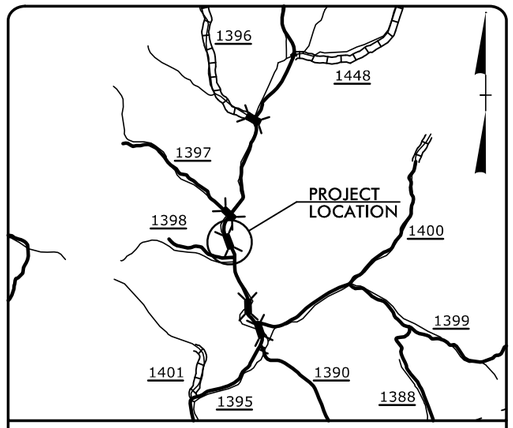
09/08/99

PROJECT: BP13–R022

CONTRACT: DM00447

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MADISON COUNTY

LOCATION: BRIDGE #560063 OVER WALNUT CREEK ON SR 1395 (WALNUT CREEK RD)

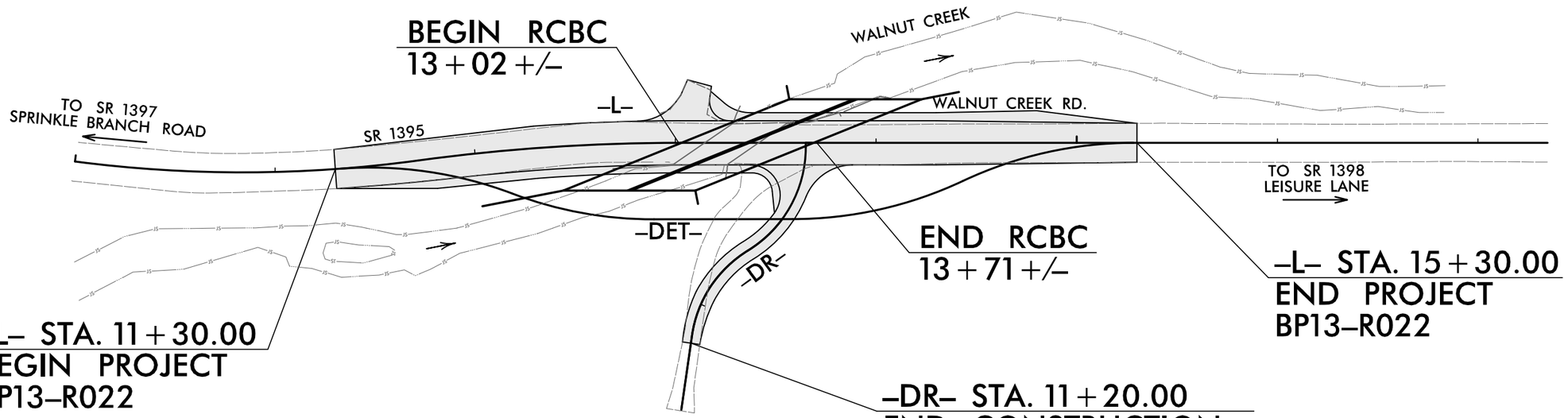
TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURE AND UTILITIES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13–R022	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP13.R022.1	N/A	PE
BP13.R022.2	N/A	R/W & UTIL.
BP13.R022.3	N/A	CONST.

NAD 83/2011

4



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS: 20 10 0 20 40

PROFILE (HORIZONTAL): 20 10 0 20 40

PROFILE (VERTICAL): 4 2 0 4 8

DESIGN DATA

ADT 2025 = 700
T = 6 % *
V = 50 MPH
* TTST = 3% DUAL = 3%

FUNC CLASS =
MINOR COLLECTOR, RURAL

SUB–REGIONAL TIER

PROJECT LENGTH

TOTAL LENGTH ROADWAY PROJECT #BP13–R022 = 0.076 MILES
TOTAL LENGTH STRUCTURE PROJECT #BP13–R022 = 0.013 MILES

TOTAL LENGTH PROJECT #BP13–R022 = 0.076 MILES

NCDOT CONTACT: MARK E. HILL, PE

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

PLANS PREPARED FOR:
NORTH CAROLINA DEPARTMENT OF TRANSPORATION
DIVISION 13
20 OLD 74
Asheville, NC 28803

RIGHT OF WAY DATE:
SEPT. 30, 2024

LETTING DATE:
JULY 1, 2026

JIMMY L. TERRY, PE
PROJECT ENGINEER

AUSTIN R. TURNER, PE
PROJECT DESIGN ENGINEER

2024 STANDARD SPECIFICATIONS

HYDRAULICS ENGINEER
6/8/2026
Signed by: David B. Petty
P.E. SIGNATURE
SEAL 038697 NORTH CAROLINA PROFESSIONAL ENGINEER DAVID B. PETTY

ROADWAY DESIGN ENGINEER
6/5/2026
DocuSigned by: Jimmy Terry
P.E. SIGNATURE
SEAL 35018 NORTH CAROLINA PROFESSIONAL ENGINEER JIMMY L. TERRY

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

6/5/2026
X:\NCDOT\Division 13 Madison 2019\Madison 63\Roadway\Proj\Madison 63_Rdy_tsh.dgn
User:cpruett

8/17/99

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

PROJECT REFERENCE NO.	SHEET NO.
BPI3-R022	IA

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 35018 ENGINEER JIMMY L. TERRY 6/5/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SHEETS

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

SIDE ROADS:

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

SUBSURFACE DRAINS:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE TOWN OF MARSHALL (WATER),AND FRENCH BROAD EMC

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

RIGHT-OF-WAY MARKERS:

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

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)
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
840.72	Pipe Collar
862.01	Guardrail Placement (Use Details in Lieu of Standards for Sheets 4, 6, 12, and 14 of 15)
862.02	Guardrail Installation
876.01	Rip Rap in Channels and Ditches

5/20/24

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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 — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — 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 — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage/Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut
- Proposed Slope Stakes Fill
- 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:

** 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 — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole — HH
- H-Frame Pole
- U/G Power Line Test Hole (SUE - LOS A)*
- U/G Power Line (SUE - LOS B)* — P
- U/G Power Line (SUE - LOS C)* — P
- U/G Power Line (SUE - LOS D)* — P

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line Test Hole (SUE - LOS A)*
- U/G Gas Line (SUE - LOS B)* — G
- U/G Gas Line (SUE - LOS C)* — G
- U/G Gas Line (SUE - LOS D)* — 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 Force Main Line Test Hole (SUE - LOS A)*
- SS Force Main Line (SUE - LOS B)* — FSS
- SS Force Main Line (SUE - LOS C)* — FSS
- SS Force Main Line (SUE - LOS D)* — FSS

MISCELLANEOUS:

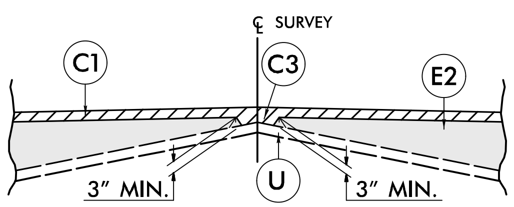
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line (SUE - LOS B)* — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- Abandoned According to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

6/2/99

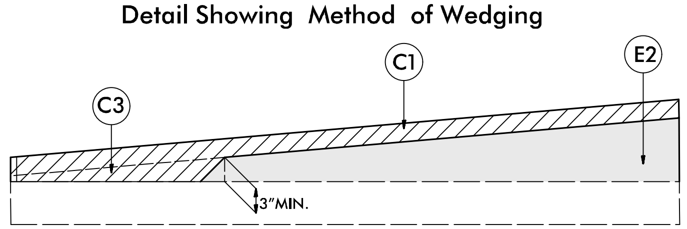
FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 1¼" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.
C2	PROP. APPROX. 2 ½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1" OR GREATER THAN 1 ½"IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
J	6" AGGREGATE BASE COURSE
P1	PRIME COAT AT THE RATE OF 0.35 GAL. PER SQ. YD.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	MILLING EXISTING PAVEMENT (SEE MILLING DETAILS THIS SHEET)
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAILS THIS SHEET)

PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE SHOWN.

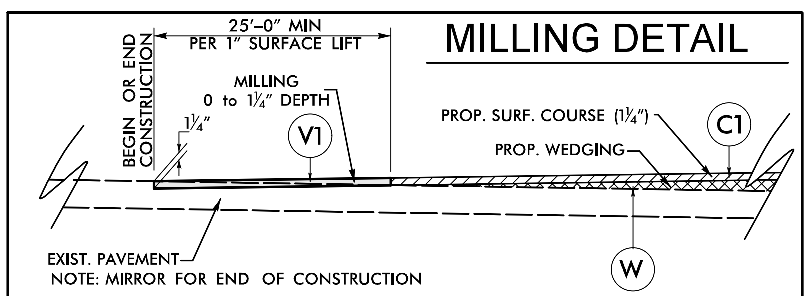


Detail Showing Method of Wedging



Wedging Detail For Resurfacing

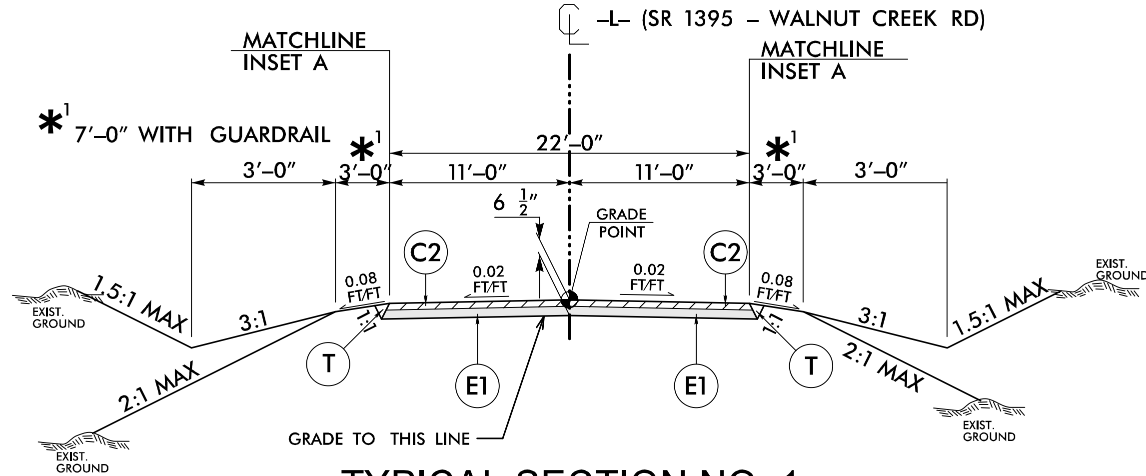
MILLING DETAIL



NOTE: MIRROR FOR END OF CONSTRUCTION

USE MILLING DETAIL AS FOLLOWS:

MILLING AND RESURFACING:
-L- STA. 11+30.00 TO -L- STA. 11+61.25
-L- STA. 14+98.75 TO -L- STA. 15+30.00



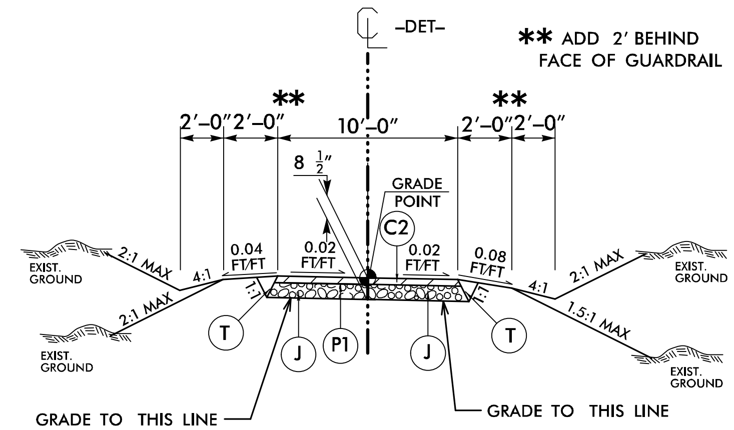
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

-L- STA. 12+30.00 TO -L- STA. 14+30.00

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

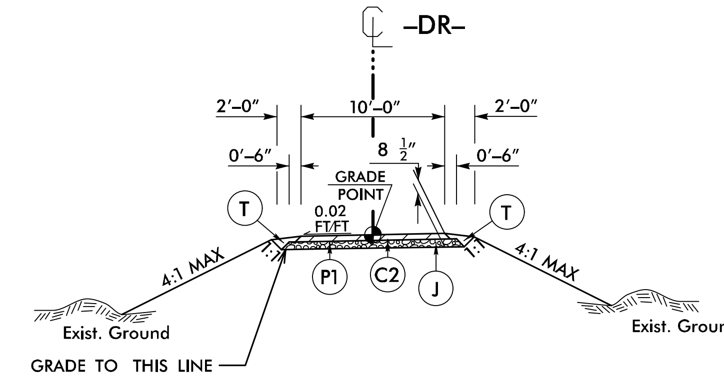
-L- STA. 11+30.00 TO -L- STA. 12+30.00
-L- STA. 14+30.00 TO -L- STA. 15+30.00



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

-DET- STA. 10+42.06 TO -DET- STA. 13+59.15



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

-DR- STA. 10+11.03 TO -DR- STA. 11+20.00

MADISON COUNTY
BRIDGE #560063

PROJECT REFERENCE NO.	SHEET NO.
BPI3-R022	2A-1

ROADWAY DESIGN ENGINEER — SEAL 35018 — JIMMY L. TERRY

PAVEMENT DESIGN ENGINEER — SEAL 044590 — ANDREW D. WARGO

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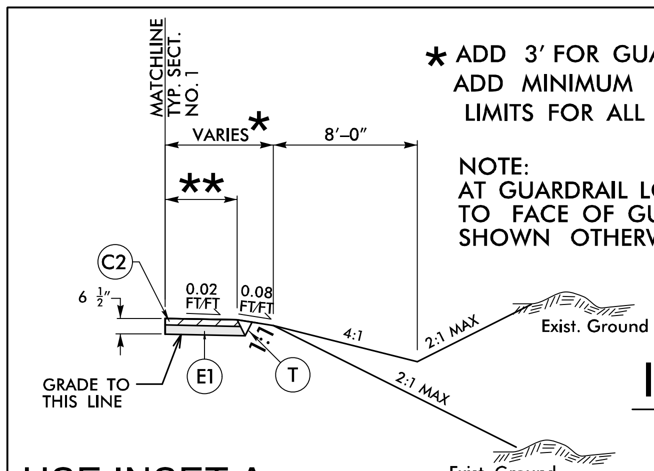
TGS ENGINEERS
201 W. MARION ST.
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275



* ADD 3' FOR GUARDRAIL LOCATIONS
ADD MINIMUM 2' PAST PAVED SHOULDER LIMITS FOR ALL OTHER LOCATIONS

NOTE:
AT GUARDRAIL LOCATIONS PAVE TO FACE OF GUARDRAIL UNLESS SHOWN OTHERWISE ON PLANS.

INSET A

USE INSET A

** FDPS WIDTH	STA. TO STA.
0'-0" TO 5'-0"	-L- STA. 11+30.00 RT TO -DR- STA. 10+40.25 RT
0'-0" TO 5'-0"	-L- STA. 13+18.08 TO -L- STA. 15+30.00 LT

5/5/2025
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DETOUR

MADISON COUNTY
BRIDGE #560063

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	2B-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035018 JIMMY L. TERRY 6/8/2026

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038697 DAVID B. PETTY 6/8/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

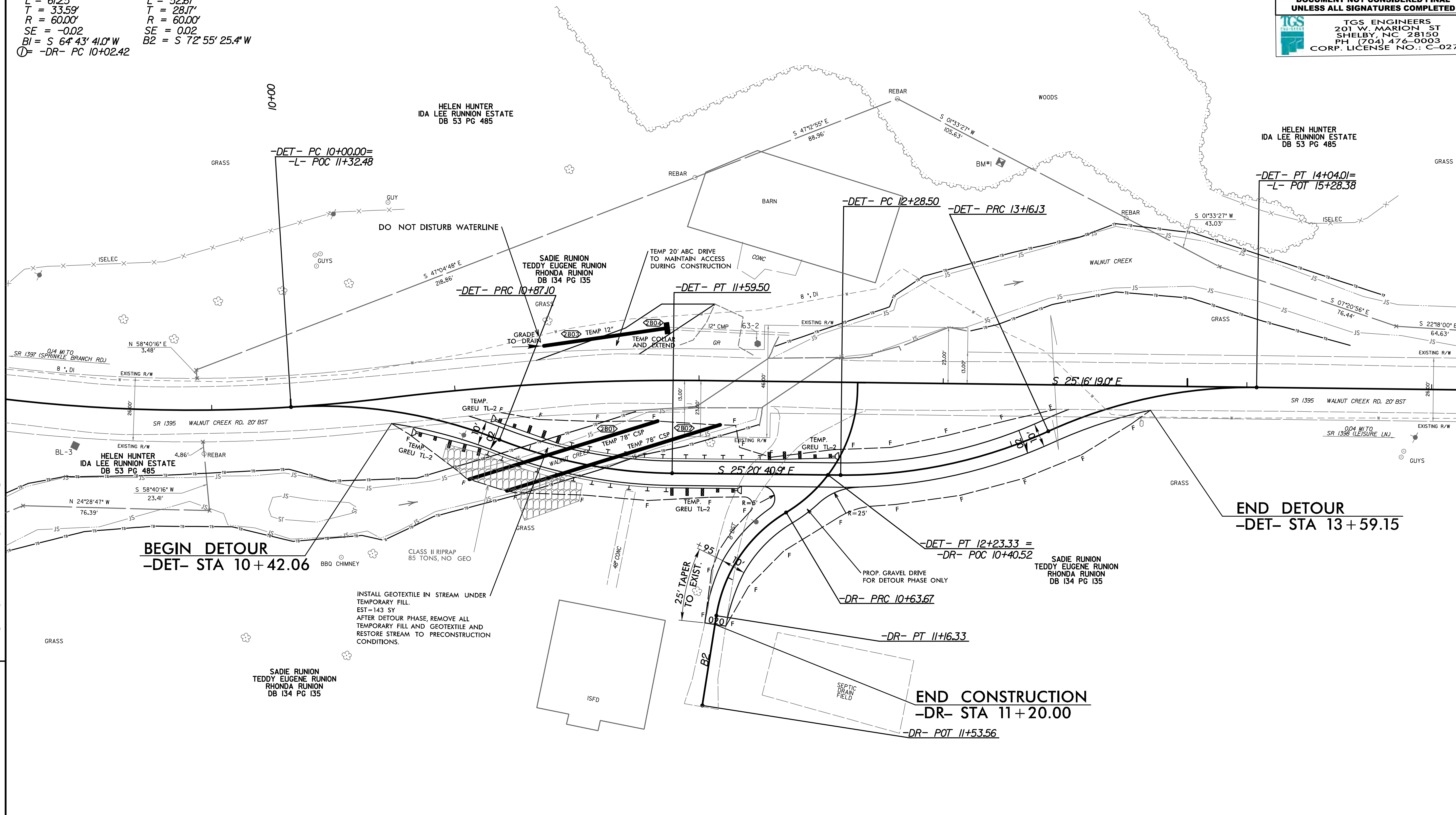
NAD 83/2011

-DET- CURVE DATA

PI Sta 10+44.25	PI Sta 11+23.70	PI Sta 12+73.03	PI Sta 13+60.79
△ = 24° 57′ 08.7″ (RT)	△ = 20° 44′ 24.5″ (LT)	△ = 25° 06′ 14.5″ (LT)	△ = 25° 10′ 36.4″ (RT)
D = 28° 38′ 52.4″	D = 28° 38′ 52.4″	D = 28° 38′ 52.4″	D = 28° 38′ 52.4″
L = 87.10′	L = 72.40′	L = 87.63′	L = 87.88′
T = 44.25′	T = 36.60′	T = 44.53′	T = 44.66′
R = 200.00′	R = 200.00′	R = 200.00′	R = 200.00′
SE = 0.02	SE = -0.02	SE = -0.02	SE = 0.02
DS = < 15 MPH	DS = < 15 MPH	DS = < 15 MPH	DS = < 15 MPH

-DR- CURVE DATA

PI Sta 10+36.01	PI Sta 10+91.83
△ = 58° 29′ 21.4″ (RT)	△ = 50° 17′ 37.0″ (LT)
D = 95° 29′ 34.7″	D = 95° 29′ 34.7″
L = 61.25′	L = 52.67′
T = 33.59′	T = 28.17′
R = 60.00′	R = 60.00′
SE = -0.02	SE = 0.02
B1 = S 64° 43′ 41.0″ W	B2 = S 72° 55′ 25.4″ W
(1) = -DR- PC 10+02.42	


10+00
HELEN HUNTER
IDA LEE RUNNION ESTATE
DB 53 PG 485
-DET- PC 10+00.00=
-L- POC 11+32.48
GRASS
DO NOT DISTURB WATERLINE
SADIE RUNION
TEDDY EUGENE RUNION
RHONDA RUNION
DB 134 PG 135
TEMP 20′ ABC DRIVE TO MAINTAIN ACCESS DURING CONSTRUCTION
-DET- PRC 10+87.10
-DET- PT 11+59.50
-DET- PC 12+28.50
-DET- PRC 13+16.13
-DET- PT 14+04.01=
-L- POT 15+28.38
REBAR
BARN
WOODS
BM#1
WALNUT CREEK
S 47°12′55″ E 88.96′
S 01°33′27″ W 105.63′
S 01°33′27″ W 43.03′
S 47°04′48″ E 218.86′
S 07°20′56″ E 76.44′
S 22°18′00″ E 64.63′
N 58°40′16″ E 3.48′
S 58°40′16″ W 23.41′
N 24°28′47″ W 76.39′
SR 1397 (SPRINKLE BRANCH RD)
SR 1395 WALNUT CREEK RD. 20′ BST
SR 1398 (LEISURE LN)
GRADE TO DRAIN
TEMP 12″
TEMP COLLAR AND EXTEND
12″ CMP
TEMP 78″ CSP
TEMP. GREU TL-2
S 25° 16′ 19.0″ E
S 25° 20′ 40.9″ E
BEGIN DETOUR
-DET- STA 10+42.06
END DETOUR
-DET- STA 13+59.15
CLASS II RIPRAP 85 TONS, NO GEO
BBQ CHIMNEY
INSTALL GEOTEXTILE IN STREAM UNDER TEMPORARY FILL.
EST=143 SY
AFTER DETOUR PHASE, REMOVE ALL TEMPORARY FILL AND GEOTEXTILE AND RESTORE STREAM TO PRECONSTRUCTION CONDITIONS.
-DET- PT 12+23.33 =
-DR- POC 10+40.52
PROP. GRAVEL DRIVE FOR DETOUR PHASE ONLY
-DR- PRC 10+63.67
-DR- PT 11+16.33
25′ TAPER TO EXIST.
END CONSTRUCTION
-DR- STA 11+20.00
-DR- POT 11+53.56
SEPTIC DRAIN FIELD
ISFD
BL-3
ISELEC
GUYS

FOR -DET- PROFILE SEE SHEET NO. 5

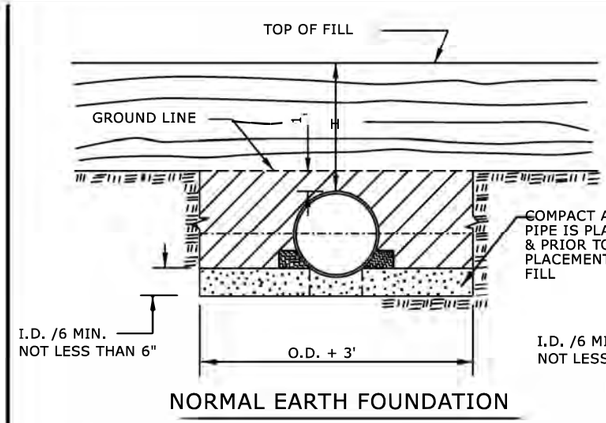
FOR -DR- PROFILE SEE SHEET NO. 5

REVISIONS

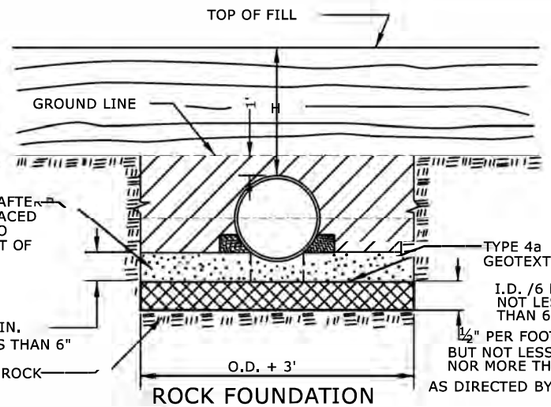
8/17/99

5/8/2025 X:\NCDOT\Division 13 Madison 2019\Madison 63\Roadway\Proj\Madison 63_Rdy_psh_det.dgn

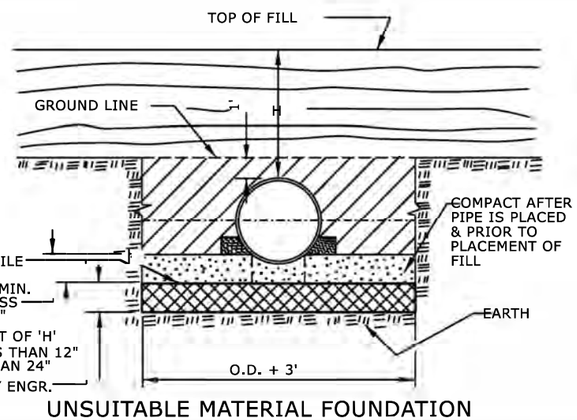
PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	2C-1



NORMAL EARTH FOUNDATION

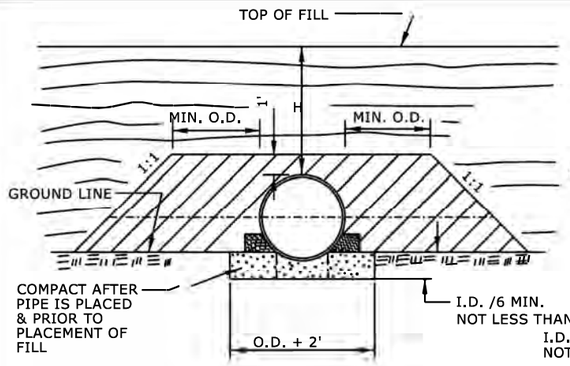


ROCK FOUNDATION

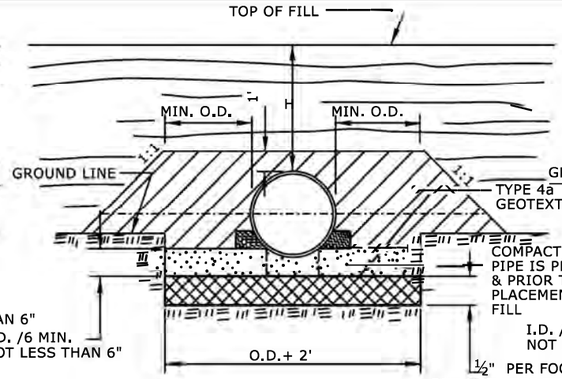


UNSUITABLE MATERIAL FOUNDATION

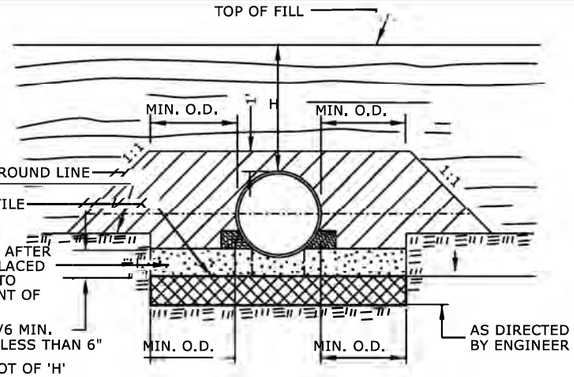
PIPE IN TRENCH



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

NORTH CAROLINA PROFESSIONAL SEAL D33144 ENGINEER NICOLE M. HACKER
6/8/2026

SHEET 1 OF 2

300.01

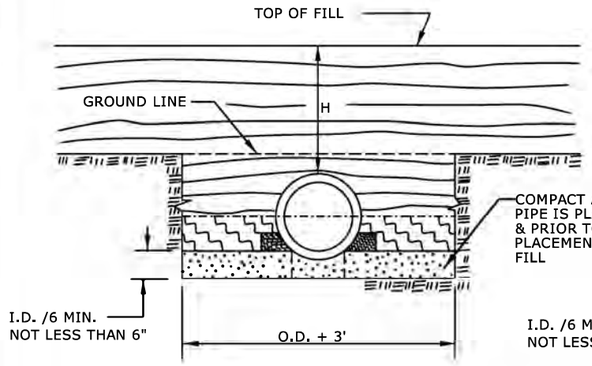
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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

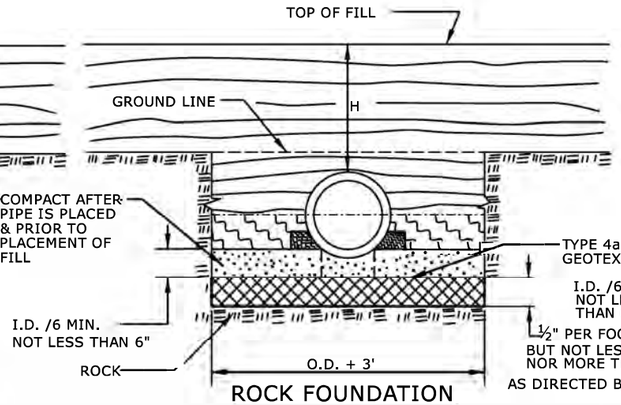
SEE TITLE BLOCK

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

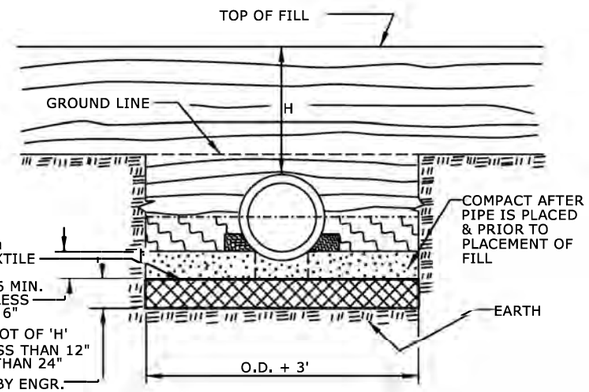
PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	2C-2



NORMAL EARTH FOUNDATION

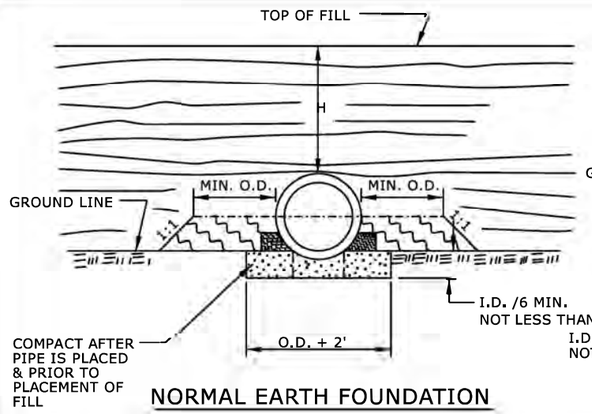


ROCK FOUNDATION

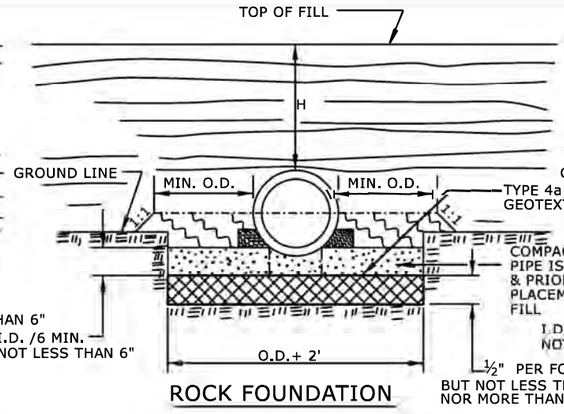


UNSUITABLE MATERIAL FOUNDATION

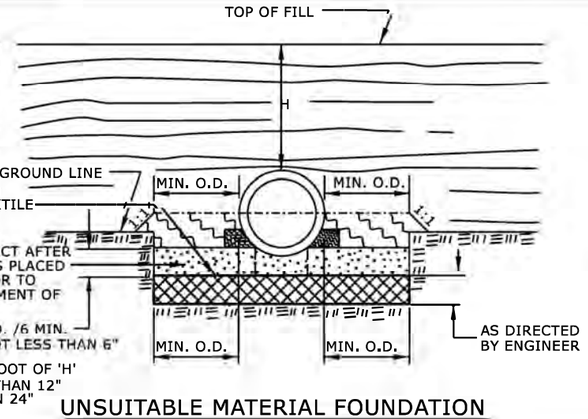
PIPE IN TRENCH



NORMAL EARTH FOUNDATION



ROCK FOUNDATION



UNSUITABLE MATERIAL FOUNDATION

PIPE ABOVE GROUND

GENERAL NOTES:

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

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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

6/8/2026

SHEET 2 OF 2

300.01

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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

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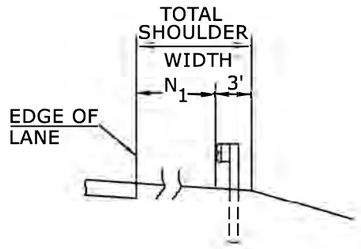
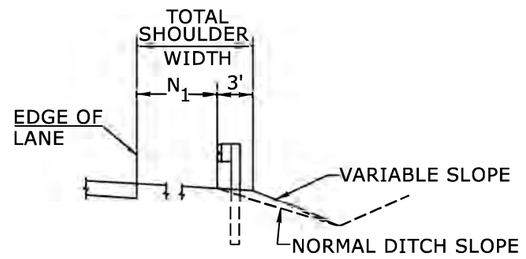
FILE SPEC.: _____

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	2C-3

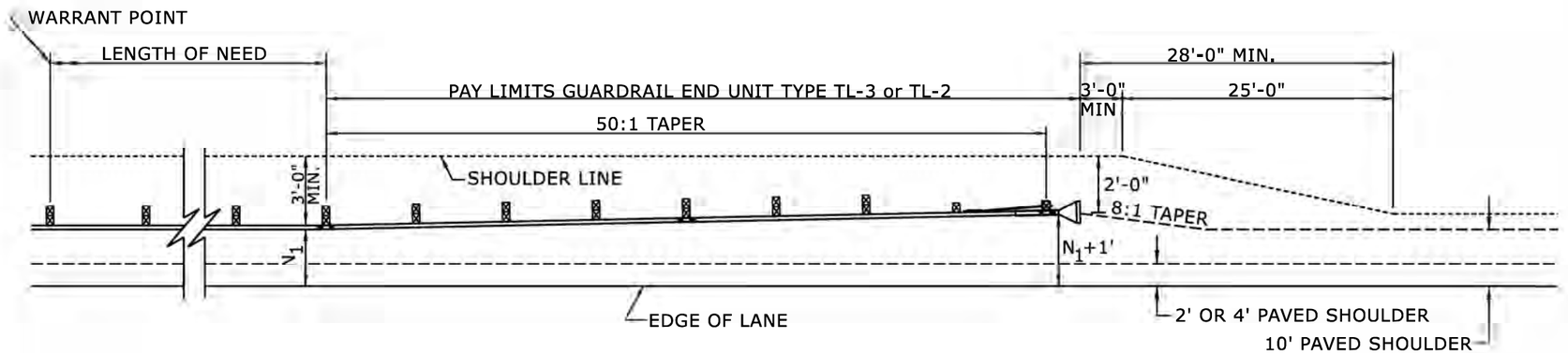


FILL SECTION



CUT SECTION

"N_1"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.



FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

DETAIL OF BEGINNING OF GUARDRAIL IN CUT OR FILL SECTION

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 6 OF 15
862D01

PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HACKLER
Digitally signed by Nicole M. Hackler
6/8/2026

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UNLESS ALL SIGNATURES COMPLETED

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: SGM DATE: 4/25/2025
CHECKED BY: JLT DATE: 5/7/2025

PROJECT NO.	SHEET NO.
BP13-R022	3B-1

STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK

IN CUBIC YARDS

Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
DETOUR CONSTRUCTION					
-DET- 10+42.06	-DET- 13+59.15	8	631	623	
-DR- 10+50.00	-DR- 11+20.00	3	26	23	
SUB-TOTAL #1:		11	657	646	0
-L- 11+30.00	-L- 15+30.00	83	714	631	
-DR- 10+11.03	-DR- 10+50.00	1	18	17	
SUB-TOTAL #2:		84	732	648	0
DETOUR REMOVAL					
-L- 11+72.59	-L- 14+85.01	676	0		676
SUB-TOTAL #3:		676	0	0	676
TOTAL:		771	1,389	1,294	676
WASTE IN LIEU OF BORROW				0	0
PROJECT TOTALS:		771	1,389	1,294	676
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				65	
GRAND TOTALS:		771	1,389	1,359	676
SAY		**800**		**1,400**	

Note: Approximate quantities only. Unclassified Excavation, Borrow 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. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

EST. SHALLOW UNDERCUT = 100 CUBIC YARDS
EST. SELECT GRANULAR MATERIAL = 400 CUBIC YARDS
PER GEOTECH RECOMMENDATION, ESTIMATED
400 CUBIC YARDS OF UNDERCUT TO BE USED IN
THE DISCRETION OF THE RESIDENT ENGINEER.

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
-L-	12+50	14+24	CL	386.36			
-DET-	10+42	13+59	CL	313.97			
			TOTAL	700.33			
			SAY	**710**			

"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

IN FEET

LINE	BEG. STA.	END STA.	LOC.	LENGTH: STRAIGHT	LENGTH: SHOP CURVED	LENGTH: DOUBLE FACED	WARRANT POINT: APPR. END	WARRANT POINT: TRAIL. END	"N" DIST. FROM E.O.L.	TOTAL SHLDR WIDTH	FLAIR LENGTH: APPR. END	FLAIR LENGTH: TRAIL. END	W: APPR. END	W: TRAIL. END	ANCHORS: AT-1	ANCHORS: TYPE III SC	ANCHORS: GREU TL-3	ANCHORS: TEMP TL-2		IMP. ATTEN. TYPE TL-2: EA	IMP. ATTEN. TYPE TL-2: G	IMP. ATTEN. TYPE TL-2: NG	REMOVE EXISTING GUARDRAIL	REMOVE & RESET EXISTING GUARDRAIL	REMARKS
-L-/-DR-	11+79.32	10+48.00	RT/RT	156.25	31.25				4'	7'	50'		1'		1		1								R=15'
-L-	13+20.50	14+83.00	LT	137.50	25				4'	7'	50'		1'		1		1								R=10'
		SUB-TOTALS		293.75	56.25										2		2								
	LESS ANCHOR DEDUCTIONS																								
	AT-1	2 @ 6.25 ft			12.5																				
	GREU TL-3	2 @ 50 ft		100.00																					
	ANCHOR TOTALS			100.00	12.5																				
		GRAND-TOTALS		**193.75**	**43.75**										**2**		**2**								
		SAY		**200.00**	**50.00**										**2**		**2**								
ADDITIONAL GUARDRAIL POSTS = 5 EA																									

TEMPORARY GUARDRAIL SUMMARY

-DET-	10+50.00	11+87.50	RT	137.50														2							TEMPORARY ANCHOR UNIT
-DET-	10+77.50	12+27.50	LT	150.00														2							TEMPORARY ANCHOR UNIT
		SUB-TOTALS		287.50														4							
	LESS ANCHOR DEDUCTIONS																								
	TEMP. TL-2	4 @ 25 ft		100.00																					
	ANCHOR TOTALS			100.00																					
		GRAND-TOTALS		**187.50**														**4**							
		SAY		**200.00**														**4**							

4/04/06

COMPUTED BY: Zachary Richard, PE DATE: 3/28/2024
CHECKED BY: David Petty, PE DATE: 3/28/2024

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	3D-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

Note: Invert Eleations 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	OFFSET	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	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 NO USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C.S. PIPE 12 (.064)	15 (.064)	18 (.064)	24 (.064)	30 (.079)	36 (.079)	42 (.109)	48 (.109)
L 12+37	16LT	2B03	2B04					52																				
L 12+86	21LT	2B04																										
L 13+32	27LT	0401								96																		
PROJECT TOTALS								52		96																		

STATION	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN FT FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A: 5' THRU 10' LIN FT	B: 10' AND ABOVE LIN FT	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STD 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN FT	REMARKS
L 12+37																								52	Temp. 12", Remove pipe after detour phase
L 12+86																						0.3528			12" Pipe Collar
L 13+32																								51	Remove 12" CMP
PROJECT TOTALS																						0.3528		103	

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

Note: Invert Eleations 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 54" & OVER)

STATION	OFFSET	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 54	60	66	72	78	84	DO NOT USE RCP	DO NOT USE CSP	DO NO USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C.S. PIPE 54	60	66	72	78 (.168)	84
DET 11+08	0 CL	2B01			2071.0	2069.5																	84	
DET 11+25	0 CL	2B02			2071.0	2069.5																	92	
PROJECT TOTALS																							176	

STATION	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN FT FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A: 5' THRU 10' LIN FT	B: 10' AND ABOVE LIN FT	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STD 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN FT	REMARKS
DET 11+08																84	Temp. 78" CSP, Remove pipe after detour phase
DET 11+25																92	Temp. 78" CSP, Remove pipe after detour phase
PROJECT TOTALS																176	

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

COMPUTED BY: REK DATE: 10/5/2023
CHECKED BY: DMB DATE: 10/5/2023

(2-3-23)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
BP13-R022	3G-1

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	200
				TOTAL LF:	200

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

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Subgrade Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU(1)	12	100	200	300		
			TOTAL CY/TONS/SY:		100	200**	300**	0	0

*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)
*AST = Aggregate Stabilization
**Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Subgrade Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.

SUMMARY OF REINFORCED SOIL SLOPES AND SLOPE EROSION CONTROL

LINE	Beginning Slope/ RSS (H:V)	Approx. Station	Ending Slope/ RSS (H:V)	Approx. Station	Location LT/RT	Reinforced Soil Slope (RSS) SY	Geocells SY	Coir Fiber Mat SY	Matting for Erosion Control SY
-L-	1:5:1	11+30	1:5:1	12+00	LT			35	
					TOTAL SY:	0	0	35*	0**

*Total square yards of "Coir Fiber Mat" is only the estimated quantity for slopes steeper than 2:1 (H:V) and may only represent a portion of the coir fiber mat quantity shown in the Item Sheets of the Proposal.
**Total square yards of "Matting for Erosion Control" is only the estimated quantity for RSS and may only represent a portion of the matting quantity shown in the Item Sheets of the Proposal.

