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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CATAWBA COUNTY

**LOCATION: NC 16 FROM NORTH OF SR 1801 (CLAREMONT RD)
TO NORTH OF SR 1814 (CALDWELL RD)**

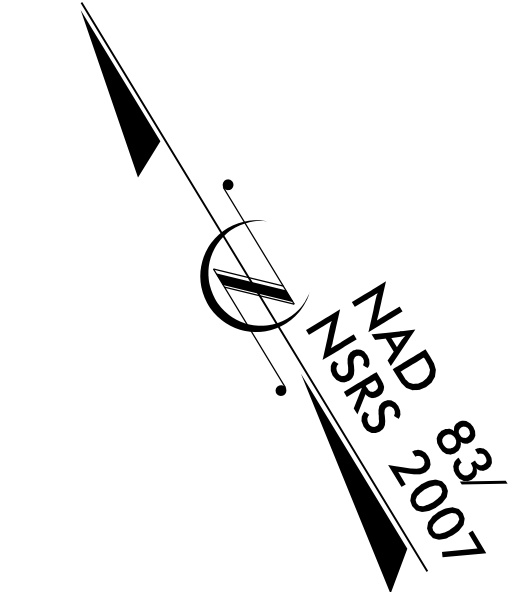
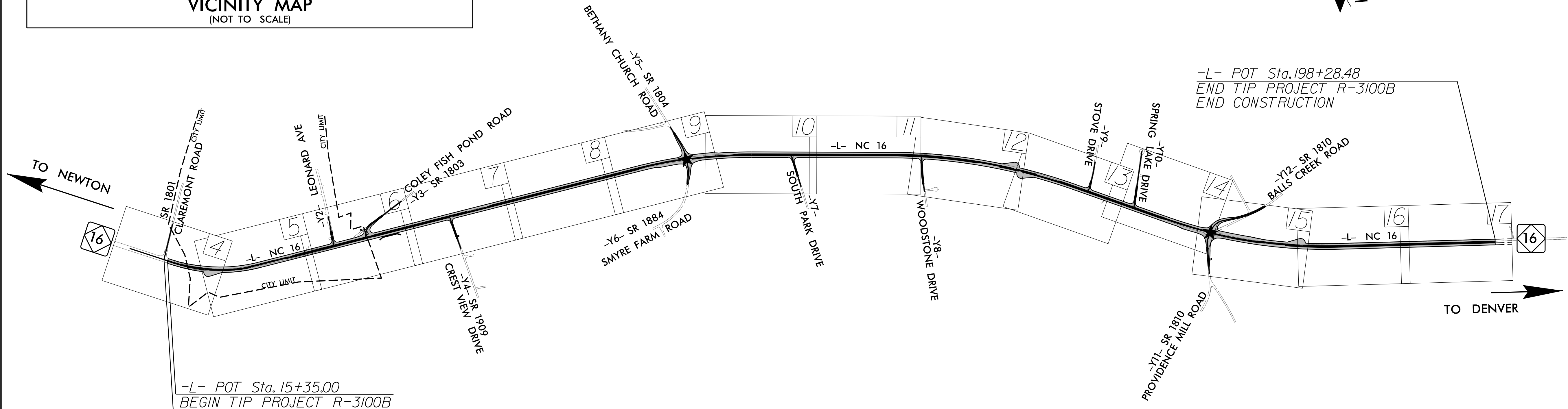
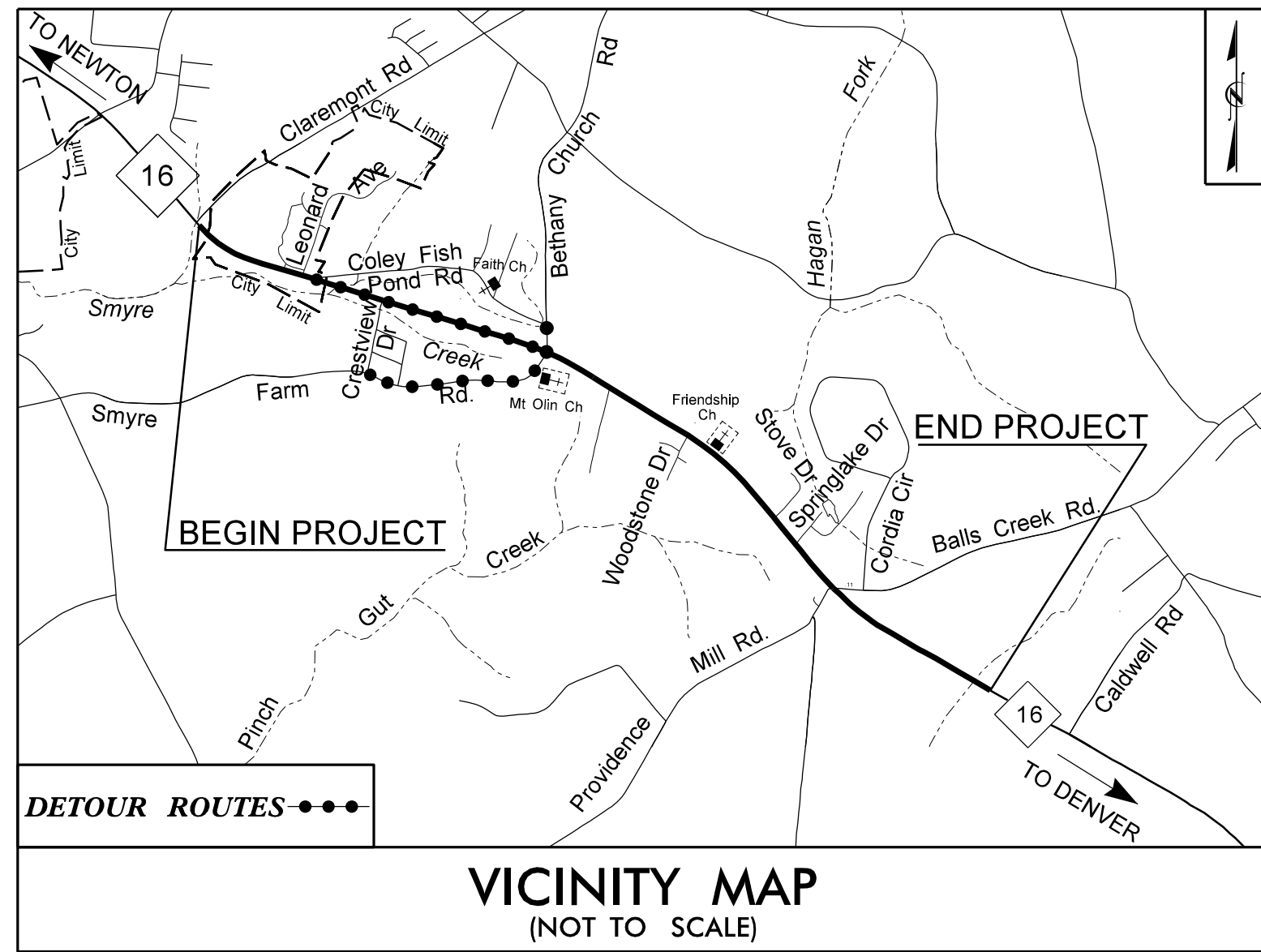
**TYPE OF WORK: GRADING, DRAINAGE, RETAINING WALL,
CULVERTS, PAVING & SIGNALS**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-3100B	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34522.1.4	STP-0016(53)	PE	
34522.2.FR4	STP-0016(53)	ROW	
34522.2.FRU4	STP-0016(53)	UTIL.	
34522.3.5	STP-0016(52)	CONST.	

PART 2 OF 2

TIP PROJECT: R-3100B

CONTRACT: C203800



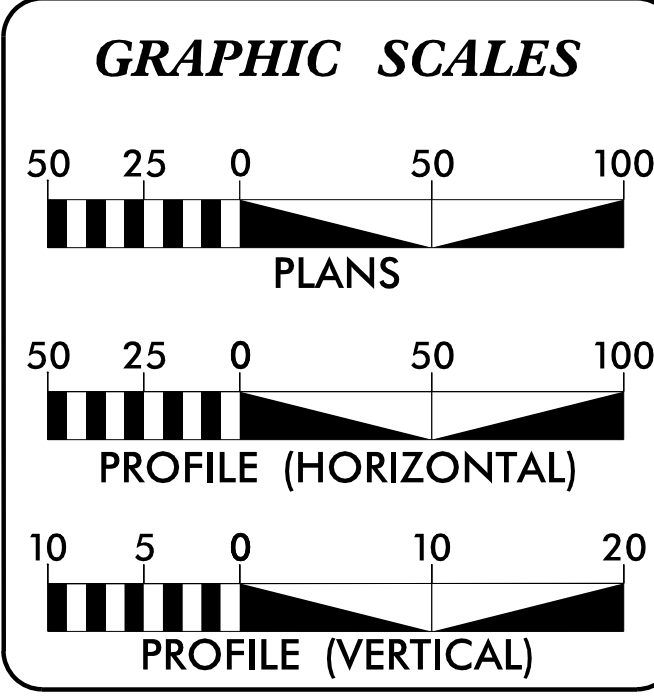
PREPARED FOR
DEPARTMENT OF TRANSPORTATION
RALEIGH, NC

NCDOT CONTACT: GARY LOVERING, PE

★ PROPOSED SIGNAL

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

THIS PROJECT IS PARTIAL CONTROL-ACCESS, WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON PLANS.



DESIGN DATA

ADT 2017	=	13,408
ADT 2037	=	20,558
K	=	10 %
D	=	65 %
T	=	9 % *
V	=	50 MPH
*(TTST 4% + DUAL 5%)		
FUNC CL	=	RURAL ARTERIAL
REGIONAL TIER		

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-3100B	=	3.465 Miles
TOTAL LENGTH TIP PROJECT R-3100B	=	3.465 Miles

Prepared in the Office of:
URS
URS Corporation - North Carolina
1600 Perimeter Park Drive
Morrisville, North Carolina 27560
TELEPHONE (919) 461-1100 FAX (919) 461-1415
NC LICENSE # C-2243

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 30, 2015

LETTING DATE:
APRIL 18, 2017

EDWARD G. EDENS, PE
PROJECT ENGINEER

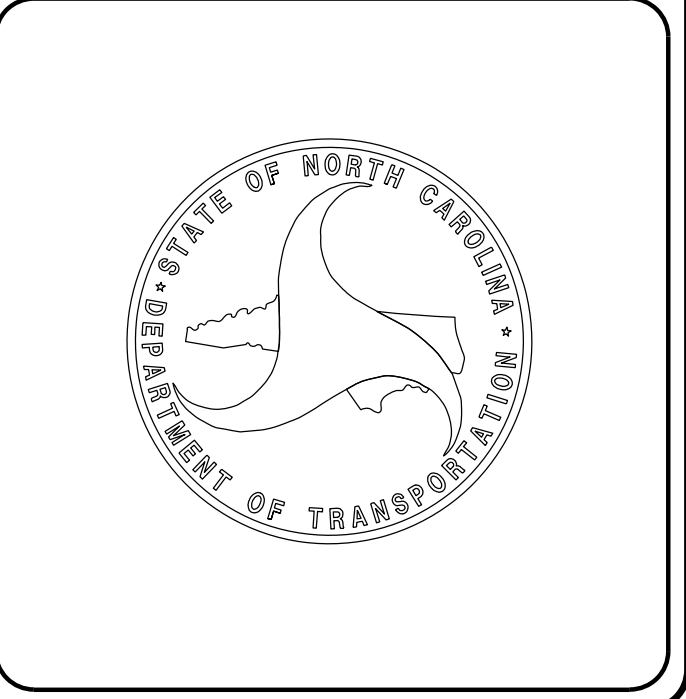
KEVIN J. VAN METRE, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

DocuSigned by:
Memo Buscemi
SEAL 037863
P.E. 3/16/2017

ROADWAY DESIGN ENGINEER

DocuSigned by:
Edward G. Edens, Jr.
SEAL 18470
P.E. 3/16/2017



STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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

04/06/15

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	①23
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	-WLB-
Proposed Wetland Boundary	-WLB-
Existing Endangered Animal Boundary	-EAB-
Existing Endangered Plant Boundary	-EPB-
Existing Historic Property Boundary	-HPB-
Known Contamination Area: Soil	☠ ☠
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 RW Marker	▲ RW
Proposed Control of Access Line with Concrete C/A Marker	○ C/A
Existing Control of Access	○ C/A
Proposed Control of Access	○ C/A
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	-T-T-T-
Proposed Guardrail	-T-T-T-
Existing Cable Guiderail	-□-□-□-
Proposed Cable Guiderail	-□-□-□-
Equality Symbol	⊕
Pavement Removal	▣

VEGETATION:

Single Tree	☀
Single Shrub	☀
Hedge	~~~~~
Woods Line	~~~~~

Orchard	☀ ☀ ☀ ☀
Vineyard	□ Vineyard

EXISTING STRUCTURES:

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

UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	○ P
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	○ T
Telephone Pedestal	□ T
Telephone Cell Tower	⌋
U/G Telephone Cable Hand Hole	○ TH
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.*)	-----TFD-----
U/G Fiber Optics Cable LOS C (S.U.E.*)	-----TFD-----
U/G Fiber Optics Cable LOS D (S.U.E.*)	-----TFD-----

WATER:

Water Manhole	○ W
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	○ TH
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.*)	-----ZUTL-----
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

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R3100-7"

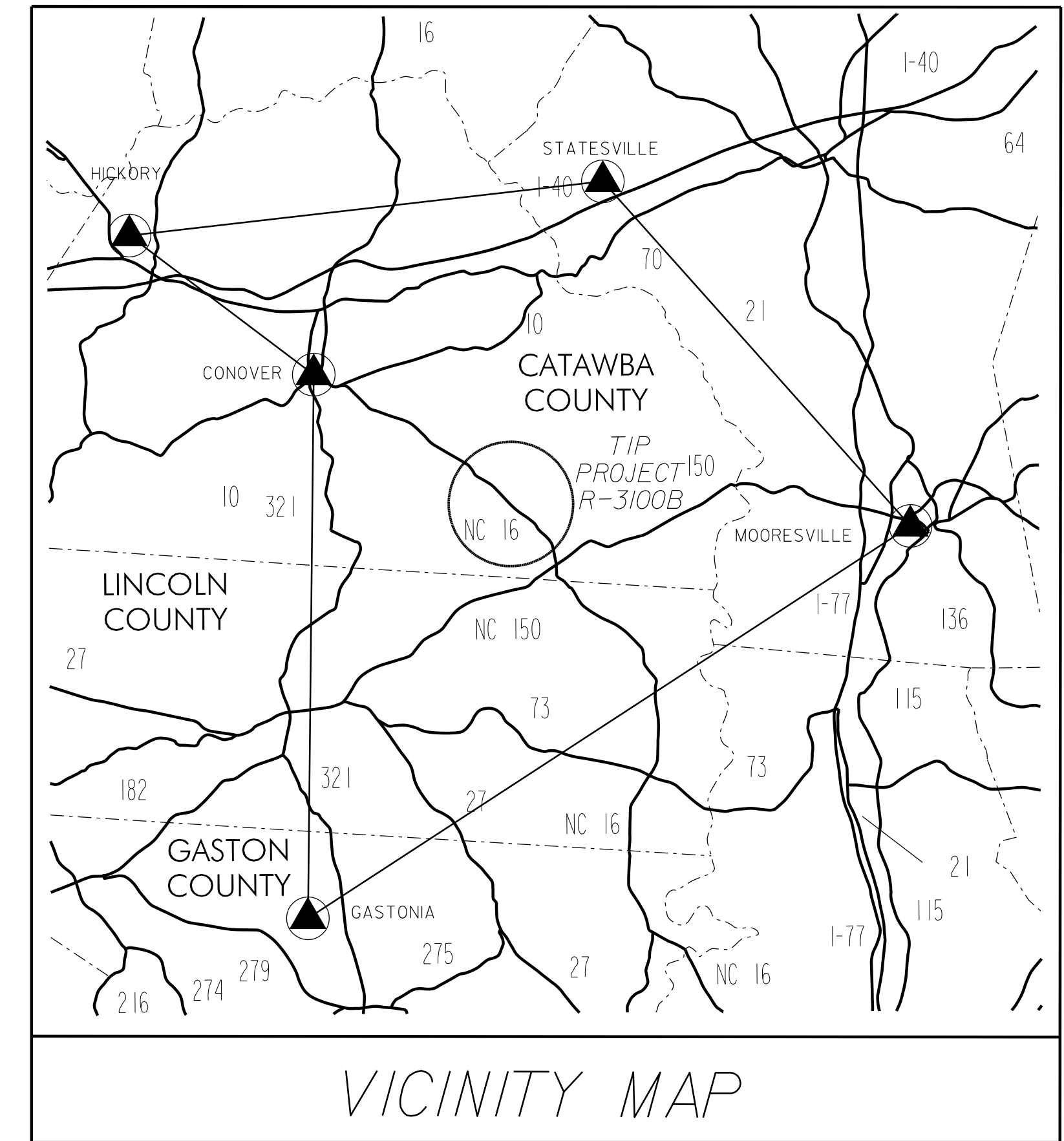
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
 NORTHING: 686365.8891(±) EASTING: 1366771.8845(±)
 ELEVATION: 999.75(±)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999851042

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R3100-7" TO -L- STATION 10+00.00 IS
 N 59°05'59.5" W 20821.85'

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

NC GRID
NAD 83/NSRS 2007



GPS R3100AB-1
 N=698288.3882
 E=1347899.5490
 ELEV.=955.15'

GPS R3100AB-2
 N=697483.1588
 E=1348589.3643
 ELEV.=922.01'

GPS R3100AB-4
 N=695342.2358
 E=1355969.8384
 ELEV.=1005.55'

GPS R3100AB-3
 N=694183.3110
 E=1356047.9145
 ELEV.=1000.67'

GPS R3100AB-5
 N=690477.8011
 E=1360802.1290
 ELEV.=1013.69'

GPS R3100AB-6
 N=689613.6668
 E=1361466.1478
 ELEV.=1031.12'

NOTES:

1. THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/95 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.
2. 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:
 R3100B-R3100_LS_GPSCALIB.HTML
 R3100B-R3100_LS_WGS84.TXT
 R3100B_LS_LOCAL.TXT
 R3100B_LS_CONTROL.TXT

THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. 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.
 NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
 SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

NOTE: DRAWING NOT TO SCALE

SURVEY CONTROL SHEET

GPS Calibration Report

Project : R3100AB

TIP Number R3100AB

User name rrwagoner

Coordinate System US State Plane 1983(at ground)

Horizontal Datum NAD 1983 (Conus)

Vertical Datum

Coordinate Units US survey feet

Distance Units US survey feet

Height Units US survey feet

Date & Time 10:14:36 AM 1/2/2013

Zone North Carolina 3200

Geoid Model G09NC

LOCAL SITE INFORMATION

Localized around

Latitude 35°37'02.01571"N

Longitude 81°07'50.83708"W

Site Scale Factor 1.0001489800

Height 895.6521sft

The North Carolina Department of Transportation uses a Localized Coordinate System which is very similar to North Carolina Zone 3200 from which it is derived.

Please take care in utilizing these coordinates to eliminate confusion of the two systems.

This file is to aid in the use of Real Time Kinematic (RTK) GPS during construction layout.

Updated Default Projection (Transverse Mercator) Definition

Updated default projection not requested

Horizontal Adjustment Parameters

Northing coordinate of rotation center 685416.7397sft

Easting coordinate of rotation center 1366641.4640sft

Rotation about the center point 0°00'00"

Translation north -0.0173sft

Translation east 0.0130sft

Scale factor 1.00000042

Vertical Adjustment Parameters

Northing coordinate of origin point 698288.3852sft

Easting coordinate of origin point 1347899.5503sft

Vertical separation at origin 0.0962sft

Slope north -1.841ppm

Slope east 0.371ppm

Geoid Model Definition

G09NC

Datum Transformation Parameters

Datum Transformation computation not requested

Residual Differences Between GPS (WGS84) And Local Coordinates Summary

	Maximum error	Root Mean Square error	Point
Horizontal	0.003sft		R31001 GPS
	0.002sft	0.000	R31008 GPS
Three-dimensional	0.003sft	0.001	31001 GPS

Point Residuals

WGS84 Coordinates	Calculated point FOR DISPLAY ONLY	Local Coordinates
Point R3100-1 GPS	Northing 698288.3852sft	Point R31001
Latitude 35°38'55.82624"N	Easting 1347899.5503sft	Northing 698288.3882sft
Longitude 81°11'42.53922"W	Elevation 955.1513sft	Easting 1347899.5490sft
Height 850.4663sft	Horz error 0.003sft	Elevation 955.1508sft
	Vert error 0.001sft	Utilized Horz and Vert
	3D error 0.003sft	Quality Adjusted quality
Point R3100-2 GPS	Northing 697483.1581sft	Point R31002
Latitude 35°38'48.01588"N	Easting 1348589.3641sft	Northing 697483.1588sft
Longitude 81°11'33.96810"W	Elevation 922.0063sft	Easting 1348589.3643sft
Height 817.3438sft	Horz error 0.001sft	Elevation 922.0066sft
	Vert error 0.000sft	Utilized Horz and Vert
	3D error 0.001sft	Quality Adjusted quality
Point R3100-3 GPS	Northing 694183.3115sft	Point R31003
Latitude 35°38'17.01055"N	Easting 1356047.9152sft	Northing 694183.3110sft
Longitude 81°10'02.75257"W	Elevation 1000.6671sft	Easting 1356047.9145sft
Height 896.1587sft	Horz error 0.001sft	Elevation 1000.6662sft
	Vert error 0.001sft	Utilized Horz and Vert
	3D error 0.001sft	Quality Adjusted quality
Point R3100-4 GPS	Northing 695342.2363sft	Point R31004
Latitude 35°38'28.45183"N	Easting 1355969.8386sft	Northing 695342.2358sft
Longitude 81°10'04.00474"W	Elevation 1005.5504sft	Easting 1355969.8384sft
Height 901.0196sft	Horz error 0.001sft	Elevation 1005.5490sft
	Vert error 0.001sft	Utilized Horz and Vert
	3D error 0.001sft	Quality Adjusted quality
Point R3100-5 GPS	Northing 690477.8015sft	Point R31005
Latitude 35°37'41.39710"N	Easting 1360802.1304sft	Northing 690477.8011sft
Longitude 81°09'04.19975"W	Elevation 1013.6907sft	Easting 1360802.1290sft
Height 909.3142sft	Horz error 0.001sft	Elevation 1013.6900sft
	Vert error 0.001sft	Utilized Horz and Vert
	3D error 0.002sft	Quality Adjusted quality
Point R3100-6 GPS	Northing 689613.6673sft	Point R31006
Latitude 35°37'32.99566"N	Easting 1361466.1481sft	Northing 689613.6668sft
Longitude 81°08'55.93199"W	Elevation 1031.1178sft	Easting 1361466.1478sft
Height 926.7660sft	Horz error 0.001sft	Elevation 1031.1185sft
	Vert error 0.001sft	Utilized Horz and Vert
	3D error 0.001sft	Quality Adjusted quality

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NOTES:

1. THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 8395 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.
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PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION

SURVEY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
R-3100B	1C-3
Location and Surveys	

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
BL1	R3100AB-1	698288.3882	1347899.5490	955.15	OUTSIDE PROJECT LIMITS	
BL2	R3100AB-2	697483.1588	1348589.3643	922.01	OUTSIDE PROJECT LIMITS	
BL15	BL-15	696670.7548	1349188.4805	889.37	14+78.87	37.43 RT
BL16	BL-16	696048.7259	1349992.0328	889.66	24+91.38	23.32 RT
BL17	BL-17	695790.9315	1350731.2046	891.39	32+71.38	31.78 RT
BL18	BL-18	695575.9111	1351474.6560	895.05	40+45.20	19.34 RT
BL19	BL-19	695324.7472	1352287.7525	907.80	48+96.20	21.03 RT
BL20	BL-20	695154.2665	1352848.8419	924.81	54+82.62	19.49 RT
BL21	BL-21	694931.1381	1353709.7919	949.81	63+71.15	19.66 LT
BL22	BL-22	694661.2709	1354585.4044	971.94	72+87.40	18.42 LT
BL23	BL-23	694421.0524	1355364.0271	986.90	81+02.15	17.15 LT
BL3	R3100AB-3	694183.3110	1356047.9145	1000.67	88+23.20	36.44 LT
BL24	BL-24	693866.0543	1356637.2665	1008.03	94+89.49	23.12 LT
BL25	BL-25	693515.4199	1357203.3391	1000.53	101+54.88	18.11 LT
BL26	BL-26	693094.7185	1357906.9305	999.46	109+74.61	26.46 LT
BL27	BL-27	692604.1610	1358700.2750	1006.84	119+05.72	33.54 LT
BL28	BL-28	692147.9174	1359319.1615	1006.85	126+70.57	48.97 LT
BL29	BL-29	691574.0615	1359898.4996	999.69	134+81.84	32.42 LT
BL30	BL-30	691018.2739	1360365.8152	1006.94	142+06.03	23.73 LT
BL5	R3100AB-5	690477.8011	1360802.1290	1013.69	149+00.63	20.44 LT
BL6	R3100AB-6	689613.6668	1361466.1478	1031.12	159+86.53	45.07 RT
BL31	BL-31	689147.1405	1362024.1241	1026.74	167+10.13	21.36 RT
BL32	BL-32	688587.4998	1362893.1274	999.27	177+42.98	1.17 LT
BL33	BL-33	688252.1021	1363470.0644	982.18	184+10.31	4.17 RT
BL34	BL-34	687805.7517	1364270.2097	966.40	193+26.48	4.77 LT
BL35	BL-35	687408.2276	1364968.4287	994.60	OUTSIDE PROJECT LIMITS	
BL36	BL-36	687059.5370	1365552.1201	1015.50	OUTSIDE PROJECT LIMITS	
BL37	BL-37	686793.0382	1366046.9128	1013.05	OUTSIDE PROJECT LIMITS	
BL7	R3100AB-7	686365.8891	1366771.8845	999.75	OUTSIDE PROJECT LIMITS	

BY1 POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
BL65	BY1-65	697432.6672	1349949.5955	927.24	OUTSIDE PROJECT LIMITS	
E015	BL-15	696670.7548	1349188.4805	889.37	OUTSIDE PROJECT LIMITS	

BY2 POINT	DESC.	NORTH	EAST	ELEVATION	Y2 STATION	OFFSET
BL67	BY2-67	696674.4646	1351601.1969	938.43	OUTSIDE PROJECT LIMITS	
BL68	BY2-68	696223.9040	1351501.1571	930.49	OUTSIDE PROJECT LIMITS	
BL69	BY2-69	695812.5038	1351315.3994	906.59	12+40.69	19.37 RT
E018	BL-18	695575.9111	1351474.6560	895.05	OUTSIDE PROJECT LIMITS	

BY3 POINT	DESC.	NORTH	EAST	ELEVATION	Y3 STATION	OFFSET
BL72	BY3-72	695700.1955	1352496.7813	904.24	OUTSIDE PROJECT LIMITS	
E0B18	BL-18	695575.9111	1351474.6560	895.05	OUTSIDE PROJECT LIMITS	

BY4 POINT	DESC.	NORTH	EAST	ELEVATION	Y4 STATION	OFFSET
E020	BL-20	695154.2665	1352848.8419	924.81	10+23.06	37.67 LT
BL74	BY4-74	694622.1007	1352686.9538	934.77	OUTSIDE PROJECT LIMITS	
BL75	BY4-75	694038.2914	1352588.7038	980.61	OUTSIDE PROJECT LIMITS	

BY5 POINT	DESC.	NORTH	EAST	ELEVATION	Y5 STATION	OFFSET
E04	R3100AB-4	695342.2358	1355969.8384	1005.55	OUTSIDE PROJECT LIMITS	
BL76	BY5-76	694702.7286	1356004.6861	984.64	OUTSIDE PROJECT LIMITS	
E0A3	R3100AB-3	694183.3110	1356047.9145	1000.67	14+66.37	91.53 LT

BY6 POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
E076	BY5-76	694702.7286	1356004.6861	984.64	85+90.79	497.89 LT
BL79	BY6-79	694941.8541	1355401.0692	965.99	79+84.93	525.85 LT

BY7 POINT	DESC.	NORTH	EAST	ELEVATION	Y6 STATION	OFFSET
E0B3	R3100AB-3	694183.3110	1356047.9145	1000.67	OUTSIDE PROJECT LIMITS	
BL81	BY7-81	693660.3311	1355592.6714	987.08	OUTSIDE PROJECT LIMITS	
BL82	BY7-82	693593.3948	1355060.2412	992.19	OUTSIDE PROJECT LIMITS	

BY8 POINT	DESC.	NORTH	EAST	ELEVATION	Y7 STATION	OFFSET
E025	BL-25	693515.4199	1357203.3391	1000.53	OUTSIDE PROJECT LIMITS	
BL84	BY8-84	692755.7794	1357019.1252	987.18	OUTSIDE PROJECT LIMITS	

BY9 POINT	DESC.	NORTH	EAST	ELEVATION	Y8 STATION	OFFSET
E027	BL-27	692604.1610	1358700.2750	1006.84	OUTSIDE PROJECT LIMITS	
BL86	BY9-86	692353.9455	1358555.0769	1010.93	12+54.25	12.21 RT
BL87	BY9-87	691950.5288	1358382.4277	990.78	OUTSIDE PROJECT LIMITS	

BY10 POINT	DESC.	NORTH	EAST	ELEVATION	Y9 STATION	OFFSET
BL88	BY10-88	691462.1794	1360786.3121	995.33	OUTSIDE PROJECT LIMITS	
BL89	BY10-89	691142.9335	1360541.6125	1010.62	11+73.82	13.32 LT
E030	BL-30	691018.2739	1360365.8152	1006.94	13+86.54	18.44 RT

BY11 POINT	DESC.	NORTH	EAST	ELEVATION	Y10 STATION	OFFSET
BL91	BY11-91	690960.3879	1361138.9517	981.86	11+76.82	21.95 RT
E05	R3100AB-5	690477.8011	1360802.1290	1013.69	17+63.49	24.52 LT

BY12 POINT	DESC.	NORTH	EAST	ELEVATION	Y11 STATION	OFFSET
E06	R3100AB-6	689613.6668	1361466.1478	1031.12	10+41.40	29.82 LT
BL94	BY12-94	689389.2574	1361268.0067	1038.48	13+49.38	15.60 RT
BL95	BY12-95	689138.2323	1361136.3661	1041.18	OUTSIDE PROJECT LIMITS	
BL96	BY12-96	688825.8685	1360810.1440	1033.60	OUTSIDE PROJECT LIMITS	

BY13 POINT	DESC.	NORTH	EAST	ELEVATION	Y11 STATION	OFFSET
BL98	BY13-98	688450.6946	1361154.1983	1040.59	OUTSIDE PROJECT LIMITS	
E095	BY12-95	689138.2323	1361136.3661	1041.18	OUTSIDE PROJECT LIMITS	

BY14 POINT	DESC.	NORTH	EAST	ELEVATION	Y12 STATION	OFFSET
BL99	BY14-99	689594.8458	1362596.6784	1024.43	OUTSIDE PROJECT LIMITS	
BL100	BY14-100	689612.9367	1362032.3888	1017.87	12+74.22	5.77 RT
E0A6	R3100AB-6	689613.6668	1361466.1478	1031.12	OUTSIDE PROJECT LIMITS	

.....
 BM1 ELEVATION = 878.35
 N 697138 E 1349218
 L STATION 11+43 289 LEFT
 8' SPIKE IN ROOT OF 36' POPLAR

 BM2 ELEVATION = 892.63
 N 695473 E 1351204
 L STATION 38+17 197 RIGHT
 8' SPIKE IN ROOT OF 30' SYCAMORE

 BM3 ELEVATION = 968.00
 N 695193 E 1353704
 L STATION 62+89 268 LEFT
 8' SPIKE IN ROOT OF 12' FIELD PINE

 BM4 ELEVATION = 975.71
 N 694049 E 1355574
 L STATION 84+28 267 RIGHT
 8' SPIKE IN ROOT OF 30' OAK

 BM5 ELEVATION = 1006.46
 N 693592 E 1357450
 L STATION 103+25 212 LEFT
 8' SPIKE IN ROOT OF 8' PIN OAK

 BM6 ELEVATION = 989.31
 N 692633 E 1359711
 L STATION 126+55 672 LEFT
 8' SPIKE IN ROOT OF 42' RED OAK

 BM7 ELEVATION = 1002.98
 N 690727 E 1360846
 L STATION 147+35 212 LEFT
 8' SPIKE IN ROOT OF 8' ELM

 BM8 ELEVATION = 1012.67
 N 689168 E 1362351
 L STATION 169+60 194 LEFT
 8' SPIKE IN ROOT OF 14' MAPLE

 BM9 ELEVATION = 975.79
 N 688171 E 1364165
 L STATION 190+54 270 LEFT
 8' SPIKE IN ROOT OF 10' HICKORY

DATUM DESCRIPTION
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R3100-7" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 686365.8891(ft) EASTING: 1366771.8845(ft) ELEVATION: 999.75(ft)
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999851042
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R3100-7" TO -L- STATION 10+00.00 IS N 59°05'59.5" W 20821.85'
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

SEE SHEET 1C-1 FOR NOTES

SURVEY CONTROL SHEET

Design Alignments

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	697058.8113	1348905.4112
PC	15+85.01	696614.4836	1349285.9506
PT	27+91.21	695962.1207	1350281.4639
PC	80+71.84	694413.6375	1355329.9564
PT	96+18.35	693779.9835	1356736.2307
PC	114+91.47	692802.4014	1358334.0130
PT	140+25.10	691143.5182	1360233.1101
PC	153+21.56	690138.6137	1361052.2424
PT	177+15.54	688600.0847	1362868.7136
POT	198+28.48	687552.7927	1364703.8402

Y8

TYPE	STATION	NORTH	EAST
POT	10+00.00	692569.8784	1358690.8795
PC	10+84.42	692497.4439	1358647.5208
PT	14+10.86	692205.9562	1358501.2137
POT	14+84.11	692138.2398	1358473.2994

Y9

TYPE	STATION	NORTH	EAST
POT	10+00.00	691282.5343	1360646.8908
PC	11+17.94	691193.4431	1360569.6142
PT	12+31.01	691111.8006	1360491.4453
POT	14+11.71	690987.5827	1360360.2186

Y1

TYPE	STATION	NORTH	EAST
POT	10+00.00	697045.3768	1349573.2106
POT	15+00.00	696691.4329	1349220.0482

Y10

TYPE	STATION	NORTH	EAST
POT	10+00.00	691082.9937	1361268.2377
POT	17+79.41	690481.0869	1360773.0808

Y2

TYPE	STATION	NORTH	EAST
POT	10+00.00	696031.5247	1351417.0728
POT	14+00.00	695656.3720	1351278.2908

Y11

TYPE	STATION	NORTH	EAST
POT	10+00.00	689661.5194	1361482.0619
PC	10+33.31	689642.3154	1361454.8486
PT	11+76.38	689535.5607	1361361.6316
POT	15+63.49	689192.0841	1361183.1014

Y3

TYPE	STATION	NORTH	EAST
POT	10+00.00	695701.2099	1352369.1669
PC	15+16.25	695645.3752	1351855.9471
PT	16+78.79	695561.9548	1351722.8528
POT	17+20.30	695526.7719	1351700.8237

Y12

TYPE	STATION	NORTH	EAST
POT	10+00.00	689580.3645	1362303.5976
PC	10+56.33	689581.8172	1362247.2864
PT	14+34.80	689651.0742	1361876.8236
PC	16+09.09	689709.8272	1361712.7363
PT	18+19.93	689682.4538	1361511.7273
POT	18+56.24	689661.5194	1361482.0619

Y4

TYPE	STATION	NORTH	EAST
POT	10+00.00	695184.5199	1352816.6620
POT	14+60.00	694734.1851	1352722.8614

Y5

TYPE	STATION	NORTH	EAST
POT	10+00.00	694674.4648	1355992.5222
PC	12+59.24	694415.2303	1355994.6002
PT	14+54.49	694223.1646	1355964.6645
POT	14+94.24	694185.4009	1355952.2604

Y6

TYPE	STATION	NORTH	EAST
POT	10+00.00	694185.4009	1355952.2604
PC	10+67.84	694120.9678	1355931.0383
PT	12+15.98	693989.1255	1355864.6762
POT	13+48.58	693880.7810	1355788.2302

Y7

TYPE	STATION	NORTH	EAST
POT	10+00.00	693500.5689	1357192.9123
POT	14+49.87	693063.9947	1357084.3503

SEE SHEET 1C-1 FOR NOTES

2/2/17

3/16/2017
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sheet1.d

SURVEY CONTROL SHEET

Right of Way & Permanent Easements

-Final-

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
L	15+35.00	75.00	696603.68140	1349196.45550
L	15+35.00	44.23	696623.69387	1349219.82258
L	15+71.33	-75.00	696673.66183	1349334.01450
L	15+85.01	-75.00	696663.26982	1349342.91461
L	15+85.01	75.00	696565.69737	1349228.98649
L	19+18.00	-75.00	696436.49518	1349570.05488
L	19+62.00	-100.00	696428.61066	1349618.46220
L	20+33.00	75.00	696247.59755	1349565.24118
L	20+33.00	-100.00	696386.62098	1349671.53082
L	20+87.00	130.00	696169.68869	1349577.78178
L	21+20.00	-95.00	696333.51830	1349735.54343
L	22+37.00	75.00	696127.54511	1349738.86345
L	22+80.00	-95.00	696250.45694	1349863.84908
L	22+80.00	75.00	696104.38962	1349776.87587
L	26+95.00	-95.00	696081.87182	1350222.07215
L	27+35.00	-75.00	696050.40774	1350251.82227
L	27+91.21	75.00	695890.41770	1350259.47104
L	27+91.21	-75.00	696033.82362	1350303.45677
L	37+85.00	-75.00	695742.40597	1351253.56059
L	38+90.00	-75.00	695711.61596	1351353.94473
L	41+06.68	75.00	695504.67213	1351517.11057
L	41+34.17	-75.00	695640.01634	1351587.37970
L	47+09.58	-75.00	695471.28421	1352137.49412
L	54+22.15	75.00	695118.92655	1352774.75010
L	54+82.27	75.00	695101.29633	1352832.22961
L	62+00.00	-75.00	695034.23568	1353562.39576
L	72+00.00	-75.00	694740.99747	1354518.43516
L	80+71.84	75.00	694341.93453	1355307.96356
L	80+71.84	-75.00	694485.34044	1355351.94930
L	86+34.49	-75.00	694293.68108	1355888.03304
L	86+37.00	75.00	694153.95330	1355833.42135
L	88+08.00	-75.00	694224.77397	1356049.56760
L	88+42.00	75.00	694073.94963	1356019.43712
L	96+18.35	-75.00	693843.95902	1356775.37326
L	96+18.35	75.00	693716.00808	1356697.08816
L	105+50.00	-75.00	693357.73201	1357570.07362
L	105+50.00	75.00	693229.78108	1357491.78852
L	114+91.47	75.00	692738.42591	1358294.87045
L	114+91.47	-75.00	692866.37685	1358373.15555
L	118+90.32	75.00	692523.49041	1358626.05301
L	119+82.00	95.00	692455.27700	1358688.99806
L	124+75.00	75.00	692177.32957	1359089.78525
L	124+75.00	95.00	692161.78082	1359077.20605
L	129+50.00	-75.00	691980.59643	1359547.30367
L	129+65.00	75.00	691860.12275	1359456.68871
L	131+95.00	-152.00	691865.09662	1359780.62151
L	132+00.00	75.00	691699.64703	1359625.12011
L	132+80.00	-75.00	691749.66075	1359787.59450
L	132+90.00	130.00	691598.04779	1359649.25521
L	134+67.50	75.00	691510.66104	1359810.61712
L	134+67.50	-75.00	691613.80865	1359919.52337
L	140+25.10	-75.00	691190.90489	1360291.24367
L	140+25.10	75.00	691096.13161	1360174.97662
L	141+95.85	-75.00	691058.55541	1360399.12628
L	142+45.77	-75.00	691019.85904	1360430.66903
L	148+44.04	-75.00	690556.13802	1360808.66400
L	148+89.96	-75.00	690520.54287	1360837.67883
L	153+21.56	75.00	690091.22710	1360994.10890
L	153+21.56	-75.00	690186.00037	1361110.37594
L	158+40.00	75.00	689698.38037	1361341.29896
L	159+00.00	-75.00	689759.46735	1361490.85790
L	160+85.00	75.00	689522.64477	1361516.02135
L	163+32.78	-75.00	689463.38481	1361799.51115
L	168+00.00	-75.00	689167.56259	1362154.03261
L	170+00.00	-90.00	689060.99587	1362320.93517
L	172+15.00	-143.00	688983.04361	1362524.18495
L	173+05.00	-75.00	688877.35601	1362560.02348
L	173+05.00	75.00	688752.03072	1362477.60035
L	177+15.54	75.00	688534.94576	1362831.53931
L	177+15.54	-75.00	688665.22355	1362905.88779
L	187+72.01	-75.00	688141.57786	1363823.45061
L	188+00.00	75.00	687997.42665	1363773.41196
L	196+30.98	75.00	687585.54478	1364495.13562
L	196+81.57	-75.00	687690.74813	1364613.42102

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y2	11+90.00	30.00	695863.73586	1351323.01489
Y2	11+90.00	15.00	695858.53153	1351337.08312
Y2	11+90.00	-15.00	695848.12288	1351365.21957
Y2	11+90.00	-30.00	695842.91855	1351379.28779
Y2	13+05.00	30.00	695755.87946	1351283.11505
Y2	13+05.00	-30.00	695735.06215	1351339.38796

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y3	12+26.50	-30.00	695646.88891	1352147.24104

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y5	11+00.00	50.00	694574.06569	1355943.32844
Y5	11+00.00	30.30	694574.22423	1355963.03004
Y5	11+00.00	-29.70	694574.70703	1356023.02833
Y5	11+00.00	-50.00	694574.87036	1356043.32521
Y5	13+53.11	43.20	694328.07366	1355945.30792
Y5	13+54.71	-58.32	694311.32889	1356045.44591

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y6	11+60.00	-55.00	694010.08719	1355942.52606
Y6	11+60.47	27.09	694049.23294	1355870.37098
Y6	12+00.00	-60.00	693969.32169	1355923.78484
Y6	13+37.59	-41.00	693866.12756	1355828.06945
Y6	13+37.59	-29.91	693872.51896	1355819.01112

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y8	11+50.00	-24.99	692428.49062	1358636.49708

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y11	11+80.00	29.98	689546.17895	1361333.36277
Y11	11+80.00	-45.00	689511.59858	1361399.89240
Y11	14+63.00	-30.00	689267.41092	1361256.06477
Y11	14+63.00	-45.00	689260.49300	1361269.37425

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y12	12+57.36	40.00	689643.15578	1362055.45123
Y12	14+34.80	40.00	689688.73294	1361890.30762
Y12	14+44.67	-69.44	689589.02346	1361844.13090
Y12	16+09.09	40.00	689747.48594	1361726.22036
Y12	17+60.00	40.00	689747.63727	1361551.35131

SEE SHEET 1C-1 FOR NOTES

SURVEY CONTROL SHEET

Right of Way & Permanent Easements

-Final-

PERMANENT EASEMENT MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
L	151+25.00	-85.00	690344.67725	1360993.93429
L	155+20.00	75.00	689937.60102	1361123.28742
L	155+35.00	88.00	689917.60968	1361123.44046
L	156+00.00	102.00	689858.85439	1361156.50370
L	156+50.00	106.00	689818.35022	1361187.42358
L	157+00.00	98.00	689786.17257	1361227.51925
L	158+20.00	75.00	689713.01474	1361327.33046
L	158+58.62	109.00	689661.21082	1361329.85300
L	158+82.00	-75.00	689772.22196	1361478.45281
L	158+82.00	-89.00	689781.96908	1361488.50237
L	158+93.00	-75.00	689764.42340	1361486.02950
L	158+93.00	-89.00	689774.18751	1361496.06255
L	160+83.00	109.00	689499.63766	1361490.90588
L	163+03.74	-144.00	689533.75174	1361824.50150
L	164+27.00	87.00	689279.55788	1361762.84572
L	164+48.91	218.00	689165.94722	1361693.87813
L	164+50.00	105.00	689250.66398	1361768.66657
L	164+59.44	246.00	689137.63123	1361683.82189
L	164+70.00	210.00	689157.77629	1361715.59614
L	164+72.00	86.00	689250.47500	1361797.98021
L	164+80.00	238.00	689129.79341	1361705.20534
L	169+70.00	105.00	688921.26230	1362181.64625
L	169+70.00	88.00	688934.96575	1362191.70684
L	169+87.00	89.00	688923.97950	1362205.01944
L	169+87.00	105.00	688911.05742	1362195.58441
L	170+87.00	97.00	688858.30242	1362282.72732
L	170+87.00	102.00	688854.21939	1362279.84135
L	170+94.00	102.00	688850.11875	1362285.64951
L	170+94.00	96.00	688855.02212	1362289.10740
L	172+08.00	98.00	688787.52989	1362383.10330
L	173+86.00	88.00	688696.48667	1362539.32818
L	173+86.00	75.00	688707.43637	1362546.33562
L	173+86.00	92.00	688693.11754	1362537.17205
L	174+10.00	87.00	688684.25685	1362560.37676
L	174+10.00	75.00	688694.38807	1362566.80780
L	174+10.00	92.00	688680.03550	1362557.69716
L	178+00.00	-84.00	688631.17766	1362983.70274
L	178+00.00	-75.00	688623.36099	1362979.24183
L	180+85.05	-84.00	688489.89257	1363231.27079
L	180+86.83	-75.00	688481.19349	1363228.35610
L	185+94.00	364.00	687848.53002	1363451.25238
L	186+27.00	379.00	687819.14557	1363472.47865
L	186+90.00	91.00	688038.05257	1363669.94441
L	187+28.00	91.00	688019.21762	1363702.94812
L	191+21.00	75.00	687838.32089	1364052.20644
L	191+45.00	93.00	687810.79180	1364064.12906
L	191+56.00	75.00	687820.97291	1364082.60459
L	192+55.00	113.00	687738.89921	1364149.75298
L	192+59.92	91.00	687755.56746	1364164.93145
L	192+63.50	75.00	687767.68983	1364175.97034
L	192+97.00	-75.00	687881.36313	1364279.41419
L	192+97.00	120.00	687712.00200	1364182.76117
L	192+97.00	-92.00	687896.12795	1364287.84036
L	193+08.60	91.00	687731.43942	1364207.21002
L	193+15.00	75.00	687742.16352	1364220.69905
L	194+00.00	102.00	687676.58271	1364281.14040
L	194+00.00	75.00	687700.03271	1364294.52313
L	194+00.00	91.00	687686.13641	1364286.59262
L	195+20.00	102.00	687617.10392	1364385.36263
L	195+20.00	91.00	687626.65763	1364390.81486
L	195+20.00	75.00	687640.55393	1364398.74536
L	195+59.00	91.00	687607.32702	1364424.68708
L	196+32.53	97.00	687565.66875	1364485.57800
L	196+81.28	-95.00	687708.26411	1364623.07901

PERMANENT EASEMENT MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y4	11+70.00	-70.00	695003.81783	1352850.52573
Y4	11+95.00	86.00	695011.15375	1352692.70563
Y4	13+00.00	-50.00	694880.62758	1352804.43709
Y4	13+33.50	-30.23	694851.85975	1352778.25336
Y4	13+35.00	29.77	694862.62823	1352719.21092

PERMANENT EASEMENT MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y5	10+00.00	50.00	694674.06245	1355942.52378
Y5	10+00.00	30.64	694674.21820	1355961.87848
Y5	11+95.00	85.00	694478.78713	1355909.09401
Y5	11+95.00	70.00	694478.90783	1355924.09353
Y5	12+15.00	70.00	694458.90848	1355924.25446
Y5	12+15.00	85.00	694458.78778	1355909.25494

PERMANENT EASEMENT MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y10	10+00.00	-48.00	691052.50230	1361305.30266
Y10	10+00.00	-73.00	691036.61667	1361324.61304
Y10	10+50.00	-28.00	691026.59200	1361258.09608
Y10	12+20.00	-42.00	690886.41283	1361160.90658
Y10	13+05.29	-43.00	690819.90738	1361107.49095
Y10	13+50.29	-45.00	690783.88831	1361080.44974
Y10	14+00.00	-45.50	690745.18168	1361049.25529
Y10	14+80.00	-35.00	690690.07118	1360990.32241
Y10	16+88.25	-40.00	690526.07263	1360861.88392
Y10	16+88.63	20.22	690564.03375	1360815.12926

PERMANENT EASEMENT MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y11	11+70.00	70.00	689574.79157	1361303.22605
Y11	11+98.00	-45.00	689495.62720	1361391.59089
Y11	14+12.00	70.00	689358.78265	1361190.85582
Y11	14+12.00	82.00	689364.31699	1361180.20823
Y11	14+33.00	82.00	689345.68371	1361170.52314
Y11	14+33.00	70.00	689340.14937	1361181.17073
Y11	15+03.00	29.96	689259.57208	1361184.41477

PERMANENT EASEMENT MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y12	11+25.00	33.02	689619.26699	1362181.54869
Y12	11+55.00	-68.00	689520.84718	1362141.48997
Y12	11+55.00	-24.55	689564.03880	1362146.20380
Y12	11+72.00	-25.19	689565.40928	1362128.89100
Y12	11+72.00	-68.00	689522.92450	1362123.63916
Y12	12+06.36	52.50	689647.01392	1362105.88737
Y12	12+60.30	62.00	689665.28198	1362056.97790
Y12	12+95.00	80.00	689689.73636	1362028.86129
Y12	12+95.00	70.00	689679.99145	1362026.61702
Y12	13+15.00	65.00	689679.51698	1362007.10616
Y12	13+15.00	77.00	689691.16396	1362009.99543
Y12	13+50.00	40.00	689663.87775	1361968.38285
Y12	14+20.00	-62.96	689586.63563	1361870.30659

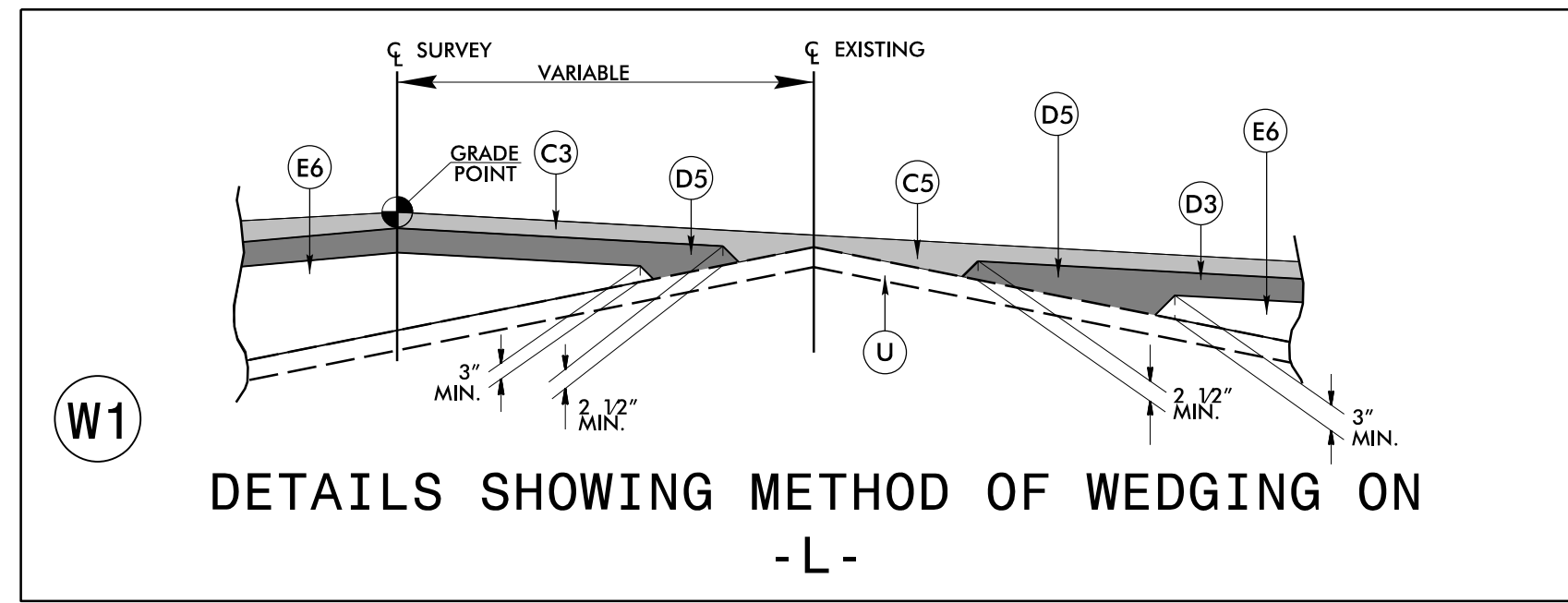
SEE SHEET 1C-1 FOR NOTES

8/17/99

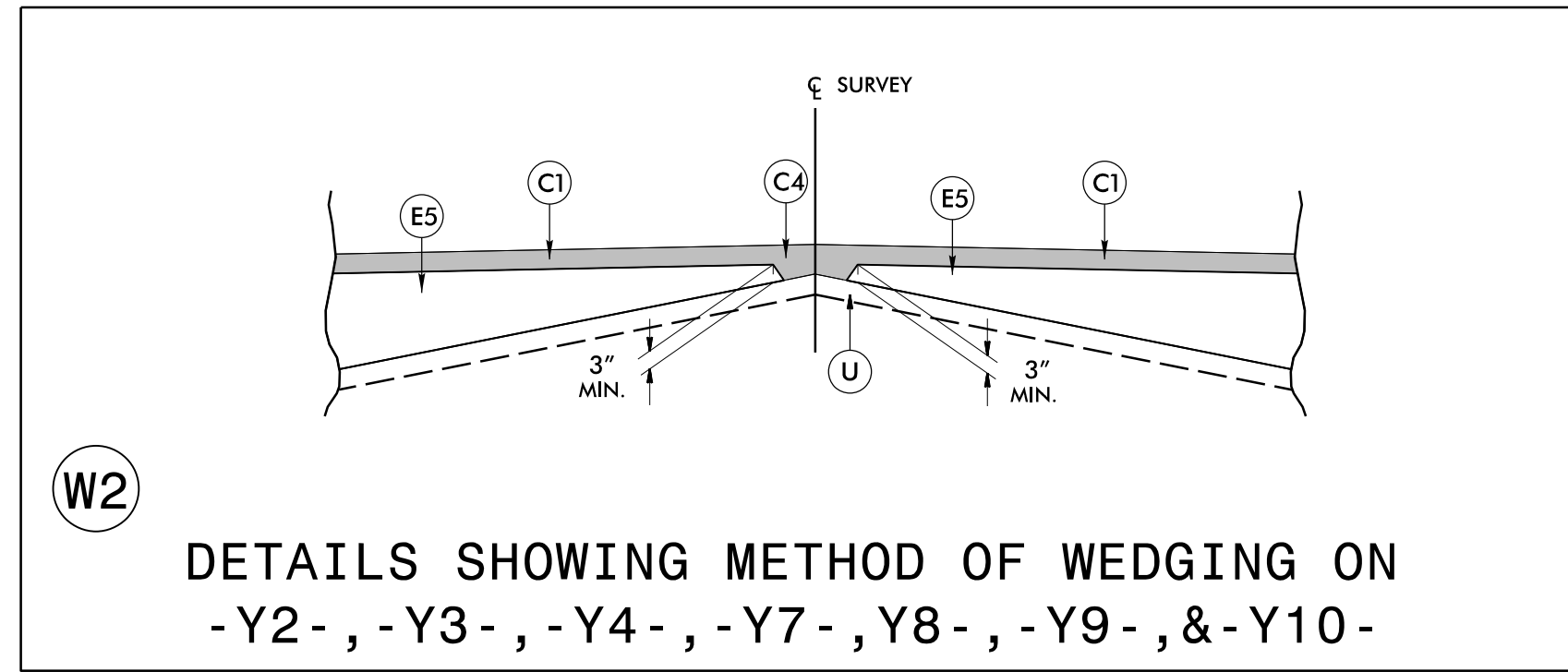
FINAL PAVEMENT SCHEDULE

C1	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.
C2	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C3	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.
C4	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.
C5	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 LESS THAN 1.5" OR GREATER THAN 2" IN DEPTH.
D1	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D3	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 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" OR GREATER THAN 4" IN DEPTH.
D5	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2.5" OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. APPROX. 3" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
E3	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E4	PROP. APPROX. 5.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
E5	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" OR GREATER THAN 5.5" IN DEPTH.
E6	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" OR GREATER THAN 5.5" IN DEPTH.
K	BASE TO BE TREATED WITH LIME 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
R1	2'-6" CONCRETE CURB AND GUTTER.
R2	2'-9" CURB AND GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	PAVEMENT WEDGING ON -L- (SEE DETAILS - THIS SHEET)
W2	PAVEMENT WEDGING ON -Y2-, -Y3-, -Y4-, -Y7-, -Y9-, & -Y10- (SEE DETAILS - THIS SHEET)
W3	PAVEMENT WEDGING ON -Y5-, -Y6-, -Y11- & -Y12- (SEE DETAILS - THIS SHEET)

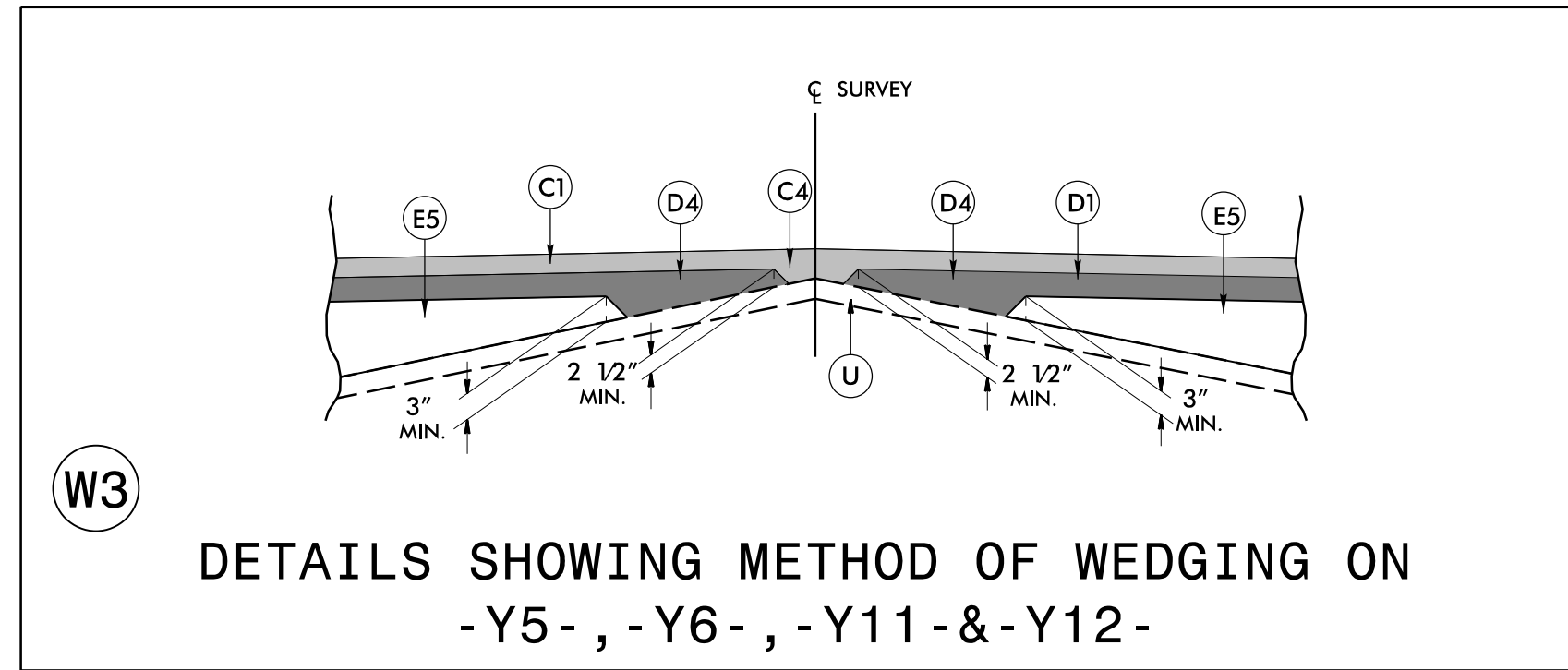
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



W1
DETAILS SHOWING METHOD OF WEDGING ON
-L-



W2
DETAILS SHOWING METHOD OF WEDGING ON
-Y2-, -Y3-, -Y4-, -Y7-, -Y8-, -Y9-, & -Y10-



W3
DETAILS SHOWING METHOD OF WEDGING ON
-Y5-, -Y6-, -Y11- & -Y12-

GRAPHIC SCALE
N.T.S.

Prepared by
URS
URS Corporation - North Carolina
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NC LICENSE # C-22842

PROJECT REFERENCE NO.
R-3100B

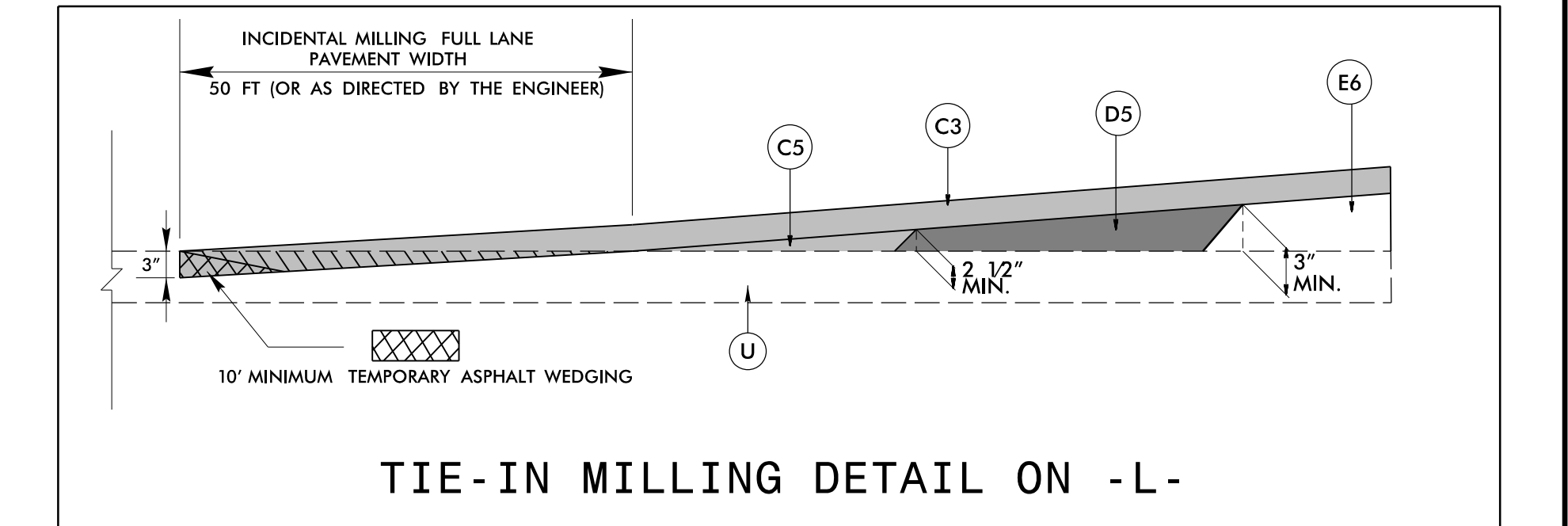
SHEET NO.
2A-1

R/W SHEET NO.

