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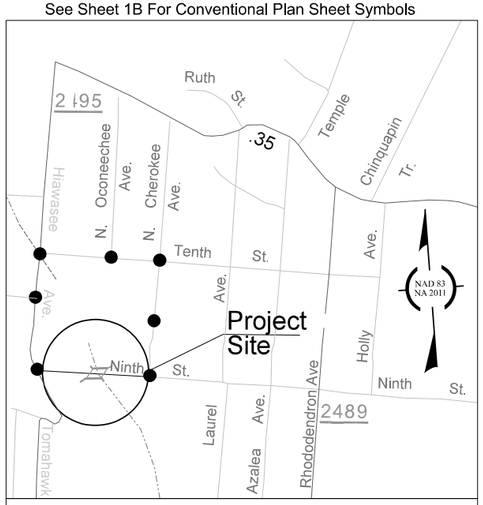
09/08/99

TIP PROJECT: HL-0013

CONTRACT: DM00462

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

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



VICINITY MAP (N.T.S)

DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

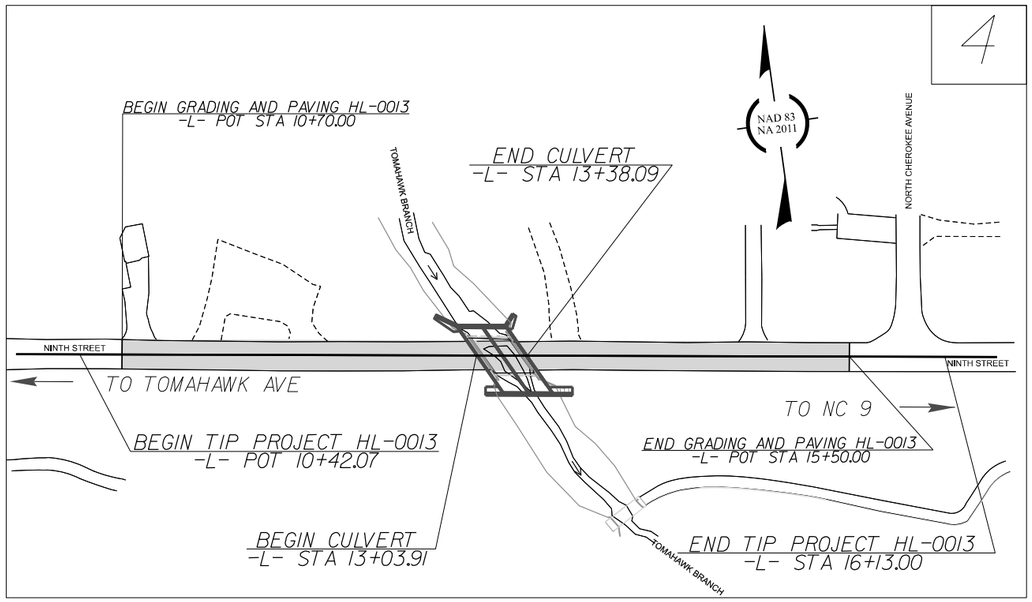
BUNCOMBE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HL-0013	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
49469.1.1	1305013	PE
49469.2.1	1305013	R/W
49469.2.2	1305013	UTILITIES
49469.3.1	1305013	CONSTRUCTION

LOCATION: *NINTH STREET REPLACE BRIDGE 100522 OVER TOMAHAWK BRANCH IN BLACK MOUNTAIN*

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



There is no control of access on this project.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS: 30 15 0 30 60

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2026 = 138
ADT 2046 = 203
K = %
D = %
T = 6% *
V = 30 MPH
* TTST =% DUAL %
FUNC CLASS =
RURAL LOCAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT HL-0013 = 0.102 Miles
LENGTH OF STRUCTURE TIP PROJECT HL-0013 = 0.006 Miles
TOTAL LENGTH TIP PROJECT HL-0013 = 0.108 Miles

Prepared In the Office of:
JOHNSON, MIRMIRAN, & THOMPSON, INC.
4700 Falls of Neuse Rd, Suite 100, Raleigh, NC, 27609
License No. C-3097

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: APRIL 3, 2025

LETTING DATE: MAY 6, 2026

JOSHUA ROEMER, PE
PROJECT ENGINEER

DANE FREDDE
PROJECT DESIGN ENGINEER

MARK E. HILL, PE CPM
NCODT PROJECT ENGINEER

HYDRAULICS ENGINEER
4/2/2026 | 2:40:08 PM EDT
SEAL 053023
SIGNATURE: Bradley Kilmer P.E.

ROADWAY DESIGN ENGINEER
4/2/2026 | 2:40:08 PM EDT
SEAL 054788
SIGNATURE: Mark Hill Roemer P.E.

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

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INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS
1B	CONVENTIONAL SYMBOLS
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1 THRU 2C-2	METHOD OF PIPE INSTALLATION DETAILS
3B-1	EARTHWORK & PAVEMENT REMOVAL SUMMARIES
3D-1	DRAINAGE SUMMARIES
3G-1	GEOTECHNICAL SUMMARIES
4 THRU 5	PLAN AND PROFILE SHEET
RW-01 THRU RW-04	SURVEY CONTROL, EXISTING CENTERLINES RIGHT OF WAY, EASEMENT AND PROPERTY TIES
TMP-1 THRU TMP-3	TRANSPORTATION MANAGEMENT PLANS
PMP-1	PAVEMENT MARKING PLANS
EC-1 THRU EC-6B	EROSION CONTROL PLANS
UC-1 THRU UC-4B	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-04	UTILITY BY OTHERS PLANS
X-1	CROSS-SECTION INDEX
X-2 THRU X-7	CROSS-SECTIONS
C-01 THRU C-10	CULVERT 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.

SUBSURFACE PLANS:

NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE CITY OF ASHEVILLE, METROPOLITAN SEWERAGE DISTRICT, TOWN OF BLACK MOUNTAIN, DUKE ENERGY, AND AT&T.

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.

STANDARD DRAWINGS

2024 SPECIFICATIONS
EFFECTIVE: 01-16-2024
REVISED:
2024 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO. TITLE
DIVISION 2 - EARTHWORK
200.02 Method of Clearing - Method II
225.02 Guide for Grading Subgrade - Secondary and Local
225.04 Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS
300.01 Method of Pipe Installation (Use Details in Lieu of Standards for Sheets 1 and 2 of 2)
310.10 Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS
560.01 Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS
654.01 Pavement Repairs
DIVISION 8 - INCIDENTALS
815.02 Subsurface Drain
876.01 Rip Rap in Channels and Ditches

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05/29/25

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

HL-0013 | 1B

Note: Not to Scale

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

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

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

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

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

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

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

EXISTING STRUCTURES:
MAJOR:
- Bridge, Tunnel or Box Culvert — 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
- Storm Sewer

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

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

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

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

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

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

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

MISCELLANEOUS:
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box
- Utility Unknown U/G Line (SUE - LOS B)*
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — 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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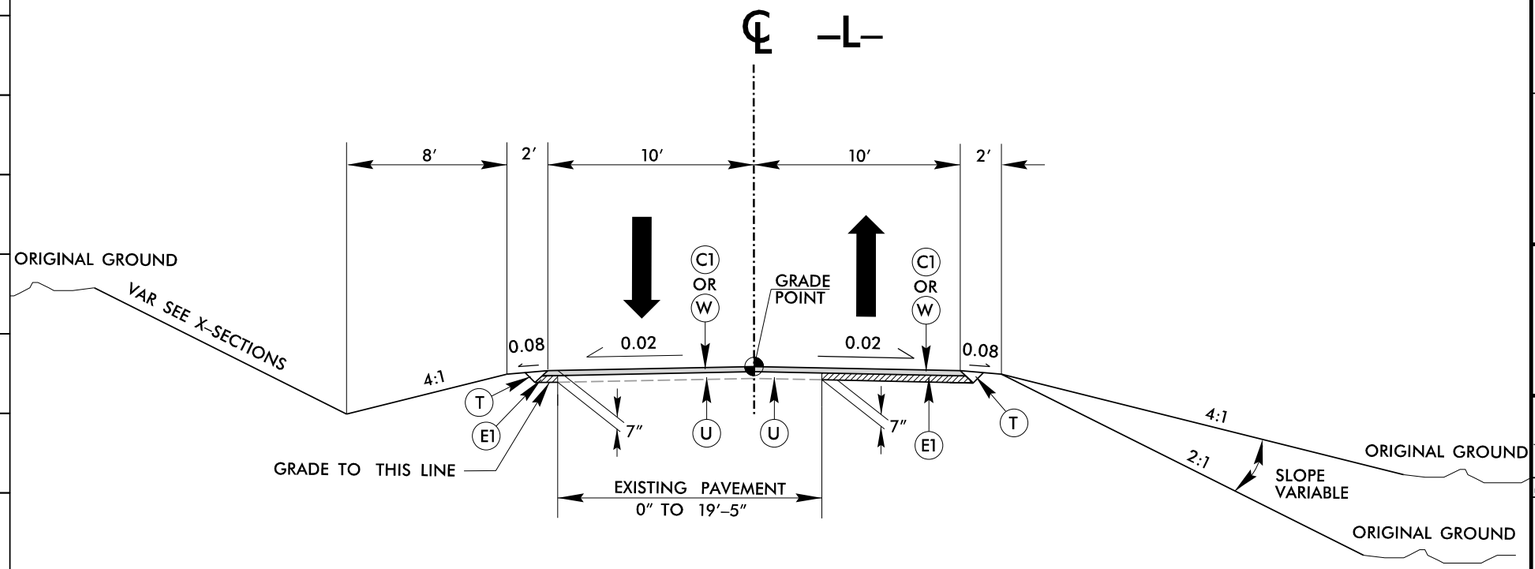
5/26/20

FINAL PAVEMENT SCHEDULE	
C1	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1″ OR GREATER THAN 1 1/2″ IN DEPTH.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3″ IN DEPTH OR GREATER THAN 5½″ IN DEPTH.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	INCIDENTAL MILLING 0″ TO 1.5″ (SEE MILLING DETAIL).
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL).

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



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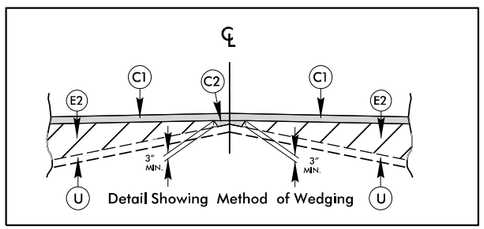
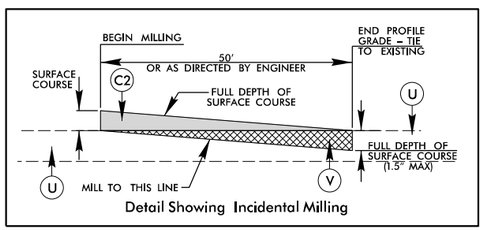
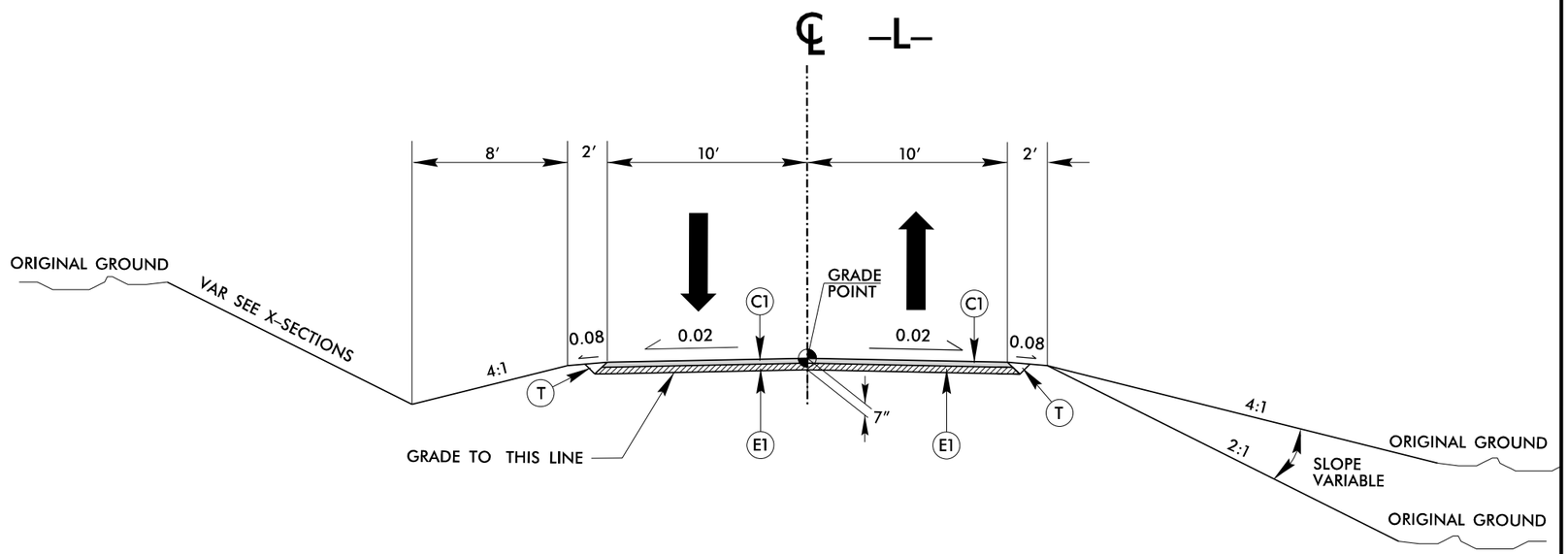
–L– STA. 15+00.00 TO STA. 15+50.00







TYPICAL SECTION NO. 2
–L– STA. 12+30.00 TO STA. 15+00.00

HL-0013
2A-1

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
BUNCOMBE COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER
2/19/2026 | 9:40:46 AM
SEAL 054788

PAVEMENT DESIGN ENGINEER
2/18/2026 | 12:56:1
SEAL 036176

JMT
Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd Suite 100
Raleigh, NC, 27609
License No: C-3097

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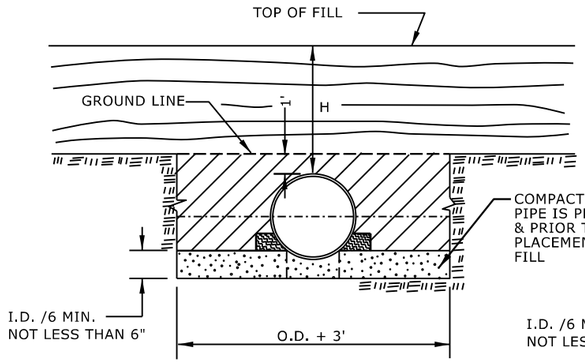
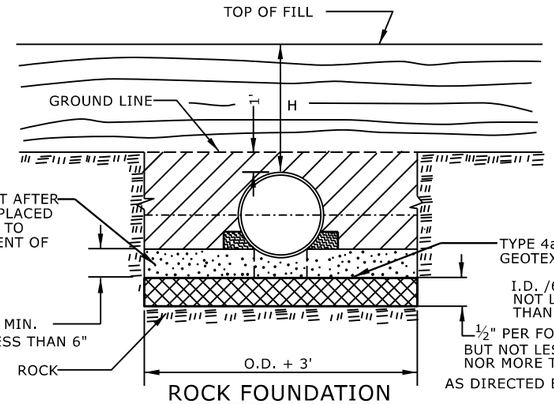
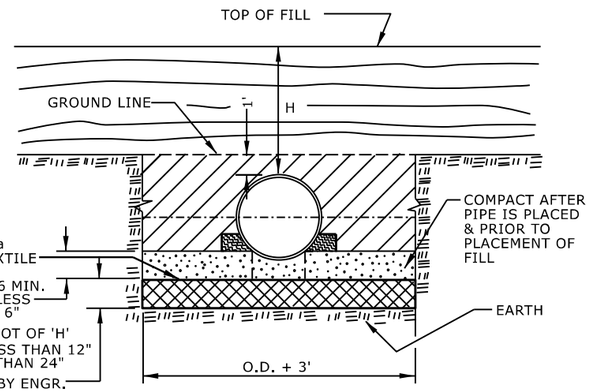
PROJECT REFERENCE NO.	SHEET NO.
HL-0013	2C-1



NORMAL EARTH FOUNDATION

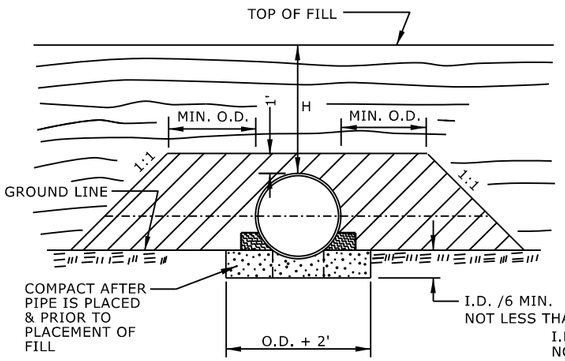


ROCK FOUNDATION



UNSUITABLE MATERIAL FOUNDATION

PIPE IN TRENCH



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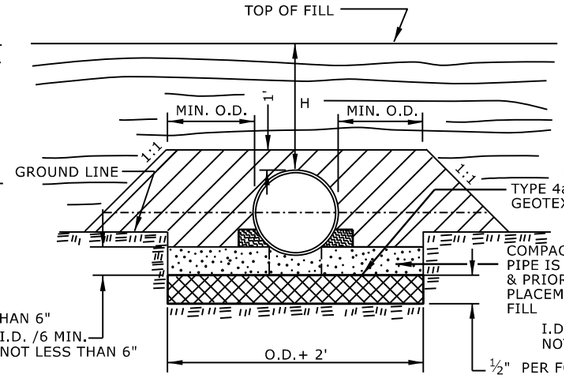

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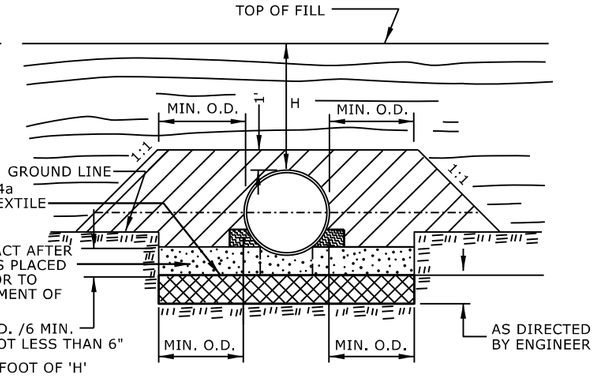

UNSUITABLE MATERIAL FOUNDATION

PIPE ABOVE GROUND

GENERAL NOTES:

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

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

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

APPROVED SUITABLE LOCAL MATERIAL.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

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

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

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

SPRINGLINE OF PIPE

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

UNDISTURBED EARTH MATERIAL

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

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

ROADWAY DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE

SHEET 1 OF 2

300.01

2/18/2026 | 10:34:11 AM PST

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HAKER

Signed by: Nicole M. Haker

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACTS STANDARDS AND DEVELOPMENT UNIT

Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

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

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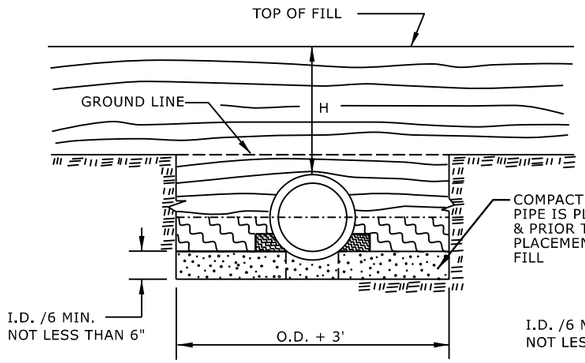
PROJECT REFERENCE NO.	SHEET NO.
HL-0013	2C-2



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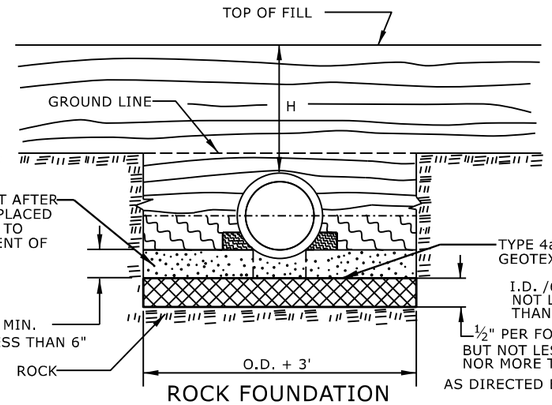
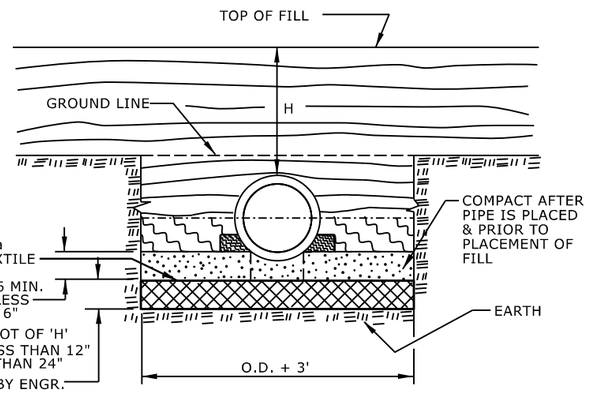
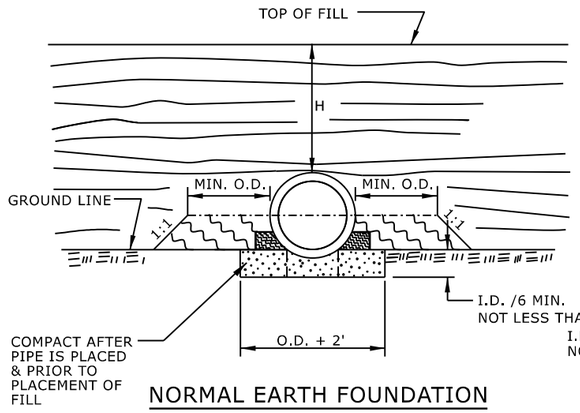


ROCK FOUNDATION



UNSUITABLE MATERIAL FOUNDATION

PIPE IN TRENCH



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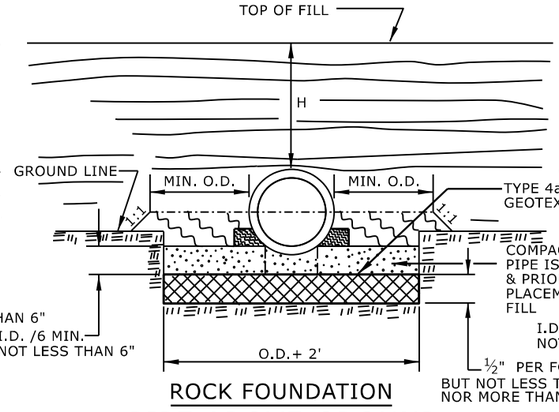
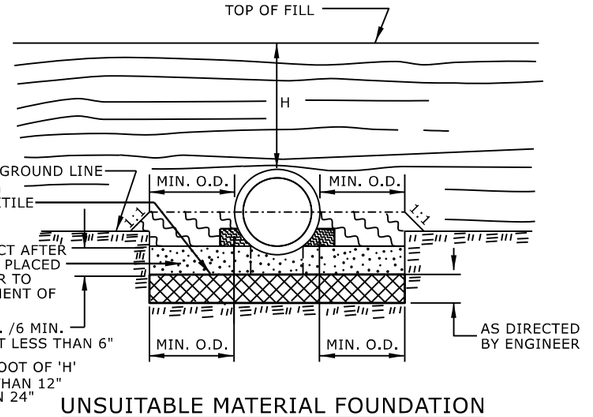


ROCK FOUNDATION



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

2/18/2026 | 10:34:11 AM PST

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HACKLER

Signed by: Nicole M. Hackler

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SEE TITLE BLOCK

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

Docusign Envelope ID: F6331BCB-4AE7-456C-AB28-C946AE19D8B5

5/26/20

SUMMARY OF EARTHWORK

IN CUBIC YARDS

Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
-L- 10+70.00	-L- 15+50.00	197	434	234	
SUBTOTALS:		197	434	234	
TOTALS:		197	434	234	
WASTE IN LIEU OF BORROW					
PROJECT TOTAL:		197	434	234	
EST. 5% REPLACE TOPSOIL ON BORROW PIT				12	
GRAND TOTAL:		197		246	
SAY:		**200**		**250**	

EST. DDE = 51 CY

EST. UNDERCUT EXCAVATION = 450 CY

EXT. SELECT GRANULAR MATERIAL = 400 CY

EST. GEOTEXTILE FOR SOIL STABILIZATION = 400 SY

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

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
L	12+30	13+14.08		162.78			
L	13+27.48	15+00		345.56			
L	11+50	12+30		57.67			
		TOTAL:		566.01			
		SAY:		**570**			

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5/26/20

CNC23444L

COMPUTED BY:	OJS	DATE:	1/27/2025
CHECKED BY:	BSR	DATE:	1/27/2025

PROJECT NO.	SHEET NO.
HL0013	3D-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

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

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	(RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	42	48	PIPE REMOVAL LIN. FT.	REMARKS
13+71	24 LT	0401	OUT		2362.1	2361.8					20					20	
14+96	21 LT	0402	OUT		2366.4	2365.6				20							
10+42	20 LT	0403	OUT		2378.2	2171.8			52								
SHEET TOTALS									52	20	20					20	
PROJECT TOTALS									52	20	20					20	

LINE & STATION	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G
13+71													
14+96													
10+42													

LINE & STATION	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29
13+71																	
14+96																	
10+42																	

LINE & STATION	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	SPRING BOX STD. 840.41	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54
13+71												
14+96												
10+42												

LINE & STATION	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING C.B. TO D.I.	CONVERT EXISTING D.I. TO J.B.	CONVERT EXISTING J.B. TO D.I.	ADJUST C.B.	ADJUST D.I.	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	BERM DITCH OUTLET STD. 850.10 (PER EACH)	BERM DITCH OUTLET STD. 850.11 (PER EACH)	MODIFIED CONC. FLUME	PREFORMED SCOUR HOLE (PER EACH)	ENERGY DISSIPATION BASIN	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY
13+71																			
14+96																			
10+42																			

ABBREVIATIONS

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

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COMPUTED BY: __CRYSTAL D. JOHNSON__ DATE: __09/03/2024__
CHECKED BY: __SHANE C. CLARK__ DATE: __09/03/2024__

(2-3-23)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
HL-0013	3G-1

SUMMARY OF SUBSURFACE DRAINAGE

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

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

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Subgrade Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU1	12	100	200	300		
			TOTAL CY/TONS/SY:		100	200	300	0	0

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

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5/26/20

HL-0013

4

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
BUNCOMBE COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER
4/2/2026 4:20:05 PM EDT
SEAL 054788

HYDRAULIC DESIGN ENGINEER
4/2/2026 4:20:05 PM EDT
SEAL 033023

JMT
Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd. Suite 100
Raleigh, NC 27609
License No: C-3097

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NAD 83
NA 2011

POT STA. 10+00.00

POT STA. 16+47.45

S86°03'13.8"E 181.00'

S86°32'36.5"E 79.05'

S85°05'05.7"E 90.38'

S04°26'57.7"W 93.43'

S04°26'57.7"W 66.28'

S86°27'18.5"E 95.00'

S85°43'57.5"E 88.67'

N86°30'03.9"E 131.03'

S82°19'02.6"E 129.83'

S82°19'02.6"E 129.54'

S03°39'45.7"W 81.16'

S04°39'45.8"W 112.82'

N01°22'03.5"E 100.00'

S04°07'41.5"W 156.33'

S04°07'50.8"W 54.95'

42.09

COASTAL MOUNTAIN PROPERTIES LLC
Deed Book/Page 5927/57
Plat Book/Page 95/44

EDUARDO T MONTERO-QUILARQUE
THOMAS P GRIGNON
Deed Book/Page 6108/5
Plat Book/Page 221/32

MARIE PADGHAM
RICHARD PADGHAM
Deed Book/Page 2426/550
Plat Book/Page 10/27

LLOYD DAVIS
MARY DAVIS
Deed Book/Page 1221/567
Plat Book/Page 40/102

LAWRENCE W COOK LIVING TRUST
KIERSTEN MICHELLE CUMMINGS TRUSTEE
Deed Book/Page 5343/1829
Plat Book/Page 40/102

LOVE IN MOTION LLC
Deed Book/Page 6296/1663
Plat Book/Page 40/102
1SBRKD

FRANCES KENNEDY
Deed Book/Page 1309/758
Plat Book/Page 10/27

JANE FRIST
Deed Book/Page 4878/1705
Plat Book/Page 10/27

THIRD EYE PROPERTIES, LLC
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Plat Book/Page 10/27

TOWN OF BLACK MOUNTAIN
Deed Book/Page 1035/347

NORTH OCONEECHEE AVENUE
NORTH CHEROKEE AVENUE
TOMAHAWK BRANCH
NINTH STREET
TO HIAWASSEE AVE
TO SR 9

8" Water UG Line
8" SS UG Line LOS B
6" SS UG Line LOS B
LINE CHANGES SIZE & MATERIAL
12" SS UG Line LOS B
12" SS UG Line LOS B
6" Water UG Line
12" SS UG Line LOS B

EXISTING RW
EXISTING RW
EXISTING RW
EXISTING RW
EXISTING RW

FLOODPLAIN BENCH
REMOVE EXISTING STRUCTURE
REMOVE
SPECIAL LATERAL 'V' DITCH SEE DETAIL 1
REMOVE & REPLACE
RELOCATE WATER METER
RETAIN
NOTE: REMOVE AND RESET SPLIT TIMBER FENCE
UNDER CONSTRUCTION
2SFD
DECK
CONC
WOODED
SOIL/GR
GR
BST
MBX
LOW WIRE 236.78'
LOW WIRE 248.12'
LOW WIRE 244.12'
LOW WIRE 236.78'
15" RCP
18" RCP
24" ALT
15" ALT
15" ALT
15" ALT
15" INC (TYP.)
+00.00
+20.00
BM-1
BM-2

-L- +87.85
26.70' LT
32.00' LT

-L- +68.60
53.79' LT

-L- +56.68
26.67' LT
42.89' LT

-L- +19.68
26.67' LT
32.00' LT

-L- +73.90
43.50' LT

-L- +05.87
26.61' LT
41.05' LT

-L- +70.00
13.29' RT
42.00' RT

-L- +50.00
36.50' RT

-L- +17.00
62.00' RT

-L- +73.00
62.00' RT
80.00' RT

-L- +00.00
49.00' RT
78.30' RT

-L- +95.00
56.92' RT

-L- +95.00
72.30' RT

-L- +96.18
66.00' RT

-L- +50.00
13.40' RT
50.00' RT

-L- +13.00
13.41' RT
50.00' RT

50' TAPER (LT & RT)
50' TAPER (LT & RT)

BEGIN TIP PROJECT HL-0013
-L- POT STA. 10+42.07

BEGIN GRADING AND PAVING HL-0013
-L- POT STA. 10+70.00

BEGIN CULVERT
STA. 13+03.91

END CULVERT
STA. 13+38.09

CHANNEL CHANGE
SEE DETAIL 2

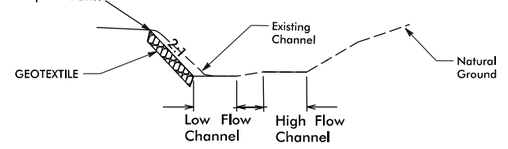
END TIP PROJECT HL-0013
-L- POT STA. 16+13.00

END GRADING AND PAVING
HL-0013 -L- POT STA. 15+50.00

SPECIAL LATERAL 'V' DITCH.
SEE DETAIL 1

NOTE: WATER METER AT -L- STA 12+80.00, 20' LT NOT INCLUDED IN SURVEY, CONTRACTOR SHALL FIELD VERFIY.

