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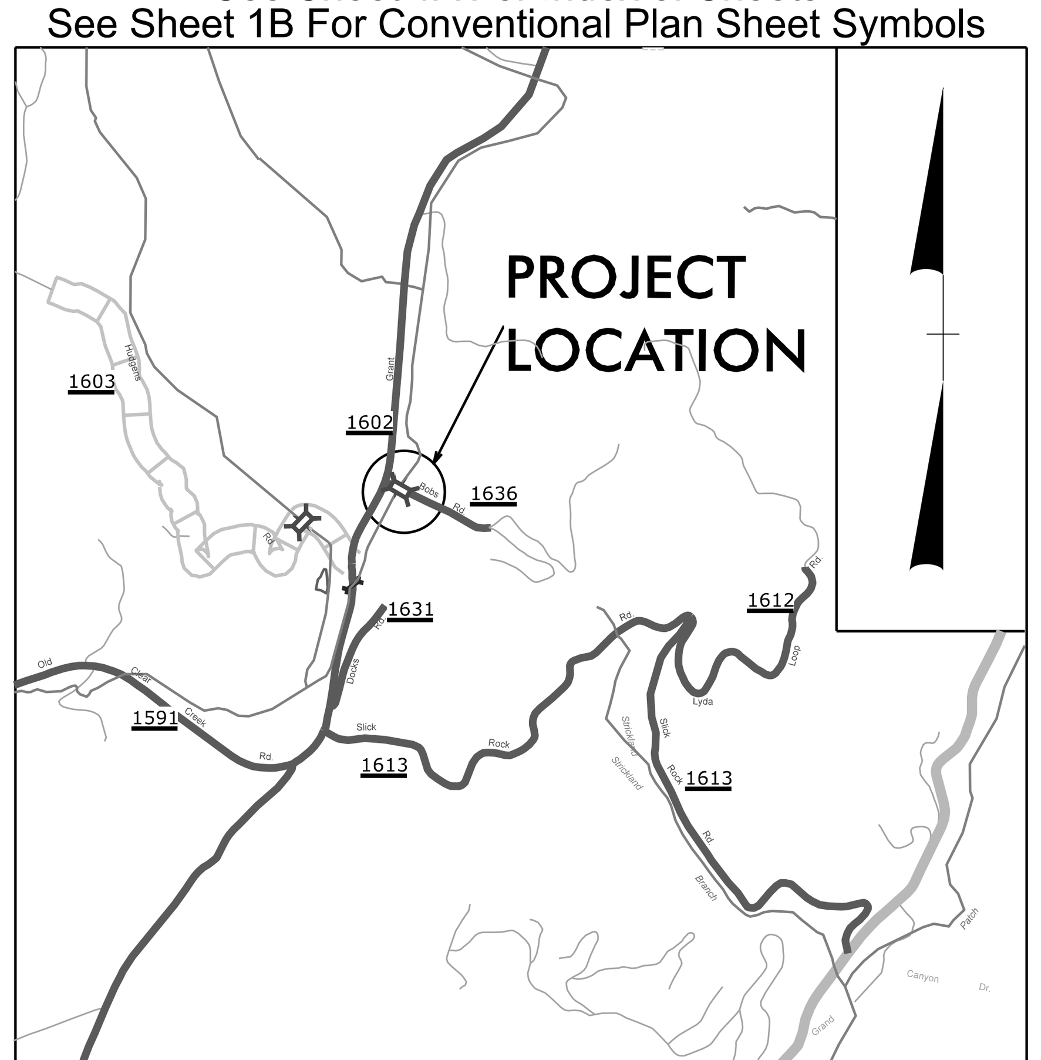
01/16/24

PROJECT: DF18314.2045324

CONTRACT: DN01140

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



VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HENDERSON COUNTY

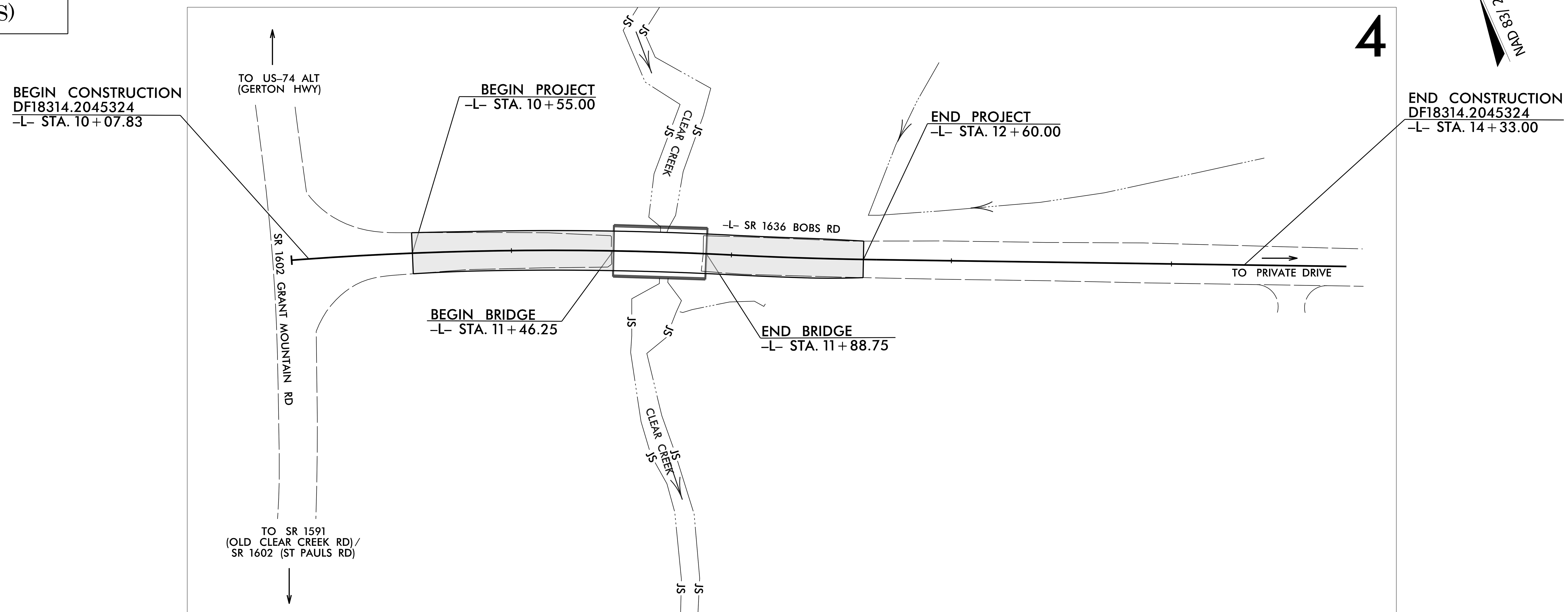
LOCATION: *STRUCTURE #440336 OVER CLEAR CREEK ON SR 1636 (BOBS RD)*

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, & STRUCTURE*

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18314.2045324	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
DF18314.2045324	FEMA	P.E.
DF18314.2045324	FEMA	R/W & UTIL.
DF18314.2045324	FEMA	CONST.

NAD 83/2011



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

20 10 0 20 40
PLANS

20 10 0 20 40
PROFILE (HORIZONTAL)

4 2 0 4 8
PROFILE (VERTICAL)

DESIGN DATA

ADT 2050 = <400
V = 30 MPH
FUNC CLASS =
LOCAL RURAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY PROJECT DF18314.2045324 = 0.031 MILES
LENGTH OF STRUCTURE PROJECT DF18314.2045324 = 0.008 MILES
TOTAL LENGTH OF PROJECT DF18314.2045324= 0.039 MILES

TGS ENGINEERS
201 W. MARION ST.
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JUN. 1, 2025

LETTING DATE:
APR. 28, 2026

NORTH CAROLINA DEPARTMENT OF TRANSPORATION
DIVISION 14
253 WEBSTER RD
SLYVA, NC 28779

JIMMY L. TERRY, P.E.
PROJECT ENGINEER

MALLORY A. COLLINS
PROJECT DESIGN ENGINEER

ZACHARY T. SHULER, P.E.
NCDOT CONTACT

HYDRAULICS ENGINEER

10/13/2025

Signed by: John W. Twisdale, Jr.

SIGNATURE: P.E.

SEAL 024897

ROADWAY DESIGN ENGINEER

10/10/2025

DocuSigned by: Jimmy Terry

SIGNATURE: P.E.

SEAL 35018

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

11/15/23

DF18314.2045324
3RD1 | 001A

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35018 JIMMY L. TERRY
10/10/2025

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1 THRU 2C-2	METHOD OF PIPE INSTALLATION
3B-1	ROADWAY AND DRAINAGE SUMMARIES
4 THRU 5	PLAN AND PROFILE SHEET
RW-01 THRU RW-04	RIGHT OF WAY PLANS
TMP-1 THRU TMP-6	TRAFFIC MANAGEMENT PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
RF-1	REFORESTATION PLANS
X-1A	CROSS-SECTION SUMMARY SHEET
X-02 THRU X-05	CROSS-SECTIONS
S-1 THRU S-13	STRUCTURE PLANS

STRUCTURE STANDARD NOTES

GENERAL NOTES: 2024 SPECIFICATIONS
EFFECTIVE: 01-16-2024
REVISED:

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.

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

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE AT&T

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

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

EFF. 01-16-2024
REV.

2024 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Contracts Standards and Development Unit - N. C. Department of Transportation - Raleigh, N. C., Dated January 16, 2024 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation (Use Details in Lieu of Standards for Sheets 1 and 2 of 2)
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" pipe 90 Skew
838.80	Precast Endwalls - 12" thru 72" Pipe Skew 90
876.01	Rip Rap in Channels and Ditches
876.02	Guide for Rip Rap at Pipe Outlets

05/20/24

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

DFI8314.2045324 | 3RD1 | 1B

Note: Not to Scale

BOUNDARIES AND PROPERTY:
- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin (EIP)
- Computed Property Corner
- Existing Concrete Monument (ECM)
- Parcel / Sequence Number
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary
- Proposed Wetland Boundary
- Existing Endangered Animal Boundary
- Existing Endangered Plant Boundary
- Existing Historic Property Boundary
- Known Contamination Area: Soil
- Potential Contamination Area: Soil
- Known Contamination Area: Water
- Potential Contamination Area: Water
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:
- Gas Pump Vent or U/G Tank Cap
- Sign
- Well
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:
- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream
- Buffer Zone 1
- Buffer Zone 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch
- False Sump

RAILROADS:
- Standard Gauge
- RR Signal Milepost
- Switch
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Secondary Horiz and Vert Control Point
- Vertical Benchmark
- Existing Right of Way Monument
- Proposed Right of Way Monument (Rebar and Cap)
- Proposed Right of Way Monument (Concrete)
- Existing Permanent Easement Monument
- Proposed Permanent Easement Monument (Rebar and Cap)
- Existing C/A Monument
- Proposed C/A Monument (Rebar and Cap)
- Proposed C/A Monument (Concrete)
- Existing Right of Way Line
- Proposed Right of Way Line
- Existing Control of Access Line
- Proposed Control of Access Line
- Proposed ROW and CA Line
- Existing Easement Line
- Proposed Temporary Construction Easement
- Proposed Temporary Drainage Easement
- Proposed Permanent Drainage Easement
- Proposed Permanent Drainage/Utility Easement
- Proposed Permanent Utility Easement
- Proposed Temporary Utility Easement
- Proposed Aerial Utility Easement

ROADS AND RELATED FEATURES:
- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut
- Proposed Slope Stakes Fill
- Proposed Curb Ramp
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:
- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard

EXISTING STRUCTURES:
MAJOR:
- Bridge, Tunnel or Box Culvert
- Bridge Wing Wall, Head Wall and End Wall

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

UTILITIES:
** SUE - Subsurface Utility Engineering*
LOS - Level of Service - A,B,C or D (Accuracy)

POWER:
- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- U/G Power Line Test Hole (SUE - LOS A)*
- U/G Power Line (SUE - LOS B)*
- U/G Power Line (SUE - LOS C)*
- U/G Power Line (SUE - LOS D)*

TELEPHONE:
- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole
- Telephone Pedestal
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole
- U/G Telephone Test Hole (SUE - LOS A)*
- U/G Telephone Cable (SUE - LOS B)*
- U/G Telephone Cable (SUE - LOS C)*
- U/G Telephone Cable (SUE - LOS D)*
- U/G Telephone Conduit (SUE - LOS B)*
- U/G Telephone Conduit (SUE - LOS C)*
- U/G Telephone Conduit (SUE - LOS D)*
- U/G Fiber Optics Cable (SUE - LOS B)*
- U/G Fiber Optics Cable (SUE - LOS C)*
- U/G Fiber Optics Cable (SUE - LOS D)*

WATER:
- Water Manhole
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line Test Hole (SUE - LOS A)*
- U/G Water Line (SUE - LOS B)*
- U/G Water Line (SUE - LOS C)*
- U/G Water Line (SUE - LOS D)*
- Above Ground Water Line

TV:
- TV Pedestal
- TV Tower
- U/G TV Cable Hand Hole
- U/G TV Test Hole (SUE - LOS A)*
- U/G TV Cable (SUE - LOS B)*
- U/G TV Cable (SUE - LOS C)*
- U/G TV Cable (SUE - LOS D)*
- U/G Fiber Optic Cable (SUE - LOS B)*
- U/G Fiber Optic Cable (SUE - LOS C)*
- U/G Fiber Optic Cable (SUE - LOS D)*

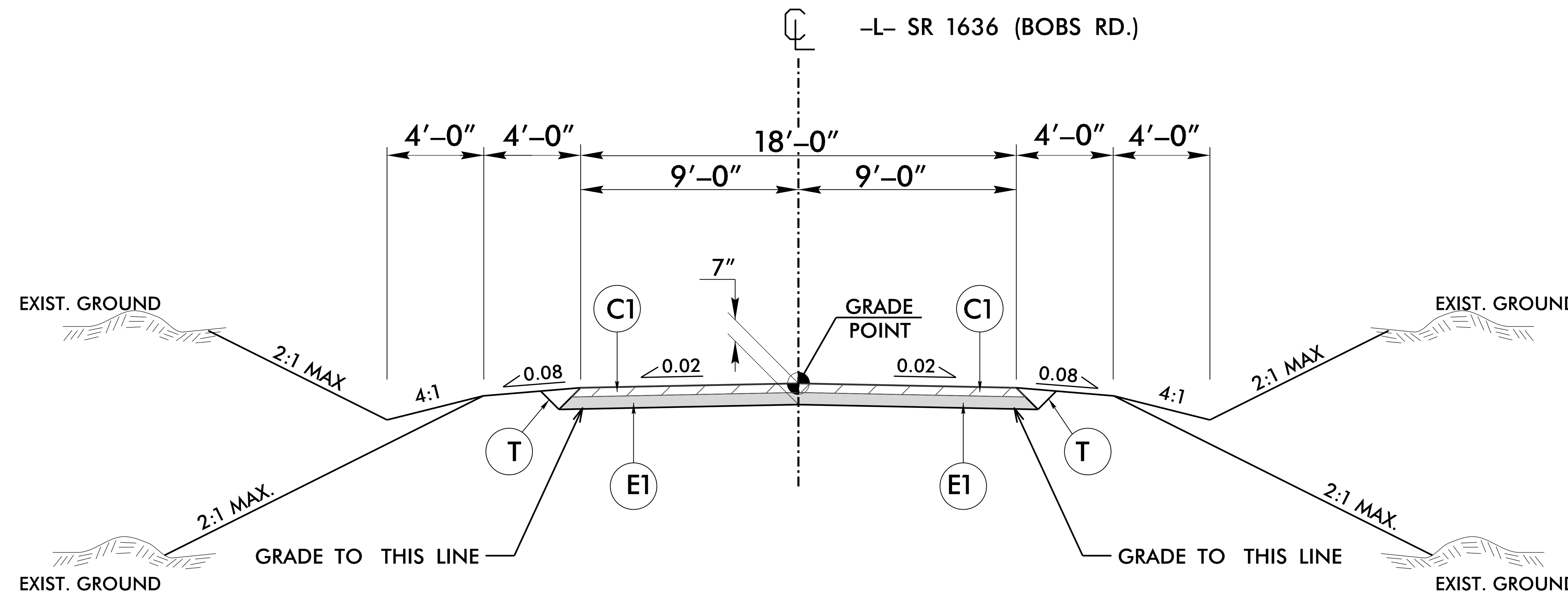
GAS:
- Gas Valve
- Gas Meter
- U/G Gas Line Test Hole (SUE - LOS A)*
- U/G Gas Line (SUE - LOS B)*
- U/G Gas Line (SUE - LOS C)*
- U/G Gas Line (SUE - LOS D)*
- Above Ground Gas Line

SANITARY SEWER:
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line
- Above Ground Sanitary Sewer
- SS Force Main Line Test Hole (SUE - LOS A)*
- SS Force Main Line (SUE - LOS B)*
- SS Force Main Line (SUE - LOS C)*
- SS Force Main Line (SUE - LOS D)*

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

PAVEMENT SCHEDULE (FINAL)	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
T	EARTH MATERIAL.