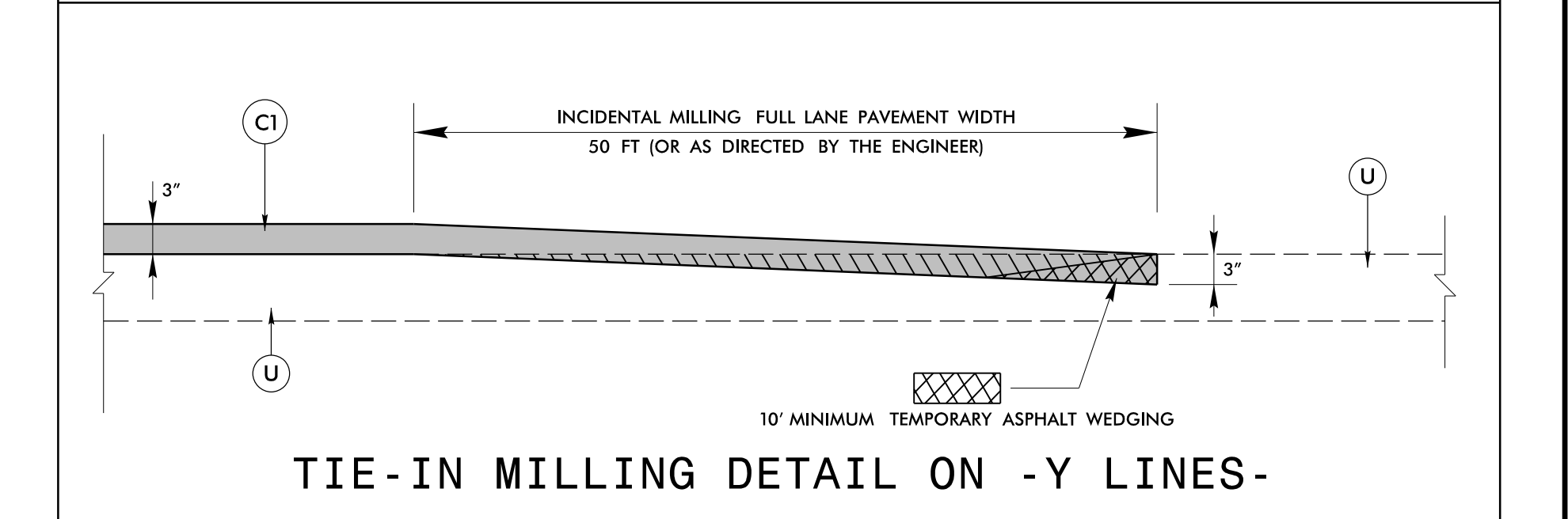
ROADWAY DESIGN ENGINEER
SEAL 18470
EDWARD GLENN EDWARDS JR.
3/16/2017

PAVEMENT DESIGN ENGINEER
SEAL 022896
CLARK S. MORRISON
3/16/2017

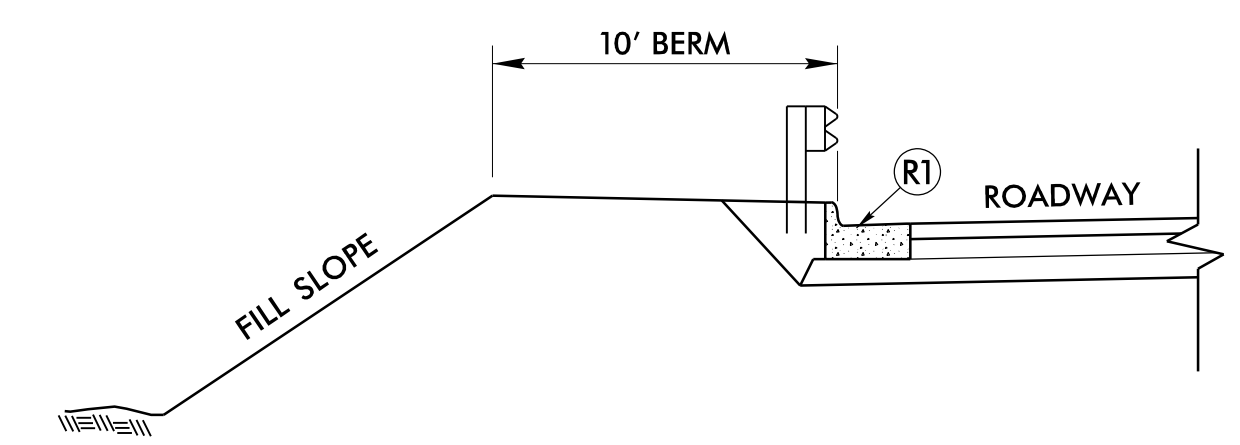
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TIE-IN MILLING DETAIL ON -L-

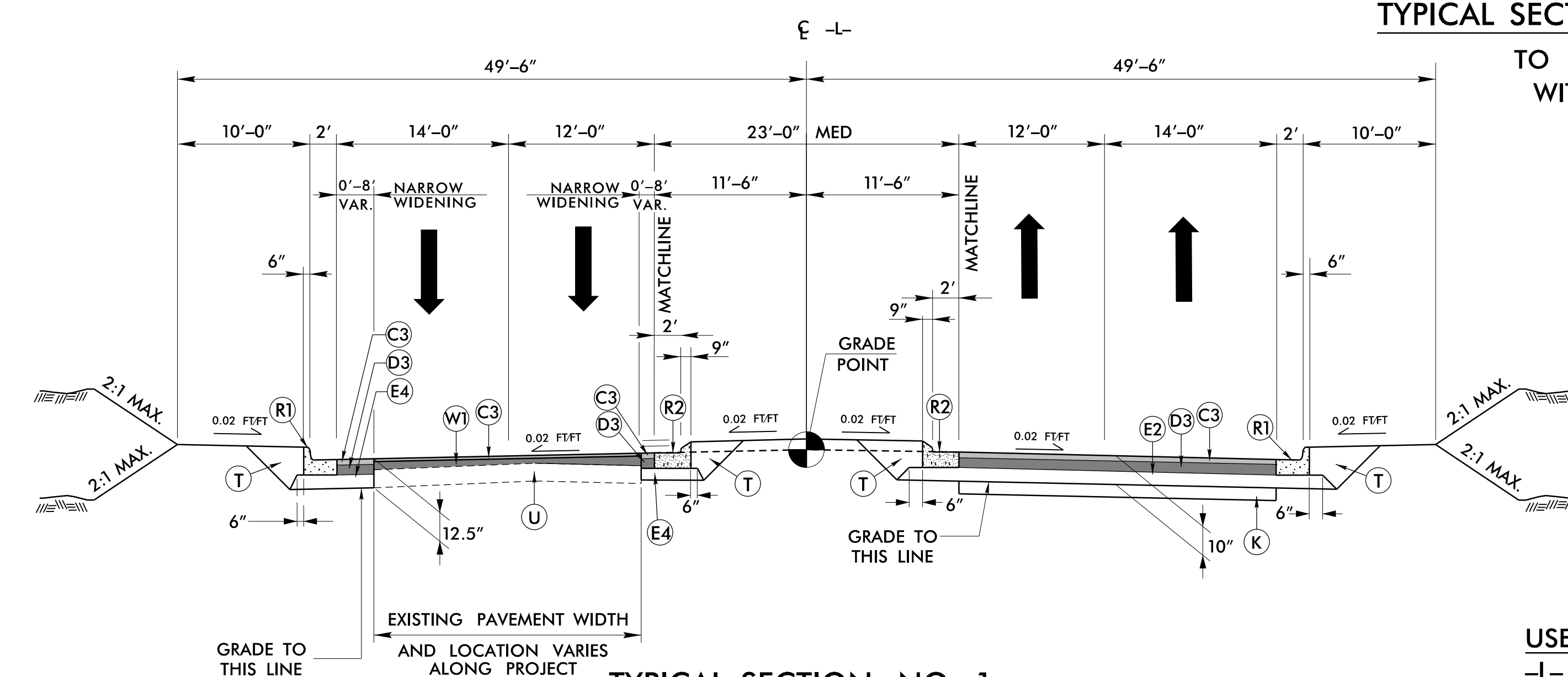


TIE-IN MILLING DETAIL ON -Y LINES-



TYPICAL SECTION AT GUARDRAIL LOCATIONS

TO BE USED IN CONJUNCTION WITH TYPICAL SECTION NO. 1



TYPICAL SECTION NO. 1

-L- NC 16

USE TYPICAL SECTION NO. 1 FOR:
-L- STA. 15+35.00 TO 159+63.98

REVISIONS

3/16/2017
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8/17/99

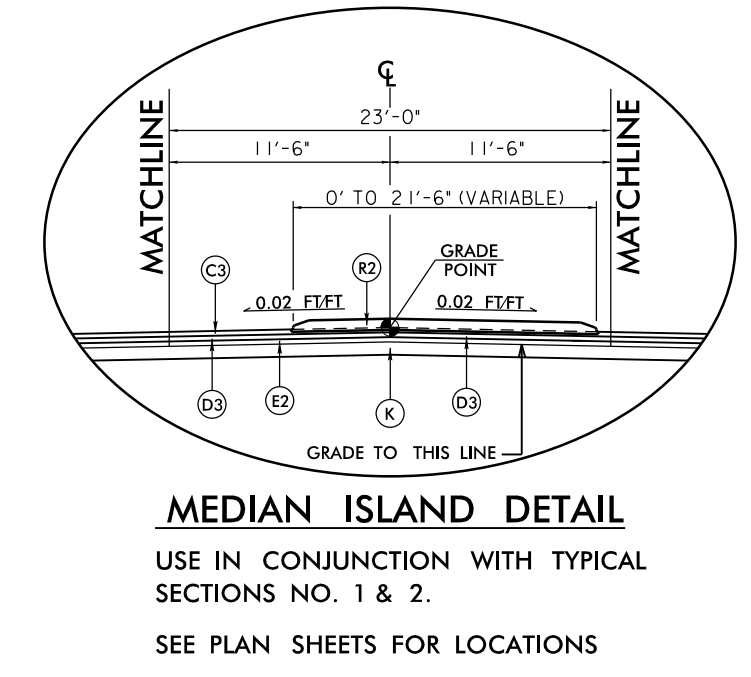
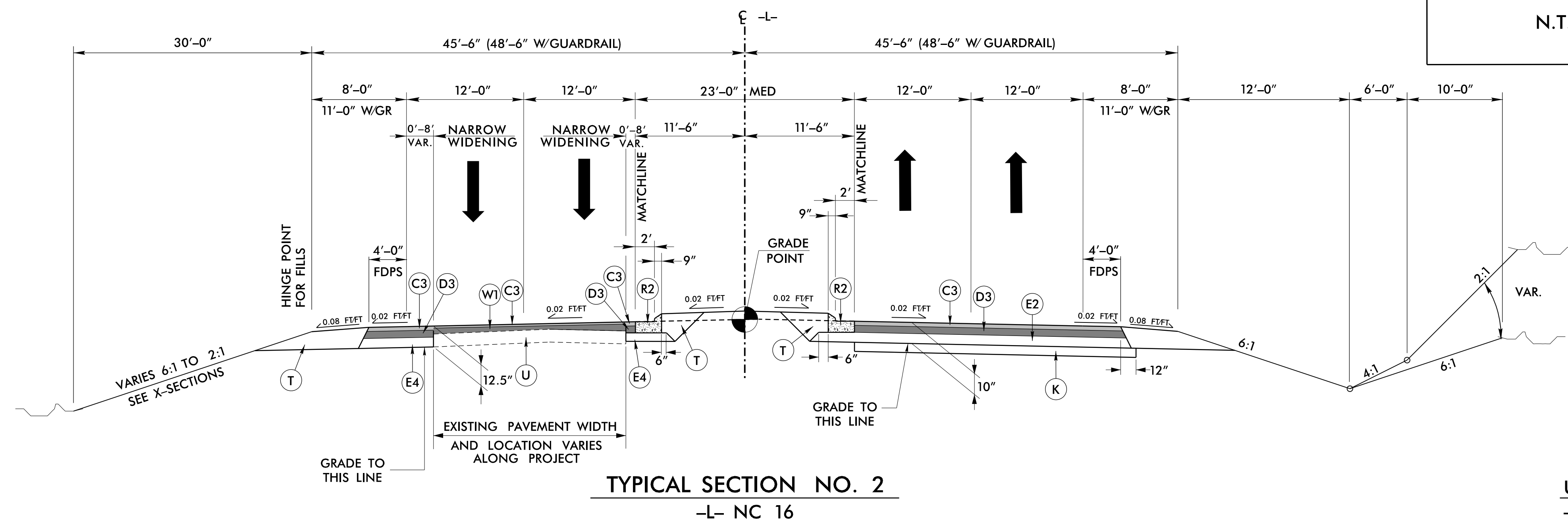
REVISIONS

8/16/2017
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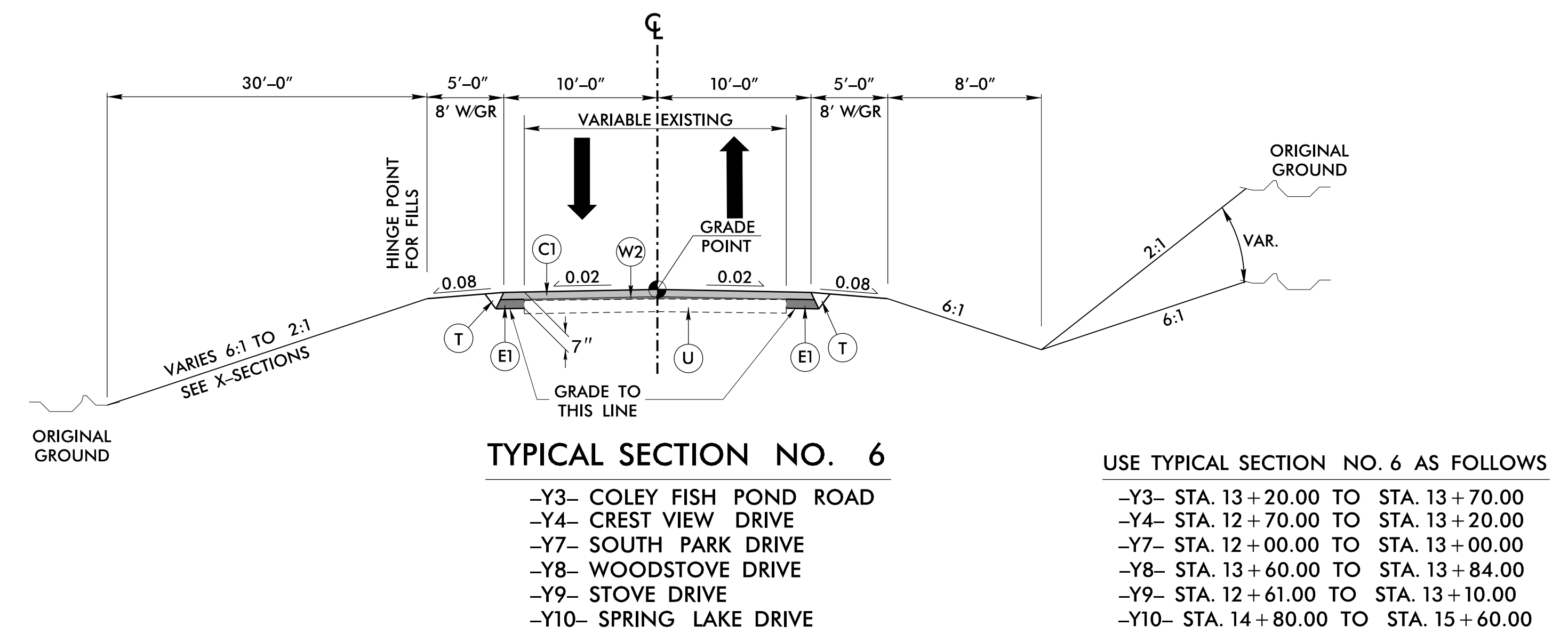
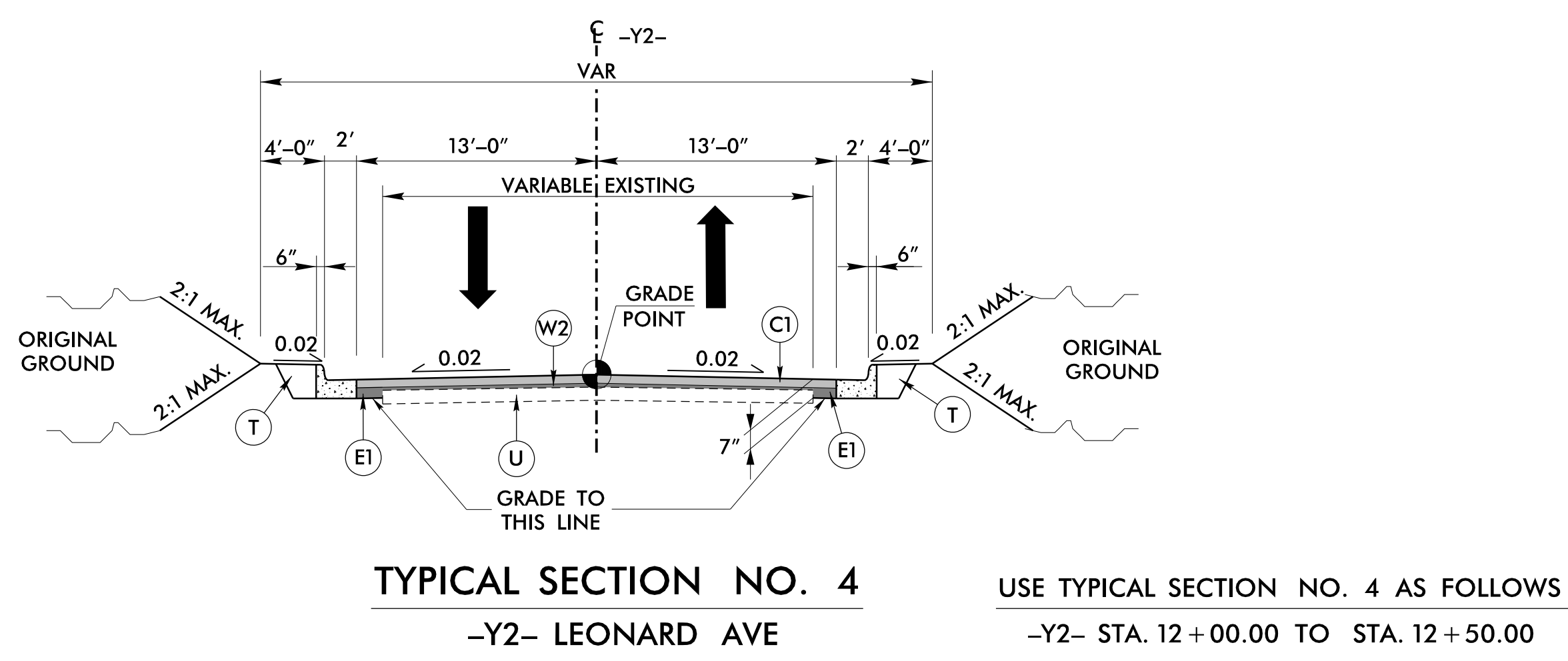
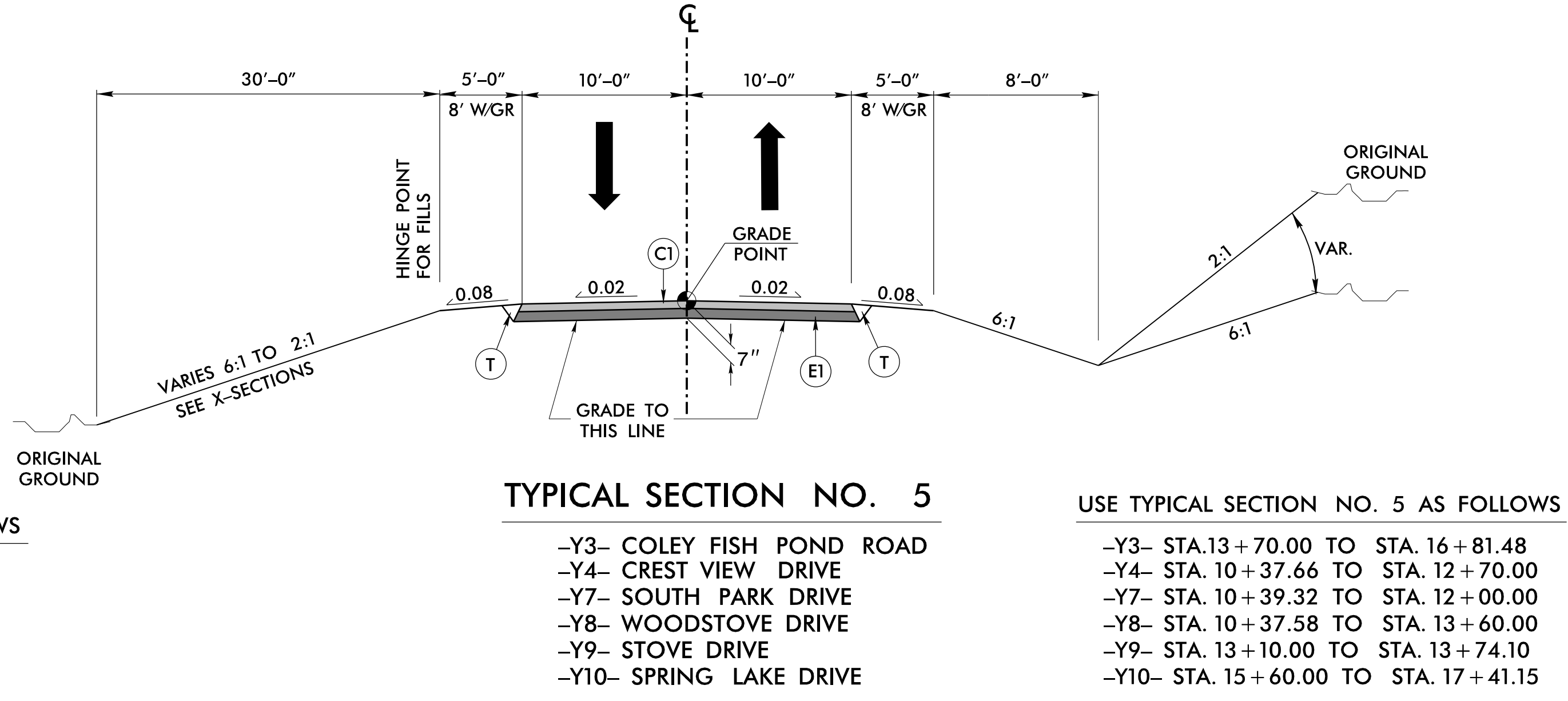
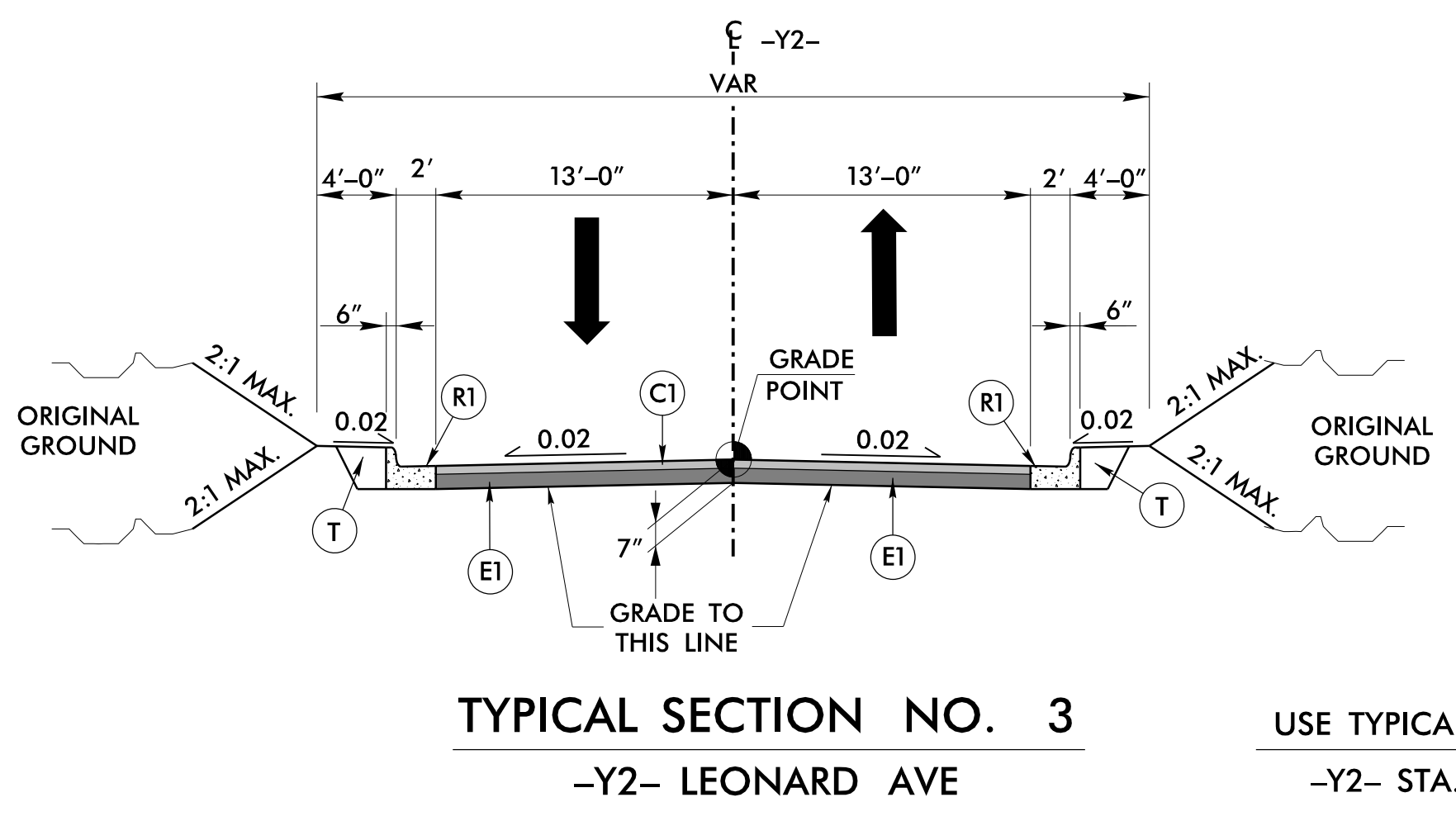
GRAPHIC SCALE
 N.T.S.

Prepared by
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 URS Corporation - North Carolina
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 NO. LICENSE # C-2243

PROJECT REFERENCE NO. <i>R-3100B</i>	SHEET NO. <i>2A-2</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



PAVEMENT SCHEDULE	
FINAL PAVEMENT DESIGN	
C1	3" S9.5B
C2	1.5" S9.5C
C3	3" S9.5C
C4	VAR. S9.5B
C5	VAR. S9.5C
D1	2.5" I19.0B
D2	2.5" I19.0C
D3	4" I19.0C
D4	VAR. I19.0B
D5	VAR. I19.0C
E1	4" B25.0B
E2	3" B25.0C
E3	4" B25.0C
E4	5.5" B25.0C
E5	VAR. B25.0B
E6	VAR. B25.0C
K	SUBGRADE STAB.
R1	2'-6" C&G
R2	2'-9" C&G
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W1	WEDGING
W2	WEDGING
W3	WEDGING

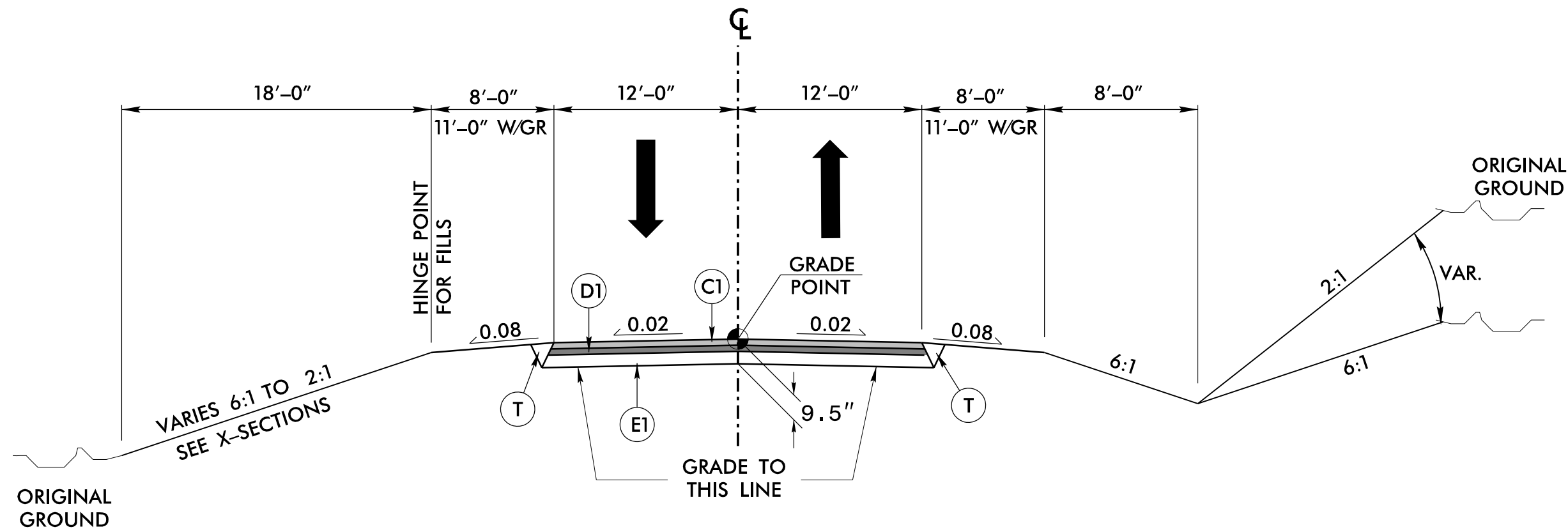


8/17/99

GRAPHIC SCALE
N.T.S.

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NO. L10296E - C-2242

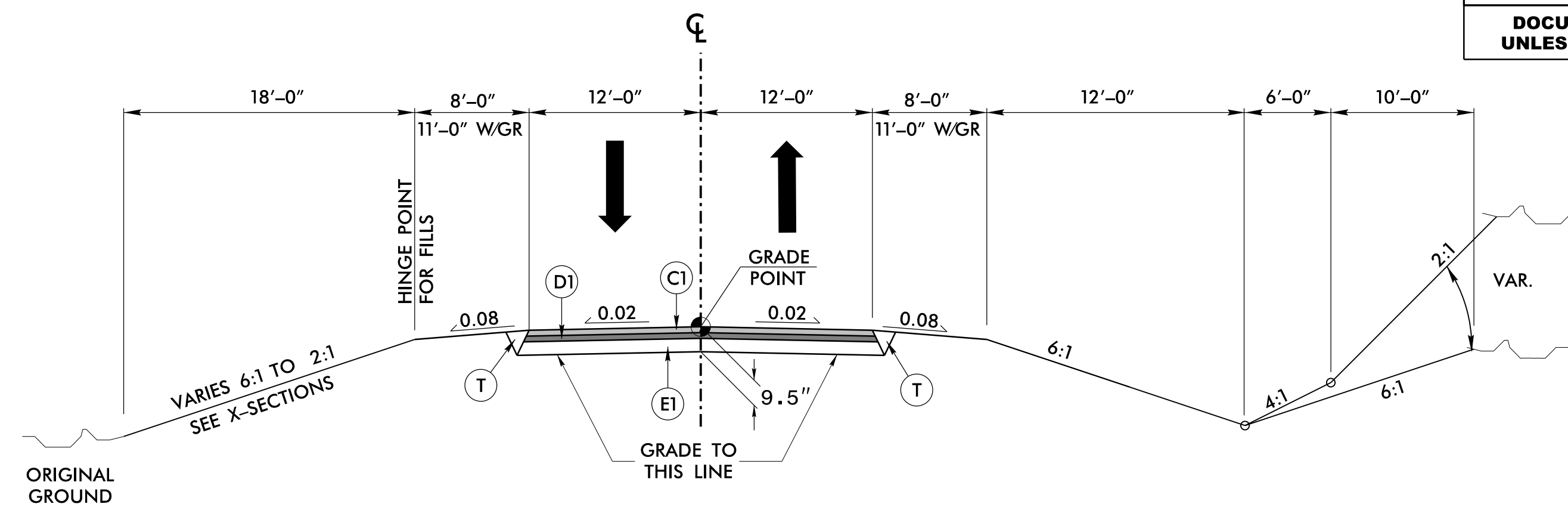
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RW SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



TYPICAL SECTION NO. 7

-Y5- BETHANY CHURCH ROAD
-Y6- SMYRE FARM ROAD

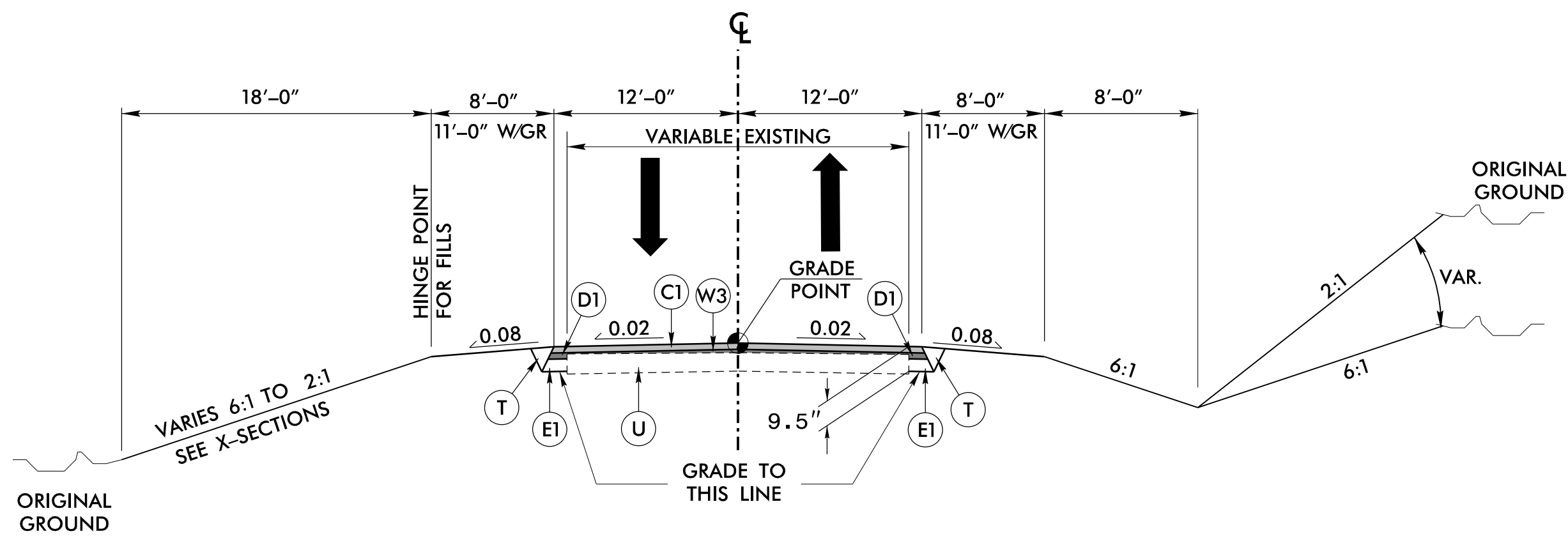
USE TYPICAL SECTION NO. 7 AS FOLLOWS
-Y5- STA. 13+00.00 TO STA. 14+56.59
-Y6- STA. 10+37.64 TO STA. 11+50.00



TYPICAL SECTION NO. 9

-Y11- PROVIDENCE MILL ROAD
-Y12- BALLS CREEK ROAD

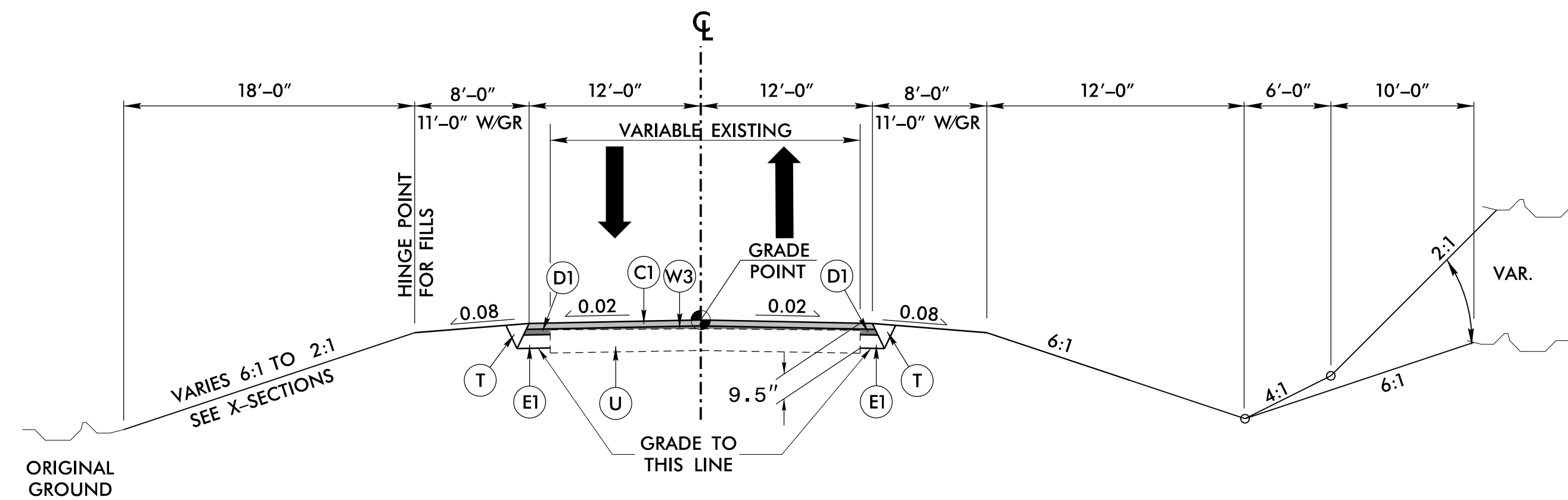
USE TYPICAL SECTION NO. 9 AS FOLLOWS
-Y11- STA. 10+36.00 TO STA. 11+50.00
-Y12- STA. 11+50.00 TO STA. 18+18.20



TYPICAL SECTION NO. 8

-Y5- BETHANY CHURCH ROAD
-Y6- SMYRE FARM ROAD

USE TYPICAL SECTION NO. 8 AS FOLLOWS
-Y5- STA. 11+00.00 TO STA. 13+00.00
-Y6- STA. 11+50.00 TO STA. 13+37.59

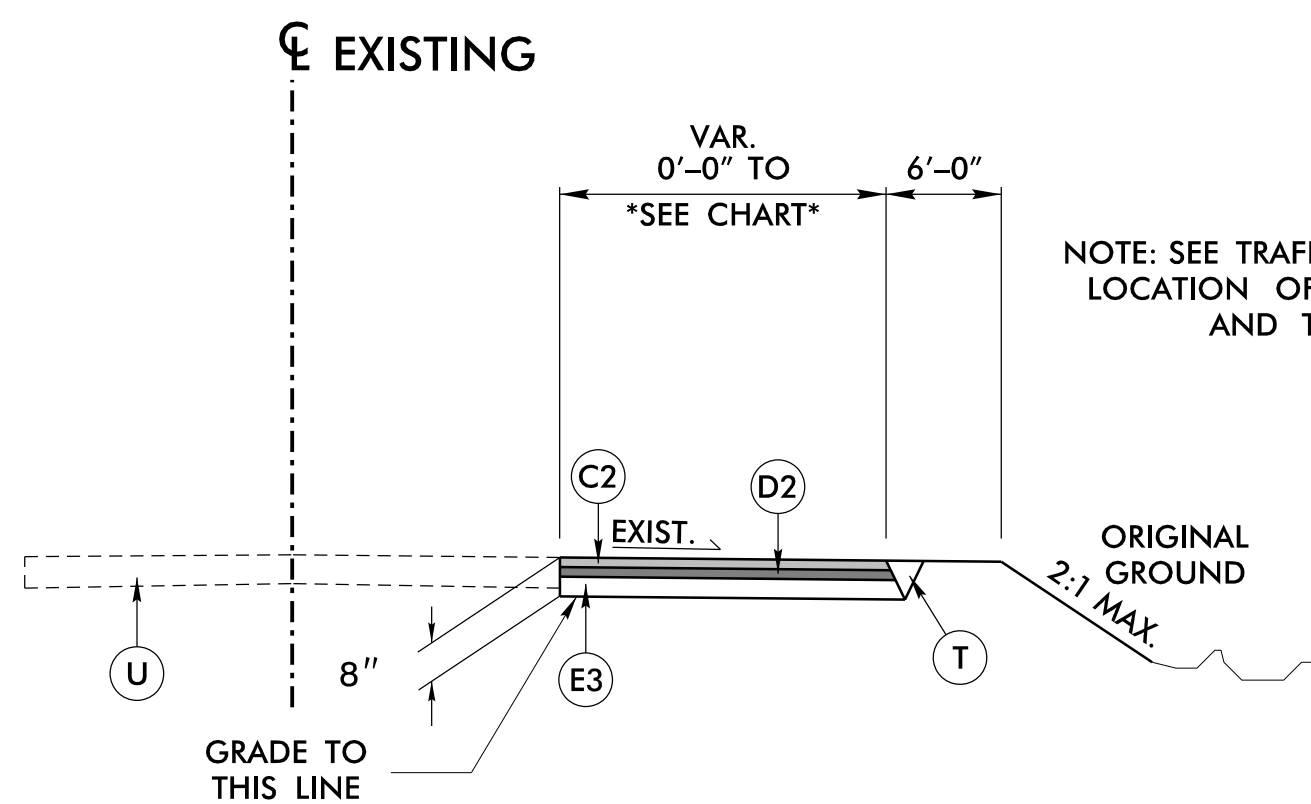


TYPICAL SECTION NO. 10

-Y11- PROVIDENCE MILL ROAD
-Y12- BALLS CREEK ROAD

USE TYPICAL SECTION NO. 10 AS FOLLOWS
-Y11- STA. 11+50.00 TO STA. 14+63.00
-Y12- STA. 10+06.00 TO STA. 11+50.00

PAVEMENT SCHEDULE	
FINAL PAVEMENT DESIGN	
C1	3" S9.5B
C2	1.5" S9.5C
C3	3" S9.5C
C4	VAR. S9.5B
C5	VAR. S9.5C
D1	2.5" I19.0B
D2	2.5" I19.0C
D3	4" I19.0C
D4	VAR. I19.0B
D5	VAR. I19.0C
E1	4" B25.0B
E2	3" B25.0C
E3	4" B25.0C
E4	5.5" B25.0C
E5	VAR. B25.0B
E6	VAR. B25.0C
K	SUBGRADE STAB.
R1	2'-6" C&G
R2	2'-9" C&G
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W1	WEDGING
W2	WEDGING
W3	WEDGING



TYPICAL SECTION NO. 9

-L- NC 16
(TEMPORARY WIDENING)

NOTE: SEE TRAFFIC MANAGEMENT PLANS FOR LOCATION OF TRAFFIC CONTROL DEVICES AND TEMPORARY SHORING

USE TYPICAL SECTION NO. 9 AS FOLLOWS

LINE	LRTR OF EXISTING PAVEMENT	PHASE	BEGIN STATION	END STATION	WIDTH
-L-	RT	PHASE I	26+00 +/-	32+10 +/-	20' +/-
-L-	RT	PHASE I	41+35 +/-	46+25 +/-	13.5' +/-
-L-	RT	PHASE I	46+25 +/-	82+91 +/-	5' +/-
-L-	LT	PHASE I	92+40 +/-	117+59 +/-	5' +/-
-L-	LT	PHASE I	137+82 +/-	155+50 +/-	5' +/-
-L-	LT	PHASE I	165+50 +/-	172+60 +/-	7.5' +/-
-L-	RT	PHASE I	186+95 +/-	195+75 +/-	6' +/-
-L-	RT	PHASE I	196+17 +/-	198+28 +/-	23' +/-
-L-	RT	PHASE II	26+25 +/-	31+00 +/-	6' +/-
-L-	RT	PHASE II	41+15 +/-	45+15 +/-	6' +/-

REVISIONS

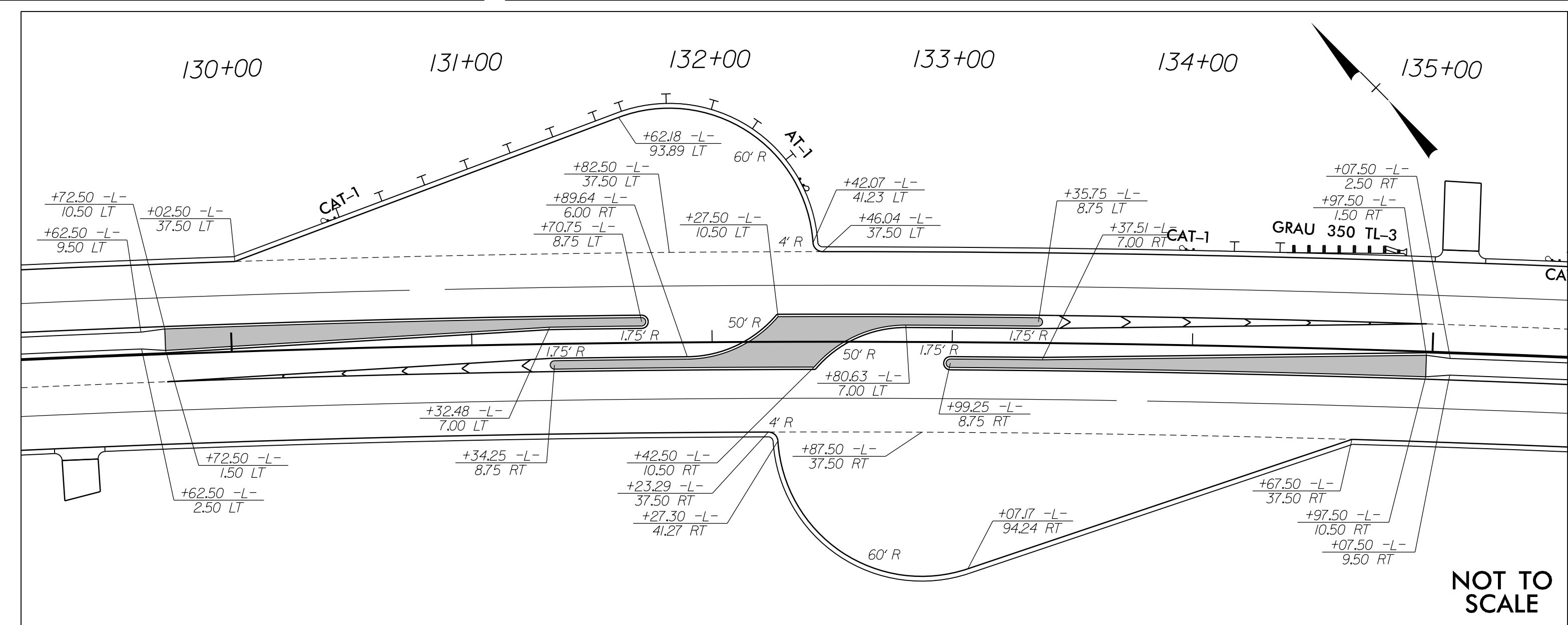
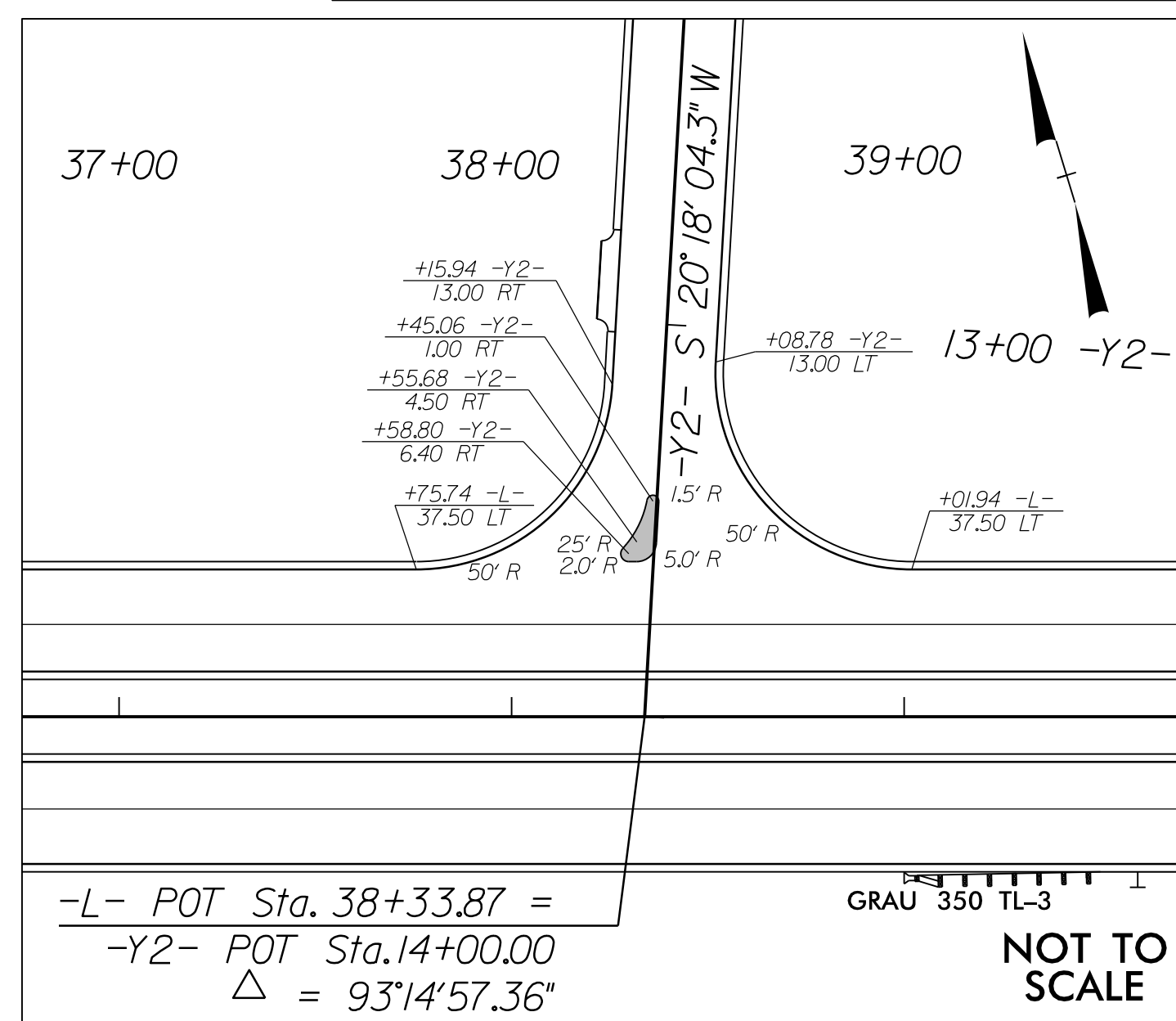
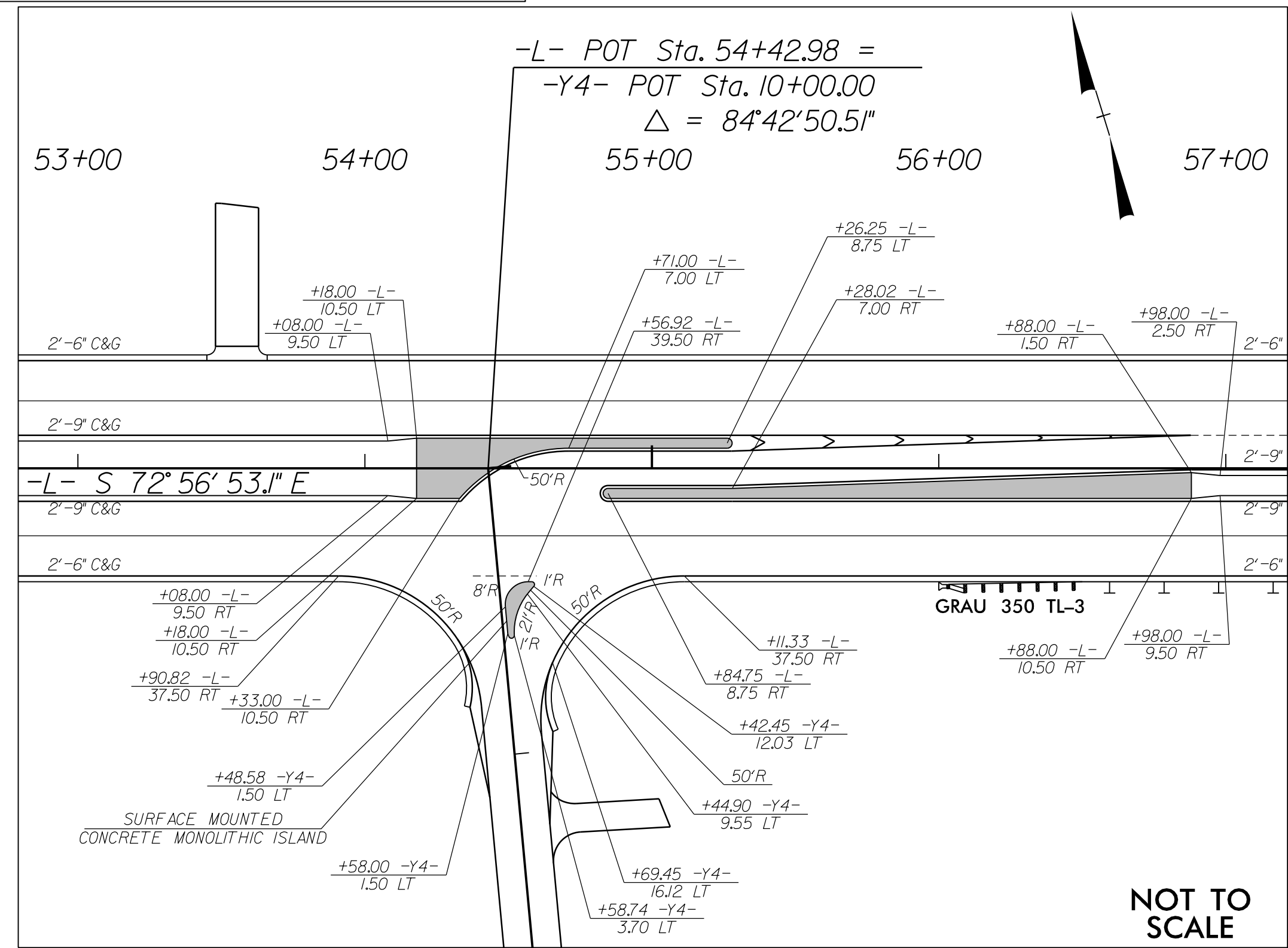
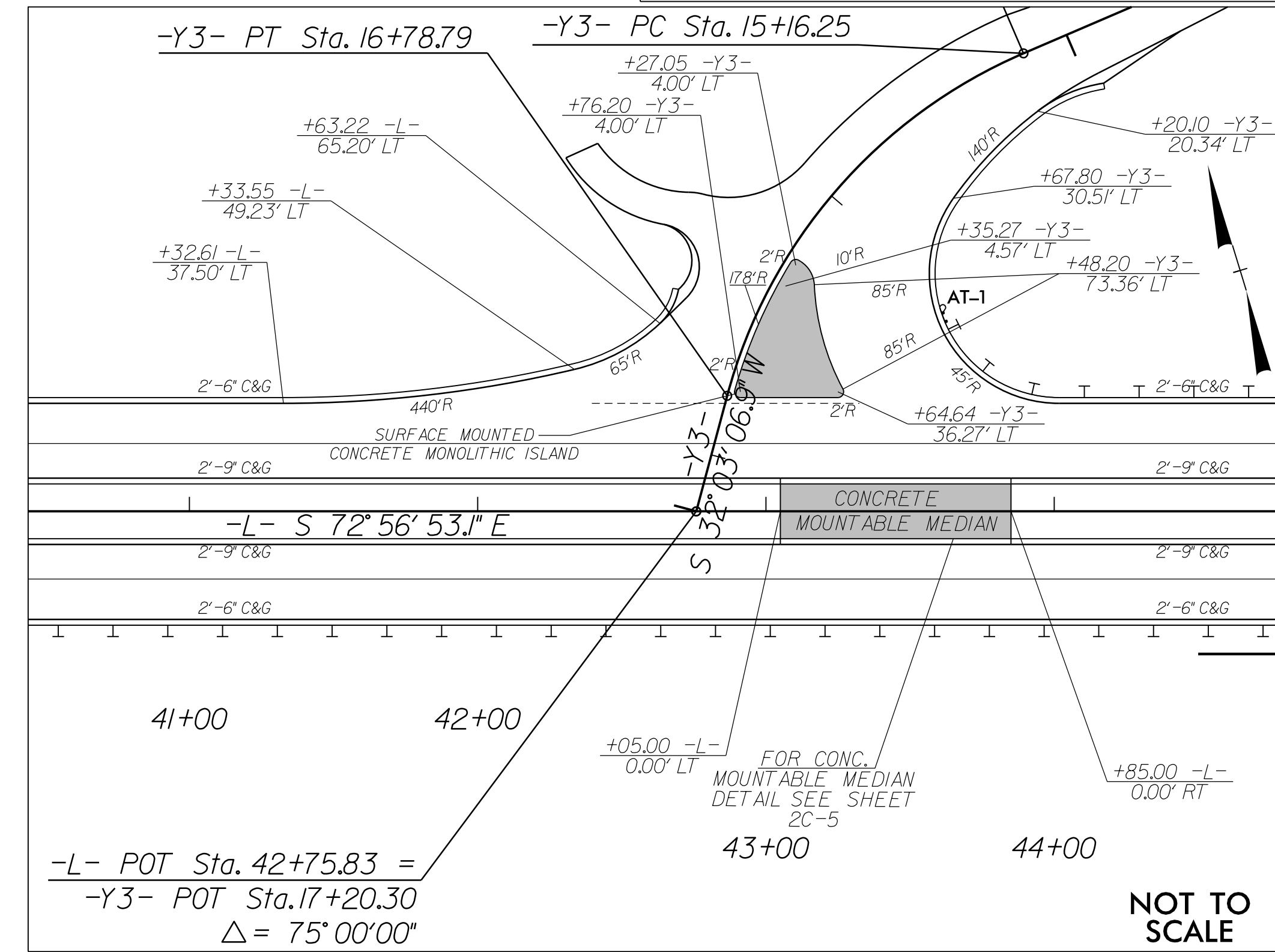
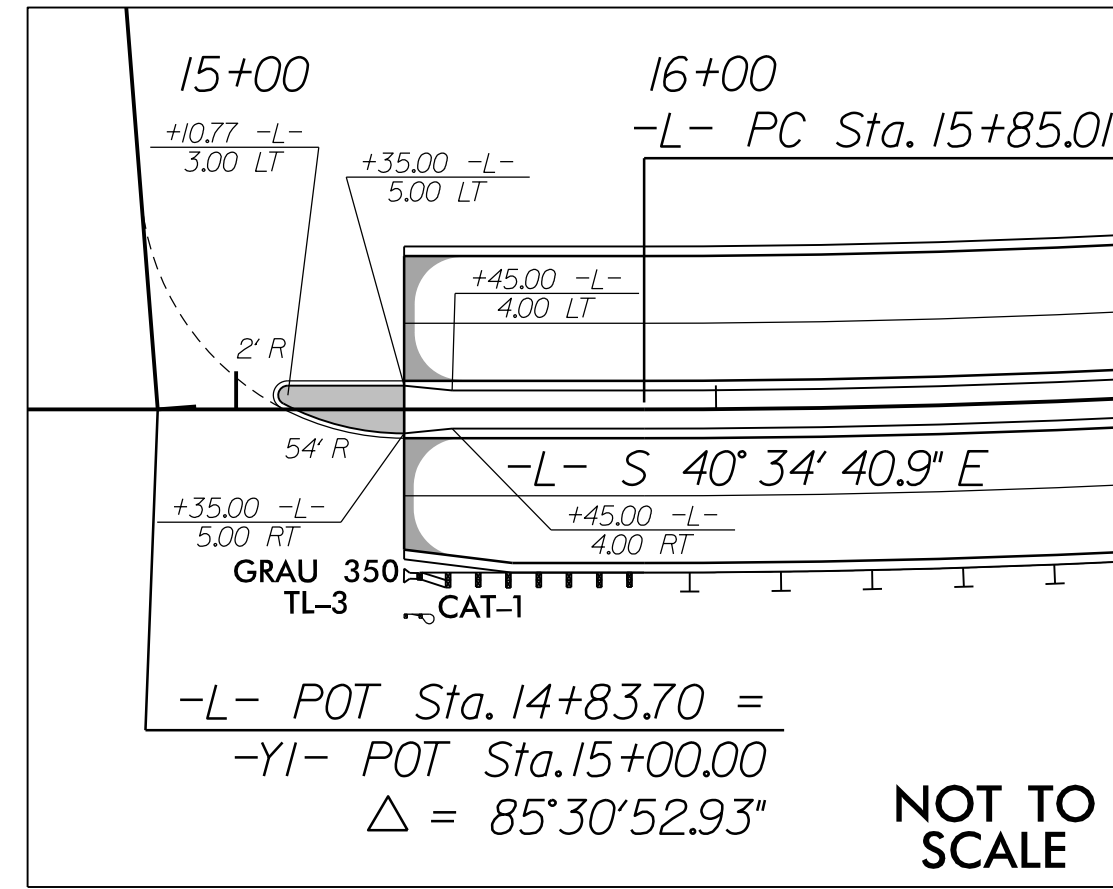
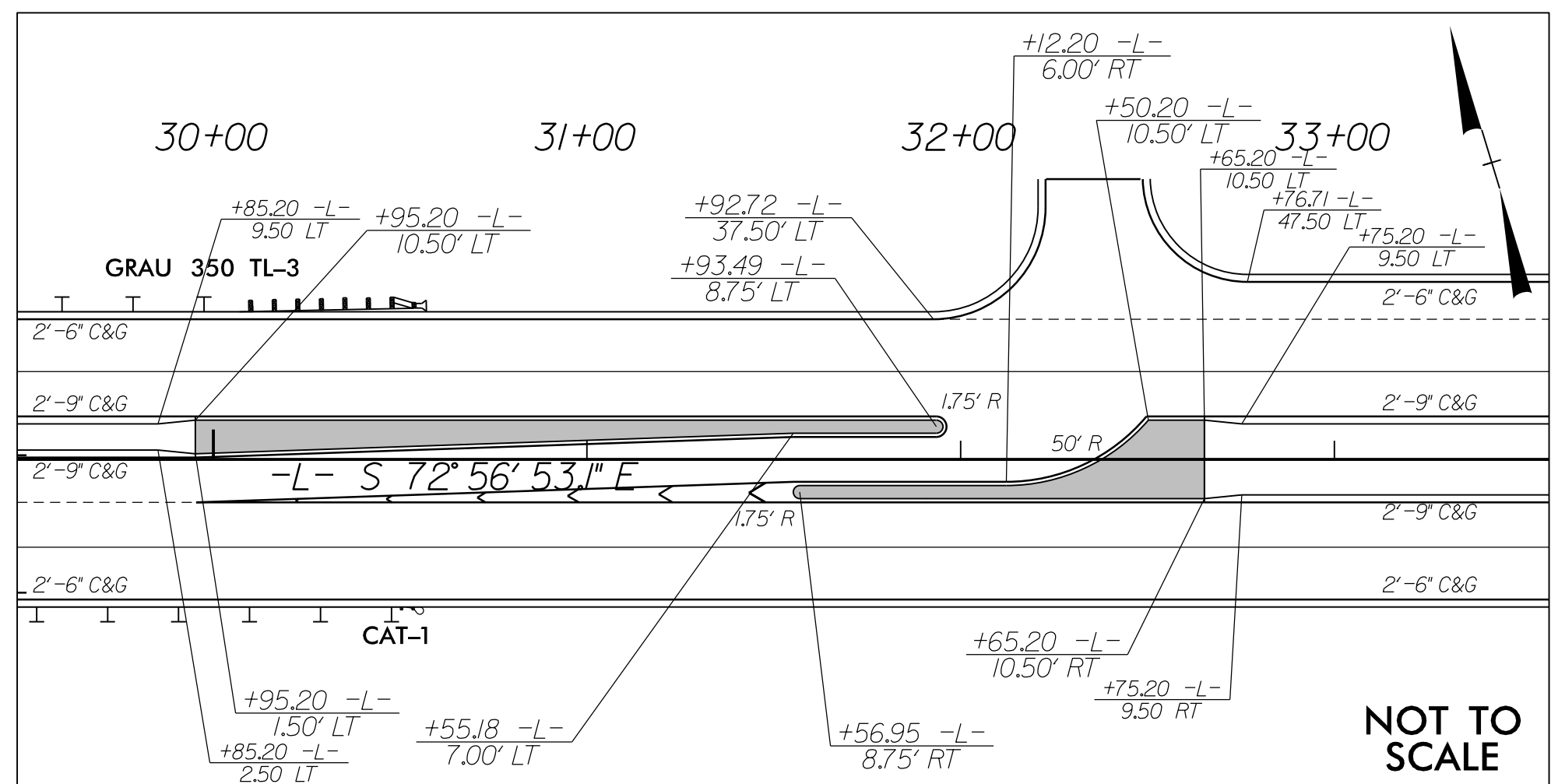
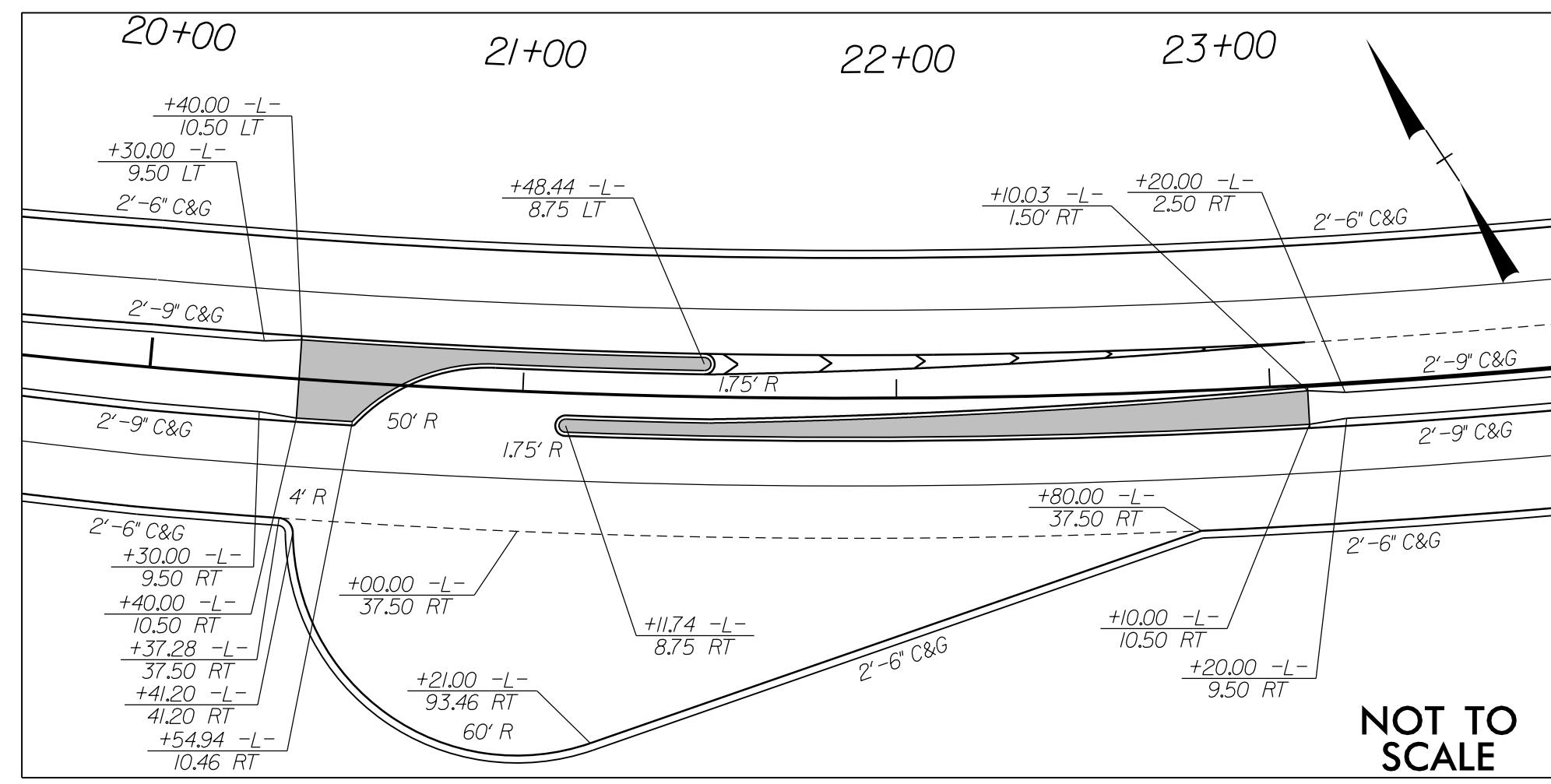
3/16/2017
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CONCRETE MONOLITHIC ISLAND DETAILS

