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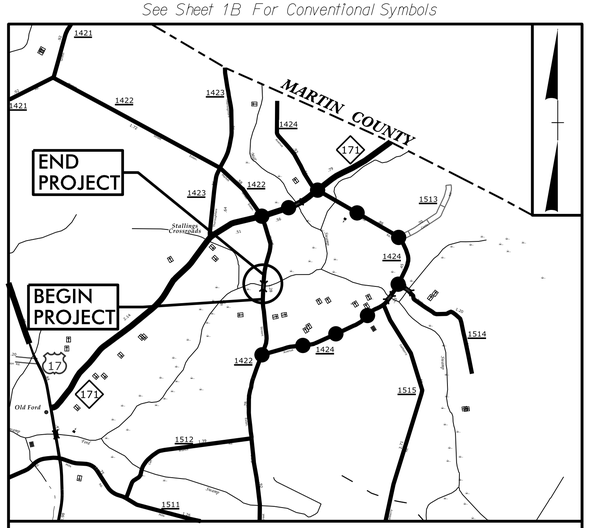
09/08/99

TIP PROJECT: 17BP.2.R.89

CONTRACT: DB00416

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



VICINITY MAP

DETOUR ROUTE N. T. S.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BEAUFORT COUNTY

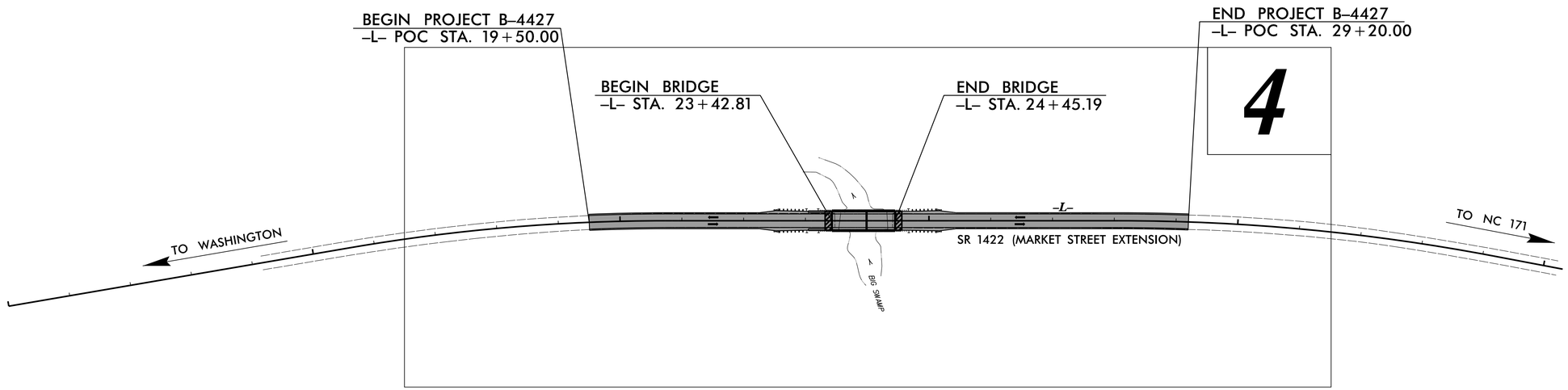
LOCATION: REPLACE BRIDGE 6 OVER BIG SWAMP ON SR 1422 (MARKET STREET EXTENSION)

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.2.R.89	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.2.R.89	N/A	PE
17BP.2.R.89	N/A	ROW/UTIL.
17BP.2.R.89	N/A	CONST.

NAD 83/
NA 2011



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2018 = 1500 VPD
ADT 2038 = 2800 VPD
K = NA %
D = NA %
T = 7 % *
V = 60 MPH
* TTST = DUAL
FUNC CLASS = COLLECTOR
SUB–REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B–4427	=	*0.165 MILES*
LENGTH BRIDGE TIP PROJECT B–4427	=	*0.019 MILES*
TOTAL LENGTH TIP PROJECT B–4427	=	*0.184 MILES*

Prepared in the Office of:

CDM Smith

CDM Smith Inc.
5400 Glenwood Avenue
Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

FOR THE NORTH CAROLINA DEPT. OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 19, 2018

LETTING DATE: AUGUST 28, 2019

DAVID Z. KEISER, P. E.
PROJECT ENGINEER

KIT A. PERSIANI, P. E.
PROJECT DESIGN ENGINEER

HEATHER C. LANE, P. E.
NCDOT CONTACT

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33246 ENGINEER LINDA M. JOHNS

DocuSigned by: Linda M. Johns
SIGNATURE:
P.E. 7/11/2019

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 033400 ENGINEER DAVID Z. KEISER

DocuSigned by: David Z. Keiser
SIGNATURE:
P.E. 7/11/2019

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
17BP.2.R.89	1A

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ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER 033400 DAVID Z. KEISER
DocuSigned by: David Z. Keiser 5FFD0B2...
2/14/2019

CDM Smith
CDM Smith Inc.
5400 Glenwood Avenue
Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C-1	SURVEY CONTROL SHEET
2A-1 THRU 2A-2	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2G-1	GEOTECHNICAL DETAIL
3B-1	ROADWAY SUMMARIES
3G-1	GEOTECHNICAL SUMMARIES
4	PLAN AND PROFILE SHEET
TMP-1 THRU TMP-2	TRANSPORTATION MANAGEMENT PLANS
EC-1 THRU RF-1	EROSION CONTROL PLANS
UC-1 THRU UC-4	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1A	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-6	CROSS-SECTIONS
S-1 THRU S-19	STRUCTURE PLANS

2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REV.

GENERAL NOTES:

GRADE LINE:
GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.01 AT LOCATIONS DIRECTED BY THE ENGINEER.

GUARDRAIL:

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

END BENTS:

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

UTILITIES:

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

RIGHT-OF-WAY MARKERS:

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

EFF. 01-16-2018
REV.

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	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.02	Bridge Approach Fills - Type II Modified Approach Fill
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
840.00	Concrete Base Pad for Drainage Structures
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.36	Traffic Bearing Grated Drop Inlet - for Steel (840.37) Double Frame and Grates
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation (Special Detail for Sheet 6 of 8)
862.03	Structure Anchor Units (Special Detail for Type III Anchor Units Sheets 1 of 7 and 2 of 7)
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

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12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
17BP.2.R.89	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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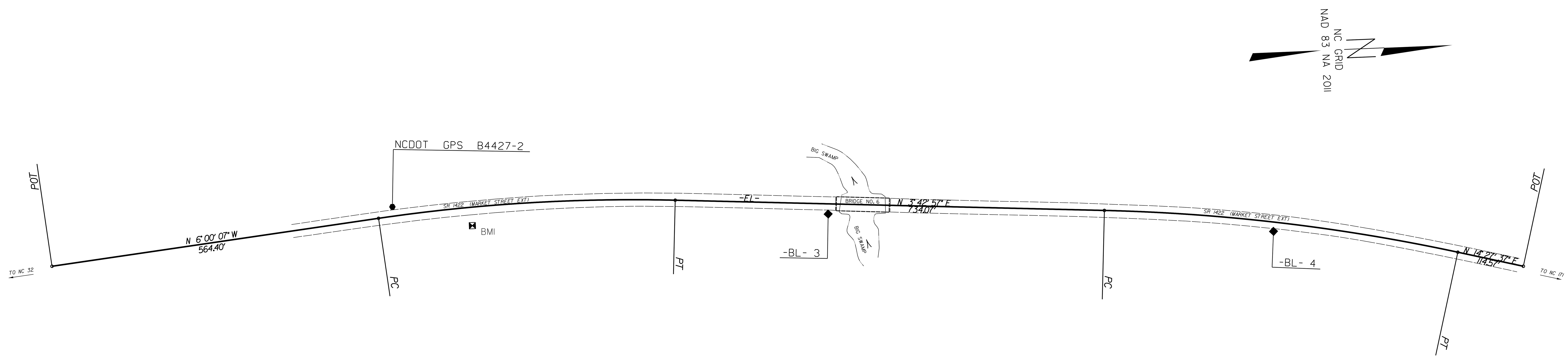
PROJECT REFERENCE NO.	SHEET NO.
17BP.2.R.89	1C-1
Location and Surveys	

SURVEY CONTROL SHEET B-4427

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



BASELINE

BL

POINT	DESC.	NORTH	EAST	ELEVATION
GPS2	NCDOT GPS B44	696610.4000	2585393.0880	33.63
3	BL-3	697354.3940	2585435.8550	31.43
4	BL-4	698114.0540	2585496.6840	30.78

BENCHMARK

****

BM1 ELEVATION = 33.72
N 696856 E 2585335
R/R SPIKE SET IN 16" PINE

****

EXISTING ALIGNMENTS

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	696024.656	2585470.685							
LINE			N 06°00'07.2" W	564.40					
PC	696585.961	2585411.669							
CURVE			N 01°08'34.8" W	508.23	09°43'04.9"(RT)	01°54'35.5"	508.84	255.03	3000.00
PT	697094.085	2585401.531							
LINE			N 03°42'57.7" E	734.07					
PC	697826.615	2585449.108							
CURVE			N 09°05'17.6" E	608.56	10°44'39.9"(RT)	01°45'46.6"	609.46	305.62	3250.00
PT	698427.539	2585545.234							
LINE			N 14°27'37.6" E	114.57					
POT	698538.483	2585573.844							

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "p-5"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 697767.214(ft) EASTING: 2585460.910(ft)
ELEVATION: 31.50(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99990078
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "p-5" TO -L- STATION IS

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

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

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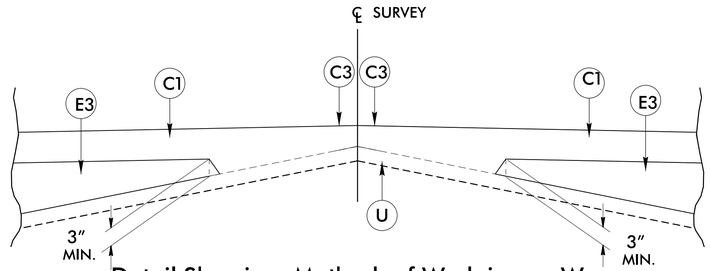
PAVEMENT SCHEDULE

(PRELIMINARY PAVEMENT DESIGN)

C1	PROP. APPROX. 1½″ ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E3	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.
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.	R	SHOULDER BERM GUTTER.
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.	T	EARTH MATERIAL.
E1	PROP. APPROX. 5″ ASPHALT CONCRETE BASE COURSE TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
E2	PROP. APPROX. 6″ ASPHALT CONCRETE BASE COURSE TYPE B25.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	V	MILLING BITUMINOUS PAVEMENT. 0″ TO 1½″ DEPTH.
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.		W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE -L- WEDGING DETAIL)



Detail Showing Method of Wedging – W –L–

PROJECT REFERENCE NO.	SHEET NO.
I7BP.2.R.89	2A-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033400 DAVID Z. KEIGER 2/14/2023

CDM Smith Inc. 5400 Glenwood Avenue Suite 400 Raleigh, NC 27612-3228 NC COA No. P-1255

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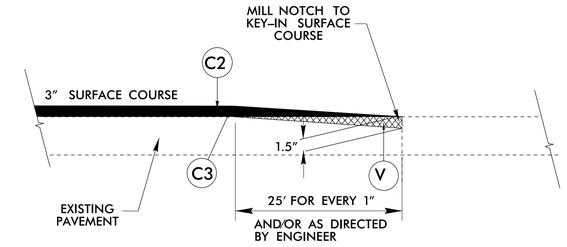
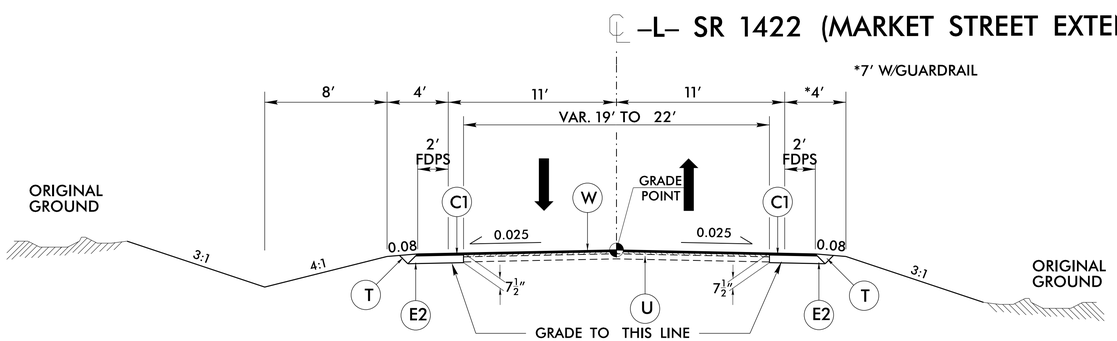
MILLING DETAIL
INCIDENTAL MILLING AT BEGIN/END FOR TIE–INS



–L– STA. 19+50.00 AND STA. 19+75.00
–L– STA. 28+95.00 AND STA. 29+20.00



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

–L– STA. 19+50.00 TO 22+45.00
–L– STA. 28+00.00 TO 29+20.00

NOTE: PAVE TO FACE OF GUARDRAIL.
USE L PAVEMENT DESIGN FOR ALL WIDENING

-SYSTIME-
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PROJECT REFERENCE NO.	SHEET NO.
17BP.2.R.89	2A-2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 033400 ENGINEER DAVID Z. KEISER 2/14/2019

CDM Smith — CDM Smith Inc. 5400 Glenwood Avenue Suite 400 Raleigh, NC 27612-3228 NC COA No. F-1255

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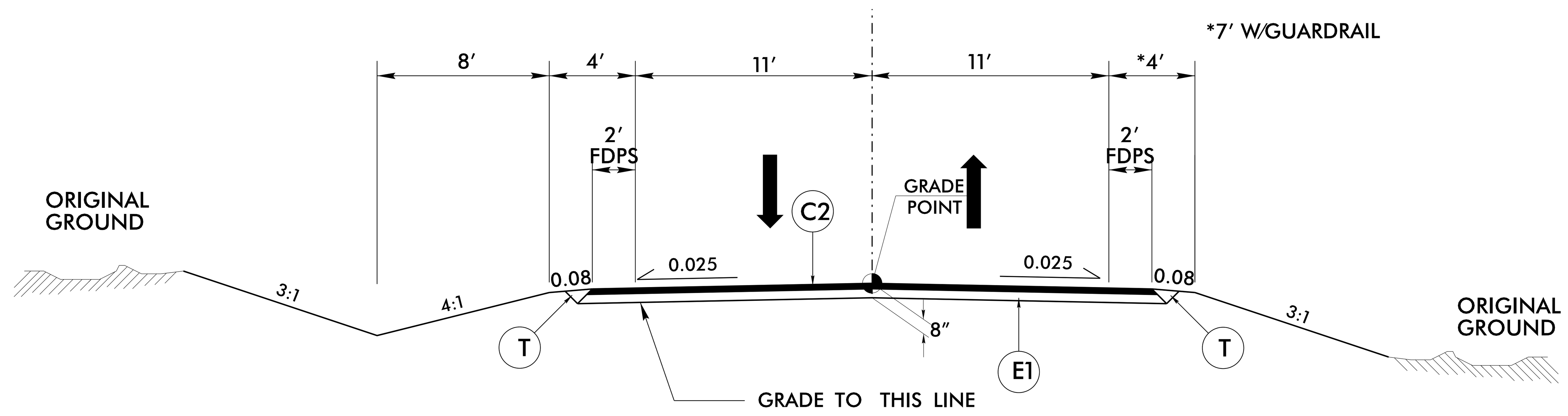
℄ –L– SR 1422 (MARKET STREET EXTENSION)

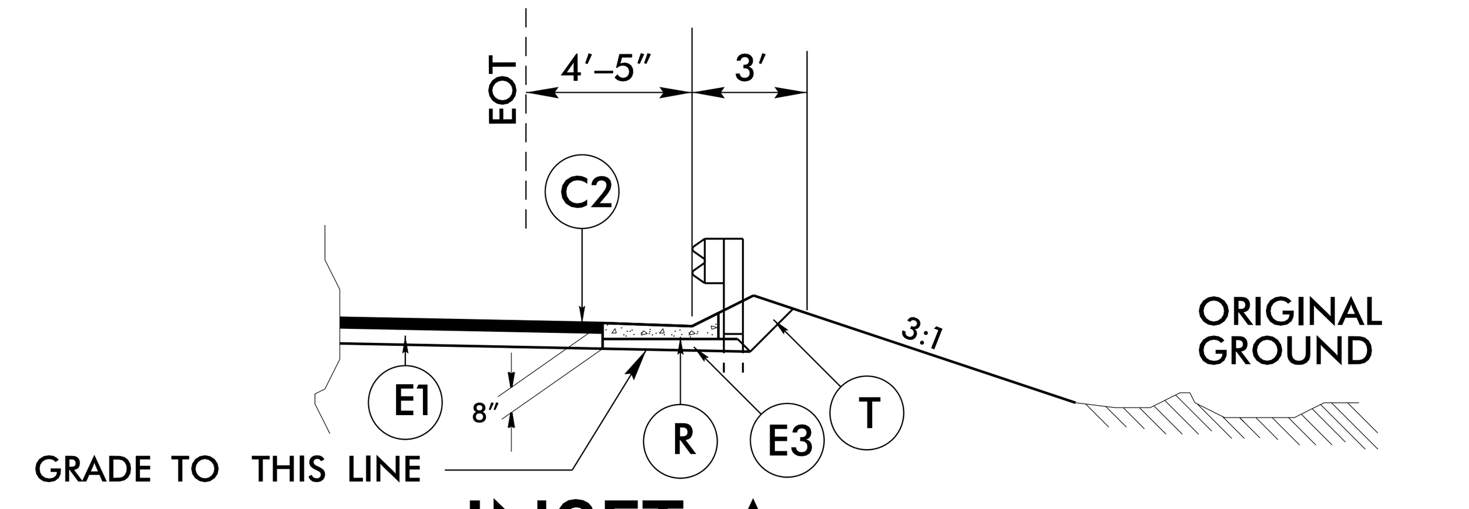


TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

–L– STA. 22+45.00 TO 23+42.81 (BEGIN BRIDGE)
–L– STA. 24+45.19 (END BRIDGE) TO 28+00.00

NOTE: PAVE TO FACE OF GUARDRAIL.

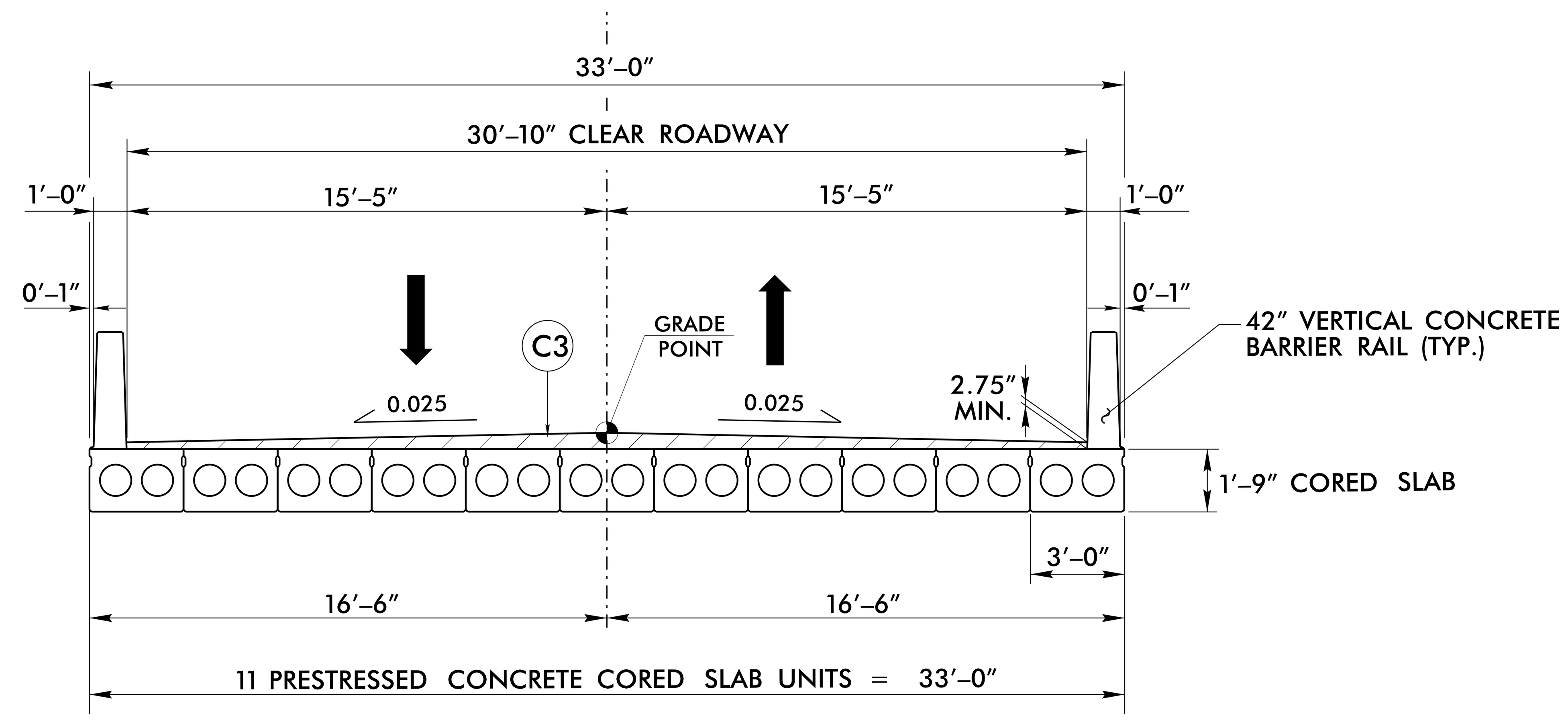


INSET A

USE INSET A WITH TYPICAL SECTION NO. 2

–L– STA. 23+04.74 TO 23+31.94 RT/LT

℄ –L– SR 1422 (MARKET STREET EXTENSION)



TYPICAL BRIDGE SECTION NO. 1

USE TYPICAL BRIDGE SECTION NO. 1

–L– STA. 23+42.81 TO 24+45.19

PAVEMENT SCHEDULE

C1	1½" S9.5B
C2	3" S9.5B
C3	VAR. S9.5B
E1	5" B25.0C
E2	6" B25.0C
E3	VAR. B25.0C
R	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V	0" - 1½" MILLING
W	WEDGING

PAVEMENT EDGESLOPES 1:1 UNLESS NOTED OTHERWISE

6/2/99
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PROJECT REFERENCE NO.	SHEET NO.
B-4427	2G-1

GEOTECHNICAL ENGINEER — SEAL 032171 JINYOUNG PARK, NORTH CAROLINA PROFESSIONAL ENGINEER — 4/17/2018

ENGINEER

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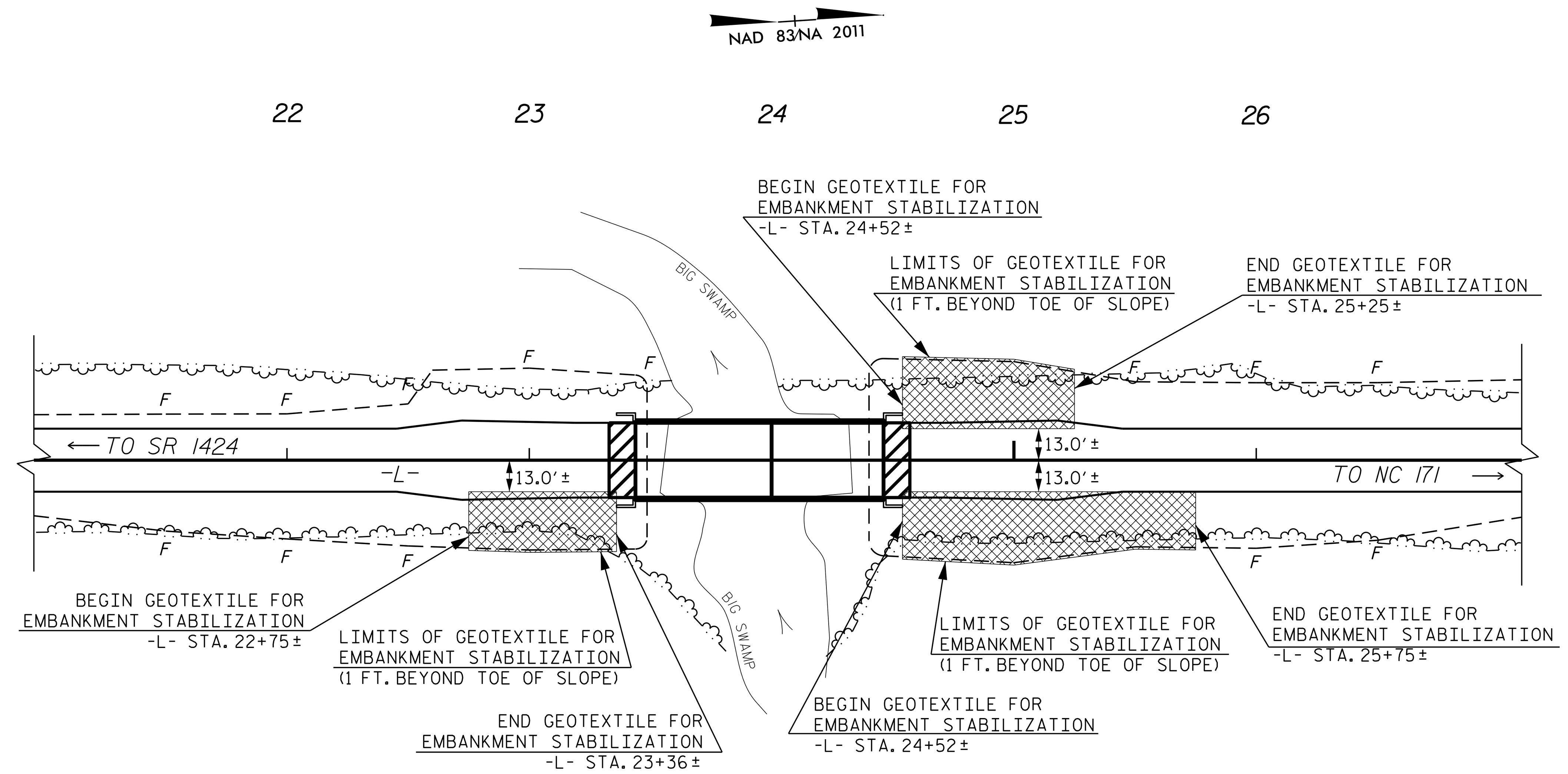


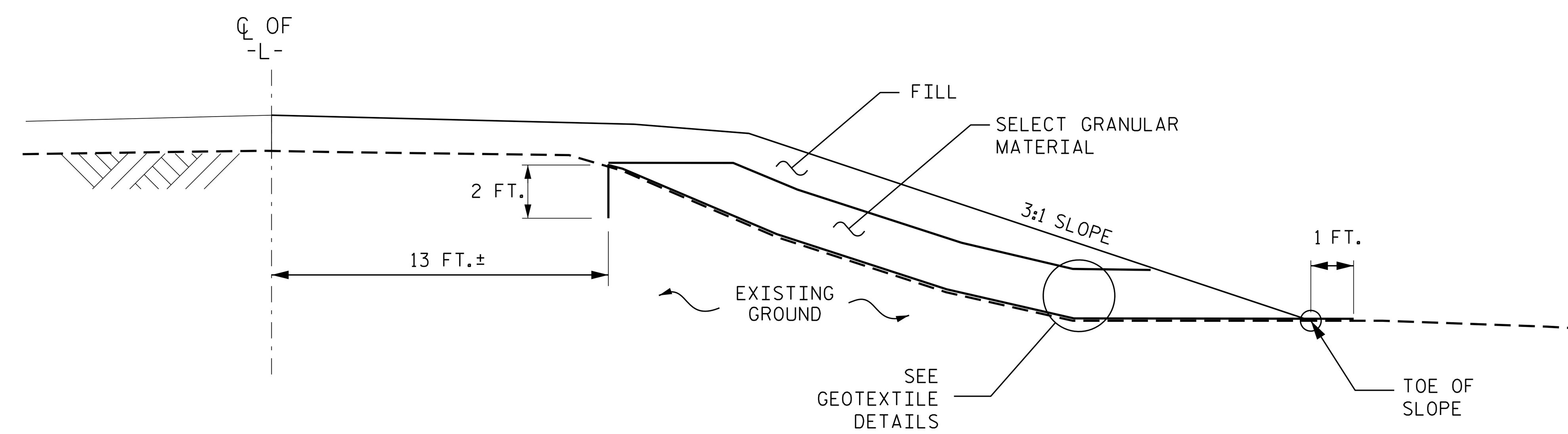
AREA OF GEOTEXTILE FOR EMBANKMENT STABILIZATION, MACHINE OR ROLL DIRECTION PERPENDICULAR TO EMBANKMENT CENTERLINE

PLAN VIEW

N.T.S.

NOTES

1. DO NOT GRUB, ONLY CLEAR THE AREA WITHIN THE LIMITS OF THE GEOTEXTILE FOR EMBANKMENT STABILIZATION.
2. PLACE GEOTEXTILE FOR EMBANKMENT STABILIZATION PERPENDICULAR TO EMBANKMENT CENTERLINE ON THE EXISTING GROUND AS SHOWN IN THE PLAN OR AS DIRECTED BY THE ENGINEER.
3. PLACE THE GEOTEXTILE WITHOUT ANY WRINKLES OR CREASES.
4. PLACE 2 FT. OF SELECT GRANULAR MATERIAL ON THE GEOTEXTILE FOR EMBANKMENT STABILIZATION.
5. NO SEAMS OR JOINTS ARE ALLOWED IN THE MACHINE DIRECTION OF GEOTEXTILE.
6. THE TERMS ROLL AND MACHINE DIRECTION ARE USED INTERCHANGEABLY.
7. ALL JOINTS IN THE CROSS MACHINE DIRECTION MUST BE OVERLAPPED A MINMUM OF 18 INCHES.
8. FOR GEOTEXTILE FOR EMBANKMENT STABILIZATION , SEE GEOTEXTILE FOR EMBANKMENT STABILIZATION SPECIAL PROVISION.

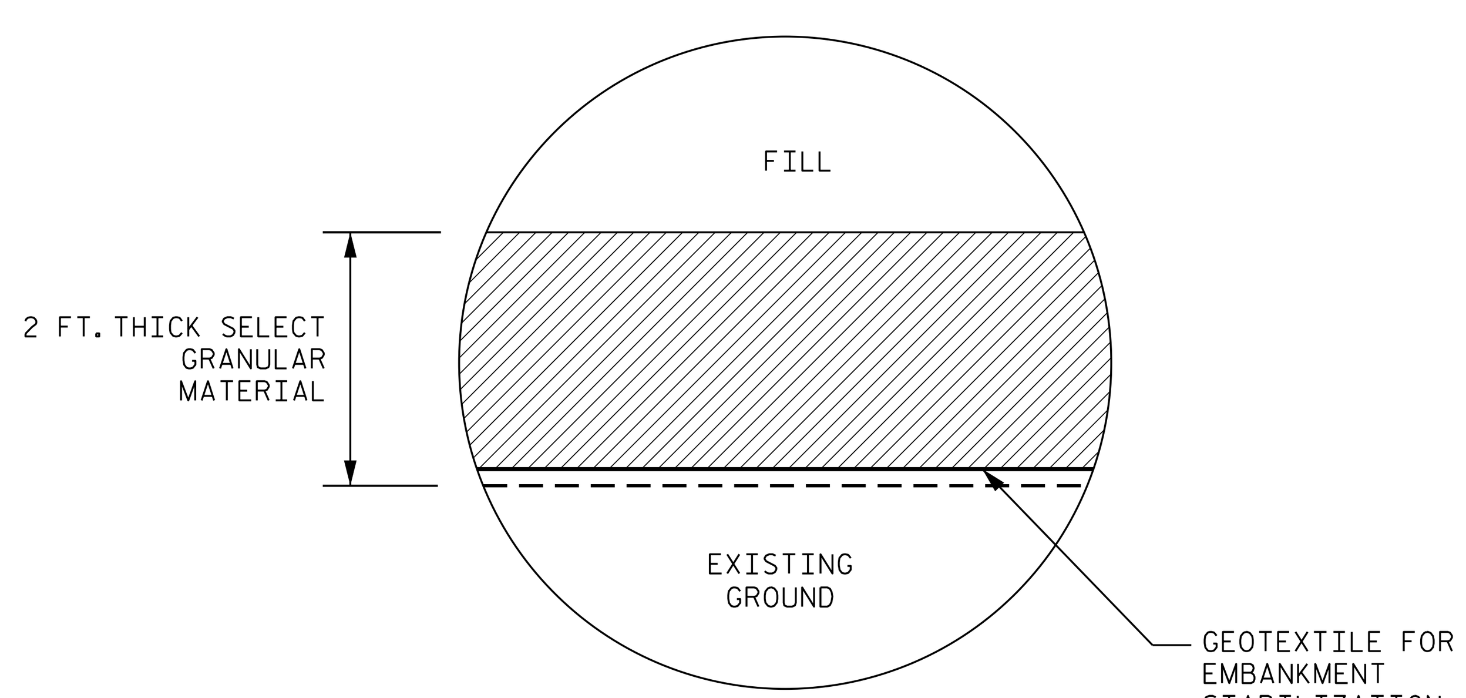


TYPICAL CROSS SECTION

N.T.S.

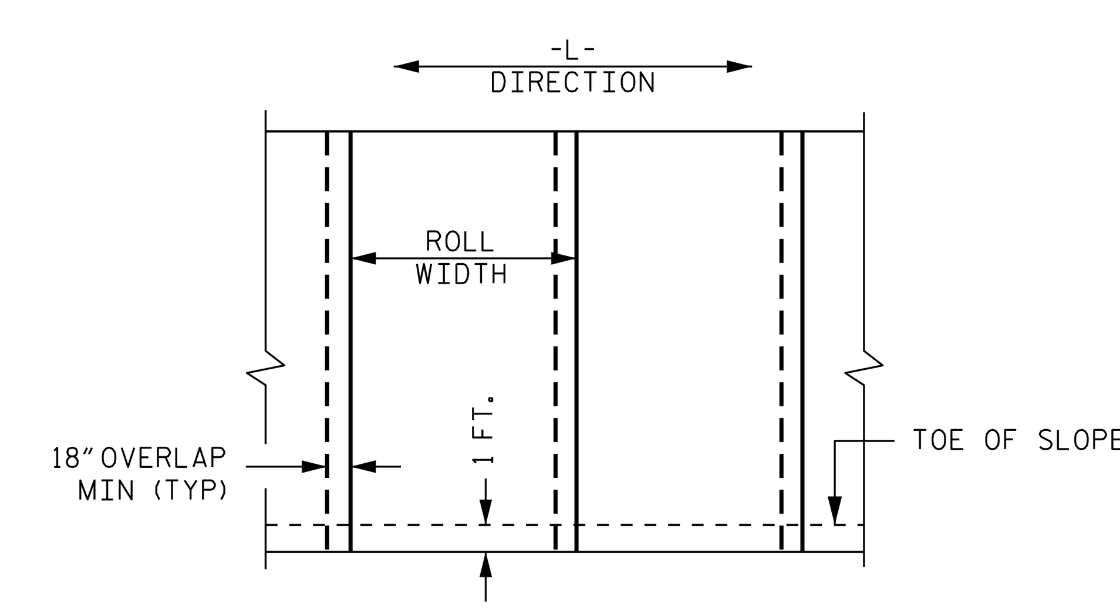
QUANTITIES	
GEOTEXTILE FOR EMBANKMENT STABILIZATION	900 SY*
SELECT GRANULAR MATERIAL	550 CY

* GEOTEXTILE FOR EMBANKMENT STABILIZATION ESTIMATED QUANTITY DOES NOT INCLUDE OVERLAPS OR WASTE.



GEOTEXTILE DETAILS

N.T.S.



GEOTEXTILE OVERLAP DETAIL

(PLAN VIEW, N.T.S.)

PREPARED BY: J. PARK	DATE: 04/2018
REVIEWED BY: J. BATTS	DATE: 04/2018

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

GEOTEXTILE FOR EMBANKMENT STABILIZATION DETAILS

REVISIONS

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

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6/21/08

COMPUTED BY: K. PERSIANI DATE: 9/27/2017
CHECKED BY: A. CONRAD DATE: 9/28/2017

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
17BP.2.R.89	3B-1

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

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

STATION / SIZE / THICKNESS OR GAUGE	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) 12"	15"	18"	24"	30"	36"	42"	48"	CLASS III R.C. PIPE (UNLESS OTHERWISE NOTED) 12"	15"	18"	24"	30"	36"	42"	48"	CLASS V R.C. PIPE 12"	15"	18"	24"	30"	36"	42"	48"
L 23+10.70	LT	401	402	33.20	30.45	28.20																			28						
L 23+10.70	RT	402	403	33.20	28.20	27.01											24														
L 23+10.70	RT	403	–	–	27.01	–																									
TOTALS																	24								28						

STATION	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	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'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME & GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	T.B.D.I. STD. 840.35	T.B.D.I. FRAME WITH TWO GRATES STD. 840.36	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.	REMARKS
L 23+10.70						1																		1	1					
L 23+10.70						1																		1	1					
L 23+10.70																														1 TON CL B RIP RAP, 5 SY GEOTEXTILE
TOTALS						2																		2	2					

ABBREVIATIONS

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

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	SHOP CURVED	DOUBLE FACED	WARRANT POINT APPROACH END	TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	TRAILING END	W APPROACH END	TRAILING END	ANCHORS GREU TL–3	III	IMPACT ATTENUATOR TYPE 350 EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
L	22+52.29	23+42.81	LT	93.75				23+42.81	4.42	7.00		50.00		1	1	1							
L	22+52.29	23+42.81	RT	93.75			23+42.81		4.42	7.00	50.00		1		1	1							
L	24+45.19	25+16.96	LT	75.00			24+45.19		4.42	7.00	50.00		1		1	1							
L	24+45.19	25+16.96	RT	75.00				24+45.19	4.42	7.00		50.00		1	1	1							
			SUBTOTALS	337.50											4	4							
			GREU, TL–3, 4@50.00'	–200.00																			
			TYPE III, 4@18.75'	–75.00																			
			PROJECT TOTALS	62.50											4	4							
			SAY	62.50											4	4							
	ADDITIONAL GUARDRAIL POSTS = 5 EA																						

SUMMARY OF EARTHWORK
IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+30%	BORROW	WASTE
–L– 19+50.00 – 23+42.81	40		572	532	
SUBTOTAL	40		572	532	
–L– 24+45.19 – 29+20.00	15		1,312	1,297	
SUBTOTAL	15		1,312	1,297	
TOTAL	55		1,884	1,829	
MATERIAL FOR SHOULDER CONSTRUCTION					
LOSS DUE TO CLEARING & GRUBBING					
ADDITIONAL UNDERCUT					
ROCK WASTE TO REPLACE BORROW					
ADJUST FOR ROCK WASTE					
WASTE IN LIEU OF BORROW					
PROJECT TOTAL	55		1,884	1,829	
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT	100			91	
GRAND TOTAL	155		1,884	1,920	
SAY	200			2,000	

PER GEOTECH RECOMMENDATION, ESTIMATED 400 CUBIC YARDS OF UNDERCUT TO BE USED IN THE DISCRETION OF THE RESIDENT ENGINEER.

SUMMARY OF PAVEMENT REMOVAL
IN SQUARE YARDS

LINE	STATION – STATION	LOCATION	REMOVAL (SY)
–L–	22+45.00 – 23+49.00	CL	265.78
–L–	27+75.00 – 28+00.00	CL	63.89
		TOTAL	329.67
		SAY	330.00

SUMMARY OF PAVEMENT BREAKING
IN SQUARE YARDS

LINE	STATION – STATION	LOCATION	BREAKING (SY)
–L–	24+39.00 – 27+75.00	CL	856.67
		TOTAL	856.67
		SAY	860.00

NOTE: Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

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

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(1-16-18)

PROJECT NO.	SHEET NO.
17BP.2.R.89	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

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

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

SUMMARY OF GEOTEXTILE FOR PAVEMENT STABILIZATION

LINE	Station	Station	Geotextile for Pavement Stabilization SY	Class IV Subgrade Stabilization TONS
CONTINGENCY				
		TOTAL SY/TONS:	0	0*

*Total tons of "Class IV Subgrade Stabilization" is only the estimated quantity for pavement stabilization and may only represent a portion of the subgrade stabilization quantity shown in the Item Sheets of the Proposal.

