

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

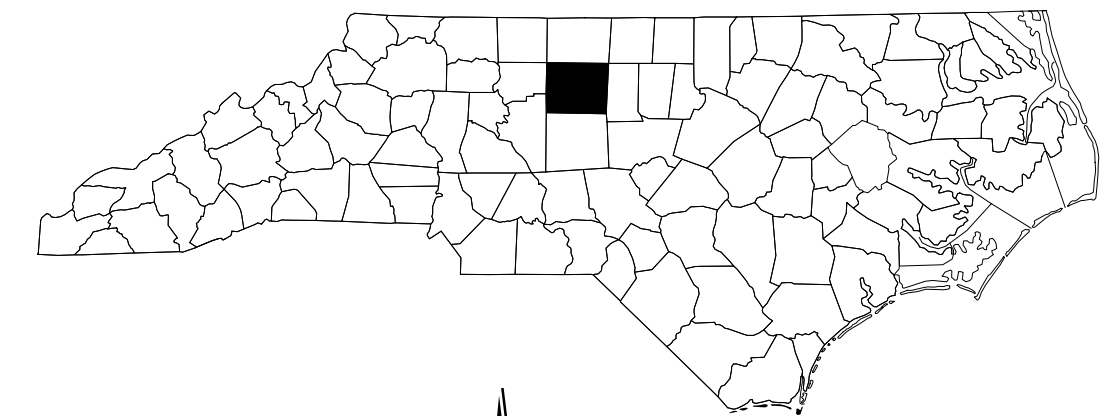
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

**LOCATION: US 70 (BURLINGTON ROAD) FROM WEST OF
SR 3045 (MT. HOPE CHURCH ROAD)/
SR 2819 (MCLEANSVILLE ROAD) TO JUST EAST OF
SR 2826 (BIRCH CREEK ROAD)**

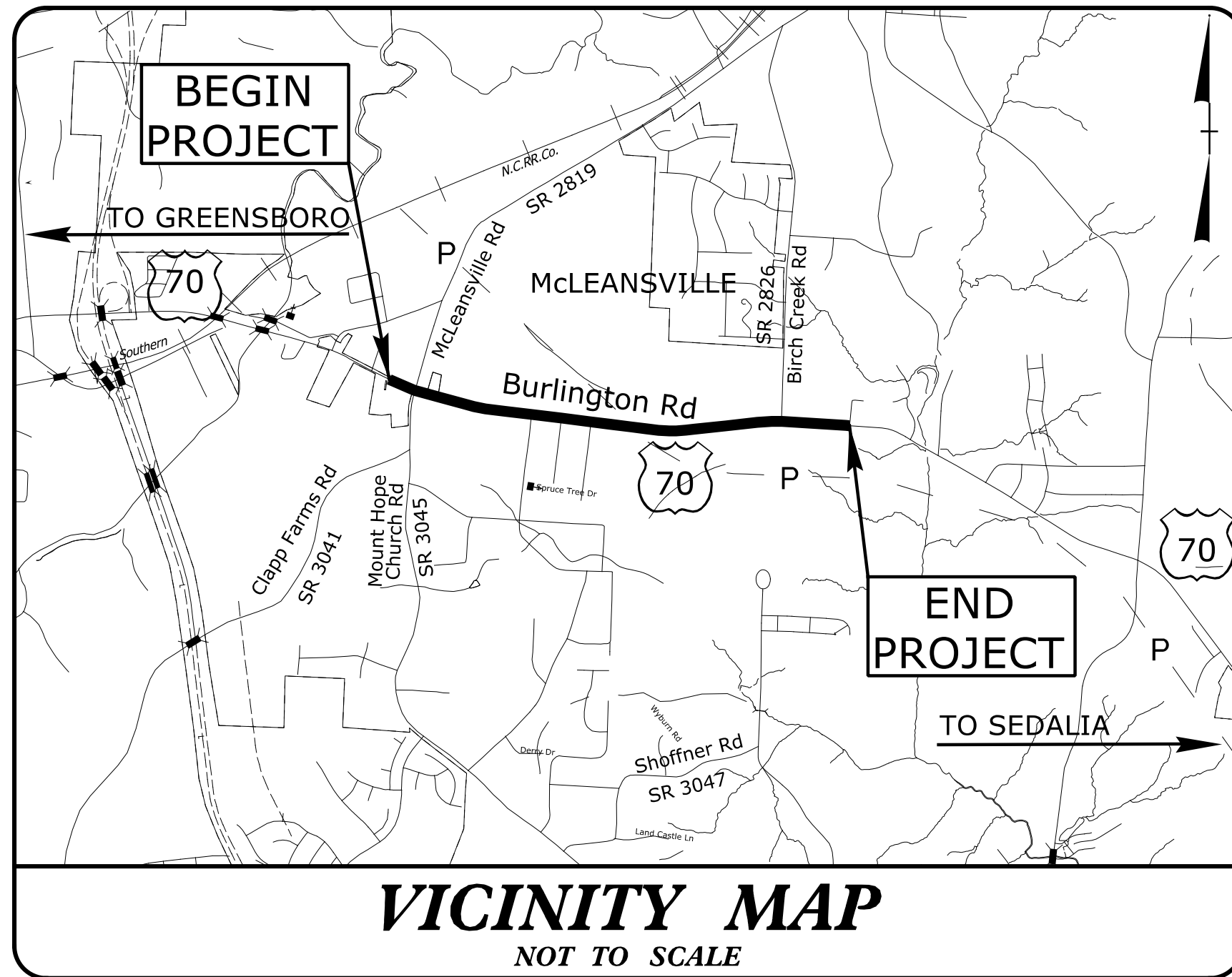
TYPE OF WORK: GRADING, PAVING, DRAINAGE, SIGNALS AND CULVERT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2581BA	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34840.1.4		PE	
34840.2.4		R/W, UTIL.	
34840.3.4		CONST.	

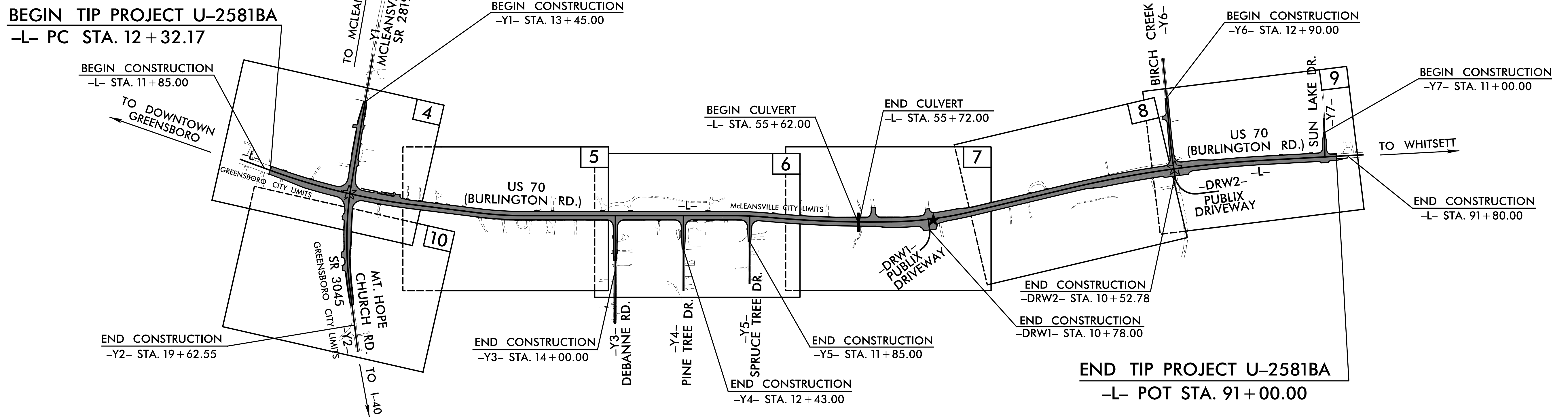


TIP PROJECT: U-2581BA

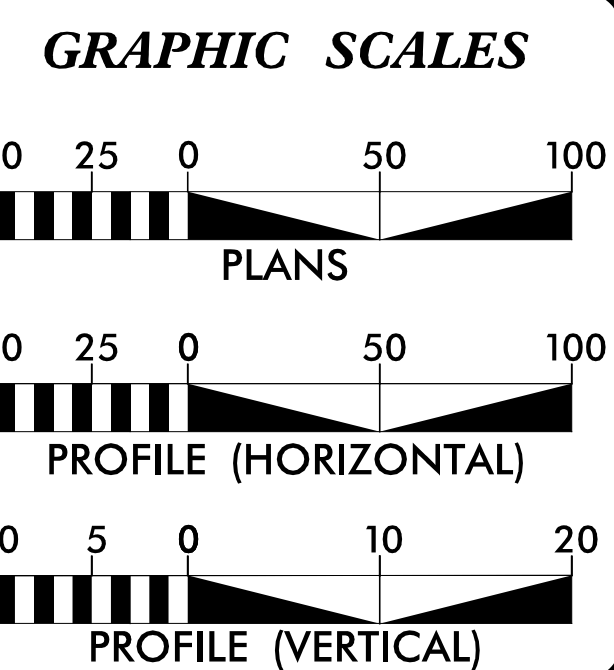
CONTRACT: C204371



- ☆ EXISTING SIGNALS TO BE MODIFIED
- ★ PROPOSED SIGNAL



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

ADT 2019 =	15,430
ADT 2039 =	25,890
K =	12 %
D =	60 %
T =	6 % *
V =	50 MPH
* (TTST 1 + DUAL 5)	
FUNC CLASS =	PRINCIPAL ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-2581BA =	1.490 MI.
TOTAL LENGTH OF TIP PROJECT U-2581BA =	1.490 MI.

Prepared for the North Carolina Department of Transportation
In the Office of:

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

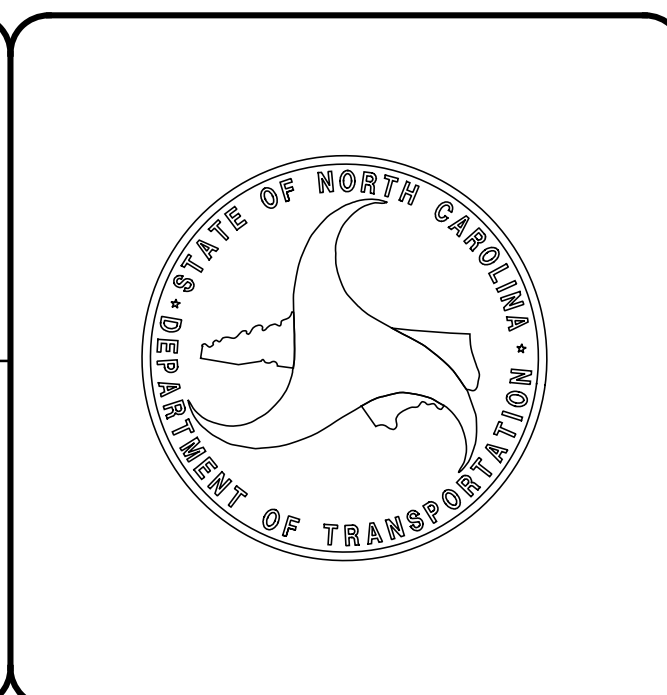
2018 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE:	JIMMY GOODNIGHT, PE PROJECT ENGINEER
OCTOBER 31, 2018	
LETTING DATE:	JERRY JAVELLANA, PE PROJECT DESIGN ENGINEER
MARCH 17, 2020	
NCDOT CONTACT	LAURA SUTTON, PE

HYDRAULICS ENGINEER

DocuSigned by:
Brandon Barham
1/21/2020
SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

DocuSigned by:
Jimmy Goodnight
1/21/2020
SIGNATURE: _____ P.E.



5/9/2019

PROJECT REFERENCE NO.	SHEET NO.
U-2581BA	1A

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA



DocuSigned by:
James Stafford Goodnight
9/10/2019

INDEX OF SHEETS	
SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, STANDARD DRAWINGS, AND GENERAL NOTES
1B	CONVENTIONAL SYMBOLS
2A-1 THRU 2A-3	PAVEMENT SCHEDULE, TYPICAL SECTIONS
2C-1 THRU 2C-2	GUARDRAIL INSTALLATION
2G-1 THRU 2G-3	STANDARD TEMPORARY WALL
3B-1 THRU 3B-2	EARTHWORK SUMMARY, GUARDRAIL SUMMARY, REMOVAL OF EXISTING ASPHALT PAVEMENT, BREAKING OF EXISTING ASPHALT PAVEMENT
3D-1 THRU 3D-7	DRAINAGE SUMMARY
3G-1	SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION, SUMMARY OF SUBSURFACE DRAINAGE
3P-1	PARCEL INDEX
4 THRU 10	PLAN SHEETS
11 THRU 16	PROFILE SHEETS
RW-01 TRHU RW-10	SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENTS AND PROPERTY TIES
TMP-1 THRU TMP-17	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-10	PAVEMENT MARKING PLANS
EC-1 THRU EC-18	EROSION CONTROL PLANS
RF-1	REFORESTATION DETAIL SHEET
SIGN-1 THRU SIGN-10	SIGNING PLANS
SIG-1.0 THRU SIG-9.0	SIGNAL PLANS
SIG-M1 THRU SIG-M8	SIGNAL METAL POLE PLANS
SCP 1 THRU SCP 3	SIGNAL COMMUNICATION PLANS
UC-1 THRU UC-12	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-8	UTILITIES BY OTHERS PLANS
X-1A THRU X-1C	CROSS-SECTION INDEX AND SUMMARY SHEETS
X-1 THRU X-52	CROSS-SECTIONS
C-1 THRU C-8	CULVERT PLANS

- 2018 ROADWAY ENGLISH STANDARD DRAWINGS EFF. 01-16-2018
REV.
- THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" HIGHWAY DESIGN BRANCH - N. C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N. C., DATED JANUARY, 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:
- STD. NO. TITLE
- DIVISION 2 - EARTHWORK
200.02 METHOD OF CLEARING - METHOD II
225.02 GUIDE FOR GRADING SUBGRADE - SECONDARY AND LOCAL
225.04 METHOD OF OBTAINING SUPERELEVATION - TWO LANE PAVEMENT
225.06 METHOD OF GRADING SIGHT DISTANCE AT INTERSECTIONS
- DIVISION 3 - PIPE CULVERTS
300.01 METHOD OF PIPE INSTALLATION
310.10 DRIVEWAY PIPE CONSTRUCTION
- DIVISION 5 - SUBGRADE, BASES AND SHOULDERS
560.01 METHOD OF SHOULDER CONSTRUCTION - HIGH SIDE OF SUPERELEVATED CURVE - METHOD I
- DIVISION 6 - ASPHALT BASES AND PAVEMENTS
654.01 PAVEMENT REPAIRS
- DIVISION 8 - INCIDENTALS
815.02 SUBSURFACE DRAIN
815.03 PIPE UNDERDRAIN AND BLIND DRAIN
840.00 CONCRETE BASE PAD FOR DRAINAGE STRUCTURES
840.01 BRICK CATCH BASIN - 12" THRU 54" PIPE
840.02 CONCRETE CATCH BASIN - 12" THRU 54" PIPE
840.03 FRAME, GRATES AND HOOD - FOR USE ON STANDARD CATCH BASIN
840.14 CONCRETE DROP INLET - 12" THRU 30" PIPE
840.15 BRICK DROP INLET - 12" THRU 30" PIPE
840.16 DROP INLET FRAME AND GRATES - FOR USE WITH STD. DWG 840.14 AND 840.15
840.31 CONCRETE JUNCTION BOX - 12" THRU 66" PIPE
840.32 BRICK JUNCTION BOX - 12" THRU 66" PIPE
840.45 PRECAST DRAINAGE STRUCTURE
840.54 MANHOLE FRAME AND COVER
840.66 DRAINAGE STRUCTURE STEPS
840.71 CONCRETE AND BRICK PIPE PLUG
840.72 PIPE COLLAR
846.01 CONCRETE CURB, GUTTER AND CURB & GUTTER
848.01 CONCRETE SIDEWALK
848.02 DRIVEWAY TURNOUT - RADIUS TYPE
848.04 STREET TURNOUT
848.05 CURB RAMP - PROPOSED CURB & GUTTER
862.01 GUARDRAIL PLACEMENT
862.02 GUARDRAIL INSTALLATION
866.01 CHAIN LINK FENCE - 4', 5' AND 6' HIGH FENCE
876.01 RIP RAP IN CHANNELS
876.02 GUIDE FOR RIP RAP AT PIPE OUTLETS
876.04 DRAINAGE DITCHES WITH CLASS 'B' RIP RAP

GENERAL NOTES:

2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

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

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

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

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

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

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

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

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

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

TEMPORARY SHORING:
SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE DUKE ENERGY - POWER; SPECTRUM - CATV; AT&T, CENTURYLINK & VERIZON - COMMUNICATIONS; CITY OF GREENSBORO - WATER/SEWER.

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

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

CURB RAMPS
CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS.
CONSTRUCT ALL CURB RAMPS IN ACCORDANCE WITH STD 848.05 and/or 848.06.

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

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STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

12/2/2016

BOUNDARIES AND PROPERTY:

State Line	_____
County Line	_____
Township Line	_____
City Line	_____
Reservation Line	_____
Property Line	_____
Existing Iron Pin	○ EIP
Computed Property Corner	_____ X
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	☠ S ☠
Potential Contamination Area: Soil	☠ S ☠
Known Contamination Area: Water	☠ W ☠
Potential Contamination Area: Water	☠ W ☠
Contaminated Site: Known or Potential	☠ ?

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

Secondary Horiz and Vert Control Point	◆
Primary Horiz Control Point	○
Primary Horiz and Vert Control Point	◆
Exist Permanent Easement Pin and Cap	◇
New Permanent Easement Pin and Cap	◆
Vertical Benchmark	⊠
Existing Right of Way Marker	△
Existing Right of Way Line	_____
New Right of Way Line	_____ (R/W)
New Right of Way Line with Pin and Cap	_____ (R/W) ◆
New Right of Way Line with Concrete or Granite R/W Marker	_____ (R/W) ◆
New Control of Access Line with Concrete C/A Marker	_____ (C/A) ◆
Existing Control of Access	_____ (C/A)
New Control of Access	_____ (C/A)
Existing Easement Line	--- E ---
New Temporary Construction Easement	--- E ---
New Temporary Drainage Easement	--- TDE ---
New Permanent Drainage Easement	--- PDE ---
New Permanent Drainage / Utility Easement	--- DUE ---
New Permanent Utility Easement	--- PUE ---
New Temporary Utility Easement	--- TUE ---
New Aerial Utility Easement	--- AUE ---

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 ---
Proposed Guardrail	--- T ---
Existing Cable Guiderail	--- T ---
Proposed Cable Guiderail	--- T ---
Equality Symbol	⊕
Pavement Removal	▨

VEGETATION:

Single Tree	☼
Single Shrub	☼

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

Hedge	_____
Woods Line	_____
Orchard	☼ ☼ ☼ ☼
Vineyard	□ Vineyard

EXISTING STRUCTURES:

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

UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊙
Power Line Tower	⊠
Power Transformer	⊠
U/G Power Cable Hand Hole	_____
H-Frame Pole	●
U/G Power Line LOS B (S.U.E.*)	--- P ---
U/G Power Line LOS C (S.U.E.*)	--- P ---
U/G Power Line LOS D (S.U.E.*)	--- P ---

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

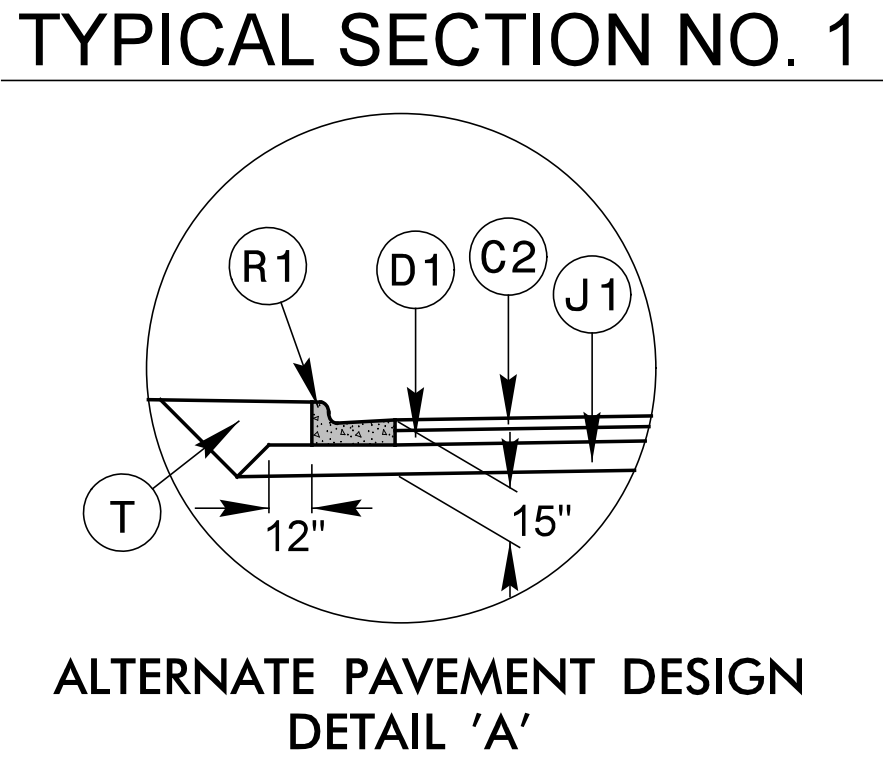
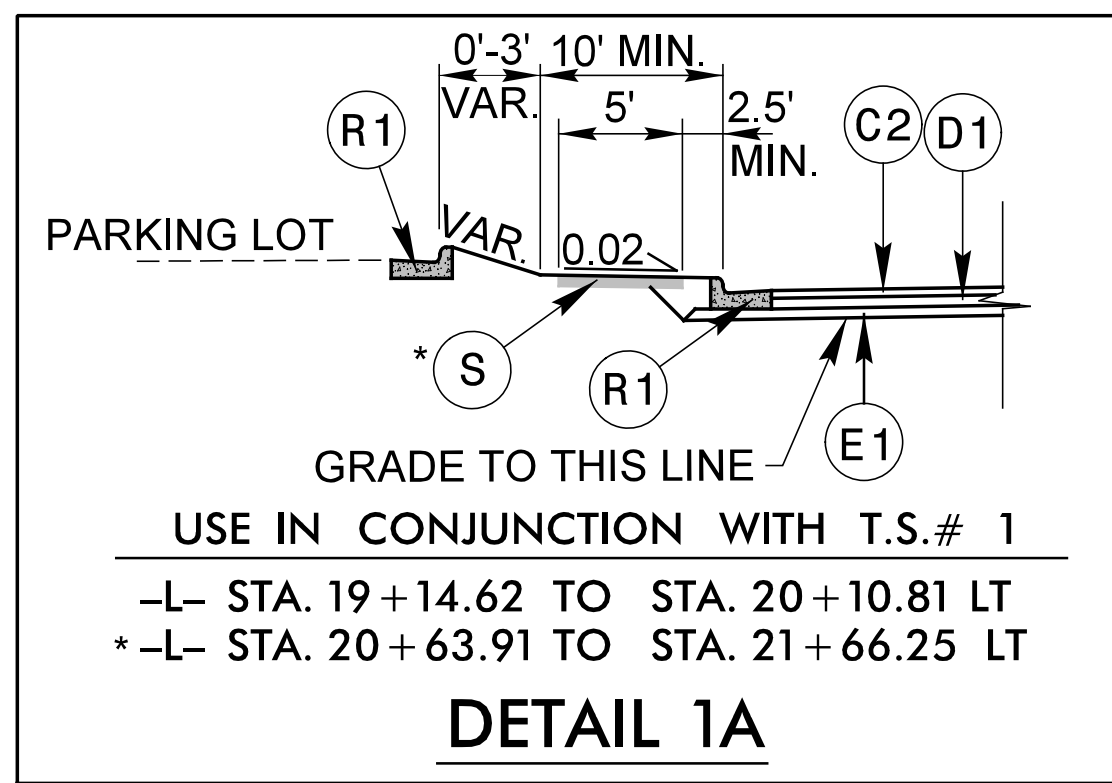
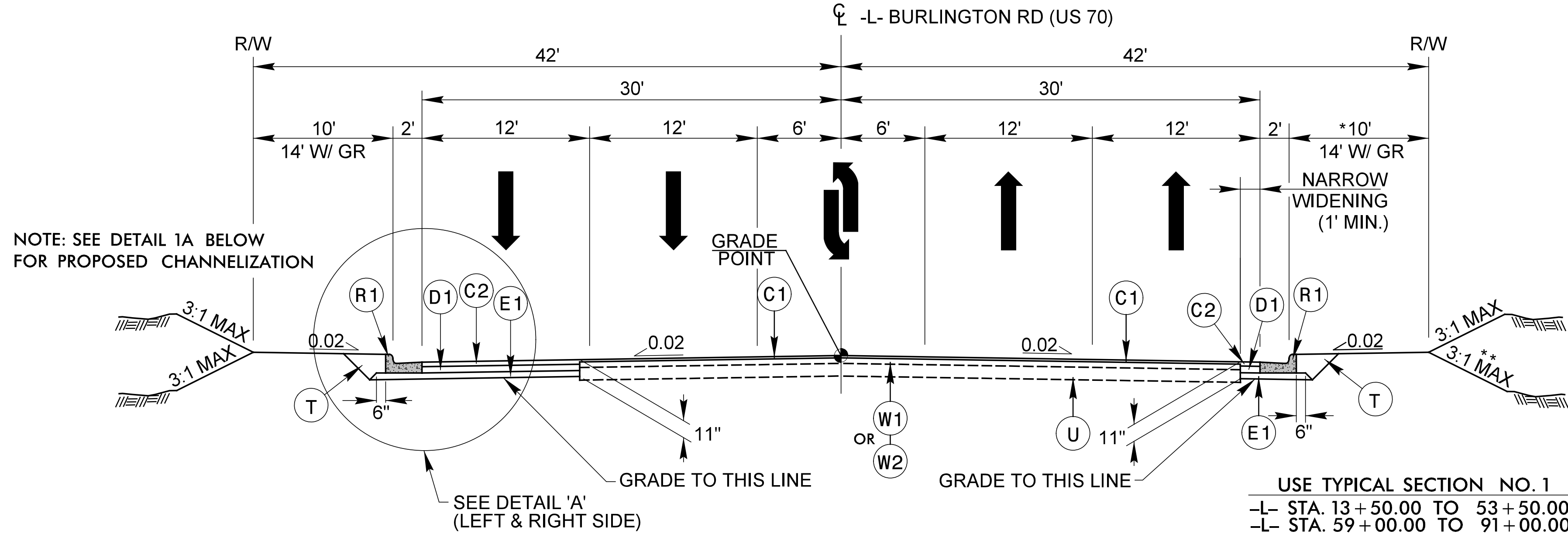
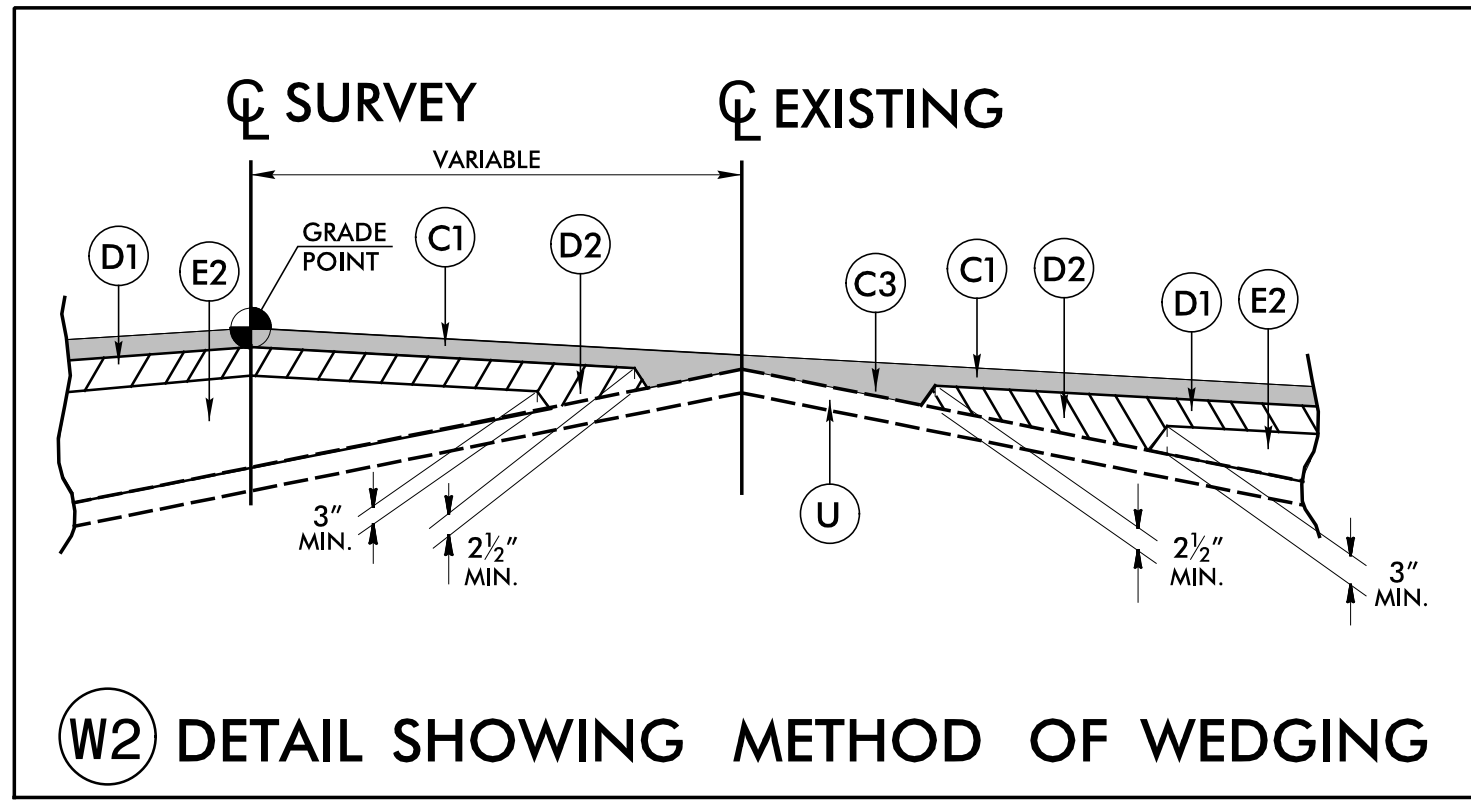
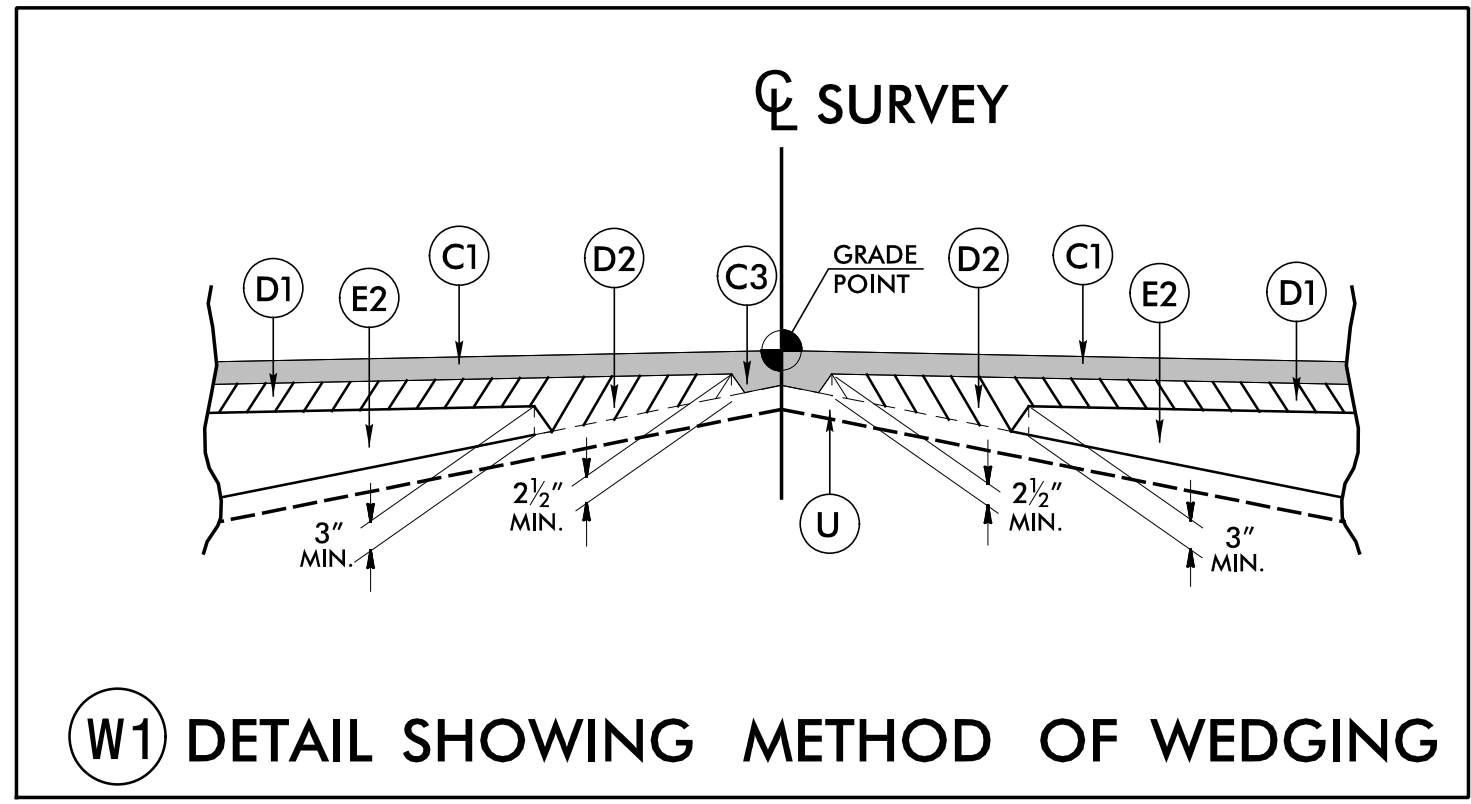
Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊠
Utility Unknown U/G Line LOS B (S.U.E.*)	--- 2UTL ---
U/G Tank; Water, Gas, Oil	□
Underground Storage Tank, Approx. Loc.	⊠
A/G Tank; Water, Gas, Oil	□
Geoenvironmental Boring	⊕
U/G Test Hole LOS A (S.U.E.*)	⊕
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