Prepared by
URS
URS Corporation - North Carolina
1600 Perimeter Park Drive
Morrisville, North Carolina 27560
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NO. L10262E • C-22943

PROJECT REFERENCE NO. R-3100B	SHEET NO. 2B-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

NOTE: ALL CONCRETE MONOLITHIC ISLANDS ARE KEYED IN UNLESS OTHERWISE NOTED



REVISIONS

3/16/2017
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8/17/99

CONCRETE MONOLITHIC ISLAND DETAILS

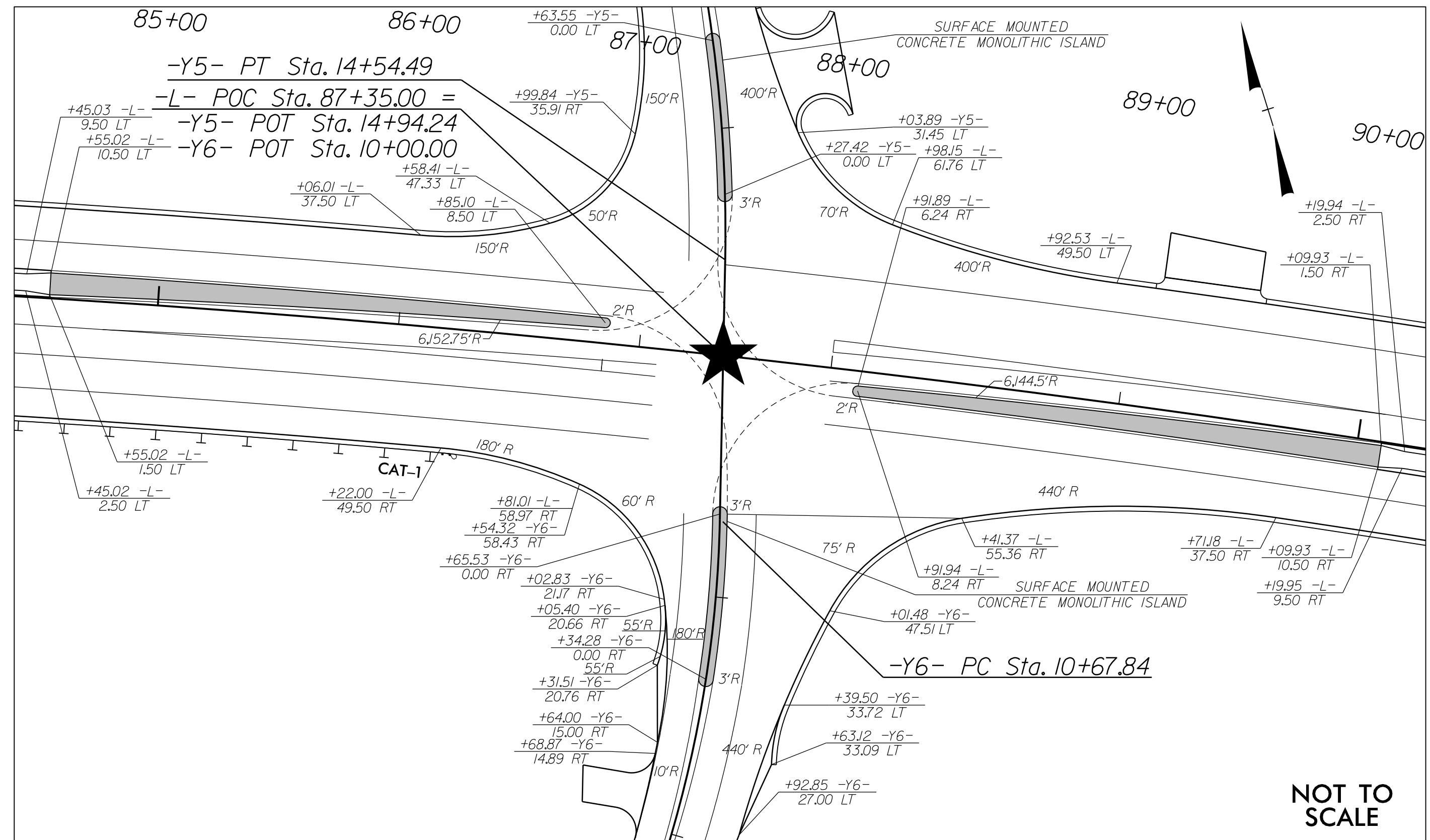
Prepared by
URS
 URS Corporation - North Carolina
 1600 Perimeter Park Drive
 Morrisville, North Carolina 27560
 TELEPHONE: (919) 461-1100 FAX: (919) 461-1415
 NO. L10266E • C-2294

PROJECT REFERENCE NO. R-3100B	SHEET NO. 2B-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	

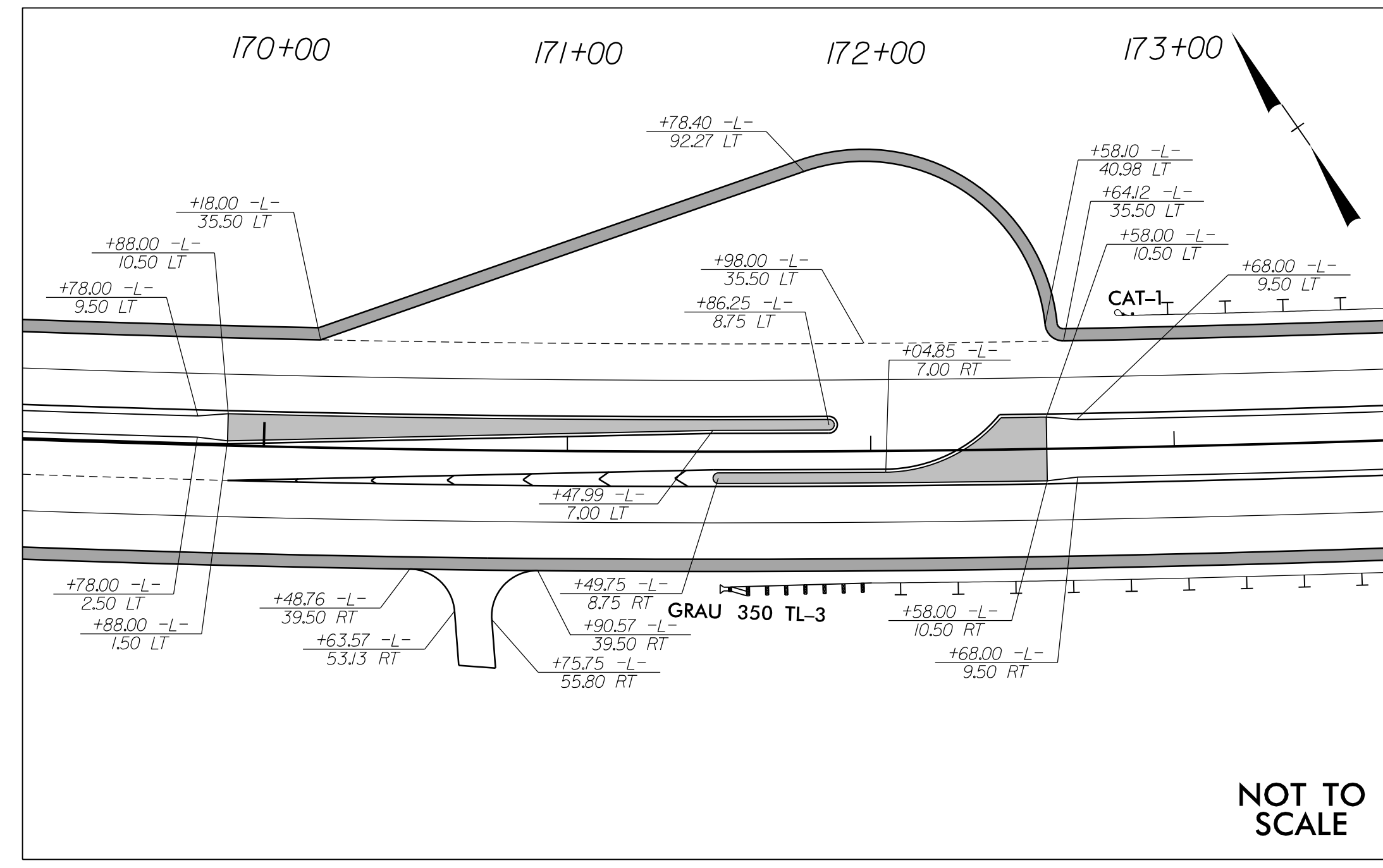
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

★ PROPOSED SIGNAL

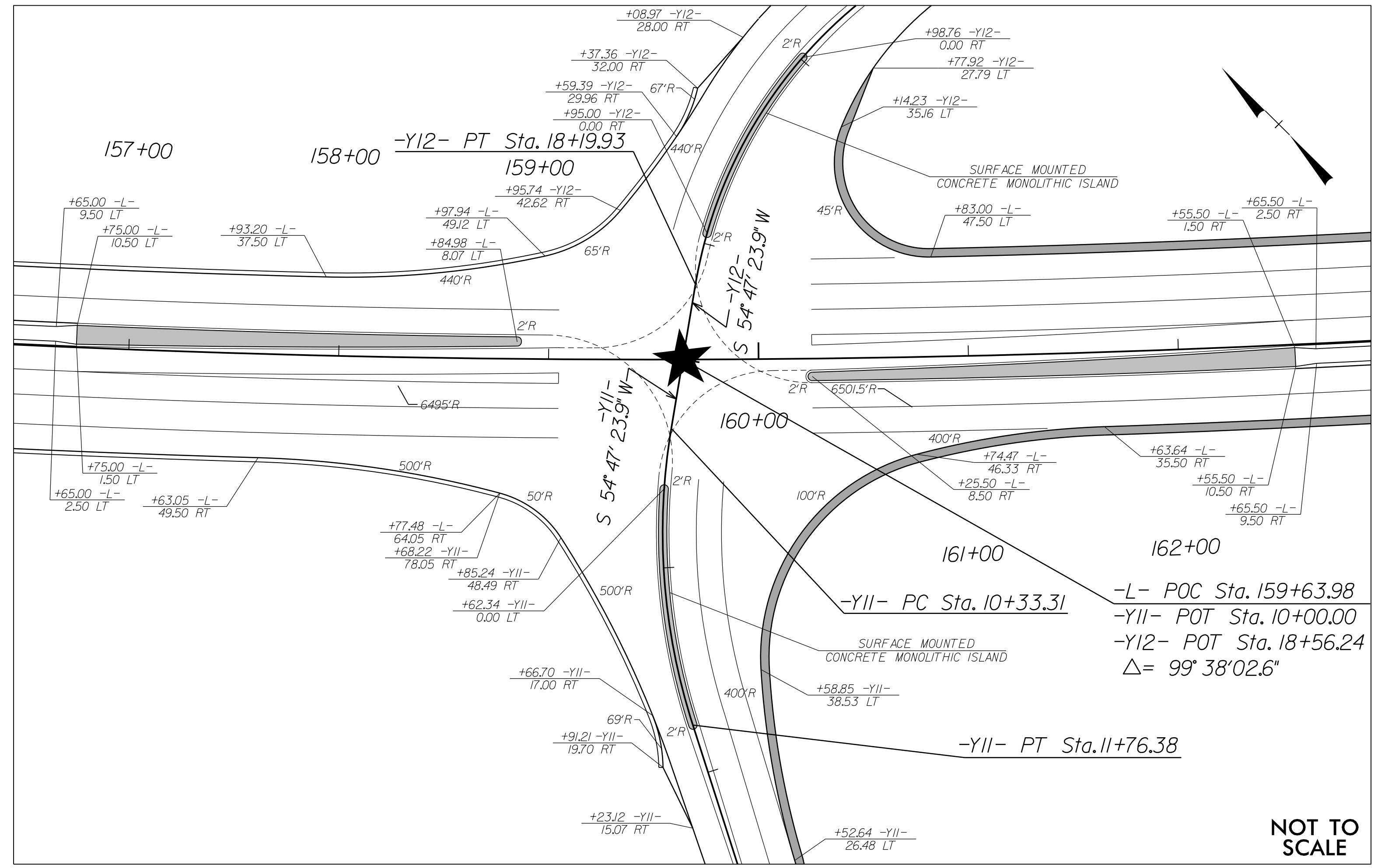
NOTE: ALL CONCRETE MONOLITHIC ISLANDS ARE KEYED IN UNLESS OTHERWISE NOTED



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NOT TO SCALE

REVISIONS

3/16/2017
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 scheld

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

ENGLISH DETAIL DRAWING FOR
2'-9" CONCRETE CURB & GUTTER

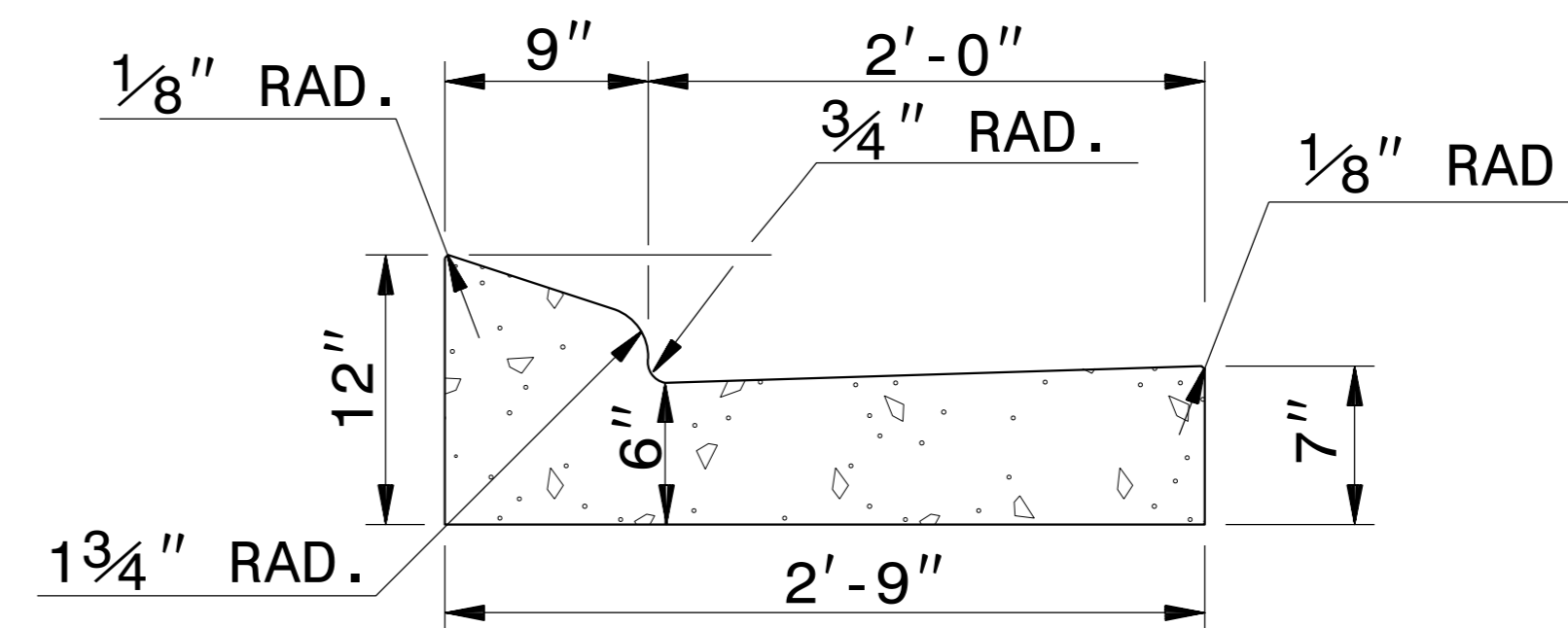
SHEET 1 OF 1
846D01

- GENERAL NOTES:
- PLACE CONTRACTION JOINTS AT 10' INTERVALS, EXCEPT THAT A 15' SPACING MAY BE USED WHEN A MACHINE IS USED OR WHEN SATISFACTORY SUPPORT FOR THE FACE FORM CAN BE OBTAINED WITHOUT THE USE OF TEMPLATES AT 10' INTERVALS.
 - JOINT SPACING MAY BE ALTERED IF REQUIRED BY THE ENGINEER.
 - CONTRACTION JOINTS MAY BE INSTALLED WITH THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS. MAKE NON-TEMPLATE FORMED JOINTS A MIN. OF 1½" DEEP.
 - FILL ALL CONSTRUCTION JOINTS WITH JOINT FILLER AND SEALER.
 - SPACE EXPANSION JOINTS AT 90' INTERVALS AND ADJACENT TO ALL RIGID OBJECTS.
 - SEE RDWY. STD. DWG. NO. 846.01, SHEET 2 OF 3 FOR PLACEMENT IN SUPERELEVATIONS. (USE 2'-6" CURB AND GUTTER RATES)

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DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

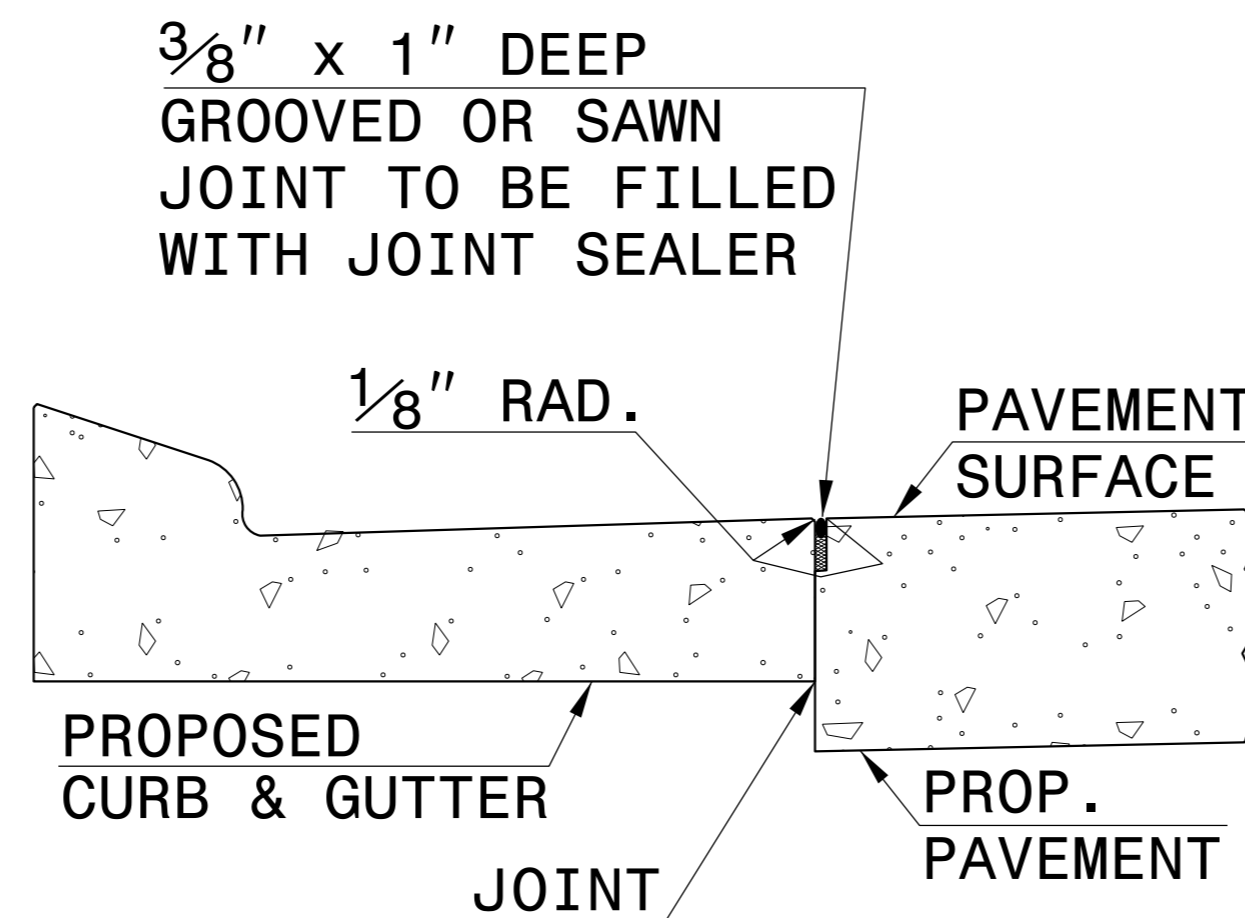
ENGLISH DETAIL DRAWING FOR
2'-9" CONCRETE CURB & GUTTER

SHEET 1 OF 1
846D01

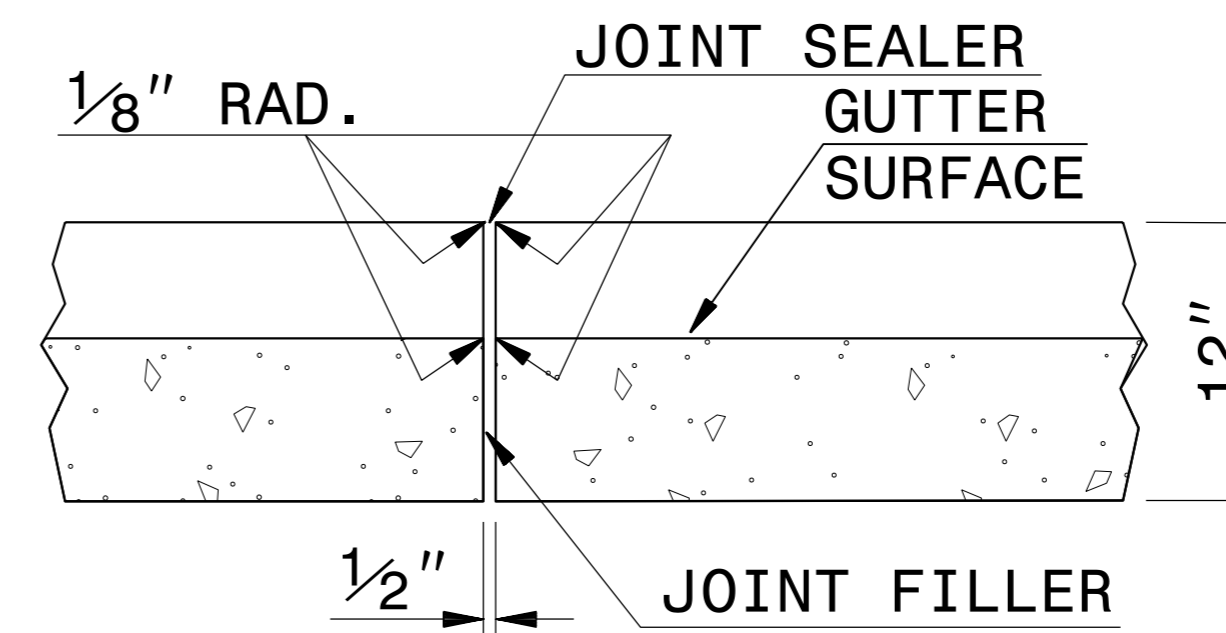


2'-9" CURB AND GUTTER

SECTION VIEW OF CURB AND GUTTER

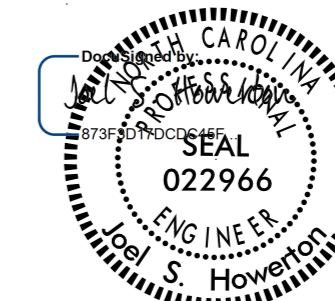


LONGITUDINAL JOINT



TRANSVERSE EXPANSION JOINT IN CURB AND GUTTER

SECTION VIEW OF JOINTS



3/16/2017

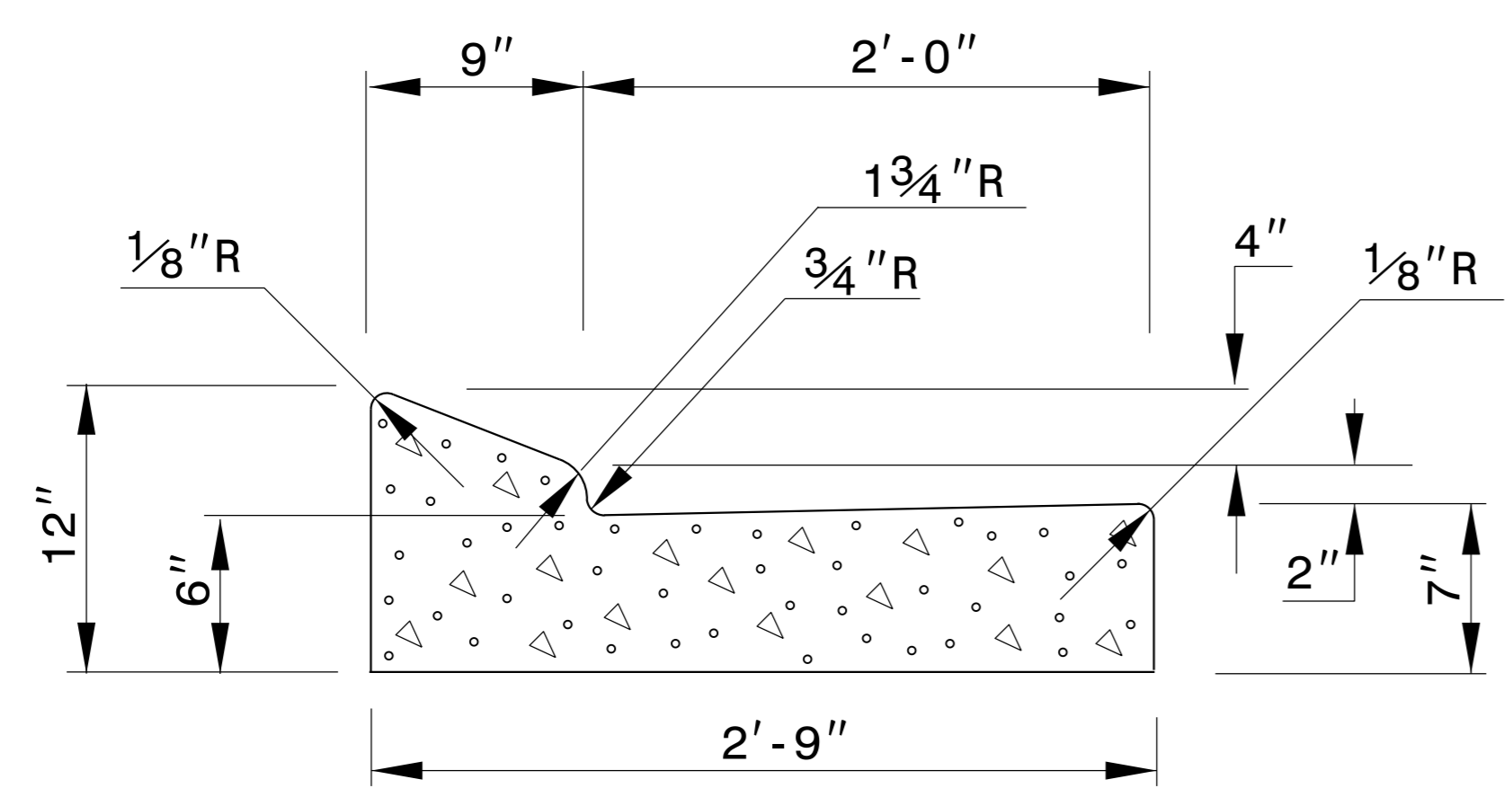
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CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

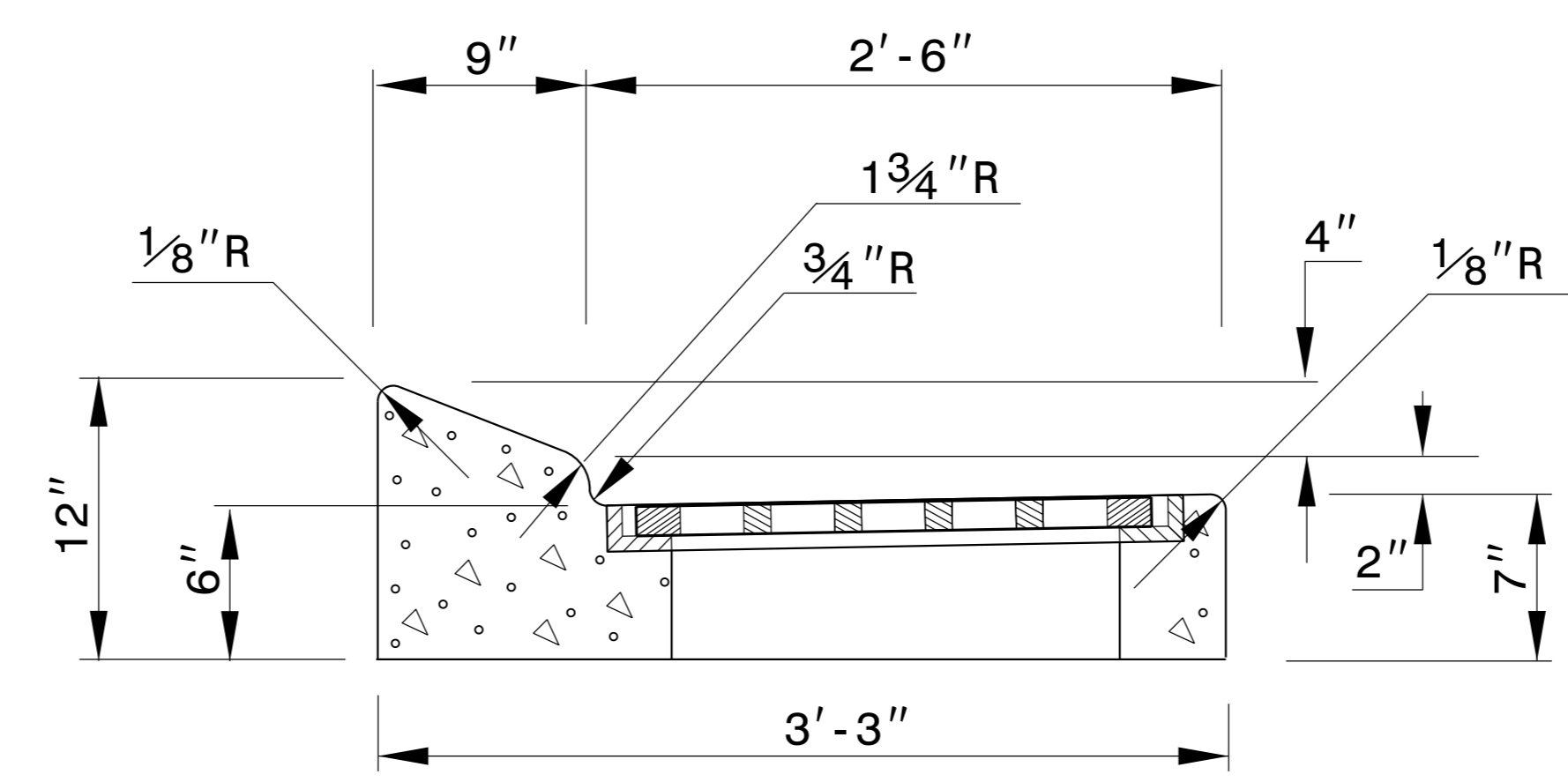
SEE PLATE FOR TITLE

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 MODIFIED BY: E.E. WARD DATE: 8-15-00
 CHECKED BY: _____ DATE: _____
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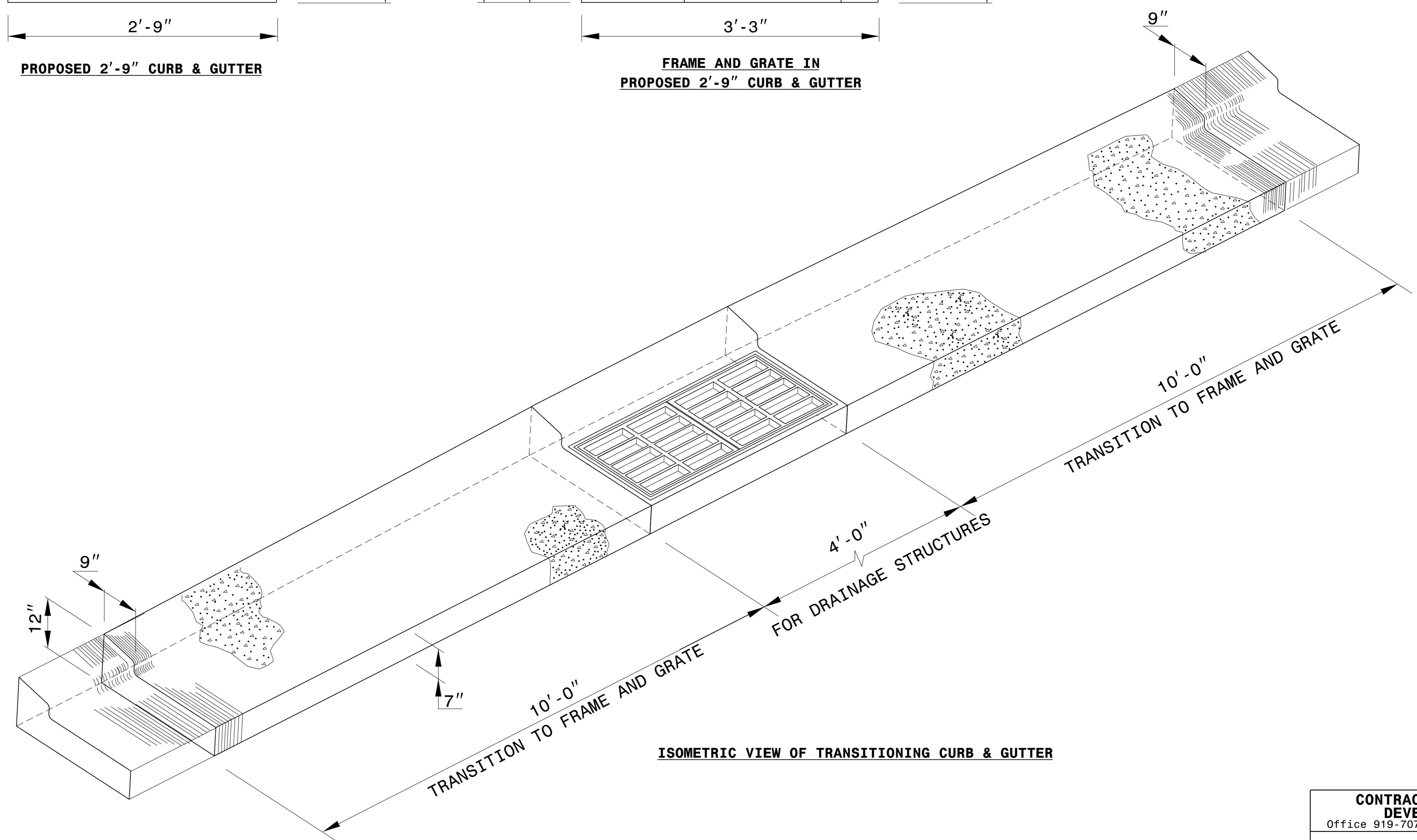
846D01.dwg
3/16/2017 10:00 AM
M.S. Howerton



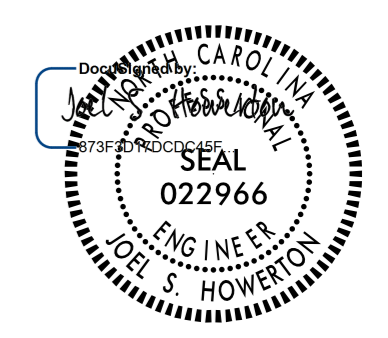
PROPOSED 2'-9" CURB & GUTTER



FRAME AND GRATE IN PROPOSED 2'-9" CURB & GUTTER



ISOMETRIC VIEW OF TRANSITIONING CURB & GUTTER



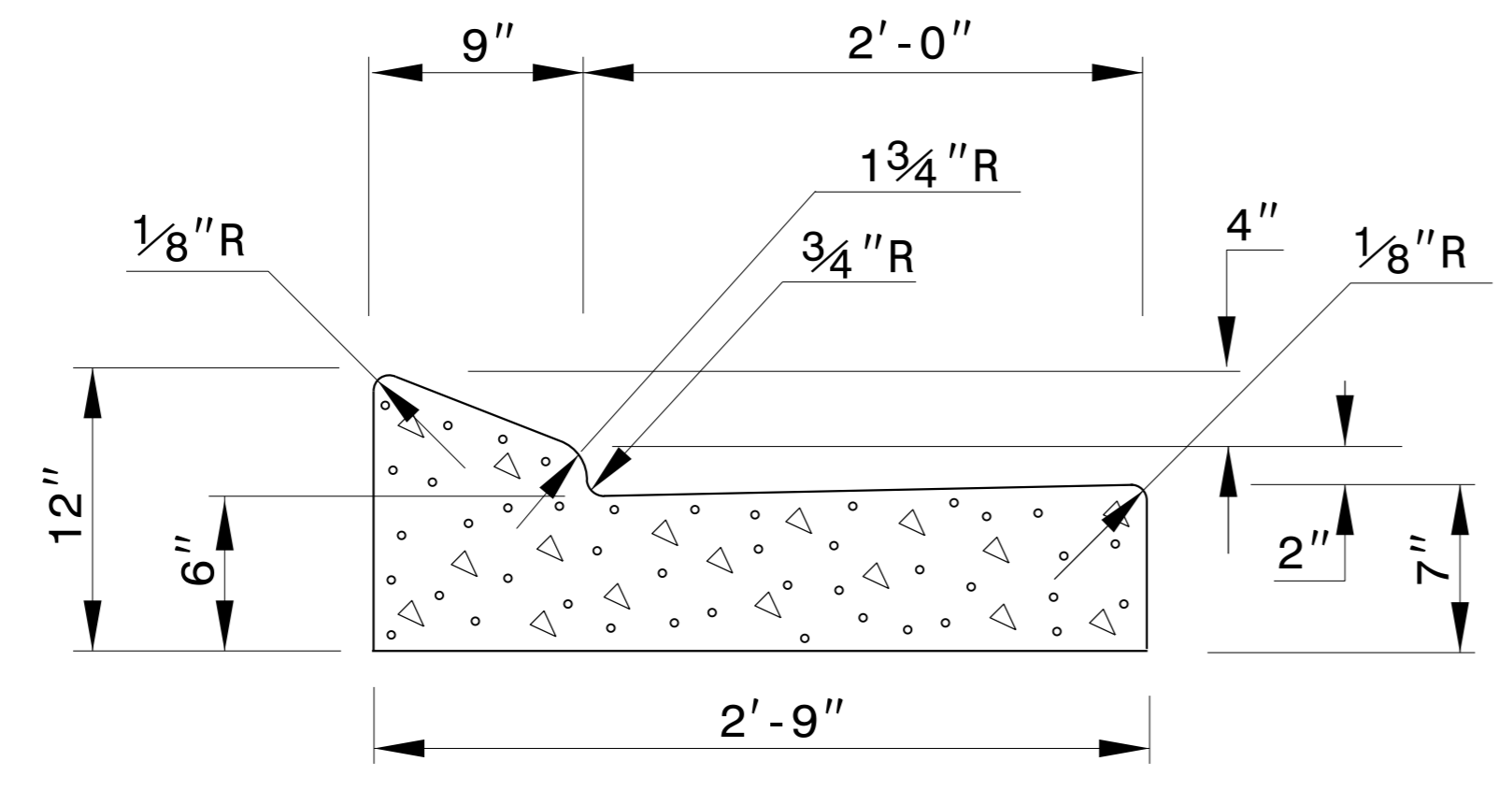
3/16/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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DETAIL OF 2'-9" TO FRAME AND GRATE

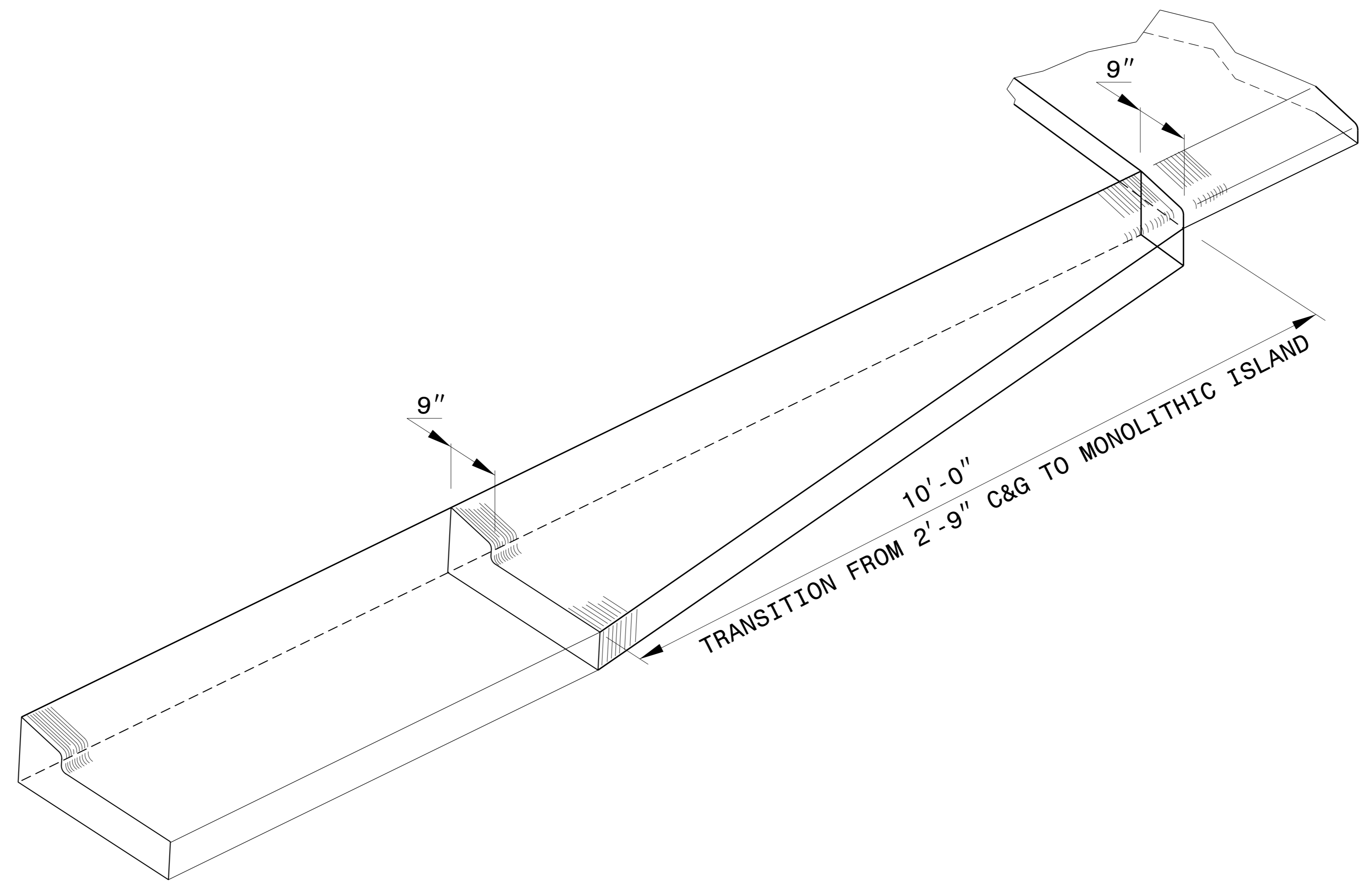
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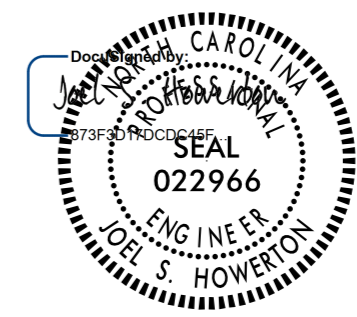
2'-9" CURB AND GUTTER

NOTE: SEE STD. DWG. 846.01 FOR ADDITIONAL CURB AND GUTTER INFORMATION.

SEE ROADWAY PLANS FOR LOCATION OF CURB TRANSITION.



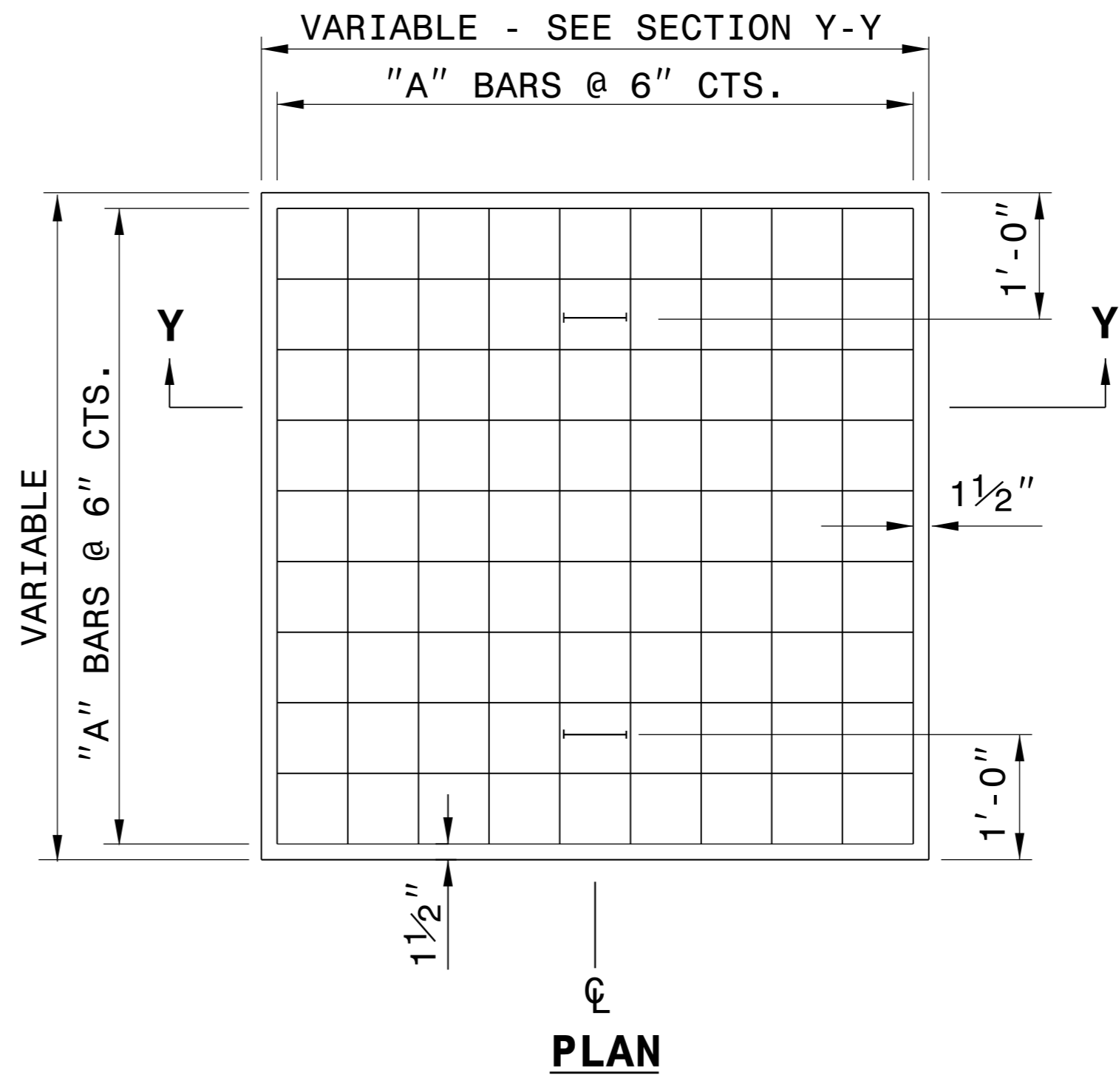
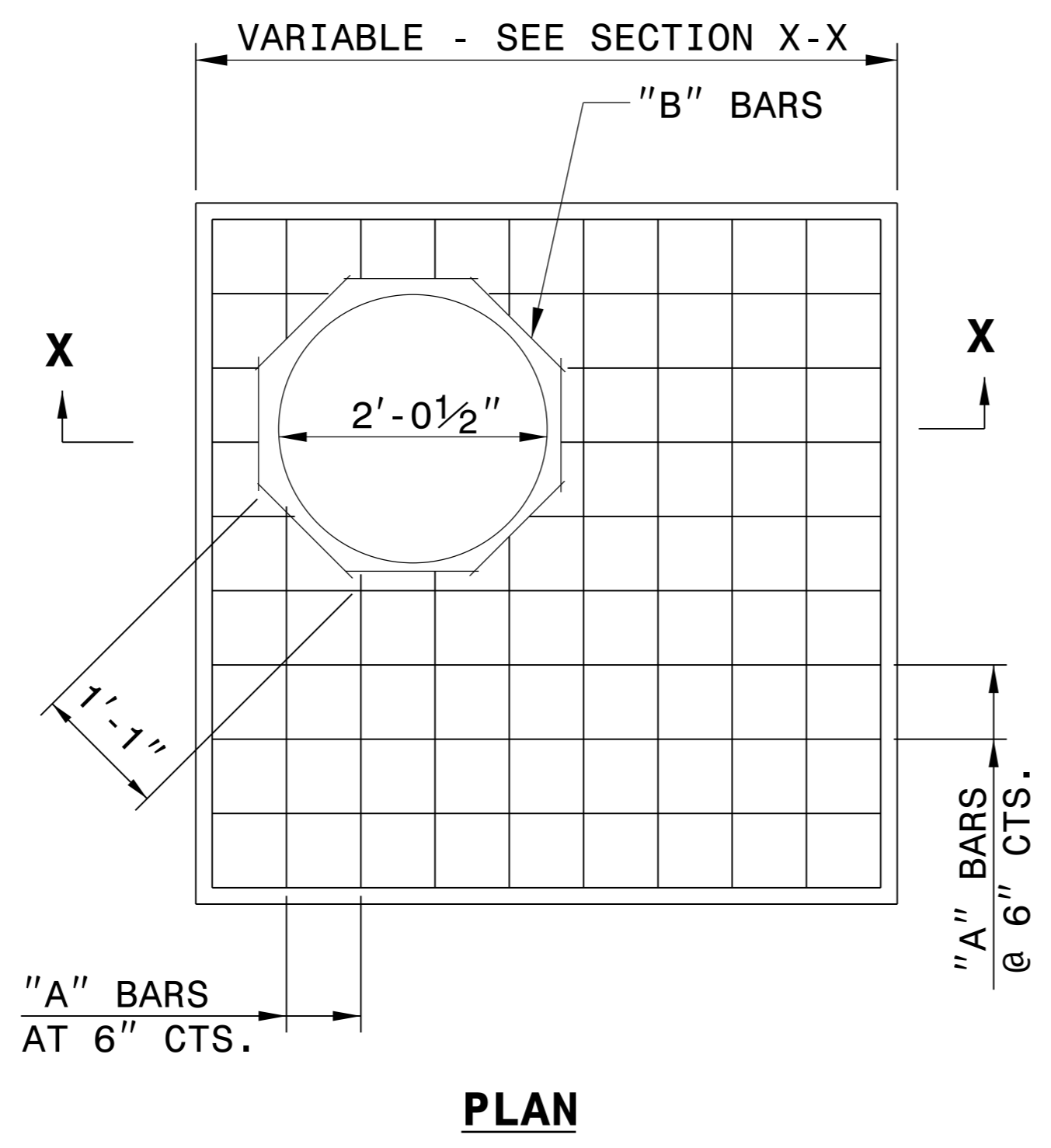
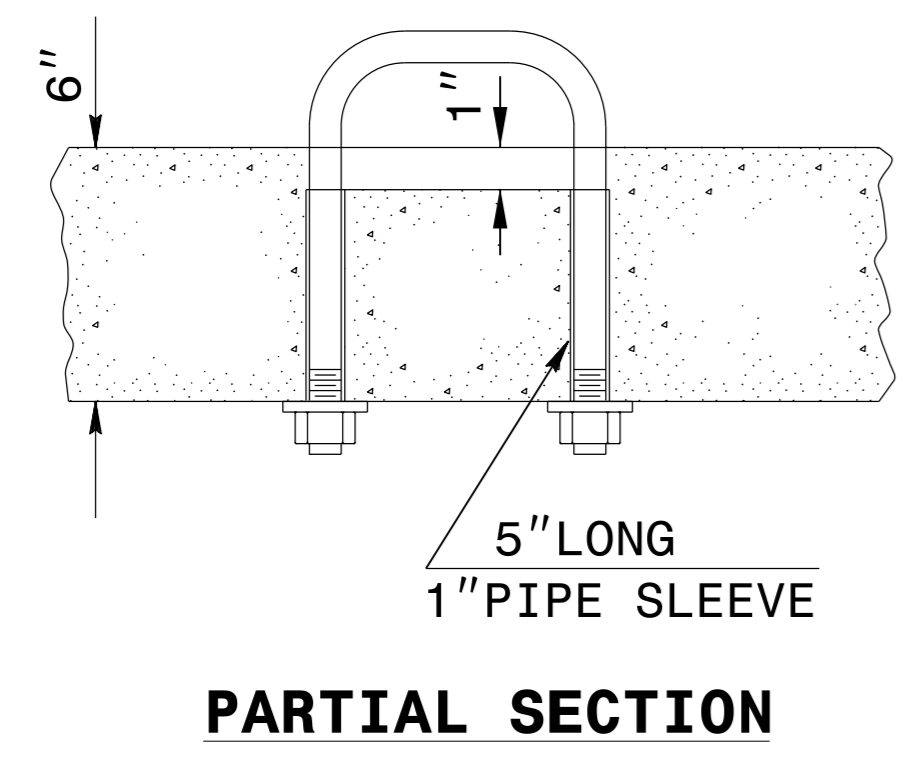
ISOMETRIC VIEW OF TRANSITIONING CURB & GUTTER



3/16/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACTS STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950	FAX 919-250-4119
DETAIL OF 2'-9" CURB & GUTTER TRANSITION SECTION	
ORIGINAL BY: _____	DATE: _____
MODIFIED BY: KKEMPF	DATE: 09-24-14
CHECKED BY: _____	DATE: _____
FILE SPEC.: kkempf/english/curb gutter tansion.dgn	



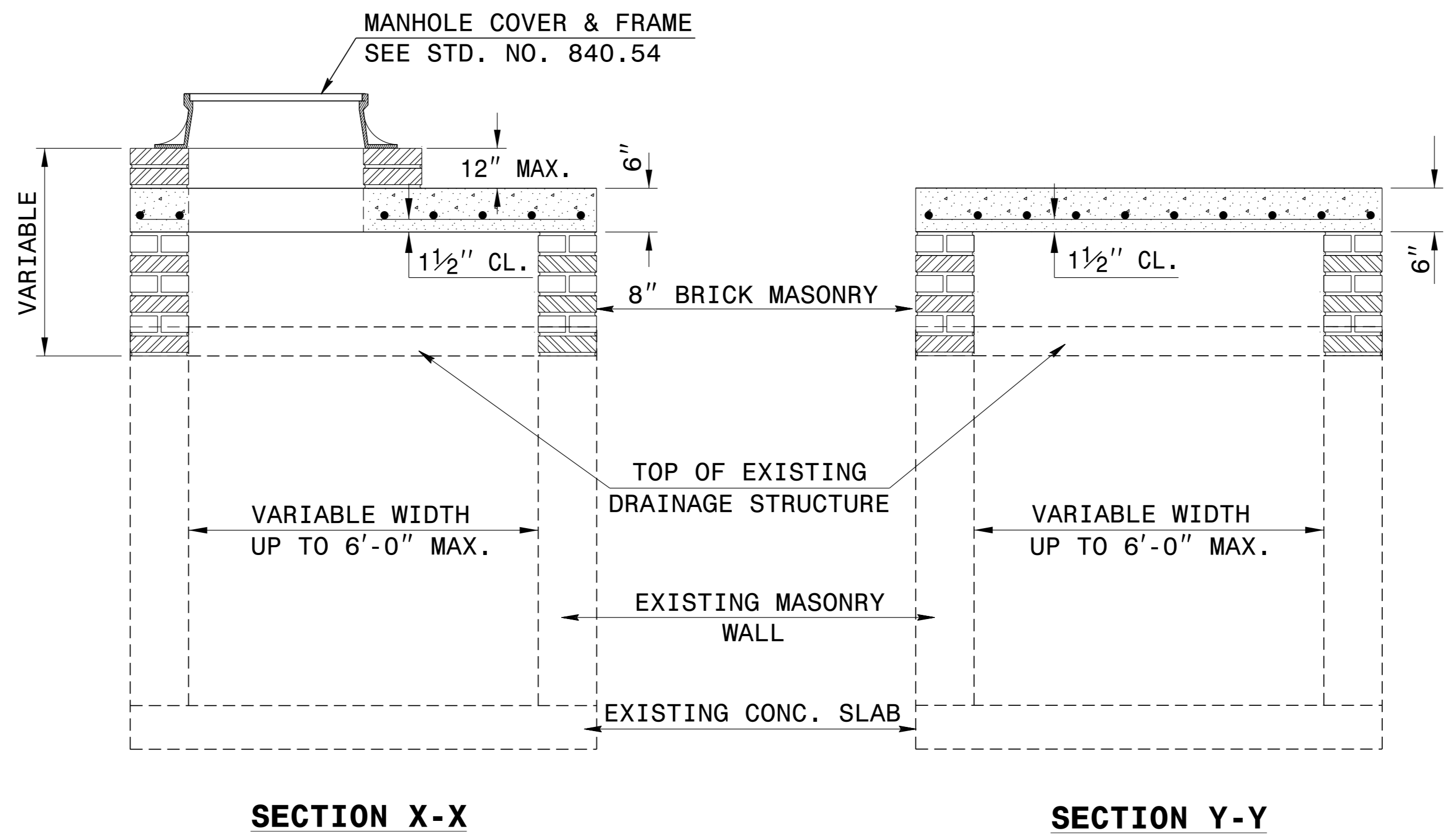
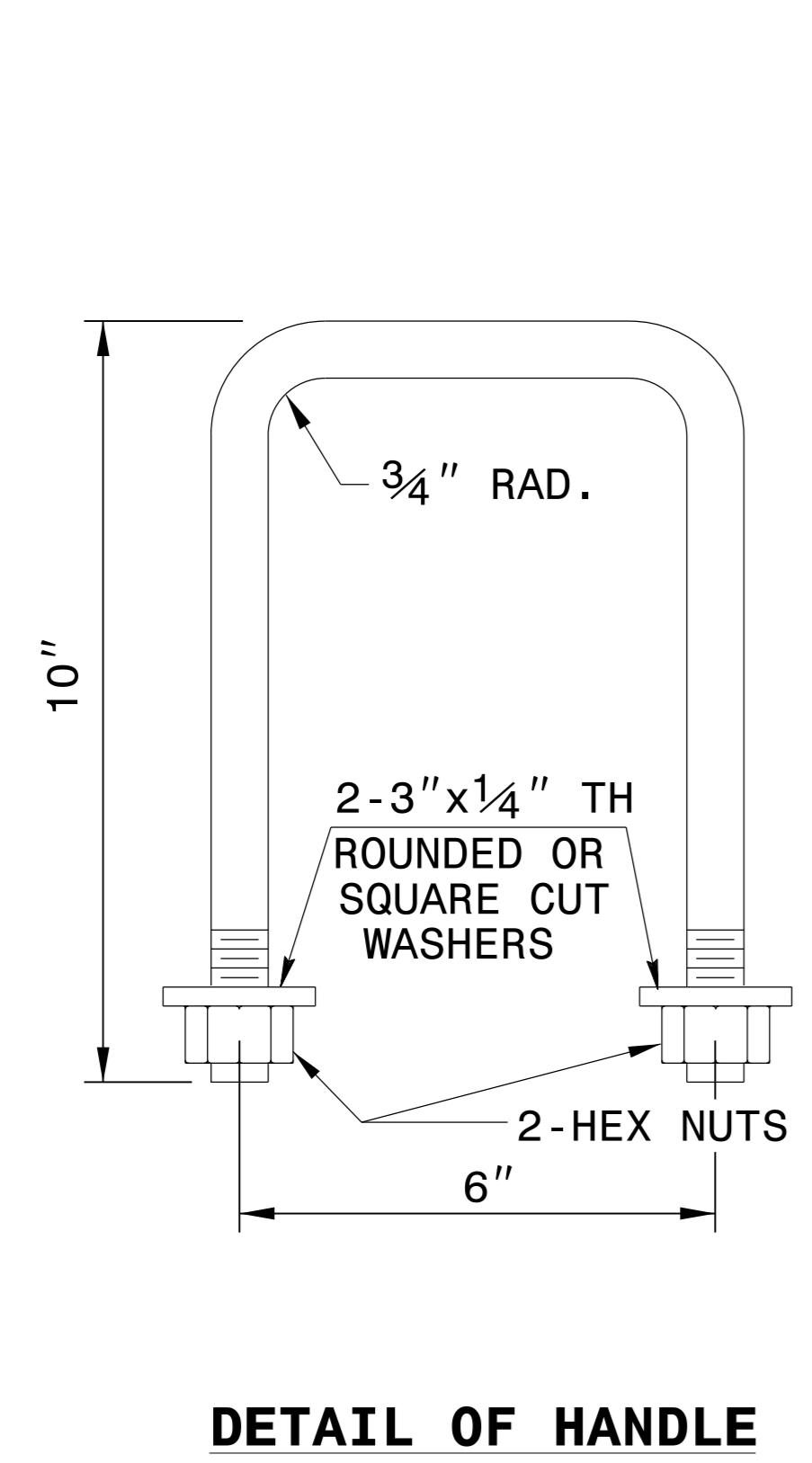
GENERAL NOTES:

CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.