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU/AST	Aggregate Thickness INCHES	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY									
			TOTAL CY/TONS/SY:		0	0**	0**	0	0

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

SUMMARY OF ROCK PLATING

LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	Rock Plating SY
							TOTAL SY:	0

*Use Class 1, 2 or B riprap if riprap class is not shown for rock plating location.

SUMMARY OF REINFORCED SOIL SLOPES AND SLOPE EROSION CONTROL

LINE	Beginning Slope/ RSS (H:V)	Approx. Station	Ending Slope/ RSS (H:V)	Approx. Station	Location LT/RT	Reinforced Soil Slope (RSS) SY	Geocells SY	Coir Fiber Mat SY	Matting for Erosion Control SY
					TOTAL SY:	0	0	0*	0**

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

SUMMARY OF PRE-SPLITTING OF ROCK

LINE	Beginning Rock Cut Slope (H:V)	Approx. Station	Ending Rock Cut Slope (H:V)	Approx. Station	Location LT/RT	Pre-splitting of Rock SY
					TOTAL SY:	0

SUMMARY OF SURCHARGES AND SURCHARGE WAITING PERIODS

LINE	Station	Station	Surcharge Height FT	MONTHS

SUMMARY OF SETTLEMENT GAUGES

Gauge No.	LINE and Station	Offset	
		Distance FT	Direction LT/RT
	TOTAL GAUGES (EACH):		

SUMMARY OF EMBANKMENT WAITING PERIODS

LINE	Station	Station	MONTHS

SUMMARY OF BRIDGE WAITING PERIODS

Bridge Description	End Bent/ Bent No.	MONTHS

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8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
17BP.2.R.89	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033400 ENGINEER DAVID Z. KEISER

2/14/2019

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032446 ENGINEER LINDA M. JOHNS

2/14/2019

CDM Smith — CDM Smith Inc. 5400 Glenwood Avenue Suite 400 Raleigh, NC 27612-3226 NC COA No. P-1255

MI Engineering, PLLC 1011 Schaub Drive Suite 100 Raleigh, NC 27606 NC COA No.

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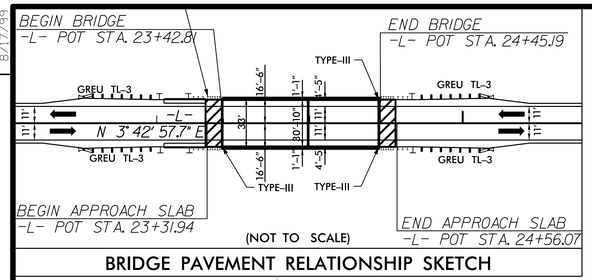


BRIDGE PAVEMENT RELATIONSHIP SKETCH

BEGIN PROJECT B-4427
-L- POC STA. 19+50.00

NAD 83/NA 2011

-L-
PI Sta 18+19.43
△ = 9° 43' 04.9" (RT)
D = 1° 54' 35.5"
L = 508.84'
T = 255.03'
R = 3,000.00'
e = EXIST.
RO = N/A

-L-
PI Sta 31+12.93
△ = 10° 44' 39.9" (RT)
D = 1° 45' 46.6"
L = 609.46'
T = 305.62'
R = 3,250.00'
e = EXIST.
RO = N/A

BRIDGE APPROACH SLAB

50' 25' 0' 50' 100'

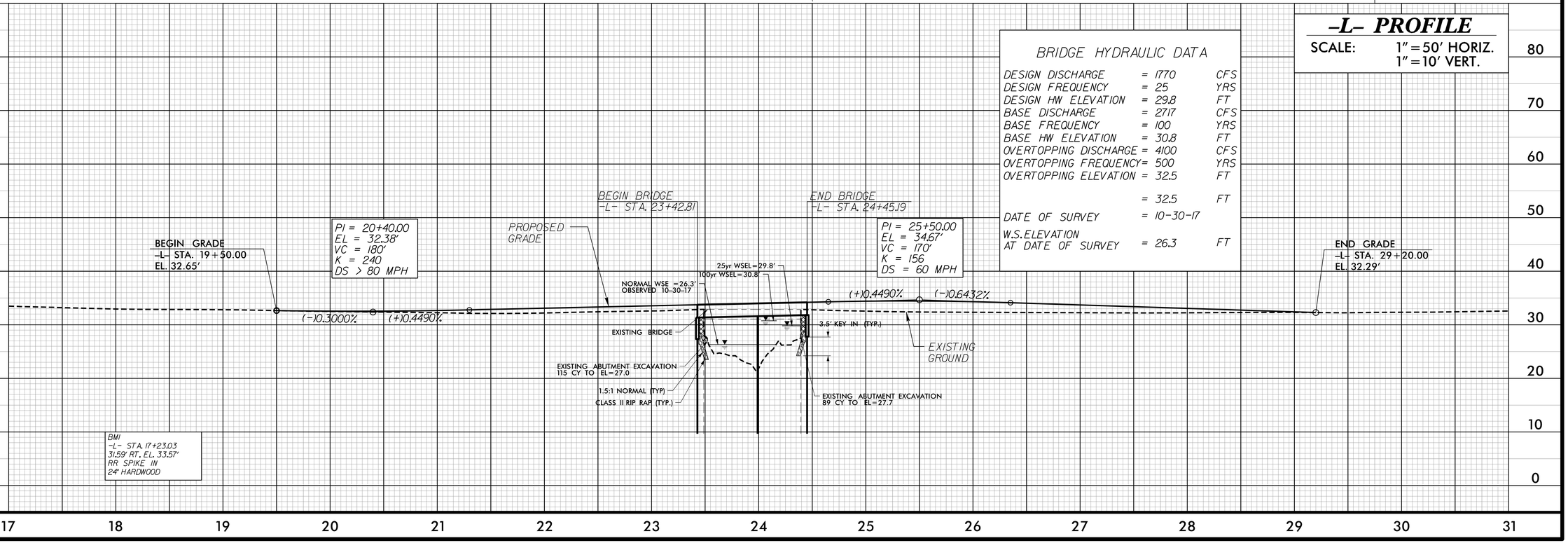
PLANS

-L- PROFILE

SCALE: 1" = 50' HORIZ.
1" = 10' VERT.

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1770	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 29.8	FT
BASE DISCHARGE	= 2717	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 30.8	FT
OVERTOPPING DISCHARGE	= 4100	CFS
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING ELEVATION	= 32.5	FT
	= 32.5	FT
DATE OF SURVEY	= 10-30-17	
W.S.ELEVATION AT DATE OF SURVEY	= 26.3	FT



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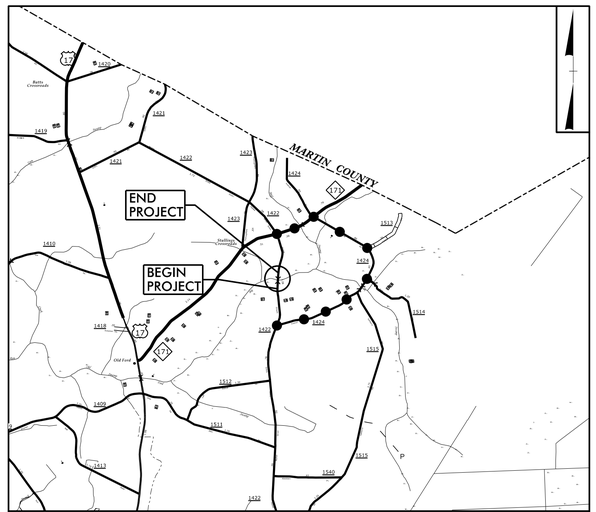
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

BEAUFORT COUNTY

LOCATION: REPLACE BRIDGE NO. 6 OVER BIG SWAMP ON RS 1422 (MARKET STREET EXTENSION)



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PROJ. REFERENCE NO.	SHEET NO.
17BP.2.R.89	TMP-1A

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 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
1145.01	BARRICADES

LEGEND

GENERAL

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

SIGNALS

EXISTING PROPOSED TEMPORARY (TEMP)

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

TRAFFIC CONTROL DEVICES

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

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

PAVEMENT MARKERS

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

PAVEMENT MARKING SYMBOLS

PAVEMENT MARKING SYMBOLS

APPROVED: David Z. Keiser (DocuSigned by: 5FFD082CD25FB4D4...)

DATE: 2/14/2019

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 033400 ENGINEER DAVID Z. KEISER

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

CDM Smith
CDM Smith Inc.
5400 Glenwood Avenue
Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

ROADWAY STANDARD DRAWINGS & LEGEND

2/11/2019
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PROJ. REFERENCE NO.	SHEET NO.
17BP.2.R.89	TMP-1B

MANAGEMENT STRATEGIES

1. CLOSE SR 1422 (MARKET STREET EXTENSION) TO TRAFFIC AND DETOUR TRAFFIC OFF-SITE.

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

PHASING

STEP 1: USING NCDOT ROADWAY STD. DRAWING 1101.03 (SHEETS 1 OF 9), INSTALL DETOUR ROUTE SIGNING TO CLOSE SR 1422 (MARKET STREET EXTENSION) FROM STA. 19+50+/- TO STA. 29+20+/-.

STEP 2: AWAY FROM TRAFFIC, COMPLETE CONSTRUCTION OF PROPOSED BRIDGE AND ROADWAY APPROACHES INCLUDING DRAINAGE, GUARDRAIL AND FINAL PAVEMENT ON PROPOSED -L- FROM STA. 19+50+/- TO STA. 29+20+/-.

STEP 3: REMOVE TEMPORARY TRAFFIC CONTROL DEVICES AND OPEN -L- TO PROPOSED TWO-LANE, TWO-WAY TRAFFIC PATTERN.

LOCAL NOTES

1. NOTIFY BEAUFORT COUNTY EMERGENCY SERVICES AND PUBLIC SCHOOLS AT LEAST ONE MONTH PRIOR TO ROAD CLOSURE.

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.

TRAFFIC CONTROL DEVICES

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

PAVEMENT MARKINGS AND MARKERS

F) STATE FORCES WILL INSTALL AND MAINTAIN THE PROJECT DETOUR AND THE TYPE III BARRICADES AT THE PROJECT LIMITS. STATE FORCES WILL INSTALL PAINT AND MARKERS ON THE FINISHED PROJECT. CONTACT JEFF DUNNING AT 252-830-3493 TWO WEEKS PRIOR TO CLOSING THE ROAD FOR THE DETOUR INSTALLATION.

CDM Smith
CDM Smith Inc.
5400 Glenwood Avenue
Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

APPROVED: DocuSigned by: David Z. Keiser 5FFD0B2D25FB4D4...

DATE: 2/14/2019

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 033400 ENGINEER DAVID Z. KEISER

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

TRANSPORTATION OPERATIONS PLAN

2/11/2019
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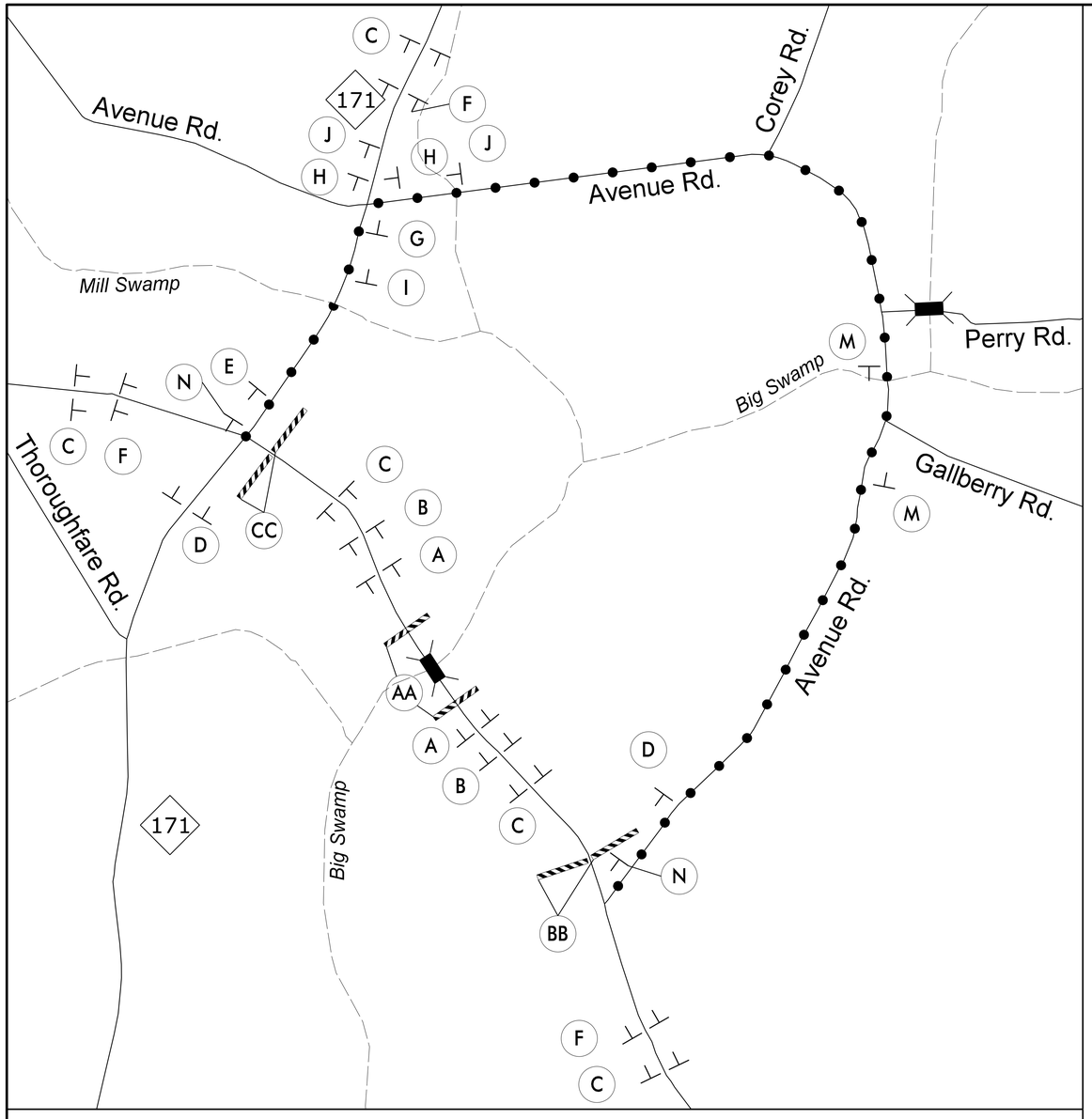
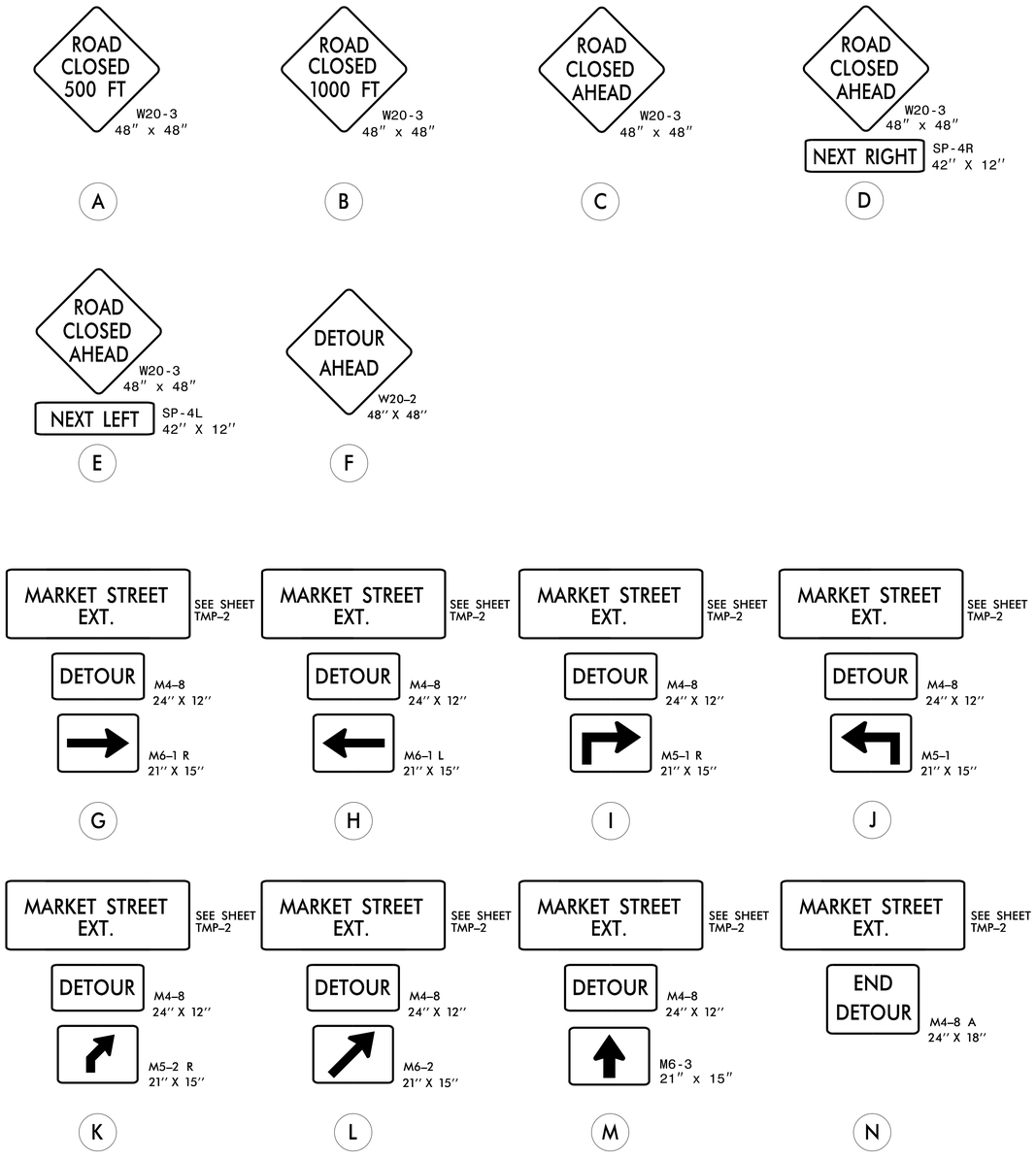
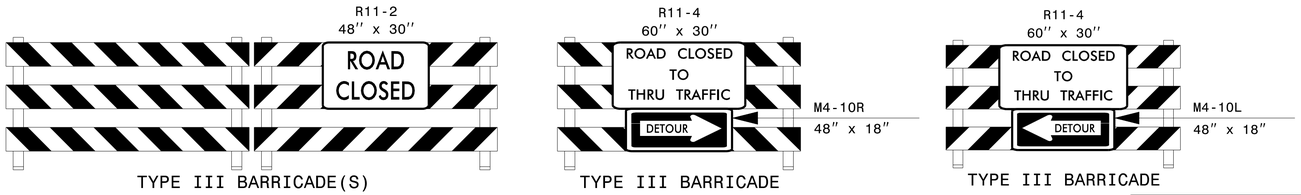
PROJ. REFERENCE NO.	SHEET NO.
17BP.2.R.89	TMP-2



DETOUR ROUTE

OFF-SITE DETOUR





CDM Smith
CDM Smith Inc.
5400 Glenwood Avenue
Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

APPROVED: DocuSigned by: David Z. Keiser 5FFD0B2025FB4D4...

DATE: 2/14/2019

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 033400 ENGINEER DAVID Z. KEISER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

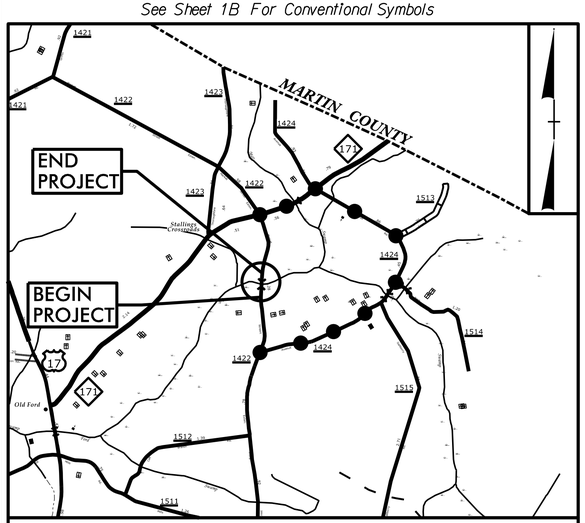
DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

TEMPORARY OFF-SITE DETOUR

2/11/2019
P:\\pw.cdmsmith.com:PW_PLN\Documents\17240\222954\10 Transportation\04 Client Folder Structure\B4427\Traffic\TrafficControl\TCP\B4427_TMP.psh TMP-3.dgn
User:LETT2

TIP PROJECT: B-4427

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



VICINITY MAP

DETOUR ROUTE N. T. S.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

BEAUFORT COUNTY

LOCATION: REPLACE BRIDGE 6 OVER BIG SWAMP ON SR 1422 (MARKET STREET EXTENSION)

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4427	EC-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
17BP.2.R.89	N/A	PE	

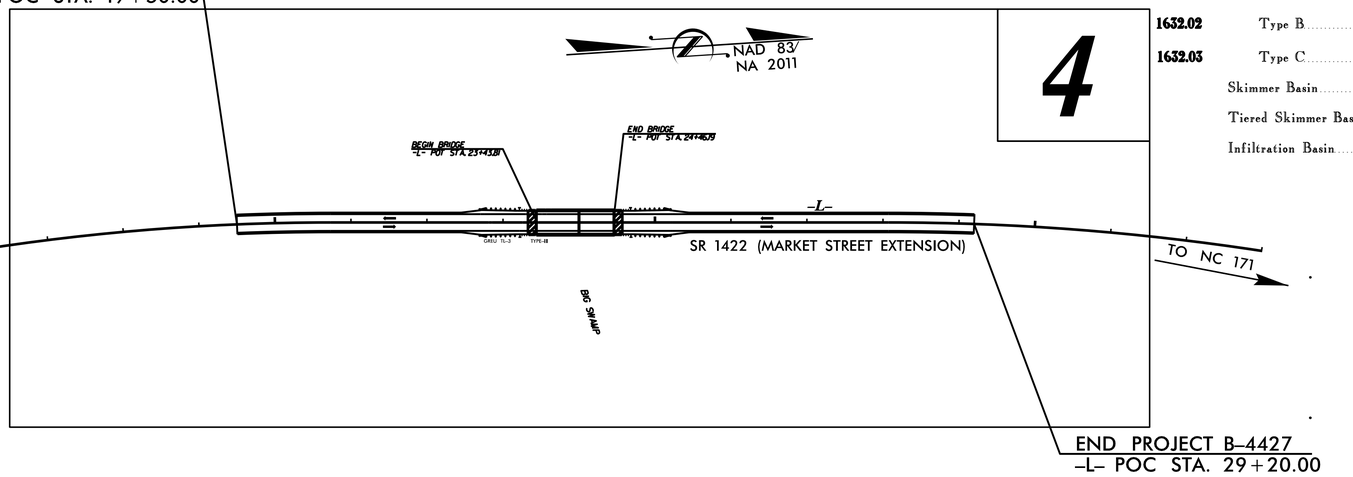
THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

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

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

Refer To E. C. Special Provisions for Special Considerations.

BEGIN PROJECT B-4427
-L- POC STA. 19+50.00



END PROJECT B-4427
-L- POC STA. 29+20.00

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	SW 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	

4

GRAPHIC SCALE

0
PLANS
0
PROFILE (HORIZONTAL)
0
PROFILE (VERTICAL)

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 1, 2016 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER RESOURCES.

Prepared In the Office of:

MI ENGINEERING, PLLC
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606

Designed by:

KAREN HEFNER, PE *3824*
NAME *LEVEL III CERTIFICATION NO.*

Reviewed In the Office of:

ROADSIDE ENVIRONMENTAL UNIT
1 South Wilmington St.
Raleigh, NC 27611

2018 STANDARD SPECIFICATIONS

Reviewed by:

ANDREW BLANKENSHIP, PE, CPESC

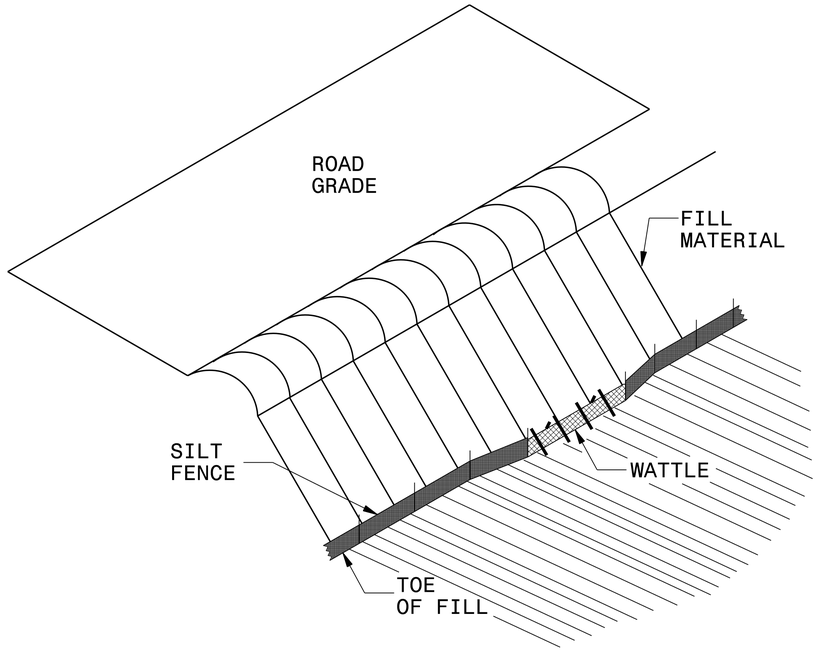
Roadway Standard Drawings

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.

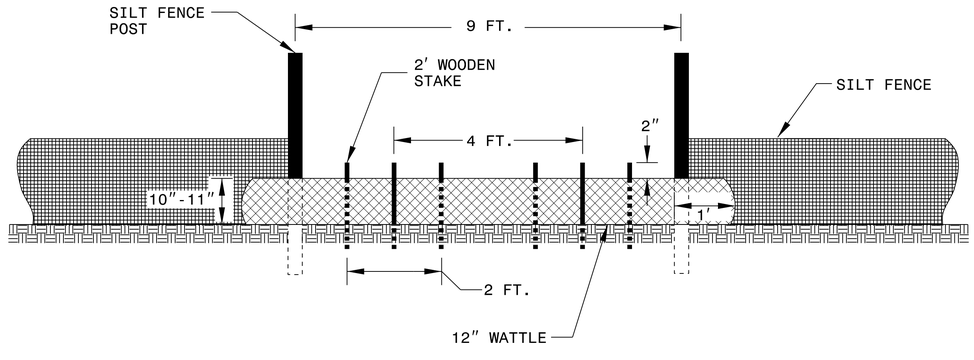
1604.01 Railroad Erosion Control Detail
1605.01 Temporary Silt Fence
1606.01 Special Sediment Control Fence
1607.01 Gravel Construction Entrance
1622.01 Temporary Berms and Slope Drains
1630.01 Riser Basin
1630.02 Silt Basin Type B
1630.03 Temporary Silt Ditch
1630.04 Stilling Basin
1630.05 Temporary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

PROJECT REFERENCE NO.	SHEET NO.
B-4427	EC-02
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SILT FENCE COIR FIBER WATTLE BREAK DETAIL



ISOMETRIC VIEW



VIEW FROM SLOPE

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 1 TO 2 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLE ON TOE OF SLOPE.

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

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

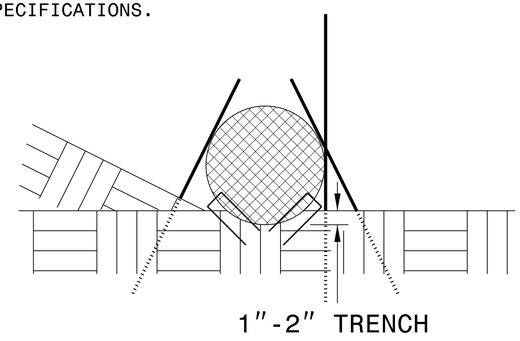
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

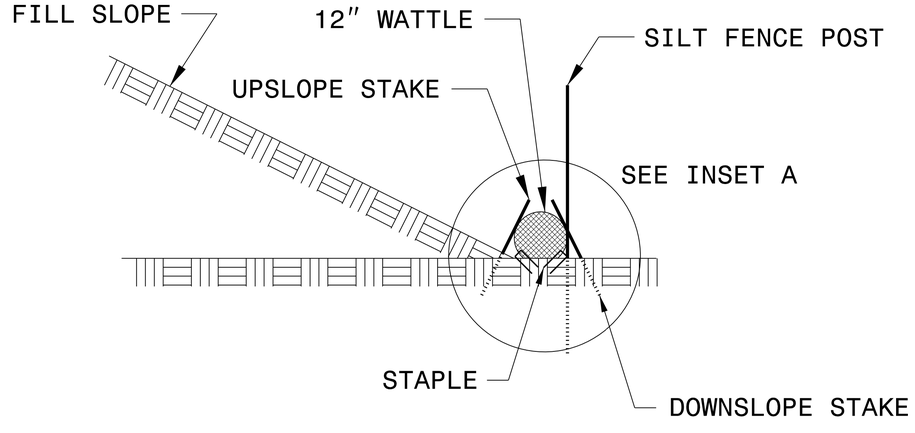
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.

INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

INSET A

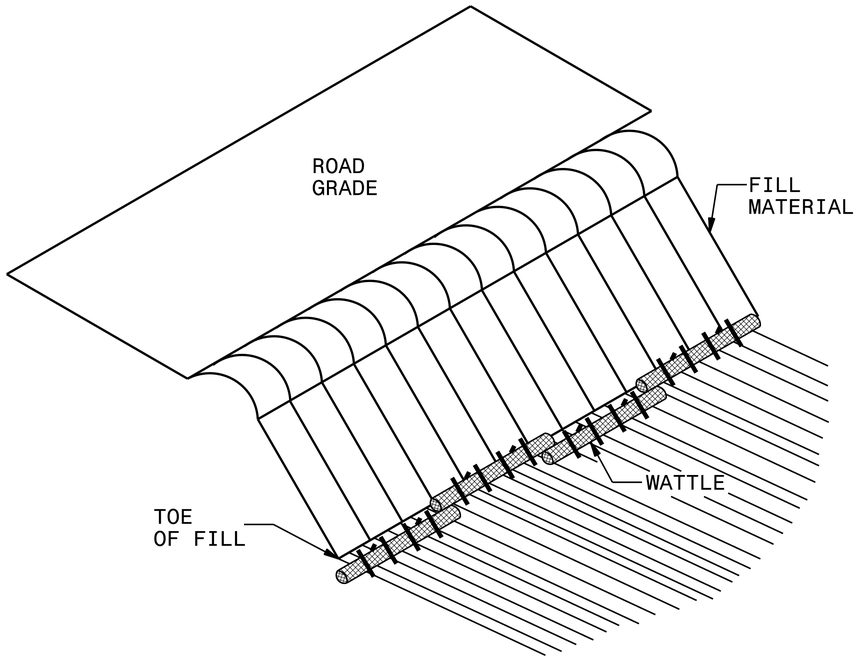




SIDE VIEW

PROJECT REFERENCE NO.	SHEET NO.
B-4427	EC-02A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

COIR FIBER WATTLE BARRIER DETAIL



ISOMETRIC VIEW

NOTES:

USE MINIMUM 18 IN. NOMINAL DIAMETER COIR FIBER (COCONUT) WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 2 TO 3 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLES ON TOE OF SLOPE.

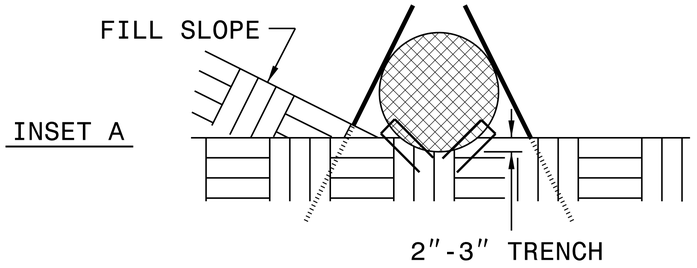
USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

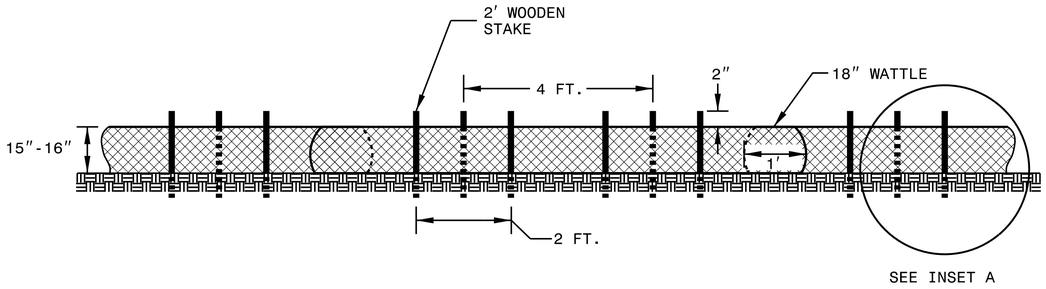
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

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

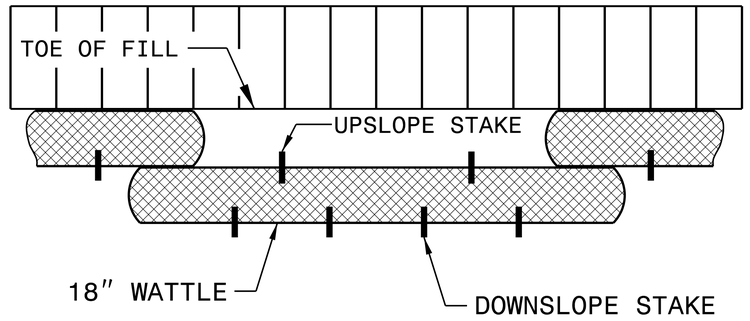
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

FOR BREAKS ALONG LARGE SLOPES, USE MAXIMUM SPACING OF 25 FT.





FRONT VIEW



TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
B-4427	EC-03
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.

CLEARING & GRUBBING PLAN

PROJECT REFERENCE NO.	SHEET NO.
B-4427	EC-04/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

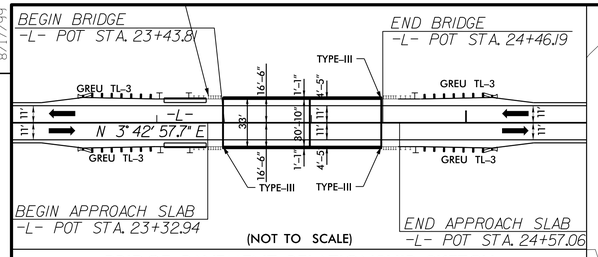
CDM Smith — CDM Smith Inc, 5400 Glenwood Avenue, Suite 400, Raleigh, NC 27612-3220, NC COA No. F-1255

MK ENGINEERING, 1011 SCHAUB DRIVE, SUITE 100, RALEIGH, NC 27606, (919) 851-6466, FIRM PE NUMBER: P-0671

8/17/99

REVISIONS

BRIDGE PAVEMENT RELATIONSHIP SKETCH



(NOT TO SCALE)

NAD 83/NA 2011

JIMMY C. HARDISON
DB 1734 PG 894

M.U. HODGES, et ux
DB 817 PG 897

ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

END SHOULDER BERM GUTTER
-L- STA. 23+31.94 LT/RT

BEGIN SHOULDER BERM GUTTER
-L- STA. 23+05.00 LT/RT

15" RCP-V

CYPRESS SWAMP WOODS

FLOATING TURBIDITY CURTAIN

PROPERTY LINE RUNS ALONG MOYE'S BEAVER DAM SWAMP

BZ 1 BZ 2

TYPE-III

SWAMP WOODS

35' TYP.

+00.00

+45.00

+02.50

EXISTING R/W

WOODS

SR 1422 (MARKET STREET EXT.)

22' BST

GREU TL-3

TB 2GI(040)

0402TB 20

CFW

SUPPORT BEAMS

PT Sta. 20+73.23

PC Sta. 28+07.31

BM2
ELEVATION = 33.57
N 696746 E 2585431
RR SPIKE IN 24" HARDWOOD

15" RCP-III

1 TONS CLASS 'B' RIP RAP
5 SY GEOTEXTILE

?? TONS CLASS II RIP RAP
?? SY GEOTEXTILE

ASHLEY McMULLAN WOOLARD
DB 1761 PG 885

JIMMY C. HARDISON
DB 933 PG 650
PC "A" SLIDE 68

NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

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

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET _4_

BRIDGE APPROACH SLAB

-L-
PI Sta 18+19.43
△ = 9° 43' 04.9" (RT)
D = 1° 54' 35.5"
L = 508.84'
T = 255.03'
R = 3,000.00'
e = EXIST.
RO = N/A

-L-
PI Sta 31+12.93
△ = 10° 44' 39.9" (RT)
D = 1° 45' 46.6"
L = 609.46'
T = 305.62'
R = 3,250.00'
e = EXIST.
RO = N/A

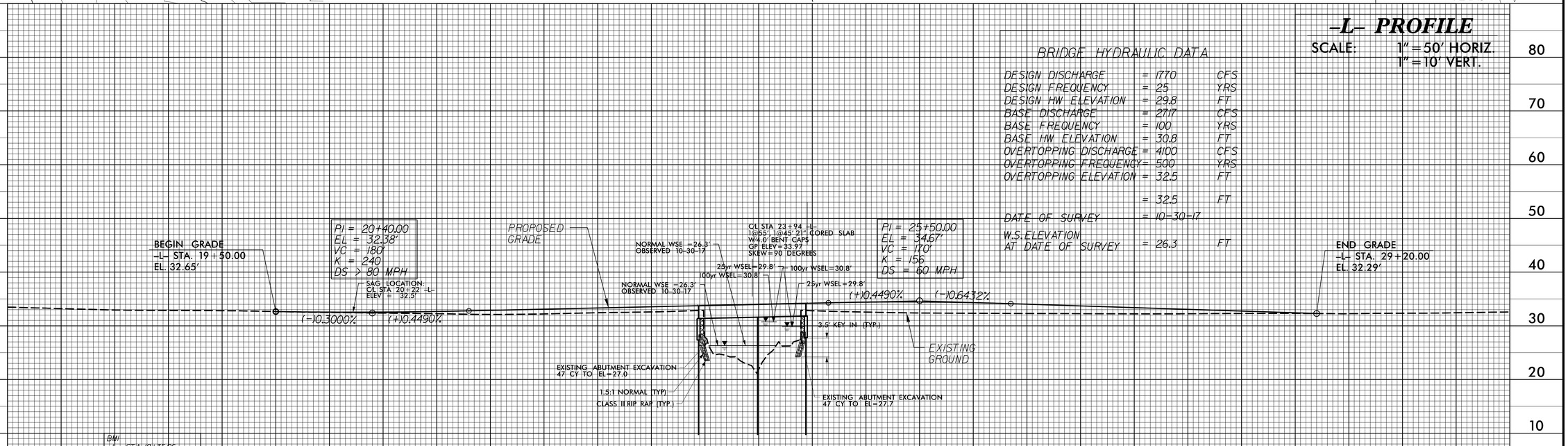
50' 25' 0' 50' 100'
PLANS

-L- PROFILE

SCALE: 1" = 50' HORIZ.
1" = 10' VERT.

