

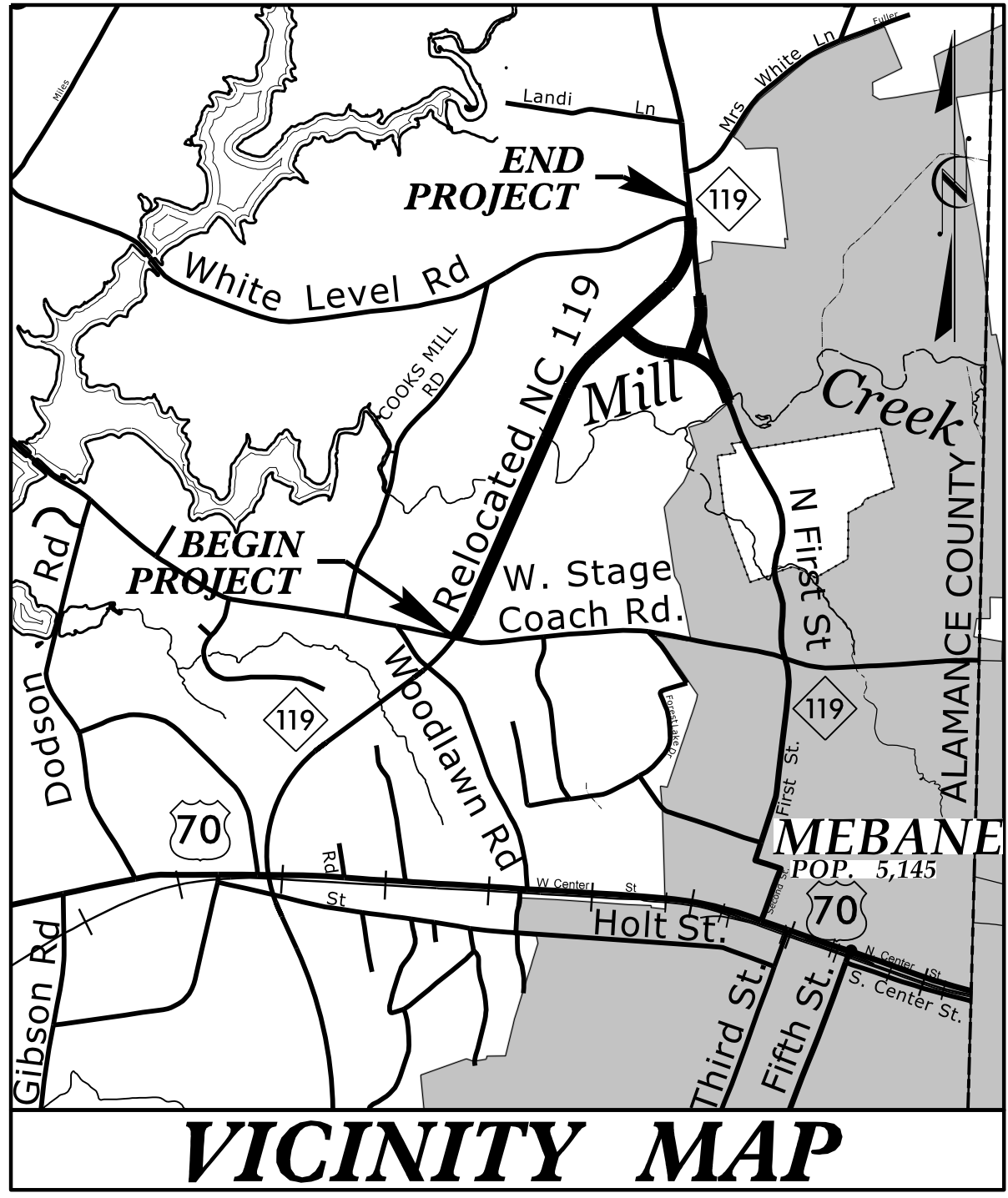
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05/30/17

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols
See 1C Sheet Series For Survey Control



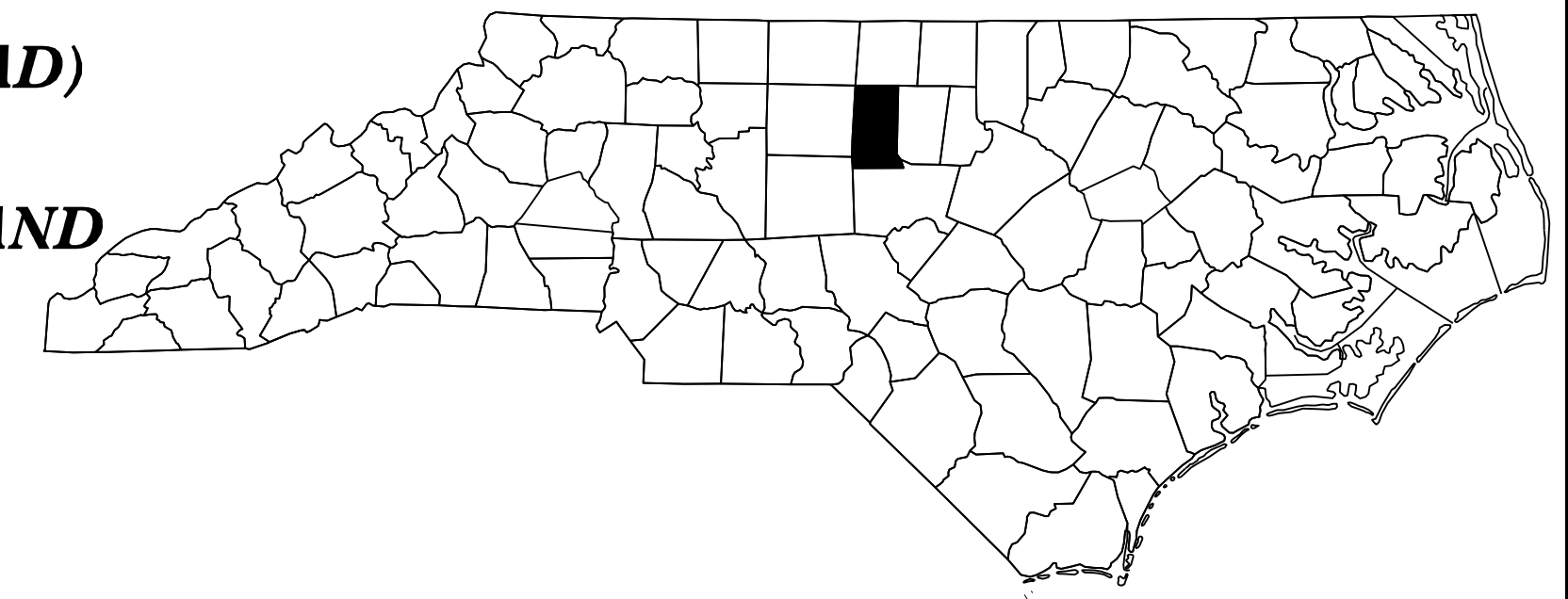
NOT TO SCALE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ALAMANCE COUNTY

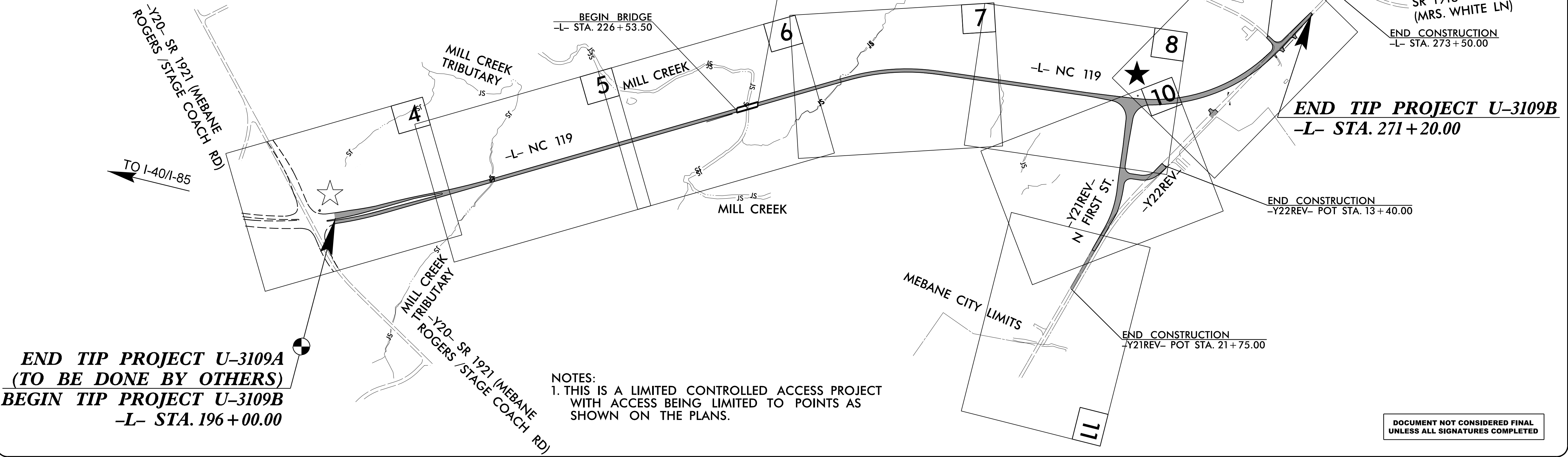
LOCATION: NC 119 RELOCATION FROM NORTH OF SR 1921 (MEBANE ROGERS/STAGE COACH ROAD) TO SOUTH OF SR 1918 (MRS. WHITE LANE)
TYPE OF WORK: GRADING, PAVING, DRAINAGE, SIGNALS, AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3109B	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34900.1.FR3	STP-0119(11)	PE	
34900.2.3	STP-0119(8)	RW	
34900.2.3	STP-0119(8)	UTILITIES	
34900.3.4	STP-0119(8)	CONSTRUCTION	



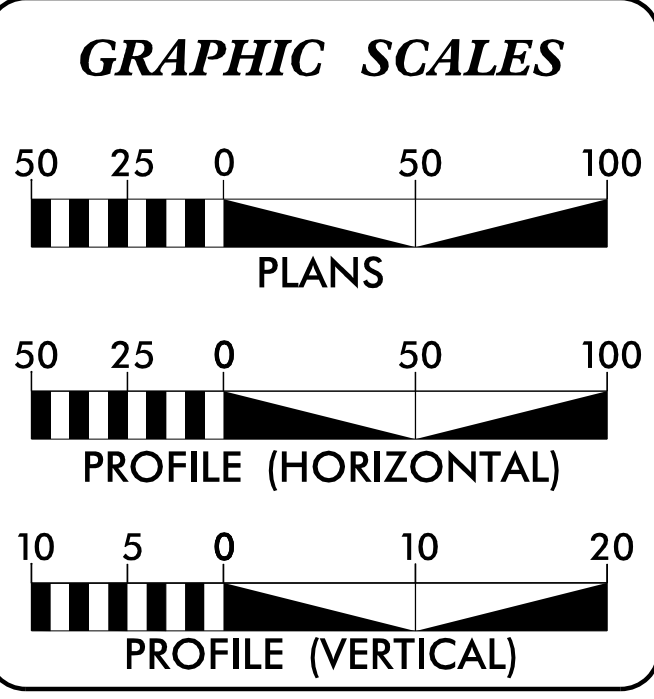
TIP PROJECT: U-3109B

CONTRACT: C204106



NOTES:
1. THIS IS A LIMITED 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 2018 =	8,810
ADT 2038 =	10,980
K =	9 %
D =	65 %
T =	5 % *
V =	50 MPH
(* TTST=1% + DUAL=4%)	
FUNC CLASS =	
MAJOR COLLECTOR REGIONAL TIER	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-3109B	1.394 mi
LENGTH STRUCTURE TIP PROJECT U-3109B	0.030 mi
TOTAL LENGTH OF TIP PROJECT U-3109B	1.424 mi

PLANS PREPARED BY: 6/12/2018

DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NORTH CAROLINA 28210
(704) 332-2289
NC LICENSE NO. C-2213

FOR DIVISION OF HIGHWAYS

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: AUGUST 30, 2017

LETTING DATE: JULY 17, 2018

CHRISTOPHER K. HAIRE, PE
PROJECT ENGINEER

MICHAEL D. HAGE, PE
PROJECT DESIGN ENGINEER

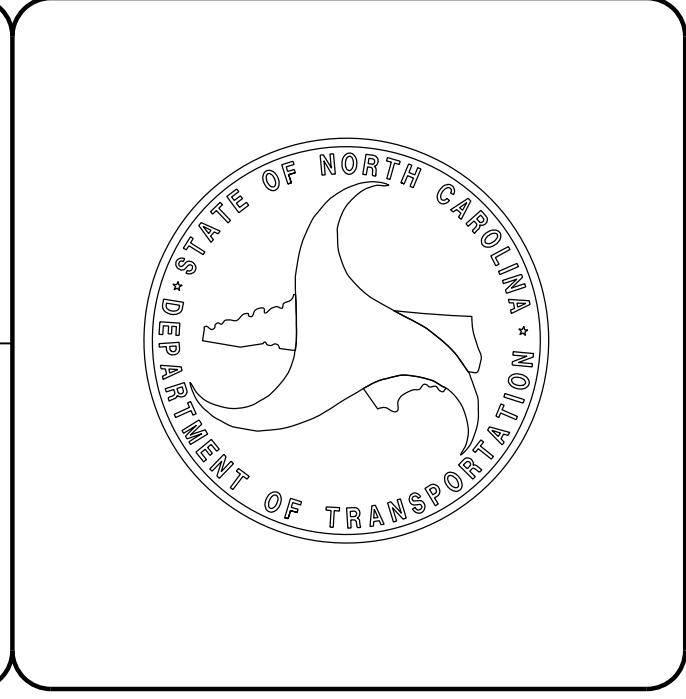
NC DOT CONTACT:
TATIA L. WHITE, PE, PLS
SENIOR PROJECT MANAGER

HYDRAULICS ENGINEER

DocuSigned by: 6/12/2018
Ryan Mitchell
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

DocuSigned by: 6/12/2018
Christopher K. Haire
SIGNATURE: P.E.



6/12/2018 4:08:46 PM R:\U3109B\Roadway\Proj\U3109B_Rdy_Tsh.dgn

5/14/19

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	1-A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	
DocuSigned by: Christopher K. Hove 6/12/2018	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES & LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C-1 THRU 1C-3	SURVEY CONTROL SHEETS
2A-1 THRU 2A-5	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B-1 THRU 2B-2	DETOUR PLAN AND PROFILE SHEETS
2C-1	GUARDRAIL DETAIL SHEET
2D-1 THRU 2D-2	DITCH DETAIL SHEETS
3B-1	EARTHWORK SUMMARY, GUARDRAIL SUMMARY, SUMMARY OF PAVEMENT REMOVAL, SHOULDER BERM GUTTER
3D-1 THRU 3D-2	DRAINAGE SUMMARY SHEET
3G-1	GEOTECHNICAL SUMMARY SHEET
3P-1	PARCEL INDEX SHEET
4 THRU 11	PLAN SHEETS
12 THRU 16	PROFILE SHEETS
TMP-1 THRU TMP-16	TRAFFIC CONTROL PLANS
PMP-1 THRU PMP-7	PAVEMENT MARKING PLANS
EC-1 THRU EC-18	EROSION CONTROL PLANS
RF-1	REFORESTATION PLANS
SIGN-1 THRU SIGN-11	SIGNING PLANS
SIG-1 THRU SIG-4	SIGNAL PLANS
SIG M-1 THRU SIG M-8	SIGNAL PLANS
UC-1 THRU UC-7	UTILITY CONSTRUCTION PLANS
UD-1 THRU UD-6	UTILITY BY OTHERS PLANS
X-1	CROSS-SECTION INDEX SHEET
X-1A	CROSS-SECTION SUMMARY SHEETS
X-2 THRU X-59	CROSS-SECTIONS
S-1 THRU S-29	STRUCTURE PLANS
C-1 THRU C-5	CULVERT PLANS

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. 560.01

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

BERM DITCHES:
 BERM DITCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 240.01 AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

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

DRIVEWAYS:
 DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3 FOOT RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS 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.

UTILITIES:
 UTILITY OWNERS ON THIS PROJECT ARE
 Duke Energy Distribution Power, Duke Energy Transmission Power, AT&T NC, CenturyLink, Time Warner Cable TV, Mebane Water, Orange-Alamance Water.
 ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:
 ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS.

ROCK
 ROCK IS ANTICIPATED BETWEEN -L- STA. 231+75 TO 232+75. BLASTING MAY BE REQUIRED FOR EXCAVATION ON THE PROJECT. SEE SECTION 220 OF THE STANDARD SPECIFICATIONS AND IF APPLICABLE, ROCK BLASTING PROVISION.

EFF. 01-16-2018
 REV.

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
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.01	Guide for Grading Subgrade - Interstate and Freeway
225.04	Method of Obtaining Super-elevation - Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersections
240.01	Guide for Berm Ditch Construction
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 4 - MAJOR STRUCTURES	
422.01	Bridge Approach Fills - Type I Standard Approach Fill
422.03	Reinforced Bridge Approach Fills - Type A Alternate Approach Fill for Integral Abutment
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Super-elevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.02	Concrete Endwall and Sluice Gate - 15" thru 36" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide 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
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.51	Brick Manhole - 12" thru 36" Pipe
840.52	Precast Manhole - 4', 5' and 6' Diameter
840.53	Precast Manhole with Masonry Base - 12" thru 42" Pipe
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
848.02	Driveway Turnout - Radius Type
848.04	Street Turnout
852.10	Median Construction - with Curb and Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
866.02	Woven Wire Fence - with Wood Post
866.03	Woven Wire Fence - with Steel Post
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.03	Drainage Ditches with Class 'A' Rip Rap
876.04	Drainage Ditches with Class 'B' Rip Rap

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6/09/2018 10:30 AM
B:\1\2018\Roadway\19101\U3109B_Rdy_1-A.dgn
6/12/2018 10:30 AM

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

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
Computed Property Corner	-----
Property Monument	□ EGM
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	⊗-s-⊗-s-
Potential Contamination Area: Soil	⊗-s-⊗-s-
Known Contamination Area: Water	⊗-w-⊗-w-
Potential Contamination Area: Water	⊗-w-⊗-w-
Contaminated Site: Known or Potential	-----

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

Stream or Body of Water	-----
Hydro, Pool or Reservoir	-----
Jurisdictional Stream	----- 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	○
Switch	□
RR Abandoned	-----
RR Dismantled	-----

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

RIGHT OF WAY & PROJECT CONTROL:

Secondary Horiz and Vert Control Point	-----
Primary Horiz Control Point	-----
Primary Horiz and Vert Control Point	-----
Exist Permanent Easement Pin and Cap	◆
New Permanent Easement Pin and Cap	◆
Vertical Benchmark	△
Existing Right of Way Marker	△
Existing Right of Way Line	-----
New Right of Way Line	-----
New Right of Way Line with Pin and Cap	-----
New Right of Way Line with Concrete or Granite RW Marker	-----
New Control of Access Line with Concrete CA Marker	-----
Existing Control of Access	-----
New Control of Access	-----
Existing Easement Line	-----
New Temporary Construction Easement	-----
New Temporary Drainage Easement	-----
New Permanent Drainage Easement	-----
New Permanent Drainage / Utility Easement	-----
New Permanent Utility Easement	-----
New Temporary Utility Easement	-----
New Aerial Utility Easement	-----

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	-----
Proposed Slope Stakes Fill	-----
Proposed Curb Ramp	-----
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	⊕
Pavement Removal	-----

VEGETATION:

Single Tree	⊗
Single Shrub	⊗

Hedge	-----
Woods Line	-----
Orchard	-----
Vineyard	-----

EXISTING STRUCTURES:

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

UTILITIES:

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

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.*)	-----
U/G Telephone Cable LOS C (S.U.E.*)	-----
U/G Telephone Cable LOS D (S.U.E.*)	-----
U/G Telephone Conduit LOS B (S.U.E.*)	-----
U/G Telephone Conduit LOS C (S.U.E.*)	-----
U/G Telephone Conduit LOS D (S.U.E.*)	-----
U/G Fiber Optics Cable LOS B (S.U.E.*)	-----
U/G Fiber Optics Cable LOS C (S.U.E.*)	-----
U/G Fiber Optics Cable LOS D (S.U.E.*)	-----

WATER:

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

TV:

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

GAS:

Gas Valve	◇
Gas Meter	⊕
U/G Gas Line LOS B (S.U.E.*)	-----
U/G Gas Line LOS C (S.U.E.*)	-----
U/G Gas Line LOS D (S.U.E.*)	-----
Above Ground Gas Line	-----

SANITARY SEWER:

Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	-----
Above Ground Sanitary Sewer	-----
SS Forced Main Line LOS B (S.U.E.*)	-----
SS Forced Main Line LOS C (S.U.E.*)	-----
SS Forced Main Line LOS D (S.U.E.*)	-----

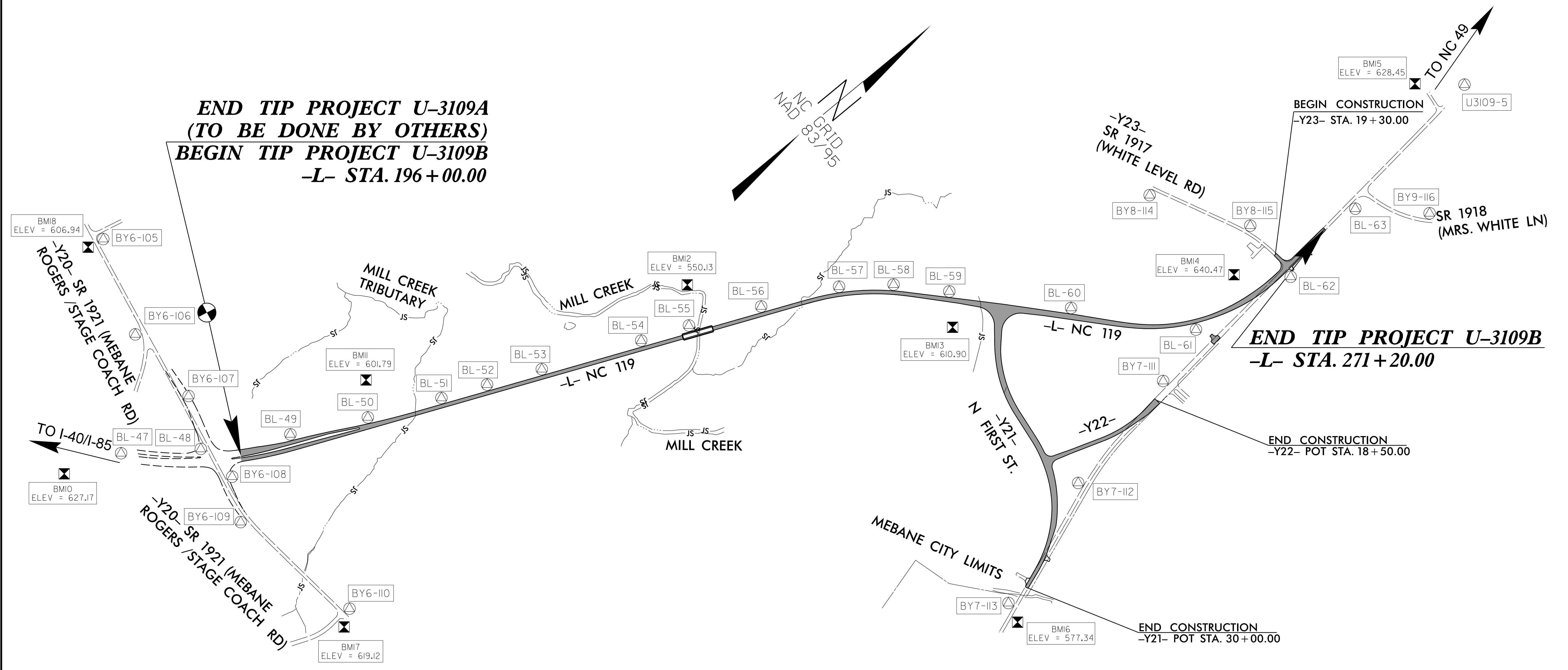
MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line LOS B (S.U.E.*)	-----
U/G Tank; Water, Gas, Oil	-----
Underground Storage Tank, Approx. Loc.	-----
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.

12/01/2005

U-3109B SURVEY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	1C-1
Location and Surveys	



NOTES

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.doh.dot.state.nc.us/preconstruct/highway/location/project/)

THE FILES TO BE FOUND ARE AS FOLLOWS:
 u3109_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.

⊙ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
 PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "U3109-3" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF
 NORTHING: 854967.949(±) EASTING: 1914759.215(±)
 ELEVATION: 659.17'(±)
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999952720
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U3109-3" TO -L- STATION 196+00.00 IS
 N 09°55'40" E 3,863.96'
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
 VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

5/18/2018 R:\U3109B\LocationSurveys\U3109B_1s_1c_1_180404.dgn

U-3109B SURVEY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	1C-2
Location and Surveys	

BASELINE DATA

BL	POINT	DESC.	NORTH	EAST	ELEVATION	BY6	POINT	DESC.	NORTH	EAST	ELEVATION
1		U3109-1	841207.2430	1910433.6690	652.45	105		BY6-105	858981.0369	1913705.1494	609.14
2		U3109-2	842594.1850	1911069.6640	662.33	106		BY6-106	858777.8898	1914367.7055	618.48
11		BL-11	842935.1813	1911240.8024	660.29	107		BY6-107	858722.8856	1914893.1166	611.91
12		BL-12	843908.5105	1911723.3920	658.75	A48		BL-48	858598.4102	1915222.1811	620.75
13		BL-13	844501.1301	1912073.6535	648.88	108		BY6-108	858607.6847	1915484.2109	615.96
14		BL-14	844853.6751	1912517.3724	648.03	109		BY6-109	858529.0053	1915754.6452	621.17
15		BL-15	845315.8353	1913076.7768	652.92	110		BY6-110	858657.2304	1916664.6650	617.52
16		BL-16	845848.9147	1913349.9812	656.41						
17		BL-17	846419.4604	1913392.7329	654.49						
18		BL-18	846858.3679	1913321.7203	636.01						
19		BL-19	847471.1937	1913221.3832	627.77						
20		BL-20	847868.8513	1913138.4992	620.67						
21		BL-21	848217.6937	1913094.1475	624.29						
22		BL-22	848490.4456	1913098.3930	614.81						
23		BL-23	848869.8439	1913106.5024	626.44						
24		BL-24	849148.4382	1913163.0953	607.22						
25		BL-25	849487.6124	1913233.2195	612.34						
26		BL-26	849899.6914	1913314.9945	593.73						
27		BL-27	850516.3358	1913431.6550	589.88						
28		BL-28	850894.6500	1913476.8357	596.23						
29		BL-29	851288.7502	1913508.4395	602.40						
30		BL-30	851895.4312	1913497.3135	606.27						
31		BL-31	852411.5035	1913436.7536	634.96						
32		BL-32	852791.4258	1913356.9529	638.29						
33		BL-33	853336.4768	1913204.3215	614.32						
34		BL-34	853678.5347	1913081.3979	621.28						
35		BL-35	854368.3176	1912775.1138	636.34						
36		BL-36	854711.0960	1912687.5904	643.16						
37		BL-37	855041.8732	1912713.6757	640.53						
38		BL-38	855328.3479	1912584.9867	632.15						
39		BL-39	855744.5961	1912541.0481	616.86						
40		BL-40	856130.1446	1912720.1433	604.92						
41		BL-41	856416.4627	1912799.7596	611.70						
42		BL-42	856710.0891	1913023.7769	609.49						
43		BL-43	856939.8322	1913267.2767	619.34						
44		BL-44	857292.5041	1913729.0431	635.68						
45		BL-45	857520.1869	1914039.8519	626.29						
46		BL-46	857816.9044	1914446.3536	618.85						
47		BL-47	858174.4072	1914908.0297	632.74						
48		BL-48	858598.4102	1915222.1811	620.75						
49		BL-49	859112.2576	1915540.8273	617.56						
50		BL-50	859568.5487	1915800.3209	609.17						
51		BL-51	860030.5966	1916010.8092	597.20						
52		BL-52	860315.9274	1916123.5728	592.73						
53		BL-53	860659.7071	1916279.1091	580.13						
54		BL-54	861281.7097	1916560.1487	577.42						
55		BL-55	861605.0338	1916694.3011	549.69						
56		BL-56	862047.2565	1916887.3181	594.35						
57		BL-57	862519.3838	1917099.3052	597.79						
58		BL-58	862792.7584	1917329.6809	614.68						
59		BL-59	863048.4901	1917600.0746	619.30						
60		BL-60	863585.5585	1918206.4639	612.75						
61		BL-61	864167.2846	1918805.1434	624.69						
62		BL-62	864855.4072	1918900.0590	634.36						
63		BL-63	865473.1908	1918831.0609	636.57						
5		U3109-5	866558.2770	1918704.1310	631.16						
6		U3109-6	867837.1210	1918347.6260	629.09						

BENCHMARK DATA

.....

