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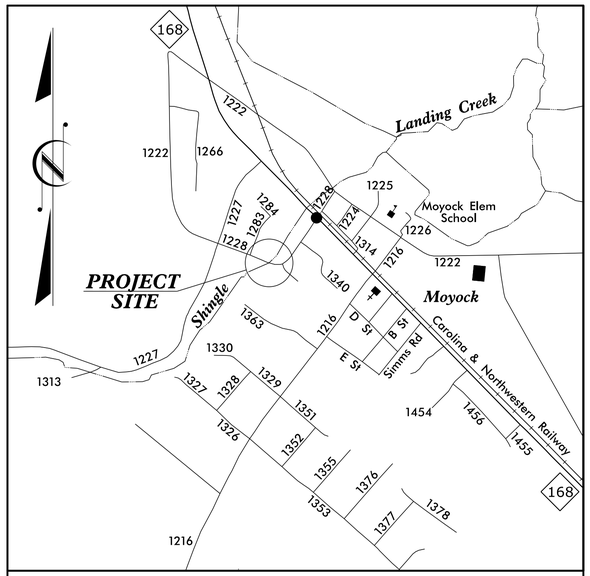
09/08/99

TIP PROJECT: 17BP.1.R.69

CONTRACT:

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

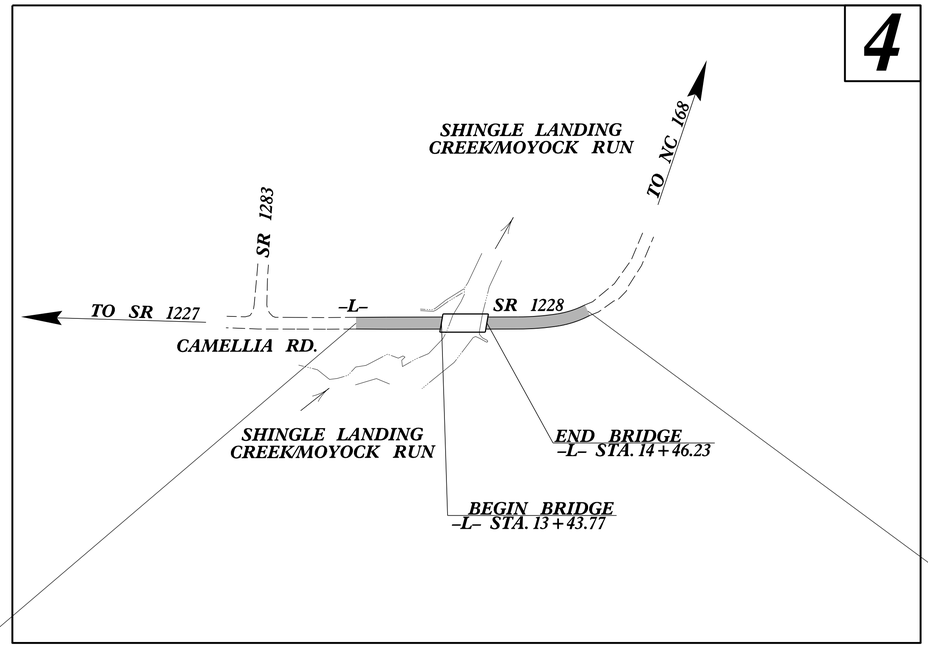
CURRITUCK COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.1.R.69	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.1.R.69		PE
17BP.1.R.69		UTIL., RW
17BP.1.R.69		CONST.

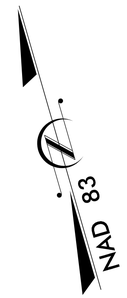
LOCATION: BRIDGE NO. 6 OVER SHINGLE LANDING CREEK CREEK/MOYOCK RUN ON SR 1228 (CAMELLIA ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURE

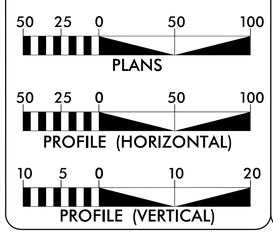


BEGIN TIP PROJECT 17BP.1.R.69 –L– STA. 12+15.00

END TIP PROJECT 17BP.1.R.69 –L– STA. 16+25.00



GRAPHIC SCALES



DESIGN DATA

ADT 2010 = 1000
ADT 2034 = 1750
K = 10 %
D = 60 %
T = 6 % *
V = 35 MPH
* TTST = 2% DUAL 4%
FUNC CLASS = LOCAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT 17BP.1.R.69 = 0.059 MILES
LENGTH STRUCTURE TIP PROJECT 17BP.1.R.69 = 0.019 MILES
TOTAL LENGTH TIP PROJECT 17BP.1.R.69 = 0.078 MILES

