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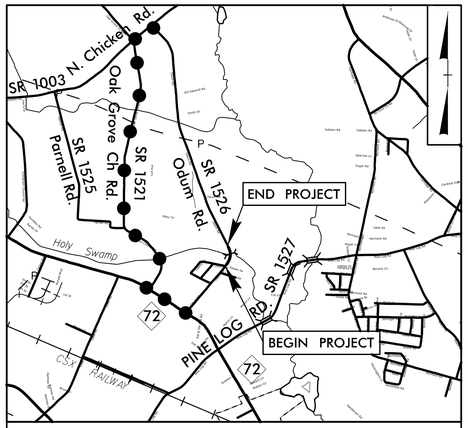
09/08/99

TIP PROJECT: DF15406.2078037

CONTRACT:

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



VICINITY MAP
N.T.S.

FINAL PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROBESON COUNTY

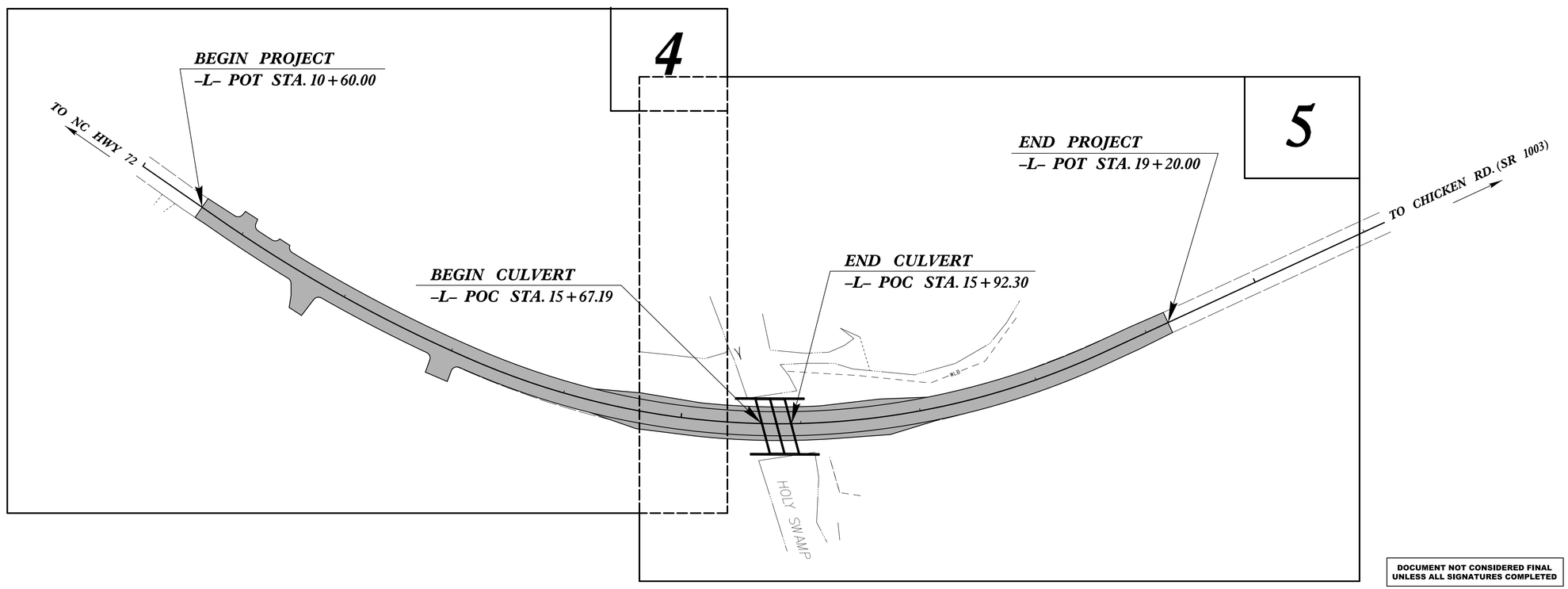
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF15406.2078037	1	54

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
DF15406.2078037	DF15406.2078037	P.E.
DF15406.2078037	DF15406.2078037	R/W & UTIL.
DF15406.2078037	DF15406.2078037	CONST.

LOCATION: CULVERT 77–2288 ON SR 1526 (ODUM ROAD) OVER HOLY SWAMP

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURES

NAD 83/2011



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GRAPHIC SCALES

20 10 0 20 40
PLANS

20 10 0 20 40
PROFILE (HORIZONTAL)

4 2 0 4 8
PROFILE (VERTICAL)

DESIGN DATA

V = 45 MPH
FUNC CLASS =
LOCAL RURAL
SUB REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY PROJECT DF15406.2078037 = 0.158 MILES
LENGTH OF STRUCTURE PROJECT DF15406.2078037 = 0.005 MILES
TOTAL LENGTH OF PROJECT DF15406.2078037 = 0.163 MILES

NCDOT CONTACT: CHRISTY HUFF, PE
DIVISION BRIDGE PROGRAM MANAGER

PLANS PREPARED FOR THE NCDOT BY:
STV ENGINEERS, INC.
1600 Perimeter Park Drive, Ste 225, Morrisville, NC 27560
NC License Number F-0991

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

LETTING DATE:

PATRICK A. LIVINGSTON, PE
PROJECT ENGINEER

E. NEAL PASCHAL, EI
PROJECT DESIGNER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029388 ENGINEER EDWARD J. VANCE
DocuSigned by: Edward Vance
SIGNATURE: 5/23/2019 P.E.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 045257 ENGINEER PATRICK A. LIVINGSTON
DocuSigned by: Patrick Livingston
SIGNATURE: 5/23/2019 P.E.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

5/23/2019
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STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
DF15406.2078037	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045257 ENGINEER PATRICK WASHINGTON

DocuSigned by: Patrick Washington
808A10E3258E468...
5/23/2019

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INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C-1	SURVEY CONTROL SHEET
2A-1	TYPICAL SECTIONS AND PAVEMENT SCHEDULE
3B-1	MISCELLANEOUS SUMMARY SHEET
4-5	PLAN SHEETS
6	PROFILE SHEET
TMP-1 THRU TMP-3	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING & SIGNING PLANS
UC-1 THRU UC-6	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-3	UTILITIES BY OTHERS PLANS
X-1 THRU X-12	CROSS-SECTIONS
C-1 THRU C-6	CULVERT PLANS

GENERAL NOTES

GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01-01-2018

GRADE LINE:
GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED 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 (MODIFIED).

SUPERELEVATION:

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

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

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.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

WATER - ROBESON COUNTRY PUBLIC WORKS

TELEPHONE - AT&T

CATV - CHARTER/SPECTRUM

POWER - LUMBEE RIVER EMC

RIGHT-OF-WAY MARKERS:

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

STANDARD DRAWINGS

2018 ROADWAY ENGLISH STANDARD DRAWINGS EFF. January, 2018

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 (Modified)
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 5 - SUBGRADE, BASES AND SHOULDER	
560.01	Method Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap in Channels

5/23/2019
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12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
DF154062078037	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

**S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Computed Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- 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 — FLOW
- False Sump

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- 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 Easment 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 — RW
- New Right of Way Line with Pin and Cap — RW
- New Right of Way Line with Concrete or Granite R/W Marker — RW
- New Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- New Control of Access — CA
- 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
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — 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
- 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 — 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 — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- 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 — S
- Utility Unknown U/G Line LOS B (S.U.E.*) — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

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PROJECT REFERENCE NO.	SHEET NO.
DF15406.2078037	1C-1
Location and Surveys	
NCDOT	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

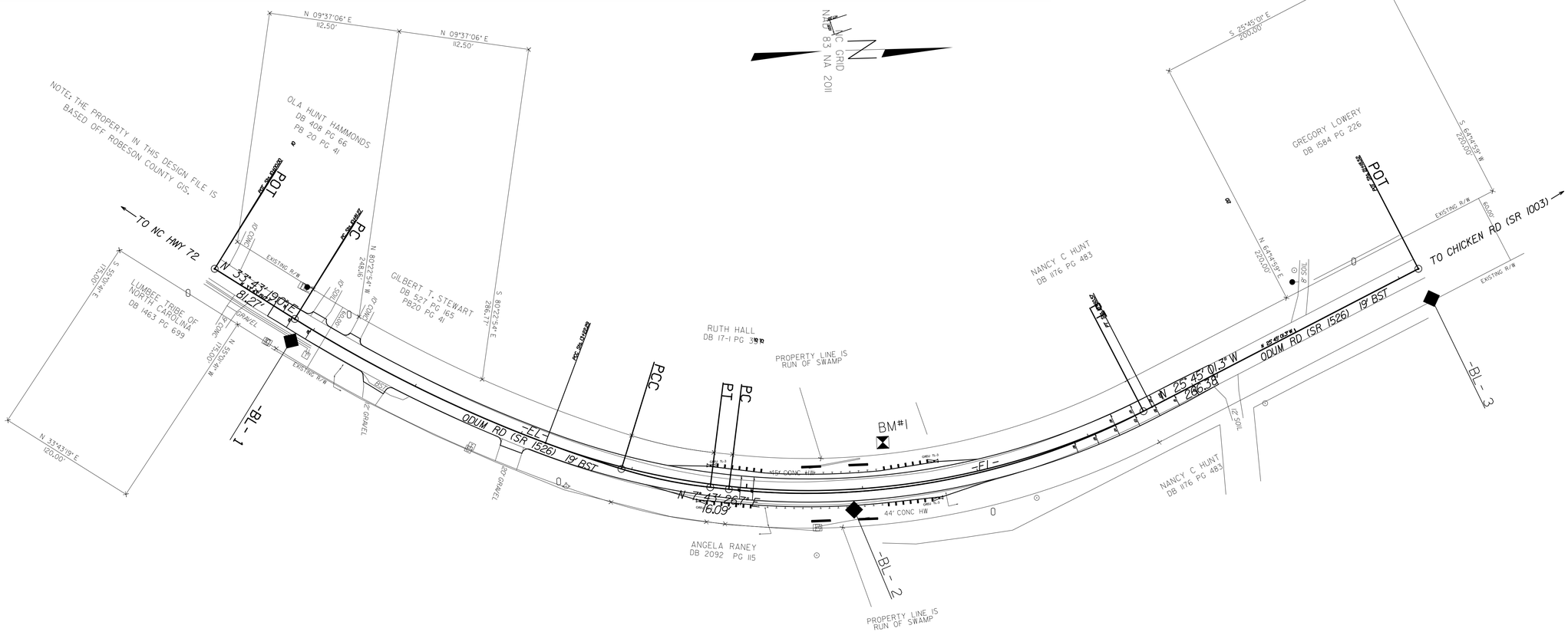
****
BM1 ELEVATION = 129.88
N 332122 E 1976309
RR SPIKE IN BASE OF 12" SWEET GUM
****

BL

POINT	DESC.		NORTH	EAST	ELEVATION
1	P470	BL-1	331625.9512	1976206.0591	132.93
2	P470	BL-2	332105.8884	1976365.3136	129.66
3	P470	BL-3	332607.5331	1976197.7766	129.66

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	331562.126	1976142.062							
LINE			N 33°43'19.0" E	81.27					
PC	331629.724	1976187.181							
CURVE			N 26°19'14.4" E	309.16	14°48'09.3"(LT)	04°46'28.7"	310.02	155.88	1200.00
PCC	331906.835	1976324.262							
CURVE			N 13°19'18.2" E	78.03	11°11'43.0"(LT)	14°19'26.2"	78.16	39.20	400.00
PT	331982.768	1976342.243							
LINE			N 07°43'26.7" E	16.09					
PC	331998.713	1976344.405							
CURVE			N 09°00'47.3" W	362.86	33°28'28.0"(LT)	09°05'40.4"	368.07	189.46	630.00
PT	332357.091	1976287.560							
LINE			N 25°45'01.3" W	266.38					
POT	332597.022	1976171.829							



NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

5/23/2019
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STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

CULVERT #77-2288

PROJECT REFERENCE NO.	SHEET NO.
DF15406.2078037	2A-1

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 045257 ENGINEER RICHARD A. LIVINGSTON
DocuSigned by: 808A1A2A2A2A2A2... 5/23/2019

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022896 ENGINEER CURTIS S. MORRISON
DocuSigned by: 8B4A2A2A2A2A2A2... 5/23/2019

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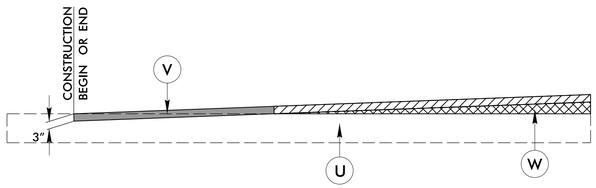
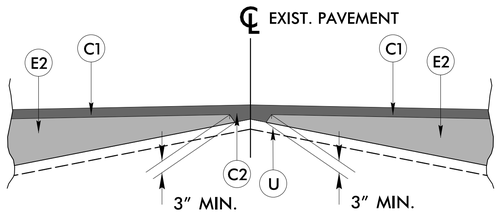


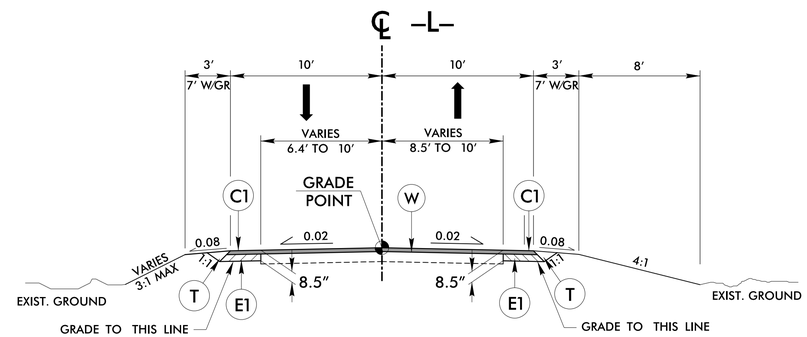
INCIDENTAL MILLING DETAIL

LINE	FROM	TO	
–L–	10+60.00	10+85.00	
–L–	18+95.00	19+20.00	(MIRROR)



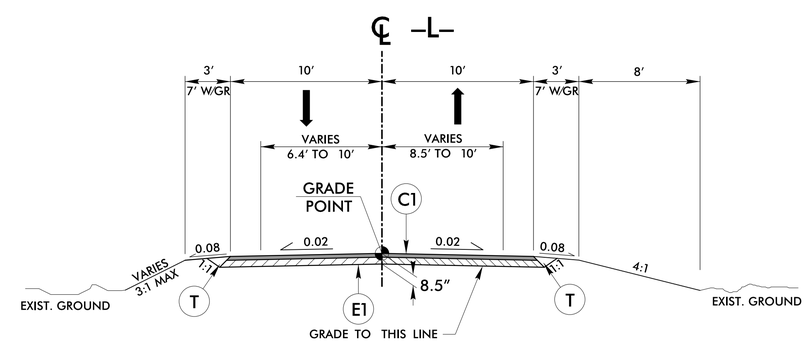
–L–

WEDGING DETAIL



TYPICAL SECTION NO. 1

–L– STA. 10+60.00 TO 15+50.00
–L– STA. 16+10.00 TO 19+20.00



TYPICAL SECTION NO. 2

–L– STA. 15+50.00 TO 16+10.00

FINAL PAVEMENT SCHEDULE (DECEMBER 6, 2018)	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ.YD.IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 1.5" IN DEPTH.
E1	PROP. APPROX. 5.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 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 5.5" IN DEPTH.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	INCIDENTAL MILLING
W	PAVEMENT WEDGING (SEE WEDGING DETAIL)

NOTES:
ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE

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5/28/99

STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
DF15406.2078037	3B-1

CULVERT #77-2288

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
–L– 10+60.00 TO 19+20.00	475		253		223
SUBTOTAL 1	475		253		223
TOTAL	475		253		223
PROJECT TOTAL	475		253		223
EST. 5% REPLACE TOP SOIL ON BORROW PIT					
GRAND TOTAL	475		253		223
SAY	480		260		

ASPHALT REMOVAL SUMMARY

SURVEY LINE	STATION RANGE	LOCATION	SY
–L–	15+50 TO 16+10	LT/RT	137
TOTAL			137
SAY			140

"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	TYPE III	GREU TL-3	XI	M-350	XIII	CAT-1	VI MOD	BIC	AT-1	EA	G	NG				
–L–	14+63.63	16+68.18	LT	200′			16+02.74 (HW)	15+50.61 (HW)	4′	7′	50′	50′	1′	1′		2														
–L–	14+64.70	16+72.58	RT	212.5′			15+59.14 (HW)	16+13.84 (HW)	4′	7′	50′	50′	1′	1′		2														
			SUBTOTAL	412.5′												4														
			LESS ANCHORS																											
		GREU TL-3	4 @ 50′ =	–200′																										
			TOTAL	212.5′																										
ADDITIONAL GUARDRAIL POSTS = 5 EACH																														

8/23/2019
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PSCOBEN

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8/17/99

NOTE: THE PROPERTY IN THIS DESIGN FILE IS BASED OFF ROBESON COUNTY GIS.

STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
DF154062078037	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045257 ENGINEER
5/24/2019

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029388 ENGINEER
5/27/2019

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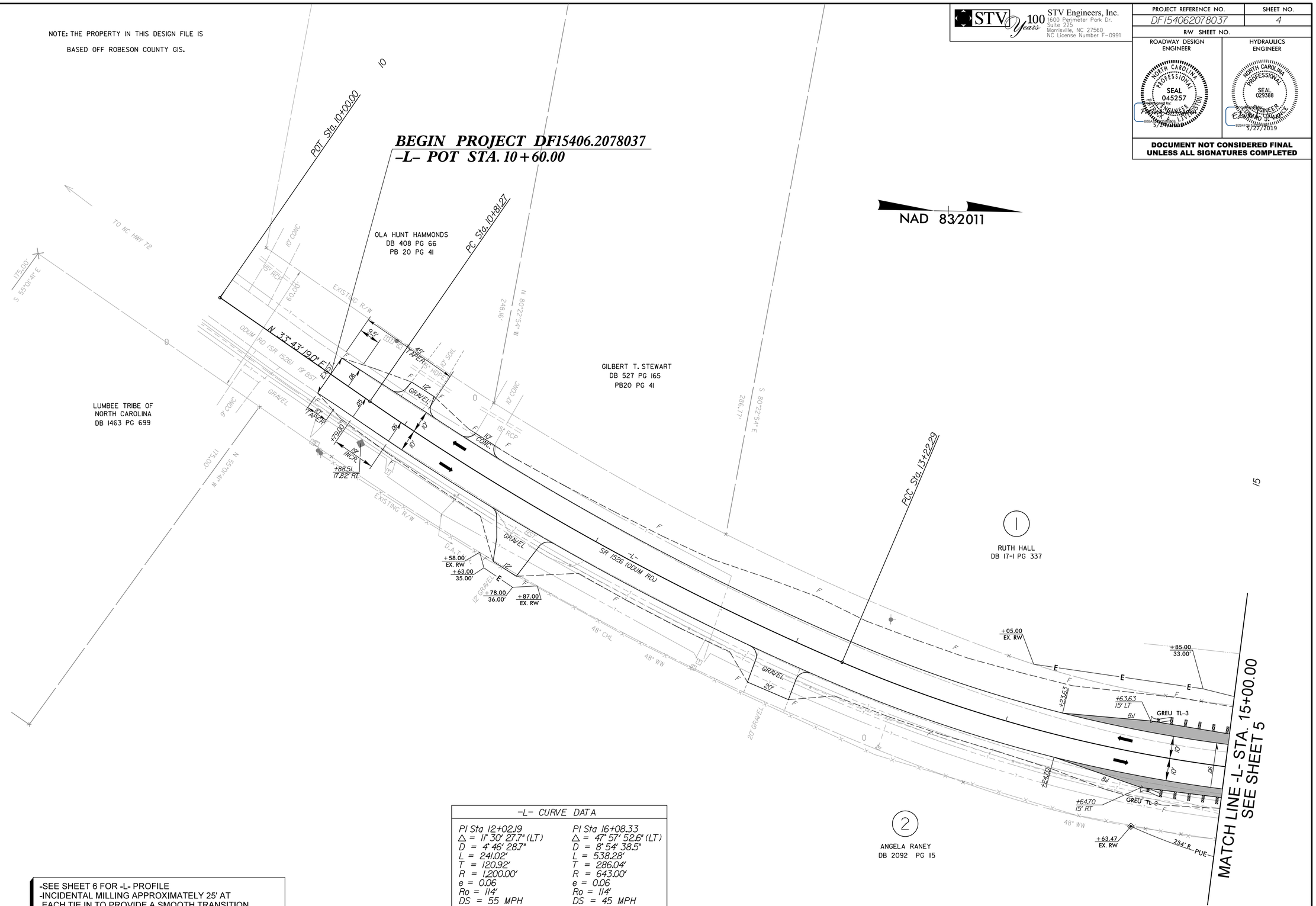

-L- CURVE DATA	
PI Sta 12+02.19	PI Sta 16+08.33
△ = 11° 30' 27.7" (LT)	△ = 47° 57' 52.6" (LT)
D = 4° 46' 28.7"	D = 8° 54' 38.5"
L = 241.02'	L = 538.28'
T = 120.92'	T = 286.04'
R = 1,200.00'	R = 643.00'
e = 0.06	e = 0.06
Ro = 114'	Ro = 114'
DS = 55 MPH	DS = 45 MPH

-SEE SHEET 6 FOR -L- PROFILE
-INCIDENTAL MILLING APPROXIMATELY 25' AT EACH TIE IN TO PROVIDE A SMOOTH TRANSITION TO THE EXISTING ASPHALT PAVEMENT.

5/23/2019
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pscicpen

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8/17/99

STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
DF154062078037	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 045257 ENGINEER
Patrick Thurston
808A1F2C1F7C4DD...
5/23/2019

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029388 ENGINEER
Charles Lassiter
826AF2E1F7C4DD...
5/23/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTE: THE PROPERTY IN THIS DESIGN FILE IS BASED OFF ROBESON COUNTY GIS.

NAD 83/2011

END TIP PROJECT DF15406.2078037
-L- POT STA. 19+20.00

MATCH LINE -L- STA. 15+00.00
SEE SHEET 4

1
RUTH HALL
DB 17-1 PG 337

2
ANGELA RANEY
DB 2092 PG 115

3
NANCY C HUNT
DB 1176 PG 483

4
NANCY C HUNT
DB 1176 PG 483

GREGORY LOWERY
DB 1584 PG 226

PROPERTY LINE IS RUN OF SWAMP

EST. 71 TON CL II RIP RAP
156 SY GEOTEXTILE

EST. 88 TONS CL II RIP RAP
195 SY GEOTEXTILE

BEGIN 2-11'X6' CULVERT
-L- POC STA.15+67.19

END 2-11'X6' CULVERT
-L- POC STA.15+92.30

BMI
+10.96
37.35' LT

SR 1526 (ODUM RD)

TO CHICKEN RD (SR 1003)

ODUM RD (SR 1526) 19' BST

N 25° 45' 01.3" W L

N 64°14' 59" E
220.00'

PT 516.18460.57

30' TAPER LT. & RT.

RESET FENCE

-L- CURVE DATA

PI Sta 16+08.33
Δ = 47° 57' 52.6" (LT)
D = 8° 54' 38.5"
L = 538.28'
T = 286.04'
R = 643.00'
e = 0.06
Ro = 114'
DS = 45 MPH

-SEE SHEET 6 FOR -L- PROFILE
-INCIDENTAL MILLING APPROXIMATELY 25' AT EACH TIE IN TO PROVIDE A SMOOTH TRANSITION TO THE EXISTING ASPHALT PAVEMENT.

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PROJECT REFERENCE NO.	SHEET NO.
DF15406.2078037	6

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 045257 ENGINEER
Patrick A. Livingston
808A1D0F4B7D4A2...

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029388 ENGINEER
Edward Bryce
8264F28D9B3D4C2...
7/11/2019

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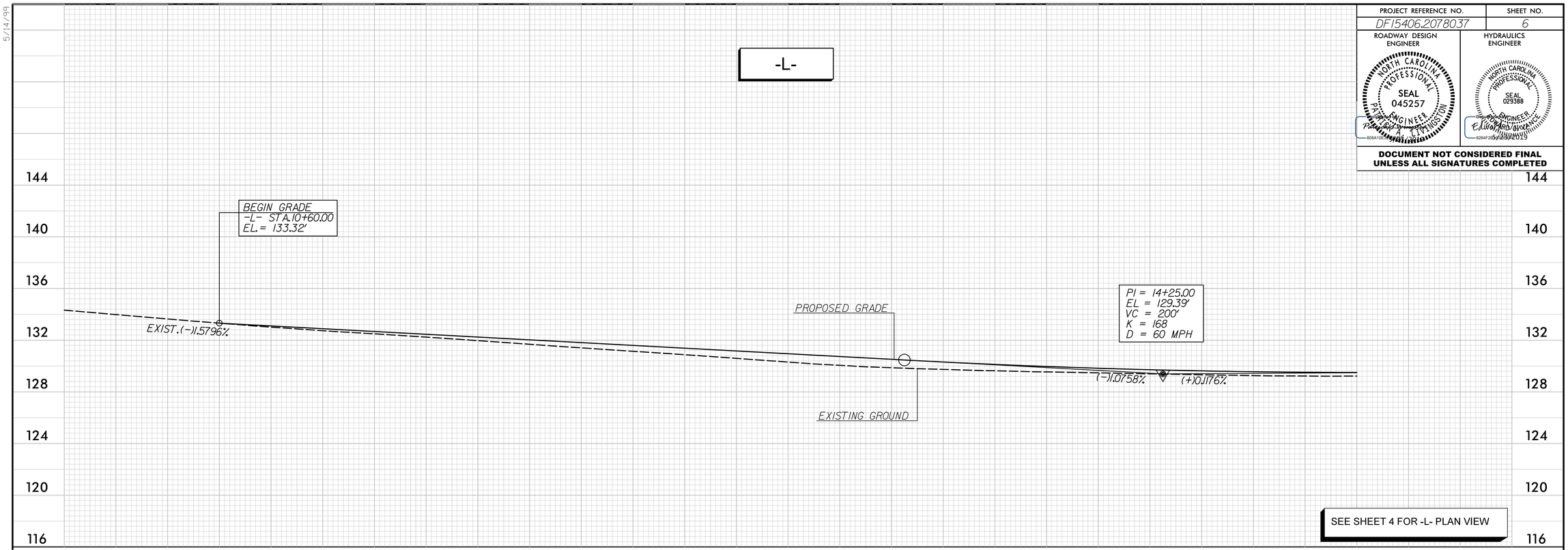
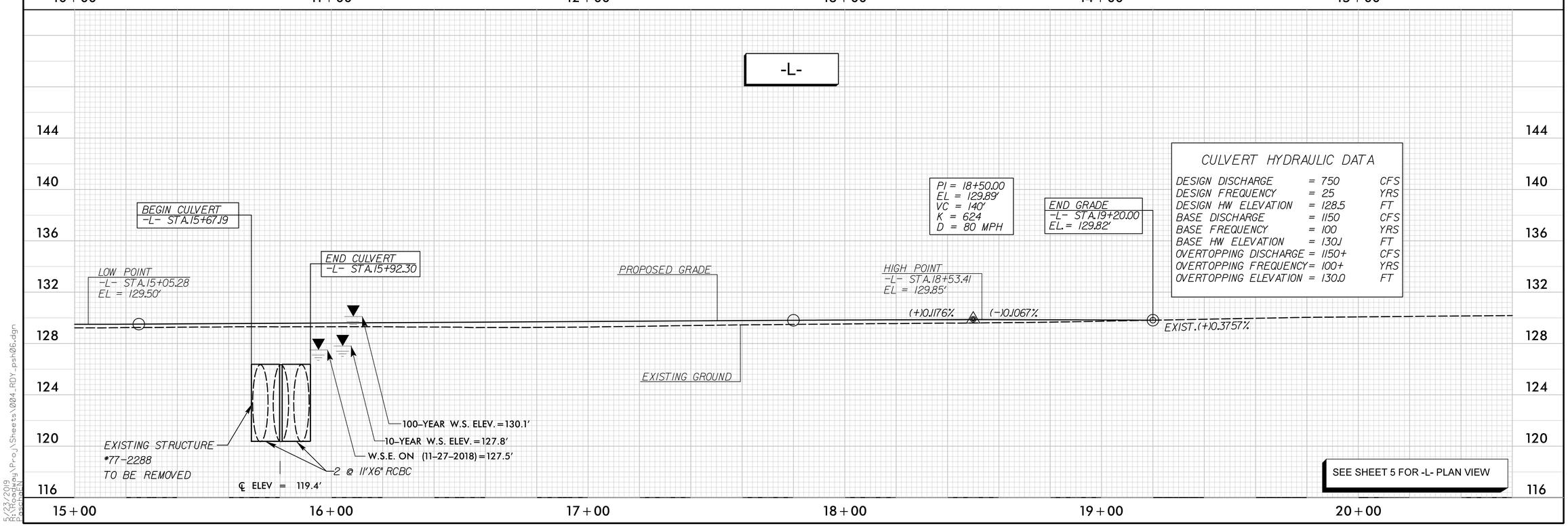


SEE SHEET 4 FOR -L- PLAN VIEW



CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=	750	CFS
DESIGN FREQUENCY	=	25	YRS
DESIGN HW ELEVATION	=	128.5	FT
BASE DISCHARGE	=	1150	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	130.1	FT
OVERTOPPING DISCHARGE	=	1150+	CFS
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING ELEVATION	=	130.0	FT

SEE SHEET 5 FOR -L- PLAN VIEW

5/14/99
5/23/2019
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PSCOPEN

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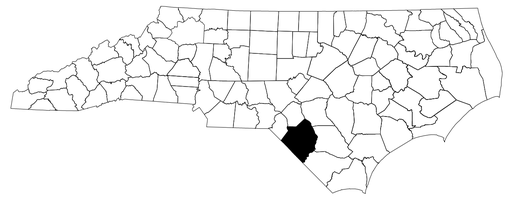
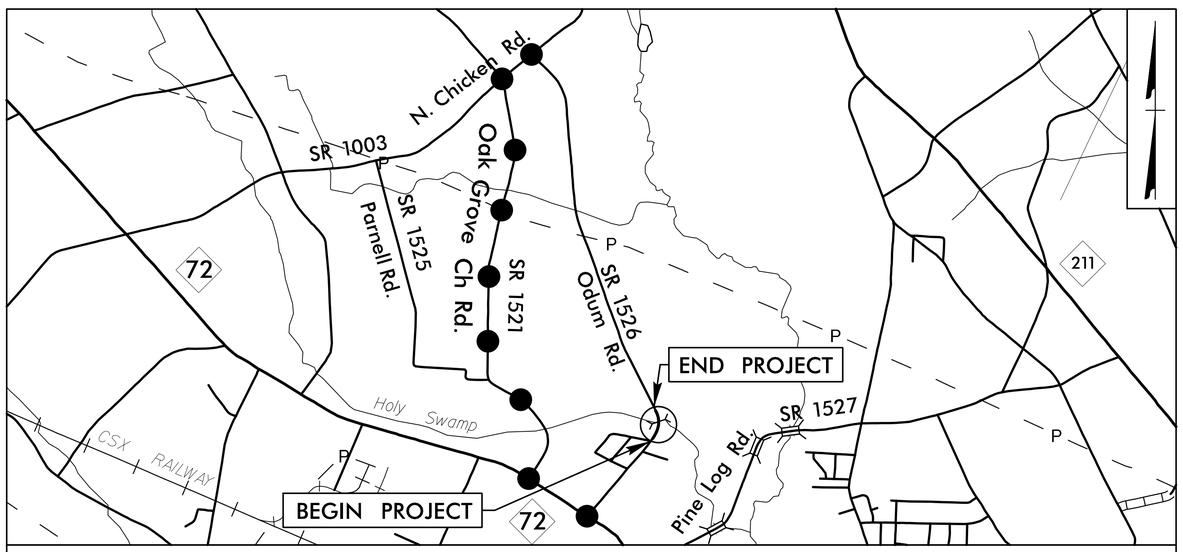
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

ROBESON COUNTY





DETOUR ROUTE

VICINITY MAP

N.T.S.