BM10 ELEVATION = 627.17
N 857799 E 1914773
BL STATION 193+36.00 214 RIGHT
RR SPIKE IN BASE OF 15" MAPLE
.....

BM11 ELEVATION = 601.79
N 859730 E 1915569
BL STATION 213+81.00 278 LEFT
RR SPIKE IN BASE OF 30" POPLAR
.....

BM12 ELEVATION = 550.13
N 861759 E 1916448
BL STATION 235+97.00 288 LEFT
RR SPIKE IN BASE OF 30" SWEETGUM
.....

BM13 ELEVATION = 610.90
N 862935 E 1917774
BL STATION 253+39.00 200 RIGHT
RR SPIKE IN BASE OF 24" POPLAR
.....

BM14 ELEVATION = 604.47
N 864588 E 1918693
BL STATION 273+31.00 169 LEFT
RR SPIKE IN BASE OF 60" WILLOW OAK
.....

BM15 ELEVATION = 628.45
N 866314 E 1918484
BL STATION 291+21.00 247 LEFT
RR SPIKE IN BASE OF 12" TWIN MAPLE
.....

BM16 ELEVATION = 577.34
N 862010 E 1919524
BY7 STATION 27+03.00
S 53+01'16.5" E DIST 97.83
RR SPIKE IN BASE OF 17" WHITEOAK
.....

BM17 ELEVATION = 619.12
N 858576 E 1916733
BY6 STATION 35+36.00
S 39+54'40.0" E DIST 106.07
RR SPIKE IN BASE OF 20" POPLAR
.....

BM18 ELEVATION = 606.94
N 858876 E 1913721
BY6 STATION 5+46.00 95 RIGHT
RR SPIKE IN BASE OF 16" MAPLE
.....

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "U3109-3" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 854967.949(ft) EASTING: 1914759.215(ft) ELEVATION: 659.17'(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9999552720 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U3109-3" TO -L- STATION 196+00.00 IS N 09°55'40" E 3,863.96' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

U-3109B SURVEY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	1C-3
Location and Surveys	

L

TYPE	STATION	NORTH	EAST
PC	190+00.00	858305.2413	1915053.2452
CS	198+48.15	858991.5685	1915544.6084
ST	200+39.64	859165.9172	1915623.7630
TS	233+92.57	862236.3862	1916970.7549
SC	235+92.57	862417.7924	1917054.8852
CS	240+68.74	862802.6044	1917332.3538
ST	242+68.74	862939.7275	1917477.8989
TS	254+74.62	863748.1792	1918372.6381
SC	257+24.62	863922.0391	1918552.1165
CS	266+02.08	864723.1693	1918859.3893
ST	268+52.08	864972.4575	1918842.2090
PC	272+18.03	865336.4485	1918804.3906
PT	273+82.95	865500.5049	1918787.4975
POT	275+38.53	865655.2840	1918771.7034

Y21

TYPE	STATION	NORTH	EAST
POT	10+00.00	863271.1442	1917844.6884
PC	12+61.56	863099.7435	1918042.2612
PT	17+54.63	862901.8934	1918486.0966
PC	19+54.63	862877.1405	1918684.5589
PT	28+68.36	862336.9392	1919365.0720
PC	30+27.81	862187.3140	1919420.1924
PT	32+18.99	862008.1558	1919486.8993

Y22

TYPE	STATION	NORTH	EAST
POT	10+00.00	862840.0957	1918847.1043
PC	14+03.34	863222.4256	1918975.5685
PT	17+60.45	863574.6686	1919014.5836
POT	25+60.57	864370.5079	1918931.8964

-L- NEW PRELIMINARY R/W MONUMENTS

ALIGN	STATION	OFFSET	NORTH	EAST
L	200+84.84	-130.00	859259.5415	1915522.8761
L	215+50.00	-130.00	860601.2668	1916111.4809
L	225+00.00	-150.00	861479.2695	1916474.8143
L	225+00.00	-130.00	861471.2348	1916493.1295
L	233+92.57	-150.00	862296.6467	1916833.3916
L	233+92.57	-130.00	862288.6120	1916851.7067
L	235+92.57	-130.00	862477.3519	1916939.3314
L	240+68.75	-130.00	862893.4338	1917239.3481
L	242+68.74	-130.00	863036.1815	1917390.7404
L	249+34.25	130.00	863289.4444	1918058.8491
L	254+74.62	-130.00	863844.6365	1918285.4831
L	254+74.62	130.00	863651.7220	1918459.7932
L	257+24.62	-130.00	864008.9113	1918455.4044
L	257+24.62	130.00	863835.1669	1918648.8286
L	259+34.43	-130.00	864158.2753	1918567.6450
L	259+57.23	-111.12	864165.9607	1918594.4379
L	259+90.39	-130.00	864201.2368	1918593.0306
L	261+00.00	130.00	864182.7851	1918874.3199
L	261+00.00	183.86	864160.8723	1918923.5159
L	264+70.00	130.00	864577.0015	1918981.2482
L	264+72.70	88.00	864584.5212	1918939.8221
L	266+00.44	-130.07	864721.7890	1918729.3209
L	266+02.08	88.00	864723.1131	1918947.3893
L	266+60.00	81.00	864784.4785	1918939.0650
L	267+37.47	-133.46	864847.5012	1918720.2001
L	267+99.91	-132.41	864907.4774	1918715.7644
L	269+00.00	-130.00	865006.6893	1918707.9525
L	269+00.00	-23.00	865017.7470	1918814.3796
L	269+70.20	57.00	865095.8358	1918886.6969
L	269+69.37	77.00	865097.0804	1918906.6780
L	271+20.00	77.00	865246.9033	1918891.1088
L	271+20.00	-23.00	865236.5690	1918791.6442

-Y21- NEW PRELIMINARY R/W MONUMENTS

ALIGN	STATION	OFFSET	NORTH	EAST
Y21	11+90.77	-90.00	863214.1160	1918047.7654
Y21	12+61.56	-90.00	863167.7264	1918101.2385
Y21	17+54.63	-90.00	862991.2015	1918497.2354
Y21	19+54.63	-90.00	862966.4486	1918695.6977
Y21	20+25.00	-90.00	862953.5562	1918772.5535
Y21	20+25.00	109.32	862758.5423	1918731.3304
Y21	22+20.97	-90.00	862884.2716	1918977.7628
Y21	28+68.36	-90.00	862368.0504	1919449.5238
Y21	30+00.00	-90.00	862244.5221	1919495.0303
Y21	30+00.00	-30.00	862223.7814	1919438.7292

-Y22- NEW PRELIMINARY R/W MONUMENTS

ALIGN	STATION	OFFSET	NORTH	EAST
Y22	11+38.05	-60.00	862990.0678	1918834.1991
Y22	11+38.07	60.00	862951.8654	1918947.9557
Y22	14+03.34	-60.00	863241.5359	1918918.6933
Y22	15+20.53	68.89	863323.1782	1919072.7181
Y22	17+60.45	-60.00	863568.4680	1918954.9048
Y22	18+50.00	-60.00	863657.5409	1918945.6502
Y22	18+50.00	-30.00	863660.6412	1918975.4896
Y22	23+52.92	-30.00	864160.8723	1918923.5159
Y22	23+79.80	-76.67	864182.7851	1918874.3199

-L- NEW PRELIMINARY PERMANENT UTILITY EASEMENTS

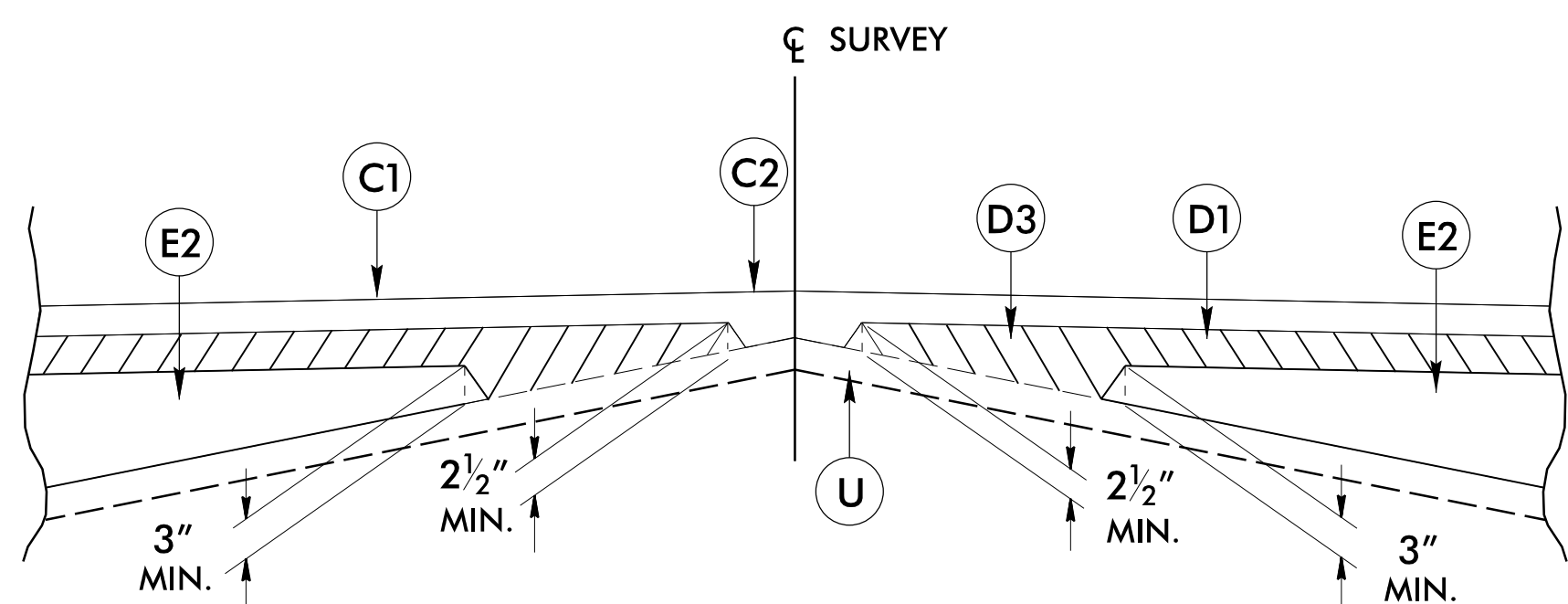
ALIGN	STATION	OFFSET	NORTH	EAST
L	260+62.12	159.75	864131.7523	1918883.4153
L	260+72.51	202.73	864123.9907	1918927.3479
L	260+79.17	154.44	864151.4473	1918886.8949
L	260+82.32	167.84	864149.0344	1918900.5527
L	261+00.00	164.27	864168.8419	1918905.6235
L	264+12.04	130.00	864513.3498	1918972.6121
L	264+70.84	116.56	864579.4075	1918967.9933
L	264+98.05	111.49	864609.5466	1918965.8860
L	265+05.00	119.10	864616.4961	1918974.1084
L	265+28.21	114.59	864642.2273	1918971.4350
L	265+30.20	106.42	864644.9019	1918963.4139
L	267+16.26	-149.92	864826.3378	1918705.3312
L	267+16.80	-133.54	864828.0322	1918721.6400
L	267+36.18	-150.51	864844.8940	1918703.3087
L	267+41.41	95.09	864870.2014	1918947.6608
L	267+41.69	108.59	864871.6180	1918961.0839
L	267+60.74	91.95	864889.8001	1918942.8062
L	267+60.99	108.22	864891.5076	1918958.9848
L	267+98.61	-156.40	864903.8426	1918692.0140
L	268+32.13	-156.62	864936.5349	1918688.4722
L	268+32.15	-131.69	864939.1117	1918713.2735
L	269+24.37	76.96	865052.3177	1918911.2885
L	269+33.00	-23.00	865050.5680	1918810.9696
L	269+43.37	76.97	865071.2198	1918909.3282
L	269+79.57	-61.26	865092.9385	1918768.0986
L	269+81.48	-45.74	865096.4442	1918783.3423
L	269+99.42	-63.71	865112.4297	1918763.6161
L	270+01.30	-48.47	865115.8715	1918778.5820
L	271+20.00	-30.84	865235.7586	1918783.8438

PROJECT REFERENCE NO. U-3109B	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER SEAL 019740 CHRISTOPHER K. HAICE 6/12/2018	PAVEMENT DESIGN ENGINEER SEAL 038176 SHIHAI ZHANG 6/12/2018
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

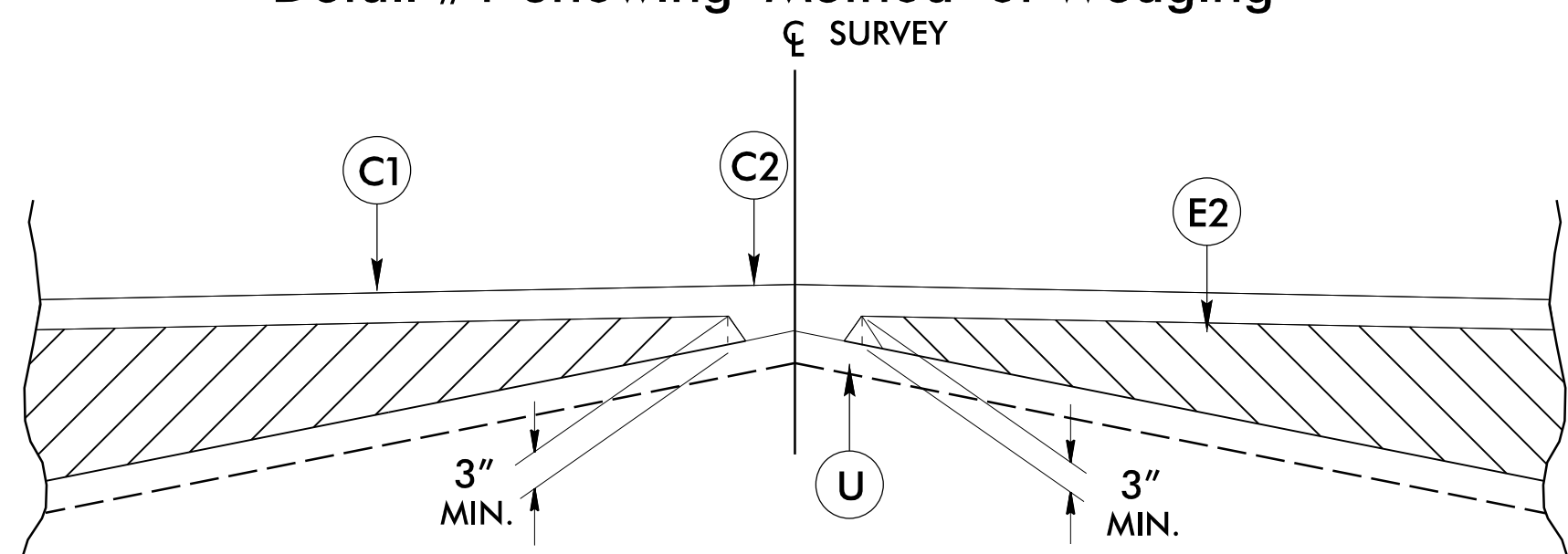
PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

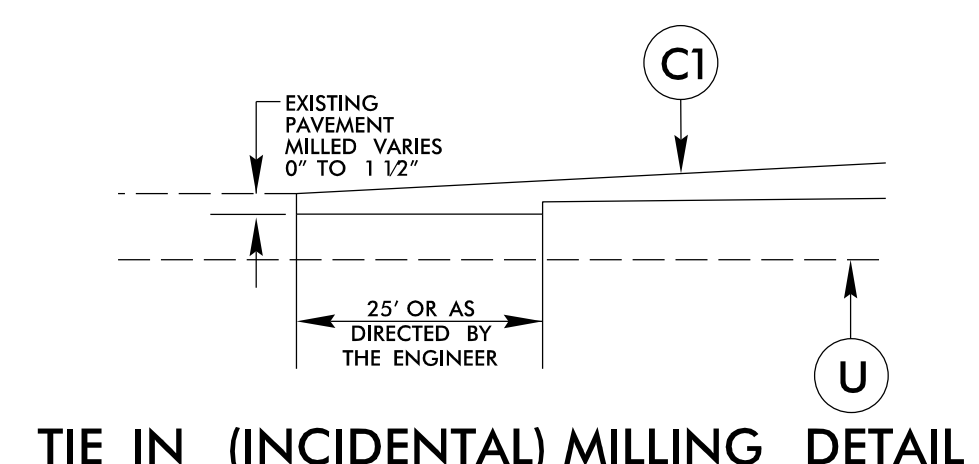
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	J	PROP. 8" AGGREGATE BASE COURSE.	R3	SHOULDER BERM GUTTER.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1½" IN DEPTH OR GREATER THAN 2" IN DEPTH.	K	BASE TO BE TREATED WITH LIME (METHOD-SLURRY) TO A DEPTH OF 8", AT A RATE OF 20 LBS. PER SQ. YD. AS DIRECTED BY THE ENGINEER. OR BASE TO BE TREATED WITH CEMENT TO A DEPTH OF 7", AT A RATE OF 55 LBS. PER SQ. YD. AS DIRECTED BY THE ENGINEER.	T	EARTH MATERIAL.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.		U	EXISTING PAVEMENT.	
D2	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	N	GEOTEXTILE FOR PAVEMENT STABILIZATION.	W1	VARIABLE DEPTH ASPHALT PAVEMENT.
D3	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 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD.	W2	VARIABLE DEPTH ASPHALT PAVEMENT.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R1	1'-6" CONCRETE CURB AND GUTTER.	NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.	
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 5½" IN DEPTH.	R2	2'-6" CONCRETE CURB AND GUTTER.		



Detail #1 Showing Method of Wedging

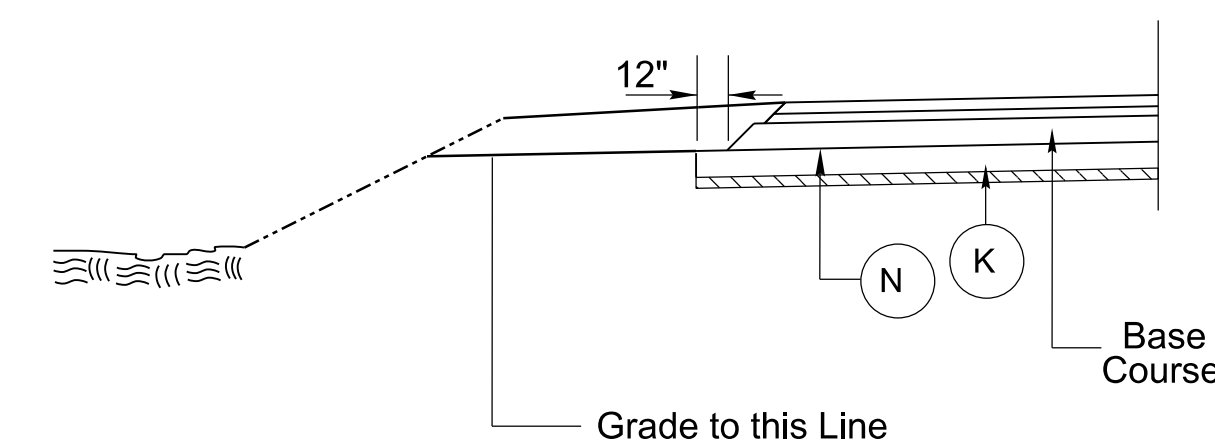


Detail #2 Showing Method of Wedging



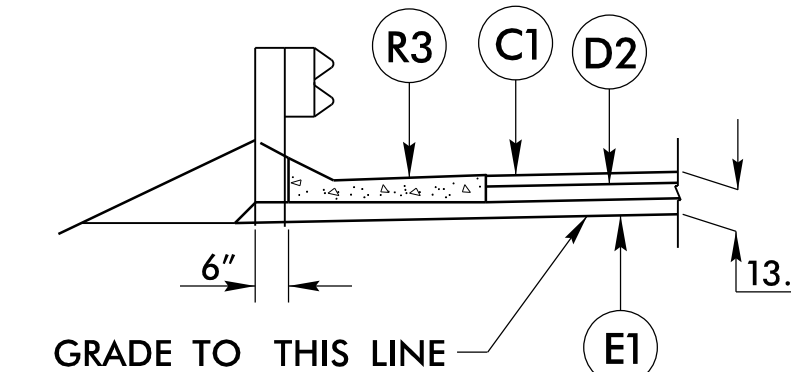
TIE IN (INCIDENTAL) MILLING DETAIL

- L- STA. 196+00.00 TO -L- STA. 196+25.00
- Y21REV- STA. 21+50.00 TO -Y21REV- STA. 21+75.00
- Y22REV- STA. 13+15.00 TO -Y22REV- STA. 13+40.00
- Y23REV- STA. 19+05.00 TO -Y23REV- STA. 19+30.00



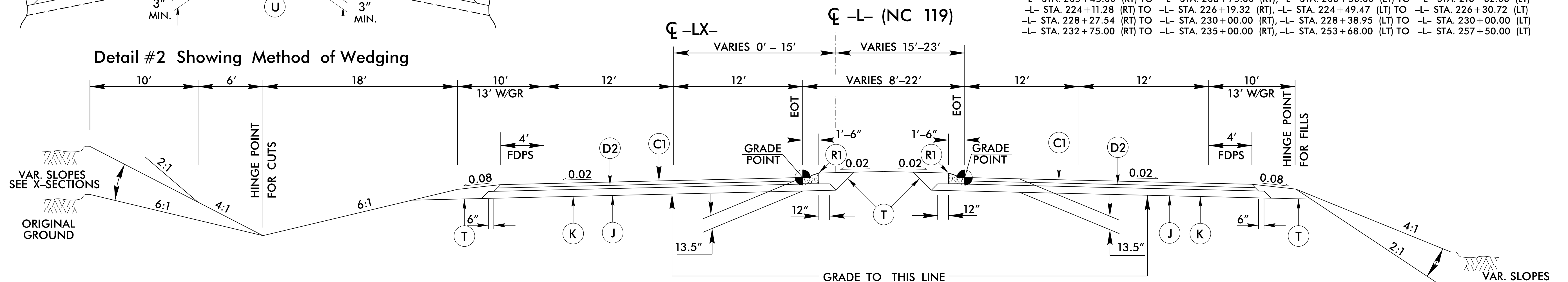
GEOTEXTILE FOR PAVEMENT STABILIZATION TO BE USED IN CONJUNCTION WITH TYPICAL SECTION NO. 1 & 2 (THESE AREAS WILL BE INVESTIGATED DURING CONSTRUCTION)

- L- STA. 206+00.00 TO -L- STA. 209+50.00, -L- STA. 213+25.00 TO -L- STA. 219+00.00
- L- STA. 224+10.00 TO -L- STA. 226+23.00, -L- STA. 228+28.00 TO -L- STA. 229+50.00
- L- STA. 233+25.00 TO -L- STA. 237+10.00, -L- STA. 245+50.00 TO -L- STA. 247+50.00



SHOULDER BERM GUTTER DETAIL (SBG)

- L- STA. 205+45.00 (RT) TO -L- STA. 208+75.00 (RT), -L- STA. 206+50.00 (LT) TO -L- STA. 210+02.00 (LT)
- L- STA. 224+11.28 (RT) TO -L- STA. 226+19.32 (RT), -L- STA. 224+49.47 (LT) TO -L- STA. 226+30.72 (LT)
- L- STA. 228+27.54 (RT) TO -L- STA. 230+00.00 (RT), -L- STA. 228+38.95 (LT) TO -L- STA. 230+00.00 (LT)
- L- STA. 232+75.00 (RT) TO -L- STA. 235+00.00 (RT), -L- STA. 253+68.00 (LT) TO -L- STA. 257+50.00 (LT)



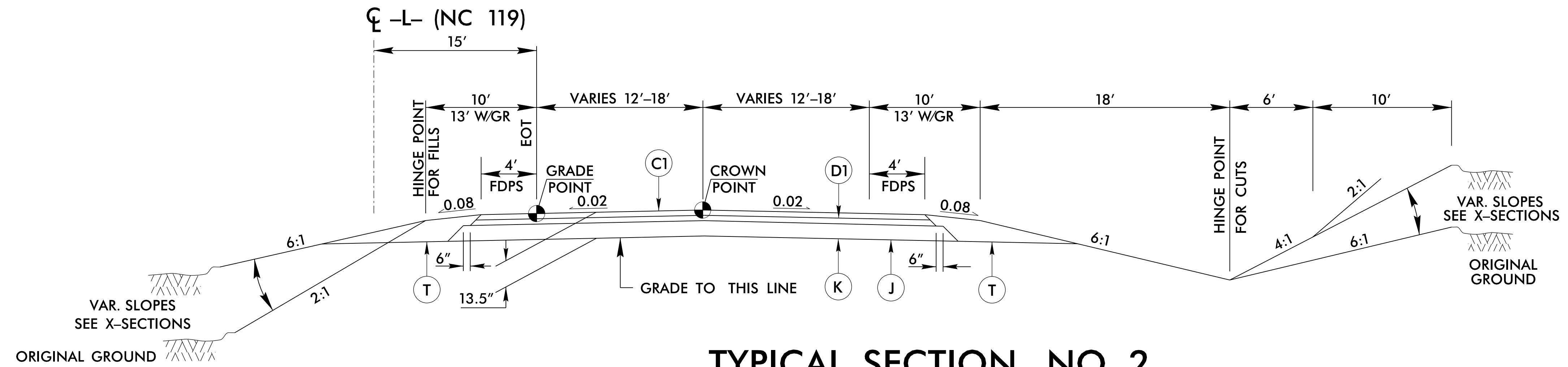
TYPICAL SECTION NO. 1

-L- STA. 196+00.00 TO -L- STA. 203+99.88

6/12/18

PROJECT REFERENCE NO. U-3109B	SHEET NO. 2A-2
ROADWAY DESIGN ENGINEER SEAL 019740 CHRISTOPHER K. HOISE 6/12/2018	PAVEMENT DESIGN ENGINEER SEAL 038176 SHIHAI ZHANG 6/12/2018
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

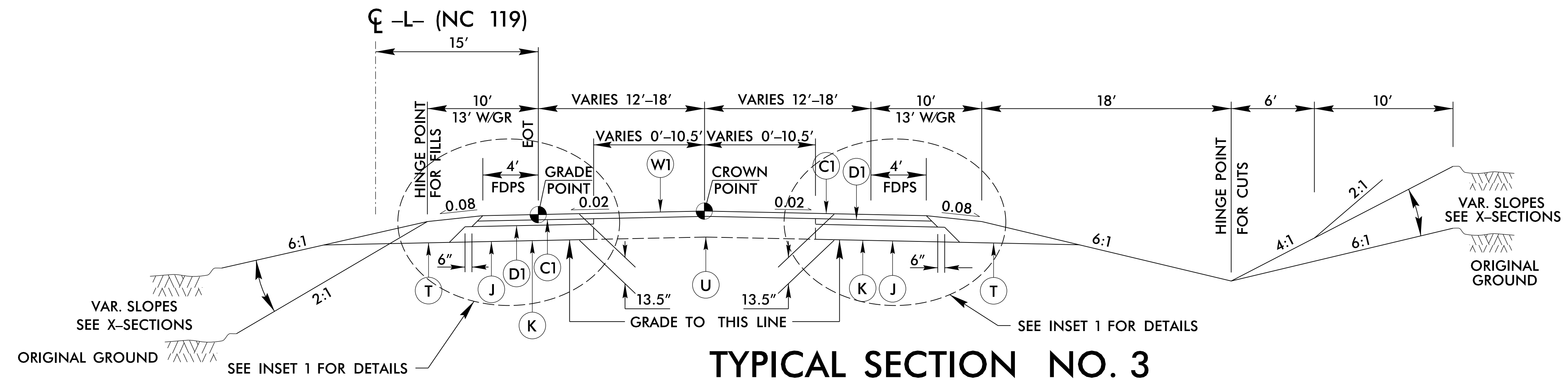
PLANS PREPARED BY:
DRMP
DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (794) 332-2289