WETHERILL ENGINEERING

Prepared for the North Carolina Department of Transportation in the Office of:
559 JONES FRANKLIN ROAD
SUITE 164
Raleigh, N.C. 27606
license No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

LETTING DATE:

EDWARD G. WETHERILL, PE
PROJECT ENGINEER

BOB A. MAY, PE
PROJECT DESIGN ENGINEER

NCDOT CONTACT: JOHN S. ABEL, JR.
DIVISION 1 BRIDGE PROGRAM MANAGER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 23454 ENGINEER ANNE D. GAMBER

SIGNATURE: DATE: 6/22/2015

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER BOB A. MAY

SIGNATURE: DATE: 6/19/2015

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

6/10/2015
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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.

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

ENGLISH

JANUARY, 1990

STD. NO. SN

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
17BPJR.69	1-A

ROADWAY DESIGN ENGINEER
Bob A. May
NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER BOB A MAY
6/19/2015

GENERAL NOTES: 2012 SPECIFICATIONS

EFFECTIVE: 01–17–2012
REVISED: 07–30–2012

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 AND/OR STD. NO. 225.05 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 AND/OR STD. NO. 560.02

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.

UNDERDRAINS:

UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 AT LOCATIONS DIRECTED BY THE ENGINEER.

GUARDRAIL:

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

TEMPORARY SHORING:

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

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 CENTURY LINK, CURRITUCK PUBLIC WORKS DEPARTMENT, DOMINION NORTH CAROLINA POWER AND MEDIACOM.

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

EFF. 01–17–2012
REV. 10–30–2012

2012 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch – N. C. Department of Transportation – Raleigh, N. C., Dated January, 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	Reinforced 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 8 – INCIDENTALS	
815.03	Pipe Underdrain and Blind Drain
840.00	Concrete Base Pad for Drainage Structures
840.19	Concrete Grated Drop Inlet Type 'D' – 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet – for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
876.02	Guide for Rip Rap at Pipe Outlets

INDEX OF SHEETS

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12/05/11

PROJECT REFERENCE NO.	SHEET NO.
17BPJR.69	1-B

Note: Not to Scale

****S.U.E. = Subsurface Utility Engineering***

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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
- Known Soil Contamination: Area or Site
- Potential Soil Contamination: Area or Site

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
- Recorded U/G Power Line — P
- Designated U/G Power Line (S.U.E.*) — P

TELEPHONE:

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

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line — W
- Designated U/G Water Line (S.U.E.*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Satellite Dish
- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- Recorded U/G TV Cable — TV
- Designated U/G TV Cable (S.U.E.*) — TV
- Recorded U/G Fiber Optic Cable — TV FO
- Designated U/G Fiber Optic Cable (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- Recorded U/G Gas Line — G
- Designated U/G Gas Line (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
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line — ?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 (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

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PROJECT REFERENCE NO.	SHEET NO.
17BPJ.R.69	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER BOB A. MAY 6/19/2015

WETHERILL ENGINEERING
559 Jones Franklin Rd. Suite 164
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