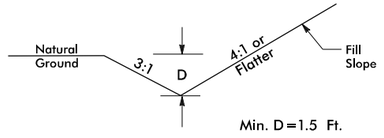
DETAIL 2
CHANNEL CHANGE
(Not to Scale)



TOTAL EST. CL 'I' RIP RAP = 40 TONS
TOTAL EST. GEOTEXTILE = 56 S.Y.
Length = 83 ft
DDE = 51 cy

FROM -L- STA 12+87 TO STA 13+23 LT
FROM -L- STA 13+39 TO STA 13+72 RT

DETAIL 1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



FROM STA.14+00 TO STA.15+00 LT
FROM STA.14+00 TO STA.15+00 RT

SEE SHEET 5 FOR -L- PROFILE

SEE SHEETS C-01 THRU C-10 FOR CULVERT PLANS

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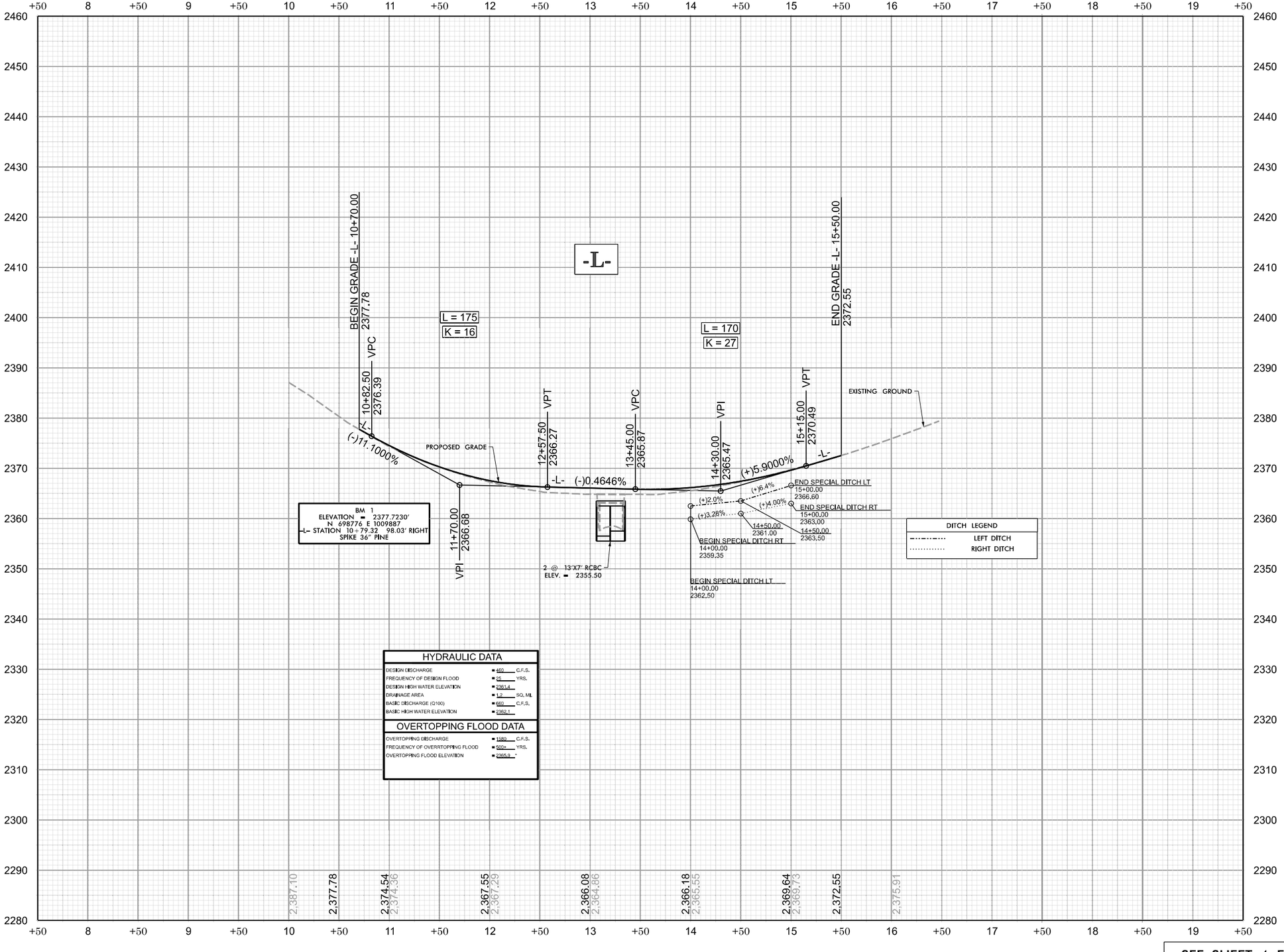
5/26/20



HYDRAULIC DATA

DESIGN DISCHARGE	= 460	C.F.S.
FREQUENCY OF DESIGN FLOOD	= 25	YRS.
DESIGN HIGH WATER ELEVATION	= 2361.4	
DRAINAGE AREA	= 1.2	SQ. MI.
BASIC DISCHARGE (Q100)	= 660	C.F.S.
BASIC HIGH WATER ELEVATION	= 2362.1	

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 1580	C.F.S.
FREQUENCY OF OVERRTOPPING FLOOD	= 500+	YRS.
OVERTOPPING FLOOD ELEVATION	= 2365.9	'

SEE SHEET 4 FOR –L– PLAN

SEE SHEETS C–01 THRU C–10 FOR CULVERT PLANS

HL-0013
5

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
BUNCOMBE COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER
2/19/2026 | 9:40:46 AM

NORTH CAROLINA PROFESSIONAL SEAL 054788 ENGINEER QUENTIN ROOSA

HYDRAULIC DESIGN ENGINEER
2/18/2026 | 12:42:0 PM

NORTH CAROLINA PROFESSIONAL SEAL 033023 ENGINEER BRADLEY KIRKMAN

JMT
Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd. Suite 100
Raleigh, NC 27609
License No. C-3097

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09/08/99

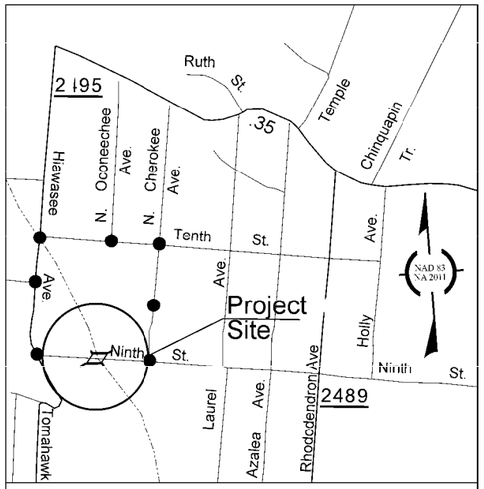
TIP PROJECT: HL-0013

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

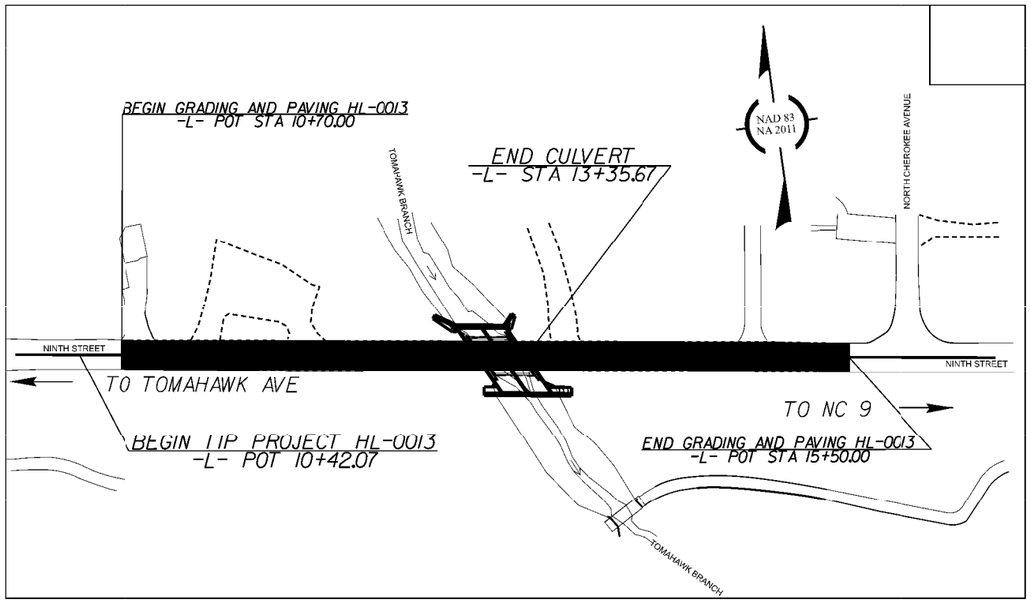
BUNCOMBE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HL-0013	RW01	5



VICINITY MAP (N.T.S)

DETOUR ROUTE



GRAPHIC SCALE

30' 15' 0' 30' 60'

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS-1"
WITH NAD 83 / NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 698840.488' EASTING: 1009759.691'
ELEVATION: 2389.277'
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999784147
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:

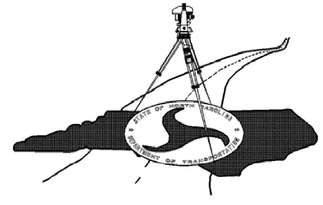
JOHNSON, MIRMIRAN, & THOMPSON, INC.
108 ASHEVILLE COMMERCE PARKWAY
CANDLER, NC 28715

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4529 LAND SURVEYOR MARK A. PARRIS

DocuSigned by:
Mark A Parris
F1570CB85C7248A...
SIGNATURE

02/23/26
DATE



5/26/20

SURVEY CONTROL SHEET

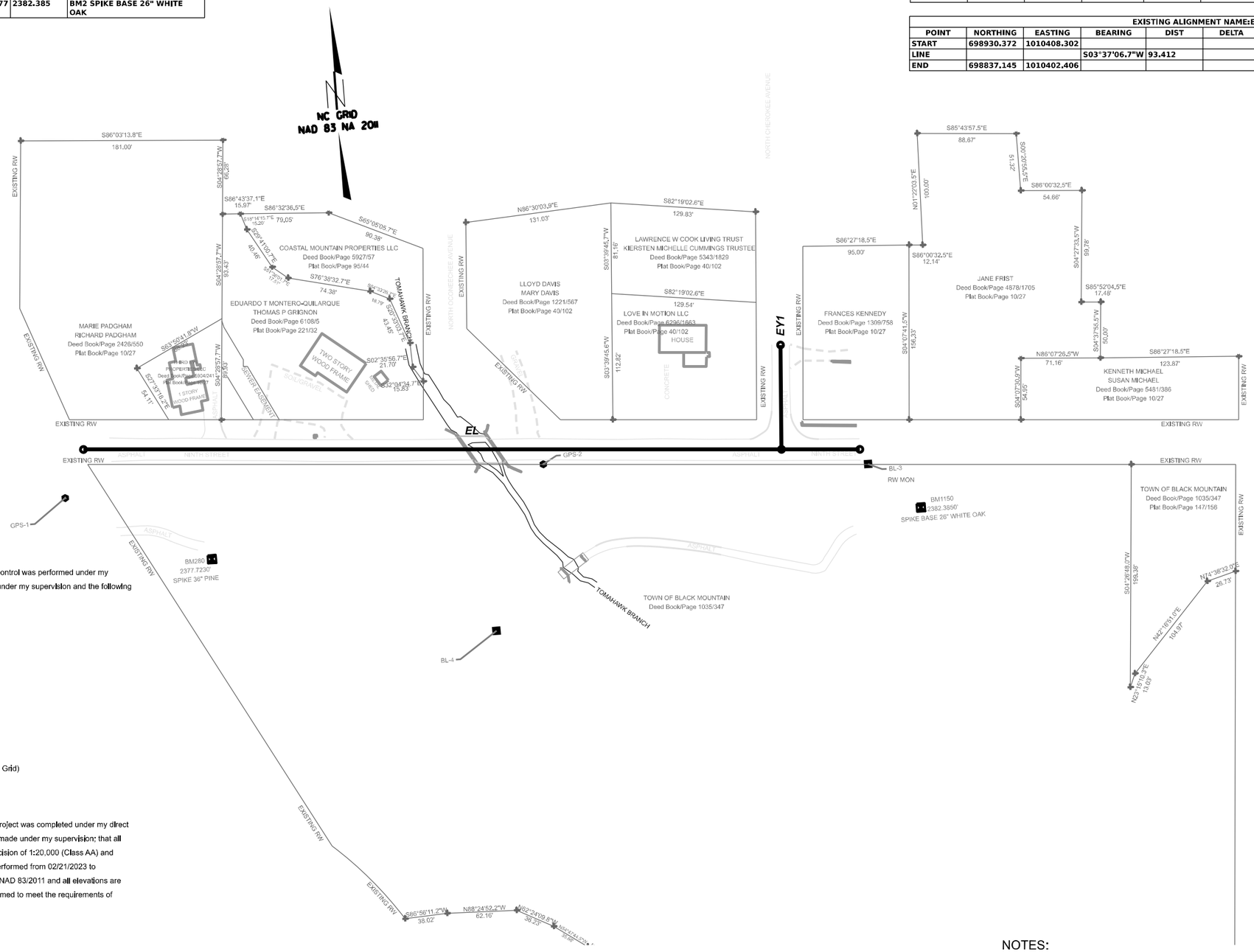
W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

BASELINE POINTS TABLE				
POINT	DESC	NORTH	EAST	ELEVATION
1		698840.488	1009759.691	2389.277
2		698839.406	1010188.787	2364.226
3		698818.481	1010478.681	2380.172
4		698693.852	1010136.021	2360.61

BENCHMARK TABLE				
BENCHMARK	NORTHING	EASTING	ELEVATION	DESCRIPTION
280	698776.375	1009886.703	2377.723	BM1 SPIKE 36" PINE
1150	698776.191	1010522.977	2382.385	BM2 SPIKE BASE 26" WHITE OAK

EXISTING ALIGNMENT NAME:EL									
POINT	NORTHING	EASTING	BEARING	DIST	DELTA	D	L	T	R
START	698882.608	1009779.085							
LINE			S85°49'42.3"E	695.07					
END	698832.047	1010472.314							

EXISTING ALIGNMENT NAME:EY1									
POINT	NORTHING	EASTING	BEARING	DIST	DELTA	D	L	T	R
START	698930.372	1010408.302							
LINE			S03°37'06.7"W	93.412					
END	698837.145	1010402.406							



I, Mark A. Parris, 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: 02/21/2023-03/24/2023
Datum/Epoch: NAD83 (NA2011)
Published/Fixed-control use: NA
Horizontal Control: N/A
Vertical Control: N/A
Localized around: 1 (GPS-1)
Northing: 698840.488'
Easting: 1009759.691'
Combined grid factor: 0.999784147 (Ground to Grid)
Geoid model: GEOID18 (Conus)
Units: U.S. Survey Feet

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from 02/21/2023 to 03/24/2023 , 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 31 day of March, 2023.

Certified by
Professional Land Surveyor L-4529

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.

HL-0013
R/W | 02C

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL LAND SURVEYOR
NORTH CAROLINA PROFESSIONAL SEAL L-4529 LAND SURVEYOR MARK A PARRIS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

2018 STANDARD SPECIFICATIONS

TIP PROJECT: HL-0013
County: Buncombe

PREPARED FOR

LOCATION AND SURVEYS UNIT

PREPARED BY

Docusign Envelope ID: D91DD8F6-CFC2-4CA3-84B1-A239B8A0E1B7

5/26/20

PROPOSED ALIGNMENT CONTROL SHEET

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

THIS 23rd DAY OF FEBRUARY, 2026.

DocuSigned by:
Mark A. Parris
F167CB65C7245A...

PROFESSIONAL LAND SURVEYOR L-4529

PROPOSED ALIGNMENT: L												
POINT	STATION	NORTHING	EASTING	BEARING	DIST	DELTA	D	L	T	R	LT	ST
START	10+00.00	698879.9107	1009814.7226	S85°49'52.6"E	647.4460							
END	16+47.45	698832.8454	1010460.4557									

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.

HL-0013
R/W | 0ZD-I

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4529 LAND SURVEYOR MARK A PARRIS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

TIP PROJECT: HL-0013
County: BUNCOMBE

PREPARED FOR

LOCATION AND SURVEYS UNIT

PREPARED BY

JMT

Docusign Envelope ID: 1DBB70EA-1B87-43BE-A910-BC4489FB1377

5/26/20

RIGHT OF WAY CONTROL SHEET

RW Sheet - Permanent Easement Iron Pin and Cap: L				
Station	**Offset**	**Northing**	**Easting**	
12+17.00	62.00	698802.3002	1010026.6415	
12+56.68	-26.67	698887.8475	1010072.6535	
12+56.68	-42.89	698904.0253	1010073.8370	- X ON ROCK
12+68.60	-53.79	698914.0325	1010086.4937	
12+73.00	80.00	698780.2770	1010081.1848	
12+73.00	62.00	698798.2293	1010082.4933	
13+00.00	78.30	698780.0035	1010108.2365	
13+00.00	49.00	698809.2158	1010110.3657	
13+95.00	72.30	698779.0866	1010203.4217	
14+96.18	66.00	698778.0164	1010304.7881	
16+13.00	13.41	698821.9754	1010425.1260	
16+13.00	50.00	698785.4817	1010422.4661	

RW Sheet - ROW Marker Iron Pin and Cap: L			
Station	**Offset**	**Northing**	**Easting**
10+70.00	13.29	698861.4129	1009883.5610
10+70.00	42.00	698832.9333	1009881.4843
10+87.85	26.70	698900.1545	1009904.2935
11+50.00	36.50	698832.6032	1009961.6724
12+19.68	26.67	698890.5444	1010035.7596
13+73.90	43.50	698896.1183	1010190.7938
13+95.00	56.92	698794.4231	1010204.5395
15+05.87	26.61	698869.6797	1010321.1908
15+50.00	50.00	698790.0614	1010359.6328
15+50.00	13.40	698826.4187	1010362.2837

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

THIS 28th DAY OF NOVEMBER, 2026.

Signed by:
F1570CB85C7248A...

PROFESSIONAL LAND SURVEYOR L-4529

NORTH CAROLINA PROFESSIONAL SEAL L-4529 LAND SURVEYOR MARK A PARRIS

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.

HL-0013
R/W | 03E

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4529 LAND SURVEYOR MARK A PARRIS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

2024 STANDARD SPECIFICATIONS

TIP PROJECT: HL-0013
County: Buncombe

PREPARED FOR

LOCATION AND SURVEYS UNIT

PREPARED BY

JMT

Docusign Envelope ID: D91DD8F6-CFC2-4CA3-84B1-A239B8A0E1B7

5/26/20

1

RIGHT OF WAY CONTROL SHEET

PERMANENT ROW MARKER IRON PIN AND CAP: L				
STATION	OFFSET	NORTH	EAST	
12+17.00	62.00	698802.3002	1010026.6415	
12+56.68	-26.67	698887.8475	1010072.6535	
12+56.68	-42.89	698904.0253	1010073.8370	
12+68.60	-53.79	698914.0325	1010086.4937	*– "X" ON ROCK*
12+73.00	80.00	698780.2770	1010081.1848	
12+73.00	62.00	698798.2293	1010082.4933	
13+00.00	78.31	698780.0035	1010108.2365	
13+00.00	49.02	698809.2158	1010110.3657	
13+95.00	72.30	698779.0866	1010203.4217	
14+96.18	66.00	698778.0164	1010304.7881	
16+13.00	13.41	698821.9754	1010425.1260	
16+13.00	50.00	698785.4817	1010422.4661	

PERMANENT ROW MARKER IRON PIN AND CAP: L			
STATION	OFFSET	NORTH	EAST
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15+05.87	26.61	698869.6797	1010321.1908
15+50.00	50.00	698790.0614	1010359.6328
15+50.00	13.40	698826.4187	1010362.2837

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

THIS 23rd DAY OF FEBRUARY, 2026.

DocuSigned by:
Mark A. Parris
F1570C2B5C724BA...

PROFESSIONAL LAND SURVEYOR L-4529

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.

HL-0013
R/W | D3E-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4529 LAND SURVEYOR MARK A. PARRIS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

TIP PROJECT: HL-0013
County: BUNCOMBE

PREPARED FOR

LOCATION AND SURVEYS UNIT

PREPARED BY

JMT

Docusign Envelope ID: D91DD8F6-CFC2-4CA3-84B1-A239B8A0E1B7

5/26/20

I , MARK A. PARRIS , 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 FROM 01/08/26 TO 01/15/26, AND ALL COORDINATES ARE BASED ON NAD83/NA 2011; THAT THIS SURVEY WAS PERFORMED TO MEET THE REQUIREMENTS OF 21NCAC 56.1600 AS APPLICABLE.

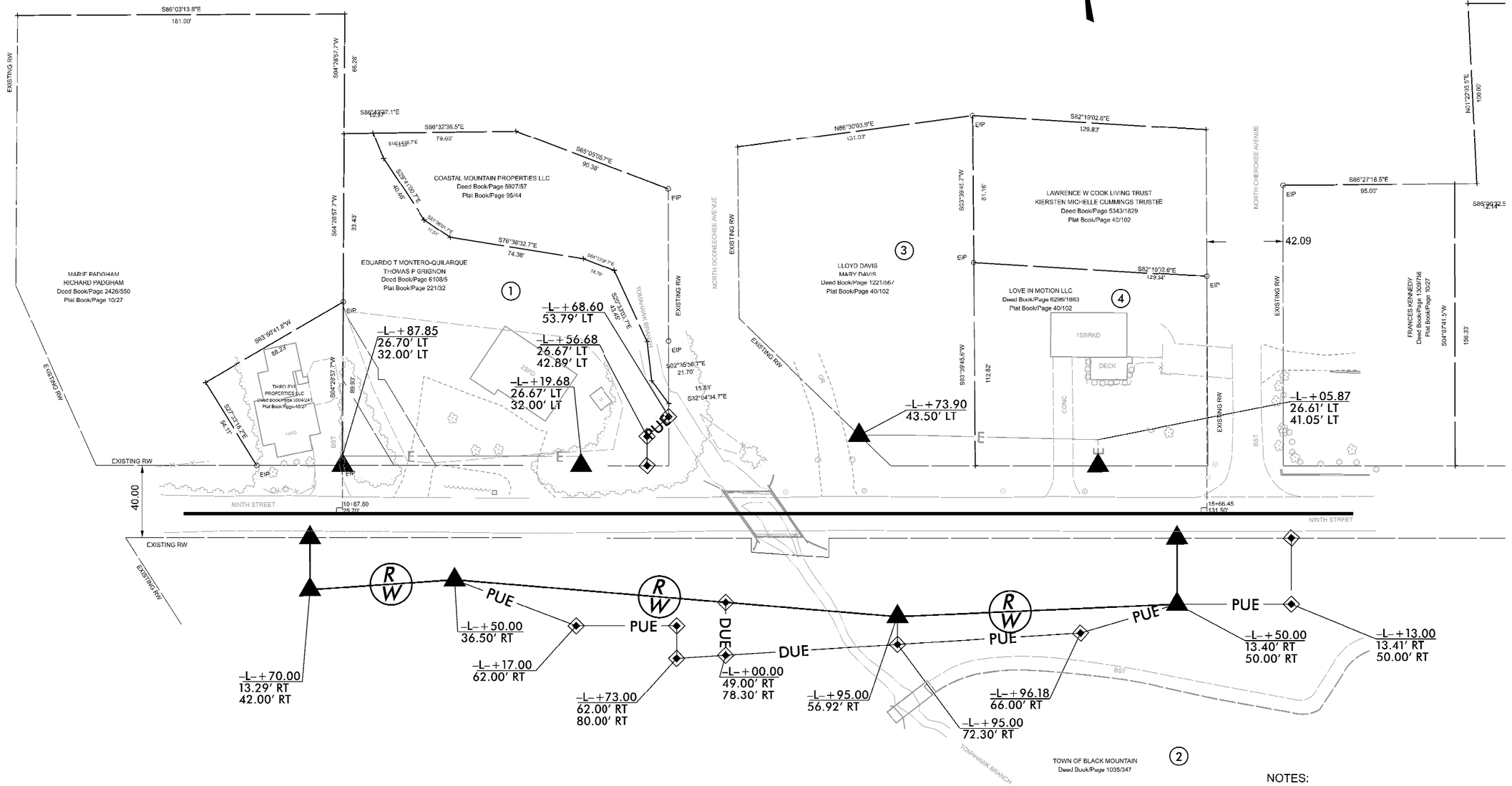
THIS 23rd DAY OF FEBRUARAY, 2026.

DocuSigned by:
Mark A. Parris
F157CC385CC7248A...

PROFESSIONAL LAND SURVEYOR L-4529

30' 15' 0' 30' 60'

NC GRID
NAD 83 NA 2011



NOTES:

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

HL-0013
R/W | 04

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL LAND SURVEYOR
SEAL L-4529 MARK A. PARRIS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

TIP PROJECT: HL-0013
County: BUNCOMBE

PREPARED FOR

LOCATION AND SURVEYS UNIT

PREPARED BY

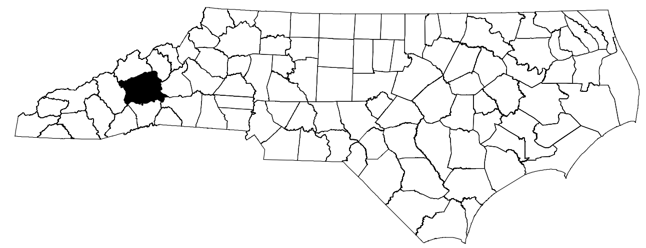
Docusign Envelope ID: 35A717DF-4F88-4564-9090-B24727510BF6

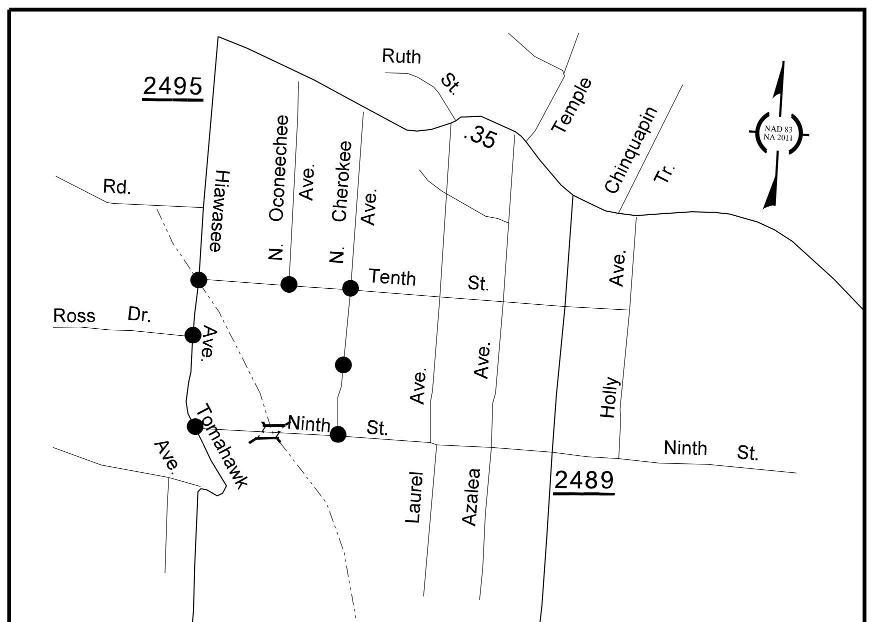
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

BUNCOMBE COUNTY

DIVISION 13





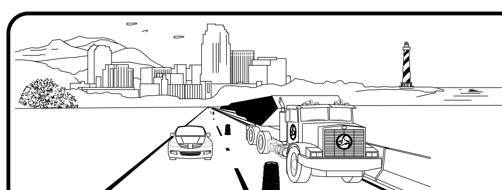
VICINITY MAP (NTS)

DETOUR ROUTE

LOCATION: BRIDGE No. 522 ON NINTH STREET OVER TOMAHAWK CREEK

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, GENERAL NOTES, AND MANAGEMENT STRATEGIES
TMP-2	SPECIAL SIGN DESIGN
TMP-3	TEMPORARY TRAFFIC CONTROL DETAIL, PHASING NOTES, OFF SITE DETOUR SIGNING AND ROAD CLOSURE



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

PLANS PREPARED BY:

JOSHUA ROEMER, PE
PROJECT ENGINEER

DANE FREDDE
PROJECT DESIGN ENGINEER

NCDOT CONTACTS:

KENNETH C. THORNEWELL, PE
STATE WORK ZONE ENGINEER

ZACHARY CLARK, PE
WESTERN WZTC ENGINEER

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

Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27609
License No: C-3097

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

APPROVED: DocuSigned by: Joshua Q. Roemer 2FA8D21C95654CD...

DATE: 2/19/2026 | 9:46:06 AM EST

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 054788 ENGINEER JOSHUA QUENTIN ROEMER

SHEET NO.
TMP-1

TIP PROJECT: HL-0013

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

Docusign Envelope ID: 12733CF4-5E04-40E1-A894-51AA7516993A

PROJ. REFERENCE NO.	SHEET NO.
HL-0013	TMP-1A

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 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
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1145.01	BARRICADES-TYPE III

MANAGEMENT STRATEGIES

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

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

LEGEND

GENERAL

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

SIGNALS

EXISTING | PROPOSED | TEMPORARY | PORTABLE

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM / SKINNY DRUM
- 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

GENERAL NOTES

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

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

TRAFFIC PATTERN ALTERATIONS

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

SIGNING

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

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 R-11-2 ATTACHED OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

PAVEMENT MARKINGS AND MARKERS

G) INSTALL PAVEMENT MARKINGS (PAINT) ON THE FINAL SURFACE OF THE ENTIRE PROJECT (SEE PMP PLANS).

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

1. NOTIFY BUNCOMBE COUNTY EMERGENCY SERVICES AND PUBLIC SCHOOLS THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.
2. MAINTAIN DRIVEWAY ACCESS AT ALL TIMES DURING CONSTRUCTION.

JMT Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27609
License No: C-3097

APPROVED: DocuSigned by: Joshua Q. Roemer 2FA8D21C95654CD...
DATE: 4/8/2026 | 1:28:58 PM EDT

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 054788 JOSHUA QUENTIN ROEMER

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

ROADWAY STANDARD DRAWINGS, GENERAL NOTES & MANAGEMENT STRATEGIES

4/8/2026
Pw://jmt-pw.bentley.com:jmt-pw-01/Documents/Projects/2022/22-V03420i-002/Design/Work Zone Traffic Control/HL0013_TMP-1A
User:dfredde

Docusign Envelope ID: 35A717DF-4F88-4564-9090-B24727510BF6

PROJ. REFERENCE NO.	SHEET NO.
HL-0013	TMP-2

SIGN NUMBER: SP-1
TYPE: D
QUANTITY: 13

SIGN WIDTH: 3′-0″
HEIGHT: 1′-6″
TOTAL AREA: 4.5 Sq.Ft.

BORDER TYPE: INSET
RECESS: 0.47″
WIDTH: 0.63″
RADII: 1.5″

NO. Z BARS:
LENGTH:

BACKG COLOR: Fluorescent Orange
COPY COLOR: Black

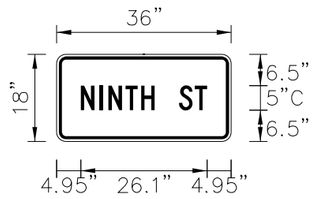
SYMBOL	X	Y	WID	HT

MAT′L: 0.125″ (3.2 mm) ALUMINUM

USE NOTES: 1,2

1. Legend and border shall be direct applied black non-reflective sheeting.
2. Background shall be NC GRADE B fluorescent orange retroreflective sheeting.

DESIGN BY: DAF
PROJECT ID: HL-0013
CHECKED BY: JQR
LOCATION:
Jan 27, 2025
DIV: 13



BORDER
R=1.5”
TH=0.63”
IN=0.47”

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter locations are panel edge to lower left corner

Series/Size
Text Length

	N	I	N	T	H		S	T																	
	5	8.9	10.7	14.2	17.4	20.2	25.2	28.5																	C 2000 26.1

NORTH CAROLINA D.O.T. SIGN DETAIL

Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27609
License No: C-3097

APPROVED: DocuSigned by: Joshua Q. Roemer
DATE: 2/19/2026 | 9:46:10 AM EST

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 054788 JOSHUA QUENTIN ROEMER

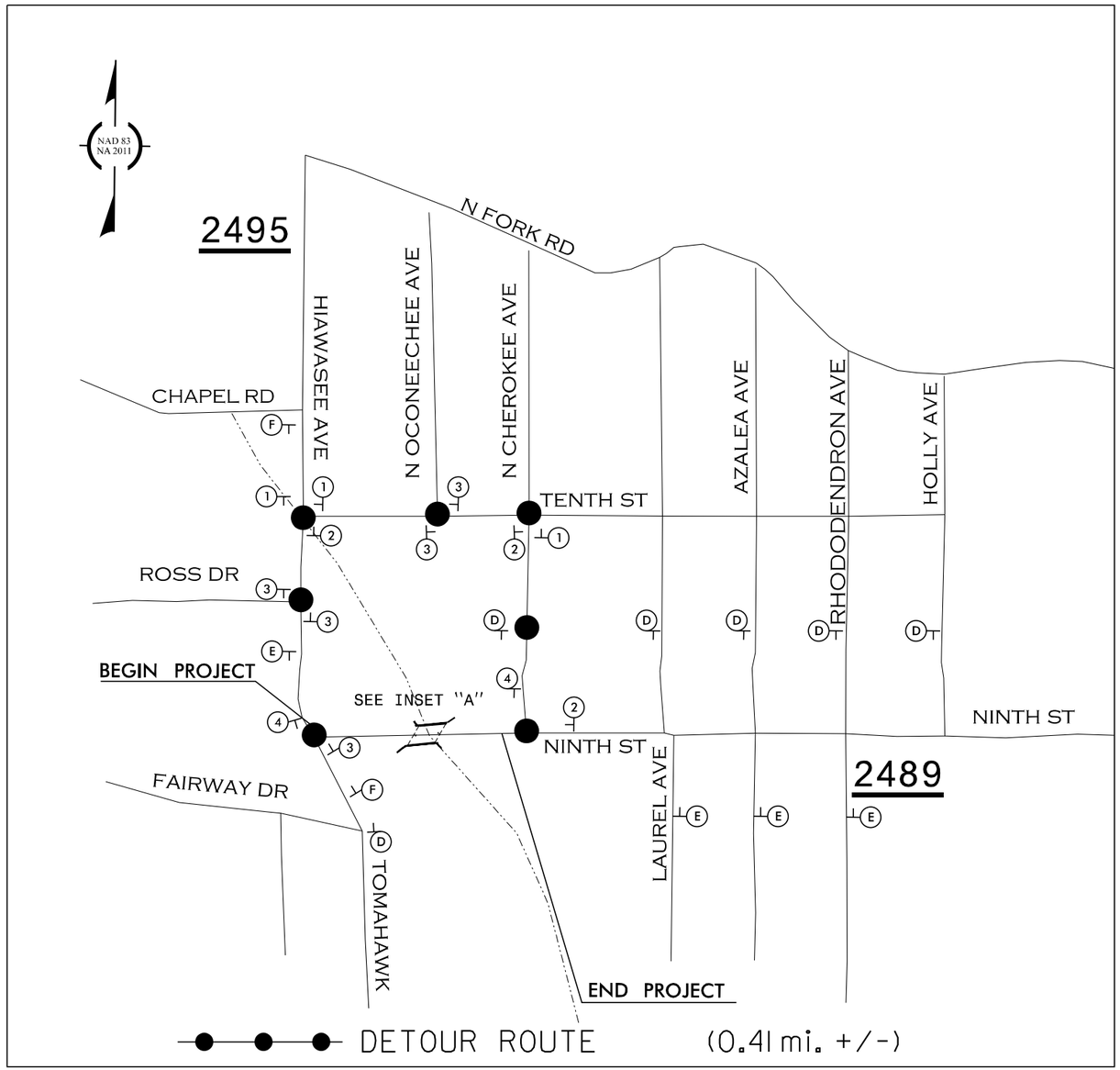
DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

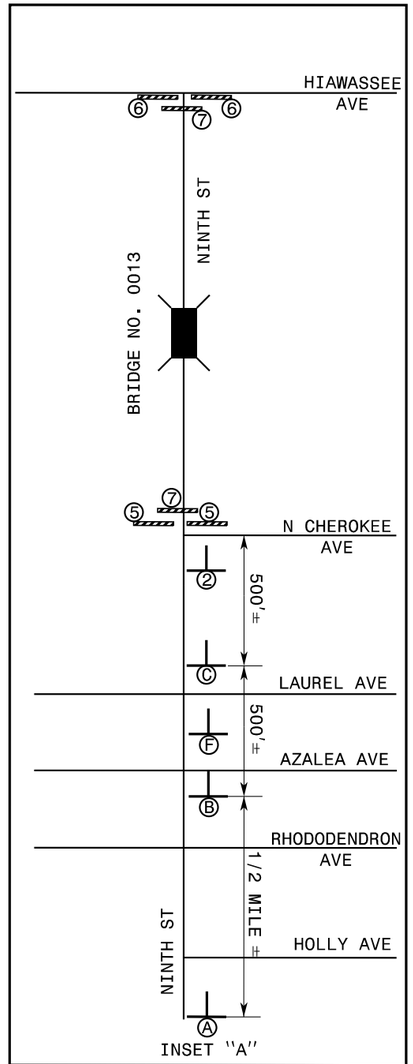
SPECIAL SIGN DESIGN

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

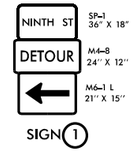
Docusign Envelope ID: 35A717DF-4F88-4564-9090-B24727510BF6

PROJ. REFERENCE NO.	SHEET NO.
HL-0013	TMP-3

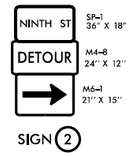




REFER TO ROADWAY STANDARD DRAWING 1101.03, SHEET 1 OF 9 FOR APPLICABLE NOTES.



SIGN (1)



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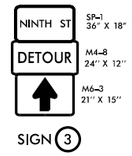

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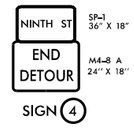

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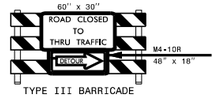
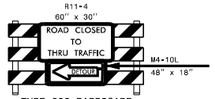
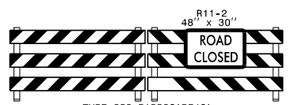


TYPE III BARRICADE
SIGN (5)



TYPE III BARRICADE
SIGN (6)



TYPE III BARRICADE(S)
SIGN (7)

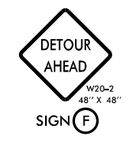
SIGN (A)

SIGN (B)

SIGN (C)

SIGN (D)

SIGN (E)



SIGN (F)

PHASING

STEP 1: - INSTALL OFF-SITE DETOUR ROUTE SIGN ASSEMBLIES FOR THE CLOSING OF NINTH ST.

- USING ROADWAY STANDARD DRAWING NO. 1101.03, SHEETS 1 OF 9, CLOSE NINTH ST. TO THRU TRAFFIC.

