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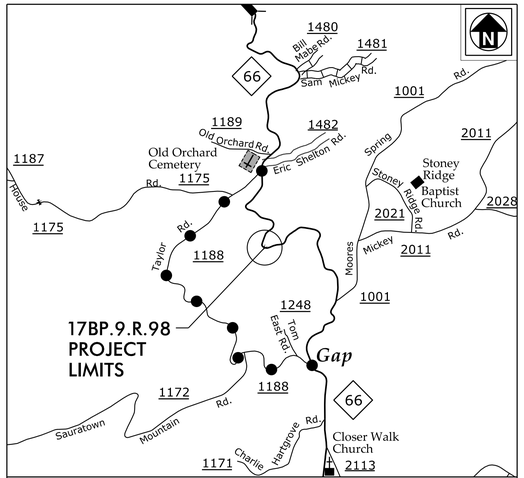
09/08/99

PROJECT: 17BP.9.R.98

CONTRACT:



VICINITY MAP
(NOT TO SCALE)
OFF-SITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

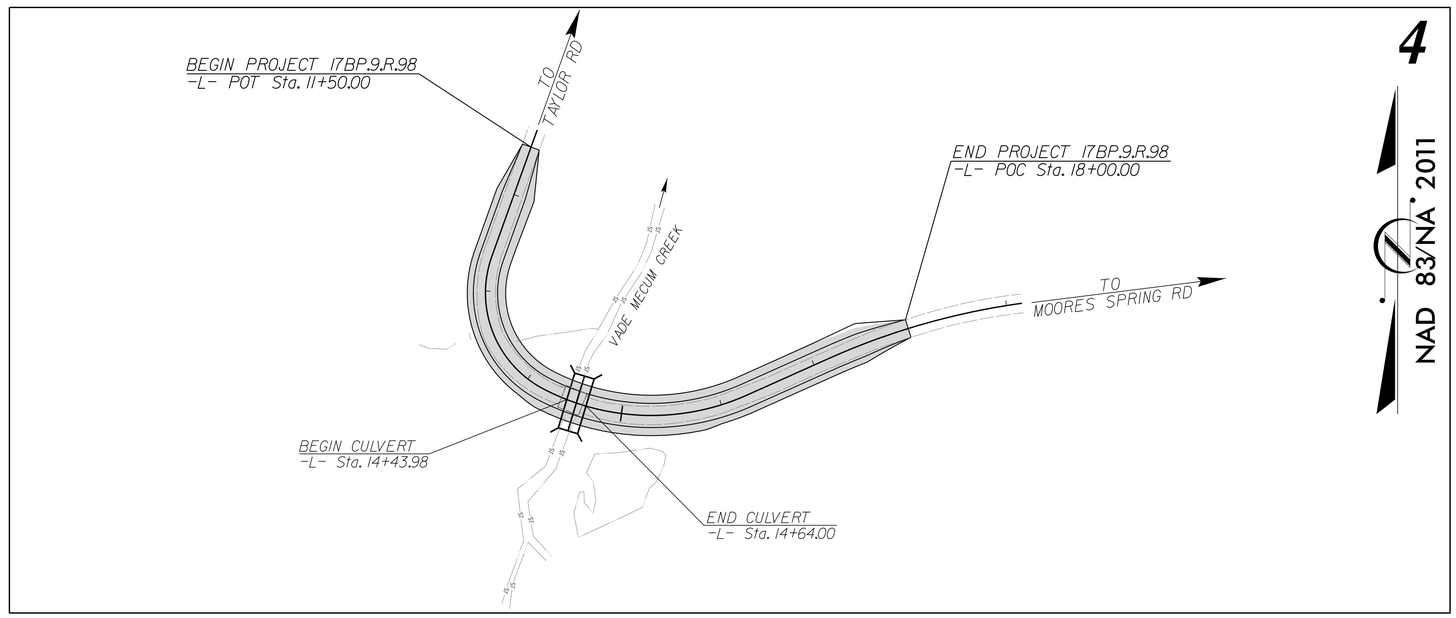
STOKES COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.9.R.98	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.9.R.98	N/A	PE
17BP.9.R.98	N/A	R/W, UTL
17BP.9.R.98	N/A	CONST

LOCATION: BRIDGE NO. 15 OVER VADE MECUM CREEK ON NC 66

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND CULVERT



*DESIGN EXCEPTION:
MIN. HORIZONTAL CURVE RADIUS
HORIZONTAL SSD

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GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT (2015) = 260
ADT (2025) = 580

V = 55 MPH

FUNC CLASS =
MINOR ARTERIAL

SUB REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT	=	0.119 MILES
LENGTH STRUCTURE TIP PROJECT	=	0.004 MILES
TOTAL LENGTH TIP PROJECT	=	0.123 MILES

Prepared in the Office of Simpson Engineers & Associates for

DIVISION 9

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 20, 2019

LETTING DATE:

DAVID SIMPSON, PE
PROJECT ENGINEER

REID B. ROBOL, PE
HYDRAULIC ENGINEER

NCDOT CONTACT:

DANIEL DAGENHART
DIVISION BRIDGE PROGRAM MANAGER

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER TIMOTHY JORDAN

DocuSigned by: James Timothy Jordan 3A6F2DB1D0224A... 1/25/2021
SIGNATURE: P.E.

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 043870 ENGINEER REID B. ROBOL

DocuSigned by: Reid B. Robol 8B25A4B6B6B4AF... 1/27/2021
SIGNATURE: P.E.

PLANS PREPARED BY:

SIMPSON ENGINEERS & ASSOCIATES
5640 Dillard Drive
Suite 200
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com

LICENSE NO. C-2521

vhb
VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

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PROJECT REFERENCE	SHEET NO.
17BP.9.R.98 – STOKES 15	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER TIMOTHY JOHNSON

Docu Signed by: 1/25/2021

MOTT MACDONALD I & E, LLC
LICENSE NO. F–0669

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Prepared in the Office of:

MOTT MACDONALD
7621 Purfoy Road, Suite 115
Fuquay–Varina, NC 27526
www.mottmac.com/americas

GENERAL NOTES

GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01–16–18

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 III.

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.

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.

SUBSURFACE PLANS:

SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT FOR THE STRUCTURE ONLY. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE DUKE ENERGY AND CENTURY LINK.
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT–OF–WAY MARKERS:

ALL RIGHT–OF–WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT.

LIST OF ROADWAY STANDARD DRAWINGS

EFF. 01–16–2018

2018 ROADWAY ENGLISH STANDARD DRAWINGS

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	
200.03	Method of Clearing – Method III
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
310.10	Driveway Pipe Construction
DIVISION 5 – SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction – High Side of Superelevated Curve – Method I
DIVISION 6 – ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 – INCIDENTALS	
806.01	Concrete Right–of–way Marker
806.02	Granite Right–of–Way Marker
862.01	Guardrail Placement
862.02	Guardrail Installation
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

INDEX OF SHEETS

SHEET NUMBER	DESCRIPTION
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A–1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C–1 THRU 2C–2	GUARDRAIL INSTALLATION DETAILS
3B–1	GUARDRAIL, PAVEMENT REMOVAL AND EARTHWORK SUMMARY
3D–1	DRAINAGE SUMMARY
4	PLAN SHEET
5	PROFILE SHEET
RW01 THRU RW04	SURVEY CONTROL SHEETS
TMP–1 THRU TMP–4	TRANSPORTATION MANAGEMENT PLANS
EC–1 THRU EC–6	EROSION CONTROL PLANS
UO–1 THRU UO–2	UTILITIES BY OTHERS PLANS
X–1 THRU X–4	CROSS–SECTIONS
C–1 THRU C–6	CULVERT PLANS
CN	CULVERT NOTES

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12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.98 – STOKES 15	1B

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 Easment 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.

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PROJECT REFERENCE	SHEET NO.
17BP.9.R.98 – STOKES 15	2A–1

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER

Signed by:
DocuSigned by:
1/25/2021

MOTT MACDONALD I & E, LLC
LICENSE NO. F–0669

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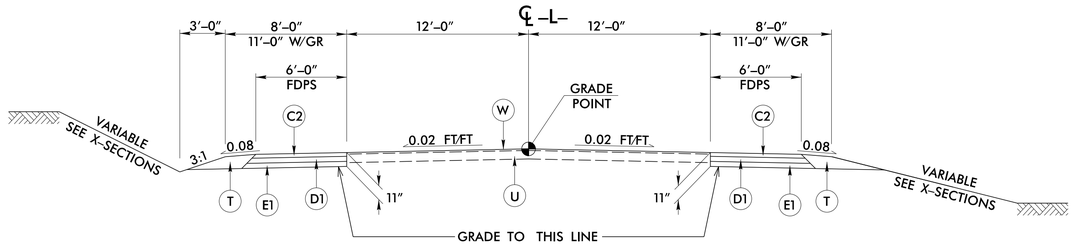
Prepared in the Office of:

MOTT MACDONALD

7621 Purfoy Road, Suite 115
Fuquay–Varina, NC 27526
www.mottmac.com/americas

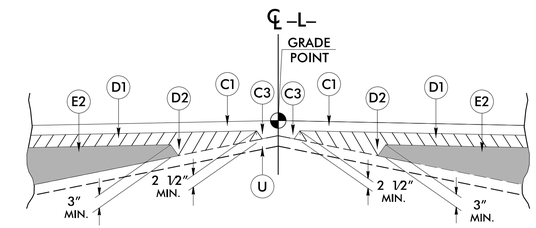


TYPICAL SECTION NO. 1

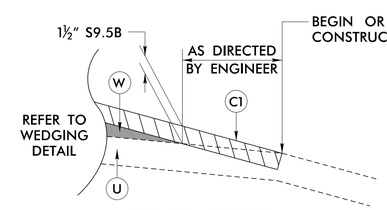
TRANSITION FROM EXISTING TO TYPICAL SECTION NO. 1:
–L– STA 11+50.00 TO 12+00.00

USE TYPICAL SECTION NO. 1:
–L– STA 12+00.00 TO 14+35.00
–L– STA 14+75.00 TO 17+50.00

TRANSITION FROM TYPICAL SECTION NO. 1 TO EXISTING:
–L– STA 17+50.00 TO 18+00.00

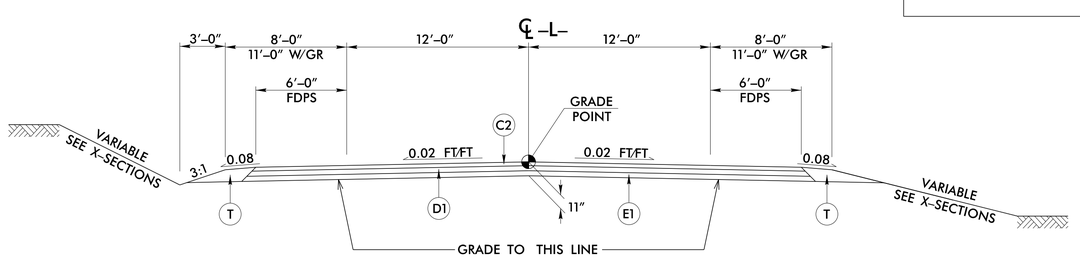


Detail Showing Method of Wedging



MILLING DETAIL

DETAIL SHOWING PROFILE VIEW



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2:
–L– STA 14+35.00 TO 14+75.00

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1½″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1½″ IN DEPTH OR GREATER THAN 2″ IN DEPTH.
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½″ IN DEPTH OR GREATER THAN 4″ IN DEPTH.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3″ IN DEPTH OR GREATER THAN 5½″ IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING (SEE DETAIL SHOWING METHOD OF WEDGING).

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

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PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.98 - STOKES 15	2C-1

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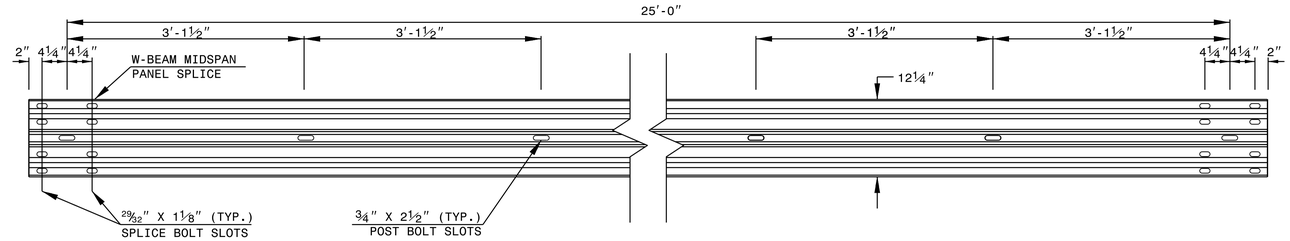
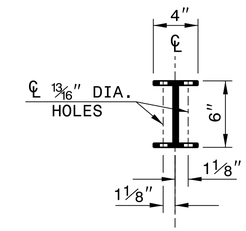
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

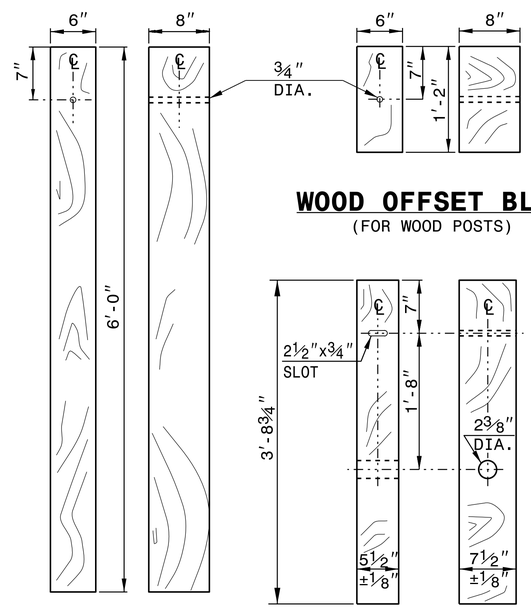
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION



STANDARD W-BEAM GUARDRAIL



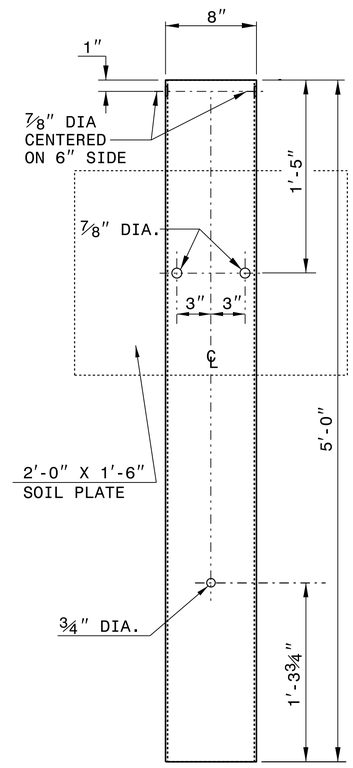
PLAN



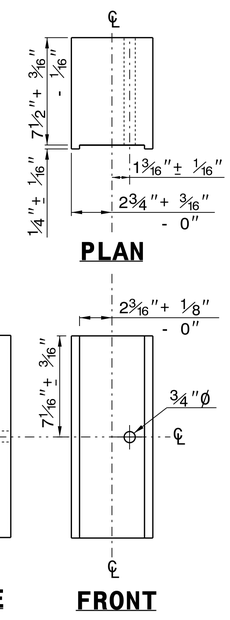
WOOD OFFSET BLOCK
(FOR WOOD POSTS)

STANDARD LINE POST

SHORT WOOD BREAKAWAY POST



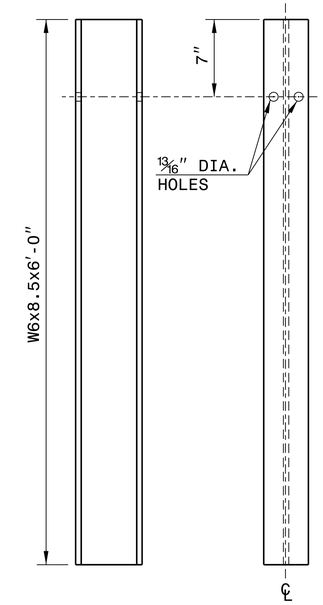
STEEL TUBE
TS 6"x8"x0.1875"



PLAN

SIDE FRONT

ROUTED OFFSET BLOCK



SIDE FRONT

"W6" STEEL POST

SYSTEM PARTS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

SHEET 6 OF 8
862D02

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOHN DAVID HOWERTON
DocuSigned by: John David Howerton
1/25/2021

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

SEE TITLE BLOCK

ORIGINAL BY: J.HOWERTON DATE: 3-7-2018
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

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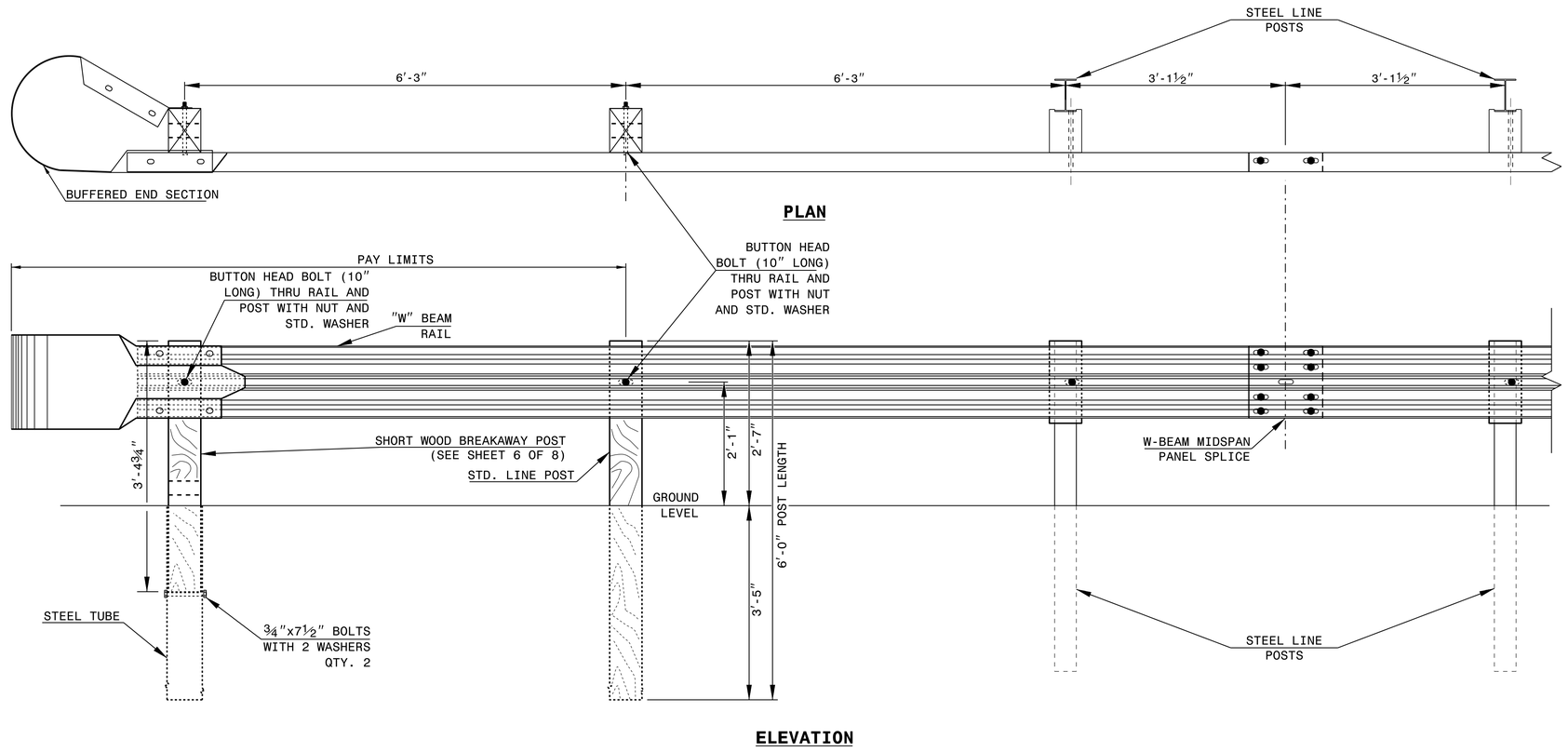
PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.98- STOKES 15	2C-2

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF



TRAILING END UNIT ASSEMBLY

A.T.-1 SYSTEM

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER
DocuSigned by: Jon Nelson Roberson
1/25/2021

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

A.T.-1 SYSTEM

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

SUMMARY OF EARTHWORK
IN CUBIC YARDS

STATION	STATION	UNCL. EXCAV.	EMBANK. + %	BORROW	WASTE
11+50.00	18+00.00	1014	1693	679	
PROJECT TOTALS:		1014	1693	679	
5% TO REPLACE BORROW				34	
GRAND TOTALS:		1014		713	
SAY:		1070		750	

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

EXISTING ASPHALT PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD^2
–L–	14+35.00	14+38.38	CL	6.61
–L–	14+59.78	14+75.00	CL	27.50
TOTAL:				34.12
SAY:				40