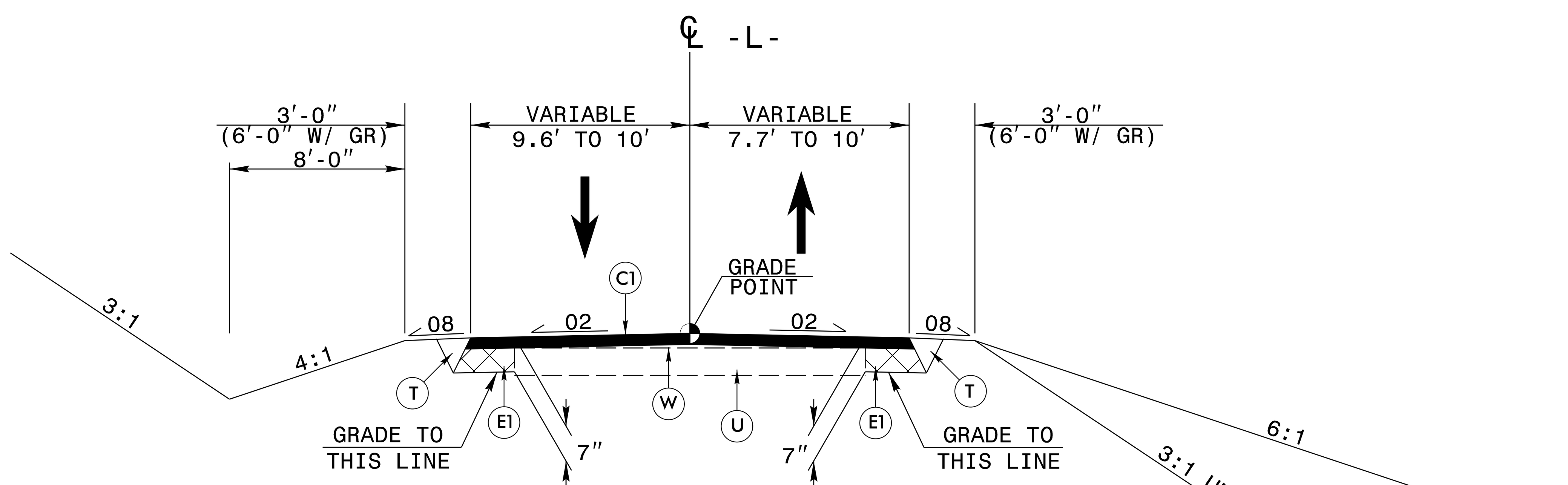
PAVEMENT SCHEDULE

FINAL PAVEMENT DESIGN

C1	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	T	EARTH MATERIAL.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2″ IN DEPTH.	U	EXISTING PAVEMENT.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)
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 5½″ IN DEPTH.		

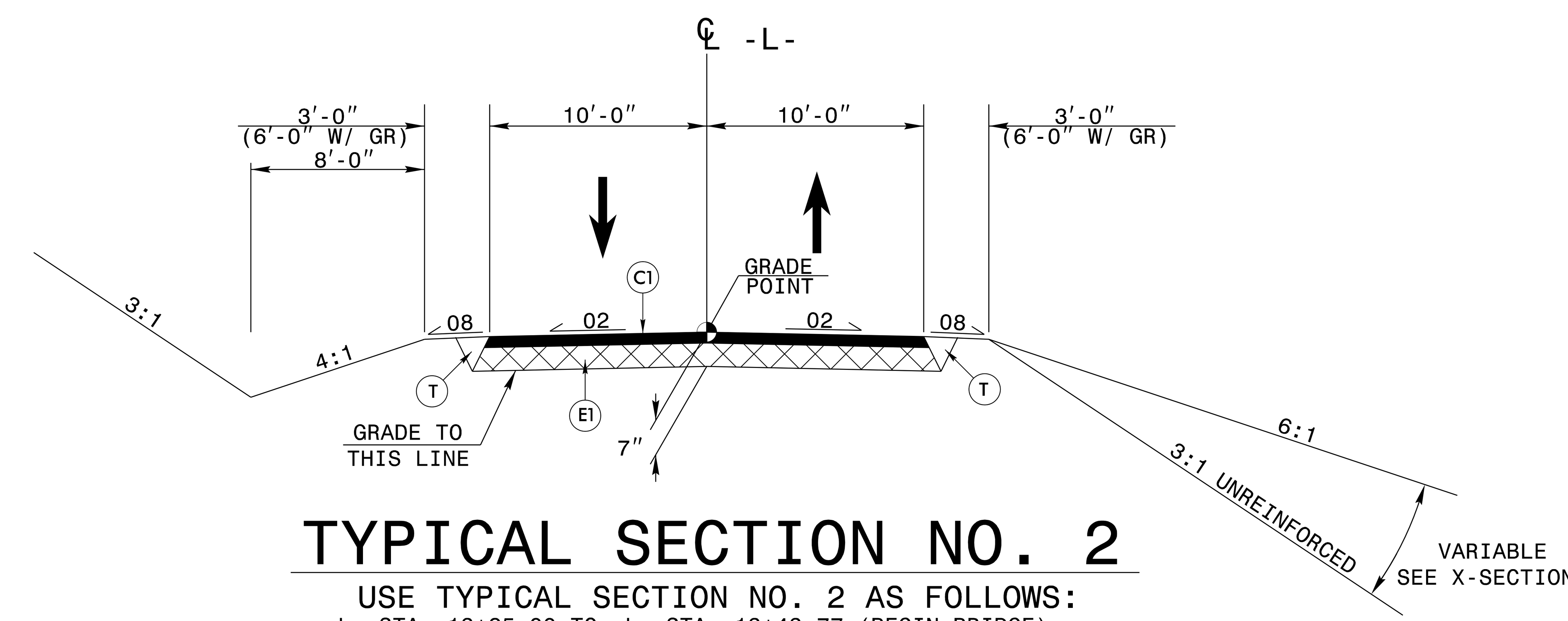
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