TYPICAL SECTION NO. 2

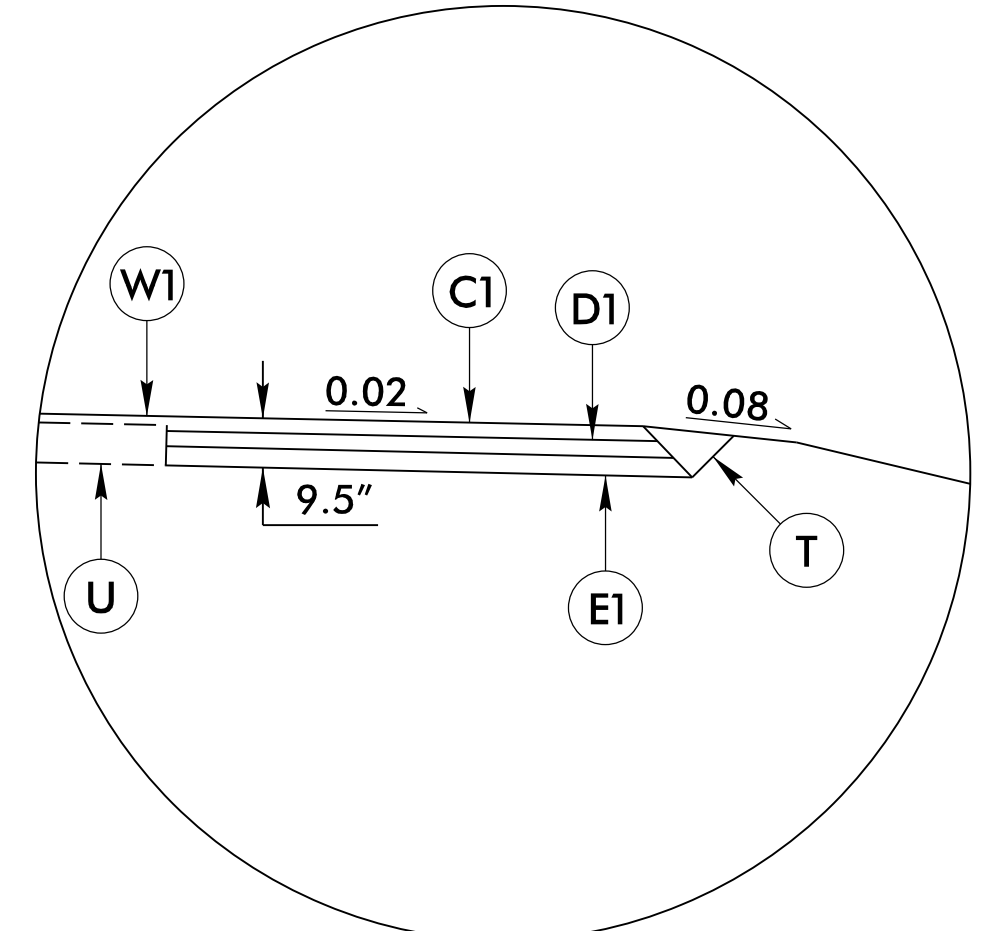
-L- STA. 203+99.88 TO -L- STA. 226+53.50 (BEGIN BRIDGE)
-L- STA. 228+13.50 (END BRIDGE) TO -L- STA. 264+20.00

PAVEMENT SCHEDULE	
FINAL PAVEMENT DESIGN	
C1	3" S9.5B
C2	VAR. S9.5B
D1	2.5" I19.5C
D2	4" I19.0C
D3	VAR. I19.0C
E1	4" B25.0C
E2	VAR. B25.0C
J	8" ABC
K	LIME/CEMENT
N	GEOTEXTILE PAVE.
P	.35 PRIME COAT
R1	1'-6" C&G
R2	2'-6" C&G
R3	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W1	WEDGING
W2	WEDGING



TYPICAL SECTION NO. 3

-L- STA. 264+20.00 TO -L- STA. 271+20.00



**INSET 1 - NARROW WIDENING
PAVEMENT DESIGN TO BE USED IN NARROW
WIDENING AREAS OF LESS THAN 8 FEET.
USE IN CONJUNCTION WITH TYPICAL SECTION NO. 3**

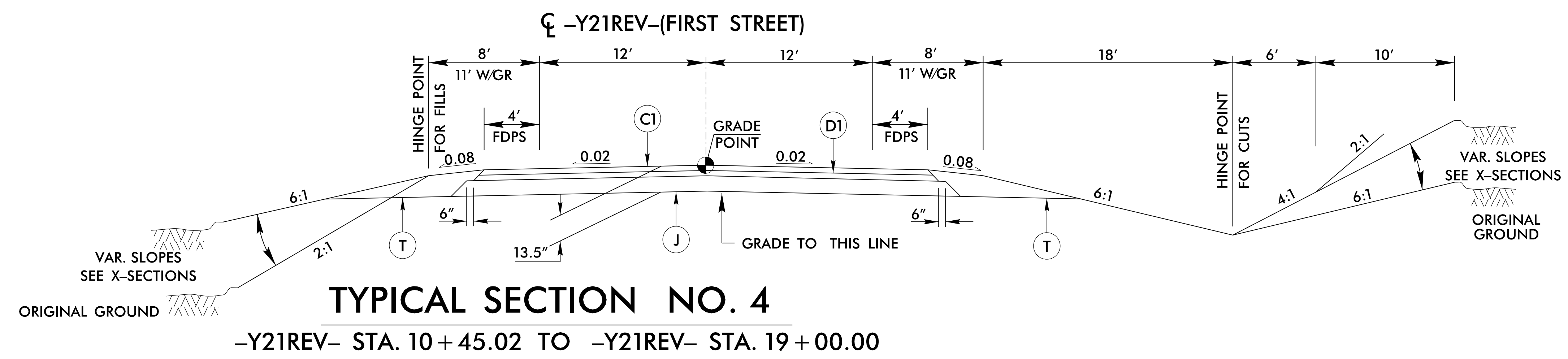
-L- STA. 266+12.88 TO -L- STA. 271+20.00

6/12/2018 1:39:11PM R:\U3109B\Roadway\Proj\U3109B_Rdy_Typ.dgn

PROJECT REFERENCE NO. U-3109B	SHEET NO. 2A-3
ROADWAY DESIGN ENGINEER SEAL 019740 CHRISTOPHER K. HARRIS	PAVEMENT DESIGN ENGINEER SEAL 038176 SHIHAI ZHANG
6/12/2018	6/12/2018

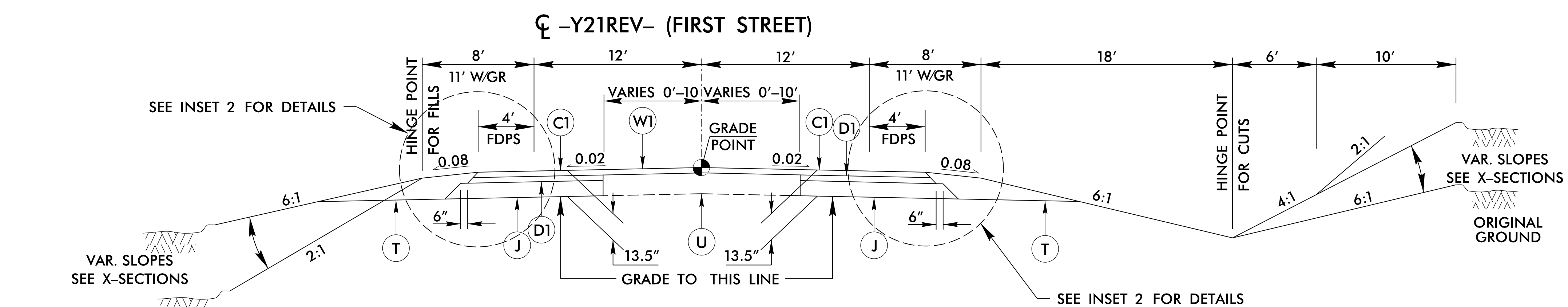
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

DRMP
DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (794) 332-2289



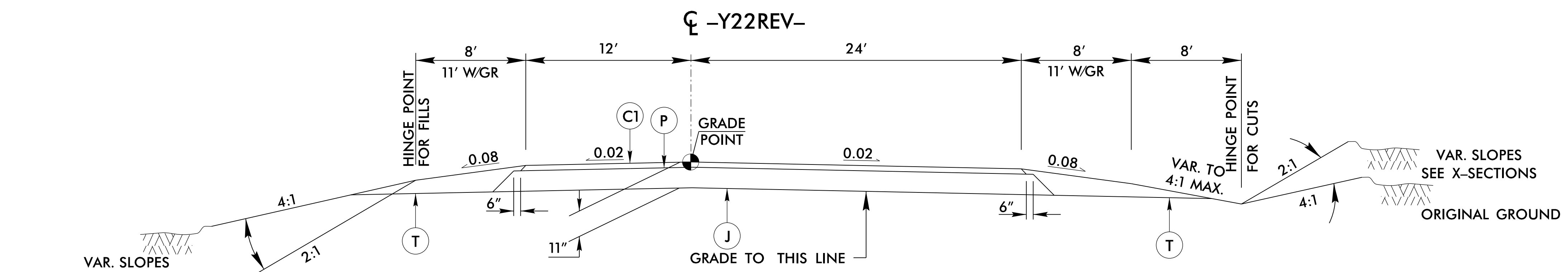
TYPICAL SECTION NO. 4

-Y21REV- STA. 10+45.02 TO -Y21REV- STA. 19+00.00



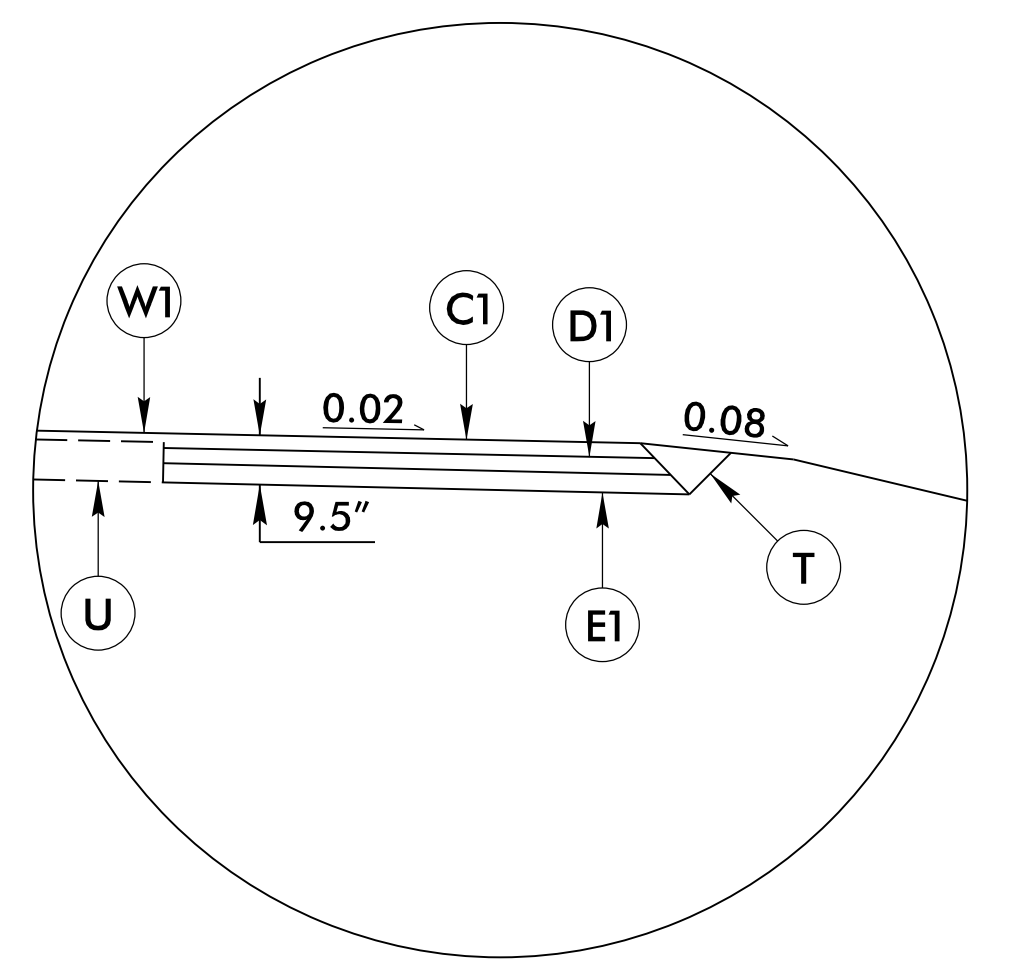
TYPICAL SECTION NO. 5

-Y21REV- STA. 19+00.00 TO -Y21REV- STA. 21+75.00



TYPICAL SECTION NO. 6

-Y22REV- STA. 10+18.00 TO -Y22REV- STA. 12+00.00



INSET 2 - NARROW WIDENING
PAVEMENT DESIGN TO BE USED IN NARROW WIDENING AREAS OF LESS THAN 8 FEET.
USE IN CONJUNCTION WITH TYPICAL SECTION NO.5.

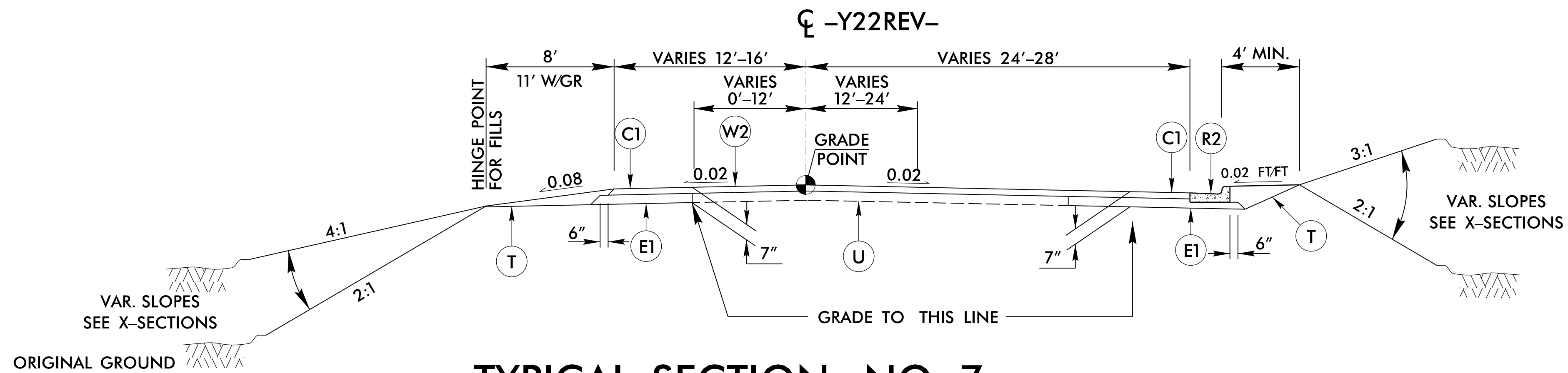
-Y21REV- STA. 19+77.65 TO -Y21REV- STA. 21+75.00

PAVEMENT SCHEDULE	
FINAL PAVEMENT DESIGN	
C1	3" S9.5B
C2	VAR. S9.5B
D1	2.5" I19.5C
D2	4" I19.0C
D3	VAR. I19.0C
E1	4" B25.0C
E2	VAR. B25.0C
J	8" ABC
K	LIME/CEMENT
N	GEOTEXTILE PAVE.
P	.35 PRIME COAT
R1	1'-6" C&G
R2	2'-6" C&G
R3	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W1	WEDGING
W2	WEDGING

6/12/2018 1:39:31 PM R:\U3109B\Roadway\Proj\U3109B_Rdy_Typ.dgn

6/12/18

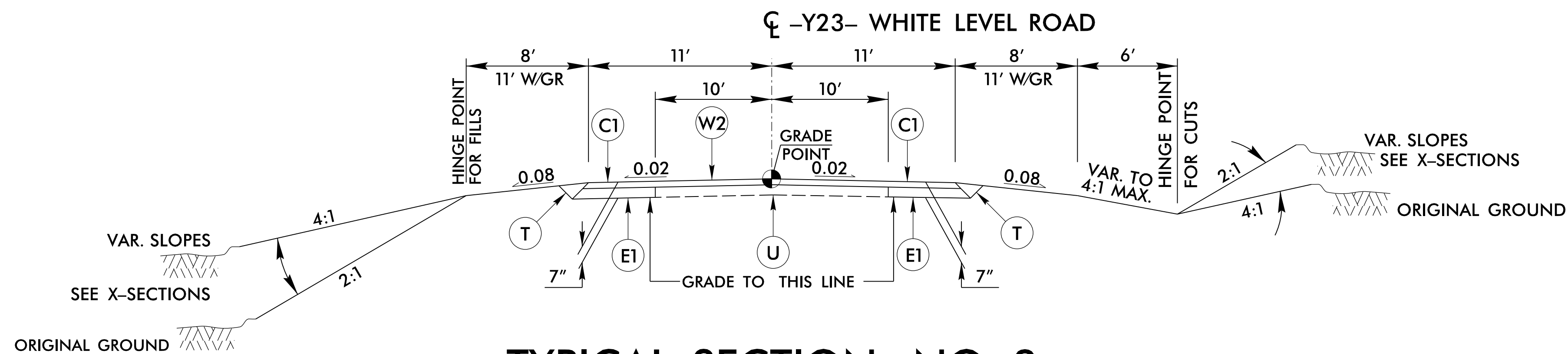
PROJECT REFERENCE NO. <i>U-3109B</i>	SHEET NO. <i>2A-4</i>
ROADWAY DESIGN ENGINEER SEAL 019740 CHRISTOPHER K. HARRIS 6/12/2018	PAVEMENT DESIGN ENGINEER SEAL 038176 SHIHAI ZHANG 6/12/2018
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



TYPICAL SECTION NO. 7
-Y22REV- STA. 12+00.00 TO -Y22REV- STA. 13+40.00

DRMP
DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (794) 332-2289

PAVEMENT SCHEDULE	
FINAL PAVEMENT DESIGN	
C1	3" S9.5B
C2	VAR. S9.5B
D1	2.5" I19.5C
D2	4" I19.0C
D3	VAR. I19.0C
E1	4" B25.0C
E2	VAR. B25.0C
J	8" ABC
K	LIME/CEMENT
N	GEOTEXTILE PAVE.
P	.35 PRIME COAT
R1	1'-6" C&G
R2	2'-6" C&G
R3	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W1	WEDGING
W2	WEDGING



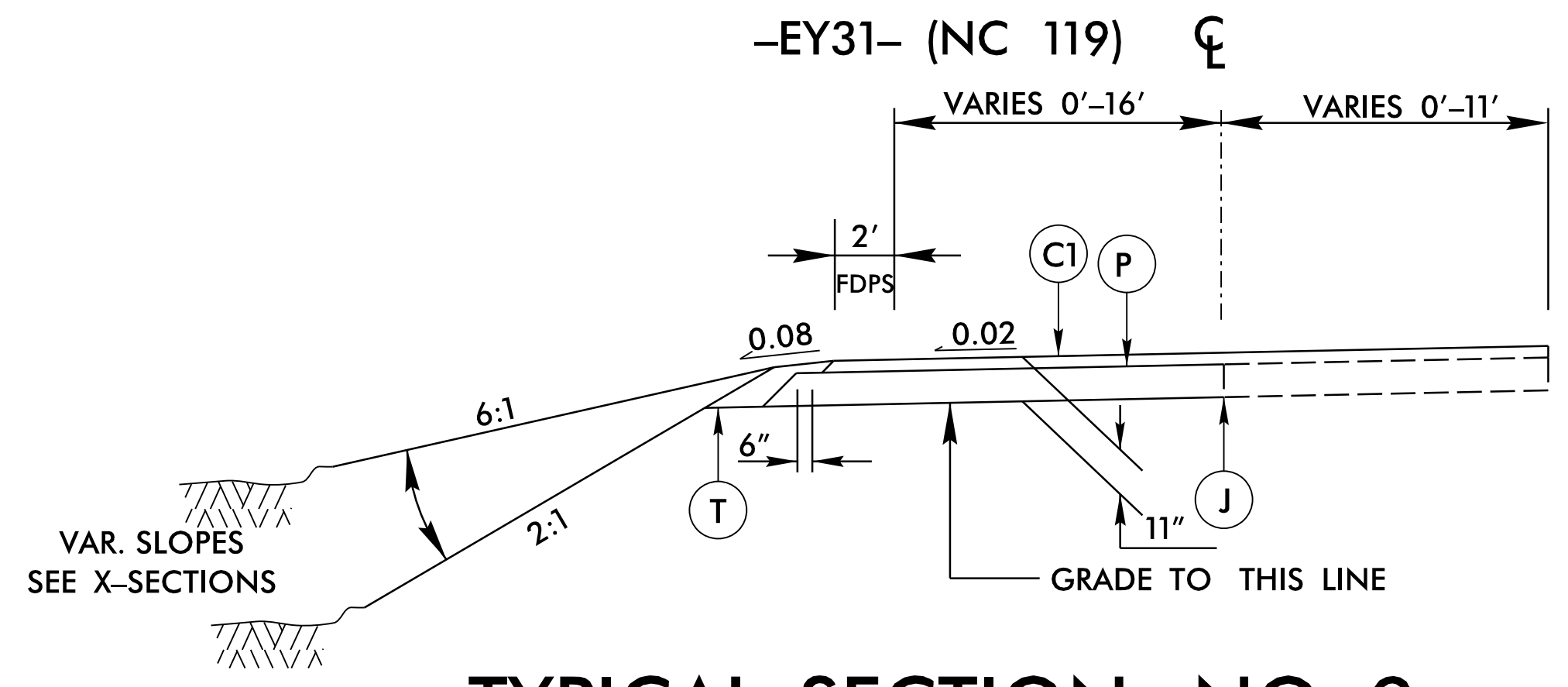
TYPICAL SECTION NO. 8
-Y23- STA. 19+30.00 TO -Y23- STA. 20+16.28

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PROJECT REFERENCE NO. U-3109B	SHEET NO. 2A-5
ROADWAY DESIGN ENGINEER SEAL 019740 CHRISTOPHER K. HOISE	PAVEMENT DESIGN ENGINEER SEAL 038176 SHIHAI ZHANG
DocuSigned by: Christopher K. Hoise 6/12/2018	DocuSigned by: Shihai Zhang 6/12/2018

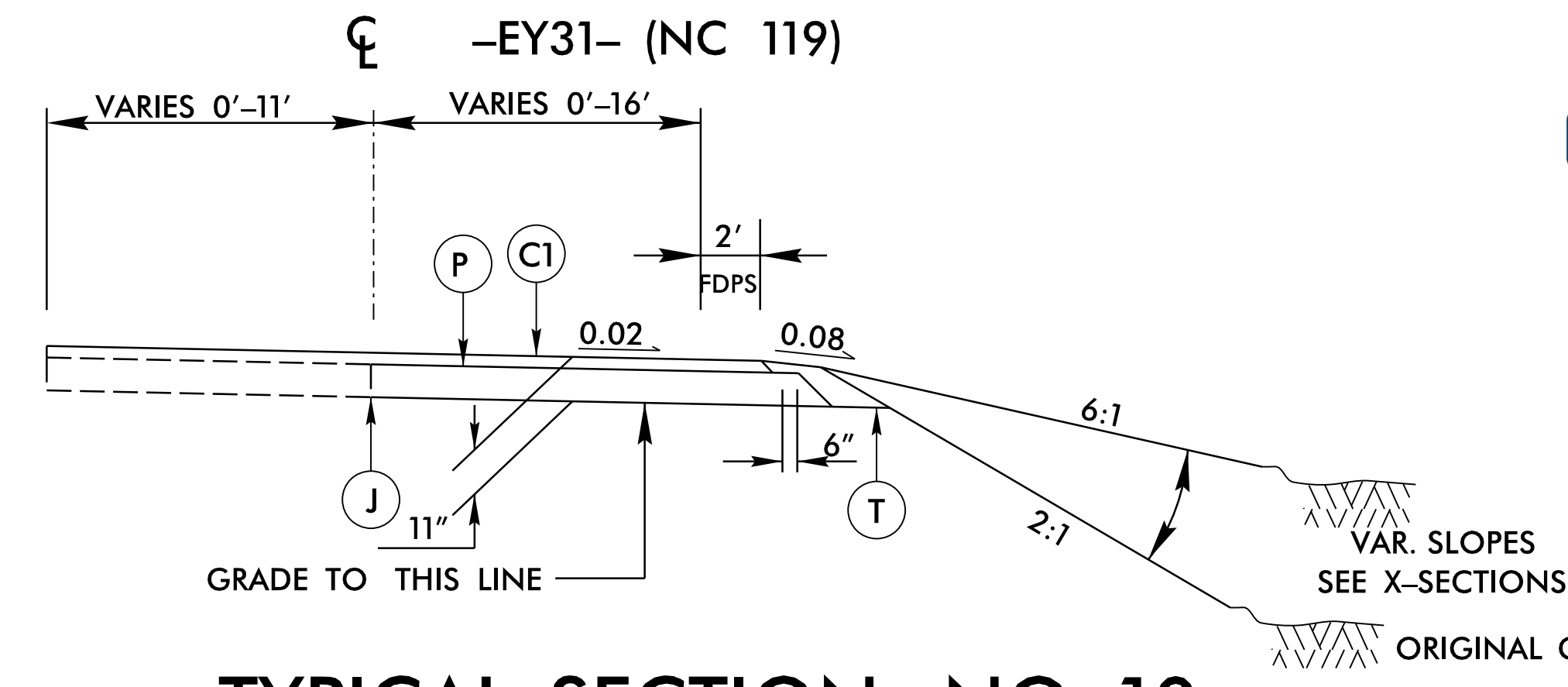
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

DRMP DRMP, INC.
9550 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 17041 332-2289



TYPICAL SECTION NO. 9

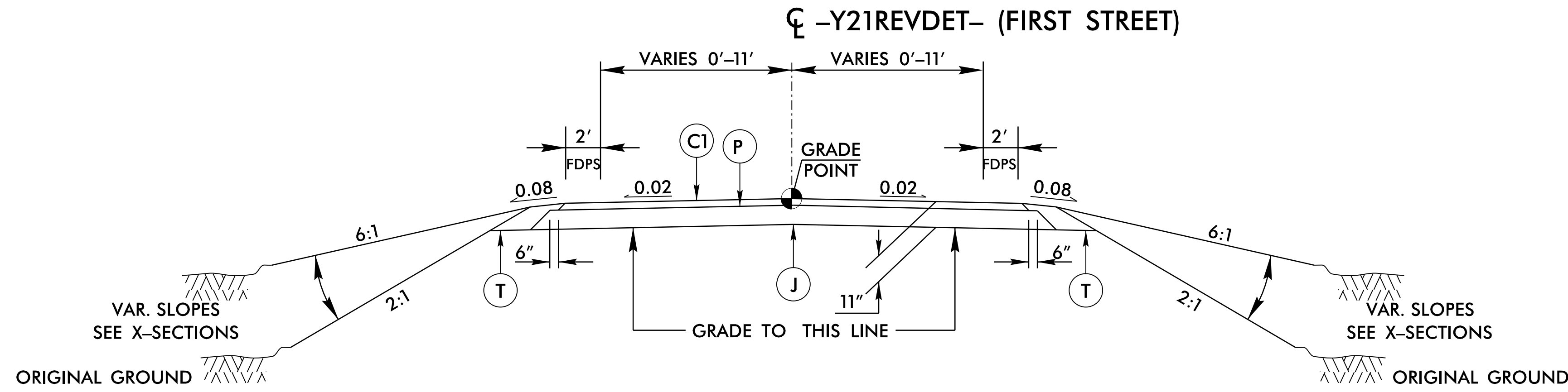
-L- STA. 264+42.00 TO -L- STA. 264+45.00
-EY31- STA. 39+94.00 TO -EY31- STA. 45+50.00



TYPICAL SECTION NO. 10

-EY31- STA. 35+71.00 TO -EY31- STA. 44+67.00

PAVEMENT SCHEDULE	
FINAL PAVEMENT DESIGN	
C1	3" S9.5B
C2	VAR. S9.5B
D1	2.5" I19.5C
D2	4" I19.0C
D3	VAR. I19.0C
E1	4" B25.0C
E2	VAR. B25.0C
J	8" ABC
K	LIME/CEMENT
N	GEOTEXTILE PAVE.
P	.35 PRIME COAT
R1	1'-6" C&G
R2	2'-6" C&G
R3	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W1	WEDGING
W2	WEDGING