LOCATION: CULVERT #77-2288 ON SR 1526 (ODUM RD.) OVER HOLY SWAMP

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, AND INDEX OF SHEETS
TMP-1A	ROADWAY STANDARD DRAWINGS AND LEGEND
TMP-1B	TRANSPORTATION OPERATIONS PLAN, PROJECT NOTES AND PHASING
TMP-2	OFFSITE DETOUR SIGNING AND ROAD CLOSURE SIGNING
TMP-3	SPECIAL SIGN DESIGN

SHEET NO.
TMP-1

PROJECT: DF15406.2078037

CULVERT #77-2288

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

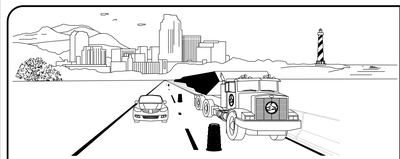
FINAL TRAFFIC CONTROL PLANS

SUBMITTED: 4-15-2019

APPROVED: DocuSigned by: Patrick Livingston
DATE: 5/24/2019

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 045257 ENGINEER PATRICK A. LIVINGSTON



WORK ZONE SAFETY & MOBILITY
"from the MOUNTAINS to the COAST"

HIGHWAY DIVISION 6
558 GILLESPIE ST.
PO BOX 1150, FAYETTEVILLE, NC 28301
PHONE: (910) 364-0603 FAX: (910)486-1959

Christy Huff, PE DIVISION BRIDGE PROGRAM MANAGER

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

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5/24/2019

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ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - 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
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES - TYPE III

LEGEND

GENERAL

DIRECTION OF TRAFFIC FLOW
DIRECTION OF PEDESTRIAN TRAFFIC FLOW
EXIST. PVMT.
NORTH ARROW
PROPOSED PVMT.
WORK AREA
REMOVAL

TRAFFIC CONTROL DEVICES

BARRICADE (TYPE III)
CONE
DRUM SKINNY DRUM TUBULAR MARKER
TEMPORARY CRASH CUSHION
FLASHING ARROW PANEL (TYPE C)
FLAGGER
LAW ENFORCEMENT
TRUCK MOUNTED IMPACT ATTENUATOR (TMIA)
CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

PORTABLE SIGN
STATIONARY SIGN
STATIONARY OR PORTABLE SIGN

SIGNALS

EXISTING PROPOSED TEMP TEMPORARY

PAVEMENT MARKINGS

EXISTING LINES
TEMPORARY LINES

PAVEMENT MARKING SYMBOLS

PAVEMENT MARKING SYMBOLS

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APPROVED: DocuSigned by: Patrick Livingston 808A10E3258E459... DATE: 5/24/2019

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 045257 ENGINEER PATRICK A. LIVINGSTON

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

ROADWAY STANDARD DRAWINGS & LEGEND

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5/24/2019

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MANAGEMENT STRATEGIES

- CLOSE SR 1526 (ODUM ROAD)
- LOCAL ACCESS TO ALL RESIDENCES AND BUSINESS WILL BE MAINTAINED BETWEEN CLOSURE POINTS AT ALL TIMES DURING CONSTRUCTION
- PROVIDE ONE MONTH NOTICE TO THE ENGINEER, ROBESON COUNTY EMERGENCY SERVICES, AND ROBESON COUNTY SCHOOL OFFICIALS PRIOR TO ROAD CLOSURE

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

TRAFFIC PATTERN ALTERATIONS

A) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

B) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC MANAGEMENT PLANS.

C) PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC MANAGEMENT PLANS.

D) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.

E) COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.

F) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

TRAFFIC CONTROL DEVICES

G) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

PHASING

STEP 1: USING RSD 1101.04, INSTALL AND COVER ALL DETOUR SIGNING.

STEP 2: USING RSD 1101.03 SHEET 1 OF 9, AND TMP-2, INSTALL TYPE III BARRICADES TO CLOSE SR 1526 (ODUM ROAD) TO THRU TRAFFIC, UNCOVER ALL DETOUR SIGNING AND SHIFT TRAFFIC ONTO PROPOSED DETOUR.

STEP 3: AWAY FROM TRAFFIC, PERFORM THE FOLLOWING:

REMOVE EXISTING STRUCTURE 77-2288 AND CONSTRUCT PROPOSED STRUCTURE FROM -L- STA 15+67+/- TO -L- STA 15+92+/-. SEE ROADWAY AND STRUCTURE PLANS.

CONSTRUCT PROPOSED -L- UP TO BUT NOT INCLUDING FINAL LAYER OF SURFACE COURSE FROM STA 10+60+/- TO STA 19+20+/-.

STEP 4: PLACE FINAL LAYER OF SURFACE COURSE AND FINAL PAVEMENT MARKINGS FROM -L- STA 10+60+/- TO -L- STA 19+20+/-, AND TIE TO EXISTING MARKINGS (SEE PAVEMENT MARKING PLAN).

STEP 5: USING RSD 1101.04, REMOVE ALL TRAFFIC CONTROL DEVICES, SIGNING AND DETOUR ROUTE SIGNING.

OPEN SR 1526 (ODUM ROAD) TO FINAL TRAFFIC PATTERN.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

APPROVED: Patrick Livingston DATE: 5/24/2019
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SEAL

NORTH CAROLINA PROFESSIONAL SEAL 045257 ENGINEER PATRICK A. LIVINGSTON

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL UNIT

TRANSPORTATION OPERATIONS PLAN, PROJECT NOTES AND PHASING

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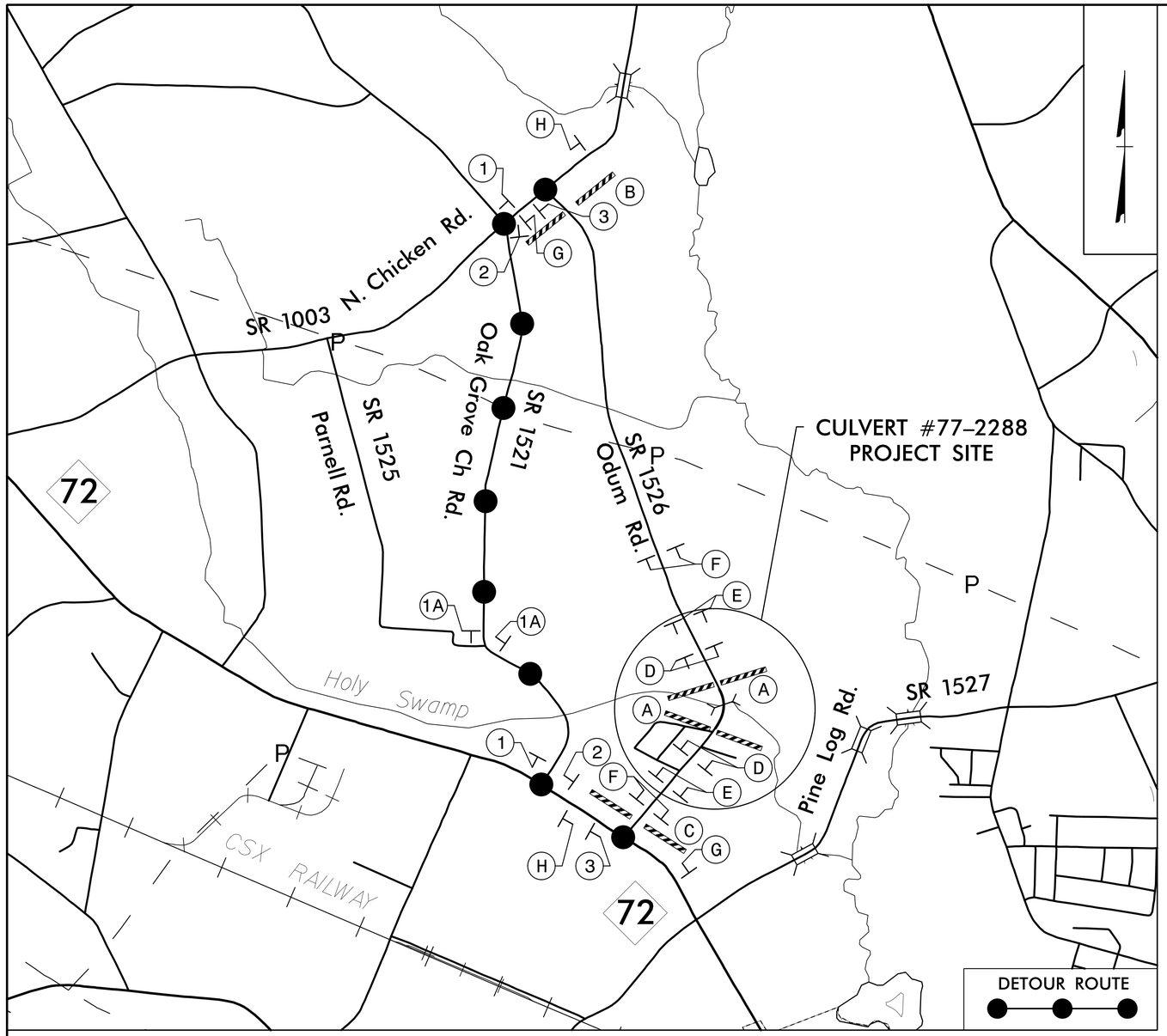
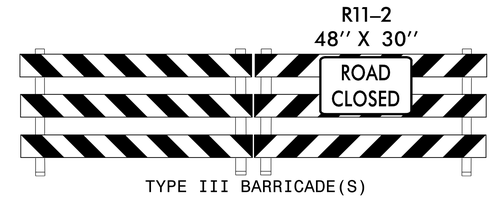
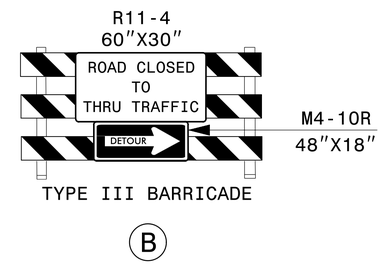
PROJ. REFERENCE NO.	SHEET NO.
DF15406.2078037	TMP-2

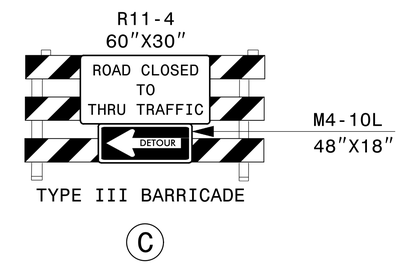
STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

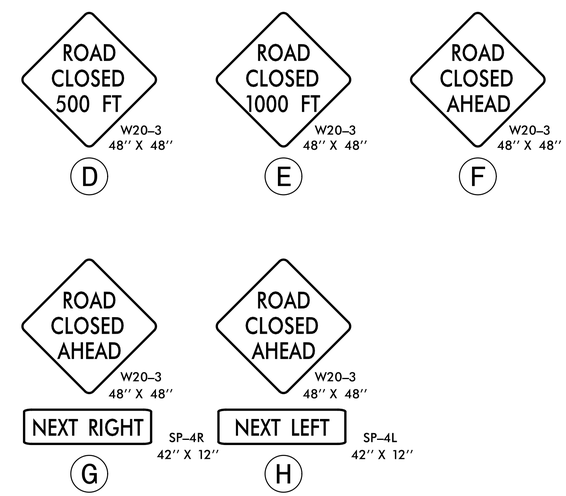
CULVERT #77-2288

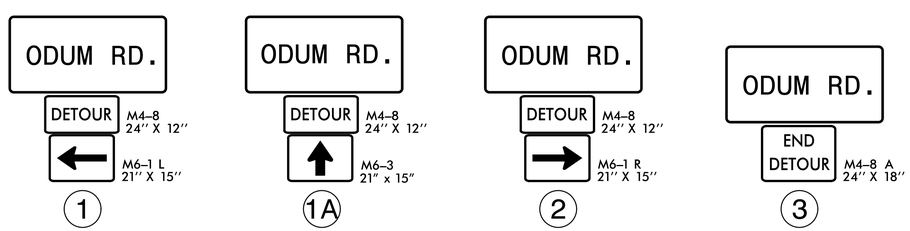












NOTES:

TRAFFIC CONTROL DEVICES (A) THRU (H) SHALL BE INSTALLED ACCORDING TO ROADWAY STANDARD DRAWING 1101.03, SHEET 1 OF 9.

TRAFFIC CONTROL DEVICES (1) THRU (3) SHALL BE INSTALLED AS PER ENGINEER'S INSTRUCTION.

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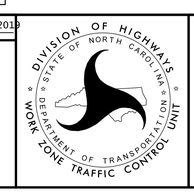
APPROVED: DocuSigned by: Patrick Livingston 8C8A1AE5C5BE45D DATE: 5/24/2019

SEAL



OFFSITE DETOUR SIGNING AND ROAD CLOSURE SIGNING

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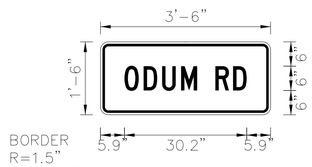
PROJ. REFERENCE NO.	SHEET NO.
DF15406.2078037	TMP-3

STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

CULVERT #77-2288

SIGN DETAIL
1:25



BORDER
R=1.5"
TH=0.63"
IN=0.47"

Panel Style: construction_guide_street_name_two_lines.ssi
M.U.T.C.D.: 2009 Edition

SIGN NUMBER	I-1
WIDTH x HGHT.	3'-6" x 1'-6"
BORDER WIDTH	0.63"
CORNER RADIUS	1.5"
MOUNTING	Ground
BACKGROUND	TYPE: Reflective
	COLOR: Orange
LEGEND/BORDER	TYPE: Reflective
	COLOR: Black/Black

SYMBOL	ROT	X	Y	WID	HT

Panel Style:construction_guide_street_name_two_lines.ssi
Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

LETTER POSITIONS (X)

O	D	U	M		R	D	LENGTH	SERIES/SIZE
5.9	10.7	15.2	19.9	23.9	28.4	32.7	30.2	C 2000 6

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APPROVED: DocuSigned by: Patrick Livingston DATE: 5/24/2019
9DBA7AB2A29B4A9...

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 045257 ENGINEER PATRICK A. LIVINGSTON

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL

SPECIAL SIGN DESIGN

5/24/2019
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PROJECT: DF15406.2078037

CONTRACT:

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE PROJECT REFERENCE NO.	SHEET NO.
DF15406.2078037	PMP-1

PLAN FOR PROPOSED PAVEMENT MARKING & SIGNING

CULVERT #77-2288 – ROBESON COUNTY

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - 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
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

INDEX OF SHEETS

SHEET NO.	TITLE
PMP-1	PAVEMENT MARKING PLAN COVER SHEET
PMP-2	PAVEMENT MARKING DETAIL

SUMMARY OF QUANTITIES

ITEM NO. DESC. NO.	ITEM NO. SECT. NO.	ITEM DESCRIPTION	QUANTITY	UNIT
		PROPOSED ROADWAY IMPROVEMENTS		
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	4	EA
4810000000	1205	PAINT, WHITE EDGELINE (4", TWO-COATS)	3440	LF
4810000000	1205	PAINT, YELLOW DOUBLE CENTER (4", TWO-COATS)	3440	LF
4900000000	1251	PERMANENT RAISED PAVEMENT MARKERS	18	EA

GENERAL NOTES

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.

A) INSTALL PAVEMENT MARKINGS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
SR 1526 (ODUM RD.)	PAINT (TWO-COATS)	PERMANENT

B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

C) REMOVE/REPLACE ANY CONFLICTING PAVEMENT MARKINGS.

D) REPLACE ANY PAVEMENT MARKINGS BEYOND THE PROJECT LIMITS DAMAGED BY THE CONTRACTORS' OPERATIONS DURING CONSTRUCTION.

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APPROVED: DocuSigned by: Patrick Livingston
DATE: 5/24/2019

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 045257 ENGINEER PATRICK A. LIVINGSTON

PLAN PREPARED FOR N.C.D.O.T. BY: STV ENGINEERS, INC.

Patrick A. Livingston, PE — PROJECT ENGINEER
Starke W. Hipp, EI — DESIGN ENGINEER
Starke W. Hipp, EI — DESIGN TECHNICIAN

5/24/2019
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PaschaEN

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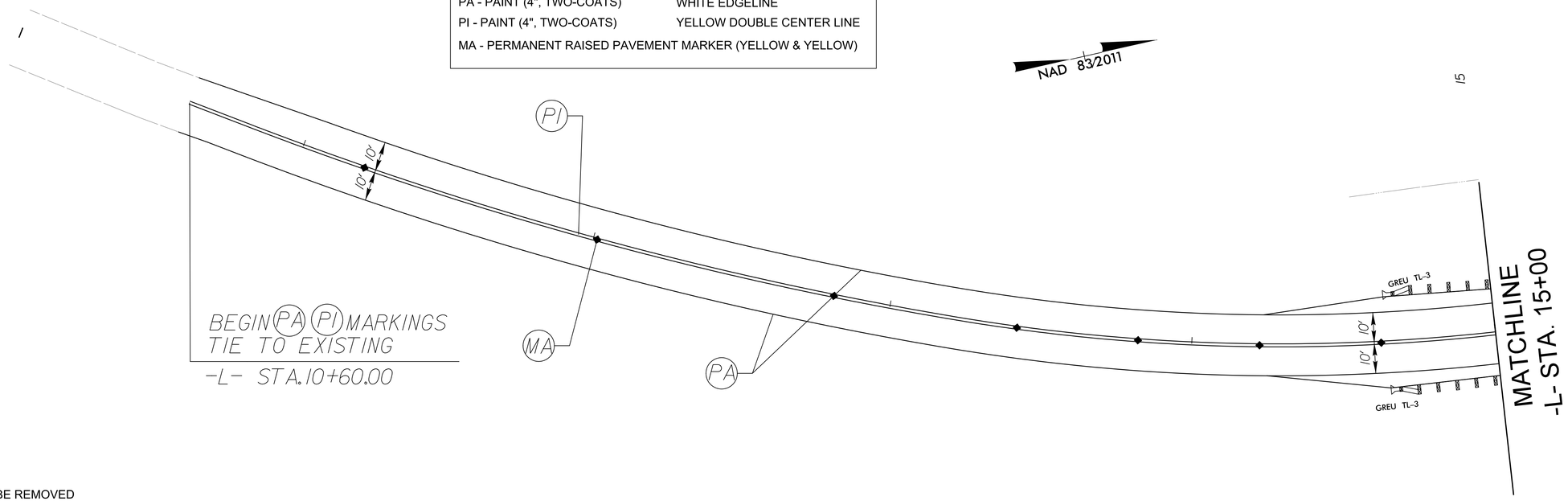
8/17/99

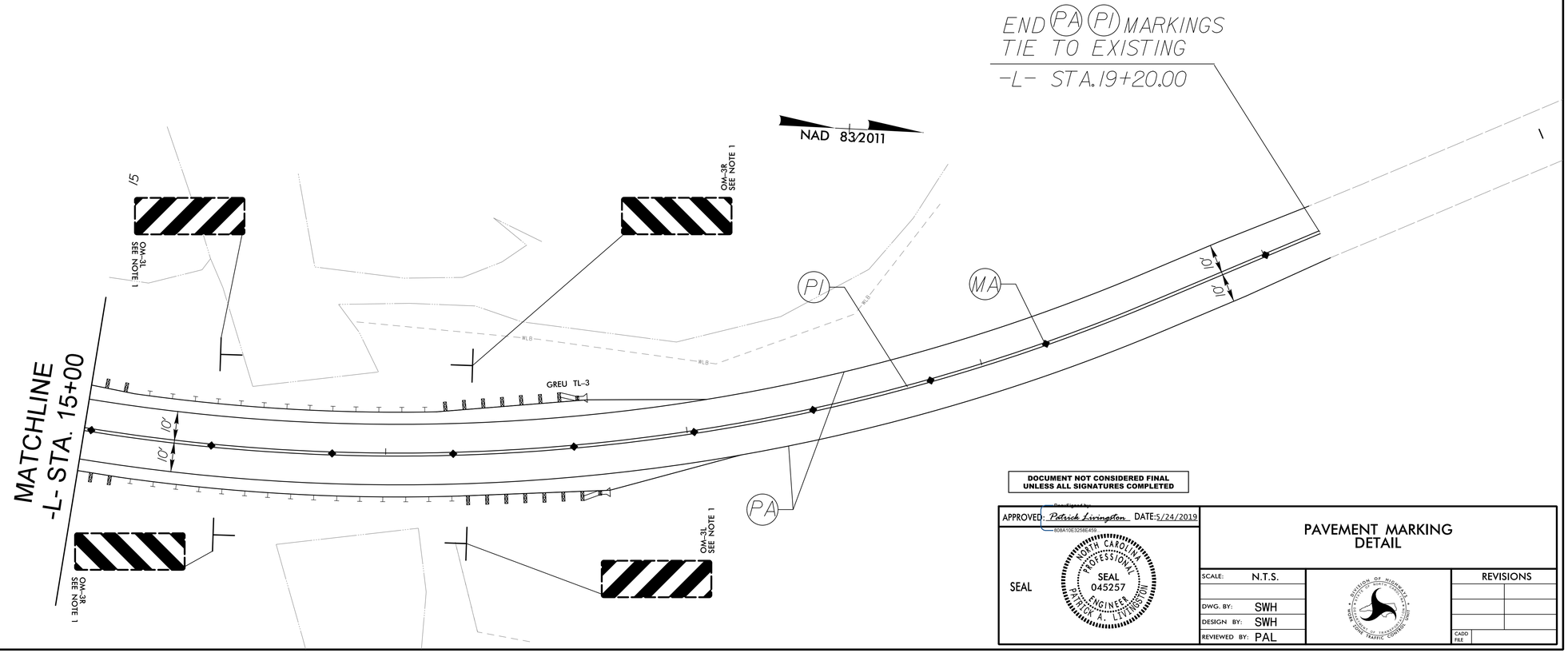
STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

PROJ. REFERENCE NO.	SHEET NO.
DF15406.2078037	PMP-2

PAVEMENT MARKING SCHEDULE	
PA - PAINT (4", TWO-COATS)	WHITE EDGELINE
PI - PAINT (4", TWO-COATS)	YELLOW DOUBLE CENTER LINE
MA - PERMANENT RAISED PAVEMENT MARKER (YELLOW & YELLOW)	



NOTES:
1) SIGN SYSTEM TO BE REMOVED



NOTES:
1) SIGN SYSTEM TO BE REMOVED

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

APPROVED: DocuSigned by: Patrick Livingston B08A10E3258E459... DATE: 5/24/2019

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 045257 ENGINEER PATRICK A. LIVINGSTON

PAVEMENT MARKING DETAIL

SCALE:	N.T.S.
DWG. BY:	SWH
DESIGN BY:	SWH
REVIEWED BY:	PAL

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · TRANSPORTATION · STATE TRAFFIC ENGINEER

REVISIONS

CADD FILE

5/24/2019
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09/08/99

TIP PROJECT: DF15406.2078037

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF15406.2078037	EC-1	9

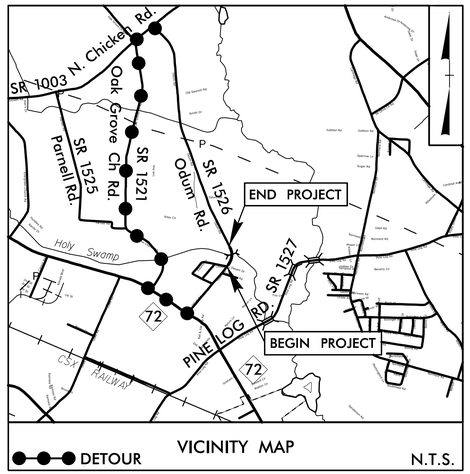
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
DF15406.2078037	DF15406.2078037	P.E.
DF15406.2078037	DF15406.2078037	R/W & UTILITIES
DF15406.2078037	DF15406.2078037	CONSTRUCTION

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

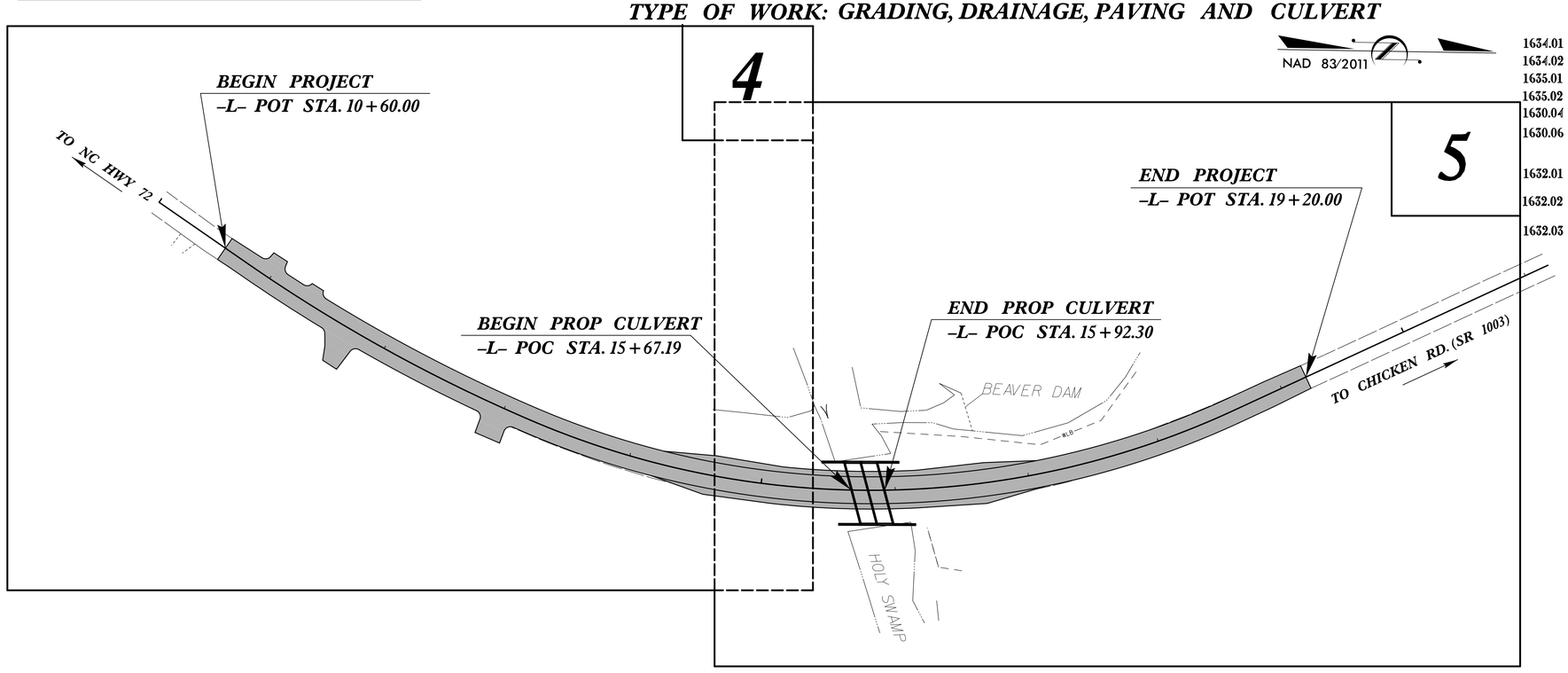
ROBESON COUNTY

LOCATION: CULVERT 78–05–004 ON SR 1526 (ODUM ROAD)
OVER HOLY SWAMP CREEK
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND CULVERT



VICINITY MAP
N.T.S.