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1170	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 29.8	FT
BASE DISCHARGE	= 2717	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 30.8	FT
OVERTOPPING DISCHARGE	= 4100	CFS
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING ELEVATION	= 32.5	FT
	= 32.5	FT
DATE OF SURVEY	= 10-30-17	
W.S. ELEVATION AT DATE OF SURVEY	= 26.3	FT



80 70 60 50 40 30 20 10 0

17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

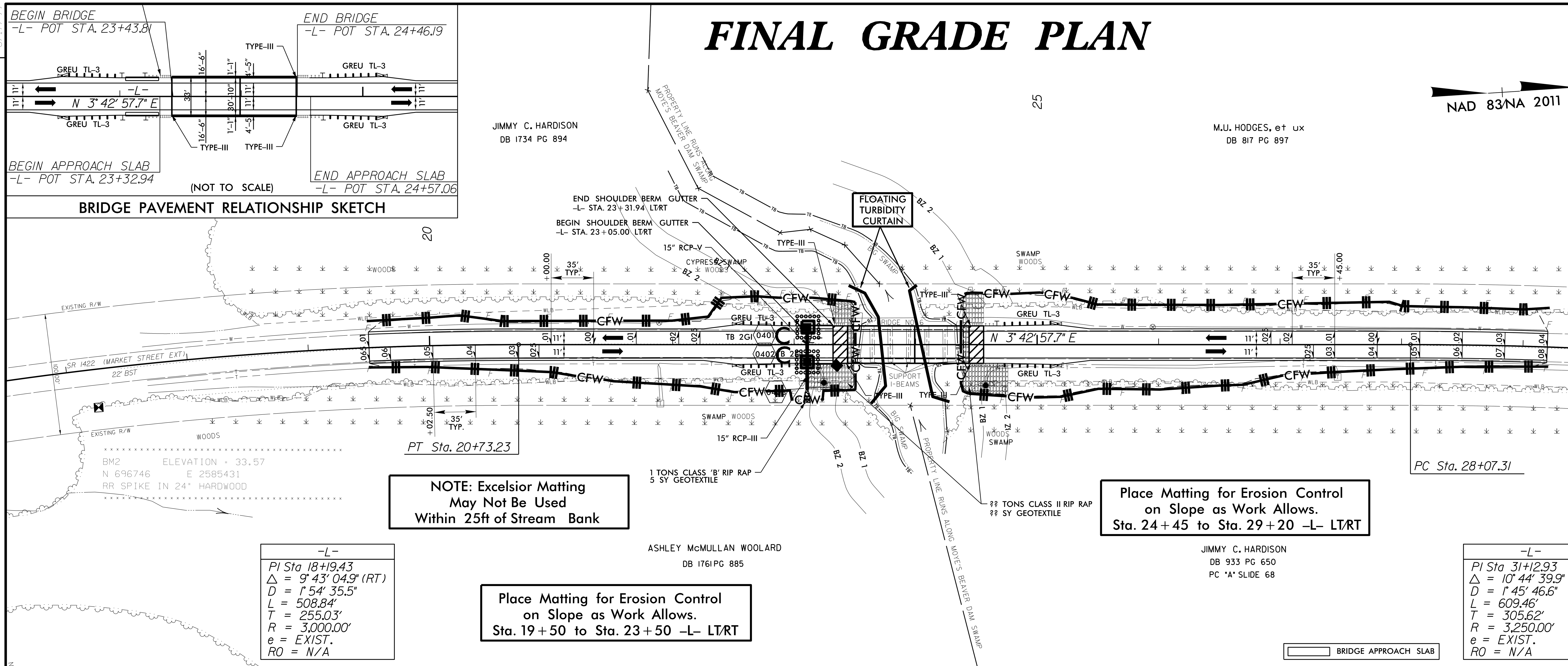
ENGINEERING SYSTEMS DIVISION
GEOTECHNICAL ENGINEERING UNIT

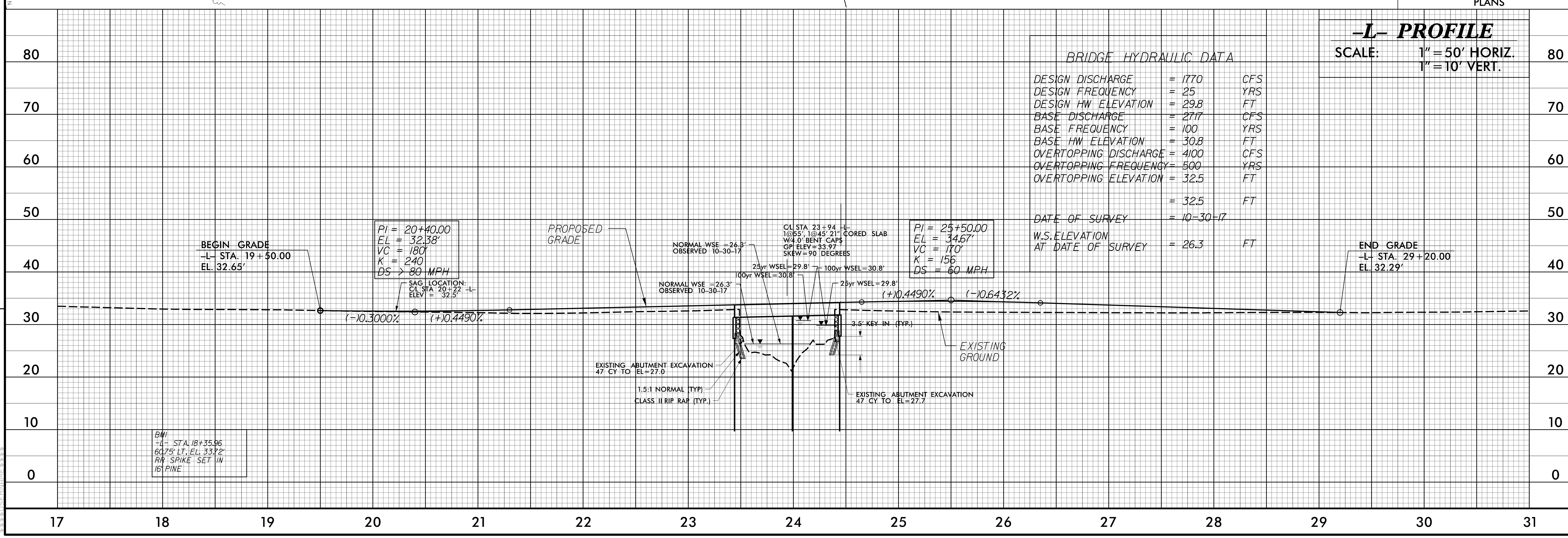
FINAL GRADE PLAN

PROJECT REFERENCE NO.	SHEET NO.
B-4427	EC-05/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CDM Smith
CDM Smith Inc.
5400 Glenwood Avenue
Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671





REVISIONS

8/17/99

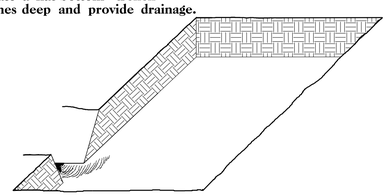
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	3-4427	RF-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

PLANTING DETAILS

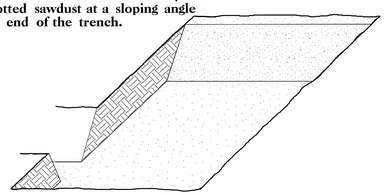
SEEDLING / LINER 3AREROOT PLANTING DETAIL

HEALING IN

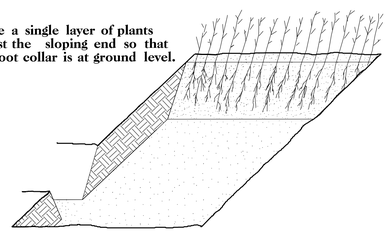
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



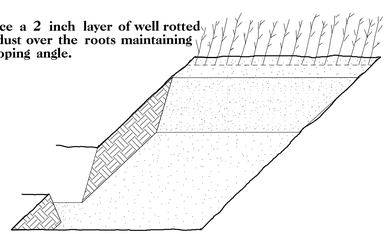
3. 3ackfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



4. Place a single layer of plants against the sloping end so that the root collar is at ground level.

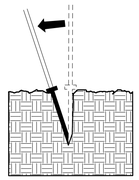


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

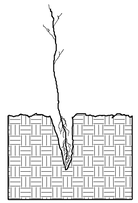


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

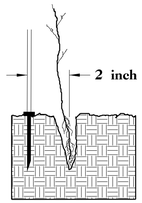
DI33LE PLANTING METHOD
USING THE K3C PLANTING 3AR



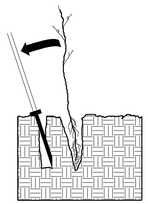
1. Insert planting bar as shown and pull handle toward planter.



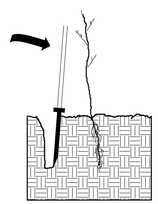
2. Remove planting bar and place seedling at correct depth.



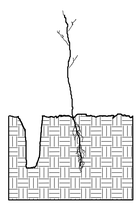
3. Insert planting bar 2 inches toward planter from seedling.



4. Pull handle of bar toward planter, firming soil at bottom.



5. Push handle forward firming soil at top.



6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING 3AG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.

K3C PLANTING 3AR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.

ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

REFORESTATION

☐ TREE REFORESTATION SHALL 3E PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

25% LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in – 18 in 3R
25% PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	12 in – 18 in 3R
25% FRAXINUS PENNSYLVANICA	GREEN ASH	12 in – 18 in 3R
25% 3ETULA NIGRA	RIVER 3IRCH	12 in – 18 in 3R

REFORESTATION DETAIL SHEET

N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT

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09/08/99

PROJECT: 17BP.2.R.89

CONTRACT: DB00416

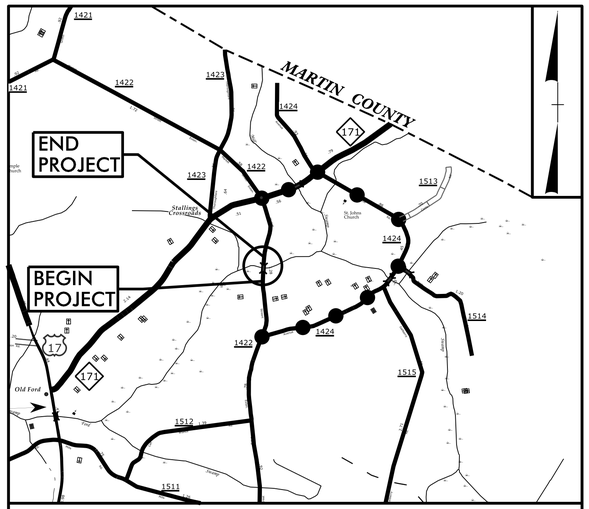
WBS NO.	SHEET NO.
17BP.2.R.89	UC–1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITY CONSTRUCTION PLANS
BEAUFORT COUNTY

LOCATION: BRIDGE NO. 6 OVER BIG SWAMP ON SR 1422 (MARKET STREET EXTENSION)

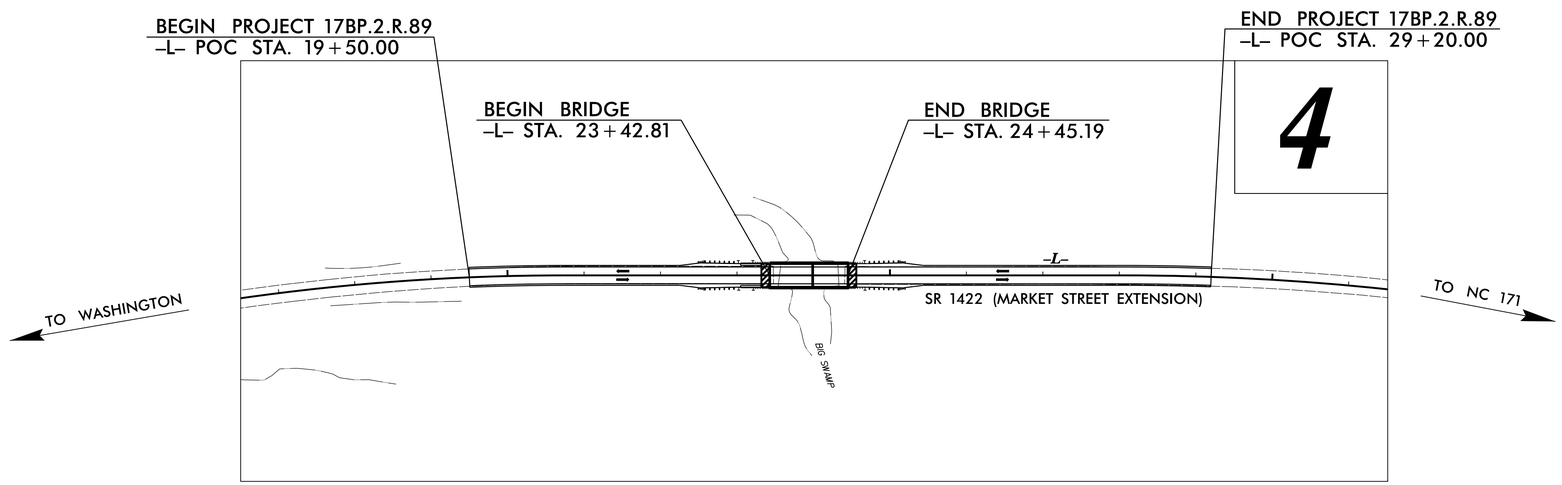
TYPE OF WORK: WATER LINE RELOCATION



VICINITY MAP

DETOUR ROUTE ***N. T. S.***

NAD 83/
NA 2011



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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)

INDEX OF SHEETS

WATER AND SEWER OWNERS ON PROJECT

(A) WATER – BEAUFORT COUNTY WATER DEPT

PREPARED IN THE OFFICE OF

CDM Smith

CDM Smith Inc.
5400 Glenwood Avenue
Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

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DAVID KEISER, P. E.	*PROJECT MANAGER*
SEAN MCFEE, P. E.	*PROJECT DESIGN ENGINEER*

SEAL

NORTH CAROLINA
Registered No.
SEAL
47132
ENGINEER
SEAN R. MCFEE
2/15/2019

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USER: GYANTMN

PROJECT REFERENCE NO.	SHEET NO.
17BP.2.R.89	UC-2

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

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

PROPOSED SEWER SYMBOLS

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

PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

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

EXISTING UTILITIES SYMBOLS

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

*For Existing Utilities

Item	Symbol
Utility Line Drawn from Record (Type as Shown)	
Designated Utility Line (Type as Shown)	

REV: 2/1/2012

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5/14/99

UTILITY CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
17BP.2.R.89	UC-3
DESIGNED BY: SRM	
DRAWN BY: MNG	
CHECKED BY: SRM	
APPROVED BY: MKS	
REVISED:	

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 47732 — 7/23/2019 — Approved by: SCOTT R. MYERS — 799A1C0B5D8B4A8...

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

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GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.

2. THE EXISTING WATER LINE UTILITIES BELONG TO BEAUFORT COUNTY.

CONTACT: ERICK JENNINGS
PHONE: 252-975-0720

3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL AND NATURAL RESOURCES, DIVISION OF ENVIRONMENTAL HEALTH.

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

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

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

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

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

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

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

11. BEAUFORT COUNTY WILL COLLECT ALL BACTERIOLOGICAL SAMPLES FOR THIS PROJECT. A BEAUFORT COUNTY REPRESENTATIVE SHALL BE PRESENT FOR THE PRESSURE TEST, CHLORINATION, AND FLUSHING OF ALL WATER LINES.

12. BEAUFORT COUNTY SHALL BE PROVIDED WITH TWO COPIES OF SURVEYED AS-BUILTS OF THE INSTALLED UTILITY. THE AS-BUILTS SHALL INCLUDE NOTATIONS OF THE SIZE AND TYPE OF MATERIAL INSTALLED; GPS COORDINATED OF ALL: FITTINGS, UTILITY CONTROLS, AND THE HORIZONTAL AND VERTICAL LOCATIONS OF THE PIPING. CONTRACTOR WILL PROVIDE BORING LOGS FROM TRENCHLESS INSTALLATIONS.

PROJECT SPECIFIC NOTES:

1. ALL PIPE FOR OPEN TRENCH CONSTRUCTION SHALL BE ANSI/AWWA C151/A21.51 PRESSURE CLASS 350 RATED FOR AT LEAST 200 PSI OR GREATER.

2. DUCTILE IRON PIPE JOINTS SHALL BE PUSH ON TYPE WITH RUBBER GASKETS. GASKET MATERIALS SHALL CONFORM TO AWWA C111. GASKETS SHALL BE OF STYRENE BUTADIENE RUBBER (SBR) UNLESS OTHERWISE SPECIFIED.

3. ALL FITTING SHALL BE DUCTILE IRON MECHANICAL JOINT, CLASS 350, AWWA C110 AND RESTRAINED WITH APPROVED RETAINER GLANDS.

4. GATE VALVES SHALL BE RESILIENT SEAT GATE VALVES CONFORMING TO AWWA C509 OR C515 OR LATEST VERSION AND THEY SHALL BE NSF 61 CERTIFIED AND SHALL BE RESTRAINED WITH APPROVED RETAINER GLANDS.

5. THE GATE VALVES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH THE NCDOT AND BEAUFORT COUNTY WATER DEPARTMENT SPECIFICATIONS AND MANUFACTURERS RECOMMENDATIONS.

6. ALL HDPE PIPE AND FITTINGS SHALL BE MANUFACTURED IN STRICT ACCORDANCE WITH AWWA C906 AND SHALL BE FROM A SINGLE MANUFACTURER WHO IS FULLY EXPERIENCED, REPUTABLE, AND QUALIFIED IN THE MANUFACTURE OF THE POLYETHYLENE PIPE AND FITTINGS TO BE FURNISHED.

7. HDPE PIPE SHALL BE PE 4710 WITH MINIMUM DR 11 SUITALE FOR 200 PSI.

8. HORIZONTAL DIRECTIONAL DRILLING (HDD) WATER MAIN PIPE IS 8-INCH DIAMETER HDDPE DR 11. TOTAL LENGTH OF THE HDD AS SHOWN ON THE DRAWINGS IS 453 LF. THIS LENGTH IS BASED ON A DESIGN USING AVAILABLE SUBSURFACE INFORMATION. AS STATED BELOW THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ADDITIONAL SUBSURFACE DATA TO CONFIRM SUBSURFACE CONDITIONS AS PRESENTED ON THE DRAWINGS AND/OR MAKE MODIFICATIONS TO THE HDD ALIGNMENT OR PIPE STRENGTH REQUIREMENTS BASED ON THE ADDITIONAL INFORMATION OBTAINED.

9. PRIOR TO COMMENCING WORK ON ANY TRENCHLESS INSTALLATION, PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION CERTIFIED BY AN ENGINEER LICENSED IN THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE STANDARD SPECIFICATIONS.

10. THE HDD DESIGN SHALL INCLUDE PLANS SHOWING LENGTH AND PROFILE, INCLUDING ENTRY AND EXIT ANGLES AND RADII.

11. SUBMITTALS FOR DESIGN OF HDD

A. HDD DESIGN BY THE CONTRACTOR'S ENGINEER SHALL INCLUDE A GEOTECHNICAL EXPLORATION AND LABORATORY TESTING PROGRAM TO ADEQUATELY DEFINE THE SUBSURFACE CONDITIONS. THIS SUPPLEMENTAL INFORMATION TO THE INFORMATION PROVIDED IN THESE DOCUMENTS SHALL BE USED AS THE BASIS OF THE HDD DESIGN AND ANY MODIFICATIONS TO THE PROPOSED LAYOUT AS SHOWN.

B. SUBMIT CALCULATIONS IDENTIFYING THE CRITICAL DOWNHOLE PRESSURE THAT WOULD CAUSE HYDROFRACTURE. THE CALCULATIONS SHALL IDENTIFY ALL PARAMETERS USED AND STATE ALL ASSUMPTIONS MADE IN THE CALCULATIONS. CALCULATIONS FOR PIPE STRESSES DUE TO PULLBACK, BENDING, FLUID BUCKLING LOADS, EARTH LOADS, GROUNDWATER LOADS, AND ANY OTHER INSTALLATION AND SERVICE LOADS. LIST ALL ASSUMPTIONS MADE IN THE CALCULATIONS, INCLUDING THE RADIUS OF CURVATURE, ASSUMED DRILLING FLUID WEIGHTS, WHETHER PIPE IS ASSUMED TO BE FILLED OR EMPTY DURING PULLBACK, AND TEMPERATURE.

C. PROVIDE RECORDS OF EQUIPMENT CALIBRATIONS AND CERTIFICATIONS FOR ALL EQUIPMENT USED FOR DOWNHOLE SURVEYS AND TRACKING OF THE DRILL HEAD. PROCEDURES FOR OPERATING THE DOWNHOLE SURVEY TOOLS SHALL BE DESCRIBED, INCLUDING MEASURES TO VERIFY THE ACCURACY OF THE EQUIPMENT READINGS.

D. SUBMIT PLANS FOR DISPOSAL OF WASTE MATERIALS RESULTING FROM THE PIPELINE CONSTRUCTION, INCLUDING DRILLING FLUIDS, CUTTINGS, WASTE OIL, FUEL, DISCHARGE WATER, ETC. IDENTIFY THE DISPOSAL SITE AND SUBMIT A LETTER INDICATING WILLINGNESS AND LEGAL AUTHORITY OF RECIPIENT TO ACCEPT THE DESCRIBED AND ANTICIPATED WASTE PRODUCTS.

E. SUBMIT A CONTINGENCY PLAN FOR REMEDIATION OF POTENTIAL PROBLEMS THAT MAY BE ENCOUNTERED DURING THE DRILLING OPERATIONS. THE CONTINGENCY PLANS SHALL ADDRESS THE OBSERVATIONS THAT WOULD LEAD TO THE DISCOVERY OF THE PROBLEM AND THE METHODS THAT WOULD BE USED TO MITIGATE THE PROBLEM. CONTRACTOR SHALL BE CAPABLE OF IMPLEMENTING THE PLAN IMMEDIATELY SHOULD AN INADVERTENT RETURN OR SURFACE SPILL OCCUR DURING THE HDD WORK.

14. SUBMITTALS AND AS-BUILT HDD SUBMITTALS

A. THE CONTRACTOR SHALL DOCUMENT ANY VARIATIONS BETWEEN THE ACTUAL CONTRACT DRAWINGS AND PROFILE OF THE BORE PATH AND THE LOCATION SHOWN ON THE CONTRACT DRAWINGS. THE CONTRACTOR SHALL NOTIFY IN WRITING AND BY TELEPHONE THE ENGINEER IMMEDIATELY UPON DISCOVERY OF ANY DEVIATIONS. SUBMIT DESCRIPTIONS OF METHODS, EQUIPMENT, AND MATERIALS TO BE USED FOR CONTACT GROUTING ANY AREAS WHERE OVER-EXCAVATION, ANNULUS BETWEEN THE FINAL REAMED BORE DIAMETER AND THE CARRIER PIPE, ABORTED BORES, VOIDS, OR CAVITIES ARE CREATED OR ENCOUNTERED DURING CONSTRUCTION.

B. THE FOLLOWING SHALL BE SUBMITTED AS CONSTRUCTION PROGRESSES AND AT THE COMPLETION OF CONSTRUCTION: MAXIMUM DRILLING SPEEDS AND REAMING RATES FOR PILOT BORE AND EACH REAMING PASS; MEASURED MUD AND/OR DRILLING FLUID WEIGHTS USED DURING PILOT BORING AND REAMING OF THE BORE MEASURED AT A MINIMUM OF THREE TIMES PER SHIFT OR AT LEAST ONCE PER 200 FEET OF DRILLED OR REAMED LENGTH, WHICHEVER IS MORE FREQUENT, WITH AT LEAST TWO (2) HOURS BETWEEN READINGS; ALL PRESSURE TEST RECORDS FOR BOTH THE PRE-INSTALLATION AND POST-INSTALLATION TESTS; AS-BUILT PROFILE OF THE PILOT BORE WITHIN 24 HOURS OF COMPLETION OF THE PILOT BORE.

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-DATE 04/27/11
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PROJECT REFERENCE NO.	SHEET NO.
17BP.2.R.89	UC-3A

DESIGNED BY:	SRM
DRAWN BY:	MNG
CHECKED BY:	SRM
APPROVED BY:	MKS
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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SEAN R. MCFEE 47732 2/15/2019

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

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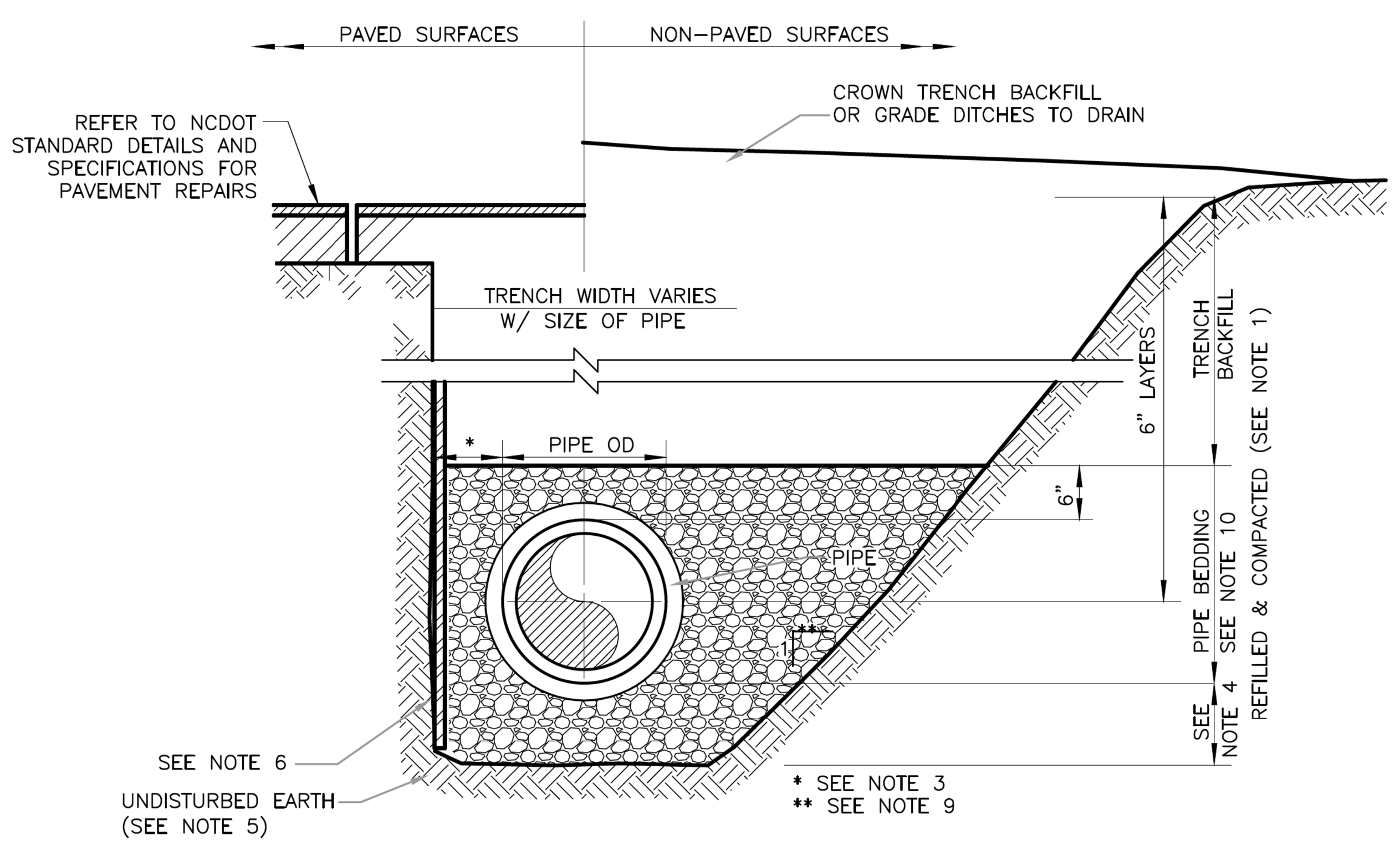
PROJECT TYPICAL DETAILS

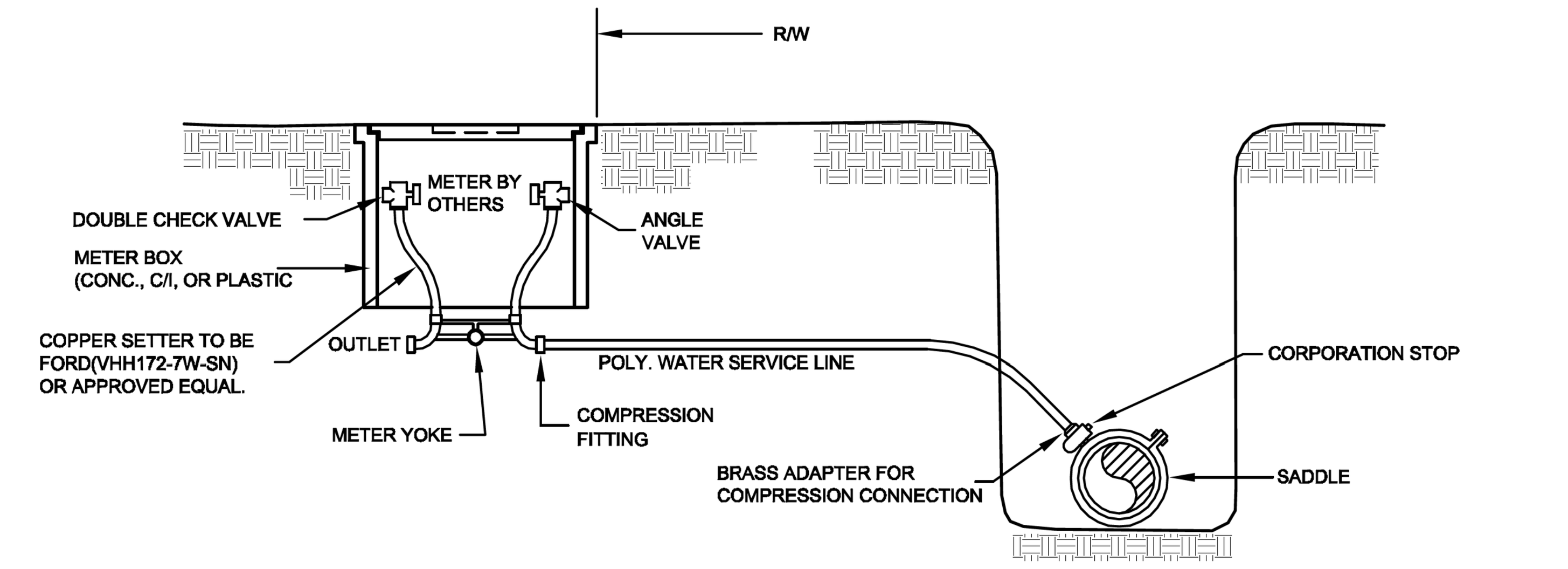


NOTES:

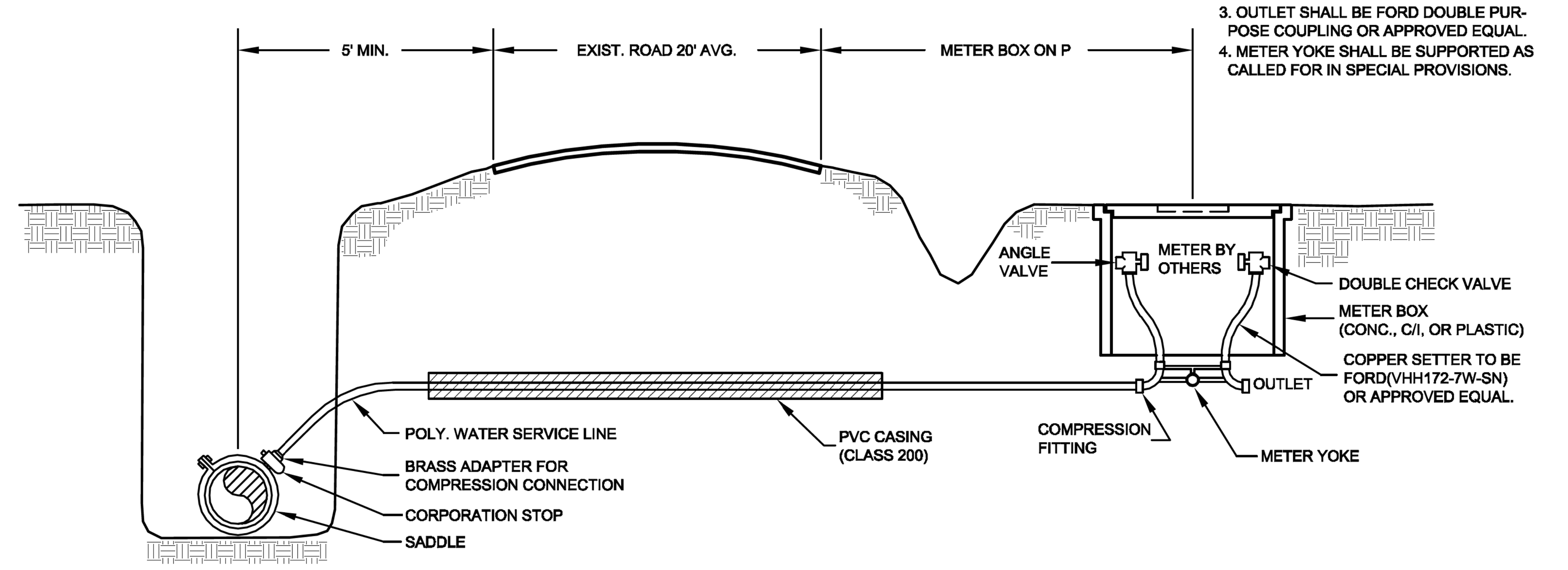
1. PIPE BEDDING & TRENCH BACKFILL – COMPACTED IN LAYERS TO 95% MAXIMUM DENSITY AS PER ASTM D698 (STANDARD PROCTOR) AND 98% IN AREAS UNDER PAVEMENT IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE NC DEPARTMENT OF TRANSPORTATION
2. WATER SHALL NOT BE PERMITTED IN THE TRENCH DURING CONSTRUCTION. DEWATER AS NECESSARY.
3. MINIMUM 18" BEYOND PIPE OD.
4. MINIMUM 6" LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.
5. PLACE FOUNDATION CONDITIONING MATERIAL (SELECT MATERIAL) BELOW BEDDING IF REQUIRED OR AS DIRECTED BY ENGINEER. FOUNDATION CONDITIONING MATERIAL SHALL BE ENCAPSULATED WITH GEOTEXTILE FABRIC AS SPECIFIED.
6. SHEETING SHALL BE DRIVEN BELOW THE UTILITY INVERT IF REQUIRED FOR LATERAL SUPPORT OR UNSUITABLE MATERIAL REMOVAL. WHERE DRIVEN BELOW PIPE SPRINGLINE, SHEETING SHALL BE CUT OFF A MIN OF 12" ABOVE TOP OF PIPE OR HIGHER, AS AUTHORIZED BY THE ENGINEER, AND LEFT IN PLACE. IN NO CASE SHALL SHEETING LEFT IN PLACE EXTEND HIGHER THAN 18" BELOW SURFACE GRADE UNLESS SPECIFICALLY APPROVED. BRACING SHALL BE PROVIDED AS REQUIRED.
7. EXCAVATED MATERIALS MIXED WITH DELETERIOUS SUBSTANCES DURING CONSTRUCTION SHALL NOT BE USED FOR BACKFILLING.
8. FOR INSTALLATIONS IN PAVEMENT, ALL EXISTING PAVEMENT SHALL BE CUT SQUARELY WITH A SAW. WEARING SURFACE SHALL BE SAME TYPE AND THICKNESS AS THE EXISTING PAVEMENT.
9. TRENCH SLOPES SHALL BE AS REQUIRED BY OSHA AND SHALL NOT EXCEED 1:1 NEXT TO ROADS – USE ACTIVE SHORING AS REQUIRED.
10. SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 INSTALLED AND COMPACTED IN 6" LIFTS.
11. TRENCH BOXES SHALL NOT EXTEND BELOW THE SPRINGLINE OF THE PIPE, UNLESS APPROVED BY THE ENGINEER ON A PER-CASE BASIS.

PIPE BEDDING DETAIL

NTS

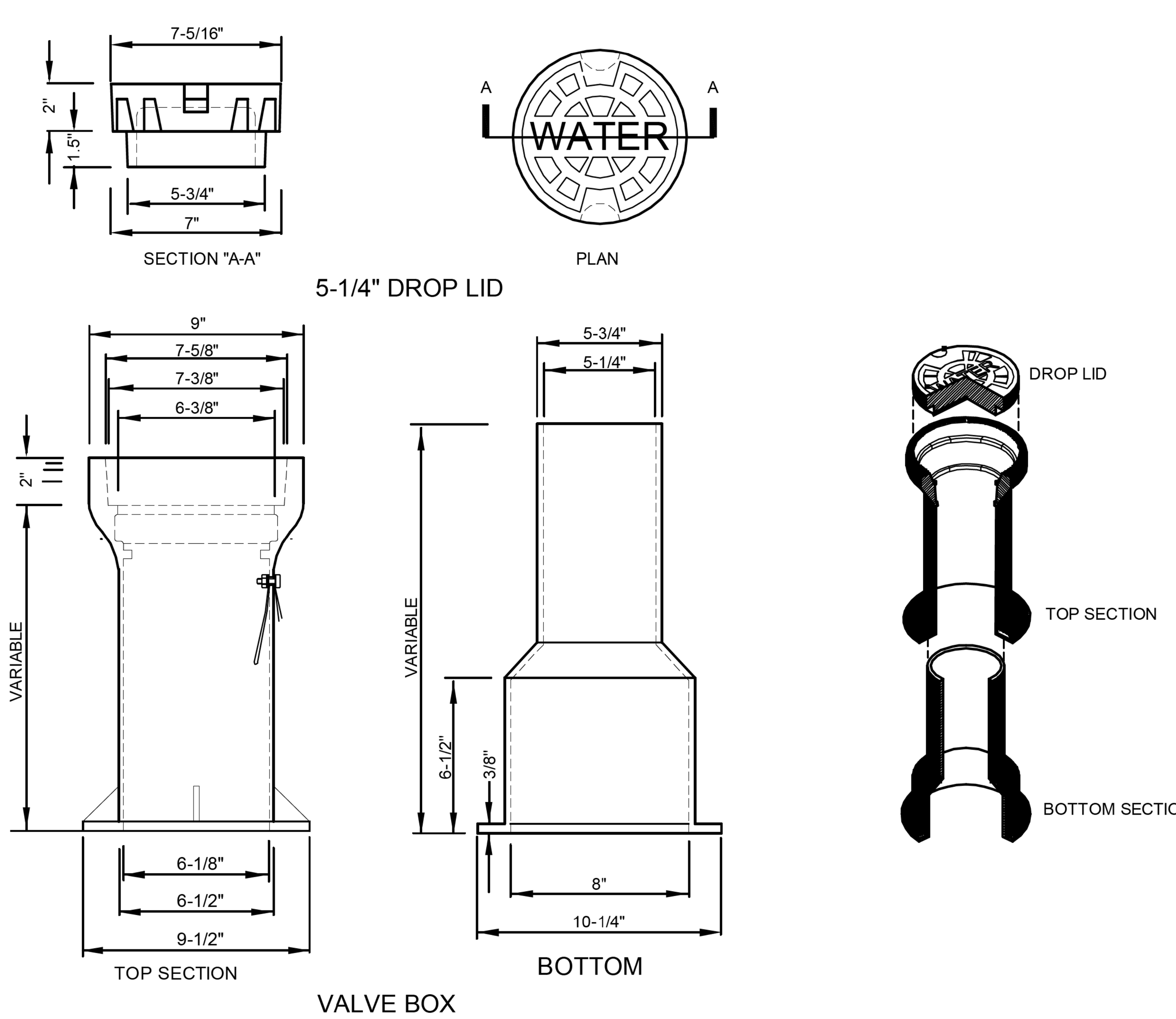


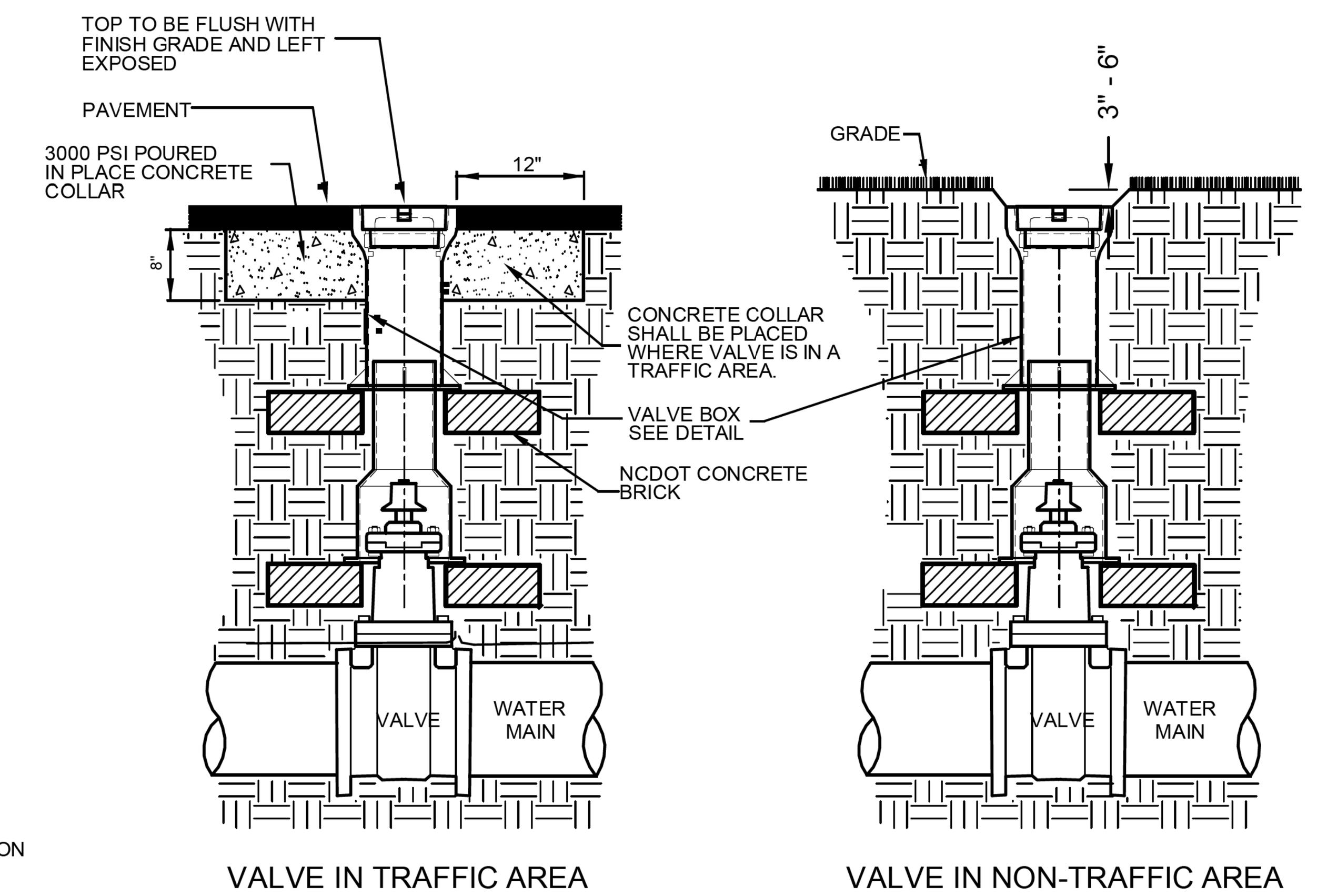
NOTES:
1. INLETS WILL HAVE A BRASS ADAPTOR AS REQUIRED FOR A COMPRESSION FITTING TO "IPS" WATER SERVICE PIPE.
2. YOKE WILL HAVE CHECK VALVE THAT SHALL HAVE SPRING-ASSISTED SEATING, AND THE SEAT SHALL BE OF BUNA-N-RUBBER.
3. OUTLET SHALL BE FORD DOUBLE PURPOSE COUPLING OR APPROVED EQUAL.
4. METER YOKE SHALL BE SUPPORTED AS CALLED FOR IN SPECIAL PROVISIONS.