6/2/2018

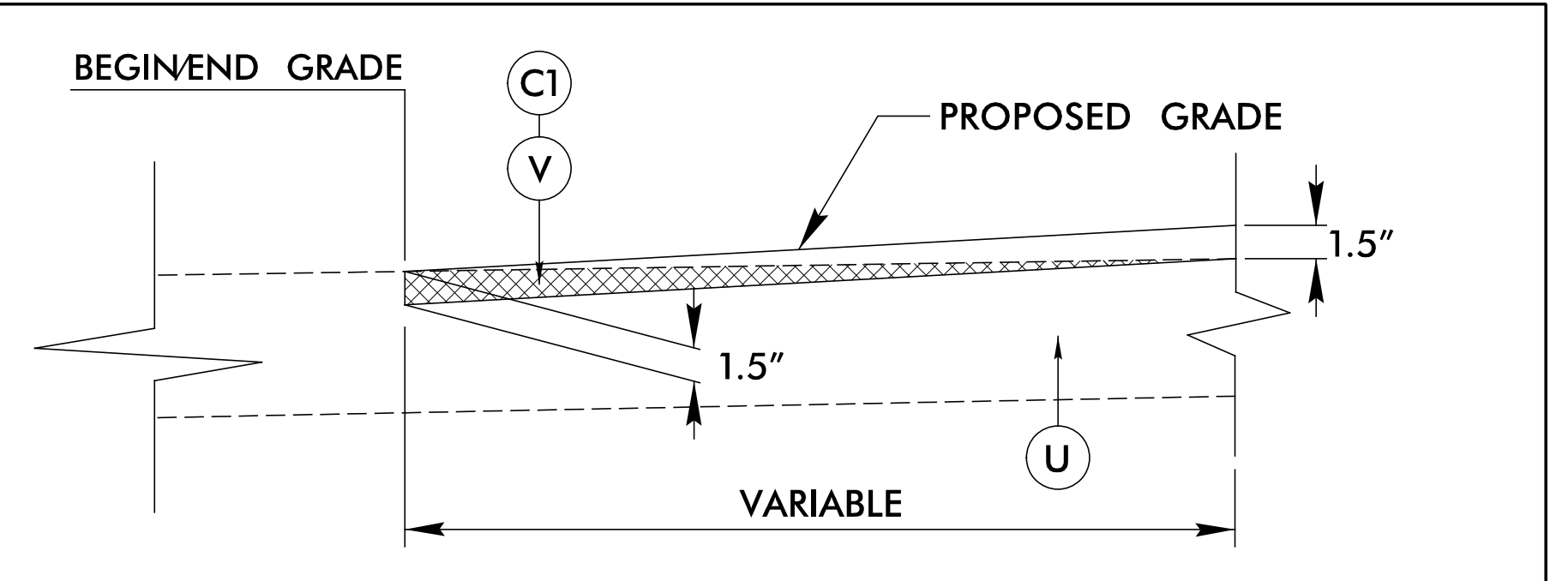
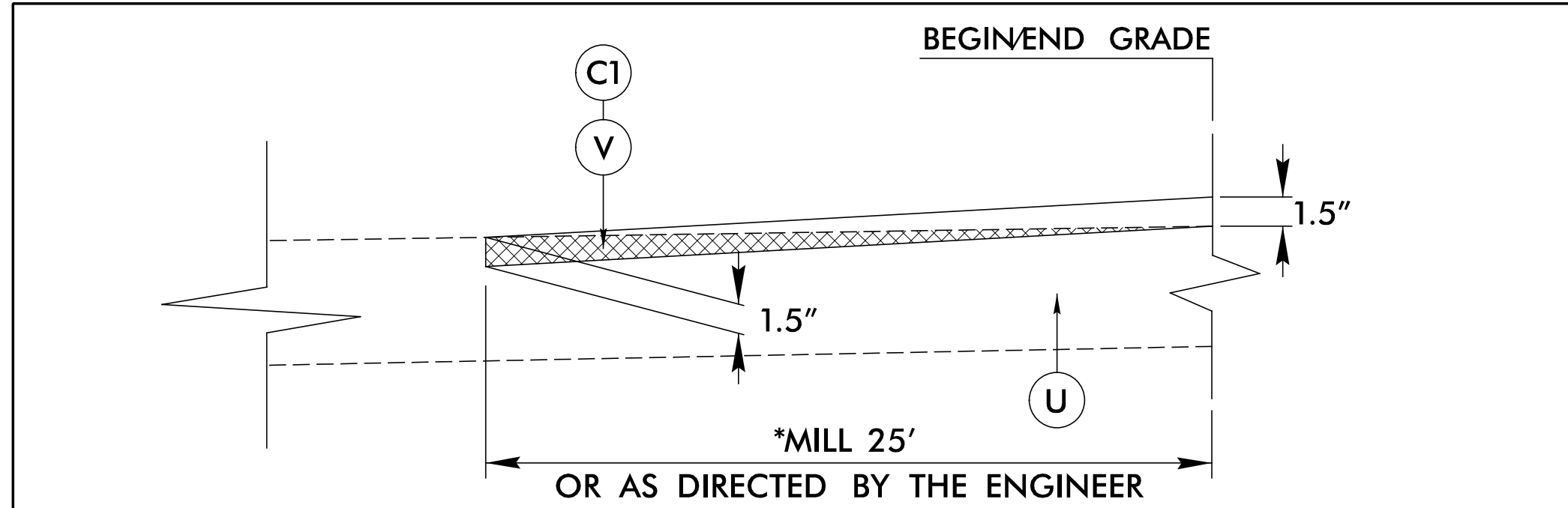
FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 1.5" IN DEPTH
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH
J1	PROP. 8" AGGREGATE BASE COURSE
J2	PROP. 4" AGGREGATE BASE COURSE
L	CLASS IV SUBGRADE STABILIZATION
N	GEOTEXTILE FOR SOIL STABILIZATION
P1	PRIME COAT AT THE RATE OF 0.35 GAL. PER SQ. YD.
R1	2'-6" CONCRETE CURB AND GUTTER
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING BITUMINOUS PAVEMENT, 0" TO 1.5"
W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)
W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)

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



NOTES:
 MILL 0"-1.5" AND RESURFACE WITH (C1) AND NARROW WIDENING AT LEFT SIDE ONLY FROM -L- STA. 12+32.17 TO 13+50.00
 SEE PLANS FOR LOCATIONS OF AUXILIARY LANES AND TAPERS
 SHALLOW UNDERCUT 1' IN DEPTH AND REPLACE WITH (L) (SEE AGGREGATE SUBGRADE DETAIL ON SHEET 2A-3 FOR LOCATIONS WITHIN T.S. #1)
 WHERE PROPOSED WIDENING IS LESS THAN 6 FT, NO ALTERNATE PAVEMENT DESIGN IS ALLOWED.



PROJECT REFERENCE NO. U-2581BA	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared by 	

8/24/2018
 R:\Roadway\Proj\U2581BA_rdy_tjrp.dgn
 Javellana

6/2/2018

PROJECT REFERENCE NO. U-2581BA	SHEET NO. 2A-2
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER

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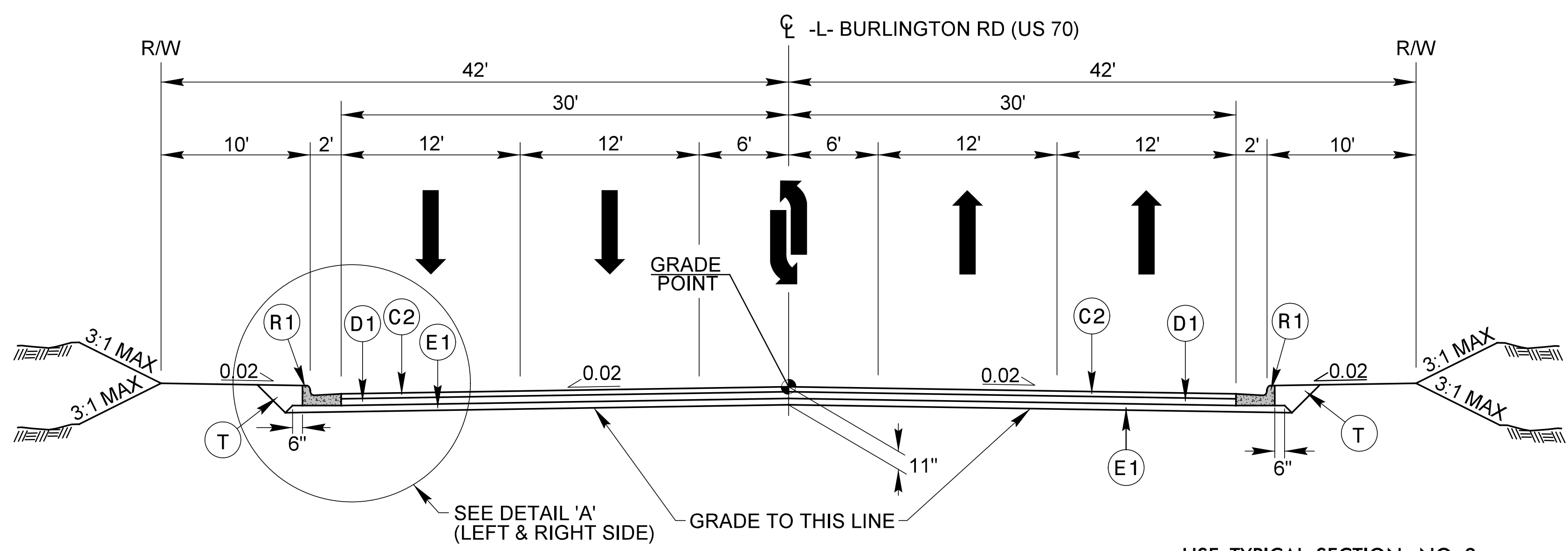
Prepared by

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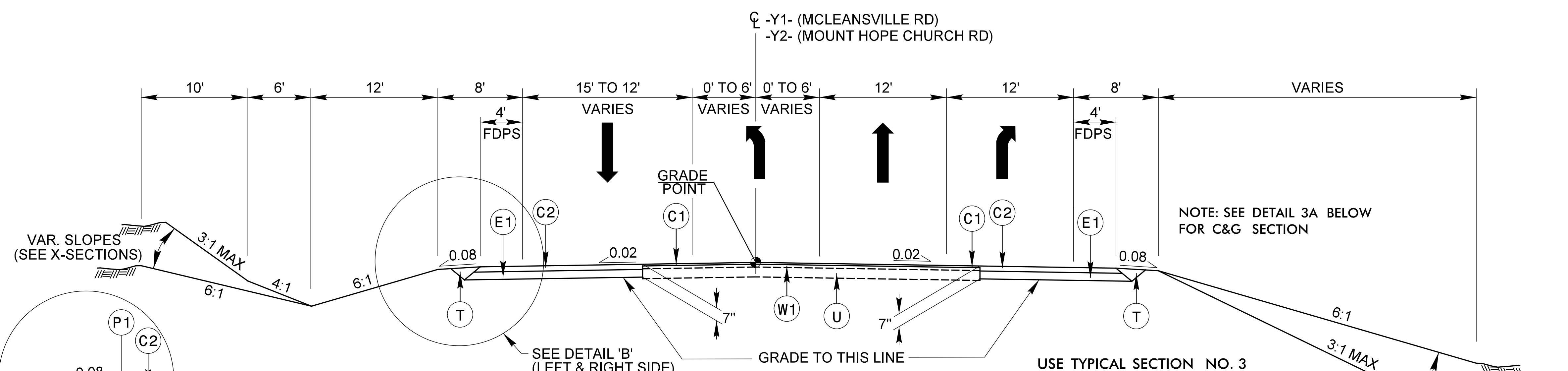
FINAL PAVEMENT SCHEDULE

C1	1 1/2" TYPE S9.5B
C2	3" TYPE S9.5B
D1	4" TYPE I19.0C
E1	4" TYPE B25.0C
J1	8" ABC
J2	4" ABC
P1	PRIME COAT
L	CLASS IV SUBGRADE STABILIZATION
N	GEOTEXTILE FOR SOIL STABILIZATION
R1	2'-6" C&G
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	WEDGING
W2	WEDGING

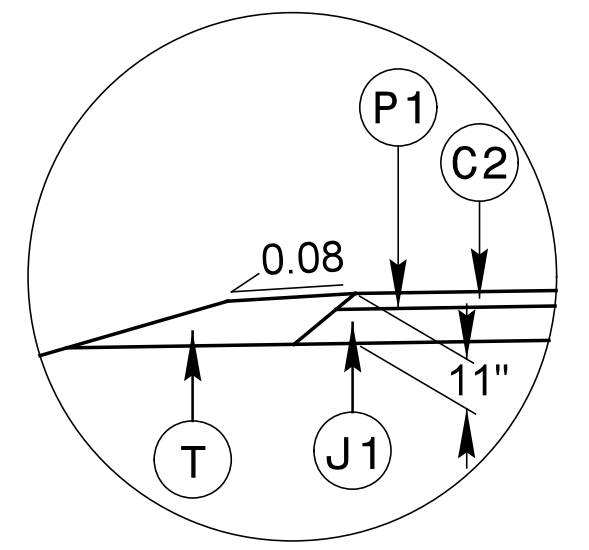
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



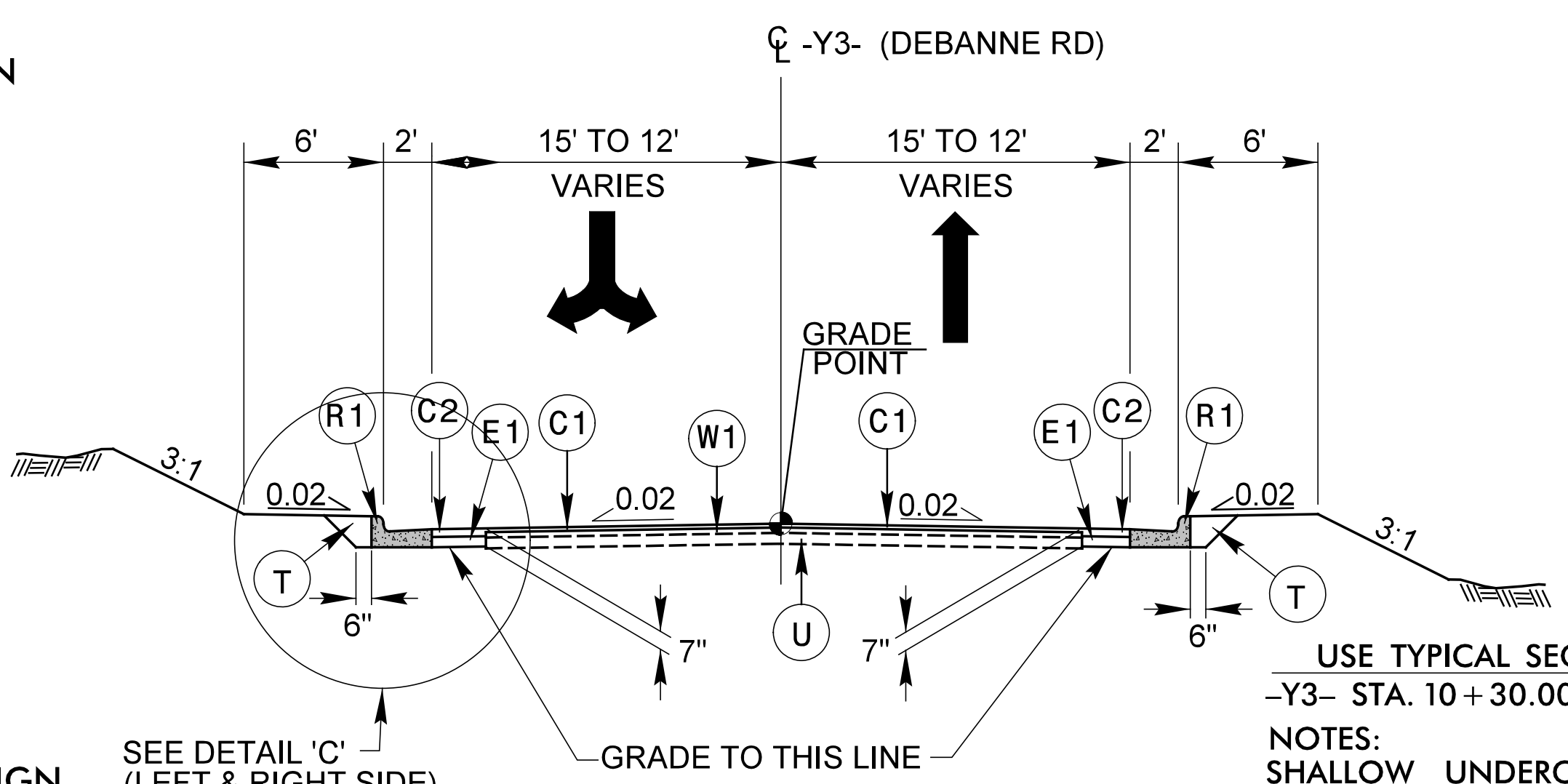
NOTE: SEE PLANS FOR LOCATIONS OF AUXILIARY LANES AND TAPERS **TYPICAL SECTION NO. 2** USE TYPICAL SECTION NO. 2 -L- STA. 53+50.00 TO 59+00.00



NOTE: SEE PLANS FOR LOCATIONS OF AUXILIARY LANES AND TAPERS **TYPICAL SECTION NO. 3** USE TYPICAL SECTION NO. 3 -Y1- STA. 13+45.00 TO 19+94.59 USE REV. OF TYPICAL SECTION NO. 3 -Y2- STA. 10+30.15 TO 18+14.00



ALTERNATE PAVEMENT DESIGN DETAIL 'B'



ALTERNATE PAVEMENT DESIGN DETAIL 'C'

SEE DETAIL 'C' (LEFT & RIGHT SIDE)

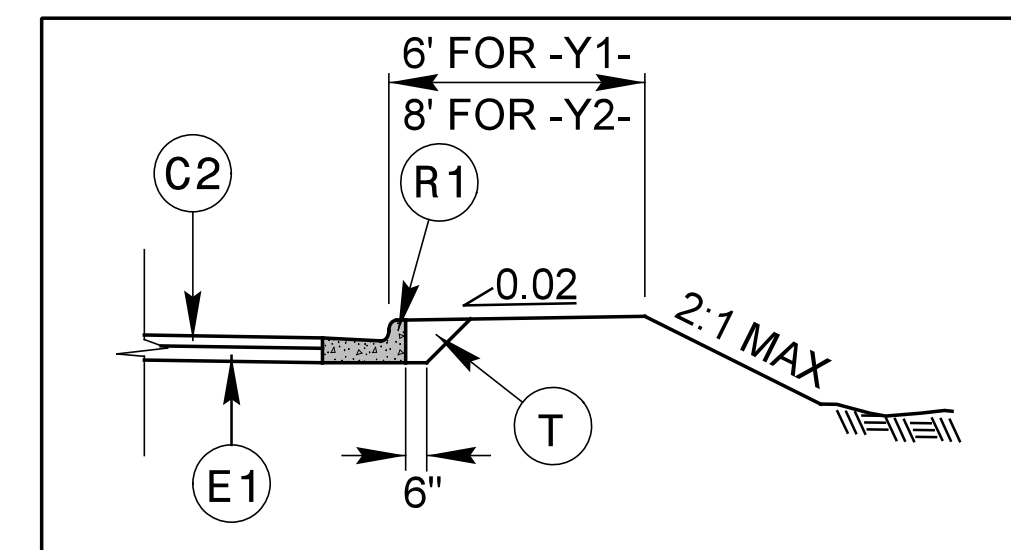
TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4 -Y3- STA. 10+30.00 TO 13+25.00

NOTES: SHALLOW UNDERCUT 1' IN DEPTH AND REPLACE WITH (L) (SEE AGGREGATE SUBGRADE DETAIL ON SHEET 2A-3 FOR LOCATIONS WITHIN T.S. #4)

WHERE PROPOSED WIDENING IS LESS THAN 6 FT, NO ALTERNATE PAVEMENT DESIGN IS ALLOWED.

NOTES: SHALLOW UNDERCUT 1' IN DEPTH AND REPLACE WITH (L) (SEE AGGREGATE SUBGRADE DETAIL ON SHEET 2A-3 FOR LOCATIONS WITHIN T.S. #3) WHERE PROPOSED WIDENING IS LESS THAN 6 FT, NO ALTERNATE PAVEMENT DESIGN IS ALLOWED.

