This electronic collection of documents is provided for the convenience of the user and is Not a Certified Document –

The documents contained herein were originally issued and sealed by the individuals whose names and license numbers appear on each page, on the dates appearing with their signature on that page.
This file or an individual page shall not be considered a certified document.

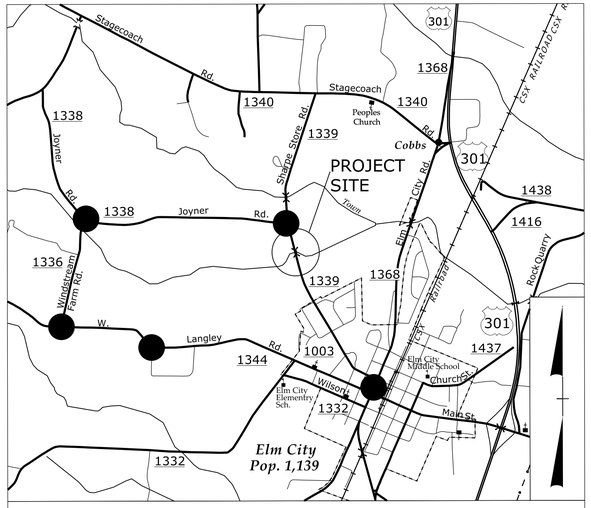
SUMMIT
DESIGN AND ENGINEERING SERVICES

09/08/99

TIP PROJECT: 17BP.4.R.94

CONTRACT: DD00281

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



VICINITY MAP

● DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WILSON COUNTY

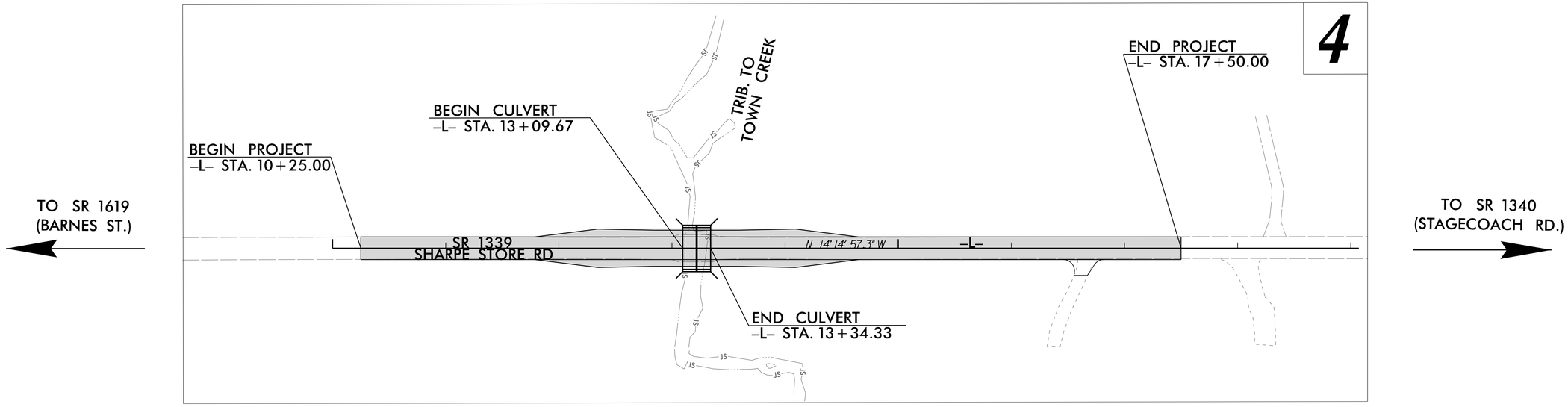
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.4.R.94	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.4.R.94	NA	PE
17BP.4.R.94	NA	ROW & UTILITIES
17BP.4.R.94	NA	CONST

LOCATION: BRIDGE 970091 ON SHARPE STORE RD. (SR 1339) OVER TOWN CREEK

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

NC GRID NAD 83 NA 2011



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2015 = 450
ADT 2025 = 840
T = 6 % *
V = 55 MPH

* TTST =3% DUAL 3%

FUNC CLASS =
LOCAL RURAL
SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT = 0.132 MILES
LENGTH STRUCTURES PROJECT = 0.005 MILES
TOTAL LENGTH PROJECT = 0.137 MILES

NCDOT CONTACT: CHAD COGGINS
DIVISION 4 CONTACT

Prepared In the Office of:

SUMMIT
DESIGN AND ENGINEERING SERVICES
FIRM NO. P-0339
504 Meadowland Drive
Hillsborough, NC 27278-8551
Voice: (919) 732-3883
Fax: (919) 732-6776
www.summit-engineer.com

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 6, 2018

LETTING DATE:
SEPTEMBER 24, 2019

BRANDON W. JOHNSON, PE
PROJECT ENGINEER

FAITH E. JAHNKE, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
8/5/2019
DocuSigned by:
6F2FA9A5BE0243...
SIGNATURE:
NORTH CAROLINA PROFESSIONAL SEAL 046226 ENGINEER JASON M. PATSKOSKI P.E.

ROADWAY DESIGN ENGINEER
8/5/2019
DocuSigned by:
Brandon W. Johnson
6A29A2BEEC9B45E...
SIGNATURE:
NORTH CAROLINA PROFESSIONAL SEAL 034371 ENGINEER BRANDON W. JOHNSON P.E.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

29-MAY-2019 13:35
97009_Rdy_tsh.dgn
faith.jahnke

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
17BP.4.R.94	1A

ROADWAY DESIGN ENGINEER

8/5/2019

NORTH CAROLINA PROFESSIONAL SEAL 034371 ENGINEER BRANDON W. JOHNSON

DocuSigned by: Brandon W. Johnson
6A29A2BE0C9B45E...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of: SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883 - (919) 732-6676 (FAX)

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C-1 THRU 1C-2	SURVEY CONTROL SHEETS
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1	SPECIAL DETAILS
3B-1	ROADWAY SUMMARIES
4	PLAN AND PROFILE SHEET
TMP-1 THRU TMP-3	TRAFFIC MANAGEMENT PLANS
SD-1	SPECIAL SIGN DESIGN
PMP-1	PAVEMENT MARKING PLANS
EC-1 THRU EC-6	EROSION CONTROL PLANS
RF-1	REFORESTATION PLANS
X-1 THRU X-7	CROSS-SECTIONS
C-1 THRU C-7	STRUCTURE PLANS
SN	STANDARD NOTES

GENERAL NOTES:

2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

DRIVEWAYS:

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

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 WILSON ENERGY

CENTURY LINK

RIGHT-OF-WAY MARKERS:

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

EFF. 01-16-2018
REV.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
DIVISION 3 - PIPE CULVERTS	
310.10	Driveway Pipe Construction
DIVISION 8 - INCIDENTALS	
862.01	Guardrail Placement
862.02	Guardrail Installation

29-MAY-2019 13:35
s:\2001 Proj\tsh.1a.dgn
fatthughes

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
17BP.4.R.94	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:

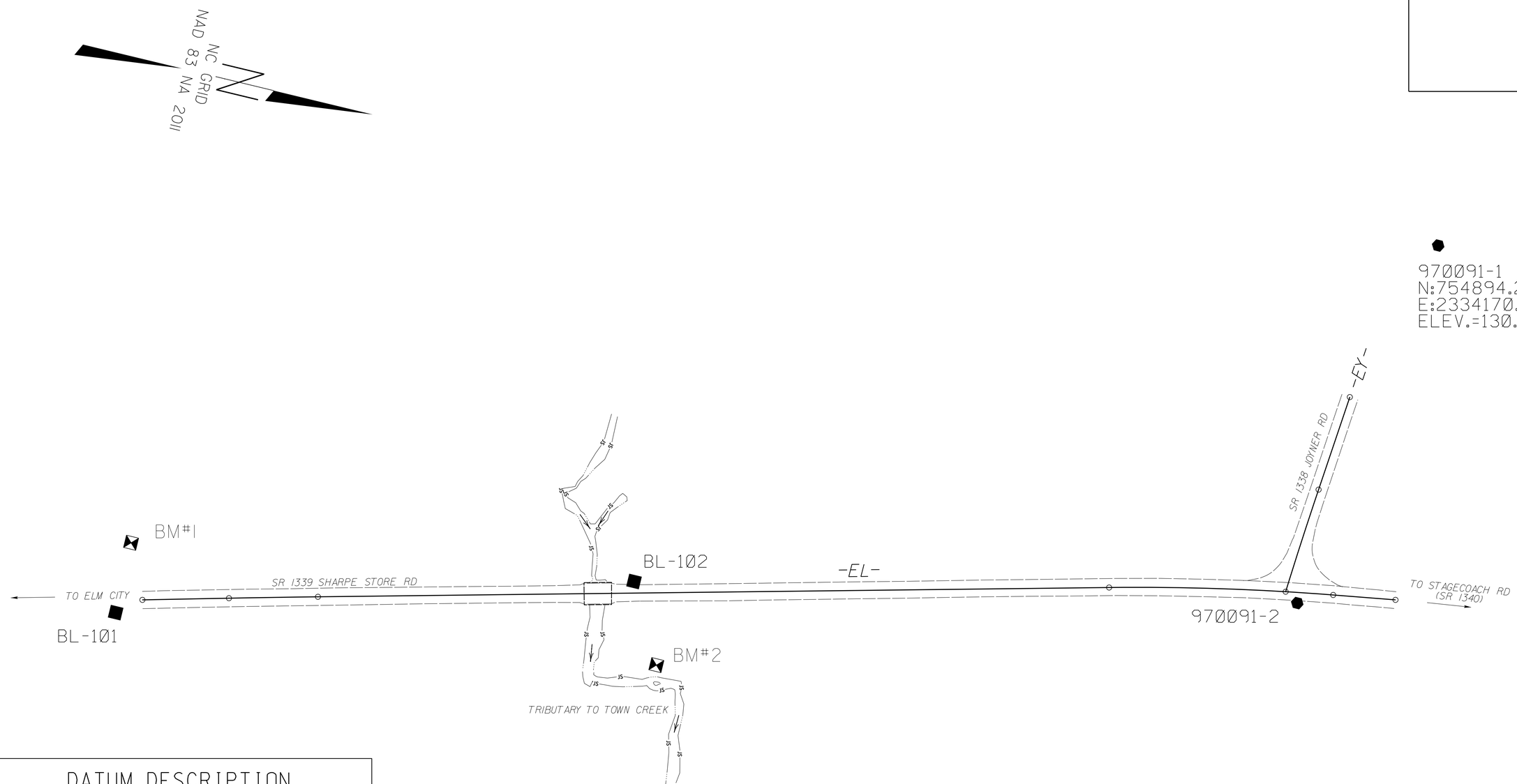
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line LOS B (S.U.E.*) — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)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

PROJECT REFERENCE NO.	SHEET NO.
17BP.4.R.94	1C-1
Location and Surveys	

PROJECT SURVEYOR

SURVEY CONTROL SHEET 97-0091

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "97-0091-2"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 754876.201(ft) EASTING: 2334840.621(ft)
ELEVATION: 129.78(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999920725
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "97-0091-2" TO -L- STATION IS

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

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

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

NOTE: DRAWING NOT TO SCALE

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
17BP.4.R.94	1C-2
Location and Surveys	

PROJECT SURVEYOR

SURVEY CONTROL SHEET 97–0091

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

BASELINE DATA

BL

POINT	DESC.	NORTH	EAST	ELEVATION
101	BL-101	753561.8860	2335169.2650	125.58
102	BL-102	754131.2060	2334995.0440	119.84
2	970091-2	754876.2010	2334840.6210	129.78

BENCHMARK DATA

****

BM1 ELEVATION = 127.55

N 753560 E 2335087

TIE SPIKE IN 12" MAPLE

****

****

BM2 ELEVATION = 118.84

N 754179 E 2335082

TIE SPIKE IN 12" MAPLE

****

ALIGNMENT DATA

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	753588.332	2335147.846							
LINE			N 14°41′22.2" W	99.24					
PC	753684.330	2335122.680							
CURVE			N 14°28′09.7" W	102.05	00°26′24.9"(RT)	00°25′53.1"	102.05	51.02	13280.81
PT	753783.139	2335097.183							
LINE			N 14°14′57.3" W	907.13					
PC	754662.359	2334873.902							
CURVE			N 11°40′07.8" W	257.04	05°09′38.9"(RT)	02°00′25.7"	257.12	128.65	2854.60
PT	754914.083	2334821.915							
LINE			N 09°05′18.4" W	71.65					
POT	754984.829	2334810.598							

EY

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	754879.366	2334596.829							
LINE			S 84°55′34.1" E	112.01					
PC	754869.460	2334708.398							
CURVE			S 85°41′58.4" E	123.00	01°32′48.6"(LT)	01°15′27.0"	123.01	61.51	4556.32
PT	754860.236	2334831.056							
LINE			S 86°28′22.7" E	0.00					
POT	754860.236	2334831.058							

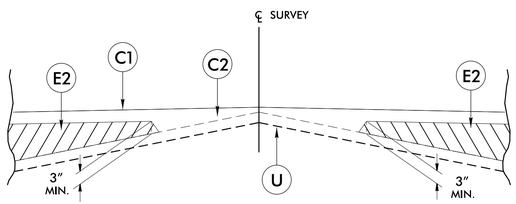
23-MAY-2019 13:35
970091_ts1c2.dgn
faith.jaincke

6/2/99

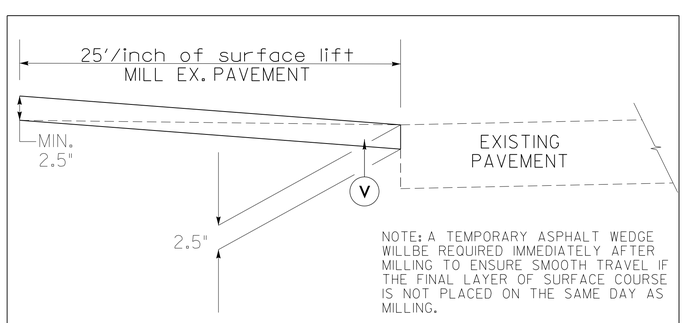
PAVEMENT SCHEDULE

C1	PROP. APPROX. 2.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 140 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1.25″ IN DEPTH.
E1	PROP. APPROX. 4.0″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED. IN LAYERS NOT LESS THAN 3″ IN DEPTH OR GREATER THAN 5½″ IN DEPTH
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING BITUMINOUS PAVEMENT. VARIABLE 0″ TO 2.5″ DEPTH.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL ON THIS SHEET)

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



Detail Showing Method of Wedging

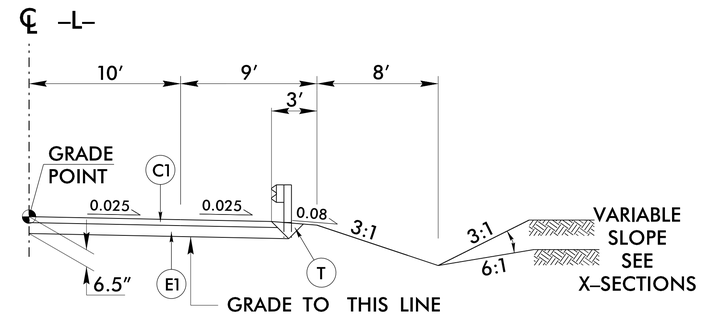


INCIDENTAL MILLING PAVEMENT KEY–IN DETAIL (TIE–IN)

–L– STA 10+25.00 TO 10+87.50
–L– STA 16+87.50 TO 17+50.00

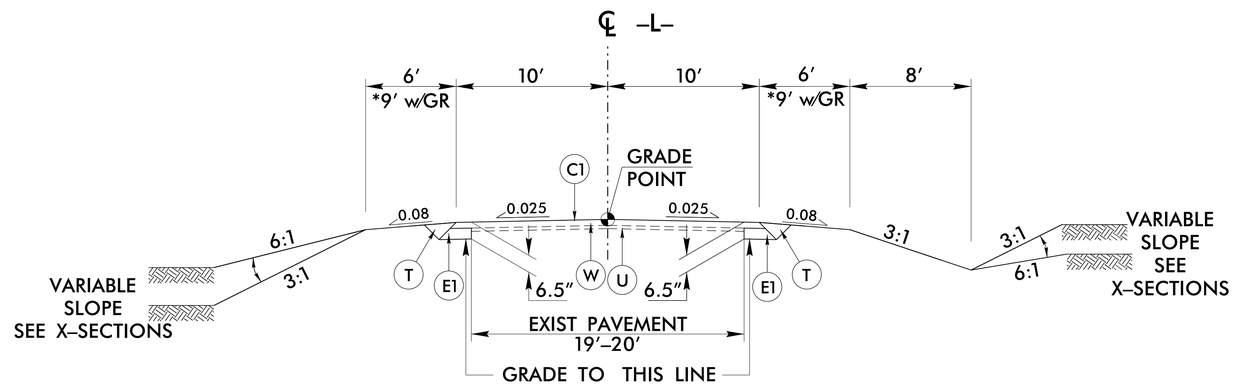
STATION RANGES ARE APPROXIMATE ONLY. GRADE MAY BE ADJUSTED BY ENGINEER TO ENSURE A PROPER TIE–IN.

BRIDGE NO.970091



DETAIL 1

PAVE TO FACE OF GUARDRAIL

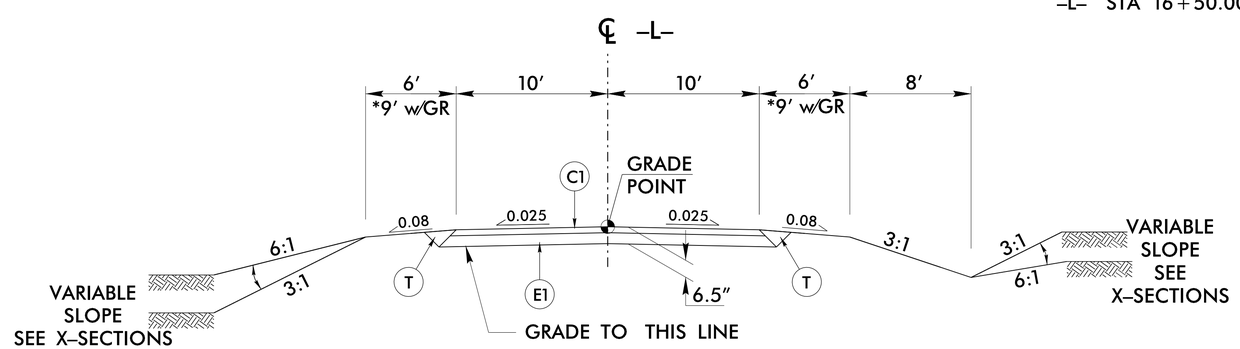


TYPICAL SECTION NO. 1

–L– (SHARPE STORE RD.)

USE TYPICAL SECTION NO. 1

–L– STA 10+25.00 TO STA 12+50.00
–L– STA 16+50.00 TO STA 17+50.00

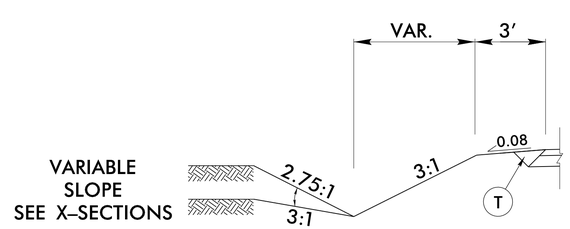


TYPICAL SECTION NO. 2

–L– (SHARPE STORE RD.)