NOTE: INCIDENTAL MILLING ALONG EXISTING PAVEMENT AT THE FOLLOWING LOCATIONS
-L- STA. 12+15.00 TO -L- STA. 12+86.50
-L- STA. 15+71.25 TO -L- STA. 16+25.00



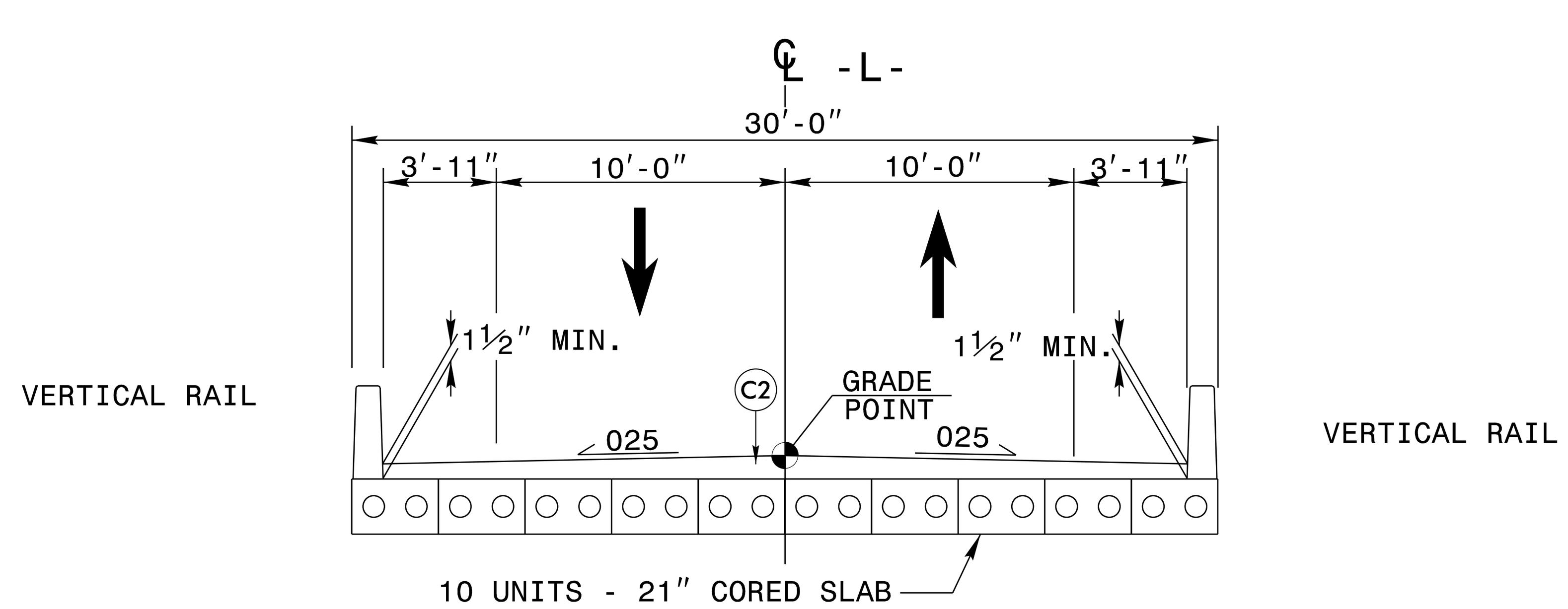
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1 AS FOLLOWS:
-L- STA. 12+15.00 TO -L- STA. 13+25.00
-L- STA. 14+65.00 TO -L- STA. 16+25.00