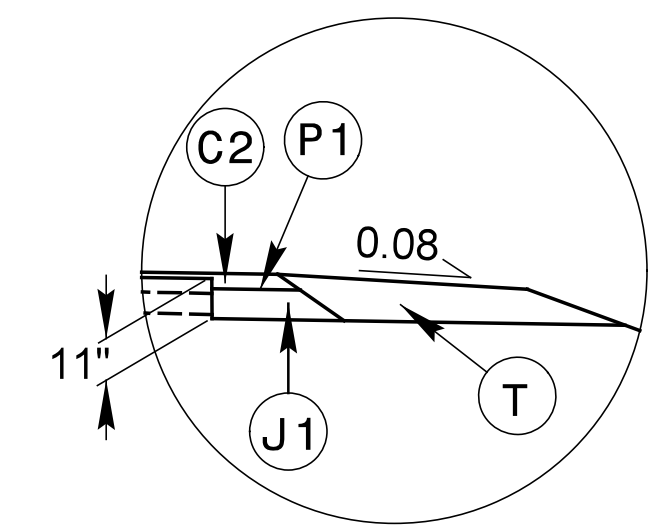
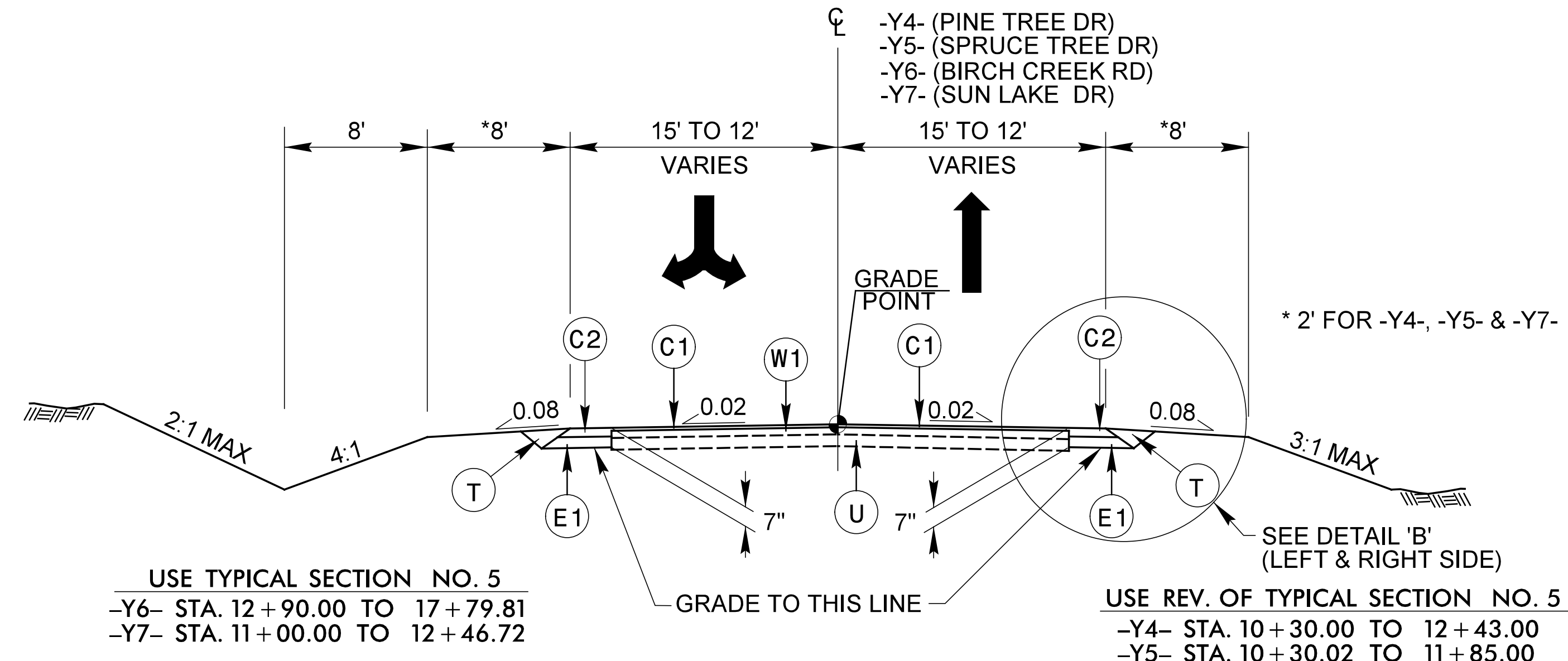


USE IN CONJUNCTION WITH T.S.# 3
-Y1- 17+35.00 TO 19+87.40 RT
-Y1- 14+50.00 TO 19+86.88 LT
-Y2- 10+30.15 TO 15+17.26 RT
-Y2- 10+40.16 TO 11+30.26 LT

DETAIL 3A
SEE ALSO DETAIL 'C' FOR ALTERNATE PAVEMENT DESIGN

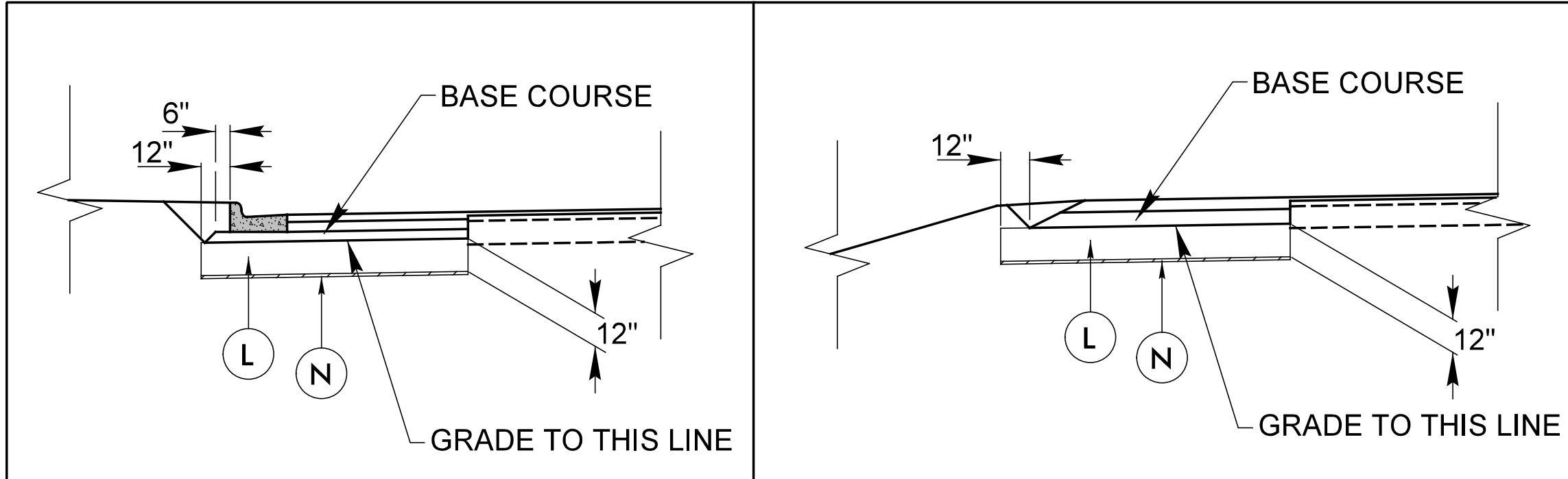
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6/2/2018



TYPICAL SECTION NO. 5

NOTES:
 SHALLOW UNDERCUT 1' IN DEPTH AND REPLACE WITH (L)
 (SEE AGGREGATE SUBGRADE DETAIL FOR LOCATIONS WITHIN T.S. #5)
 WHERE PROPOSED WIDENING IS LESS THAN 6 FT,
 NO ALTERNATE PAVEMENT DESIGN IS ALLOWED.



AGGREGATE SUBGRADE DETAIL

USE AGGREGATE SUBGRADE DETAIL IN CONJUNCTION WITH T.S.# 1, 3, 4 & 5

-L- STA. 24+25.00 TO STA. 26+75.00 LT & RT	-Y1- STA. 13+50.00 TO STA. 16+75.00 LT & RT
-L- STA. 30+75.00 TO STA. 37+25.00 LT & RT	-Y1- STA. 18+75.00 TO STA. 19+75.00 LT & RT
-L- STA. 63+75.00 TO STA. 69+75.00 LT & RT	-Y2- STA. 12+25.00 TO STA. 18+25.00 LT & RT
-L- STA. 73+75.00 TO STA. 78+75.00 LT & RT	-Y3- STA. 10+25.00 TO STA. 13+25.00 LT & RT
-L- STA. 81+75.00 TO STA. 82+25.00 LT & RT	-Y5- STA. 10+75.00 TO STA. 11+75.00 LT & RT
-L- STA. 88+25.00 TO STA. 89+25.00 LT & RT	-Y6- STA. 16+25.00 TO STA. 17+75.00 LT & RT

NOTE:
 FOR -DRW1- AND -DRW2- PAVEMENT COMPOSITION, USE TYPICAL SECTION NO. 2.
 SEE PLAN SHEET 7 FOR -DRW1- AND PLAN SHEET 9 FOR -DRW2-.

PROJECT REFERENCE NO. U-2581BA	SHEET NO. 2A-3
ROADWAY DESIGN ENGINEER DocuSigned by: Jerry Jaullana	PAVEMENT DESIGN ENGINEER DocuSigned by: Vladimir G. Mitelev
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared by VHB Engineering NC, P.C. (C-3705) 940 Main Campus Drive, Suite 500 Raleigh, NC 27605	
FINAL PAVEMENT SCHEDULE	
C1	1 1/2" TYPE S9.5B
C2	3" TYPE S9.5B
E1	4" TYPE B25.0C
J1	8" ABC
P1	PRIME COAT
L	CLASS IV SUBGRADE STABILIZATION
N	GEOTEXTILE FOR SOIL STABILIZATION
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	WEDGING

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

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 6/24/2018
 11:41:00 AM

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

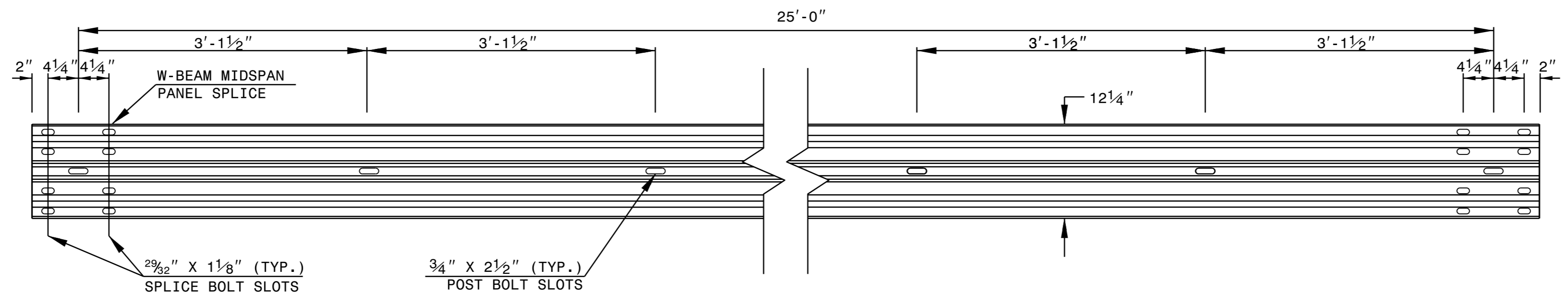
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

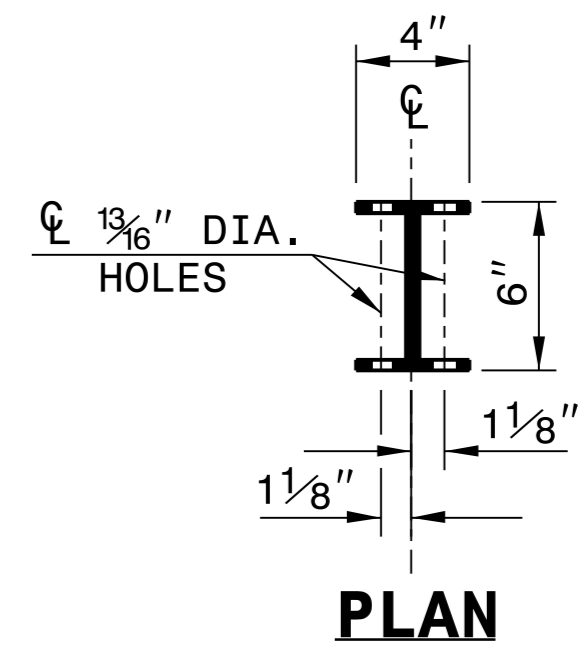
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

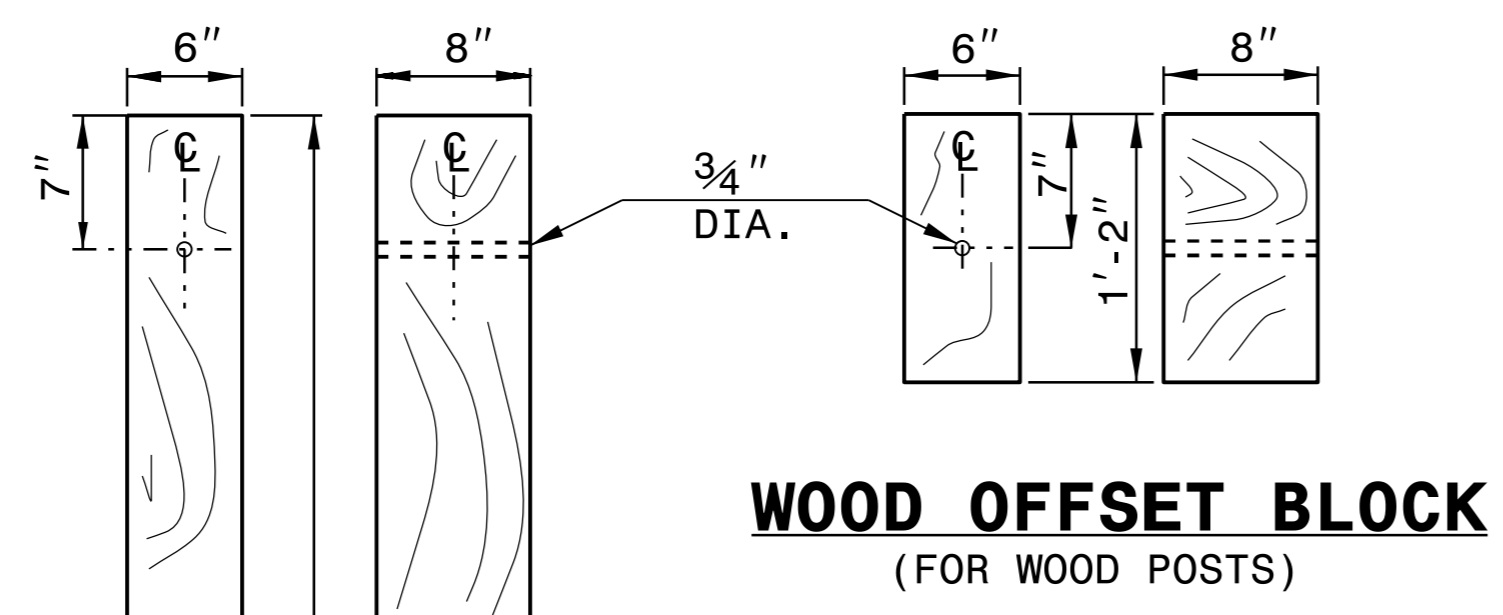
SHEET 6 OF 8
862D02



STANDARD W-BEAM GUARDRAIL



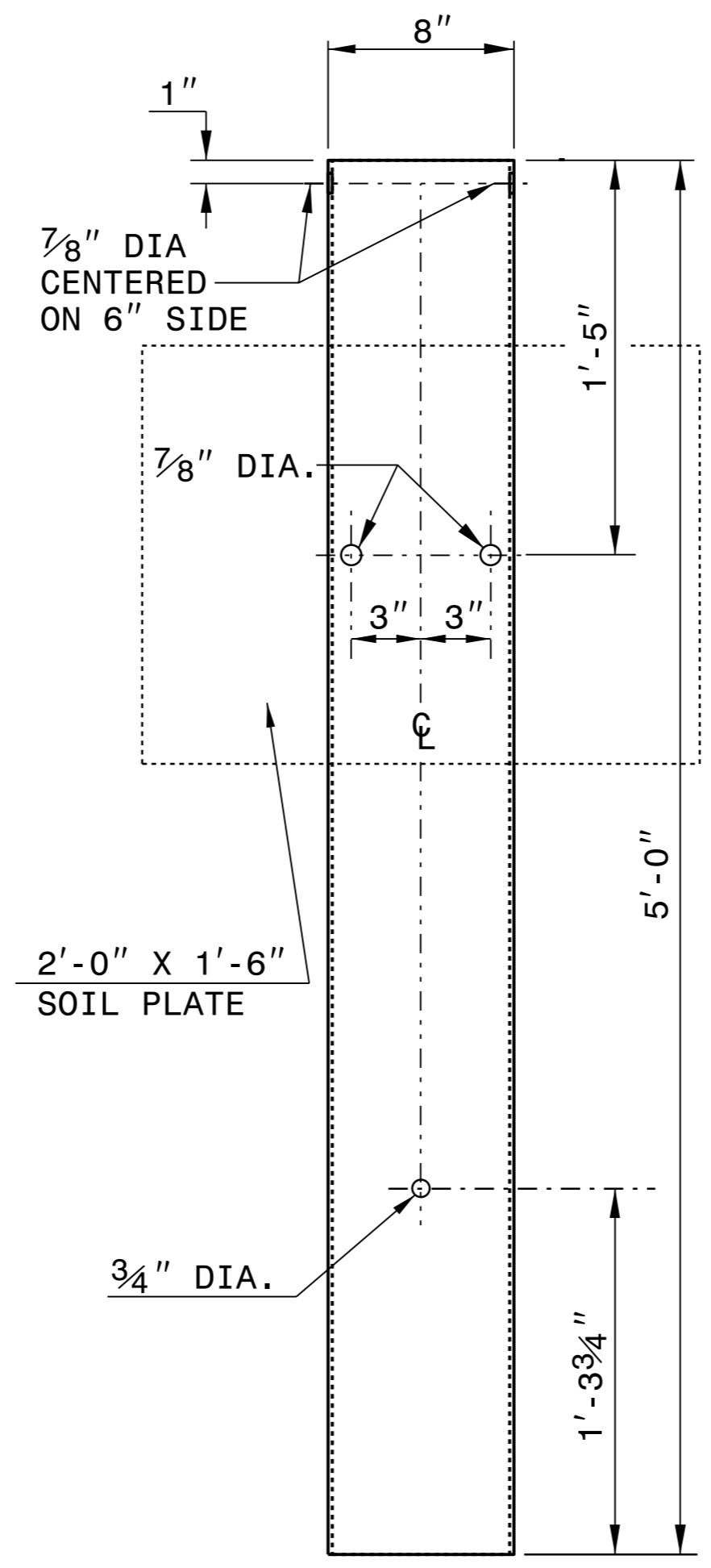
PLAN



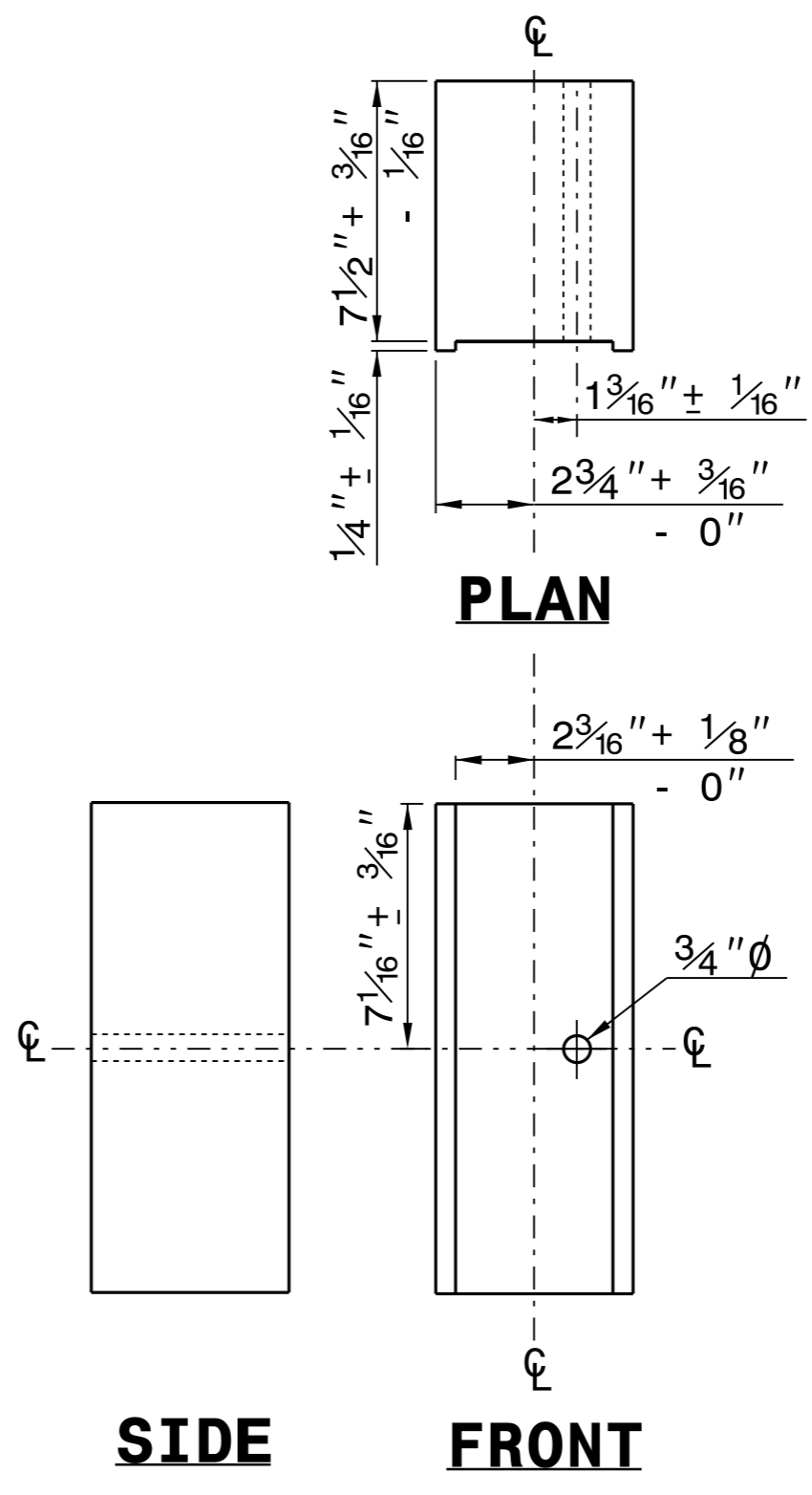
**WOOD OFFSET BLOCK
(FOR WOOD POSTS)**

**STANDARD
LINE POST**

**SHORT WOOD
BREAKAWAY POST**



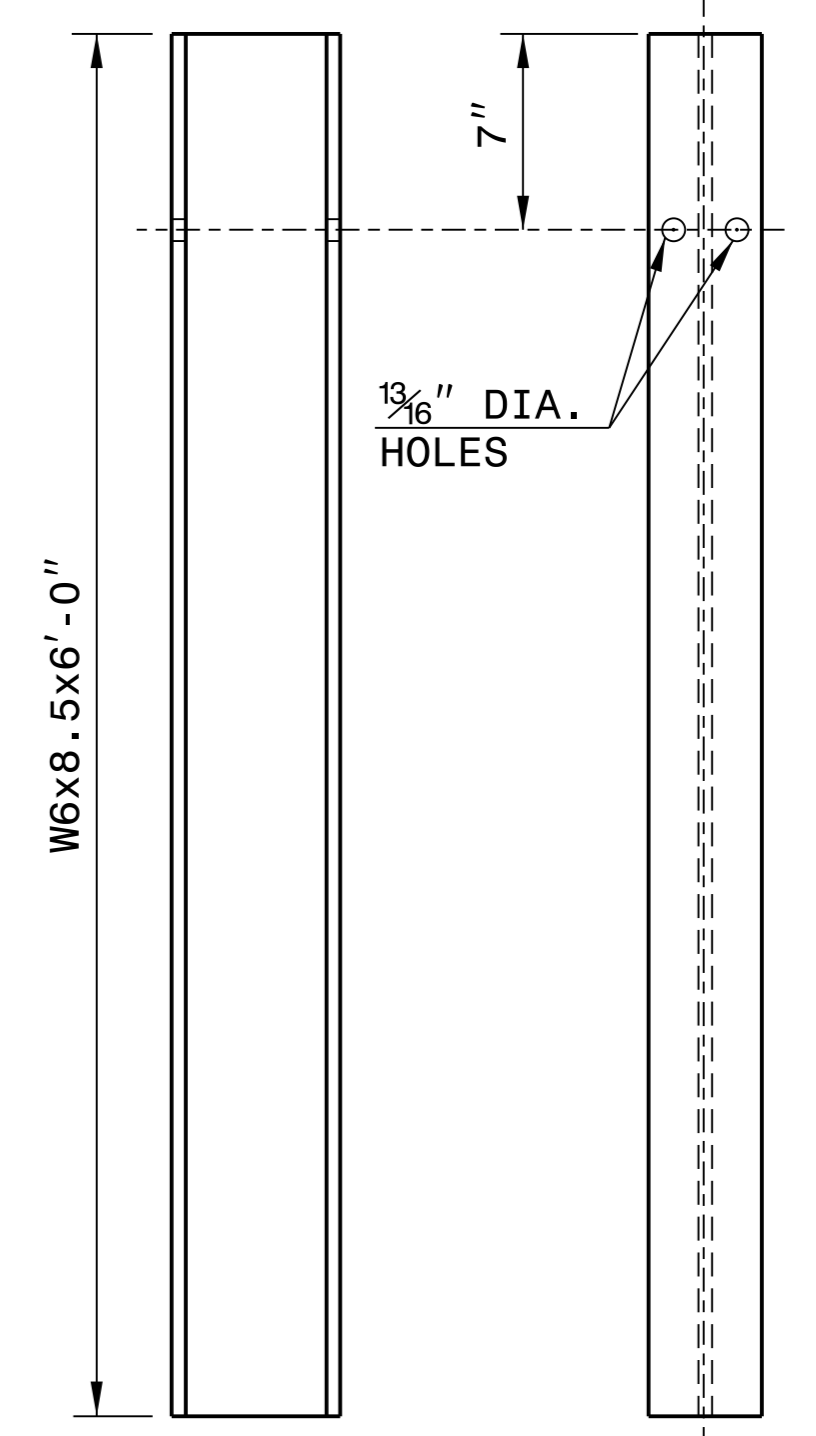
**STEEL TUBE
TS 6"x8"x0.1875"**



SIDE

FRONT

**ROUTED
OFFSET BLOCK**



SIDE

FRONT

"W6" STEEL POST

SYSTEM PARTS



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

SEE TITLE BLOCK

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

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

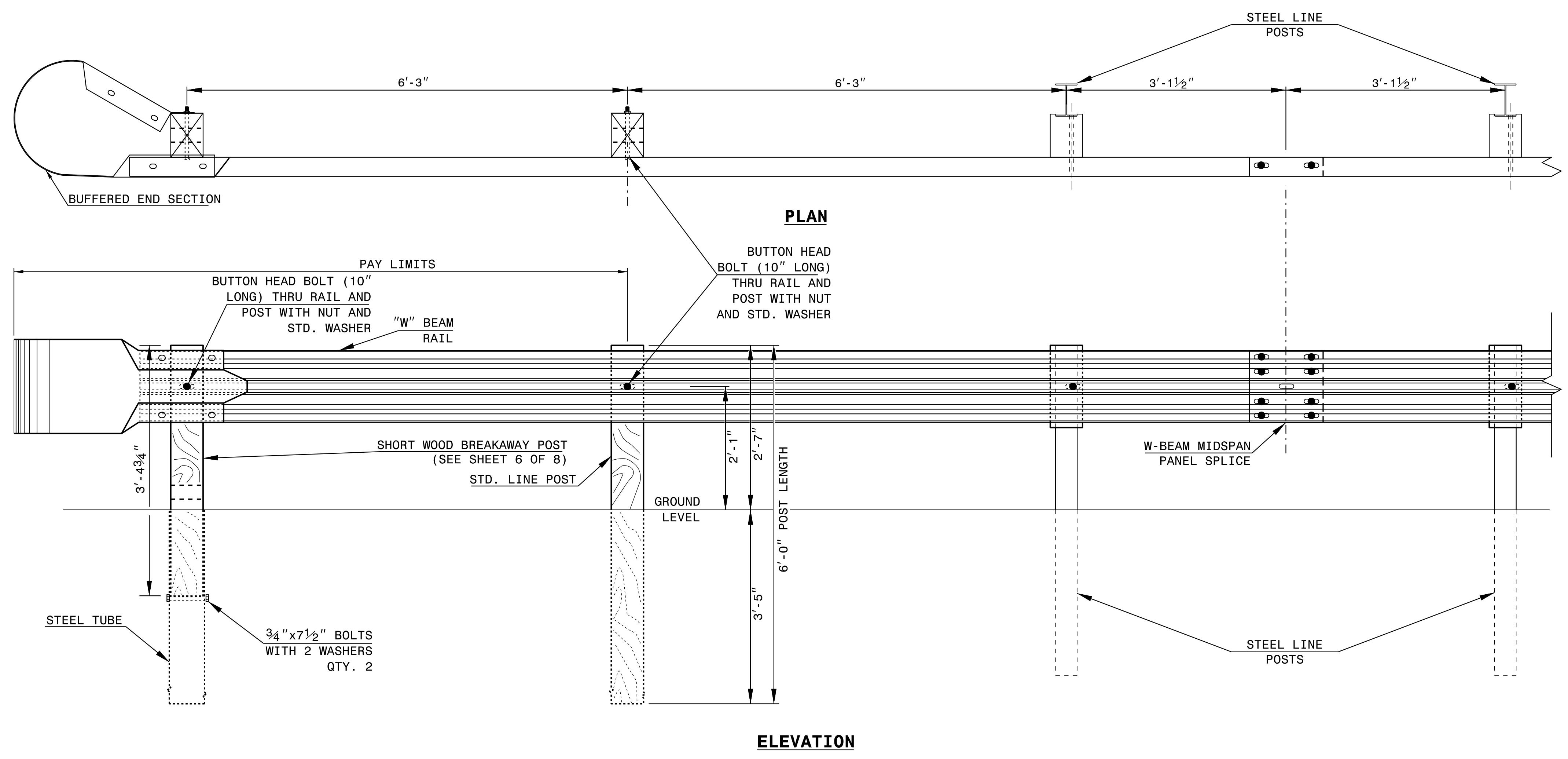
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF

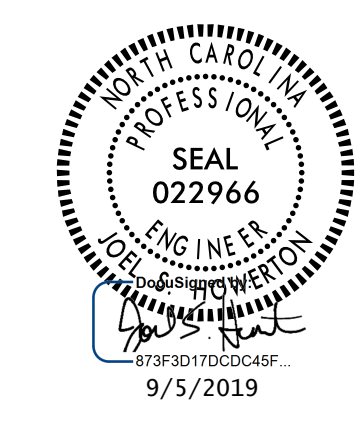
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF



TRAILING END UNIT ASSEMBLY
A.T. - 1 SYSTEM

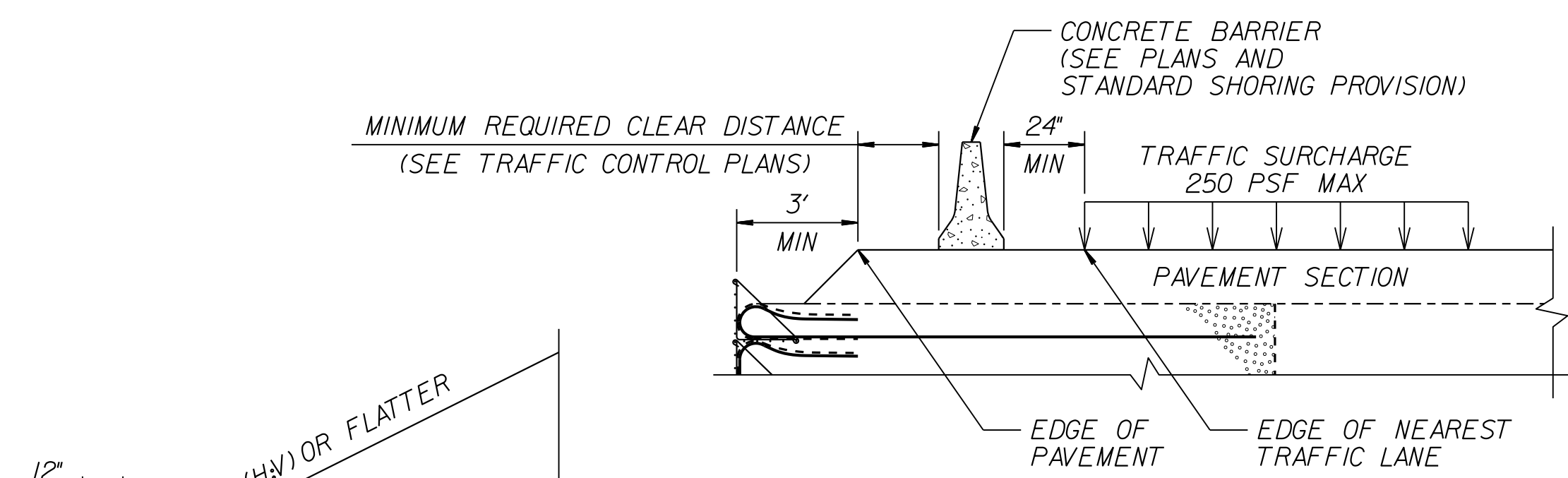


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UNLESS ALL SIGNATURES COMPLETED

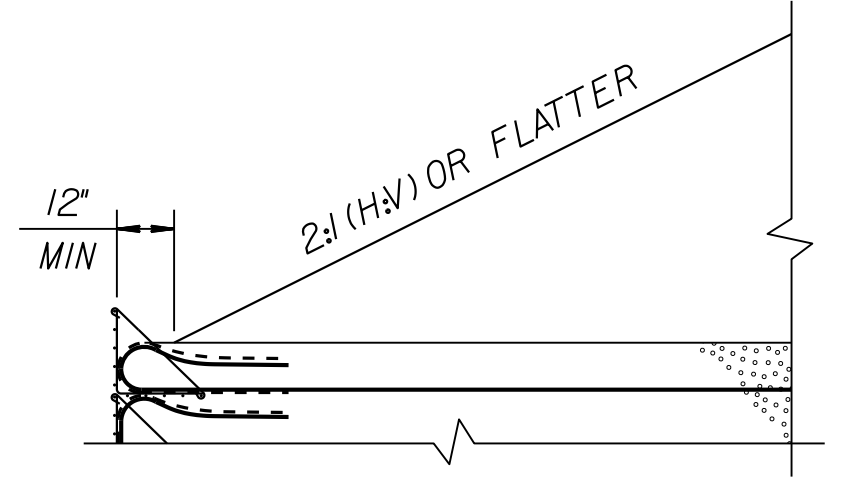
CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

A.T. - 1 SYSTEM

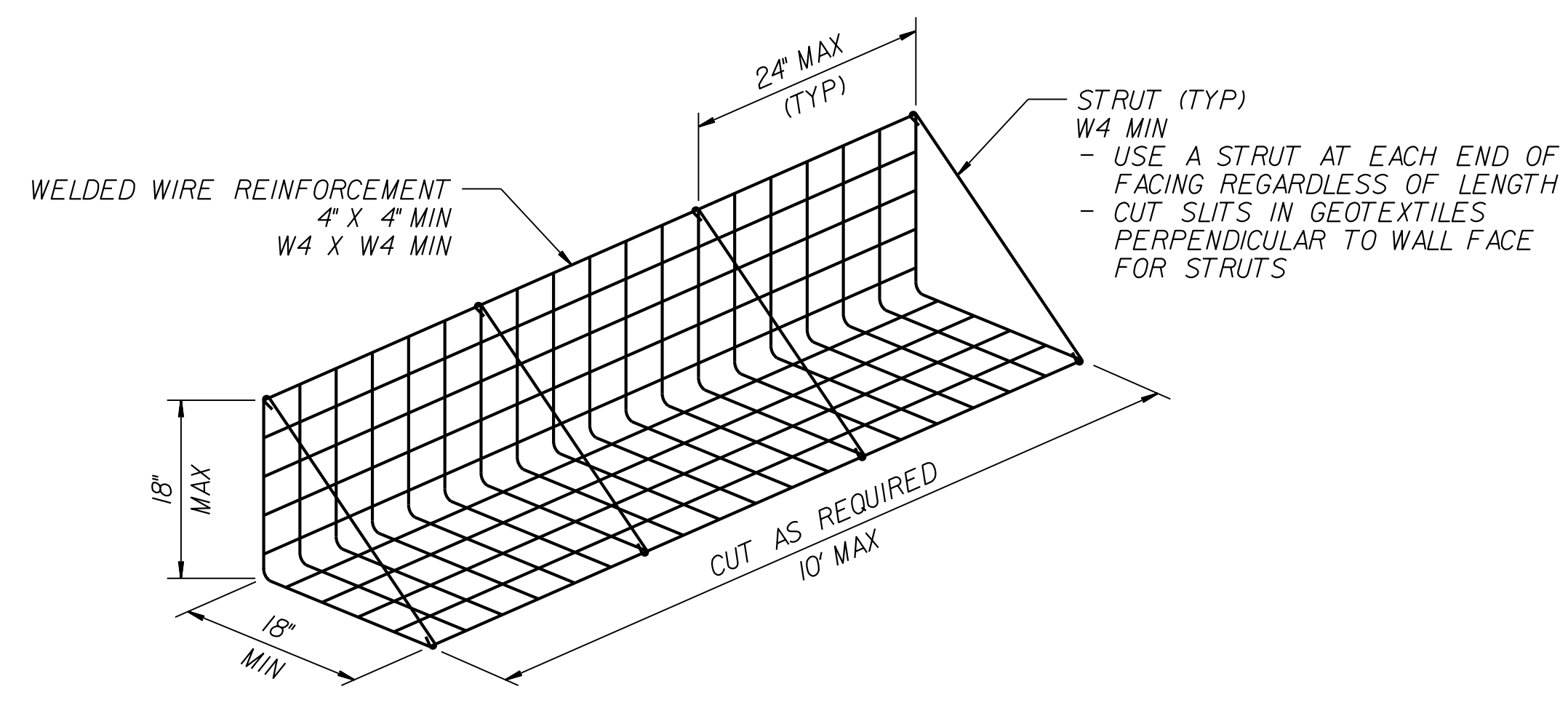
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 MODIFIED BY: _____ DATE: _____
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 FILE SPEC.: _____



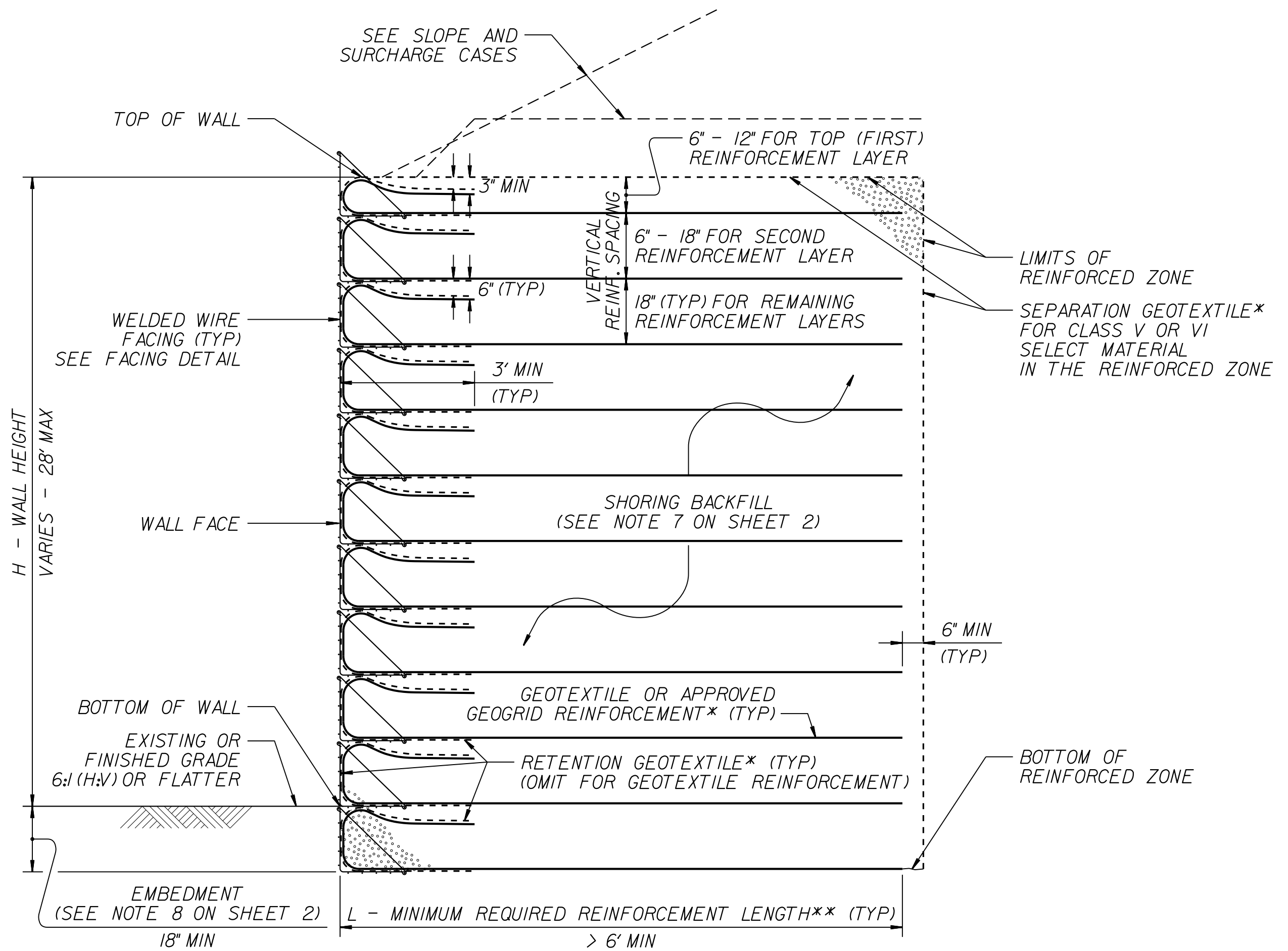
SURCHARGE CASE



SLOPE CASE

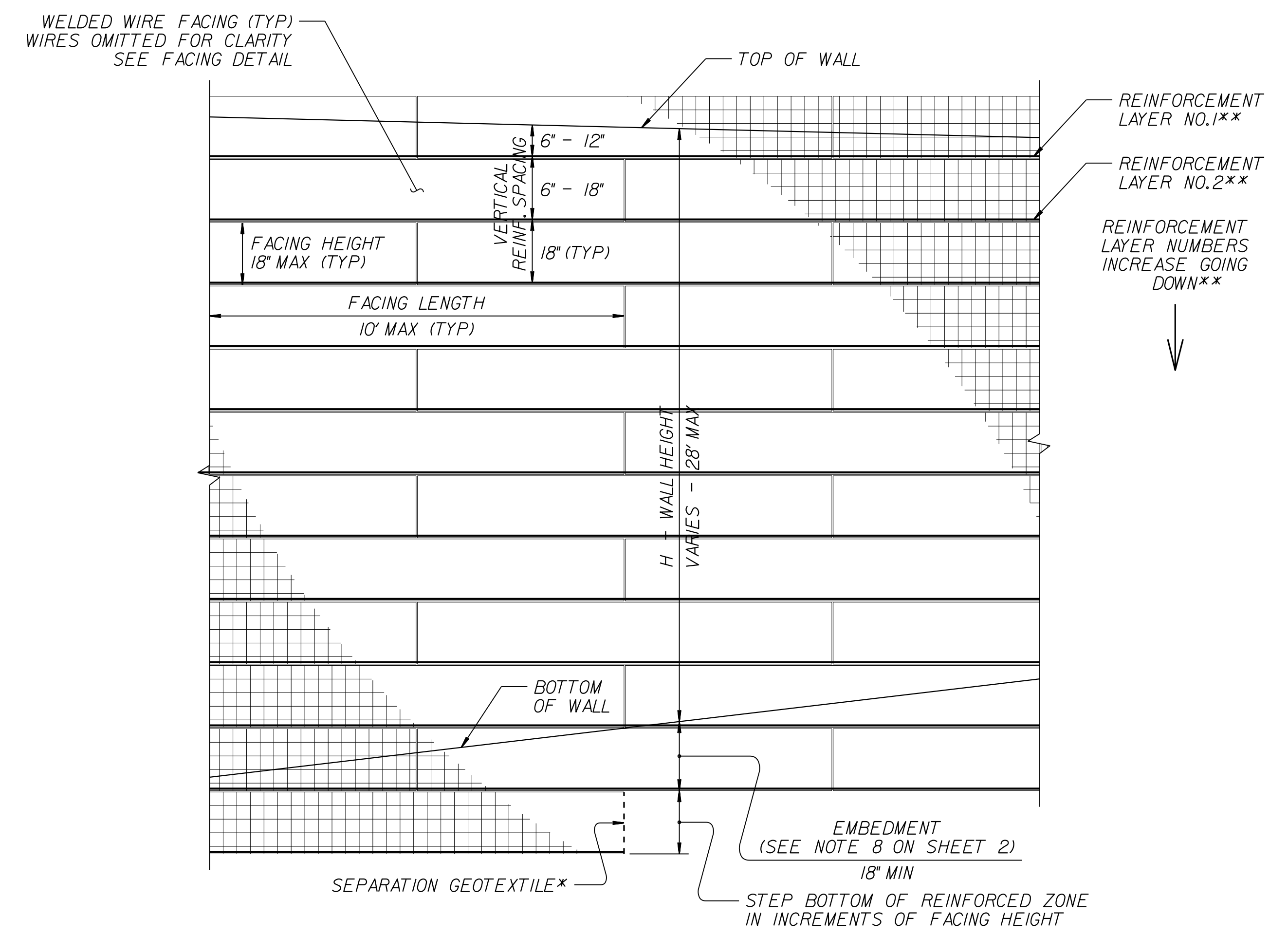


FACING DETAIL



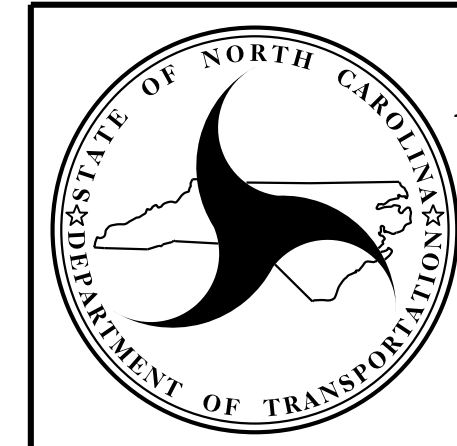
STANDARD TEMPORARY WALL

(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.

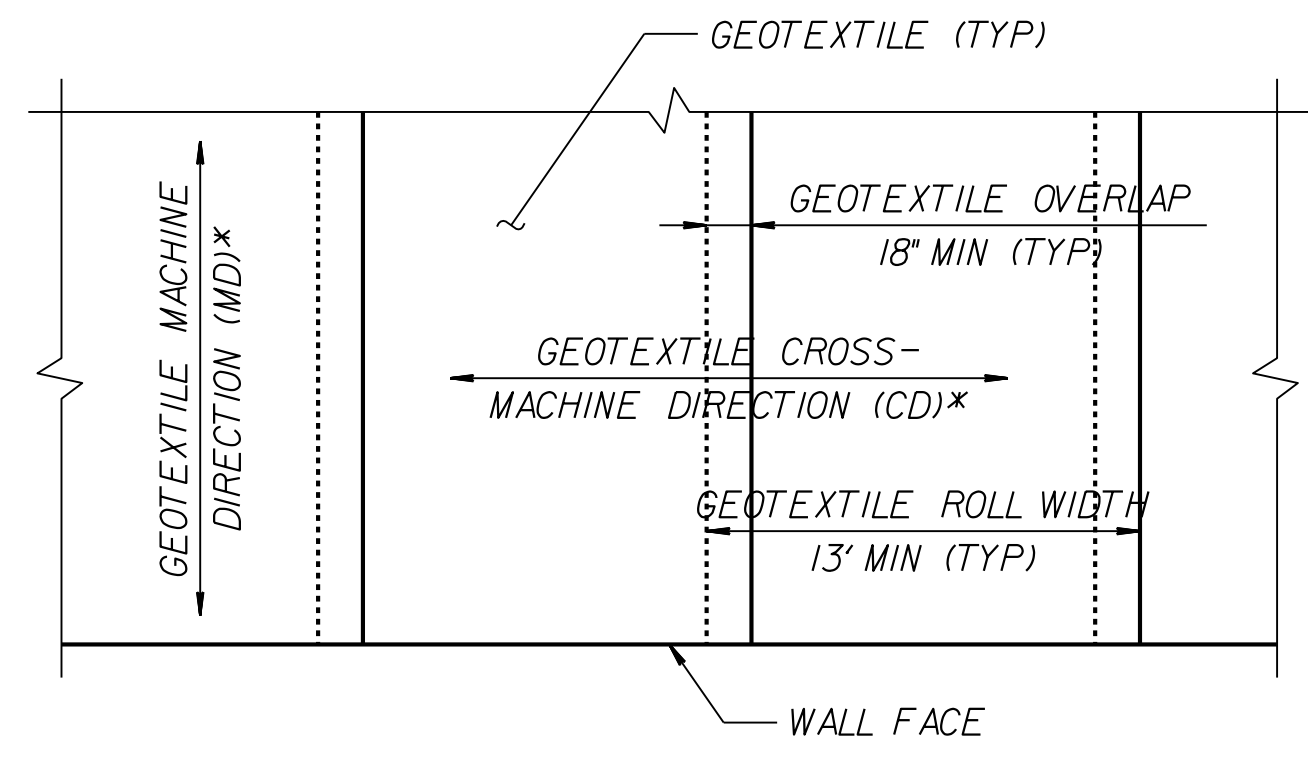


NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
**GEOTECHNICAL
 ENGINEERING UNIT**

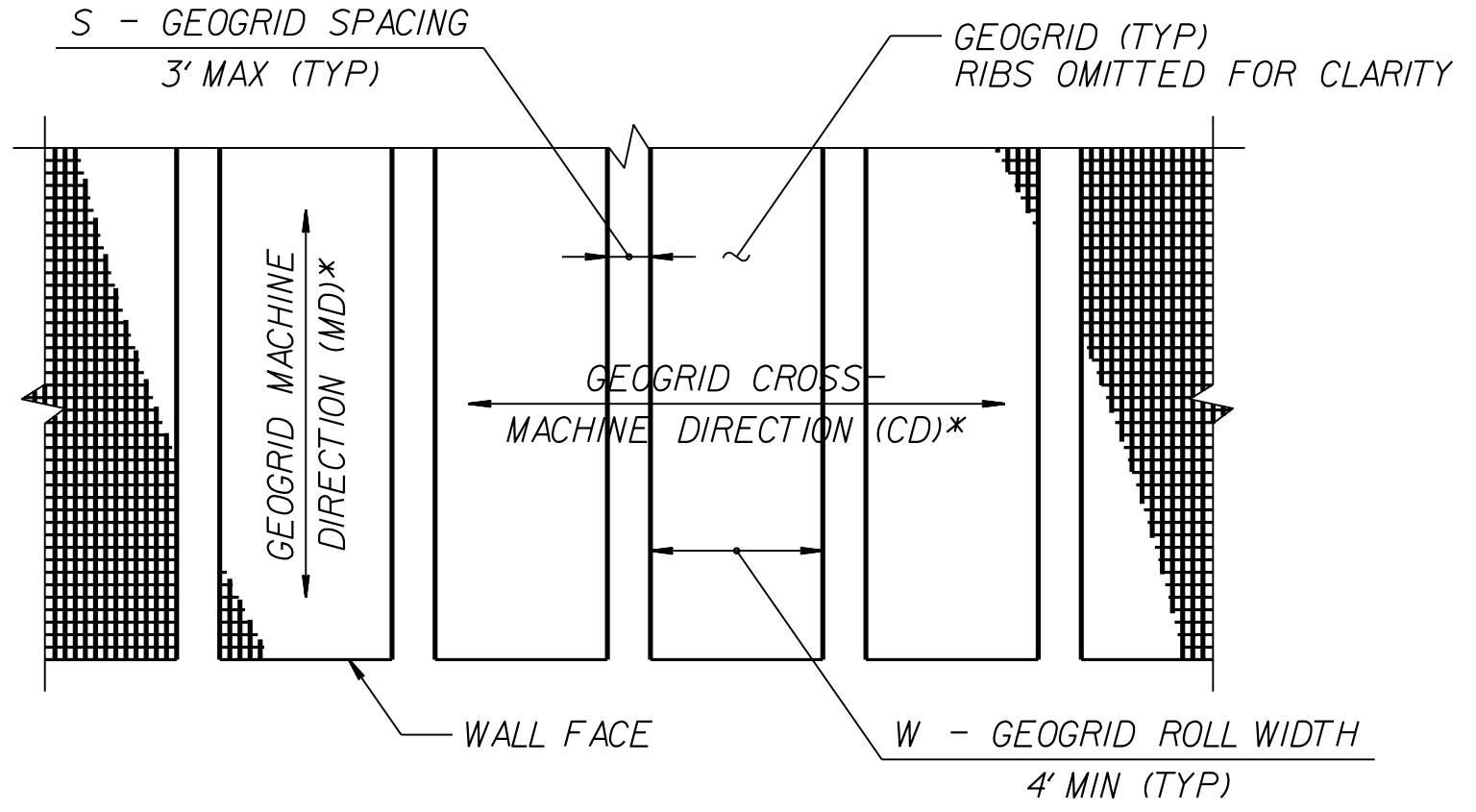
STANDARD DETAIL NO. 1801.02

STANDARD
 TEMPORARY WALL
 SHEET 1 OF 3

PROJECT REFERENCE NO.		SHEET NO.	
U-2581BA		2G-2	
GEOTECHNICAL ENGINEER  DocuSigned by: Scott A. Holden F780CAE89FCA03 7/1/2019		ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

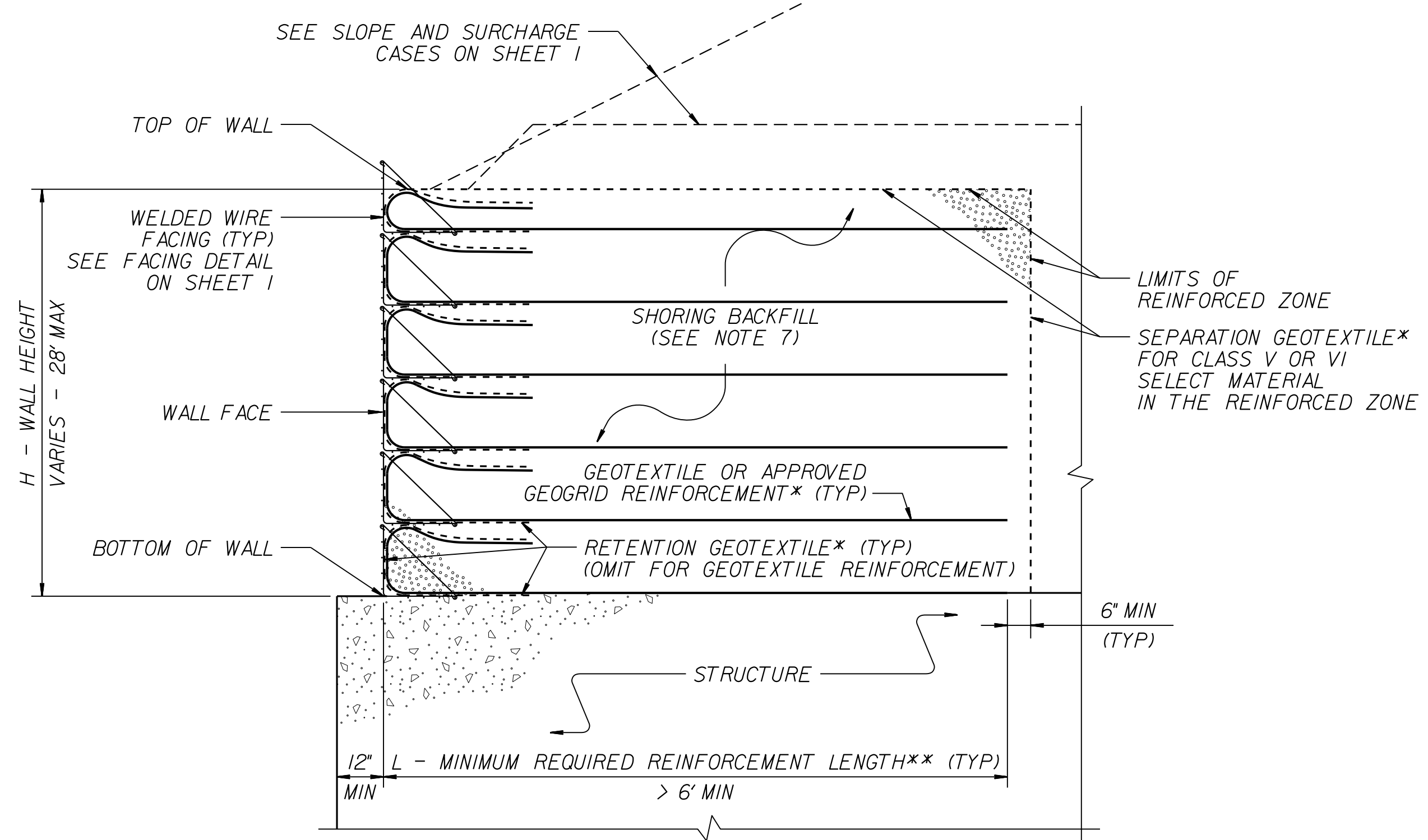


GEOTEXTILE PLACEMENT
 (100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)



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.