USE TYPICAL SECTION NO. 2

–L– STA 12+50.00 TO STA 16+50.00



PARTIAL TYPICAL

USE IN CONJUCTION WITH TYPICAL SECTIONS NO. 1 & 2
–L– STA 16+00 TO STA 17+50 LT

PROJECT REFERENCE NO.	SHEET NO.
17BP.4.R.94	2A–1

ROADWAY DESIGN ENGINEER
8/6/2019
NORTH CAROLINA PROFESSIONAL SEAL 034371 ENGINEER BRANDON W. JOHNSON
DocuSigned by: Brandon W. Johnson
6A29A2BE0C9B45E

PAVEMENT DESIGN ENGINEER
8/6/2019
NORTH CAROLINA PROFESSIONAL SEAL 040257 ENGINEER W. MATTHEW CLARKE
DocuSigned by: W. Matthew Clarke
1EB20093E4AE43T

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of: SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883 – (919) 732-6676 (FAX)

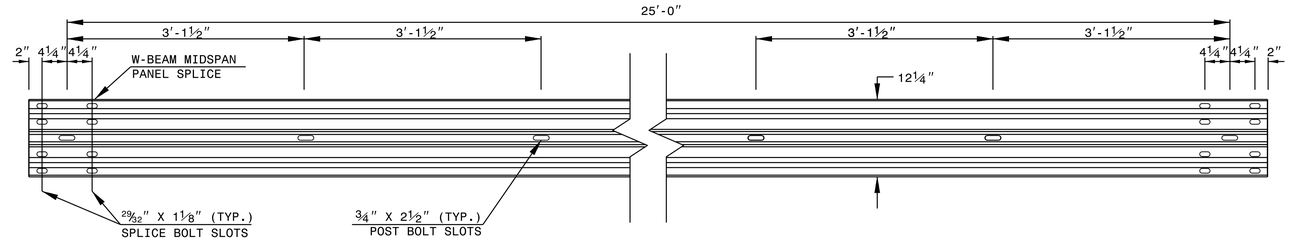
*PLACE FDPS TO FACE OF GUARDRAIL AS SHOWN ON PLANS (SEE DETAIL 1)

06-AUG-2019 07:48
R:\Roadway\Proj\17bp.4.r.94_sht_2a-1_pavsch.dgn
rerichson

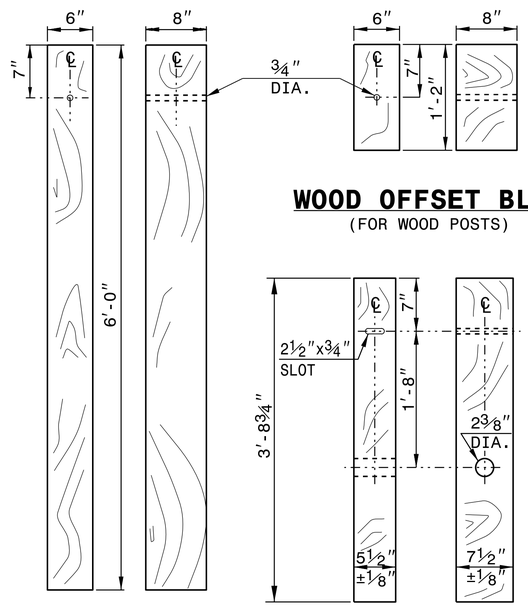
PROJECT REFERENCE NO.	SHEET NO.
17BP.4.R.94	2C-1
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION



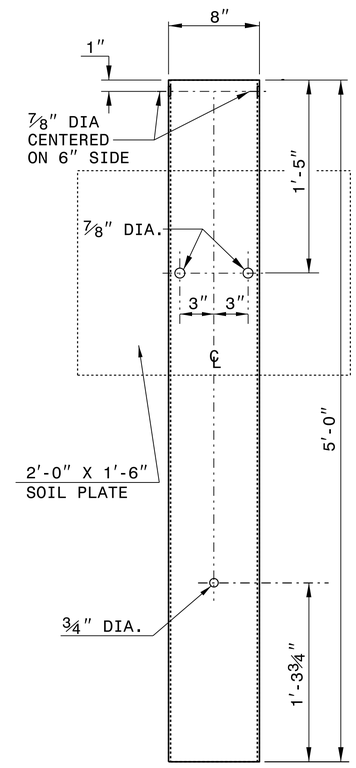
STANDARD W-BEAM GUARDRAIL



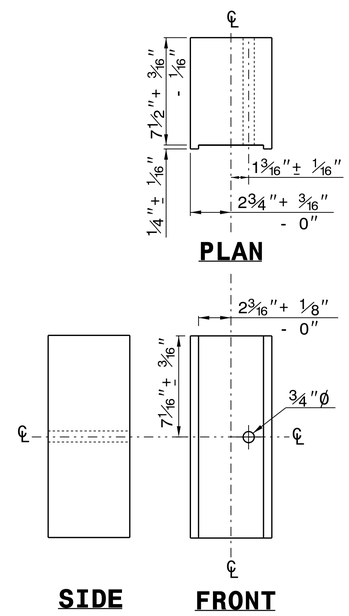
STANDARD LINE POST

WOOD OFFSET BLOCK
(FOR WOOD POSTS)

SHORT WOOD BREAKAWAY POST



STEEL TUBE
TS 6"x8"x0.1875"

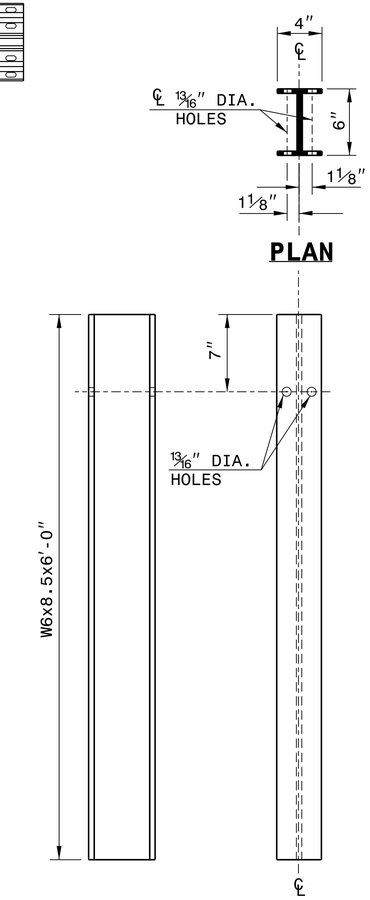


PLAN

SIDE

FRONT

ROUTED OFFSET BLOCK



PLAN

SIDE

FRONT

"W6" STEEL POST

SYSTEM PARTS

SHEET 6 OF 8
862D02

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

8/5/2019

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON

DocuSigned by: Joel S. Howerton
873F3D17DCDC45F...

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

SEE TITLE BLOCK

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

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
17BP.4.R.94	3B-1

Prepared in the Office of:
SUMMIT
DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883 - (919) 732-6676 (FAX)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS XI MOD	ANCHORS TYPE-III	ANCHORS GREU 350 TL-3	ANCHORS M-350	ANCHORS XIII	ANCHORS CAT-1	ANCHORS VI MOD	ANCHORS BIC	ANCHORS AT-1	IMPACT ATTENUATOR TYPE 350 EA	IMPACT ATTENUATOR TYPE 350 G	IMPACT ATTENUATOR TYPE 350 NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-L-	12+34.50	14+09.17	LT	175'			13+34.17	13+09.50	6'-0"	9'-0"	50	50	1	1			2													
-L-	12+34.50	14+09.17	RT	175'			13+09.50	13+34.17	6'-0"	9'-0"	50	50	1	1			2													
SUBTOTAL				350'																										
LESS	ANCHOR DEDUCTIONS																													
		GREU TL-3	4@50.00'	200'																										
ADDITIONAL GUARDRAIL POSTS = 5 EA																														
PROJECT TOTAL				150'													4													

NOTE: INVERT ELEVATIONS INDICATED ARE FOR BID PURPOSES ONLY AND SHALL NOT BE USED FOR PROJECT CONSTRUCTION STAKEOUT. SEE "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES, SECTION 300-5".

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	DRAINAGE PIPE 15"	DRAINAGE PIPE 18"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C.S. PIPE (UNLESS NOTED OTHRWISE) 12" .064	C.S. PIPE 15" .064	C.S. PIPE 18" .064	C.S. PIPE 24" .064	C.S. PIPE 24"	C.S. PIPE 30" .079	C.S. PIPE 30"	C.S. PIPE 36" .079	C.S. PIPE 36"	C.S. PIPE 42" .109	C.S. PIPE 42"	C.S. PIPE 48" .109	C.S. PIPE 48"	CLASS III R.C. PIPE (UNLESS OTHERWISE NOTED) 12"	CLASS III R.C. PIPE 15"	CLASS III R.C. PIPE 18"	CLASS III R.C. PIPE 24"	CLASS III R.C. PIPE 30"	CLASS III R.C. PIPE 36"	CLASS III R.C. PIPE 42"	CLASS III R.C. PIPE 48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	ENDWALLS CU. YDS. C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	* TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. *FT. A 5.0' THRU 10.0'	LIN. *FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	TYPE OF GRATE F	TYPE OF GRATE G		D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME & GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	G.D.I STD. 840.35 AND 340.20	G.D.I. FRAME (N.S. FLAT) W/2 STD. 840.29	T.B.D.I STD. 840.35	T.B.D.I WITH FRAME & GRATE STD. 840.35				CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.	REMARKS
16+60 -L-	RT	0401								20'																																																													
TOTALS										20'																																																													

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I. (N.S.)	GRATED DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

SUMMARY OF EARTHWORK
IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+25%	BORROW	WASTE
-L- STA. 10+25.00 TO 17+50.00	347		1192	1019	173
TOTAL	347		1192	1019	173
PROJECT TOTALS	347		1192	1019	173
5% TO REPLACE TOP SOIL				51	
GRAND TOTALS	347		1192	1070	173
SAY	350			1070	
DDE = 40 CY					

APPROXIMATE QUANTITIES ONLY. CLEARING AND GRUBBING, UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, REMOVAL OF EXISTING PAVEMENT, AND FINE GRADING WILL BE PAID FOR AT THE CONTRACT LS PRICE FOR GRADING.

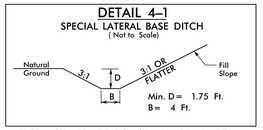
SUMMARY OF PAVEMENT REMOVAL

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD'
-L-	12+50.00	16+50.00	CL	882
			TOTAL:	882
			SAY:	890

27-AUG-2019 14:31
970091_Rdy_sum.dgn
faith.jahnke

8/17/99

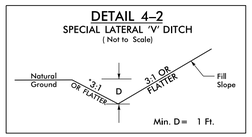
DETAIL 4-1
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D = 1.75 Ft.
B = 4 Ft.

FROM STA. 10+25 TO STA. 11+25 -L- RT

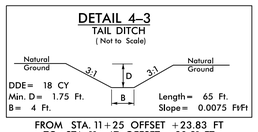
DETAIL 4-2
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D = 1 Ft.

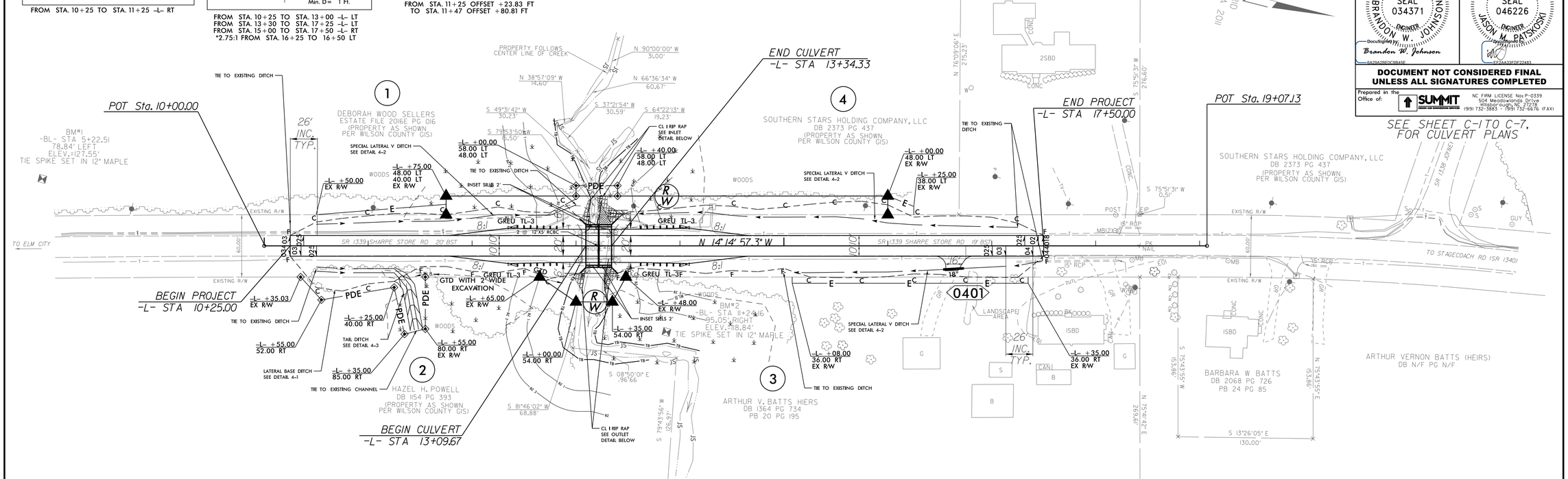
FROM STA. 10+25 TO STA. 13+00 -L- LT
FROM STA. 13+30 TO STA. 17+25 -L- LT
FROM STA. 15+00 TO STA. 17+50 -L- RT
*2.75:1 FROM STA. 16+25 TO 16+50 LT

DETAIL 4-3
TAIL DITCH
(Not to Scale)



DDE= 18 CY
Min. D= 1.75 Ft.
B= 4 Ft.
Length= 65 Ft.
Slope= 0.0075 Ft/Ft

FROM STA. 11+25 OFFSET +23.83 FT
TO STA. 11+47 OFFSET +80.81 FT



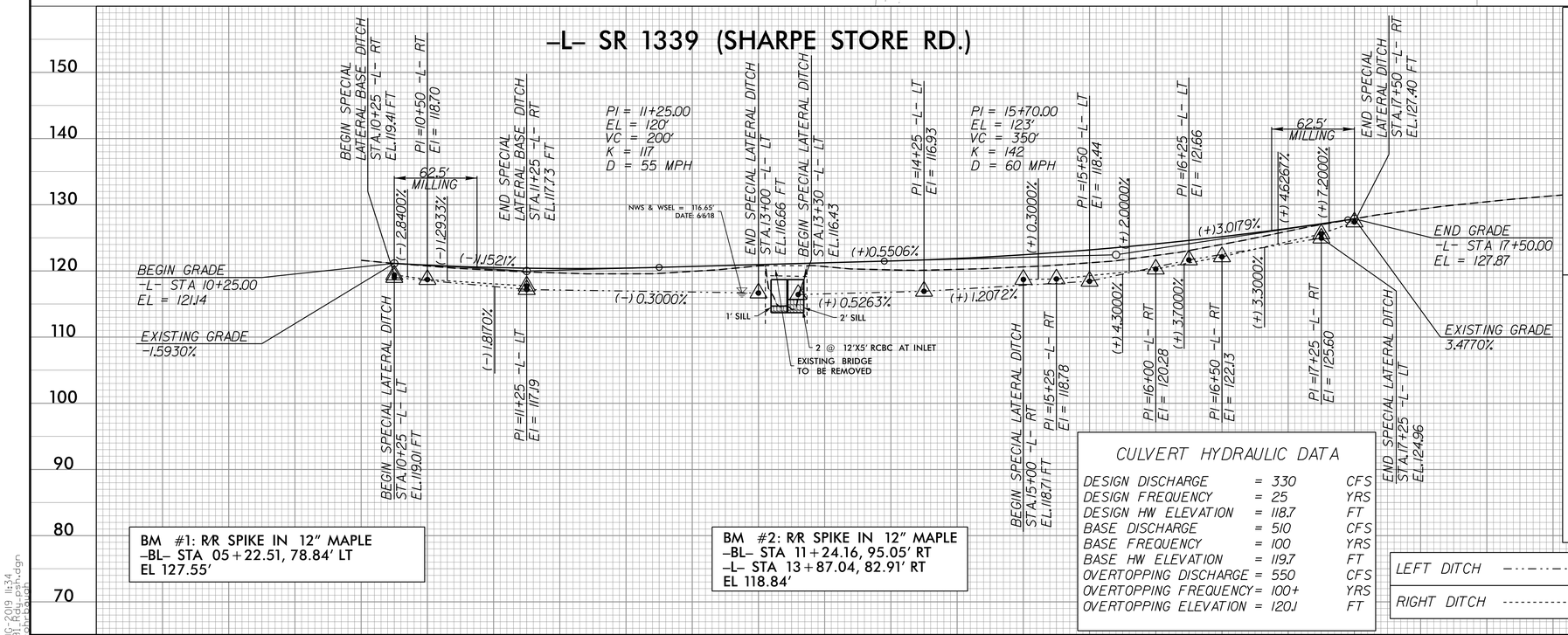
PROJECT REFERENCE NO.	SHEET NO.
17BP.4.R.94	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
8/5/2019
NORTH CAROLINA PROFESSIONAL SEAL 034371 ENGINEER BRANDON W. JOHNSON
DocuSigned by: Brandon W. Johnson
6A29A29E0C984AE...

HYDRAULICS ENGINEER
8/5/2019
NORTH CAROLINA PROFESSIONAL SEAL 046226 ENGINEER JASON M. PATSKOSKI
DocuSigned by: Jason Patskoski
E72AA3EDF324483...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of: SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE Nos P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883 • (919) 732-6676 (FAX)



BM #1: R/R SPIKE IN 12" MAPLE
-BL- STA 05+22.51, 78.84' LT
EL 127.55'

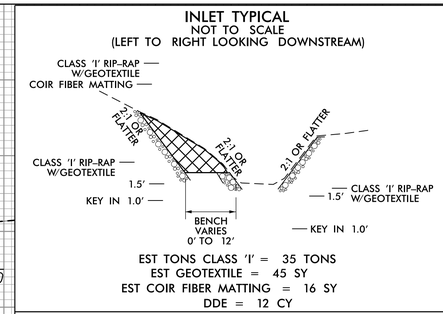
BM #2: R/R SPIKE IN 12" MAPLE
-BL- STA 11+24.16, 95.05' RT
-L- STA 13+87.04, 82.91' RT
EL 118.84'

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 330	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 118.7	FT
BASE DISCHARGE	= 510	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 119.7	FT
OVERTOPPING DISCHARGE	= 550	CFS
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING ELEVATION	= 120.1	FT

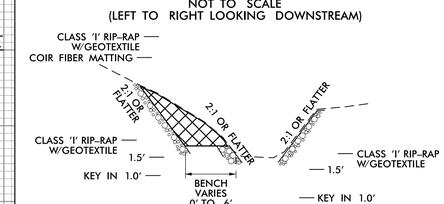
LEFT DITCH
RIGHT DITCH

INLET TYPICAL
NOT TO SCALE
(LEFT TO RIGHT LOOKING DOWNSTREAM)



EST TONS CLASS 'I' = 35 TONS
EST GEOTEXTILE = 45 SY
EST COIR FIBER MATTING = 16 SY
DDE = 12 CY

OUTLET TYPICAL
NOT TO SCALE
(LEFT TO RIGHT LOOKING DOWNSTREAM)

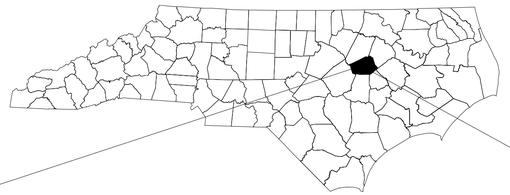


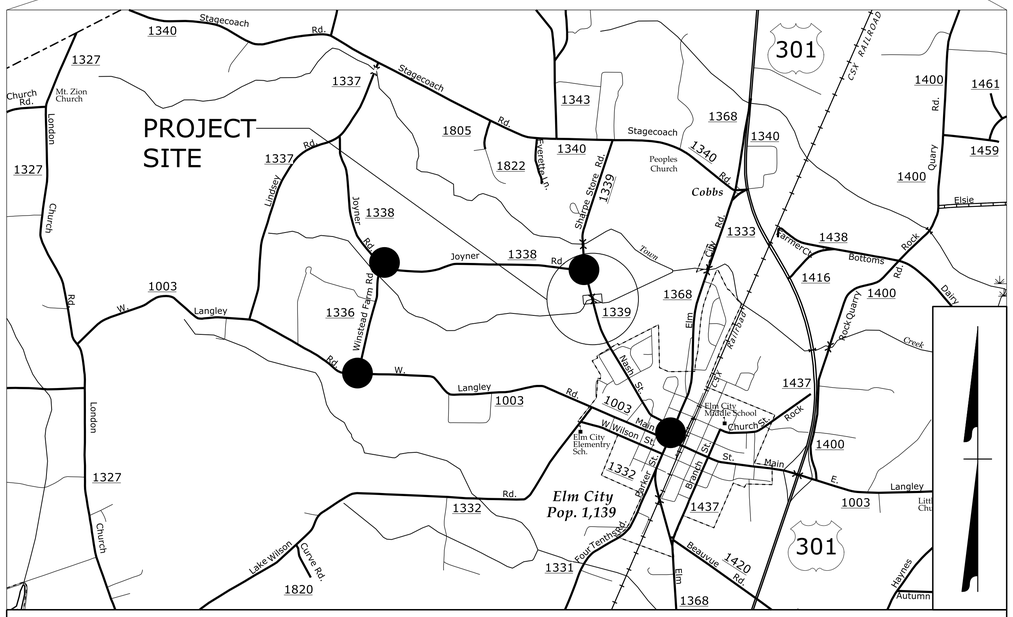
EST TONS CLASS 'I' = 19 TONS
EST GEOTEXTILE = 23 SY
EST COIR FIBER MATTING = 6 SY
DDE = 5 CY
NOTE: BACKFILL TO TOP OF SILLS W/CLASS B RIP RAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

WILSON COUNTY
(BRIDGE NO. 970091)





VICINITY MAP

● DETOUR ROUTE

INDEX OF SHEETS

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
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.03	TEMPORARY ROAD CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICARDES TYPE III

LEGEND

- DIRECTION OF TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- WORK AREA
- BARRICADE (TYPE III)
- STATIONARY SIGN

SHEET NO.
TMP-1

17BP.4.R.94

PROJECT:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

N.C.D.O.T. WORK ZONE TRAFFIC CONTROL
1561 MAIL SERVICE CENTER (MSC) RALEIGH, NC 27699-1561
750 N. GREENFIELD PARKWAY, GARNER, NC 27529 (DELIVERY)
PHONE: (919) 773-2800 FAX: (919) 771-2745

J. E. HUMMER, PE. — STATE TRAFFIC MANAGEMENT ENGINEER
J. S. BOURNE, PE. — TRAFFIC CONTROL PROJECT ENGINEER
B. W. JOHNSON, PE — TRAFFIC CONTROL PROJECT DESIGN ENGINEER
SARA LOUKILI — TRAFFIC CONTROL DESIGNER

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

Prepared in the Office of:
SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

APPROVED: DocuSigned by: J. Stuart Bourne 267656C76F1246D...
DATE: 8/5/2019
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19680 ENGINEER J. STUART BOURNE

Prepared in the Office of: SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE Nos P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

PROJ. REFERENCE NO.	SHEET NO.
17BP.4.R.94	TMP-1A

MANAGEMENT STRATEGIES

BRIDGE #970091 ON SR 1339 (SHARPE STORE RD.) REPLACEMENT TO BE PERFORMED UNDER ROAD CLOSURE WITH AN INTERMEDIATE CONTRACT TIME.