GUARDRAIL SUMMARY

FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	XI	GREU TL–3	M–350	TYPE III	CAT–1	VI MOD	BIC	AT–1	EA	G	NG				
–L–	12+00 +/–	17+53 +/–	LT	512.50			17+50.00	12+00.00	8′	11′	50′	50′	1′	1′			2													BEGIN / END AT PROJECT LIMITS
–L–	14+00 +/–	15+95 +/–	RT	187.50	37.50		14+43.98	15+50.00	8′	11′													2							BREAK FOR DRIVE
			TOTALS	700.00	37.50																									
	DEDUCTION FOR ANCHOR UNITS																													
	GREU TL–3		2 @ 50′ =	–100.00																										
	AT–1		2 @ 6.25′ =	–12.50																										
			TOTAL	587.50	37.50												2						2							ADDITIONAL GUARDRAIL POST = 5 EACH

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PROJECT REFERENCE	SHEET NO.
17BP.9.R.98 – STOKES 15	3D–1

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

| STATION | LOCATION (LT,RT, OR CL) | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SLOPE CRITICAL | DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) SIZE 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | DO NOT USE RCP | DO NOT USE PVC | DO NOT USE CAAP | DO NOT USE HDPE | C.S. PIPE SIZE 12" | 15" | 18" | 24" | 36" | 42" | 48" | R.C. PIPE (CLASS III) SIZE 15" | 18" | 24" | 30" | 36" | 42" | 48" | R.C. PIPE (CLASS IV) SIZE 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | *** 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. R.C.P. | C.S.P. | QUANTITIES FOR DRAINAGE STRUCTURES * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. "A" + (1.3 X COL. B') PER EACH (0' THRU 5.0') | LIN. *FT. A (5.0' THRU 10.0') | LIN. *FT. B (10.0' AND ABOVE) | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G | 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. 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 |
|---|---|---

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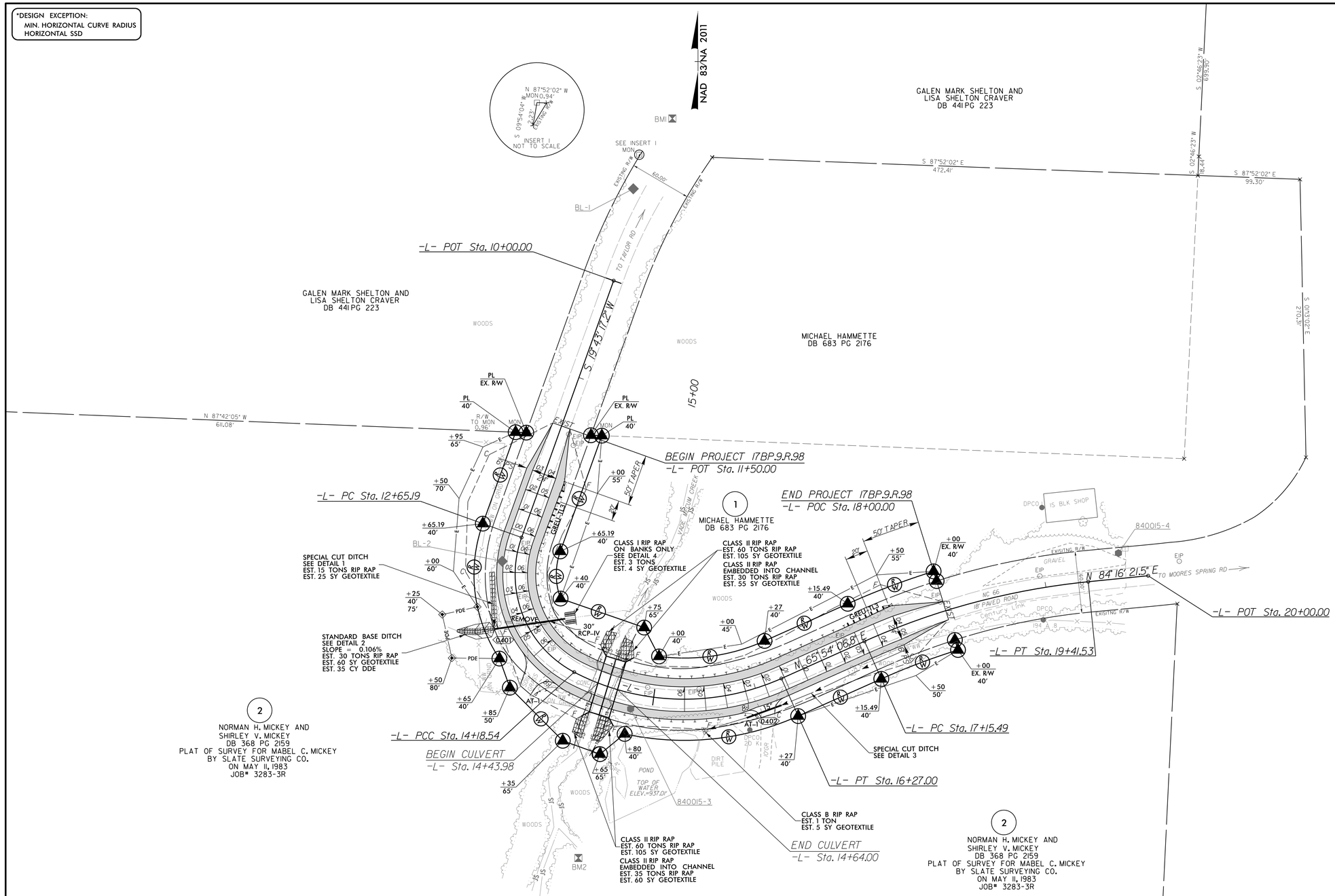
*DESIGN EXCEPTION:
MIN. HORIZONTAL CURVE RADIUS
HORIZONTAL SSD



PROJECT REFERENCE	SHEET NO.
17BP.9.R.98 – STOKES 15	4

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER TIMOTHY JOHNSON
DocuSigned by: Timothy Johnson
1/27/2021
MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

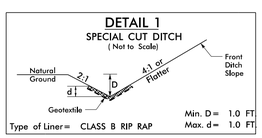
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 043870 ENGINEER KIM E. ROBB
DocuSigned by: Kim E. Robb
1/27/2021
VHB ENGINEERING
LICENSE NO. C-3705

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of:
MOTT MACDONALD
7621 Purfoy Road, Suite 115
Fuquay-Varina, NC 27526
www.mottmac.com/americas

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

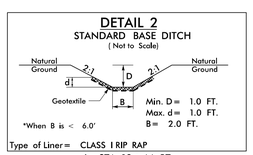
DETAIL 1
SPECIAL CUT DITCH
(Not to Scale)



Min. D = 1.0 FT
Max. d = 1.0 FT
Type of Liner = CLASS B RIP RAP

-L- STA. 13+00 TO 13+44 RT

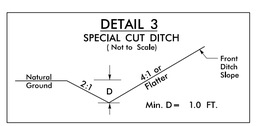
DETAIL 2
STANDARD BASE DITCH
(Not to Scale)



Min. D = 1.0 FT.
Max. d = 1.0 FT.
B = 2.0 FT.
*When B is < 6.0'
Type of Liner = CLASS I RIP RAP

-L- STA. 13+44 RT

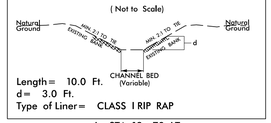
DETAIL 3
SPECIAL CUT DITCH
(Not to Scale)



Min. D = 1.0 FT.

-L- STA. 15+50 TO 17+50 RT

DETAIL 4
PIPE OUTLET CHANNEL
(Not to Scale)



Length = 10.0 Ft.
d = 3.0 Ft.
Type of Liner = CLASS I RIP RAP

-L- STA. 13+70 LT

-L-

PI Sta 13+58.39	PI Sta 15+30.47	PI Sta 18+29.49
Δ = 82° 06' 55.2" (LT)	Δ = 51° 42' 15.1" (LT)	Δ = 18° 22' 14.7" (RT)
D = 53° 32' 50.8"	D = 24° 48' 12.1"	D = 8° 07' 37.4"
L = 153.35'	L = 208.46'	L = 226.04'
T = 93.20'	T = 111.93'	T = 114.00'
R = 107.00'	R = 231.00'	R = 705.00'

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PROJECT REFERENCE	SHEET NO.
17BP.9.R.98 – STOKES 15	5

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER
DocuSigned by: Jeffrey L. Hayes
1/25/2021
MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

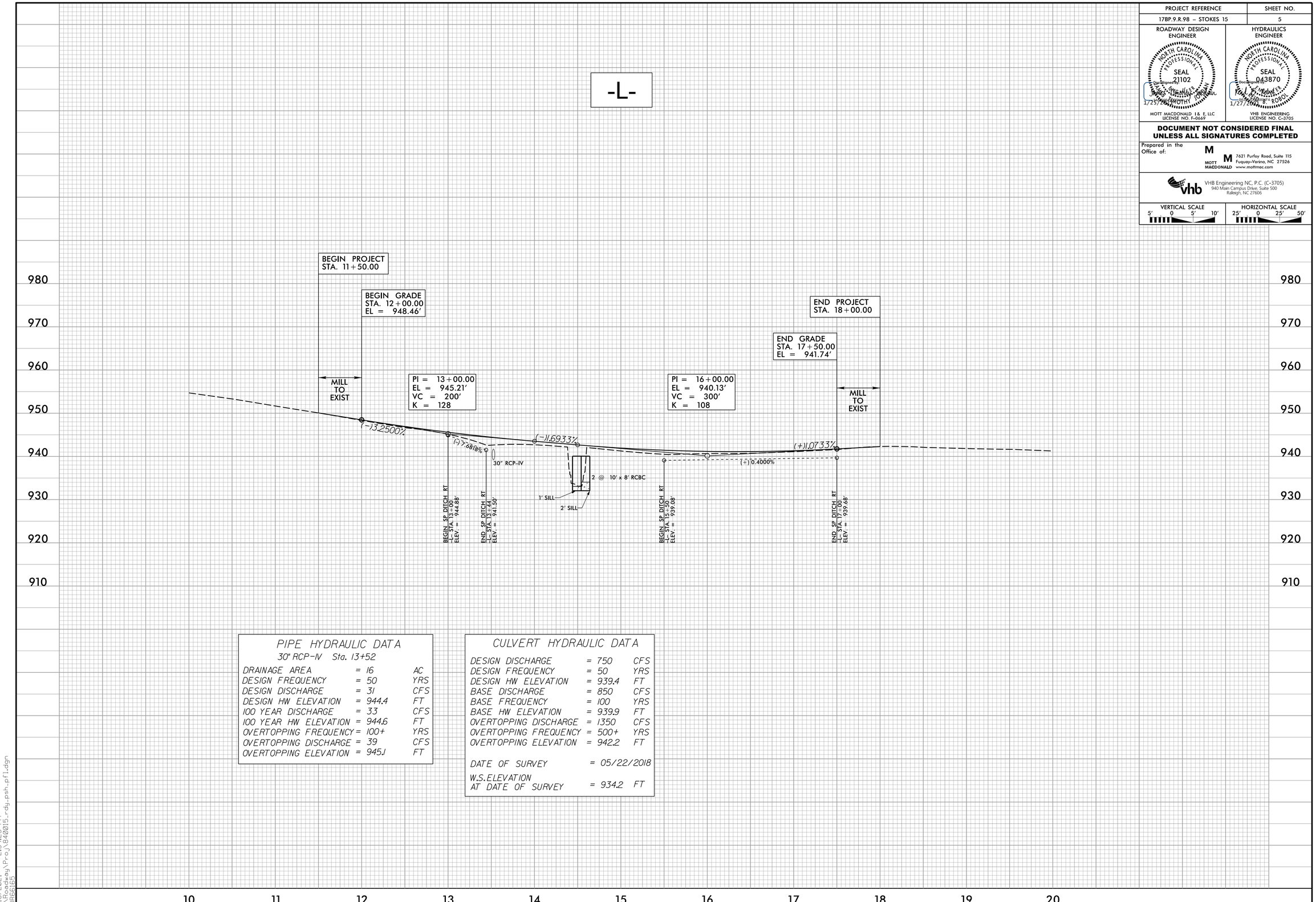
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 043870 ENGINEER
DocuSigned by: Kevin B. Robertson
1/27/2021
VHB ENGINEERING
LICENSE NO. C-3705

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of:
MOTT MACDONALD
7621 Parfay Road, Suite 115
Fuquay-Varina, NC 27526
www.mottmac.com

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

VERTICAL SCALE 5' 0 5' 10'
HORIZONTAL SCALE 25' 0 25' 50'



PIPE HYDRAULIC DATA

30" RCP-IV Sta. 13+52

DRAINAGE AREA	= 16	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 31	CFS
DESIGN HW ELEVATION	= 944.4	FT
100 YEAR DISCHARGE	= 33	CFS
100 YEAR HW ELEVATION	= 944.6	FT
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING DISCHARGE	= 39	CFS
OVERTOPPING ELEVATION	= 945.1	FT

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 750	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 939.4	FT
BASE DISCHARGE	= 850	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 939.9	FT
OVERTOPPING DISCHARGE	= 1350	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 942.2	FT
DATE OF SURVEY	= 05/22/2018	
W.S.ELEVATION AT DATE OF SURVEY	= 934.2	FT

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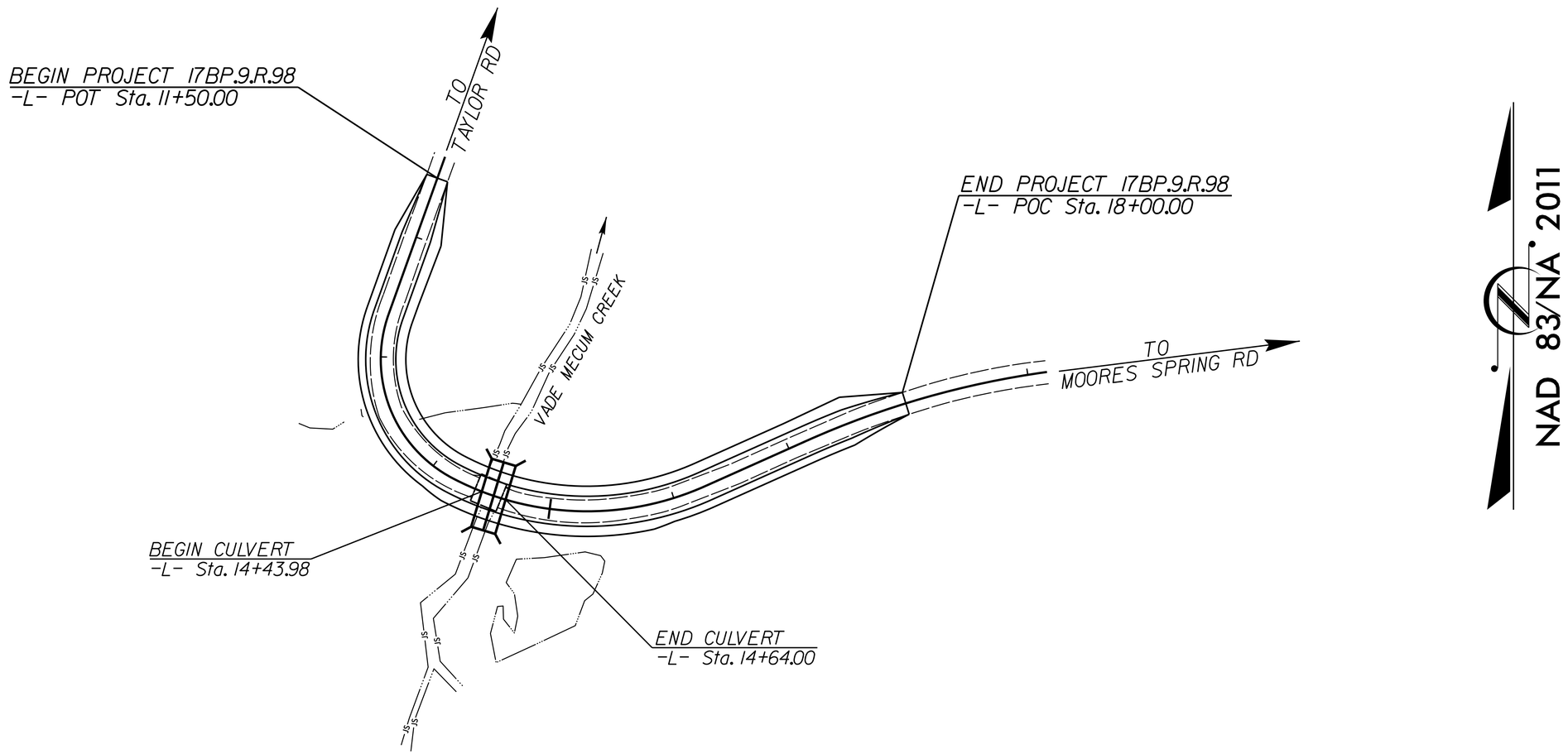
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	84-0015	RW01	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STOKES COUNTY

TIP PROJECT: 84-0015



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
NCGS FOR MONUMENT "840015-3"
WITH NAD 83/NSRS 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 966,298.837(ft) EASTING: 1,608,259.407(ft)
ELEVATION: 942.10(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 1.00003284
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"840015-3" TO -L- STATION 11+50.00 IS
N 13-42'41.24" W 283.090(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared In the Office of:

NCDOT

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: _____

LETTING DATE: _____

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-3877 LAND SURVEYOR MICHAEL L. MOTSINGER

DocuSigned by:
Michael L. Motsinger
FDB6FE70E23C40E...

SIGNATURE: *Date:*

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

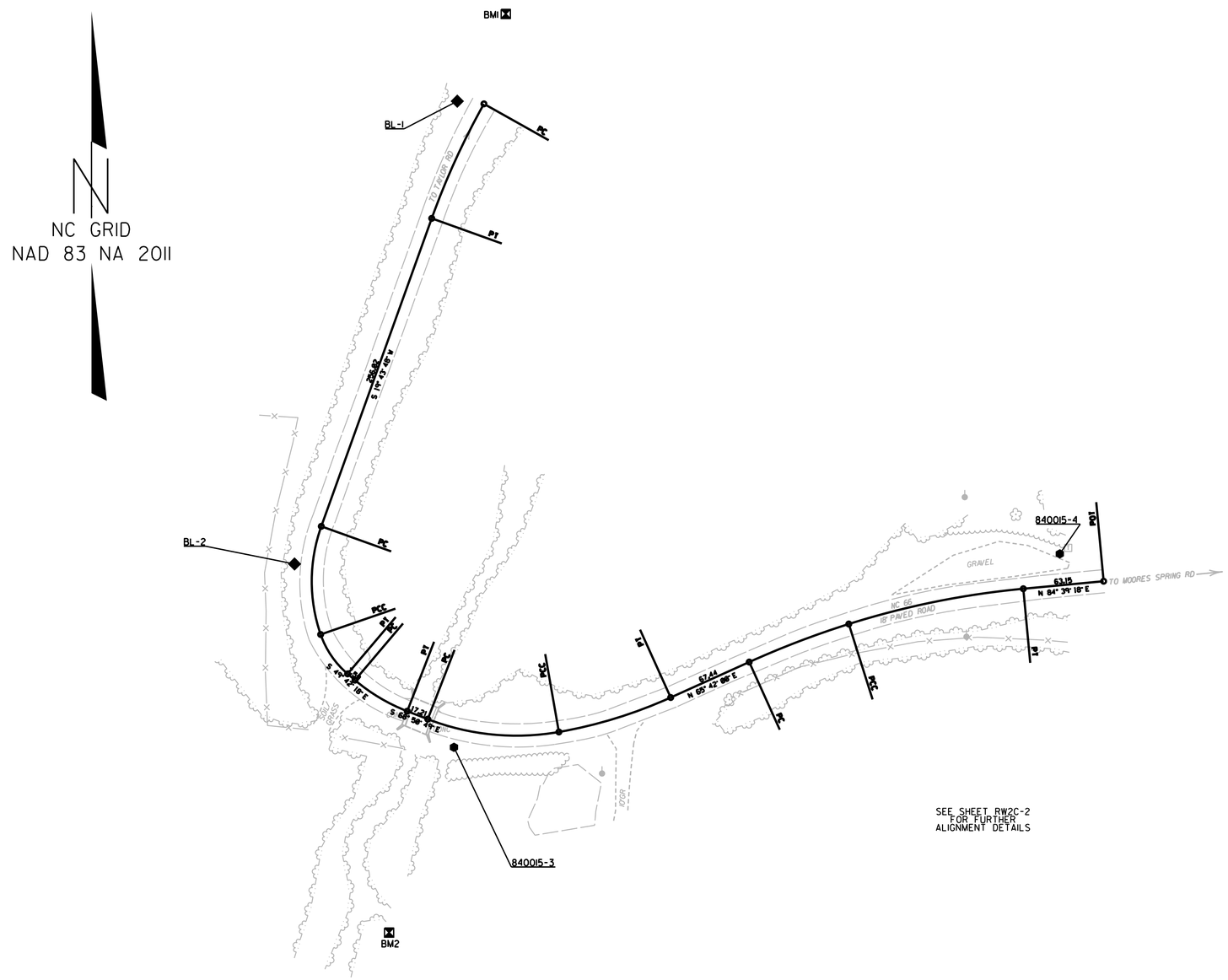
09/08/99

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

PROJECT REFERENCE NO.	SHEET NO.
84-0015	RW02C-1
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



SEE SHEET RW2C-2 FOR FURTHER ALIGNMENT DETAILS

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.

