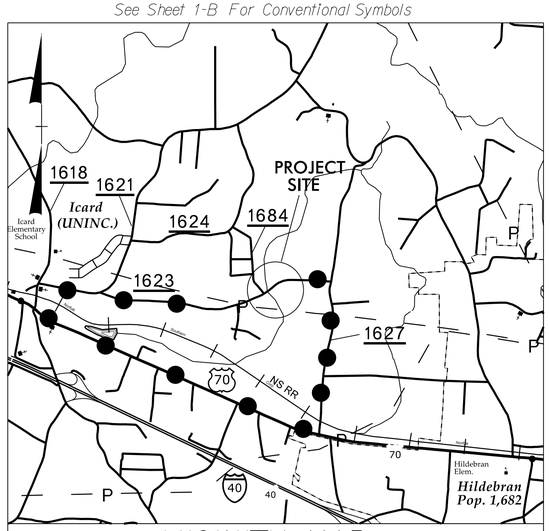
09/08/99

STATE PROJECT: 17BP.13.R.153

CONTRACT: DM00325

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



VICINITY MAP

DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BURKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.13.R.153	1	

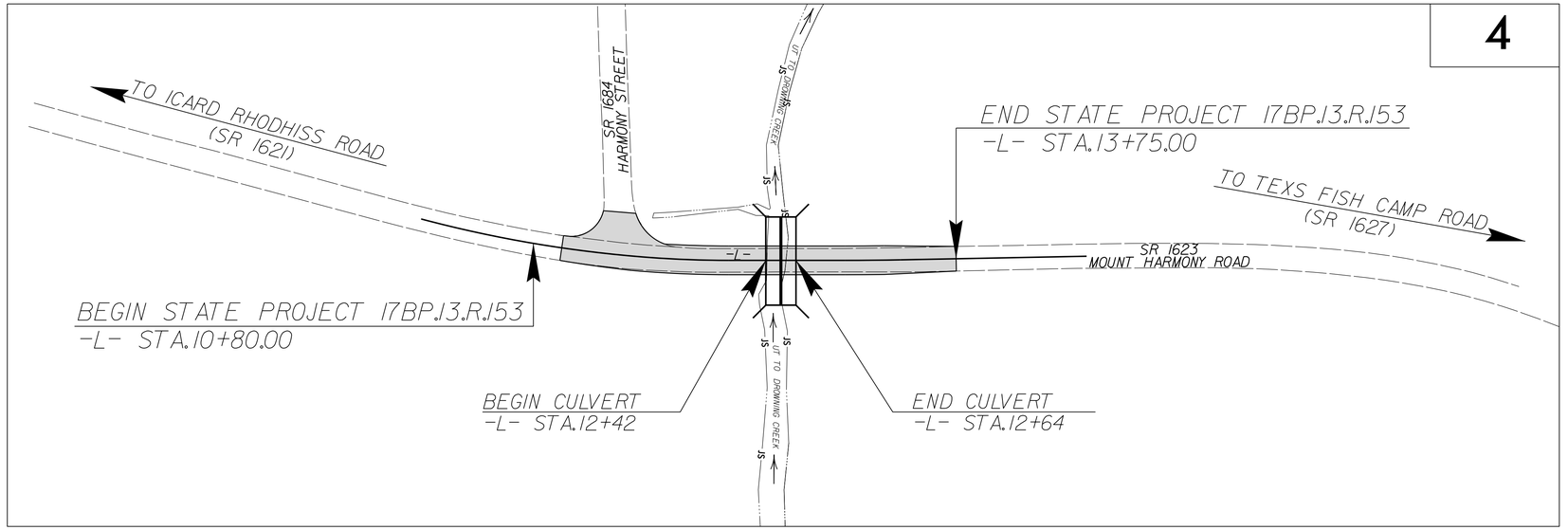
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.13.PE.153		PE
17BP.13.ROW.153		R/W & UTIL
17BP.13.R.153		CON

LOCATION: REPLACE BRIDGE NO. 209 OVER UT TO DROWNING CREEK ON SR 1623 (MOUNT HARMONY RD.)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND CULVERT

NAD 83 / NA 2011

4



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2017 = 950

V = 35 MPH

FUNC CLASS = MAJOR COLLECTOR

SUB – REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY STATE PROJECT 17BP.13.R.153 = .052 MILES

LENGTH OF STRUCTURE STATE PROJECT 17BP.13.R.153 = .004 MILES

TOTAL LENGTH OF STATE PROJECT 17BP.13.R.153 = .056 MILES

Prepared In the Office of:

KCI Associates of N.C., P.A.
4505 Falls of Neuse Road, Suite 400
Raleigh, NC 27609
Phone (919) 783-9214
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http://www.kci.com

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: APRIL 2, 2021

LETTING DATE: JANUARY 5, 2022

NCDOT CONTACT: MIKE CALLOWAY, *NCDOT DIVISION 13*

Plans Prepared For:

NCDOT DIVISION 13
55 Orange Street
Asheville, NC 28801

CHARLES L. FLOWE, P.E.
KCI ROADWAY PRACTICE LEAD

RONALD D. ALLEN, P.E.
KCI ROADWAY PROJECT MANAGER

HYDRAULICS ENGINEER

10/27/2021

DocuSigned by: Joshua G Dalton
SIGNATURE: P.E.

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

ROADWAY DESIGN ENGINEER

10/27/2021

DocuSigned by: Ronald (Ron) D. Allen, PE, CPM
SIGNATURE: P.E.

NORTH CAROLINA PROFESSIONAL SEAL 015356 ENGINEER RONALD D. ALLEN

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

25-OCT-2021 12:32
M:\2016\2216019\46.09 NCDOT Division 13 Bridge Replacement\VA_17BP.13.R.153_Burke_110209\Roadway\Proj\110209_Rdy_tsh.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.153	1A

ROADWAY DESIGN ENGINEER
10/27/2021

NORTH CAROLINA PROFESSIONAL SEAL 015356 ENGINEER RONALD D. ALLEN

DocuSigned by:
Ronald (Ron) D. Allen, PE, CPM
B5CDFCC3924745D...

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1	TYPICAL SECTION, PAVEMENT SCHEDULE, WEDGING DETAIL, PROFILE KEY-IN DETAIL AND SHOULDER BERM GUTTER DETAIL
3B-1	SUMMARY OF EARTHWORK, SUMMARY OF SHOULDER BERM GUTTER, SUMMARY OF PAVEMENT REMOVAL, AND SUMMARY OF GUARDRAIL
3D-1	SUMMARY OF DRAINAGE QUANTITIES
4	PLAN SHEET
5	PROFILE SHEET
RW01	TITLE SHEET FOR RW SERIES SHEETS
RW02C-1 TO RW02C-2	SURVEY CONTROL SHEETS
RW02D-1	PROPOSED ALIGNMENT CONTROL SHEET
RW03E-1	PERMANENT EASEMENT CONTROL SHEET
RW04	RIGHT OF WAY SHEET
TCP-1 TO TCP-4	TRANSPORTATION MANAGEMENT PLANS (6 SHEETS)
PMP-1 TO PMP-2	PAVEMENT MARKING PLANS
EC-1 TO EC-5	EROSION CONTROL PLANS (7 SHEETS)
UO-1 TO UO-2	UTILITIES BY OTHERS PLANS
UC-1 TO UC-5	UTILITY CONSTRUCTION PLANS (7 SHEETS)
X-0	CROSS SECTION SUMMARY SHEET
X-1 TO X-3	-L- CROSS SECTIONS
C-1 TO C-5	CULVERT PLANS (6 SHEETS)

GENERAL NOTES:

2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01

SIDE ROADS:

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

SUBSURFACE DRAINS:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE Duke Energy (Power), Centurylink (Communications), Charter (Cable), and Icard Township Water Corporation (Water)

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

RIGHT-OF-WAY MARKERS:

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

2018 ROADWAY ENGLISH STANDARD DRAWINGS

EFF. 01-16-2018
REV.

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
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
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
866.01	Chain Link Fence - 4', 5' and 6' High Fence
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3,RJ53	1-B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale **S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Computed Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — W
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent Easement Pin and Cap
- New Permanent Easement Pin and Cap
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line — RW
- New Right of Way Line with Pin and Cap — RW
- New Right of Way Line with Concrete or Granite R/W Marker — RW
- New Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- New Control of Access — CA
- Existing Easement Line — E
- New Temporary Construction Easement — E
- New Temporary Drainage Easement — TDE
- New Permanent Drainage Easement — PDE
- New Permanent Drainage / Utility Easement — DUE
- New Permanent Utility Easement — PUE
- New Temporary Utility Easement — TUE
- New Aerial Utility Easement — AUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

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

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- U/G Power Line LOS B (S.U.E.*) — P
- U/G Power Line LOS C (S.U.E.*) — P
- U/G Power Line LOS D (S.U.E.*) — P

TELEPHONE:

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

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E*) — W
- U/G Water Line LOS C (S.U.E*) — W
- U/G Water Line LOS D (S.U.E*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- U/G TV Cable LOS B (S.U.E.*) — TV
- U/G TV Cable LOS C (S.U.E.*) — TV
- U/G TV Cable LOS D (S.U.E.*) — TV
- U/G Fiber Optic Cable LOS B (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS C (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS D (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) — G
- U/G Gas Line LOS C (S.U.E.*) — G
- U/G Gas Line LOS D (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS
- SS Forced Main Line LOS D (S.U.E.*) — FSS

MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.R.153	2A-1
ROADWAY DESIGN ENGINEER 10/27/2021 SEAL 015356 RONALD D. ALLEN Ronald (Ron) D. Allen, PE	PAVEMENT DESIGN ENGINEER 10/28/2021 SEAL 022896 CLARK S. MORRISON Clark S. Morrison

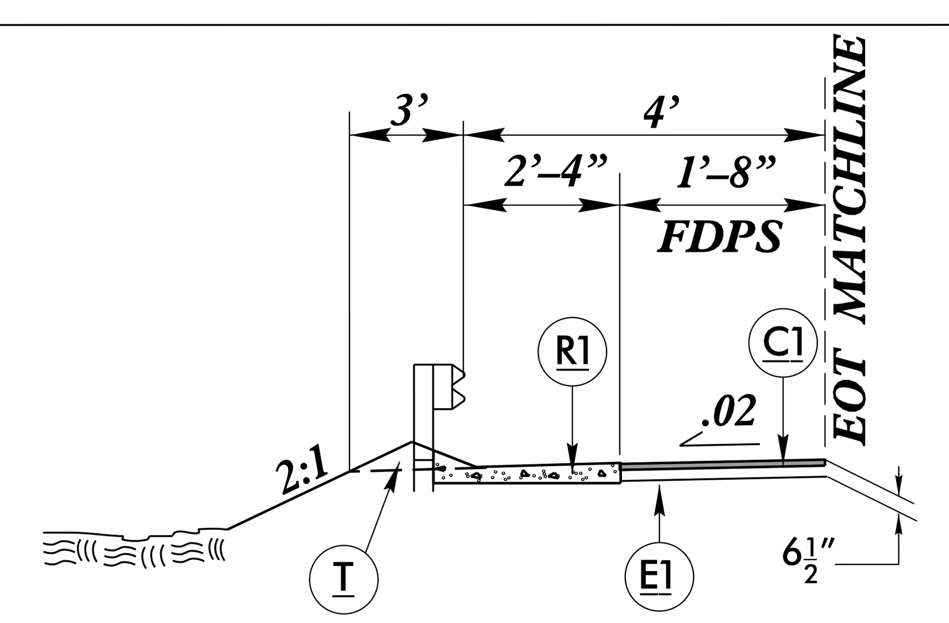
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

KCI http://www.kci.com Engineers • Planners • Scientists • Construction Managers 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Phone (919) 783-9214 • Fax (919) 783-9266

FINAL PAVEMENT DESIGN

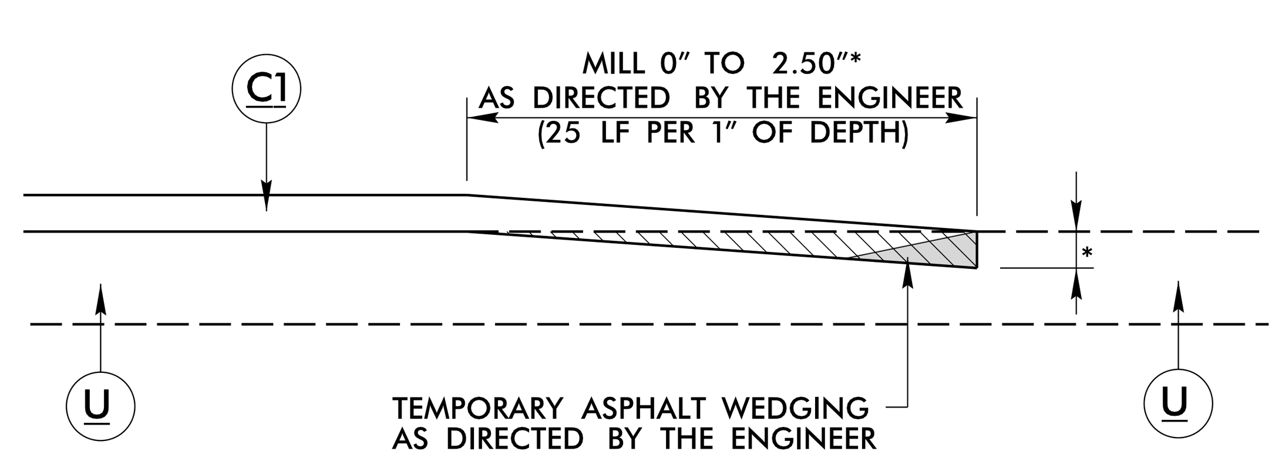
C1	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
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.
R1	SHOULDER BERM GUTTER
T_	EARTH MATERIAL.
U_	EXISTING PAVEMENT.

ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.



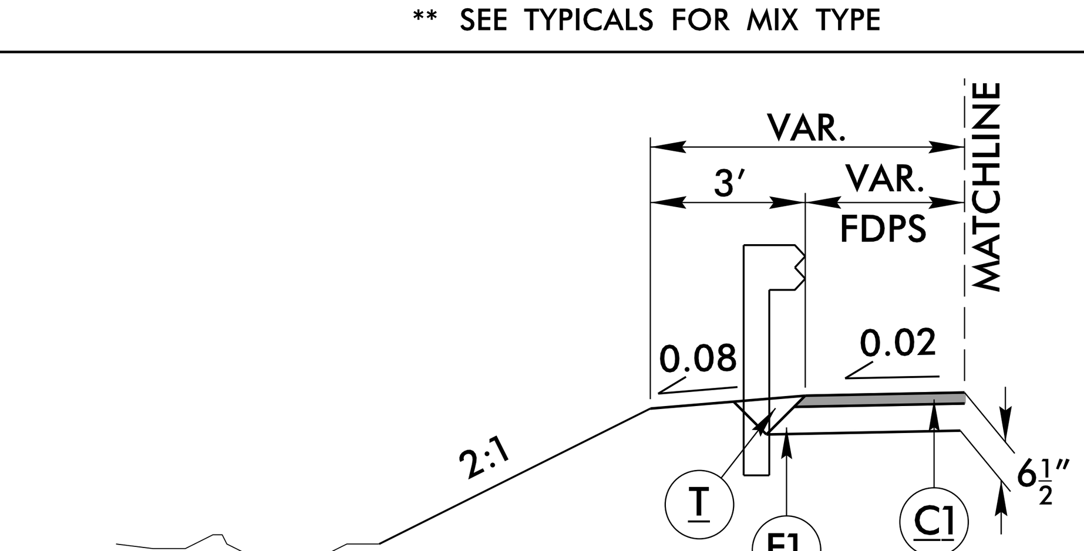
SHOULDER BERM GUTTER DETAIL 1

PROFILE KEY-IN DETAIL



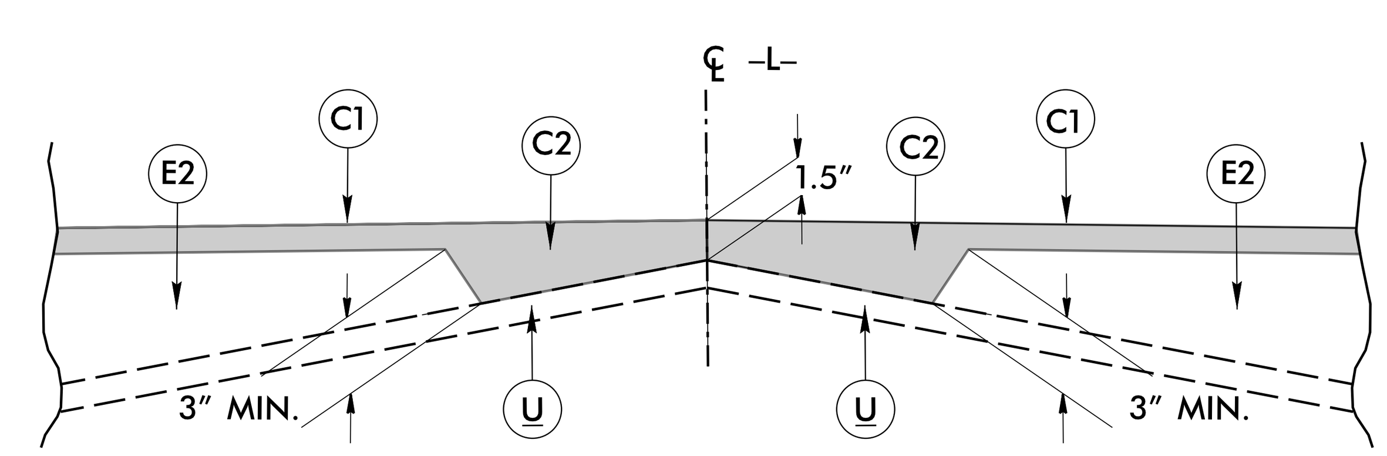
* MILL DEPTH AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER

** SEE TYPICALS FOR MIX TYPE

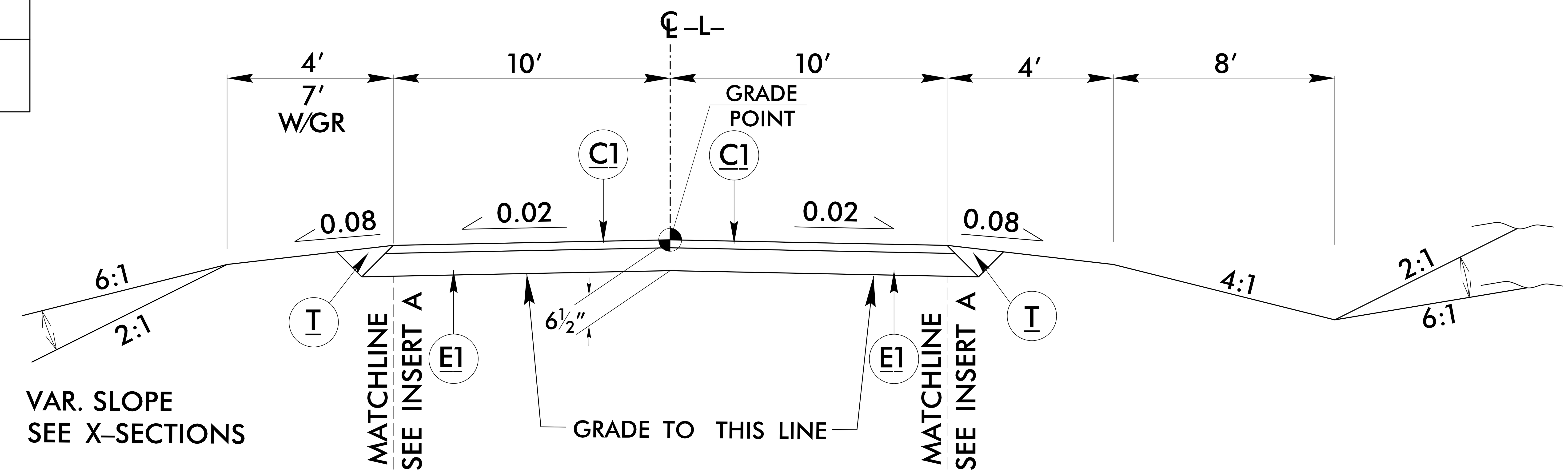


INSET A

USE IN GUARDRAIL LOCATIONS



Detail Showing Method of Wedging



ROADWAY TYPICAL SECTION

-L- STA. 11+00.00 TO STA. 13+75.00

6/2/99

10-MAY-2021 14:48 M:\2016\22160946.09 NCDOT Division 13 Bridge Replacements\A_17BP.13.R.153_Burke_110209\Roadway\Proj\110209_Rdy_typ.dgn $$$$USERNAME$$$$

COMPUTED BY: T. KRAUSS DATE: 4/14/2021
CHECKED BY: R. ALLEN DATE: 5/10/2021

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.R.153	3B-1

SUMMARY OF EARTHWORK

STATION	STATION	UNCL. EXCAV.	EMBANK. +15%	BORROW	WASTE
11+00.00	13+75.00	104	222	118	
TOTALS:		104	222	118	
PROJECT TOTALS:		104	222	118	
EST 5% TO REPLACE TOPSOIL ON BORROW PIT				6	
GRAND TOTALS:		104		124	
SAY:		120		140	

EST. UNDERCUT PER DIVISION = 100 CY

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

SUMMARY OF REMOVAL OF EXISTING ASPHALT PAVEMENT

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD^2
–L–	11+00	13+75	CL	519
			TOTAL:	519
			SAY:	520

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
–L–	11+66	12+89	123.0
		TOTAL:	123.0
		SAY:	125.0

RIP RAP, FABRIC, & DDE

DDE – DRAINAGE DITCH EXCAVATION
GT – GEOTEXTILE FABRIC
CFM – COIR FIBER MAT

LINE	STATION	STATION	LOC	CLASS & TONS I	CLASS & TONS II	CLASS & TONS B	GT (SY)	DDE (CY)	CFM (SY)	DETAIL	COMMENTS
–L–	12+00	12+40	LT		94		127	30		4	
–L–	12+50		RT	70	6		120		35	1	
–L–	12+50		LT	50	10		90		35	2	
–L–	12+75	13+60	RT			33	96			3	
–L–	10+98	11+13	LT	40			70				36" DRAINAGE PIPE OUTLET
TOTALS				160	110	33	503	30	70		
SAY				160	110	33	505	30	70		

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS XI MOD	XI	GRAU 350	M-350	XIII	TYPE III	TYPE III SHOP CURVE	GREU TL-2	AT-1	IMPACT ATTENUATOR TYPE 350 EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
–L–	12+03	13+18	RT	102.5'	12.50'		12+42.50	12+63.50	4'	0'–4'	0	25'	0	0.5'								1	1							
–L–	11+60	13+19	LT	146.5'	12.50'		12+63.50	12+42.50	4'	0'–4'	25'	0	0.5'	0								1	1							
			SUBTOTAL	249.00'	25.00'																									
		LESS ANCHOR DEDUCTIONS:																												
		GREU TL-2	2 @ 25.00' =	–50.00'																										
		AT-1	2 @ 6.25' =	–12.50'																										
		ANCHOR DEDUCTION TOTAL:		–62.50'																										
			PROJECT TOTAL	186.5'	25.00'																	2	2							
			SAY	187.5'	25.00'																	2	2							
		ADDITIONAL GUARDRAIL POST =		6 EA																										

4/04/06

COMPUTED BY: B. ELAM DATE: 12/4/2019
CHECKED BY: DATE:

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.153	3D-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

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

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC)												C.S. PIPE						
SIZE								12"	15"	18"	24"	30"	36"	42"	48"					12"	15"	18"	24"	36"	42"	48"
THICKNESS OR GAUGE		FROM	TO													DO NOT USE RCP	DO NOT USE PVC	DO NOT USE CAAP	DO NOT USE HDPE	.064	.064	.064	.064	.079	.109	.109
-L- 11+40	LT	401			1068.5	1065.2																				
-L- 12+20	LT	402		1071.5																						
		402	403		1068.7	1060.6			28'							X										
-L- 13+34	RT	404							28'																	
TOTAL									56'																	

STATION	R.C. PIPE (CLASS III)							R.C. PIPE (CLASS IV)								**" R. C. PIPE (CLASS V)	**" R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	**" R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS.	
SIZE	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"						R.C.P.	C.S.P.
-L- 11+40													52'								4.5	
-L- 12+20																						
-L- 13+34																						
TOTAL													52'								4.5	

STATION	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	* TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. *FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G		CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	T.B.D.I. STD. 840.35	15" DRAINAGE PIPE ELBOW	CONC. COLLARS CL. "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.	REMARKS
-L- 11+40																					REMOVE EXISTING 24" CMP
-L- 12+20	1														1	1					
																	2				
-L- 13+34																					
TOTAL	1														1	1	2				

ABBREVIATIONS

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

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

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.RJ53	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — 10/27/2021 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 015356 RONALD D. ALLEN — Ronald D. Allen, PE

HYDRAULICS ENGINEER — 10/27/2021 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 JOSHUA G. DALTON