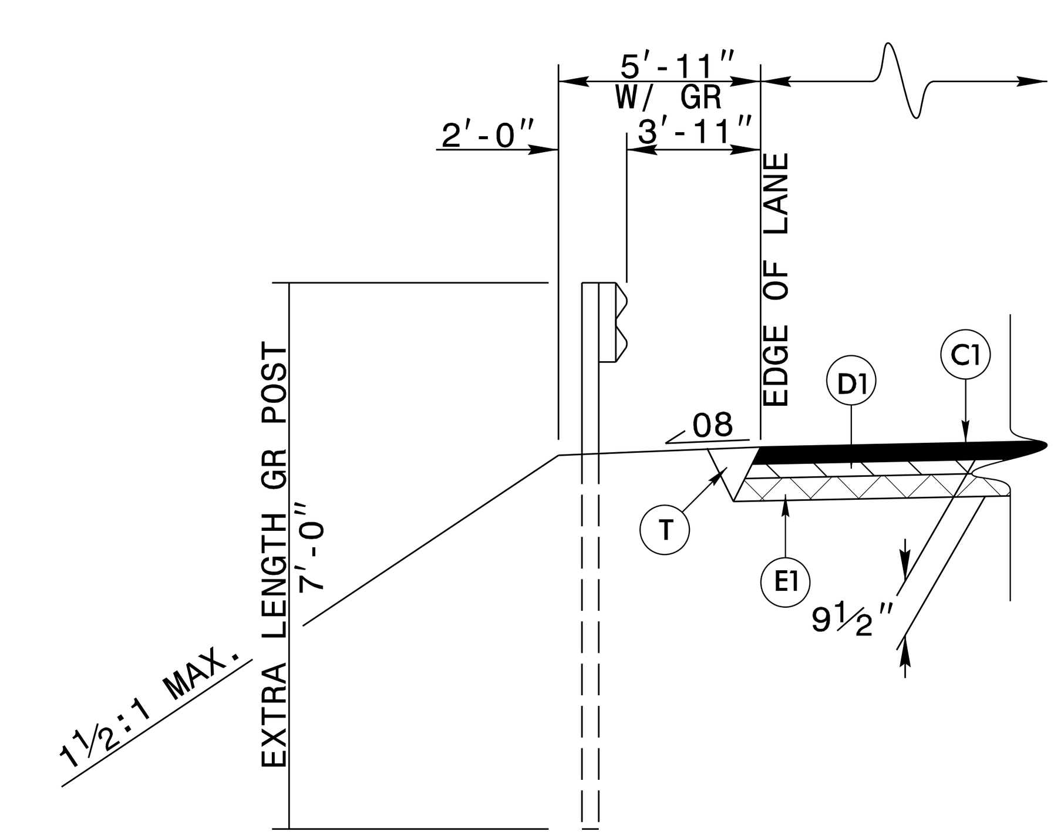
TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2 AS FOLLOWS:
-L- STA. 13+25.00 TO -L- STA. 13+43.77 (BEGIN BRIDGE)
-L- STA. 14+46.23 (END BRIDGE) TO -L- STA. 14+65.00