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



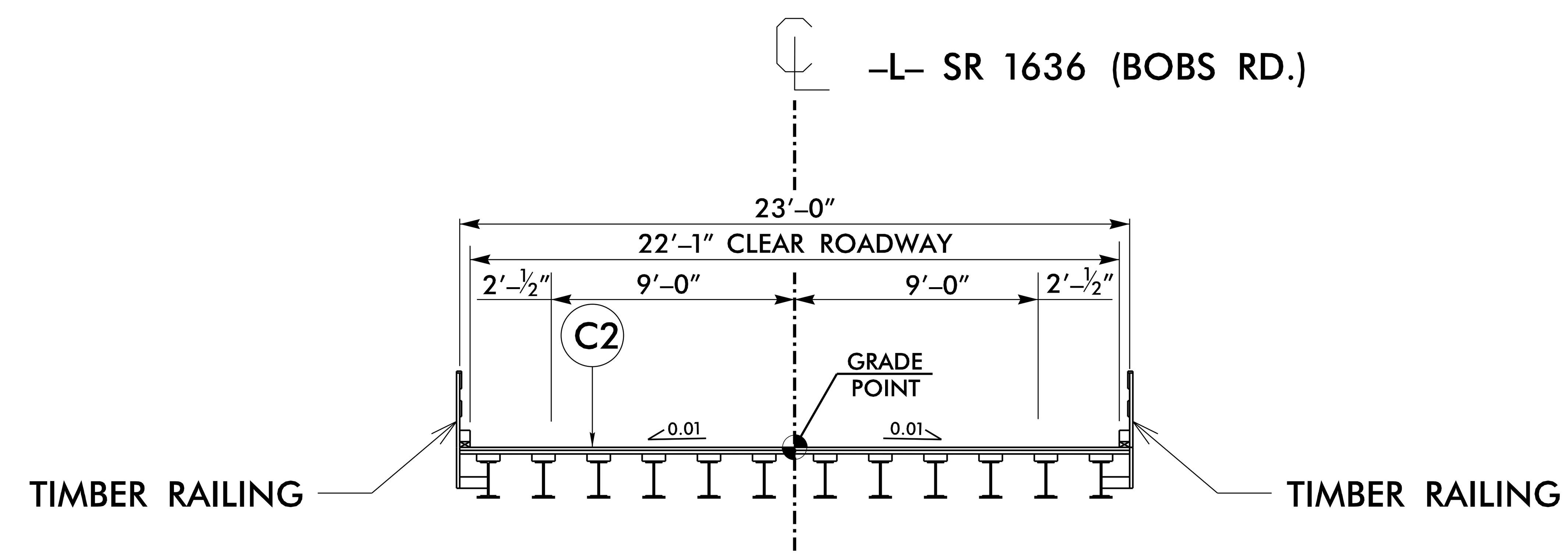
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO.1

-L- STA. 10+80.00 TO -L- STA. 11+46.25 (BEGIN BRIDGE)
-L- STA. 11+88.75 (END BRIDGE) TO -L- STA. 12+35.00

NOTE: TRANSITION BETWEEN EXISTING AND TYP. SECT. NO. 1 AS FOLLOWS:

-L- STA. 10+55.00 TO -L- STA. 10+80.00
-L- STA. 12+35.00 TO -L- STA. 12+60.00



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO.2

-L- STA. 11+46.25 TO -L- STA. 11+88.75

DF18314.2045324
3RD1 | 2A-1

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HENDERSON COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 35018 ENGINEER JIMMY L. TERRY
10/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 35018 ENGINEER JIMMY L. TERRY
10/2025

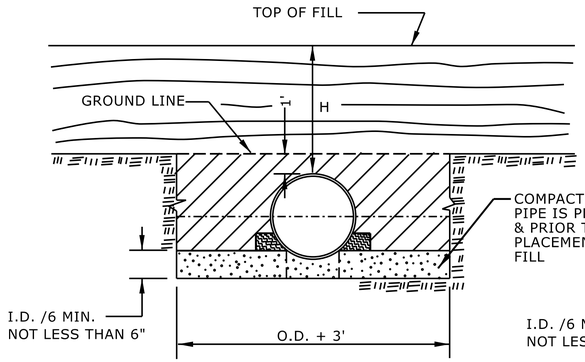
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PREPARED BY

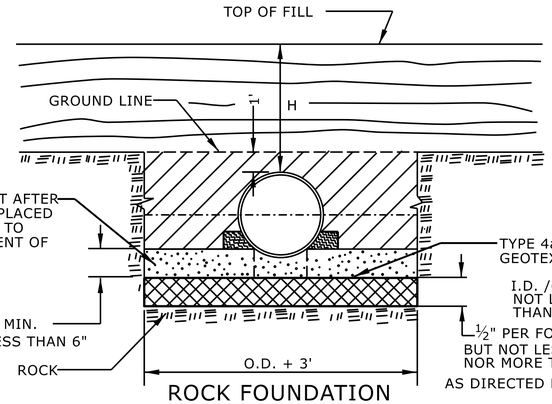
TGS ENGINEERS
201 W. MARION ST. STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS

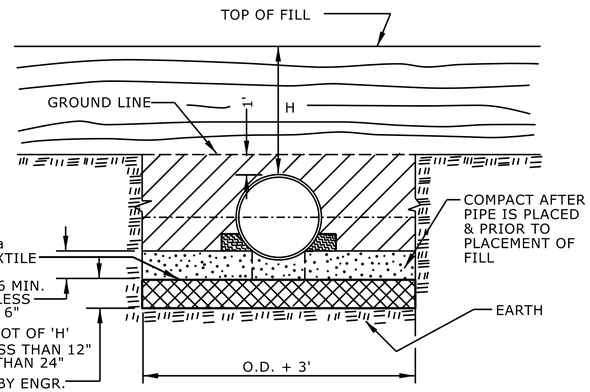
PROJECT REFERENCE NO.	SHEET NO.
DF18314.2045324	2C-1



NORMAL EARTH FOUNDATION

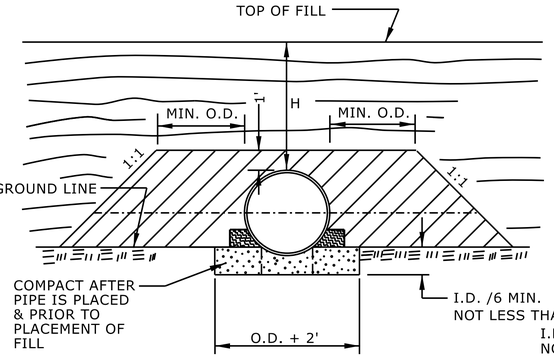


ROCK FOUNDATION

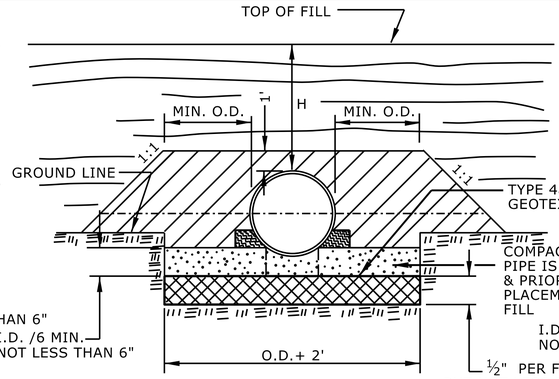


UNSUITABLE MATERIAL FOUNDATION

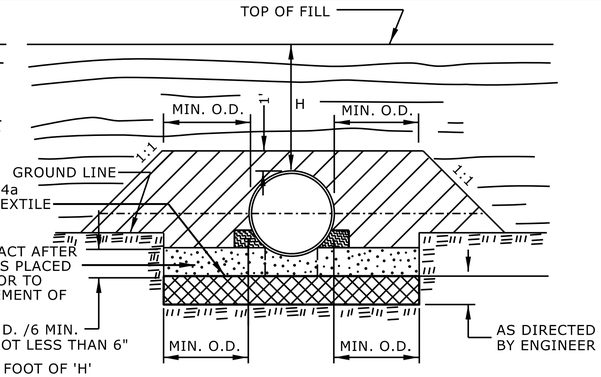
PIPE IN TRENCH



NORMAL EARTH FOUNDATION



ROCK FOUNDATION



UNSUITABLE MATERIAL FOUNDATION

PIPE ABOVE GROUND

GENERAL NOTES:

I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.

O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.

H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

APPROVED SUITABLE LOCAL MATERIAL.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

REFER TO NCDOT PIPE MATERIAL SELECTION GUIDE AND STANDARD SPECIFICATIONS FOR ALLOWABLE PIPE FILL HEIGHTS AND PIPE SPECIFICATIONS.

SPRINGLINE OF PIPE

SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 ABOVE AND BELOW SPRINGLINE.

UNDISTURBED EARTH MATERIAL

SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH TYPE IV GEOTEXTILE AS DIRECTED BY THE ENGINEER.

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

ROADWAY DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE

SHEET 1 OF 2

300.01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033144 NICOLE M. HACKER
10/10/2025

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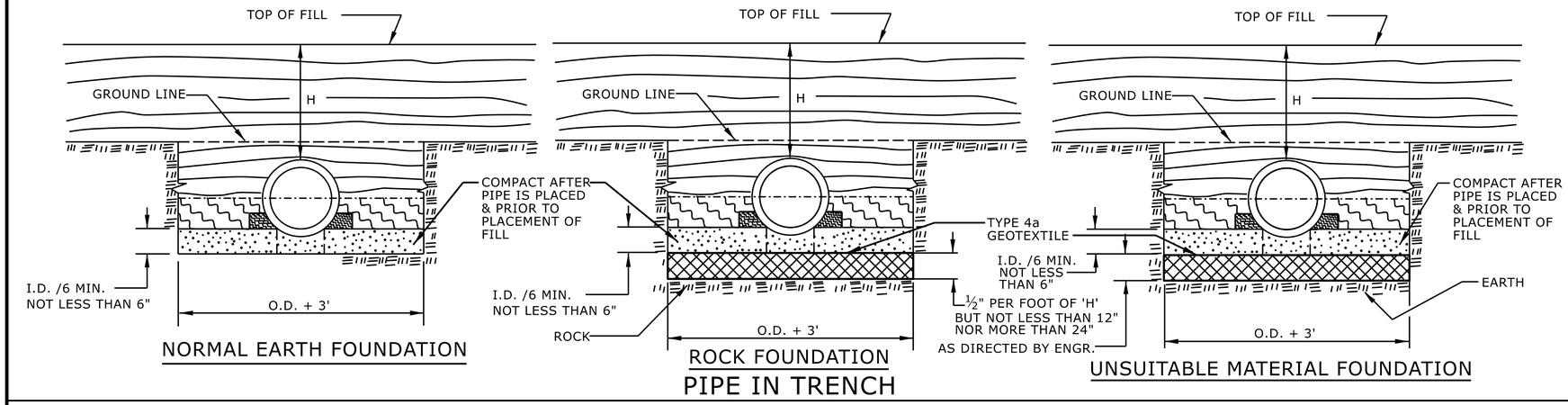
CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

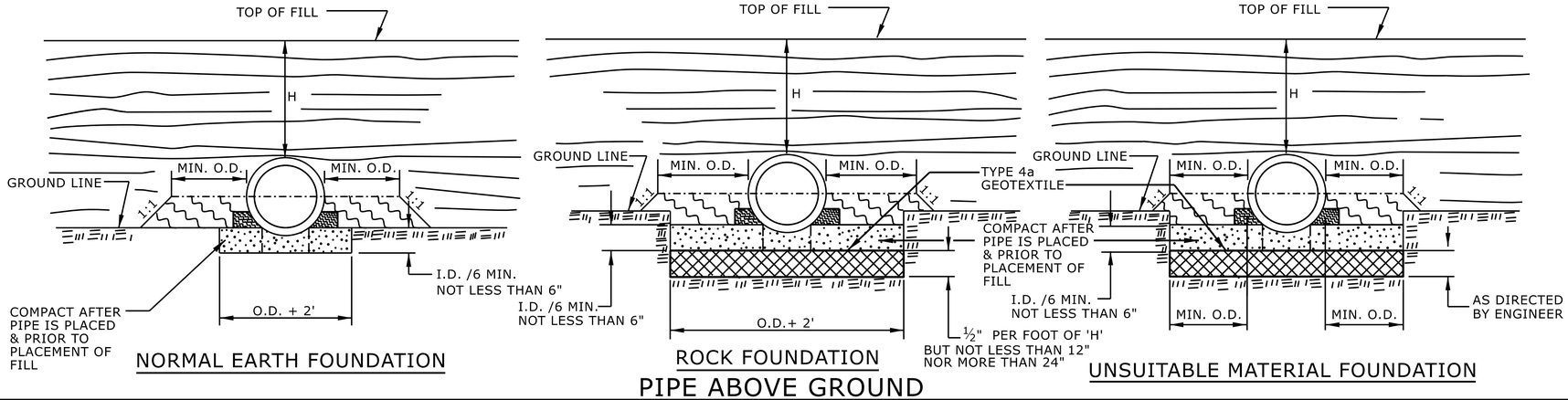
SEE TITLE BLOCK

ORIGINAL BY: S.CALHOUN DATE: 7-25-2024
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

PROJECT REFERENCE NO.	SHEET NO.
DF18314.2045324	2C-2



PIPE IN TRENCH



PIPE ABOVE GROUND

GENERAL NOTES:

I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.