THE DIMENSIONS FOR THE EXISTING BOXES ARE APPROXIMATE AND MAY VARY SLIGHTLY.

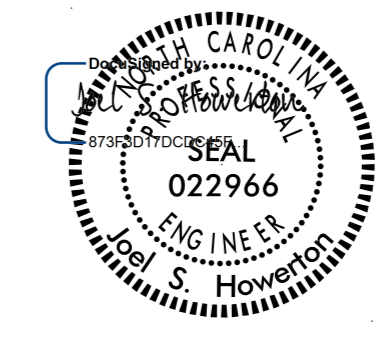
DETAIL INTENDED FOR NON-TRAFFIC BEARING DRAINAGE STRUCTURES.

BILL OF MATERIALS				
REINFORCING STEEL				
CODE	SIZE	QTY.	LENGTH	REINF. STEEL LBS.
A	#4	20	4'-6"	60.12
B	#4	8	1'-1"	5.79
TOTAL				65.91 *
MASONRY				CU YDS
TOP SLAB CONCRETE CLASS "B"				.4326 *
BRICK MASONRY PER FT HT (MIN)				.4111



*** NOTE:**
QUANTITIES BASED ON 3'-6" X 3'-6" DRAINAGE STRUCTURE. ADJUST QUANTITIES FOR LARGER STRUCTURES AND MANHOLE CONSTRUCTION.

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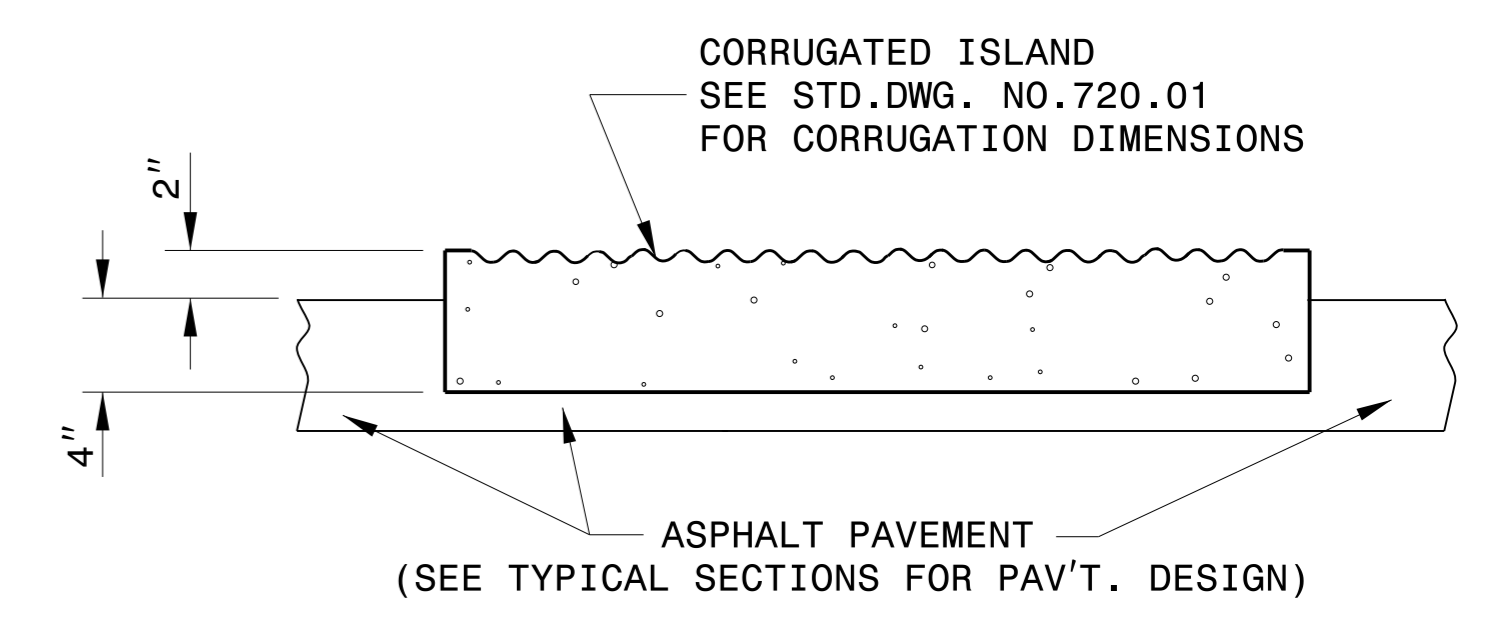
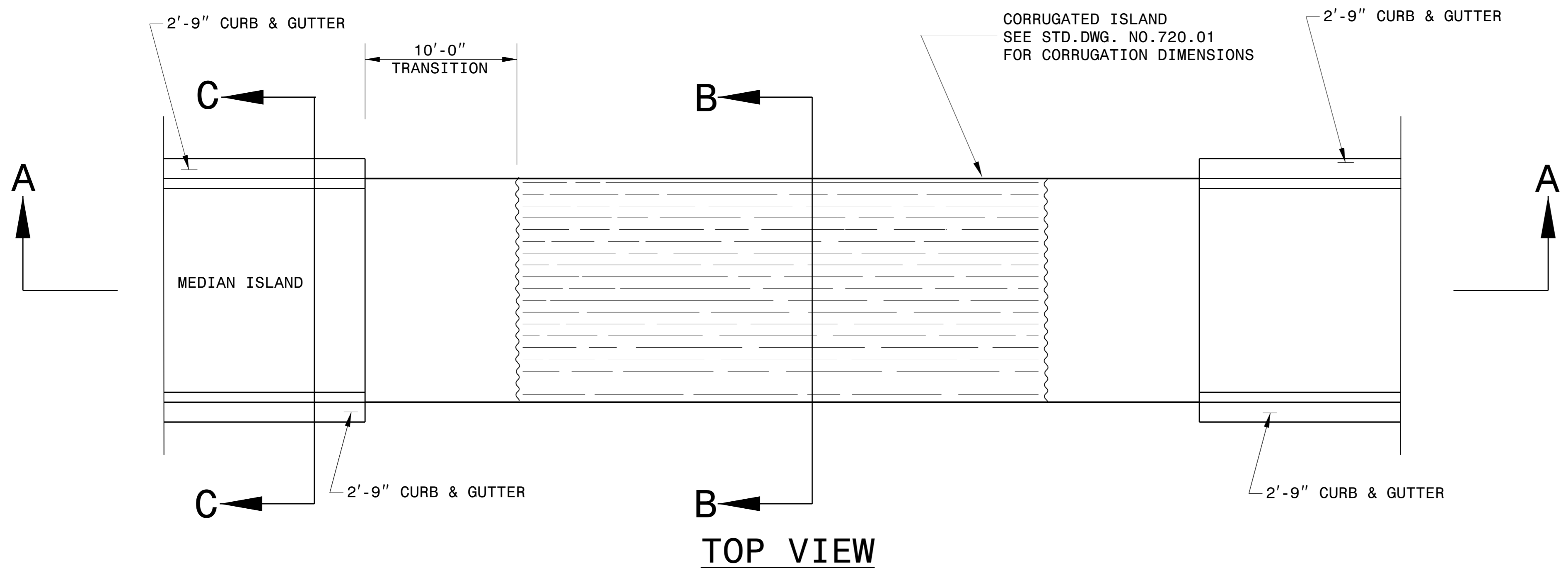
3/16/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

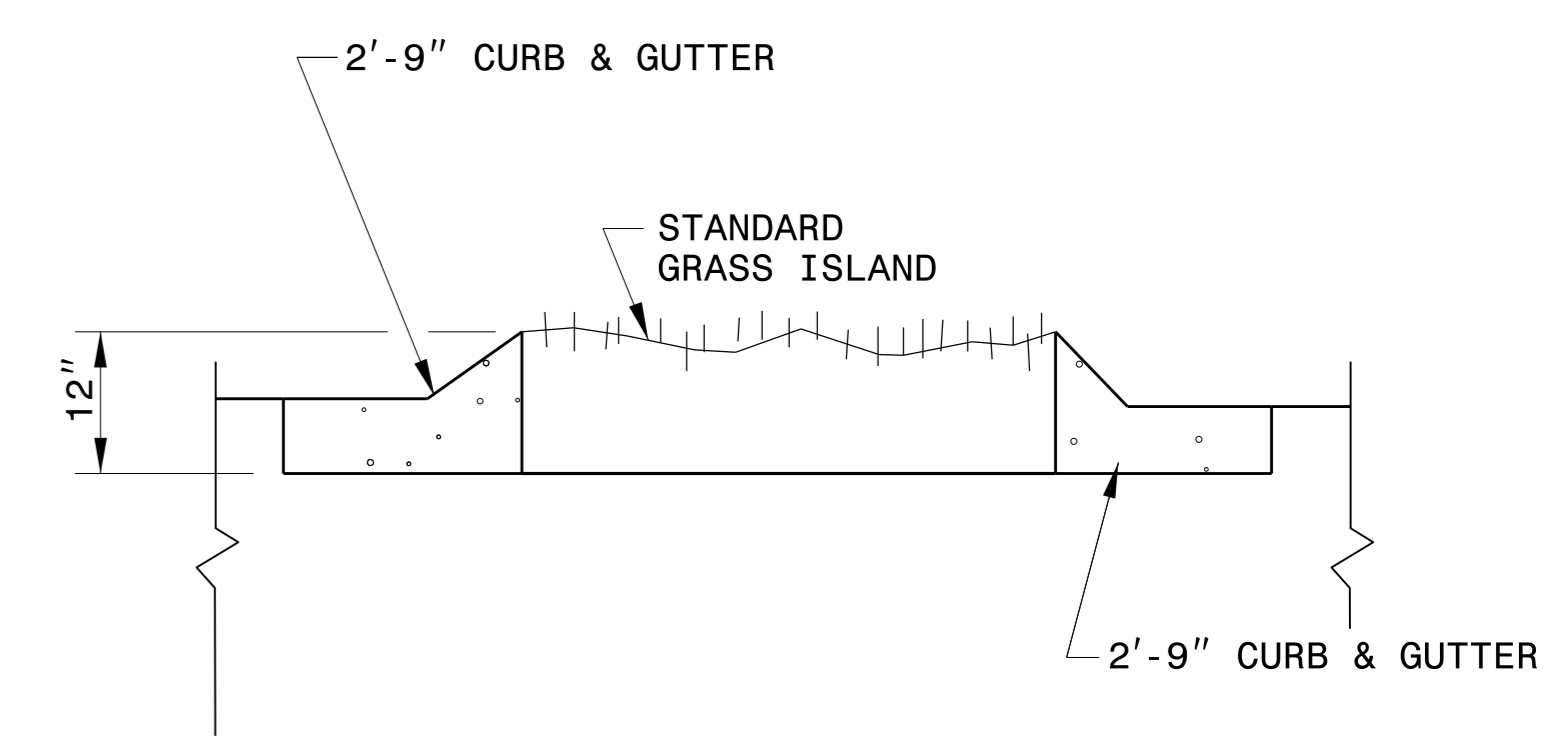
CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

DETAIL TO CONVERT EXISTING DI, CB, OTCB or GI TO JUNCTION BOX (MANHOLE OPTIONAL)

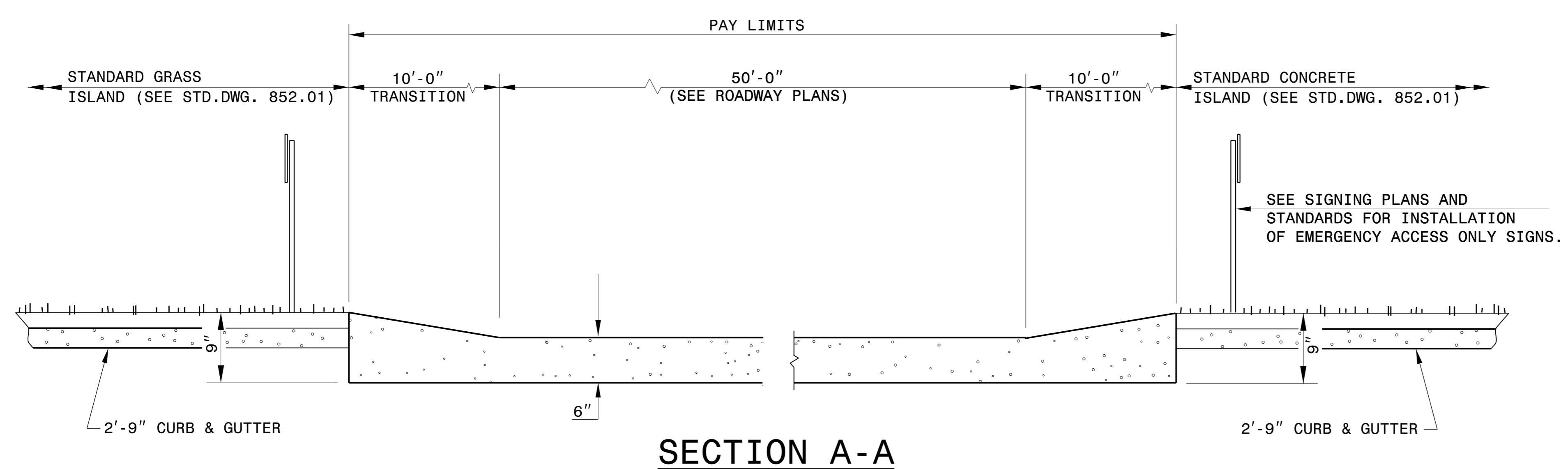
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SECTION B-B



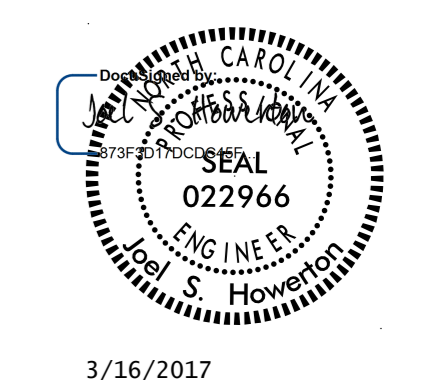
SECTION C-C



SECTION A-A

DETAIL OF EMERGENCY VEHICLE ACCESS

- NOTES:
- REFER TO SECTION 852 OF STANDARD SPECIFICATIONS FOR CONCRETE ISLANDS.
 - REFER TO STANDARD DRAWING 852.01 FOR CONTRACTION/EXPANSION JOINTS.
 - PLACE W6xW6 REINFORCING WIRE MESH IN THE BOTTOM 3RD OF THE EMERGENCY VEHICLE ACCESS PORTION OF THE CONCRETE ISLAND THAT MEETS SECTION 1070 OF THE STANDARD SPECIFICATIONS.



3/16/2017

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**CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN**
Office 919-707-6950 FAX 919-250-4119

**EMERGENCY VEHICLE ACCESS
FOR CONCRETE ISLAND**

ORIGINAL BY: _____ DATE: _____
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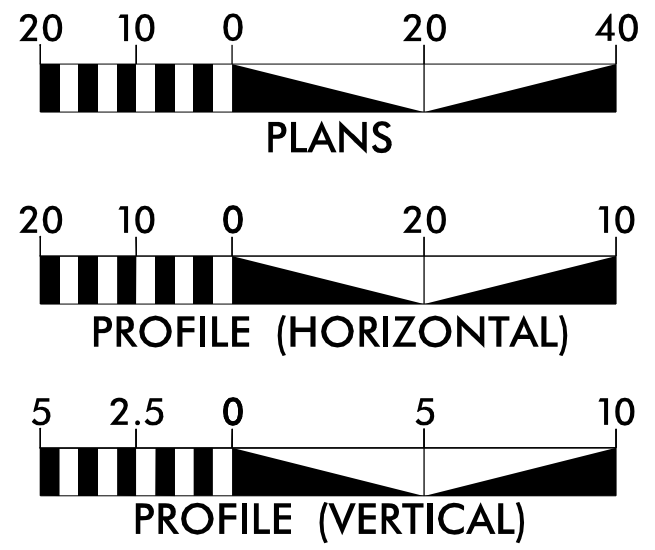
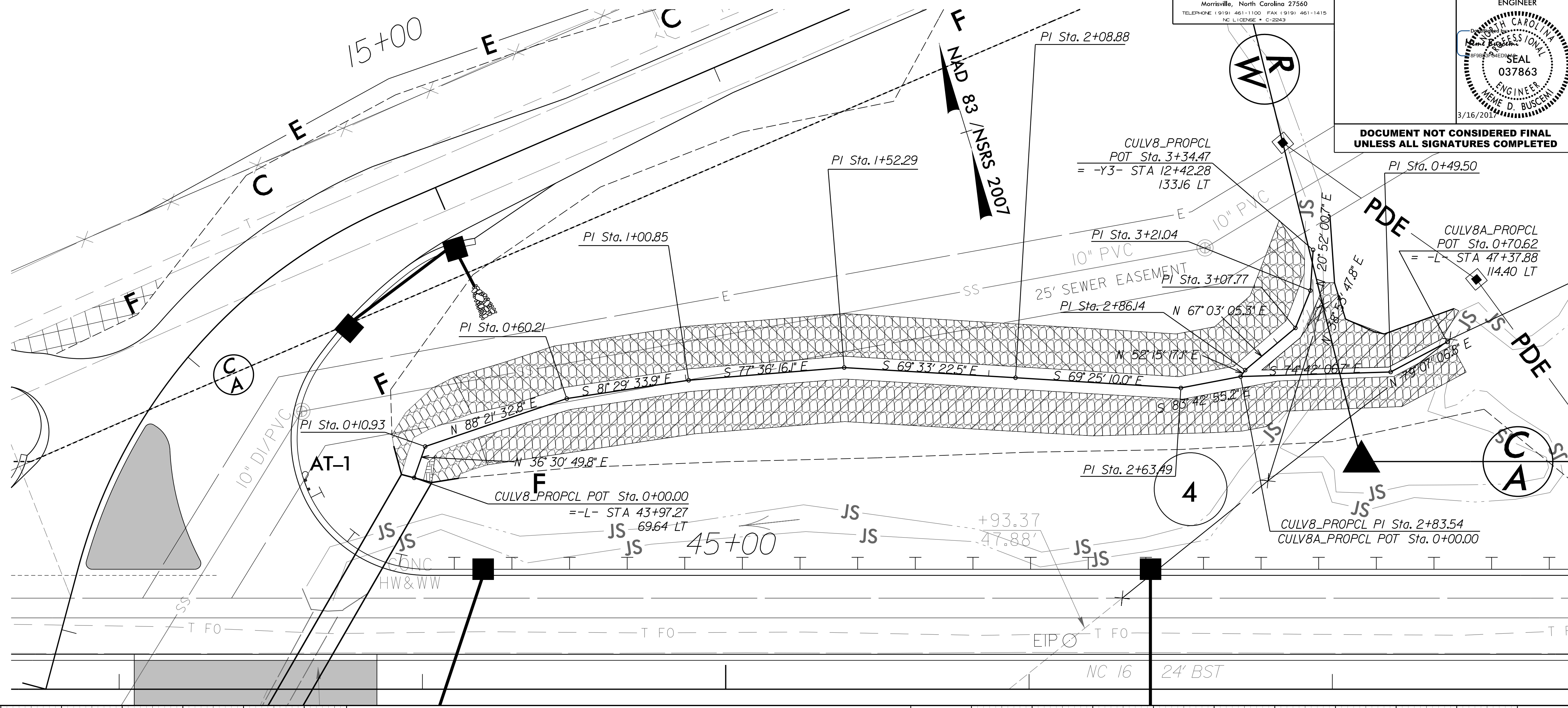
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 PLOTTER: HP DesignJet 2500C
 USER: jrb

8/17/09

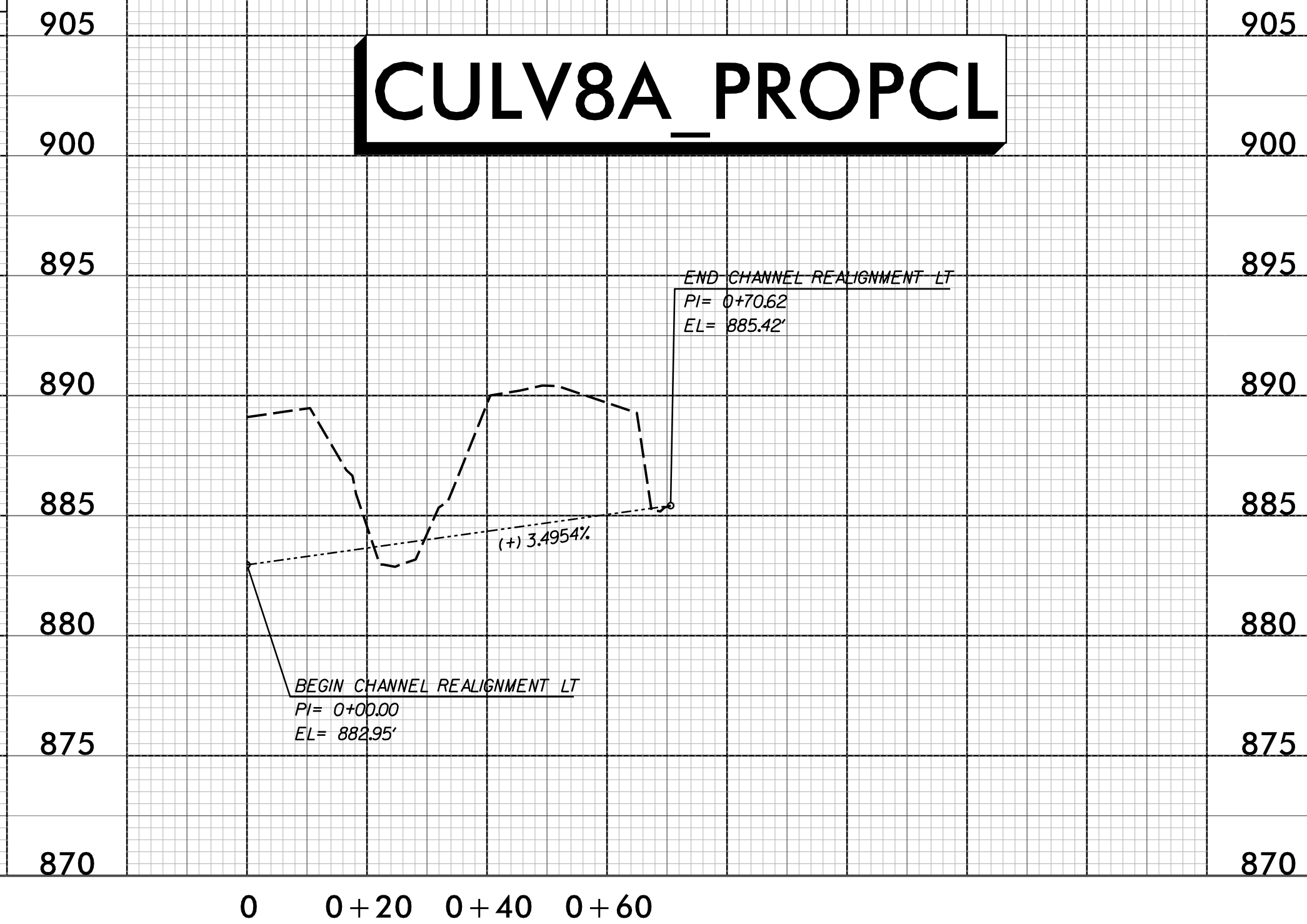
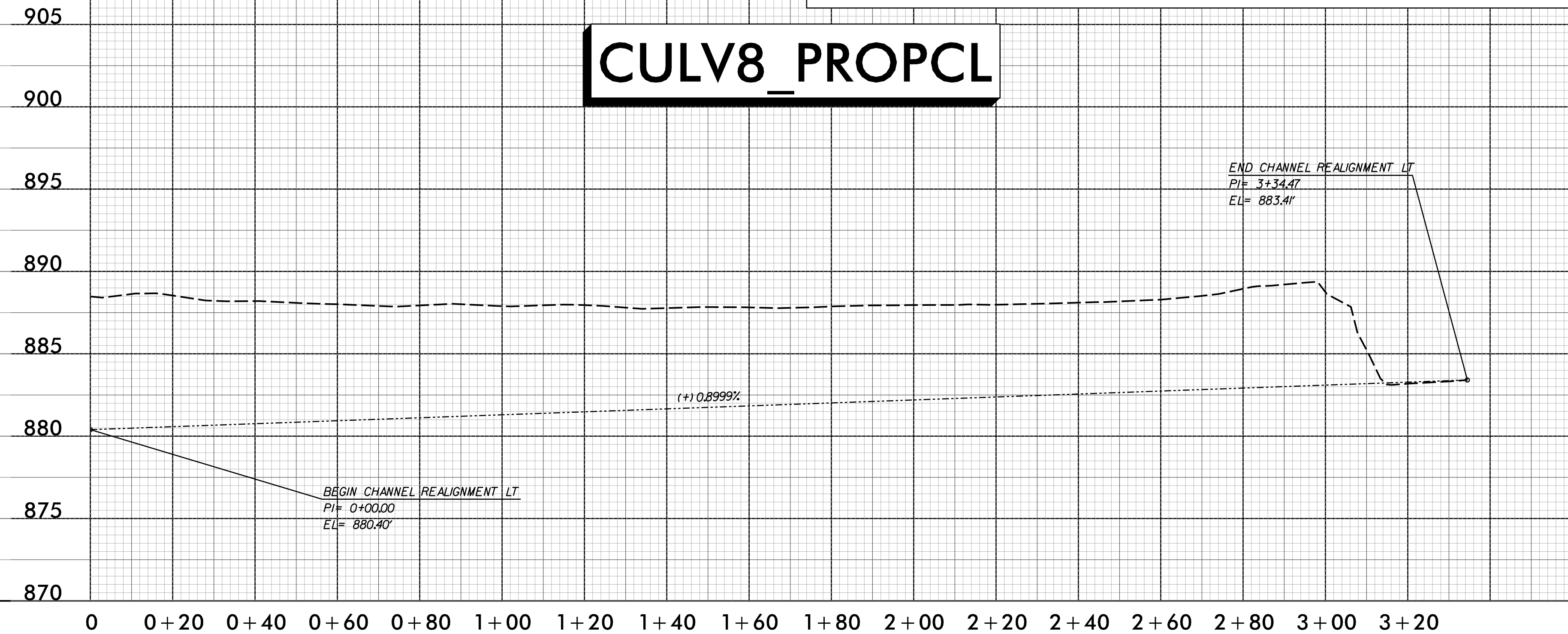
STREAM CHANNEL CHANGE ALIGNMENT DETAIL

Prepared by
URS
 URS Corporation - North Carolina
 1600 Perimeter Park Drive
 Morrisville, North Carolina 27560
 TELEPHONE 1 919 461-1100 FAX 1 919 461-1415
 NC LIC# 02666 • C-2243

PROJECT REFERENCE NO. R-3100B	SHEET NO. 2D-1
RW SHEET NO.	
HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



FOR ROADWAY AND DRAINAGE PLANS SEE SHEET 6
 FOR ROADWAY AND DRAINAGE PROFILES SEE SHEETS 19 & 25



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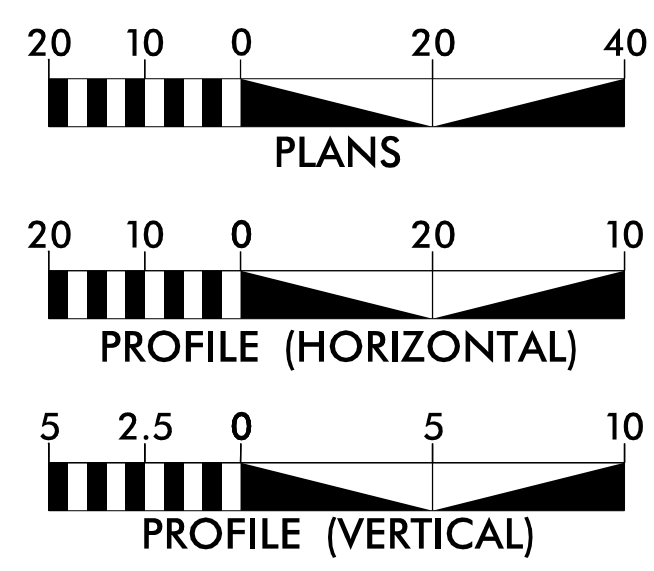
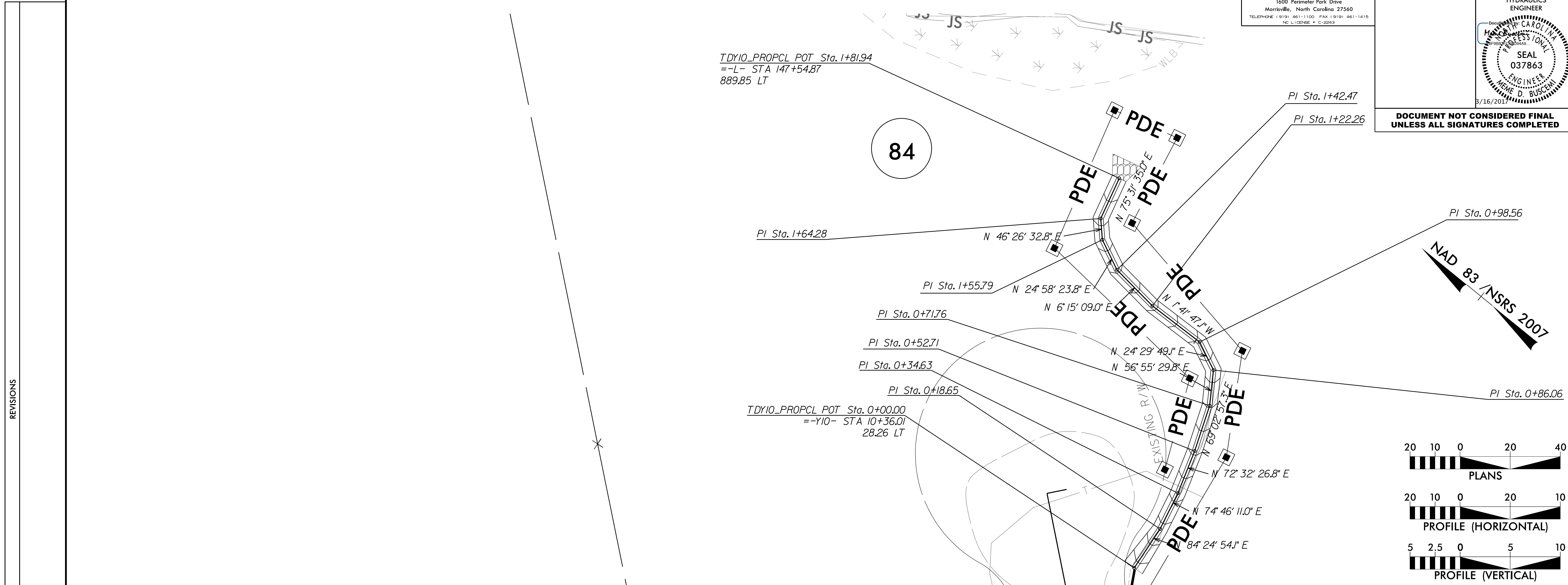
REVISIONS

8/17/09

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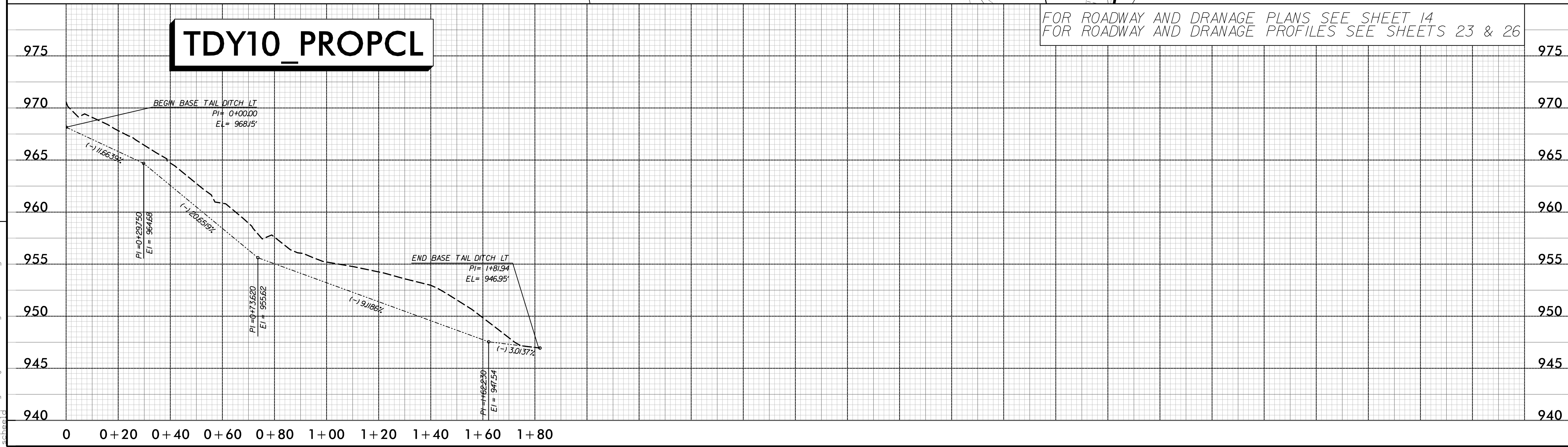
Prepared by
URS
 URS Corporation - North Carolina
 1600 Perimeter Park Drive
 Morrisville, North Carolina 27560
 TELEPHONE 1 919 461-1100 FAX 1 919 461-1415
 NC LIC# 05618 • C-2243

PROJECT REFERENCE NO. R-3100B	SHEET NO. 2D-2
RW SHEET NO.	
HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



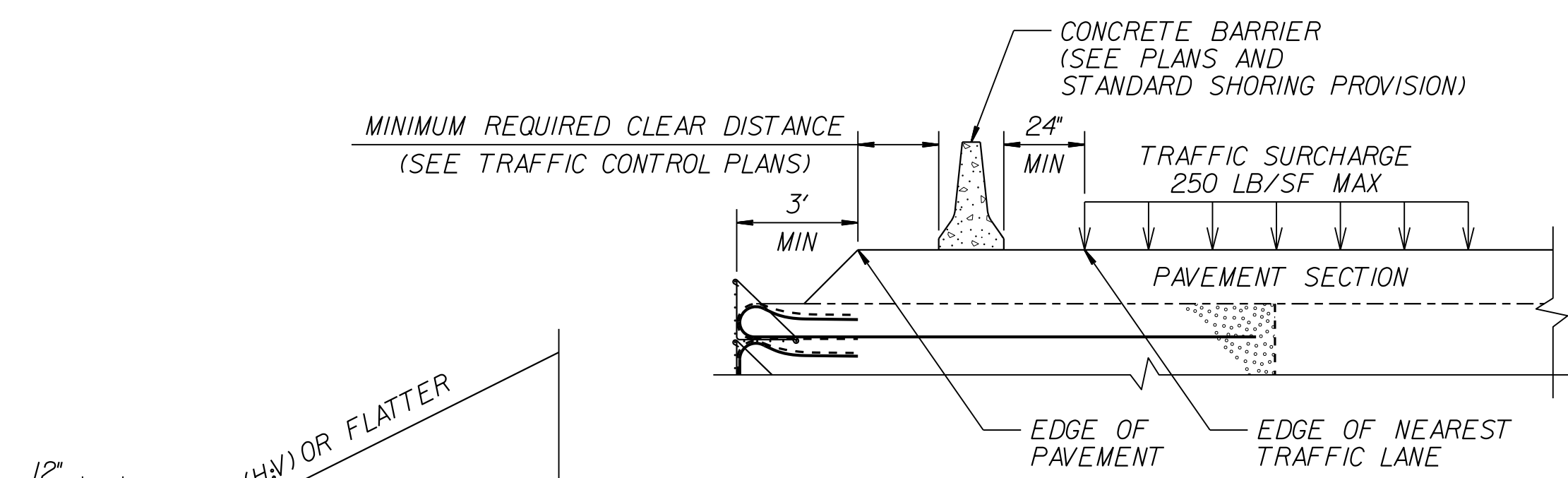
FOR ROADWAY AND DRAINAGE PLANS SEE SHEET 14
 FOR ROADWAY AND DRAINAGE PROFILES SEE SHEETS 23 & 26

TDY10_PROPCL

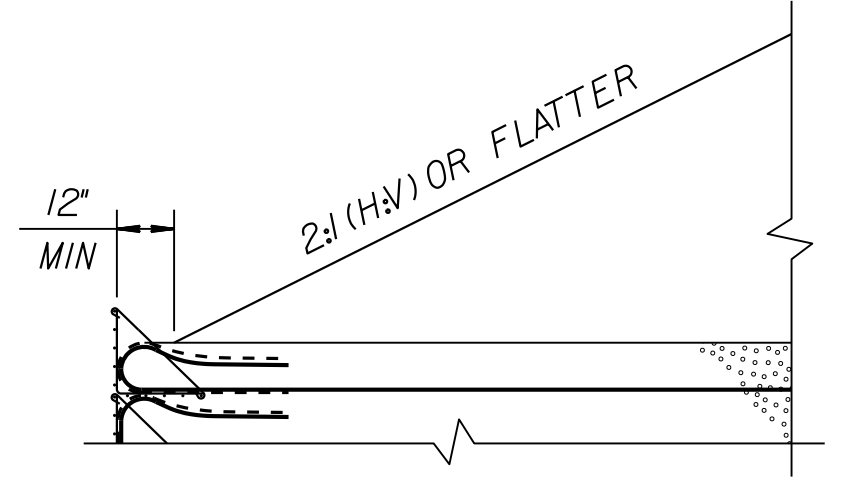


REVISIONS

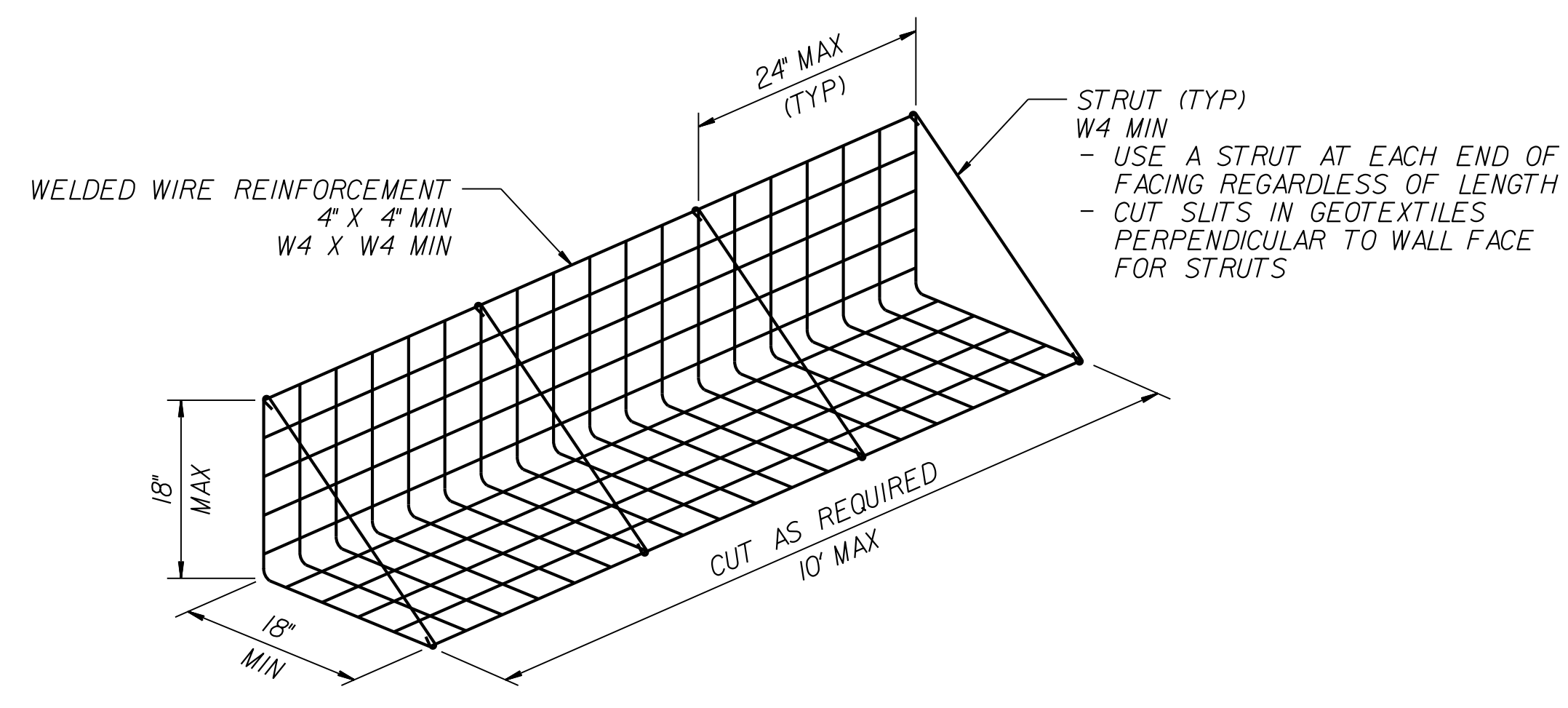
8/16/2017
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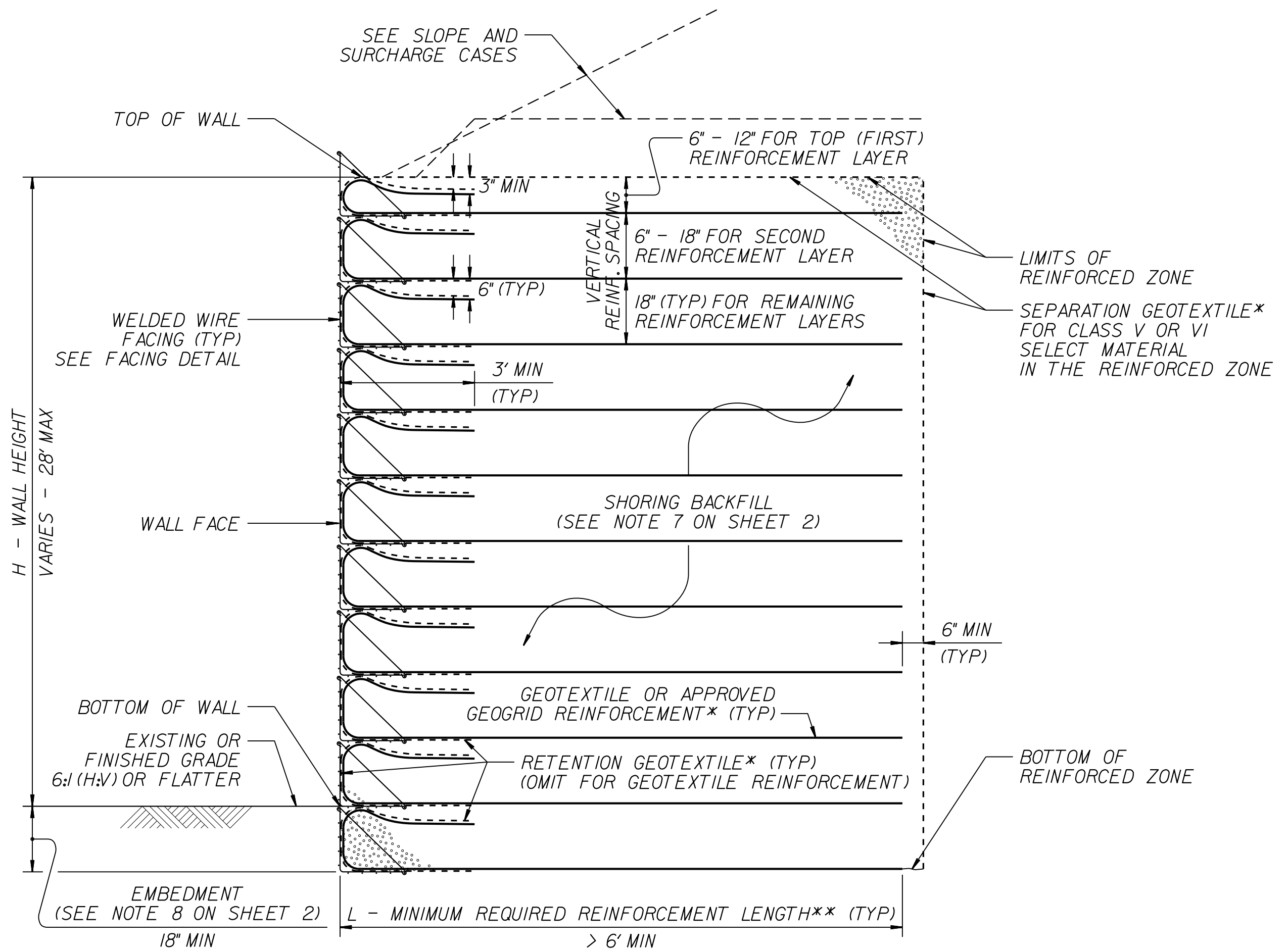
SURCHARGE CASE



SLOPE CASE

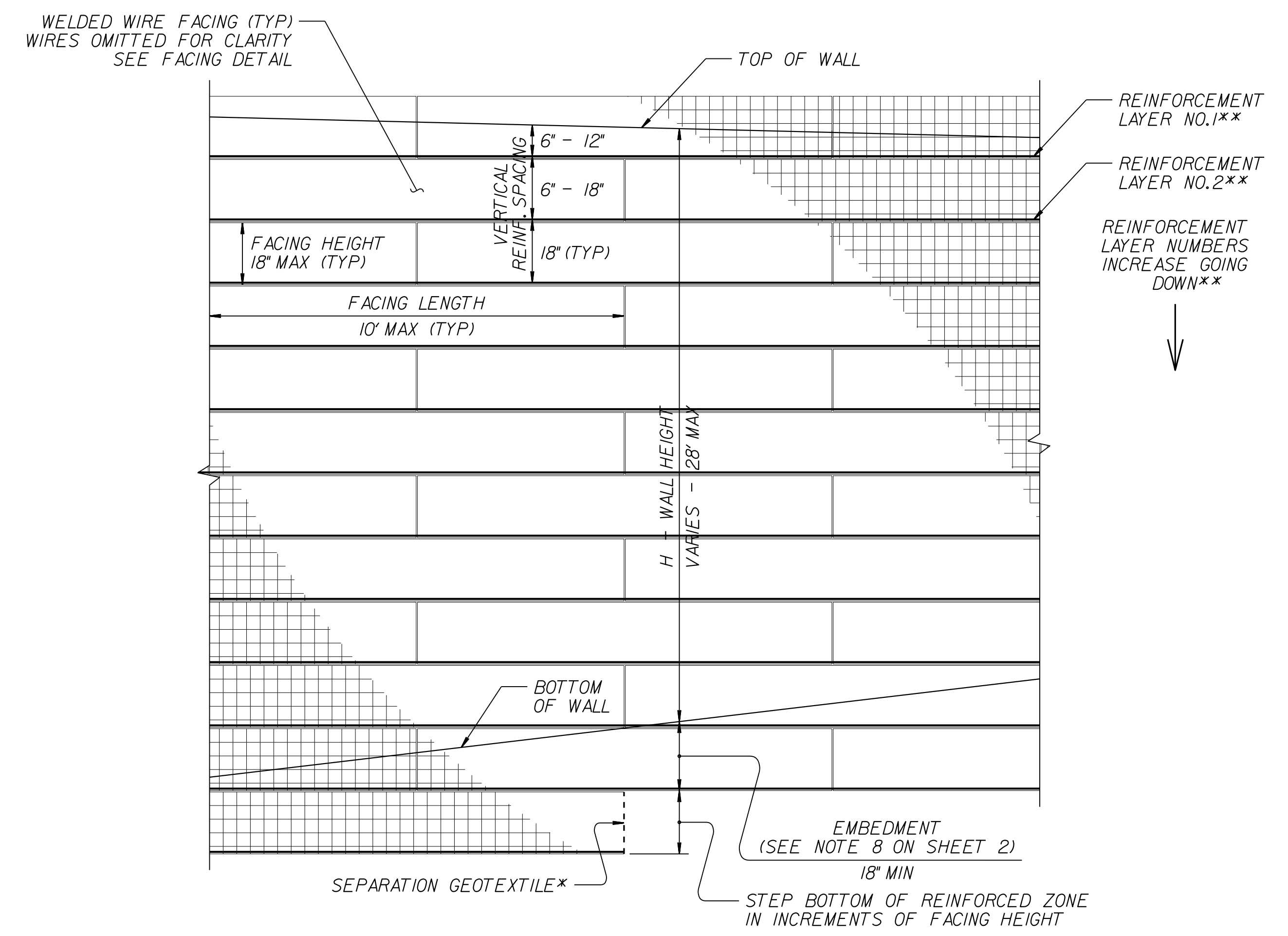


FACING DETAIL



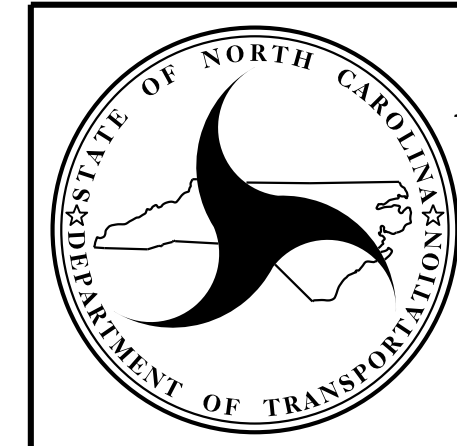
STANDARD TEMPORARY WALL

(FOR STANDARD TEMPORARY WALLS ON STRUCTURES, SEE TEMPORARY WALL ON STRUCTURE DETAIL ON SHEET 2.)
 *SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
 **SEE REINFORCEMENT TABLES ON SHEET 3.



STANDARD TEMPORARY WALL – PARTIAL ELEVATION


*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
 **SEE REINFORCEMENT TABLES ON SHEET 3.

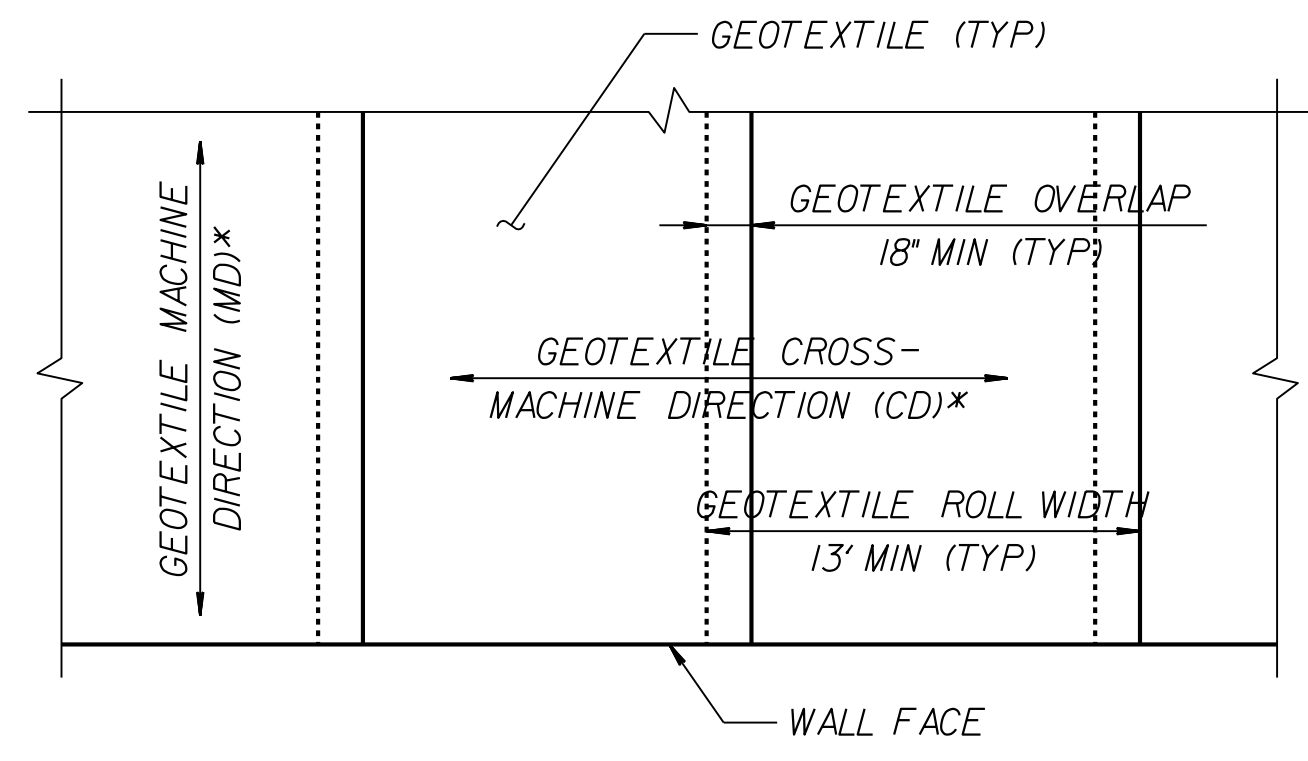


NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
**GEOTECHNICAL
 ENGINEERING UNIT**

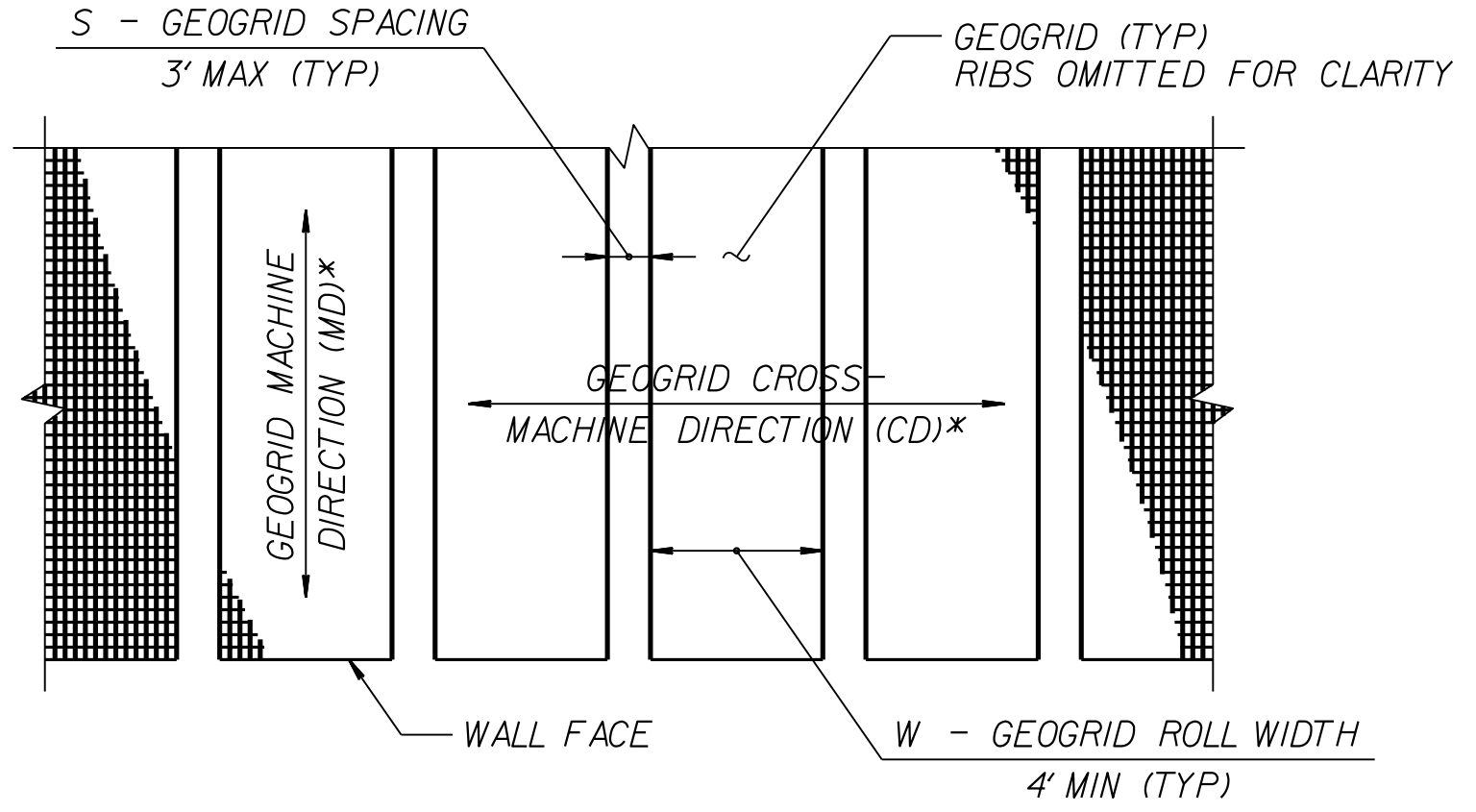
STANDARD DETAIL NO. 1801.02

STANDARD
 TEMPORARY WALL
 SHEET 1 OF 3

PROJECT REFERENCE NO. R-3100B		SHEET NO. 2G-2
GEOTECHNICAL ENGINEER  DocuSigned by: Scott A. Hidden 1/13/2017		ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

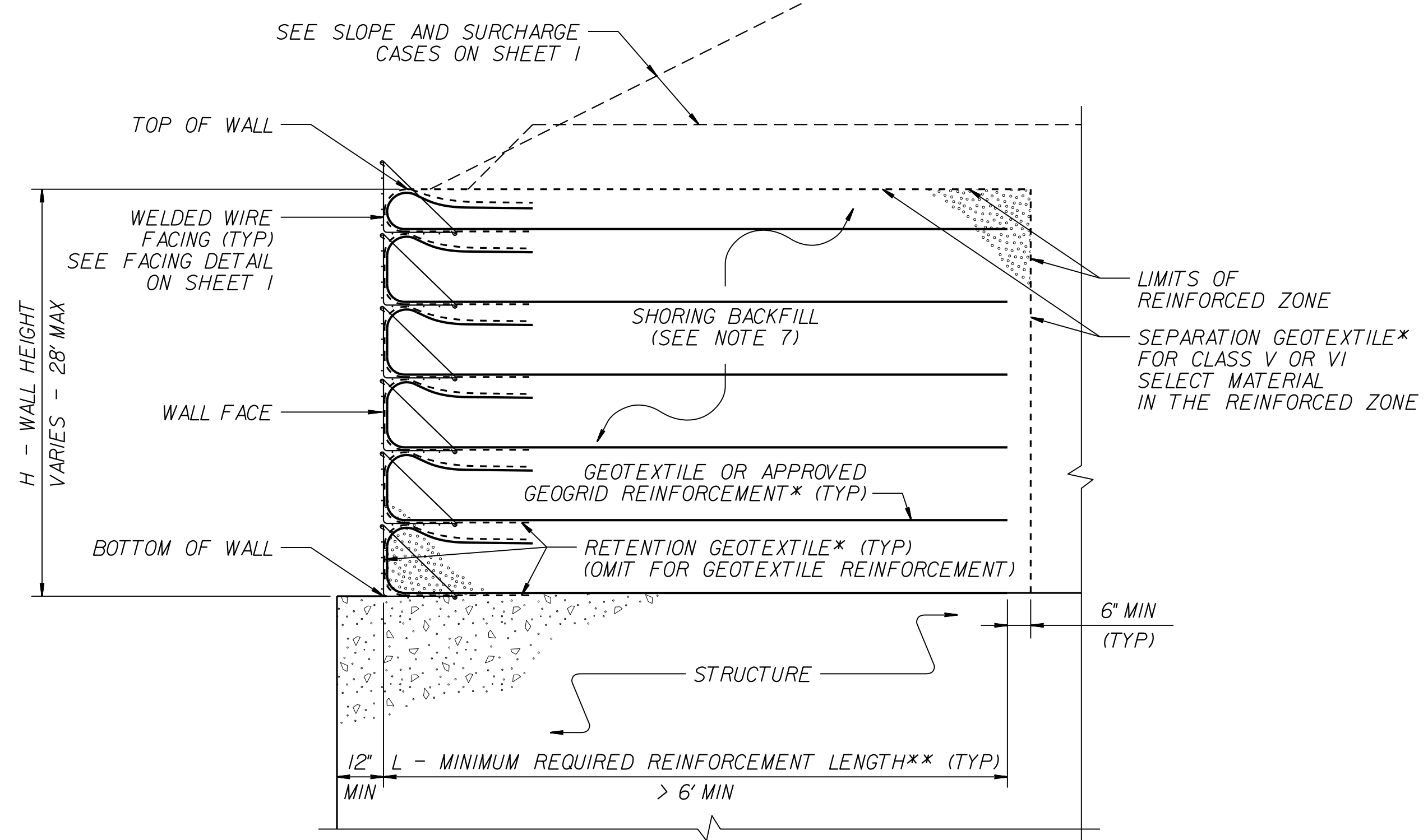


GEOTEXTILE PLACEMENT
(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)



GEOGRID PLACEMENT
(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT - $\frac{W}{W+S} \times 100 \geq 80\%$, SEE NOTE 11)

GEOSYNTHETIC PLACEMENT DETAILS
(PLAN VIEW)
*SEE NOTE 12.



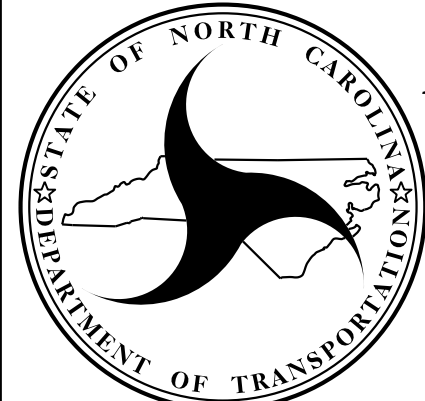
TEMPORARY WALL ON STRUCTURE DETAIL
*SEE GEOSYNTHETIC PLACEMENT DETAILS.
**SEE REINFORCEMENT TABLES ON SHEET 3.