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

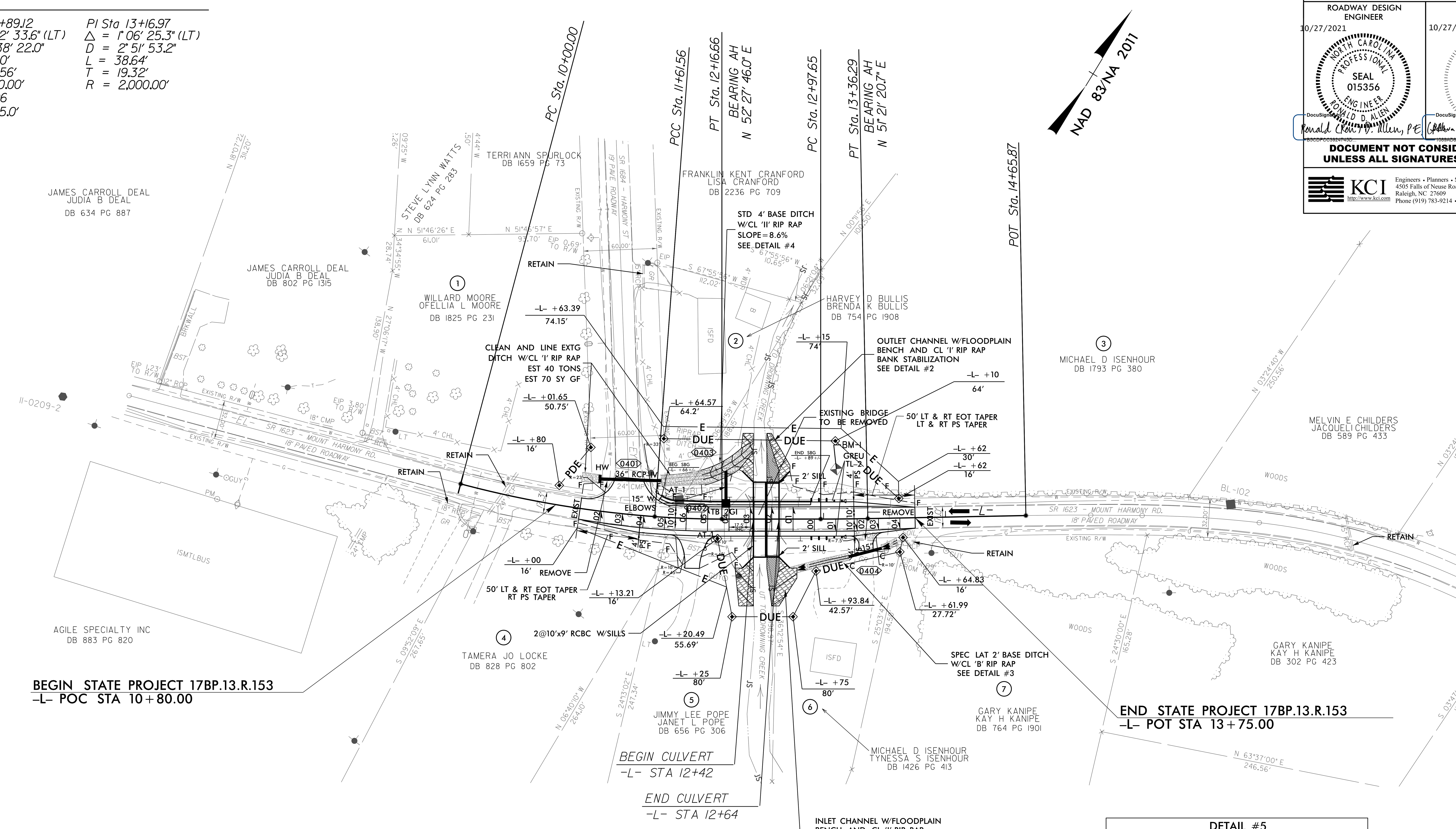
KCI — Engineers • Planners • Scientists • Construction Managers
4505 Falls of Neuse Road, Suite 400
Raleigh, NC 27609
Phone (919) 783-9214 • Fax (919) 783-9266
http://www.kci.com

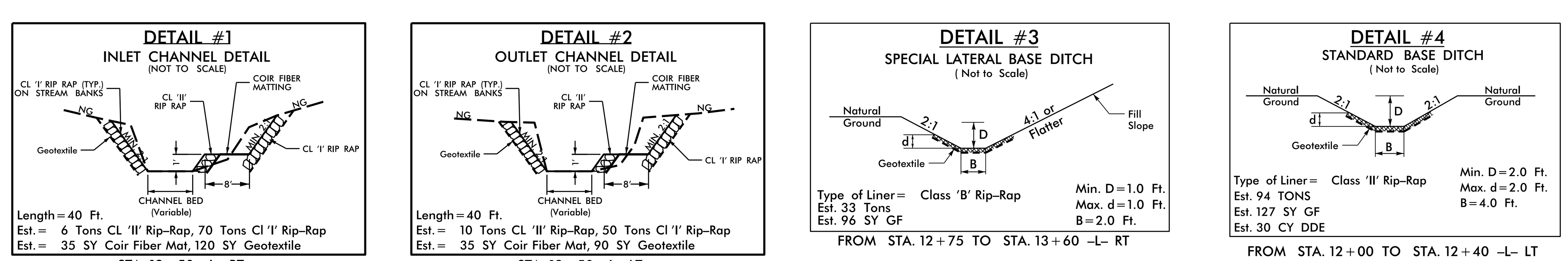
8/17/99

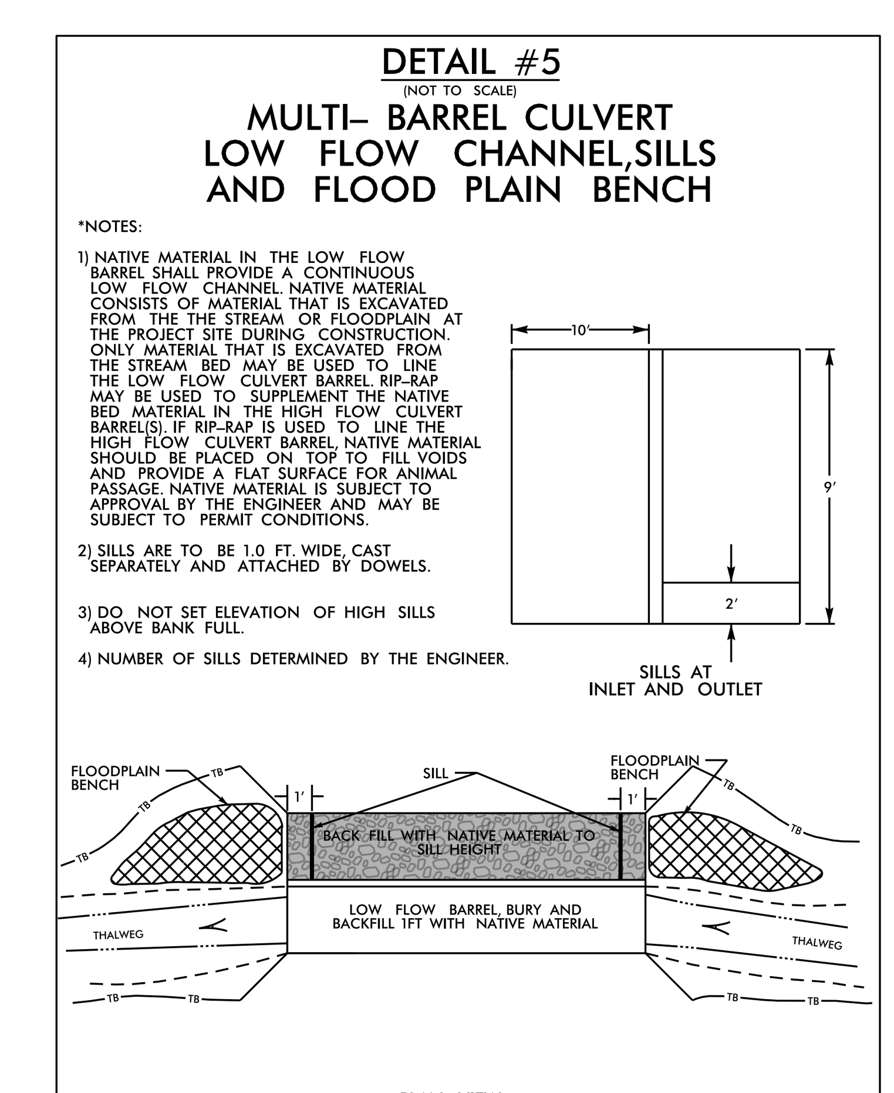
REVISIONS

-L-

PI Sta 10+81.01	PI Sta 11+89.12	PI Sta 13+16.97
Δ = 10° 42' 04.6" (LT)	Δ = 4° 12' 33.6" (LT)	Δ = 1° 06' 25.3" (LT)
D = 6° 37' 25.6"	D = 7° 38' 22.0"	D = 2° 51' 53.2"
L = 161.56'	L = 55.10'	L = 38.64'
T = 81.01'	T = 27.56'	T = 19.32'
R = 865.00'	R = 750.00'	R = 2,000.00'
SE = .06	SE = .06	
RO = 105.0'	RO = 105.0'	







FOR CULVERT PLANS, SEE SHEETS C-01 THRU C-05

FOR -L- PROFILE SEE SHEET 5

SBG - SHOULDER BERM GUTTER

ROADWAY DESIGN ENGINEER 10/27/2021 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 015356 RONALD D. ALLEN — Ronald (Ron) D. Allen, P.E.

HYDRAULICS ENGINEER 10/27/2021 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 JOSHUA G. DALTON — Joshua G. Dalton

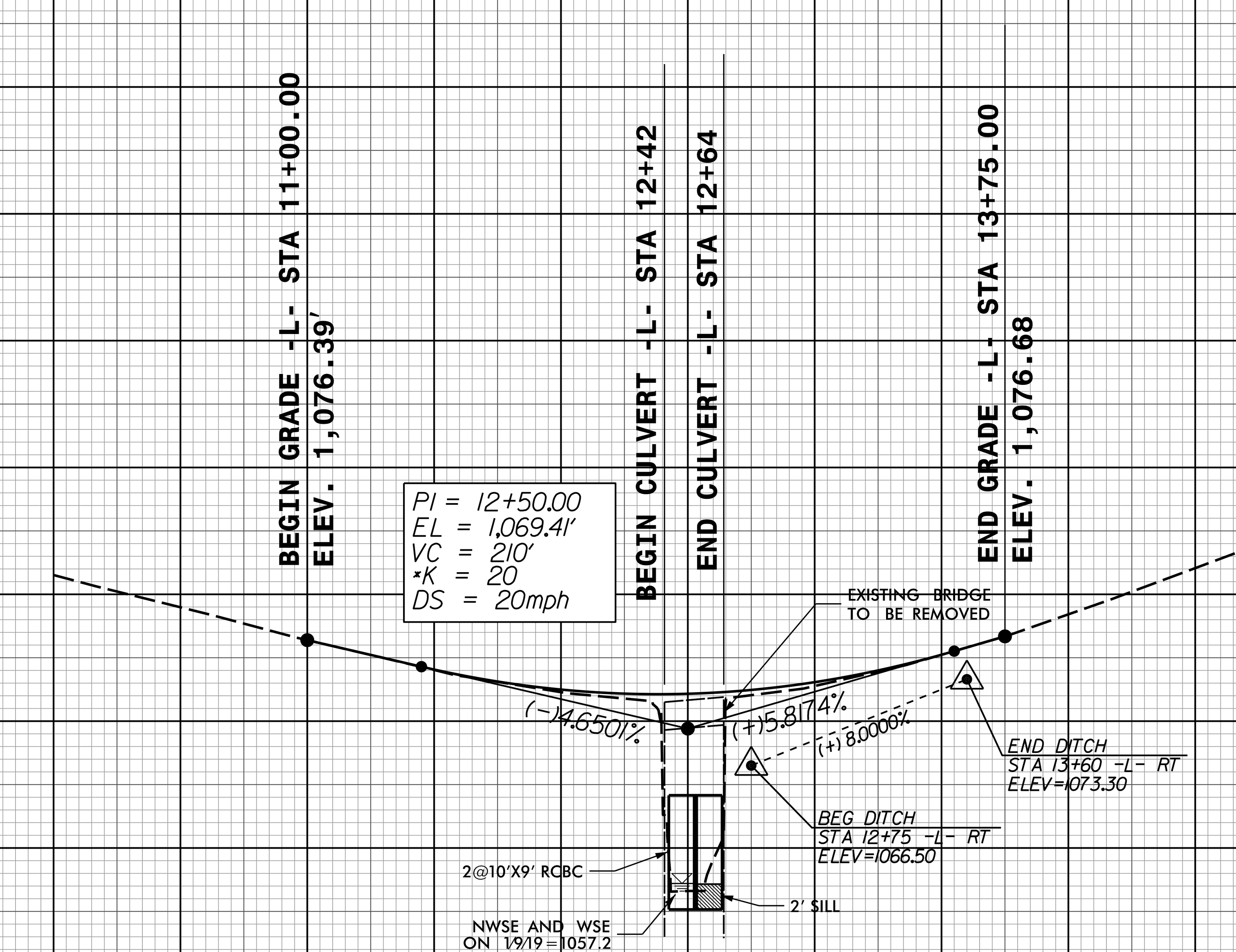
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

5/14/99

-L-

BM #1
-L- STA. 13+10.74, 40.96′ LT
EL = 1068.16′

*-DOES NOT MEET DESIGN SPEED VERTICAL CURVE K-VALUE BUT IS WITHIN SUBREGIONAL TIER PARAMETERS



1,090 / 1,080 / 1,070 / 1,060 / 1,050

10 11 12 13 14

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 1000	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 1063.7	FT
BASE DISCHARGE	= 1300	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 1064.6	FT
OVERTOPPING DISCHARGE	= > 1600	CFS
OVERTOPPING FREQUENCY	= > 500	YRS
OVERTOPPING ELEVATION	= 1072.1	FT

FOR -L- ALIGNMENT SEE SHEET 4

3/2021

TIP PROJECT: 17BP.13.R.153

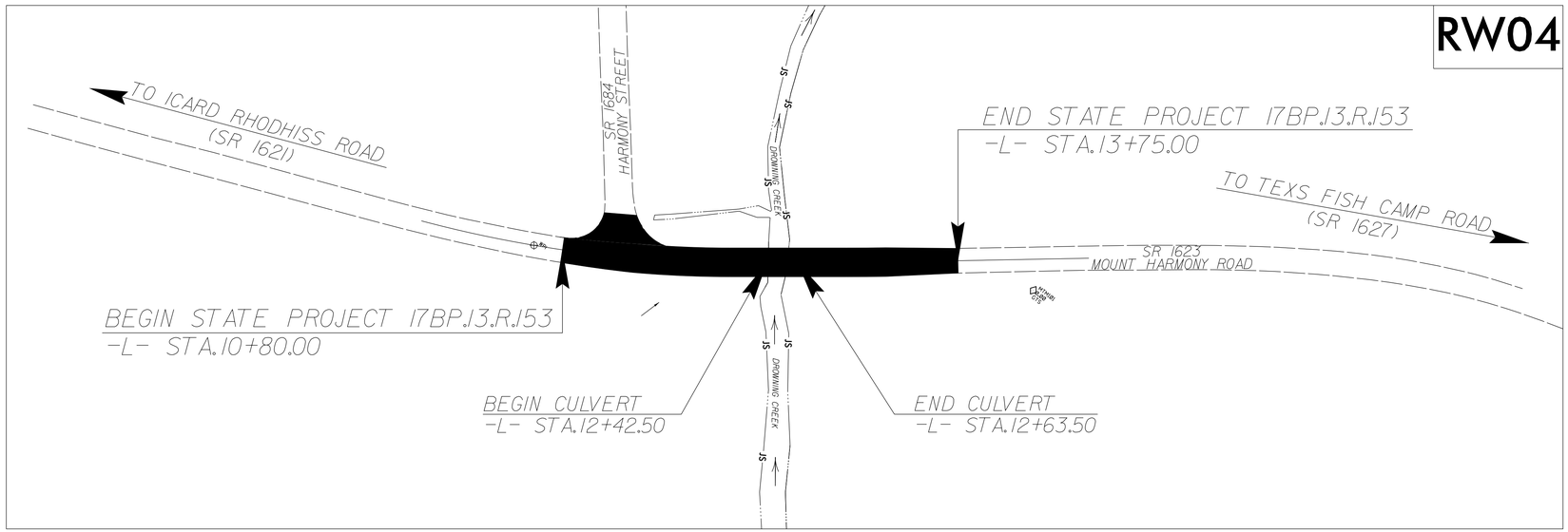
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.13.R.153	RW01	XX

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

BURKE COUNTY

NAD 83 / NA 2011



GRAPHIC SCALE

50 25 0 50 100

PLANS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "11-0209-2" WITH NAD 83/NSRS 2011 STATE PLANE GRID COORDINATES OF NORTHING: 728,451.4180(ft) EASTING: 1,272,859.4790(ft) ELEVATION: 1,106.575(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999859118 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "11-0209-2" TO -L- STATION 10+80.00 IS N 64°48'32.0" E 413.83(ft) ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

Prepared In the Office of:

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

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:	*LETTING DATE:*
2/5/2021	*6/2/2021*

PROFESSIONAL LAND SURVEYOR

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

Docusigned by: Matthew Cornwell EBD36F11473E475...

3/8/2021

SIGNATURE: ***Date:***

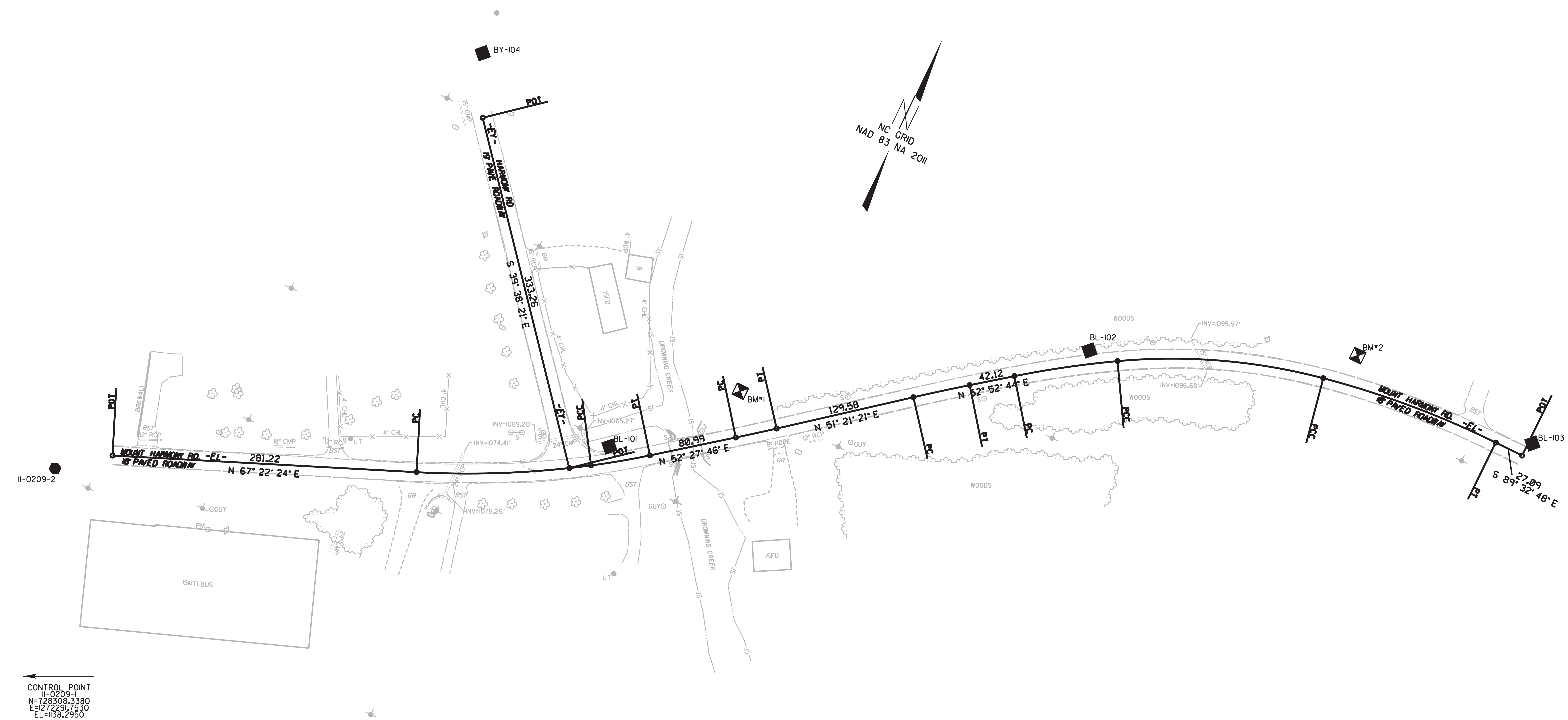
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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

PROJECT REFERENCE NO.	SHEET NO.
11-0209	RW02C-1
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



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.

REVISIONS

6/2/99

02-AUG-2018 14:54
M:\2018\15180284 NCDOT\P 11-0209 Div13 Bridge\DRAWINGS\11-0209_ls_rw02c1.dgn

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
11-0209	RW02C-2
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

BASELINE CONTROL

BL

POINT	DESC.	NORTH	EAST	ELEVATION
1	110209-1	728308.3380	1272291.7530	1138.30
2	11-0209-2	728451.4180	1272859.4790	1106.58
101	BL-101	728692.1038	1273311.6730	1071.27
102	BL-102	728964.6629	1273672.4050	1094.37
103	BL-103	729065.0591	1274078.1540	1122.87

BY

POINT	DESC.	NORTH	EAST	ELEVATION
104	BY-104	728968.4626	1273048.4230	1063.04
501	BL-101	728692.1038	1273311.6730	1071.27

BENCHMARKS

BM1 ELEVATION - 1068.16
N 728791 E 1273398
BENCH TIE NAIL 27 IN PINE

BM2 ELEVATION - 1112.40
N 729068 E 1273898
BENCH TIE NAIL 8 IN OAK

ALIGNMENTS

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	728485.220	1272902.056							
LINE			N 67°22'24.2" E	281.22					
PC	728593.414	1273161.635							
CURVE			N 62°01'21.9" E	161.32	10°42'04.6"(LT)	06°37'25.6"	161.56	81.01	865.00
PCC	728669.094	1273304.106							
CURVE			N 54°34'02.8" E	55.09	04°12'33.6"(LT)	07°38'22.0"	55.10	27.56	750.00
PT	728701.031	1273348.991							
LINE			N 52°27'46.0" E	80.99					
PC	728750.378	1273413.216							
CURVE			N 51°54'33.3" E	38.64	01°06'25.3"(LT)	02°51'53.2"	38.64	19.32	2000.00
PT	728774.217	1273443.628							
LINE			N 51°21'20.7" E	129.58					
PC	728855.136	1273544.833							
CURVE			N 52°07'02.2" E	53.16	01°31'23.1"(RT)	02°51'53.2"	53.17	26.58	2000.00
PT	728887.781	1273586.794							
LINE			N 52°52'43.8" E	42.12					
PC	728913.203	1273620.381							
CURVE			N 55°56'34.3" E	96.21	06°07'41.1"(RT)	06°21'58.3"	96.26	48.18	900.00
PCC	728967.084	1273700.093							
CURVE			N 68°59'27.3" E	190.71	19°58'04.9"(RT)	10°25'02.7"	191.68	96.82	550.00
PCC	729035.457	1273878.126							
CURVE			N 84°42'50.8" E	170.00	11°28'42.0"(RT)	06°44'26.4"	170.28	85.43	850.00
PT	729051.118	1274047.403							
LINE			S 89°32'48.2" E	27.09					
POT	729050.904	1274074.495							

EY

POINT	N	E	BEARING	DIST
POT	728914.743	1273074.362		
LINE			S 39°38'21.3" E	333.26
POT	728658.109	1273286.964		

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.

REVISIONS

3/2021

REVISIONS

PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.153	RW02D-1

Location and Surveys

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

PROJECT SURVEYOR

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

DocuSigned by: Matthew Cornwell EBD36F11473E475...

3/8/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

L

TYPE	STATION	NORTH	EAST
PC	10+00.00	728593.4137	1273161.6354
PCC	11+61.56	728669.0939	1273304.1055
PT	12+16.66	728701.0307	1273348.9910
PC	12+97.65	728750.3785	1273413.2158
PT	13+36.29	728774.2168	1273443.6281
POT	14+65.87	728855.1358	1273544.8332

NOTES:

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

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

08-MAR-2021 11:11
C:\Users\mcornwell.TGSE\Desktop\10209\10209_ls_rw02d-1.dgn
mcornwell AT MCORNWELLLAPTOP

3/2021

REVISIONS

PERMANENT EASEMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.153	RW03E-1

Location and Surveys

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

PROJECT SURVEYOR

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

DocuSigned by: Matthew Cornwell EBD36F11473E475...

7/6/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I , Matthew T. Cornwell , certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed on 3/5/2021, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 6th day of July, 2021.

DocuSigned by: Matthew Cornwell EBD36F11473E475... 7/6/2021

Professional Land Surveyor L-4775

ROW MARKER PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
L	10+80.00	-16.00	728641.6969	1273226.4573
L	11+01.66	-50.77	728682.1906	1273228.0630
L	11+64.57	-64.20	728724.2478	1273271.1304
L	12+13.21	16.00	728686.2030	1273355.9404
L	12+25.00	80.00	728642.6765	1273404.3478
L	12+75.00	80.00	728673.1404	1273443.9957
L	12+93.84	42.57	728714.2967	1273436.1318
L	13+10.00	-64.00	728808.4394	1273383.6775
L	13+61.99	27.72	728768.6125	1273481.0034
L	13+62.00	-16.00	728802.7661	1273453.7134
L	13+64.96	16.00	728779.6199	1273476.0069

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

I further certify that the 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.

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

Witness my original signature, registration number and seal this 6th day of July, 2021.

DocuSigned by: Matthew Cornwell EBD36F11473E475... 7/6/2021

L-4775

Professional Land Surveyor PLS # Seal

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED 3/5/2021 TO 6/30/2021.

06-JUL-2021 09:16
S:\Surveyors\Projects\LIB\2021\110209\2021 RW Revision-1\TO SUBMIT\110209_ls_rw03e-1.dgn
mcornwell AT MCORNWELLLAPTOP

6/2021

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.153	RW04

Location and Surveys

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

PROJECT SURVEYOR

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

DocuSigned by: Matthew Cornwell E8D36F11473E475...

7/6/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I , Matthew T. Cornwell , certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed on 3/5/2021, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 6th day of July, 2021.