STEP 2: - REMOVE THE EXISTING STRUCTURE, AND CONSTRUCT THE PROPOSED STRUCTURE AND ROADWAY, UP TO, AND INCLUDING THE FINAL LAYER OF SURFACE COURSE. (SEE ROADWAY PLANS).

- PLACE THE FINAL PAVEMENT MARKINGS ON NINTH ST. (SEE PMP PLANS).

STEP 3: - REMOVE ALL TRAFFIC CONTROL DEVICES, SIGNING AND DETOUR ROUTE SIGNING.

- OPEN NINTH ST. TO FINAL TRAFFIC PATTERN.

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

Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC. 27609
License No: C-3097

APPROVED: Docusigned by: Joshua Q. Roemer
DATE: 2/19/2026 | 9:46:0

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 054788 ENGINEER JOSHUA QUENTIN ROEMER

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

TEMPORARY TRAFFIC CONTROL DETAIL, PHASING NOTES, OFF SITE DETOUR SIGNING AND ROAD CLOSURE

Docusign Envelope ID: 12733CF4-5E04-40E1-A894-51AA7516993A

T.I.P.: HL-0013

CONTRACT: DM00462

TIP NO.	SHEET NO.
HL-0013	PMP-1

APPROVED: Joshua Q. Roemer

DATE: 4/8/2026 | 1:28:58 PM EDT

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 054788 JOSHUA QUENTIN ROEMER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN
BUNCOMBE COUNTY

INDEX

SHEET NO.	DESCRIPTION
PMP-1	INDEX, ROADWAY STANDARD DRAWINGS, PAVEMENT MARKINGS SCEDHULE, GENERAL NOTES, AND PAVEMENT MARKING DETAILS
PMP-1A	SPECIAL DETAIL SHEET

GENERAL NOTES

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

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

ROAD NAME	MARKING	MARKER
-L- (NINTH STREET)	PAINT	NONE

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

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

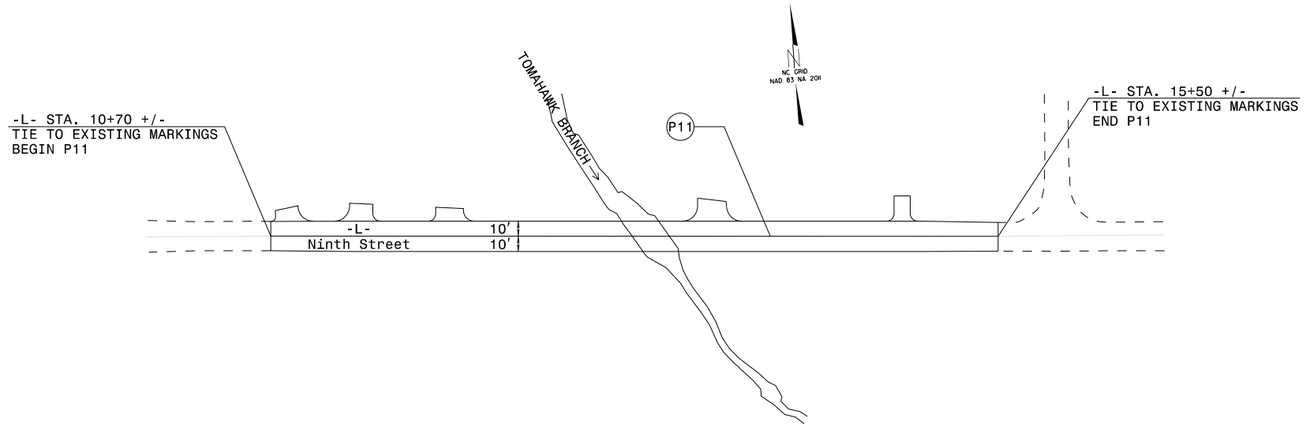
ROADWAY STANDARD DRAWING

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

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS

PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
P11	PAINT YELLOW SINGLE CENTER (4", 30 MIL)



PLAN SUBMITTED TO:	
KELVIN L. JORDAN	SIGNING AND DELINEATION REGIONAL ENGINEER
ASHLEY K. MATTHEWS, PE	SIGNING AND DELINEATION DESIGN ENGINEER III

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PLAN PREPARED BY: JMT	
JOSHUA ROEMER, PE	PROJECT ENGINEER
DANE FREDDE	PROJECT DESIGN ENGINEER

JMT Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd. Suite 100,
Raleigh, NC, 27609
License No: C-3097

4/8/2026
pw://jmt-pw.bentley.com:jmt-pw-01/Documents/Projects/2022/22-V034201-002/Design/Signing and Delineation/Pavement Marking/Design/HL0013_PMP
User:dfredde

2018_PEF Pavement Marking Seed_08-13-19.dgn 4/8/2026 9:32:11 AM

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PROJECT REFERENCE NO.	SHEET NO.
HL-0013	PMP-1A

CONTINUOUS LINES

EDGE LINE
YELLOW OR WHITE — 4″/6″

LANE LINE
WHITE — 4″/6″

CENTER LINE
YELLOW — 4″/6″

GORE LINE
WHITE — 8″/12″

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

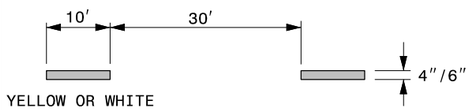
CROSSWALK LINE
WHITE — 8″ TRANSVERSE
24″ LONGITUDINAL

RxR LINE
WHITE — 16″

STOP OR TRANSVERSE BAR
WHITE — 24″

10′-30′/SP SKIP LINE

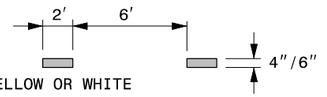
UNLESS OTHERWISED SHOWN, USE 10′-30′/SP SKIPS FOR SKIP LANE LINES AND SKIP CENTER LINES.



YELLOW OR WHITE

2′-6′/SP MINI-SKIP LINE

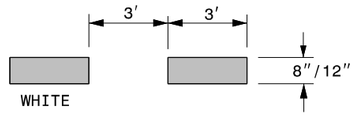
UNLESS OTHERWISED SHOWN, USE 2′-6′/SP MINI-SKIPS FOR LANE LINE EXTENSIONS THROUGH INTERSECTIONS, EDGE LINE EXTENSIONS THROUGH INTERSECTIONS AND BICYCLE LANE EXTENSIONS.



YELLOW OR WHITE

3′-3′/SP MINI-SKIP LINE

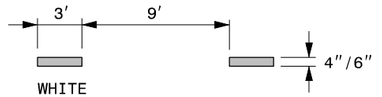
UNLESS OTHERWISED SHOWN, USE 3′-3′/SP MINI-SKIPS FOR THE WHITE EDGE LINE ENTENSIONS AT ROUNDABOUTS.



WHITE

3′-9′/SP MINI-SKIP LINE

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



WHITE

GENERAL NOTES:

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

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

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

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

ROADWAY DETAIL DRAWING FOR

PAVEMENT MARKINGS

LINE TYPES AND OFFSETS

SHEET 1 OF 2

1205D01

2/18/2026 | 10:33:12 AM PST

NORTH CAROLINA PROFESSIONAL SEAL 042546 ENGINEER MATTHEW V. SPRINGER

Signed by: Matthew V. Springer, PE

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

SEE TITLE BLOCK

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HL-0013	EC-1	

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

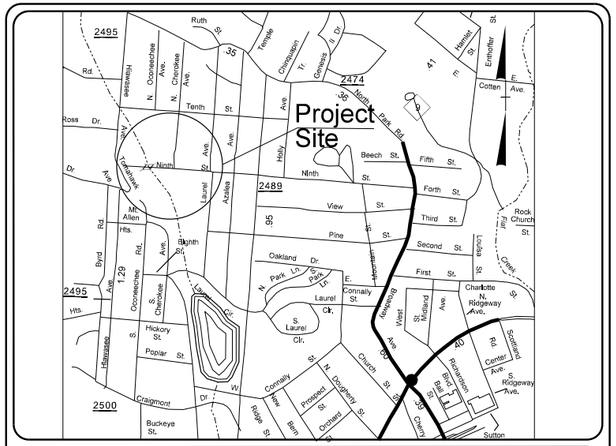
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

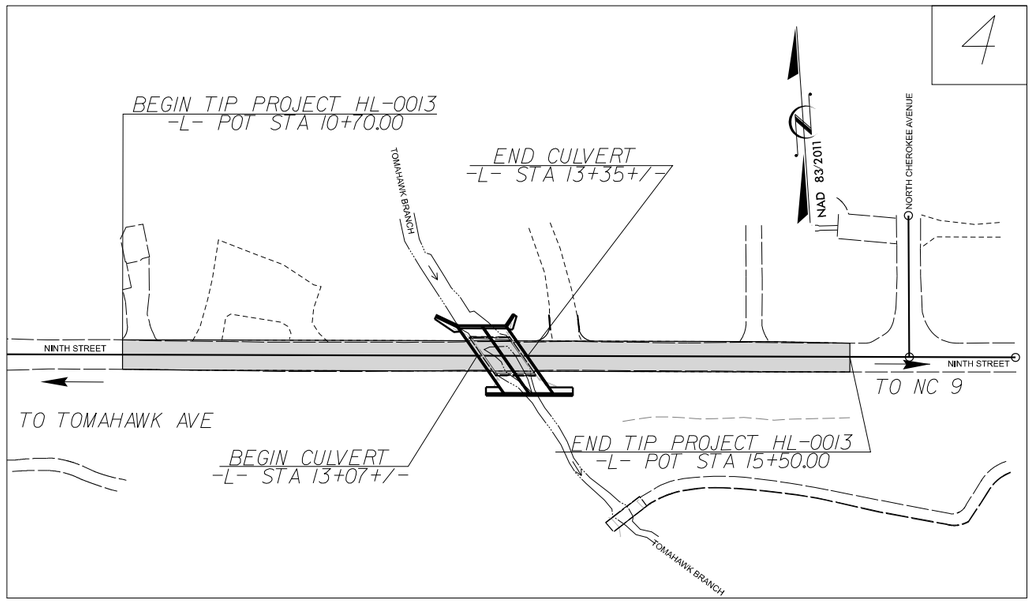
BUNCOMBE COUNTY

LOCATION: *BRIDGE No. 522 ON NINTH STREET OVER TOMAHAWK CREEK*

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, CULVERTS*



VICINITY MAP
NOT TO SCALE



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

GRAPHIC SCALE

50 25 0 50 100
PLANS

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE APPLICABLE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE APRIL 1, 2019 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF WATER RESOURCES.

Prepared in the Office of:

Johnson, Mirmiran, and Thompson
2550 W Tyvola Rd, Suite 120
Charlotte, NC 28217

Designed by:

Henry Traynor ***4694***
NAME *LEVEL III CERTIFICATION NO.*

Roadway Standard Drawings

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

TIP PROJECT: HL-0013

4/26/2024 10:59:59 PM
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User:Traynor

PROJECT REFERENCE NO.	SHEET NO.
HL-0013	EC-02

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

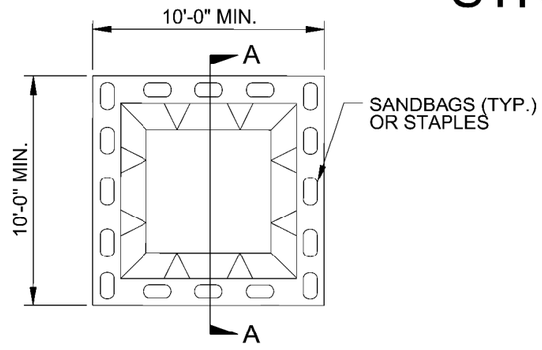
EROSION & SEDIMENT CONTROL LEGEND

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

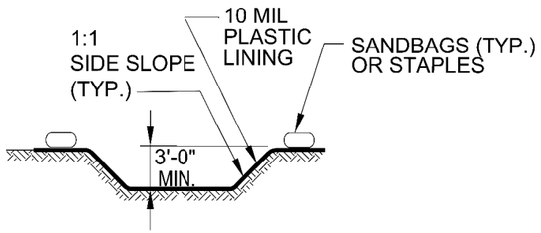
Std. #	Description	Symbol
1633.01	Temporary Rock Silt Check Type A	
1633.02	Temporary Rock Silt Check Type B	
1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1634.01	Temporary Rock Sediment Dam Type A	
1634.02	Temporary Rock Sediment Dam Type B	
1635.01	Rock Pipe Inlet 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.
HL-0013	EC-2A

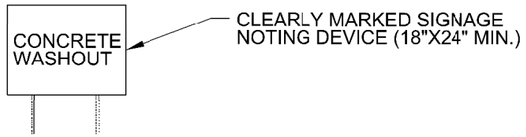
ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



PLAN



SECTION A-A



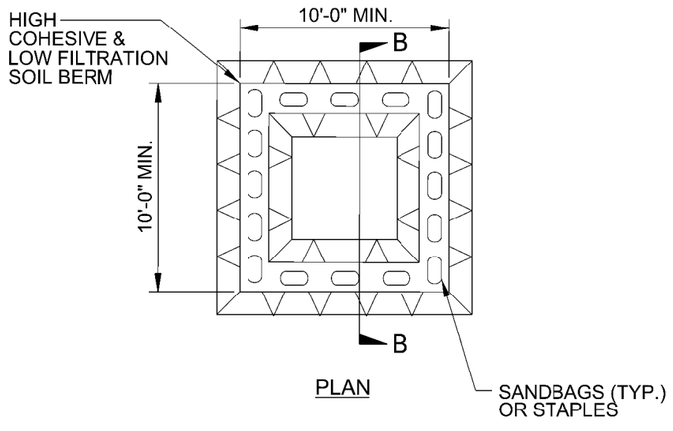
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

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.

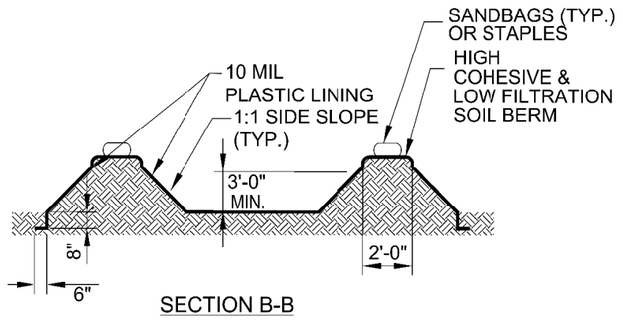
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

BELOW GRADE WASHOUT STRUCTURE

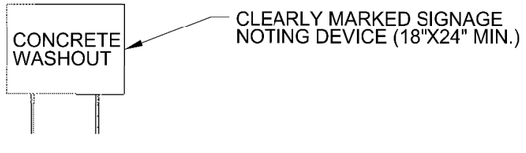
NOT TO SCALE



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.
HL-0013	EC-3A

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

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

PROJECT REFERENCE NO.	SHEET NO.
HL-0013	EC-3B

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL (STRAW)

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	15+50	13+68	RT	245
				SUBTOTAL	245
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					25
				TOTAL	270
				SAY	270

MATTING FOR EROSION CONTROL (EXCELSIOR)

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	10+17	13+17	RT	340
4	-L-	15+50	13+30	LT	295
				SUBTOTAL	635
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					25
				TOTAL	660
				SAY	660

PROJECT REFERENCE NO.	SHEET NO.
HL-0013	EC-4/Const.4

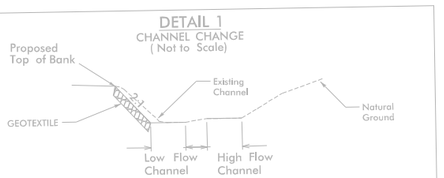
CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 04

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

REVISIONS

8/17/99

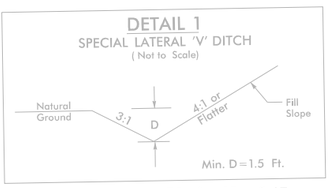
DETAIL 1
CHANNEL CHANGE
(Not to Scale)



TOTAL EST. CL 'I' RIP RAP = 40 TONS
TOTAL EST. GEOTEXTILE = 56 S.Y.
Length = 65.6 ft
DDE = 1 cy

FROM -L- STA 13+07 TO STA 13+55 RT

DETAIL 1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D = 1.5 Ft.

FROM STA.14+00LT TO STA.15+50 LT

POT STA. 10+00.00

POT STA. 16+47.45

NAD 83/NA 2011

EXISTING RW

TOMAHAWK BRANCH

NORTH OCONEECHEE AVENUE

NORTH CHEROKEE AVENUE

6" SS UG Line LOS B
LINE CHANGES SIZE & MATERIAL

8" SS UG Line LOS B

12" SS UG Line LOS B

TOP = 2371.3'
INV = 2366.1'

TOP = 2394.7'
INV = 2389.3'

TOP = 2366.6'
INV = 2361.5'

TOP = 2387.1'
INV = 2374.0'

1SBRKD

DECK

EY1

UNDER CONSTRUCTION

SOIL/GR

REMOVE & REPLACE

REMOVE

REMOVE
REPLACE

SPECIAL LATERAL 'V' DITCH
SEE DETAIL 1

-L- 68.60
53.79' LT

BEGIN CULVERT
STA. 13+07+/-

25.67' LT
42.89' LT

19.68
26.67' LT
32.00' LT

END CULVERT
STA. 13+35+/-

0401
0402
0403

24" ALT.
18" ALT.
15" CMP

11+00
12+00
13+00
14+00
15+00
16+00

-L-

TO HIAWASSEE AVE
EXISTING RW

NINTH STREET

TO SR 9

BST

GPS-1
GPS-2

BL-3
BL-4

RW MON

BEGIN TIP PROJECT HL-0013
-L- POT STA. 10+70.00

END TIP PROJECT HL-0013
-L- POT STA. 15+50.00

BM280
2377.7230'
SPIKE 36" PINE
TOP = 2376.8'
INV = 2371.7'

BM1150
2382.3850'
SPIKE BASE 26" WHITE OAK

-L- 17.00
62.00' RT

-L- 73.00
62.00' RT
80.00' RT

-L- 00.00
43.00' RT
78.30' RT

-L- 95.00
72.30' RT

-L- 96.18
66.00' RT

-L- 13.00
13.41' RT
50.00' RT

CHANNEL
CHANGE
SEE DETAIL 2

SPECIAL LATERAL 'V' DITCH.
SEE DETAIL 1

IMPERVIOUS DIKE (C & G)

TOP = 2359.0'
INV = 2353.7'

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User:HTaylor
Plan Sheets\HL0013 EC-04.dgn

PROJECT REFERENCE NO.	SHEET NO.
HL-0013	EC-5/Const.4

FINAL GRADE
EROSION CONTROL FOR
CONSTRUCTION SHEET 04

Place Matting for Erosion Control
on Slopes as Work Allows.

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

REVISIONS

8/17/99

DETAIL 1
CHANNEL CHANGE
(Not to Scale)

Proposed Top of Bank
Existing Channel
Natural Ground
GEOTEXTILE
3:1
Low Flow Channel
High Flow Channel

TOTAL EST. CL 'I' RIP RAP = 40 TONS
TOTAL EST. GEOTEXTILE = 56 S.Y.
Length = 65.6 ft
DDE = 1 cy

FROM –L– STA 13+07 TO STA 13+55 RT

DETAIL 1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

Natural Ground
3:1
D
4:1 or Flatter
Fill Slope
Min. D=1.5 Ft.

FROM STA.14+00LT TO STA.15+50 LT

POT STA. 10+00.00

POT STA. 16+47.45

NAD 83/NA 2011

BEGIN TIP PROJECT HL-0013
-L- POT STA. 10+70.00

END TIP PROJECT HL-0013
-L- POT STA. 15+50.00

TOMAHAWK BRANCH

NORTH CHEROKEE AVENUE

NORTH OCONEECHEE AVENUE

NINTH STREET

EXISTING RW

-L- +87.85
26.70' LT
32.00' LT

BEGIN CULVERT
STA. 13+07+/-

END CULVERT
STA. 13+35+/-

-L- +68.60
53.79' LT
26.67' LT
42.89' LT

-L- +19.68
26.67' LT
32.00' LT

-L- +73.90
43.50' LT

-L- +05.87
26.61' LT
41.05' LT

-L- +70.00
13.29' RT
42.00' RT

-L- +50.00
36.50' RT

-L- +17.00
62.00' RT

-L- +73.00
62.00' RT
80.00' RT

-L- +50.00
78.30' RT

-L- +95.00
56.92' RT

-L- +95.00
72.30' RT

-L- +96.18
66.00' RT

-L- +50.00
13.40' RT
50.00' RT

-L- +13.00
13.41' RT
50.00' RT

SPECIAL LATERAL 'V' DITCH
SEE DETAIL 1

CHANNEL CHANGE
SEE DETAIL 2

REMOVE & REPLACE

REMOVE

0401
0402
0403

11+00
12+00
13+00
14+00
15+00
16+00

BM280
2377.7230'
SPIKE 36" PINE

BM1150
2382.3850'
SPIKE BASE 26" WHITE OAK

GPS-1
GPS-2
BL-3
BL-4

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User:ltharpe

8/17/99

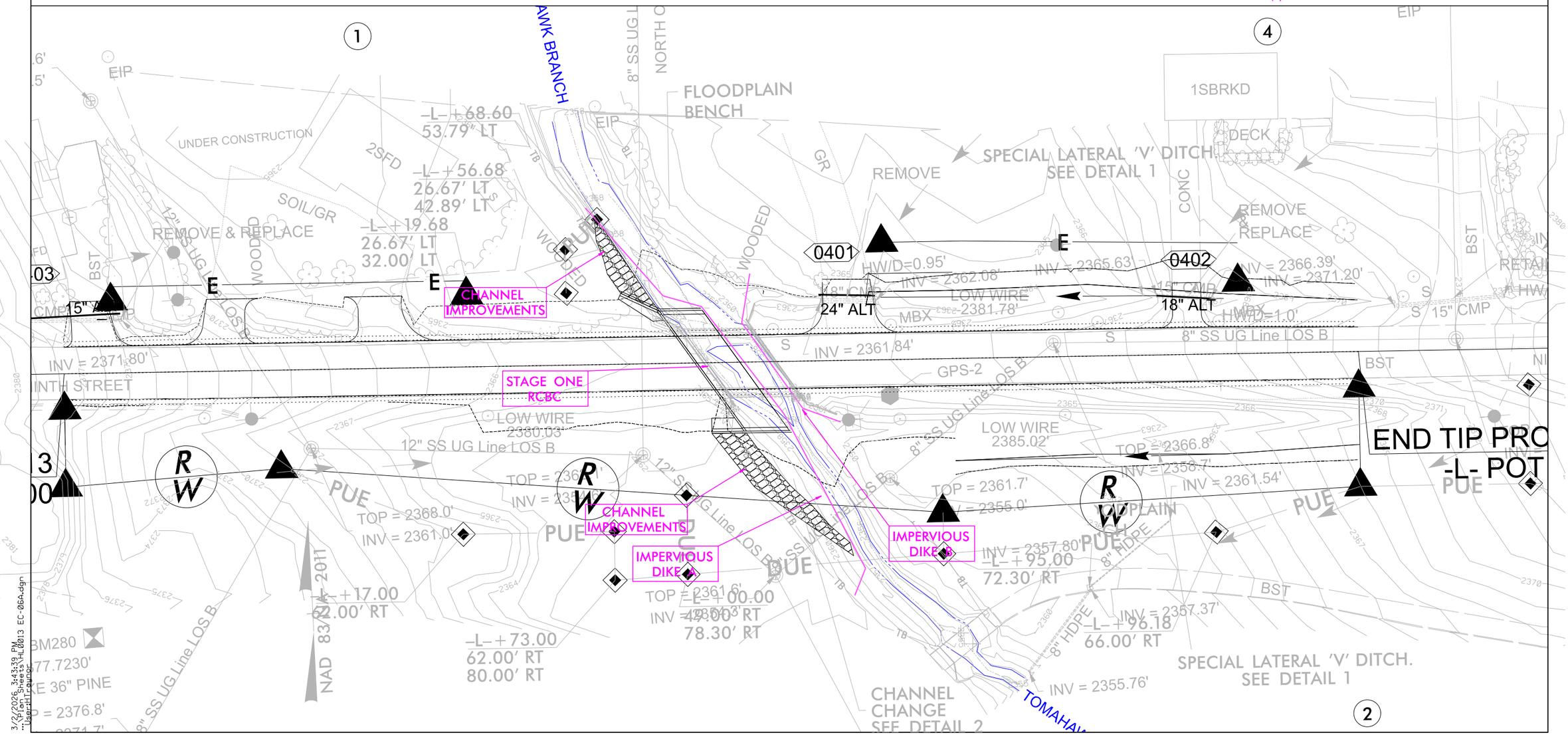
PROJECT REFERENCE NO.	SHEET NO.
HL0013	EC-6A/CONST.06

CULVERT CONSTRUCTION SEQUENCE STA. 13+21 –L–

PHASE 1

1. UTILIZE SPECIAL STILLING BASIN(S) AND PUMP AS NEEDED DURING CULVERT CONSTRUCTION.
2. INSTALL IMPERVIOUS DIKES A AND B, ALLOWING FLOW THROUGH EASTERN HALF OF CHANNEL.
3. REMOVE EXISTING BRIDGE AND ABUTMENTS BEHIND IMPERVIOUS DIKES.
4. CONSTRUCT PROPOSED RCBC PHASE 1 AND PORTION OF CHANNEL IMPROVEMENTS.

NOTES: UTILIZE SPECIAL STILLING BASIN(S) AS NEEDED DURING CULVERT CONSTRUCTION.



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8/17/99

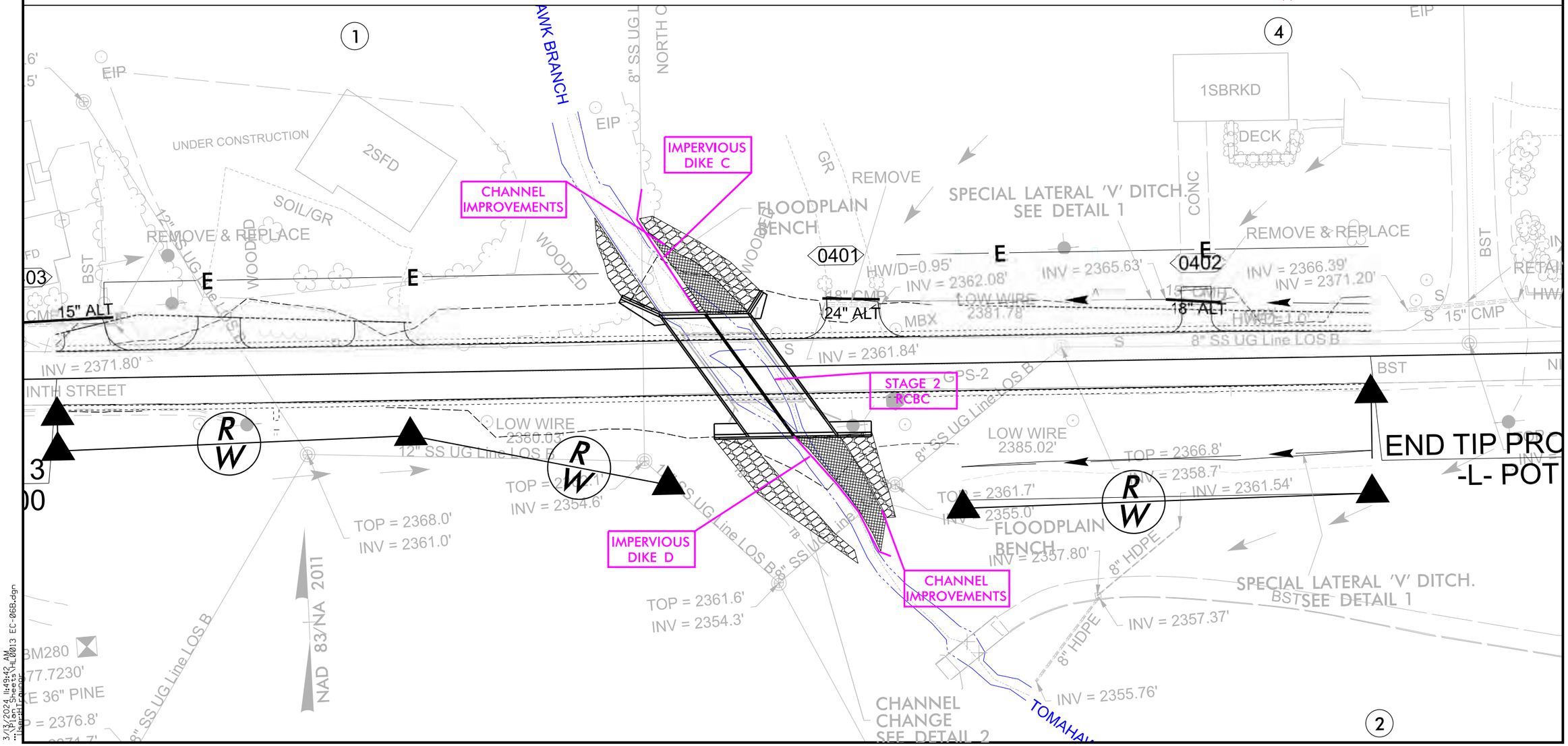
PROJECT REFERENCE NO.	SHEET NO.
HL0013	EC-6B/CONST.06
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CULVERT CONSTRUCTION SEQUENCE STA. 13+21 –L–

PHASE II

1. REMOVE IMPERVIOUS DIKE A AND B.
2. CONSTRUCT IMPERVIOUS DIKE C AND D, DIRECTING FLOW THROUGH NEWLY CONSTRUCTED STAGE ONE RCBC.
3. CONSTRUCT STAGE TWO RCBC AND CHANNEL IMPROVEMENTS.
4. REMOVE IMPERVIOUS DIKES C AND D, ALLOWING FLOW THROUGH NEWLY COMPLETED CULVERT, AND REMOVE ANY REMAINING SPECIAL STILLING BASIN(S).

NOTES: UTILIZE SPECIAL STILLING BASIN(S) AS NEEDED DURING CULVERT CONSTRUCTION.



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8/17/99

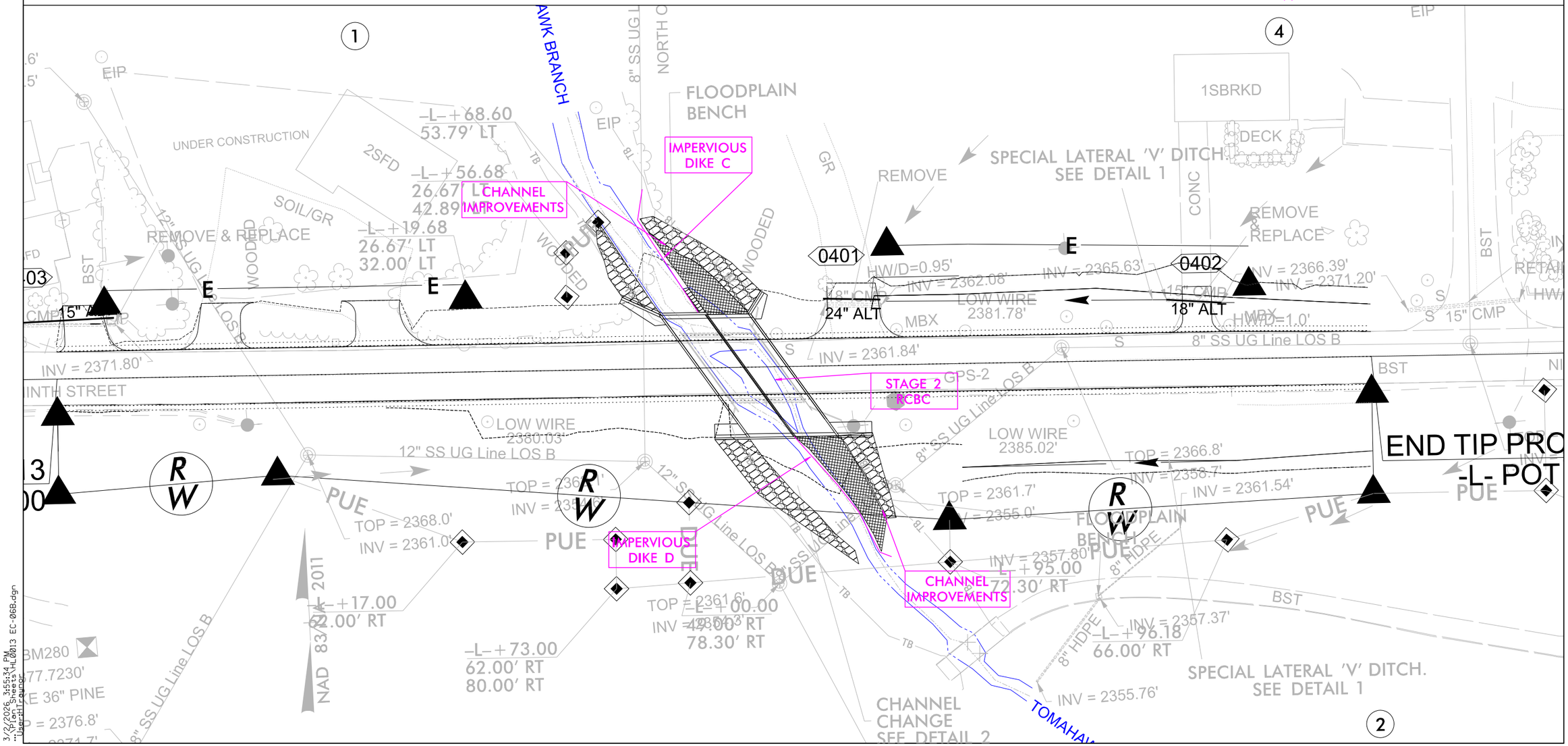
PROJECT REFERENCE NO.	SHEET NO.
HL0013	EC-6B/CONST.06

CULVERT CONSTRUCTION SEQUENCE STA. 13+21 –L–

PHASE II

1. REMOVE IMPERVIOUS DIKE A AND B.
2. CONSTRUCT IMPERVIOUS DIKE C AND D, DIRECTING FLOW THROUGH NEWLY CONSTRUCTED STAGE ONE RCBC.
3. CONSTRUCT STAGE TWO RCBC AND CHANNEL IMPROVEMENTS.
4. REMOVE IMPERVIOUS DIKES C AND D, ALLOWING FLOW THROUGH NEWLY COMPLETED CULVERT, AND REMOVE ANY REMAINING SPECIAL STILLING BASIN(S).

NOTES: UTILIZE SPECIAL STILLING BASIN(S) AS NEEDED DURING CULVERT CONSTRUCTION.