O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.

H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

APPROVED SUITABLE LOCAL MATERIAL.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

REFER TO NCDOT PIPE MATERIAL SELECTION GUIDE AND STANDARD SPECIFICATIONS FOR ALLOWABLE PIPE FILL HEIGHTS AND PIPE SPECIFICATIONS.

SPRINGLINE OF PIPE

SELECT BACKFILL MATERIAL CLASS III OR CLASS II, BELOW SPRINGLINE.

UNDISTURBED EARTH MATERIAL

SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH TYPE IV GEOTEXTILE AS DIRECTED BY THE ENGINEER.

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

ROADWAY DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

RIGID PIPE

SHEET 2 OF 2

300.01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033144 NICOLE M. HACKER
10/10/2025

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

SEE TITLE BLOCK

ORIGINAL BY: S.CALHOUN DATE: 7-25-2024
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

COMPUTED BY: MAC DATE: 9/17/2025
CHECKED BY: JLT DATE: 10/2/25

PROJECT NO.	SHEET NO.
DF18314.2045324	3B-1

STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK

IN CUBIC YARDS

Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
-L- 10+55.00	-L- 11+46.25	26	15	0	10
BRIDGE					
-L- 11+88.75	-L- 12+60.00	32	24	0	8
SUBTOTALS:		58	39	0	18
TOTALS:		58	39	0	
LOSS DUE TO CLEARING & GRUBBING					
PROJECT TOTALS:		58	39	0	
EST. 5% TO REPLACE TOPSOIL ON BORROW PIT					
GRAND TOTALS:		58	39	0	
SAY		100		0	

Note: Approximate quantities only. Unclassified Excavation, Fine Grading, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for grading.

Note: Earthwork quantities are calculated by TGS Engineers.

EST. DRAINAGE DITCH EXCAVATION = 94 CUBIC YARDS
SELECT GRANULAR MATERIAL = 50 CUBIC YARDS

PER TGS RECOMMENDATION, ESTIMATED 50 CUBIC YARDS OF UNDERCUT TO BE USED IN THE DISCRETION OF THE RESIDENT ENGINEER.

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
-L-	10+55	11+46	RT/LT	164.29			
-L-	11+89	12+60	RT/LT	135.5			
			TOTAL:	299.79			
			SAY	325			

**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".**

COMPUTED BY: REL DATE:9/11/2025
CHECKED BY: JWT DATE:9/11/2025

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 54 INCHES & OVER)

STATION SIZE THICKNESS OR GAUGE	OFFSET	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION FT	INVERT ELEVATION FT	INVERT ELEVATION FT	SLOPE CRITICAL %	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 54"	60"	66"	72"	78"	84"		DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C.S. PIPE 54" .109	60"	66"	72"	78" .168	84" .168		R.C. PIPE CLASS III 54"	60"	66"	72"	78"	84"		R.C. PIPE CLASS IV 54"	60"	66"	72"	78"	84"		STRUCTURAL PLATE PIPE 60	66	72			ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURE *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') 0' THRU 5' EACH	A 5.0' THRU 10.0' LIN.FT	B 10.0' AND ABOVE LIN.FT	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD.840.19 OR STD 840.28	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	54" C.S. ELBOW	CONCRETE COLLARS CL. "B" STD 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
-L- 11+65	40 RT																								24																																																24	TEMPORARY PIPE (DETOUR)
TOTALS																									24																																																		

ABBREVIATIONS

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

**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".**

COMPUTED BY: REL DATE: 9/11/2025
CHECKED BY: JWT DATE: 9/11/2025

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

STATION SIZE THICKNESS OR GAUGE	OFFSET	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION FT	INVERT ELEVATION FT	INVERT ELEVATION FT	SLOPE CRITICAL %	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	C.S. PIPE 12" .064	15" .064	18" .064	24" .064	15" .079	18" .079	24" .109	30" .109	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"	** " R.C. PIPE (CLASS V)	***" RC PIPE CULVERTS, CONTRACTO	***" RC PIPE CULVERTS, CONTRACTO	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0') EACH	A 5.0' THRU 10.0' LIN.FT	B 10.0' AND ABOVE LIN.FT	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	T.B.D.I STD. 840.35	G.D.I. (N.S. FLAT)FRAME W/2 GRATES STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	T.B.D.I STD. 840.35	G.D.I (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	T.B.D.I STD. 840.35	15" C.S. ELBOW		CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
-L- 12+48	0 CL			2323.6	2322.5																														60														6																								
-L- 12+40	0 CL																																																																							60	
TOTALS																																			60														6																								

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.)	(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

DF18314.2045324

3RD1	04

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HENDERSON COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER

SEAL 35018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HYDRAULICS ENGINEER

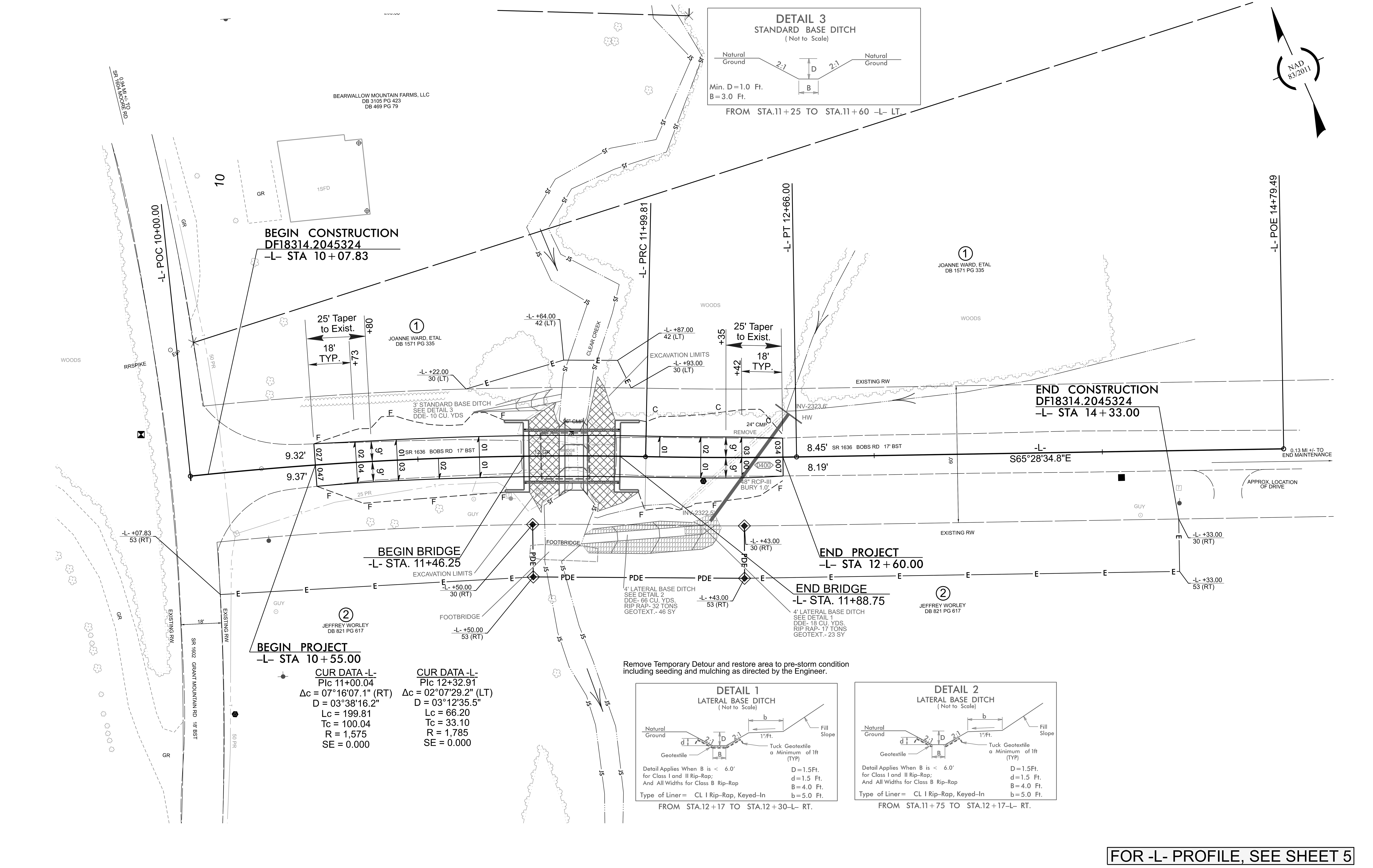
SEAL 024897

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

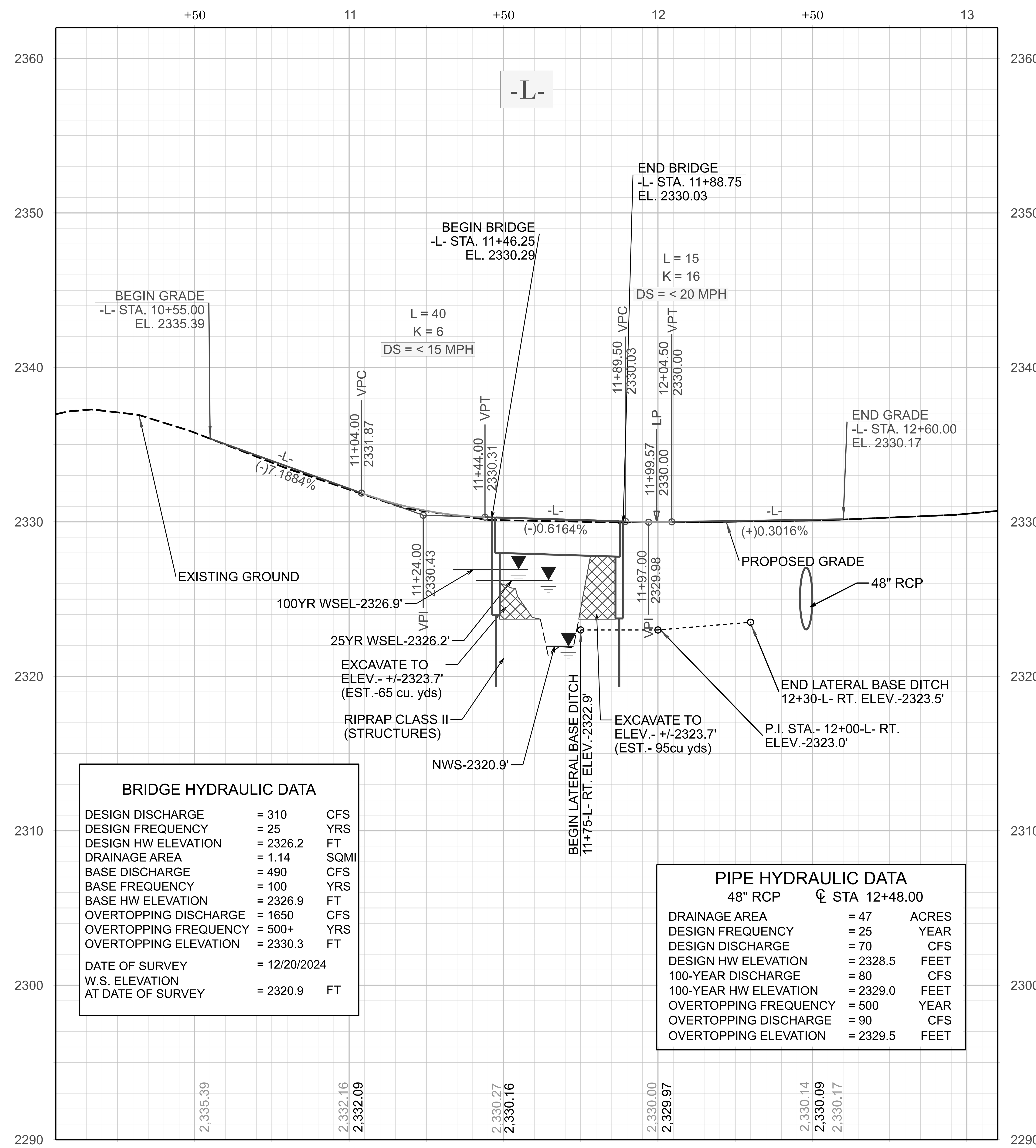
PREPARED BY

TGS ENGINEERS
201 W. MARION ST. STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS


DETAIL 3
STANDARD BASE DITCH
(Not to Scale)
Natural Ground
2:1
D
2:1
Natural Ground
B
Min. D=1.0 Ft.
B=3.0 Ft.
FROM STA.11+25 TO STA.11+60 -L- LT.
NAD 83/2011
BEARWALLOW MOUNTAIN FARMS, LLC
DB 3105 PG 423
DB 469 PG 79
0.94 MI +/- TO SR 1604 MOORE RD
10
GR
1SFD
BEGIN CONSTRUCTION
DF18314.2045324
-L- STA 10+07.83
-L- POC 10+00.00
-L- PRC 11+99.81
-L- PT 12+66.00
-L- POE 14+79.49
1
JOANNE WARD, ETAL
DB 1571 PG 335
WOODS
25' Taper to Exist.
18' TYP.
+80
+73
+35
+42
-L- +64.00
42 (LT)
-L- +87.00
42 (LT)
EXCAVATION LIMITS
-L- +93.00
30 (LT)
-L- +22.00
30 (LT)
CLEAR CREEK
3' STANDARD BASE DITCH
SEE DETAIL 3
DDE- 10 CU. YDS
EXISTING RW
END CONSTRUCTION
DF18314.2045324
-L- STA 14+33.00
-L-
S65°28'34.8"E
NV-2323.6'
HW
24" CMP
REMOVE
9.32'
9.37'
8.45'
8.19'
SR 1636 BOBS RD 17' BST
48" RCP-III
BURY 1.0'
0.13 MI +/- TO END MAINTENANCE
APPROX. LOCATION OF DRIVE
RRSPIKE
GUY
INV-2322.5'
-L- +07.83
53 (RT)
BEGIN BRIDGE
-L- STA. 11+46.25
FOOTBRIDGE
PDE
-L- +43.00
30 (RT)
END PROJECT
-L- STA 12+60.00
END BRIDGE
-L- STA. 11+88.75
EXCAVATION LIMITS
-L- +50.00
30 (RT)
4' LATERAL BASE DITCH
SEE DETAIL 2
DDE- 66 CU. YDS.
RIP RAP- 32 TONS
GEOTEXT.- 46 SY
-L- +43.00
53 (RT)
4' LATERAL BASE DITCH
SEE DETAIL 1
DDE- 18 CU. YDS.
RIP RAP- 17 TONS
GEOTEXT.- 23 SY
-L- +33.00
30 (RT)
-L- +33.00
53 (RT)
2
JEFFREY WORLEY
DB 821 PG 617
FOOTBRIDGE
-L- +50.00
53 (RT)
EXISTING RW
18'
SR 1602 GRANT MOUNTAIN RD 18' BST
BEGIN PROJECT
-L- STA 10+55.00
CUR DATA -L-
PIc 11+00.04
Δc = 07°16'07.1" (RT)
D = 03°38'16.2"
Lc = 199.81
Tc = 100.04
R = 1,575
SE = 0.000
CUR DATA -L-
PIc 12+32.91
Δc = 02°07'29.2" (LT)
D = 03°12'35.5"
Lc = 66.20
Tc = 33.10
R = 1,785
SE = 0.000
Remove Temporary Detour and restore area to pre-storm condition including seeding and mulching as directed by the Engineer.
DETAIL 1
LATERAL BASE DITCH
(Not to Scale)
Natural Ground
Geotextile
Fill Slope
Tuck Geotextile a Minimum of 1ft (TYP)
Detail Applies When B is < 6.0' for Class I and II Rip-Rap; And All Widths for Class B Rip-Rap
Type of Liner= CL I Rip-Rap, Keyed-In
D=1.5Ft.
d=1.5 Ft.
B=4.0 Ft.
b=5.0 Ft.
FROM STA.12+17 TO STA.12+30-L- RT.
DETAIL 2
LATERAL BASE DITCH
(Not to Scale)
Natural Ground
Geotextile
Fill Slope
Tuck Geotextile a Minimum of 1ft (TYP)
Detail Applies When B is < 6.0' for Class I and II Rip-Rap; And All Widths for Class B Rip-Rap
Type of Liner= CL I Rip-Rap, Keyed-In
D=1.5Ft.
d=1.5 Ft.
B=4.0 Ft.
b=5.0 Ft.
FROM STA.11+75 TO STA.12+17-L- RT.
FOR -L- PROFILE, SEE SHEET 5