6/2/99
10-SEP-2019 16:06
S:\Units\Divisions\Winston\Ruths Computer\Bridge\Division_LowImpact\84-0015\Control_Sheets\C Series RW2C\84-0015_LS_rw02c-1.dgn
jdmorse AT LS-300138

PROJECT REFERENCE NO.	SHEET NO.
84-0015	RW02C-2
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

BASELINE

BL

POINT	DESC.	NORTH	EAST	ELEVATION
1	BL-1	966804.4172	1608261.9939	956.69
2	BL-2	966442.2655	1608134.6160	944.64
3	840015-3	966298.8367	1608259.4070	942.10
4	840015-4	966450.1897	1608733.5415	940.57

****

BM1 ELEVATION = 960.01
N 966873 E 1608300
RR SPIKE IN 20" OAK

****

****

BM2 ELEVATION = 943.83
N 966154 E 1608209
RR SPIKE IN 20" POPLAR

****

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

10-SEP-2019 16:36
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idmorse AT LS-300138

PROJECT REFERENCE NO.	SHEET NO.
84-0015	RW02C-3
Location and Surveys	
INSERT CONSULTANT'S NAME	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

EL POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	966802.326	1608282.871							
CURVE			S 24°30'36.8" W	98.47	09°33'37.2"(LT)	09°42'33.6"	98.47	49.41	590.82
PT	966712.731	1608242.020							
LINE			S 19°43'48.2" W	256.02					
PC	966471.743	1608155.592							
CURVE			S 00°20'31.9" W	84.63	38°46'32.5"(LT)	46°11'23.0"	83.95	44.86	127.47
PCC	966387.115	1608155.086							
CURVE			S 34°22'31.3" E	37.35	30°39'33.9"(LT)	90°07'01.4"	34.02	19.36	70.64
PT	966356.288	1608176.174							
LINE			S 49°42'18.2" E	7.59					
PC	966351.377	1608181.967							
CURVE			S 59°16'33.5" E	47.55	19°08'30.5"(LT)	40°55'57.8"	46.76	24.11	143.00
PT	966327.082	1608222.844							
LINE			S 68°50'48.7" E	17.21					
PC	966320.873	1608238.892							
CURVE			S 84°24'14.8" E	103.12	31°06'52.1"(LT)	30°09'01.9"	103.20	53.52	192.24
PCC	966310.818	1608341.520							
CURVE			N 72°52'09.5" E	91.57	14°20'19.1"(LT)	15°40'02.2"	91.52	46.14	366.85
PT	966337.789	1608429.024							
LINE			N 65°42'00.0" E	67.44					
PC	966365.542	1608490.490							
CURVE			N 69°05'53.2" E	83.42	06°47'46.5"(RT)	08°08'58.1"	83.40	41.78	703.65
PCC	966395.302	1608568.417							
CURVE			N 78°34'32.1" E	139.32	12°09'31.1"(RT)	08°43'10.2"	139.44	70.05	657.73
PT	966422.897	1608704.972							
LINE			N 84°39'17.6" E	63.15					
POT	966428.780	1608767.846							

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.

6/2/99
REVISIONS
03-SEP-2019 15:43
S:\Units\Div04\Winston\Ruths Computer\Bridge\Division_LowImpact\84-0015\Control_Sheets\C Series RW2C\84-0015_LS_rw02c-3.dgn
idmorse
AT LS-300138

PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
84-0015	RW02D-1
Location and Surveys	
ENTER CONSULTANT'S NAME IN THIS BOX	

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	966715.0615	1608242.9225
PC	12+65.19	966465.4269	1608153.4349
PCC	14+18.54	966334.5015	1608204.5760
PT	16+27.00	966328.3353	1608405.9365
PC	17+15.49	966364.4675	1608486.7181
PT	19+41.53	966422.3905	1608704.2145
POT	20+00.00	966428.2250	1608762.3880

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 INFORMATINO REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

REVISIONS

6/2/99

03-SEP-2019 15:23
$$$$USER$$$$ (jwinston)Ruths Computer\Bridge\Division_LowImpact\84-0015\Control Sheets\D Series RW2D\84-0015_LS_rw02d-1.dgn
$$$$DATE | $$$$TIME

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
84-0015	RW03E-1

Location and Surveys

NCDOT

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-3877 LAND SURVEYOR MICHAEL L. MOTSINGER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, MICHAEL L. MOTSINGER, 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 9th day of September, 2019.

DocuSigned by:
Michael L. Motsinger
FDB8FE70E23C40E...

Professional Land Surveyor — L-3877 PLS #

NORTH CAROLINA PROFESSIONAL SEAL L-3877 LAND SURVEYOR MICHAEL L. MOTSINGER

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	11+45.70	-40.00	966564.4117	1608231.4109
L	11+48.87	-29.92	966564.8300	1608220.8478
L	11+67.69	30.09	966567.3644	1608158.0147
L	11+70.80	40.00	966567.7811	1608147.6338
L	12+65.19	-40.00	966451.9290	1608191.0887
L	12+65.19	40.00	966478.9248	1608115.7812
L	13+40.00	-40.00	966406.0340	1608191.3355
L	13+65.00	40.00	966347.7054	1608131.8965
L	13+85.00	50.00	966319.4062	1608142.0519
L	14+35.00	65.00	966267.8017	1608193.4783
L	14+65.00	65.00	966254.7874	1608229.6211
L	14+75.00	-65.00	966377.8591	1608272.5796
L	14+80.00	40.00	966274.4864	1608253.6017
L	15+00.00	-40.00	966349.7945	1608287.0150
L	16+27.00	-40.00	966364.8492	1608389.6045
L	16+27.00	40.00	966291.8214	1608422.2685
L	17+15.49	-40.00	966400.9814	1608470.3861
L	17+15.49	40.00	966327.9535	1608503.0501
L	18+00.00	40.00	966356.0670	1608577.5918
L	18+00.00	29.83	966365.7820	1608574.5790
L	18+00.00	-30.17	966423.0917	1608556.8058
L	18+00.00	-40.00	966432.4769	1608553.8952

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.

REVISIONS

6/2/99

30-SEP-2019 08:43
S:\Units\Div09\Winston\Ruths Computer\Bridge\Division_LowImpact\84-0015\Control_Sheets\E Series RW2E\84-0015_LS_rw03e-1.dgn
Submitted: AJR-312635

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
XXXXXXX	XXXXX

Location and Surveys

NCDOT

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-3877 LAND SURVEYOR MICHAEL L. MOTSINGER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, MICHAEL L. MOTSINGER, 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 9th day of September, 2019.

DocuSigned by:
Michael L. Motsinger
FDB6FE70E23C40E...

Professional Land Surveyor

L-3877
PLS #

NORTH CAROLINA PROFESSIONAL SEAL L-3877 LAND SURVEYOR MICHAEL L. MOTSINGER

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	13+25.00	40.00	966397.9905	1608110.5362
L	13+25.00	75.00	966390.5311	1608076.3403
L	13+50.00	80.00	966348.2479	1608085.6467

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.

REVISIONS

6/2/99

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mmotsinger ATTS=312635

PROJECT REFERENCE NO.	SHEET NO.
84-0015	RW04

Location and Surveys

NCDOT

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-3877 LAND SURVEYOR MICHAEL L. MOTSINGER

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I, MICHAEL L. MOTSINGER, 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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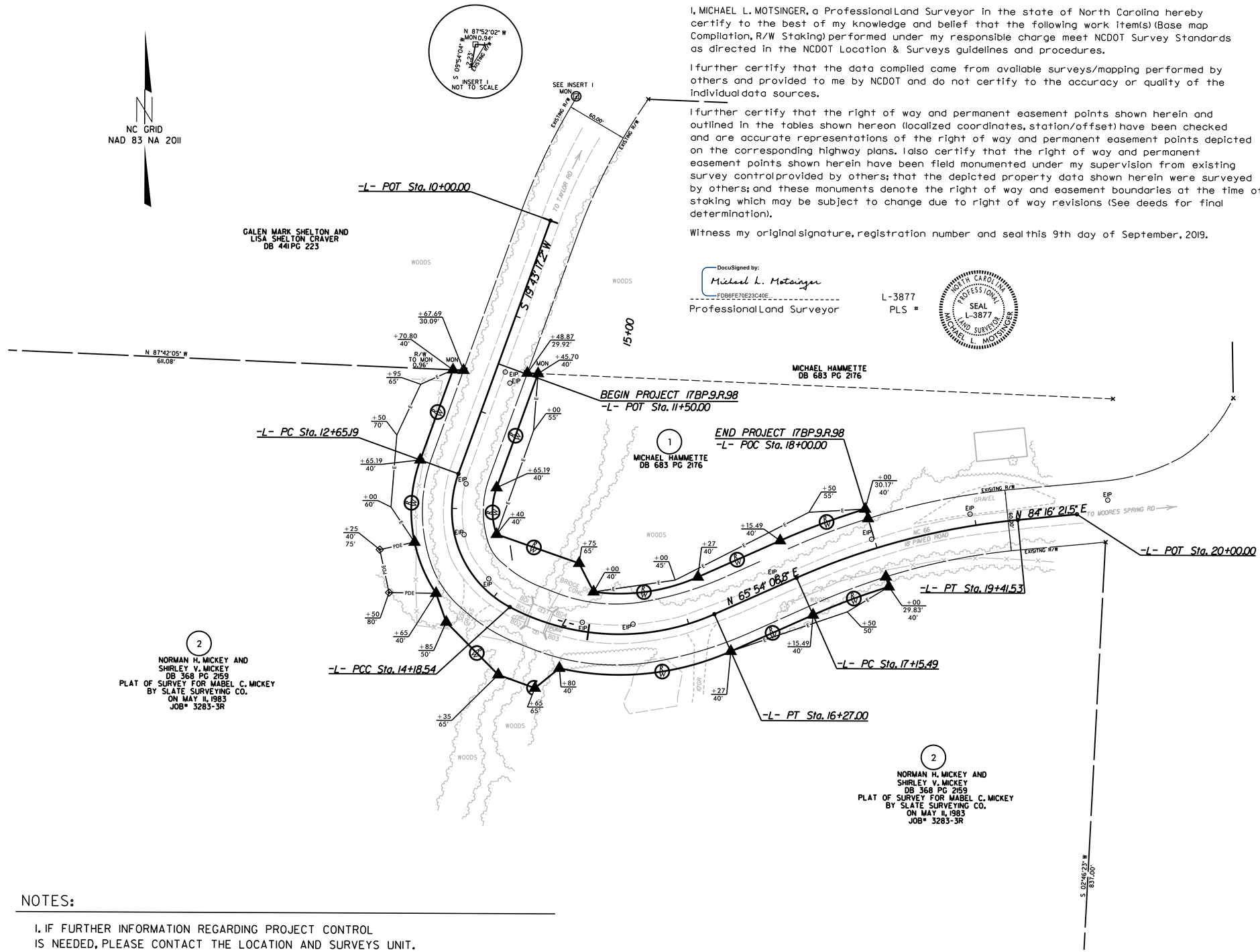
Witness my original signature, registration number and seal this 9th day of September, 2019.

DocuSigned by:
Michael L. Motsinger
FDB6FE70E23C40E...

Professional Land Surveyor — L-3877 PLS #

NORTH CAROLINA PROFESSIONAL SEAL L-3877 LAND SURVEYOR MICHAEL L. MOTSINGER



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.

REVISIONS

6/2/99

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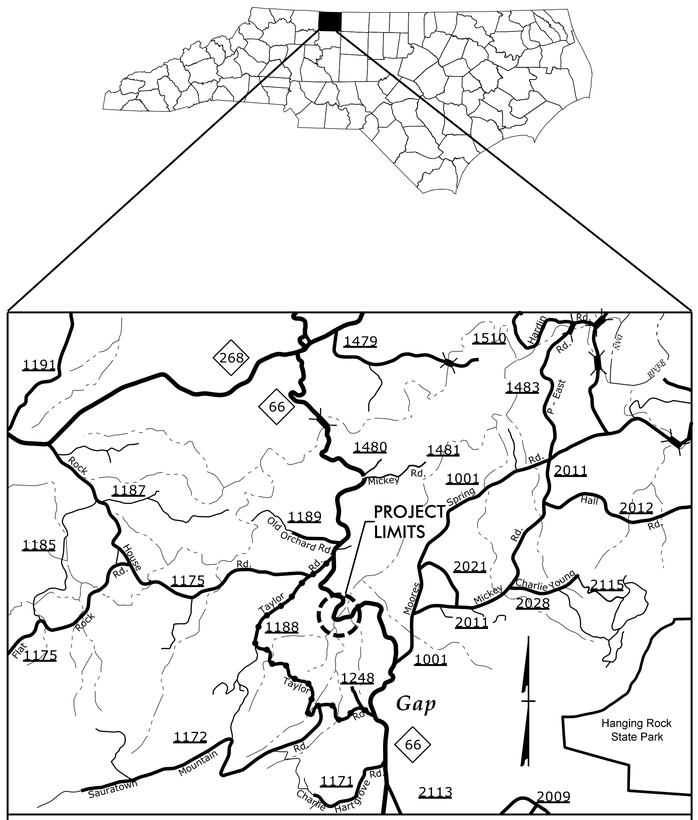
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

STOKES COUNTY



VICINITY MAP

DETOUR ROUTE

LOCATION: BRIDGE NO. 15 OVER VADE MECUM CREEK ON NC 66

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURES

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS AND LEGEND
TMP-2	TRANSPORTATION OPERATIONS PLAN: MANAGEMENT STRATEGY, GENERAL NOTES, LOCAL NOTES AND PHASING
TMP-3	DETOUR FOR NC 66 ROAD CLOSURE
TMP-4	ROAD CLOSURE SIGNS AND DETOUR SIGNS

SHEET NO.
TMP-1

17BP.9.R.98

PROJECT:

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

PLANS PREPARED BY:

M. RZEPKA, P.E.
PROJECT ENGINEER

B. SCOTT
PROJECT DESIGN ENGINEER

NCDOT CONTACTS:

D. DAGENHART
DIV. 9 BRIDGE PROGRAM MANAGER

PROJECT DESIGN ENGINEER

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

HDR
555 Fayetteville St.,
Suite 900
Raleigh, NC 27601

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APPROVED: DocuSigned by: Michael T. Rzepka 01BC3480C260490...

DATE: 2/3/2020

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 15876 ENGINEER MICHAEL T. RZEPKA

2/3/2020
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555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

PROJ. REFERENCE NO.	SHEET NO.
17BP.9.R.98	TMP-1A

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 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
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1130.01	DRUMS
1145.01	BARRICADES

LEGEND

GENERAL

NORTH ARROW

TRAFFIC CONTROL DEVICES

BARRICADE (TYPE III)

CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

STATIONARY SIGN

APPROVED: DocuSigned by: Michael T. Rzepka 01BC3480C26049D...

DATE: 2/3/2020

NORTH CAROLINA PROFESSIONAL SEAL 15876 ENGINEER MICHAEL T. RZEPKA

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

2/3/2020
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PROJ. REFERENCE NO.	SHEET NO.
17BP.9.R.98	TMP-2

MANAGEMENT STRATEGY

THIS PROJECT CONSISTS OF REPLACING BRIDGE NO. 15 OVER VADE MECUM CREEK ON NC 66 DURING CONSTRUCTON, NC 66 WILL BE CLOSED AT THE CONSTRUCTION LIMITS AND TRAFFIC WILL BE PLACED ON AN OFF-SITE DETOUR ALONG SR 1188 (TAYLOR RD).

NC 66 WILL BE REOPENED TO 2-LANE/2-WAY TRAFFIC UPON COMPLETION OF 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 THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

B) 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.

C) 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.

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

LOCAL NOTES

1) MAINTAIN ACCESS TO ALL RESIDENCES AND BUSINESSES BETWEEN THE CLOSURE POINTS AT ALL TIMES DURING CONSTRUCTION.

PHASING

STEP 1

INSTALL CMS BOARDS AT DETOUR POINTS AND ACTIVATE SEVEN DAYS BEFORE CLOSING NC 66 (SEE SHEET TMP-3).

STEP 2

USING ROADWAY STANDARD DRAWING 1101.03 (SHEET 1 OF 9) AND SHEETS TMP-3 & TMP-4, INSTALL ROAD CLOSURE AND DETOUR SIGNS. RELOCATE CMS BOARDS AS SHOWN ON SHEET TMP-3. CLOSE NC 66 AND DETOUR TRAFFIC (SEE LOCAL NOTE 1).

STEP 3

REMOVE EXISTING BRIDGE.

STEP 4

CONSTRUCT PROPOSED STRUCTURE AND ROADWAY.

STEP 5

PLACE FINAL PAVEMENT MARKINGS AND MARKERS ON NC 66 AND OPEN ROAD TO TRAFFIC.

STEP 6

REMOVE ALL WORK ZONE TRAFFIC CONTROL DEVICES.

APPROVED: DocuSigned by: Michael T. Rzepka 01BC3480C26049D...

DATE: 2/3/2020

NORTH CAROLINA PROFESSIONAL SEAL 15876 ENGINEER MICHAEL T. RZEPKA

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

2/3/2020
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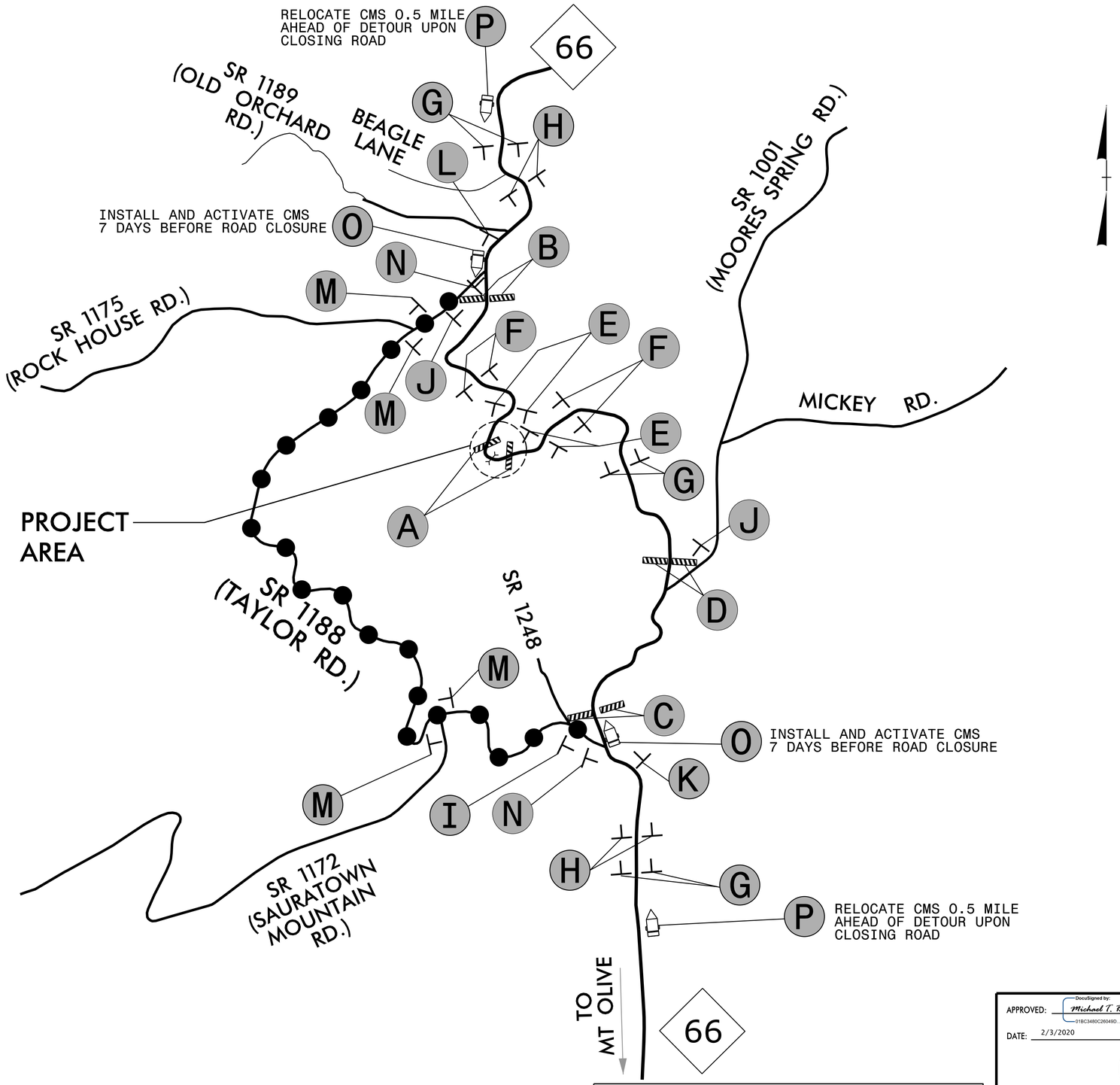
N.C.B.E.L.S. License Number: F-0116

PROJ. REFERENCE NO.	SHEET NO.
17BP.9.R.98	TMP-3



DETOUR ROUTE

NOTES: REFER TO RSD 1101.03, (SHEET 1 OF 9) FOR APPLICABLE NOTES

APPROVED: DocuSigned by: Michael T. Rzepka 01BC3480C260490...