NAD 83/2011



EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
1633.02	Temporary Rock Silt Check Type-B	
	Wattle / Coir Fiber Wattle	EW CFW
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1630.04	Stilling Basin	
1630.06	Special Stilling Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	
	Tiered Skimmer Basin	
	Infiltration Basin	

THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.

GRAPHIC SCALE

20 10 0 20 40
PLANS

20 10 0 20 40
PROFILE (HORIZONTAL)

2 1 0 2 4
PROFILE (VERTICAL)

ROADSIDE ENVIRONMENTAL UNIT
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG–010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 1, 2016 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF WATER RESOURCES.

Prepared In the Office of:

STV ENGINEERS, INC.
900 WEST TRADE STREET, SUITE 715
CHARLOTTE, NC 28202

Designed by:

DILLON BAWAYAN ***4157***
NAME *LEVEL III CERTIFICATION NO.*

Reviewed In the Office of:

ROADSIDE ENVIRONMENTAL UNIT
1 South Wilmington St.
Raleigh, NC 27611

2018 STANDARD SPECIFICATIONS

Reviewed by:

NOELLE RING, CPESC

Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"– Roadway Design Unit – N. C. Department of Transportation – Raleigh, N. C., dated January 2018 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type A
1622.01	Temporary Berms and Slope Drains	1633.02	Temporary Rock Silt Check Type B
1630.01	Riser Basin	1634.01	Temporary Rock Sediment Dam Type A
1630.02	Silt Basin Type B	1634.02	Temporary Rock Sediment Dam Type B
1630.03	Temporary Silt Ditch	1635.01	Rock Pipe Inlet Sediment Trap Type A
1630.04	Stilling Basin	1635.02	Rock Pipe Inlet Sediment Trap Type B
1630.05	Temporary Diversion	1640.01	Coir Fiber Baffle
1630.06	Special Stilling Basin	1645.01	Temporary Stream Crossing
1631.01	Matting Installation		

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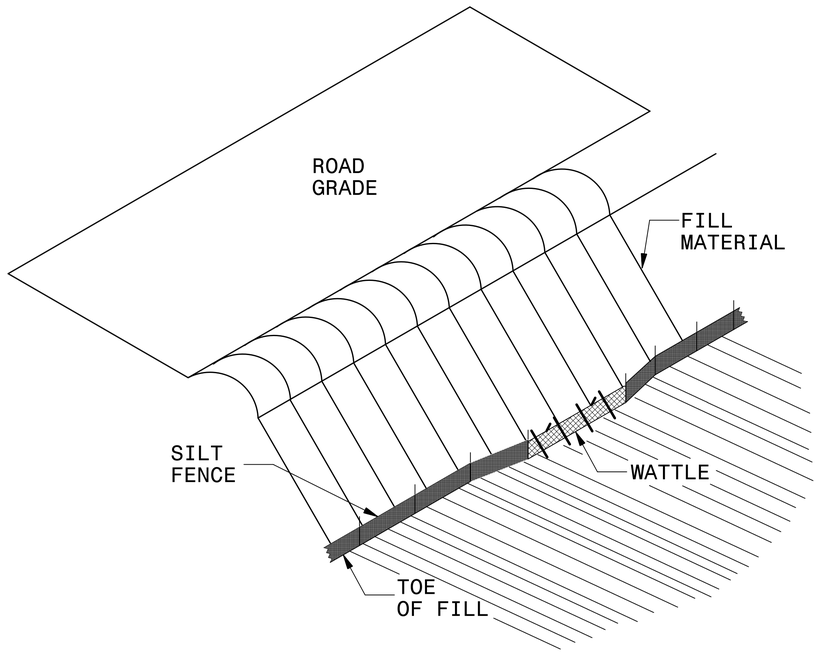
PROJECT REFERENCE NO.	SHEET NO.
DF154062078037	EC-2
R/W SHEET NO.	

SILT FENCE COIR FIBER WATTLE BREAK DETAIL



ISOMETRIC VIEW

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 1 TO 2 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLE ON TOE OF SLOPE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

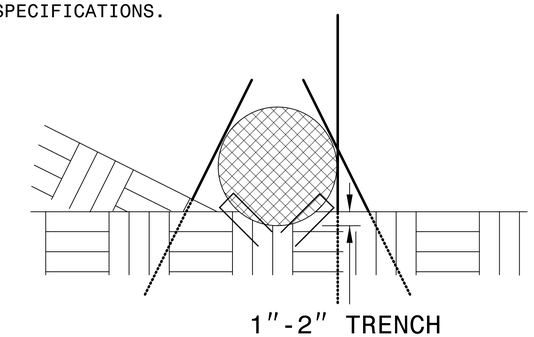
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

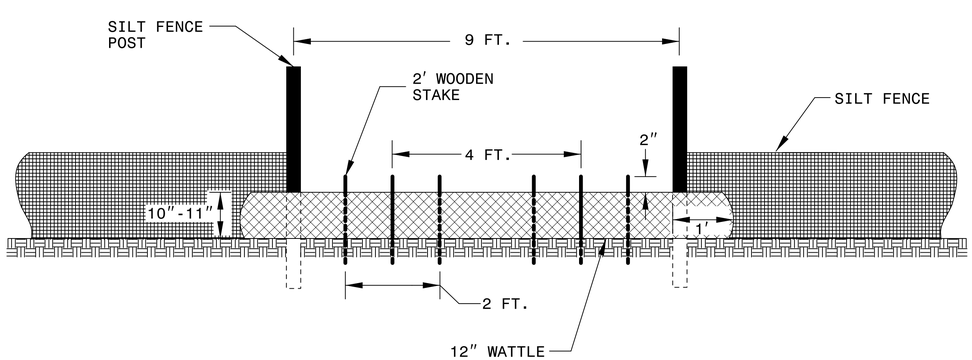
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.

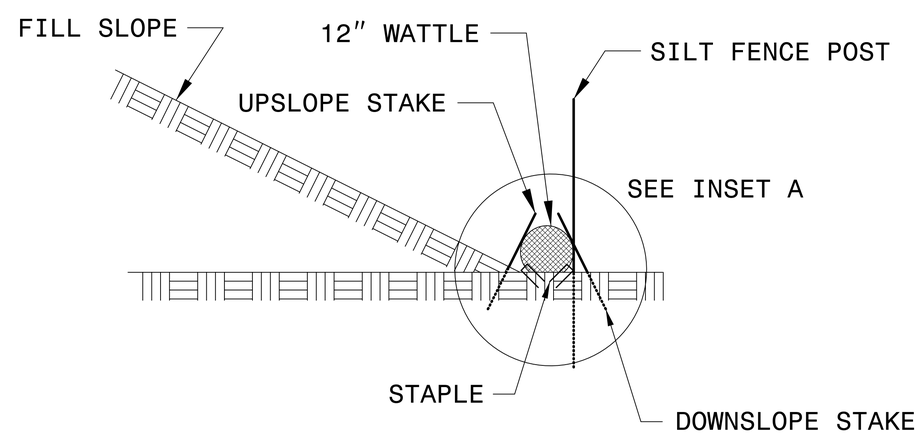
INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

INSET A





VIEW FROM SLOPE



SIDE VIEW

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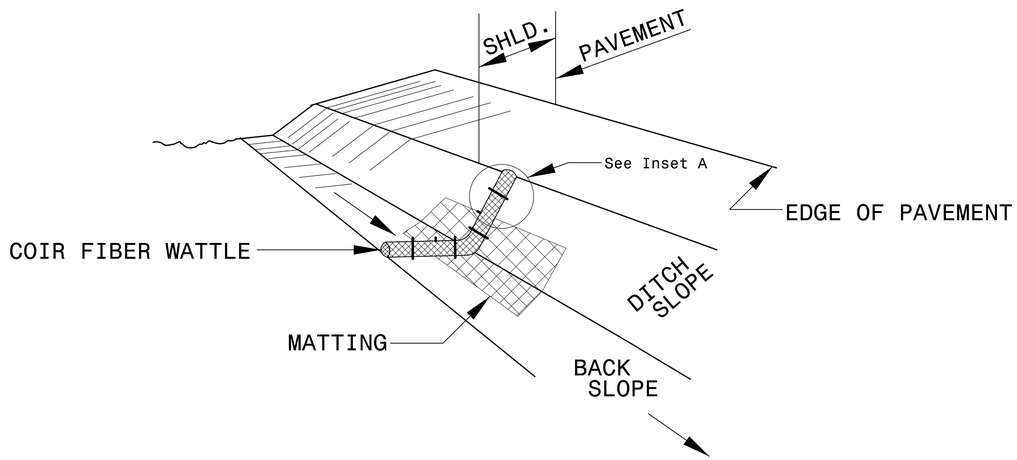
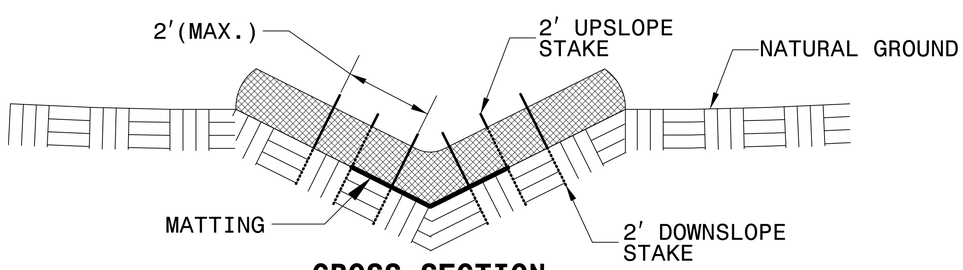
PROJECT REFERENCE NO.	SHEET NO.
DF154062078037	EC-2A

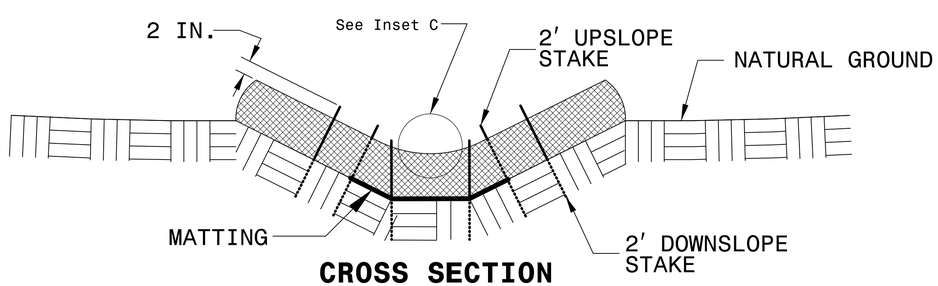
COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

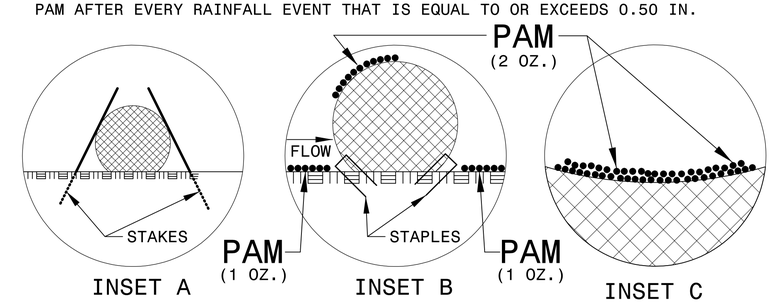
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

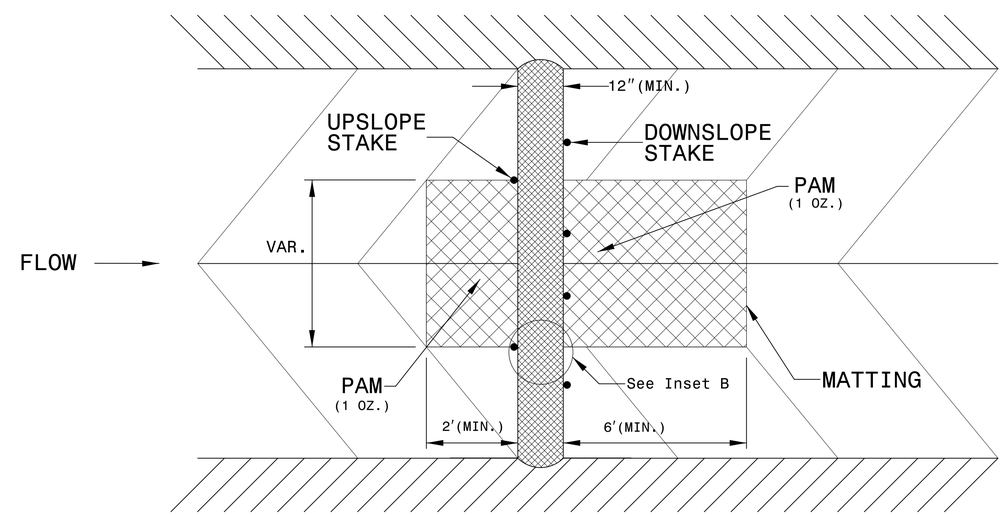
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.

INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.





TOP VIEW

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PROJECT REFERENCE NO.	SHEET NO.
DF154062078037	EC-3

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

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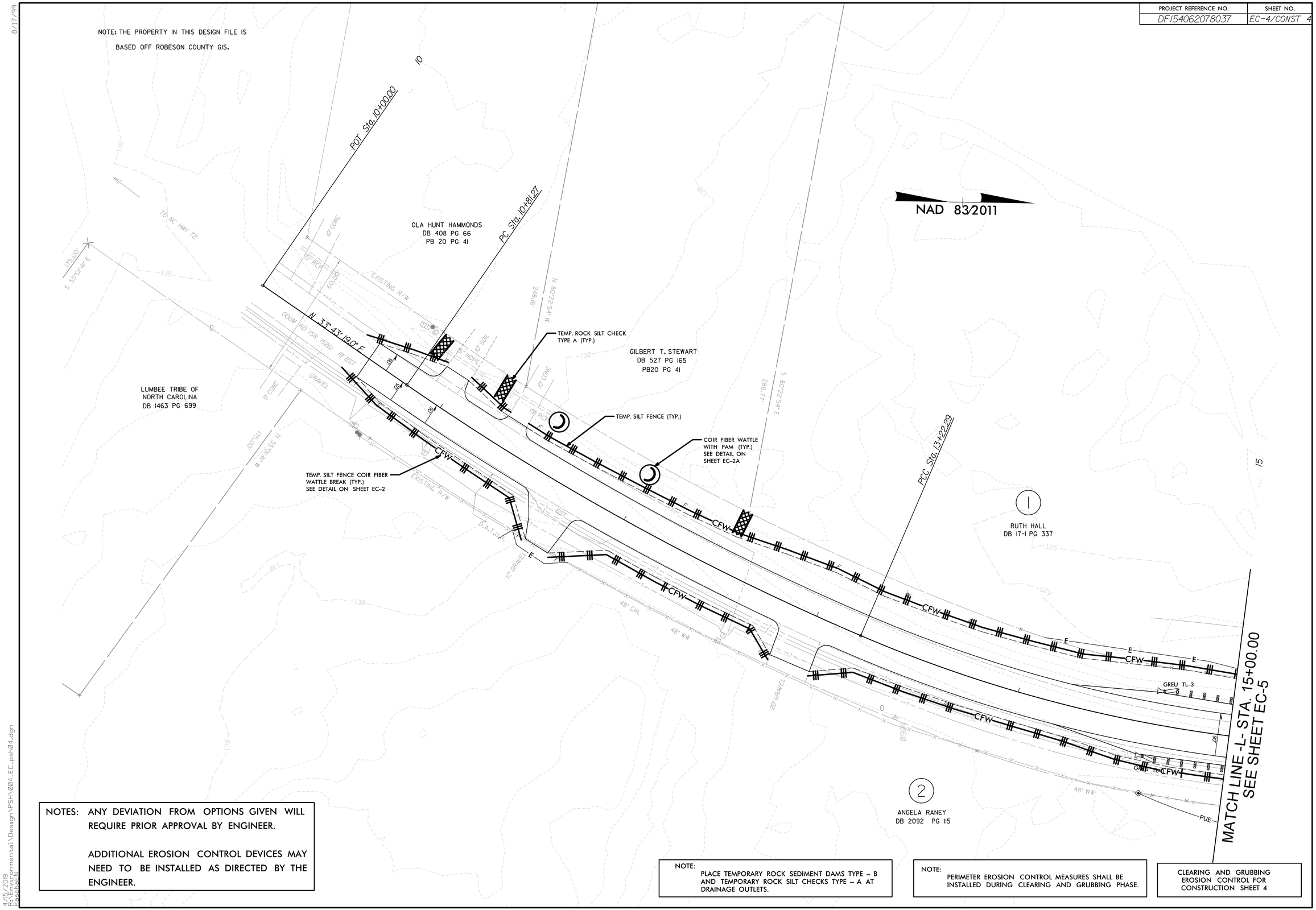
PROJECT REFERENCE NO.	SHEET NO.
DF154062078037	EC-4/CONST 4

NOTE: THE PROPERTY IN THIS DESIGN FILE IS BASED OFF ROBESON COUNTY GIS.



NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

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PROJECT REFERENCE NO.	SHEET NO.
DF154062078037	EC-5/CONST 5

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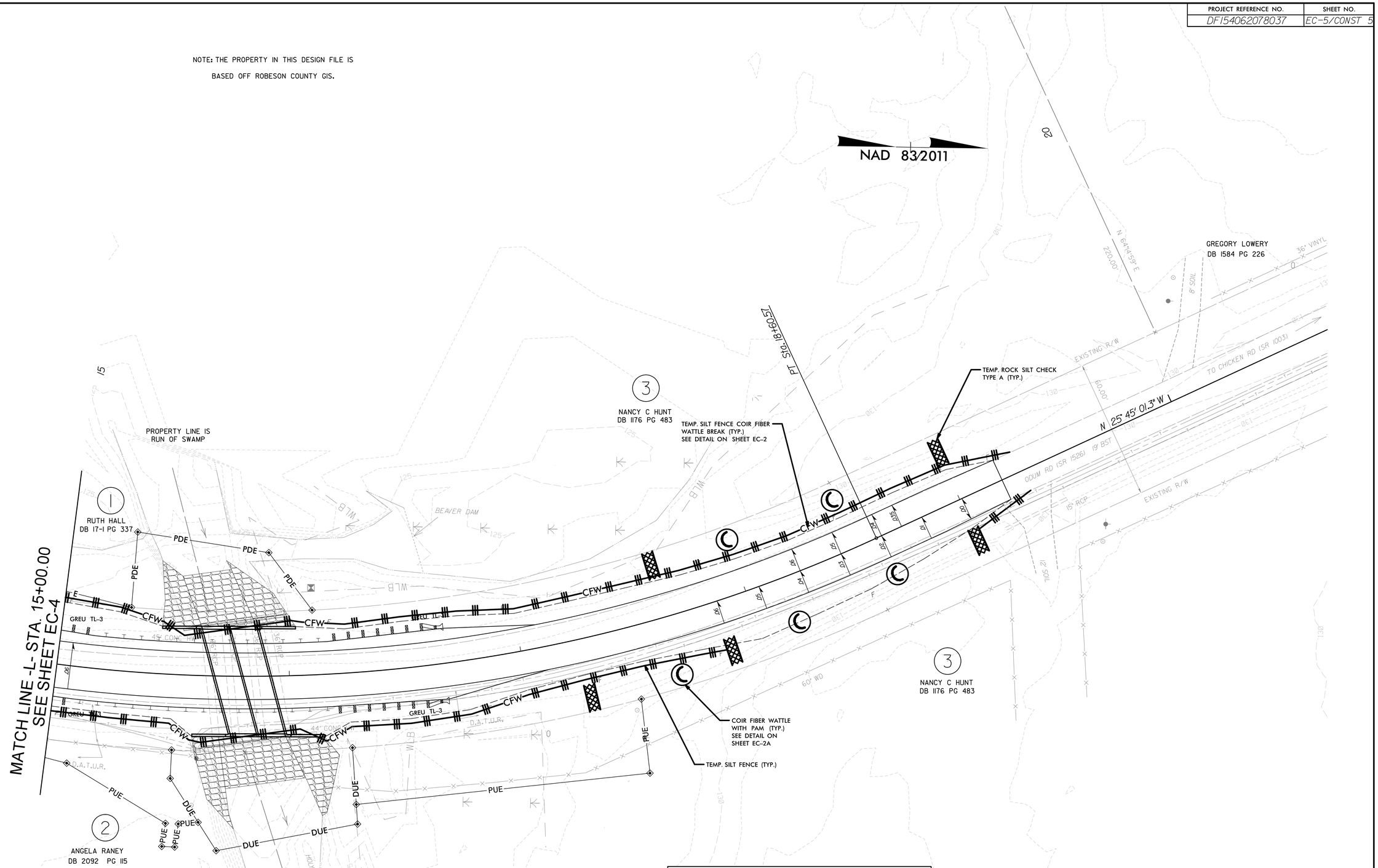

NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

NOTE: UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

NOTE: PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

NOTE: PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 5

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CULVERT CONSTRUCTION SEQUENCE STA. 15 + 80 –L–

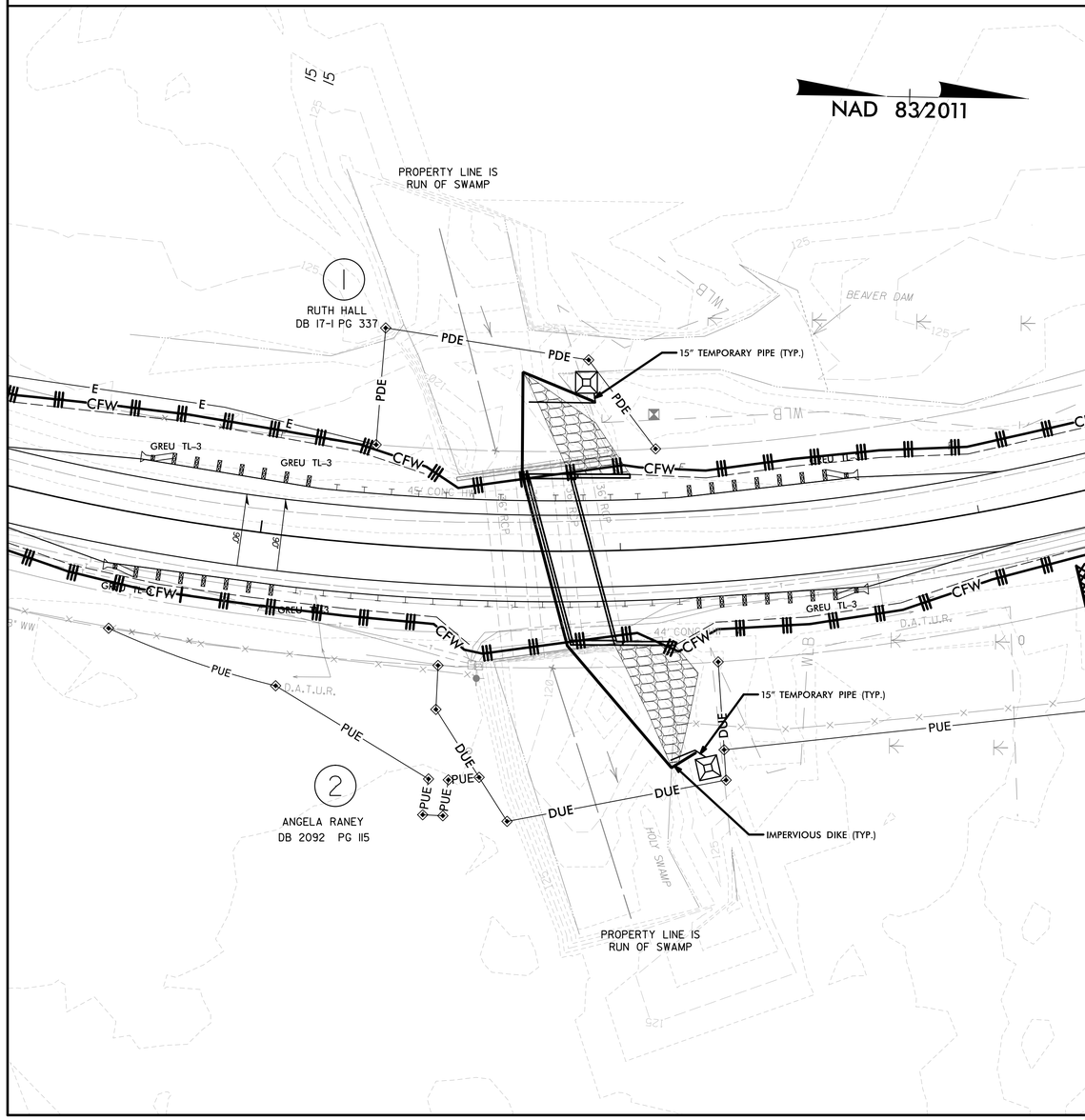
PROJECT REFERENCE NO.	SHEET NO.
DF154062078037	EC-5A/CONST 5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

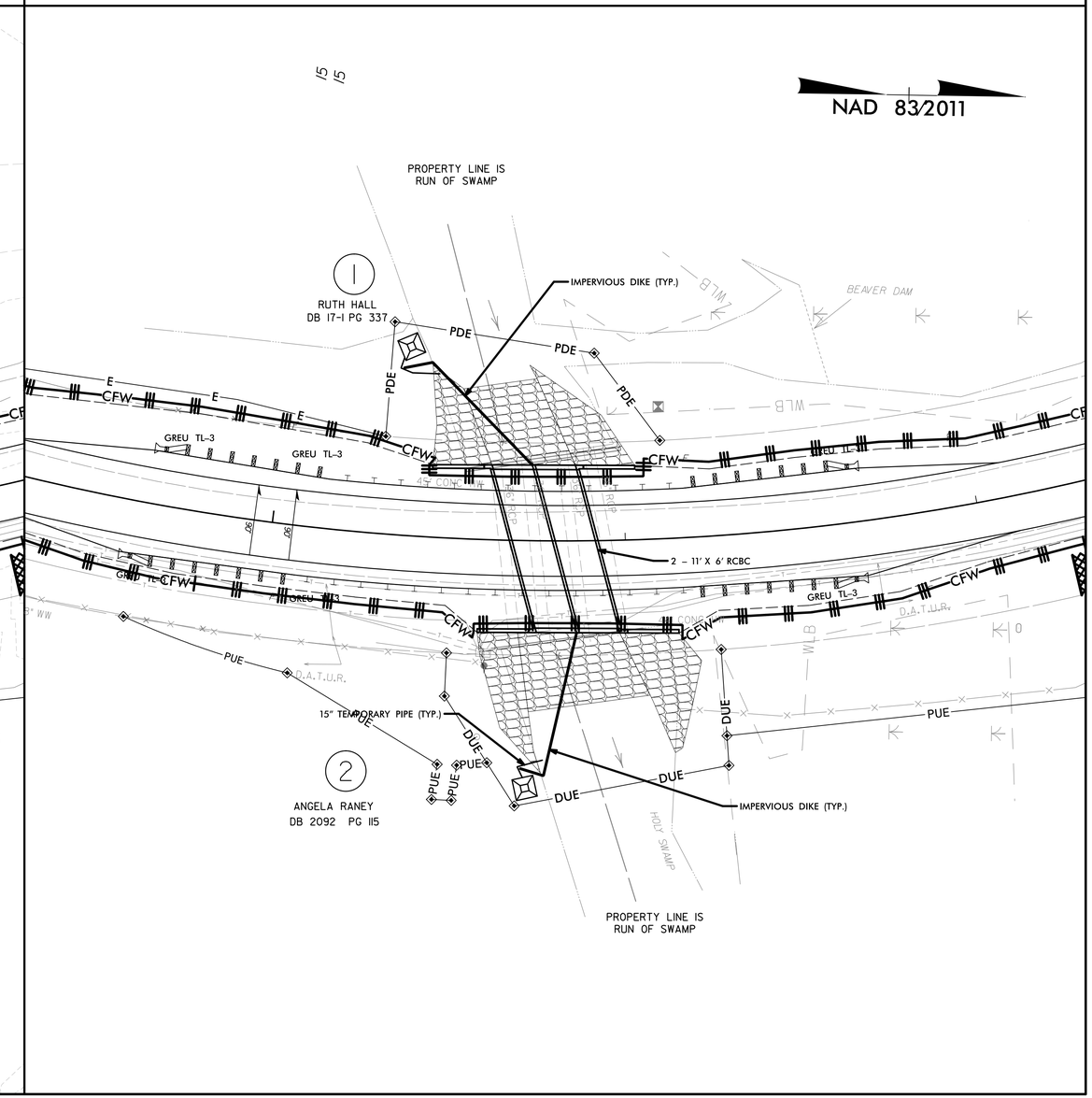
PHASE I

1. UTILIZE SPECIAL STILLING BASIN(S) AS NEEDED THROUGHOUT CULVERT CONSTRUCTION.
2. INSTALL IMPERVIOUS DIKES TO DIVERT WATER THROUGH THE OPEN CHANNEL.
3. DEWATER CULVERT CONSTRUCTION AREA.
4. REMOVE EXISTING CULVERT.
5. CONSTRUCT NORTHERN BARREL OF THE PROPOSED CULVERT.
6. CONSTRUCT THE NORTHERN HALVES OF THE RETAINING WALLS FOR THE PROPOSED CULVERT AND ANY NECESSARY EMBANKMENT IMPROVEMENTS.

