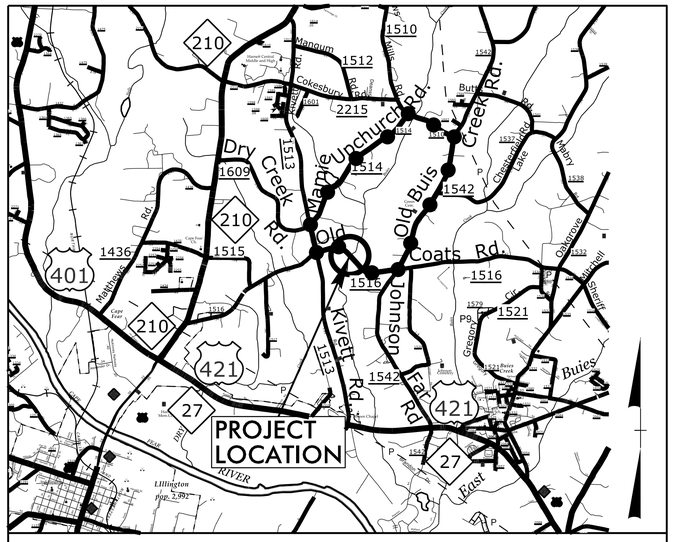
09/08/99

TIP PROJECT: B–5412

CONTRACT: DF00158

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



VICINITY MAP ***N.T.S.***

DENOTES OFF–SITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HARNETT COUNTY

LOCATION: BRIDGE NO. 420007 OVER WEST BUIES CREEK ON SR 1516 (SHERIFF JOHNSON ROAD)

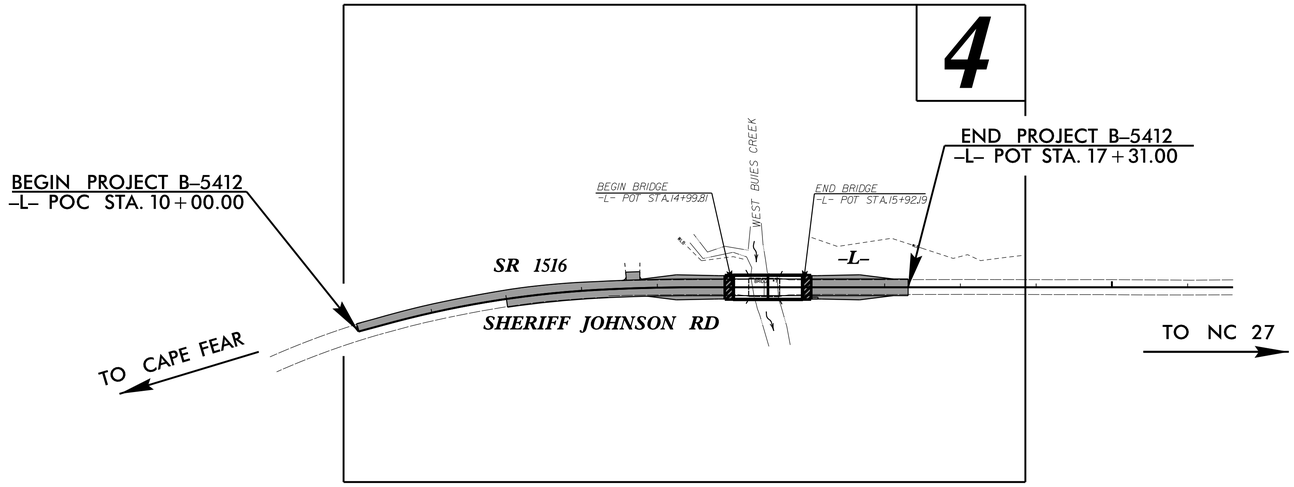
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–5412	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
55042.1.1	BRZ–1516(003)	PE
55042.2.1	BRZ–1516(003)	R/W & UTILITIES
55042.3.1	BRZ–1516(003)	CONST

NAD 83/
NA 2011

4



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

30 15 0 30 60
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2016 = 1400
ADT 2036 = 2529
K = NA %
D = NA %
T = 6 % *
V = 60 MPH
* TTST = DUAL
FUNC CLASS = MINOR COLLECTOR
SUB REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B–5412 = 0.120 MILES

LENGTH STRUCTURE TIP PROJECT B–5412 = 0.018 MILES

TOTAL LENGTH TIP PROJECT B–5412 = 0.138 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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 27, 2017

LETTING DATE:
JUNE 21, 2017

DAVID J. CLODGO, P.E.
PROJECT ENGINEER

KIT PERSIANI, P.E.
PROJECT DESIGN ENGINEER

STEVE KENDALL, P.E.
NCDOT CONTACT

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 31025 ENGINEER KAREN HEFNER P.E.
5/17/2017
DocuSigned by: Karen Hefner
SIGNATURE:

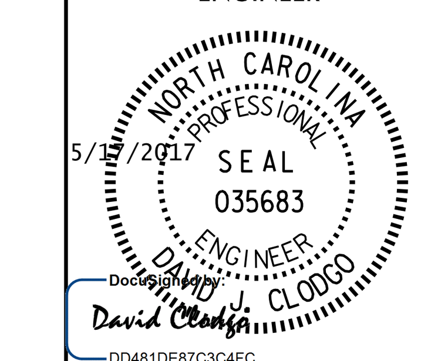
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 035683 ENGINEER DAVID J. CLODGO P.E.
5/12/2017
DocuSigned by: David Clodgo
SIGNATURE:

STATE OF NORTH CAROLINA * DEPARTMENT OF TRANSPORTATION *

PROJECT REFERENCE NO.	SHEET NO.
B-5412	1A

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ROADWAY DESIGN ENGINEER



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 SHEETS
2A-1 THRU 2A-2	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1	SPECIAL DETAILS
3B-1	ROADWAY SUMMARIES AND DRAINAGE SUMMARIES
4 THRU 5	PLAN AND PROFILE SHEET
TMP-1 THRU TMP-3	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-6	EROSION CONTROL PLANS
UC-1 THRU UC-4	UTILITIES CONSTRUCTION PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1	CROSS-SECTION INDEX SHEET
X-1A	CROSS-SECTION SUMMARY SHEET
X-2 THRU X-9	CROSS-SECTIONS
S-1 THRU S-16	STRUCTURE PLANS

GENERAL NOTES: 2012 SPECIFICATIONS EFFECTIVE: 01-17-2012 REVISED: 01-24-2017

GRADE LINE:
GRADING AND SURFACING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

SUBSURFACE PLANS:

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

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE CENTURYLINK AND HARNETT COUNTY WATER.

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

RIGHT-OF-WAY MARKERS:

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

2012 ROADWAY ENGLISH STANDARD DRAWINGS EFF. 01-17-2012 REV. 02-29-2016

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2012 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 4 - MAJOR STRUCTURES	
422.11	Bridge Approach Fills - Sub Regional Tier
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.20	Frames and Wide Slot Flat Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.45	Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

04/06/15

PROJECT REFERENCE NO.	SHEET NO.
B-5412	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
- 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
- Potential Contamination Area: Soil
- Known Contamination Area: Water
- Potential Contamination Area: Water
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — 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:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite R/W Marker — RW
- Proposed Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
B-5412	1C-1
Location and Surveys	

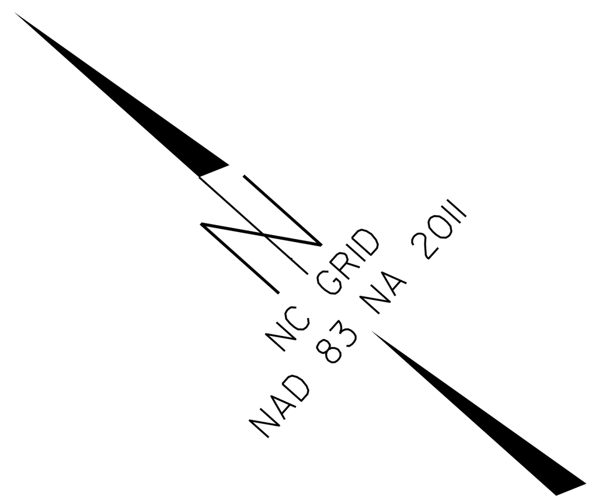
SURVEY CONTROL SHEET B-5412

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	613359.0318	2068883.2788
PC	10+41.81	613336.1827	2068918.2937
PCC	13+21.56	613159.8811	2069134.8286
PT	14+46.25	613069.1293	2069220.3157
POT	21+59.84	612536.7928	2069695.5419

BL

POINT	DESC.		NORTH	EAST	ELEVATION	L STATION	OFFSET
1	B5412	BL1	613277.2950	2069024.7370	197.22	11+62.00	14.34 LT
2	B5412	BL2	612966.6660	2069291.6350	192.77	15+70.18	15.03 RT
3	B5412	BL3	612733.3050	2069539.0020	193.60	19+09.00	14.09 LT



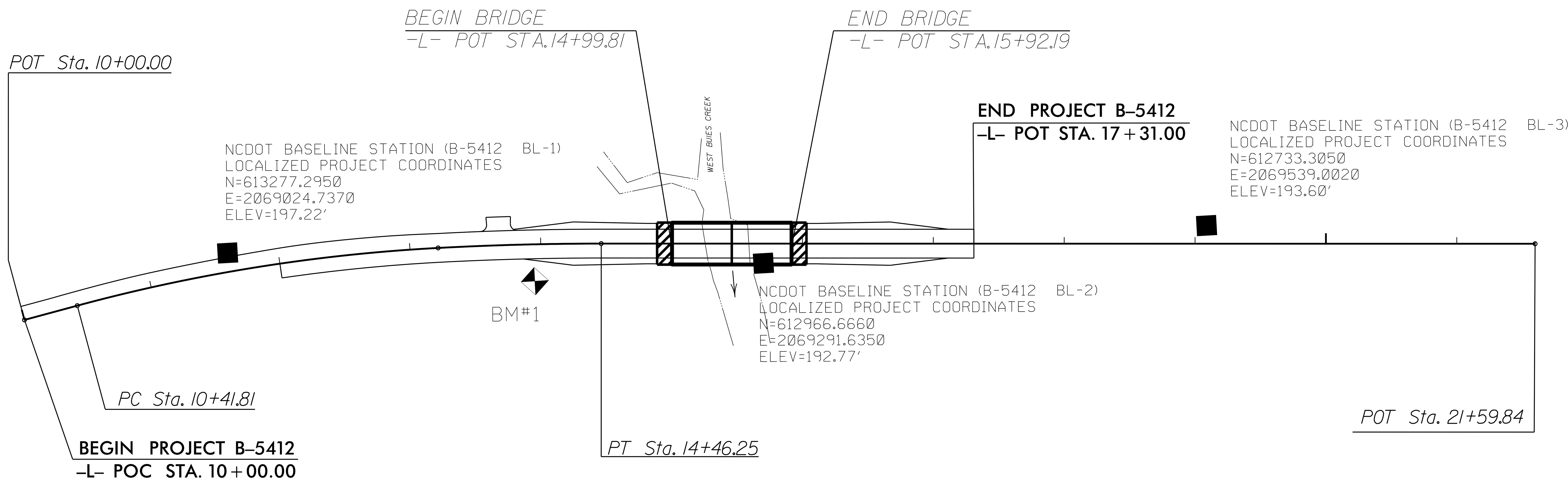
****

BM1 ELEVATION = 194.00
N 613088 E 2069166
L STATION 13+95.00 28 RIGHT
RR SPIKE IN BASE OF 24" MAPLE TREE

****

FINAL ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	16+28.00	30.43	612913.27771	2069318.65502
L	16+28.00	49.00	612900.91122	2069304.80239
L	15+88.00	30.45	612943.10493	2069292.00287
L	15+88.00	49.00	612930.75080	2069278.16407



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B5412 BL2"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 612966.6660(ft) EASTING: 2069291.6350(ft)
ELEVATION: 192.7700(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999873536
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B5412 BL2" TO -L- STATION 10+00 IS
N59°58'47.96"W 163.38'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

NOTES:

○ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL AND VERTICAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING GNSS (GLOBAL NAVIGATION SATELLITE SYSTEM).

THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/

THE FILES TO BE FOUND ARE AS FOLLOWS:
B5412_LS_CONTROL.TXT

SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

PROJECT REFERENCE NO.	SHEET NO.
B-5412	2A-1

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 035683 ENGINEER DAVID J. CLODGO — 5/17/2017 — DocuSigned by: David Clodgo

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 033296 ENGINEER STEVEN D. KENDALL — 5/17/2017 — DocuSigned by: Steve Kendall

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

NC DEPARTMENT OF TRANSPORTATION PAVEMENT MANAGEMENT UNIT 1593 MAIL SERVICE CENTER RALEIGH, NC 27699-1593

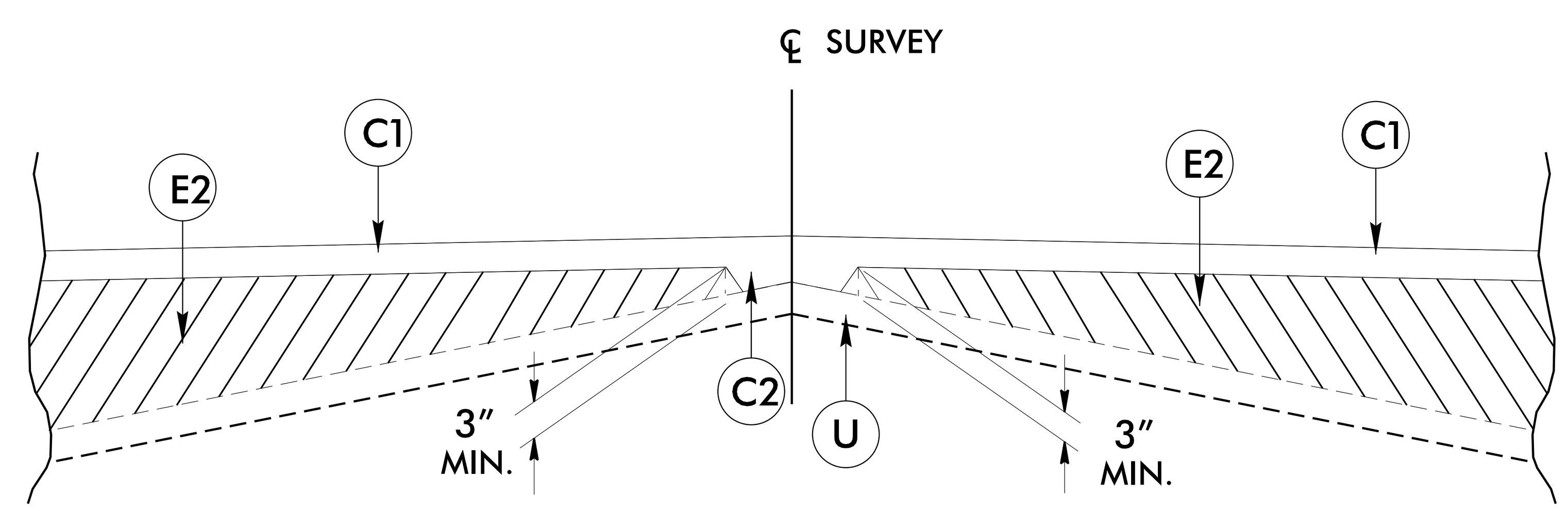
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

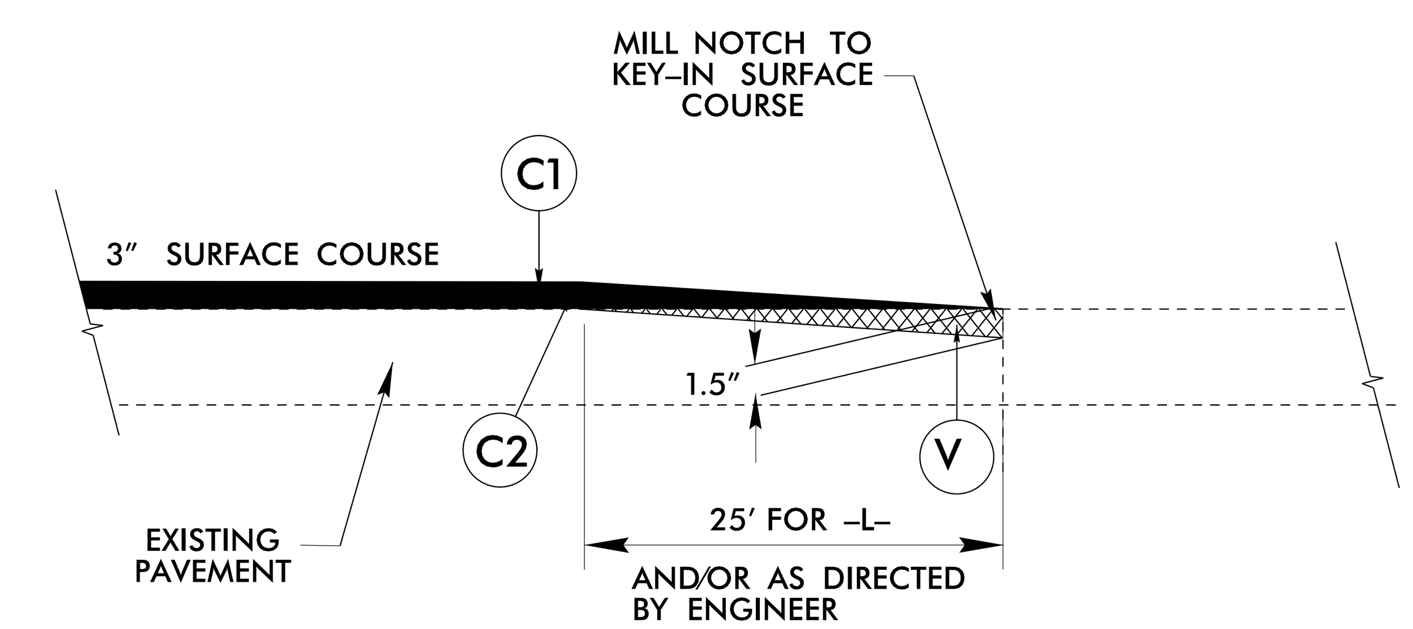
C1	PROP. APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	T	EARTH MATERIAL.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BEPLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	U	EXISTING PAVEMENT.
E1	PROP. APPROX. 5.0" ASPHALT CONCRETE BASE COURSE TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	V	MILLING BITUMINOUS PAVEMENT. 0" TO 1.5" DEPTH.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, 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 5.5" IN DEPTH.	W	VARIABLE DEPTH ASPHALT PAVEMENT

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



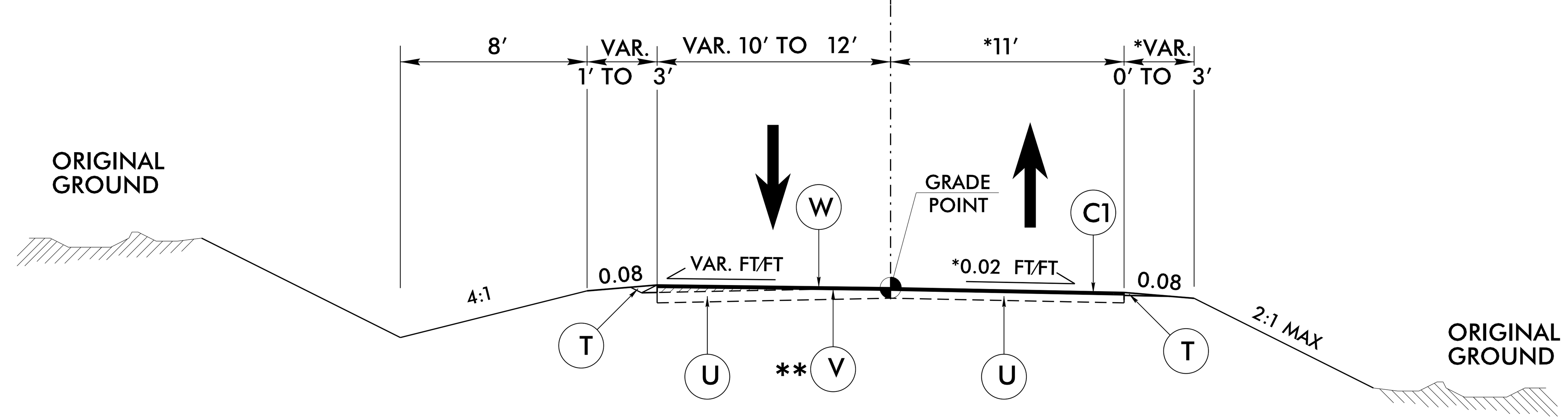
Detail Showing Method of Wedging

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



-L-LT STA. 10+00.00 AND STA. 17+31.00
-L-RT STA. 12+00.00 AND STA. 17+31.00

℄ -L- (SHERIFF JOHNSON RD.)



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

**-L- STA. 10+00.00 TO 12+00.00 LT
-L- STA. 17+20.00 TO 17+31.00 LT

*-L- STA. 17+20.00 TO 17+31.00 RT

NOTE: FOR -L- STA. 10+00.00 TO 12+00.00 LT MILL TO TIE AT CENTERLINE

PROJECT REFERENCE NO.	SHEET NO.
B-5412	2A-2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 035683 ENGINEER DAVID J. CLODGO 5/17/2017 David Clodgo	NORTH CAROLINA PROFESSIONAL SEAL 033296 ENGINEER STEVEN D. KENDALL 5/17/2017 Steve Kendall
CDM Smith — CDM Smith Inc. 5400 Glenwood Avenue Suite 400 Raleigh, NC 27612-3228 NC COA No. F-1255	NC DEPARTMENT OF TRANSPORTATION PAVEMENT MANAGEMENT UNIT 1593 MAIL SERVICE CENTER RALEIGH, NC 27699-1593

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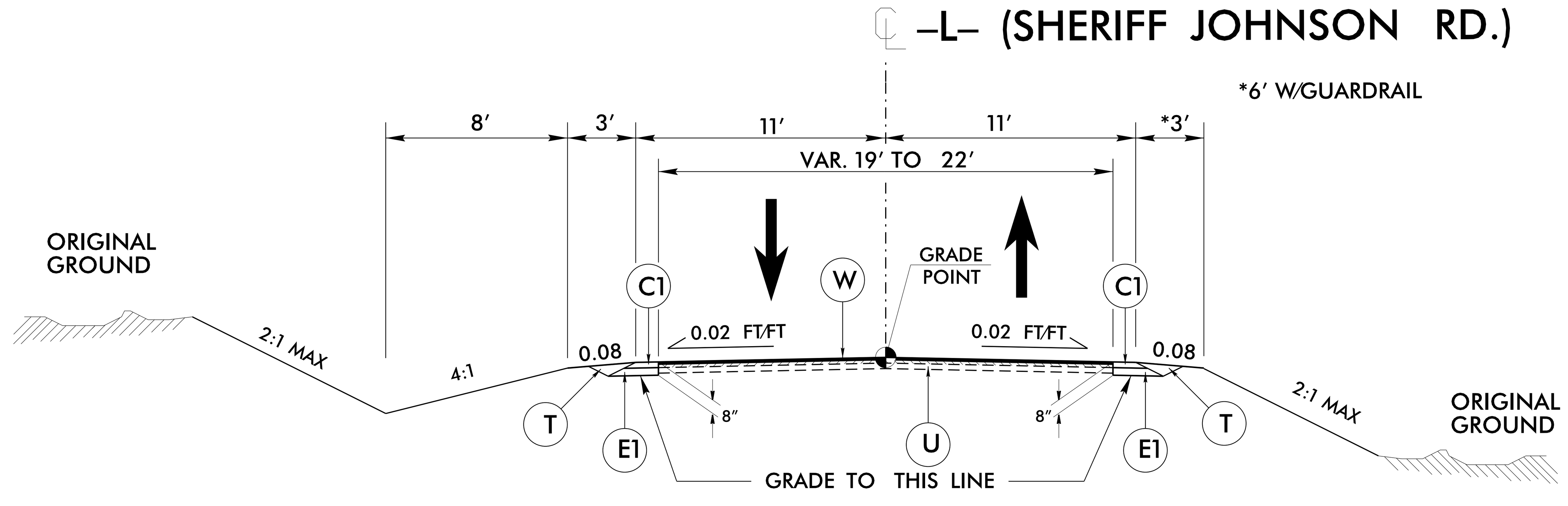


TYPICAL SECTION NO. 2

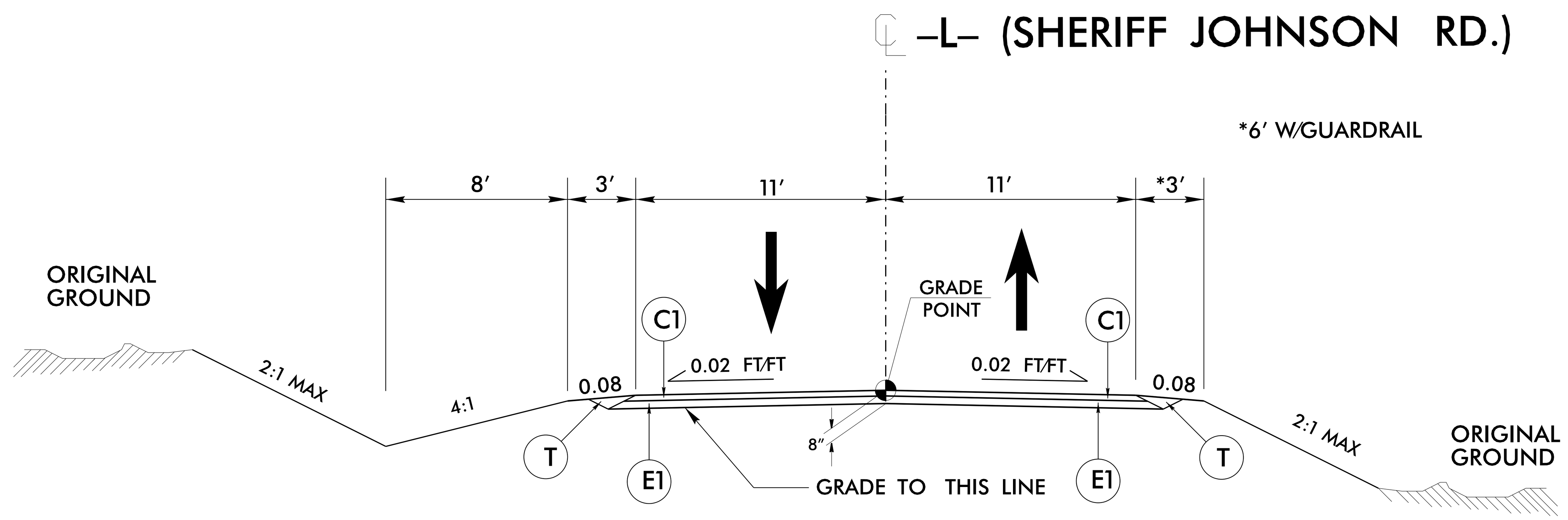
USE TYPICAL SECTION NO. 2

-L- STA. 12+00.00 TO 14+49.88
-L- STA. 16+42.13 TO 17+20.00

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

PAVEMENT SCHEDULE	
C1	3.0" S9.5B
C2	VAR. S9.5B
E1	5.0" B25.0B
E2	VAR. B25.0B
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V	0" - 1.5" MILLING
W	WEDGING

PAVEMENT EDGESLOPES 1:1 UNLESS NOTED OTHERWISE

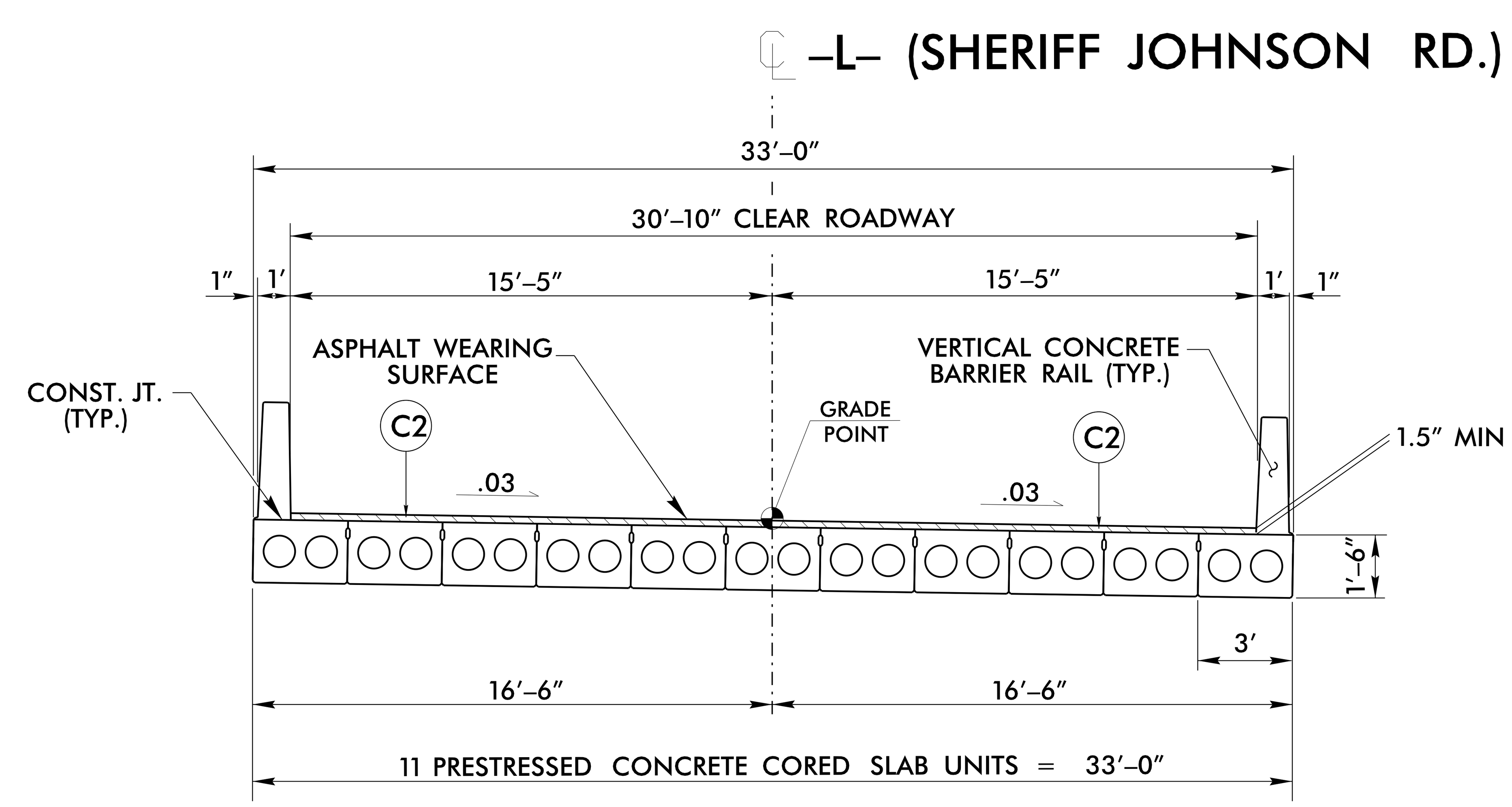


TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

-L- STA. 14+49.88 TO 14+99.81 (BEGIN BRIDGE)
-L- STA. 15+92.19 (END BRIDGE) TO 16+42.13

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

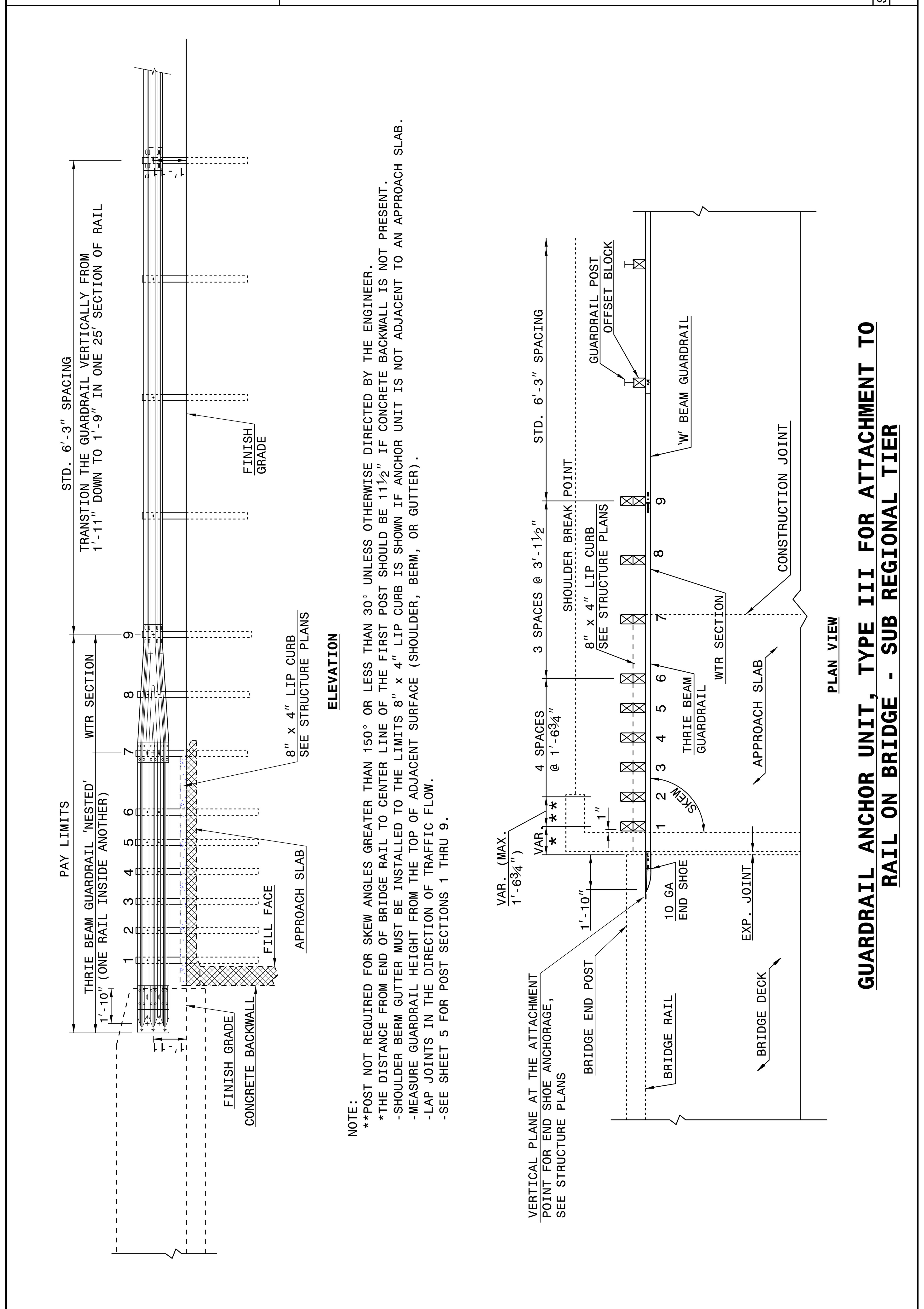


TYPICAL BRIDGE SECTION NO. 1

USE TYPICAL BRIDGE SECTION NO. 1

-L- STA. 14+99.81 TO 15+92.19

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. — ENGLISH DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER — SHEET 2 OF 7 862d03