DATE: 2/3/2020

NORTH CAROLINA PROFESSIONAL SEAL 15876 ENGINEER MICHAEL T. RZEPKA

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

DETOUR FOR NC 66 ROAD CLOSURE

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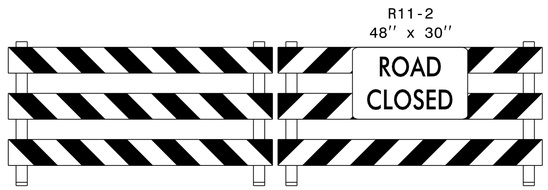
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

PROJ. REFERENCE NO.	SHEET NO.
17BP.9.R.98	TMP-4



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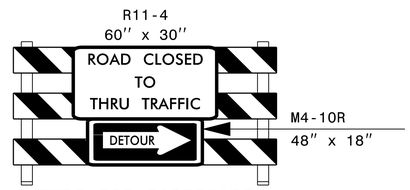

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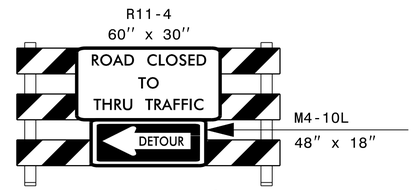

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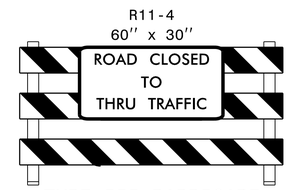


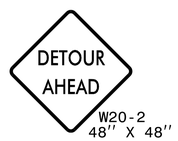
TYPE III BARRICADE

D

E

F

G



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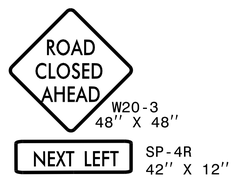

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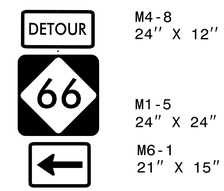

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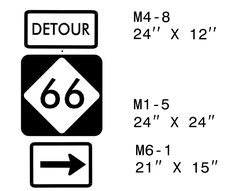

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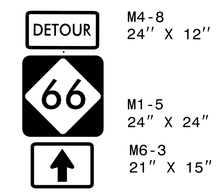

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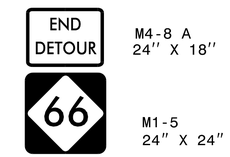

N

MESSAGES AS SHOWN OR AS DIRECTED BY THE ENGINEER

MESSAGE NO. 1	MESSAGE NO. 2
NC 66 TO CLOSE (DATE)	NC 66 TO CLOSE (DATE)

CHANGEABLE MESSAGE SIGN

O

INSTALL AND ACTIVATE CMS AT DETOUR POINTS 7 DAYS BEFORE ROAD CLOSURE.

MESSAGE NO. 1	MESSAGE NO. 2
NC 66 CLOSED AHEAD	FOLLOW DETOUR

CHANGEABLE MESSAGE SIGN

P

RELOCATE CMS UPON CLOSING NC 66

APPROVED: DocuSigned by: Michael T. Rzepka 01BC3480C26049D...

DATE: 2/3/2020

NORTH CAROLINA PROFESSIONAL SEAL 15876 ENGINEER MICHAEL T. RZEPKA

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

ROAD CLOSURE SIGNS AND DETOUR SIGNS

2/3/2020
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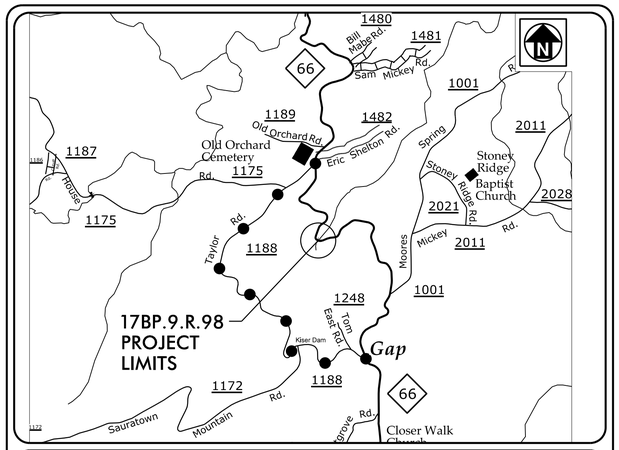


VICINITY MAP

NOT TO SCALE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED HIGHWAY EROSION CONTROL

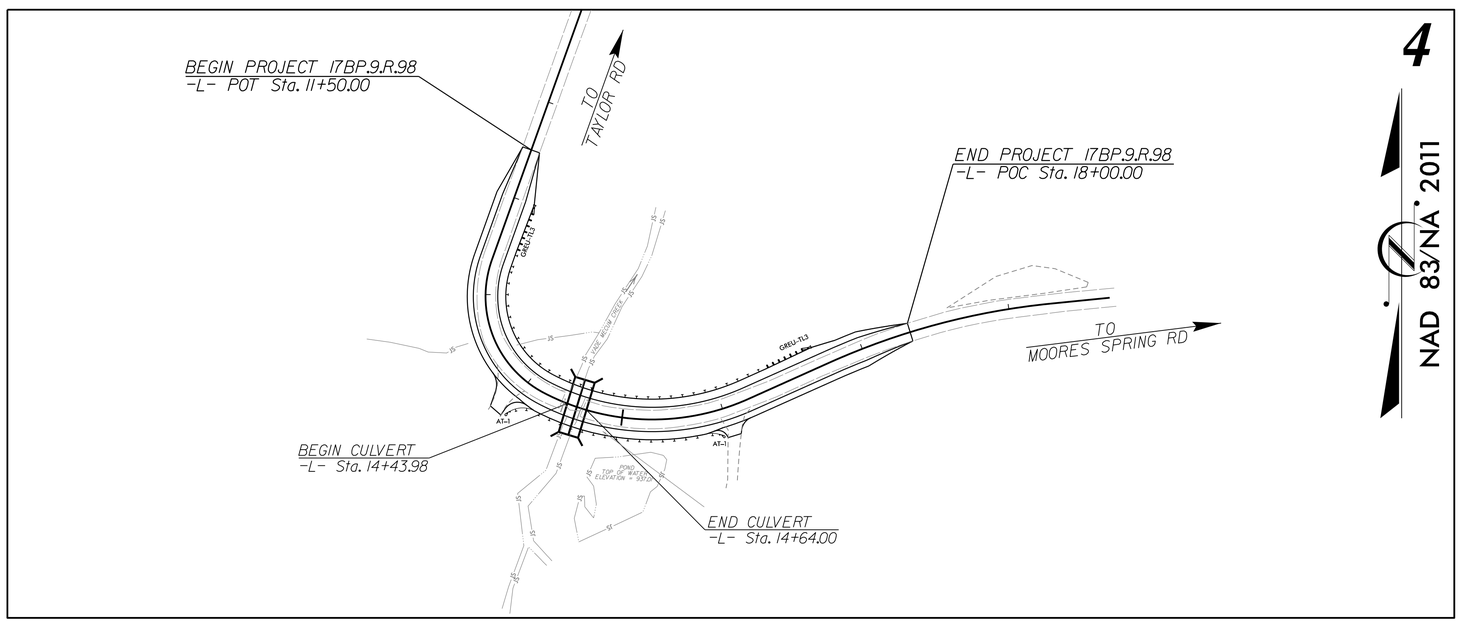
STOKES COUNTY

LOCATION: BRIDGE NO. 15 OVER VADE MECUM CREEK ON NC 66

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND CULVERT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.9.R.98	EC-1	

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



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.

*DESIGN EXCEPTION:
MIN. HORIZONTAL CURVE RADIUS
HORIZONTAL SSD

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.

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

Prepared in the Office of:

VHB ENGINEERING NC, P.C.

940 Main Campus Drive, Suite 500
Raleigh, NC 27606

Designed by:

ERIC BERGER, EI — ***4036***

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		

8/9/2019
Date: 8/9/2019 9:40:01 AM
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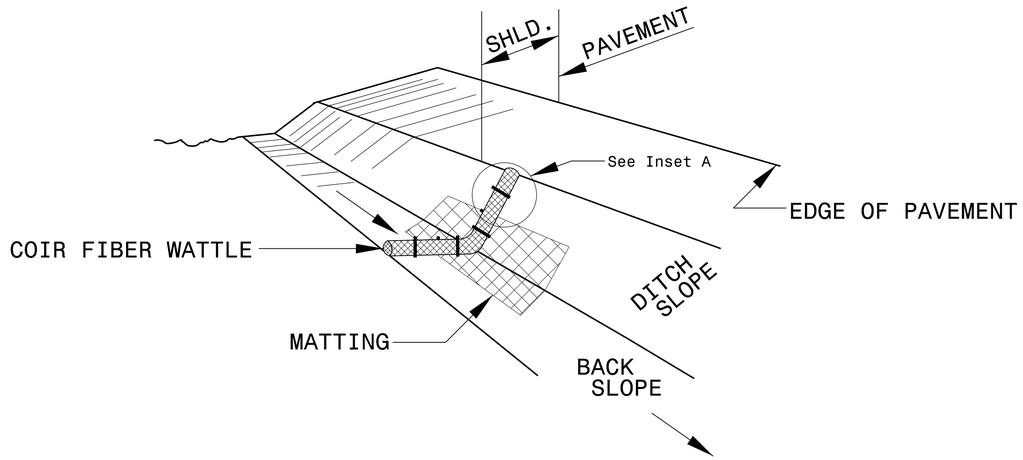
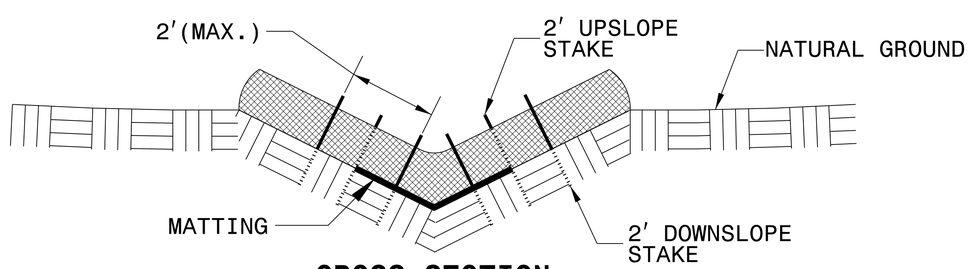
PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.98	EC-2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

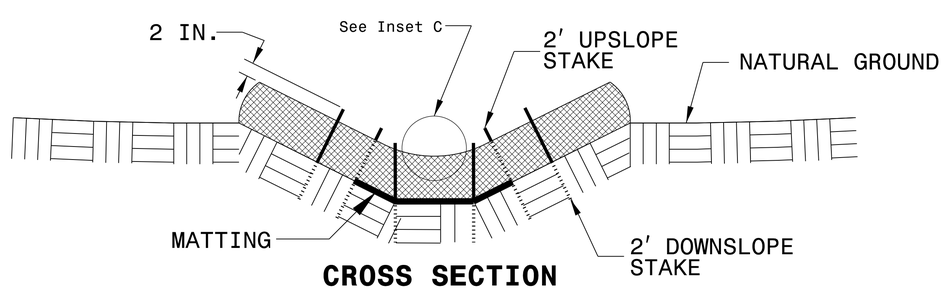
COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

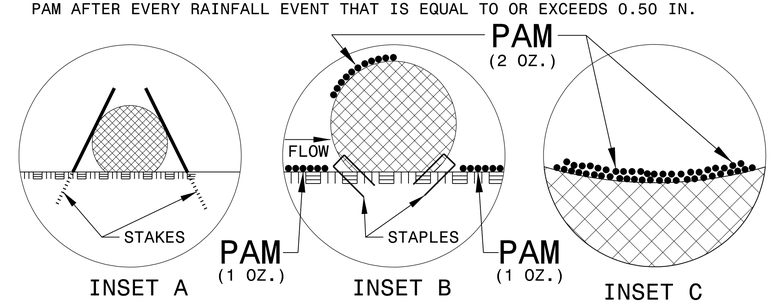
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

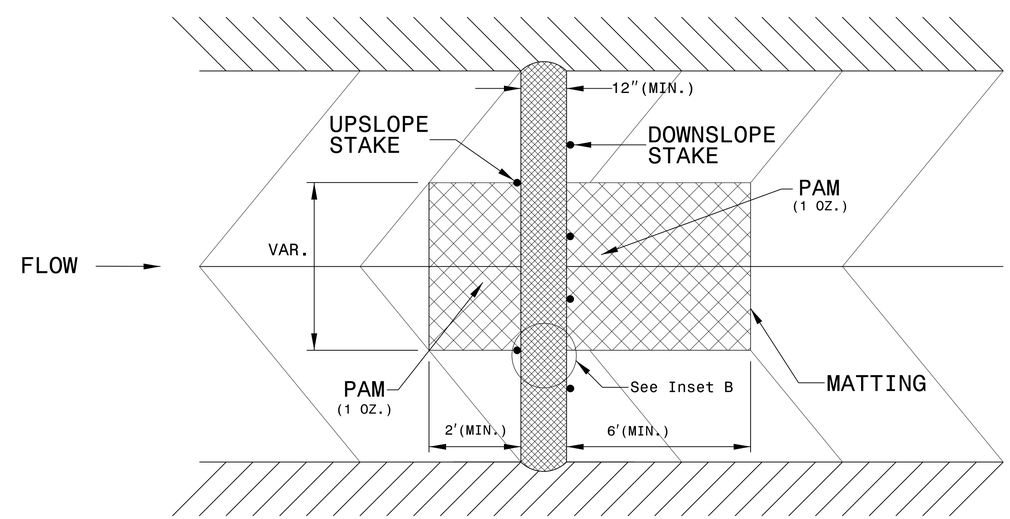
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.

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 WATTLE.

INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.

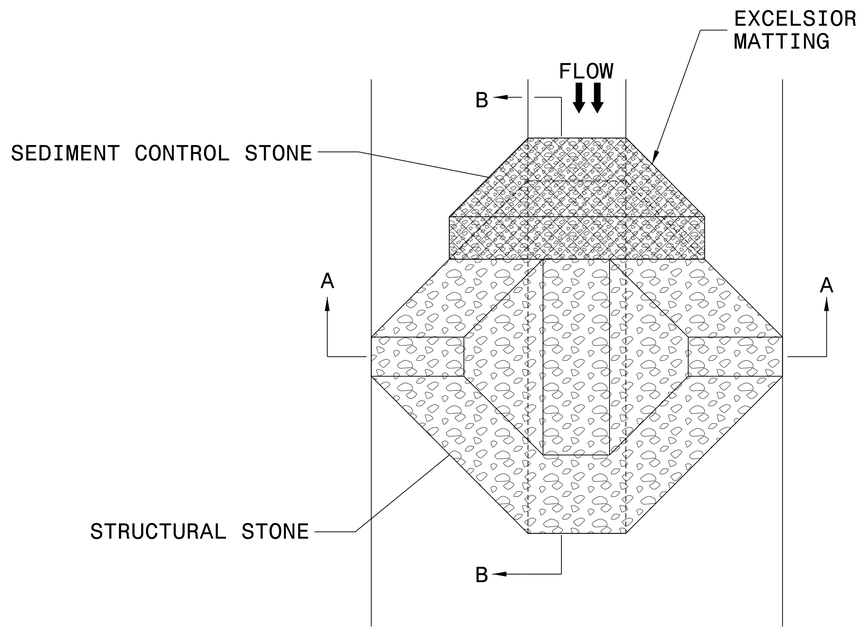




TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.98	EC-2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



PLAN

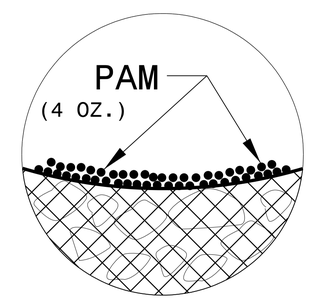
NOTES:

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

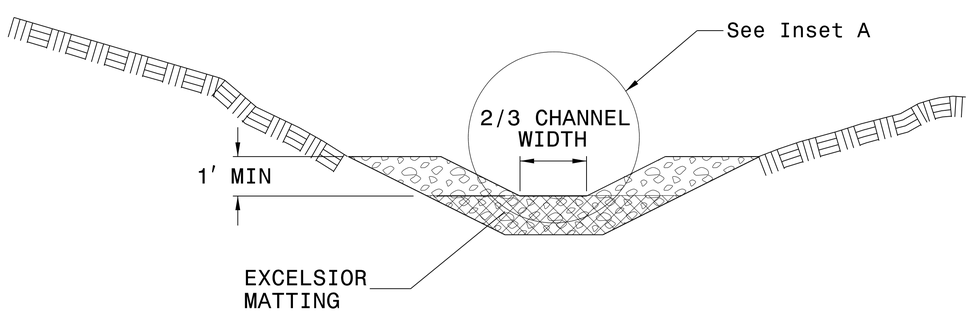
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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.

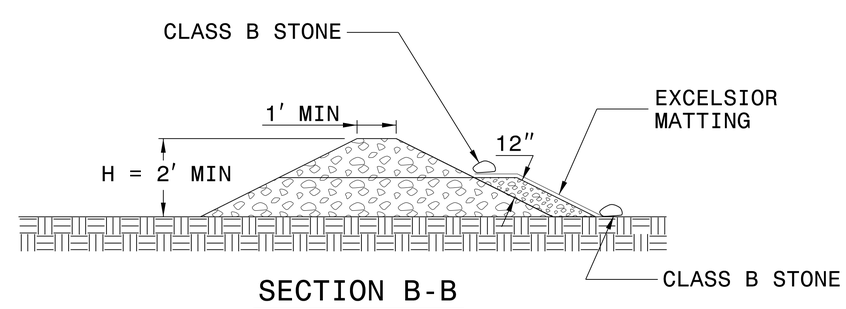
INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A



SECTION A-A



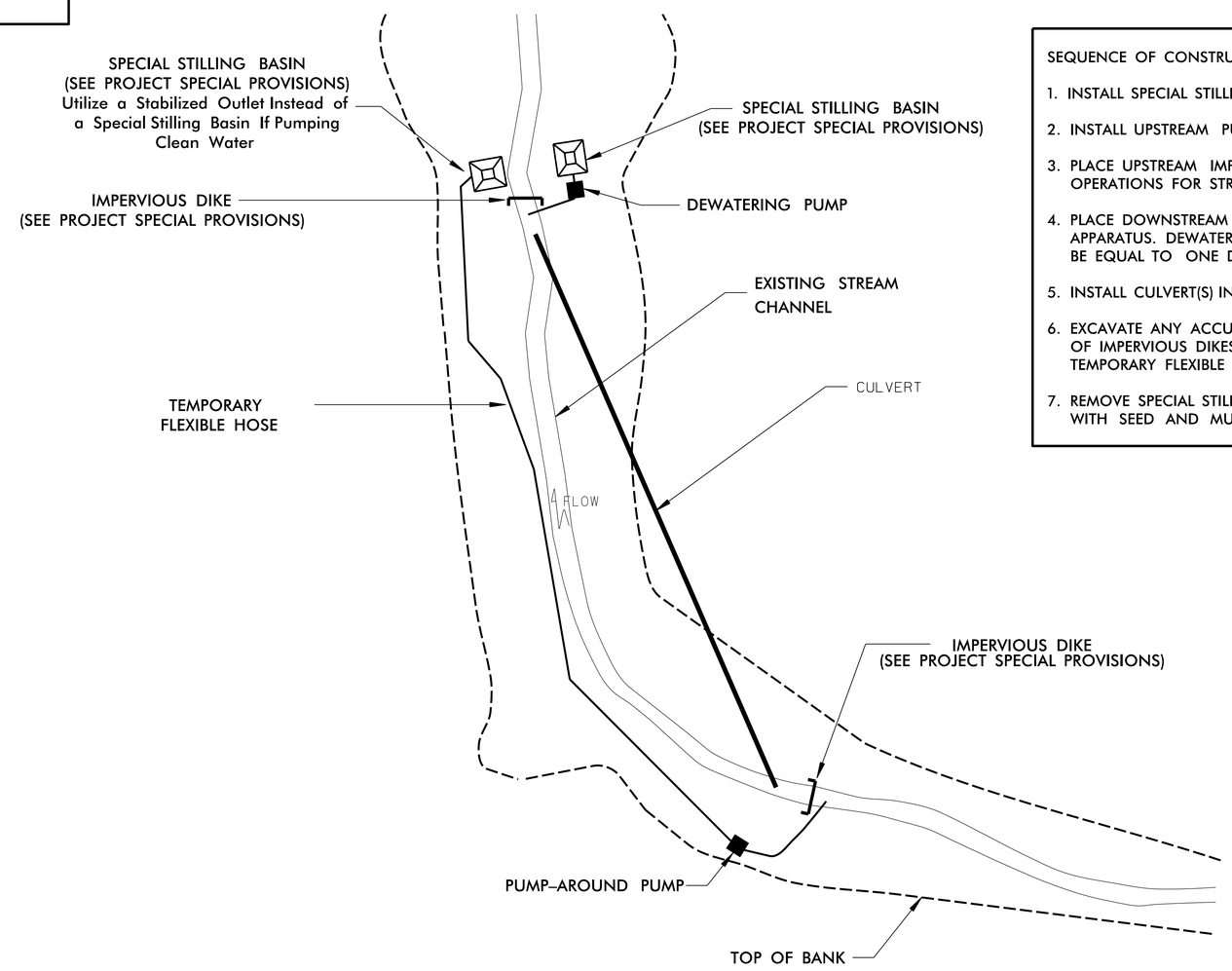
SECTION B-B

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.98	EC-2C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