PHASE II

7. REMOVE IMPERVIOUS DIKES FROM PHASE I.
8. INSTALL IMPERVIOUS DIKES TO DIVERT WATER THROUGH THE RIGHT BARREL OF THE PROPOSED CULVERT.
9. CONSTRUCT SOUTHERN BARREL OF THE PROPOSED CULVERT.
10. CONSTRUCT THE SOUTHERN HALVES OF THE RETAINING WALLS FOR THE PROPOSED CULVERT AND ANY NECESSARY EMBANKMENT IMPROVEMENTS.
11. EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF IMPERVIOUS DIKES.
12. REMOVE IMPERVIOUS DIKES AND SPECIAL STILLING BASINS. COMPLETE ROADWAY.





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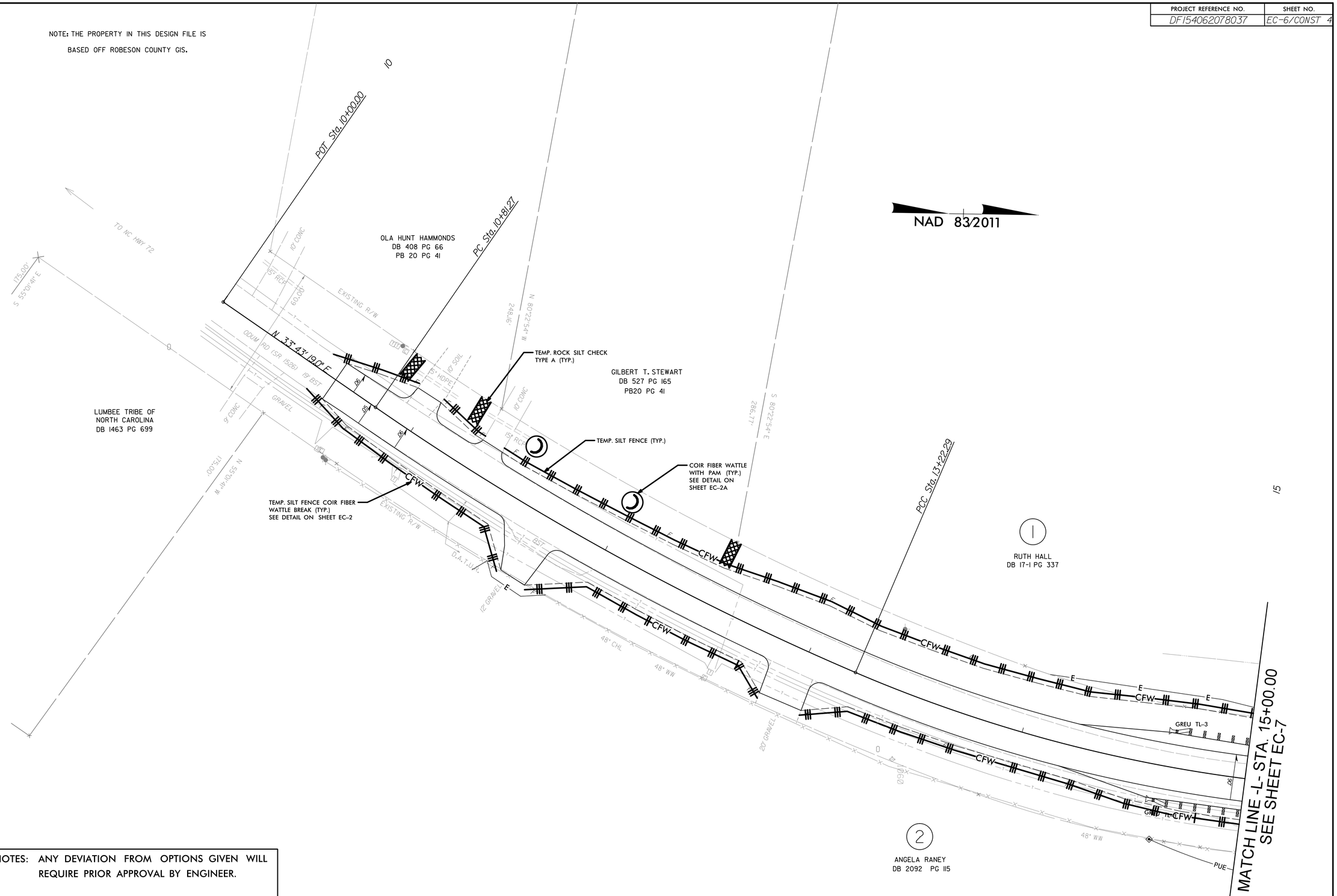
PROJECT REFERENCE NO.	SHEET NO.
DF154062078037	EC-6/CONST 4

NOTE: THE PROPERTY IN THIS DESIGN FILE IS BASED OFF ROBESON COUNTY GIS.



NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

FINAL EROSION CONTROL FOR CONSTRUCTION SHEET 4

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
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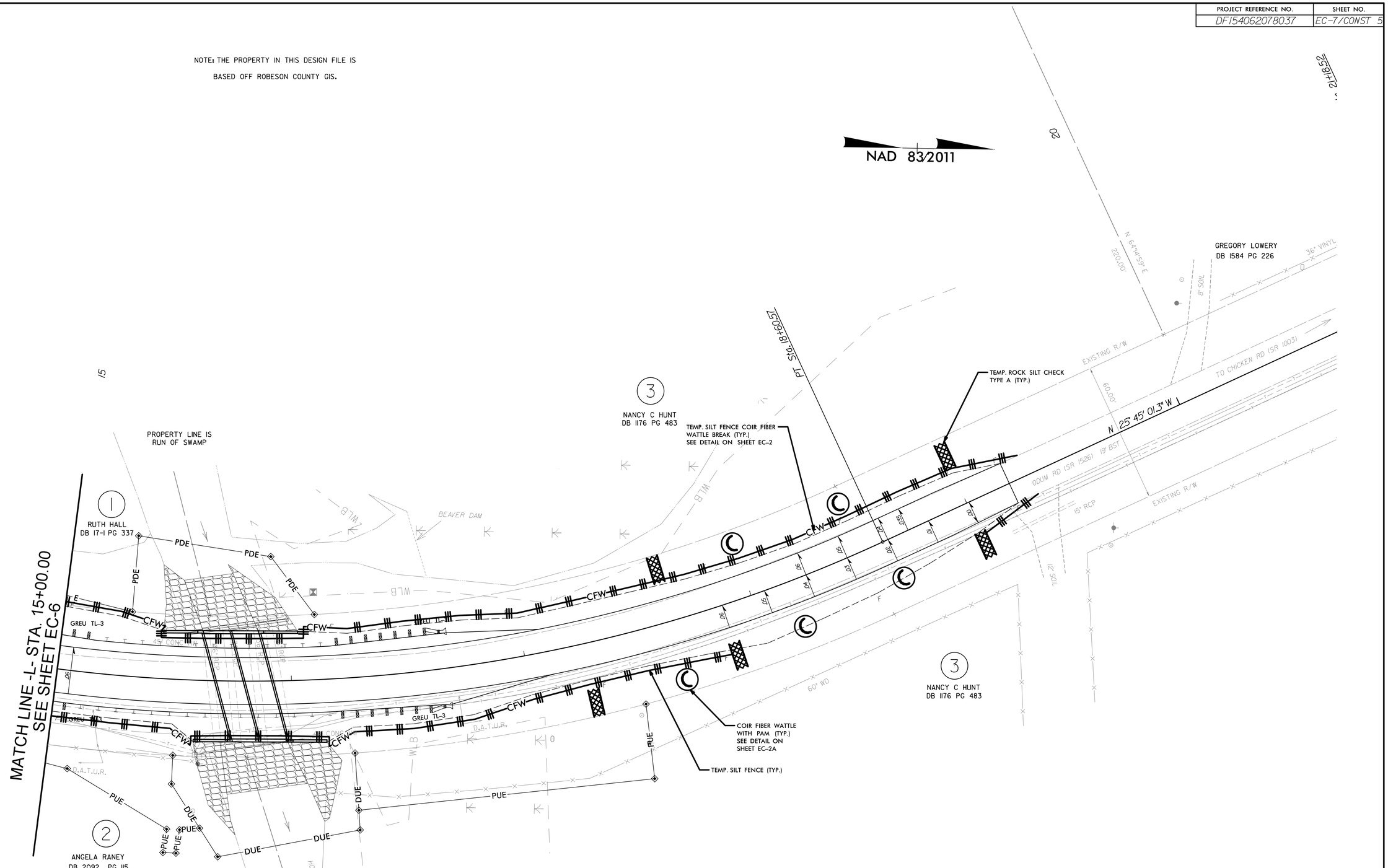
NOTE: THE PROPERTY IN THIS DESIGN FILE IS BASED OFF ROBESON COUNTY GIS.



NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

NOTE:
UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

FINAL EROSION CONTROL FOR CONSTRUCTION SHEET 5

8/17/99

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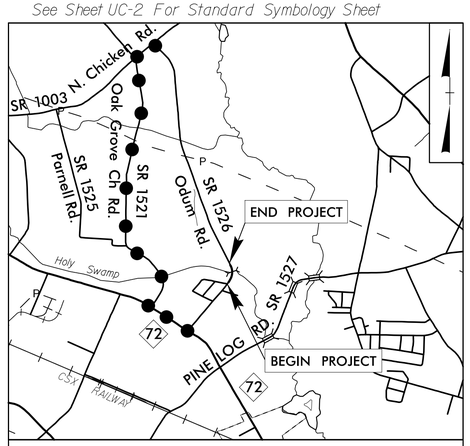
09/08/99

TIP PROJECT: DF15406.2078037

CONTRACT:

See Sheet UC-1 For Index of Sheets
See Sheet UC-2 For Standard Symbology Sheet



DETOUR VICINITY MAP N.T.S.

T.I.P. NO.	SHEET NO.
DF15406.2078037	UC–1

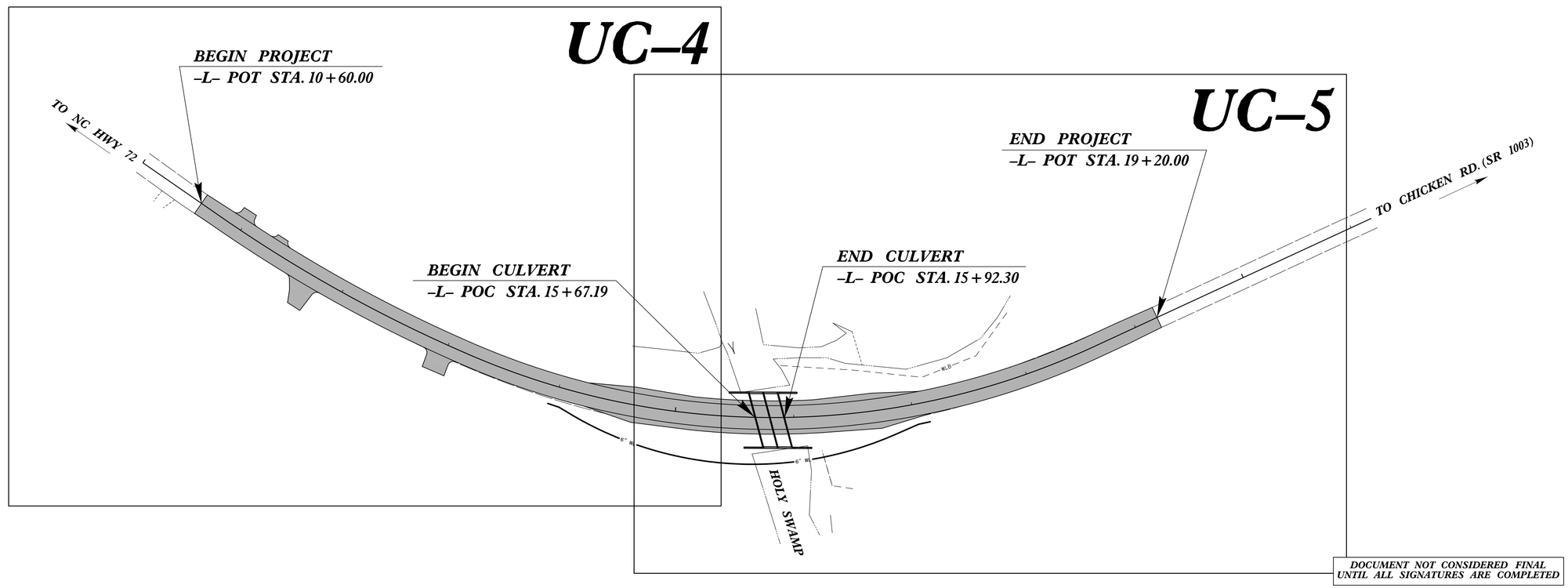
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITY CONSTRUCTION PLANS
ROBESON COUNTY

NAD 83/2001

LOCATION: CULVERT 78–05–004 ON SR 1526 (ODUM ROAD) OVER HOLY SWAMP CREEK

TYPE OF WORK: WATER LINE RELOCATION



DOCUMENT NOT CONSIDERED FINAL UNTIL ALL SIGNATURES ARE COMPLETED

GRAPHIC SCALES

20 10 0 20 40
PLANS

20 10 0 20 40
PROFILE (HORIZONTAL)

4 2 0 4 8
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.:	DESCRIPTION:
UC–1	TITLE SHEET
UC–2	UTILITY SYMBOLOGY
UC–3	NOTES
UC–3A	DETAILS
UC–4 THRU UC–5	UTILITY CONSTRUCTION SHEETS
UC–6	UTILITY PROFILE SHEET

WATER AND SEWER OWNERS ON PROJECT

(A) WATER – ROBESON COUNTY PUBLIC WORKS

PREPARED IN THE OFFICE OF

STV 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F–0991

(704) 372–1885 FAX: (704) 372–3393

PATRICK A. LIVINGSTON, PE	CONSULTANT CONTACT #1
ANDREW VANE, PE	CONSULTANT CONTACT #2
E. NEAL PASCHAL, EI	CONSULTANT CONTACT #3

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 025221 ENGINEER ANDREW VANE

DocuSigned by: Andrew Vane 7A9EE7299AE5484...

5/23/2019

DIVISION OF HIGHWAYS
UTILITIES UNIT
1555 MAIL SERVICES CENTER
RALEIGH NC 27699–1555
PHONE (919) 707–6690
FAX (919) 250–4151

BO HEMPHILL, PE	UTILITIES REGIONAL ENGINEER
–	UTILITIES ENGINEER
KYLE PLEASANT	UTILITIES AREA COORDINATOR
TODD LAPHAM	UTILITIES COORDINATOR

5/23/2019
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HughesCT

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5/14/99

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STV 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
DF15406.2078037	UC-2

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

- Water Line (Sized as Shown) — 12" WL
- 11¼ Degree Bend
- 22½ Degree Bend
- 45 Degree Bend
- 90 Degree Bend
- Plug
- Tee
- Cross
- Reducer
- Gate Valve — GV
- Butterfly Valve — BV
- Tapping Valve — TGV
- Line Stop — LS
- Line Stop with Bypass — LS/BP
- Blow Off — BO
- Fire Hydrant — PFH
- Relocate Fire Hydrant — RFH
- Remove Fire Hydrant — REM FH
- Water Meter — PWM
- Relocate Water Meter — RWM
- Remove Water Meter — REM WM
- Water Pump Station — PS(W)
- RPZ Backflow Preventer — PRPZ
- DCV Backflow Preventer — PBFP
- Relocate RPZ Backflow Preventer — RRPZ
- Relocate DCV Backflow Preventer — RBFP

PROPOSED SEWER SYMBOLS

- Gravity Sewer Line (Sized as Shown) — 12" SS
- Force Main Sewer Line (Sized as Shown) — 12" FSS
- Manhole (Sized per Note)
- Sewer Pump Station — PS(SS)

PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Telephone Pedestal — TEL PED
- Utility Line by Others (Type as Shown) — PROP O/H POW LINES
- Trenchless Installation — 12" TL INSTALL
- Encasement by Open Cut — 24" ENCAS BY OC
- Encasement — 24" ENCASEMENT
- Thrust Block
- Air Release Valve — AR
- Utility Vault — UV
- Concrete Pier — CP
- Steel Pier — SP
- Plan Note — NOTE
- Pay Item Note — PAY ITEM

EXISTING UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Utility Pole
- Utility Pole with Base
- H-Frame Pole
- Power Transmission Line Tower
- Water Manhole
- Power Manhole
- Telephone Manhole
- Sanitary Sewer Manhole
- Hand Hole for Cable
- Power Transformer
- Telephone Pedestal
- CATV Pedestal
- Gas Valve
- Gas Meter
- Located Miscellaneous Utility Object
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.
- *Underground Power Line
- *Underground Telephone Cable
- *Underground Telephone Conduit
- *Underground Fiber Optics Telephone Cable
- *Underground TV Cable
- *Underground Fiber Optics TV Cable
- *Underground Gas Pipeline
- Aboveground Gas Pipeline — A/G Gas
- *Underground Water Line
- Aboveground Water Line — A/G Water
- *Underground Gravity Sanitary Sewer Line — SS
- Aboveground Gravity Sanitary Sewer Line — A/G Sanitary Sewer
- *Underground SS Forced Main Line
- Underground Unknown Utility Line
- SUE Test Hole
- Water Meter
- Water Valve
- Fire Hydrant
- Sanitary Sewer Cleanout

*For Existing Utilities
- Utility Line Drawn from Record (Type as Shown)
- Designated Utility Line (Type as Shown)

REV: 2/1/2012

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Charlotte, NC 28202
NC License Number F-0991

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PROJECT REFERENCE NO.	SHEET NO.
DF15406.2078037	UC-3
DESIGNED BY: CTH	
DRAWN BY: CTH	
CHECKED BY: ASV	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 025221 ENGINEER
DocuSigned by: 7A9EE72A6E7F4A0... 5/23/2019

UTILITY CONSTRUCTION

UTILITY CONSTRUCTION

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.

2. THE EXISTING UTILITIES BELONG TO ROBESON COUNTY PUBLIC WORKS . MYRON NEVILLE, (910) 671-3485, DIRECTOR OF ROBESON COUNTY PUBLIC WORKS, WILL SERVE AS THE UTILITY OWNER CONTACT.

3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT QUALITY, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.

4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.

5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE DEPARTMENT.

7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.

8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.

9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

PROJECT SPECIFIC NOTES:

1. PROPOSED WATER LINE FROM -WL1- LINE STATION 10+00.00 TO -WL1- LINE STATION 13+37.36 SHALL BE AWWA C900, DR18 FPVC PIPE.

2. IN ADVANCE OF BEGINNING UTILITY WORK, SOFT DIGS SHALL BE PERFORMED BY CONTRACTOR TO VERIFY ACTUAL WATER LINE DEPTH AND LOCATION AT PROPOSED TIE-IN LOCATIONS.

3. JOINTS OF FPVC PIPE SEGMENTS SHALL BE BUTT-WELDED FLUSH TO THE OUTSIDE DIAMETER OF THE PIPE. PRIOR TO PERFORMING THE FINAL HYDROSTATIC TEST, THE ENDS OF PIPE SHALL BE PROVIDED WITH A DUCTILE IRON BLIND FLANGE, WITH A FLANGE CONNECTION TO THE FPVC PIPE. FLANGED JOINTS SHALL MEET THE REQUIREMENTS OF ANSI B16.1, CLASS 125.

4. THE CONTRACTOR SHALL INSTALL THE FPVC PIPE BY THE HORIZONTALLY-DRILLED, DIRECTIONALLY-CONTROLLED METHOD OF CONSTRUCTION. PIPE SHALL BE FILLED WITH POTABLE WATER AND NOT BE CONNECTED TO ANY OTHER PIPE OR FITTINGS FOR ONE WEEK FROM TIME OF INSTALLATION.

5. THE CONTRACTOR SHALL EMPLOY EXPERIENCED PERSONNEL TO OPERATE THE DIRECTIONAL DRILLING EQUIPMENT AND THE POSITION MONITORING AND STEERING EQUIPMENT. THE CONTRACTOR SHALL USE CERTIFIED FUSING PERSONNEL APPROVED BY THE PIPE MANUFACTURER.

6. THE CONTRACTOR SHALL AT ALL TIMES, PROVIDE AND MAINTAIN INSTRUMENTATION THAT WILL ACCURATELY LOCATE THE PILOT HOLE POSITION IN THE X, Y, AND Z AXES RELATIVE TO THE GROUND SURFACE. DRILL FLUID FLOW RATE AND PRESSURE SHALL ALSO BE MONITORED. THE CONTRACTOR SHALL MAINTAIN AND PROVIDE TO THE ENGINEER ACCESS TO THE DATA GENERATED BY THE DOWNHOLE SURVEY TOOLS.

7. PIPE INSTALLED BY HORIZONTAL DIRECTIONAL DRILLING SHALL BE LOCATED AS SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL PLOT THE ACTUAL HORIZONTAL AND VERTICAL ALIGNMENT OF THE PILOT BORE AT INTERVALS NOT EXCEEDING 30 FEET. THIS "AS-BUILT" PLAN AND PROFILE SHALL BE UPDATED AS THE PILOT BORE IS ADVANCED. AT THE COMPLETION OF THE PILOT HOLE, THE CONTRACTOR SHALL PROVIDE THE COORDINATES OF THE PILOT HOLE AS SPECIFIED.

8. THE CONTRACTOR SHALL HAVE ACCURATE WORKING GAUGES THAT REGISTER TENSILE FORCE BEING USED TO PULL THE PIPELINE BACK THROUGH THE REAMED BOREHOLE.

9. DEVIATIONS FROM, AND CORRECTIONS TO, THE DESIGN CENTERLINE SHALL NOT EXCEED 2% OF THE DEPTH PER 100 FEET AND 2% HORIZONTALLY PER 100 FEET. CONTRACTOR TO ENSURE NEWLY CONSTRUCTED UTILITIES ARE ENTIRELY WITHIN RIGHT-OF-WAY OR UTILITY EASEMENT.

10. THE HORIZONTAL DIRECTIONAL DRILLING OPERATION SHALL BE CONDUCTED IN A MANNER TO ELIMINATE THE DISCHARGE OF WATER, DRILLING MUD, AND CUTTINGS TO AREAS NOT INVOLVED IN THE CONSTRUCTION PROCESS. THE CONTRACTOR SHALL IMMEDIATELY CONTAIN AND CLEAN UP ANY INADVERTENT RETURNS. THE CONTRACTOR SHALL ALSO PROVIDE EQUIPMENT AND PROCEDURES TO MAXIMIZE THE RECIRCULATION OR REUSE OF DRILLING MUD TO MINIMIZE WASTE DISPOSAL.

11. AFTER INSTALLING DIRECTIONAL DRILL, CONTRACTOR TO DIG DOWN, CUT PIPE AND INSTALL FITTINGS REQUIRED TO COMPLETE CONNECTION.

12. MYRON NEVILLE, DIRECTOR OF ROBESON COUNTY PUBLIC WORKS, WILL SERVE AS THE UTILITY OWNER CONTACT ON THIS PROJECT. CONTRACTOR, AS REQUIRED BY STANDARD SPECIFICATION SECTION 1500-2, SHALL CONTACT HIM AT (910) 671-3485.

13. ROBESON COUNTY PUBLIC WORKS SHALL BE CONTACTED 48 HOURS BEFORE DISRUPTION OF SERVICE OF THE EXISTING WATER LINE TO GIVE THEM TIME TO MANIPULATE VALVES TO ENSURE WATER SERVICE IS MAINTAINED ON EACH SIDE OF THE CULVERT.

14. NO INTERRUPTION TO EXISTING SERVICE SHALL TAKE PLACE UNTIL ALL CUSTOMERS HAVE BEEN NOTIFIED A MINIMUM OF 48 HOURS IN ADVANCE. NOTICE OF INTERRUPTION SHALL BE PREPARED BY THE PUBLIC WORKS OFFICE ON OFFICIAL LETTERHEAD. DISTRIBUTION TO EACH CUSTOMER SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR UNDER THE DIRECTION OF THE PUBLIC WORKS OFFICE.

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NC License Number F-0991

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DF15406.2078037	UC-3A
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REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

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DocuSigned by: 5/23/2019
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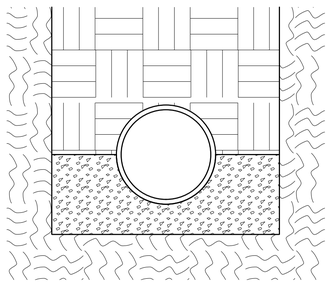
PROJECT TYPICAL DETAILS

UTILITY CONSTRUCTION

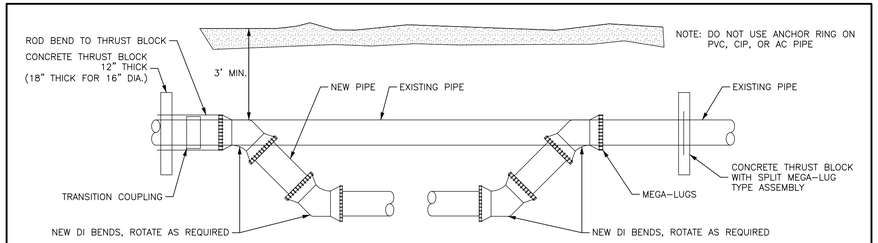
PIPE BEDDING DETAIL



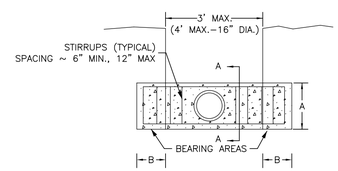
PIPE BEDDED IN SAND, GRAVEL OR CRUSHED STONE TO A DEPTH OF ½ PIPE DIAMETER, 4″ MINIMUM UNDER PIPE. TRENCH BACKFILLED IN LOOSE 6″ LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL, IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROX. 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

MAXIMUM TRENCH WIDTH AT TOP OF PIPE

NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)	NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)
4	28	20	44
6	30	24	48
8	32	30	54
10	34	36	60
12	36	42	66
14	38	48	72
16	40	54	78
18	42		

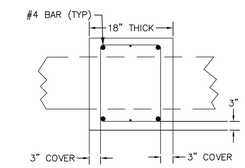


PROFILE VIEW
NOT TO SCALE



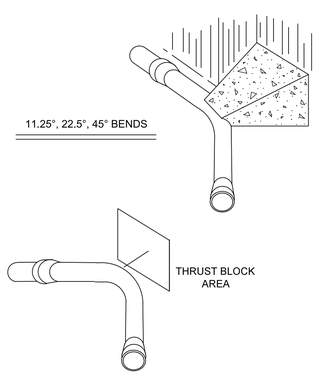
CONCRETE THRUST COLLAR (TYPICAL)
NOT TO SCALE

SIZE	"A"	"B"
4"	36"	24"
6"	36"	24"
8"	36"	30"
10"	36"	48"
12"	48"	48"
16"	36"	60"



SECTION A-A
SECTION A-A
NOT TO SCALE

THRUST BLOCKING



NOTES:

1. CONCRETE SHALL BE 3000 PSI
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
3. ALL BENDS AND INTERSECTIONS SHALL HAVE CONCRETE THRUST BLOCKING.

6 INCH DIAMETER PIPE CONCRETE THRUST BLOCKS

BEND ANGLE	CONCRETE [CY]	AREA [SF]	HEIGHT [FT]	WIDTH [FT]	DEPTH [FT]
11.25°	0.1	1.2	1.2	1.2	1.0
22.5°	0.2	2.5	1.6	1.6	1.5
45°	0.4	4.8	2.2	2.2	2.0

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NOTE: THE PROPERTY IN THIS DESIGN FILE IS BASED OFF ROBESON COUNTY GIS.