11/14/23



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 310	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 2326.2	FT
DRAINAGE AREA	= 1.14	SQMI
BASE DISCHARGE	= 490	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2326.9	FT
OVERTOPPING DISCHARGE	= 1650	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 2330.3	FT
DATE OF SURVEY	= 12/20/2024	
W.S. ELEVATION AT DATE OF SURVEY	= 2320.9	FT

PIPE HYDRAULIC DATA

48" RCP ℄ STA 12+48.00

DRAINAGE AREA	= 47	ACRES
DESIGN FREQUENCY	= 25	YEAR
DESIGN DISCHARGE	= 70	CFS
DESIGN HW ELEVATION	= 2328.5	FEET
100-YEAR DISCHARGE	= 80	CFS
100-YEAR HW ELEVATION	= 2329.0	FEET
OVERTOPPING FREQUENCY	= 500	YEAR
OVERTOPPING DISCHARGE	= 90	CFS
OVERTOPPING ELEVATION	= 2329.5	FEET

POINT	NORTH	EAST	ELEVATION	DESCRIPTION
BM 1	630372.2186	1010500.5028	2339.05	RR SPIKE IN 24" DBL TRUNK POPLAR

FOR -L- PLAN, SEE SHEET 4

DF18314.2045324

3RD1	05

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HENDERSON COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35018 JIMMY L. TERRY
DocuSigned by: Jimmy Terry FD39F38882E94D0...
2/11/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 024897 John W. Twisdale, Jr.
Signed by: John W. Twisdale, Jr. 06E4FD4C9E304CE...
2/12/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PREPARED BY

TGS ENGINEERS
201 W. MARION ST., STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS

$$$-USER NAME-$$$ - $$$-DATE-$$$

09/08/99

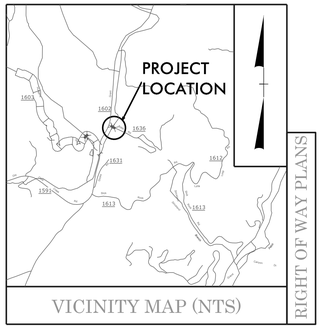
TIP PROJECT: DF18314.2045324

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18314.2045324	RW01	5

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

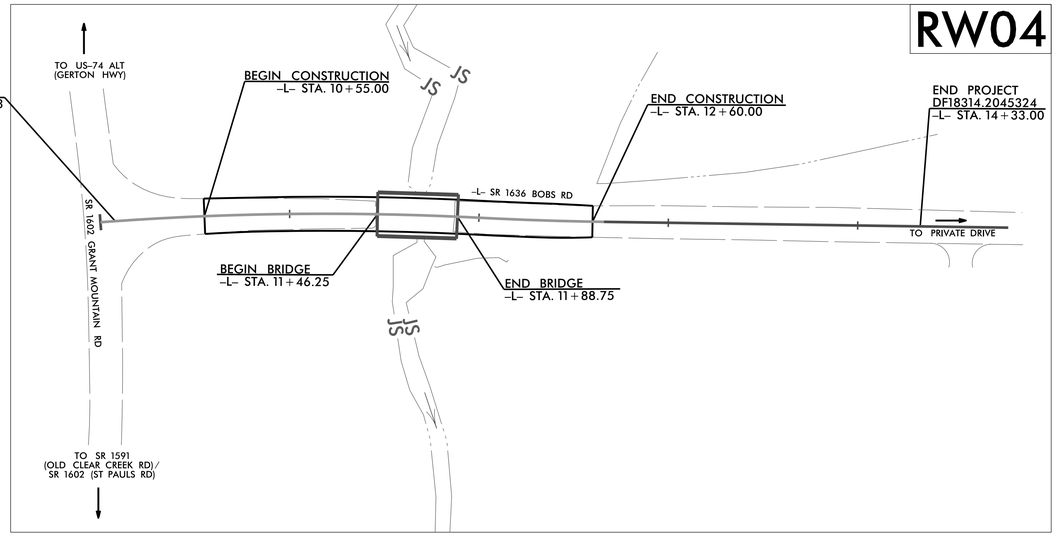
SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENTS AND PROPERTY TIES

HENDERSON COUNTY



VICINITY MAP (NTS)

RIGHT OF WAY PLANS



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50' 25' 0' 50' 100'

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT 336-1
WITH NAD83/2011 STATE PLANE GRID COORDINATES OF
NORTHING: 630243.7730' EASTING: 1010484.9640'
ELEVATION: 2333.0400'
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99977099
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:

LOCATION AND SURVEYS
DIVISION 14
122 BONNIE LANE
SYLVA, NC 28779

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: June 1,2025

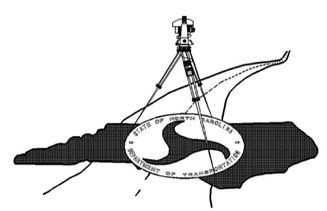
LETTING DATE: December 9, 2025

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4727 LAND SURVEYOR BRYAN A. BARNHARDT

DocuSigned by: Bryan Barnhardt A8355FE84A8A4CE... 07/01/2025

SIGNATURE: *DATE:*



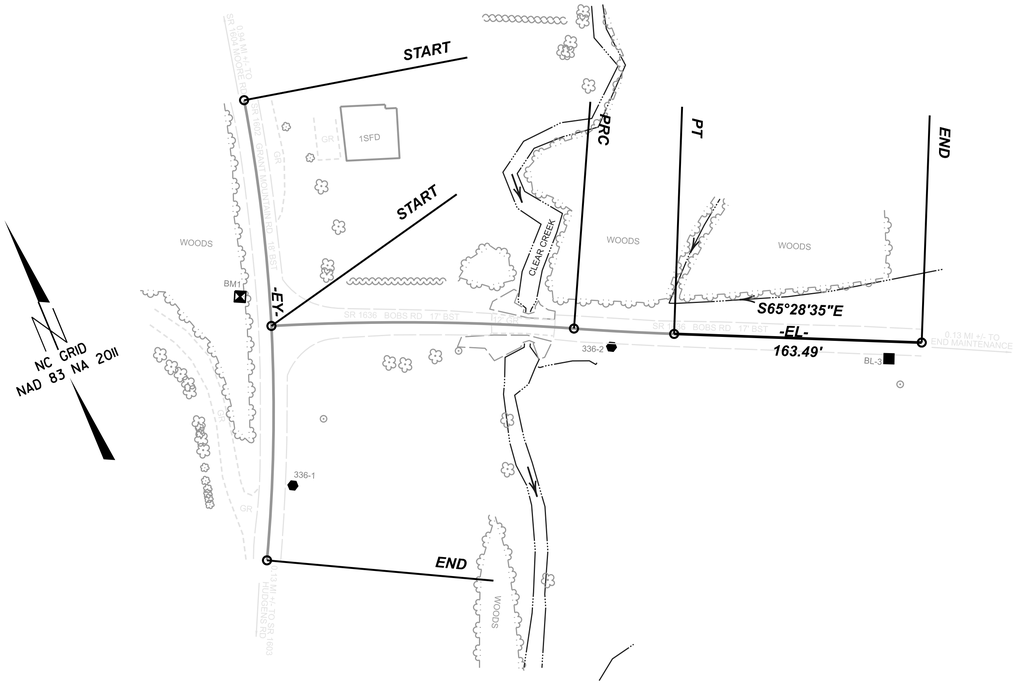
5/26/20

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

BASELINE POINTS TABLE				
POINT	DESC	NORTH	EAST	ELEVATION
1	336-1	630243.7730	1010484.9640	2333.0400
2	336-2	630247.7970	1010714.2130	2329.1300
3	BL-3	630170.4109	1010880.3123	2333.4600

BENCHMARK TABLE				
POINT	DESC	NORTH	EAST	ELEVATION
BM1	RR SPIKE IN 24" POPLAR	630372.2186	1010500.5028	2339.0500



I, MATTHEW T. CORNWELL, PLS, CERTIFY THAT THE PROJECT CONTROL WAS PERFORMED UNDER MY SUPERVISION FROM AN ACTUAL GPS SURVEY MADE UNDER MY SUPERVISION AND THE FOLLOWING INFORMATION WAS USED TO PERFORM THE SURVEY:

CLASS OF SURVEY: ***AA***
TYPE OF GPS FIELD PROCEDURE: RTN
DATES OF SURVEY: 10/14/2024
DATUM/EPOCH: NAD83/2011
PUBLISHED/FIXED-CONTROL USE: N/A
LOCALIZED AROUND: 336-1
NORTHING: 630243.773
EASTING: 1010484.964
COMBINED GRID FACTOR: 0.99977099
GEOID MODEL: GEOID18
UNITS: US SURVEY FEET

I ALSO CERTIFY THAT THE BASELINE CONTROL FOR THIS PROJECT WAS COMPLETED UNDER MY DIRECT AND RESPONSIBLE CHARGE FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; THAT ALL HORIZONTAL CLOSURES HAD A MINIMUM RATIO OF PRECISION OF 1:20,000 (CLASS AA) AND VERTICAL ACCURACY TO CLASS A. FIELD WORK WAS PERFORMED OCTOBER 2024, AND ALL COORDINATES ARE BASED ON NAD 83/NA 2011 AND ALL ELEVATIONS ARE BASED ON NAVD 88; THAT THIS SURVEY WAS PERFORMED TO MEET THE REQUIREMENTS OF 21NCAC 56.1600 AS APPLICABLE.

THIS 10/31/2024

DocuSigned by:
Matthew Cornwell
EBD36F11473E475...

PROFESSIONAL LAND SURVEYOR L-4775

EXISTING ALIGNMENT NAME:EL									
POINT	NORTHING	EASTING	BEARING	DIST	DELTA	D	L	T	R
PC	630346.4476	1010512.1775							
CURVE					07°16'07.1" Right	03°38'16.2"	199.807	100.038	1575.000
PRC	630268.3837	1010695.9586							
CURVE					02°07'29.2" Left	03°12'35.5"	66.195	33.101	1785.000
PT	630239.7979	1010755.6591							
LINE			S65°28'34.8"E	163.4898					
END	630171.9383	1010904.4005							

EXISTING ALIGNMENT NAME:EY									
POINT	NORTHING	EASTING	BEARING	DIST	DELTA	D	L	T	R
PC	630490.9620	1010552.5904							
CURVE					15°57'33.2" Right	05°13'57.0"	305.002	153.495	1095.000

50' 25' 0' 50' 100'

NOTES:

1. THE PROPOSED ALIGNMENT 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.

440336
R/W | D2C-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL LAND SURVEYOR
NORTH CAROLINA PROFESSIONAL SEAL L-4775 LAND SURVEYOR MATTHEW T. CORNWELL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

2024 STANDARD SPECIFICATIONS

TIP PROJECT: 440336
County: Henderson

PREPARED FOR

LOCATION AND SURVEYS UNIT

PREPARED BY

TGS ENGINEERS
201 WEST MARION ST.
SUITE 200
SHELBY, NC 28150
704-476-0003

5/26/20

PROPOSED ALIGNMENT CONTROL SHEET

I, BRIAN BARWATT, PLS, CERTIFY THAT THE DATA COMPILED CAME FROM AVAILABLE SURVEYS/MAPPING PERFORMED BY OTHERS AND PROVIDED TO ME BY NCDOT AND DO NOT CERTIFY TO THE ACCURACY OR QUALITY OF THE INDIVIDUAL DATA SOURCES.

THIS 30TH DAY OF JUNE, 2025.

DocuSigned by:
Brian Barwatt
A9365FE84A8A4CE...

PROFESSIONAL LAND SURVEYOR L-4727

PROPOSED ALIGNMENT: L												
POINT	STATION	NORTHING	EASTING	BEARING	DIST	DELTA	D	L	T	R	LT	ST
PC	10+00.00	630346.4476	1010512.1775	S66°59'09.2"E	199.6734	07°16'07.1"	03°38'16.2"	199.8074	100.0379	1575.0000		
PRC	11+99.81	630268.3837	1010695.9586	S64°24'50.2"E	66.1914	02°07'29.2"	03°12'35.5"	66.1952	33.1014	1785.0000		
PT	12+66.00	630239.7979	1010755.6591	S65°28'34.8"E	213.4918							
END	14+79.49	630151.1841	1010949.8918									

NOTES:

1. THE PROPOSED ALIGNMENT 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.

DF18314.2045324

R/W | D2D-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL LAND SURVEYOR

SEAL L-4727 NORTH CAROLINA PROFESSIONAL LAND SURVEYOR BRIAN A. BARWATT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

2024 STANDARD SPECIFICATIONS

TIP PROJECT: *DF18314.2045324*

County: Henderson

PREPARED FOR

LOCATION AND SURVEYS UNIT

PREPARED BY

LOCATION AND SURVEYS
DIVISION 14
122 BONNIE LANE
SYLVA, NC 28779

5/26/20

RIGHT OF WAY CONTROL SHEET

I , BRIAN BARWATT, PLS, CERTIFY THAT THE RIGHT OF WAY AND PERMANENT EASEMENT MONUMENTATION FOR THIS PROJECT SHOWN HEREIN WAS COMPLETED UNDER MY DIRECT AND RESPONSIBLE CHARGE FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; THAT ALL HORIZONTAL CLOSURES HAD A MINIMUM RATIO OF PRECISION OF 1:10,000 (CLASS A). FIELD WORK WAS PERFORMED ON 6/12/2025, AND ALL COORDINATES ARE BASED ON NAD83/NA 2011; THAT THIS SURVEY WAS PERFORMED TO MEET THE REQUIREMENTS OF 21NCAC 56.1600 AS APPLICABLE.