EXAMPLE OF PUMP–AROUND OPERATION

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



SEQUENCE OF CONSTRUCTION FOR TYPICAL WORK AREA

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

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.98	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

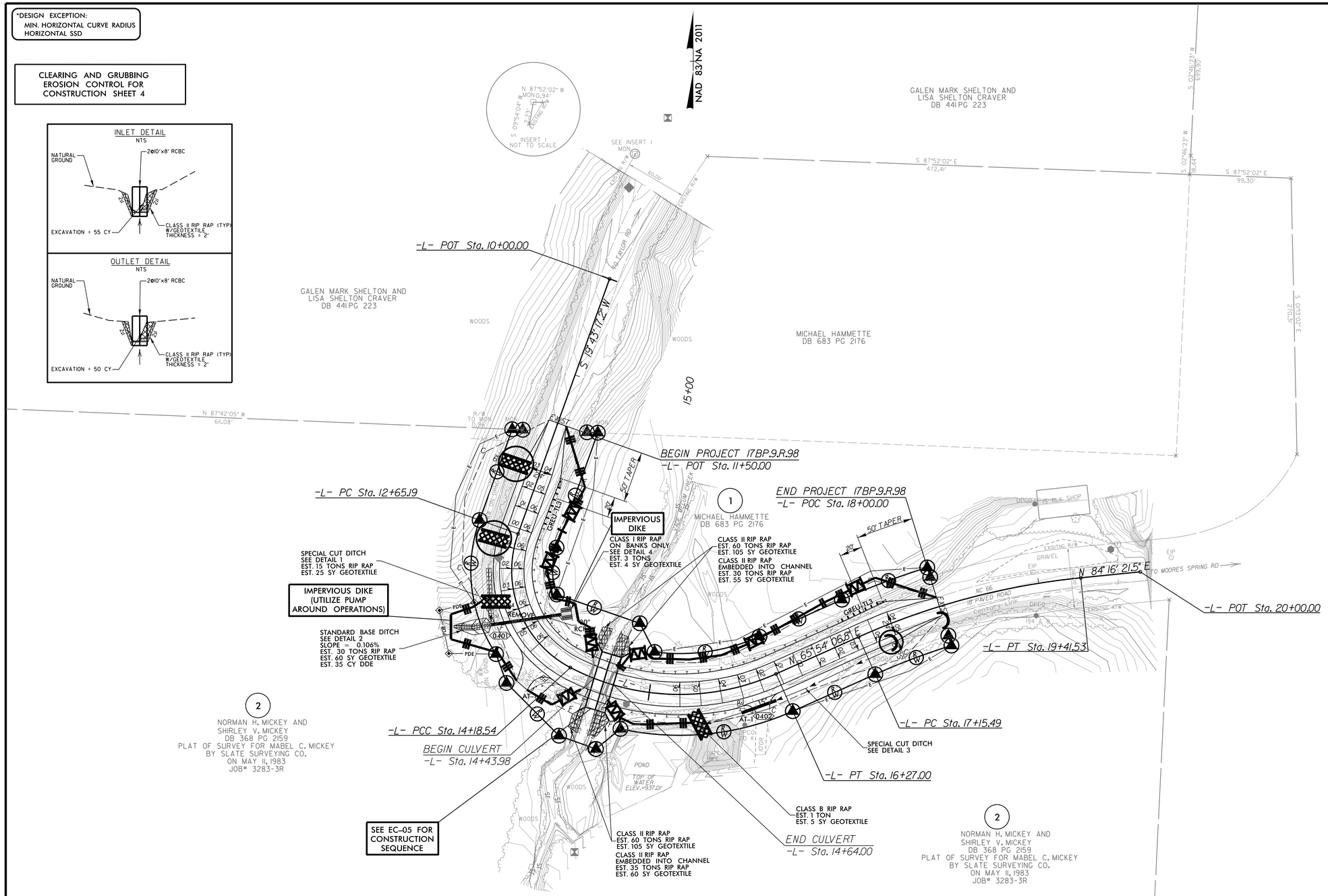
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

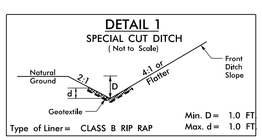
SOIL STABILIZATION TIMEFRAMES

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.

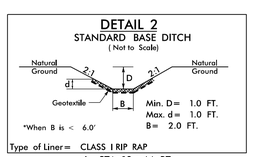
*DESIGN EXCEPTION:
MIN. HORIZONTAL CURVE RADIUS
HORIZONTAL SSD

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4





-L- STA. 13+00 TO 13+44 RT



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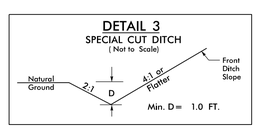
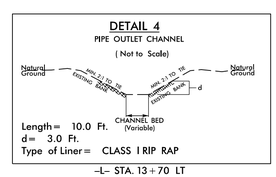


-L- STA. 15+50 TO 17+50 RT



-L- STA. 13+70 LT

-L-

PI Sta 13+58.39	PI Sta 15+30.47	PI Sta 18+29.49
Δ = 82° 06' 55.2" (LT)	Δ = 51° 42' 15.1" (LT)	Δ = 18° 22' 14.7" (RT)
D = 53° 32' 50.8"	D = 24° 48' 12.1"	D = 8° 07' 37.4"
L = 153.35'	L = 208.46'	L = 226.04'
T = 93.20'	T = 111.93'	T = 114.00'
R = 107.00'	R = 231.00'	R = 705.00'

PROJECT REFERENCE	SHEET NO.
17BP.9.R.98 – STOKES 15	EC-04/CONST.04
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
MOTT MACDONALD I & E, LLC LICENSE NO. F-0669	VHB ENGINEERING LICENSE NO. C-3705

Prepared in the Office of:
MOTT MACDONALD
PO Box 700
Fuquay-Varina, NC 27526
www.mottmac.com/americas

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

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$$DATE$$ 1/19/2021

CULVERT CONSTRUCTION SEQUENCE STA. 14 + 54 –L–

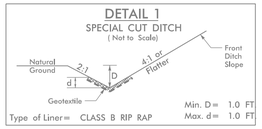
PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.98	EC-05/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PHASE I

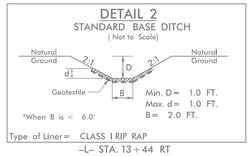
1. CLOSE ROAD AND DETOUR TRAFFIC.
2. INSTALL IMPERVIOUS DIKE A.
3. DEWATER SITE UTILIZING SPECIAL STILLING BASIN.
4. REMOVE EXISTING REINFORCED CONCRETE ARCH.
5. INSTALL PROPOSED RCBC WEST BARREL AND BANK STABILIZATION ON THE WEST SIDE.
6. BEGIN PHASE II.

PHASE II

7. REMOVE IMPERVIOUS DIKE A.
8. INSTALL IMPERVIOUS DIKES B AND C AND DIVERT FLOW THROUGH THE WEST BARREL.
9. DEWATER SITE UTILIZING SPECIAL STILLING BASIN.
10. INSTALL PROPOSED RCBC EAST BARREL AND BANK STABILIZATION ON THE EAST SIDE.
11. REMOVE IMPERVIOUS DIKES B AND C.
12. REMOVE SPECIAL STILLING BASINS.
13. COMPLETE ROADWAY.



–L– STA. 13 + 00 TO 13 + 44 RT



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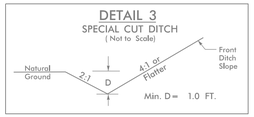

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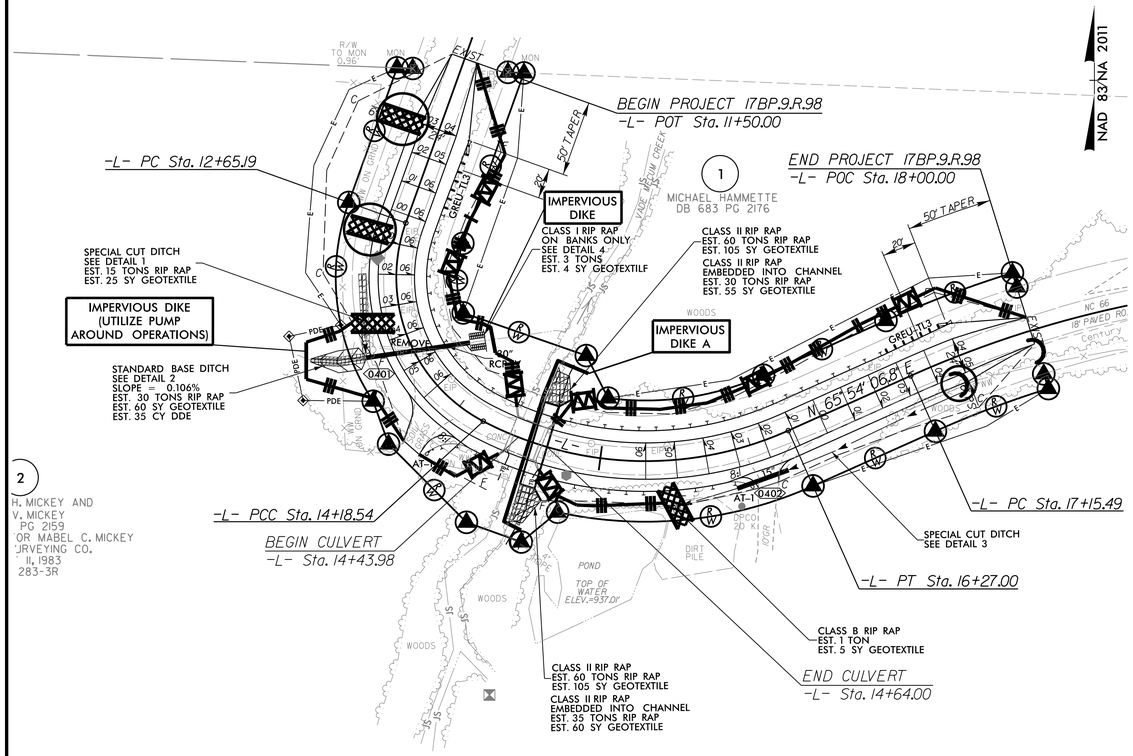

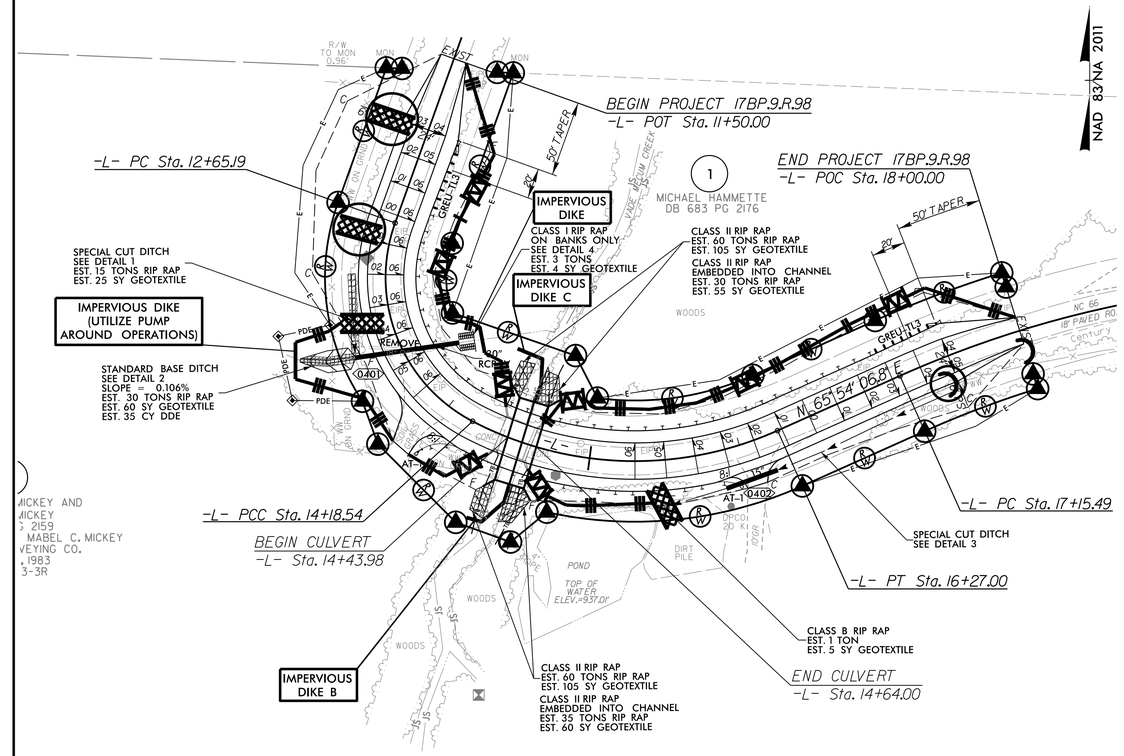

*DESIGN EXCEPTION:
MIN. HORIZONTAL CURVE RADIUS
HORIZONTAL SSD

PROJECT REFERENCE	SHEET NO.
17BP.9.R.98 – STOKES 15	EC-06/CONST.04
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
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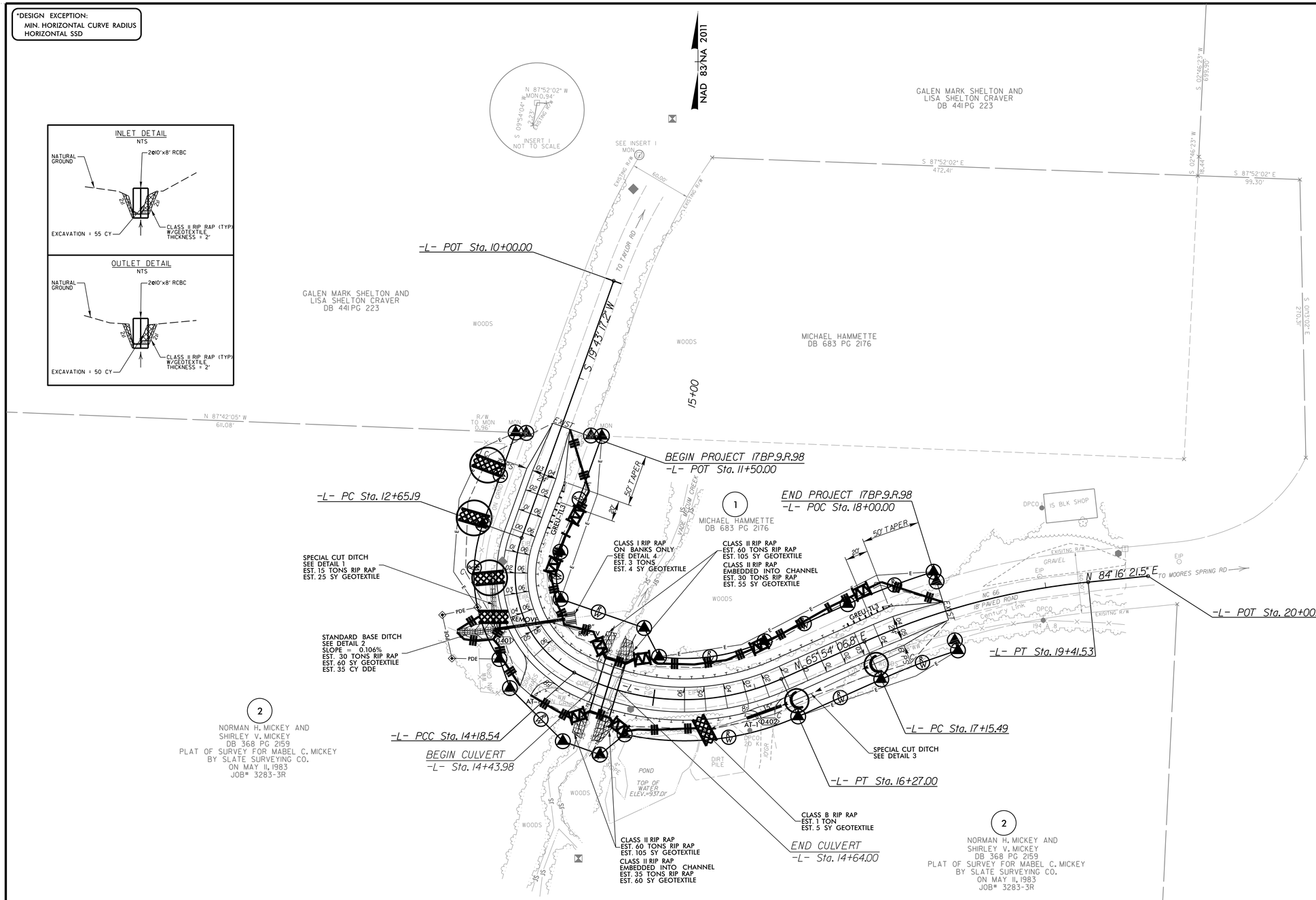
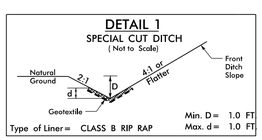
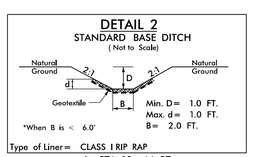




–L– STA. 13+00 TO 13+44 RT



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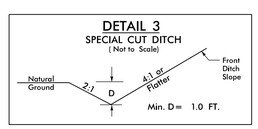

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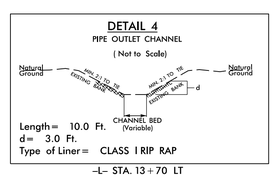

–L– STA. 13+70 LT

–L–

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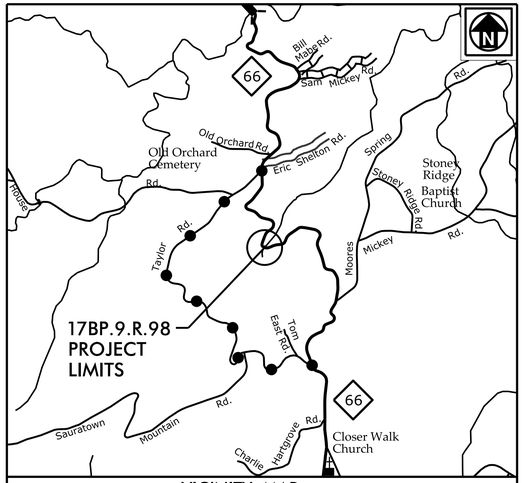
$$DATE$$ 1/19/2021

PROJECT: 17BP.9.R.98

CONTRACT:



VICINITY MAP
(NOT TO SCALE)
OFF-SITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

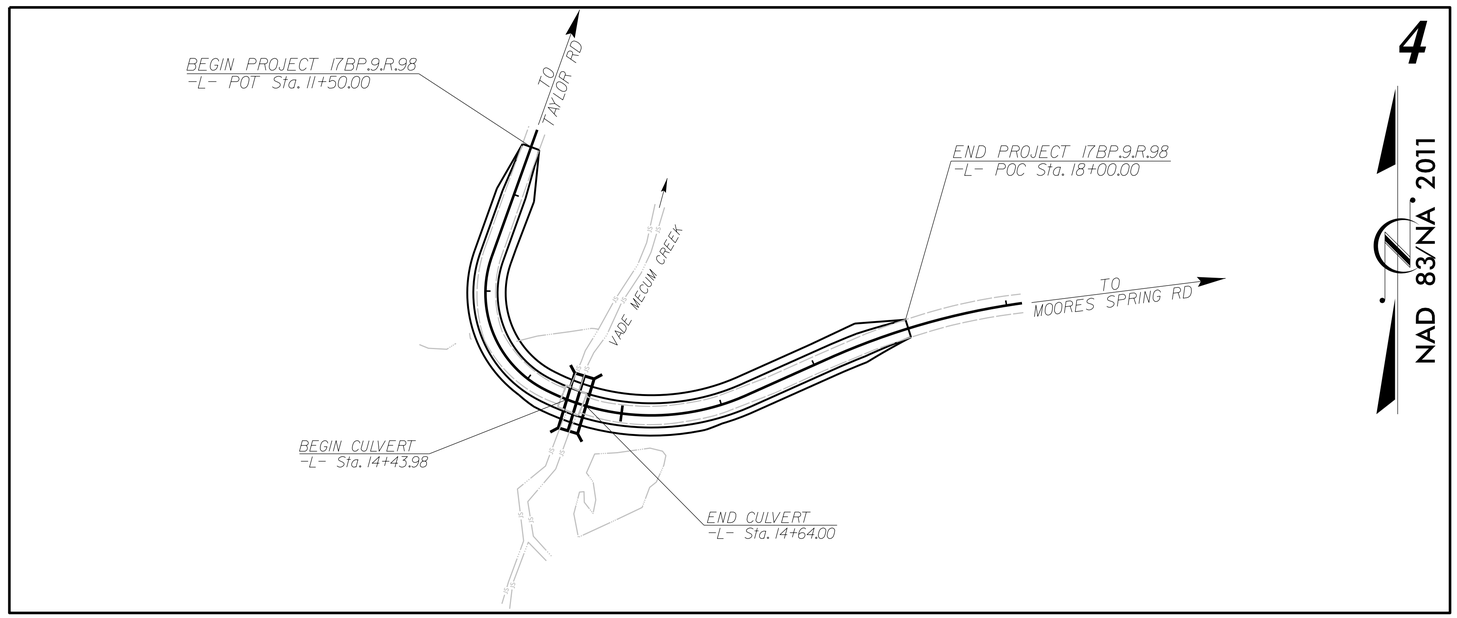
UTILITIES BY OTHERS PLANS
STOKES COUNTY

LOCATION: BRIDGE NO. 15 OVER VADE MECUM CREEK ON NC 66

TYPE OF WORK: COMMUNICATIONS

T.I.P. NO.	SHEET NO.
17BP.9.R.98	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.