SCALE 1" = 20'

0 20 40 60 80

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900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
DF15406.2078037	UC-4
DESIGNED BY: CTH	
DRAWN BY: CTH	
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APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 025221

DocuSigned by: Andrew S. Vick, PE
5/23/2019

UTILITY CONSTRUCTION

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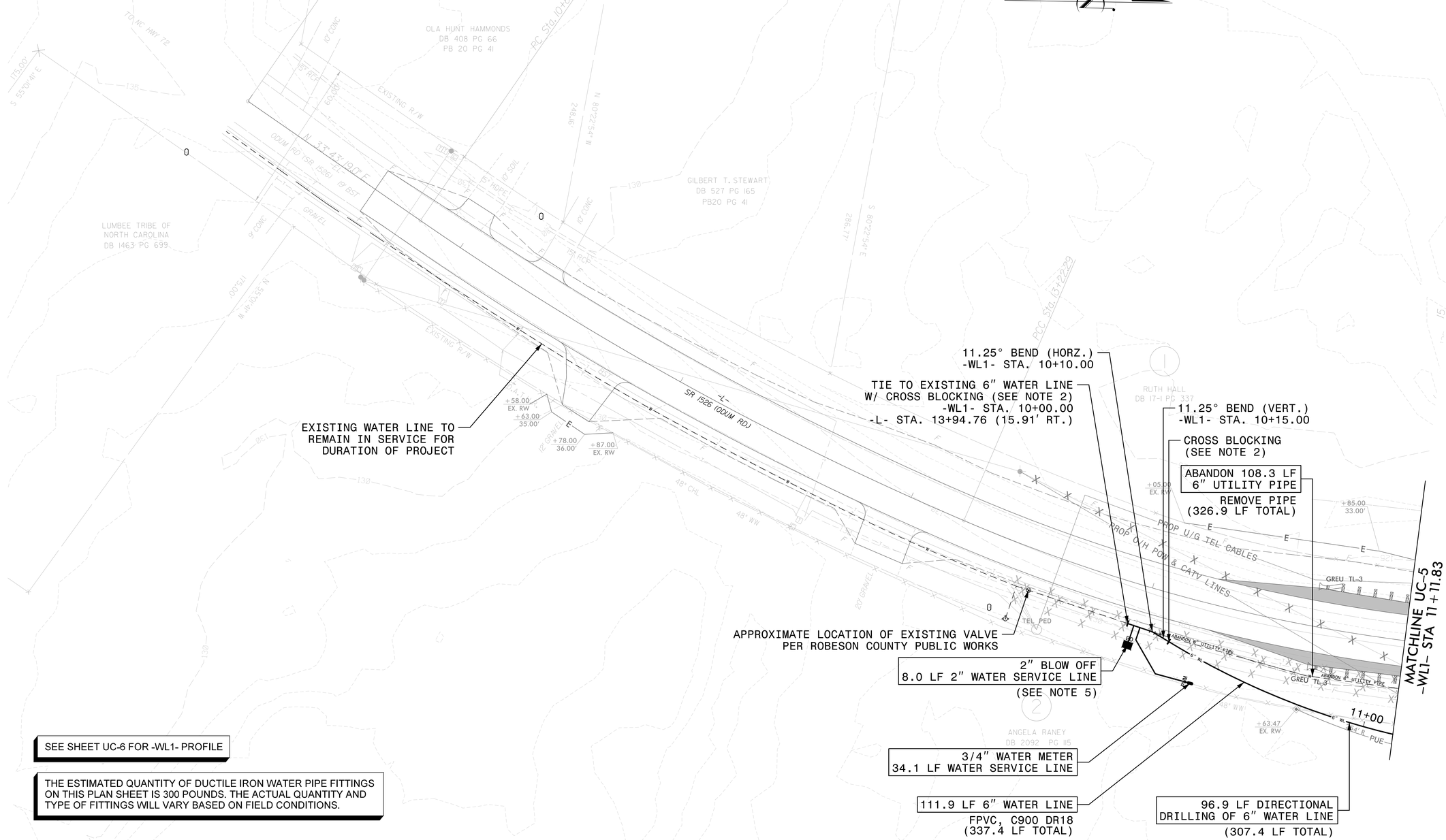
NOTES:
1. CONNECT PROPOSED 6″ AWWA C900, DR18 FPVC WATER MAIN TO EXISTING 6″ WATER MAIN USING NECESSARY FITTINGS AND TRANSITION COUPLINGS RECOMMENDED BY PIPE MANUFACTURER. CONTRACTOR TO SCHEDULE SHUT DOWN AND CONNECTION TO EXISTING WATER LINE WITH UTILITY OWNER. CONTRACTOR TO FIELD VERIFY EXISTING PIPE MATERIAL AND DEPTHS AT TIE-IN POINTS.
2. CONTRACTOR SHALL RESTRAIN THE TRANSITION CONNECTION, AND ALSO INSTALL AN IN-LINE ANCHOR ON THE FPVC PIPE BY BUTT-FUSING AND POURING A CONCRETE ANCHOR AROUND IT TO PREVENT DISJOINING IN THE TRANSITION AREA. REFER TO SHEET UC-3A FOR CROSS BLOCKING DETAILS.
3. PRIOR TO COMMENCING ANY WORK ON THIS TRENCHLESS INSTALLATION ON THIS PROJECT, PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION CERTIFIED BY AN ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE STANDARD SPECIFICATIONS.
4. HDD CONTRACTOR MAY DEFLECT FPVC PIPE IN LIEU OF 11-1/4 DI FITTINGS PROVIDED DEFLECTIONS ARE WITHIN MANUFACTURER'S TOLERANCES AND IF APPROVED BY ENGINEER.
5. CONTRACTOR TO INSTALL TEMPORARY BLOW OFF VALVE. BLOW OFF TO BE REMOVED FOLLOWING PROPOSED 6″ WATER LINE BEING PLACED INTO SERVICE.
6. THREE EXISTING SERVICE (TAPS) ON EXISTING LINE TO BE REMOVED ARE NOT IN SERVICE.



SEE SHEET UC-6 FOR -WL1- PROFILE

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 300 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

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SCALE 1" = 20'

0 20 40 60 80

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PROJECT REFERENCE NO.	SHEET NO.
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REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

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DocuSigned by: Alvin Vaughan Williams
TAGEET 5/23/2019

UTILITY CONSTRUCTION

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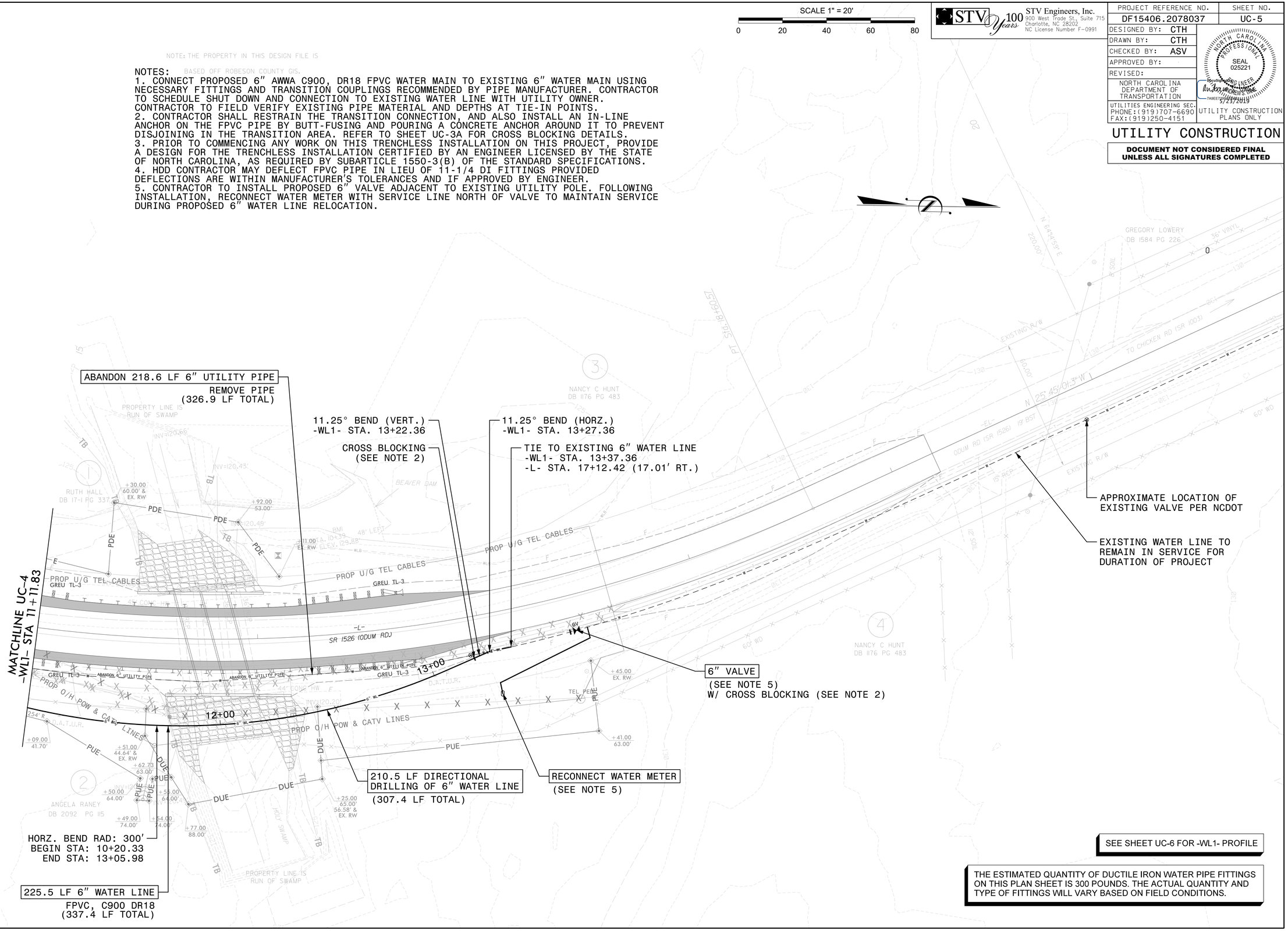
NOTE: THE PROPERTY IN THIS DESIGN FILE IS BASED OFF ROBESON COUNTY GIS.

NOTES:
1. CONNECT PROPOSED 6″ AWWA C900, DR18 FPVC WATER MAIN TO EXISTING 6″ WATER MAIN USING NECESSARY FITTINGS AND TRANSITION COUPLINGS RECOMMENDED BY PIPE MANUFACTURER. CONTRACTOR TO SCHEDULE SHUT DOWN AND CONNECTION TO EXISTING WATER LINE WITH UTILITY OWNER. CONTRACTOR TO FIELD VERIFY EXISTING PIPE MATERIAL AND DEPTHS AT TIE-IN POINTS.
2. CONTRACTOR SHALL RESTRAIN THE TRANSITION CONNECTION, AND ALSO INSTALL AN IN-LINE ANCHOR ON THE FPVC PIPE BY BUTT-FUSING AND POURING A CONCRETE ANCHOR AROUND IT TO PREVENT DISJOINING IN THE TRANSITION AREA. REFER TO SHEET UC-3A FOR CROSS BLOCKING DETAILS.
3. PRIOR TO COMMENCING ANY WORK ON THIS TRENCHLESS INSTALLATION ON THIS PROJECT, PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION CERTIFIED BY AN ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE STANDARD SPECIFICATIONS.
4. HDD CONTRACTOR MAY DEFLECT FPVC PIPE IN LIEU OF 11-1/4 DI FITTINGS PROVIDED DEFLECTIONS ARE WITHIN MANUFACTURER'S TOLERANCES AND IF APPROVED BY ENGINEER.
5. CONTRACTOR TO INSTALL PROPOSED 6″ VALVE ADJACENT TO EXISTING UTILITY POLE. FOLLOWING INSTALLATION, RECONNECT WATER METER WITH SERVICE LINE NORTH OF VALVE TO MAINTAIN SERVICE DURING PROPOSED 6″ WATER LINE RELOCATION.



SEE SHEET UC-6 FOR -WL1- PROFILE

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 300 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

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SCALE: 1" = 20' HORIZONTAL
1" = 4' VERTICAL

PROP. 6" WATER LINE -WL1-

STV 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
DF15406.2078037	UC-6

DESIGNED BY: CTH
DRAWN BY: CTH
CHECKED BY: ASV
APPROVED BY:
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

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5/23/2019

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UTILITY CONSTRUCTION

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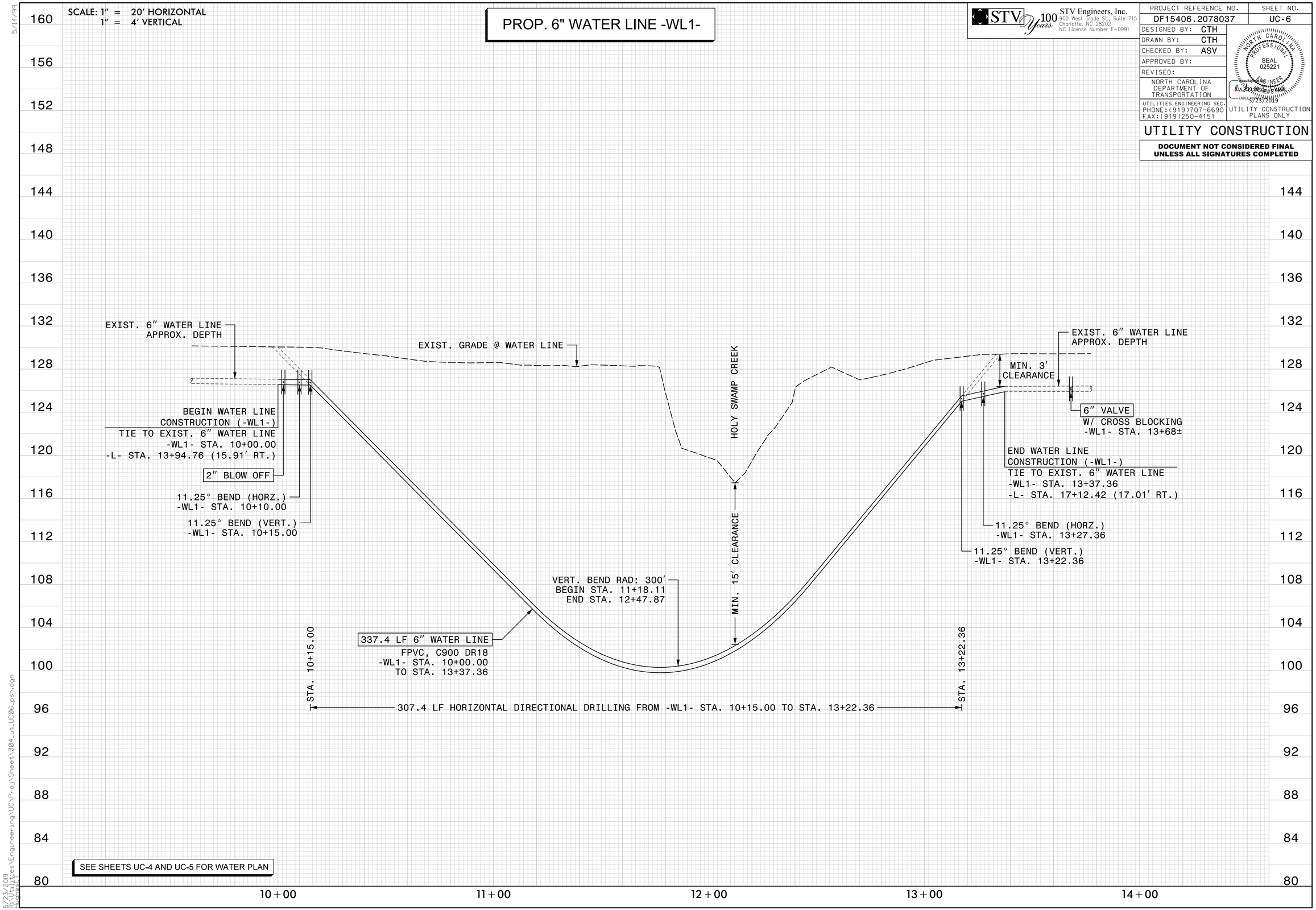

SEE SHEETS UC-4 AND UC-5 FOR WATER PLAN

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Hopkins

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09/08/99

TIP PROJ.: DF15406.2078037

T.I.P. NO.	SHEET NO.
DF15406.2078037	UO–1

NOTE:
ALL UTILITY WORK SHOWN ON THIS SHEET IS DONE BY OTHERS.
NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.

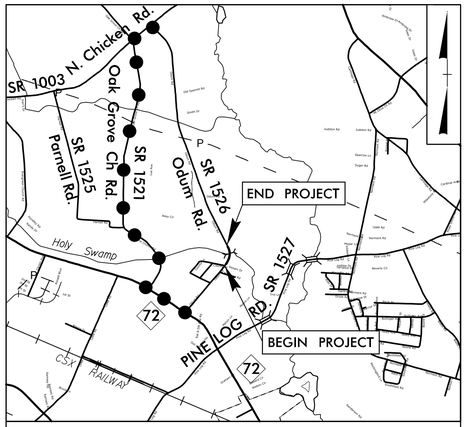
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
ROBESON COUNTY

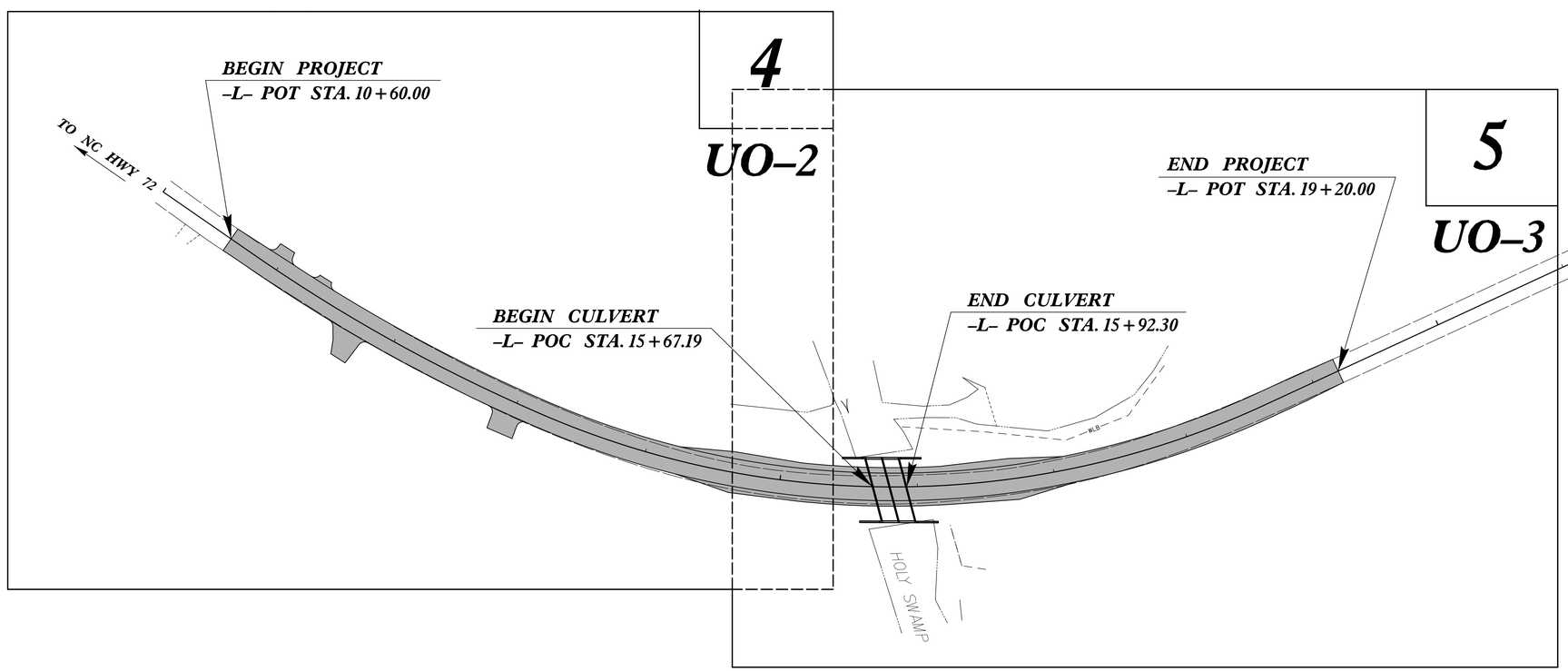
LOCATION: CULVERT 77–2288 ON SR 1526 (ODUM ROAD) OVER HOLY SWAMP

TYPE OF WORK: POWER AND COMMUNICATIONS

NAD 83/2011



VICINITY MAP N.T.S.



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

20 10 0 20 40
PLANS

20 10 0 20 40
PROFILE (HORIZONTAL)

4 2 0 4 8
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.:	DESCRIPTION:
UO–1	TITLE SHEET
UO–2 THRU UO–3	UBO PLAN SHEETS

UTILITY OWNERS WITH CONFLICTS

(A) POWER – LUMBEE RIVER EMC
(B) CATV – CHARTER/SPECTRUM
(C) TELEPHONE – AT&T

PREPARED IN THE OFFICE OF:

STV ENGINEERS, INC.
900 W. Trade St., Suite 715, Charlotte, NC 28202
NC License Number F–0991

NCDOT	UTILITY PROJECT MANAGER
NCDOT – Rick Bounds	PROJECT UTILITY COORDINATOR
STV – Laura Braunfeld	PROJECT UTILITY CAD

DIVISION OF HIGHWAYS
UTILITIES UNIT
1555 MAIL SERVICES CENTER
RALEIGH NC 27699–1555
PHONE (919) 707–6690
FAX (919) 250–4151

Rick Handlin	UTILITIES REGIONAL ENGINEER
Rick Handlin	UTILITIES ENGINEER
Rick Bounds	UTILITIES AREA COORDINATOR
Rick Bounds	UTILITIES COORDINATOR

$$$$SYSTIME$$$$DGN$$$$USERNAME$$$$

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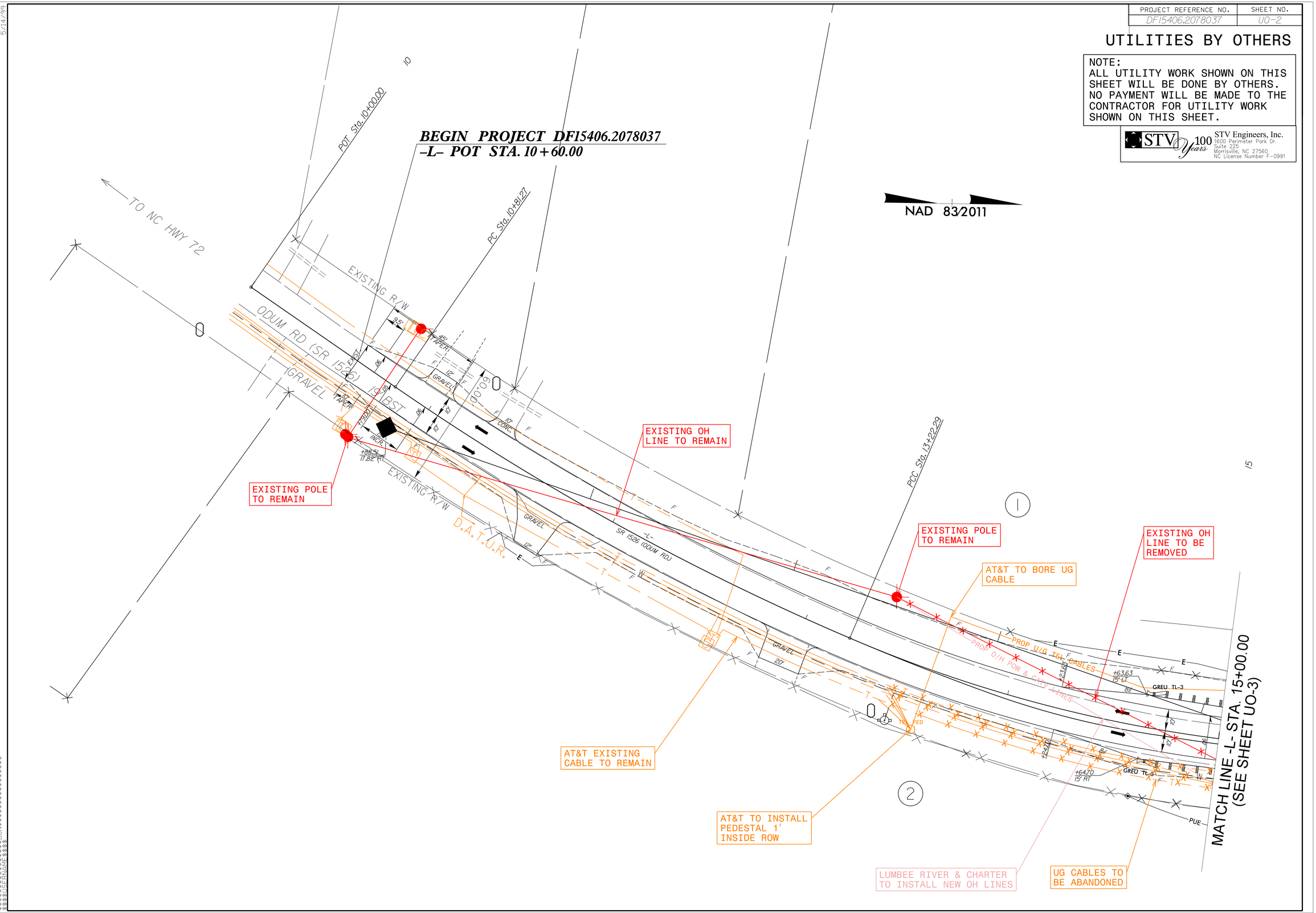
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
DF15406.2078037	UO-2

UTILITIES BY OTHERS

NOTE:
ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.

STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991



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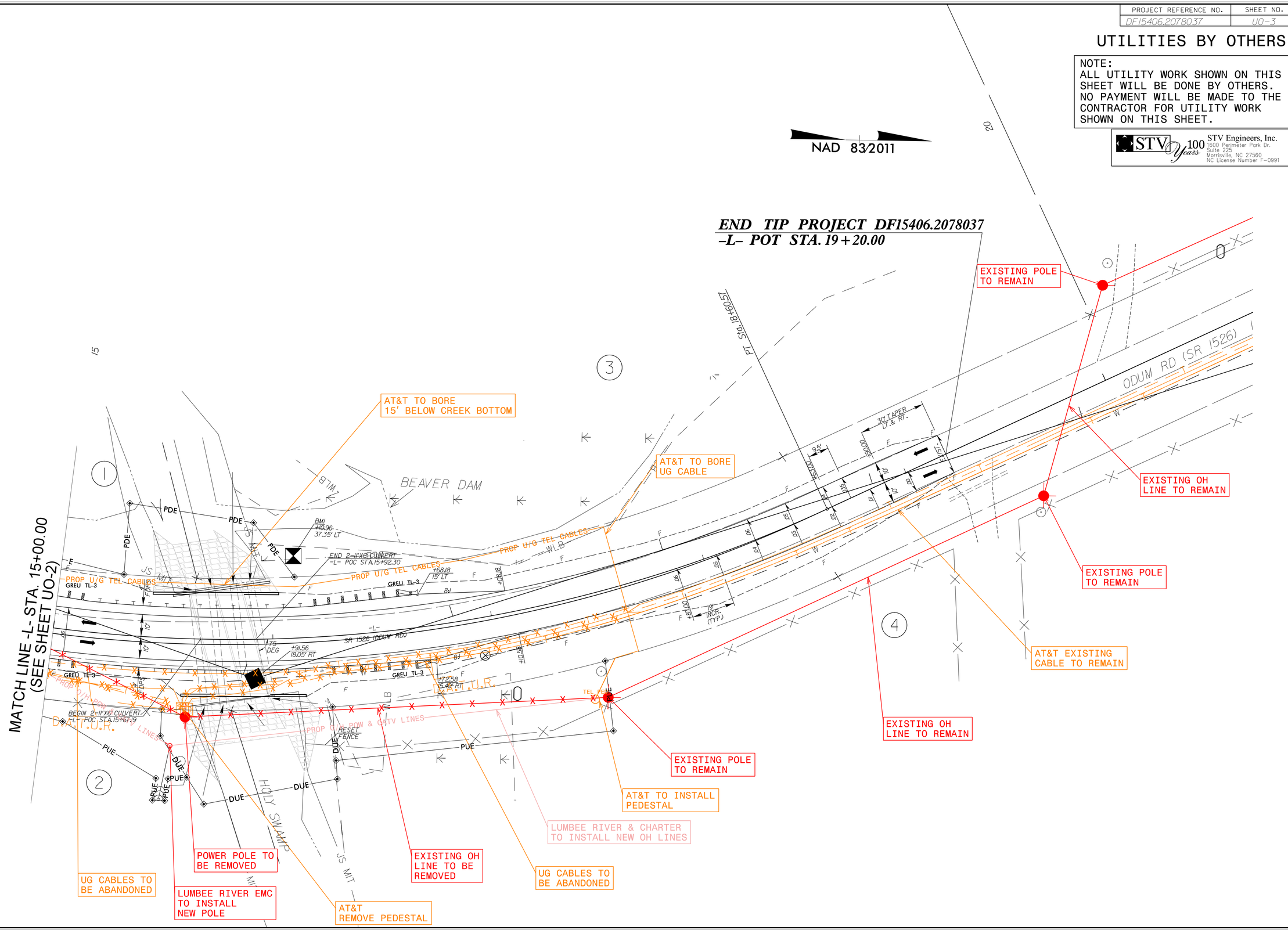

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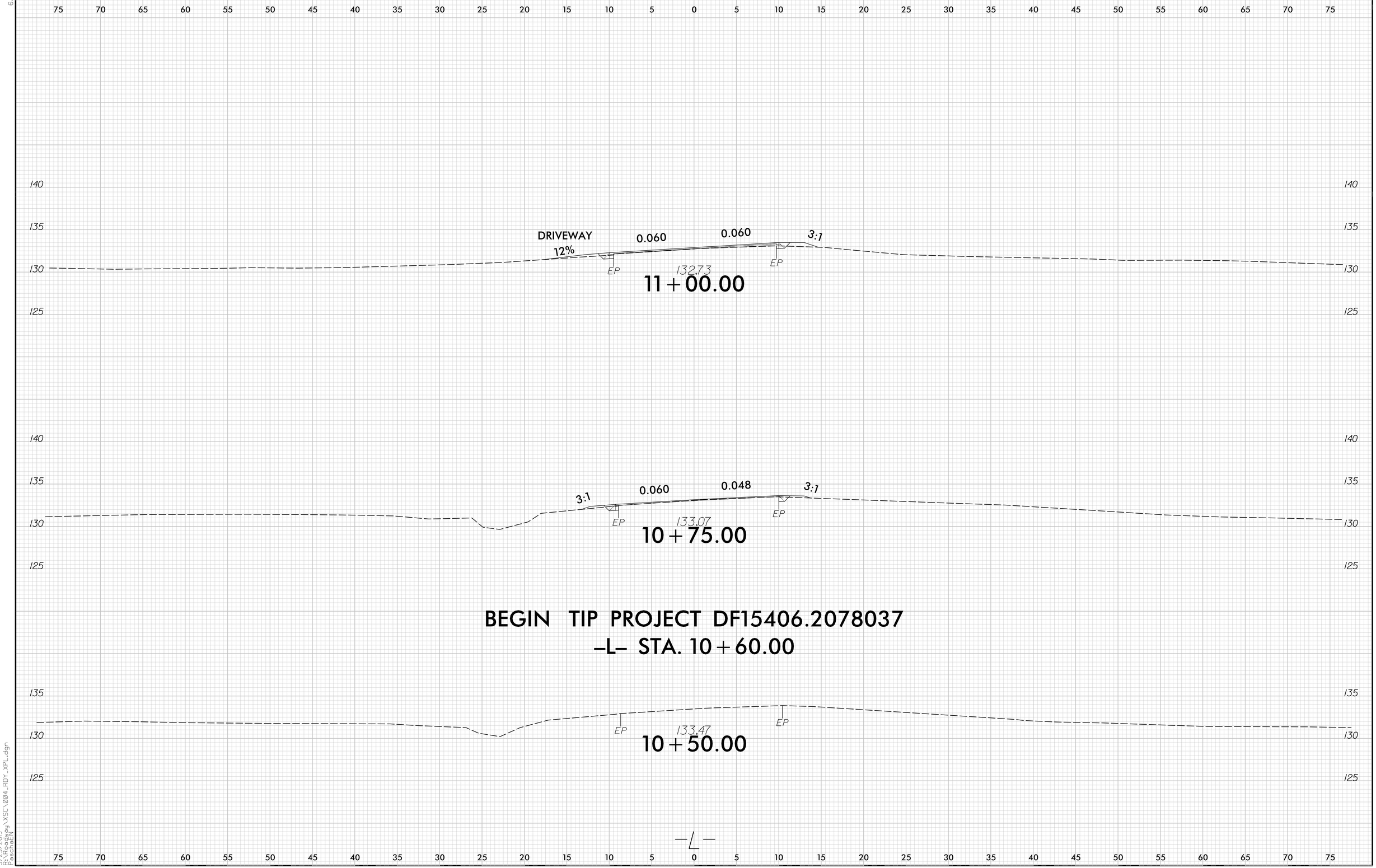