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08/05/24

MSD PROJECT NO. 2023130

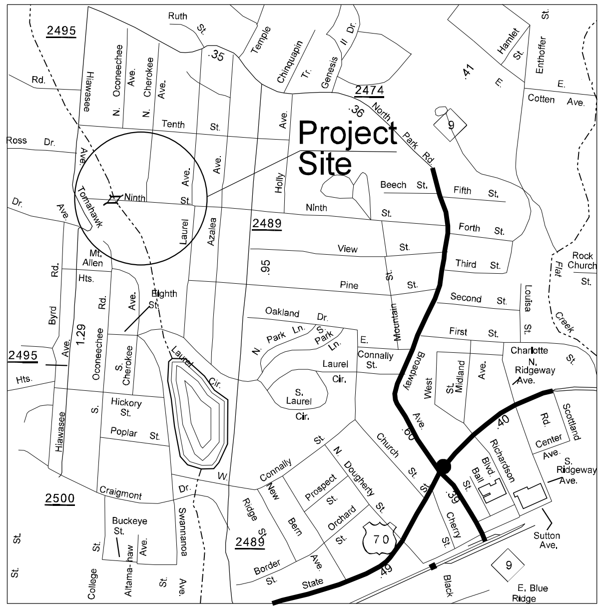
WPFY-25-26-039

UTILITY CONSTRUCTION

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BUNCOMBE COUNTY

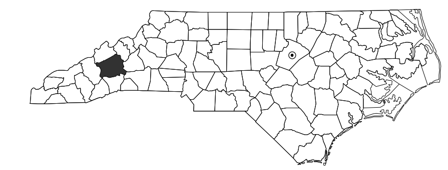
T.I.P. NO.	SHEET NO.
HL-0013	UC-1

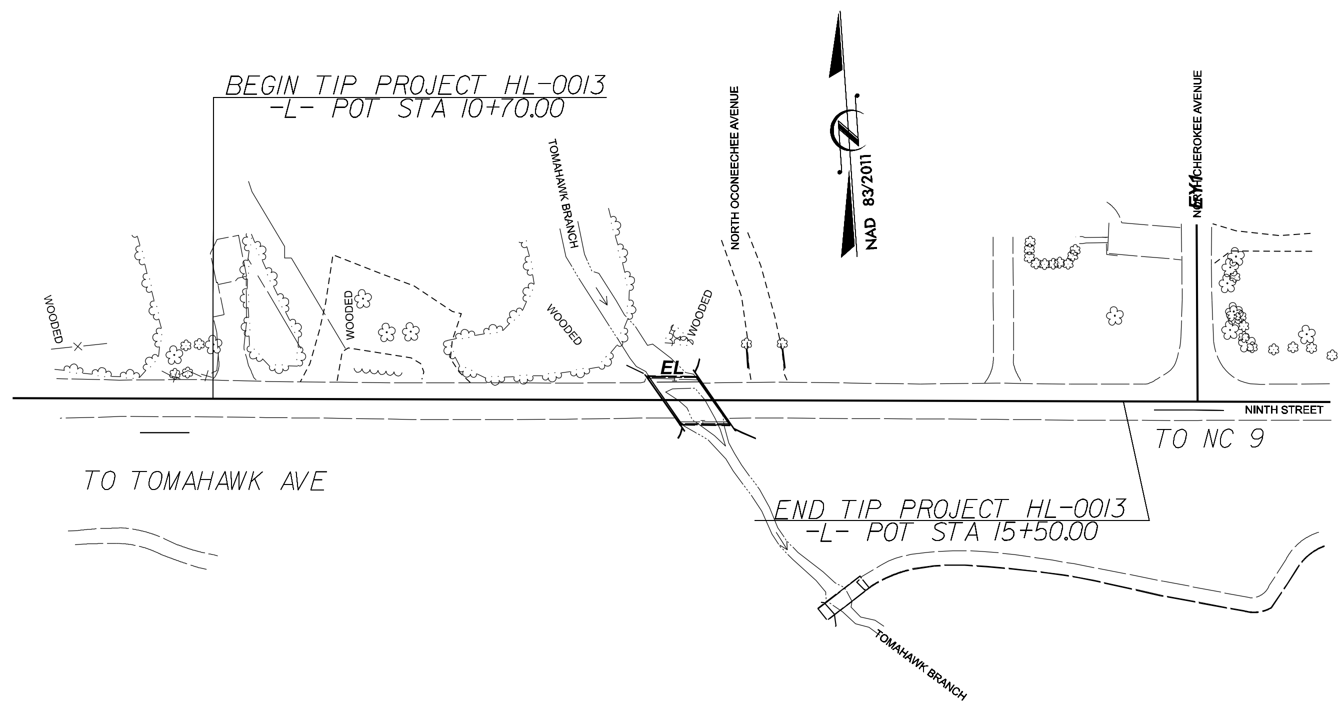


VICINITY MAP NTS

LOCATION: *BRIDGE No. 522 ON NINTH STREET OVER TOMAHAWK CREEK BUNCOMBE*

TYPE OF WORK: *RELOCATION OF WATER, AND SEWER UTILITIES*





PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

40 20 0 40 80
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

5 2.5 0 5 10
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.:	DESCRIPTION:
UC-1	TITLE SHEET
UC-2	SYMBOLOGY SHEET
UC-3	NOTES AND DETAILS
UC-4 - UC-4D	UC PLAN AND PROFILE SHEETS

UTILITY OWNERS WITH CONFLICTS

(A) WATER - CITY OF ASHEVILLE
(B) SEWER - METROPOLITAN SEWERAGE DISTRICT
(C) WATER - TOWN OF BLACK MOUNTAIN

PROJECT LET: MAY 6, 2026

PREPARED IN THE OFFICE OF:

JMT

NICK ASARO, PLS	UTILITY PROJECT MANAGER
MARIE U. PEEDIN, P.E.	PROJECT DESIGN ENGINEER
BEN WILSON, EIT	PROJECT UTILITY DESIGNER

DIVISION OF HIGHWAYS
DIVISION 13
55 Orange Street
Asheville, NC 28801

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

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UC-1

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
BUNCOMBE COUNTY

UTILITY DESIGN UNIT

UTILITY CONSTRUCTION PLANS ONLY

INCOMPLETE PLANS

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Signed by: Marie Uzdavinis
3/31/2026 ... :38 PM EDT

DESIGNED BY:	MRD
DRAWN BY:	BDW
CHECKED BY:	MUP
APPROVED BY:	MUP
REVISED:	

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

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08/05/24

UTILITY CONSTRUCTION

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

- Water Line (Sized as Shown)
- 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 — PSTAW
- RPZ Backflow Preventer — PRPZ
- DCV Backflow Preventer — PRPD
- Relocate RPZ Backflow Preventer — RRPZ
- Relocate DCV Backflow Preventer — RRPD

PROPOSED SEWER SYMBOLS

- Gravity Sewer Line (Sized as Shown)
- Force Main Sewer Line (Sized as Shown)
- Manhole (Sized per Note)
- Sewer Pump Station — PSTASS

PROPOSED MISCELLANOUS UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Telephone Pedestal — TEL PED
- Utility Line by Others (Type as Shown)
- Trenchless Installation
- Encasement by 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
- *Underground Telephone Cable
- *Underground Telephone Conduit
- *Underground Fiber Optics Telephone Cable
- *Underground TV Cable
- *Underground Fiber Optics TV Cable
- *Underground Gas Pipeline
- Aboveground Gas Pipeline — A/G Gas
- *Underground Water Line
- Aboveground Water Line — A/G Water
- *Underground Gravity Sanitary Sewer Line
- Aboveground Gravity Sanitary Sewer Line — A/G Sanitary Sewer
- *Underground SS Forced Main Line
- Underground Unknown Utility Line
- SUE Test Hole
- Water Meter
- Water Valve
- Fire Hydrant
- Sanitary Sewer Cleanout

*For Existing Utilities

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

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NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
BUNCOMBE COUNTY

UTILITY DESIGN UNIT

UTILITY CONSTRUCTION
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DESIGNED BY:	MRD
DRAWN BY:	BDW
CHECKED BY:	MUP
APPROVED BY:	MUP
REVISED:	

UTILITIES ENGINEERING SEC.
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FAX)(919)250-4151

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06/05/24

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 OR LATEST EDITION AND CITY OF ASHEVILLE DESIGN STANDARDS AND SPECIFICATIONS.

2. THE EXISTING UTILITIES BELONG TO THE CITY OF ASHEVILLE, THE METROPOLITAN SEWERAGE DISTRICT, AND THE TOWN OF BLACK MOUNTAIN.

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

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

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

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

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

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

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

PROJECT SPECIFIC NOTES:

1. WATER AND SEWER LINE CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE TOWN OF BLACK MOUNTAIN AND THE METROPOLITAN SEWERAGE DISTRICT STANDARD DETAILS AND THE PROJECT SPECIAL PROVISIONS.

2. THE LOCATION OF EXISTING UTILITIES SHOWN ON THE PLANS IS FOR THE USE OF THE CONTRACTOR IN PROVIDING PROTECTION FOR THE UTILITIES DURING CONSTRUCTION OPERATIONS. NCDOT, DESIGN CONSULTANT AND/OR AGENT SHALL NOT BE HELD RESPONSIBLE FOR THE ACCURACY OF LOCATION, SIZE, DEPTH, OR COMPLETENESS OF THE INFORMATION. THE CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION.

3. THE CITY OF ASHEVILLE, THE TOWN OF BLACK MOUNTAIN, AND THE METROPOLITAN SEWERAGE DISTRICT SHALL BE NOTIFIED A MINIMUM OF 48 HOURS PRIOR TO THE BEGINNING OF WATER AND SEWER WORK.

4. THE CITY OF ASHEVILLE, THE TOWN OF BLACK MOUNTAIN, AND THE METROPOLITAN SEWERAGE DISTRICT MAY HAVE A REPRESENTATIVE ON SITE DURING ALL WATER AND SEWER LINE CONSTRUCTION ACTIVITIES.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMING WITH ALL NCDEQ REQUIREMENTS.

6. SERVICE INTERRUPTION SHALL NOT EXCEED 8 HOURS.

7. ALL NCDEQ AND LOCAL TESTING MUST BE COMPLETED AND APPROVED PRIOR TO CONNECTING THE NEW CONSTRUCTION TO THE EXISTING WATER LINES.

8. CONTRACTOR RESPONSIBLE FOR REMOVING ALL ABANDONED WATER METERS, WATER VALVES AND VALVE BOXES. OLD WATER LINES TO BE PLUGGED AND ABANDONED AFTER VALVE REMOVAL.

9. CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF EXISTING WATER SERVICES. CONTRACTOR SHALL RECONNECT WATER SERVICE WITH A NEW WATER LINE FROM MAIN TO WATER METER. IF WATER SERVICE LINE CROSSES EXISTING ROADWAY, THE INSTALLATION SHALL BE VIA TRENCHLESS CONSTRUCTION METHOD.

10. CONTRACTOR SHALL FIELD VERIFY ANY EXISTING FIRE HYDRANT THAT IS TO BE RELOCATED OR RECONNECTED. IF HYDRANT DOES NOT HAVE NATIONAL STANDARD THREADS (NST) OR IS OLDER THAN 1990 OR IS A US PIPE HYDRANT, THE HYDRANT SHALL BE REPLACED.

11. IN RESIDENTIAL AREAS, METER BOXES SHALL BE LOCATED 3 TO 5 FEET BEYOND THE EDGE OF PAVEMENT OR BACK OF CURB AS APPLICABLE, IN A FLAT AREA, AWAY FROM STEEP SLOPES. WATER METERS SHALL NOT BE LOCATED IN DRAINAGE DITCHES, SIDEWALKS, DRIVEWAYS, PARKING AREAS OR OTHER AREAS WHERE THEY ARE SUSCEPTIBLE TO VEHICULAR TRAFFIC. WHERE ADEQUATE SPACE IS NOT AVAILABLE BETWEEN THE EDGE OF PAVEMENT AND DRAINAGE DITCHES, THE METER BOX SHALL BE LOCATED BEYOND THE DRAINAGE DITCH AT THE FIRST POSSIBLE LOCATION; MAXIMUM 3 FEET BEYOND THE DITCH.

12. IF ANY WATERLINE IS ASBESTOS CEMENT PIPE, USE SPECIAL HANDLING AND DISPOSAL. ALL FEDERAL AND STATE REQUIREMENTS MUST BE FOLLOWED.

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NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
BUNCOMBE COUNTY

UTILITY DESIGN UNIT

UTILITY CONSTRUCTION PLANS ONLY

INCOMPLETE PLANS

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CHECKED BY:	MUP
APPROVED BY:	MUP
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UTILITY CONSTRUCTION

WATER LINE CONSTRUCTION NOTES:

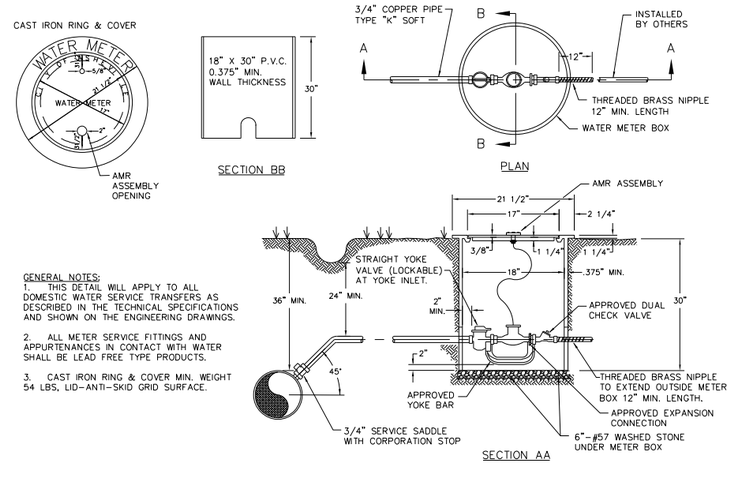
1. THE WATER LINE EXTENSION WORK SHALL BE PERFORMED BY A LICENSED NORTH CAROLINA UTILITY CONTRACTOR.
2. CONTRACTOR SHALL PROTECT ALL UTILITIES AND OTHER IMPROVEMENTS SHOWN OR NOT SHOWN ON THESE PLANS. CONTRACTOR SHALL ASSUME ALL RESPONSIBILITY FOR REPAIRS OF UTILITIES AND IMPROVEMENTS DAMAGED DURING CONSTRUCTION AND SHALL MAINTAIN SUFFICIENT PROTECTION TO ALL UTILITIES REQUIRED TO PROTECT THEM FROM DAMAGE AND TO PROTECT THE PUBLIC DURING CONSTRUCTION. THE LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY ALL UNDERGROUND UTILITIES WITH NORTH CAROLINA ONE CALL PRIOR TO CONSTRUCTION. 811 OR 1-800-632-4949.
3. CONTRACTOR SHALL TAKE NECESSARY STEPS TO KEEP THE UTILITY IN SERVICE AT ALL TIMES DURING CONSTRUCTION.
4. THE WATER LINE COVER IS TO BE 3 FEET DEEP (MINIMUM) EXCEPT AT UTILITY CROSSINGS WHERE THERE ARE CONFLICTS. IN THIS CASE WATERLINE COVER IS NOT TO EXCEED 5 FEET (MAXIMUM) AND AS APPROVED BY THE WATER INSPECTOR.
5. CONTRACTOR SHALL VERIFY EXISTING WATER LINE LOCATION FOR CONNECTION.
6. INSTALLATIONS OF THE WATER LINE AND SUPPORTING APPURTENANCES SHALL BE IN ACCORDANCE WITH TITLE 15A SUBCHAPTER 18C OF THE NORTH CAROLINA ADMINISTRATIVE CODE AND WITH THE TECHNICAL SPECIFICATIONS FOR THIS PROJECT. APPROVAL BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY - PUBLIC WATER SUPPLY SECTION OR THE CITY OF ASHEVILLE OR THE TOWN OF BLACK MOUNTAIN MUST BE OBTAINED PRIOR TO CONSTRUCTION.
7. ALL WATER LINES, HYDRANTS, VALVES, FDC & APPURTENANCES ARE TO BE PER THE MOST STRICT STANDARD BETWEEN THE CITY OF ASHEVILLE AND THE TOWN OF BLACK MOUNTAIN SPECIFICATIONS, STANDARDS AND DETAILS. MATERIALS TO BE APPROVED BY OWNER AND ENGINEER. ALL BRASS FITTINGS ARE TO BE LEAD FREE.
8. ALL WATER LINE JOINTS AND FITTINGS USE RESTRAINT DEVICES PER STANDARDS, SPECIFICATIONS AND DETAILS. ALL FITTINGS TO BE RESTRAINED. RESTRAINED JOINTS BY AN APPROVED PIPE MANUFACTURER ARE TO BE USED FOR ALL PUBLIC WATER LINES WHERE THRUST RESTRAINING IS REQUIRED; HOWEVER, THRUST BLOCKS ARE PERMITTED WHERE CONNECTIONS ARE MADE TO EXISTING WATER LINES OR WHERE THE USE OF MECHANICAL RESTRAINT IS NOT FEASIBLE.
9. PER SECTION .0300, SUBCHAPTER 18C, CHAPTER 18 OF THE NCAC, AN "AUTHORIZATION TO CONSTRUCT" MUST BE OBTAINED PRIOR TO ANY CONSTRUCTION. THIS AUTHORIZATION WILL BE GRANTED UPON FINAL PLAN APPROVAL AND ISSUED AT THE REQUIRED PRE-CONSTRUCTION MEETING FOR THIS PROJECT.
10. WATER MAINS SHALL HAVE A MINIMUM VERTICAL SEPARATION OF 12" WITH ALL STORM DRAINAGE WHEN CROSSING.
11. RELATION OF WATER MAINS TO OTHER UTILITIES:

    WATER MAINS SHOULD ONLY CROSS SANITARY SEWER MAINS AT AN APPROXIMATE 90-DEGREE ANGLE.

    STORM SEWER: WATER MAINS AND STORM SEWER MAINS SHALL HAVE A MINIMUM VERTICAL SEPARATION OF 12-INCHES WHEN HORIZONTAL SEPARATION IS LESS THAN 3-FEET UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.

    NATURAL GAS MAINS, CABLES AND OTHER UTILITIES: OTHER UTILITIES SHALL HAVE A MINIMUM HORIZONTAL CLEARANCE OF 3-FEET AND VERTICAL CLEARANCE OF 12-INCHES, TO PERMIT PROPER MAINTENANCE OF THE WATER MAIN.
12. WATER METERS MUST BE PLACED IN FRONT OF THE BUILDING WHICH THEY SERVE AND MUST BE LOCATED IN RELATIVELY FLAT AREAS, NOT IN STEEP BANKS OR SLOPES. ALSO THE WATER METER BOXES SHALL BE CLEARLY LABELED TO DESCRIBE THE ADDRESS OF THE UNIT OR BUILDING SERVED.
13. TESTING, INSPECTION AND DISINFECTION OF WATER MAINS ARE TO COMPLY WITH THE OWNER'S MANUAL.
14. LOCATION OF FIRE HYDRANTS, AIR RELEASE VALVES, WATER METERS, PRV STATION VALVES, ROAD CROSSINGS AND OTHER APPURTENANCES ARE APPROXIMATE. LOCATION IS TO BE FIELD VERIFIED BY CITY OR TOWN AND ENGINEER.
15. ALL WATER LINES ARE TO BE INSTALLED IN ACCORDANCE WITH THE TOWN OF BLACK MOUTAIN AND CITY OF ASHEVILLE WATER RESOURCES DESIGN & CONSTRUCTION MANUAL.
16. ALL FIRE HYDRANTS, VAULTS, BACKFLOWS AND WATER METERS ARE TO BE LOCATED IN RELATIVELY FLAT AREAS AND OUTSIDE PAVEMENT OR DRIVEWAYS.
17. TREES ARE TO BE 10 FEET MINIMUM FROM PROPOSED WATER LINES.

PROJECT SPECIFIC DETAILS



GENERAL NOTES:
1. THIS DETAIL WILL APPLY TO ALL DOMESTIC WATER SERVICE TRANSFERS AS DESCRIBED IN THE TECHNICAL SPECIFICATIONS AND SHOWN ON THE ENGINEERING DRAWINGS.
2. ALL METER SERVICE FITTINGS AND APPURTENANCES IN CONTACT WITH WATER SHALL BE LEAD FREE TYPE PRODUCTS.
3. CAST IRON RING & COVER MIN. WEIGHT 54 LBS, LID-ANTI-SKID GRID SURFACE.

5/8" - 3/4" WATER METER BOX

NOT TO SCALE

GENERAL NOTES:
1. BALL VALVE ON INLET.
2. DUAL CHECK ON OUTLET
3. BY-PASS INCLUDES A BALL VALVE WITH PADLOCK WINGS.
4. BRACE PIPE EYELETS.
5. DIFFERENT FLANGE SPACING MAY BE SPECIFIED
   17¼" FOR 2" METER SETTERS
   13¾" FOR 1½" METER SETTERS
6. BE SURE THAT COPPER SETTER IS INSTALLED IN THE CORRECT POSITION IN RELATION TO WATER FLOW.
7. SEPARATION VARIES BETWEEN 1½" AND 2" METER SETTERS.

NOTES: ANGLE BALL VALVES SHOULD NOT BE USED ON THE OUTLET SIDE AS A CUSTOMER SHUT OFF. FLANGED ANGLE INVERTED KEY VALVE SHOULD BE USED FOR THIS PURPOSE. MUST BE SET BEFORE CONNECTION TO BRASS NIPPLE.

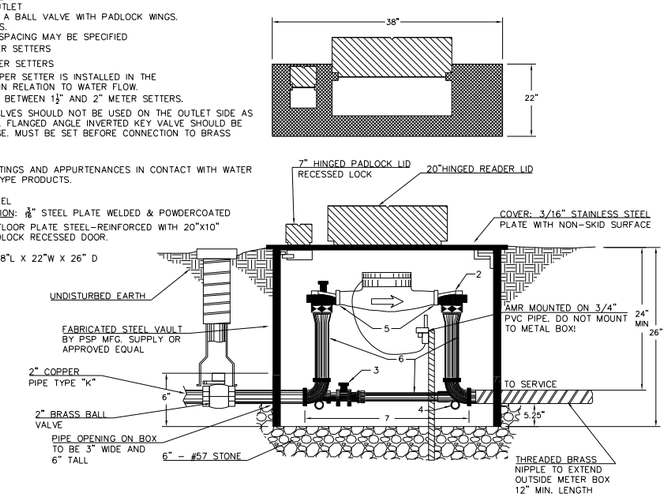
ALL METER SERVICE FITTINGS AND APPURTENANCES IN CONTACT WITH WATER SHALL BE LEAD FREE TYPE PRODUCTS.

MATERIAL: COPPER-STEEL

METHOD OF CONSTRUCTION: ¼" STEEL PLATE WELDED & POWDERCOATED

LID: 3/16" STAINLESS FLOOR PLATE STEEL-REINFORCED WITH 20"x10" READER DOOR AND PADLOCK RECESSED DOOR.

WEIGHT: 200lbs SIZE: 38"L X 22"W X 26" D



POSITIVE DISPLACEMENT
1 1/2" - 2" METER & METER VAULT

NOT TO SCALE

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SEAL 032115 ENGINEER
3/6/2025 12:22 AM EST

DESIGNED BY:	MRD
DRAWN BY:	BDW
CHECKED BY:	MUP
APPROVED BY:	MUP
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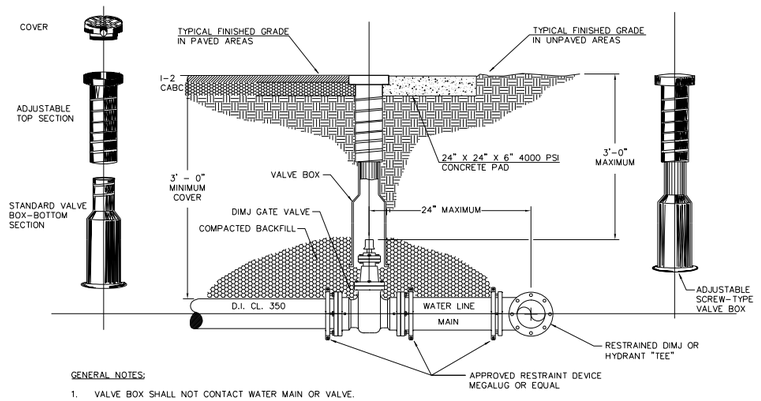
PROJECT SPECIFIC DETAILS

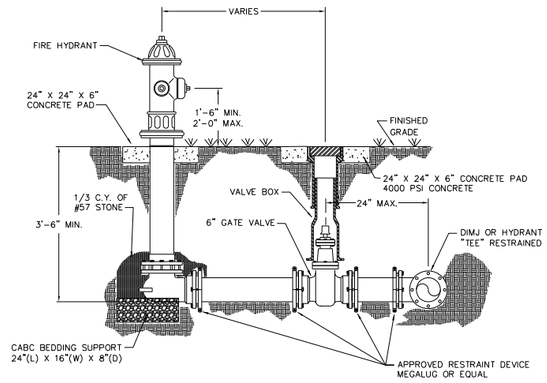


GENERAL NOTES:

1. VALVE BOX SHALL NOT CONTACT WATER MAIN OR VALVE.
2. VALVE PAD REQUIREMENTS SHALL NOT BE APPLICABLE FOR IMPROVED PAVED SURFACES.
3. VALVE BOX ADJUSTMENT MUST BE DONE BY ADJUSTING/RAISING THE TOP SECTION OF THE EXISTING ADJUSTABLE SCREW-TYPE VALVE BOX TO GRADE OR BY INSTALLING A NEW VALVE BOX TOP SECTION. THE USE OF PAVING RINGS OR ADJUSTING C.I. SLEEVES IS NOT ALLOWED.

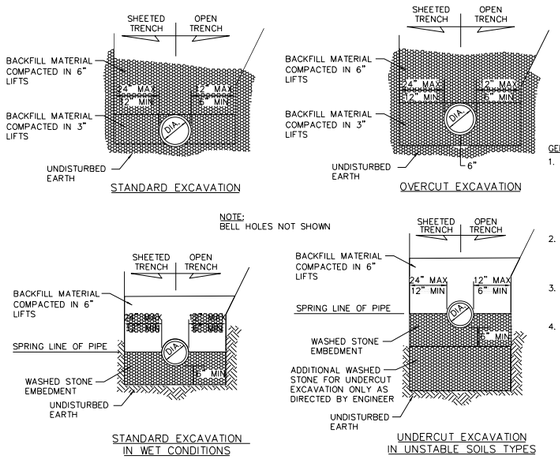
TYPICAL VALVE & VALVE BOX INSTALLATION/ADJUSTMENT

NOT TO SCALE



FIRE HYDRANT INSTALLATION

NOT TO SCALE

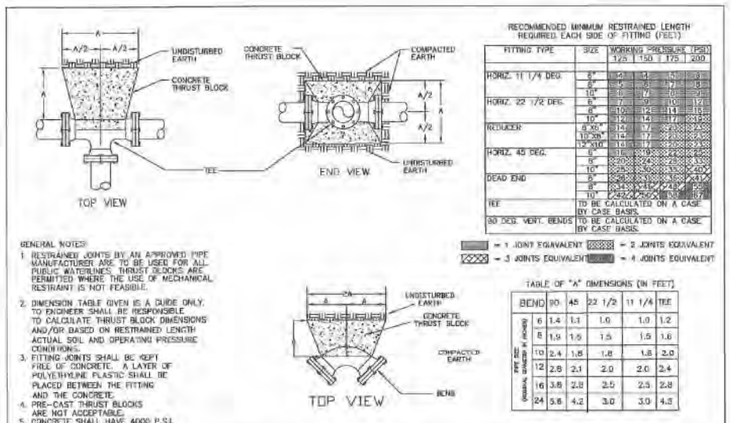


GENERAL NOTES:

1. CONSTRUCTION OF TRENCHES SHALL BE IN ACCORDANCE WITH THE LATEST OSHA REGULATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE REGULATIONS.
2. NO BOULDERS OR STONES IN EXCESS OF 4" IN SIZE SHALL BE USED AS PART OF THE INITIAL BACKFILL.
3. PIPE BEDDING MATERIAL SHALL BE # 57 WASHED STONE.
4. SELECT BACKFILL MATERIAL SHALL BE CLASS I OR II AS PER NCDOT STANDARD SPECIFICATIONS.

TYPICAL TRENCH DETAIL

NOT TO SCALE



RECOMMENDED MINIMUM RESTRAINED LENGTH REQUIRED EACH SIDE OF FITTING (FEET)

FITTING TYPE	SIZE	WORKING PRESSURE (PSI) 125	150	175	200
HORIZ. 11 1/4 DEG.	4"	5	5	5	5
	6"	7	7	7	7
	10"	10	10	10	10
HORIZ. 22 1/2 DEG.	4"	10	10	10	10
	6"	15	15	15	15
	10"	24	24	24	24
REDUCER	6"X4"	12	14	16	18
	10"X6"	24	27	30	33
	12"X10"	31	35	39	43
HORIZ. 45 DEG.	4"	11	13	15	17
	6"	16	19	22	25
	10"	26	31	36	41
DEAD END	4"	20	24	28	32
	6"	30	36	42	48
	10"	49	59	69	79
TEE	TO BE CALCULATED ON A CASE BY CASE BASIS.				
90 DEG. VERT. BENDS	TO BE CALCULATED ON A CASE BY CASE BASIS.				

= 1 JOINT EQUIVALENT = 2 JOINTS EQUIVALENT
= 3 JOINTS EQUIVALENT = 4 JOINTS EQUIVALENT

TABLE OF "A" DIMENSIONS (IN FEET)

PIPE SIZE (DIAMETER IN INCHES)	BEND	90	45	22 1/2	11 1/4	TEE
4		1.4	1.1	1.0	1.0	1.2
6		1.9	1.5	1.5	1.5	1.6
10		2.4	1.8	1.8	1.8	2.0
12		2.9	2.1	2.0	2.0	2.4
16		3.8	2.8	2.5	2.5	2.8
24		5.8	4.2	3.0	3.0	4.3

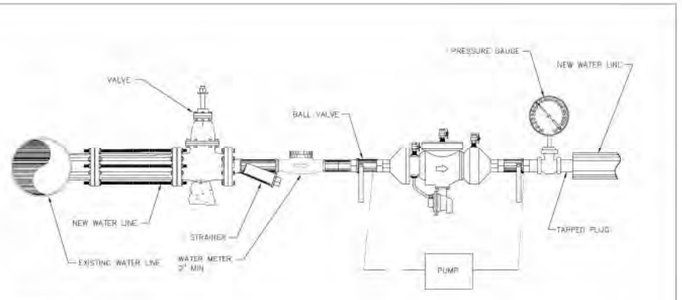
GENERAL NOTES:

1. RESTRAINED JOINTS BY AN APPROVED PIPE MANUFACTURER ARE TO BE USED FOR ALL PUBLIC WATERLINES. THRUST BLOCKS ARE PERMITTED WHERE THE USE OF MECHANICAL RESTRAINT IS NOT FEASIBLE.
2. DIMENSION TABLE GIVEN IS A GUIDE ONLY. TO ENGINEER SHALL BE RESPONSIBLE TO CALCULATE THRUST BLOCK DIMENSIONS AND/OR BASED ON RESTRAINED LENGTH ACTUAL SOIL AND OPERATING PRESSURE CONDITIONS.
3. FITTING JOINTS SHALL BE KEPT FREE OF CONCRETE. A LAYER OF POLYETHYLENE PLASTIC SHALL BE PLACED BETWEEN THE FITTING AND THE CONCRETE.
4. PRE-CAST THRUST BLOCKS ARE NOT ACCEPTABLE.
5. CONCRETE SHALL HAVE 4000 P.S.I. COMPRESSIVE STRENGTH.

City of Asheville, NC
WATER ENGINEERING DIVISION

THRUST BLOCK FOR FITTINGS & RESTRAINING REQUIREMENTS

REVISIONS DATE	DESCRIPTION	STD. NO.
6/2018	REVISED	W.22



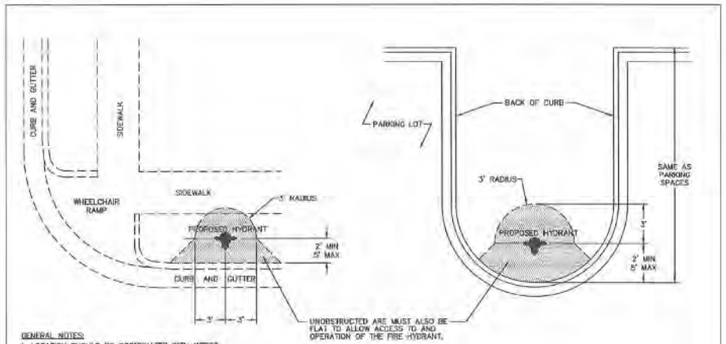
GENERAL NOTES:

1. PRIOR TO CONNECTING TO THE EXISTING WATERLINE, THE NEW WATER LINE WILL BE PRESSURE TESTED, DISINFECTED AND A CLEAR WATER SAMPLE OBTAINED.
2. ALL WATER FOR FILLING AND FLUSHING OF NEW WATER LINE WILL BE DRAWN THROUGH THE REDUCED PRESSURE ZONE (RPZ) ASSEMBLY.
3. THE COSTS FOR PROVIDING REDUCED PRESSURE ZONE (RPZ) ASSEMBLY AND SLEEVE NECESSARY FOR FINAL CONNECTION WILL BE INCIDENTAL TO THE WATER LINE INSTALLATION.
4. THE BOTTOM OF THE REDUCED PRESSURE ZONE (RPZ) ASSEMBLY TO BE INSTALLED MINIMUM 12" FROM THE GROUND. ALL DISCHARGE MUST DRAIN AWAY FROM ASSEMBLY. CONTRACTOR IS RESPONSIBLE FOR PROTECTING REDUCED PRESSURE ZONE ASSEMBLY FROM FREEZING.
5. A PRV MUST BE INSTALLED BEFORE THE REDUCED PRESSURE ZONE (RPZ) ASSEMBLY IF THE PRESSURE IS GREATER THAN 175 PSI.

