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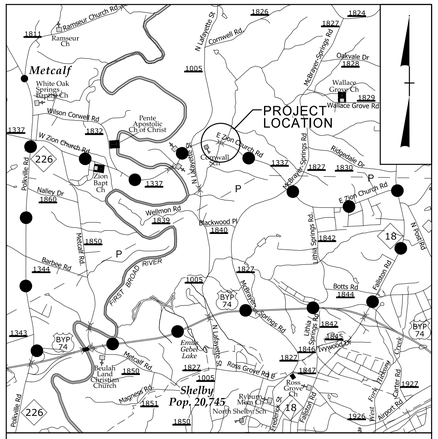
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01/16/24

TIP PROJECT: BP12-R034

CONTRACT: DL00404

See Sheet 1A For Index of Sheets



VICINITY MAP (NTS)

OFFSITE DETOUR

90% PLAN SET SUBMITTAL

NAD 83 2011

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CLEVELAND COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP12-R034	1	

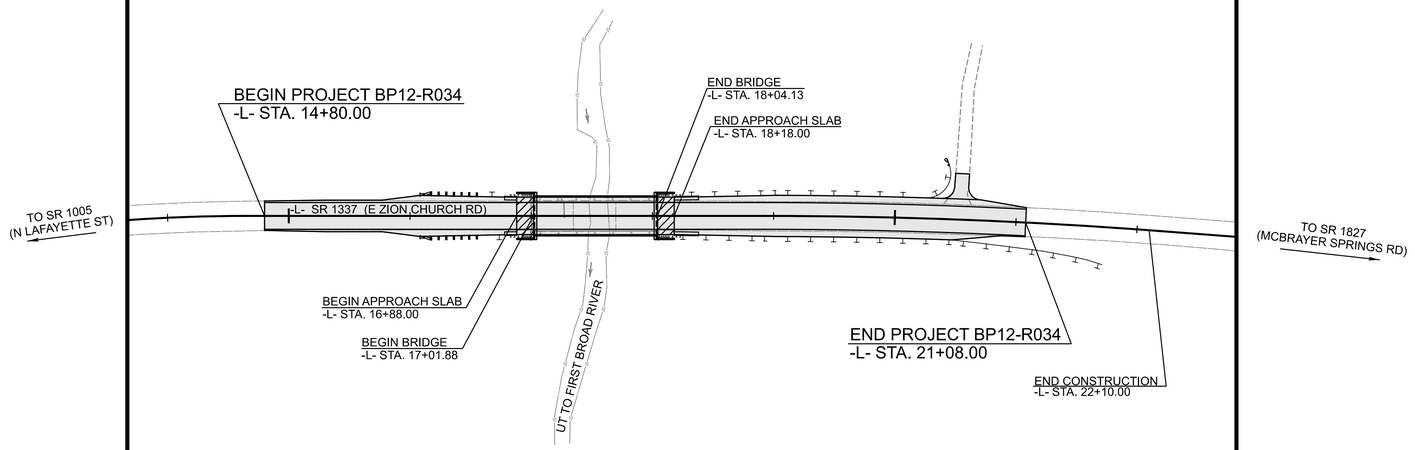
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP12.R034.1		P.E.
BP12.R034.2		ROW/UTIL.
BP12.R034.3		CONST.

LOCATION: *REPLACEMENT OF BRIDGE NO. 220012 ON SR 1337 (ZION CHURCH RD) OVER UT TO FIRST BROAD RIVER*

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



4



THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

30 15 0 30 60
PLANS

30 15 0 30 60
PROFILE (HORIZONTAL)

6 3 0 6 12
PROFILE (VERTICAL)

DESIGN DATA

ADT 2026 = 2,289
ADT 2046 = 2,793
V = 50 MPH
TTST = 10%
FUNC CLASS = LOCAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT BP12-R034 = 0.100 MILES
LENGTH OF STRUCTURE TIP PROJECT BP12-R034 = 0.019 MILES
TOTAL LENGTH OF TIP PROJECT BP12-R034 = 0.119 MILES

PLANS PREPARED BY:

VOLKERT
5430 Wade Park Blvd., Suite 410
Raleigh, NC 27609 Tel. 919-854-0344
NC License No. F-0785

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
DECEMBER 12, 2025

LETTING DATE:
DECEMBER 8, 2026

PLANS PREPARED FOR:

DIVISION OF HIGHWAYS
DIVISION 12
1710 E. MARION ST (US 74 BUS)
SHELBY, NC 28151

CHRISTOPHER H. LEE, PE
PROJECT ENGINEER

W. CRAIG PARKER, PE
PROJECT DESIGN ENGINEER

JOSHUA B. WHITE, PE, PLS
NCDOT CONTACT
DIVISION 12 PROJECT TEAM LEAD

HYDRAULICS ENGINEER

WSP 434 FAYETTEVILLE ST. #1500 RALEIGH, N.C. 27601 NC ENG F-0165

Signed by: James O Britt
SIGNATURE: *P.E.*

NORTH CAROLINA PROFESSIONAL SEAL 052432 ENGINEER JAMES O BRITT

11/13/2026

ROADWAY DESIGN ENGINEER

Signed by: W. Craig Parker
SIGNATURE: *P.E.*

NORTH CAROLINA PROFESSIONAL SEAL 25474 ENGINEER W CRAIG PARKER

11/13/2026

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

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INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1 AND 2C-2	METHOD OF PIPE INSTALLATION - DETAIL IN LIEU OF STANDARDS FOR DRAWING 300.01, SHEETS 1 AND 2 OF 2
2C-3 AND 2C-5	GUARDRAIL PLACEMENT - DETAIL IN LIEU OF STANDARDS FOR DRAWING 862.01, SHEETS 4, 6, AND 14 OF 15
3B-1	ROADWAY SUMMARIES
3D-1	DRAINAGE SUMMARY
3G-1	GEOTECHNICAL SUMMARY OF SUBSURFACE DRAINAGE
4	PLAN SHEET
5	PROFILE SHEET
RW-01 THRU RW-04	SURVEY CONTROL SHEETS
TMP-1 THRU TMP-5	TRAFFIC MANAGEMENT PLANS (INCLUDES SIGNING AND DELINEATION)
EC-1 THRU EC-5	EROSION CONTROL PLANS
UC-1 THRU UC-5	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1 THRU X-12	CROSS-SECTIONS
S-1 THRU S-18	STRUCTURES PLANS

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

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. 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 WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE AT&T & CLEVELAND COUNTY WATER.

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.

2024 ROADWAY ENGLISH STANDARD DRAWINGS EFF. 08-11-2025
REV. 11-26-2025

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	
310.10	DRIVEWAY PIPE CONSTRUCTION
DIVISION 4 - MAJOR STRUCTURES	
423.01	BRIDGE APPROACH FILLS - TYPE 1 APPROACH FILL FOR BRIDGE ABUTMENT
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	METHOD OF SHOULDER CONSTRUCTION - HIGH SIDE OF SUPER-ELEVATED CURVE - METHOD I
DIVISION 8 - INCIDENTALS	
815.02	SUBSURFACE DRAIN
840.00	CONCRETE BASE PAD FOR DRAINAGE STRUCTURES
840.25	ANCHORAGE FOR FRAMES - BRICK OR CONCRETE OR PRECAST
840.29	FRAMES AND NARROW SLOT FLAT GRATES
840.46	TRAFFIC BEARING PRECAST DRAINAGE STRUCTURE
840.66	DRAINAGE STRUCTURE STEPS
846.01	CONCRETE CURB, GUTTER AND CURB & GUTTER
846.04	DROP INLET INSTALLATION IN SHOULDER BERM GUTTER
862.01	GUARDRAIL PLACEMENT
862.02	GUARDRAIL INSTALLATION
862.03	STRUCTURE ANCHOR UNITS
876.01	RIP RAP IN CHANNELS AND DITCHES
876.02	GUIDE FOR RIP RAP AT PIPE OUTLETS
876.04	DRAINAGE DITCHES WITH CLASS 'B' RIP RAP

BP12-R034
3RD1 | 1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25774 ENGINEER CRAIG PARKER
Docusigned by: Craig Parker
9/30/2026

VOLKERT
5430 Wade Park Blvd., Suite 410
Raleigh, NC 27606 Tel. 919-854-0344
NC License No. F-0765

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STATE OF NORTH CAROLINA
CLEVELAND COUNTY

05/20/24

BP12-R034
3RD1 | 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) — EIP
- Computed Property Corner
- Existing Concrete Monument (ECM) — ECM
- Parcel / Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — W
- Contaminated Site: Known or Potential

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

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

RAILROADS:
- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:
- 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 — RW
- Existing Control of Access Line — CA
- Proposed Control of Access Line — CA
- Proposed ROW and CA Line — RW CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- 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 — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

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

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

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

UTILITIES:
** 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

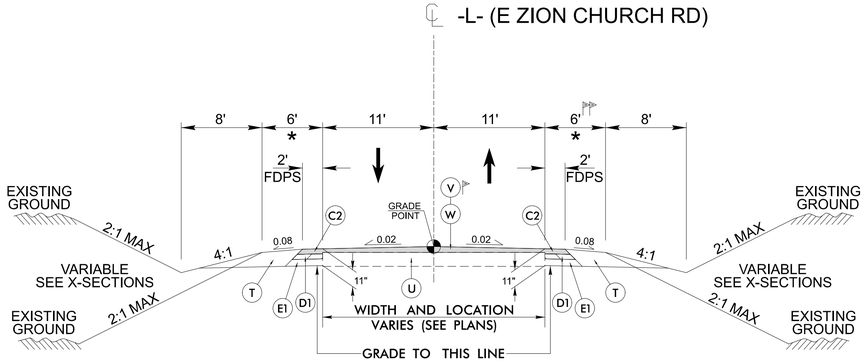
GAS:
- Gas Valve
- Gas Meter
- U/G Gas Line Test Hole (SUE - LOS A)*
- U/G Gas Line (SUE - LOS B)* — G
- U/G Gas Line (SUE - LOS C)* — G
- U/G Gas Line (SUE - LOS D)* — G
- Above Ground Gas Line — A/G Gas

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.

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5/26/20



TYPICAL SECTION NO. 1

* 9' WITH GUARDRAIL

USE TYPICAL SECTION NO. 1 AS FOLLOWS:

-L- STA. 14+80.00 TO 15+70.00
-L- STA. 18+65.00 TO 22+10.00

NOTES:

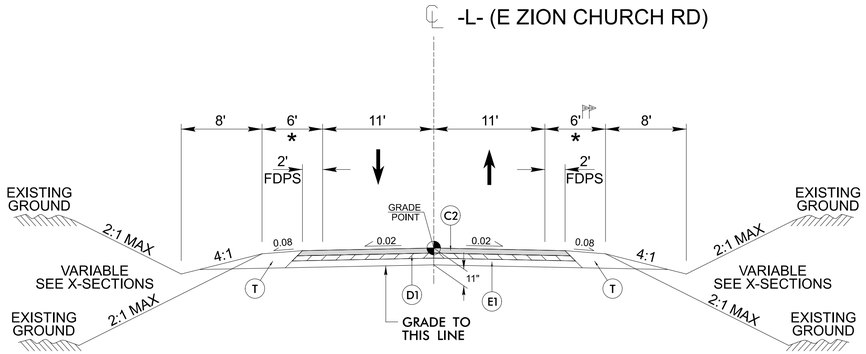
MILL , WEDGE, AND OVERLAY EXISTING PAVEMENT AS NEEDED TO PROVIDE CORRECT SUPER (SEE PLANS) AS FOLLOWS:
-L- STA. 19+00.00 TO 19+70 RT
-L- STA. 19+70.00 TO 21+08 LT/RT

SHOULDER WORK ONLY AS FOLLOWS:
-L- STA. 21+08.00 TO 22+10.00 RT

USABLE SHOULDER WIDTH = 9' AS FOLLOWS:
-L- STA. 15+30.00 TO 17+01.88 (BEGIN BRIDGE) RT

PAVEMENT SCHEDULE (FINAL)	
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1½" OR GREATER THAN 2" IN DEPTH
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2½" OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" OR GREATER THAN 5½" IN DEPTH
R1	CONCRETE SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	INCIDENTAL MILLING BITUMINOUS PAVEMENT (1.5" MAX. DEPTH). SEE MILLING DETAIL
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAILS)

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

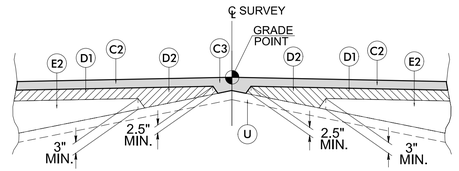


TYPICAL SECTION NO. 2

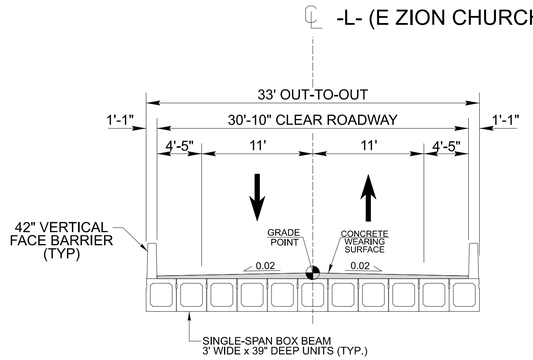
* 9' WITH GUARDRAIL

USE TYPICAL SECTION NO. 2 AS FOLLOWS:

-L- 15+70.00 TO 17+01.88 (BEGIN BRIDGE)
-L- STA. 18+04.13 (END BRIDGE) 18+65.00



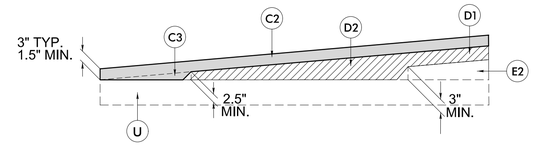
DETAIL SHOWING METHOD OF WEDGING NO. 1



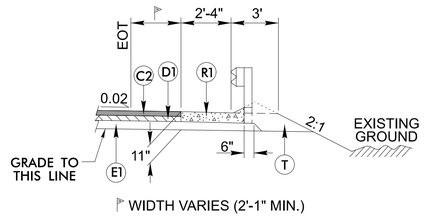
BRIDGE SKETCH NO. 1

USE BRIDGE TYPICAL SECTION AS FOLLOWS:

-L- STA. 17+01.88 (BEGIN BRIDGE) TO
-L- STA. 18+04.13 (END BRIDGE)
SEE STRUCTURES PLANS FOR STRUCTURE CONSTRUCTION DETAILS



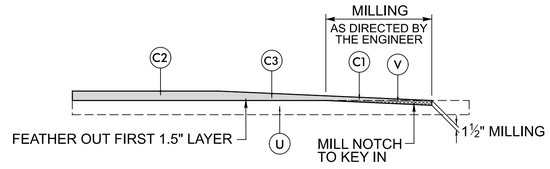
WEDGING DETAIL FOR RESURFACING



TYPICAL SECTION FOR SHOULDER BERM GUTTER

(NOTE: SCALE ENLARGED FOR DETAIL)

-L- STA 16+78.00 TO -L- STA 16+88.00 LT
-L- STA 16+78.00 TO -L- STA 16+88.00 RT
-L- STA 18+18.00 TO -L- STA 18+38.00 LT
-L- STA 18+18.00 TO -L- STA 18+38.00 RT



INCIDENTAL MILLING OF EXISTING PAVEMENT AS DIRECTED BY ENGINEER

-L- STA 14+80.00 TO -L- STA 15+10.00

BP12-R034
3RD1 | 2A-1

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25874 ENGINEER CRAIG PARKER
Digitally signed by Craig Parker
9/29/2026

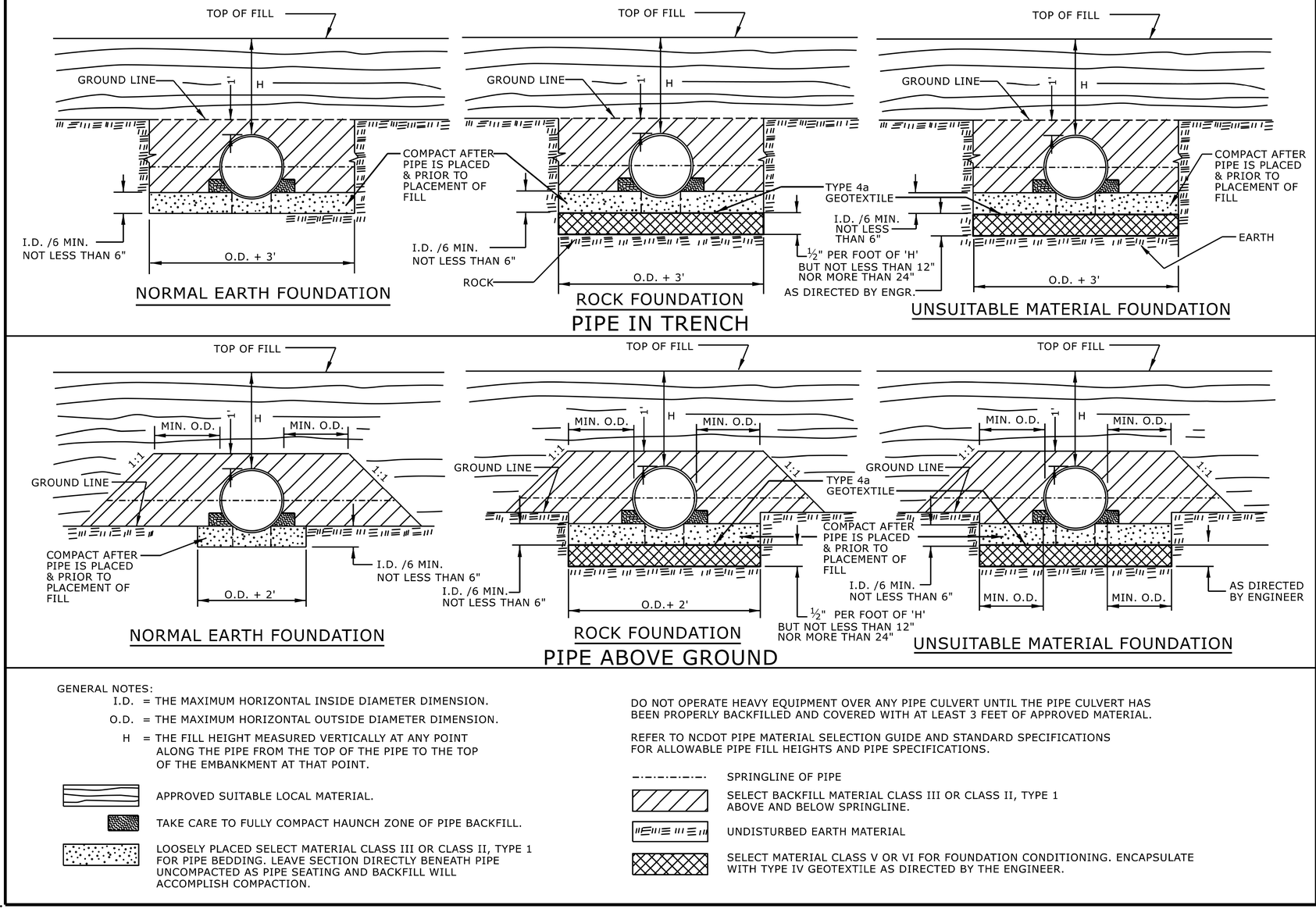
VOLKERT
5430 Wade Park Blvd., Suite 410
Raleigh, NC 27609 Tel. 919-854-0344
NC License No. F-0765

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 038176 ENGINEER SHINAI ZHANG
Digitally signed by Shinai Zhang
9/29/2026

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STATE OF NORTH CAROLINA
CLEVELAND COUNTY

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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
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DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE

SHEET 1 OF 2

300.01

BP12-R034

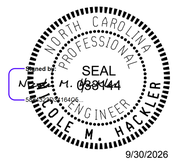
3RD1 | 2C-1

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STATE OF NORTH CAROLINA
CASWELL COUNTY





9/30/2026

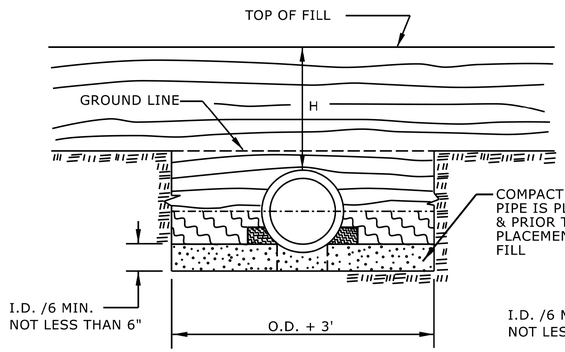
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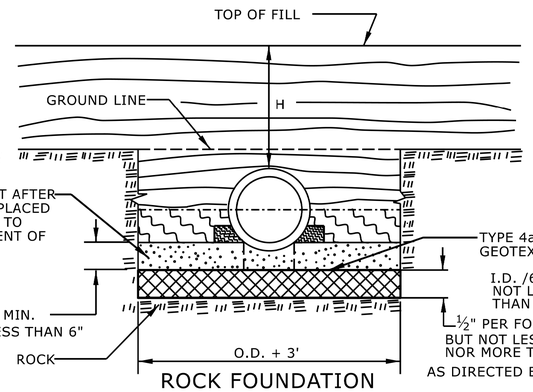
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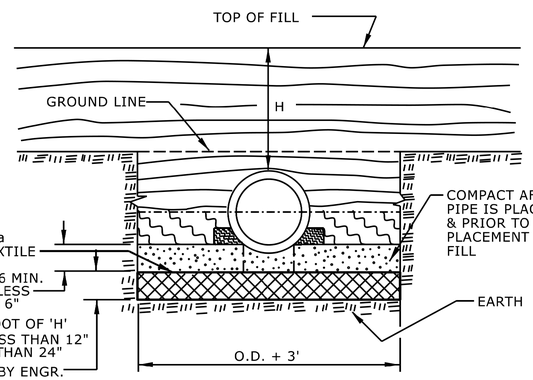
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NORMAL EARTH FOUNDATION

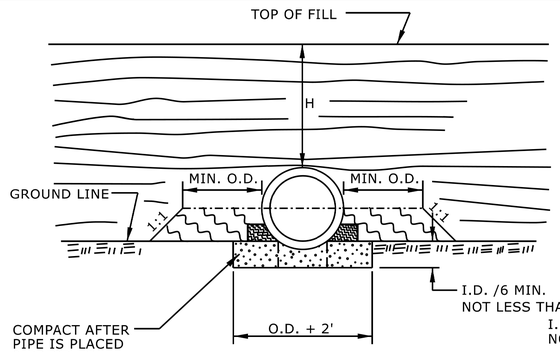


ROCK FOUNDATION

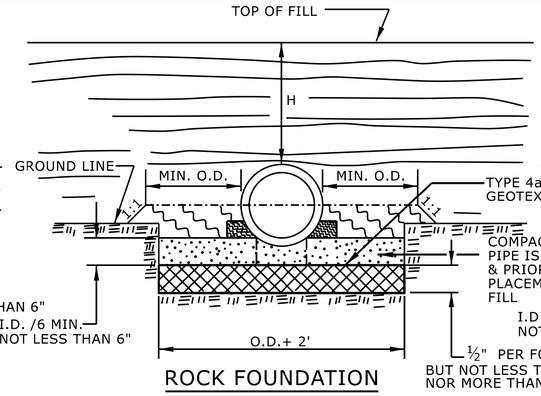


UNSUITABLE MATERIAL FOUNDATION

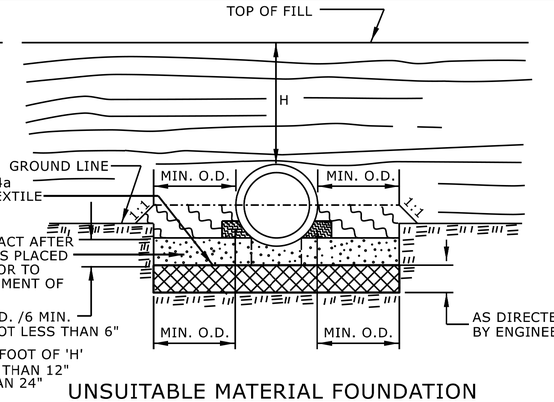
PIPE IN TRENCH



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, BELOW SPRINGLINE.

UNDISTURBED EARTH MATERIAL

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

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

ROADWAY DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

RIGID PIPE

SHEET 2 OF 2

300.01

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CASWELL COUNTY





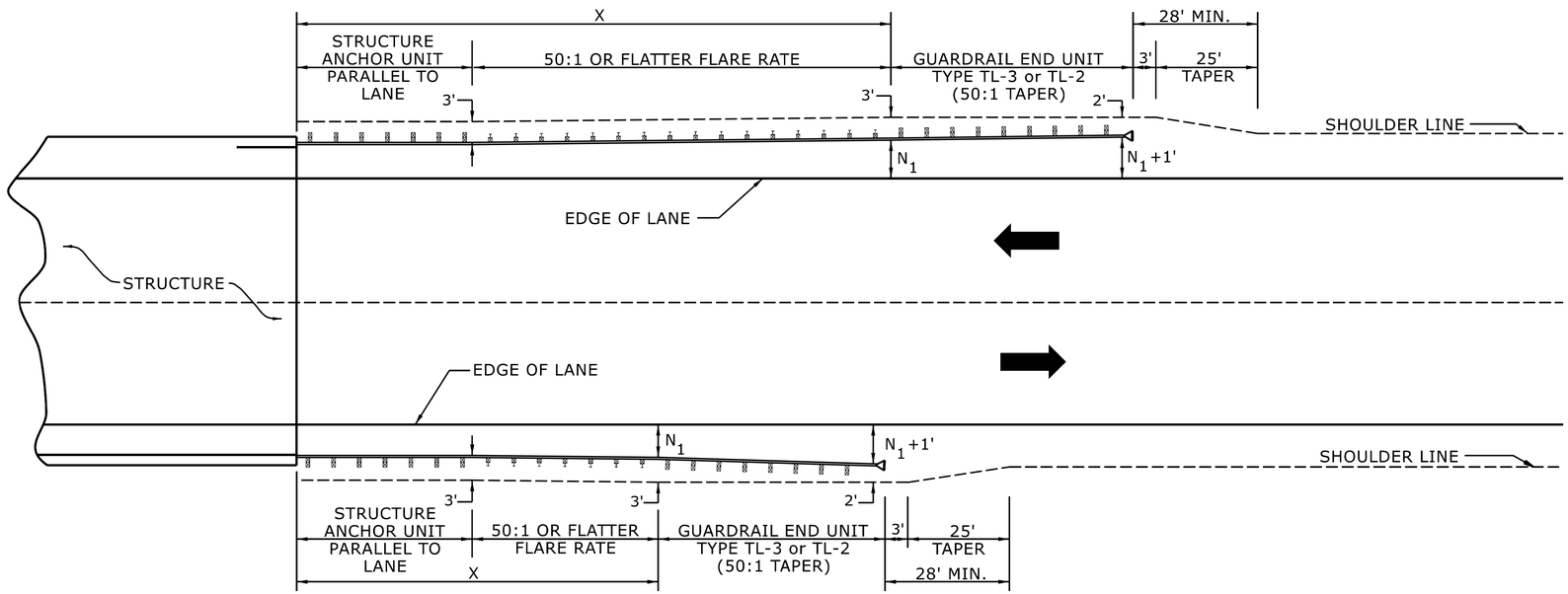
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USE FLARE RATE AS THE CONTROL IF THE "N_1" DISTANCE IS NOT OBTAINED.
("N_1" IS BASED ON SHOULDER WIDTHS IN THE ROADWAY DESIGN MANUAL)

SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

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

GUARDRAIL LENGTH OF NEED (X) IS CALCULATED BASED ON THE AASHTO ROADSIDE DESIGN GUIDE.

LENGTHS AND OFFSETS FOR PROPOSED GUARDRAIL AT TWO LANE - TWO WAY LOCATIONS

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DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

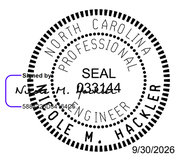
SHEET 4 OF 15
862D01

BP12-R034
3RD1 | 2C-3

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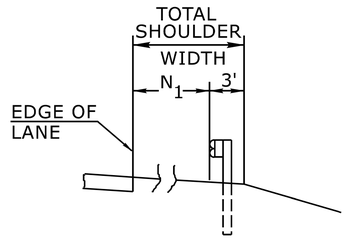
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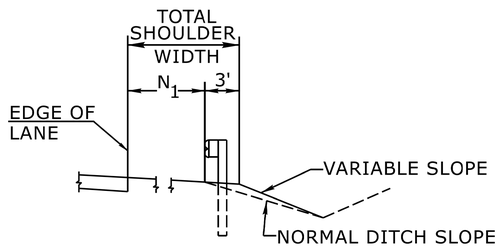
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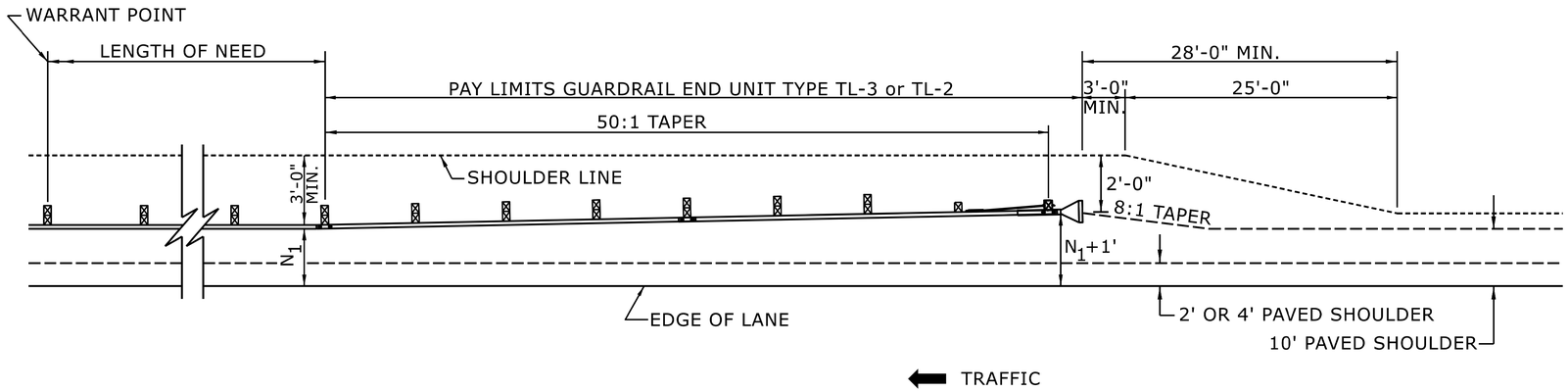


FILL SECTION



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
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 6 OF 15
862D01

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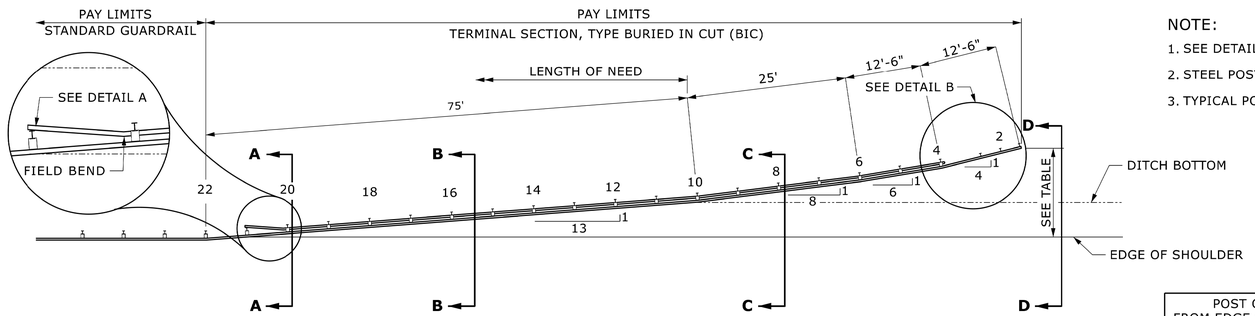
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DRAWING NOT TO SCALE

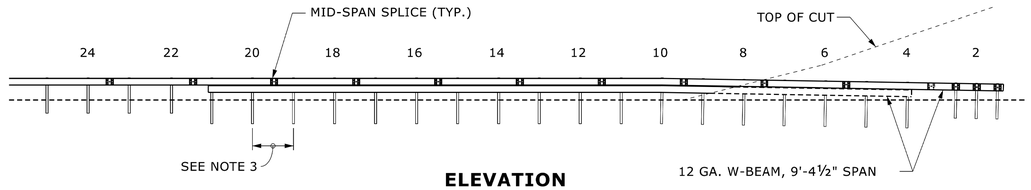


PLAN

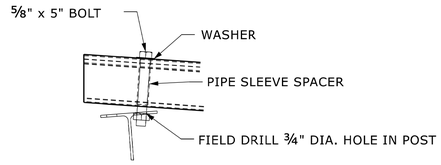
NOTE:

1. SEE DETAIL SHEET 2 OF 2 FOR OTHER DETAILS.
2. STEEL POSTS SHOWN.
3. TYPICAL POST SPACING IS 6'-3" UNLESS OTHERWISE NOTED.