8/17/99

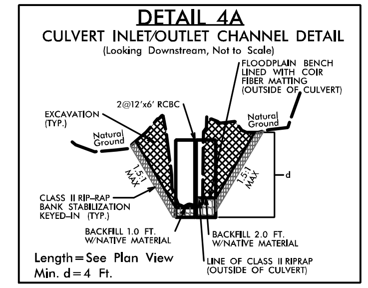
REVISIONS

-L- CURVE DATA

PI Sta 10+86.28	PI Sta 12+37.10
Δ = 15° 07' 21.9" (LT)	Δ = 7° 43' 48.7" (RT)
D = 8° 48' 53.0"	D = 5° 54' 24.4"
L = 171.56'	L = 130.87'
T = 86.28'	T = 65.53'
R = 650.00'	R = 970.00'
SE = EXIST.	SE = NC
	DS = 15 MPH

-DR- CURVE DATA

PI Sta 10+36.01	PI Sta 10+91.83
Δ = 58° 29' 21.4" (RT)	Δ = 50° 17' 37.0" (LT)
D = 95° 29' 34.7"	D = 95° 29' 34.7"
L = 61.25'	L = 52.67'
T = 33.59'	T = 28.17'
R = 60.00'	R = 60.00'
SE = -0.02	SE = 0.02
B1 = S 64° 43' 41.0" W	B2 = S 72° 55' 25.4" W
(1) = -DR- PC 10+02.42	



MADISON COUNTY
BRIDGE #560063

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	4
R/W SHEET NO.	

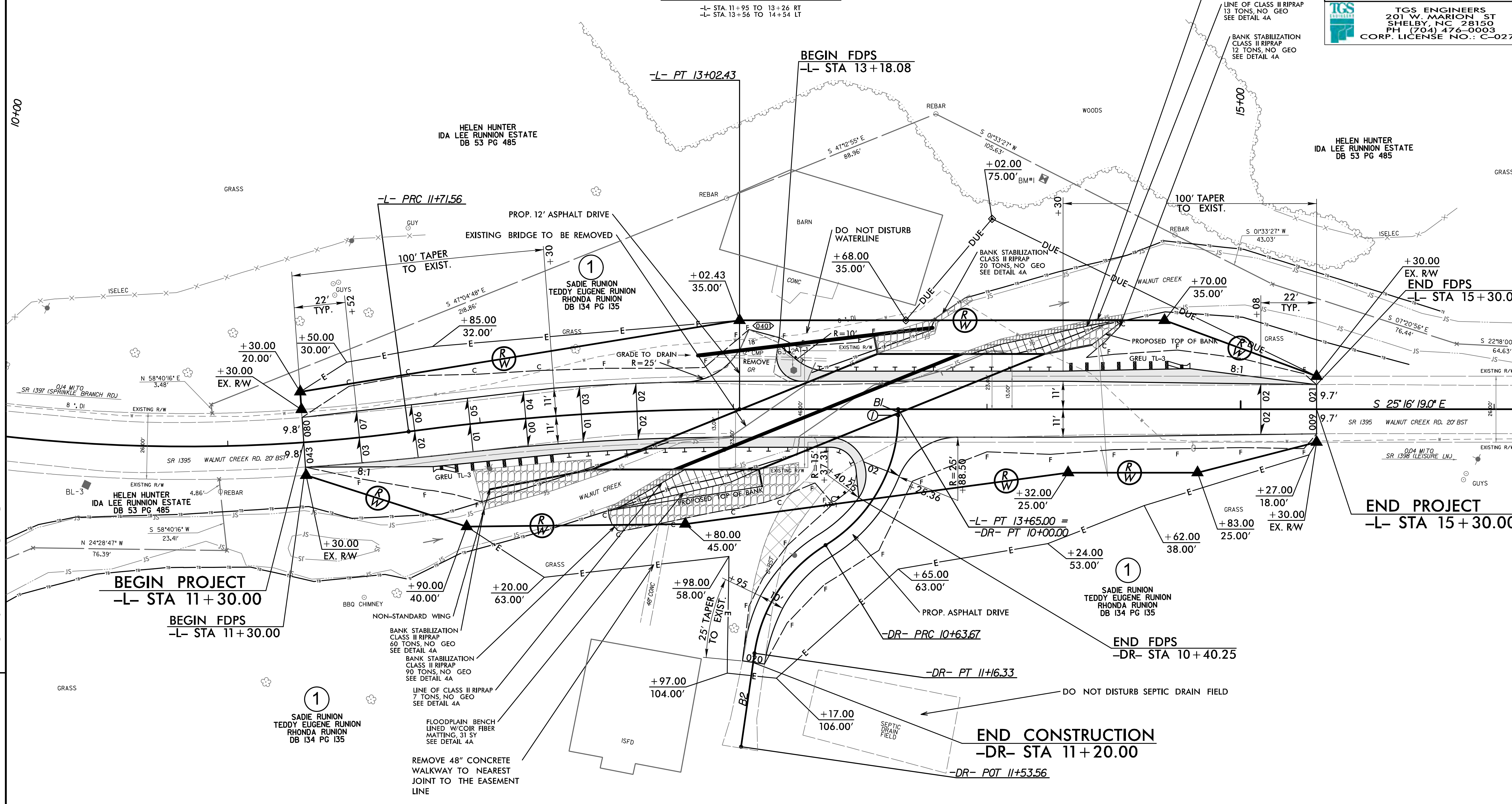
ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035018 JIMMY L. TERRY 6/5/2026

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038697 DAVID B. PETTY 6/8/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

NAD 83/2011


BEGIN PROJECT
-L- STA 11+30.00
BEGIN FDPS
-L- STA 11+30.00
END PROJECT
-L- STA 15+30.00
END FDPS
-L- STA 15+30.00
BEGIN FDPS
-L- STA 13+18.08
END FDPS
-DR- STA 10+40.25
END CONSTRUCTION
-DR- STA 11+20.00
-L- PT 13+02.43
-L- PRC 11+71.56
-L- PT 13+65.00 = -DR- PT 10+00.00
-DR- PRC 10+63.67
-DR- PT 11+16.33
-DR- POT 11+53.56
SR 1395 WALNUT CREEK RD. 20' BST
S 25° 16' 19.0" E
HELEN HUNTER
IDA LEE RUNNION ESTATE
DB 53 PG 485
SADIE RUNION
TEDDY EUGENE RUNION
RHONDA RUNION
DB 134 PG 135
PROP. 12' ASPHALT DRIVE
EXISTING BRIDGE TO BE REMOVED
100' TAPER TO EXIST.
22' TYP.
DO NOT DISTURB WATERLINE
GRADE TO DRAIN
PROPOSED TOP OF BANK
WALNUT CREEK
FLOODPLAIN BENCH LINED W/COIR FIBER MATTING, 22 SY SEE DETAIL 4A
LINE OF CLASS II RIPRAP 13 TONS, NO GEO SEE DETAIL 4A
BANK STABILIZATION CLASS II RIPRAP 12 TONS, NO GEO SEE DETAIL 4A
BANK STABILIZATION CLASS II RIPRAP 20 TONS, NO GEO SEE DETAIL 4A
NON-STANDARD WING
BANK STABILIZATION CLASS II RIPRAP 60 TONS, NO GEO SEE DETAIL 4A
BANK STABILIZATION CLASS II RIPRAP 90 TONS, NO GEO SEE DETAIL 4A
LINE OF CLASS II RIPRAP 7 TONS, NO GEO SEE DETAIL 4A
FLOODPLAIN BENCH LINED W/COIR FIBER MATTING, 31 SY SEE DETAIL 4A
REMOVE 48" CONCRETE WALKWAY TO NEAREST JOINT TO THE EASEMENT LINE
PROP. ASPHALT DRIVE
DO NOT DISTURB SEPTIC DRAIN FIELD
25' TAPER TO EXIST.
GREU TL-3
BARN
WOODS
GRASS
ISFD
BBQ CHIMNEY
SEPTIC DRAIN FIELD

⊠	PAVEMENT REMOVAL

FOR -L- PROFILE, SEE SHEET NO. 5
FOR -DR- PROFILE, SEE SHEET NO. 5

7/3/2025
X:\NCDOT\Division 13 Madison 2019\Madison 63\Roadway\Proj\Madison 63_Rdy_psh.dgn

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	5

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35018 JIMMY L. TERRY — DocuSigned by: Jimmy Terry — FD39E38882E94D0... — 6/5/2026

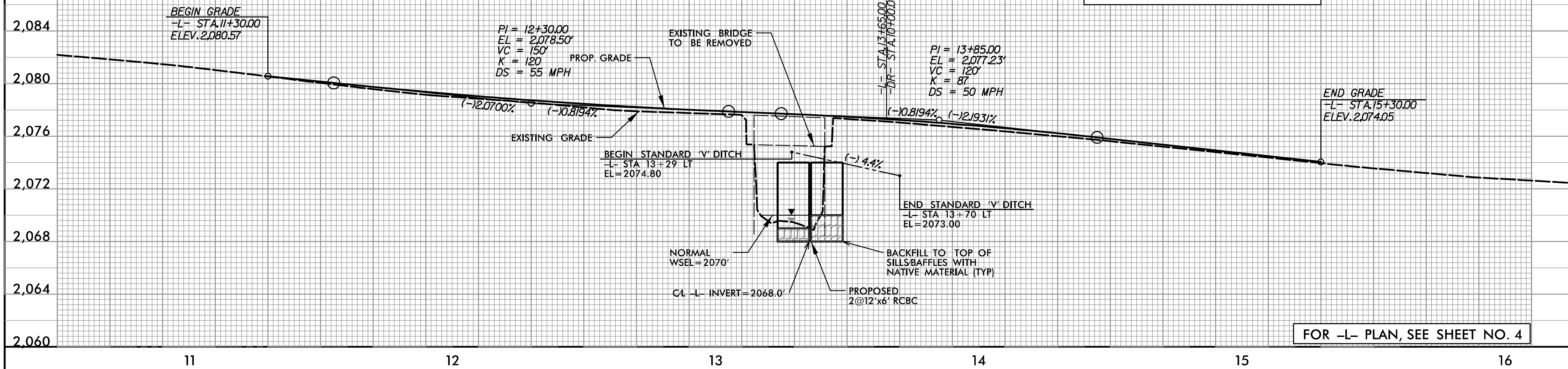
HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038697 DAVID B. PETTY — Signed by: David B. Petty — 400EFF4863B6465... — 6/8/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–L–

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 900	CFS
DESIGN FREQUENCY	= 5	YRS
DESIGN HW ELEVATION	= 2075.6	FT
BASE DISCHARGE	= 2300	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2079.8	FT
OVERTOPPING DISCHARGE	= 1100	CFS
OVERTOPPING FREQUENCY	= 5+	YRS
OVERTOPPING ELEVATION	= 2077.5	FT



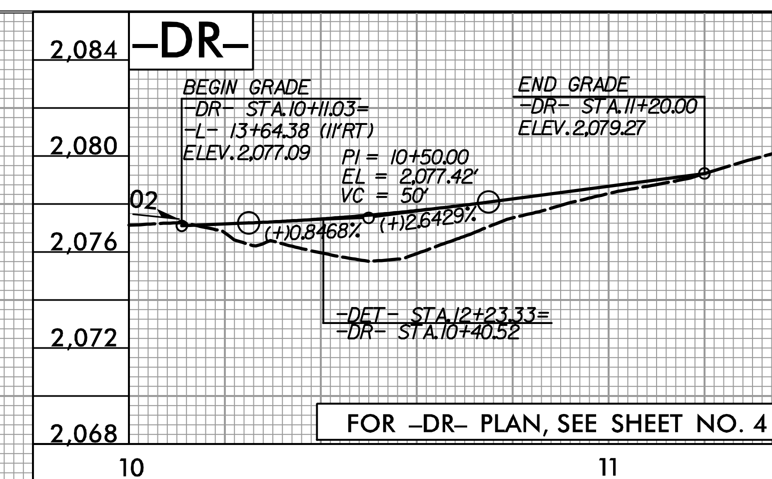
–DET–

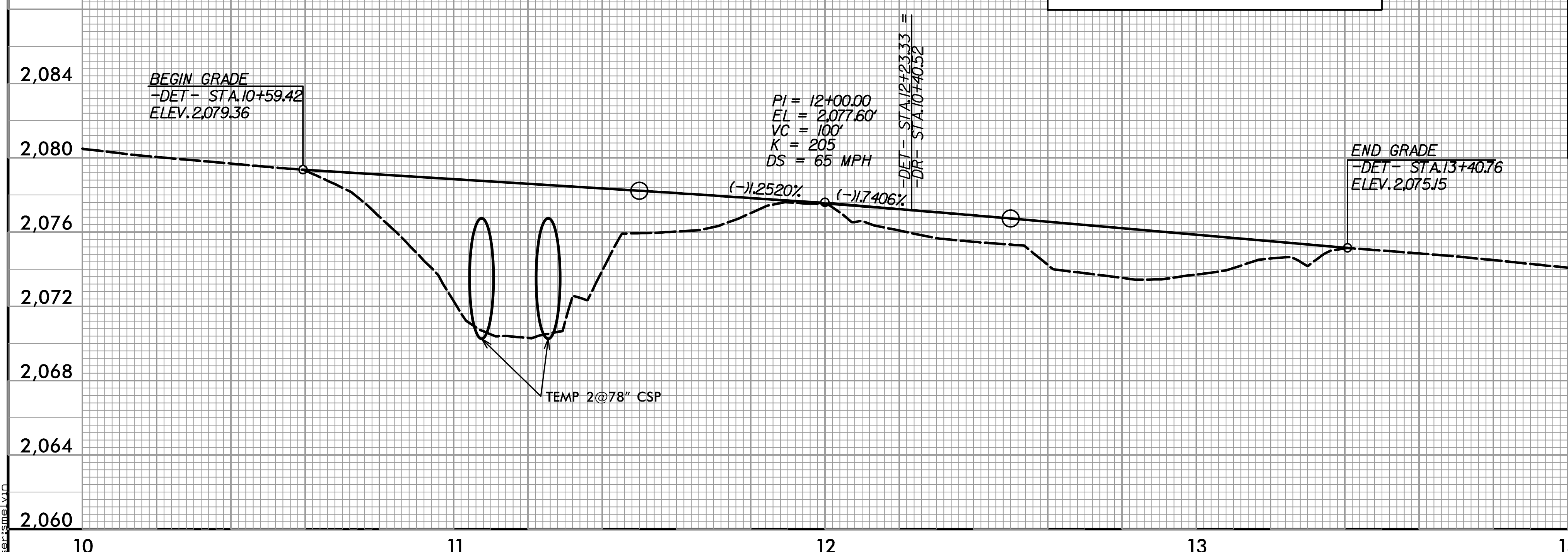
PIPE HYDRAULIC DATA

TEMP 2@78" CSP –DET– Sta.11+16

DRAINAGE AREA	= 7.05	SQ MILES
DESIGN FREQUENCY	= 2	YRS
DESIGN DISCHARGE	= 500	CFS
DESIGN HW ELEVATION	= 2078.0	FT
OVERTOPPING FREQUENCY	= 2+	YRS
OVERTOPPING DISCHARGE	= 530	CFS
OVERTOPPING ELEVATION	= 2078.2	FT

–DR–





FOR –DET– PLAN, SEE SHEET NO. 2A–1

5/28/99

5/5/2025 X:\NCD01\Division 13 Madison 2019\Madison 63\Roadway\Proj\Madison 63_Rdy_pfl.dgn

10/2023

TIP PROJECT: BP13-R022

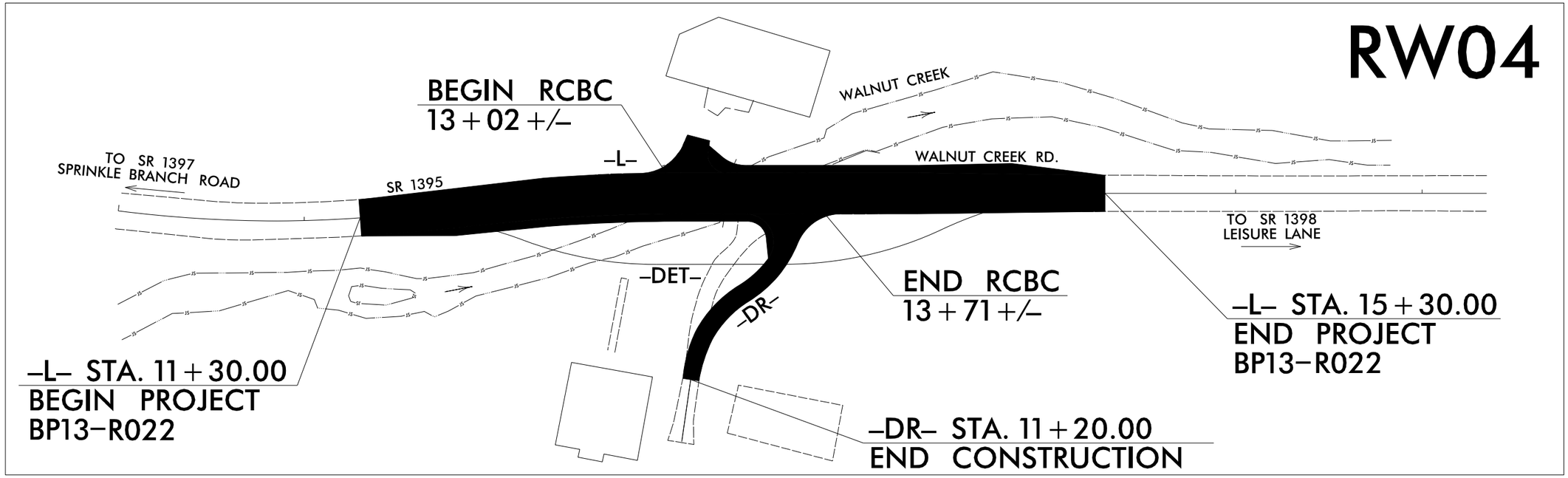
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13-R022	RW01	5

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

MADISON COUNTY

NAD 83/2011



GRAPHIC SCALE

50 25 0 50 100

PLANS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT
IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY
NCDOT FOR MONUMENT "63-2"
WITH NAD 83/NSRS 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 781,837.899(ft) EASTING: 911,874.949(ft)
ELEVATION: 2,076.76(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 0.99983115
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"63-2" TO -L- STATION 10+00.00 IS
N 29°38'21.6" W 323.873(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared In the Office of:

TGS ENGINEERS
201 WEST MARION STREET
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:	*LETTING DATE:*
9/30/2024	*7/01/2026*

PROFESSIONAL LAND SURVEYOR

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

DocuSigned by: Matthew Cornwell EBD36F11473E475... 10/9/2023

SIGNATURE: *Date:*

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

09-OCT-2023 09:18
S:\Surveyors\Projects\LIB\560063\2023 RW Staking\MTC\560063_ls_rw01.dgn
mcornwell AT MCORNWELLLAPTOP

4/2022

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	RW02C-1

Location and Surveys

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PROJECT SURVEYOR

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NC GRID NAD 83 NA 2011

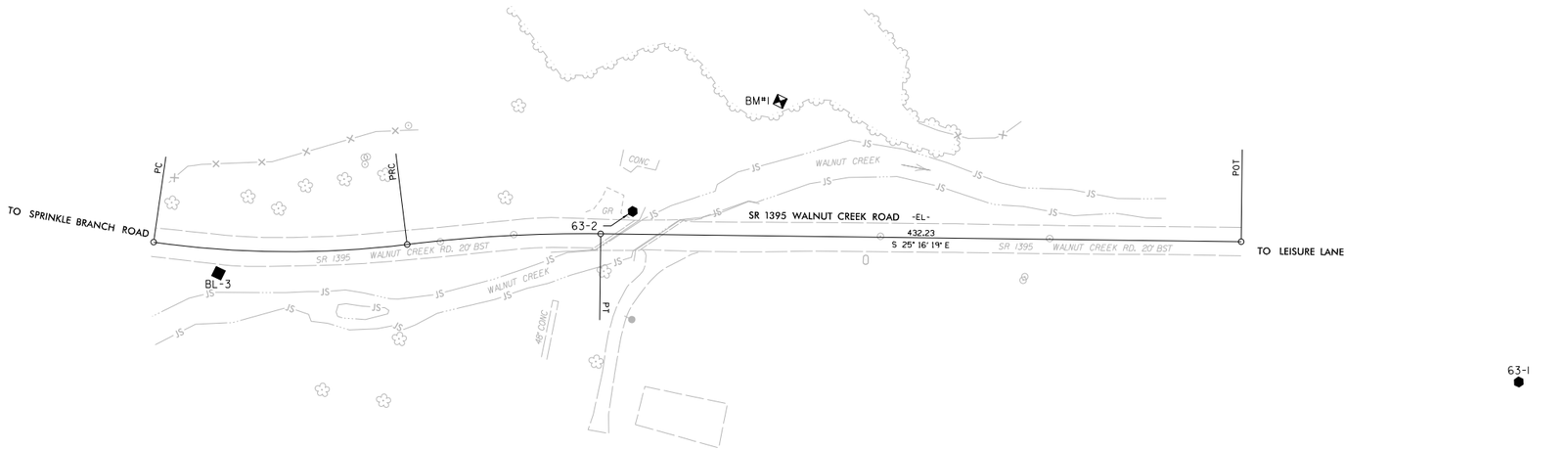
BENCHMARK

```
.....................................
BM1       ELEVATION = 2077.39
N 781781      E 911985
BL STATION 10+25.00 92 RIGHT
RR SPIKE IN BASE OF 28" WHITE OAK
.....................................
```

BASELINE

BL

POINT	DESC.	NORTH	EAST	ELEVATION
1	63-1	781249.9610	912033.3470	2069.55
2	63-2	781837.8990	911874.9490	2076.76
3	BL-3	782070.8358	911715.0323	2081.56



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: January 28, 2022
Datum/Epoch: NAD83/2011
Published/Fixed-control use: N/A
Localized around: 63-2
Northing: 781837.899
Easting: 911874.949
Combined grid factor: 0.99983115
Geoid model: GEOID 18
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 February 8, 2022, and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 4/25/2022

DocuSigned by:
Matthew Cornwell
E8C08F14736478...
Professional Land Surveyor L-4775

EXISTING CENTERLINE ALIGNMENT

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	782119.395	911714.781							
CURVE			S 25°26'26.7" E	171.06	15°07'21.9"(LT)	08°48'53.0"	171.56	86.28	650.00
PCC	781964.919	911788.267							
CURVE			S 29°08'13.4" E	130.77	07°43'48.7"(RT)	05°54'24.4"	130.87	65.53	970.00
PT	781850.696	911851.939							
LINE			S 25°16'19.0" E	432.23					
POT	781459.838	912036.463							

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

25-APR-2022 15:36
S:\Surveyors\projects\LIB\2021\560063\MTC\560063_ls_rw02c-1.dgn
mcornwell AT MCORNWELLLAPTOP

10/2023

REVISIONS

PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	RW02D-1

Location and Surveys

TGS ENGINEERS
201 WEST MARION STREET
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PROJECT SURVEYOR

DocuSigned by:
Matthew Cornwell
EBD39F11473E475...

10/9/2023

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, Matthew T. Cornwel, 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 10/9/2023

DocuSigned by:
Matthew Cornwell
EBD39F11473E475...

Professional Land Surveyor L-4775

L

TYPE	STATION	NORTH	EAST
PC	10+00.00	782119.3951	911714.7813
PRC	11+71.56	781964.9185	911788.2669
PT	13+02.43	781850.6962	911851.9390
POT	17+34.66	781459.8383	912036.4627

DR

TYPE	STATION	NORTH	EAST
POT	10+00.00	781794.1163	911878.6503
PC	10+02.42	781793.0842	911876.4641
PRC	10+63.67	781797.1458	911817.9802
PT	11+16.33	781804.3047	911767.4925
POT	11+53.56	781793.3751	911731.9128

NOTES:

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

2. 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.

09-OCT-2023 09:19
S:\Surveys\Projects\LIB\5600063\2023 RW Staking\MTC\5600063_ls_rw02d-1.dgn
mcornwell AT MCORNWELLLAPTOP

RIGHT OF WAY & PERMANENT EASEMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	RW03E-1

Location and Surveys

TGS ENGINEERS
201 WEST MARION STREET
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PROJECT SURVEYOR

DocuSigned by: Matthew Cornwell
EBD36F11473E475...

10/9/2023

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I , Matthew T. Cornwell, 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 from 9/28/2023 to 10/2/2023, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 10/9/2023

DocuSigned by: Matthew Cornwell
EBD36F11473E475...
Professional Land Surveyor L-4775

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST	
L	11+30.00	13.00	781994.1049	911755.4259	
L	11+30.00	-20.00	782010.2738	911784.1934	PAINTED "X" IN ROCK FACE
L	11+30.00	-13.00	782006.8441	911778.0912	
L	11+90.00	40.00	781928.2159	911764.2077	NOT SET – FALLS IN CREEK
L	12+80.00	45.00	781850.7215	911801.8908	
L	13+02.43	-35.00	781865.6382	911883.5892	
L	14+32.00	25.00	781722.8526	911884.6479	
L	14+70.00	-35.00	781714.1077	911955.1266	
L	14+83.00	25.00	781676.7370	911906.4190	
L	15+30.00	13.00	781639.3583	911937.3355	
L	15+30.00	-13.00	781650.4581	911960.8471	

ROW MARKER PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
L	13+68.00	-35.00	781806.3455	911911.5812
L	14+02.00	-75.00	781792.6761	911962.2680

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.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED 9/28/2023 TO 10/2/2023.

REVISIONS

10/2023

09-OCT-2023 09:25
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mcornwell AT MCORNWELLLAPTOP

10/2023

REVISIONS

-L- CURVE DATA	
PI Sta 10+86.28	PI Sta 12+37.10
△ = 15° 07' 21.9" (LT)	△ = 7° 43' 48.7" (RT)
D = 8° 48' 53.0"	D = 5° 54' 24.4"
L = 171.56'	L = 130.87'
T = 86.28'	T = 65.53'
R = 650.00'	R = 970.00'
SE = EXIST.	SE = NC
	DS = 15 MPH

-DR- CURVE DATA	
PI Sta 10+36.01	PI Sta 10+91.83
△ = 58° 29' 21.4" (RT)	△ = 50° 17' 37.0" (LT)
D = 95° 29' 34.7"	D = 95° 29' 34.7"
L = 61.25'	L = 52.67'
T = 33.59'	T = 28.17'
R = 60.00'	R = 60.00'
SE = -0.02	SE = 0.02
BI = S 64° 43' 41.0" W	B2 = S 72° 55' 25.4" W
(1) = -DR- PC 10+02.42	

NC GRID NAD 83 NA 2011

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	RW04

Location and Surveys

TGS ENGINEERS
201 WEST MARION STREET
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PROJECT SURVEYOR

DocuSigned by: Matthew Cornwell EBD36F11473E475...

10/9/2023

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

10+00

15+00

-L- PT 13+02.43

-L- PRC 11+71.56

HELEN HUNTER
IDA LEE RUNNION ESTATE
DB 53 PG 485

SADIE RUNION
TEDDY EUGENE RUNION
RHONDA RUNION
DB 134 PG 135

REBAR

S 47°12'55" E 88.96'

S 47°04'48" E 218.86'

S 01°33'27" W 105.63'

S 01°33'27" W 43.03'

S 07°20'56" E 76.44'

S 22°18'00" E 64.63'

S 25° 16' 19.0" E

N 58°40'16" E 3.48'

N 24°28'47" W 76.39'

S 58°40'16" W 23.41'

+02.43 35.00'

+85.00 32.00'

+50.00 30.00'

+30.00 20.00'

+30.00 13.00'

+55.22 13.05'

+95.22 13.05'

+68.00 35.00'

+02.00 75.00'

+70.00 35.00'

+30.00 13.00'

+80.00 45.00'

+90.00 40.00'

+30.00 13.00'

+20.00 63.00'

+98.00 58.00'

+97.00 104.00'

+17.00 106.00'

+32.00 25.00'

+24.00 53.00'

+65.00 63.00'

+62.00 38.00'

+83.00 25.00'

+27.00 18.00'

+30.00 13.00'

-L- PT 13+65.00 =
-DR- PT 10+00.00

-DR- PRC 10+63.67

-DR- PT 11+16.33

-DR- POT 11+53.56

DUE

E

JS

WOODS

GRASS

WALNUT CREEK

CONC

CONC WW

GARION BASKET WW

RK WW

BRIDGE 63

BD1

BD2

BD3

BD4

BI

B2

EXISTING R/W

SR 1397 (SPRINKLE BRANCH RD.)

SR 1395 WALNUT CREEK RD. 20' BST

SR 1398 (LEISURE LN.)

O/H MITO

HELEN HUNTER
IDA LEE RUNNION ESTATE
DB 53 PG 485

REBAR

4.86'

I, Matthew T. Cornwell, 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 from 9/28/2023 to 10/2/2023, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 10/9/2023

DocuSigned by: Matthew Cornwell EBD36F11473E475...

Professional Land Surveyor L-4775

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.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED 9/28/2023 TO 10/2/2023.

08-OCT-2023 09:30
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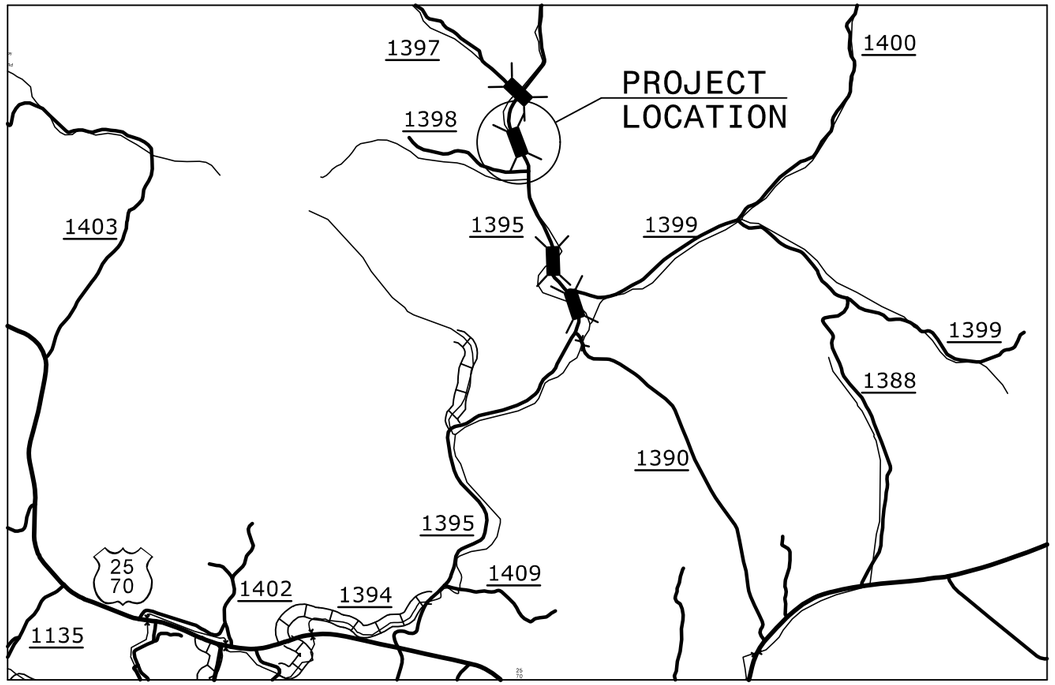
mcornwell
ALMCORNWELL-LAPTOP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

MADISON COUNTY

LOCATION: BRIDGE #560063 OVER WALNUT CREEK ON SR 1395 (WALNUT CREEK RD)



INDEX OF SHEETS

SHEET NO.
TMP-1

PROJECT: BP13-R022

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

PLANS PREPARED BY:

DON PARKER, PE — *PROJECT ENGINEER*

SANDRA MELVIN — *DESIGN ENGINEER*

NCDOT CONTACTS:

JOEL M DAVIS
ASSISTANT DIVISION BRIDGE PROGRAM MANAGER

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

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

DATE: 6/5/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

7/3/2025
X:\NCDOT\Division 13 Madison 2019\Madison 63\Traffic\TrafficControl\TCP\Madison 63_TC_TMP_01.dgn
User:cpruett

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	FLAGGING DEVICES
1170.01	PORTABLE CONCRETE BARRIER
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO LANE AND MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

MADISON COUNTY
BRIDGE #560063

PROJ. REFERENCE NO.	SHEET NO.
BP13-R022	TMP-1A

TGS ENGINEERS
201 W. MARION ST. STE 200
SHELBY, NC 28150
PH (704) 476-0003
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
- MILL EXISTING PAVEMENT

SIGNALS

EXISTING PROPOSED TEMPORARY PORTABLE

DS DRIVEWAY

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

TEMPORARY PAVEMENT MARKING SCHEDULE

PAINT (4")

P1 (4") WHITE EDGELINE
P13 (4") YELLOW DOUBLE CENTER

PAINT (24")

P61 (24") WHITE STOPBAR

APPROVED: Don A. Parker
75D8BE90ADEF440...

DATE: 6/5/2026

SEAL

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

ROADWAY STANDARD DRAWINGS & LEGEND

5/5/2025
X:\NCDOT\Division 13 Madison 2019\Madison 63\Traffic\TrafficControl\TCP\Madison 63_TC_TMP_0IA.dgn
User:smelvin

MADISON COUNTY
BRIDGE #560063

PROJ. REFERENCE NO.	SHEET NO.
BP13-R022	TMP-1B

TGS ENGINEERS
201 W. MARION ST., STE 200
SHELBY, NC 28150
PH (704) 476-0003
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 ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, 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 ON THE SHOULDER ADJACENT TO A DIVIDED FACILITY AND WITHIN 10 FT OF AN OPEN TRAVEL LANE, 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) 200 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) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.

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

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

M) INSTALL BLACK ON ORANGE ''DIP'' SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 200 FT IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC BARRIER

N) INSTALL TEMPORARY BARRIER ACCORDING TO THE TRANSPORTATION MANAGEMENT PLANS A MAXIMUM OF TWO (2) WEEKS PRIOR TO BEGINNING WORK IN ANY LOCATION. ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION PROCEED IN A CONTINUOUS MANNER TO COMPLETE THE PROPOSED WORK IN THAT LOCATION UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS OR AS DIRECTED BY THE ENGINEER.

DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE.

ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION AND NO WORK IS PERFORMED BEHIND THE TEMPORARY BARRIER FOR A PERIOD LONGER THAN TWO (2) MONTHS, REMOVE / RESET TEMPORARY BARRIER AT NO COST TO THE DEPARTMENT UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS, TEMPORARY BARRIER IS PROTECTING A HAZARD, OR AS DIRECTED BY THE ENGINEER.

INSTALL TEMPORARY BARRIER WITH THE TRAFFIC FLOW BEGINNING WITH THE UPSTREAM SIDE OF TRAFFIC. REMOVE TEMPORARY BARRIER AGAINST THE TRAFFIC FLOW BEGINNING WITH THE DOWNSTREAM SIDE OF TRAFFIC.

INSTALL AND SPACE DRUMS NO GREATER THAN TWICE THE POSTED SPEED LIMIT (MPH) TO CLOSE OR KEEP THE SECTION OF THE ROADWAY CLOSED UNTIL THE TEMPORARY BARRIER CAN BE PLACED OR AFTER THE TEMPORARY BARRIER IS REMOVED.

O) PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER AT ALL TIMES DURING THE INSTALLATION AND REMOVAL OF THE BARRIER BY EITHER A TRUCK MOUNTED ATTENUATOR (MAXIMUM 72 HOURS) OR A TEMPORARY CRASH CUSHION.

PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER FROM ONCOMING TRAFFIC AT ALL TIMES BY A TEMPORARY CRASH CUSHION UNLESS THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER IS OFFSET FROM ONCOMING TRAFFIC AS FOLLOWS OR AS SHOWN IN THE PLANS: (SEE ALSO 1101.05)

POSTED SPEED LIMIT	MINIMUM OFFSET
40 OR LESS	15 FT
45 - 50	20 FT
55	25 FT
60 MPH or HIGHER	30 FT

TRAFFIC CONTROL DEVICES

P) 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.

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

PAVEMENT MARKINGS AND MARKERS

R) INSTALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY PAVEMENT MARKERS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

ROAD NAME	MARKING	MARKER
WALNUT CREEK RD (-L-)	PAINT	NONE

S) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE.

T) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.

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

V) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

MANAGEMENT STRATEGIES

PROPOSED SR 1395 (WALNUT CREEK RD) WILL BE CONSTRUCTED USING A COMBINATION OF DEVICES INCLUDING AN ONSITE DETOUR IN A ONE-LANE TWO-WAY PATTERN, A PORTABLE TRAFFIC SIGNAL SYSTEM, AND TEMPORARY LANE CLOSURES UTILIZING FLAGGERS.

APPROVED: Signed by: Don A. Parker 75DB8E90ADEF440... DATE: 6/5/2026

SEAL

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

5/5/2025
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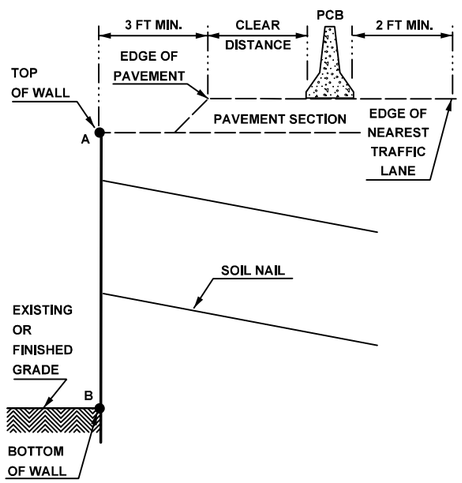
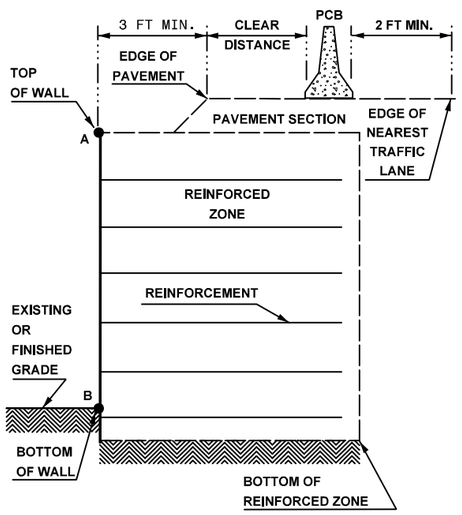
User:smelvin

PROJ. REFERENCE NO.	SHEET NO.
BP13-R022	TMP-2

TEMPORARY SOIL NAIL WALL



TEMPORARY MSE WALL



NOTE: WALL OR SHORING HEIGHT = A-B

TEMPORARY SHORING

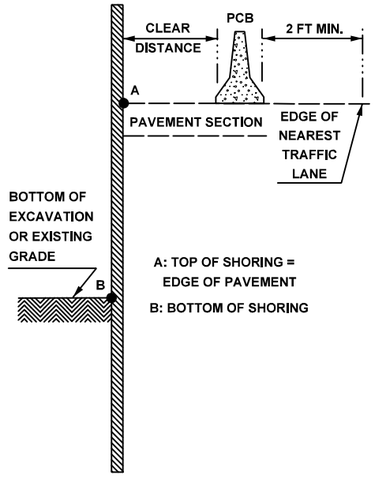


FIGURE A

NOTES

1- REFER TO THE TRAFFIC CONTROL PLANS FOR TEMPORARY SHORING LOCATIONS AND NOTES.

2- REFER TO THE "TEMPORARY SHORING" STANDARD PROVISION FOR INFORMATION ABOUT TEMPORARY SHORING AND PORTABLE CONCRETE BARRIER (PCB).

3- PCB IS REQUIRED IF TEMPORARY SHORING/WALL IS LOCATED WITHIN THE CLEAR ZONE IN ACCORDANCE WITH THE AASHTO ROADSIDE DESIGN GUIDE. DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE. (CONTACT NCDOT PAVEMENT MANAGEMENT FOR APPLICABLE PAVEMENT DESIGN).

4- BASED ON THE CLEAR DISTANCE, OFFSET, DESIGN SPEED AND PAVEMENT TYPE, CHOOSE AN UNANCHORED OR ANCHORED PCB FROM THE TABLE SHOWN IN FIGURE B. CLEAR DISTANCE IS DEFINED AS SHOWN IN FIGURE A AND OFFSET IS DEFINED AS SHOWN IN FIGURE B.

5- AT THE CONTRACTOR'S OPTION OR IF THE MINIMUM REQUIRED CLEAR DISTANCE IS NOT AVAILABLE, SET PCB NEXT TO AND UP AGAINST THE TRAFFIC SIDE OF THE TEMPORARY SHORING/WALLS EXCEPT FOR BARRIER ABOVE TEMPORARY WALLS. PCB WITH THE MINIMUM REQUIRED CLEAR DISTANCE IS REQUIRED ABOVE TEMPORARY WALLS.

6- USE NCDOT PORTABLE CONCRETE BARRIER (PCB) IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1170.01 AND SECTION 1170 OF THE STANDARD SPECIFICATIONS.

7- SET PCB WITH A MINIMUM HORIZONTAL DISTANCE OF 2 FT BETWEEN THE FRONT FACE OF THE BARRIER AND THE EDGE OF THE NEAREST TRAFFIC LANE AS SHOWN IN FIGURE A UNLESS OTHERWISE SHOWN IN THE PLANS OR APPROVED BY THE ENGINEER.

8- FOR PCB ABOVE AND BEHIND TEMPORARY WALLS, PROVIDE A MINIMUM DISTANCE OF 3 FT BETWEEN THE EDGE OF PAVEMENT AND THE WALL FACE AS SHOWN IN FIGURE A. IF THIS MINIMUM REQUIRED DISTANCE IS NOT AVAILABLE, CONTACT THE ENGINEER.

9- TABLE SHOWN IN FIGURE B IS BASED ON NCDOT RESEARCH PROJECT NO. 2005-010 WITH VEHICLE TYPE USED FOR NCHRP 350 CRASH TESTS.