DocuSigned by: Matthew Cornwell E8D36F11473E475... 7/6/2021

Professional Land Surveyor L-4775

-L-

PI Sta 10+81.01	PI Sta 11+89.12	PI Sta 13+16.97
△ = 10° 42' 04.6" (LT)	△ = 4° 12' 33.6" (LT)	△ = 1° 06' 25.3" (LT)
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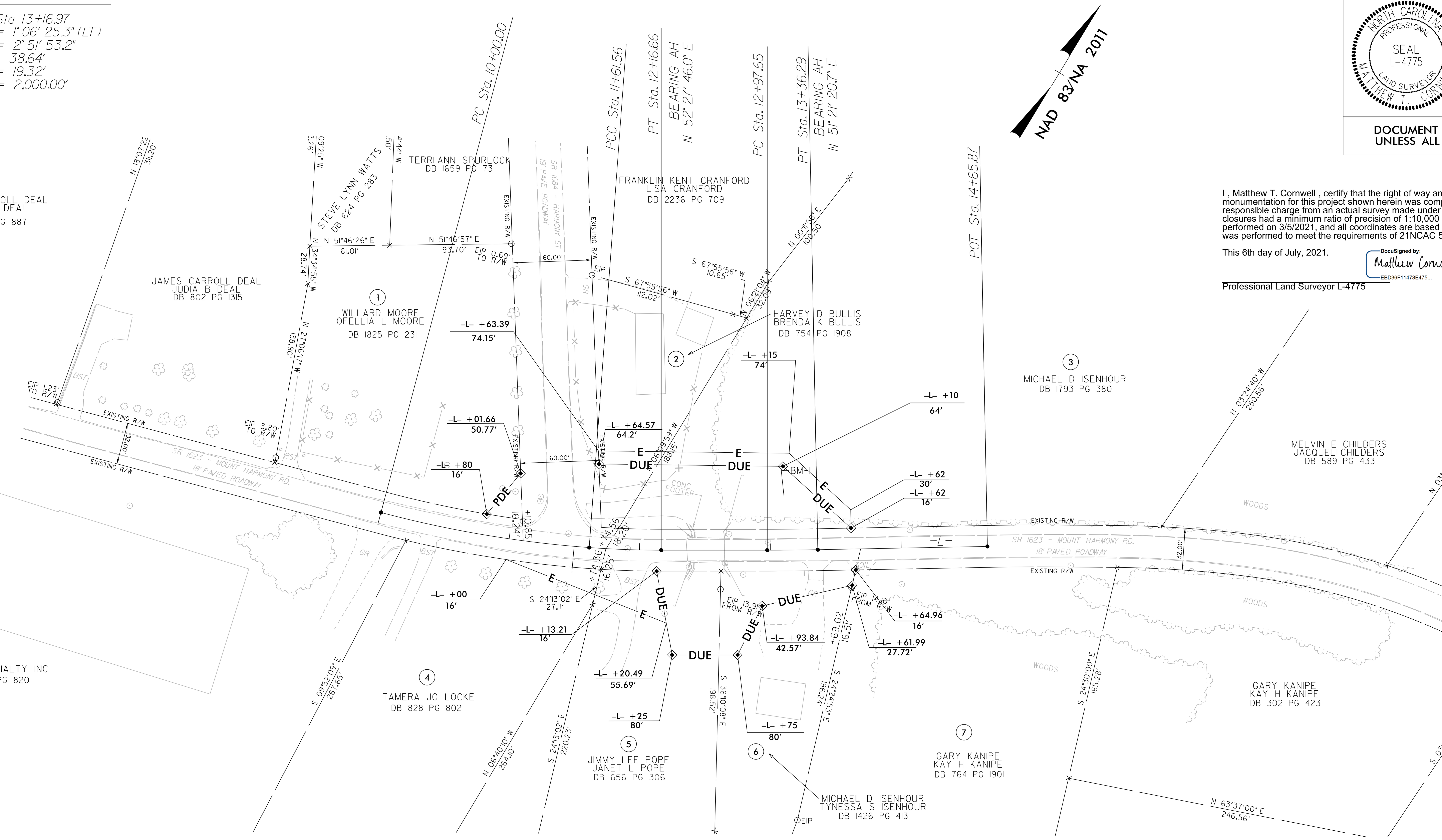

I, Matthew T. Cornwell, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (Base map Compilation, R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location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

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

Witness my original signature, registration number and seal this 6th day of July, 2021.

DocuSigned by: Matthew Cornwell E8D36F11473E475... 7/6/2021

Professional Land Surveyor — L-4775 PLS # — Seal

NOTES:

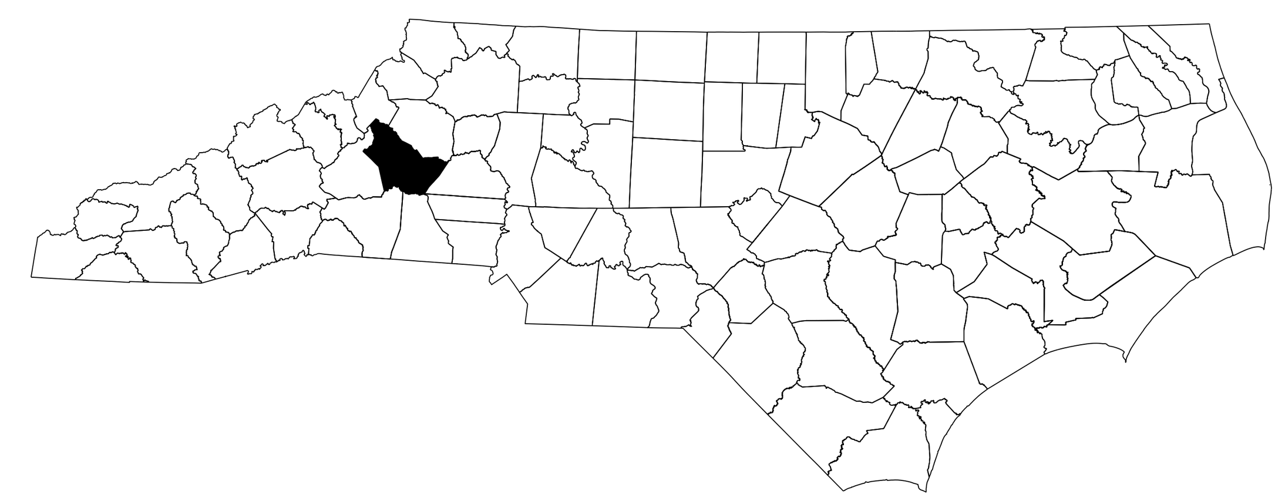
1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED 3/5/2021 TO 6/30/2021.

06-JUL-2021 09:08
S:\Surveyors\Projects\LIB\2021\110209\2021 RW Revision-1\TO SUBMIT\110209_ls_rw04.dgn
mcornwell AT MCORNWELL-LAPTOP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

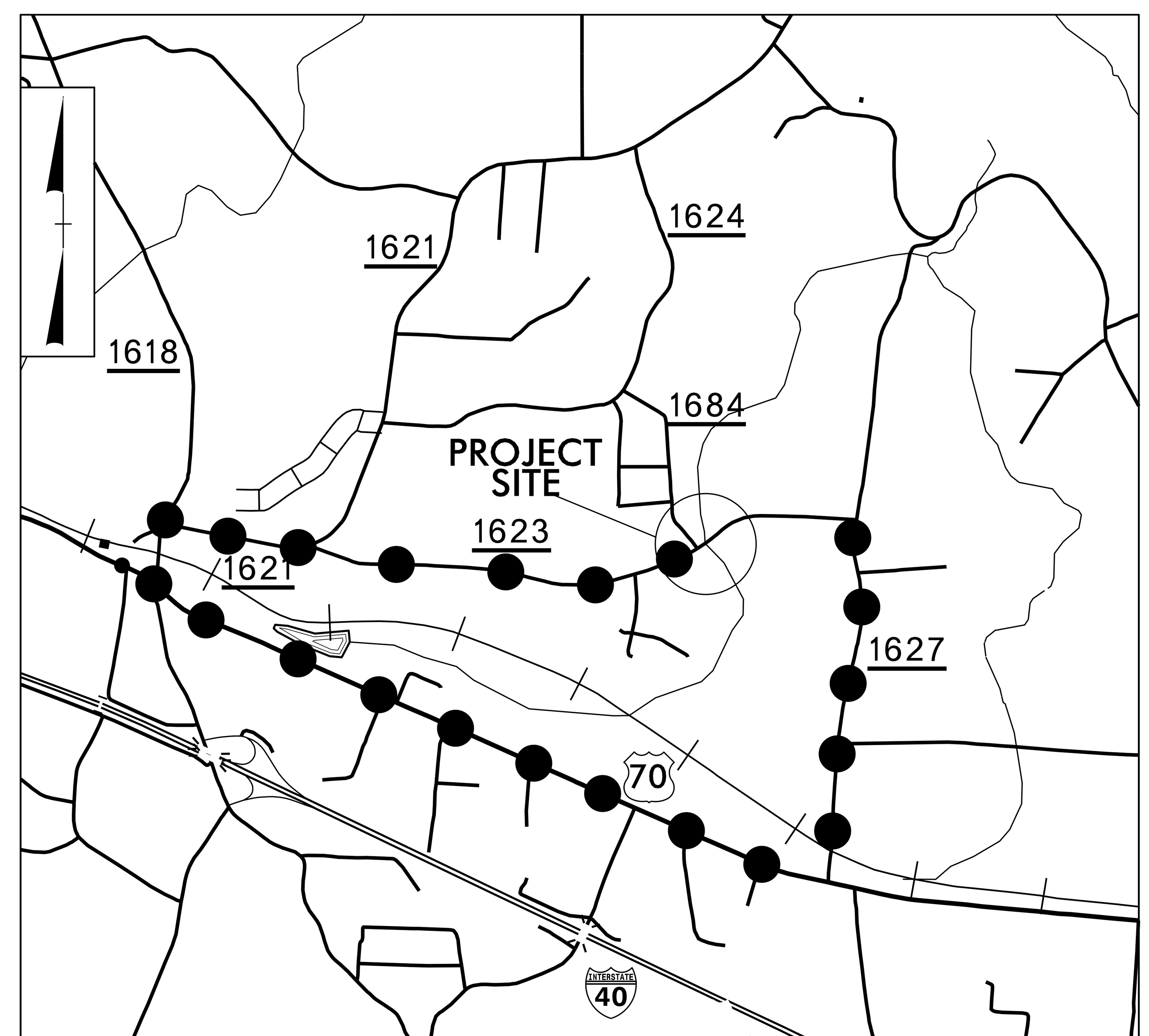
TRANSPORTATION MANAGEMENT PLAN

BURKE COUNTY



LOCATION: *REPLACE BRIDGE NO. 209 OVER UT TO DROWNING CREEK ON SR 1623 (MT. HARMONY RD.)*

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

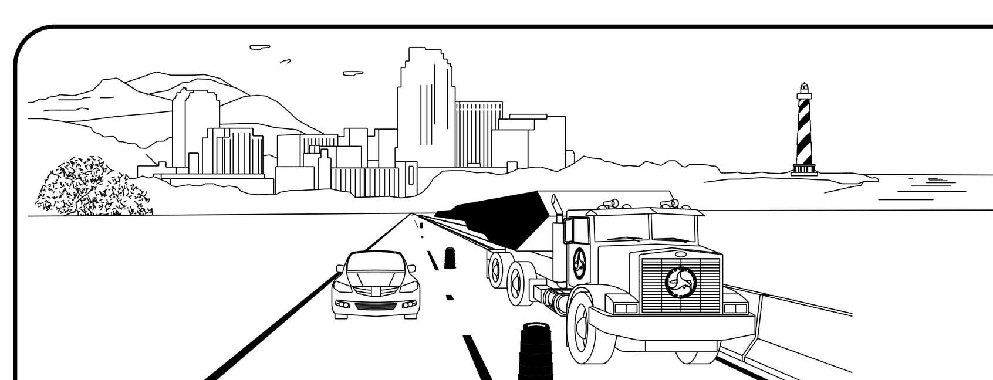


VICINITY MAP

OFFSITE DETOUR ROUTE

INDEX OF SHEETS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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

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

D. A. PARKER, P.E. — TRAFFIC CONTROL PROJECT ENGINEER

KARMEN DAIS, P.E. — TRAFFIC CONTROL PROJECT DESIGN ENGINEER

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

KCI ASSOCIATES OF N.C.
CIVIL ENGINEERS
ENVIRONMENTAL - CEI
LAND SURVEYING
SUBSURFACE UTILITY ENGINEERING
4505 FALLS OF NEUSE ROAD
SUITE 400
RALEIGH, NORTH CAROLINA 27609
(919) 783-9214
WWW.KCI.COM

APPROVED: Ronald (Ron) D. Allen, PE, CPM
DATE: 10/27/2021

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 015356 ENGINEER RONALD D. ALLEN

SHEET NO. TCP-1

PROJECT: 17BP.13.R.153

CONTRACT: DM00325

11-MAY-2021 11:10
M:\2016\22160946.09 NCDOT Division 13 Bridge Replacements\A_17BP.13.R.153_Burke_110209\Traffic\TrafficControl\TCP\17BP.13.R.153_Bridge 209_TC_TMP_01.dgn
$$$$USERNAME$$$$

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.03	TEMPORARY ROAD CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES

LEGEND

GENERAL

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

SIGNALS

- EXISTING
- PROPOSED
- TEMPORARY (TEMP)

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

TRAFFIC CONTROL DEVICES

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

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

PAVEMENT MARKERS

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

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

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APPROVED: Ronald (Ron) D. Allen, PE, CPM

DATE: 10/27/2021

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 015356 RONALD D. ALLEN

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

ROADWAY STANDARD DRAWINGS & LEGEND

MANAGEMENT STRATEGIES

1. CLOSE SR 1623 (MT HARMON RD) AND DETOUR TRAFFIC OFF-SITE VIA SR 1627, STATE HWY 70, SR 1618, AND SR 1621.

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

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, COUNTY EMS, AND COUNTY SCHOOL OFFICIALS THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

B) NOTIFY THE ENGINEER FIFTEEN (15) DAYS PRIOR TO INSTALLATION OF A LANE CLOSURE AND SUBMIT DETAILS FOR APPROVAL BY THE ENGINEER.

C) AS APPROVED BY THE ENGINEER, LANE CLOSURES WILL BE ALLOWED FOR GEOTECHNICAL BORINGS AND THE RELOCATION OF UTILITIES PRIOR TO THE ROAD CLOSURE.

SIGNING

D) 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.

E) 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.

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

TRAFFIC CONTROL DEVICES

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

PAVEMENT MARKINGS AND MARKERS

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

BRIDGE #	MARKING	MARKER
110209	PAINT	NONE

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

PHASING

NOTE: BEFORE BEGINNING CONSTRUCTION THE CONTRACTOR SHALL PLACE ADVANCE WORK ZONE WARNING SIGNS ALONG MOUNT HARMONY RD., (SEE RSD 1101.01, SHEET 3 OF 3)

STEP 1) USING ROADWAY STD. DRAWING 1101.03, SHEET 1 OF 9, CLOSE MT HARMONY RD. (SR 1623) AND DETOUR TRAFFIC OFF-SITE AS SHOWN ON TCP-3.

STEP 2) REMOVE THE EXISTING STRUCTURE.

STEP 3) CONSTRUCT THE PROPOSED STRUCTURE AND ROADWAY

STEP 4) PLACE FINAL PAVEMENT MARKINGS AND MARKERS ACCORDING TO THE FINAL PAVEMENT MARKING PLANS.

STEP 5) REMOVE ALL WORK ZONE TRAFFIC CONTROL DEVICES AND SIGNING. OPEN MT HARMONY RD. (SR 1623) AND PLACE TRAFFIC ONTO THE FINAL PATTERN.

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APPROVED: DocuSigned by: Ronald (Ron) D. Allen, PE, CPM
85CDFCC39247450...

DATE: 10/27/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 015356 ENGINEER RONALD D. ALLEN

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TRANSPORTATION OPERATIONS PLAN

SP-1

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

SIGN WIDTH: 4'-0"
HEIGHT: 2'-0"
TOTAL AREA: 8.0 Sq.Ft.

BORDER TYPE: RECESSED
RECESS: 0.38"
WIDTH: 0.63"
RADII: 1.50"

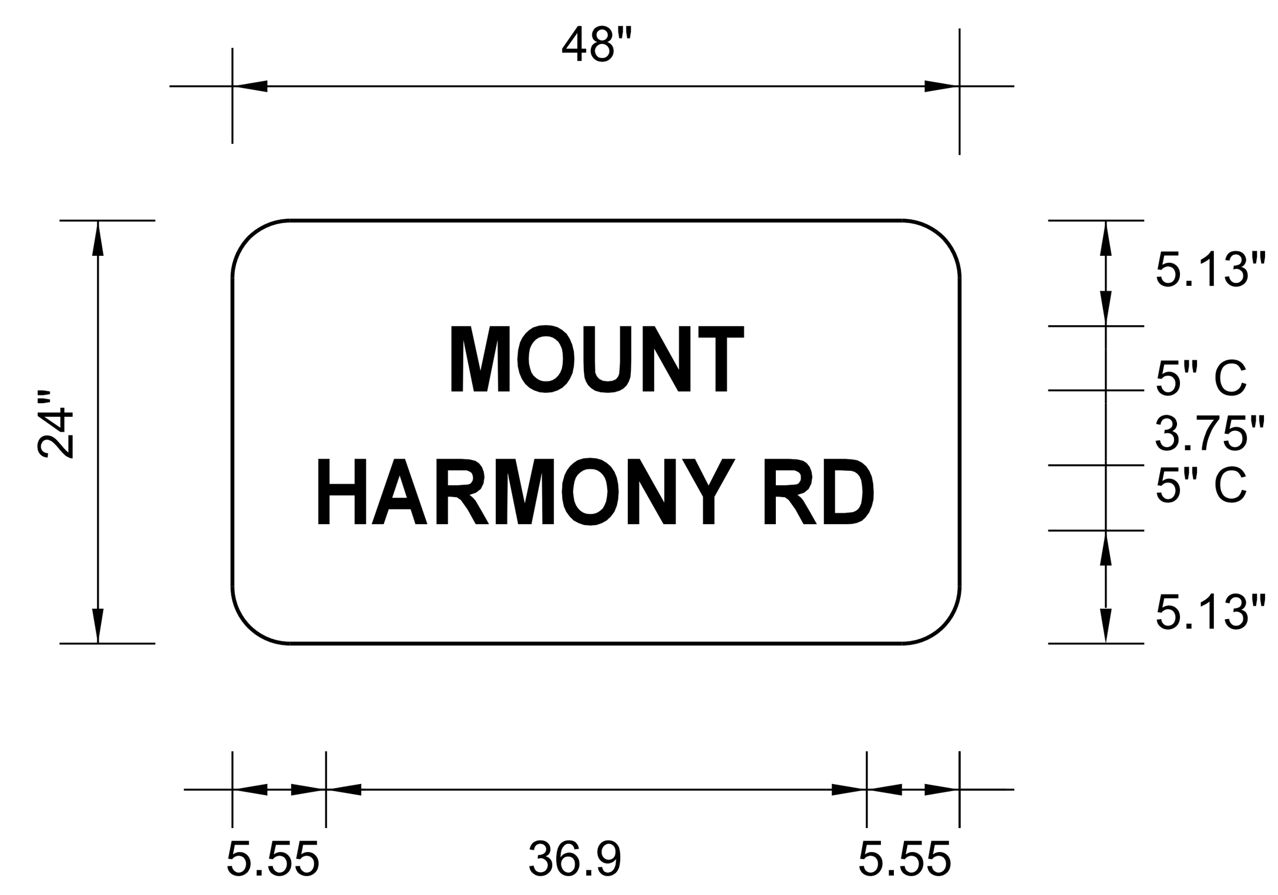
NO. Z BARS: N/A
LENGTH: N/A

BACKG COLOR: Fluorescent Orange
COPY COLOR: Black

SYMBOL	X	Y	WID	HT

MAT'L: 0.080" ALUMINUM

DESIGN BY: AH
PROJECT ID: B-110209
CHECKED BY:
DIV: 13
DATE: Aug 15, 2019



Spacing Factor is 1 unless specified otherwise

USE NOTES: 1,4

1. Legend and border shall be direct applied black non-reflective sheeting.
4. Background shall be encapsulated lens reflective.

LETTER POSITIONS

Letter spacings are to start of next letter

													Series/Size Text Length
	M	O	U	N	T								C 2000
14.59	4.29	3.94	3.79	3.58	2.50	14.95							18.10
	H	A	R	M	O	N	Y		R	D			C 2000
5.55	3.58	3.97	3.79	4.29	3.94	3.58	3.13	4.09	3.79	2.74	5.55		32.81

FILENAME: B-110209 DETOUR SIGN FACE LAYOUT

NORTH CAROLINA D.O.T. SIGN DETAIL

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DATE: 10/27/2021

SEAL

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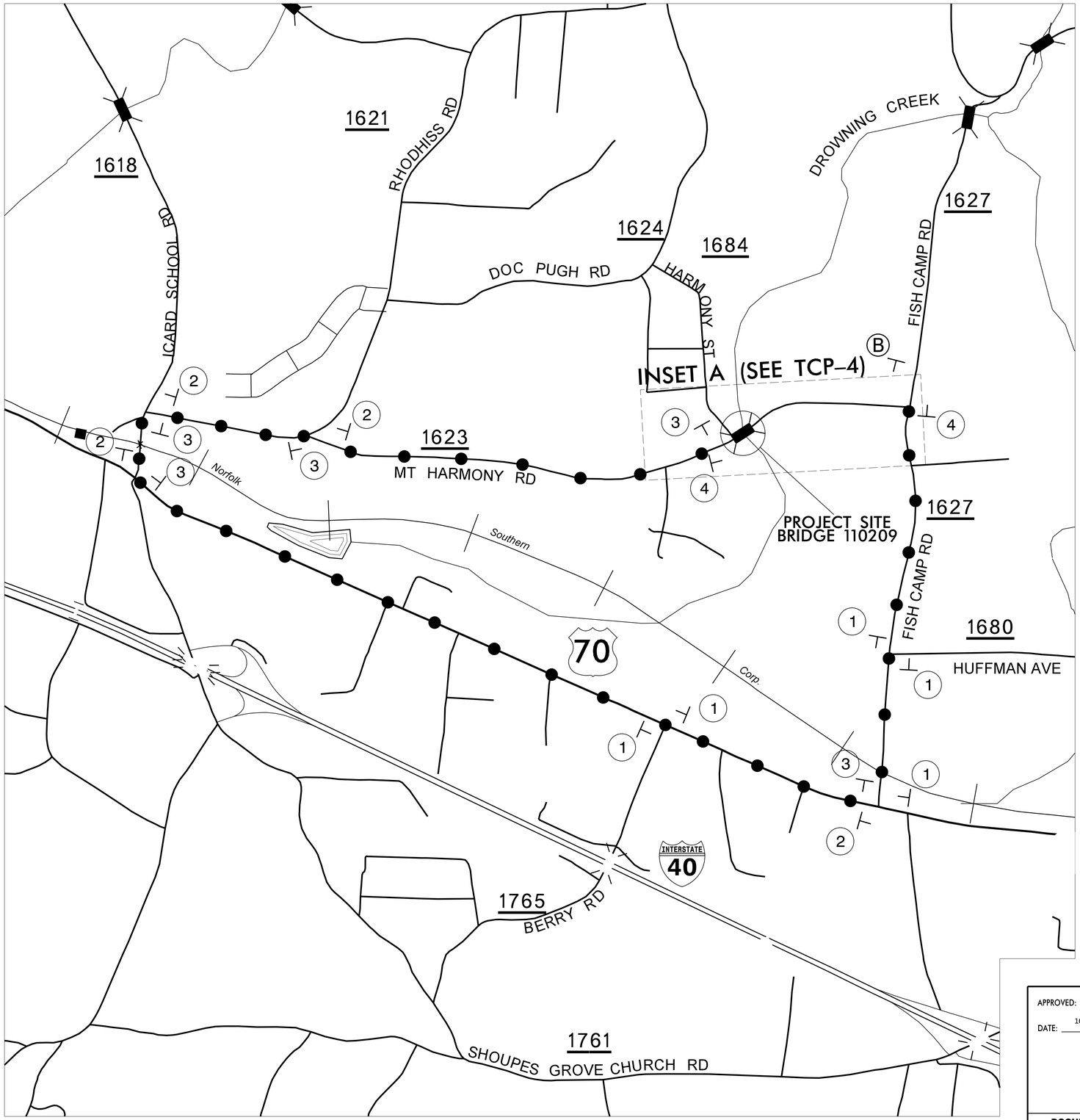
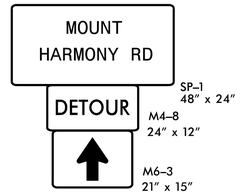
DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

SPECIAL SIGN DESIGN

BRIDGE 110209

PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.153	TCP-3





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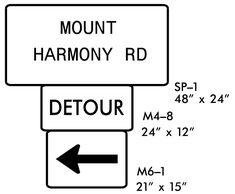

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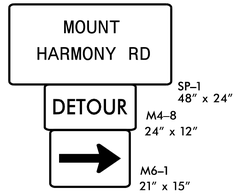

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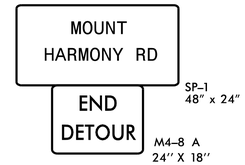
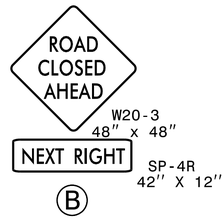


4

5

A



B

NOTES:
1. REFER TO ROADWAY STANDARD DRAWING 1101.03, SHEET 1 OF 9 FOR APPLICABLE NOTES.
2. ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE. FIELD ADJUST AS NECESSARY OR AS DIRECTED BY THE ENGINEER.
3. SEE SHEET TCP-2 FOR THE SPECIAL SIGN DESIGN
4. ALL DETOUR SIGN LOCATIONS ARE APPROXIMATE.