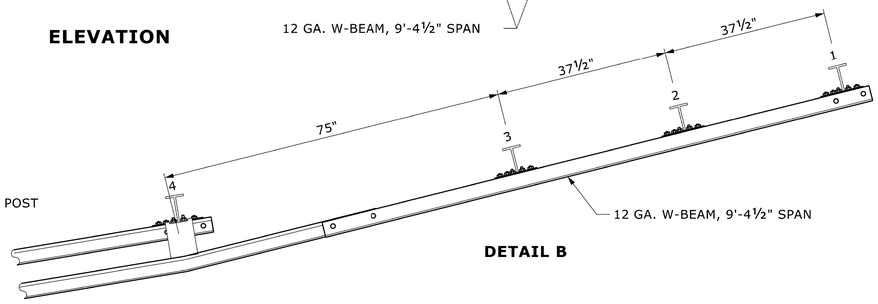
POST OFFSETS FROM EDGE OF SHOULDER	
POST	DISTANCE
1	13'-11¾"
4	10'-11"
6	8'-10¼"
10	69"



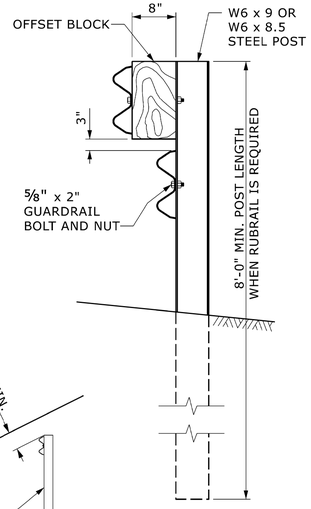
ELEVATION



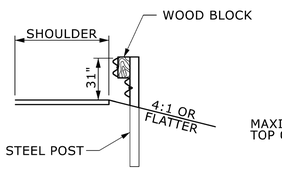
DETAIL A



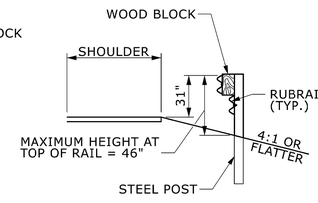
DETAIL B



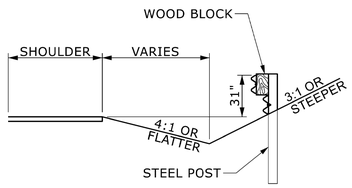
STEEL POST AND BLOCK DETAIL



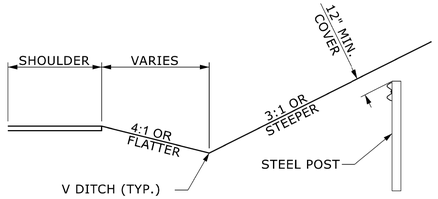
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

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

ROADWAY DETAIL DRAWING FOR

GUARDRAIL PLACEMENT

BURIED IN CUT END UNIT

SHEET 14 OF 15

862D01

BP12-R034

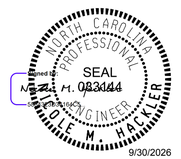
3RD1 | 2C-5

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SEE TITLE BLOCK

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

SUMMARY OF EARTHWORK

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
-L-	(BEG BRIDGE)				
14+80.00	17+01.88	363	274	0	89
SUBTOTALS:		363	274	0	89
-L- (END BRIDGE)					
18+04.13	22+10.00	192	1,580	1,388	
SUBTOTALS:		192	1,580	1,388	
TOTALS:		555	1,854	1,388	89
LOSS DUE TO CLEARING & GRUBBING				0	
USE WASTE IN LIEU OF BORROW				-89	-89
SHOULDER MATERIAL			129	129	
PROJECT TOTALS:		555	1,983	1,428	0
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				71	
GRAND TOTALS:		555	1,983	1,499	
SAY:		**580**		**1,600**	

NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY VOLKERT, INC. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

PAVEMENT STRUCTURE VOLUME = 464 CUBIC YARDS

PER GEOTECH RECOMMENDATION DATED 9/3/2025 TO BE USED IN THE DISCRETION OF THE RESIDENT ENGINEER.:

ESTIMATED 450 CUBIC YARDS OF UNDERCUT

ESTIMATED 400 CUBIC YARDS OF SELECT GRANULAR MATERIAL

ESTIMATED 400 SQUARE YARDS OF GEOTEXTILE FOR SOIL STABILIZATION

EXISTING ASPHALT PAVEMENT REMOVAL

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	SQUARE YARDS
-L-	15+70.00	17+00.16	CL	346.06
-L-	18+04.52	18+65.00	CL	159.96
			TOTAL:	506.02
			SAY:	**530**

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

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT	LENGTH (LF)
-L-	16+78.00	16+88.00	LT	10.00
-L-	16+78.00	16+88.00	RT	10.00
-L-	18+18.00	18+38.00	LT	20.00
-L-	18+18.00	18+38.00	RT	20.00
			TOTAL:	60.00
			SAY:	**65**

BP12-R034

3RD1 | 3B-1

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STATE OF NORTH CAROLINA
CLEVELAND COUNTY



DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

GUARDRAIL SUMMARY

"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

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL WIDTH	FLARE LENGTH		W		ANCHORS						IMPACT ATTENUATOR		SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVE	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	Type III	B-77	GREU TL-3	GREU TL-2	CAT-1	AT-1	G	NG				
-L-	16+08.13	17+01.88	LT	93.75				17+01.88	4'-5"	7'-5"		75'		1.5'	1		1							105.29		
-L-	16+08.13	17+01.88	RT	93.75			17+01.88		4'-5"	7'-5"	75'		1.5'		1		1							104.86		
-L-	18+04.13	20+45+/-	LT	218.75	43.75		20+00+/-	18+04.13	6'	9'					1					1						
-L-	18+04.13	21+72.88	RT	368.75			18+04.13	20+50+/-	6'	9'		125'		13.98'	1											End Unit is Buried In Cut
SUBTOTALS:				775.00	43.75										4		2			1				**210.15**		
ANCHOR DEDUCTIONS:		2 TYPE TL-3 @ 50.00' =		100.00																						
		4 TYPE III @ 18.75' =		75.00																						
		1 TYPE AT-I @ 6.25' =			6.25																					
TOTALS:				**600.00**	**37.50**																			**210.15**		
SAY:				**625.00**	**50.00**																			**212.50**		
ADDITIONAL GUARDRAIL POSTS = 5 EA																										

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

| STATION | LOCATION (LT,RT, OR CL) | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SLOPE CRITICAL | DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) SIZE 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | C.S. PIPE (UNLESS NOTED OTHRWISE) THICKNESS OR GAUGE 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | CLASS IV R.C. PIPE (UNLESS OTHERWISE NOTED) SIZE 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | 15" SIDE DRAIN PIPE | 18" SIDE DRAIN PIPE | 24" SIDE DRAIN PIPE | ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P. | CU. YDS. C.S.P. | QUANTITIES FOR DRAINAGE STRUCTURES * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') PER EACH (0' THRU 5.0') | LIN. *FT. A 5.0' THRU 10.0' | LIN. *FT. B 10.0' AND ABOVE | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G | D.I. STD. 840.13 | D.I. FRAME & GRATE STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR 840.26 | G.D.I. TYPE "B" STD. 840.18 OR 840.27 | G.D.I. TYPE "D" STD. 840.19 OR 840.28 | G.D.I. FRAME WITH GRATE STD. 840.22 | G.D.I. FRAME WITH TWO GRATES STD. 840.22 | G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24 | G.D.I. (N.S. SAG) FRAME WITH TWO GRATES STD. 840.24 | J.B. STD. 840.31 OR 840.32 | G.D.I. (N.S. FLAT) FRAME WITH TWO GRATES STD. 840.29 | T.B.D.I. STD. 840.35 | | | | | 15" SIDE DRAIN PIPE ELBOW | 15" C.S. ELBOW | CONC. COLLARS CL. "B" C.Y. STD. 840.72 | CONC. & BRICK PIPE PLUGS, C.Y. STD. 840.71 | PIPE REMOVAL LIN.FT. | REMARKS |
|---|---|---

COMPUTED BY: Patrick F. Tomasic DATE: 9/3/2025
CHECKED BY: _____ DATE: _____

(9-17-24)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

BP12-R034
3RD1 | 3G-1

PREPARED BY

VOLKERT
5430 Wade Park Blvd., Suite 410
Raleigh, NC 27606 Tel. 919-854-0344
NC License No. F-0765

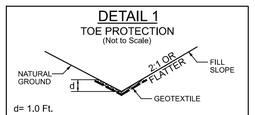
STATE OF NORTH CAROLINA
CASWELL COUNTY



Docusign Envelope ID: 775FC810-CC7A-84ED-8253-3B069A0C4E36

11/14/23

DETAIL 1
TOE PROTECTION
(Not to Scale)

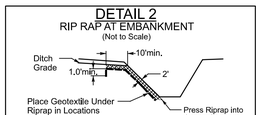


d= 1.0 Ft.

Type of Liner= Class B Rip-Rap

FROM -L- STA. 18+15 TO STA. 20+32 LT
FROM -L- STA. 21+00 TO STA. 21+35 RT

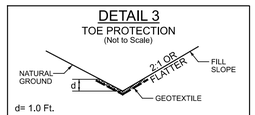
DETAIL 2
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= 26 TONS,CL II Rip-Rap, Keyed-In
29 SY Geotextile

FROM -L- STA. 17+08 TO STA. 17+41 LT

DETAIL 3
TOE PROTECTION
(Not to Scale)

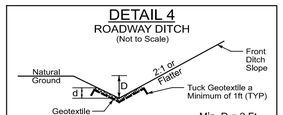


d= 1.0 Ft.

Type of Liner= Class I Rip-Rap

FROM -L- STA. 16+05 TO STA. 16+30 RT

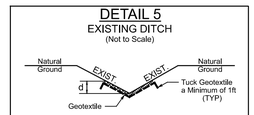
DETAIL 4
ROADWAY DITCH
(Not to Scale)



Type of Liner = CL I Rip-Rap, Keyed-In
Min. D = 2 Ft.
d = 1 Ft.

FROM -L- STA. 14+80 TO STA. 16+20 LT
FROM -L- STA. 15+02 TO STA. 16+05 RT

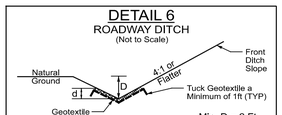
DETAIL 5
EXISTING DITCH
(Not to Scale)



Type of Liner = CL I Rip-Rap, Keyed-In
d = 1 Ft.

FROM -L- STA. 14+80 TO STA. 15+02 RT
FROM -L- STA. 16+20 TO STA. 17+09 LT
FROM -L STA. 16+30 TO STA. 16+79 RT

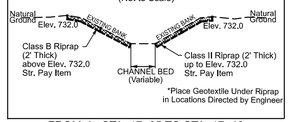
DETAIL 6
ROADWAY DITCH
(Not to Scale)



Type of Liner = CL B Rip-Rap, Keyed-In
Min. D = 2 Ft.
d = 1 Ft.

FROM -L- STA. 21+35 TO STA. 21+69 RT

DETAIL 7
BANK STABLIZATION
(Not to Scale)



FROM -L- STA. 17+05 TO STA. 17+42
FROM -L- STA. 17+64 TO STA. 18+01

CUR DATA -L-
PIc 13+62.61
Δc = 08°30'48.0" (RT)
D = 04°09'06.7"
Lc = 205.05
Tc = 102.71
R = 1,380

CUR DATA -L-
PIc 20+55.49
Δc = 04°21'57.0" (RT)
D = 01°20'01.3"
Lc = 327.35
Tc = 163.75
R = 4,296
SE = See Plans

① TURNER FAMILY INVESTMENTS LLC
DB 1558 PG 753

② ARTHUR GRAHAM PHIFER AND PATRICA J. ALLEN
DB 10E PG 37
DB 1594 PG 1500

-L- PT 14+64.94

-L- PC 18+91.74

-L- PT 22+19.09

15

20

WOODS

LINE DITCH TO A DEPTH OF 1' WITH CLASS I RIP RAP
EST 37 TNS
EST 63 SY GEOTEXTILE
SEE DETAIL 4

CLASS B RIP RAP BANK STABLIZATION ABOVE ELEV. 732.0
STRUCTURES PAY ITEM
EST 264 TONS
EST 240 SY GEOTEXTILE
SEE DETAIL 7

RIP RAP AT EMBANKMENT
SEE DETAIL 2

LINE DITCH TO A DEPTH OF 1' WITH CLASS I RIP RAP
EST 24 TNS
EST 40 SY GEOTEXTILE
SEE DETAIL 5

SBG FROM 16+78 TO APPROACH SLAB

CLASS B RIP RAP
EST 1 TN
EST 5 SY GEOTEXTILE

SBG FROM APPROACH SLAB TO 18+38

TOE PROTECTION
CLASS B RIP RAP
EST 46 TNS
EST 102 SY GEOTEXTILE
SEE DETAIL 1

TEMPORARY EASEMENT FOR THE PLACEMENT OF TEMPORARY BARBED WIRE FENCE TO TIE INTO EXISTING.

REMOVE

END PROJECT BP12-R034
-L- STA. 21+08.00

END CONSTRUCTION
-L- STA. 22+10.00

EXISTING RW

50' TAPER

GREU TL-3

TYPE III

15" CSP W/ 2 ELBOWS

TB 2GI

-L- S72°42'00.3"E

-L- S68°20'03.3"E

BRIDGE 12
PAVED DECK

30'10" CLEAR ROADWAY

SR 1337(E ZION CHURCH RD)
25' PAVED ROADWAY

AT-1

GR DRIVE

BM-100

BIC

BEGIN PROJECT BP12-R034
-L- STA. 14+80.00

LINE DITCH TO A DEPTH OF 1' WITH CLASS I RIP RAP
EST 40 TNS
EST 69 SY GEOTEXTILE
SEE DETAIL 5

LINE DITCH TO A DEPTH OF 1' WITH CLASS I RIP RAP
EST 36 TNS
EST 56 SY GEOTEXTILE
SEE DETAIL 4

TOE PROTECTION
CLASS I RIP RAP
EST 8 TNS
EST 11 SY GEOTEXTILE
SEE DETAIL 3

SBG FROM 16+78 TO APPROACH SLAB

LINE DITCH TO A DEPTH OF 1' WITH CLASS I RIP RAP
EST 40 TNS
EST 69 SY GEOTEXTILE
SEE DETAIL 5

BEGIN APPROACH SLAB
-L- STA 16+88.00

BEGIN BRIDGE
-L- STA 17+01.88

END BRIDGE
-L- STA 18+04.13

END APPROACH SLAB
-L- STA 18+18.00

CLASS II RIP RAP BANK STABLIZATION
UP TO ELEV. 732.0
STRUCTURES PAY ITEM
END BENT 1: 68 TONS
END BENT 2: 82 TONS

CLASS B RIP RAP BANK STABLIZATION
ABOVE ELEV. 732.0
STRUCTURES PAY ITEM
EST 165 TONS
EST 150 SY GEOTEXTILE
SEE DETAIL 7

CLASS B RIP RAP
EST 1 TN
EST 5 SY GEOTEXTILE

SBG FROM APPROACH SLAB TO 18+38

CLASS B RIP RAP
EST 5 TN
EST 14 SY GEOTEXTILE

TOE PROTECTION
CLASS B RIP RAP
EST 8 TNS
EST 17 SY GEOTEXTILE
SEE DETAIL 1

RETAIN

TIE TO EXISTING DITCH

LINE DITCH TO A DEPTH OF 1' WITH CLASS B RIP RAP
EST 10 TNS
EST 23 SY GEOTEXTILE
SEE DETAIL 6

UT TO FIRST BROAD RIVER

411.67'
S54°56'01"W

233.36'
S16°27'56"W

196.19'
S75°40'09"E

28.30'
S75°40'07"E

10.97'
S33°26'43"W

④ RONALD RICHARD AND ANTOINETTE RICHARD
DB 1810 PG 1045

⑤ DAVID J. SHERIDAN AND KIRBY P. SHERIDAN
DB 1439 PG 2129
PB 23 PG 80

SEE SHEET 5 FOR -L- PROFILE
SEE SHEETS S-1 THRU S-18 FOR STRUCTURES PLANS

BP12-R034
3RD1 | 04

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047432 ENGINEER CRAIG PARKER
Digitally signed by
DN: C=US, E=craig.parker@volkert.com, O=VOLKERT, CN=CRAIG PARKER
Date: 2026.03.30 08:54:34 -04'00'
3/30/2026

PREPARED BY
VOLKERT
5430 Wade Park Blvd., Suite 410
Raleigh, NC 27606 Tel 919-854-0344
NC License No. F-0765

HYDRAULIC DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047432 ENGINEER JAMES O BRITT
Digitally signed by
DN: C=US, E=james.britt@wsp.com, O=WSP USA INC, CN=JAMES O BRITT
Date: 2026.03.30 08:54:34 -04'00'
3/30/2026

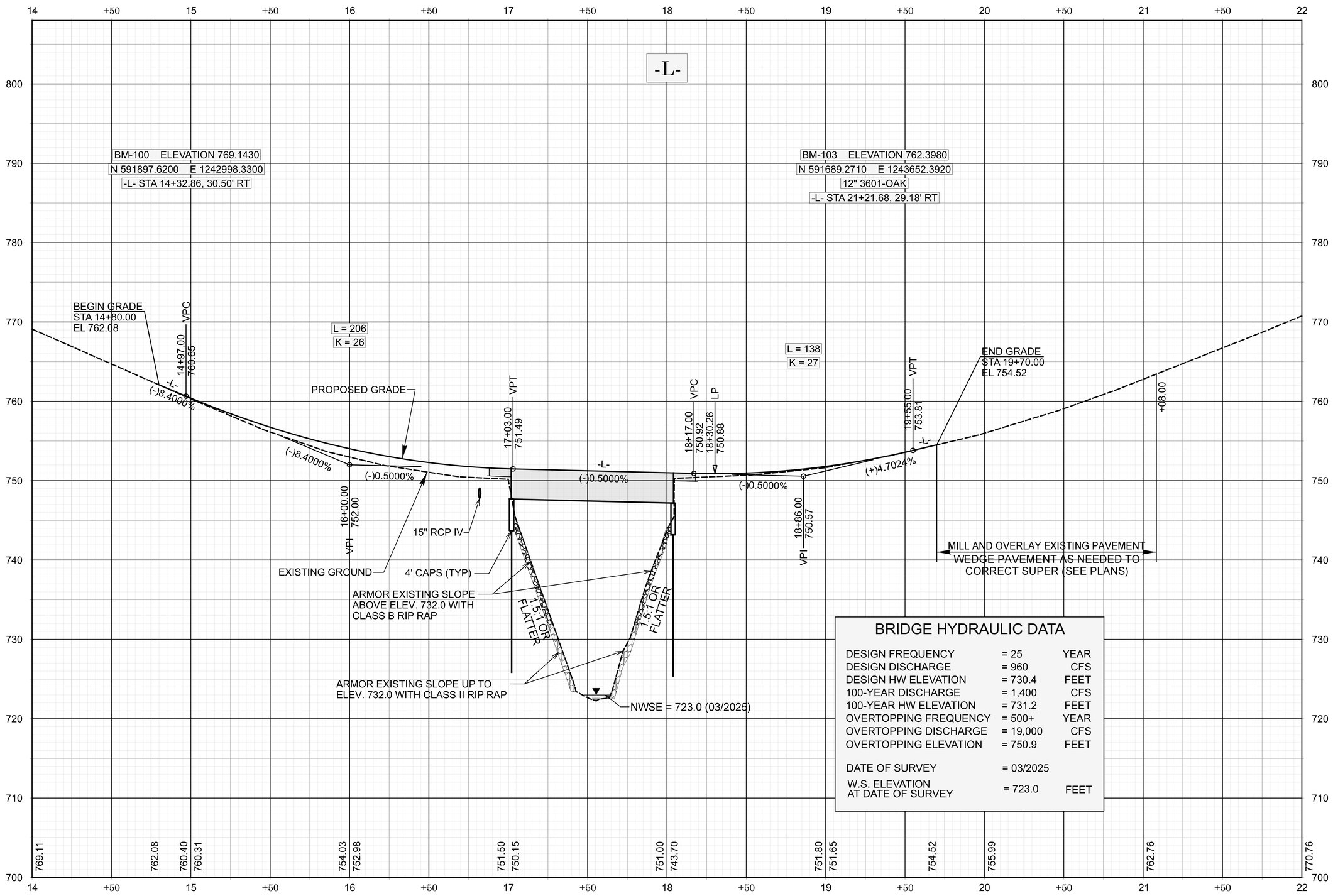
wsp
434 FAYETTEVILLE ST. #1500
RALEIGH, N.C. 27601
NC ENG F-0165

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STATE OF NORTH CAROLINA
CLEVELAND COUNTY

NAD 83/2011

Docusign Envelope ID: 775FC810-CC7A-84ED-8253-3B069A0C4E36



BRIDGE HYDRAULIC DATA

DESIGN FREQUENCY	= 25	YEAR
DESIGN DISCHARGE	= 960	CFS
DESIGN HW ELEVATION	= 730.4	FEET
100-YEAR DISCHARGE	= 1,400	CFS
100-YEAR HW ELEVATION	= 731.2	FEET
OVERTOPPING FREQUENCY	= 500+	YEAR
OVERTOPPING DISCHARGE	= 19,000	CFS
OVERTOPPING ELEVATION	= 750.9	FEET
DATE OF SURVEY	= 03/2025	
W.S. ELEVATION AT DATE OF SURVEY	= 723.0	FEET

SEE SHEET 4 FOR -L- PLAN

BP12-R034

3RD1	05

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 049474 ENGINEER CRAIG PARKER
Signed by: Craig Parker
9/30/2026

PREPARED BY

VOLKERT
5430 Wade Park Blvd., Suite 410
Raleigh, NC 27607 Tel 919-854-0344
NC License No. F-0765

HYDRAULIC DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052432 ENGINEER JAMES O BRITT
Signed by: James Britt
9/30/2026

wsp
434 FAYETTEVILLE ST. #1500
RALEIGH, N.C. 27601
NC ENG F-0165

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STATE OF NORTH CAROLINA
CLEVELAND COUNTY

03/03/2026

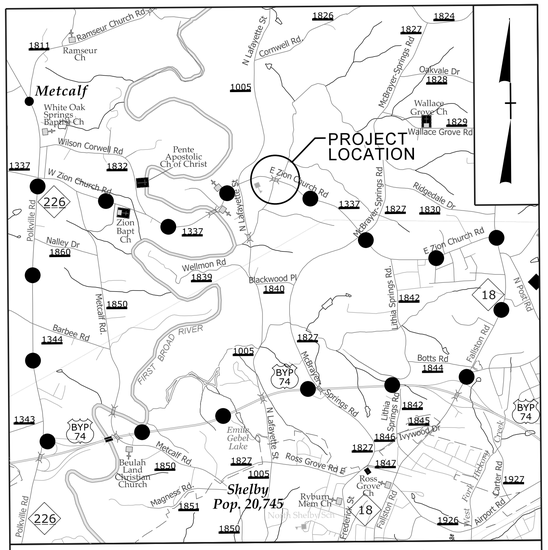
TIP PROJECT: *BP12.R034*

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP12-R034	RW01	5

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

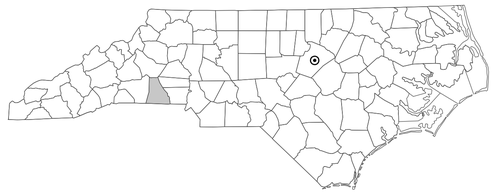
SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENTS AND PROPERTY TIES

CLEVELAND COUNTY

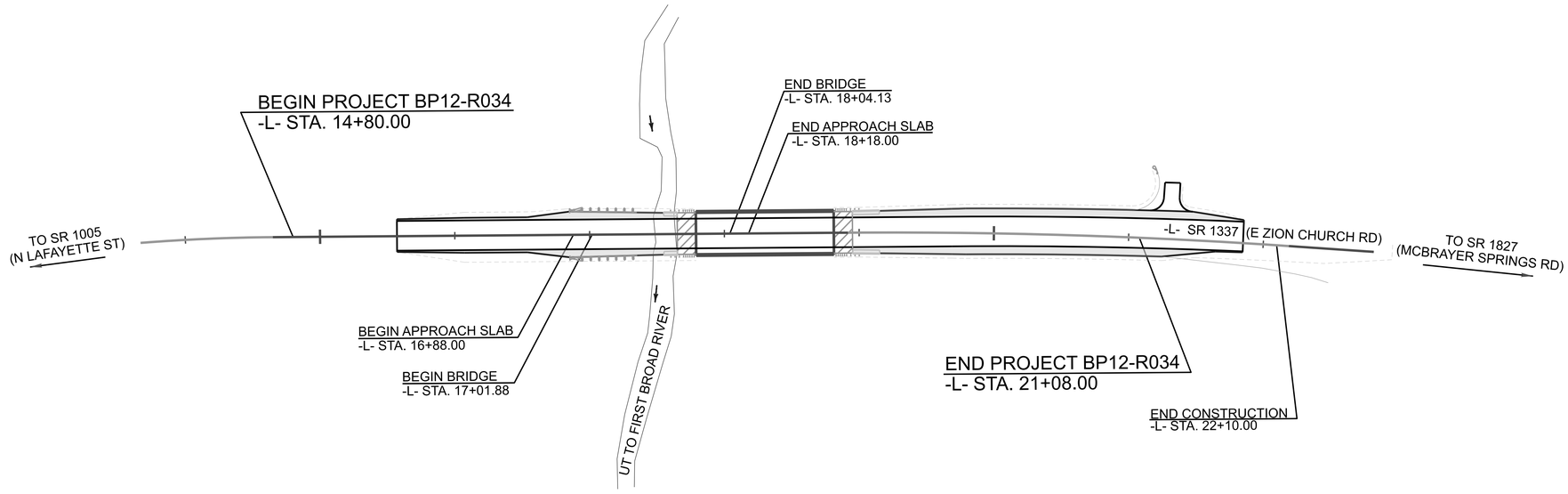


VICINITY MAP (NTS)

OFFSITE DETOUR







DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50' 25' 0' 50' 100'

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS-2"
WITH NAD 83/2011 STATE PLANE GRID COORDINATES OF
NORTHING: 591916.073 (ft) EASTING: 1242415.938 (ft)
ELEVATION: 792.841(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99984556
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:

LOCATION AND SURVEYS
DIVISION 12
2312 KINGS RD EXT.
SHELBY NC 28150

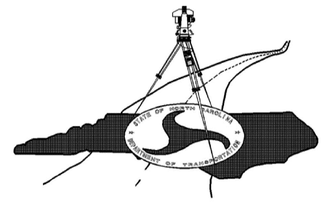
PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-5298 LAND SURVEYOR GAVIN D. PROFFIT

DocuSigned by: Gavin D. Proffit 282D4122681647...

03/03/2026

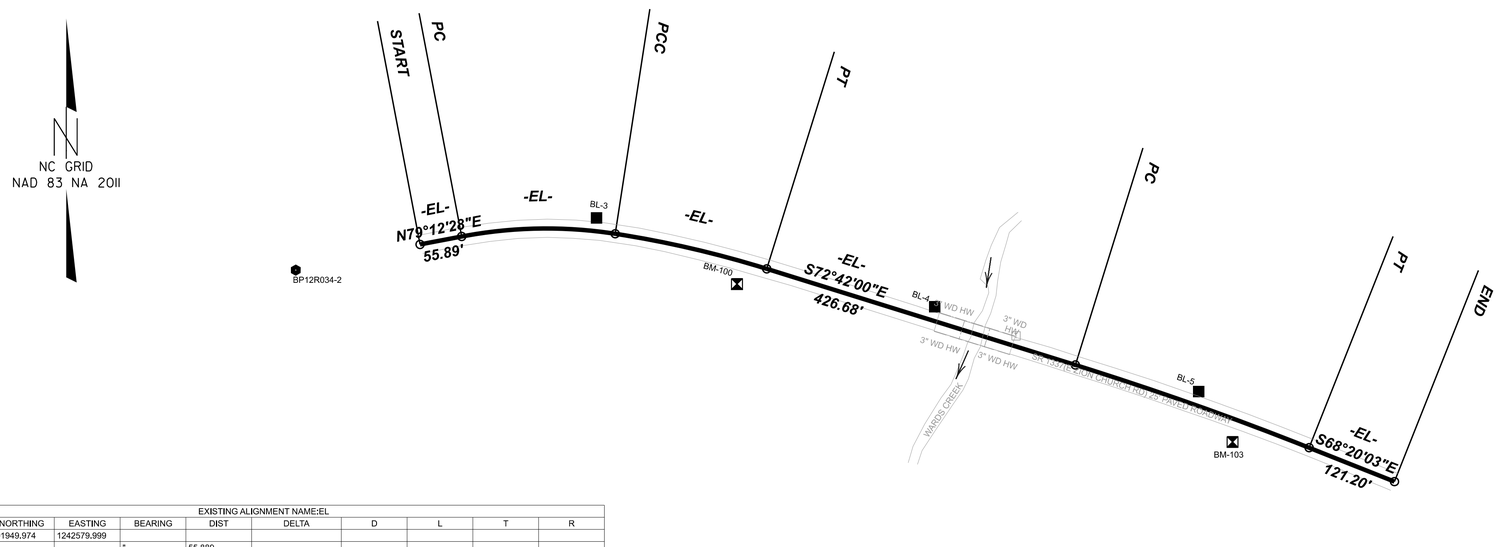
SIGNATURE: *DATE:*



5/26/20

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



EXISTING ALIGNMENT NAME:EL									
POINT	NORTHING	EASTING	BEARING	DIST	DELTA	D	L	T	R
START	591949.974	1242579.999							
LINE			"	55.889					
PC	591960.440	1242634.900							
CURVE					19.560°" Right,9.603°"	203.694	102.848	596.672	
PCC	591964.021	1242837.575							
CURVE					8.532°" Right,4.153°"	205.460	102.920	1379.699	
PT	591917.727	1243037.557							
LINE			"	426.675					
PC	591790.845	1243444.930							
CURVE					4.366°" Right,1.334°"	327.381	163.770	4296.427	
PT	591681.682	1243753.491							
LINE			"	121.195					
END	591636.938	1243866.124							

BASELINE POINTS TABLE				
POINT	DESC	NORTH	EAST	ELEVATION
BP12R034-1	4017	591725.85	1241897.944	824.94
BP12R034-2	4017	591916.073	1242415.938	792.841
BL-3	4020	591984.852	1242812.819	782.276
BL-4	4020	591867.707	1243259.41	748.447
BL-5	4020	591755.927	1243607.538	758.588
BL-6	4020	591565.266	1244054.709	798.583

BENCHMARK TABLE				
BENCHMARK	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	591897.62	1242998.33	769.143	BENCHTIE SET IN 12" OAK
103	591689.271	1243652.392	762.398	BENCHTIE SET IN 12" OAK

I, Jeffrey D. Aker, 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: March 6, 2024
Datum/Epoch:NAD83/2011
Published/Fixed-control use: N/A
Localized around: GPS-2
Northing:591916.073
Easting:1242415.938
Combined grid factor:0.99984556
Geoid model:18
Units:USFT

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 from March 6, 2024 to March 18, 2024 , 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 1st day of April, 2024.

Signed by:
Jeffrey D. Aker
B5C6B9C5345942D...

Professional Land Surveyor L-4234

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.

BP12R034
R/W | 02C-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4234 LAND SURVEYOR JEFFREY D AKER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

2018 STANDARD SPECIFICATIONS

TIP PROJECT: BP12R034
County:CLEVELAND

PREPARED FOR

LOCATION AND SURVEYS UNIT

PREPARED BY

McKIM & CREED

03/03/2026

PROPOSED ALIGNMENT CONTROL SHEET

I, Gavin D. Proffit, PLS certify that the data compiled came from available surveys/mapping performed by others and provided to me from by NCDOT and do not certify to the accuracy or or quality of the indiviudual data source.

This 3rd day of March 2026

DocuSigned by:
Gavin D. Proffit
282D4122681647...

Professional Land Surveyor L-5298

PROPOSED ALIGNMENT: L												
POINT	STATION	NORTHING	EASTING	BEARING	DIST	DELTA	D	L	T	R	LT	ST
START	10+00.00	591949.9744	1242579.9994	N79°12'28.0"E	55.8895							
PC	10+55.89	591960.4396	1242634.9003	N88°59'49.9"E	203.0124	19°34'43.6"	09°35'50.2"	204.0035	103.0060	597.0000		
PCC	12+59.89	591963.9926	1242837.8816	S76°57'24.3"E	204.8596	08°30'48.0"	04°09'06.7"	205.0482	102.7131	1380.0000		
PT	14+64.94	591917.7586	1243037.4558	S72°42'00.3"E	426.7973							
PC	18+91.74	591790.8405	1243444.9454	S70°31'01.8"E	327.2690	04°21'57.0"	01°20'01.3"	327.3481	163.7533	4296.0000		
PT	22+19.09	591681.6883	1243753.4754	S68°20'03.3"E	121.2117							
END	23+40.30	591636.9380	1243866.1239									

NOTES:

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

BP12.R034

R/W | 2D-I

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-5298 LAND SURVEYOR GAVIN D. PROFFIT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

TIP PROJECT: BP12.R034

County: Cleveland

PREPARED FOR

LOCATION AND SURVEYS UNIT

PREPARED BY

LOCATION AND SURVEYS
DIVISION 12
2312 KINGS RD EXT.
SHELBY NC 28150

03/03/2026

RIGHT OF WAY CONTROL SHEET

PERMANENT ROW MARKER IRON PIN AND CAP: L				
STATION	OFFSET	NORTH	EAST	
14+80.00	-30.00	591941.9233	1243060.7547	
14+85.00	30.00	591883.1526	1243047.6866	
15+03.00	40.00	591868.2523	1243061.8986	
15+30.00	-40.00	591936.6023	1243111.4665	
16+25.00	-40.00	591908.3536	1243202.1694	
17+20.00	-65.00	591903.9704	1243300.3055	
17+80.00	40.00	591785.8799	1243326.3675	
18+10.00	-65.00	591877.2086	1243386.2345	NOT SET DUE TO TREE
18+10.00	65.00	591753.0896	1243347.5760	
19+00.00	-56.00	591841.8124	1243469.5871	
20+21.00	-40.34	591788.6905	1243580.9128	
20+35.00	-63.00	591805.4594	1243601.7205	
20+35.00	45.00	591703.4733	1243566.1841	
21+10.00	-30.00	591748.8257	1243661.9582	
21+75.00	40.00	591660.4322	1243698.0359	
22+10.00	30.00	591657.1318	1243734.0112	

PERMANENT EASEMENT MARKER IRON PIN AND CAP: L				
STATION	OFFSET	NORTH	EAST	
16+00.00	40.00	591839.4052	1243154.5099	
16+65.00	85.00	591777.1117	1243203.1876	
16+90.00	65.00	591788.7726	1243233.0041	
16+90.00	40.00	591812.6416	1243240.4384	NOT SET DUE TO TREE

I, GAVIN D. PROFFIT, PLS, CERTIFY THAT THE RIGHT OF WAY AND PERMANENT EASEMENT MONUMENTATION FOR THIS PROJECT SHOWN HEREIN WAS COMPLETED UNDER MY DIRECT AND RESPONSIBLE CHARGE FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; THAT ALL HORIZONTAL CLOSURES HAD A MINIMUM RATIO OF PRECISION OF 1:10,000 (CLASS A). FIELD WORK WAS PERFORMED IN JAN.- MARCH 2026 AND ALL COORDINATES ARE BASED ON NAD83/NA 2011; THAT THIS SURVEY WAS PERFORMED TO MEET THE REQUIREMENTS OF 21NCAC 56.1600 AS APPLICABLE.

THIS 3rd DAY OF MARCH 2026.

DocuSigned by:
Gavin D. Proffit
282D412268164E7...

PROFESSIONAL LAND SURVEYOR L- 5298

NOTES:

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

BP12.R034

R/W | 3E-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-5298 LAND SURVEYOR GAVIN D. PROFFIT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

TIP PROJECT: BP12.R034

County: Cleveland

PREPARED FOR

LOCATION AND SURVEYS UNIT

PREPARED BY

LOCATION AND SURVEYS DIVISION12
2312 KINGS RD EXT.
SHELBY NC 28150

06/09/2026

NC GRID
NAD 83 NA 2011

CUR DATA -L-
PIC 13+82.61
Δc = 08°30'48.0" (RT)
D = 04°09'06.7"
Lc = 205.05
Tc = 102.71
R = 1,380

1
TURNER FAMILY INVESTMENTS LLC
DB 1558 PG 753

15

WOODS

-L- PT 14+64.94

+80.00 -L-
30.00' LT

+30.00 -L-
40.00' LT

+25.00 -L-
40.00' LT

+20.00 -L-
65.00' LT

+10.00 -L-
65.00' LT
NOT SET

-L- PC 18+91.74

+00.00 -L-
56.00' LT

CUR DATA -L-
PIC 20+55.49
Δc = 04°21'57.0" (RT)
D = 01°20'01.3"
Lc = 327.35
Tc = 163.75
R = 4,296
SE = See Plans

20

WOODS

N33°26'43"E
97.48'

+35.00 -L-
63.00' LT

+21.00 -L-
40.34' LT

GR DRIVE

+10.00 -L-
30.00' LT

-L- PT 22+19.09

RW MON

EXISTING RW

3" WD HW

3" WD HW

CONC WALL

-L-
S72°42'00.3"E

SR 1337(E ZION CHURCH RD)
25' PAVED ROADWAY

19+91.34
31.02'

20+65.03
29.91'

-L-
S68°20'03.3"E

60'

EXISTING RW

+85.00 -L-
30.00' RT

+03.00 -L-
40.00' RT

+00.00 -L-
40.00' RT

PDE

PDE

PDE

PDE

NOT SET

+65.00 -L-
85.00' RT

+90.00 -L-
40.00' &
65.00' RT

WOODS

1
TURNER FAMILY INVESTMENTS LLC
DB 1558 PG 753

4
RONALD RICHARD AND
ANTOINETTE RICHARD
DB 1810 PG 1045

UT TO FIRST BROAD RIVER

233.36'
S16°27'56"W

411.67'
S64°56'01"W

EIP

28.30'
S75°40'07"E

+80.00 -L-
40.00' RT

+10.00 -L-
65.00' RT

196.19'
S75°40'09"E

EIP

19+91.34
31.04'

10.97'
S33°26'43"W

WOODS

+35.00 -L-
45.00' RT

+75.00 -L-
40.00' RT

+10.00 -L-
30.00' RT

EXISTING RW

5
DAVID J. SHERIDAN AND
KIRBY P. SHERIDAN
DB 1439 PG 2129
PB 23 PG 60

30' 15' 0' 30' 60'

SCALE: 1"= 30'

NOTES:

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

I, Gavin D. Proffit, a Professional Land Surveyor In the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures.

I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my original signature, registration number and seal this 9th day of June 2026.

DocuSigned by:
Gavin D. Proffit
2925041236816487

Professional Land Surveyor L- 5298

2
ARTHUR GRAHAM PHIFER AND
PATRICIA J. ALLEN
DB 10E PG 37
DB 1594 PG 1500

BP12.R034
R/W | 04

NORTH CAROLINA
DEPARTMENT
OF TRANSPORTATION

PROFESSIONAL LAND
SURVEYOR

NORTH CAROLINA
PROFESSIONAL
SEAL
L-5298
LAND SURVEYOR
GAVIN D. PROFFIT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

TIP PROJECT: BP12.R034
County: Cleveland

PREPARED FOR

LOCATION AND
SURVEYS UNIT

PREPARED BY

LOCATION AND SURVEYS
DIVISION 12
2312 KINGS RD EXT.
SHELBY NC 28150

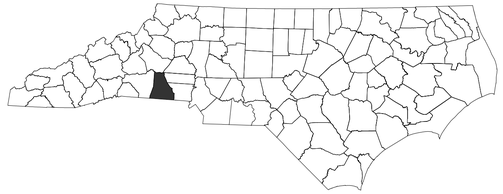
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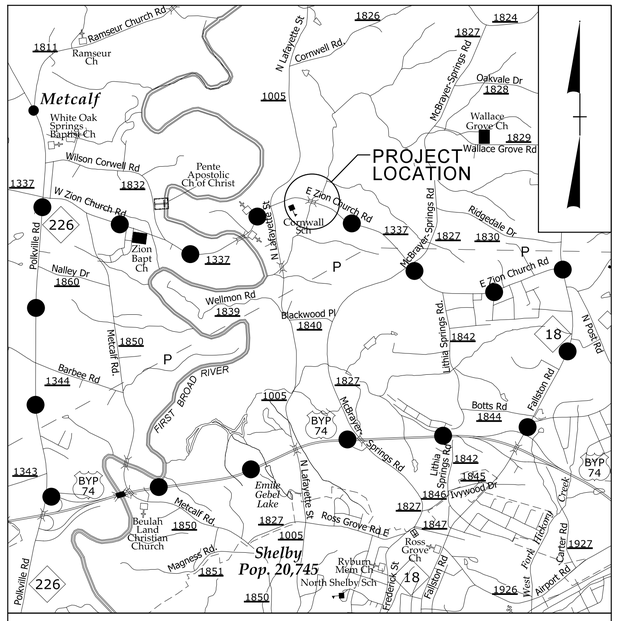
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

CLEVELAND COUNTY

DIVISION 12





VICINITY MAP (NTS)

OFFSITE DETOUR

LOCATION: REPLACEMENT OF BRIDGE NO. 220012 ON SR 1337 (ZION CHURCH RD) OVER UT TO FIRST BROAD RIVER

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



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

PLANS PREPARED BY:

HAOCHEN PAN
PROJECT DESIGN ENGINEER

ZACHARY THORNTON, PE
PROJECT ENGINEER

NCDOT CONTACTS:

JOSHUA B. WHITE, PE, PLS
DIV 12 PROJECT TEAM LEAD

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

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	ROADWAY STANDARD DRAWINGS & LEGEND
TMP-1B	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES, LOCAL NOTES, AND PHASING)
TMP-2	SR 1337 (ZION CHURCH RD) ROAD CLOSURE AND DETOUR ROUTE
TMP-3	SIGN AND DEVICE LEGEND
TMP-4	SPECIAL SIGN DESIGN
TMP-5	PAVEMENT & SIGNING DETAIL

SHEET NO.
TMP-1

TIP PROJECT: BP12-R034

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VOLKERT
5430 Wade Park Blvd., Suite 410
Raleigh, NC 27606 Tel. 919-854-0344
NC License No. F-0765

APPROVED: Signed by: Zachary Thornton E4D10EEB0CBB48A...