TYPICAL HOUSE SERVICE DETAIL

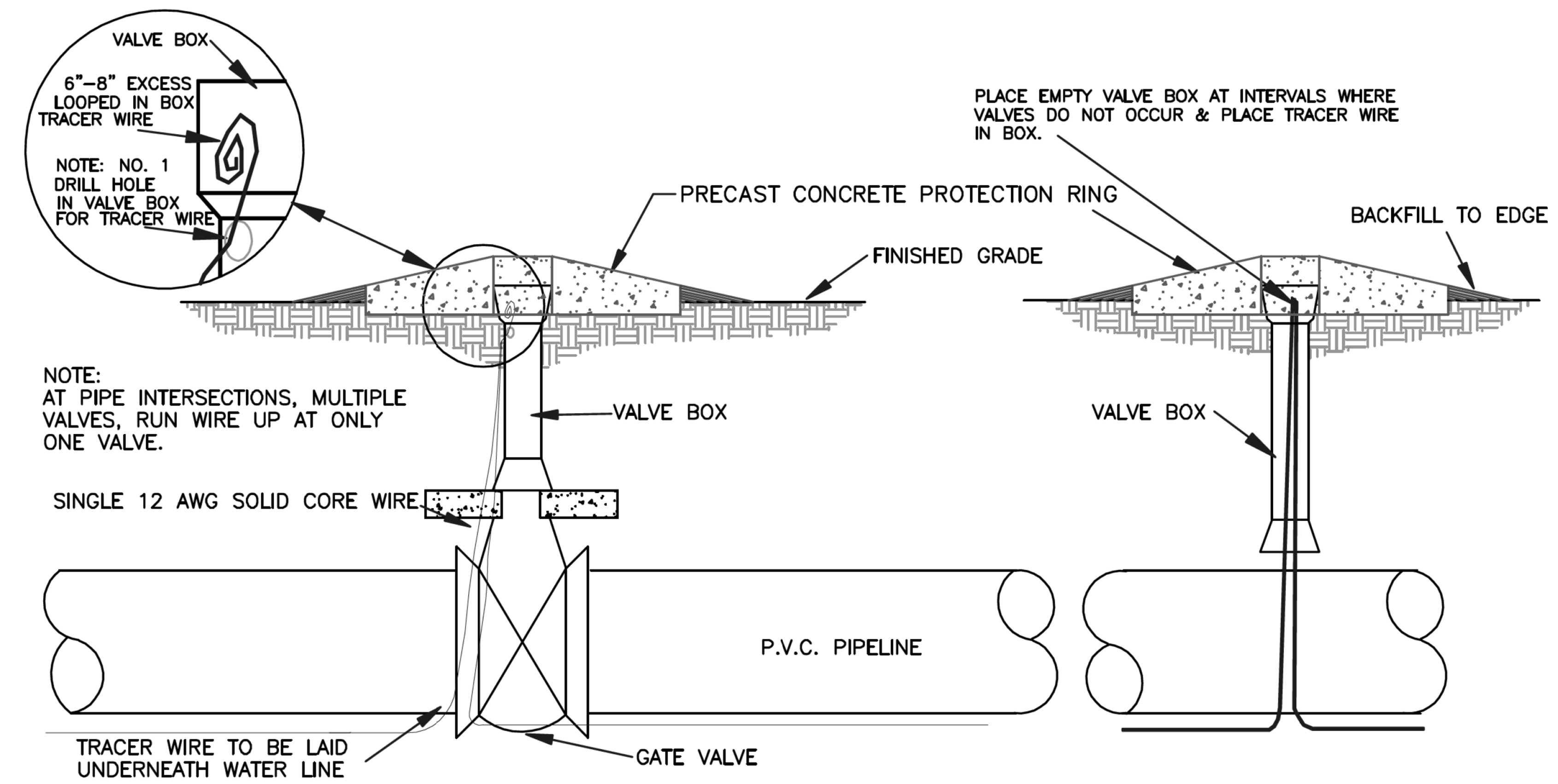
NTS





VALVE BOX DETAIL

NTS



NOTES:
1. DRILL HOLE IN VALVE BOX TO INSERT TRACER WIRE,BRING UP TO INSIDE AND ROLL UP AT LEAST 6"–8" EXCESS
2. PLACE TRACER WIRE IN VALVE BOX AT 1,000' INTERVALS OR AS NOTED ON THE PLANS, TYPICAL.
3. DO NOT SPLICE WIRE WHEN BEGINNING A NEW SPOOL. INSTEAD INSTALL A VALVE BOX AND ATTACH EACH WIRE WITH A BRASS SCREW TO THE VALVE BOX.

TRACER WIRE DETAIL

NTS

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PROJECT REFERENCE NO.	SHEET NO.
17BP.2.R.89	UC-3B

DESIGNED BY: SRM
DRAWN BY: MNG
CHECKED BY: SRM
APPROVED BY: MKS
REVISED:

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAN R. MCFEE 047752
2/15/2019

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

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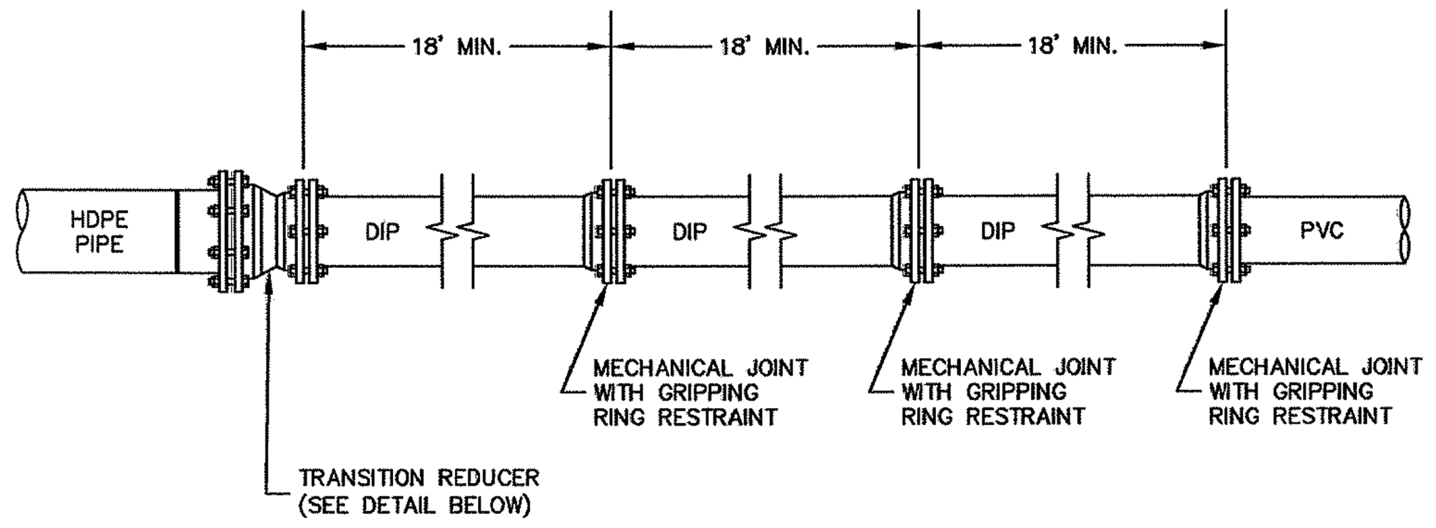
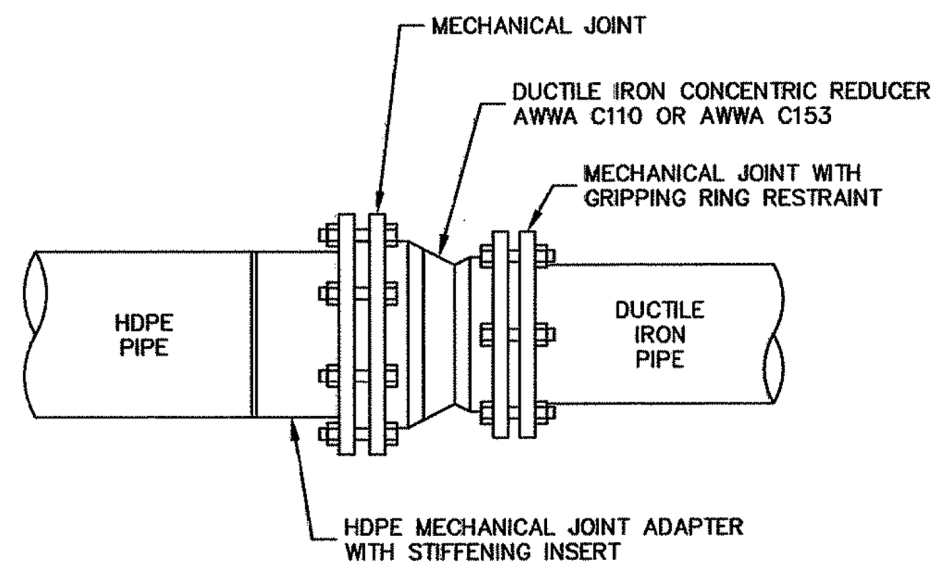
PROJECT TYPICAL DETAILS





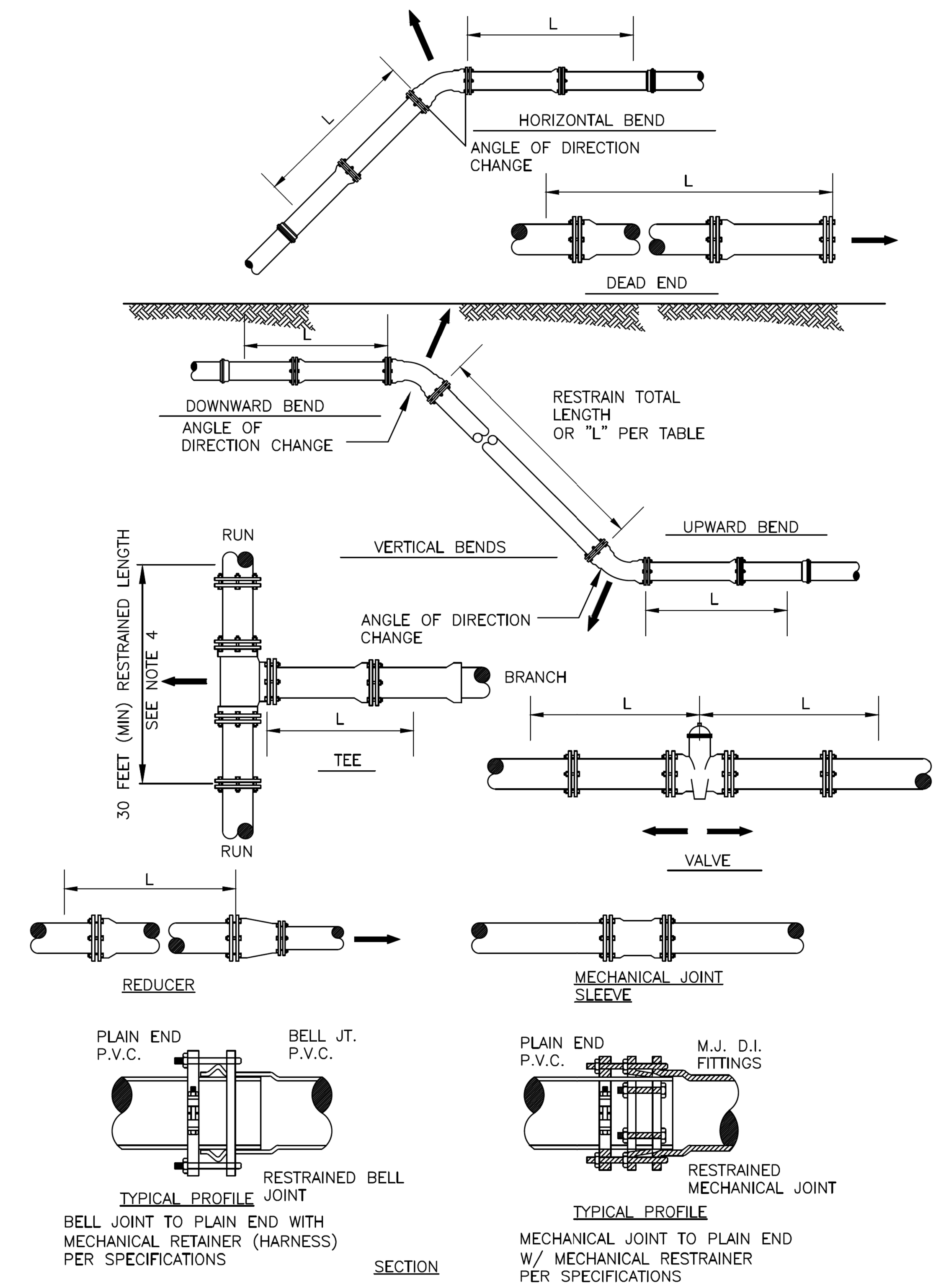
TRANSITION REDUCER

NOTES:

1. HDPE AND DIP SIZE SHALL BE AS NOTED ON THE DRAWINGS AT EACH TRANSITION. PIPE CLASS AND THICKNESS AS SPECIFIED.
2. SEE DRAWING NOTES AND SPECIFICATIONS FOR DI FITTING CLASS.
3. TRANSITION TO DIP SHALL OCCUR AFTER HDD ALIGNMENT HAS REACHED NEAR HORIZONTAL SLOPE.

TRANSITION REDUCER AND JOINT RESTRAINT

NTS



PVC PIPE RESTRAINT NOTES:

1. THE "PVC PIPE RESTRAINT JOINT SCHEDULE" SHALL BE UTILIZED ON ALL PVC PIPING.
2. ASSUMPTIONS: PVC PIPE, SAFETY FACTOR=1.5, TEST PRESSURE=200PSI, SOIL=GW, TRENCH TYPE 5, DEPTH OF COVER=36 INCHES. CALCULATIONS DONE IN ACCORDANCE WITH AWWA M23 AND M41 MANUALS.
3. BENDS AND VALVES: SHALL BE RESTRAINED ON EACH SIDE OF FITTING W/MECHANICAL JOINT AND BELL RESTRAINT WHERE APPLICABLE.
4. TEES, BLOW-OFF, ARV, AND FIRE HYDRANT FITTINGS: TOTAL LENGTH BETWEEN FIRST JOINTS OR RESTRAINED LENGTH ON EITHER SIDE OF TEE OR FITTING (RUN) SHALL BE A TOTAL DISTANCE OF 30 FEET (MIN). SEE SCHEDULE FOR RESTRAINED LENGTH ON TEE "BRANCH" LINE.
5. HDPE TO PVC TRANSITIONS: THE PVC PIPE SIDE SHALL BE RESTRAINED 35 FT (MIN).
6. CONTRACTOR SHALL USE FULL (20 FT NOMINAL) LENGTH JOINTS OF PVC PIPE INTO AND OUT OF EACH FITTING UNLESS OTHERWISE DIRECTED. WHERE SHORTER JOINTS ARE REQUIRED ON EITHER SIDE OF A FITTING ADDITIONAL JOINT RESTRAINT MAY BE REQUIRED BY USE OF HARNESS ASSEMBLIES PER THE SPECIFICATION.
7. WHERE THE CALCULATED RESTRAINED JOINT LENGTH IS LESS THAN OR EQUAL TO 20 FEET (NOMINAL LENGTH OF ONE JOINT OF PIPE) THE FITTING ONLY SHALL BE RESTRAINED BY USE OF A MECHANICAL JOINT RETAINER GLAND DESIGNED FOR USE WITH PVC PIPING IN ACCORDANCE WITH THE SPECIFICATIONS.
8. WHERE THE CALCULATED RESTRAINED JOINT LENGTH IS GREATER THAN OR EQUAL TO 20 FEET THE FITTING SHALL BE RESTRAINED BY USE OF A MECHANICAL JOINT RETAINER GLAND DESIGNED FOR USE WITH PVC PIPING IN ACCORDANCE WITH THE SPECIFICATIONS. IN ADDITION TO THE FITTING THE FOOTAGE SPECIFIED IN THE TABLE UPSTREAM/DOWNSTREAM OF THE FITTING SHALL BE RESTRAINED BY USE OF HARNESSED JOINT ASSEMBLIES (BELL RESTRAINT SYSTEMS) DESIGNED FOR USE WITH PVC PIPE IN ACCORDANCE WITH THE SPECIFICATIONS.
9. WHERE NON-STANDARD CIRCUMSTANCES ARISE IN THE FIELD CONSULT THE ENGINEER PRIOR TO INSTALLATION OF RESTRAINT SYSTEMS. FAILURE TO CONSULT THE ENGINEER MAY REQUIRE EXCAVATION AND ADJUSTMENT TO THE RESTRAINED JOINT ASSEMBLIES.
10. ALL FITTINGS SHALL BE DUCTILE IRON MECHANICAL RESTRAINED JOINT FITTINGS IN ACCORDANCE WITH THE SPECIFICATIONS.
11. THE INSTALLATION OF BELL HARNESS RESTRAINTS AT PVC JOINTS SHALL BE COMPLETED PER THE MANUFACTURERS RECOMMENDATION, WHICH INCLUDES NOT OVER TIGHTENING THE PARALLEL RODS/NUTS. THESE NUTS SHOULD ONLY BE SNUG TIGHT. THE HOME MARKS ON THE PIPE SHOULD ALWAYS BE VISIBLE AFTER THE RESTRAINT IS INSTALLED.
12. WHERE ADJACENT OR OFFSET BENDS (NOT INCLUDING VALVES, OR DEADENDS) HAVE OVERLAPPING RESTRAINED LENGTHS, ALL PIPE BETWEEN THE BENDS SHALL BE RESTRAINED. RESTRAINED LENGTH FOR THE OUTERMOST BENDS SHALL BE TWICE THE SELECTED LENGTH FROM THE STANDARD LENGTHS TABLE INCLUDED IN THIS DETAIL FOR PVC PIPE.

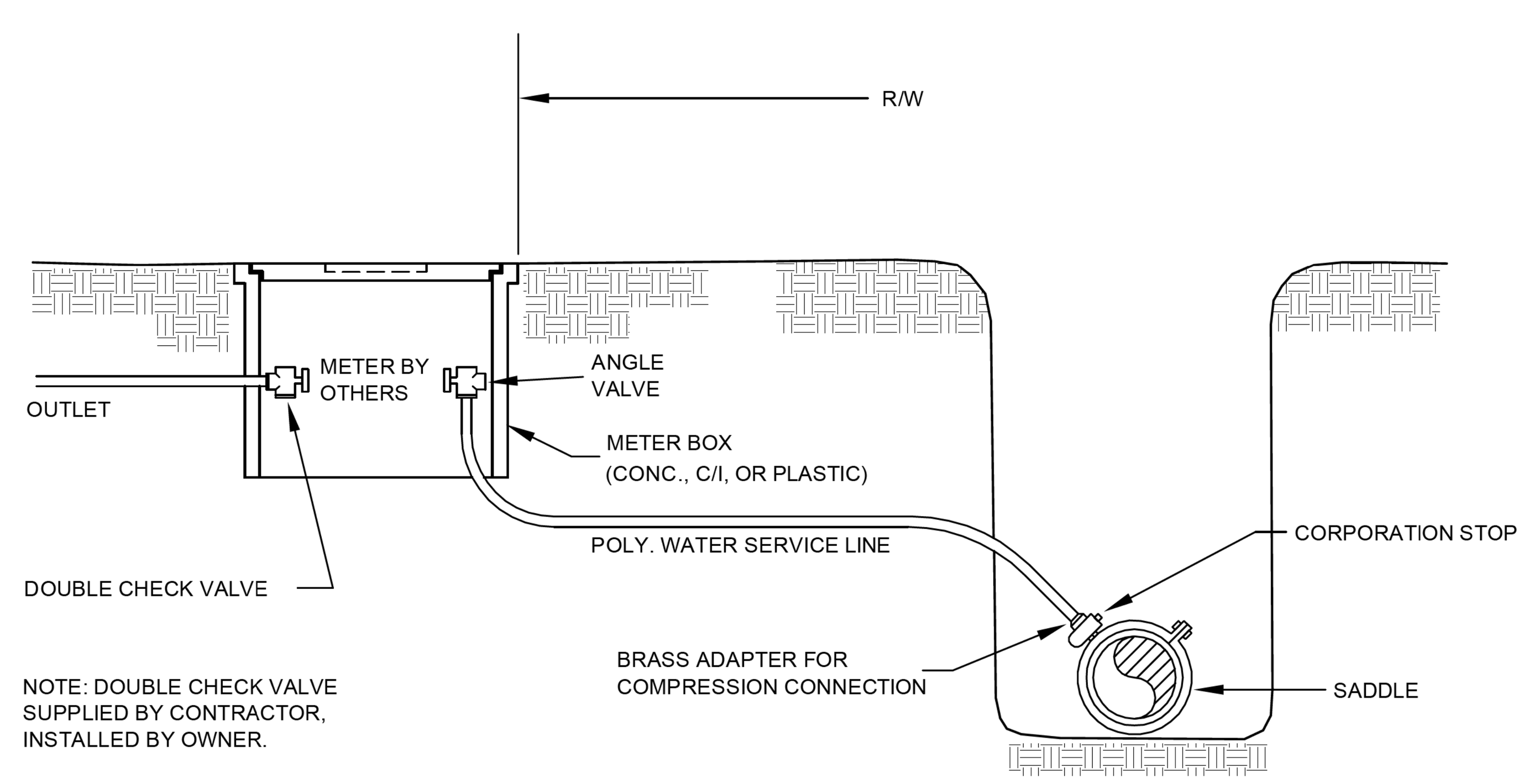
SUMMARY TABLE - PVC PIPE RESTRAINED JOINT LENGTHS

NOMINAL PIPE SIZE (IN)	HORIZONTAL BENDS			VERTICAL BENDS						VALVES
	45° BENDS L (FT)	22.5° BENDS L (FT)	11.25° BENDS L (FT)	45° BENDS L (FT) VERTICAL UP BEND	45° BENDS L (FT) VERTICAL DN BEND	22.5° BENDS L (FT) VERTICAL UP BEND	22.5° BENDS L (FT) VERTICAL DN BEND	11.25° BENDS L (FT) VERTICAL UP BEND	11.25° BENDS L (FT) VERTICAL DN BEND	L (FT)
6	12	6	3	12	42	6	21	3	10	101
TEES SEE NOTE 4			REDUCERS							
RUN SIZE (IN)	BRANCH SIZE (IN)	L (FT)	SIZE (IN)	L (FT)						
			8"x6"	44						

Notes:
***F.O. = Fitting Only

RESTRAINED JOINT DETAIL

NTS



NOTE: DOUBLE CHECK VALVE SUPPLIED BY CONTRACTOR, INSTALLED BY OWNER.

2" SERVICE CONNECTION DETAIL

NTS

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8/17/99

REVISIONS

NOTES:
1. ELEVATION OF EXISTING 6″ WATERLINE AT WATERLINE TIE-IN LOCATIONS IS ASSUMED TO BE 3 FEET BELOW EXISTING GRADE. CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF THE EXISTING WATERLINE PRIOR TO MAKING CONNECTION AND ADJUST PIPE AS NEEDED LEADING UP TO CONNECTION.
2. REFER TO THE RESTRAINED JOINT DETAIL ON SHEET UC-3A FOR RESTRAINED JOINT LENGTHS.
3. CONTRACTOR SHALL RESTRAIN THE EXISTING WATERLINE BY EXCAVATING AND INSTALLING A BELL AND HARNESS RESTRAINT AROUND EACH PIPE JOINT FOR A MINIMUM LENGTH AS SPECIFIED IN THE RESTRAINED JOINT DETAIL ON SHEET UC-3A. IF THE REQUIRED RESTRAINED LENGTH DOESN'T END AT A PIPE JOINT, CONTRACTOR SHALL INSTALL BELL AND HARNESS RESTRAINT ON THE NEXT PIPE JOINT PAST THE REQUIRED RESTRAINED LENGTH.
4. ALL DUCTILE IRON PIPE SHALL BE RESTRAINED.
5. CONTRACTOR SHALL PROVIDE END CAP WITH 2″ IPT CONNECTOR FOR TEMPORARY BLOWOFF TO TEST THE WATERLINE. SUPER-CHLORINATED WATER SHALL BE DISCHARGED AND DISCHARGED WATER SHALL BE DECHLORINATED AS APPROVED BY THE ENGINEER.

PROJECT REFERENCE NO.	SHEET NO.
17BP.2.R.89	UC-4
DESIGNED BY: SRM	
DRAWN BY: MNG	
CHECKED BY: SRM	
APPROVED BY: MKS	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	

NORTH CAROLINA PROFESSIONAL ENGINEER SEAN R. MCFEE 47732 — Digitally signed by Sean R McFee — 2/15/2019

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROP. 6″-45° BEND -WL1- STA. 0+36.76 = -L- STA. 21+13.66, 29.36′ LT

PROP. 8″X6″ REDUCER -WL1- STA. 0+87.50

PROP. 6″-45° BEND -WL1- STA. 5+84.45 = -L- STA. 26+61.35, 32.12′ LT

PROP. 8″X6″ REDUCER -WL1- STA. 5+39.96

PROP. 6″ DIP WATERLINE

PROP. 6″-45° BEND -WL1- STA. 6+09.80 = -L- STA. 26+79.40, 14.33′ LT

END SHOULDER BERM GUTTER -L- STA. 23+34.94 LT/RT

BEGIN SHOULDER BERM GUTTER -L- STA. 23+01.00 LT/RT

15″ RCP-V

15″ RCP-III

1 TONS CLASS 'B' RIP RAP 5 SY GEOTEXTILE

SEE NOTE 5

BEGIN: CONNECT TO EXIST. 6″ PVC WATERLINE WITH A 6″ TRANSITION COUPLING -WL1- STA. 0+00.00 = -L- STA. 20+81.87, 17.35′ LT

PROP. 6″ GATE VALVE -WL1- STA. 0+11.20

REMOVE 33.0′ OF 6″ PVC WATERLINE

PROP. 6″-45° BEND -WL1- STA. 0+20.00 = -L- STA. 21+01.87, 17.45′ LT

PROP. 6″ DIP WATERLINE

ABANDON 218.0′ OF 6″ PVC WATERLINE

ABANDON 6″ GATE VALVE AFTER NEW WATERLINE IS INSTALLED

REMOVE 125.0′ OF 6″ PVC WATERLINE

ABANDON 6″ GATE VALVE AFTER NEW WATERLINE IS INSTALLED

ABANDON 214.0′ OF 6″ PVC WATERLINE

END: CONNECT TO EXIST. 6″ PVC WATERLINE WITH A 6″ TRANSITION COUPLING -WL1- STA. 6+24.80 = -L- STA. 26+94.40, 14.43′ LT

PROP. 6″ GATE VALVE -WL1- STA. 6+16.57

REMOVE 29.0′ OF 6″ PVC WATERLINE

ABANDON 6″ UTILITY PIPE

TB 2GI (0401)

(0402)TB 2GI

(0403)

SR 1422 (MARKET STREET EXT.)

22 BST

EXISTING R/W

WOODS

BIG SWAMP

PROPERTY LINE RUNS ALONG MOYES BEAVER DAM SWAMP

ASHLEY McMULLAN WOOLARD DB 1761 PG 885

M.U. HODGES, et ux DB 817 PG 897

JIMMY C. HARDISON DB 933 PG 650 PC "A" SLIDE 68

50′ 25′ 0′ 50′ 100′ PLANS

3′ MIN. BURIAL DEPTH (TYP.)

HORIZONTAL DIRECTIONAL DRILL LIMITS

-WL1- STA. 0+91.65

EXIST. GRADE

-WL1- STA. 5+39.24

EXIST. 6″ PVC WATERLINE -WL1- STA. 0+00.00

PROP. 8″ HDPE DR II WATERLINE

PROP. 6″ GATE VALVE -WL1- STA. 0+11.20

PROP. 6″ 45° BEND -WL1- STA. 0+20.00

PROP. 6″ 45° BEND -WL1- STA. 0+36.76

PROP. 6″ DIP WATERLINE

PROP 8″X6″ REDUCER SEE DIP/HDPE TRANSITION IN DETAIL SHEET UC-3B -WL1- STA. 0+87.50

R=600′

12°

15.00′

117.00′ HORIZONTAL PIPE

BEGIN VERTICAL CURVE -WL1- PC STA. 1+33.15 EL. 19.70

END VERTICAL CURVE -WL1- PT STA. 2+58.21 EL. 6.60

BEGIN VERTICAL CURVE -WL1- PC STA. 3+75.21 EL. 6.60

END VERTICAL CURVE -WL1- PT STA. 4+99.96 EL. 19.70

EXIST. 6″ PVC WATERLINE -WL1- STA. 6+24.80

PROP. 6″ GATE VALVE -WL1- STA. 6+16.57

PROP. 6″ 45° BEND -WL1- STA. 6+09.80

PROP. 6″ 45° BEND -WL1- STA. 5+84.45

PROP. 6″ DIP WATERLINE

PROP 8″X6″ REDUCER SEE DIP/HDPE TRANSITION IN DETAIL SHEET UC-3B -WL1- 5+39.96

40 30 20 10 0 -10 -20 -30 -40

0+00 1+00 2+00 3+00 4+00 5+00 6+00

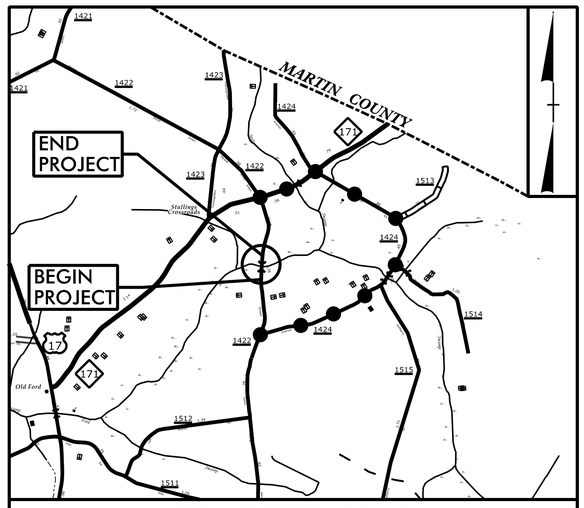
50′ 25′ 0′ 50′ 100′ PROFILE (HORIZONTAL)

10′ 5′ 0′ 10′ 20′ PROFILE (VERTICAL)

09/08/09

TIP PROJECT: B–4427

CONTRACT:



VICINITY MAP

DETOUR ROUTE *N. T. S.*

T.I.P. NO.	SHEET NO.
B–4427	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.

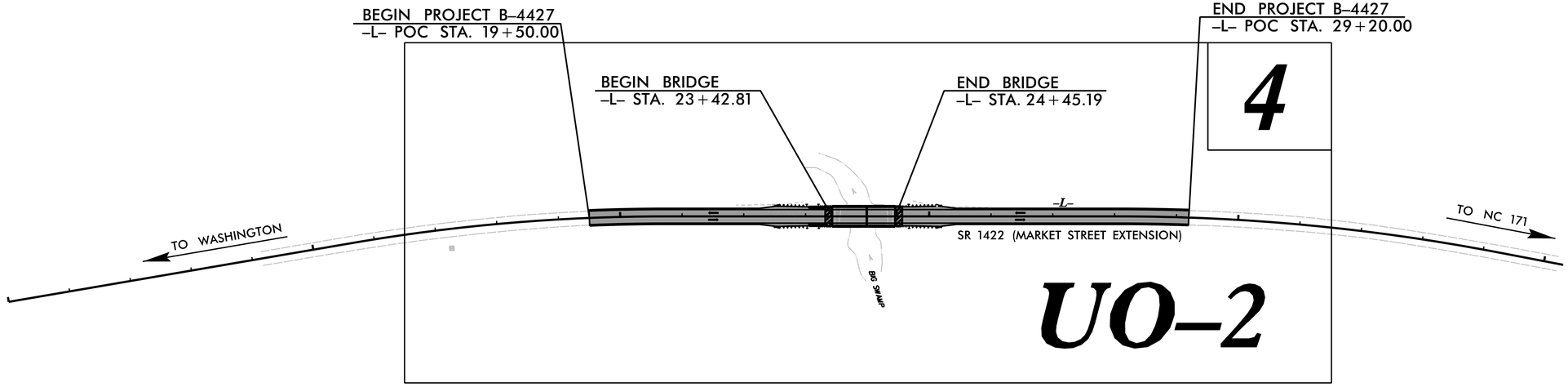
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
BEAUFORT COUNTY

LOCATION: REPLACE BRIDGE 6 OVER BIG SWAMP ON SR 1422 (MARKET STREET EXTENSION)

TYPE OF WORK: COMMUNICATIONS

NAD 83/
NA 2011



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 02

DIV ADDRESS
1037 W.H. Smith Blvd
P.O. Box 1587
Greenville, NC 27835

Heather Lane, PE — *DIVISION CONTACT #1*
David Kramer — *DIVISION CONTACT #2*

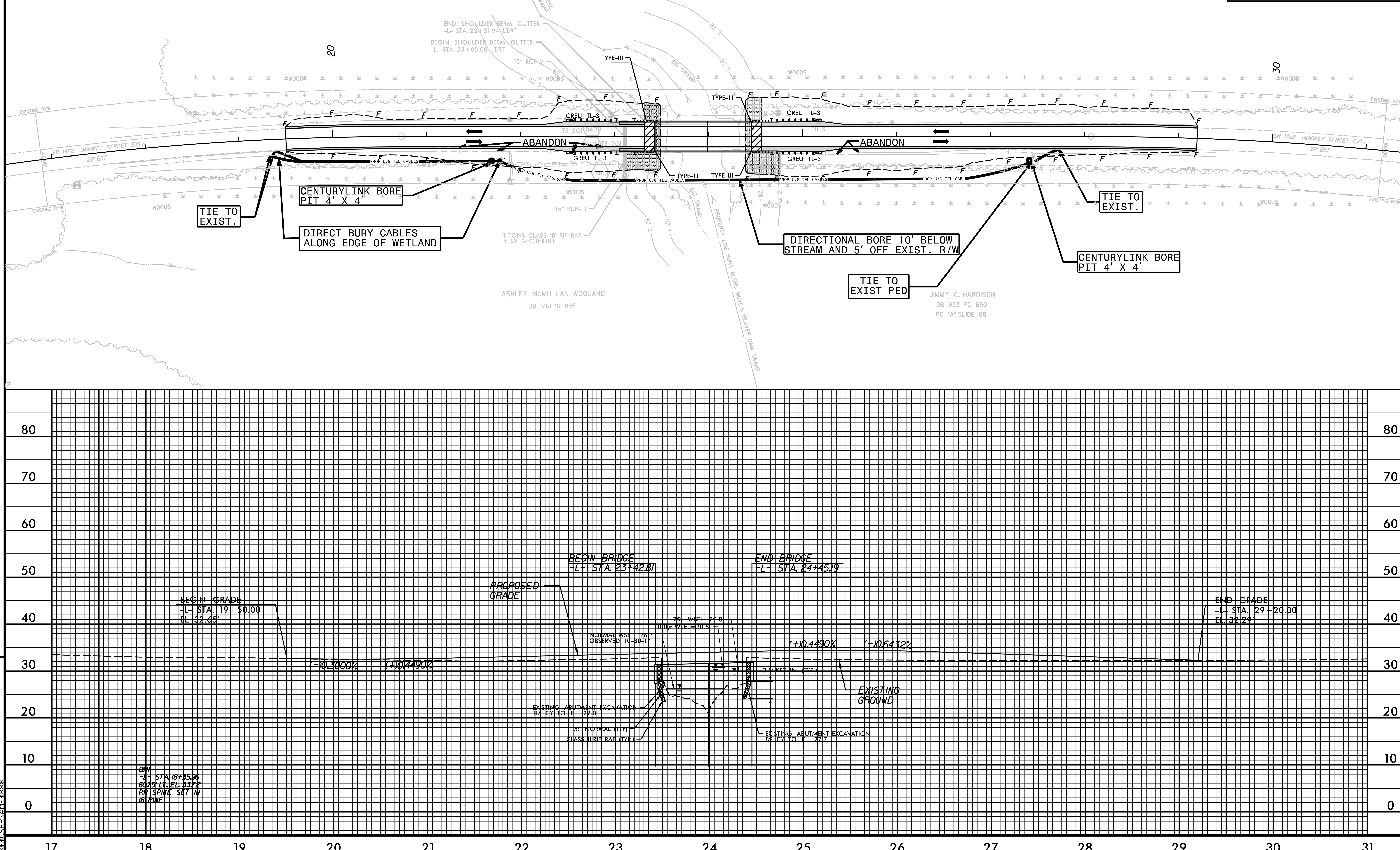
$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-4427	UO-2

THIS SHEET CORRESPONDS TO RDY-4

UTILITIES BY OTHERS

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.