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

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

UTILITY OWNERS WITH CONFLICTS

(A) COMMUNICATIONS – CENTURYLINK

PREPARED IN THE OFFICE OF:

SO-DEEP | SAM NC™

SO-DEEP I SAM NC, Inc.
A SAM COMPANY
2800-154 Sumner Boulevard, Raleigh, NC 27616 Tel 919-878-7466

Keith Garry — UTILITY PROJECT MANAGER
Zaki Wafa — PROJECT UTILITY COORDINATOR

DIVISION OF HIGHWAYS
DIVISION 09
DIV ADDRESS
375 SILAS CREEK PARKWAY
WINSTON SALEM, 27127

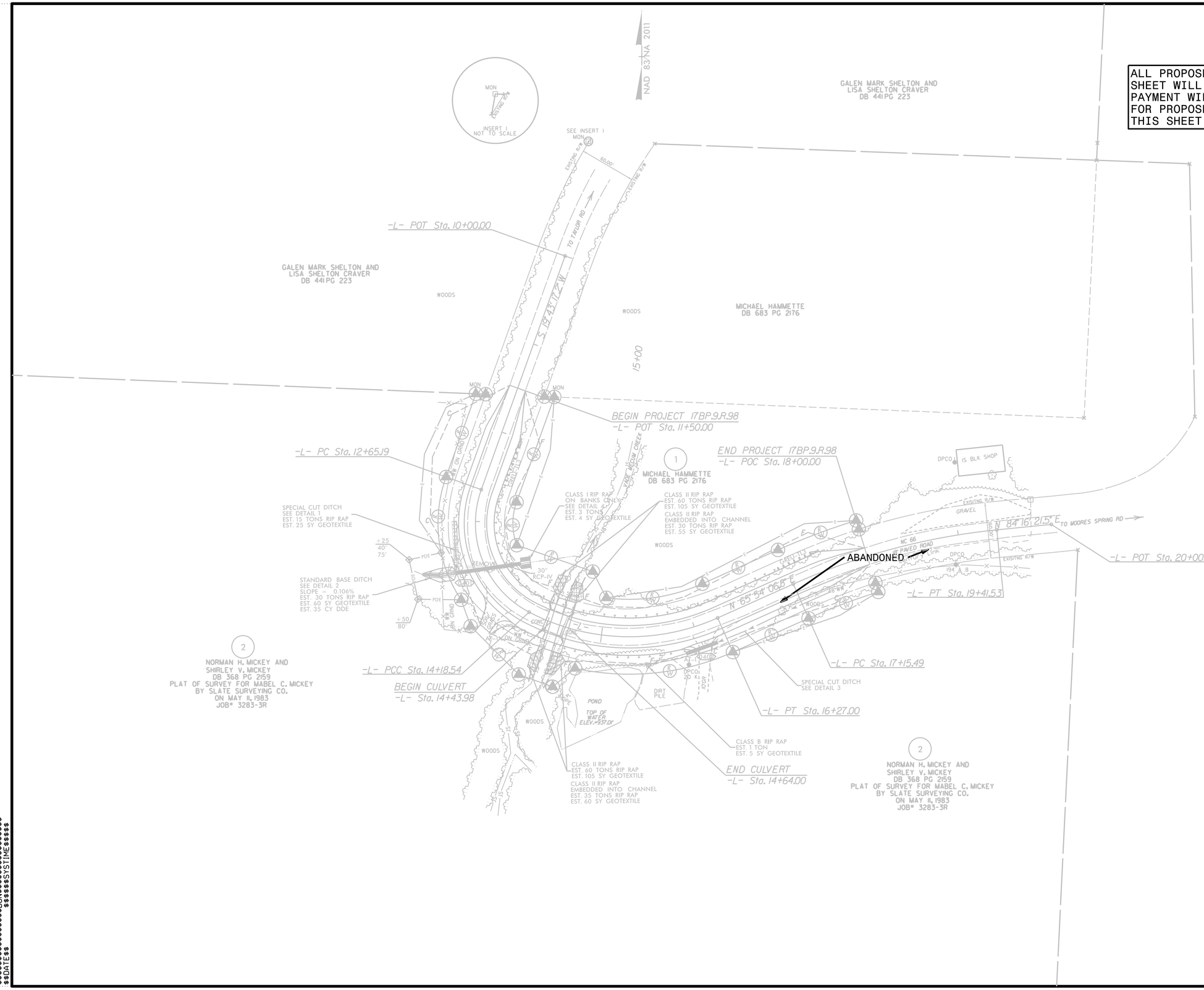
David Trantham — DIVISION CONTACT #1
Lynn Basinger — DIVISION CONTACT #2

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

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.98 - STOKES 105	UO-2
THIS SHEET CORRESPONDS TO RDY- 4	

UTILITIES BY OTHERS

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



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

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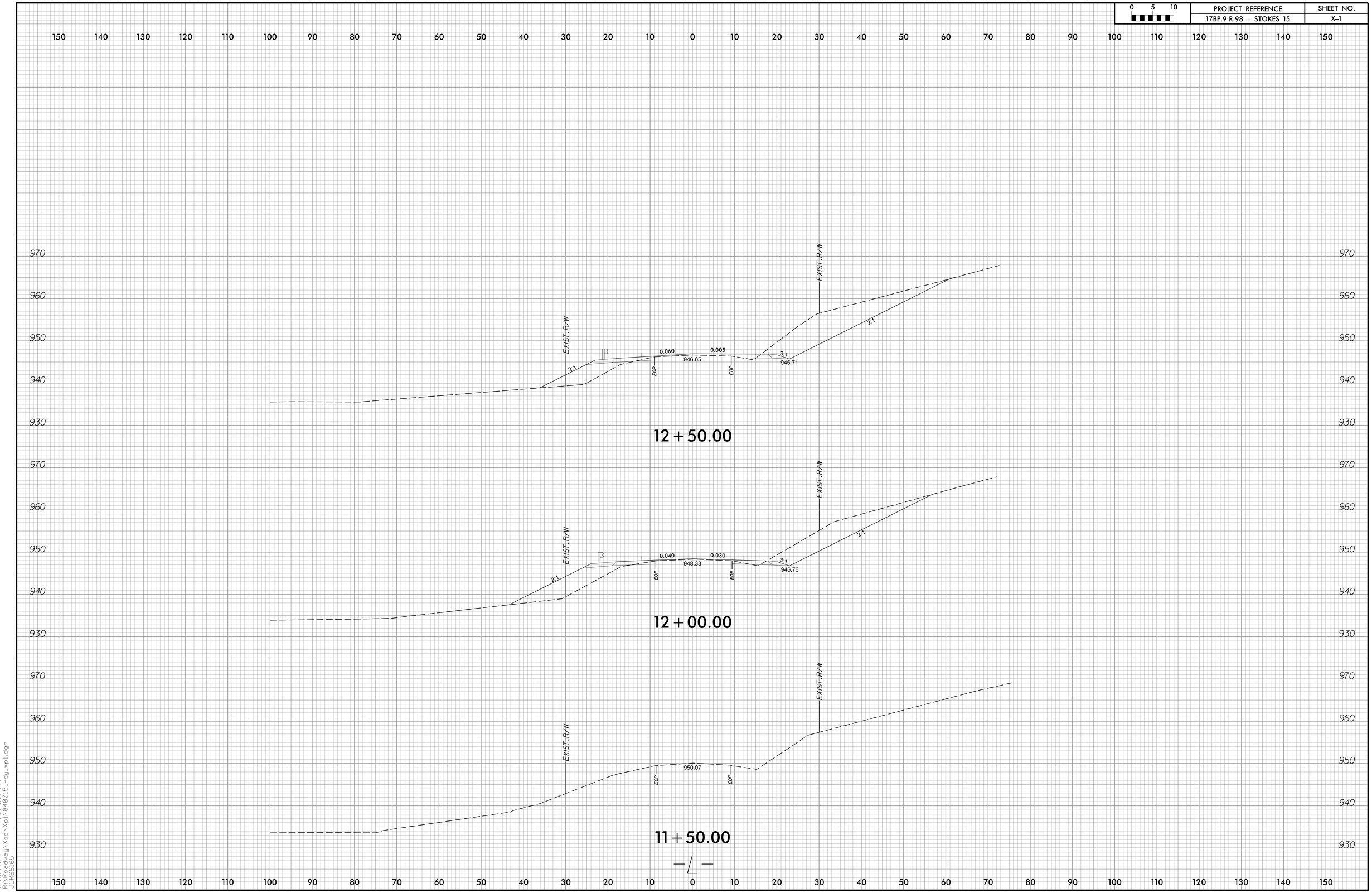

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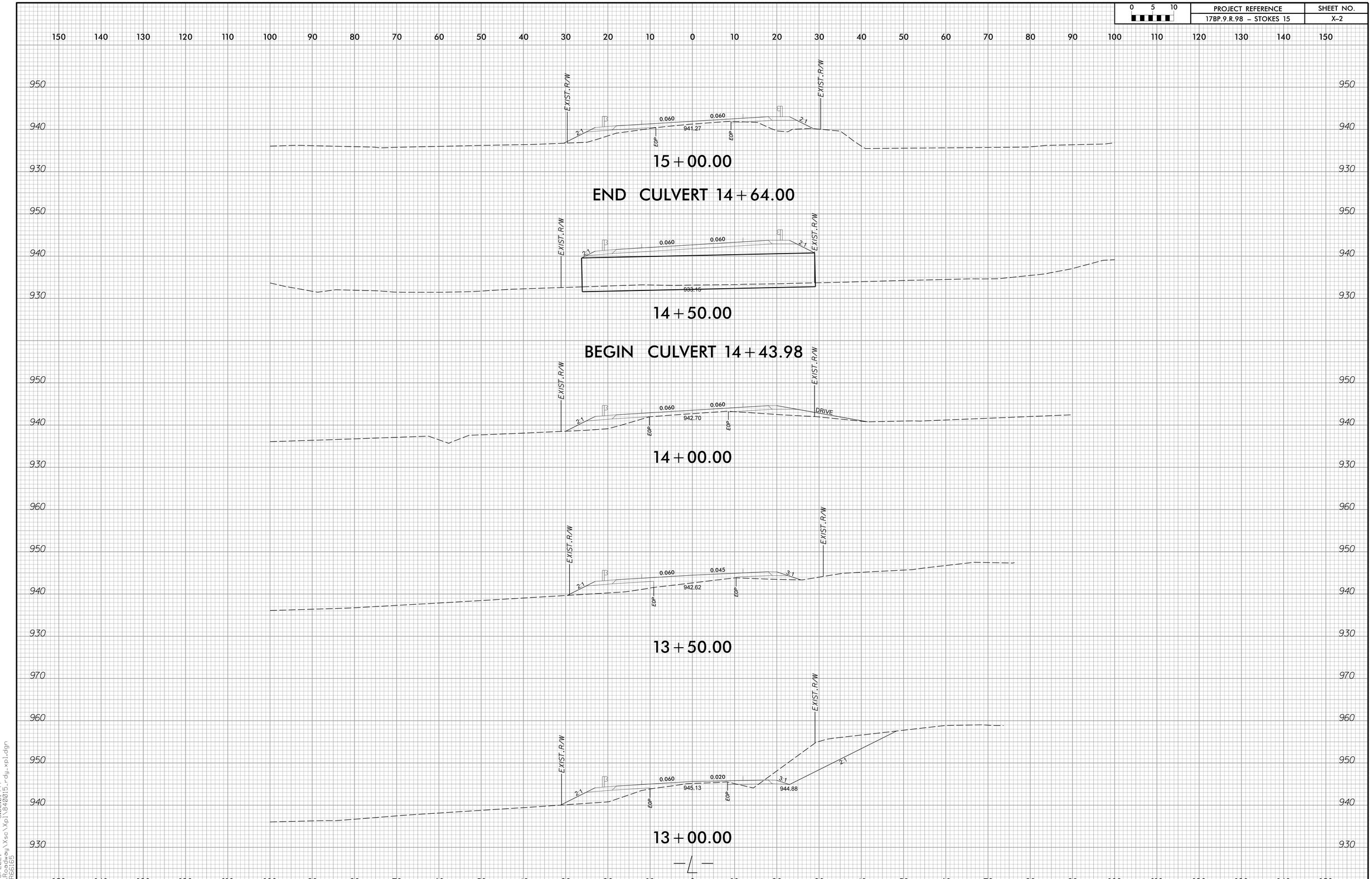

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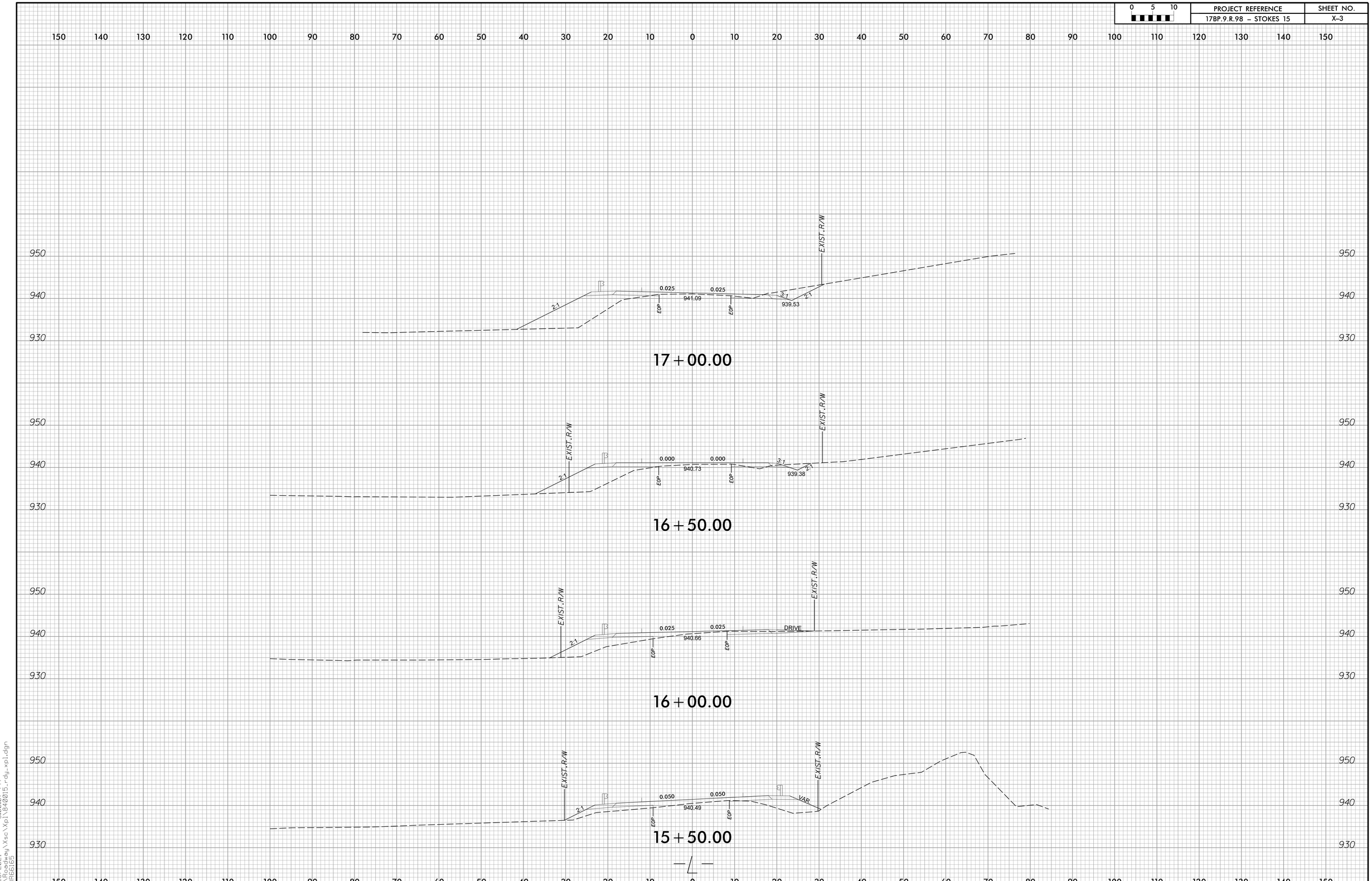

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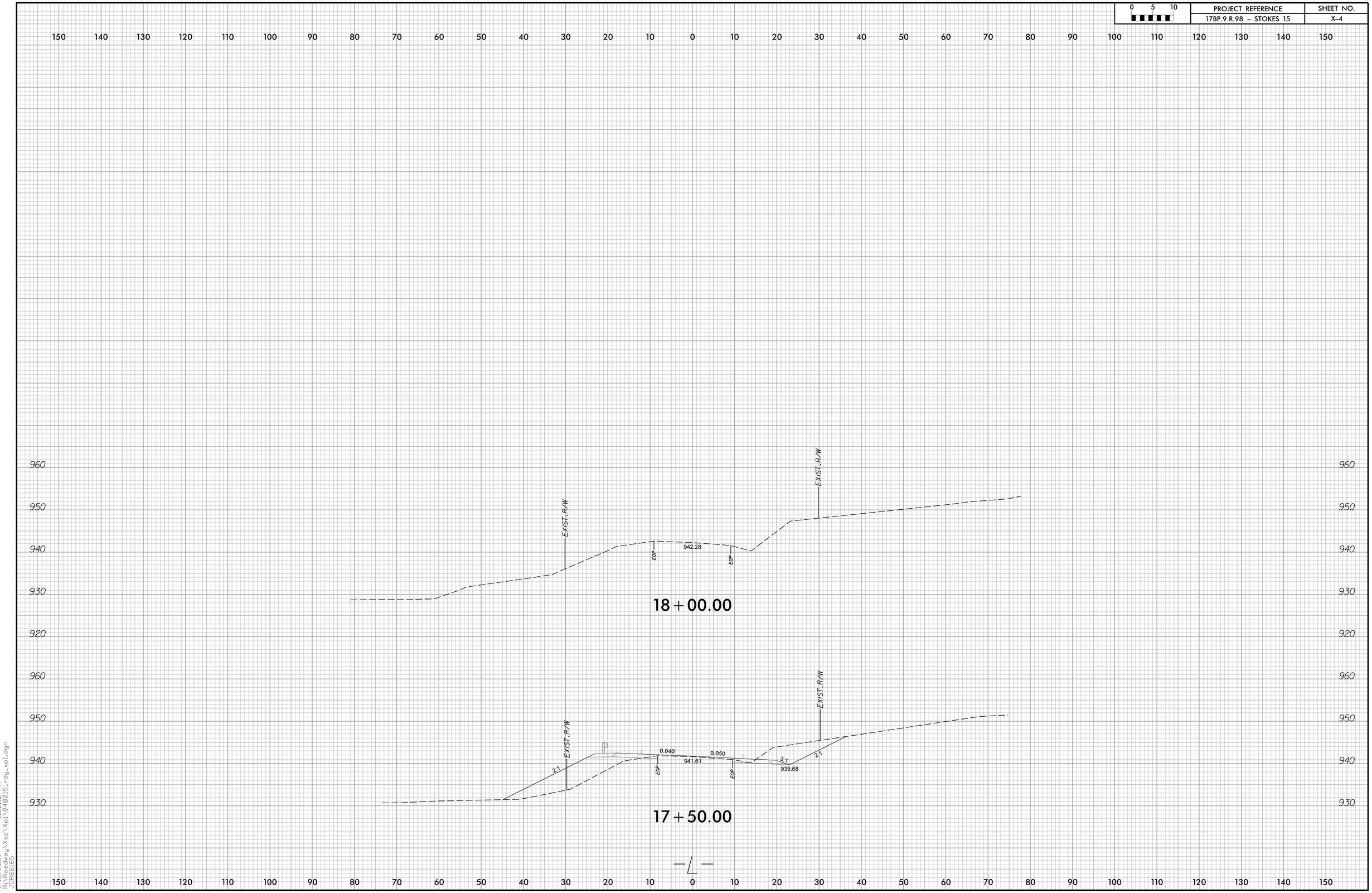
	17BP.9.R.98 – STOKES 15	X–4