DATE: 9/29/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 047243 ENGINEER ZACHARY J. THORNTON

6/9/2026
BP12_R034_TMP_TSH_01.dgn
zachary.thornton

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PROJ. REFERENCE NO.	SHEET NO.
BP12-R034	TMP-1A

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 ADVANCE WARNING SIGNS
1101.03	TEMPORARY ROAD CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

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

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

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NC License No. F-0765

APPROVED: Zachary Thornton (Signature) — E4D10EEB0C8B46A...

DATE: 9/29/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 047243 ENGINEER ZACHARY J. THORNTON

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

6/9/2026
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PROJ. REFERENCE NO.	SHEET NO.
BP12-R034	TMP-1B

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.

REFER TO THE NCDOT 2024 STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES FOR ADDITIONAL REQUIREMENTS.

TRAFFIC PATTERN ALTERATIONS

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

SIGNING

B) INSTALL ADVANCED 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.

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

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

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

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

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

TRAFFIC CONTROL DEVICES

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

PAVEMENT MARKINGS

G) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
ZION CHURCH RD	PAINT	NONE
BRIDGE	PAINT	NONE

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

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

LOCAL NOTES

J) IN ORDER TO HAVE TIME TO ADEQUATELY REROUTE SCHOOL BUSES,CLEVELAND COUNTY SCHOOLS WILL BE CONTACTED AT LEAST ONE MONTH PRIOR TO ROAD CLOSURE.

K) CLEVELAND COUNTY EMERGENCY SERVICES WILL BE CONTACTED AT LEAST ONE MONTH PRIOR TO ROAD CLOSURE TO MAKE THE NECESSARY TEMPORARY REASSIGNMENT TO PRIMARY RESPONSE UNITS.

TRAFFIC MANAGEMENT STRATEGY

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

RECOMMENDED STRATEGIES:

TRAFFIC MANAGEMENT STRATEGIES:
- FULL ROADWAY CLOSURES
- OFF-SITE DETOURS / USE OF ALTERNATIVE ROUTES

TRAFFIC / INCIDENT MANAGEMENT & SPEED ENFORCEMENT STRATEGIES:
- LOCAL DETOUR ROUTES

PHASING

STEP 1:

USING ROADWAY STANDARD DRAWINGS 1101.03 SHEET 1 OF 3, TMP-2 AND TMP-3 INSTALL OFFSITE DETOUR SIGNS AND TRAFFIC CONTROL DEVICES AND CLOSE E ZION CHURCH RD (SR 1337) TO THROUGH TRAFFIC.

STEP 2:

COMPLETE THE FOLLOWING WITHIN THE ROAD CLOSURE:

A) REMOVE EXISTING BRIDGE AND REMOVE/RELOCATE/ REPLACE ANY SIGNS WITHIN PROJECT LIMITS AS DIRECTED BY ENGINEER.
B) CONSTRUCT THE PROPOSED BRIDGE AND ROADWAY APPROACHES INCLUDING THE FINAL LAYER OF SURFACE COURSE AND FINAL PAVEMENT MARKINGS

STEP 3:INSTALL THE FINAL LAYER OF SURFACE AND FINAL PAVEMENT MARKINGS AND MARKERS AS SHOWN ON SHEET TMP-5.

STEP 4:

REMOVE ALL TRAFFIC CONTROL DEVICES AND DETOUR SIGNS, AND OPEN E ZION CHURCH RD (SR 1337) TO THROUGH TRAFFIC.

VOLKERT
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Raleigh, NC 27606 Tel. 919-854-0344
NC License No. F-0765

APPROVED: Zachary Thornton
E4D7EE1B0C0B4BA...
DATE: 9/29/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 047243 ENGINEER ZACHARY J. THORNTON

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

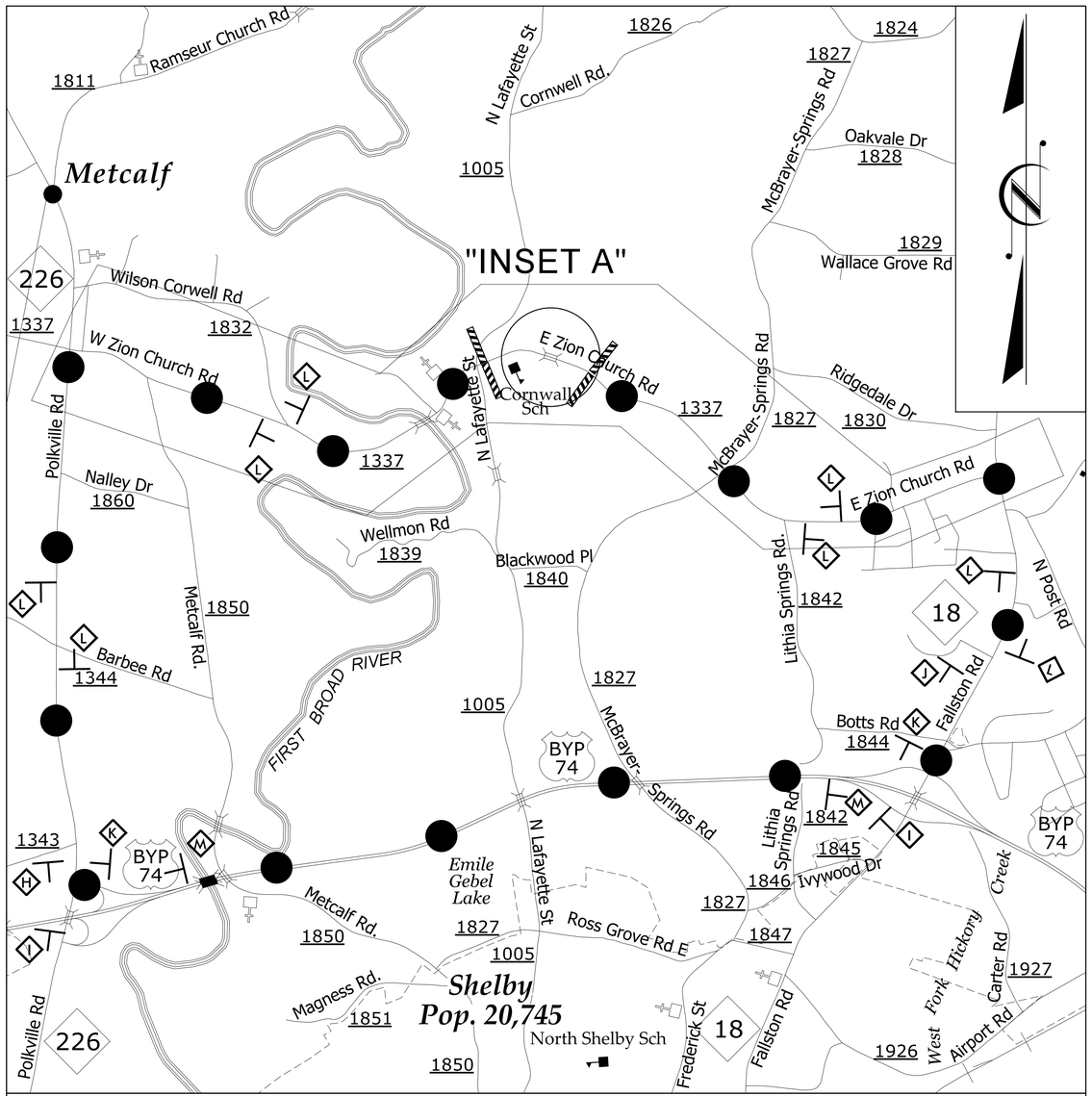
DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES, AND LOCAL NOTES, PHASING)

6/9/2026
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zachary.thornton

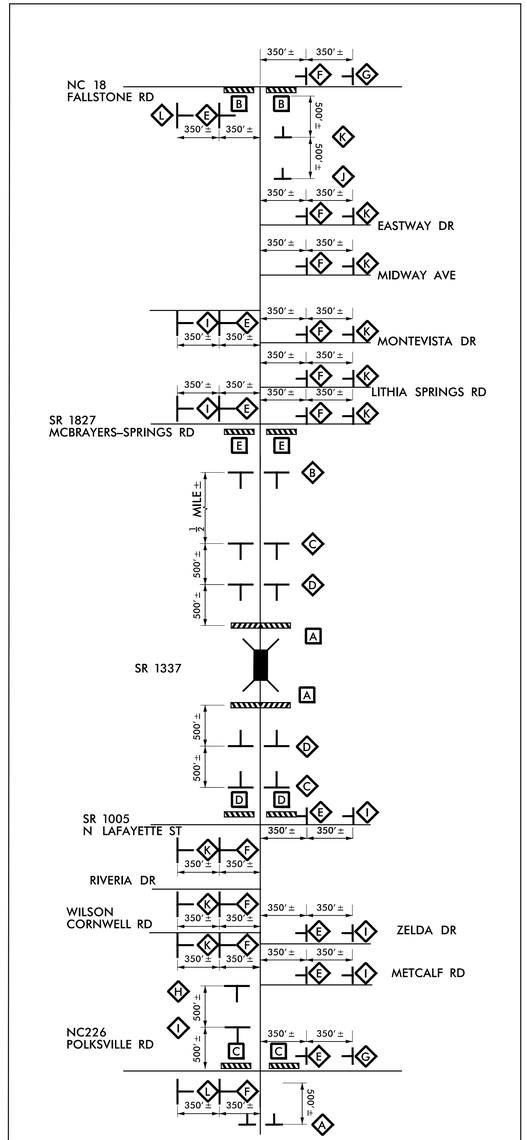
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PROJ. REFERENCE NO.	SHEET NO.
BP12-R034	TMP-2



VICINITY MAP (NTS)

OFFSITE DETOUR



INSET "A"

REFER TO ROADWAY STANDARD DRAWING 1101.03, SHEET 1 OF 9 FOR APPLICABLE NOTES.

LOCATION: REPLACEMENT OF BRIDGE NO. 220012 ON SR 1337 (ZION CHURCH RD) OVER UT TO FIRST BROAD RIVER

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Raleigh, NC 27606 Tel. 919-854-0344
NC License No. F-0765

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DATE: 9/29/2026

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NORTH CAROLINA PROFESSIONAL SEAL 047243 ENGINEER ZACHARY J. THORNTON

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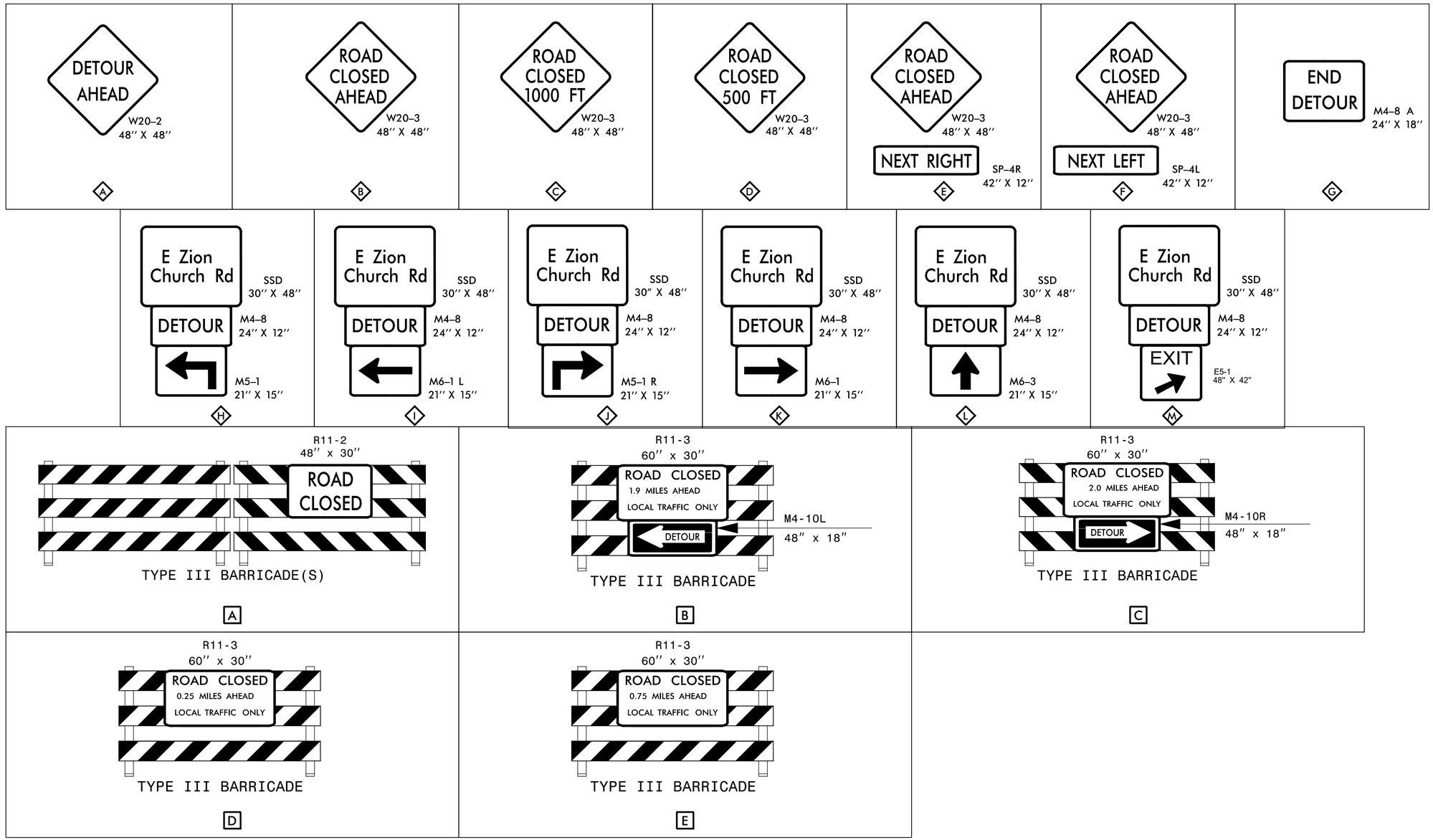
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SR 1337 (ZION CHURCH RD) ROAD CLOSURE AND DETOUR ROUTE

6/9/2026
BP12_R034_TMP_02.dgn
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PROJ. REFERENCE NO.	SHEET NO.
BP12-R034	TMP-3



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Raleigh, NC 27606 Tel. 919-854-0344
NC License No. F-0765

APPROVED: DocuSigned by: Zachary Thornton E4D1EEBDCB84AA...

DATE: 9/29/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 047243 ENGINEER ZACHARY J. THORNTON

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

SIGN AND DEVICE LEGEND

6/9/2026
BP12_R034_TMP_03.dgn
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PROJ. REFERENCE NO.	SHEET NO.
BP12-R034	TMP-4

SIGN NUMBER: SP-1
TYPE: D
QUANTITY: SEE PLANS

SIGN WIDTH: 4'-0"
HEIGHT: 2'-6"
TOTAL AREA:

BORDER TYPE: INSET
RECESS: 0.50"
WIDTH: 0.60"
RADII: 5.00"

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

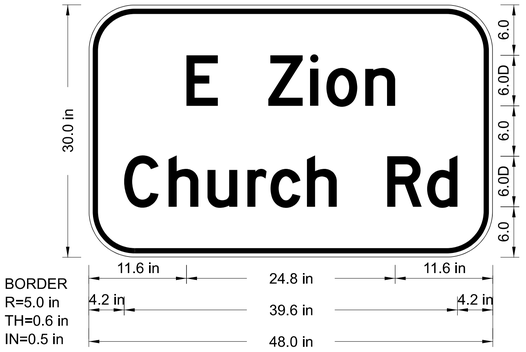
BACKG COLOR: Fluorescent Orange
COPY COLOR: Black

SYMBOL	X	Y	WID	HT

MAT'L: 0.080" (2.0 mm) ALUMINUM

1. Legend and border shall be direct applied non-reflective sheeting.
2. Background shall be Grade B, fluorescent orange, reflective sheeting.
3. To be mounted with Detour signing.

DESIGN BY: ZACHARY THORNTON, PE CHECKED BY: ADAM ALVEY , PE March 3, 2026
PROJECT ID: BP12-R034 LOCATION: OFFSITE DETOUR DIV: 12



Panel Style: Construction_Special_Sign_Design.ssi
M.U.T.C.D.:: 2023 Edition

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter locations are panel edge to lower left corner — Series/Size Text Length

		E		Z	i	o	n																				D 2000
	11.6	3.7	6.0	5.0	1.9	4.6	3.5	11.6																			24.8
		C	h	u	r	c	h		R	d																	D 2000
	4.2	5.3	4.6	4.7	2.8	4.3	3.5	6.0	4.7	3.6	4.2																39.6

FILENAME: BP12.R034_TMP4

NORTH CAROLINA D.O.T. SIGN DETAIL

VOLKERT
5430 Wade Park Blvd., Suite 410
Raleigh, NC 27606 Tel. 919-854-0344
NC License No. F-0765

APPROVED: Zachary Thornton (Docusigned by: EA01DEC6AC0845A...)
DATE: 9/29/2026
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 047243 ENGINEER ZACHARY J. THORNTON

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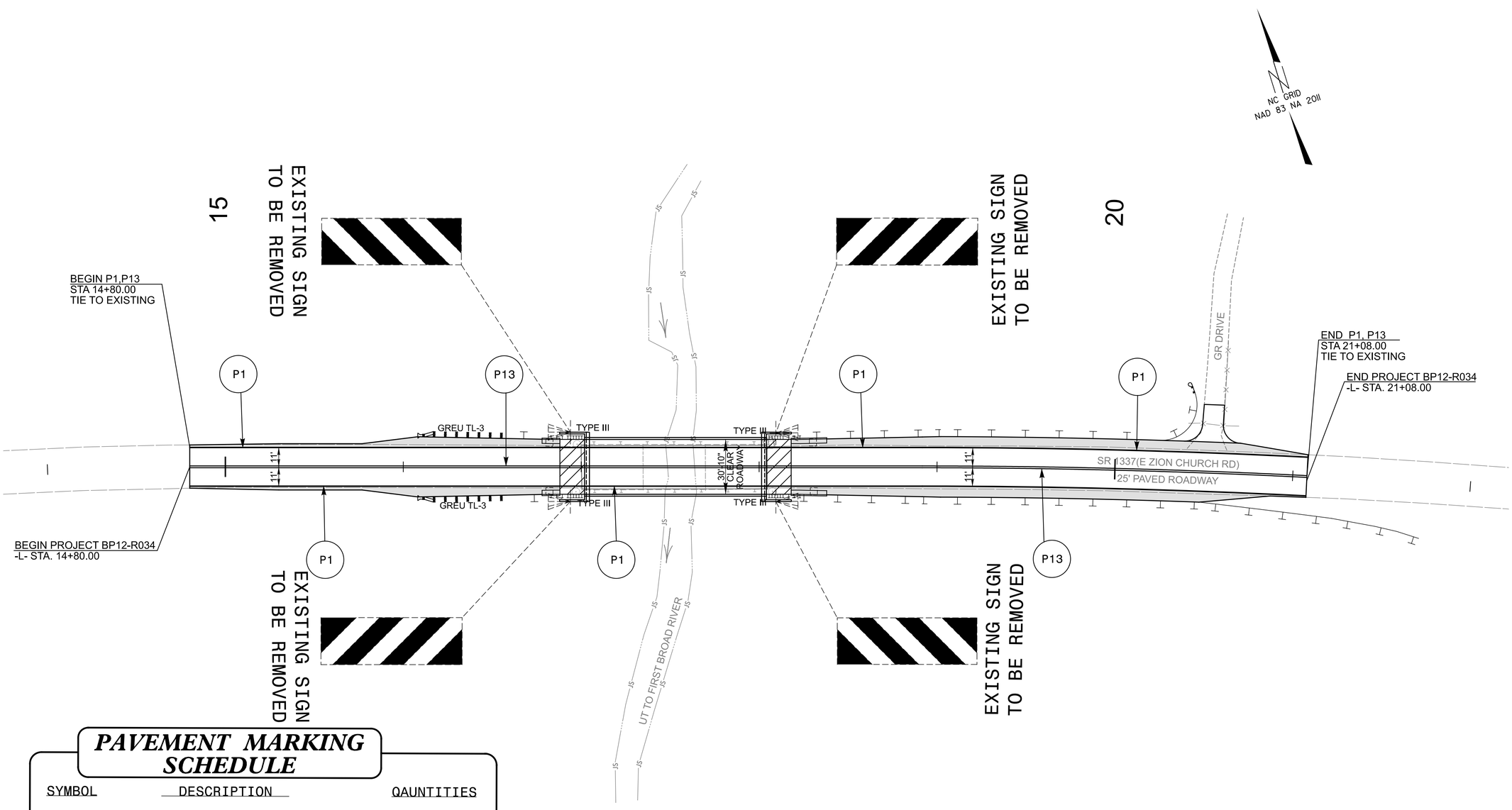
DIVISION OF HIGHWAYS * STATE OF NORTH CAROLINA * DEPARTMENT OF TRANSPORTATION * WORK ZONE TRAFFIC CONTROL

SPECIAL SIGN DESIGN

6/9/2026
BP12.R034_TMP_04.dgn
zachary.thornton

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PROJ. REFERENCE NO.	SHEET NO.
BP12-R034	TMP-5



PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION	QAUNTITIES
	PAINT (4″)	
P1	WHITE EDGELINE	2512 LF
P13	YELLOW DOUBLE CENTER	2512 LF

VOLKERT
5430 Wade Park Blvd., Suite 410
Raleigh, NC 27606 Tel. 919-854-0344
NC License No. F-0765

APPROVED: Zachary Thornton
DATE: 9/30/2026
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 047243 ENGINEER ZACHARY J. THORNTON

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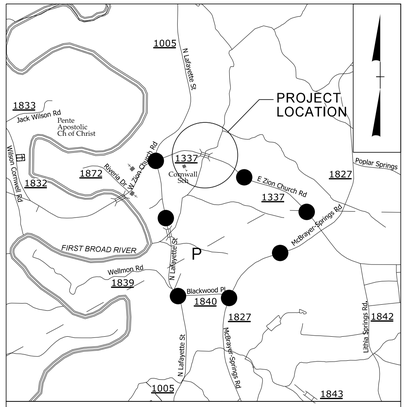
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL

PAVEMENT
& SIGNING DETAIL

9/30/2026
BP12-R034_TMP_05.dgn
zachary.thornton

01/16/24

TIP PROJECT: BP12-R034



VICINITY MAP (NTS)

OFFSITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CLEVELAND COUNTY

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

LOCATION: *REPLACEMENT OF BRIDGE NO. 220012 ON SR 1337 (ZION CHURCH RD) OVER UT TO FIRST BROAD RIVER*

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

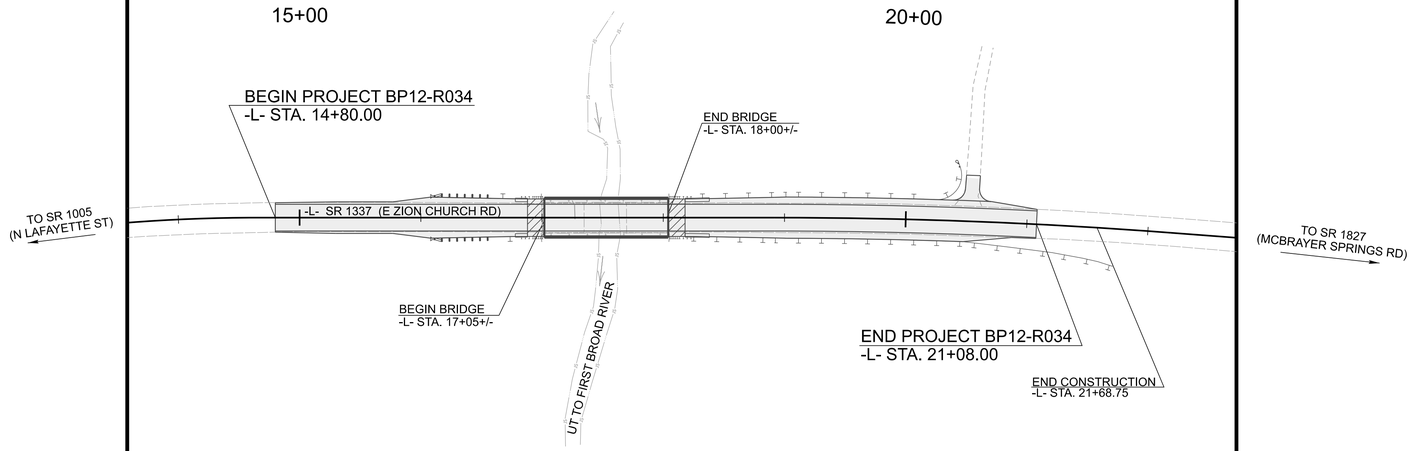
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP12-R034	EC-01	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP12.R034.1		P.E.
BP12.R034.2		ROW/UTIL.
BP12.R034.3		CONST.





4



DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED

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

GRAPHIC SCALE

30 15 0 30 60

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.

wsp

PLANS PREPARED FOR:

Prepared in the Office of:

wsp

434 FAYETTEVILLE ST. #1500
RALEIGH, N.C. 27601
NC ENG F-0165

Designed by:

JAMES OWEN BRITT, P.E. *4228*

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 revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

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

PROJECT REFERENCE NO.	SHEET NO.
BP12-R034	EC-02
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

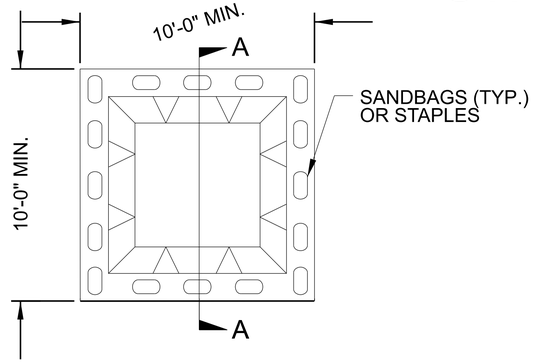
EROSION & SEDIMENT CONTROL LEGEND

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

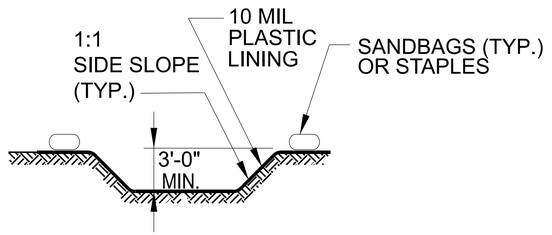
Std. #	Description	Symbol
1633.01	Temporary Rock Silt Check Type A	
1633.02	Temporary Rock Silt Check Type B	
1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1634.01	Temporary Rock Sediment Dam Type A	
1634.02	Temporary Rock Sediment Dam Type B	
1635.01	Rock Pipe Inlet 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.
BPI2-R034	EC-02A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



PLAN



SECTION A-A



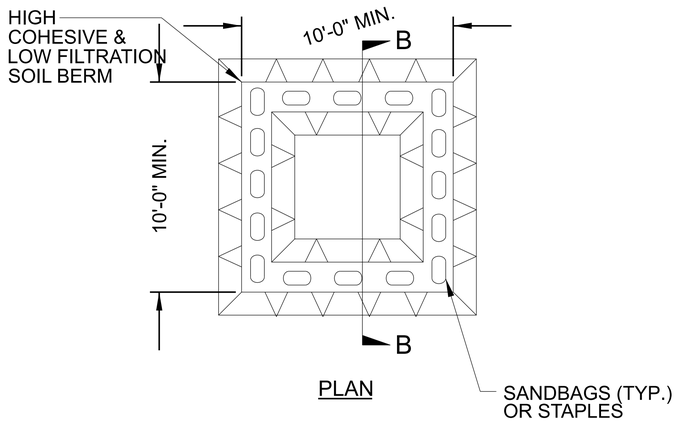
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

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

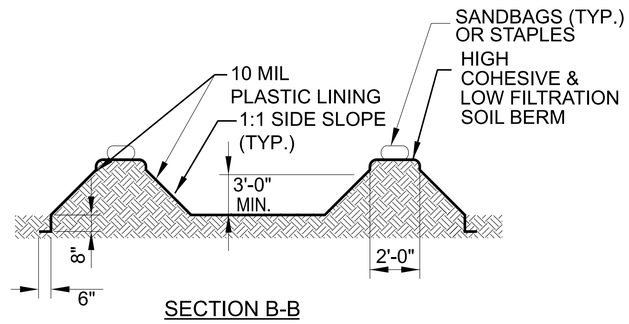
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

BELOW GRADE WASHOUT STRUCTURE

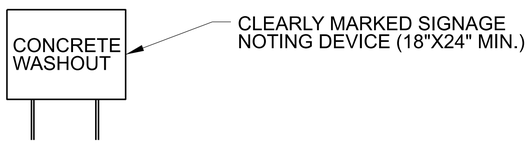
NOT TO SCALE



PLAN



SECTION B-B



NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

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

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

ABOVE GRADE WASHOUT STRUCTURE

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
BP12-R034	EC-03
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL (SLOPE)

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	15+15	16+20	LT	364
4	-L-	18+00	19+45	RT	461
4	-L-	18+00	19+45	LT	424
			SUBTOTAL		1249
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					1000
				TOTAL	2249
				SAY	2250

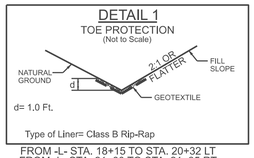
PROJECT REFERENCE NO.	SHEET NO.
BP12-R034	EC-03A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

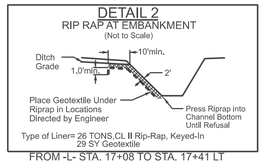
SOIL STABILIZATION TIMEFRAMES

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

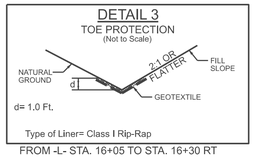
11/14/23



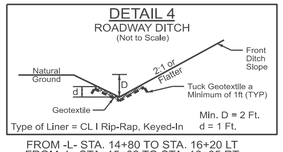
FROM -L- STA. 18+15 TO STA. 20+32 LT
FROM -L- STA. 21+00 TO STA. 21+35 RT



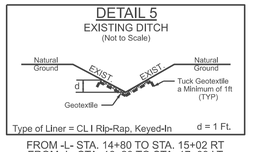
FROM -L- STA. 17+08 TO STA. 17+41 LT



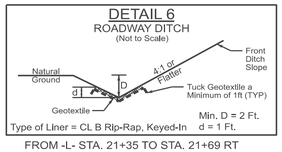
FROM -L- STA. 16+05 TO STA. 16+30 RT



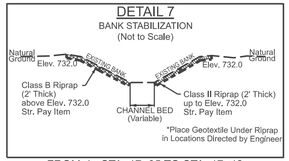
FROM -L- STA. 14+80 TO STA. 16+20 LT
FROM -L- STA. 15+02 TO STA. 16+05 RT



FROM -L- STA. 14+80 TO STA. 15+02 RT
FROM -L- STA. 16+20 TO STA. 17+09 LT
FROM -L STA. 16+30 TO STA. 16+79 RT



FROM -L- STA. 21+35 TO STA. 21+69 RT



FROM -L- STA. 17+05 TO STA. 17+42
FROM -L- STA. 17+64 TO STA. 18+01

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

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

BP12-R034
EC-04 | CONST.04

ROADWAY DESIGN ENGINEER

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Raleigh, NC 27606
Tel. 919-854-0344 Fax. 919-854-0355
NC License No. F-0755

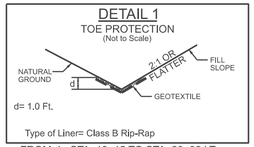
HYDRAULIC DESIGN ENGINEER

wsp
434 FAYETTEVILLE ST. #1500
RALEIGH, N.C. 27601
NC ENG F-0165

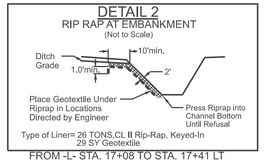
STATE OF NORTH CAROLINA
CLEVELAND COUNTY

NAD 83/2011

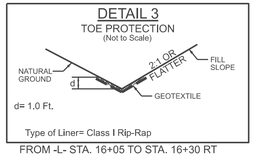
11/14/23



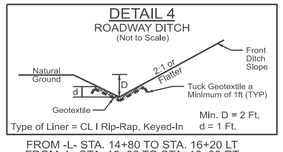
FROM -L- STA. 18+15 TO STA. 20+32 LT
FROM -L- STA. 21+00 TO STA. 21+35 RT



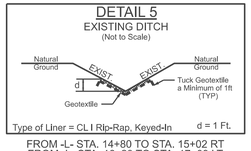
FROM -L- STA. 17+08 TO STA. 17+41 LT



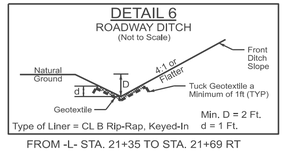
FROM -L- STA. 16+05 TO STA. 16+30 RT



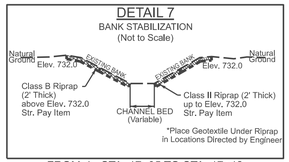
FROM -L- STA. 14+80 TO STA. 16+20 LT
FROM -L- STA. 15+02 TO STA. 16+05 RT



FROM -L- STA. 14+80 TO STA. 15+02 RT
FROM -L- STA. 16+20 TO STA. 17+09 LT
FROM -L STA. 16+30 TO STA. 16+79 RT



FROM -L- STA. 21+35 TO STA. 21+69 RT



FROM -L- STA. 17+05 TO STA. 17+42
FROM -L- STA. 17+64 TO STA. 18+01

Place Matting for Erosion Control on Slope as Work Allows.