REVISIONS

8/17/99

DL-6NX4KC2.5/7/2018.c:\ow_pl1\lett2\d0906244\B-4427_Earthwork XSC Volume Summary.xls
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PROJ. REFERENCE NO.	SHEET NO.
17BP.2.R.89	X-1A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY

NOTE: EMBANKMENT DOES NOT COLUMN INCLUDES BACKFILL FOR UNDERCUT

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
19+50.00	0	0
20+00.00	8	8
20+50.00	6	16
21+00.00	4	27
21+50.00	2	47
22+00.00	1	71
22+50.00	1	96
23+00.00	1	97
23+42.81	17	78

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
24+50.00	0	0
25+00.00	5	201
25+50.00	0	190
26+00.00	0	139
26+50.00	0	124
27+00.00	0	96
27+50.00	0	72
28+00.00	0	70
28+50.00	2	64
29+00.00	5	42
29+20.00	3	11

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

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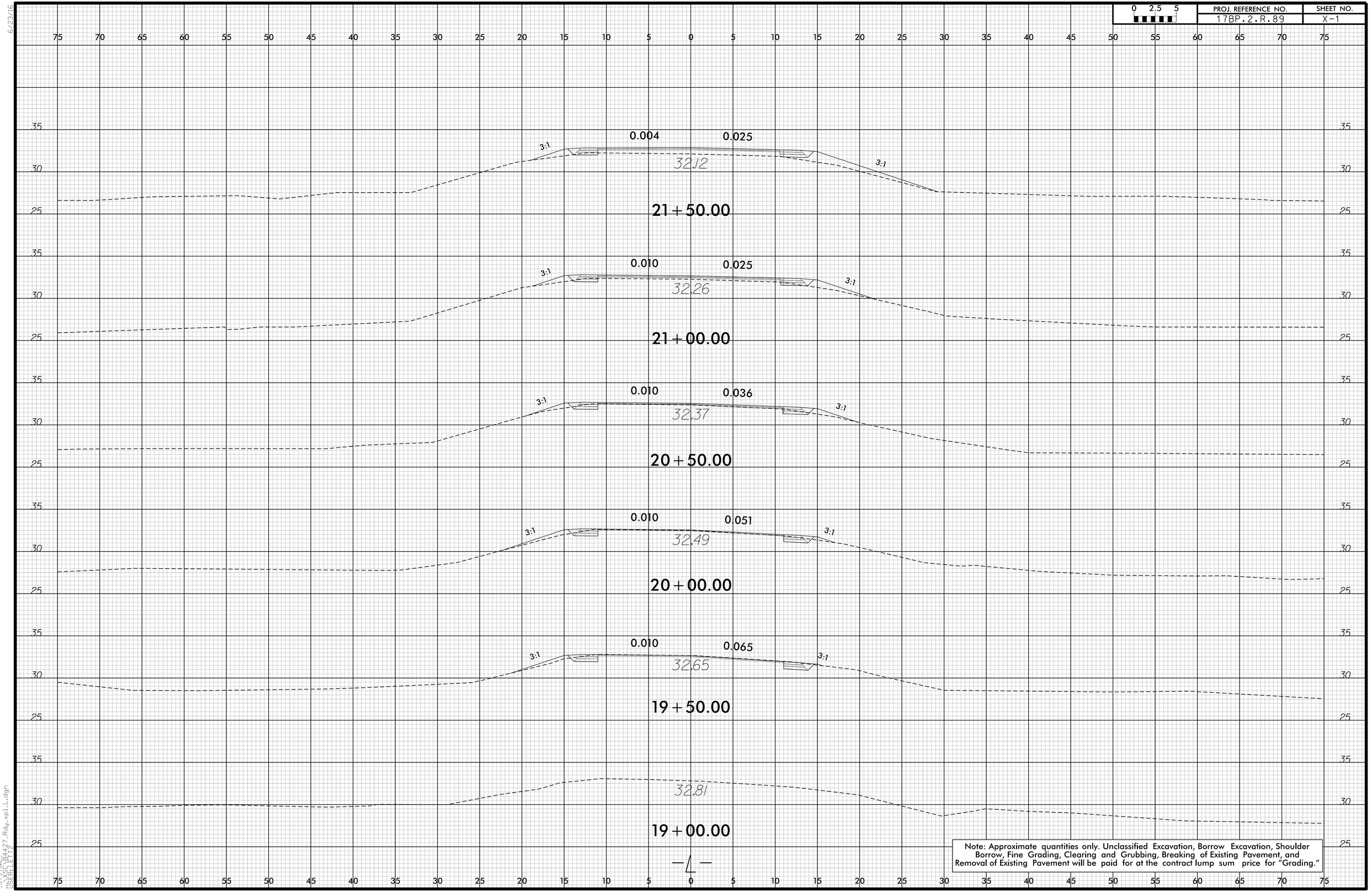
6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.2.R.89	X-1



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

-SYSTIME
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USER: LEE12
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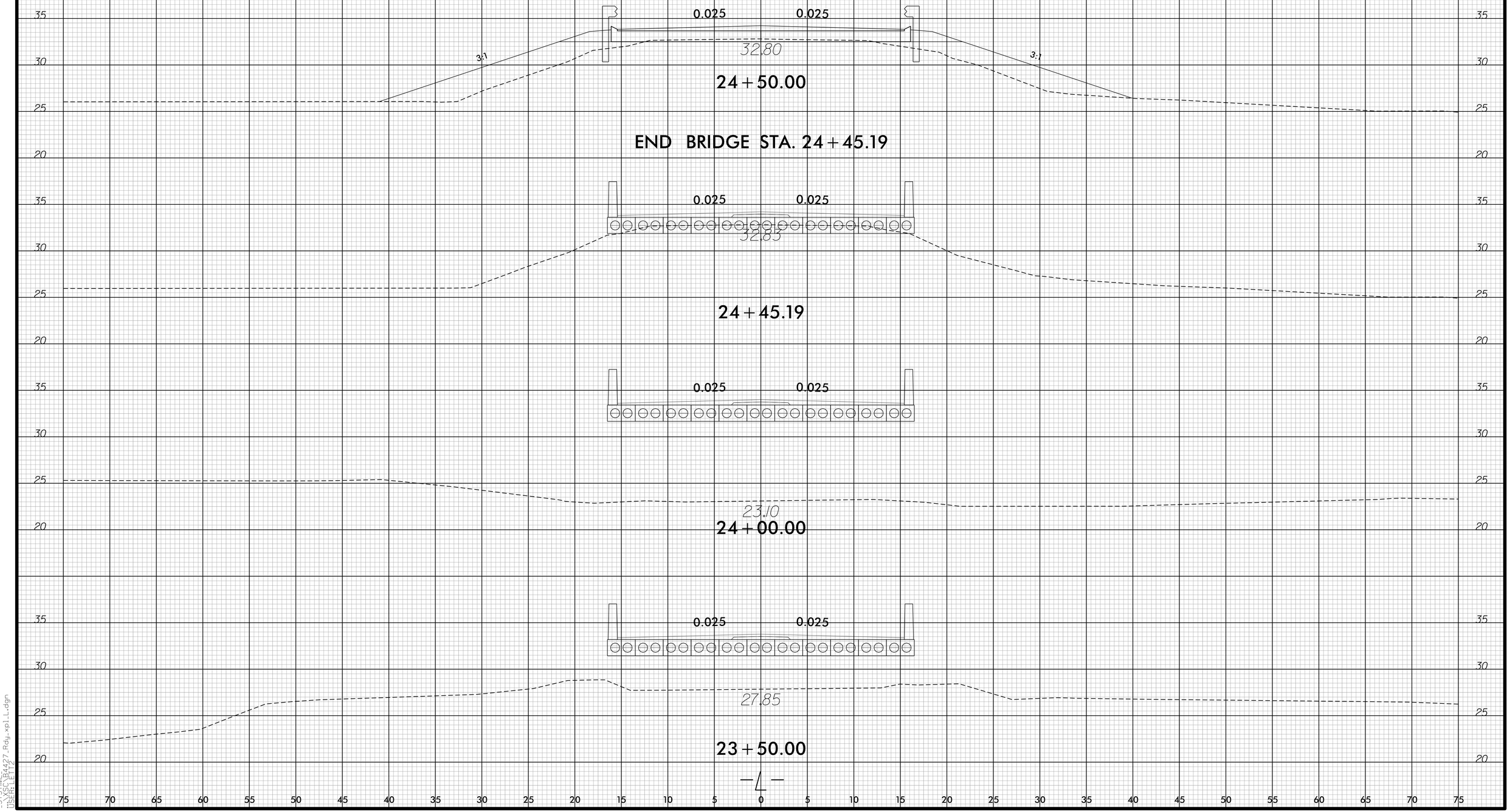

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USER: LHB

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	17BP.2.R.89	X-4

6/23/16

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	17BP.2.R.89	X-5

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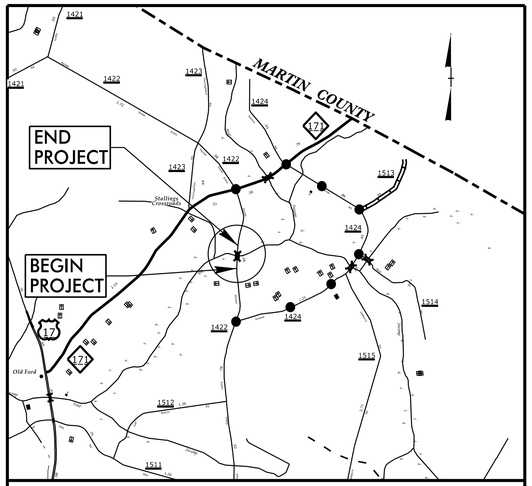
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.2.R.89	X-6

PROJECT: 17BP.2.R.89

CONTRACT: DB00416

STRUCTURE



VICINITY MAP

OFF–SITE DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

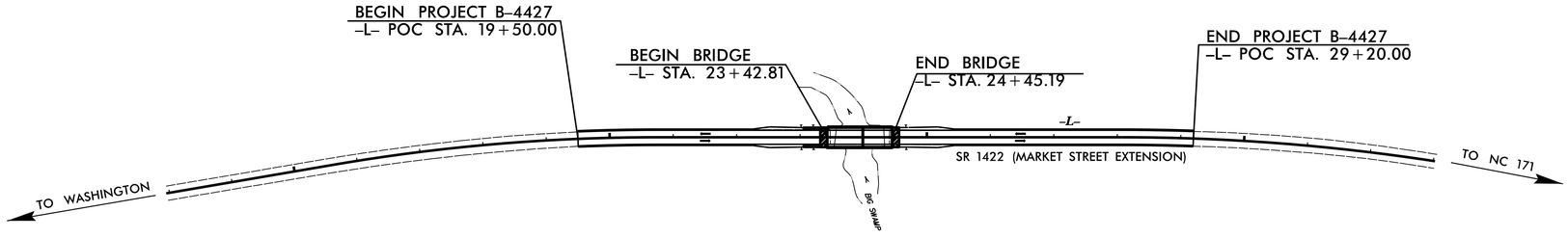
BEAUFORT COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.2.R.89		19

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.2.R.89	N/A	P.E.
17BP.2.R.89	N/A	UTIL. & R/W
17BP.2.R.89	N/A	CONSTR.

LOCATION: REPLACE BRIDGE 6 OVER BIG SWAMP ON SR 1422 (MARKET STREET EXTENSION)

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



NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

DocuSigned by: Ting Fang 60E43C9AEA60462...

7/11/2019

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT 2018 = 1500 VPD
ADT 2038 = 2800 VPD
K = N/A %
D = N/A %
T = 7 % *
V = 60 MPH
* TTST = DUAL
FUNC CLASS = COLLECTOR
SUB–REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT 17BP.2.R.89 = 0.165 MILES

LENGTH STRUCTURE TIP PROJECT 17BP.2.R.89 = 0.019 MILES

TOTAL LENGTH OF TIP PROJECT 17BP.2.R.89 = 0.184 MILES

Prepared In the Office of:

DIVISION OF HIGHWAYS

STRUCTURES MANAGEMENT UNIT

1000 BIRCH RIDGE DR.

RALEIGH, N.C. 27610

2018 STANDARD SPECIFICATIONS

LETTING DATE : AUGUST 28, 2019

DAVID Z. KEISER, P.E.
PROJECT ENGINEER

TING H. FANG, P.E.
PROJECT DESIGN ENGINEER

CDM Smith

CDM SMITH
5400 Glenwood Avenue, Suite 400
Raleigh, NC 27612–3228
NC COA No. F–1255

DocuSign Envelope ID: BDB26A4D-BAD4-451A-8924-14C4700842DC

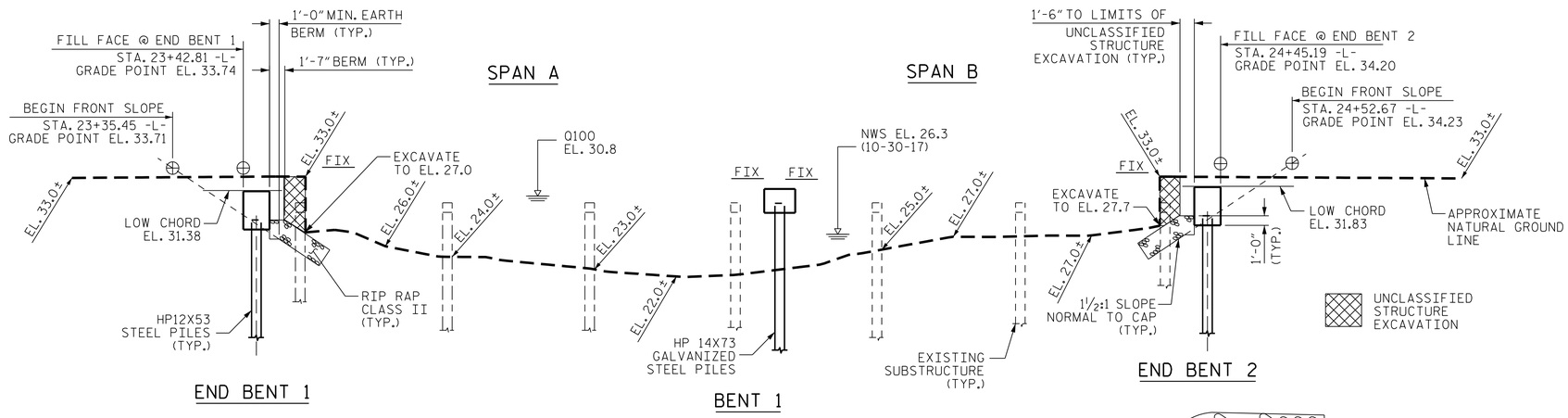
23+50 24+00 24+50

50 40 30 20

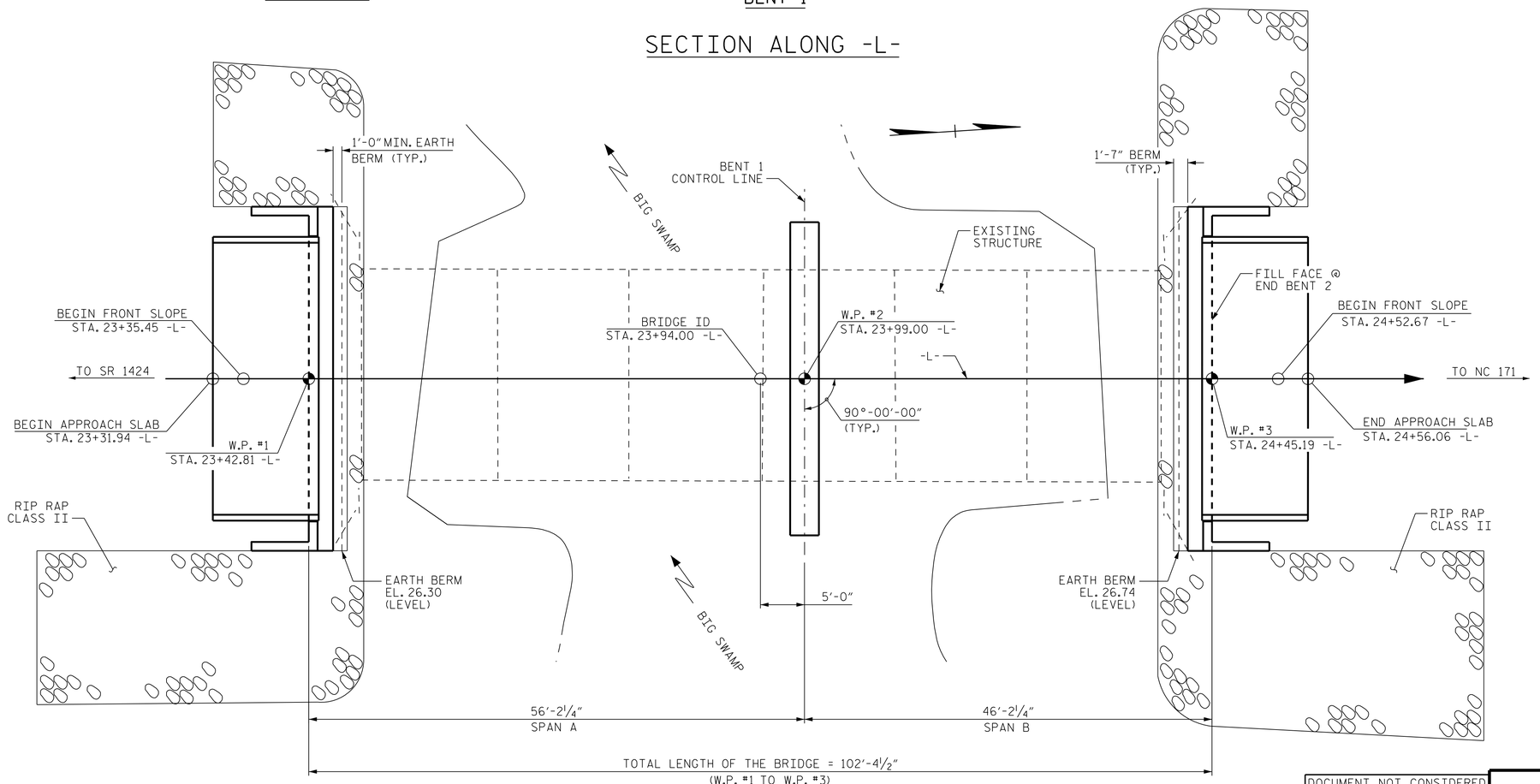
+0.4490% (-)0.6432%

PVI STA. = 25+50.00 -L-
PVI EL. = 34.67'
V.C. = 170'

GRADE DATA -L-



SECTION ALONG -L-



PLAN
(PILES NOT SHOWN FOR CLARITY)

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. 17BP.2.R.89
BEAUFORT COUNTY
STATION: 23+94.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER
BIG SWAMP ON SR 1422
BETWEEN SR 1424 & NC 171

CDM Smith
CDM SMITH
5400 Glenwood Avenue, Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

DRAWN BY : VDK DATE : 03/18
CHECKED BY : THF DATE : 03/18
DESIGN ENGINEER : VDK DATE : 03/18

DWG. No.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSIUNG FANG
Ting Fang
5/11/2018 6:44:52 AM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-01
1			3			TOTAL SHEETS
2			4			19

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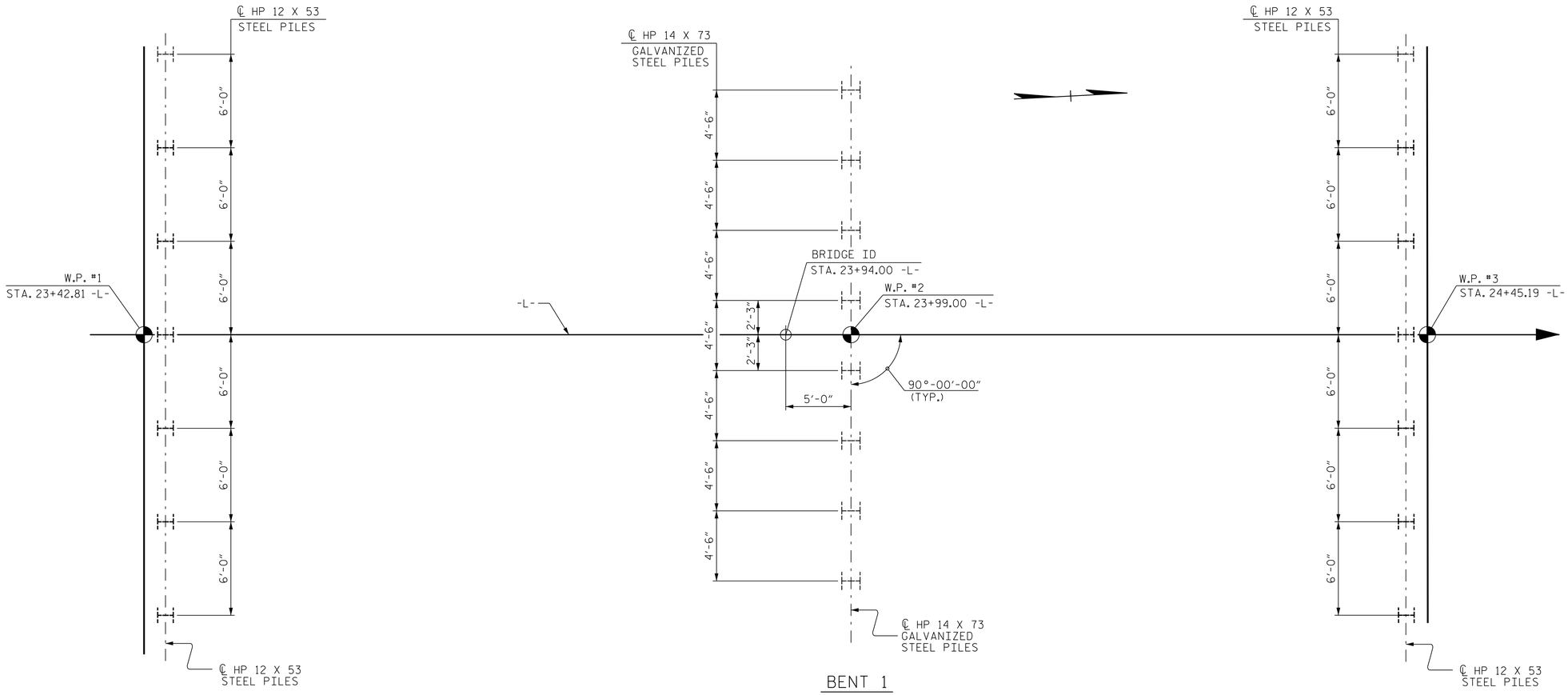

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES.

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 71 TONS PER PILE.

PILES AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 118 TONS PER PILE.

PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 61 TONS PER PILE.

DRIVE PILES AT END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 120 TONS PER PILE.

DRIVE PILES AT BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 205 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 105 TONS PER PILE.

INSTALL PILES AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN -10.0 FT.

THE SCOUR CRITICAL ELEVATION FOR BENT 1 IS ELEVATION 9.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEM DURING THE LIFE OF THE STRUCTURE.

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. 17BP.2.R.89

BEAUFORT COUNTY

STATION: 23+94.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER
BIG SWAMP ON SR 1422
BETWEEN SR 1424 & NC 171

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CDM Smith
CDM SMITH
5400 Glenwood Avenue, Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

DRAWN BY : VDK DATE : 03/18
CHECKED BY : THF DATE : 03/18
DESIGN ENGINEER : VDK DATE : 03/18

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSILING FANG
Ting Fang
5/11/2018 6:44:52 AM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-02
1			3			TOTAL SHEETS
2			4			19

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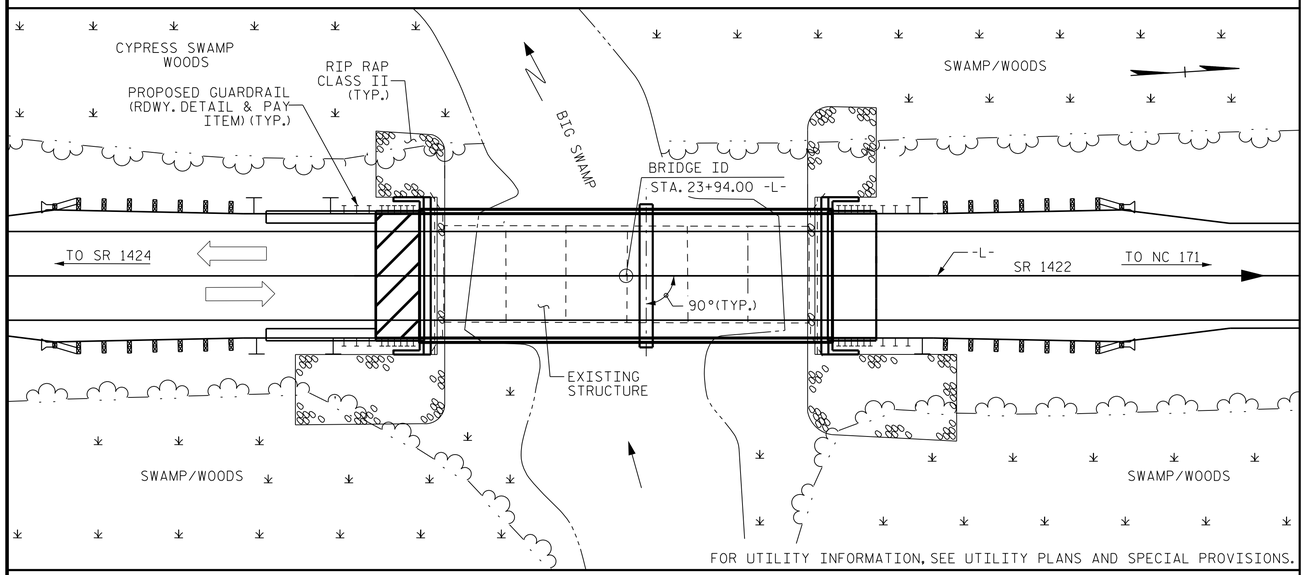
DATE: 4/6/2018 4:28:49 PM

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR HP 14X73 GALVANIZED STEEL PILES	HP 12 X 53 STEEL PILES		HP 14 X 73 GALVANIZED STEEL PILES		PILE REDRIVES	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS		FIBER OPTIC CONDUIT SYSTEM
	LUMP SUM	LUMP SUM	EA.	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	EA.	EA.	NO.	LIN. FT.	NO.	LIN. FT.	EA.	LIN. FT.	TON	SQ. YD.	LUMP SUM	NO.	LIN. FT.	LIN. FT.
SUPERSTRUCTURE															200.25			LUMP SUM	22	1,100	196.25
END BENT 1				LUMP SUM	21.6		2,636	7		7	490.0			4		160	180				
BENT 1					10.7		2,136		8			8	600.0	4							
END BENT 2				LUMP SUM	21.6		2,636	7		7	455.0			4		210	235				
TOTAL	LUMP SUM	LUMP SUM	1	LUMP SUM	53.9	LUMP SUM	7,408	14	8	14	945.0	8	600.0	12	200.25	370	415	LUMP SUM	22	1,100	196.25

B.M. #1: RR SPIKE IN 24" HARDWOOD, 31.59' RIGHT OF STA. 17+23.03 -L-, EL. 33.57



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

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

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

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

FOR BENT 1, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE BENT 1 SHEET FOR REQUIRED GALVANIZED LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 30 FT. BOTH SIDES, AT END BENTS 1 AND 2 OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE EXISTING STRUCTURE CONSISTING OF 6 SPANS: 1 @ 15'-10", 1 @ 14'-10", 1 @ 15'-4", 1 @ 14'-10", 1 @ 15'-1" AND 1 @ 15'-10" WITH A 3" AWS CLEAR ROADWAY WIDTH OF 24'-0" AND RC DECK ON TIMBER JOISTS (BMD-10), SUBSTRUCTURE CONSISTING OF TIMBER CAP ON TIMBER PILES AND STEEL CRUTCH BENTS ADDED AT END BENTS AND INTERIOR BENTS LOCATED AT THE SITE OF THE PROPOSED BRIDGE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

FOR FIBER OPTIC CONDUIT SYSTEM, SEE SPECIAL PROVISIONS.

ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.

HYDRAULIC DATA

DESIGN DISCHARGE	= 1770 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YR.
DESIGN HIGH WATER ELEVATION	= 29.8 FT.
DRAINAGE AREA	= 21.0 SQ. MI.
BASE DISCHARGE (Q100)	= 2717 CFS
BASE HIGH WATER ELEVATION	= 30.8 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 4100 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 500 YRS.
OVERTOPPING FLOOD ELEVATION	= 32.5 FT.*

*ELEVATION IS TAKEN AT STA. 20+22.0 -L- SAG POINT.

PROJECT NO. 17BP.2.R.89

BEAUFORT COUNTY

STATION: 23+94.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER
BIG SWAMP ON SR 1422
BETWEEN SR 1424 & NC 171

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CDM Smith
CDM SMITH
5400 Glenwood Avenue, Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

DRAWN BY : VDK DATE : 03/18
CHECKED BY : THF DATE : 03/18
DESIGN ENGINEER : VDK DATE : 03/18

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSIUNG FANG

DocuSigned by: Ting Fang 7/18/2019
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-03
1			3			TOTAL SHEETS
2			4			19

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DATE: 7/18/2019 9:26:08 PM

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LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR PRESTRESSED CONCRETE CORED SLAB UNITS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	1	1.055	--	1.75	0.275	1.23	55′	EL	27	0.523	1.23	55′	EL	5.4	0.80	0.275	**1.05**	55′	EL	**27**	
		HL-93(Opr)	N/A	--	1.591	--	1.35	0.275	1.59	55′	EL	27	0.523	1.59	55′	EL	5.4	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	2	1.322	47.585	1.75	0.275	1.54	55′	EL	27	0.523	1.47	55′	EL	5.4	0.80	0.275	**1.32**	55′	EL	**27**	
		HS-20(Opr)	36.000	--	1.900	68.396	1.35	0.275	1.99	55′	EL	27	0.523	1.90	55′	EL	5.4	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.776	37.476	1.4	0.275	4.04	55′	EL	27	0.523	4.17	55′	EL	5.4	0.80	0.275	2.78	55′	EL	27	
		SNGARBS2	20.000	--	2.155	43.095	1.4	0.275	3.14	55′	EL	27	0.523	3.02	55′	EL	5.4	0.80	0.275	2.15	55′	EL	27	
		SNAGRIS2	22.000	--	2.079	45.734	1.4	0.275	3.03	55′	EL	27	0.523	2.83	55′	EL	5.4	0.80	0.275	2.08	55′	EL	27	
		SNCOTTS3	27.250	--	1.384	37.708	1.4	0.275	2.01	55′	EL	27	0.523	2.09	55′	EL	5.4	0.80	0.275	1.38	55′	EL	27	
		SNAGGRS4	34.925	--	1.189	41.527	1.4	0.275	1.73	55′	EL	27	0.523	1.77	55′	EL	5.4	0.80	0.275	1.19	55′	EL	27	
		SNS5A	35.550	--	1.160	41.255	1.4	0.275	1.69	55′	EL	27	0.523	1.82	55′	EL	5.4	0.80	0.275	1.16	55′	EL	27	
		SNS6A	39.950	--	1.079	43.102	1.4	0.275	1.57	55′	EL	27	0.523	1.68	55′	EL	5.4	0.80	0.275	1.08	55′	EL	27	
		SNS7B	42.000	--	1.028	43.175	1.4	0.275	1.50	55′	EL	27	0.523	1.67	55′	EL	5.4	0.80	0.275	1.03	55′	EL	27	
	TTST	TNAGRIT3	33.000	--	1.320	43.556	1.4	0.275	1.92	55′	EL	27	0.523	1.98	55′	EL	5.4	0.80	0.275	1.32	55′	EL	27	
		TNT4A	33.075	--	1.330	43.979	1.4	0.275	1.94	55′	EL	27	0.523	1.91	55′	EL	5.4	0.80	0.275	1.33	55′	EL	27	
		TNT6A	41.600	--	1.101	45.811	1.4	0.275	1.60	55′	EL	27	0.523	1.83	55′	EL	5.4	0.80	0.275	1.10	55′	EL	27	
		TNT7A	42.000	--	1.114	46.804	1.4	0.275	1.62	55′	EL	27	0.523	1.71	55′	EL	5.4	0.80	0.275	1.11	55′	EL	27	
		TNT7B	42.000	--	1.163	48.848	1.4	0.275	1.69	55′	EL	27	0.523	1.62	55′	EL	5.4	0.80	0.275	1.16	55′	EL	27	
		TNAGRIT4	43.000	--	1.101	47.330	1.4	0.275	1.60	55′	EL	27	0.523	1.56	55′	EL	5.4	0.80	0.275	1.10	55′	EL	27	
		TNAGT5A	45.000	--	1.031	46.405	1.4	0.275	1.50	55′	EL	27	0.523	1.58	55′	EL	5.4	0.80	0.275	1.03	55′	EL	27	
		TNAGT5B	45.000	3	1.013	45.582	1.4	0.275	1.47	55′	EL	27	0.523	1.48	55′	EL	5.4	0.80	0.275	**1.01**	55′	EL	**27**	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

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

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

COMMENTS:

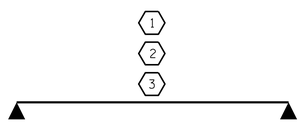
1.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)
(2) DESIGN LOAD RATING (HS-20)
(3) LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY
FOR SPAN A

PROJECT NO. 17BP.2.R.89
BEAUFORT COUNTY
STATION: 23+94.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR 55′ CORED SLAB UNIT 90°SKEW SPAN A
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-04
1			3			TOTAL SHEETS
2			4			19

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CDM Smith
CDM SMITH
5400 Glenwood Avenue, Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

DRAWN BY : VDK DATE : 03/18
CHECKED BY : THF DATE : 03/18
DESIGN ENGINEER : VDK DATE : 03/18

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
Ting Fang 5/11/2018 6:44:52 AM

FILE: c:\pw_pll\langth\d0996016\l401_007_17BP2R89_SHU_LRFR_004_060006.dgn
DATE: 4/18/2018 4:29:05 PM

STD. NO. 21LRFR1_75&90S_55L

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LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR PRESTRESSED CONCRETE CORED SLAB UNITS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	1	1.088	--	1.75	0.277	1.34	45'	EL	22	0.539	1.23	45'	EL	2.2	0.80	0.277	**1.09**	45'	EL	**22**	
		HL-93(Opr)	N/A	--	1.590	--	1.35	0.277	1.74	45'	EL	22	0.539	1.59	45'	EL	2.2	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	2	1.336	48.104	1.75	0.277	1.65	45'	EL	22	0.539	1.45	45'	EL	2.2	0.80	0.277	**1.34**	45'	EL	**22**	
		HS-20(Opr)	36.000	--	1.882	67.763	1.35	0.277	2.14	45'	EL	22	0.539	1.88	45'	EL	2.2	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.611	35.252	1.4	0.277	4.02	45'	EL	22	0.539	4.01	45'	EL	2.2	0.80	0.277	2.61	45'	EL	22	
		SNGARBS2	20.000	--	2.108	42.166	1.4	0.277	3.25	45'	EL	22	0.539	2.94	45'	EL	2.2	0.80	0.277	2.11	45'	EL	22	
		SNAGRIS2	22.000	--	2.067	45.466	1.4	0.277	3.15	45'	EL	17.6	0.539	2.77	45'	EL	2.2	0.80	0.277	2.07	45'	EL	22	
		SNCOTTS3	27.250	--	1.304	35.527	1.4	0.277	2.01	45'	EL	22	0.539	2.01	45'	EL	2.2	0.80	0.277	1.30	45'	EL	22	
		SNAGGRS4	34.925	--	1.150	40.181	1.4	0.277	1.77	45'	EL	22	0.539	1.74	45'	EL	2.2	0.80	0.277	1.15	45'	EL	22	
		SNS5A	35.550	--	1.121	39.841	1.4	0.277	1.73	45'	EL	22	0.539	1.79	45'	EL	2.2	0.80	0.277	1.12	45'	EL	22	
		SNS6A	39.950	--	1.056	42.175	1.4	0.277	1.63	45'	EL	22	0.539	1.67	45'	EL	2.2	0.80	0.277	1.06	45'	EL	22	
		SNS7B	42.000	3	1.006	42.268	1.4	0.277	1.55	45'	EL	22	0.539	1.68	45'	EL	2.2	0.80	0.277	**1.01**	45'	EL	**22**	
	TTST	TNAGRIT3	33.000	--	1.296	42.759	1.4	0.277	2.00	45'	EL	22	0.539	1.96	45'	EL	2.2	0.80	0.277	1.30	45'	EL	22	
		TNT4A	33.075	--	1.309	43.305	1.4	0.277	2.02	45'	EL	22	0.539	1.88	45'	EL	2.2	0.80	0.277	1.31	45'	EL	22	
		TNT6A	41.600	--	1.099	45.712	1.4	0.277	1.69	45'	EL	22	0.539	1.83	45'	EL	2.2	0.80	0.277	1.10	45'	EL	22	
		TNT7A	42.000	--	1.120	47.043	1.4	0.277	1.73	45'	EL	22	0.539	1.69	45'	EL	2.2	0.80	0.277	1.12	45'	EL	22	
		TNT7B	42.000	--	1.166	48.975	1.4	0.277	1.80	45'	EL	22	0.539	1.61	45'	EL	2.2	0.80	0.277	1.17	45'	EL	22	
		TNAGRIT4	43.000	--	1.111	47.757	1.4	0.277	1.71	45'	EL	22	0.539	1.55	45'	EL	2.2	0.80	0.277	1.11	45'	EL	22	
		TNAGT5A	45.000	--	1.033	46.505	1.4	0.277	1.59	45'	EL	22	0.539	1.59	45'	EL	2.2	0.80	0.277	1.03	45'	EL	22	
		TNAGT5B	45.000	--	1.009	45.408	1.4	0.277	1.56	45'	EL	22	0.539	1.47	45'	EL	2.2	0.80	0.277	1.01	45'	EL	22	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

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

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

COMMENTS:

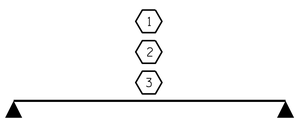
1.
2.
3.
4.

 # CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)
2 DESIGN LOAD RATING (HS-20)
3 LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY
FOR SPAN B

PROJECT NO. 17BP.2.R.89
BEAUFORT COUNTY
STATION: 23+94.00 -L-

SHEET 2 OF 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CDM Smith
CDM SMITH
5400 Glenwood Avenue, Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

DRAWN BY : VDK DATE : 03/18
CHECKED BY : THF DATE : 03/18
DESIGN ENGINEER : VDK DATE : 03/18

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSIUNG FANG
Ting Fang
5/11/2018 6:44:52 AM

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

LRFR SUMMARY FOR 45' CORED SLAB UNIT 90°SKEW SPAN B

(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-05
1			3			TOTAL SHEETS
2			4			19

STD. NO. 21LRFR1_75&90S_45L

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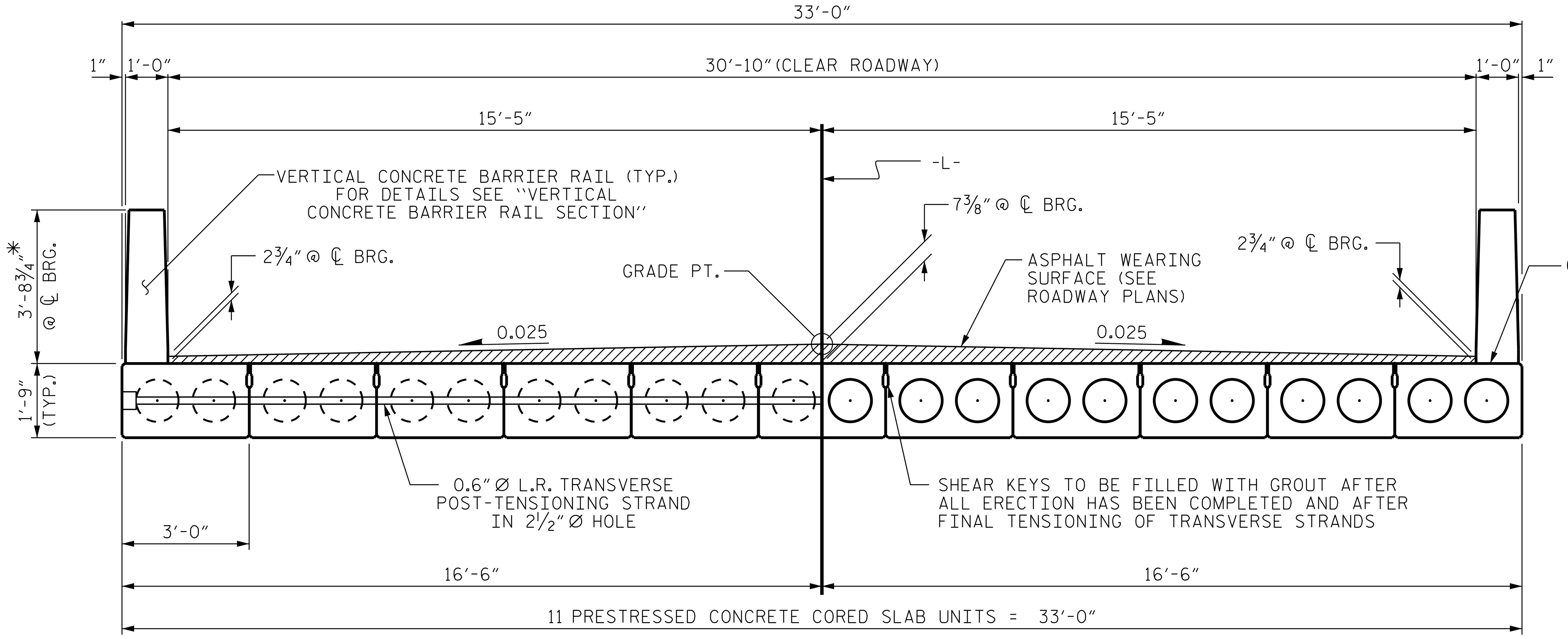
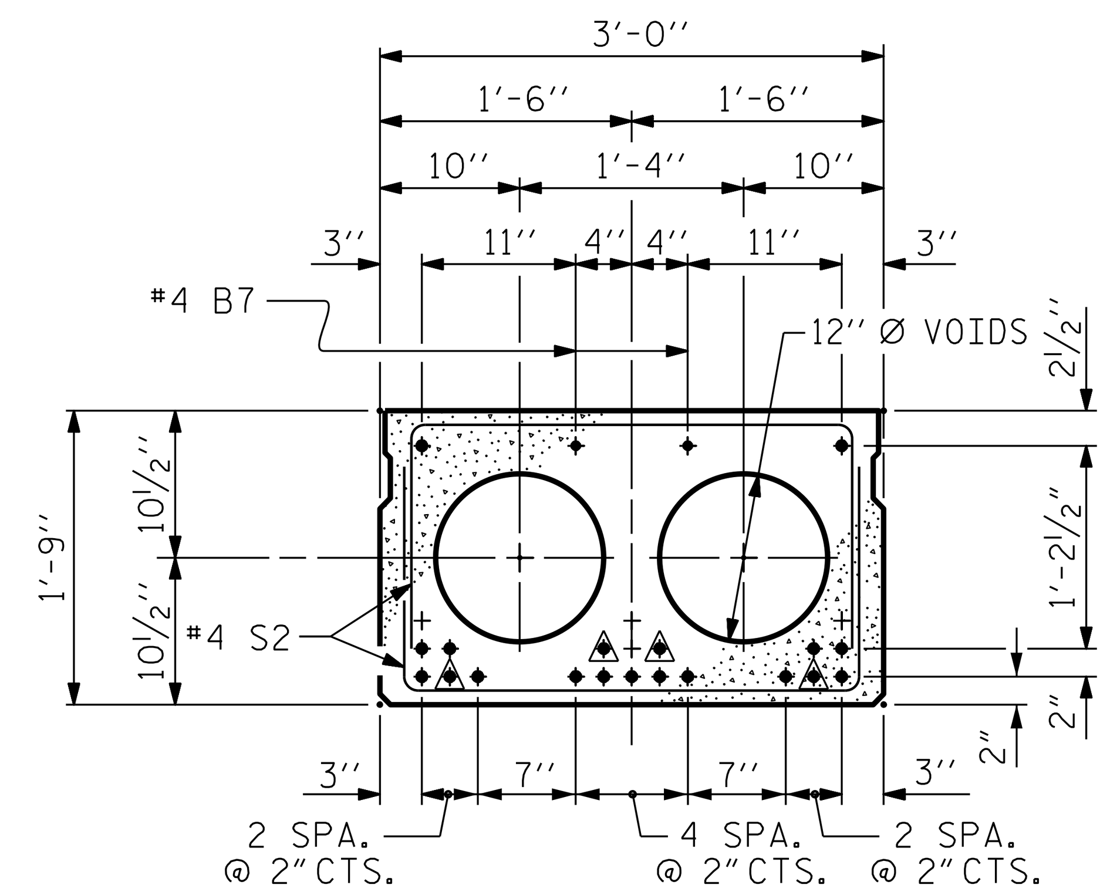


HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

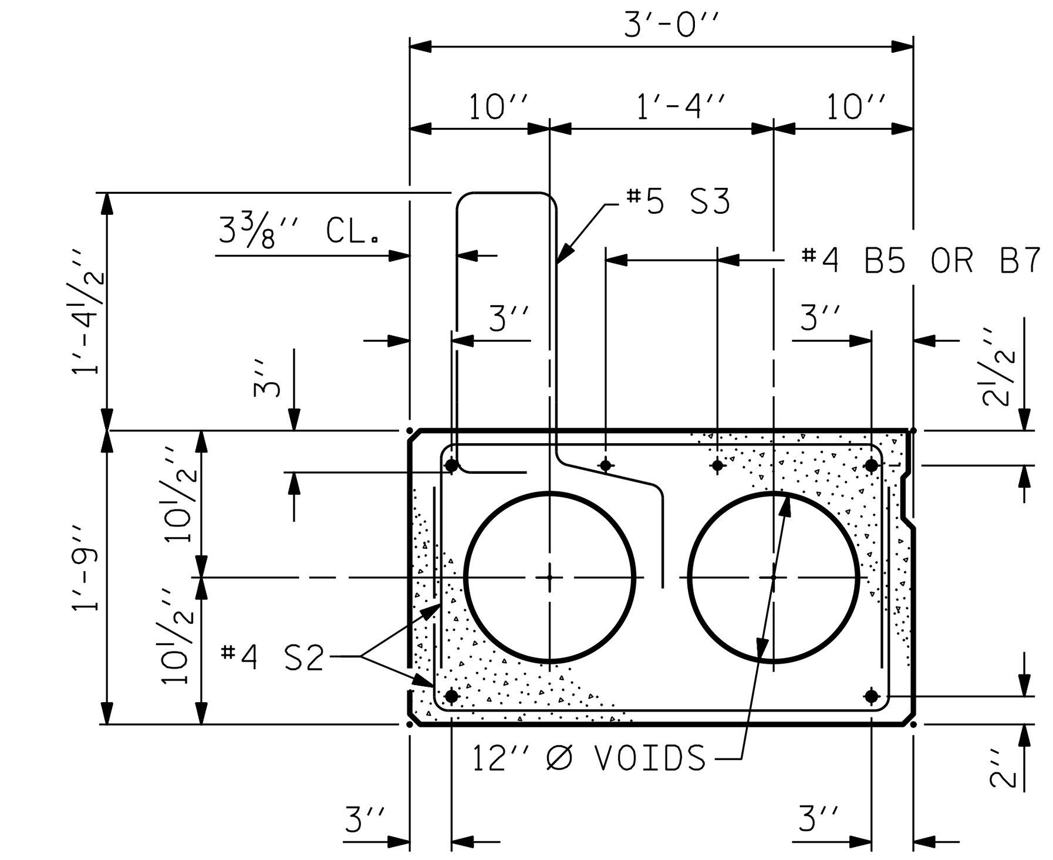
TYPICAL SECTION

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



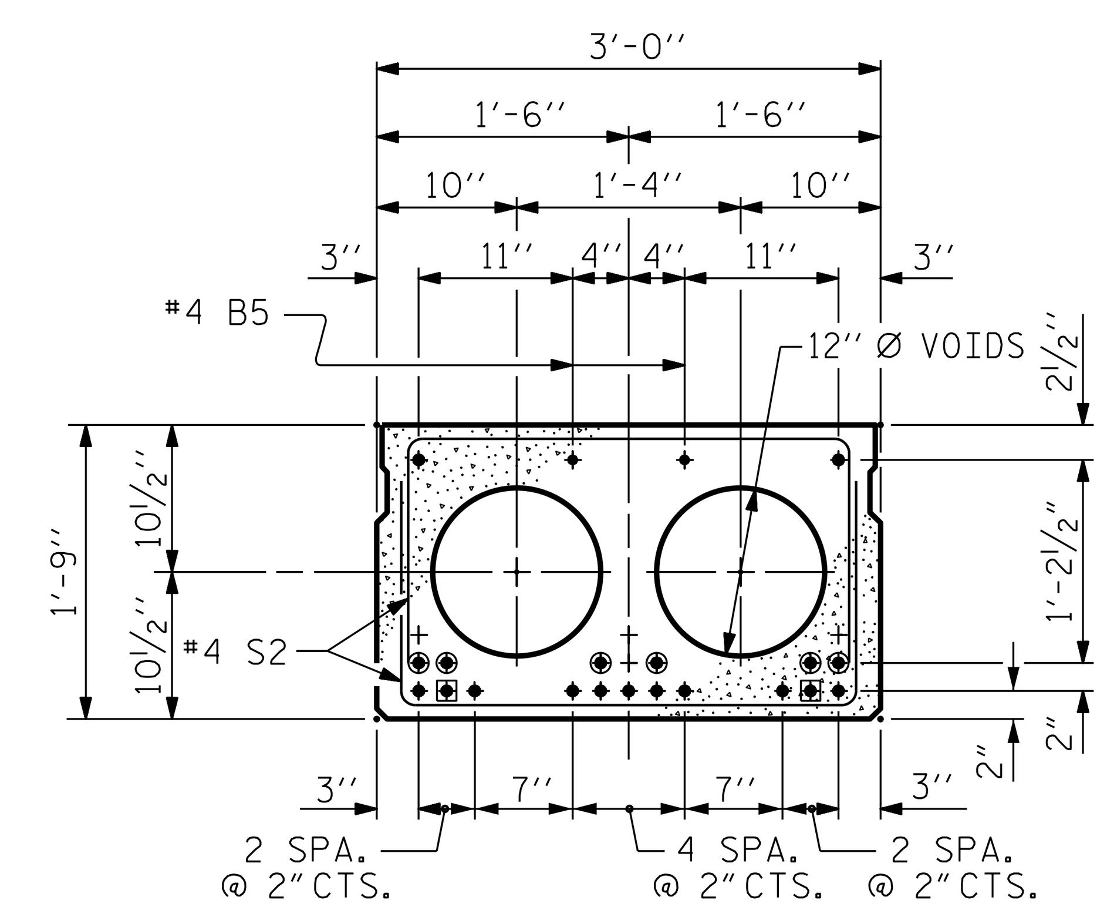
INTERIOR SLAB SECTION SPAN A (55' UNIT)

(19 STRANDS REQUIRED)



EXT. SLAB SECTION

(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)



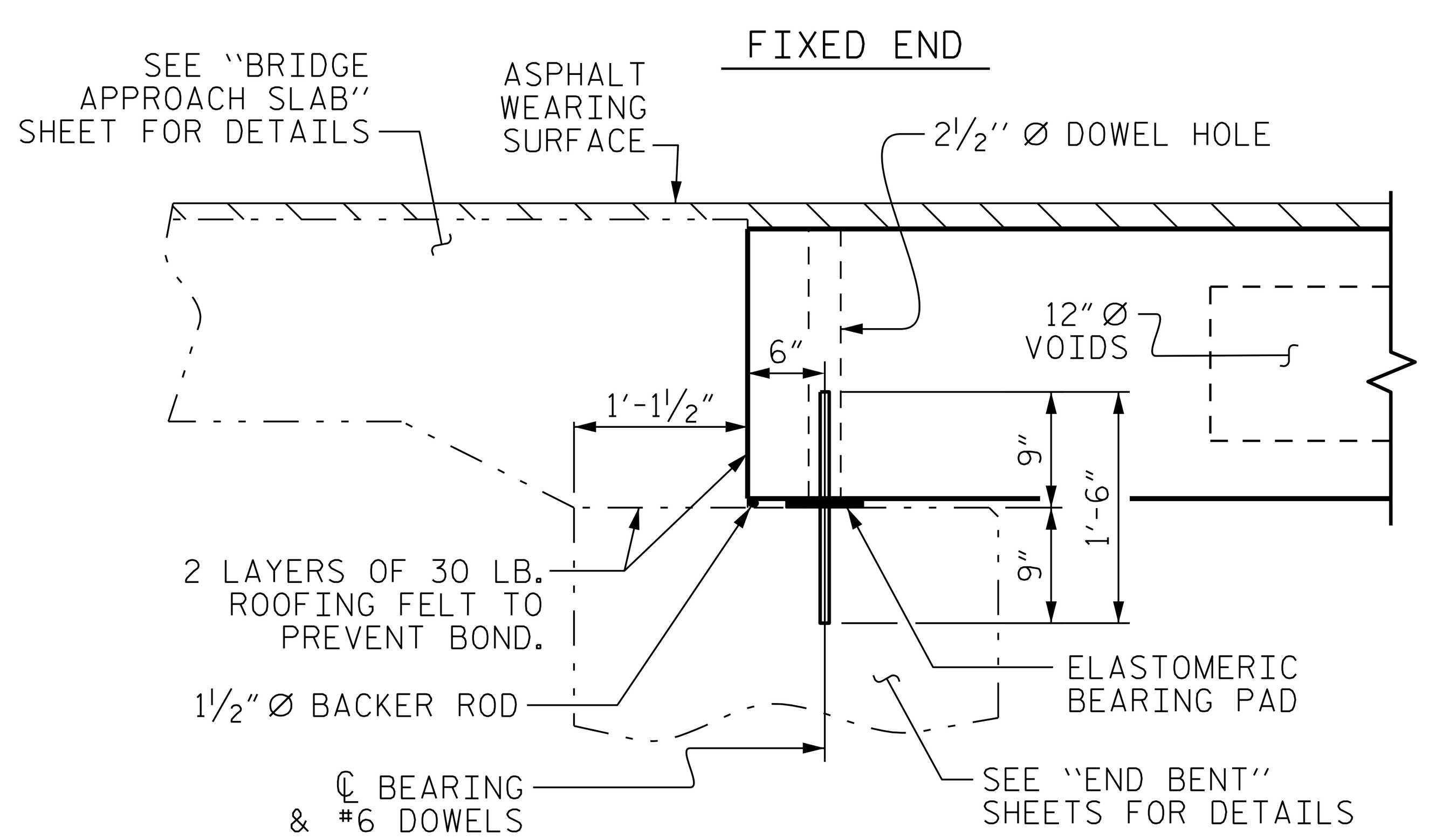
INTERIOR SLAB SECTION SPAN B (45' UNIT)

(13 STRANDS REQUIRED)

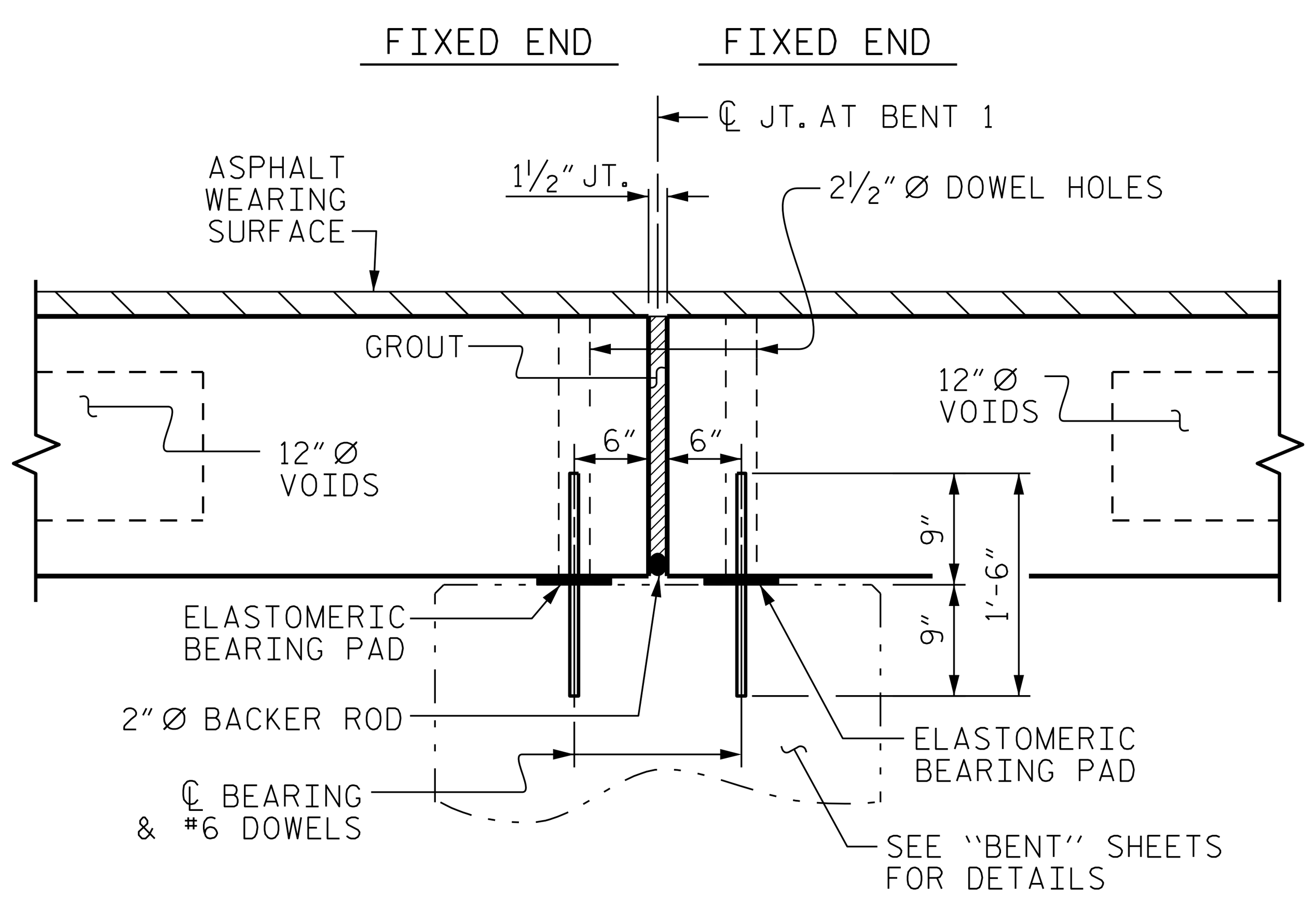
0.6" Ø LOW RELAXATION STRAND LAYOUT

- ▲ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- ■ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- ◉ OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

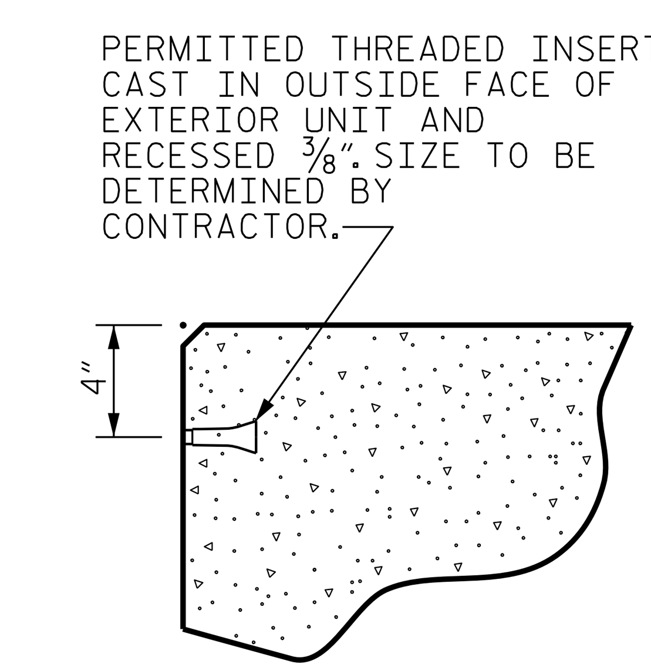
DEBONDING LEGEND



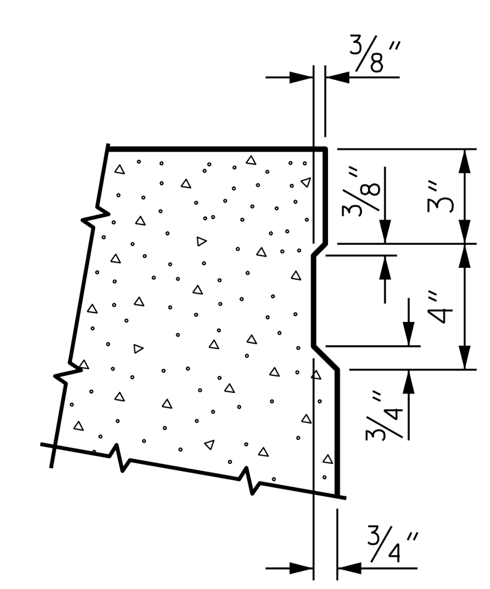
SECTION AT END BENT



SECTION AT BENT 1

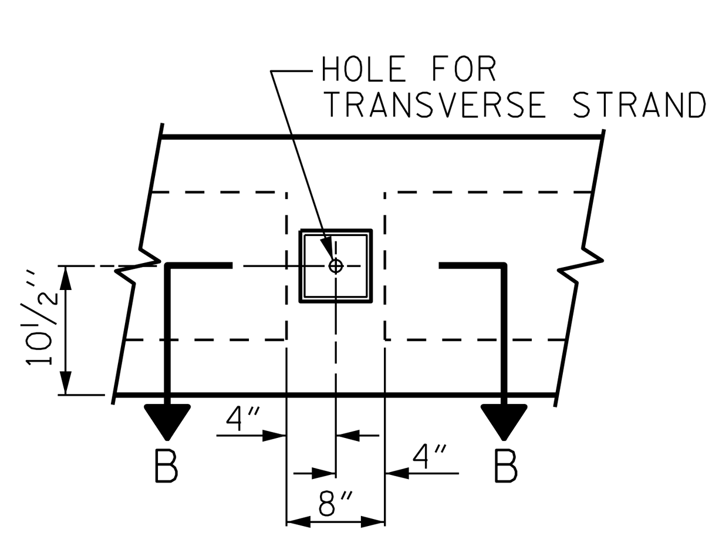


THREADED INSERT DETAIL

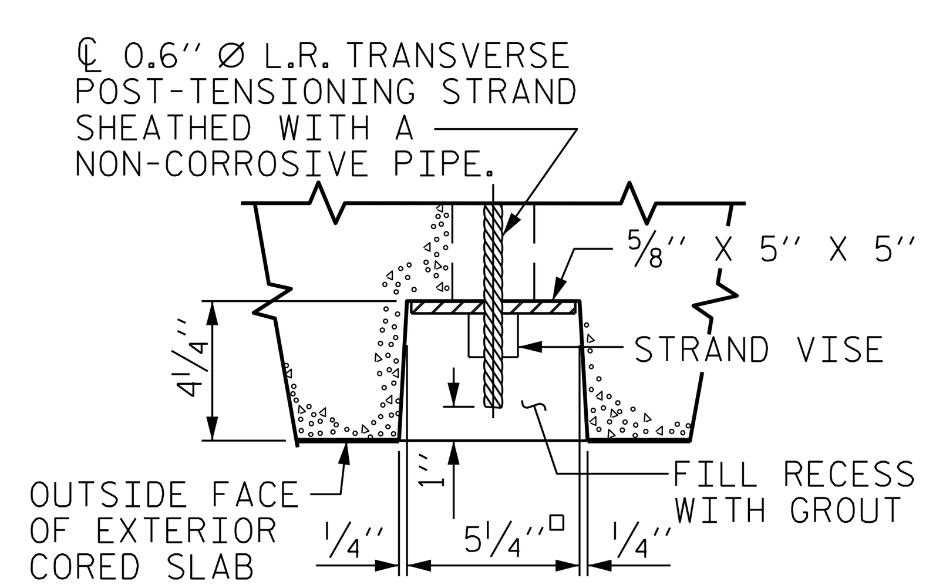


SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.

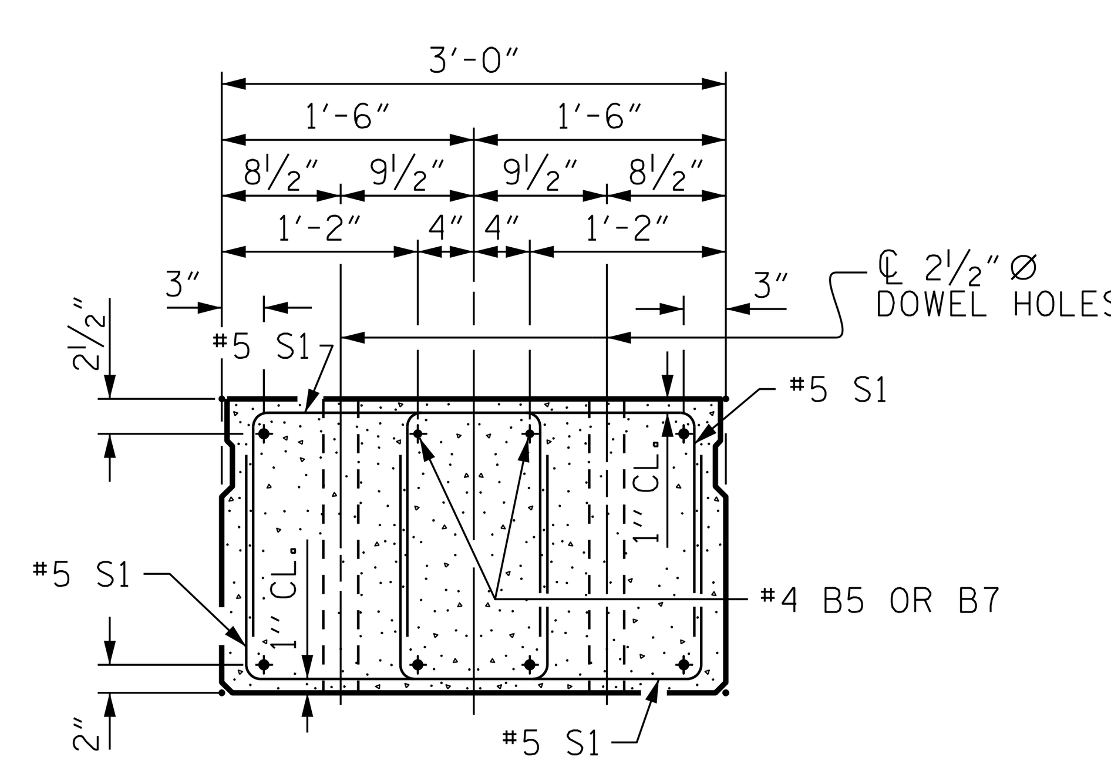


ELEVATION VIEW



SECTION B-B

GROUTED RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS



END ELEVATION

SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.

PROJECT NO. 17BP.2.R.89
BEAUFORT COUNTY
STATION: 23+94.00 -L-

SHEET 1 OF 5

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Raleigh, NC 27612-3228
NC COA No. F-1255

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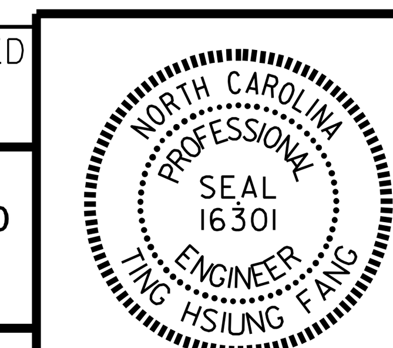
CHECKED BY : THF DATE : 03/18
DESIGN ENGINEER : VDK DATE : 03/18

DWG. No.



Ting Fang
5/11/2018 6:44:52 AM

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT 90° SKEW SPANS A & B

REVISIONS

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

SHEET NO. S-06
TOTAL SHEETS 19

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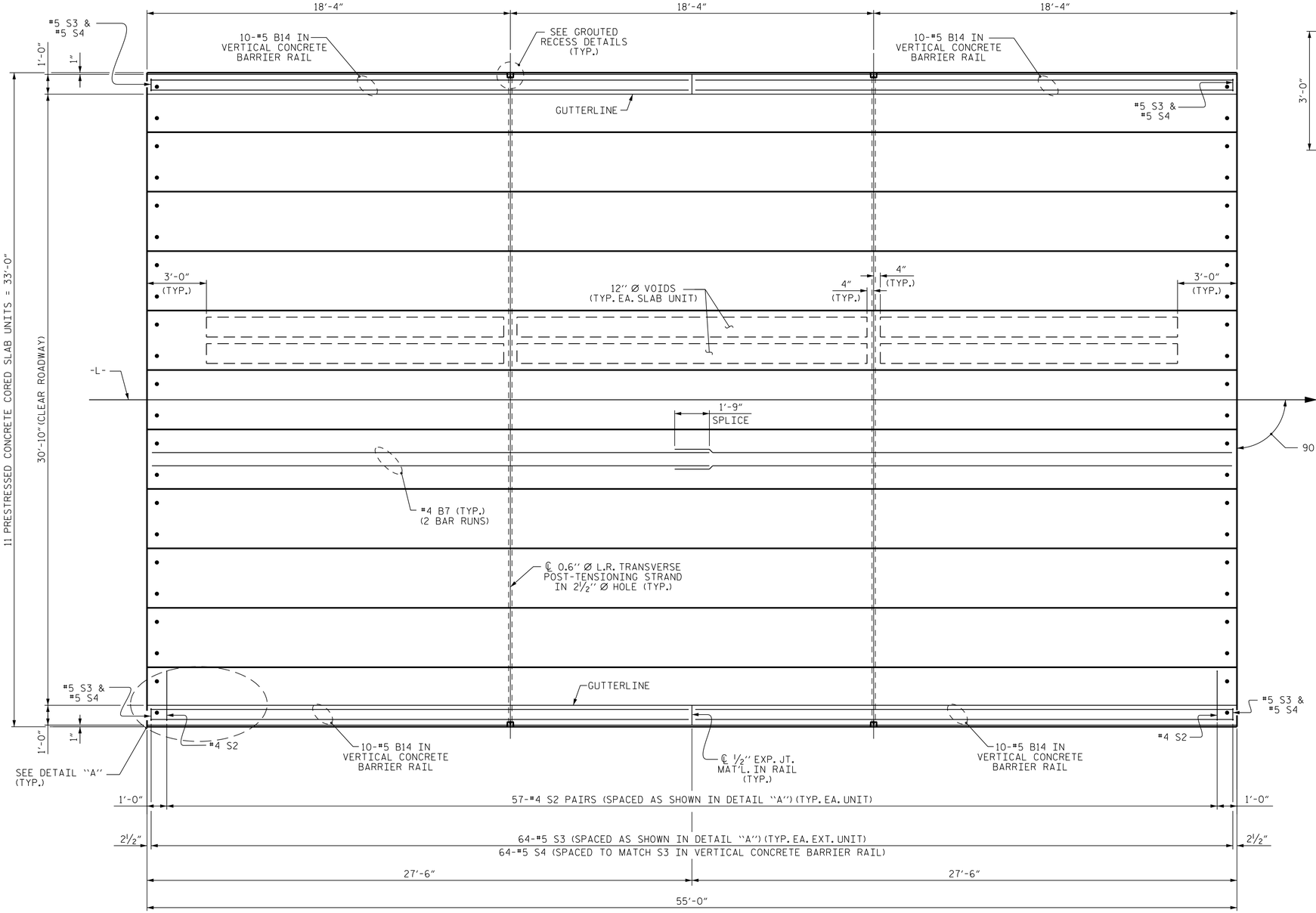
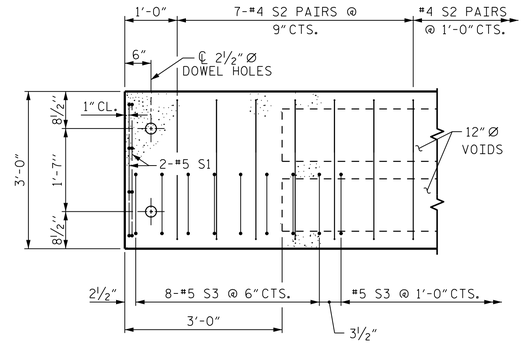


PLAN OF SPAN A



DETAIL ″A″

(TYPICAL EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PROJECT NO. 17BP.2.R.89

BEAUFORT COUNTY

STATION: 23+94.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 55′ UNIT 30′-10″ CLEAR ROADWAY 90° SKEW

SPAN A

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DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSIUNG FANG

Ting Fang 5/11/2018 6:44:52 AM

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1			3			TOTAL SHEETS
2			4			19

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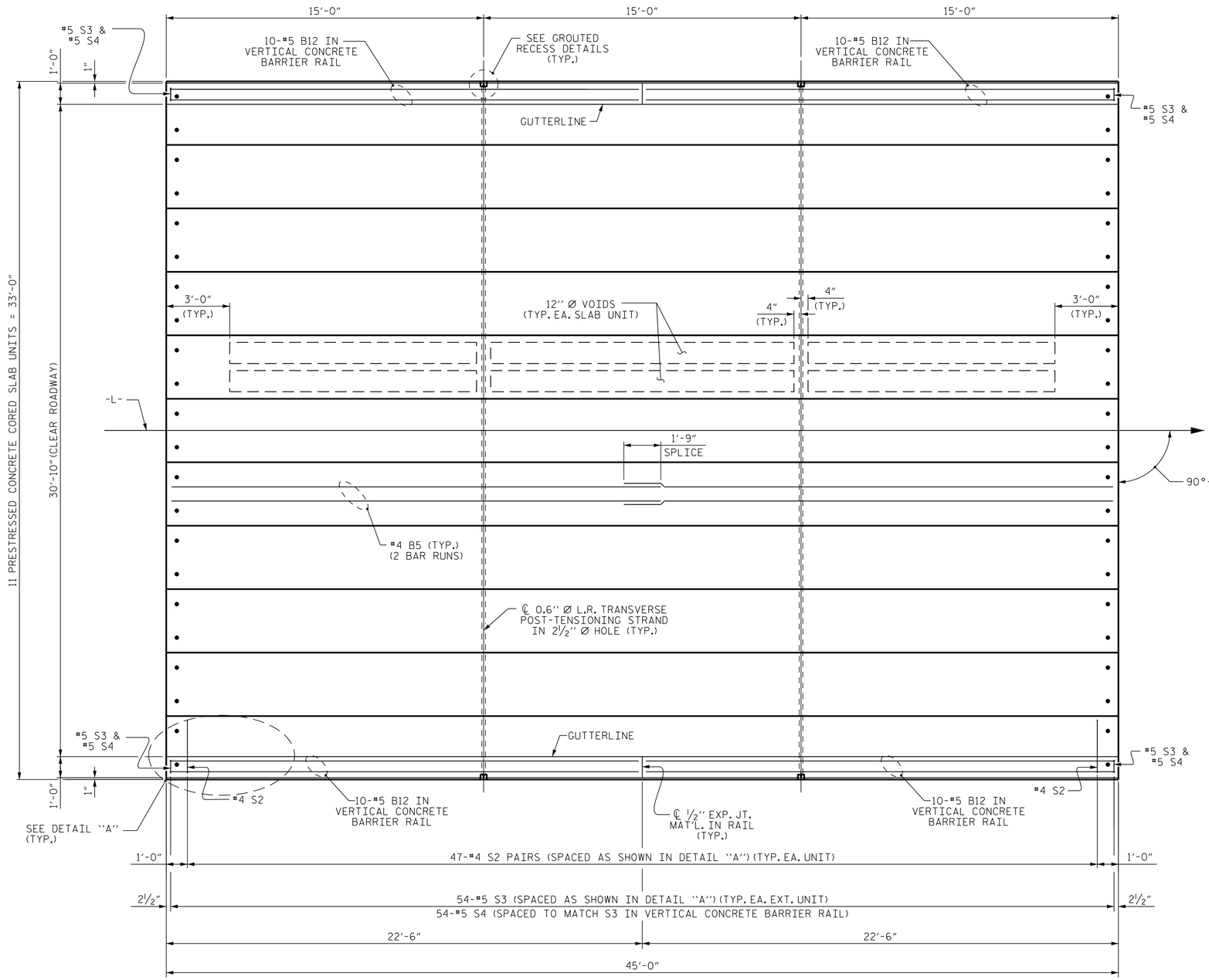
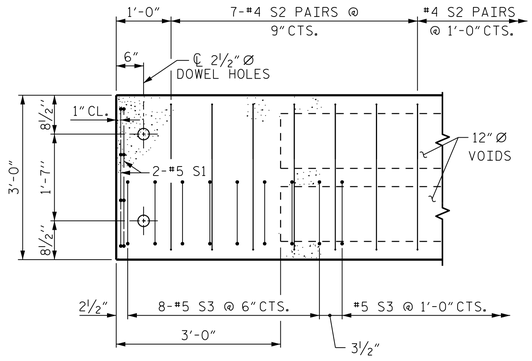


PLAN OF SPAN B



DETAIL ″A″

(TYPICAL EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PROJECT NO. 17BP.2.R.89
BEAUFORT COUNTY
STATION: 23+94.00 -L-

SHEET 3 OF 5

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DESIGN ENGINEER :	VDK	DATE :	03/18

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Ting Fang
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 45′ UNIT 30′-10″ CLEAR ROADWAY 90° SKEW

SPAN B

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1			3			TOTAL SHEETS
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STD. NO. 21″PCS_33_90S_45L

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CONCRETE RELEASE STRENGTH

UNIT	PSI
SPAN A (55' UNITS)	4900
SPAN B (45' UNITS)	4000

DEAD LOAD DEFLECTION AND CAMBER

ALL UNITS, 0.6" Ø L.R. STRAND	SPAN A 55' - 21"CS UNIT	SPAN B 45' - 21"CS UNIT
CAMBER (SLAB ALONE IN PLACE)	1½" ↑	⅞" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD **	⅜" ↓	⅛" ↓
FINAL CAMBER	1⅛" ↑	¾" ↑

** INCLUDES FUTURE WEARING SURFACE

GRADE 270 STRANDS

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

CORED SLABS REQUIRED

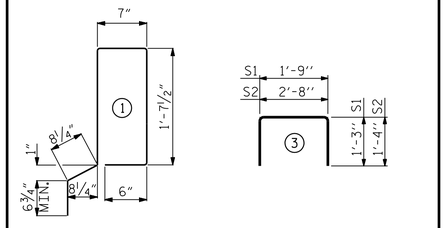
SPAN A (55' UNITS)

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	55'-0"	110'-0"
INTERIOR C.S.	9	55'-0"	495'-0"
TOTAL			605'-0"

SPAN B (45' UNITS)

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	45'-0"	90'-0"
INTERIOR C.S.	9	45'-0"	405'-0"
TOTAL			495'-0"

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

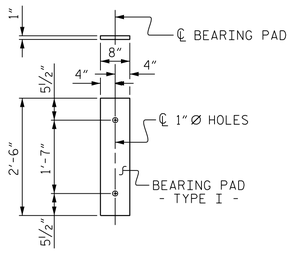
BILL OF MATERIAL FOR ONE CORED SLAB UNIT

SPAN A (55' - 21"CORED SLAB UNIT)

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B7	4	#4	STR	28'-3"	75	28'-3"	75
S1	8	#5	3	4'-3"	35	4'-3"	35
S2	114	#4	3	5'-4"	406	5'-4"	406
* S3	64	#5	1	5'-7"	373		
REINFORCING STEEL		LBS.			516		516
* EPOXY COATED REINFORCING STEEL		LBS.			373		
6500 P.S.I. CONCRETE		CU. YDS.			7.8		7.8
0.6" Ø L.R. STRANDS		No.			19		19

SPAN B (45' - 21"CORED SLAB UNIT)

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B5	4	#4	STR	23'-3"	62	23'-3"	62
S1	8	#5	3	4'-3"	35	4'-3"	35
S2	94	#4	3	5'-4"	335	5'-4"	335
* S3	54	#5	1	5'-7"	314		
REINFORCING STEEL		LBS.			432		432
* EPOXY COATED REINFORCING STEEL		LBS.			314		
5000 P.S.I. CONCRETE		CU. YDS.			6.5		6.5
0.6" Ø L.R. STRANDS		No.			13		13



FIXED END
(TYPE I - 44 REQ'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.