THIS 30TH DAY OF JUNE, 2025.

DocuSigned by:
Brian Barwatt
A8568FE86A84CE...

PROFESSIONAL LAND SURVEYOR L-4727

PERMANENT EASEMENT MARKER IRON PIN AND CAP: L			
STATION	OFFSET	NORTH	EAST
11+50.00	30.00	630262.7902	1010638.4953
11+50.00	53.00	630241.9175	1010628.8346
12+43.00	30.00	630222.3491	1010721.9910
12+43.00	53.00	630201.5487	1010712.1755

NOTES:

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

DF18314.2045324

R/W | 03E-I

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4727 LAND SURVEYOR BRIAN A. BARWATT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

2024 STANDARD SPECIFICATIONS

TIP PROJECT: *DF18314.2045324*

County: Henderson

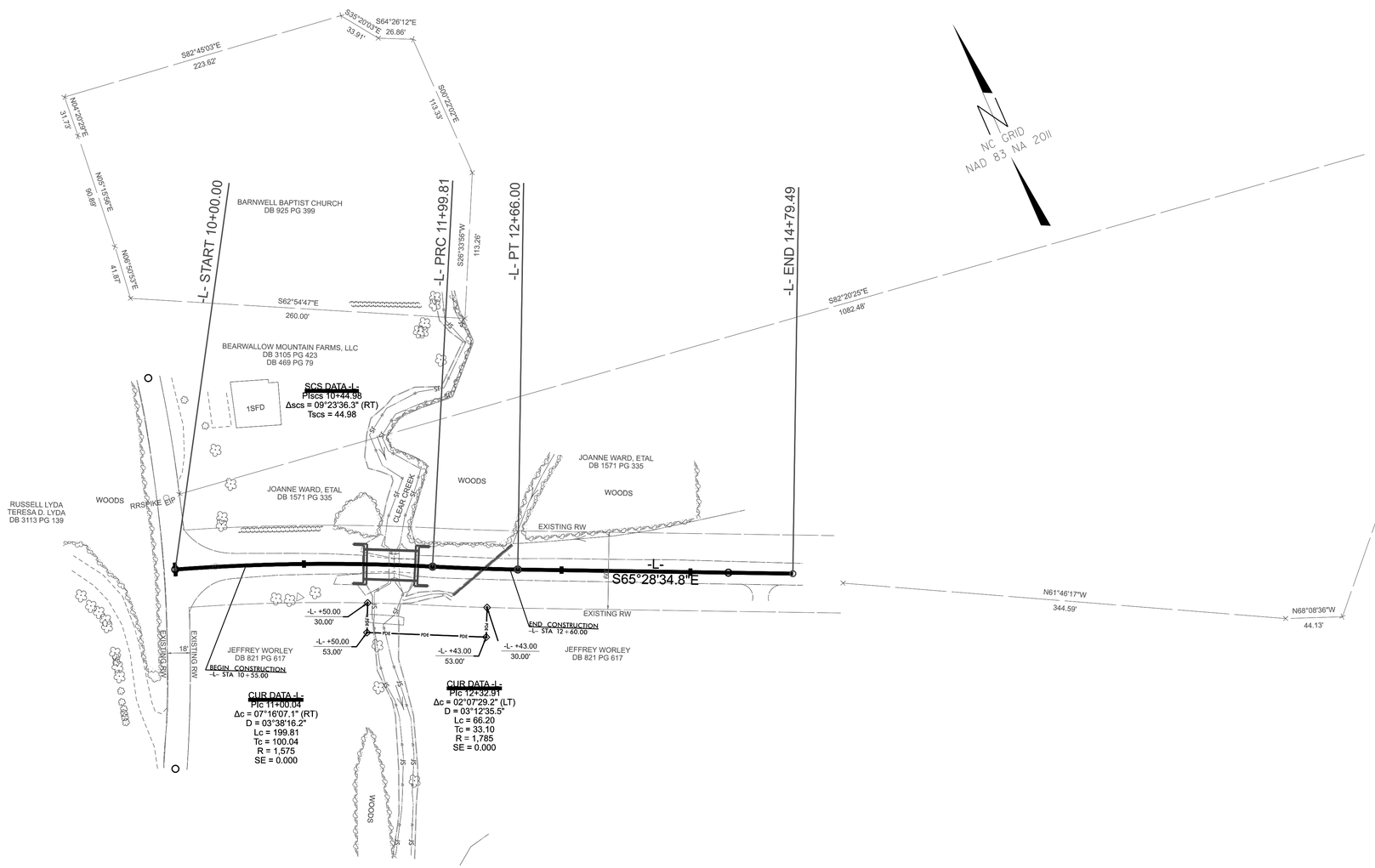
PREPARED FOR

LOCATION AND SURVEYS UNIT

PREPARED BY

LOCATION AND SURVEYS
DIVISIOON 14
122 BONNIE LANE
SYLVA, NC 28779

5/26/20



I , BRIAN BARWATT, PLS, CERTIFY THAT THE RIGHT OF WAY AND PERMANENT EASEMENT MONUMENTATION FOR THIS PROJECT SHOWN HEREIN WAS COMPLETED UNDER MY DIRECT AND RESPONSIBLE CHARGE FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; THAT ALL HORIZONTAL CLOSURES HAD A MINIMUM RATIO OF PRECISION OF 1:10,000 (CLASS A). FIELD WORK WAS PERFORMED ON 6/12/2025, AND ALL COORDINATES ARE BASED ON NAD83/NA 2011; THAT THIS SURVEY WAS PERFORMED TO MEET THE REQUIREMENTS OF 21NCAC 56.1600 AS APPLICABLE.

THIS 30TH DAY OF JUNE, 2025.

DocuSigned by:
Brian Barwatt
A9355FE84A8A4CE...

PROFESSIONAL LAND SURVEYOR L-4727

NOTES:

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

DF18314.2045324

R/W | 04

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4727 LAND SURVEYOR BRIAN A. BARWATT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

2024 STANDARD SPECIFICATIONS

TIP PROJECT: *DF18314.2045324*

County: Henderson

PREPARED FOR

LOCATION AND SURVEYS UNIT

PREPARED BY

LOCATION AND SURVEYS DIVISION 14
122 BONNIE LANE
SYLVA, NC 28779

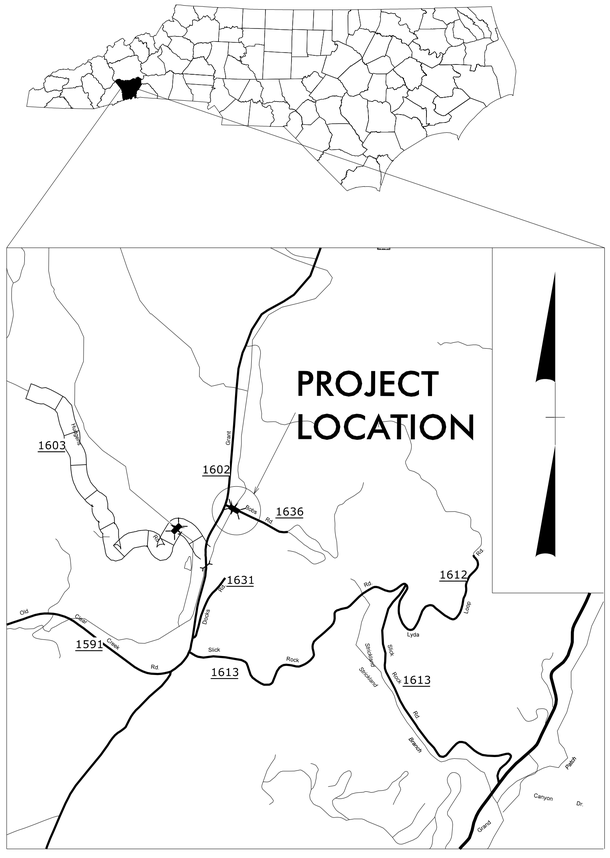
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

HENDERSON COUNTY

LOCATION: *STRUCTURE #440336 OVER CLEAR CREEK ON SR 1636 (BOBS RD)*

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, & STRUCTURE*



VICINITY MAP

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND LEGEND
TMP-1B	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES, LOCAL NOTES, AND PHASING)
TMP-4	TEMPORARY TRAFFIC CONTROL PHASE I
TMP-5	TEMPORARY TRAFFIC CONTROL PHASE II
TMP-6	TEMPORARY TRAFFIC CONTROL PHASE III

SHEET NO.
TMP-1

TIP PROJECT: DF1814.2045324

PLANS PREPARED FOR N.C.D.O.T. BY: *TGS ENGINEERS*

TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

DON A. PARKER, P.E.
PROJECT ENGINEER

CODA BRANNAN, E.I.
DESIGN ENGINEER

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ZACHARY T. SHULER, P.E.
NCDOT CONTACT

APPROVED: Signed by: Don A. Parker 75DB9E90ADEF440...

DATE: 10/13/2025

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

10/7/2025
X:\NCDOT\Div 14 Henderson 336\Work Zone Traffic Control\Henderson336_TC_TMP_01.dgn
User:cbrannan

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGERS

PROJ. REFERENCE NO.	SHEET NO.
DF18314.2045324	TMP-1A

TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
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PH (919) 773-8887
CORP. LICENSE NO.: C-0275

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- TEMP. SHORING (LOCATION PURPOSES ONLY)
- WORK AREA
- REMOVAL

SIGNALS

EXISTING PROPOSED TEMP TEMPORARY

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM SKINNY DRUM TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW BOARD
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED ATTENUATOR (TMA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

PAVEMENT MARKING SYMBOLS

PAVEMENT MARKING SYMBOLS

APPROVED: Signed by: Don A. Parker 75DB8E9DADEF440...

DATE: 10/13/2025

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

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

ROADWAY STANDARD DRAWINGS & LEGEND

10/7/2025
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User:cbrannan

PROJ. REFERENCE NO.	SHEET NO.
DF18314.2045324	TMP-1B

TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

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.

LANE AND SHOULDER CLOSURE REQUIREMENTS

A) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

B) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

C) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 5 FT OF AN OPEN TRAVEL LANE ON AN UNDIVIDED FACILITY, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 10 FT OF AN OPEN TRAVEL LANE ON A DIVIDED FACILITY, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

E) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

PAVEMENT EDGE DROP OFF REQUIREMENTS

F) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

G) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 100 FT IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

H) NOTIFY THE ENGINEER THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

I) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

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

TRAFFIC CONTROL DEVICES

K) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.

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

MANAGEMENT STRATEGIES

THE FOLLOWING LISTED WORK ZONE STRATEGIES ARE RECOMMENDED FOR INCLUSION WITHIN THIS TRANSPORTATION MANAGEMENT PLAN (TMP).

RECOMMENDED STRATEGIES:

TRAFFIC MANAGEMENT STRATEGIES:
- FULL ROADWAY CLOSURES
- LANE SHIFTS OR CLOSURES
- SHOULDER CLOSURES
- ONE-LANE, TWO WAY OPERATION (FLAGGING)
- ON-SITE DETOURS

PHASING

NOTE: FOR ALL FLAGGING OPERATIONS, SEE RSD 1101.02, SHEET 1.

PHASE I

STEP 1 -- INSTALL WORK ZONE ADVANCE WARNING SIGNS IN ACCORDANCE WITH RSD 1101.01, SHEET 3 AND TMP-4.

STEP 2 -- AWAY FROM TRAFFIC AND USING FLAGGERS AS NECESSARY, INSTALL TEMPORARY 84” PIPE AND COMPLETE PARTIALLY CONSTRUCTED TEMPORARY ON-SITE DETOUR FROM -Y- SR 1602 (GRAND MOUNTAIN RD) TO -L- SR 1636 (BOBS RD) AS DIRECTED BY THE ENGINEER.

-- INSTALL AND COVER SIGNING FOR UPCOMING TRAFFIC SHIFT.

PHASE II

STEP 1 -- USING FLAGGERS, SHIFT TRAFFIC TO THE PHASE II PATTERN AND CLOSE THE EXISTING ROADWAY. (SEE TMP-5).

STEP 2 -- AWAY FROM TRAFFIC, PERFORM THE FOLLOWING:

-- CONSTRUCT -L- SR 1636 (BOBS RD) INCLUDING PROPOSED BRIDGE FROM -L- STA. 10+55 +/- TO -L- STA. 12+60 +/-(SEE TMP-5).

-- INSTALL APPROXIMATELY 40’ OF 48” RCP-III (DRAINAGE STRUCTURE 0400) FROM THE UPSTREAM END INCLUDING THE UPSTREAM HEADWALL (SEE TMP-5).

PHASE III

STEP 1 -- USING FLAGGERS, SHIFT TRAFFIC TO THE FINAL TRAFFIC PATTERN AND CLOSE THE ON-SITE DETOUR (SEE TMP-6).

STEP 2 -- AWAY FROM TRAFFIC AND USING FLAGGERS AS NECESSARY, PERFORM THE FOLLOWING:

-- COMPLETE INSTALLATION OF 48” RCP-III (DRAINAGE STRUCTURE 0400) AND DOWNSTREAM HEADWALL.

-- REMOVE ON-SITE DETOUR AND RESTORE AREA IN ACCORDANCE WITH THE ROADWAY PLANS.

STEP 3 -- REMOVE ALL TRAFFIC CONTROL DEVICES.