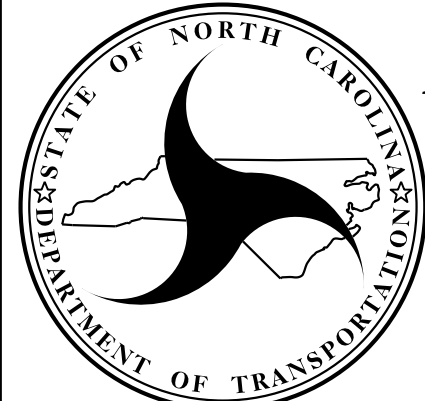
TEMPORARY WALL ON STRUCTURE DETAIL
 *SEE GEOSYNTHETIC PLACEMENT DETAILS.
 **SEE REINFORCEMENT TABLES ON SHEET 3.

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, $\gamma = 120$ PCF
 FRICTION ANGLE, $\phi = 30$ DEGREES
 COHESION, $c = 0$ PSF
- 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/Materials-Manual-by-Manual.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.



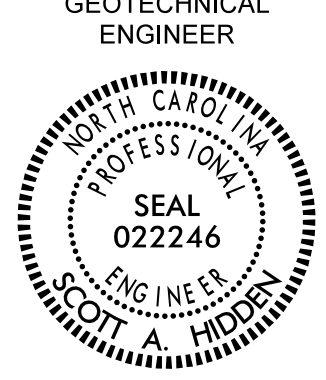
NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

GEOTECHNICAL
 ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD
 TEMPORARY WALL
 SHEET 2 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO. U-2581BA	SHEET NO. 2G-3
GEOTECHNICAL ENGINEER  ENGINEER	ENGINEER
Designated by: Scott A. Hadden 7/1/2019 <small>Signature Date</small>	<small>Signature Date</small>
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	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.

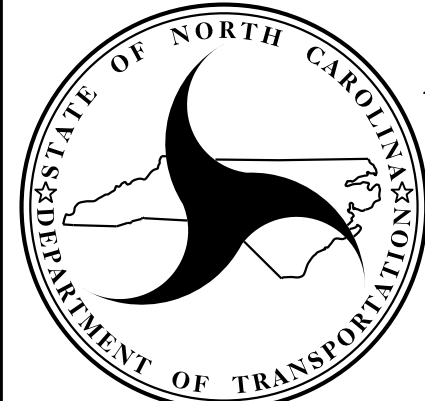
REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400	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

DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK
 IN CUBIC YARDS

STATION	STATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT +%	BORROW	WASTE
PHASE I						
-L- LT 12+32.17	42+00.00	2,556		3,634	2,494	1,416
-Y1- 13+45.00	19+94.59	548		518	450	480
	SUBTOTAL	3,104		4,152	2,944	1,896
-L- LT 42+00.00	48+50.00	50		1,456	1,406	
-L- 48+50.00	52+00.00	368		994	626	
-L- RT 52+00.00	72+00.00	310	1,800	16,994	16,684	1,800
-Y4- LT 10+30.00	12+43.00	4		143	139	
-DRW1- 10+42.00	10+78.00	235		36		199
	SUBTOTAL	967	1,800	19,623	18,855	1,999
-L- RT 72+00.00	91+80.00	1,816		3,124	1,834	526
-DRW2- 10+42.00	10+52.78	146		4		142
	SUBTOTAL	1,962		3,128	1,834	668
	PHASE I SUBTOTAL	6,033	1,800	26,903	23,633	4,563
PHASE II						
-L- RT 12+32.17	42+00.00	891		3,221	2,672	342
-Y2- 10+30.15	18+14.00	960		775	564	749
-Y3- 10+30.00	13+25.00	82		77	74	79
	SUBTOTAL	1,933		4,073	3,310	1,170
-L- RT 42+00.00	48+50.00	14		458	444	
-L- LT 52+00.00	72+00.00	739		4,703	4,100	136
-L- LT 56+20.00 DRIVEWAY	57+30.00			806	806	
-Y4- RT 10+30.00	12+43.00	32		91	59	
-Y5- 10+30.02	11+85.00	54		42		12
	SUBTOTAL	839		6,100	5,409	148
-L- LT 72+00.00	91+00.00	545		3,151	2,928	322
-Y6- 12+90.00	17+79.81	433		1,028	595	
-Y6- 14+19.00 DRIVEWAY	14+45.00			16	16	
-Y7- 11+00.00	12+46.72	28		16		12
	SUBTOTAL	1,006		4,211	3,539	334
	PHASE II SUBTOTAL	3,778		14,384	12,258	1,652
	SUMMARY TOTALS	9,811	1,800	41,287	35,891	6,215
MATERIAL FOR SHOULDER CONSTRUCTION				12	12	
LOSS DUE TO CLEARING & GRUBBING		-3,500			3,500	
SELECT GRANULAR MATERIAL IN LIEU OF BORROW				-2,160	-2,160	
ADDITIONAL UNDERCUT EXCAVATION			200	240	240	200
WASTE IN LIEU OF BORROW					-365	-365
	PROJECT TOTALS	6,311	2,000	39,379	37,118	6,050
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT					1,856	
	GRAND TOTAL	6,311	2,000		38,974	
	SAY	6,400	2,000		39,100	

PAVEMENT ALTERNATE 1 STRUCTURE VOLUME 23,040 CY

STATION	STATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT +%	BORROW	WASTE
EARTHWORK TOTALS FOR ALTERNATE PAVEMENT DESIGN						
SUMMARY TOTALS		9,811	1,800	41,287	35,891	6,215
ADJ. FOR ALTERNATE PAVEMENT DESIGN		1,877		-3,058	-4,887	48
MATERIAL FOR SHOULDER CONSTRUCTION				552	552	
LOSS DUE TO CLEARING & GRUBBING		-3,500			3,500	
SELECT GRANULAR MATERIAL IN LIEU OF BORROW				-2,160	-2,160	
ADDITIONAL UNDERCUT EXCAVATION			200	240	240	200
WASTE IN LIEU OF BORROW					-413	-413
	PROJECT TOTALS	8,188	2,000	36,861	32,723	6,050
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT					1,636	
	GRAND TOTAL	8,188	2,000		34,359	
	SAY	8,200	2,000		34,400	

PAVEMENT ALTERNATE 2 STRUCTURE VOLUME 31,760 CY

EST. DDE = 70 CUBIC YARDS

ESTIMATED 1,800 CY OF UNCLASSIFIED EXCAVATION PER GEOTECH RECOMMENDATION ACCEPTABLE BUT NOT TO BE USED IN THE TOP 3 FT OF EMBANKMENT OR BACKFILL

ESTIMATED 2,850 CY AND ADDITIONAL OF 300 CY AS CONTINGENCY OF SHALLOW UNDERCUT PER GEOTECH RECOMMENDATION

CLASS IV SUBGRADE STABILIZATION TO REPLACE SHALLOW UNDERCUT (PER GEOTECH RECOMMENDATION) = 6,200 TONS

NOTE:
 APPROXIMATE QUANTITIES ONLY, UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, BREAKING OF EXISTING PAVEMENT, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING".

5/9/2018 7:30:20 AM R:\Projects\2581BA\2581BA_rdy_sum.dgn localuser

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS							IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS											
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	TYPE B-77	GREU TL-3	GREU MEDIAN	XIII	CAT-1	VI MOD	BIC	AT-1	EA					G	NG									
-L-	53+40.00	57+05.00	RT	365.00'			54+40.00	56+10.00	14'	14' BERM																													
-L-	55+60.00	56+41.13	LT	65.50'	50.00'		DRIVEWAY	55+60.00	14'	14' BERM																													
TOTAL				430.50'																																			
DEDUCTION FOR ANCHORS				-112.50'																																			
PROJECT TOTAL				318.00'	50.00'																																		
SAY				325'	50'																																		
ADDITIONAL GUARDRAIL POST = 5 EACH																																							
															DEDUCTION FOR ANCHORS: (GREU, TL-3) 2 @ 50' = 100.00'																								
															(CAT-1) 1 @ 6.25' = 6.25'																								
															(AT-1) 1 @ 6.25' = 6.25'																								
															TOTAL DEDUCTIONS = 112.50'																								

REMOVAL OF EXISTING ASPHALT PAVEMENT

LINE	BEGIN STATION	END STATION	LOCATION	SQ. YD.
-L-	25+15.28	28+15.74	RT	75.93
-L-	29+50.00	37+49.30	RT	560.35
-L-	38+38.86	42+62.67	RT	307.13
-L-	43+26.19	47+31.00	RT	352.18
-L-	52+14.07	54+50.00	LT	284.59
-L-	58+50.00	60+45.72	LT	254.42
-L-	65+00.00	67+50.00	LT	116.95
-L-	73+37.90	78+93.56	LT	606.91
-L-	63+12.08	65+00.00	LT	77.92
-L-	67+50.00	68+00.00	LT	18.45
-L-	79+02.00	79+24.00	RT	66.34
TOTAL				2,721.17
SAY				2,730

BREAKING OF EXISTING ASPHALT PAVEMENT

LINE	BEGIN STATION	END STATION	LOCATION	SQ. YD.
-L-	28+15.74	29+50.00	RT	93.33
-L-	54+00.00	58+50.00	LT	1,653.24
TOTAL				1,746.57
SAY				1,750

Z8624

COMPUTED BY: VHB DATE: 07/02/2019
CHECKED BY: VHB DATE: 07/18/2019

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO. U2581BA SHEET NO. 3D-1

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, and Pipe Removal. Includes a SHEET TOTALS row at the bottom.

ABBREVIATIONS table listing materials like 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.

COMPUTED BY: VHB DATE: 07/02/2019
CHECKED BY: VHB DATE: 07/18/2019

PROJECT NO. SHEET NO.
U2581BA 3D-3

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, and Pipe Removal. Includes a SHEET TOTALS row at the bottom.

ABBREVIATIONS table listing codes and descriptions for materials like 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.

REMARKS

COMPUTED BY: VHB DATE: 07/02/2019
CHECKED BY: VHB DATE: 07/18/2019

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO. SHEET NO.
U2581BA 3D-4

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, 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

Z6824

COMPUTED BY: VHB DATE: 07/02/2019
CHECKED BY: VHB DATE: 07/18/2019

PROJECT NO. SHEET NO.
U2581BA 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 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, DRAINAGE STRUCTURE, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, CONCRETE TRANSITIONAL SECTION, and REMARKS. Includes a SHEET TOTALS row at the bottom.

COMPUTED BY: VHB DATE: 07/02/2019
CHECKED BY: VHB DATE: 07/18/2019

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO. U2581BA SHEET NO. 3D-6

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, 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, and Abbreviations. Includes a SHEET TOTALS row at the bottom.

COMPUTED BY: S.E. Mitchell DATE: 7/23/19
 CHECKED BY: S.S. Laney DATE: 7/23/19

(2-16-16)

PROJECT NO.
U-2581BA

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
L	90+75	91+25	RT	SD	100
Y3	13+00	14+00	RT	SD	200
Y4	11+00	12+00	CL	SD	200
CONTINGENCY					200
TOTAL LF:					700

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

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
L	24+25	26+75	ASU	12	200	400	800		
L	30+75	37+25	ASU	12	950	1700	2800		
L	63+75	69+75	ASU	12	150	300	700		
L	73+75	78+75	ASU	12	350	650	1450		
L	81+75	82+25	ASU	12	50	100	100		
L	88+25	89+25	ASU	12	150	250	400		
Y1	13+50	16+75	ASU	12	250	400	800		
Y1	18+75	19+75	ASU	12	100	200	400		
Y2	12+25	18+25	ASU	12	300	500	1100		
Y3	10+25	14+25	ASU	12	250	450	750		
Y5	10+75	11+75	ASU	12	50	50	100		
Y6	16+25	17+75	ASU	12	50	50	150		
CONTINGENCY			ASU	12	300	1750	900		
TOTAL CY/TONS/SY:					3150	6800	10450**	0	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

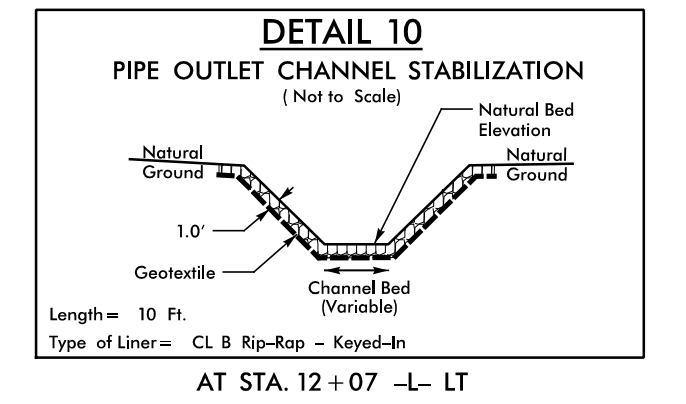
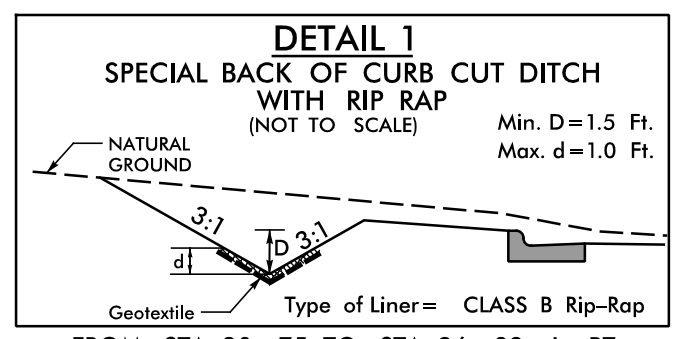
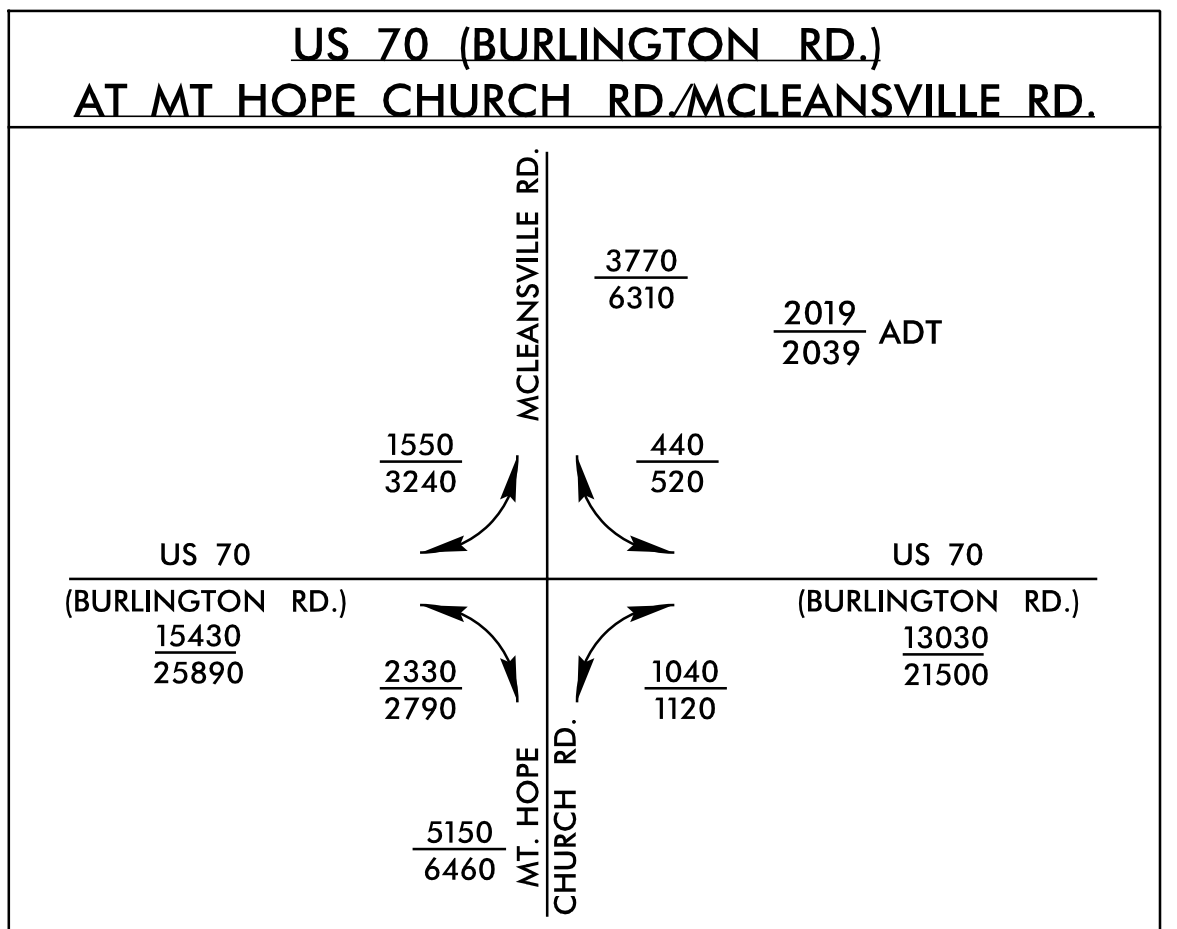
PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4	MCLEANSVILLE LIONS CLUB
2	4, 5, 10	SPENCE & ROBINSON REAL ESTATE, LLC
3	4	LARRY MICHAEL OVERBY
4	4	WHITE & WHITE INVESTMENTS, LLC
5	4, 5	LADY LUCK, LLC
6	5	ARLEY GLENN REESE, JR.
7	5	WILLIAM H. OVERBY, BEATRICE OVERBY
8	5	RONNIE D. OVERBY AND LARRY M. OVERBY
9	5	ARLEY G. REESE, JR., FONDA T. REESE
9A	5	ARLEY GLENN REESE, JR., FONDA T. REESE
10	5	RONNIE D. OVERBY
11	5	BEVERLY B. HANKS, ROGER LYRICK HANKS
12	5	LARRY W. MCMASTERS, DELORES O. MCMASTERS
13	5	BOBBIE L. LYNN
14	5	ROBERT C. MASON, THERESA RICH
15	5	ISIAH HICKMAN
16	5	RONNIE D. OVERBY
16A	5	RONNIE D. OVERBY
17	5, 6	RICKY N. SMITH
18	6	DAVID D. HARRIS, KRISTIE H. HARRIS
19	6	TIMOTHY A. AYERS, NORMA J. AYERS
20	6	ROBERT C. MCDONALD
21	6	RONNIE D. OVERBY
22	6	TONYA D. COLE
23	6	RONNIE D. OVERBY
24	6	DEBORAH O. WAY, JAMES N. WAY, JR.
25	6	FRED E. BURGIN, KATHY M. BURGIN, JAMES G. ALLRED, JUDY B. ALLRED
26	6	RONNIE D. OVERBY
26A	6	RONNIE OVERBY
27	6	DARRYL L. BEAN, TERESA M. BEAN
28	6	GERALD D. POWELL, HAZEL J. POWELL
29		NOT USED
30	6	CLONNIE J. OVERBY BURKE
31	6, 7	TRIAD WORSHIP CENTER CHURCH OF GOD
32	7	GLORIA POOLE
33	7	MARY T. WEDDINGTON
34	7	DAVID T. TURNER, MARY T. WEDDINGTON
35	7	PIERRE A. GORIA, CAROLYN E. GORIA
36	7	ASHTON PLACE HEALTHCARE PROPERTIES LLC
37	7, 8, 9	CALVARY BAPTIST CHURCH, INC. OF MCLEANSVILLE
38	7, 8	THOMAS GILMER LOWDERMILK
39		NOT USED
40		NOT USED
41		NOT USED
42		NOT USED
43	6, 7, 8, 9	PUBLIX SUPER MARKETS, INC.
44	9	MORRIS E. CARTER AND WIFE, BARBARA G. CARTER

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
45	9	SOUTHERN NET, INC.
46	9	MORRIS PHILIP ALLISON, SARA LYN SZOSTAK
47	9	MORRIS PHILIP ALLISON, SARA LYN SZOSTAK
48	9	MORRIS PHILIP ALLISON, SARA LYN SZOSTAK
49	9	MORRIS PHILIP ALLISON, SARA LYN SZOSTAK
50	9	MORRIS PHILIP ALLISON, SARA LYN SZOSTAK
51	9	AHMAD H. HAMZE
52	10	BOYD LEE SUMMERS, JERRY LANCE SUMMERS
53	1, 10	MT. PLEASANT METHODIST CHURCH
54	6	DOLORES O. MCMASTERS, BARBARA O. COOK, RONNIE D. OVERBY, DEBORAH O. WAY, CONNIE O. MISENHEIMER, SHIRLEY OVERBY, CHARLES R. OVERBY, JR.
55	4	THOMAS EDWARD PAYNE
56	4	ONE WAY BAPTIST CHURCH
57	4	THOMAS EDWARD PAYNE, TONI DUKE PAYNE
58	6	ROGER SCOTT APPLE, TONILYN J. APPLE
(NO CLAIM)		
59	6	DONNA G. BATES WITT
(NO CLAIM)		
60	6	DONALD G. BATES, ERNESTINE C. BATES
61	6	BARBARA SUE GAULDIN
62	6	RACHEL M. LEVENS
63	6	RACHEL M. LEVENS
64	5	MILDRED O. ALLRED
65	6	BRIAN KELLY, PATRICIA KELLY

8.17.19

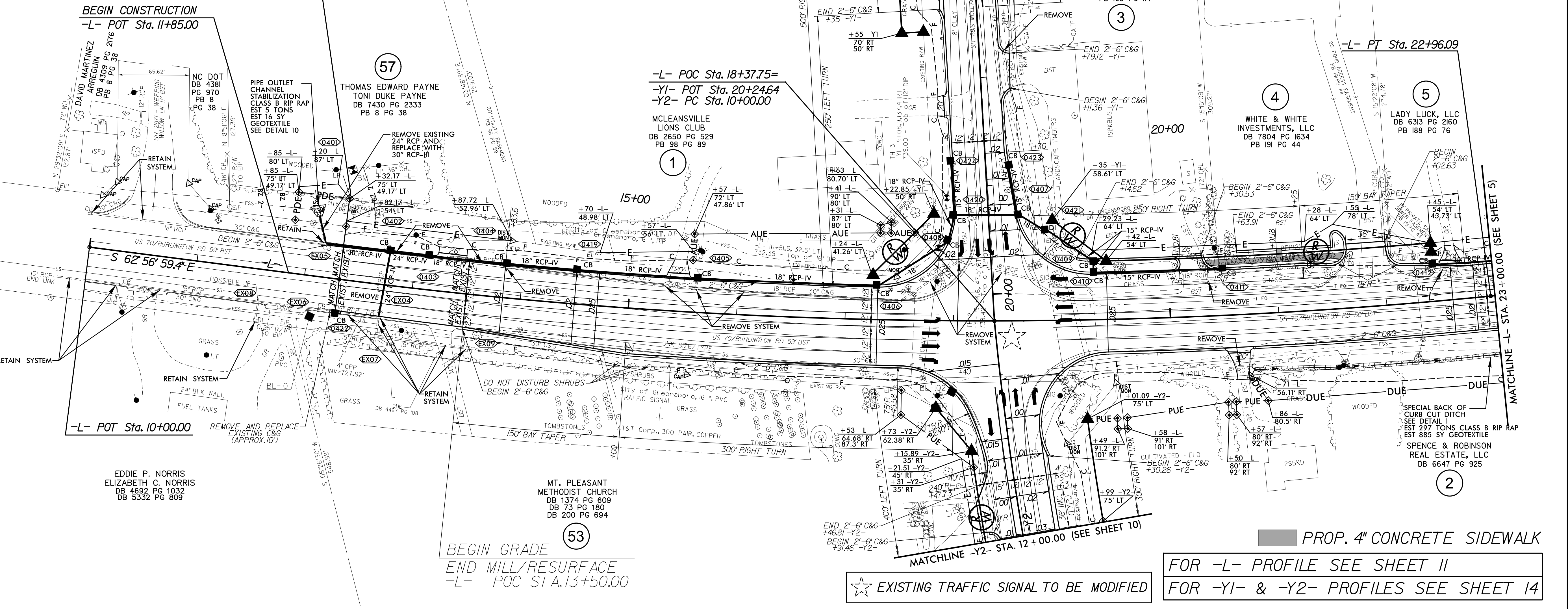
-L- CURVE DATA
 PI Sta 17+66.41
 $\Delta = 12' 58" 11.1" (LT)$
 $D = 1' 13" 08.6"$
 $L = 1,063.91'$
 $T = 534.24'$
 $R = 4,700.00'$
 $SE = 0.025$
 $RO = 105'$
 $INC = 42'$

-Y2- CURVE DATA
 PI Sta 13+49.93
 $\Delta = 14' 39" 42.3" (LT)$
 $D = 2' 06" 23.3"$
 $L = 696.04'$
 $T = 349.93'$
 $R = 2,720.00'$
 $SE = 0.04$
 $RO = 144'$