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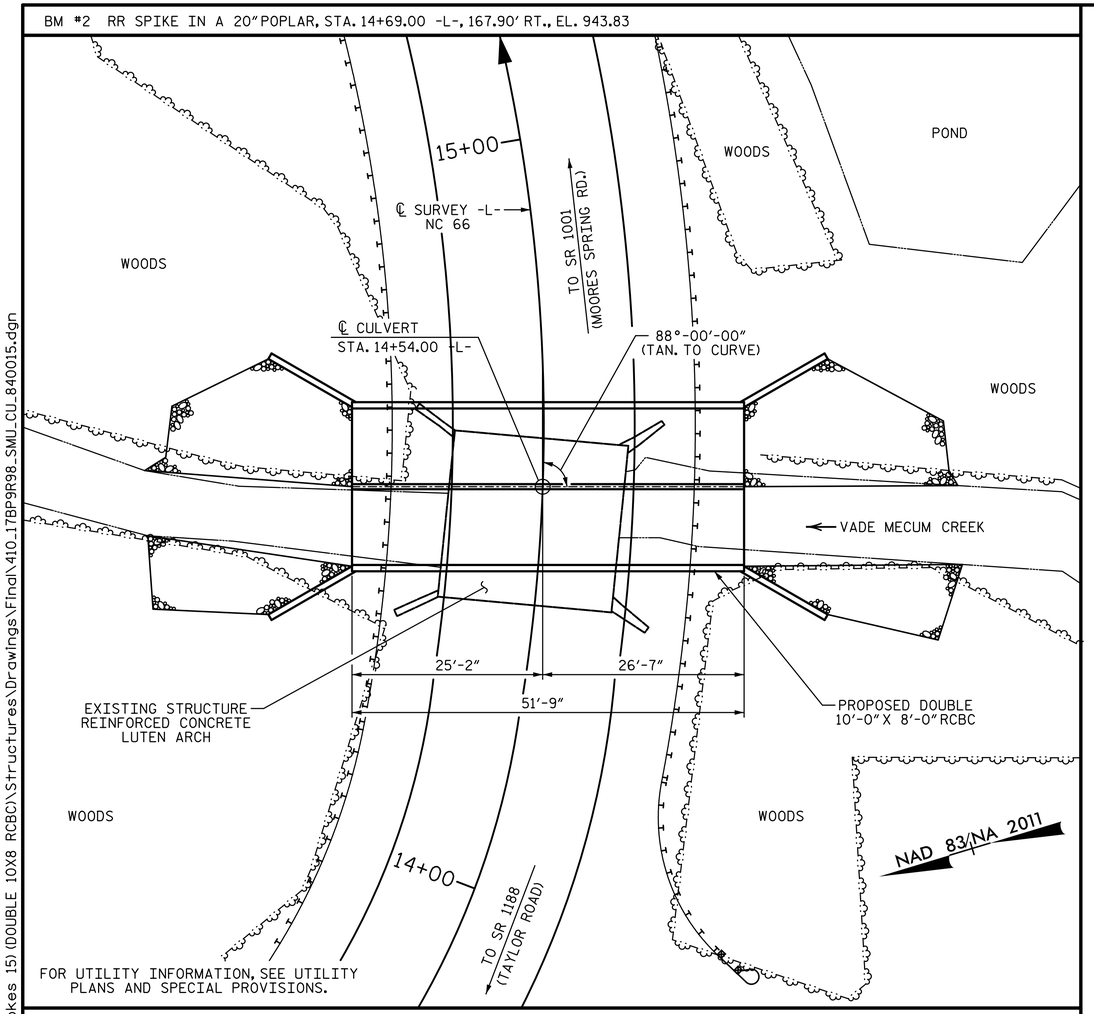


LOCATION SKETCH

HYDRAULIC DATA:

DESIGN DISCHARGE	= 750 CFS
FREQUENCY OF DESIGN FLOOD	= 50 YEAR
DESIGN HIGH WATER ELEVATION	= 939.40
DRAINAGE AREA	= 1.2 SQ. MI.
BASE DISCHARGE (Q 100)	= 850 CFS
BASE HIGH WATER ELEVATION	= 939.90

OVERTOPPING FLOOD DATA:

OVERTOPPING DISCHARGE	= 1350 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YEAR
OVERTOPPING FLOOD ELEVATION	= 942.20 ✱✱

✱✱ OVERTOPPING OCCURS AT ROADWAY STA. 15+59.00 -L-

GRADE DATA:

GRADE POINT EL. @ STA. 14+54.00 -L- = EL. 942.60
BED EL. @ STA. 14+54.00 -L- = EL. 931.99
ROADWAY SLOPE 2:1

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE			
BARREL @	2.561	CY/FT	132.5 CY
HEADWALLS			2.1 CY
SILLS			3.0 CY
WING ETC.			23.8 CY
TOTAL			161.4 CY
REINFORCING STEEL			
BARREL			15,804 LB
WINGS ETC.			1,453 LB
TOTAL			17,257 LB
CULVERT EXCAVATION			LUMP SUM
FOUNDATION CONDITIONING MATERIAL			96 TONS
REMOVAL OF EXISTING STRUCTURE			LUMP SUM
ASBESTOS ASSESSMENT			LUMP SUM
PLACEMENT OF NATURAL STREAM BED MATERIAL			LUMP SUM

NOTES:

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

DESIGN FILL---------- 1'-6" (MIN.) AND 3'-6" (MAX.)

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 AND BOTH FACES OF INTERIOR WALLS 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.

REMOVAL OF THE EXISTING STRUCTURE 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.

THE EXISTING STRUCTURE CONSISTS OF 1 SPAN @ 18'-6" WITH A CLEAR ROADWAY WIDTH OF 20'-0". THE STRUCTURE CONSISTS OF A REINFORCED CONCRETE LUTEN ARCH. THE EXISTING STRUCTURE, WHICH IS LOCATED AT THE SITE OF THE PROPOSED STRUCTURE, SHALL BE REMOVED. THE EXISTING BRIDGE IS NOT PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, THE LOAD LIMIT MAY BE REDUCED AS NECESSARY DURING THE LIFE OF THE PROJECT.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

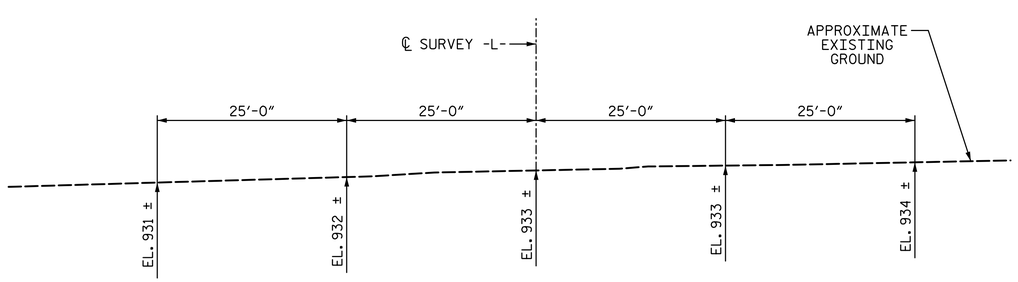
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

NO PRECAST REINFORCED BOX CULVERT WILL BE ALLOWED.

FOR PLACEMENT OF NATURAL STREAM BED MATERIAL, SEE SPECIAL PROVISION.



PROFILE ALONG ℄ CULVERT

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. 17BP.9.R.98
STOKES COUNTY
STATION: 14+54.00 -L-

SHEET 1 OF 6 REPLACES BRIDGE #15

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 10 FT. X 8 FT. CONCRETE BOX CULVERT

88° SKEW

PLANS PREPARED BY:
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Suite 200
Cary, NC 27518
(919) 852-0468
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www.simpsonengr.com
LICENSURE NO. C-2521

NORTH CAROLINA PROFESSIONAL SEAL 048943 ENGINEER NEHEMIAH J. MABRY
10/12/2021

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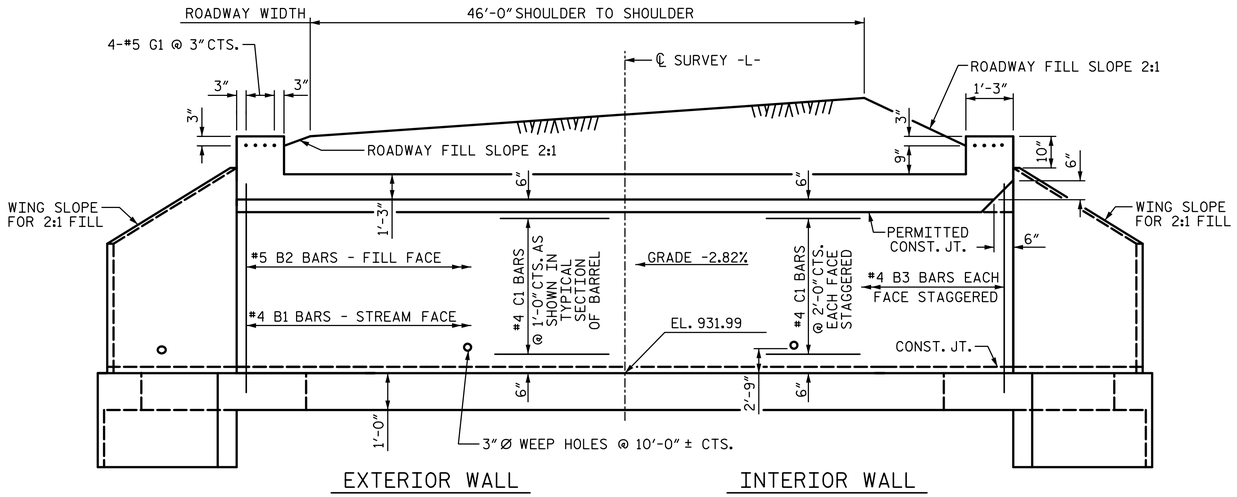
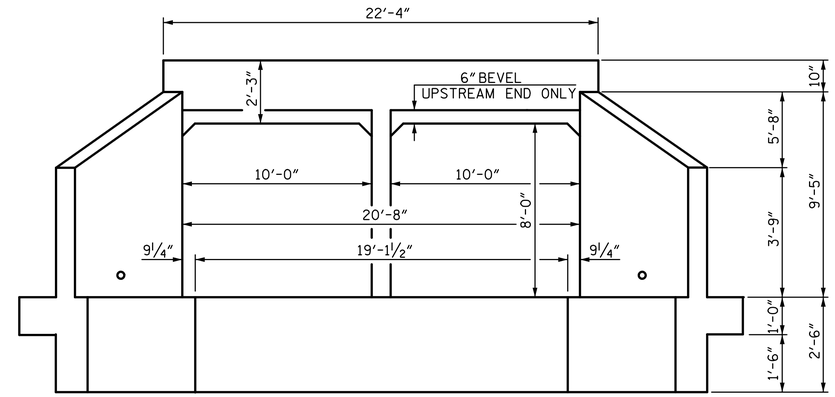
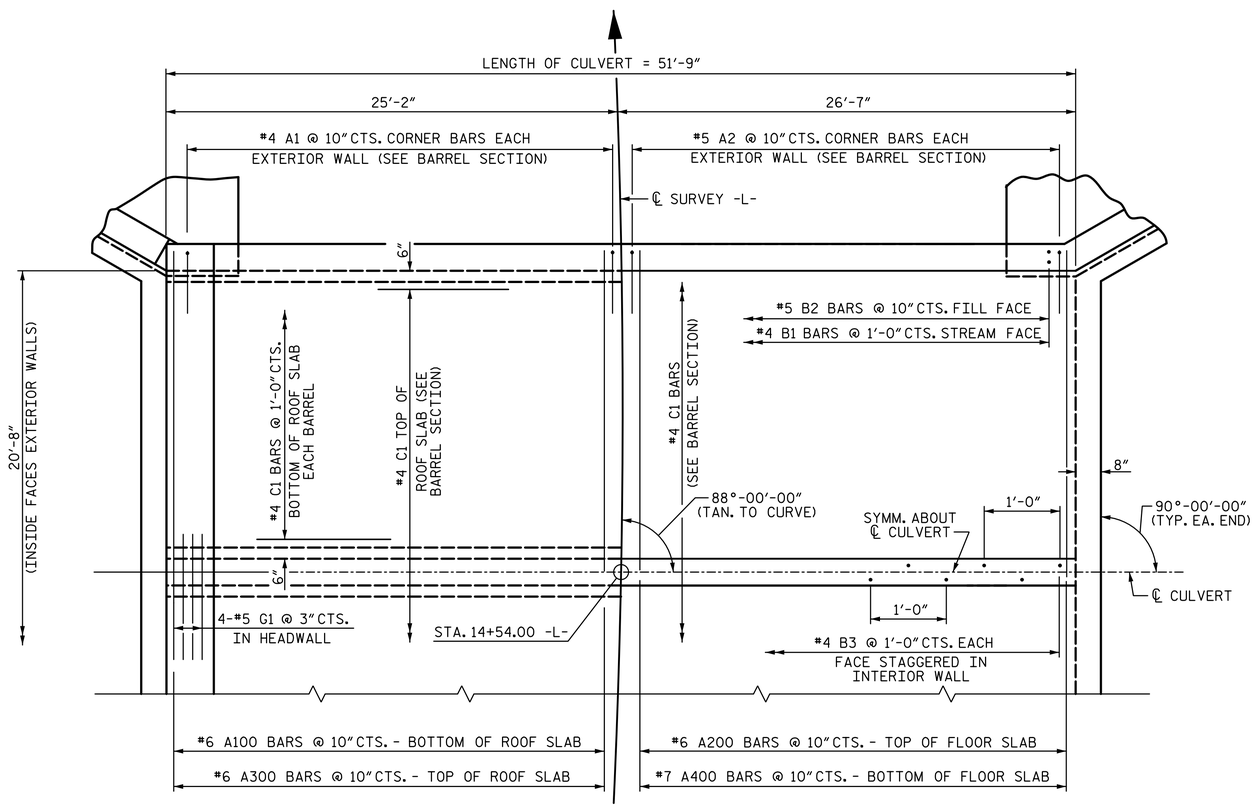


CULVERT SECTION NORMAL TO ROADWAY



END ELEVATION



PART PLAN - ROOF SLAB

PART PLAN - FLOOR SLAB

C1 BARS ARE 2 BAR RUNS.

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. 17BP.9.R.98

STOKES COUNTY

STATION: 14+54.00 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 10 FT. X 8 FT. CONCRETE BOX CULVERT

88° SKEW

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PLANS PREPARED BY:

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NORTH CAROLINA PROFESSIONAL SEAL 048943 ENGINEER NEHEMIAH J. MABRY
10/11/2021

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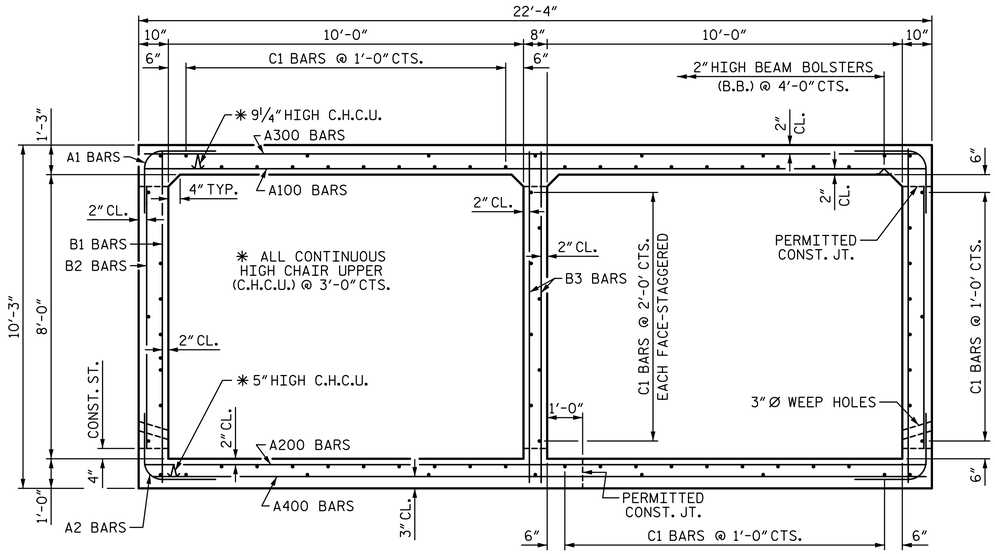
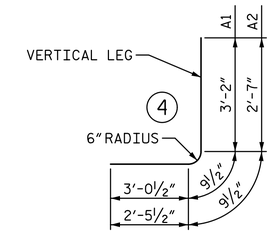


RIGHT ANGLE SECTION OF BARREL

(THERE ARE 80 C1 BARS IN SECTION OF BARREL)
(C1 BARS ARE 2 BAR RUNS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

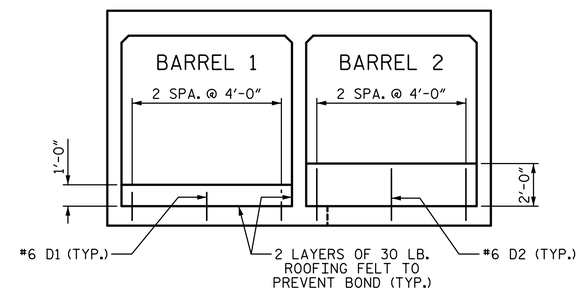
BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	126	#4	4	7'-0"	589
A2	126	#5	4	5'-10"	767
A100	63	#6	STR	21'-11"	2074
A200	63	#6	STR	21'-11"	2074
A300	63	#6	STR	21'-11"	2074
A400	63	#7	STR	21'-11"	2822
B1	104	#4	STR	9'-9"	677
B2	126	#5	STR	7'-4"	964
B3	104	#4	STR	9'-9"	677
C1	160	#4	STR	26'-8"	2850
D1	12	#6	STR	1'-7"	29
D2	6	#6	STR	2'-7"	23
G1	8	#5	STR	22'-0"	184
TOTAL REINFORCING STEEL					15804 LB

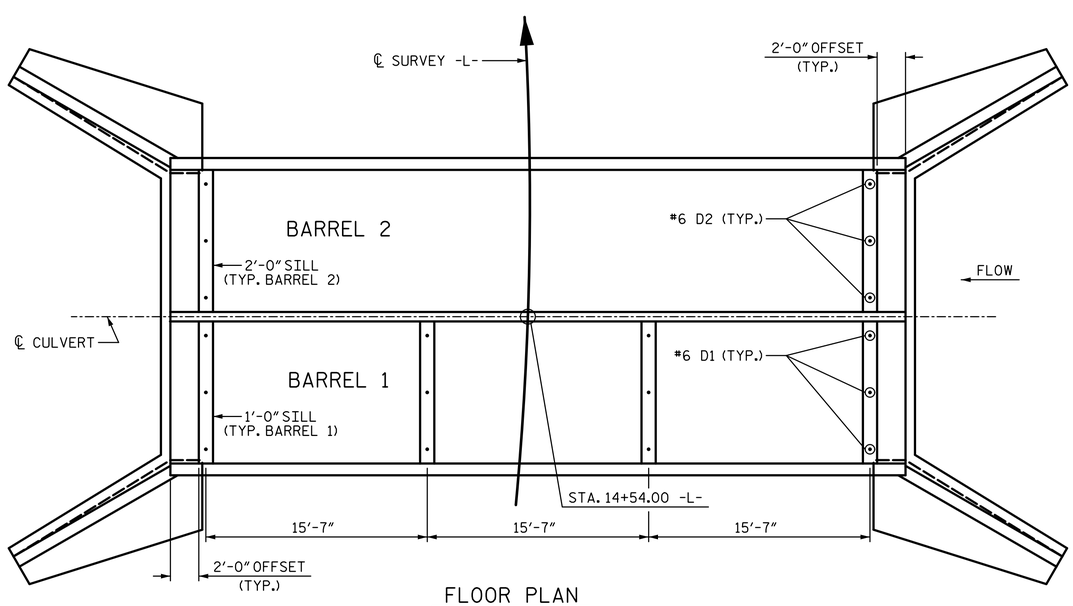
CLASS A CONCRETE BREAKDOWN	
BARREL	132.5 CY
SILLS	3.0 CY
HEADWALLS	2.1 CY

SPLICE CHART

#4 B1 SPLICE LENGTH = 1'-9"
#4 B3 SPLICE LENGTH = 1'-9"
#4 C1 SPLICE LENGTH = 1'-11"
#6 A200, ETC. SPLICE LENGTH = 3'-1"
#7 A400, ETC. SPLICE LENGTH = 3'-0"

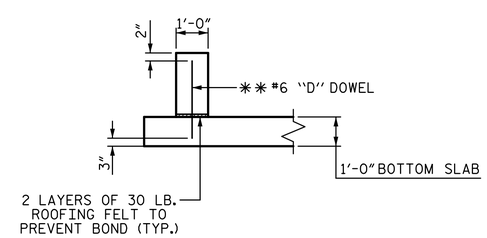


ELEVATION - LOOKING DOWNSTREAM



FLOOR PLAN

(SHOWING PLACEMENT OF SILLS)



SECTION THROUGH SILL

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

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

CULVERT SILL DETAILS

BACKFILL WITH NATIVE MATERIAL TO SILL HEIGHT. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING THE CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

NATIVE MATERIAL WILL BE PLACED BETWEEN THE SILLS IN THE LOW FLOW BARREL AND NATIVE MATERIAL/ RIPRAP WILL BE PLACED IN THE HIGH FLOW BARREL.