DETOUR ROUTE

APPROX. 3 MILES

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APPROVED: DocuSigned by: Ronald (Ron) D. Allen, PE, CPM
B5CDFCC39267450...

DATE: 10/27/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 015356 ENGINEER RONALD D ALLEN

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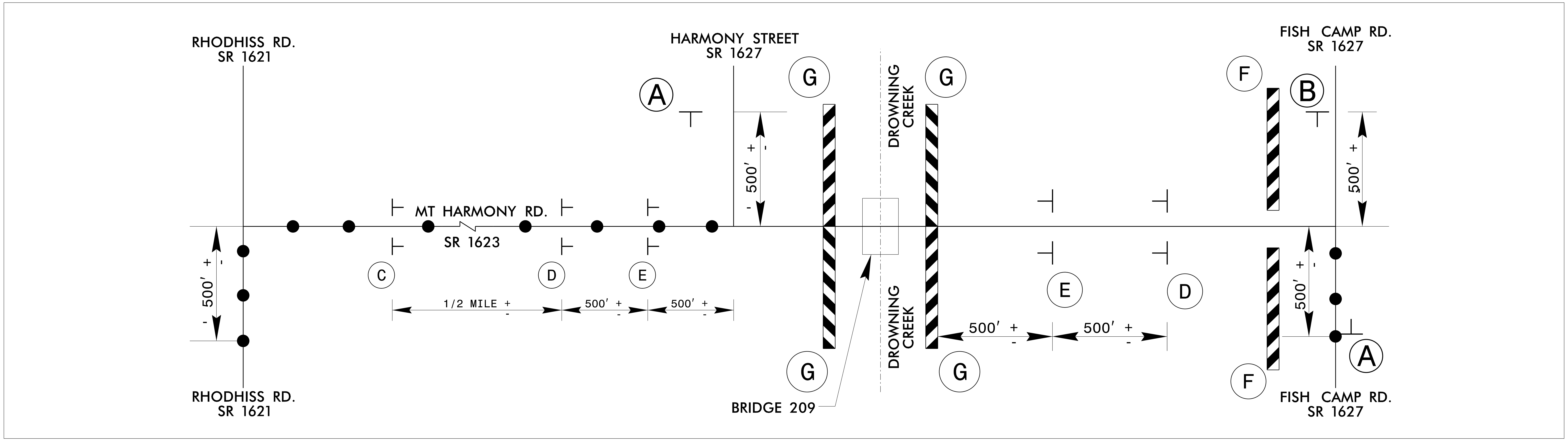
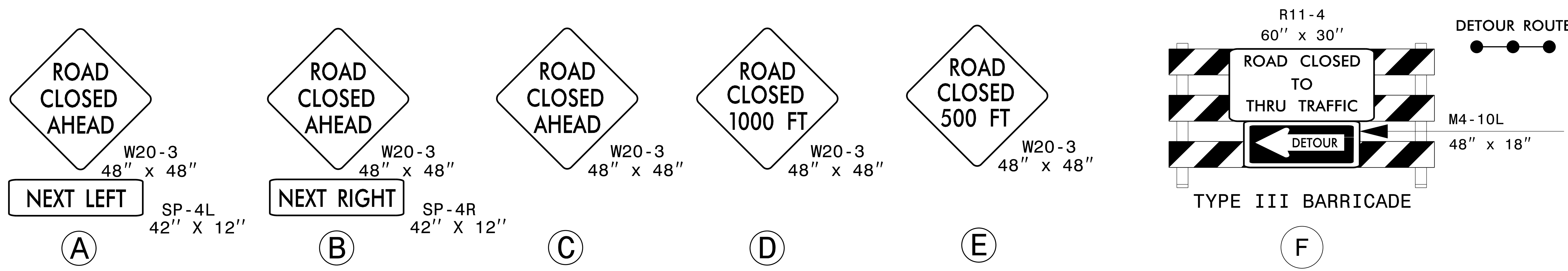
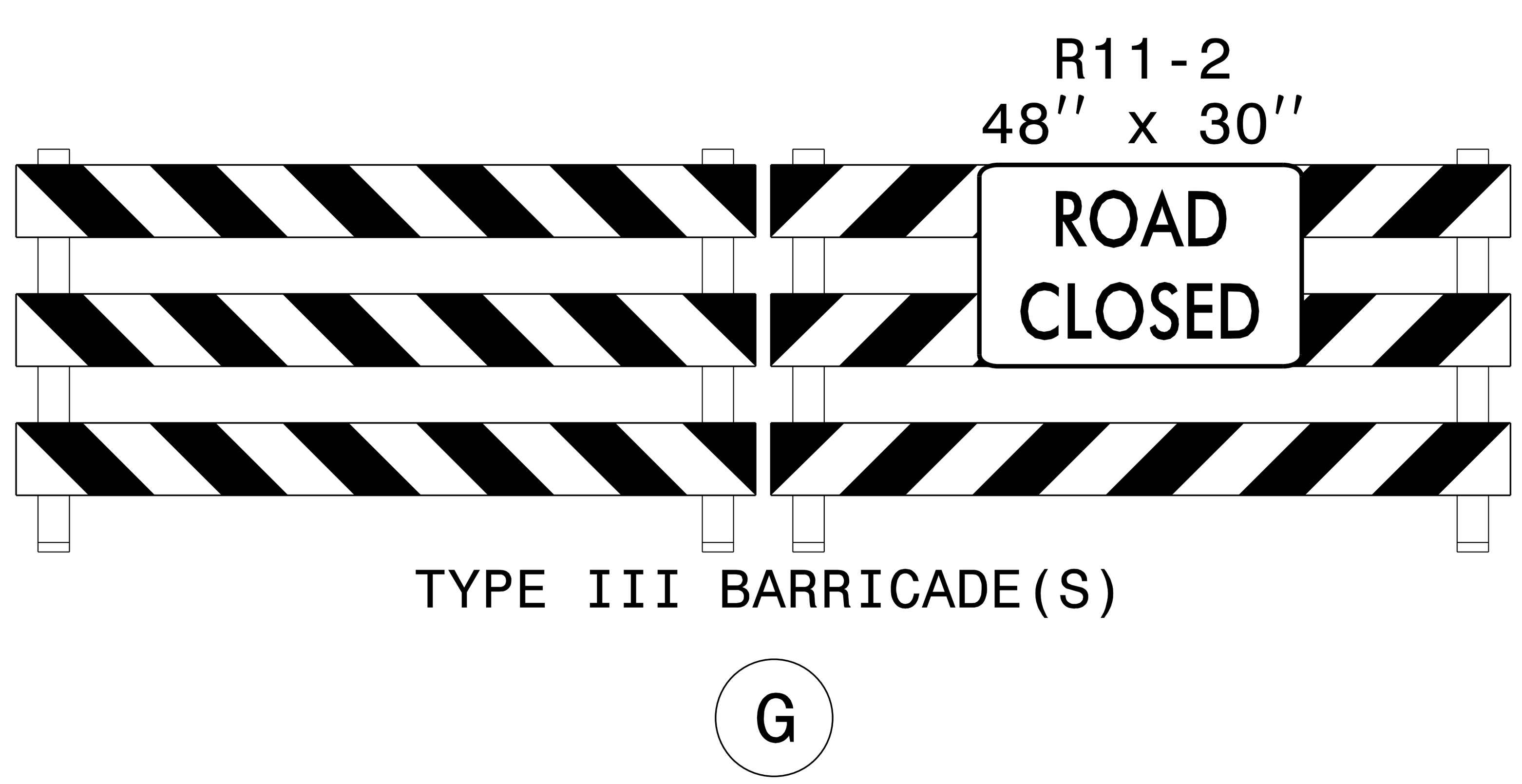
DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

OFFSITE DETOUR ROUTE

INSET A







NOTES:
1. REFER TO ROADWAY STANDARD DRAWING 1101.03, SHEET 1 OF 9 FOR APPLICABLE NOTES.
2. ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE. FIELD ADJUST AS NECESSARY OR AS DIRECTED BY THE ENGINEER.
3. SEE SHEET TCP-2 FOR THE SPECIAL SIGN DESIGN
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APPROVED: Ronald (Ron) D. Allen, PE, CPM
DATE: 10/27/2021
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 015356 ENGINEER RONALD D. ALLEN

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

OFFSITE DETOUR ROUTE

14-APR-2021 16:51
M:\2016\22160\1946.09 NCDOT Division 13 Bridge Replacements\A_17BP_13_R_153_Burke_110209\Traffic\TrafficControl\TCP\17BP_13_R_153_Bridge 209_TC_TMP_04.dgn
$$$$USERNAME$$$$

PROJECT: 17BP.13.R.153

CONTRACT: DM00325

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.153	PMP-1

APPROVED: Ronald (Ron) D. Allen, PE, CPM (Docusigned by: B5CDFCC39247450...)

DATE: 10/27/2021

SEAL:

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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PAVEMENT MARKING PLAN

BURKE COUNTY

LOCATION: BRIDGE No. 110209 OVER UT TO DROWNING CREEK ON SR 1623 (MOUNT HARMONY RD.)

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

GENERAL NOTES

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

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

BRIDGE #	MARKING	MARKER
No. 110209	PAINT	NONE

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

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

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

PAVEMENT MARKING SCHEDULE

SYMB	FINAL PAVEMENT MARKING DESCRIPTION
P1	PAINT (4″) WHITE EDGELINE
P5	PAINT (4″) 2′-6′/SP WHITE MINISKIP
P13	PAINT (4″) YELLOW DOUBLE CENTER

INDEX

KELVIN L. JORDAN — SIGNING & DELINEATION REGIONAL ENGINEER

RENEE B. ROACH, PE, CPM — STATE SIGNING & DELINEATION ENGINEER

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROJECT REFERENCE NO.	SHEET NO.
	PMP-2

APPROVED: Ronald (Ron) D. Allen, PE, CPM
DocuSigned by: B5CDFCC3924745D...

DATE: 10/27/2021

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 015356 ENGINEER RONALD D. ALLEN

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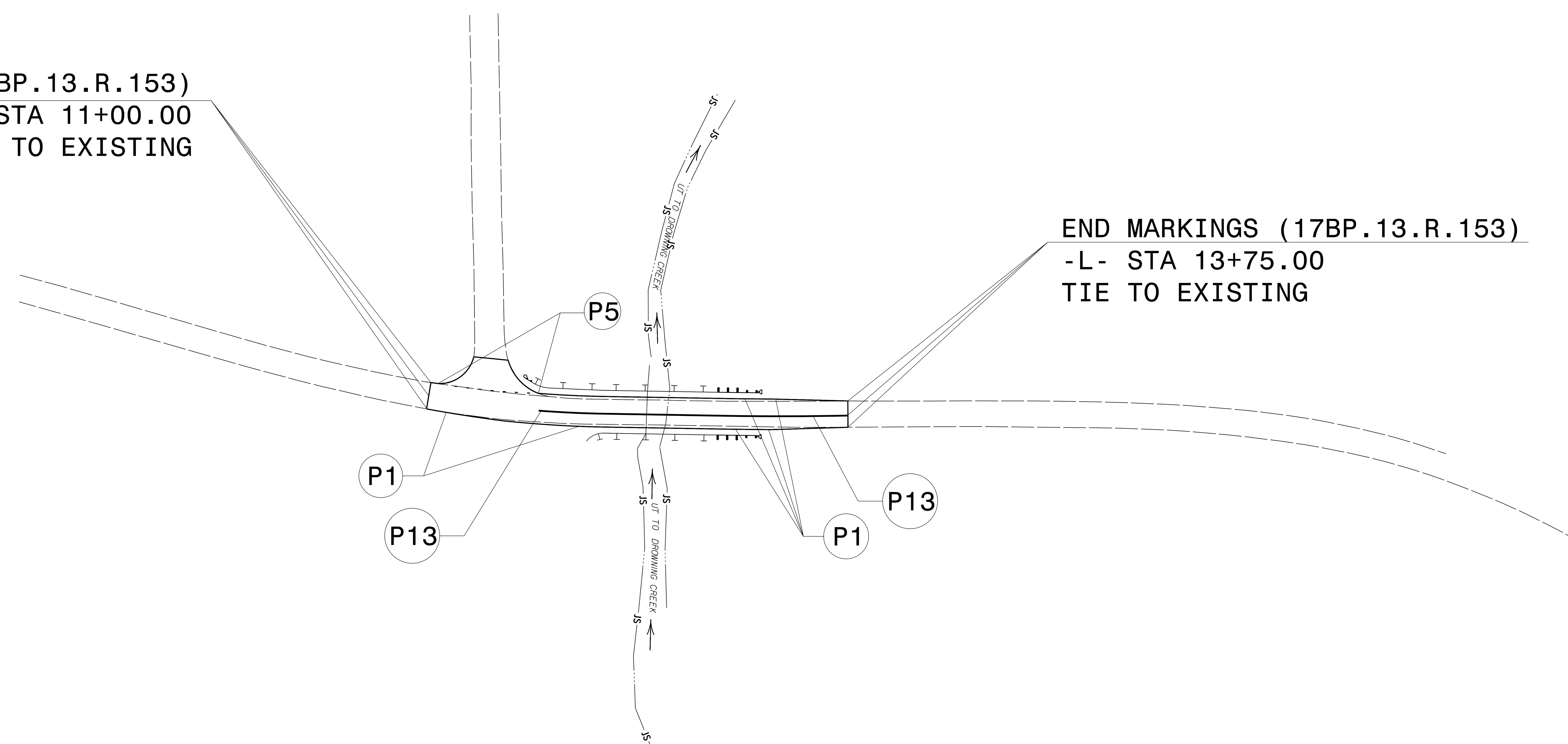
BEGIN MARKINGS (17BP.13.R.153)
-L- STA 11+00.00
TIE TO EXISTING

END MARKINGS (17BP.13.R.153)
-L- STA 13+75.00
TIE TO EXISTING



PAVEMENT MARKING LEGEND

P1	WHITE EDGELINE (4″)
P5	2′-6″/SP WHITE MINISKIP (4″)
P13	YELLOW DOUBLE CENTER (4″)

PAVEMENT MARKING DETAIL

15-APR-2021 09:16
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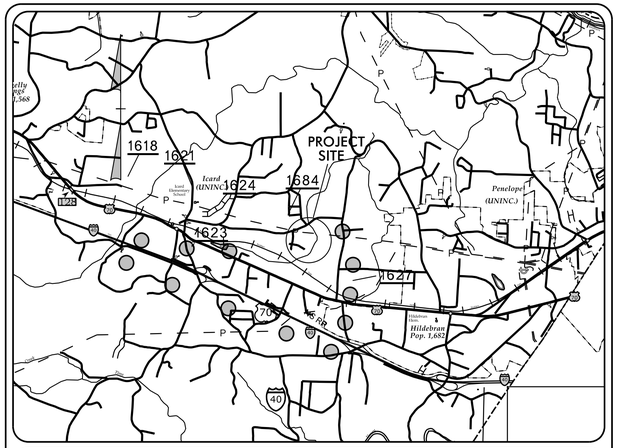
$$$$USERNAME$$$$

TIP PROJECT: 17BP.13.R.153



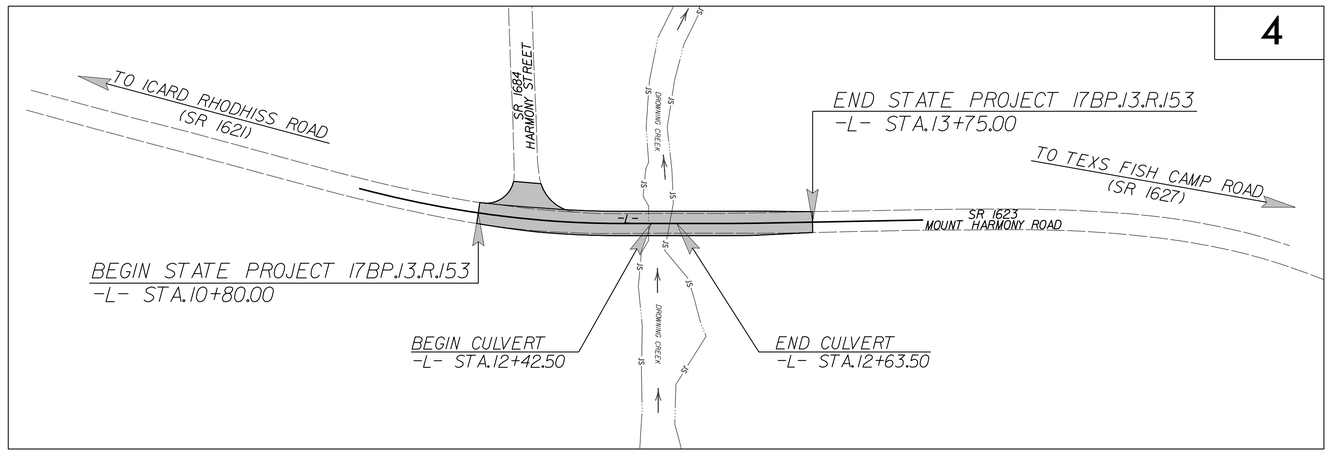
VICINITY MAP
NOT TO SCALE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
PLAN FOR PROPOSED HIGHWAY EROSION CONTROL
BURKE COUNTY

LOCATION: REPLACE BRIDGE NO. 209 OVER UT TO DROWNING CREEK ON SR 1623 (MOUNT HARMONY RD.)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE

NAD 83 NA 2011



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.13.R.153	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.13.R.153		PE,RW,UTIL,CON

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
1633.02	Temporary Rock Silt Check Type-B	
	Wattle / Coir Fiber Wattle	EW CFW
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1630.04	Stilling Basin	
1630.06	Special Stilling Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	
	Tiered Skimmer Basin	
	Infiltration Basin	

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:
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

Designed by:
DILLON J. BRUER ***4297***
NAME ***LEVEL III CERTIFICATION NO.***

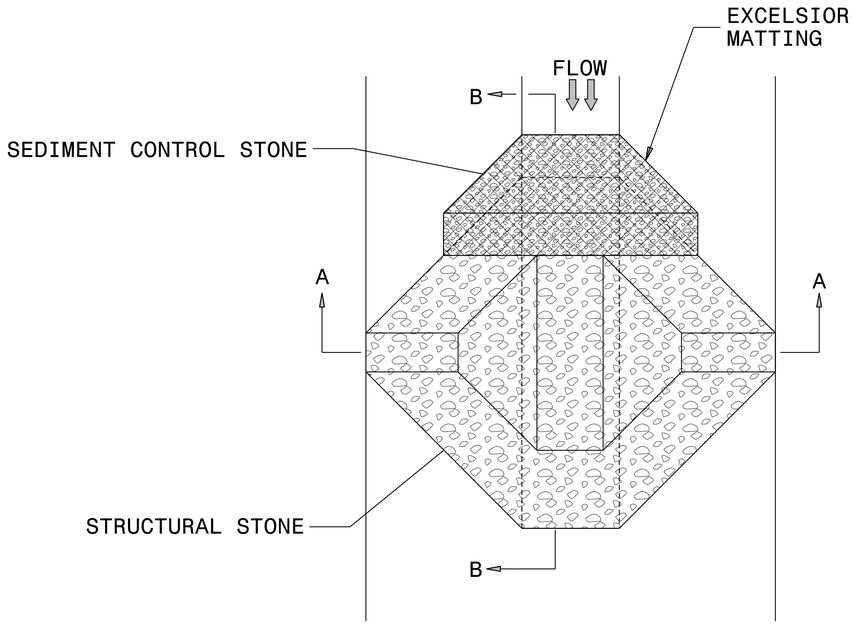
Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2018 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

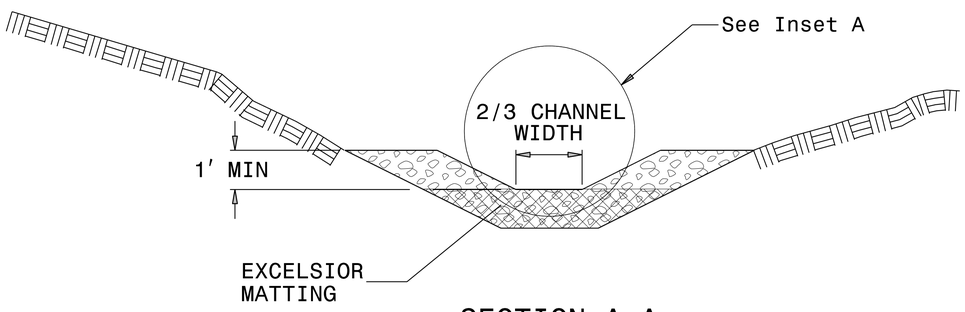
1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type A
1622.01	Temporary Berms and Slope Drains	1633.02	Temporary Rock Silt Check Type B
1630.01	Riser Basin	1634.01	Temporary Rock Sediment Dam Type A
1630.02	Silt Basin Type B	1634.02	Temporary Rock Sediment Dam Type B
1630.03	Temporary Silt Ditch	1635.01	Rock Pipe Inlet Sediment Trap Type A
1630.04	Stilling Basin	1635.02	Rock Pipe Inlet Sediment Trap Type B
1630.05	Temporary Diversion	1640.01	Coir Fiber Baffle
1630.06	Special Stilling Basin	1645.01	Temporary Stream Crossing
1631.01	Matting Installation		

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.153	EC-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

TEMPORARY ROCK SILT CHECK TYPE 'A' WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM)



PLAN



SECTION A-A

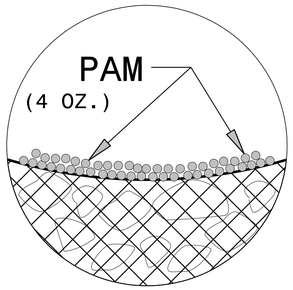
NOTES:

INSTALL TEMPORARY ROCK SILT CHECK TYPE A IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1633.01.

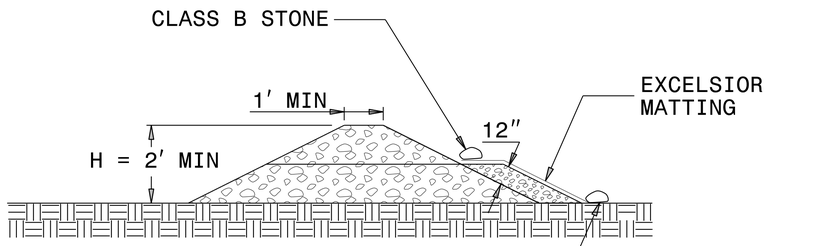
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH ROCK SILT CHECK.

INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A



SECTION B-B

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.53	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

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

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.153	EC-04/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 04

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

NAD 83/NA 2011

BEGIN STATE PROJECT 17BP.13.R.153
–L– POC STA 10+80.00

END STATE PROJECT 17BP.13.R.153
–L– POT STA 13+75.00

BEGIN CULVERT
–L– STA 12+42.50

END CULVERT
–L– STA 12+63.50

PC Sta. 10+00.00
PCC Sta. 11+61.56
PT Sta. 12+16.66
BEARING AH
N 52° 27' 46.0" E
PC Sta. 12+97.65
PT Sta. 13+36.29
BEARING AH
N 51° 21' 20.7" E
POT Sta. 14+65.87

JAMES CARROLL DEAL
JUDIA B DEAL

STEVE LYNN WATTS

TERRI ANN SPURLOCK

FRANKLIN KENT CRANFORD
LISA CRANFORD

WILLARD MOORE
OFELLIA L MOORE

HARVEY D BULLIS
BRENDA E BULLIS

MICHAEL D ISENHOUR

MELVIN E CHILDERS
JACQUELI CHILDERS

AGILE SPECIALTY INC

TAMERA JO LOCKE

JIMMY LEE POPE
JANET L POPE

MICHAEL D ISENHOUR
LYNNSAY C ISENHOUR

GARY KANIPE
KAY H KANIPE

STD 4' BASE DITCH
W/CL 'II' RIP RAP
SLOPE = 8.6%
SEE DETAIL #4

CLEAN AND LINE EXTG
DITCH W/CL 'I' RIP RAP
EST 40 TONS
EST 70 SY GF

OUTLET CHANNEL W/FLOODPLAIN
BENCH AND CL 'I' RIP RAP
BANK STABILIZATION
SEE DETAIL #2

EXISTING BRIDGE
TO BE REMOVED

50' LT & RT EOT TAPER
LT & RT PS TAPER

BM=1
GREU
TL-2

15" W
ELBOWS

16' REMOVE

50' LT & RT EOT TAPER
RT PS TAPER

2@10'x9' RCBC W/SILLS

SPEC LAT 2' BASE DITCH
W/CL 'B' RIP RAP
SEE DETAIL #3

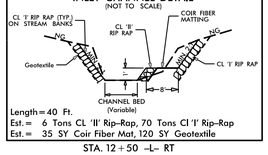
INLET CHANNEL W/FLOODPLAIN
BENCH AND CL 'I' RIP RAP
BANK STABILIZATION
SEE DETAIL #1

SR 1627 MOUNT HARMONY RD.
18' PAVED ROADWAY

SR 1604 HARMONY ST.
19' PAVE ROADWAY

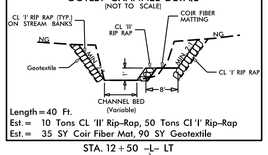
ISMTLBUS

DETAIL #1
INLET CHANNEL DETAIL
(NOT TO SCALE)



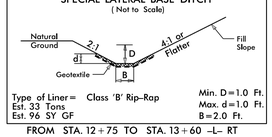
Length = 40 Ft.
Est. = 6 Tons CL 'II' Rip-Rap, 70 Tons Cl 'I' Rip-Rap
Est. = 35 SY Coir Fiber Mat, 120 SY Geotextile
STA. 12+50 –L– RT

DETAIL #2
OUTLET CHANNEL DETAIL
(NOT TO SCALE)



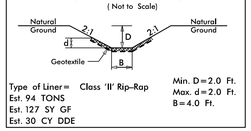
Length = 40 Ft.
Est. = 10 Tons CL 'II' Rip-Rap, 50 Tons Cl 'I' Rip-Rap
Est. = 35 SY Coir Fiber Mat, 90 SY Geotextile
STA. 12+50 –L– LT

DETAIL #3
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Type of Liner = Class 'B' Rip-Rap
Est. 33 Tons
Est. 96 SY GF
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
B = 2.0 Ft.
FROM STA. 12+75 TO STA. 13+60 –L– RT

DETAIL #4
STANDARD BASE DITCH
(Not to Scale)



Type of Liner = Class 'II' Rip-Rap
Est. 94 TONS
Est. 127 SY GF
Est. 30 CY DDE
Min. D = 2.0 Ft.
Max. d = 2.0 Ft.
B = 4.0 Ft.
FROM STA. 12+00 TO STA. 12+40 –L– LT

FOR –L– PROFILE SEE SHEET 5

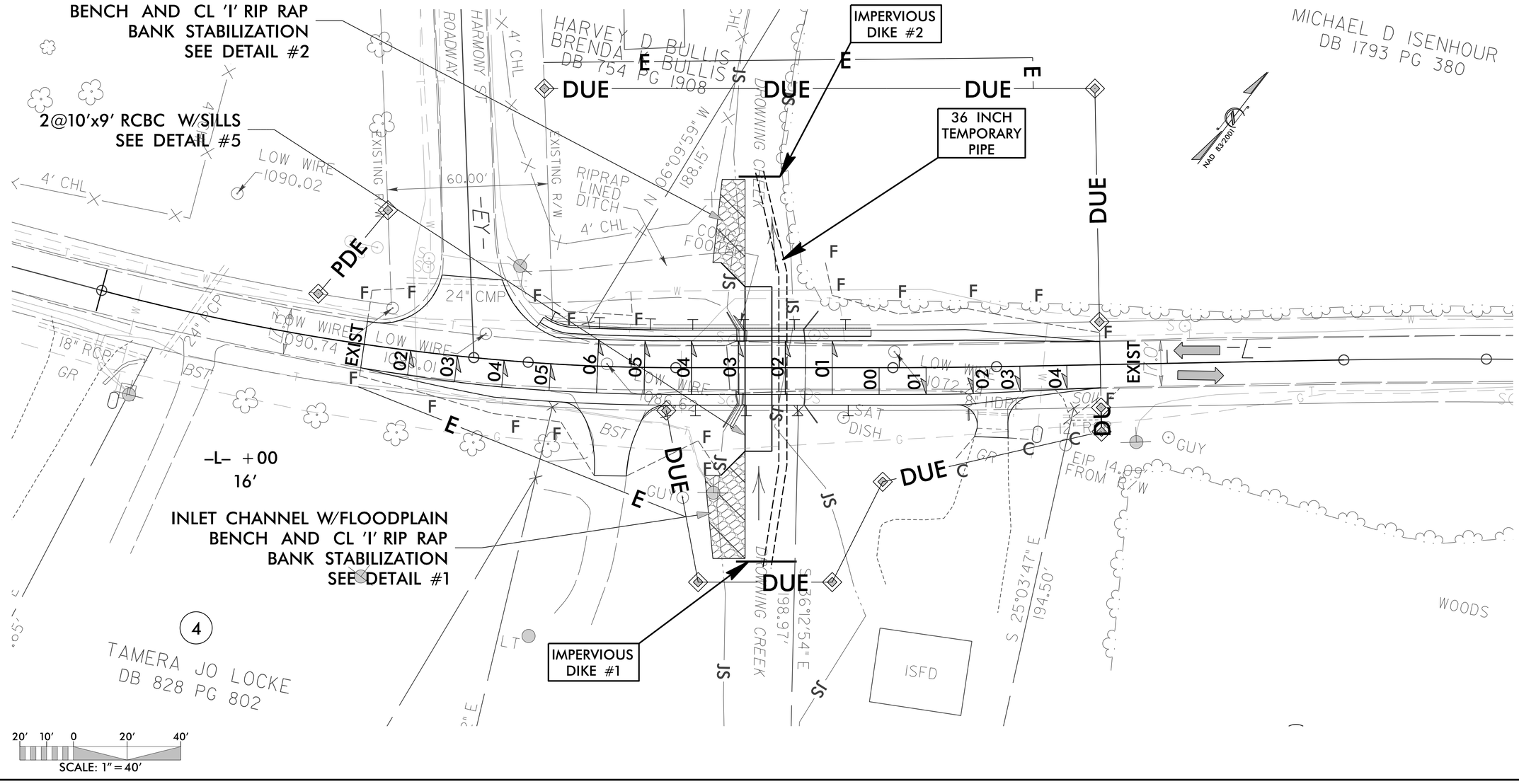
SBG - SHOULDER BERM GUTTER

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.153	EC-04A/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

2@10'X9' CULVERT CONSTRUCTION SEQUENCE
STA. 12+53 –L– UT TO DROWNING CREEK

PHASE 1

1.) UTILIZE SPECIAL STILLING BASIN(S) AS NEEDED THROUGHOUT CULVERT CONSTRUCTION.
2.) INSTALL 36" TEMPORARY PIPE AND IMPERVIOUS DIKES #1 AND #2.
3.) DEWATER CONSTRUCTION AREA, UTILIZING SPECIAL STILLING BASIN(S) FOR PUMPED EFFLUENT.
4.) REMOVE EXISTING BRIDGE.
5.) CONSTRUCT UPSTREAM BANK STABILIZATION, WEST BARREL OF 10'X9' RCBC AND DOWNSTREAM RIP RAP BANK STABILIZATION.
6.) EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF IMPERVIOUS DIKES.
7.) REMOVE IMPERVIOUS DIKES AND TEMPORARY 36" PIPE.
8.) DIVERT FLOW THROUGH NEWLY CONSTRUCTED BARREL OF 10'X9' RCBC.

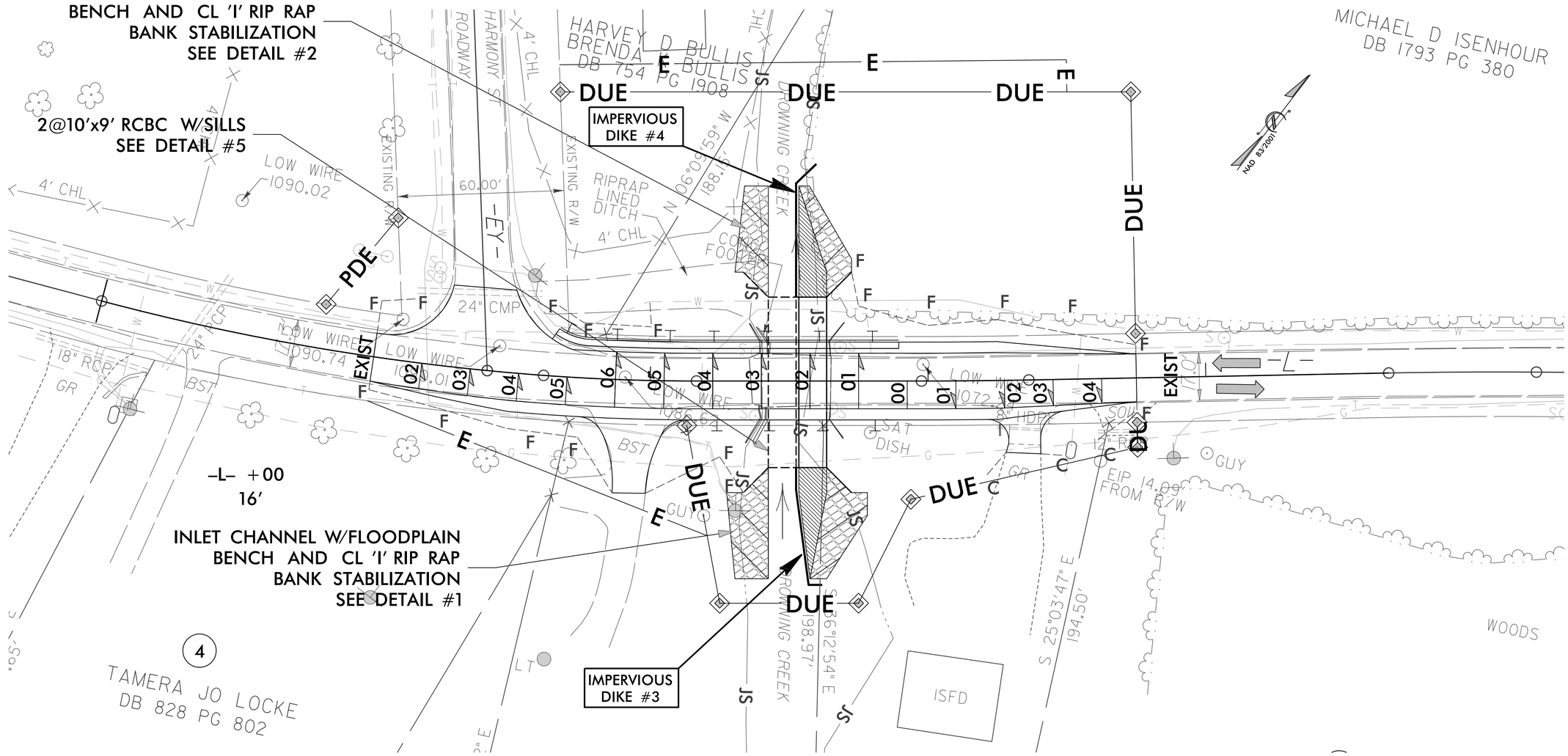


2@10'X9' CULVERT CONSTRUCTION SEQUENCE
STA. 12+53 –L– UT TO DROWNING CREEK

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.153	EC-04B/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

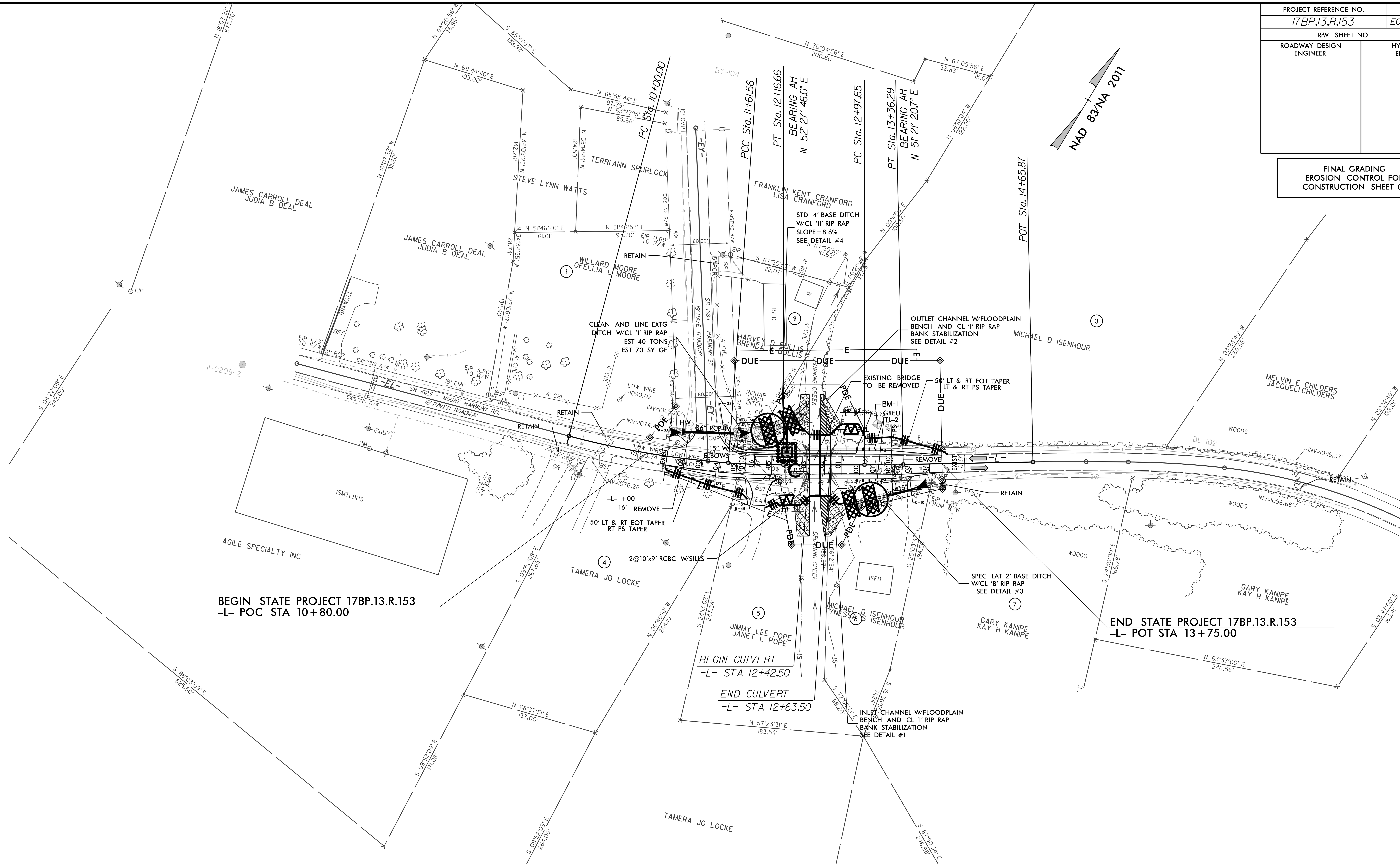
PHASE II

1.) INSTALL IMPERVIOUS DIKES #3 AND #4, AND DIRECT FLOW THROUGH WEST BARREL.
2.) DEWATER CONSTRUCTION AREA, UTILIZING SPECIAL STILLING BASIN(S) FOR PUMPED EFFLUENT.
3.) CONSTRUCT UPSTREAM FLOODPLAIN BENCH AND BANK STABILIZATION, EAST BARREL OF 2@10'X9' RCBC AND DOWNSTREAM FLOODPLAIN BENCH AND BANK STABILIZATION.
4.) EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF IMPERVIOUS DIKES.
5.) STABILIZE FLOODPLAIN BENCH AND REMOVE ANY REMAINING SPECIAL STILLING BASIN(S) AND IMPERVIOUS DIKES.
6.) COMPLETE ROADWAY.



PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.153	EC-05/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FINAL GRADING
EROSION CONTROL FOR
CONSTRUCTION SHEET 04



DETAIL #1
INLET CHANNEL DETAIL
(NOT TO SCALE)

CL 'I' RIP RAP (TYP.) ON STREAM BANKS; CL 'II' RIP RAP; COIR FIBER MATTING; NG; Geotextile; CL 'I' RIP RAP; MIN. 2:1; 1'; 8'; CHANNEL BED (Variable)

Length = 40 Ft.
Est. = 6 Tons CL 'II' Rip-Rap, 70 Tons Cl 'I' Rip-Rap
Est. = 35 SY Coir Fiber Mat, 120 SY Geotextile

STA. 12+50 -L- RT

DETAIL #2
OUTLET CHANNEL DETAIL
(NOT TO SCALE)

CL 'I' RIP RAP (TYP.) ON STREAM BANKS; CL 'II' RIP RAP; COIR FIBER MATTING; NG; Geotextile; CL 'I' RIP RAP; MIN. 2:1; 1'; 8'; CHANNEL BED (Variable)

Length = 40 Ft.
Est. = 10 Tons CL 'II' Rip-Rap, 50 Tons Cl 'I' Rip-Rap
Est. = 35 SY Coir Fiber Mat, 90 SY Geotextile

STA. 12+50 -L- LT

DETAIL #3
SPECIAL LATERAL BASE DITCH
(Not to Scale)

Natural Ground; 2:1; D; d; 4:1 or Flatter; Fill Slope; Geotextile; B

Type of Liner = Class 'B' Rip-Rap
Est. 33 Tons
Est. 96 SY GF

Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
B = 2.0 Ft.

FROM STA. 12+75 TO STA. 13+60 -L- RT

DETAIL #4
STANDARD BASE DITCH
(Not to Scale)

Natural Ground; 2:1; D; d; 2:1; Natural Ground; Geotextile; B

Type of Liner = Class 'II' Rip-Rap
Est. 94 TONS
Est. 127 SY GF
Est. 30 CY DDE

Min. D = 2.0 Ft.
Max. d = 2.0 Ft.
B = 4.0 Ft.

FROM STA. 12+00 TO STA. 12+40 -L- LT

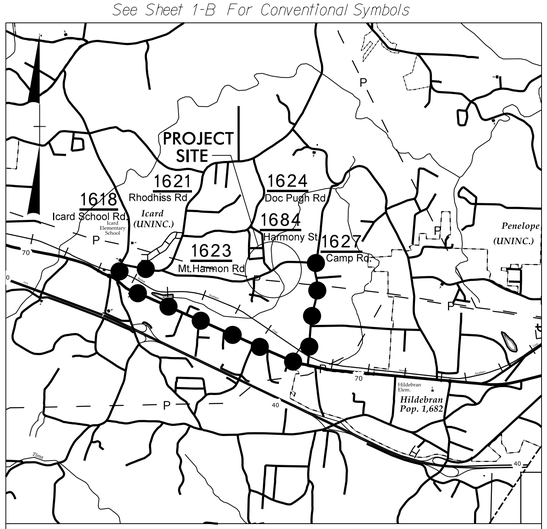
FOR -L- PROFILE SEE SHEET 5

SBG - SHOULDER BERM GUTTER

09/08/99

TIP PROJECT: 17BP.13.R.153

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



VICINITY MAP

DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

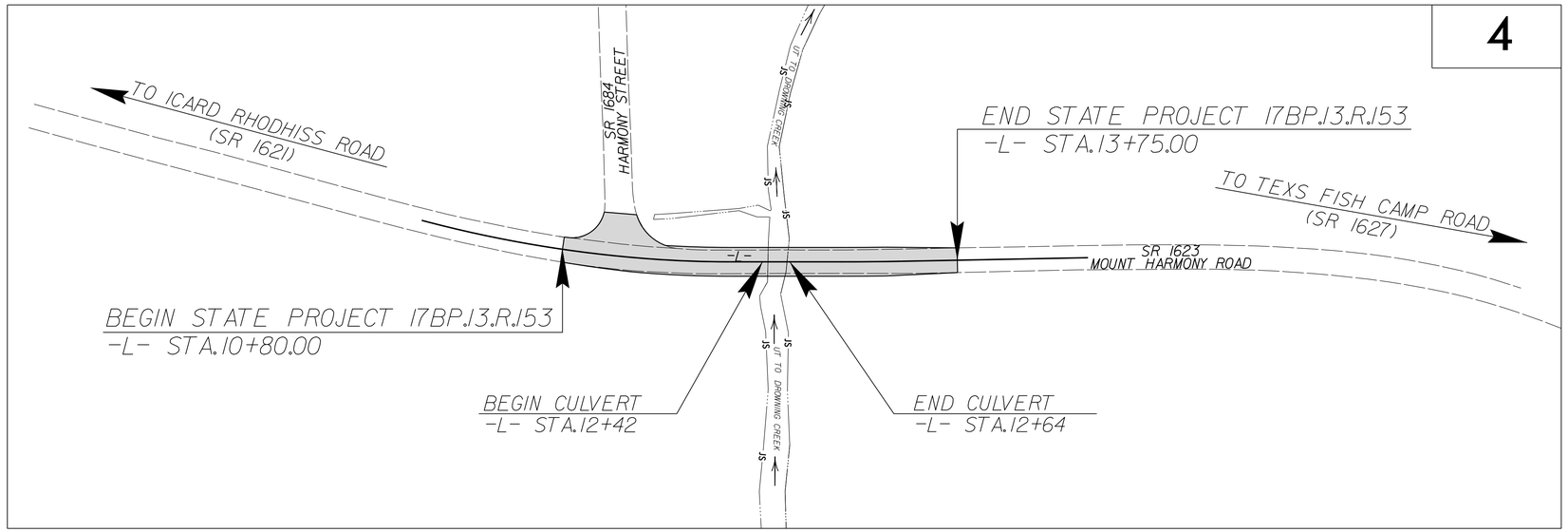
UTILITIES BY OTHERS PLANS
BURKE COUNTY

T.I.P. NO.	SHEET NO.
17BP.13.R.153	UO–1

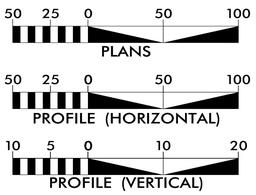
NOTE:
ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.

LOCATION: REPLACE BRIDGE NO. 209 OVER DROWNING CREEK ON SR 1623 (MOUNT HARMONY RD.)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE



GRAPHIC SCALES



INDEX OF SHEETS

UTILITY OWNERS WITH CONFLICTS

(A) POWER – DUKE ENERGY

(B) TELEPHONE – CENTURYLINK

(C) CABLE TV – CHARTER

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http://www.kci.com

KCI Associates of N.C., P.A.
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Raleigh, NC 27609
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DANIEL ALLEN	*PROJECT UTILITY COORDINATOR*
KELSEY BARTLETT	*PROJECT UTILITY COORDINATOR*

DIVISION OF HIGHWAYS
UTILITIES UNIT
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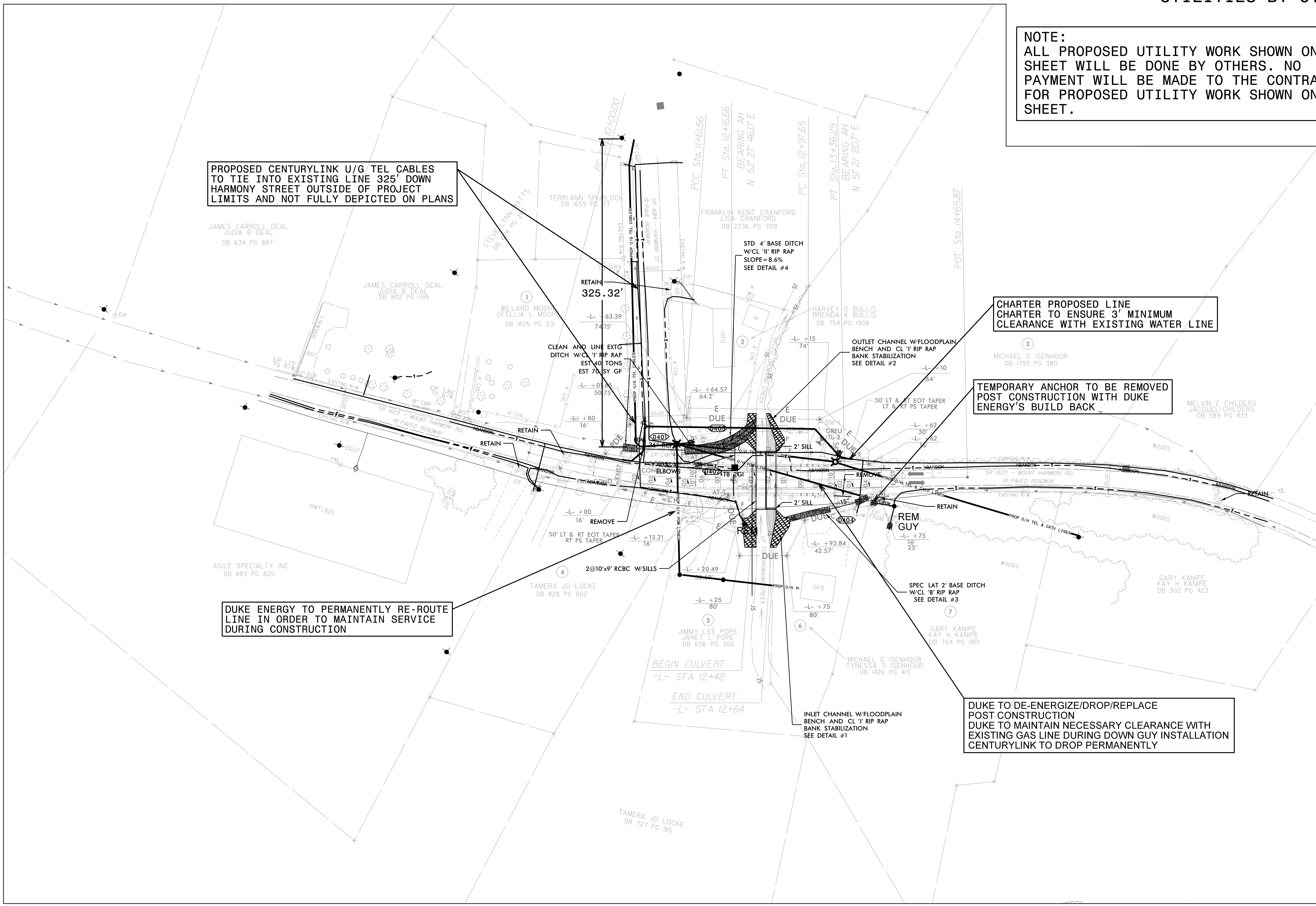
RALEIGH NC 27699–1555
PHONE (919) 707–6690
FAX (919) 250–4151

KEITH RADCLIFF	*UTILITIES COORDINATOR*
MARK GIBBS, PE	*DIVISION ENGINEER*

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.153	UO-02

UTILITIES BY OTHERS

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



8/17/99
02-JUN-2021 11:31
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09/08/99

TIP PROJECT: 17.BP.13.R.153

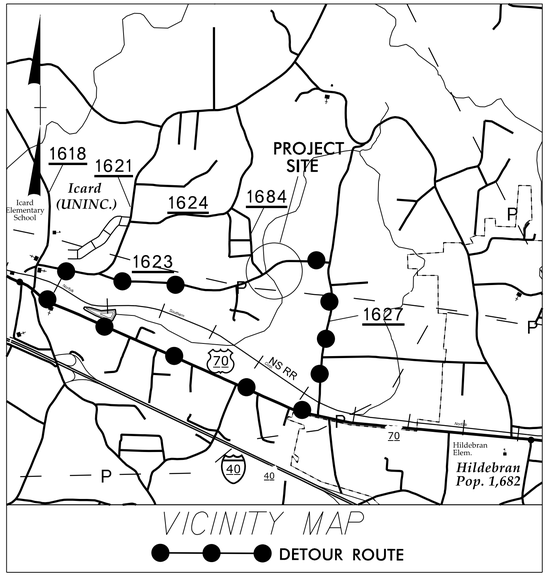
T.I.P. NO.	SHEET NO.
17BP.13.R.153	UC–1

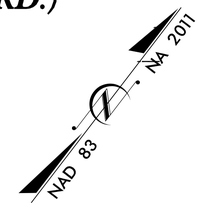
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

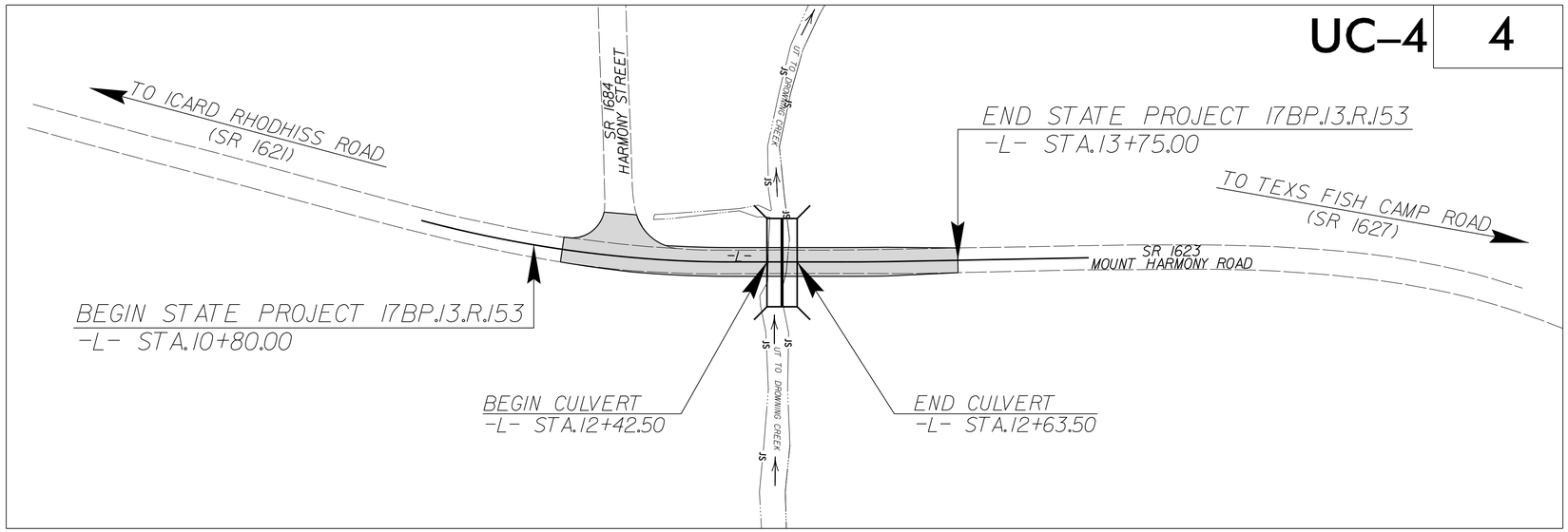
UTILITY CONSTRUCTION PLANS
BURKE COUNTY

LOCATION: BRIDGE NO. 209 OVER DROWNING CREEK ON SR 1623 (MOUNT HARMONY RD.)