PROJECT REFERENCE NO. U-2581BA	SHEET NO. 4
ROADWAY DESIGN ENGINEER SEAL 014493 MANN Goodnight	HYDRAULICS ENGINEER SEAL 014493 MANN Goodnight
9/9/2019	9/6/2019
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared by vhb VH8 Engineering NC, P.C. (C-3705) 940 W. Cannon Drive, Suite 200 Raleigh, NC 27606	

BEGIN TIP PROJECT U-2581BA
-L- PC STA. 12+32.17
 BEGIN MILL/RESURFACE
 BEGIN WIDENING (LT SIDE ONLY)

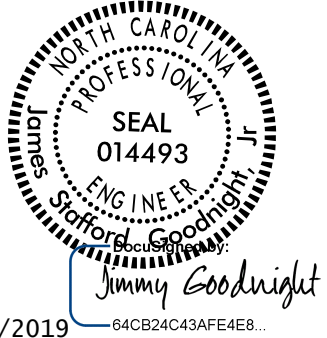




REVISIONS

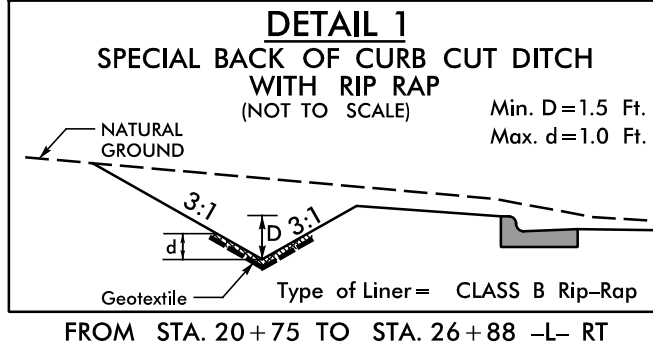
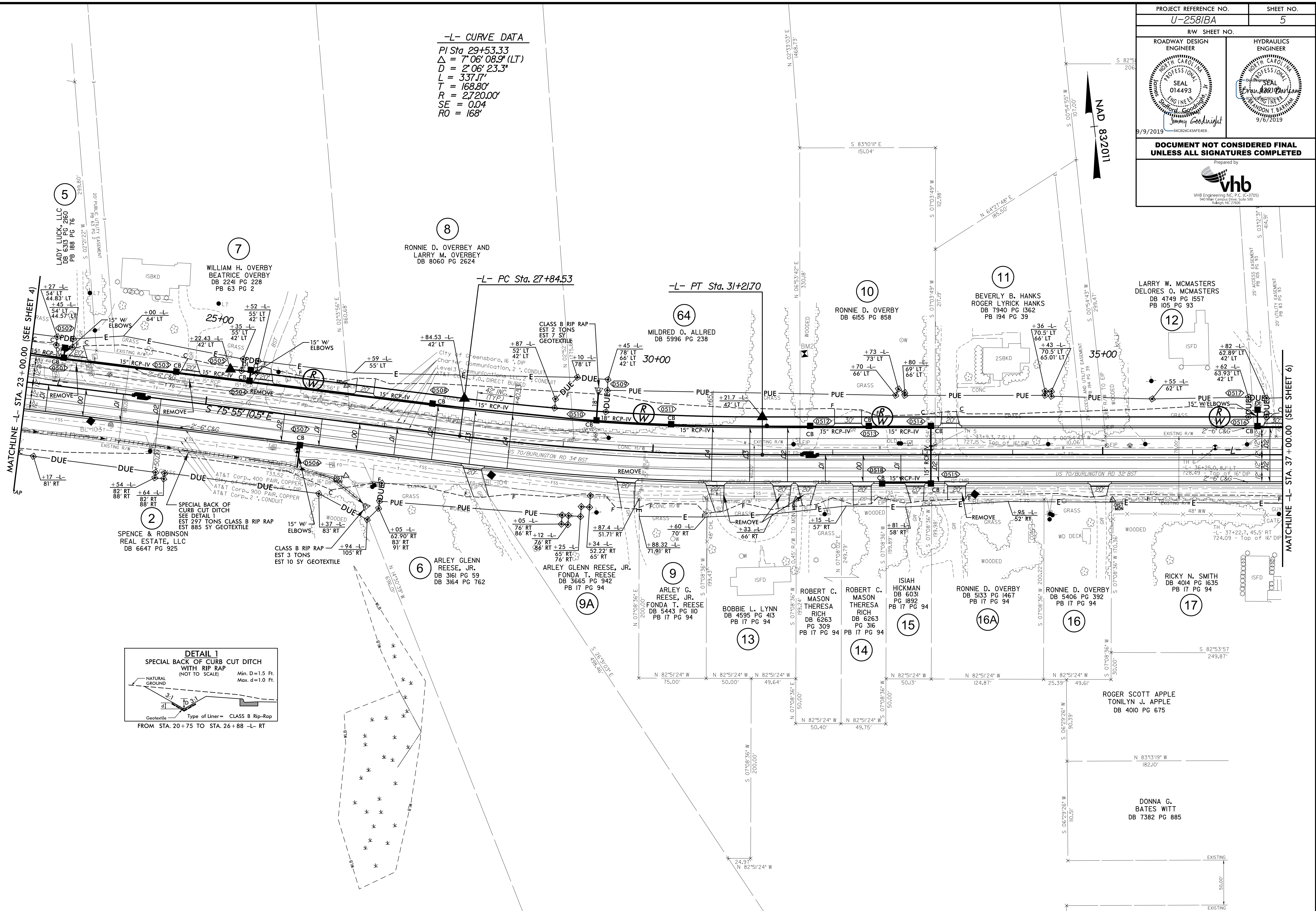
8/28/2019
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EXISTING TRAFFIC SIGNAL TO BE MODIFIED

FOR -L- PROFILE SEE SHEET 11
FOR -Y1- & -Y2- PROFILES SEE SHEET 14

PROJECT REFERENCE NO. U-2581BA		SHEET NO. 5	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
			
9/9/2019 0462434FE4E8			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
Prepared by			
			
<small>VH8 Engineering NC, P.C. (C-3705) 940 W. Campus Drive, Suite 200 Raleigh, NC 27606</small>			

-L- CURVE DATA
 PI Sta. 29+53.33
 $\Delta = 7^{\circ}06'08.9''$ (LT)
 $D = 2^{\circ}08'23.3''$
 $L = 337.17'$
 $T = 168.80'$
 $R = 2720.00'$
 $SE = 0.04$
 $RO = 168'$



FOR -L- PROFILE SEE SHEET II

REVISIONS

8/17/19

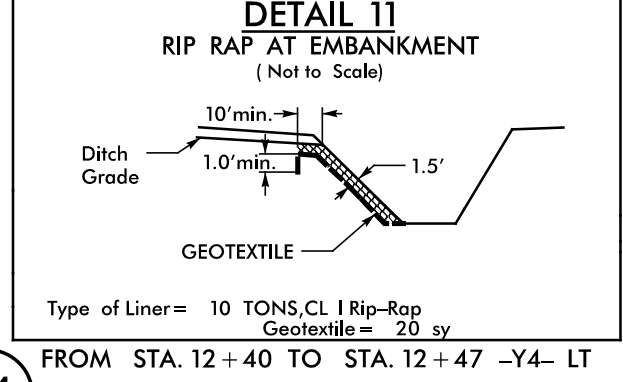
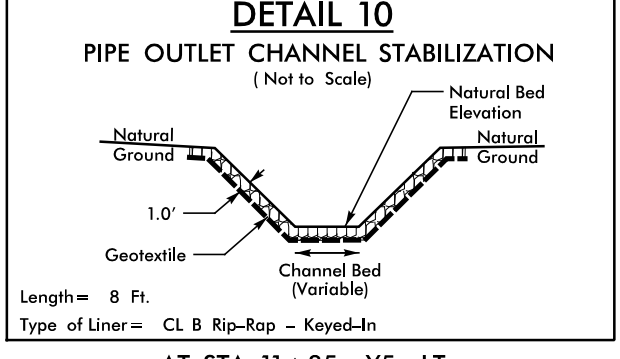
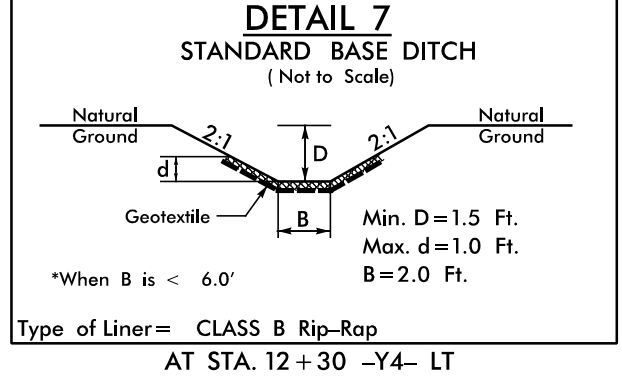
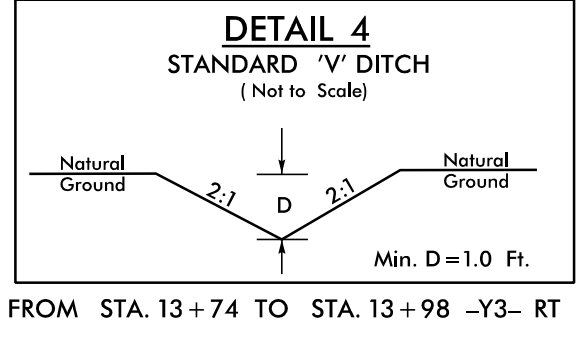
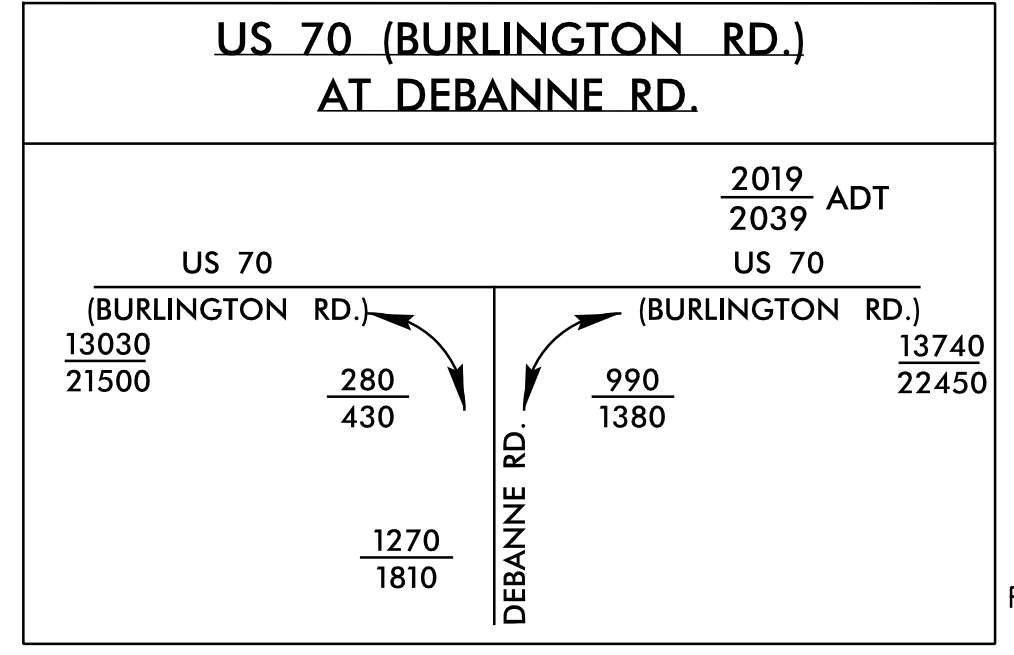
7/24/2019
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8.17/7.99

-L- CURVE DATA

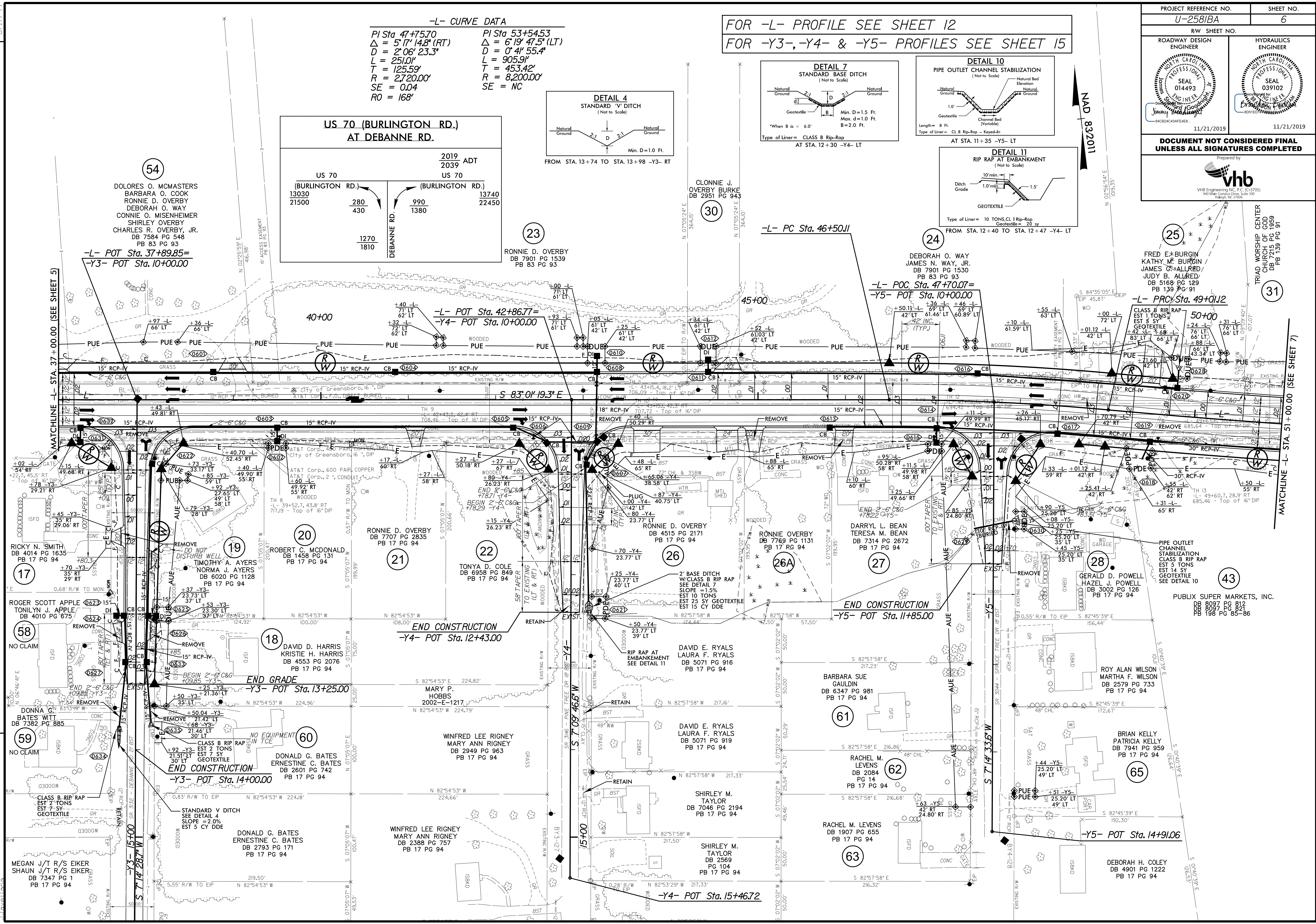
PI Sta 47+75.0	PI Sta 53+54.53
$\Delta = 5^{\circ}17'14.8"$ (RT)	$\Delta = 6^{\circ}19'47.5"$ (LT)
D = 2'06" 23.3'	D = 0'41" 55.4'
L = 251.0'	L = 905.9'
T = 125.59'	T = 453.42'
R = 2720.00'	R = 8,200.00'
SE = 0.04	SE = NC
RO = 168'	

FOR -L- PROFILE SEE SHEET 12
 FOR -Y3-, -Y4- & -Y5- PROFILES SEE SHEET 15



NAD 83/2011

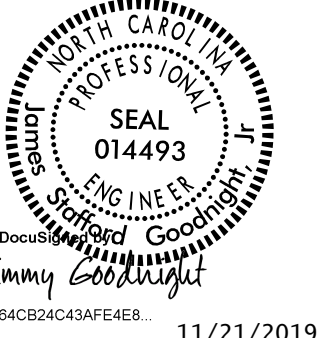
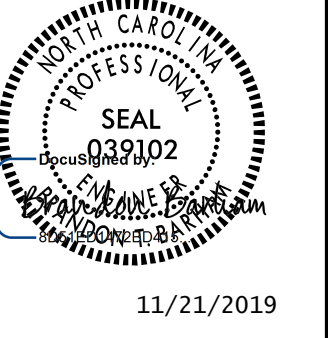

PROJECT REFERENCE NO. U-2581BA	SHEET NO. 6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
 SEAL 014493 Jimmy Edwards 11/21/2019	 SEAL 039102 Deborah H. Coley 11/21/2019
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 VHB Engineering NC, P.C. (C-3705) 940 W. Centex Drive, Suite 200 Raleigh, NC 27606	



REVISIONS

MATCHLINE -L- STA. 51+00.00 (SEE SHEET 7)

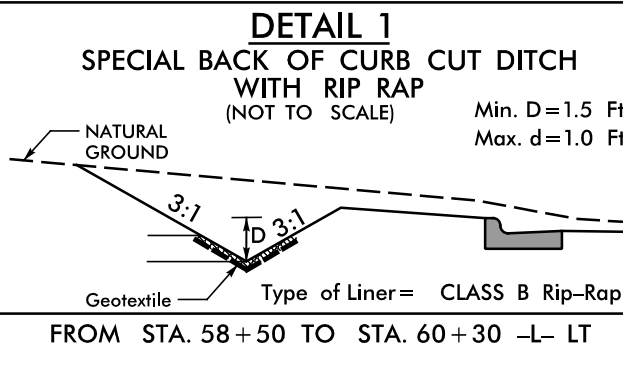
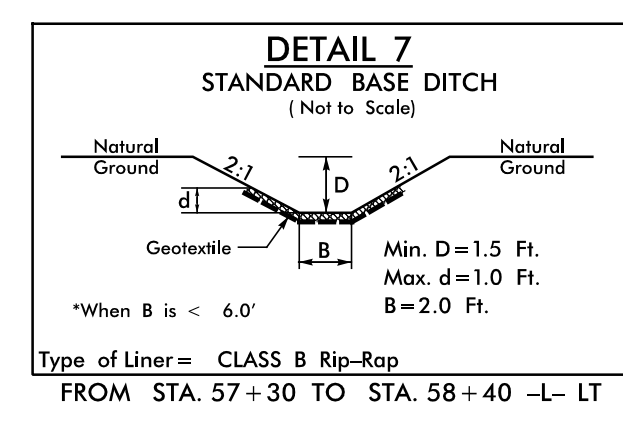
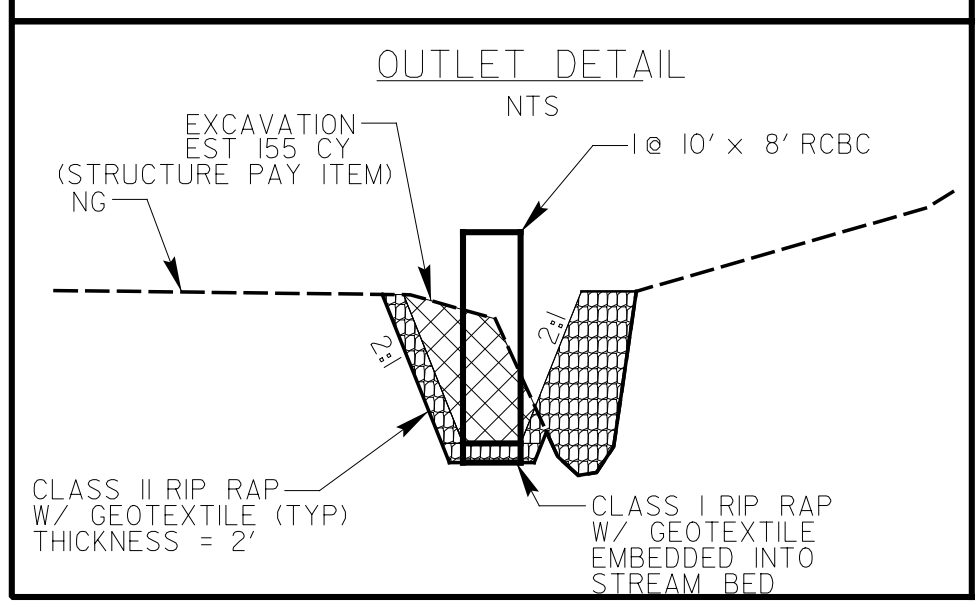
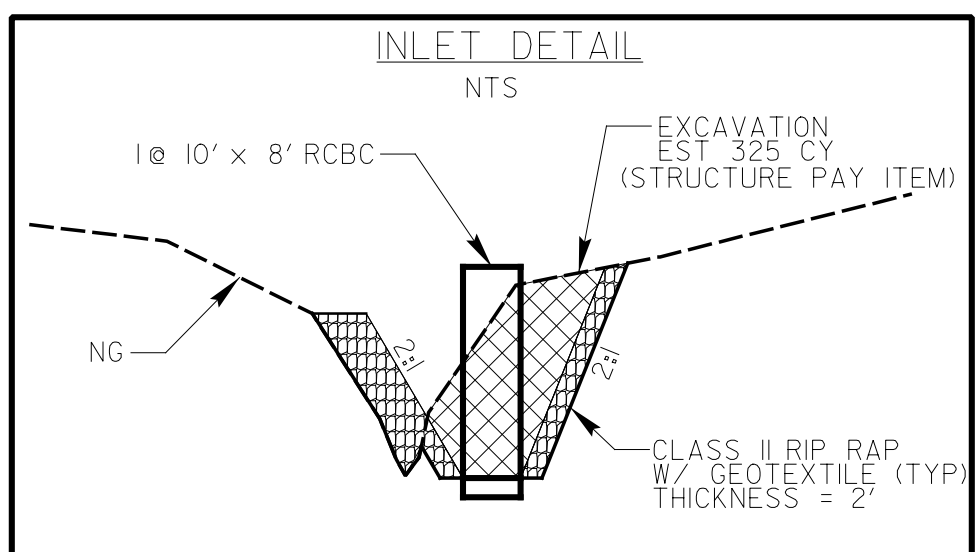
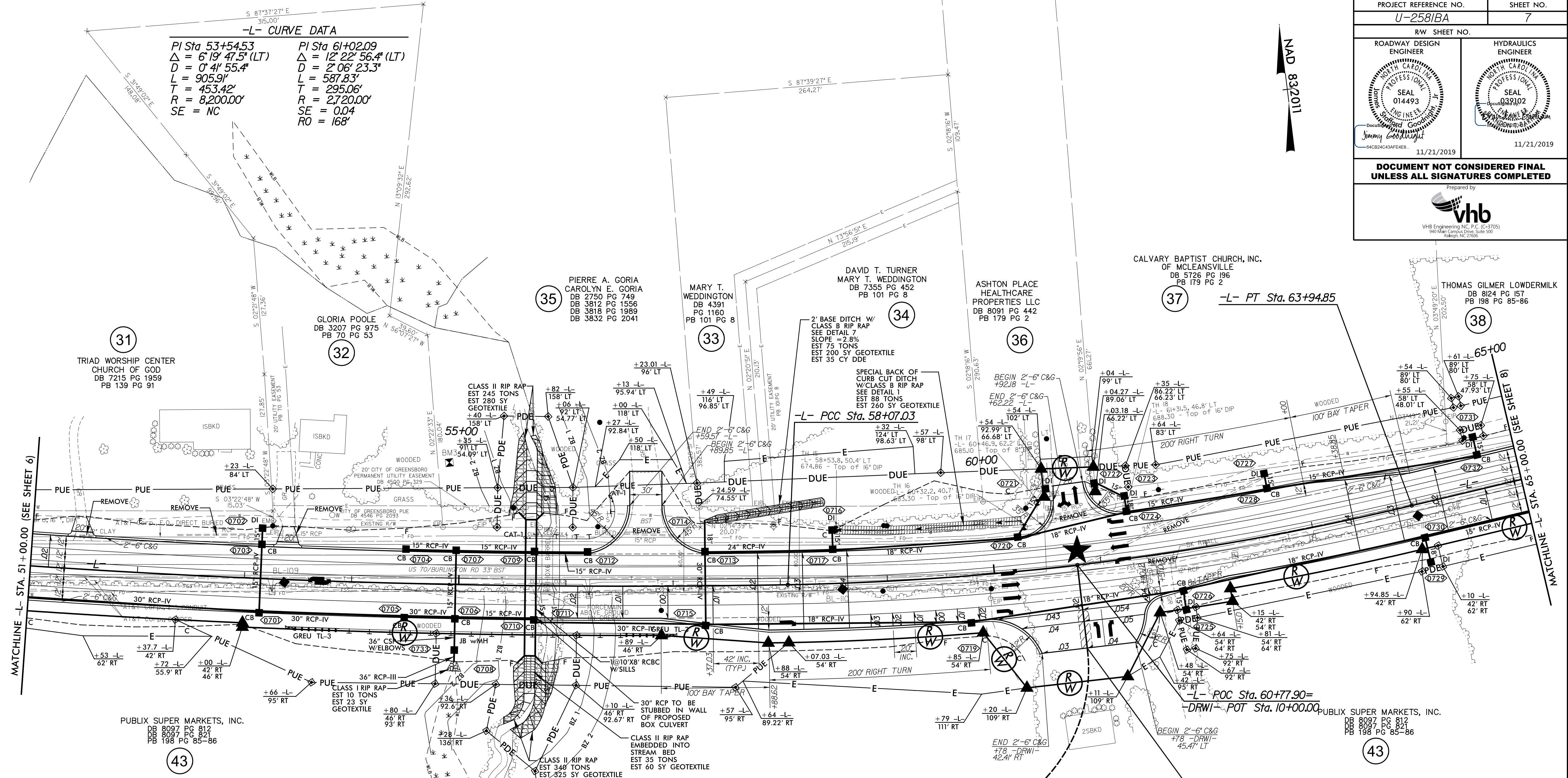
1/2/2019 (C:\Users\psh06\dgn\Projects\U-2581BA_r.dwg - psh06.dgn)

PROJECT REFERENCE NO. U-2581BA		SHEET NO. 7	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		SEAL 039102	
			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
Prepared by  VHB Engineering N.C., P.C. (C-3705) 9400 Wilkes Center Drive, Suite 200 Raleigh, NC 27606			

NAD 83/2011

-L- CURVE DATA

PI Sta 53+54.53	PI Sta 61+02.09
$\Delta = 6^{\circ}19'47.5"$ (LT)	$\Delta = 12^{\circ}22'56.4"$ (LT)
$D = 0^{\circ}4'55.4"$	$D = 2^{\circ}06'23.3"$
$L = 905.91'$	$L = 587.83'$
$T = 453.42'$	$T = 295.06'$
$R = 8,200.00'$	$R = 2,720.00'$
SE = NC	SE = 0.04
	RO = 168'