NOTES:

- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
- FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
- STANDARD TEMPORARY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
UNIT WEIGHT, $\gamma = 120$ LB/CF
FRICTION ANGLE, $\phi = 30$ DEGREES
COHESION, $c = 0$ LB/SF
- DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
- DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
- USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, ASSUME GROUNDWATER DEPTH IS LESS THAN 7' BELOW BOTTOM OF REINFORCED ZONE. DO NOT USE STANDARD TEMPORARY WALLS IF GROUNDWATER IS ABOVE BOTTOM OF REINFORCED ZONE.
- DO NOT USE A-2-4 SOIL FOR STANDARD TEMPORARY WALLS AROUND CULVERTS OR IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS FOR SLOPE CASES. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS WITH GEOTEXTILE REINFORCEMENT.
- EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
- DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
- GEOGRIDS ARE TYPICALLY APPROVED FOR ULTIMATE TENSILE STRENGTHS IN THE MACHINE DIRECTION (MD) AND CROSS-MACHINE DIRECTION (CD) OR SHORT-TERM DESIGN STRENGTHS FOR A 3-YEAR DESIGN LIFE IN THE MD BASED ON MATERIAL TYPE. THE LIST OF APPROVED GEOGRIDS WITH DESIGN STRENGTHS IS AVAILABLE FROM: connect.ncdot.gov/resources/Materials/Pages/SoilsLaboratory.aspx
DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE I OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

- IF THE WEBSITE DOES NOT LIST A SHORT-TERM DESIGN STRENGTH FOR AN APPROVED GEOGRID, USE A SHORT-TERM DESIGN STRENGTH EQUAL TO THE ULTIMATE TENSILE STRENGTH DIVIDED BY 3.5 FOR THE GEOGRID REINFORCEMENT.
- FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
 - AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH OF THE FOLLOWING CONDITIONS OCCUR:
- W (REINFORCEMENT ROLL WIDTH) \geq (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
- REINFORCEMENT STRENGTH IN CD \geq MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
 - SUBMIT A "STANDARD TEMPORARY WALL SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY WALL CONSTRUCTION. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
 - DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
 - FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
 - DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
 - CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
 - FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
 - FOR STANDARD TEMPORARY WALLS WITH TOP OF WALL WITHIN 5' OF FINISHED GRADE, REMOVE TOP FACING AND INCORPORATE TOP REINFORCEMENT LAYER INTO FILL WHEN PLACING FILL IN FRONT OF WALL.



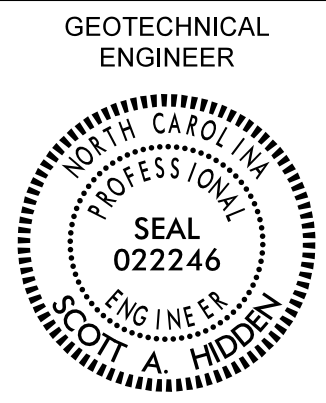
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD
TEMPORARY WALL
SHEET 2 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO. R-3100B	SHEET NO. 2G-3
 GEOTECHNICAL ENGINEER ENGINEER	ENGINEER DATE: 1/13/2017 SIGNATURE: _____
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

SLOPE OR SURCHARGE CASE	GROUNDWATER DEPTH BELOW BOTTOM OF REINFORCED ZONE (SEE NOTE 6 ON SHEET 2) (FT)	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)	H - WALL HEIGHT (FT)																									
			< 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
SLOPE CASE	> 0	CLASS II, TYPE I, CLASS III, CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	8	9	11	12	13	13	14	15	16	17	18	19	20	21	22	23	24	24	25	26	27	27	
SURCHARGE CASE	> 0 TO 7 FOR H < 20' > 0 TO 10 FOR H ≥ 20'	ALL SHORING BACKFILL TYPES	6	7	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	17	17	18	19	19	20	21	22	
		A-2-4 SOIL	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16	17	18	18	19	20	20	21	
		CLASS II, TYPE I OR CLASS III SELECT MATERIAL	6	6	7	7	8	8	9	10	10	11	11	12	12	13	14	15	15	16	16	17	17	18	18	19	20	
	> 7 FOR H < 20' > 10 FOR H ≥ 20'	CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	7	8	8	9	9	10	10	11	12	13	13	14	14	15	15	16	17	17	18	19	19		

L - MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)
(FOR ALL REINFORCEMENT TYPES)

WALL HEIGHT (H) + EMBEDMENT (FT)	NUMBER OF REINFORCEMENT LAYERS*
2.5 - 4	3
4 - 5.5	4
5.5 - 7	5
7 - 8.5	6
8.5 - 10	7
10 - 11.5	8
11.5 - 13	9
13 - 14.5	10
14.5 - 16	11
16 - 17.5	12
17.5 - 19	13
19 - 20.5	14
20.5 - 22	15
22 - 23.5	16
23.5 - 25	17
25 - 26.5	18
26.5 - 28	19
28 - 29.5	20

*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

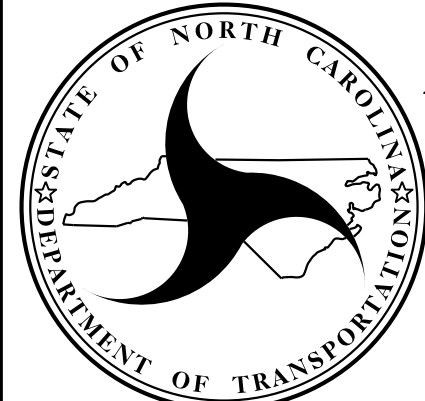
REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400	2400
2	2400	2400	2400	2400	2400
3	2400	2400	2400	2400	2400
4	2400	2400	2500	2400	2400
5	2500	2400	3000	2400	2400
6	3000	2400	3500	2800	2400
7	3500	2700	4000	3200	2600
8	4000	3100	4500	3600	2900
9	4500	3500	5000	4000	3200
10	5000	3900	5500	4400	3500
11	5500	4300	6000	4800	3800
12	6000	4700	6500	5200	4100
13	6500	5100	7000	5600	4400
14	7000	5400	7500	6000	4700
15	7500	5800	8000	6400	5000
16	8000	6200	8500	6800	5300
17	8500	6600	9000	7200	5600
18	9000	7000	9500	7600	5900
19	9500	7400	10000	8000	6200
20	10000	7800	10500	8400	6500

GEOTEXTILE REINFORCEMENT
ULTIMATE TENSILE STRENGTH (LB/FT)

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL
1	240	200	340	290	240
2	380	310	520	430	350
3	530	420	700	570	460
4	690	550	870	720	570
5	860	690	1050	860	680
6	1030	830	1220	1000	790
7	1200	970	1400	1150	900
8	1370	1110	1580	1290	1010
9	1550	1240	1750	1430	1120
10	1720	1380	1930	1580	1230
11	1890	1520	2100	1720	1340
12	2060	1660	2280	1860	1450
13	2240	1800	2450	2010	1560
14	2410	1940	2630	2150	1670
15	2580	2080	2800	2290	1780
16	2750	2220	2980	2440	1890
17	2930	2360	3160	2580	2000
18	3100	2500	3330	2720	2110
19	3270	2640	3510	2860	2220
20	3440	2780	3690	3000	2330

GEOGRID REINFORCEMENT
SHORT-TERM DESIGN STRENGTH (LB/FT)
(SEE NOTE 10 ON SHEET 2.)

MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD
(SEE NOTE 9 ON SHEET 2.)
*SEE PARTIAL ELEVATION ON SHEET 1 FOR REINFORCEMENT LAYER NUMBERING.



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD
TEMPORARY WALL
SHEET 3 OF 3

DATE: 11-19-13

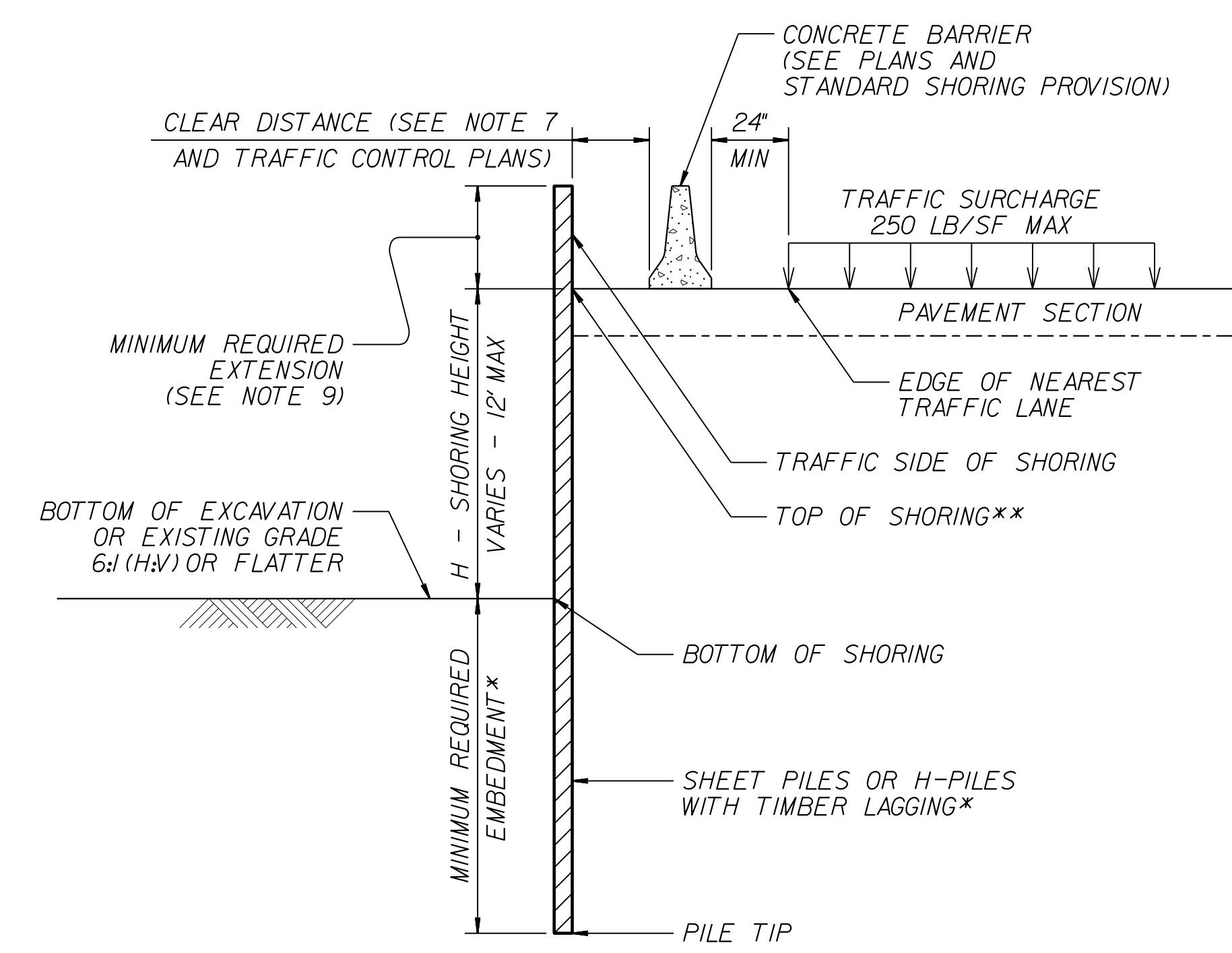
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN ³ /FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)			MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN ³ /FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)		
				HP 10x42	HP 12x53	HP 14x73			HP 10x42	HP 12x53	HP 14x73
GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP	< 6	11.5	4.5	11.5	11.5	11.5	16.0	12.0	13.0	13.0	13.0
	7	13.0	7.0	13.0	13.0	13.0	17.0	14.5	14.5	14.5	14.5
	8	15.0	10.0	--	15.0	15.0	18.0	17.0	--	15.5	15.5
	9	17.0	14.0	--	17.0	17.0	19.0	20.0	--	17.0	17.0
	10	18.5	19.5	--	--	18.5	20.0	23.5	--	--	18.5
	11	20.5	26.0	--	--	--	21.0	28.0	--	--	20.0
GROUNDWATER ELEVATION BELOW PILE TIP	< 6	7.5	3.0	8.0	8.0	8.0	11.0	10.0	9.5	9.5	9.5
	7	8.5	4.5	9.5	9.5	9.5	12.0	12.0	10.5	10.5	10.5
	8	10.0	6.5	10.5	10.5	10.5	12.5	14.0	11.5	11.5	11.5
	9	11.0	9.5	--	12.0	12.0	13.5	16.5	--	12.5	12.5
	10	12.5	13.0	--	--	13.5	14.0	19.5	--	13.5	13.5
	11	13.5	17.0	--	--	14.5	15.0	22.5	--	--	14.5
12	15.0	21.5	--	--	16.0	16.0	25.5	--	--	15.5	

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

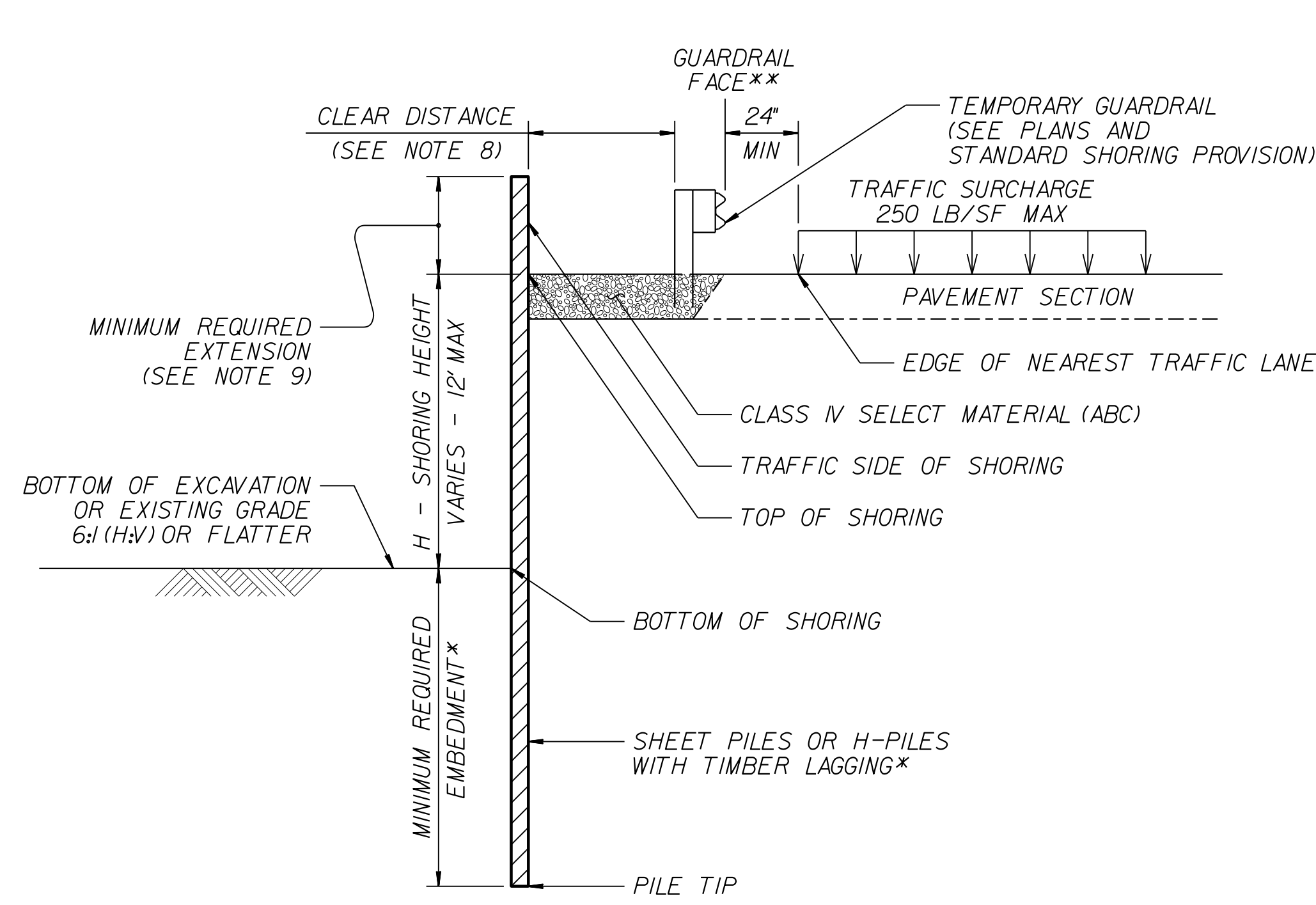
*DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".

NOTES:

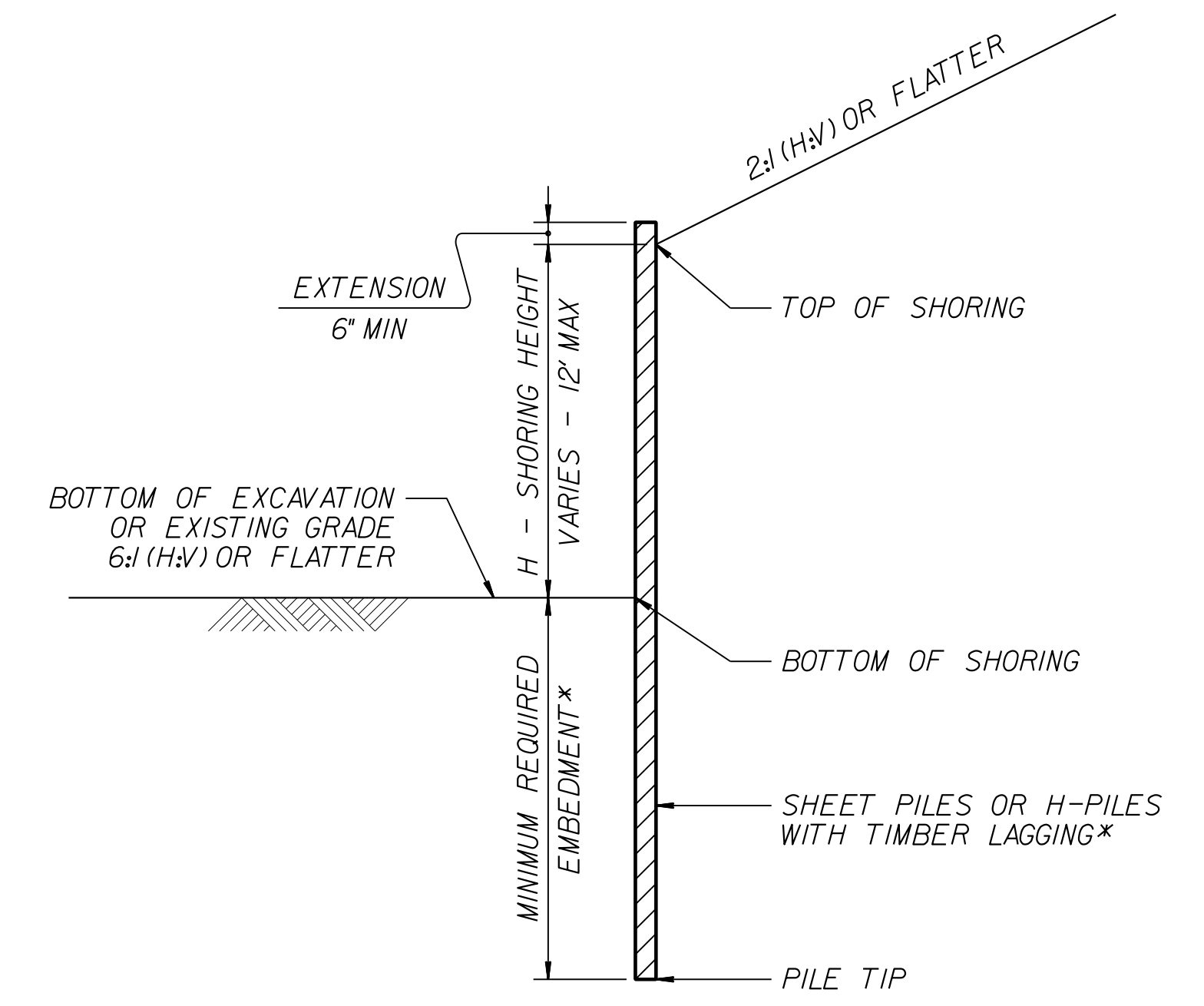
- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
- FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
- STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
UNIT WEIGHT, $\gamma = 120$ LB/CF
FRICTION ANGLE, $\phi = 30$ DEGREES
COHESION, $c = 0$ LB/SF
- DO NOT USE STANDARD TEMPORARY SHORING IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
- DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS WITHIN THE EMBEDMENT DEPTH.
- USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, USE "GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP" FOR GROUNDWATER CONDITION. DO NOT USE STANDARD TEMPORARY SHORING IF GROUNDWATER IS ABOVE BOTTOM OF SHORING.
- AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN THE MINIMUM REQUIRED FOR CONCRETE BARRIER, SET BARRIER NEXT TO AND UP AGAINST TRAFFIC SIDE OF PILES AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
- AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN 4' FOR TEMPORARY GUARDRAIL, ATTACH GUARDRAIL TO TRAFFIC SIDE OF PILES AS SHOWN IN THE PLANS AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
- MINIMUM REQUIRED EXTENSION IS 6" FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32" FOR "SURCHARGE CASE WITH TRAFFIC IMPACT".
- MINIMUM REQUIRED EMBEDMENT FOR H-PILES WITH TIMBER LAGGING IS BASED ON DRIVEN H-PILES AT MAXIMUM 6' SPACING. AT THE CONTRACTOR'S OPTION, EMBEDMENT DEPTHS MAY BE REDUCED BY 25% FOR DRILLED-IN H-PILES.
- SUBMIT A "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY SHORING CONSTRUCTION. UP TO 3 SHORING LOCATIONS MAY BE INCLUDED ON EACH FORM. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM:
connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
- CONTACT THE ENGINEER IF PILES DO NOT ATTAIN THE MINIMUM REQUIRED EMBEDMENT.



CONCRETE BARRIER
**TOP OF SHORING = EDGE OF PAVEMENT



TEMPORARY GUARDRAIL
**GUARDRAIL FACE = EDGE OF PAVEMENT



STANDARD TEMPORARY SHORING (SLOPE CASE)
*SEE TABLE ABOVE.

STANDARD TEMPORARY SHORING (SURCHARGE CASE)
*SEE TABLE ABOVE.



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**GEOTECHNICAL
ENGINEERING UNIT**

STANDARD DETAIL NO. 1801.01

STANDARD
TEMPORARY SHORING

CONST. REV - 9/7/17: REVISED EARTHWORK QUANTITIES
 DUE TO UPDATING THE MAINLINE CROSS SECTIONS.

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS
SUMMARY OF EARTHWORK
 IN CUBIC YARDS

STATION TO STATION	PHASE	UNCLASSIFIED EXCAVATION	EMBT + %	BORROW	WASTE
-L- 15+35.00 TO 45+00.00 LT	I	3,291	7,336	4,045	
-L- 45+00.00 TO 75+00.00 LT	I	11,331	9,200		2,131
-L- 75+00.00 TO 84+00.00 LT	I	38	1,477	1,439	
-L- 84+00.00 TO 92+00.00 LT	I	250	1,219	969	
-L- 92+00.00 TO 105+00.00 RT	I	107	3,420	3,313	
-L- 105+00.00 TO 135+00.00 RT	I	10,860	8,467		2,393
-L- 135+00.00 TO 165+00.00 RT	I	6,222	4,385		1,837
-L- 165+00.00 TO 195+00.00 RT	I	4,433	25,239	20,806	
-L- 195+00.00 TO 198+28.48 RT	I	5,076	29		5,047
-Y2- 12+00.00 TO 14+00.00	I	99	5		94
-Y3- 13+20.00 TO 16+50.00	I	226	683	457	
-Y5- 11+00.00 TO 14+54.49	I	158	907	749	
-Y6- 10+50.00 TO 13+37.59	I	10	823	813	
-Y7- 10+50.00 TO 13+00.00	I	26	453	427	
-Y8- 10+50.00 TO 13+84.00	I	1,771	28		1,743
-Y11- 11+00.00 TO 14+63.00	I	708	455		253
-Y12- 10+00.00 TO 18+00.00	I	166	7,719	7,553	
SUBTOTAL		44,772	71,845	40,571	13,498
-L- 15+35.00 TO 45+00.00 RT	II	1,623	22,012	20,389	
-L- 45+00.00 TO 75+00.00 RT	II	789	18,349	17,560	
-L- 75+00.00 TO 84+00.00 RT	II	102	2,786	2,684	
-L- 84+00.00 TO 92+00.00 RT	II	23	4,683	4,660	
-L- 92+00.00 TO 105+00.00 LT	II	619	2,186	1,567	
-L- 105+00.00 TO 135+00.00 LT	II	555	11,729	11,174	
-L- 135+00.00 TO 165+00.00 LT	II	441	11,587	11,146	
-L- 165+00.00 TO 195+00.00 LT	II	2,924	8,489	5,565	
-L- 195+00.00 TO 198+28.48 LT	II	21	454	433	
-Y4- 10+50.00 TO 13+20.00	II	85	3,138	3,053	
-Y9- 12+61.00 TO 13+74.10	II	25	66	41	
-Y10- 10+19.00 TO 12+50.00	II	57	434	377	
SUBTOTAL		7,264	85,913	78,649	
-L- 15+35.00 TO 45+00.00 MED	III	325	848	523	
-L- 45+00.00 TO 75+00.00 MED	III	186	1,580	1,394	
-L- 75+00.00 TO 84+00.00 MED	III	23	521	498	
-L- 84+00.00 TO 92+00.00 MED	III	28			28
-L- 92+00.00 TO 105+00.00 MED	III	92	857	765	
-L- 105+00.00 TO 135+00.00 MED	III	380	2,025	1,645	
-L- 135+00.00 TO 165+00.00 MED	III	197	1,194	997	
-L- 165+00.00 TO 195+00.00 MED	III	231	6,419	6,188	
-L- 195+00.00 TO 198+28.48 MED	III	132	413	281	
SUBTOTAL		1,594	13,857	12,291	28
SUMMARY TOTALS		53,630	171,615	131,511	13,526
MATERIAL FOR SHOULDER CONSTRUCTION			2,300	2,300	
LOSS DUE TO CLEARING AND GRUBBING		-14,000		14,000	
WASTE IN LIEU OF BORROW				-13,526	-13,526
PROJECT TOTALS		39,630	173,915	134,285	
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				6,715	
GRAND TOTALS		39,630	173,915	141,000	
SAY		39,700		141,100	

ESTIMATED DDE = 2,780 CY
 SELECT GRANULAR MATERIAL = 1,000 CY
 UNDERCUT EXCAVATION = 7,500 CY
 SHALLOW UNDERCUT = 1,000 CY
 CLASS IV SUBGRADE STABILIZATION = 1,800 TONS
 PAVEMENT STRUCTURE VOLUME = 44,255 CY

Earthwork quantities are calculated by the Roadway Design Unit.
 These earthwork quantities are based in part on subsurface data
 provided by the Geotechnical Engineering Unit.

5/28/99

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1612LP-N70106

COMPUTED BY: URS DATE: 02/15/2017
CHECKED BY: NJD DATE: 02/15/2017

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO. R-3100B SHEET NO. 3D-3

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)

Table with columns for Line & Station, Offset, Structure Number, Invert Elevation, Minimum Required Slope, Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC), C.S. Pipe (15, 18, 24, 30, 60), R.C. Pipe Class III (15, 18, 24, 30), R.C. Pipe Class IV (15, 18, 24, 30), Endwalls (STD. 8x8 or STD. 8x8.11), Reinforced Endwalls, Drainage Structure (Masonry, 0' thru 5', 5' thru 10', 10' and above), Quantities for Drainage Structures (A, B), Frame, Grates, and Hood (STD. 840.03), Concrete Transitional Section (D.I., C.B., D.I., G.D.I., G.D.I., G.D.I., G.D.I., G.D.I., G.D.I., G.D.I., J.B., T.B.D.I.), 15" Pipe End Section, Convert Existing D.I. to J.B. W/WH, 15" C.S. Elbow, 18" C.S. Elbow, 24" C.S. Elbow, Berm Ditch Outlet (STD. 850.10, STD. 850.11), Preformed Scour Hole, Drainage Inlet Transitional Gutter Sect., Flowable Fill, Concrete and Brick Pipe Plug (STD. 840.71), Pipe Removal, and Remarks. Includes a SHEET TOTALS row at the bottom.

1612LP-W70106

COMPUTED BY: URS DATE: 02/15/2017
CHECKED BY: NJD DATE: 02/15/2017

PROJECT NO. R-3100B SHEET NO. 3D-5

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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)

Table with multiple columns including LINE & STATION, OFFSET, STRUCTURE NUMBER, TOP ELEVATION, INVERT ELEVATION, MINIMUM REQUIRED SLOPE, Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC), C. S. PIPE (15, 18, 24, 30, 60), R. C. PIPE CLASS III (15, 18, 24, 30), R. C. PIPE CLASS IV (15, 18, 24, 30), ENDWALLS, REINFORCED ENDWALLS, QUANTITIES FOR DRAINAGE STRUCTURES (A, B), FRAME, GRATES, AND HOOD (E, F, G), CONCRETE TRANSITIONAL SECTION, OPEN THROAT C.B., D.I., D.L., G.D.I., G.D.I. (W.S. FLAT), G.D.I. (W.S. SAG), J.B., T.B.D.I., M.H., 15" PIPE END SECTION, CONVERT EXISTING D.I. TO J.B. W/MH, 15" C.S. ELBOW, 18" C.S. ELBOW, 24" C.S. ELBOW, BERM DITCH OUTLET, BERM DITCH OUTLET, PREFORMED SCOUR HOLE, DRAINAGE INLET TRANSITIONAL GUTTER SECT., FLOWABLE FILL, CONCRETE AND BRICK PIPE PLUG, PIPE REMOVAL. Includes an ABBREVIATIONS list on the right.

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COMPUTED BY: URS DATE: 02/15/2017
CHECKED BY: NJD DATE: 02/15/2017

PROJECT NO. SHEET NO.
R-3100B 3D-6

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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)

Table with columns for LINE & STATION, OFFSET, STRUCTURE NUMBER, ELEVATIONS, PIPE TYPES (Drainage Pipe, C.S. PIPE, R.C. PIPE CLASS III/IV), ENDWALLS, REINFORCED ENDWALLS, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, CONCRETE TRANSITIONAL SECTION, and REMARKS. Includes a SHEET TOTALS row at the bottom.

ABBREVIATIONS
C.A.A. CORRUGATED ALUMINIUM ALLOY
C.B. CATCH BASIN
C.S. CORRUGATED STEEL
D.I. DROP INLET
G.D.I. GRATED DROP INLET
H.D.P.E. HIGH DENSITY POLYETHYLENE
J.B. JUNCTION BOX
M.H. MANHOLE
N.S. NARROW SLOT
P.V.C. POLYVINYL CHLORIDE
R.C. REINFORCED CONCRETE
T.B.D.I. TRAFFIC BEARING DROP INLET
T.B.J.B. TRAFFIC BEARING JUNCTION BOX
W.S. WIDE SLOT

1612LP-N70106

COMPUTED BY: URS DATE: 02/15/2017
CHECKED BY: NJD DATE: 02/15/2017

PROJECT NO. SHEET NO.
R-3100B 3D-7

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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)

Table with columns for Line & Station, Offset, Structure Number, Top Elevation, Invert Elevation, Minimum Required Slope, Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC), C.S. Pipe, R.C. Pipe Class III, R.C. Pipe Class IV, Endwalls, Reinforced Endwalls, Drainage Structure, Quantities for Drainage Structures, Frame, Grates, and Hood, Concrete Transitional Section, and Pipe Removal. Includes a 'SHEET TOTALS' row at the bottom.

ABBREVIATIONS
C.A.A. CORRUGATED ALUMINIUM ALLOY
C.B. CATCH BASIN
C.S. CORRUGATED STEEL
D.I. DROP INLET
G.D.I. GRATED DROP INLET
H.D.P.E. HIGH DENSITY POLYETHYLENE
J.B. JUNCTION BOX
M.H. MANHOLE
N.S. NARROW SLOT
P.V.C. POLYVINYL CHLORIDE
R.C. REINFORCED CONCRETE
T.B.D.I. TRAFFIC BEARING DROP INLET
T.B.J.B. TRAFFIC BEARING JUNCTION BOX
W.S. WIDE SLOT

1612LP-N70106

COMPUTED BY: URS DATE: 02/15/2017
CHECKED BY: NJD DATE: 02/15/2017

PROJECT NO. SHEET NO.
R-3100B 3D-8

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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)

Table with columns for Line & Station, Offset, Structure Number, Invert Elevation, Minimum Required Slope, Drainage Pipe, C.S. Pipe, R.C. Pipe Class III, R.C. Pipe Class IV, Endwalls, Reinforced Endwalls, Drainage Structure, Quantities for Drainage Structures, Frame, Grates, and Hood, Concrete Transitional Section, 15" Pipe End Section, Convert Existing D.I. to J.B. W/MH, 15" C.S. Elbow, 18" C.S. Elbow, 24" C.S. Elbow, BERM Ditch Outlet, BERM Ditch Outlet, Preformed Scour Hole, Drainage Inlet Transitional Gutter Sect., Flowable Fill, Concrete and Brick Pipe Plug, Pipe Removal, and Remarks.

SHEET TOTALS

240 80 128 68 60 60 856 108 48 18 1.7 9 7 2 4 4 4 5 5 4 5 9

1612LP-N70106

COMPUTED BY: URS DATE: 02/15/2017
CHECKED BY: NJD DATE: 02/15/2017

PROJECT NO. SHEET NO.
R-3100B 3D-10

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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)

Table with columns for Line & Station, Offset, Structure Number, Invert Elevation, Minimum Required Slope, Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC), C.S. Pipe, R.C. Pipe Class III, R.C. Pipe Class IV, Endwalls, Reinforced Endwalls, Drainage Structure, Quantities for Drainage Structures, Frame, Grates, and Hood, Concrete Transitional Section, 15" Pipe End Section, Convert Existing D.I. to J.B. W/MH, 15" C.S. Elbow, 18" C.S. Elbow, 24" C.S. Elbow, BERM Ditch Outlet, Preformed Scour Hole, Drainage Inlet Transitional Gutter Sect., Flowable Fill, Concrete and Brick Pipe Plug, Pipe Removal, and Remarks. Includes a SHEET TOTALS row at the bottom.

1612LP-N70106

COMPUTED BY: URS DATE: 02/15/2017
CHECKED BY: NJD DATE: 02/15/2017

PROJECT NO. SHEET NO.
R-3100B 3D-11

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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)

Table with columns for LINE & STATION, OFFSET, STRUCTURE NUMBER, TOP ELEVATION, INVERT ELEVATION, MINIMUM REQUIRED SLOPE, Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC), C. S. PIPE, R. C. PIPE CLASS III, R. C. PIPE CLASS IV, ENDWALLS, REINFORCED ENDWALLS, MASONRY, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, CONCRETE TRANSITIONAL SECTION, 15" PIPE END SECTION, CONVERT EXISTING D.I. TO J.B. W/WH, 15" C.S. ELBOW, 18" C.S. ELBOW, 24" C.S. ELBOW, BERM DITCH OUTLET, PREFORMED SCOUR HOLE, DRAINAGE INLET TRANSITIONAL GUTTER SECT., FLOWABLE FILL, CONCRETE AND BRICK PIPE PLUG, PIPE REMOVAL, and REMARKS. Includes a SHEET TOTALS row at the bottom.

1612LP-107018

COMPUTED BY: URS DATE: 02/15/2017

CHECKED BY: NJD DATE: 02/15/2017

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO. SHEET NO.
R-3100B 3D-13

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)

Table with columns for Line & Station, Size, Thickness, Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC), C.S. Pipe, R.C. Pipe Class III, R.C. Pipe Class IV, Endwalls, Reinforced Endwalls, Drainage Structure, Quantities for Drainage Structures, Frame, Grates, and Hood, Concrete Transitional Section, and various pipe types and gauges.

ABBREVIATIONS
C.A.A. CORRUGATED ALUMINIUM ALLOY
C.B. CATCH BASIN
C.S. CORRUGATED STEEL
D.I. DROP INLET
G.D.I. GRATED DROP INLET
H.D.P.E. HIGH DENSITY POLYETHYLENE
J.B. JUNCTION BOX
M.H. MANHOLE
N.S. NARROW SLOT
P.V.C. POLYVINYL CHLORIDE
R.C. REINFORCED CONCRETE
T.B.D.I. TRAFFIC BEARING DROP INLET
T.B.J.B. TRAFFIC BEARING JUNCTION BOX
W.S. WIDE SLOT

SHEET TOTALS

71 1012

1612LP-W700B

COMPUTED BY: URS DATE: 02/15/2017
CHECKED BY: NJD DATE: 02/15/2017

PROJECT NO. SHEET NO.
R-3100B 3D-14

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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 table with columns: LINE & STATION, OFFSET, STRUCTURE NUMBER, TOP ELEVATION, INVERT ELEVATION, MINIMUM REQUIRED SLOPE, Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC), C. S. PIPE, R. C. PIPE CLASS III, R. C. PIPE CLASS IV, ENDWALLS, REINFORCED ENDWALLS, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, CONCRETE TRANSITIONAL SECTION, 15" PIPE END SECTION, CONVERT EXISTING D.I. TO J.B. W/MH, 15" C.S. ELBOW, 18" C.S. ELBOW, 24" C.S. ELBOW, BERM DITCH OUTLET, PREFORMED SCOUR HOLE, DRAINAGE INLET TRANSITIONAL GUTTER SECT., FLOWABLE FILL, CONCRETE AND BRICK PIPE PLUG, PIPE REMOVAL.

ABBREVIATIONS table listing items like C.A.A., C.B., C.S., D.I., G.D.I., H.D.P.E., J.B., M.H., N.S., P.V.C., R.C., T.B.D.I., T.B.J.B., W.S. with their corresponding descriptions.

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

COMPUTED BY: GDS DATE: 2/1/2017
 CHECKED BY: NJD DATE: 2/1/2017

PROJECT NO.
 R-3100B

SHEET NO.
 3G-1

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				1000 SD	1000
				TOTAL LF:	1000

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

SUMMARY OF GEOTEXTILE FOR PAVEMENT STABILIZATION

LINE	Station	Station	SY
CONTINGENCY			8000
			TOTAL SY: 8000

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
CONTINGENCY			ASU		1000	1800	2000		
CONTINGENCY			AST	3"				1000	
			TOTAL CY/TONS/SY:		1000	1800	2000**	1000	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.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4,5,6	UNITED CHURCH HOMES AND SERVICES
2	4,5,6	UNITED CHURCH HOMES AND SERVICES
3	6	JAMES MARVIN YOUNT
4	6	SUDIE B YOUNT
5	6	GLENDA S YOUNT
6	6,7	ROBERT E & DONNA A LUDEMAN
6A	6	OSCAR L & CAROLYN Y BAUCOM
7	6,7	KEVIN J & BARBARA C LUDEMAN
8	6,7	DANIEL J HAMMONDS
9	7	DWIGHT M HUFFSTETLER
10	7	FRANKIE R ROACH
11	7	JEFFREY S & LAURA J MCREE
12	7	ROGER HAM
13	7	FRANCES S GUERNSEY
14	7,8	BETTY SHUFORD MCQUEEN
15	7	STEPHEN ANDREW DOUGLAS
16	7	ALDOLFO H. RIOS
17	7,8	RICHARD A BENFIELD
18	8	JOSE L & MILAGRAS RAMOS
19	8	PAUL J & ROBERT E PROPST
20	8	US LAND DEVELOPMENT LLC
21	8	JAMES & SUSAN SMITH
22	8	BRADLEY S GOOD
23	8	SAMUEL C & BETTY G HASS
24	8	JOHN T & GWEN B SHERMAN
25	8	BENNIE W & JOEL D ALEXANDER
26	8	MICHAEL E HUFFMAN
27	8	WORTH WRAY JR & GLENDA A FRAZIER
28	8	PHILLIP R & FAYE W SIGMON
29	8	PATRICIA A CUPP
30	8	THOMAS S & SUSAN H HARRILL
31	8	SHIRLEY MCALISTER CLINE LFI
32	8,9	MILLIE DELLINGER FINCH
33	8	JOHN A & BETTY W SHERRILL
34	8,9	2535 NC HIGHWAY 16 SOUTH LLC
35	9	FRANCES DARLENE PARLIER
36	9	ROGER D & CATHERINE D JONES
37	9	STEEL SPIKE LLC
38	9	DAVID L & JOYCE C ROBERTS
39	9	RICHARD F & DORIS K SIGMON
40	9,10	ELO & THOM NGUYEN
41	9	JULIE FRAZIER
42	9	NADINE L CALLOWAY REVOCABLE LIVING TRUST
43	9,10	JIMMY P & SHIRLEY S SHERRILL
44	9,10	MARK A SHERRILL
45	10	THELMA GANTT SHERRILL
46	10	BILL CECIL SHERRILL
47	10	THELMA GANTT SHERRILL
48	10	DRUMS PARTNERSHIP #1
49	10	DONALD RALPH SHERRILL
50	10	BELL SOUTH TELECOMMUNICATIONS INC
51	10,11	DARRELL C & GLENDA L DRUM
52	10,11	JAMES W POWELL JR
53	10,11	JEAN CLINE BARRINGER
54	11	CRAIG A HANKINSON
54A	11	JOHN T BARRINGER
55	11	JAMES WILLARD POWELL JR
56	11	JEAN CLINE BARRINGER
56A	11,12	ELMER H & ABIGAIL B LUTZ
57	11	DUKE ENERGY CORP

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
58	11	JOEL ALAN & MELINDA L SHAW
59	11,12	LEE ROY & JUDY A RINEHARDT
60	12	JANET H KIRST
61	12	GARY D & SANDRA R PRESNELL
62	12	ROBERT D & ANN K COX
63	12	BARBARA R BURTON
64	12	EDWARD L STERNE
65	12	JAMES LEE MCCLEAVE
66	12	HOWARD T & LARRY D DRUM
67	12	MA MAR ASSOCIATES
68	12	FRIENDSHIP UNITED METHODIST CHURCH
69	12	LARRY N & DONNA T MORETZ
70	12	LEON RIVERS
71	12,13	CARROL M & MELLONEE B OWENBY
72	12,13	WILLARD WILSON HUFFMAN
73	13	BERTILLA CARMEN MARTINEZ
74	13	MERLO I & PRISCA RIVAS
75	13	JAIRO RAFAEL MERCADO-G
76	13	JOSE S & AMANDA E VALLADARES
77	13	MARIA M OLMOS & JOSE VALLADARES
78	13	BOBBY & RITA IKERD
79	13	BOBBY & RITA IKERD
80	13	WILLARD WILSON HUFFMAN
81	13	BOBBY C & RITA B IKERD
82	13,14	SHAWN & HEATHER O PAUL
83	14	JOE RAY ABERNETHY
84	13,14	BLUE RIDGE PARKS LLC
85	14	RUSSELL W CRAIG
86	14	HAROLD THOMAS SR & BETTY H BALLEW
87	14	ADOLPH C JR & LINDA B NIEHOFF
88	14	RONNIE C & CAROL P HURLEY
89	14,15	MICHAEL MONACO
90	15	CLAUDE AVERY BALLARD
91	15	WESLEY R & CASEY WHITENER
92	15	JESSICA C MORENO
93	15	GERALD R & SHIRLEY S CALDWELL
94	15	BILLY W & ALICE H YANCEY
95	14,15	ELMER UDEAN & NANCY B BURKE
96	14,15	JOHN TOLAR FURMAGE JR
96A	15	ELMER UDEAN & NANCY B BURKE
96B	15	ROBERT M & CLARISSA A WEIDERT
97	15	RAM SINGH DASS
98	15,16	WILLARD WILSON HUFFMAN
99	15	WILLARD WILSON HUFFMAN
100	15	TIMOTHY MARK CARTER
101	16	COYTE L & NANCY PUNCH
101A	16	ROGER ALAN MCCASLIN
102	16,17	MARY CALDWELL BEATTY
103Z	16,17	ALLEN & SARAH HERMAN
104	17	DORIS PUNCH GLOVER
105	17	MACK & DORIS P GLOVER
106	17	HOWARD J MINCKLER
107	17	RUDY H COOK III
108	17	ORA ELIZABETH CLINE HEIRS
109	17	SCOTT L & ANGELA R LEATHERMAN
110	17	CHARLES R & TINA H RAMSEY

5/28/99

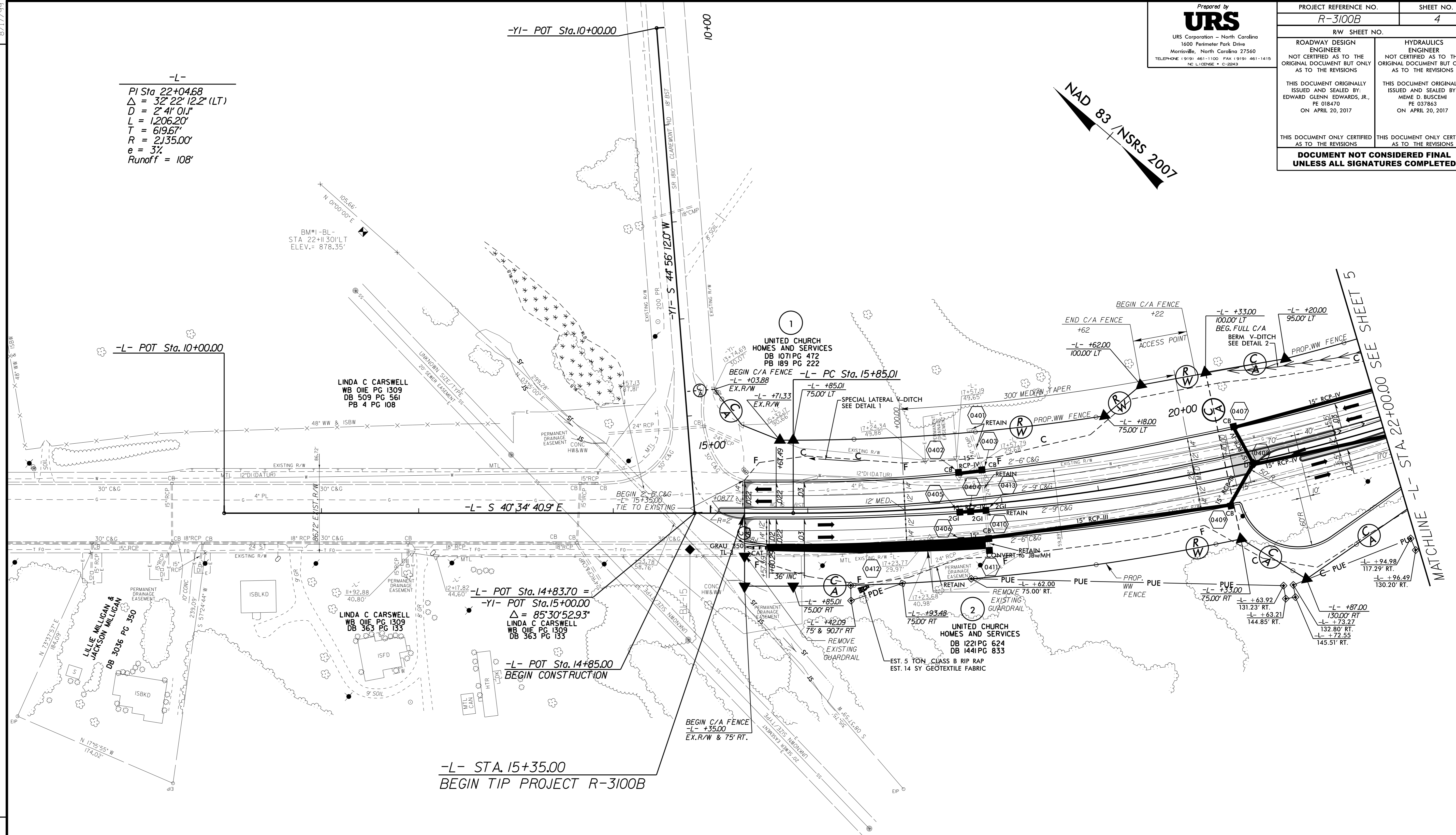
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sheet1

PROJECT REFERENCE NO. R-3100B	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER NOT CERTIFIED AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS	HYDRAULICS ENGINEER NOT CERTIFIED AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS
THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY: EDWARD GLENN EDWARDS, JR. PE 018470 ON APRIL 20, 2017	THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY: MEME D. BUSCEMI PE 037863 ON APRIL 20, 2017
THIS DOCUMENT ONLY CERTIFIED AS TO THE REVISIONS	THIS DOCUMENT ONLY CERTIFIED AS TO THE REVISIONS
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

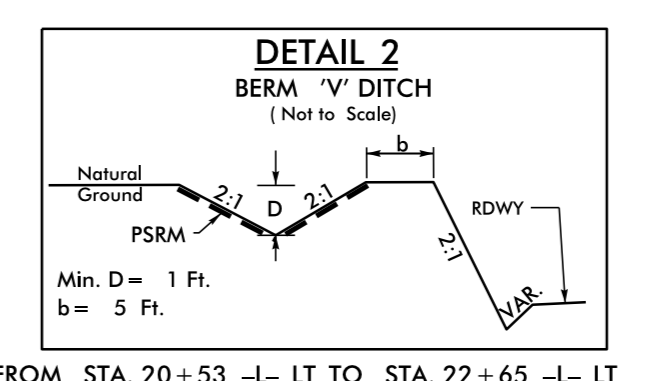
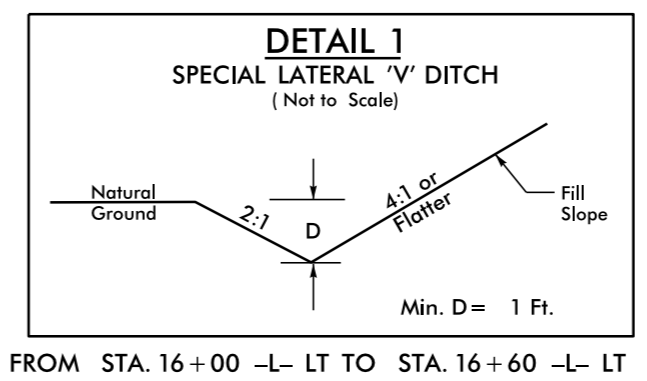
NAD 83 / NSRS 2007

-L-
 PI Sta. 22+04.68
 $\Delta = 32^{\circ} 22' 12.2" (LT)$
 $D = 2^{\circ} 41' 01.1"$
 $L = 1,206.20'$
 $T = 619.67'$
 $R = 2,135.00'$
 $e = 3\%$
 Runoff = 108'

REVISIONS
 ROW REV. ON LET. PROJECT - APRIL 20, 2017 - REVISED PUE ALONG PACEL 2 (EGE)
 ROW REV. ON LET. PROJECT - SEPTEMBER 11, 2020 - ADDED AN ACCESS BREAK ON PARCEL 1 FROM -L- STATION 19+62 TO 20+22 (TLW)



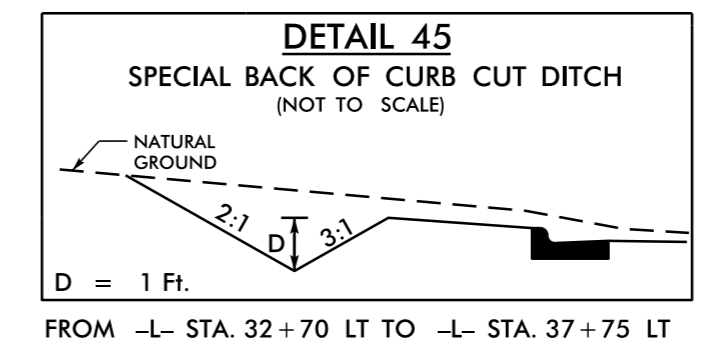
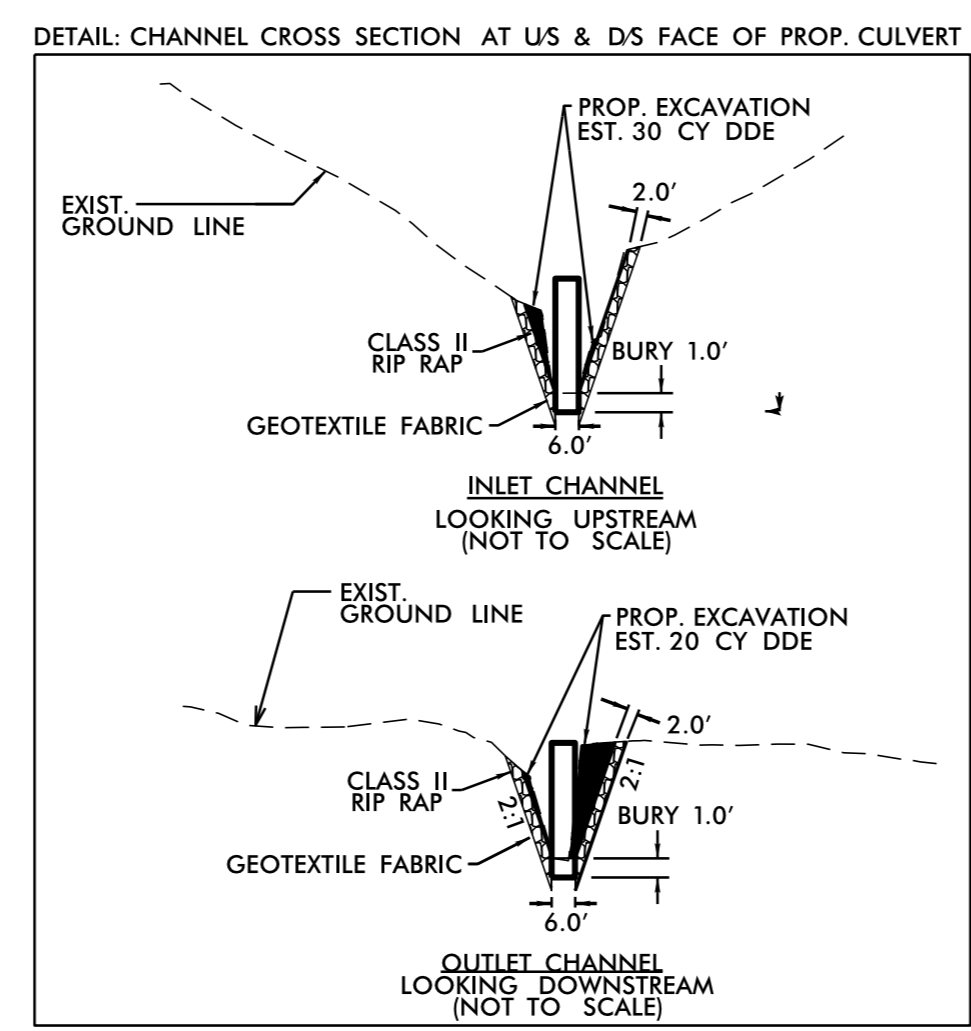
-L- POT Sta. 14+83.70 =
 -YI- POT Sta. 15+00.00
 $\Delta = 85^{\circ} 30' 52.93"$
 LINDA C CARSWELL
 WB 01E PG 1309
 DB 363 PG 133



FOR -L- PROFILE SEE SHEET 18
 FOR CONC. MONO. ISLAND DETAIL SEE SHEET 2B-1

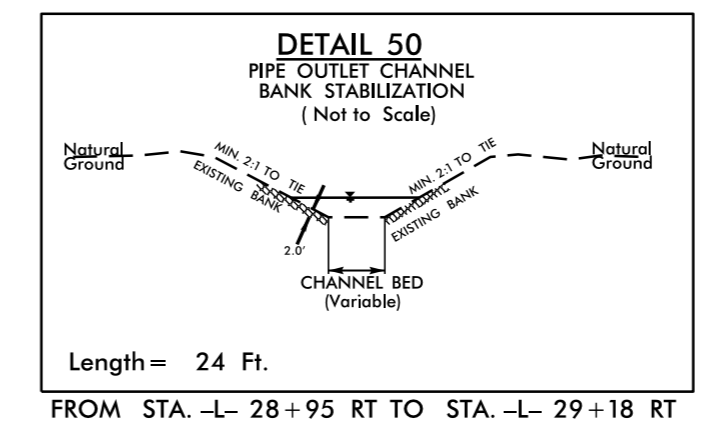
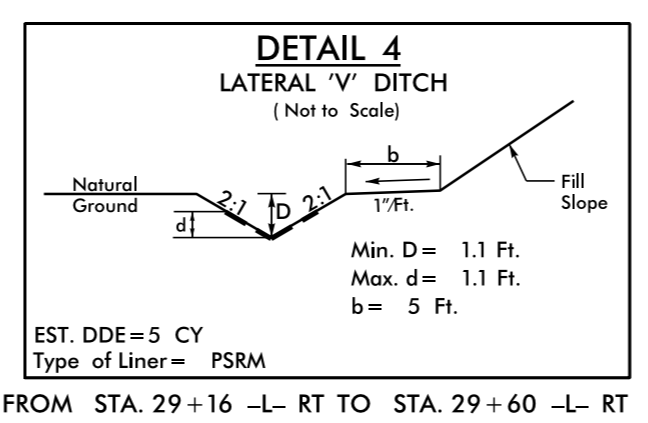
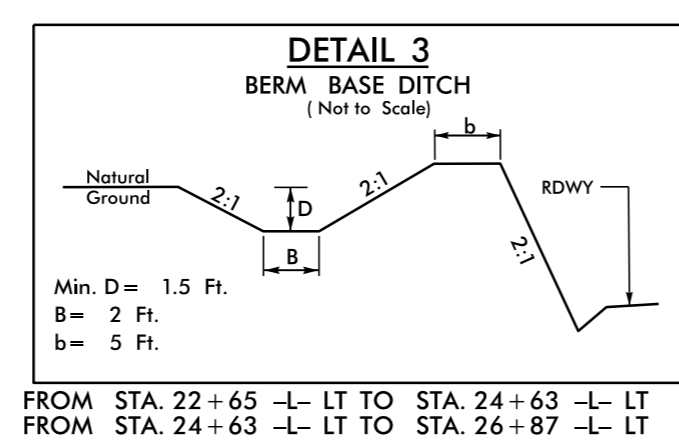
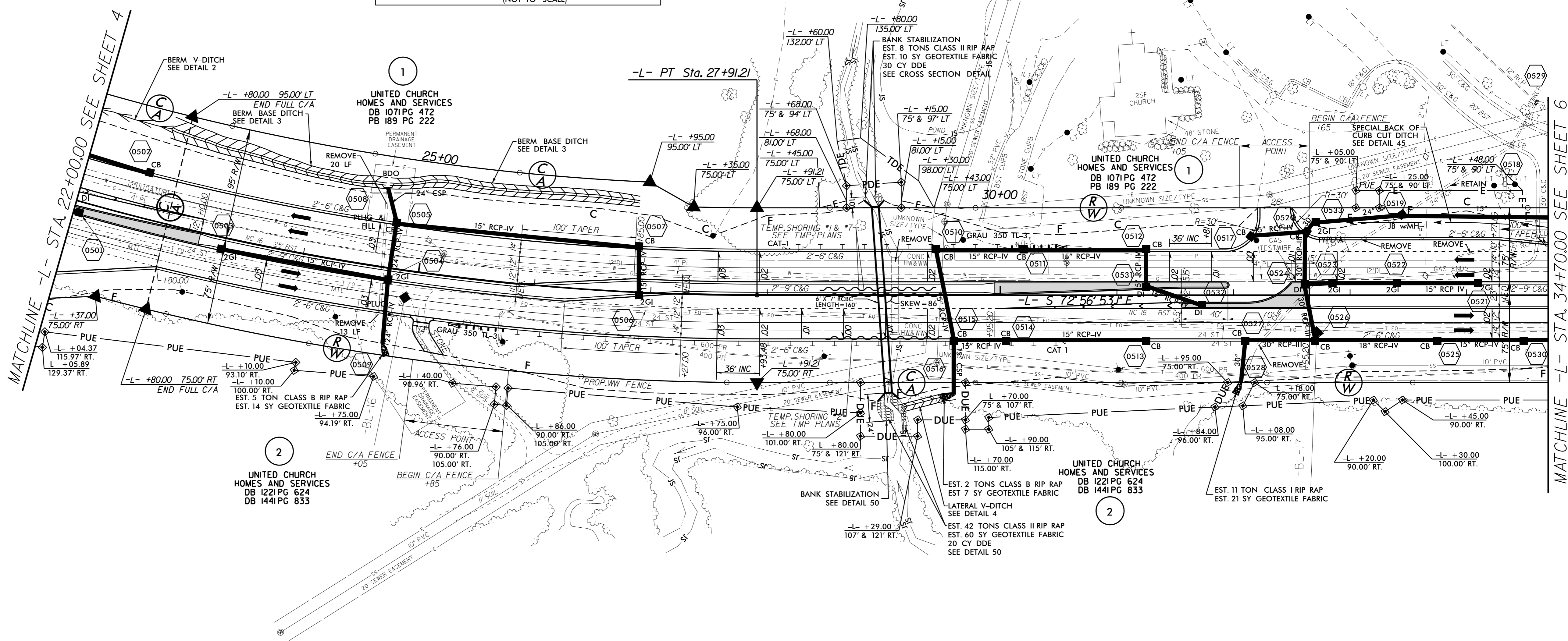
PROJECT REFERENCE NO. R-3100B	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER NOT CERTIFIED AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS	HYDRAULICS ENGINEER NOT CERTIFIED AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS
THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY: EDWARD GLENN EDWARDS, JR., PE 018470 ON APRIL 26, 2017	THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY: MEME D. BUSCEMI PE 037863 ON APRIL 27, 2017
THIS DOCUMENT ONLY CERTIFIED AS TO THE REVISIONS	THIS DOCUMENT ONLY CERTIFIED AS TO THE REVISIONS
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

-L-
 $PI\ Sta\ 22+04.68$
 $\Delta = 32' 22" (2.2' LT)$
 $D = 2' 4" (0.1')$
 $L = 1206.20'$
 $T = 619.67'$
 $R = 2135.00'$
 $e = 3\%$
 $Runoff = 108'$



MAP 8 / NSRS 2007

REVISIONS
 FROM REV. ON LET PROJECT - APRIL 27 2017 - REVISED PUE ALONG PARCEL 2 (EGE)
 FROM REV. ON LET PROJECT - FEBRUARY 18 2019 - MOVED ACCESS POINT ON PARCEL FROM STA. 34+48 TO STA. 32+05 (+/- EGE)
 FROM REV. ON LET PROJECT - SEPTEMBER 11 2020 - INCREASED THE ACCESS POINT AT -L- STATION 25+45 FROM 60 TO 80 ON PARCEL 2 (TLW)