City of Asheville, NC
WATER ENGINEERING DIVISION

NEW WATER LINE PRESSURE TEST BACKFLOW PREVENTION ASSEMBLY

REVISIONS DATE	DESCRIPTION	STD. NO.
1/2023	REVISED DETAIL FROM 6.21	W.28



GENERAL NOTES:

1. LOCATION SHOULD BE COORDINATED WITH NCDOT ALONG STATE MAINTAINED ROADWAYS.
2. OBSTRUCTION TREE AREA SHALL APPLY TO ALL LOCATIONS FOR FIRE HYDRANT INSTALLATION.
3. HYDRANT LOCATION SHALL NOT INTERFERE WITH THE REQUIREMENTS OF THE NORTH CAROLINA BUILDING CODE.
4. CONCRETE BOLLARDS WILL BE REQUIRED FOR INSTALLATION WITHIN PARKING AREAS

City of Asheville, NC
WATER ENGINEERING DIVISION

STANDARD HYDRANT LOCATION

REVISIONS DATE	DESCRIPTION	STD. NO.
6/2018	REVISED	W.15

REVISIONS

HL-0013
UC-3B

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

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UTILITY CONSTRUCTION PLANS ONLY

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35141 RYAN D. PHILLIPS
3/6/2023 10:22 AM EST

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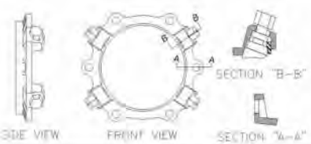
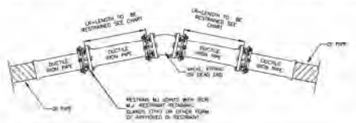
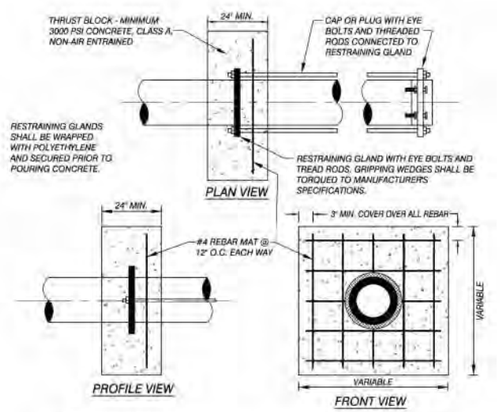


IRON RETAINING GLAND M.J. RESTRAINT			
NOMINAL PIPE SIZE	WEDGES QUANTITY	BOLTS QUANTITY	PRESS RATING
6"	3	6	350
8"	4	6	350
12"	8	8	350
16"	12	12	350

	Bend Angle									Reducers	
	Valves, Dead Ends, Tees	11.25 Horizontal and Vertical Up Bends	11.25 Vertical Down Bends	22.5 Horizontal and Vertical Up Bends	22.5 Vertical Down Bends	45 Horizontal and Vertical Up Bends	45 Vertical Down Bends	90 Horizontal and Vertical Up Bends	90 Vertical Down Bends	Large Diameter X Small Diameter	Lare Diameter Slid	Small Diameter Side
Pipe Size												
2"	44	2	6	5	11	10	23	25	56			
4"	68	3	7	5	14	10	28	25	68			
6"	98	4	10	7	19	15	40	34	96			
8"	124	5	13	9	25	19	52	44	124 6"X8"		52	69
10"	150	6	15	11	30	22	62	53	150			
12"	175	7	18	13	35	26	72	62	175 12"X8"		93	69
16"	224	8	23	16	45	33	93	78	224 16"X16"		164	333



DATE: 08/27/2025	
SCALE: NOT TO SCALE	SMALL DIAMETER DI PIPE RESTRAINT DETAIL



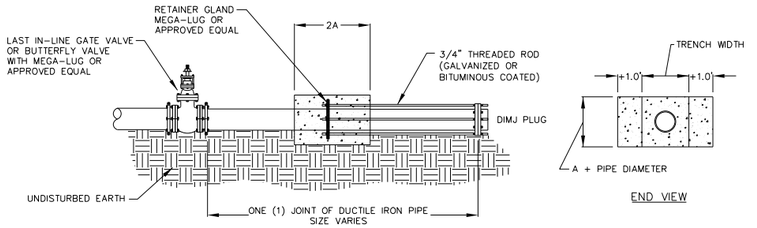
NOTES:
1. THRUST BLOCK SHALL BE ORIENTED APPROXIMATELY CENTER OF PIPE JOINT.
2. "OPTIONAL" A WELDED COLLAR (INSTALLED BY PIPE MANUFACTURER) MAY BE USED IN LIEU OF RESTRAINING GLANDS. ALL OTHER DESIGN REQUIREMENTS SHALL APPLY AS SHOWN.
3. FOR PIPES LARGER THAN 18" DIAMETER, THE DEADMAN THRUST RESTRAINT WITH BLOCKING MUST BE DESIGNED AND SEALED BY A N.C. PROFESSIONAL ENGINEER.
4. ANY PROPOSED MODIFICATIONS TO THIS STANDARD BASED ON THE FIELD CONDITIONS MUST BE PRE-APPROVED BY THE CITY AND/OR THE ENGINEER OF RECORD.
5. QUANTITIES SHOWN BELOW ARE TO THE NEAREST QUARTER YARD AND ARE BASED ON MINIMUM MASS WEIGHT REQUIREMENTS OF THE TEST PRESSURES SHOWN.

MINIMUM CUBIC YARDS OF CONCRETE REQUIRED			
PIPE DIAMETER	150 PSI TEST PRES.	200 PSI TEST PRES.	250 PSI TEST PRES.
6"	0.75	1.0	1.25
8"	1.5	2.0	2.25
10"	2.0	3.0	3.5
12"	3.0	5.0	5.0
16"	5.5	7.25	9.0

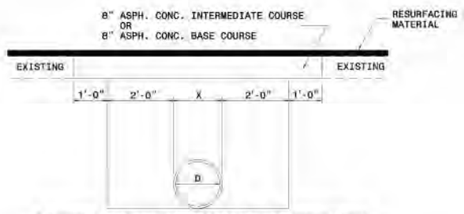
DEADMAN
NOT TO SCALE

GENERAL NOTES:
1. ALL FITTINGS MUST BE RESTRAINED AS SPECIFIED IN THE STANDARD SPECIFICATIONS AND DETAILS MANUAL.
2. DIMENSION TABLE GIVEN IS A GUIDE ONLY. ENGINEER SHALL BE RESPONSIBLE TO CALCULATE THRUST BLOCK DIMENSIONS BASED ON ACTUAL SOIL AND OPERATING.
3. FITTING JOINTS SHALL BE KEPT FREE OF CONCRETE. A LAYER OF POLYETHYLENE PLASTIC SHALL BE PLACED BETWEEN THE FITTING AND THE CONCRETE.
4. CONTRACTOR HAS THE OPTION TO RESTRAIN PIPE JOINTS IN LIEU OF CONCRETE DEADMAN & RODDING.

	PIPE SIZE (NOMINAL DIAMETER IN INCHES)					
	6	8	10	12	16	24
"A" DIMEN. IN FEET	1.2	1.6	2.0	2.4	2.8	4.5

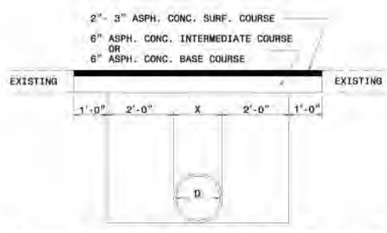


DEADMAN/END OF LINE PLUG
NOT TO SCALE



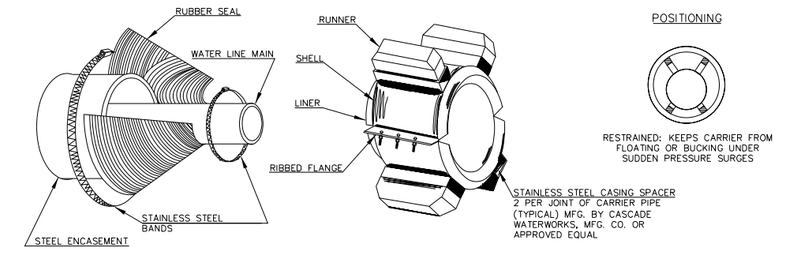
PAVEMENT REPAIRS ON ROADS TO BE RESURFACED (PIPE IS PLACED UNDER EXISTING PAVEMENT)

D	X	W
12"	1'-4"	7'-4"
15"	1'-7"	7'-7"
18"	1'-10"	7'-10"
24"	2'-6"	8'-6"
30"	3'-1"	9'-1"
36"	3'-8"	9'-8"
42"	4'-5"	10'-5"
48"	5'-0"	11'-0"



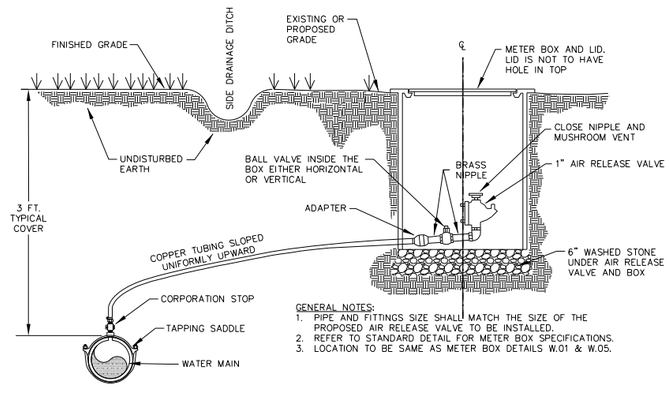
PAVEMENT REPAIRS ON ROADS NOT TO BE RESURFACED (PIPE IS TO BE PLACED UNDER EXISTING PAVEMENT)

ROADWAY REPAIR
NOT TO SCALE



GENERAL NOTES:
1. RESTRAINED POSITIONING TO BE USED AT ALL TIMES.
2. CARRIER PIPE JOINTS SHALL BE RESTRAINED.
3. CONTRACTOR MAY USE BRICK MASONRY AND NON-SHRINK GROUT TO SEAL ENCASEMENT ENDS IN LIEU OF RUBBER SEAL. A 3/4" WEEPHOLE MUST BE PROVIDED AT LOW POINT OF CASING.

CARRIER PIPE IN STEEL ENCASEMENT
NOT TO SCALE



GENERAL NOTES:
1. PIPE AND FITTINGS SIZE SHALL MATCH THE SIZE OF THE PROPOSED AIR RELEASE VALVE TO BE INSTALLED.
2. REFER TO STANDARD DETAIL FOR METER BOX SPECIFICATIONS.
3. LOCATION TO BE SAME AS METER BOX DETAILS W.01 & W.05.

STANDARD AIR RELEASE VALVE INSTALLATION
NOT TO SCALE

REVISIONS

HL-0013
UC-3C

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
BUNCOMBE COUNTY

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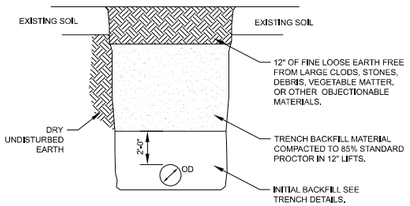
06/05/24

METROPOLITAN SEWERAGE DISTRICT PROJECT SPECIFIC DETAILS

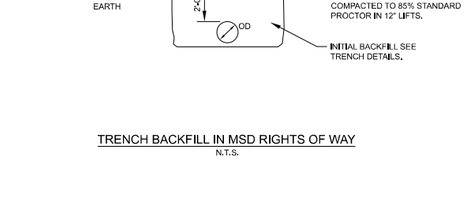


TRENCH BACKFILL IN MSD RIGHTS OF WAY
N.T.S.

STANDARD DETAIL	
Metropolitan Sewerage District of Buncombe County, North Carolina	
TRENCH BACKFILL	
DATE APPROVED: MARCH 2017	1.16 - 01

STANDARD RING AND COVER
N.T.S

FRAME SET IN NON-ROADWAY LOCATION
N.T.S



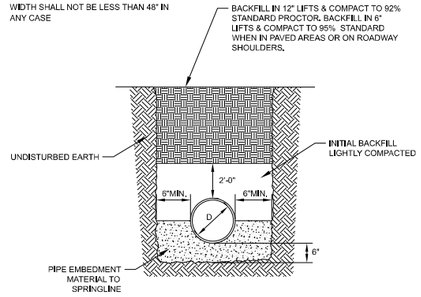
FRAME SET IN ROADWAY LOCATION
N.T.S

NOTE:

1. WHERE M.H. IS IN ROAD SHOULDER AND ROAD DOES NOT HAVE CURB AND GUTTER, DO NOT USE ANCHOR BOLTS IN FRAME.
2. "MSD OF BUNCOMBE COUNTY" TO APPEAR ON COVERS ONLY WHEN THE SEWER SYSTEM IS TO BE MAINTAINED BY MSD

STANDARD DETAIL	
Metropolitan Sewerage District of Buncombe County, North Carolina	
STANDARD MANHOLE FRAME & COVER	
DATE APPROVED: MARCH 2017	2.11 - 08.1

TRENCH WIDTH
THE MINIMUM TRENCH WIDTH SHALL BE THE NOMINAL PIPE DIAMETER PLUS 24", EXCEPT THAT THE MINIMUM TRENCH WIDTH SHALL NOT BE LESS THAN 48" IN ANY CASE

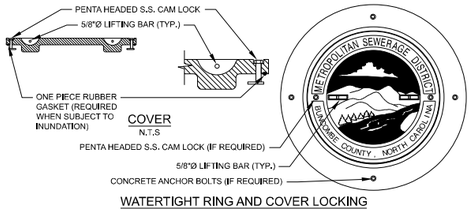


TRENCH FOR PVC PIPE (15" DIA. AND LESS)
N.T.S.

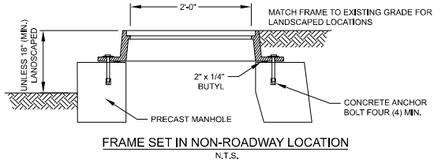
NOTES:

1. WALL THICKNESS SHALL BE SDR 35.
2. PVC PIPES REQUIRE #57 WASHED STONE PIPE EMBEDMENT MATERIALS.
3. THIS DETAIL IS VALID FOR PVC SEWER PIPE INSTALLED AT DEPTHS OF UP TO 20 FEET.
4. PVC PIPE NOT ALLOWED WITH LESS THAN 3'-0" COVER.
5. NO BOULDERS OR STONES WILL BE USED IN INITIAL BACKFILL.
6. WHEN TRENCH IS SUBJECT TO INUNDATION, EMBEDMENT MATERIALS MUST EXTEND TO TOP OF PIPE.

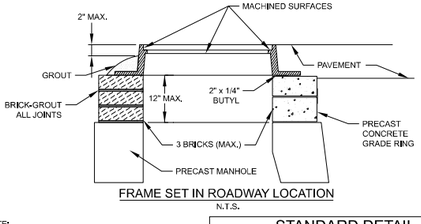
STANDARD DETAIL	
Metropolitan Sewerage District of Buncombe County, North Carolina	
TRENCH FOR PVC PIPE	
DATE APPROVED: MARCH 2017	2.04 - 01



WATERTIGHT RING AND COVER LOCKING
N.T.S.



FRAME SET IN NON-ROADWAY LOCATION
N.T.S.

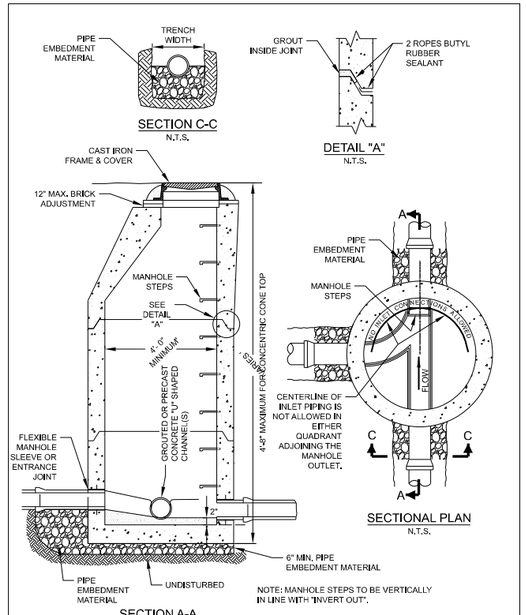


FRAME SET IN ROADWAY LOCATION
N.T.S.

NOTE:

1. WATERTIGHT FRAME & COVER REQUIRED IN FLOODPLAIN OR WHEN SPECIFIED ON PLANS
2. "MSD OF BUNCOMBE COUNTY" TO APPEAR ON COVERS ONLY WHEN THE SEWER SYSTEM IS TO BE MAINTAINED BY MSD

STANDARD DETAIL	
Metropolitan Sewerage District of Buncombe County, North Carolina	
WATERTIGHT MANHOLE FRAME & COVER	
DATE APPROVED: MARCH 2017	2.11 - 08.2



MANHOLE NOTES:

1. FOR MANHOLES LARGER THAN 4 FT. DIA., MAINTAIN FULL MANHOLE DIA. TO 6 FT. ABOVE INVERT BENCH.
2. FOR 5 FT. AND 6 FT. DIA. MANHOLES, USE A TRANSITION CONE TO REDUCE TO 4 FT. DIA. FOR 7 FT. TO 10 FT. DIA. MANHOLES, USE A TRANSITION TOP TO REDUCE TO 4 FT. DIA.

STANDARD DETAIL	
Metropolitan Sewerage District of Buncombe County, North Carolina	
STANDARD MANHOLE	
DATE APPROVED: MARCH 2017	2.11 - 01

HL-0013
UC-3D

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
BUNCOMBE COUNTY

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REVISIONS

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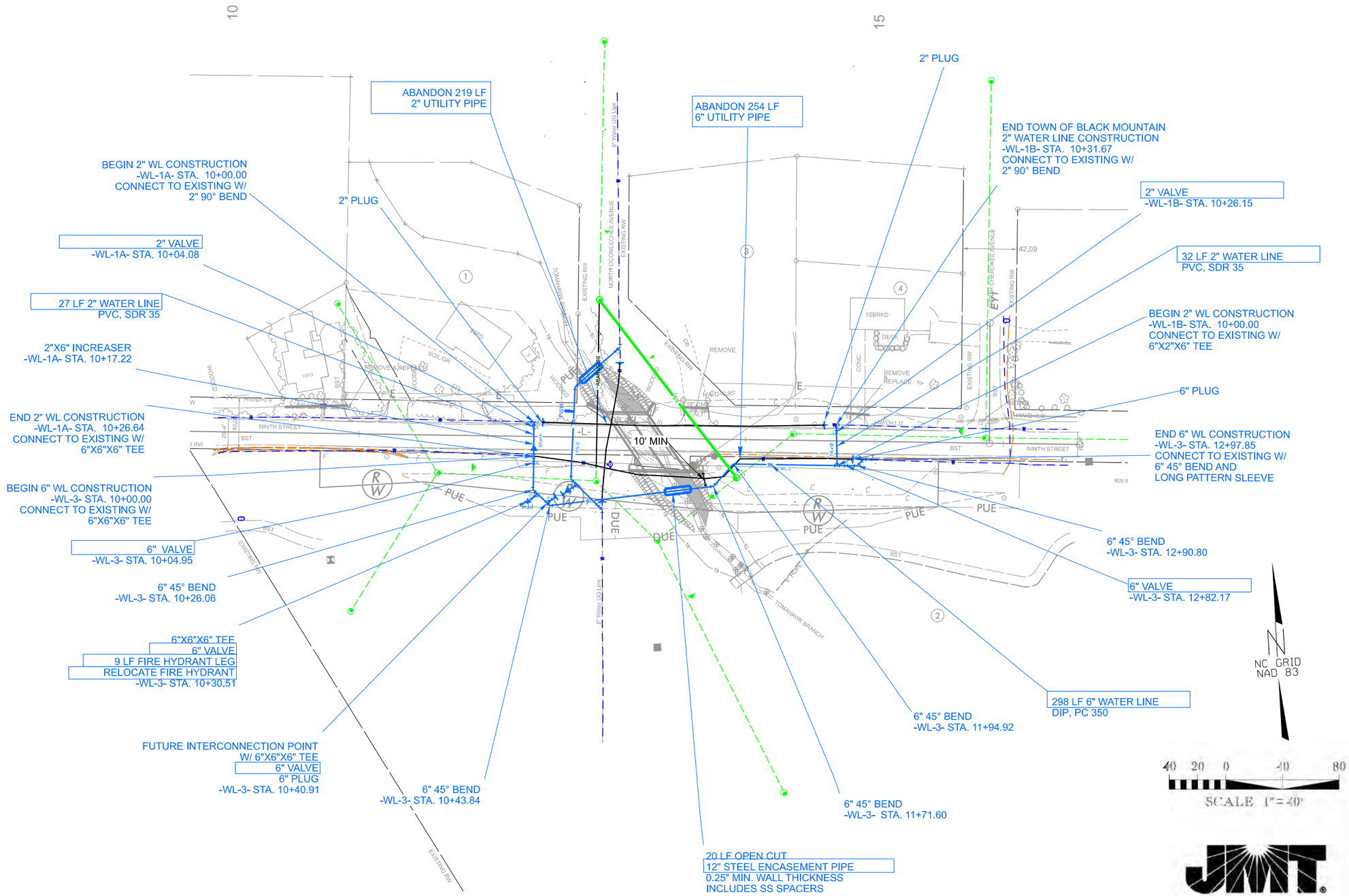
06/05/24

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 1093 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

UTILITY CONSTRUCTION



REVISIONS

HL-0013
UC-4

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
BUNCOMBE COUNTY

UTILITY DESIGN UNIT

UTILITY CONSTRUCTION
PLANS ONLY

INCOMPLETE PLANS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DESIGNED BY:	MRD
DRAWN BY:	BDW
CHECKED BY:	MJP
APPROVED BY:	MJP
REVISED:	

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

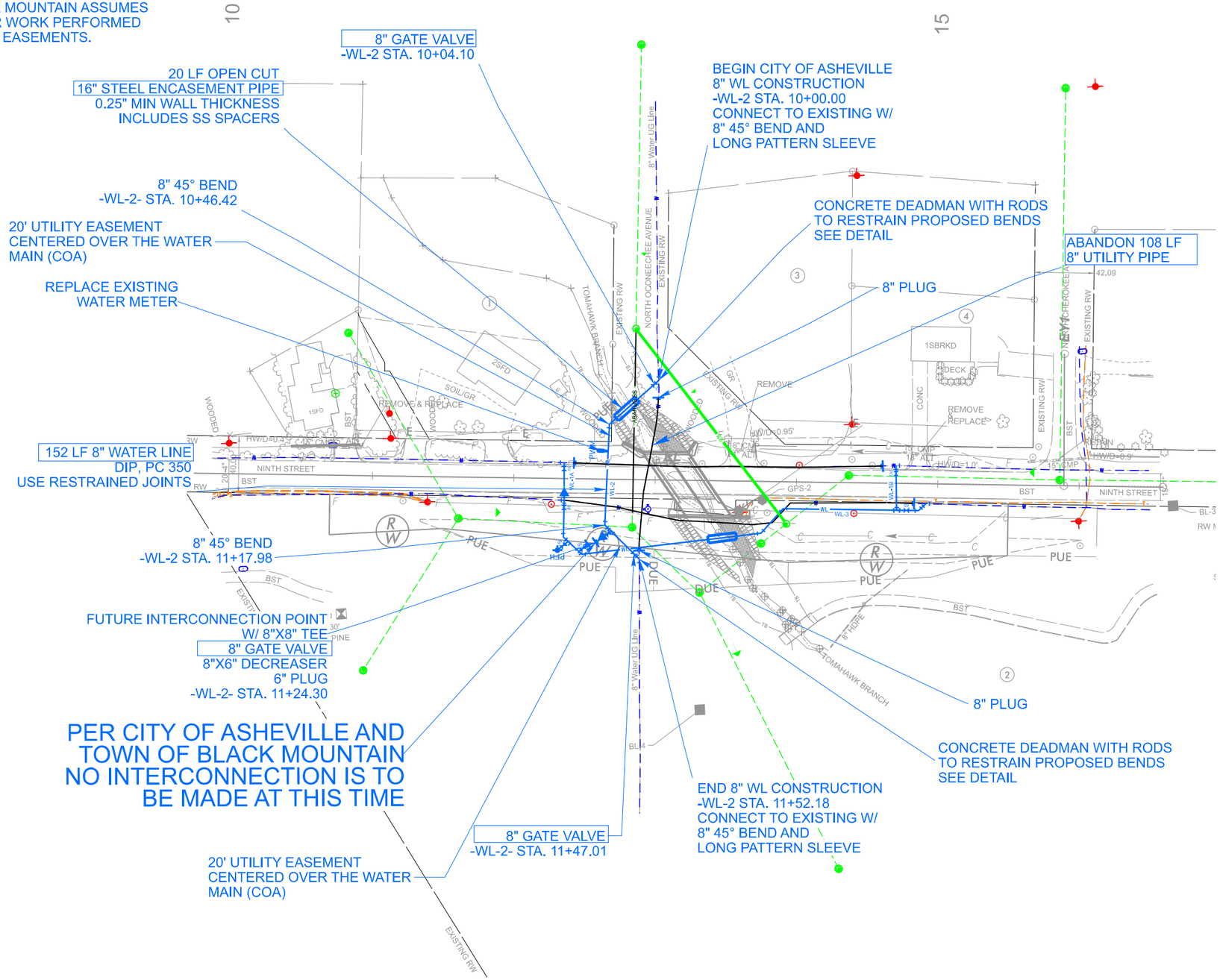
Docusign Envelope ID: 6066F023-E7C7-4BC1-8012-85887F5548A6

08/05/24

UTILITY CONSTRUCTION

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 1005 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

THE TOWN OF BLACK MOUNTAIN OWNS THE STREET RIGHT OF WAY AND UTILITY EASEMENTS SHOWN ON THIS MAP. THE TOWN OF BLACK MOUNTAIN ASSUMES RESPONSIBILITY FOR WORK PERFORMED WITHIN THE R/W AND EASEMENTS.



NC GRID
NAD 83

40 20 0 40 80

SCALE 1"=40'

HL-0013

WPFY-25-26-039 | UC-4A

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
BUNCOMBE COUNTY

UTILITY DESIGN UNIT

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3/6/2026 8:43:22 AM EST

DESIGNED BY:	MRD
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CHECKED BY:	MUP
APPROVED BY:	MUP
REVISED:	

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

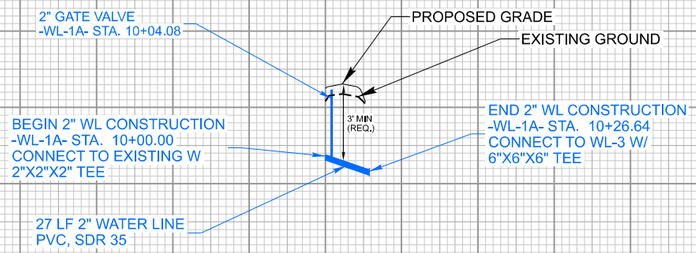
REVISIONS

Docusign Envelope ID: 6066F023-E7C7-4BC1-8012-85887F5548A6

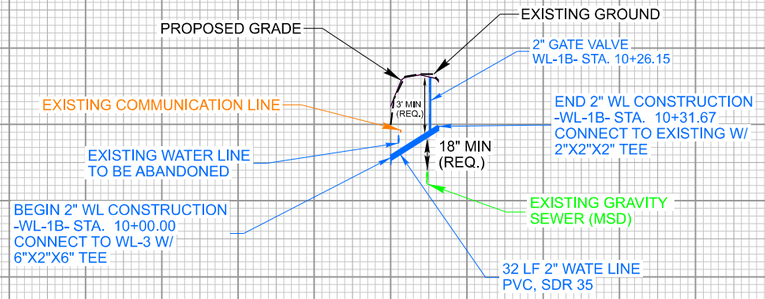
08/05/24

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 740 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

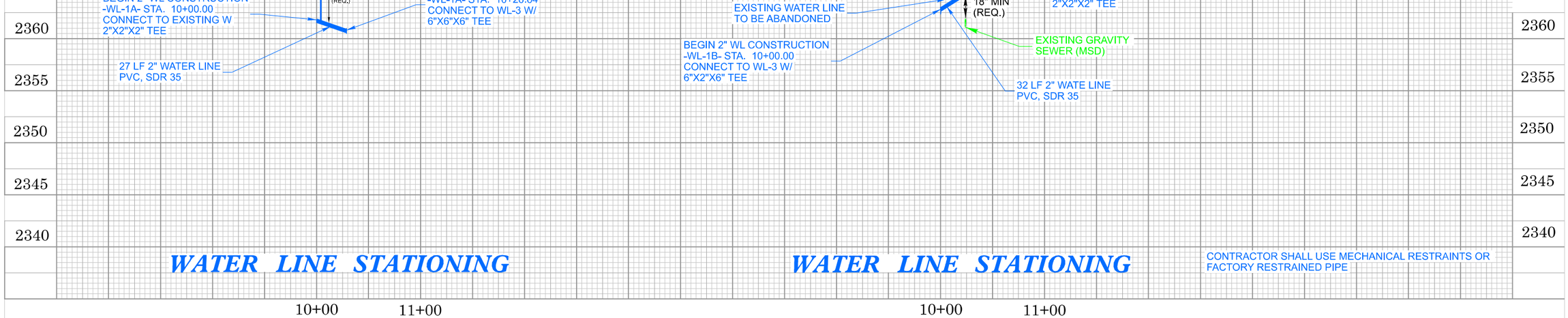
WATER LINE WL–1A PROFILE



WATER LINE WL–1B PROFILE



WATER LINE STATIONING

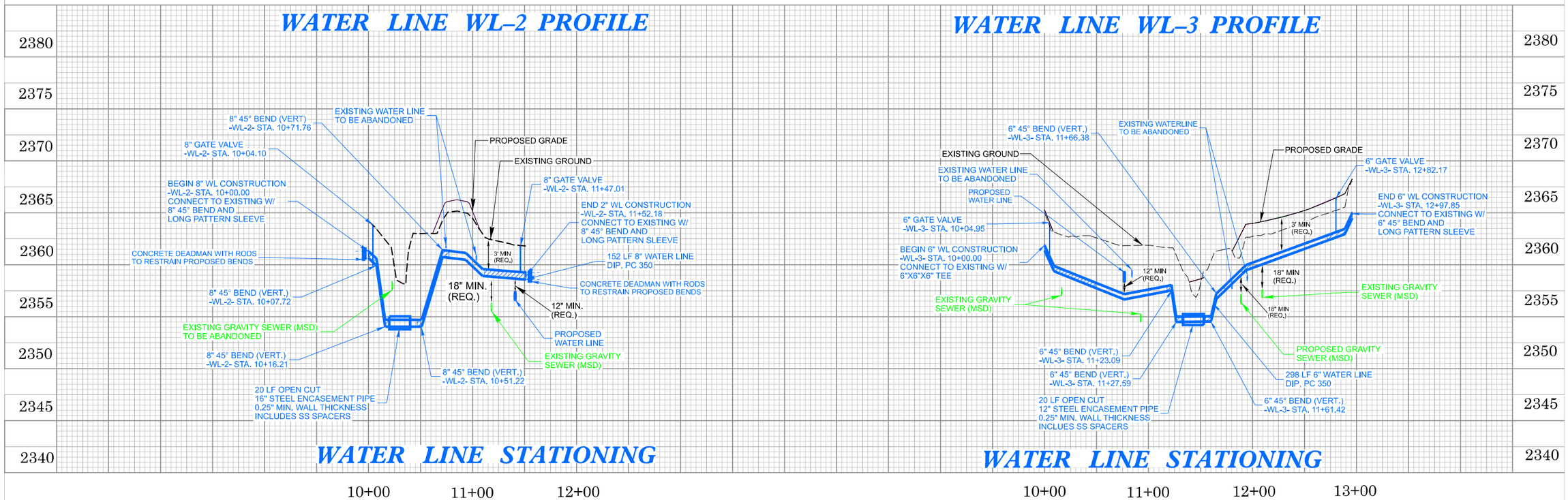


WATER LINE STATIONING

CONTRACTOR SHALL USE MECHANICAL RESTRAINTS OR FACTORY RESTRAINED PIPE

WATER LINE WL–2 PROFILE

WATER LINE STATIONING



WATER LINE WL–3 PROFILE

WATER LINE STATIONING

REVISIONS

UTILITY CONSTRUCTION

5 2.5 0 5 10

SCALE 1"= 5' (VERTICAL)

JMT

HL-0013

UC-48

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
BUNCOMBE COUNTY

UTILITY DESIGN UNIT

UTILITY CONSTRUCTION PLANS ONLY

INCOMPLETE PLANS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROFESSIONAL ENGINEER SEAL 042322 — REGISTERED — MARK U. PUTNAM — 3/5/2025 10:22:22 AM EST

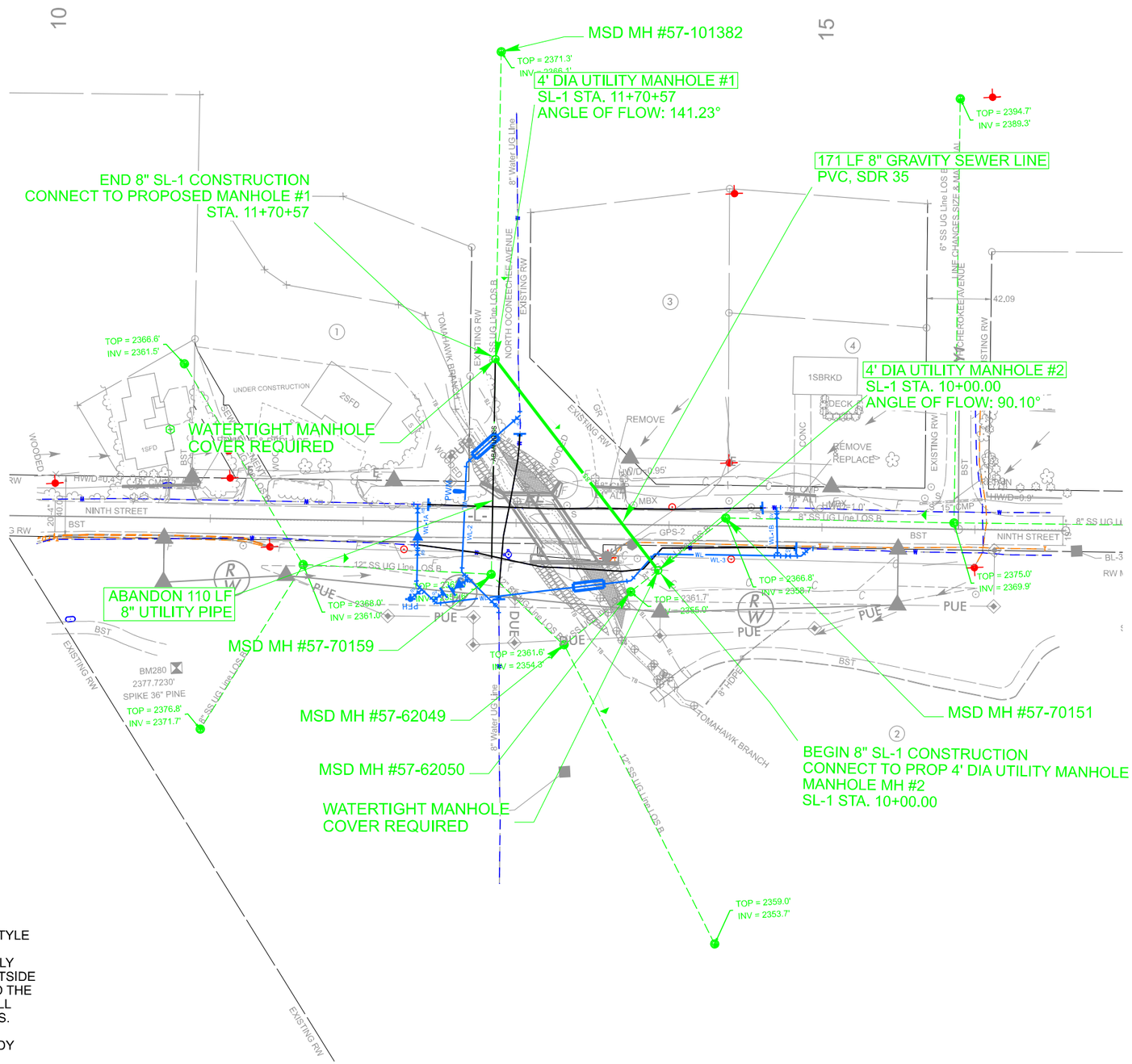
DESIGNED BY:	MRD
DRAWN BY:	BDW
CHECKED BY:	MUP
APPROVED BY:	MUP
REVISED:	

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

Docusign Envelope ID: 6066F023-E7C7-4BC1-8012-85887F5548A6

08/05/24

UTILITY CONSTRUCTION



NOTES:
1. PROPOSED MANHOLES 1 AND 2 SHALL BE CUT-IN. DOGHOUSE STYLE MANHOLES ARE NOT ACCEPTABLE.
2. ABANDONED MAINS AT ACTIVE MANHOLES SHALL BE COMPLETELY DISCONNECTED FROM THE MANHOLE BY CUTTING THE PIPE OUTSIDE THE MANHOLE AND THEN PLUGGING THE ABANDONED MAIN AND THE MANHOLE WALL WITH WATERTIGHT MASONRY. THE INVERT SHALL THEN BE REBUILT TO CONFORM TO THE STANDARD MSD DETAILS.
3. STREAMBANK BY THE SEWER IS STABILIZED BY RIPRAP.
4. FOR PVC TO D.I.P., AND D.I.P. TO D.I.P. CONNECTIONS, LONG BODY D.I.M.J. SLEEVES SHALL BE USED.