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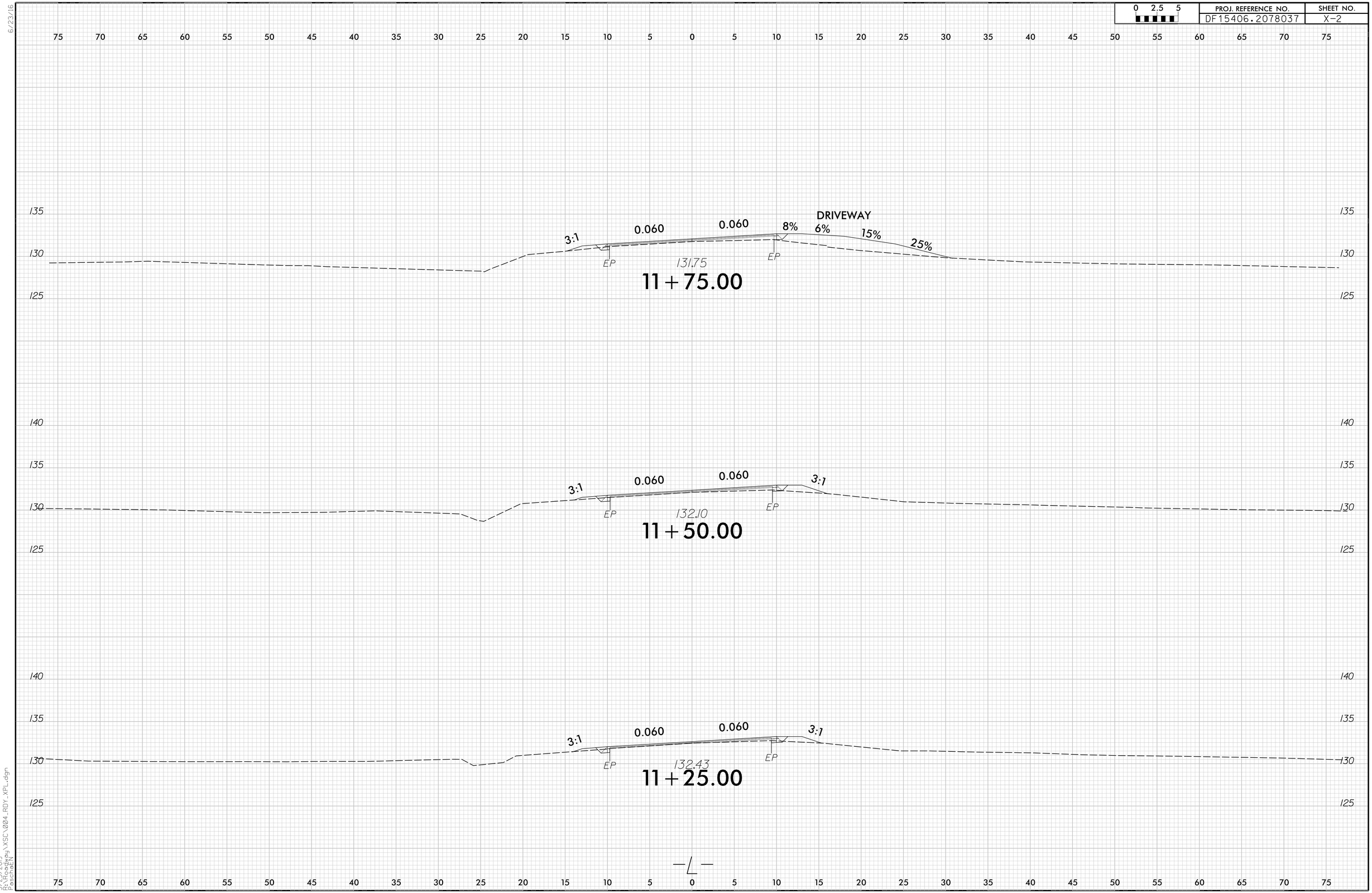

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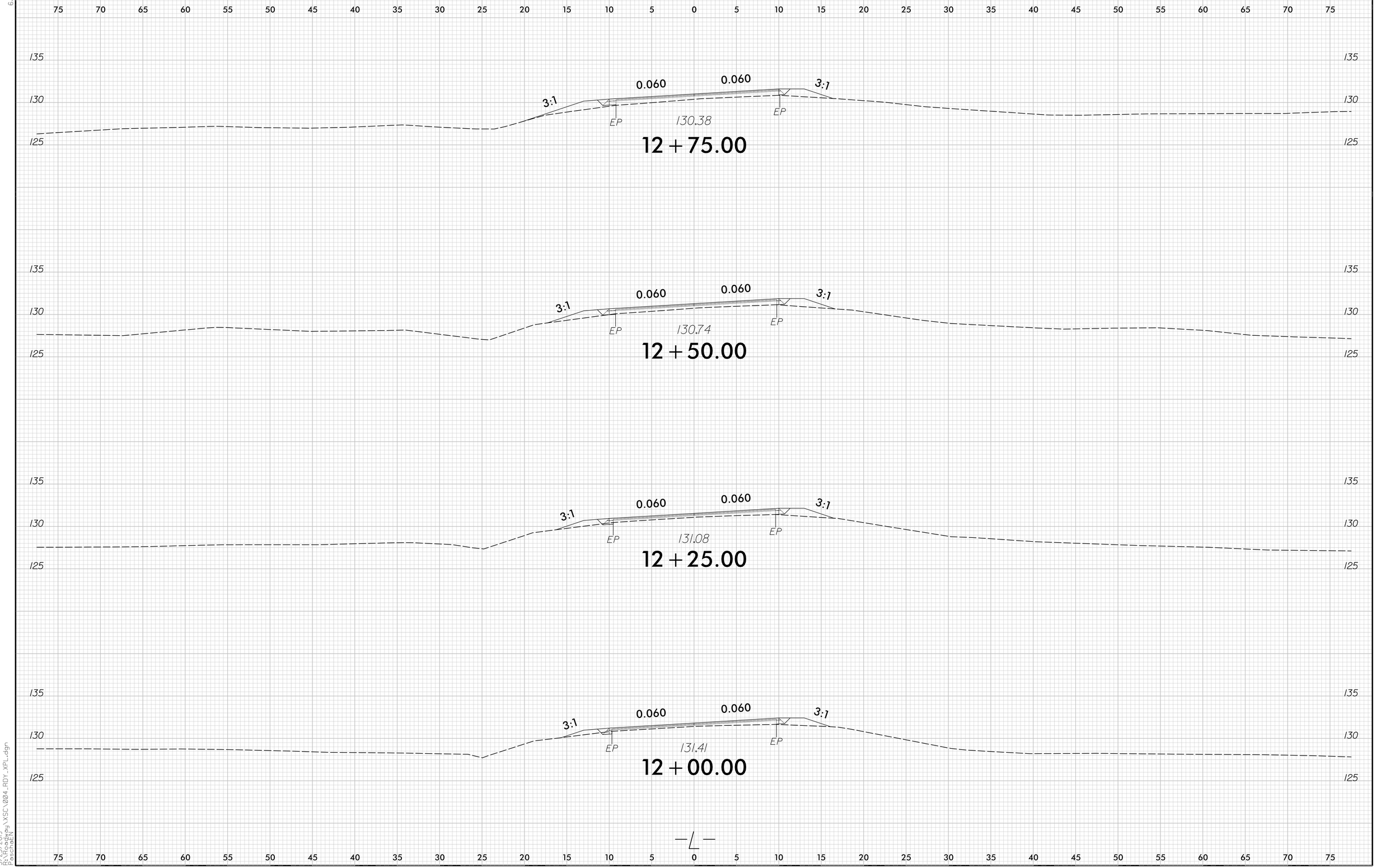

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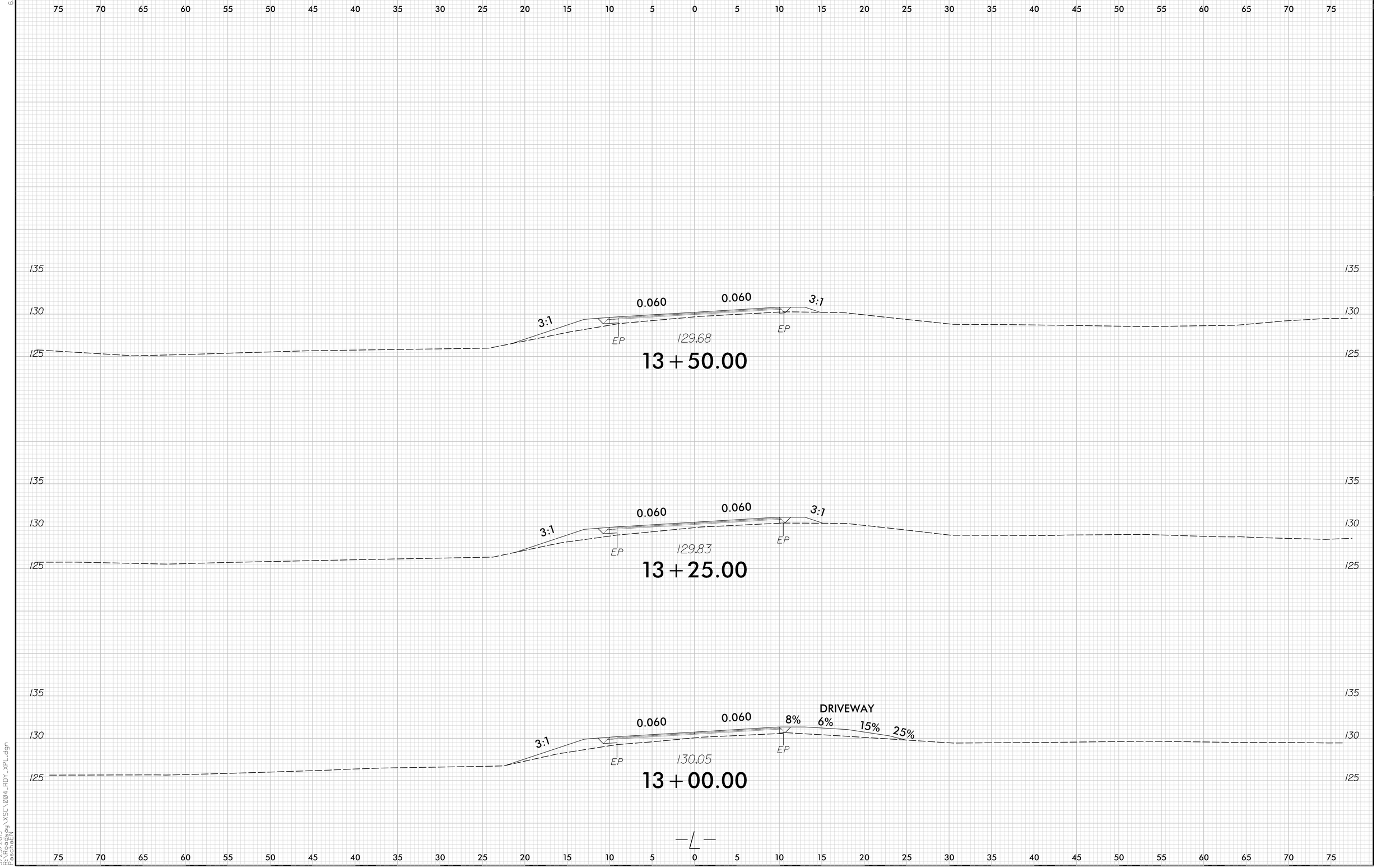

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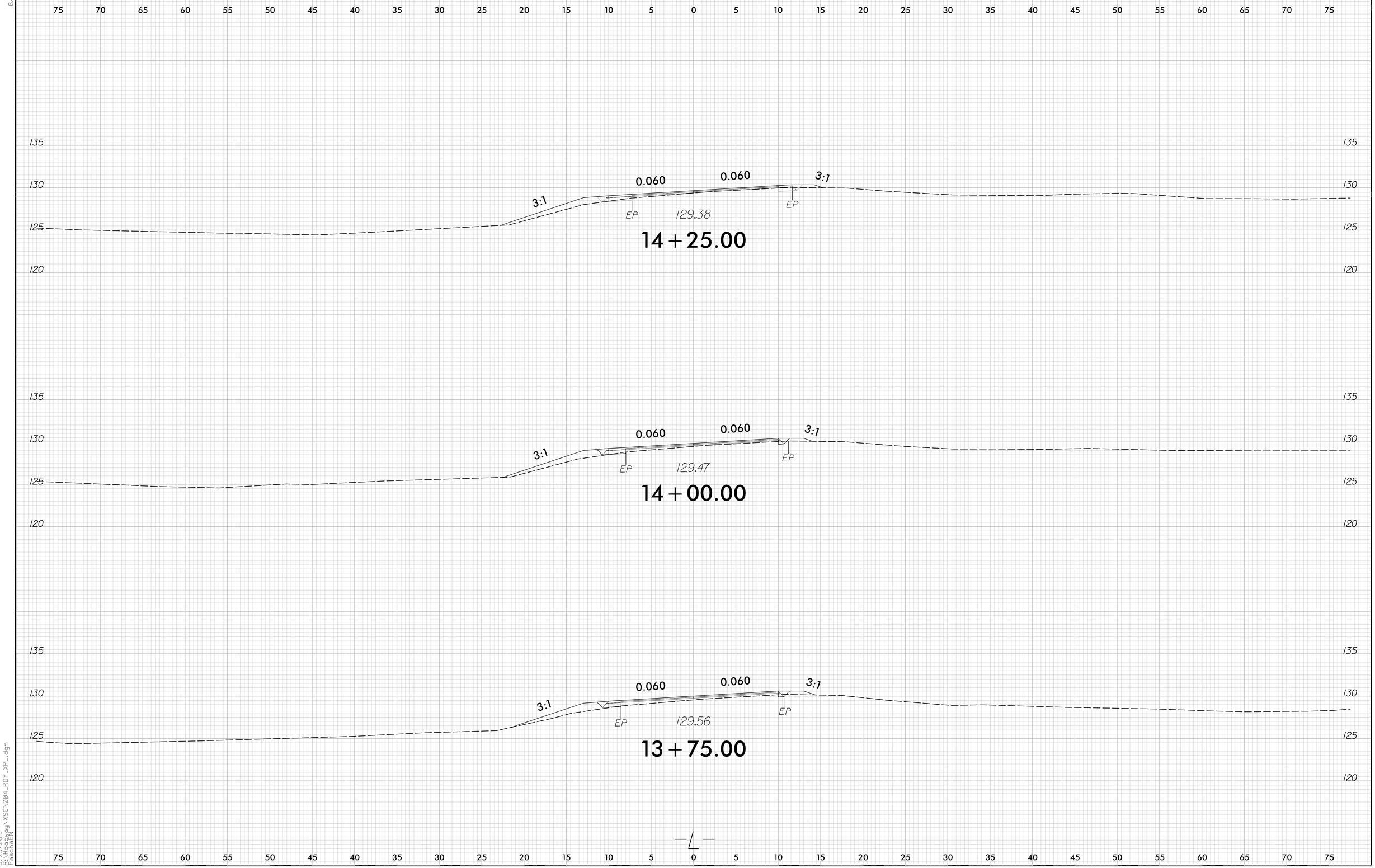

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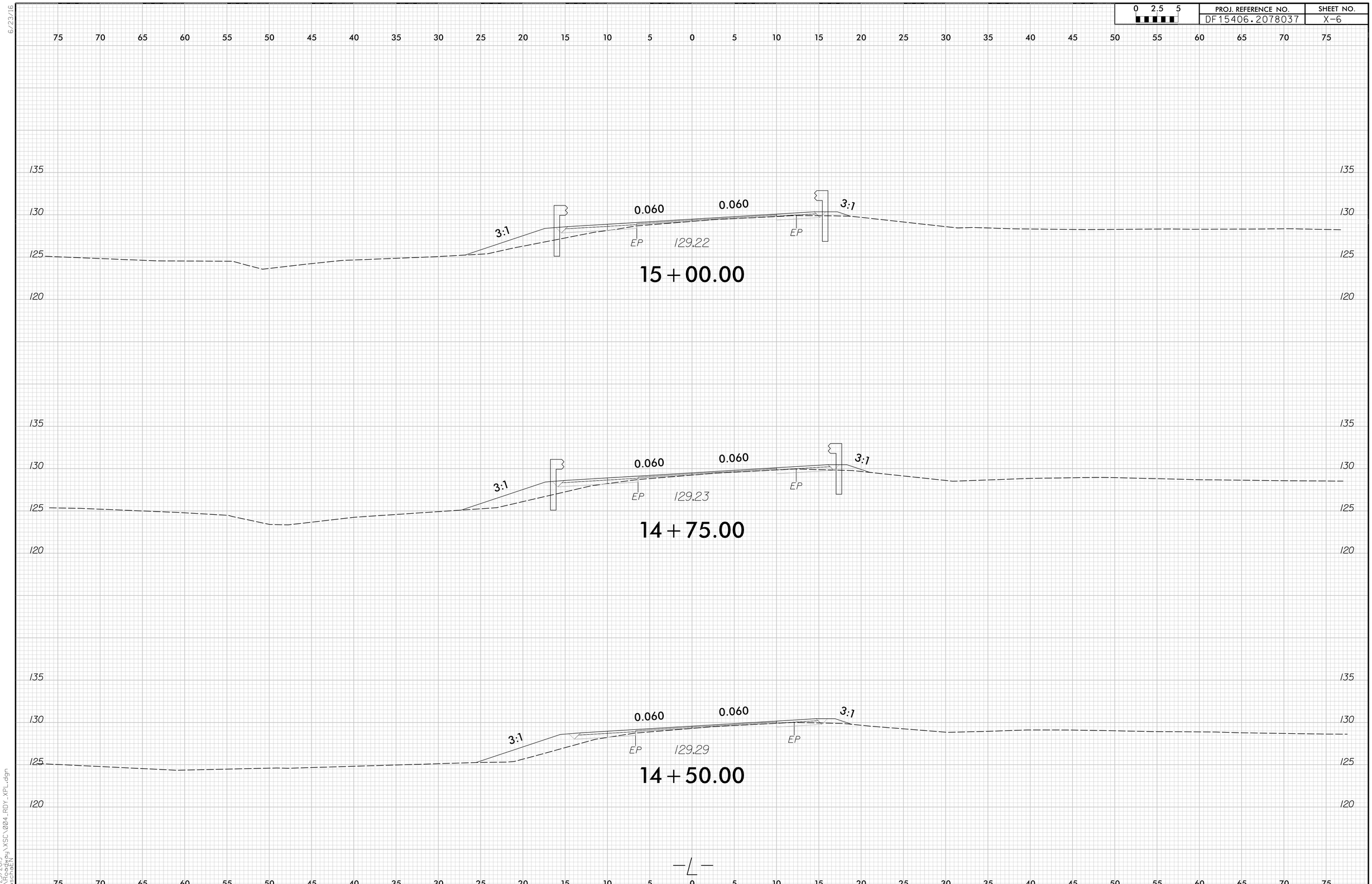

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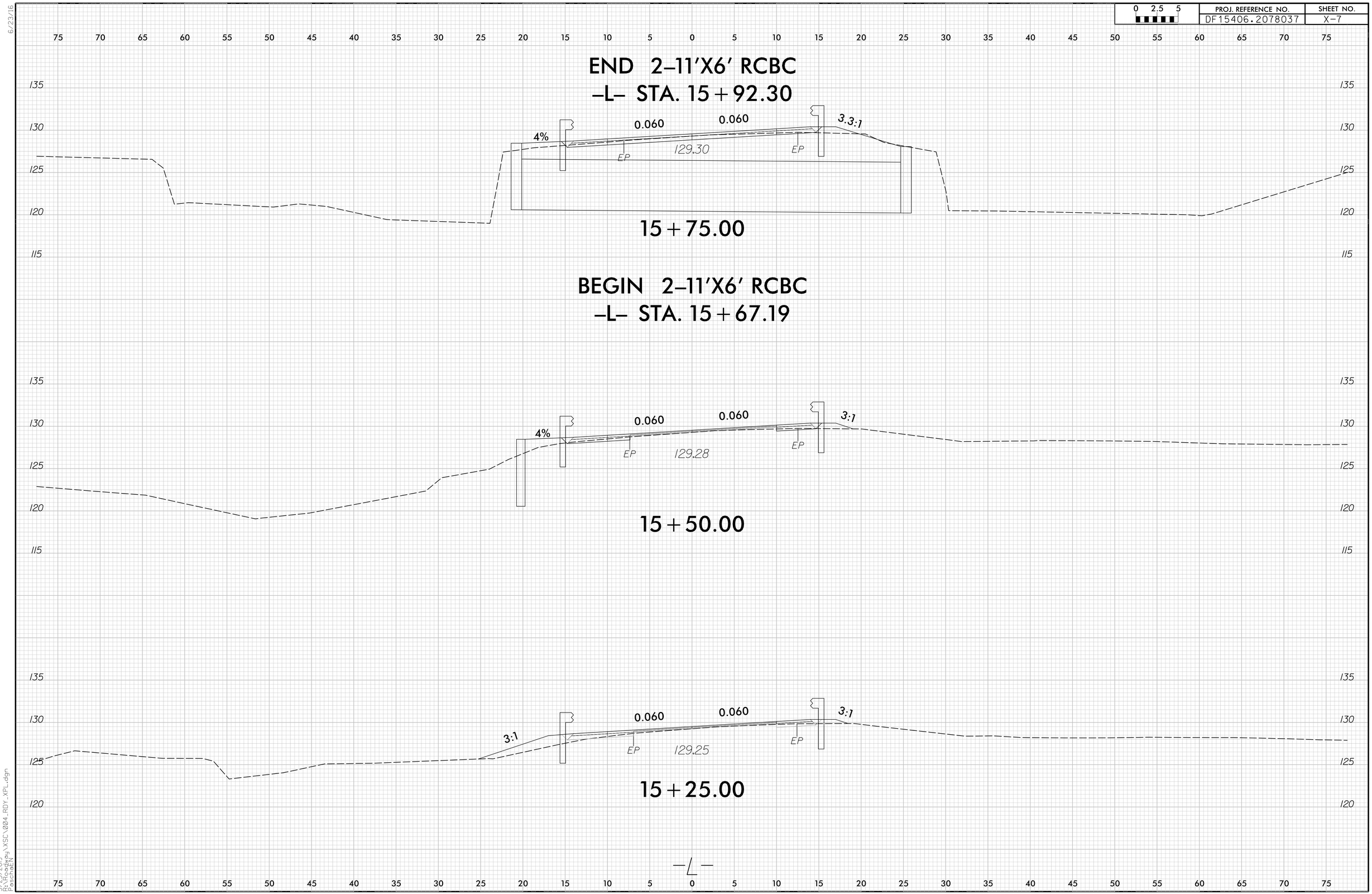

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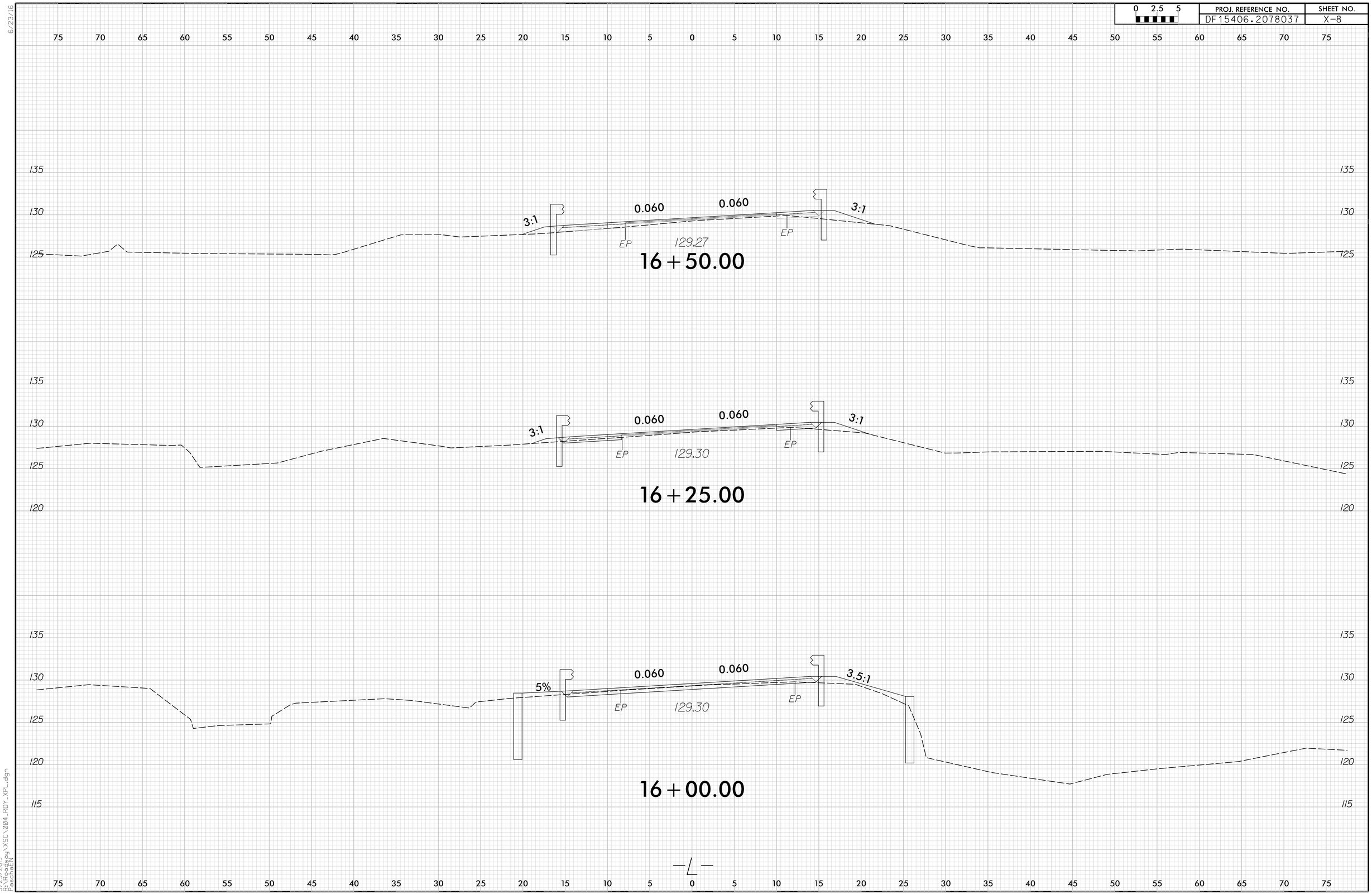