-L- Sta. 15+15 to Sta. 16+20 LT
-L- Sta. 18+00 to Sta. 19+45 RT
-L- Sta. 18+00 to Sta. 19+45 LT

BP12-R034
EC-05 | CONST.04
ROADWAY DESIGN ENGINEER

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Tel. 919-854-0344 Fax. 919-854-0355
NC License No. F-0755
HYDRAULIC DESIGN ENGINEER

wsp
434 FAYETTEVILLE ST. #1500
RALEIGH, N.C. 27601
NC ENG P-0165

STATE OF NORTH CAROLINA
CLEVELAND COUNTY

NAD 83/2011

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

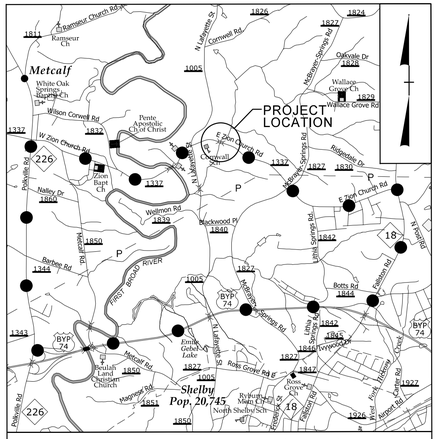
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01/16/24

TIP PROJECT: BP12-R034

CONTRACT:

See Sheet 1A For Index of Sheets



VICINITY MAP (NTS)

OFFSITE DETOUR

RIGHT OF WAY ACQUISITION PLAN SET

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

T.I.P. NO.	SHEET NO.
BP12-R034	*UC-1*

UTILITY CONSTRUCTION PLANS
CLEVELAND COUNTY

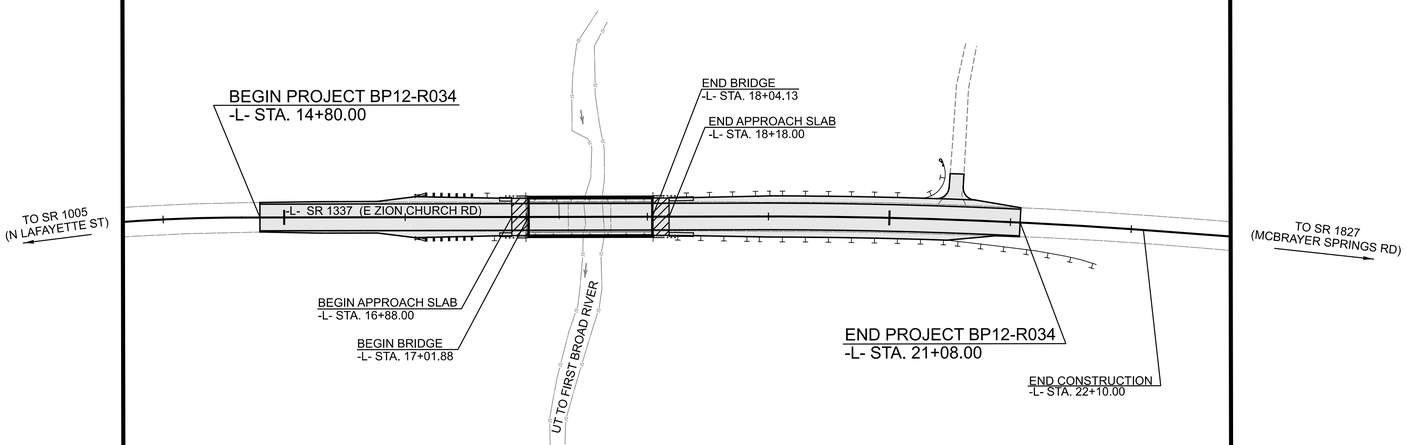
NAD 83 2011

LOCATION: *REPLACEMENT OF BRIDGE NO. 220012 ON SR 1337 (ZION CHURCH RD) OVER UT TO FIRST BROAD RIVER*

TYPE OF WORK: *WATER LINE RELOCATION*



UC-4 **4**



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

30 15 0 30 60
PLANS

30 15 0 30 60
PROFILE (HORIZONTAL)

6 3 0 6 12
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.:	DESCRIPTION:
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3	UTILITY CONSTRUCTION NOTES
UC-3A	UTILITY CONSTRUCTION DETAILS
UC-4	UTILITY CONSTRUCTION SHEET
UC-5	PROFILE SHEET

WATER OWNERS ON PROJECT

(A) WATER - CLEVELAND COUNTY WATER

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 049088 ENGINEER CHRISTOPHER H. LEE

Signed by: Christopher Lee, PE

5/27/2026

PREPARED IN THE OFFICE OF

VOLKERT

5430 Wade Park Blvd., Suite 410
Raleigh, NC 27606 Tel. 919-854-0344
NC License No. F-0765

CHRISTOPHER H. LEE, PE *CONSULTANT CONTACT #1*

RANCE GAMBLE *CONSULTANT CONTACT #2*

DIVISION OF HIGHWAYS
UTILITIES UNIT

1555 MAIL SERVICES CENTER
RALEIGH NC 27699-1555
PHONE (919) 707-7194

VACANT	WESTERN UTILITIES MANAGER
ALI KOUCHEKI, PE	REGIONAL UTILITIES ENGINEER
DAYTON MARTIN	REGIONAL UTILITY COORDINATOR
MARK COLE	SENIOR UTILITIES COORDINATOR

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03/07/25

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

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

PROPOSED SEWER SYMBOLS

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

PROPOSED MISCELLANOUS UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Telephone Pedestal — TEL PED
- Utility Line by Others (Type as Shown) — OH POW
- Trenchless Installation — TRENCHLESS WL
- Encasement Method — OPEN CUT
- 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 G
- *Underground Water Line — W
- Aboveground Water Line — W A/G Water
- *Underground Gravity Sanitary Sewer Line — SS
- Aboveground Gravity Sanitary Sewer Line — A/G Sanitary Sewer SS
- *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)

BP12-R034

UC-2

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
CLEVELAND COUNTY



UTILITIES UNIT

UTILITY CONSTRUCTION PLANS ONLY



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PREPARED BY

VOLKERT
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Raleigh, NC 27606 Tel. 919-854-0344
NC License No. F-0765

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UTILITY CONSTRUCTION

GENERAL NOTES:

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

2. THE EXISTING UTILITIES BELONG TO THE CLEVELAND COUNTY WATER DEPARTMENT

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 AND CLEVELAND COUNTY WATER.

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

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

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

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

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

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

PROJECT SPECIFIC NOTES:

1. PROPOSED WATER LINE FROM -WL- STATION 0+16 TO -WL- STATION 7+92 SHALL BE 12" CL350 TR FLEX (DUCTILE IRON RESTRAINED JOINT) PIPE.

2. CONTRACTOR'S ATTENTION IS DIRECTED TO SECTIONS 102, 107, AND 1550 OF THE STANDARD SPECIFICATIONS CONCERNING TRENCHLESS INSTALLATION. IT IS CONTRACTOR'S RESPONSIBILITY TO HAVE BORE DESIGNED AND SEALED BY A LICENSED NORTH CAROLINA PROFESSIONAL ENGINEER. NO DAMAGE IS ALLOWED TO RIVER, WETLANDS, OR BUFFER ZONES.

3. ENGINEER SHALL INSPECT ALL MATERIALS ONSITE PRIOR TO INSTALLATION. DAMAGED MATERIALS SHALL BE REPLACED OR REPAIRED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

4. WATER MAINS CROSSING UNDER STORM DRAIN PIPES SHALL HAVE 24" MINIMUM VERTICAL CLEARANCE UNLESS SPECIFIED ON THE PLAN/PROFILE.

5. INSTALL CHANGEABLE MESSAGE BOARD ON EITHER SIDE OF PROJECT AREA TO ALERT RESIDENTS TWO WEEKS AHEAD OF TIE-IN WORK.WILL NEED TO COORDINATE WITH ENGINEER PRIOR TO BEGINNING WORK.

BP12-R034
UC-3

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
CLEVELAND COUNTY



UTILITIES UNIT

UTILITY CONSTRUCTION
PLANS ONLY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

UTILITY DESIGN ENGINEER



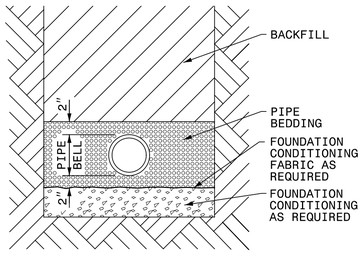
5/27/2026

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VOLKERT
5430 Wade Park Blvd., Suite 410
Raleigh, NC 27606 Tel. 919-854-0344
NC License No. F-0765

Docusign Envelope ID: BE783679-4AFF-8E64-8210-D36655B503A5

PROJECT TYPICAL DETAILS

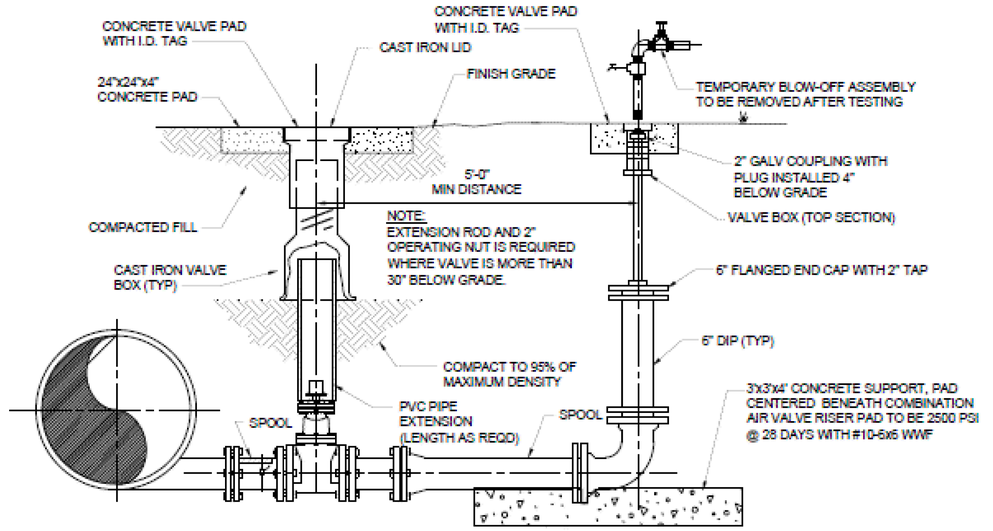
TRENCH DETAIL



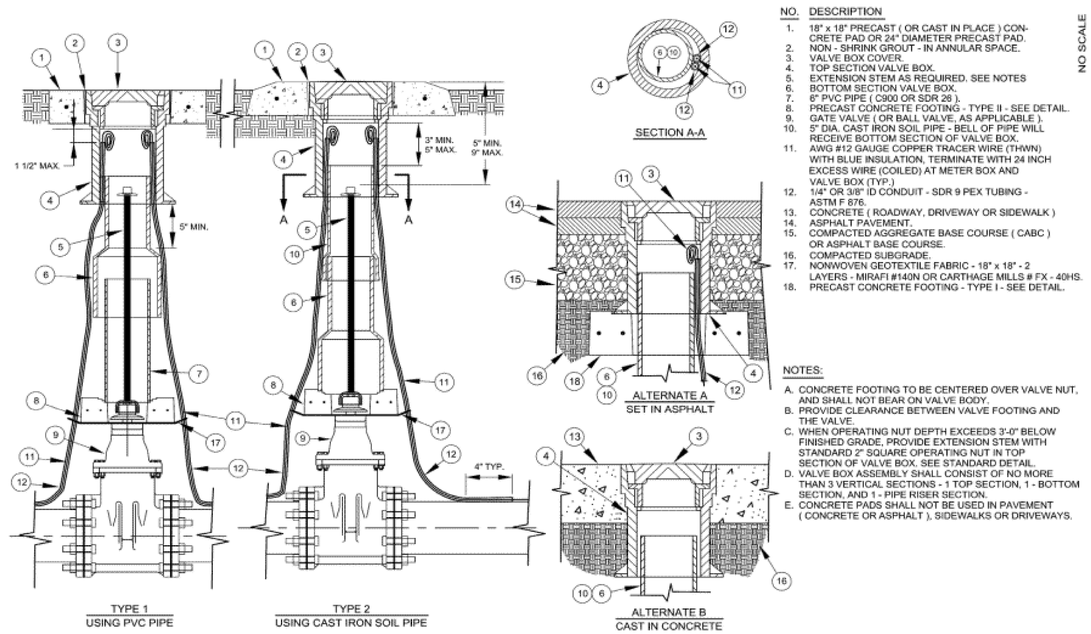
PLACE FOUNDATION CONDITIONING MATERIAL BELOW BEDDING IF REQUIRED, AS DIRECTED BY ENGINEER. PIPE BEDDED IN SELECT MATERIAL, CLASS II (TYPE 1) OR CLASS III. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL 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.

MAXIMUM TRENCH WIDTH AT TOP OF PIPIE

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



TYPICAL BLOW OFF DETAIL



VALVE BOX ASSEMBLY INSTALLATION
12" AND SMALLER VALVES

BP12-R034

UC-03A

UTILITY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042611 ENGINEER CHRISTOPHER H. THEE

9/20/2026

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Raleigh, NC 27606
Tel. 919-854-0344 Fax: 919-854-0355
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STATE OF NORTH CAROLINA
CLEVELAND COUNTY



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11/14/23

UTILITY CONSTRUCTION

BP12-R034

UC-04

UTILITY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 049161 ENGINEER CHRISTOPHER H. LEE

Signed by: Christopher Lee, PE

5/27/2026

PREPARED BY

VOLKERT

5430 Wade Park Blvd., Suite 410
Raleigh, NC 27606 Tel: 919-854-0344
NC License No. F-0765

UTILITY CONSTRUCTION PLANS

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STATE OF NORTH CAROLINA
CLEVELAND COUNTY

NAD 83/2011

TURNER FAMILY INVESTMENTS LLC
DB 1558 PG 753

ARTHUR GRAHAM PHIFER AND
PATRICA J. ALLEN
DB 10E PG 37
DB 1594 PG 1500

15

20

WOODS

EXISTING RW

60'

12"PVC

GV BO

BM-100

SR 1337(E ZION CHURCH RD)

25' PAVED ROADWAY

GR DRIVE

REMOVE

15"

RW MON

45° RCP MITER

RIP RAP

UT TO FIRST BROAD RIVER

BO BCGV

BM-101

1 - 12" 22.5° RJ DI BEND
-WL- STA. 0+75

1 - 12" 22.5° RJ DI BEND
-WL- STA. 0+31

1 - 12" GATE VALVE
-WL- STA. 0+16

BEGIN 12" WATER LINE
TIE TO EXISTING 12" PVC

PROP. 814 LF - 12" CL350 TR FLEX
RESTRAINED JOINT DI PIPE

ABANDON - 809 LF 12" UTILITY PIPE

RONALD RICHARD AND
ANTOINETTE RICHARD
DB 1810 PG 1045

DAVID J. SHERIDAN AND
KIRBY P. SHERIDAN
DB 1439 PG 2129
PB 23 PG 60

1 - 12" 45° RJ DI BEND
-WL- STA. 7+55

1 - 12" 45° RJ DI BEND
-WL- STA. 7+74

1- 6" BLOW-OFF
-WL- STA. 7+82

1 - 12" GATE VALVE
-WL- STA. 7+92

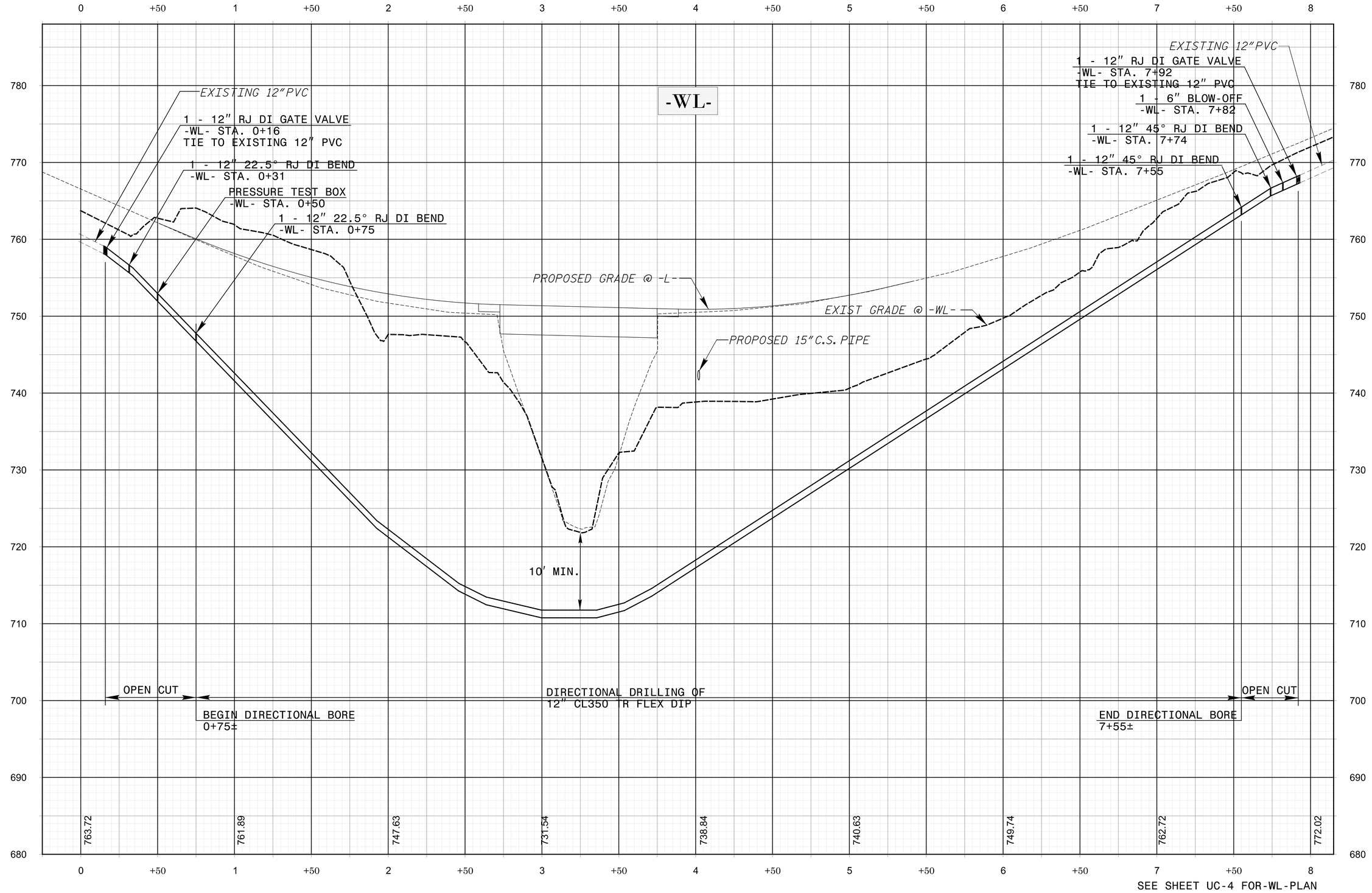
END 12" WATER LINE
TIE TO EXISTING 12" PVC

THE ESTIMATED QUANTITY OF
DUCTILE IRON WATER PIPE FITTINGS
ON THIS PLAN SHEET IS 870 POUNDS.
THE ACTUAL QUANTITY AND TYPE OF FITTINGS
MAY VARY BASED ON FIELD CONDITIONS.

SEE SHEET 4 FOR -L- PLAN
SEE SHEET 5 FOR -L- PROFILE
SEE SHEET UC-5 FOR -WL- PROFILE

Docusign Envelope ID: 6CA896D9-F1E4-8AFA-80CC-A03A18376734

UTILITY CONSTRUCTION



SEE SHEET UC-4 FOR-WL-PLAN

BP12-R034

UC-05

UTILITY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 049182 ENGINEER CHRISTOPHER H. TIEF

5/27/2026

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UTILITY CONSTRUCTION PLANS

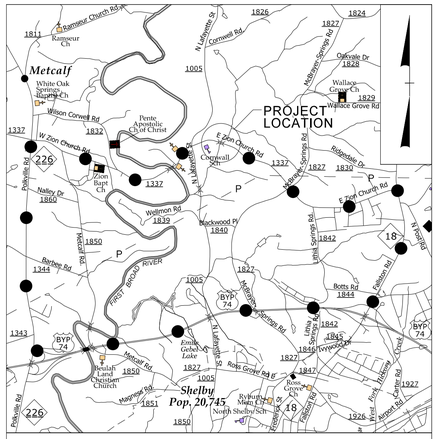
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STATE OF NORTH CAROLINA
CLEVELAND COUNTY

09/08/99

TIP PROJECT: BP12-R034

CONTRACT: _____



NAD 83/ 2011

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
CLEVELAND COUNTY

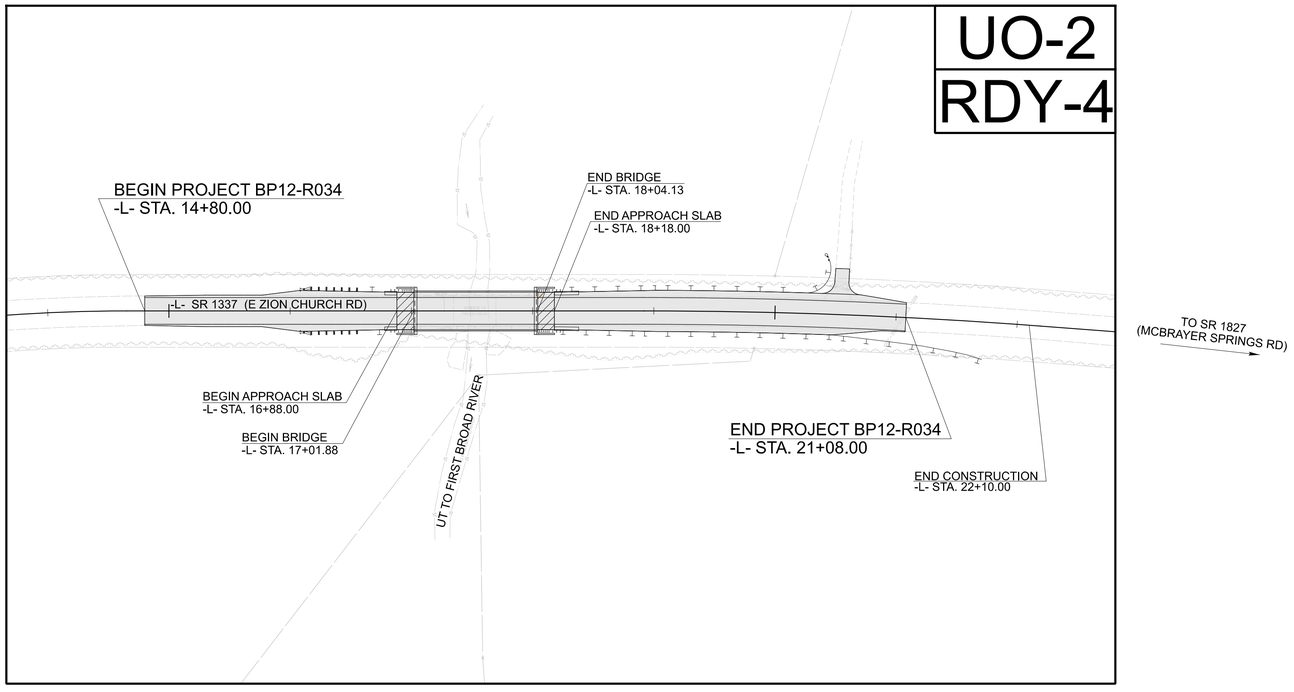
T.I.P. NO.	SHEET NO.
BP12–R034	UO–1

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.

LOCATION: REPLACEMENT OF BRIDGE NO. 220012 ON SR 1337 (ZION CHURCH RD) OVER UT TO FIRST BROAD RIVER

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

UO-2
RDY-4



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

30 15 0 30 60
PLANS

30 15 0 30 60
PROFILE (HORIZONTAL)

6 3 0 3 6
PROFILE (VERTICAL)

INDEX OF SHEETS

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

UTILITY OWNERS WITH CONFLICTS

(A) WATER – CLEVELAND COUNTY WATER
(B) TELECOMMUNICATIONS – AT&T

PREPARED IN THE OFFICE OF
VOLKERT
5430 Wade Park Blvd., Suite 410
Raleigh, NC 27606 Tel. 919-854-0344
NC License No. F-0765

CHRIS LEE, PE — *UTILITY PROJECT MANAGER*
ZACHARY THORNTON, PE — *PROJECT UTILITY COORDINATOR*

DIVISION OF HIGHWAYS
DIVISION 12
1710 E. MARION ST (US 74 BUS)
SHELBY, NC 28151

DANNY POWELL — *ASSISTANT DIVISION UTILITY ENGINEER*
ANDERSON WARREN — *DIVISION UTILITY ENGINEER*

12/16/24

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

BP12-R034
U0-1B

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
AVERY COUNTY



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PROPOSED WATER SYMBOLS

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

PROPOSED SEWER SYMBOLS

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

PROPOSED MISCELLANOUS UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Telephone Pedestal — TEL_PED
- Utility Line by Others (Type as Shown) — OHPOW
- Trenchless Installation — WL TRENCHLESS
- Encasement Method — OPEN CUT
- 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 G
- *Underground Water Line — W
- Aboveground Water Line — A/G Water W
- *Underground Gravity Sanitary Sewer Line — SS
- Aboveground Gravity Sanitary Sewer Line — A/G Sanitary Sewer SS
- *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

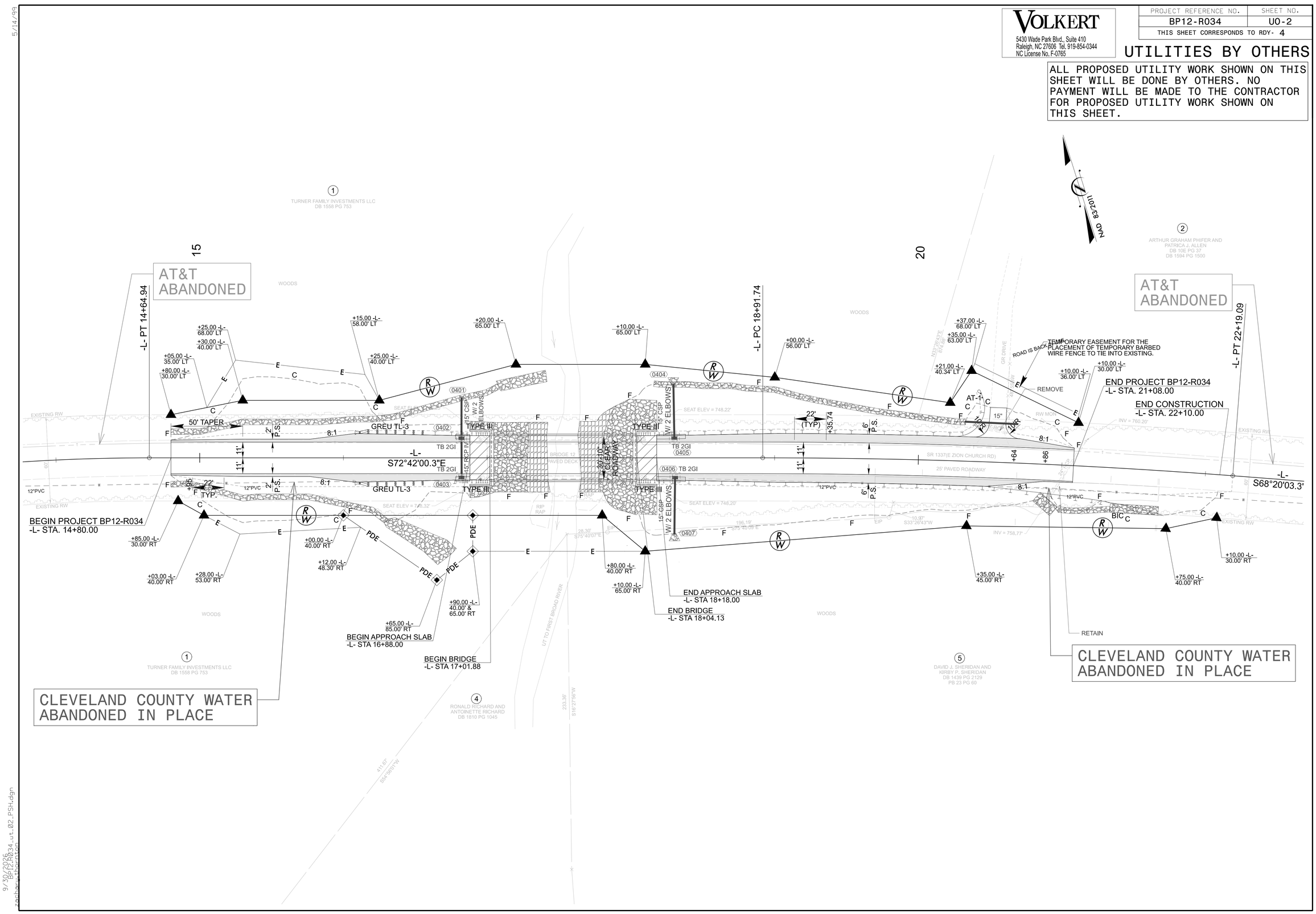
5/14/99

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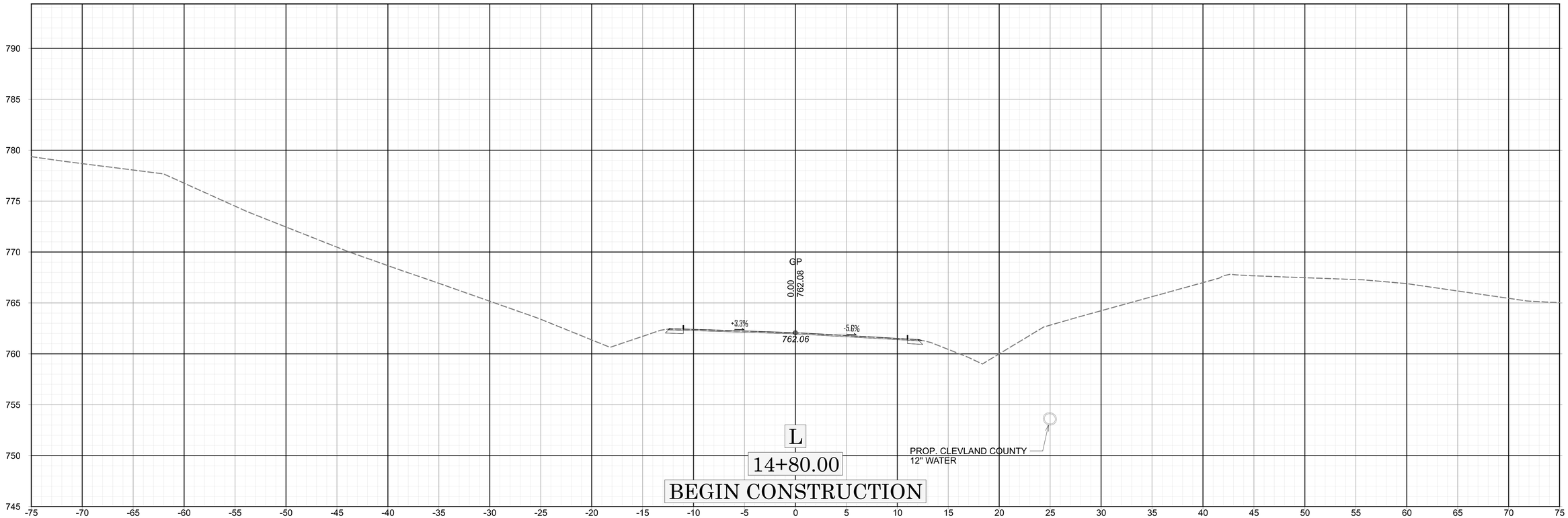
PROJECT REFERENCE NO.	SHEET NO.
BP12-R034	U0-2
THIS SHEET CORRESPONDS TO RDY- 4	

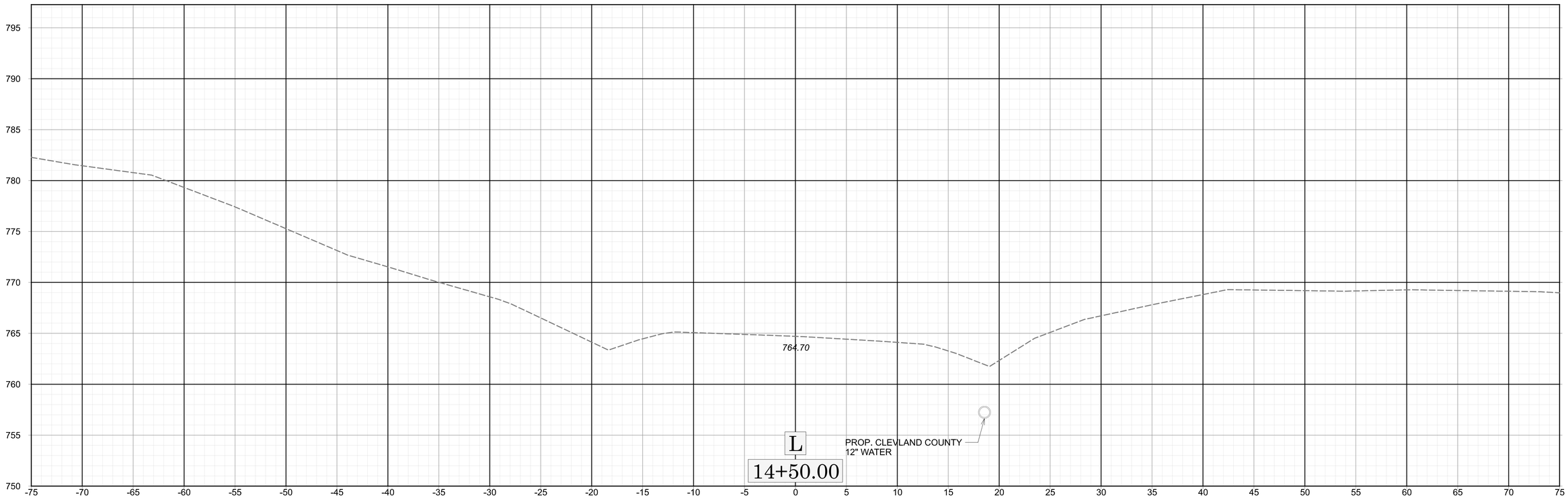
UTILITIES BY OTHERS

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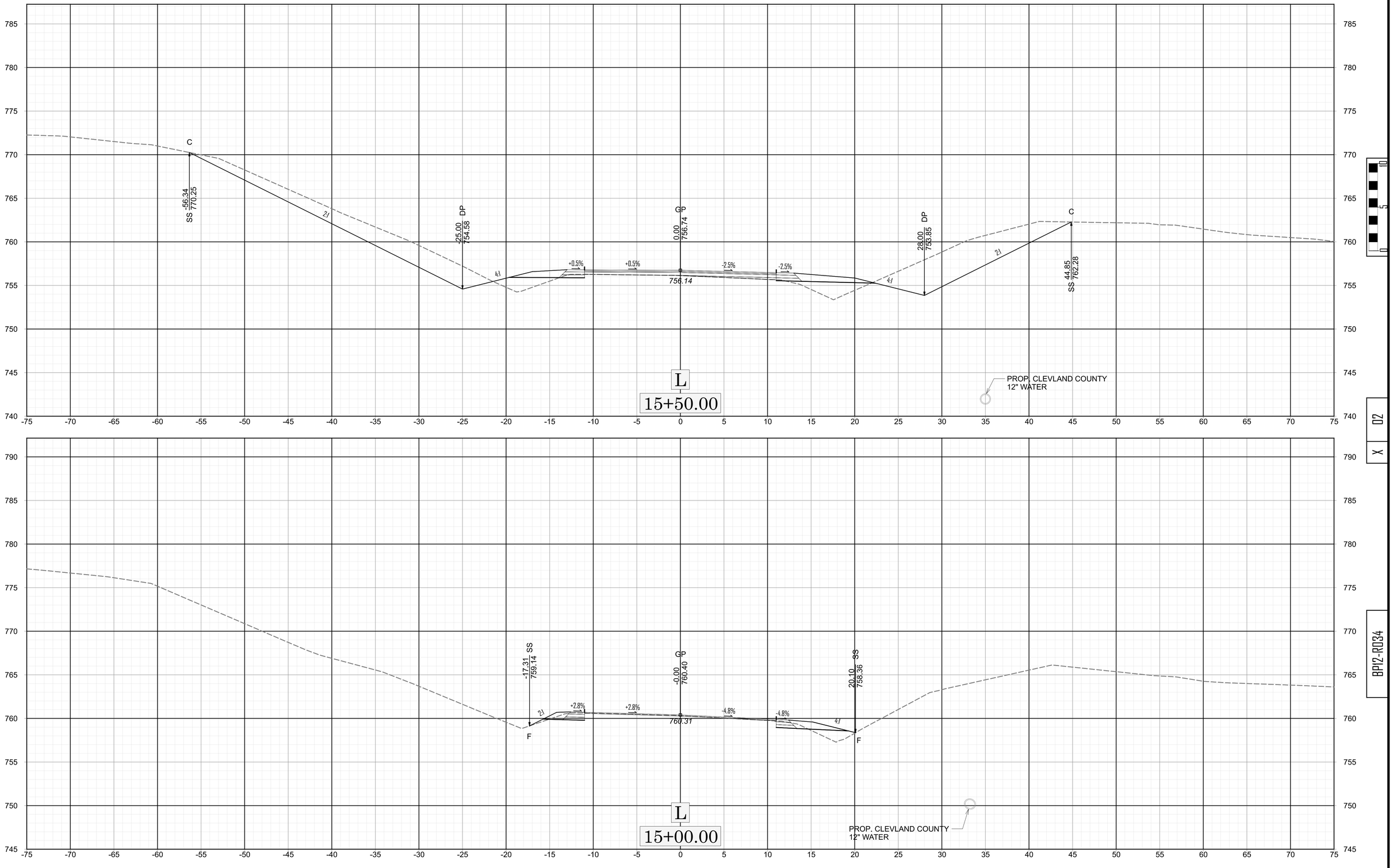