LOCAL ACCESS TO ALL RESIDENCES AND BUSINESSES WILL BE MAINTAINED BETWEEN CLOSURE POINTS AT ALL TIMES DURING CONSTRUCTION.

BRIDGE #970091 SHALL BE CONSTRUCTED PRIOR TO CONSTRUCTING BRIDGE #970092

PHASING

THE CONTRACTOR SHALL COMPLETE STEPS 1 THROUGH 3 IN 90 DAYS. SEE INTERMEDIATE CONTRACT TIME AND LIQUIDATED DAMAGES.

PROVIDE ENGINEER A THIRTY (30) DAY WRITTEN NOTICE PRIOR TO ROAD CLOSURE.

STEP 1:

USING RSD 1101.03 IMPLEMENT OFF–SITE DETOUR AND ROAD CLOSURE FOR SR 1339 AT BRIDGE #970091 AS SHOWN ON SHEET TMP–2 AND TMP–3 AND IN ACCORDANCE WITH THE GENERAL NOTES. COVER ALL ADVANCE WARNING SIGNS AND DETOUR SIGNS PRIOR TO ROAD CLOSURE.

STEP 2:

WITH SR 1339 CLOSED TO TRAFFIC PERFORM ALL BRIDGE REPLACEMENT OPERATIONS. PRIOR TO OPENING THE ROADWAY TO TRAFFIC, PLACE FINAL PAVEMENT MARKINGS.

STEP 3:

UPON COMPLETION OF BRIDGE WORK REMOVE THE ROAD CLOSURE AND DETOUR SIGNS AND OPEN SR 1339 TO TRAFFIC.

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSION 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 THIRTY (30) 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 CONTROL PLANS.

C) PROVIDE SIGNING REQUIRED FOR THE OFF–SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS. COVER OR REMOVE SIGNS WHEN DETOUR IS NOT IN OPERATION.

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

TRAFFIC CONTROL DEVICES

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

PAVEMENT MARKINGS AND MARKERS

F) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE, AS SHOWN IN THE PAVEMENT MARKING PLAN.

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

APPROVED: DocuSigned by: J. Stuart Bourne 287656C76F1246D...
DATE: 8/28/2019
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19680 ENGINEER J. STUART BOURNE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TRANSPORTATION OPERATIONS PLAN

27-AUG-2019 14:34
97009_TC_TMP_1A.dgn
fatrn,jonnke

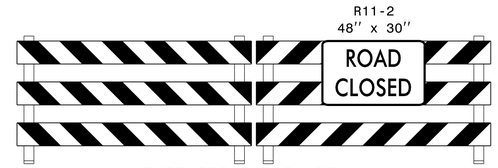
Prepared in the Office of: SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

PROJ. REFERENCE NO.	SHEET NO.
17BP.4.R.94	TMP-2

A

B

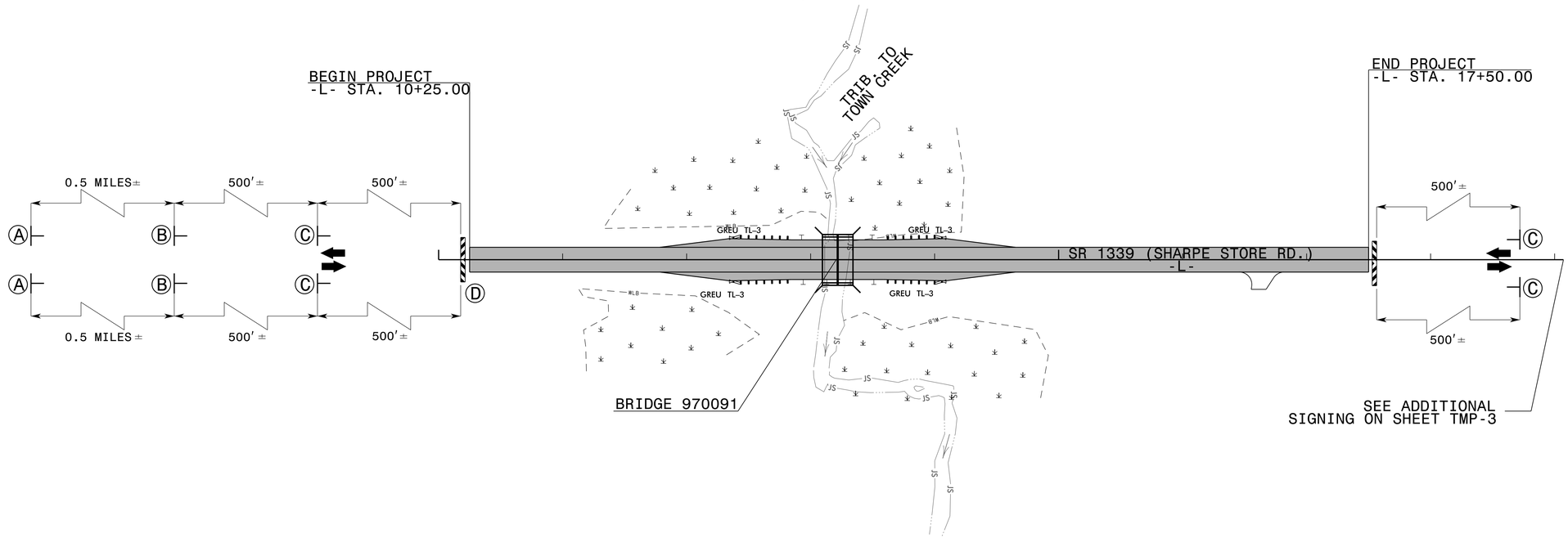
C

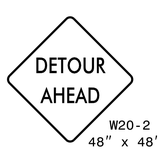


TYPE III BARRICADE(S)

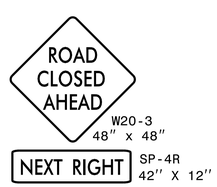
D

5

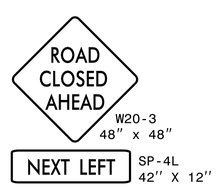




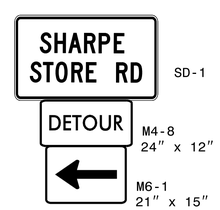
E



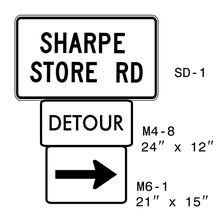
F



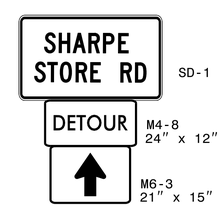
G



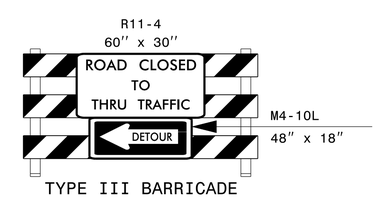
H



I

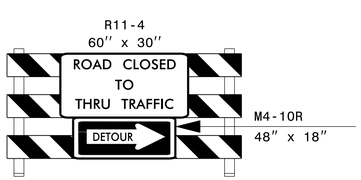


J



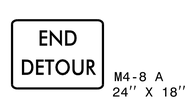
TYPE III BARRICADE

K



TYPE III BARRICADE

L



M

APPROVED: DocuSigned by: J. Stuart Bourne 287656C76F1246D...

DATE: 8/5/2019

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19680 ENGINEER J. STUART BOURNE

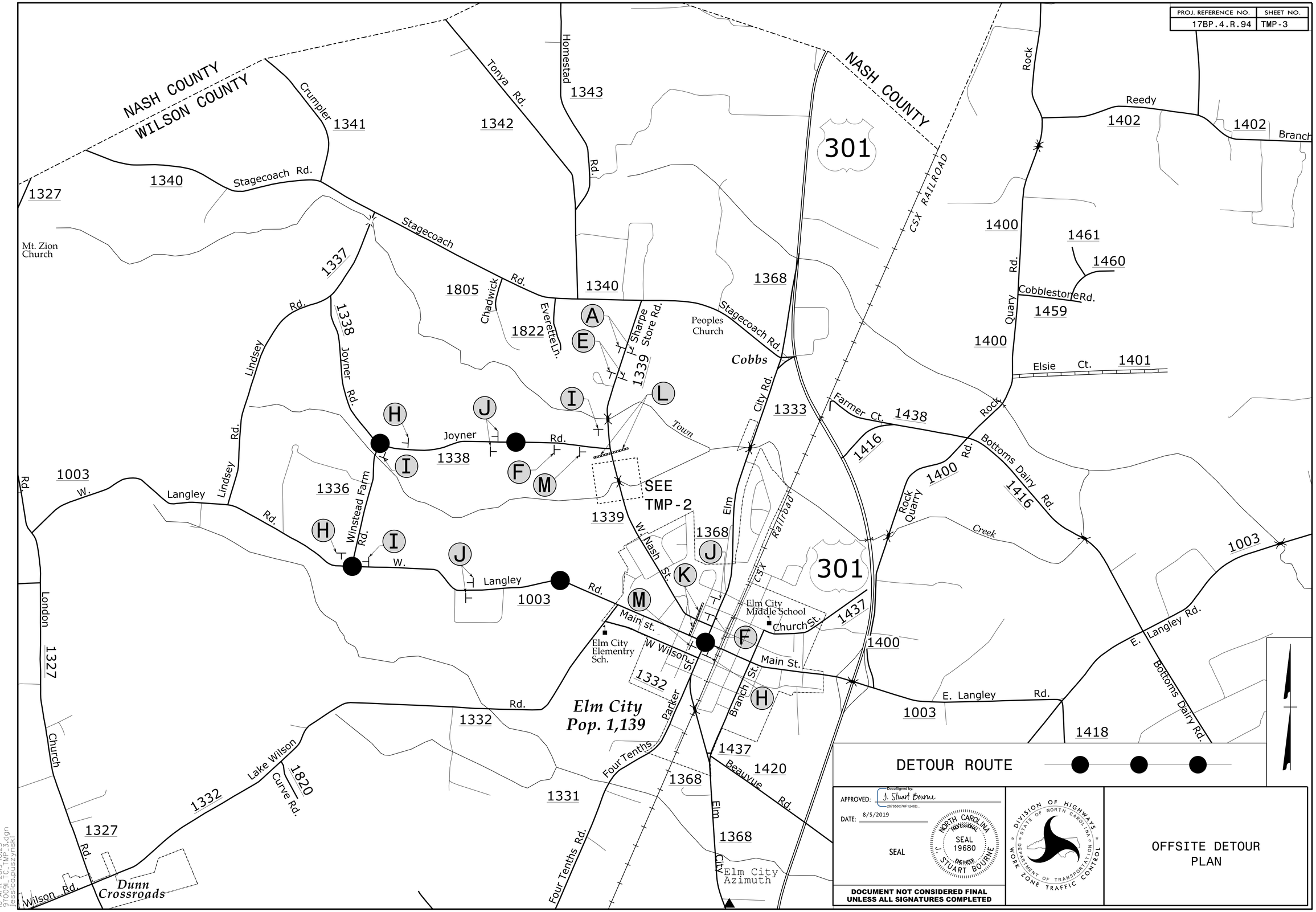
DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PHASE 1 DETAIL DRAWING

10-APR-2019 10:23
97009_TC_TMP_2.dgn
jessica.puszynski

PROJ. REFERENCE NO.	SHEET NO.
17BP.4.R.94	TMP-3



DETOUR ROUTE

APPROVED: DocuSigned by: J. Stuart Bourne 267656C76F1246D...

DATE: 8/5/2019

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19680 ENGINEER J. STUART BOURNE

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

OFFSITE DETOUR PLAN

10-APR-2019 10:23
97009_TC_TMP_3.dgn
jessica.puszynski

Prepared in the Office of: SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE Nos P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

PROJ. REFERENCE NO.	SHEET NO.
17BP.4.R.94	SD-1

SIGN NUMBER: SD-1
TYPE: STATIONARY
QUANTITY: SEE PLANS

BACKG COLOR: Fluorescent Orange
COPY COLOR: Black

SIGN WIDTH: 3'-6"
HEIGHT: 2'-0"
TOTAL AREA: 7.0 SF

BORDER TYPE: INSERT
RECESS: 0.50"
WIDTH: 0.375"
RADII: 1.50"

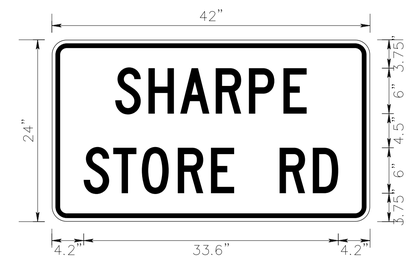
NO. Z BARS: N/A
LENGTH: N/A

SYMBOL	X	Y	WID	HT

MAT'L: 0.080" ALUMINUM

USE NOTES: 1,2
1. Legend and border shall be direct applied black non-reflective sheeting.
2. Background shall be NC GRADE B flourescent orange retroreflective sheeting.

DESIGN BY: SWM
CHECKED BY:
DATE: SEPT 2018
PROJECT ID: 17BP.4.R.94
DIV: 4



BORDER
R=1.50"
TH=0.63"
IN=0.47"

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

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter spacings are to start of next letter

																											Series/Size Text Length
		S	H	A	R	P	E																				C 2000
	8.4	4.4	4.2	4.7	4.4	4.6	3.1	8.4																		25.3	6
		S	T	O	R	E		R	D																		C 2000
	4.2	3.9	3.8	4.7	4.4	3.1	6	4.4	3.4	4.2																33.6	6

FILENAME: 970091_TC_SD-1.dgn

SUMMIT DESIGN & ENGINEERING SIGN DETAIL

APPROVED: DocuSigned by: J. Stuart Bourne 267656C76F1246D...
DATE: 8/5/2019
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19680 ENGINEER J. STUART BOURNE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SPECIAL SIGN DESIGN

10-APR-2019 10:23
970091_TC_SD_1.dgn
jessica.puszynski

PROJECT: 17BP.4.R.94

CONTRACT: DD00301

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WILSON COUNTY

TIP NO.	SHEET NO.
17BP.4.R.94	PMP–1

APPROVED: DocuSigned by: J. Stuart Bourne 267656C76F12460...

DATE: 8/5/2019

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19680 ENGINEER J. STUART BOURNE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LOCATION: BRIDGE NO. 970091 ON SR 1339 (SHARPE STORE RD.) OVER TOWN CREEK

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

ROADWAY STANDARD DRAWING

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 MULTILANE 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 & BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION	QUANTITY
PAINT (4", 2 COATS)		
PA	WHITE EDGE LINE	2900 LF
PI	YELLOW DOUBLE CENTER	2900 LF

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 AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

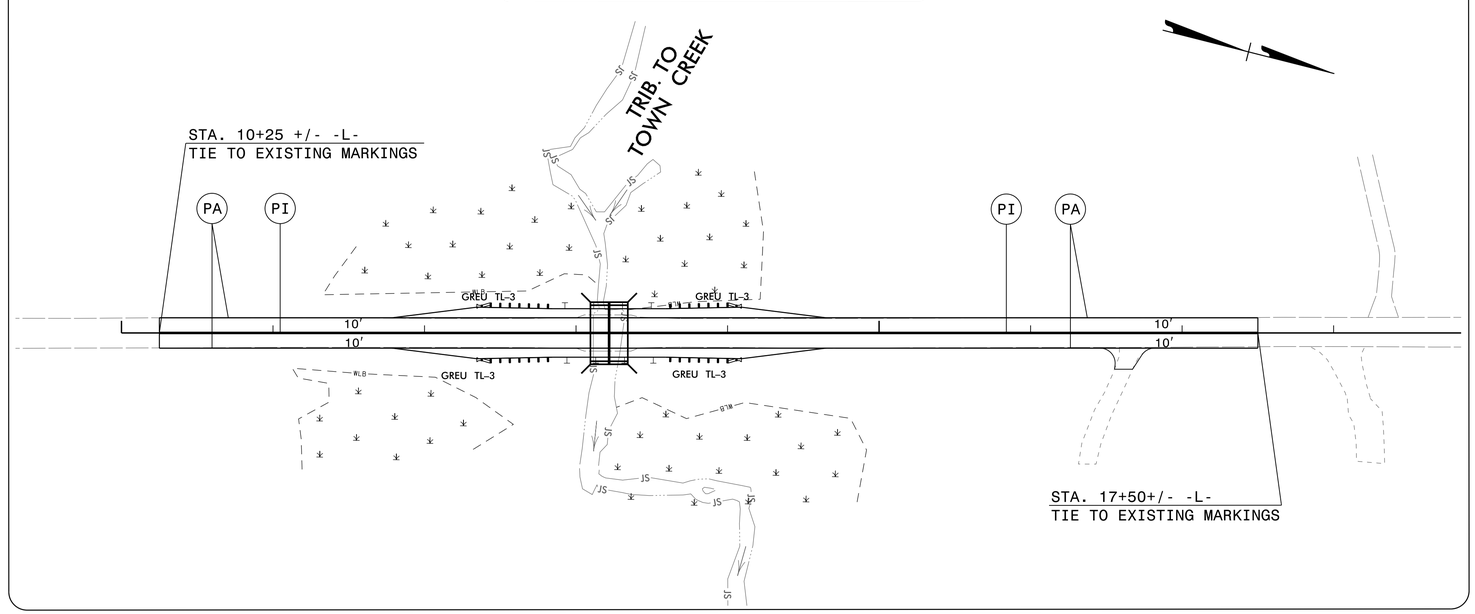
ROAD NAME	MARKING
SHARPE STORE RD.	PAINT

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

C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.

D) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

PAVEMENT MARKING DETAIL



Prepared in the Office of:
SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

J. STUART BOURNE, PE — *PROJECT ENGINEER*

SARA LOUKILI — *PROJECT DESIGNER*

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

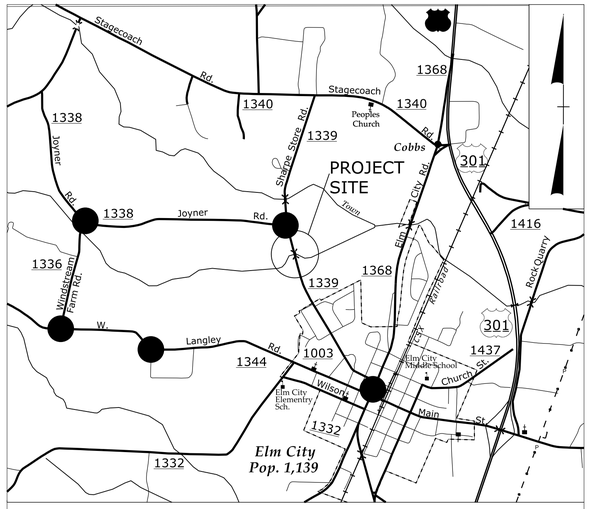
INDEX

10-APR-2019 10:56
970091_PMP_1.dgn
jessica.puszynski

TIP PROJECT: 17BP.4.R.94

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.4.R.94	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION



VICINITY MAP

NOTE: THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

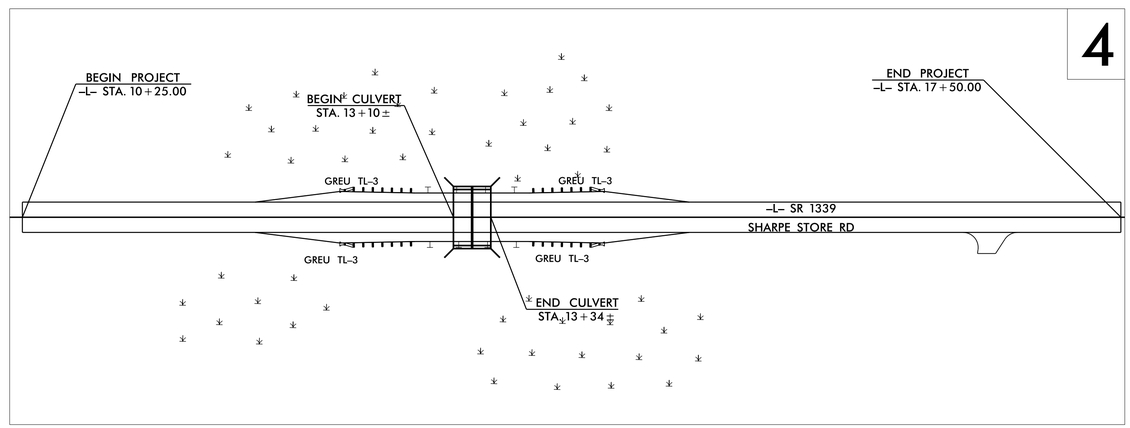
WILSON COUNTY

LOCATION: BRIDGE 970091 ON SHARPE STORE RD. (SR 1339) OVER TOWN CREEK

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

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	
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	



TO SR 1619
BARNES ST.