MINIMUM REQUIRED CLEAR DISTANCE, inches

Barrier Type	Pavement Type	Offset * ft	Design Speed, mph					
			<30	31-40	41-50	51-60	61-70	71-80
Unanchored PCB	Asphalt	<8	24	26	29	32	36	40
		8-14	26	28	31	35	38	42
		14-20	27	29	34	36	39	43
		20-26	28	31	35	38	40	44
		26-32	29	32	36	39	42	45
		32-38	30	34	38	41	43	46
		38-44	31	34	41	43	45	48
		44-50	31	35	41	43	46	49
		50-56	32	36	42	44	47	50
		>56	32	36	42	45	47	51
	Concrete	<8	17	18	21	22	25	26
		8-14	19	20	23	25	26	29
		14-20	22	22	24	26	28	31
		20-26	23	24	26	27	30	34
		26-32	24	25	27	28	32	35
		32-38	24	26	27	30	33	36
		38-44	25	26	28	30	34	37
		44-50	26	26	28	32	35	37
		50-56	26	26	28	32	35	38
		>56	26	27	29	32	36	38
Anchored PCB	Asphalt	All Offsets	24 for All Design Speeds					
Anchored PCB	Concrete (including bridge approach slabs)	All Offsets	12 for All Design Speeds					

* See Figure Below

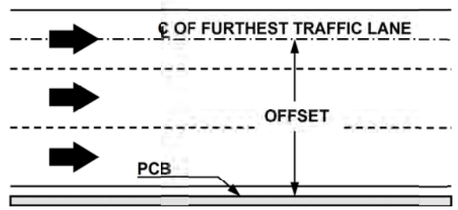


FIGURE B

APPROVED: Don A. Parker
DATE: 6/5/2026
SEAL

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

PORTABLE CONCRETE BARRIER AT TEMPORARY SHORING LOCATIONS

5/5/2025
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User:smelvin

TEMPORARY SHORING DATA

PROJ. REFERENCE NO.	SHEET NO.
BP13-R022	TMP-2A

Shoring Location No. 1 (FILL SHORING):

FOR TEMPORARY SHORING AND POSITIVE PROTECTION OR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.

TEMPORARY SHORING IS REQUIRED FOR THE STRUCTURE CONSTRUCTION FROM -L- STATION 12+69, 4.0 FT RT TO -L- STATION 14+13, 4.0 FT RT.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING FROM -L- STATION 12+69, 4.0 FT RT TO -L- STATION 14+13, 4.0 FT RT, FOR THE FOLLOWING ASSUMED SOIL PARAMETERS:

ABOVE ELEVATION 2068 FT
UNIT WEIGHT (γ) = 115 LB/CF
FRICTION ANGLE (ϕ) = 26 DEGREES
COHESION (c) = 0 LB/SF
GROUNDWATER ELEVATION = 2070 ft

BELOW ELEVATION 2068 (ROCK)
UNIT WEIGHT (γ) = 165 LB/CF
FRICTION ANGLE (ϕ) = 40 DEGREES
COHESION (c) = 1000 LB/SF

LIMITED SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF TEMPORARY SHORING FROM -L- STATION 12+69, 4.0 FT RT TO -L- STATION 14+13, 4.0 FT RT. THE INFORMATION PROVIDED FOR TEMPORARY SHORING DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

DRIVEN PILING FOR TEMPORARY SHORING FROM -L- STATION 12+69, 4.0 FT RT TO -L- STATION 14+13, 4.0 FT RT MAY NOT PENETRATE BELOW ELEVATION 2068 FT DUE TO OBSTRUCTIONS, VERY DENSE OR HARD SOIL, BOULDERS OR WEATHERED OR HARD ROCK.

DO NOT USE STANDARD TEMPORARY SHORING FOR TEMPORARY SHORING FROM -L- STATION 12+69, 4.0 FT RT TO -L- STATION 14+13, 4.0 FT RT. CONTRACTOR DESIGNED SHORING IS REQUIRED. SEE TEMPORARY SHORING SPECIAL PROVISION.

IF GROUNDWATER OR THE FLOOD ELEVATION IS ABOVE THE BOTTOM OF THE REINFORCED ZONE, DO NOT USE A TEMPORARY WALL FOR TEMPORARY SHORING FROM -L- STATION 12+69, 4.0 FT RT TO -L- STATION 14+13, 4.0 FT RT. A TEMPORARY WALL IS ONLY ALLOWED ON TOP OF THE CULVERT.

APPROVED: Matthew Brewer
DATE: 6/6/2026
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 041986 ENGINEER MATTHEW BREWER

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

TEMPORARY SHORING DATA

5/5/2025
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User:smelvin

PHASING

NOTE: UNLESS OTHERWISE NOTED ACCESS TO ALL DRIVEWAYS MUST BE PROVIDED AT ALL TIMES WITHIN THE PROJECT AREA.

NOTE: FOR ALL FLAGGING OPERATIONS, SEE NCDOT RSD 1101.02, SHT 1

PHASE I

STEP 1

PLACE ADVANCED WORK WARNING SIGNS IN ACCORDANCE WITH TMP-4. FOR ADDITIONAL INFORMATION SEE NCDOT RSD 1101.01, SHT 3 OF 3.

STEP 2 (TMP-4)

WITH TRAFFIC IN EXISTING PATTERN AND USING TEMPORARY LANE CLOSURES AS NEED CONSTRUCT THE FOLLOWING:(SEE TMP-4 & RSD 1101.02, SHT 1)

-DET- FROM -DET- STA.12+05± TO STA. 13+59±.
-DR- FROM -DR- 10+47± TO 11+20± ,PLACE ONLY ABC BASE AND TIE TO EXISTING DRIVE.

SHIFT DR TRAFFIC TO NEWLY CONSTRUCTED DR AND DETOUR PAVEMENT AS SHOWN ON PLANS.

STEP 3 (TMP-4)

WITH SR 1395 TRAFFIC IN EXISTING PATTERN AND USING TEMPORARY LANE CLOSURES AS NEEDED CONSTRUCT THE FOLLOWING:

COMPLETE DETOUR CONSTRUCTION FROM -DET- 10+42± TO 12+05±, INCLUDING TEMPORARY DRAINAGE PIPES. (SEE ROADWAY AND DRAINAGE PLANS)

CONSTRUCT TEMPORARY DRIVEWAY LEFT OF -L- STA 12+55±, INCLUDING TEMPORARY PIPE. (SEE ROADWAY AND DRAINAGE PLANS)

STEP 4

INSTALL TEMPORARY PORTABLE TRAFFIC SIGNAL SYSTEM. (SEE SPECIAL PROVISION)

PLACE SIGNAGE ALONG SR 1395, KEEP COVERED. (SEE TMP-5)

NOTIFY OVERSIZE/OVERWEIGHT UNIT A MINIMUM OF 2 WEEKS PRIOR TO THE IMPLEMENTATION OF 1L-2W PHASE II PATTERN.

PHASE II (TMP-5)

STEP 1

PLACE TEMPORARY PAVEMENT MARKINGS, ACTIVATE SIGNALS,AND SHIFT TRAFFIC IN A ONE-LANE TWO -WAY PATTERN ONTO THE DETOUR, AND CLOSE SR 1395 WALNUT CREEK RD (-L-) TO TRAFFIC AS SHOWN ON PLANS.

STEP 2

REMOVE THE EXISTING STRUCTURE OVER WALNUT CREEK.

CONSTRUCT THE PROPOSED DOWNSTREAM PORTION OF THE CULVERT ON WALNUT CREEK AS SHOWN ON PLANS.

SETP 3

PLACE TEMPORARY SHORING

CONSTRUCT SR 1395 WALNUT CREEK AS SHOWN ON PLANS UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE. TIE PROPOSED PAVEMENT TO EXISTING AT TIE-INS.

CONSTRUCT DRIVE LT OF -L- STA. 13+00±

PLACE PORTABLE CONCRETE BARRIER, PLACE TEMPORARY PAVEMENT MARKINGS.

PHASE III (TMP-6)

STEP 1

USE FLAGGERS TO PERFORM THE FOLLOWING:

CLOSE DETOUR TO SR 1395 TRAFFIC, KEEP OPEN FOR DR TRAFFIC AS SHOWN ON PLANS

ADJUST DRIVEWAY SIGNALS

CLOSE TEMPORARY DRIVE LT OF -L- STA. 12+55±

SHIFT SR 1395 TRAFFIC IN A ONE-LANE ONE WAY TRAFFIC ONTO THE NEWLY CONSTRUCTED SR 1395 AS SHOWN ON PLANS.

STEP 2

COMPLETE THE CULVERT CONSTRUCTION AS SHOWN ON PLANS

STEP 3

USING FLAGGERS AS NEEDED CONSTRUCT SR 1395 (WALNUT CREEK RD) UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE AS SHOWN ON PLAN.

CONSTRUCT DR FROM -DR- STA 10+35± TO 11+20± INCLUDING THE FINAL LAYER OF SURFACE COURSE.

PHASE IV

STEP 1 (TMP-7)

USE FLAGGERS TO PERFORM THE FOLLOWING:

REMOVE PORTABLE CONCRETE BARRIER

PLACE TEMPORARY PAVEMENT MARKINGS IN FINAL PATTERN

DEACTIVATE THE PORTABLE TRAFFIC SIGNAL SYSTEM AND REMOVE SIGNAGE

PLACE SR 1395 TRAFFIC INTO A TWO LANE TWO WAY PATTERN.

OPEN -DR- TO TRAFFIC

STEP 2 (TMP-7)

USING FLAGGERS CONSTRUCT SR 1395 (-L-) UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE AS SHOWN ON PLANS.

STEP 3

USING TEMPORARY LANE CLOSURES AND FLAGGERS IN ACCORDANCE WITH NCDOT RSD 1101.02, SHT 1 OF 19 PERFORM THE FOLLOWING:

PLACE FINAL LAYER OF SURFACE FROM -L- STA. 11+30± TO STA. 15+30±,

PLACE FINAL PAVEMENT MARKINGS AS SHOWN IN PAVEMENT MARKING PLANS.

STEP 4

REMOVE ALL TEMPORARY TRAFFIC CONTROL DEVICES.

APPROVED: Don A. Parker
75DB9E90ADEF440...
DATE: 6/5/2026
SEAL

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 *

TEMPORARY TRAFFIC CONTROL PHASING

5/5/2025
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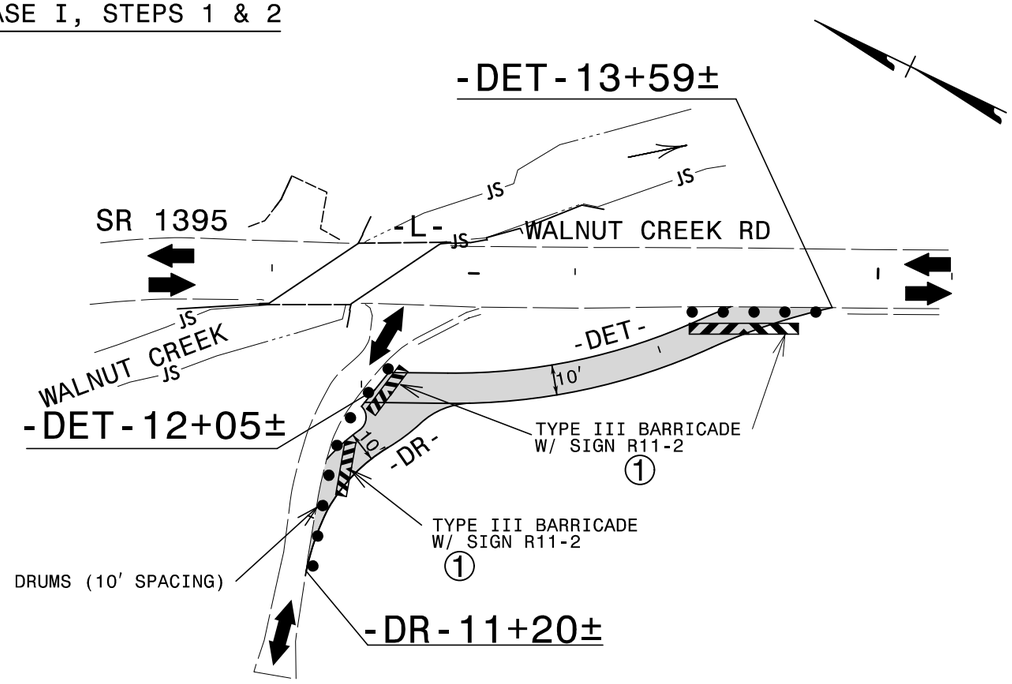
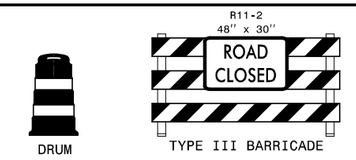
User:smelvin

PHASE I, STEPS 1 & 2

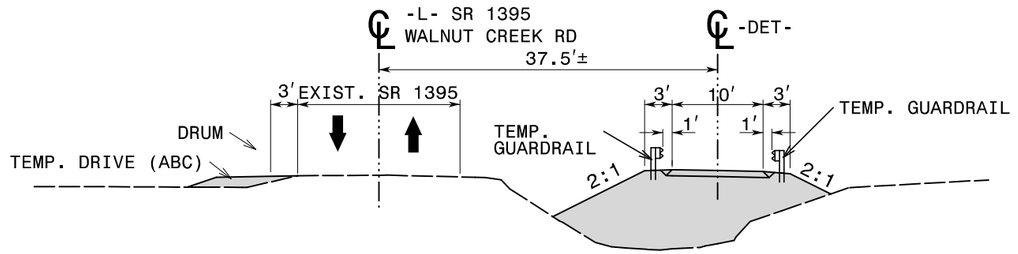




PROJ. REFERENCE NO.	SHEET NO.
BP13-R022	TMP-4

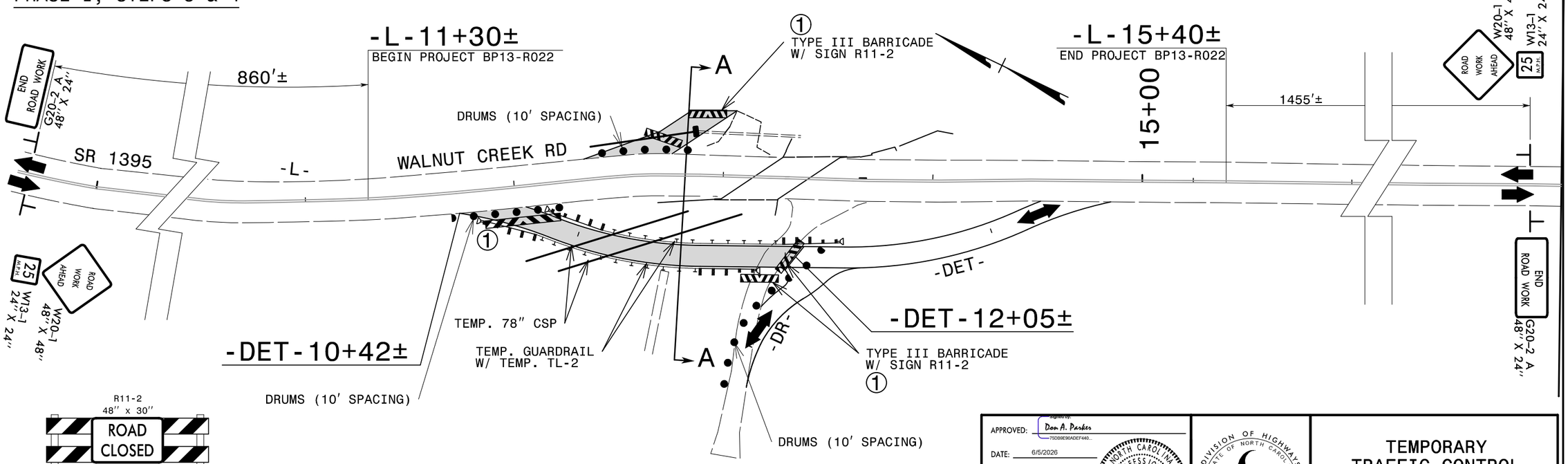
TGS ENGINEERS
201 W. MARION ST. STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

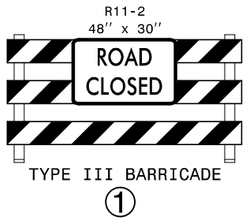
MADISON COUNTY
BRIDGE #560063



SECTION A-A
-DET- 11+50±

PHASE I, STEPS 3 & 4





APPROVED: Don A. Parker
DATE: 6/5/2026
SEAL

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

TEMPORARY TRAFFIC CONTROL

PHASE I DETAIL

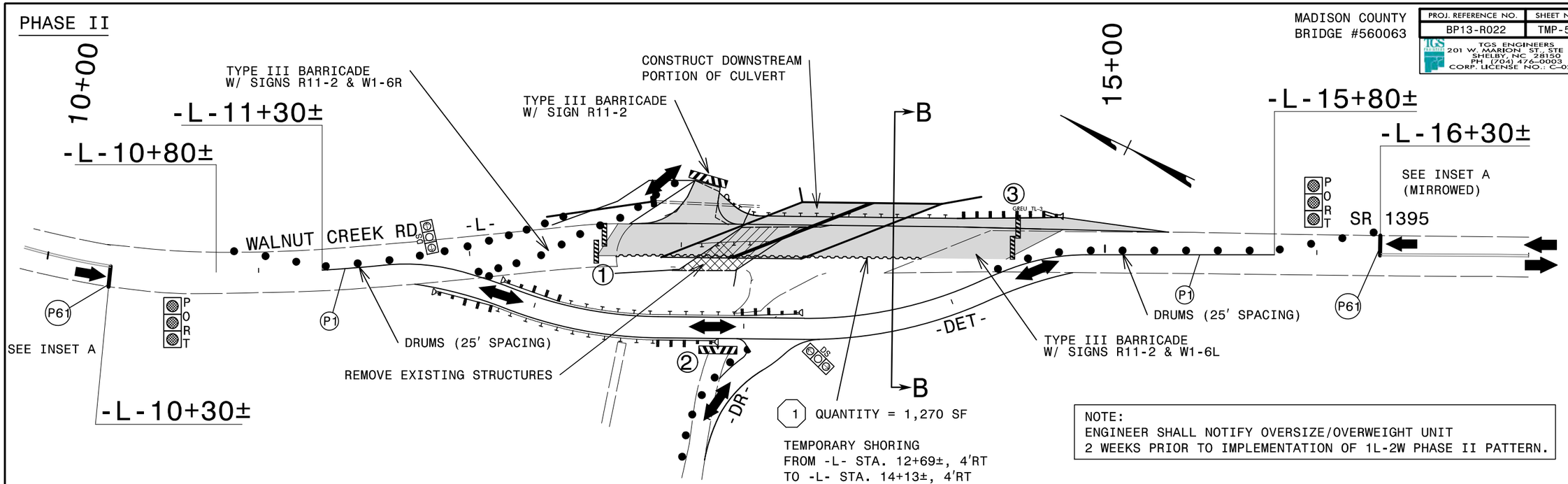
5/13/2025
X:\NCDOT\Division 13 Madison 2019\Madison 63\Traffic\TrafficControl\TCP\Madison 63_TC_TMP_04.dgn
User:cpruett

PROJ. REFERENCE NO.	SHEET NO.
BP13-R022	TMP-5

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

MADISON COUNTY
BRIDGE #560063

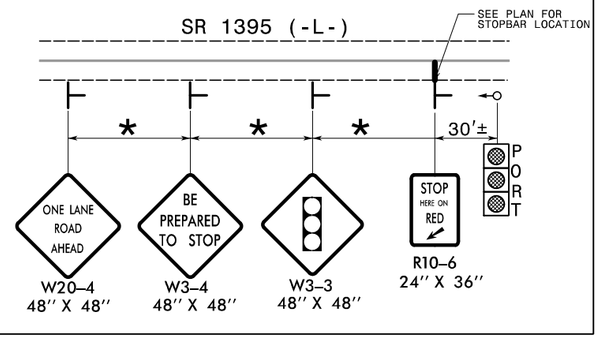
PHASE II

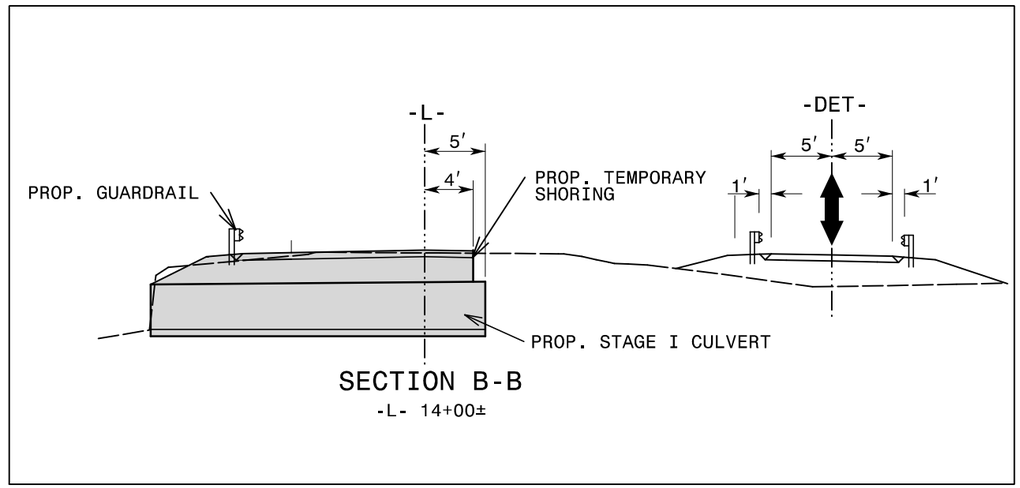


NOTE:
ENGINEER SHALL NOTIFY OVERSIZE/OVERWEIGHT UNIT
2 WEEKS PRIOR TO IMPLEMENTATION OF 1L-2W PHASE II PATTERN.

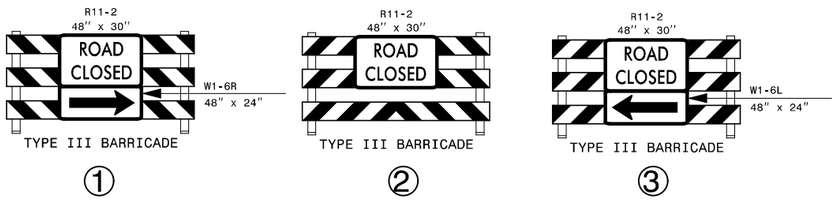
INSET A

★ USE 200′± SPACING ALONG SOUTHBOUND SR 1395
USE 350′± SPACING ALONG NORTHBOUND SR 1395





SECTION B-B
-L- 14+00±



SEE TMP-1A FOR TEMPORARY PAVEMENT SCHEDULE

APPROVED: Don A. Parker
75DB9E90ADEF440...
DATE: 6/5/2026
SEAL
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

TEMPORARY TRAFFIC CONTROL

PHASE II DETAIL

5/5/2025
X:\NCDOT\Division 13 Madison 2019\Madison 63\Traffic\TrafficControl\TCP\Madison 63_TC_TMP_05.dgn
User:smelvin

PHASE III

MADISON COUNTY
BRIDGE #560063

PROJ. REFERENCE NO.	SHEET NO.
BP13-R022	TMP-6

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

10+00

15+00

-L- STA 13+41±,3′LT
PORTABLE CONCRETE BARRIER (ANCHORED)

-L- STA 13+06±,1′LT
PORTABLE CONCRETE BARRIER (ANCHORED)

-L- STA 12+40±,3′RT
BEGIN PORTABLE CONCRETE BARRIER (ANCHORED)
CRASH CUSHION

-L-14+77±, 4′LT

WALNUT CREEK RD -L-

SR 1395

TYPE III BARRICADE
W/SIGN R11-2 ③

TYPE III BARRICADE
W/SIGN R11-2 ①

TYPE III BARRICADE
W/SIGN R11-2 ①

TYPE III BARRICADE
W/SIGN R11-2 ②

-L-11+30±

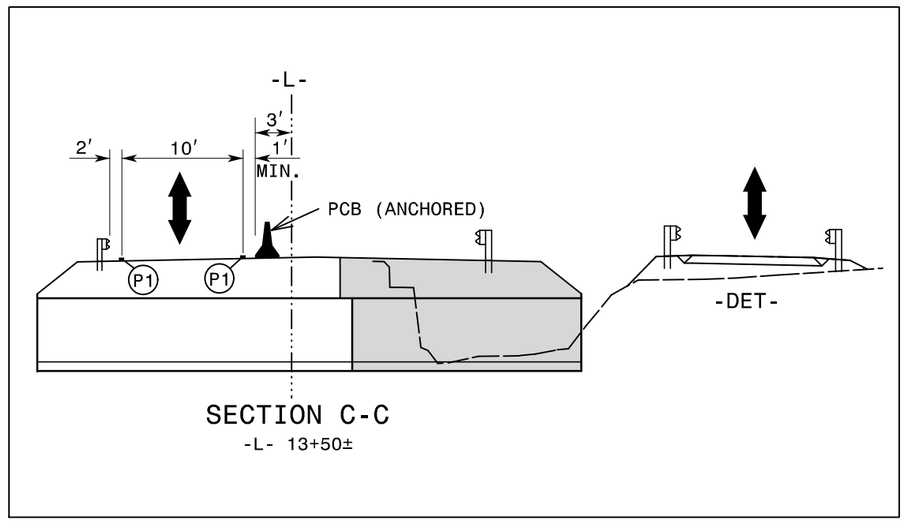
-L-11+70±
2′RT

-L-15+66±

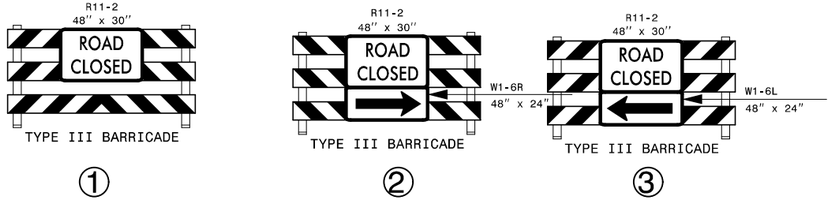
-L- STA 14+44±,3′LT
END PORTABLE CONCRETE BARRIER (ANCHORED)
CRASH CUSHION

-DET-

-DR-



SECTION C-C
-L- 13+50±



SEE TMP-1A FOR TEMPORARY PAVEMENT SCHEDULE

APPROVED: Signed by: Don A. Parker 75D8BE99ADEF440...

DATE: 6/5/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TEMPORARY TRAFFIC CONTROL

PHASE III DETAIL

7/3/2025
X:\NCDOT\Division 13 Madison 2019\Madison 63\Traffic\TrafficControl\TCP\Madison 63_TC_TMP_06.dgn
User:cpruett

PHASE IV, STEPS 1 & 2

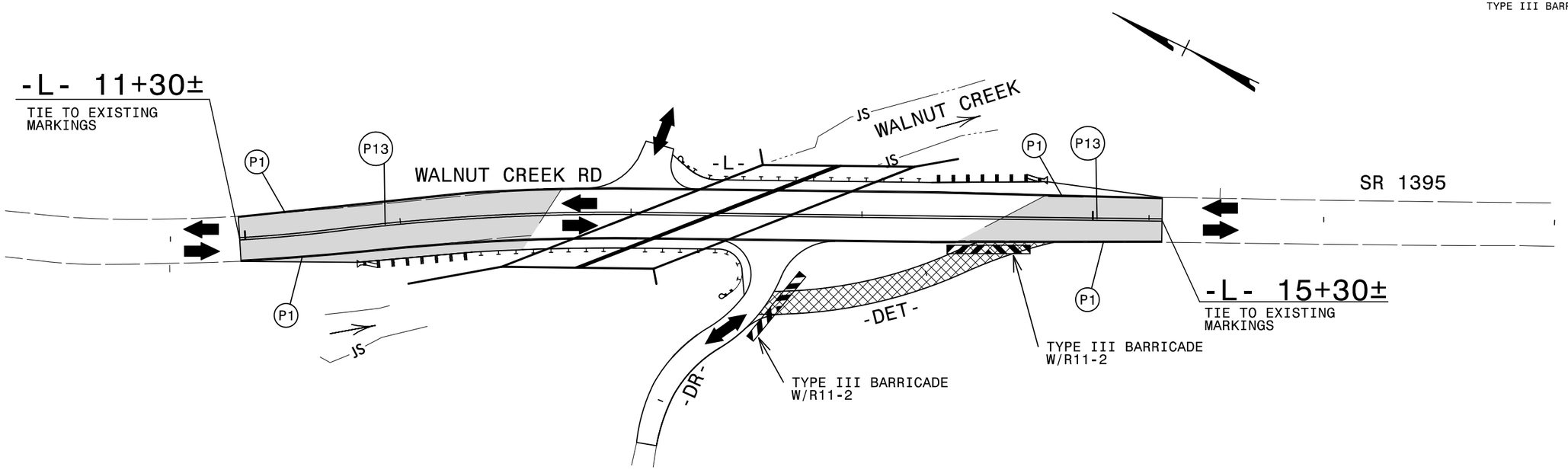
MADISON COUNTY
BRIDGE #560063

PROJ. REFERENCE NO.	SHEET NO.
BP13-R022	TMP-7

TGS ENGINEERS
201 W. MARION ST. STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275
R11-2

48" x 30"

TYPE III BARRICADE



SEE TMP-1A FOR TEMPORARY PAVEMENT SCHEDULE

APPROVED: Signed by: Don A. Parker 75DB8E90ADEF440...

DATE: 6/5/2026

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043251 DON A. PARKER

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TEMPORARY TRAFFIC CONTROL

PHASE IV DETAIL

5/5/2025
X:\NCDOT\Division 13 Madison 2019\Madison 63\Traffic\TrafficControl\TCP\Madison 63_TC_TMP_07.dgn
User:smelvin

PROJECT:BP13-R022

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN

MADISON COUNTY

LOCATION: BRIDGE #560063 OVER WALNUT CREEK ON SR 1395 (WALNUT CREEK RD)

TIP NO.	SHEET NO.
BP13-R022	PMP-1

APPROVED: Signed by: Don A. Parker 75DB8E90ADEF440...

DATE: 6/5/2026

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043251 DON A. PARKER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX

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 2024 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
1205.12	PAVEMENT MARKINGS - BRIDGES
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

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	MARKER
SR 1395 WALNUT CREEK (-L-)	PAINT	NONE

B) PLACE TWO APPLICATIONS OF PAINT PAVEMENT MARKINGS ON THE FINAL WEARING SURFACE. PLACE THE SECOND APPLICATION OF PAINT UPON SUFFICIENT DRYING TIME OF THE FIRST.

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

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

FINAL PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
	PAVEMENT MARKINGS
	PAINT (4")
P1	(4") WHITE EDGELINE
P13	(4") YELLOW DOUBLE CENTER

PLAN SUBMITTED TO:

JOEL M DAVIS
ASSISTANT DIVISION BRIDGE PROGRAM MANAGER

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PLAN PREPARED BY: TGS ENGINEERS

DON PARKER, PE — PROJECT ENGINEER
SANDRA MELVIN — DESIGN TECHNICIAN

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

6/4/2026
X:\NCDOT\Division 13 Madison 2019\Madison 63\Traffic\Pavement Marking\Madison 63_Sgn_PMP_01.dgn
User:cpruett

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	PMP-1A

CONTINUOUS LINES

EDGE LINE
YELLOW OR WHITE — 4″/6″

LANE LINE
WHITE — 4″/6″

CENTER LINE
YELLOW — 4″/6″

GORE LINE
WHITE — 8″/12″

DIAGONAL LINE
YELLOW OR WHITE — 12″ 45 MPH OR HIGHER
8″ LESS THAN 45 MPH
4″-6″ FOR BICYCLE FACILITIES

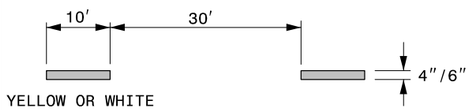
CROSSWALK LINE
WHITE — 8″ TRANSVERSE
24″ LONGITUDINAL

RxR LINE
WHITE — 16″

STOP OR TRANSVERSE BAR
WHITE — 24″

10′-30′/SP SKIP LINE

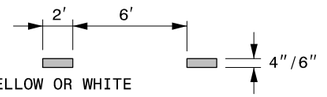
UNLESS OTHERWISED SHOWN, USE 10′-30′/SP SKIPS FOR SKIP LANE LINES AND SKIP CENTER LINES.



YELLOW OR WHITE

2′-6′/SP MINI-SKIP LINE

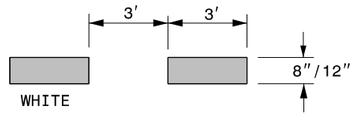
UNLESS OTHERWISED SHOWN, USE 2′-6′/SP MINI-SKIPS FOR LANE LINE EXTENSIONS THROUGH INTERSECTIONS, EDGE LINE EXTENSIONS THROUGH INTERSECTIONS AND BICYCLE LANE EXTENSIONS.



YELLOW OR WHITE

3′-3′/SP MINI-SKIP LINE

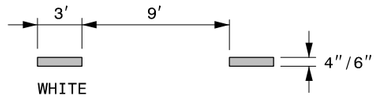
UNLESS OTHERWISED SHOWN, USE 3′-3′/SP MINI-SKIPS FOR THE WHITE EDGE LINE ENTENSIONS AT ROUNDABOUTS.



WHITE

3′-9′/SP MINI-SKIP LINE

UNLESS OTHERWISED SHOWN, USE 3′-9′/SP MINI-SKIPS FOR MINI-SKIP LANE LINES, LINE EXTENSIONS THROUGH TAPERS, AND MINI-SKIPS USED FOR BICYCLE LANE LINES.



WHITE

GENERAL NOTES:

1- USE 6″ LANE, EDGE, AND CENTER LINES ON ALL FULL CONTROL OF ACCESS FACILITIES AND OTHER ROUTES AS DIRECTED BY THE ENGINEER.

2- LANE LINES INDICATED AS "WIDE" ON THE ROADWAY STANDARD DRAWINGS SHALL BE AT LEAST TWICE THE WIDTH OF THE NORMAL LINE.

3- GORE LINES SHALL BE TWICE THE WIDTH OF THE NORMAL LINE.

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

ROADWAY DETAIL DRAWING FOR

PAVEMENT MARKINGS

LINE TYPES AND OFFSETS

SHEET 1 OF 2

1205D01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042546 MATTHEW V. SPRINGER
Matthew V. Springer, PE
6/5/2026

CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-8950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: M.V. SPRINGER DATE: 2-15-24
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

TIP NO.	SHEET NO.
BP13-R022	PMP-2

APPROVED: Signed by: Don A. Parker 75D88E90ADEF440...

DATE: 6/5/2026

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

10+00

15+00

-L- 11+30±
TIE TO EXISTING MARKINGS

WALNUT CREEK

SR 1395 WALNUT CREEK RD

-DR-

-L- 15+30±
TIE TO EXISTING MARKINGS

P1 P13 JS -L- +30 11' 11'

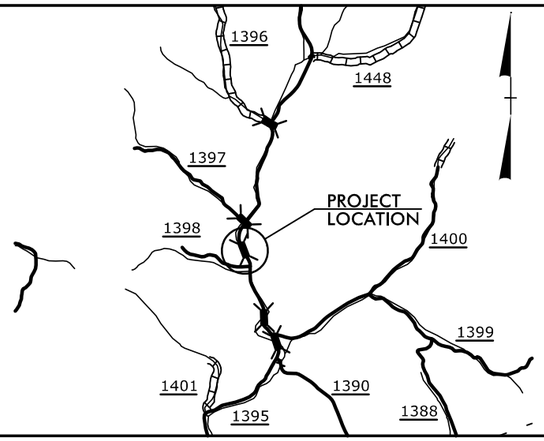
SEE PMP-1 FOR FINAL PAVEMENT MARKING SCHEDULE

PAVEMENT MARKING DETAIL

5/5/2025
X:\NCDOT\Division 13 Madison 2019\Madison 63\Traffic\Pavement Marking\Madison 63_Sgn_PMP_02.dgn
User:smelvin

PROJECT: BP13–R022

CONTRACT: DM00447



VICINITY MAP
NOT TO SCALE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

MADISON COUNTY

LOCATION: BRIDGE NO. 560063 OVER WALNUT CREEK ON SR 1395 (WALNUT CREEK ROAD)

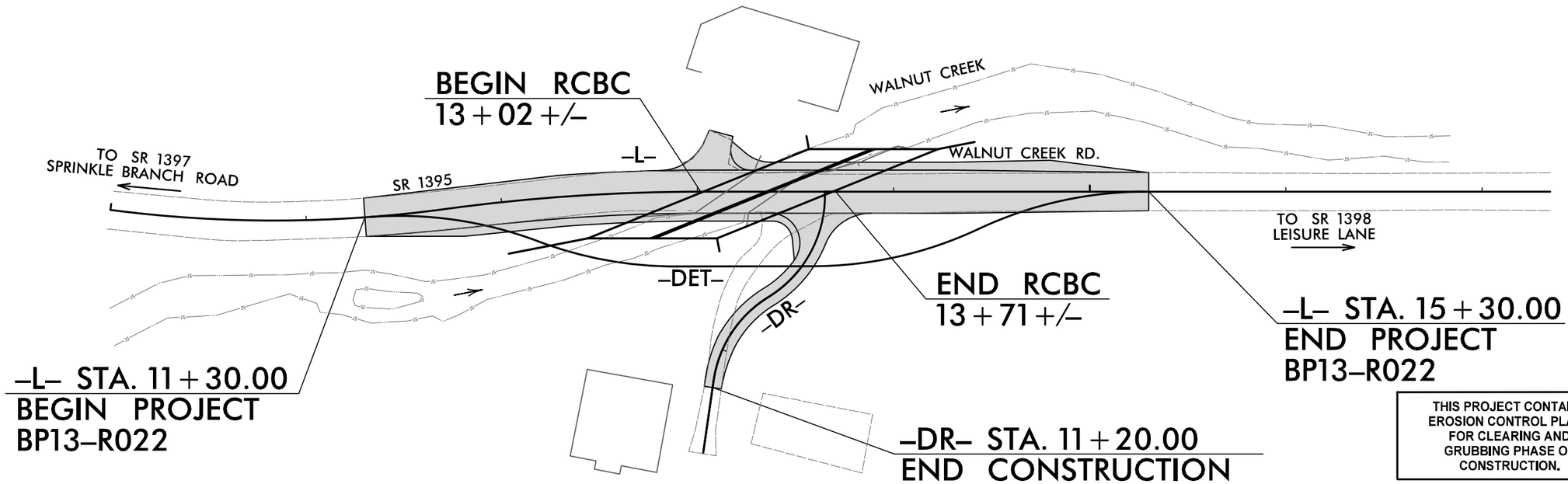
TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURE, AND UTILITIES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13-R022	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP13.R022.1	N/A	PE
BP13.R022.2	N/A	R/W & UTIL.
BP13.R022.3	N/A	CONST.

NAD 83/2011

4



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

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
201 W. MARION ST-STE 200
SHELBY, NC 28150

Designed by:
Andrew H. Cochrane, PE *3015*
NAME *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 revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	EC-02
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

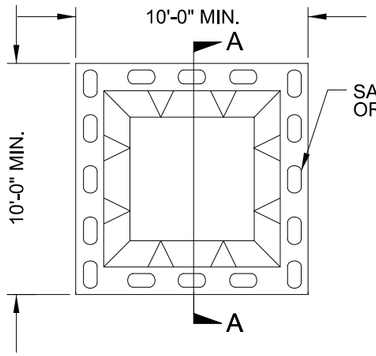
EROSION & SEDIMENT CONTROL LEGEND

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

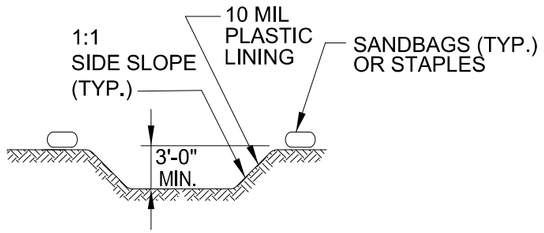
Std. #	Description	Symbol
1633.01	Temporary Rock Silt Check Type A	
1633.02	Temporary Rock Silt Check Type B	
1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1634.01	Temporary Rock Sediment Dam Type A	
1634.02	Temporary Rock Sediment Dam Type B	
1635.01	Rock Pipe Inlet 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.
BP13-R022	EC-2A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



PLAN



SECTION A-A

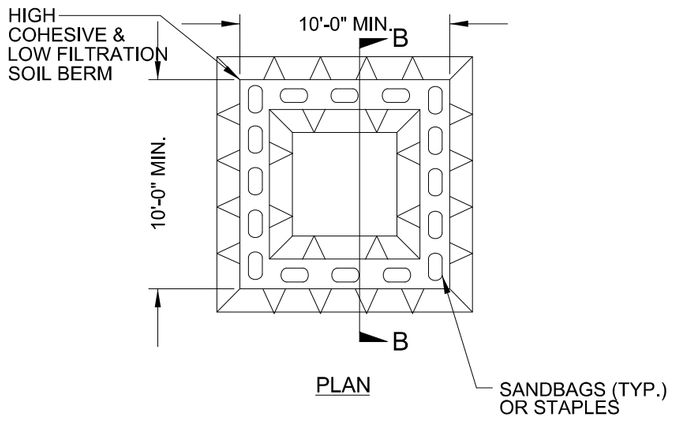
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

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.

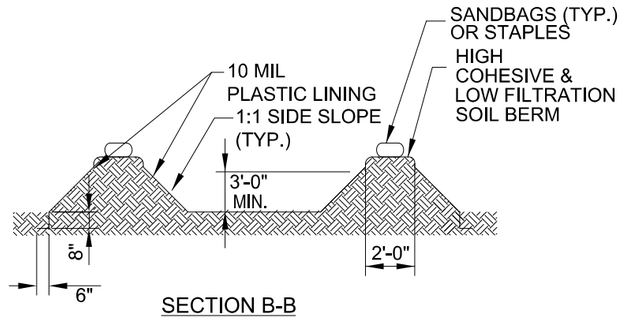
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

BELOW GRADE WASHOUT STRUCTURE

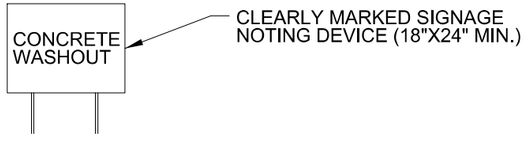
NOT TO SCALE



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.