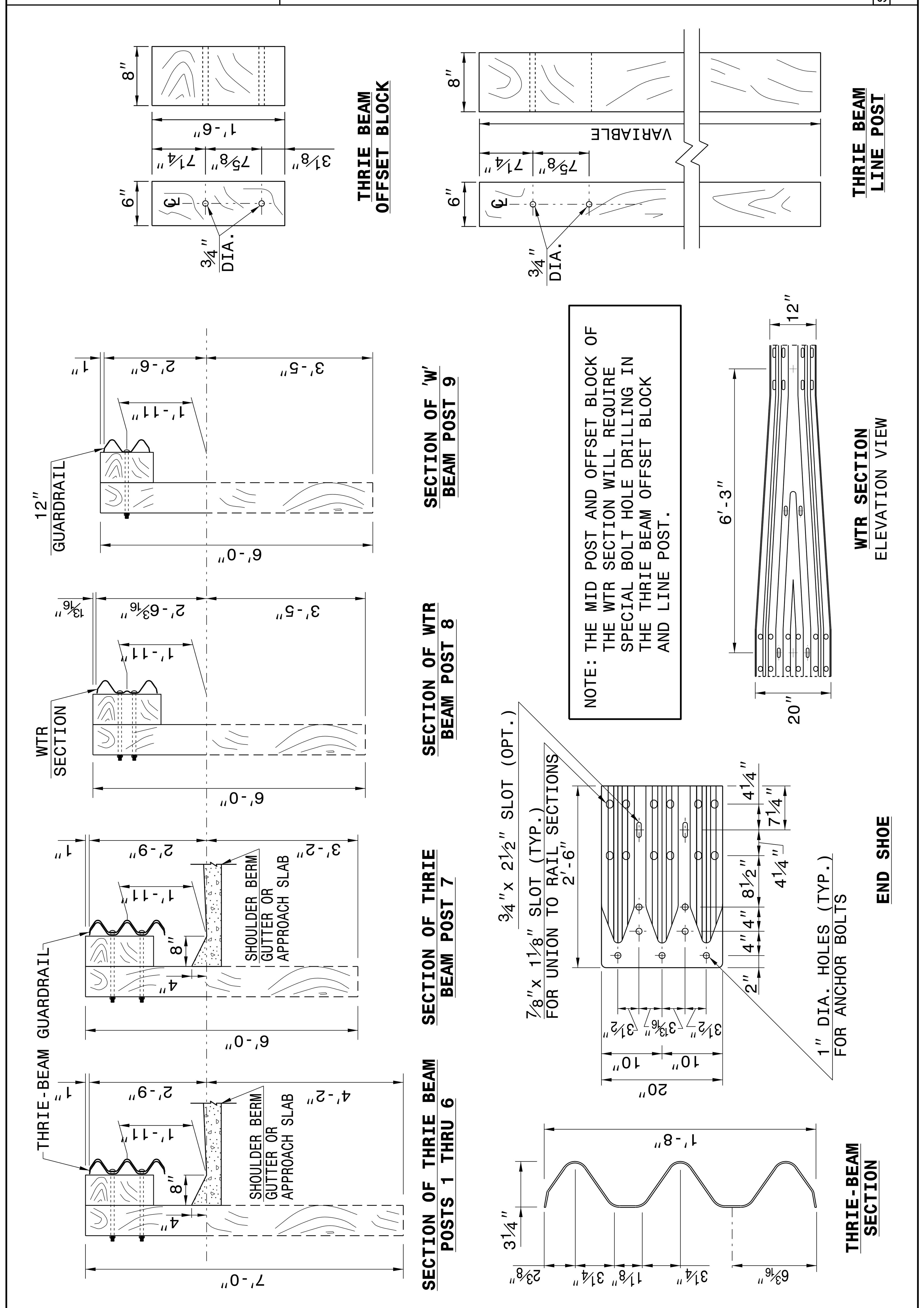


STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7
862d03

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. — ENGLISH DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III — SHEET 3 OF 7 862d03



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

ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III

SHEET 3 OF 7
862d03

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

SEE TITLE BLOCK

ORIGINAL BY: J HOWERTON DATE: 06-22-12
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

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

COMPUTED BY: K. PERSIANI	DATE: 8/16/2016
CHECKED BY: D. CLODGO	DATE: 8/16/2016

PROJECT REFERENCE NO.	SHEET NO.
B-5412	3B-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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	SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
-L- 16+08.00	RT	0400		193.60															
		0400	0401		189.50	189.00													
SHEET TOTALS																			

STATION	C.S. PIPE 12" (.064)	15" (.064)	18" (.064)	24" (.064)	30" (.079)	36" (.079)	42" (.109)	48" (.109)	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"
-L- 16+08.00																								
										12														
SHEET TOTALS										12														

STATION	48" WELDED STEEL (0.625" THICK) TRENCHLESS INSTALLATION	*36" WELDED STEEL (0.625" THICK) TRENCHLESS INSTALLATION	***" RC PIPE CULVERTS, CONTRACTOR DESIGN	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') PER EACH (0' THRU 5.0')	LIN. FT. A 5.0' THRU 10.0'	LIN. FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND 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 TWO GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22
-L- 16+08.00								1											1			1	
SHEET TOTALS								1											1			1	

STATION	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.J.D. STD. 840.34	T.B.J.D. STD. 840.46	M.H. FRAME AND COVER STD. 840.54	PARALLEL PIPE END SECTION STD. 310.02	OPEN THROAT CATCH BASIN STD. 840.04 OR 840.05	SPING BOX STD. 540.41	DRY DETENTION OUTLET CONTROL STR. SHEETS 2-BC AND 2-BE	T.B.G.D.I. STD. 840.36	T.B.D.I. FRAME WITH TWO GRATES STD. 840.37		ADJUST CB	ADJUST C.B/M.H.	CONVERT TO C.B.	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
-L- 16+08.00																					
SHEET TOTALS																					

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 ROP 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	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS XI MOD	XI	GRAU 350 TL-3	M-350	XIII	CAT-1	VI MOD	BIC	TYPE III	IMPACT ATTENUATOR TYPE 350 NO.	PERMITTED G	PERMITTED NG				REMARKS
-L-	14+24.81	14+99.81	LT.	75.00				14+99.81	4.42	7.42		50.00		1.00			1						1							
-L-	14+24.81	14+99.81	RT.	75.00			14+99.81		4.42	7.42	50.00		1.00				1						1							
-L-	15+92.19	16+67.19	LT.	75.00			15+92.19		4.42	7.42	50.00		1.00				1						1							
-L-	15+92.19	16+67.19	RT.	75.00				15+92.19	4.42	7.42		50.00		1.00			1						1							
			SUBTOTAL	300.00													4						4							
			ANCHOR UNIT DEDUCTION GRAU350 Type III: 4 @ 50.00 = 200.00 TYPE III: 4 @ 18.75 = 75.00 TOTAL: 275.00																											
			TOTAL	25.00													4						4							
			SAY	25.00																										
			ADDITIONAL GUARDRAIL POSTS:	5																										

SHOULDER BERM GUTTER

LINE	STATION	STATION	LOCATION	LENGTH
-L-	16+03	16+12	RT	9
			TOTAL	9
			SAY	10

REMOVAL OF EXISTING ASPHALT PAVEMENT

LINE	STATION	STATION	LOCATION	LENGTH OR AREA	WIDTH	SQUARE YARDS
-L-	14+50	15+21	CL	1423.93		158.21
-L-	15+62	16+42	CL	1591.67		176.85
					TOTAL	335.07
					SAY	340

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

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.

SUMMARY OF EARTHWORK

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
-L- 10+00.00	-L- 14+99.81 (BRIDGE)	6	164	158	
SUBTOTALS:		6	164	158	
-L- 15+92.19 (BRIDGE)	-L- 17+31.00	56	8		48
SUBTOTALS:		56	8		48
TOTAL		62	172	158	48
MATERIAL FOR SHOULDER CONSTRUCTION					
LOSS DUE TO CLEARING AND GRUBBING					
WASTE IN LIEU OF BORROW				-48	-48
PROJECT TOTALS:		62	172	110	
EST. 5% TO REPL. TOP SOIL ON BORROW PIT				5	
GRAND TOTALS:		62		115	
SAY:		70		120	

5/28/99

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PROJECT REFERENCE NO.	SHEET NO.
B-5412	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035683 DAVID J. CLODGO — 5/17/2017 — David Clodgo

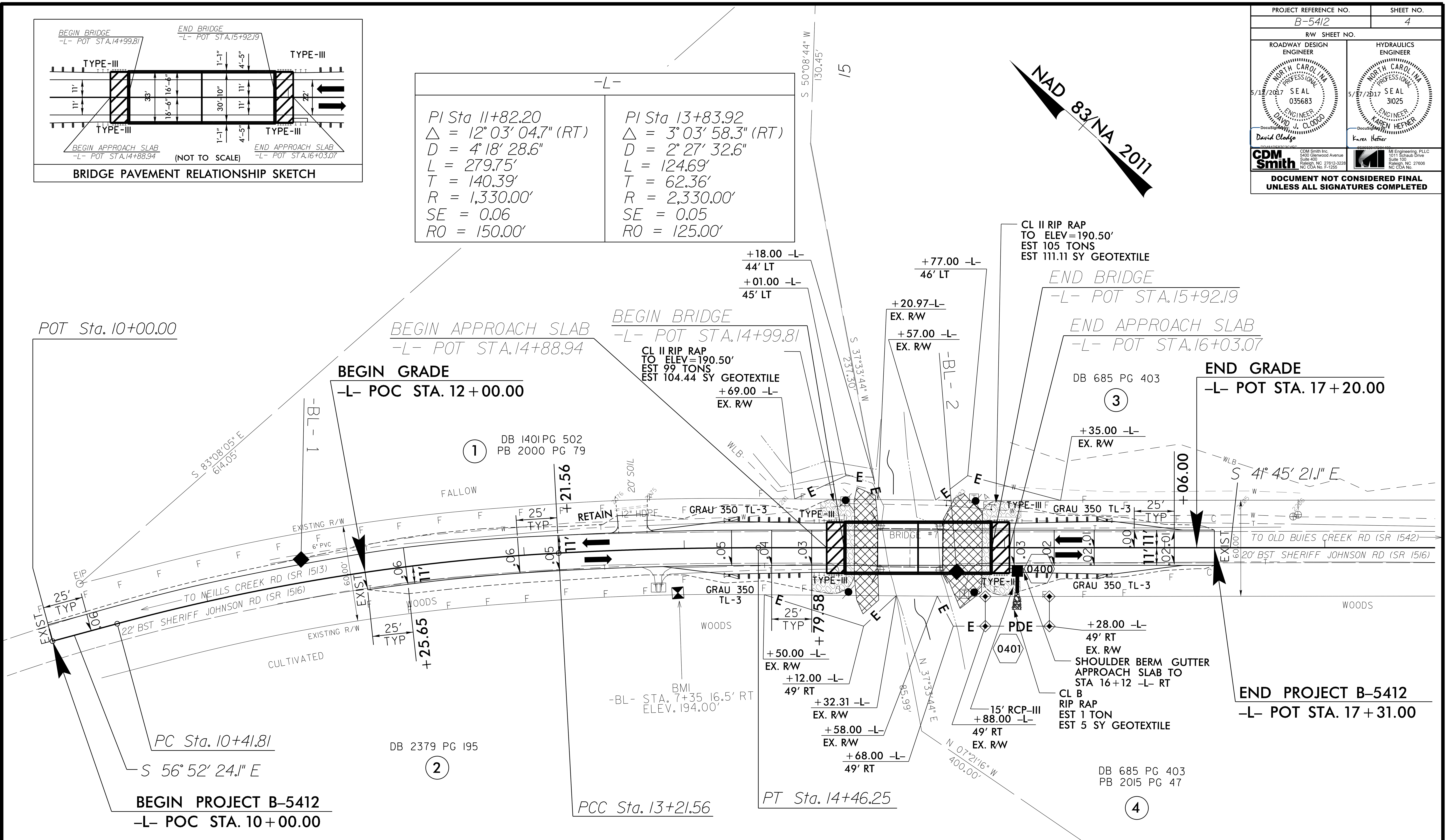
HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 31025 KAREN HEFNER — 5/17/2017 — Karen Hefner

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

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS



BEGIN BRIDGE -L- POT STA.14+99.81
END BRIDGE -L- POT STA.15+92.19
TYPE-III
BEGIN APPROACH SLAB -L- POT STA.14+88.94
END APPROACH SLAB -L- POT STA.16+03.07
(NOT TO SCALE)
BRIDGE PAVEMENT RELATIONSHIP SKETCH
-L-
PI Sta 11+82.20
Δ = 12° 03' 04.7" (RT)
D = 4° 18' 28.6"
L = 279.75'
T = 140.39'
R = 1,330.00'
SE = 0.06
R0 = 150.00'
PI Sta 13+83.92
Δ = 3° 03' 58.3" (RT)
D = 2° 27' 32.6"
L = 124.69'
T = 62.36'
R = 2,330.00'
SE = 0.05
R0 = 125.00'
NAD 83/NA 2011
POT Sta. 10+00.00
BEGIN GRADE -L- POC STA. 12+00.00
END GRADE -L- POT STA. 17+20.00
CL II RIP RAP TO ELEV=190.50' EST 99 TONS EST 104.44 SY GEOTEXTILE
CL II RIP RAP TO ELEV=190.50' EST 105 TONS EST 111.11 SY GEOTEXTILE
DB 1401 PG 502 PB 2000 PG 79
DB 685 PG 403
DB 2379 PG 195
DB 685 PG 403 PB 2015 PG 47
TO NEILLS CREEK RD (SR 1513)
22' BST SHERIFF JOHNSON RD (SR 1516)
TO OLD BUIES CREEK RD (SR 1542)
20' BST SHERIFF JOHNSON RD (SR 1516)
S 41° 45' 21.1" E
S 56° 52' 24.1" E
S 83°08'05" E 614.05'
S 50°08'44" W 130.45'
S 37°33'44" W 237.30'
N 37°33'44" E 85.99'
N 07°21'16" W 400.00'
GRAU 350 TL-3
SHOULDER BERM GUTTER APPROACH SLAB TO STA 16+12 -L- RT
CL B RIP RAP EST 1 TON EST 5 SY GEOTEXTILE
15' RCP-III
BMI -BL- STA. 7+35 16.5' RT ELEV. 194.00'
PC Sta. 10+41.81
PCC Sta. 13+21.56
PT Sta. 14+46.25
BEGIN PROJECT B-5412 -L- POC STA. 10+00.00
END PROJECT B-5412 -L- POT STA. 17+31.00
FALLOW
WOODS
CULTIVATED
EXISTING R/W
PDE
0400
0401

RIGHT OF WAY AREA DATA

PARCEL NUMBER	PROPERTY OWNERS NAMES	TOTAL AREA	AREA TAKEN	AREA REMAINING	CONST. EASEMENT	PERMANANT DRAINAGE EASEMENT	TEMPORARY UTILITY EASEMENT
1	JOHNNY ADD JOHNSON	2.86 Ac.		2.86 Ac.	501.20 SF		
2	ELIZABETH SEXTON EARP	29.13 Ac.		29.13 Ac.	787.14 SF		
3	A & M FARMS INC	76.33 Ac.		76.33 Ac.	602.17 SF		
4	A & M FARMS INC	97.55 Ac.		97.55 Ac.	465.40 SF	742.17 SF	

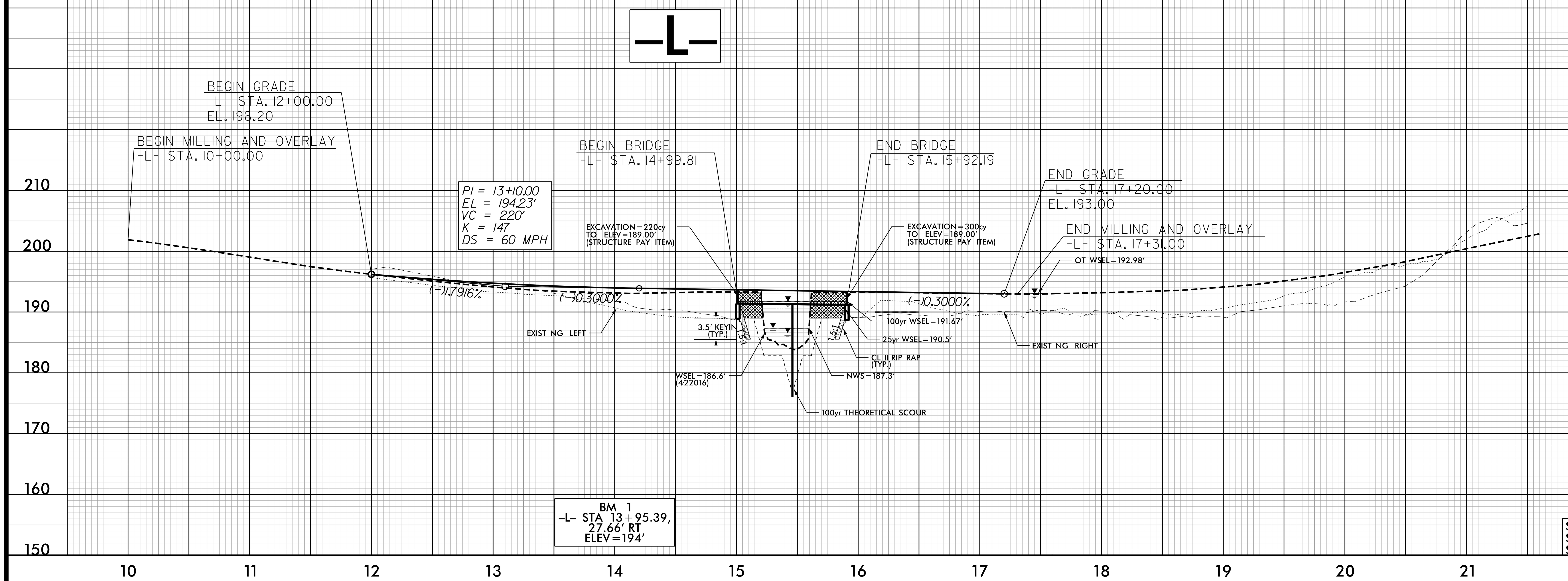
30' 0' 30' 60'
15'
(ENGLISH)

SEE SHEET 5 FOR -L- PROFILE
SEE SHEET S-1 THRU S-16 FOR STRUCTURE PLANS

PROJECT REFERENCE NO.	SHEET NO.
B-5412	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 035683 ENGINEER DAVID J. CLODGO 5/17/2017 David Clodgo	NORTH CAROLINA PROFESSIONAL SEAL 31025 ENGINEER KAREN HEFNER 5/12/2017 Karen Hefner
CDM Smith — CDM Smith Inc. 5400 Glenwood Avenue Suite 400 Raleigh, NC 27612-3228 NC COA No. F-1255	MI Engineering, PLLC 1011 Schaub Drive Suite 100 Raleigh, NC 27606 NC COA No.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-



SEE SHEET 4 FOR -L- ALIGNMENT
SEE SHEET S-1 THRU S-16 FOR STRUCTURE PLANS

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	900	CFS
DESIGN FREQUENCY	=	25	YRS
DESIGN HW ELEVATION	=	190.5	FT
BASE DISCHARGE	=	1350	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	191.67	FT
OVERTOPPING DISCHARGE	=	2570	CFS
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING ELEVATION	=	192.98	FT
DATE OF SURVEY	=	4/2/2016	
W.S.ELEVATION AT DATE OF SURVEY	=	186.6	FT

5/28/99

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PROJ. REFERENCE NO.	SHEET NO.
B-5412	TMP-3

SIGN NUMBER: 1
TYPE: STATIONARY
QUANTITY: SEE PLANS

SIGN WIDTH: 3′-6″
HEIGHT: 1′-6″
TOTAL AREA: 5.3 Sq.Ft.

BORDER TYPE: INSET
RECESS: 0.38″
WIDTH: 0.5″
RADII: 1.5″

NO. Z BARS:
LENGTH:

BACKG COLOR: Fluorescent Orange
COPY COLOR: Black

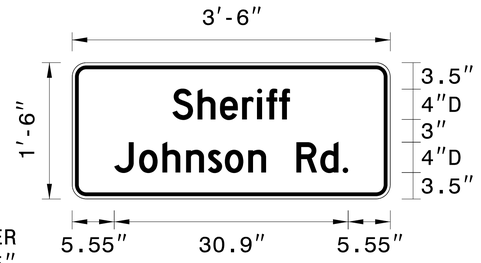
SYMBOL	X	Y	WID	HT

MAT′L: 0.080″ (2.0 mm) ALUMINUM

USE NOTES: 1,2

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

DESIGN BY: BN
PROJECT ID: B-5412
CHECKED BY: KAP
LOCATION: LILLINGTON
Feb 15, 2017
DIV: 5



Panel Style: Traffic Control.ssi
M.U.T.C.D.: 2009 Edition

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter locations are string start to lower left corner

																										Series/Size Text Length
		S	h	e	r	i	f	f																		D 2000
	13.2	0	3.3	6.3	9.2	11.2	12.4	14.1																		15.5
		J	o	h	n	s	o	n		R	d	.														D 2000
	5.6	0	3.3	6.4	9.5	12.4	14.6	17.7	20	24	27.2	30.2														30.9

FILENAME: B5412_TMP_TC03

NORTH CAROLINA D.O.T. SIGN DETAIL

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

APPROVED: DocuSigned by: Kit A. Persiani 69634AC5704C424...
DATE: 5/16/2017
SEAL

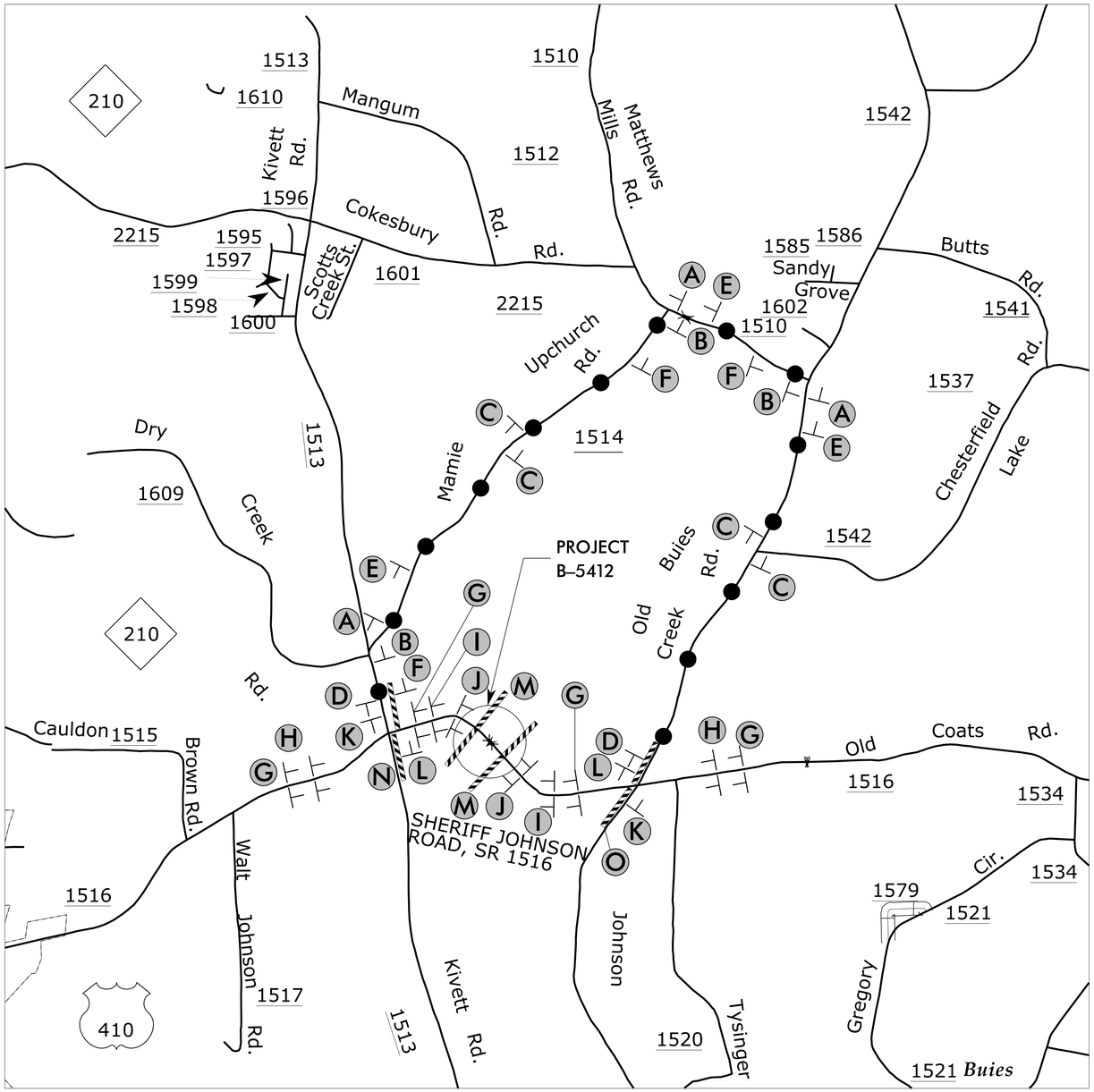
NORTH CAROLINA PROFESSIONAL SEAL 021655 ENGINEER KIT A. PERSIANI

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SIGN DESIGN

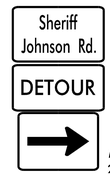
PROJ. REFERENCE NO.	SHEET NO.
B-5412	TMP-2



OFF-SITE DETOUR ROUTE

SEE SHEET TMP–3
M4–8 24″ X 12″
M6–1 L 21″ X 15″

Ⓐ

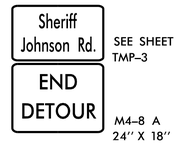


SEE SHEET TMP–3
M4–8 24″ X 12″
M6–1 21″ X 15″

Ⓑ

SEE SHEET TMP–3
M4–8 24″ X 12″
M6–3 21″ X 15″

Ⓒ



SEE SHEET TMP–3
M4–8 A 24″ X 18″

Ⓓ

SEE SHEET TMP–3
M4–8 24″ X 12″
M5–1 21″ X 15″

Ⓔ

SEE SHEET TMP–3
M4–8 24″ X 12″
M5–1 R 21″ X 15″

Ⓕ

W20–3 48″ X 48″

Ⓖ

W20–2 48″ X 48″

Ⓗ

W20–3 48″ X 48″

Ⓘ

W20–3 48″ X 48″

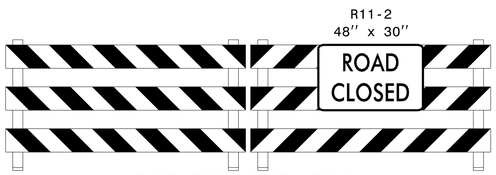
Ⓙ

W20–3 48″ X 48″
SP–4L 42″ X 12″

Ⓚ

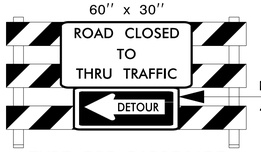
W20–3 48″ X 48″
SP–4R 42″ X 12″

Ⓛ



TYPE III BARRICADE(S)

Ⓜ



M4-10L 48″ x 18″

TYPE III BARRICADE

Ⓝ

M4-10R 48″ x 18″

TYPE III BARRICADE

Ⓞ

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

APPROVED: DocuSigned by: Kit A. Persiani 69634AC5704C424...
DATE: 5/16/2017
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 021655 ENGINEER KIT A. PERSIANI

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

OFF–SITE DETOUR

4/10/2017
R:\ncdot\B5412\Traffic\TrafficControl\TCP\B5412_TMP_TC02.dgn
User:persianik

PROJ. REFERENCE NO.	SHEET NO.
B-5412	TMP-1B

MANAGEMENT STRATEGIES

1- CLOSE SR 1516 SHERIFF JOHNSON ROAD TO TRAFFIC AND DETOR TRAFFIC OFF-SITE.

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

GENERAL NOTES

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

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

TRAFFIC PATTERN ALTERATIONS

A) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

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

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

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

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

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

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

TRAFFIC CONTROL DEVICES

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

PHASING

STEP 1: USING RSD 1101.03 (SHEET 1 OF 9), INSTALL DETOUR ROUTE SIGNING TO CLOSE SR 1516 (SHERIFF JOHNSON ROAD) FROM STA. 10+00+/- TO STA. 17+31+/- -L-.

STEP 2: AWAY FROM TRAFFIC, COMPLETE CONSTRUCTION OF PROPOSED BRIDGE AND ROADWAY APPROACHES, INCLUDING DRAINAGE, GUARDRAIL, FINAL PAVEMENT MARKINGS AND MARKERS ON PROPOSED -L- FROM STA. 10+00+/- TO STA. 17+31+/-.

STEP 3: REMOVE TEMPORARY TRAFFIC CONTROL DEVICES AND OPEN -L- TO PROPOSED 2-LANE, 2-WAY TRAFFIC PATTERN.

LOCAL NOTES

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

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

APPROVED: DocuSigned by: Kit A. Persiani 69634AC5704C424...

DATE: 5/16/2017

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 021655 ENGINEER KIT A. PERSIANI

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TRANSPORTATION OPERATIONS PLAN

4/10/2017
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User:persianik

PROJ. REFERENCE NO.	SHEET NO.
B-5412	TMP-1A

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2012 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)

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: DocuSigned by: kt A. Persiani 6963AAC5704C424...