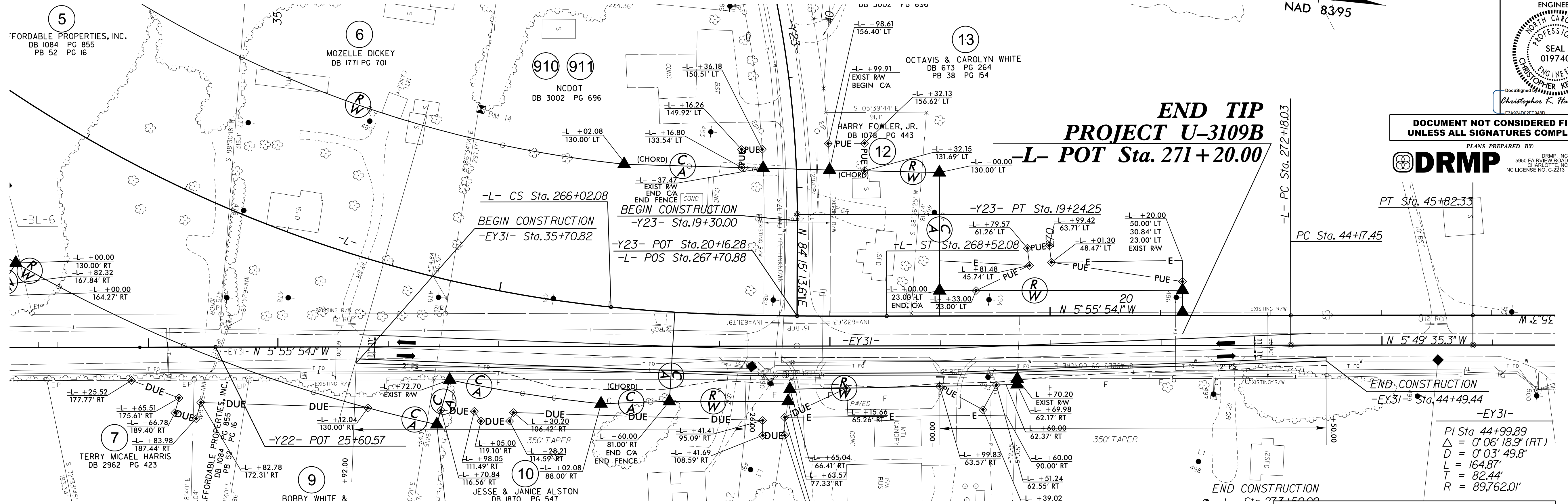
TYPICAL SECTION NO. 11

-Y21REVDET- STA. 10+00.00 TO -Y21REVDET- STA. 22+18.55

8/17/99

FOR PHASE 1 DETOUR WIDENING USE ONLY

PROJECT REFERENCE NO. U-3109B	SHEET NO. 2B-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	
Documented by: Christopher K. Hoise Date: 6/12/2018	

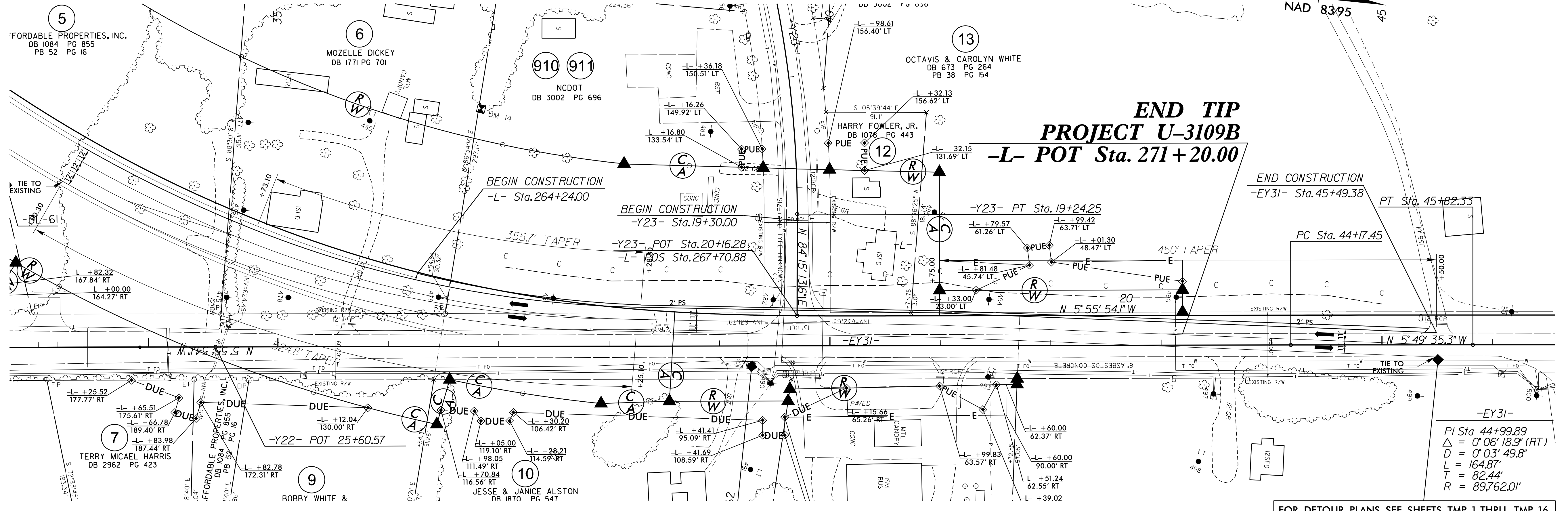


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY: **DRMP**

DRMP, INC.
5905 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2215 (704) 332-2289

FOR PHASE 2 DETOUR WIDENING USE ONLY

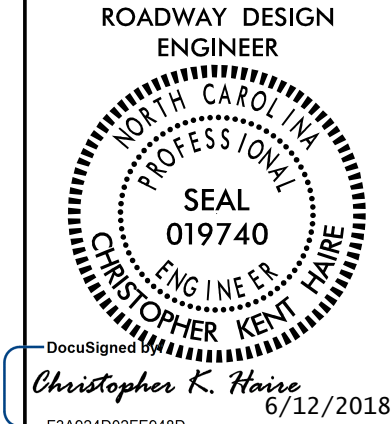


FOR DETOUR PLANS SEE SHEETS TMP-1 THRU TMP-16

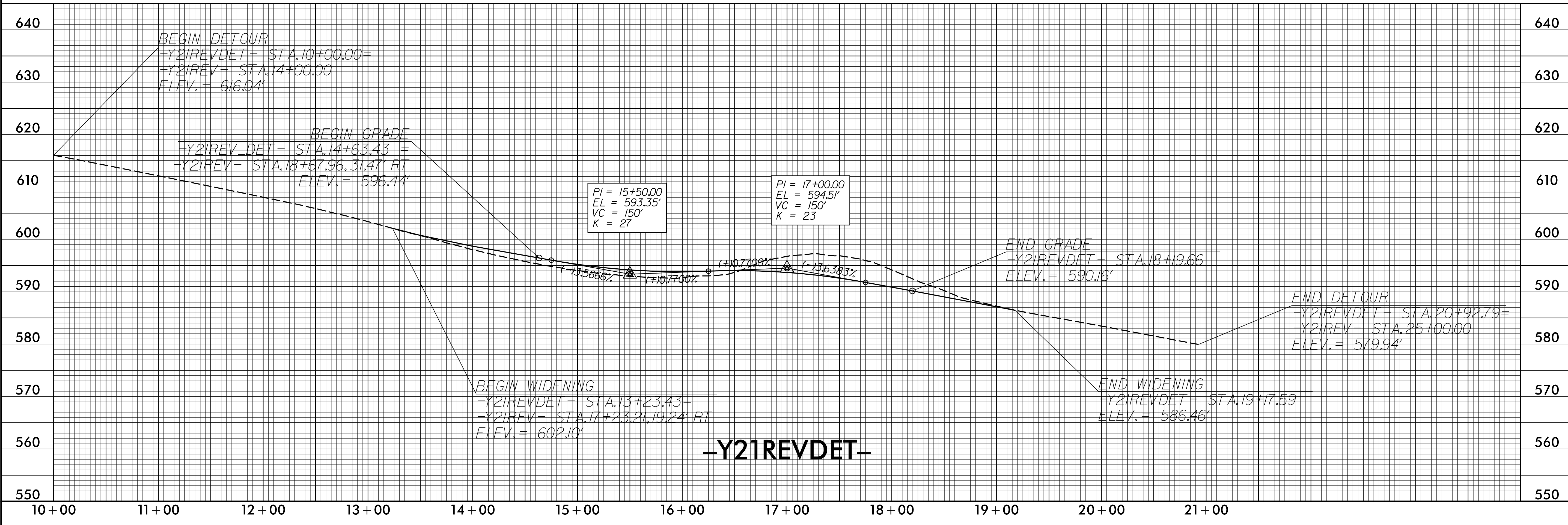
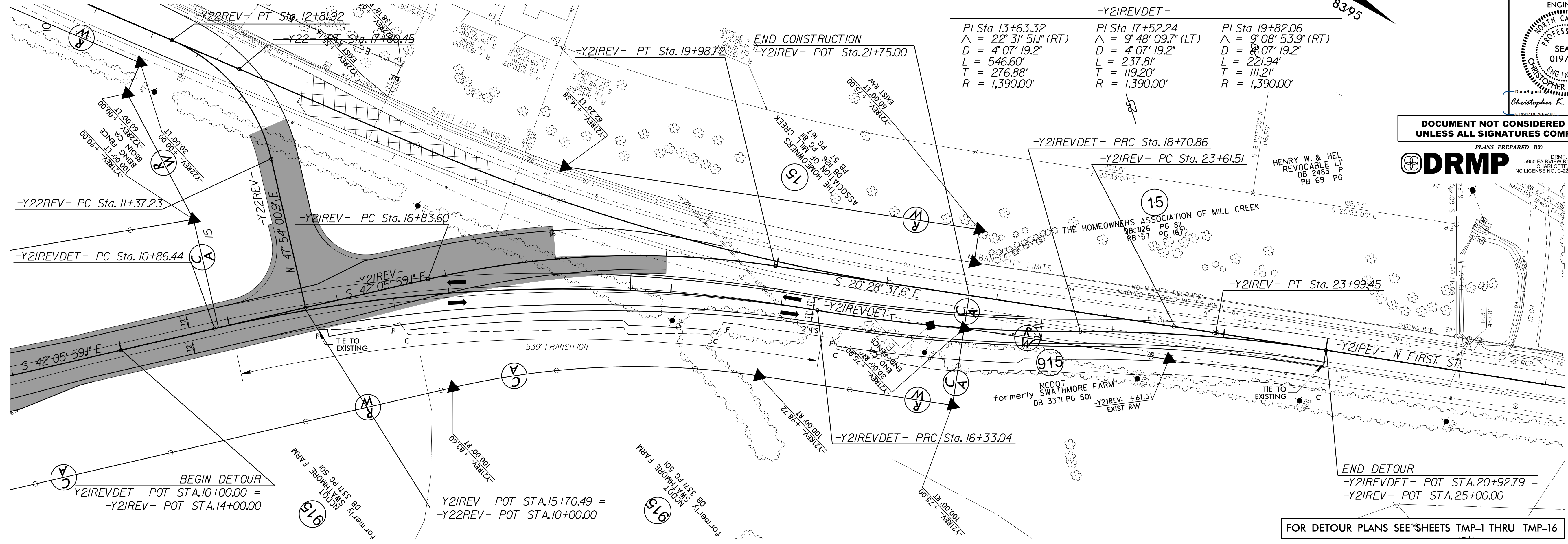
-EY31-
 PI Sta 44+99.89
 $\Delta = 0'06''18.9''$ (RT)
 $D = 0'03''49.8''$
 $L = 164.87'$
 $T = 82.44'$
 $R = 89,762.0'$

8/17/2018 3:51:19 PM R:\U3109B\Roadway\Plan\U3109B_Rdy_dtl_2B-1.dgn

FOR -Y21REVDET- DETOUR USE ONLY



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

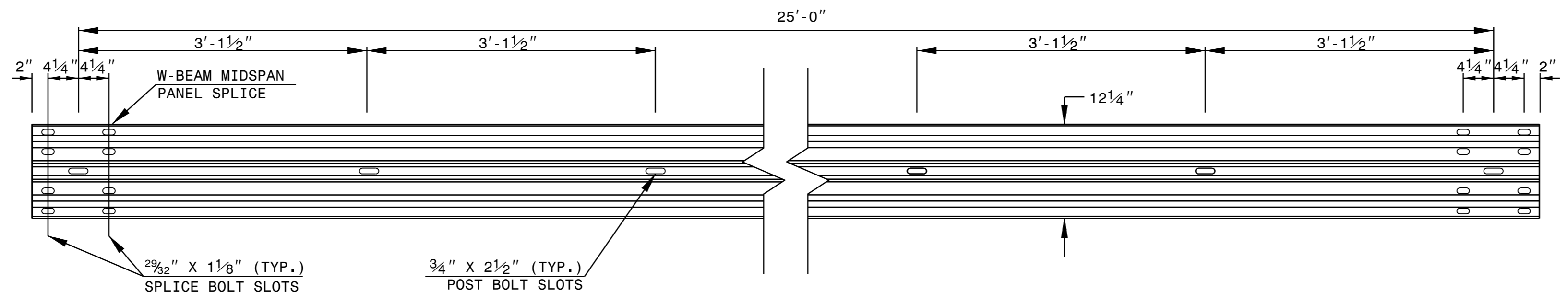


FOR DETOUR PLANS SEE SHEETS TMP-1 THRU TMP-16

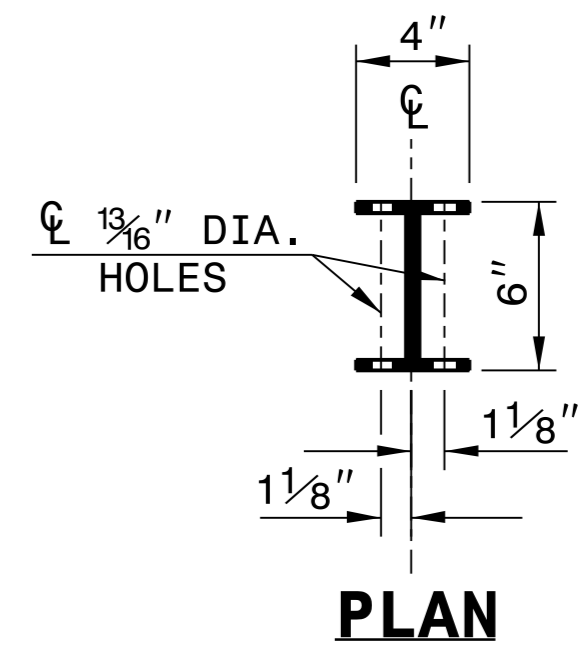
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

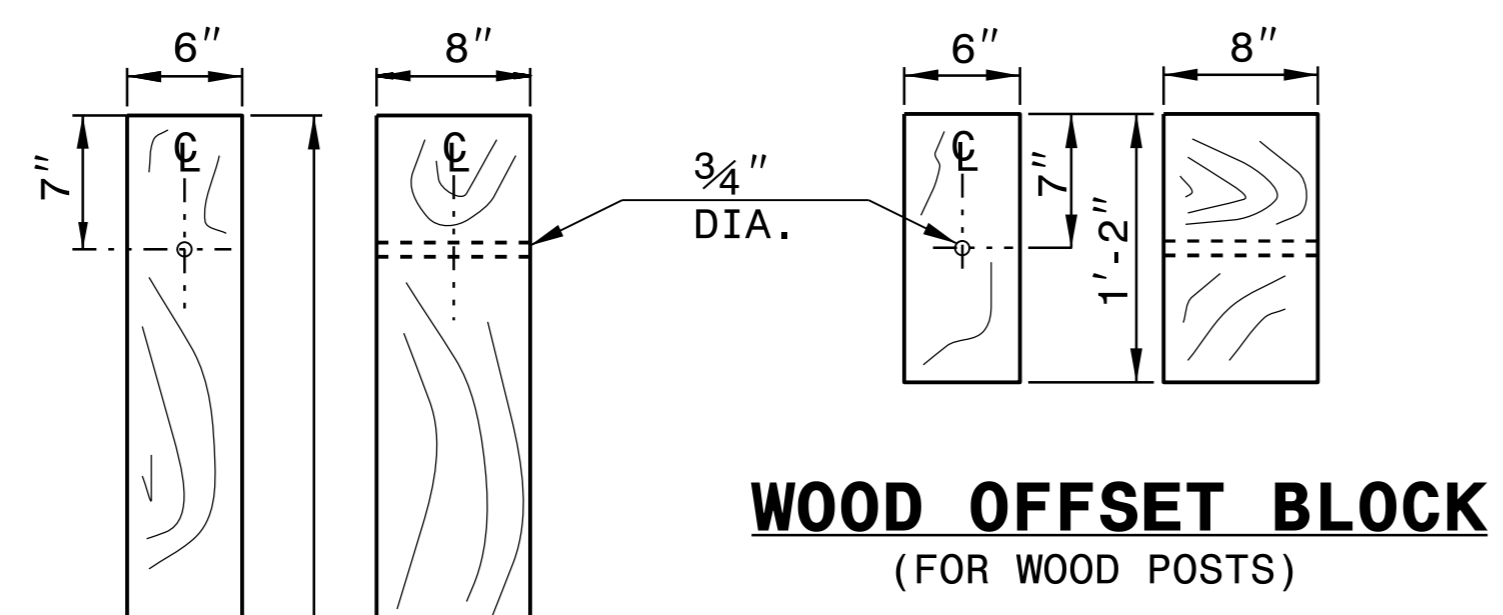
SHEET 6 OF 8
862D02



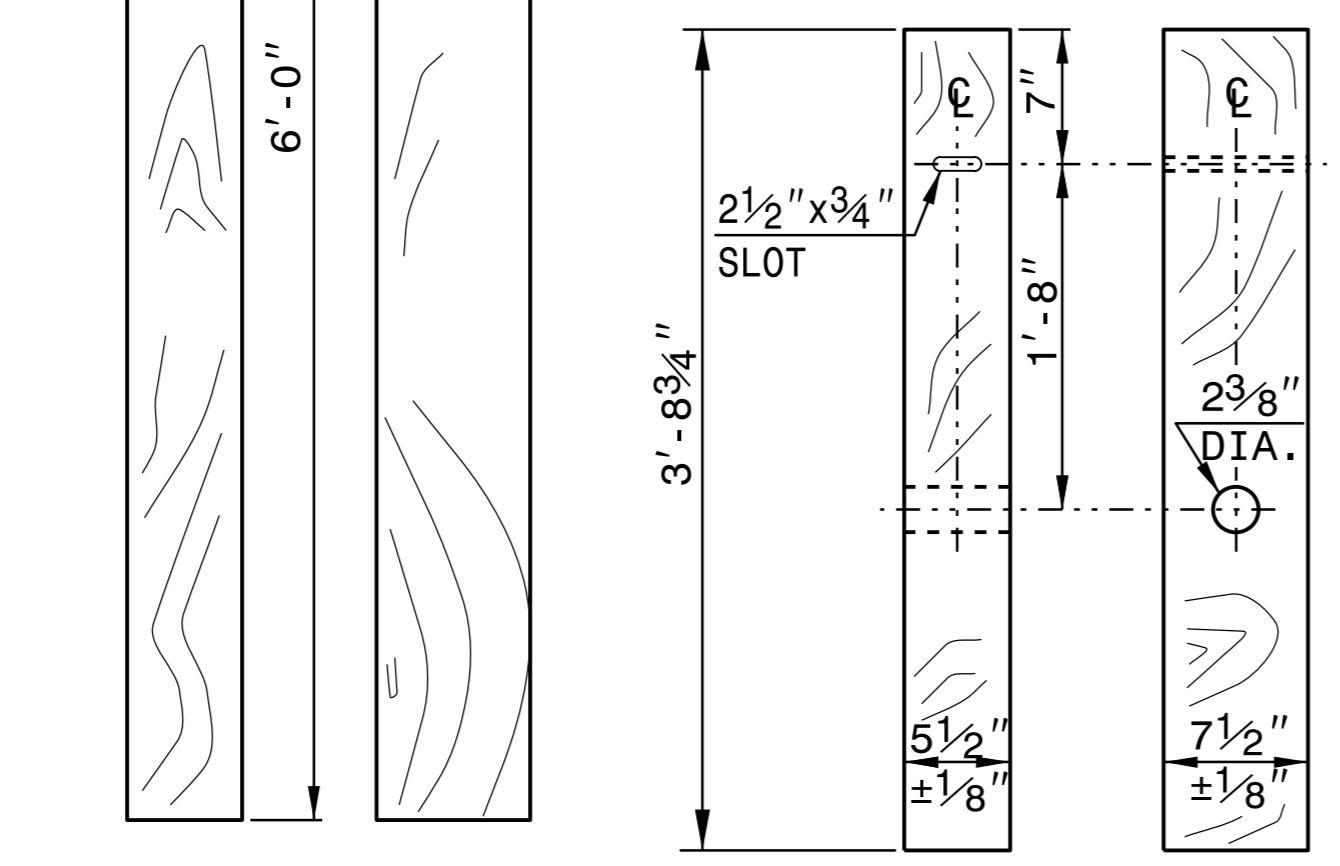
STANDARD W-BEAM GUARDRAIL



PLAN



**WOOD OFFSET BLOCK
(FOR WOOD POSTS)**

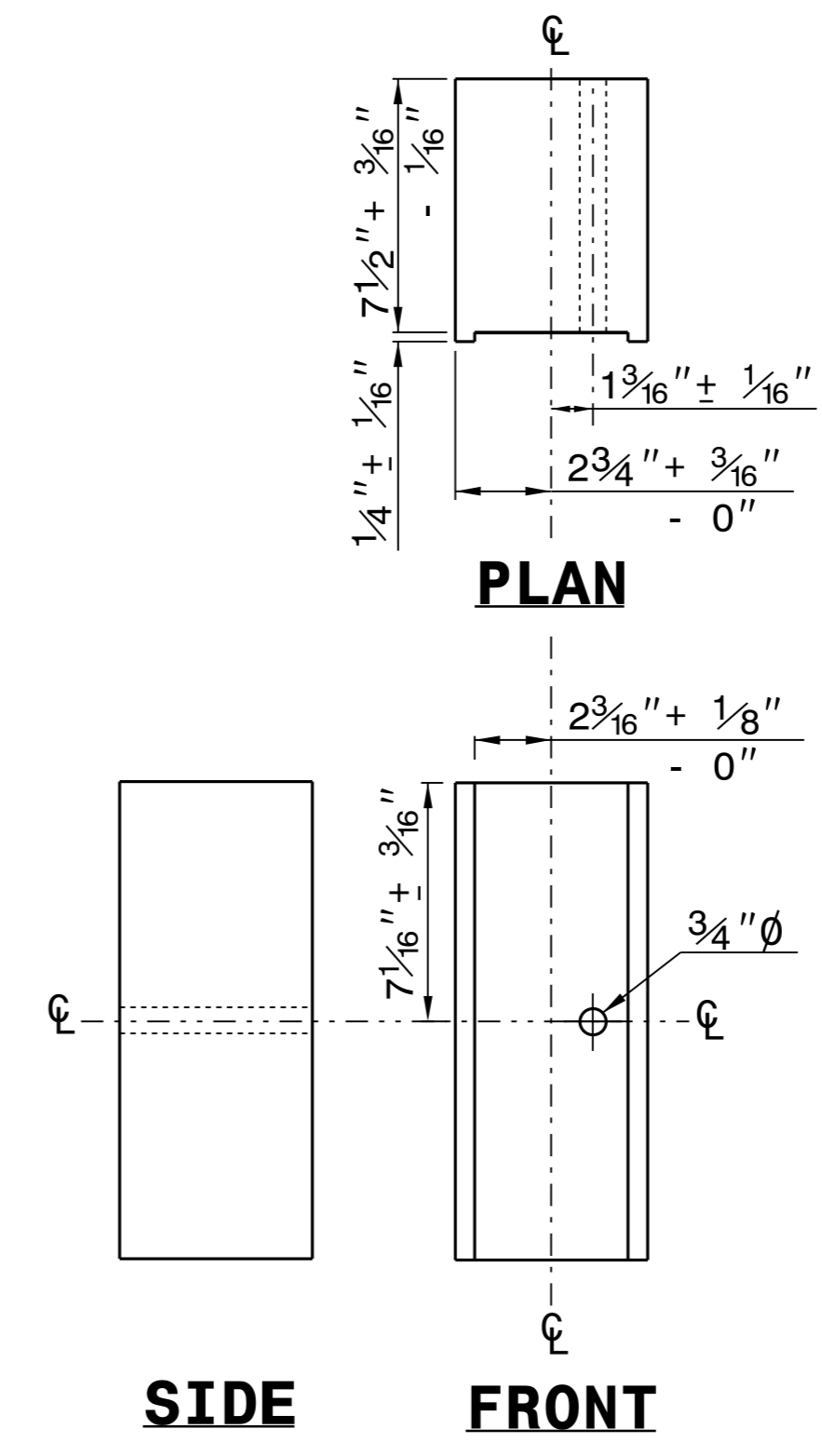


**STANDARD
LINE POST**

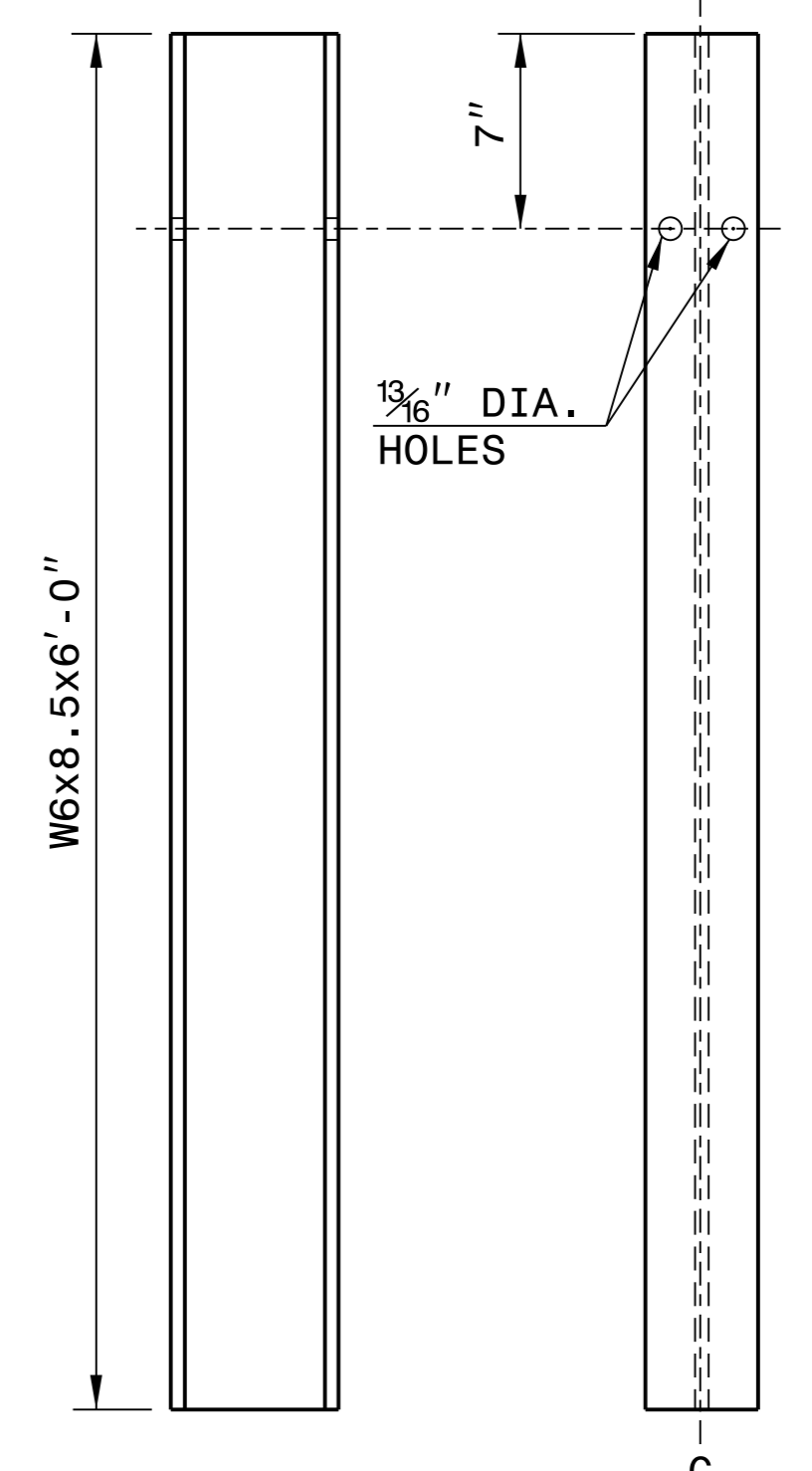
**SHORT WOOD
BREAKAWAY POST**



**STEEL TUBE
TS 6"x8"x0.1875"**



**ROUTED
OFFSET BLOCK**



"W6" STEEL POST

SYSTEM PARTS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

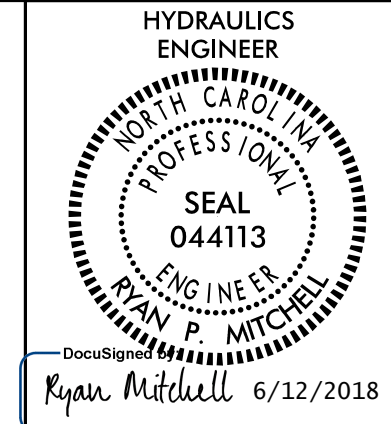
6/14/2018



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

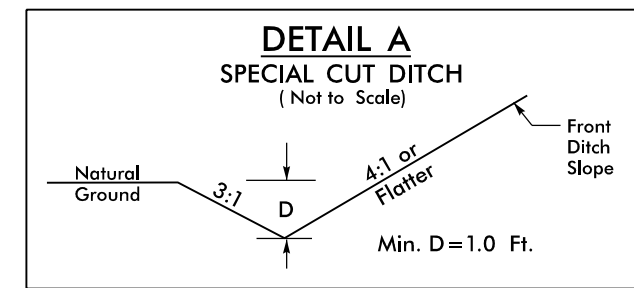
SEE TITLE BLOCK

ORIGINAL BY: J. HOWERTON DATE: 3-7-2018
MODIFIED BY: DATE: _____
CHECKED BY: DATE: _____
FILE SPEC.: _____

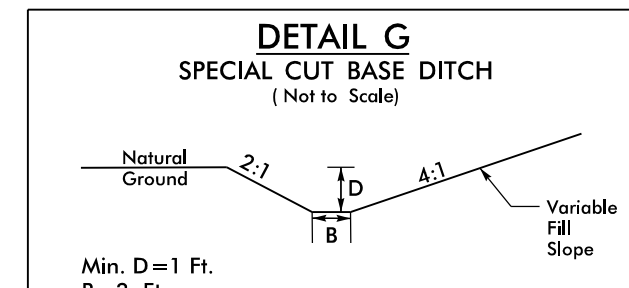


DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

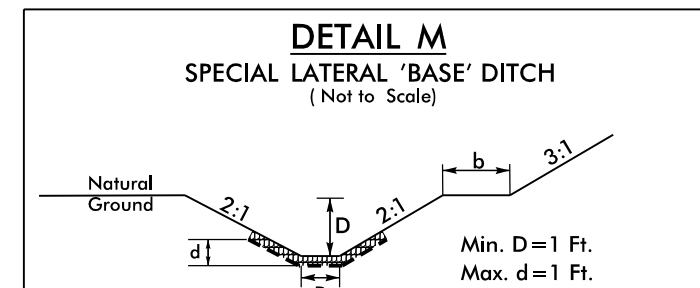
PLANS PREPARED BY:
DRMP
DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (704) 332-2289