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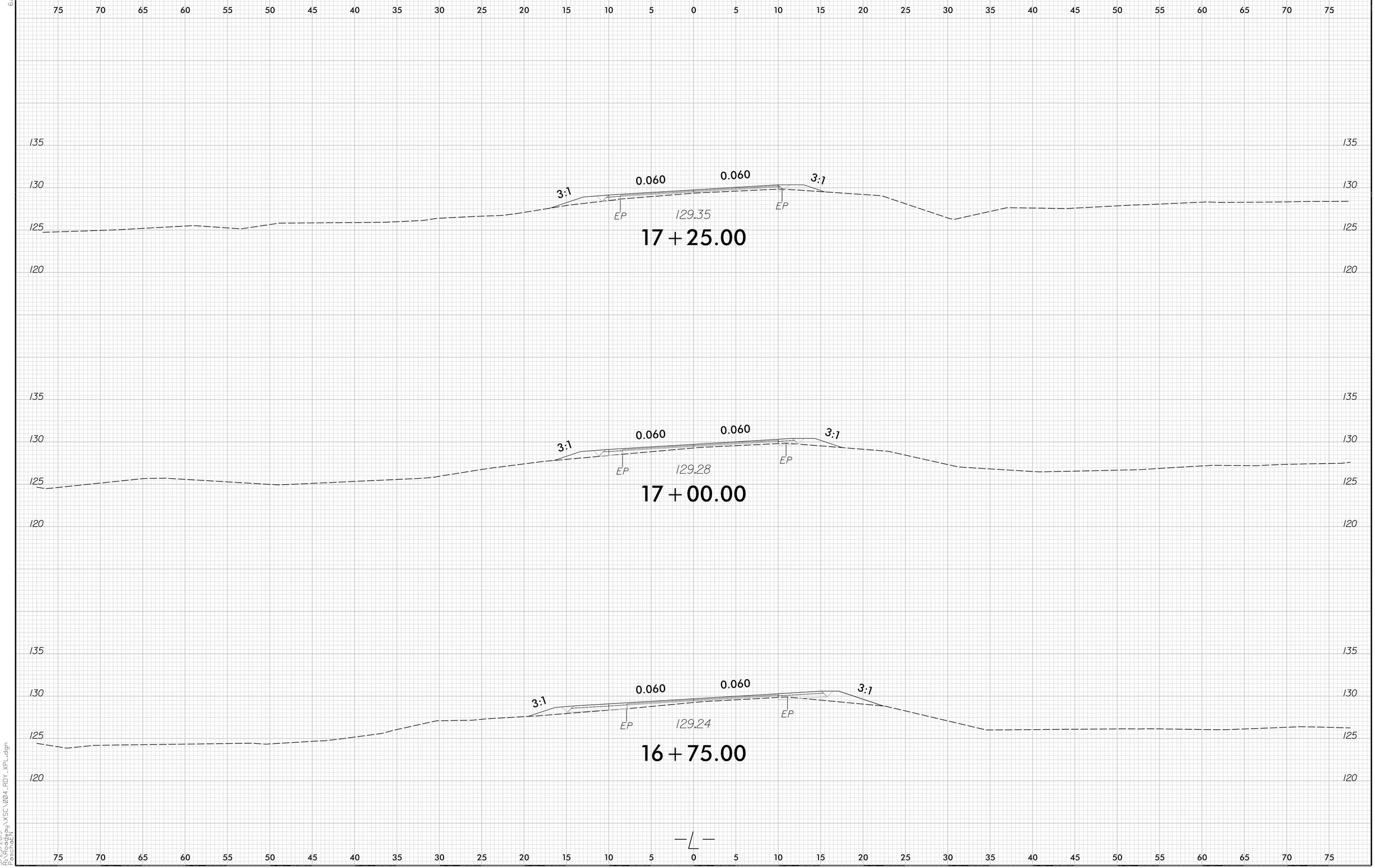

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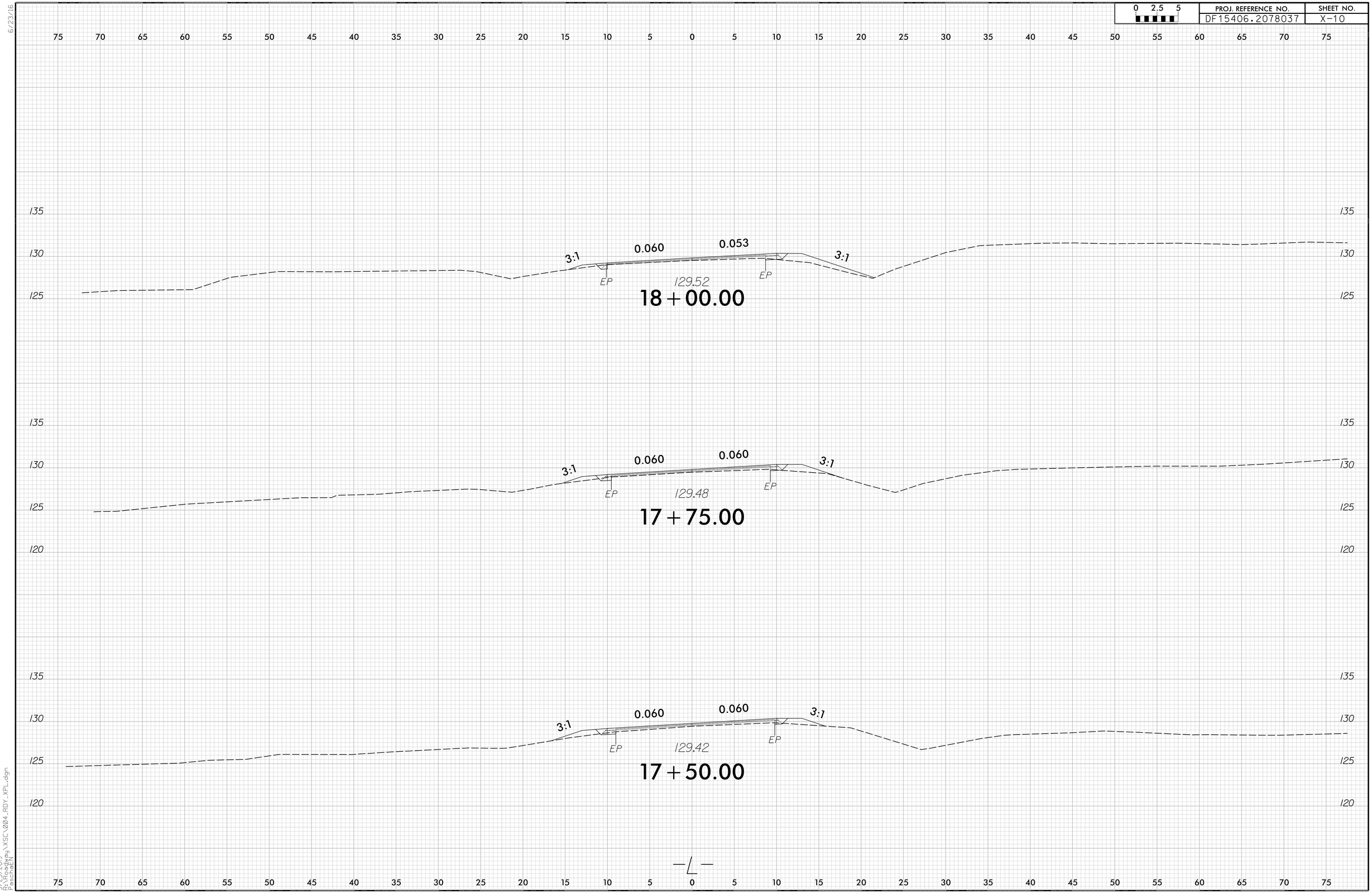

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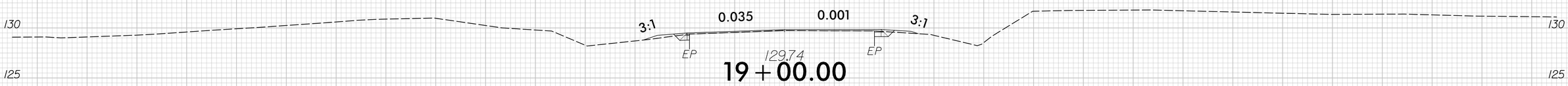
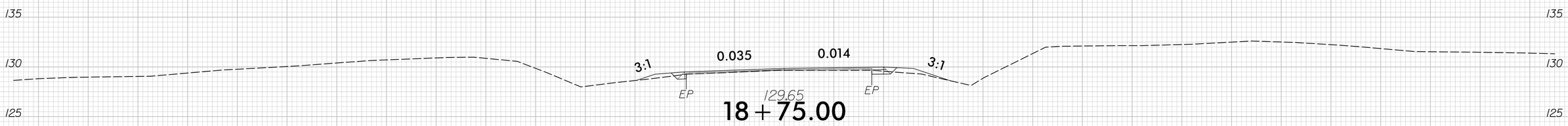
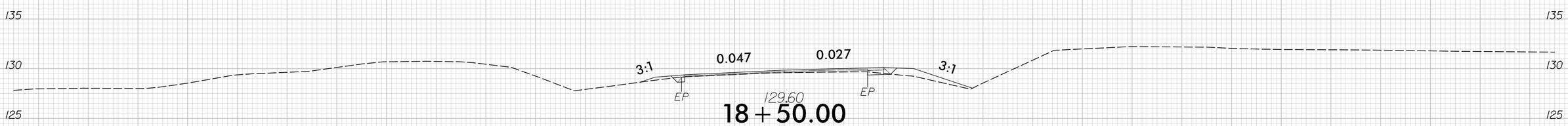
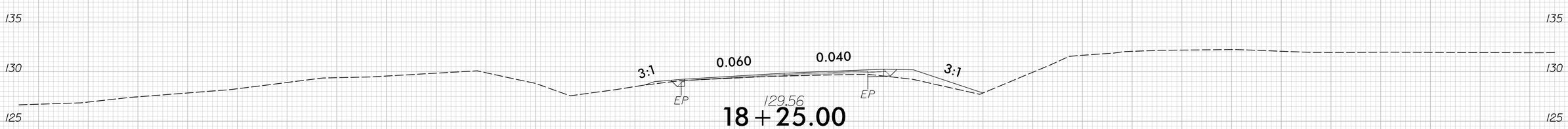
END TIP PROJECT DF15406.2078037

-L- STA. 19+20.00









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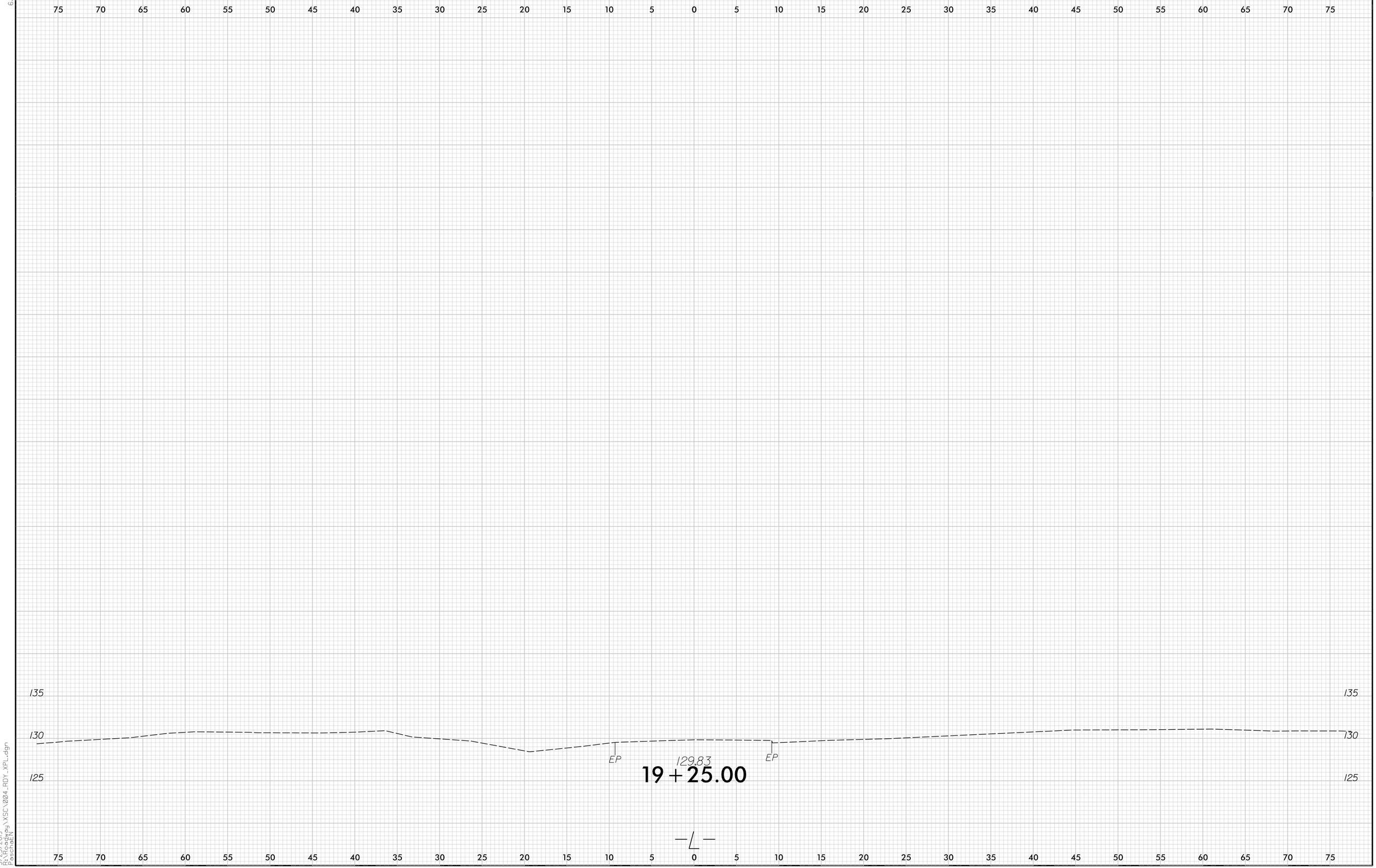

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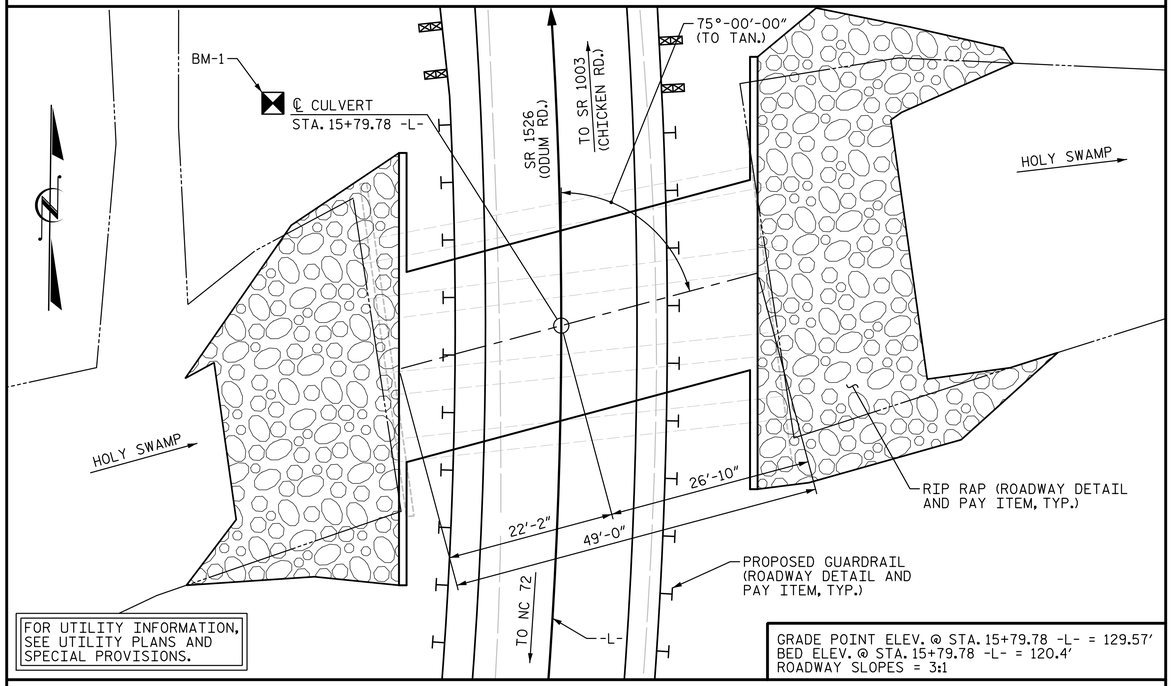
F.A. PROJECT: DF15406.2078037

BENCHMARK BM-1: RR SPIKE IN BASE OF 12" SWEET GUM, STA. 16+10.96 -L-, 37.35' LT, N 332122, E 1976309, EL. 129.88



LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD----------HL-93 OR ALTERNATE LOADING.

DESIGN FILL----------4.16' MAX. AND 2.20' MIN.

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

THE EXISTING STRUCTURE CONSISTING OF (4) 36" REINFORCED CONCRETE PIPES AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED.

REMOVAL OF THE EXISTING STRUCTURE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE STRUCTURE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:
1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT.
3. ROOF SLAB AND HEADWALLS.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF THE CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON THE WING SHEET.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF THE EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE 2'-2" FOR #5 BARS AND 1'-9" FOR #4 BARS. EXTRA WEIGHT OF STEEL DUE TO SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

FOR BOX CULVERT EXCAVATION, SEE SECTION 414 OF THE STANDARD SPECIFICATIONS.

THE REINFORCED CONCRETE BOX CULVERT SHALL BE PLACED ON THE STANDARD 1.0 FOOT BLANKET OF FOUNDATION CONDITIONING MATERIAL.

UNDERCUT FOUNDATIONS TO ELEVATION 118. LINE THE BOTTOM OF THE UNDERCUT EXCAVATION WITH TYPE 4 GEOTEXTILE THEN BACKFILL WITH CLASS VI FOUNDATION CONDITIONING MATERIAL.

NO WORK SHALL BE DONE ON THE CULVERT AT STA. 15+80 -L- UNTIL THE AREA OF THE BOX CULVERT HAS BEEN UNDERCUT AND UNSUITABLE MATERIAL REPLACED WITH SUITABLE MATERIAL, PROPERLY COMPACTED TO THE ELEVATION OF THE BOTTOM OF THE PROPOSED FLOOR SLAB. THE LIMITS OF THIS UNDERCUT EXCAVATION SHALL BE AT LEAST THE LIMITS OF THE BOX CULVERT INCLUDING THE WINGS. NO SEPARATE PAYMENT WILL BE MADE FOR ANY TEMPORARY SHEETING, UNDERCUT, OR UNSUITABLE MATERIAL REPLACEMENT AS REQUIRED TO CONSTRUCT THE PROPOSED CULVERT. PAYMENT IS INCLUDED IN THE LUMP SUM PRICE FOR CULVERT EXCAVATION.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

HYDRAULIC DATA

DESIGN DISCHARGE:	750 CFS
FREQUENCY OF DESIGN FLOOD:	25 YRS.
DESIGN HIGH WATER ELEVATION:	128.5
DRAINAGE AREA:	6.64 SQ. MI.
BASE DISCHARGE (Q100):	1,150 CFS
BASE HIGH WATER ELEVATION:	130.1

OVERTOPPING DATA

OVERTOPPING DISCHARGE:	1,150+ CFS
FREQUENCY OF OVERTOPPING:	100+ YRS.
OVERTOPPING FLOOD ELEVATION:	130.0

ROADWAY OVERTOPS LOW POINT AT STA. 15+05.28 -L-

I HEREBY CERTIFY THESE ARE THE AS-BUILT PLANS

RESIDENT ENGINEER

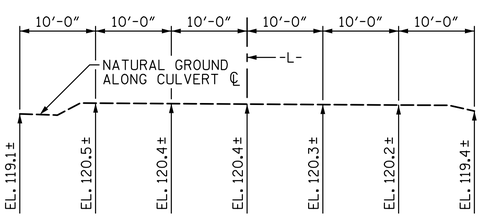
SAMPLE BAR REPLACEMENT

SIZE	LENGTH
#3	6'-2"
#4	7'-4"
#5	8'-6"
#6	9'-8"
#7	10'-10"
#8	12'-0"
#9	13'-2"
#10	14'-6"
#11	15'-10"

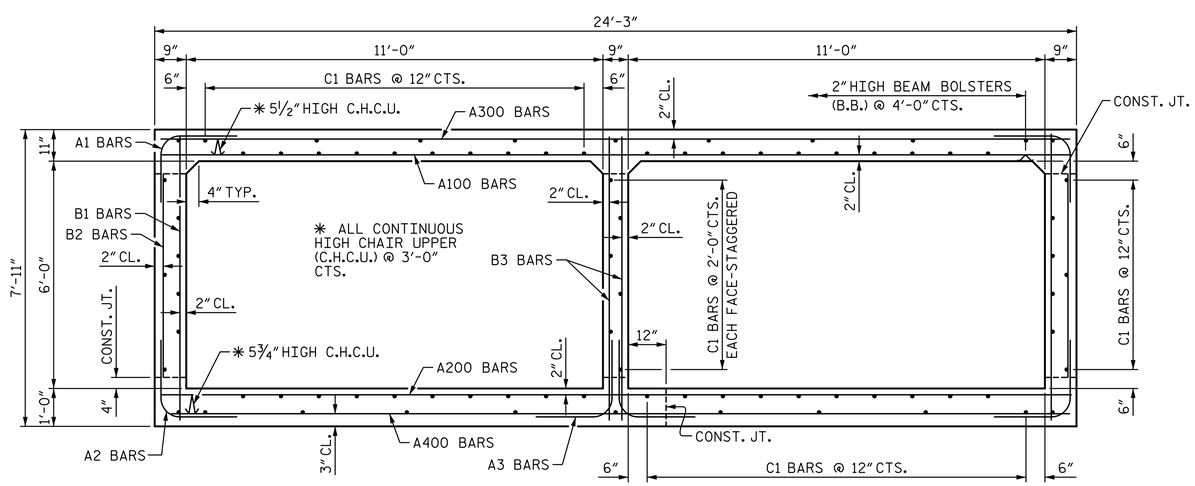
NOTE:
SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND f_y = 60ksi

TOTAL STRUCTURE QUANTITIES

REMOVAL OF EXISTING STRUCTURE	LUMP SUM
CULVERT EXCAVATION @ STA. 15+80 -L-	LUMP SUM
FOUNDATION CONDITIONING MATERIAL	
TOTAL	98 TONS
CLASS A CONCRETE	
BARREL @ 2.230 C.Y./FT.	109.3 C.Y.
WINGS, ETC.	48.0 C.Y.
TOTAL	157.3 C.Y.
REINFORCING STEEL	
BARREL	16,387 LBS.
WINGS, ETC.	4,977 LBS.
TOTAL	21,364 LBS.



PROFILE ALONG ℄ CULVERT



RIGHT ANGLE SECTION OF BARREL

LOOKING DOWNSTREAM
THERE ARE 82 "C" BARS IN SECTION OF BARREL

NORTH CAROLINA PROFESSIONAL SEAL 029429 ENGINEER JASON T. GRISCOM
5/28/2019

STV 100 Years
STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

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PROJECT NO. DF15406.2078037
ROBESON COUNTY
STATION: 15+80 -L-

SHEET 1 OF 6 REPLACES PIPE NO. 288

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 11 FT. X 6 FT. CONCRETE BOX CULVERT ON SR 1526 AT HOLY SWAMP 75° SKEW

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		C-1
1			3				TOTAL SHEETS
2			4				6

DRAWN BY : LEM DATE : 3-19
CHECKED BY : JWJ DATE : 3-19
DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 4-19

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LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE									COMMENT NUMBER
								MOMENT				SHEAR				
							LIVE-LOAD FACTORS (γ_{LL})	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.11	--	1.75	1.11	1 & 2	TOP SLAB	5.08′	1.12	1 & 2	TOP SLAB	10.96′	
		HL-93 (OPERATING)	N/A		1.44	--	1.35	1.44	1 & 2	TOP SLAB	5.08′	1.46	1 & 2	TOP SLAB	10.96′	
		HS-20 (INVENTORY)	36.000	2	1.12	40.320	1.75	1.12	1 & 2	TOP SLAB	5.08′	1.37	1 & 2	TOP SLAB	10.96′	
		HS-20 (OPERATING)	36.000		1.45	52.200	1.35	1.45	1 & 2	TOP SLAB	5.08′	1.78	1 & 2	TOP SLAB	10.96′	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.03	27.405	1.40	2.03	1 & 2	TOP SLAB	5.08′	2.51	1 & 2	TOP SLAB	10.96′	
		SNGARBS2	20.000		1.90	38.000	1.40	1.90	1 & 2	TOP SLAB	5.08′	2.34	1 & 2	TOP SLAB	10.96′	
		SNAGRIS2	22.000		2.03	44.660	1.40	2.03	1 & 2	TOP SLAB	5.08′	2.49	1 & 2	TOP SLAB	10.96′	
		SNCOTTS3	27.250	3	1.39	37.878	1.40	1.39	1 & 2	TOP SLAB	5.08′	1.40	1 & 2	TOP SLAB	10.96′	
		SNAGGRS4	34.925		1.67	58.325	1.40	1.67	1 & 2	TOP SLAB	5.08′	1.72	1 & 2	TOP SLAB	10.96′	
		SNS5A	35.550		1.58	56.169	1.40	1.66	1 & 2	TOP SLAB	5.08′	1.58	1 & 2	TOP SLAB	10.96′	
		SNS6A	39.950		1.56	62.322	1.40	1.59	1 & 2	TOP SLAB	5.08′	1.56	1 & 2	TOP SLAB	10.96′	
		SNS7B	42.000		1.56	65.520	1.40	1.65	1 & 2	TOP SLAB	5.08′	1.56	1 & 2	TOP SLAB	10.96′	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.00	66.000	1.40	2.03	1 & 2	BOTTOM SLAB	11.75′	2.00	1 & 2	BOTTOM SLAB	11.03′	
		TNT4A	33.075		1.63	53.912	1.40	1.65	1 & 2	TOP SLAB	5.08′	1.63	1 & 2	TOP SLAB	10.96′	
		TNT6A	41.600		1.58	65.728	1.40	1.69	1 & 2	TOP SLAB	5.08′	1.58	1 & 2	TOP SLAB	10.96′	
		TNT7A	42.000		1.60	67.200	1.40	1.67	1 & 2	TOP SLAB	5.08′	1.60	1 & 2	TOP SLAB	10.96′	
		TNT7B	42.000		1.60	67.200	1.40	1.60	1 & 2	TOP SLAB	5.08′	1.61	1 & 2	TOP SLAB	10.96′	
		TNAGRIT4	43.000		1.60	68.800	1.40	1.65	1 & 2	TOP SLAB	5.08′	1.60	1 & 2	TOP SLAB	10.96′	
		TNAGT5A	45.000		1.60	72.000	1.40	1.77	1 & 2	TOP SLAB	5.08′	1.60	1 & 2	TOP SLAB	10.96′	
		TNAGT5B	45.000		1.55	69.750	1.40	1.56	1 & 2	BOTTOM SLAB	11.75′	1.55	1 & 2	BOTTOM SLAB	11.03′	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS

LOAD TYPE	MAX FACTOR	MIN FACTOR
DC	1.25	0.90
DW	1.50	0.65
EV	1.30	0.90
EH	1.35	0.90
ES	1.35	0.90
LS	1.75	--
WA	1.00	--

NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

1.
2.
3.
4.