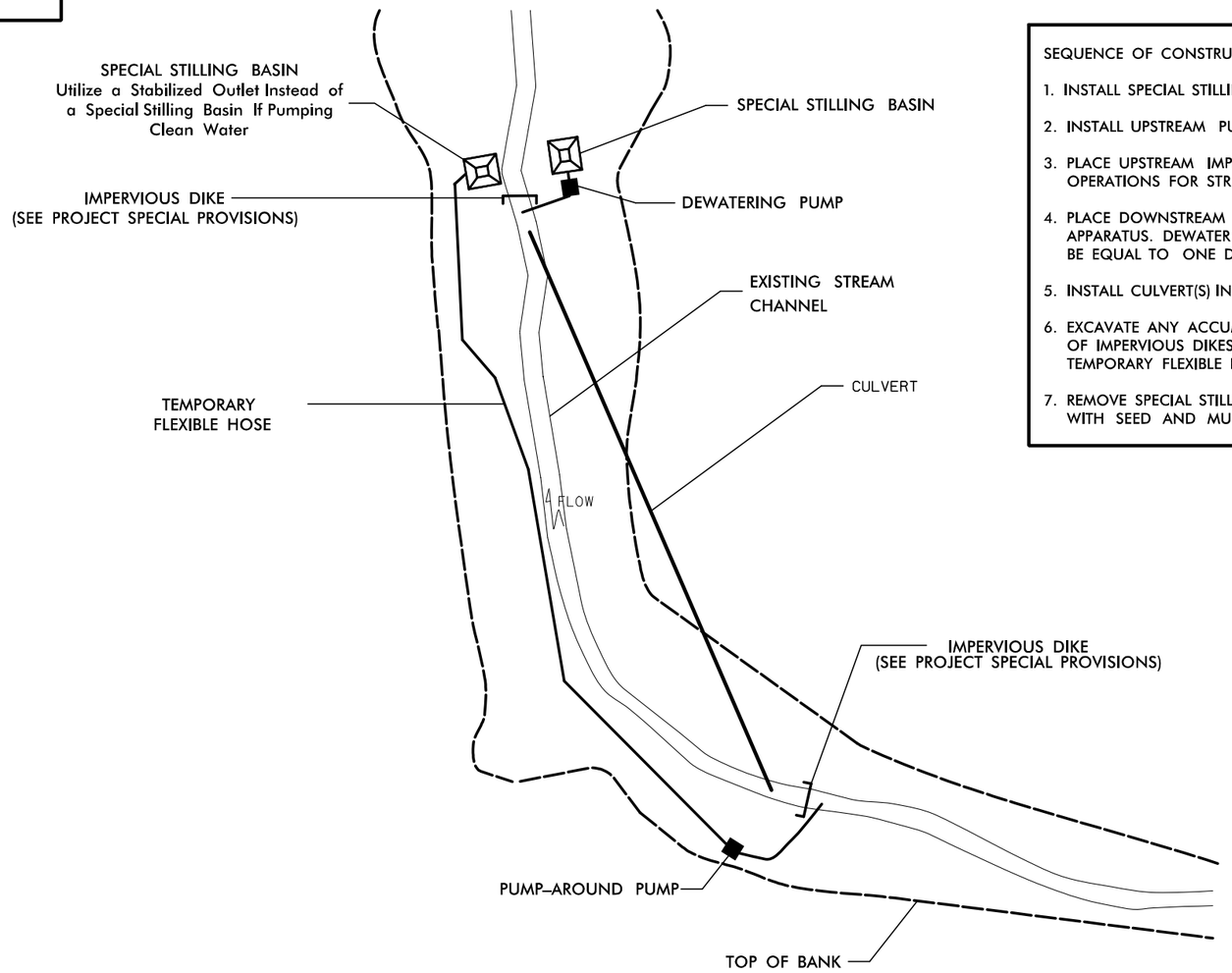
ABOVE GRADE WASHOUT STRUCTURE

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	EC-2B
RW 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.
BP13-R022	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

SLOPE STRAW MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	L	11+75	13+25	RT	261
	SLOPE STRAW MATTING SUBTOTAL				261

DITCHLINE STRAW MATTING FOR EROSION CONTROL

4	L	11+50	12+25	LT	50
	DITCHLINE STRAW MATTING SUBTOTAL				50

DITCHLINE EXCELSIOR MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
	SLOPE STRAW MATTING SUBTOTAL				261
	DITCHLINE STRAW MATTING SUBTOTAL				50
	DITCHLINE EXCELSIOR MATTING SUBTOTAL				0
	MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER				1,311
				TOTAL	1,311

SLOPE COIR FIBER MATTING FOR EROSION CONTROL

4	DET	10+75	11+00	RT	44
4	DET	11+25	11+50	LT	44
	SLOPE COIR FIBER MATTING SUBTOTAL				88
	MISCELLANEOUS COIR FIBER MATTING				12
				TOTAL	100

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	EC-3A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

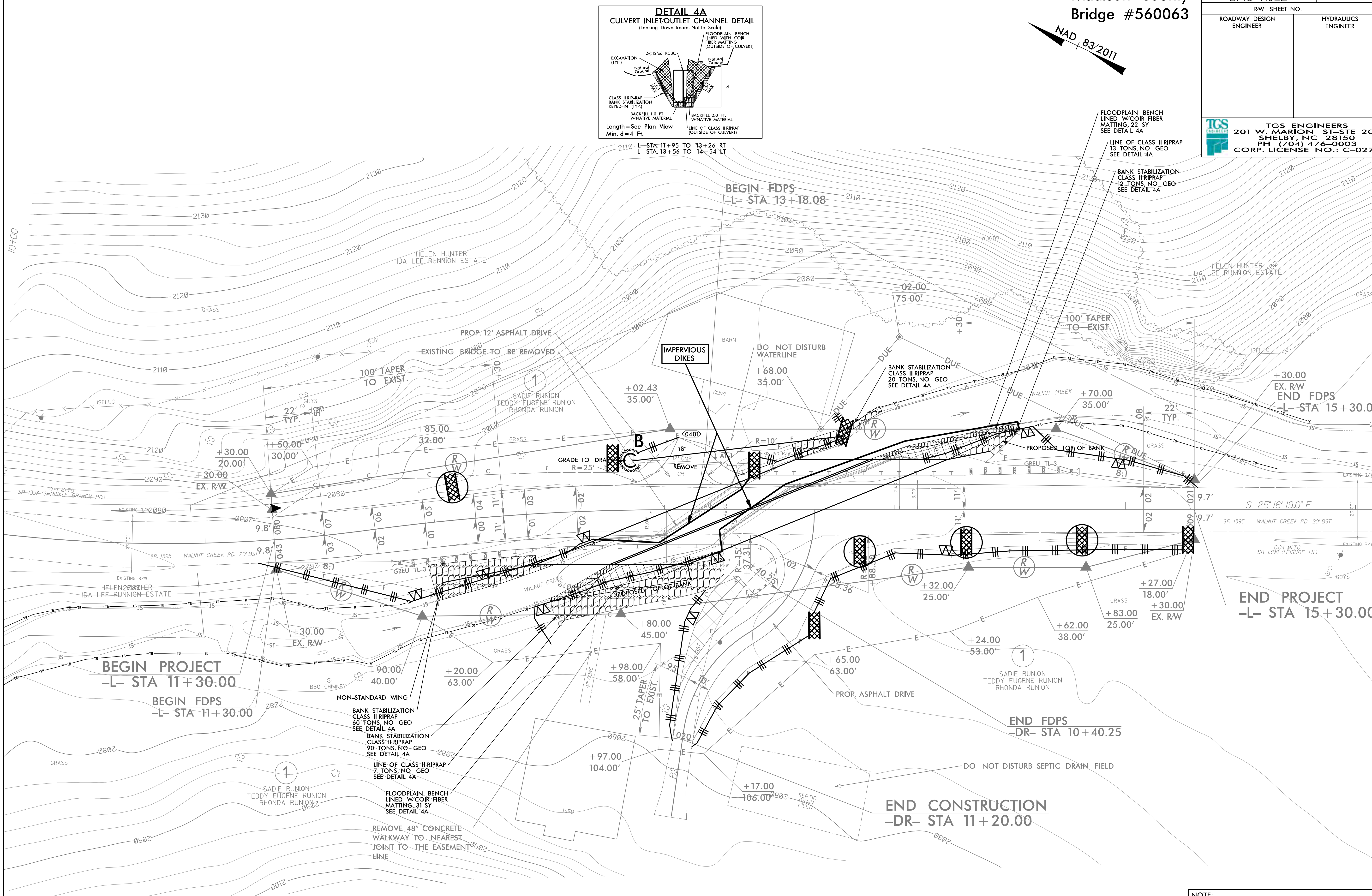
SOIL STABILIZATION TIMEFRAMES

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

Madison County
Bridge #560063

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	EC-4/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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


DETAIL 4A
CULVERT INLET/OUTLET CHANNEL DETAIL
(Looking Downstream, Not to Scale)
Length = See Plan View
Min. d = 4 Ft.
-L- STA. 11+95 TO 13+26 RT
-L- STA. 13+56 TO 14+54 LT
NAD 83/2011
BEGIN FDPS
-L- STA 13+18.08
FLOODPLAIN BENCH LINED W/COIR FIBER MATTING, 22 SY SEE DETAIL 4A
LINE OF CLASS II RIPRAP 13 TONS, NO GEO SEE DETAIL 4A
BANK STABILIZATION CLASS II RIPRAP 12 TONS, NO GEO SEE DETAIL 4A
BANK STABILIZATION CLASS II RIPRAP 20 TONS, NO GEO SEE DETAIL 4A
HELEN HUNTER
IDA LEE RUNNION ESTATE
PROP. 12' ASPHALT DRIVE
EXISTING BRIDGE TO BE REMOVED
IMPERVIOUS DIKES
DO NOT DISTURB WATERLINE
100' TAPER TO EXIST.
SADIE RUNION
TEDDY EUGENE RUNION
RHONDA RUNION
GRADE TO DRAIN
REMOVE
PROPOSED TOP OF BANK
EX. R/W
END FDPS
-L- STA 15+30.00
S 25°16' 19.0" E
SR 1395 WALNUT CREEK RD. 20' BST
SR 1397 (SPRINKLE BRANCH RD)
END PROJECT
-L- STA 15+30.00
BEGIN PROJECT
-L- STA 11+30.00
BEGIN FDPS
-L- STA 11+30.00
NON-STANDARD WING
BANK STABILIZATION CLASS II RIPRAP 60 TONS, NO GEO SEE DETAIL 4A
BANK STABILIZATION CLASS II RIPRAP 90 TONS, NO GEO SEE DETAIL 4A
LINE OF CLASS II RIPRAP 7 TONS, NO GEO SEE DETAIL 4A
FLOODPLAIN BENCH LINED W/COIR FIBER MATTING, 31 SY SEE DETAIL 4A
REMOVE 48" CONCRETE WALKWAY TO NEAREST JOINT TO THE EASEMENT LINE
25' TAPER TO EXIST.
PROP. ASPHALT DRIVE
END FDPS
-DR- STA 10+40.25
DO NOT DISTURB SEPTIC DRAIN FIELD
END CONSTRUCTION
-DR- STA 11+20.00

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 4

INSTALL PIPE(S) IN JURISDICTIONAL AREAS WITHOUT IMPACTING STREAM UNTIL AREA STABILIZED AND ACCORDING TO NCDOT BEST MANAGEMENT PRACTICES FOR CONSTRUCTION AND MAINTENANCE ACTIVITIES MANUAL.

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

CULVERT CONSTRUCTION SEQUENCE STA. 13+36 –L–

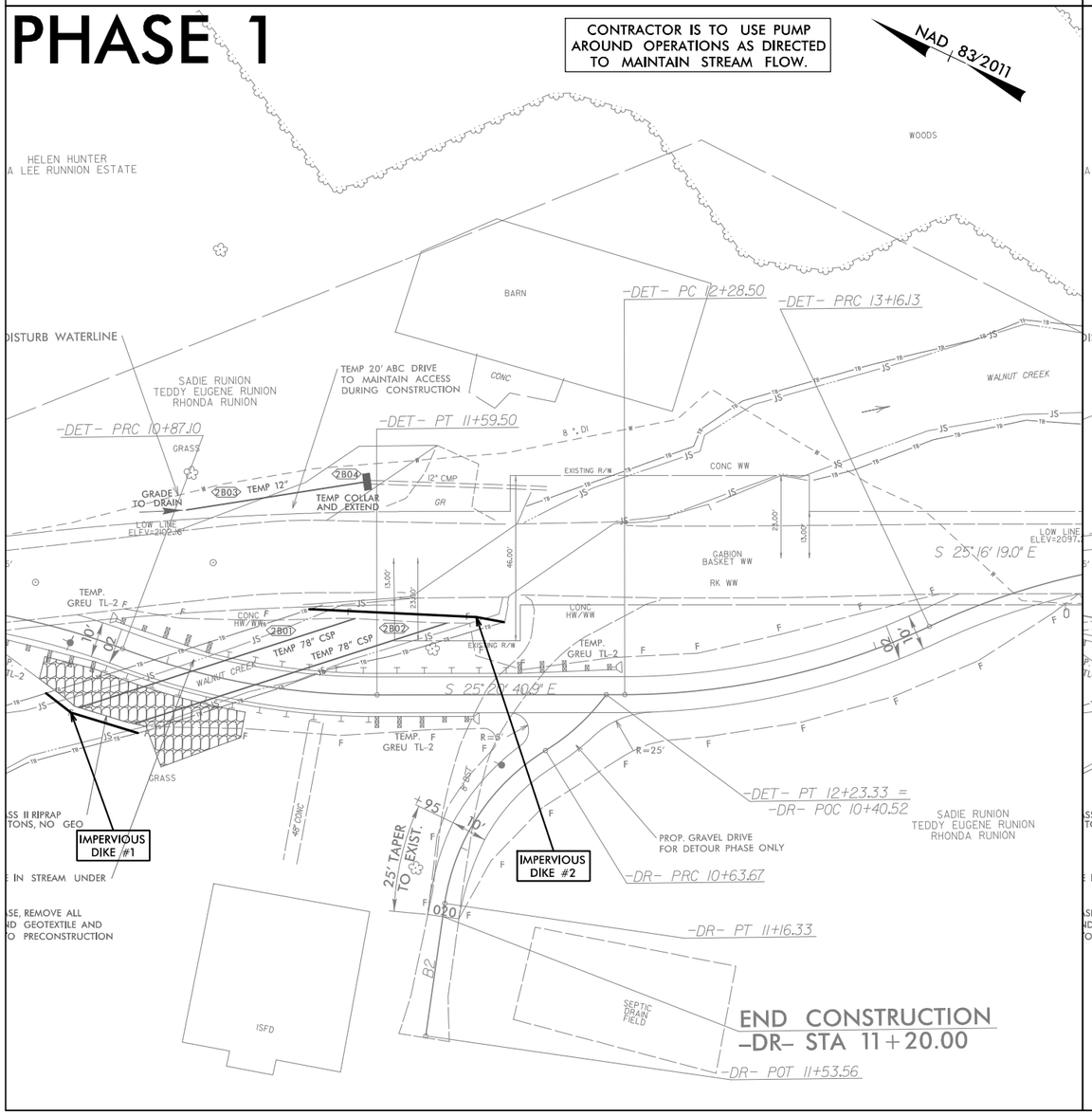
PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	EC-05/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

1. INSTALL IMPERVIOUS DIKES #1 & #2 AND BEGIN PUMP AROUND.
2. DEWATER WORK SITES AS NEEDED INTO SPECIAL STILLING BASIN(S).
3. INSTALL TEMPORARY 78" DRAINAGE PIPES PER NCDOT RDY STD. 1645.01.
4. COMPLETE DETOUR ROADWAY AND DIVERT TRAFFIC AS DESCRIBED ON TMP–4.

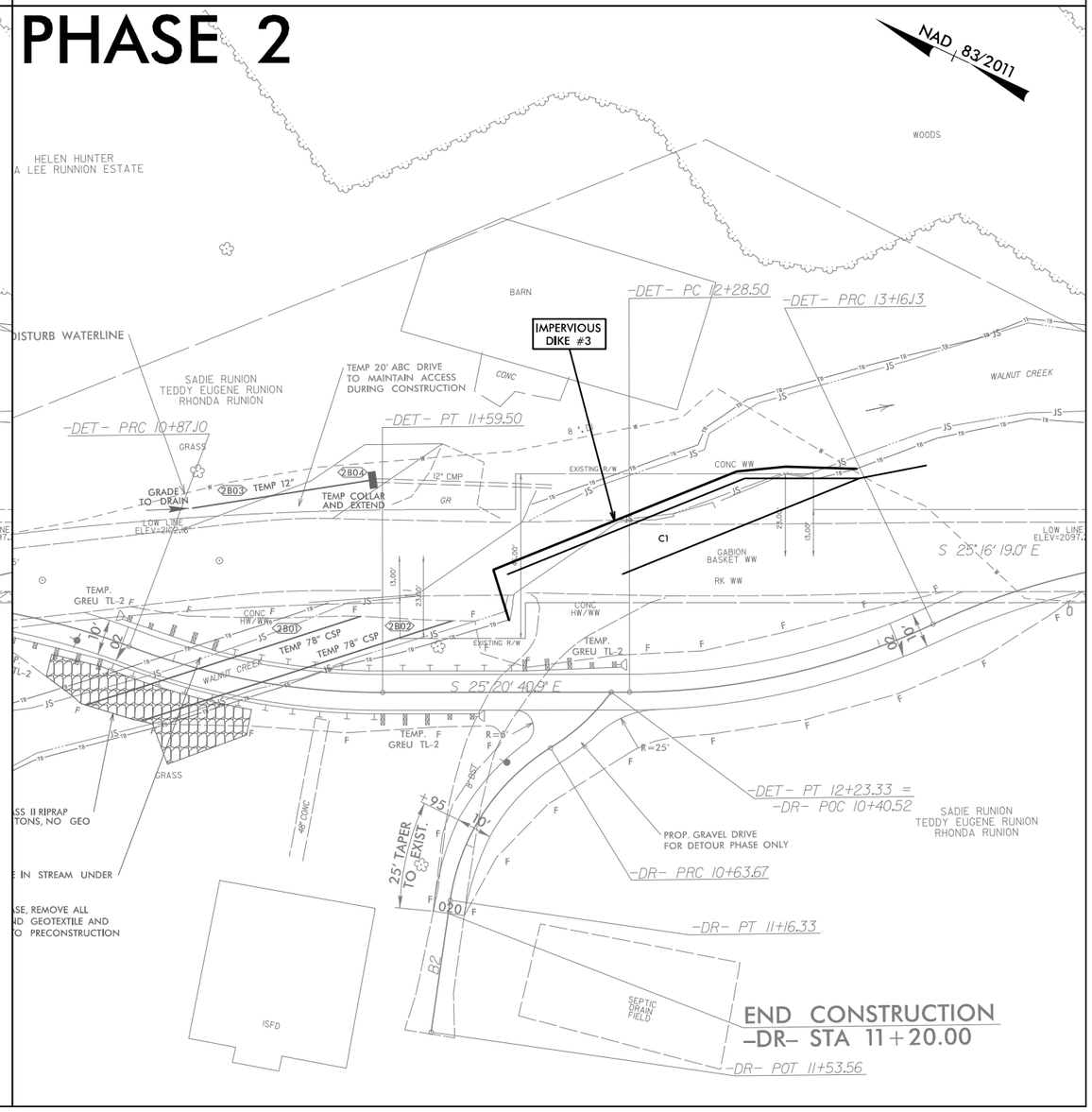
1. REMOVE IMPERVIOUS DIKES #1 & #2 AND STOP PUMP AROUND.
2. INSTALL IMPERVIOUS DIKE #3.
3. REMOVE EXISTING BRIDGE ALONG SOUTHERN BANK OF WALNUT CREEK.
4. INSTALL DOWNSTREAM PORTION OF SOUTHERNMOST BOX CULVERT (C1).

PHASE 1

CONTRACTOR IS TO USE PUMP AROUND OPERATIONS AS DIRECTED TO MAINTAIN STREAM FLOW.



PHASE 2

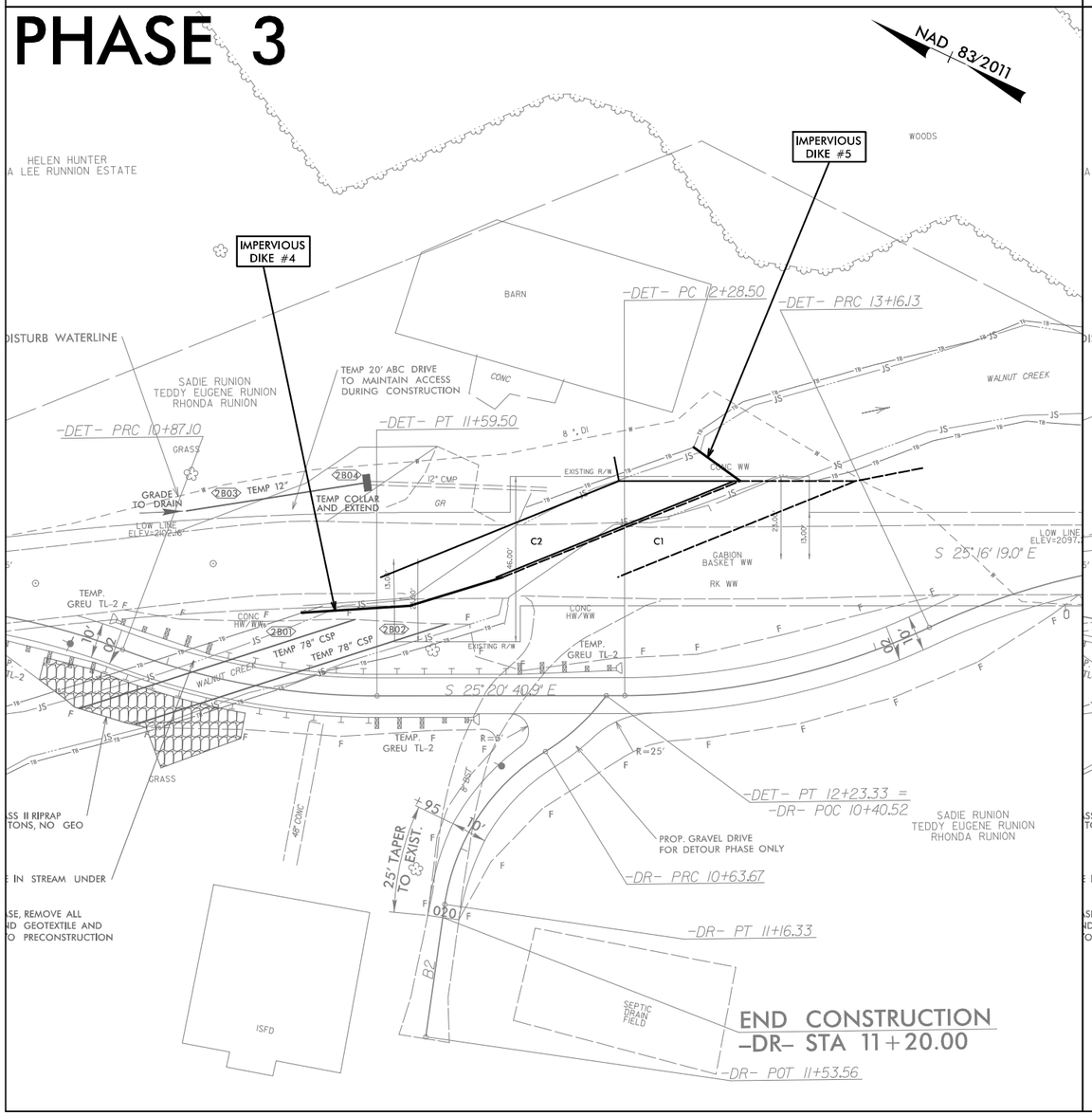


CULVERT CONSTRUCTION SEQUENCE STA. 13+36 –L–

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	EC-05A/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

1. REMOVE IMPERVIOUS DIKE #3.
2. INSTALL IMPERVIOUS DIKES #4 & #5, DIRECTING FLOW THRU C1.
3. REMOVE EXISTING BRIDGE ALONG NORTHERN BANK OF WALNUT CREEK.
4. INSTALL DOWNSTREAM PORTION OF NORTHERNMOST BOX CULVERT (C2).
5. CONSTRUCT EASTERN LANE OF –L– AS DESCRIBED ON TMP–5.
6. SHIFT TRAFFIC ONTO NEWLY CONSTRUCTED PAVEMENT AS DESCRIBED ON TMP–6.

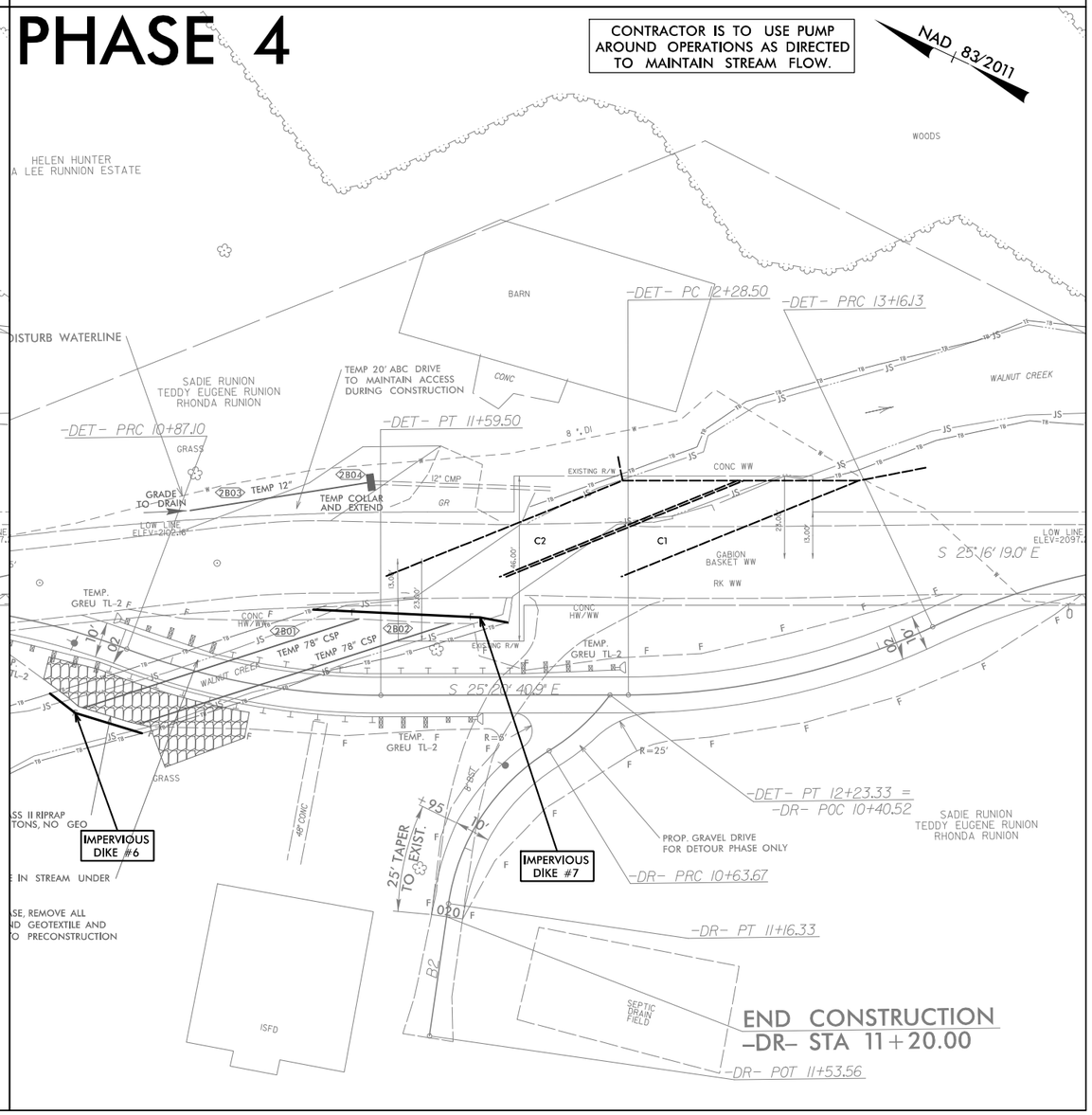
PHASE 3



1. REMOVE IMPERVIOUS DIKES #4 & #5.
2. INSTALL IMPERVIOUS DIKES #6 & #7 AND BEGIN PUMP AROUND.
3. REMOVE DETOUR ROADWAY.
4. DISPOSE OF TEMPORARY 78" DRAINAGE PIPES AS DESCRIBED IN DRAINAGE PLANS.

PHASE 4

CONTRACTOR IS TO USE PUMP AROUND OPERATIONS AS DIRECTED TO MAINTAIN STREAM FLOW.

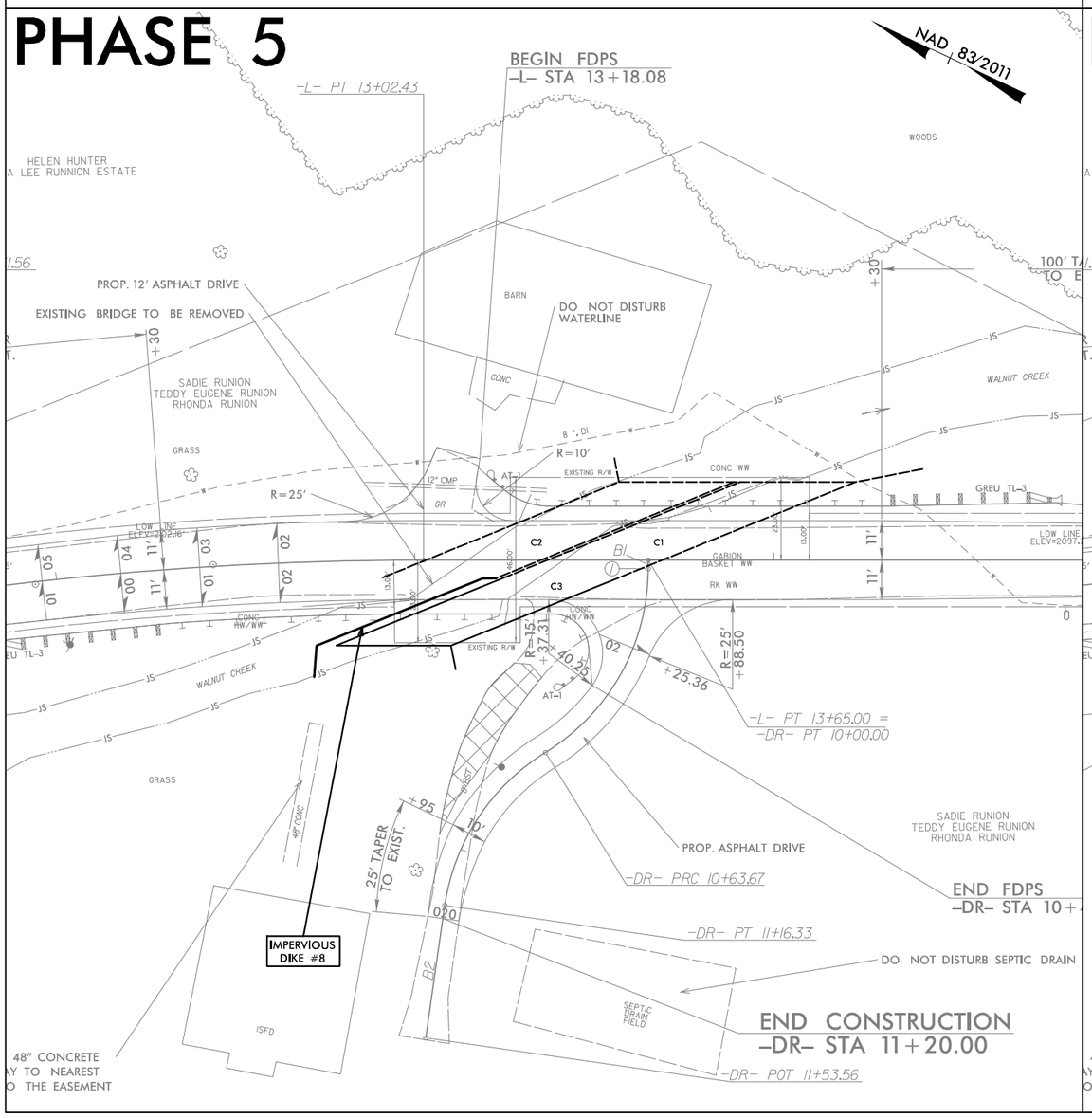


CULVERT CONSTRUCTION SEQUENCE STA. 13+36 –L–

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	EC-05B/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

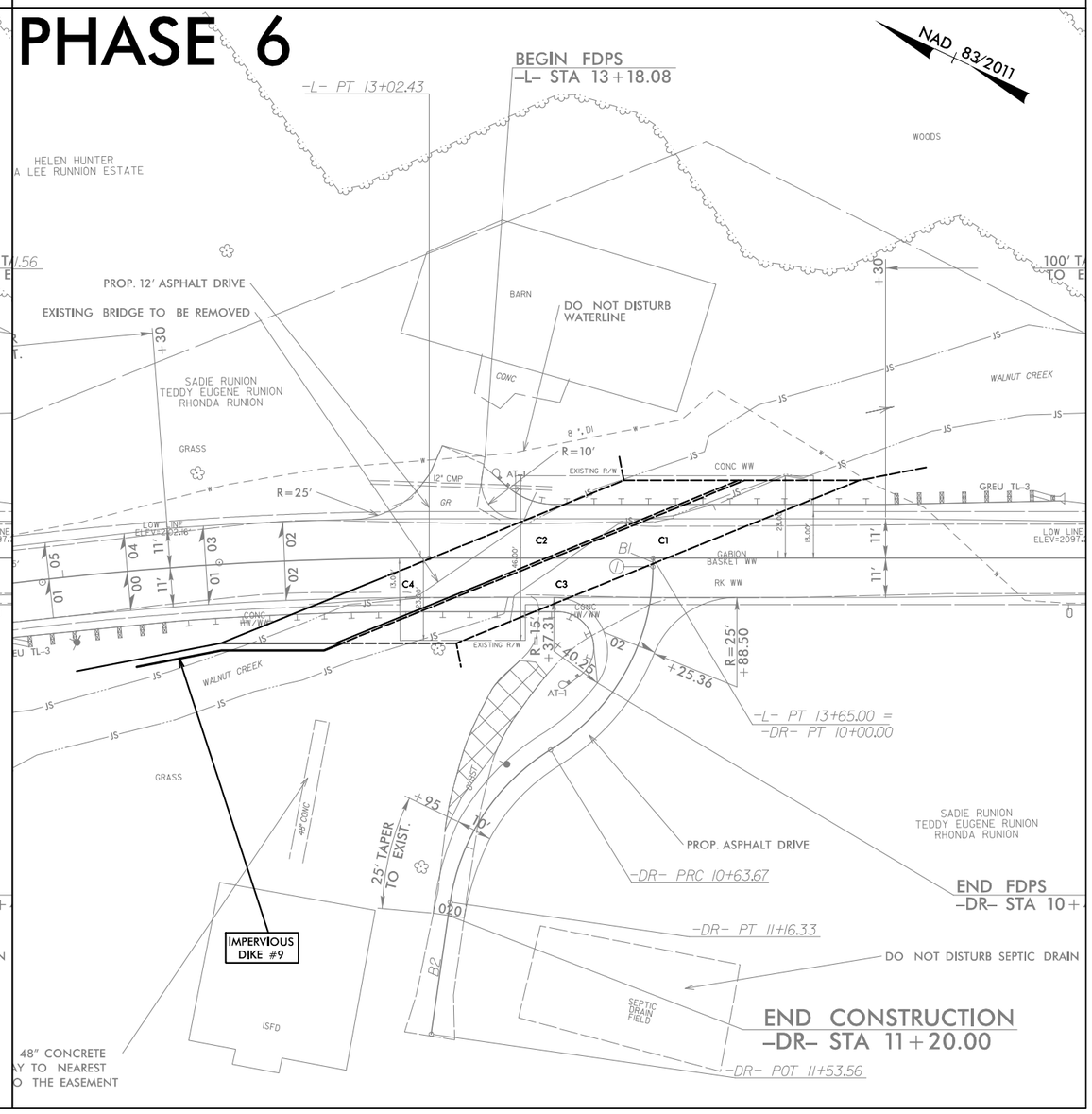
1. REMOVE IMPERVIOUS DIKES #6 & #7 AND STOP PUMP AROUND.
2. INSTALL IMPERVIOUS DIKE #8, DIRECTING FLOW THRU C2.
3. INSTALL UPSTREAM PORTION OF SOUTHERNMOST BOX CULVERT (C3).

PHASE 5



1. REMOVE IMPERVIOUS DIKE #8.
2. INSTALL IMPERVIOUS DIKE #9, DIRECTING FLOW THRU C3.
3. INSTALL UPSTREAM PORTION OF NORTHERNMOST BOX CULVERT (C4).

PHASE 6

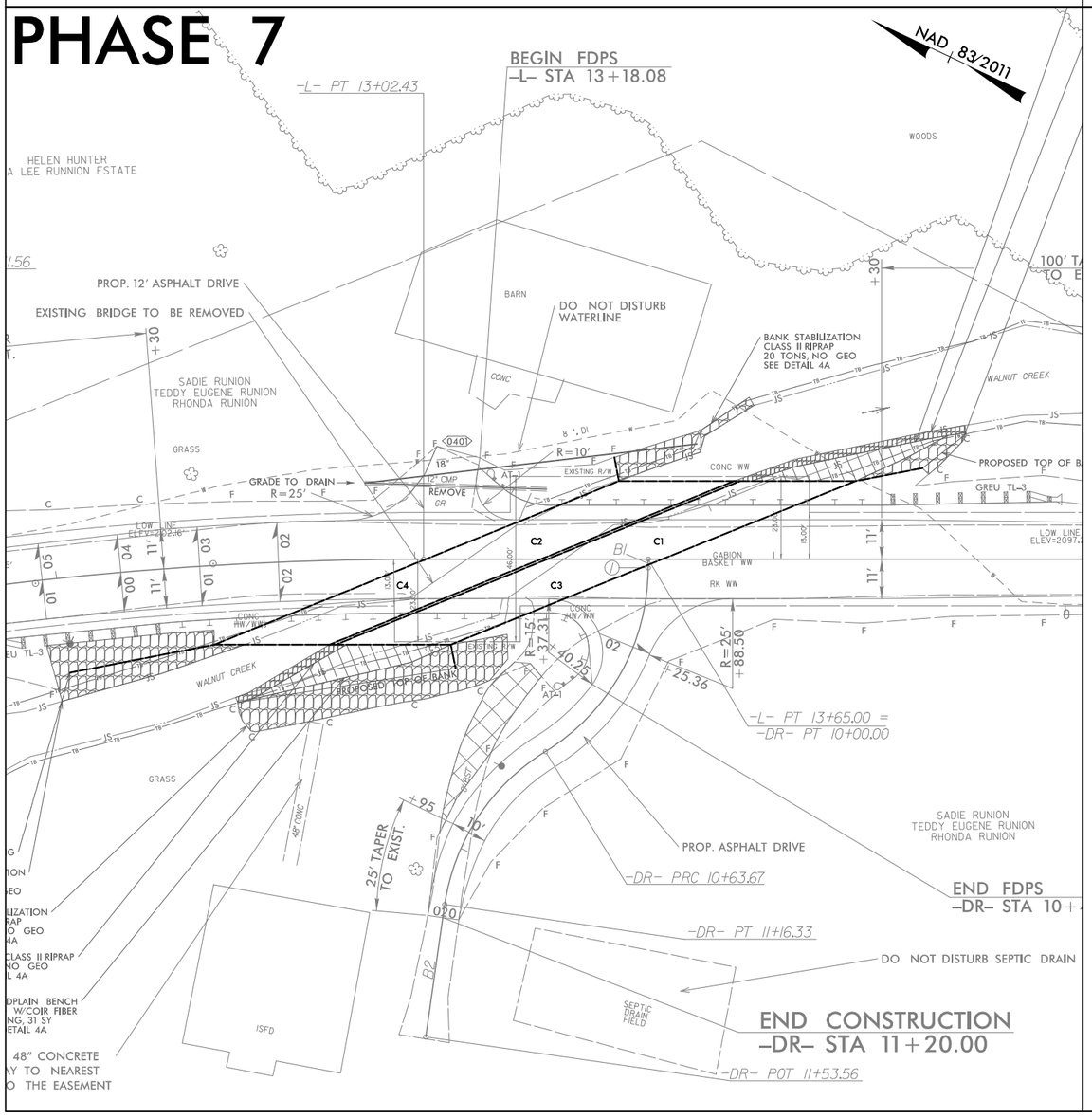


CULVERT CONSTRUCTION SEQUENCE STA. 13+36 –L–

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	EC-05C/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

1. REMOVE IMPERVIOUS DIKE #9.
2. SHIFT TRAFFIC AND CONSTRUCT WESTERN LANE OF –L– AS DESCRIBED ON TMP–6.
3. COMPLETE ANY NECESSARY INLET/OUTLET CHANNEL IMPROVEMENTS AND REESTABLISH STREAM ACCORDING TO CONST. PLANS.
4. REMOVE ANY REMAINING SPECIAL STILLING BASIN(S) AND COMPLETE ROADWAY.

PHASE 7



DETOUR

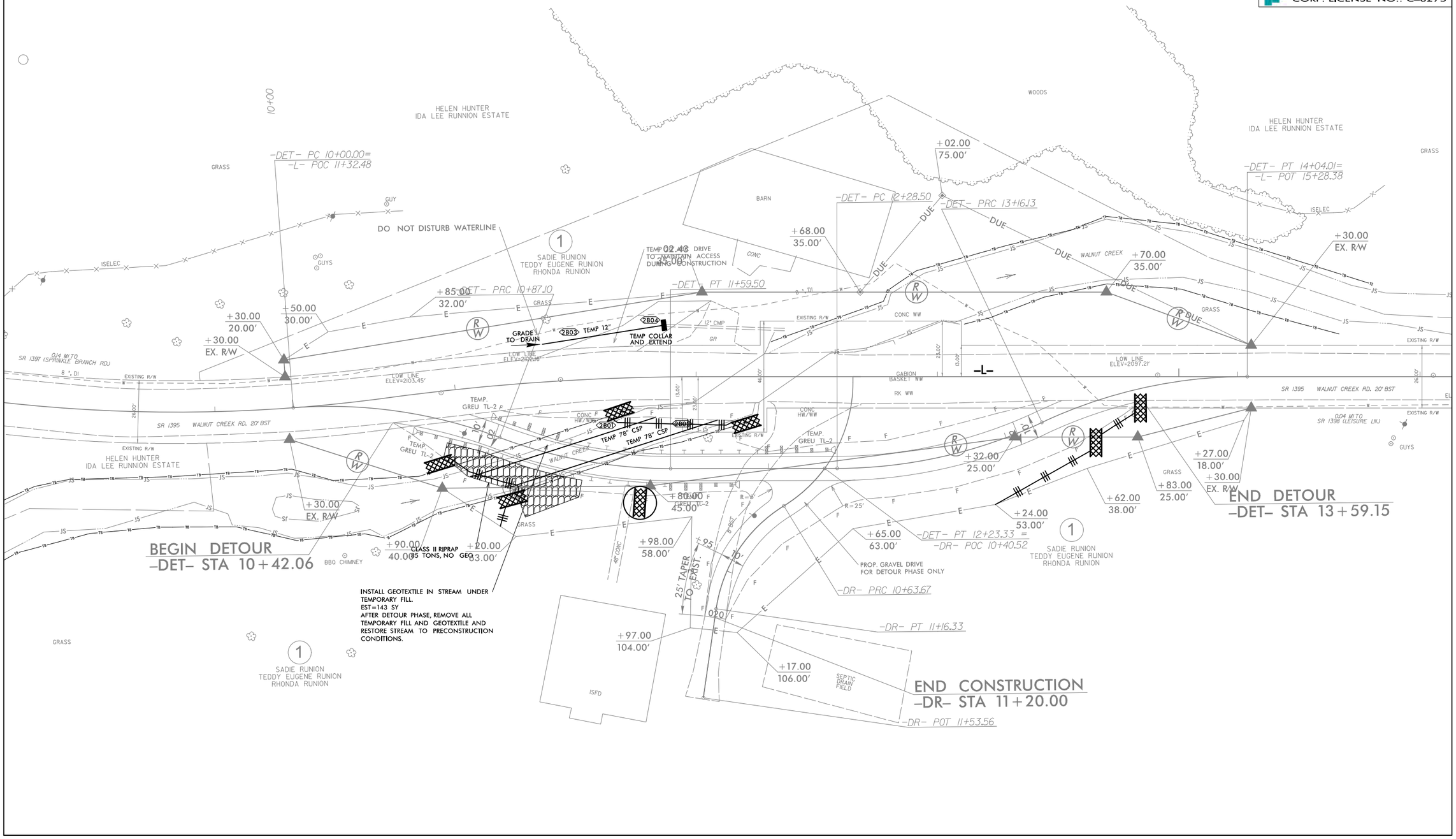
MAINTAIN EROSION CONTROL PERIMETER PROTECTION FROM EC-4/CONST.4 AS APPROPRIATE FOR FINAL DETOUR PHASE.