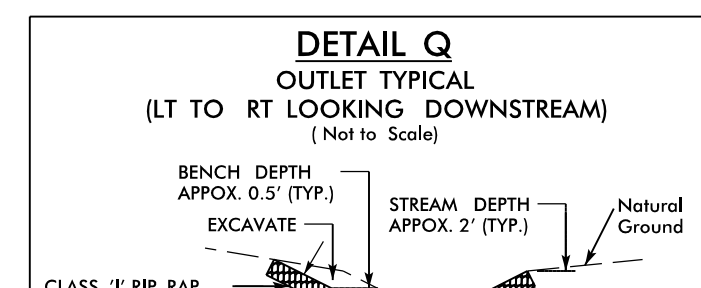
FROM STA. 196+50 TO STA. 199+50 -L- LT
FROM STA. 196+00 TO STA. 198+50 -L- RT
FROM STA. 203+00 TO STA. 205+00 -L- RT
FROM STA. 203+50 TO STA. 205+97 -L- LT
FROM STA. 208+71 TO STA. 211+00 -L- RT
FROM STA. 213+50 TO STA. 213+50 -L- RT
FROM STA. 213+65 TO STA. 214+00 -L- RT
FROM STA. 218+00 TO STA. 220+00 -L- RT
FROM STA. 222+00 TO STA. 224+40 -L- RT
FROM STA. 224+00 TO STA. 224+50 -L- LT
FROM STA. 229+90 TO STA. 230+50 -L- LT
FROM STA. 230+00 TO STA. 232+00 -L- RT
FROM STA. 233+50 TO STA. 234+50 -L- LT
FROM STA. 243+00 TO STA. 245+50 -L- RT
FROM STA. 246+54 TO STA. 249+00 -L- RT
FROM STA. 249+00 TO STA. 250+50 -L- RT
FROM STA. 243+06 TO STA. 246+23 -L- LT
FROM STA. 253+76 TO STA. 255+50 -L- LT
FROM STA. 20+00 TO STA. 21+75 -Y21REV- LT
FROM STA. 17+50 TO STA. 18+00 -Y21REV- RT
FROM STA. 19+50 TO STA. 21+50 -Y21REV- RT



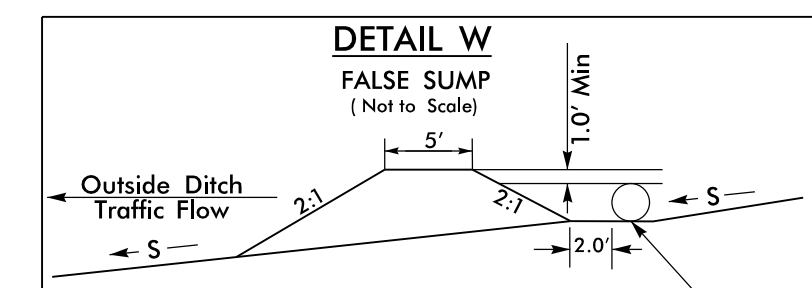
FROM STA. 16+50 TO STA. 17+50 -Y21REV- LT
FROM STA. 18+00 TO STA. 19+50 -Y21REV- RT
FROM STA. 11+00 TO STA. 12+00 -Y22REV- RT



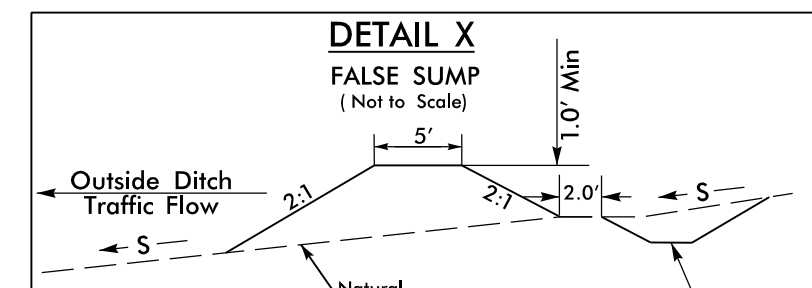
FROM STA. 235+65 TO STA. 237+00 -L- LT



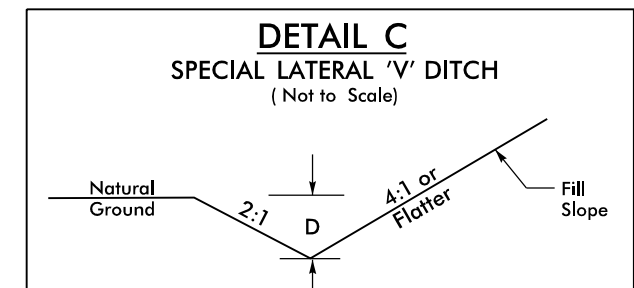
EST TON CLASS 1 RIP RAP=59 TONS EXCAVATION=49 CY
EST GEOTEXTILE=74 SY
STA. 208+00 -L- LT NWS=578.1



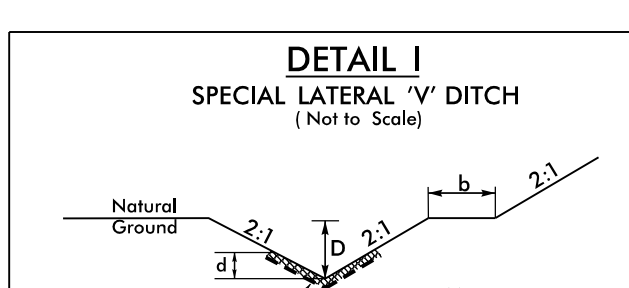
FROM STA. 262+50 -L- LT



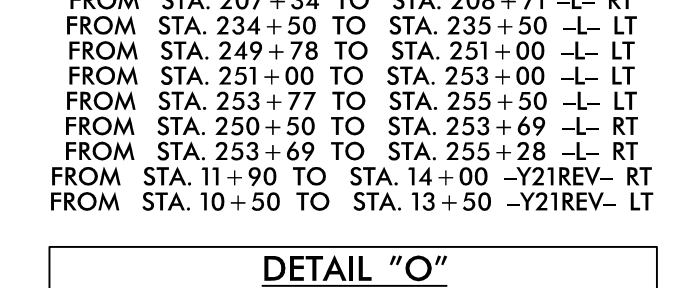
FROM STA. 12+00 -Y22- RT



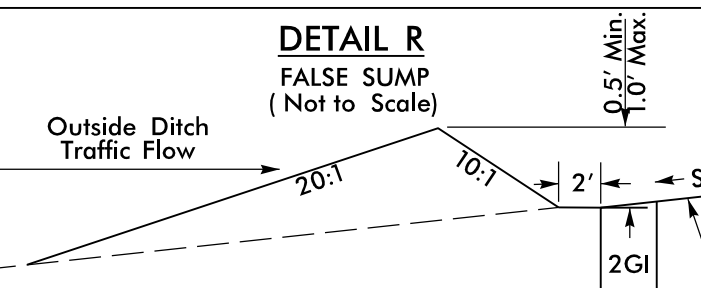
FROM STA. 251+50 TO STA. 252+50 -L- RT



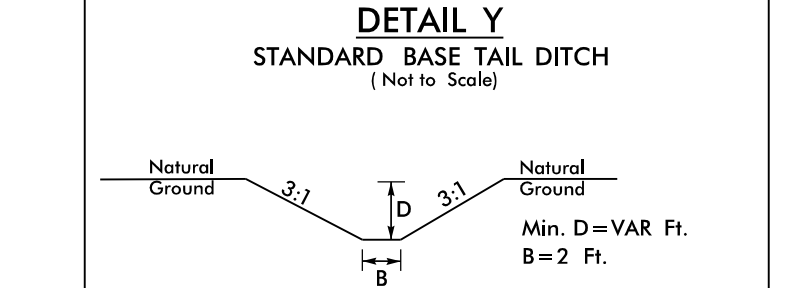
FROM STA. 208+00 TO STA. 209+00 -L- LT



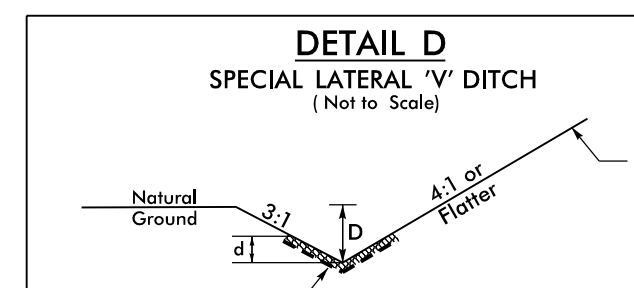
FROM STA. 207+34 TO STA. 208+71 -L- RT
FROM STA. 234+50 TO STA. 235+50 -L- LT
FROM STA. 249+78 TO STA. 251+00 -L- LT
FROM STA. 251+00 TO STA. 253+00 -L- LT
FROM STA. 253+77 TO STA. 255+50 -L- LT
FROM STA. 250+50 TO STA. 253+69 -L- RT
FROM STA. 253+69 TO STA. 255+28 -L- RT
FROM STA. 11+90 TO STA. 14+00 -Y21REV- RT
FROM STA. 10+50 TO STA. 13+50 -Y21REV- LT



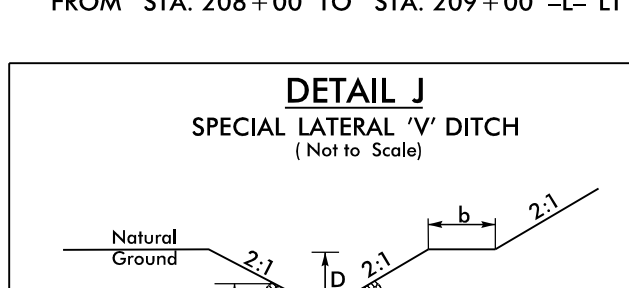
FROM STA. 213+10 -L- LT
FROM STA. 224+70 -L- LT
FROM STA. 19+43 -Y21REV- LT



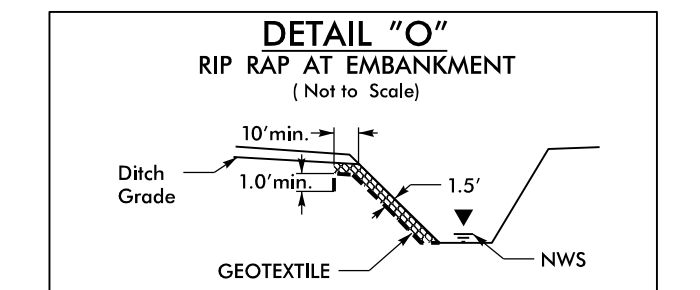
FROM STA. 262+74 TO STA. 262+84 -L- RT



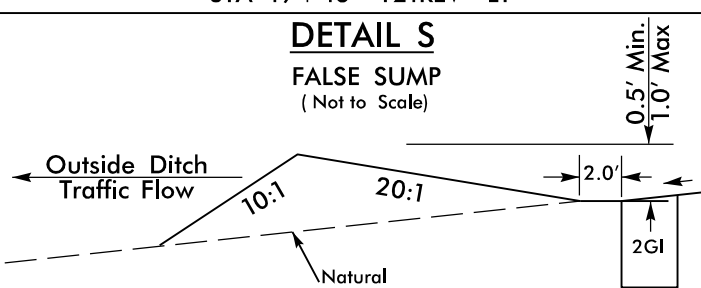
FROM STA. 249+50 TO STA. 250+50 -L- RT



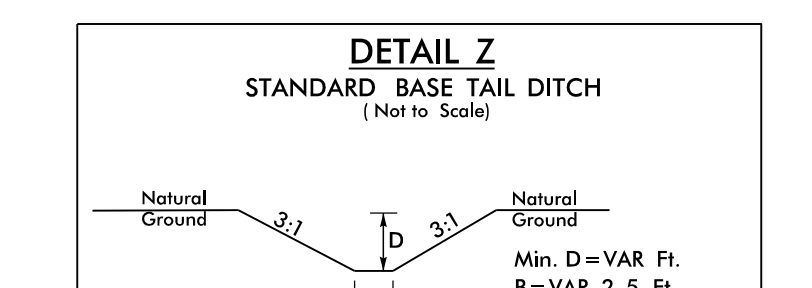
FROM STA. 207+00 TO STA. 208+00 -L- LT



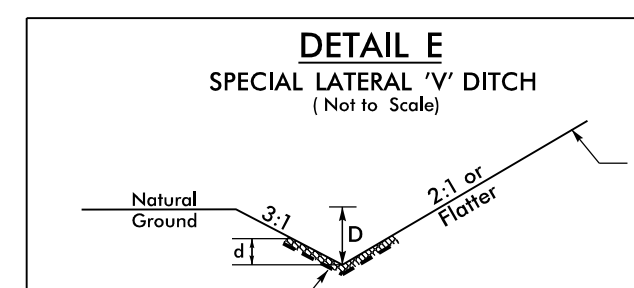
See plans for quantities
STA. 207+00 -L- RT NWS=581.2
STA. 207+38 -L- RT NWS=581.2
STA. 207+99 -L- LT NWS=578.1
STA. 208+20 -L- LT NWS=578.1
STA. 226+87 -L- RT NWS=539.9
STA. 227+24 -L- RT NWS=539.9



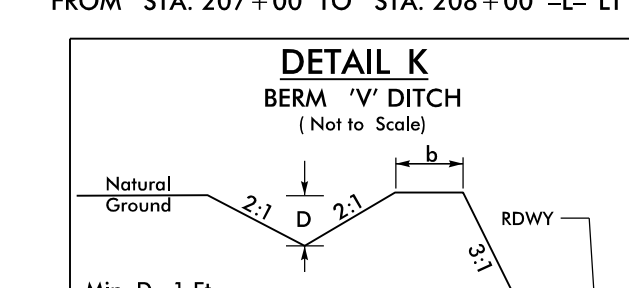
FROM STA. 229+75 -L- LT



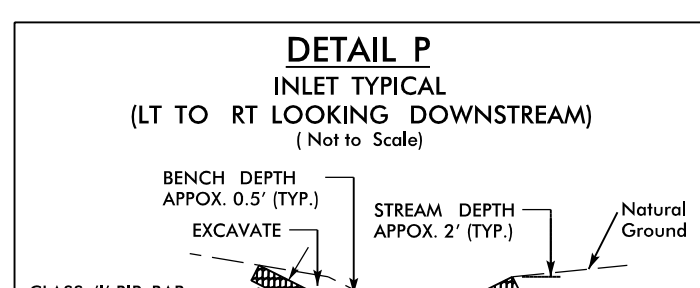
FROM STA. 19+50 TO STA. 20+00 -Y21REV- RT



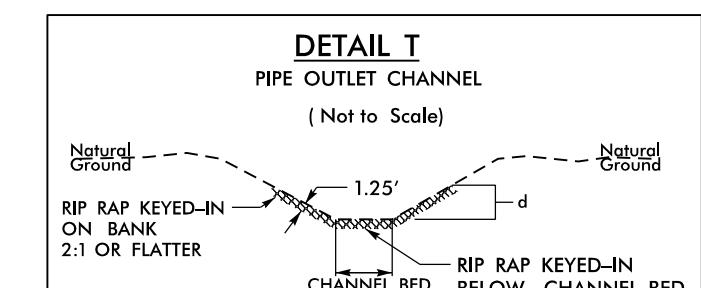
FROM STA. 245+50 TO STA. 246+54 -L- RT



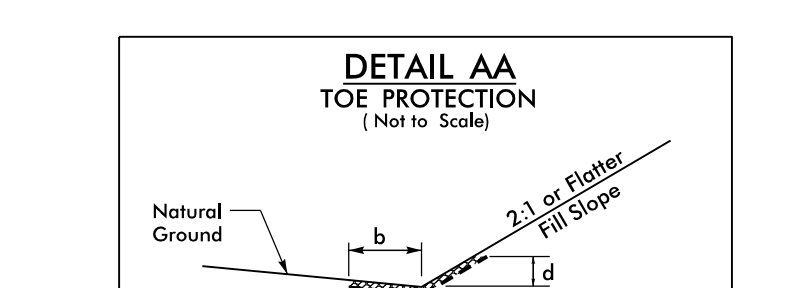
FROM STA. 231+82 TO STA. 234+00 -L- LT
FROM STA. 237+00 TO STA. 243+06 -L- LT
FROM STA. 243+06 TO STA. 246+00 -L- LT



EST TON CLASS 1 RIP RAP=27 TONS EXCAVATION=26 CY
EST GEOTEXTILE=34 SY
STA. 207+44 -L- RT NWS 581.2



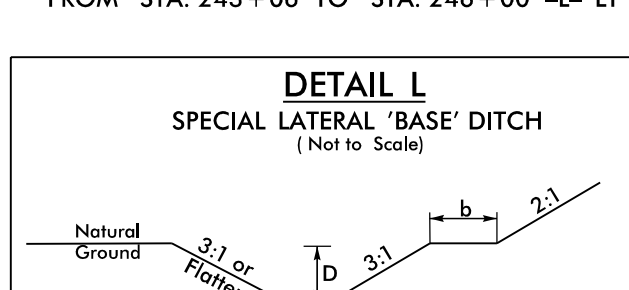
FROM STA. 233+62 -L- RT



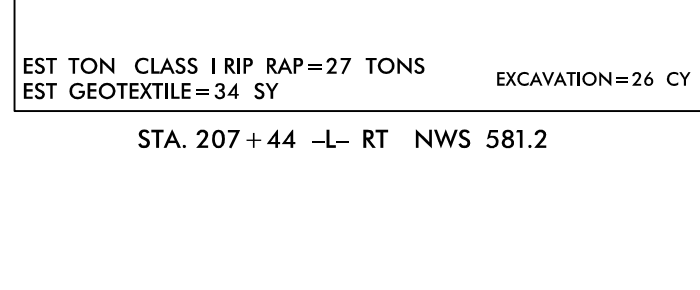
FROM STA. 256+75.00 TO STA. 258+50 -L- RT



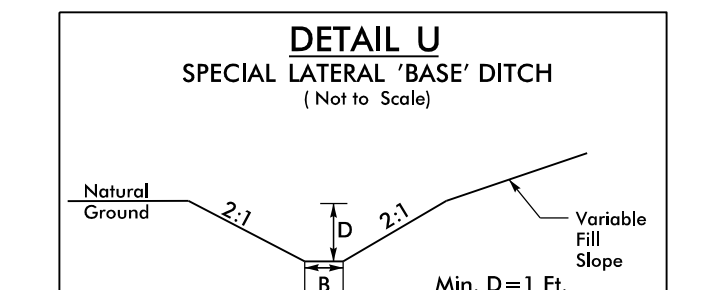
FROM STA. 206+00 TO STA. 207+17 -L- RT
FROM STA. 226+00 TO STA. 226+86 -L- RT
FROM STA. 227+22 TO STA. 227+41 -L- RT
FROM STA. 234+50 TO STA. 237+00 -L- RT



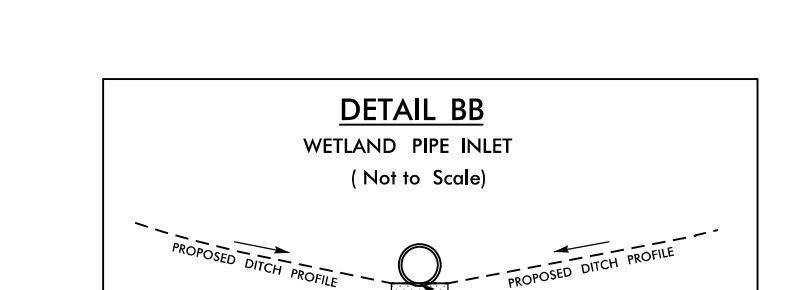
FROM STA. 206+00 TO STA. 207+17 -L- RT
FROM STA. 226+00 TO STA. 226+86 -L- RT
FROM STA. 227+22 TO STA. 227+41 -L- RT
FROM STA. 234+50 TO STA. 237+00 -L- RT



FROM STA. 246+23 TO STA. 248+00 -L- LT



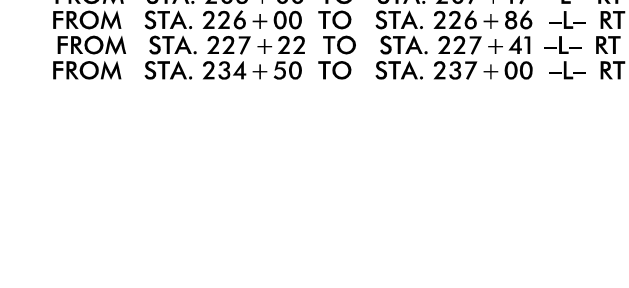
FROM STA. 237+00 TO STA. 239+00 -L- LT



FROM STA. 246+25 -L- LT
FROM STA. 251+00 -L- LT
FROM STA. 255+51 -L- LT



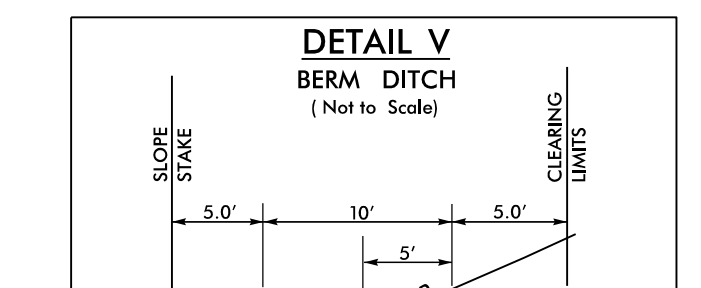
FROM STA. 206+00 TO STA. 207+17 -L- RT
FROM STA. 226+00 TO STA. 226+86 -L- RT
FROM STA. 227+22 TO STA. 227+41 -L- RT
FROM STA. 234+50 TO STA. 237+00 -L- RT



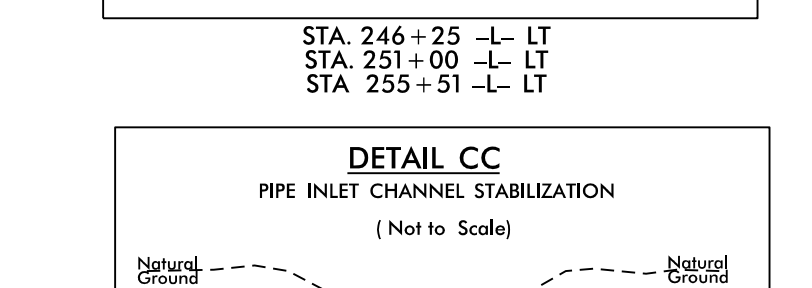
FROM STA. 206+00 TO STA. 207+17 -L- RT
FROM STA. 226+00 TO STA. 226+86 -L- RT
FROM STA. 227+22 TO STA. 227+41 -L- RT
FROM STA. 234+50 TO STA. 237+00 -L- RT



FROM STA. 206+00 TO STA. 207+17 -L- RT
FROM STA. 226+00 TO STA. 226+86 -L- RT
FROM STA. 227+22 TO STA. 227+41 -L- RT
FROM STA. 234+50 TO STA. 237+00 -L- RT