TO SR 1340
STAGECOACH RD.

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

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

Refer To E. C. Special Provisions for Special Considerations.

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

GRAPHIC SCALE

25 0 50
PLANS

25 0 50
PROFILE (HORIZONTAL)

5 0 10
PROFILE (VERTICAL)

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:

SUMMIT
DESIGN AND ENGINEERING SERVICES
FIRM NO. P-0339

504 Meadowland Drive
Hillsborough, NC 27278-8551
Voice: (919) 732-3883
Fax: (919) 732-6776
www.summitde.net

Designed by:

SARA LOUKILI — *NAME*

4150 — *LEVEL III CERTIFICATION NO.*

Reviewed In the Office of:

ROADSIDE ENVIRONMENTAL UNIT

1 South Wilmington St.
Raleigh, NC 27611

2018 STANDARD SPECIFICATIONS

Reviewed by:

DONALD R. PEARSON

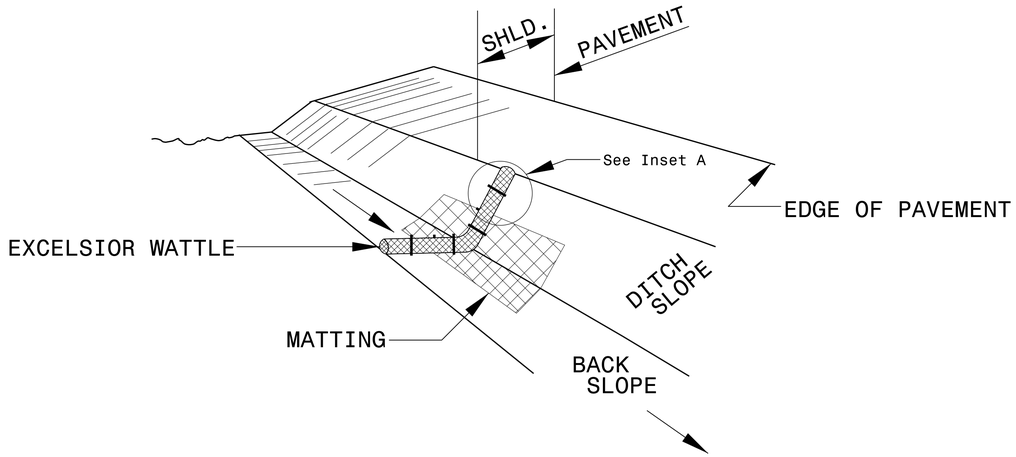
Roadway Standard Drawings

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.

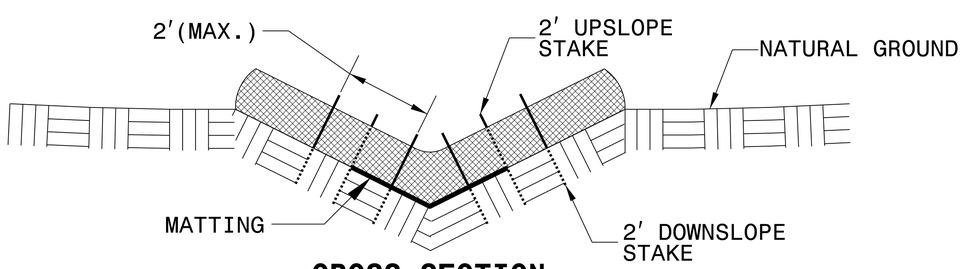
1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type 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		

PROJECT REFERENCE NO.	SHEET NO.
17BP.4.R.94	EC-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

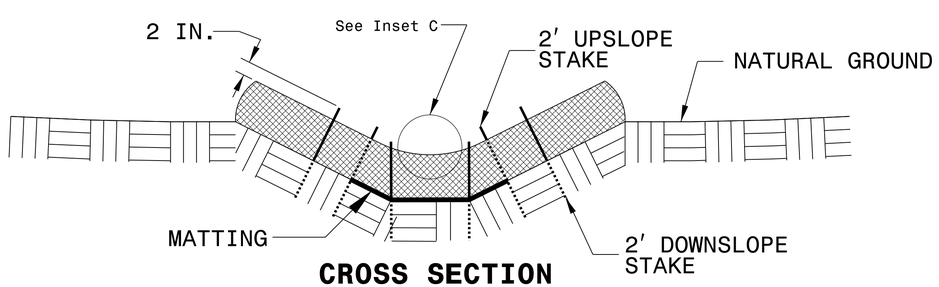
WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER EXCELSIOR 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.

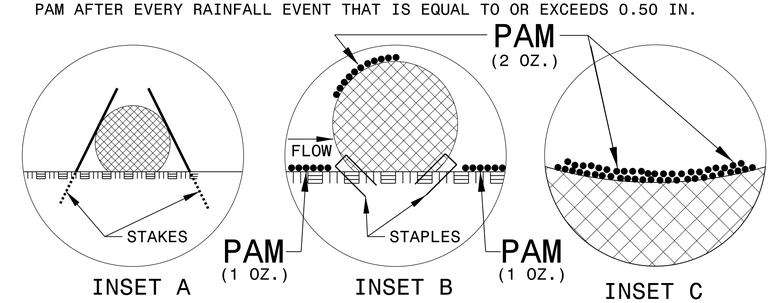
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

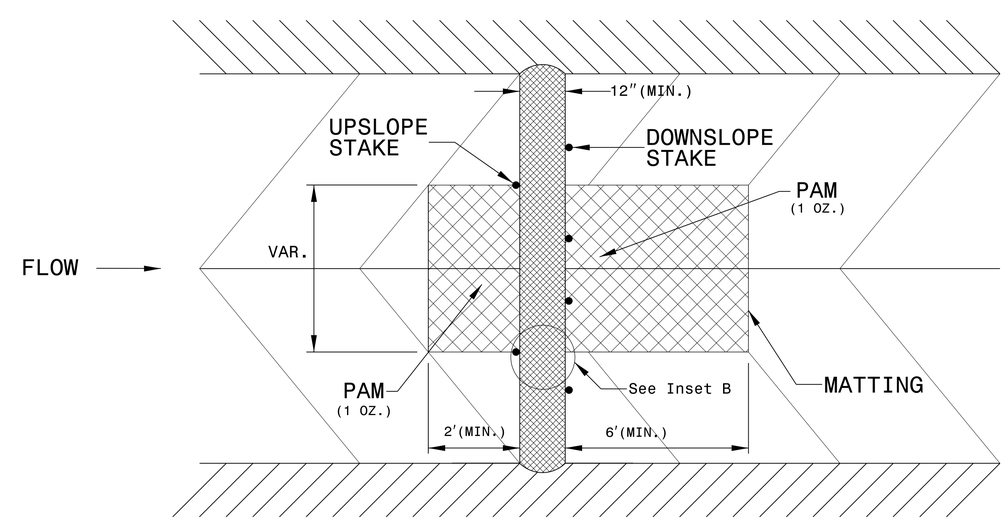
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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

PROJECT REFERENCE NO.	SHEET NO.
17BP.4.R.94	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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.

PROJECT REFERENCE NO.	SHEET NO.
17BP.4.R.94	EC-3A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	L	10+25	11+25	RT	170
4	L	10+25	13+00	LT	70
4	L	13+30	17+25	LT	235
4	L	15+00	17+25	RT	90
4	L	11+25	11+47	RT	110
				SUBTOTAL	675
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					
				TOTAL	675
				SAY	700

PERMANENT SOIL REINFORCEMENT MAT

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
				SUBTOTAL	
		ADDITIONAL PSRM TO BE INSTALLED			
				TOTAL	
				SAY	

PROJECT REFERENCE NO.	SHEET NO.
17BP.4.R.94	EC-4/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

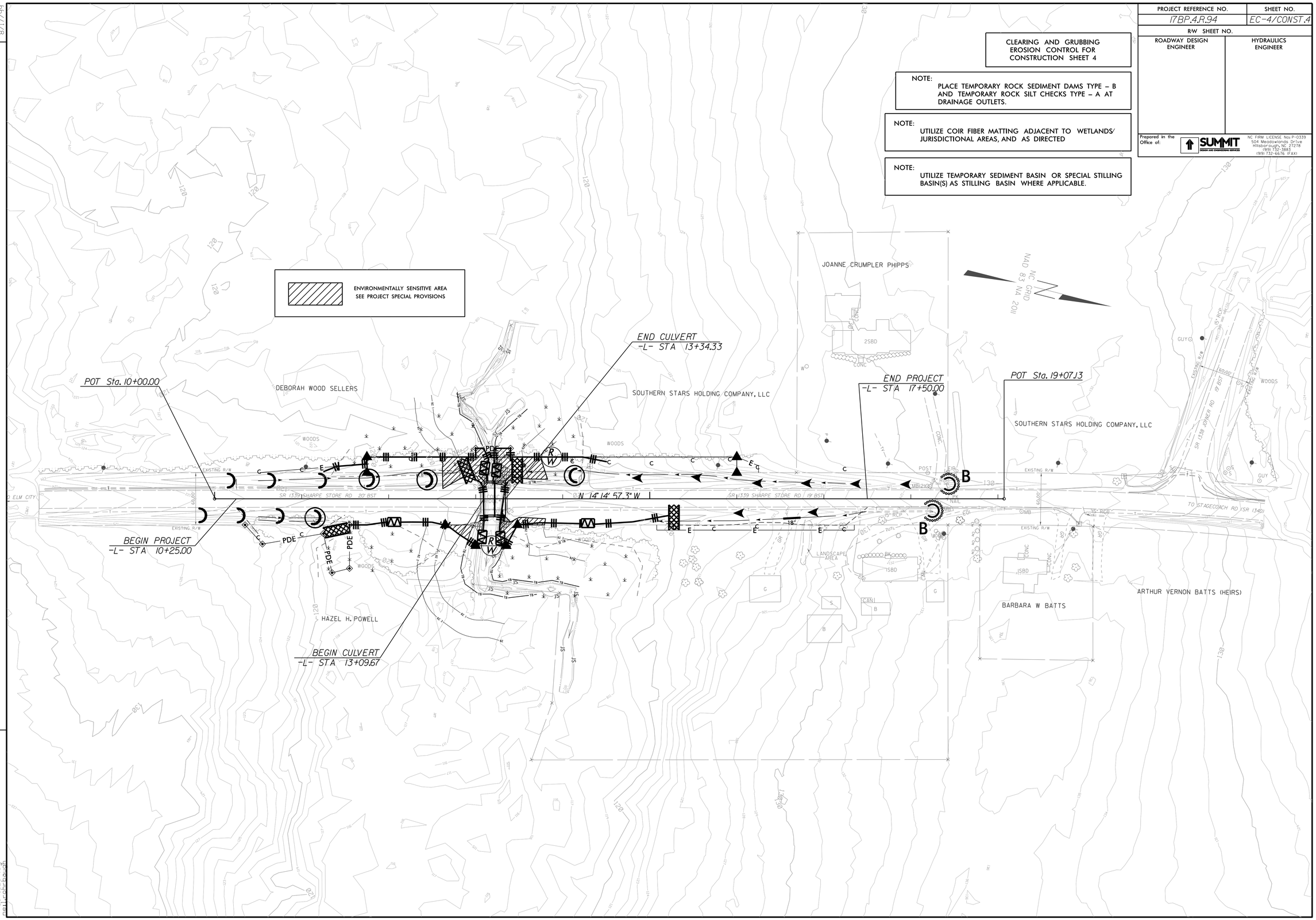
Prepared in the Office of: SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

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

NOTE:
UTILIZE COIR FIBER MATTING ADJACENT TO WETLANDS/ JURISDICTIONAL AREAS, AND AS DIRECTED

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



REVISIONS

8/17/99

07-AUG-2019 08:27
97091_EC4.dgn
ellicoir.ralph

CONSTRUCTION SEQUENCE
2@11'X8' RCBC

PROJECT REFERENCE NO.	SHEET NO.
17BP.4.R.94	EC-5/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PHASE 1
DEMOLITION

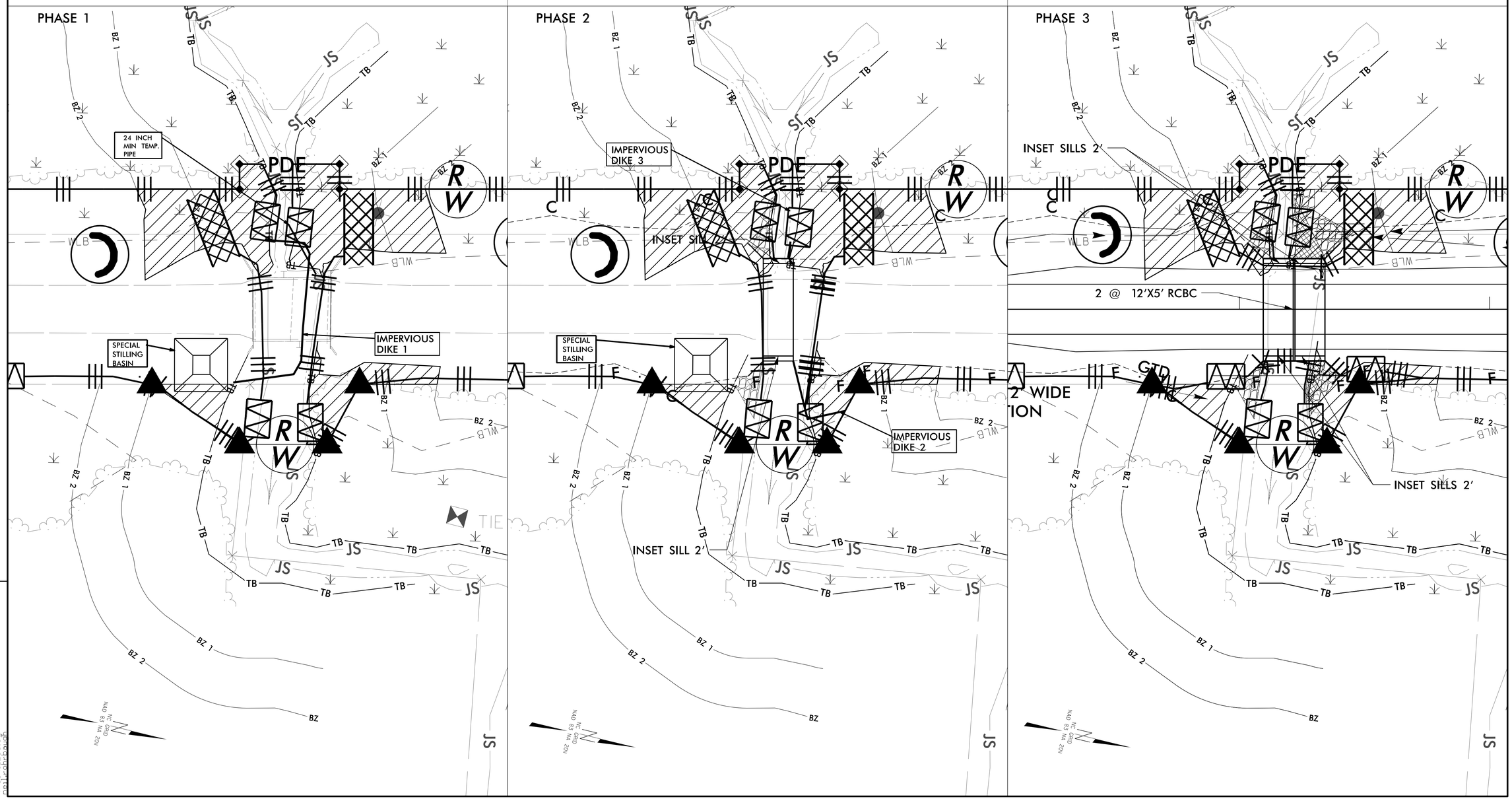
1. INSTALL PERIMETER SEDIMENT CONTROL DEVICES ALONG AND ADJACENT TO STREAM TO THE GREATEST EXTENT POSSIBLE.
2. REMOVE EXISTING BRIDGE.
3. INSTALL IMPERVIOUS DIKE 1 AND 24" TEMPORARY PIPE.
4. CONSTRUCT SOUTH BARREL OF CULVERT.
5. CONSTRUT STREAMBANK/CHANNEL IMPROVEMENT ON SOUTH BARREL (LOW FLOW).
6. DEWATER CONSTRUCTION AREA INTO SPECIAL STILLING BASIN.

PHASE 2
CULVERT CONSTRUCTION

1. REMOVE IMPERVIOUS DIKE 1 AND INSTALL IMPERVIOUS DIKES 2 AND 3 TO DIVERT ALL FLOW THROUGH THE SOUTH BARREL.
3. CONSTRUCT ALL BARREL BACKFILL CLVERT
4. CONSTRUCT STREAMBANK CHANNEL IMPROVEMENT FOR NORTH BARREL.

PHASE 3
CULVERT CONSTRUCTION

1. REMOVE IMPERVIOUS DIKES TO RESTORE NATURAL FLOW.
2. REMOVE SPECIAL STILLING BASIN.



REVISIONS

8/17/99

07-AUG-2019 08:28
970041_EC5.dgn
pelucchi

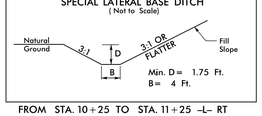
PROJECT REFERENCE NO.	SHEET NO.
17BP.4.R.94	EC-6/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Prepared in the Office of: SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

NOTE:
UTILIZE COIR FIBER MATTING ADJACENT TO WETLANDS/ JURISDICTIONAL AREAS, AND AS DIRECTED

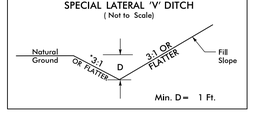
NOTE:
UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

DETAIL 4-1
SPECIAL LATERAL BASE DITCH
(Not to Scale)



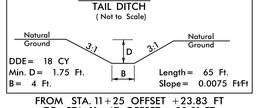
FROM STA. 10+25 TO STA. 11+25 -L- RT

DETAIL 4-2
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

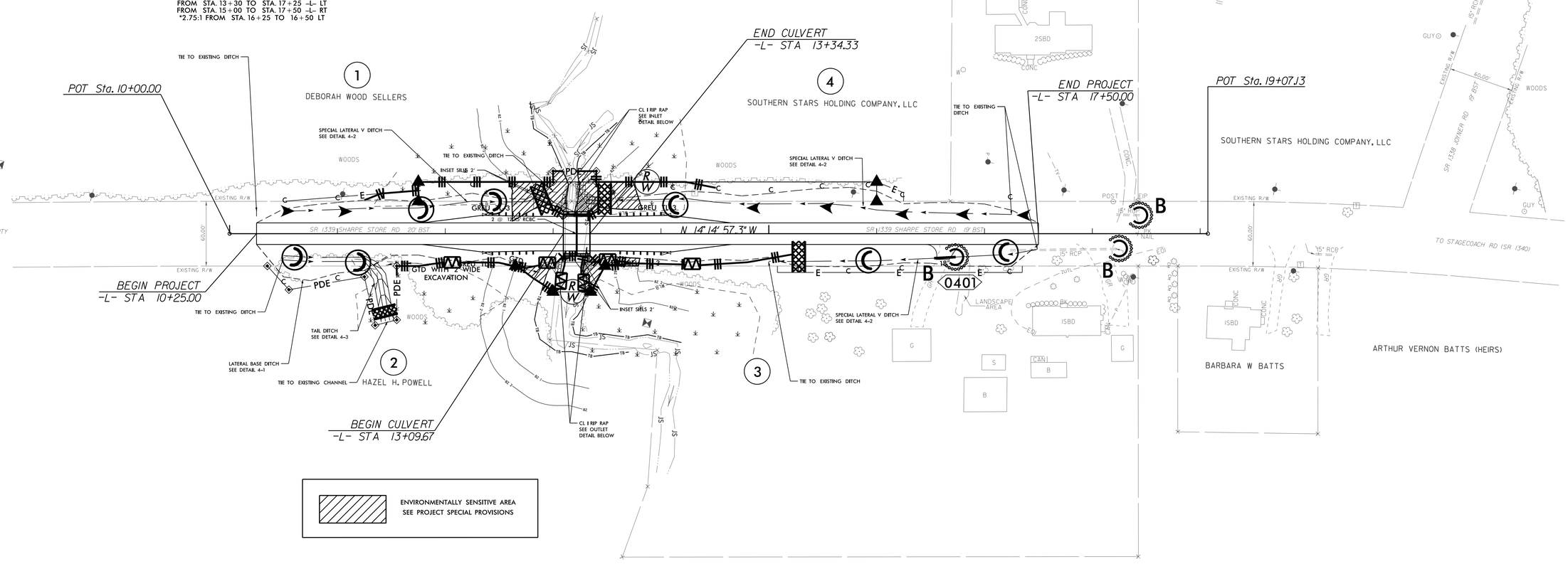


FROM STA. 10+25 TO STA. 13+00 -L- LT
FROM STA. 13+30 TO STA. 17+25 -L- LT
FROM STA. 15+00 TO STA. 17+50 -L- RT
*2.75:1 FROM STA. 16+25 TO 16+50 LT

DETAIL 4-3
TAIL DITCH
(Not to Scale)



FROM STA. 11+25 OFFSET +23.83 FT
TO STA. 11+47 OFFSET +80.81 FT



REVISIONS

8/17/99

07-AUG-2019 08:28
97091_EC6.dgn
eliscobrough

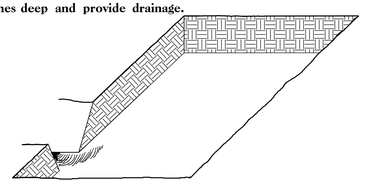
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.4.R.94	RF-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

PLANTING DETAILS

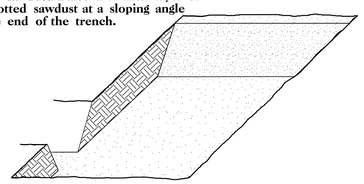
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

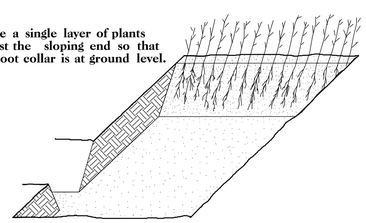
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



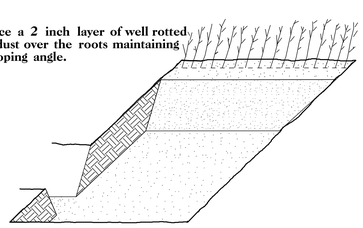
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



4. Place a single layer of plants against the sloping end so that the root collar is at ground level.

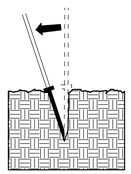


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

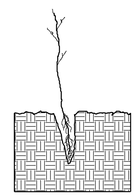


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

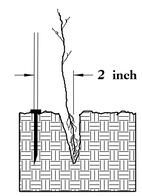
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



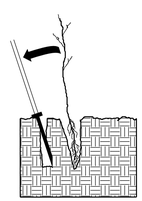
1. Insert planting bar as shown and pull handle toward planter.