NC GRID
NAD 83

40 20 0 40 80
SCALE 1" = 40'

REVISIONS

HL-0013
UC-4C

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
BUNCOMBE COUNTY

UTILITY DESIGN UNIT

UTILITY CONSTRUCTION
PLANS ONLY

INCOMPLETE PLANS

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Mark Dunker
3/6/2024 8:22 AM EST

DESIGNED BY:	MRD
DRAWN BY:	BDW
CHECKED BY:	MUP
APPROVED BY:	MUP
REVISED:	

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

Docusign Envelope ID: 6066F023-E7C7-4BC1-8012-85887F5548A6

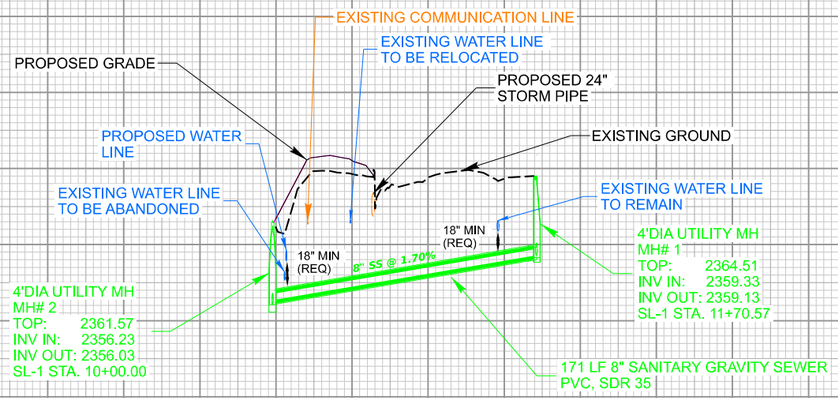
08/05/24

UTILITY CONSTRUCTION

5 2.5 0 5 10

SCALE 1"=5' (VERTICAL)

SEWER LINE SL-1 PROFILE



SEWER LINE STATIONING

10+00 11+00 12+00

HL-0013

UC-4D

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
BUNCOMBE COUNTY

UTILITY DESIGN UNIT

UTILITY CONSTRUCTION PLANS ONLY

INCOMPLETE PLANS

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042888 MARK RUSSELL DOCUSIGNED BY

3/6/2024 | 11:55:22 AM EST

DESIGNED BY:	MRD
DRAWN BY:	BDW
CHECKED BY:	MUP
APPROVED BY:	MUP
REVISED:	

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

REVISIONS

06/19/2023

TIP PROJECT: HL–0013

CONTRACT: DM00462

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

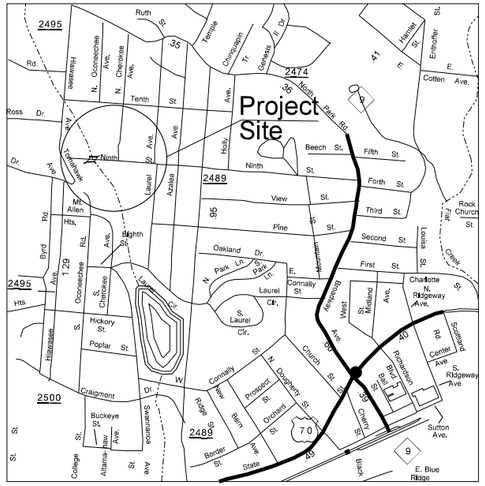
BUNCOMBE COUNTY

LOCATION: *BRIDGE No. 522 ON NINTH STREET OVER TOMAHAWK CREEK BUNCOMBE*

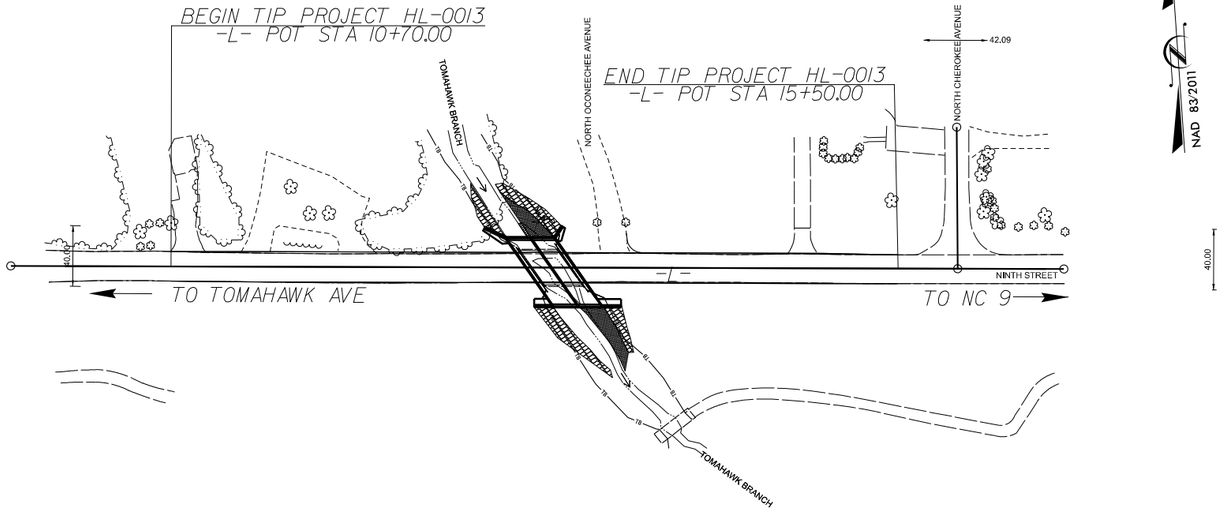
TYPE OF WORK: *RELOCATION OF POWER, TELEPHONE, FIBER, WATER, AND SEWER UTILITIES*

T.I.P. NO.	SHEET NO.
HL–0013	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.



VICINITY MAP NTS



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

20 10 0 20 40
PLANS

INDEX OF SHEETS

SHEET NO.:	DESCRIPTION:
UO–1	TITLE SHEET
UO–2	SYMBOLOGY SHEET
UO–3	OMITTED
UO–04	UBO PLAN SHEETS

UTILITY OWNERS WITH CONFLICTS

(A) POWER – DUKE ENERGY
(B) TELEPHONE – AT&T
(C) WATER – CITY OF ASHEVILLE
(D) SEWER – CITY OF ASHEVILLE
(E) WATER – TOWN OF BLACK MOUNTAIN

PROJECT LET: MAY 6, 2026

PREPARED IN THE OFFICE OF:

JOHNSON, MIRMIRAN, & THOMPSON, INC.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27609
License No. C-3097

Nick Asaro, PLS — UTILITY PROJECT MANAGER
Joe Montgomery — PROJECT UTILITY COORDINATOR

DIVISION OF HIGHWAYS
DIVISION 13
55 Orange Street
Asheville, NC 28801

R. Keith Radcliff
SENIOR DIVISION UTILITY COORDINATOR
John D. Metcalf
DIVISION UTILITY COORDINATOR

4/1/2026 4:28:12 PM
...\Utilities\HL-0013_UTL_UO-1_ORD
User:SFearon

06/19/2023

PROJECT REFERENCE NO.	SHEET NO.
HL-0013	U0-2

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

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

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 — PSTSS

PROPOSED MISCELLANOUS UTILITIES SYMBOLS

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

EXISTING UTILITIES SYMBOLS

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

*For Existing Utilities

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

REV: 2/1/2012

UTILITIES BY OTHERS

THIS SHEET CORRESPONDS TO RDW-1

HL-0013
UTL 1 OF 4

UTILITY CONSTRUCTION PLANS ONLY

ALL PROPOSED 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.

DESIGNED BY: SRW
DRAWN BY: SRW
CHECKED BY: RTV
APPROVED BY:
REVISED:

REVISIONS

06/19/2023

CROSS-SECTION SUMMARY

Station		
-L-	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+70.00	0	0
11+00.00	4	4
11+50.00	9	11
12+00.00	13	12
12+50.00	4	24
13+00.00	0	62
13+50.00	0	55
14+00.00	20	101
14+50.00	51	48
15+00.00	65	40
15+50.00	34	20

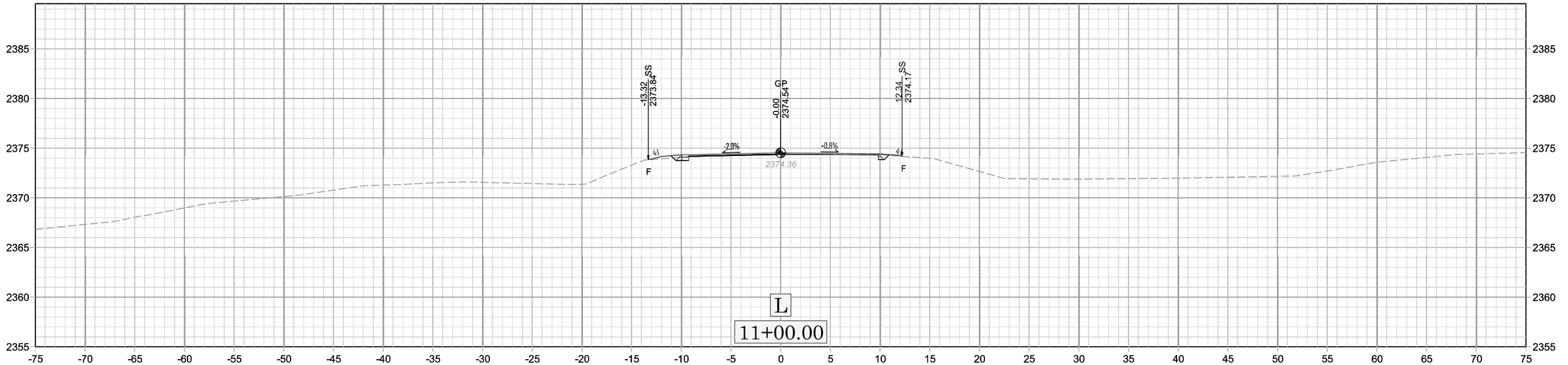
Approximate quantities only. Unclassified excavation, borrow excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the lump sum price for "Grading".

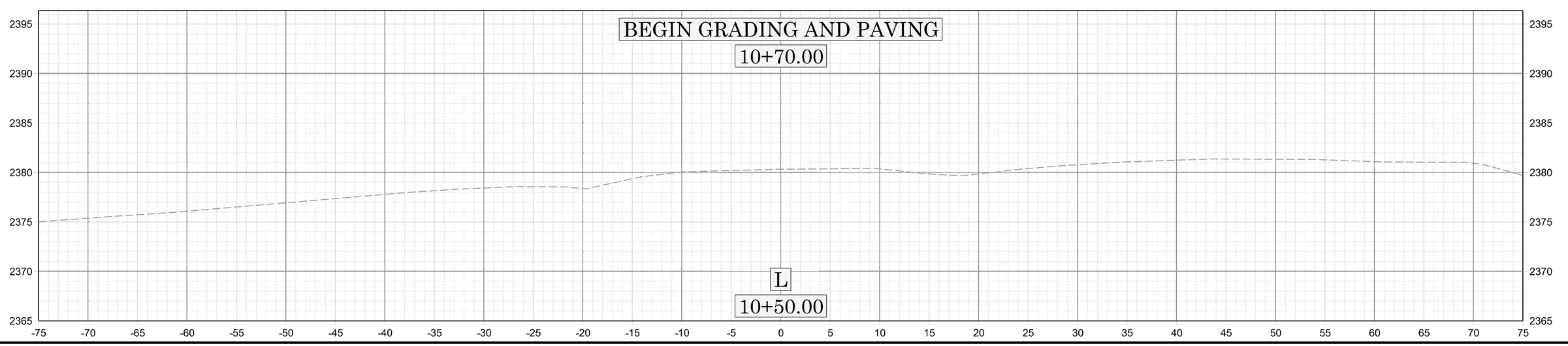
NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

5/26/20

0 5 10

HL-0013
X 2





5/26/20

0 5 10

HL-0013
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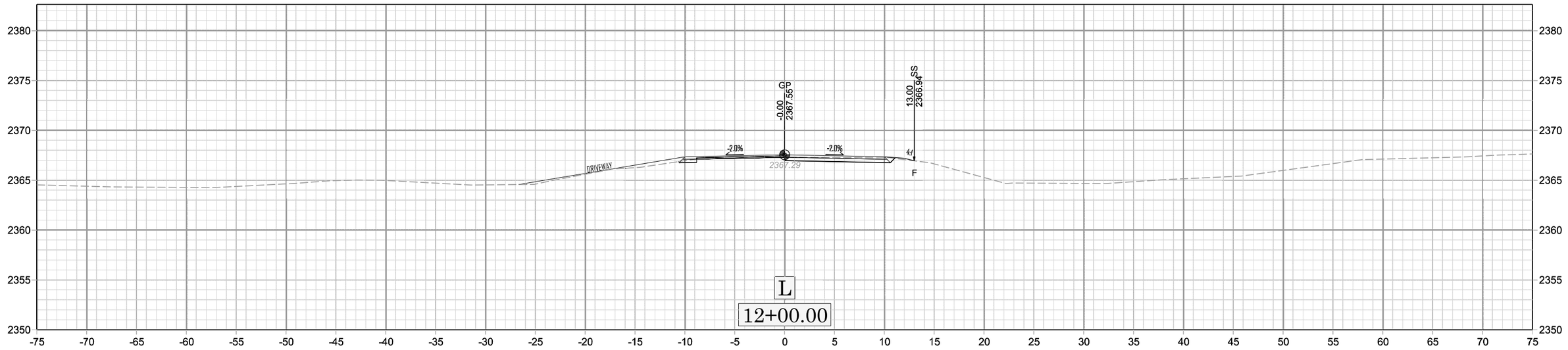
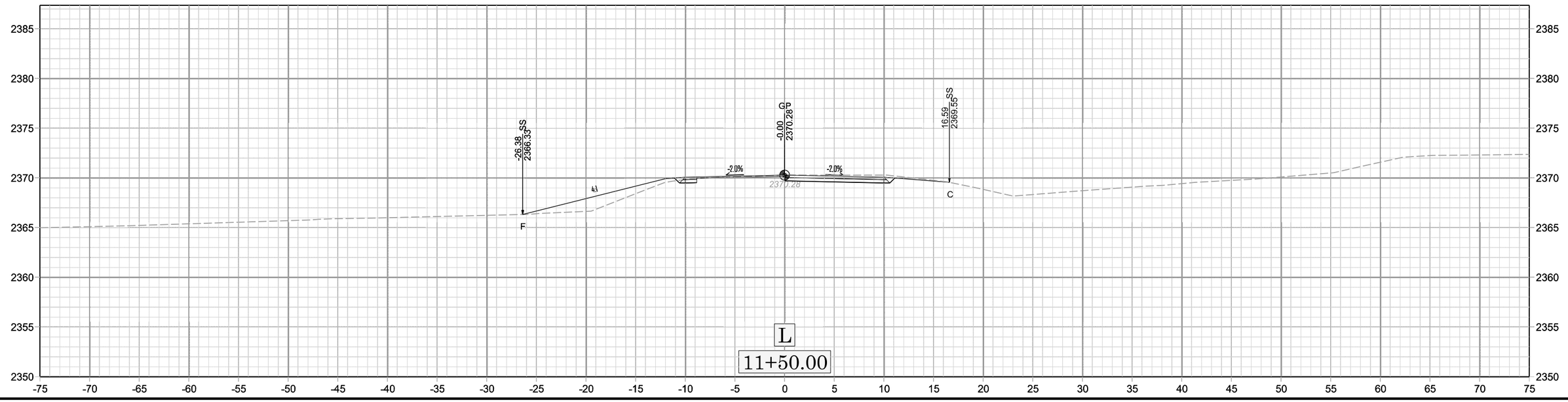
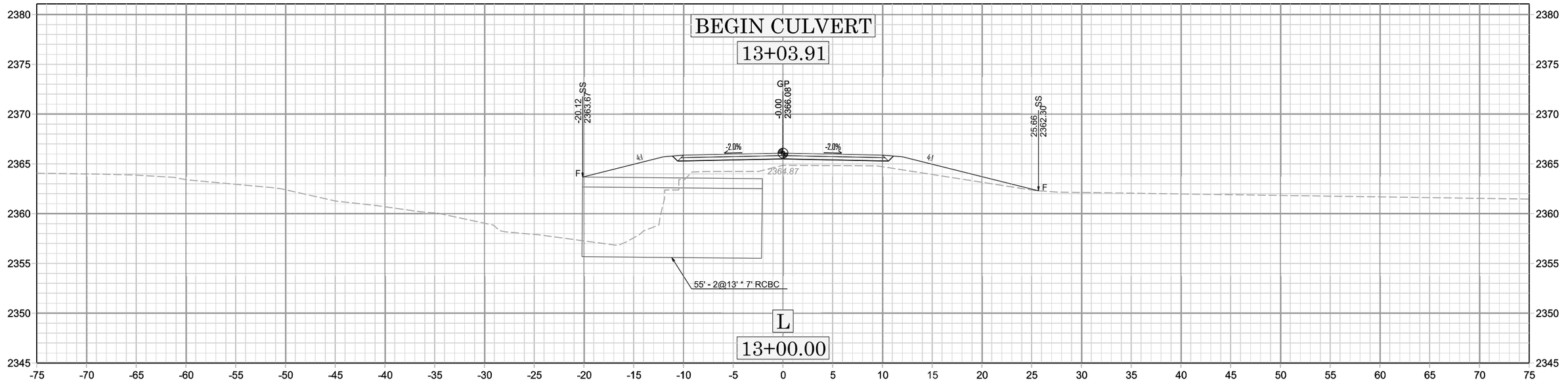


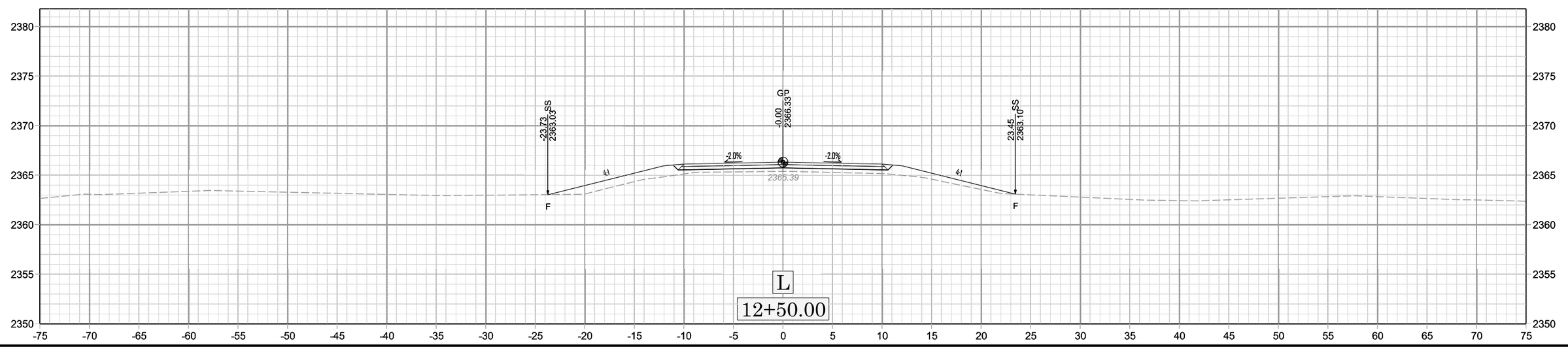


5/26/20

0 5 10

HL-0013
X | 4





5/26/20

0 5 10

HL-0013
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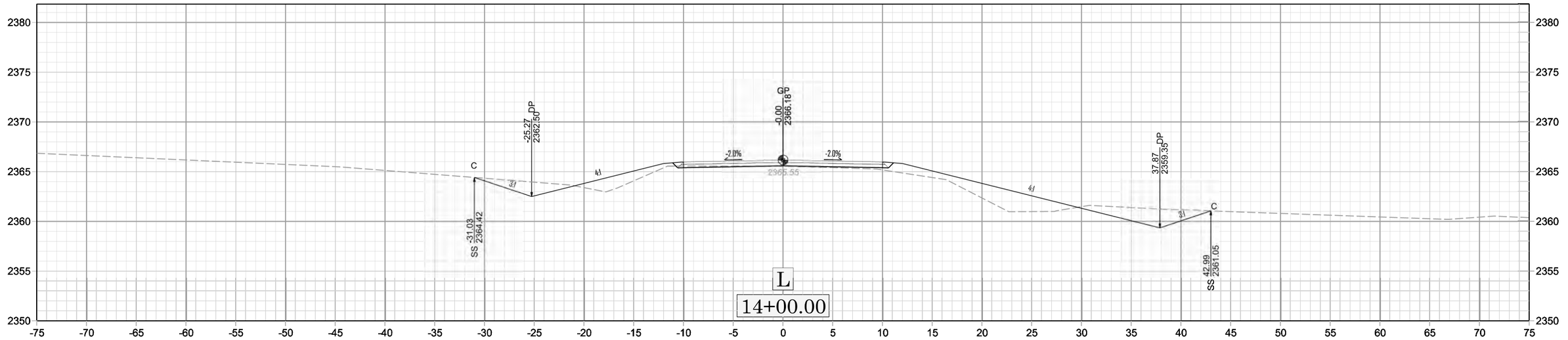

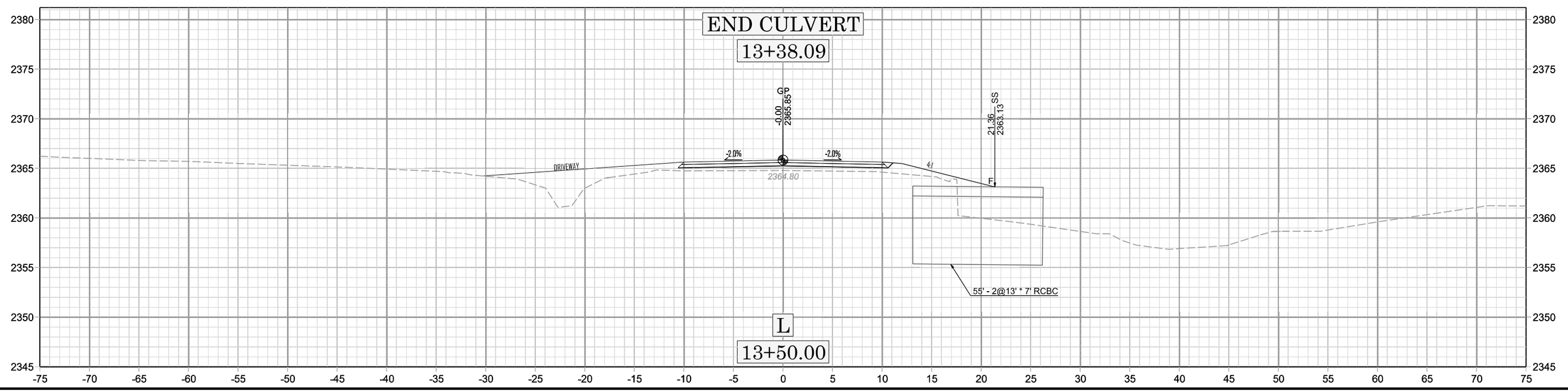

5/26/20

0 5 10

HL-0013
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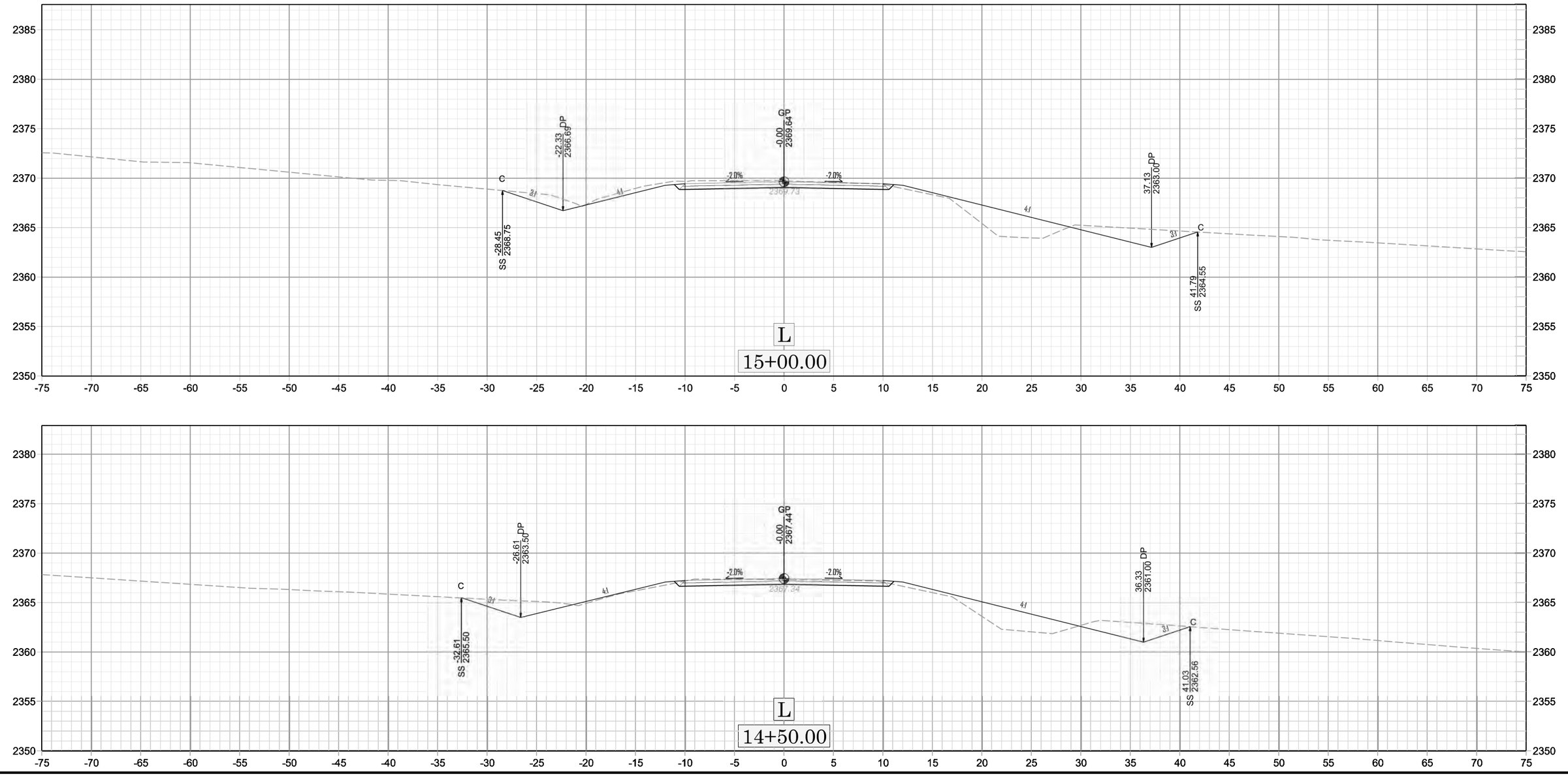
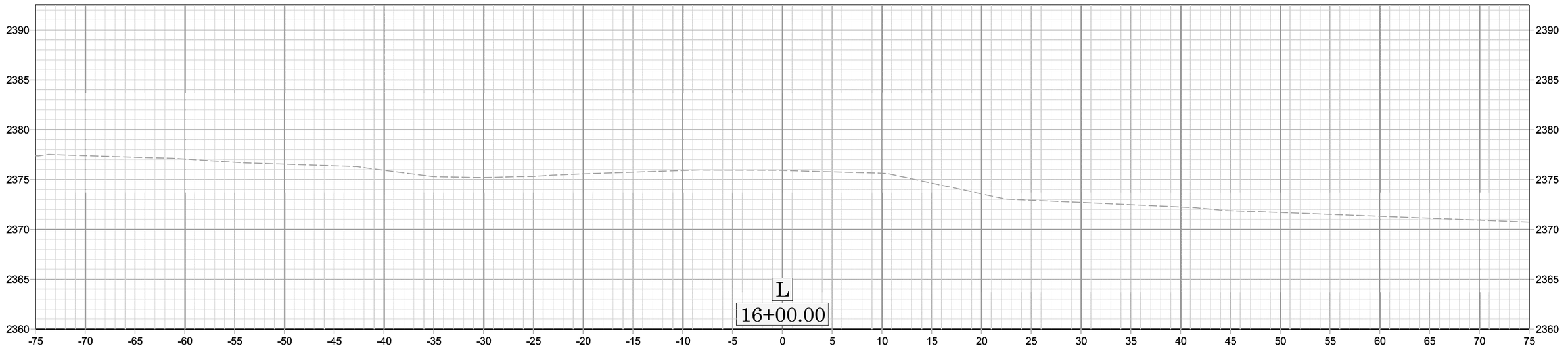
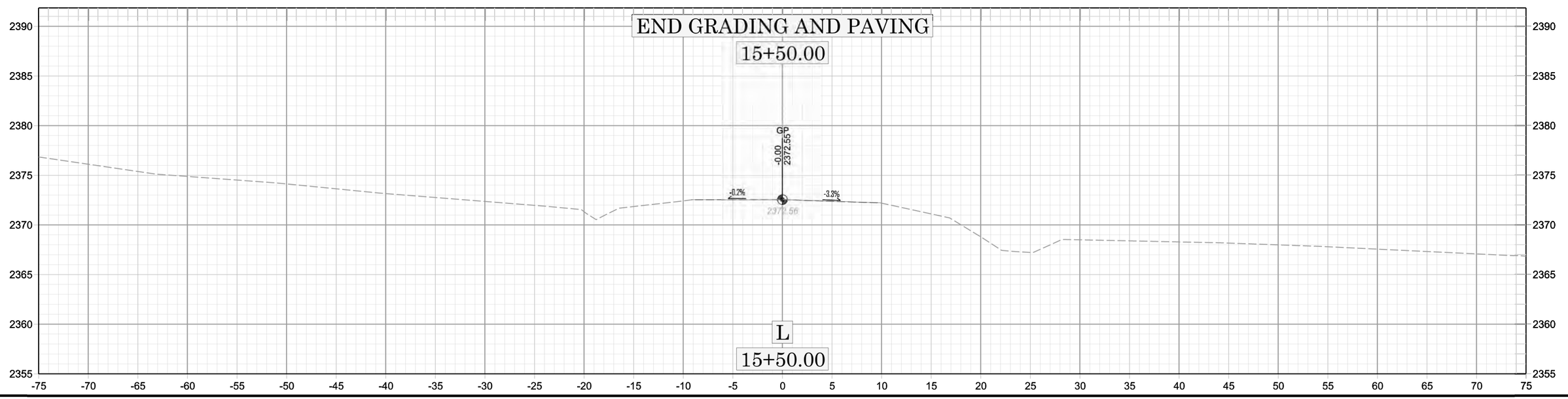


5/26/20

0 5 10

HL-0013
X | 7





STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

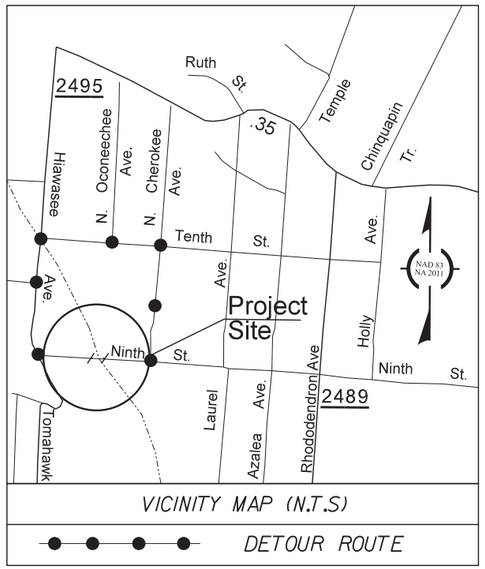
BUNCOMBE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HL-0013		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
49469.1.1	1305013	PE
49469.2.1	1305013	R/W
49469.2.2	1305013	UTILITIES
49469.3.1	1305013	CONSTRUCTION

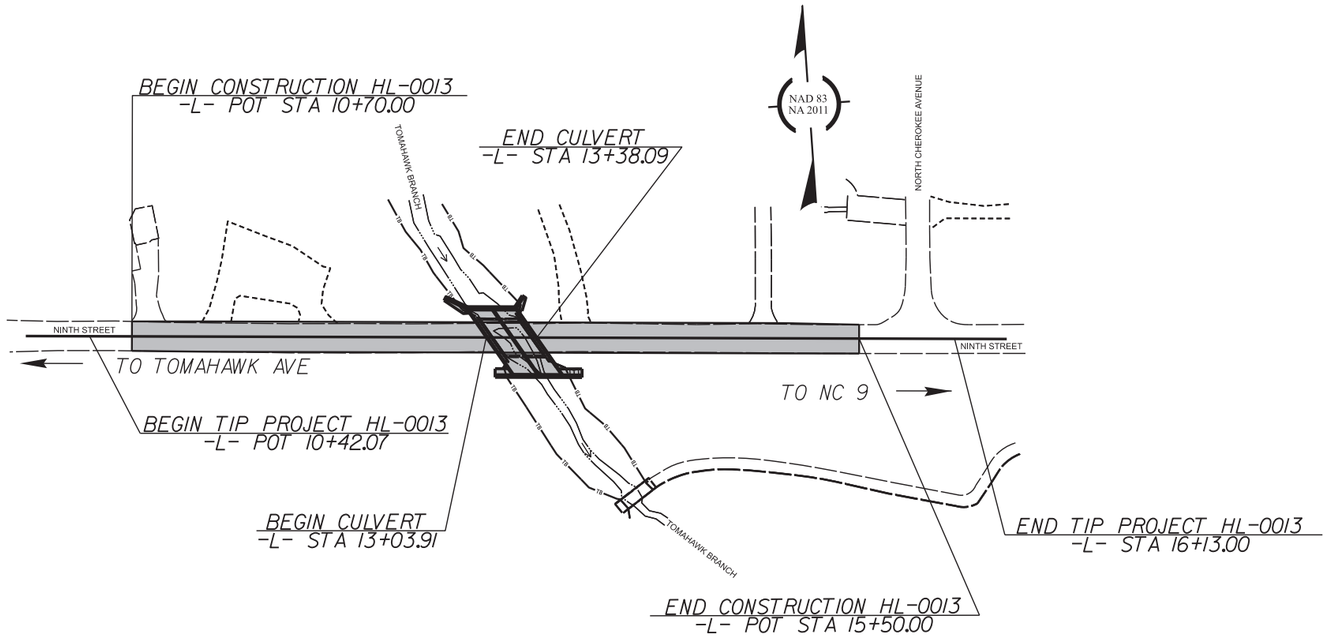
LOCATION: *BRIDGE No. 522 ON NINTH STREET OVER TOMAHAWK BRANCH*

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



VICINITY MAP (N.T.S)

DETOUR ROUTE



CULVERT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Johnson, Mirmiran, & Thompson Inc.
1318 Patton Ave Suite F,
Asheville, NC, 28806
License No: C-3097

DESIGN DATA

ADT 2025 = 138
ADT 2045 = 203
K = %
D = %
T = 6% *
V = 30 MPH
* TTST = % DUAL %
FUNC CLASS =
RURAL LOCAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT HL-0013 = 0.102 Miles
LENGTH OF STRUCTURE TIP PROJECT HL-0013 = 0.006 Miles
TOTAL LENGTH TIP PROJECT HL-0013 = 0.108 Miles

Prepared in the Office of:
JOHNSON, MIRMIRAN, & THOMPSON, INC.
1318 Patton Ave, Suite F,
Asheville, NC, 28806
License No. C-3097