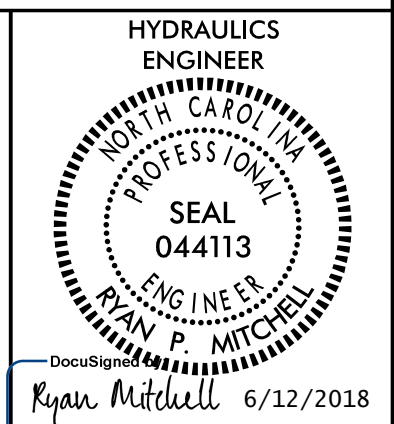


FROM STA. 235+58 -L- LT

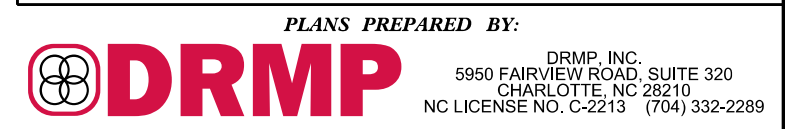


FROM STA. 235+58 -L- LT

8/17/99



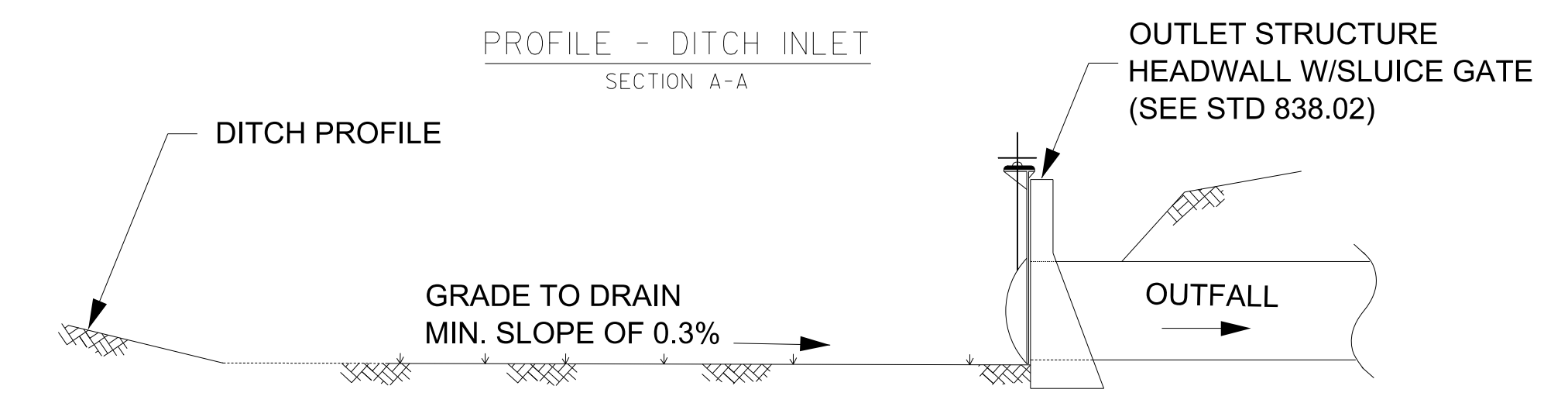
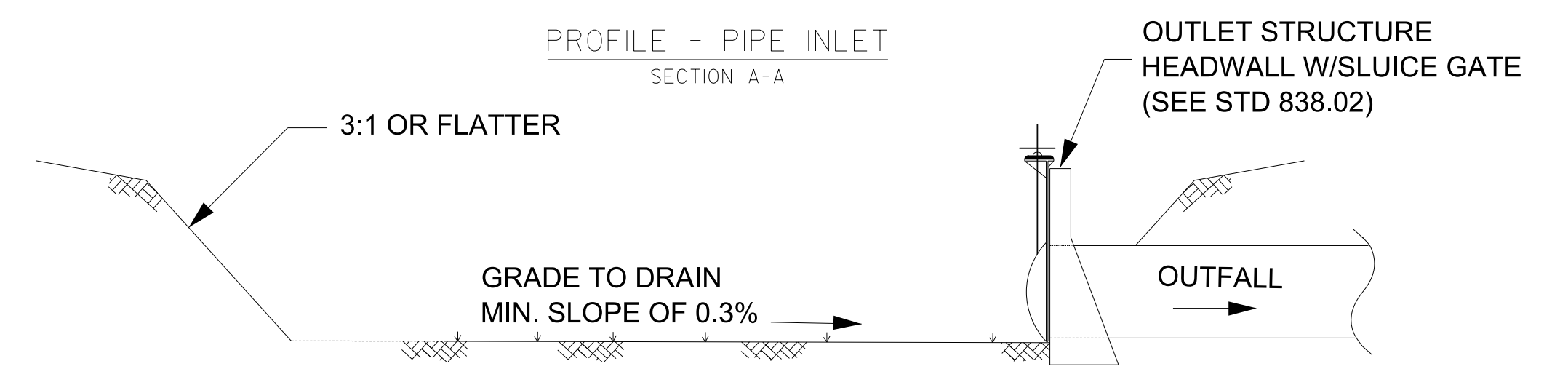
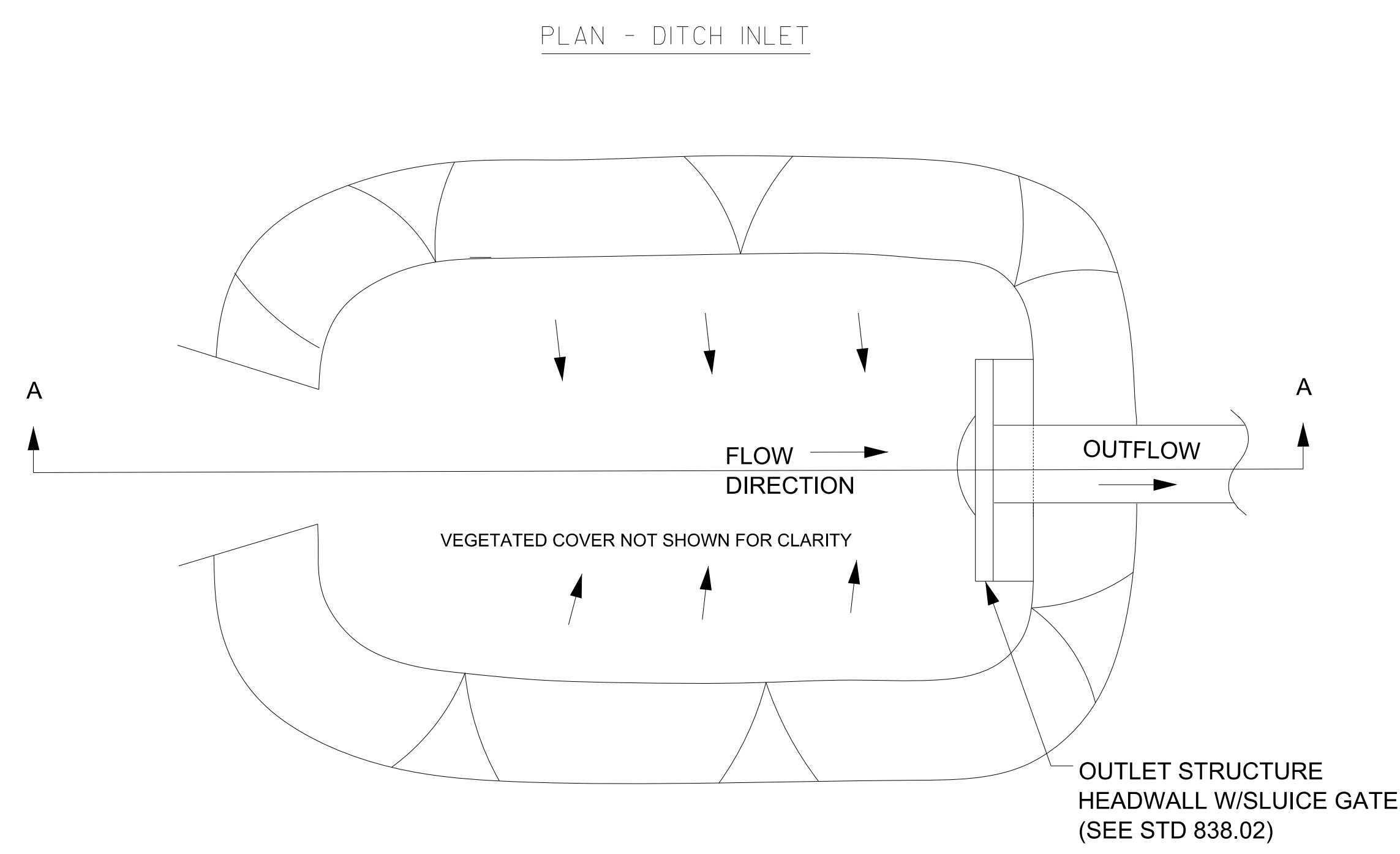
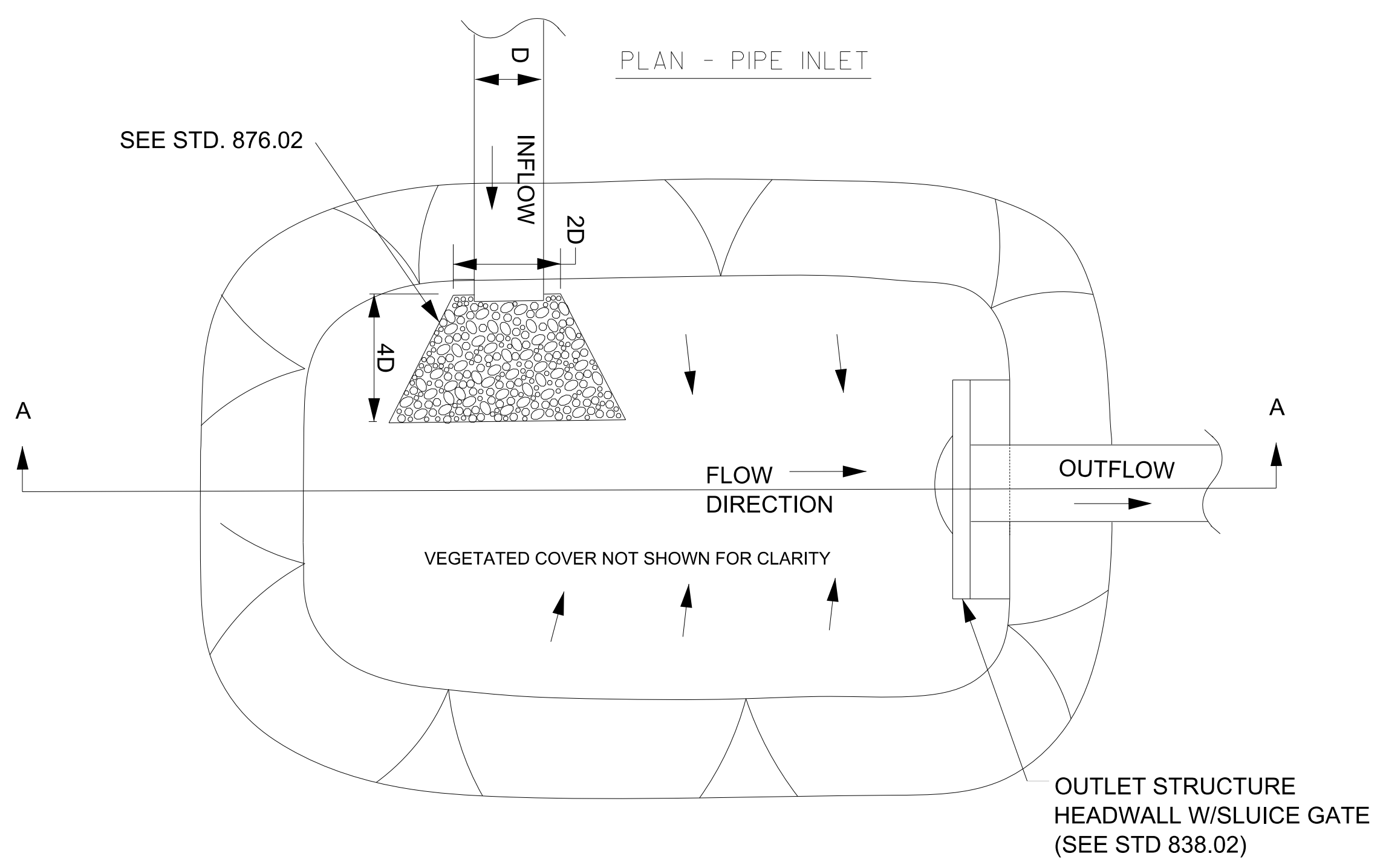
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**



HAZARDOUS SPILL BASIN DETAIL

NOT TO SCALE

BASIN LAYOUT POINTS AND ELEVATIONS																		
POINT LOCATION	HSB1: Station 206+00 LT			HSB2: Station 205+00 RT			HSB3: Station 210+00 LT			HSB4: Station 224+50 RT			HSB5: Station 229+50 RT			HSB6: Station 256+50		
	NORTH	EAST	RADIUS	NORTH	EAST	RADIUS	NORTH	EAST	RADIUS	NORTH	EAST	RADIUS	NORTH	EAST	RADIUS	NORTH	EAST	RADIUS
1	859,689.08	1,915,820.16	1.0'	859,560.97	1,915,873.55	1.0'	860,029.51	1,915,971.64	5.0'	861,330.71	1,916,666.15	4.0'	861,783.71	1,916,853.70	4.0'	863,900.08	1,918,445.04	8.0'
2	859,683.87	1,915,832.07	1.0'	859,555.75	1,915,885.46	1.0'	860,027.50	1,915,976.21	5.0'	861,323.42	1,916,682.76	4.0'	861,777.34	1,916,868.21	4.0'	863,891.81	1,918,463.99	8.0'
3	859,733.04	1,915,839.45	1.0'	859,604.93	1,915,892.84	1.0'	860,056.98	1,915,983.69	5.0'	861,368.32	1,916,675.01	4.0'	861,845.42	1,916,882.17	4.0'	863,935.33	1,918,479.52	8.0'
4	859,726.33	1,915,850.41	1.0'	859,727.82	1,915,851.35	1.0'	860,054.97	1,915,988.27	5.0'	861,358.22	1,916,698.03	4.0'	861,839.59	1,916,893.90	4.0'	863,927.05	1,918,498.47	8.0'
INLET/BASE ELEV = 595.0'			INLET/BASE ELEV = 596.0'			INLET/BASE ELEV = 589.0'			INLET/BASE ELEV = 566.0'			INLET/BASE ELEV = 571.0'			INLET/BASE ELEV = 612.0'			
STORAGE ELEV = 596.8'			STORAGE ELEV = 596.8'			STORAGE ELEV = 591.1'			STORAGE ELEV = 567.6'			STORAGE ELEV = 572.2'			STORAGE ELEV = 613.4'			
BERM/TOP ELEV = 598.0'			BERM/TOP ELEV = 599.0'			BERM/TOP ELEV = 593.0'			BERM/TOP ELEV = 569.0'			BERM/TOP ELEV = 576.0'			BERM/TOP ELEV = 615.0'			
OUTLET ELEV = 594.8			OUTLET ELEV = 595.8			OUTLET ELEV = 588.8'			OUTLET ELEV = 565.8'			OUTLET ELEV = 570.8'			OUTLET ELEV = 610.8'			



REVISIONS

6/11/2018 11:53:44 AM C:\Users\j31098\Hydro\Projects\CADD\U3109B_Hyd_ddsh_02.dgn
 Ryan Mitchell

CHA-NWRIGLTYW

COMPUTED BY: ZJM DATE: 4/2/2018
CHECKED BY: RPM DATE: 4/2/2018

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO. U-3109B SHEET NO. 3D-2

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

Main data table with columns for Line & Station, Offset, Structure Number, Invert Elevation, Minimum Required Slope, Pipe Size (12-48 inches), R.C. Pipe Class III/IV, Endwalls, Reinforced Endwalls, Drainage Structure, Quantities for Drainage Structures, Frame, Grates, and Hood, and Remarks.

SHEET TOTALS and PROJECT TOTALS summary rows at the bottom of the table.

ABBREVIATIONS table listing codes like C.A.A., C.B., C.S., etc. and their corresponding material or structure names.

COMPUTED BY: J. B. Barfield DATE: 8/10/17
 CHECKED BY: MDH DATE: 4/3/18

(2-16-16)

PROJECT NO.
U-3109B

SHEET NO.
3G-1

**STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS**

**SUMMARY OF GEOTEXTILE
 FOR PAVEMENT STABILIZATION**

LINE	Station	Station	SY	OFFSET
-L-	206+00	209+50	1439	CL
-L-	213+25	219+00	2364	CL
-L-	224+10	226+23	1112	CL
-L-	228+28	229+50	637	CL
-L-	233+25	237+10	1583	CL
-L-	245+50	247+50	1244	CL
CONTINGENCY				
TOTAL SY:			8379	

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

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
			AST					500	
			ASU	12	500	1000	1500		
CONTINGENCY									
TOTAL CY/TONS/SY:					500	1000	1500**	500	0

*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 SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	500
CONTINGENCY				UD	
TOTAL LF:					500

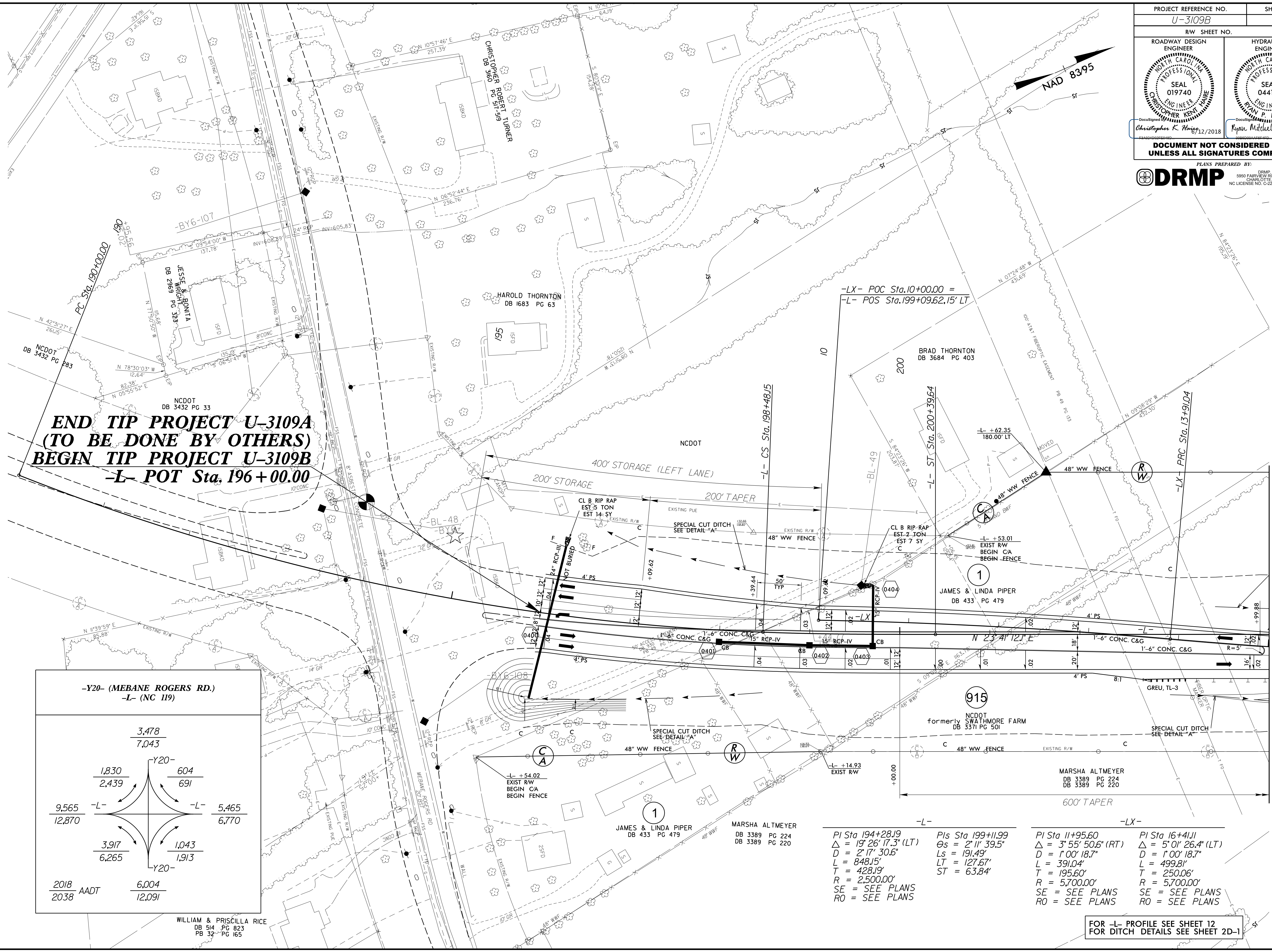
*UD = Underdrain
 *BD = Blind Drain
 *SD = Subsurface Drain

EMBANKMENT DENSITY TESTING FREQUENCY

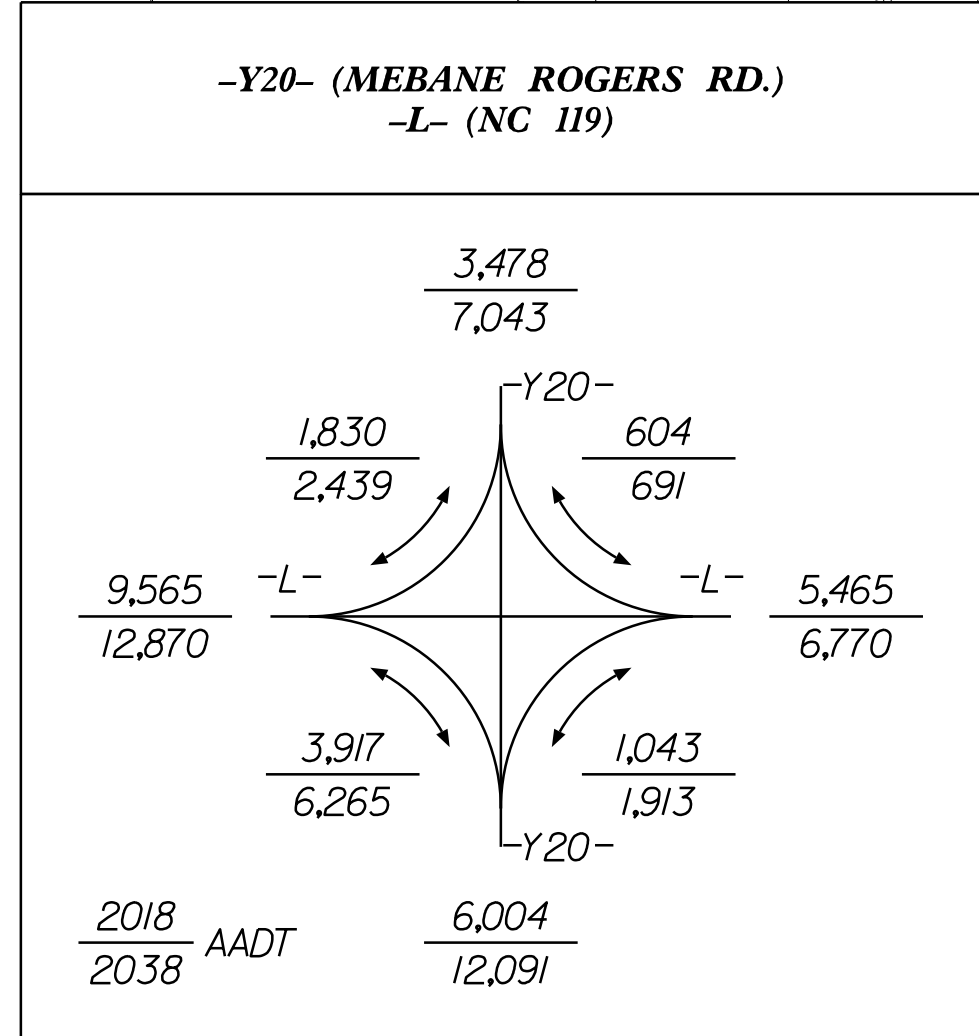
We recommend increasing the density testing frequency to the following requirements:
1 density test per 40,000 sq. ft. of 1 ft. lift placed
1 density test per 20,000 sq. ft. of 1 ft. placed within 5 ft. of subgrade
1 density test per foot of fill placed within 100 ft. of a structure

PROJECT REFERENCE NO. U-3109B	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER CHRISTOPHER K. HOIG SEAL 019740 NORTH CAROLINA PROFESSIONAL ENGINEER	HYDRAULICS ENGINEER RYAN MITCHELL SEAL 044113 NORTH CAROLINA PROFESSIONAL ENGINEER
DocuSigned by: Christopher K. Hoig 6/12/2018	DocuSigned by: Ryan Mitchell 6/12/2018
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
PLANS PREPARED BY: DRMP	

DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2615 (794) 332-2289



**END TIP PROJECT U-3109A
(TO BE DONE BY OTHERS)
BEGIN TIP PROJECT U-3109B
-L- POT Sta. 196+00.00**



PI Sta 194+28.19 $\Delta = 19' 26'' 17.3''$ (LT) D = 2' 17'' 30.6" L = 848.15' T = 428.19' R = 2,500.00' SE = SEE PLANS RO = SEE PLANS	PIs Sta 199+11.99 $\Theta_s = 2' 11'' 39.5''$ Ls = 191.49' LT = 127.67' ST = 63.84'	PI Sta 11+95.60 $\Delta = 3' 55'' 50.6''$ (RT) D = 1' 00'' 18.7" L = 391.04' T = 195.60' R = 5,700.00' SE = SEE PLANS RO = SEE PLANS	PI Sta 16+41.11 $\Delta = 5' 01'' 26.4''$ (LT) D = 1' 00'' 18.7" L = 499.81' T = 250.06' R = 5,700.00' SE = SEE PLANS RO = SEE PLANS
---	---	---	---

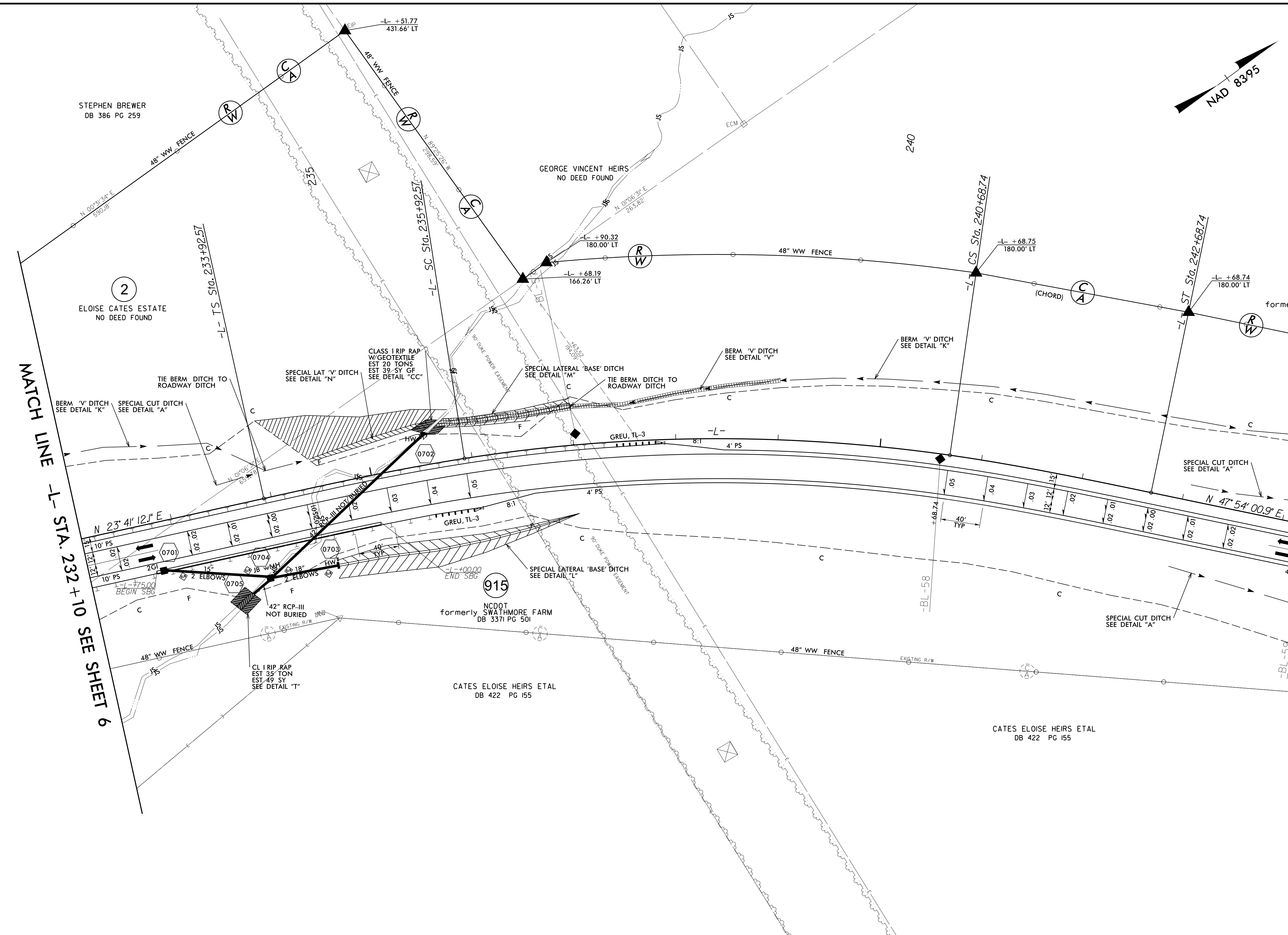
FOR -L- PROFILE SEE SHEET 12
FOR DITCH DETAILS SEE SHEET 2D-1

REVISIONS

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DRMP

MATCH LINE -L- STA. 204+10 SEE SHEET 5

PROJECT REFERENCE NO. U-3109B	SHEET NO. 7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p> <p>PLANS PREPARED BY: DRMP</p> <p><small>DRMP, INC. 5950 FAIRVIEW ROAD, SUITE 320 CHARLOTTE, NC 28210 NC LICENSE NO. C-2215 (704) 332-2289</small></p>	



REVISIONS

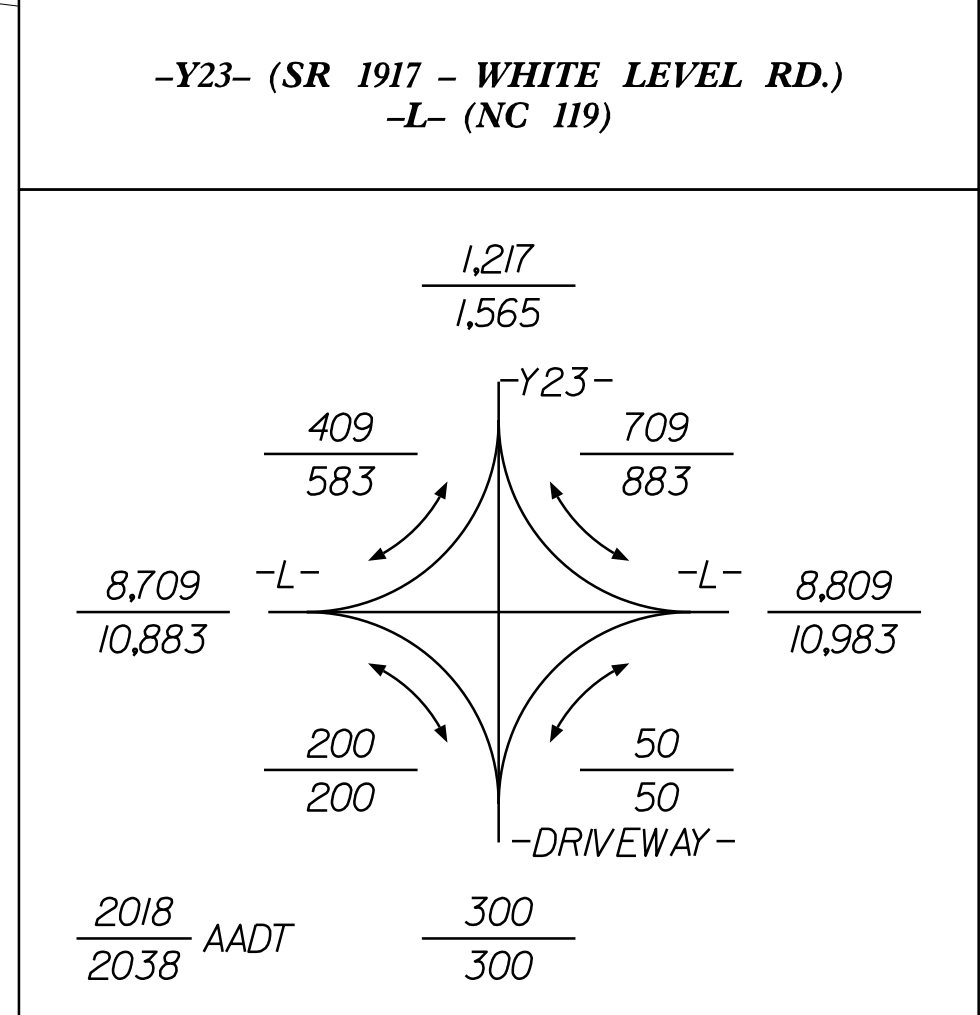
-L-		
PIs Sta 235+25.93	PI Sta 238+32.43	PIs Sta 241+35.43
$\theta_s = 3^\circ 34' 51.6''$	$\Delta = 17^\circ 03' 05.7''$ (RT)	$\theta_s = 3^\circ 34' 51.6''$
LS = 200.00'	D = 3' 34' 51.6"	LS = 200.00'
LT = 133.36'	L = 476.17'	LT = 133.36'
ST = 66.69'	T = 239.86'	ST = 66.69'
	R = 1,600.00'	
	SE = SEE PLANS	
	RO = SEE PLANS	