Madison County
Bridge #560063

NAD 83/2011

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	EC-6/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	EC-7/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Madison County Bridge #560063

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

-L- CURVE DATA

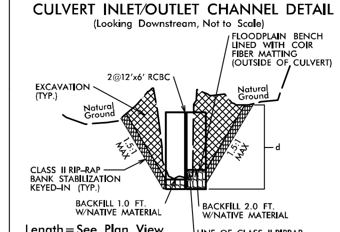
PI Sta 10+86.28	PI Sta 12+37.10
Δ = 15° 07' 21.9" (LT)	Δ = 7° 43' 48.7" (RT)
D = 8° 48' 53.0"	D = 5° 54' 24.4"
L = 171.56'	L = 130.87'
T = 86.28'	T = 65.53'
R = 650.00'	R = 970.00'
SE = EXIST.	SE = NC
	DS = 15 MPH

-DR- CURVE DATA

PI Sta 10+36.01	PI Sta 10+91.83
Δ = 58° 29' 21.4" (RT)	Δ = 50° 17' 37.0" (LT)
D = 95° 29' 34.7"	D = 95° 29' 34.7"
L = 61.25'	L = 52.67'
T = 33.59'	T = 28.17'
R = 60.00'	R = 60.00'
SE = -0.02	SE = 0.02
B1 = S 64° 43' 41.0" W	B2 = S 72° 55' 25.4" W
(1) = -DR- PC 10+02.42	

DETAIL 4A

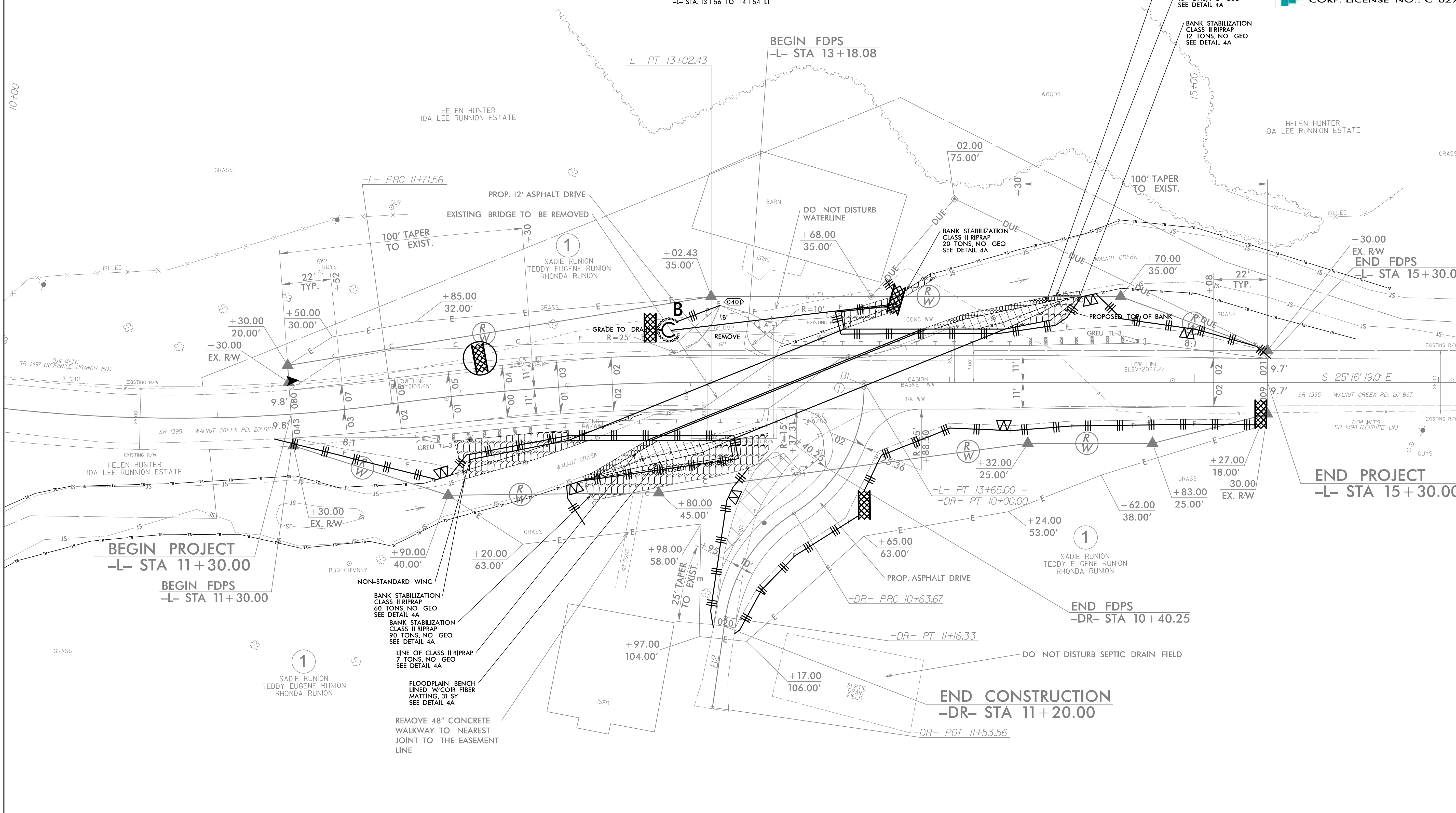
CULVERT INLET/OUTLET CHANNEL DETAIL
(Looking Downstream, Not to Scale)


FLOODPLAIN BENCH LINED WITH COIR FIBER MATTING (OUTSIDE OF CULVERT)
2@12'x6' RCBC
EXCAVATION (TYP.)
Natural Ground
CLASS II RIP-RAP BANK STABILIZATION KEYED-IN (TYP.)
BACKFILL 1.0 FT. W/NATIVE MATERIAL
BACKFILL 2.0 FT. W/NATIVE MATERIAL
LINE OF CLASS II RIPRAP (OUTSIDE OF CULVERT)

Length = See Plan View
Min. d = 4 Ft.

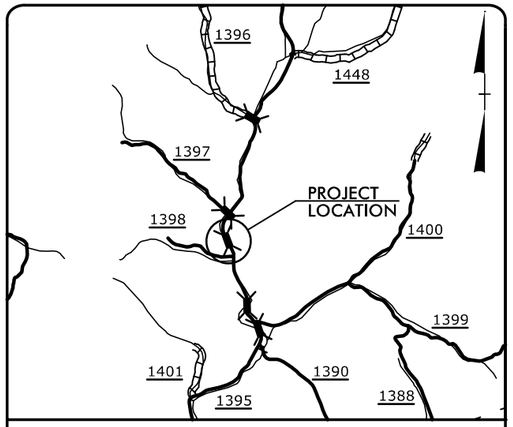
-L- STA. 11+95 TO 13+26 RT
-L- STA. 13+56 TO 14+54 LT

NAD 83/2011


FLOODPLAIN BENCH LINED W/COIR FIBER MATTING, 22 SY SEE DETAIL 4A
LINE OF CLASS II RIPRAP 13 TONS, NO GEO SEE DETAIL 4A
BANK STABILIZATION CLASS II RIPRAP 12 TONS, NO GEO SEE DETAIL 4A
BEGIN FDPS -L- STA 13+18.08
-L- PT 13+02.43
HELEN HUNTER IDA LEE RUNNION ESTATE
WOODS
GRASS
-L- PRC 11+71.56
PROP. 12' ASPHALT DRIVE
EXISTING BRIDGE TO BE REMOVED
DO NOT DISTURB WATERLINE
BANK STABILIZATION CLASS II RIPRAP 20 TONS, NO GEO SEE DETAIL 4A
100' TAPER TO EXIST.
SADIE RUNION TEDDY EUGENE RUNION RHONDA RUNION
GRADE TO DRAIN
REMOVE
PROPOSED TOP OF BANK
EX. R/W
END FDPS -L- STA 15+30.00
S 25° 16' 19.0" E
SR 1395 WALNUT CREEK RD. 20' BST
SR 1397 (SPRINKLE BRANCH RD)
SR 1398 (LEISURE LN)
END PROJECT -L- STA 15+30.00
BEGIN PROJECT -L- STA 11+30.00
BEGIN FDPS -L- STA 11+30.00
-L- PT 13+65.00 = -DR- PT 10+00.00
NON-STANDARD WING
BANK STABILIZATION CLASS II RIPRAP 60 TONS, NO GEO SEE DETAIL 4A
BANK STABILIZATION CLASS II RIPRAP 90 TONS, NO GEO SEE DETAIL 4A
LINE OF CLASS II RIPRAP 7 TONS, NO GEO SEE DETAIL 4A
FLOODPLAIN BENCH LINED W/COIR FIBER MATTING, 31 SY SEE DETAIL 4A
REMOVE 48" CONCRETE WALKWAY TO NEAREST JOINT TO THE EASEMENT LINE
PROP. ASPHALT DRIVE
-DR- PRC 10+63.67
END FDPS -DR- STA 10+40.25
-DR- PT 11+16.33
DO NOT DISTURB SEPTIC DRAIN FIELD
END CONSTRUCTION -DR- STA 11+20.00
-DR- POT 11+53.56
25' TAPER TO EXIST.
BBQ CHIMNEY

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

TIP PROJECT: BP13-R022



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

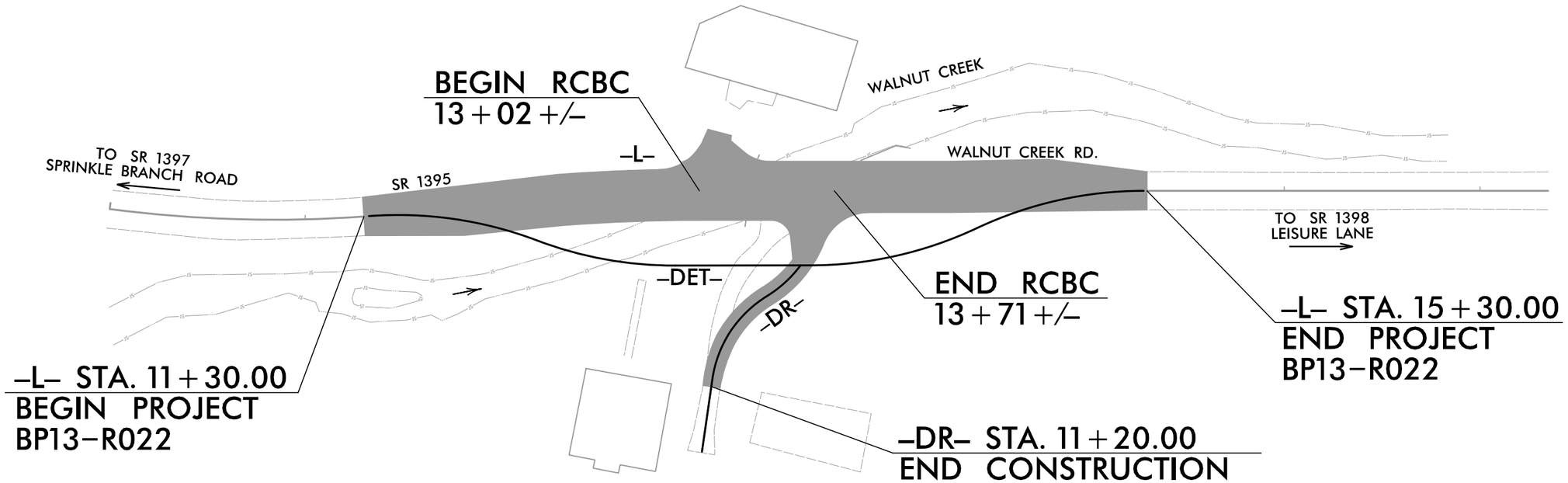
T.I.P. NO.	SHEET NO.
BP13-R022	UC-1

UTILITY CONSTRUCTION PLANS
MADISON COUNTY

LOCATION: BRIDGE #560063 OVER WALNUT CREEK ON SR 1395 (WALNUT CREEK RD)

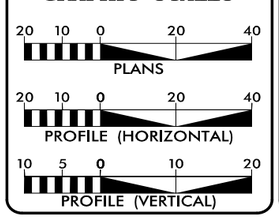
TYPE OF WORK: WATER LINE RELOCATION

4



DOCUMENT NOT CONSIDERED FINAL UNTIL ALL SIGNATURES ARE COMPLETED

GRAPHIC SCALES



INDEX OF SHEETS

WATER AND SEWER OWNERS ON PROJECT

(A) WATER TOWN OF MARSHALL

PREPARED IN THE OFFICE OF

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

CHAD HOUSER, PE, PLS *UTILITIES DESIGN ENGINEER*

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 130499 ENGINEER BOBBY C HOUSER

6/5/2024

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

R. KEITH RADCLIFF *SENIOR UTILITY COORDINATOR*
JOHN D. METCALF *DIVISION UTILITY COORDINATOR*

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	UC-2

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

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

PROPOSED SEWER SYMBOLS

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

PROPOSED MISCELLANOUS UTILITIES SYMBOLS

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

EXISTING UTILITIES SYMBOLS

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

*For Existing Utilities

- Utility Line Drawn from Record (Type as Shown) — W
- Designated Utility Line (Type as Shown) — W

REV: 2/1/2012

UTILITY CONSTRUCTION NOTES

PROJECT REFERENCE NO.	SHEET NO.
RP13-R022	UC-3
DESIGNED BY: BCH	
DRAWN BY: ADC	
CHECKED BY:	
APPROVED BY:	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

NORTH CAROLINA PROFESSIONAL SEAL 30493 ENGINEER Bobby Clyde Houser BOBBY C HOUSER 6/5/2024

UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2024.

2. THE EXISTING UTILITIES BELONG TO THE TOWN OF MARSHALL.

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

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

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

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

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

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

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

PROJECT SPECIFIC NOTES:

1. ALL PROPOSED WATER LINE 4 TO 16 INCHES IN DIAMETER, SHALL BE DUCTILE IRON PIPE - PRESSURE CLASS 350 AND UTILIZE FLEXIBLE PUSH-ON RESTRAINED JOINTS.

2. ALL PROPOSED STEEL ENCASEMENTS SHALL BE SMOOTH WALL WITH A MINIMUM THICKNESS OF 0.25 INCHES.

3. ALL WATER LINE FITTINGS 4 TO 16 INCHES IN DIAMETER, SHALL BE PRESSURE CLASS 350 DUCTILE IRON RESTRAINED JOINT IN ACCORDANCE WITH ANSI A21.10 / AWWA C110 AND ANSI A21.4 / AWWA C104.

4. WATER LINE UTILIZING RESTRAINED JOINTS SHALL BE TYTON JOINT, HP LOK, AMERICAN "FAST GRIP", US PIPE "FIELD-LOK" OR APPROVED EQUAL.

5. ALL WATERLINE SHALL HAVE COATED TRACER WIRE NO SMALLER THAN 12 AWG SOLID COPPER.

6. ALL VALVES - 2" THROUGH 16" SHALL BE RESILIENT WEDGE GATE, CAST IRON BODY, CONFORMING TO AWWA C509, LATEST VERSION. SEALING MECHANISM SHALL PROVIDE ZERO LEAKAGE AT THE WATER WORKING PRESSURE AGAINST THE LINE FLOW FROM EITHER DIRECTION AND BE DESIGNED SUCH THAT NO EXPOSED METAL SEAMS, EDGES, SCREWS, ETC. ARE WITHIN THE WATERWAY IN THE CLOSED POSITION. THE GATE SHALL NOT BE WEDGED INTO A POCKET NOR SLIDE ACROSS THE SEATING SURFACE TO OBTAIN TIGHT CLOSURE. ALL INTERNAL AND EXTERNAL FERROUS SURFACES OF THE VALVE, INCUDING THE INTERIOR OF THE GATE, SHALL BE COATED WITH A PROTECTIVE COATING CONFORMING TO AWWA C550, LATEST VERSION. COATING SHALL BE APPLIED TO CASTINGS PRIOR TO ASSEMBLY TO ASSURE ALL EXPOSED AREAS WILL BE COVERED. VALVES SHALL BE RATED AT 200 PSI WORKING PRESSURE. UNLESS OTHERWISE NOTED, UNDERGROUND VALVES SHALL HAVE AN OPERATING NUT AND EXPOSED VALVES SHALL HAVE A HAND WHEEL OPERATOR. OPERATING NUT SHALL BE 2"X2", OPEN LEFT.

7. EACH VALVE BURIED IN THE GROUND SHALL BE PROVIDED WITH AN APPROVED TYPE OF VALVE BOX AND COVER. THE BOXES SHALL BE ADJUSTABLE SCREW TYPE 24-INCH OR 36-INCH.

8. ALL VALVE BOXES SHALL BE CONSTRUCTED OF CAST IRON THAT COMPLIES WITH THE REQUIREMENTS OF ASTM A48. VALVE BOXES SHALL BE THE APPROPRIATE RANGE OF ADJUSTMENT FOR THE SITE AND CONTRACTOR SHOULD MINIMIZE THE USE OF EXTENSIONS.

9. PROVIDE THRUST RESTRAINT ON THE EXISTING WATER LINE WHERE TIE-INS ARE MADE AS NECESSARY.

10. CONTRACTOR SHALL NOT OPERATE ANY VALVES ON THE EXISTING UTILITY SYSTEMS. CONTRACTOR SHALL CONTACT THE UTILITY OWNER TO CONDUCT STRATEGIC OPERATION OF VALVES FOR SERVICE INTERRUPTION IN ORDER TO PERFORM SPECIFIC WORK.

11. ANY BENDS OF PVC WATER PIPE NOT SPECIFICALLY CALLED OUT WITH A 90, 45, 22.5, OR 11.25 DEGREE BEND FITTING, SHALL BE CONSTRUCTED BY A RADIAL BEND OF THE PIPE AS NOTED ON THE PLANS OR IN ACCORDANCE WITH PIPE MANUFACTURER'S SPECIFICATIONS (WHICHEVER IS MORE STRINGENT) - OR A COMBINATION OF BEND FITTINGS AND A RADIAL BEND OF THE PIPE. DEFLECTION OF THE PIPE JOINTS ON PVC PIPE MATERIAL IS NOT AN ACCEPTABLE METHOD OF PIPE BENDING.

12. ALL MATERIALS, EQUIPMENT, LABOR, AND WORKSMANSHIP SHALL BE IN ACCORDANCE WITH NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

13. UTILITY OWNER MUST BE PRESENT FOR ANY TESTING OR CONNECTIONS TO THE EXISTING SYSTEM INCLUDING BUT NOT LIMITED TO ALL TAPS AND TEMPORARY CONSTRUCTION CONNECTIONS. A NOTICE OF 72 HOURS MUST BE PROVIDED.

PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	UC-3A

DESIGNED BY: BCH
DRAWN BY: KSA
CHECKED BY:
APPROVED BY:
REVISED:

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

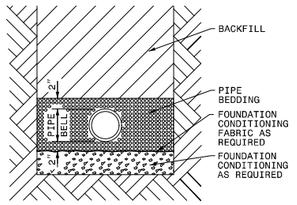
NORTH CAROLINA PROFESSIONAL SEAL 30499 ENGINEER BOBBY C HOUSER
8/5/2024

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

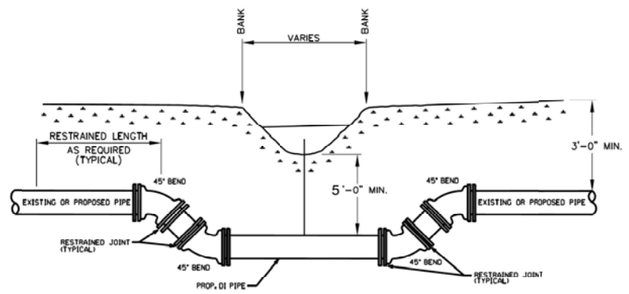
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TRENCH DETAIL



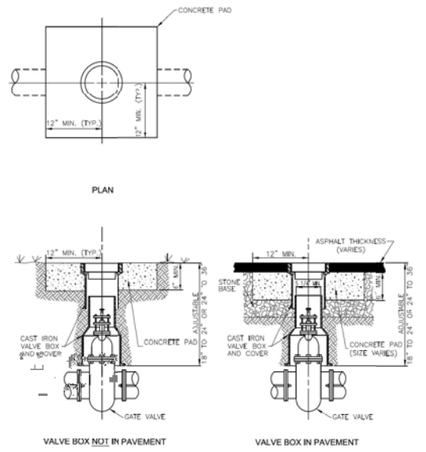
PLACE FOUNDATION CONDITIONING MATERIAL BELOW BEDDING IF REQUIRED, AS DIRECTED BY ENGINEER. PIPE BEDDED IN SELECT MATERIAL, CLASS II (TYPE 1) OR CLASS III. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROXIMATELY 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

CREEK CROSSING DETAIL

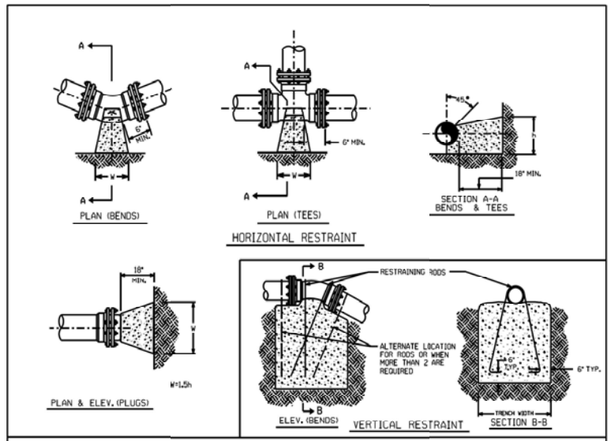


CROSS SECTION

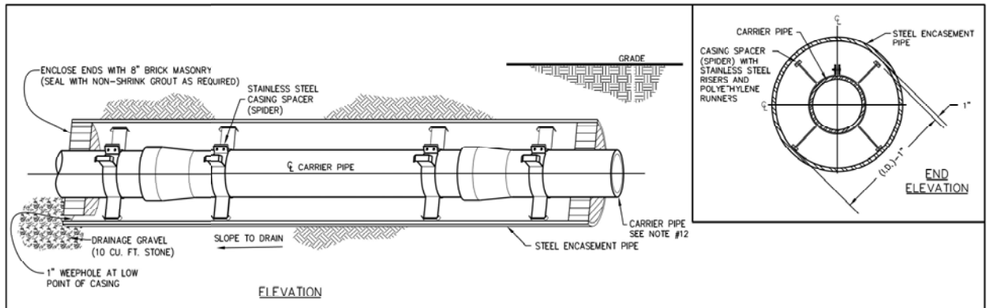
WATER VALVE BOX INSTALLATION FOR 4", 6", 8", AND 12" GATE VALVES



THRUST RESTRAINT FOR PIPE LINES



STEEL ENCASEMENT PIPE UNDER ROADS



ELEVATION

NOTES:

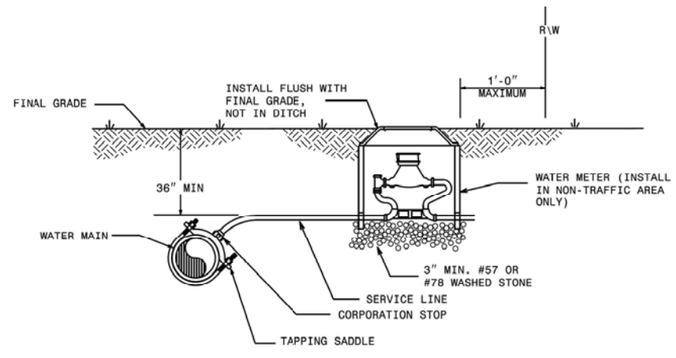
1. CASING SPACERS "SPIDERS" SHALL BE USED FOR SUPPORT OF THE CARRIER PIPE WITHIN THE STEEL ENCASEMENT PIPE. SPIDERS SHALL BE CENTERED AND RESTRAINED. SPIDERS SHALL HAVE A STAINLESS STEEL SHEE AND STAINLESS STEEL RISERS WITH POLYETHYLENE RUNNERS. MANUFACTURED BY CASCADE WATERWORKS MFG. COMPANY, OR APPROVED EQUAL.
2. A MINIMUM SPACING OF 2 SPIDERS PER JOINT OF CARRIER PIPE SHALL BE REQUIRED IN ORDER TO PREVENT SAGGING OF CARRIER PIPE. REFER TO THE MANUFACTURER'S RECOMMENDATIONS FOR SPACING AND SIZE OF SPACERS BASED ON THE SIZE AND TYPE OF THE CARRIER PIPE.
3. THE SPIDERS SHALL BE SPACED EVENLY ALONG THE CARRIER PIPE SUCH THAT EACH SPIDER SUPPORTS THE SAME UNIT WEIGHT OF THE CARRIER MAIN.
4. REFER TO PLAN SHEETS AND PROFILE SHEETS FOR LENGTH AND DIAMETER OF PROPOSED STEEL ENCASEMENT PIPES FOR EACH CROSSING.
5. STEEL ENCASEMENT PIPES SHALL EXTEND AS A MINIMUM: TO 3 FEET BEHIND BACK OF CURB LINES; TO 5 FEET BEYOND THE TOE OF SLOPE IN FILL SECTIONS, AND; FROM DITCH LINE TO DITCH LINE IN CUT SECTIONS.
6. THE TOP OF ENCASEMENT PIPE SHALL PROVIDE THE FOLLOWING MINIMUM BURY DEPTHS: 3 FEET BELOW THE TRAVEL SURFACE OF ROADWAYS, AND; 2 FEET BELOW PAVED OR UNPAVED DITCH ELEVATIONS; UNLESS OTHERWISE NOTED ON THE PLANS.
7. THE INSIDE DIAMETER OF THE ENCASEMENT PIPE SHALL BE AT LEAST 2 INCHES GREATER THAN THE LARGEST OUTSIDE DIAMETER OF THE CARRIER PIPE JOINTS OR COUPLINGS FOR CARRIER PIPE LESS THAN 6 INCHES IN DIAMETER; AND AT LEAST 4 INCHES GREATER FOR CARRIER PIPE 6 INCHES AND LARGER IN DIAMETER.
8. ALL JOINTS BETWEEN THE SECTIONS OF ENCASEMENT PIPE SHALL BE FULLY WELDED AROUND THE COMPLETE CIRCUMFERENCE OF THE PIPE.
9. FOR EXISTING UTILITY PIPE INSTALLATIONS, THE STEEL ENCASEMENT PIPE SHALL BE A SPLIT STEEL ENCASEMENT PIPE MADE UP OF TWO (2) SEMI-CIRCULAR SECTIONS JOINED BY A CONTINUOUS WELD FROM ONE END TO THE OTHER WITHOUT ANY TRACEABLE VOIDS. JOINTS BETWEEN HORIZONTAL SECTIONS OF ENCASEMENT PIPE SHALL BE FULLY WELDED AROUND THE COMPLETE CIRCUMFERENCE OF THE PIPE.
10. STEEL ENCASEMENT PIPES SHALL BE EITHER SMOOTH WALL OR SPIRAL WELDED AND HAVE A SPECIFIED MINIMUM YIELD STRENGTH OF AT LEAST 35,000 PSI.
11. UNCOATED AND UNPROTECTED STEEL ENCASEMENT PIPE SHALL HAVE A MINIMUM WALL THICKNESS AS NOTED BELOW FOR THE FOLLOWING OUTSIDE DIAMETER OF PIPES:

0.100 INCHES FOR 12" AND SMALLER	0.312 INCHES FOR 20"
0.250 INCHES FOR 14"	0.312 INCHES FOR 28"
0.250 INCHES FOR 16"	0.312 INCHES FOR 30"
0.250 INCHES FOR 18"	0.375 INCHES FOR 36"
0.250 INCHES FOR 20"	0.500 INCHES FOR 42"
0.250 INCHES FOR 24"	0.500 INCHES FOR 48"

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.
1-12

ENGLISH STANDARD DRAWING FOR
WATER METER

SHEET 1 OF 1
1515.01



NOTES:

1. THIS DETAIL SHOWS THE TYPICAL FINAL WATER METER CONFIGURATION AFTER INSTALLATION OF A PROPOSED WATER METER, RECONNECTION OF AN EXISTING WATER METER, OR RELOCATION OF A WATER METER.

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.
1-12

ENGLISH STANDARD DRAWING FOR
WATER METER

SHEET 1 OF 1
1515.01

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	UC-4

DESIGNED BY: BCH
DRAWN BY:
CHECKED BY:
APPROVED BY:
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

UTILITIES ENGINEERING SEC.
PHONE: (919)707-6690
FAX: (919)250-4151

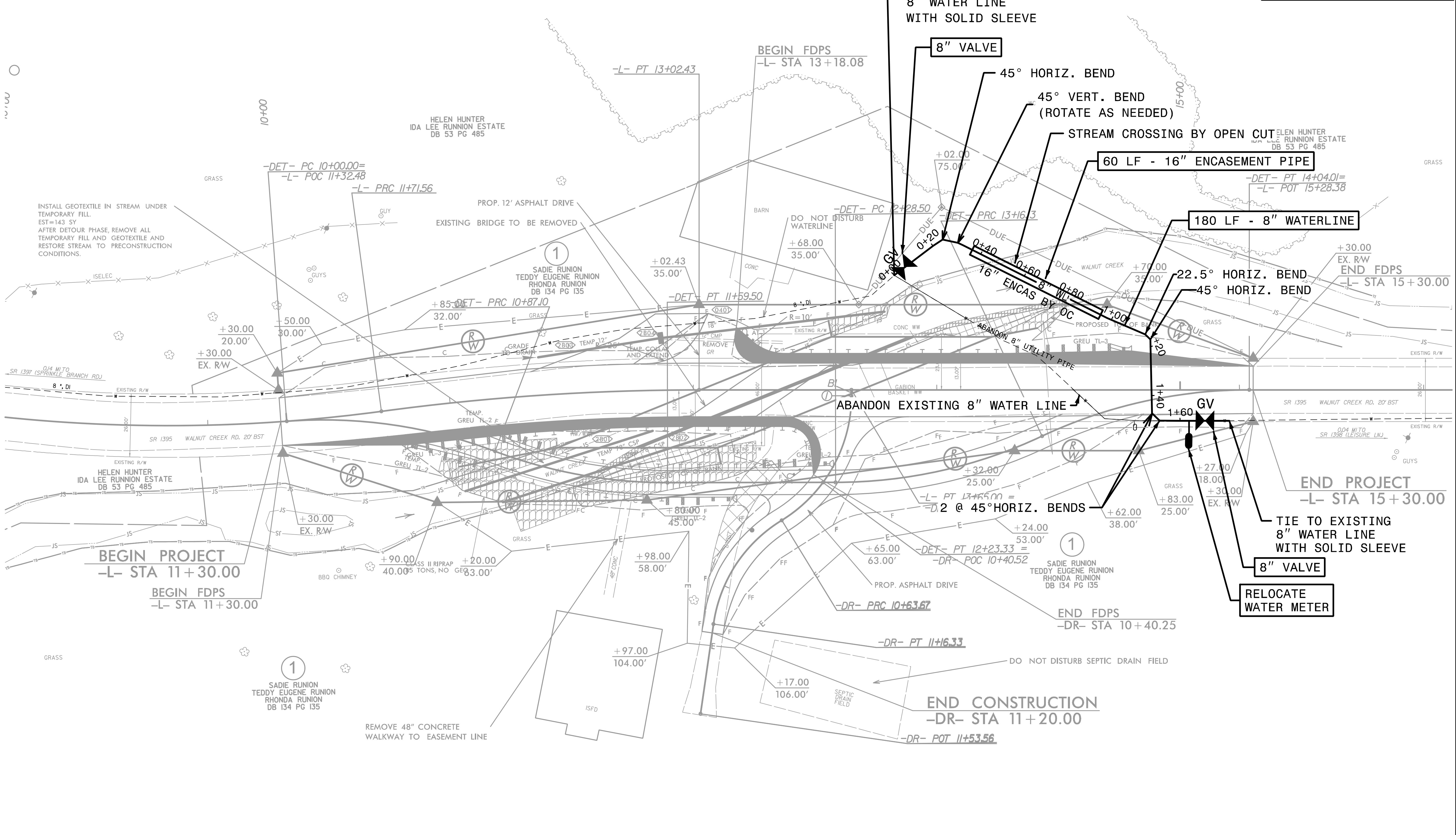
6/5/2024

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

The estimated quantity of Ductile Iron Water Pipe Fittings on this plan sheet is 1,710 pounds. The actual quantity and type of fittings will vary based on field conditions.



NC GRID NAD 83 NA 2011
TIE TO EXISTING 8" WATER LINE WITH SOLID SLEEVE
8" VALVE
45° HORIZ. BEND
45° VERT. BEND (ROTATE AS NEEDED)
STREAM CROSSING BY OPEN CUT
60 LF - 16" ENCASEMENT PIPE
180 LF - 8" WATERLINE
22.5° HORIZ. BEND
45° HORIZ. BEND
16" ENCAS BY OC
ABANDON 8" UTILITY PIPE
ABANDON EXISTING 8" WATER LINE
GV
2 @ 45° HORIZ. BENDS
TIE TO EXISTING 8" WATER LINE WITH SOLID SLEEVE
8" VALVE
RELOCATE WATER METER
BEGIN FDPS -L- STA 13+18.08
-L- PT 13+02.43
HELEN HUNTER IDA LEE RUNNION ESTATE DB 53 PG 485
-DET- PC 10+00.00= -L- POC 11+32.48
-L- PRC 11+71.56
INSTALL GEOTEXTILE IN STREAM UNDER TEMPORARY FILL. EST=143 SY AFTER DETOUR PHASE, REMOVE ALL TEMPORARY FILL AND GEOTEXTILE AND RESTORE STREAM TO PRECONSTRUCTION CONDITIONS.
PROP. 12' ASPHALT DRIVE
EXISTING BRIDGE TO BE REMOVED
SADIE RUNION TEDDY EUGENE RUNION RHONDA RUNION DB 134 PG 135
DO NOT DISTURB WATERLINE
-DET- PC 12+28.50
-DET- PRC 13+16.13
-DET- PT 14+04.01= -L- POT 15+28.38
END FDPS -L- STA 15+30.00
-DET- PRC 10+87.10
-DET- PT 11+59.50
SR 1395 WALNUT CREEK RD. 20' BST
SR 1397 (SPRINKLE BRANCH RD)
SR 1398 (LEISURE LN)
END PROJECT -L- STA 15+30.00
BEGIN PROJECT -L- STA 11+30.00
BEGIN FDPS -L- STA 11+30.00
-L- PT 13+65.00 = -DR- PC
-DET- PT 12+23.33 = -DR- POC 10+40.52
PROP. ASPHALT DRIVE
-DR- PRC 10+63.67
END FDPS -DR- STA 10+40.25
-DR- PT 11+16.33
DO NOT DISTURB SEPTIC DRAIN FIELD
END CONSTRUCTION -DR- STA 11+20.00
-DR- POT 11+53.56
REMOVE 48" CONCRETE WALKWAY TO EASEMENT LINE

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	UC-5

DESIGNED BY: BCH
DRAWN BY: ADC
CHECKED BY:
APPROVED BY:
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

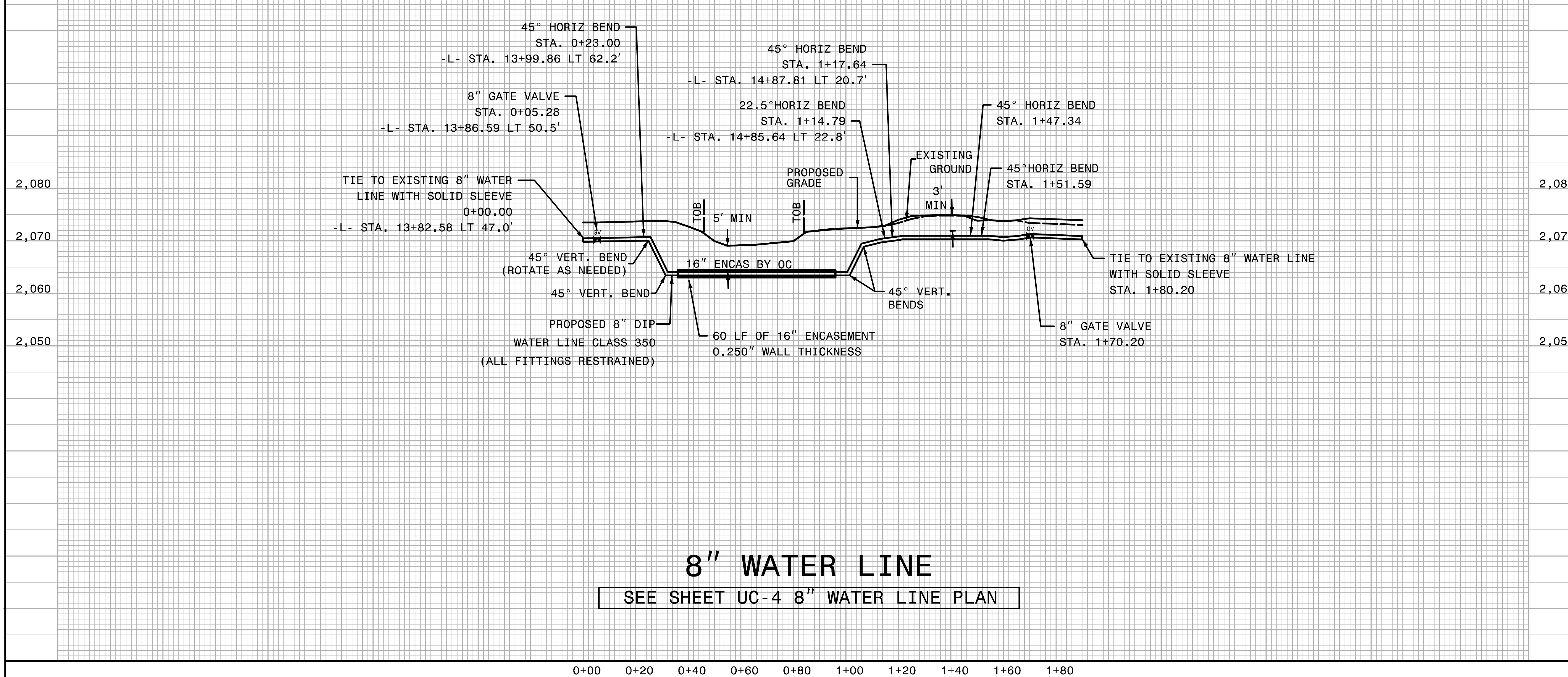
NORTH CAROLINA PROFESSIONAL SEAL ENGINEER BOBBY C HOUSER
6/5/2024

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

20 10 0 20 40
PROFILE (HORIZONTAL)
10 5 0 10 20
PROFILE (VERTICAL)

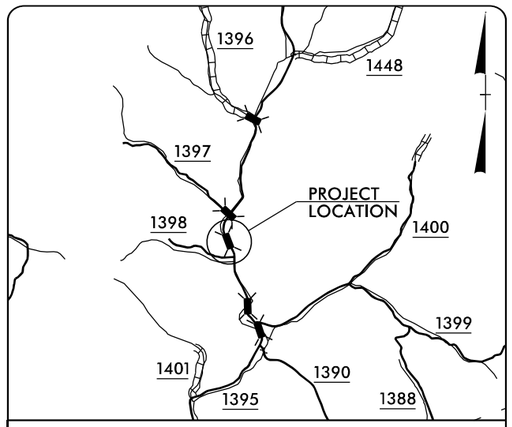


8″ WATER LINE

SEE SHEET UC-4 8″ WATER LINE PLAN

09/08/99

PROJECT: BP13–R022



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
MADISON COUNTY

T.I.P. NO.	SHEET NO.
BP13–R022	UO–1

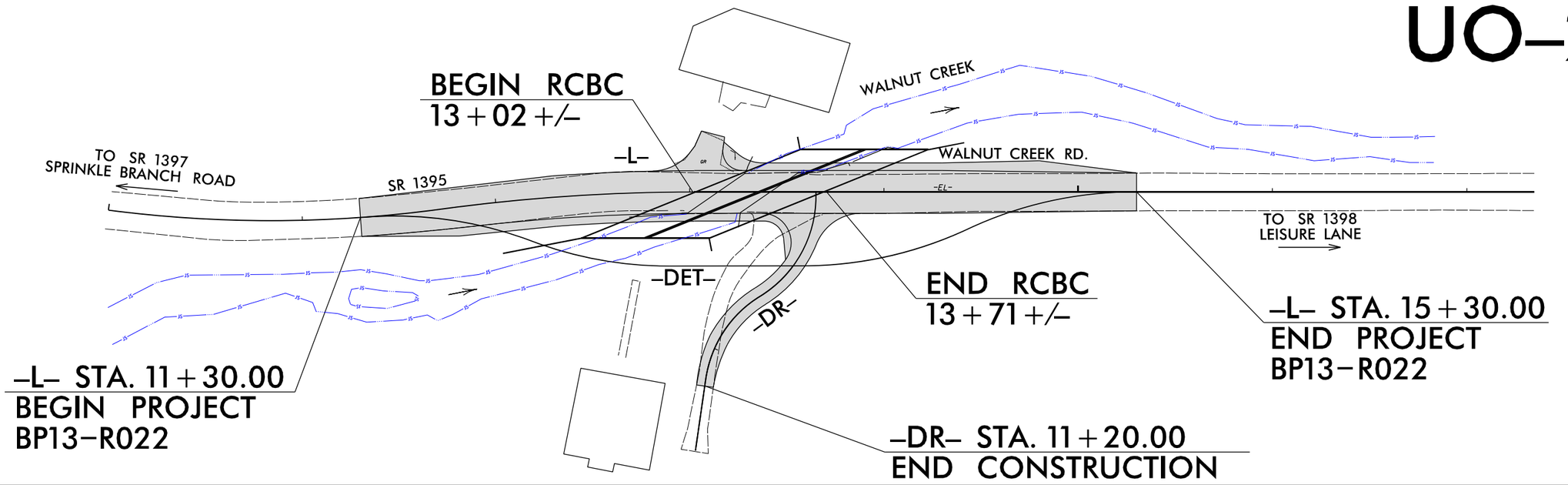
NOTE:
ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.