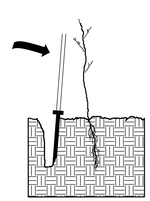
2. Remove planting bar and place seedling at correct depth.



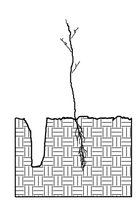
3. Insert planting bar 2 inches toward planter from seedling.



4. Pull handle of bar toward planter, firming soil at bottom.



5. Push handle forward firming soil at top.



6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING BAG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.

KBC PLANTING BAR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.

ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

REFORESTATION

☐ TREE REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

25%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in – 18 in BR
25%	PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	12 in – 18 in BR
25%	FRAXINUS PENNSYLVANICA	GREEN ASH	12 in – 18 in BR
25%	BETULA NIGRA	RIVER BIRCH	12 in – 18 in BR

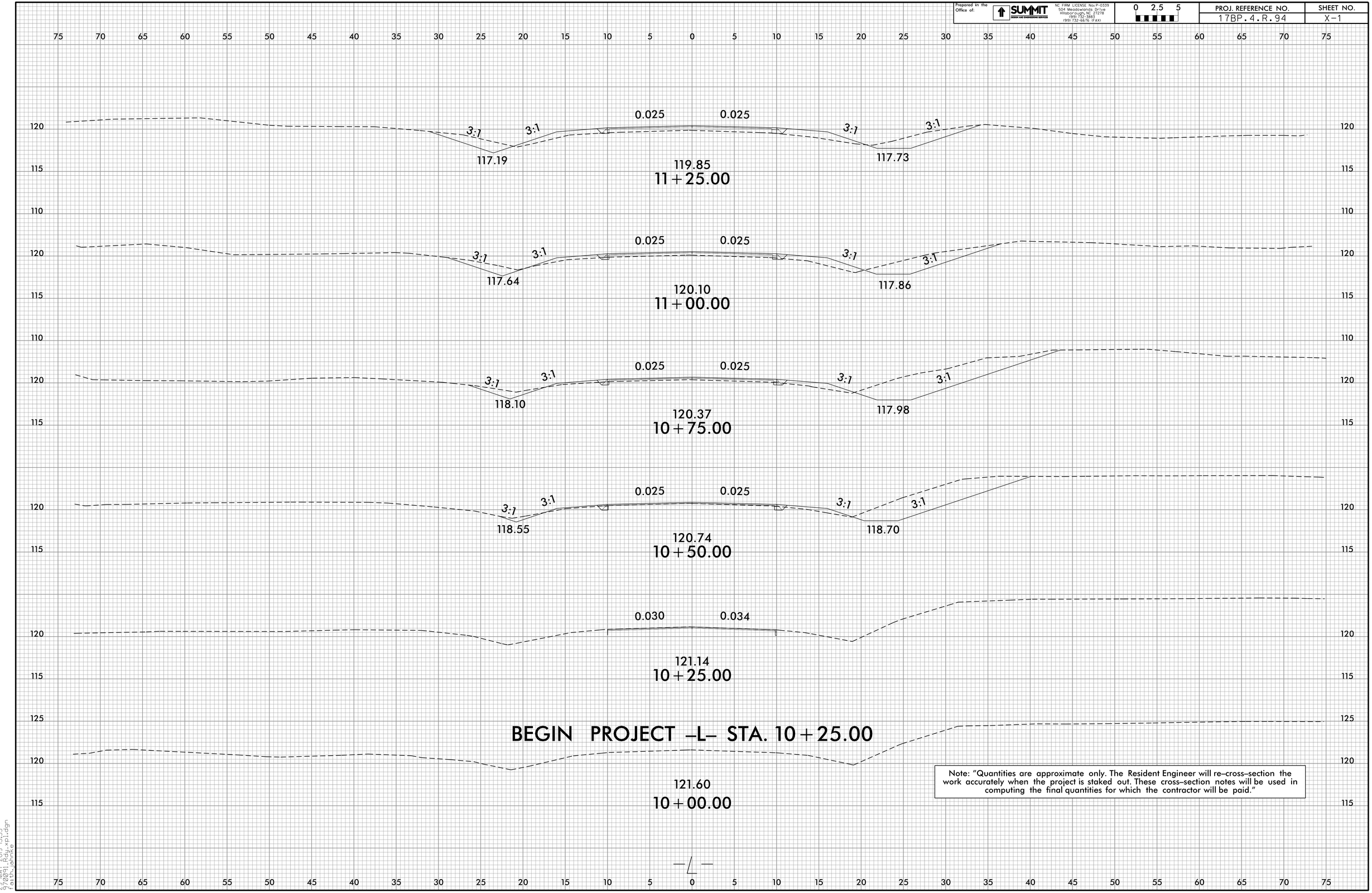
REFORESTATION DETAIL SHEET

N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT

Prepared in the Office of:
SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
17BP.4.R.94	X-1



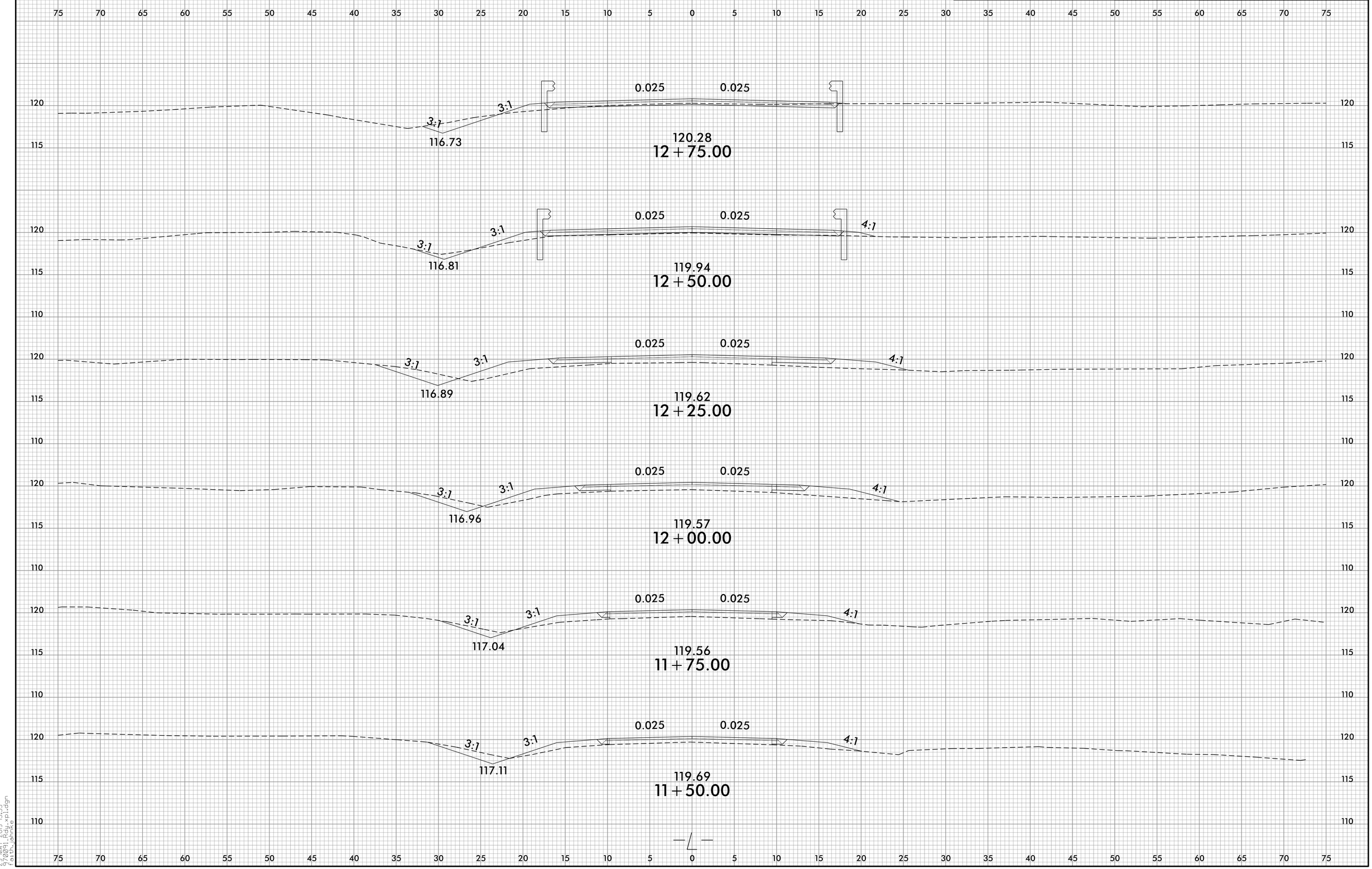
Note: "Quantities are approximate only. The Resident Engineer will re–cross–section the work accurately when the project is staked out. These cross–section notes will be used in computing the final quantities for which the contractor will be paid."

29-MAY-2018 13:35
67001_ROU_xpl.dgn
faith.lahnke

Prepared in the Office of:
SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
17BP.4.R.94	X-2

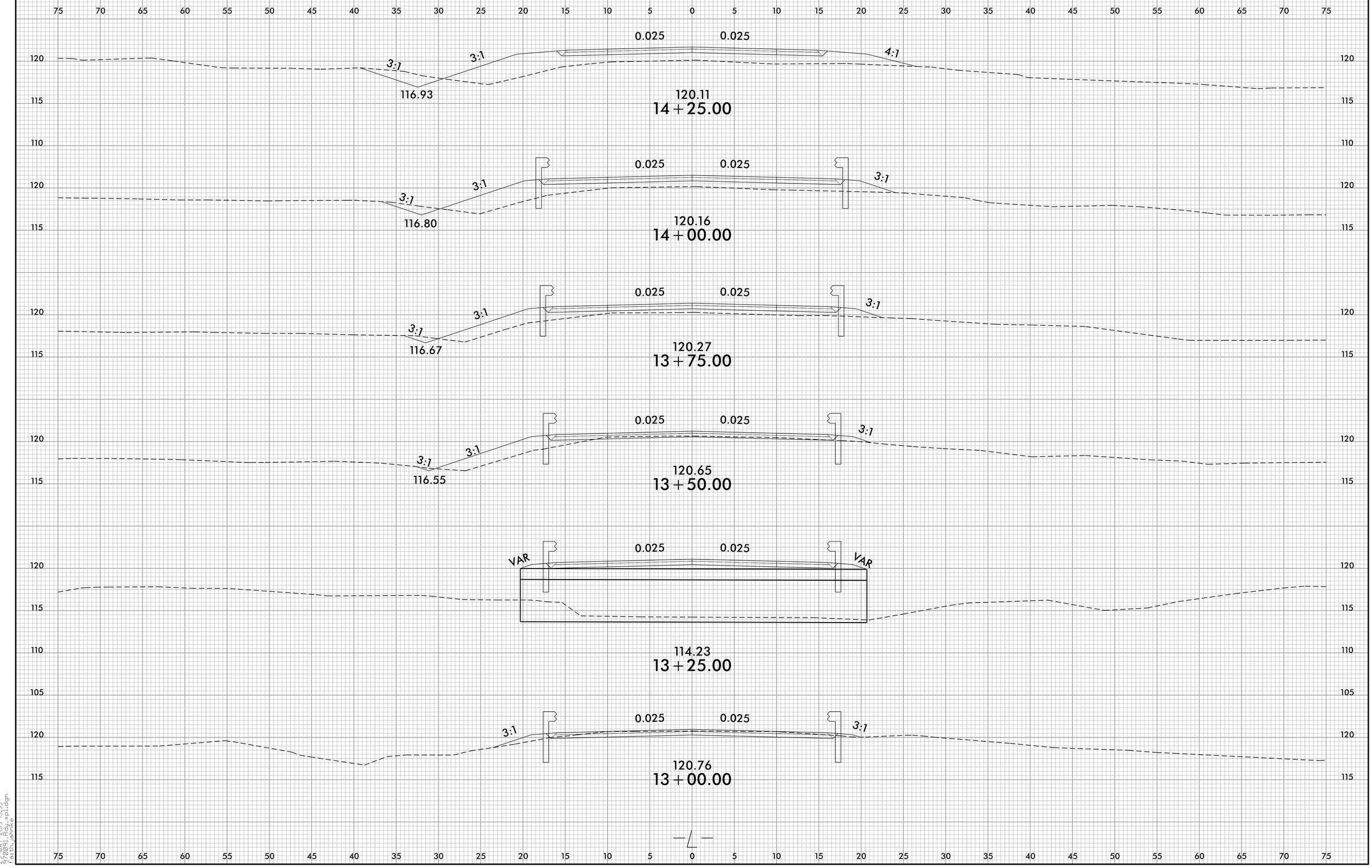


29-MAY-2018 13:35
s7_0091_ro_xpl.dgn
faith.lahnke

Prepared in the Office of:
SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
17BP.4.R.94	X-3

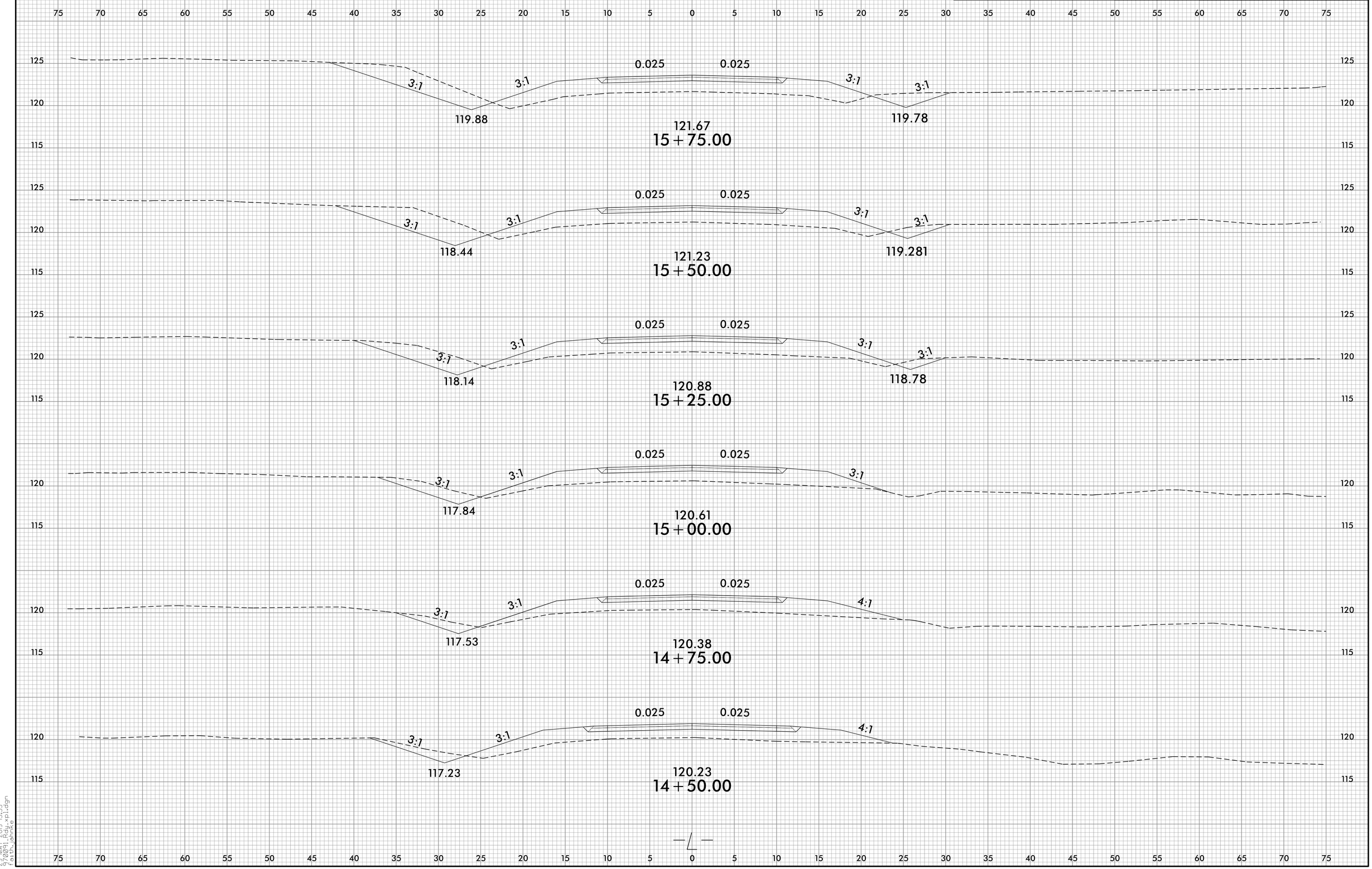


29-MAY-2019 13:35
R2001-01-01 xs1.dgn
faith.henke

Prepared in the Office of:
SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
17BP.4.R.94	X-4