NOTES

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

ALL REINFORCING STEEL CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

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

THE 2½" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

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

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

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

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN THE REQUIRED STRENGTH SHOWN IN THE "CONCRETE RELEASE STRENGTH" TABLE.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

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

PROJECT NO. 17BP.2.R.89
BEAUFORT COUNTY
STATION: 23+94.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" x 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT 90° SKEW SPANS A & B

REVISIONS						SHEET NO.
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NC COA No. F-1255

DRAWN BY : VDK DATE : 03/18
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DESIGN ENGINEER : VDK DATE : 03/18

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSIUNG FANG
Ting Fang
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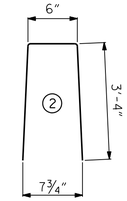
GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
SPAN A (55' UNITS)	1⅝"	3'-7⅝"
SPAN B (45' UNITS)	2"	3'-8"

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	SPAN A (55' UNIT)					
✳B14	40	40	#5	STR	27'-1"	1130
✳S4	128	128	#5	2	7'-2"	957
✳EPOXY COATED REINFORCING STEEL				LBS.		2087
CLASS AA CONCRETE				CU.YDS.		14.1
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		110.125

	SPAN B (45' UNIT)					
✳B12	40	40	#5	STR	22'-1"	921
✳S4	108	108	#5	2	7'-2"	807
✳EPOXY COATED REINFORCING STEEL				LBS.		1728
CLASS AA CONCRETE				CU.YDS.		11.5
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		90.125

BAR TYPE

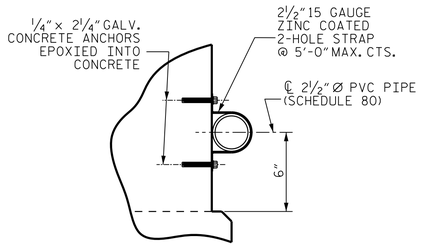


ALL BAR DIMENSIONS ARE OUT TO OUT

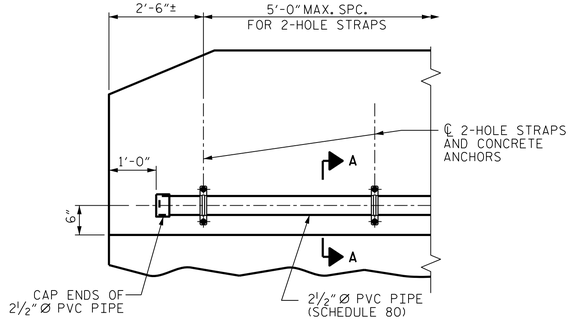
TOTAL VERTICAL CONCRETE BARRIER RAIL FOR ENTIRE BRIDGE: 200.25 LN.FT.

TOTAL LENGTH OF FIBER OPTIC CONDUIT SYSTEM FOR ENTIRE BRIDGE: 196.25 LN.FT.

NOTE: FOR FIBER OPTIC CONDUIT SYSTEM, SEE SPECIAL PROVISIONS.



SECTION A-A



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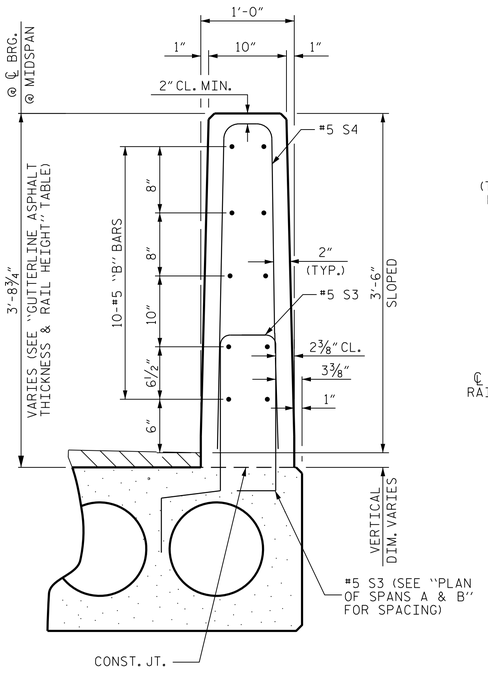
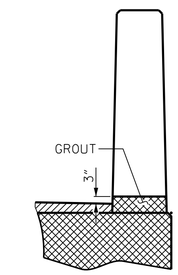
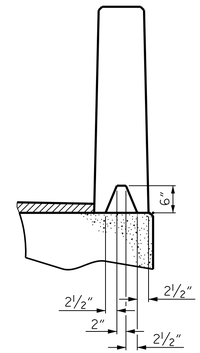
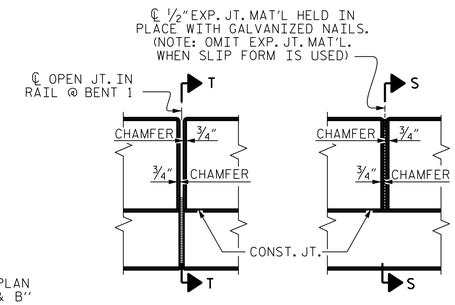




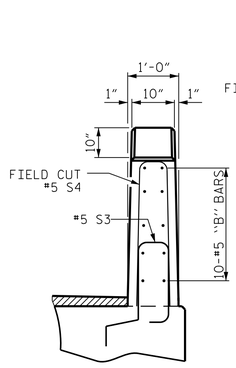
SECTION T-T
AT OPEN JOINT AT BENT
(THIS IS TO BE USED WHERE FOAM JOINT IS NOT USED)



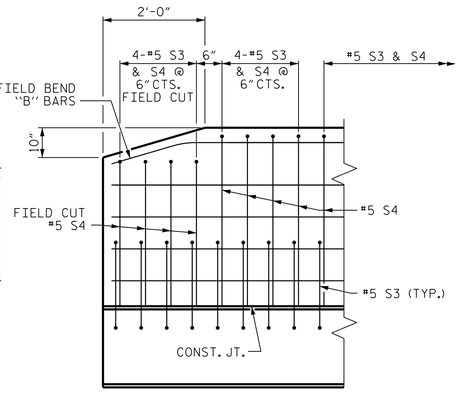
SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS



END VIEW



SIDE VIEW

END OF RAIL DETAILS

FIBER OPTIC CONDUIT SYSTEM DETAILS

2½" Ø SCHEDULE 80 PVC PIPE ATTACHED TO THE BACK OF BOTH RAILS FOR FUTURE FIBER OPTIC CABLE.

VERTICAL CONCRETE BARRIER RAIL SECTION

PROJECT NO. 17BP.2.R.89
BEAUFORT COUNTY
STATION: 23+94.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

VERTICAL CONCRETE BARRIER RAIL DETAILS

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DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
DocuSigned by: Ting Fang 7/18/2019

REVISIONS						SHEET NO.
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2			4			19

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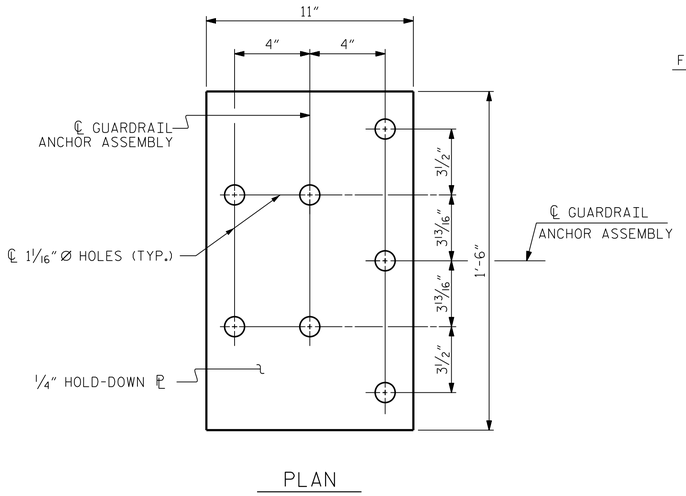
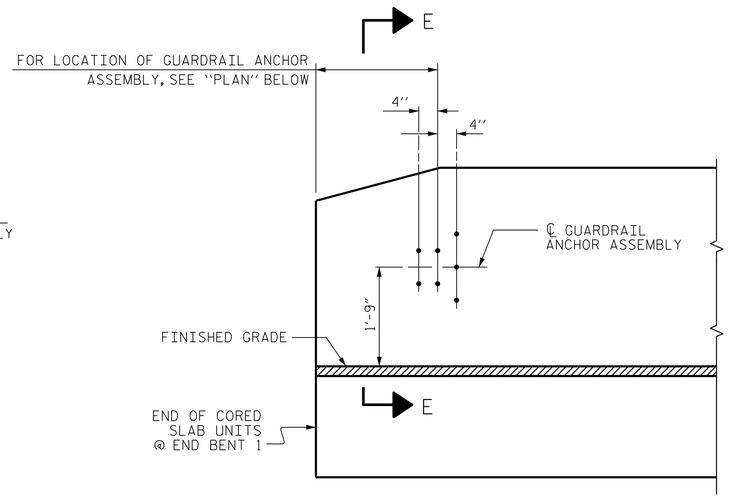
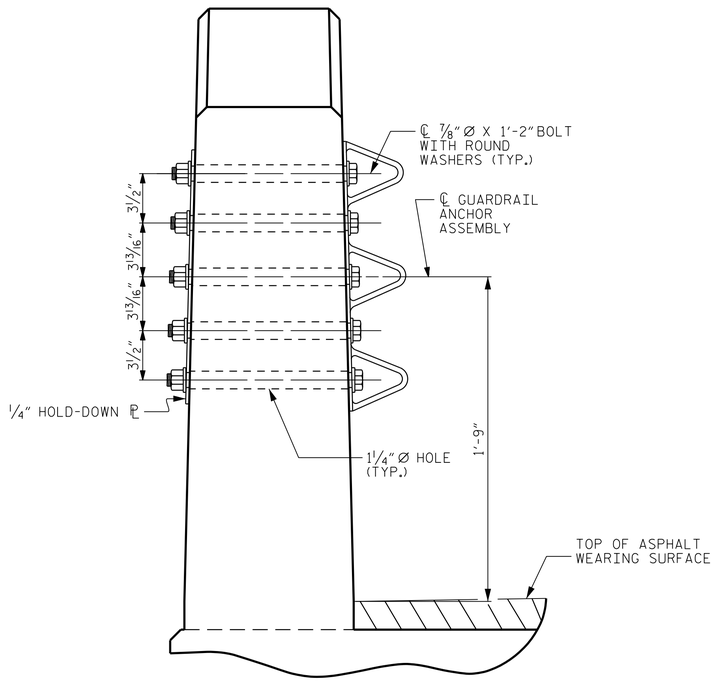


PLAN

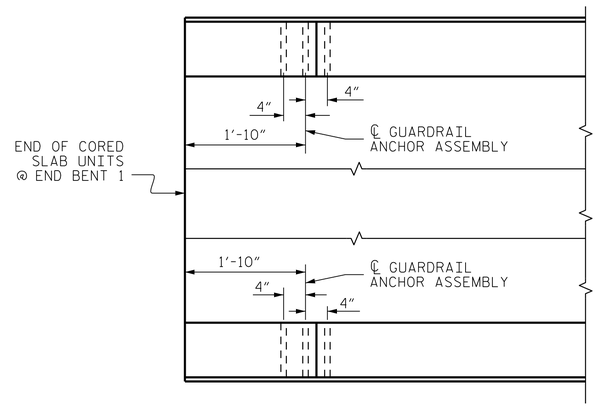


ELEVATION



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR.

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4″ HOLD DOWN PLATE AND 7 - 7/8″ Ø BOLTS WITH NUTS AND WASHERS.

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8″ Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

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

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

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

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

THE 1 1/4″ Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. 17BP.2.R.89

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DESIGN ENGINEER : VDK DATE : 03/18

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Ting Fang
5/11/2018 6:44:52 AM

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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STANDARD GUARDRAIL ANCHORAGE FOR VERTICAL CONCRETE BARRIER RAIL

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1			3			TOTAL SHEETS
2			4			19

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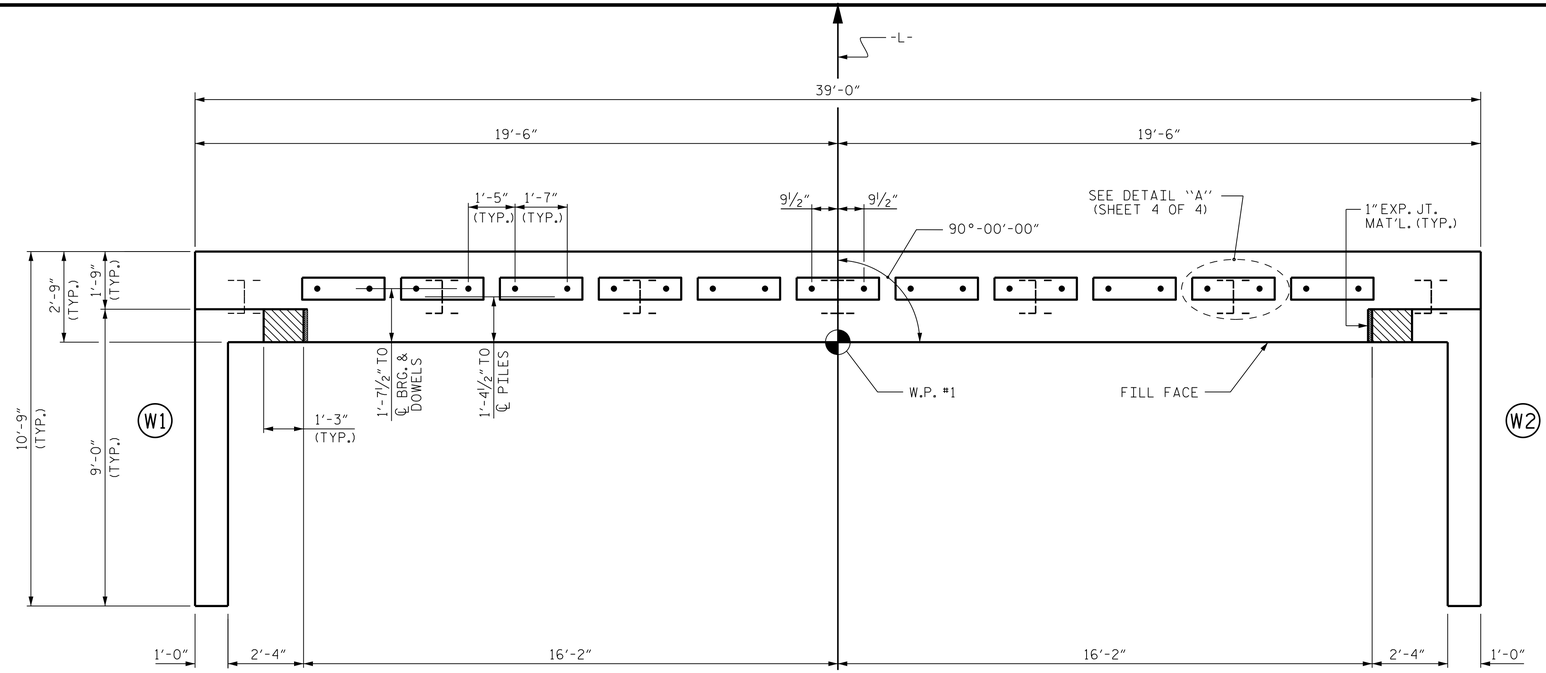

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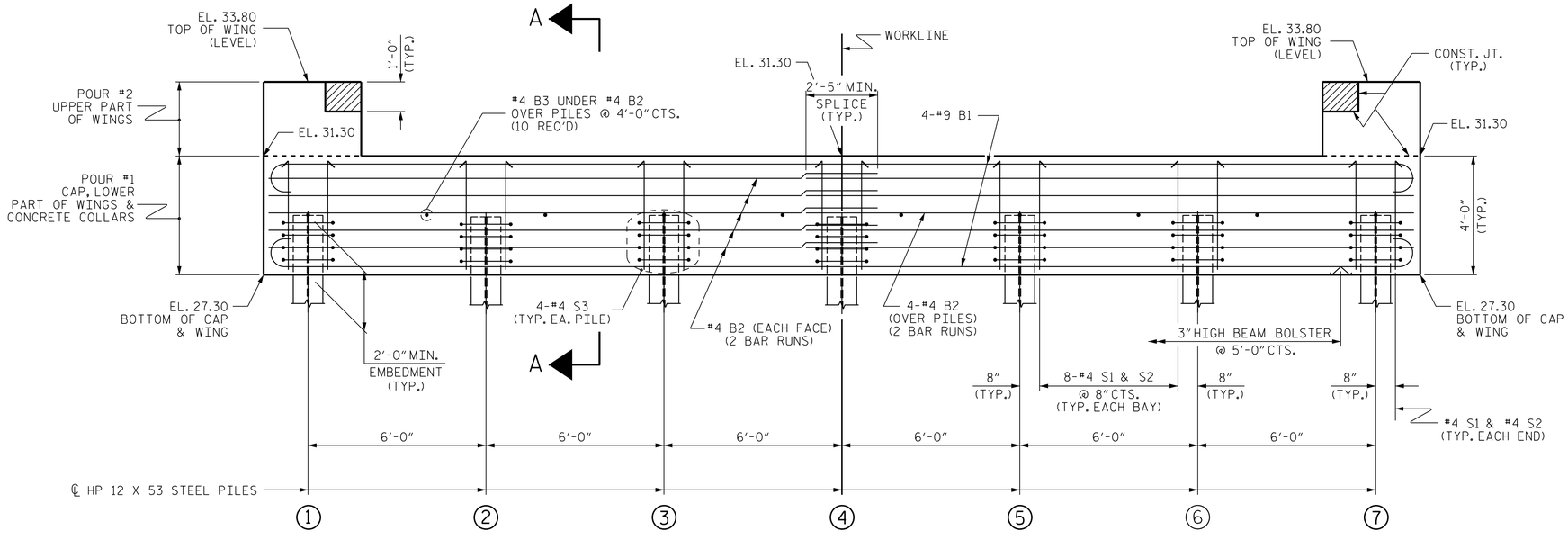

ELEVATION

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

NOTES

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

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

PROJECT NO. 17BP.2.R.89
BEAUFORT COUNTY
STATION: 23+94.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE

END BENT 1

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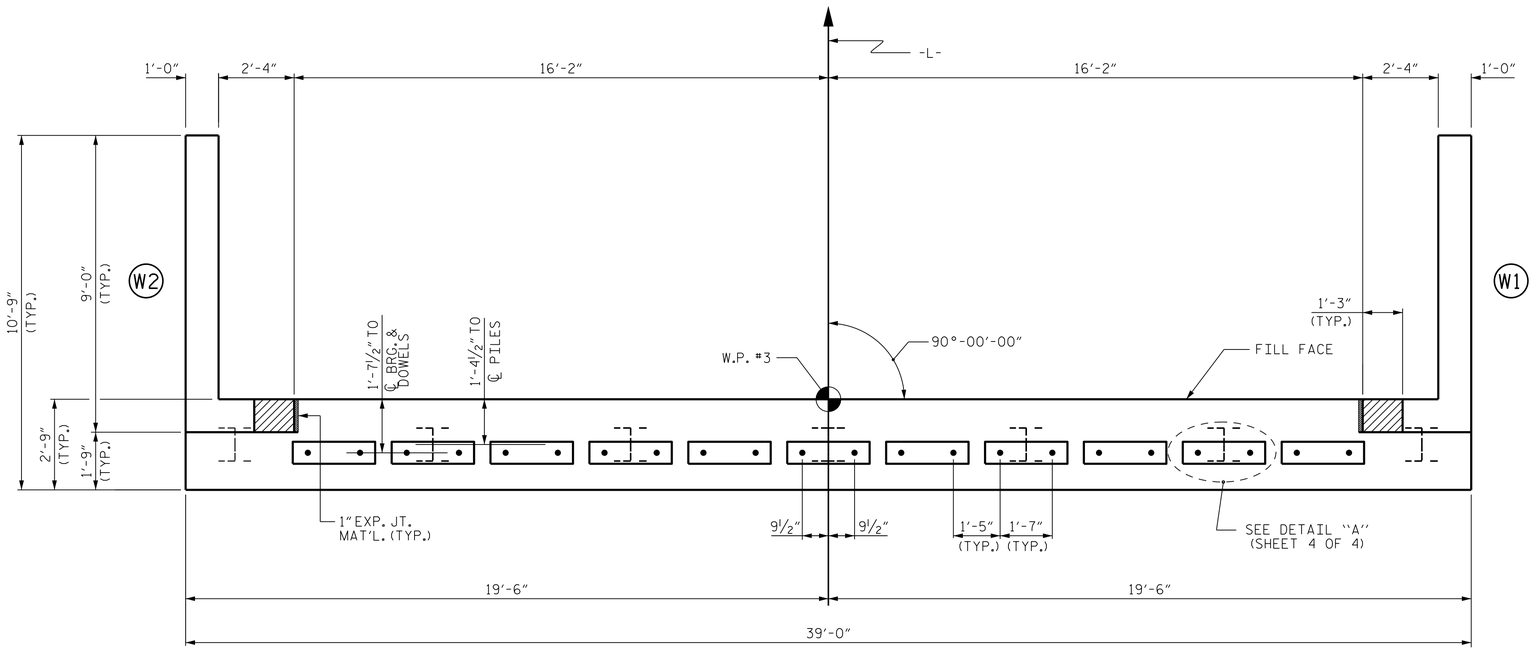

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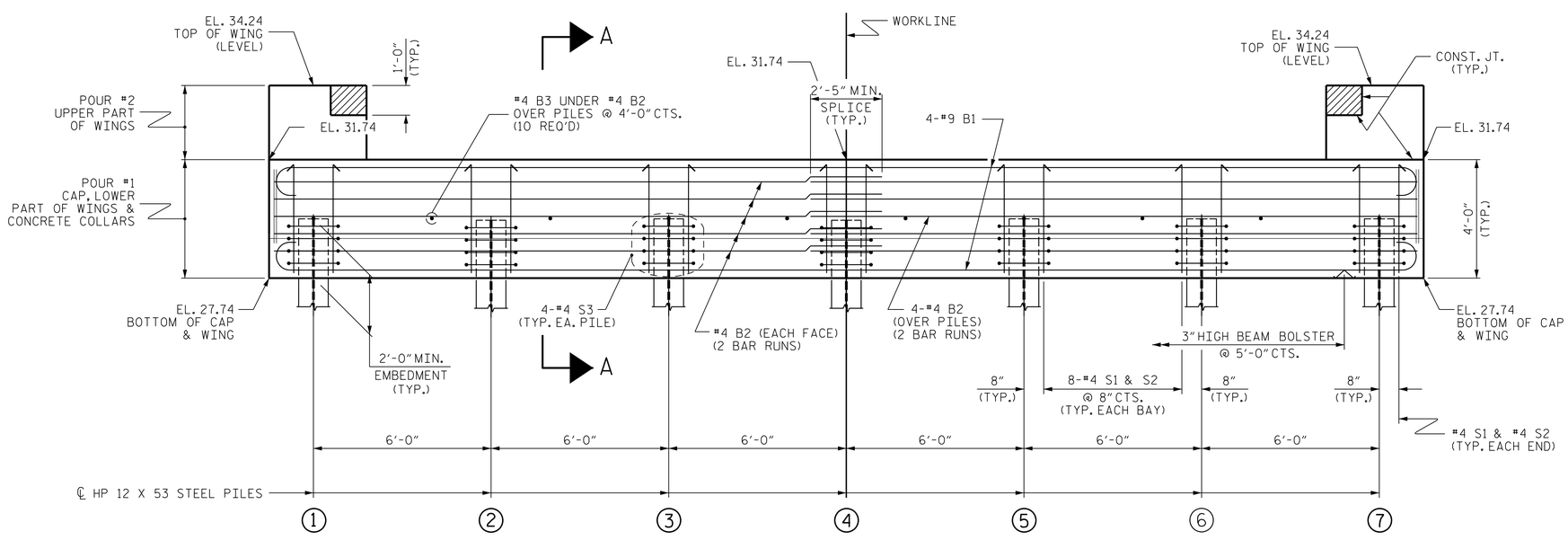

ELEVATION

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

NOTES

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FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

PROJECT NO. 17BP.2.R.89
BEAUFORT COUNTY
STATION: 23+94.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE

END BENT 2

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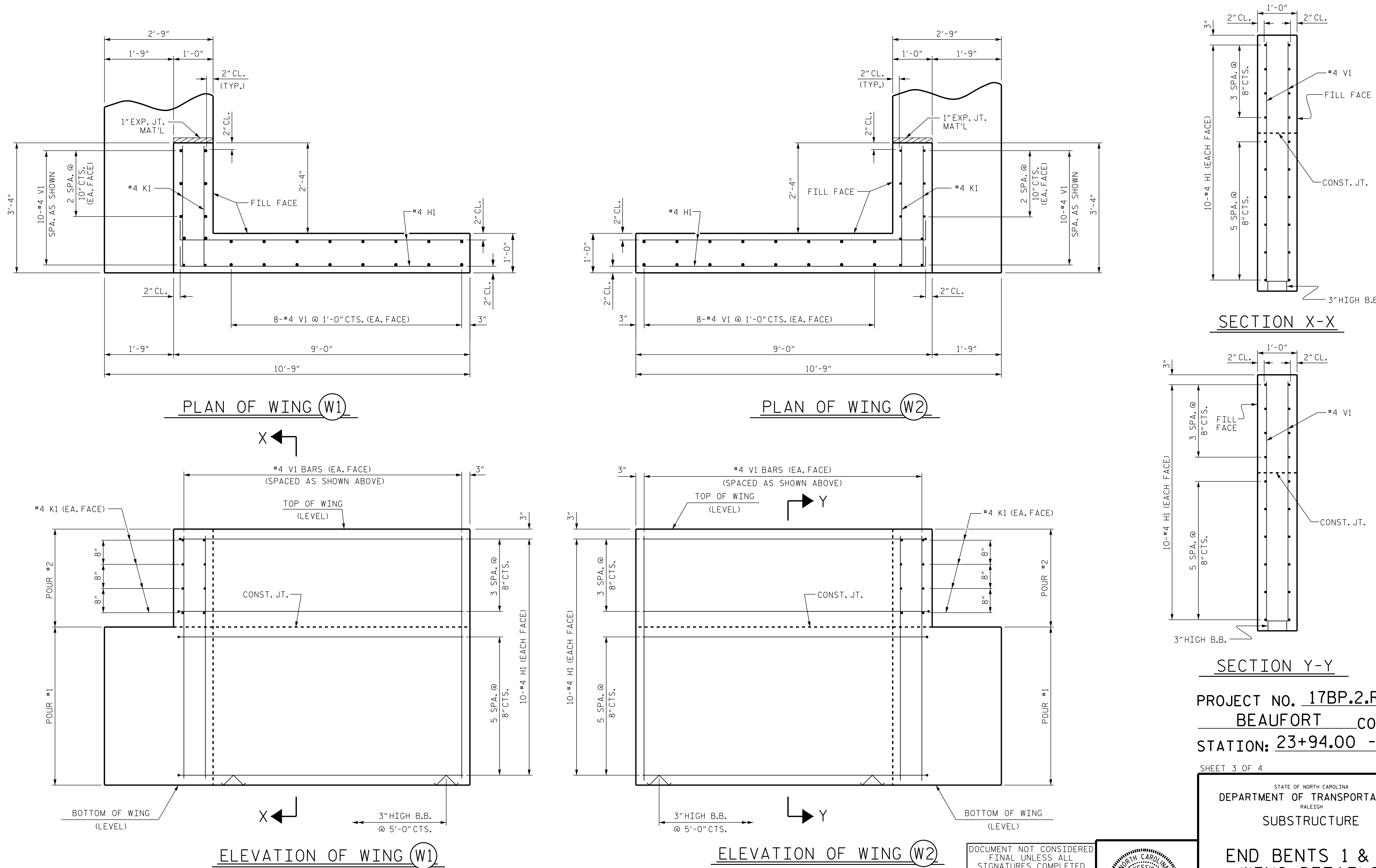

WING DETAILS

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BEAUFORT COUNTY

STATION: 23+94.00 -L-

SHEET 3 OF 4

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END BENTS 1 & 2
WING DETAILS

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2			4			

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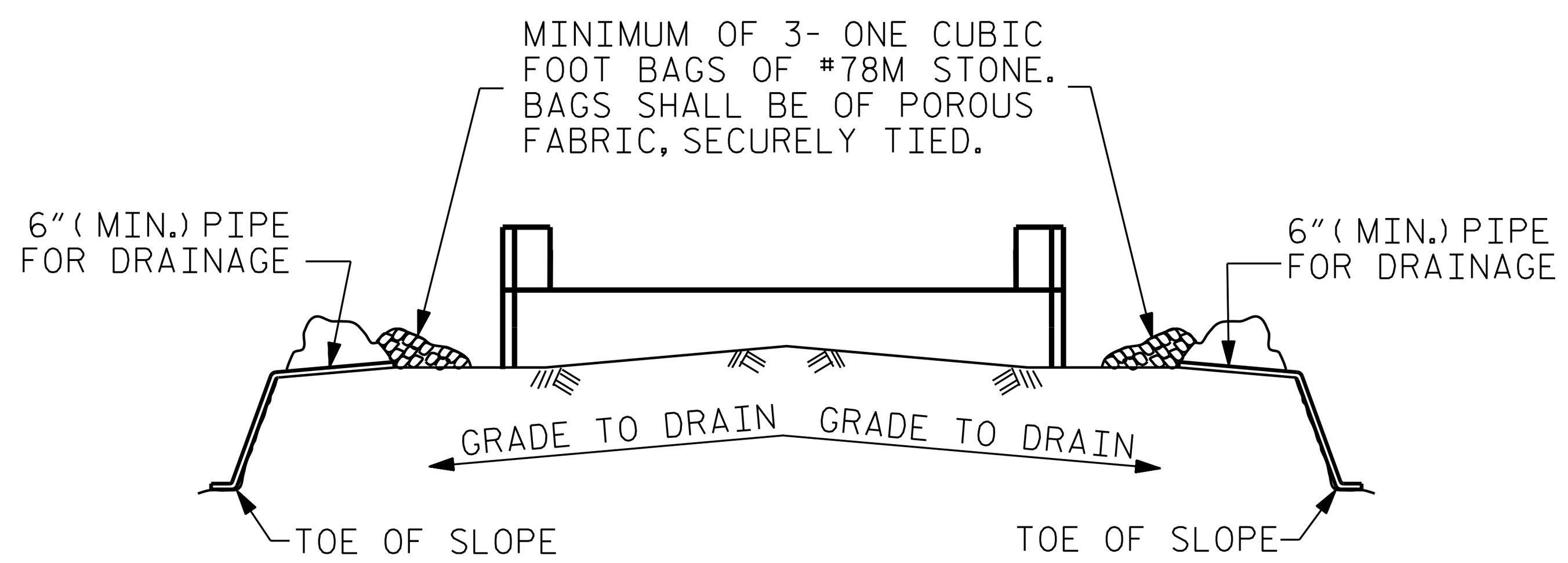
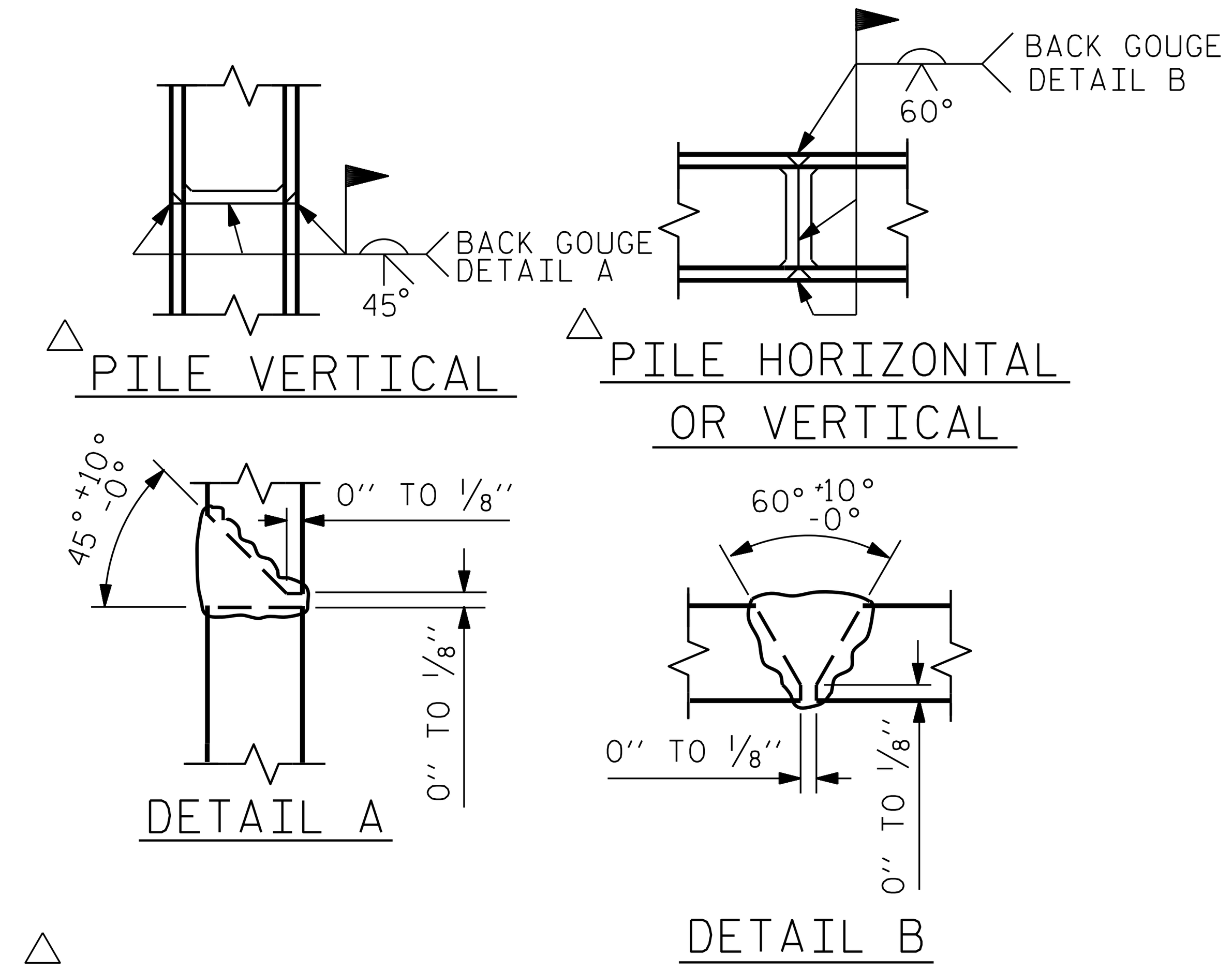


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

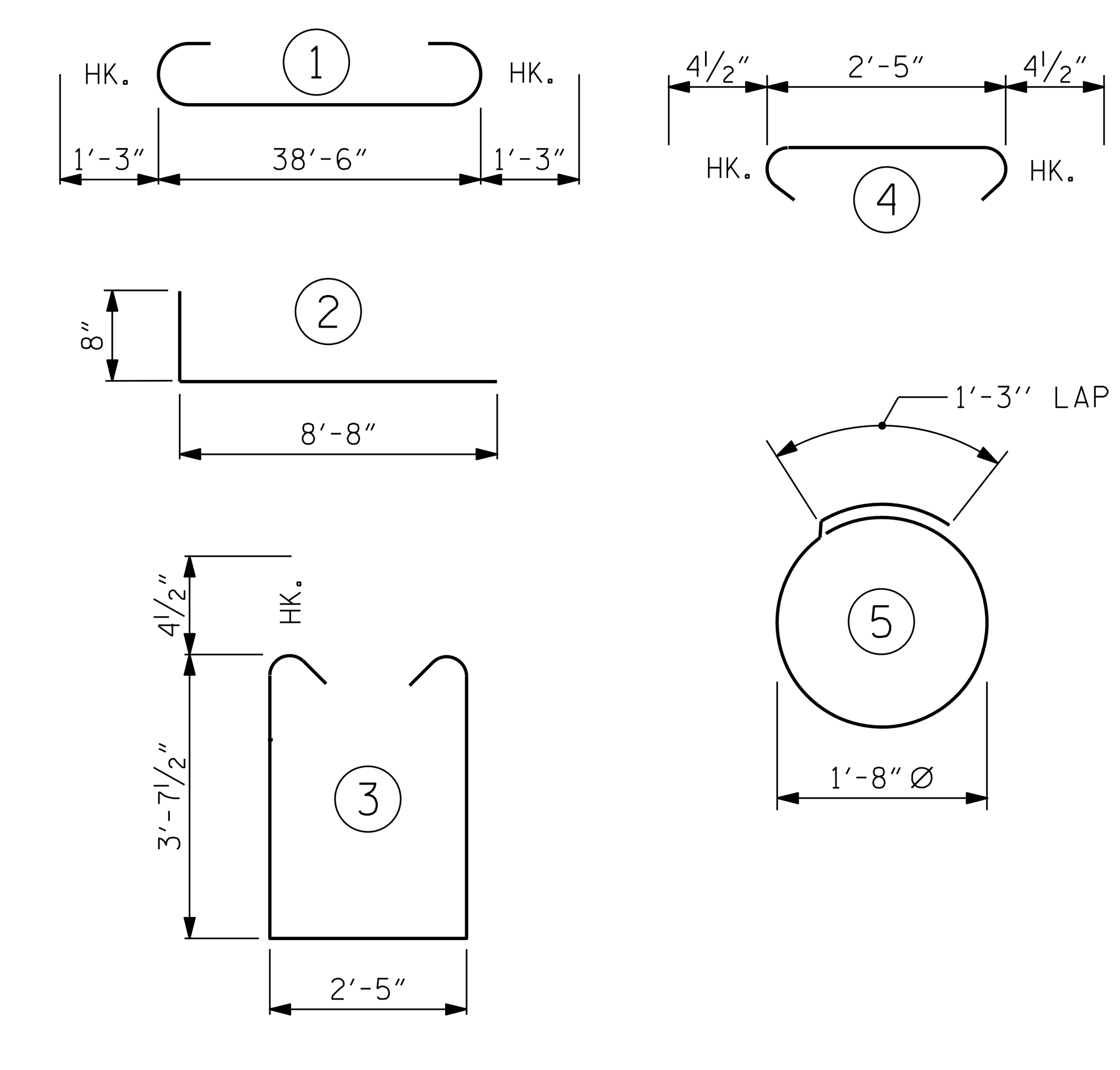
TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