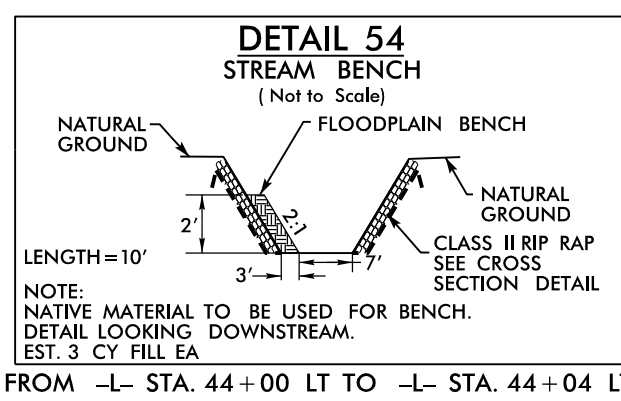
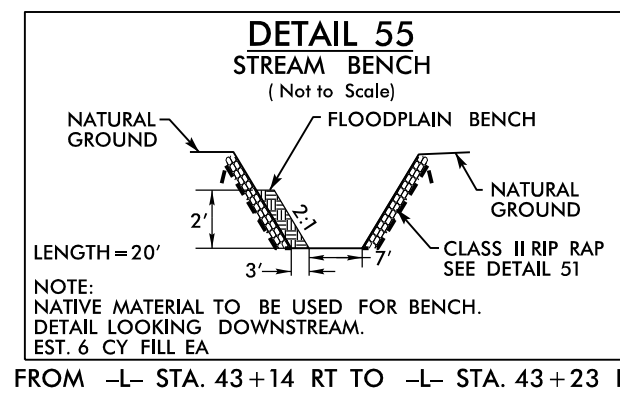
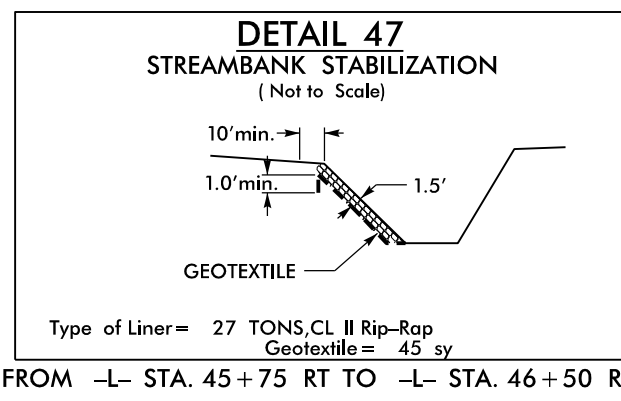
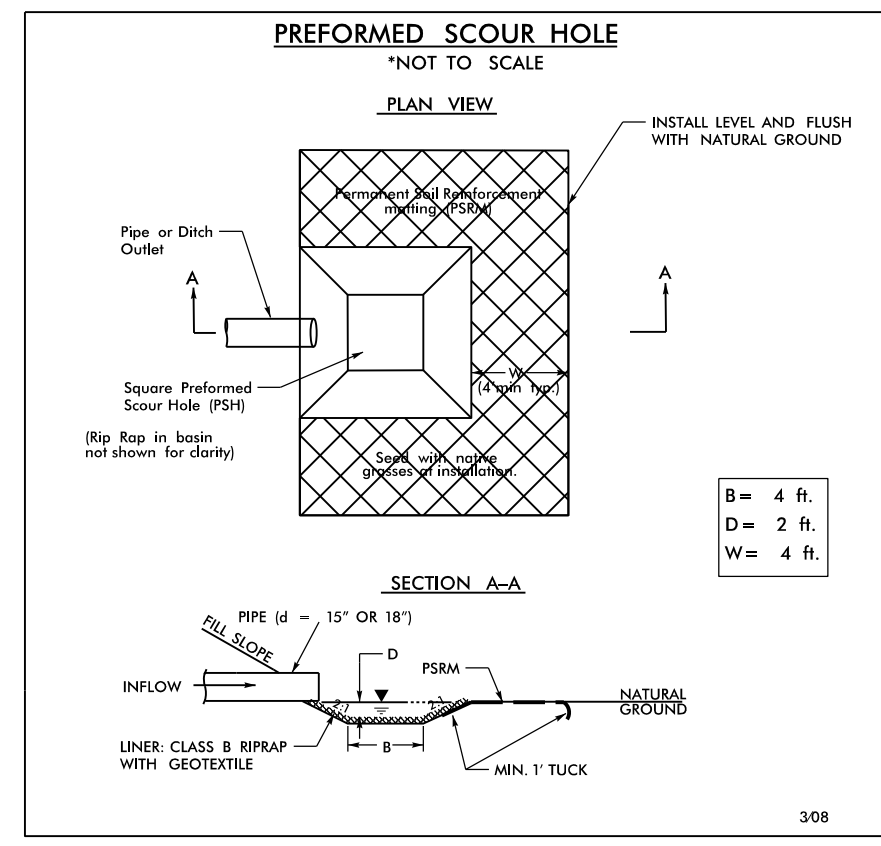
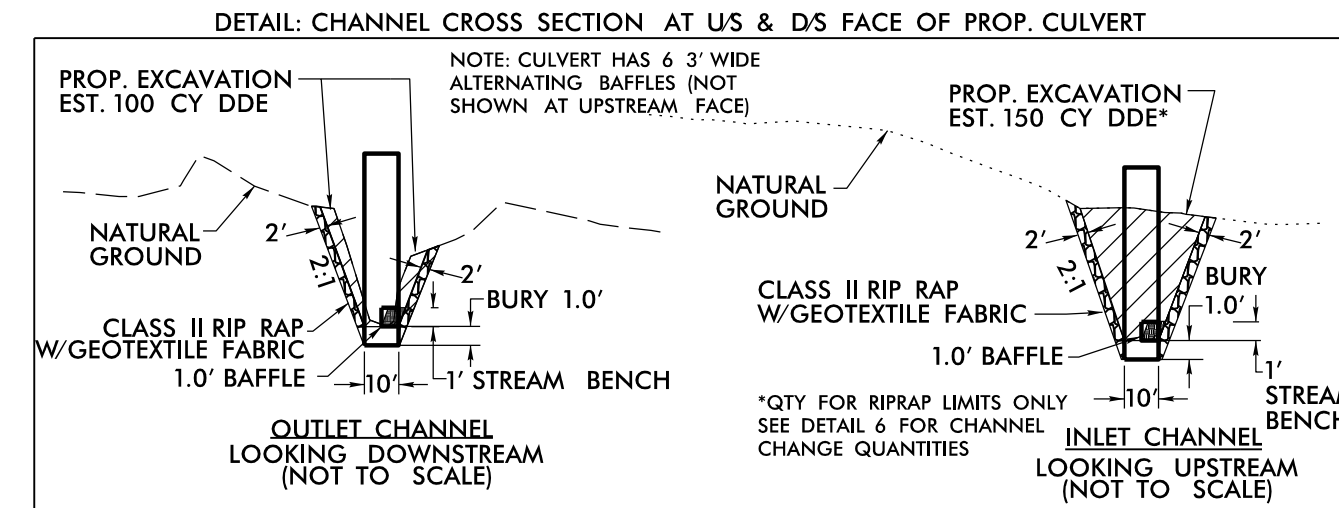
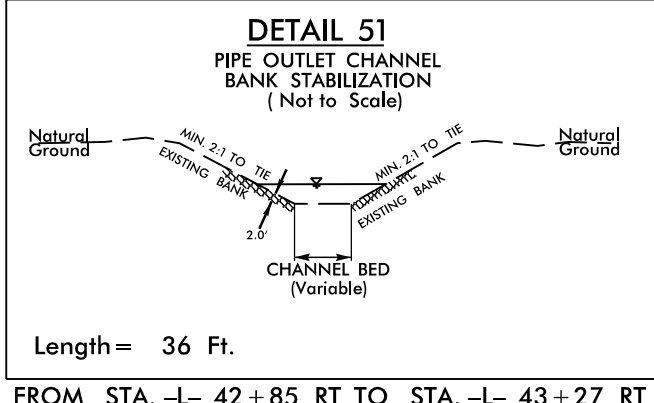
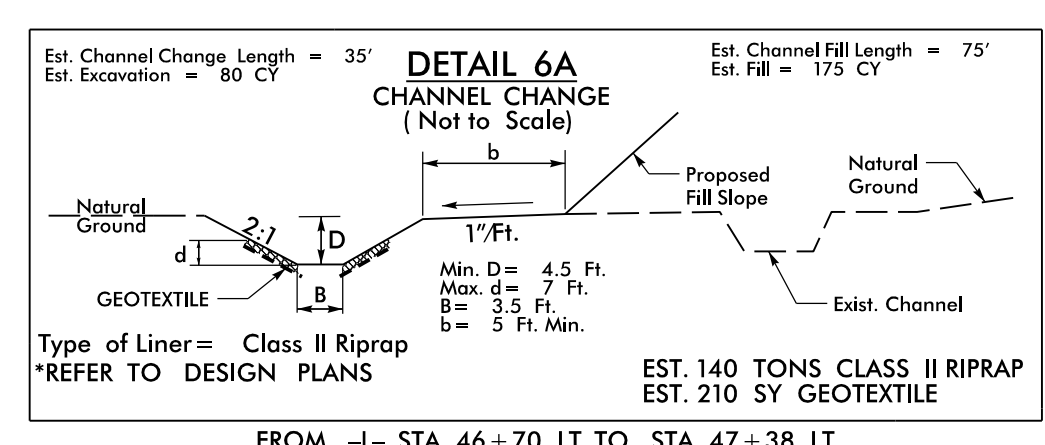
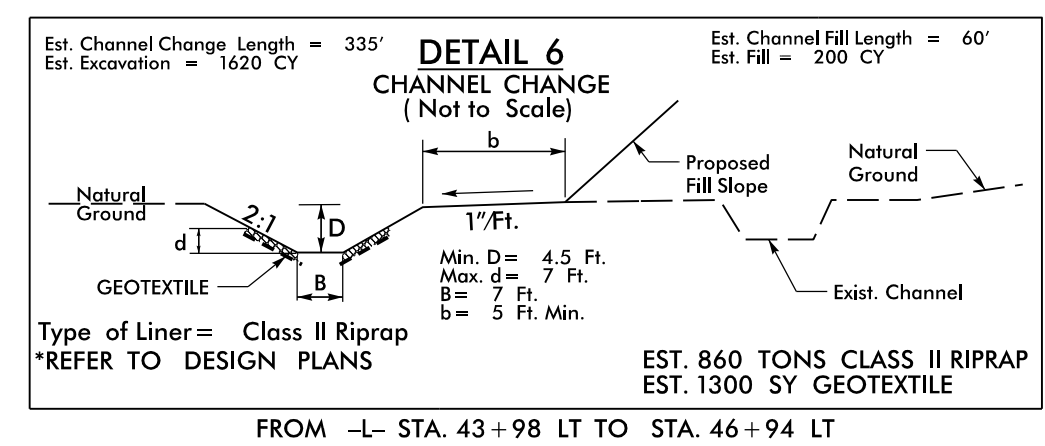
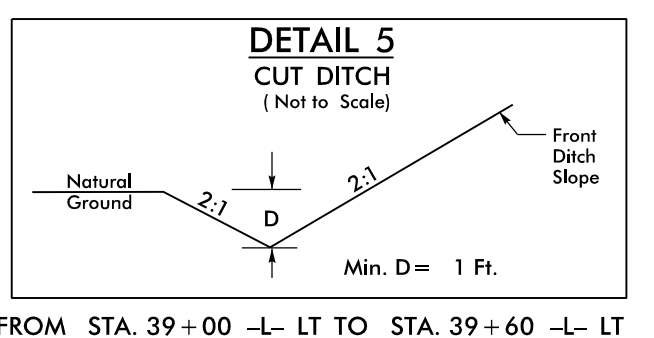
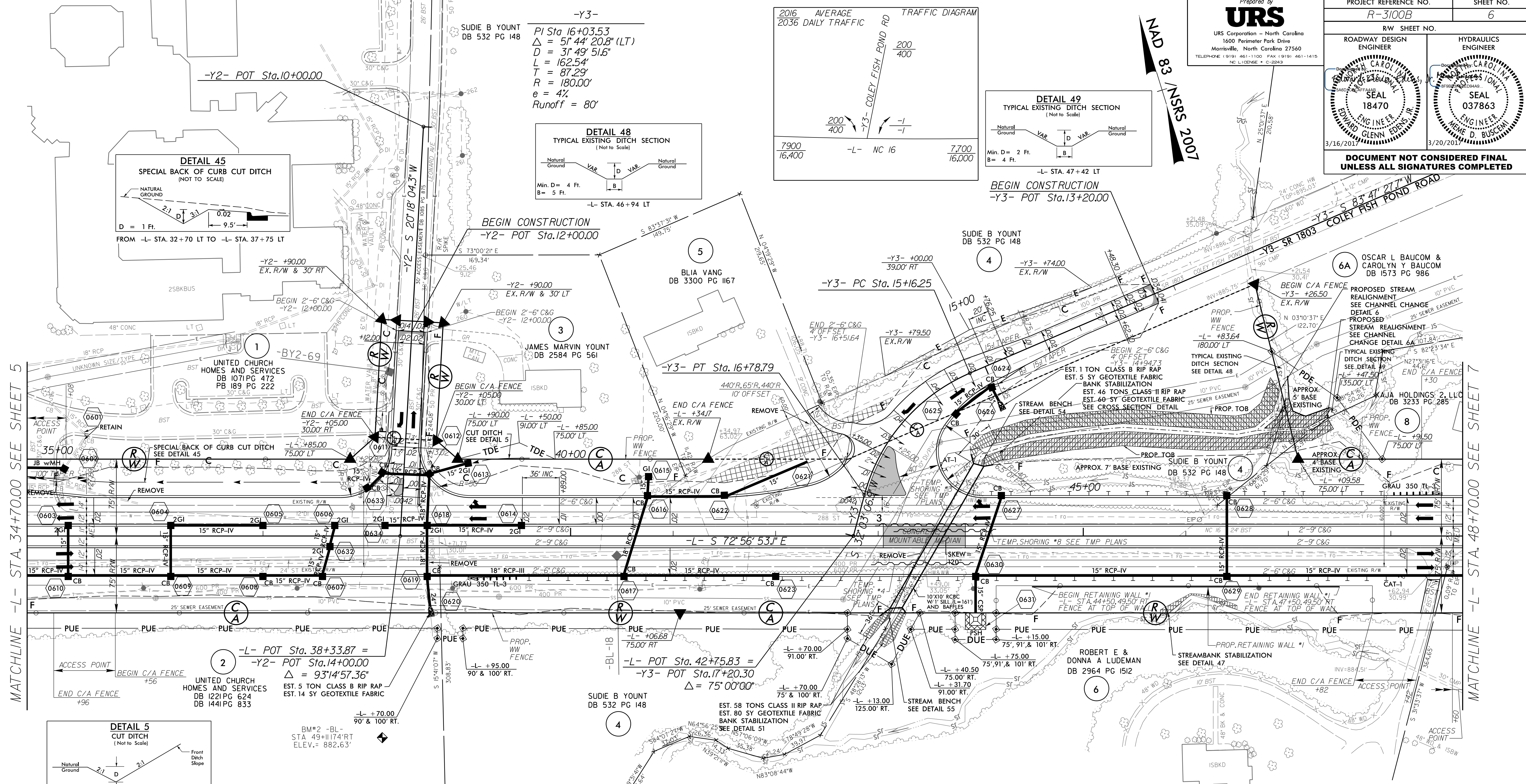
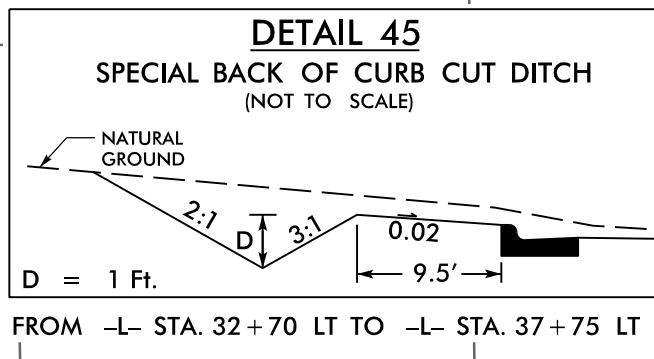
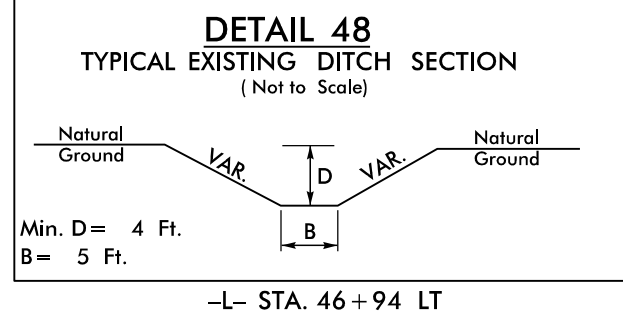
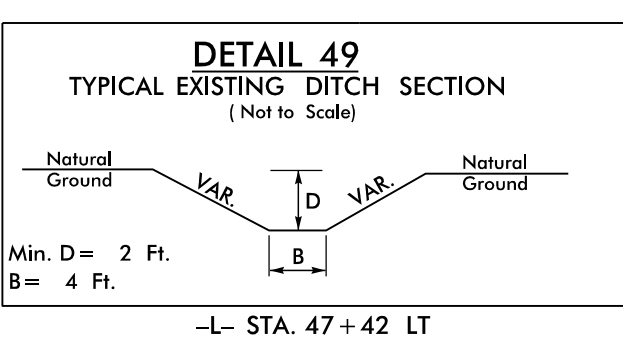
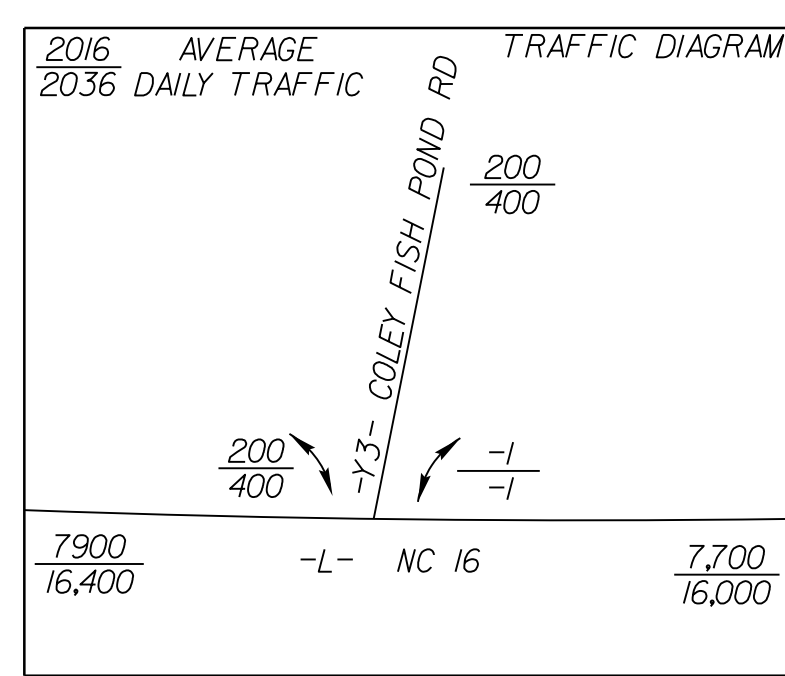


FOR -L- PROFILE SEE SHEET 18
 FOR CONC. MONO. ISLAND DETAIL SEE SHEET 2B-1

8/17/99

Prepared by
URS
URS Corporation - North Carolina
1600 Perimeter Park Drive
Morrisville, North Carolina 27560
TELEPHONE (919) 461-1100 FAX (919) 461-1415
NC LICENSE # C-22923

PROJECT REFERENCE NO. R-3100B		SHEET NO. 6	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		ENGINEER	
SEAL 18470		SEAL 037863	
3/16/2017		3/20/2017	
DO NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

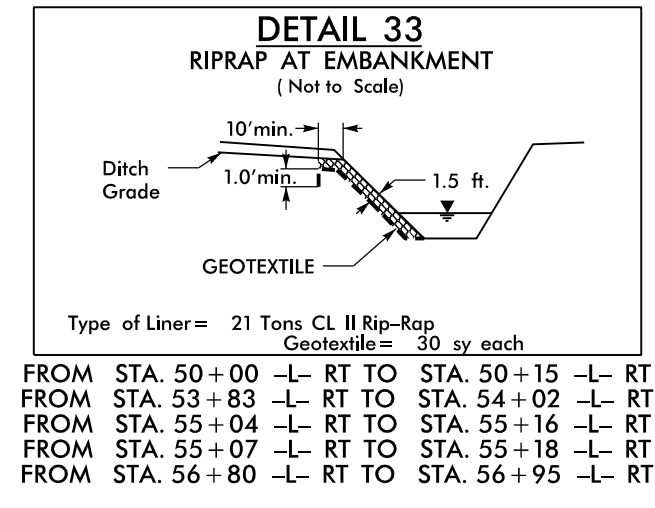
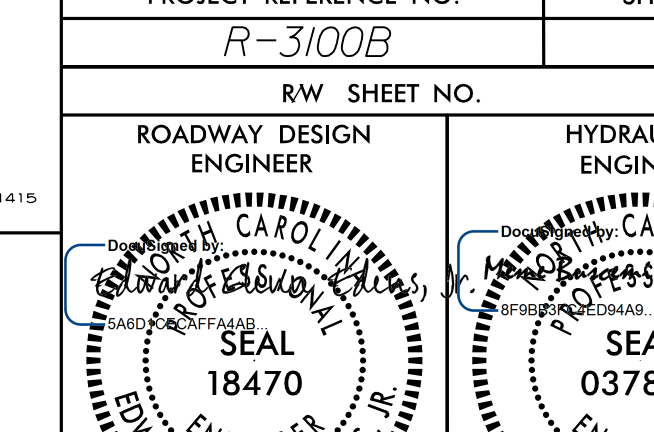
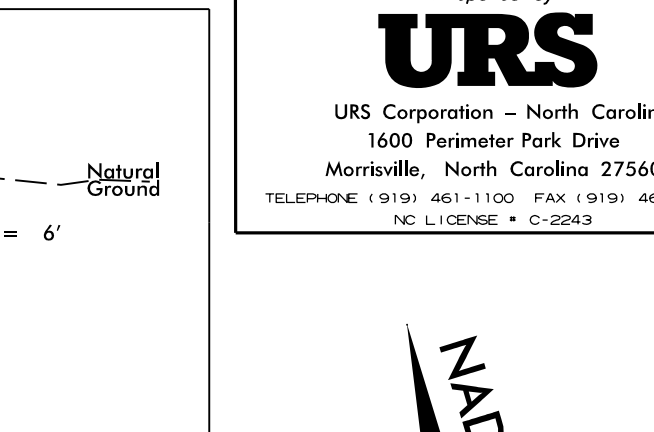
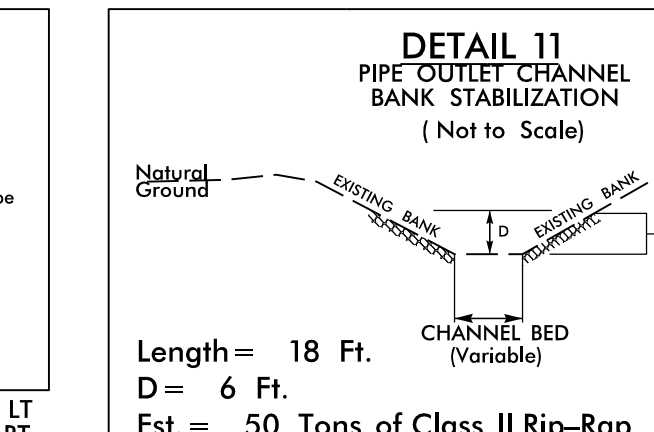
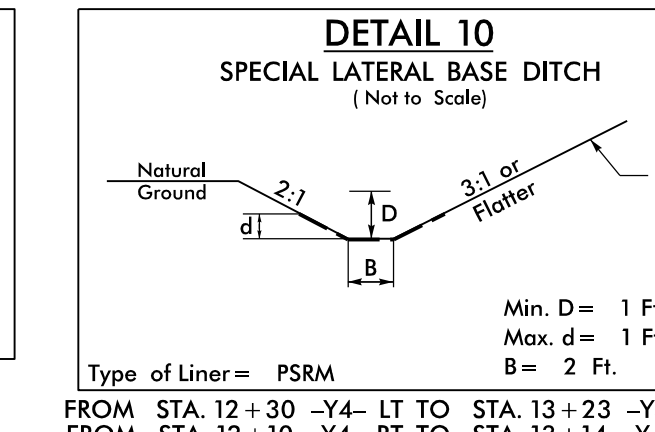
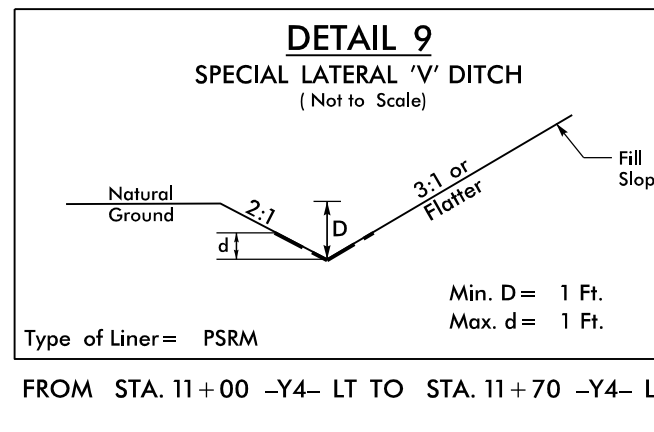
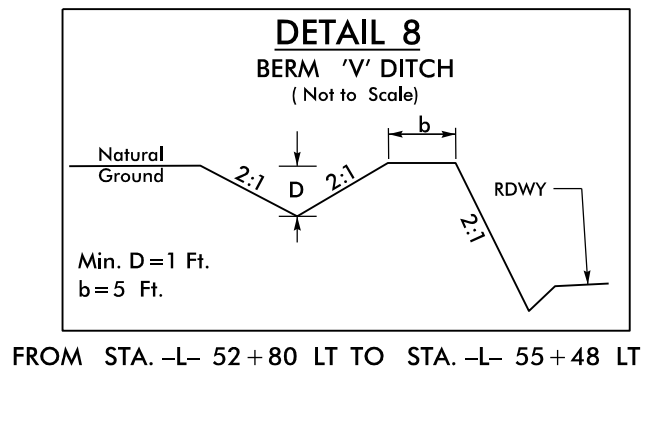
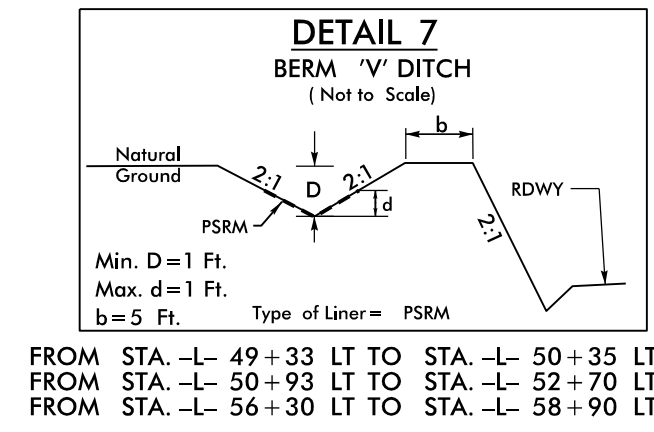


PAVEMENT REMOVAL

FOR -L- PROFILE SEE SHEETS 18&19
 FOR -Y2- PROFILE SEE SHEET 25
 FOR -Y3- PROFILE SEE SHEET 25
 FOR CONC. MOUNTABLE MEDIAN DETAIL SEE SHEET 2B-1
 FOR CULVERT PLANS SEE SHEETS C-27 THRU C-47
 FOR WALL #1 PLANS SEE W-1 THRU W-2
 FOR STREAM CHANNEL CHANGE ALIGNMENT DETAIL SEE SHEET 2D-1

REVISIONS

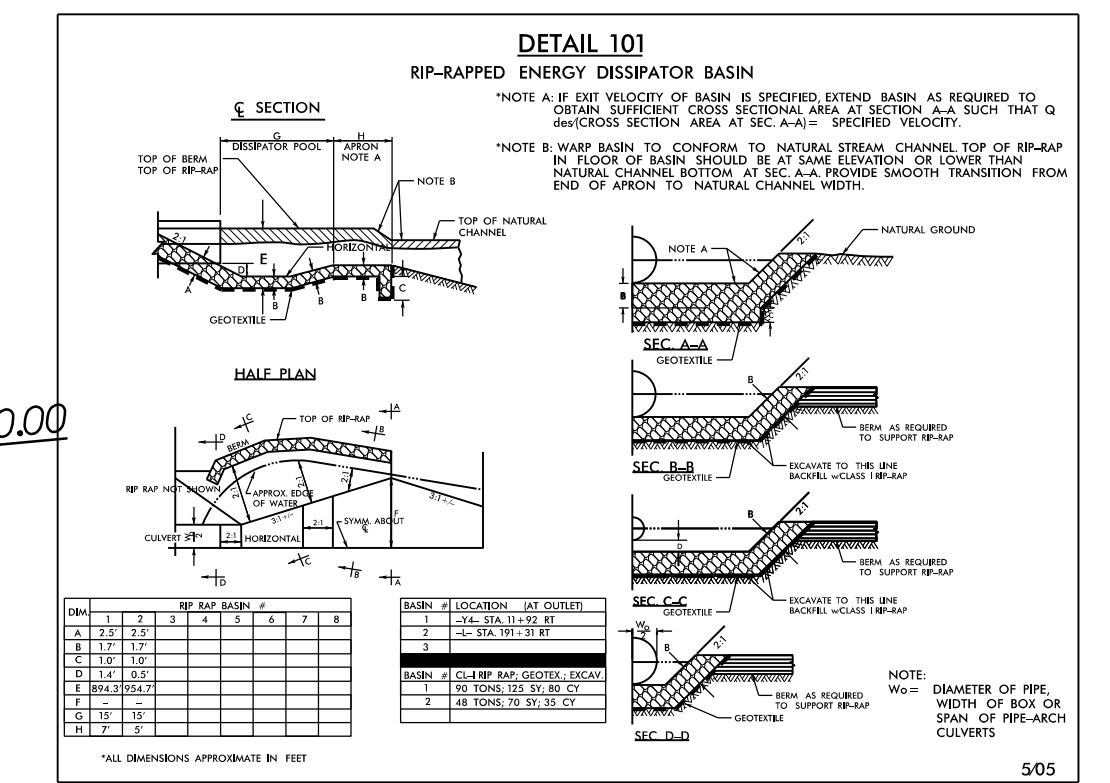
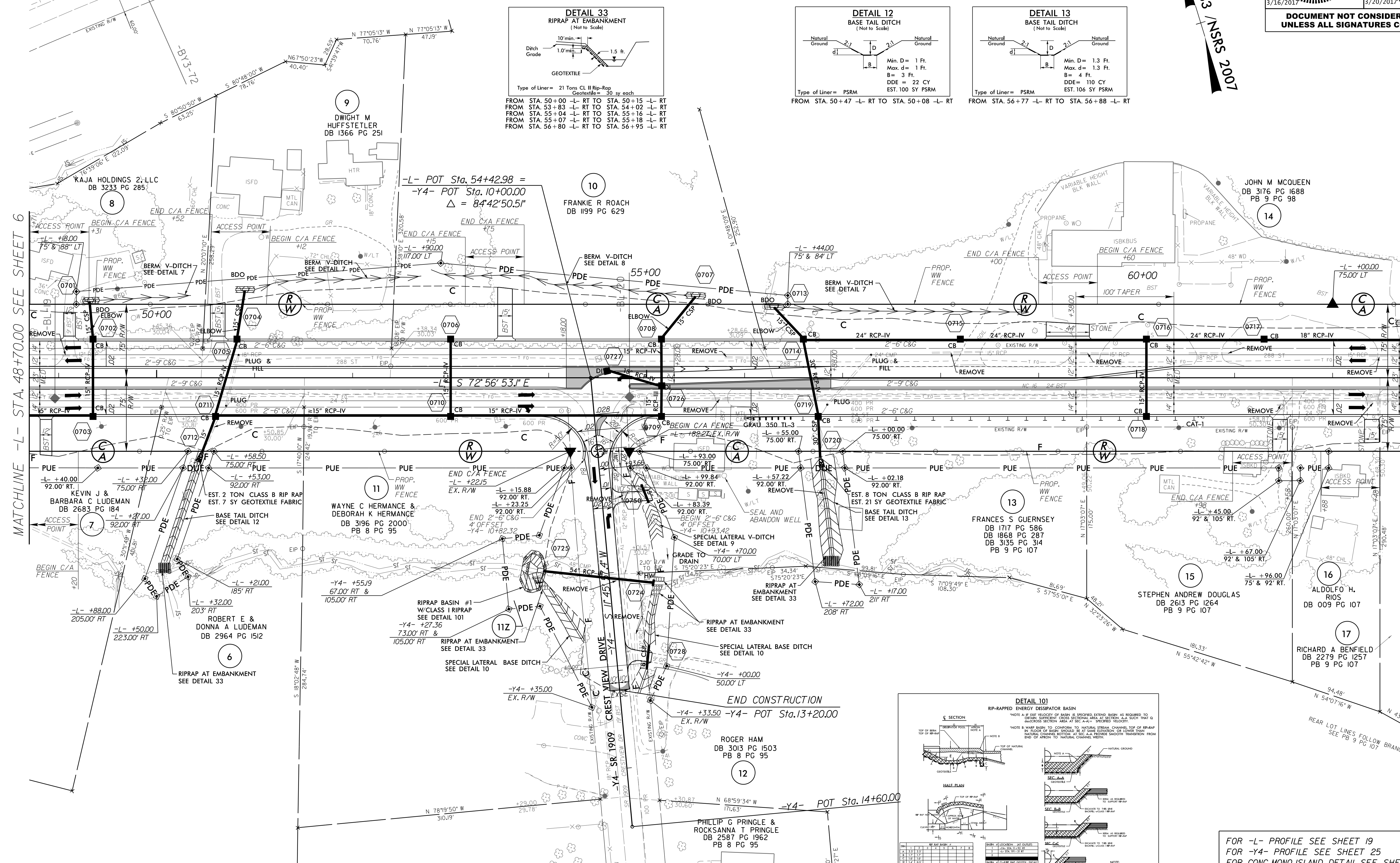
3/16/2017
R:\Roadway\Proje\3100b_rdy_PSH06.dgn
rscheid



REVISIONS

MATCHLINE -L- STA. 48+70.00 SEE SHEET 6

MATCHLINE -L- STA. 62+75.00 SEE SHEET 8

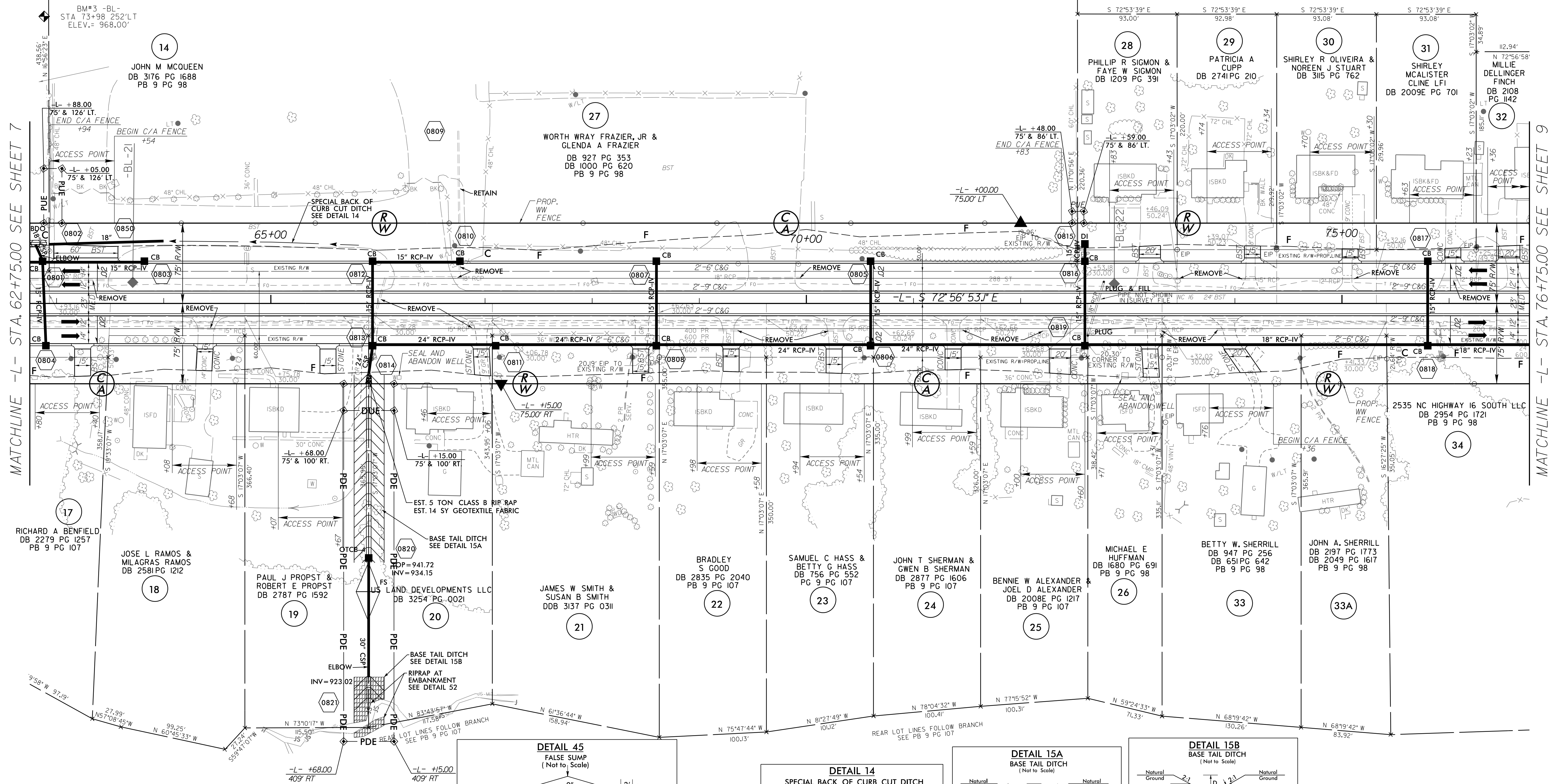
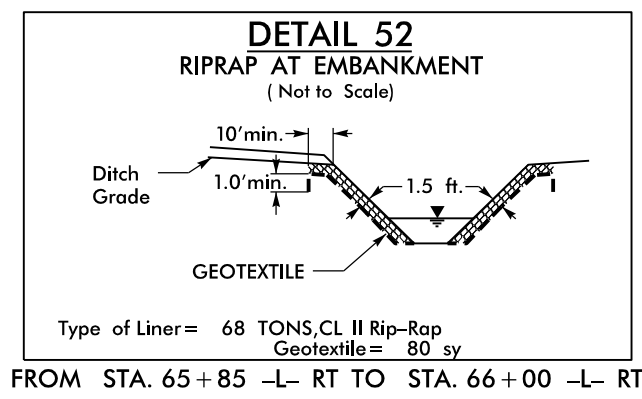


FOR -L- PROFILE SEE SHEET 19 FOR -Y4- PROFILE SEE SHEET 25 FOR CONC.MONO.ISLAND DETAIL SEE SHEET 2B-1

8/17/99

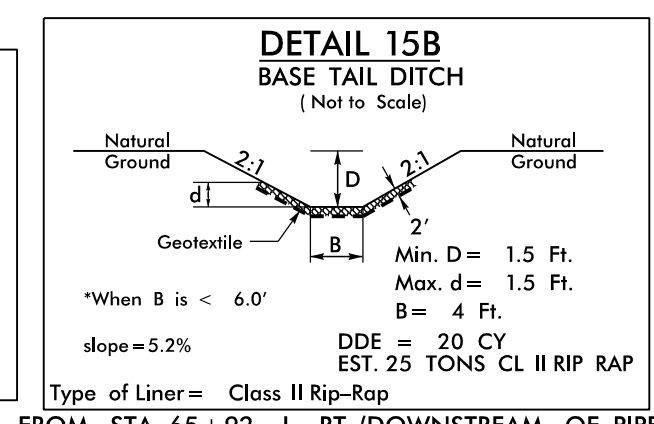
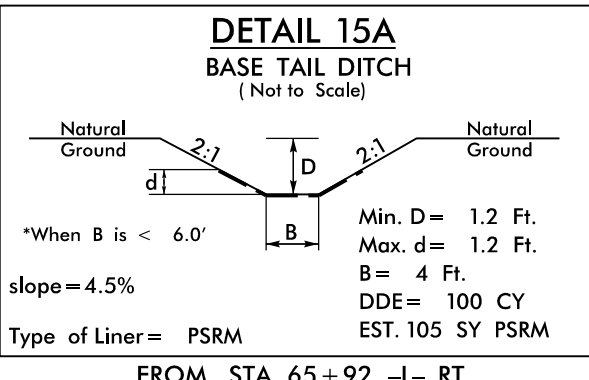
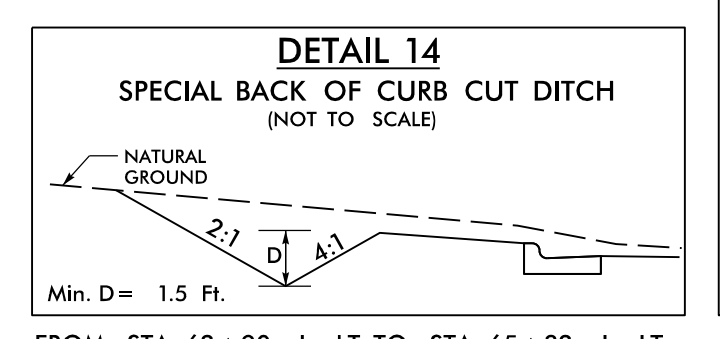
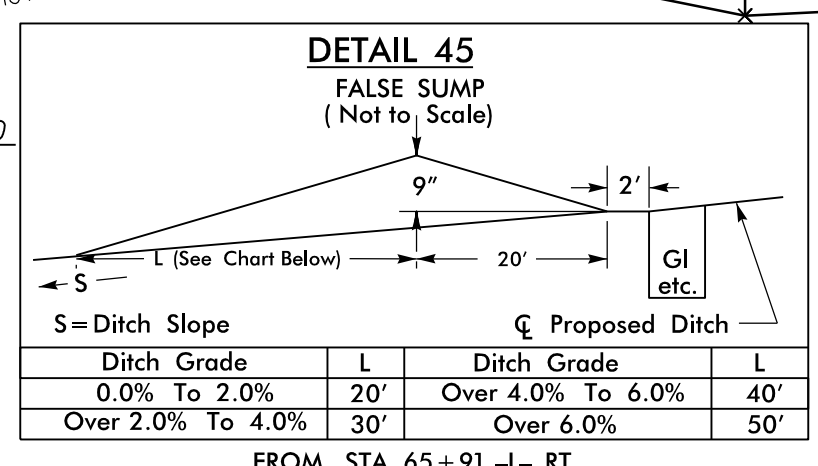
Prepared by
URS
URS Corporation - North Carolina
1600 Perimeter Park Drive
Morrisville, North Carolina 27560
TELEPHONE (919) 461-1100 FAX (919) 461-1415
NC LICENSE # C-22943

PROJECT REFERENCE NO. R-3100B	SHEET NO. 8
R/W SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



MATCHLINE -L- STA. 62+75.00 SEE SHEET 7

MATCHLINE -L- STA. 76+75.00 SEE SHEET 9



FOR -L- PROFILE SEE SHEETS 19&20

REVISIONS

3/16/2017
R:\Roadway\Proj\13100b_rdy_PSH08.dgn
schneid

8/17/99

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URS Corporation - North Carolina
1600 Perimeter Park Drive
Morrisville, North Carolina 27560
TELEPHONE (919) 461-1100 FAX (919) 461-1415
NC LIC# 000662 • C-22943

PROJECT REFERENCE NO. R-3100B		SHEET NO. 9	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		SEAL 18470 EDWARD GLENN 3/16/2017	
		SEAL 037863 MEME D. BUSCH 3/20/2017	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

-L-
PI Sta 88+49.20
Δ = 14° 24' 28.5" (RT)
D = 0' 55' 53.9"
L = 1,546.51'
T = 777.36'
R = 6,150.00'
e = RC
Runoff = 72'

-Y5-
PI Sta 13+57.74
Δ = 18° 38' 40.7" (RT)
D = 9' 32' 57.5"
L = 195.25'
T = 98.49'
R = 600.00'
e = RC
Runoff = 80'

-Y6-
PI Sta 11+42.46
Δ = 16° 58' 33.5" (RT)
D = 11' 27' 33.0"
L = 148.14'
T = 74.62'
R = 500.00'
e = RC
Runoff = 46'

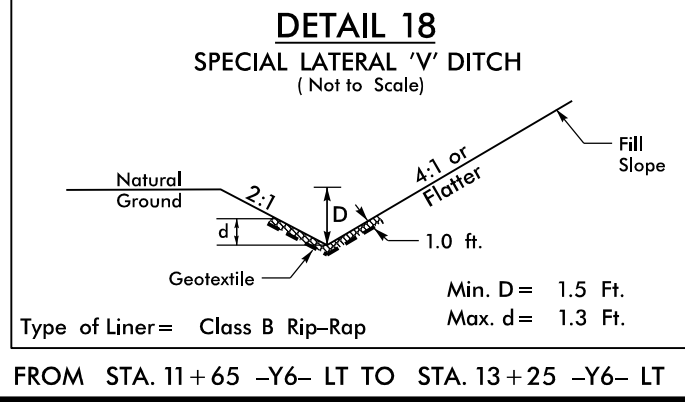
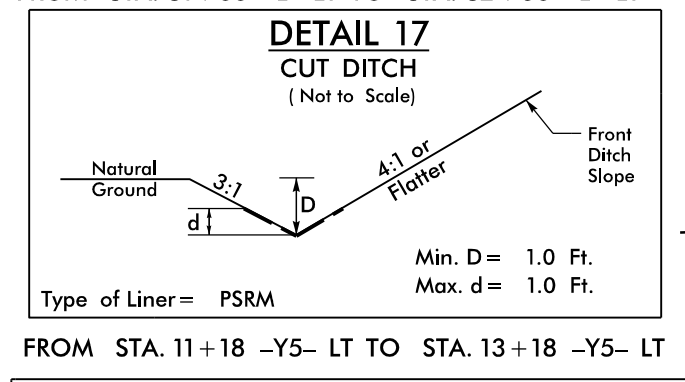
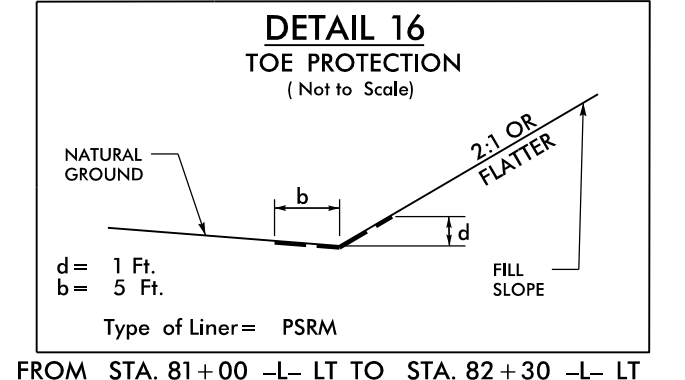
NAD 83
NSRS 2007

MATCHLINE -L- STA. 76+75.00 SEE SHEET 8

MATCHLINE -L- STA. 90+50.00 SEE SHEET 10

2016 AVERAGE TRAFFIC DIAGRAM
2036 DAILY TRAFFIC

-Y5- BETHANEY CHURCH RD		3,674 4,859	
-L- NC 16	459 607	2,207 2,726	
10,159 16,309	130 204	1,267 1,933	13,044 20,156
-Y6- SMYRE FARM RD		2,404 3,663	



REVISIONS

3/16/2017
R:\Roadway\Proje\3100b_rdy_PSH09.dgn
rschield

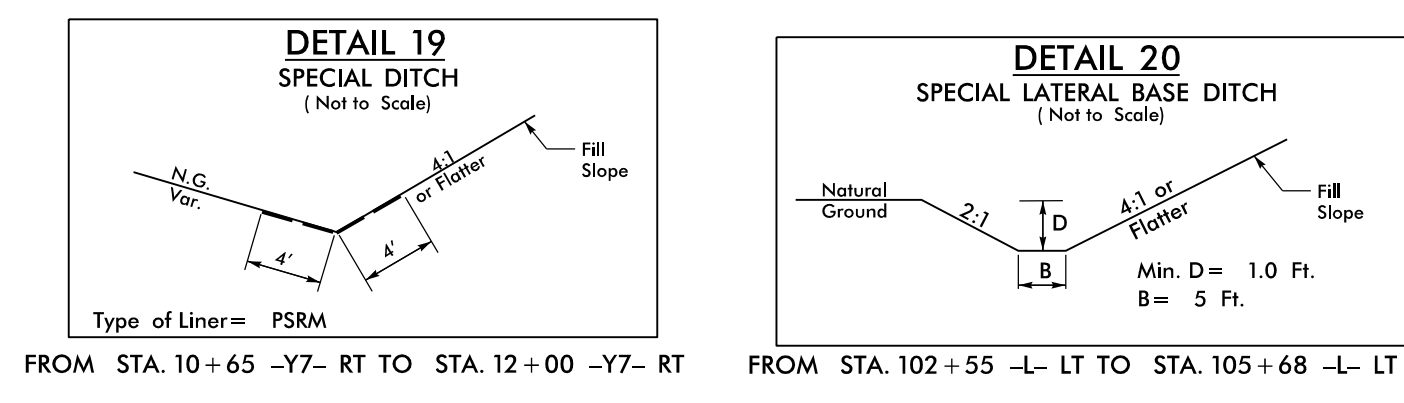
★ PROPOSED SIGNAL

FOR -L- PROFILE SEE SHEET 20
FOR -Y5- PROFILE SEE SHEET 25
FOR -Y6- PROFILE SEE SHEET 25
FOR CONC. MONO-ISLAND DETAIL SEE SHEET 2B-2
CONTAMINATED AREAS WILL BE HANDLED BY
THE NCDOT GEOMONITORING UNIT

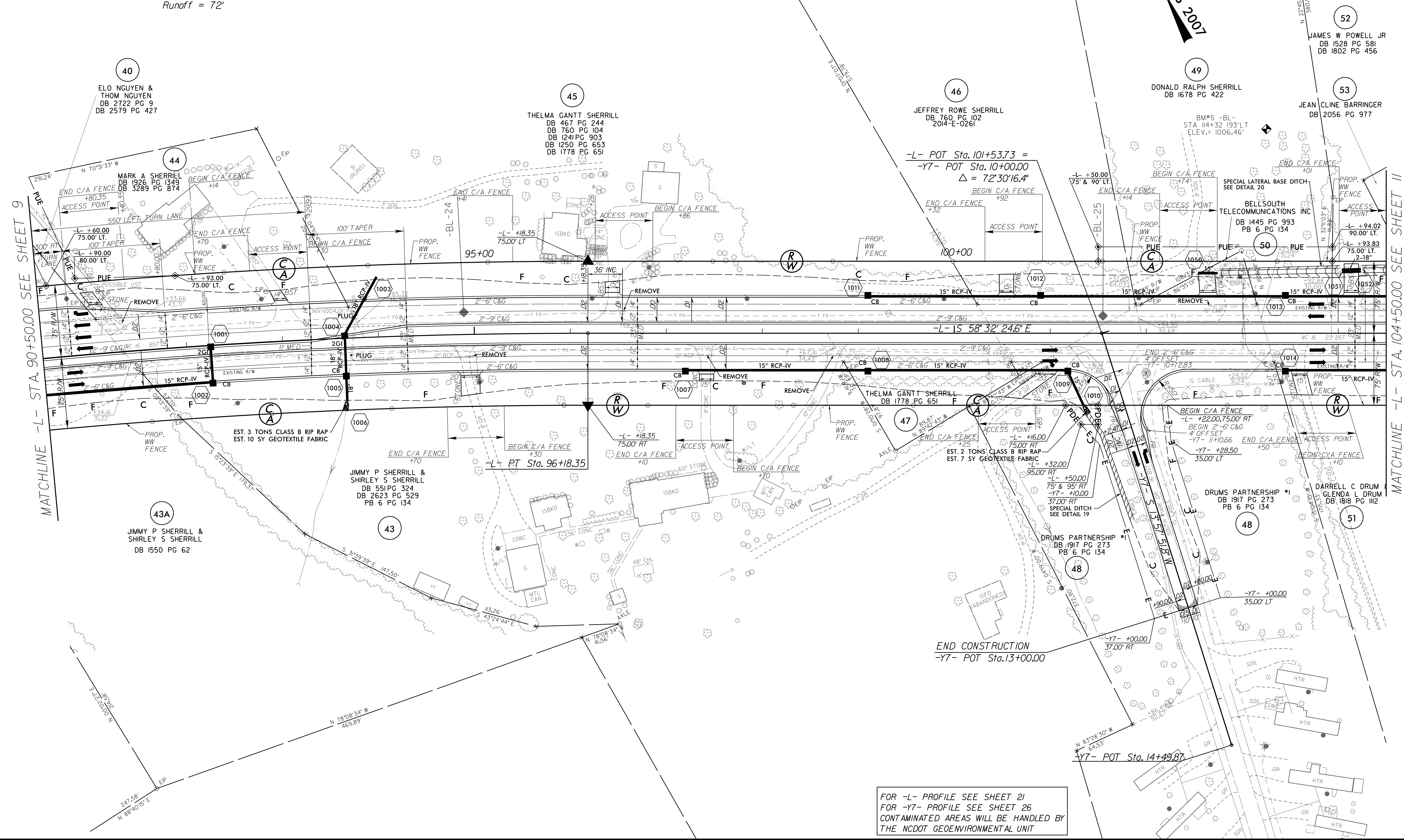
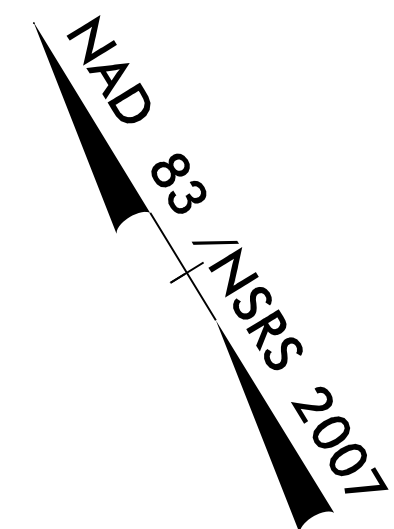
8/17/99

Prepared by
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TELEPHONE: (919) 461-1100 FAX: (919) 461-1415
NO. L10266E - C-2243

PROJECT REFERENCE NO. R-3100B		SHEET NO. 10	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		SEAL 18470 EDWARD GLENN EDWARDS JR. ENGINEER 3/16/2017	
		SEAL 037863 MEME D. BUSCENI ENGINEER 3/20/2017	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



-L-
PI Sta 88+49.20
 $\Delta = 14' 24'' 28.5'' (RT)$
 $D = 0' 55'' 53.9''$
 $L = 1,546.51'$
 $T = 777.36'$
 $R = 6,150.00'$
 $e = RC$
Runoff = 72'



FOR -L- PROFILE SEE SHEET 21
FOR -Y7- PROFILE SEE SHEET 26
CONTAMINATED AREAS WILL BE HANDLED BY
THE NCDOT GEOENVIRONMENTAL UNIT

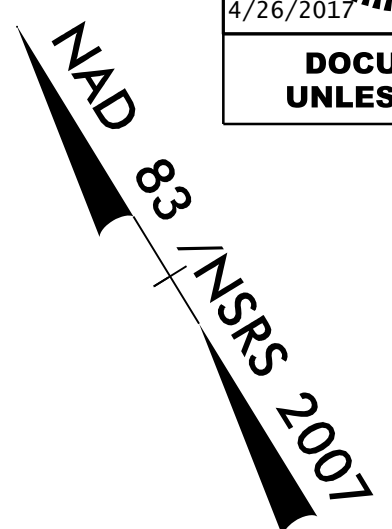
REVISIONS

3/16/2017
R:\Roadway\Pro\A-3100b_rdy_PSH10.dgn
rscheild

8/17/99

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URS
URS Corporation - North Carolina
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Morrisville, North Carolina 27560
TELEPHONE: (919) 461-1100 FAX: (919) 461-1415
NO. LICENSE: C-22943

PROJECT REFERENCE NO. R-3100B		SHEET NO. 11	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		SEAL 18470 EDWARD GLENN EDWARDS JR. ENGINEER 4/26/2017	
		SEAL 037863 MEME D. BUSCENI ENGINEER 4/27/2017	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

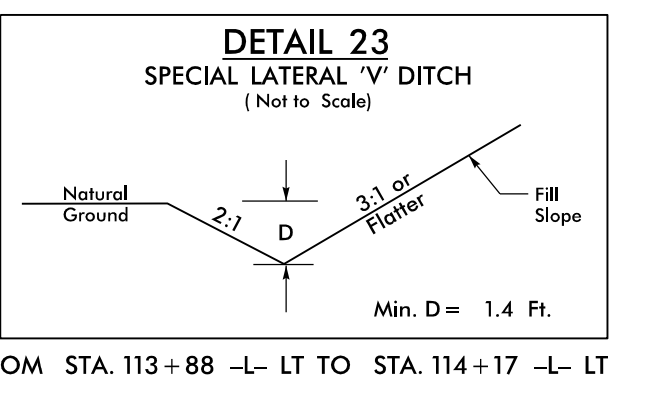
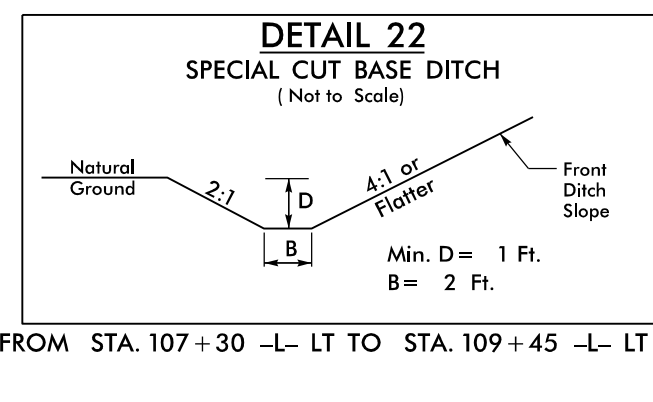
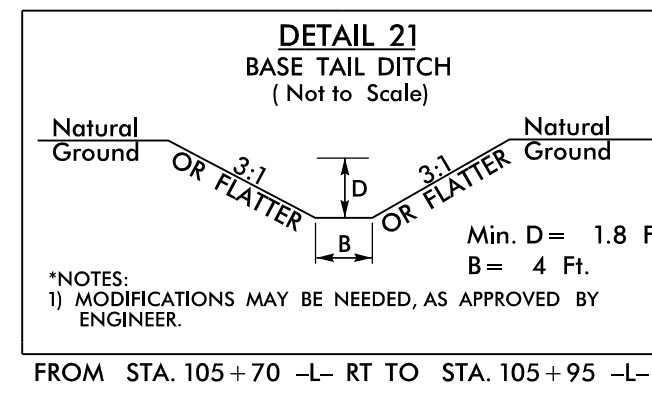
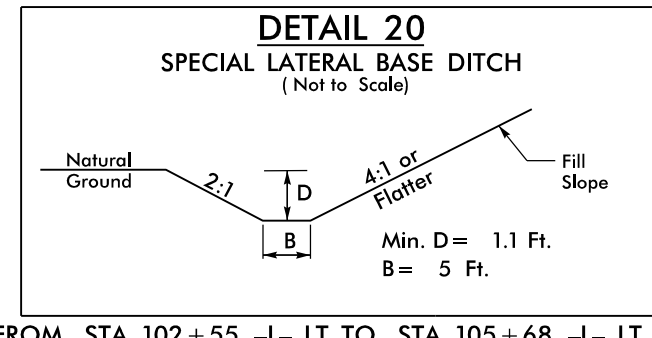
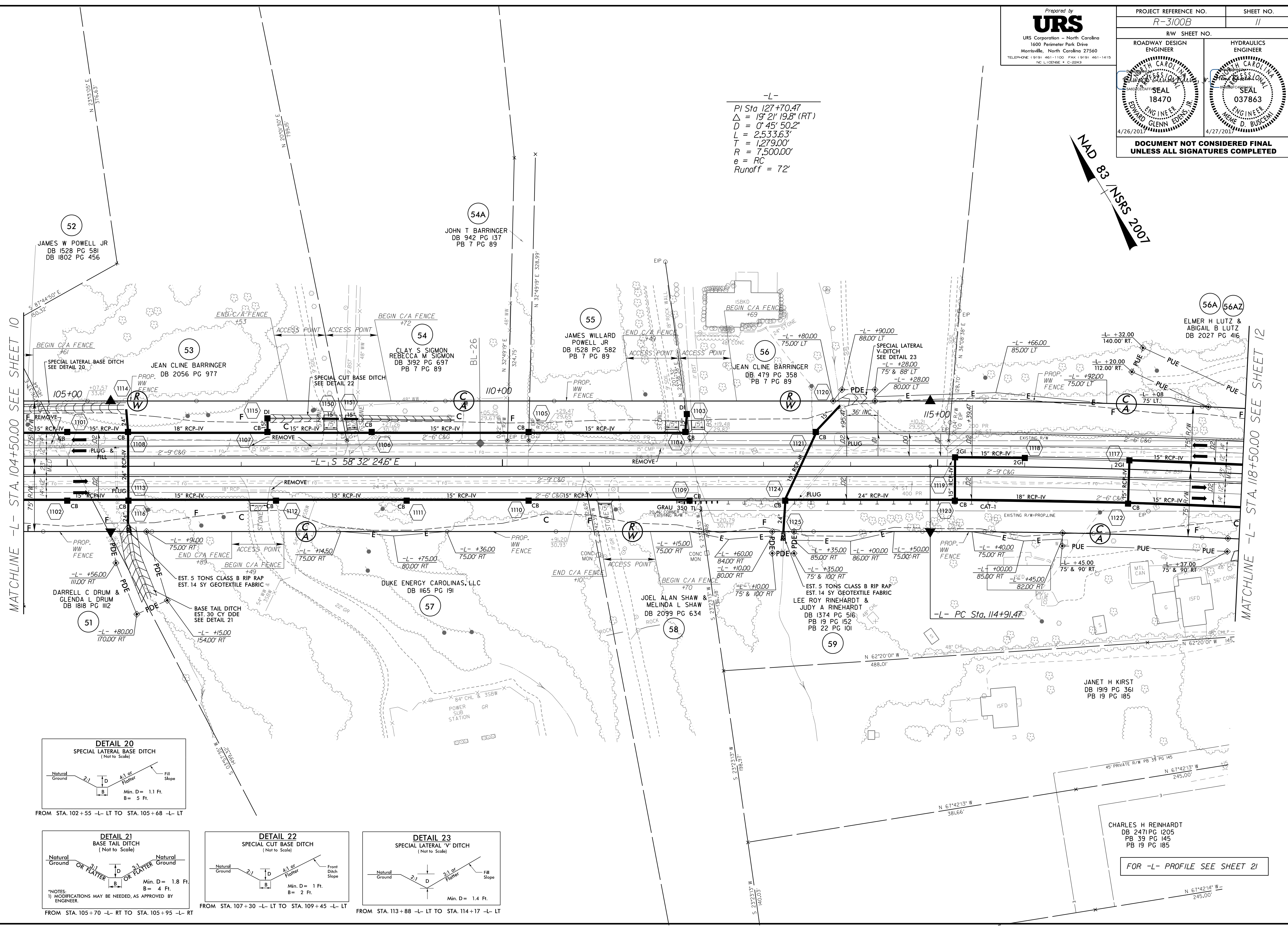


-L-
 PI Sta 127+70.47
 $\Delta = 19^\circ 21' 19.8" (RT)$
 $D = 0^\circ 45' 50.2"$
 $L = 2,533.63'$
 $T = 1,279.00'$
 $R = 7,500.00'$
 $e = RC$
 $Runoff = 72'$

REVISIONS
ROW REV. ON LET. PROJECT - APRIL 27, 2017 - REVISED PUE ALONG PACEL 56A AND ADDED PARCEL NUMBER 56AZ (EGE)

MATCHLINE -L- STA. 104+50.00 SEE SHEET 10

MATCHLINE -L- STA. 118+50.00 SEE SHEET 12



*NOTES:
1) MODIFICATIONS MAY BE NEEDED, AS APPROVED BY ENGINEER.