DATE: 5/16/2017

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 021655 ENGINEER K. A. PERSIANI

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NC COA No. F-1255

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

ROADWAY STANDARD DRAWINGS & LEGEND

4/10/2017
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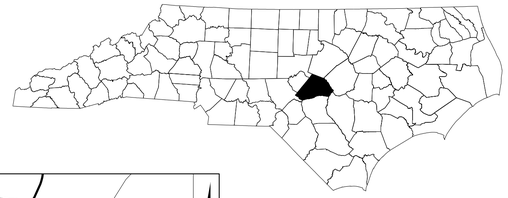
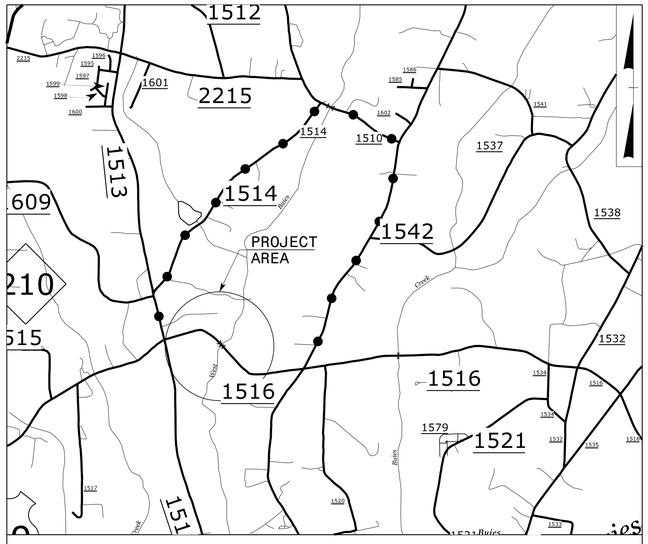
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

HARNETT COUNTY





VICINITY MAP

OFF-SITE DETOUR ROUTE

LOCATION: BRIDGE NO. 7 OVER WEST BUIES CREEK ON SR 1516 (SHERIFF JOHNSON ROAD)

INDEX OF SHEETS

SHEET NO.
TMP-1

TIP PROJECT: B-5412

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

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

J. S. BOURNE, P.E. — *STATE TRAFFIC MANAGEMENT ENGINEER*
J. S. KITE, P.E. — *TRAFFIC CONTROL PROJECT ENGINEER*
M. SPRINGER, P.E. — *TRAFFIC CONTROL PROJECT DESIGN ENGINEER*
_____ — *TRAFFIC CONTROL DESIGN ENGINEER*

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

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APPROVED: DocuSigned by: kt A. Persiani
DATE: 5/16/2017

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 021655 ENGINEER KIT A. PERSIANI

4/10/2017
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User:persianik

TIP NO.	SHEET NO.
B-5412	PMP-2

APPROVED:

DATE:

SEAL

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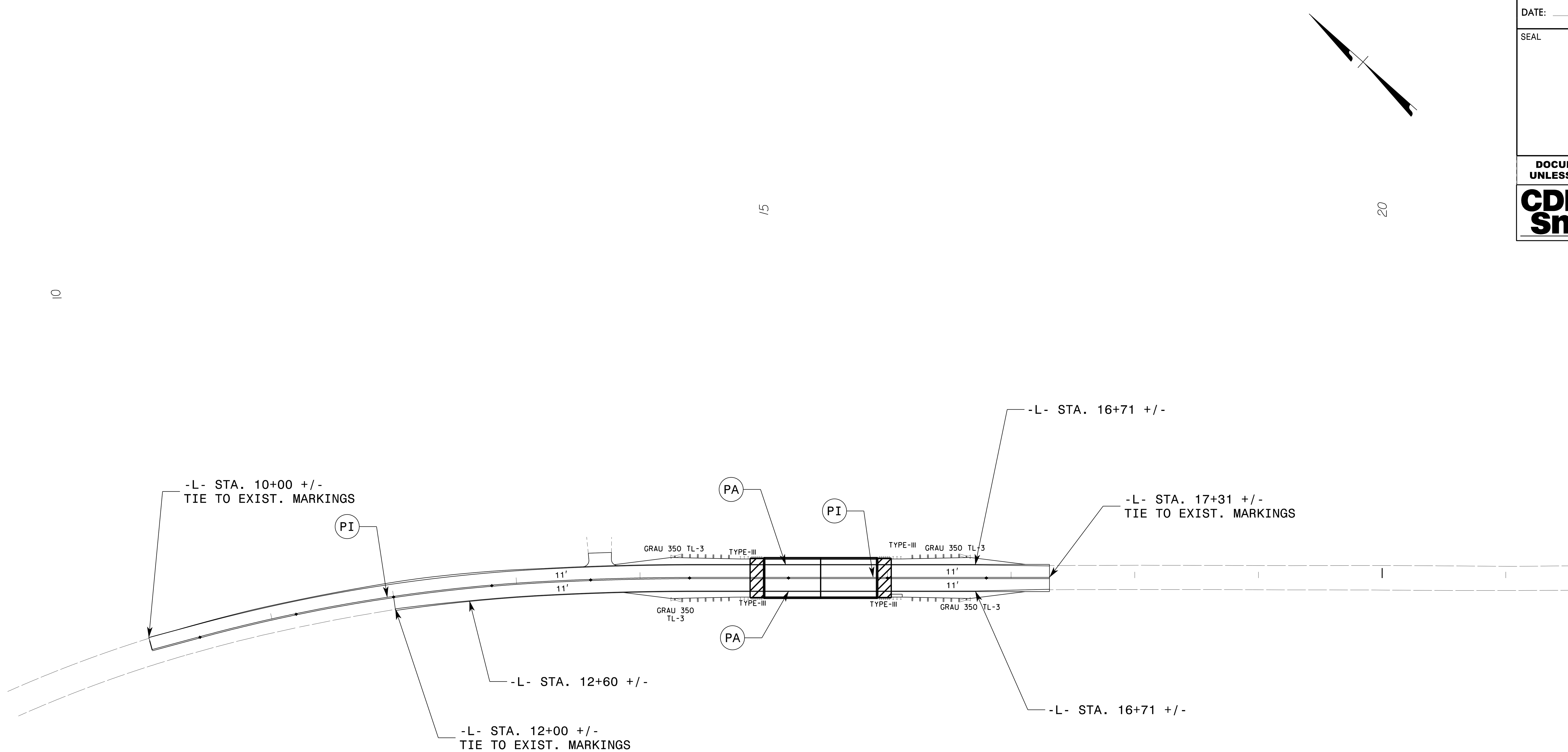
NC COA No. F-1225



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PAVEMENT MARKING DETAIL

T.I.P.: B-5412

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN
HARNETT COUNTY
LOCATION: SR 1516 (SHERIFF JOHNSON ROAD) AT WEST BUIES CREEK

TIP NO.	SHEET NO.
B-5412	PMP-1

APPROVED: _____

DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 021655 ENGINEER MATT A. PERSIANI

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CDM Smith

CDM Smith Inc.
5400 Glenwood Avenue
Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1225

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

GENERAL NOTES

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

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

ROAD NAME	MARKING	MARKER
SHERRIFF JOHNSON ROAD	PAINT	PERMANENT RAISED

B) PLACE TWO APPLICATIONS OF PAINT PAVEMENT MARKINGS ON THE FINAL WEARING SURFACE. PLACE THE SECOND APPLICATION OF PAINT UPON SUFFICIENT DRYING TIME OF THE FIRST.

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

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

E) MARKERS SHALL BE INSTALLED ACCORDING TO THE NCDOT ROADWAY STANDARD DRAWING 1250.01.

INDEX

PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
PAINT(4")	
PA	WHITE EDGELINE
PI	YELLOW DOUBLE CENTER

PLAN PREPARED BY: N.C.D.O.T. SIGNING AND DELINEATION UNIT

_____ SIGNING & DELINEATION REGIONAL ENGINEER

_____ SIGNING & DELINEATION PROJECT DESIGN ENGINEER/TECHNICIAN

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

4/10/2017
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EROSION CONTROL PLAN FOR UTILITY CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
B-5412	EC-06/CONST.UC-04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISIONS 8/17/99

30′ 0′ 30′ 60′
ENGLISH

NAD 83/NA 2011

UTILIZE SPECIAL STILLING BASIN(S) AS STILLING BASINS AS NEEDED

A & M FARMS INC
DB 685 PG 403

JOHNNY ADD JOHNSON
DB 1401 PG 502
PB 2000 PG 79
(1)

PROP. 6"-45 DEG BEND
WL1 STA: 0+57.28
L STA: 13+97.70,
26.52' LT

PROP. 8"X6" REDUCER
WL1 STA: 0+64.52

WEST BUIES CREEK

20' SOIL

FALLOW

EXISTING R/W

6" PVC

EIP

TO NEILLS CREEK RD (SR 1513)

22' BST SHERIFF JOHNSON RD (SR 1516)

60'

WOODS

EXISTING R/W

CULTIVATED

BEGIN:
CONNECT TO EXISTING 6" PVC WATERLINE WITH A 6" DI MJ RESTRAINED JOINT SOLID SLEEVE
WL1 STA 0+00.00
L STA: 13+44.20,
18.22' LT

PROP. 6" GATE VALVE
WL1 STA: 0+05.00

PROP. 6"-45 DEG BEND
WL1 STA: 0+45.20
L STA: 13+89.05,
18.17' LT

PROP. 6" PVC WATERLINE

EXCAVATION TO ELEV=189.0'

(2)

(3)

PROP. 6"-45 DEG BEND
WL1 STA: 4+02.11
L STA: 17+41.98,
26.00' LT

PROP. 8"X6" REDUCER
WL1 STA: 3+95.63

PROP. 6" PVC WATERLINE

PROP. 6"-45 DEG BEND
WL1 STA: 4+09.87
L STA: 17+47.47,
20.51' LT

PROP. 6" GATE VALVE
WL1 STA: 4+17.31

WOODS

END:
CONNECT TO EXISTING 6" PVC WATERLINE WITH A 6" DI MJ RESTRAINED JOINT SOLID SLEEVE
WL1 STA 4+23.28
L STA: 17+60.88,
20.20' LT

A & M FARMS INC
DB 685 PG 403
PB 2015 PG 47
(4)

ELIZABETH SEXTON EARP
DB 2379 PG 195

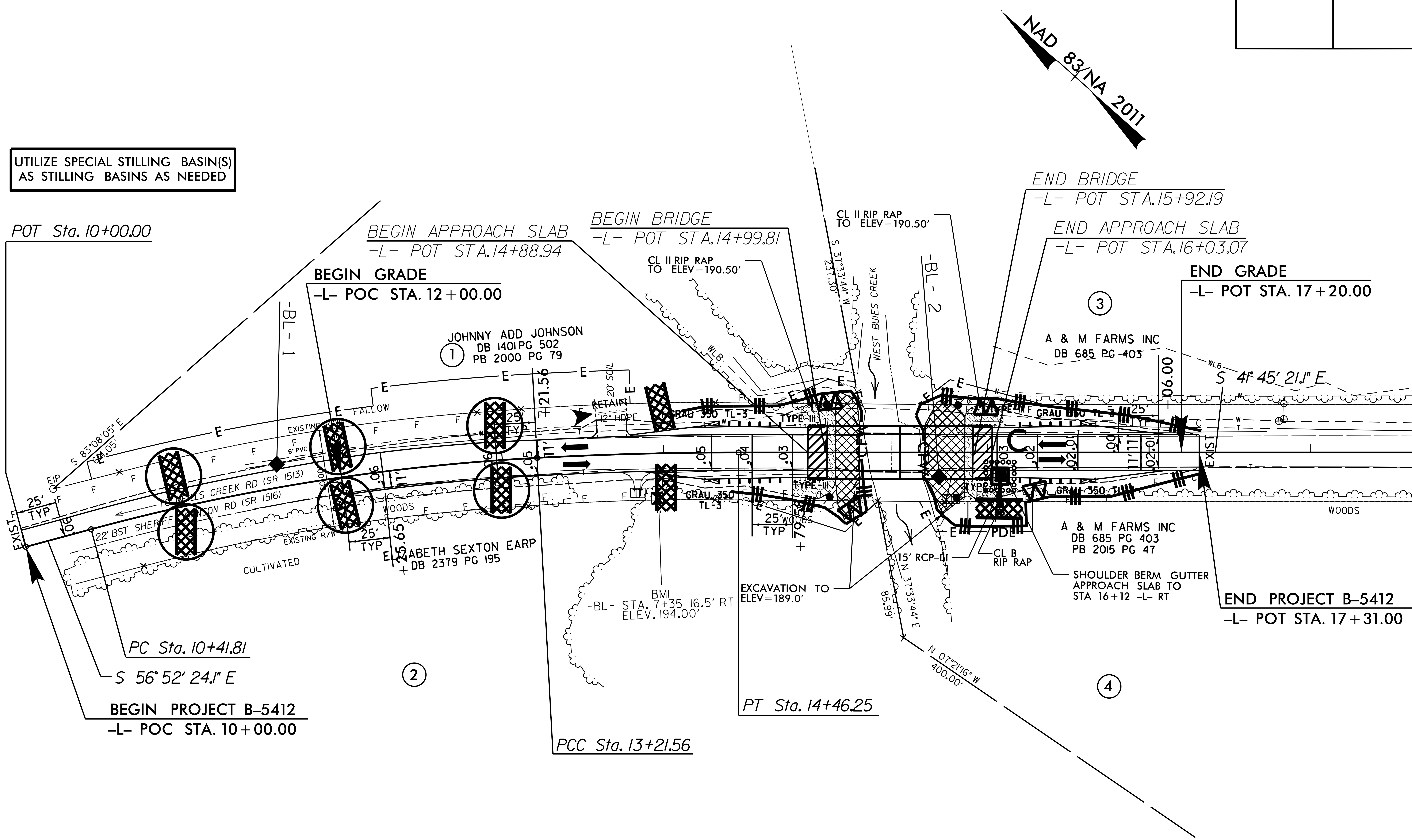
$$$$SYSTIME$$$$
$$$$USERNAME$$$$
$$$$DGN$$$$

FINAL GRADE PLAN

PROJECT REFERENCE NO.	SHEET NO.
B-5412	EC-05/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

30' 0' 30' 60'
ENGLISH

UTILIZE SPECIAL STILLING BASIN(S) AS STILLING BASINS AS NEEDED



NAD 83/NA 2011
POT Sta. 10+00.00
BEGIN GRADE
-L- POC STA. 12+00.00
BEGIN APPROACH SLAB
-L- POT STA.14+88.94
BEGIN BRIDGE
-L- POT STA.14+99.81
CL II RIP RAP TO ELEV=190.50'
END BRIDGE
-L- POT STA.15+92.19
END APPROACH SLAB
-L- POT STA.16+03.07
END GRADE
-L- POT STA. 17+20.00
JOHNNY ADD JOHNSON
DB 1401 PG 502
PB 2000 PG 79
A & M FARMS INC
DB 685 PG 403
PB 2015 PG 47
S 41° 45' 21.1" E
S 83°08'05" E
S 37°33'44" W
237.30'
WEST BUIES CREEK
-BL- 1
-BL- 2
FALLOW
CULTIVATED
WOODS
EXIST
25' TYP
GRAU 350 TL-3
TYPE-III
ELIZABETH SEXTON EARP
DB 2379 PG 195
BMI
-BL- STA. 7+35 16.5' RT
ELEV. 194.00'
EXCAVATION TO ELEV=189.0'
15' RCP-III
CL B RIP RAP
SHOULDER BERM GUTTER
APPROACH SLAB TO
STA 16+12 -L- RT
END PROJECT B-5412
-L- POT STA. 17+31.00
N 37°33'44" E
85.99'
N 07°21'16" W
400.00'
PC Sta. 10+41.81
S 56° 52' 24.1" E
BEGIN PROJECT B-5412
-L- POC STA. 10+00.00
PCC Sta. 13+21.56
PT Sta. 14+46.25

PROJECT REFERENCE NO.	SHEET NO.
B-5412	EC-04/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

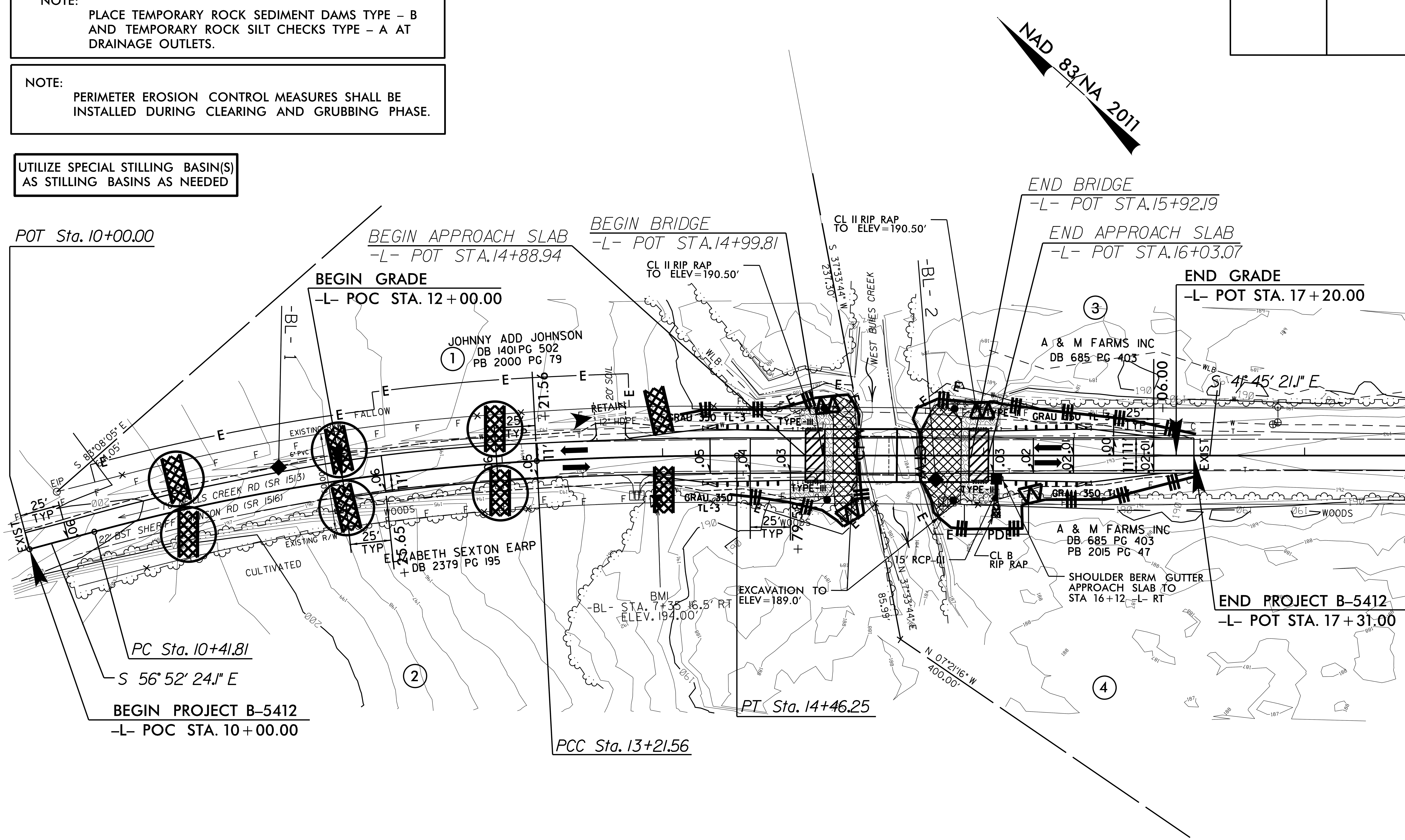
CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 4

CLEARING & GRUBBING PLAN

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

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

UTILIZE SPECIAL STILLING BASIN(S) AS STILLING BASINS AS NEEDED



30' 0' 30' 60'
ENGLISH
NAD 83/NA 2011
POT Sta. 10+00.00
BEGIN APPROACH SLAB
-L- POT STA.14+88.94
BEGIN BRIDGE
-L- POT STA.14+99.81
END BRIDGE
-L- POT STA.15+92.19
END APPROACH SLAB
-L- POT STA.16+03.07
BEGIN GRADE
-L- POC STA. 12+00.00
END GRADE
-L- POT STA. 17+20.00
CL II RIP RAP TO ELEV=190.50'
JOHNNY ADD JOHNSON DB 1401 PG 502 PB 2000 PG 79
A & M FARMS INC DB 685 PG 403
A & M FARMS INC DB 685 PG 403 PB 2015 PG 47
S 41° 45' 21.1" E
WEST BUIES CREEK
S 37°33'44" W 237.30'
-BL- 1
-BL- 2
GRAU 350 TL-3
TYPE-III
CULTIVATED
WOODS
FALLOW
12" HDPE
15' RCP-II
CL B RIP RAP
SHOULDER BERM GUTTER APPROACH SLAB TO STA 16+12 -L- RT
EXCAVATION TO ELEV=189.0'
BMI -BL- STA. 7+35 16.5' RT ELEV. 194.00'
ELIZABETH SEXTON EARP DB 2379 PG 195
END PROJECT B-5412
-L- POT STA. 17+31.00
PC Sta. 10+41.81
S 56° 52' 24.1" E
BEGIN PROJECT B-5412
-L- POC STA. 10+00.00
PCC Sta. 13+21.56
PT Sta. 14+46.25
N 07°21'16" W 400.00'
N 37°33'44" E 85.99'

REVISIONS

8/17/99

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

PROJECT REFERENCE NO.	SHEET NO.
B-5412	EC-3A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

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

PROJECT REFERENCE NO.	SHEET NO.
B-5412	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL

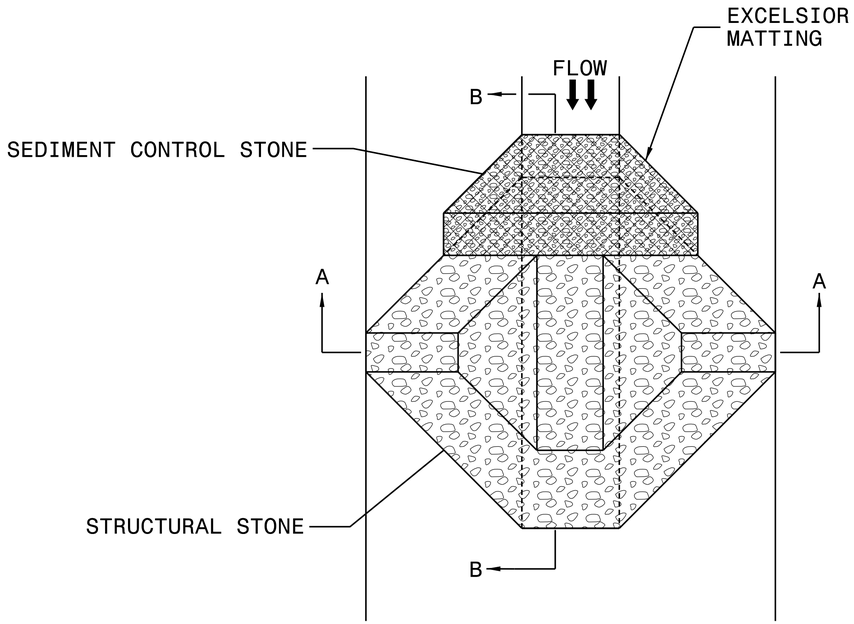
CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	10+00	14+00	LT	255
4	-L-	10+00	14+00	RT	365
				SUBTOTAL	620
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					270
				TOTAL	890
				SAY	900

MATTING FOR EROSION CONTROL

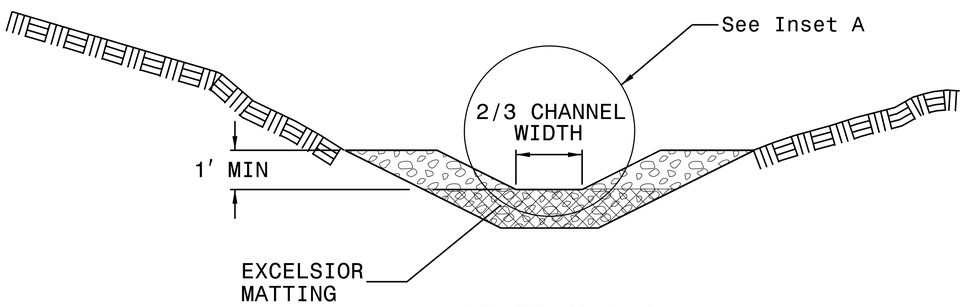
CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)

PROJECT REFERENCE NO.	SHEET NO.
B-5412	EC-2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



PLAN



SECTION A-A

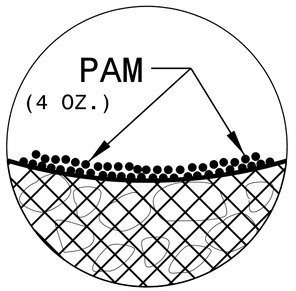
NOTES:

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

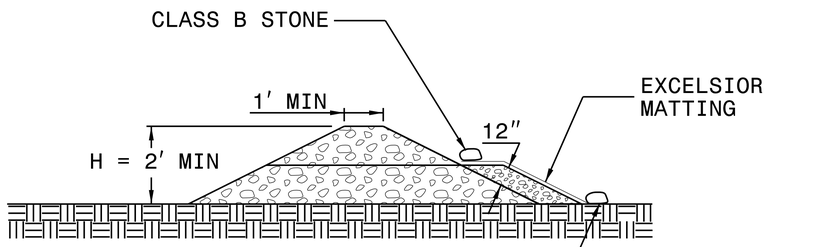
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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

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



INSET A

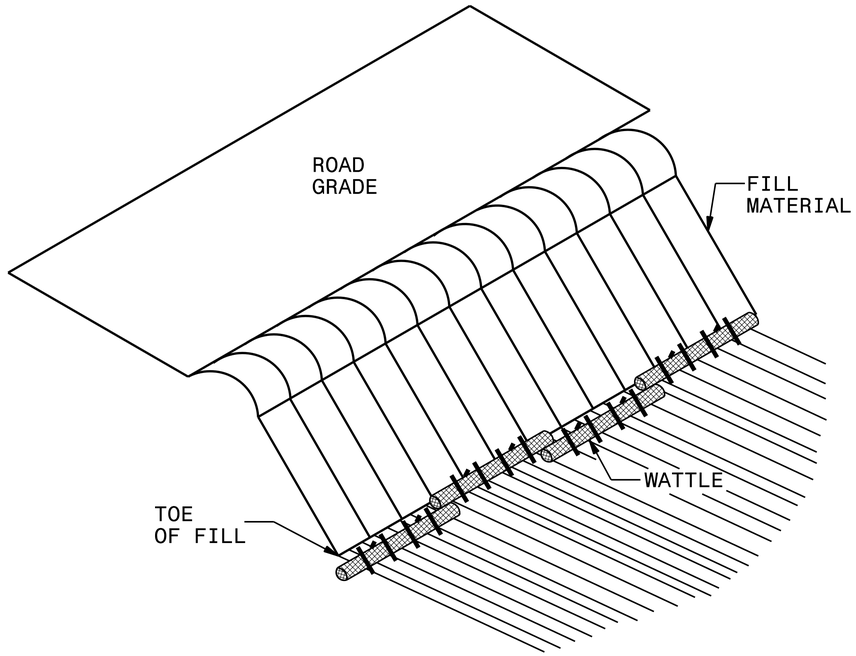


SECTION B-B

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
B-5412	EC-2
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.

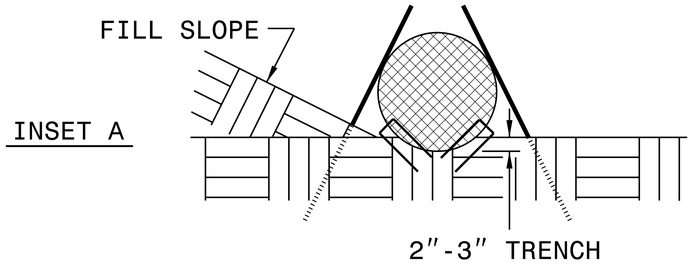
USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

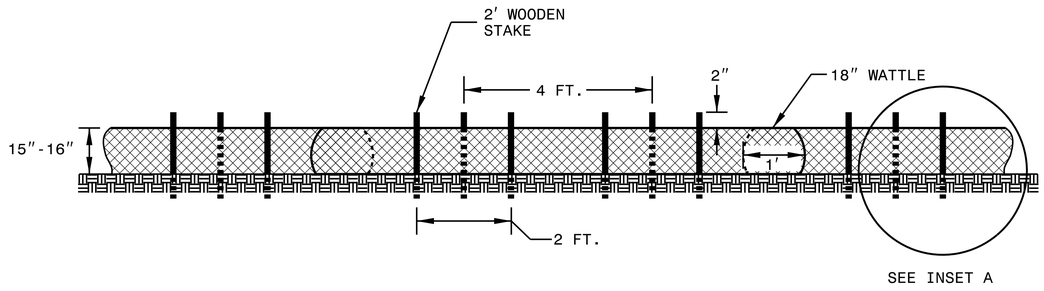
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

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

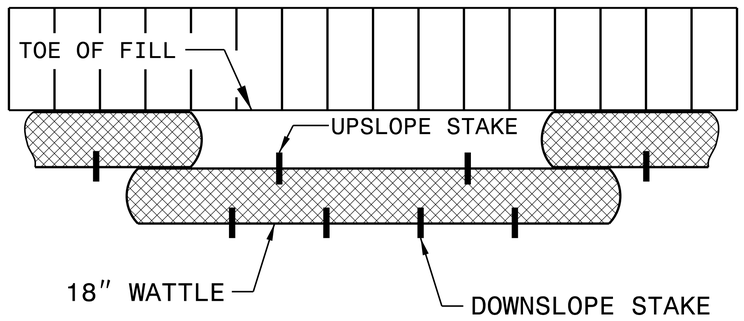
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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

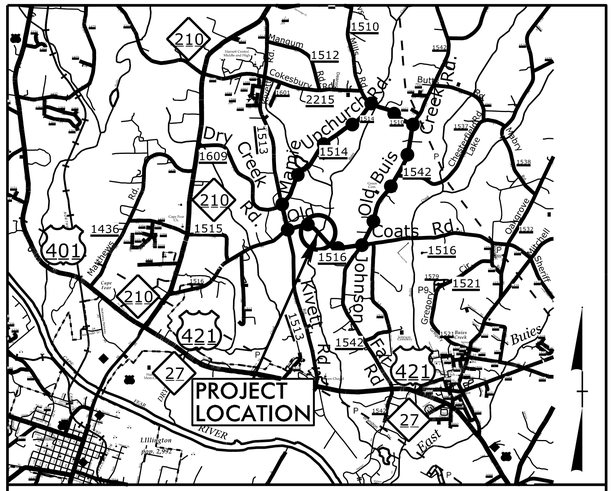


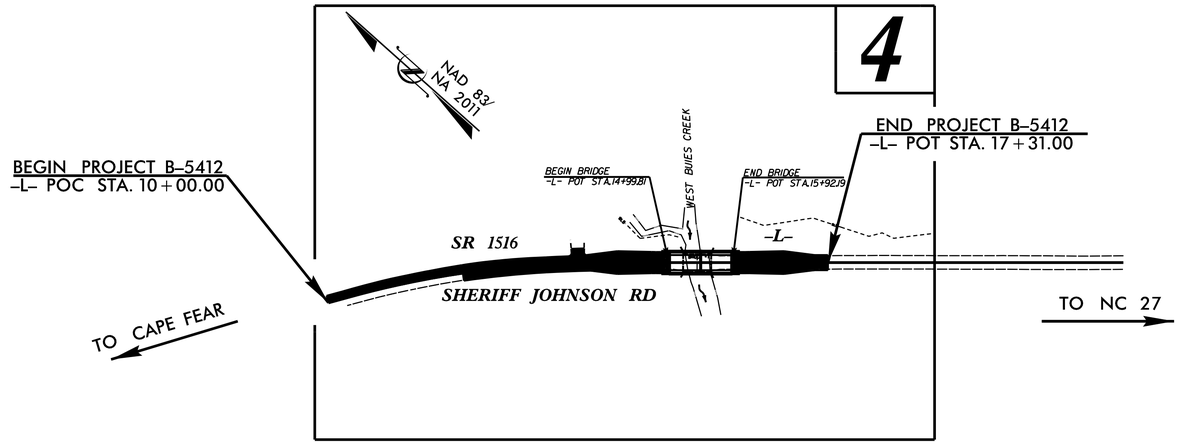


FRONT VIEW



TOP VIEW





TIP PROJECT: B-5412

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5412	EC-1	

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

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

VICINITY MAP

N.T.S.

●——●——●——●——● DENOTES OFF-SITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

HARNETT COUNTY

LOCATION: BRIDGE NO. 7 OVER WEST BUIES CREEK
ON SR 1516 (SHERIFF JOHNSON ROAD)

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

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	BW CFW
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1630.04	Stilling Basin	
1630.06	Special Stilling Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	
	Tiered Skimmer Basin	
	Infiltration Basin	

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

GRAPHIC SCALE

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

Prepared in the Office of:

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

Designed by:

MELANIE NGUYEN, PE — 3223
NAME — LEVEL III CERTIFICATION NO.