2024 STANDARD SPECIFICATIONS

LETTING DATE:
MAY 6, 2026

RYAN T. SHIPMAN, PE
PROJECT ENGINEER

JASON E. BARTLEY, EI
PROJECT DESIGN ENGINEER

MARK HILL, PE
NCDOT DIVISION PROJECT MANAGER

Signed by:
Ryan T Shipman
13D872AE06E443A...
RYAN TYLER SHIPMAN
4/1/2026

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

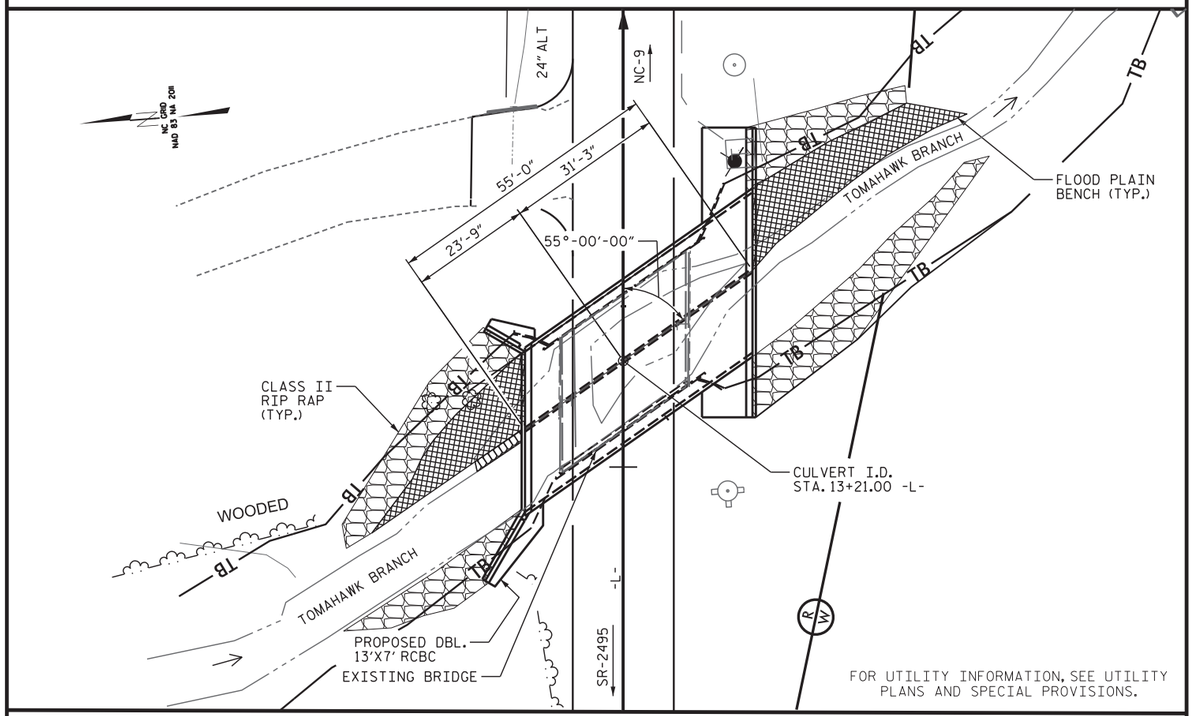
TIP PROJECT: HL-0013

CONTRACT: DM00462

09/08/99
hlangar
DGN:pw://jmt-pw.bentley.com:jmt-pw-01/Documents/Projects/2022/22-V03420I-002/Design/Structures/Plans/400_000_HL0013_SMU_CU_TSH_100522.dgn
TIME:3/30/2026

F.A. PROJECT NO. 1305013

BM280, 98.03' RT OF STA. 10+79.32 -L-, N698776.3750, E 1009886.7030, EL 2377.7230



LOCATION SKETCH

TOTAL STRUCTURE QUANTITIES

REMOVAL OF EXISTING STRUCTURE	LUMP SUM	
✱CULVERT EXCAVATION	LUMP SUM	
✱FOUNDATION CONDITIONING MATERIAL	240	TONS
ASBESTOS ASSESSMENT	LUMP SUM	
CLASS A CONCRETE		
BARREL @ 3.64 CY/FT	200.2	C.Y.
WINGS ETC.	42.9	C.Y.
TOTAL	243.1	C.Y.
REINFORCING STEEL		
BARREL	31,251	LBS.
WINGS ETC.	3,783	LBS.
TOTAL	35,431	LBS.
CLASS II RIP RAP (2'-0" THICK)	155	TONS
GEOTEXTILE FOR DRAINAGE	172	SY

HYDRAULIC DATA

DESIGN DISCHARGE	= 460	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 2361.4	FT
BASE DISCHARGE	= 660	CFS
DRAINAGE AREA	= 1.2	SQ. MI.
BASE HW ELEVATION	= 2362.1	FT

OVERTOPPING FLOOD DATA

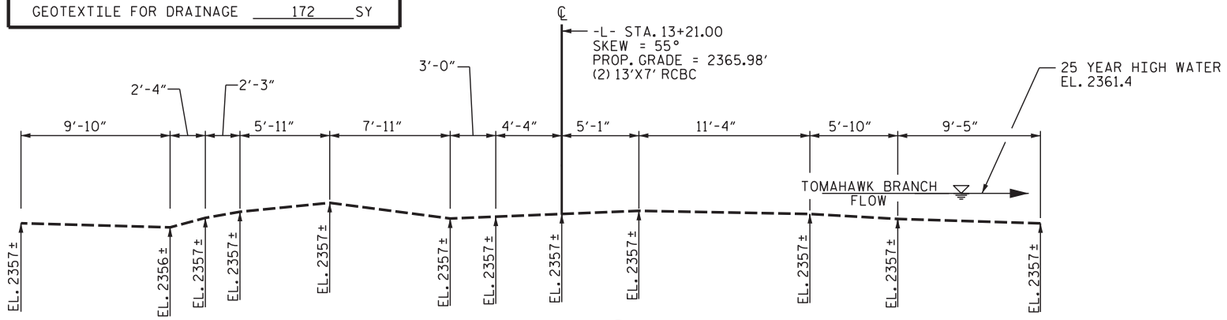
OVERTOPPING DISCHARGE	= 1580	CFS
OVERTOPPING FREQUENCY	= 500 +	YRS
OVERTOPPING ELEVATION	= 2365.9**	FT

**AT SAG POINT NEAR 13+68

W.S. EL. TAKEN @ RIVER STATION 7594

SAMPLE BAR REPLACEMENT

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



PROFILE ALONG ℄ CULVERT

NOTES

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

DESIGN FILL----------MAX. FILL = 1.972', MIN. FILL = 1.531'

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

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

CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:

1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.

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

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

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COST RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 13+21.00 -L-.

THE EXISTING STRUCTURE CONSISTING OF 1 SPAN @ 28'-0", ON I-BEAMS AND CHANNELS, WITH A CLEAR ROADWAY WIDTH OF 24'-5" AND ON TIMBER FLOOR ON TIMBER CAPS AND TIMBER PILES, AND LOCATED AT PROPOSED STRUCTURE, SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS

FOR ASBESTOS ASSESSMENT, SEE SPECIAL PROVISIONS.

GRADE DATA

GRADE POINT ELEV. @ STATION 13+21.00 -L- = 2365.98
BED ELEV. @ STATION 13+21.00 -L- = 2355.50
ROADWAY SLOPES = 4:1

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

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

A 3'-0" STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL MANAGEMENT PLANS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.

DETAILED DRAWINGS FOR FALSEWORK AND FORMS FOR THIS CULVERT SHALL BE SUBMITTED. SEE SHEET SN.

FOUNDATION NOTES

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

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

THE FACTORED BEARING CAPACITY AT THE BASE OF THE CULVERT IS 3.0 KSF. VERIFY A BEARING RESISTANCE OF 6.7 KSF PRIOR TO THE PLACEMENT OF FOUNDATION CONDITIONING MATERIAL. THE ENGINEER SHALL DETERMINE THE NEED FOR UNDERCUTTING AT THE TIME OF CONSTRUCTION.

✱AS A CONTINGENCY ITEM, WE RECOMMEND A QUANTITY OF 60 CUBIC YARDS OF UNDERCUT AND AN ADDITIONAL 60 CUBIC YARDS OF FOUNDATION CONDITIONING MATERIAL TO BE USED AS BACKFILL FOR AREAS OF UNDERCUT OF SOFT/ALLUVIAL SOILS, AS DETERMINED BY THE ENGINEER.

✱IN LIEU OF UNDERCUTTING, A LAYER OF TYPE V GEOTEXTILE CAN BE PLACED AT THE BOTTOM OF THE EXCAVATION PRIOR TO THE PLACEMENT OF FOUNDATION CONDITIONING MATERIAL. WE RECOMMEND A CONTINGENCY QUANTITY OF 90 SQUARE YARDS OF TYPE V GEOTEXILE BE INCLUDED IN THE CONTRACT TO BE USED AT THE DISCRETION OF THE ENGINEER.

I HEREBY CERTIFY THAT THESE PLANS ARE THE AS-BUILT PLANS.

Signed by: Ryan T Shipman
13D872AE06E443A...
RYAN TYLER SHIPMAN
4/1/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. HL-0013
BUNCOMBE COUNTY
STATION: 13+21.00 -L-
SHEET 1 OF 10 REPLACES BRIDGE NO. 100522

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE BARREL 13'-0" X 7'-0" RCBC ON 9TH STREET BETWEEN SR-2495 AND NC-9

Johnson, Mirmiran, & Thompson Inc.
1318 Patton Ave Suite F,
Asheville, NC, 28806
License No: C-3097

ENG. OF RECORD.: JEB DATE: 11/2024
DWN. BY: JA DATE: 02/2025
CHKD. BY: RTS DATE: 02/2025

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2			4			10

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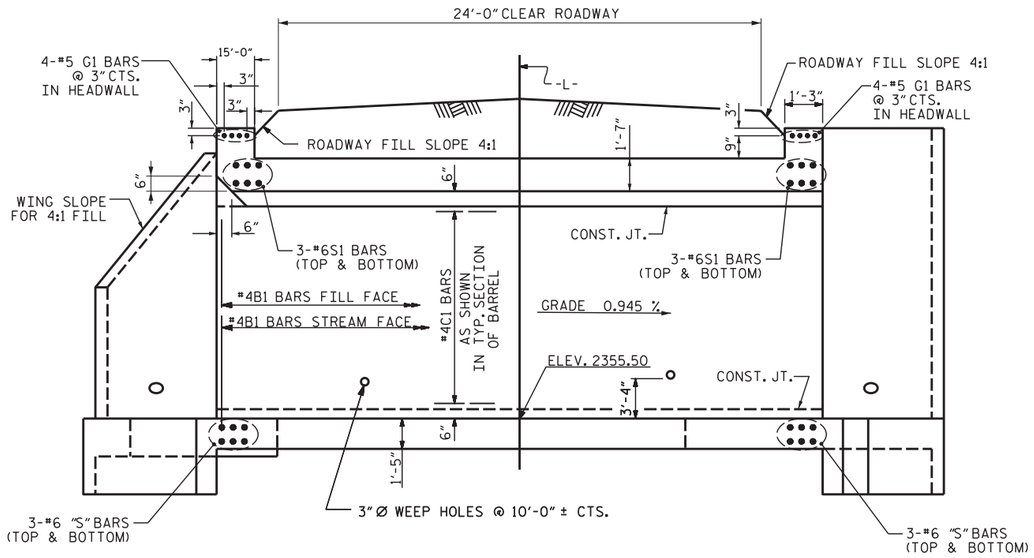
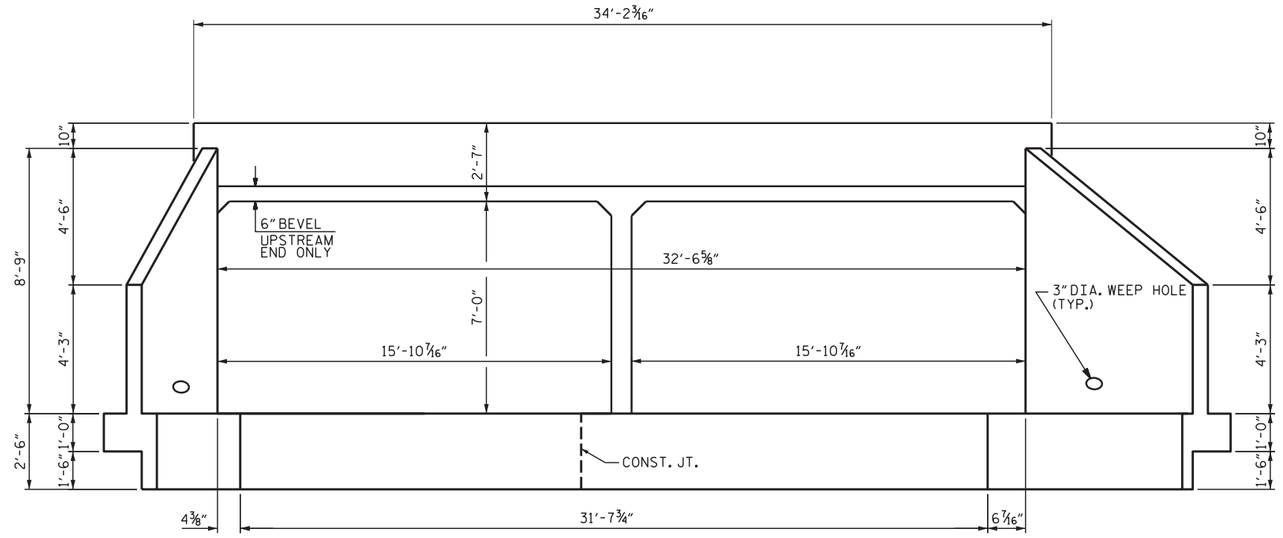
TIME: 1/8/2026

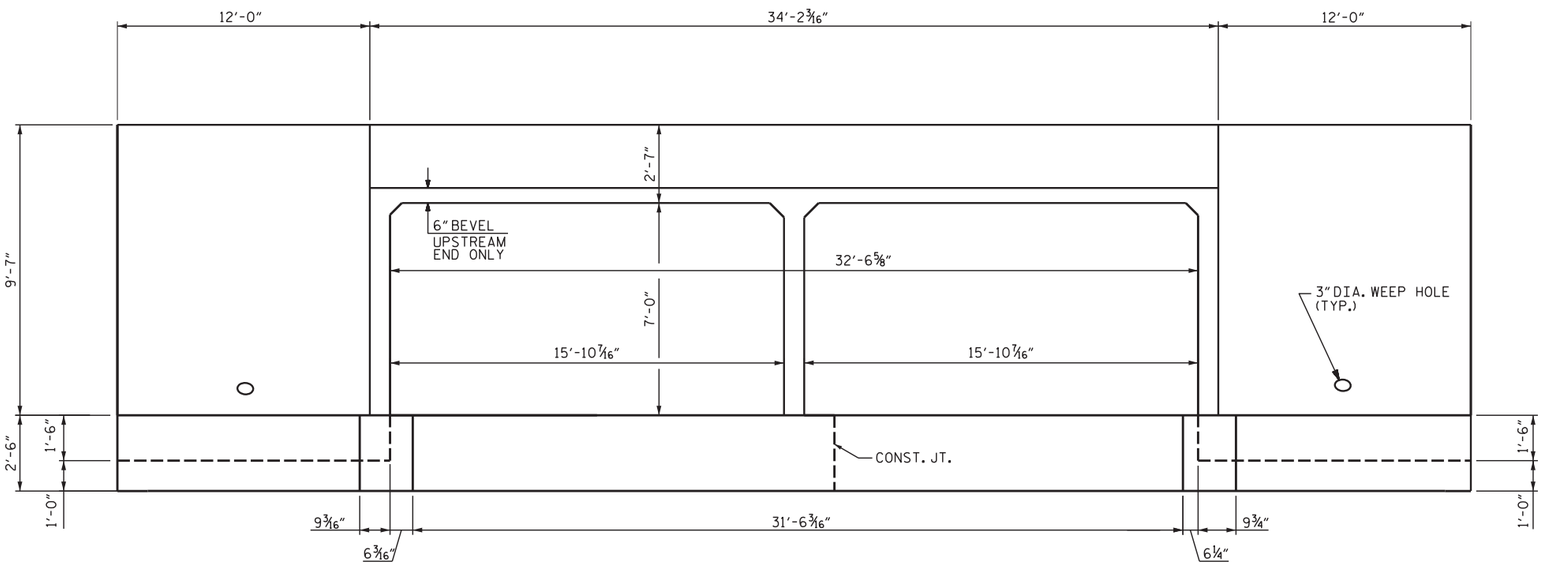


CULVERT SECTION NORMAL TO ROADWAY



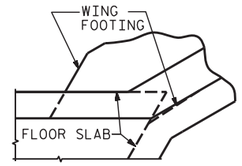
END ELEVATION NORMAL TO SKEW

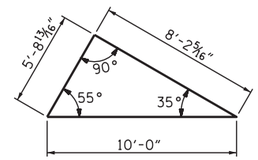
(INLET SHOWN)



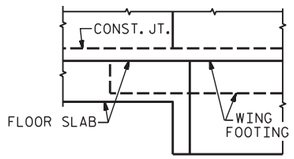
END ELEVATION NORMAL TO SKEW

(OUTLET SHOWN)





SKEW TRIANGLE



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

PROJECT NO. HL-0013

BUNCOMBE COUNTY

STATION: 13+21.00 -L-

SHEET 2 OF 10

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE BARREL 13'-0" X 7'-0" RCBC ON 9TH STREET BETWEEN SR-2495 AND NC-9

Signed by: Ryan T Shipman
13D872AE06E443A...
4/1/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Johnson, Mirmiran, & Thompson Inc.
1318 Patton Ave Suite F,
Asheville, NC, 28806
License No: C-3097

ENG. OF RECORD.: JEB DATE: 11/2024
DWN. BY: JA DATE: 02/2025
CHKD. BY: RTS DATE: 02/2025

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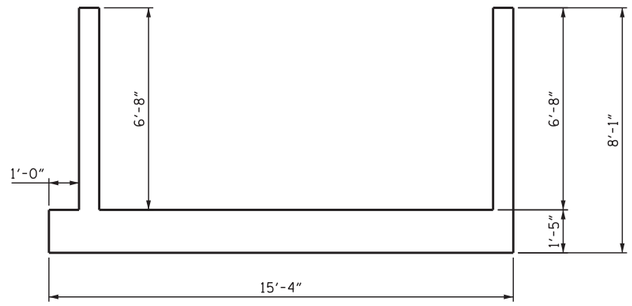
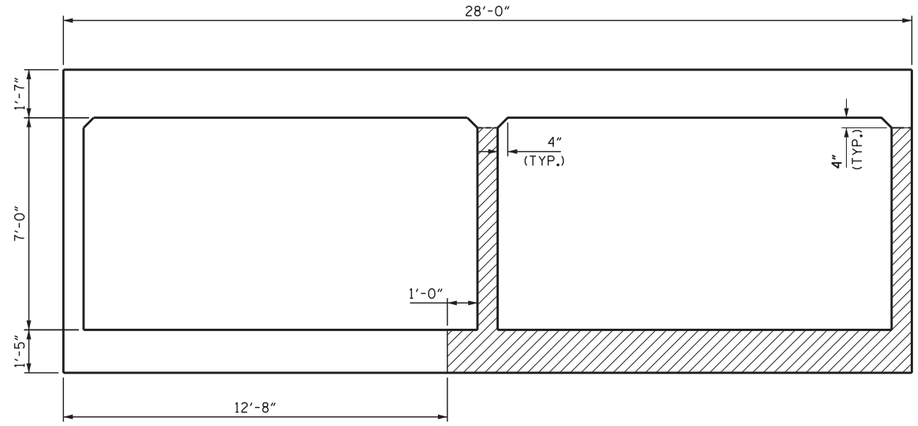


STAGING DIAGRAM - STAGE I

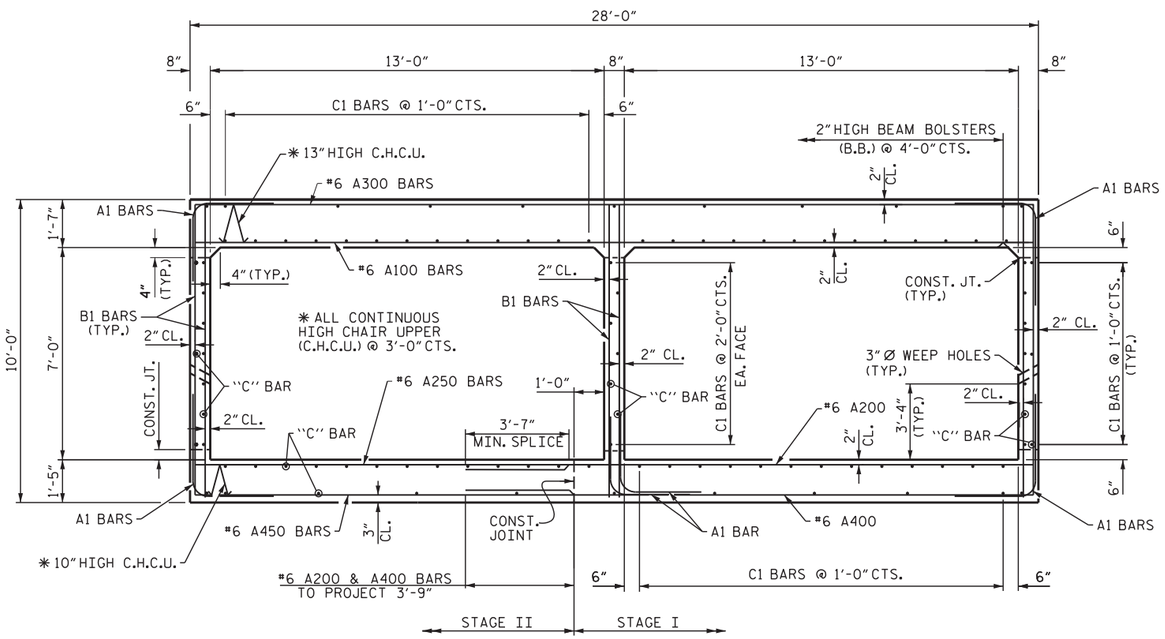
(LOOKING DOWNSTREAM)



STAGING DIAGRAM - STAGE II

(LOOKING DOWNSTREAM)

STAGE I CONSTRUCTION



RIGHT ANGLE SECTION OF BARREL

THERE ARE 101 "C" BARS IN SECTION OF BARREL
(LOOKING DOWNSTREAM)

Signed by: RYAN TYLER SHIPMAN
13D872AE06E443A...
4/1/2026

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PROJECT NO. HL-0013

BUNCOMBE COUNTY

STATION: 13+21.00 -L-

SHEET 3 OF 10

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE BARREL 13'-0" X 7'-0" RCBC ON 9TH STREET BETWEEN SR-2495 AND NC-9

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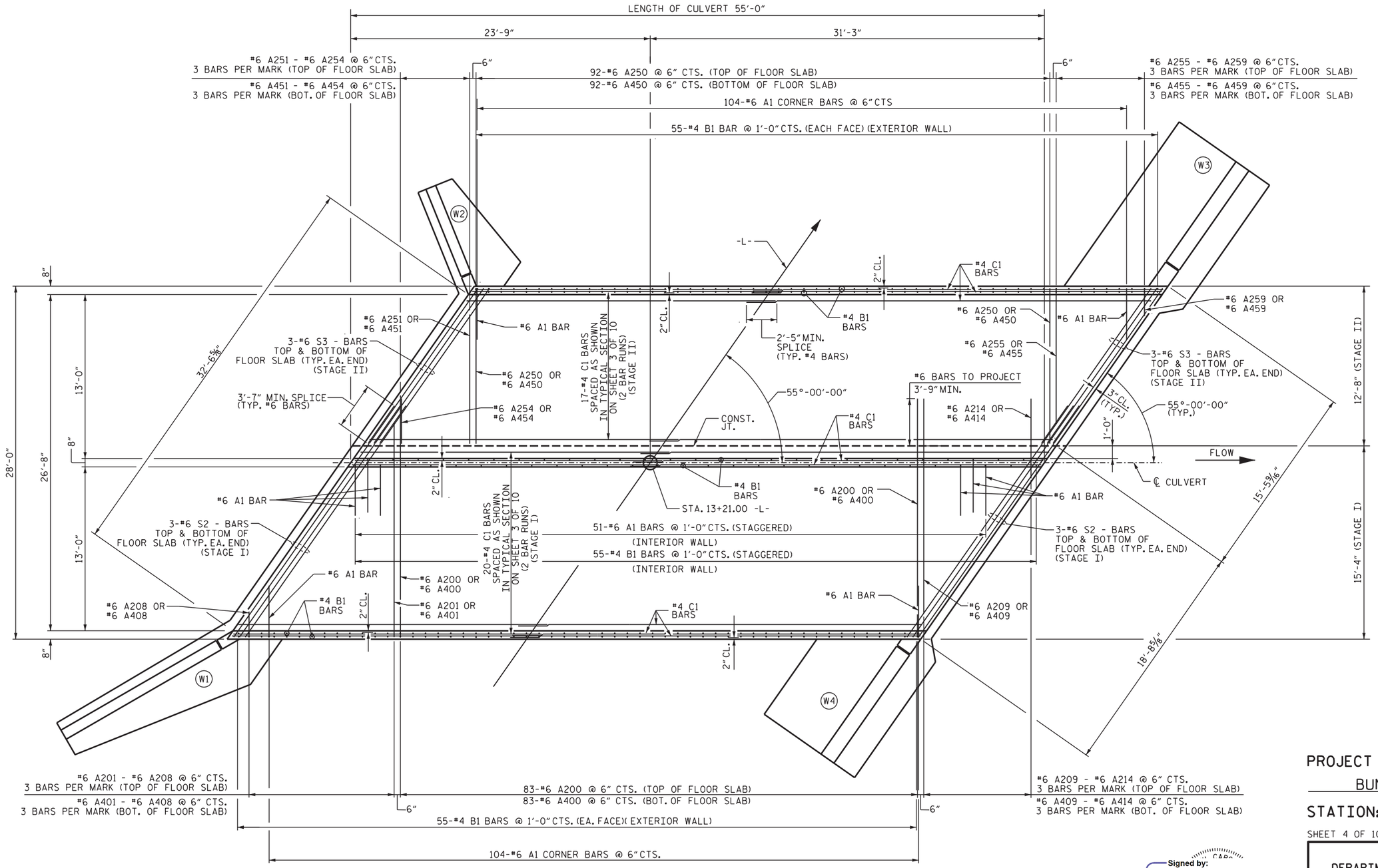

FLOOR SLAB

PROJECT NO. HL-0013

BUNCOMBE COUNTY

STATION: 13+21.00 -L-

SHEET 4 OF 10

Signed by: Ryan T Shipman
13D872AE06E443A...
RYAN TYLER SHIPMAN
4/1/2026

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE BARREL
13'-0" X 7'-0" RCBC
ON 9TH STREET BETWEEN
SR-2495 AND NC-9

Johnson, Mirmiran, & Thompson Inc.
1318 Patton Ave Suite F,
Asheville, NC, 28806
License No: C-3097

ENG. OF RECORD.: JEB DATE: 11/2024
DWN. BY: JA DATE: 02/2025
CHKD. BY: RTS DATE: 02/2025

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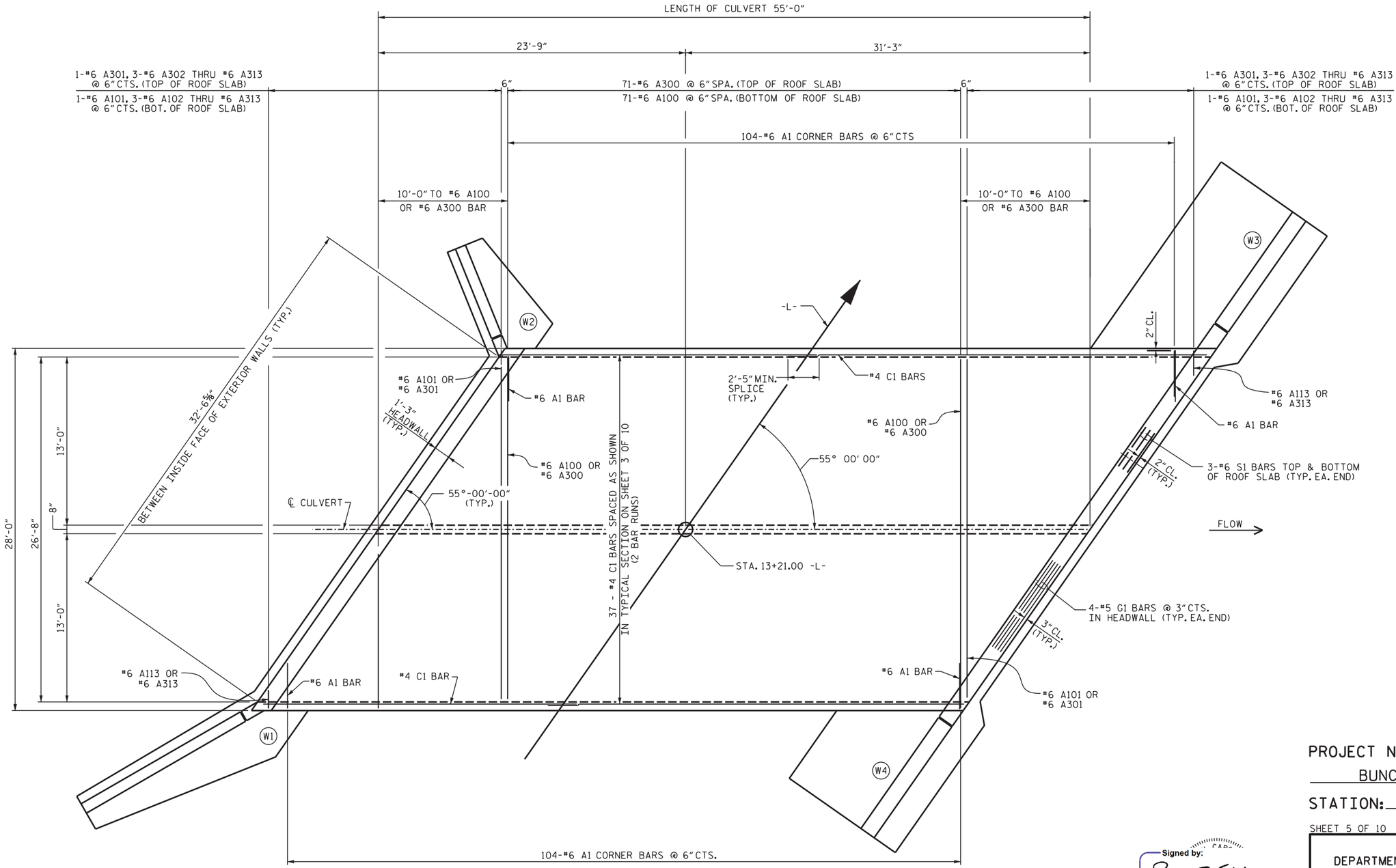
DGN: $$DGN$$
TIME: 1/8/2026



ROOF SLAB

PROJECT NO. HL-0013

BUNCOMBE COUNTY

STATION: 13+21.00 -L-

SHEET 5 OF 10

Signed by: Ryan T Shipman
13D872AE06E443A...
RYAN TYLER SHIPMAN
4/1/2026

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE BARREL 13'-0" X 7"-0" RCBC ON 9TH STREET BETWEEN SR-2495 AND NC-9

Johnson, Mirmiran, & Thompson Inc.
1318 Patton Ave Suite F.
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TIME: 1/8/2026

BILL OF MATERIAL

STAGE I

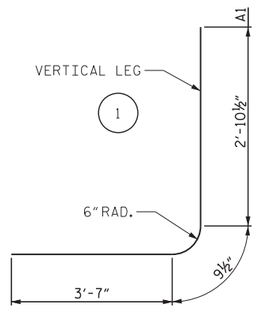
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	259	#6	1	7'-3"	2820
A200	83	#6	STR.	18'-11"	2358
A201	3	#6	STR.	17'-0"	77
A202	3	#6	STR.	14'-10"	67
A203	3	#6	STR.	12'-8"	57
A204	3	#6	STR.	10'-7"	48
A205	3	#6	STR.	8'-5"	38
A206	3	#6	STR.	6'-3"	28
A207	3	#6	STR.	4'-2"	19
A208	3	#6	STR.	2'-0"	9
A209	3	#6	STR.	17'-0"	77
A210	3	#6	STR.	14'-10"	67
A211	3	#6	STR.	12'-8"	57
A212	3	#6	STR.	10'-7"	48
A213	3	#6	STR.	8'-5"	38
A214	3	#6	STR.	6'-3"	28
A400	83	#6	STR.	18'-11"	2358
A401	3	#6	STR.	17'-0"	77
A402	3	#6	STR.	14'-10"	67
A403	3	#6	STR.	12'-8"	57
A404	3	#6	STR.	10'-7"	48
A405	3	#6	STR.	8'-5"	38
A406	3	#6	STR.	6'-3"	28
A407	3	#6	STR.	4'-2"	19
A408	3	#6	STR.	2'-0"	9
A409	3	#6	STR.	17'-0"	77
A410	3	#6	STR.	14'-10"	67
A411	3	#6	STR.	12'-8"	57
A412	3	#6	STR.	10'-7"	48
A413	3	#6	STR.	8'-5"	38
A414	3	#6	STR.	6'-3"	28
B1	165	#4	STR.	9'-7"	1056
C1	74	#4	STR.	28'-9"	1421
D2	10	#6	STR.	2'-0"	30
S2	12	#6	STR.	22'-5"	404

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	208	#6	1	7'-3"	2265
A100	71	#6	STR.	27'-8"	2950
A101	2	#6	STR.	27'-1"	81
A102	6	#6	STR.	24'-11"	225
A103	6	#6	STR.	22'-9"	205
A104	6	#6	STR.	20'-8"	186
A105	6	#6	STR.	18'-6"	167
A106	6	#6	STR.	16'-4"	147
A107	6	#6	STR.	14'-3"	128
A108	6	#6	STR.	12'-1"	109
A109	6	#6	STR.	9'-11"	89
A110	6	#6	STR.	7'-9"	70
A111	6	#6	STR.	5'-8"	51
A112	6	#6	STR.	3'-6"	32
A113	6	#6	STR.	1'-4"	12
A250	92	#6	STR.	12'-4"	1704
A251	3	#6	STR.	10'-3"	46
A252	3	#6	STR.	8'-1"	36
A253	3	#6	STR.	5'-11"	27
A254	3	#6	STR.	3'-10"	17
A255	3	#6	STR.	10'-9"	48
A256	3	#6	STR.	8'-7"	39
A257	3	#6	STR.	6'-5"	29
A258	3	#6	STR.	4'-4"	20
A259	3	#6	STR.	2'-2"	10
A300	71	#6	STR.	27'-8"	2950
A301	2	#6	STR.	27'-1"	81
A302	6	#6	STR.	24'-11"	225
A303	6	#6	STR.	22'-9"	205
A304	6	#6	STR.	20'-8"	186
A305	6	#6	STR.	18'-6"	167
A306	6	#6	STR.	16'-4"	147
A307	6	#6	STR.	14'-3"	128
A308	6	#6	STR.	12'-1"	109
A309	6	#6	STR.	9'-11"	89
A310	6	#6	STR.	7'-9"	70
A311	6	#6	STR.	5'-8"	51
A312	6	#6	STR.	3'-6"	32
A313	6	#6	STR.	1'-4"	12

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A450	92	#6	STR.	12'-4"	1704
A451	3	#6	STR.	10'-3"	46
A452	3	#6	STR.	8'-1"	36
A453	3	#6	STR.	5'-11"	27
A454	3	#6	STR.	3'-10"	17
A455	3	#6	STR.	10'-9"	48
A456	3	#6	STR.	8'-7"	39
A457	3	#6	STR.	6'-5"	29
A458	3	#6	STR.	4'-4"	20
A459	3	#6	STR.	2'-2"	10
B1	110	#4	STR.	9'-7"	704
C1	128	#4	STR.	28'-9"	2458
D1	10	#6	STR.	3'-0"	45
G1	8	#5	STR.	33'-9"	282
S1	12	#6	STR.	33'-9"	608
S3	12	#6	STR.	15'-0"	270

BAR TYPE



BAR DIMENSIONS ARE OUT TO OUT

SPLICE LENGTH CHART

SIZE	SPLICE LENGTH
#4	2'-5"
#5	3'-0"
#6	3'-7"
#7	4'-2"
#8	4'-9"

STAGE I REINFORCING STEEL:	11,763 LBS.
STAGE I BARREL CLASS A CONCRETE:	62.4 C.Y.
STAGE I SILL CLASS A CONCRETE:	1.0 C.Y.
STAGE II REINFORCING STEEL:	19,488 LBS.
STAGE II BARREL CLASS A CONCRETE:	137.8 C.Y.
STAGE II SILL CLASS A CONCRETE:	1.9 C.Y.
TOTAL REINFORCING STEEL:	31,251 LBS.
TOTAL BARREL CLASS A CONCRETE:	200.2 C.Y.
TOTAL SILL CLASS A CONCRETE:	2.9 C.Y.