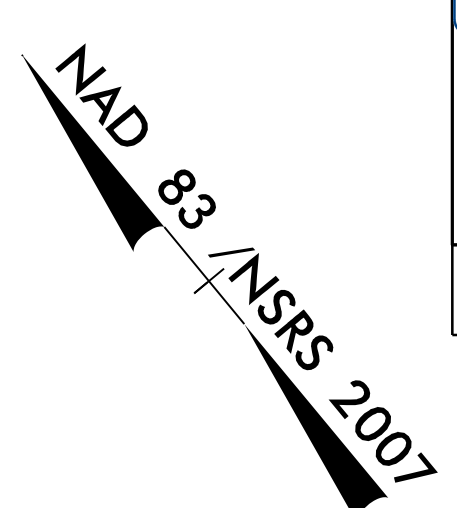
FOR -L- PROFILE SEE SHEET 21

4/26/2017
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rscheid

8/17/99

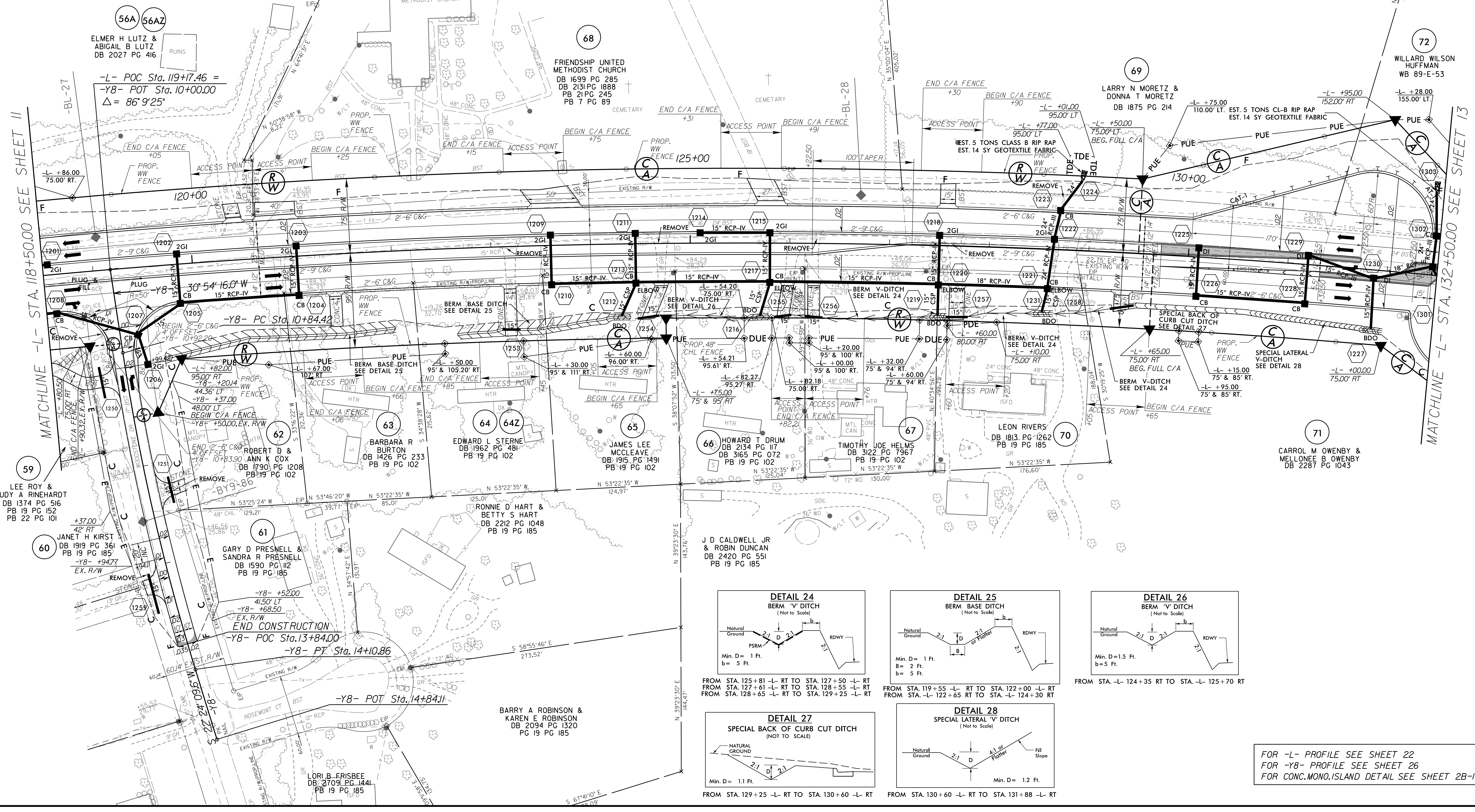
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URS Corporation - North Carolina
1600 Perimeter Park Drive
Morrisville, North Carolina 27560
TELEPHONE (919) 461-1100 FAX (919) 461-1415
NC LICENSE # C-22943

PROJECT REFERENCE NO. R-3100B	SHEET NO. 12
R/W SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



-L-
PI Sta 127+70.47
 $\Delta = 19' 21'' 19.8''$ (RT)
D = 0' 45' 50.2"
L = 2,533.63'
T = 1,279.00'
R = 7,500.00'
e = RC
Runoff = 72'

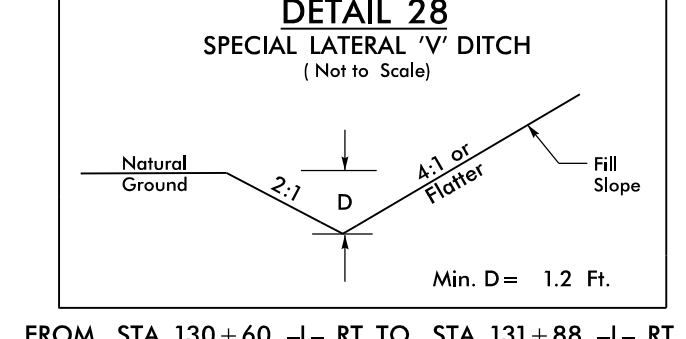
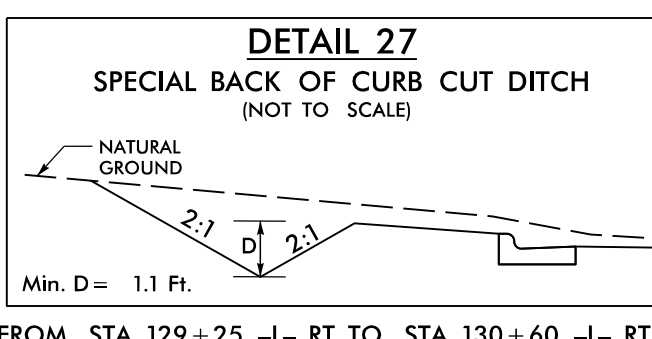
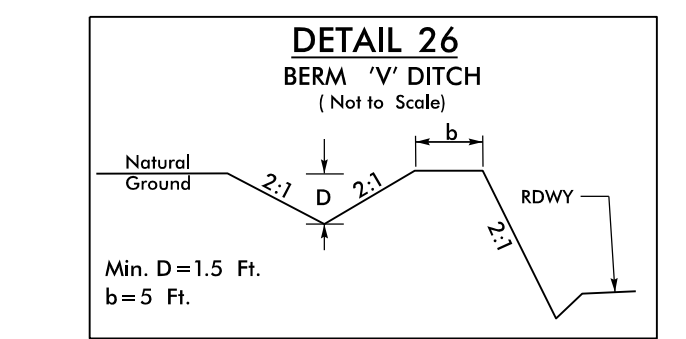
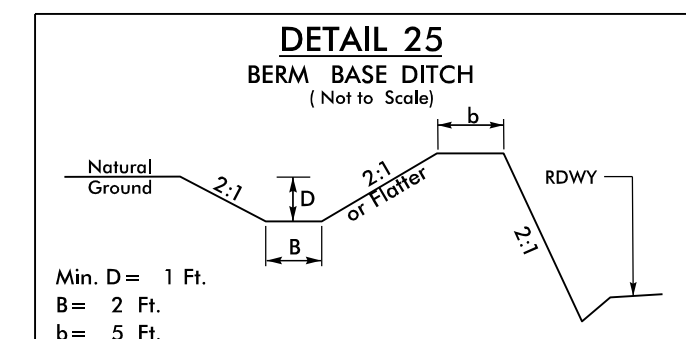
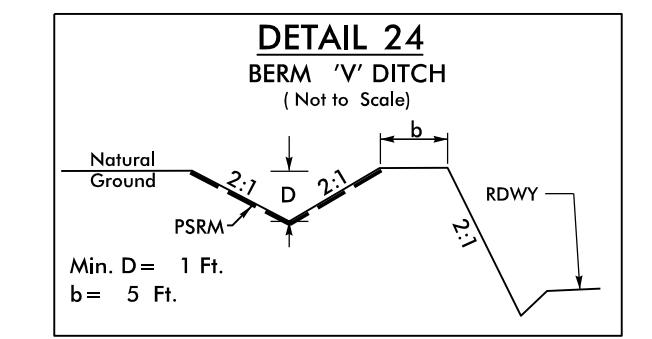
-Y8-
PI Sta 12+47.94
 $\Delta = 8' 30'' 06.4''$ (LT)
D = 2' 36' 15.7"
L = 326.44'
T = 163.52'
R = 2,200.00'
e = RC
Runoff = 40'



REVISIONS
FROM REV. ON LET PROJECT - APRIL 27, 2017 - REVISED PUE ALONG PACEL 56A, 62, 63, 64, AND ADDED PARCEL NUMBERS 56AZ AND 64Z (EGE)

MATCHLINE -L- STA. 118+50.00 SEE SHEET 11

MATCHLINE -L- STA. 132+50.00 SEE SHEET 13

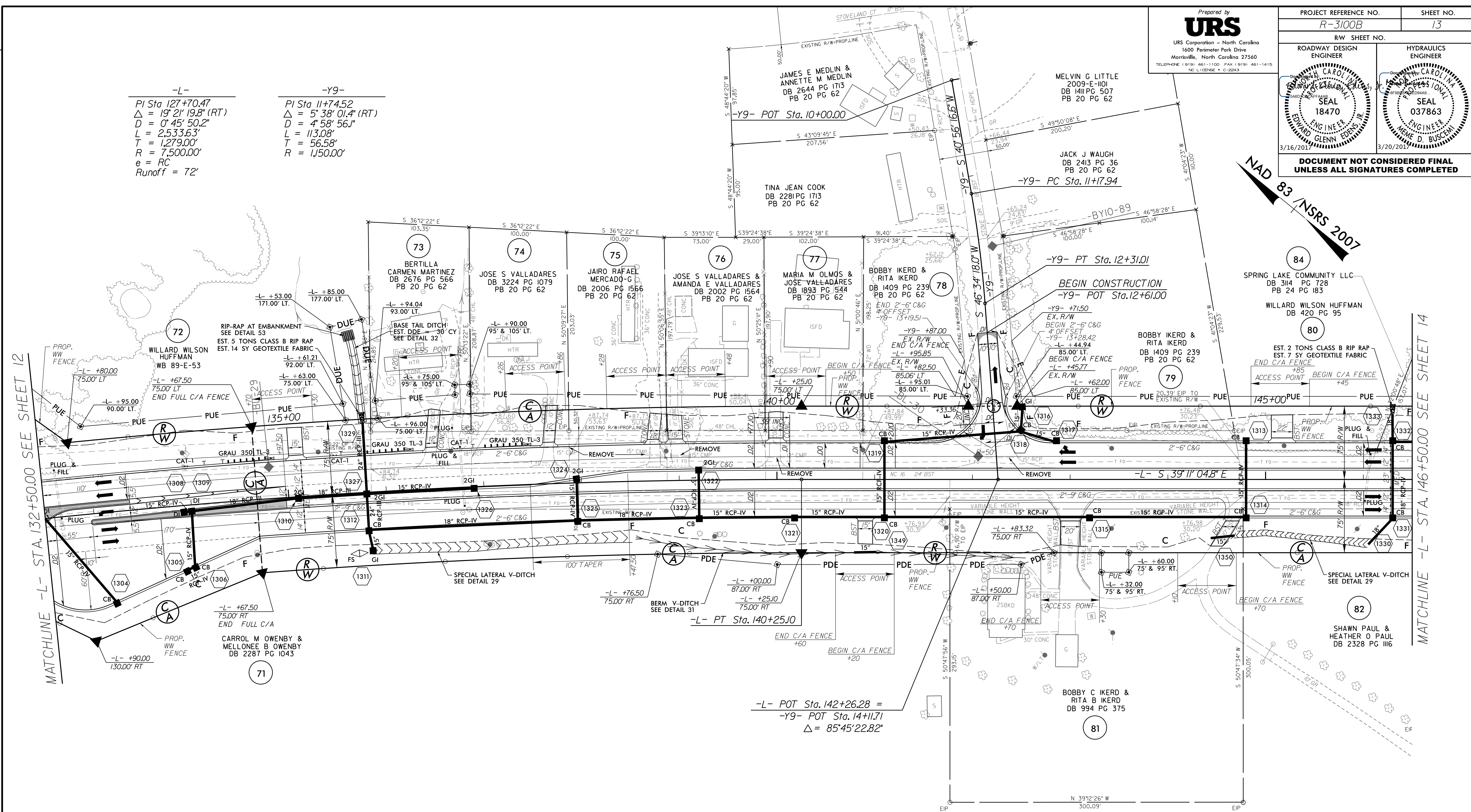


FOR -L- PROFILE SEE SHEET 22
FOR -Y8- PROFILE SEE SHEET 26
FOR CONC. MONO. ISLAND DETAIL SEE SHEET 2B-1

4/26/2017
R:\Roadway\Proj\Ar-3100b_rdy_PSH12.dgn
rscheid

PROJECT REFERENCE NO. R-3100B	SHEET NO. 13
R/W SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

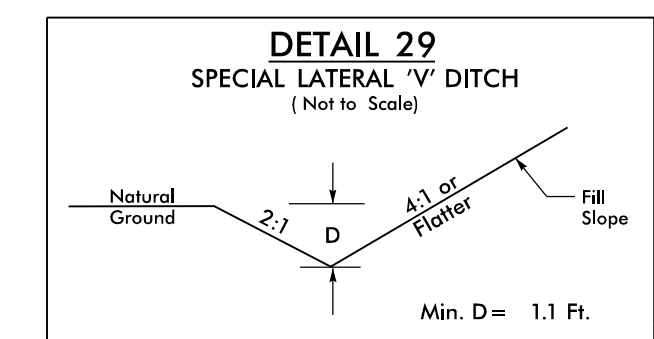
-L-	-Y9-
PI Sta 127+70.47	PI Sta 11+74.52
$\Delta = 19^{\circ} 21' 19.8''$ (RT)	$\Delta = 5^{\circ} 38' 01.4''$ (RT)
D = 0' 45' 50.2"	D = 4' 58' 56.1"
L = 2,533.63'	L = 113.08'
T = 1,279.00'	T = 56.58'
R = 7,500.00'	R = 1,150.00'
e = RC	
Runoff = 72'	



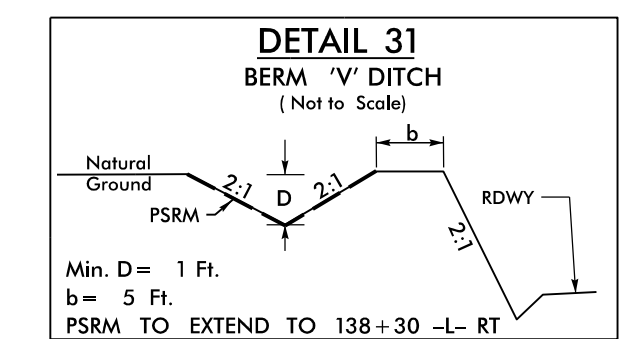
REVISIONS

MATCHLINE -L- STA. 132+50.00 SEE SHEET 12

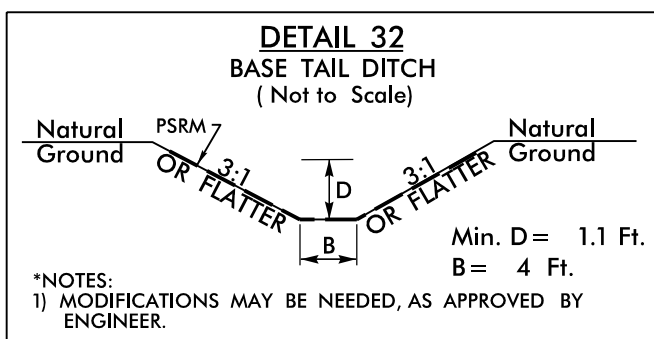
MATCHLINE -L- STA. 146+50.00 SEE SHEET 14



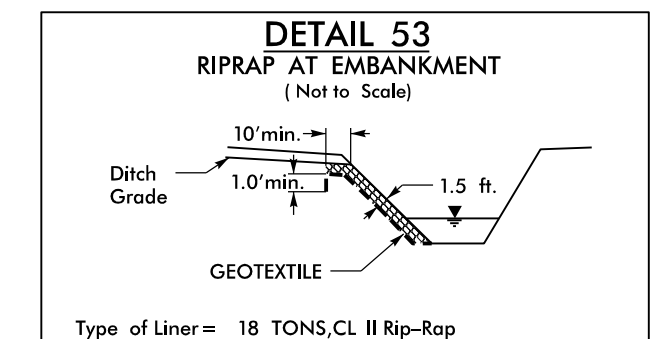
FROM STA. 135+83 -L- RT TO STA. 138+50 -L- RT
 FROM STA. 144+68 -L- RT TO STA. 146+05 -L- RT



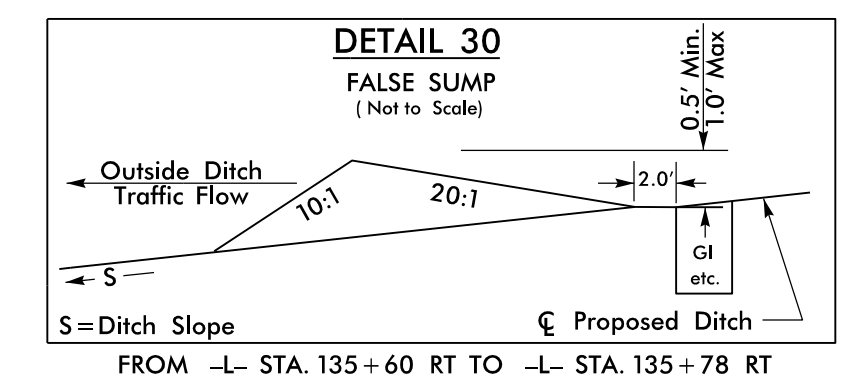
FROM STA. 138+50 -L- RT TO STA. 142+53 -L- RT



FROM STA. 135+70 -L- RT TO STA. 135+80 -L- RT



FROM STA. 135+70 -L- LT TO STA. 135+80 -L- LT



FROM -L- STA. 135+60 RT TO -L- STA. 135+78 RT

FOR -L- PROFILE SEE SHEET 22
 FOR -Y9- PROFILE SEE SHEET 26
 FOR CONC. MONOISLAND DETAIL SEE SHEET 2B-1

8/17/99

REVISIONS

FROM REV. ON LET PROJECT - APRIL 27, 2017 - REVISED PUE ALONG PARCEL 84 AND ADDED PARCEL NUMBER 84Z (EGE)
FROM REV. ON LET PROJECT - JULY 6, 2017 - ADDED MISSING DUE AND PUE LINES AND A MARKER ON PARCEL 84Z (EGE)

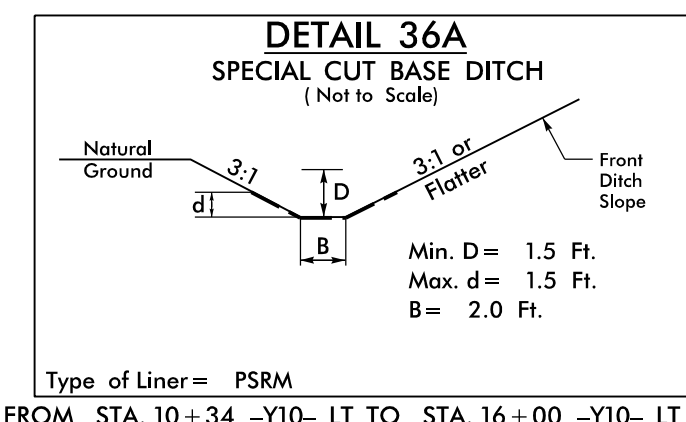
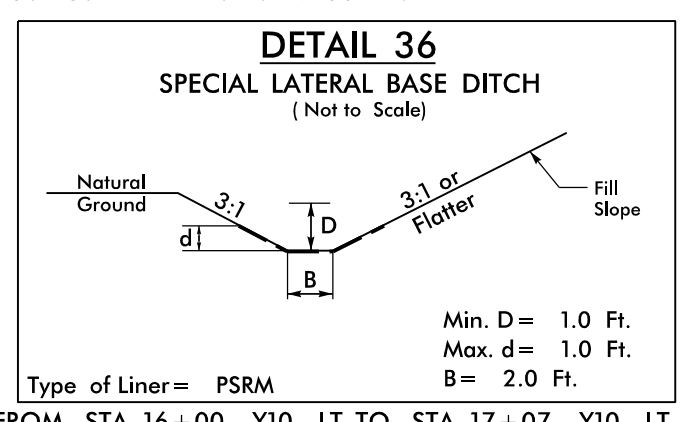
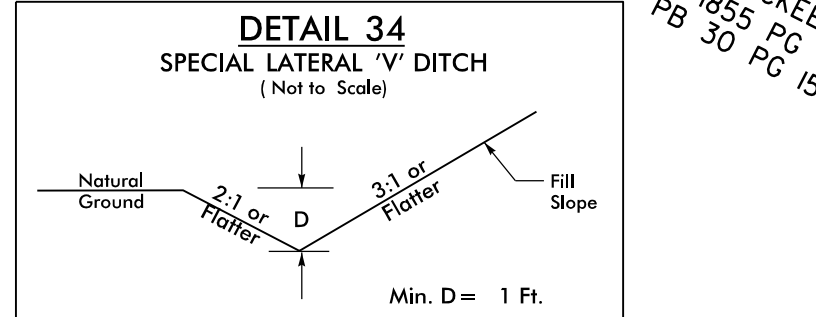
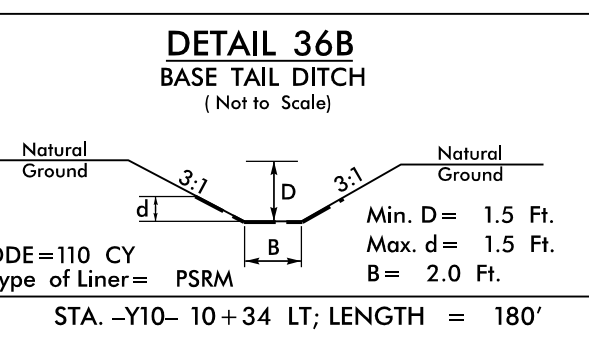
7/5/2017
R:\Roadway\Pro\17-3100b_rdy_PSH14.dgn
rscheid

MATCHLINE -Y10- STA. 11+70.00 SEE INSET

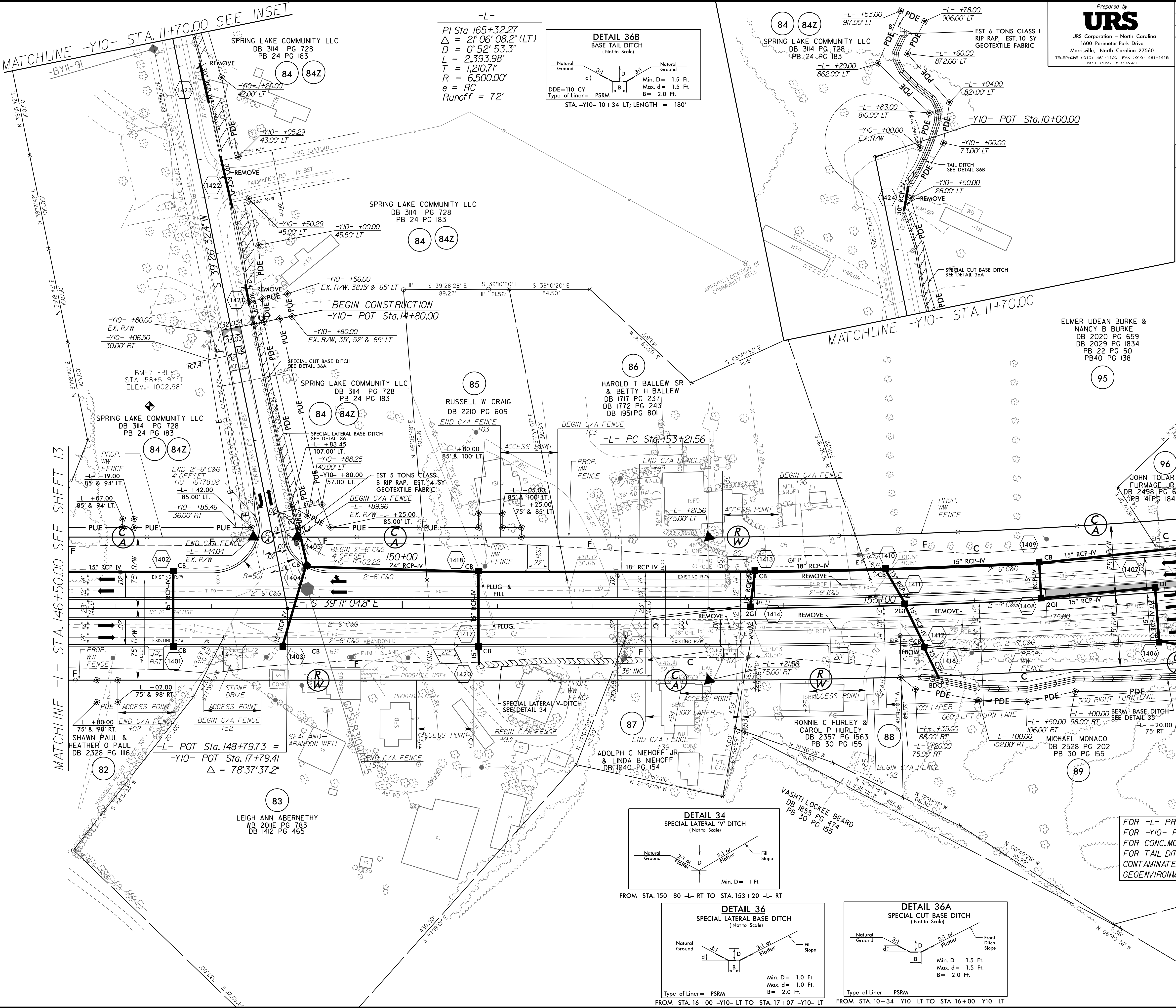
MATCHLINE -L- STA. 146+50.00 SEE SHEET 13

MATCHLINE -L- STA. 158+30.00 SEE SHEET 15

-L-
PI Sta 165+32.27
 $\Delta = 21^{\circ}06'08.2''$ (LT)
 $D = 0^{\circ}52'53.3''$
 $L = 2,393.98'$
 $T = 1,210.71'$
 $R = 6,500.00'$
 $e = RC$
Runoff = 72'



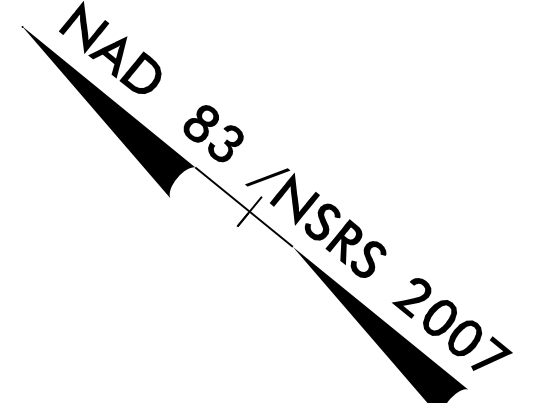
FOR -L- PROFILE SEE SHEET 23
FOR -Y10- PROFILE SEE SHEET 26
FOR CONC. MONO-ISLAND DETAIL SEE SHEET 2B-2
FOR TAIL DITCH ALIGNMENT DETAILS SEE SHEET 2D-2
CONTAMINATED AREAS WILL BE HANDLED BY THE NCDOT
GEOENVIRONMENTAL UNIT



Prepared by
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Morrisville, North Carolina 27560
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NC L10265E • C-2294

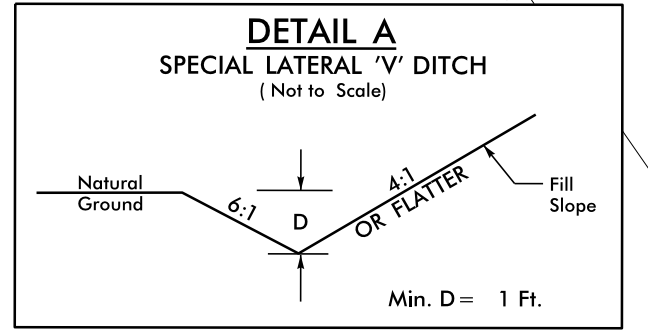
PROJECT REFERENCE NO.	R-3100B
SHEET NO.	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY: MEME D. BUSCEMI PE 037863 ON APRIL 27, 2017 THIS MEDIA SHALL NOT BE CONSIDERED A CERTIFIED DOCUMENT.	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

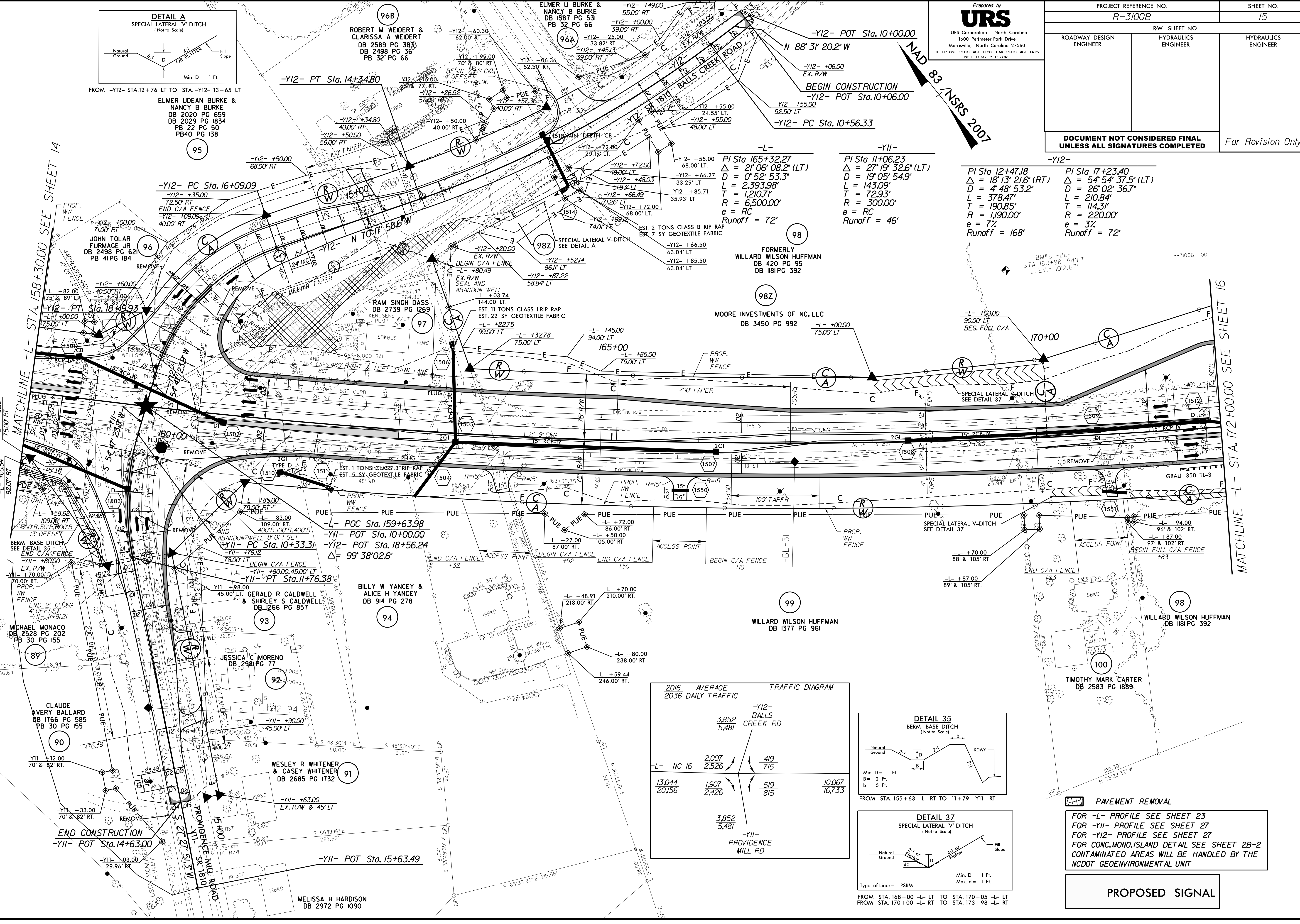


PROJECT REFERENCE NO. R-3100B		SHEET NO. 15
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
For Revision Only		

Prepared by
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URS Corporation - North Carolina
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Morrisville, North Carolina 27560
TELEPHONE: (919) 461-1100 FAX: (919) 461-1415
NC LICENSE # C-2243



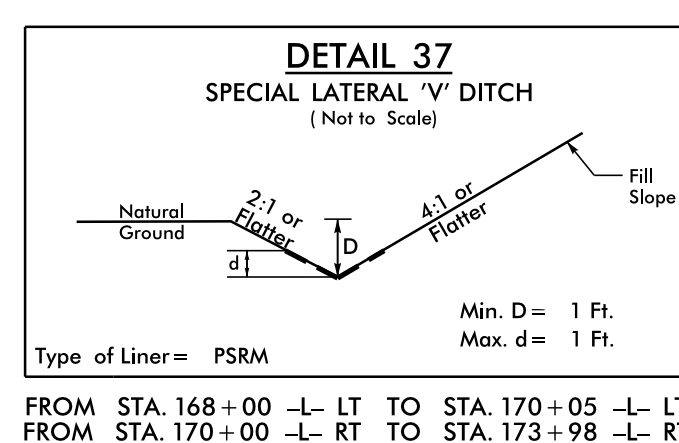
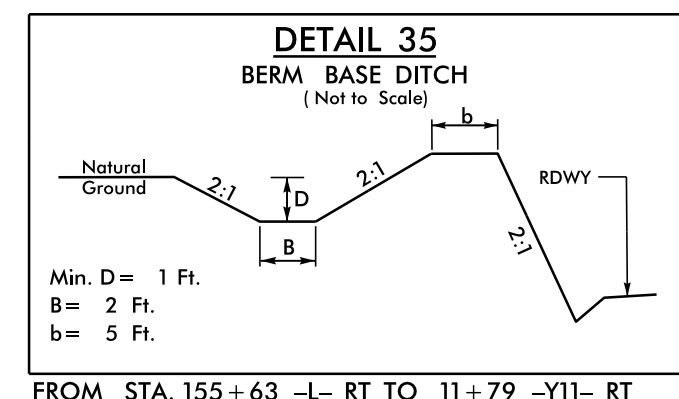
FROM -Y12- STA.12+76 LT TO STA.-Y12- 13+65 LT
ELMER UDEAN BURKE & NANCY B BURKE
DB 2020 PG 659
DB 2029 PG 1834
PB 22 PG 50
PB40 PG 138



REVISIONS
DATE: 3/18/2020 - CONSTRUCTION REVISION - EXTENDED CURB & GUTTER -Y12- BACK TO 12+46.96 AND ADDED 15' RCP-V AT -Y12- 12+76;
3/18/2020 - R/W REVISION - ADDED PERMANENT DRAINAGE EASEMENT AND TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 98Z
6/10/2020 - R/W REVISION - CHANGED OWNER NAME AND DEED BOOK CALL OUT ON PARCEL 98Z/98Z

2016 AVERAGE TRAFFIC DIAGRAM
2036 DAILY TRAFFIC

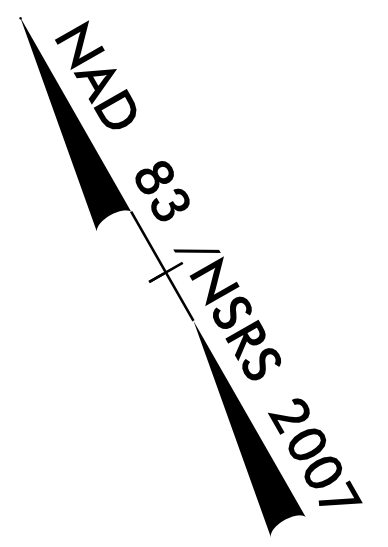
-Y12- BALLS CREEK RD	3,852 / 5,481	419 / 715
-Y11- PROVIDENCE MILL RD	3,852 / 5,481	519 / 815
-L- NC 16	2,007 / 2,526	13,044 / 20,156
	1,907 / 2,426	10,067 / 16,733



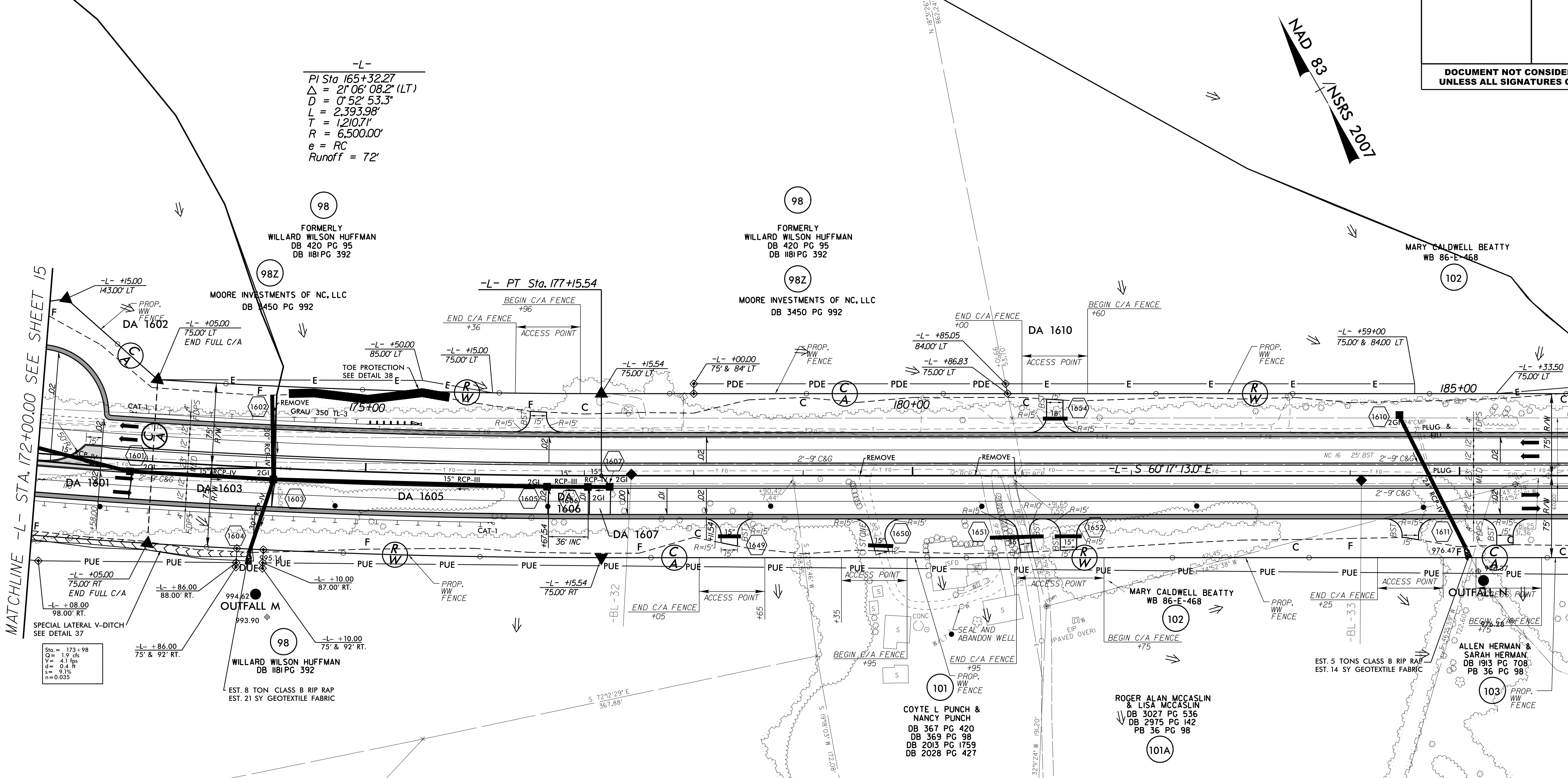
FOR -L- PROFILE SEE SHEET 23
FOR -Y11- PROFILE SEE SHEET 27
FOR -Y12- PROFILE SEE SHEET 27
FOR CONC.MONO.ISLAND DETAIL SEE SHEET 2B-2
CONTAMINATED AREAS WILL BE HANDLED BY THE
NCDOT GEOENVIRONMENTAL UNIT

PROPOSED SIGNAL

09-JUN-2020 11:55
R:\PROJECTS\2020\155\155-3100b-rdw_PSH15.dgn
R:\PROJECTS\2020\155\155-3100b-rdw_PSH15.dgn



-L-
 PI Sta. 165+32.27
 $\Delta = 2^{\circ}06'08.2''$ (LT)
 $D = 0^{\circ}52'53.3''$
 $L = 2,393.98'$
 $T = 1,210.71'$
 $R = 6,500.00'$
 $e = RC$
 Runoff = 72'

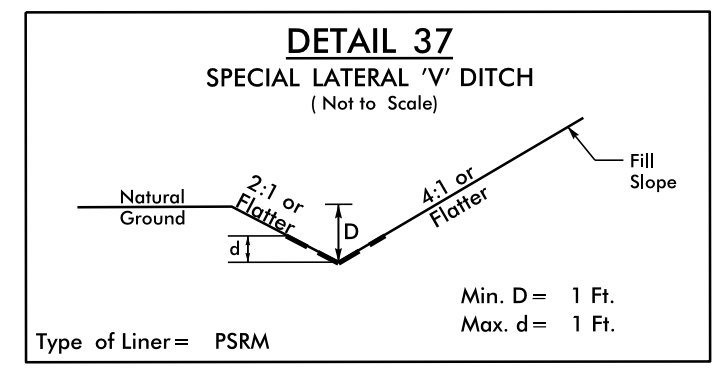


MATCHLINE -L- STA. 172+00.00 SEE SHEET 15

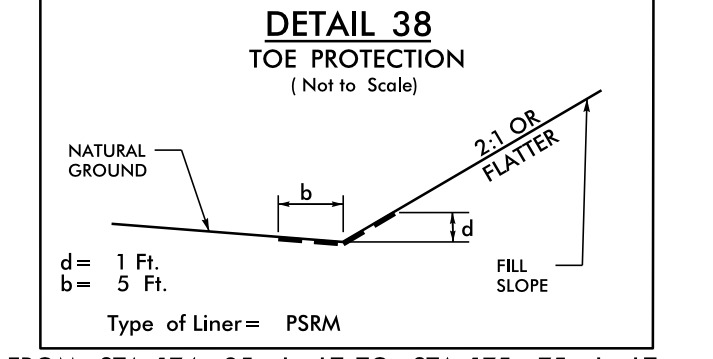
MATCHLINE -L- STA. 186+00.00 SEE SHEET 17

DATE: 6/10/2020 - R/W REVISION - CHANGED OWNER NAME AND DEED BOOK CALL OUT ON PARCEL 98/98Z

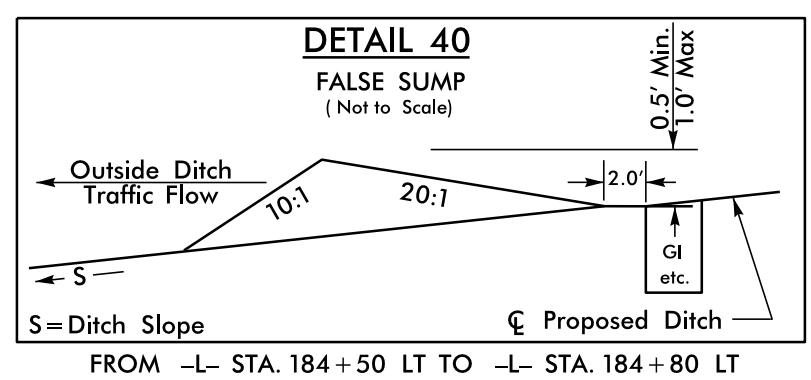
Sta = 173+98
 Q = 1.9 cfs
 V = 4.1 fps
 d = 0.4 ft
 s = 9.1%
 n = 0.025



FROM STA. 168+00 -L- LT TO STA. 170+05 -L- LT
 FROM STA. 170+00 -L- RT TO STA. 173+98 -L- RT



FROM STA. 174+25 -L- LT TO STA. 175+75 -L- LT



FROM -L- STA. 184+50 LT TO -L- STA. 184+80 LT

FOR -L- PROFILE SEE SHEET 24
 FOR CONC. MONO. ISLAND DETAIL SEE SHEET 2B-2

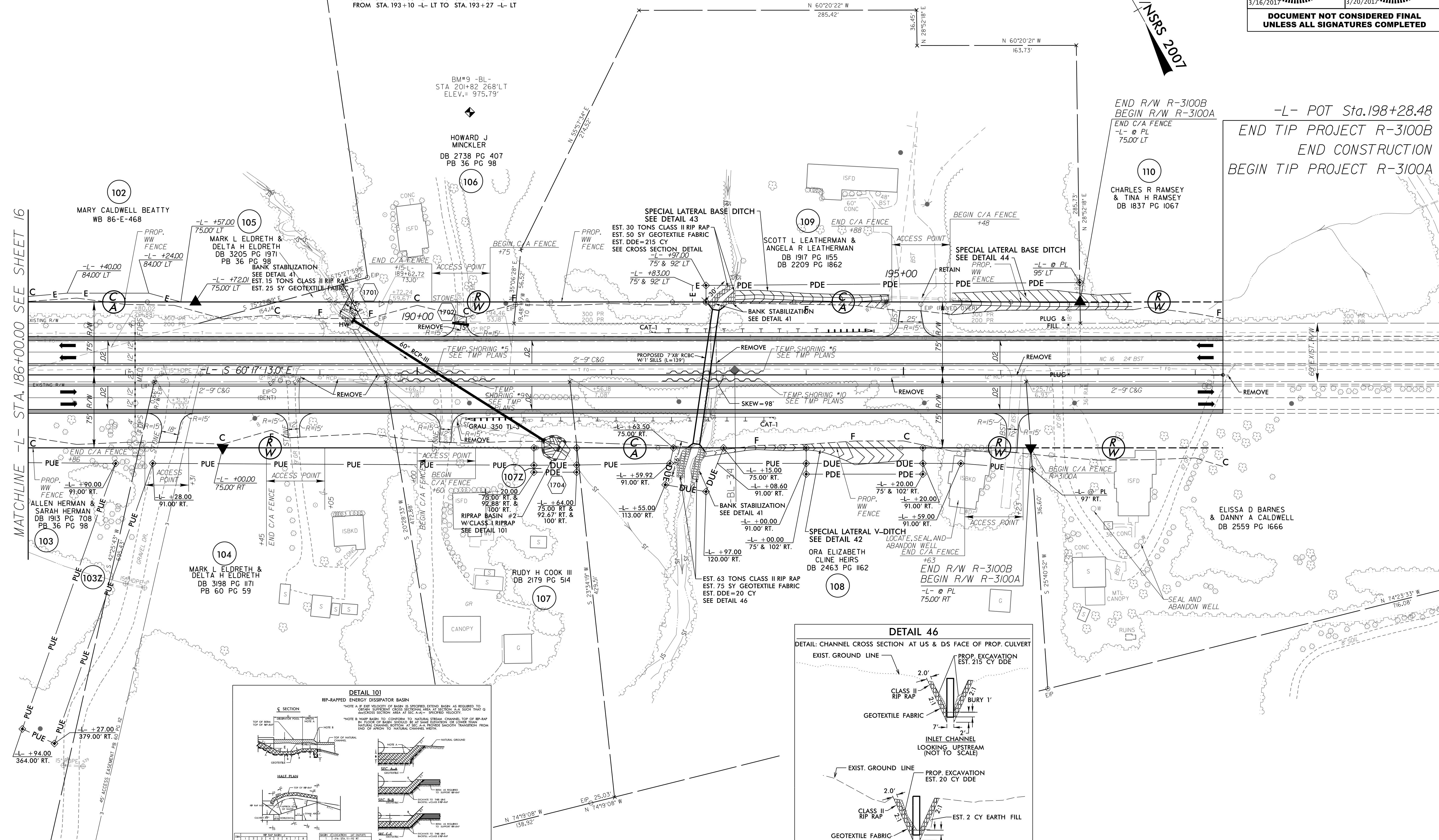
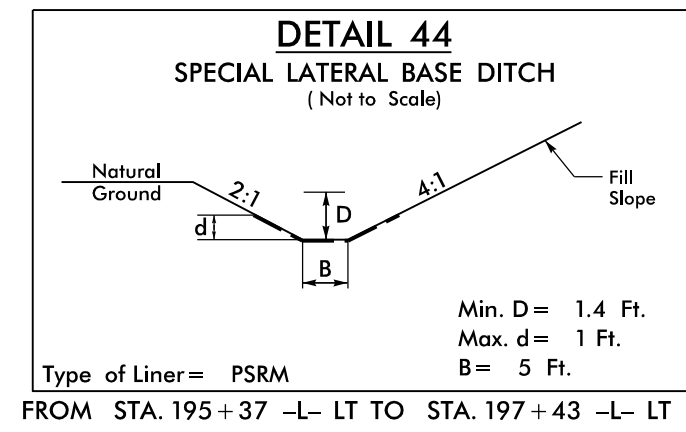
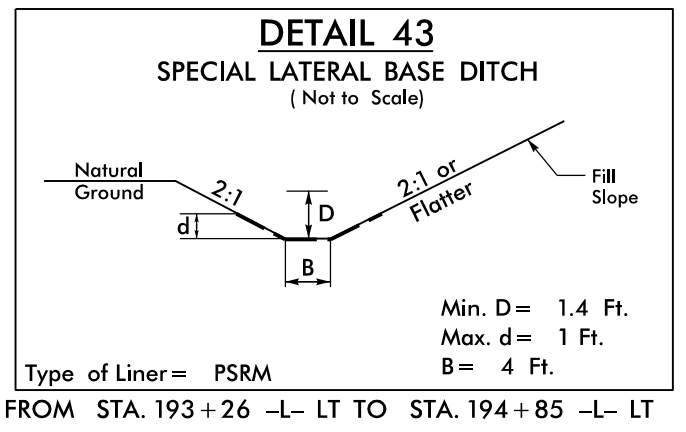
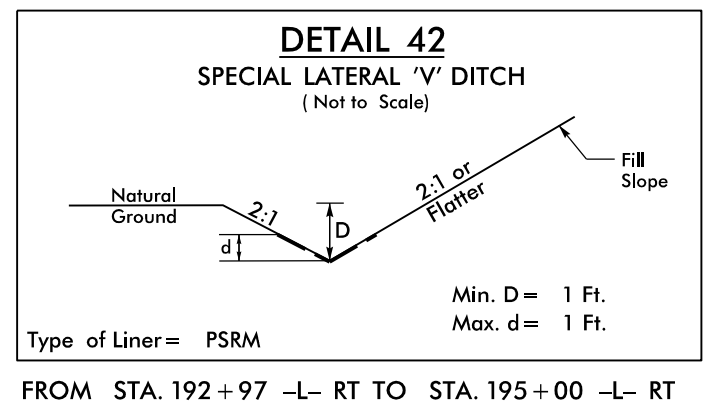
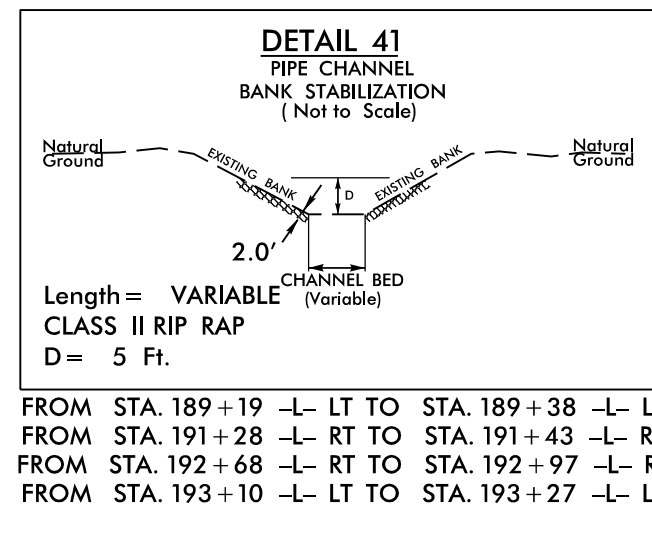
09-JUN-2020 11:59
 V:\3108\p\c\p\SH16.dgn
 16:55:55

8/17/99

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URS Corporation - North Carolina
1600 Perimeter Park Drive
Morrisville, North Carolina 27560
TELEPHONE: (919) 461-1100 FAX: (919) 461-1415
NC LIC. # 050466 • C-2243

PROJECT REFERENCE NO. R-3100B	SHEET NO. 17
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 18470	SEAL 037863
EDWARD GLENN EDWARDS JR. ENGINEER	MEME D. BUSCENI ENGINEER
3/16/2017	3/20/2017
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

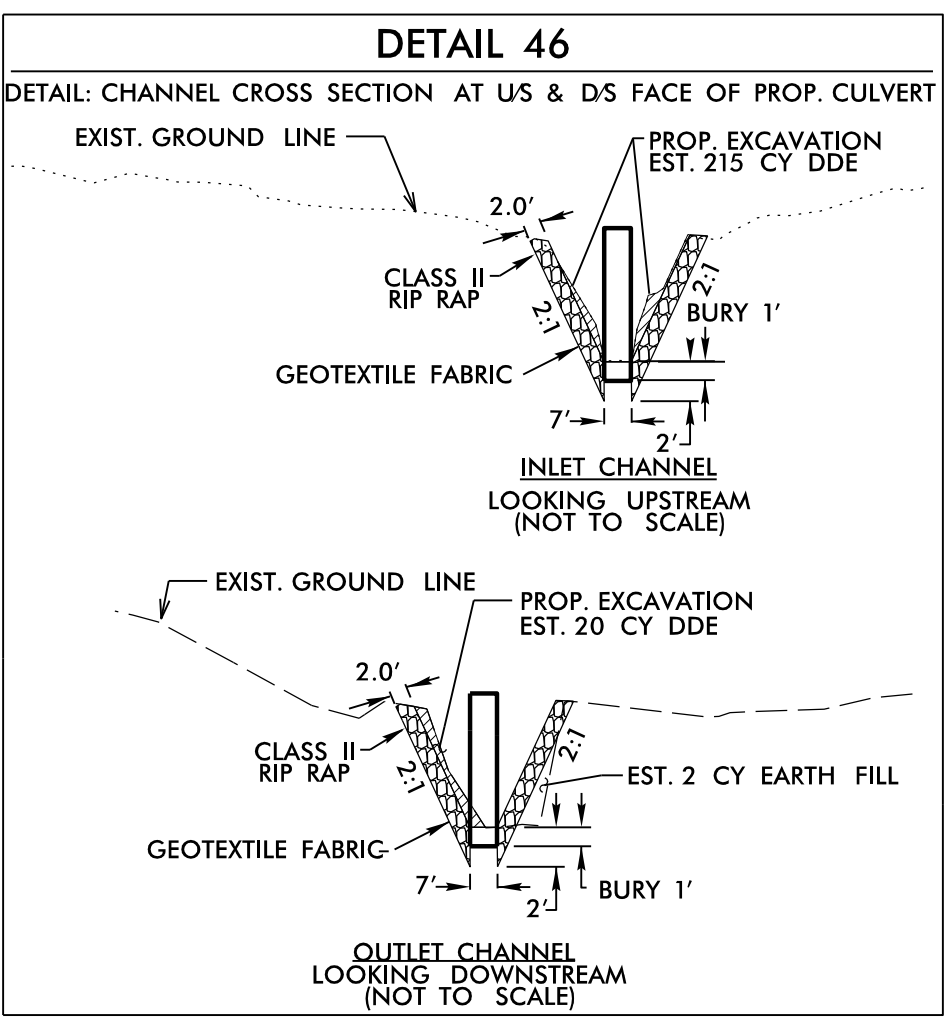
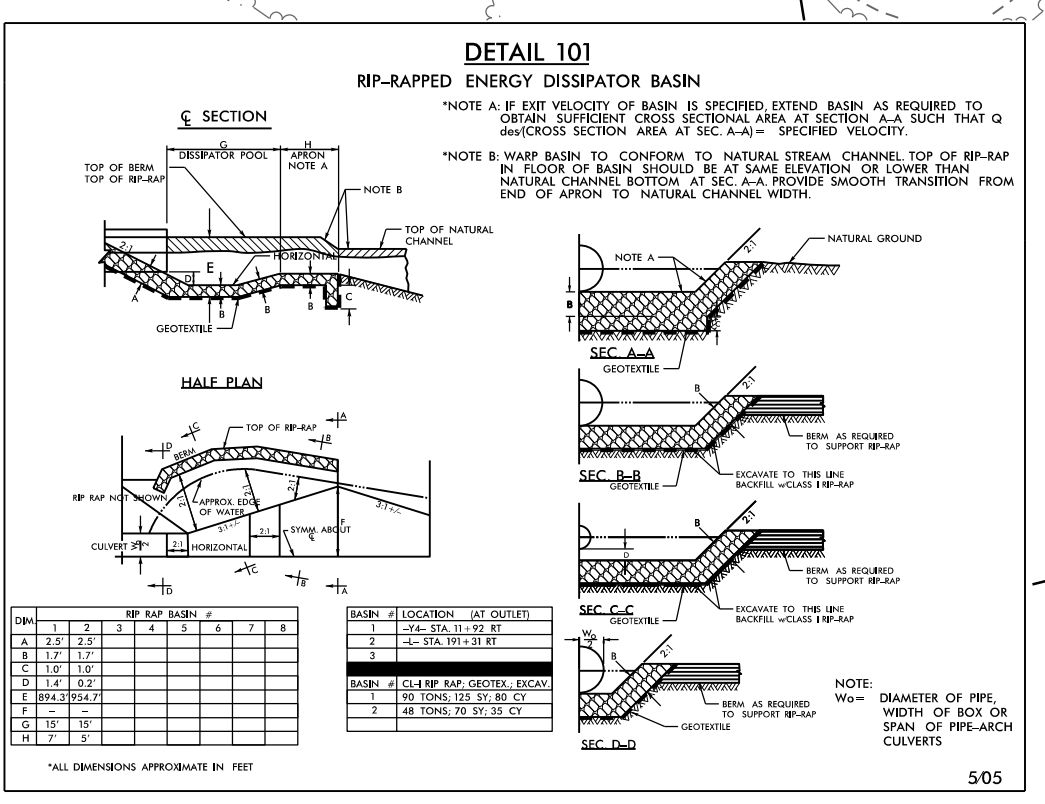
NAD 83 / NSRS 2007



REVISIONS

MATCHLINE -L- STA. 186+00.00 SEE SHEET 16

-L- POT Sta. 198+28.48
END TIP PROJECT R-3100B
END CONSTRUCTION
BEGIN TIP PROJECT R-3100A




FOR -L- PROFILE SEE SHEET 24
FOR CULVERT PLANS SEE SHEETS C-20 THRU C-25

3/16/2017
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rschneid

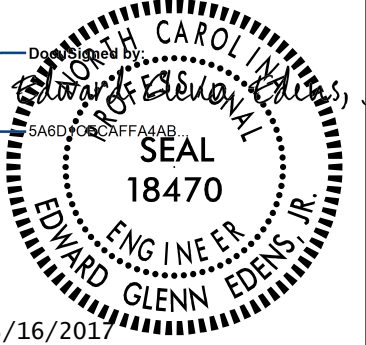
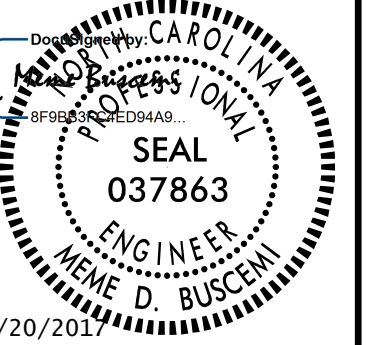
5/28/99

BMI
ELEV = 878.35'
N 697138 E 1349218
-L- STA. 11+43.00 289.00' LT
8" SPIKE IN ROOT OF 36" POPLAR

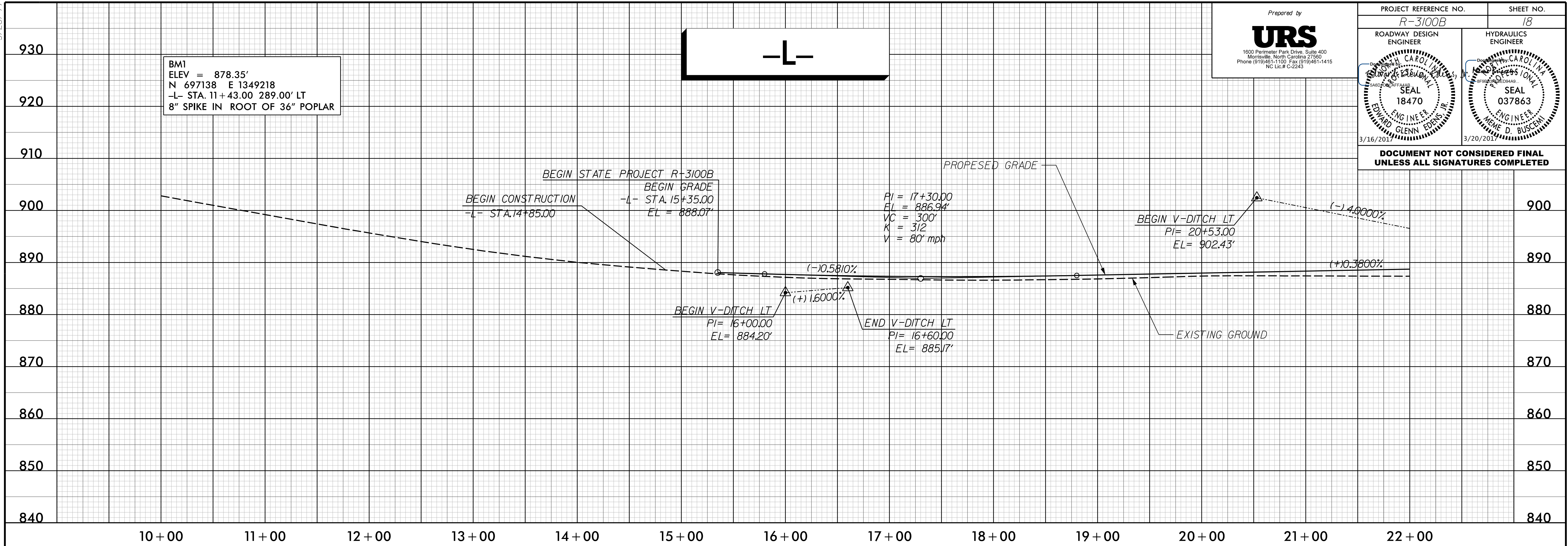
Prepared by



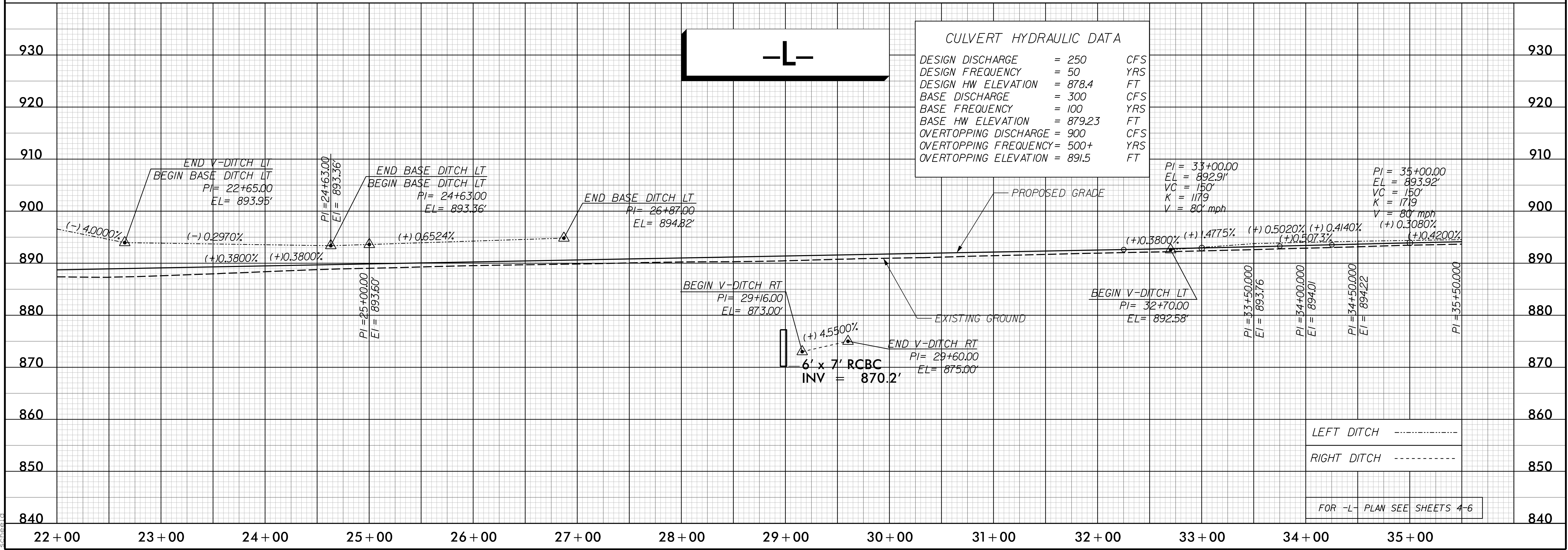
1600 Perimeter Park Drive, Suite 400
Morrisville, North Carolina 27560
Phone (919)461-1100 Fax (919)461-1415
NC Lic.# C-2243