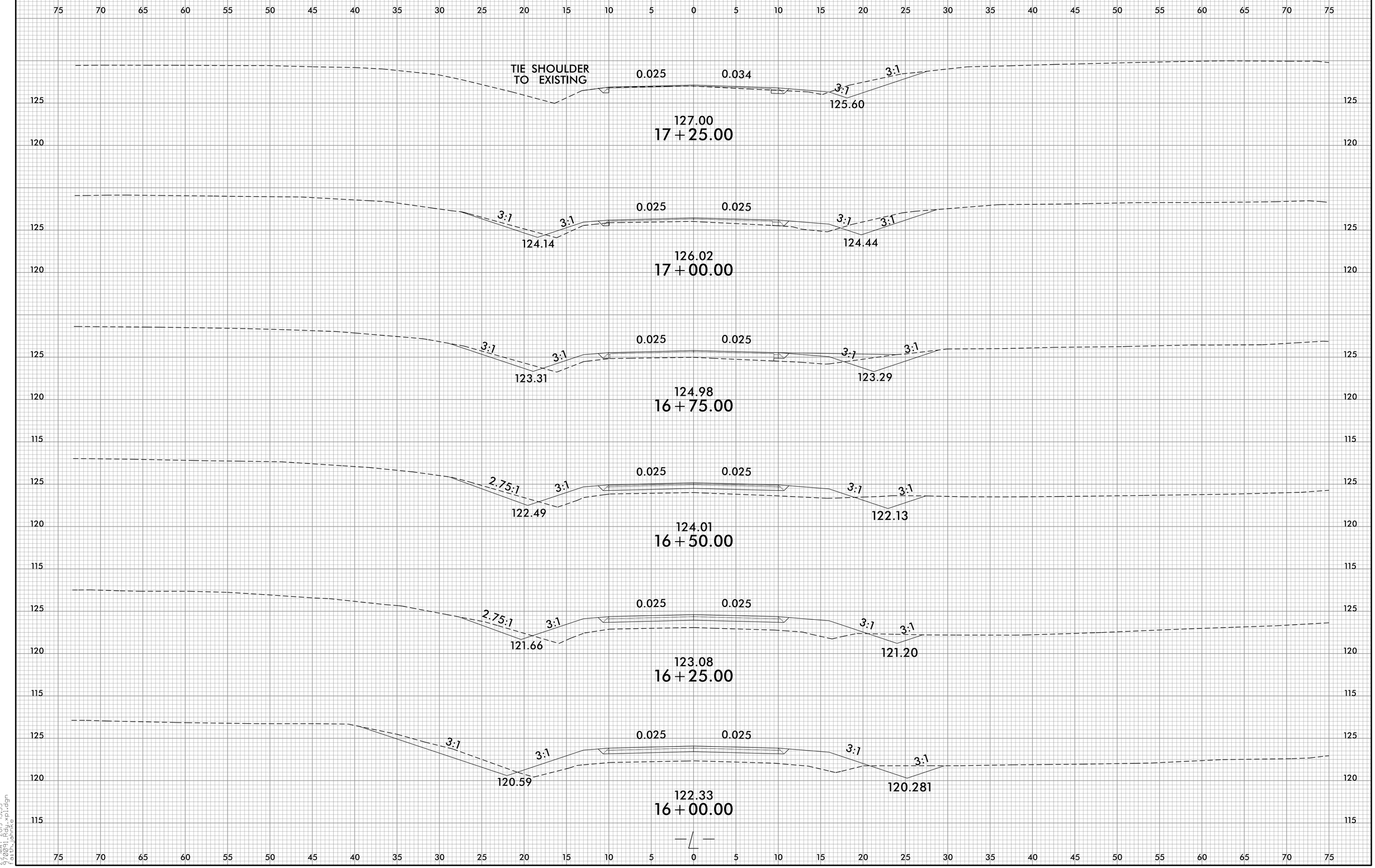


29-MAY-2018 13:35
s7_0091_ro_xpl.dgn
faith.lahnke

Prepared in the Office of: SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
17BP.4.R.94	X-5

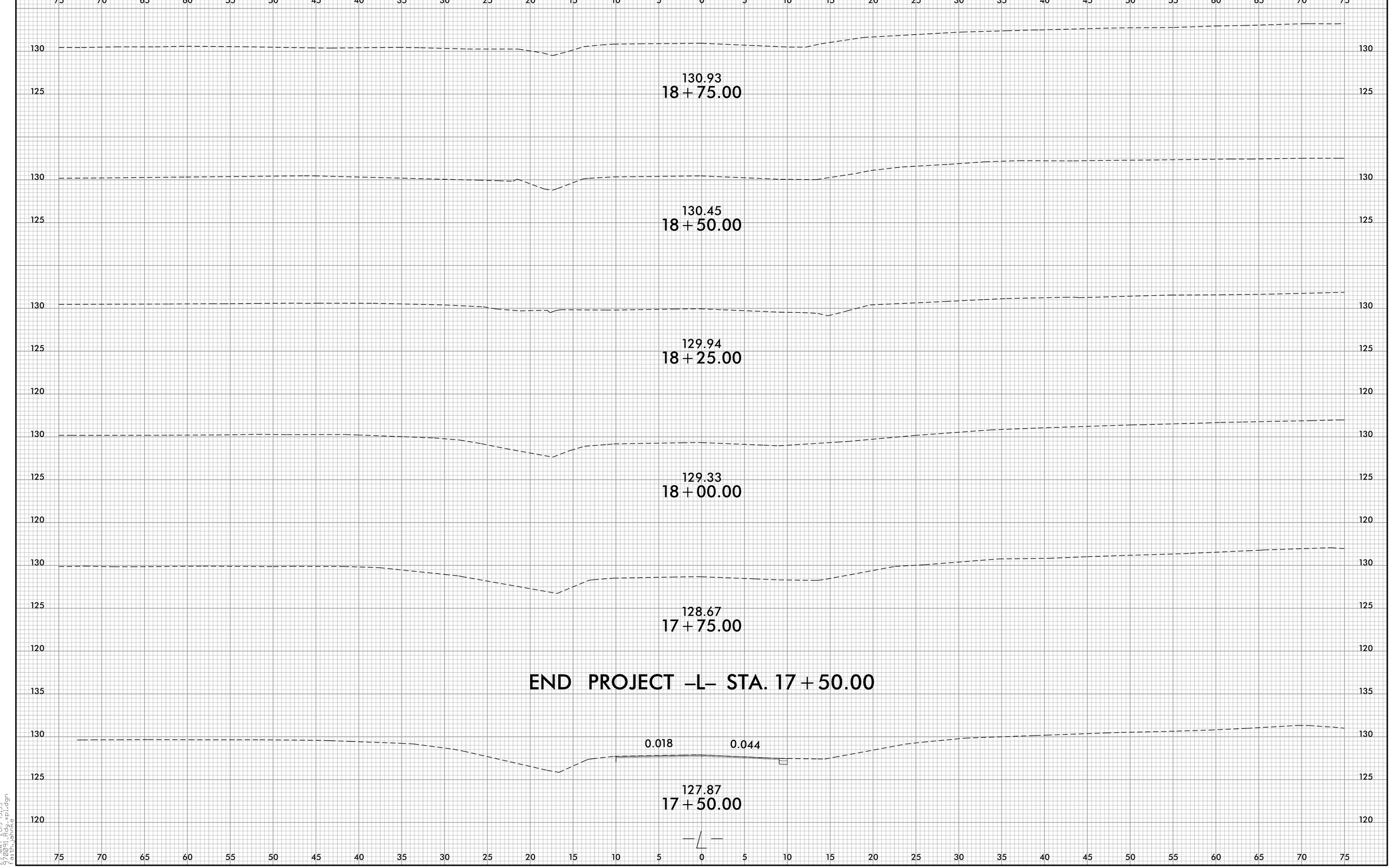


29-MAY-2018 13:35
s7_0091_ro_xpl.dgn
faith.lahnke

Prepared in the Office of:
SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
17BP.4.R.94	X-6

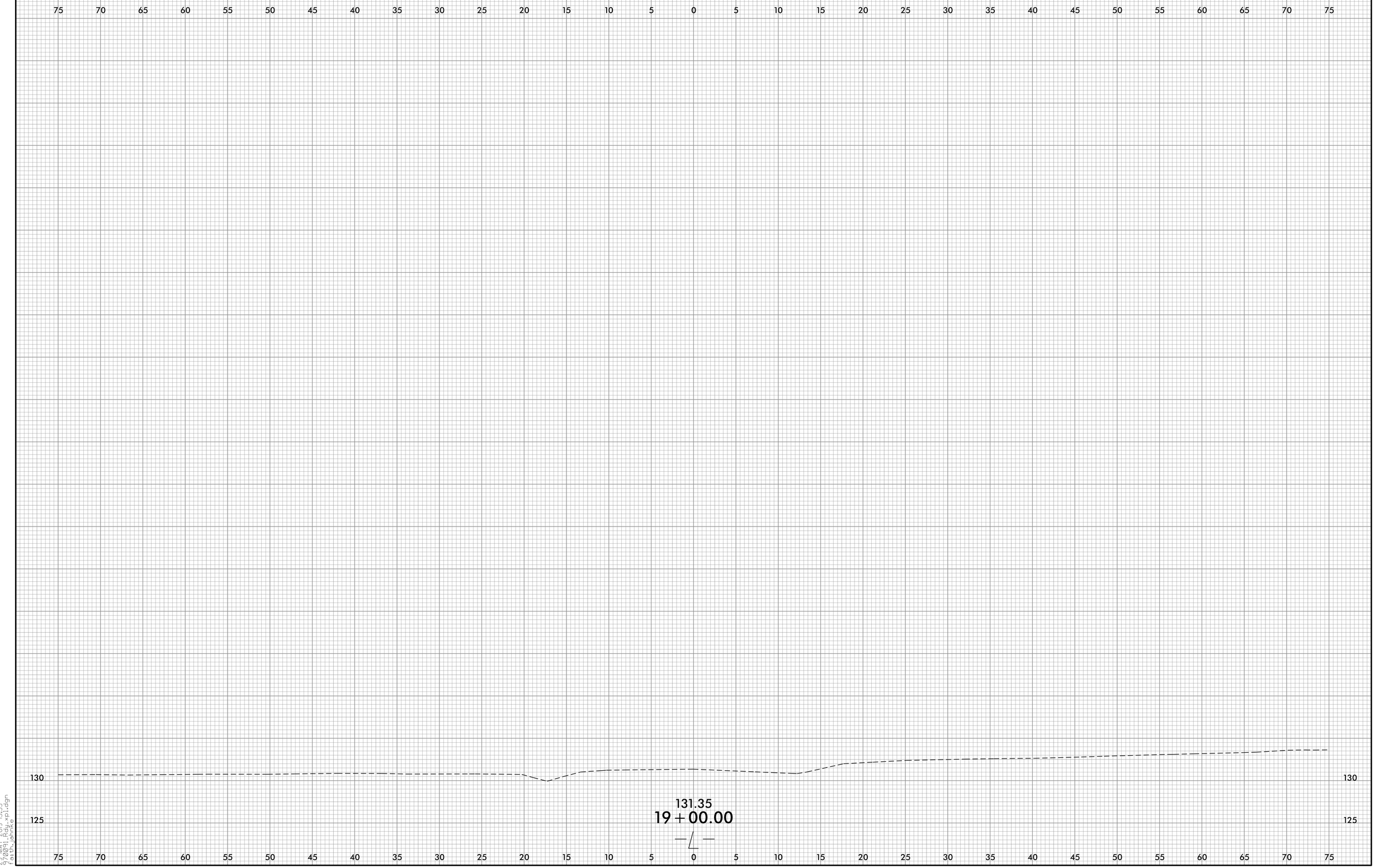


29-MAY-2018 13:35
s7_0091_fod_xplt.dgn
faith.lahnke

Prepared in the Office of:
SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

0 2.5 5

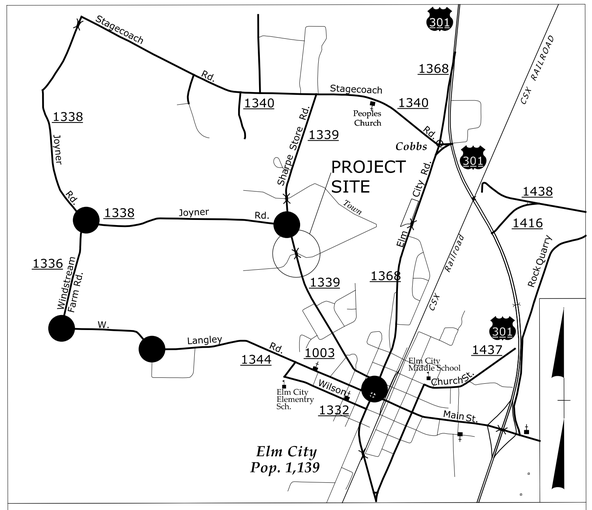
PROJ. REFERENCE NO.	SHEET NO.
17BP.4.R.94	X-7



29-MAY-2018 13:35
s7_0091_fod_xpl.dgn
faith.lahnke

PROJECT: 17BP.4.R.94

CONTRACT NO: DD00281



VICINITY MAP

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES

DETOUR ROUTE

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

WILSON COUNTY

STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.4.R.94		

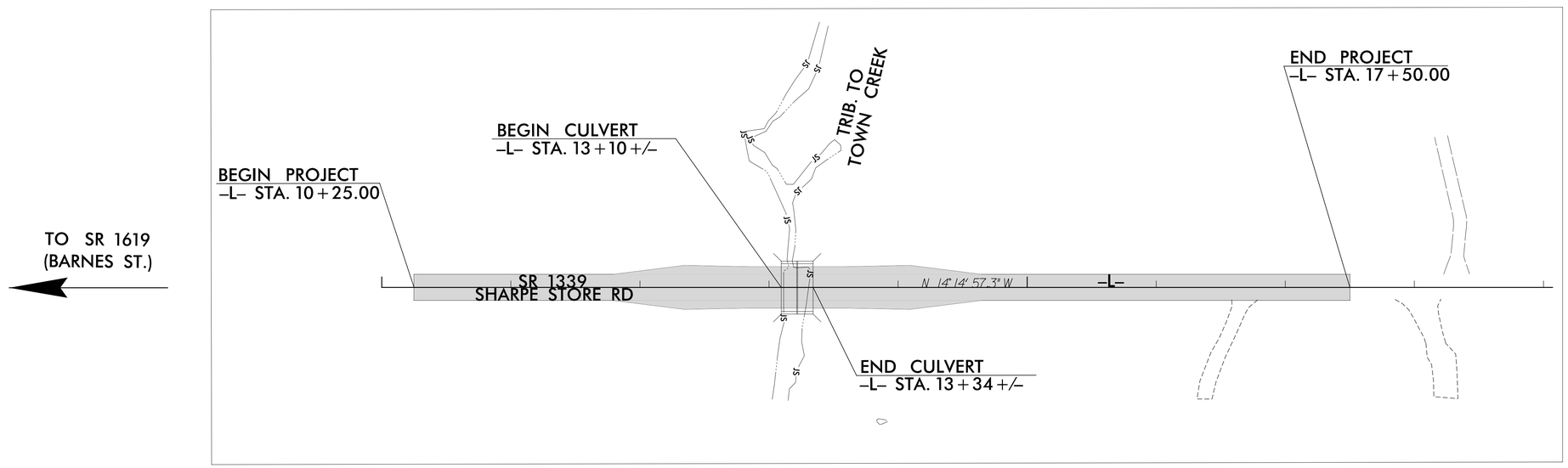
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
17BP.4.R.94		P.E./CONST.

LOCATION: CULVERT 970091 ON SHARPE STORE RD. (SR 1339) OVER TOWN CREEK

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND CULVERT

S N

NC GRID
NAD 83 NA 2011



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

WILSON COUNTY

ADT 2016 = 450
ADT 2025 = 840
T = 6%*
V = 55 MPH

*TTST = 3% DUAL 3%

FUNC CLASS = LOCAL RURAL SUB–REGIONAL TIER

PROJECT LENGTH

WILSON COUNTY

LENGTH ROADWAY PROJECT	=	0.132 MILES
LENGTH STRUCTURES PROJECT	=	0.005 MILES
TOTAL LENGTH PROJECT	=	0.137 MILES

NCDOT CONTACT: CHAD COGGINS
DIVISION 4 CONTACT

PLANS PREPARED BY:

Gannett Fleming
Excellence Delivered As Promised

2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

ERIC B. NELSON, P.E.
PROJECT DESIGN ENGINEER

2018 STANDARD SPECIFICATIONS

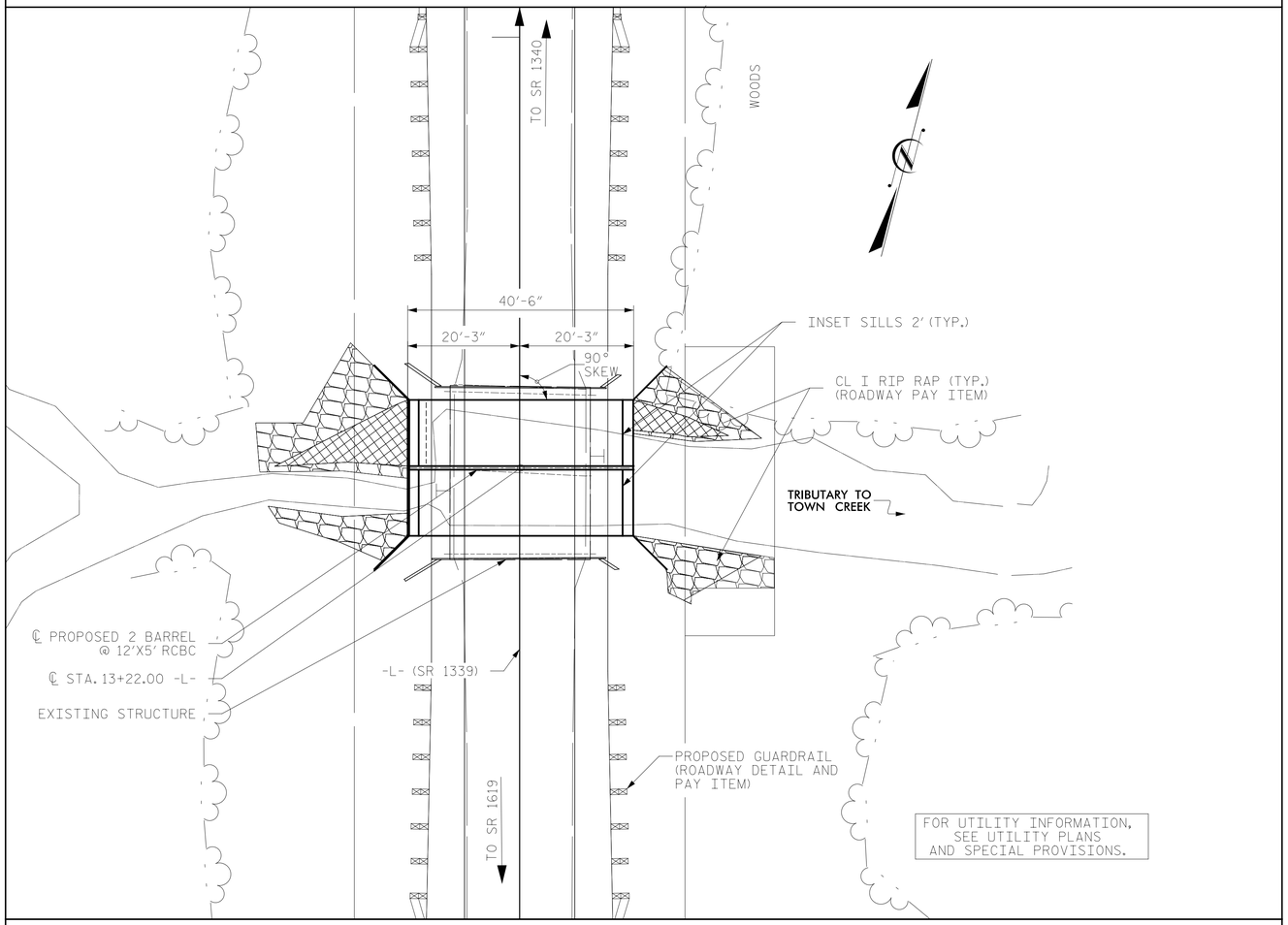
LETTING DATE:
SEPTEMBER 24, 2019

DocuSigned by:
Eric B Nelson Jr
ACB8082119D74CD...
4/22/2019

NORTH CAROLINA PROFESSIONAL SEAL 020208 ENGINEER ERIC B. NELSON JR.

ERIC B. NELSON, P.E.
PROJECT DESIGN ENGINEER

BENCH MARK #2: R/R SPIKE IN 12" MAPLE, 82.91' RT., STA 13+87.04 -L-, ELEV. 118.84'



LOCATION SKETCH

GENERAL NOTES

ASSUMED LIVE LOAD HL-93 OR ALTERNATE LOADING.

THIS CULVERT IS LOCATED IN SEISMIC ZONE 1.

DESIGN FILL 1.90' MIN. AND 2.50' MAX.

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

3" Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:

WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.

THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.

CONTRACTOR SHALL VERIFY EXISTING ELEVATIONS IN FIELD. PRIOR TO STAKING OUT CULVERT FOR CONSTRUCTION, CONTRACTOR SHALL SUBMIT LAYOUT CALCULATIONS FOR PROPOSED LENGTH, ELEVATION, AND ALIGNMENT OF CULVERT TO THE RESIDENT ENGINEER FOR APPROVAL.

THIS BARREL STANDARD TO BE USED ONLY ON CULVERTS ON A 90° SKEW AND TO BE USED WITH STANDARD WING SHEET WITH THE SAME SKEW AND VERTICAL CLEARANCE.

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

STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

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

FOR CHANNEL SUBSTRATE MATERIAL, SEE SPECIAL PROVISIONS.

FOR HIGH FLOW CHANNEL - PLACEMENT OF NATURAL STREAM BED MATERIAL, SEE SPECIAL PROVISIONS.