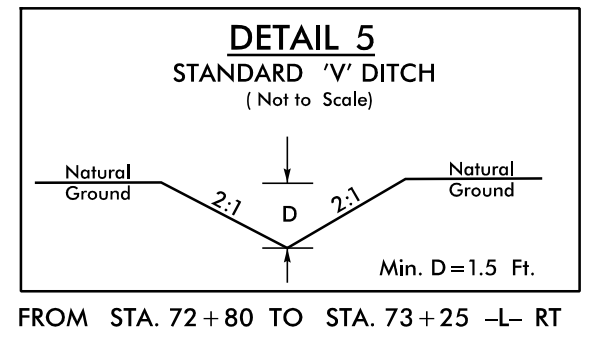
★ PROPOSED TRAFFIC SIGNAL

FOR -L- PROFILE SEE SHEET 12
 FOR -DRWI- PROFILE SEE SHEET 16
 FOR CULVERT PLANS SEE SHEETS C-1 THRU C-8

REVISIONS

8.17.17.19
K:\21\2019\14\4\2019\U-2581BA_rdw_pah07.dgn

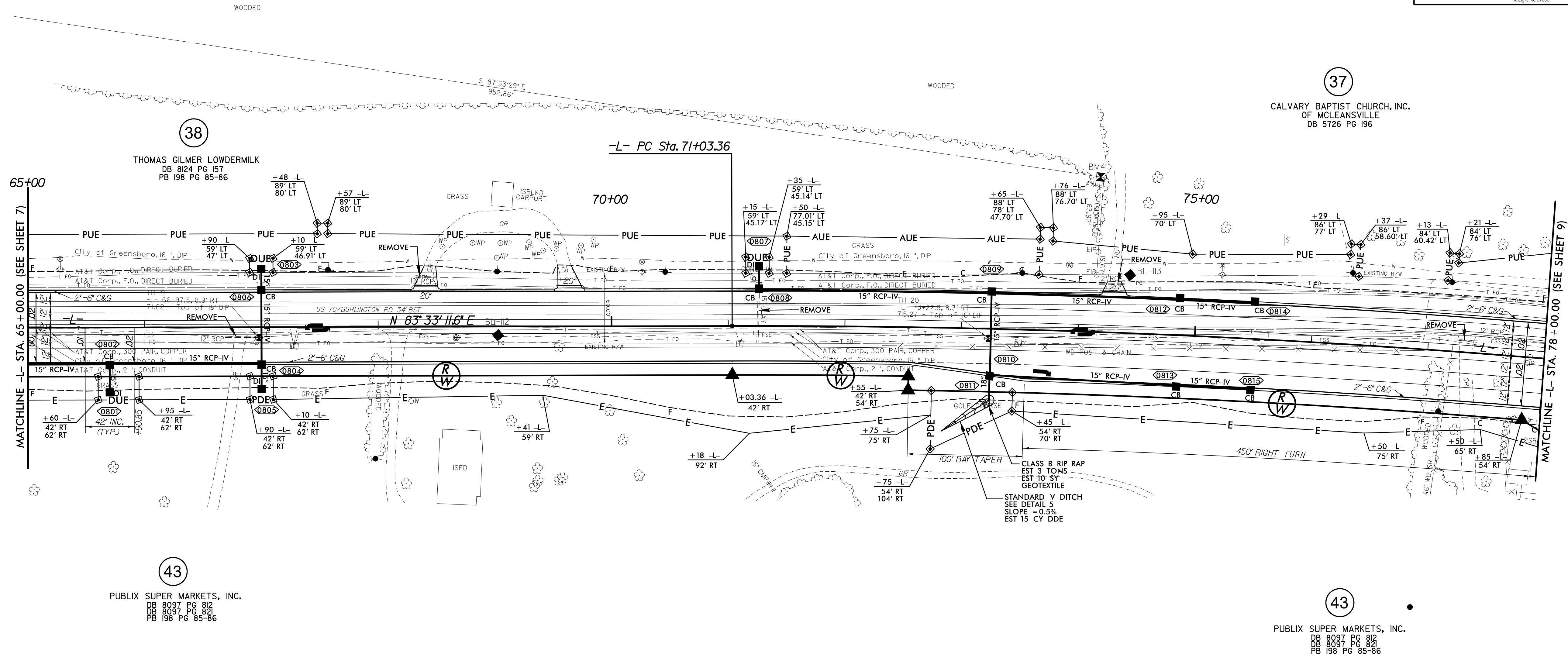
8/17/19



-L- CURVE DATA
 PI Sta 78+31.90
 $\Delta = 101^{\circ}2'58.5''$ (RT)
 $D = 0^{\circ}42'10.9''$
 $L = 1,453.20'$
 $T = 728.53'$
 $R = 8,150.00'$
 SE = NC



PROJECT REFERENCE NO. U-2581BA	SHEET NO. 8
RW SHEET NO.	
ROADWAY DESIGN ENGINEER Jimmy Goodnight 9/9/2019	HYDRAULICS ENGINEER James T. Batham 9/6/2019
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared by VHB Engineering NC, P.C. (C-3705) 940 West Campus Drive, Suite 200 Raleigh, NC 27606	

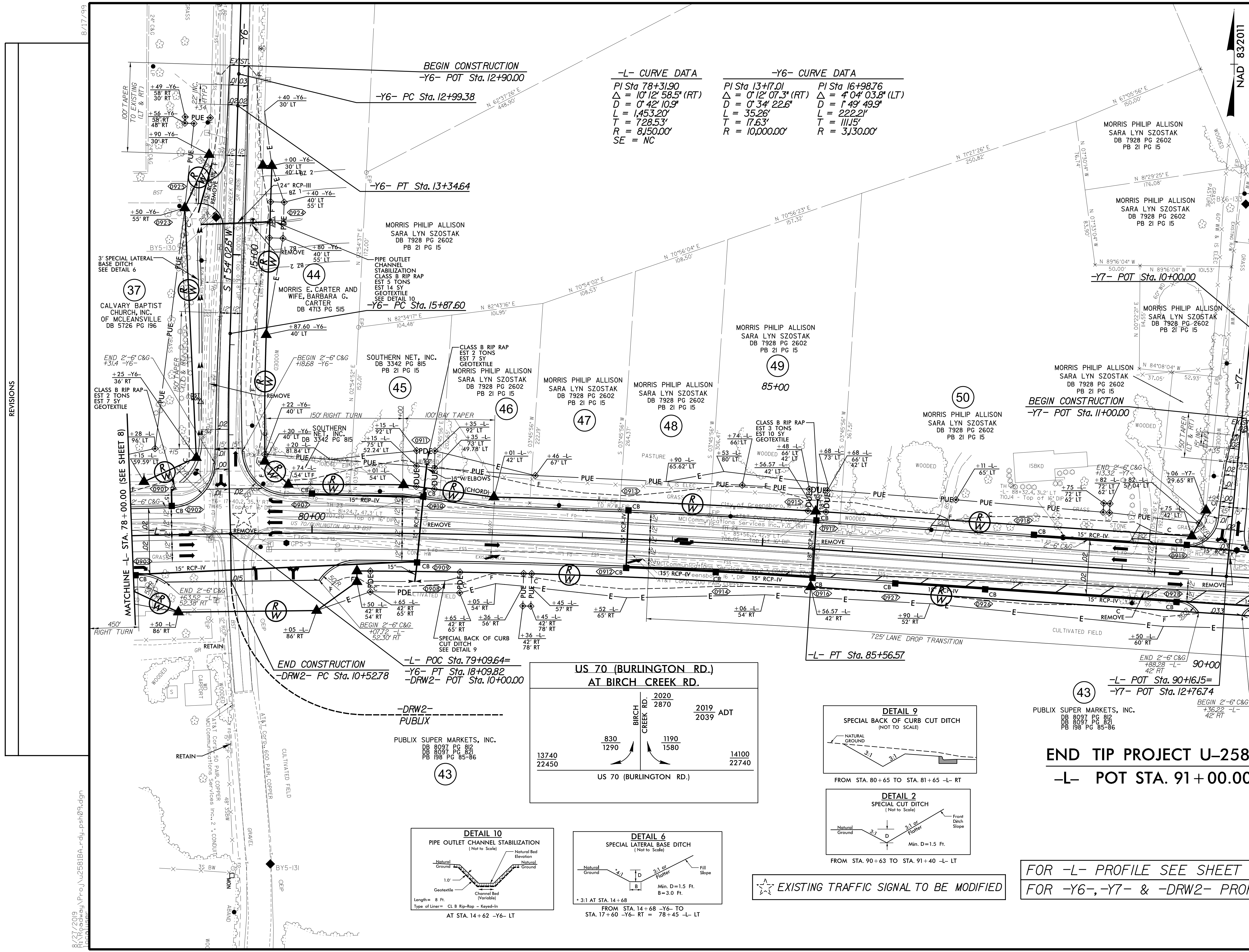


REVISIONS

FOR -L- PROFILE SEE SHEET 13

8/27/2019
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localuser

PROJECT REFERENCE NO. U-2581BA		SHEET NO. 9	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		PROFESSIONAL SEAL 014493 NORTH CAROLINA PROFESSIONAL ENGINEER SARA LYN SZOSTAK DB 7928 PG 2602 PB 21 PG 15 9/9/2019	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
Prepared by vhb VHB Engineering NC, P.C. (C-3705) 9400 W. Cannon Drive, Suite 200 Raleigh, NC 27606			



FOR -L- PROFILE SEE SHEET 13
FOR -Y6-, -Y7- & -DRW2- PROFILES SEE SHEET 16

EXISTING TRAFFIC SIGNAL TO BE MODIFIED

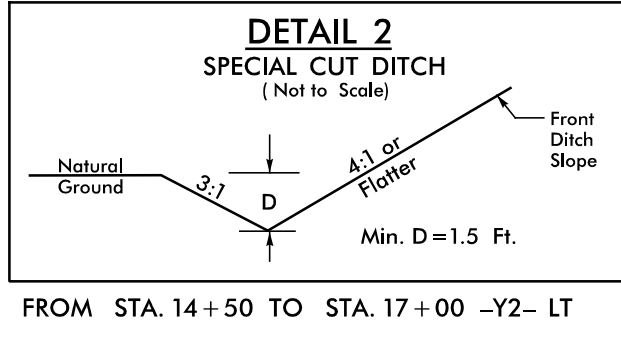
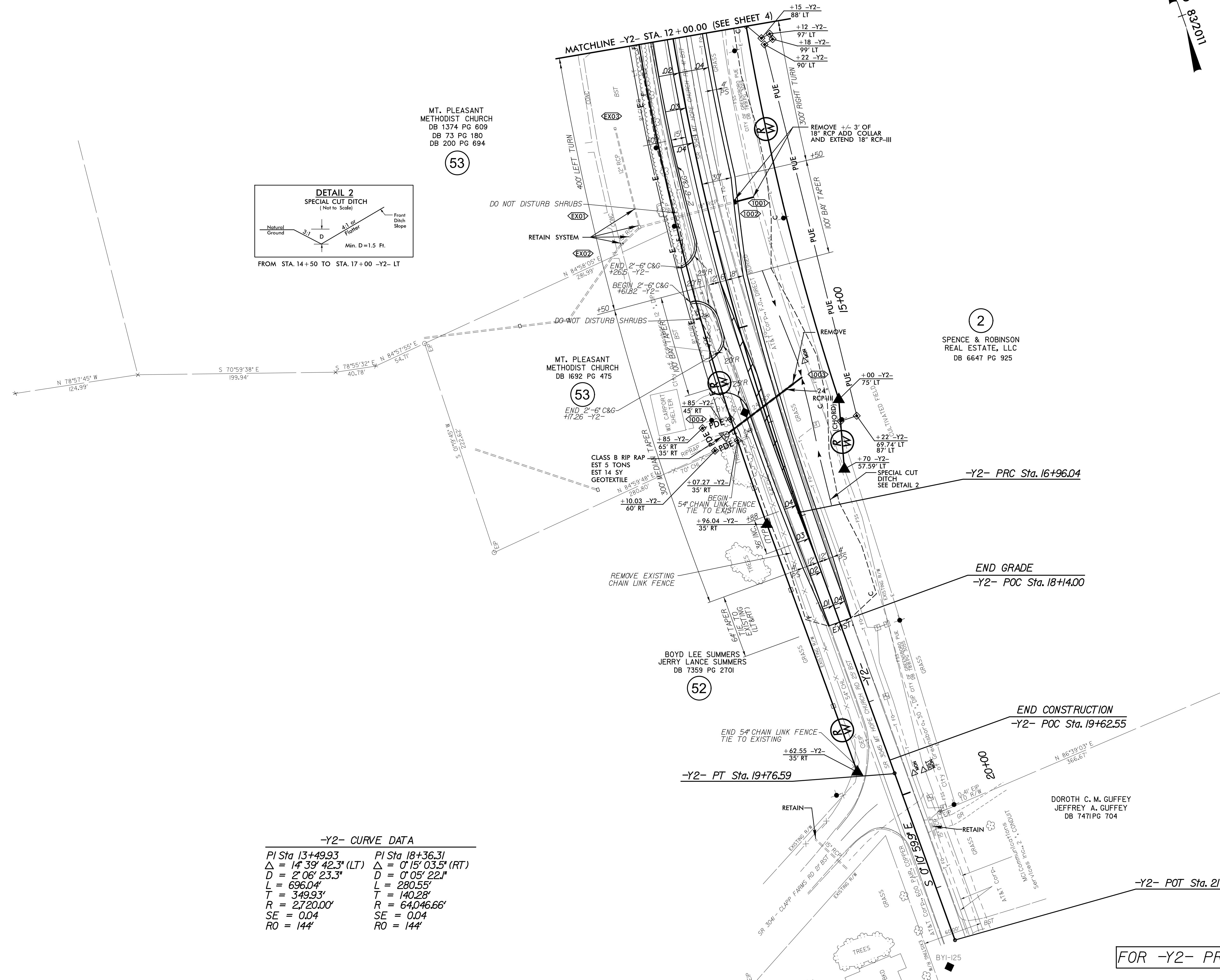
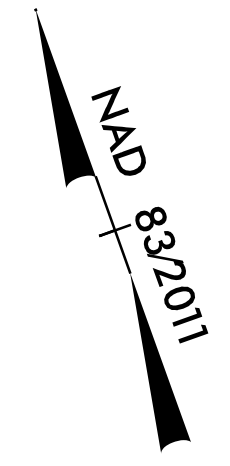
REVISIONS
 8/17/19
 8/27/2019
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8/17/19

REVISIONS

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8/27/2019
localuser

PROJECT REFERENCE NO. U-2581BA	SHEET NO. 10
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared by VHB Engineering NC, P.C. (C-3705) 940 West Campus Drive, Suite 200 Raleigh, NC 27608	



-Y2- CURVE DATA

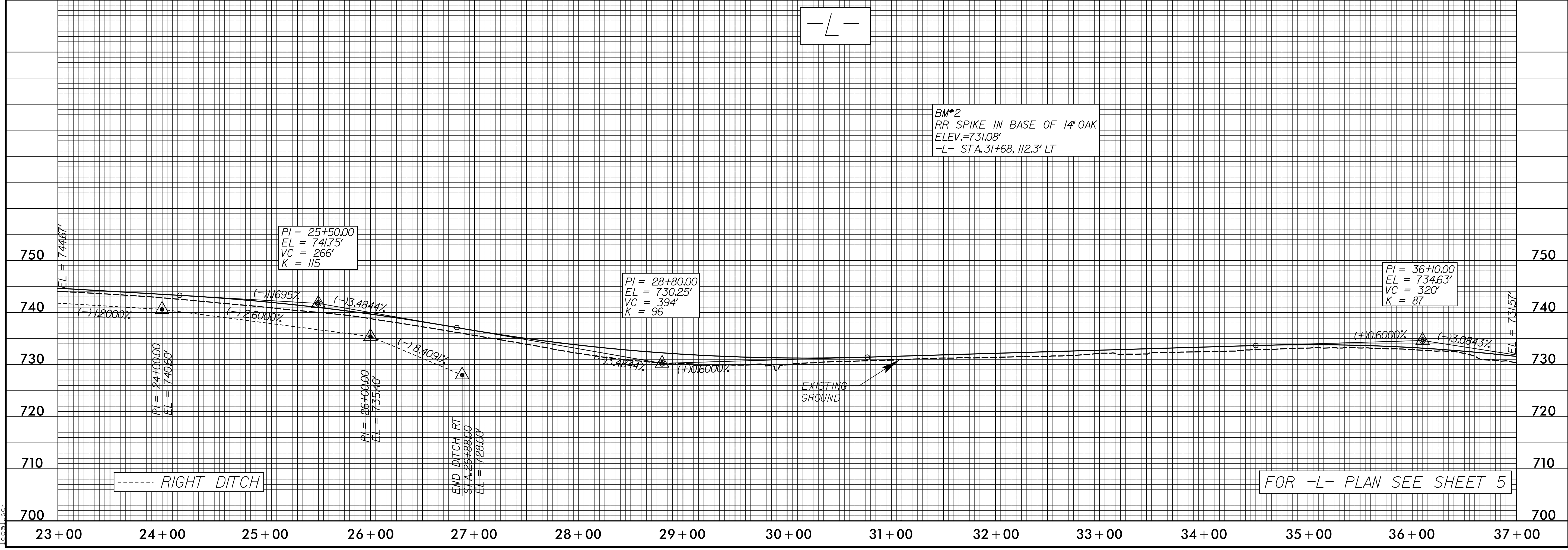
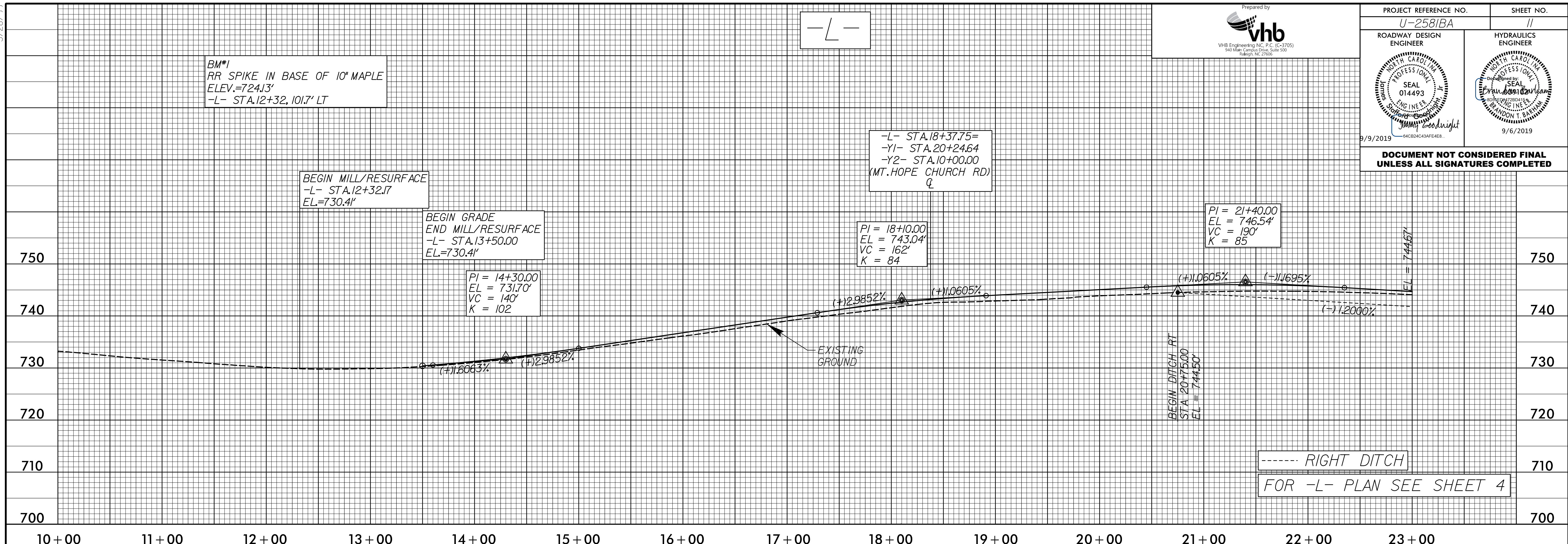
PI Sta 13+49.93	PI Sta 18+36.31
$\Delta = 14^{\circ} 39' 42.3''$ (LT)	$\Delta = 0^{\circ} 15' 03.5''$ (RT)
$D = 2^{\circ} 06' 23.3''$	$D = 0^{\circ} 05' 22.1''$
$L = 696.04'$	$L = 280.55'$
$T = 349.93'$	$T = 140.28'$
$R = 2,720.00'$	$R = 64,046.66'$
$SE = 0.04$	$SE = 0.04$
$RO = 144'$	$RO = 144'$

FOR -Y2- PROFILE SEE SHEET 14



PROJECT REFERENCE NO. U-2581BA	SHEET NO. 11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
9/9/2019	9/6/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

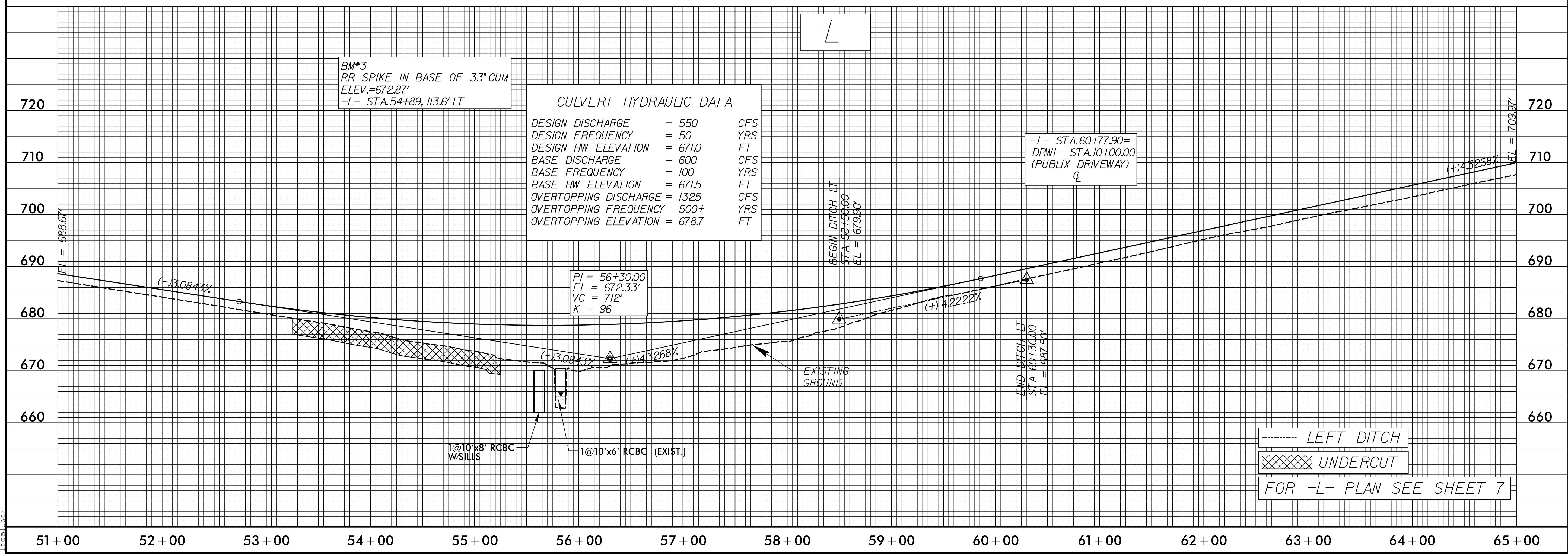
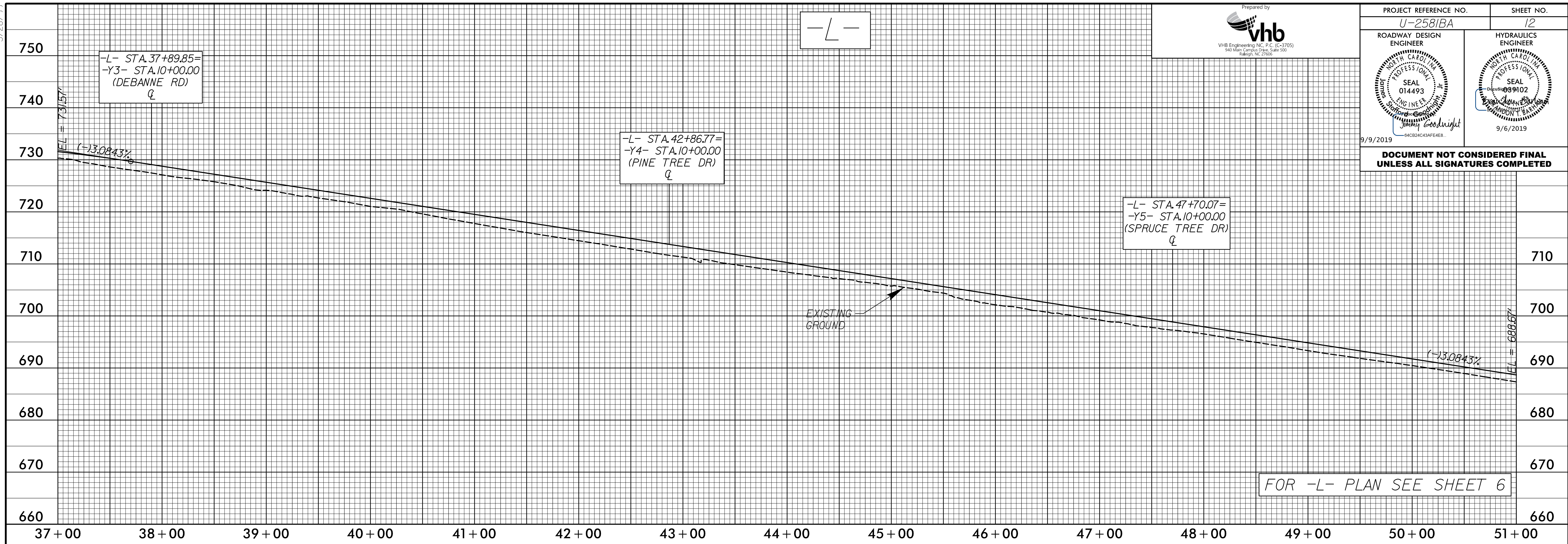


5/28/19



PROJECT REFERENCE NO. U-2581BA	SHEET NO. 12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 014493	SEAL 089102
9/9/2019	9/6/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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5/28/19