Reviewed in the Office of:

ROADSIDE ENVIRONMENTAL UNIT
1 South Wilmington St.
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2012 STANDARD SPECIFICATIONS

Reviewed by:

MARK STALEY, CPESC, CPSWQ

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 2012 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

8/17/99

REVISIONS

DOCUMENT NOT CONSIDERED FINAL UNTIL ALL SIGNATURES ARE COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
B5412	UC-4

DESIGNED BY:	WPS
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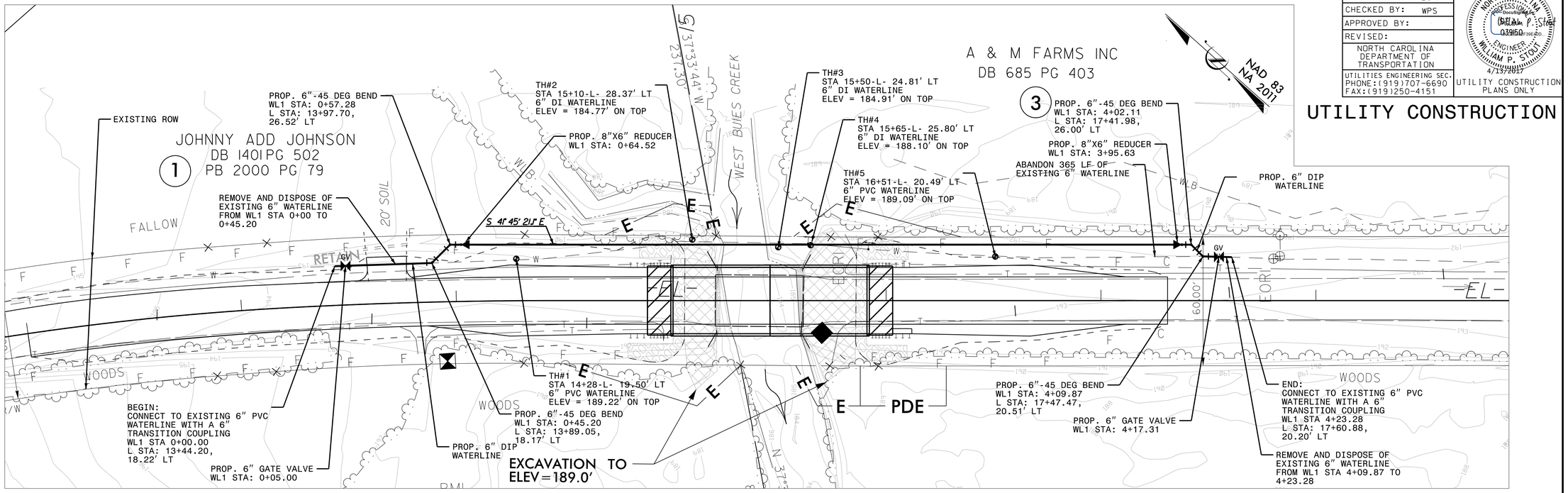
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039150 WILLIAM P. STOUT 4/13/2017

UTILITY CONSTRUCTION PLANS ONLY

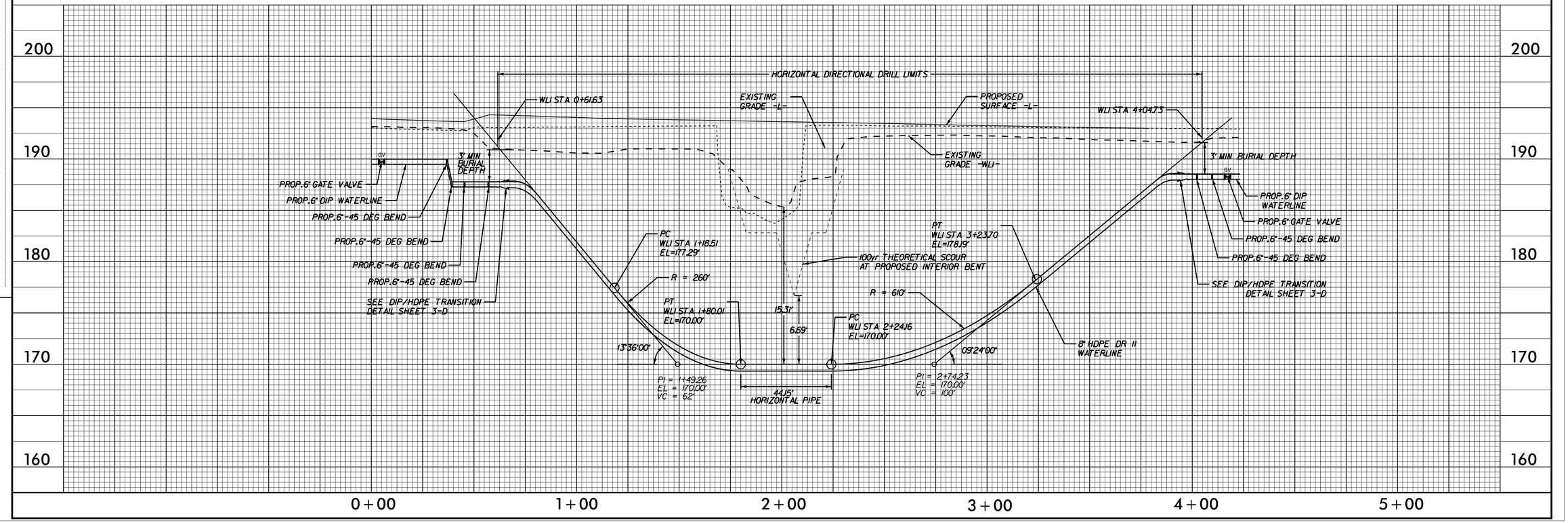
UTILITY CONSTRUCTION



1. ALL PROPOSED WATERLINE FROM THE PROPOSED GATE VALVE TO THE 8"X6" REDUCER ON EACH SIDE OF THE CREEK SHALL BE DUCTILE IRON RESTRAINED JOINT PIPE. ALL PIPE JOINTS AND FITTINGS SHALL BE RESTRAINTED USING GRIP RINGS.

2. 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.

PLAN SCALE: 1"=25'
PROFILE HORIZONTAL SCALE: 1"=25'
PROFILE VERTICAL SCALE: 1"=5'



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5/14/99

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		UC-3D

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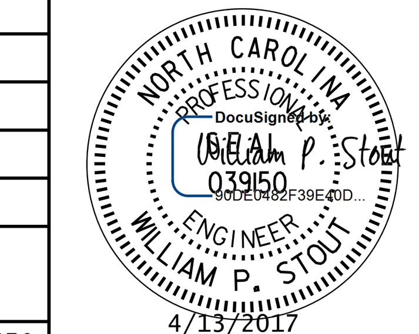
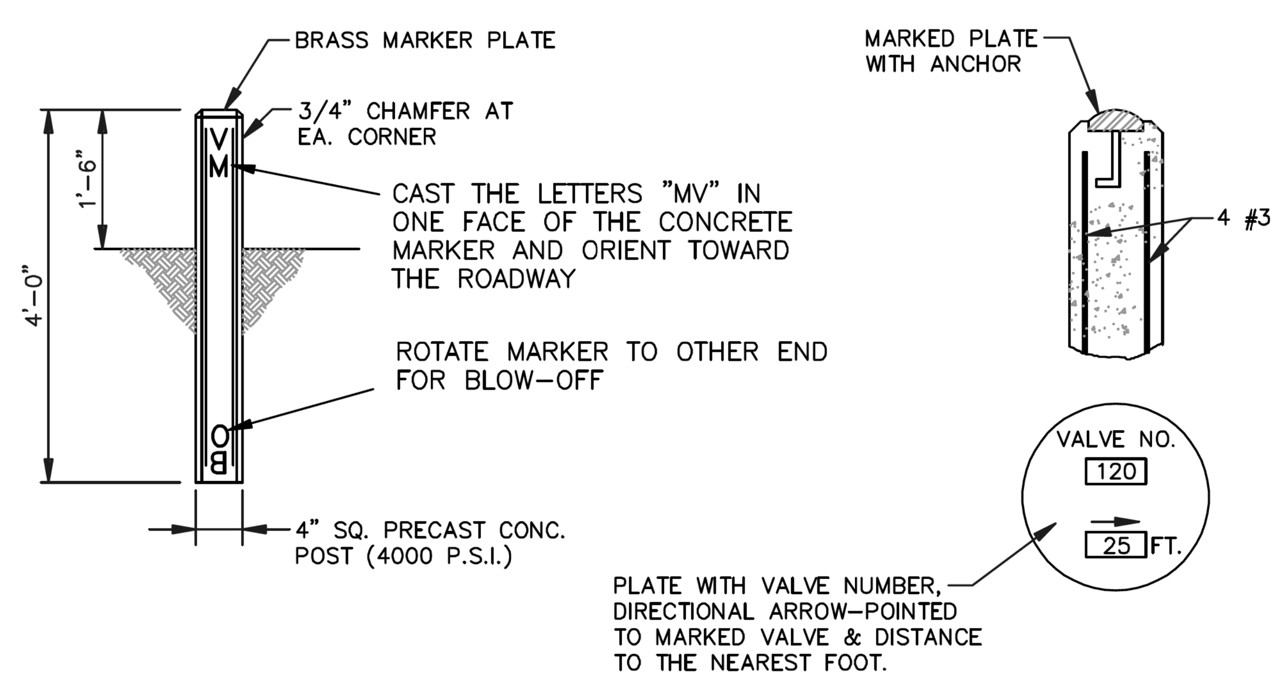


UTILITY CONSTRUCTION PLANS ONLY

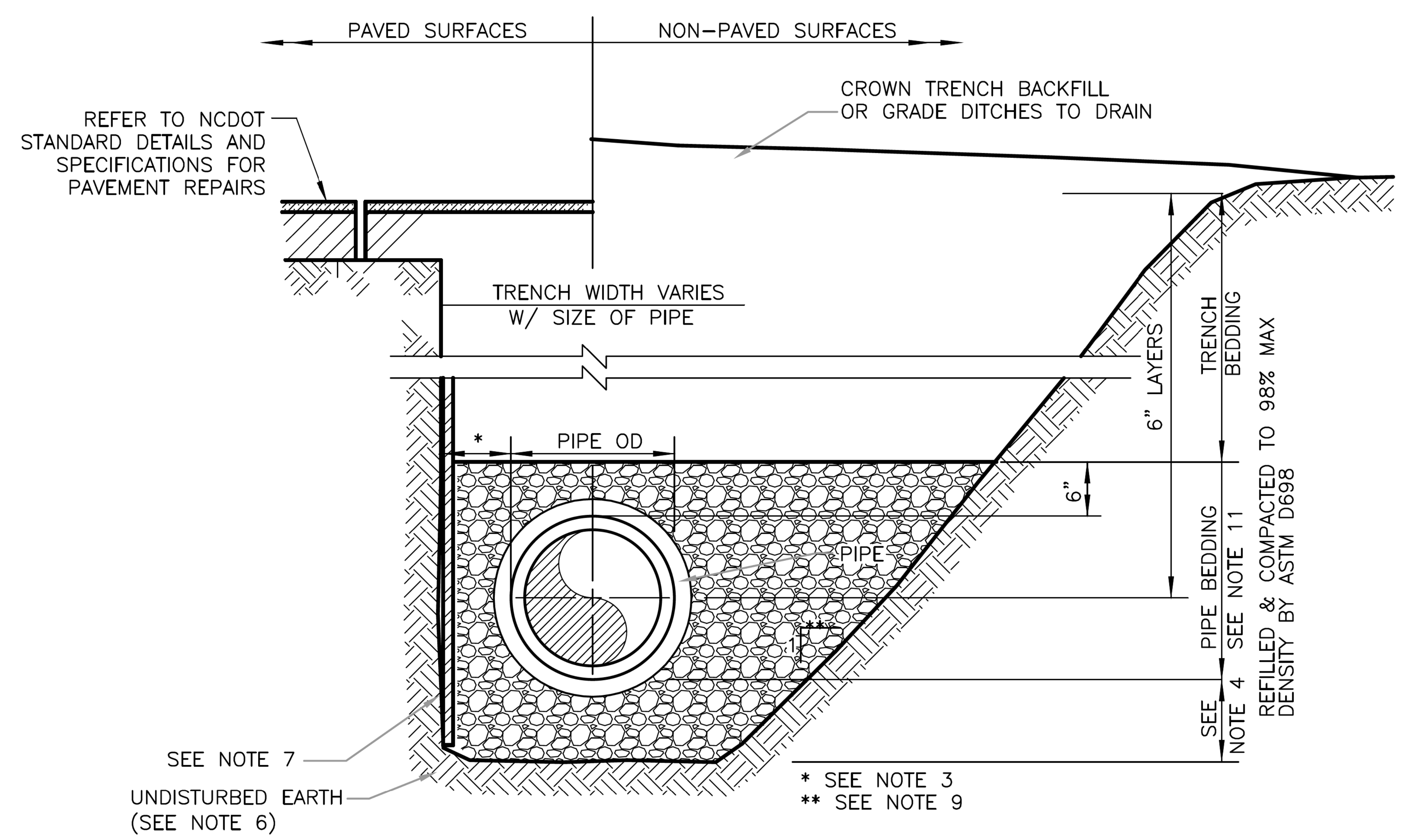
UTILITY CONSTRUCTION

PROJECT TYPICAL DETAILS



TYPICAL VALVE MARKER DETAIL W/1
NO SCALE

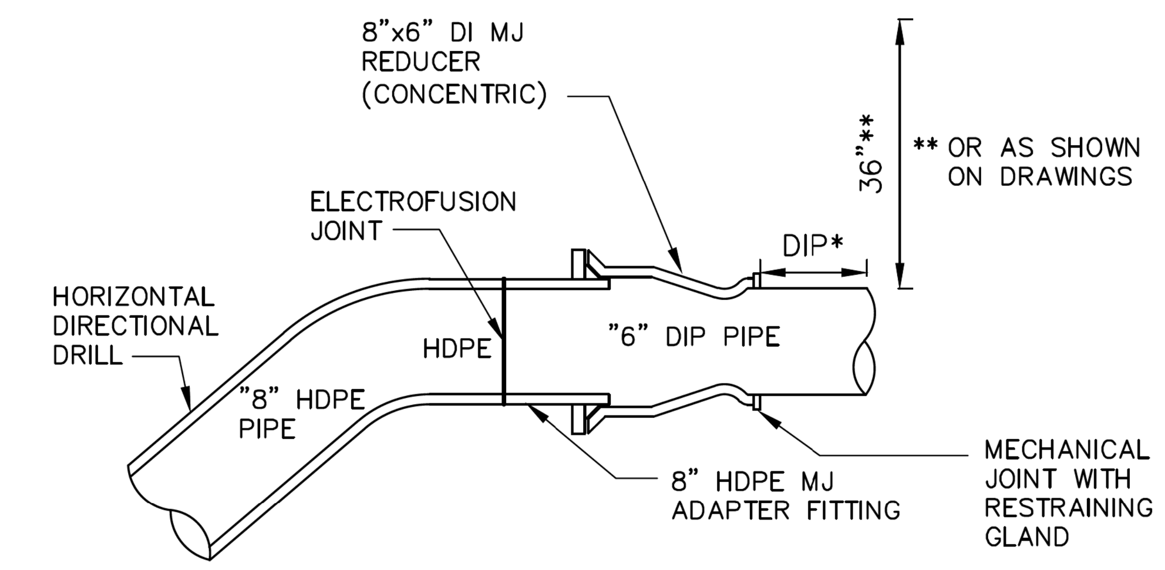
NOTES:
PAINT MARKER BLUE AFTER INSTALLATION



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 TRENCHBOXES AND SHEETING 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 B/–
NTS

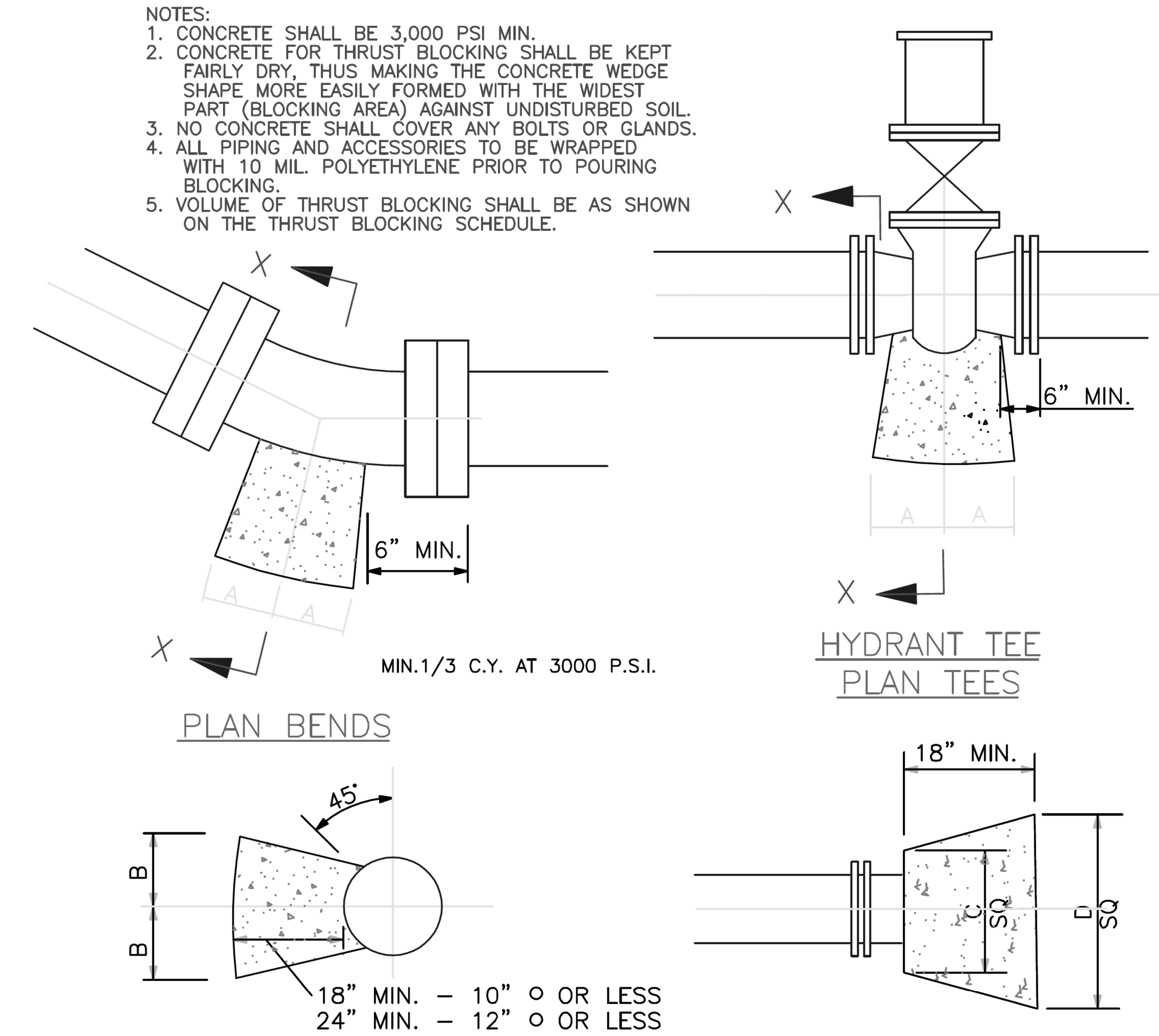


NOTES:

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.

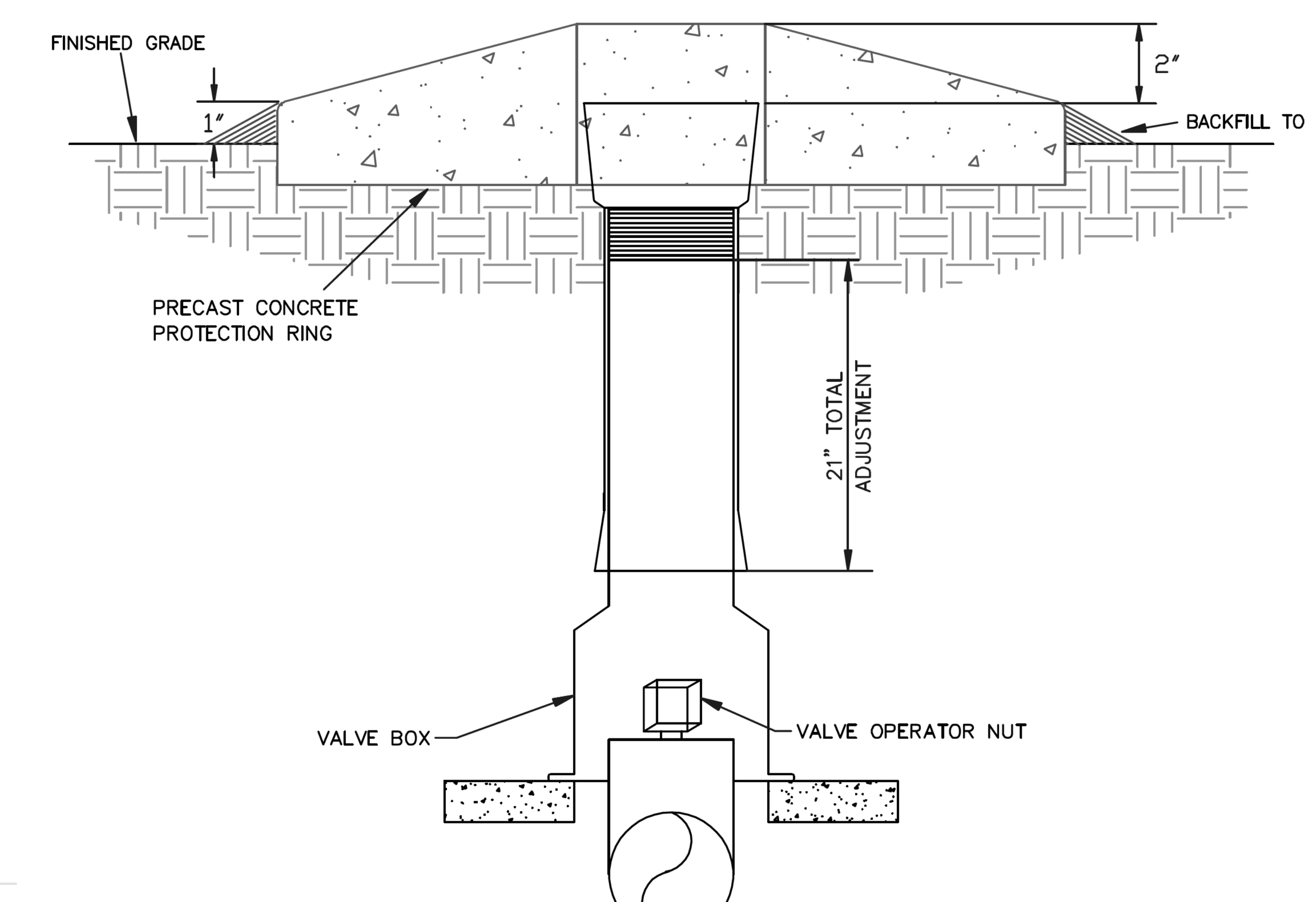
DIP/HDPE TRANSITION
DETAIL A/–
NTS

NOTES:
1. CONCRETE SHALL BE 3,000 PSI MIN.
2. CONCRETE FOR THRUST BLOCKING SHALL BE KEPT FAIRLY DRY, THUS MAKING THE CONCRETE WEDGE SHAPE MORE EASILY FORMED WITH THE WIDEST PART (BLOCKING AREA) AGAINST UNDISTURBED SOIL.
3. NO CONCRETE SHALL COVER ANY BOLTS OR GLANDS.
4. ALL PIPING AND ACCESSORIES TO BE WRAPPED WITH 10 MIL. POLYETHYLENE PRIOR TO POURING BLOCKING.
5. VOLUME OF THRUST BLOCKING SHALL BE AS SHOWN ON THE THRUST BLOCKING SCHEDULE.

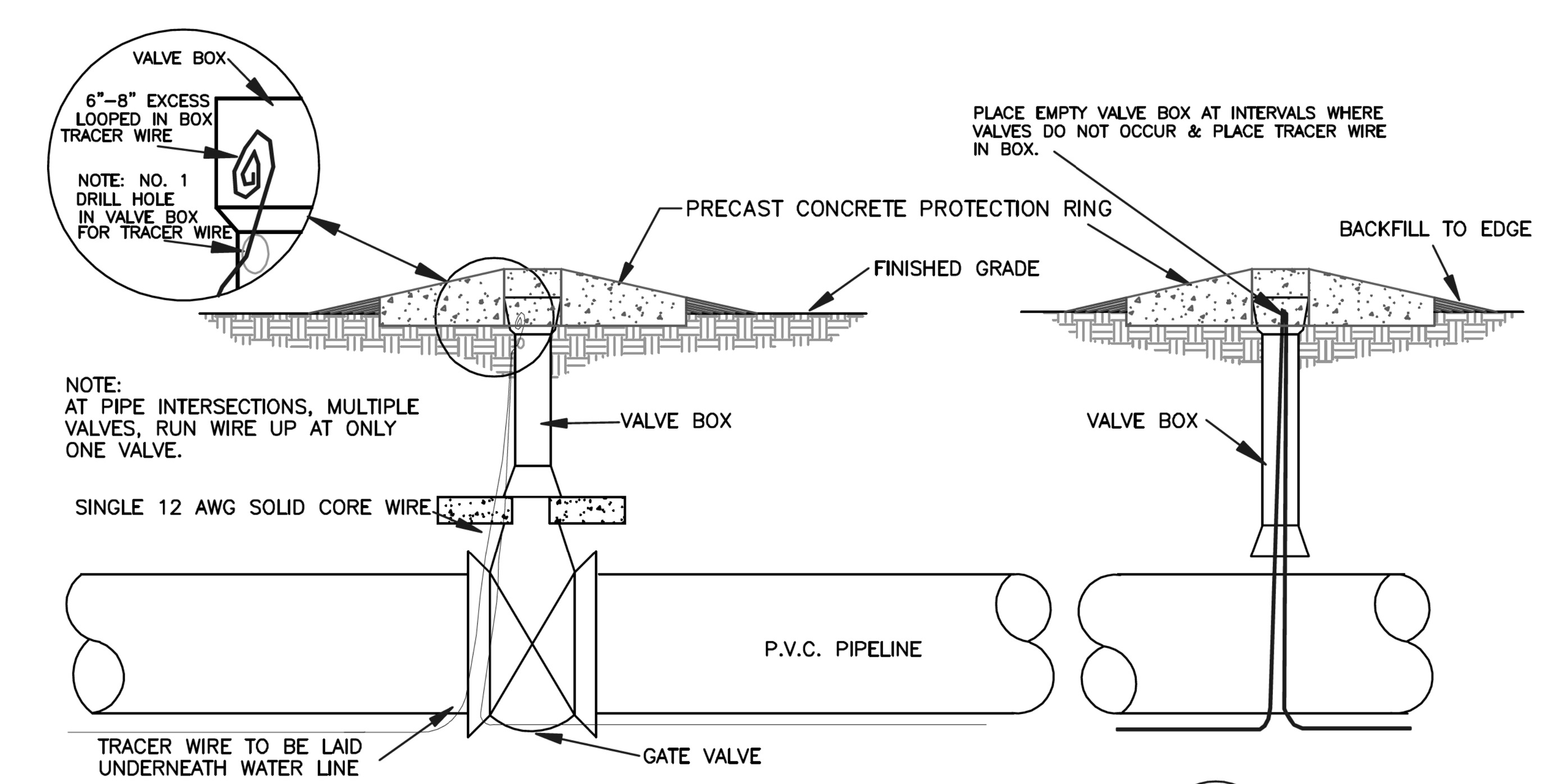


PIPE SIZE	90° BEND		45° BEND		221/2° BEND		11/4° BEND		TEE		PLUG	
	A	B	A	B	A	B	A	B	A	B	C	D
4"	8"	12"	8"	8"	6"	6"	6"	6"	8"	9"	10"	16"
6"	10"	12"	8"	10"	8"	8"	8"	8"	10"	10"	12"	18"
8"	15"	13"	10"	10"	8"	8"	8"	8"	10"	12"	12"	24"
10"	16"	14"	10"	12"	6"	10"	6"	10"	11"	14"	14"	25"
12"	20"	16"	12"	14"	8"	12"	8"	12"	14"	16"	16"	30"
14"	22"	18"	14"	16"	10"	14"	10"	14"	16"	18"	18"	34"
16"	26"	20"	16"	18"	12"	16"	12"	16"	18"	20"	20"	36"

TYPICAL THRUST BLOCK DETAIL W/7
NO SCALE



TYPICAL VALVE BOX DETAIL W/2
NO SCALE



TYPICAL TRACER WIRE INSTALLATION DETAIL W/3
NO SCALE

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.

UTILITY CONSTRUCTION

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. DIP 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 FITTINGS SHALL BE DUCTILE IRON MECHANICAL JOINT, CLASS 350, AWWA C110 AND RESTRAINED WITH APPROVED RETAINER GLANDS.

4. CONCRETE THRUST BLOCKS SHALL BE INSTALLED AT ALL FITTINGS AND BENDS IN ADDITION TO FITTINGS BEING RESTRAINED WITH APPROVED RETAINER GLANDS.

5. 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.

6. THE GATE VALVES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH THE NCDOT AND HCDPU SPECIFICATIONS, AND MANUFACTURERS RECOMMENDATIONS.

7. 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.

8. HDPE PIPE SHALL BE PE 4710 WITH A MINIMUM DR 11 SUITABLE FOR 200 PSI.

9. CONTRACTOR SHALL COORDINATE WITH HARNETT COUNTY PUBLIC UTILITIES A MINIMUM OF 30-DAYS PRIOR TO PERFORMING ANY WATERLINE CONNECTIONS, SO HARNETT COUNTY PUBLIC UTILITIES CAN ISOLATE THE SECTION OF WATERLINE BEING RELOCATED.

10. WATERLINE PIPING JOINT DEFLECTION SHALL BE LIMITED TO 75% OF THE MANUFACTURERS ALLOWABLE DEFLECTION

11. HORIZONTAL DIRECTIONAL DRILLING (HDD) WATER MAIN PIPE IS 8-INCH DIAMETER HDPE DR 11. TOTAL LENGTH OF THE HDD AS SHOWN ON THE DRAWINGS IS APPROXIMATELY 350 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.

12. ALL SUBMITTALS MUST BE SIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA.

13. 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.

UTILITY CONSTRUCTION

HARNETT COUNTY PUBLIC UTILITIES NOTES:

13. HCDPU REQUIRES THAT THE UTILITY CONTRACTOR INSTALL TRACER WIRE IN THE TRENCH WITH ALL WATER LINES. THE TRACER WIRE SHALL BE 12 GA. INSULATED, SOLID COPPER CONDUCTOR AND IT SHALL BE TERMINATED AT THE TOP OF THE VALVE BOXES OR MANHOLES. NO SPLICED WIRE CONNECTIONS SHALL BE MADE UNDERGROUND ON TRACER WIRE INSTALLED IN HARNETT COUNTY. THE TRACER WIRE MAY BE SECURED WITH DUCT TAPE TO THE TOP OF THE PIPE BEFORE BACKFILLING.

14. THE UTILITY CONTRACTOR WILL PROVIDE PROFESSIONAL ENGINEER (PE) AND THE HCDPU UTILITY CONSTRUCTION INSPECTOR WITH A SET OF RED LINE FIELD DRAWINGS TO IDENTIFY THE INSTALLED LOCATIONS OF THE WATER LINE(S) AND ALL ASSOCIATED SERVICES. ALL CHANGE ORDERS MUST BE PRE-APPROVED BY HCDPU AND THE PROFESSIONAL ENGINEER (PE) IN WRITING AND PROPERLY DOCUMENTED IN THE RED LINE FIELD DRAWINGS.