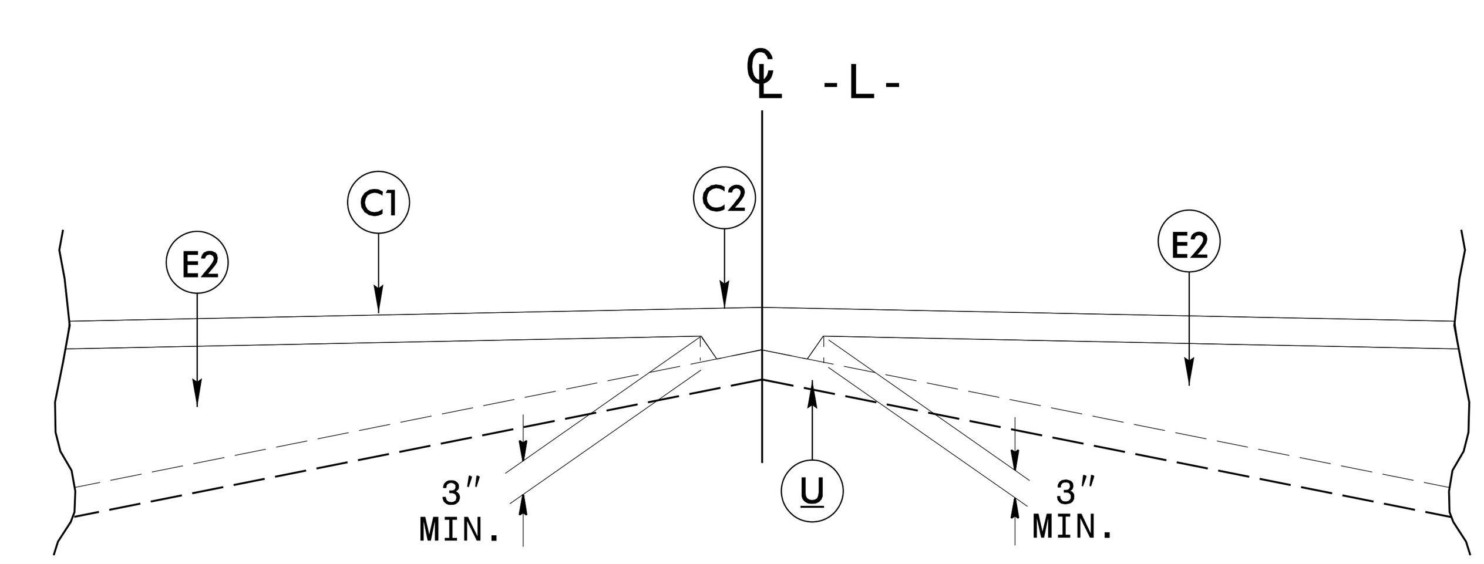
TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3 AS FOLLOWS:
-L- STA. 13+43.77 TO -L- STA. 14+46.23



PARTIAL TYPICAL SECTION

USE IN CONJUNCTION W/ TYPICAL SECTION NO. 1 & 2 AS FOLLOWS:
-L- STA. 13+13.73 TO -L- STA. 13+47.50 LT.
-L- STA. 14+49.96 TO -L- STA. 14+99.96 LT.
-L- STA. 14+42.50 TO -L- STA. 14+92.50 RT.



Detail Showing Method of Wedging

6/18/2015

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

ITEM #	SECT. #	DESCRIPTION	QUANTITY	UNIT
0000100000-N	800	Mobilization	1.00	LS
0000400000-N	801	Construction Surveying	1.00	LS
0043000000-N	226	Grading	1.00	LS
0030000000-N	SP	Reinfirced Bridge Approach Fill-Sub Regional, Station 13+95.00	1.00	LS
0050000000-E	226	Supplemental Clearing & Grubbing	1.00	AC
0057000000-E	226	Undercut Excavation	50.00	CY
0195000000-E	265	Select Granular Material	70.00	CY
0196000000-E	270	Geotextile for Soil Stabilization	175.00	SY
0318000000-E	300	Foundation Conditioning Material	30.00	TON
0320000000-E	300	Foundation Conditioning Geotextile	90.00	SY
0335200000-E	305	15" Drainage Pipe	12.00	LF
0335300000-E	305	18" Drainage Pipe	60.00	LF
0448200000-E	310	15" RC Pipe Culverts, Class IV	24.00	LF
0448400000-E	310	24" RC Pipe Culverts, Class IV	160.00	LF
1220000000-E	545	Incidental Stone Base	30.00	TON
1330000000-E	607	Incidental Milling	275.00	SY
1489000000-E	610	Apshalt Conc. Base Course, Type B25.0B	125.00	TON
1519000000-E	610	Asphalt Conc. Surface Course, Type S9.5B	210.00	TON
1575000000-E	620	Asphalt Binder for Plant Mix	19.00	TON
2022000000-E	815	Subdrain Excavation	23.00	CY
2033000000-E	815	Subdrain Fine Aggregate	17.00	CY
2044000000-E	815	6" Perforated Subdrain Pipe	100.00	LF
2070000000-N	815	Subdrain Pipe Outlet	1.00	EACH
2077000000-E	815	6" Outlet Pipe	6.00	LF
2209000000-E	838	Endwalls	8.00	CY
2286000000-N	840	Masonry Drainage Structure	2.00	EACH
2367000000-N	840	Frame w/Two Grates, Std. 840.29	2.00	EACH
2556000000-E	846	Shoulder Berm Gutter	50.00	LF
3030000000-E	862	Steel Bm Guardrail	50.00	LF
3045000000-E	862	Steel Bm Guardrail, Shop Curved	25.00	LF
3150000000-N	862	Additional Guardrail Posts	5.00	EACH
3215000000-N	862	Guardrail Anchor Unit. Type III	4.00	EACH
3165000000-N	SP	Guardrail Anchor Unit, Type 350 TL-2	3.00	EACH
3195000000-N	862	Guardrail Anchor Unit, Type AT-1	1.00	EACH
3649000000-E	876	Class B Rip Rap	2.00	TON
3656000000-E	876	Geotextile for Drainage	176.00	SY
4400000000-E	1110	Work Zone Signs (Stationary)	334.00	SF
4405000000-E	1110	Work Zone Signs (Portable)	32.00	SF
4410000000-E	1110	Work Zone Signs (Barricade Mounted)	70.00	SF
4435000000-N	1135	Cones	8.00	EACH
4445000000-E	1145	Barricades (Type III)	88.00	LF
4685000000-E	1205	Thermoplastic Pavement Marking (4", 90 mils)	820.00	LF
4686000000-E	1205	Thermoplastic Pavement Marking (4", 120 mils)	820.00	LF