TYPE OF WORK: WATERLINE RELOCATION







DOCUMENT NOT CONSIDERED FINAL UNTIL ALL SIGNATURES ARE COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

WATER OWNER ON PROJECT

ICARD TOWNSHIP WATER CORPORATION
218 MAIN AVE E
HILDEBRAN, NC 28637

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DINKISSA KEREYU, PE	*PROJECT ENGINEER*
MARCO MENENDEZ, PE	*PROJECT MANAGER*
CHARLES SHEARON	*PROJECT DESIGNER*

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032322 MARCO R. MENENDEZ
Digitally Signed by
4/27/2021

DIVISION OF HIGHWAYS
UTILITIES UNIT
1555 MAIL SERVICES CENTER
RALEIGH NC 27699–1555
PHONE (919) 707–6690
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	UTILITIES REGIONAL ENGINEER
	UTILITIES ENGINEER
	UTILITIES AREA COORDINATOR
	UTILITIES COORDINATOR

PROJECT REFERENCE NO.	SHEET NO.
I7BPJ3.RJ53	UC-2

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

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

PROPOSED MISCELLANOUS UTILITIES SYMBOLS

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

EXISTING UTILITIES SYMBOLS

Item	Symbol label
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	SS
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)

Designated Utility Line (Type as Shown)

REV: 2/1/2012

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.RJ53	UC-3

DESIGNED BY: DK
DRAWN BY: CS
CHECKED BY: MM
APPROVED BY:
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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

UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 032322 ENGINEER MARCO R. MENENDEZ 4/27/2021

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License No. C-764
http://www.kci.com

UTILITY CONSTRUCTION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 2018.

2. THE EXISTING UTILITIES BELONG TO ICARD TOWNSHIP WATER CORPORATION.

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 ENVIRONMENT QUALITY, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.

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

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

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

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

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

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

PROJECT SPECIFIC NOTES:

1. ALL PROPOSED WATER LINE SHALL BE PRESSURE CLASS 350 DIP.

2. ALL PIPE JOINTS AT FITTINGS AND VALVES SHALL BE RESTRAINED WITH THRUST BLOCKING. ADDITIONALLY ALL PIPE JOINTS SHALL BE RESTRAINED JOINTS.

3. CONTRACTOR SHALL COORDINATE WITH THE ICARD TOWNSHIP WATER CORPORATION FOR SHUTDOWN OF EXISTING WATER LINE.

4. CONTRACTOR SHALL REMOVE EXISTING 6" WATER LINE AS NECESSARY TO CONNECT WITH THE PROPOSED WATERLINE.

5. CONTRACTOR SHALL FOLLOW ALL SPECIAL PROVISIONS ASSOCIATED WITH HANDLING OF EXISTING ASBESTOS CEMENT PIPING.

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.RJ53	UC-3A

DESIGNED BY: DK
DRAWN BY: CS
CHECKED BY: MM
APPROVED BY:
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

UTILITIES ENGINEERING SEC.
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NORTH CAROLINA PROFESSIONAL SEAL 032322 ENGINEER MARCO R. MENENDEZ
4/27/2021

UTILITY CONSTRUCTION PLANS ONLY

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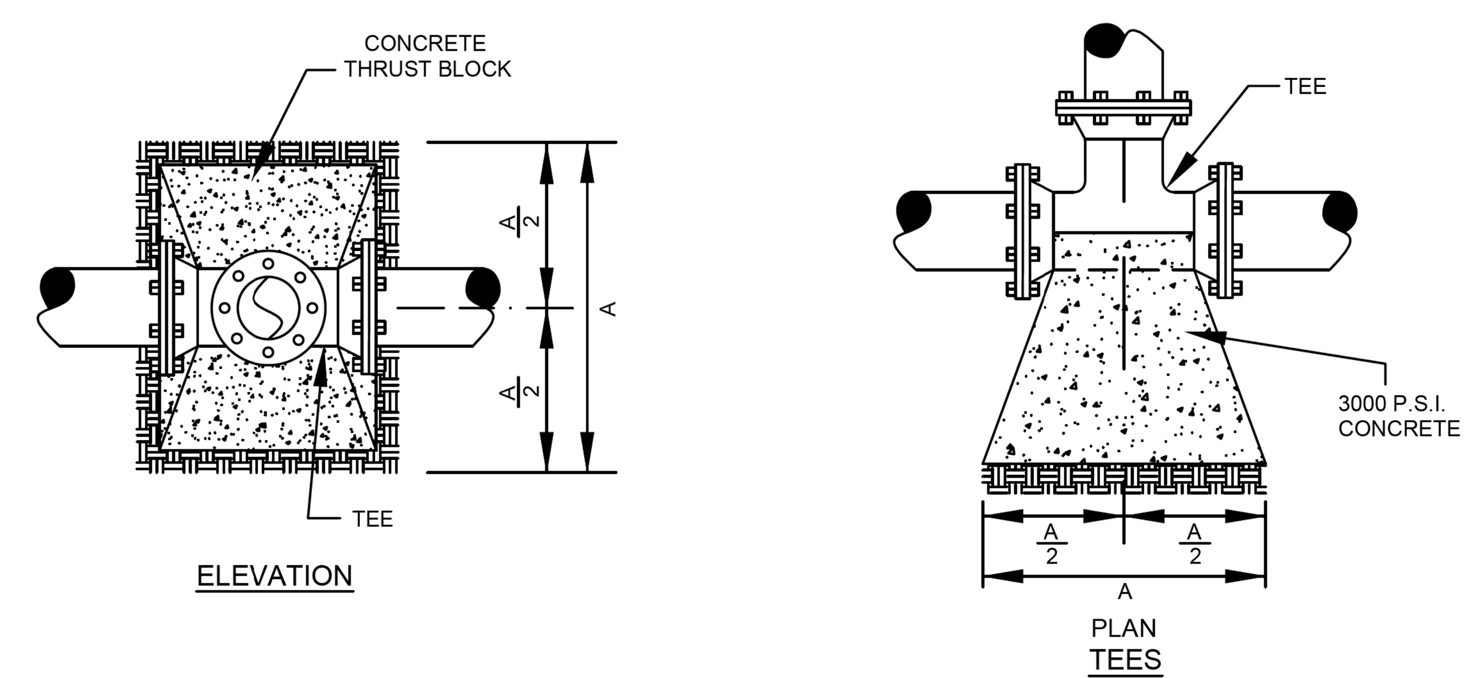
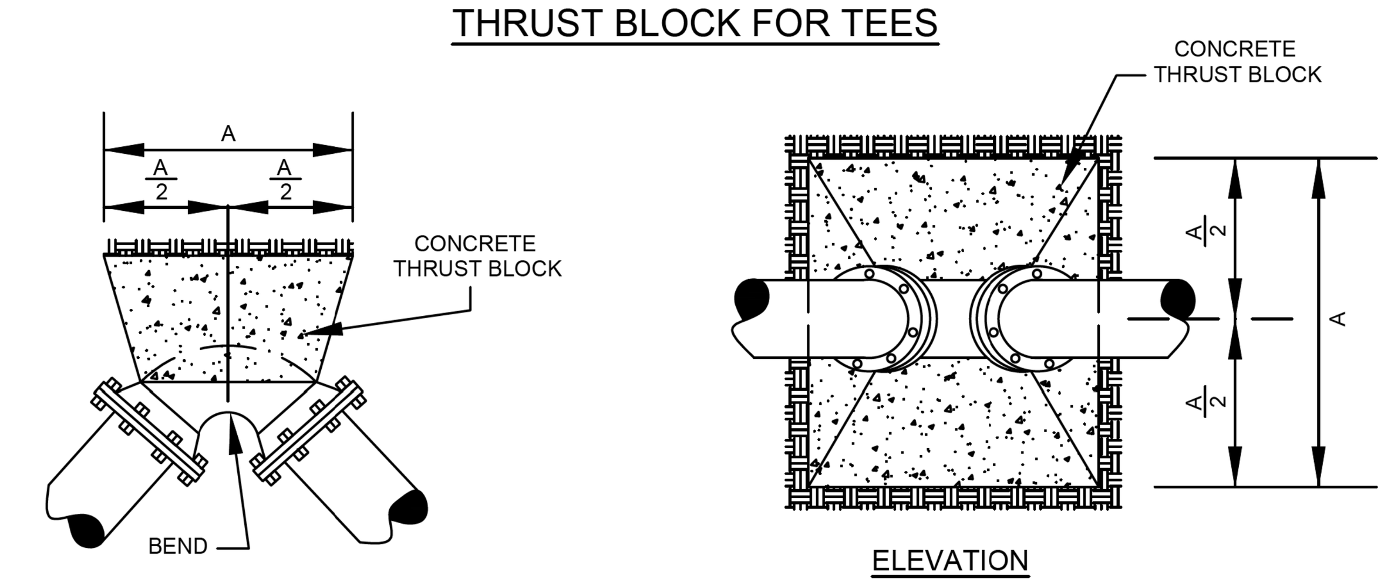
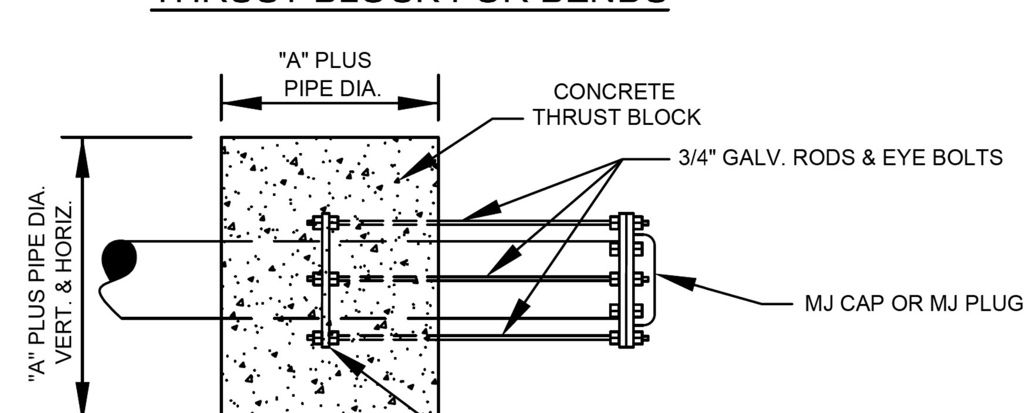


THRUST BLOCK FOR TEES



THRUST BLOCK FOR BENDS



NOTES:
1. DEAD MAN RESTRAINED W/ 2-3/4" ALL THREAD RODS 3" TO 8" AND 4-3/4" ALL THREAD RODS 12" TO 16"

THRUST BLOCK FOR PIPE CAP

NOT TO SCALE

THRUST BLOCK FOR WATER MAINS (150 PSI WORKING PRESSURE)	STD. NO.	DATE
	104.1	3-7-11 / SHEET 1 OF 2

CITY OF MORGANTON

SIZE	11 1/4° BEND	22 1/2° BEND	45° BEND	90° BEND	TEE	CAP
6	12	12	12	16	16	14
8	12	12	16	22	22	18
10	12	14	20	28	28	22
12	12	18	24	32	32	28
14	14	20	28	38	38	32
16	16	22	32	42	42	36
18	18	26	36	48	48	40
20	20	28	40	52	52	44
24	24	34	46	64	64	54
30	30	42	58	78	78	66
36	36	50	70	94	94	80
42	40	58	80	108	108	90
48	46	66	90	124	124	104

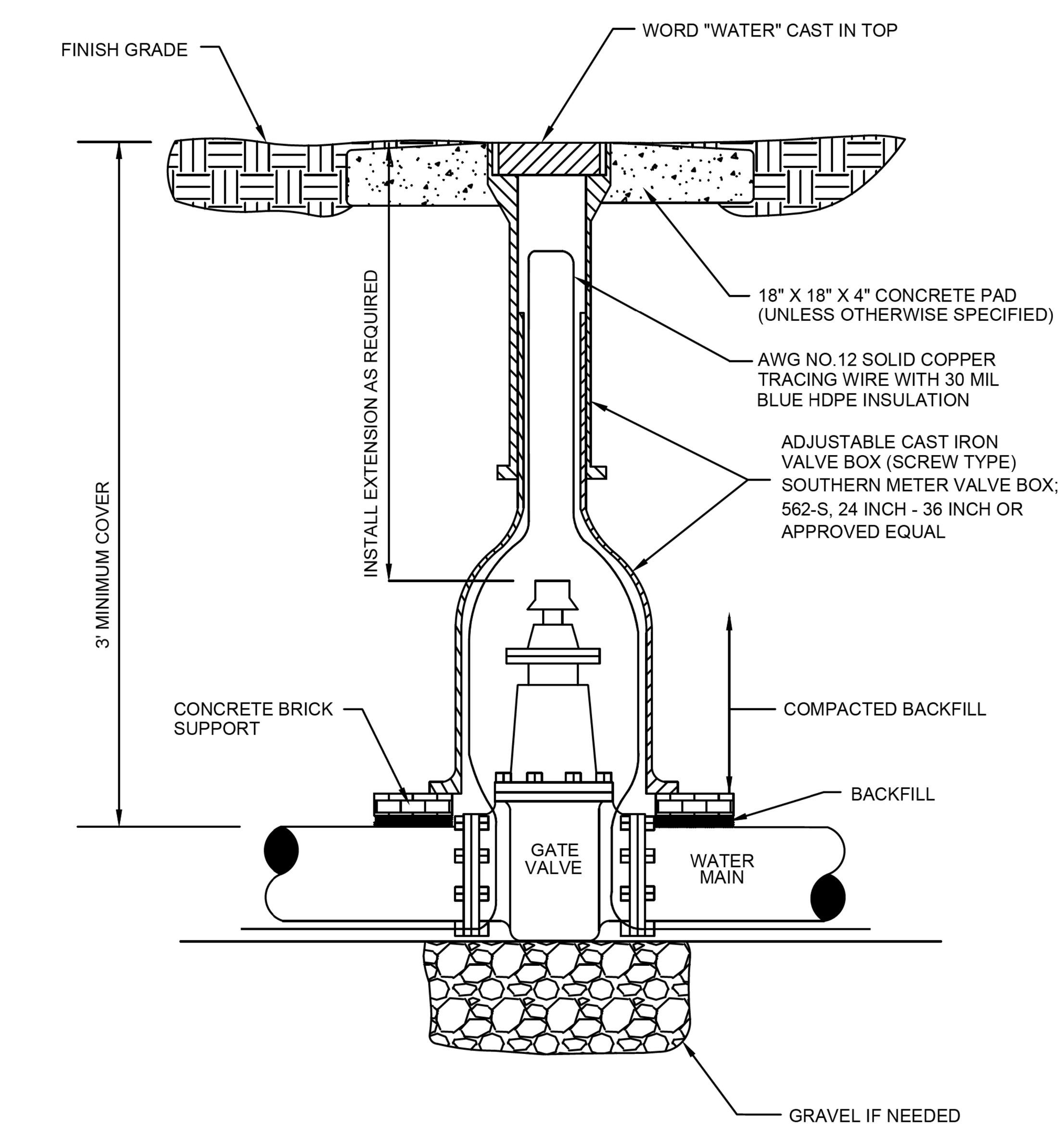
THRUST BLOCK DIMENSION "A"

(DIMENSION "A" IN INCHES)
4,000 P.S.I. CONCRETE

NOT TO SCALE

THRUST BLOCK FOR WATER MAINS	STD. NO.	DATE
	104.2	3-7-11 / SHEET 2 OF 2

CITY OF MORGANTON



NOT TO SCALE
REVISED: 3-4-19

VERTICAL GATE VALVE ASSEMBLY	STD. NO.	DATE
	105	3-7-11 / SHEET 1 OF 1

CITY OF MORGANTON

UTILITY CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
I7BPJ3.RJ53	UC-3B

DESIGNED BY: DK
DRAWN BY: CS
CHECKED BY: MM
APPROVED BY:
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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4/27/2021

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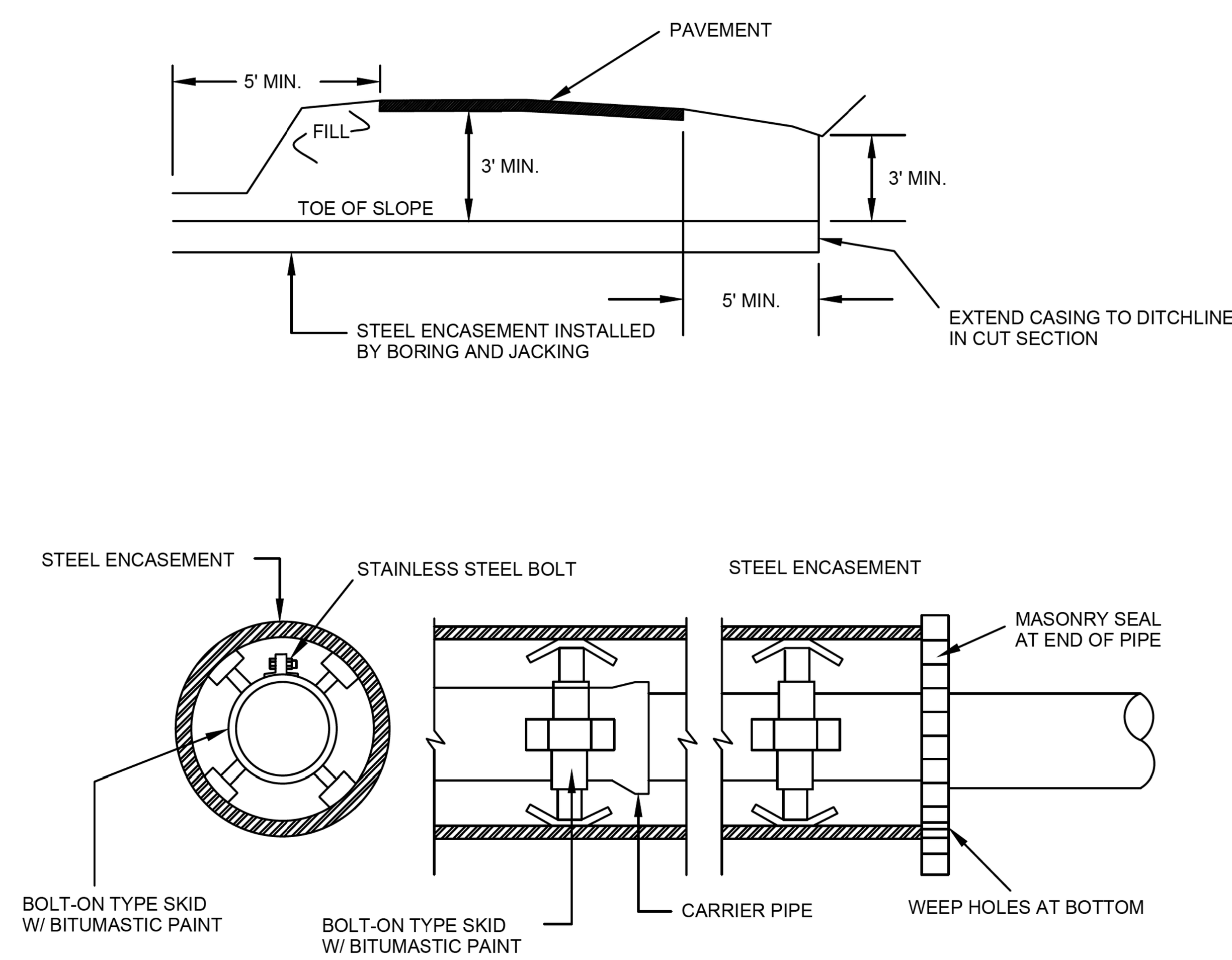


BORE ENCASEMENT DETAIL

NOTES

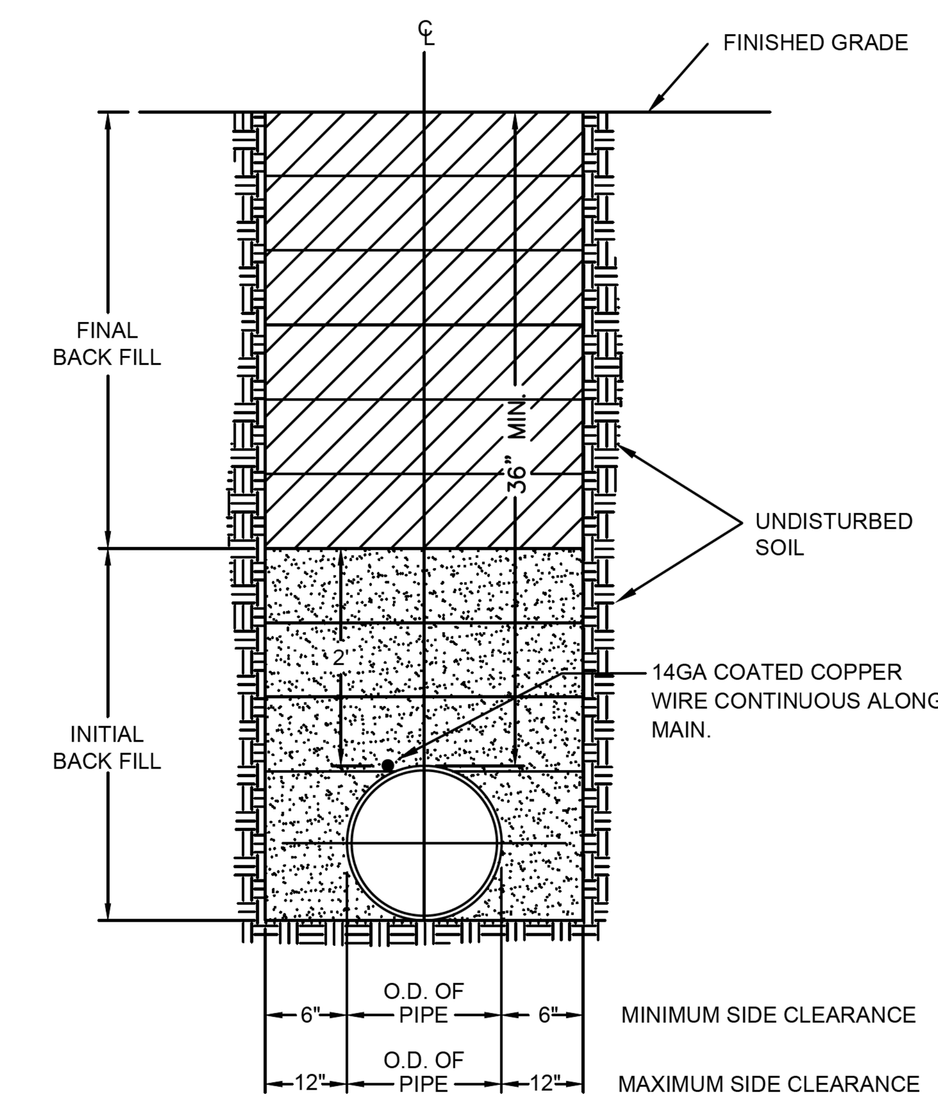
CARRIER PIPE SUPPORTS SHALL BE STEEL SPIDERS (A.S.T.M. A-36 STEEL. SUPPORTS SHALL BE APPROPRIATE SIZE TO SUPPORT AND HOLD THE CARRIER PIPE TO THE SPECIFIED GRADE. THE SUPPORTS SHALL BE LOCATED FOLLOWING AND ADJACENT TO EACH CARRIER PIPE BELL.