9/30/2016
BP12R034_ut_02_PSH.dgn
zpabru.thornton

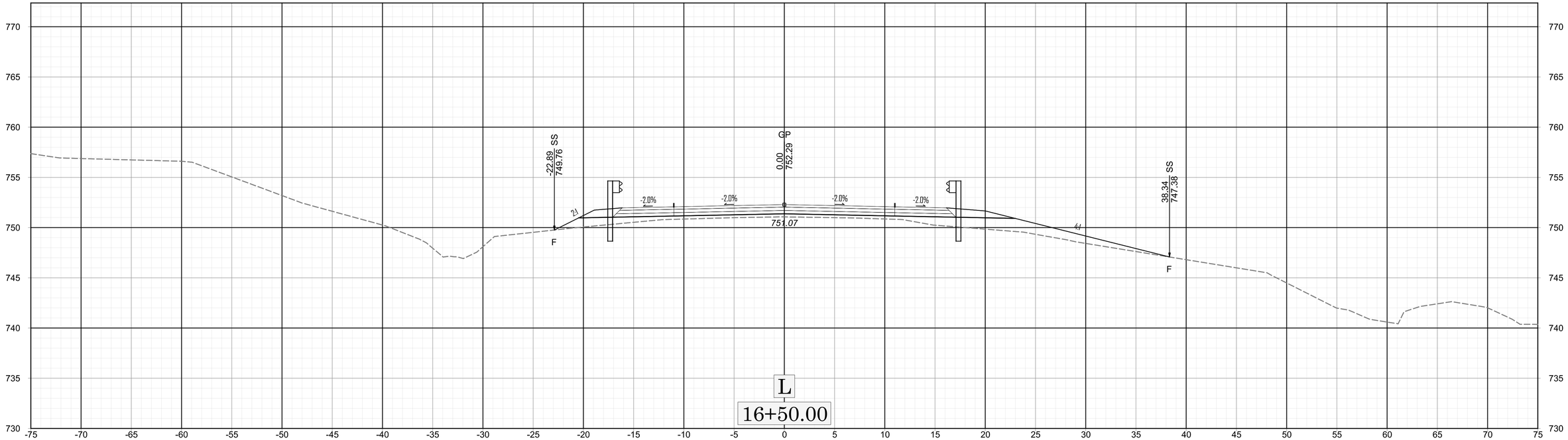

GP
0.00
762.08
+3.3%
-5.6%
762.06
L
14+80.00
BEGIN CONSTRUCTION
PROP. CLEVLAND COUNTY
12" WATER

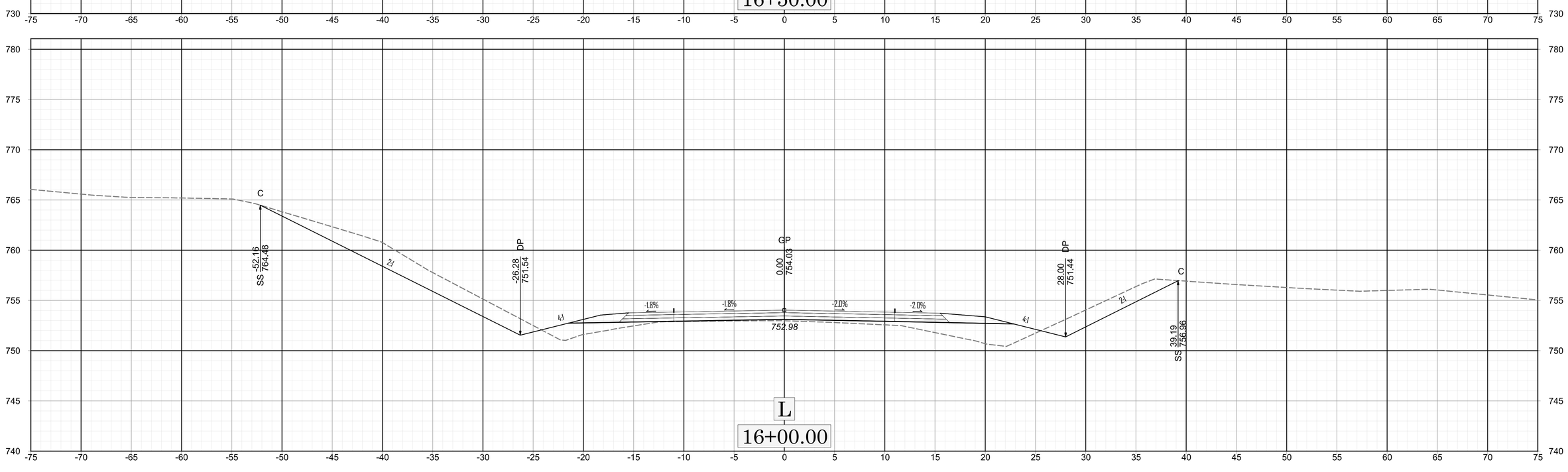

764.70
L
14+50.00
PROP. CLEVLAND COUNTY
12" WATER

11/14/23

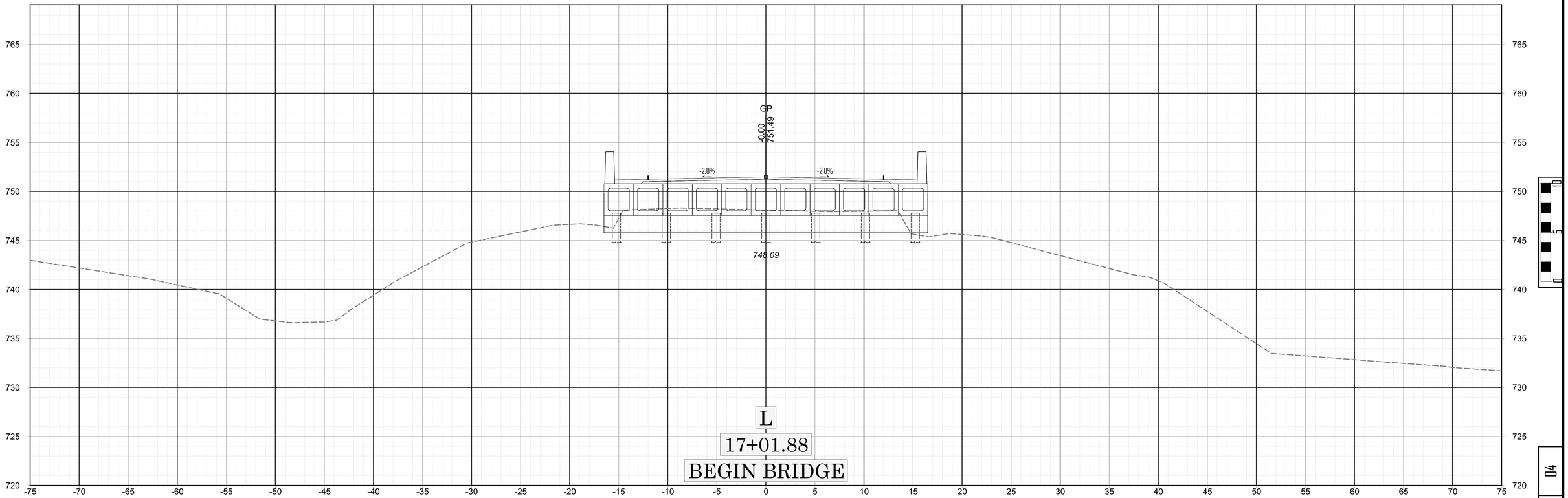


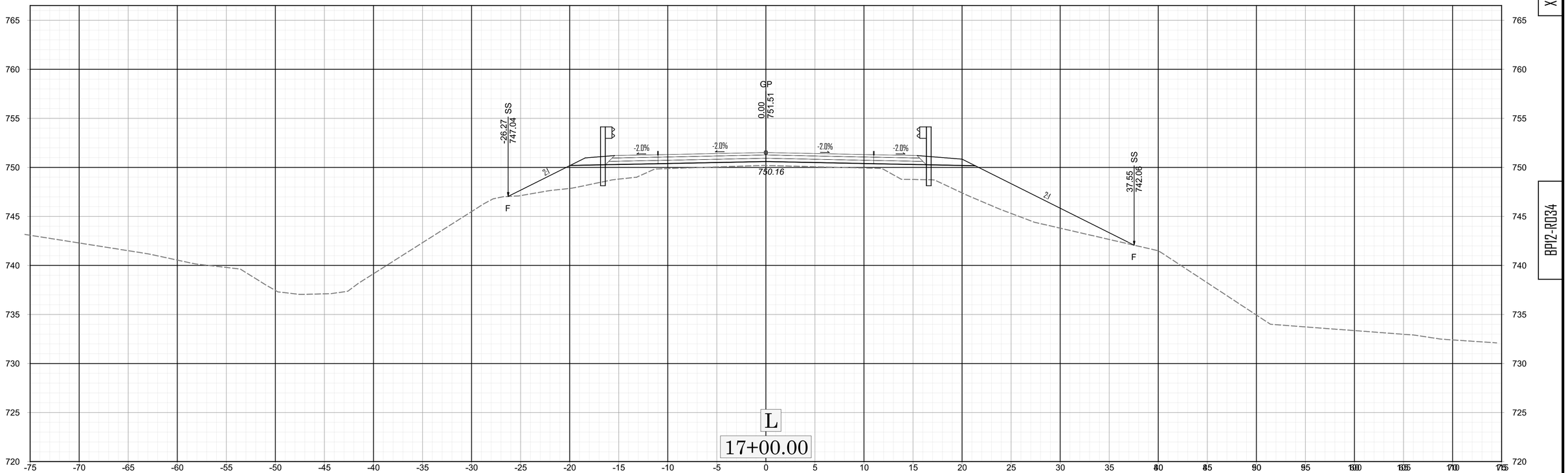
VOLKERT/rance.gamble 7/31/2026


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752.29
-22.89
749.76
SS
38.34
747.38
SS
-2.0%
-2.0%
-2.0%
-2.0%
2:1
4:1
751.07
F
F
L
16+50.00


C
SS
-52.16
764.48
DP
-26.28
751.54
GP
0.00
754.03
DP
28.00
751.44
C
SS
39.19
756.96
2:1
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-1.8%
-2.0%
-2.0%
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L
16+00.00

11/14/23





0 5 10

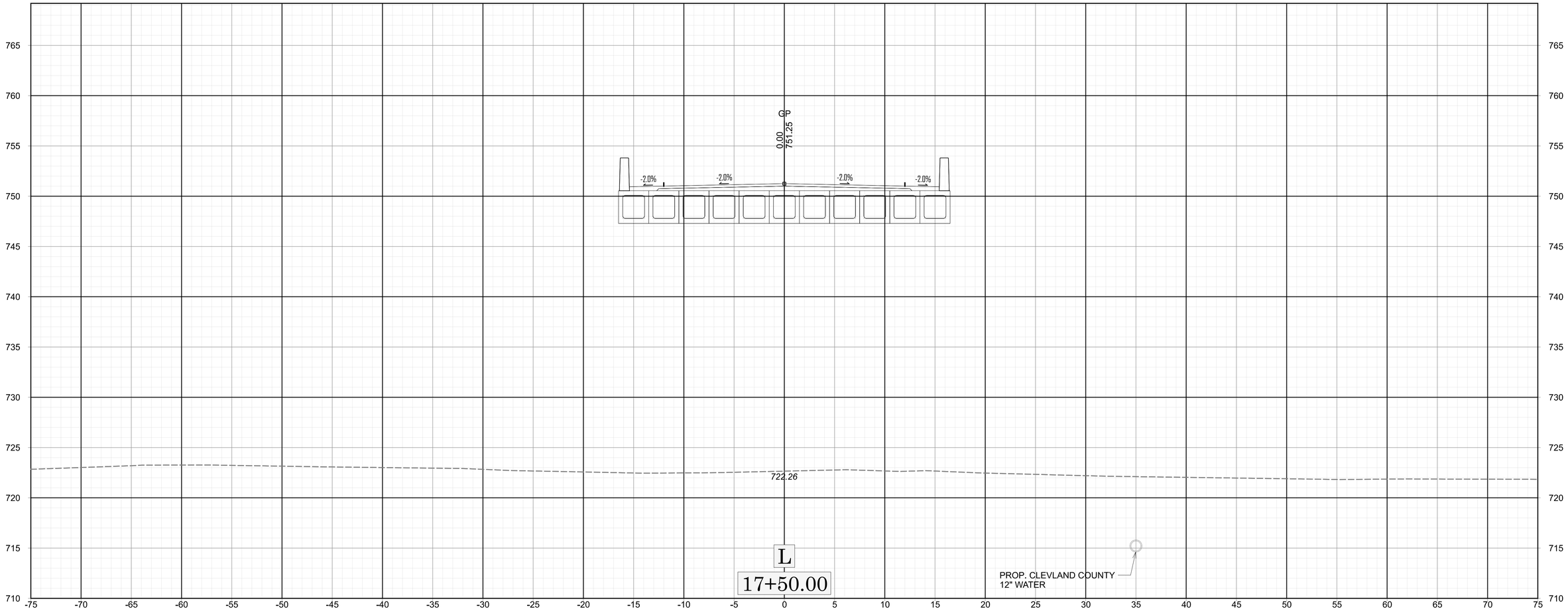
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04

BP17-R034

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11/14/23



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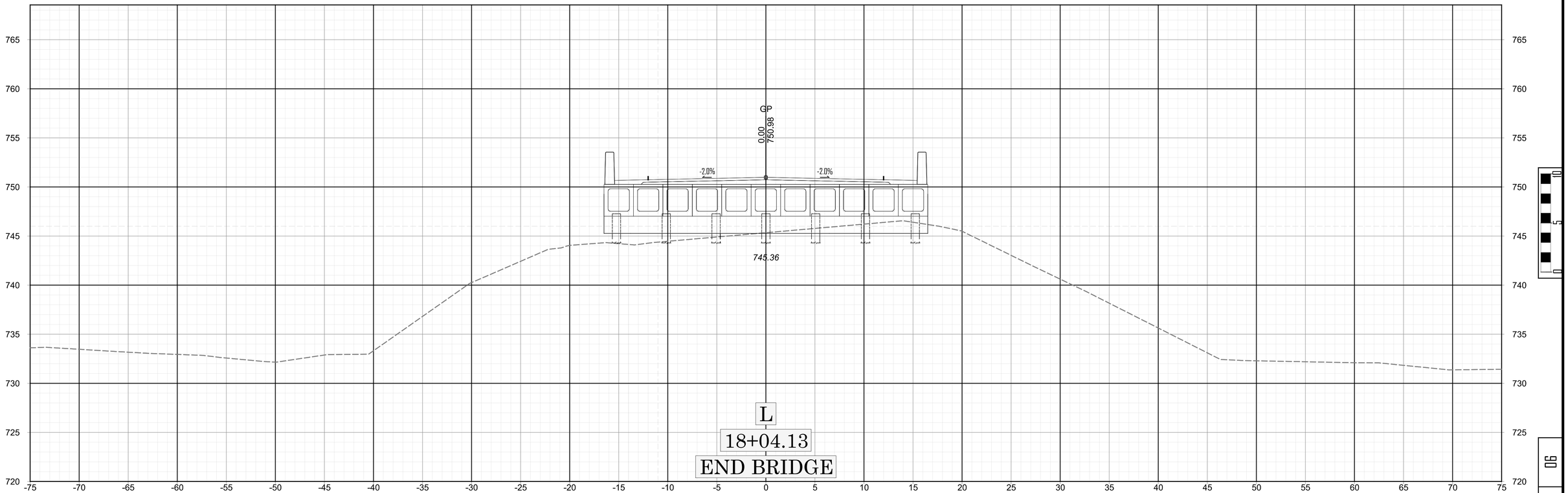
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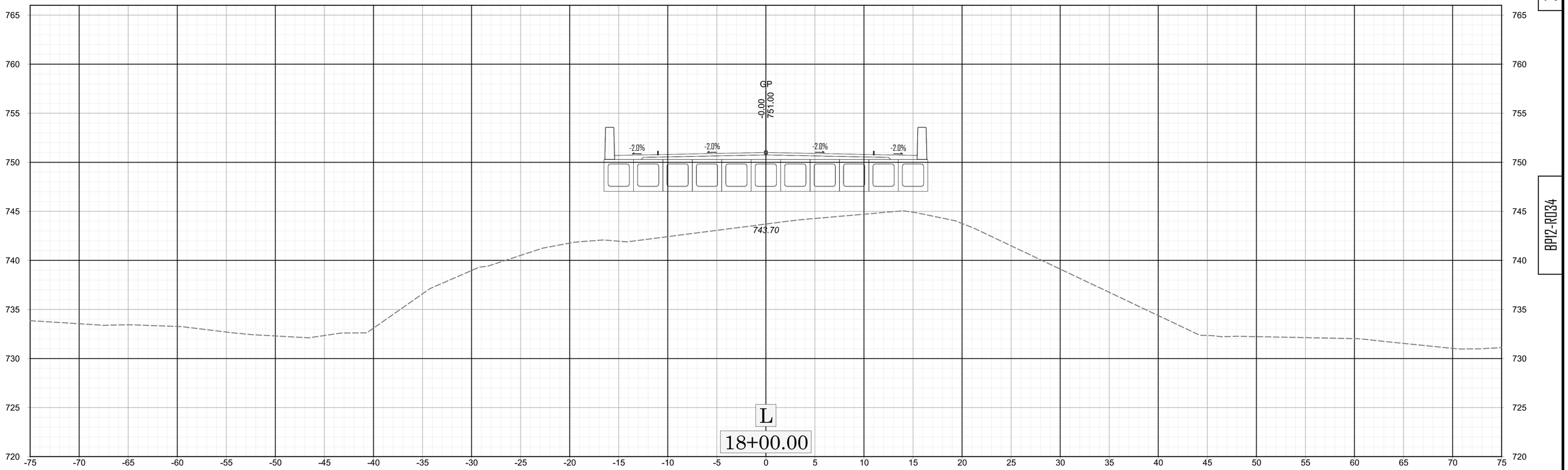
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BP12-R034

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11/14/23





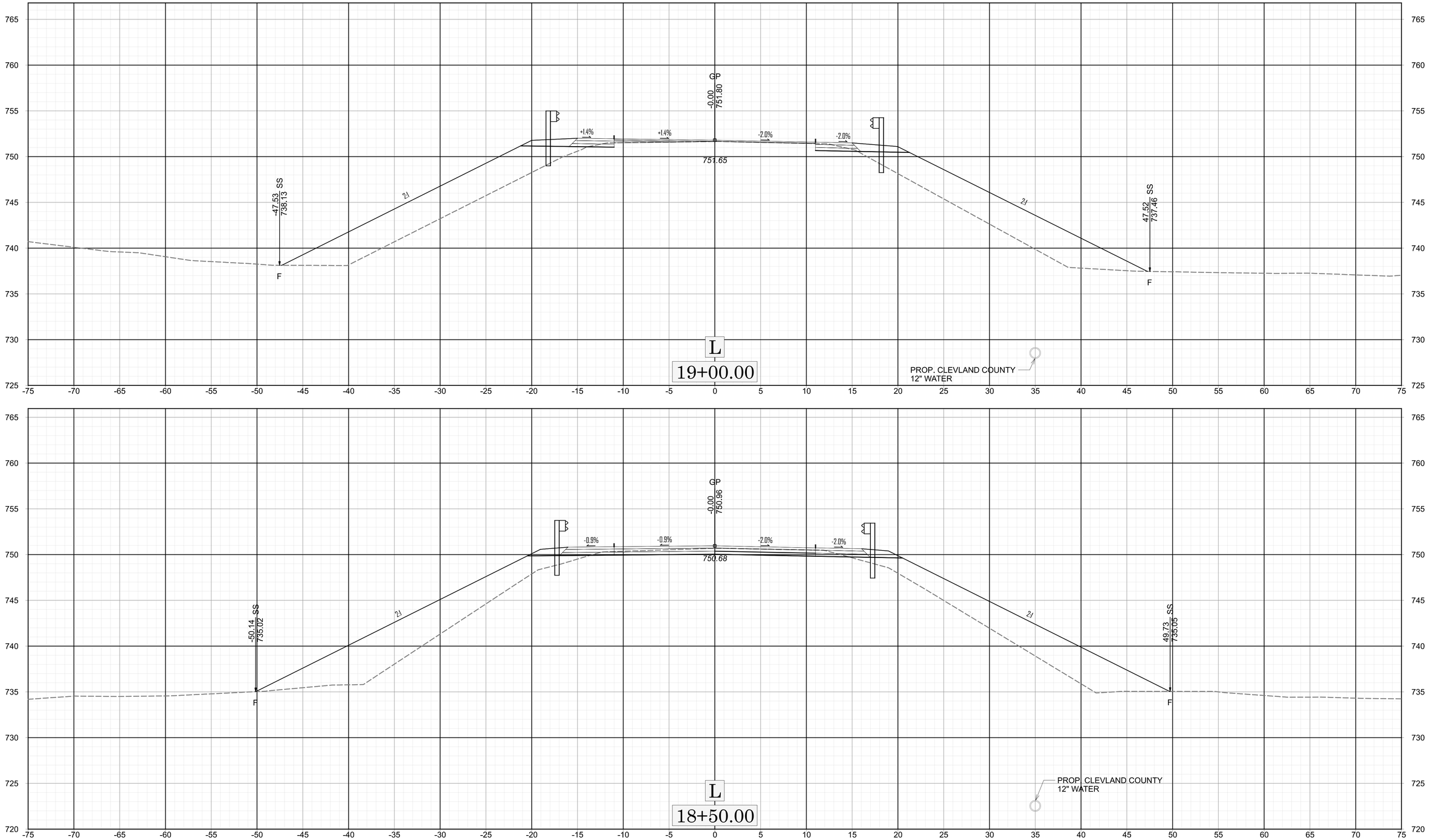
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BRI2-R034

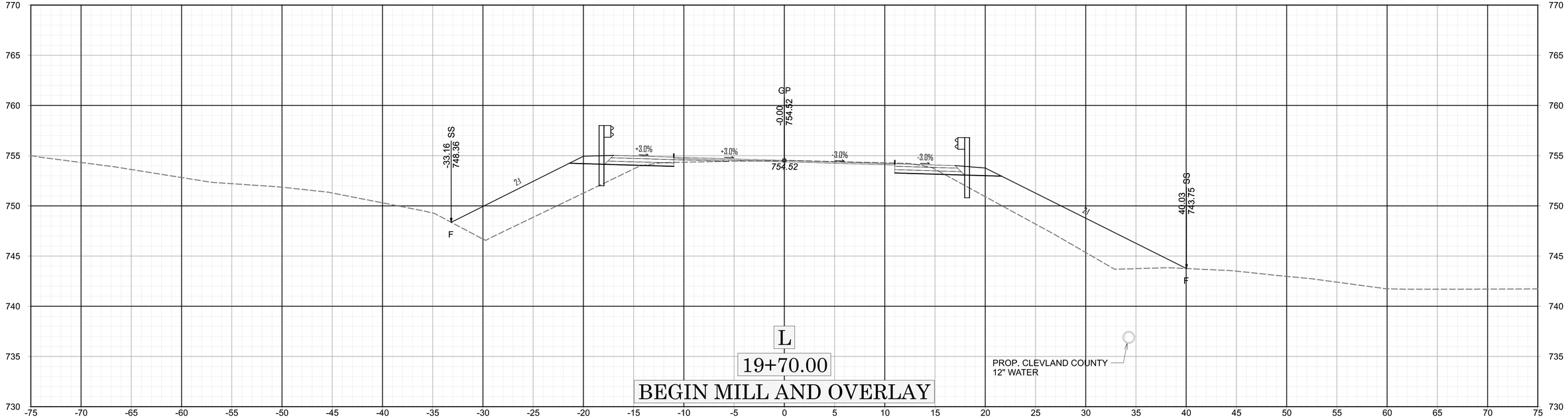
VOLKERT/rance.gamble 7/31/2026

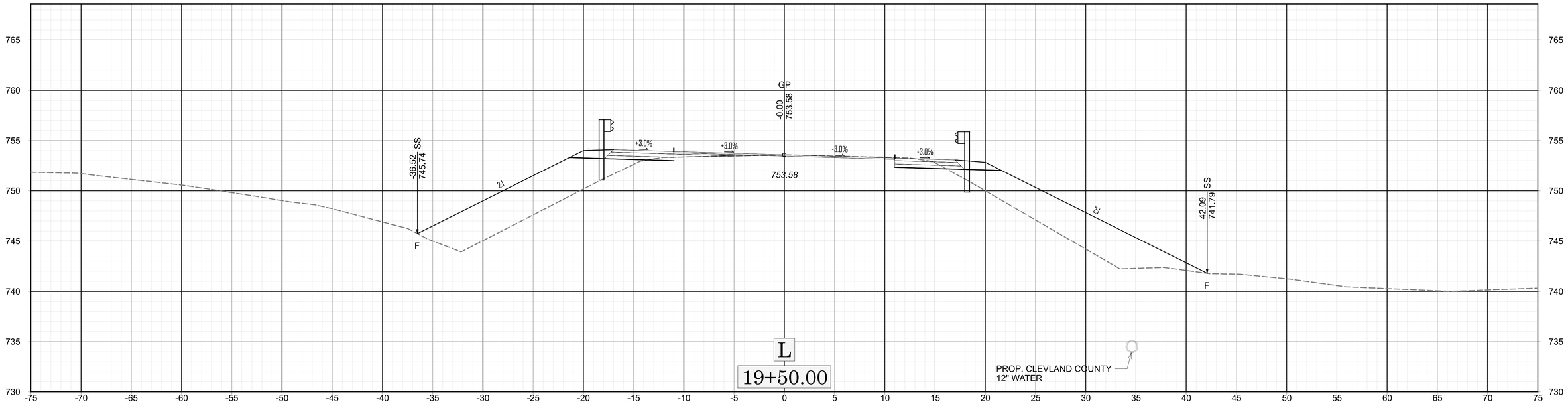


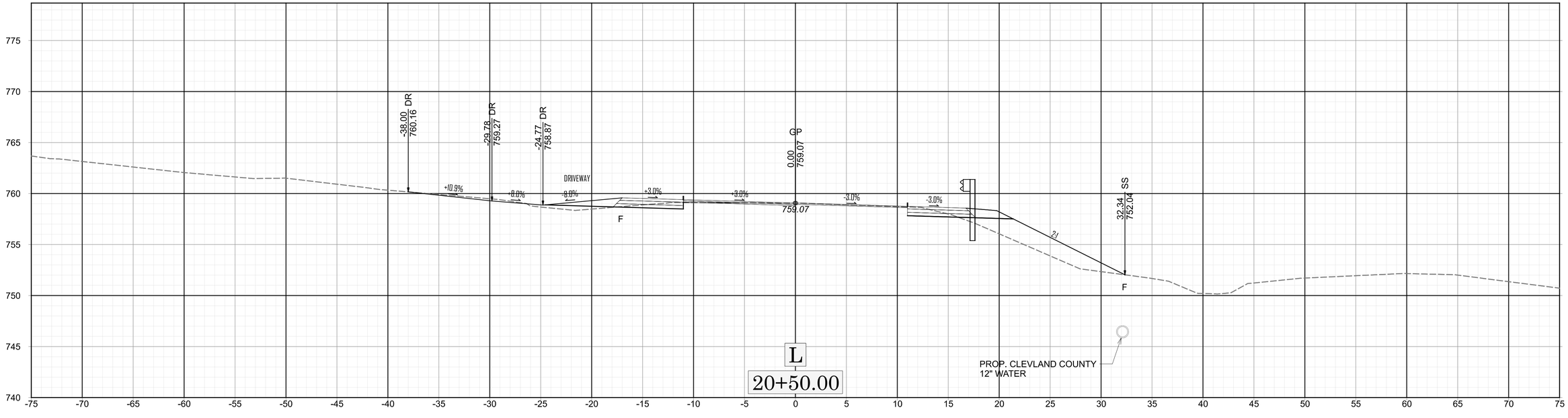
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X

BP12-R034

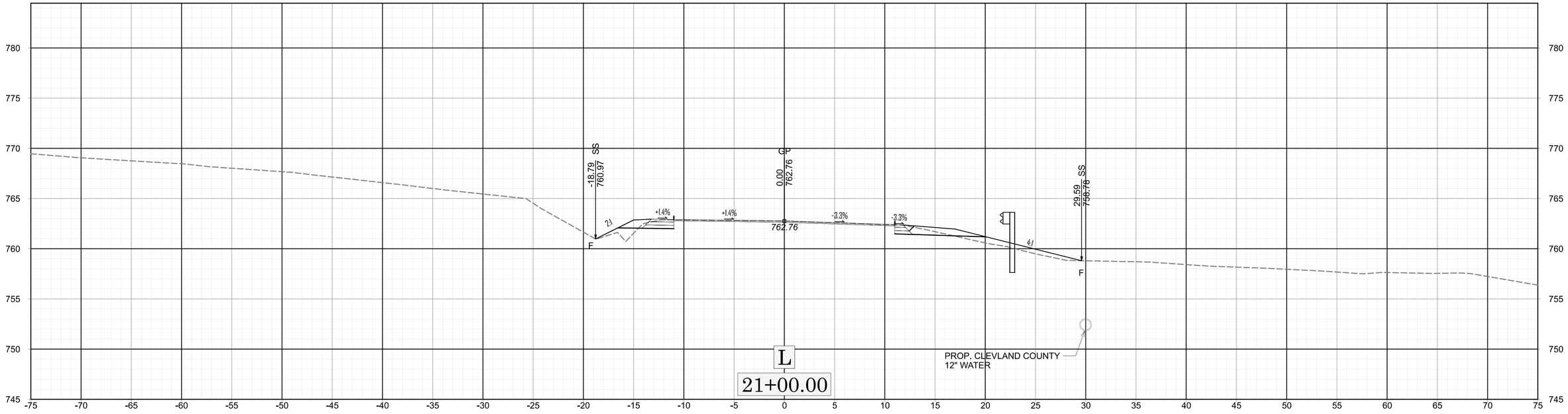

770
765
760
755
750
745
740
735
730
-75 -70 -65 -60 -55 -50 -45 -40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75
-33.16 SS
748.36
F
2:1
+3.0%
+3.0%
-3.0%
-3.0%
GP
-0.00
754.52
754.52
2:1
40.03 SS
743.75
F
L
19+70.00
BEGIN MILL AND OVERLAY
PROP. CLEVLAND COUNTY
12" WATER

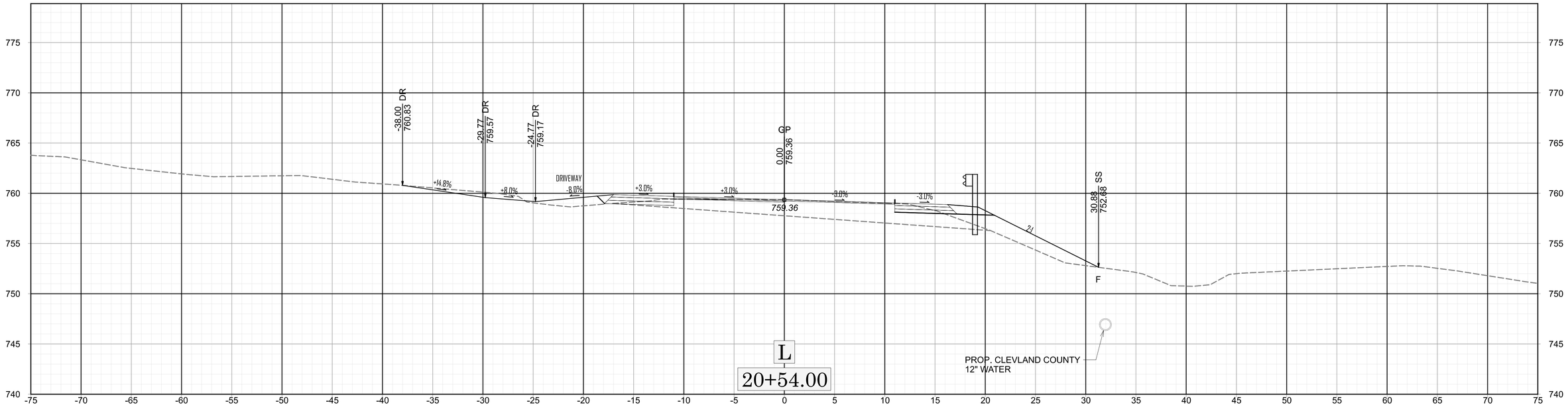

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760
755
750
745
740
735
730
-75 -70 -65 -60 -55 -50 -45 -40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75
-36.52 SS
745.74
F
2:1
+3.0%
+3.0%
-3.0%
-3.0%
GP
-0.00
753.58
753.58
2:1
42.09 SS
741.79
F
L
19+50.00
PROP. CLEVLAND COUNTY
12" WATER


-38.00 DR
760.16
-29.78 DR
759.27
-24.77 DR
758.87
DRIVEWAY
+10.9%
-8.0%
-8.0%
+3.0%
+3.0%
GP
0.00
759.07
759.07
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SS
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F
PROP. CLEVLAND COUNTY
12" WATER
L
20+50.00

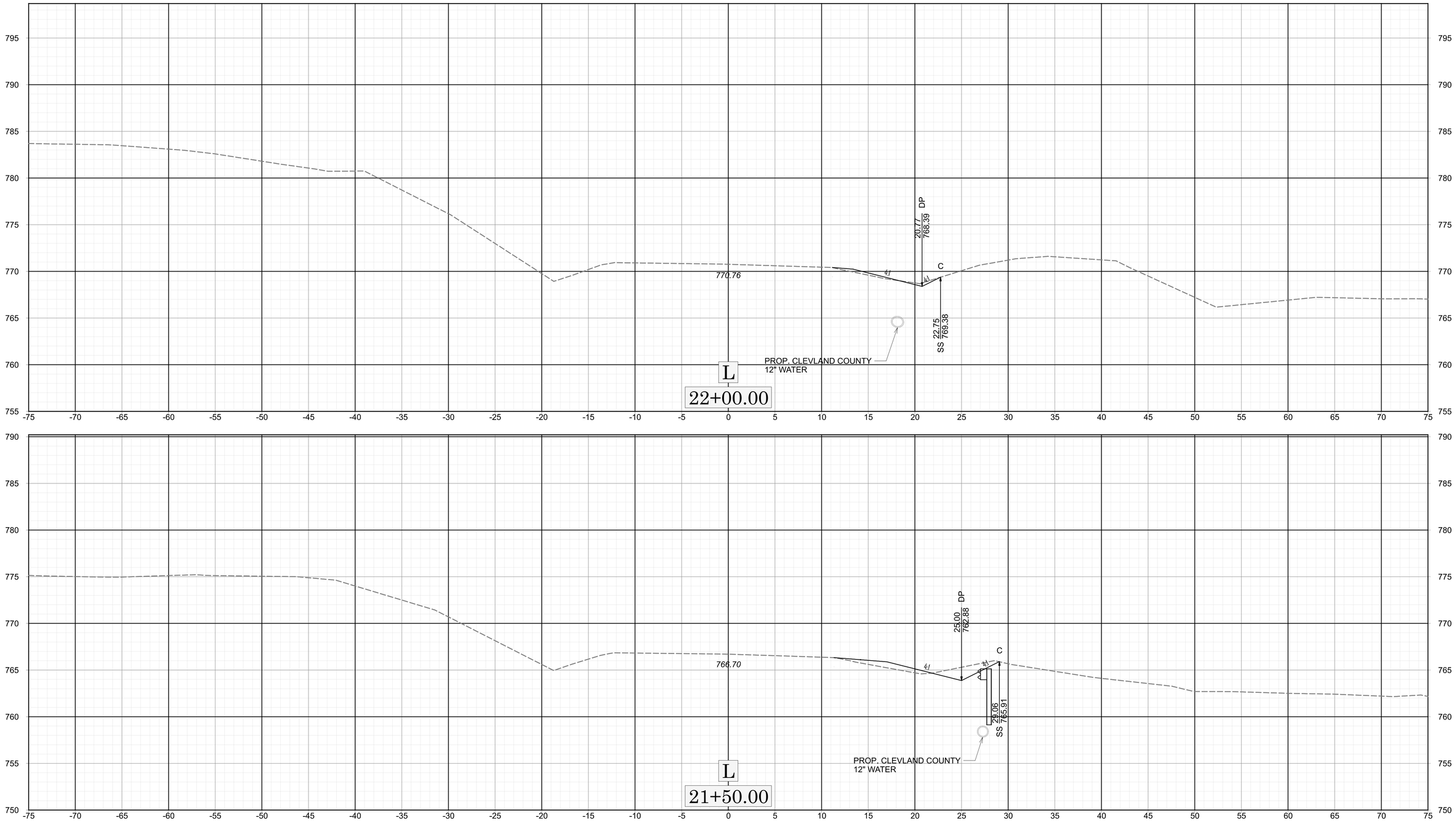
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+3.0%
+3.0%
-3.0%
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PROP. CLEVLAND COUNTY
12" WATER
L
20+00.00