15. PRIOR TO THE COMMENCEMENT OF ANY WORK WITHIN ESTABLISHED UTILITY EASEMENTS OR NCDOT RIGHT-OF-WAYS THE UTILITY CONTRACTOR IS REQUIRED TO HAVE A SIGNED NCDOT ENCROACHMENT AGREEMENT POSTED ON SITE AND NOTIFY ALL CONCERNED UTILITY COMPANIES IN ACCORDANCE WITH G.S. 87-102. THE UTILITY CONTRACTOR MUST CALL THE NC ONE CALL CENTER AT 811 OR (800) 632-4949 TO VERIFY THE LOCATION OF EXISTING UTILITIES PRIOR TO THE BEGINNING OF CONSTRUCTION. EXISTING UTILITIES SHOWN IN THESE PLANS ARE TAKEN FROM MAPS FURNISHED BY VARIOUS UTILITY COMPANIES AND HAVE NOT BEEN PHYSICALLY LOCATED OR VERIFIED BY THE P.E. (I.E. TELEPHONE, CABLE, WATER, SEWER, ELECTRICAL POWER, FIBER OPTIC, NATURAL GAS, ETC.). THE UTILITY CONTRACTOR WILL BE RESPONSIBLE TO REPAIR ANY AND ALL DAMAGES TO THE SATISFACTION OF THE RELATED UTILITY COMPANY.

16. THE UTILITY CONTRACTOR SHALL PROVIDE HCDPU WITH AT LEAST ONE (1) FIRE HYDRANT WRENCH AND ONE (1) BREAK-AWAY FLANGE KIT FOR EVERY SUBDIVISION WITH FIRE HYDRANTS DEVELOPED IN HARNETT COUNTY. THESE ITEMS MUST BE PROVIDED TO HCDPU BEFORE THE FINAL INSPECTION WILL BE SCHEDULED BY THE HCDPU UTILITY CONSTRUCTION INSPECTOR. IN ADDITION, THE UTILITY CONTRACTOR SHALL INSTALL A 4" X 4" CONCRETE VALVE MARKER AT THE EDGE OF THE RIGHT-OF-WAY TO IDENTIFY THE LOCATION OF EACH GATE VALVE INSTALLED IN THE NEW WATER SYSTEM WITH THE EXCEPTION OF THE FIRE HYDRANT ISOLATION VALVES. THE CONTRACTOR SHALL MEASURE THE DISTANCE FROM THE CENTER OF THE CONCRETE MARKER TO THE CENTER OF THE VALVE BOX. THIS DISTANCE (IN LINEAR FEET) SHALL BE STAMPED ON THE BRASS PLATE LOCATED ON THE TOP OF THE CONCRETE VALVE MARKER. IN LIEU OF INSTALLING THE CONCRETE VALVE MARKERS, THE UTILITY CONTRACTOR MAY PROVIDE AT LEAST TWO MEASUREMENTS FROM TWO INDEPENDENT PERMANENT ABOVE GROUND STRUCTURES TO THE PROFESSIONAL ENGINEER (PE) IN THE RED LINE DRAWINGS TO IDENTIFY THE VALVE LOCATIONS. THE PROFESSIONAL ENGINEER (PE) MUST INCLUDE THESE MEASUREMENTS IN THE AS-BUILT RECORD DRAWINGS SUBMITTED TO HCDPU.

17. THE UTILITY CONTRACTOR WILL BE RESPONSIBLE FOR ANY AND ALL REPAIRS DUE TO LEAKAGE DAMAGE FROM POOR WORKMANSHIP DURING THE ONE YEAR WARRANTY PERIOD ONCE THE WATER SYSTEM IMPROVEMENTS HAVE BEEN ACCEPTED BY HARNETT COUNTY. HARNETT COUNTY WILL PROVIDE MAINTENANCE AND REPAIRS WHEN REQUESTED AND BILL THE DEVELOPER AND/OR UTILITY CONTRACTOR IF NECESSARY DUE TO LACK OF RESPONSE WITHIN 48 HOURS OF NOTIFICATION OF WARRANTY WORK. THE UTILITY CONTRACTOR WILL BE RESPONSIBLE FOR ANY AND ALL REPAIRS DUE TO DAMAGES RESULTING FROM FAILURE TO LOCATE THE NEW WATER LINES AND ASSOCIATED APPURTENANCES FOR OTHER UTILITIES AND THEIR CONTRACTORS UNTIL THE WATER LINES HAVE BEEN APPROVED BY NCDENR AND ACCEPTED BY HCDPU. THE FINAL INSPECTION OF WATER SYSTEM IMPROVEMENTS CANNOT BE SCHEDULED WITH HCDPU UNTIL THE STREETS HAVE BEEN PAVED; THE RIGHTS-OF-WAY AND UTILITY EASEMENTS HAVE BEEN SEEDED AND STABILIZED WITH AN ADEQUATE STAND OF GRASS IN PLACE TO PREVENT EROSION ISSUES ON SITE.

18. THE ENGINEER OF RECORD IS RESPONSIBLE TO INSURE THAT CONSTRUCTION IS, AT ALL TIMES, IN COMPLIANCE WITH ACCEPTED SANITARY ENGINEERING PRACTICES AND APPROVED PLANS AND SPECIFICATIONS. NO FIELD CHANGES TO THE APPROVED PLANS ARE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL BY HCDPU. A COPY OF EACH ENGINEER'S FIELD REPORT IS TO BE SUBMITTED TO HCDPU AS EACH SUCH INSPECTION IS MADE ON SYSTEM IMPROVEMENTS OR TESTING IS PERFORMED BY THE CONTRACTOR. WATER AND SEWER INFRASTRUCTURE MUST PASS ALL TESTS REQUIRED BY HCDPU SPECIFICATIONS AND THOSE OF ALL APPLICABLE REGULATORY AGENCIES. THESE TESTS INCLUDE, BUT ARE NOT LIMITED TO: AIR TEST, VACUUM TEST, MANDREL TEST, VISUAL TEST, PRESSURE TEST, BACTERIOLOGICAL TEST, ETC. A HCDPU INSPECTOR MUST BE PRESENT DURING TESTING AND ALL TEST RESULTS SHALL BE SUBMITTED TO HCDPU. ALL TESTS MUST BE SATISFIED BEFORE THE FINAL INSPECTION WILL BE SCHEDULED WITH THE HCDPU INSPECTOR. THE ENGINEER OF RECORD MUST REQUEST IN WRITING TO SCHEDULE THE FINAL INSPECTION ONCE ALL CONSTRUCTION IS COMPLETE. THE DEVELOPER'S ENGINEER OF RECORD AND THE HCDPU UTILITY CONSTRUCTION INSPECTOR SHALL PREPARE A WRITTEN PUNCH LIST OF ANY DEFECTS OR DEFICIENCIES NOTED DURING THE FINAL INSPECTION, SHOULD ANY EXIST. UPON COMPLETION OF THE PUNCH LIST, THE DEVELOPER'S ENGINEER OF RECORD WILL SCHEDULE ANOTHER INSPECTION. IN THE EVENT THE NUMBER OF INSPECTIONS PERFORMED BY THE HCDPU EXCEEDS TWO, ADDITIONAL FEES MAY BE ACCESSED TO THE DEVELOPER.

DOCUMENT NOT CONSIDERED FINAL UNTIL ALL SIGNATURES ARE COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
B-5412	UC-3A

DESIGNED BY: WPS
DRAWN BY: BJN
CHECKED BY: WPS
APPROVED BY:
REVISED:

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90DE0482F39E40D...
4/13/2017

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

UTILITY CONSTRUCTION

HARNETT COUNTY PUBLIC UTILITIES NOTES:

1. THE PROFESSIONAL ENGINEER (PE) SHALL OBTAIN AND PROVIDE THE NCDEQ "AUTHORIZATION TO CONSTRUCT" PERMIT TO THE UTILITY CONTRACTOR BEFORE THE CONSTRUCTION OF THE WATER LINE SHALL BEGIN. THE UTILITY CONTRACTOR MUST POST A COPY OF THE NCDEQ "AUTHORIZATION TO CONSTRUCT" PERMIT ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, PUBLIC WATER SUPPLY SECTION (NCDEQ,PWSS) ON SITE PRIOR TO THE START OF CONSTRUCTION. THE PERMIT MUST BE MAINTAINED ON SITE THROUGHOUT THE ENTIRE CONSTRUCTION PROCESS OF THE PROPOSED WATER LINES THAT WILL SERVE THIS PROJECT.

2. THE UTILITY CONTRACTOR SHALL NOTIFY HARNETT COUNTY DEPARTMENT OF PUBLIC UTILITIES (HCDPU) AND THE PROFESSIONAL ENGINEER (PE) AT LEAST TWO DAYS PRIOR TO CONSTRUCTION COMMENCING. THE UTILITY CONTRACTOR MUST SCHEDULE A PRE-CONSTRUCTION CONFERENCE WITH MR. ALAN MOSS, HCDPU UTILITY CONSTRUCTION INSPECTOR AT LEAST TWO (2) DAYS BEFORE CONSTRUCTION WILL BEGIN AND THE UTILITY CONTRACTOR MUST COORDINATE WITH HCDPU FOR REGULAR INSPECTION VISITATIONS AND ACCEPTANCE OF THE WATER SYSTEM(S). CONSTRUCTION WORK SHALL BE PERFORMED ONLY DURING THE NORMAL WORKING HOURS OF HCDPU WHICH IS 8:00 AM 5:00 PM MONDAY THROUGH FRIDAY. HOLIDAY AND WEEKEND WORK IS NOT PERMITTED BY HCDPU.

3. THE PROFESSIONAL ENGINEER (PE) SHALL PROVIDE HCDPU AND THE UTILITY CONTRACTOR WITH A SET OF NCDEQ APPROVED PLANS MARKED "RELEASED FOR CONSTRUCTION" AT LEAST TWO DAYS PRIOR TO CONSTRUCTION COMMENCING. THE REGISTERED LAND SURVEYOR (RLS) SHOULD STAKE OUT ALL LOT CORNERS AND THE GRADE STAKES FOR THE PROPOSED FINISH GRADE FOR EACH STREET BEFORE THE UTILITY CONTRACTOR BEGINS CONSTRUCTION OF THE WATER LINE(S). THE GRADE STAKES SHOULD BE SET WITH A CONSISTENT OFFSET FROM THE STREET CENTERLINE SO AS NOT TO INTERFERE WITH THE STREET GRADING AND UTILITY CONSTRUCTION.

4. THE UTILITY CONTRACTOR SHALL PROVIDE THE HCDPU UTILITY CONSTRUCTION INSPECTOR WITH MATERIAL SUBMITTALS AND SHOP DRAWINGS FOR ALL PROJECT MATERIALS PRIOR TO THE CONSTRUCTION OF ANY WATER LINE EXTENSION(S), AND ASSOCIATED WATER SERVICES IN HARNETT COUNTY. THE MATERIALS TO BE USED ON THE PROJECT MUST MEET THE ESTABLISHED SPECIFICATIONS OF HCDPU AND BE APPROVED BY THE ENGINEER OF RECORD PRIOR TO CONSTRUCTION. ALL SUBSTANDARD MATERIALS OR MATERIALS NOT APPROVED FOR USE IN HARNETT COUNTY FOUND ON THE PROJECT SITE MUST BE REMOVED IMMEDIATELY WHEN NOTIFIED BY THE HCDPU UTILITY CONSTRUCTION INSPECTOR.

5. THE WATER MAIN(S), FIRE HYDRANTS, SERVICE LINES, METER SETTERS AND ALL ASSOCIATED APPURTENANCES SHALL BE CONSTRUCTED IN STRICT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS OF THE HARNETT COUNTY DEPARTMENT OF PUBLIC UTILITIES (HCDPU). THE UTILITY CONTRACTOR SHALL BE RESPONSIBLE TO LOCATE THE NEWLY INSTALLED WATER MAIN(S), WATER SERVICE LINES AND ALL ASSOCIATED METER SETTERS AND METER BOXES FOR OTHER UTILITY COMPANIES AND THEIR CONTRACTORS UNTIL THE NEW WATER MAIN(S) HAVE BEEN APPROVED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, PUBLIC WATER SUPPLY SECTION (NCDEQ, PWSS)AND ACCEPTED BY HCDPU.

6. THE UTILITY CONTRACTOR SHALL PROVIDE THE PROFESSIONAL ENGINEER (PE) AND HCDPU UTILITY CONSTRUCTION INSPECTOR WITH A SET OF RED LINE DRAWINGS IDENTIFYING THE COMPLETE WATER SYSTEM INSTALLED FOR EACH PROJECT. THE RED LINE DRAWINGS SHOULD IDENTIFY THE MATERIALS, PIPE SIZES AND APPROXIMATE DEPTHS OF THE WATER LINES AS WELL AS THE GATE VALVES, FIRE HYDRANTS, METER SETTERS, BLOW OFF ASSEMBLIES AND ALL ASSOCIATED APPURTENANCES FOR ALL WATER LINE(S) CONSTRUCTED IN HARNETT COUNTY. THE RED LINE DRAWINGS SHOULD CLEARLY IDENTIFY ANY DEVIATIONS FROM THE NCDENR APPROVED PLANS. ALL CHANGE ORDERS MUST BE APPROVED BY HCDPU AND THE PROFESSIONAL ENGINEER (PE) IN WRITING AND PROPERLY DOCUMENTED IN THE RED LINE FIELD DRAWINGS.

7. POTABLE WATER MAINS CROSSING OTHER UTILITIES AND NON-POTABLE WATER LINES (SANITARY SEWER, STORM SEWER, RCP, ETC.) SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF TWENTY-FOUR (24") INCHES BETWEEN THE POTABLE WATER MAIN AND ALL OTHER UTILITIES. NCDOT REQUIRES THE NEW WATER MAINS TO BE INSTALLED UNDER THE STORM WATER LINES. THE POTABLE WATER MAIN SHALL BE INSTALLED WITH TWENTY-FOUR (24") INCHES OF VERTICAL SEPARATION AND WITH DUCTILE IRON PIPE WHEN DESIGNED TO BE PLACED UNDER A NON- POTABLE WATER LINE SUCH AS SANITARY SEWER OR STORM SEWER LINES. IF THESE SEPARATIONS CANNOT BE MAINTAINED THEN THE WATER MAIN SHALL BE INSTALLED WITH DUCTILE IRON PIPE. BOTH THE POTABLE WATER MAIN AND THE NON-POTABLE WATER LINE MUST BE CAST IRON OR DUCTILE IRON PIPE (DIP) IF THE STATE MINIMUM SEPARATIONS CANNOT BE MAINTAINED. THE DUCTILE IRON PIPE MUST BE LAID SO THE MECHANICAL JOINTS ARE AT LEAST (10') FEET FROM THE POINT WHERE THE POTABLE WATER MAIN CROSSES THE NON-POTABLE WATER LINE.

8. POTABLE WATER MAINS INSTALLED PARALLEL TO NON-POTABLE WATER LINES (SANITARY SEWER, STORM SEWER, RCP, ETC.) SHALL BE LAID TO PROVIDE A MINIMUM HORIZONTAL DISTANCE OF TEN (10') FEET BETWEEN THE POTABLE WATER MAIN AND SANITARY SEWER MAINS, SEWER LATERALS AND SERVICES. THE HORIZONTAL SEPARATION BETWEEN THE POTABLE WATER MAIN AND ANY OTHER UTILITY OR STORM SEWER SHALL NOT BE LESS THAN FIVE (5') FEET. THE POTABLE WATER MAIN MUST BE DUCTILE IRON PIPE IF THIS HORIZONTAL SEPARATION OF TEN (10') FEET CANNOT BE MAINTAINED. THE DUCTILE IRON PIPE SHALL EXTEND AT LEAST TEN (10') FEET BEYOND THE POINT WHERE THE MINIMUM REQUIRED HORIZONTAL SEPARATION OF TEN (10') FEET CAN BE RE-ESTABLISHED.

9. THE WATER MAIN(S), FIRE HYDRANTS, GATE VALVES, SERVICE LINES, METER SETTERS AND ASSOCIATED APPURTENANCES MUST BE RATED FOR 200 PSI AND HYDROSTATICALLY PRESSURE TESTED TO 200 PSI. THE HYDROSTATIC PRESSURE TEST(S) MUST BE WITNESSED BY THE HCDPU UTILITY CONSTRUCTION INSPECTOR. THE UTILITY CONTRACTOR MUST NOTIFY HCDPU WHEN THEY ARE READY TO BEGIN FILLING IN LINES AND COORDINATE WITH HARNETT COUNTY TO WITNESS ALL PRESSURE TESTING.

~~10. ALL WATER MAINS WILL BE CONSTRUCTED WITH SDR-21 PVC PIPE OR CLASS 50 DUCTILE IRON PIPE RATED FOR AT LEAST 200 PSI OR GREATER. ALL PIPES MUST BE PROTECTED DURING LOADING, TRANSPORT, UNLOADING, STAGING, AND INSTALLATION. PVC PIPE MUST BE PROTECTED FROM EXTENDED EXPOSURE TO SUNLIGHT PRIOR TO INSTALLATION.~~

11. ALL WATER MAINS WILL BE FLUSHED AND DISINFECTED IN STRICT ACCORDANCE WITH THE STANDARD SPECIFICATIONS OF THE HARNETT COUNTY DEPARTMENT OF PUBLIC UTILITIES. ALL WATER SAMPLES COLLECTED FOR BACTERIA TESTING WILL BE COLLECTED BY THE HCDPU UTILITY CONSTRUCTION INSPECTOR AND TESTED IN THE HCDPU LABORATORY.

12. ALL FITTINGS LARGER THAN TWO (2") INCHES DIAMETER SHALL BE DUCTILE IRON. HCDPU REQUIRES THAT MECHANICAL JOINTS BE ASSEMBLED WITH GRIP RINGS AS "MEGALUG" FITTINGS ARE NOT APPROVED BY HARNETT COUNTY FOR PIPE SIZES SMALLER THAN TWELVE INCHES (12") DIAMETER. PVC PIPE USED FOR WATER MAINS SHALL BE CONNECTED BY SLIP JOINT OR MECHANICAL JOINT WITH GRIP RINGS. GLUED PIPE JOINTS ARE NOT ALLOWED ON PVC PIPE USED FOR WATER MAINS IN HARNETT COUNTY.

UTILITY CONSTRUCTION

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2012.

2. THE EXISTING UTILITIES ARE OWNED BY HARNETT COUNTY PUBLIC UTILITIES .

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

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

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

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

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

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

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.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

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

PROPOSED SEWER SYMBOLS

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

PROPOSED MISCELLANOUS UTILITIES SYMBOLS

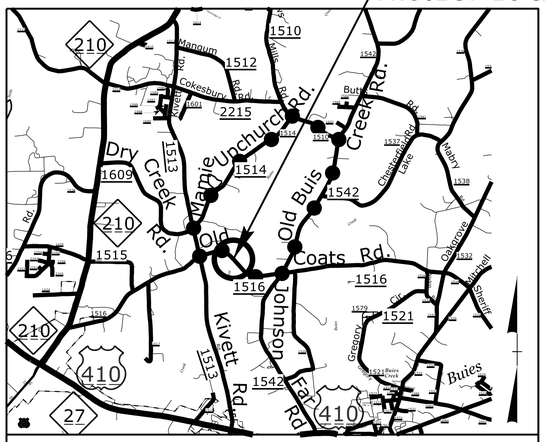
- Power Pole
- Telephone Pole
- Joint Use Pole
- Telephone Pedestal — TEL PED
- Utility Line by Others (Type as Shown) — PROP O/H POW LINES
- Trenchless Installation — 12" TL INSTALL
- Encasement by Open Cut — 24" ENCAS BY OC
- Encasement — 24" ENCASEMENT
- Thrust Block
- Air Release Valve — AR
- Utility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

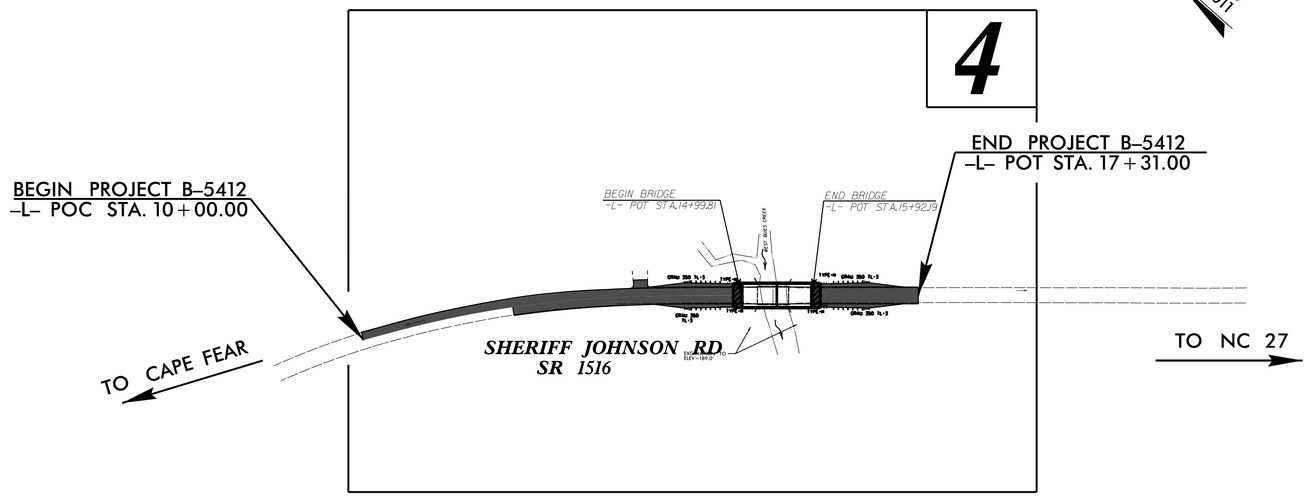
EXISTING UTILITIES SYMBOLS

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

*For Existing Utilities
- Utility Line Drawn from Record (Type as Shown)
- Designated Utility Line (Type as Shown)

REV: 2/1/2012





TIP PROJECT: B-5412

T.I.P. NO.	SHEET NO.
B-5412	UC-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITY CONSTRUCTION PLANS
HARNETT COUNTY

LOCATION: BRIDGE NO. 7 OVER WEST BUIES CREEK
ON SR 1516 (SHERIFF JOHNSON ROAD)

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

VICINITY MAP *N.T.S.*

DENOTES OFF-SITE DETOUR

DOCUMENT NOT CONSIDERED FINAL UNTIL ALL SIGNATURES ARE COMPLETED

GRAPHIC SCALES

INDEX OF SHEETS

SHEET NO.:	*DESCRIPTION:*
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3 TO UC-3C	NOTES
UC-3D	DETAILS
UC-4	PLAN/PROFILE SHEET

WATER AND SEWER OWNERS ON PROJECT

(A) WATER HARNETT COUNTY

PREPARED IN THE OFFICE OF

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

PATRICK STOUT, P.E.

SEAL

DocuSigned by:
William P. Stout
039150
90DE0482F39E40D...
WILLIAM P. STOUT

4/13/2017

DIVISION OF HIGHWAYS
UTILITIES UNIT
1555 MAIL SERVICES CENTER
RALEIGH NC 27699-1555
PHONE (919) 707-6690
FAX (919) 250-4151

BO HEMPHILL, P.E.	*UTILITIES REGIONAL ENGINEER*
NABIL HAMDAN	*UTILITIES ENGINEER*
KYLE PLEASANT	*UTILITIES AREA COORDINATOR*
RANDY ROGERS	*UTILITIES COORDINATOR*

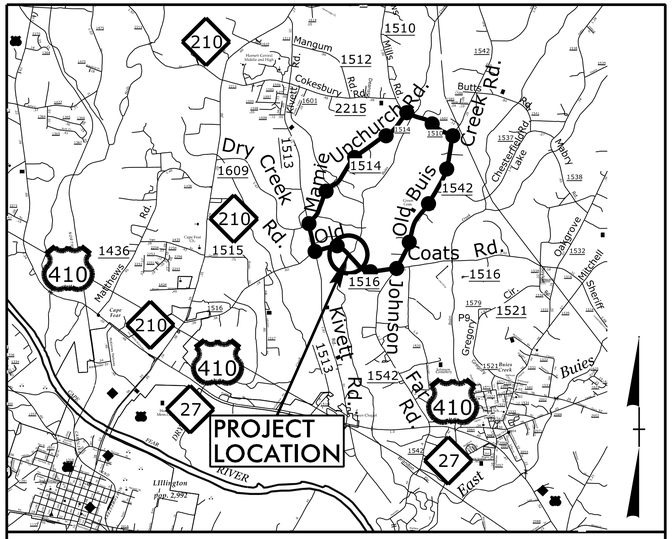
09/08/69

TIP PROJECT: B-5412

CONTRACT:

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

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



VICINITY MAP N.T.S.

DENOTES OFF-SITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

T.I.P. NO.	SHEET NO.
B-5412	UO-1

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

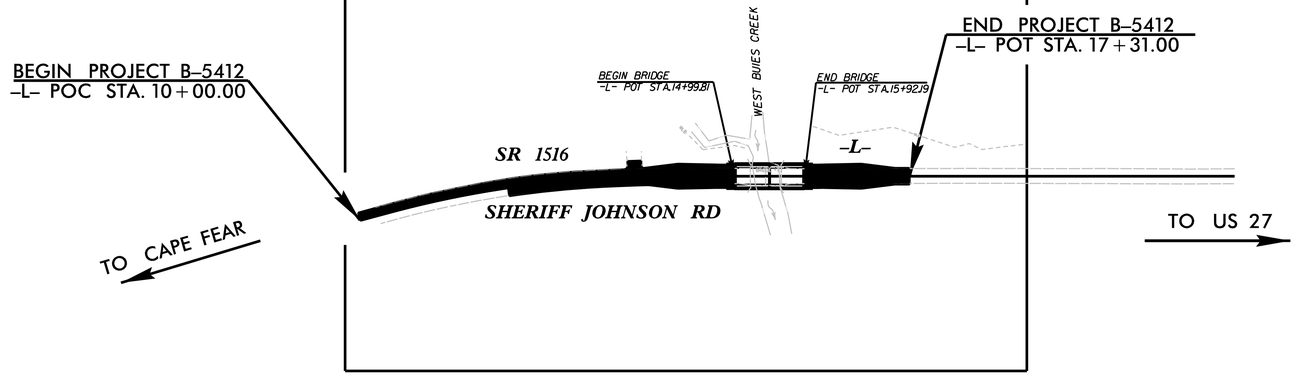
UTILITIES BY OTHERS PLANS
HARNETT COUNTY

LOCATION: BRIDGE NO. 7 OVER WEST BUIES CREEK ON SR 1516 (SHERIFF JOHNSON ROAD)

TYPE OF WORK: DISTRIBUTION POWER AND TELECOMMUNICATIONS

NAD 83
NA 2011

UO-02 | 4



GRAPHIC SCALES

PLANS: 30 15 0 30 60

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

INDEX OF SHEETS

SHEET NO.:	*DESCRIPTION:*
UO-1	*TITLE SHEET*
UO-02	*UBO PLAN SHEET*

UTILITY OWNERS WITH CONFLICTS

(A) CENTURYLINK – TELECOMMUNICATIONS

PREPARED IN THE OFFICE OF:

SO-DEEP | SAM NC™

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

Keith Garry — *UTILITY PROJECT MANAGER*
Freddie Bunn — *UTILITY COORDINATOR*

Prepared In the Office of:

CDM Smith
CDM Smith Inc.
5400 Glenwood Avenue
Suite 400
Raleigh, NC 27612-3228
NC COA No. F-0412

FOR THE NORTH CAROLINA DEPT. OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: TBD 2016

LETTING DATE: JANUARY 18, 2017

DAVID J. CLODGO, P.E.
PROJECT ENGINEER

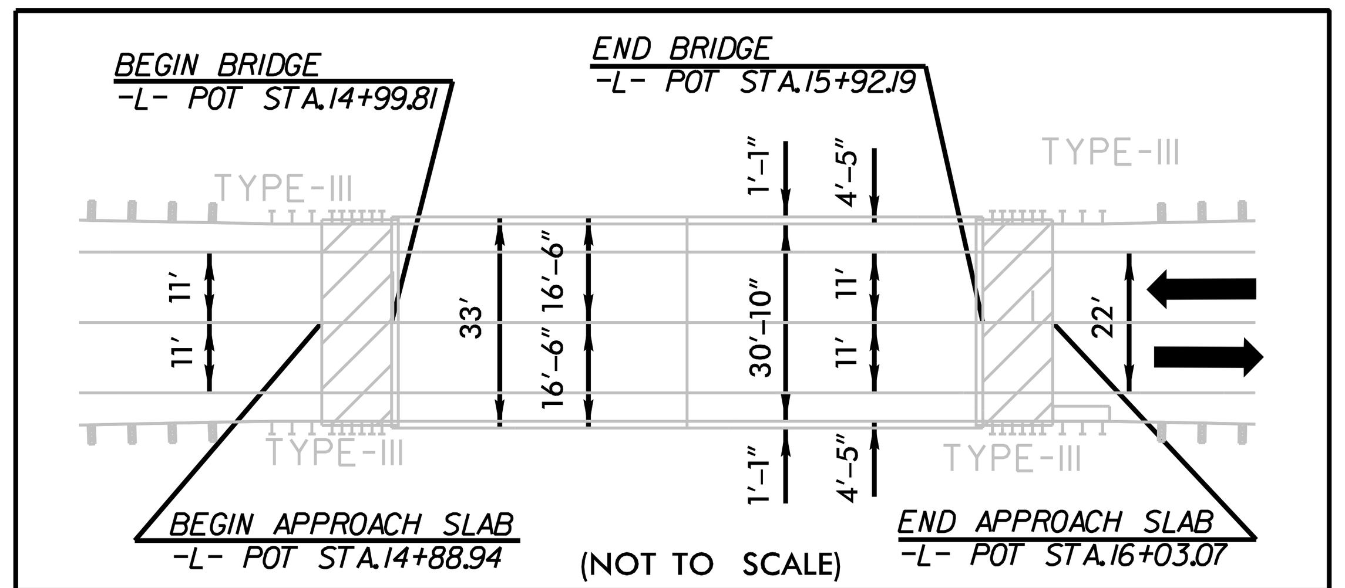
CURTIS J. TILLMAN, P.E.
PROJECT DESIGN ENGINEER

BRICE BELL, P.E.
NCDOT CONTACT

PROJECT REFERENCE NO.	SHEET NO.
B-5412	UO-02

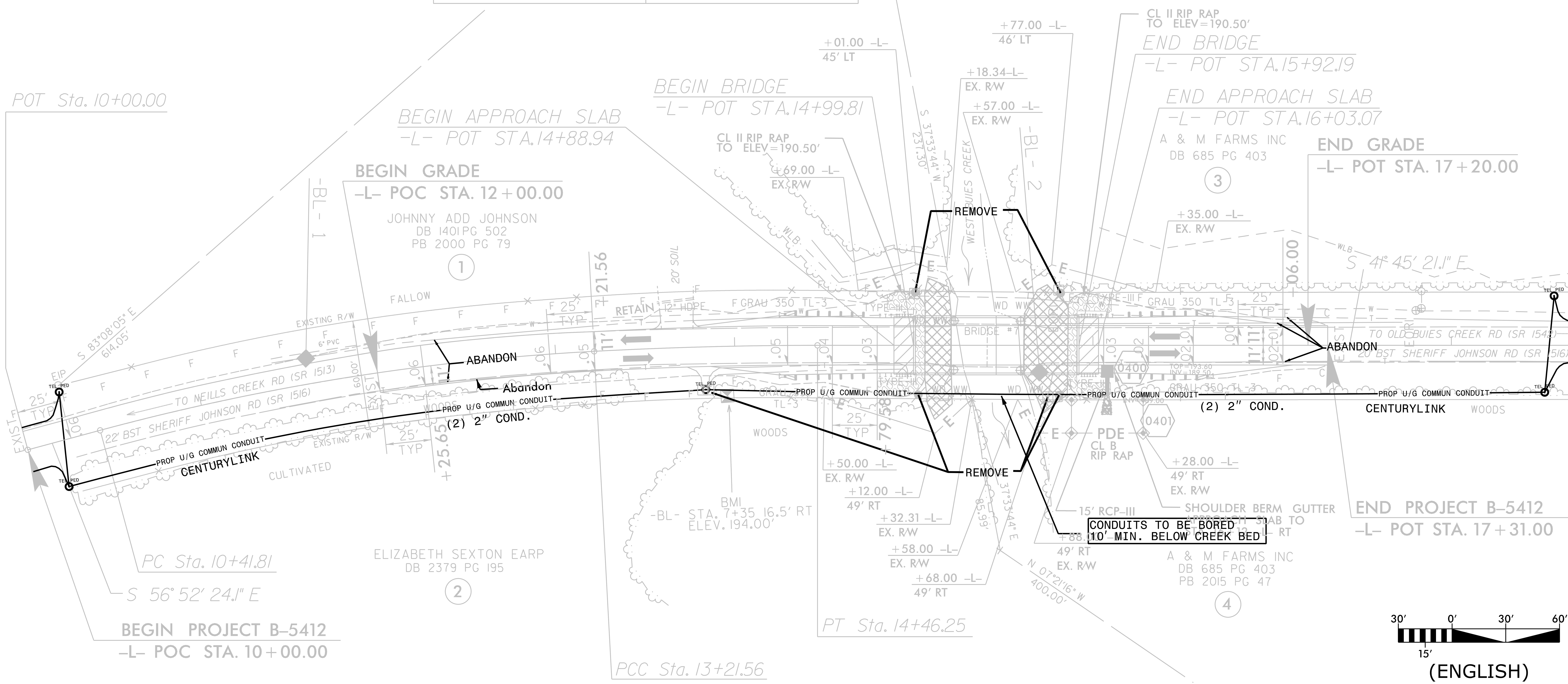
UTILITIES BY OTHERS

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.