APPROVED: Signed by: Don A. Parker 75DB9E90ADEF440... DATE: 10/13/2025

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

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

PROJ. REFERENCE NO.	SHEET NO.
DF18314.2045324	TMP-4

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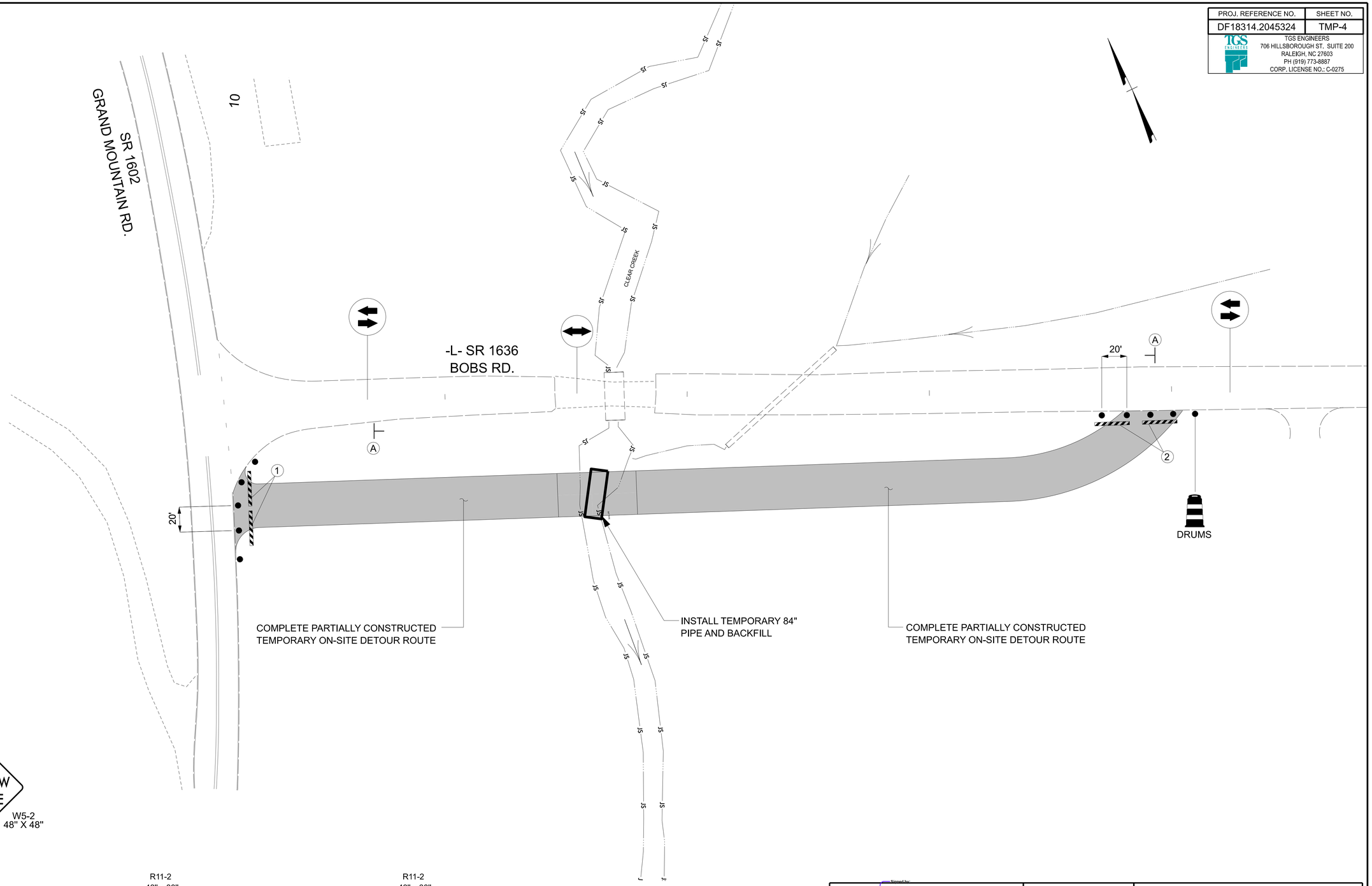
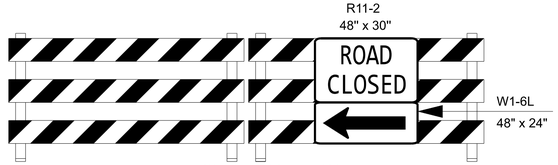
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275



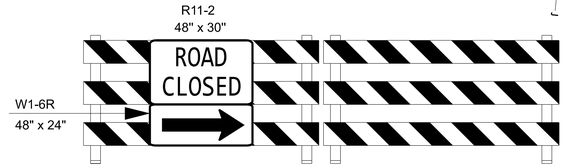
W5-2
48" X 48"

(A)



TYPE III BARRICADE(S)

(1)



TYPE III BARRICADE(S)

(2)

APPROVED: Don A. Parker
75DB9E90ADEF440...

DATE: 10/13/2025

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A PARKER

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

PHASE I

10/7/2025
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User:cbrannan

PROJ. REFERENCE NO.	SHEET NO.
DF18314.2045324	TMP-5

TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

SR 1602
GRAND MOUNTAIN RD.

10

INSTALL APPROXIMATELY
40' OF PROPOSED 48" RCP-III
FROM THE UPSTREAM END

-L- STA. 11+46.25
BEGIN BRIDGE

-L- STA. 10+55±
BEGIN CONSTRUCTION

CLEAR CREEK

-L- SR 1636
BOBS RD.

48" RCP-III
BURY 1.0'
Ø400

20'

10'

40'

DRUMS

-L- STA. 11+88.75
END BRIDGE

-L- STA. 12+60±
END CONSTRUCTION

JS

W1-4L
48" X 48"
(A)

STOP
R1-1
48" X 48"
(B)

R11-2
48" x 30"
ROAD
CLOSED
W1-6L
48" x 24"

TYPE III BARRICADE(S)
(1)

R11-2
48" x 30"
ROAD
CLOSED
W1-6R
48" x 24"

TYPE III BARRICADE(S)
(2)

APPROVED: Signed by: Don A. Parker 75DB9E90ADEF440...

DATE: 10/13/2025

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A PARKER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

PHASE II

10/7/2025
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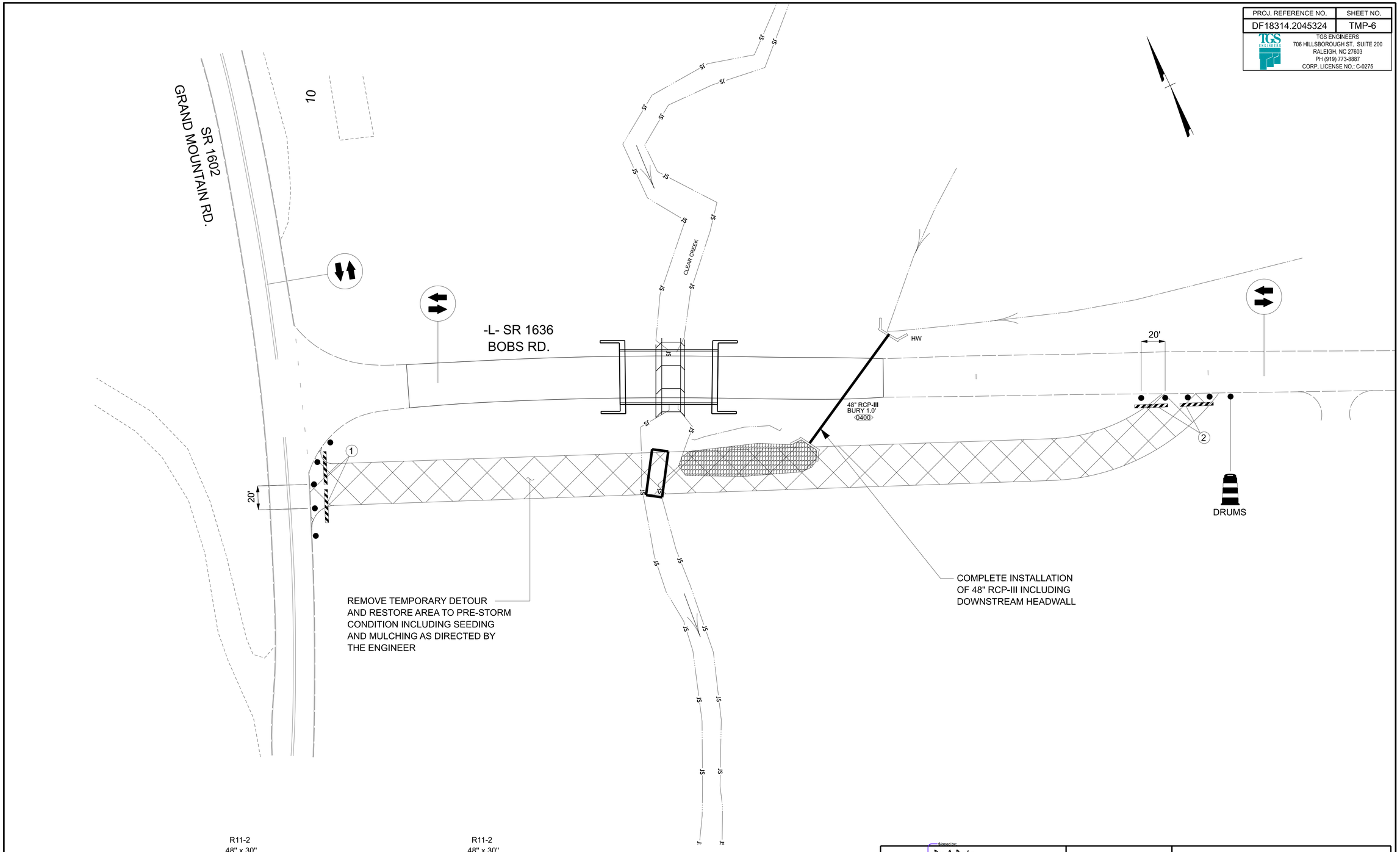
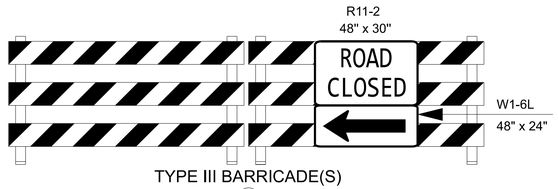
User:cbrannan

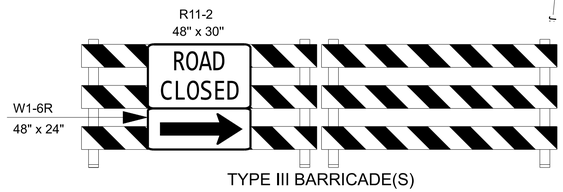
PROJ. REFERENCE NO.	SHEET NO.
DF18314.2045324	TMP-6

TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275





TYPE III BARRICADE(S)
①



TYPE III BARRICADE(S)
②

APPROVED: Signed by: Don A. Parker 75DB9E90ADEF440...

DATE: 10/13/2025

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

PHASE III

10/7/2025
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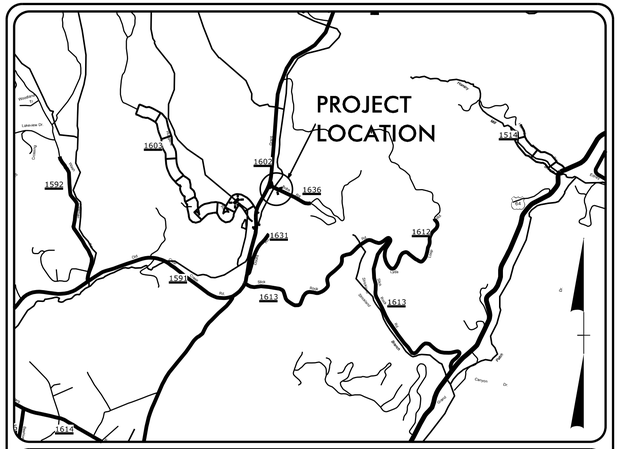
User:cbrannan

TIP PROJECT: DF18314.2045324



VICINITY MAP
NOT TO SCALE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

HENDERSON COUNTY

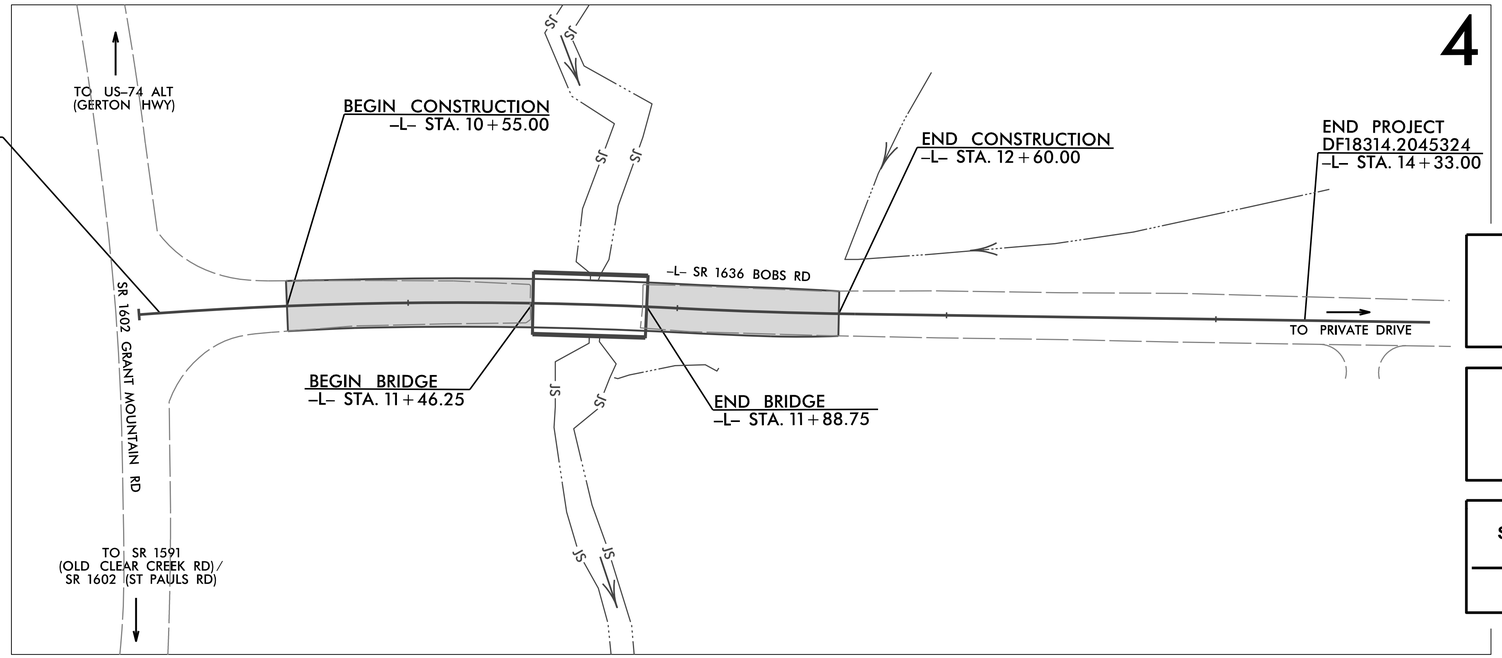
LOCATION: *STRUCUTRE #440336 OVER CLEAR CREEK ON SR 1636 (BOBS RD)*

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, AND STRUCTURE*

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18314.2045324	EC-1	

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

NAD 83/ 2011



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.

GRAPHIC SCALE

20 10 0 20 40
PLANS

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG 010000 GENERAL STORMWATER CONSTRUCTION PERMIT ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF ENERGY, MINERAL, AND LAND RESOURCES.

TGS ENGINEERS

Prepared in the Office of:

TGS ENGINEERS

706 HILLSBOROUGH ST
SUITE 200
RALEIGH, NC 27603

Designed by:

Ben Henegar, PE — NAME
3564 — LEVEL III CERTIFICATION NO.