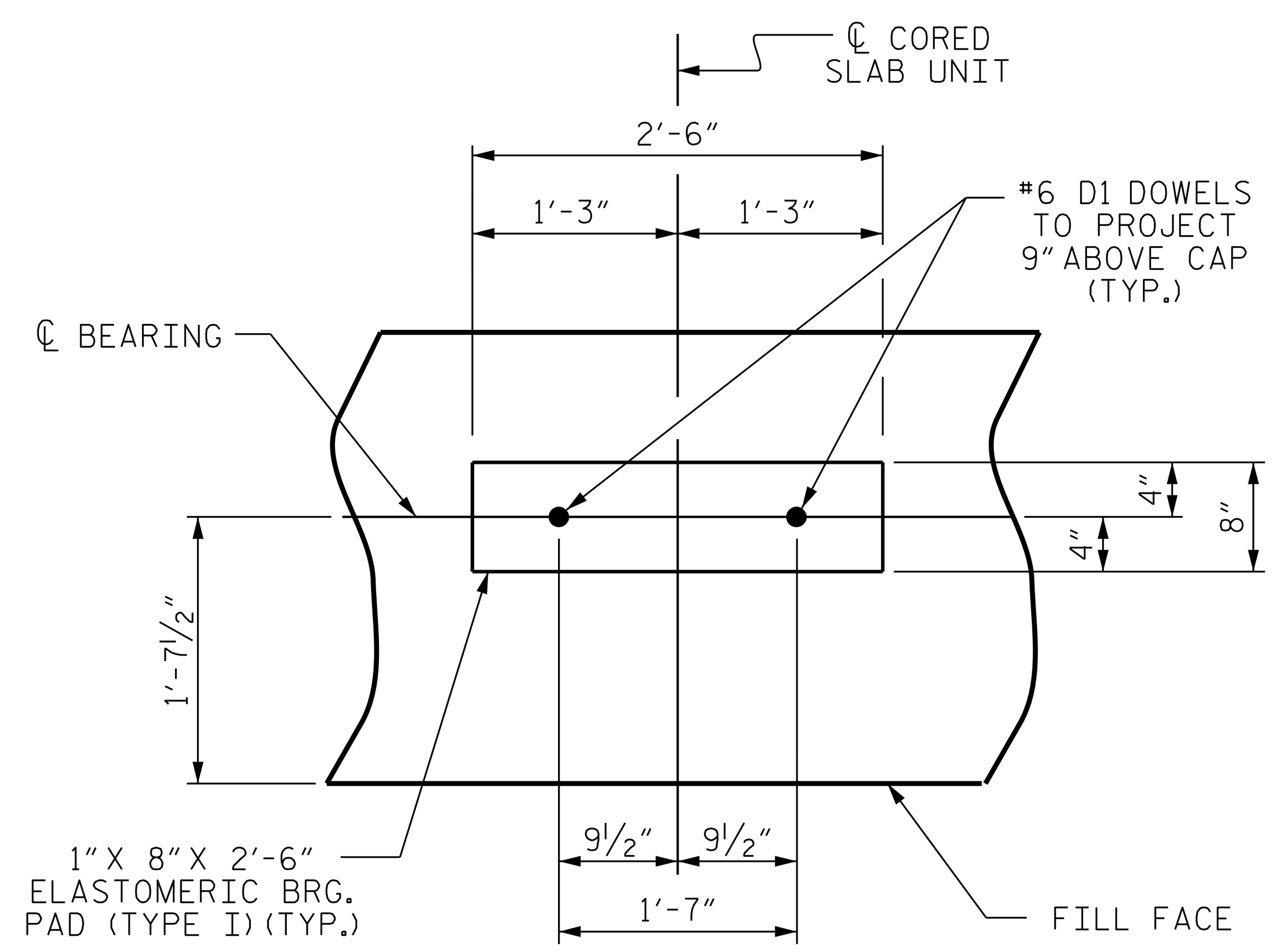
END BENT 1		END BENT 2	
HP 12 X 53 STEEL PILES		HP 12 X 53 STEEL PILES	
NO: 7	LIN. FT.= 490	NO: 7	LIN. FT.= 455
PILE DRIVING EQUIP. SETUP	EA. 7	PILE DRIVING EQUIP. SETUP	EA. 7
PILE REDRIVES	EA. 4	PILE REDRIVES	EA. 4

BILL OF MATERIAL
FOR ONE END BENT
(2 REQUIRED)

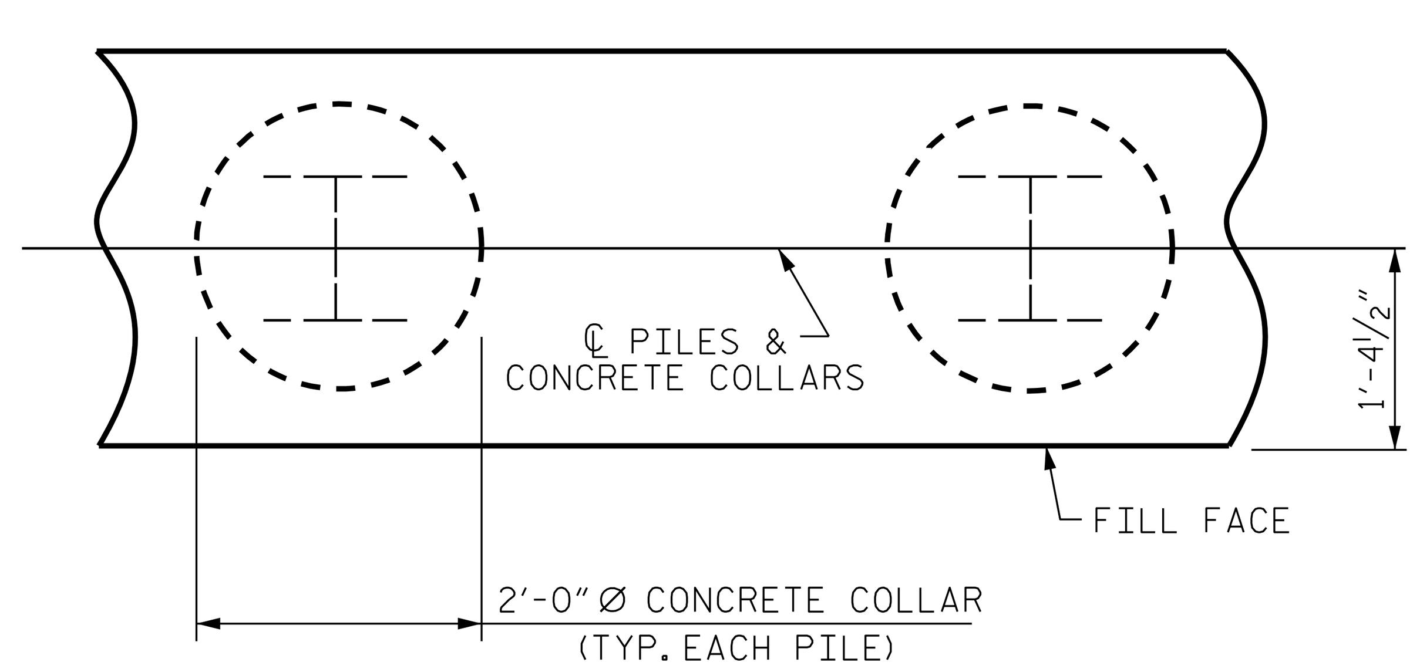
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	41'-0"	1115
B2	28	#4	STR	20'-7"	385
B3	10	#4	STR	2'-5"	16
D1	22	#6	STR	1'-6"	50
H1	40	#4	2	9'-4"	249
K1	16	#4	STR	2'-11"	31
S1	50	#4	3	10'-5"	348
S2	50	#4	4	3'-2"	106
S3	28	#4	5	6'-6"	122
V1	52	#4	STR	6'-2"	214
REINFORCING STEEL					2636 LBS.

CLASS A CONCRETE BREAKDOWN:

POUR #1	CAP, LOWER PART OF WINGS & COLLARS	19.5 C.Y.
POUR #2	UPPER PART OF WINGS	2.1 C.Y.
	TOTAL	21.6 C.Y.



DETAIL "A"
(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)



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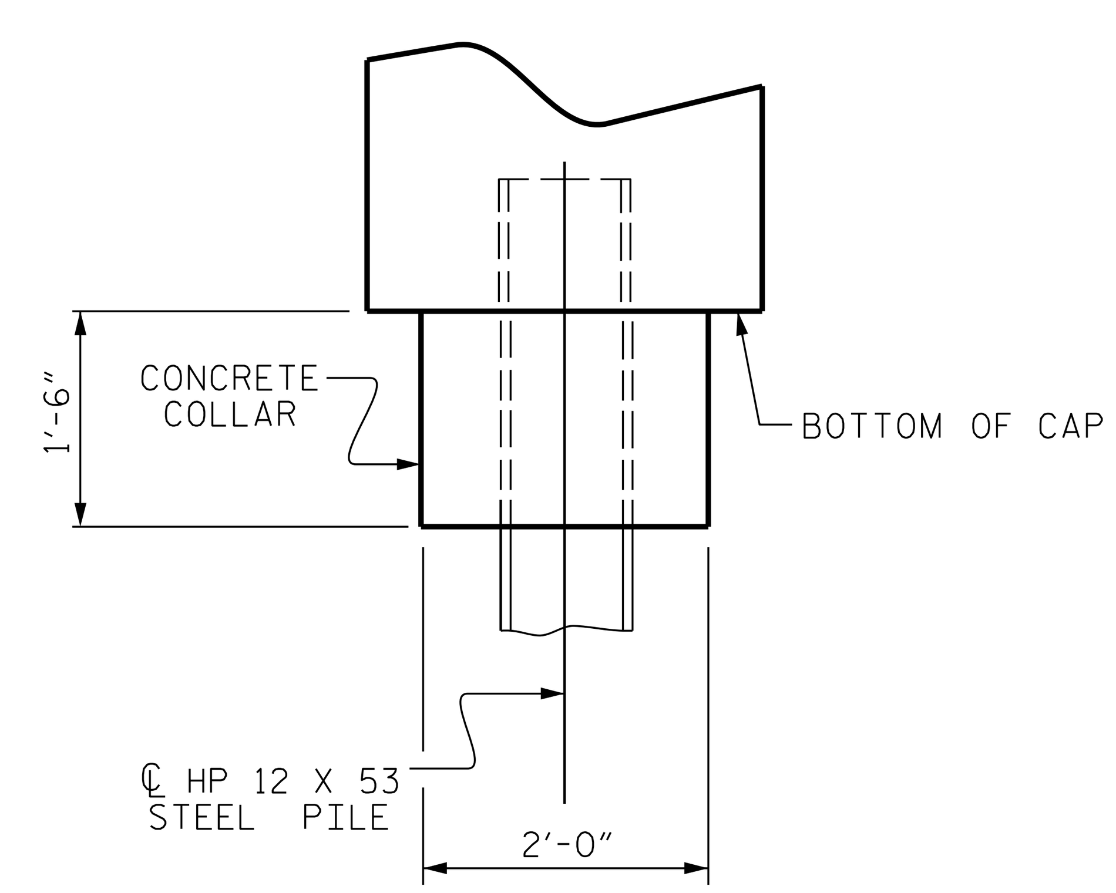
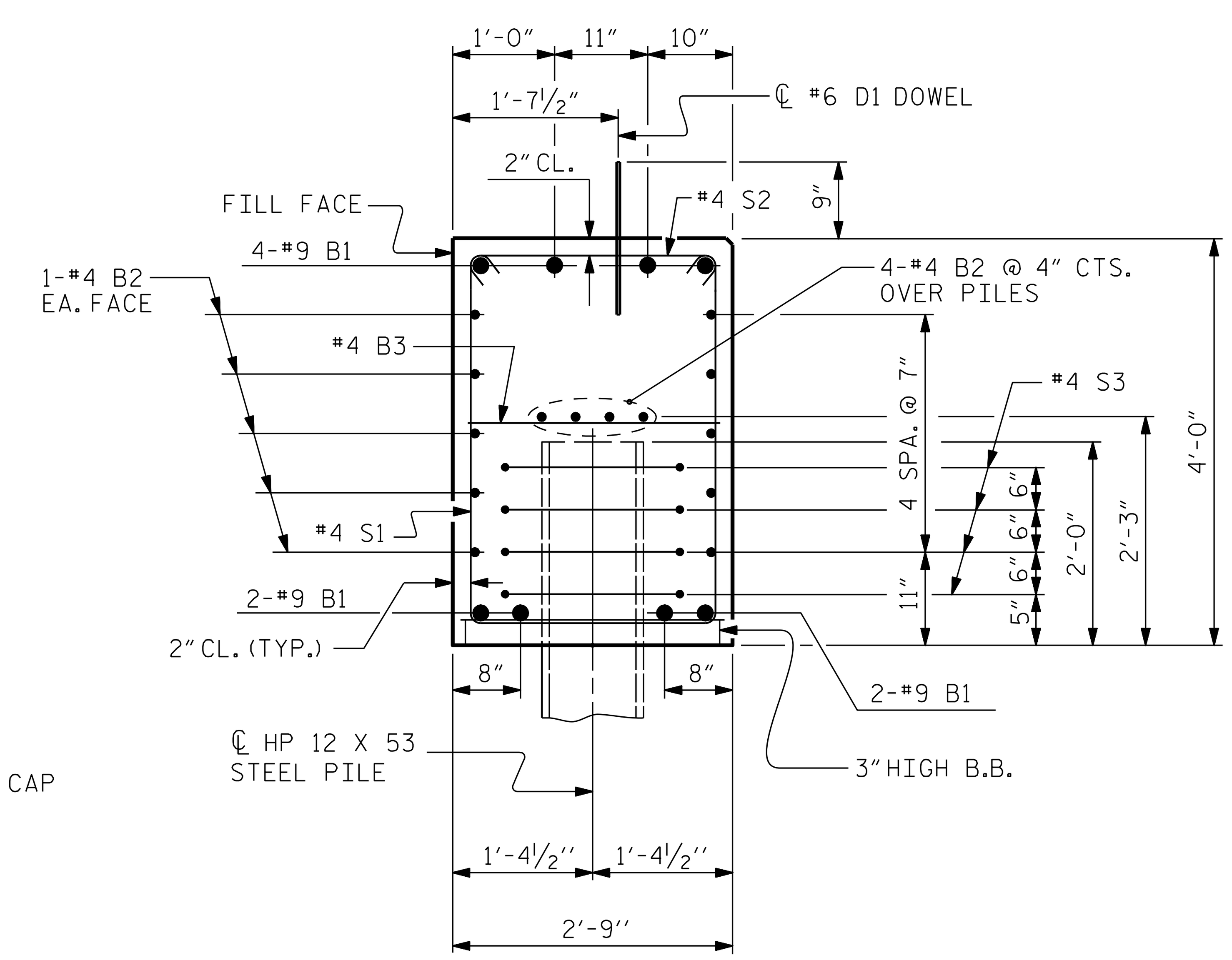


ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL
(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)



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

PROJECT NO. 17BP.2.R.89
BEAUFORT COUNTY
STATION: 23+94.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
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SUBSTRUCTURE

END BENTS 1 & 2 DETAILS

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SHEET NO. S-15
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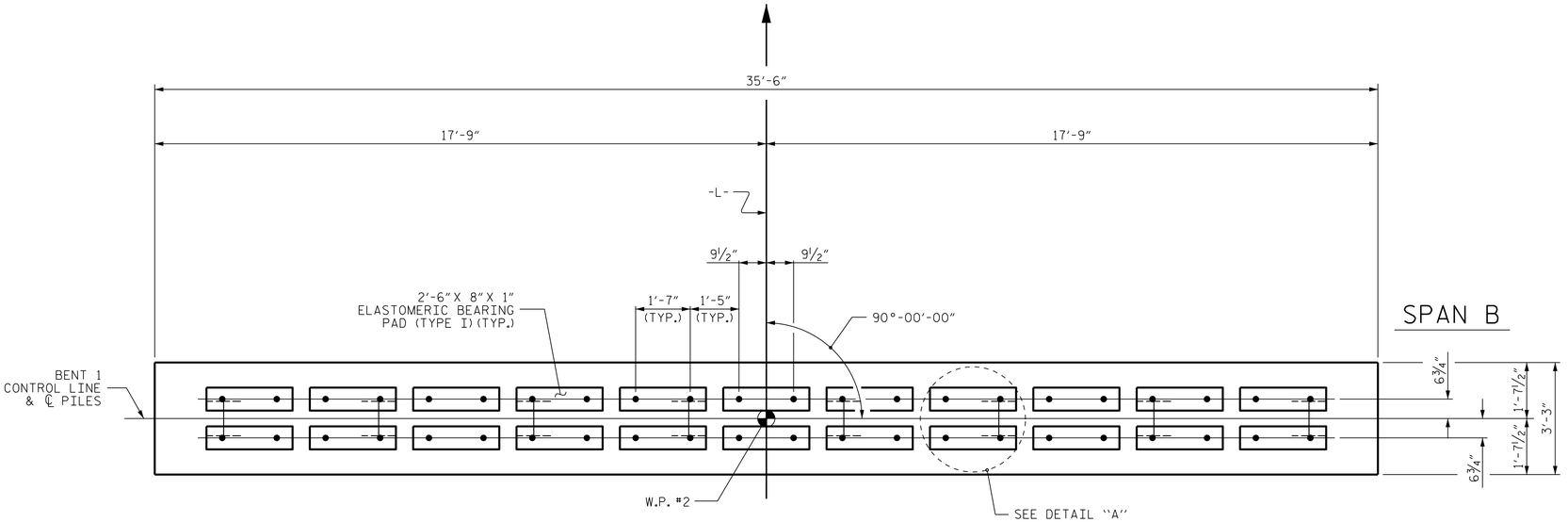
NOTES

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

★ INVERT ALTERNATE STIRRUPS.

GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 28 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.



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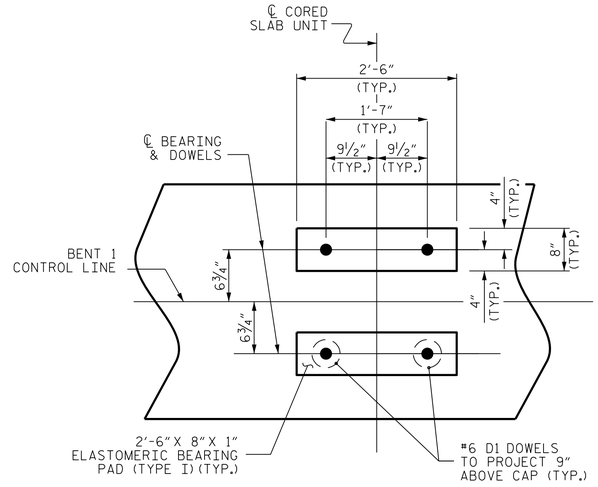
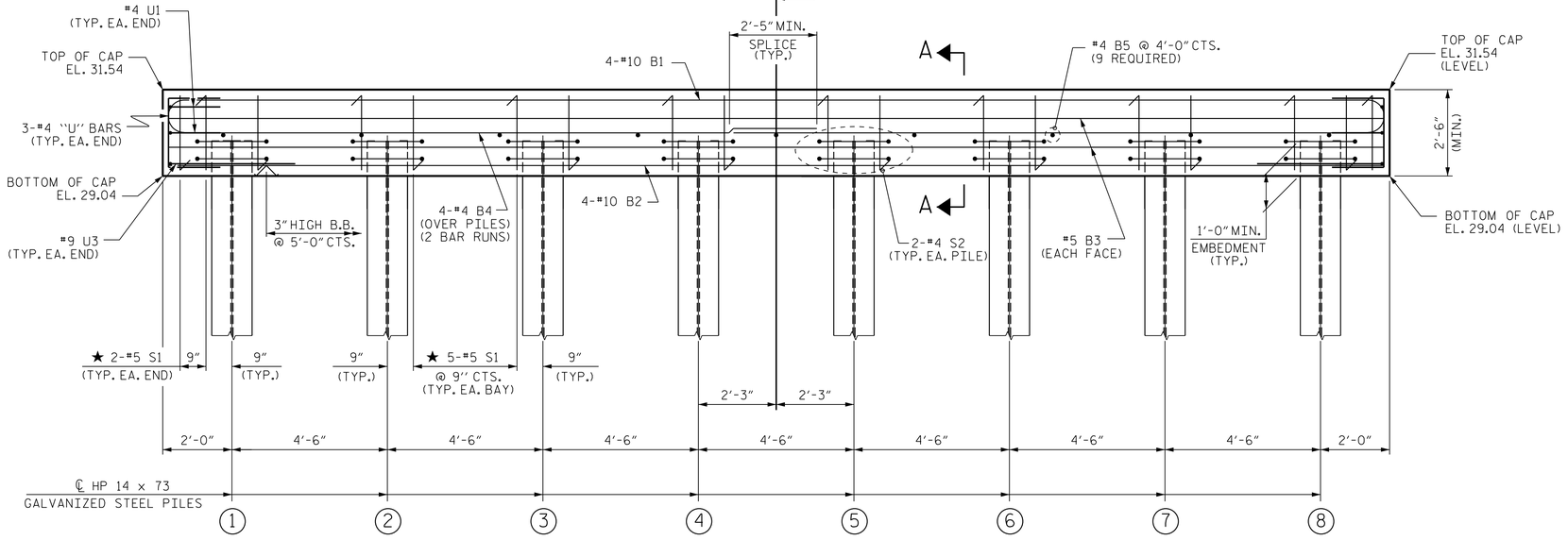


DETAIL "A"
(DIMENSIONS ARE TYPICAL EACH BEARING)



ELEVATION
FOR SECTION A-A, SEE SHEET 2 OF 2

PROJECT NO. 17BP.2.R.89
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SHEET 1 OF 2

STATE OF NORTH CAROLINA
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BENT 1

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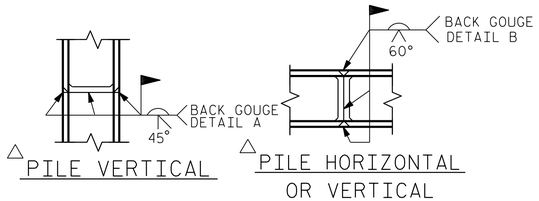
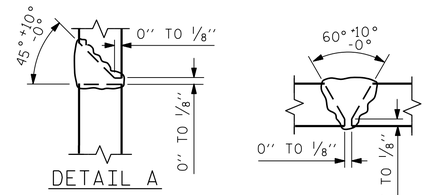


△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



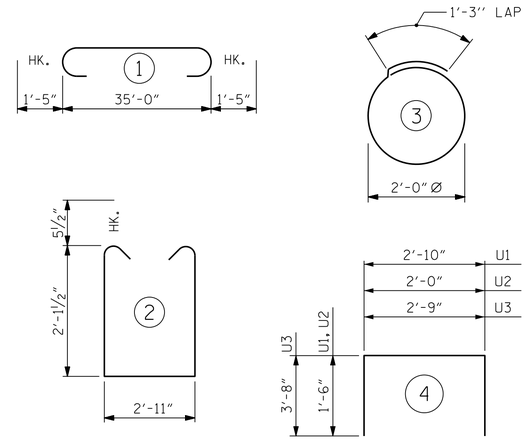
DETAIL A

DETAIL B

△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	37'-10"	651
B2	4	#10	STR	35'-2"	605
B3	4	#5	STR	35'-2"	147
B4	8	#4	STR	18'-10"	101
B5	9	#4	STR	2'-11"	18
D1	44	#6	STR	1'-6"	99
S1	39	#5	2	8'-1"	329
S2	16	#4	3	7'-7"	81
U1	4	#4	4	5'-10"	16
U2	6	#4	4	5'-0"	20
U3	2	#9	4	10'-1"	69

REINFORCING STEEL 2136 LBS

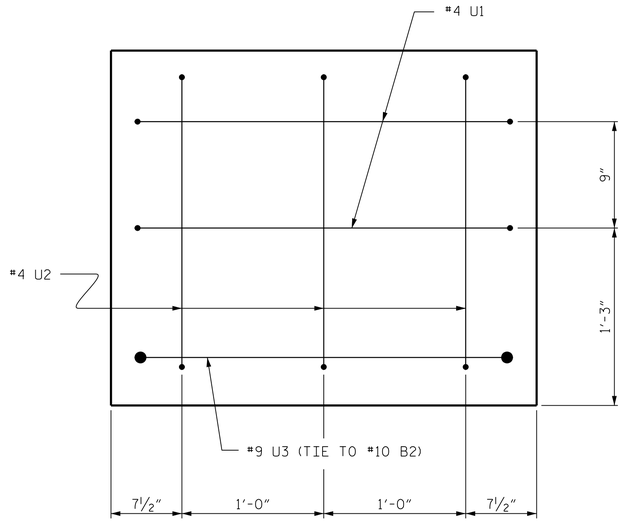
TOTAL CLASS A CONCRETE 10.7 C.Y.

HP 14 X 73 GALVANIZED STEEL PILES

No. 8 LIN. FT. 600

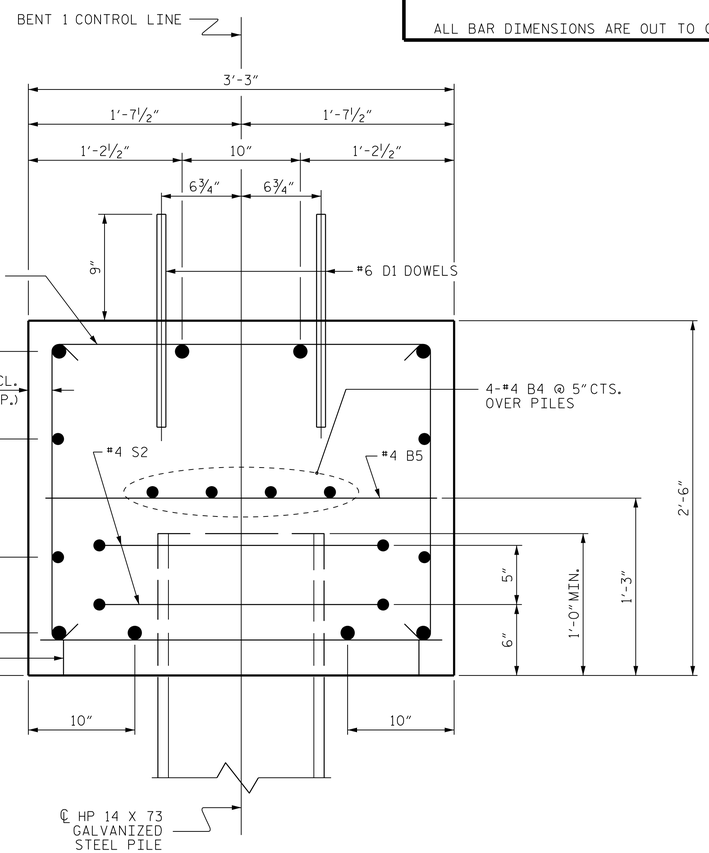
PILE DRIVING EQUIPMENT SETUP EA. 8

PILE REDRIVES EA. 4



END OF CAP VIEW

(TYPICAL BOTH ENDS)



SECTION A-A

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Ting Fang

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DEPARTMENT OF TRANSPORTATION
RALEIGH

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BENT 1

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SHEET 2 OF 2

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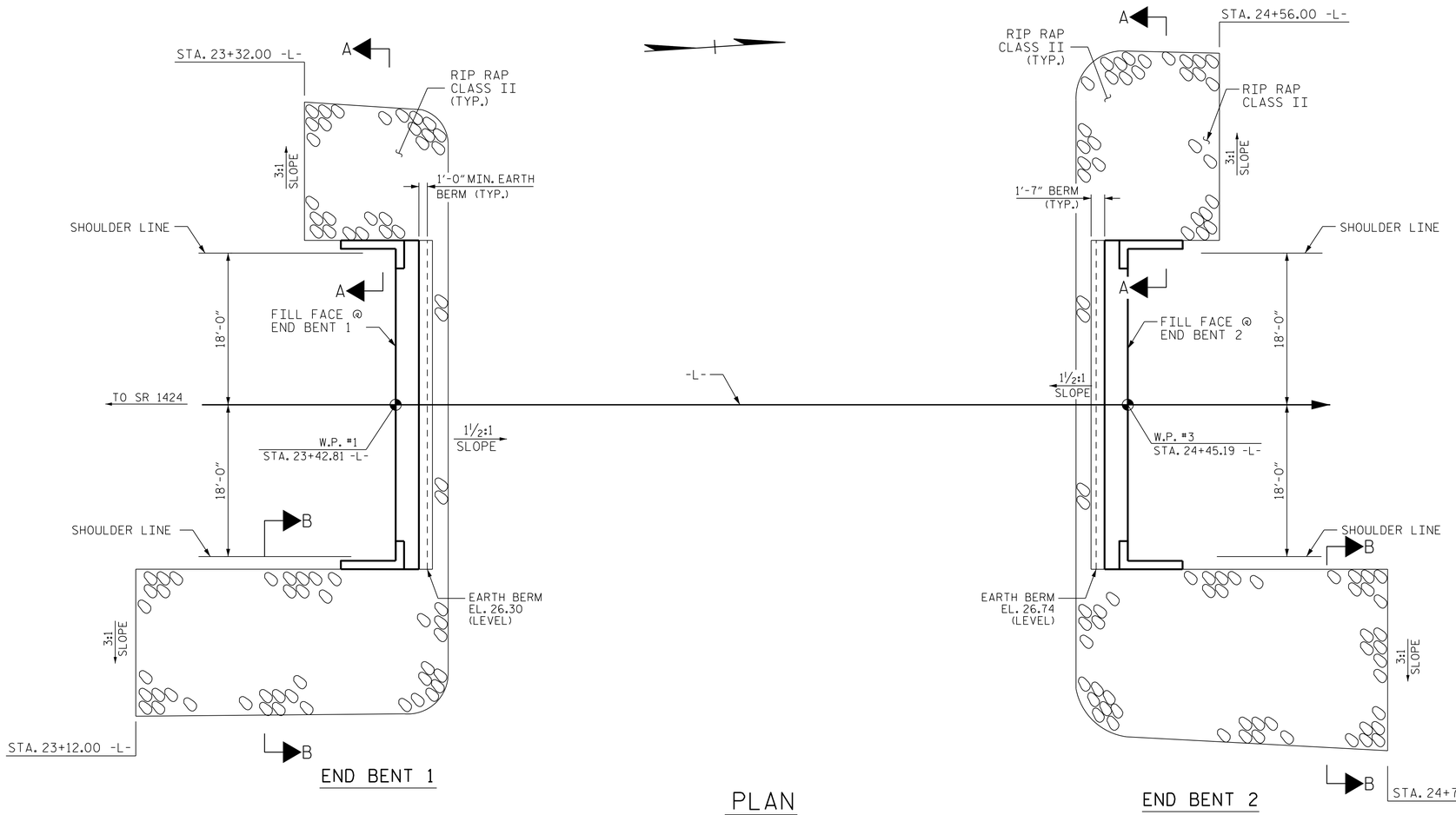
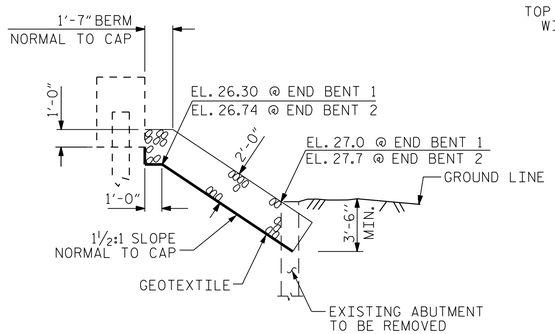
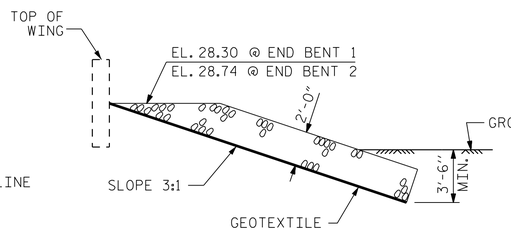
ESTIMATED QUANTITIES		
BRIDGE @ STA. 23+94.00 -L-	RIP RAP CLASS II	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	160	180
END BENT 2	210	235
TOTAL	370	415



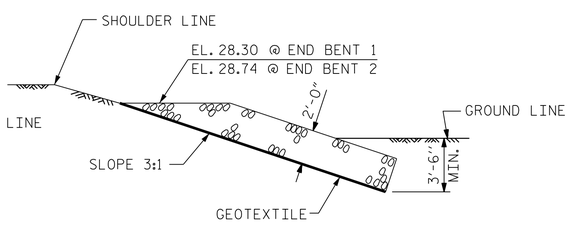


℄ SECTION @ END BENTS

BERM RIP RAPPED



SECTION A-A



SECTION B-B

PROJECT NO. 17BP.2.R.89

BEAUFORT COUNTY

STATION: 23+94.00 -L-

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CDM Smith

CDM SMITH
5400 Glenwood Avenue, Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

DRAWN BY : VDK DATE : 03/18
CHECKED BY : THF DATE : 03/18
DESIGN ENGINEER : VDK DATE : 03/18

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSIUNG FANG
Ting Hsiung Fang
5/11/2018 6:44:52 AM

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			19

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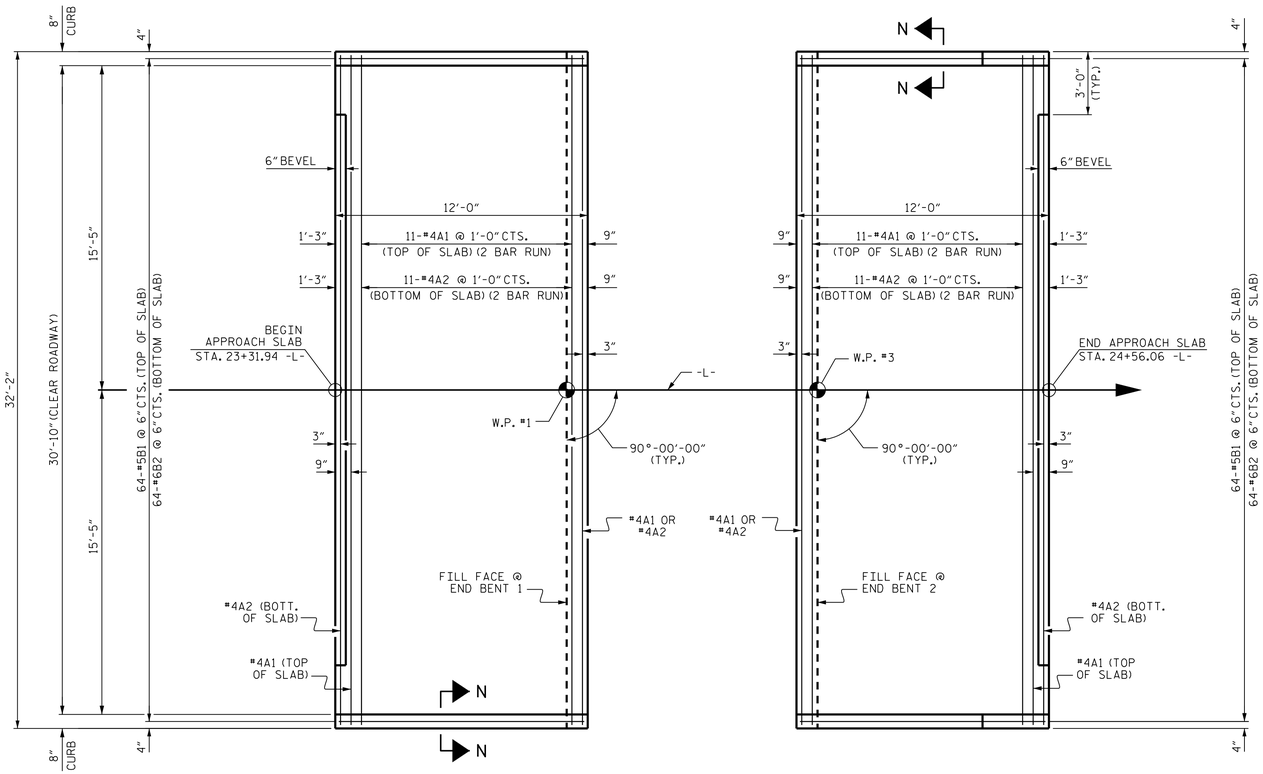
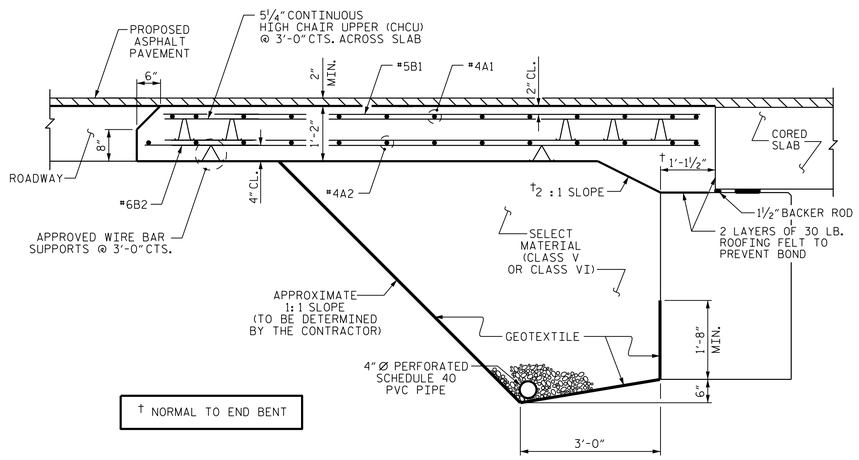


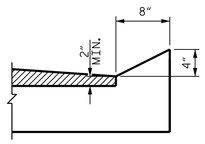
PLAN

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

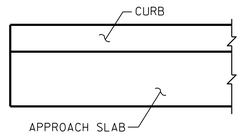


SECTION THRU SLAB

(TYPE II - MODIFIED APPROACH FILL)

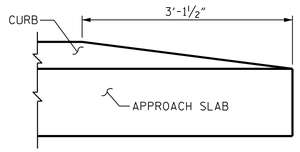


SECTION N-N



END OF CURB WITH SHOULDER BERM GUTTER

AT END BENT 1 (SEE ROADWAY PLANS)



END OF CURB WITHOUT SHOULDER BERM GUTTER

AT END BENT 2 (SEE ROADWAY PLANS)

CURB DETAILS

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

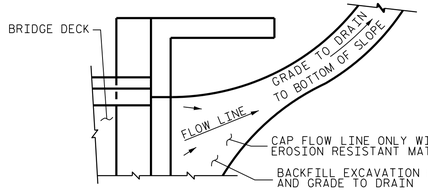
SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

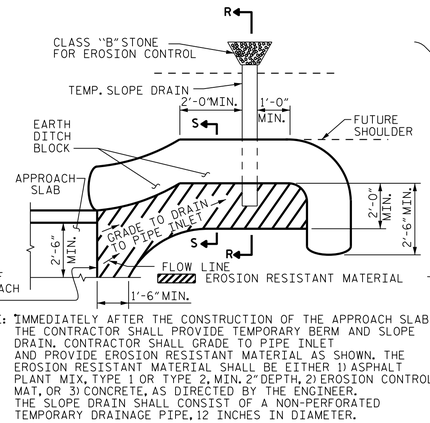
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.



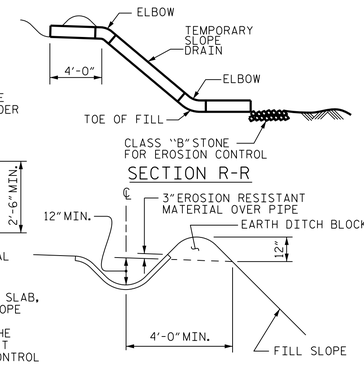
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL



NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

PLAN VIEW



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

BILL OF MATERIAL

APPROACH SLAB AT EB 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	26	#4	STR	16'-11"	294
A2	26	#4	STR	16'-9"	291
✳ B1	64	#5	STR	11'-2"	745
B2	64	#6	STR	11'-8"	1121
REINFORCING STEEL				LBS.	1412
✳ EPOXY COATED REINFORCING STEEL				LBS.	1039
CLASS AA CONCRETE				C.Y.	18.4

APPROACH SLAB AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	26	#4	STR	16'-11"	294
A2	26	#4	STR	16'-9"	291
✳ B1	64	#5	STR	11'-2"	745
B2	64	#6	STR	11'-8"	1121
REINFORCING STEEL				LBS.	1412
✳ EPOXY COATED REINFORCING STEEL				LBS.	1039
CLASS AA CONCRETE				C.Y.	18.4

SPLICE LENGTHS

BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"

PROJECT NO. 17BP.2.R.89

BEAUFORT COUNTY

STATION: 23+94.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED SLAB UNIT (SUB-REGIONAL TIER) 90°SKEW

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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5400 Glenwood Avenue, Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

DRAWN BY : VDK DATE : 03/18
CHECKED BY : THF DATE : 03/18
DESIGN ENGINEER : VDK DATE : 03/18

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSIUNG FANG

Ting Fang 5/11/2018 6:44:52 AM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			19

STD. NO. BAS_33_90S

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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