NAD 83/2011

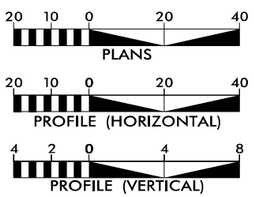
LOCATION: BRIDGE #560063 OVER WALNUT CREEK ON SR 1395 (WALNUT CREEK RD)

TYPE OF WORK: POWER

UO–2



GRAPHIC SCALES



INDEX OF SHEETS

SHEET NO.:	*DESCRIPTION:*
UO–1	*TITLE SHEET*
UO–2	*UBO PLAN SHEET*

UTILITY OWNERS WITH CONFLICTS

(A) POWER – FRENCH BROAD EMC

PREPARED IN THE OFFICE OF:

TELICS
1598 WESTBROOK PLAZA DR.
SUITE 202
WINSTON-SALEM, NC 27103
(336) 705-8844

CORY WOOD	*UTILITY PROJECT MANAGER*
CORY WOOD	*PROJECT UTILITY COORDINATOR*

DIVISION OF HIGHWAYS
DIVISION 13
55 ORANGE ST.
ASHEVILLE, NC 28801

KEITH RADCLIFF	*DIVISION UTILITY ENGINEER*
JOHN METCALF	*DIVISION UTILITY COORDINATOR*

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	U0-2

THIS SHEET CORRESPONDS TO RDY-4

UTILITIES BY OTHERS

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

-L- CURVE DATA

PI Sta 10+86.28	PI Sta 12+37.10
△ = 15° 07' 21.9" (LT)	△ = 7° 43' 48.7" (RT)
D = 8° 48' 53.0"	D = 5° 54' 24.4"
L = 171.56'	L = 130.87'
T = 86.28'	T = 65.53'
R = 650.00'	R = 970.00'
SE = EXIST.	SE = NC
	DS = 15 MPH

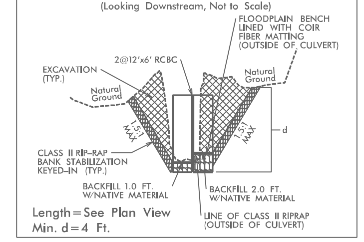
-DR- CURVE DATA

PI Sta 10+36.01	PI Sta 10+91.83
△ = 58° 29' 21.4" (RT)	△ = 50° 17' 37.0" (LT)
D = 95° 29' 34.7"	D = 95° 29' 34.7"
L = 61.25'	L = 52.67'
T = 33.59'	T = 28.17'
R = 60.00'	R = 60.00'
SE = -0.02	SE = 0.02
B1 = S 64° 43' 41.0" W	B2 = S 72° 55' 25.4" W
(1) = -DR- PC 10+02.42	

DETAIL 4A

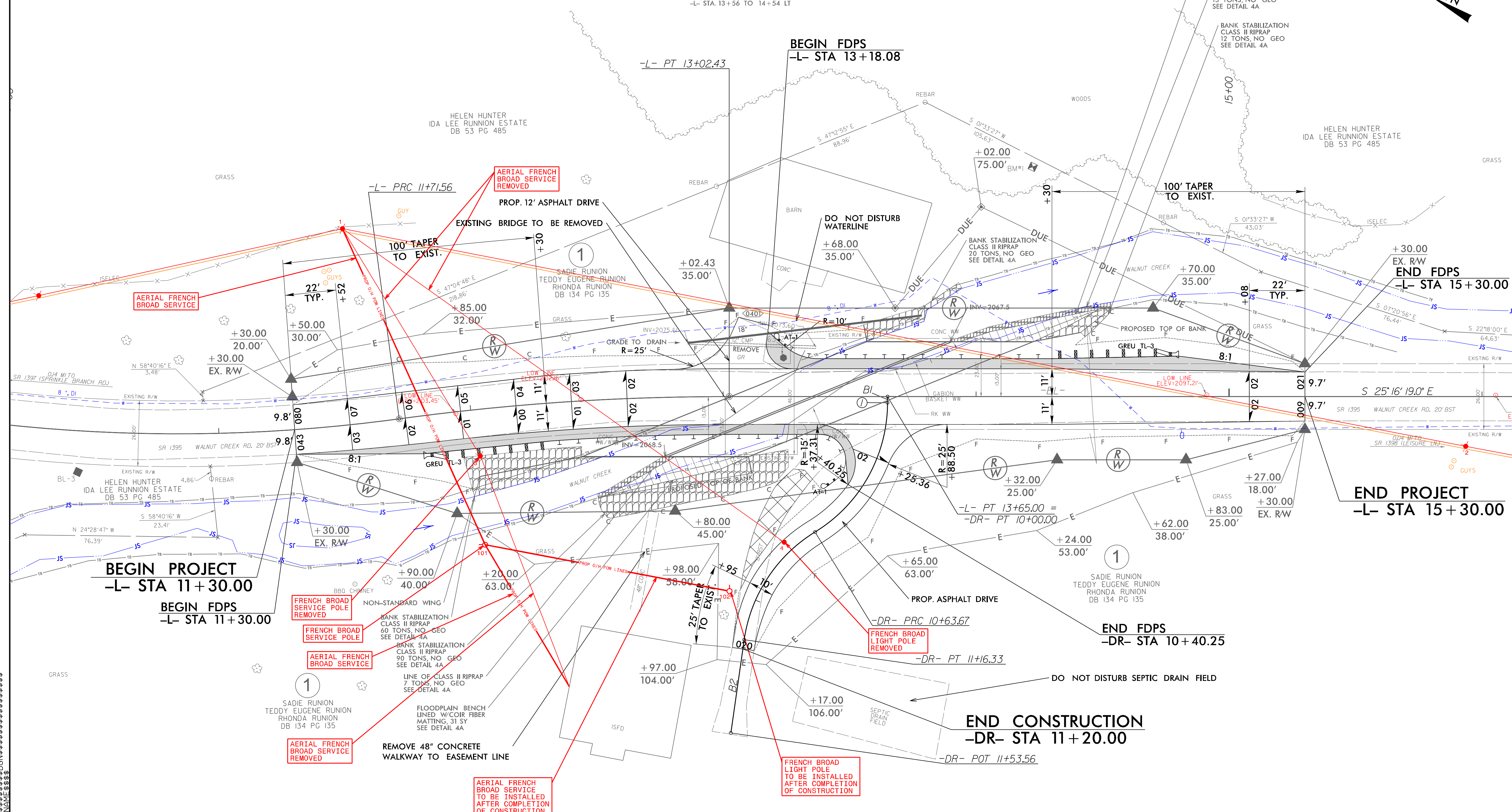
CULVERT INLET/OUTLET CHANNEL DETAIL

(Looking Downstream, Not to Scale)



FLOODPLAIN BENCH LINED WITH COIR FIBER MATTING (OUTSIDE OF CULVERT)
2@12'x6' RCBC
EXCAVATION (TYP.)
Natural Ground
CLASS II RIP-RAP BANK STABILIZATION KEYED-IN (TYP.)
BACKFILL 1.0 FT. W/NATIVE MATERIAL
BACKFILL 2.0 FT. W/NATIVE MATERIAL
Length = See Plan View
Min. d = 4 Ft.
LINE OF CLASS II RIPRAP (OUTSIDE OF CULVERT)

-L- STA. 11+95 TO 13+26 RT
-L- STA. 13+56 TO 14+54 LT



NAD 83/2011
BEGIN PROJECT
-L- STA 11+30.00
BEGIN FDPS
-L- STA 11+30.00
END PROJECT
-L- STA 15+30.00
END FDPS
-L- STA 15+30.00
BEGIN FDPS
-L- STA 13+18.08
END FDPS
-DR- STA 10+40.25
END CONSTRUCTION
-DR- STA 11+20.00
-L- PT 13+02.43
-L- PRC 11+71.56
-L- PT 13+65.00 =
-DR- PT 10+00.00
-DR- PRC 10+63.67
-DR- PT 11+16.33
-DR- POT 11+53.56
HELEN HUNTER
IDA LEE RUNNION ESTATE
DB 53 PG 485
SADIE RUNION
TEDDY EUGENE RUNION
RHONDA RUNION
DB 134 PG 135
AERIAL FRENCH BROAD SERVICE REMOVED
AERIAL FRENCH BROAD SERVICE
PROP. 12' ASPHALT DRIVE
EXISTING BRIDGE TO BE REMOVED
DO NOT DISTURB WATERLINE
100' TAPER TO EXIST.
22' TYP.
BANK STABILIZATION CLASS II RIPRAP 20 TONS, NO GEO SEE DETAIL 4A
FLOODPLAIN BENCH LINED W/COIR FIBER MATTING, 22 SY SEE DETAIL 4A
LINE OF CLASS II RIPRAP 13 TONS, NO GEO SEE DETAIL 4A
BANK STABILIZATION CLASS II RIPRAP 12 TONS, NO GEO SEE DETAIL 4A
PROPOSED TOP OF BANK
SR 1395 WALNUT CREEK RD. 20' BST
SR 1397 (SPRINKLE BRANCH RD.)
SR 1398 (LEISURE LN.)
S 25° 16' 19.0" E
FRENCH BROAD SERVICE POLE REMOVED
FRENCH BROAD SERVICE POLE
AERIAL FRENCH BROAD SERVICE
NON-STANDARD WING
BANK STABILIZATION CLASS II RIPRAP 60 TONS, NO GEO SEE DETAIL 4A
BANK STABILIZATION CLASS II RIPRAP 90 TONS, NO GEO SEE DETAIL 4A
LINE OF CLASS II RIPRAP 7 TONS, NO GEO SEE DETAIL 4A
FLOODPLAIN BENCH LINED W/COIR FIBER MATTING, 31 SY SEE DETAIL 4A
AERIAL FRENCH BROAD SERVICE REMOVED
REMOVE 48" CONCRETE WALKWAY TO EASEMENT LINE
AERIAL FRENCH BROAD SERVICE TO BE INSTALLED AFTER COMPLETION OF CONSTRUCTION
25' TAPER TO EXIST.
PROP. ASPHALT DRIVE
FRENCH BROAD LIGHT POLE REMOVED
DO NOT DISTURB SEPTIC DRAIN FIELD
FRENCH BROAD LIGHT POLE TO BE INSTALLED AFTER COMPLETION OF CONSTRUCTION
WALNUT CREEK

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

PROJECT REFERENCE NO.	SHEET NO.
BP13-R022	X-1
R/W SHEET NO.	

BP13-R022
CROSS-SECTION INDEX

REVISIONS

8/17/99

5/5/2025
X:\NCDOT\Division 13 Madison 2019\Madison 63\Roadway\XSC\Madison 63_Rdy_xpl_Index.dgn
User:smelvin

PROJ. REFERENCE NO.	SHEET NO.
BP13-R022	X-1A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

Station Det	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+42.06	0	0
10+50.00	0	0
10+75.00	1	17
11+00.00	0	84
11+25.00	0	148
11+50.00	0	134
11+75.00	0	60
12+00.00	3	7
12+25.00	3	4
12+50.00	0	12
12+75.00	0	26
13+00.00	0	32
13+25.00	0	19
13+50.00	1	6
13+59.15	0	0

Station DET REMOVAL along -L-	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
11+72.59	0	0
12+25.00	136	0
12+50.00	142	0
12+75.00	137	0
13+00.00	89	0
13+25.00	29	0
13+50.00	10	0
13+75.00	22	0
14+00.00	33	0
14+25.00	39	0
14+50.00	27	0
14+85.01	12	0

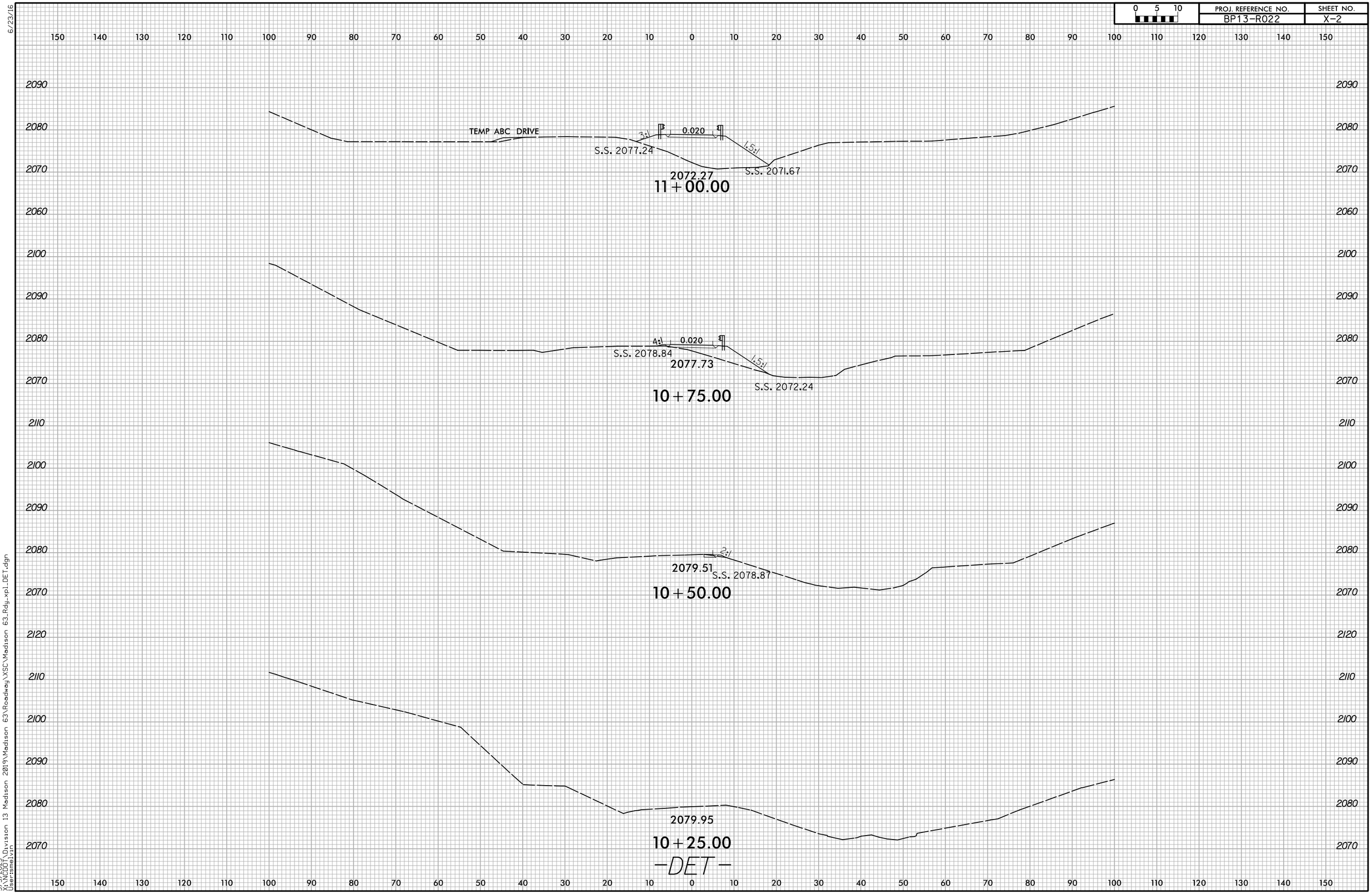
Approximate quantities only. Unclassified excavation, borrow excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the lump sum price for "Grading".

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
11+30.00	0	0
11+50.00	1	1
11+75.00	5	5
12+00.00	4	13
12+25.00	2	19
12+50.00	4	29
12+75.00	6	57
13+00.00	12	81
13+25.00	10	128
13+50.00	4	143
13+75.00	8	89
14+00.00	9	31
14+25.00	10	3
14+50.00	5	5
14+75.00	1	7
15+00.00	1	6
15+25.00	1	4
15+30.00	0	0

Station Dr	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+25.00	0	0
10+50.00	1	15

Station Dr	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+11.03	0	0
10+25.00	0	1
10+50.00	1	15

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	BP13-R022	X-2



6/23/16

5/5/2025
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User:smelvin

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	BP13-R022	X-3

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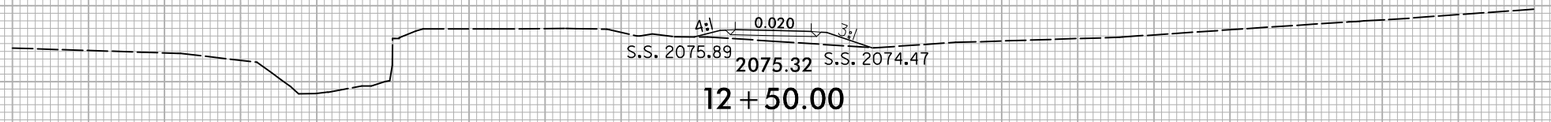
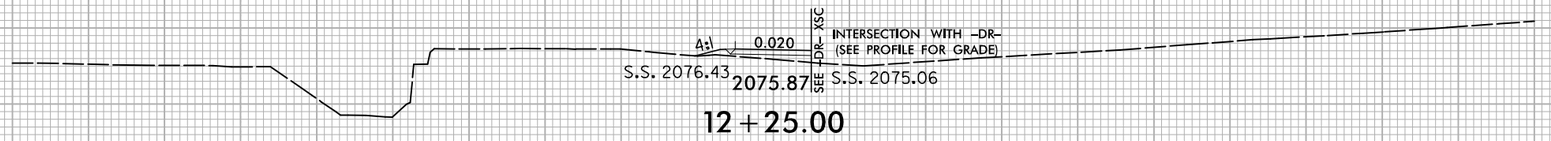
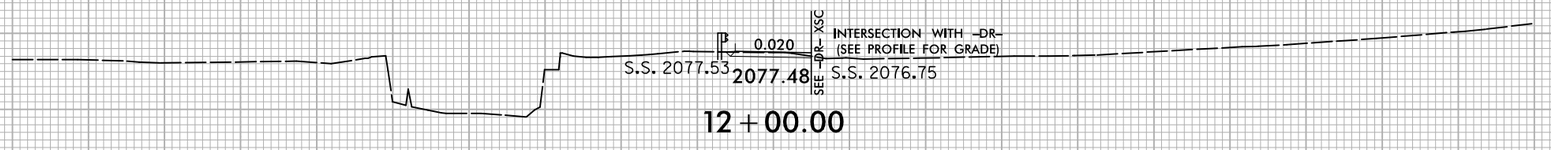
2080 2070 2090



12+50.00

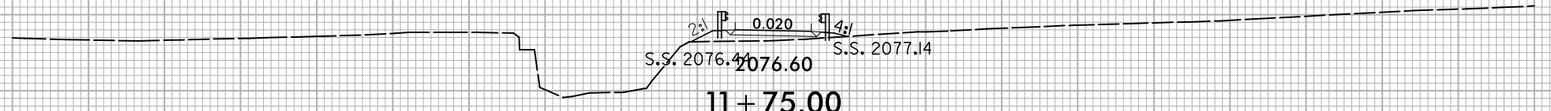


12+25.00



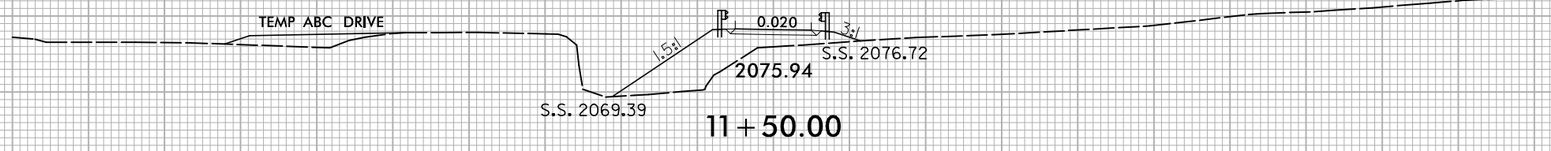
12+00.00

2090 2080 2070 2090



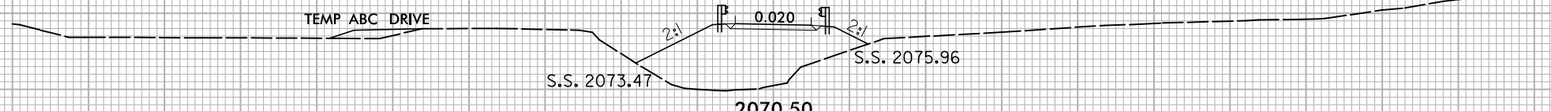
11+75.00

2090 2080 2070 2090



11+50.00

2090 2080 2070 2090



11+25.00

2060

-DET-

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

6/23/16

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
BP13-R022	X-4

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

2100
2090
2080
2070
2090

2074.59
13+75.00

2080
2070

3:1
2075.00 S.S. 2074.23
13+50.00

2080
2070

0.020
3:1
S.S. 2075.46
2074.65 S.S. 2072.75
13+25.00

2080
2070

4:1
0.020
3:1
S.S. 2074.97
S.S. 2073.19
2073.71
13+00.00

2060
2080
2070

4:1
0.020
3:1
S.S. 2075.16
2073.66 S.S. 2073.87
12+75.00

2060

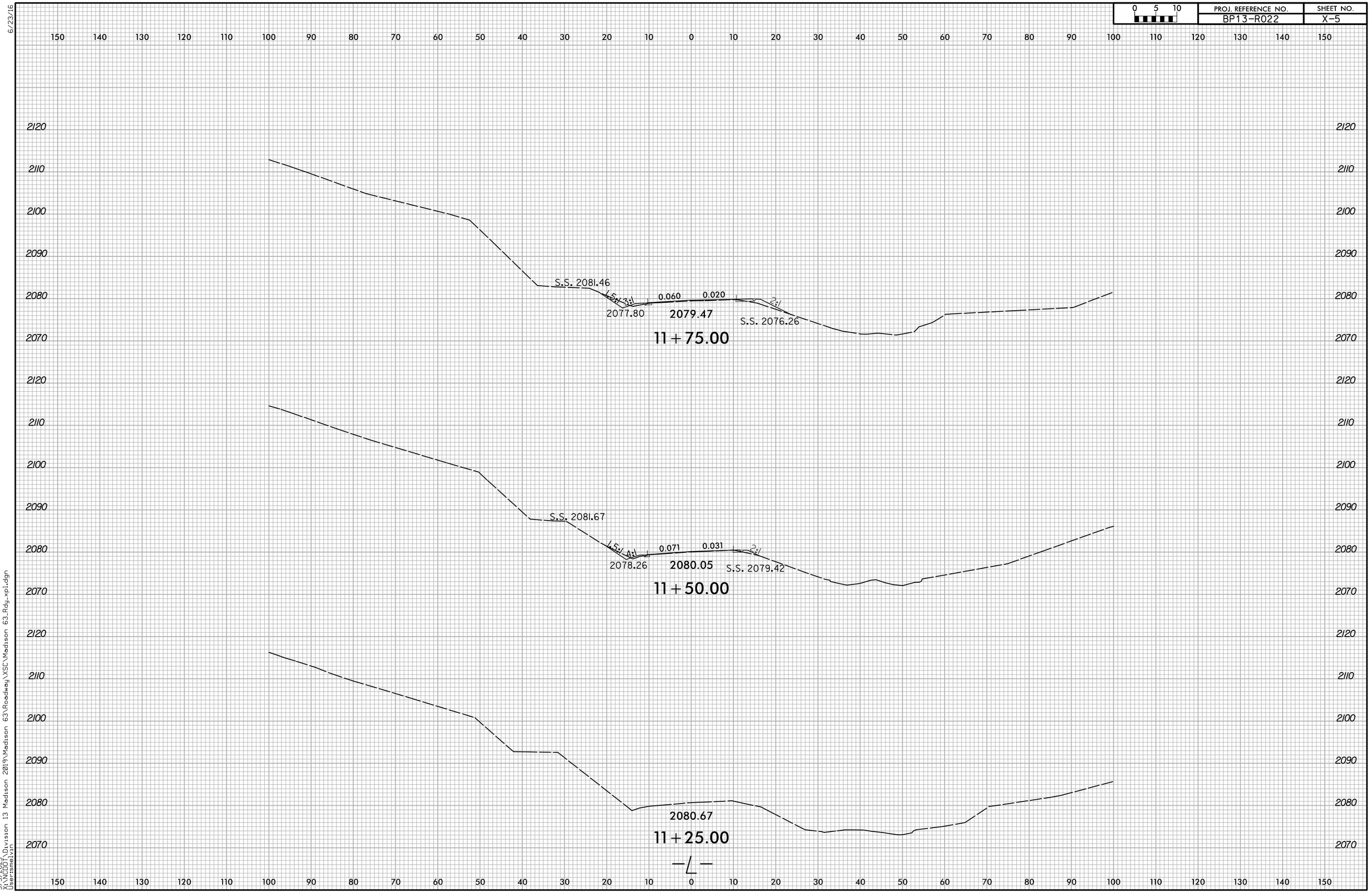
-DET-

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

5/5/2025
X:\VDOT\Division 13 Madison 2019\Madison 63\Roadway\XSC\Madison 63_Rdy_xpl_DET.dgn
User:smelvin

0 5 10

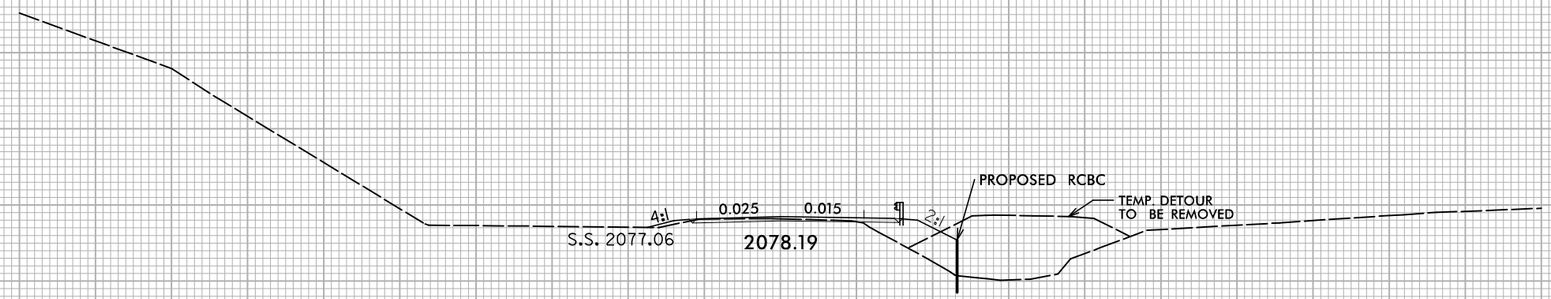
PROJ. REFERENCE NO.	SHEET NO.
BP13-R022	X-5



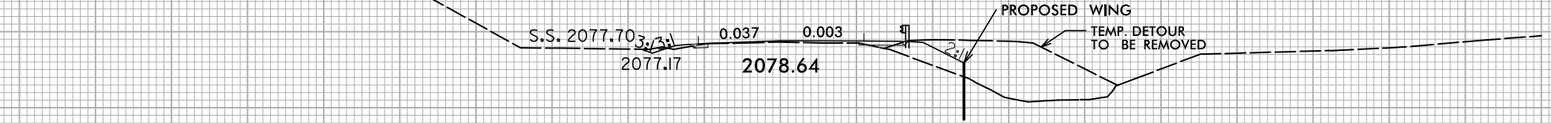
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	BP13-R022	X-6

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

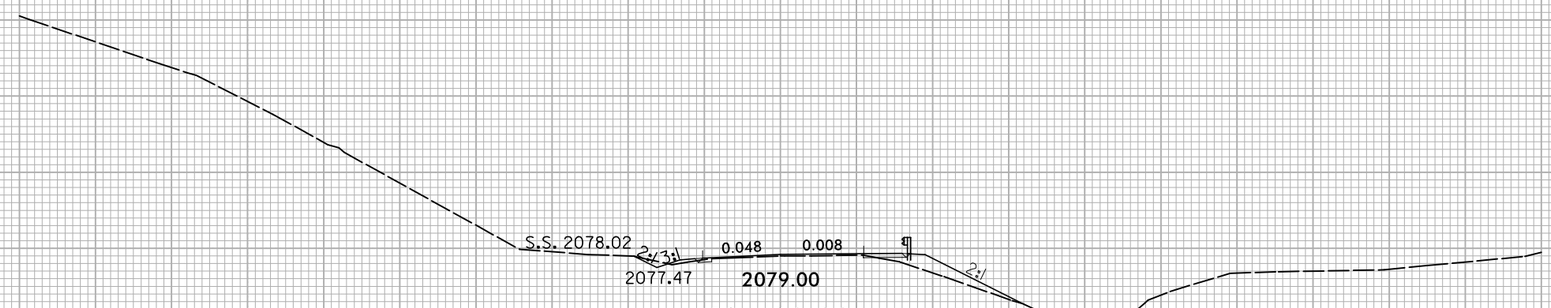
2110
2100
2090
2080
2070
2060



12 + 50.00

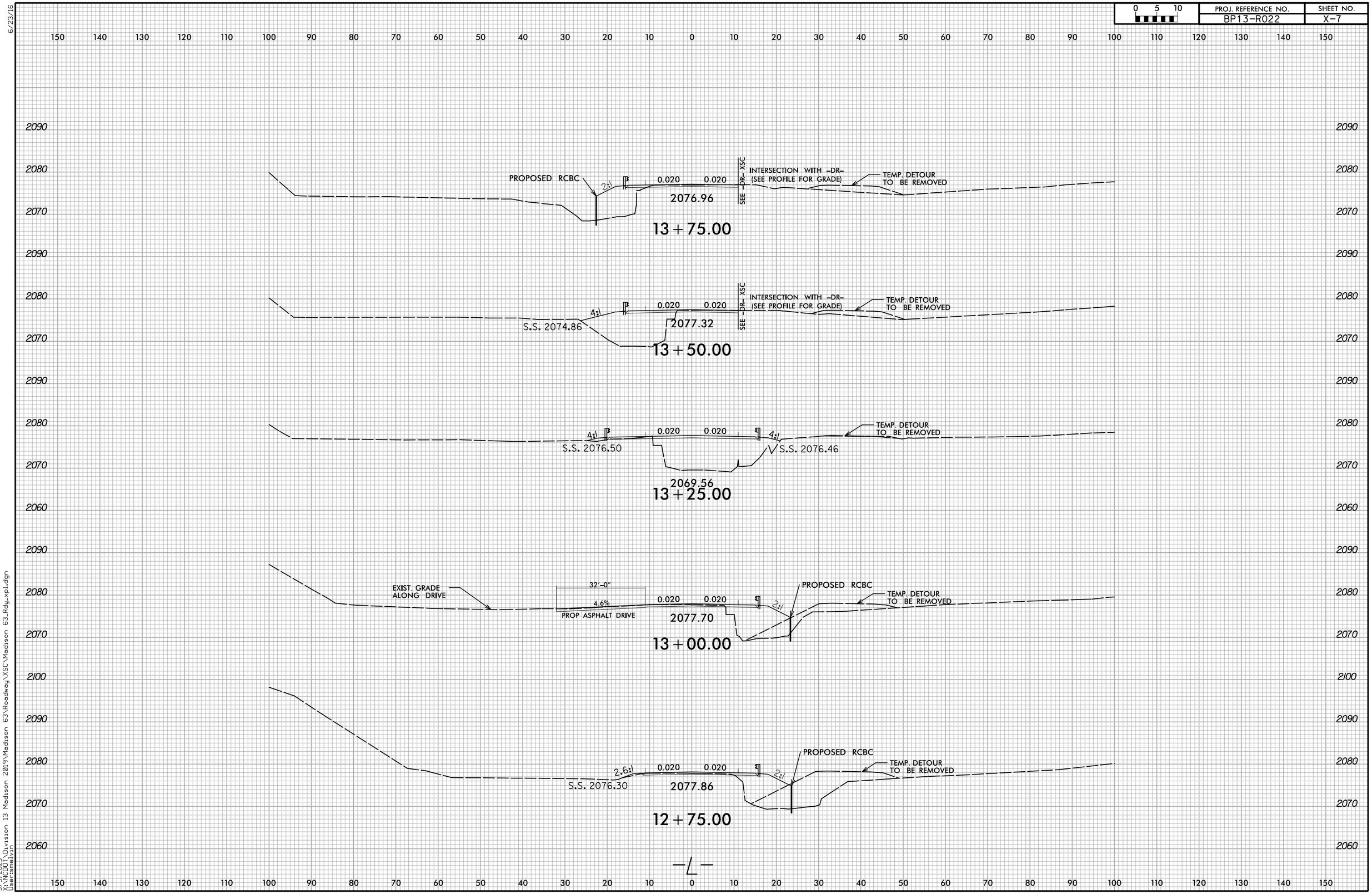


12 + 25.00



12 + 00.00

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	BP13-R022	X-7



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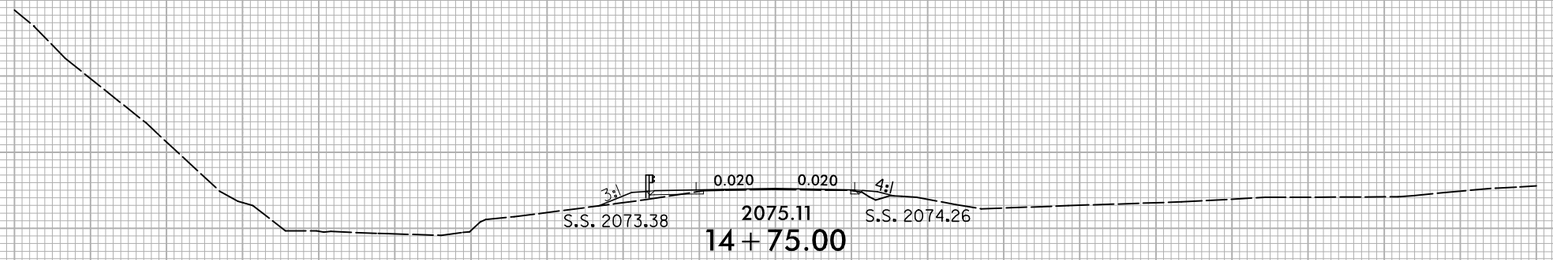
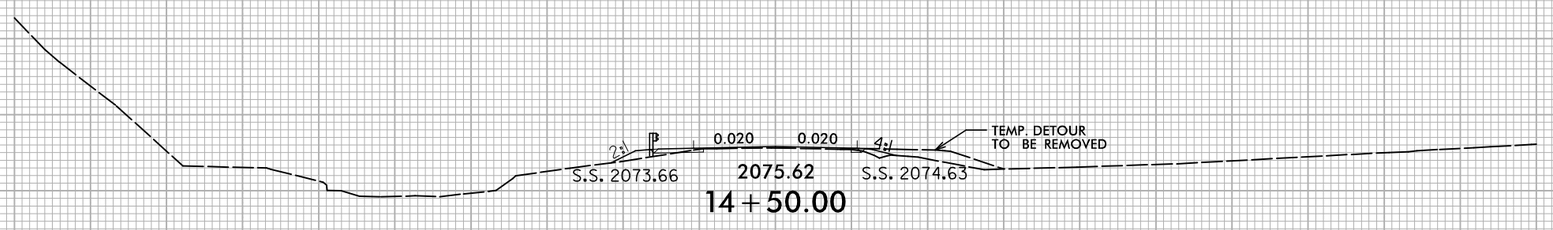
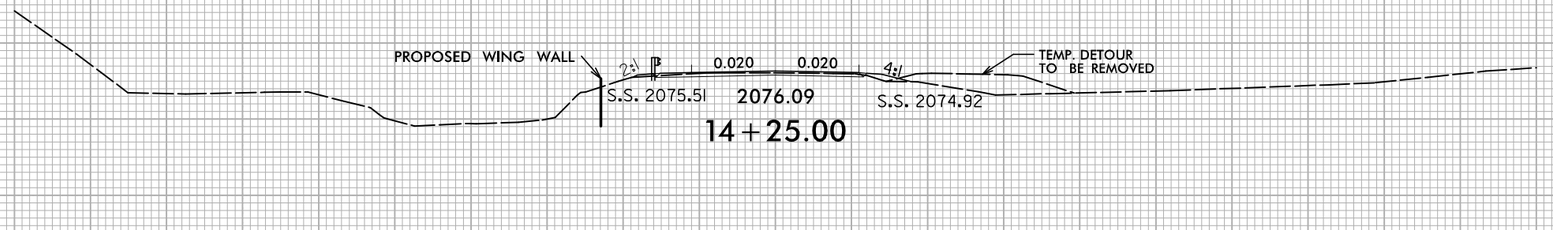
2100
2090
2080
2070



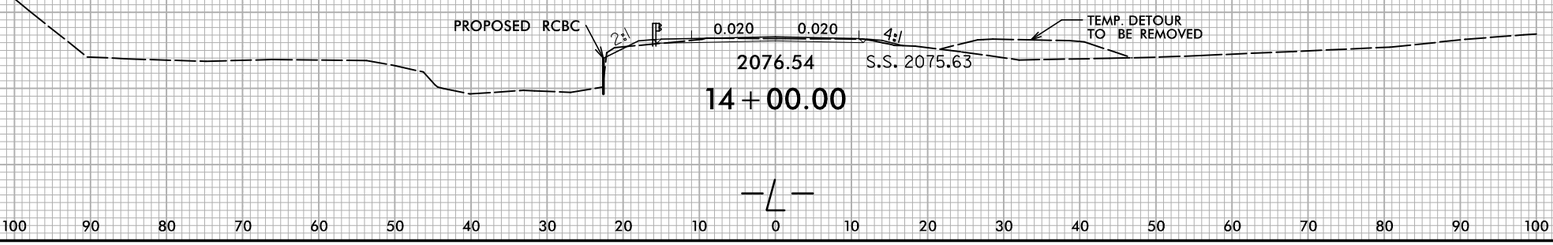
14+75.00



14+50.00



14+25.00



14+00.00

6/23/16

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
BP13-R022	X-9

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

2110
2100
2090
2080
2070
2120
2060

2073.56
15+50.00

3:1 0.021 0.012 11.6:1
S.S. 2073.14 2074.07 S.S. 2073.58
15+25.00

3:1 0.020 0.020 6:1
S.S. 2072.46 2074.59 S.S. 2073.92
15+00.00

—℄—

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	BP13-R022	X-10

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

2090
2080
2070
2060

2079.57
11+25.00

4:1 0.020 4:1
S.S. 2077.96 2078.43 S.S. 2078.63
11+00.00

4:1 0.020 4:1
S.S. 2076.52 2077.05 S.S. 2077.60
10+75.00

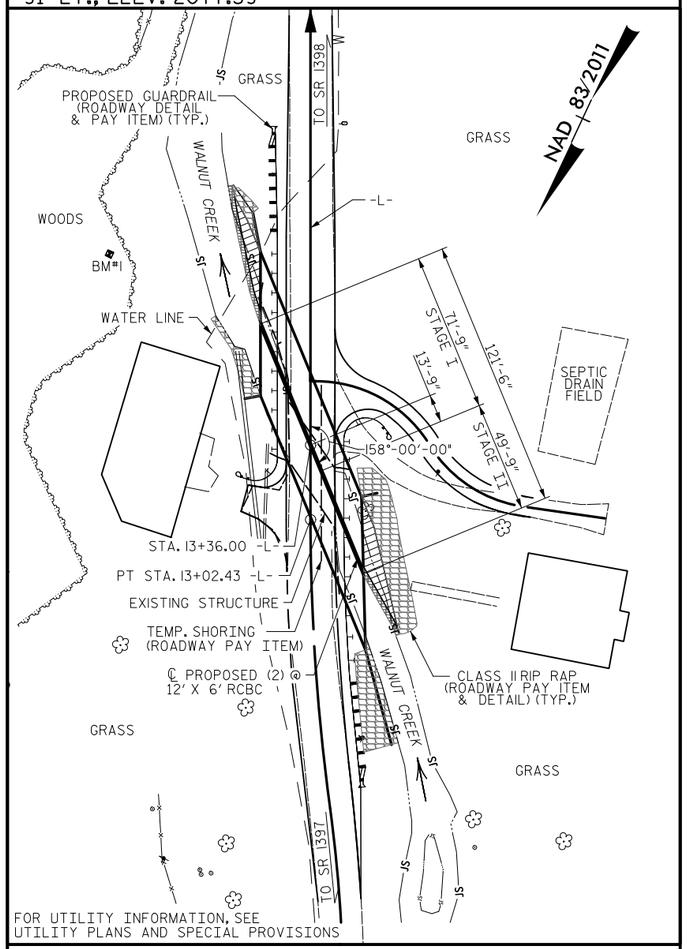
4:1 0.020 4:1
S.S. 2075.36 2075.61 S.S. 2076.55
10+50.00

4:1 0.020
S.S. 2076.05 2076.32 S.S. 2077.31
10+25.00

2077.12
10+00.00

-DR-

BENCH MARK #1:
RR SPIKE IN BASE OF 28" WHITE OAK; STA. 14+22.41 -L-; 91' LT.; ELEV. 2077.39



LOCATION SKETCH

ROADWAY DATA

GRADE POINT ELEV. @ STA. 13+36.00 -L-	= 2077.62'
BED ELEV. @ STA. 13+36.00 -L-	= 2068.0'
ROADWAY SLOPES	= 2:1

HYDRAULIC DATA

DESIGN DISCHARGE	= 900 CFS
FREQUENCY OF DESIGN FLOOD	= 5+ YRS
DESIGN HIGH WATER ELEVATION	= 2075.6'
DRAINAGE AREA	= 7.05 SQ. MI.
BASE DISCHARGE (Q100)	= 2300 CFS
BASE HIGH WATER ELEVATION	= 2079.8'

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 1100 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 5+ YRS
OVERTOPPING FLOOD ELEVATION	= 2077.5 *

* OVERTOPPING OCCURS AT STA. 10+20.00 -DR-, RT

WS ELEV. TAKEN AT RIVER STATION 39929

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE			REINFORCING STEEL			FOUNDATION COND. MAT'L.		
STAGE I	228.4	C.Y.	STAGE I	26,042	LBS.	STAGE I	153	TONS
STAGE II	174.6	C.Y.	STAGE II	19,395	LBS.	STAGE II	106	TONS
TOTAL	403.0	C.Y.	TOTAL	45,437	LBS.	TOTAL	259	TONS
REMOVAL OF EXISTING STRUCTURE	LUMP SUM		CULVERT EXCAVATION	LUMP SUM		ASBESTOS ASSESSMENT	LUMP SUM	

NOTES:

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

DESIGN FILL---------- 1.5' MIN. FILL AND 3.0' MAX. FILL.