DUE TO THE SOFT CLAYS BENEATH THE CULVERT, STABILIZATION OF THE CULVERT FOUNDATION SUBGRADE MAY BE REQUIRED UTILIZING EITHER UNDERCUT EXCAVATION IN ACCORDANCE WITH SECTION 225.4 OF THE STANDARD SPECIFICATIONS FOR ROAD AND STRUCTURES, WITH ADDITIONAL CLASS VI SELECT FOUNDATION CONDITION MATERIAL, OR THE USE OF TYPE 4 GEOTEXTILE IN ACCORDANCE WITH SECTION 270 OF THE STANDARD SPECIFICATIONS FOR ROAD AND STRUCTURES.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

THE EXISTING STRUCTURE CONSISTING OF TWO REINFORCED CONCRETE DECK ON TIMBER JOIST SPANS, 1 @ 15'-5" AND 1 @ 16'-0" WITH A CLEAR ROADWAY WIDTH OF 24' ON TIMBER BENTS LOCATED AT THE PROPOSED STRUCTURE SITE SHALL BE REMOVED.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

SEE SECTION 414 OF THE STANDARD SPECIFICATIONS FOR CULVERT EXCAVATION AND BACKFILLING.

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE".

BENEATH THE ENTIRE BASE OF THE REINFORCED CONCRETE BOX CULVERT (RCBC), PLACE AT LEAST 1-FOOT OF CLASS VI SELECT FOUNDATION CONDITIONING MATERIAL IN ACCORDANCE WITH ARTICLE 414 OF THE STANDARD SPECIFICATIONS FOR ROAD AND STRUCTURES.

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE				
BARREL @	2.465	CY/FT	99.8	C.Y.
WING ETC.			18.0	C.Y.
TOTAL			117.8	C.Y.
REINFORCING STEEL				
BARREL			16010	LBS.
WINGS ETC.			680	LBS.
TOTAL			16690	LBS.

CULVERT EXCAVATION	LUMP SUM
FOUNDATION COND. MAT'L.	86 TONS
REMOVAL OF EXIST. STRUCTURE	LUMP SUM
ASBESTOS ASSESSMENT	LUMP SUM
CHANNEL SUBSTRATE MATERIAL	LUMP SUM

HYDRAULIC DATA

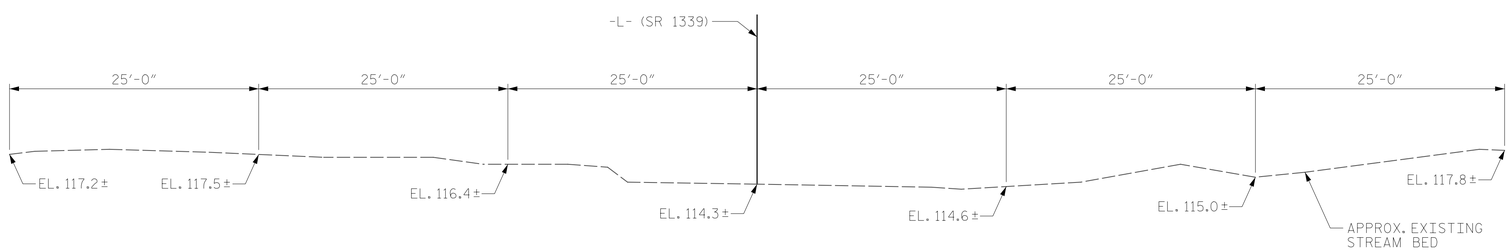
DESIGN DISCHARGE	= 330 C.F.S.
FREQUENCY OF DESIGN FLOOD	= 25 YRS
DESIGN HIGH WATER ELEVATION	= 118.7 FT.
DRAINAGE AREA	= 1.64 SQ. MI.
BASE DISCHARGE (Q100)	= 510 C.F.S.
BASE HIGH WATER ELEVATION	= 119.7 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 550 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	= 100 YRS
OVERTOPPING FLOOD ELEVATION	= 120.1 FT.

GRADE DATA

GRADE POINT ELEV. @ STA 13+22 -L-	= 121.07
BED ELEV. @ STA 13+22 -L-	= 113.64
ROADWAY FILL SLOPES	= 2:1



PROFILE ALONG ℄ CULVERT

PROJECT NO. 17BP.4.R.94

WILSON COUNTY

CULVERT NO. 91

STATION 13+22.00 -L-

SHEET 1 OF 7 REPLACES BRIDGE NO. 970091

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE
12 FT. X 5 FT.
CONCRETE BOX CULVERT
90° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 020208 ENGINEER ERIC B. NELSON, JR.

DocuSigned by: Eric B. Nelson Jr. 4/3/2019
ACB8082119D74CD...

DRAWN BY :	M. SPENCER	DATE :	12/2018
CHECKED BY :	J. FARNHAM	DATE :	02/2019
DESIGN ENGINEER OF RECORD :	R. WERTMAN	DATE :	02/2019

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	C-1
1			3			TOTAL SHEETS	7
2			4				

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 × RF	STRENGTH I LIMIT STATE									COMMENT NUMBER
							LIVE-LOAD FACTORS (γ_{LL})	MOMENT				SHEAR				
								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	1.01	--	1.75	1.01	1	TOP SLAB	5.07	1.05	1	TOP SLAB	10.72	1
		HL-93 (OPERATING)	N/A		1.31	--	1.35	1.31	1	TOP SLAB	5.07	1.36	1	TOP SLAB	10.72	1
		HS-20 (INVENTORY)	36.000	2	1.11	39.96	1.75	1.11	1	TOP SLAB	5.07	1.16	1	TOP SLAB	10.72	1
		HS-20 (OPERATING)	36.000		1.44	51.84	1.35	1.44	1	TOP SLAB	5.07	1.51	1	TOP SLAB	10.72	1
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.03	27.41	1.40	2.03	1	TOP SLAB	5.07	2.70	1	TOP SLAB	10.72	1
		SNGARBS2	20.000		1.90	38.00	1.40	1.90	1	TOP SLAB	5.07	2.52	1	TOP SLAB	10.72	1
		SNAGRIS2	22.000		2.03	44.66	1.40	2.03	1	TOP SLAB	5.07	2.61	1	BOTTOM SLAB	10.89	1
		SNCOTTS3	27.250		1.34	36.52	1.40	1.34	1	TOP SLAB	5.07	1.39	1	TOP SLAB	10.72	1
		SNAGGRS4	34.925		1.44	50.29	1.40	1.44	1	BOTTOM SLAB	5.07	1.59	1	TOP SLAB	10.72	1
		SNS5A	35.550		1.41	50.13	1.40	1.41	1	BOTTOM SLAB	5.07	1.51	1	TOP SLAB	10.72	1
		SNS6A	39.950		1.35	53.93	1.40	1.35	1	BOTTOM SLAB	5.07	1.46	1	BOTTOM SLAB	10.89	1
		SNS7B	42.000		1.43	60.06	1.40	1.43	1	BOTTOM SLAB	5.07	1.49	1	TOP SLAB	10.72	1
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.72	56.76	1.40	1.72	1	BOTTOM SLAB	5.07	1.76	1	BOTTOM SLAB	10.89	1
		TNT4A	33.075		1.59	52.59	1.40	1.59	1	BOTTOM SLAB	5.07	1.62	1	TOP SLAB	10.72	1
		TNT6A	41.600		1.43	59.49	1.40	1.43	1	BOTTOM SLAB	5.07	1.51	1	TOP SLAB	10.72	1
		TNT7A	42.000		1.38	57.96	1.40	1.38	1	BOTTOM SLAB	5.07	1.45	1	BOTTOM SLAB	10.89	1
		TNT7B	42.000		1.39	58.38	1.40	1.39	1	BOTTOM SLAB	5.07	1.46	1	BOTTOM SLAB	10.89	1
		TNAGRIT4	43.000	3	1.31	56.33	1.40	1.31	1	BOTTOM SLAB	5.07	1.35	1	BOTTOM SLAB	10.89	1
		TNAGT5A	45.000		1.53	68.85	1.40	1.53	1	BOTTOM SLAB	5.07	1.52	1	BOTTOM SLAB	10.89	1
		TNAGT5B	45.000		1.31	58.95	1.40	1.31	1	BOTTOM SLAB	5.07	1.38	1	BOTTOM SLAB	10.89	1

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. BOX STRUCTURE IS SYMMETRICAL, THEREFORE BOX 1 RATING SIMILAR TO BOX 2.

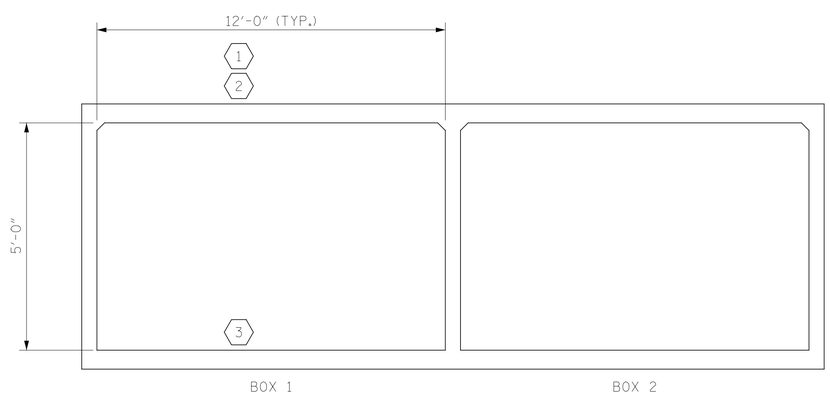
(#) CONTROLLING LOAD RATING

(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. 17BP.4.R.94

WILSON COUNTY

CULVERT NO. 91

STATION 13+22.00 -L-

SHEET 2 OF 7

NORTH CAROLINA PROFESSIONAL SEAL 020208 ENGINEER ERIC B. NELSON JR.

DocuSigned by: Eric B Nelson Jr. 4/3/2019
ACBB0821190D74CD...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

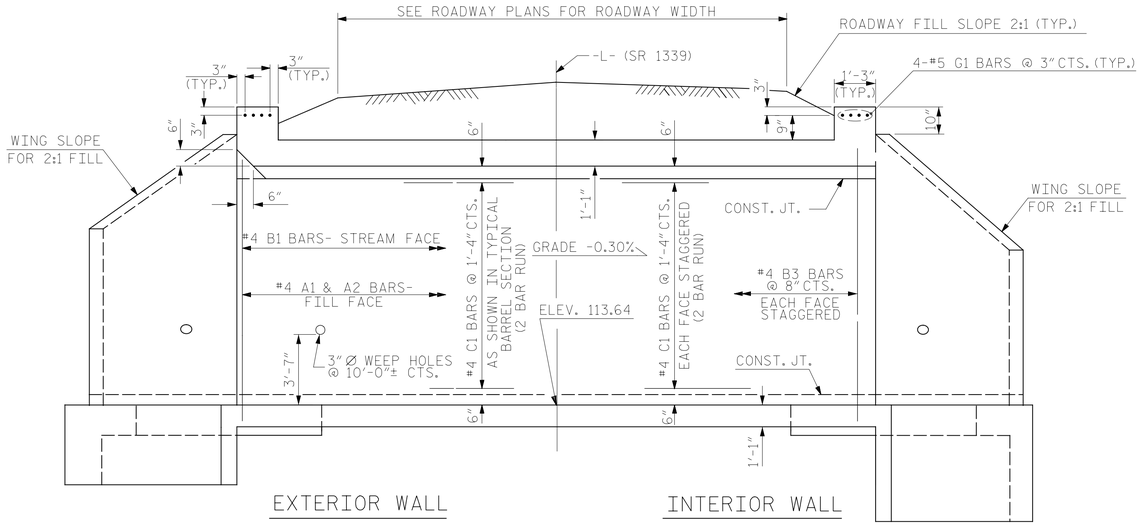
LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS (NON-INTERSTATE TRAFFIC)

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			C-2
1			3					TOTAL SHEETS
2			4					7

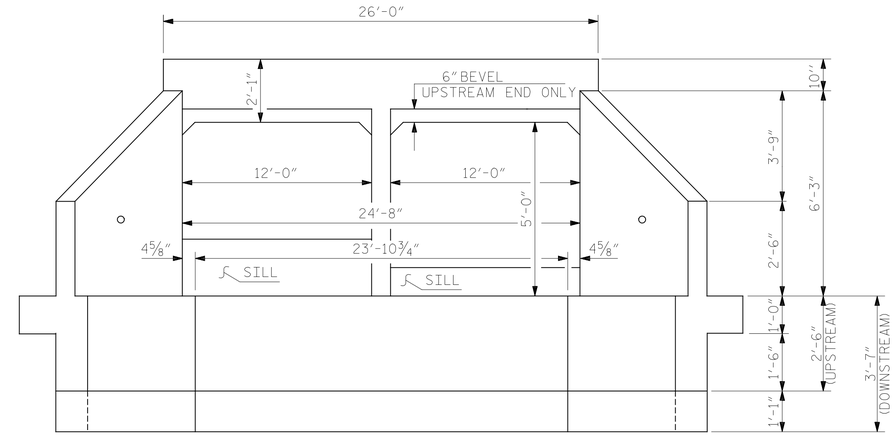
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY : T. FORD		DATE : 12/2018	
CHECKED BY : J. FARNHAM		DATE : 12/2018	
DRAWN BY : WMC	7/11	REV. 10/1/11	MAA/GM
CHECKED BY : GM	7/11	REV. 12/17	MAA/THC

STD. NO. LRFR5

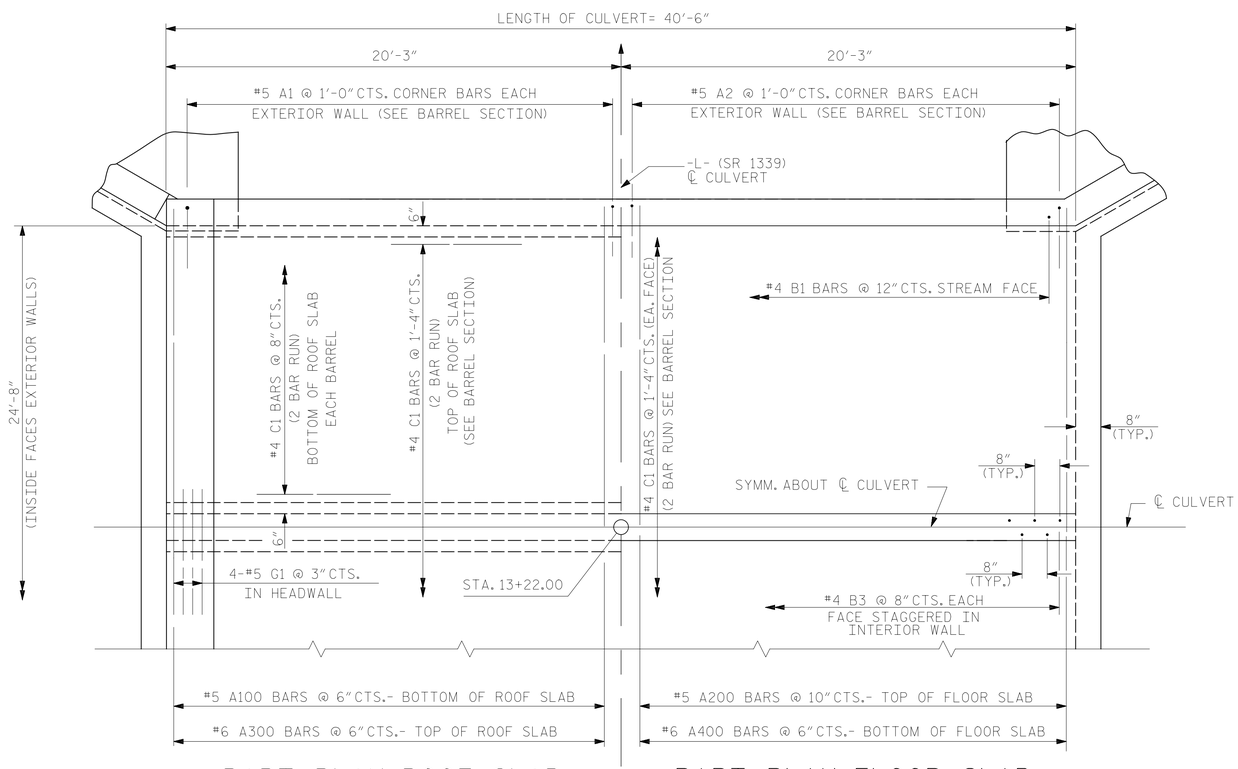


CULVERT SECTION NORMAL TO ROADWAY



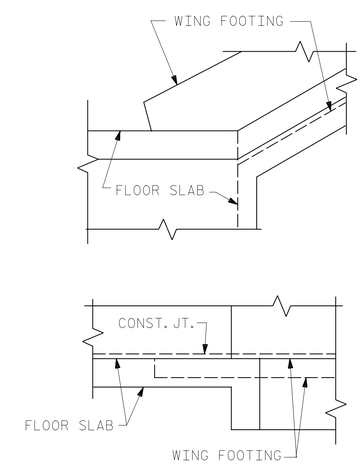
END ELEVATION

(LOOKING DOWNSTREAM)



PART PLAN-ROOF SLAB

PART PLAN-FLOOR SLAB



DETAIL

CONNECTION OF WING FOOTING AND FLOOR SLAB WHEN SLAB IS THICKER THAN FOOTING

PROJECT NO. 17BP.4.R.94

WILSON COUNTY

CULVERT NO. 91

STATION 13+22.00 -L-

SHEET 3 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE
12 FT. X 5 FT.
CONCRETE BOX CULVERT
90° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 020208 ENGINEER ERIC B. NELSON JR.

DocuSigned by: Eric B Nelson Jr. ACB80821190740D... 4/3/2019

REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

SHEET NO. C-3

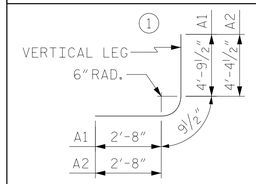
TOTAL SHEETS 7

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY :	M. SPENCER	DATE :	12/2018
CHECKED BY :	J. FARNHAM	DATE :	02/2019
DESIGN ENGINEER OF RECORD :	R. WERTMAN	DATE :	02/2019

SPLICE LENGTH CHART		
BAR	SIZE	SPLICE LENGTH
A1	#5	2'-5"
A2	#5	2'-5"
C1	#4	1'-11"

BAR TYPES



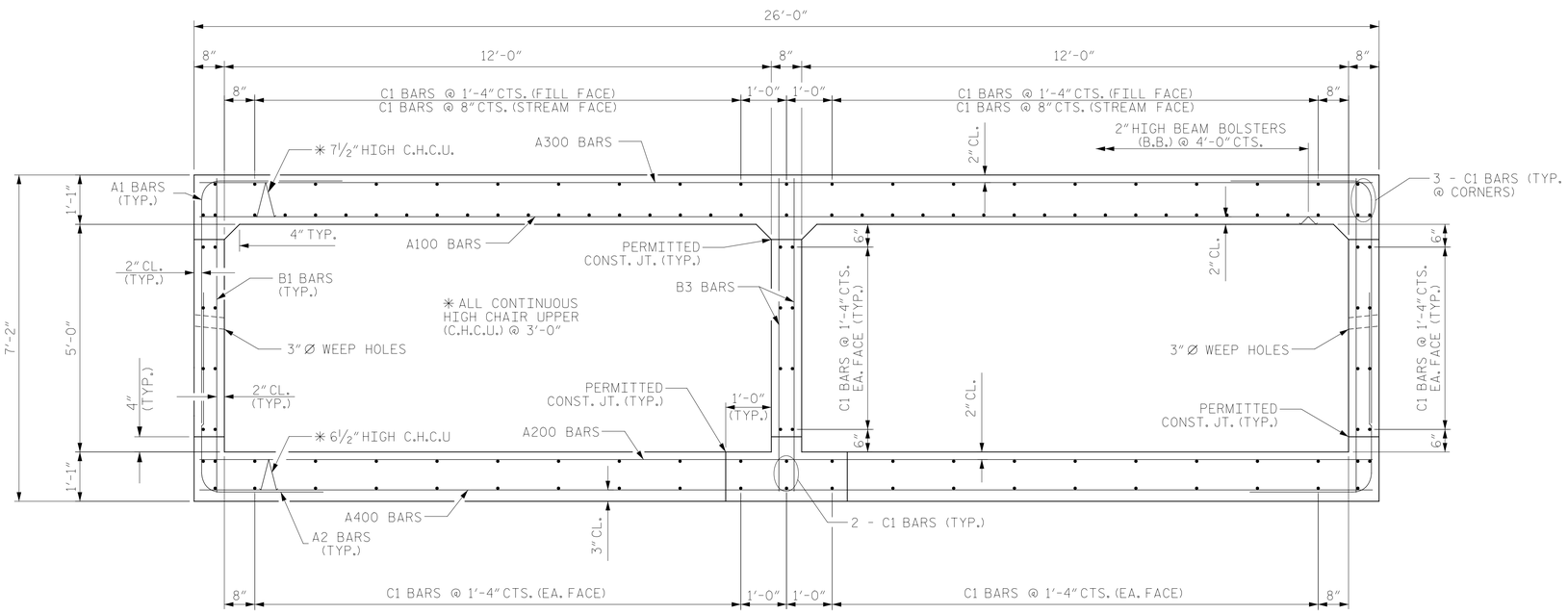
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	82	#5	1	8'-3"	706
A2	82	#5	1	7'-10"	670
A100	81	#5	STR	25'-8"	2168
A200	49	#5	STR	25'-8"	1312
A300	81	#6	STR	25'-8"	3123
A400	81	#6	STR	25'-8"	3123
B1	82	#4	STR	6'-9"	370
B3	122	#4	STR	6'-9"	550
C1	256	#4	STR	21'-1"	3605
D1	8	#6	STR	2'-6"	30
D2	8	#6	STR	1'-6"	18
G1	8	#5	STR	40'-2"	335

REINFORCING STEEL 16010 LBS.