FOR -L- PROFILE SEE SHEET 13
FOR DITCH DETAILS SEE SHEET 2D-1

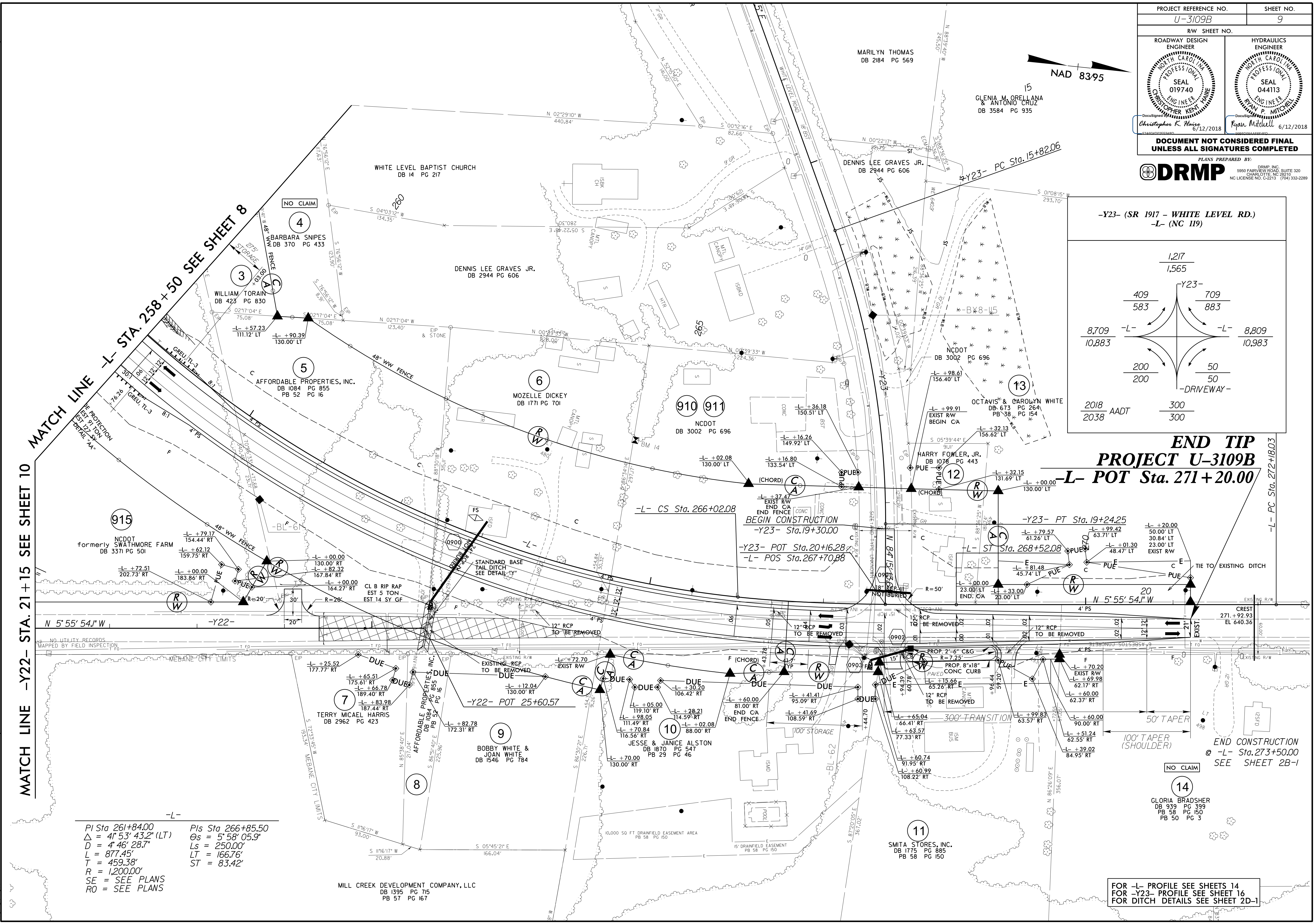
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 DRMP, INC.

PROJECT REFERENCE NO. U-3109B	SHEET NO. 9
RW SHEET NO.	
ROADWAY DESIGN ENGINEER ANTONIO CRUZ SEAL 019740 DB 3584 PG 935	HYDRAULICS ENGINEER RYAN MITCHELL SEAL 044113 DB 1775 PG 885 PB 50 PG 3
<p>Documented by: Christopher K. Hoise 6/12/2018</p> <p>Documented by: Ryan Mitchell 6/12/2018</p>	
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p> <p>PLANS PREPARED BY: DRMP</p>	

DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2215 (704) 332-2289



END TIP PROJECT U-3109B
-L- POT Sta. 271+20.00



-L-
 PI Sta 261+84.00
 $\Delta = 4' 53'' 43.2''$ (LT)
 $D = 4' 46'' 28.7''$
 $L = 877.45'$
 $T = 459.38'$
 $R = 1,200.00'$
 SE = SEE PLANS
 RO = SEE PLANS

PIs Sta 266+85.50
 $\Delta s = 5' 58'' 05.9''$
 $Ls = 250.00'$
 $LT = 166.76'$
 $ST = 83.42'$

MILL CREEK DEVELOPMENT COMPANY, LLC
 DB 1395 PG 715
 PB 57 PG 167

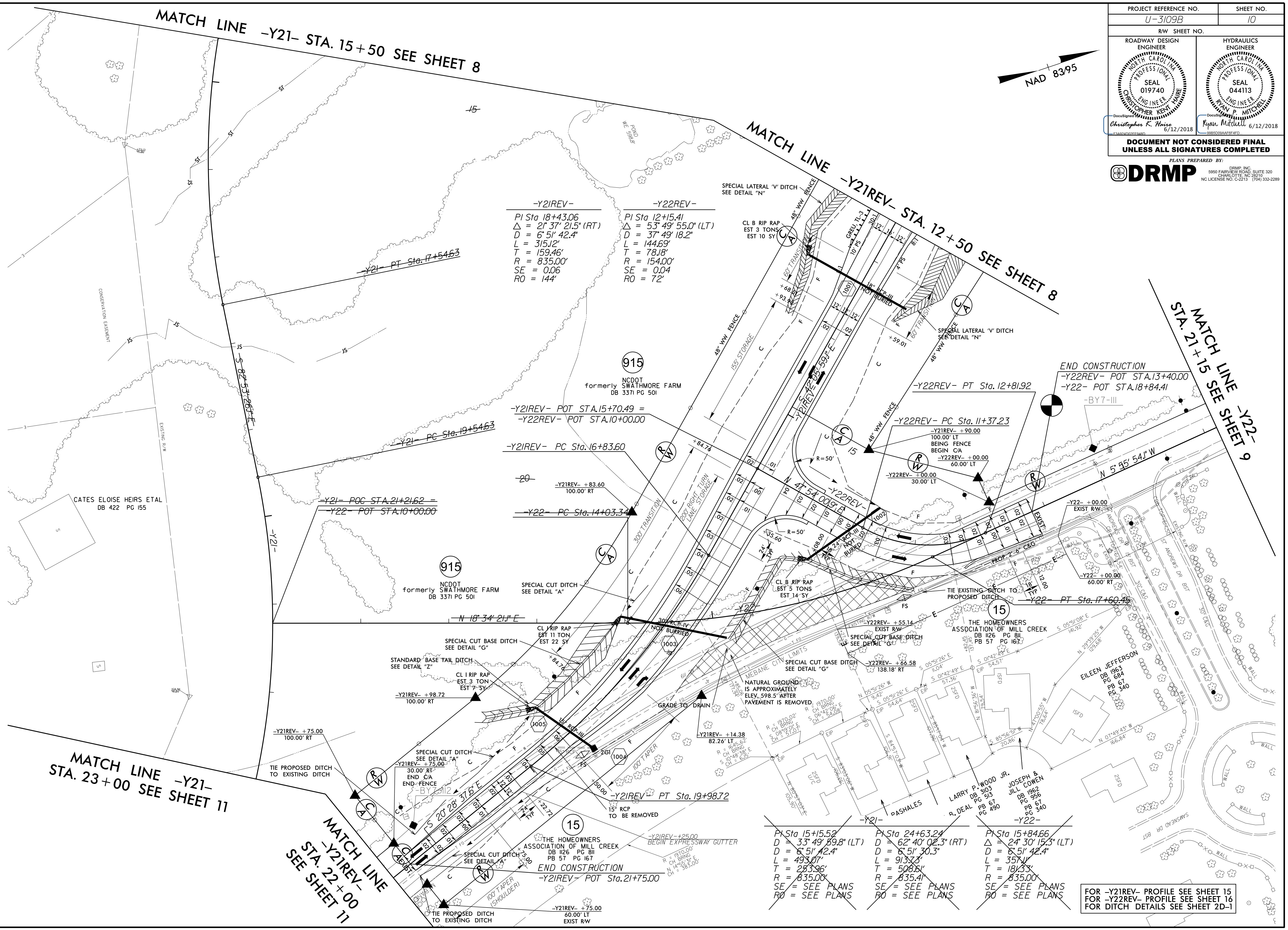
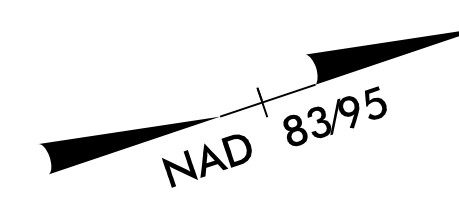
FOR -L- PROFILE SEE SHEETS 14
 FOR -Y23- PROFILE SEE SHEET 16
 FOR DITCH DETAILS SEE SHEET 2D-1

REVISIONS

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 DRMP

PROJECT REFERENCE NO. U-3109B	SHEET NO. 10
RW SHEET NO.	
ROADWAY DESIGN ENGINEER CHRISTOPHER K. HAIN SEAL 019740 6/12/2018	HYDRAULICS ENGINEER RYAN MITCHELL SEAL 044113 6/12/2018
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
PLANS PREPARED BY: DRMP	



-Y21REV-
 PI Sta 18+43.06
 $\Delta = 21' 37" 21.5" (RT)$
 $D = 6' 51' 42.4"$
 $L = 315.12'$
 $T = 159.46'$
 $R = 835.00'$
 $SE = 0.06$
 $RO = 144'$

-Y22REV-
 PI Sta 12+15.41
 $\Delta = 53' 49' 55.0" (LT)$
 $D = 37' 49' 18.2"$
 $L = 144.69'$
 $T = 78.18'$
 $R = 154.00'$
 $SE = 0.04$
 $RO = 72'$

PI Sta 15+15.52
 $D = 33' 49' 89.8" (LT)$
 $D = 6' 51' 42.4"$
 $L = 493.07'$
 $T = 253.96'$
 $R = 835.00'$
 $SE = SEE PLANS$
 $RO = SEE PLANS$

PI Sta 24+63.24
 $D = 62' 40' 02.3" (RT)$
 $D = 6' 51' 30.3"$
 $L = 913.73'$
 $T = 508.61'$
 $R = 835.41'$
 $SE = SEE PLANS$
 $RO = SEE PLANS$

PI Sta 15+84.66
 $\Delta = 24' 30' 15.3" (LT)$
 $D = 6' 51' 42.4"$
 $L = 357.11'$
 $T = 181.33'$
 $R = 835.00'$
 $SE = SEE PLANS$
 $RO = SEE PLANS$

FOR -Y21REV- PROFILE SEE SHEET 15
 FOR -Y22REV- PROFILE SEE SHEET 16
 FOR DITCH DETAILS SEE SHEET 2D-1

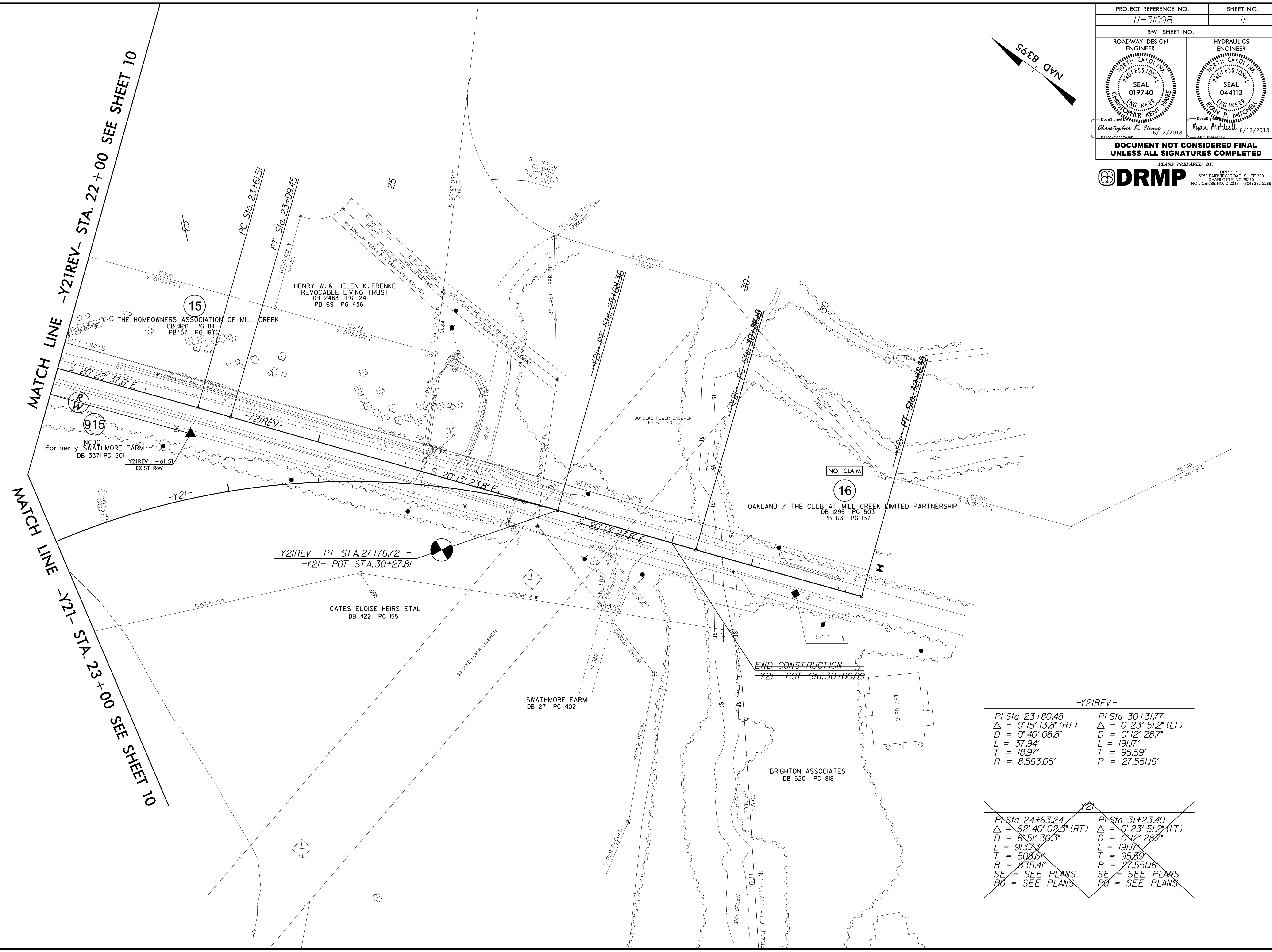
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REVISIONS

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MATCH LINE -Y21REV- STA. 22+00 SEE SHEET 10

PC Sta. 23+16.51

PT Sta. 23+99.45

PC Sta. 28+168.36

PT Sta. 28+168.36

PC Sta. 30+142.89

PT Sta. 30+142.89

MATCH LINE -Y21- STA. 23+00 SEE SHEET 10

-Y21REV- PT STA. 27+76.72 =
-Y21- POT STA. 30+27.81

-Y21- POT Sta. 30+00.00

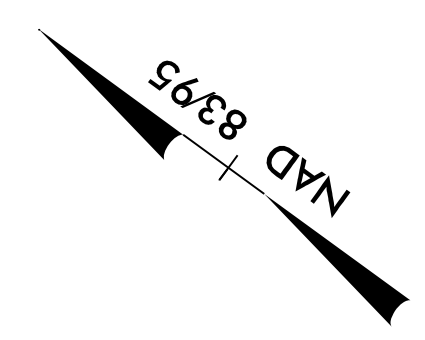
-Y21REV-

PI Sta 23+80.48	PI Sta 30+31.77
$\Delta = 0' 15' 13.8" (RT)$	$\Delta = 0' 23' 51.2" (LT)$
$D = 0' 40' 08.8"$	$D = 0' 12' 28.7"$
$L = 37.94'$	$L = 191.17'$
$T = 18.97'$	$T = 95.59'$
$R = 8,563.05'$	$R = 27,551.16'$

~~-Y21-~~

PI Sta 24+63.24	PI Sta 31+23.40
$\Delta = 62' 40' 02.3" (RT)$	$\Delta = 0' 23' 51.2" (LT)$
$D = 8' 51' 30.3"$	$D = 0' 12' 28.7"$
$L = 913.73'$	$L = 191.17'$
$T = 508.61'$	$T = 95.59'$
$R = 835.41'$	$R = 27,551.16'$
SE = SEE PLANS	SE = SEE PLANS
RO = SEE PLANS	RO = SEE PLANS

PROJECT REFERENCE NO. U-3109B	SHEET NO. 11
RW SHEET NO.	
ROADWAY DESIGN ENGINEER CHRISTOPHER K. HOISE SEAL 019740 NORTH CAROLINA PROFESSIONAL ENGINEER	HYDRAULICS ENGINEER RYAN MITCHELL SEAL 044113 NORTH CAROLINA PROFESSIONAL ENGINEER
DocuSigned by: Christopher K. Hoise 6/12/2018	DocuSigned by: Ryan Mitchell 6/12/2018
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
PLANS PREPARED BY: DRMP, INC. 5950 FAIRVIEW ROAD, SUITE 320 CHARLOTTE, NC 28210 NC LICENSE NO. C-2215 (704) 332-2289	



R = 162.50'
CH BRNG N 21°06'09"E
CH = 212.13'

SIZE AND TYPE UNKNOWN

HENRY W. & HELEN K. FRENKE
REVOCABLE LIVING TRUST
DB 2483 PG 124
PB 69 PG 436

THE HOMEOWNERS ASSOCIATION OF MILL CREEK
DB 126 PG 81
PB 57 PG 167

915
NCDOT SWATHMORE FARM
DB 3371 PG 501

16
OAKLAND / THE CLUB AT MILL CREEK LIMITED PARTNERSHIP
DB 1295 PG 503
PB 63 PG 137

CATES ELOISE HEIRS ETAL
DB 422 PG 155

SWATHMORE FARM
DB 27 PG 402

BRIGHTON ASSOCIATES
DB 520 PG 818

25FD APT

END CONSTRUCTION
-Y21- POT Sta. 30+00.00

NO CLAIM

16

DB 1295 PG 503
PB 63 PG 137

BM 16

-BY7-113

25FD APT

END CONSTRUCTION

-Y21- POT Sta. 30+00.00

BRIGHTON ASSOCIATES

DB 520 PG 818

25FD APT

END CONSTRUCTION

-Y21- POT Sta. 30+00.00

BRIGHTON ASSOCIATES

DB 520 PG 818

25FD APT

END CONSTRUCTION

-Y21- POT Sta. 30+00.00

BRIGHTON ASSOCIATES

DB 520 PG 818

25FD APT

END CONSTRUCTION

-Y21- POT Sta. 30+00.00

BRIGHTON ASSOCIATES

DB 520 PG 818

25FD APT

END CONSTRUCTION

-Y21- POT Sta. 30+00.00

BRIGHTON ASSOCIATES

DB 520 PG 818

25FD APT

END CONSTRUCTION

-Y21- POT Sta. 30+00.00

BRIGHTON ASSOCIATES

DB 520 PG 818

25FD APT

END CONSTRUCTION

-Y21- POT Sta. 30+00.00

BRIGHTON ASSOCIATES

DB 520 PG 818

25FD APT

END CONSTRUCTION

-Y21- POT Sta. 30+00.00

BRIGHTON ASSOCIATES

DB 520 PG 818

25FD APT

END CONSTRUCTION

-Y21- POT Sta. 30+00.00

BRIGHTON ASSOCIATES

DB 520 PG 818

25FD APT

END CONSTRUCTION

-Y21- POT Sta. 30+00.00

BRIGHTON ASSOCIATES

DB 520 PG 818

25FD APT

END CONSTRUCTION

-Y21- POT Sta. 30+00.00

BRIGHTON ASSOCIATES

DB 520 PG 818

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-Y21- POT Sta. 30+00.00

BRIGHTON ASSOCIATES

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-Y21- POT Sta. 30+00.00

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BRIGHTON ASSOCIATES

DB 520 PG 818

25FD APT

END CONSTRUCTION

-Y21- POT Sta. 30+00.00

BRIGHTON ASSOCIATES

DB 520 PG 818

5/28/19

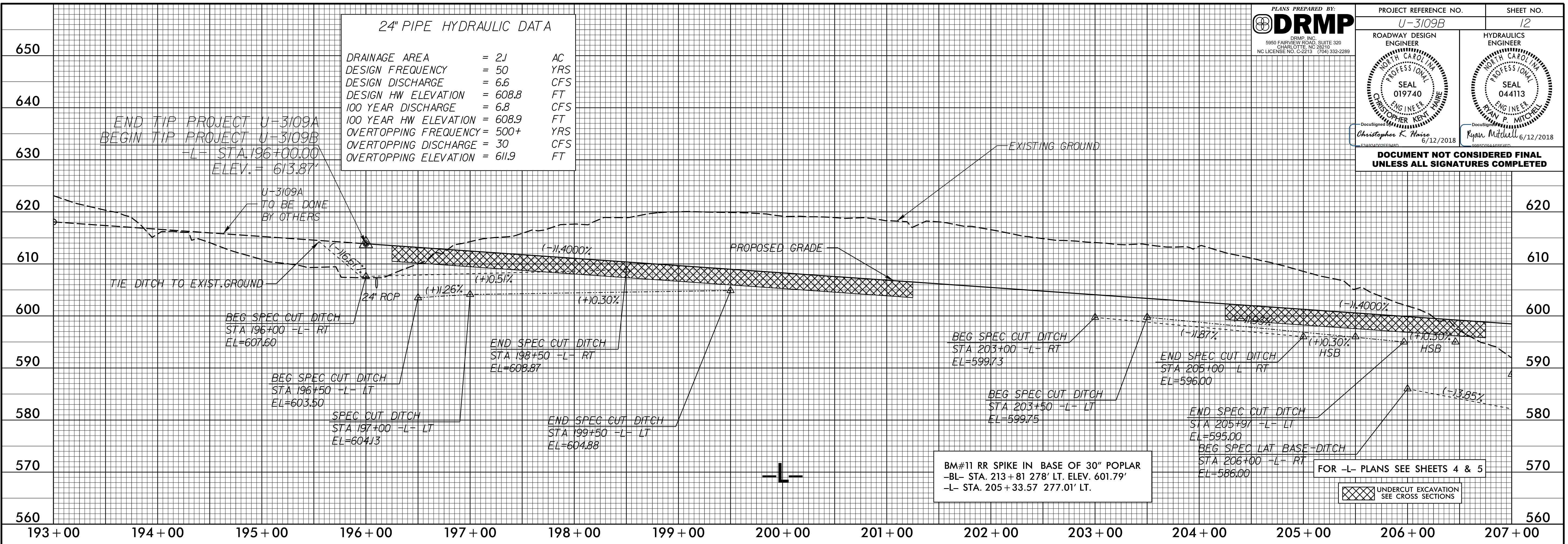
PLANS PREPARED BY: **DRMP**
 DRMP, INC.
 5950 FAIRVIEW ROAD, SUITE 320
 CHARLOTTE, NC 28210
 NC LICENSE NO. C-2213 (704) 332-2289

PROJECT REFERENCE NO. **U-3109B** SHEET NO. **12**

ROADWAY DESIGN ENGINEER
 SEAL 019740
 CHRISTOPHER K. HOWE
 6/12/2018

HYDRAULICS ENGINEER
 SEAL 044113
 RYAN P. MITCHELL
 6/12/2018

**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**



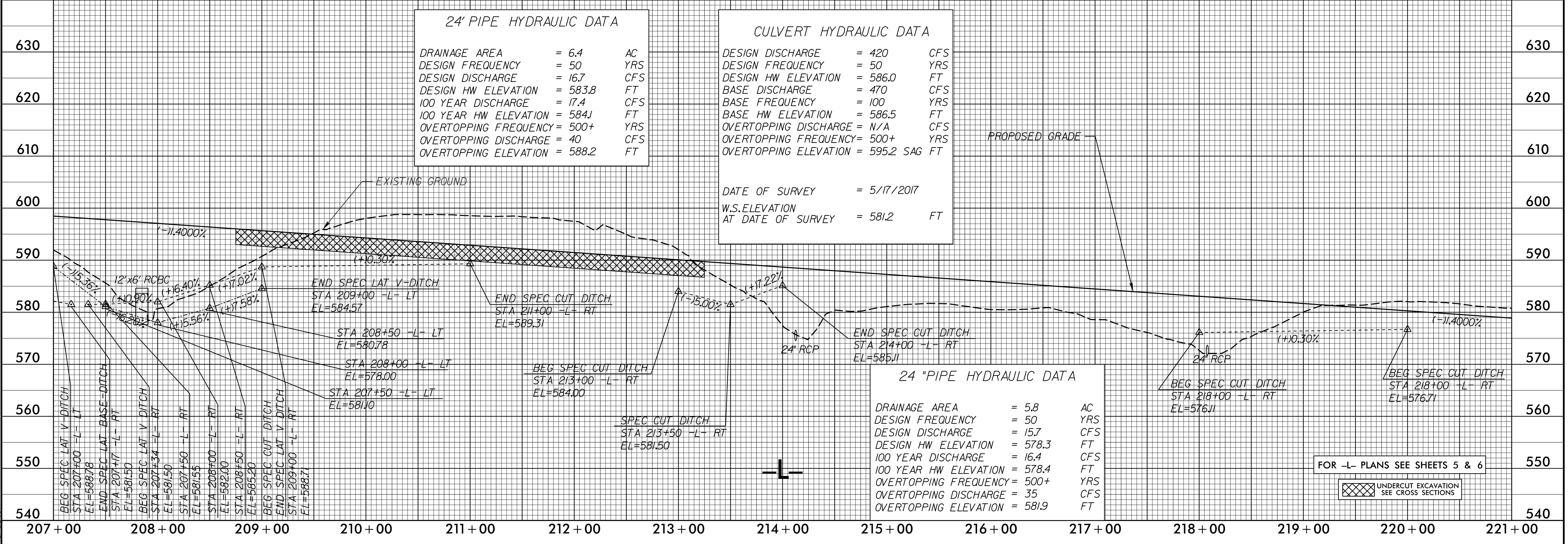
24" PIPE HYDRAULIC DATA

DRAINAGE AREA	= 2.1	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 6.6	CFS
DESIGN HW ELEVATION	= 608.8	FT
100 YEAR DISCHARGE	= 6.8	CFS
100 YEAR HW ELEVATION	= 608.9	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 30	CFS
OVERTOPPING ELEVATION	= 611.9	FT

BM#11 RR SPIKE IN BASE OF 30' POPLAR
 -BL- STA. 213+81 278' LT. ELEV. 601.79'
 -L- STA. 205+33.57 277.01' LT.