FOR OTHER DESIGN DATA AND NOTES, SEE STANDARD NOTES SHEET.

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

CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:

1. PHASE I WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
2. THE REMAINING PORTIONS OF PHASE I WALLS AND PHASE I WINGS FULL HEIGHT.
3. PHASE II WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
4. THE REMAINING PORTIONS OF PHASE II WALLS AND PHASE II WINGS FULL HEIGHT.
5. ROOF SLAB AND HEADWALLS.

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

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

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL 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.

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

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

AT THE CONTRACTOR'S OPTION HE MAY SUBMIT, TO THE ENGINEER FOR APPROVAL, DESIGN AND DETAIL DRAWINGS FOR A PRECAST REINFORCED CONCRETE BOX CULVERT IN LIEU OF THE CAST-IN-PLACE CULVERT SHOWN ON THE PLANS. THE DESIGN SHALL PROVIDE THE SAME SIZE AND NUMBER OF BARRELS AS USED ON THE CAST-IN-PLACE DESIGN. FOR OPTIONAL PRECAST REINFORCED CONCRETE BOX CULVERT, SEE SPECIAL PROVISIONS.

EXCAVATE 1 FOOT BELOW THE BOTTOM OF THE CULVERT AND REPLACE WITH FOUNDATION CONDITIONING MATERIAL IN ACCORDANCE WITH ARTICLE 414 OF THE STANDARD SPECIFICATIONS. FOUNDATION CONDITIONING MATERIAL SHOULD CONSIST OF SELECT MATERIAL CLASS V OR VI FOR CULVERTS.

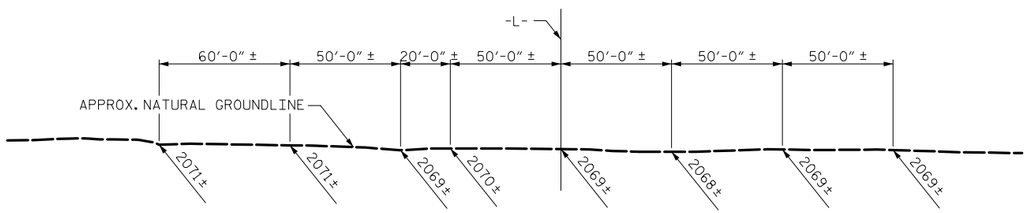
IF REQUIRED, UNDERCUT LOOSE SOILS THAT MAY BE ENCOUNTERED BENEATH THE BOTTOM OF THE FOUNDATION CONDITIONING MATERIAL. BACKFILL UNDERCUT AREAS WITH FOUNDATION CONDITIONING MATERIAL.

FOR ASBESTOS ASSESSMENT, SEE SPECIAL PROVISIONS.

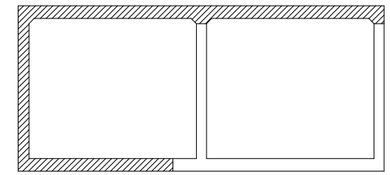
REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS. FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

FOR TRAFFIC PHASING, SEE TRAFFIC CONTROL PLANS.

FOR LIMITS OF TEMPORARY SHORING, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING, SEE ROADWAY PLANS.



PROFILE ALONG ℄ CULVERT



CONSTRUCTION PHASING

(LOOKING DOWNSTREAM)

PHASE I CONSTRUCTION

PHASE II CONSTRUCTION

PROJECT NO. BP13-R022

MADISON COUNTY

STATION: 13+36.00 -L-

SHEET 1 OF 12 REPLACES BRIDGE #560063

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
Marshall G. Cheek, Jr.
6/5/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 12 FT. X 6 FT. CONCRETE BOX CULVERT 158°-00'-00" SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-1
1			3			TOTAL SHEETS
2			4			12

DRAWN BY :	ZCS	DATE :	6/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD:	ZCS	DATE :	7/24

5/8/2025
X:\NCDOT\Division 13 Madison 2019\Madison 63\Structures\Final plans\DGNs\411_001_BP13_R022_SMU_CU01_560063.dgn
User:ZSmith

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

LOAD TYPE		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x 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		HL-93 (INVENTORY)	N/A	1	1.03	--	1.75	1.07	1	TOP SLAB	6.00	1.03	1	TOP SLAB	10.73	
		HL-93 (OPERATING)	N/A		1.34	--	1.35	1.38	1	TOP SLAB	6.00	1.34	1	TOP SLAB	10.73	
		HS-20 (INVENTORY)	36.000	2	1.08	38.88	1.75	1.11	1	TOP SLAB	6.00	1.08	1	TOP SLAB	10.73	
		HS-20 (OPERATING)	36.000		1.40	50.40	1.35	1.44	1	TOP SLAB	6.00	1.40	1	TOP SLAB	10.73	
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		2.26	30.51	1.40	2.26	1	TOP SLAB	6.00	2.37	1	TOP SLAB	10.73	
		SNGARBS2	20.000		2.11	42.20	1.40	2.11	1	TOP SLAB	6.00	2.19	1	TOP SLAB	10.73	
		SNAGRIS2	22.000		2.26	49.72	1.40	2.26	1	TOP SLAB	6.00	2.32	1	TOP SLAB	10.73	
		SNCOTTS3	27.250	3	1.28	34.88	1.40	1.33	1	TOP SLAB	6.00	1.28	1	TOP SLAB	10.73	
		SNAGGRS4	34.925		1.53	53.44	1.40	1.59	1	TOP SLAB	6.00	1.53	1	TOP SLAB	10.73	
		SNS5A	35.550		1.43	50.84	1.40	1.52	1	TOP SLAB	6.00	1.43	1	TOP SLAB	10.73	
		SNS6A	39.950		1.41	56.33	1.40	1.52	1	TOP SLAB	6.00	1.41	1	TOP SLAB	10.73	
		SNS7B	42.000		1.41	59.22	1.40	1.55	1	BOTT. SLAB	11.67	1.41	1	TOP SLAB	10.73	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.80	59.40	1.40	1.80	1	BOTT. SLAB	11.67	1.83	1	BOTT. SLAB	10.83	
		TNT4A	33.075		1.49	49.28	1.40	1.59	1	TOP SLAB	6.00	1.49	1	TOP SLAB	10.73	
		TNT6A	41.600		1.41	58.66	1.40	1.60	1	BOTT. SLAB	11.67	1.41	1	TOP SLAB	10.73	
		TNT7A	42.000		1.44	60.48	1.40	1.51	1	BOTT. SLAB	11.67	1.44	1	TOP SLAB	10.73	
		TNT7B	42.000		1.46	61.32	1.40	1.54	1	TOP SLAB	6.00	1.46	1	TOP SLAB	10.73	
		TNAGRIT4	43.000		1.36	58.48	1.40	1.36	1	BOTT. SLAB	11.67	1.40	1	BOTT. SLAB	10.83	
		TNAGT5A	45.000		1.45	65.25	1.40	1.55	1	BOTT. SLAB	11.67	1.45	1	TOP SLAB	10.73	
		TNAGT5B	45.000		1.40	63.00	1.40	1.40	1	BOTT. SLAB	11.67	1.42	1	TOP SLAB	10.73	
EMERGENCY VEHICLE (EV)		EV2	28.750		1.59	45.71	1.30	1.59	1	TOP SLAB	6.00	1.67	1	TOP SLAB	10.73	
		EV3	43.000	4	1.11	47.73	1.30	1.15	1	TOP SLAB	6.00	1.11	1	TOP SLAB	10.73	

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	--

NOTES:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATES.

COMMENTS:

1.

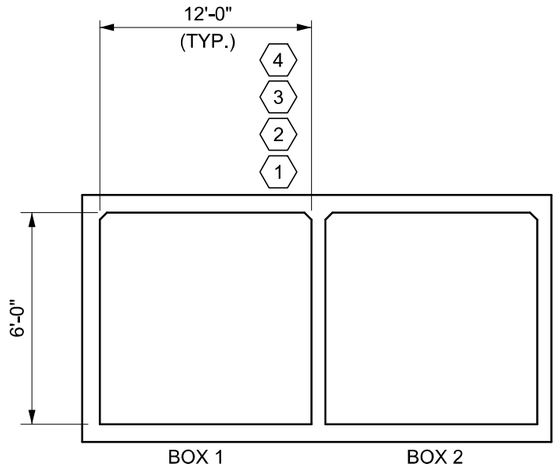
2.

3.

4.

(#)	CONTROLLING LOAD RATING
1	DESIGN LOAD RATING (HL-93)
2	DESIGN LOAD RATING (HS-20)
3	LEGAL LOAD RATING * *
4	EMERGENCY VEHICLE LOAD RATING * *

* * SEE CHART FOR VEHICLE TYPE



LRFR SUMMARY

(LOOKING DOWNSTREAM)

PROJECT NO. BP13-R022

MADISON COUNTY

STATION: 13+36.00 -L-

SHEET 2 OF 12

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CREEK, JR.
Marshall G. Creek, Jr.
6/5/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0103
CORP. LICENSE NO.: C-0275

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			12

STD. NO. LRFR5

ASSEMBLED BY :	ZCS	DATE :	6/23
CHECKED BY :	MGC	DATE :	7/23
DRAWN BY : WMC	7/11	REV. 10/1/11	MAA/GM
CHECKED BY : GM	7/11	REV. 12/17	MAA/THC
		REV. 04/23	BNB/AAI

8/20/2024
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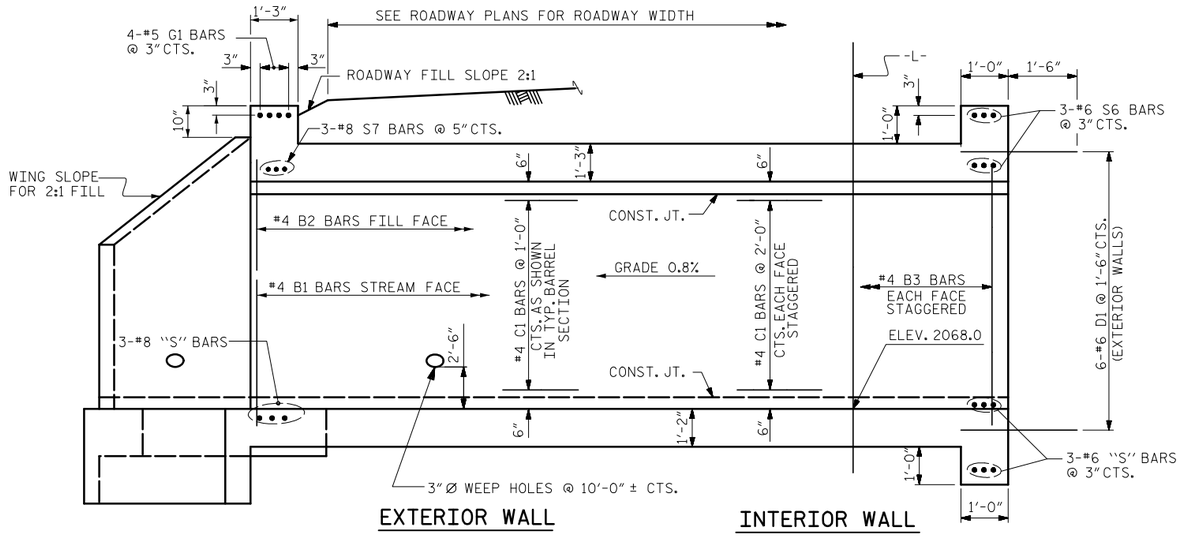
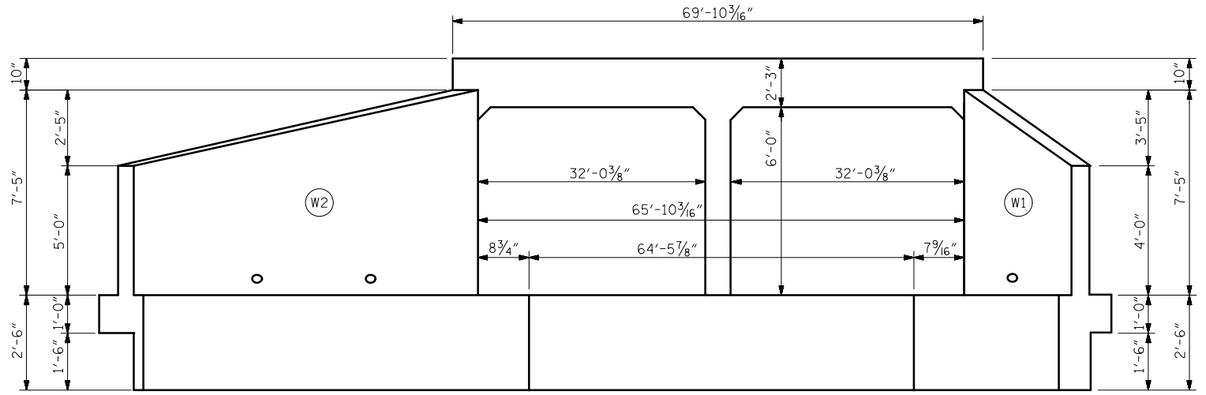
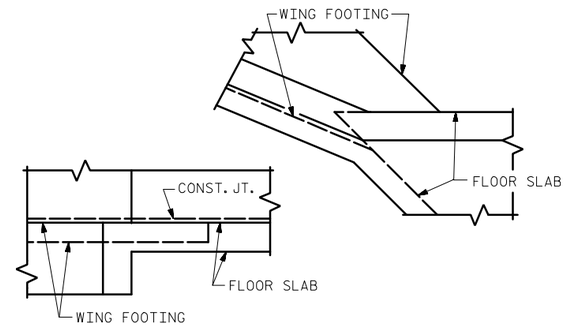
User:ZSmith



CULVERT SECTION NORMAL TO ROADWAY

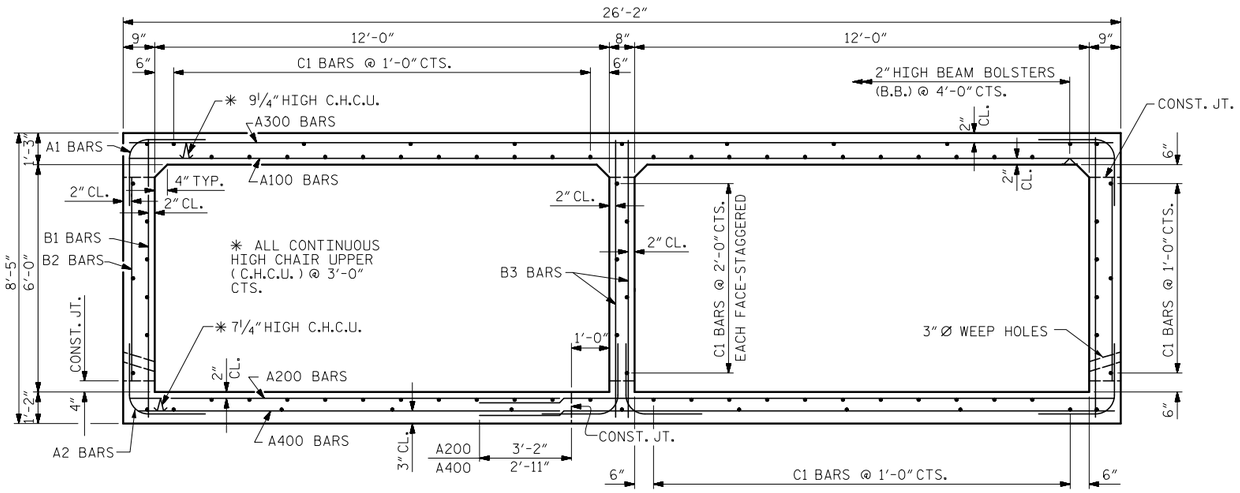


OUTLET END ELEVATION NORMAL TO SKEW



DETAIL

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



RIGHT ANGLE SECTION OF BARREL

THERE ARE 86 "C" BARS IN SECTION OF BARREL.
LOOKING DOWNSTREAM

STAGE I QUANTITIES

CLASS A CONCRETE		
BARREL @ 2.832 CY/FT	203.2	C.Y.
WINGS, ETC.	17.7	C.Y.
EDGE BEAMS	5.2	C.Y.
SILLS	2.3	C.Y.
TOTAL	228.4	C.Y.
REINFORCING STEEL		
BARREL & SILLS	25,423	LBS.
WINGS, ETC.	619	LBS.
TOTAL	26,042	LBS.
CULVERT EXCAVATION	LUMP SUM	
FOUNDATION COND. MAT'L.	153 TONS	

PROJECT NO. BP13-R022
MADISON COUNTY
STATION: 13+36.00 -L-

SHEET 3 OF 12

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHECK, JR.
6/5/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

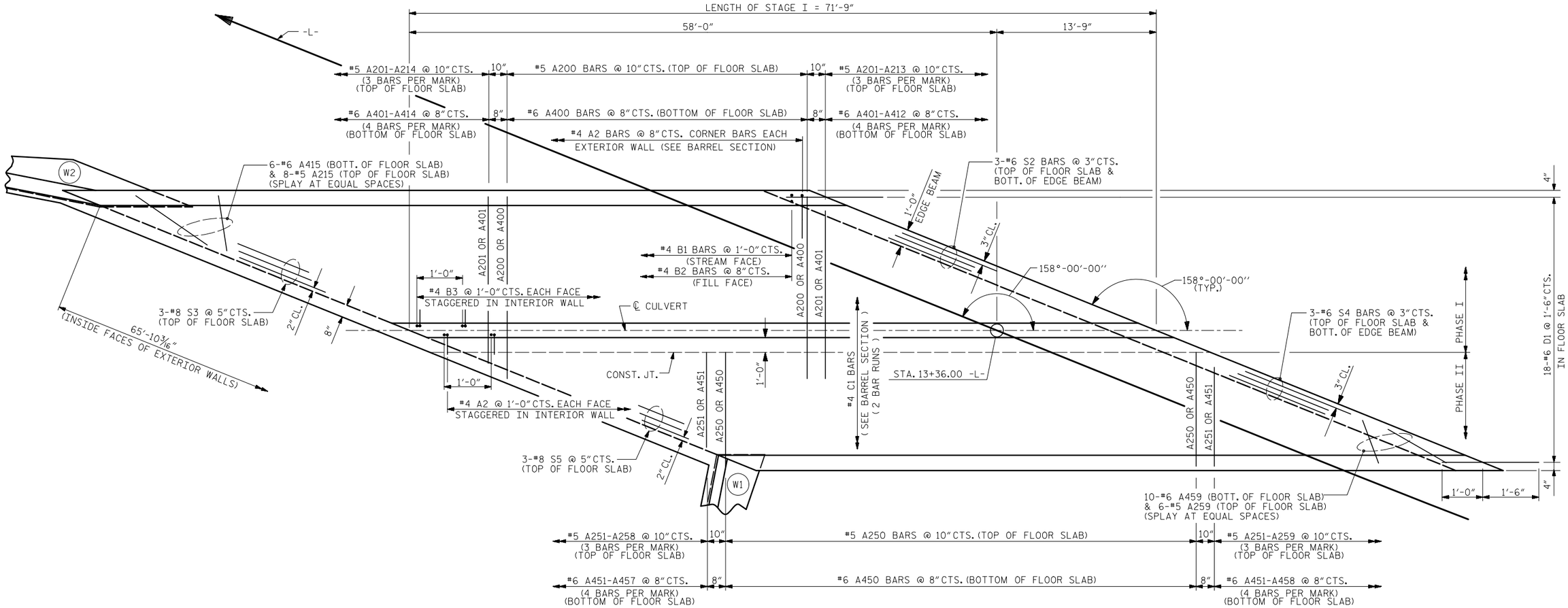
TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 12 FT. X 6 FT.
CONCRETE BOX CULVERT
158°-00'-00" SKEW
STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-3
1			3			TOTAL SHEETS
2			4			12

DRAWN BY :	ZCS	DATE :	6/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD:	ZCS	DATE :	7/24



PLAN - FLOOR SLAB

NOTE: FOR S1 BARS IN FLOOR SLAB & WING FOOTINGS, SEE SHEET 6 OF 11

PROJECT NO. BP13-R022

MADISON COUNTY

STATION: 13+36.00 -L-

SHEET 4 OF 12

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
Marshall G. Cheek, Jr.
6/5/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 12 FT. X 6 FT. CONCRETE BOX CULVERT 158°-00'-00" SKEW STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-4
1			3			TOTAL SHEETS
2			4			12

DRAWN BY :	ZCS	DATE :	6/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD:	ZCS	DATE :	7/24

STAGE I BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A100	9	#6	STR	25'-10"	349
A101	6	#6	STR	24'-10"	224
A102	6	#6	STR	23'-10"	215
A103	6	#6	STR	22'-10"	206
A104	6	#6	STR	21'-10"	197
A105	6	#6	STR	20'-10"	188
A106	6	#6	STR	19'-9"	178
A107	6	#6	STR	18'-9"	169
A108	6	#6	STR	17'-9"	160
A109	6	#6	STR	16'-9"	151
A110	6	#6	STR	15'-9"	142
A111	6	#6	STR	14'-9"	133
A112	6	#6	STR	13'-9"	124
A113	6	#6	STR	12'-9"	115
A114	6	#6	STR	11'-8"	105
A115	6	#6	STR	10'-8"	96
A116	6	#6	STR	9'-8"	87
A117	6	#6	STR	8'-8"	78
A118	6	#6	STR	7'-8"	69
A119	6	#6	STR	6'-8"	60
A120	6	#6	STR	5'-8"	51
A121	6	#6	STR	4'-8"	42
A122	6	#6	STR	3'-7"	32
A123	6	#6	STR	2'-7"	23
A124	12	#6	STR	2'-6"	45

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A200	34	#5	STR	17'-5"	618
A201	6	#5	STR	16'-5"	103
A202	6	#5	STR	15'-5"	96
A203	6	#5	STR	14'-5"	90
A204	6	#5	STR	13'-5"	84
A205	6	#5	STR	12'-4"	77
A206	6	#5	STR	11'-4"	71
A207	6	#5	STR	10'-4"	65
A208	6	#5	STR	9'-4"	58
A209	6	#5	STR	8'-4"	52
A210	6	#5	STR	7'-4"	46
A211	6	#5	STR	6'-4"	40
A212	6	#5	STR	5'-4"	33
A213	6	#5	STR	4'-4"	27
A214	3	#5	STR	3'-3"	10
A215	8	#5	STR	2'-6"	21

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A250	51	#5	STR	11'-7"	616
A251	6	#5	STR	10'-7"	66
A252	6	#5	STR	9'-7"	60
A253	6	#5	STR	8'-7"	54
A254	6	#5	STR	7'-7"	47
A255	6	#5	STR	6'-6"	41
A256	6	#5	STR	5'-6"	34
A257	6	#5	STR	4'-6"	28
A258	6	#5	STR	3'-6"	22
A259	9	#5	STR	2'-6"	23

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A300	11	#6	STR	25'-10"	427
A301	8	#6	STR	24'-9"	297
A302	8	#6	STR	23'-8"	284
A303	8	#6	STR	22'-7"	271
A304	8	#6	STR	21'-6"	258
A305	8	#6	STR	20'-5"	245
A306	8	#6	STR	19'-5"	233
A307	8	#6	STR	18'-4"	220
A308	8	#6	STR	17'-3"	207
A309	8	#6	STR	16'-2"	194
A310	8	#6	STR	15'-1"	181
A311	8	#6	STR	14'-0"	168
A312	8	#6	STR	12'-11"	155
A313	8	#6	STR	11'-10"	142
A314	8	#6	STR	10'-9"	129
A315	8	#6	STR	9'-8"	116
A316	8	#6	STR	8'-7"	103
A317	8	#6	STR	7'-6"	90
A318	8	#6	STR	6'-5"	77
A319	8	#6	STR	5'-4"	64
A320	8	#6	STR	4'-4"	52
A321	8	#6	STR	3'-3"	39
A322	8	#6	STR	2'-2"	26
A323	12	#6	STR	2'-0"	36

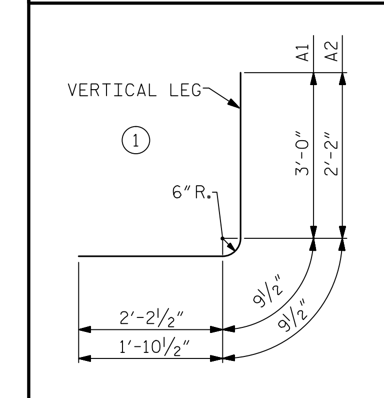
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A400	43	#6	STR	17'-2"	1109
A401	8	#6	STR	16'-1"	193
A402	8	#6	STR	15'-0"	180
A403	8	#6	STR	13'-11"	167
A404	8	#6	STR	12'-10"	154
A405	8	#6	STR	11'-9"	141
A406	8	#6	STR	10'-9"	129
A407	8	#6	STR	9'-8"	116
A408	8	#6	STR	8'-6"	102
A409	8	#6	STR	7'-6"	90
A410	8	#6	STR	6'-5"	77
A411	8	#6	STR	5'-4"	64
A412	8	#6	STR	4'-3"	51
A413	4	#6	STR	3'-3"	20
A414	4	#6	STR	2'-2"	13
A415	6	#6	STR	2'-0"	18

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A450	64	#6	STR	11'-7"	1113
A451	8	#6	STR	10'-6"	126
A452	8	#6	STR	9'-5"	113
A453	8	#6	STR	8'-4"	100
A454	8	#6	STR	7'-3"	87
A455	8	#6	STR	6'-2"	74
A456	8	#6	STR	5'-1"	61
A457	8	#6	STR	4'-0"	48
A458	4	#6	STR	2'-11"	18
A459	10	#6	STR	2'-3"	34

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	196	#4	1	6'-0"	786
A2	326	#4	1	4'-10"	1053
B1	144	#4	STR	8'-0"	770
B2	214	#4	STR	5'-4"	762
B3	144	#4	STR	8'-0"	770
C1	172	#4	STR	36'-8"	4213
D1	48	#6	STR	2'-6"	180
S2	6	#6	STR	40'-10"	368
S3	3	#8	STR	41'-9"	334
S4	6	#6	STR	30'-10"	278
S5	3	#8	STR	30'-10"	247
S6	12	#6	STR	35'-11"	647
S7	6	#8	STR	36'-4"	582
G1	8	#5	STR	36'-0"	300

REINFORCING STEEL 25,423 LBS

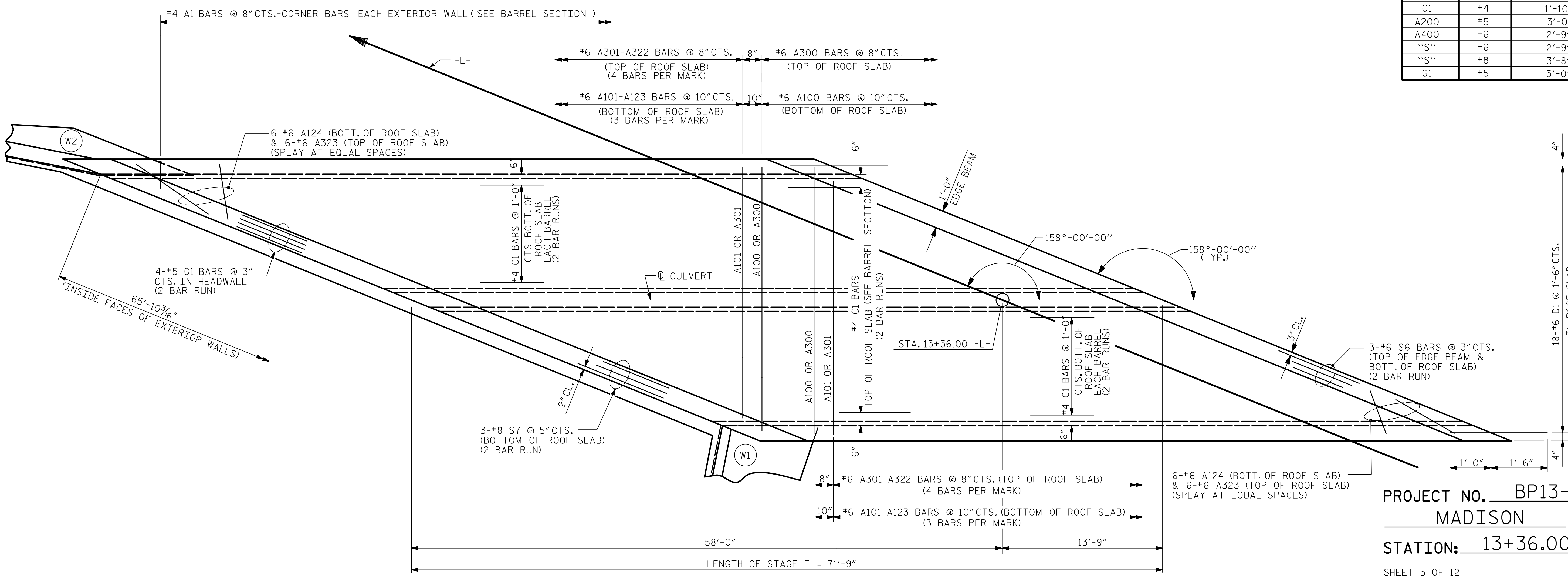
BAR TYPE



DIMENSIONS ARE OUT TO OUT

SPLICE LENGTHS CHART

BAR	SIZE	SPLICE LENGTH
"B"	#4	1'-10"
C1	#4	1'-10"
A200	#5	3'-0"
A400	#6	2'-9"
"S"	#6	2'-9"
"S"	#8	3'-8"
G1	#5	3'-0"



PLAN - ROOF SLAB

PROJECT NO. BP13-R022
MADISON COUNTY
STATION: 13+36.00 -L-

SHEET 5 OF 12

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR. — Marshall G. Cheek, Jr. 6/5/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

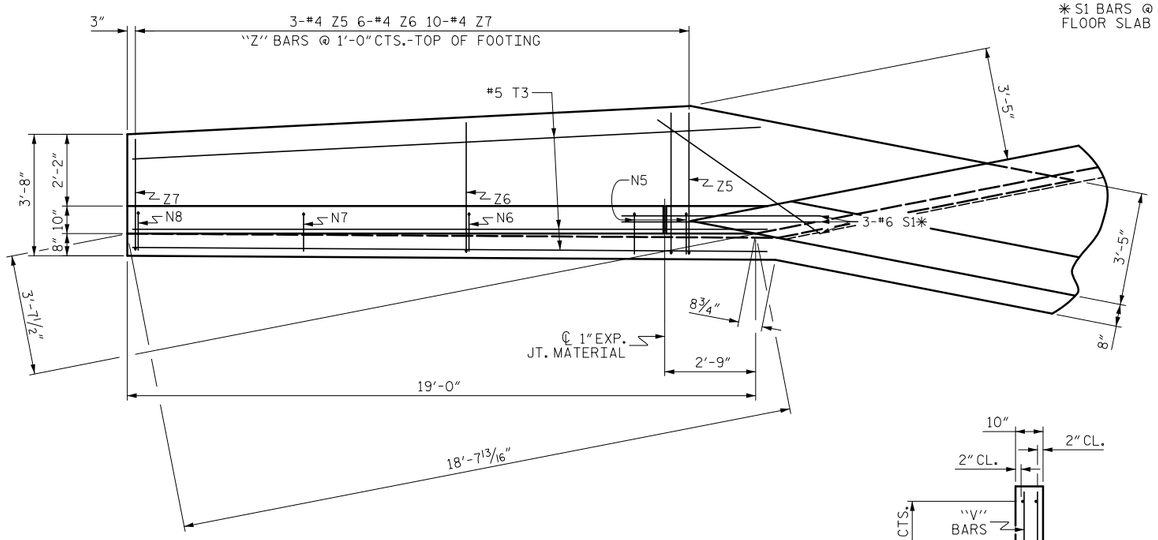
DOUBLE 12 FT. X 6 FT.
CONCRETE BOX CULVERT
158°-00'-00" SKEW
STAGE I

DRAWN BY :	ZCS	DATE :	6/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD:	ZCS	DATE :	7/24

REVISIONS

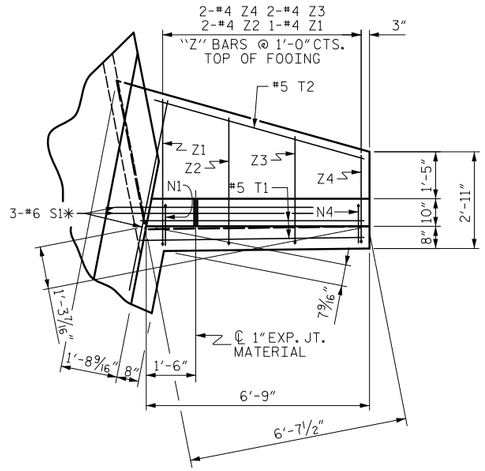
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. C-5
TOTAL SHEETS 12

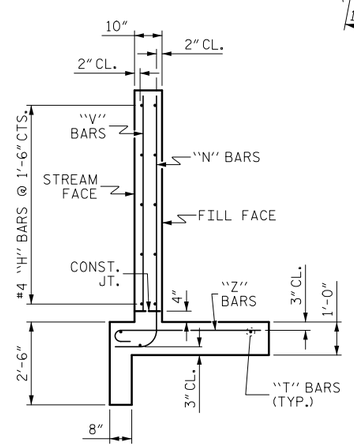


PLAN W2

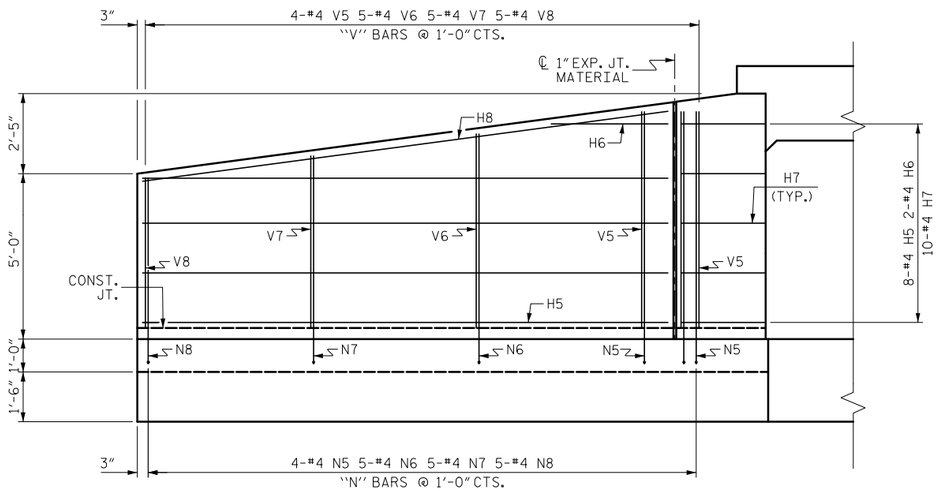
* S1 BARS @ BOTTOM OF FLOOR SLAB & FOOTING



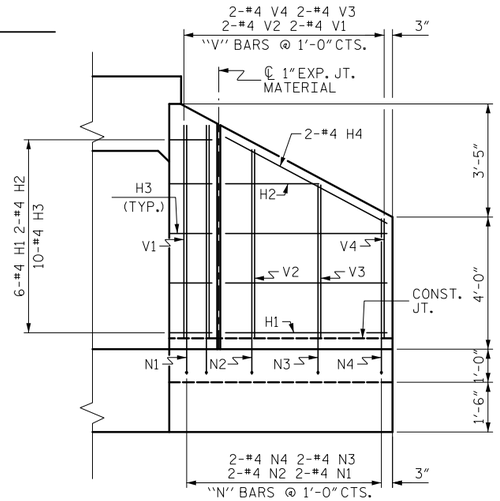
PLAN W1



TYPICAL WING SECTION

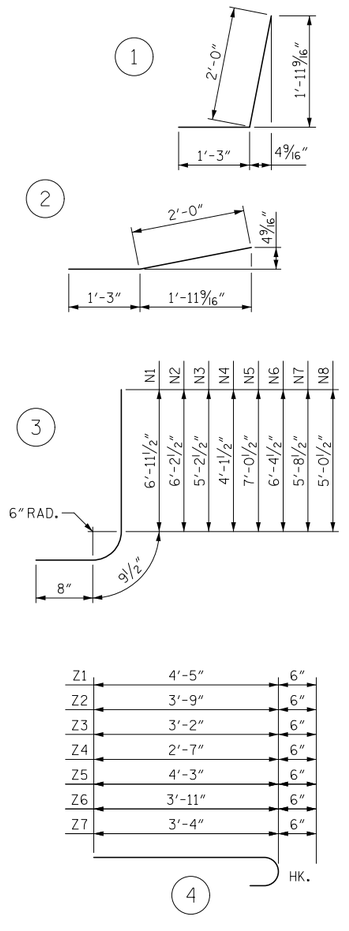


ELEVATION W2



ELEVATION W1

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	6	#4	STR	4'-10"	19
H2	2	#4	STR	2'-9"	4
H3	10	#4	1	3'-3"	22
H4	2	#4	STR	5'-6"	7
H5	8	#4	STR	15'-10"	85
H6	2	#4	STR	3'-6"	5
H7	10	#4	2	3'-3"	22
H8	2	#4	STR	16'-0"	21
N1	2	#4	3	8'-5"	11
N2	2	#4	3	7'-8"	10
N3	2	#4	3	6'-8"	9
N4	2	#4	3	5'-7"	7
N5	4	#4	3	8'-6"	23
N6	5	#4	3	7'-10"	26
N7	5	#4	3	7'-2"	24
N8	5	#4	3	6'-6"	22
S1	6	#6	STR	6'-0"	54
T1	2	#5	STR	6'-9"	14
T2	1	#5	STR	6'-7"	7
T3	3	#5	STR	19'-0"	59
V1	2	#4	STR	6'-5"	9
V2	2	#4	STR	5'-8"	8
V3	2	#4	STR	4'-7"	6
V4	2	#4	STR	3'-7"	5
V5	4	#4	STR	6'-6"	17
V6	5	#4	STR	5'-10"	19
V7	5	#4	STR	5'-2"	17
V8	5	#4	STR	4'-6"	15
Z1	1	#4	4	4'-11"	3
Z2	2	#4	4	4'-3"	6
Z3	2	#4	4	3'-8"	5
Z4	2	#4	4	3'-1"	4
Z5	3	#4	4	4'-9"	10
Z6	6	#4	4	4'-5"	18
Z7	10	#4	4	3'-10"	26

REINFORCING STEEL FOR 2 WINGS	619 LBS
CLASS A CONCRETE	
2 WINGS	10.6 CY
1 HEADWALL	3.2 CY
1 END CURTAIN WALL	3.9 CY
TOTAL	17.7 CY

NOTES

G1 BARS IN HEADWALL ARE INCLUDED WITH BARREL REINFORCING STEEL.