MECHANICAL JOINT DUCTILE IRON PIPE WITH FIELD LOK 350 GASKETS BY US PIPE CO. SHALL BE USED WITHIN THE ENCASEMENT PIPE.

NOT TO SCALE

REVISED 3-4-13

	STD. NO.	DATE
BORE ENCASEMENT	109	3-7-11 / SHEET 1 OF 1
CITY OF MORGANTON		



TYPICAL TRENCH BOTTOM DIMENSIONS FOR:
DUCTILE IRON, C-900 PVC, AND CONCRETE PIPE

TRENCH DETAIL
CLASS D FLAT SUBGRADE

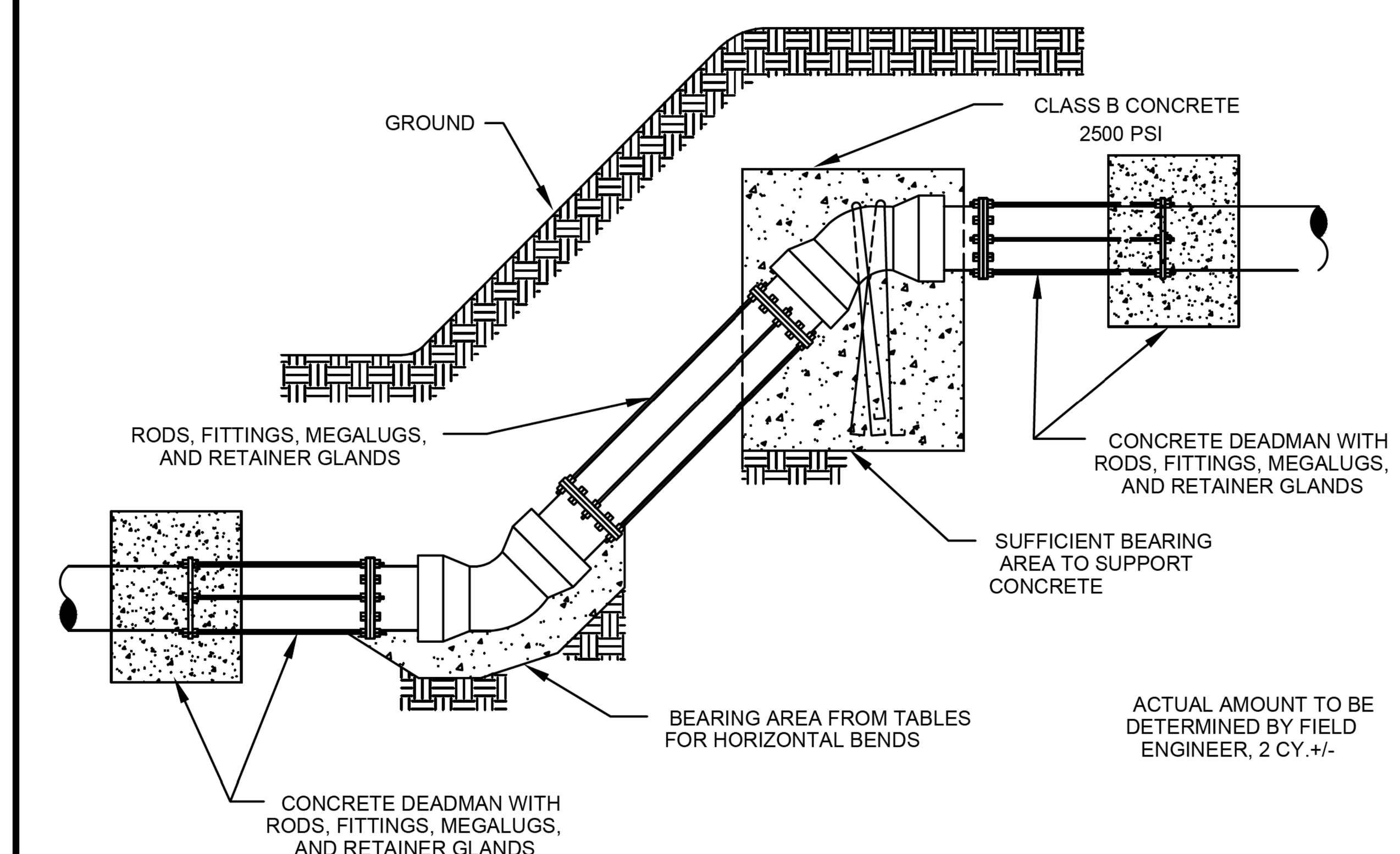
DEPTH OF BEDDING MATERIAL BELOW PIPE

D	d (MIN.)
27" & SMALLER	6"
30" - 60"	12"
66" & LARGER	18"

NOTES:
1. TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
2. NO ROCKS OR BOULDERS 2" OR LARGER TO BE USED IN INITIAL BACKFILL.
3. ALL BACKFILL MATERIAL SHALL BE SUITABLE MATERIAL.
4. BACKFILL SHALL BE COMPACTED IN 6" LAYERS IN TRAFFIC AREAS, 12" LAYERS IN NON-TRAFFIC AREAS USING VIBRATORY EQUIPMENT.

NOT TO SCALE

	STD. NO.	DATE
WATER LINE TRENCH BOTTOM AND BACKFILLING REQUIREMENTS	111	3-7-11 / SHEET 1 OF 1
CITY OF MORGANTON		



ACTUAL AMOUNT TO BE DETERMINED BY FIELD ENGINEER, 2 CY.+/-

CUBIC YARDS OF CONCRETE TO ANCHOR VERTICAL BENDS

PIPE DIA.	11-1/4"° BEND		22-1/2"° BEND		45° BEND	
6"	812#	1/2 CY.	1653#	1/2 CY.	3247#	1.0 CY.
8"	1444#	1/2 CY.	2939#	3/4 CY.	5773#	1.5 CY.
12"	3248#	1.0 CY.	6612#	1-3/4 CY.	12988#	3.5 CY.
16"	5775#	1-1/2 CY.	11756#	3.0 CY.	23090#	6.0 CY.

NOT TO SCALE

	STD. NO.	DATE
STANDARD VERTICAL BEND ANCHORS	122	3-7-11 / SHEET 1 OF 1
CITY OF MORGANTON		

5/14/99

27-APR-2021 09:36
e Replacements\A_I7BPJ3.RJ53_Burke_110209\Water and wastewater\110209_ut_dtls_UC03A_psh.dgn
$$$$USERNAME$$$$

DocuSign Envelope ID: C9A796BB-2407-4C32-9473-5DA5DFB65E7D

PROJECT REFERENCE NO.	SHEET NO.
I7BPJ3.RJ53	UC-4

DESIGNED BY: DK
DRAWN BY: CS
CHECKED BY: MM
APPROVED BY:
REVISED:

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NORTH CAROLINA PROFESSIONAL SEAL 032322 ENGINEER MARCO R. MENENDEZ
4/27/2021

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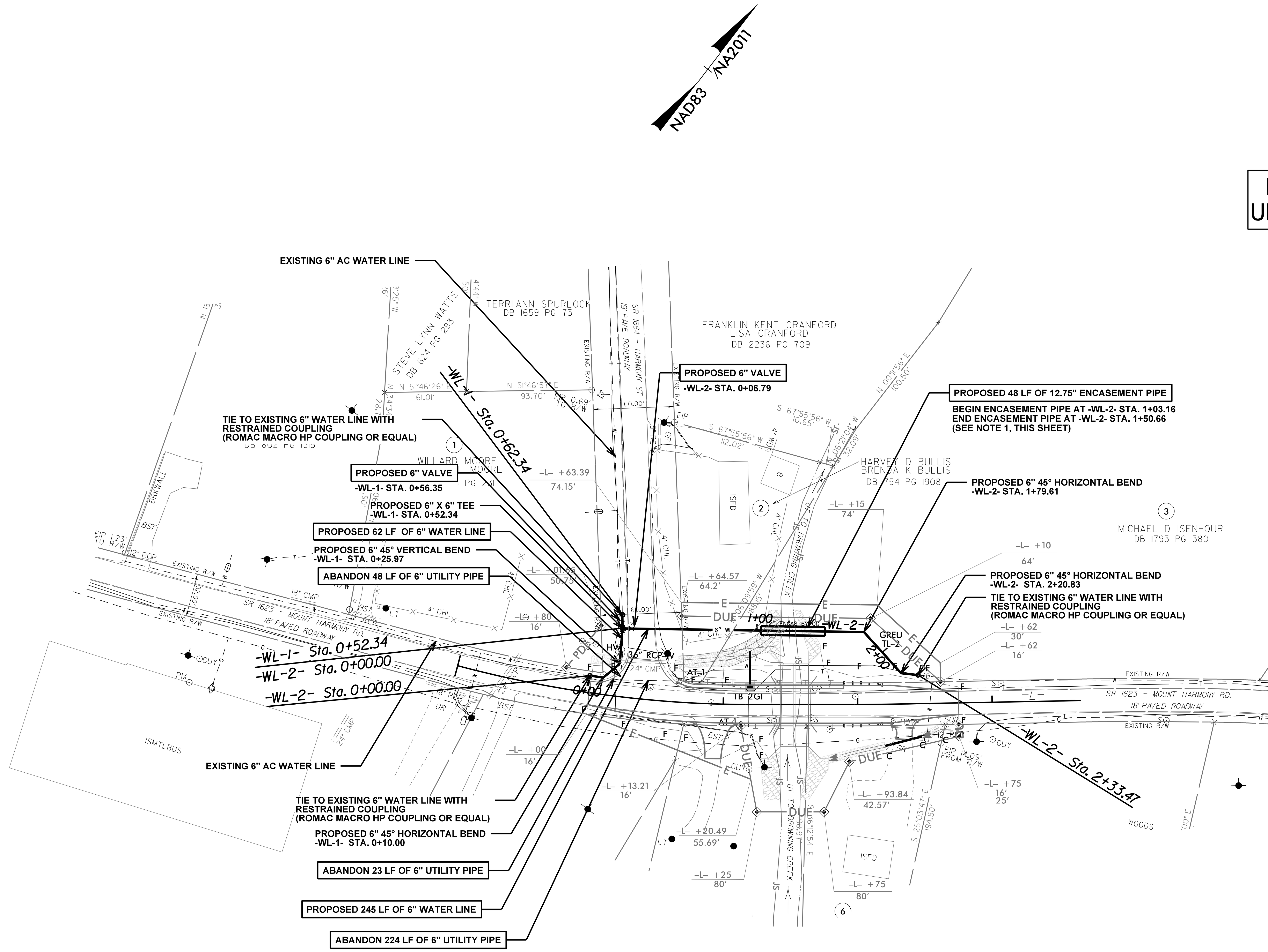


NOTES:

1. CONTRACTOR SHALL INSTALL ENCASEMENT PIPE UTILIZING OPEN CUT CONSTRUCTION METHODS. WALL THICKNESS OF ENCASEMENT PIPE SHALL BE 0.188 INCHES.
2. CONTRACTOR SHALL UTILIZE OPEN CUT CONSTRUCTION METHOD FOR PROPOSED 6" WATER LINE STREAM CROSSING. FOR BACKFILLING AND RESTORATION, CONTRACTOR SHALL UTILIZE 50% CLASS A STONE / 50% NATIVE BED MATERIAL MIXTURE AT LEAST 12" DEPTH ON TOP OF PROPOSED PIPE, FOR THE ENTIRE TRENCH WIDTH. FOR THE STREAM BANKS, CONTRACTOR SHALL MIX 25% CLASS B STONES, 25% CLASS A STONES, AND 50% NATIVE SOILS. CONTRACTOR SHALL ENSURE THAT ALL DISTURBED AREAS ARE RESTORED AND THAT BANKS OR BENCHES, OUTSIDE OF THE MAIN TRENCH GRADING IN NEED OF RESTORATION, ARE STABILIZED WITH SEED AND HAY AND 900 GRAM COIR MATTING, SEED AND MULCH. CONTRACTOR SHALL STAKE MATTING WITH 1' MINIMUM WOODEN STAKES.

1,075 LB OF DUCTILE IRON PIPE FITTINGS

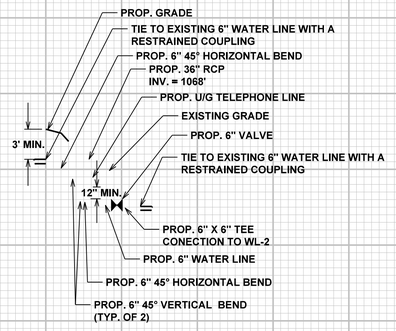
50 25 0 50 100
PLANS

5/14/99

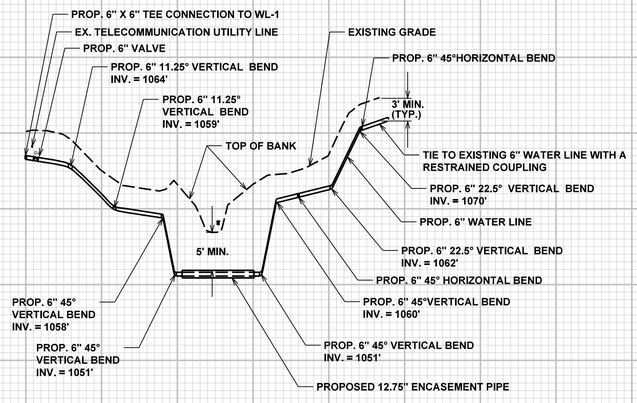
27-APR-2021 16:18
Replacements\4.17BP.13.R.153_Burke_110209\Water and wastewater\110209_ut_rdy4_UC04_psh.dgn

5/28/99

-WL-1-



-WL-2-



PROJECT REFERENCE NO.	SHEET NO.
17BP.13.RJ53	UC-5
DESIGNED BY: DK	
DRAWN BY: CS	
CHECKED BY: MM	
APPROVED BY:	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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NORTH CAROLINA PROFESSIONAL SEAL 032322 ENGINEER MARIO R. MENENDEZ
DocuSigned by: Mario Menendez
4/27/2021

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COMPUTED BY: T. KRAUSS DATE: 4/15/21
CHECKED BY: R. ALLEN DATE: XXX/21

5/9/06

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY

PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.153	X-0

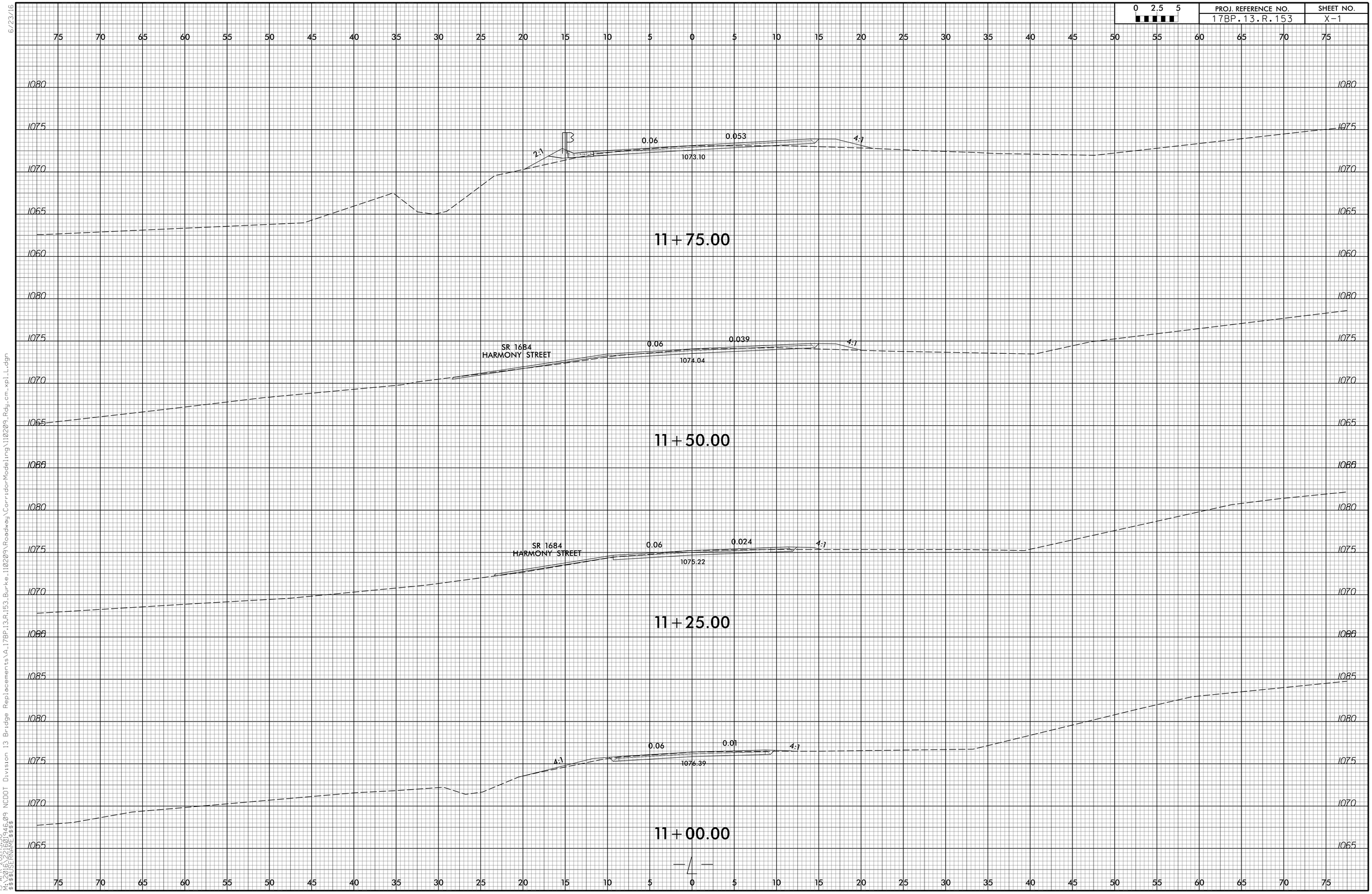
BRIDGE 110209

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".

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
11+00.00	0	0
11+25.00	8	1
11+50.00	8	2
11+75.00	7	6
12+00.00	5	12
12+25.00	4	39
12+42.50	3	43
12+63.50	0	0
12+75.00	4	31
13+00.00	18	41
13+25.00	24	12
13+35.00	6	2
13+50.00	6	2
13+75.00	11	2

15-APR-2021 08:02
N:\Roadway\Corridor Modeling\110209_Rdy_xsc_X-0.dgn
$$$$USERNAME$$$$
NCDOT Division 13 Bridge Replacements\VA_17BP.13.R.153_Burke_110209\Roadway\CorridorModeling\110209_Rdy_xsc_X-0.dgn

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.13.R.153	X-1



PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.153	X-3

6/23/16

15-APR-2021 15:50
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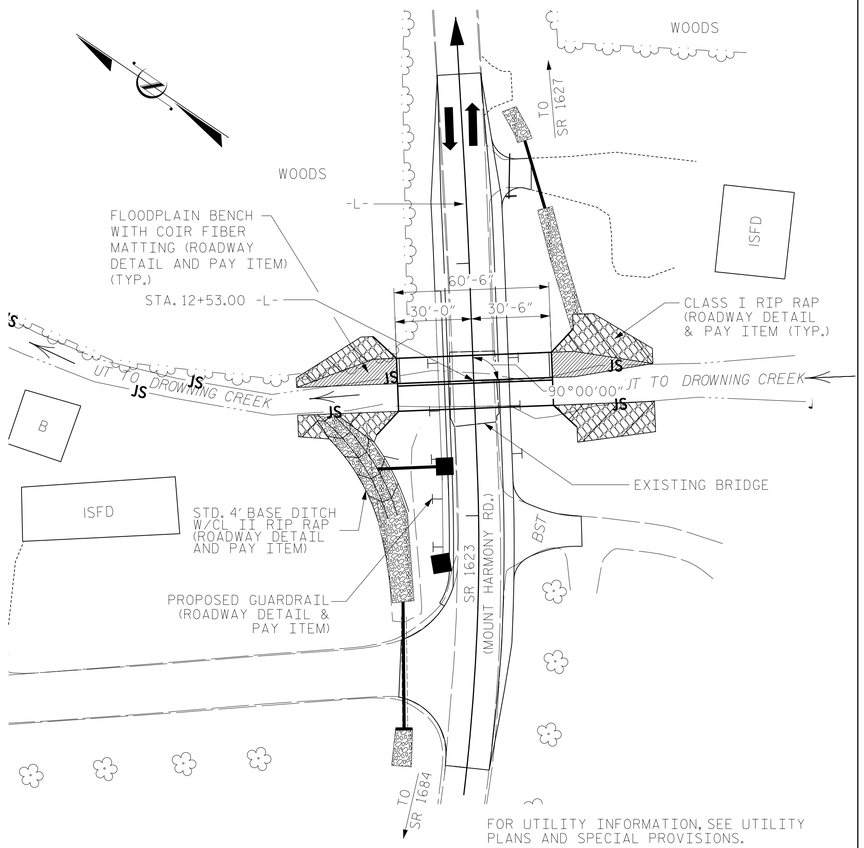
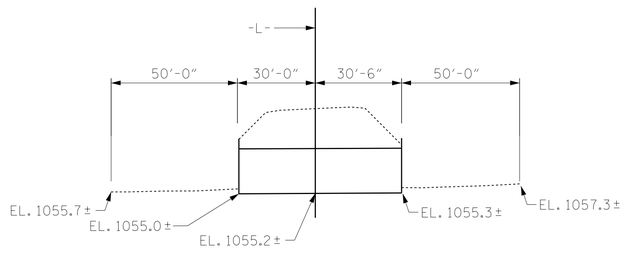
$$$$USERNAME$$$$

BENCH MARK: BM #1: BENCH TIE NAIL IN 27"PINE, STA 13+10.74 -L-, 41FT LT NAVD 88, EL. 1068.16



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH



PROFILE ALONG ℄ CULVERT

ROADWAY DATA

GRADE POINT ELEV @ STA. 12+53.00 -L- = 1072.18
BED ELEV @ STA. 12+53.00 -L- = 1055.15
ROADWAY SLOPES = 2:1

HYDRAULIC DATA

DESIGN DISCHARGE	= 1,000 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YRS
DESIGN HIGH WATER ELEVATION	= 1,063.70
DRAINAGE AREA	= 1.7 SQ MI.
BASE DISCHARGE (Q100)	= 1,300 CFS
BASE HIGH WATER ELEVATION	= 1064.60

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= >1600 CFS
FREQUENCY OF OVERTOPPING FLOOD	= >500 YRS
OVERTOPPING FLOOD ELEVATION	= 1072.1 ✳

✳RIGHT SHOULDER AT SAG STA. 12+38.00 -L-

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE

BARREL @	2.237 CY/FT	135.3	C.Y.
WING ETC.		31.1	C.Y.
TOTAL		166.4	C.Y.

REINFORCING STEEL

BARREL	27,763	LBS.
WINGS ETC.	1,803	LBS.
TOTAL	29,566	LBS.

FOUNDATION CONDITIONING MATERIAL

TOTAL	111	TONS

CULVERT EXCAVATION,	LUMP SUM
REMOVAL OF EXISTING, STRUCTURE AT STA. 12+53.00 -L-	LUMP SUM
ASBESTOS ASSESSMENT,	LUMP SUM

NOTES:

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

DESIGN FILL---------- MIN = 7.7' MAX = 8.3'

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.

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

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

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

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

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

THE EXISTING STRUCTURE CONSISTING OF 1 @ 25'-9"STEEL I-BEAMS; 19'-1"CLEAR ROADWAY TIMBER FLOOR ON TIMBER CAPS WITH TIMBER PILES AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 12+53.00 -L-."

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

PROJECT NO. 17BP.13.R.153
BURKE COUNTY
STATION: 12+53.00 -L-

REPLACES BRIDGE NO. 110209

KCI JOB NO: 22160194 6.09A

DESIGN ENGINEER OF RECORD: R. F. DECOLA	DATE : 10/21		
DRAWN BY : R.J. FLORY	DATE : 01/13/21		
CHECKED BY : R.F. DECOLA	DATE : 01/19/21		

10/27/2021

NORTH CAROLINA PROFESSIONAL SEAL 36321 ENGINEER ROBERT F. DECOLA

DocuSigned by: Rob DeCola C91B1BE8951B4FF...