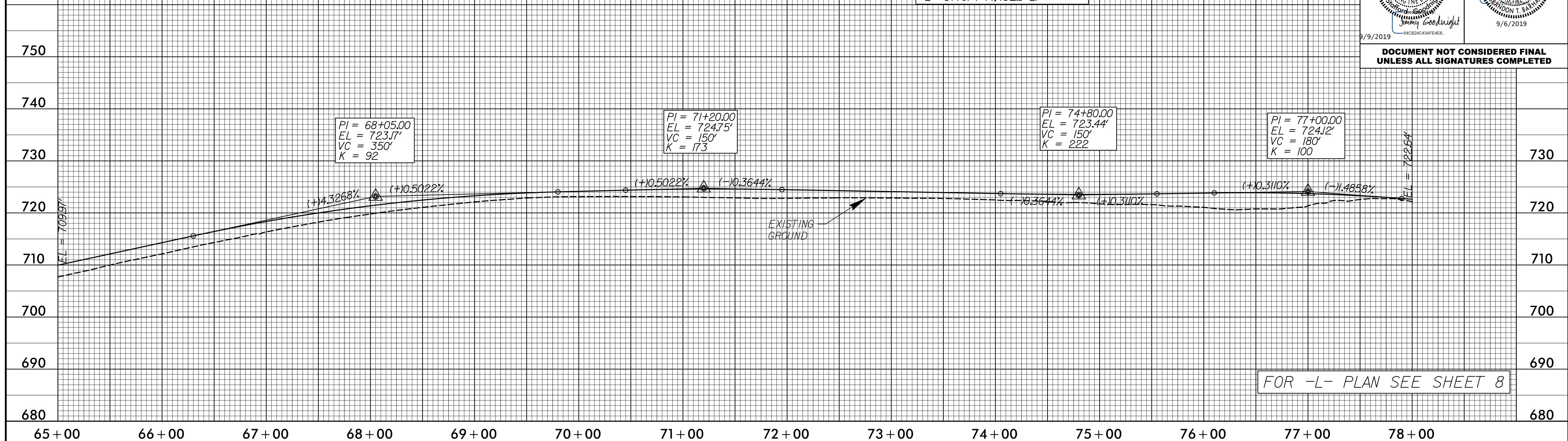
-L-



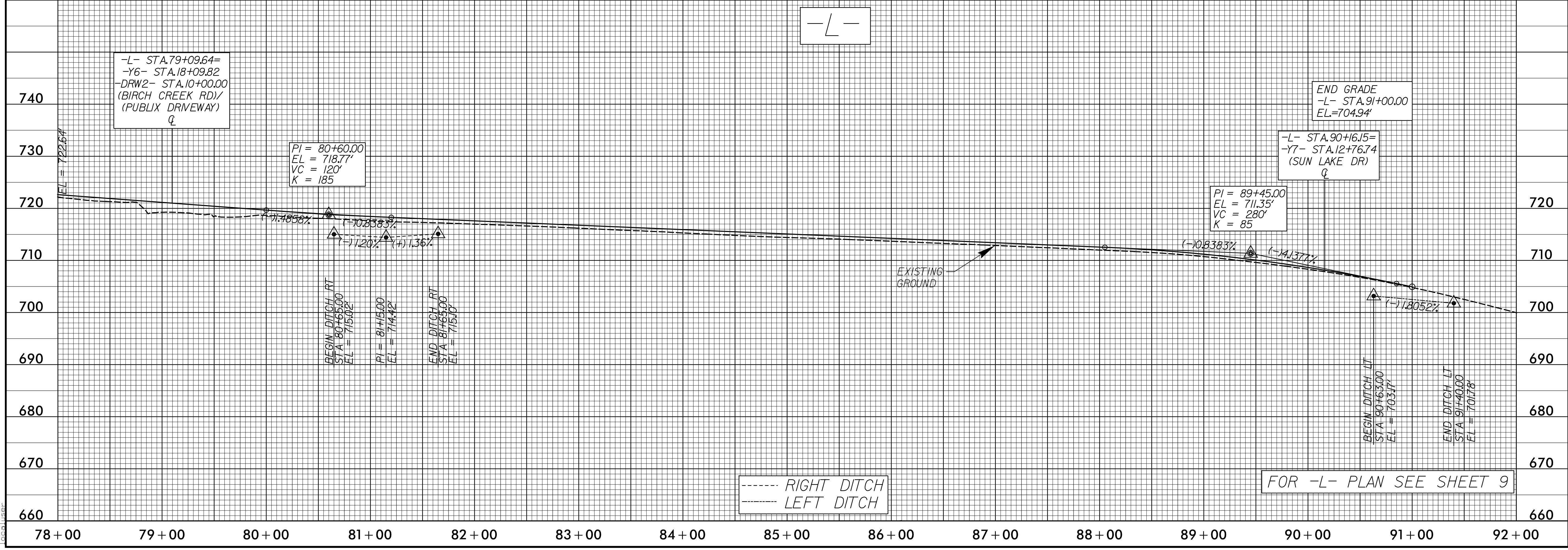
PROJECT REFERENCE NO. U-2581BA	SHEET NO. 13
ROADWAY DESIGN ENGINEER SEAL 014493 Jimmy Goodnight	HYDRAULICS ENGINEER SEAL 039102 Thomson T. Ballew
9/9/2019	

BM*4
RR SPIKE IN BASE OF 3" OAK
ELEV.=727.48'
-L- STA.74+14, 132.9' LT

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



-L-



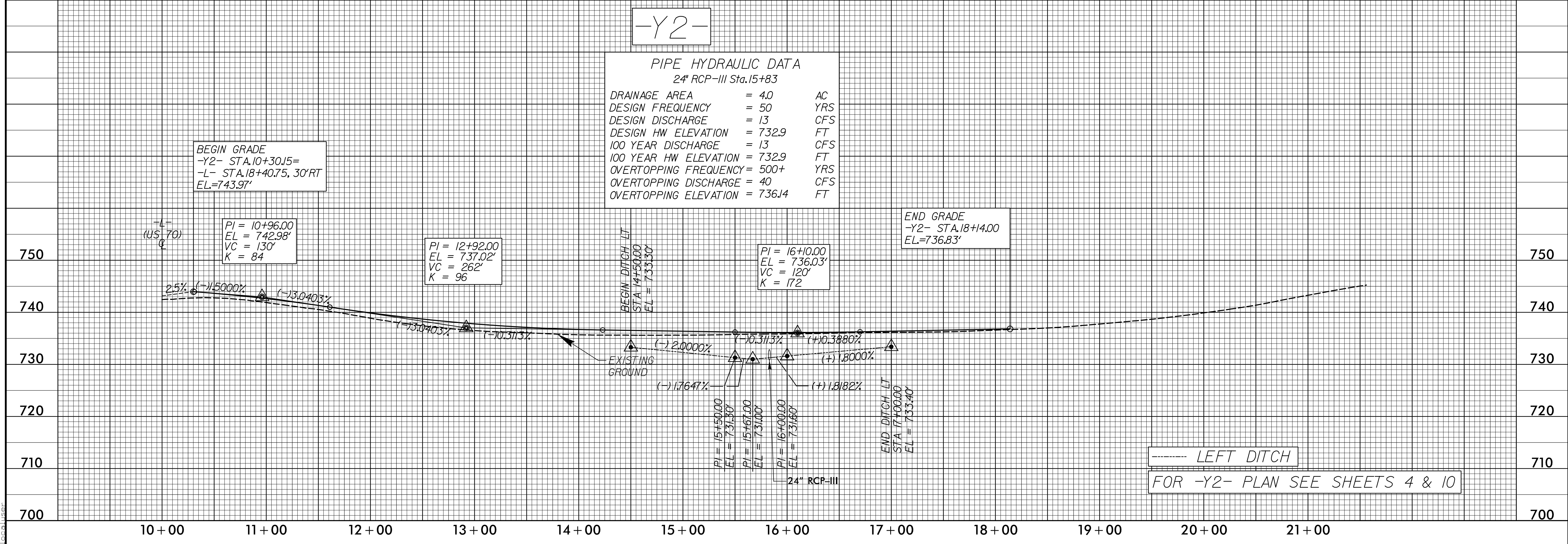
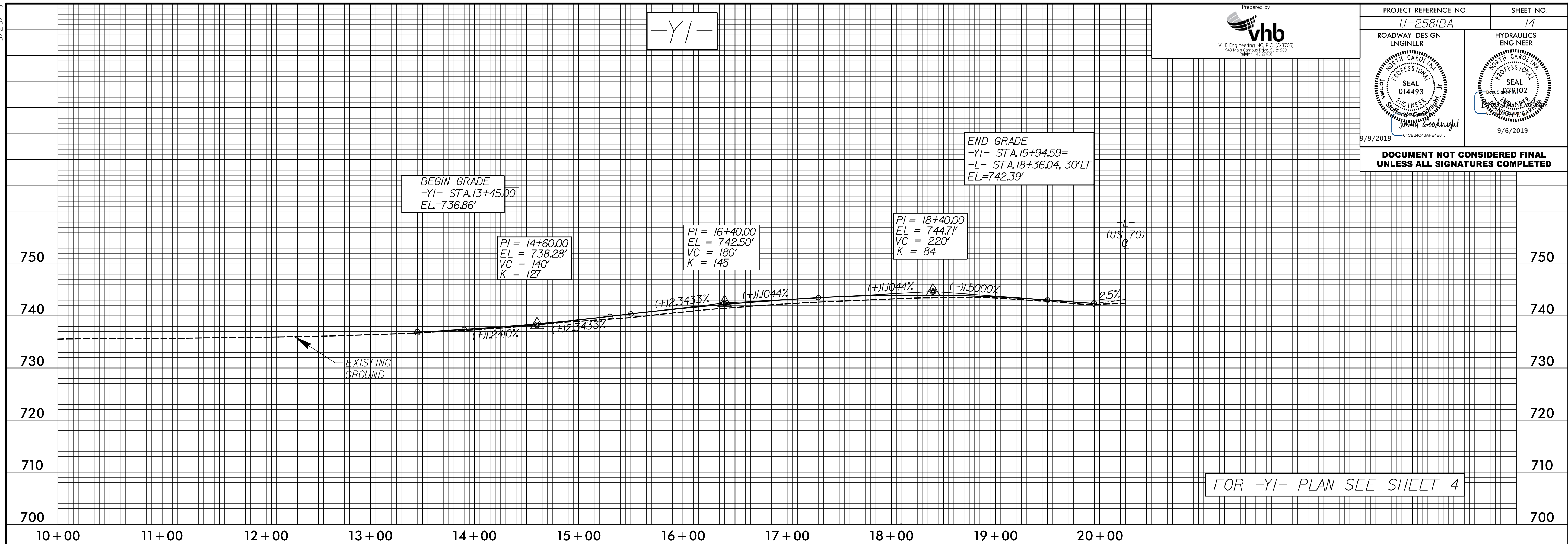
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5/28/19



PROJECT REFERENCE NO. U-2581BA	SHEET NO. 14
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 014493 9/9/2019	SEAL 030102 9/6/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



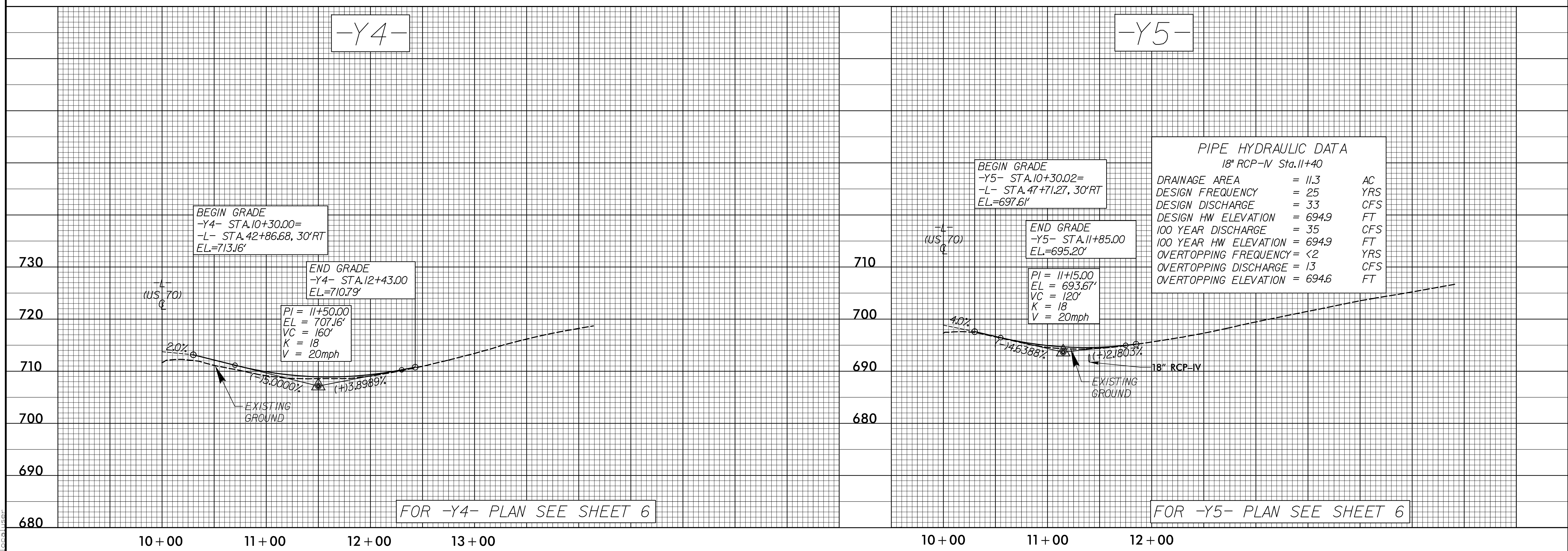
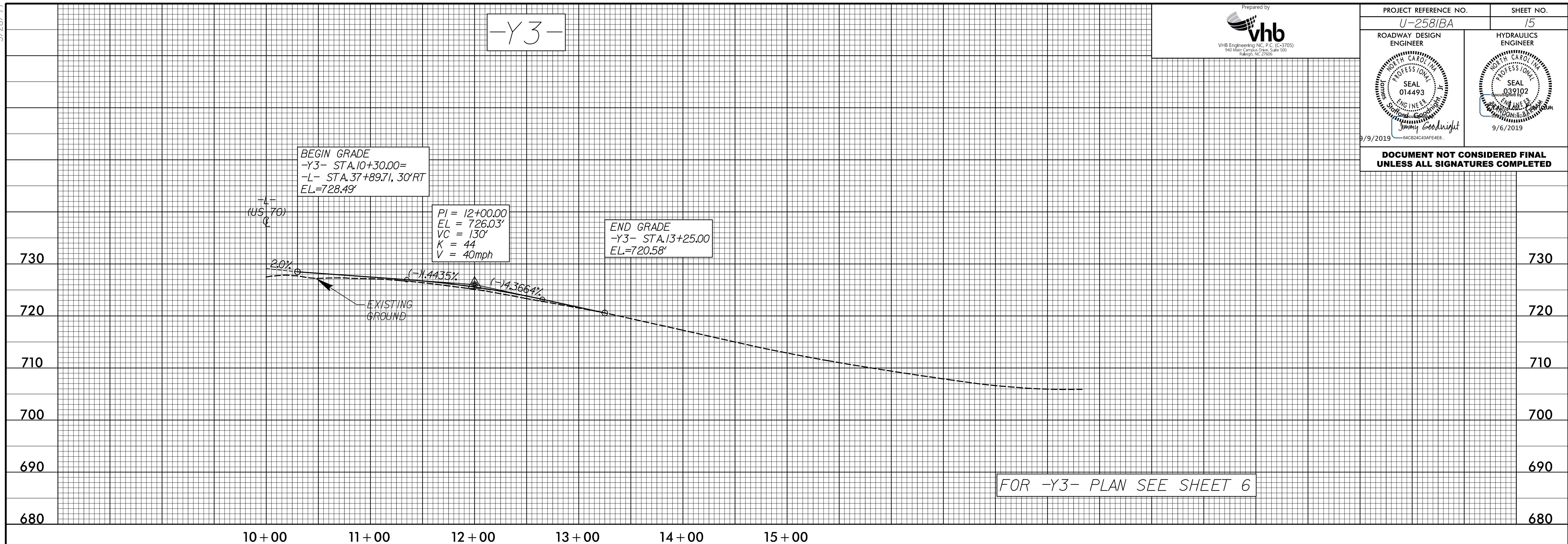
7/10/2019
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Local User

5/28/19



PROJECT REFERENCE NO. U-2581BA	SHEET NO. 15
ROADWAY DESIGN ENGINEER SEAL 014493 9/9/2019	HYDRAULICS ENGINEER SEAL 039102 9/6/2019

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



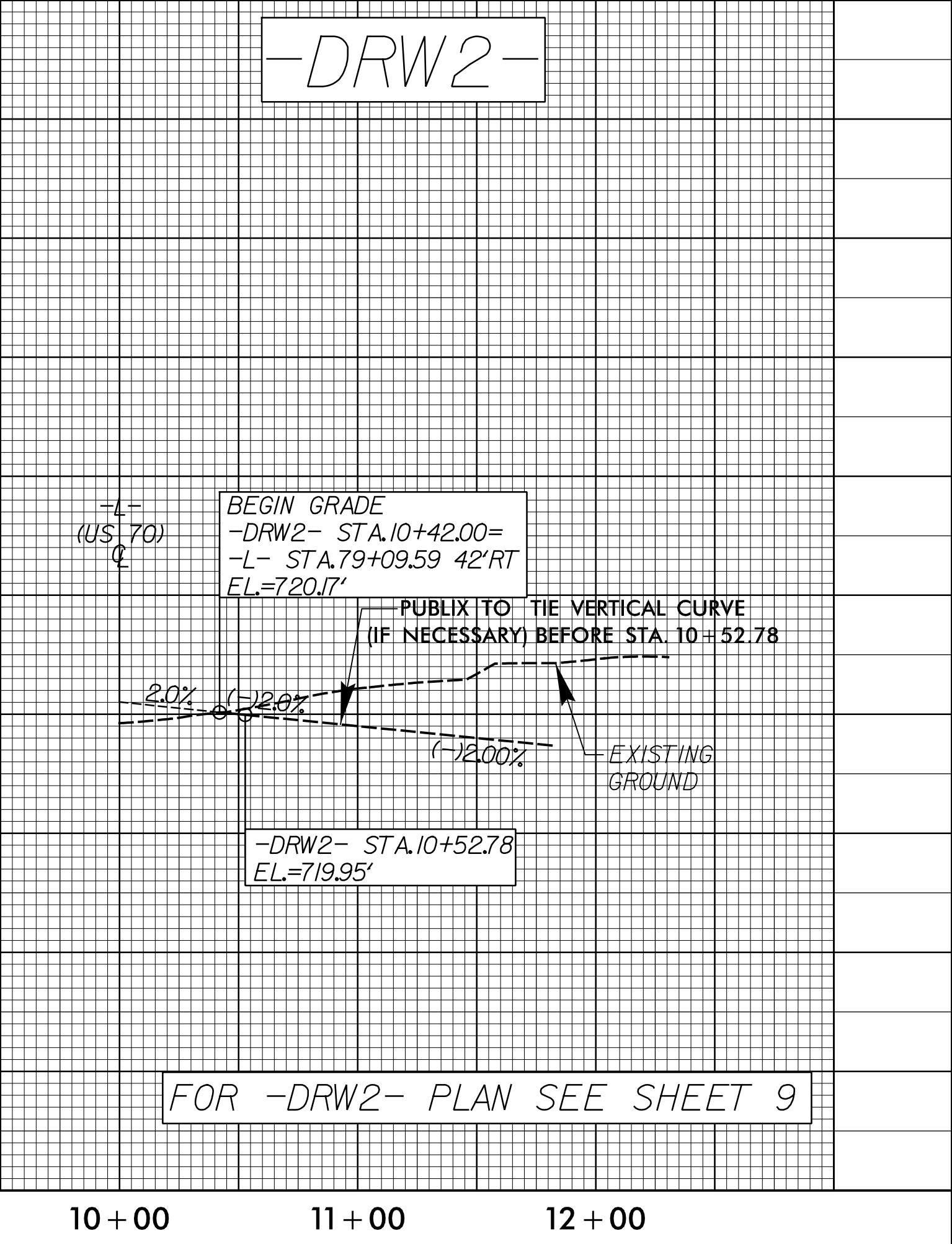
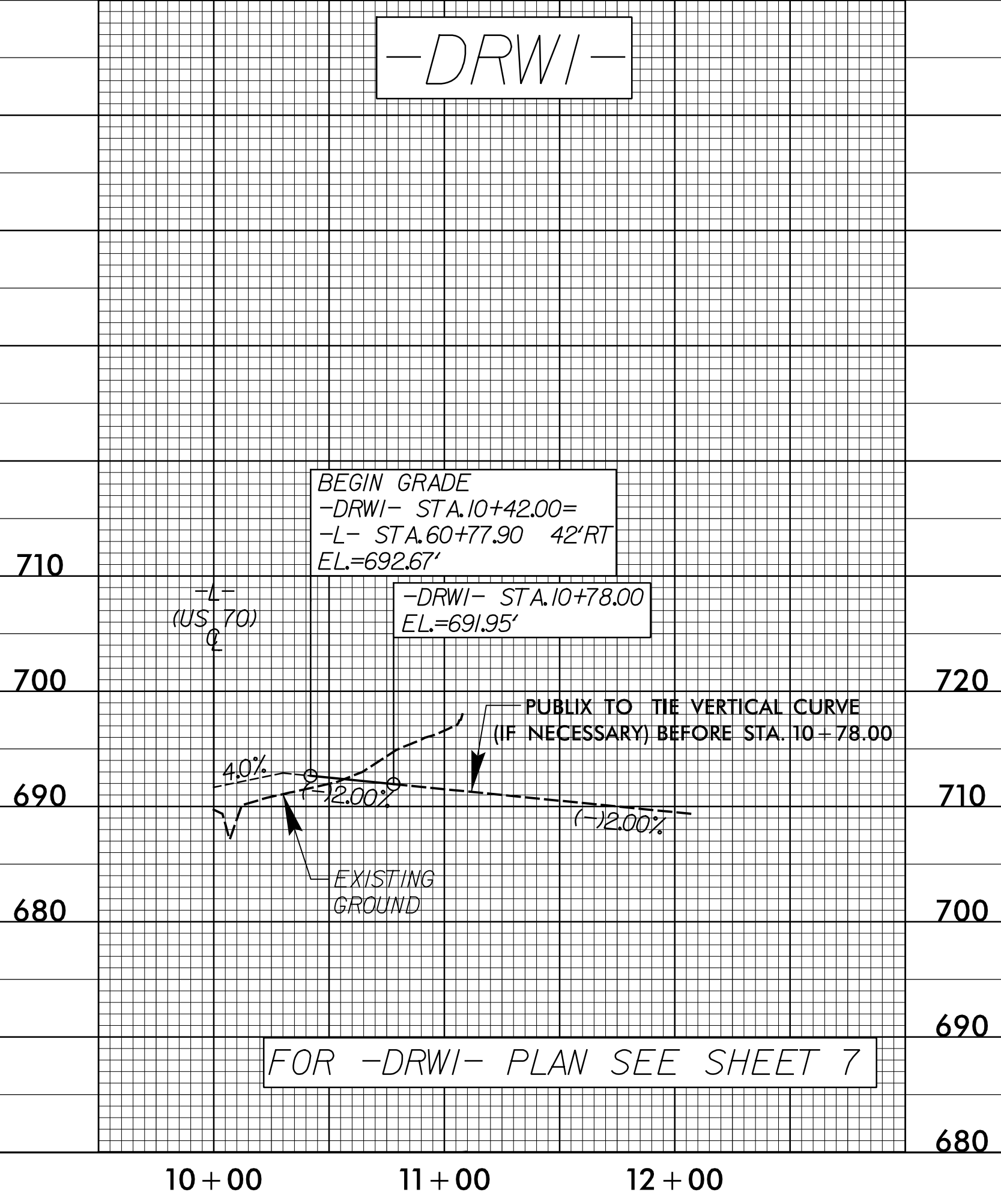
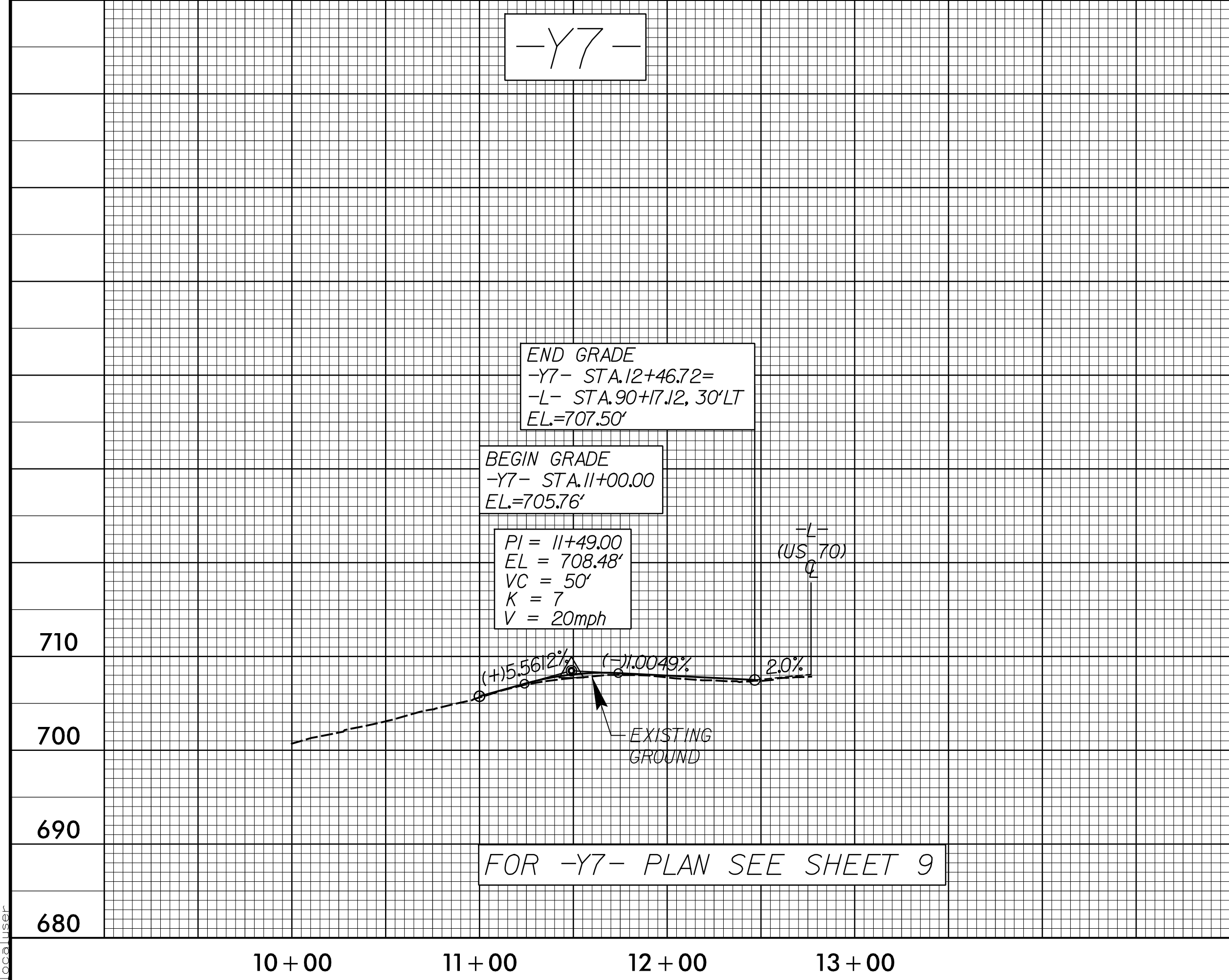
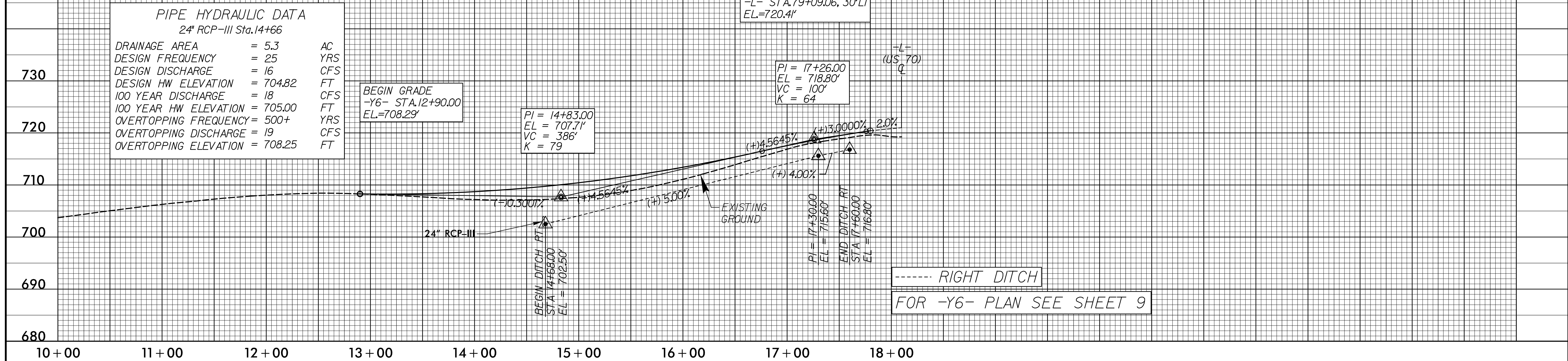
7/10/2019
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Local User

5/28/19



PROJECT REFERENCE NO. U-2581BA	SHEET NO. 16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
9/9/2019	9/6/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



7/10/2019 R:\Projects\U-2581BA_rdy_p\116.dgn