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

PROJECT NO. BP13-R022

MADISON COUNTY

STATION: 13+36.00 -L-

SHEET 6 OF 12

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
Marshall G. Cheek, Jr.
6/5/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STAGE I
WINGS W1 & W2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-6
1			3			TOTAL SHEETS
2			4			12

DRAWN BY :	ZCS	DATE :	6/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD:	ZCS	DATE :	7/24

8/20/2024
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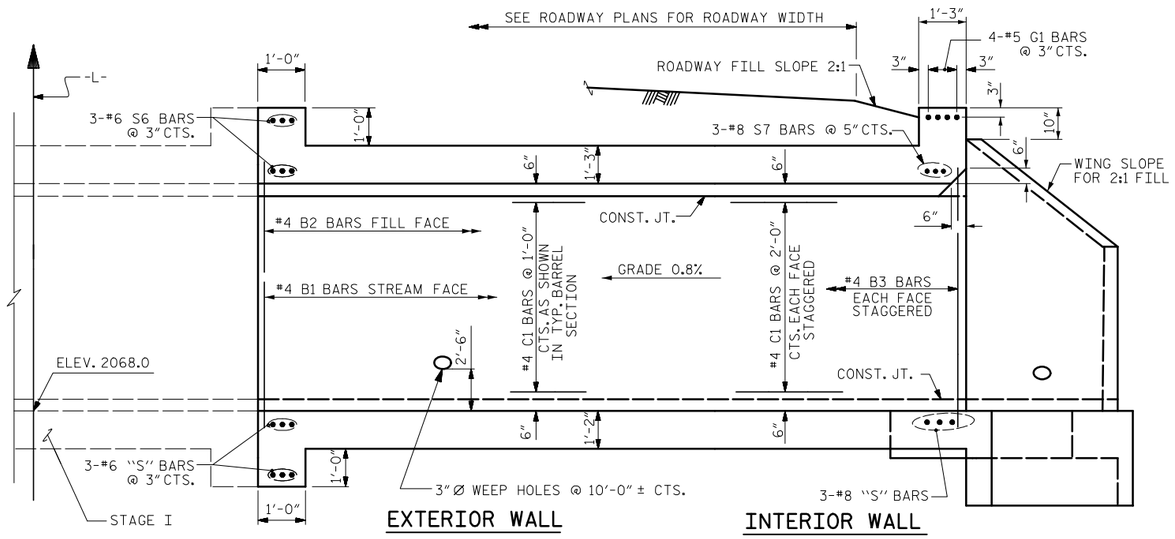
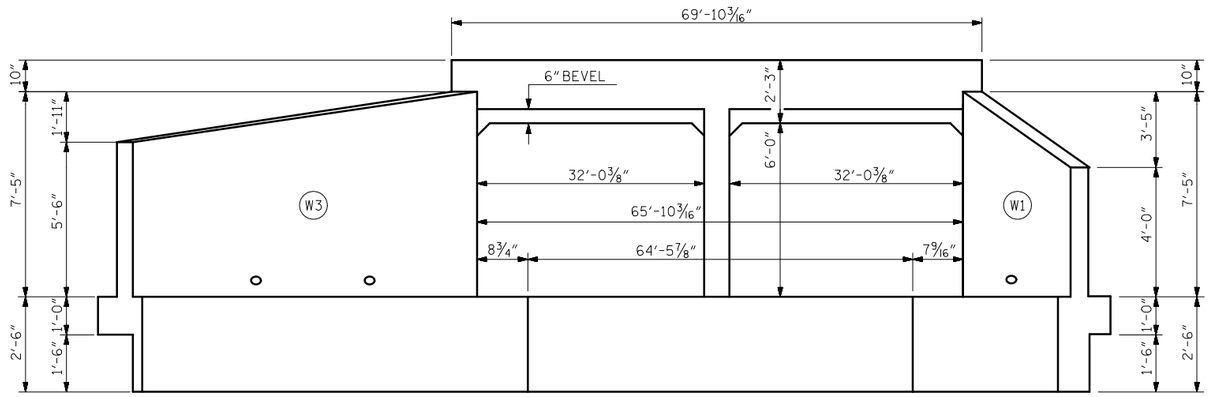
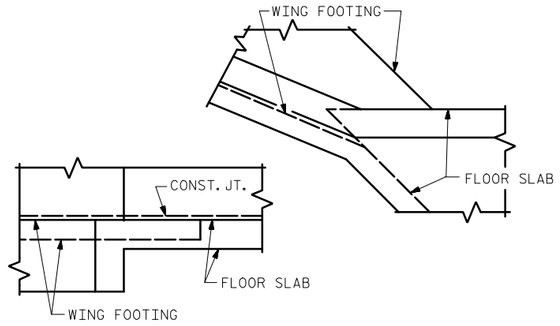
User:ZSmith



CULVERT SECTION NORMAL TO ROADWAY

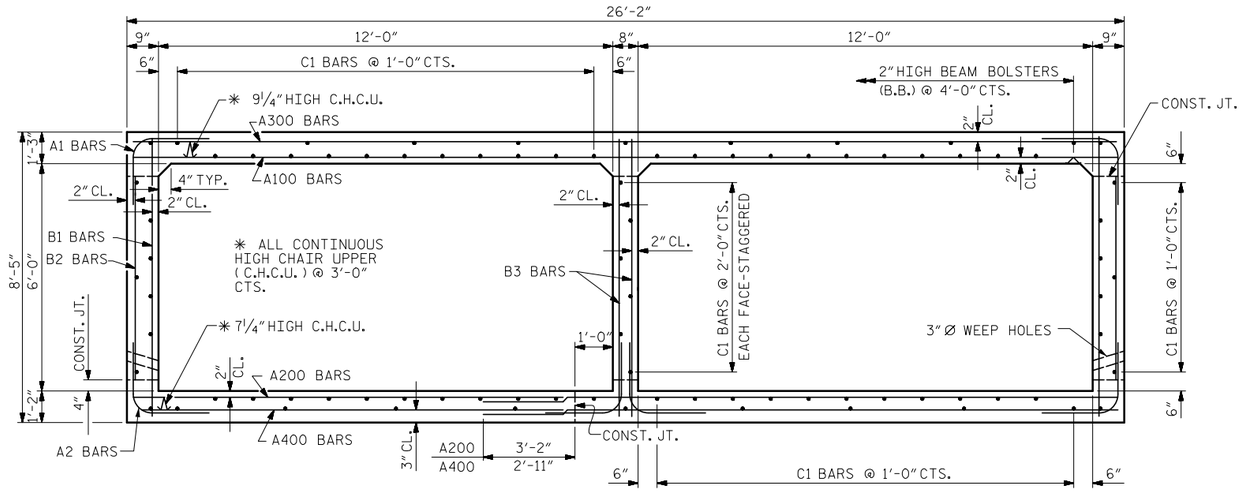


INLET END ELEVATION NORMAL TO SKEW



DETAIL

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



RIGHT ANGLE SECTION OF BARREL

THERE ARE 86 "C" BARS IN SECTION OF BARREL.
LOOKING DOWNSTREAM

STAGE II QUANTITIES

CLASS A CONCRETE		
BARREL @ 2.832 CY/FT	140.9	C.Y.
WINGS, ETC.	26.7	C.Y.
EDGE BEAMS	5.2	C.Y.
SILLS	1.8	C.Y.
TOTAL	174.6	C.Y.
REINFORCING STEEL		
BARREL & SILLS	18,278	LBS.
WINGS, ETC.	1,117	LBS.
TOTAL	19,395	LBS.
CULVERT EXCAVATION	LUMP SUM	
FOUNDATION COND. MAT'L.	106 TONS	

PROJECT NO. BP13-R022
MADISON COUNTY
STATION: 13+36.00 -L-

SHEET 7 OF 12

NORTH CAROLINA PROFESSIONAL SEAL 20126 ENGINEER MARSHALL G. CHEEK, JR.
Marshall G. Cheek, Jr.
6/5/2026

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

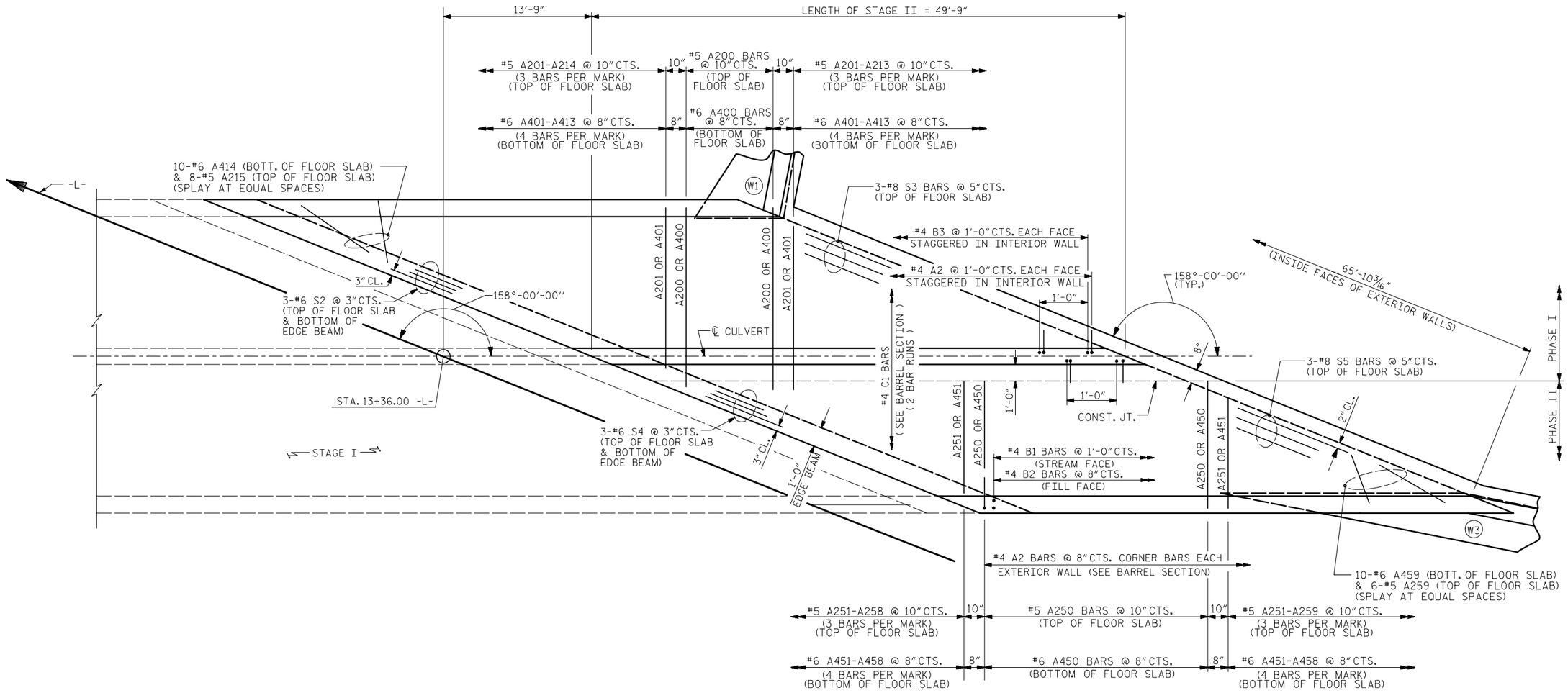
DOUBLE 12 FT. X 6 FT.
CONCRETE BOX CULVERT
158°-00'-00" SKEW
STAGE II

DRAWN BY : ZCS DATE : 6/23
CHECKED BY : MGC DATE : 7/23
DESIGN ENGINEER OF RECORD: ZCS DATE : 7/24

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-7
1			3			TOTAL SHEETS
2			4			12



PLAN - FLOOR SLAB

NOTE: FOR S1 BARS IN FLOOR SLAB & WING FOOTINGS, SEE SHEET 11 OF 11

PROJECT NO. BP13-R022

MADISON COUNTY

STATION: 13+36.00 -L-

SHEET 8 OF 12

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
Marshall G. Cheek, Jr.
6/5/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 12 FT. X 6 FT. CONCRETE BOX CULVERT 158°-00'-00" SKEW STAGE II

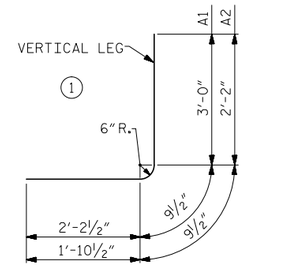
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-8
1			3			TOTAL SHEETS
2			4			12

DRAWN BY :	ZCS	DATE : 6/23
CHECKED BY :	MGC	DATE : 7/23
DESIGN ENGINEER OF RECORD:	ZCS	DATE : 7/24

STAGE II BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A100	19	#6	STR	19′-8″	561	A200	8	#5	STR	17′-5″	145	A250	25	#5	STR	11′-7″	302	A300	23	#6	STR	19′-8″	679	A400	10	#6	STR	17′-2″	258	A450	30	#6	STR	11′-7″	522	A1	135	#4	1	6′-0″	541
A101	6	#6	STR	18′-8″	168	A201	6	#5	STR	16′-4″	102	A251	6	#5	STR	10′-6″	66	A301	8	#6	STR	18′-8″	224	A401	8	#6	STR	16′-0″	192	A451	8	#6	STR	10′-8″	128	A2	212	#4	1	4′-10″	684
A102	6	#6	STR	17′-8″	159	A202	6	#5	STR	15′-4″	96	A252	6	#5	STR	9′-6″	59	A302	8	#6	STR	17′-8″	212	A402	8	#6	STR	14′-11″	179	A452	8	#6	STR	9′-7″	115						
A103	6	#6	STR	16′-8″	150	A203	6	#5	STR	14′-4″	90	A253	6	#5	STR	8′-6″	53	A303	8	#6	STR	16′-7″	199	A403	8	#6	STR	13′-10″	166	A453	8	#6	STR	8′-6″	102	B1	100	#4	STR	8′-0″	534
A104	6	#6	STR	15′-8″	141	A204	6	#5	STR	13′-4″	83	A254	6	#5	STR	7′-6″	47	A304	8	#6	STR	15′-6″	186	A404	8	#6	STR	12′-9″	153	A454	8	#6	STR	7′-5″	89	B2	148	#4	STR	5′-4″	527
A105	6	#6	STR	14′-8″	132	A205	6	#5	STR	12′-4″	77	A255	6	#5	STR	6′-6″	41	A305	8	#6	STR	14′-5″	173	A405	8	#6	STR	11′-8″	140	A455	8	#6	STR	6′-4″	76	B3	100	#4	STR	8′-0″	534
A106	6	#6	STR	13′-8″	123	A206	6	#5	STR	11′-4″	71	A256	6	#5	STR	5′-6″	34	A306	8	#6	STR	13′-4″	160	A406	8	#6	STR	10′-7″	127	A456	8	#6	STR	5′-3″	63						
A107	6	#6	STR	12′-8″	114	A207	6	#5	STR	10′-3″	64	A257	6	#5	STR	4′-5″	28	A307	8	#6	STR	12′-3″	147	A407	8	#6	STR	9′-7″	115	A457	8	#6	STR	4′-2″	50	C1	172	#4	STR	25′-8″	2949
A108	6	#6	STR	11′-8″	105	A208	6	#5	STR	9′-3″	58	A258	6	#5	STR	3′-5″	21	A308	8	#6	STR	11′-2″	134	A408	8	#6	STR	8′-6″	102	A458	8	#6	STR	3′-1″	37						
A109	6	#6	STR	10′-7″	95	A209	6	#5	STR	8′-3″	52	A259	9	#5	STR	2′-6″	23	A309	8	#6	STR	10′-1″	121	A409	8	#6	STR	7′-5″	89	A459	10	#6	STR	2′-3″	34	D2	15	#6	STR	1′-9″	39
A110	6	#6	STR	9′-7″	86	A210	6	#5	STR	7′-3″	45							A310	8	#6	STR	9′-0″	108	A410	8	#6	STR	6′-4″	76							D3	6	#6	STR	2′-9″	25
A111	6	#6	STR	8′-7″	77	A211	6	#5	STR	6′-3″	39							A311	8	#6	STR	7′-11″	95	A411	8	#6	STR	5′-3″	63												
A112	6	#6	STR	7′-7″	68	A212	6	#5	STR	5′-3″	33							A312	8	#6	STR	6′-10″	82	A412	8	#6	STR	4′-2″	50							S2	6	#6	STR	40′-10″	368
A113	6	#6	STR	6′-7″	59	A213	6	#5	STR	4′-3″	27							A313	8	#6	STR	5′-9″	69	A413	8	#6	STR	3′-1″	37							S3	3	#8	STR	41′-9″	334
A114	6	#6	STR	5′-7″	50	A214	3	#5	STR	3′-3″	10							A314	8	#6	STR	4′-8″	56	A414	10	#6	STR	2′-4″	35							S4	6	#6	STR	30′-10″	278
A115	6	#6	STR	4′-7″	41	A215	8	#5	STR	2′-6″	21							A315	8	#6	STR	3′-7″	43													S5	3	#8	STR	30′-10″	247
A116	6	#6	STR	3′-7″	32													A316	8	#6	STR	2′-7″	31													S6	12	#6	STR	35′-11″	647
A117	6	#6	STR	2′-7″	23													A317	16	#6	STR	2′-4″	56													S7	6	#8	STR	36′-4″	582
A118	12	#6	STR	2′-6″	45																																				
																																			G1	8	#5	STR	36′-0″	300
																																			REINFORCING STEEL				18,278 LBS	

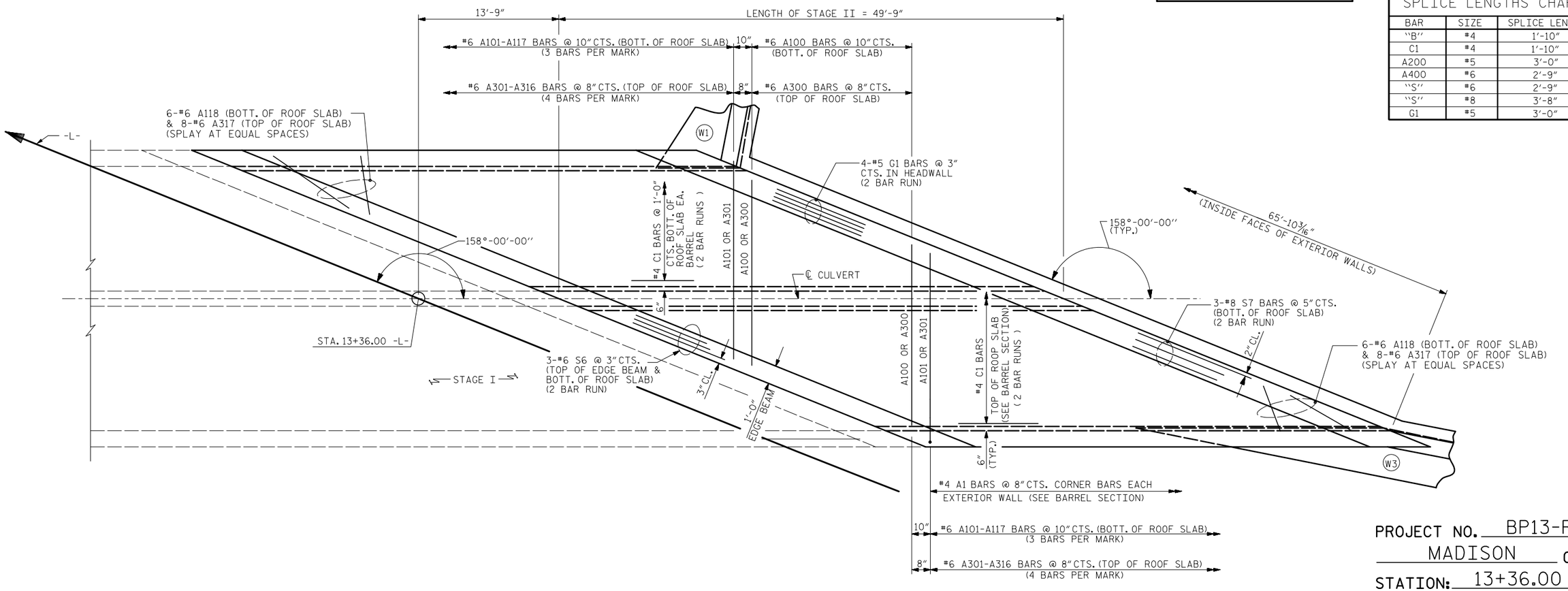
BAR TYPE



DIMENSIONS ARE OUT TO OUT

SPLICE LENGTHS CHART

BAR	SIZE	SPLICE LENGTH
''B''	#4	1′-10″
C1	#4	1′-10″
A200	#5	3′-0″
A400	#6	2′-9″
''S''	#6	2′-9″
''S''	#8	3′-8″
G1	#5	3′-0″



PLAN - ROOF SLAB

PROJECT NO. BP13-R022

MADISON COUNTY

STATION: 13+36.00 -L-

SHEET 9 OF 12

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
Marshall G. Cheek, Jr.
6/5/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 12 FT. X 6 FT. CONCRETE BOX CULVERT 158°-00′-00″ SKEW STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-9
1			3			TOTAL
2			4			12

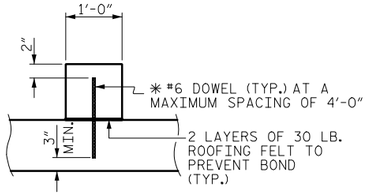
DRAWN BY :	ZCS	DATE :	6/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD:	ZCS	DATE :	7/24

NOTES

THE ENTIRE COST OF WORK REQUIRED TO PLACE EXCAVATED MATERIAL OR SUPPLEMENTAL MATERIAL AS SHOWN ON THE PLANS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE BID FOR CULVERT EXCAVATION.

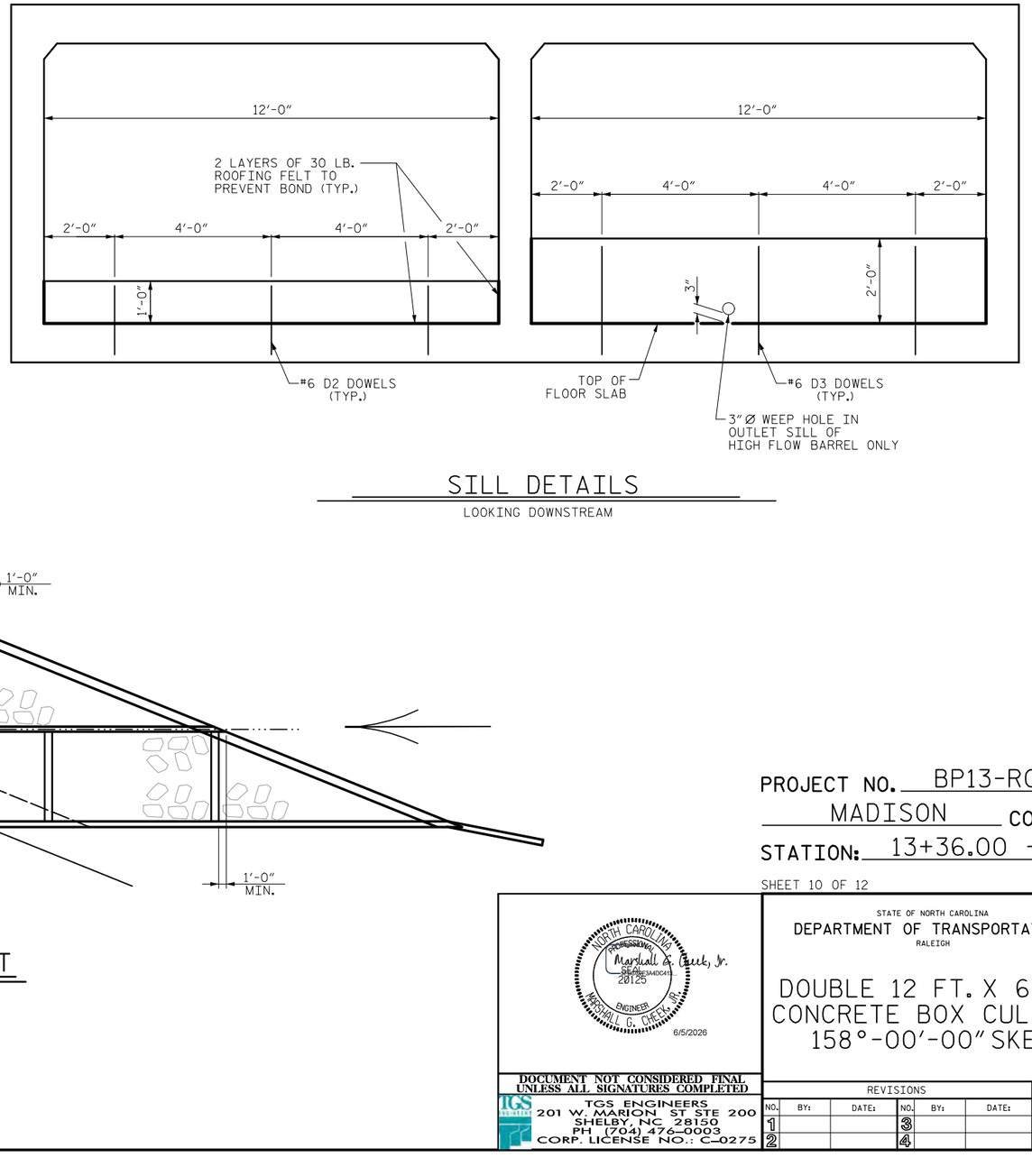
THE ENTIRE COST OF WORK REQUIRED TO CONSTRUCT THE SILLS SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE ENGINEER, IN CONSULTATION WITH DEO STAFF, SHALL REVIEW ALL MATERIAL TO BE USED AS BACKFILL PRIOR TO CONDUCTING THE BACKFILL ACTIVITY. BACKFILL SHALL CONSIST OF NATIVE MATERIAL ONLY UNLESS THE ENGINEER, IN CONSULTATION WITH THE DEO STAFF, DETERMINES THAT (1) THE NATIVE MATERIAL IS UNSUITABLE, OR (2) ADDITIONAL MATERIAL IS REQUIRED TO SUPPLEMENT THE NATIVE MATERIAL. THE CHOSEN BACKFILL MATERIAL SHALL NOT HAVE ADVERSE EFFECTS TO AQUATIC LIFE, AQUATIC LIFE PASSAGE, OR WATER QUALITY. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION.



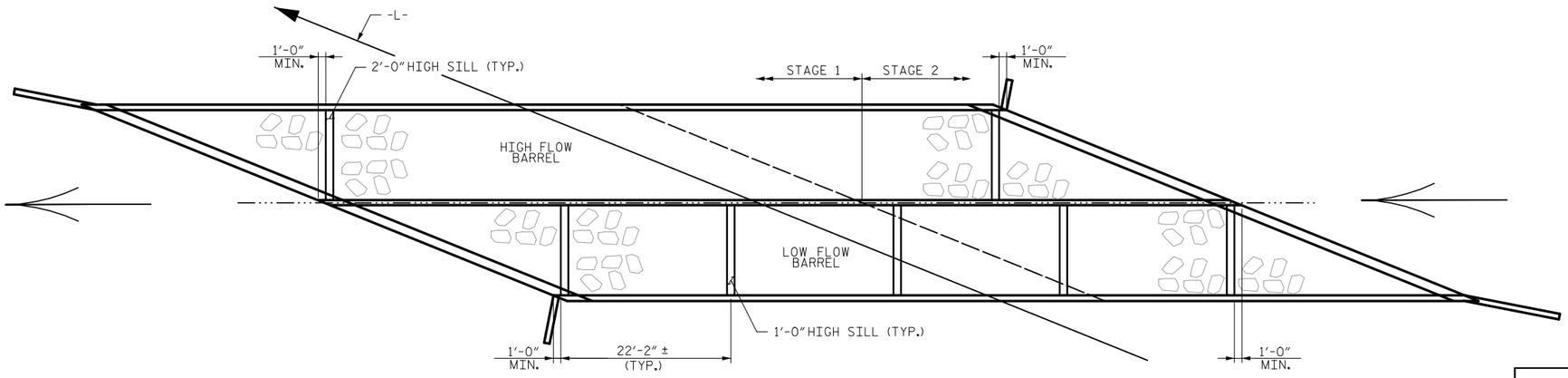
SECTION THROUGH SILL

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



SILL DETAILS

LOOKING DOWNSTREAM



PLAN OF FLOOR SILL LAYOUT

PROJECT NO. BP13-R022

MADISON COUNTY

STATION: 13+36.00 -L-

SHEET 10 OF 12

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
Marshall G. Cheek, Jr.
6/5/2026

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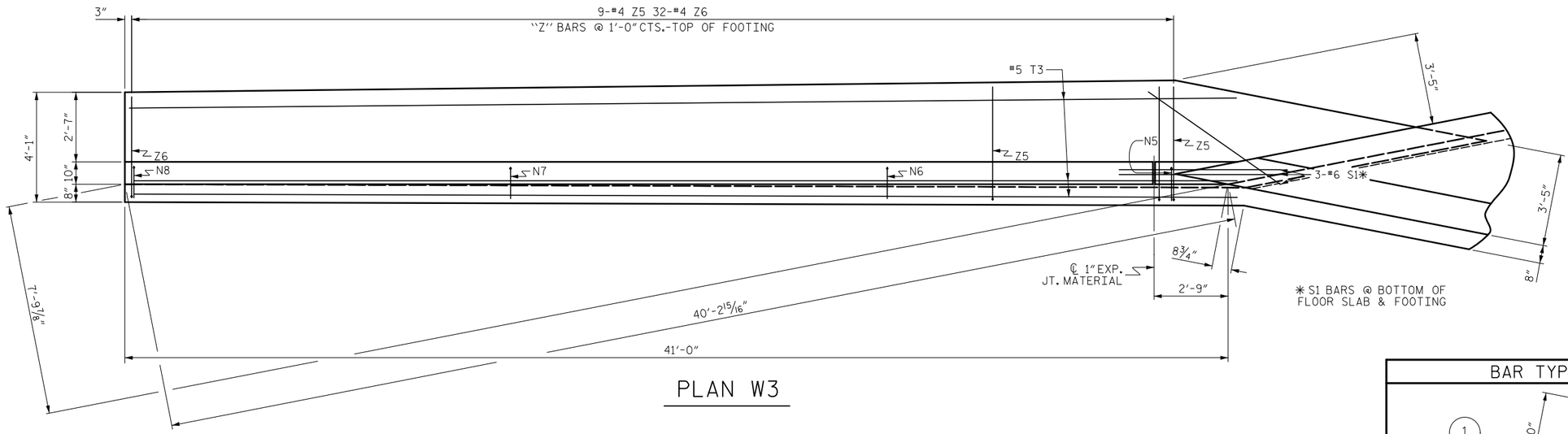
TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

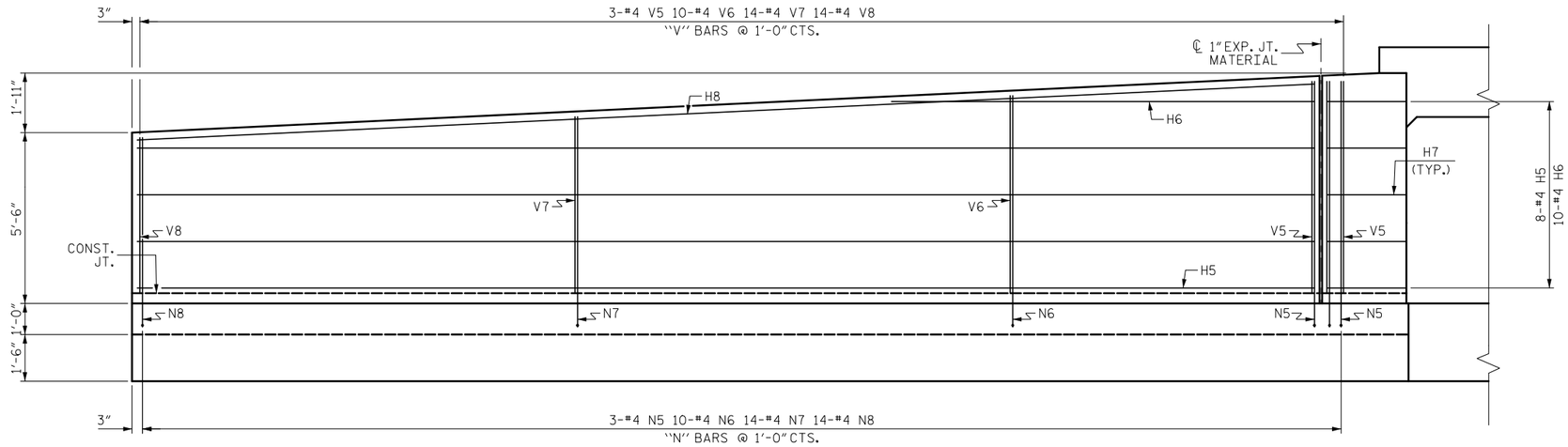
DOUBLE 12 FT. X 6 FT. CONCRETE BOX CULVERT
158°-00'-00" SKEW

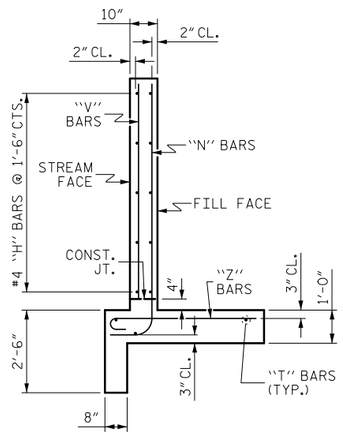
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-10
1			3			TOTAL SHEETS
2			4			12

DRAWN BY : ZCS DATE : 6/23
CHECKED BY : MGC DATE : 7/23

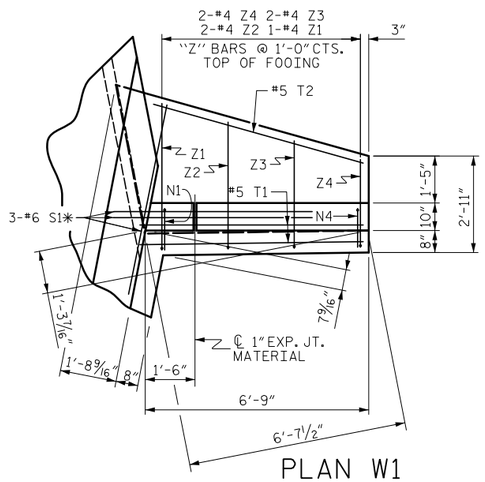


PLAN W3



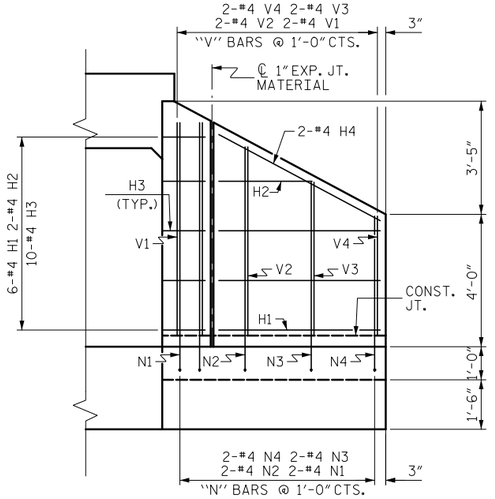


TYPICAL WING SECTION



ELEVATION W3

PLAN W1



ELEVATION W1

BILL OF MATERIAL

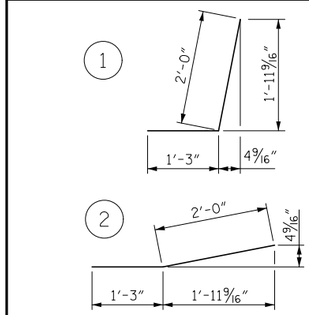
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	6	#4	STR	4'-10"	19
H2	2	#4	STR	2'-9"	4
H3	10	#4	1	3'-3"	22
H4	2	#4	STR	5'-6"	7
H5	8	#4	STR	37'-10"	202
H6	2	#4	STR	13'-7"	18
H7	10	#4	2	3'-3"	22
H8	2	#4	STR	37'-11"	51
N1	2	#4	3	8'-5"	11
N2	2	#4	3	7'-8"	10
N3	2	#4	3	6'-8"	9
N4	2	#4	3	5'-7"	7
N5	3	#4	3	8'-10"	18
N6	10	#4	3	8'-4"	56
N7	14	#4	3	7'-8"	72
N8	14	#4	3	7'-0"	65
S1	6	#6	STR	6'-0"	54
T1	2	#5	STR	6'-9"	14
T2	1	#5	STR	6'-7"	7
T3	3	#5	STR	41'-0"	128
V1	2	#4	STR	6'-5"	9
V2	2	#4	STR	5'-8"	8
V3	2	#4	STR	4'-7"	6
V4	2	#4	STR	3'-7"	5
V5	3	#4	STR	6'-9"	14
V6	10	#4	STR	6'-4"	42
V7	14	#4	STR	5'-8"	53
V8	14	#4	STR	5'-0"	47
Z1	1	#4	4	4'-11"	3
Z2	2	#4	4	4'-3"	6
Z3	2	#4	4	3'-8"	5
Z4	2	#4	4	3'-1"	4
Z5	9	#4	4	4'-8"	28
Z6	32	#4	4	4'-3"	91

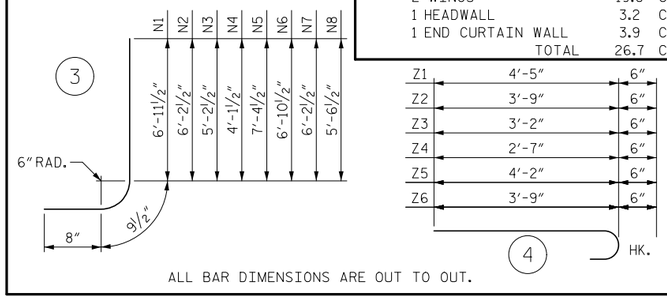
REINFORCING STEEL FOR 2 WINGS 1117 LBS

CLASS A CONCRETE

2 WINGS	19.6 CY
1 HEADWALL	3.2 CY
1 END CURTAIN WALL	3.9 CY
TOTAL	26.7 CY

BAR TYPES





ALL BAR DIMENSIONS ARE OUT TO OUT.

NOTES

G1 BARS IN HEADWALL ARE INCLUDED WITH BARREL REINFORCING STEEL.

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

PROJECT NO. BP13-R022

MADISON COUNTY

STATION: 13+36.00 -L-

SHEET 11 OF 12

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR. Signed by: Marshall G. Cheek, Jr. 6/5/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY NC 28150
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CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STAGE II WINGS W1 & W3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-11
1			3			TOTAL SHEETS
2			4			12

DRAWN BY :	ZCS	DATE :	6/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD:	ZCS	DATE :	7/24

8/20/2024
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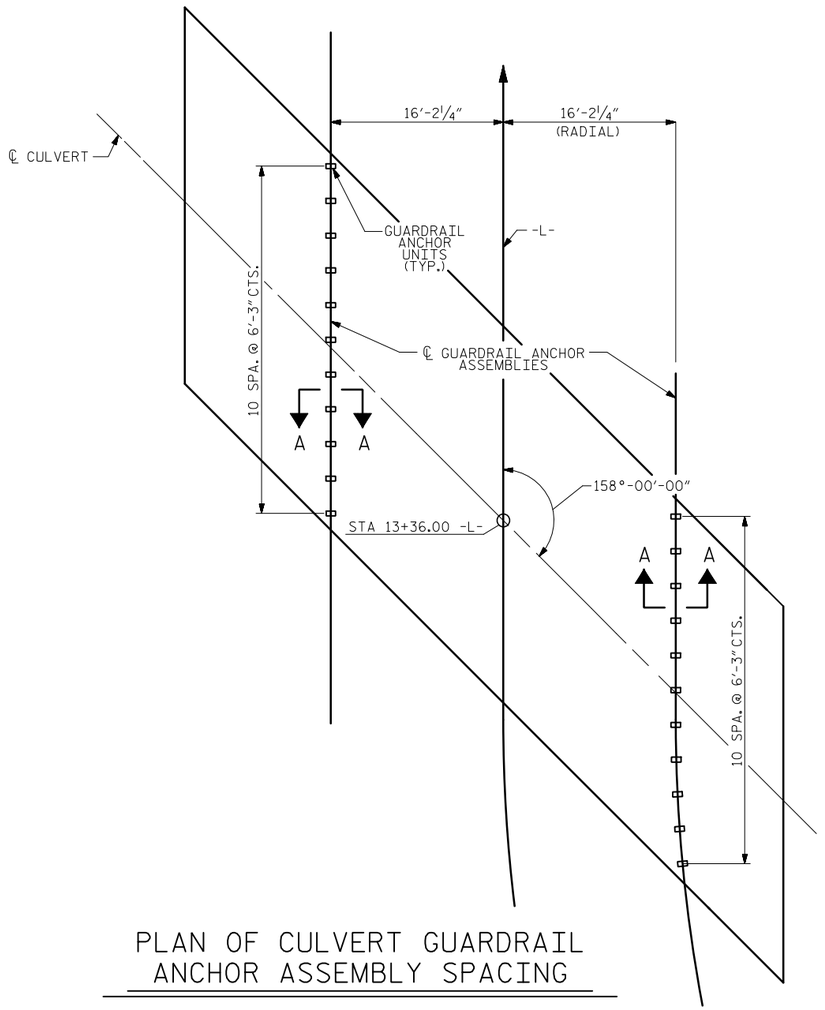
User:ZSmith



PLAN OF CULVERT 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 2¼" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1"Ø X 2 ¼" 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.

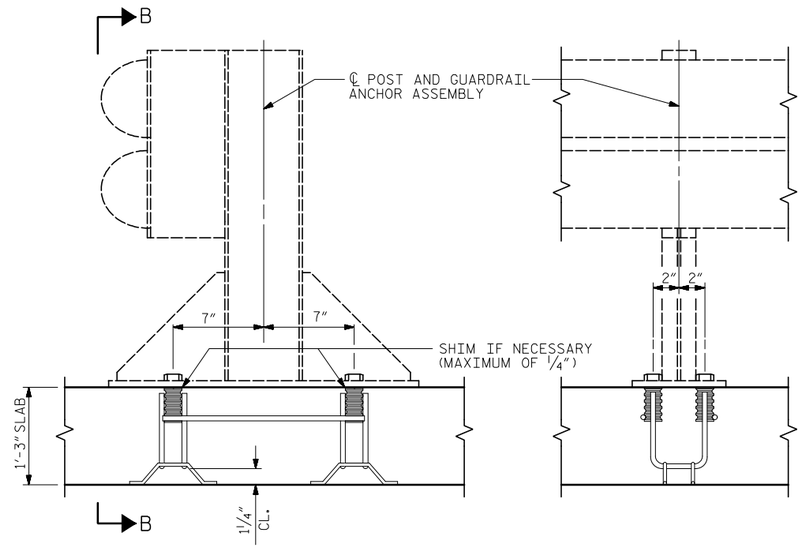
FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

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.

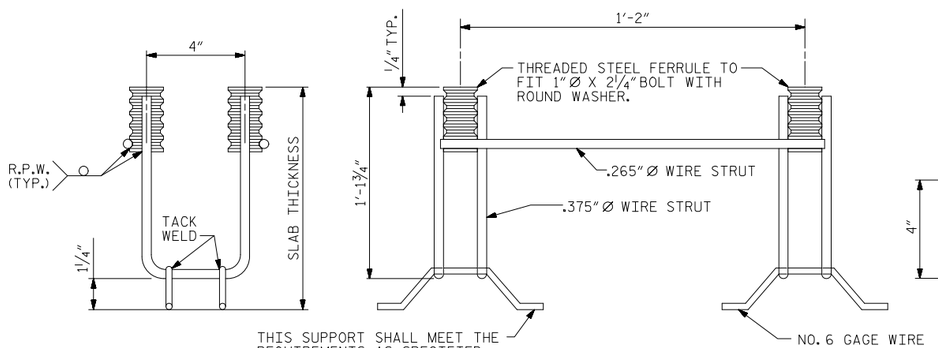
SLAB REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR GUARDRAIL ANCHOR ASSEMBLY. CARE SHOULD BE TAKEN TO KEEP THE SHIFTING OF REINFORCING STEEL TO A MINIMUM.

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.



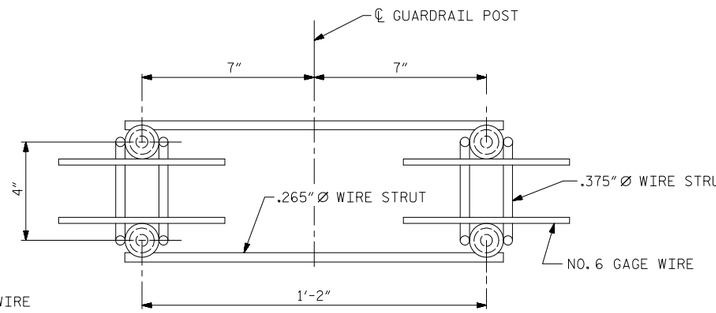
SECTION A-A

SECTION B-B



ELEVATION

SIDE VIEW



PLAN

PROJECT NO. BP13-R022

MADISON COUNTY

STATION: 13+36.00 -L-

SHEET 12 OF 12

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
Marshall G. Cheek, Jr.
6/5/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ANCHORAGE DETAILS FOR GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-12
1			3			TOTAL SHEETS
2			4			12

ASSEMBLED BY :	ZCS	DATE :	8/24
CHECKED BY :	MGC	DATE :	8/24
DRAWN BY : FCJ	6/88	REV. 10/1/11	MAA/GM
CHECKED BY : ARB	6/88	REV. 12/17	MAA/THC
		REV. 6/19	MAA/THC

GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

STD. NO. GRA1 (SHT 1)

8/20/2024
X:\NCDOT\Division 13 Madison 2019\Madison 63\Structures\Final plans\DGNs\411_023_BP13_R022_SMU_CU12_560063.dgn
User:ZSmith

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2024 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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