PROJECT NO. 17BP.9.R.98
STOKES COUNTY
STATION: 14+54.00 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 10 FT. X 8 FT. CONCRETE BOX CULVERT

88° SKEW

PLANS PREPARED BY:
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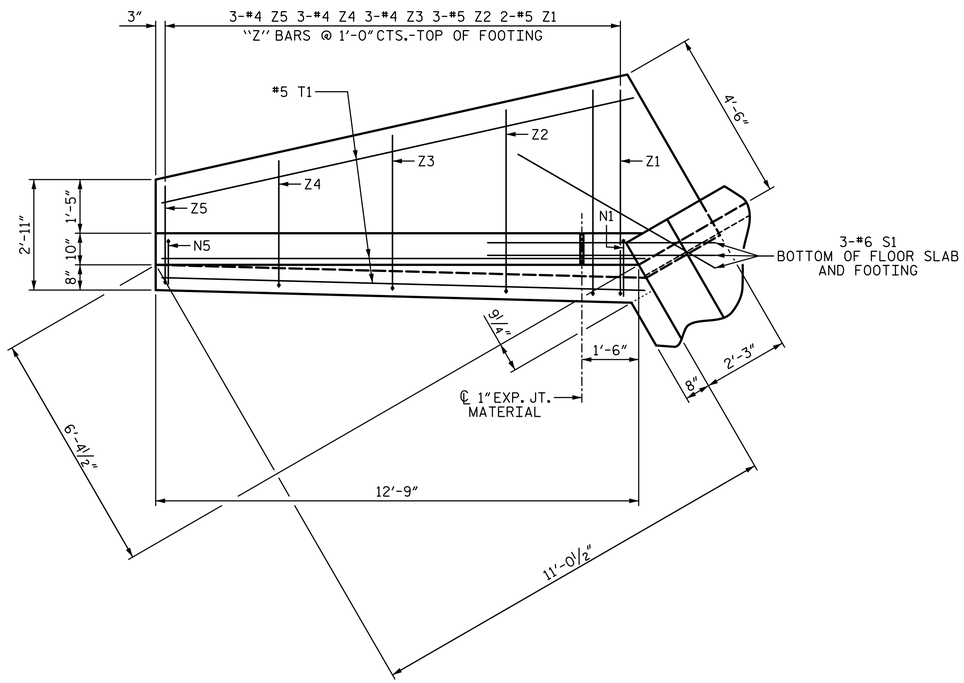
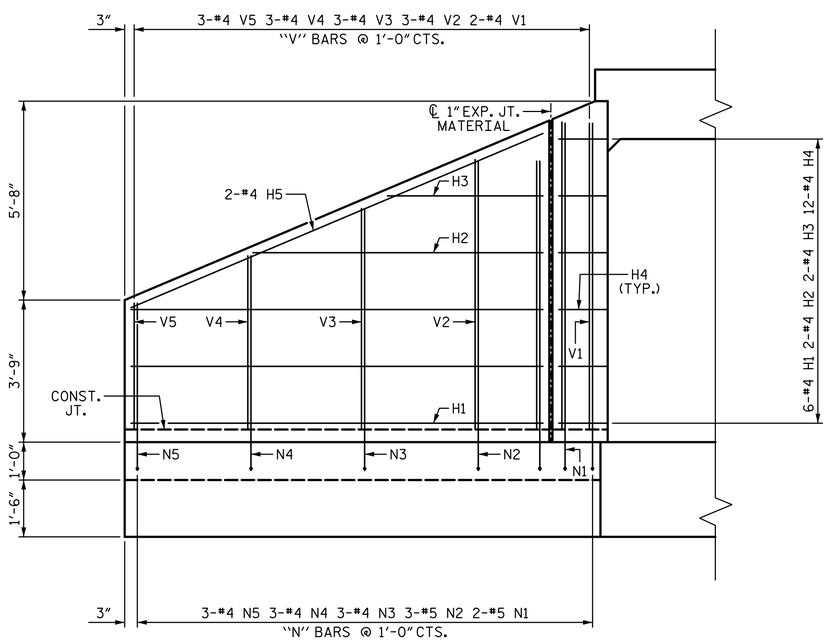
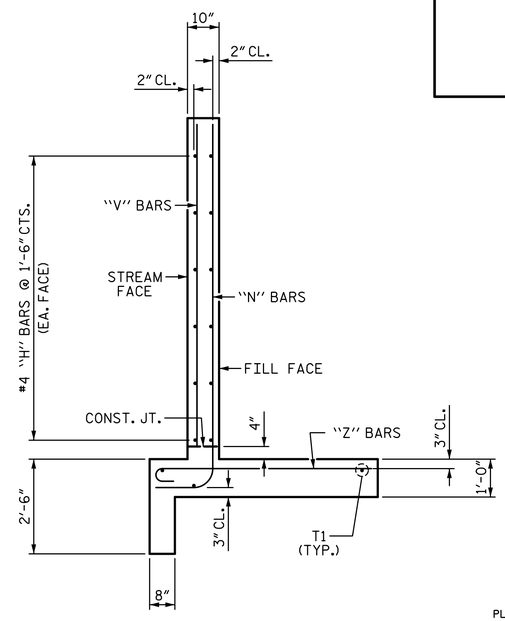


PLAN

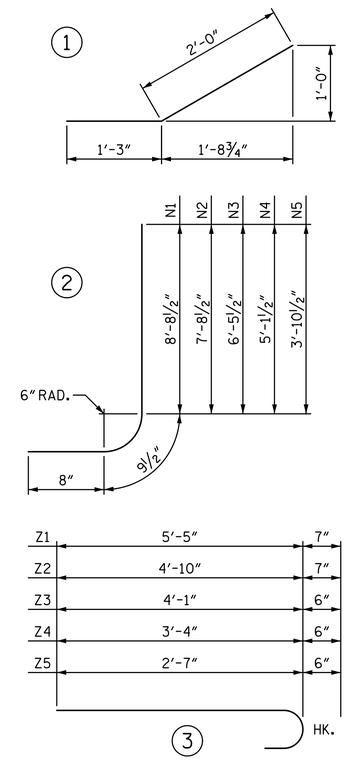


ELEVATION



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	10'-10"	174
H2	8	#4	STR	7'-8"	41
H3	8	#4	STR	4'-1"	22
H4	48	#4	1	3'-3"	104
H5	8	#4	STR	11'-9"	63
N1	8	#5	2	10'-2"	85
N2	12	#5	2	9'-2"	115
N3	12	#4	2	7'-11"	63
N4	12	#4	2	6'-7"	53
N5	12	#4	2	5'-4"	43
S1	12	#6	STR	6'-0"	108
T1	12	#5	STR	12'-9"	160
V1	8	#4	STR	8'-1"	43
V2	12	#4	STR	7'-1"	57
V3	12	#4	STR	5'-10"	47
V4	12	#4	STR	4'-7"	37
V5	12	#4	STR	3'-4"	27
Z1	8	#5	3	6'-0"	50
Z2	12	#5	3	5'-5"	68
Z3	12	#4	3	4'-7"	37
Z4	12	#4	3	3'-10"	31
Z5	12	#4	3	3'-1"	25

REINFORCING STEEL
FOR 4 WINGS 1453 LBS

CLASS A CONCRETE
4 WINGS 21.4 CY
2 END CURTAIN WALLS 2.4 CY
TOTAL 23.8 CY

PROJECT NO. 17BP.9.R.98
STOKES COUNTY
STATION: 14+54.00 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WINGS FOR CONCRETE BOX CULVERT

H = 8'-0" SLOPE = 2:1

90° SKEW

PLANS PREPARED BY:

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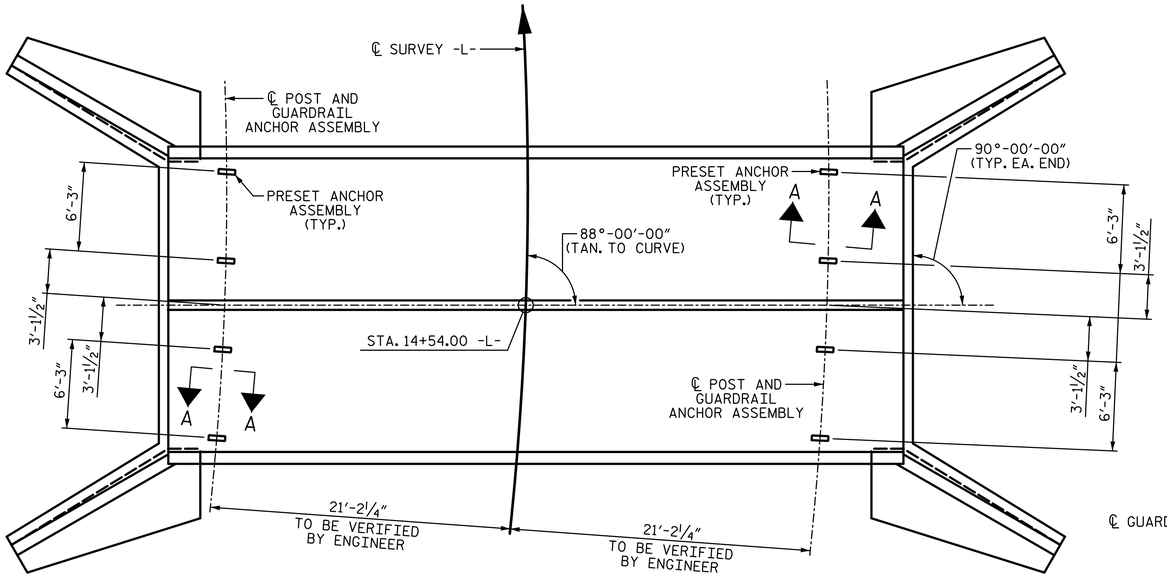
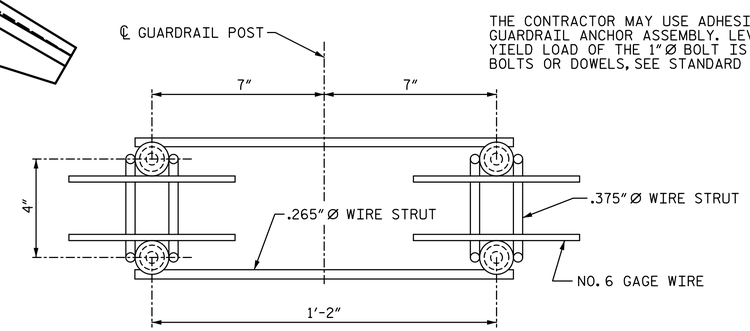


PLAN

(SHOWING GUARDRAIL ANCHOR ASSEMBLY SPACING)



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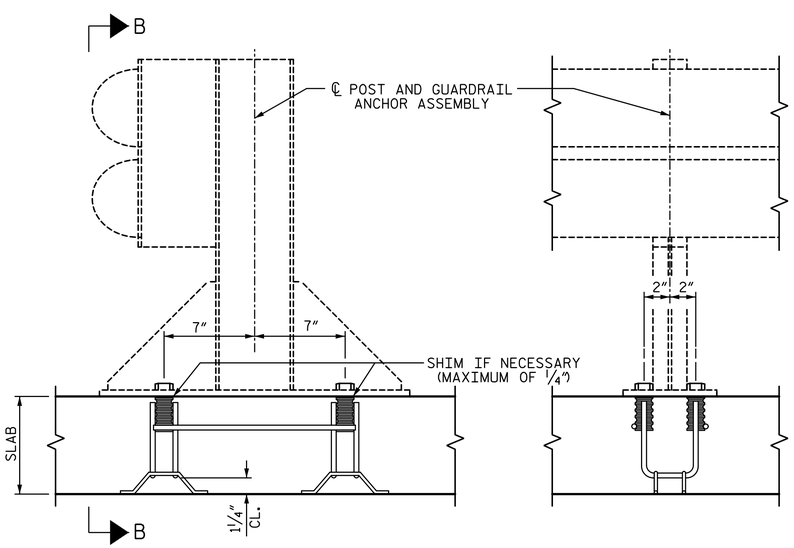
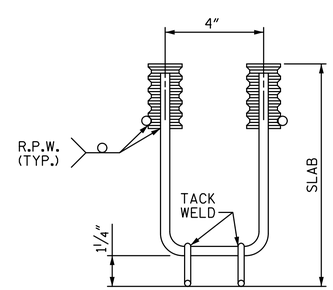
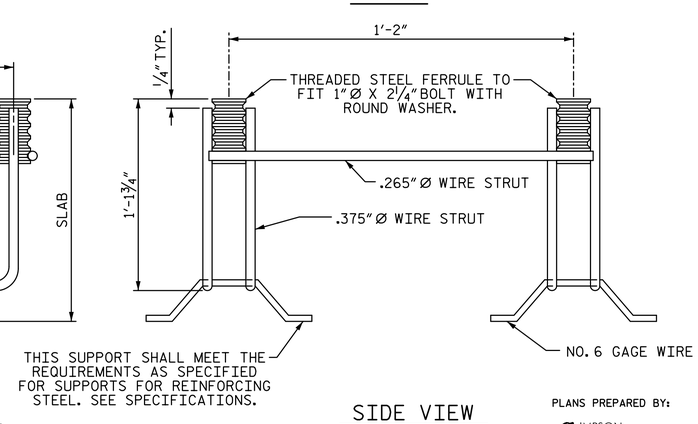


SECTION A-A

SECTION B-B



ELEVATION



SIDE VIEW

GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

NOTES:

THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS SHALL CONSIST OF THE FOLLOWING COMPONENTS :

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2½".

B. 4 - 1"Ø X 2¼" BOLTS WITH WASHERS, BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1"Ø X 2¼" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C. WIRE STRUTS SHOWN IN THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS DETAIL ARE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 P.S.I. AS AN OPTION, A 7/16"Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

GUARDRAIL ANCHOR ASSEMBLY WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY TO INSURE FIT.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CLASS "A" CONCRETE.

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

AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

PAYMENT FOR GUARDRAIL, POSTS, AND POST BASE PLATES IS INCLUDED IN ROADWAY PAY ITEMS.

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

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF GUARDRAIL ANCHOR ASSEMBLY. LEVEL TWO FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 1"Ø BOLT IS 21.8 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.

PROJECT NO. 17BP.9.R.98

STOKES COUNTY

STATION: 14+54.00 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ANCHORAGE DETAILS FOR GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

DRAWN BY: S.D. COOPER	DATE: 1-20
CHECKED BY: B.S. COX	DATE: 1-20
DESIGN ENGINEER OF RECORD: N. MABRY	DATE: 1-20

PLANS PREPARED BY:
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LICENSURE NO. C-2521

THE NORTH CAROLINA PROFESSIONAL SEAL 048943 ENGINEER NEHEMIAH J. MABRY
10/11/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-5
1			3			TOTAL SHEETS
2			4			6

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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 × RF	STRENGTH I LIMIT STATE									COMMENT NUMBER
							LIVE-LOAD FACTORS $\gamma_{(LL)}$	MOMENT				SHEAR				
								RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.03	- -	1.75	1.34	1	TOP SLAB - MID	3.88	1.03	1	TOP SLAB - RT END	9.06	
		HL-93 (OPERATING)	N/A		1.34	- -	1.35	1.74	1	TOP SLAB - MID	3.88	1.34	1	TOP SLAB - RT END	9.06	
		HS-20 (INVENTORY)	36.000	2	1.07	38.5	1.75	1.34	1	TOP SLAB - MID	3.88	1.07	1	TOP SLAB - RT END	9.06	
		HS-20 (OPERATING)	36.000		1.39	49.9	1.35	1.74	1	TOP SLAB - MID	3.88	1.39	1	TOP SLAB - RT END	9.06	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.40	32.4	1.40	2.45	1	TOP SLAB - MID	3.88	2.40	1	TOP SLAB - RT END	9.06	
		SNGARBS2	20.000		2.25	45.0	1.40	2.29	1	TOP SLAB - MID	3.88	2.25	1	TOP SLAB - RT END	9.06	
		SNAGRIS2	22.000		2.40	52.8	1.40	2.44	1	TOP SLAB - MID	3.88	2.40	1	TOP SLAB - RT END	9.06	
		SNCOTTS3	27.250	3	1.28	34.9	1.40	1.66	1	TOP SLAB - MID	3.88	1.28	1	TOP SLAB - RT END	9.06	
		SNAGGRS4	34.925		1.52	53.1	1.40	2.06	1	TOP SLAB - MID	3.88	1.52	1	TOP SLAB - RT END	9.06	
		SNS5A	35.550		1.41	50.1	1.40	1.97	1	TOP SLAB - MID	3.88	1.41	1	TOP SLAB - RT END	9.06	
		SNS6A	39.950		1.38	55.1	1.40	1.97	1	TOP SLAB - MID	3.88	1.38	1	TOP SLAB - RT END	9.06	
		SNS7B	42.000		1.38	58.0	1.40	2.04	1	BOT SLAB - RT END	10	1.38	1	TOP SLAB - RT END	9.06	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.64	54.1	1.40	2.27	1	BOT SLAB - RT END	10	1.64	1	BOT SLAB - RT END	9.28	
		TNT4A	33.075		1.50	49.6	1.40	1.98	1	TOP SLAB - MID	3.88	1.50	1	TOP SLAB - RT END	9.06	
		TNT6A	41.600		1.42	59.1	1.40	2.02	1	TOP SLAB - MID	3.88	1.42	1	TOP SLAB - RT END	9.06	
		TNT7A	42.000		1.42	59.6	1.40	2.00	1	TOP SLAB - MID	3.88	1.42	1	BOT SLAB - RT END	9.28	
		TNT7B	42.000		1.43	60.1	1.40	1.94	1	TOP SLAB - MID	3.88	1.43	1	TOP SLAB - RT END	9.06	
		TNAGRIT4	43.000		1.47	63.2	1.40	1.98	1	TOP SLAB - MID	3.88	1.47	1	TOP SLAB - RT END	9.06	
		TNAGT5A	45.000		1.47	66.2	1.40	2.01	1	TOP SLAB - RT END	10	1.47	1	TOP SLAB - RT END	9.06	
		TNAGT5B	45.000	3	1.28	57.6	1.40	1.77	1	BOT SLAB - RT END	10	1.28	1	BOT SLAB - RT END	9.28	

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.

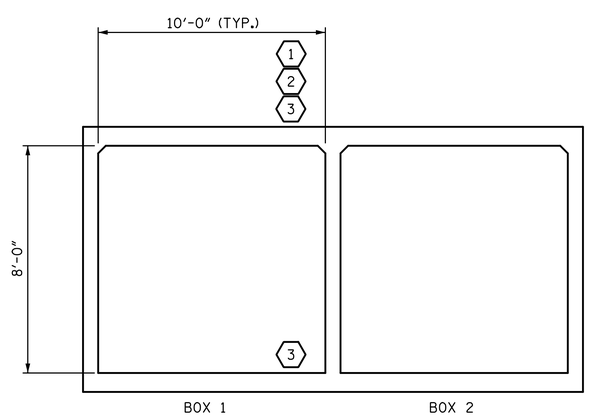
(#) CONTROLLING LOAD RATING

(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.9.R.98

STOKES COUNTY

STATION: 14+54.00 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

(NON-INTERSTATE TRAFFIC)

PLANS PREPARED BY:
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10/11/2021

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

DRAWN BY: S.D. COOPER DATE: 1-20
CHECKED BY: B.S. COX DATE: 1-20
DESIGN ENGINEER OF RECORD: N. MABRY DATE: 1-20

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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 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" 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