FOR -L- PLANS SEE SHEETS 4 & 5

UNDERCUT EXCAVATION
 SEE CROSS SECTIONS



24" PIPE HYDRAULIC DATA

DRAINAGE AREA	= 6.4	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 16.7	CFS
DESIGN HW ELEVATION	= 583.8	FT
100 YEAR DISCHARGE	= 17.4	CFS
100 YEAR HW ELEVATION	= 584.1	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 40	CFS
OVERTOPPING ELEVATION	= 588.2	FT

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 420	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 586.0	FT
BASE DISCHARGE	= 470	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 586.5	FT
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 595.2	SAG FT

DATE OF SURVEY = 5/17/2017
 W.S. ELEVATION AT DATE OF SURVEY = 581.2 FT

24" PIPE HYDRAULIC DATA

DRAINAGE AREA	= 5.8	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 15.7	CFS
DESIGN HW ELEVATION	= 578.3	FT
100 YEAR DISCHARGE	= 16.4	CFS
100 YEAR HW ELEVATION	= 578.4	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 35	CFS
OVERTOPPING ELEVATION	= 581.9	FT

FOR -L- PLANS SEE SHEETS 5 & 6

UNDERCUT EXCAVATION
 SEE CROSS SECTIONS

6/1/2018 R:\U3109B\Roadway\Proj\U3109B_Rdy.plt.dgn

5/28/19

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE = 3,290 CFS
 DESIGN FREQUENCY = 50 YRS
 DESIGN HW ELEVATION = 554.5 FT
 BASE DISCHARGE = 3,720 CFS
 BASE FREQUENCY = 100 YRS
 BASE HW ELEVATION = 555.1 FT
 OVERTOPPING DISCHARGE = N/A CFS
 OVERTOPPING FREQUENCY = 500+ YRS
 OVERTOPPING ELEVATION = 574.8 SAG FT

DATE OF SURVEY = 5/17/2017
 W.S. ELEVATION AT DATE OF SURVEY = 539.9 FT

PI = 224+16.00
 EL = 574.45'
 VC = 185'
 K = 97

PI = 230+10.00
 EL = 577.42'
 VC = 260'
 K = 98

BM#12 RR SPIKE IN BASE OF 30" SWEETGUM
 -BL- STA. 235+97 288' LT. ELEV. 550.13'
 -L- STA. 227+45.50 287.33' LT.

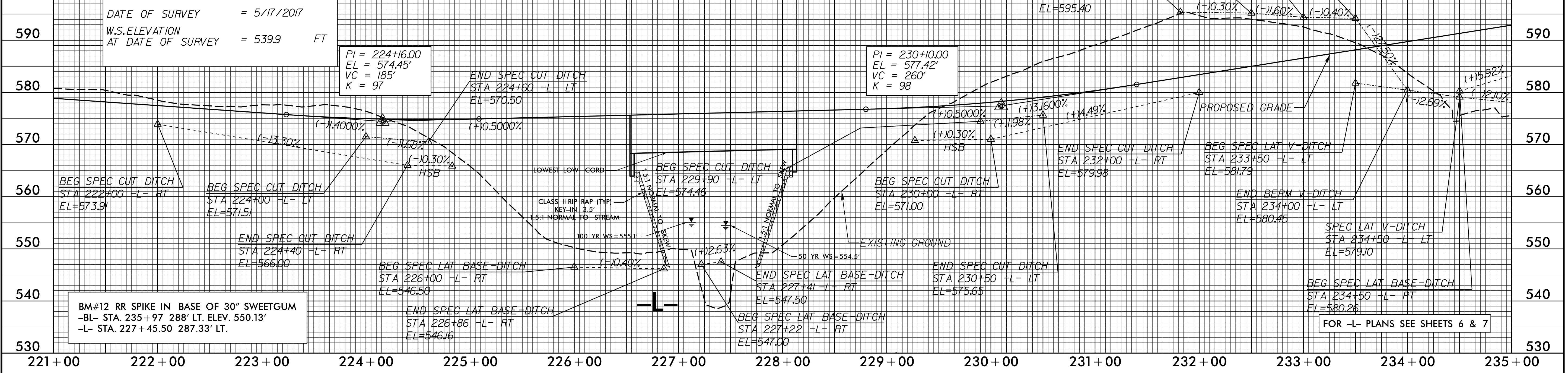
BEGIN BRIDGE
 -L- STA. 226+53.50

END BRIDGE
 -L- STA. 228+13.50



PROJECT REFERENCE NO. U-3109B	SHEET NO. 13
ROADWAY DESIGN ENGINEER CHRISTOPHER K. HANCOCK SEAL 019740 6/12/2018	HYDRAULICS ENGINEER RYAN P. MITCHELL SEAL 044113 6/12/2018

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 UNLESS ALL SIGNATURES COMPLETED



42" PIPE HYDRAULIC DATA

DRAINAGE AREA = 24.4 AC
 DESIGN FREQUENCY = 50 YRS
 DESIGN DISCHARGE = 56J CFS
 DESIGN HW ELEVATION = 580.3 FT
 100 YEAR DISCHARGE = 65J CFS
 100 YEAR HW ELEVATION = 580.8 FT
 OVERTOPPING FREQUENCY = 500+ YRS
 OVERTOPPING DISCHARGE = 140 CFS
 OVERTOPPING ELEVATION = 586.2 FT

BERM V-DITCH
 STA 238+00 -L- LT
 EL=605.07

PI = 237+50.00
 EL = 600.80'
 VC = 200'
 K = 100

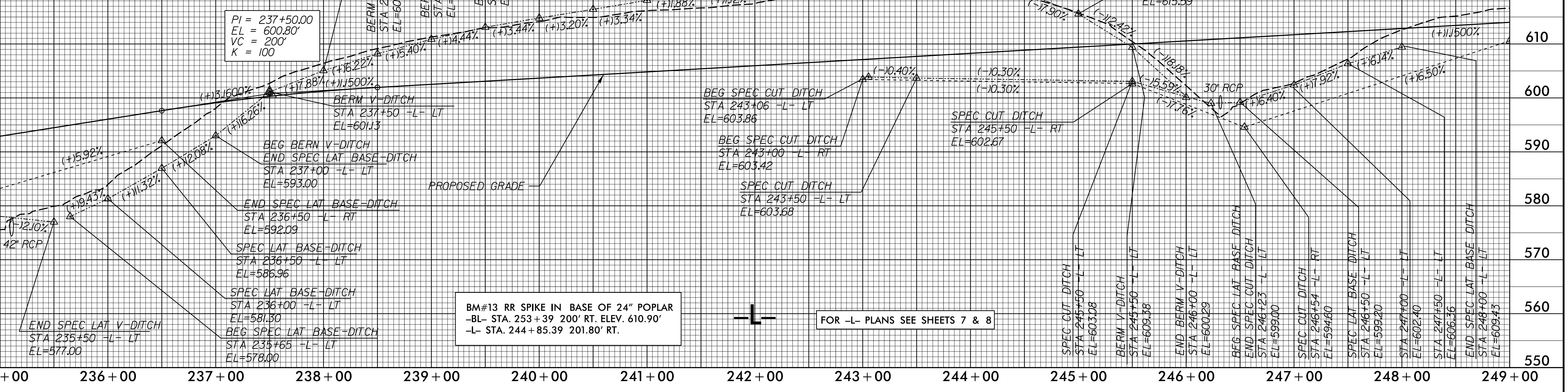
30" PIPE HYDRAULIC DATA

DRAINAGE AREA = 9.43 AC
 DESIGN FREQUENCY = 50 YRS
 DESIGN DISCHARGE = 23.5 CFS
 DESIGN HW ELEVATION = 601.6 FT
 100 YEAR DISCHARGE = 24.4 CFS
 100 YEAR HW ELEVATION = 601.7 FT
 OVERTOPPING FREQUENCY = 500+ YRS
 OVERTOPPING DISCHARGE = 65 CFS
 OVERTOPPING ELEVATION = 606.9 FT

BERM V-DITCH
 STA 244+00 -L- LT
 EL=621.10

BERM V-DITCH
 STA 244+50 -L- LT
 EL=619.54

BERM V-DITCH
 STA 245+00 -L- LT
 EL=615.59



BM#13 RR SPIKE IN BASE OF 24" POPLAR
 -BL- STA. 253+39 200' RT. ELEV. 610.90'
 -L- STA. 244+85.39 201.80' RT.

FOR -L- PLANS SEE SHEETS 7 & 8

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5/28/19

30" PIPE HYDRAULIC DATA

660	DRAINAGE AREA	= 9.25	AC
	DESIGN FREQUENCY	= 50	YRS
	DESIGN DISCHARGE	= 23.4	CFS
	DESIGN HW ELEVATION	= 606.3	FT
650	100 YEAR DISCHARGE	= 24.4	CFS
	100 YEAR HW ELEVATION	= 606.3	FT
	OVERTOPPING FREQUENCY	= 500+	YRS
	OVERTOPPING DISCHARGE	= 80	CFS
640	OVERTOPPING ELEVATION	= 614.2	FT

36" PIPE HYDRAULIC DATA

	DRAINAGE AREA	= 12.5	AC
	DESIGN FREQUENCY	= 50	YRS
	DESIGN DISCHARGE	= 32.9	CFS
	DESIGN HW ELEVATION	= 610.4	FT
	100 YEAR DISCHARGE	= 34.2	CFS
	100 YEAR HW ELEVATION	= 610.4	FT
	OVERTOPPING FREQUENCY	= 500+	YRS
	OVERTOPPING DISCHARGE	= 138.8	CFS
	OVERTOPPING ELEVATION	= 620.2	FT

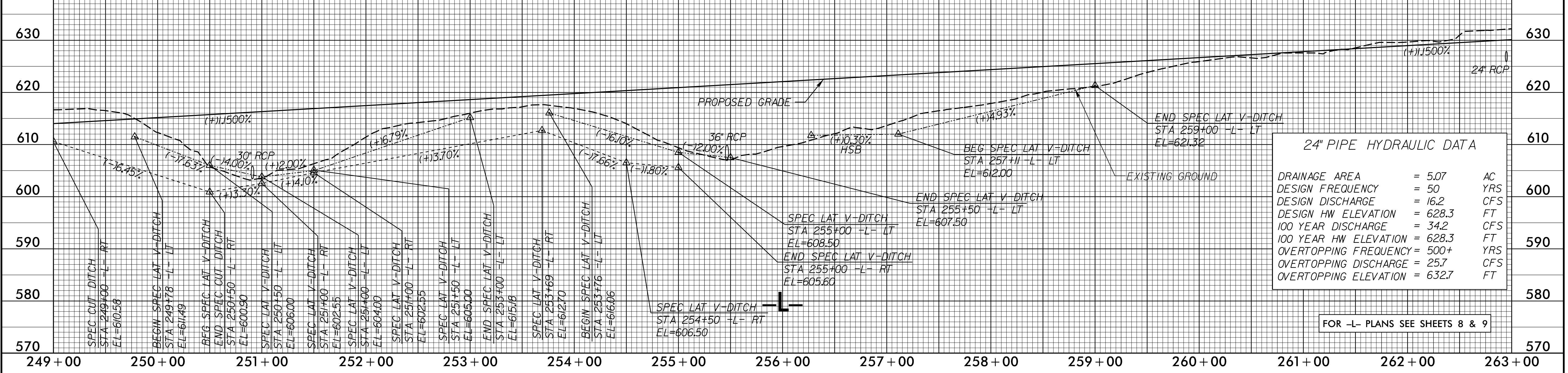
PLANS PREPARED BY: **DRMP**
 DRMP, INC.
 9850 FAIRVIEW ROAD, SUITE 320
 CHARLOTTE, NC 28210
 NC LICENSE NO. C-2213 (704) 332-2289

PROJECT REFERENCE NO. **U-3109B** SHEET NO. **14**

ROADWAY DESIGN ENGINEER: **CHRISTOPHER K. HAYES**, SEAL 019740, 6/12/2018

HYDRAULICS ENGINEER: **RYAN P. MITCHELL**, SEAL 044113, 6/12/2018

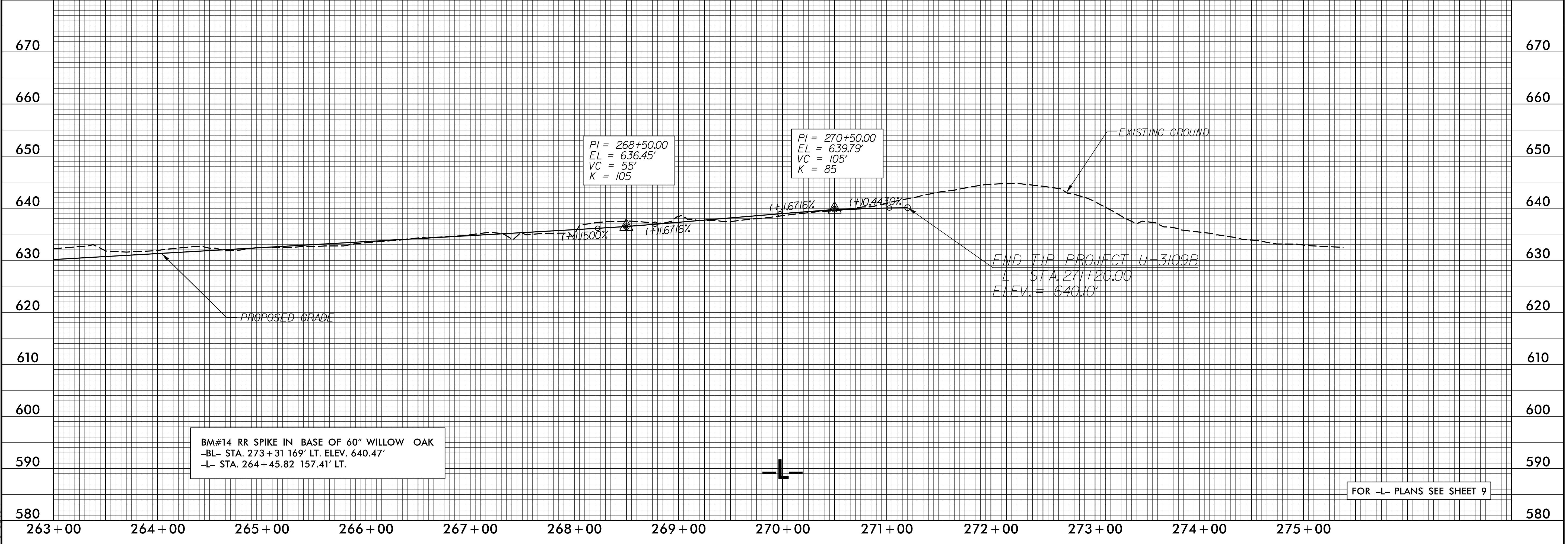
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24" PIPE HYDRAULIC DATA

660	DRAINAGE AREA	= 5.07	AC
	DESIGN FREQUENCY	= 50	YRS
	DESIGN DISCHARGE	= 16.2	CFS
	DESIGN HW ELEVATION	= 628.3	FT
650	100 YEAR DISCHARGE	= 34.2	CFS
	100 YEAR HW ELEVATION	= 628.3	FT
	OVERTOPPING FREQUENCY	= 500+	YRS
	OVERTOPPING DISCHARGE	= 25.7	CFS
640	OVERTOPPING ELEVATION	= 632.7	FT

FOR -L- PLANS SEE SHEETS 8 & 9



BM#14 RR SPIKE IN BASE OF 60" WILLOW OAK
 -BL- STA. 273 + 31 169' LT. ELEV. 640.47'
 -L- STA. 264 + 45.82 157.41' LT.

FOR -L- PLANS SEE SHEET 9

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5/28/19



PROJECT REFERENCE NO. U-3109B	SHEET NO. 15
ROADWAY DESIGN ENGINEER SEAL 019740 CHRISTOPHER K. HOGG 6/12/2018	HYDRAULICS ENGINEER SEAL 044113 RYAN P. MITCHELL 6/12/2018

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18" PIPE HYDRAULIC DATA

DRAINAGE AREA	= 1.45	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 4J	CFS
DESIGN HW ELEVATION	= 609.9	FT
100 YEAR DISCHARGE	= 4.5	CFS
100 YEAR HW ELEVATION	= 610.0	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 230	CFS
OVERTOPPING ELEVATION	= 616.9	FT

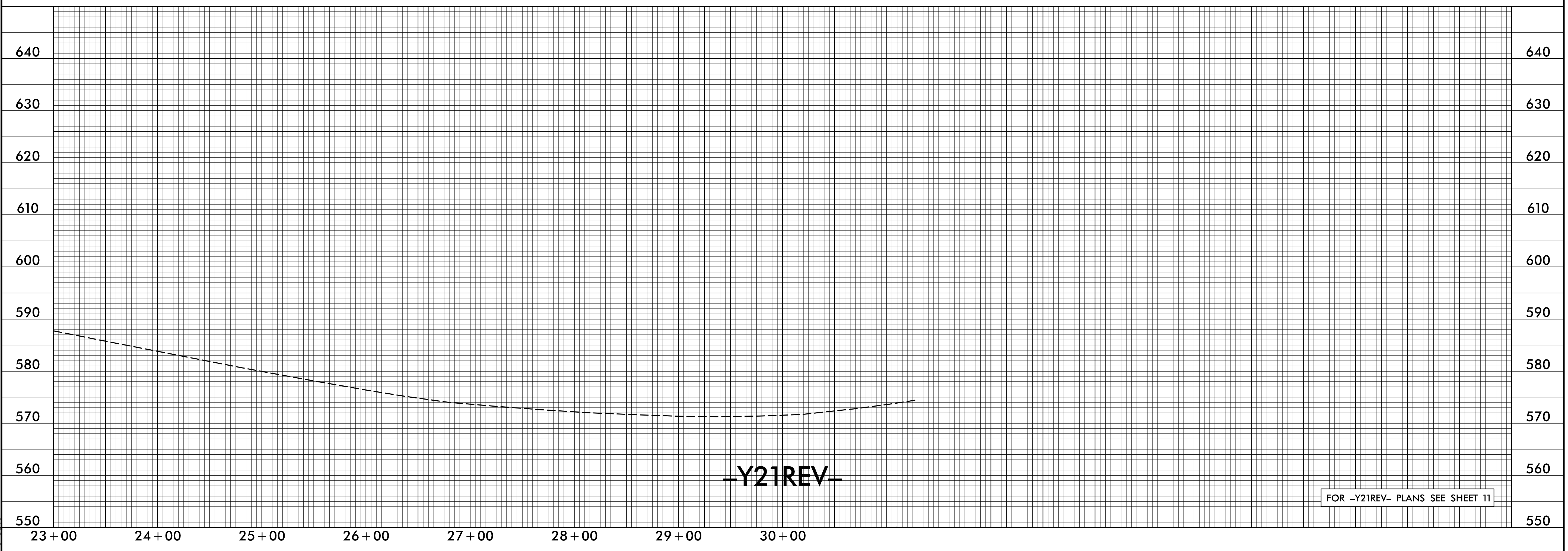
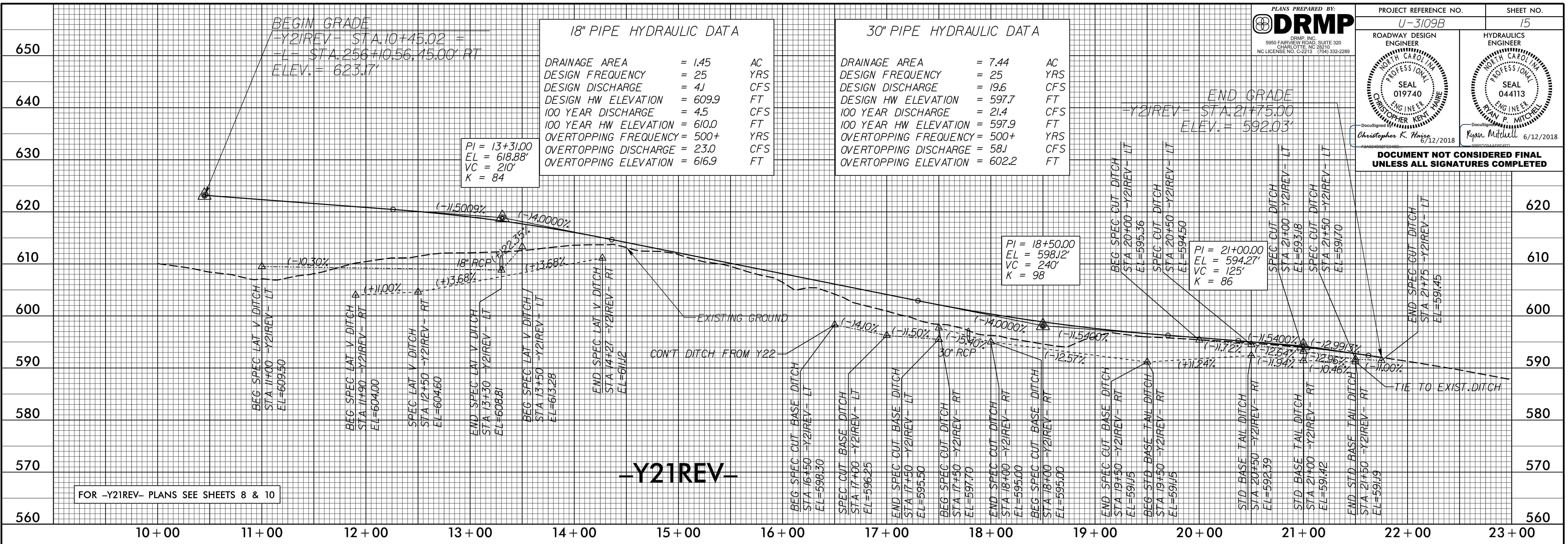
30" PIPE HYDRAULIC DATA

DRAINAGE AREA	= 7.44	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 19.6	CFS
DESIGN HW ELEVATION	= 597.7	FT
100 YEAR DISCHARGE	= 21.4	CFS
100 YEAR HW ELEVATION	= 597.9	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 58J	CFS
OVERTOPPING ELEVATION	= 602.2	FT

PI = 13+31.00
EL = 618.88'
VC = 210'
K = 84

PI = 18+50.00
EL = 598.12'
VC = 240'
K = 98

PI = 21+00.00
EL = 594.27'
VC = 125'
K = 86



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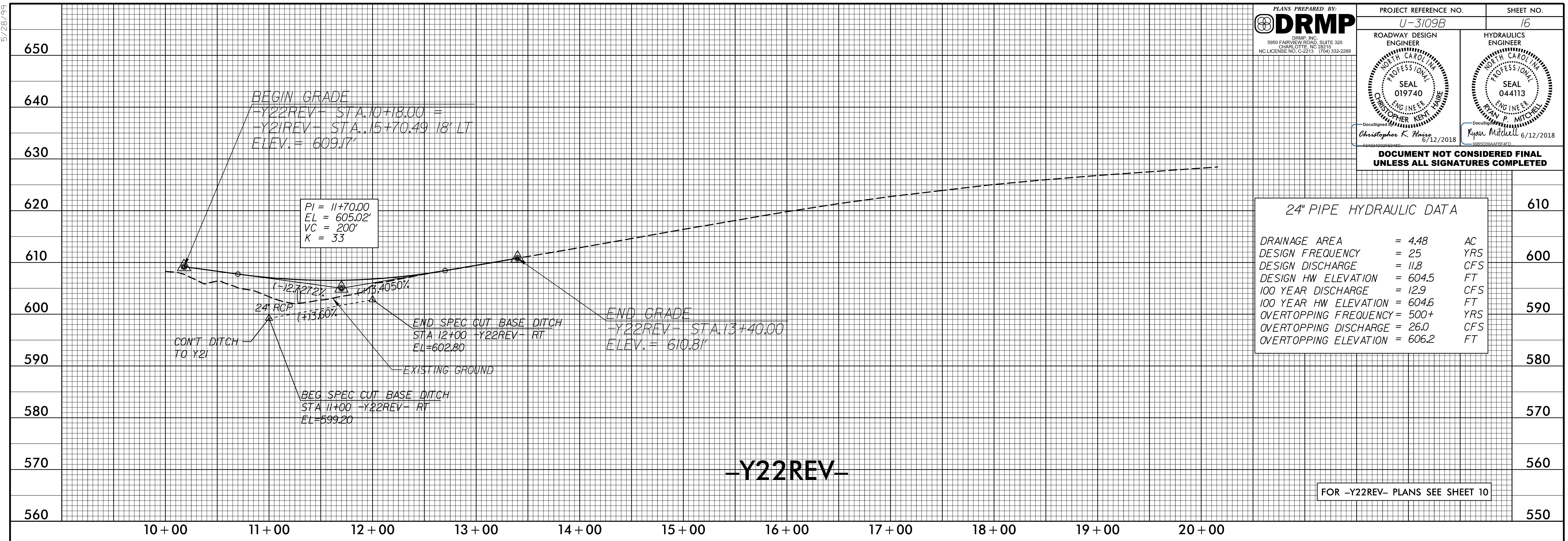
PLANS PREPARED BY: **DRMP**
 DRMP, INC.
 9850 FAIRVIEW ROAD, SUITE 320
 CHARLOTTE, NC 28210
 NC LICENSE NO. C-2213 (704) 332-2289

PROJECT REFERENCE NO. **U-3109B** SHEET NO. **16**

ROADWAY DESIGN ENGINEER
 SEAL 019740
 PROFESSIONAL ENGINEER
 CHRISTOPHER K. HAYES
 6/12/2018

HYDRAULICS ENGINEER
 SEAL 044113
 PROFESSIONAL ENGINEER
 RYAN P. MITCHELL
 6/12/2018

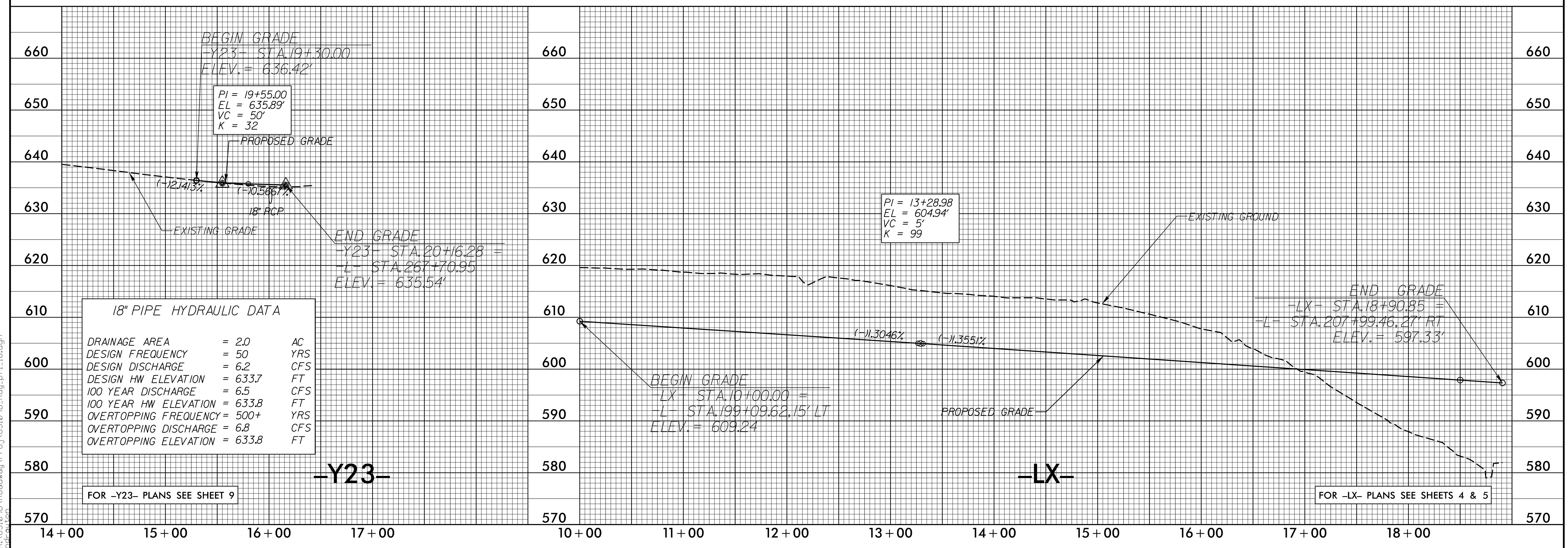
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24" PIPE HYDRAULIC DATA

DRAINAGE AREA	= 4.48	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 11.8	CFS
DESIGN HW ELEVATION	= 604.5	FT
100 YEAR DISCHARGE	= 12.9	CFS
100 YEAR HW ELEVATION	= 604.6	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 26.0	CFS
OVERTOPPING ELEVATION	= 606.2	FT

FOR -Y22REV- PLANS SEE SHEET 10



18" PIPE HYDRAULIC DATA

DRAINAGE AREA	= 2.0	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 6.2	CFS
DESIGN HW ELEVATION	= 633.7	FT
100 YEAR DISCHARGE	= 6.5	CFS
100 YEAR HW ELEVATION	= 633.8	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 6.8	CFS
OVERTOPPING ELEVATION	= 633.8	FT

FOR -Y23- PLANS SEE SHEET 9

FOR -LX- PLANS SEE SHEETS 4 & 5

6/1/2018
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