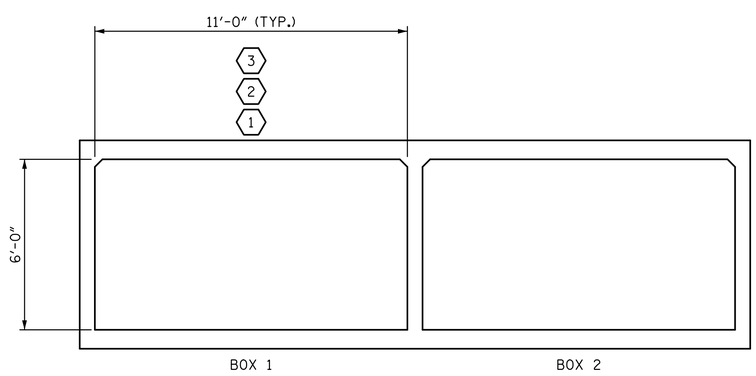
(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE



LRFR SUMMARY

(LOOKING DOWNSTREAM)

PROJECT NO. DF15406.2078037

ROBESON COUNTY

STATION: 15+80 -L-

SHEET 2 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 029429 ENGINEER JASON T. GRISCOM

5/28/2019

STV 100 Years

STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-2
1			3			TOTAL SHEETS
2			4			6

DRAWN BY : LEM DATE : 3-19
CHECKED BY : JWJ DATE : 3-19
DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 4-19

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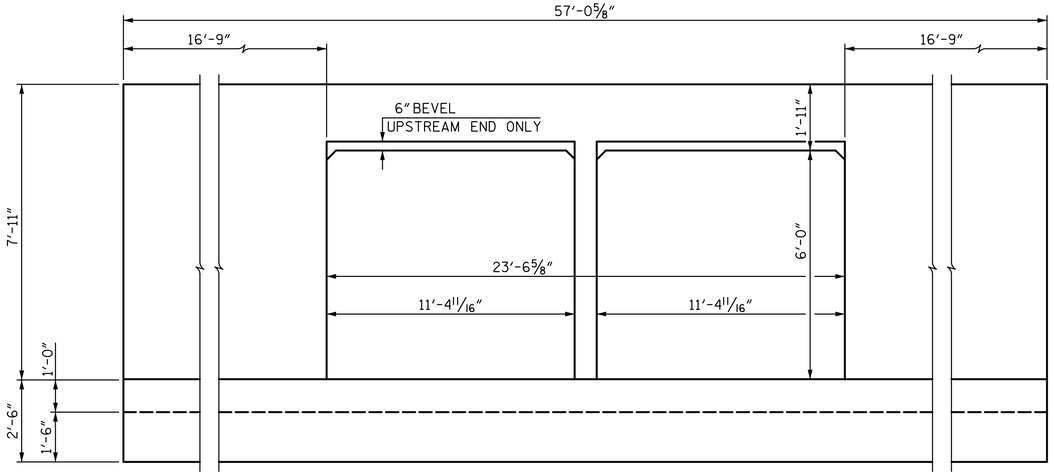
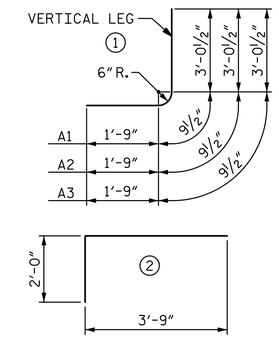


END ELEVATION NORMAL TO SKEW

BAR TYPES

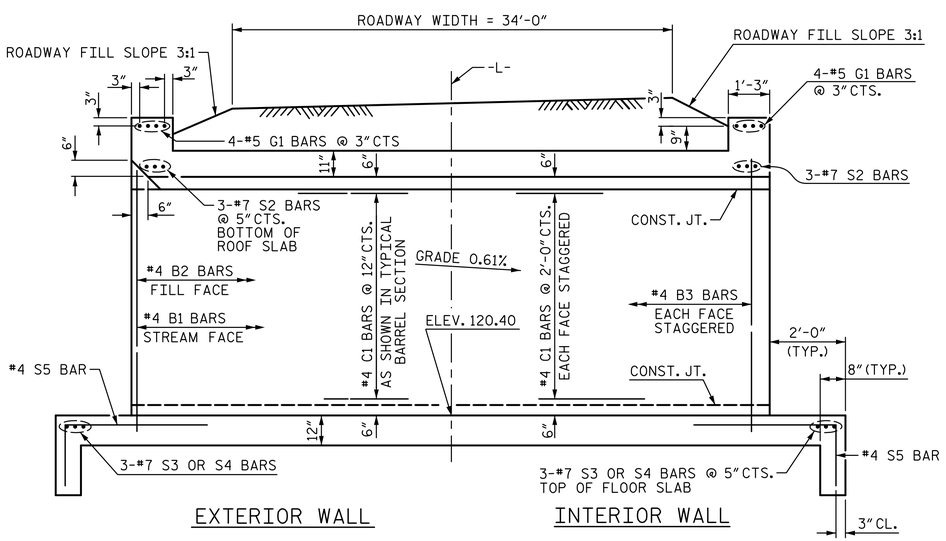


ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING FOR BARREL

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT	MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	194	#4	1	5'-7"	724	A300	85	#5	STR	23'-11"	2120
A2	194	#4	1	5'-7"	724	A301	2	#5	STR	22'-6"	47
A3	98	#4	1	5'-7"	366	A302	2	#5	STR	20'-7"	43
						A303	2	#5	STR	18'-9"	39
A100	85	#5	STR	23'-11"	2120	A304	2	#5	STR	16'-11"	35
A101	2	#5	STR	22'-6"	47	A305	2	#5	STR	15'-0"	31
A102	2	#5	STR	20'-7"	43	A306	2	#5	STR	13'-2"	27
A103	2	#5	STR	18'-9"	39	A307	2	#5	STR	11'-3"	23
A104	2	#5	STR	16'-11"	35	A308	2	#5	STR	9'-5"	20
A105	2	#5	STR	15'-0"	31	A309	2	#5	STR	7'-7"	16
A106	2	#5	STR	13'-2"	27	A310	2	#5	STR	5'-8"	12
A107	2	#5	STR	11'-3"	23	A311	2	#5	STR	3'-10"	8
A108	2	#5	STR	9'-5"	20	A312	2	#5	STR	1'-11"	4
A109	2	#5	STR	7'-7"	16	A400	90	#5	STR	15'-9"	1478
A110	2	#5	STR	5'-8"	12	A401	1	#5	STR	14'-4"	15
A111	2	#5	STR	3'-10"	8	A402	1	#5	STR	12'-5"	13
A112	2	#5	STR	1'-11"	4	A403	1	#5	STR	10'-7"	11
A200	90	#4	STR	15'-4"	922	A404	1	#5	STR	8'-9"	9
A201	1	#4	STR	13'-11"	9	A405	1	#5	STR	6'-10"	7
A202	1	#4	STR	12'-0"	8	A406	1	#5	STR	5'-0"	5
A203	1	#4	STR	10'-2"	7	A407	1	#5	STR	3'-1"	3
A204	1	#4	STR	8'-4"	6	A408	1	#5	STR	13'-2"	14
A205	1	#4	STR	6'-5"	4	A409	1	#5	STR	11'-3"	12
A206	1	#4	STR	4'-7"	3	A410	2	#5	STR	9'-5"	20
A207	1	#4	STR	2'-8"	2	A411	2	#5	STR	7'-7"	16
A208	1	#4	STR	13'-2"	9	A412	2	#5	STR	5'-8"	12
A209	1	#4	STR	11'-3"	8	A413	2	#5	STR	3'-10"	8
A210	2	#4	STR	9'-5"	13	A414	2	#5	STR	1'-11"	4
A211	2	#4	STR	7'-7"	10	A415	1	#5	STR	8'-11"	9
A212	2	#4	STR	5'-8"	8	A416	1	#5	STR	7'-0"	7
A213	2	#4	STR	3'-10"	5	A417	1	#5	STR	5'-2"	5
A214	2	#4	STR	1'-11"	3	A418	1	#5	STR	3'-4"	3
A215	1	#4	STR	8'-11"	6	A419	92	#5	STR	10'-4"	992
A216	1	#4	STR	7'-0"	5						
A217	1	#4	STR	5'-2"	3	B1	98	#4	STR	7'-6"	491
A218	1	#4	STR	3'-4"	2	B2	194	#4	STR	5'-0"	648
A219	92	#4	STR	10'-4"	635	B3	98	#4	STR	7'-6"	491
						C1	164	#4	STR	25'-3"	2766
						G1	8	#5	STR	24'-9"	207
						S2	6	#7	STR	24'-9"	304
						S3	6	#7	STR	17'-10"	219
						S4	6	#7	STR	10'-9"	132
						S5	40	#4	2	5'-9"	154

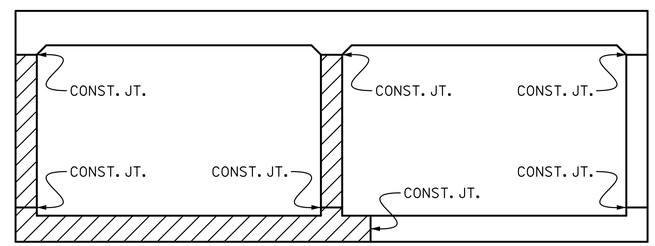
TOTAL BARREL REINFORCING STEEL = 16,387 LBS.



EXTERIOR WALL

INTERIOR WALL

CULVERT SECTION NORMAL TO ROADWAY



PHASE 1

PHASE 2

PHASE 1

POUR 1. PHASE 1 FLOOR SLAB (INCLUDING WING FOOTINGS) WITH 4" OF VERTICAL WALLS/WINGS.

POUR 2. REMAINING PORTIONS OF PHASE 1 WALLS/WINGS TO FULL HEIGHT.

PHASE 2

POUR 1. PHASE 2 FLOOR SLAB (INCLUDING WING FOOTINGS) WITH 4" OF VERTICAL WALL/WINGS.

POUR 2. REMAINING PORTIONS OF PHASE 2 WALL/WINGS TO FULL HEIGHT.

POUR 3. ENTIRE ROOF SLAB AND HEADWALLS.

CULVERT CONSTRUCTION SEQUENCE

LOOKING DOWNSTREAM

PROJECT NO. DF15406.2078037

ROBESON COUNTY

STATION: 15+80 -L-

SHEET 3 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 029429 ENGINEER JASON T. GRISCOM

5/28/2019

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NC License Number F-0991

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DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 11 FT. X 6 FT. CONCRETE BOX CULVERT 75° SKEW

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			6

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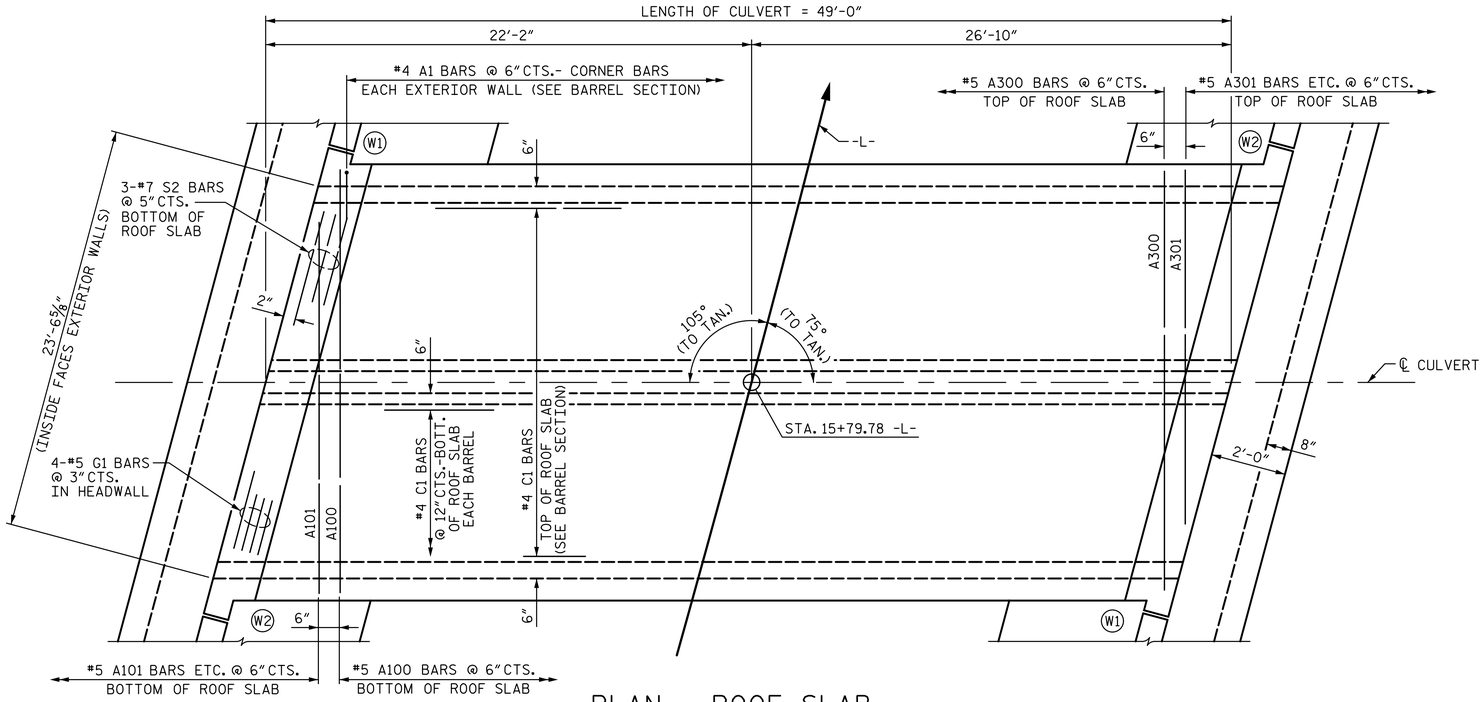
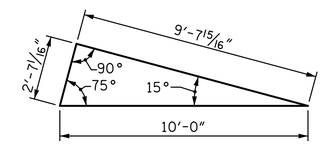
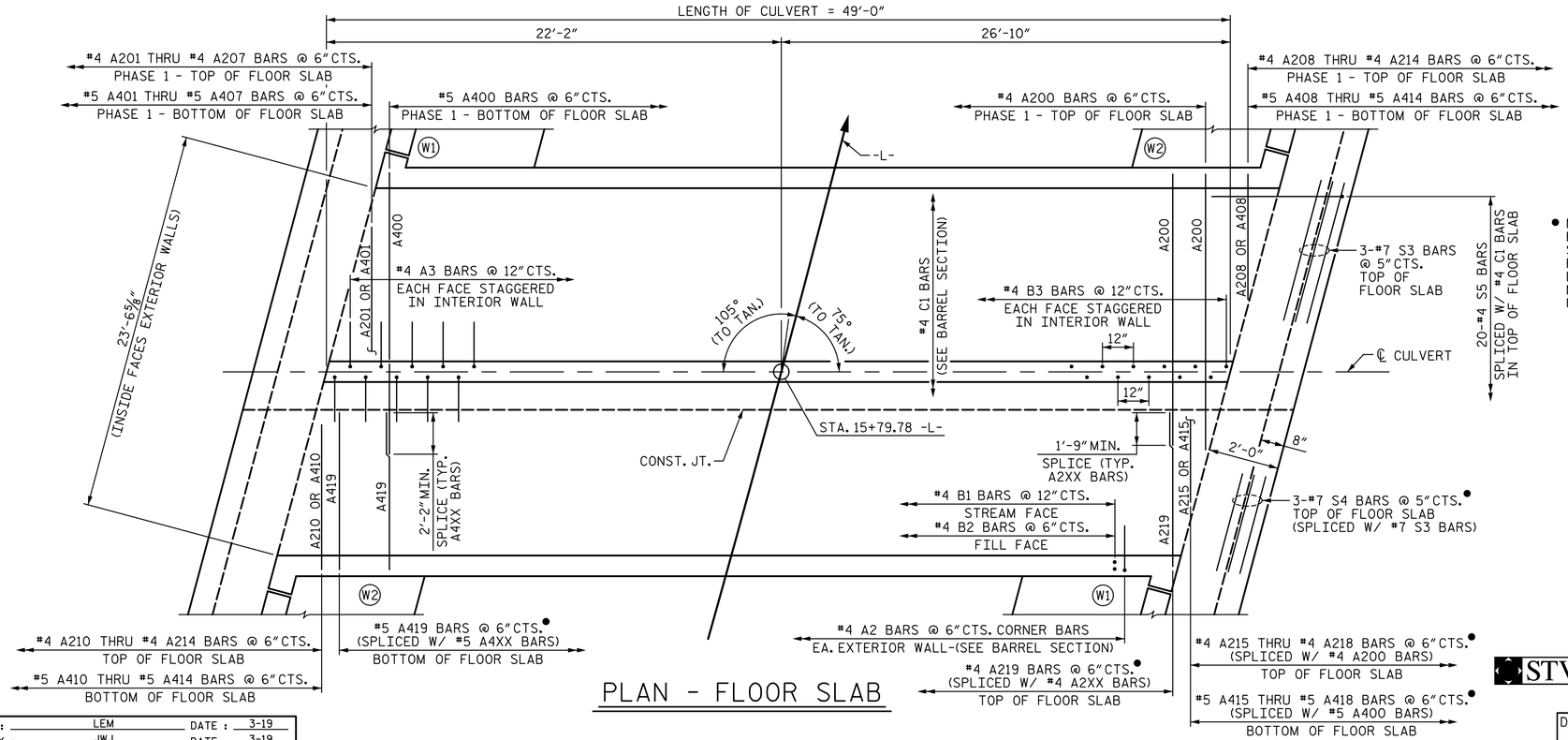


PLAN - ROOF SLAB



SKEW TRIANGLE



PLAN - FLOOR SLAB

- MECHANICAL SPLICES MAY BE USED IF NECESSARY FOR THE CONSTRUCTION OF THE PHASE 1 FLOOR SLAB. NO ADDITIONAL PAYMENT WILL BE MADE FOR THE MECHANICAL SPLICES. ALL MATERIAL AND LABOR COSTS FOR PROVIDING AND INSTALLING MECHANICAL SPLICES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "REINFORCING STEEL".

PROJECT NO. DF15406.2078037

ROBESON COUNTY

STATION: 15+80 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 11 FT. X 6 FT. CONCRETE BOX CULVERT 75° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 029429 ENGINEER JASON T. GRISCOM

5/28/2019

STV 100 Years
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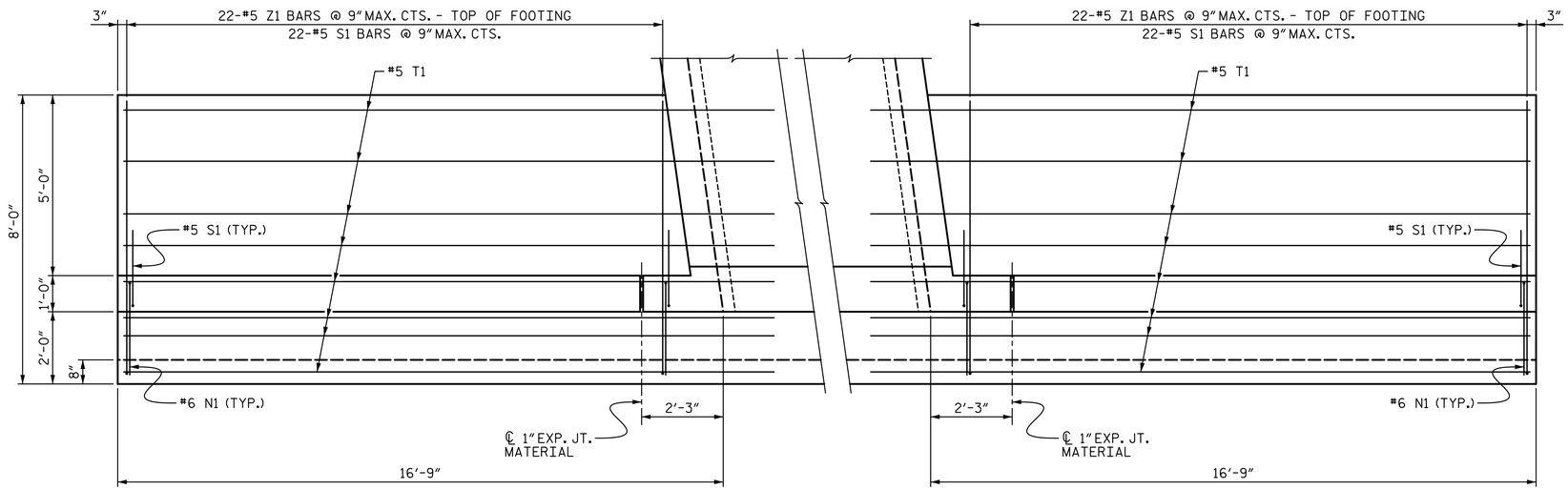
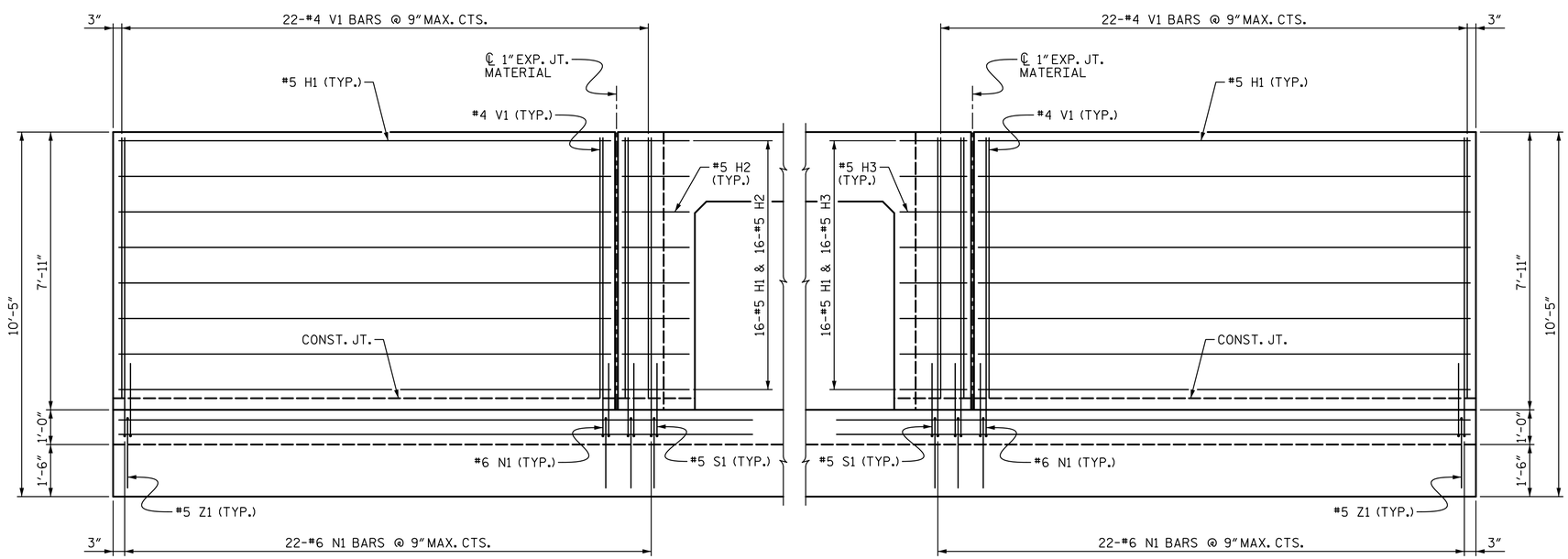


PLAN W1

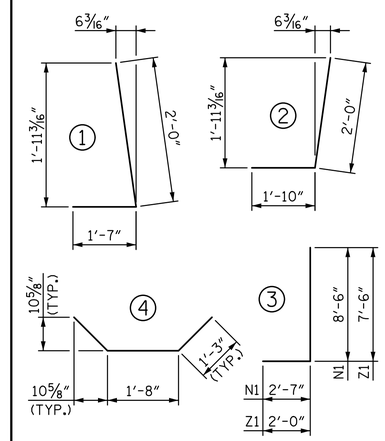
PLAN W2



ELEVATION W1

ELEVATION W2

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

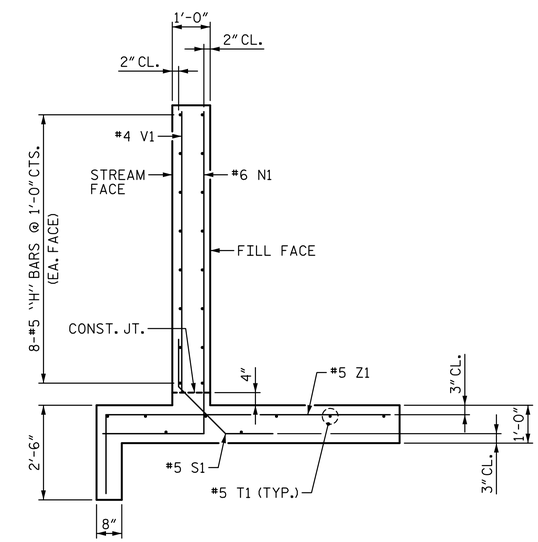
BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	64	#5	STR	14'-1"	940
H2	32	#5	1	3'-7"	120
H3	32	#5	2	3'-10"	128
N1	88	#6	3	11'-1"	1465
S1	88	#5	4	4'-2"	382
T1	32	#5	STR	19'-0"	634
V1	88	#4	STR	7'-5"	436
Z1	88	#5	3	9'-6"	872

TOTAL REINFORCING STEEL FOR 4 WINGS 4,977 LBS

CLASS A CONCRETE

4 WINGS	37.7 CY
2 HEADWALLS	2.3 CY
2 END CURTAIN WALLS	8.0 CY
TOTAL	48.0 CY



TYPICAL WING SECTION

PROJECT NO. DF15406.2078037

ROBESON COUNTY

STATION: 15+80 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WINGS FOR CONCRETE BOX CULVERT

NORTH CAROLINA PROFESSIONAL SEAL 029429 ENGINEER JASON T. GRISCOM

5/28/2019

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2			4				6

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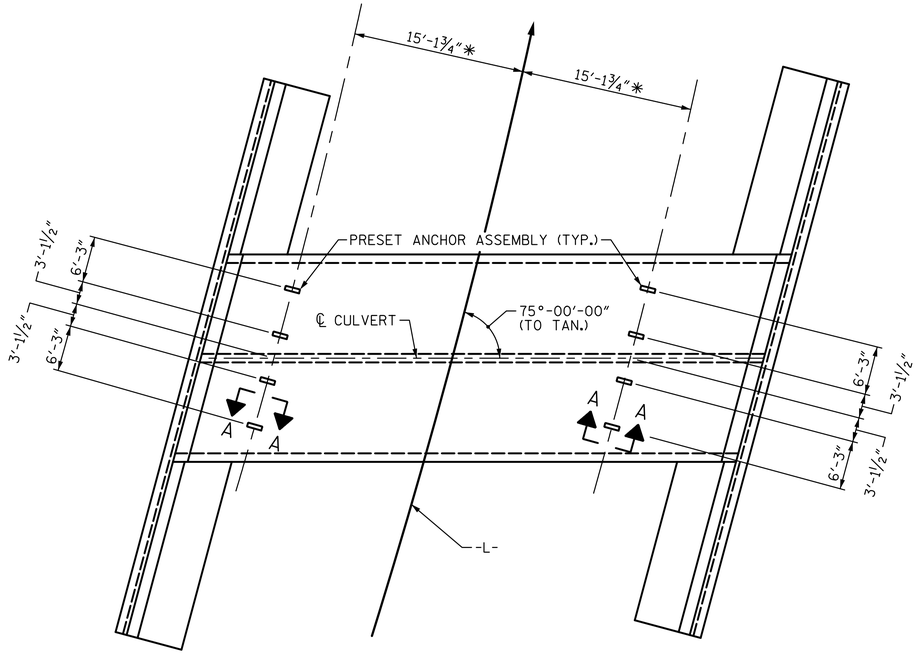
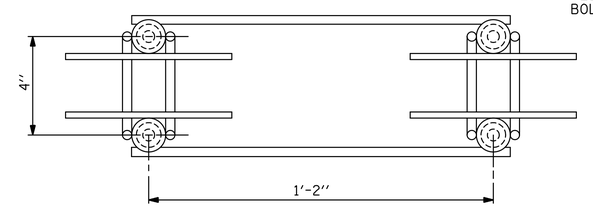
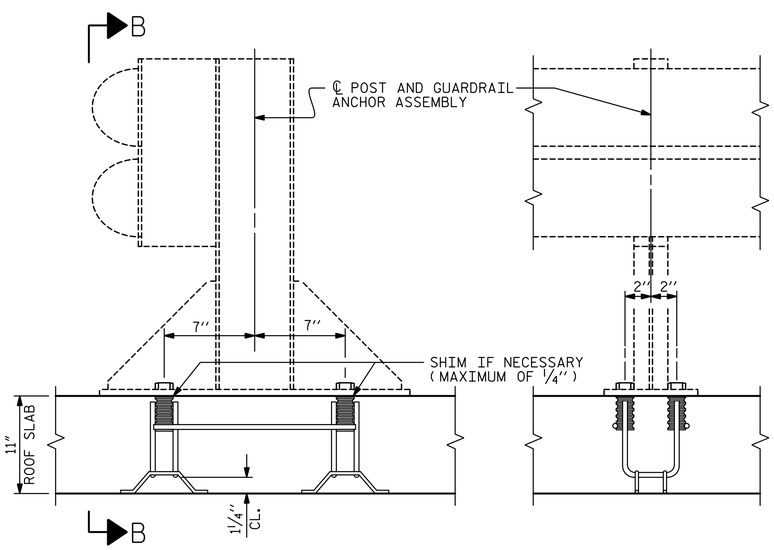


PLAN

SHOWING: GUARDRAIL ANCHOR ASSEMBLY SPACING.
✱ THIS DIMENSION TO BE CONFIRMED BY THE ENGINEER IN THE FIELD.

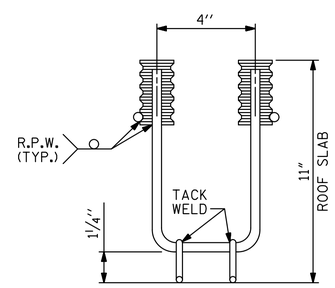


PLAN

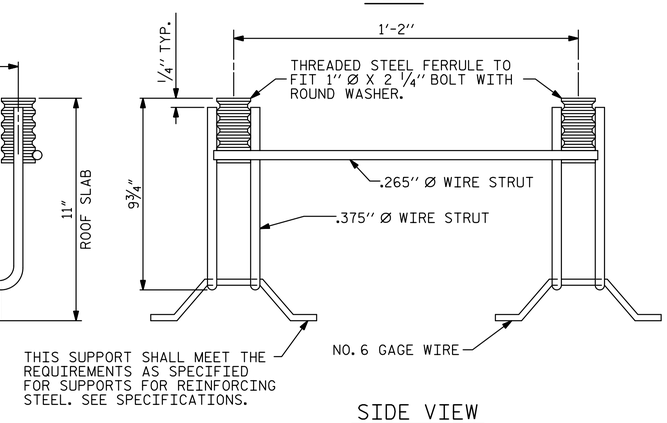


SECTION A-A

SECTION B-B



ELEVATION



SIDE VIEW

GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS SHALL CONSIST OF THE FOLLOWING COMPONENTS :

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2½".

B. 4 - 1" Ø X 2¼" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1" Ø X 2¼" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C. WIRE STRUTS SHOWN IN THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS DETAIL ARE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 P.S.I. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

GUARDRAIL ANCHOR ASSEMBLY WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY TO INSURE FIT.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CLASS "A" CONCRETE.

FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

PAYMENT FOR GUARDRAIL, POSTS, AND POST BASE PLATES IS INCLUDED IN ROADWAY PAY ITEMS.

SLAB REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR GUARDRAIL ANCHOR ASSEMBLY. CARE SHOULD BE TAKEN TO KEEP THE SHIFTING OF REINFORCING STEEL TO A MINIMUM.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF GUARDRAIL ANCHOR ASSEMBLY. LEVEL TWO FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 1" Ø BOLT IS 21.8 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.

PROJECT NO. DF15406.2078037
ROBESON COUNTY
STATION: 15+80 -L-

SHEET 6 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 029429 ENGINEER JASON T. GRISCOM
5/28/2019

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NC License Number F-0991

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ANCHORAGE DETAILS FOR GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-6
1			3			TOTAL SHEETS
2			4			6

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STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS - - - - - - - - - - - - - - - - -	A.A.S.H.T.O. (CURRENT)
LIVE LOAD -	SEE PLANS
IMPACT ALLOWANCE - - - - - - - - - - - - - - - - -	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF STRUCTURAL STEEL - AASHTO M270 GRADE 36 - -	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W - -	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50 - -	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION - GRADE 60 - - -	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION - - - - - - - - - - - -	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR - - - - - - - - - - - - - - - - -	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR UNTREATED EXTREME FIBER STRESS - - -	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER - - - - -	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH - - - - -	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1 1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

JANUARY, 1990