PROJECT NO. HL-0013

BUNCOMBE COUNTY

STATION: 13+21.00 -L-

SHEET 6 OF 10

Signed by:
Ryan T Shipman
13D872AE06E443A...
RYAN TYLER SHIPMAN
NORTH CAROLINA
4/1/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE BARREL
13'-0" X 7"-0" RCBC
ON 9TH STREET BETWEEN
SR-2495 AND NC-9

Johnson, Mirmiran, & Thompson Inc.
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License No: C-3097

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SHEET NO. C-06

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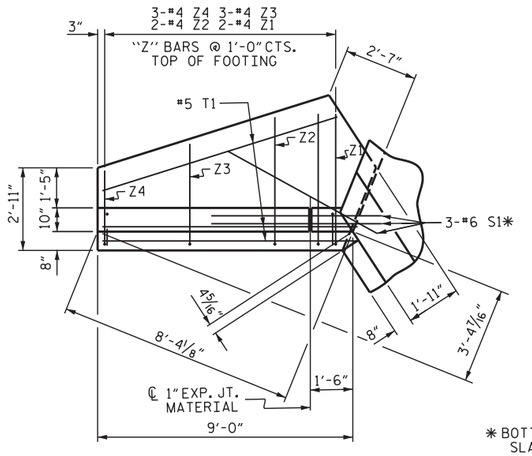
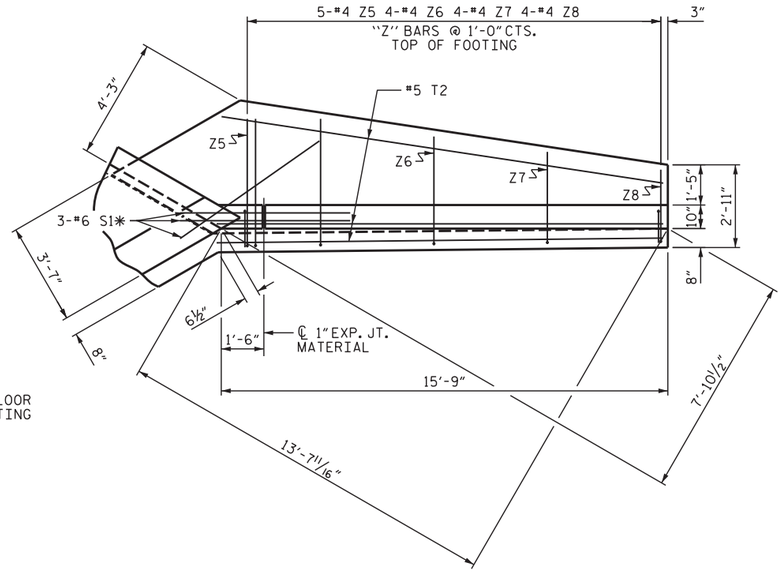
DGN: pw://jmt-pw.bentley.com:jmt-pw-01/Documents/Projects/2022/22-V034201-002/Design/Structures/Plans/410_011_HL0013_SMU_CU_S06_100522.dgn
TIME: 1/8/2026



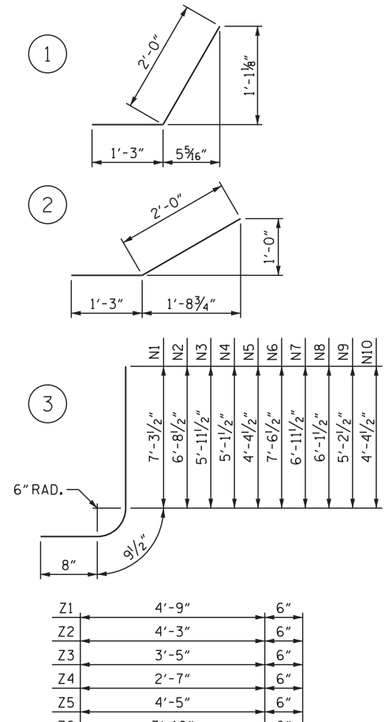
PLAN W2

* BOTTOM OF FLOOR SLAB & FOOTING



PLAN W1

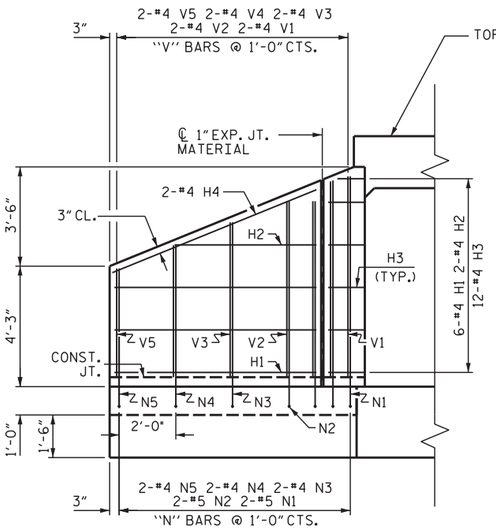
BAR TYPES



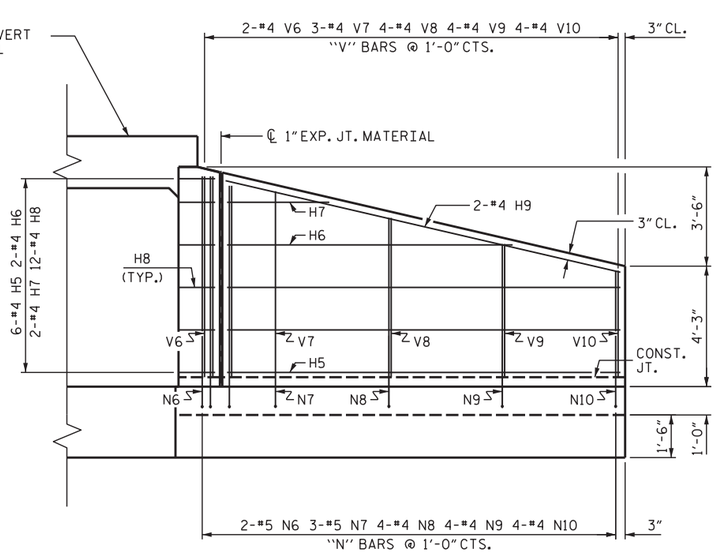
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

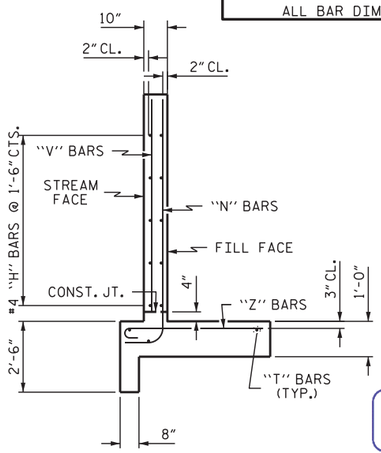
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	6	#4	STR	7'-1"	28
H2	2	#4	STR	5'-1"	7
H3	12	#4	1	3'-3"	26
H4	2	#4	STR	7'-7"	10
H5	6	#4	STR	14'-0"	56
H6	2	#4	STR	10'-3"	14
H7	2	#4	STR	3'-6"	5
H8	12	#4	2	3'-3"	26
H9	2	#4	STR	14'-2"	19
N1	2	#4	3	8'-9"	12
N2	2	#4	3	8'-2"	11
N3	2	#4	3	7'-5"	10
N4	2	#4	3	6'-7"	9
N5	2	#4	3	5'-10"	8
N6	2	#4	3	9'-0"	12
N7	3	#4	3	8'-5"	17
N8	4	#4	3	7'-7"	20
N9	4	#4	3	6'-8"	18
N10	4	#4	3	5'-10"	16
S1	6	#6	STR	6'-0"	54
T1	3	#5	STR	9'-0"	28
T2	3	#5	STR	15'-9"	49
V1	2	#4	STR	6'-9"	9
V2	2	#4	STR	6'-2"	8
V3	2	#4	STR	5'-4"	7
V4	2	#4	STR	4'-7"	6
V5	2	#4	STR	3'-10"	5
V6	2	#4	STR	6'-11"	9
V7	3	#4	STR	6'-5"	13
V8	4	#4	STR	5'-6"	15
V9	4	#4	STR	4'-8"	12
V10	4	#4	STR	3'-9"	10
Z1	2	#4	4	5'-3"	7
Z2	2	#4	4	4'-9"	6
Z3	3	#4	4	3'-11"	8
Z4	3	#4	4	3'-1"	6
Z5	5	#4	4	4'-11"	17
Z6	4	#4	4	4'-4"	12
Z7	4	#4	4	3'-8"	10
Z8	4	#4	4	3'-1"	8
*REINFORCING STEEL FOR 2 WINGS					623 LBS
*CLASS A CONCRETE					
2 WINGS					9.9 CY
1 HEADWALLS					1.6 CY
1 END CURTAIN WALLS					2.1 CY
TOTAL					13.6 CY



ELEVATION W2



ELEVATION W1



TYPICAL WING SECTION

*NOTE:

QUANTITIES SHOWN IN BILL OF MATERIAL ARE FOR BOTH WING WALLS W1 AND W2. WING WALL W1 SHALL BE BUILT IN STAGE I CONSTRUCTION AND WING WALL W2 SHALL BE BUILT IN STAGE II CONSTRUCTION.

PROJECT NO. HL-0013

BUNCOMBE COUNTY

STATION: 13+21.00 -L-

SHEET 7 OF 10

Signed by: Ryan T Shipman
13D872AE06E443A...
4/1/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

INLET WINGWALLS FOR 13'-0" X 7'-0" RCBC 55° SKEW

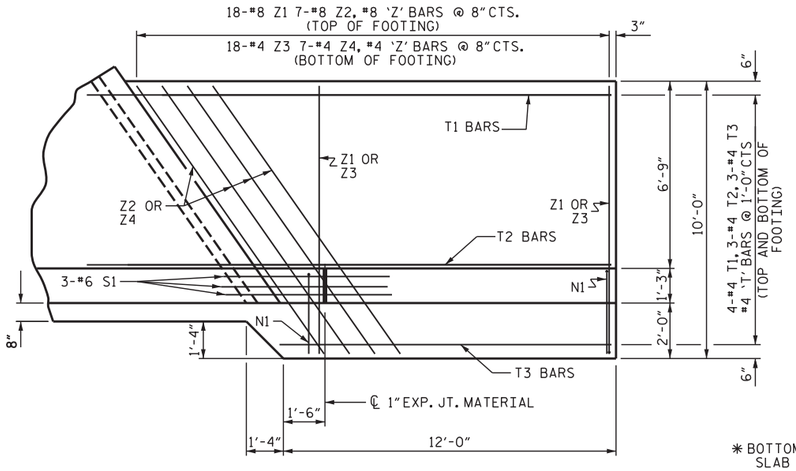
Johnson, Mirmiran, & Thompson Inc.
1318 Patton Ave Suite F,
Asheville, NC, 28806
License No: C-3097

ENG. OF RECORD.: JEB DATE: 11/2024
DWN. BY: JA DATE: 02/2025
CHKD. BY: RTS DATE: 02/2025

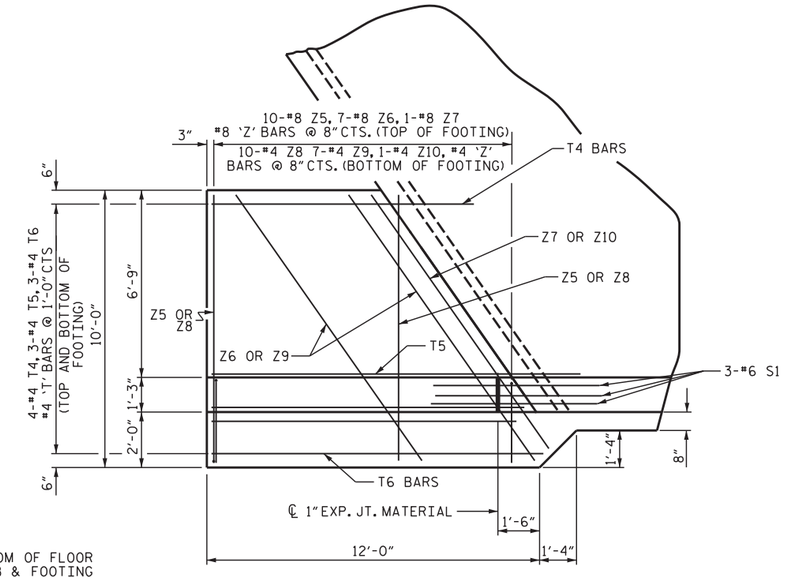
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. C-07
TOTAL SHEETS 10

awilliams
DGN: pw://jmt-pw.bentley.com:jmt-pw-01/Documents/Projects/2022/22-V034201-002/Design/Structures/Plans/410_013_HL0013_SMU_CU_S07_I00522.dgn
TIME: 11/8/2026



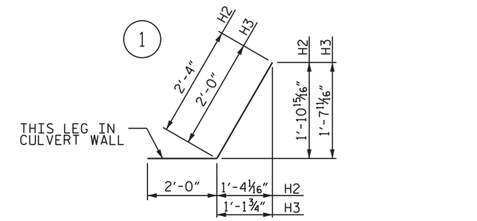
PLAN W3

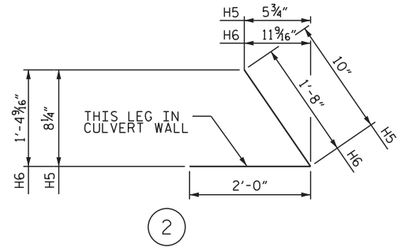


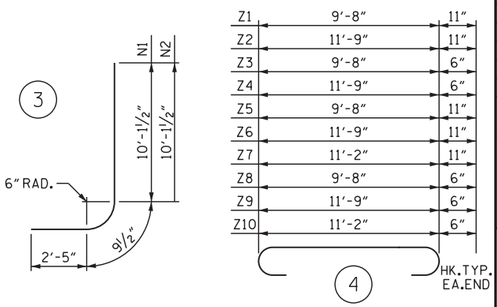
PLAN W4

✱BOTTOM OF FLOOR SLAB & FOOTING

BAR TYPES







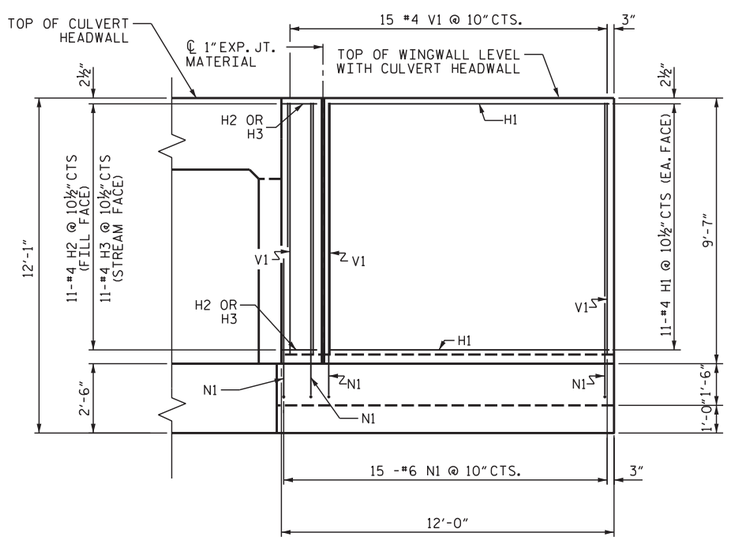
Z1	9'-8" 11"
Z2	11'-9" 11"
Z3	9'-8" 6"
Z4	11'-9" 6"
Z5	9'-8" 11"
Z6	11'-9" 11"
Z7	11'-2" 11"
Z8	9'-8" 6"
Z9	11'-9" 6"
Z10	11'-2" 6"

ALL BAR DIMENSIONS ARE OUT TO OUT.

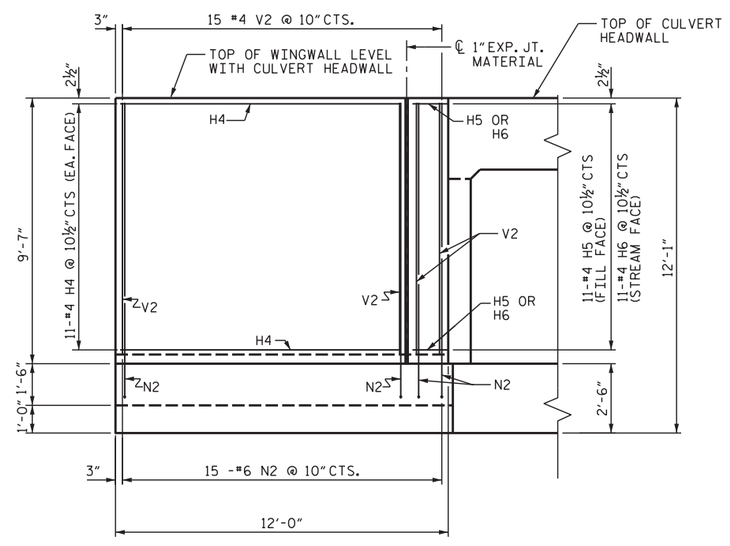
BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	22	#4	STR	10'-1"	148
H2	11	#4	1	4'-4"	32
H3	11	#4	1	4'-0"	29
H4	22	#4	STR	10'-1"	148
H5	11	#4	2	2'-10"	21
H6	11	#4	2	3'-8"	27
N1	15	#6	1	13'-4"	300
N2	15	#6	1	13'-4"	300
S1	6	#6	STR	6'-0"	54
T1	4	#4	STR	19'-7"	53
T2	3	#4	STR	17'-6"	35
T3	3	#4	STR	12'-1"	24
T4	4	#4	STR	11'-3"	30
T5	3	#4	STR	13'-4"	27
T6	3	#4	STR	12'-1"	24
V1	15	#4	STR	8'-11"	89
V2	15	#4	STR	8'-11"	89
Z1	18	#8	4	11'-6"	553
Z2	7	#8	4	13'-7"	254
Z3	18	#4	4	10'-8"	128
Z4	7	#4	4	12'-9"	60
Z5	10	#8	4	11'-6"	307
Z6	7	#8	4	13'-7"	254
Z7	1	#8	4	13'-0"	35
Z8	10	#4	4	10'-8"	71
Z9	7	#4	4	12'-9"	60
Z10	1	#4	4	12'-2"	8

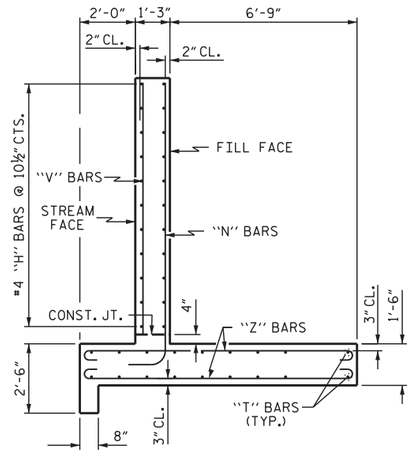
✱REINFORCING STEEL FOR 2 WINGS	3160 LBS
✱CLASS A CONCRETE	
2 WINGS	24.1 CY
1 HEADWALLS	1.6 CY
1 END CURTAIN WALLS	2.2 CY
TOTAL	27.9 CY



ELEVATION W3



ELEVATION W4



TYPICAL WING SECTION

✱ NOTE:

QUANTITIES SHOWN IN BILL OF MATERIAL ARE FOR BOTH WING WALLS W3 AND W4. WING WALL W4 SHALL BE BUILT IN STAGE I CONSTRUCTION AND WING WALL W3 SHALL BE BUILT IN STAGE II CONSTRUCTION.

Signed by: Ryan T Shipman
13D872AE06E443A...
ORIGINAL IN TYLER SHIPMAN
4/1/2026

PROJECT NO. HL-0013

BUNCOMBE COUNTY

STATION: 13+21.00 -L-

SHEET 8 OF 10

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
PRELIMINARY

OUTLET WINGWALLS FOR 13"-0' X 7'-0" RCBC 55° SKEW

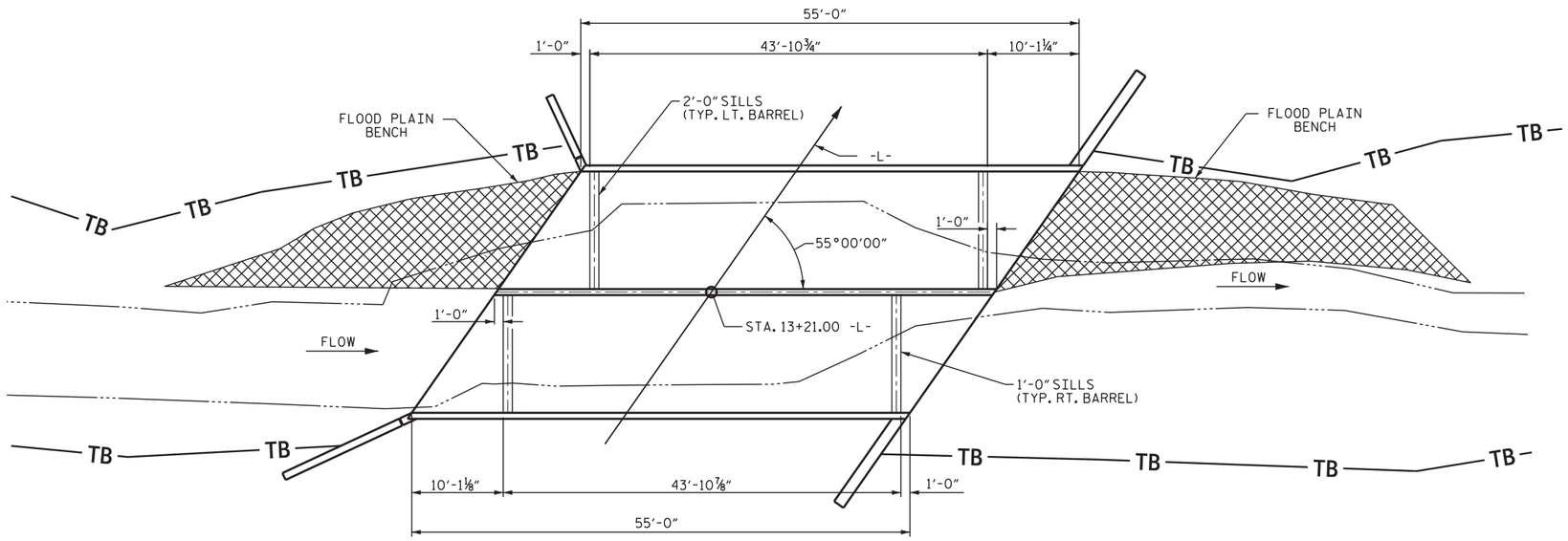
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

JMT Johnson, Mirmiran, & Thompson Inc.
1318 Patton Ave Suite F,
Asheville, NC, 28806
License No: C-3097

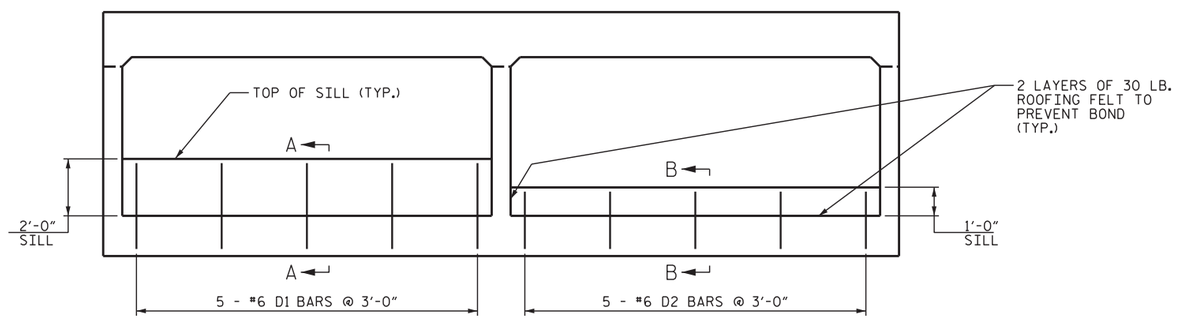
ENG. OF RECORD.: JEB DATE: 11/2024
DWN. BY: JA DATE: 02/2025
CHKD. BY: RTS DATE: 02/2025

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-08
1			3			TOTAL SHEETS
2			4			10

awilliams
DGN: pw://jmt-pw.bentley.com:jmt-pw-01/Documents/Projects/2022/22-V03420I-002/Design/Structures/Plans/410_015_HL0013_SMU_CU_S08_I00522.dgn
TIME: 1/8/2026

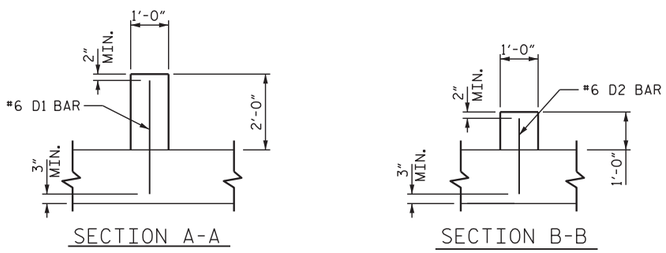


SILL LOCATION SKETCH

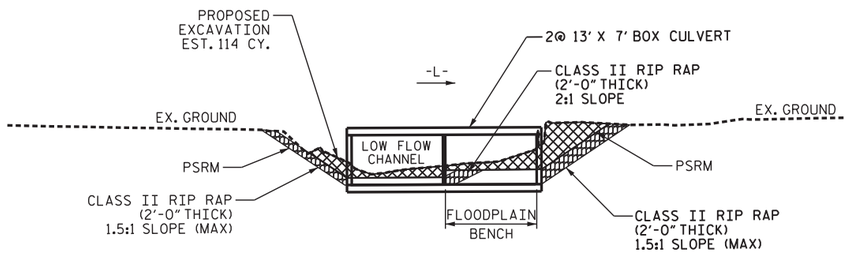


END ELEVATION

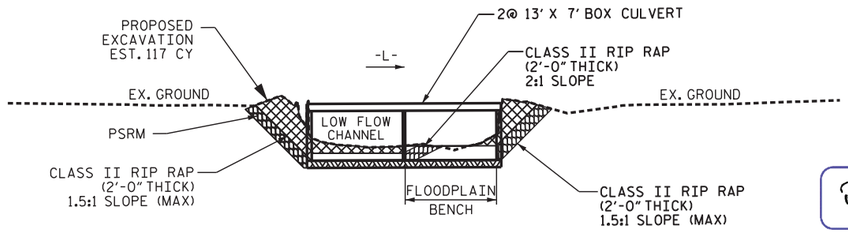
(ILOOKING DOWNSTREAM)



SECTION THROUGH STILL



INLET CHANNEL & FLOODPLAIN BENCH PROFILE



OUTLET CHANNEL & FLOODPLAIN BENCH PROFILE

NATIVE MATERIAL SPECIFICATION FOR BACKFILLING NOTE

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

SILLS ARE TO BE 1 FT. AND 2 FT. TALL, CAST SEPARATELY AND ATTACHED BY DOWELS,

DO NOT SET ELEVATION OF HIGH SILL ABOVE BANK FULL.

NUMBER OF SILLS DETERMINED BY THE ENGINEER.

Signed by: Ryan T Shipman
13D872AE06E443A...
RYAN TYLER SHIPMAN
4/1/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. HL-0013

BUNCOMBE COUNTY

STATION: 13+21.00 -L-

SHEET 9 OF 10

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE BARREL 13'-0" X 7"-0" RCBC ON 9TH STREET BETWEEN SR-2495 AND NC-9

Johnson, Mirmiran, & Thompson Inc.
1318 Patton Ave Suite F,
Asheville, NC, 28806
License No: C-3097

ENG. OF RECORD.: JEB DATE: 11/2024
DWN. BY: JA DATE: 02/2025
CHKD. BY: RTS DATE: 02/2025

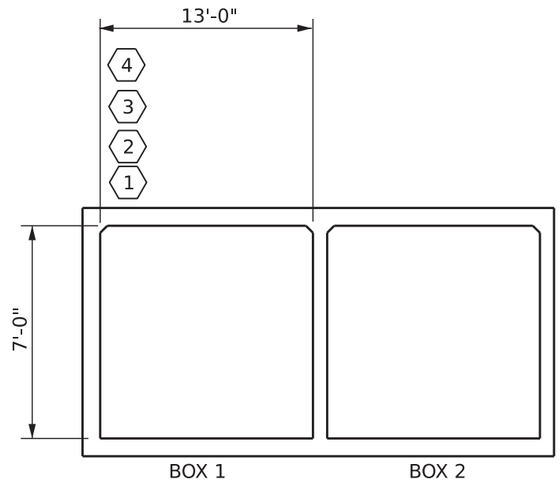
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-09
1			3			TOTAL SHEETS
2			4			10

awilliams
DGN: pw://jmt-pw.bentley.com:jmt-pw-01/Documents/Projects/2022/22-V03420I-002/Design/Structures/Plans/410_017_HL0013_SMU_CU_S09_I00522.dgn
TIME: 1:8:2026

8/26/21

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

LOAD TYPE		VEHICLE	WEIGHT (W) (TONS)	(#) CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE									COMMENT NUMBER
							LIVE-LOAD FACTORS (γ LL)	MOMENT				SHEAR				
								RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD		HL-93 (INVENTORY)	N/A	(1)	1.10	--	1.75	2.50	1	TOP SLAB	7.17'	1.10	1	TOP SLAB	0.67'	
		HL-93 (OPERATING)	N/A		1.42	--	1.35	3.24	1	TOP SLAB	7.17'	1.42	1	TOP SLAB	0.67'	
		HS-20 (INVENTORY)	36.00	(2)	1.37	49.320	1.75	2.96	1	TOP SLAB	7.17'	1.37	1	TOP SLAB	0.67'	
		HS-20 (OPERATING)	36.00		1.77	63.720	1.35	3.84	1	TOP SLAB	7.17'	1.77	1	TOP SLAB	0.67'	
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.50		2.82	38.070	1.40	3.98	1	EXT WALL	8.50'	2.82	1	TOP SLAB	0.67'	
		SNGARBS2	20.00		2.59	51.800	1.40	3.88	1	EXT WALL	8.50'	2.59	1	TOP SLAB	0.67'	
		SNAGRIS2	22.00		2.98	65.560	1.40	3.98	1	EXT WALL	8.50'	2.98	1	TOP SLAB	0.67'	
		SNCOTTS3	27.25	(3)	1.37	37.333	1.40	2.94	1	EXT WALL	8.50'	1.37	1	TOP SLAB	0.67'	
		SNAGGRS4	34.93		1.67	58.325	1.40	3.09	1	EXT WALL	8.50'	1.67	1	TOP SLAB	0.67'	
		SNS5A	35.55		1.53	54.392	1.40	3.08	1	EXT WALL	8.50'	1.53	1	TOP SLAB	0.67'	
		SNS6A	39.95		1.53	61.124	1.40	3.08	1	EXT WALL	8.50'	1.53	1	TOP SLAB	0.67'	
		SNS7B	42.00		1.62	68.040	1.40	3.18	1	EXT WALL	8.50'	1.62	1	TOP SLAB	0.67'	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.00		2.20	72.600	1.40	3.86	1	EXT WALL	0.71'	2.20	1	BOTTOM SLAB	13.67'	
		TNT4A	33.08		1.63	53.912	1.40	3.17	1	EXT WALL	8.50'	1.63	1	TOP SLAB	0.67'	
		TNT6A	41.60		1.59	66.144	1.40	3.29	1	EXT WALL	8.50'	1.59	1	TOP SLAB	0.67'	
		TNT7A	42.00		1.60	67.200	1.40	3.20	1	EXT WALL	8.50'	1.60	1	TOP SLAB	0.67'	
		TNT7B	42.00		1.57	65.940	1.40	3.14	1	EXT WALL	8.50'	1.57	1	TOP SLAB	0.67'	
		TNAGRIT4	43.00		1.56	67.080	1.40	3.06	1	BOTTOM SLAB	13.67'	1.56	1	BOTTOM SLAB	13.67'	
		TNAGT5A	45.00		1.66	74.700	1.40	3.22	1	BOTTOM SLAB	13.67'	1.66	1	TOP SLAB	0.67'	
		TNAGT5B	45.00		1.55	69.750	1.40	3.07	1	BOTTOM SLAB	13.67'	1.55	1	BOTTOM SLAB	13.67'	
EMERGENCY VEHICLE (EV)		EV2	28.75		1.64	47.150	1.30	3.45	1	EXT WALL	8.50'	1.64	1	TOP SLAB	0.67'	
		EV3	43.00	(4)	1.14	49.020	1.30	2.56	1	TOP SLAB	7.17'	1.14	1	TOP SLAB	0.67'	



LRFR SUMMARY

(LOOKING DOWNSTREAM)

LOAD FACTORS:

DESIGN LOAD RATING FACTORS

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

NOTES:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATES.

COMMENTS:

1.

2.

3.

4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING * *

(4) EMERGENCY VEHICLE LOAD RATING * *

* * SEE CHART FOR VEHICLE TYPE

PROJECT NO. HL-0013

BUNCOMBE COUNTY

STATION: 13+21.00 -L-

SHEET 10 OF 10

Signed by: Ryan T Shipman
13D872AE06E443A...
4/1/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE BARREL
13'-0" X 7"-0" RCBC
ON 9TH STREET BETWEEN
SR-2495 AND NC-9

ASSEMBLED BY : JA	DATE : 02/25		
CHECKED BY : RTS	DATE : 02/25		
DRAWN BY : WMC	7/11	REV. 10/1/11	MAA/GM
CHECKED BY : GM	7/11	REV. 12/17	MAA/THC
		REV. 04/23	BNB/AAI

Johnson, Mirmiran, & Thompson Inc.
1318 Patton Ave Suite F,
Asheville, NC, 28806
License No: C-3097

ENG. OF RECORD.: JEB	DATE: 11/2024
DWN. BY: JA	DATE: 02/2025
CHKD. BY: RTS	DATE: 02/2025

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

awilliams
DGN: pw://jmt-pw.bentley.com:jmt-pw-01/Documents/Projects/2022/22-V03420I-002/Design/Structures/Plans/410_019_HL0013_SMU_CU_S10_I00522.dgn
TIME: 1/8/2026

8/26/21

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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