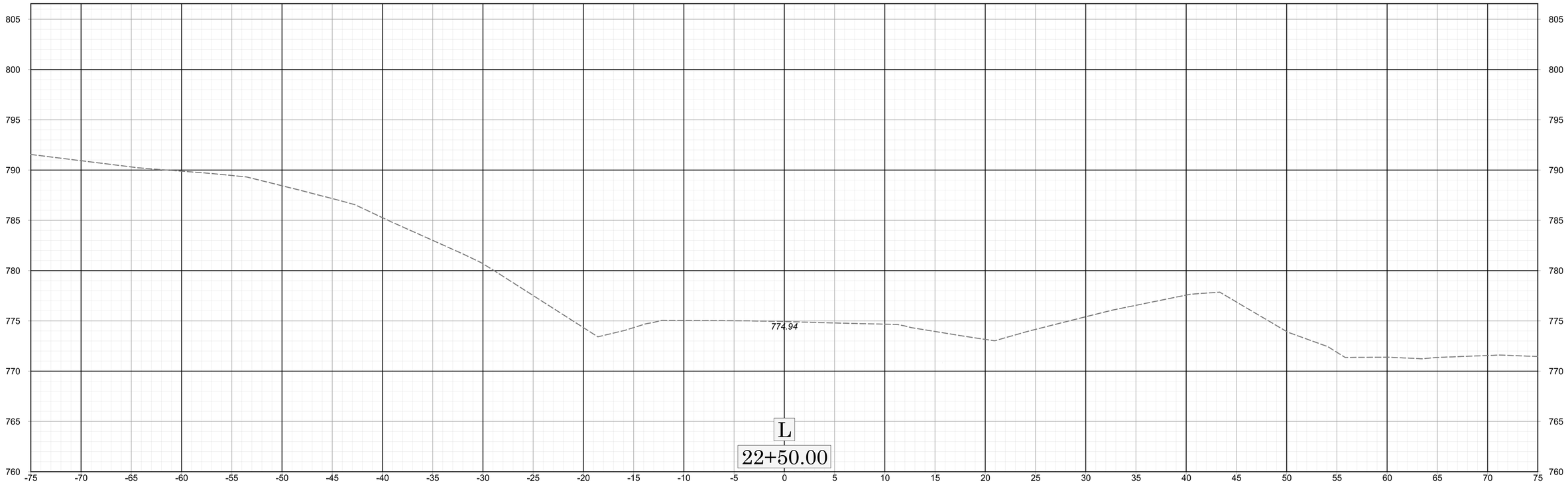
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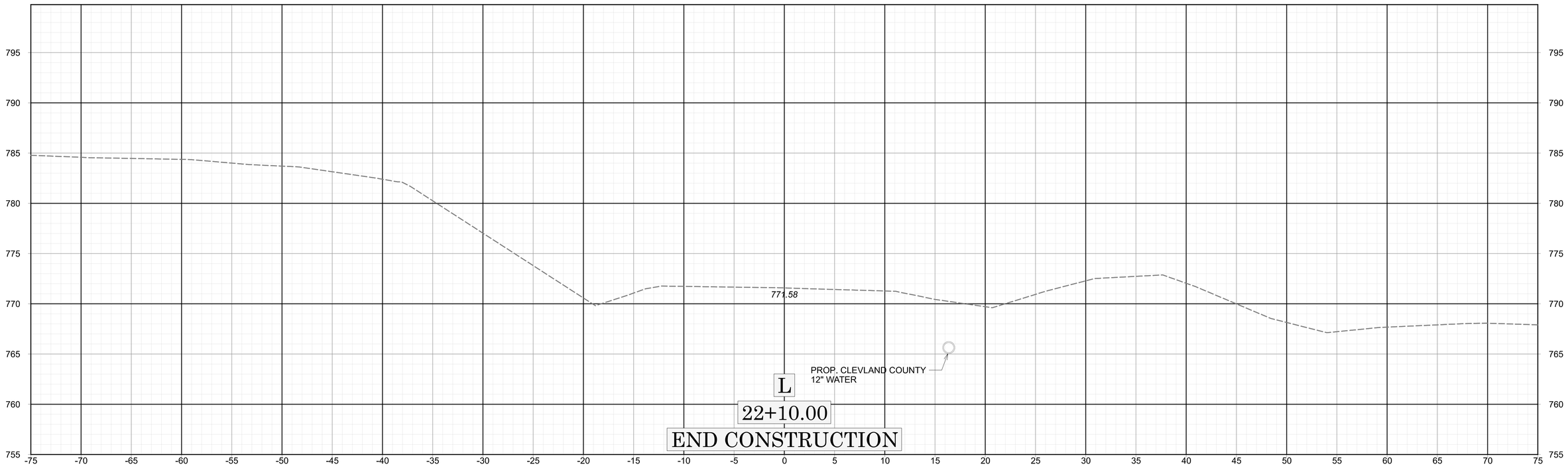

-18.79 SS
760.97
0.00
762.76
29.59 SS
758.76
+1.4%
+1.4%
-3.3%
-3.3%
2:1
4:1
762.76
F
F
PROP. CLEVLAND COUNTY
12" WATER
L
21+00.00


-38.00 DR
760.83
-29.77 DR
759.57
-24.77 DR
759.17
0.00
759.36
30.88 SS
752.68
+14.8%
+8.0%
-8.0%
DRIVEWAY
+3.0%
+3.0%
-3.0%
-3.0%
759.36
2:1
F
PROP. CLEVLAND COUNTY
12" WATER
L
20+54.00

BP12-R034


795
790
785
780
775
770
765
760
755
-75 -70 -65 -60 -55 -50 -45 -40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75
770.76
4:1
20.77
DP
768.39
C
SS
22.75
769.38
PROP. CLEVLAND COUNTY
12" WATER
L
22+00.00
790
785
780
775
770
765
760
755
750
766.70
4:1
25.00
DP
762.88
C
SS
29.06
765.91
PROP. CLEVLAND COUNTY
12" WATER
L
21+50.00





12

X

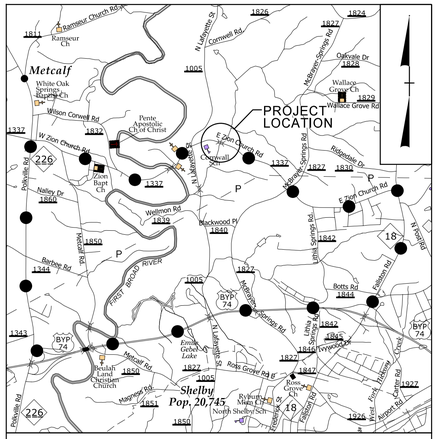
BP12-R034

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01/16/24

TIP PROJECT: BP12-R034

CONTRACT: DL00388



VICINITY MAP (NTS)

OFFSITE DETOUR

NAD 83 2011

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

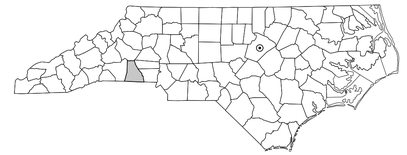
CLEVELAND COUNTY

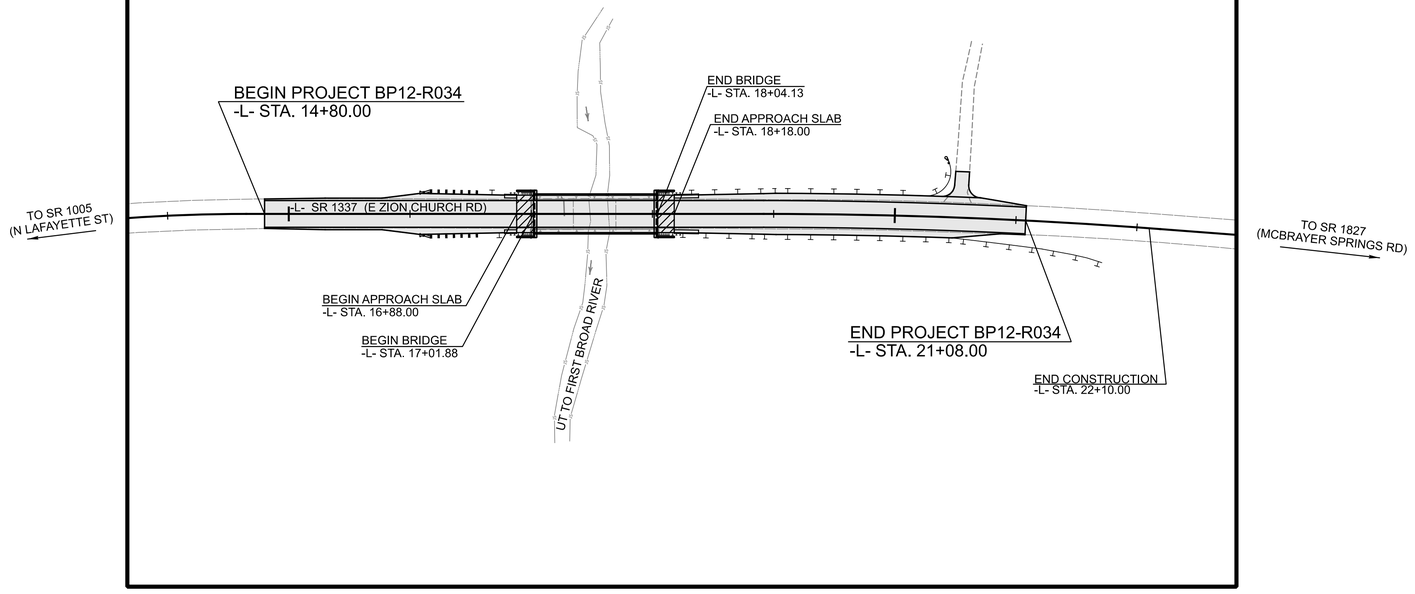
LOCATION: *REPLACEMENT OF BRIDGE NO. 220012 ON SR 1337 (ZION CHURCH RD) OVER UT TO FIRST BROAD RIVER*

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP12-R034	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP12.R034.1		P.E.
BP12.R034.2		ROW/UTIL.
BP12.R034.3		CONST.





STRUCTURES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA

ADT 2026 = 2,289
ADT 2046 = 2,793
V = 50 MPH
TTST = 10%
FUNC CLASS = LOCAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT BP12-R034 = 0.100 MILES
LENGTH OF STRUCTURE TIP PROJECT BP12-R034 = 0.019 MILES
TOTAL LENGTH OF TIP PROJECT BP12-R034 = 0.119 MILES

PLANS PREPARED FOR:
DIVISION OF HIGHWAYS
DIVISION 12
1710 E. MARION ST (US 74 BUS)
SHELBY, NC 28151

2024 STANDARD SPECIFICATIONS

LETTING DATE:
DECEMBER 12, 2026

EMILY MURRAY, PE
PROJECT ENGINEER

PATRICK HOLDER, PE
PROJECT DESIGN ENGINEER

JOSHUA B. WHITE, PE, PLS
NCDOT CONTACT
DIVISION 12 PROJECT TEAM LEAD

PREPARED IN THE OFFICE OF:

VOLKERT
5430 Wade Park Blvd., Suite 410
Raleigh, NC 27607
Tel. 919-854-0344 Fax. 919-854-0355
NC License No. F-0765

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8/26/21

16+50 17+00 17+50 18+00 18+50

770 760 750 740 730 720

GRADE DATA

(-) 8.4000% (-) 0.5000%

PI. STA. = 16+00.00 -L-
EL. = 752.00
V.C. = 206'

GRADE DATA

(-) 0.5000% (+) 4.7024%

PI. STA. = 18+86.00 -L-
EL. = 750.57
V.C. = 138'

FILL FACE @ END BENT 1
STA. 17+01.88 -L-
EL. 751.49

BEGIN FRONT SLOPE
STA. 16+91.94 -L-
EL. 751.56

EXISTING GROUND

FIX.

EL. 750 ±

EL. 750 ±

LOW CHORD
EL. 747.52

3
12

SLOPE 1.5:1
OR FLATTER
NORMAL TO CAP
(TYP.)

HP 12 x 53 STEEL PILES
(TYP. EA. END BENT)

EXISTING
SUBSTRUCTURE
(TYP.)

100 YR FLOOD
EL. 731.2

CLASS II RIP RAP
TO EL. 732.00 (TYP.)

25 YR FLOOD
EL. 730.4

NWS
EL. 723.0
(03/2025)

EL. 723 ±

EL. 722 ±

EL. 728 ±

EL. 730 ±

END BENT 1

SPAN A

END BENT 2

FILL FACE @ END BENT 2
STA. 18+04.13 -L-
EL. 750.98

1'-7" MIN. BERM
(TYP.)

1'-0" MIN. EARTH BERM
(TYP.)

FIX.

CLASS B RIP RAP
ABOVE EL. 732.00
(TYP.)

3
12

1'-0"
(TYP.)

BEGIN FRONT SLOPE
STA. 18+13.85 -L-
EL. 750.93

EL. 750 ±

EL. 750 ±

LOW CHORD
EL. 747.03

SECTION ALONG -L-

102'-3" (SPAN A) (FILL FACE @ END BENT 1 TO FILL FACE @ END BENT 2)

51'-1½" 51'-1½"

1'-0" MIN. EARTH BERM
BERM EL. 742.44
(LEVEL)

CLASS II RIP RAP
TO EL. 732.00

CLASS II RIP RAP
TO EL. 732.00

1'-0" MIN. EARTH BERM
BERM EL. 741.95
(LEVEL)

EXISTING
BRIDGE

UT TO FIRST
BROAD RIVER

JS

JS

JS

W.P. #1
FILL FACE @ END BENT 1
STA. 17+01.88 -L-

BEGIN FRONT SLOPE
STA. 16+91.94 -L-

TO N. LAFAYETTE ST.
(SR-1005)

-L-

BRIDGE I.D.
STA. 17+53.00 -L-

SR-1334 (EAST ZION
CHURCH RD.)
S72°42'00.3"E

W.P. #2
FILL FACE @ END BENT 2
STA. 18+04.13 -L-

BEGIN FRONT SLOPE
STA. 18+13.85 -L-

90°00'00"
(TYP.)

BEGIN APPROACH SLAB
STA. 16+88.00 -L-

END APPROACH SLAB
STA. 18+18.00 -L-

TO MCBRAYER-SPRINGS RD
(SR-1827)

CLASS B
RIP RAP

CLASS B
RIP RAP

PLAN ALONG -L-

(PILES NOT SHOWN FOR CLARITY)

NAD 83/2011

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
Signed by: Emily E. Murray
A689F83FD9D1484...
10/2/2026

NORTH CAROLINA PROFESSIONAL SEAL 048615 ENGINEER PATRICK N. HOLDER
Signed by: Patrick N. Holder
318222A0C...
10/2/2026

PROJECT NO. BP12-R034

CLEVELAND COUNTY

STATION: 17+53.00 -L-

SHEET 1 OF 4 REPLACES BRIDGE NO. 220012

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER UT TO FIRST BROAD RIVER ON SR-1337 (E. ZION CHURCH RD.) BETWEEN SR-1005 (N. LAFAYETTE ST.)AND SR-1827 (MCBRAYER-SPRINGS RD.)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-01
1			3			TOTAL SHEETS
2			4			18

DRAWN BY : M. HOGAN DATE : 06/25
CHECKED BY : P. N. HOLDER DATE : 07/25
DESIGN ENGINEER OF RECORD: P. N. HOLDER DATE : 06/26

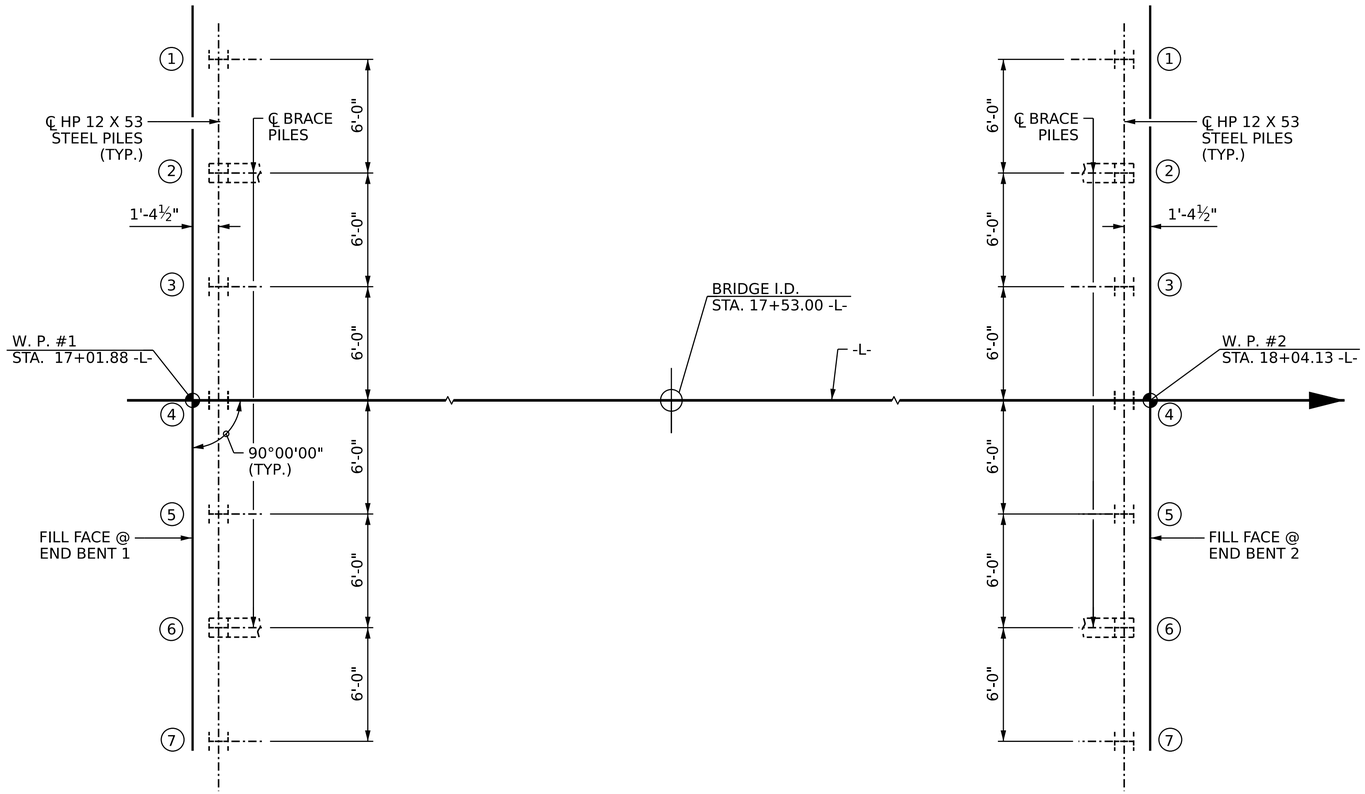
8/10/2026
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patrick.holder

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NC License No. F-0765

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8/26/21



END BENT 1

END BENT 2

NAD 83/2011

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO CENTERLINE OF PILES.

NOTE: PILES 2 AND 6 ARE BRACE PILES.

FOUNDATION NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. **BP12-R034**

CLEVELAND COUNTY

STATION: **17+53.00 -L-**

SHEET 2 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 048615 ENGINEER PATRICK N. HOLDER
DocuSigned by: 3182...
10/2/2026

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER UT TO FIRST BROAD RIVER ON SR-1337 (E. ZION CHURCH RD.) BETWEEN SR-1005 (N. LAFAYETTE ST.)AND SR-1827 (MCBRAYER-SPRINGS RD.)

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			18

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DRAWN BY : M. HOGAN DATE : 05/26
CHECKED BY : P. N. HOLDER DATE : 06/26
DESIGN ENGINEER OF RECORD: P. N. HOLDER DATE : 06/26

5/6/2026
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SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Number of Piles per Line	Factored Resistance per Pile KIPS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Length per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles **			Drilled-In Piles		
						Minimum Pile Tip (Tip No Higher Than) Elevation FT	Required Driving Resistance (RDR)* per pile KIPS	Pile Redrives Quantity EACH	Predrilling Length per Pile LIN FT	Predrilling Elevation (Elevation Not To Predrill Below) FT	Maximum Predrilling Diameter INCHES	Pile Excavation (Bottom of Hole) Elevation FT	Pile Excavation Not In Soil per Pile LIN FT	Pile Excavation In Soil per Pile LIN FT
End Bent No. 1	7	226		25			377							
End Bent No. 2	7	226		25			377							
TOTAL QUANTITY:														

$$^{*}RDR = \frac{Factored\ Resistance + Factored\ Drag\ Load + Factored\ Dead\ Load}{Dynamic\ Resistance\ Factor} + Nominal\ Drag\ Load\ Resistance + Nominal\ Resistance\ from\ Scourable\ Material$$

** Predrilling for Piles is required for end bents/bents with a predrilling length and at the Contractor's option for end bents/bents with predrilling information but no predrilling length.

PILE DESIGN INFORMATION

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile KIPS	Factored Drag Load per Pile KIPS	Factored Dead Load * per Pile KIPS	Dynamic Resistance Factor	Nominal Drag Resistance per Pile KIPS	Nominal Scour Resistance per Pile KIPS
End Bent No. 1	226			0.60		
End Bent No. 2	226			0.60		

* Factored Dead Load is factored weight of pile above the ground line.

PROJECT NO. BP12.R034.1

Cleveland COUNTY

STATION: 17+53.00 -L-

NOTES:

1. The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Michael H. Stephens, #028893) on 011-21-2025.
2. Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
3. The Engineer may adjust the quantity for DPT Testing and Pipe Pile Plates when necessary.

NORTH CAROLINA PROFESSIONAL SEAL 48615 ENGINEER MICHAEL HAROLD STEPHENS N.

Docusigned by: MICHAEL STEPHENS 31822A...

10/2/2026

SIGNATURE DATE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE FOUNDATION TABLES

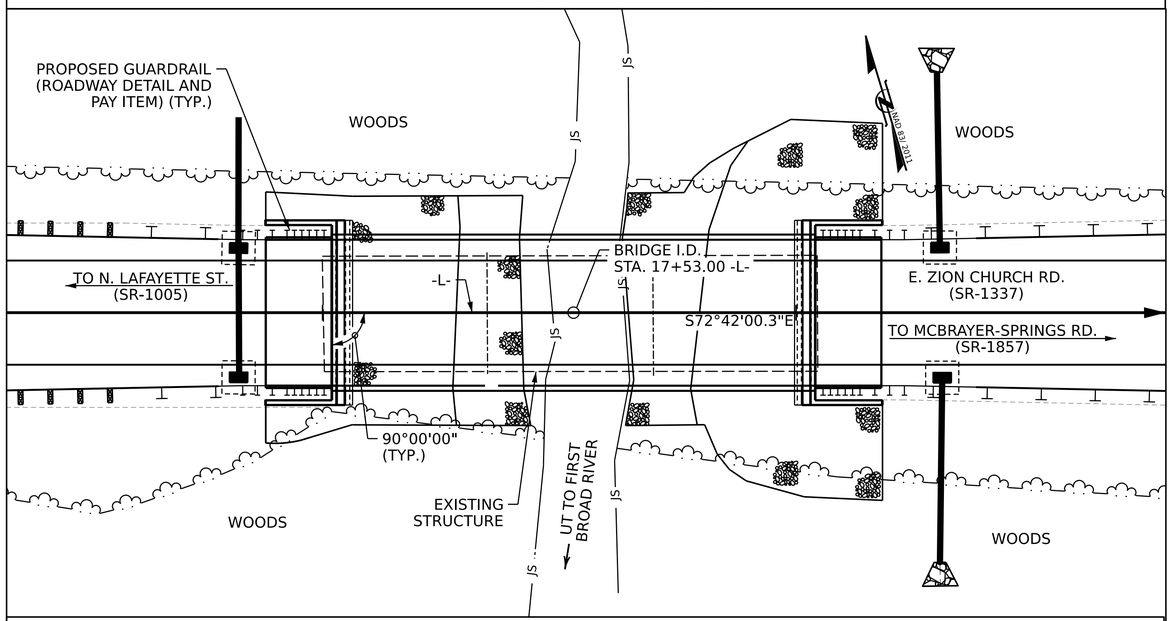
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1			3			TOTAL SHEETS
2			4			18

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8/26/21

BM 103: SPIKE IN 12" OAK, STA. 21+21.68 -L-, 29.18' RIGHT, NORTHING 591689.2710, EASTING 1243652.3920, ELEV. 762.40, DATUM NAVD 88



LOCATION SKETCH

FOR UTILITY INFORMATION SEE UTILITY PLANS AND SPECIAL PROVISIONS

GENERAL NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR ASBESTOS ASSESSMENT, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE EXISTING STRUCTURE CONSISTING OF THREE SPAN CORED SLABS WITH ASPHALT WEARING SURFACE ON CONCRETE BENT CAPS WITH STEEL PILES AND LOCATED IN THE SAME LOCATION OF THE PROPOSED BRIDGE SHALL BE REMOVED.
THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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 SPECIFICATION.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18-EVALUATING SCOUR AT BRIDGES."

FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.

FOR CORED SLAB AND BOX BEAM POST-TENSIONING, SEE SPECIAL PROVISIONS.

FOR CORED SLAB AND BOX BEAM POST-TENSIONING, SEE SPECIAL PROVISIONS.

HYDRAULIC DATA

DESIGN DISCHARGE	= 960 C.F.S.
FREQUENCY OF DESIGN FLOOD	= 25 YRS.
DESIGN HIGH WATER ELEVATION	= 730.4 FT.
DRAINAGE AREA	= 2.99 SQ. MI.
BASIC DISCHARGE (Q100)	= 1,400 C.F.S.
BASIC HIGH WATER ELEVATION	= 731.2 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 19,000 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YRS.
OVERTOPPING FLOOD ELEVATION	= 750.9 FT.
OVERTOPPING STATION	= 18+30 -L-

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE @ STATION 17+53.00 -L-	ASBESTOS ASSESSMENT	CONCRETE WEARING SURFACE	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS @ STATION 17+53.00 -L-	REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES		VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS B	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAMS	
	LUMP SUM	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	EACH	NO.	LIN. FT.	LIN. FT.	TONS	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE			3084	3572							200.0				LUMP SUM	11	1100
END BENT 1					29.0		4610	7	7	175		165	68	225			
END BENT 2					29.0		4610	7	7	175		264	82	331			
TOTAL	LUMP SUM	LUMP SUM	3084	3572	58.0	LUMP SUM	9220	14	14	350	200.0	429	150	556	LUMP SUM	11	1100

PROJECT NO. BP12-R034

CLEVELAND COUNTY

STATION: 17+53.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER UT TO FIRST BROAD RIVER ON SR-1337 (E. ZION CHURCH RD.) BETWEEN SR-1005 (N. LAFAYETTE ST.)AND SR-1827 (MCBRAYER-SPRINGS RD.)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-04
1			3			TOTAL SHEETS
2			4			18

NORTH CAROLINA PROFESSIONAL SEAL 048615 ENGINEER PATRICK NEIL HOLDER
31822A236F...
10/2/2026

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DRAWN BY : M. HOGAN DATE : 06/26
CHECKED BY : P. N. HOLDER DATE : 06/26
DESIGN ENGINEER OF RECORD: P. N. HOLDER DATE : 06/26

8/12/2026
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8/26/21

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LOAD TYPE		VEHICLE	WEIGHT (W) (TONS)	⟨#⟩ CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVE-LOAD FACTORS (γ LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD		HL-93 (INVENTORY)	N/A	⟨1⟩	1.035	--	1.75	0.272	1.26	100'	EL	49.25	0.489	1.34	100'	EL	4.925	0.80	0.272	1.04	100'	EL	49.25	
		HL-93 (OPERATING)	N/A		1.633	--	1.35	0.272	1.63	100'	EL	49.25	0.489	1.73	100'	EL	4.925	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	⟨2⟩	1.440	51.840	1.75	0.272	1.75	100'	EL	49.25	0.489	1.81	100'	EL	4.925	0.80	0.272	1.44	100'	EL	49.25	
		HS-20 (OPERATING)	36.000		2.271	81.756	1.35	0.272	2.27	100'	EL	49.25	0.489	2.35	100'	EL	4.925	N/A	--	--	--	--	--	
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		3.413	46.079	1.4	0.272	5.19	100'	EL	49.25	0.489	5.59	100'	EL	4.925	0.80	0.272	3.41	100'	EL	49.25	
		SNGARBS2	20.000		2.473	49.452	1.4	0.272	3.76	100'	EL	49.25	0.489	3.91	100'	EL	4.925	0.80	0.272	2.47	100'	EL	49.25	
		SNAGRIS2	22.000		2.313	50.885	1.4	0.272	3.52	100'	EL	49.25	0.489	3.60	100'	EL	4.925	0.80	0.272	2.31	100'	EL	49.25	
		SNCOTTS3	27.250		1.696	46.228	1.4	0.272	2.58	100'	EL	49.25	0.489	2.78	100'	EL	4.925	0.80	0.272	1.70	100'	EL	49.25	
		SNAGGRS4	34.925		1.390	48.556	1.4	0.272	2.11	100'	EL	49.25	0.489	2.26	100'	EL	4.925	0.80	0.272	1.39	100'	EL	49.25	
		SNS5A	35.550		1.361	48.398	1.4	0.272	2.07	100'	EL	49.25	0.489	2.27	100'	EL	4.925	0.80	0.272	1.36	100'	EL	49.25	
		SNS6A	39.950		1.238	49.456	1.4	0.272	1.88	100'	EL	49.25	0.489	2.05	100'	EL	4.925	0.80	0.272	1.24	100'	EL	49.25	
		SNS7B	42.000		1.178	49.496	1.4	0.272	1.79	100'	EL	49.25	0.489	2.00	100'	EL	4.925	0.80	0.272	1.18	100'	EL	49.25	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.506	49.709	1.4	0.272	2.29	100'	EL	49.25	0.489	2.46	100'	EL	4.925	0.80	0.272	1.51	100'	EL	49.25	
		TNT4A	33.075		1.510	49.942	1.4	0.272	2.30	100'	EL	49.25	0.489	2.41	100'	EL	4.925	0.80	0.272	1.51	100'	EL	49.25	
		TNT6A	41.600		1.224	50.926	1.4	0.272	1.86	100'	EL	49.25	0.489	2.09	100'	EL	4.925	0.80	0.272	1.22	100'	EL	49.25	
		TNT7A	42.000		1.225	51.442	1.4	0.272	1.86	100'	EL	49.25	0.489	2.05	100'	EL	4.925	0.80	0.272	1.22	100'	EL	49.25	
		TNT7B	42.000		1.254	52.657	1.4	0.272	1.91	100'	EL	49.25	0.489	1.96	100'	EL	4.925	0.80	0.272	1.25	100'	EL	49.25	
		TNAGRIT4	43.000		1.203	51.711	1.4	0.272	1.83	100'	EL	49.25	0.489	1.91	100'	EL	4.925	0.80	0.272	1.20	100'	EL	49.25	
		TNAGT5A	45.000		1.139	51.236	1.4	0.272	1.73	100'	EL	49.25	0.489	1.87	100'	EL	4.925	0.80	0.272	1.14	100'	EL	49.25	
		TNAGT5B	45.000	⟨3⟩	1.129	50.805	1.4	0.272	1.72	100'	EL	49.25	0.489	1.82	100'	EL	4.925	0.80	0.272	1.13	100'	EL	49.25	
EMERGENCY VEHICLE (EV)		EV2	28.750		2.129	61.213	1.3	0.272	2.87	100'	EL	49.25	0.489	3.06	100'	EL	4.925	0.80	0.272	2.13	100'	EL	49.25	
		EV3	43.000	⟨4⟩	1.403	60.325	1.3	0.272	1.89	100'	EL	49.25	0.489	2.06	100'	EL	4.925	0.80	0.272	1.40	100'	EL	49.25	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γDC	γDW
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

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

GIRDER LOCATION

I - INTERIOR GIRDER

EL - EXTERIOR LEFT GIRDER

ER - EXTERIOR RIGHT GIRDER

⟨1⟩
⟨2⟩
⟨3⟩
⟨4⟩

LRFR SUMMARY

FOR SPAN " A "

PROJECT NO. **BP12-R034**

CLEVELAND COUNTY

STATION: **17+53.00 -L-**

NORTH CAROLINA PROFESSIONAL SEAL 48615 ENGINEER PATRICK K. HOLDER
31822A2360F1446...
10/2/2026

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR 100' BOX BEAM UNIT 90° SKEW

(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-05
1			3			TOTAL SHEETS
2			4			18

ASSEMBLED BY:	K. M. FARRELL	DATE :	02/26
CHECKED BY :	P. N. HOLDER	DATE :	06/26
DRAWN BY :	TMG II/II	REV. 06/23	AKP/AAI
CHECKED BY :	AAC II/II		

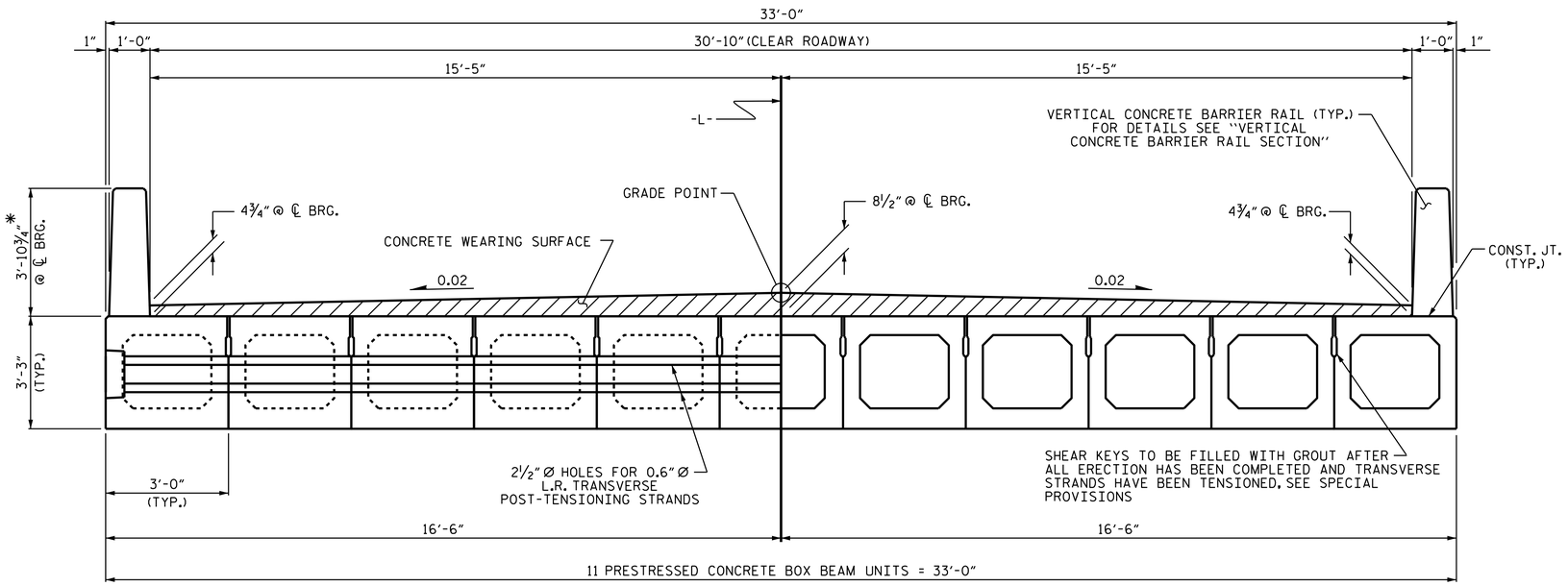
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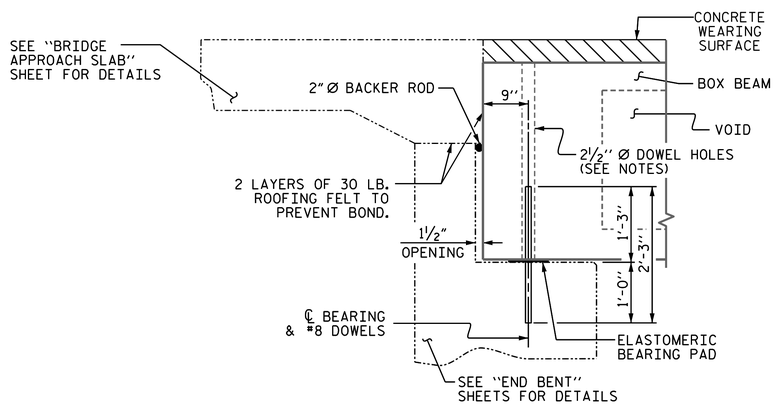
HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

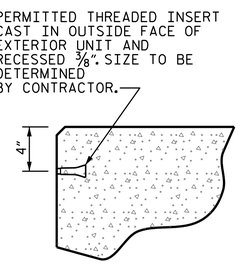
TYPICAL SECTION

* THE MAXIMUM BARRIER RAIL HEIGHT AND CONCRETE THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND CONCRETE THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND CONCRETE THICKNESS, SEE THE ''VERTICAL CONCRETE BARRIER RAIL SECTION'' DETAIL.

FIXED END



SECTION AT END BENT



THREADED INSERT DETAIL

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.

FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2½″ Ø DOWEL HOLES AT FIXED ENDS OF BOX BEAM SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE BACKER RODS SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5,500 PSI.

ALL REINFORCING STEEL IN VERTICAL CONCRETE BARRIER RAILS SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.

VERTICAL GROOVED CONTRACTION JOINTS, ½'' IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A VERTICAL CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.

THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4′-0″ CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.

PLACEMENT OF THE CONCRETE WEARING SURFACE SHALL OCCUR AFTER CASTING THE CONCRETE RAIL. THE COST OF THE REINFORCING STEEL CAST WITH THE CONCRETE WEARING SURFACE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONCRETE WEARING SURFACE. FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.

WHEN A CONCRETE WEARING SURFACE IS DETAILED ON THE BOX BEAM BRIDGE TYPICAL SECTION, THE TOP SURFACE OF THE BOX BEAM UNITS SHALL HAVE A ¼″ RAKED FINISH.