CLASS A CONCRETE
2 BARRELS @ 2.465 CY/FT 99.8 C.Y.



RIGHT ANGLE SECTION OF BARREL

THERE ARE 128 "C" BARS IN SECTION OF BARREL.
(LOOKING DOWNSTREAM)

PROJECT NO. 17BP.4.R.94
WILSON COUNTY
CULVERT NO. 91
STATION 13+22.00 -L-

SHEET 4 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE
12 FT. X 5 FT.
CONCRETE BOX CULVERT
90° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 020208 ENGINEER ERIC B. NELSON JR.

DocuSigned by: Eric B Nelson Jr. ACB80821907 4CD... 4/3/2019

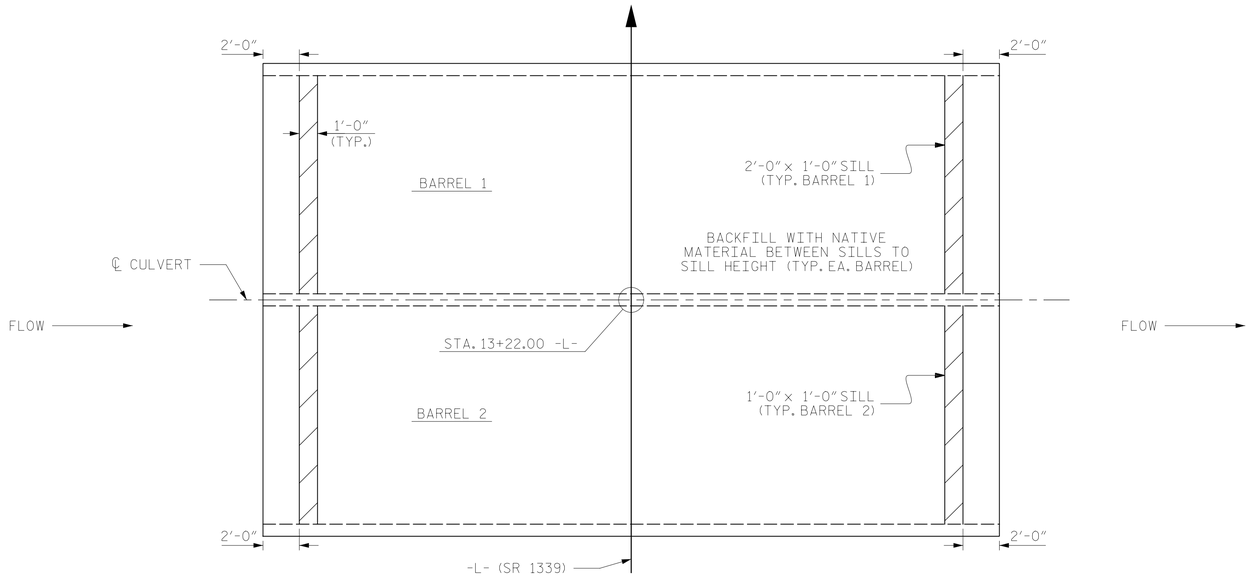
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

SHEET NO. C-4
TOTAL SHEETS 7

DRAWN BY : M. SPENCER DATE : 12/2018
CHECKED BY : J. FARNHAM DATE : 02/2019
DESIGN ENGINEER OF RECORD : R. WERTMAN DATE : 02/2019



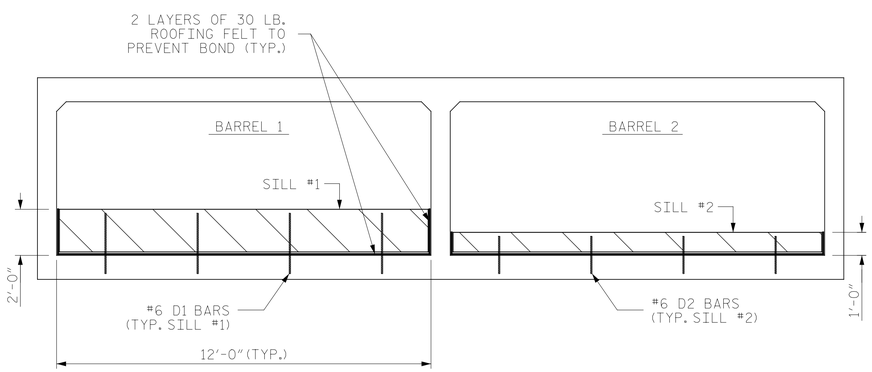
FLOOR SILL LAYOUT

NOTES

NATIVE MATERIAL BETWEEN SILLS IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL. IF RIP RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL, NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

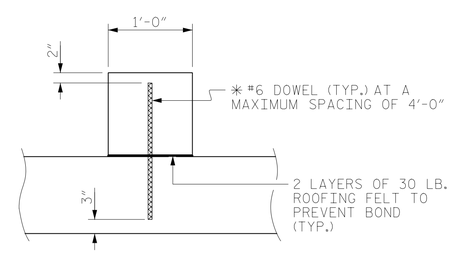
SILLS ARE TO BE 1.0 FT. WIDE, CAST SEPERATELY AND ATTACHED BY DOWELS.

DO NOT SET ELEVATION OF HIGH SILLS ABOVE BANK FULL.



INLET ELEVATION

(LOOKING DOWNSTREAM)



SECTION THROUGH SILL

* DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED.

CULVERT SILL DETAILS

PROJECT NO. 17BP.4.R.94

WILSON COUNTY

CULVERT NO. 91

STATION 13+22.00 -L-

SHEET 5 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE
12 FT. X 5 FT.
CONCRETE BOX CULVERT
90° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 020208 ENGINEER ERIC B. NELSON JR.

DocuSigned by: Eric B Nelson Jr 4/3/2019
ACB8082119D74CD...

REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

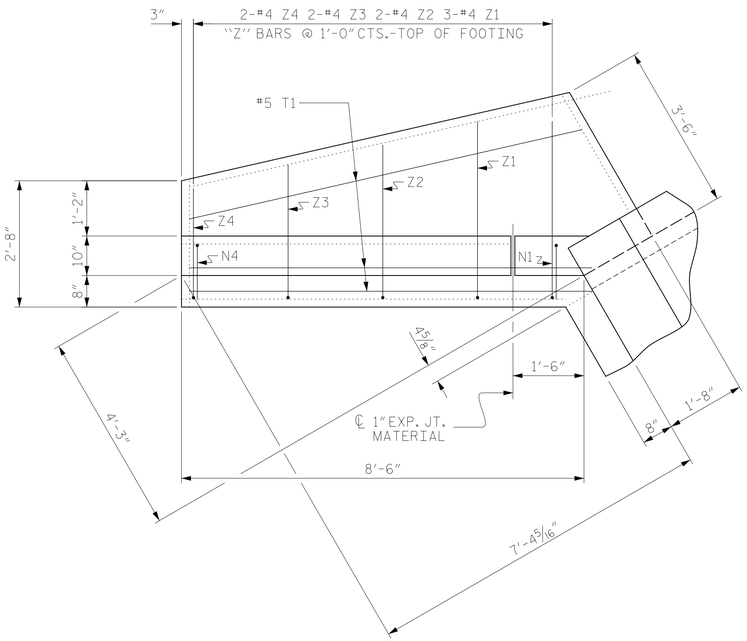
SHEET NO. C-5

TOTAL SHEETS 7

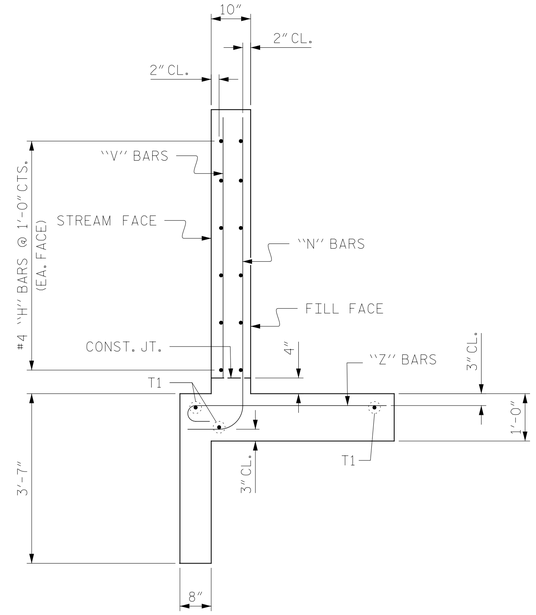
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

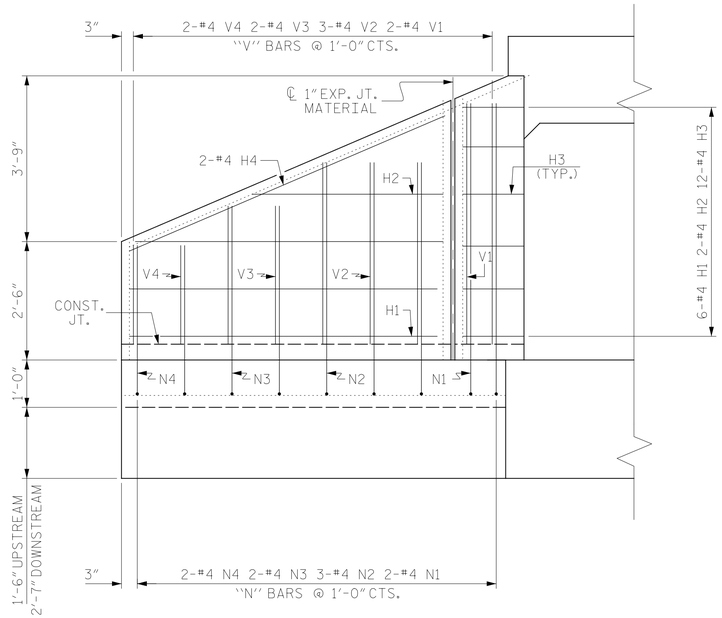
DRAWN BY :	M. SPENCER	DATE :	12/2018
CHECKED BY :	J. FARNHAM	DATE :	02/2019
DESIGN ENGINEER OF RECORD :	R. WERTMAN	DATE :	02/2019



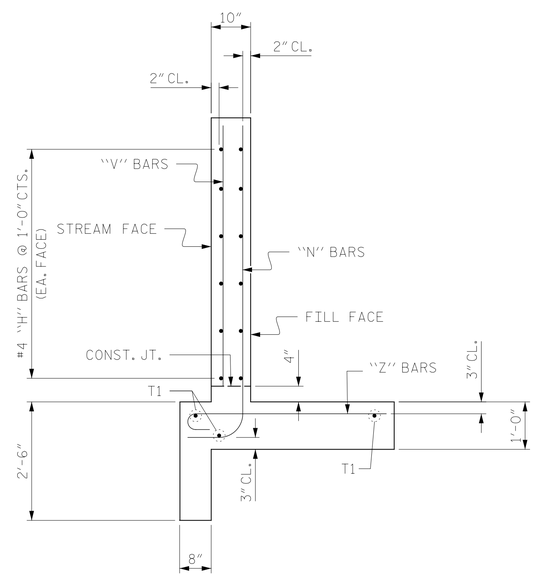
PLAN



TYPICAL DOWNSTREAM WING SECTION



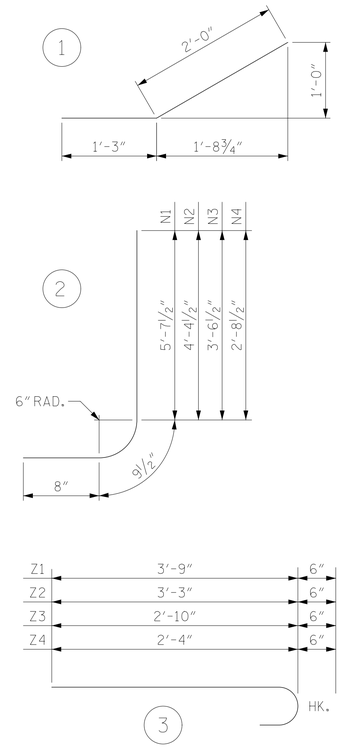
ELEVATION



TYPICAL UPSTREAM WING SECTION

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	24	#4	STR	6'-6"	104
H2	8	#4	STR	4'-0"	21
H3	48	#4	1	3'-3"	104
H4	8	#4	STR	7'-3"	39
N1	8	#4	2	7'-1"	38
N2	12	#4	2	5'-10"	47
N3	8	#4	2	5'-0"	27
N4	8	#4	2	4'-2"	22
T1	12	#5	STR	8'-6"	106
V1	8	#4	STR	5'-1"	27
V2	12	#4	STR	3'-10"	31
V3	8	#4	STR	2'-11"	16
V4	8	#4	STR	2'-1"	11
Z1	12	#4	3	4'-3"	34
Z2	8	#4	3	3'-9"	20
Z3	8	#4	3	3'-4"	18
Z4	8	#4	3	2'-10"	15

REINFORCING STEEL FOR 4 WINGS 680 LBS

CLASS A CONCRETE
- 4 WINGS 10.5 CY
- 2 HEADWALLS 2.4 CY
- 4 SILLS 2.7 CY
- END CURTAIN WALLS 2.4 CY
- TOTAL 18.0 CY

PROJECT NO. 17BP.4.R.94
WILSON COUNTY
CULVERT NO. 91
STATION 13+22.00 -L-

SHEET 6 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE
12 FT. X 5 FT.
CONCRETE COX CULVERT
90° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 020208 ENGINEER ERIC B. NELSON JR.

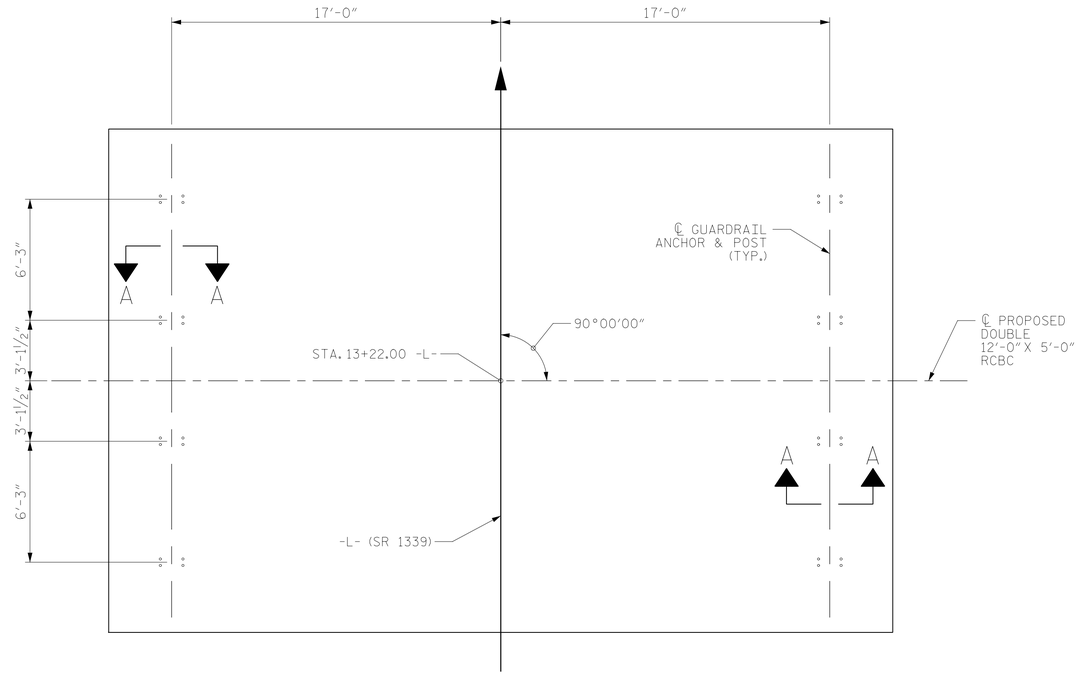
DocuSigned by: Eric B. Nelson Jr. ACB80821190704CD... 4/3/2019

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO. C-6
1			3			TOTAL SHEETS 7
2			4			

DRAWN BY : M. SPENCER DATE : 12/2018
CHECKED BY : J. FARNHAM DATE : 02/2019
DESIGN ENGINEER OF RECORD : R. WERTMAN DATE : 02/2019



PLAN

SHOWING : GUARDRAIL ANCHOR ASSEMBLY SPACING.

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 2 ¼" 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.

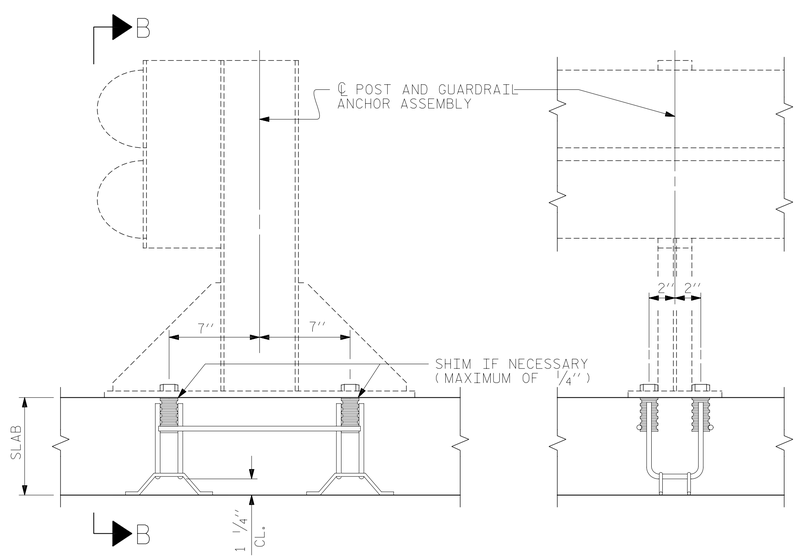
FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

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.

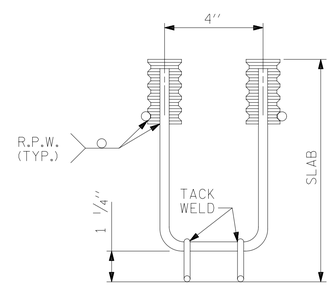
SLAB REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR GUARDRAIL ANCHOR ASSEMBLY. CARE SHOULD BE TAKEN TO KEEP THE SHIFTING OF REINFORCING STEEL TO A MINIMUM.

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.

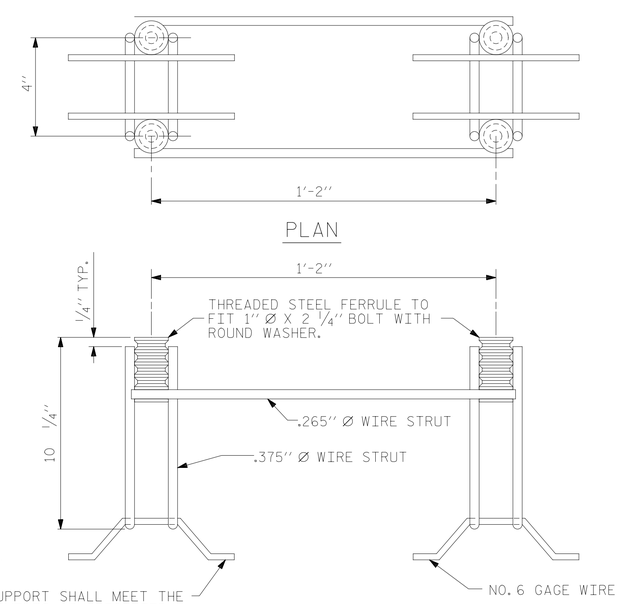


SECTION A-A

SECTION B-B



ELEVATION



PLAN

SIDE VIEW

GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

PROJECT NO. 17BP.4.R.94

WILSON COUNTY

CULVERT NO. 91

STATION 13+22.00 -L-

SHEET 7 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ANCHORAGE DETAILS FOR GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

NORTH CAROLINA PROFESSIONAL SEAL 020208 ENGINEER ERIC B. NELSON JR.

DocuSigned by: Eric B Nelson Jr. 4/3/2019
AC88082119074CD...

ASSEMBLED BY : M. SPENCER		DATE : 12/2018	
CHECKED BY : J. FARNHAM		DATE : 12/2018	
DRAWN BY : FCJ	6/88	REV. 5/1/06R	KMM/GM.
CHECKED BY : ARB	6/88	REV. 10/1/11	MAA/GM.
		REV. 12/17	MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

SHEET NO. C-7

TOTAL SHEETS 7

STD. NO. GRA1