Roadway Standard Drawings

The "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2024 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

PROJECT REFERENCE NO.	SHEET NO.
DF18314.2045324	EC-02
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

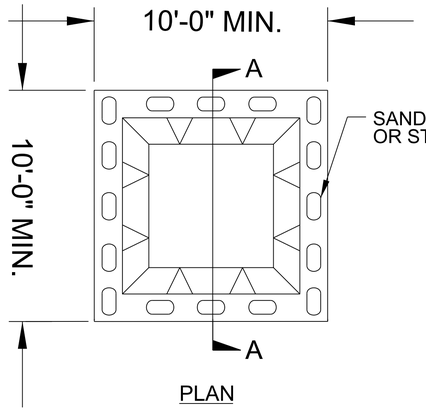
EROSION & SEDIMENT CONTROL LEGEND

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1630.03	Temporary Silt Ditch	TSD
1630.04	Stilling Basin	
1630.05	Temporary Diversion	TD
1630.06	Special Stilling Basin	
1630.07	Skimmer Basin	
1630.08	Tiered Skimmer Basin	
1630.09	Earthen Dam with Skimmer	
	Infiltration Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C

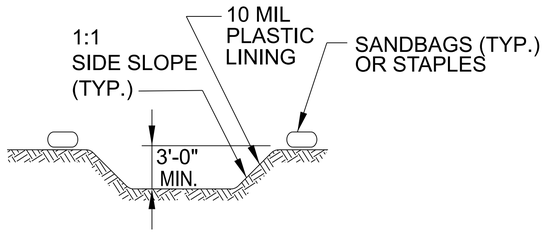
Std. #	Description	Symbol
1633.01	Temporary Rock Silt Check Type A	
1633.02	Temporary Rock Silt Check Type B	
1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1634.01	Temporary Rock Sediment Dam Type A	
1634.02	Temporary Rock Sediment Dam Type B	
1635.01	Rock Pipe Inlet Sediment Trap Type A	A
1635.02	Rock Pipe Inlet Sediment Trap Type B	B
1636.01	Excelsior Wattle Check	
1636.01	Excelsior Wattle Check with Flocculant	
1636.01	Coir Fiber Wattle Check	
1636.01	Coir Fiber Wattle Check with Flocculant	
1636.02	Silt Fence Excelsior Wattle Break	EW
	Silt Fence Coir Fiber Wattle Break	CFW
1636.03	Excelsior Wattle Barrier	—EW—EW—EW—
1636.03	Coir Fiber Wattle Barrier	—CFW—CFW—CFW—

PROJECT REFERENCE NO.	SHEET NO.
DF18314.2045324	EC-2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



PLAN



SECTION A-A

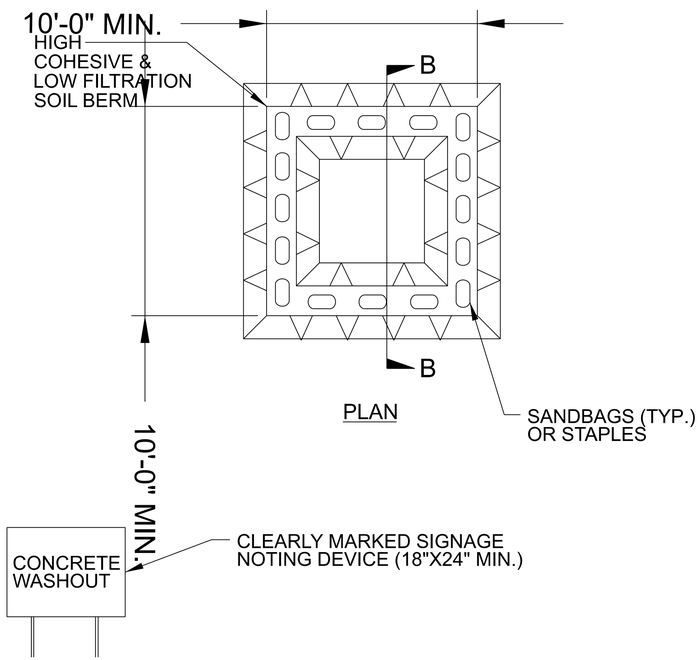
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.

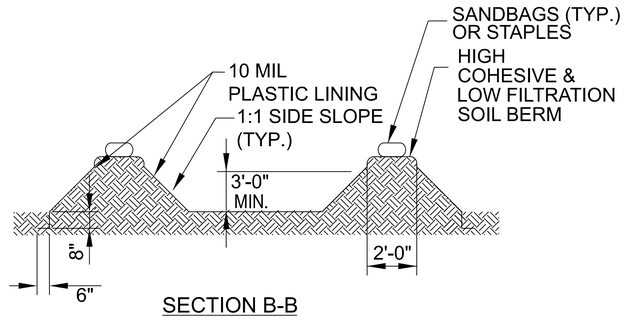
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

BELOW GRADE WASHOUT STRUCTURE

NOT TO SCALE



PLAN



SECTION B-B

NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.

3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

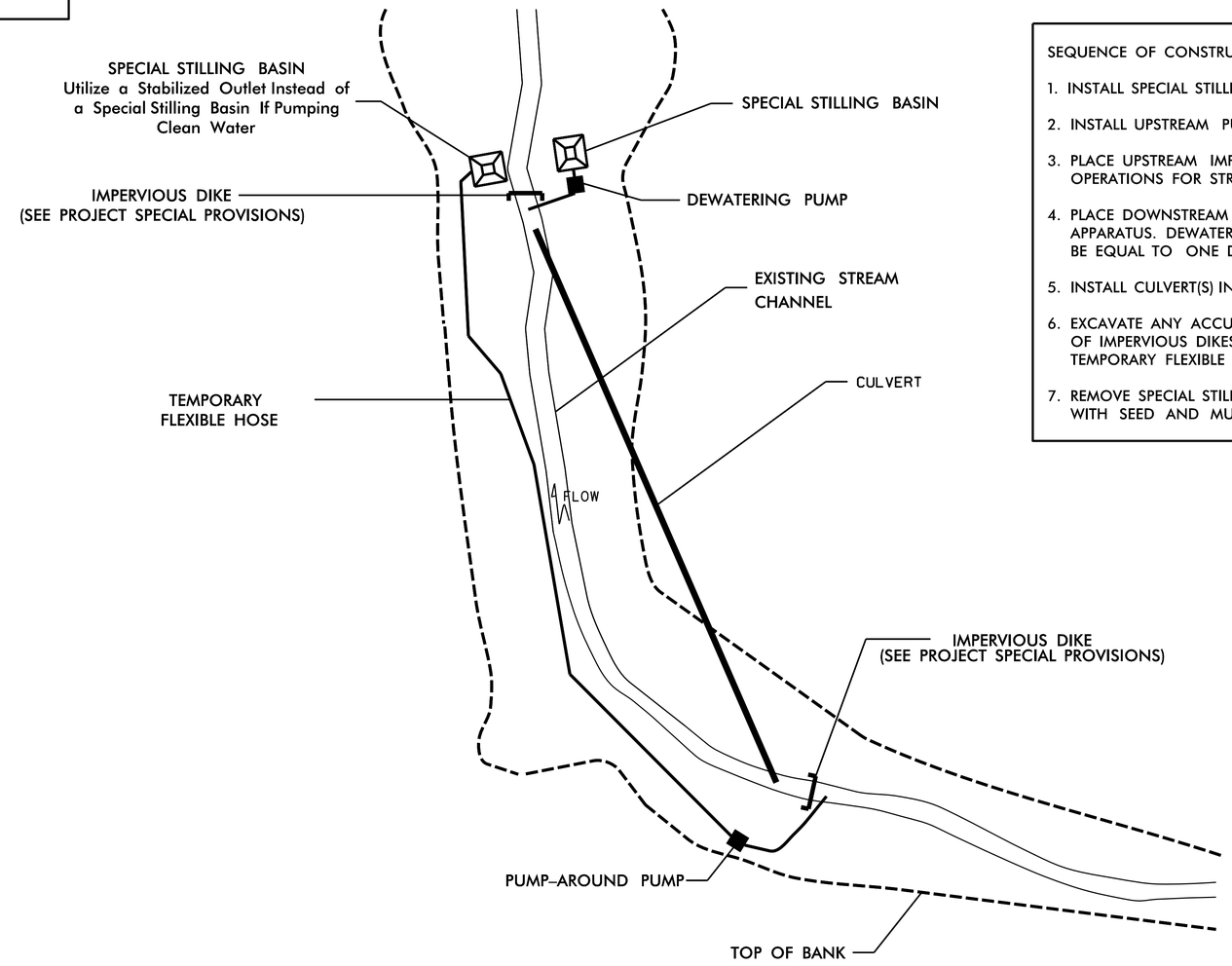
ABOVE GRADE WASHOUT STRUCTURE

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
DF1831420453 24	EC-2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

EXAMPLE OF PUMP–AROUND OPERATION

NOTES:
1) All excavation shall be performed in only dry or isolated areas of the work zone.
2) Impervious dikes are to be used to isolate work from stream flow when necessary.
3) Maintenance of stream flow operations shall be incidental to the work. This includes polyethylene sheeting, diversion pipes, pumps and hoses.
4) Pumps and hoses shall be of sufficient size to dewater the work area.



SEQUENCE OF CONSTRUCTION FOR TYPICAL WORK AREA

1. INSTALL SPECIAL STILLING BASIN(S).
2. INSTALL UPSTREAM PUMP AND TEMPORARY FLEXIBLE HOSE.
3. PLACE UPSTREAM IMPERVIOUS DIKE AND BEGIN PUMPING OPERATIONS FOR STREAM DIVERSION.
4. PLACE DOWNSTREAM IMPERVIOUS DIKE AND PUMPING APPARATUS. DEWATER ENTRAPPED AREA. AREA TO BE DEWATERED SHALL BE EQUAL TO ONE DAY'S WORK.
5. INSTALL CULVERT(S) IN ACCORDANCE WITH THE PLANS.
6. EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF IMPERVIOUS DIKES. REMOVE IMPERVIOUS DIKES, PUMPS, AND TEMPORARY FLEXIBLE HOSE. (DOWNSTREAM IMPERVIOUS DIKES FIRST).
7. REMOVE SPECIAL STILLING BASIN(S) AND BACKFILL. STABILIZE DISTURBED AREA WITH SEED AND MULCH.

PROJECT REFERENCE NO.	SHEET NO.
DF18314.2045324	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

DITCHLINE EXCELSIOR MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	–L–	11+25	11+60	LT	150
				SUBTOTAL	150

SLOPE MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	–L–	10+55	11+45	LT	70
4	–L–	10+55	11+45	RT	70
4	–L–	11+90	12+60	LT	75
4	–L–	11+90	12+60	RT	75
				SUBTOTAL	290

MATTING FOR EROSION CONTROL TOTALS

	ESTIMATE (SY)
DITCHLINE STRAW MATTING SUBTOTAL	N/A
DITCHLINE EXCELSIOR MATTING SUBTOTAL	150
SLOPE MATTING SUBTOTAL	290
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER	560
TOTAL	1,000
SAY	1,000

PROJECT REFERENCE NO.	SHEET NO.
DF18314.2045324	EC-3A
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 TO 4:1	*14 DAYS*	*7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH WITH SLOPES STEEPER THAN 4:1.* *7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES PERIMETER SLOPES, AND HQW ZONES*
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	*14 DAYS*	*7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES PERIMETER SLOPES, AND HQW ZONES*

11/14/23

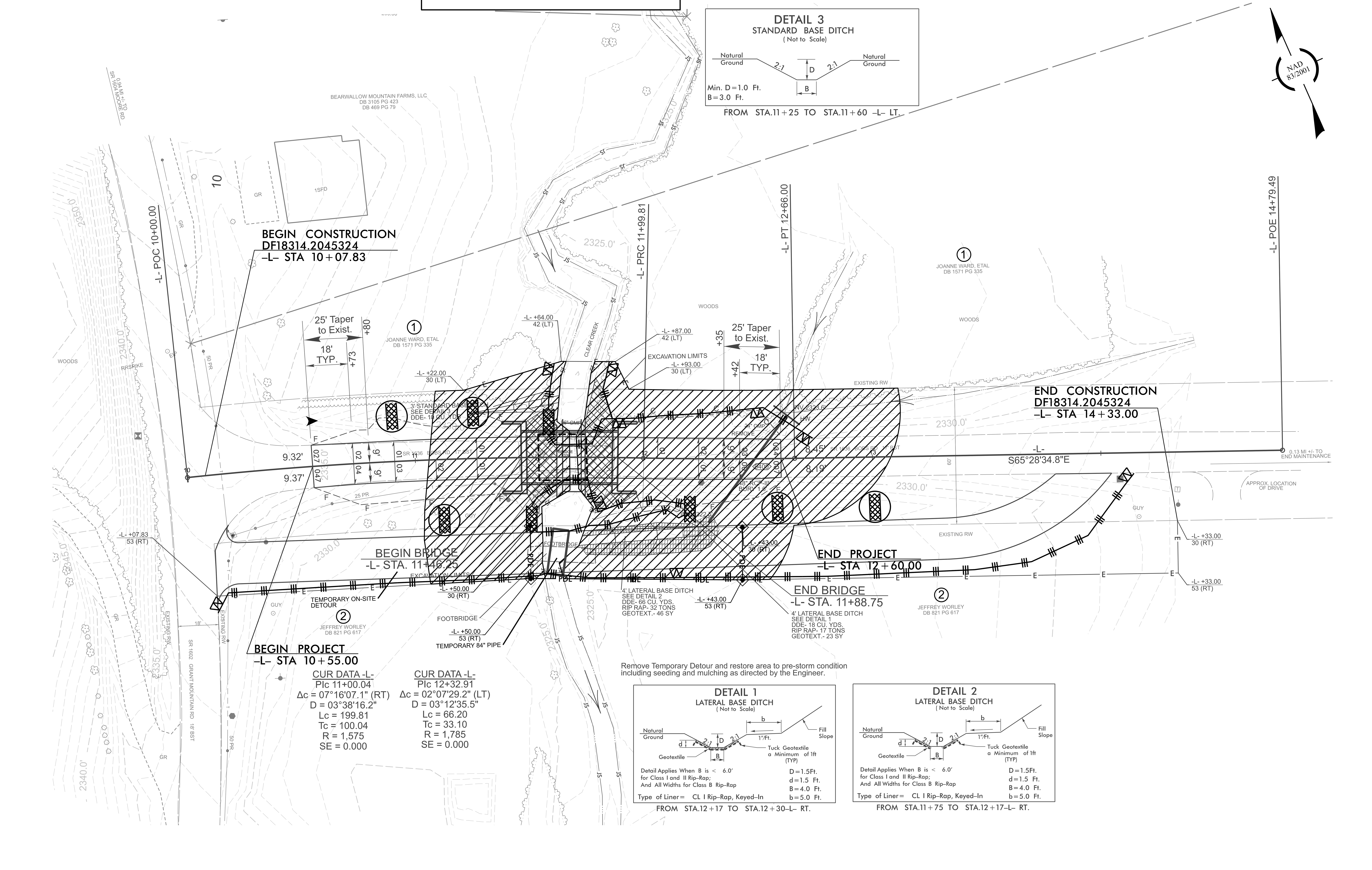
NOTE:
UTILIZE SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