PROJECT NO. **BP12-R034**

CLEVELAND COUNTY

STATION: **17+53.00 -L-**

SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

3′-0″ X 3′-3″ PRESTRESSED CONCRETE BOX BEAM UNIT

NORTH CAROLINA PROFESSIONAL SEAL 48615 ENGINEER PATRICK N. HOLDER
Digitally signed by Patrick N. Holder
31822A2B8F...
10/2/2026

REVISIONS						SHEET NO.
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ASSEMBLED BY : K. M. FARRELL	DATE : 05/26
CHECKED BY : P. N. HOLDER	DATE : 05/26
DRAWN BY : DGE 8/11	REV. 10/15 MAA/TMG
CHECKED BY : TMG 11/11	

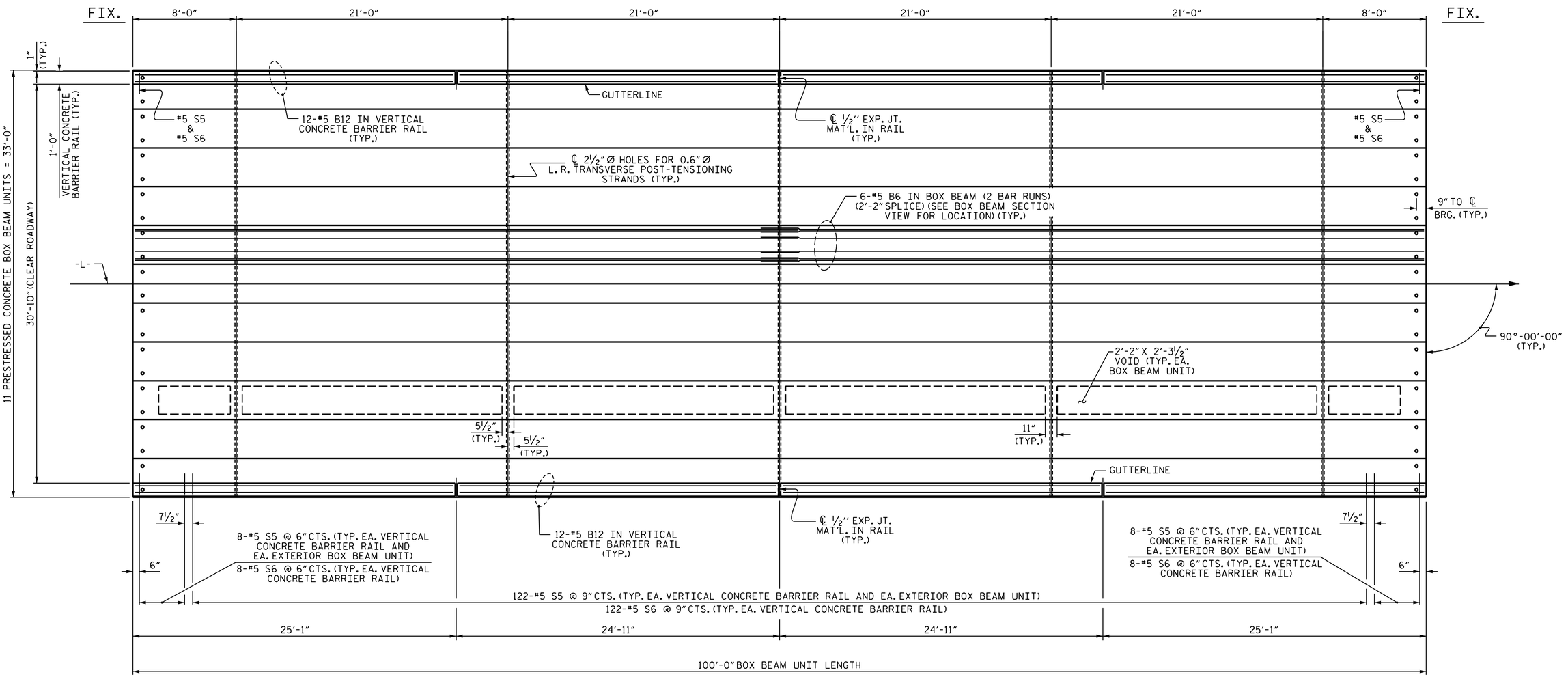
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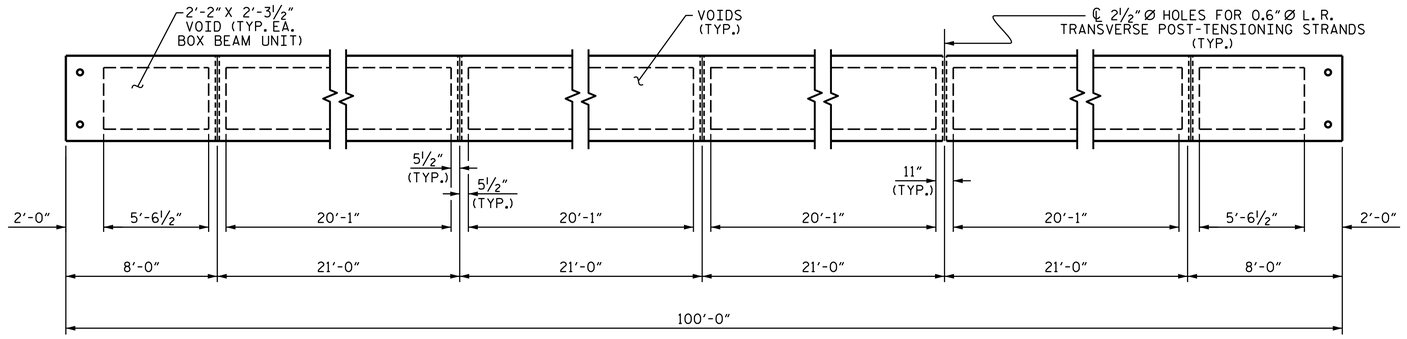
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8/7/2026
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PLAN OF UNIT



DIAPHRAGM AND VOID LAYOUT

PROJECT NO. **BP12-R034**

CLEVELAND COUNTY

STATION: **17+53.00 -L-**

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 100' UNIT 30'-10" CLEAR ROADWAY 90° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 48615 ENGINEER PATRICK NOLDER
Digitally signed by PATRICK NOLDER
31822A2E8F1...
10/2/2026

ASSEMBLED BY :	K. M. FARRELL DATE : 05/26
CHECKED BY :	P. N. HOLDER DATE : 05/26
DRAWN BY :	DGE 8/10
CHECKED BY :	TMG 11/11
REV. 8/14	MAA/TMG

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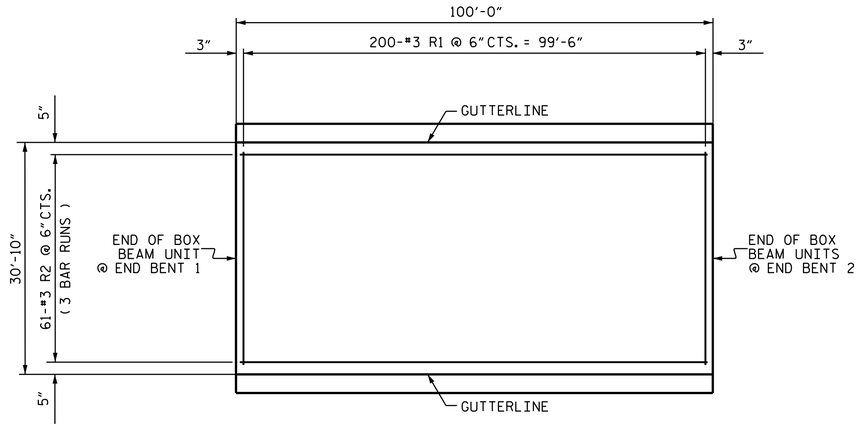
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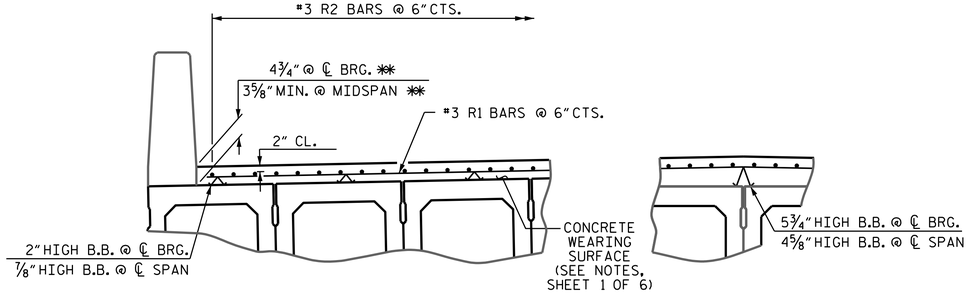
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PLAN SHOWING CONCRETE WEARING SURFACE REINFORCING STEEL



REINFORCING FOR CONCRETE WEARING SURFACE

✱✱ BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS

BEAM AND TOP OF SLAB BOLSTER HEIGHTS ARE BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATION AND VARY BETWEEN ℄ BEARING AND MIDSPAN.

PLACEMENT OF THE CONCRETE WEARING SURFACE SHALL OCCUR AFTER CASTING THE CONCRETE RAIL. THE COST OF THE REINFORCING STEEL CAST WITH THE CONCRETE WEARING SURFACE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONCRETE WEARING SURFACE. FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.

THE TOP OF THE BOX BEAM UNITS SHALL HAVE A ¼" RAKED FINISH IN ACCORDACE WITH SECTION 1078-16 OF THE STANDARD SPECIFICATIONS.

BILL OF MATERIAL FOR CONCRETE WEARING SURFACE

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
✱ R1	200	#3	STR	30'-6"	2294
✱ R2	183	#3	STR	34'-6"	2374
✱EPOXY COATED REINFORCING STEEL				LBS.	4668
CONCRETE WEARING SURFACE				SQ.FT.	3084

GROOVING BRIDGE FLOORS

APPROACH SLABS	798	SQ.FT.
BRIDGE DECK	2774	SQ.FT.
TOTAL	3572	SQ.FT.

SPLICE LENGTH CHART

BAR SIZE	EPOXY COATED
#3	1'-11" (MIN.)

PROJECT NO. BP12-R034

CLEVELAND COUNTY

STATION: 17+53.00 -L-

SHEET 3 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 48615 ENGINEER PATRICK N. HOLDER
31822A236FC7472... 10/2/2026

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE WEARING SURFACE DETAILS

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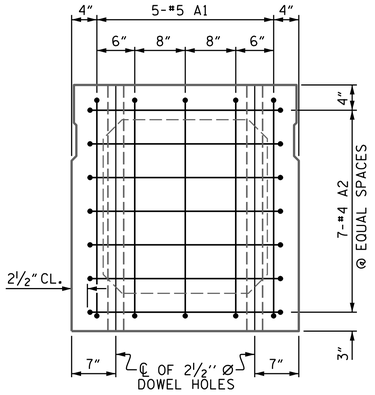
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1			3			TOTAL SHEETS
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ASSEMBLED BY :	K. M. FARRELL	DATE : 06/2026
CHECKED BY :	P. N. HOLDER	DATE : 06/2026
DESIGN ENGINEER OF RECORD :	P. N. HOLDER	DATE : 06/2026

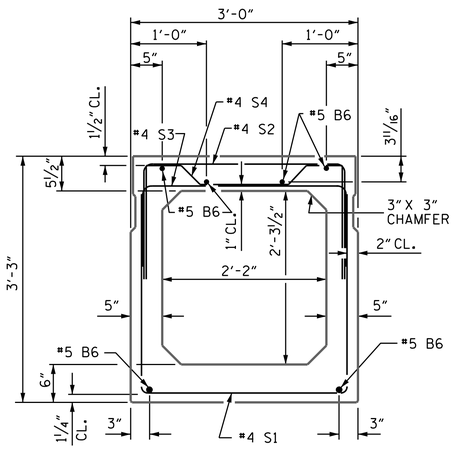
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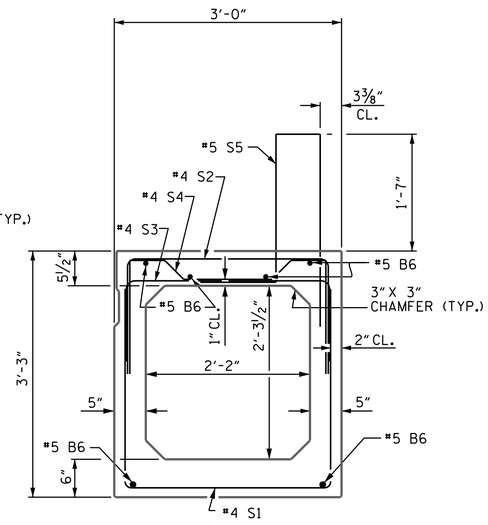
END ELEVATION

SHOWING PLACEMENT OF #5 & #4 "A" BARS AND LOCATION OF DOWEL HOLES.
(INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION. STRAND LAYOUT NOT SHOWN.)



INTERIOR BOX BEAM SECTION

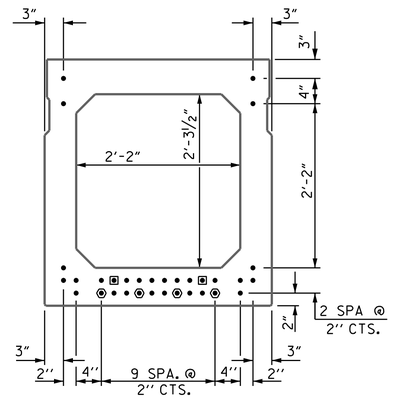
(STRAND LAYOUT NOT SHOWN)



EXTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)

0.6" Ø LOW RELAXATION STRAND LAYOUT



TYPICAL STRAND LOCATION

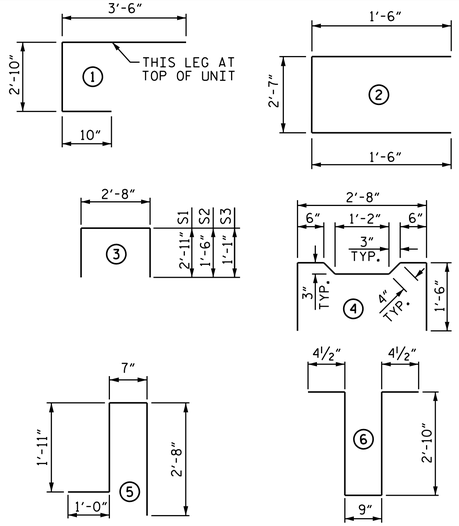
(32 STRANDS REQUIRED)

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ◉ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ⬢ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER

BOND SHALL BE BROKEN ON STRANDS AS SHOWN FOR THE SPECIFIED LENGTH FROM EACH END OF THE BOX BEAM. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.

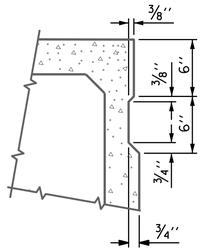
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE BOX BEAM SECTION

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	1	7'-2"	75	7'-2"	75
A2	44	#4	2	5'-7"	164	5'-7"	164
B6	12	#5	STR	50'-11"	637	50'-11"	637
K1	15	#4	6	7'-2"	72	7'-2"	72
K2	10	#4	STR	2'-7"	17	2'-7"	17
S1	81	#4	3	8'-6"	460	8'-6"	460
S2	81	#4	3	5'-8"	307	5'-8"	307
S3	141	#4	3	4'-10"	455	4'-10"	455
S4	60	#4	4	5'-10"	234	5'-10"	234
✳ S5	138	#5	5	6'-2"	888	--	--
REINFORCING STEEL					2421 LBS.		2421 LBS.
✳ EPOXY COATED REINF. STEEL					888 LBS.		
7500 P.S.I. CONCRETE				19.6	CU. YDS.	19.4	CU. YDS.
0.6" Ø L.R. STRANDS				No. 32		No. 32	

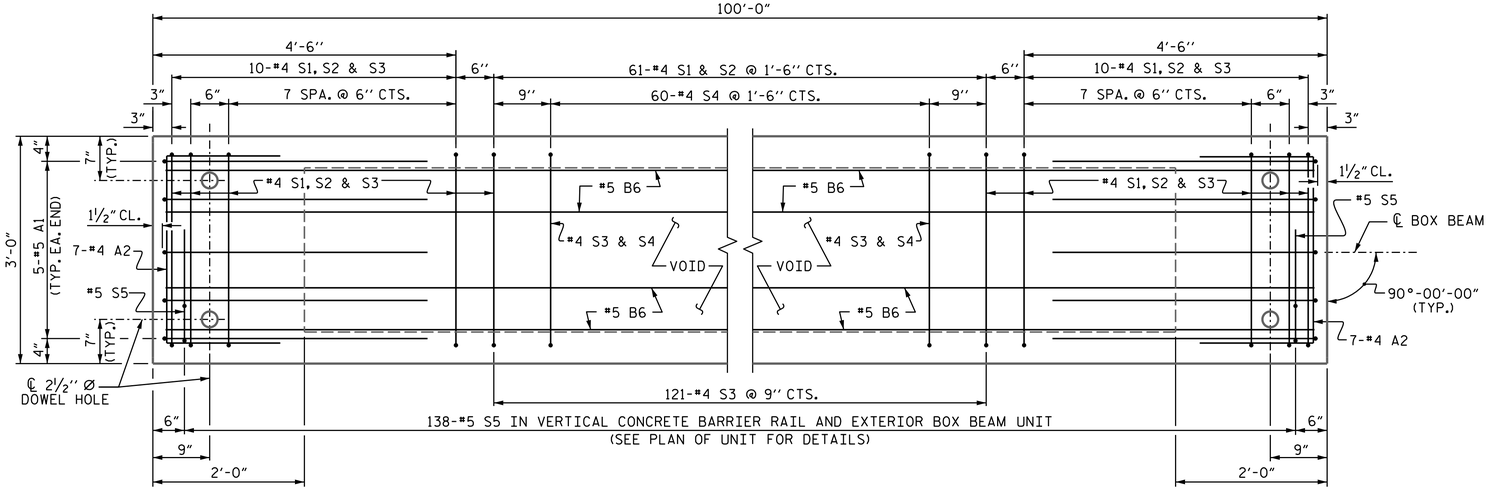


SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.

GRADE 270 STRANDS

	0.6" Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950



PLAN OF BOX BEAM

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS.
FOR LOCATION OF DIAPHRAGMS, SEE "PLAN OF UNIT".
FOR THREADED INSERTS, SEE "THREADED INSERT DETAIL".
FOR REINFORCING STEEL IN DIAPHRAGMS, SEE "DOUBLE DIAPHRAGM DETAILS".

PROJECT NO. **BP12-R034**

CLEVELAND COUNTY

STATION: **17+53.00 -L-**

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAM UNIT



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ASSEMBLED BY : K. M. FARRELL DATE : 05/26
CHECKED BY : P. N. HOLDER DATE : 05/26
DRAWN BY : DGE II/II
CHECKED BY : TMG II/II
REV. 9/14 MAA/TMG

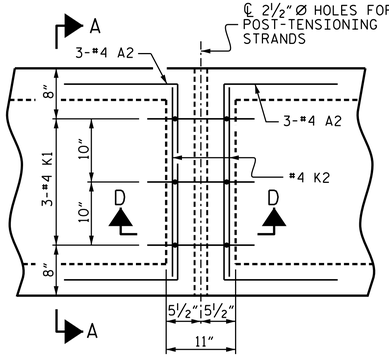
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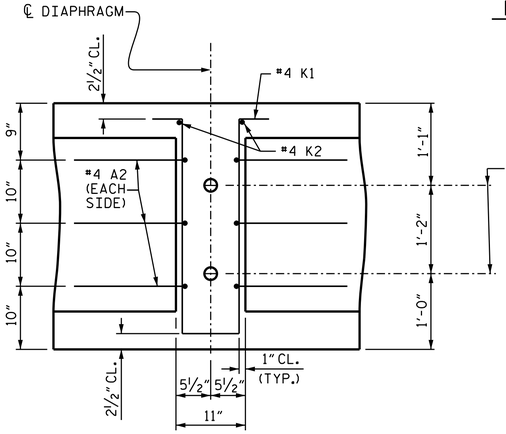
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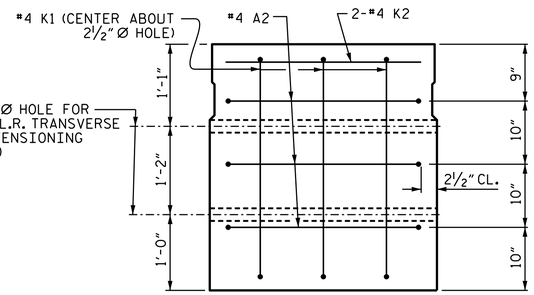
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PLAN



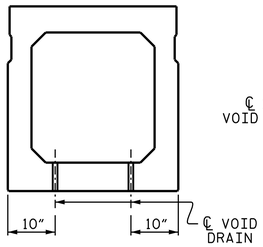
SECTION D-D



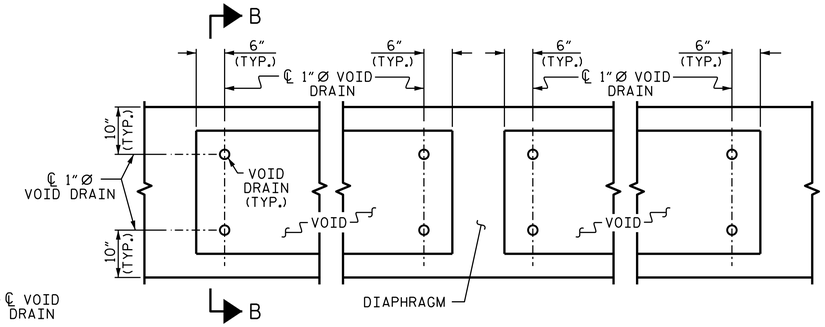
SECTION A-A
VOIDS NOT SHOWN

DOUBLE DIAPHRAGM DETAILS

#4 "S" BARS NOT SHOWN. #4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2½" Ø HOLE.



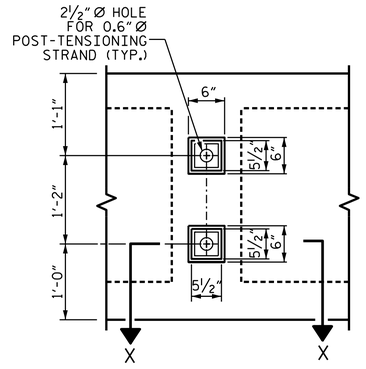
SECTION B-B



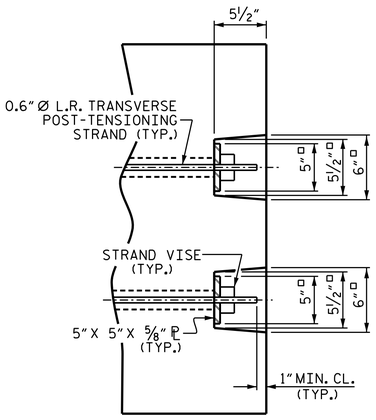
PART PLAN

VOID DRAIN DETAILS

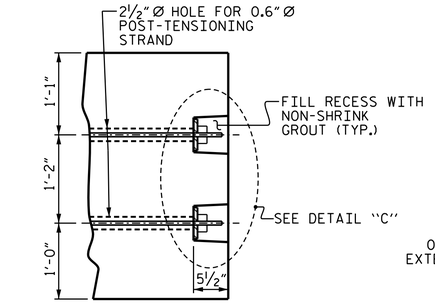
(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)



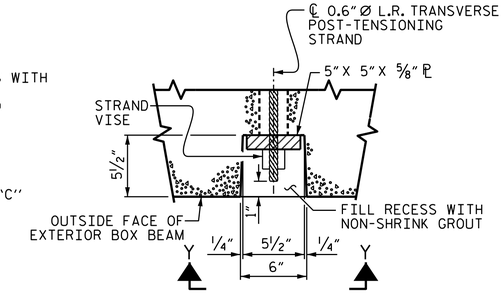
VIEW Y-Y
SHOWING ELEVATION VIEW OF GROUTED RECESS



DETAIL "C"



PART SECTION AT RECESS



SECTION X-X
SHOWING PLAN VIEW OF GROUTED RECESS

GROUTED RECESS DETAIL AT END OF POST-TENSIONED STRANDS OF EXTERIOR BOX BEAM

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 3'-3"
100' BOX BEAM UNIT (NC & SE)	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	2" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	⅞" ↓
FINAL CAMBER	1⅛" ↑

** INCLUDES FUTURE WEARING SURFACE

PROJECT NO. BP12-R034
CLEVELAND COUNTY
STATION: 17+53.00 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAM UNIT

NORTH CAROLINA PROFESSIONAL SEAL 48615 ENGINEER Patrick N. Holder
31822A236FC7473... 10/2/2026

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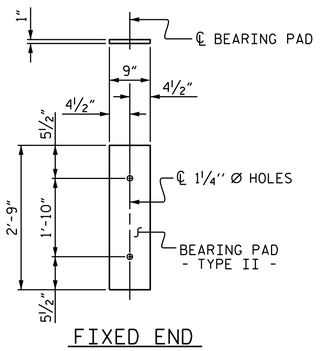
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CHECKED BY : P. N. HOLDER	DATE : 05/26
DRAWN BY : DGE II/II	REV. 8/14 MAA/TMG
CHECKED BY : TMG II/II	

7/7/2026
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annie.wu

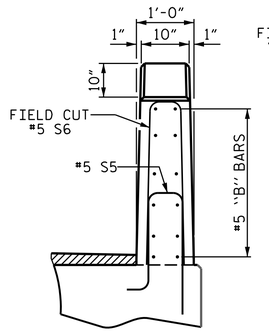
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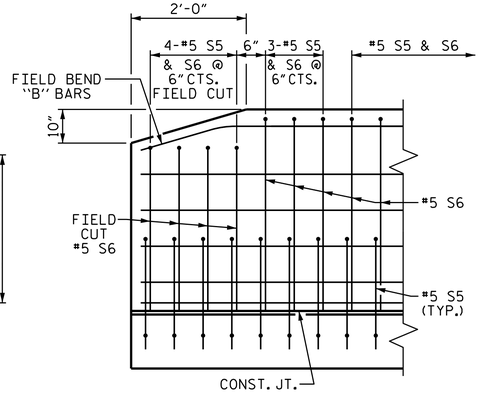


FIXED END

(TYPE II - 22 REQ'D)



END VIEW



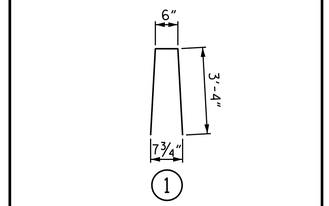
SIDE VIEW

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

END OF RAIL DETAILS

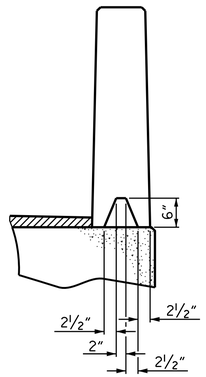
BOX BEAM UNITS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	100'-0"	200'-0"
INTERIOR B.B.	9	100'-0"	900'-0"
TOTAL	11	——	1100'-0"



BAR TYPE

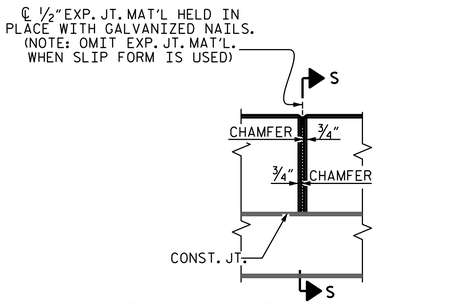
BAR DIMENSIONS ARE OUT TO OUT

SECTION THRU RAIL



SECTION S-S

AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS

VERTICAL CONCRETE BARRIER RAIL DETAILS

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL					
BAR	BARS PER PAIR OF EXTERIOR UNITS 100' UNIT	SIZE	TYPE	LENGTH	WEIGHT
✳B12	96	#5	STR	24'-7"	2461
✳S6	276	#5	1	7'-2"	2063
✳EPOXY COATED REINFORCING STEEL			LBS.		4524
CLASS AA CONCRETE			CU.YDS.		25.9
TOTAL VERTICAL CONCRETE BARRIER RAIL			LN. FT.		200.0

GUTTERLINE CONCRETE THICKNESS & RAIL HEIGHT		
	CONCRETE OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
100' UNITS	3⅝"	3'-9⅝"

PROJECT NO. BP12-R034

CLEVELAND COUNTY

STATION: 17+53.00-L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAM UNIT

NORTH CAROLINA PROFESSIONAL SEAL 48615 ENGINEER Patrick Holder

31822A236FC747... 10/2/2026

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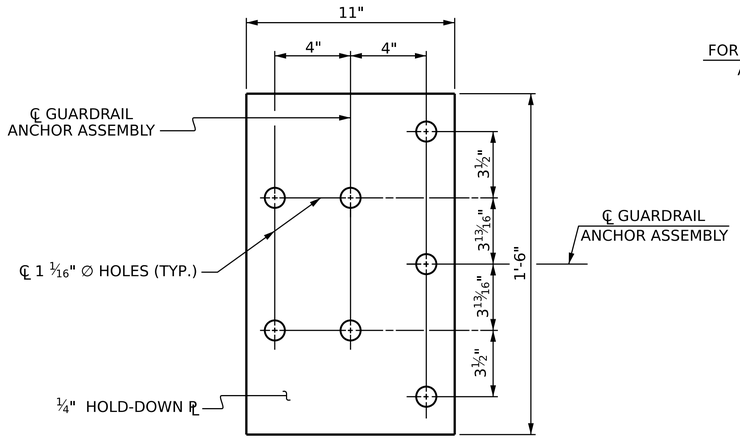
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ASSEMBLED BY : K. M. FARRELL	DATE : 05/26	
CHECKED BY : P. N. HOLDER	DATE : 05/26	
DRAWN BY : DGE 10/11	REV. 5/18	MAA/THC
CHECKED BY : TMG 11/11		

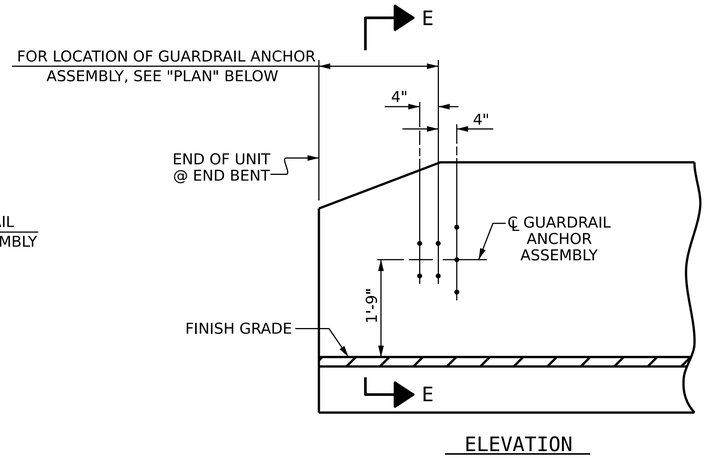
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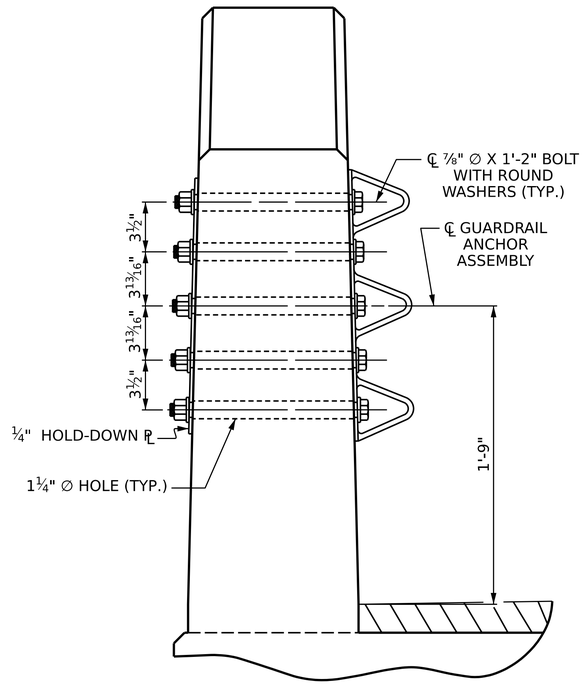
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PLAN

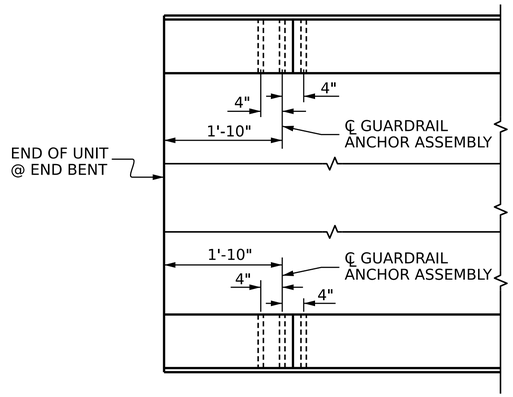


ELEVATION



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A ¼'' HOLD DOWN PLATE AND 7 - ⅞'' ∅ BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE ⅞'' ∅ GALVANIZED BOLTS, NUTS 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.)

THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

THE 1 ¼'' ∅ HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



SKETCH SHOWING POINTS OF ATTACHMENT

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. BP12-R034

CLEVELAND COUNTY

STATION: 17+53.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

GUARDRAIL ANCHORAGE DETAILS FOR VERTICAL CONCRETE BARRIER RAIL

ASSEMBLED BY : K. M. FARRELL	DATE : 05/26
CHECKED BY : P. N. HOLDER	DATE : 05/26
DRAWN BY : MAA 5/10	REV. 1/15 MAA/TMG
CHECKED BY : GM 5/10	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

NORTH CAROLINA PROFESSIONAL SEAL 48615 ENGINEER PATRICK N. HOLDER
DocuSigned by: Patrick Holder 31822A23BF1... 10/2/2026

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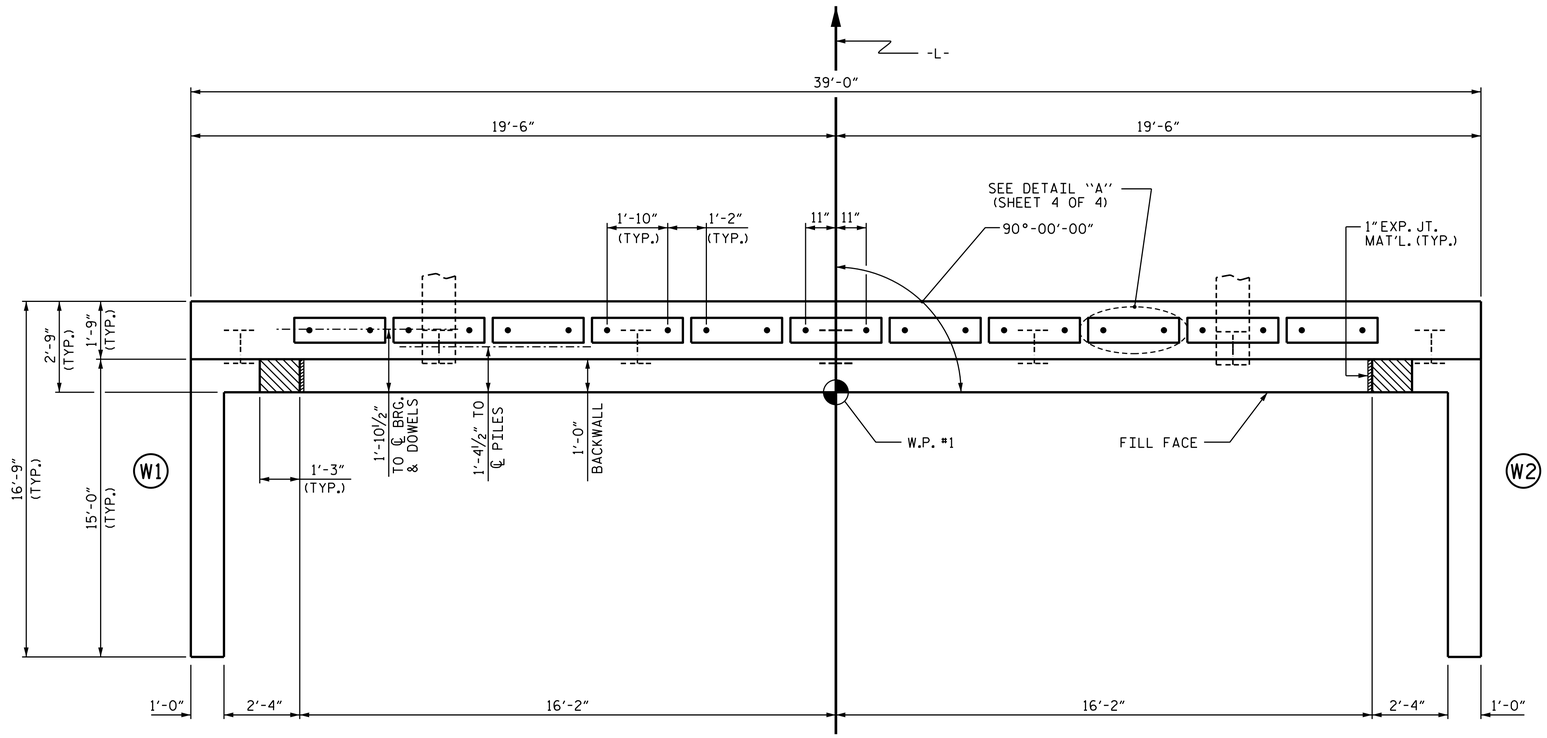
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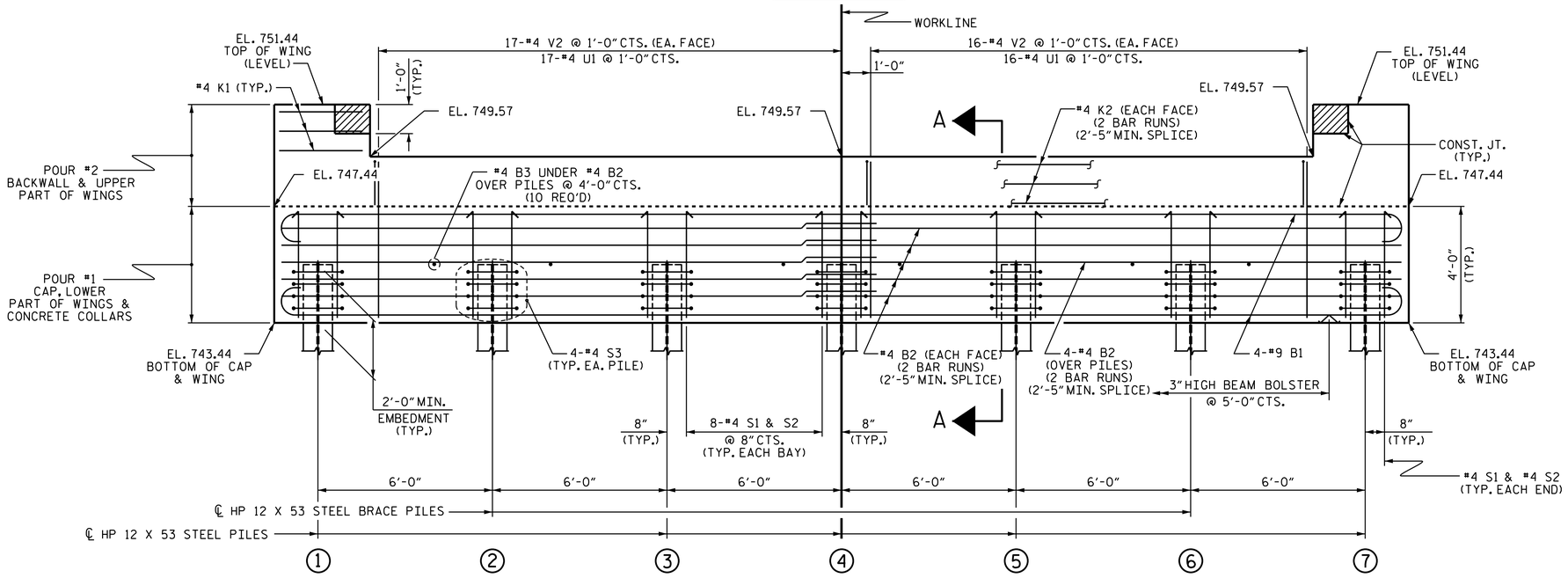
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kayla.farrell

STD. GRA3 Sht. 1

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PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

PROJECT NO. BP12-R034

CLEVELAND COUNTY

STATION: 17+53.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 48615 ENGINEER Patrick Holder
31822A236FC747... 10/2/2026

ASSEMBLED BY : K. M. FARRELL	DATE : 05/26
CHECKED BY : P. N. HOLDER	DATE : 05/26
DRAWN BY : WJH 12/11	REV. 4/15 MAA/TMG
CHECKED BY : AAC 12/11	

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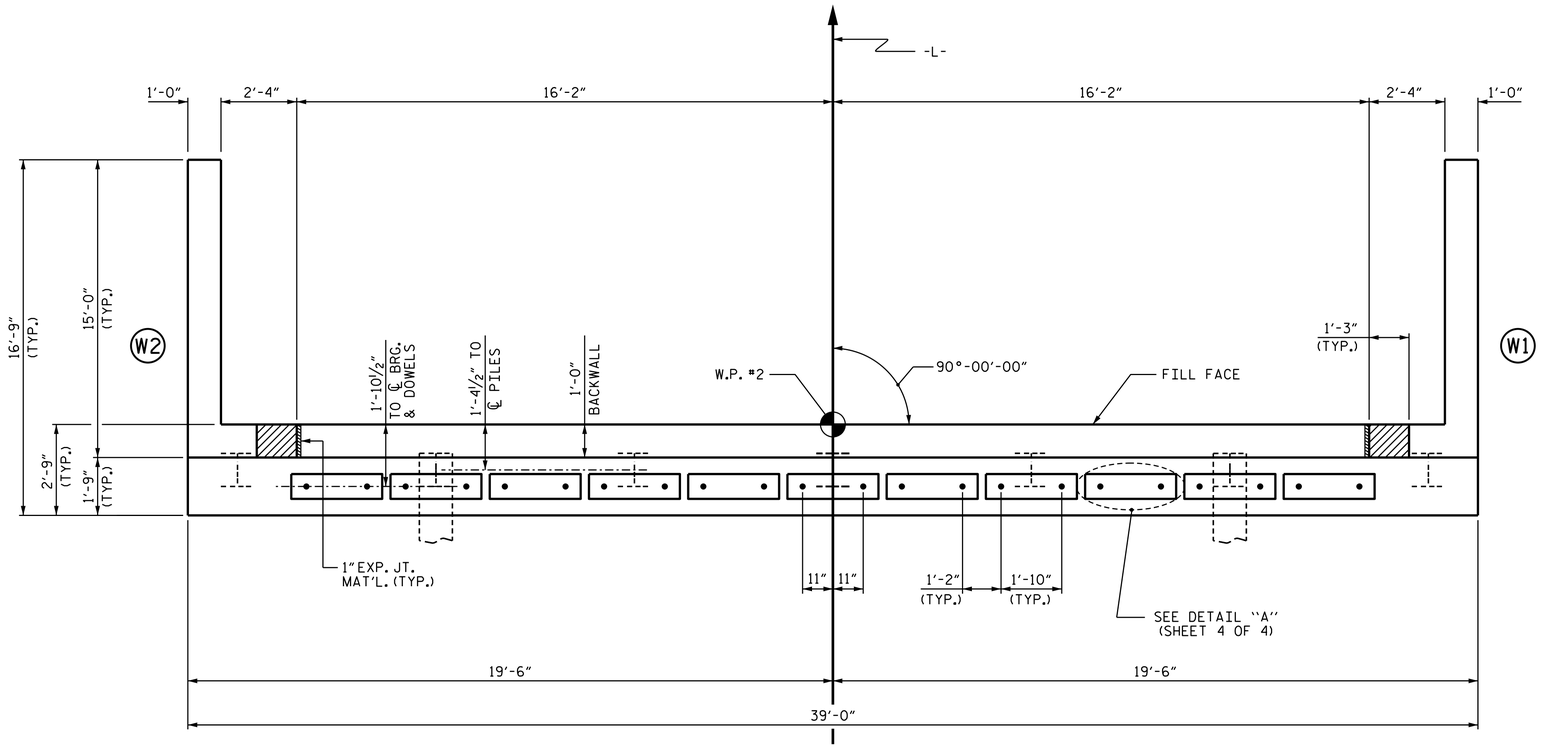
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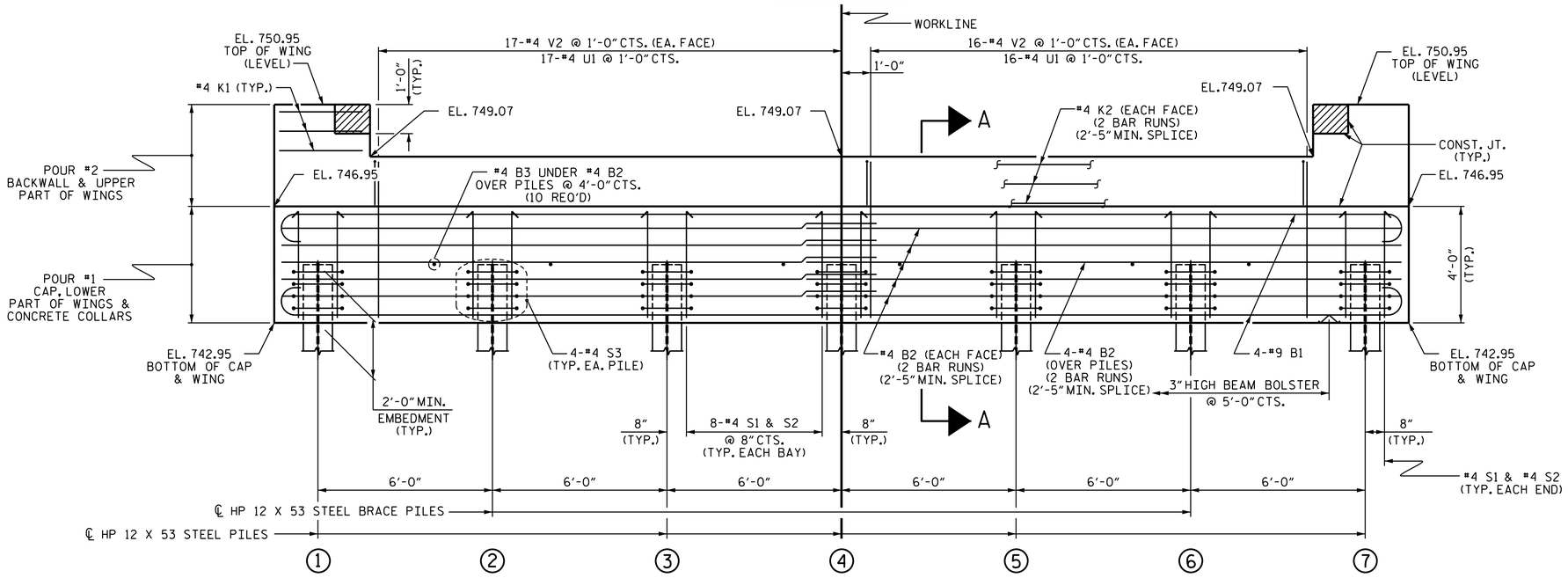
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PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

PROJECT NO. BP12-R034

CLEVELAND COUNTY

STATION: 17+53.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 2

NORTH CAROLINA PROFESSIONAL SEAL 48615 ENGINEER PATRICK N. HOLDER
31822A238FC7473...
10/2/2026

ASSEMBLED BY : K. M. FARRELL	DATE : 05/26
CHECKED BY : P. N. HOLDER	DATE : 05/26
DRAWN BY : WJH	12/11
CHECKED BY : AAC	12/11
REV. 4/15	MAA/TMG

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Raleigh, NC 27607
Tel. 919-854-0344 Fax. 919-854-0355
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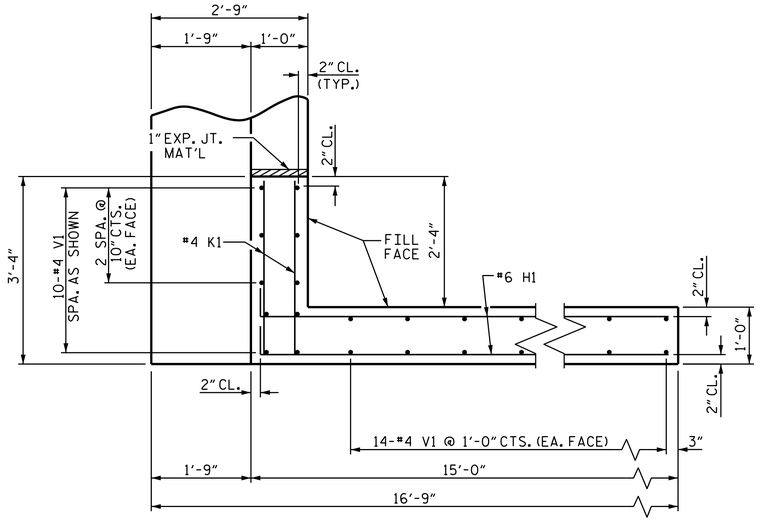
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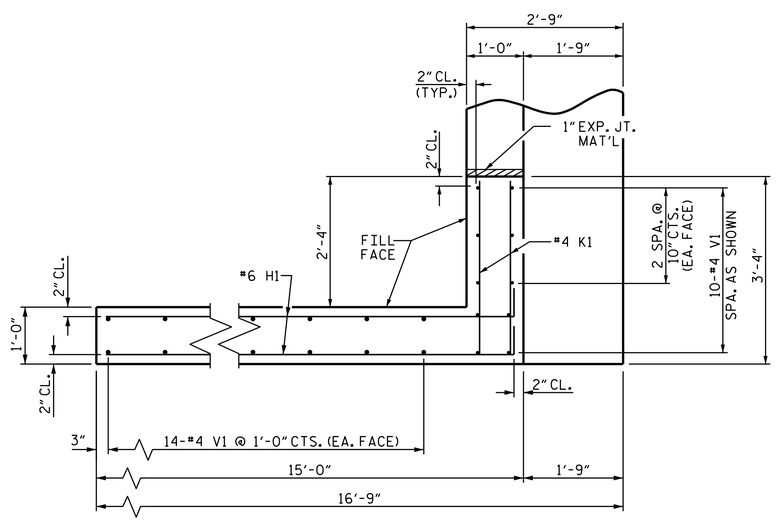
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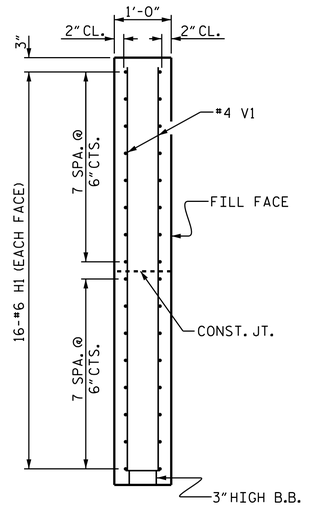
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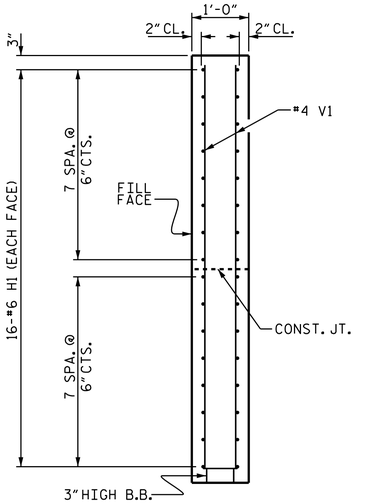
PLAN OF WING (W1)



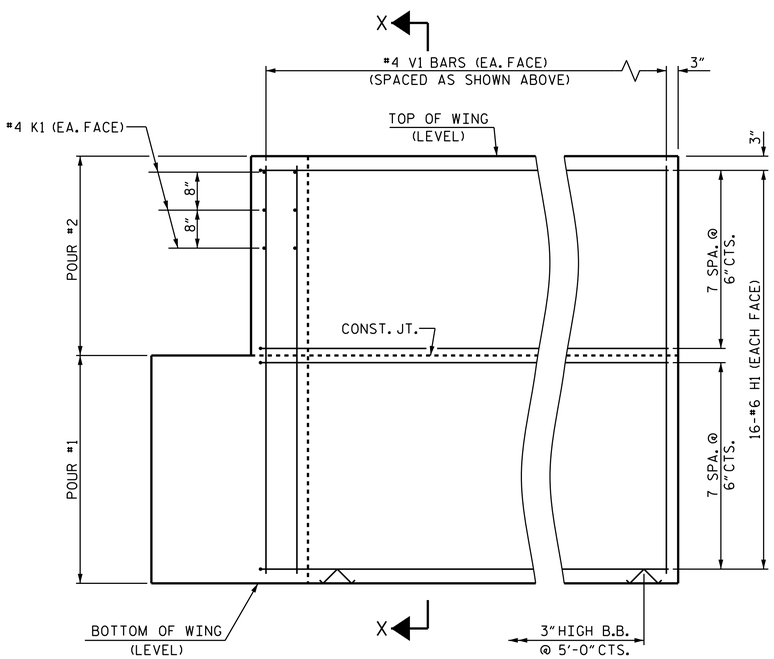
PLAN OF WING (W2)



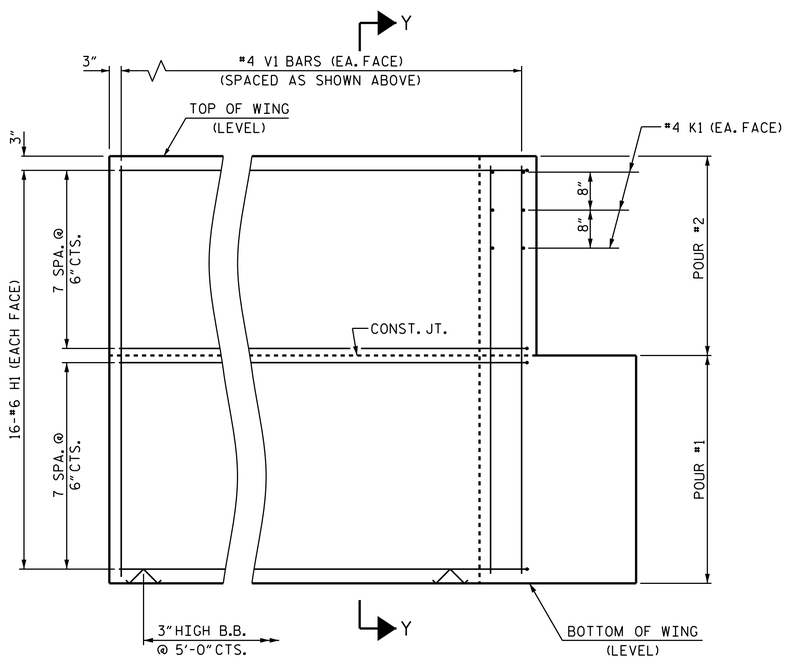
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

PROJECT NO. **BP12-R034**

CLEVELAND COUNTY

STATION: **17+53.00 -L-**

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT WING DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 48615 ENGINEER PATRICK NEIL HOLDER
Digitally signed by Patrick N. Holder
31822A236FC7471...10/2/2026

ASSEMBLED BY : K. M. FARRELL	DATE : 05/26
CHECKED BY : P. N. HOLDER	DATE : 05/26
DRAWN BY : WJH 12/11	REV. 4/15 MAA/TMG
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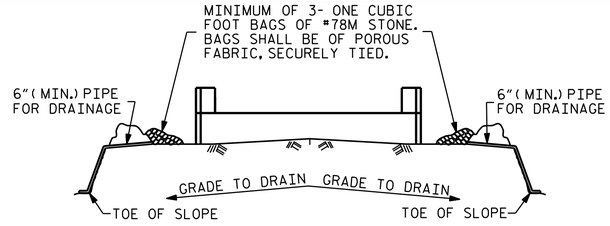
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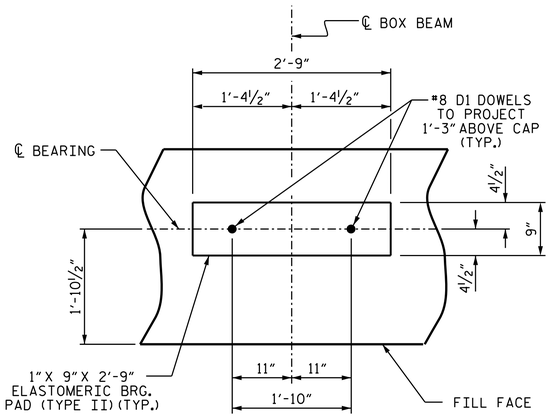


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

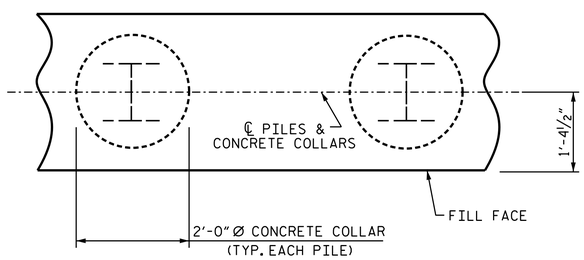
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

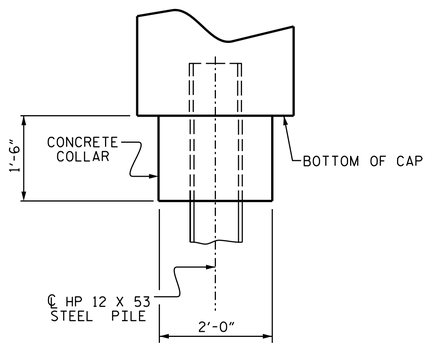


DETAIL "A"

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



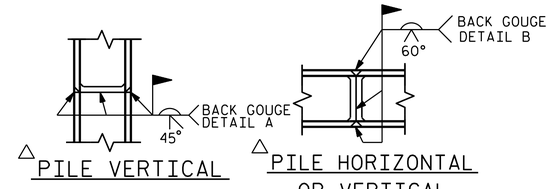
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ELEVATION

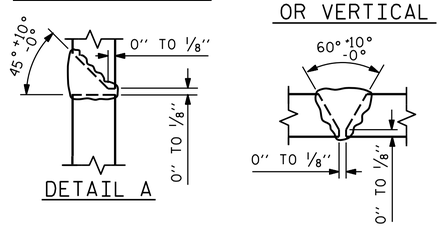
CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



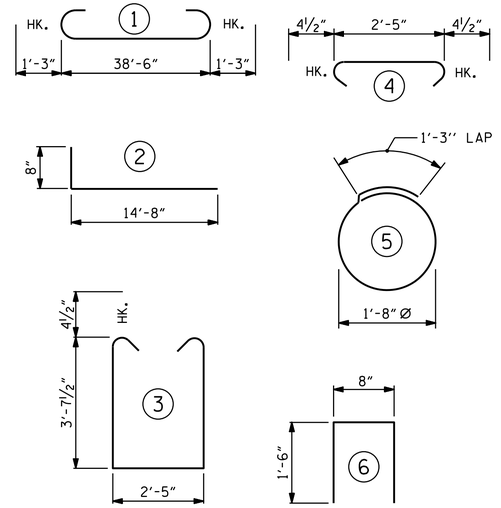
DETAIL A

DETAIL B

△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR ONE END BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	41'-0"	1115
B2	28	#4	STR	20'-7"	385
B3	10	#4	STR	2'-5"	16
D1	22	#8	STR	2'-3"	132
H1	64	#6	2	15'-4"	1474
K1	12	#4	STR	2'-11"	23
K2	12	#4	STR	20'-7"	165
S1	50	#4	3	10'-5"	348
S2	50	#4	4	3'-2"	106
S3	28	#4	5	6'-6"	122
U1	33	#4	6	3'-8"	81
V1	76	#4	STR	7'-8"	389
V2	66	#4	STR	5'-9"	254

REINFORCING STEEL (FOR ONE END BENT) 4610 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 21.3 C.Y.

POUR #2 BACKWALL & UPPER PART OF WINGS 7.7 C.Y.

TOTAL CLASS A CONCRETE 29.0 C.Y.

SECTION A-A

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

PROJECT NO. BP12-R034

CLEVELAND COUNTY

STATION: 17+53.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1 & 2 DETAILS

ASSEMBLED BY : K. M. FARRELL DATE : 05/26	
CHECKED BY : P. N. HOLDER DATE : 05/26	
DRAWN BY : WJH 12/11	REV. 4/17 MAA/THC
CHECKED BY : AAC 12/11	

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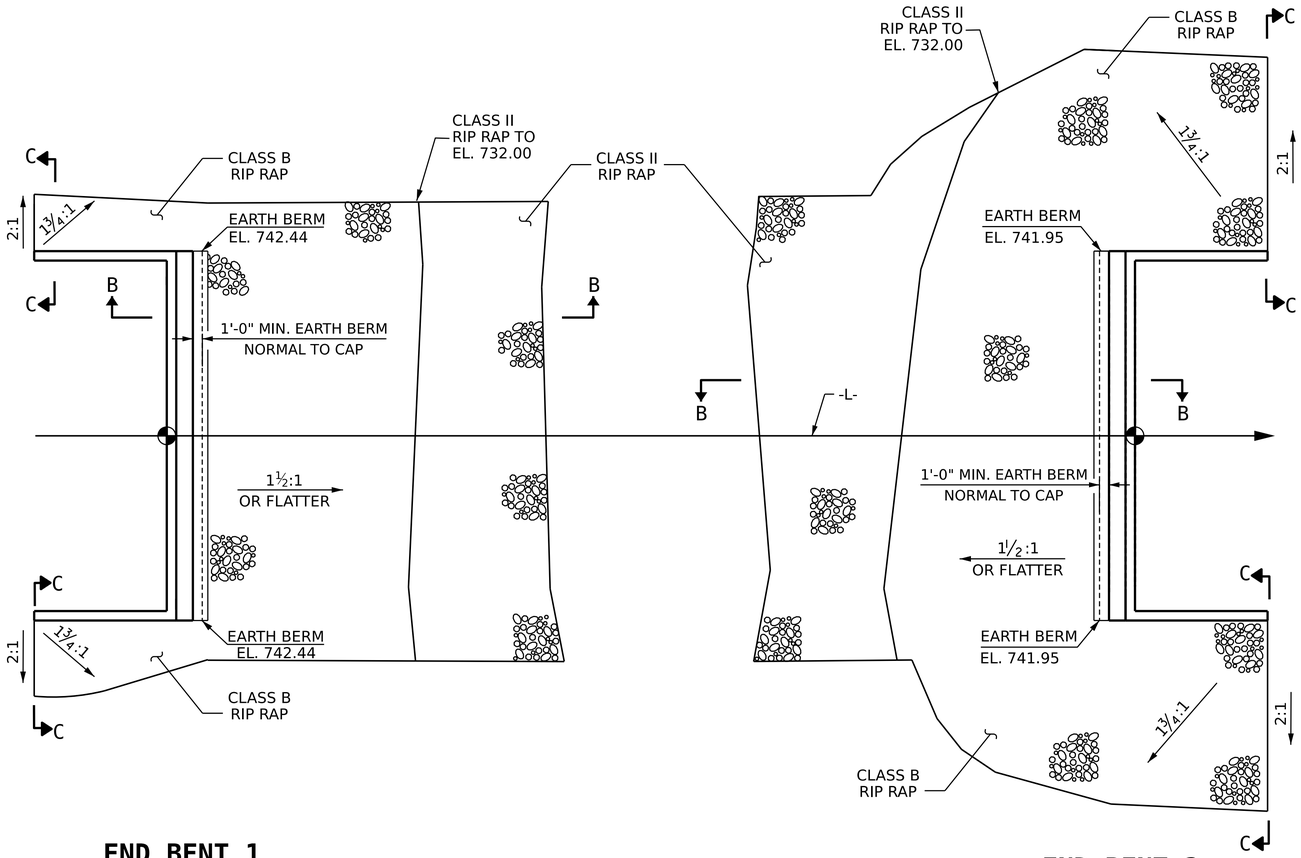
NORTH CAROLINA PROFESSIONAL SEAL 48615 ENGINEER PATRICK NEIL HOLDER
Digitally signed by PATRICK NEIL HOLDER
31822A2385FC7873 10/2/2026

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8/12/2026
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patrick.holder

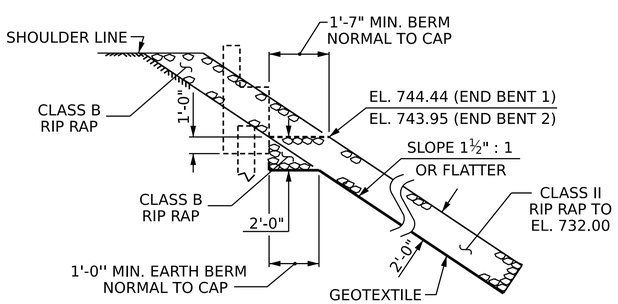
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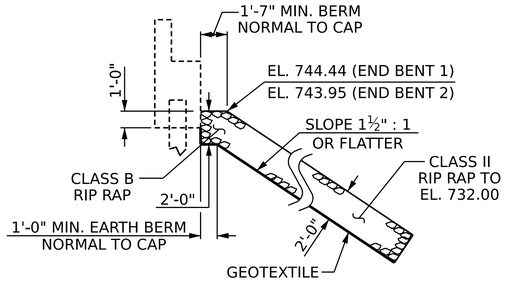


END BENT 1

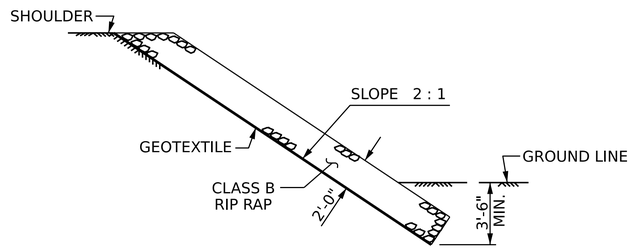
END BENT 2



SECTION B-B



℄ SECTION



SECTION C-C

BERM RIP RAPPED

NOTES :

FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

RIP RAP KEY IN IS NOT REQUIRED AT END BENT 1 AND END BENT 2 WHERE CLASS II RIP RAP MERGES WITH CLASS B RIP RAP.

ESTIMATED QUANTITIES

BRIDGE @ STA. 17+53.00 -L-	RIP RAP CLASS II (2'-0" THICK)	RIP RAP CLASS B (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	TONS	SQUARE YARDS
END BENT 1	68	165	225
END BENT 2	82	264	331

PROJECT NO. BP12-R034

CLEVELAND COUNTY

STATION: 17+53.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RIP RAP DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 48615 ENGINEER Patrick N. Holder
Electronically signed by Patrick N. Holder
31822A238B1F4A1...
10/2/2026

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NC License No. F-0765

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ASSEMBLED BY :	K. M. FARRELL	DATE :	10/25
CHECKED BY :	P. N. HOLDER	DATE :	06/26
DRAWN BY :	REK 1/84	REV. 10/1/11	MAA/GM
CHECKED BY :	RDU 1/84	REV. 12/21/11	MAA/GM
		REV. 12/17	MAA/THC

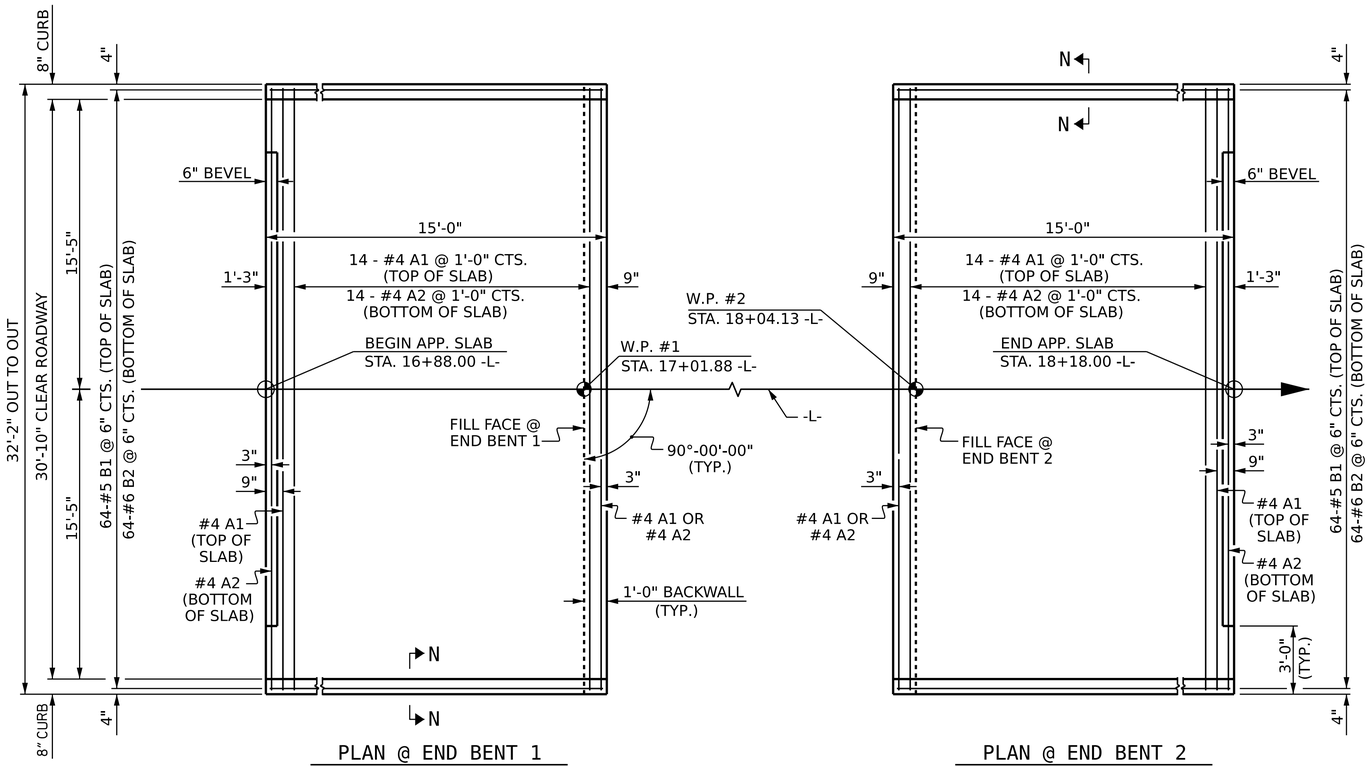
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STD. NO. RR1

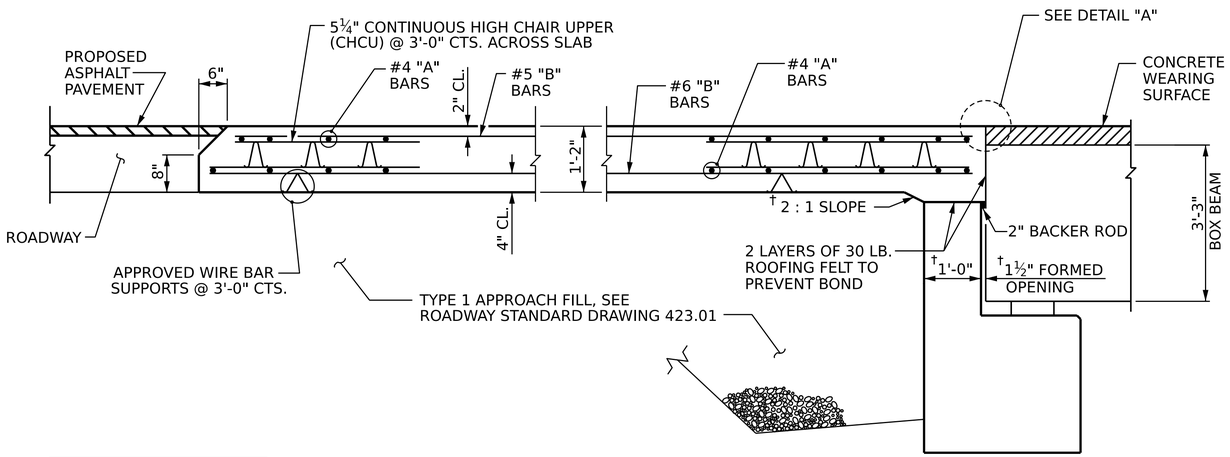
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patrick.holder

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8/26/21



DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



† NORMAL TO END BENT

SECTION THRU SLAB

NOTES

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLABS SHALL BE POURED AFTER CONCRETE WEARING SURFACE IS POURED.

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

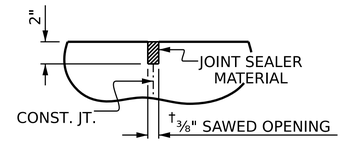
BILL OF MATERIAL

APPROACH SLAB AT EB 1

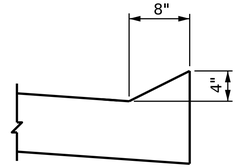
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	16	#4	STR	31'-10"	340
A2	16	#4	STR	31'-10"	340
*B1	64	#5	STR	14'-2"	946
B2	64	#6	STR	14'-8"	1410
REINFORCING STEEL				LBS.	1750
* EPOXY COATED REINFORCING STEEL				LBS.	1286
CLASS AA CONCRETE				C. Y.	21.9

APPROACH SLAB AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	16	#4	STR	31'-10"	340
A2	16	#4	STR	31'-10"	340
*B1	64	#5	STR	14'-2"	946
B2	64	#6	STR	14'-8"	1410
REINFORCING STEEL				LBS.	1750
* EPOXY COATED REINFORCING STEEL				LBS.	1286
CLASS AA CONCRETE				C. Y.	21.9



DETAIL "A"



SECTION N-N

CURB DETAILS

PROJECT NO. BP12-R034

CLEVELAND COUNTY

STATION: 17+53.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE BOX BEAM

NORTH CAROLINA PROFESSIONAL SEAL 48615 ENGINEER Patrick N. Holder
31822A236FC7473... 10/2/2026

ASSEMBLED BY:	K. M. FARRELL	DATE :	05/26
CHECKED BY :	P. N. HOLDER	DATE :	06/26
DRAWN BY : FCJ 6/87	REV. 12/17		MAA/THC
CHECKED BY : EGA 6/87	REV. 06/19		BNB/THC
	REV. 07/23		BNB/SNM

8/12/2026
R:\PROJECTS\Engineering Projects\1201291.001 BP12-R034 (2021 LSC)\Structures\2.4 FinalStructure Plans\BP12R034_Superstructure.dgn
patrick.holder

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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 ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" 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 ¼" 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 ⅞" ∅ SHEAR STUDS FOR THE ¾" ∅ STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" ∅ STUDS FOR 4 - ¾" ∅ STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" ∅ STUDS ALONG THE BEAM AS SHOWN FOR ¾" ∅ STUDS BASED ON THE RATIO OF 3 - ⅞"∅ STUDS FOR 4 - ¾" ∅ STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

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

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16" 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.