BRIDGE PAVEMENT RELATIONSHIP SKETCH

-L-	
PI Sta 11+82.20	PI Sta 13+83.92
△ = 12° 03′ 04.7″ (RT)	△ = 3° 03′ 58.3″ (RT)
D = 4° 18′ 28.6″	D = 2° 27′ 32.6″
L = 279.75′	L = 124.69′
T = 140.39′	T = 62.36′
R = 1,330.00′	R = 2,330.00′
SE = 0.06	SE = 0.05
RO = 150.00′	RO = 125.00′



NAD 83/NA 2011
POT Sta. 10+00.00
BEGIN APPROACH SLAB
-L- POT STA.14+88.94
BEGIN BRIDGE
-L- POT STA.14+99.81
END BRIDGE
-L- POT STA.15+92.19
END APPROACH SLAB
-L- POT STA.16+03.07
BEGIN GRADE
-L- POC STA. 12+00.00
END GRADE
-L- POT STA. 17+20.00
JOHNNY ADD JOHNSON
DB 1401 PG 502
PB 2000 PG 79
A & M FARMS INC
DB 685 PG 403
ELIZABETH SEXTON EARP
DB 2379 PG 195
A & M FARMS INC
DB 685 PG 403
PB 2015 PG 47
REMOVE
ABANDON
Abandon
PROP U/G COMMUN CONDUIT
(2) 2″ COND.
CENTURYLINK
CONDUITS TO BE BORED
10′ MIN. BELOW CREEK BED
TO NEILLS CREEK RD (SR 1513)
22′ BST SHERIFF JOHNSON RD (SR 1516)
TO OLD BUIES CREEK RD (SR 1543)
WEST BUIES CREEK
BRIDGE
FALLOW
CULTIVATED
WOODS
BMI
-BL- STA. 7+35 16.5′ RT
ELEV. 194.00′
PC Sta. 10+41.81
S 56° 52′ 24.1″ E
PCC Sta. 13+21.56
PT Sta. 14+46.25
S 41° 45′ 21.1″ E
BEGIN PROJECT B-5412
-L- POC STA. 10+00.00
END PROJECT B-5412
-L- POT STA. 17+31.00
(ENGLISH)

RIGHT OF WAY AREA DATA

PARCEL NUMBER	PROPERTY OWNERS NAMES	TOTAL AREA	AREA TAKEN	AREA REMAINING	CONST. EASEMENT	PERMANANT DRAINAGE EASEMENT	TEMPORARY UTILITY EASEMENT
1	JOHNNY ADD JOHNSON	2.86 Ac.		2.86 Ac.	503.73 SF		
2	ELIZABETH SEXTON EARP	29.13 Ac.		29.13 Ac.	787.14 SF		
3	A & M FARMS INC	76.33 Ac.		76.33 Ac.	602.17 SF		
4	A & M FARMS INC	97.55 Ac.		97.55 Ac.	465.40 SF	742.17 SF	

REVISIONS

8/17/99

PROJ. REFERENCE NO.	SHEET NO.
B-5412	X-9

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
B-5412	X-8

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8/23/99

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2:1 0.022 0.022 2:1

193.27

16+25.00

200 195 190 185

2:1 0.030 0.030 2:1

193.28

16+00.00

END BRIDGE

STA. 15+92.19

200 195 190 185

0.030 0.030

193.29

15+75.00

200 195 190 185 180

0.030 0.030

183.88

15+50.00

200 195 190 185 180 175

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8/23/99

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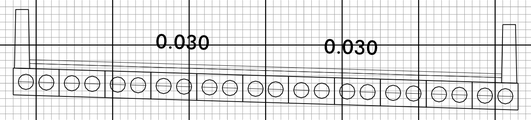

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15+25.00

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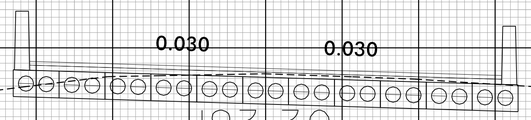

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15+00.00

BEGIN BRIDGE
STA. 14+99.81

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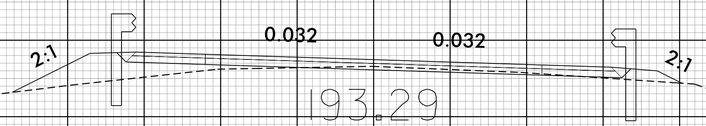

193.29

14+75.00

-L-

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PROJ. REFERENCE NO.
B-5412
SHEET NO.
X-5
0 2.5 5
0.042
0.042
2:1
2:1
193.20
14 + 50.00
0.050
0.050
2:1
2:1
193.10
14 + 25.00
0.050
0.050
2:1
2:1
193.13
14 + 00.00
TIE TO DRIVEWAY
4.55:1
0.050
0.050
2:1
193.26
13 + 75.00

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-5412	X-4


PROJ. REFERENCE NO.
B-5412
SHEET NO.
X-3
0 2.5 5
0.060
0.060
2:1
2:1
195.63
12+25.00
0.060
EXIST.
2:1
196.20
12+00.00
0.060
2:1
196.80
11+75.00
0.060
2:1
197.46
11+50.00
0.060
2:1
198.24
11+25.00

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-5412	X-2

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

205 200 195 190

2:1 0.060

199.03

11+00.00

205 200 195

2:1 0.060

199.80

10+75.00

205 200 195

2:1 0.060

200.55

10+50.00

205 200 195

2:1 0.060

201.26

10+25.00

205 200 195

2:1 EXIST.

201.88

10+00.00

205 200 195

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

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'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: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY

PROJ. REFERENCE NO.	SHEET NO.
B-5412	X-1A

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

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+00.00	0	0
10+25.00	0	0
10+50.00	0	0
10+75.00	0	0
11+00.00	0	1
11+25.00	0	1
11+50.00	0	1
11+75.00	0	1
12+00.00	0	1
12+25.00	1	3
12+50.00	1	5
12+75.00	0	6
13+00.00	0	7
13+25.00	0	7
13+50.00	0	8
13+75.00	0	9
14+00.00	0	10
14+25.00	0	16
14+50.00	0	22
14+75.00	1	18
14+99.81	3	15

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
SKIP STATION RANGE = 14+99.81 to 15+92.19		
15+92.19	0	0
16+00.00	11	0
16+25.00	24	2
16+50.00	8	3
16+75.00	4	1
17+00.00	4	0
17+20.00	3	0
17+25.00	1	0
17+31.00	1	0

PROJECT REFERENCE NO.	SHEET NO.
B-5412	X-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS SECTION INDEX

5/28/99

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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 2012 "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

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

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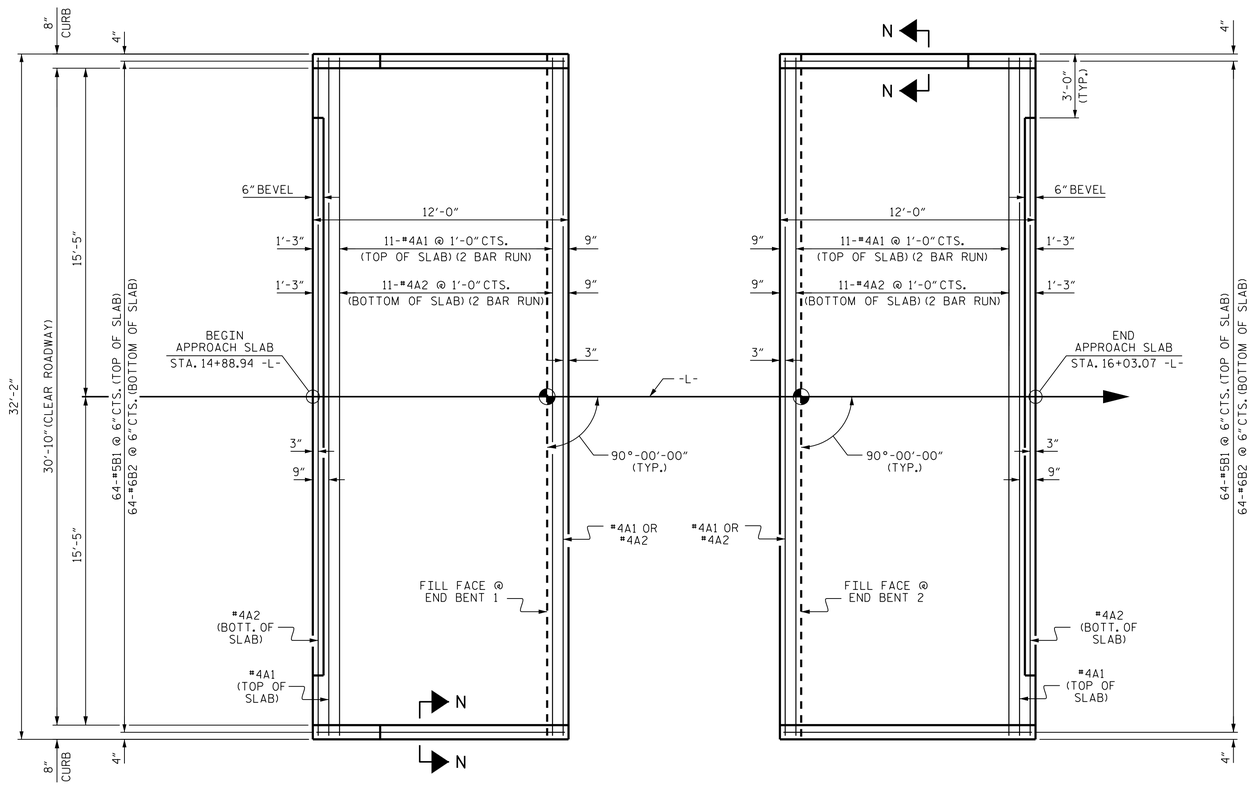
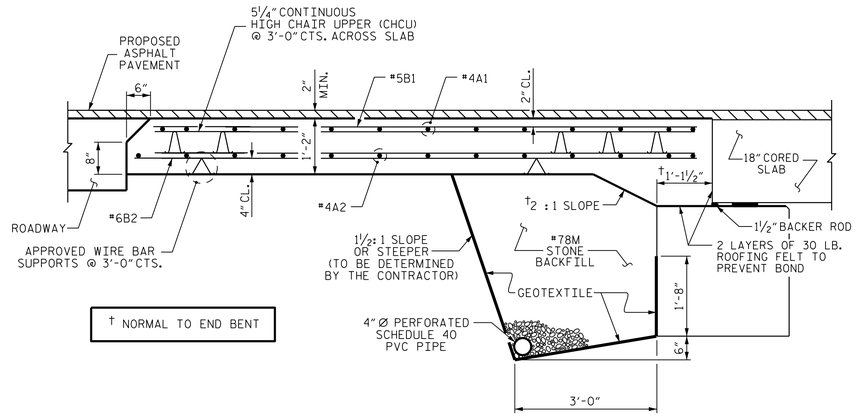


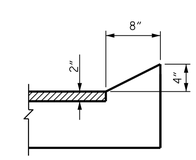
AT END BENT 1 AT END BENT 2

PLAN

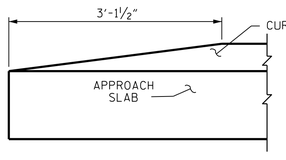
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



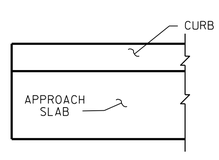
SECTION THRU SLAB



SECTION N-N



END OF CURB
WITHOUT SHOULDER BERM GUTTER



END OF CURB
WITH SHOULDER BERM GUTTER @ END BENT 2 RIGHT SIDE

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY PLANS.

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

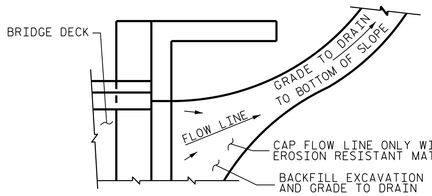
#78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

#78M STONE 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.

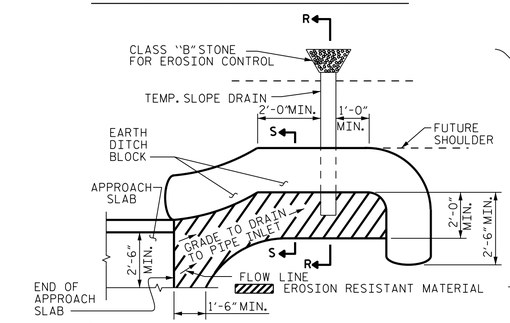
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.



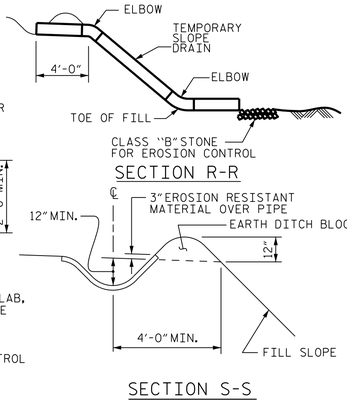
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT 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.	17.3

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.	17.3

SPLICE LENGTHS

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

PROJECT NO. B-5412

HARNETT COUNTY

STATION: 15+46.00 -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

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

DRAWN BY : A.L. STROUD DATE : 04/17
CHECKED BY : J.B. TAYLOR DATE : 04/17
DESIGN ENGINEER : A.L. STROUD DATE : 04/17

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 33698 ENGINEER JOSHUA B. TAYLOR
5/16/2017

DocuSigned by: Joshua B. Taylor

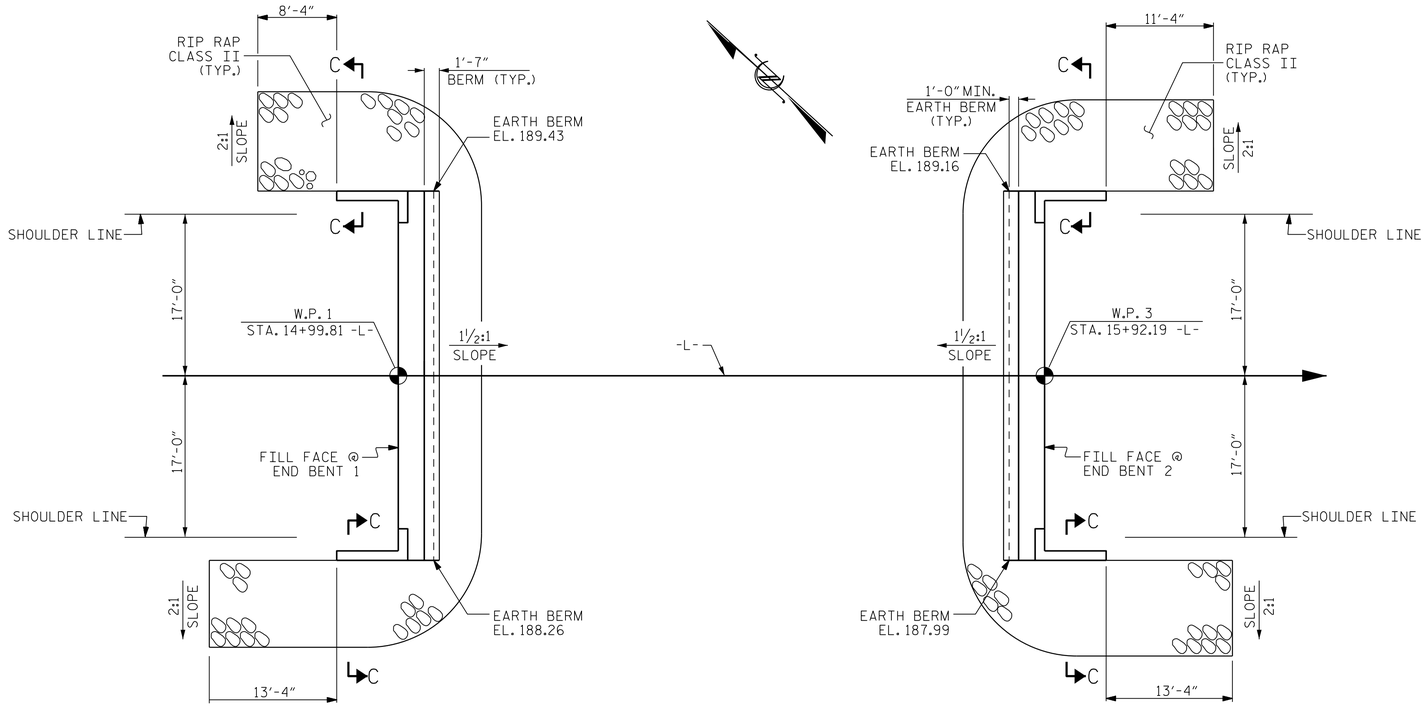
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			16

STD. NO. BAS_33_90S

DRAWN BY : SHS/MAA 5-09
CHECKED BY : BCH 5-09
REV. 9-15 MAA/TMG

FILE: c:\pw_pll\taylorjb\d0349153\B5412_SMU_AS_016_420007.dgn
DATE: 5/5/2017 3:23:59 PM

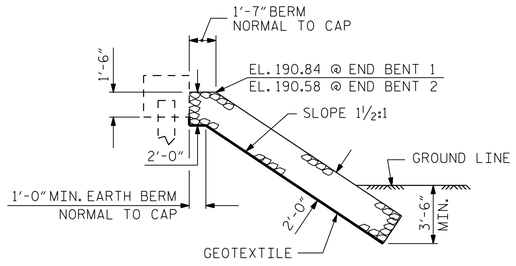
ESTIMATED QUANTITIES		
BRIDGE @ STA. 15+46.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	73	81
END BENT 2	72	80



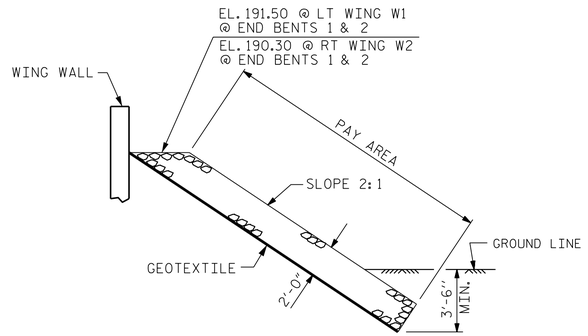
AT END BENT 1

AT END BENT 2

PLAN



℄ SECTION
BERM RIP RAPPED



SECTION C-C

PROJECT NO. B-5412
HARNETT COUNTY
STATION: 15+46.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
RIP RAP DETAILS

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 : A.L. STROUD DATE : 04/17
CHECKED BY : J.B. TAYLOR DATE : 04/17
DESIGN ENGINEER : A.L. STROUD DATE : 04/17

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 33698 ENGINEER JOSHUA B. TAYLOR
5/16/2017
DocuSigned by: Joshua B. Taylor

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			16

STD. NO. RR1

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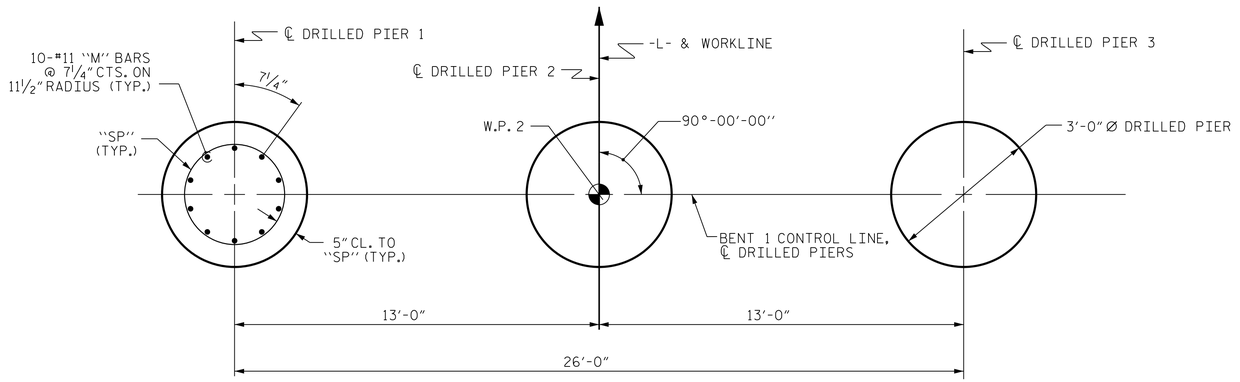
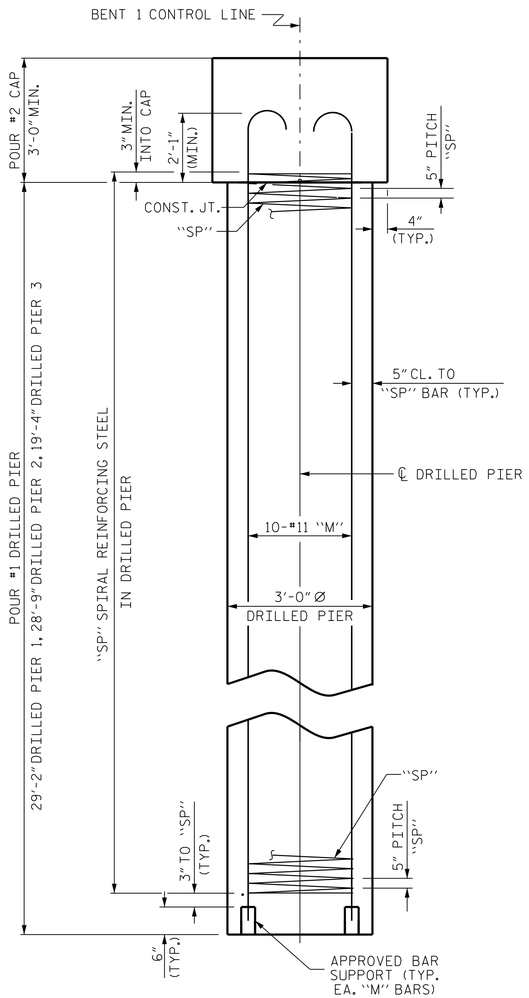
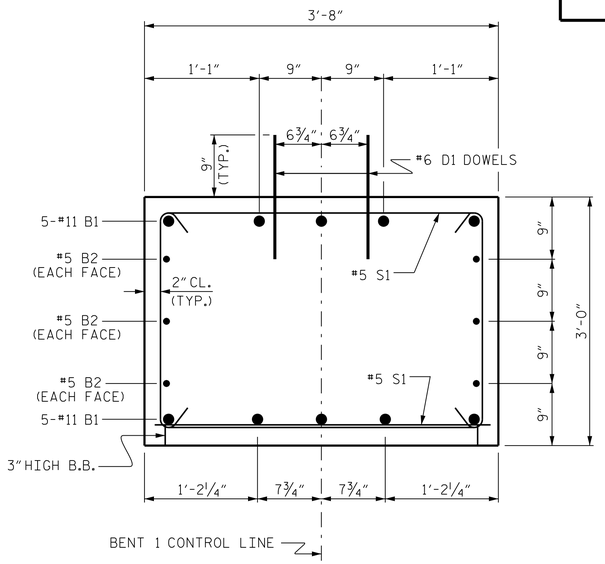


PLAN OF DRILLED PIERS

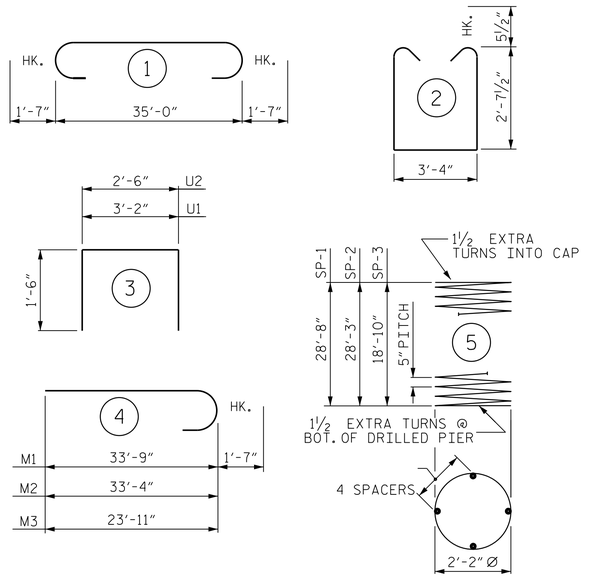


END ELEVATION

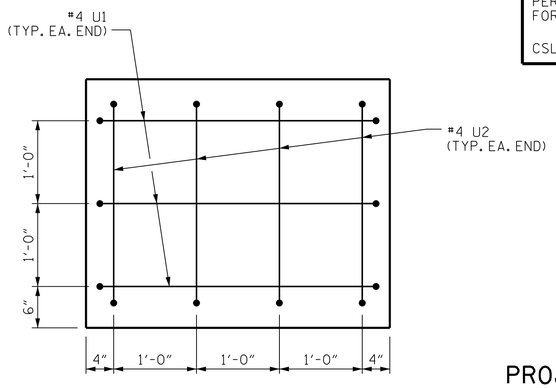


SECTION THRU CAP

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT



END OF CAP VIEW

(TYPICAL BOTH ENDS)

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	38'-2"	2028
B2	6	#5	STR	35'-2"	220
D1	44	#6	STR	1'-6"	99
M1	10	#11	4	35'-4"	1877
M2	10	#11	4	34'-11"	1855
M3	10	#11	4	25'-6"	1355
S1	60	#5	2	9'-6"	595
U1	6	#4	3	6'-2"	25
U2	8	#4	3	5'-6"	29

REINFORCING STEEL 8,083 LBS.

SP-1	1	✳	5	478'-0"	499
SP-2	1	✳	5	471'-4"	492
SP-3	1	✳	5	320'-10"	335

SPIRAL COLUMN REINFORCING STEEL 1,326 LBS.

✳ SP-1, SP-2, AND SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

CLASS A CONCRETE

POUR #2 (CAP) 14.5 C.Y.

TOTAL CLASS A CONCRETE 14.5 C.Y.

DRILLED PIERS:

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS) 20.2 C.Y.

3'-0" Ø DRILLED PIER NOT IN SOIL 14.0 LIN. FT.

3'-0" Ø DRILLED PIER IN SOIL 63.3 LIN. FT.

PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER 52.1 LIN. FT.

CSL TUBES 327 LIN. FT.

PROJECT NO. B-5412

HARNETT COUNTY

STATION: 15+46.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

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

DRAWN BY : A.L. STROUD DATE : 04/17
CHECKED BY : J.B. TAYLOR DATE : 04/17
DESIGN ENGINEER : J.B. TAYLOR DATE : 04/17

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 33698 ENGINEER JOSHUA B. TAYLOR
5/16/2017
DocuSigned by: Joshua B. Taylor

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			16

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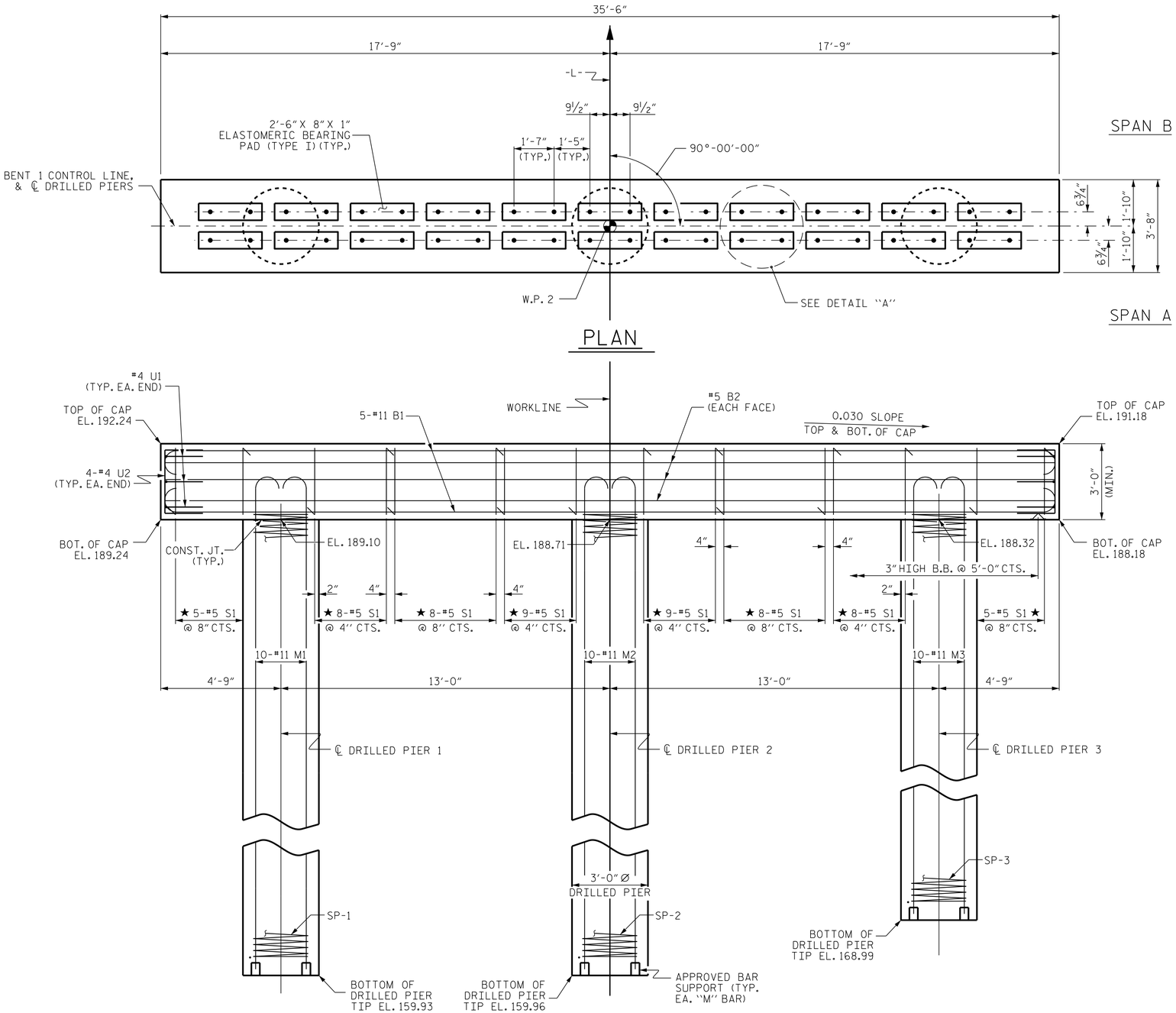


ELEVATION

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH DRILLED PIER UNLESS OTHERWISE NOTED.

NOTES

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

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

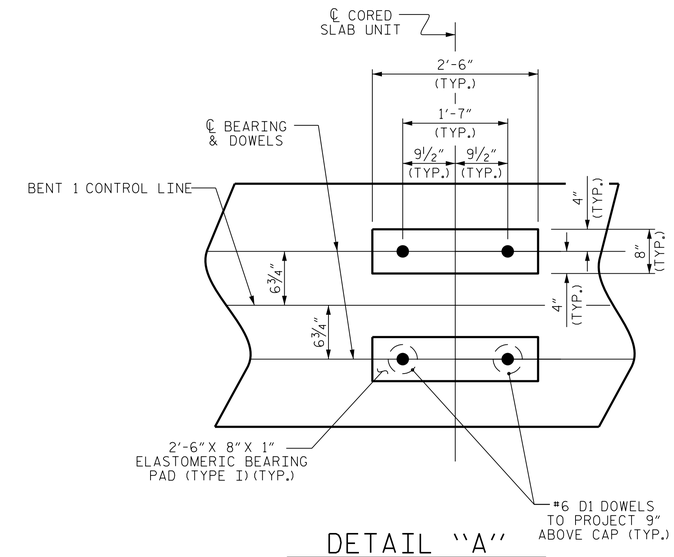
★ INVERT ALTERNATE STIRRUPS.