NOTE:
ALL IN-STREAM WORK SHALL BE PERFORMED IN THE DRY

ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

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

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 04



DETAIL 3
STANDARD BASE DITCH
(Not to Scale)
Natural Ground
Min. D=1.0 Ft.
B=3.0 Ft.
FROM STA.11+25 TO STA.11+60 -L- LT.
BEARWALLOW MOUNTAIN FARMS, LLC
DB 3105 PG 423
DB 469 PG 79
BEGIN CONSTRUCTION
DF18314.2045324
-L- STA 10+07.83
-L- POC 10+00.00
-L- PRC 11+99.81
-L- PT 12+66.00
-L- POE 14+79.49
JOANNE WARD, ETAL
DB 1571 PG 335
25' Taper to Exist.
18' TYP.
CLEAR CREEK
EXCAVATION LIMITS
EXISTING RW
END CONSTRUCTION
DF18314.2045324
-L- STA 14+33.00
-L-
S65°28'34.8"E
0.13 MI +/- TO END MAINTENANCE
APPROX. LOCATION OF DRIVE
BEGIN BRIDGE
-L- STA. 11+46.25
END PROJECT
-L- STA 12+60.00
END BRIDGE
-L- STA. 11+88.75
TEMPORARY ON-SITE DETOUR
FOOTBRIDGE
TEMPORARY 84" PIPE
4' LATERAL BASE DITCH
SEE DETAIL 2
DDE- 66 CU. YDS.
RIP RAP- 32 TONS
GEOTEXT.- 46 SY
4' LATERAL BASE DITCH
SEE DETAIL 1
DDE- 18 CU. YDS.
RIP RAP- 17 TONS
GEOTEXT.- 23 SY
JEFFREY WORLEY
DB 821 PG 617
BEGIN PROJECT
-L- STA 10+55.00
SR 1602 GRANT MOUNTAIN RD 18' BST
CUR DATA -L-
PIc 11+00.04
Δc = 07°16'07.1" (RT)
D = 03°38'16.2"
Lc = 199.81
Tc = 100.04
R = 1,575
SE = 0.000
CUR DATA -L-
PIc 12+32.91
Δc = 02°07'29.2" (LT)
D = 03°12'35.5"
Lc = 66.20
Tc = 33.10
R = 1,785
SE = 0.000
Remove Temporary Detour and restore area to pre-storm condition including seeding and mulching as directed by the Engineer.
DETAIL 1
LATERAL BASE DITCH
(Not to Scale)
Detail Applies When B is < 6.0' for Class I and II Rip-Rap; And All Widths for Class B Rip-Rap
D=1.5Ft.
d=1.5 Ft.
B=4.0 Ft.
b=5.0 Ft.
Type of Liner= CL I Rip-Rap, Keyed-In
FROM STA.12+17 TO STA.12+30-L- RT.
DETAIL 2
LATERAL BASE DITCH
(Not to Scale)
Detail Applies When B is < 6.0' for Class I and II Rip-Rap; And All Widths for Class B Rip-Rap
D=1.5Ft.
d=1.5 Ft.
B=4.0 Ft.
b=5.0 Ft.
Type of Liner= CL I Rip-Rap, Keyed-In
FROM STA.11+75 TO STA.12+17-L- RT.
NAD 83/2001

DF18314.2045324

EC-04/CONST.04

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HENDERSON COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PREPARED BY

TGS ENGINEERS
201 W. MARION ST. STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS

CONSTRUCTION PHASING NARRATIVE

PROJECT REFERENCE NO.	SHEET NO.
DF18314.2045324	EC-4A/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PHASE I

1. INSTALL IMPERVIOUS DIKES AND TEMPORARY PUMP-AROUND DOWNSTREAM OF EXISTING CROSSING.
2. INSTALL SPECIAL STILLING BASIN(S). DEWATER CONSTRUCTION AREA INTO SPECIAL STILLING BASIN(S) AS REQUIRED.
3. INSTALL TEMPORARY 84" PIPE.
4. CONSTRUCT TEMPORARY ON-SITE DETOUR.
5. REMOVE IMPERVIOUS DIKES AND TEMPORARY PUMP-AROUND.

PHASE II

1. SHIFT TRAFFIC TO ON-SITE DETOUR.
2. INSTALL IMPERVIOUS DIKES AND TEMPORARY PUMP-AROUND AT THE EXISTING CROSSING.
3. INSTALL SPECIAL STILLING BASIN(S). DEWATER CONSTRUCTION AREA INTO SPECIAL STILLING BASIN(S) AS REQUIRED.
4. REMOVE EXISTING 96" PIPE AND EXCAVATE FOR PROPOSED BRIDGE.
5. CONSTRUCT PROPOSED BRIDGE.
6. INSTALL 40' OF PROPOSED 48" RCP FROM THE UPSTREAM END INCLUDING THE UPSTREAM HEADWALL.
7. CONSTRUCT REMAINDER OF PROPOSED ROADWAY.
8. REMOVE IMPERVIOUS DIKES AND TEMPORARY PUMP-AROUND.

PHASE III

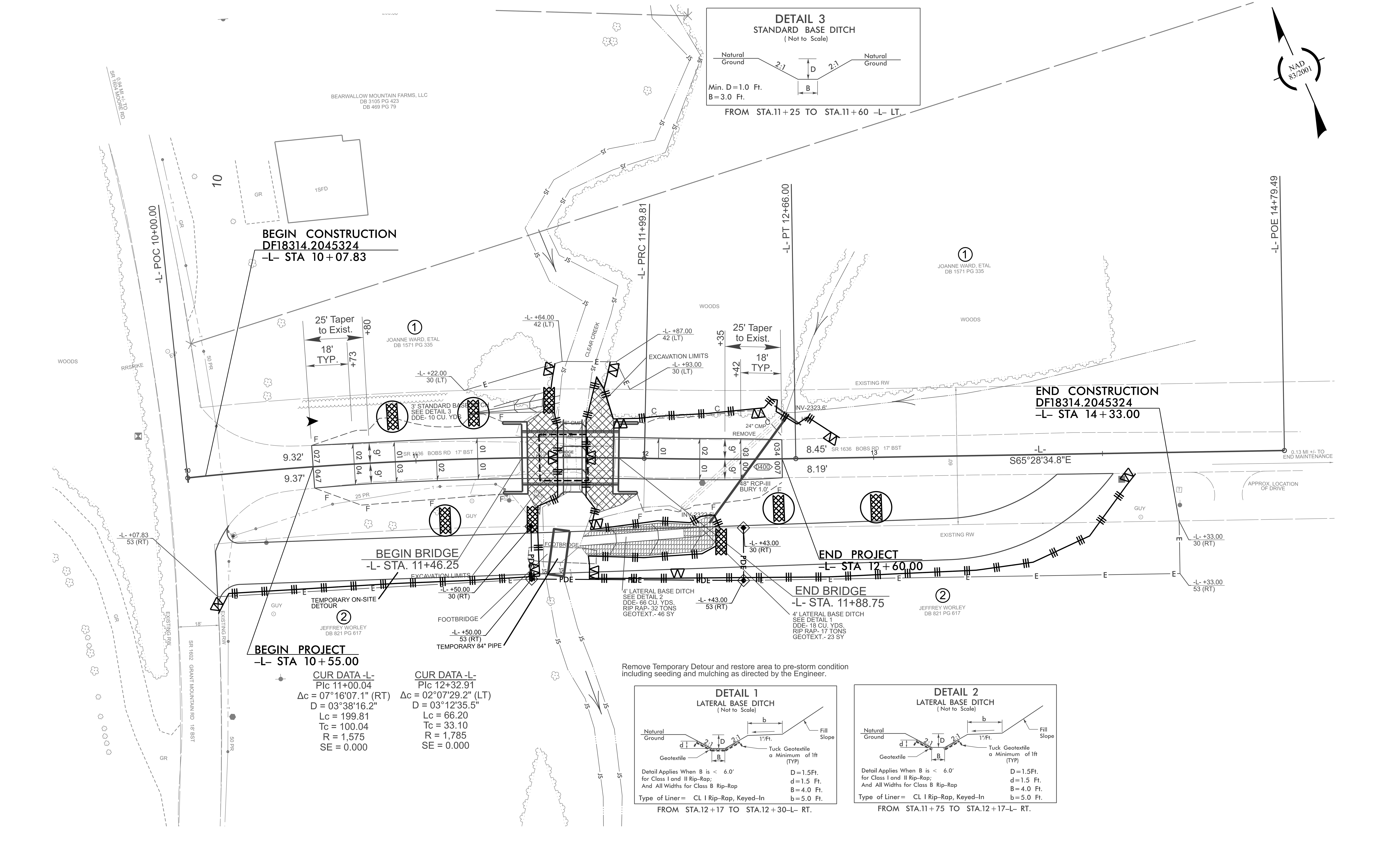
1. SHIFT TRAFFIC TO THE PROPOSED ROADWAY.
2. INSTALL IMPERVIOUS DIKES AND TEMPORARY PUMP-AROUND AT DOWNSTREAM DETOUR CROSSING.
3. INSTALL SPECIAL STILLING BASIN(S). DEWATER CONSTRUCTION AREA INTO SPECIAL STILLING BASIN(S) AS REQUIRED.
4. REMOVE TEMPORARY 84" PIPE.
5. REMOVE ON-SITE DETOUR AND RESTORE AREA.
6. EXCAVATE PROPOSED 4' BASE DITCH. INSTALL REMAINDER OF PROPOSED 48" RCP AND DOWNSTREAM HEADWALL.
7. REMOVE IMPERVIOUS DIKES AND TEMPORARY PUMP-AROUND.

NOTE: ALL IN-STREAM WORK SHALL BE PERFORMED IN THE DRY.

11/14/23

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

NOTE:
ALL IN-STREAM WORK SHALL BE PERFORMED IN THE DRY


DETAIL 3
STANDARD BASE DITCH
(Not to Scale)
Natural Ground
Natural Ground
2:1
2:1
D
B
Min. D=1.0 Ft.
B=3.0 Ft.
FROM STA.11+25 TO STA.11+60 -L- LT.
NAD 83/2001
BEARWALLOW MOUNTAIN FARMS, LLC
DB 3105 PG 423
DB 469 PG 79
BEGIN CONSTRUCTION
DF18314.2045324
-L- STA 10+07.83
-L- POC 10+00.00
-L- PRC 11+99.81
-L- PT 12+66.00
-L- POE 14+79.49
JOANNE WARD, ETAL
DB 1571 PG 335
25' Taper to Exist.
18' TYP.
CLEAR CREEK
EXCAVATION LIMITS
EXISTING RW
END CONSTRUCTION
DF18314.2045324
-L- STA 14+33.00
-L-
S65°28'34.8"E
9.32'
9.37'
8.45'
8.19'
48" RCP-III BURY 1.0'
24" CMP REMOVE
BEGIN BRIDGE
-L- STA. 11+46.25
END PROJECT
-L- STA 12+60.00
END BRIDGE
-L- STA. 11+88.75
TEMPORARY ON-SITE DETOUR
FOOTBRIDGE
TEMPORARY 84" PIPE
JEFFREY WORLEY
DB 821 PG 617
4' LATERAL BASE DITCH
SEE DETAIL 2
DDE- 66 CU. YDS.
RIP RAP- 32 TONS
GEOTEXT.- 46 SY
4' LATERAL BASE DITCH
SEE DETAIL 1
DDE- 18 CU. YDS.
RIP RAP- 17 TONS
GEOTEXT.- 23 SY
3' STANDARD BASE
SEE DETAIL 3
DDE- 10 CU. YDS
BEGIN PROJECT
-L- STA 10+55.00
CUR DATA -L-
PIc 11+00.04
Δc = 07°16'07.1" (RT)
D = 03°38'16.2"
Lc = 199.81
Tc = 100.04
R = 1,575
SE = 0.000
CUR DATA -L-
PIc 12+32.91
Δc = 02°07'29.2" (LT)
D = 03°12'35.5"
Lc = 66.20
Tc = 33.10
R = 1,785
SE = 0.000
Remove Temporary Detour and restore area to pre-storm condition including seeding and mulching as directed by the Engineer.
DETAIL 1
LATERAL BASE DITCH
(Not to Scale)
Detail Applies When B is < 6.0' for Class I and II Rip-Rap; And All Widths for Class B Rip-Rap
D=1.5Ft.
d=1.5 Ft.
B=4.0 Ft.
b=5.0 Ft.
Type of Liner= CL I Rip-Rap, Keyed-In
FROM STA.12+17 TO STA.12+30-L- RT.
DETAIL 2
LATERAL BASE DITCH
(Not to Scale)
Detail Applies When B is < 6.0' for Class I and II Rip-Rap; And All Widths for Class B Rip-Rap
D=1.5Ft.
d=1.5 Ft.
B=4.0 Ft.
b=5.0 Ft.
Type of Liner= CL I Rip-Rap, Keyed-In
FROM STA.11+75 TO STA.12+17-L- RT.

DF18314.2045324

EC-05/CONST.04

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HENDERSON COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PREPARED BY

TGS ENGINEERS
201 W. MARION ST. STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS

$$$-USER_NAME-$$$ - $$$-DATE-$$$

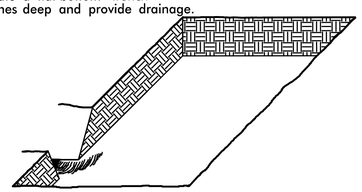
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18314.2045324	RF–1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

PLANTING DETAILS

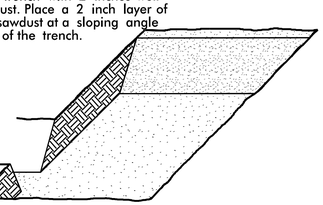
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

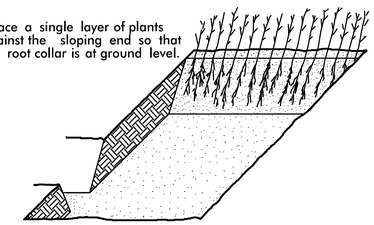
1. Locate a healing–in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



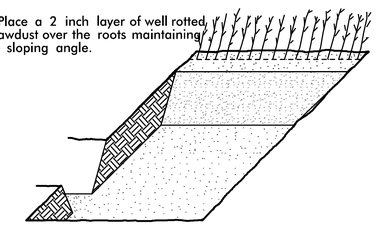
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



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

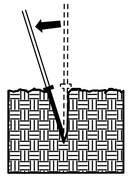


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

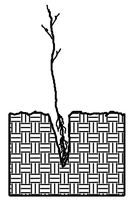


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

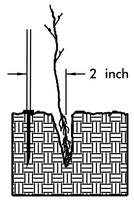
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



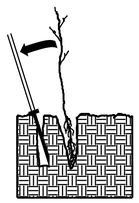
1. Insert planting bar as shown and pull handle toward planter.



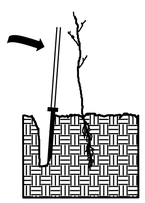
2. Remove planting bar and place seedling at correct depth.



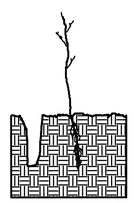
3. Insert planting bar 2 inches toward planter from seedling.



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	SYCAMORE	12 in – 18 in BR
25%	BETULA NIGRA	RIVER BIRCH	12 in – 18 in BR
25%	NYSSA SYLVATICA	BLACK GUM	12 in – 18 in BR

REFORESTATION DETAIL SHEET

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