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ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS LICENSE NUMBER: C-0769
KCI Associates of North Carolina, P.A.
4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 783-9214

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 10 FT. X 9 FT. CONCRETE BOX CULVERT 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-01
1			3			TOTAL SHEETS
2			4			5

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE									COMMENT NUMBER
								MOMENT				SHEAR				
							LIVE-LOAD FACTORS (γ_{LL})	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.29	--	1.75	2.52	1	INT WALL	9.00	1.29	2	TOP SLAB	0.00	
		HL-93 (OPERATING)	N/A		1.67	--	1.35	3.26	1	INT WALL	9.00	1.67	2	TOP SLAB	0.00	
		HS-20 (INVENTORY)	36.000	2	1.86	66.960	1.75	3.35	2	EXT. WALL	4.50	1.86	2	TOP SLAB	0.00	
		HS-20 (OPERATING)	36.000		2.42	87.120	1.35	3.38	2	EXT. WALL	4.50	2.42	2	TOP SLAB	0.00	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.10	55.350	1.40	4.10	2	EXT. WALL	4.50	5.13	2	TOP SLAB	0.00	
		SNGARBS2	20.000		4.09	81.800	1.40	4.09	2	EXT. WALL	4.50	4.66	2	TOP SLAB	0.00	
		SNAGRIS2	22.000		4.10	90.200	1.40	4.10	2	EXT. WALL	4.50	4.87	2	TOP SLAB	0.00	
		SNCOTTS3	27.250		2.61	71.123	1.40	4.02	2	EXT. WALL	4.50	2.61	2	TOP SLAB	0.00	
		SNAGGRS4	34.925		2.90	101.283	1.40	4.04	2	EXT. WALL	4.50	2.90	1	TOP SLAB	10.00	
		SNS5A	35.550		2.69	95.630	1.40	4.04	2	EXT. WALL	4.50	2.69	1	TOP SLAB	10.00	
		SNS6A	39.950		2.64	105.468	1.40	4.04	2	EXT. WALL	4.50	2.64	1	TOP SLAB	10.00	
		SNS7B	42.000	3	2.59	108.780	1.40	4.04	2	EXT. WALL	4.50	2.59	2	TOP SLAB	0.00	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		3.82	126.060	1.40	4.10	2	EXT. WALL	4.50	3.82	2	BOTTOM SLAB	0.00	
		TNT4A	33.075		3.01	99.556	1.40	4.04	2	EXT. WALL	4.50	3.01	2	TOP SLAB	0.00	
		TNT6A	41.600		2.81	116.896	1.40	4.04	2	EXT. WALL	4.50	2.81	1	TOP SLAB	10.00	
		TNT7A	42.000		2.95	123.900	1.40	4.04	2	EXT. WALL	4.50	2.95	1	TOP SLAB	10.00	
		TNT7B	42.000		2.83	118.860	1.40	4.04	2	EXT. WALL	4.50	2.83	2	TOP SLAB	0.00	
		TNAGRIT4	43.000		2.93	125.990	1.40	4.04	2	EXT. WALL	4.50	2.93	2	TOP SLAB	0.00	
		TNAGT5A	45.000		2.95	132.750	1.40	4.04	2	EXT. WALL	4.50	2.95	2	TOP SLAB	0.00	
		TNAGT5B	45.000		2.89	130.050	1.40	4.04	2	EXT. WALL	4.50	2.89	2	TOP SLAB	0.00	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS

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

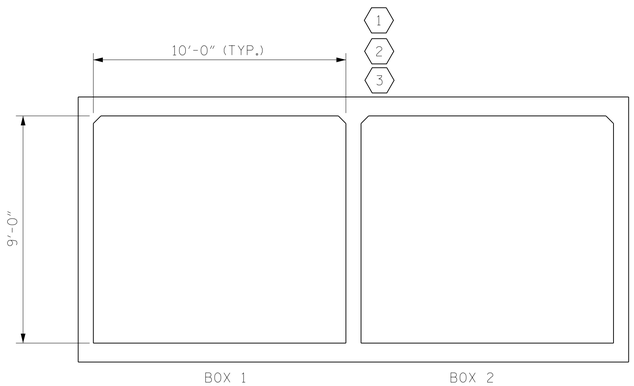
NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

(#) CONTROLLING LOAD RATING

1. DESIGN LOAD RATING (HL-93)
2. DESIGN LOAD RATING (HS-20)
3. LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE



LRFR SUMMARY

(LOOKING DOWNSTREAM)

PROJECT NO. 17BP.13.R.153

BURKE COUNTY

STATION: 12+53.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

10/27/2021

NORTH CAROLINA PROFESSIONAL SEAL 36321 ENGINEER ROBERT F. DECOLA

DocuSigned by: Rob DeCola C91B1BEB951B4FF...

ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS LICENSE NUMBER: C-0764
KCI Associates of North Carolina, P.A.
4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 783-9104

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

SHEET NO. C-02

TOTAL SHEETS 5

STD. NO. LRFR5

DESIGN ENGINEER OF RECORD: R. F. DECOLA DATE: 10/21

ASSEMBLED BY : R.J. FLORY DATE : 01/22/21
CHECKED BY : R.F. DECOLA DATE : 01/22/21

DRAWN BY : WMC 7/11
CHECKED BY : GM 7/11

REV. 10/1/11 MAA/GM
REV. 12/17 MAA/THC

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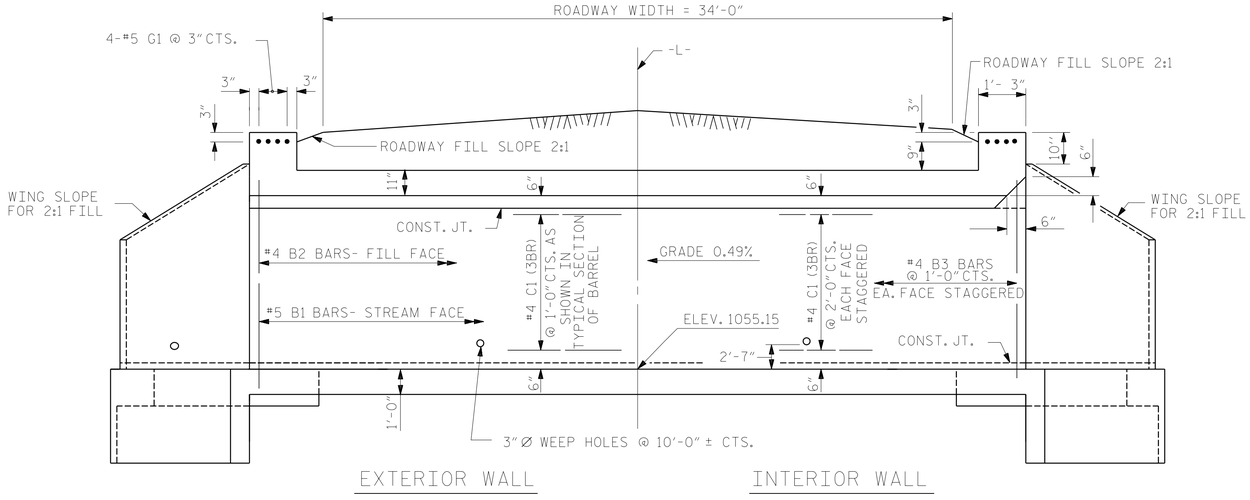
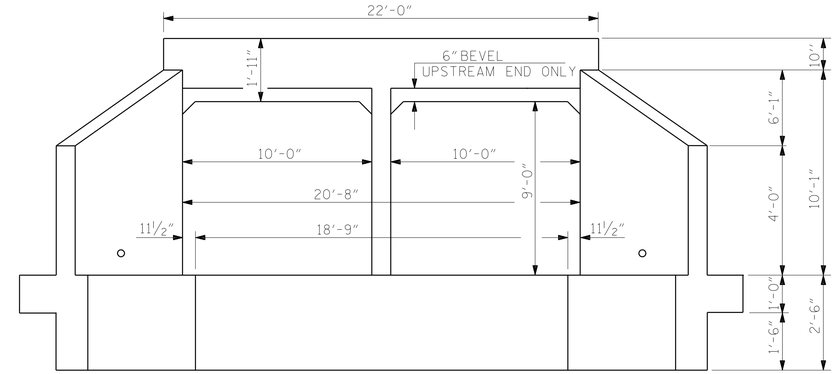
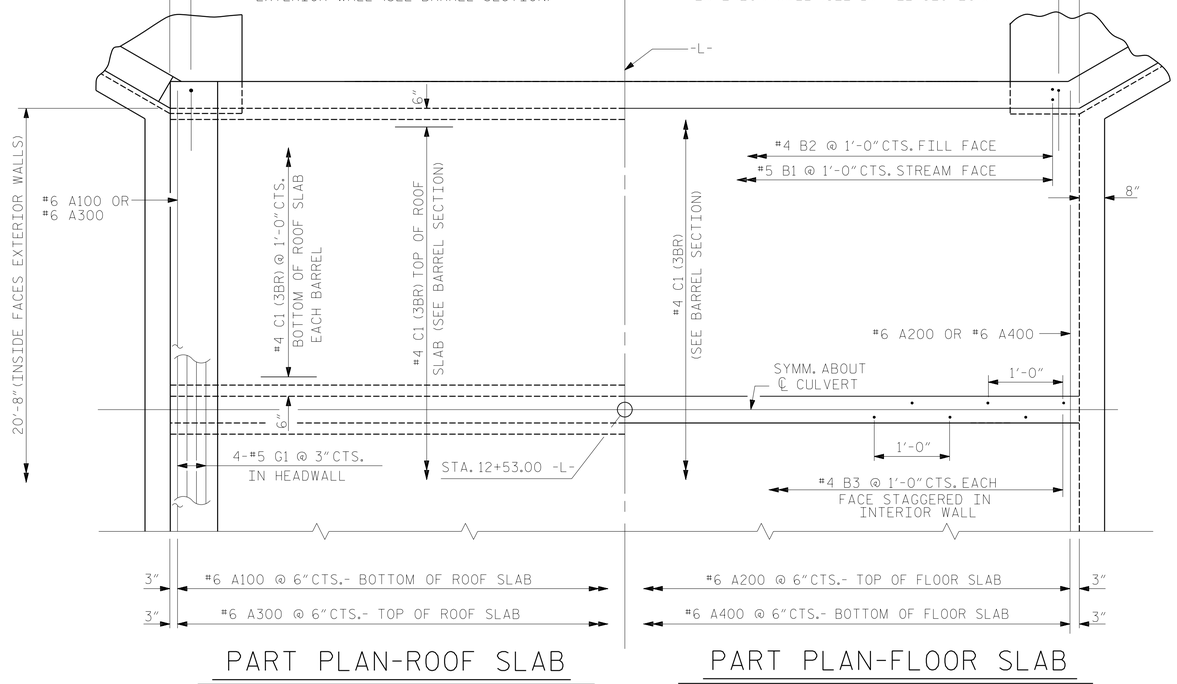
KCI JOB NO: 216011946.09A



CULVERT SECTION NORMAL TO ROADWAY



END ELEVATION



PART PLAN-ROOF SLAB

PART PLAN-FLOOR SLAB

(3BR) DENOTES 3 BAR RUN

KCI JOB NO: 2216011946.09A

DESIGN ENGINEER OF RECORD: R.F. DeCOLA		DATE : 10/21	
ASSEMBLED BY : R.J. FLORY		DATE : 12/09/20	
CHECKED BY : R.F. DeCOLA		DATE : 12/09/20	
DRAWN BY : TSS	11/90	REV. 6/19	MAA/THC
CHECKED BY : ARB	11/90		

PROJECT NO. 17BP.13.R.153

BURKE COUNTY

STATION: 12+53.00 -L-

10/27/2021

DocuSigned by: Rob DeCola C91B1BEB951B4FF...

NORTH CAROLINA PROFESSIONAL SEAL 36321 ENGINEER ROBERT F. DECOLA

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BARREL STANDARD

DOUBLE 10 FT. X 9 FT. CONCRETE BOX CULVERT 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-03
1			3			TOTAL SHEETS
2			4			5

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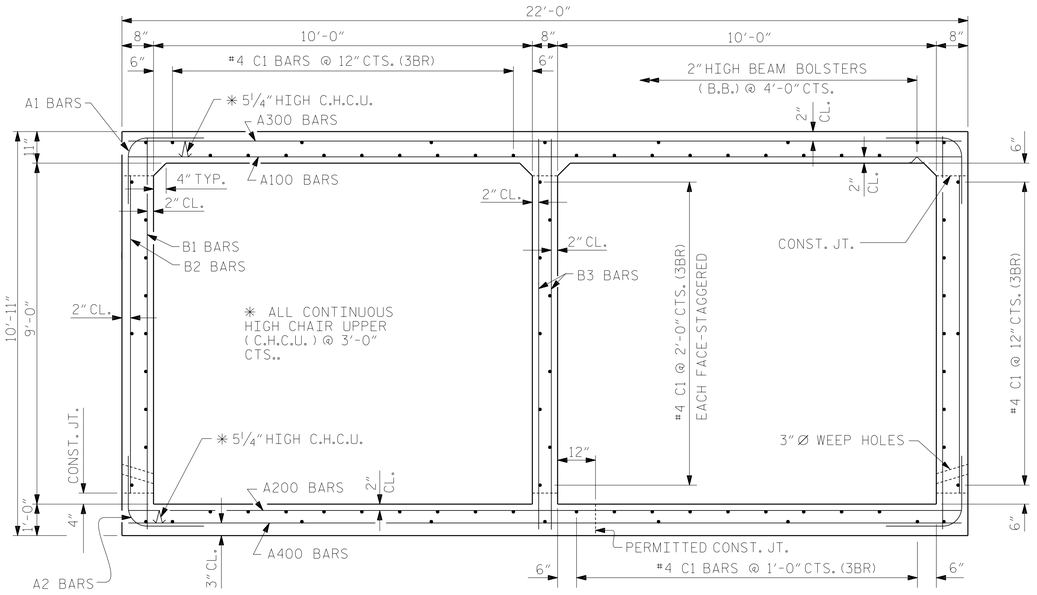
1505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6210 Phone 1919 783-9214

STD. NO. CB90_2



RIGHT ANGLE SECTION OF BARREL

THERE ARE 83 ''C'' BARS IN SECTION OF BARREL.
(3BR) DENOTES 3 BAR RUN

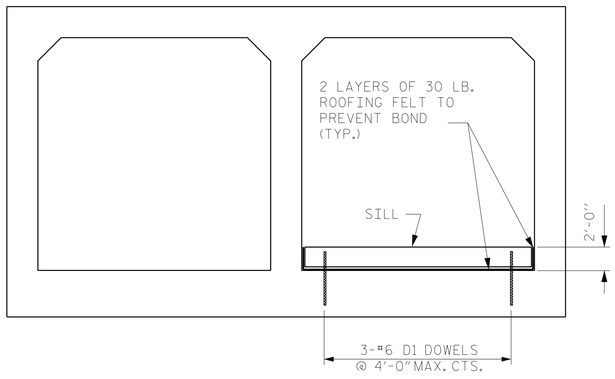
NOTES:

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

2) SILLS ARE TO BE 1.0 FT WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

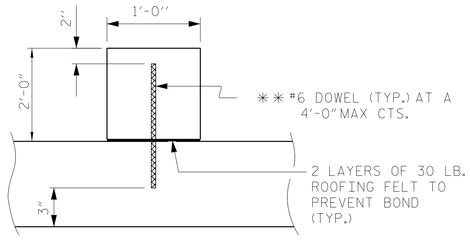
3) DO NOT SET ELEVATIONS OF HIGH SILLS ABOVE BANK FULL.

4) NUMBER OF SILLS DETERMINED BY THE ENGINEER.



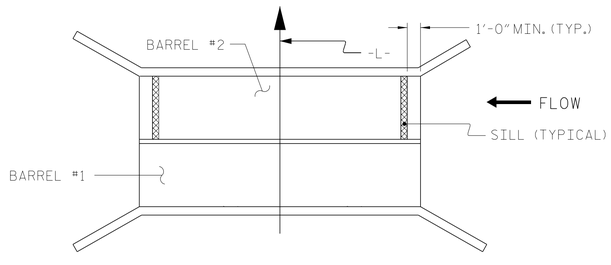
ELEVATION - INLET END

(LOOKING DOWNSTREAM)
INLET END SHOWN, OUTLET END SIMILAR



SECTION THROUGH SILL

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

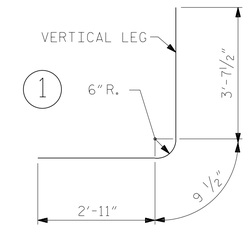


PLAN OF SILLS

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	242	6	1	7'-4"	2666
A2	242	6	1	7'-4"	2666
A100	121	6	STR.	21'-8"	3938
A200	121	6	STR.	21'-8"	3838
A300	121	6	STR.	21'-8"	3938
A400	121	6	STR.	21'-8"	3938
B1	122	5	STR.	10'-6"	1336
B2	122	4	STR.	8'-4"	679
B3	122	4	STR.	10'-6"	856
C1	249	4	STR.	21'-8"	3604
D1	6	6	STR.	2'-7"	23
G1	8	5	STR.	21'-8"	181
REINFORCING STEEL, LB.					27,763

BAR TYPES



DIMENSIONS ARE OUT TO OUT

REINFORCING SPLICE LENGTH CHART

BAR	SPLICE
#4 B2	1'-10"
#4 C1	2'-5"
#6 ''A''	2'-9"

PROJECT NO. 17BP.13.R.153
BURKE COUNTY
STATION: 12+53.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BARREL SECTION & SILL DETAILS
DOUBLE 10 FT. X 9 FT. CONCRETE BOX CULVERT 90° SKEW

10/27/2021

NORTH CAROLINA PROFESSIONAL SEAL 36321 ENGINEER ROBERT F. DECOLA

DocuSigned by: Rob DeCola C91B1BEB9518 4FF...

DESIGN ENGINEER OF RECORD: R. F. DECOLA DATE: 10/21
DRAWN BY: R.J. FLORY DATE: 01/22/21
CHECKED BY: R.F. DECOLA DATE: 01/22/21

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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KCI Associates of North Carolina, P.A.
4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 783-9214

REVISIONS						SHEET NO.
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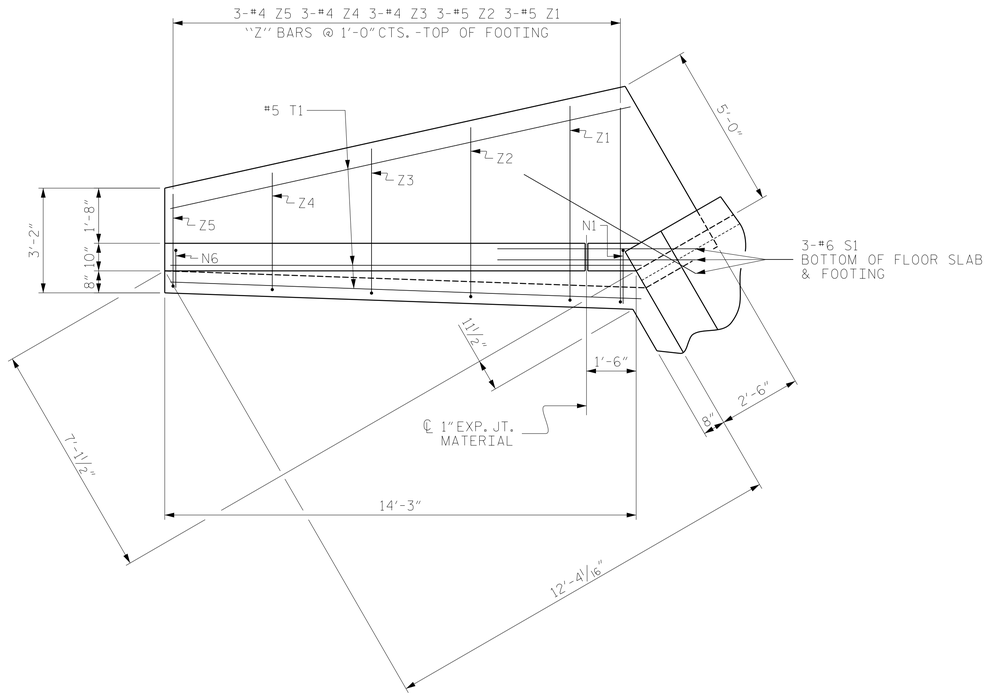
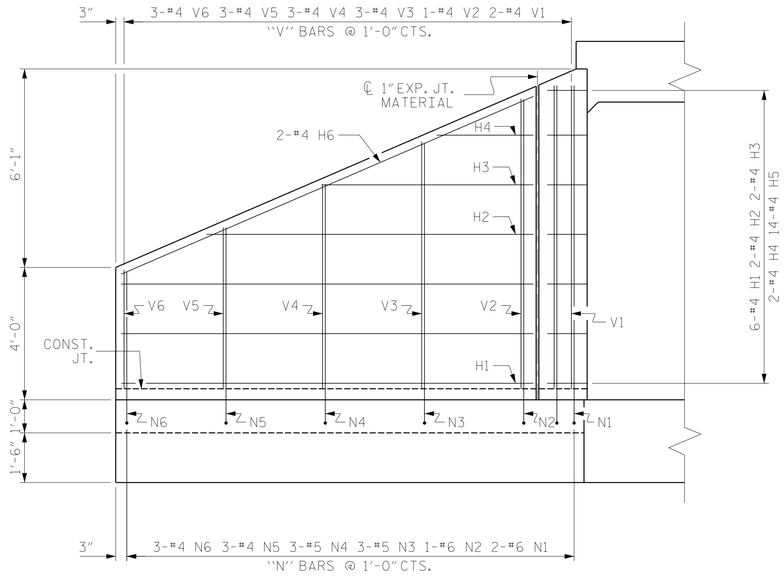
1			3			TOTAL SHEETS
2			4			5

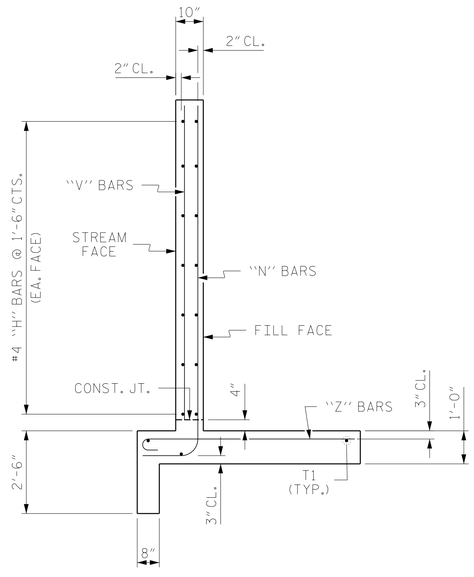
KCI JOB NO: 221601946.09A



PLAN

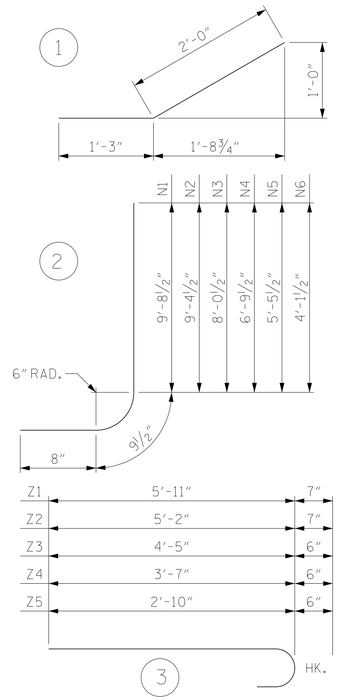


ELEVATION



TYPICAL WING SECTION

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	24	#4	STR	12'-5"	199
H2	8	#4	STR	9'-10"	53
H3	8	#4	STR	6'-5"	34
H4	8	#4	STR	2'-11"	16
H5	56	#4	1	3'-3"	122
H6	8	#4	STR	13'-6"	72
N1	8	#6	2	11'-2"	134
N2	4	#6	2	10'-10"	65
N3	12	#5	2	9'-6"	119
N4	12	#5	2	8'-3"	103
N5	12	#4	2	6'-11"	55
N6	12	#4	2	5'-7"	45
S1	12	#6	STR	6'-0"	108
T1	12	#5	STR	14'-3"	178
V1	8	#4	STR	9'-2"	49
V2	4	#4	STR	8'-9"	23
V3	12	#4	STR	7'-5"	59
V4	12	#4	STR	6'-2"	49
V5	12	#4	STR	4'-10"	39
V6	12	#4	STR	3'-7"	29
Z1	12	#5	3	6'-6"	81
Z2	12	#5	3	5'-9"	72
Z3	12	#4	3	4'-11"	39
Z4	12	#4	3	4'-1"	33
Z5	12	#4	3	3'-4"	27

REINFORCING STEEL
FOR 4 WINGS 1803 LBS

CLASS A CONCRETE

4 WINGS	26.2	CY
2 HEADWALLS	2.0	CY
2 END CURTAIN WALLS	1.4	CY
2 SILLS	1.5	CY
TOTAL	31.1	CY

PROJECT NO. 17BP.13.R.153
BURKE COUNTY
STATION: 12+53.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD WINGS FOR CONCRETE BOX CULVERT

H = 9'-0" SLOPE = 2:1
90° SKEW

10/27/2021

NORTH CAROLINA PROFESSIONAL SEAL 36321 ENGINEER ROBERT F. DECOLA

DocuSigned by:
Rob DeCola
C91B1BEB951B4FF...

DESIGN ENGINEER OF RECORD: R.F. DECOLA	DATE : 10/21
ASSEMBLED BY : R.J. FLORY CHECKED BY : R.F. DECOLA	DATE : 01/21/21 DATE : 01/22/21
DRAWN BY : CCJ 10/99 CHECKED BY : RWW 03/00	REV. 6/19 MAA/THC

KCI JOB NO: 221601946.09A

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS LICENSE NUMBER: C-0764
KCI Associates of North Carolina, P.A.
4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6270 Phone: (919) 783-9214

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-05
1			3			TOTAL SHEETS
2			4			5

STD. NO. CW9009

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE A.A.S.H.T.O.
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 A.A.S.H.T.O.
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 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE ⅞"Ø SHEAR STUDS FOR THE ¾"Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞"Ø STUDS FOR 4 - ¾"Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞"Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾"Ø STUDS BASED ON THE RATIO OF 3 - ⅞"Ø STUDS FOR 4 - ¾"Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

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

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

ENGLISH

JANUARY, 1990

STD. NO. SN

REV. 6-16-95 EEM (/) RGW REV. 5-7-03 RWW (/) JTE REV. 10-1-11 MAA (/) GM
REV. 8-16-99 RWW (/) LES REV. 5-1-06 TLA (/) GM REV. 12-17 MAA (/) THC

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