PERMANENT STEEL CASING AT DRILLED PIERS 1, 2 & 3 EXTENDS TO ELEVATION EL. 188.30. SEE FOUNDATION NOTES ON SHEET S-2 FOR BOTTOM ELEVATIONS FOR PERMANENT STEEL CASING.

DRILLED PIERS SHALL BE TERMINATED ONE FOOT ± ABOVE NORMAL WATER SURFACE ELEVATION FOR SHAFTS LOCATED IN WATER.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

SPLICING OF THE LONGITUDINAL BARS IN THE DRILLED PIER WILL NOT BE PERMITTED.



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. B-5412

HARNETT COUNTY

STATION: 15+46.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE

BENT 1

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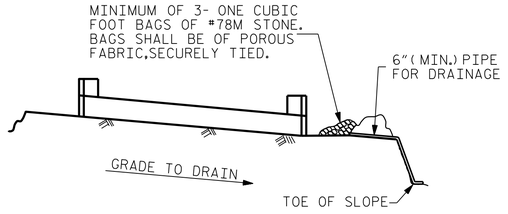
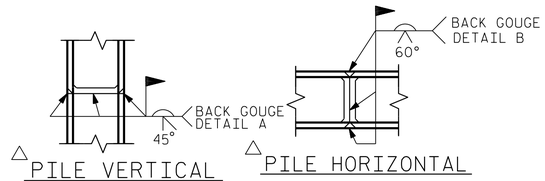


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

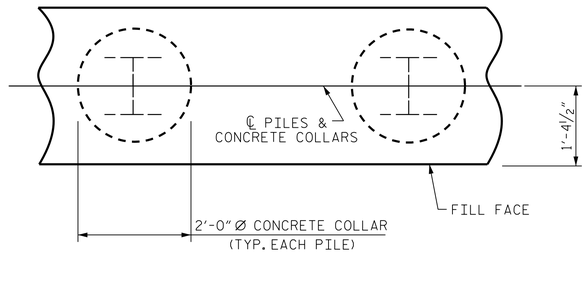
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



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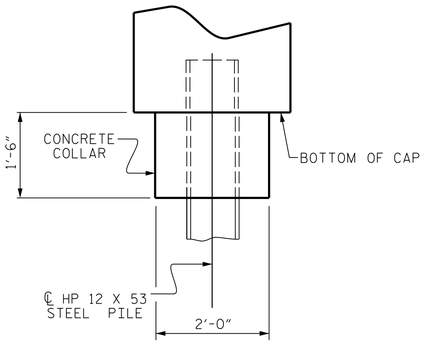
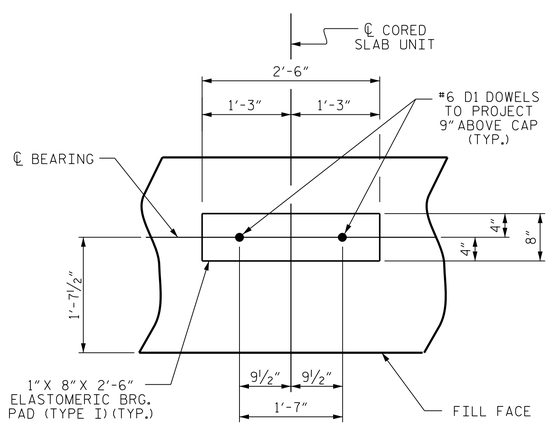


ELEVATION

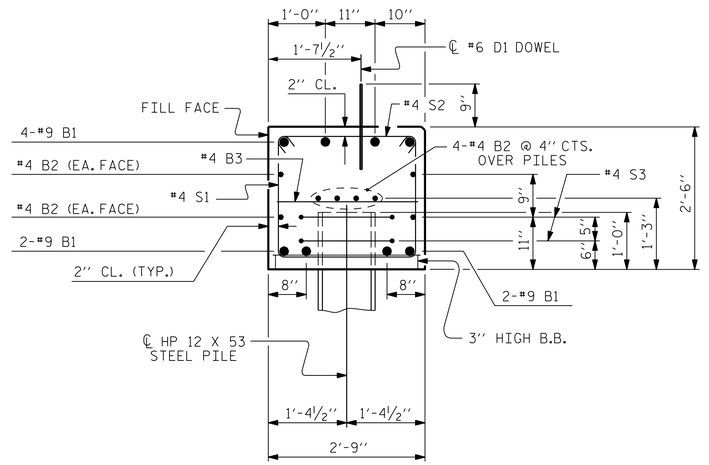
CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)



DETAIL "A"

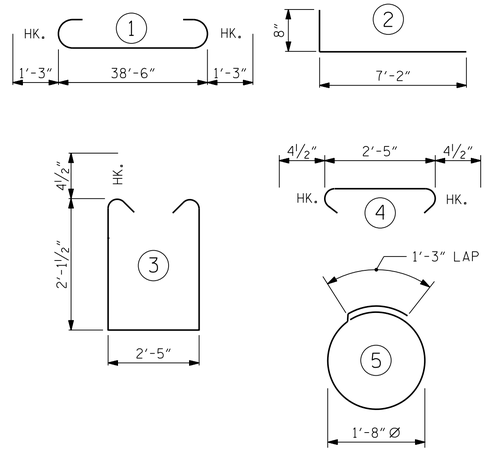
(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)



SECTION A-A

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

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.= 105.0	NO: 7	LIN. FT.= 180.0
STEEL PILE POINTS	7 EACH	STEEL PILE POINTS	7 EACH
PILE DRIVING EQUIPMENT SETUP	7 EACH	PILE DRIVING EQUIPMENT SETUP	7 EACH

BILL OF MATERIAL

FOR ONE END BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	41'-0"	1115
B2	16	#4	STR	20'-7"	220
B3	10	#4	STR	2'-5"	16
D1	22	#6	STR	1'-6"	50
H1	24	#4	2	7'-10"	126
K1	12	#4	STR	2'-11"	23
S1	50	#4	3	7'-5"	248
S2	50	#4	4	3'-2"	106
S3	14	#4	5	6'-6"	61
V1	24	#4	STR	4'-2"	67
V2	24	#4	STR	4'-5"	71

REINFORCING STEEL (FOR ONE END BENT) 2103 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1	CAP, LOWER PART OF WINGS & COLLARS	12.4 C.Y.
POUR #2	UPPER PART OF WINGS	1.6 C.Y.
TOTAL CLASS A CONCRETE		14.0 C.Y.

PROJECT NO. B-5412

HARNETT COUNTY

STATION: 15+46.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENTS 1 & 2 DETAILS

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DESIGN ENGINEER : J.B. TAYLOR DATE : 04/17

DWG. No.

5/16/2017
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DocuSigned by: Joshua B. Taylor

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CHECKED BY : MKT 01/10	

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WING DETAILS

PROJECT NO. B-5412

HARNETT COUNTY

STATION: 15+46.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE

END BENT WING DETAILS

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1			3					TOTAL SHEETS
2			4					16

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STD. NO. EB_33_90S

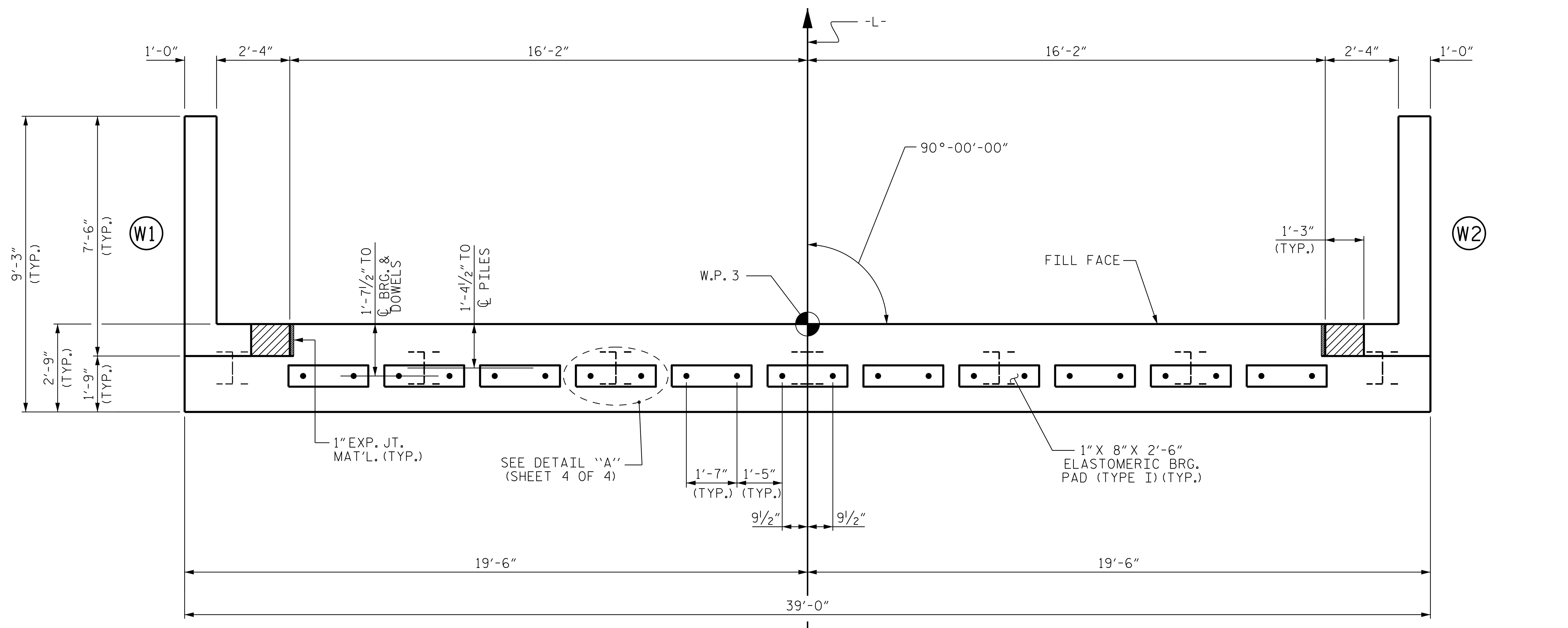
NOTES

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

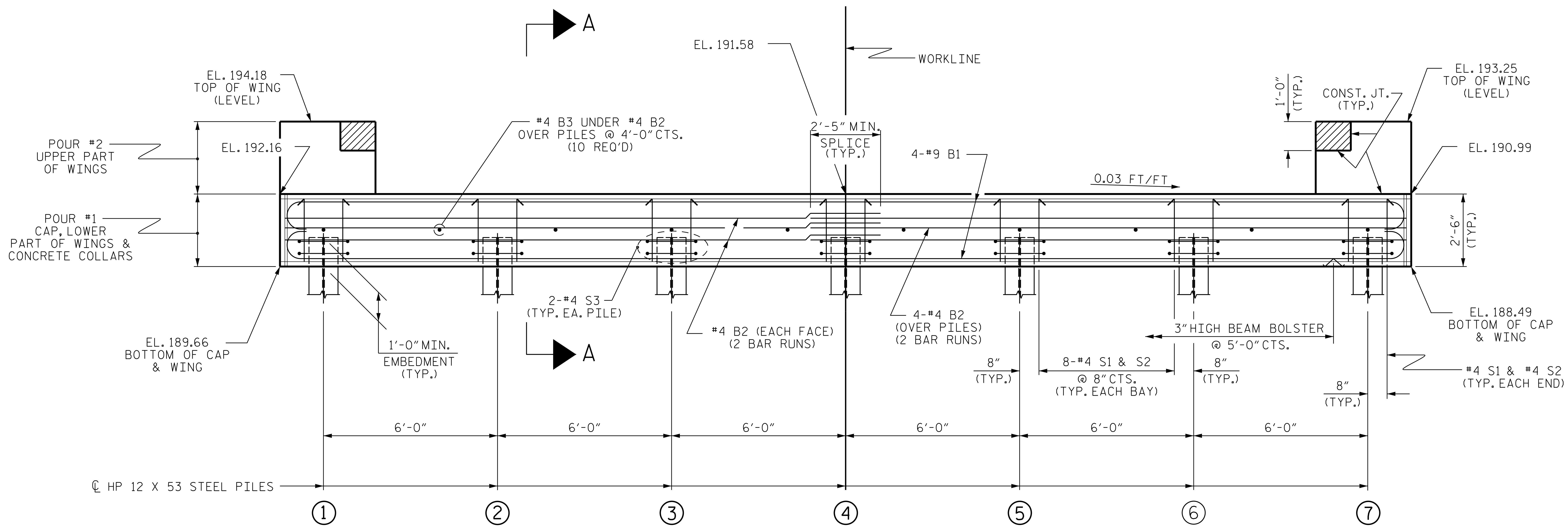
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN



ELEVATION

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

TOP OF PILE ELEVATIONS

Pile	Elevation
1	190.62
2	190.44
3	190.26
4	190.08
5	189.90
6	189.72
7	189.54

PROJECT NO. B-5412
HARNETT COUNTY
STATION: 15+46.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

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DESIGN ENGINEER :	J.B. TAYLOR	DATE :	04/17

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2			4		

SHEET NO. S-10
TOTAL SHEETS 16

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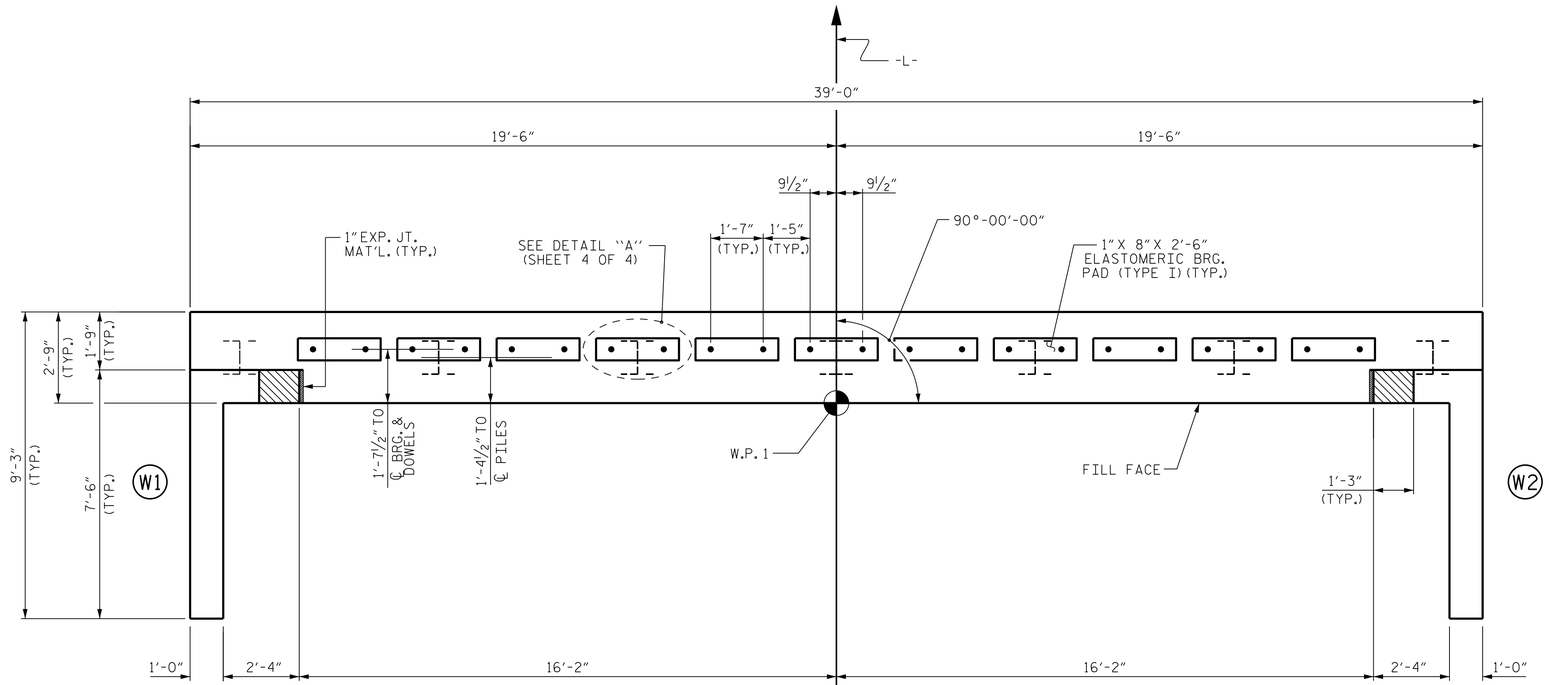

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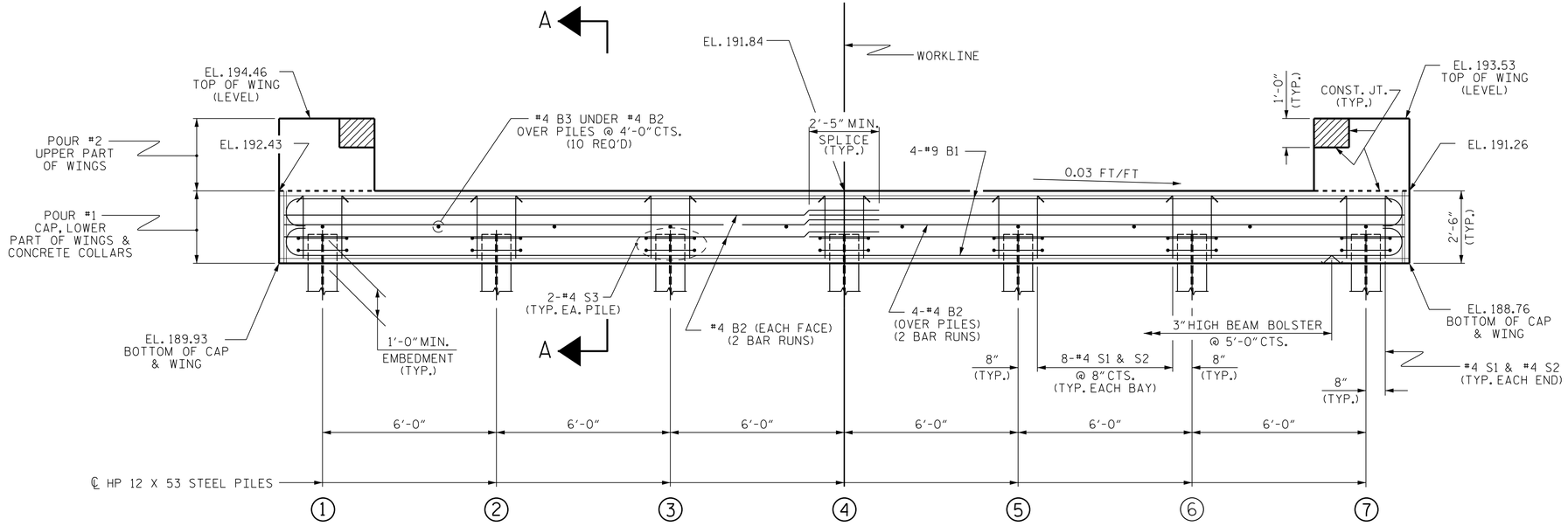

ELEVATION

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.

TOP OF PILE ELEVATIONS	
1	190.89
2	190.71
3	190.53
4	190.35
5	190.17
6	189.99
7	189.81

PROJECT NO. B-5412
HARNETT COUNTY
STATION: 15+46.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

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1			3			TOTAL SHEETS
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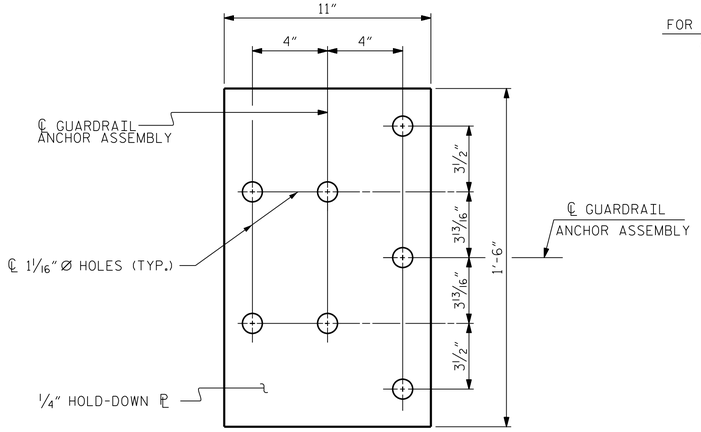

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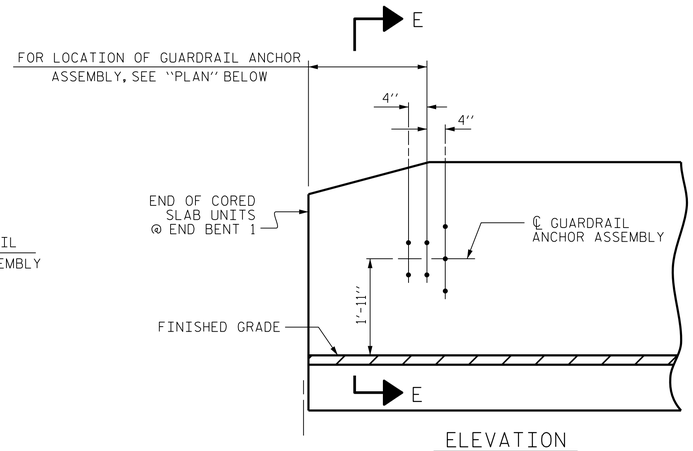

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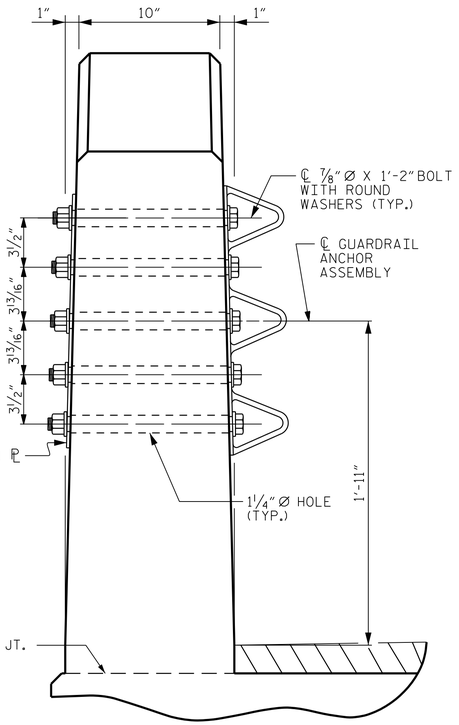


SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS

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.)

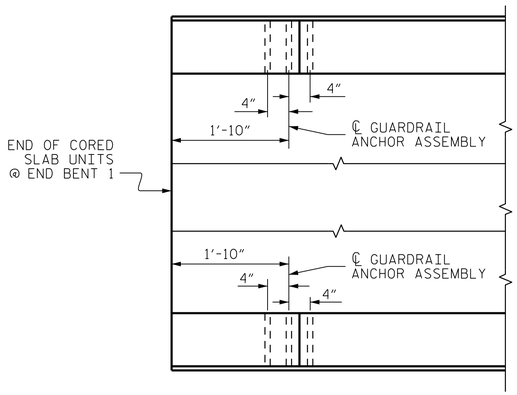
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR.

SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-5412

HARNETT COUNTY

STATION: 15+46.00 -L-

ASSEMBLED BY :		DATE :	
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DRAWN BY : MAA 5/10	REV. 12/5/11		MAA/GM
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	REV. 1/15		MAA/TMG

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DocuSigned by: Joshua B. Taylor

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

GUARDRAIL ANCHORAGE DETAILS FOR VERTICAL CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			16

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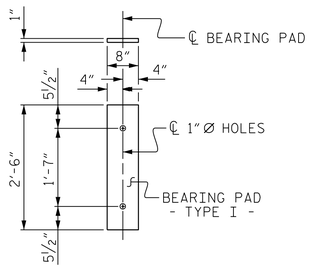


FIXED END
(TYPE I - 44 REQ'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 1'-6"
45' CORED SLAB UNIT	0.6"Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1⅜" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	⅜" ↓
FINAL CAMBER	1" ↑

** INCLUDES FUTURE WEARING SURFACE

BILL OF MATERIAL FOR ONE 45' 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	16	#5	3	3'-9"	63	3'-9"	63
S2	108	#4	3	4'-10"	349	4'-10"	349
* S3	54	#5	1	5'-8"	319		
REINFORCING STEEL				LBS.	474		474
* EPOXY COATED REINFORCING STEEL				LBS.	319		
7000 P.S.I. CONCRETE				CU. YDS.	5.9		5.9
0.6"Ø L.R. STRANDS				No.	17		17

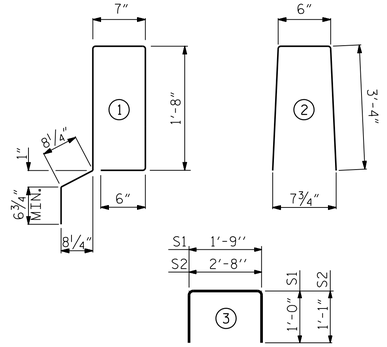
GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

	ASPHALT OVERLAY THICKNESS	RAIL HEIGHT
SPANS A & B	@ MID-SPAN	@ MID-SPAN
45' UNIT	1¾"	3'-7¾"

CONCRETE RELEASE STRENGTH

UNIT	PSI
45' UNIT	5500

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

18" CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
SPAN A - 45' C.S. UNIT			
EXTERIOR C.S.	2	45'-0"	90'-0"
INTERIOR C.S.	9	45'-0"	405'-0"
SUBTOTAL	11		495'-0"
SPAN B - 45' C.S. UNIT			
EXTERIOR C.S.	2	45'-0"	90'-0"
INTERIOR C.S.	9	45'-0"	405'-0"
SUBTOTAL	11		495'-0"
TOTAL C.S. UNITS	NO. 22	990.0	LIN. FT.

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.

THE #4 S2 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUTED RECESSES.

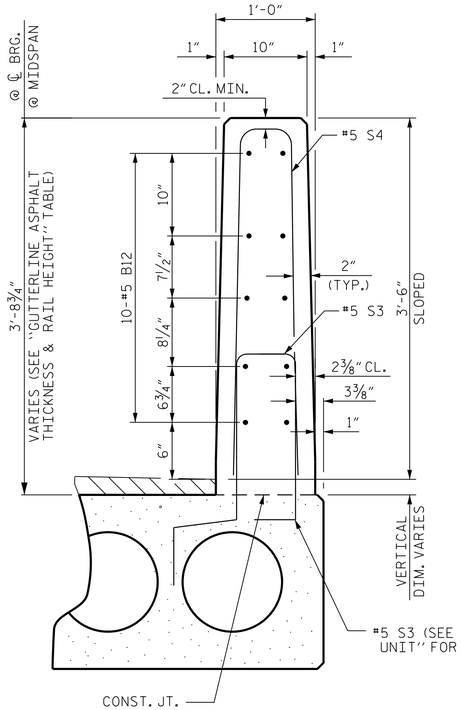
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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.



VERTICAL CONCRETE BARRIER RAIL SECTION

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

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	NUMBER PER SPAN		TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	SPAN A	SPAN B					
*B12	40	40	80	#5	STR	22'-1"	1842
*S4	108	108	216	#5	2	7'-2"	1614
* EPOXY COATED REINFORCING STEEL						3,456	LBS.
CLASS AA CONCRETE						23.0	CU. YDS.
TOTAL LIN. FT. OF VERTICAL CONCRETE BARRIER RAIL						180.50	LIN. FT.

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

SPLICE CHART

BAR	SIZE	LENGTH
B5	#4	1'-9"

PROJECT NO. B-5412
HARNETT COUNTY
STATION: 15+46.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-6" PRESTRESSED CONCRETE CORED SLAB UNIT

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 : A.L. STROUD DATE : 04/17
CHECKED BY : J.B. TAYLOR DATE : 04/17
DESIGN ENGINEER : A.L. STROUD DATE : 04/17

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 33698 ENGINEER JOSHUA B. TAYLOR
5/16/2017
DocuSigned by: Joshua B. Taylor

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			16

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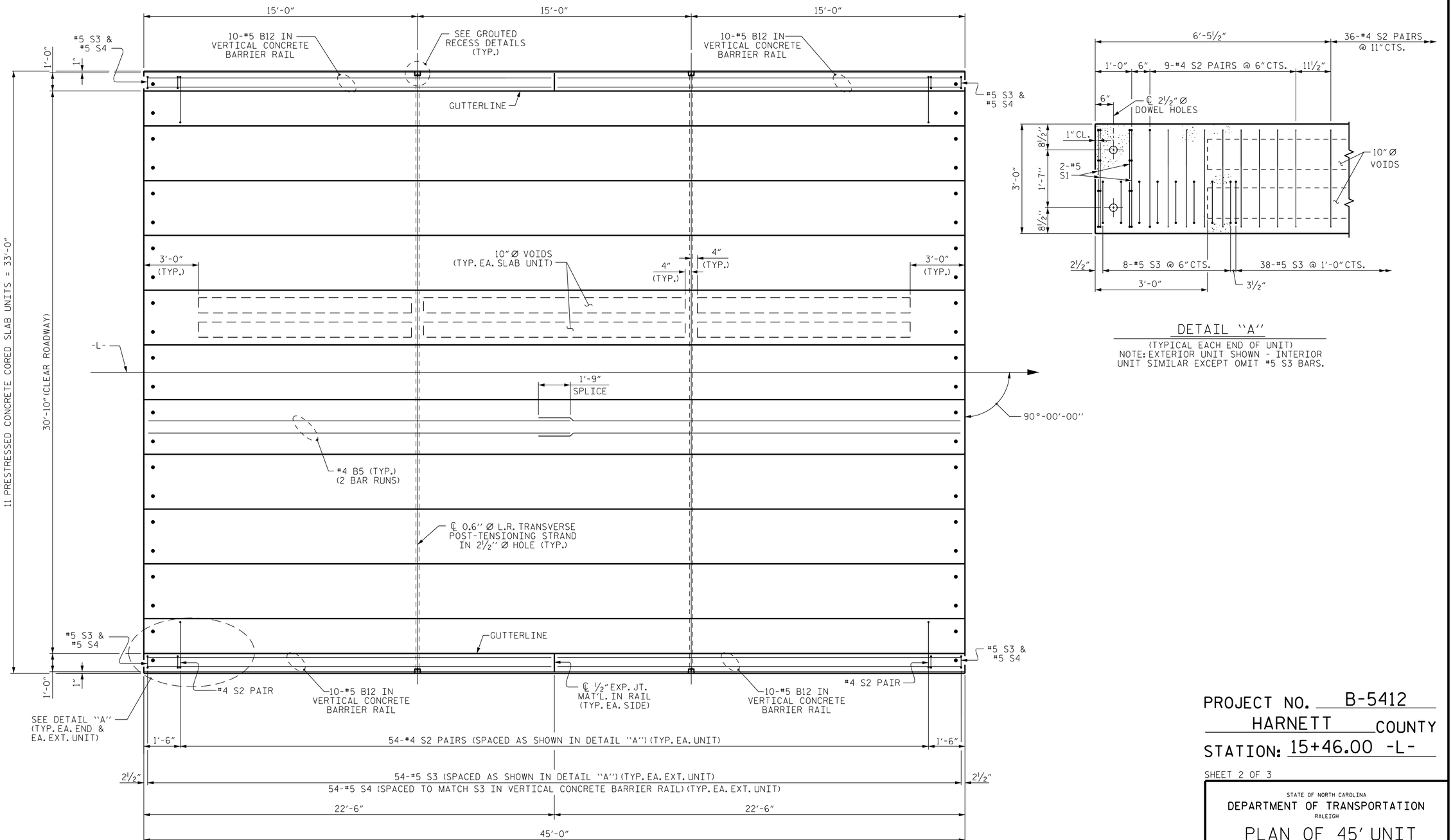

PLAN OF UNIT: SPAN A OR B

DETAIL "A"

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

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PROJECT NO. B-5412
HARNETT COUNTY
STATION: 15+46.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 45' UNIT
30'-10" CLEAR ROADWAY
90° SKEW
PLAN OF SPANS A & B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			16