PROJECT REFERENCE NO. R-3100B	SHEET NO. 18
ROADWAY DESIGN ENGINEER  SEAL 18470 EDWARD GLEN EDENS, JR. ENGINEER 3/16/2017	HYDRAULICS ENGINEER  SEAL 037863 NEME D. BUSCEMI ENGINEER 3/20/2017

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CULVERT HYDRAULIC DATA	
DESIGN DISCHARGE	= 250 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 878.4 FT
BASE DISCHARGE	= 300 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 879.23 FT
OVERTOPPING DISCHARGE	= 900 CFS
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING ELEVATION	= 891.5 FT



LEFT DITCH -----

RIGHT DITCH -----

FOR -L- PLAN SEE SHEETS 4-6

3/16/2017
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sheet18

5/28/19

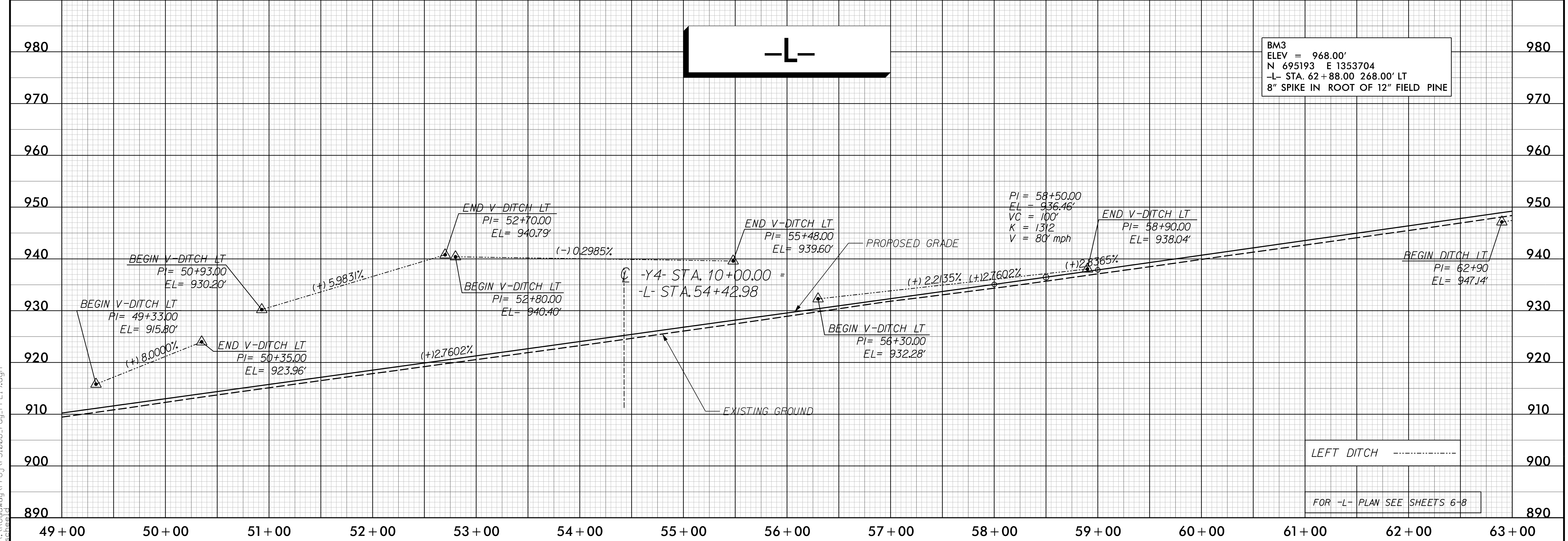
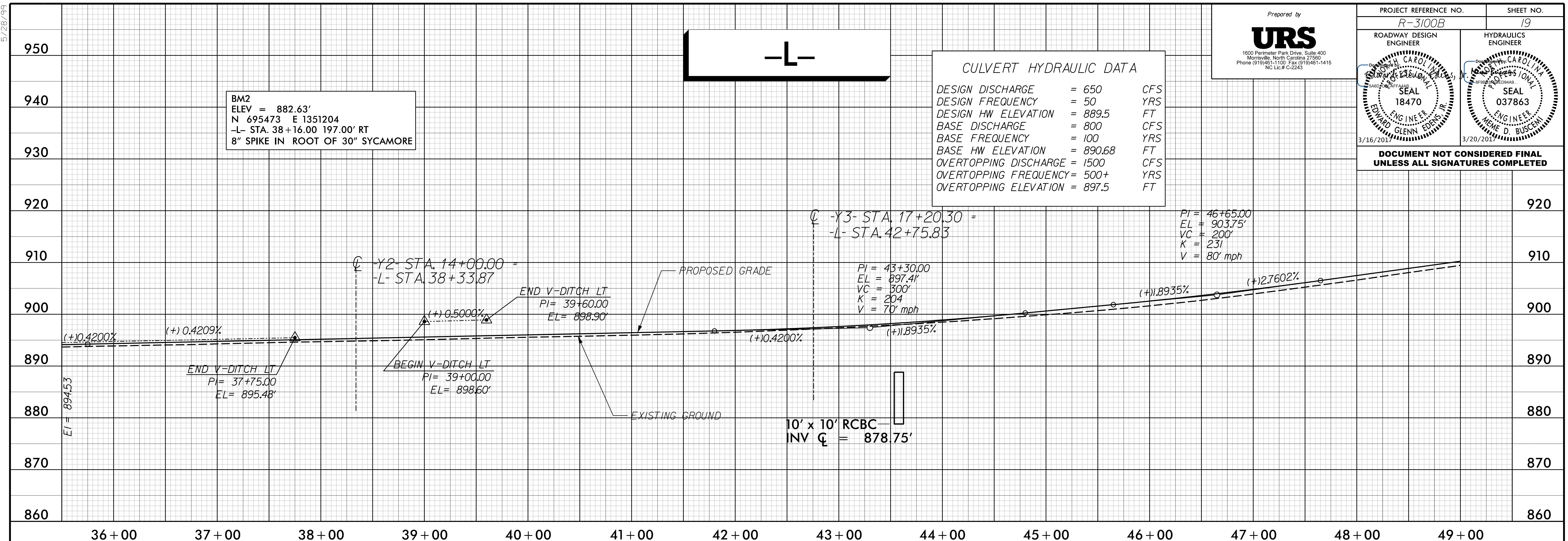
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PROJECT REFERENCE NO. R-3100B	SHEET NO. 19
ROADWAY DESIGN ENGINEER EDWARD GLEN EDWARDS JR. SEAL 18470 3/16/2017	HYDRAULICS ENGINEER JENNIFER D. BUSCENI SEAL 037863 3/20/2017

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 650	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 889.5	FT
BASE DISCHARGE	= 800	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 890.68	FT
OVERTOPPING DISCHARGE	= 1500	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 897.5	FT

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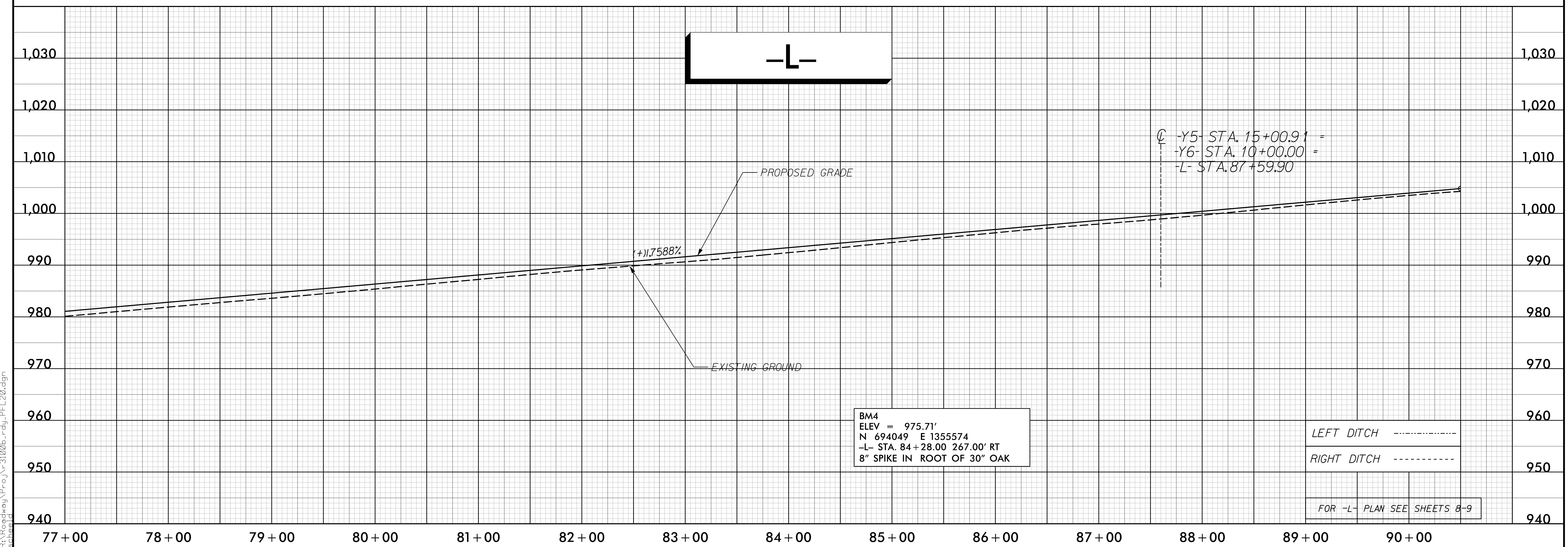
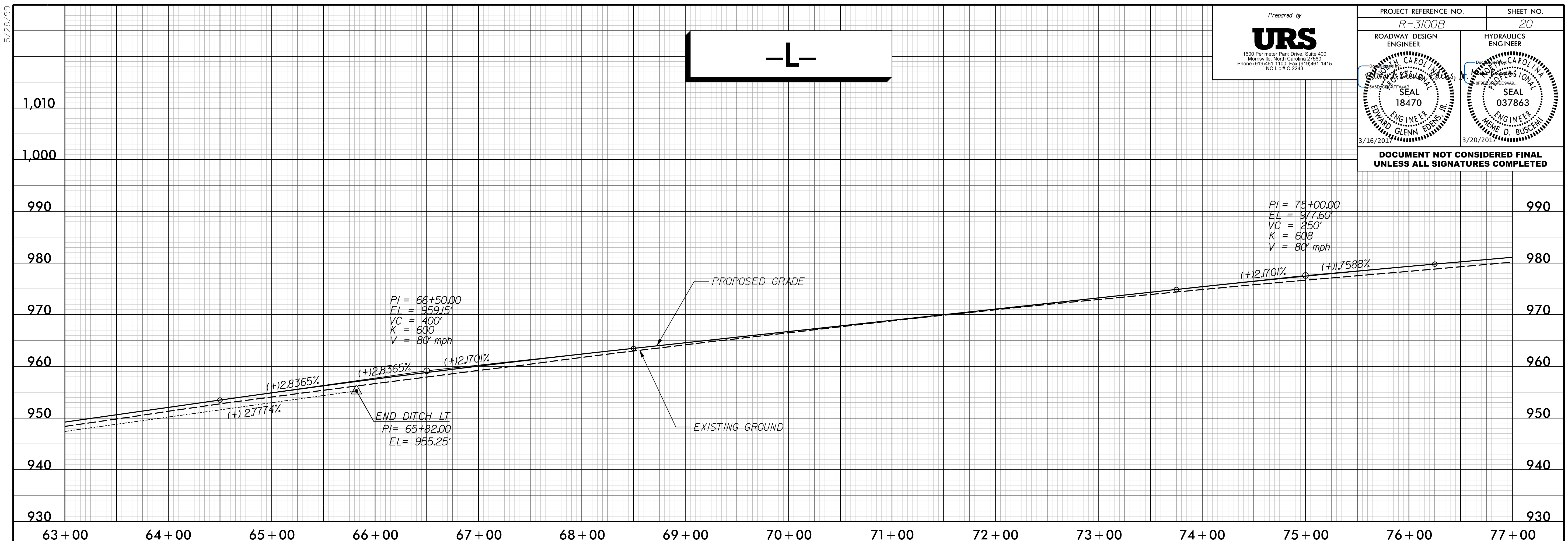
3/16/2017 R:\Roadway\Proj\3100b_rdu_PFL19.dgn

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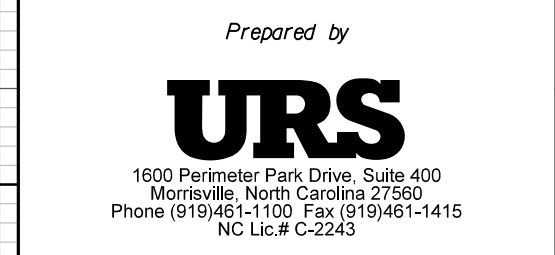
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ROADWAY DESIGN ENGINEER <i>EDWARD GLEN EDWARDS JR.</i>	HYDRAULICS ENGINEER <i>GENIE D. BUSCENI</i>
SEAL 18470 3/16/2017	SEAL 037863 3/20/2017

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UNLESS ALL SIGNATURES COMPLETED**



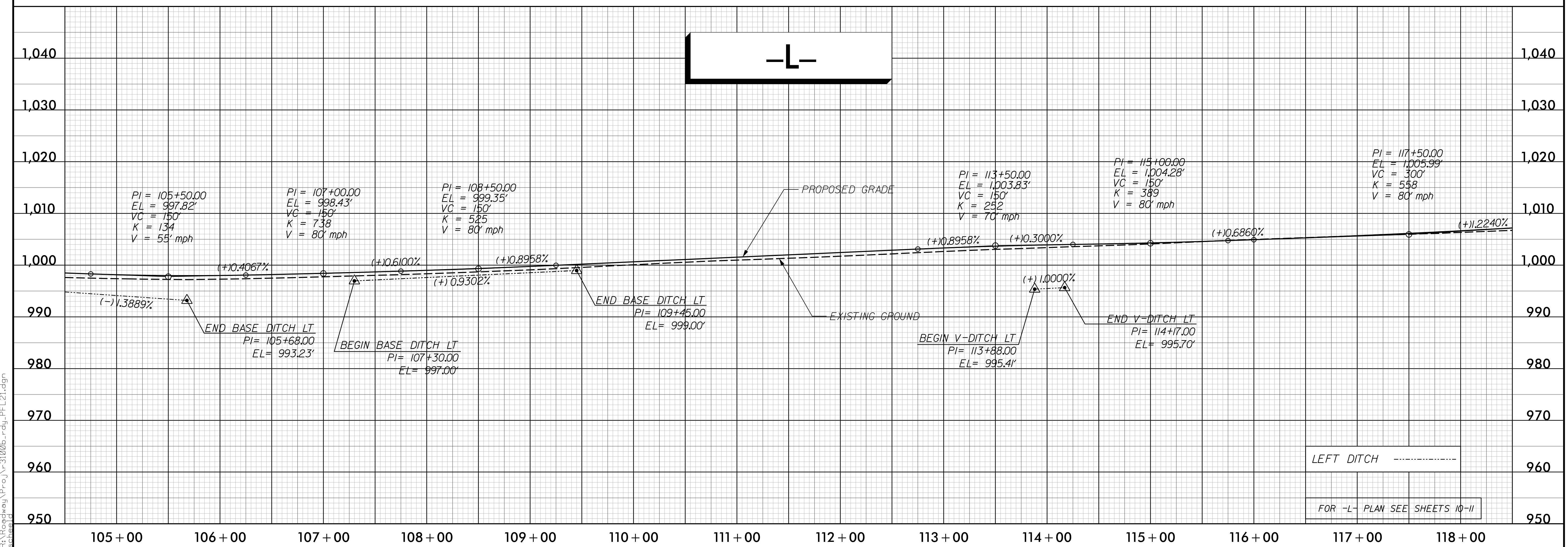
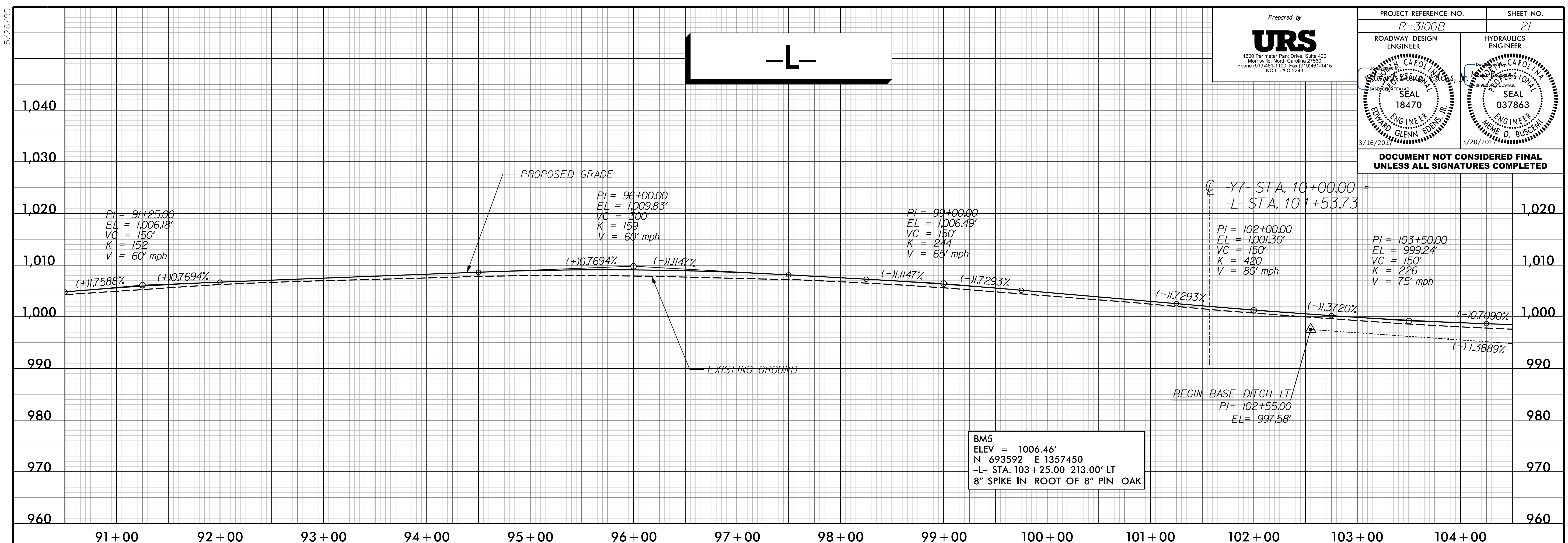
3/16/2017
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 schmid

5/28/09



PROJECT REFERENCE NO. R-3100B	SHEET NO. 21
ROADWAY DESIGN ENGINEER EDWARD GLENZ EDWARDS JR. SEAL 18470 3/16/2017	HYDRAULICS ENGINEER JENNIFER BUSCENI SEAL 037863 3/20/2017

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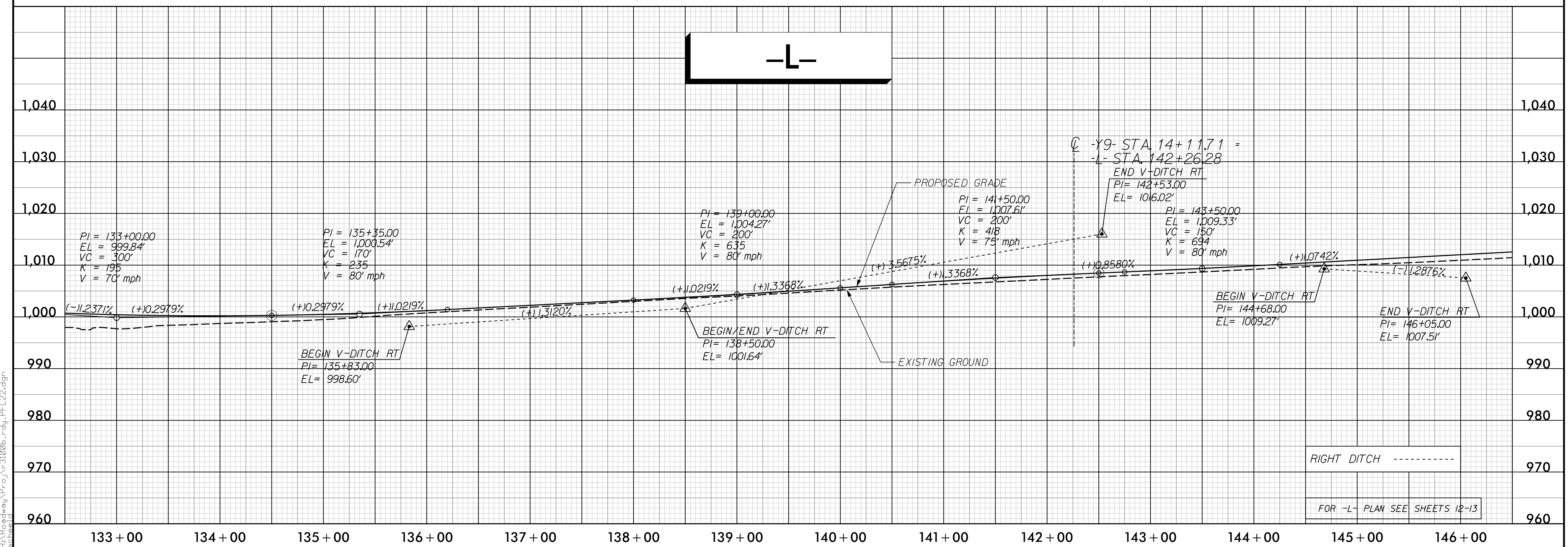
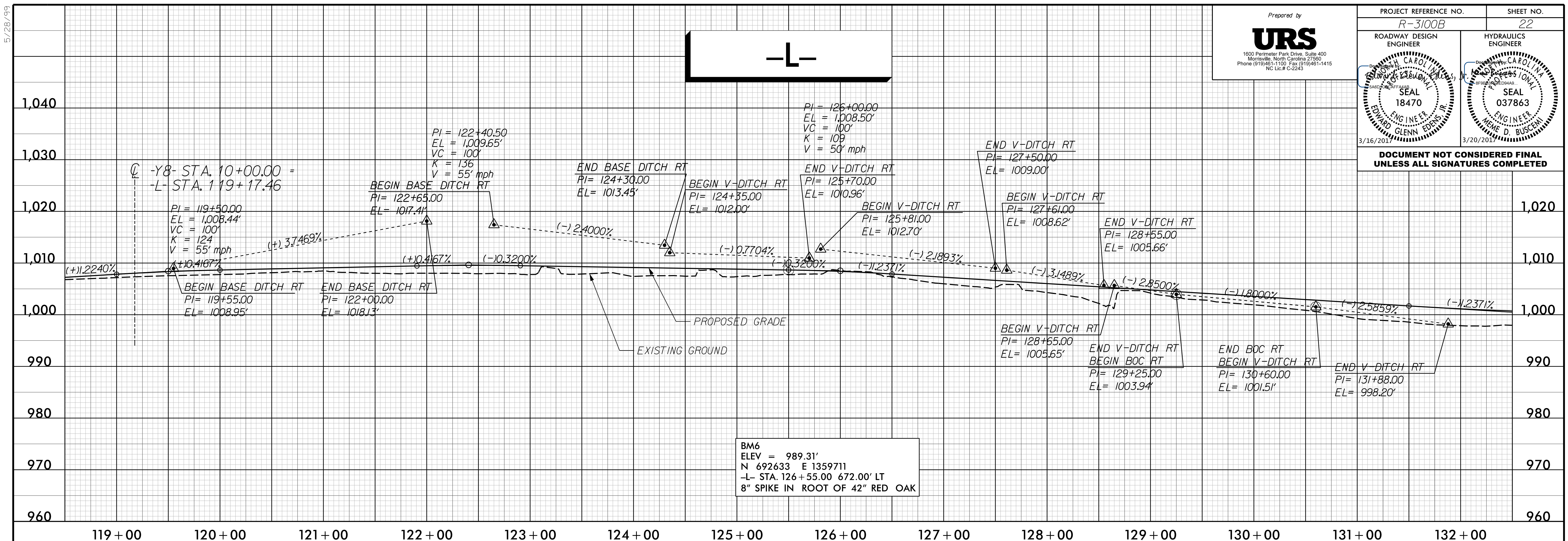
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PROJECT REFERENCE NO. R-3100B	SHEET NO. 22
ROADWAY DESIGN ENGINEER EDWARD GLENZ EDWARDS JR. SEAL 18470 3/16/2017	HYDRAULICS ENGINEER JENNIFER D. BUSCENI SEAL 037863 3/20/2017

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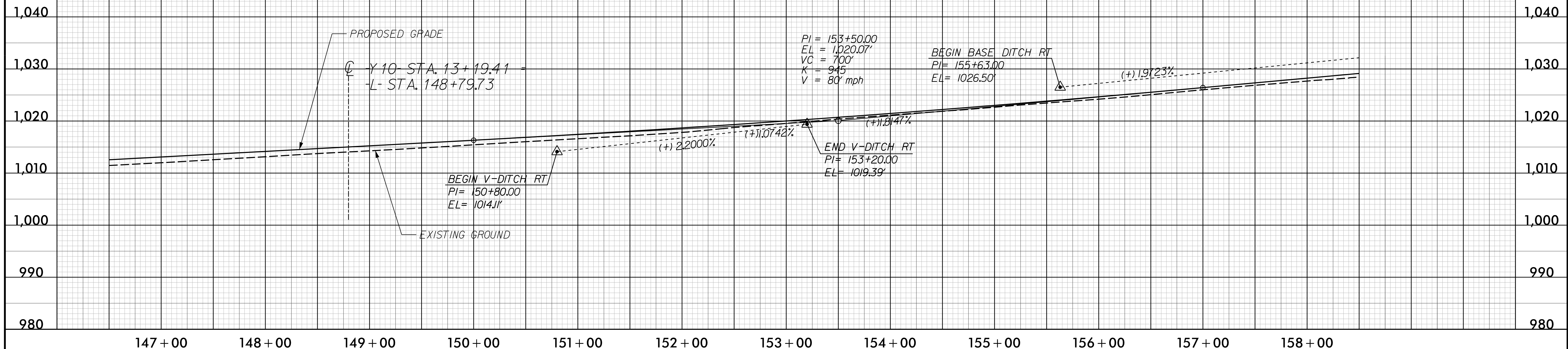
5/28/99

BM7
ELEV = 1002.98'
N 690727 E 1360846
-L- STA. 147 + 35.00 212.00' LT
8" SPIKE IN ROOT OF 8" ELM

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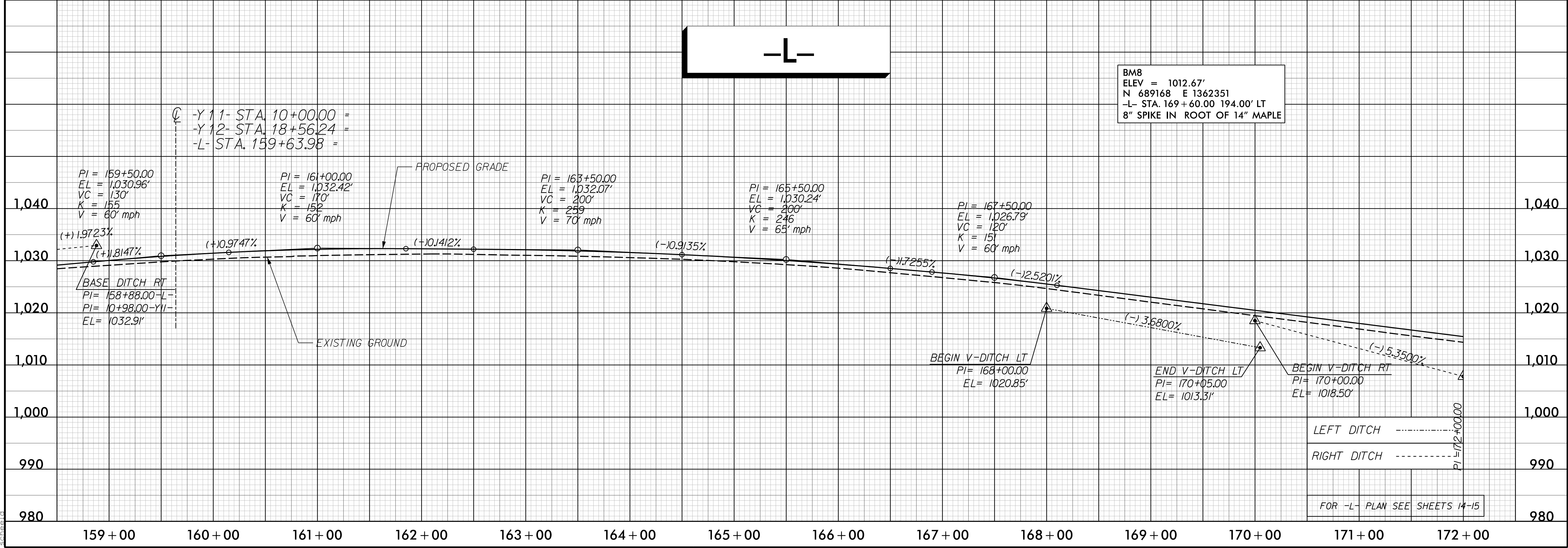
PROJECT REFERENCE NO. R-3100B	SHEET NO. 23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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schmid

BM8
ELEV = 1012.67'
N 689168 E 1362351
-L- STA. 169 + 60.00 194.00' RT
8" SPIKE IN ROOT OF 14" MAPLE



5/28/17

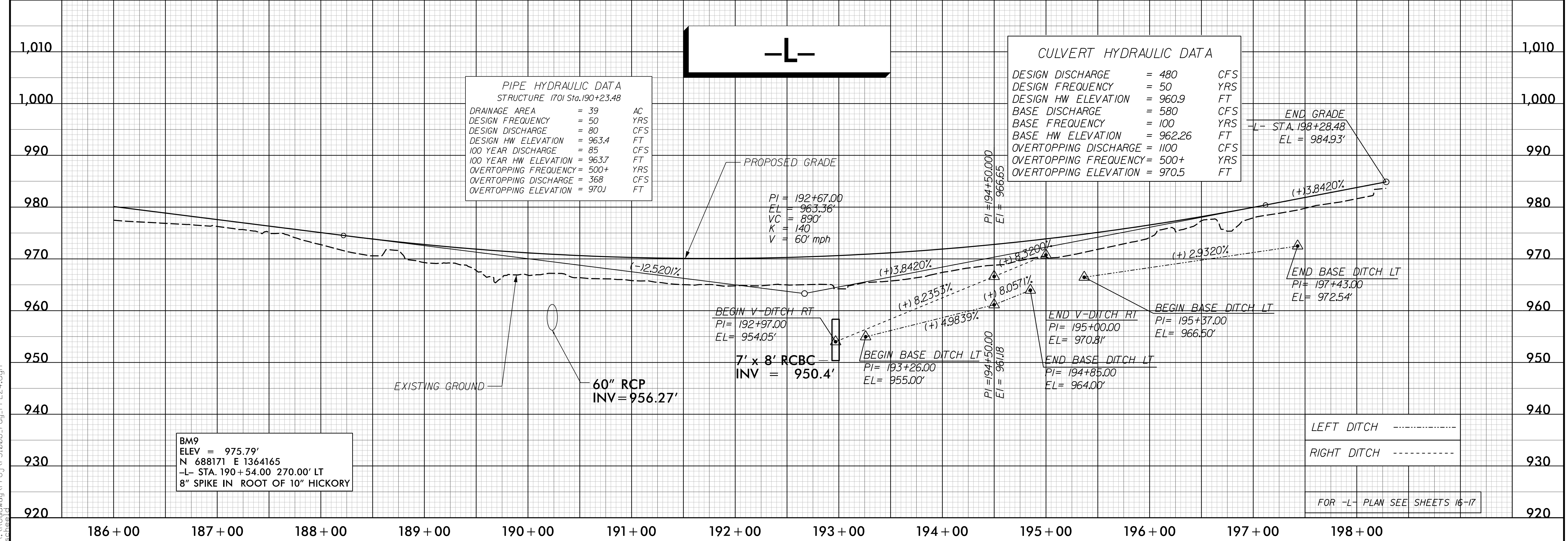
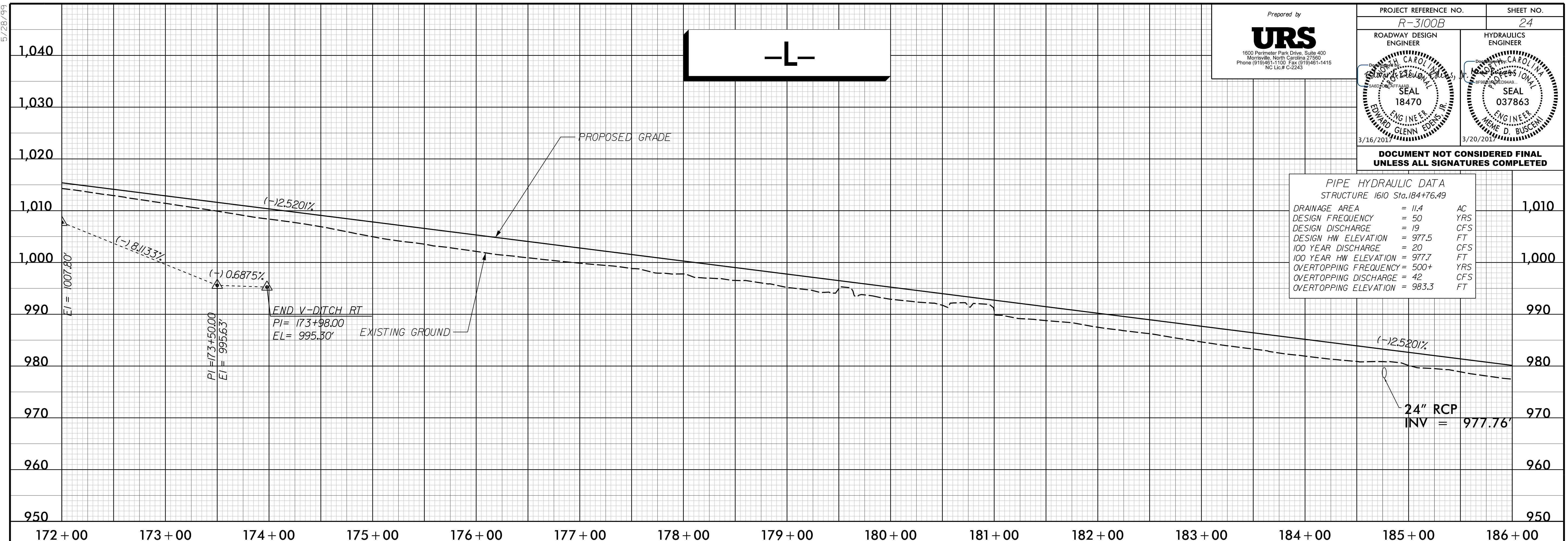
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PROJECT REFERENCE NO. R-3100B	SHEET NO. 24
ROADWAY DESIGN ENGINEER EDWARD GLENZ EDWARDS JR.	HYDRAULICS ENGINEER ANNE D. BUSCENI
SEAL 18470	SEAL 037863
3/16/2017	3/20/2017

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PIPE HYDRAULIC DATA
STRUCTURE 1610 Sta.184+76.49

DRAINAGE AREA	= 11.4	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 19	CFS
DESIGN HW ELEVATION	= 977.5	FT
100 YEAR DISCHARGE	= 20	CFS
100 YEAR HW ELEVATION	= 977.7	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 42	CFS
OVERTOPPING ELEVATION	= 983.3	FT



PIPE HYDRAULIC DATA
STRUCTURE 1701 Sta.190+23.48

DRAINAGE AREA	= 39	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 80	CFS
DESIGN HW ELEVATION	= 963.4	FT
100 YEAR DISCHARGE	= 85	CFS
100 YEAR HW ELEVATION	= 963.7	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 368	CFS
OVERTOPPING ELEVATION	= 970.1	FT

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 480	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 960.9	FT
BASE DISCHARGE	= 580	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 962.26	FT
OVERTOPPING DISCHARGE	= 1100	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 970.5	FT

BM9
 ELEV = 975.79'
 N 688171 E 1364165
 -L- STA. 190+54.00 270.00' LT
 8" SPIKE IN ROOT OF 10" HICKORY

LEFT DITCH -----
 RIGHT DITCH -----
 FOR -L- PLAN SEE SHEETS 16-17

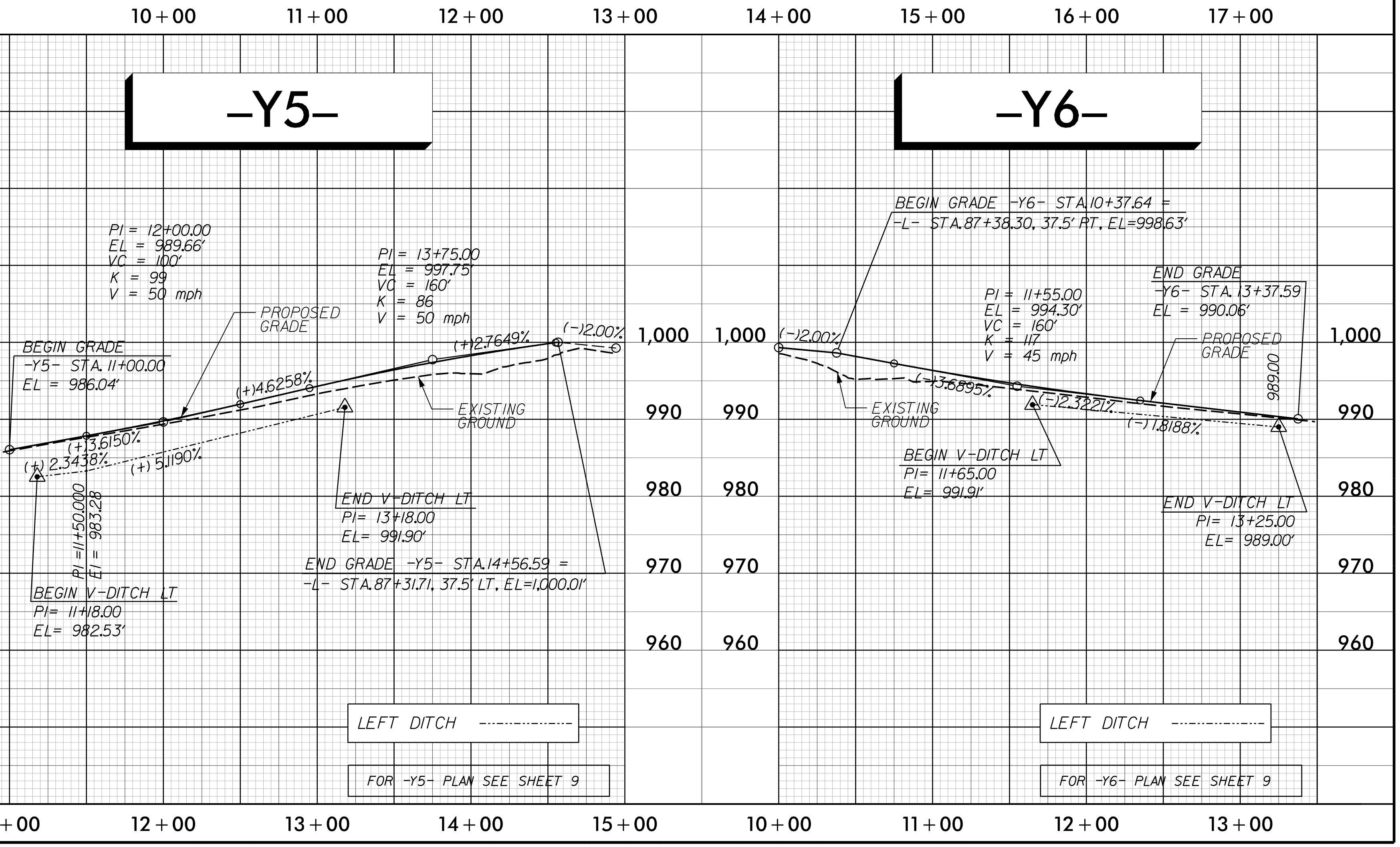
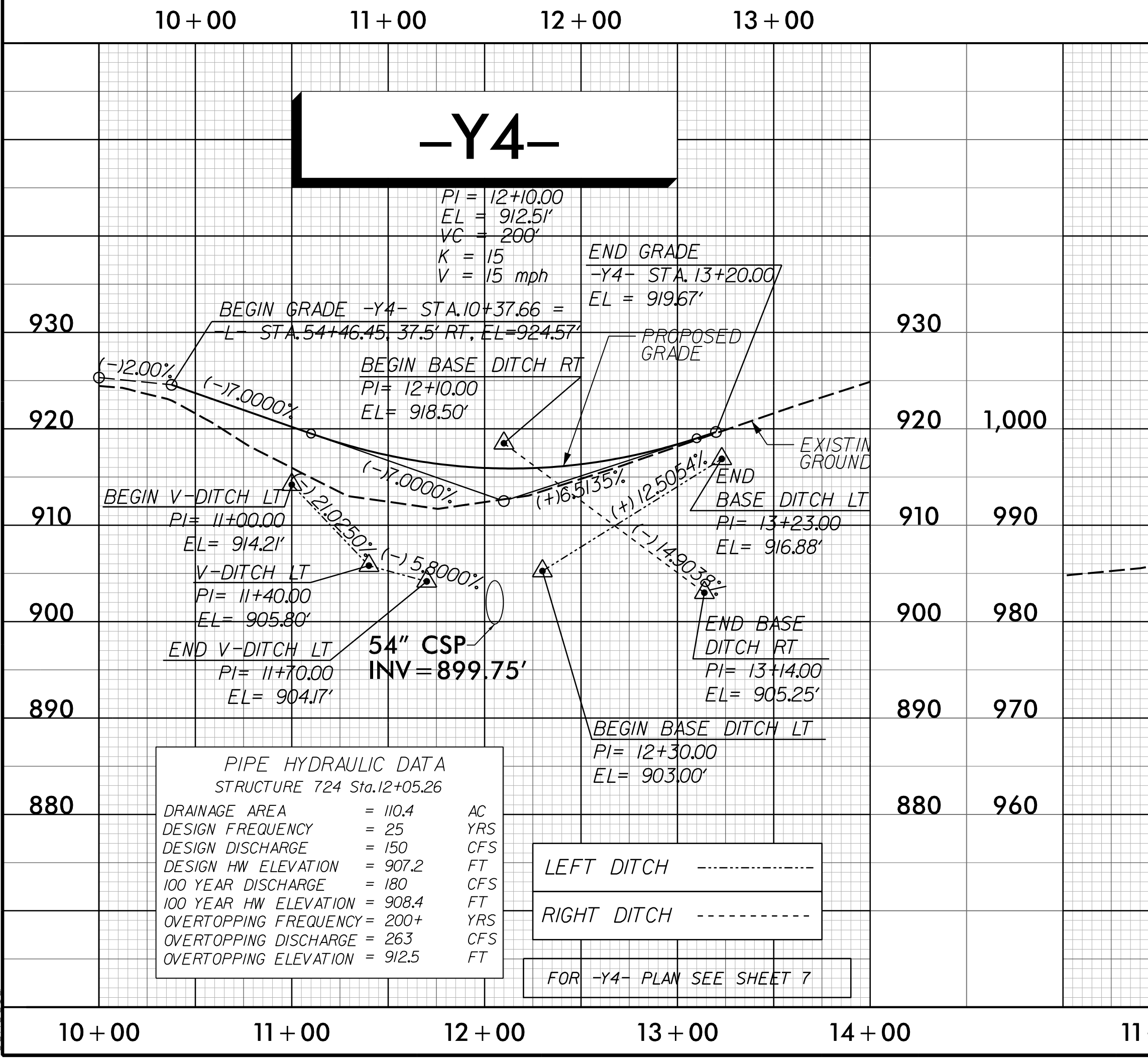
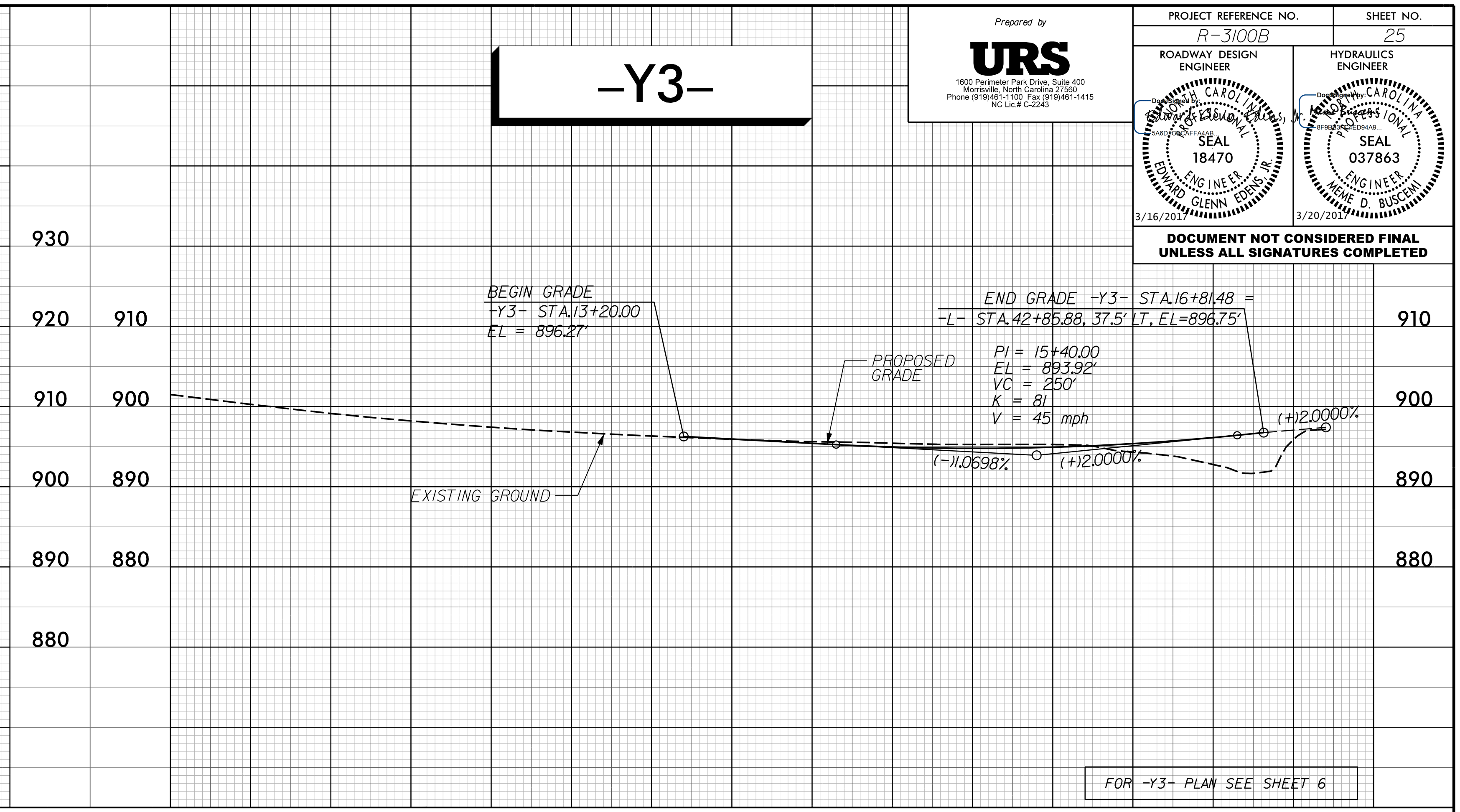
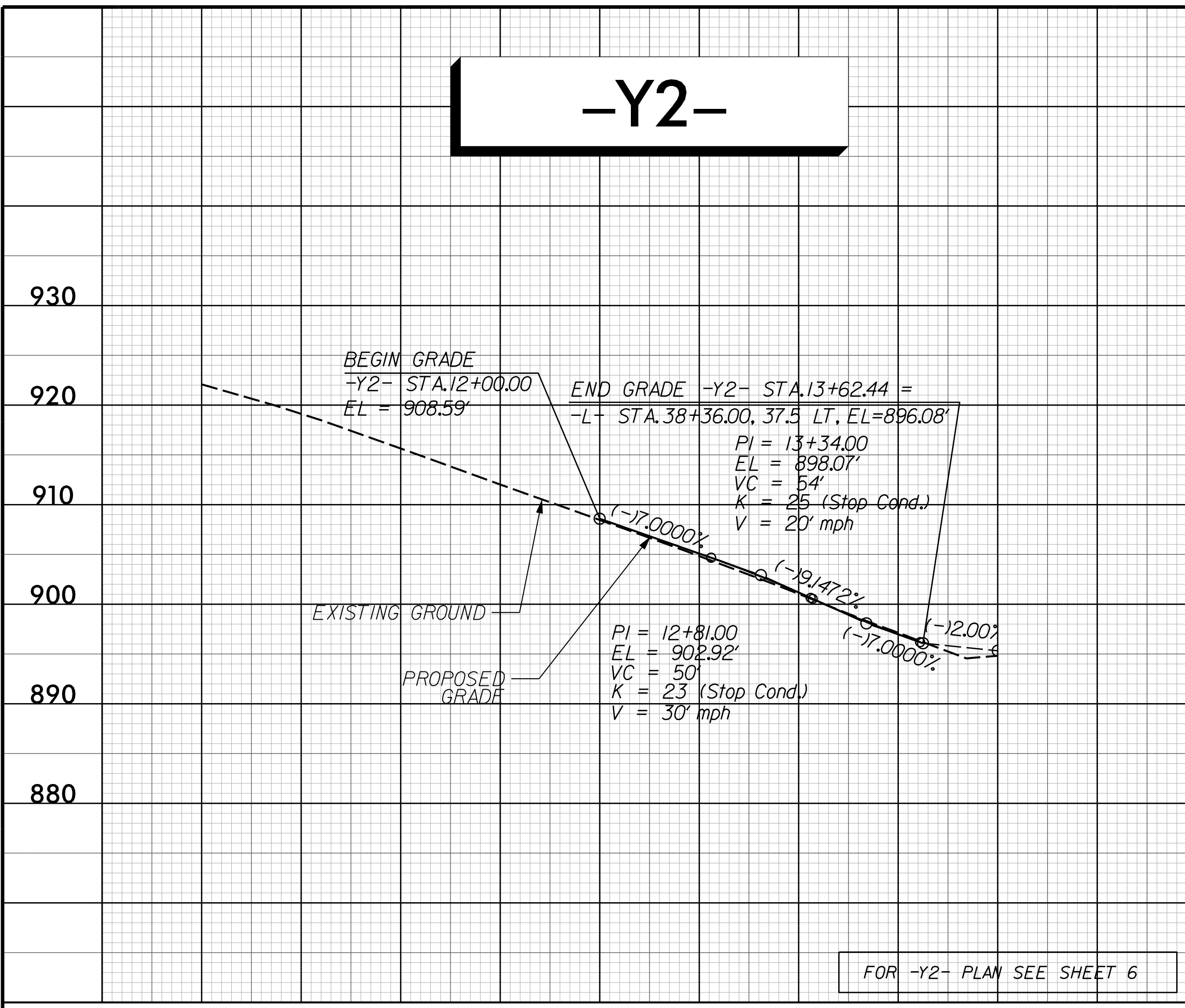
3/16/2017
 R:\Roadway\ProJ\3100b_rdu_PFL24.dgn
 schmid

5/28/19

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PROJECT REFERENCE NO. R-3100B	SHEET NO. 25
ROADWAY DESIGN ENGINEER EDWARD GLEN EDWARDS JR. SEAL 18470 3/16/2017	HYDRAULICS ENGINEER NEMIE D. BUSCENI SEAL 037863 3/20/2017

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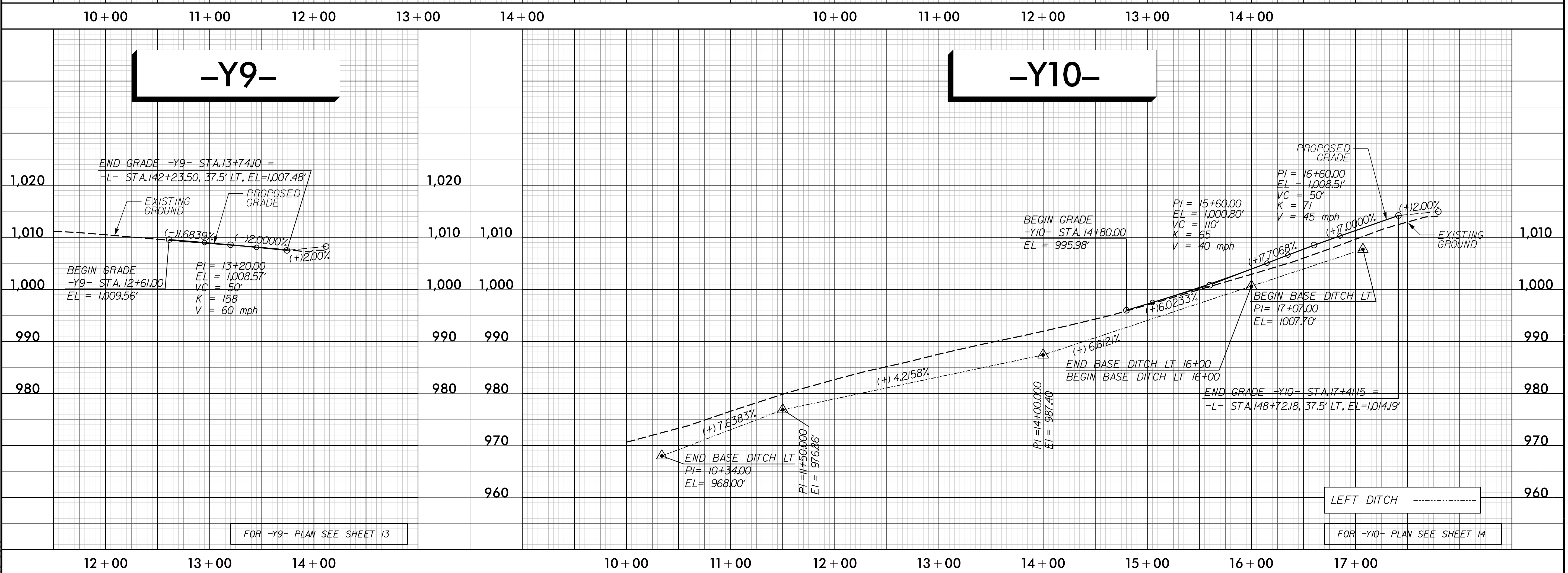
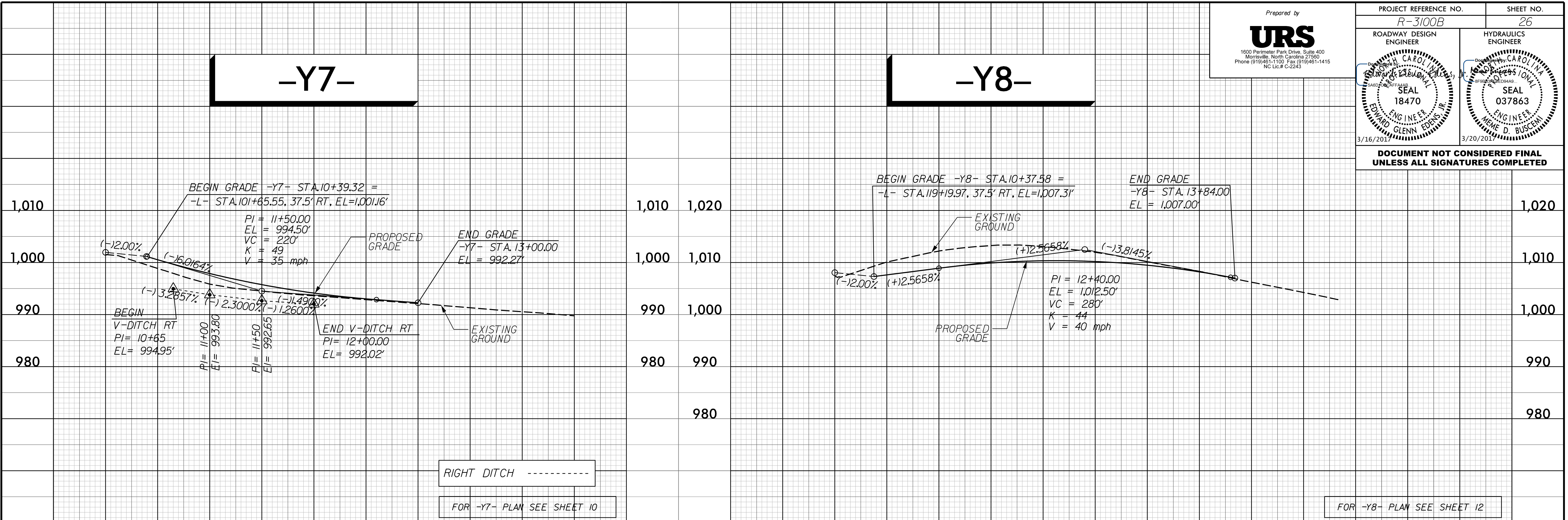
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PROJECT REFERENCE NO. R-3100B	SHEET NO. 26
ROADWAY DESIGN ENGINEER EDWARD GLENZ EDWARDS JR.	HYDRAULICS ENGINEER ANNE D. BUSCENI
SEAL 18470	SEAL 037863
3/16/2017	3/20/2017

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R:\Roadway\pcoj\3100b_rdu_PFL26.dgn
sheet14

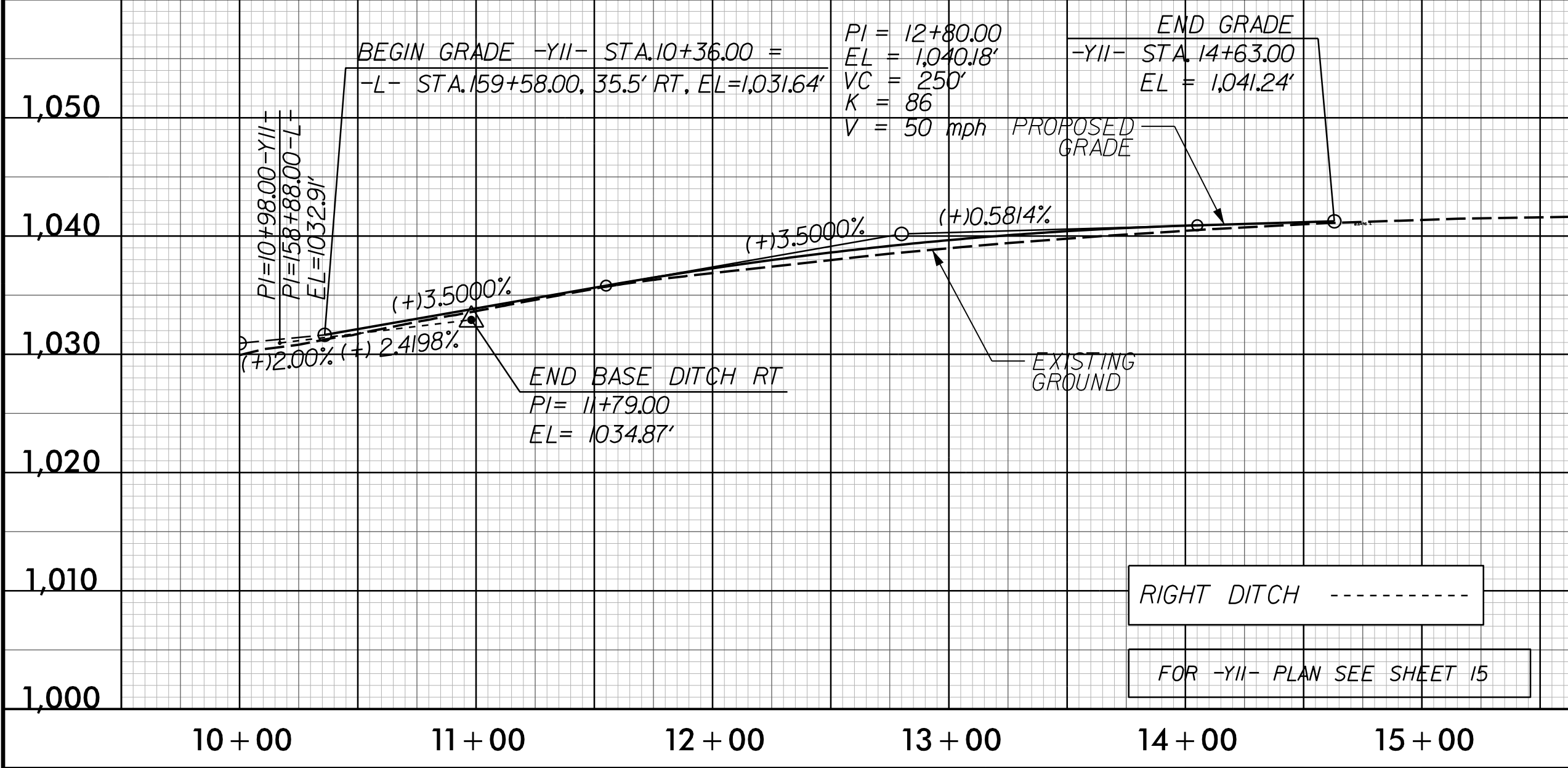
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 NC Lic.# C-2243

PROJECT REFERENCE NO. <i>R-3100B</i>	SHEET NO. <i>27</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<i>EDWARD GLEN</i>	<i>AGNE D. BUSCENI</i>
SEAL 18470 3/16/2017	SEAL 037863 3/20/2017

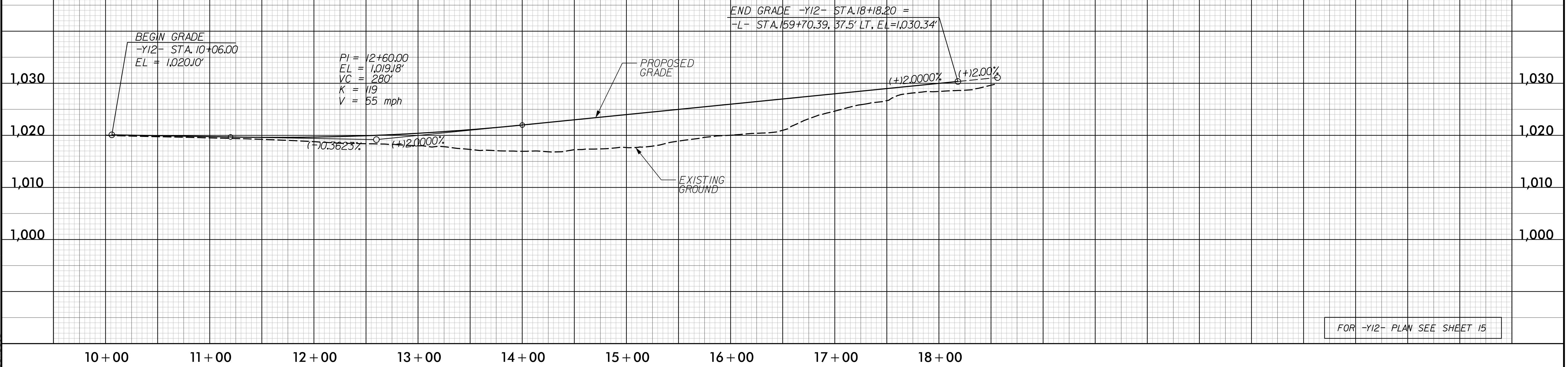
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UNLESS ALL SIGNATURES COMPLETED

-Y11-



RIGHT DITCH -----
 FOR -Y11- PLAN SEE SHEET 15

-Y12-



FOR -Y12- PLAN SEE SHEET 15

3/16/2017
R:\Roadway\Proj\3100b_rdu_PFL27.dgn
Schedule