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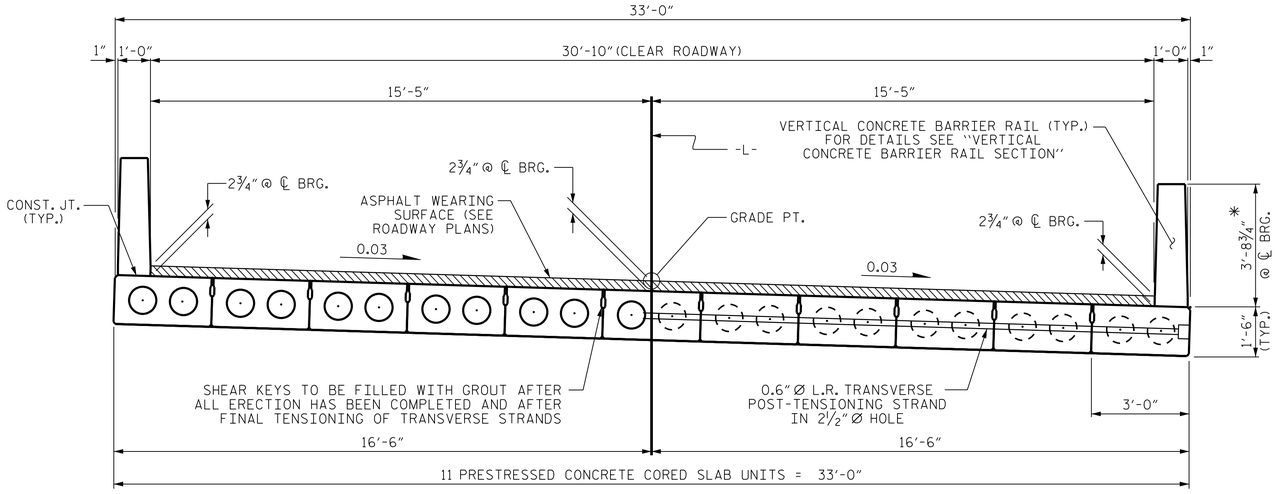
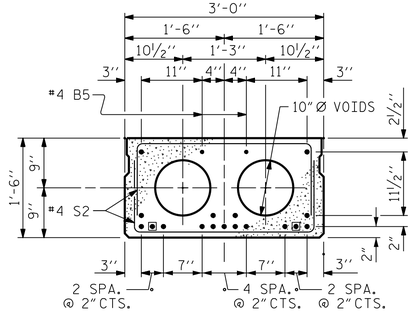


HALF SECTION
THROUGH VOIDS

HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

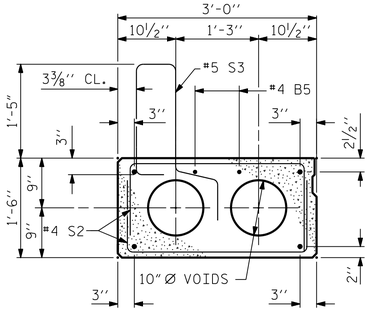
TYPICAL SECTION

* - 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

FOR 45° UNIT
(17 STRANDS REQUIRED)



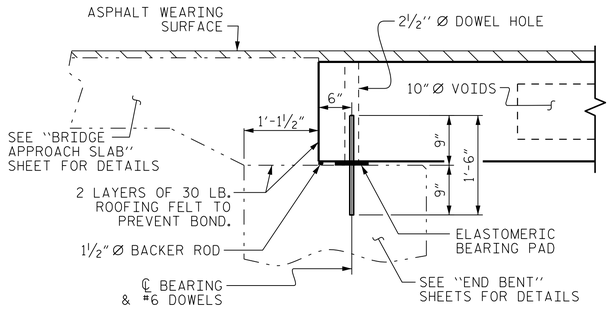
EXT. SLAB SECTION

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

◉ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 4'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

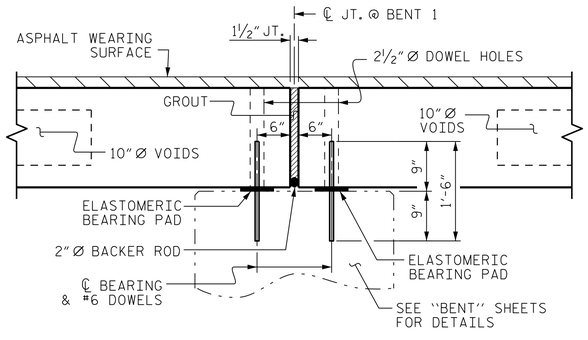
DEBONDING LEGEND

FIXED END

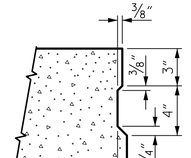


SECTION AT END BENT

FIXED END FIXED END

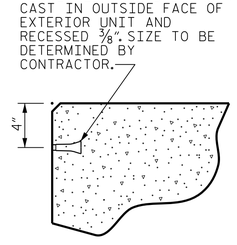


SECTION AT BENT

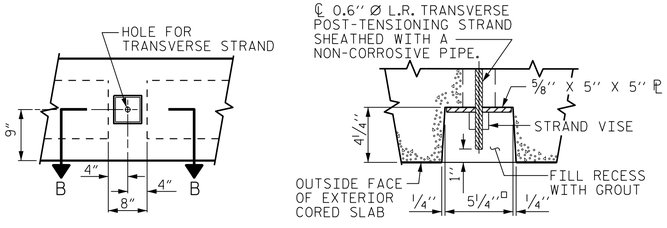


SHEAR KEY DETAIL

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



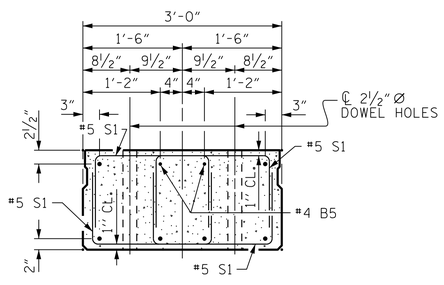
THREADED INSERT DETAIL



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. B-5412
HARNETT COUNTY
STATION: 15+46.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-6" PRESTRESSED CONCRETE CORED SLAB UNIT 90° SKEW 45' UNIT

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1			3			TOTAL SHEETS
2			4			16

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

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)	1.29	--	1.75	0.286	1.64	45′	EL	22.0	0.6	1.72	45′	I	44.0	0.80	0.286	1.29	45′	EL	22.0	
		HL-93(Opr)	N/A	--	2.13	--	1.35	0.286	2.13	45′	EL	22.0	0.6	2.23	45′	I	44.0	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	(2)	1.59	57.240	1.75	0.286	2.03	45′	EL	22.0	0.6	2.05	45′	I	44.0	0.80	0.286	1.59	45′	EL	22.0	
		HS-20(Opr)	36.000	--	2.63	94.680	1.35	0.286	2.63	45′	EL	22.0	0.6	2.66	45′	I	44.0	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.18	42.930	1.40	0.286	5.09	45′	EL	22.0	0.6	5.76	45′	I	44.0	0.80	0.286	3.18	45′	EL	22.0	
		SNGARBS2	20.000	--	2.53	50.600	1.40	0.286	4.03	45′	EL	17.5	0.6	4.20	45′	I	44.0	0.80	0.286	2.53	45′	EL	17.5	
		SNAGRIS2	22.000	--	2.44	53.680	1.40	0.286	3.86	45′	EL	17.5	0.6	3.94	45′	I	44.0	0.80	0.286	2.44	45′	EL	17.5	
		SNCOTTS3	27.250	--	1.57	42.783	1.40	0.286	2.51	45′	EL	22.0	0.6	2.89	45′	I	44.0	0.80	0.286	1.57	45′	EL	22.0	
		SNAGGRS4	34.925	--	1.37	47.847	1.40	0.286	2.18	45′	EL	22.0	0.6	2.47	45′	I	44.0	0.80	0.286	1.37	45′	EL	22.0	
		SNS5A	35.550	--	1.34	47.637	1.40	0.286	2.14	45′	EL	22.0	0.6	2.54	45′	I	44.0	0.80	0.286	1.34	45′	EL	22.0	
		SNS6A	39.950	--	1.25	49.938	1.40	0.286	2.00	45′	EL	22.0	0.6	2.35	45′	I	44.0	0.80	0.286	1.25	45′	EL	22.0	
		SNS7B	42.000	--	1.20	50.400	1.40	0.286	1.91	45′	EL	22.0	0.6	2.35	45′	I	44.0	0.80	0.286	1.20	45′	EL	22.0	
	TTST	TNAGRIT3	33.000	--	1.55	51.150	1.40	0.286	2.47	45′	EL	22.0	0.6	2.77	45′	I	44.0	0.80	0.286	1.55	45′	EL	22.0	
		TNT4A	33.075	--	1.55	51.266	1.40	0.286	2.47	45′	EL	22.0	0.6	2.66	45′	I	44.0	0.80	0.286	1.55	45′	EL	22.0	
		TNT6A	41.600	--	1.30	54.080	1.40	0.286	2.07	45′	EL	22.0	0.6	2.58	45′	I	44.0	0.80	0.286	1.30	45′	EL	22.0	
		TNT7A	42.000	--	1.32	55.440	1.40	0.286	2.10	45′	EL	22.0	0.6	2.39	45′	I	44.0	0.80	0.286	1.32	45′	EL	22.0	
		TNT7B	42.000	--	1.37	57.540	1.40	0.286	2.18	45′	EL	22.0	0.6	2.26	45′	I	44.0	0.80	0.286	1.37	45′	EL	22.0	
		TNAGRIT4	43.000	--	1.31	56.330	1.40	0.286	2.10	45′	EL	22.0	0.6	2.18	45′	I	44.0	0.80	0.286	1.31	45′	EL	22.0	
		TNAGT5A	45.000	--	1.22	54.900	1.40	0.286	1.95	45′	EL	22.0	0.6	2.22	45′	I	44.0	0.80	0.286	1.22	45′	EL	22.0	
		TNAGT5B	45.000	(3)	1.19	53.550	1.40	0.286	1.90	45′	EL	22.0	0.6	2.07	45′	I	44.0	0.80	0.286	1.19	45′	EL	22.0	

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)

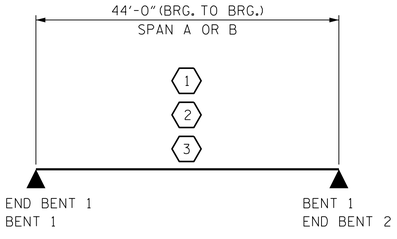
(2) DESIGN LOAD RATING (HS-20)

(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 SPANS A AND B

PROJECT NO. B-5412

HARNETT COUNTY

STATION: 15+46.00 -L-

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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5/16/2017

DocuSigned by: Joshua B. Taylor

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR 45′ CORED SLAB UNIT 90° SKEW

(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			16

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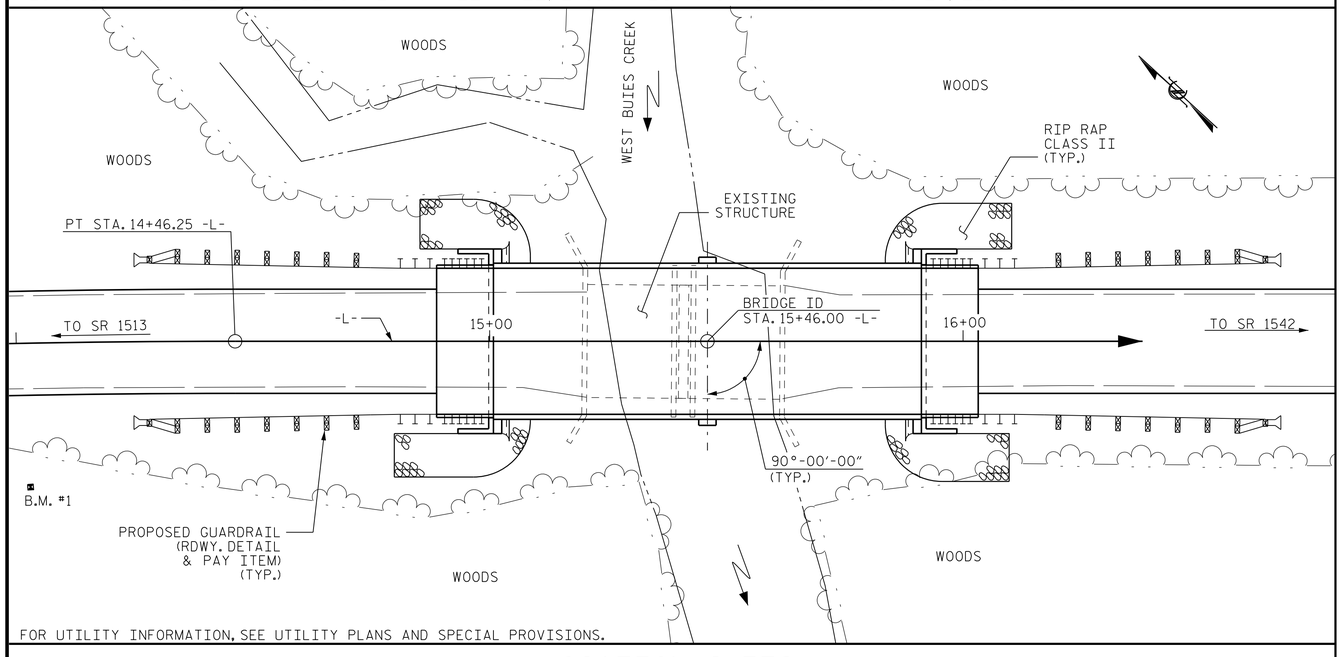
TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	3'-0" Ø DRILLED PIERS IN SOIL	3'-0" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	SID TESTING	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	PILE DRIVING SETUP FOR HP12X53 STEEL PILES	HP 12 X 53 STEEL PILES		STEEL PILE POINTS	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 1'-6" PRESTRESSED CONCRETE CORED SLABS		ASBESTOS ASSESSMENT
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EA.	EA.	EA.	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	LBS.	EA.	NO.	LIN. FT.	EA.	LIN. FT.	TON	SQ. YD.	LUMP SUM	NO.	LIN. FT.	LUMP SUM
SUPERSTRUCTURE																		180.50			LUMP SUM	22	990	
END BENT 1									LUMP SUM	14.0		2,103		7	7	105.0	7		73	81				
BENT 1			63.3	14.0	52.1	1	2	1		14.5		8,083	1,326											
END BENT 2									LUMP SUM	14.0		2,103		7	7	180.0	7		72	80				
TOTAL	LUMP SUM	LUMP SUM	63.3	14.0	52.1	1	2	1	LUMP SUM	42.5	LUMP SUM	12,289	1,326	14	14	285.0	14	180.50	145	161	LUMP SUM	22	990	LUMP SUM

B.M. #1: RR SPIKE IN BASE OF 24" MAPLE TREE; 27.66' RIGHT OF STA. 13+95.39 -L-, EL. 194.00.



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE	= 900 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YR.
DESIGN HIGH WATER ELEVATION	= 190.5
DRAINAGE AREA	= 8.5 SQ.MI.
BASE DISCHARGE (Q100)	= 1350 CFS
BASE HIGH WATER ELEVATION	= 191.67

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 2570 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YR.
OVERTOPPING FLOOD ELEVATION (AT STA. 17+50.00 -L-)	= 192.98

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 PERFORMANCE ZONE 1.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET S-N.

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

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

FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SAME SIZE AND LENGTH OF THE SAMPLE PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

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.

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 15+46.00 -L-.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

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.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 40 FT. EACH SIDE AT END BENT 1 AND 35 FT. EACH SIDE AT END BENT 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.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 15+46.00 -L-."

THE EXISTING STRUCTURE CONSISTING OF SPANS OF 1 @ 20'-5" & 1 @ 20'-4" WITH A CLEAR ROADWAY WIDTH OF 24'-0" WITH RC DECK ON STEEL I-BEAMS ON VERTICAL END BENTS WITH TIMBER PILES WITH CONCRETE CAP, TIMBER INTERIOR BENT PILES WITH CONCRETE CAP, WITH STEEL CRUTCH BENTS ON BOTH SIDES OF THE ORIGINAL BENT AND 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 PROVISION.

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

PROJECT NO. B-5412

HARNETT COUNTY

STATION: 15+46.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER
WEST BUIES CREEK ON SR 1516
BETWEEN SR 1513 & SR 1542

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 : A.L. STROUD DATE : 04/17
CHECKED BY : J.B. TAYLOR DATE : 04/17
DESIGN ENGINEER : J.B. TAYLOR DATE : 04/17

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 33698 ENGINEER JOSHUA B. TAYLOR
5/16/2017

DocuSigned by: Joshua B. Taylor

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			16

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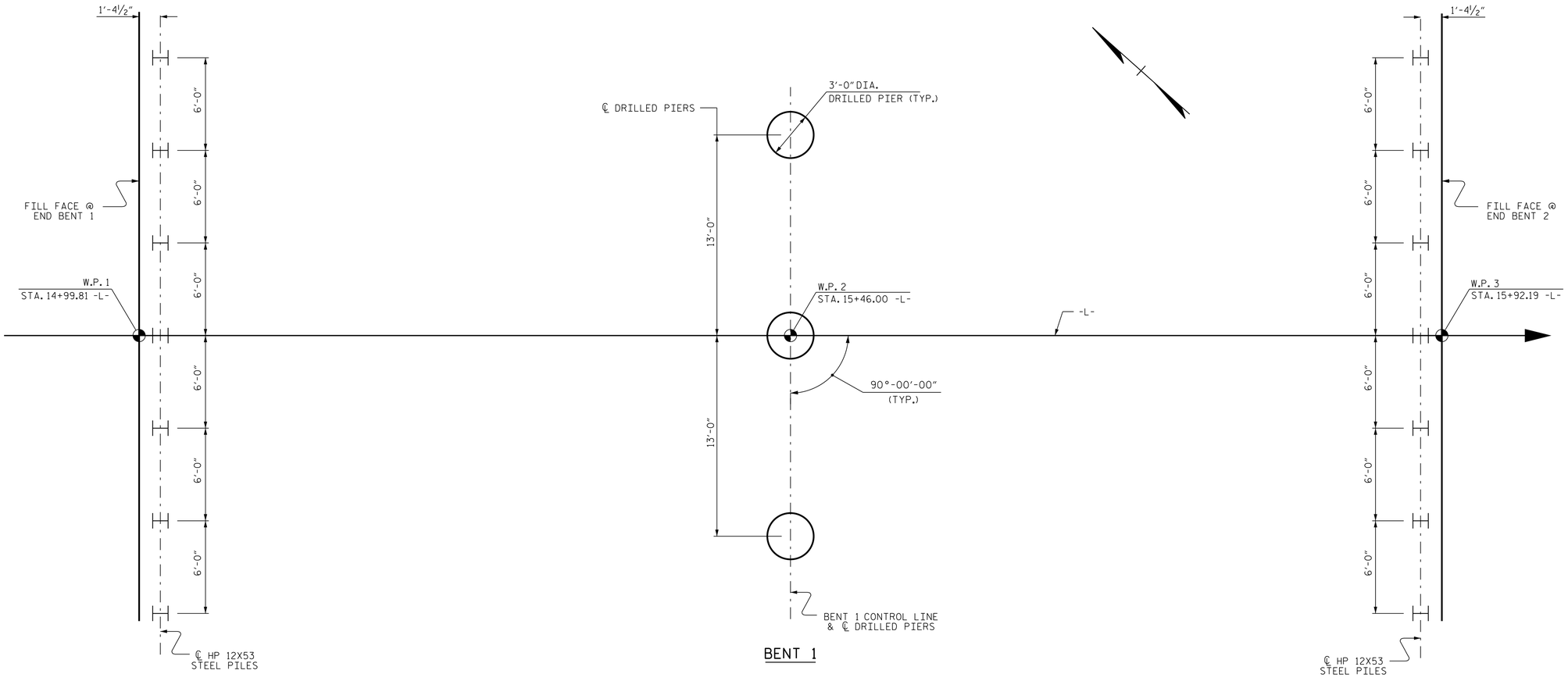

END BENT 1 BENT 1 END BENT 2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES AND PIERS ARE SHOWN TO PILE AND PIER CENTERLINES.
ALL PILES ARE VERTICAL.

NOTES

FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENTS 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 61 TONS PER PILE.

STEEL H PILE POINTS ARE REQUIRED FOR STEEL H PILES AT END BENTS 1 AND 2. FOR STEEL PILE POINTS, SEE PILES PROVISION.

DRIVE PILES AT END BENTS 1 AND 2 TO A REQUIRED RESISTANCE OF 105 TONS PER PILE.

FOR DRILLED PIERS, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 360 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 120 TSF LEFT AND CENTER AND 65 TSF RIGHT.

PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLED PIERS AT BENT 1. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 168.0 FT LEFT AND CENTER AND ELEVATION 178.0 FT RIGHT WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

INSTALL PERMAMENT STEEL CASINGS AT BENT 1 LEFT AND CENTER BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 178.0 FT.

INSTALL DRILLED PIERS AT BENT 1 LEFT AND CENTER TO A TIP ELEVATION NO HIGHER THAN 160.0 FT WITH THE REQUIRED TIP RESISTANCE AND A PENETRACTION OF AT LEAST 1 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

INSTALL DRILLED PIERS AT BENT 1 RIGHT TO A TIP ELEVATION NO HIGHER THAN 169.0 FT WITH THE REQUIRED TIP RESISTANCE.

THE SCOUR CRITICAL ELEVATION FOR BENT 1 IS ELEVATION 177.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DO NOT USE SLURRY CONSTRUCTION FOR DRILLED PIERS AT BENT 1.

SPT TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SPT. FOR SPT, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS AT BENT 1. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. B-5412
HARNETT COUNTY
STATION: 15+46.00 -L-

SHEET 2 OF 3

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

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CHECKED BY : J.B. TAYLOR DATE : 04/17
DESIGN ENGINEER : J.B. TAYLOR DATE : 04/17

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 33698 ENGINEER JOSHUA B. TAYLOR
5/16/2017
DocuSigned by: Joshua B. Taylor

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER
WEST BUIES CREEK ON SR 1516
BETWEEN SR 1513 & SR 1542

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			16

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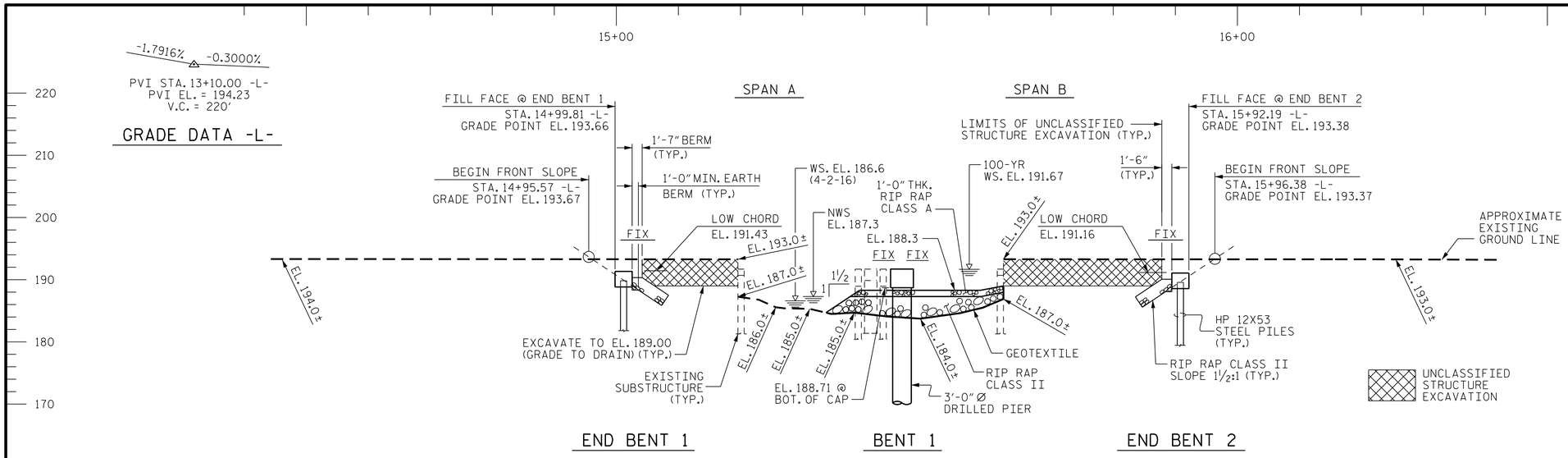
F.A. PROJ. NO. BRZ-1516(003)

-1.7916% -0.3000%

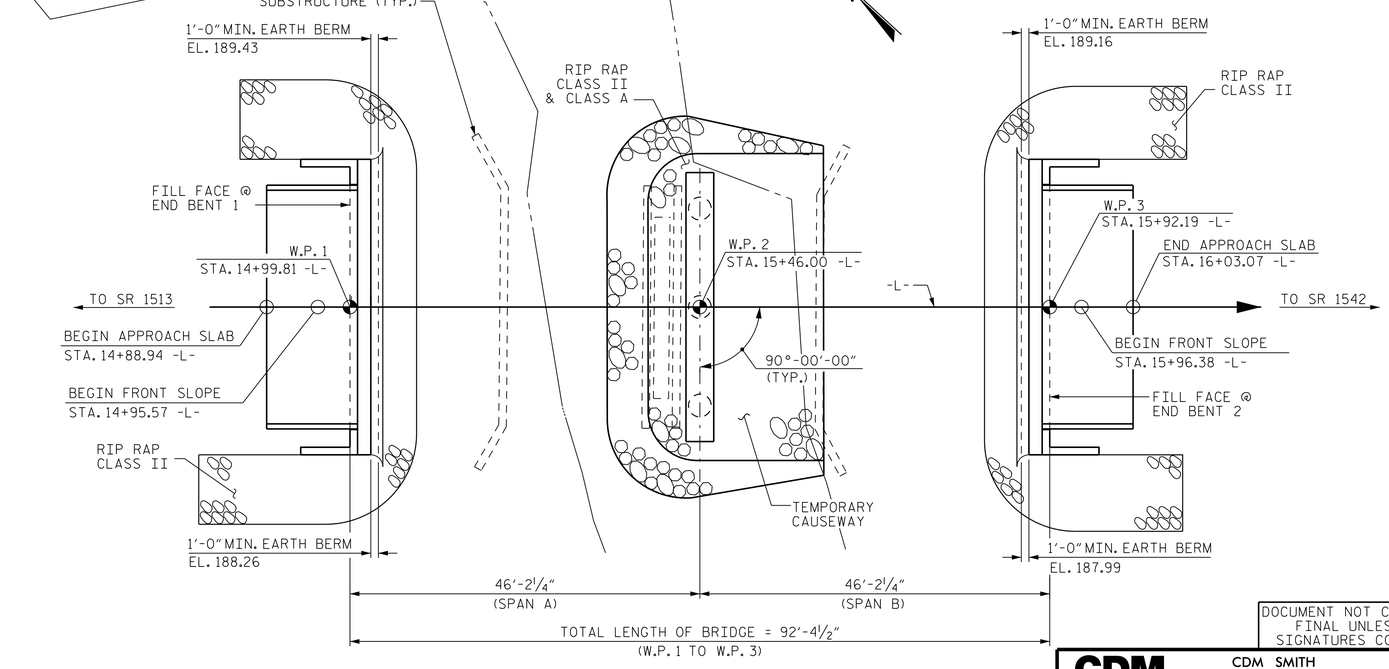
PVI STA. 13+10.00 -L-
PVI EL. = 194.23
V.C. = 220'

GRADE DATA -L-



SECTION ALONG -L-

(SECTION AT END BENTS AND BENT ARE AT RIGHT ANGLES)



PLAN

(PILES NOT SHOWN FOR CLARITY)

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. B-5412

HARNETT COUNTY

STATION: 15+46.00 -L-

SHEET 1 OF 3 REPLACES BRIDGES NO. 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER
WEST BUIES CREEK ON SR 1516
BETWEEN SR 1513 & SR 1542

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DRAWN BY : A.L. STROUD DATE : 04/17
CHECKED BY : J.B. TAYLOR DATE : 04/17
DESIGN ENGINEER : J.B. TAYLOR DATE : 04/17

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 33698 ENGINEER JOSHUA B. TAYLOR
5/16/2017
DocuSigned by: Joshua B. Taylor

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			16

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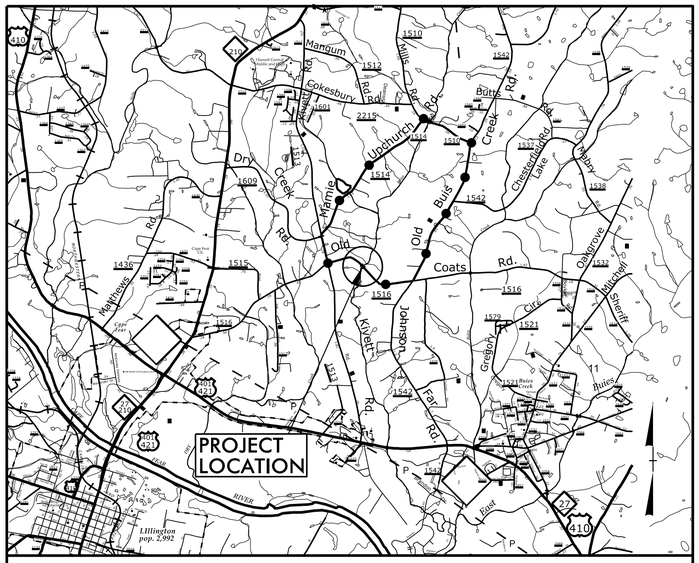
TIP PROJECT: B–5412

CONTRACT: DF00158

STRUCTURE



VICINITY MAP

DENOTES OFF–SITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

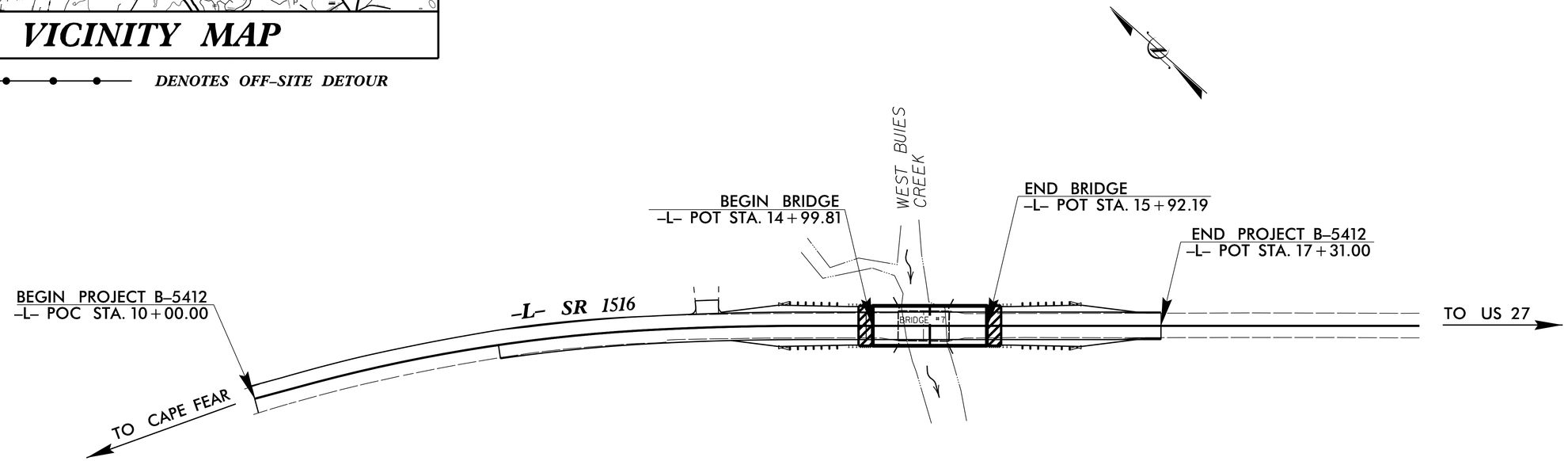
HARNETT COUNTY

LOCATION: BRIDGE NO. 7 OVER WEST BUIES CREEK ON SR 1516 (SHERIFF JOHNSON ROAD)

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–5412		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
55042.1.1	BRZ–1516(003)	P.E.
55042.2.1	BRZ–1516(003)	R/W & UTILITIES
55042.3.1	BRZ–1516(003)	CONST.



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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT 2016 = 1400
ADT 2036 = 2529
K = NA %
D = NA %
T = 6 % *
V = 60 MPH
* TTST = DUAL

FUNC CLASS =
MINOR COLLECTOR
SUB REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B–5412 = 0.120 MILES

LENGTH STRUCTURE TIP PROJECT B–5412 = 0.018 MILES

TOTAL LENGTH TIP PROJECT B–5412 = 0.138 MILES

Prepared In the Office of:

DIVISION OF HIGHWAYS

STRUCTURES MANAGEMENT UNIT

1000 BIRCH RIDGE DR.

RALEIGH, N.C. 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE :

JUNE 21, 2017

DAVID J. CLODGO, P.E.
PROJECT ENGINEER

JOSH B. TAYLOR, P.E.
PROJECT DESIGN ENGINEER

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