ITEM #	SECT. #	DESCRIPTION	QUANTITY	UNIT
6000000000-E	1605	Temporary Silt Fence	610.00	LF
6006000000-E	1610	Stone for Erosion Control, Class A	75.00	TON
6009000000-E	1610	Stone for Erosion Control, Class B	5.00	TON
6012000000-E	1610	Sediment Control Stone	15.00	TON
6015000000-E	1615	Temporary Mulching	0.50	ACRE
6018000000-E	1620	Seed for Temporary Seeding	100.00	LB
6021000000-E	1620	Fertilizer for Temporary Seeding	0.50	TON
6024000000-E	1622	Temporary Slope Drains	200.00	LF
6029000000-E	SP	Safety Fence	200.00	LF
6030000000-E	1630	Silt Excavation	20.00	CY
6036000000-E	1631	Matting for Erosion Control	1125.00	SY
6037000000-E	SP	Coir Fiber Mat	100.00	SY
6042000000-E	1632	1/4" Hardware Cloth	45.00	LF
6048000000-E	SP	Floating Turbidity Curtain	160.00	SY
6071010000-E	SP	Wattle	90.00	LF
6084000000-E	1660	Seeding & Mulching	0.50	ACRE
6087000000-E	1660	Mowing	0.50	ACRE
6090000000-E	1661	Seed for Repair Seeding	50.00	LB
6093000000-E	1661	Fertilizer for Repair Seeding	0.25	TON
6096000000-E	1662	Seed for Supplemental Seeding	50.00	LB
6108000000-E	1665	Fertilizer Topdressing	0.25	TON
6114000000-N	1667	Specialized Hand Mowing	10.00	HR
6117000000-N	SP	Response for Erosion Control	7.00	EACH
6123000000-E	1670	Reforestation	1.00	ACRE
8035000000-N	402	Removal of Exist. Structure at Sta. 13+95.00	1.00	LS
8112730000-N	450	PDA Testing	2.00	EACH
8121000000-N	412	Unclassified Structure Exc. at Sta. 13+95.00	1.00	LS
8182000000-E	420	Class A Concrete (Bridge)	47.40	CY
8210000000-N	422	Bridge Approach Slabs, Station 13+95.00	1.00	LS
8217000000-E	425	Reinforcing Steel (Bridge)	8196.00	LBS
8364000000-E	450	HP 12x53 Steel Piles	700.00	LF
8393000000-N	450	Pile Redrives	10.00	EACH
8505000000-E	460	Vertical Conc. Barrier Rail	200.25	LF
8384200000-E	450	HP 14x73 Galvanized Steel Piles	525.00	LF
8892000000-E	SP	Steel Sheet Pile	2080.00	SF
8657000000-N	430	Elastomeric Bearings	1.00	LS
8762000000-E	430	3'-0"x1'-9" Prestressed Conc. Cored Slabs	1000.00	LF

5/28/99

COMPUTED BY: bam	DATE: 3/19/14
CHECKED BY:	DATE:

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
I7BPJ.R.69	3-A

SUMMARY OF EARTHWORK

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
-L- 12+15.00	-L- 13+43.77	7	44	37	
SUBTOTALS:		7	44	37	
-L- 14+46.23	-L- 16+25.00	3	118	115	
SUBTOTALS:		3	118	115	
PROJECT SUBTOTALS:		10	162	152	
PROJECT TOTALS:		10	66	152	
5% TO REPLACE TOPSOIL ON BORROW PIT				8	
GRAND TOTALS:		10	–	160	
SAY:		50		200	

CONTINGENCY PAY ITEMS
UNDERCUT EXCAVATION = 50 CY
SELECT GRANULAR MATERIAL = 70 CY
GEOTEXTILE FOR SOLI STABILIZATION = 175 SY
SUBDRAIN EXCAVATION = 23 CY
SUBDRAIN FINE AGGREGATE = 17 CY
6" PERFORATED SUBDRAIN PIPE = 100 LF
SUBDRAIN PIPE OUTLET = 1 EACH
6" OUTLET PIPE = 6 LF

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

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD^2
-L-	13+25.00	13+64.44	CL	82.60
-L-	14+24.45	14+65.00	CL	86.21
			TOTAL:	168.81
			SAY:	175.00

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
-L- LT.	13+20.00	13+36.50	16.50'
-L- RT.	13+10.00	13+30.43	20.43'
		TOTAL:	36.93'
		SAY:	50.00'

RIGHT OF WAY AREA DATA

PARCEL NO.	PROPERTY OWNERS NAMES	TOTAL ACREAGE	AREA TAKEN	AREA REMAINING RT.	AREA REMAINING LT.	CONST. EASE.	PERM. DRAIN. EASE.	TEMP. DRAIN. EASE.
1	GARY D. DISHAROON					700.03 SF		
2	TRACIE BEACHAM		1,644.39 SF			506.03 SF		
3	ROBERT C. BALLANCE		2,054.73 SF			191.05 SF		

NOTE: INVERT ELEVATIONS INDICATED ARE FOR BID PURPOSES ONLY AND SHALL NOT BE USED FOR PROJECT CONSTRUCTION STAKEOUT. SEE "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES, SECTION 300-5".

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"
-L- 13+25	LT	0401		4.18	0.93										
-L- 13+15	RT	0402		4.15	0.85										
		0401	0402	0.93	0.85										
		0402	0403	0.85	0.00				12'						
-L- 13+00.00	LT	0404								60'					
-L- 14+88.50	CL	0405	0406	0.60	0.60										
-L- 14+95.50	CL	0407	0408	0.60	0.60										
TOTAL									12'	60'					
SAY															

STATION	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	C.S. PIPE 12" .064	15" .064	18" .064	24" .064	30" .079	36" .109	42" .109	48"
-L- 13+25												
-L- 13+15												
0401-0402												
0402-0403												
-L- 13+00.00												
-L- 14+88.50												
-L- 14+95.50												
TOTAL												
SAY												

STATION	R.C. PIPE (CLASS III) 15"	18"	24"	30"	36"	42"	48"	R.C. PIPE (CLASS IV) 12"	15"	18"	24"	30"	36"	42"	48"
-L- 13+25															
-L- 13+15															
0401-0402									24'						
0402-0403															
-L- 13+00.00															
-L- 14+88.50											80'				
-L- 14+95.50											80'				
TOTAL									24'		160'				
SAY															

STATION	**" R. C. PIPE (CLASS V)	**" R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	**" R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	* TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. *FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02
-L- 13+25								1			
-L- 13+15								1			
0401-0402											
0402-0403											
-L- 13+00.00											
-L- 14+88.50						4.0					
-L- 14+95.50						4.0					
TOTAL						8.0		2			
SAY											

STATION	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	T.B.D.I. STD. 840.35	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	M.H. FRAME & COVER STD. 840.54	J.B. STD. 840.31 OR 840.32	MODIFIED CONCRETE FLUME	CONC. COLLARS CL. "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.	REMARKS
-L- 13+25									1							
-L- 13+15									1							
0401-0402																
0402-0403																
-L- 13+00.00																
-L- 14+88.50																
-L- 14+95.50																
TOTAL									2							
SAY																

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

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END
-L-	13+13.73	13+42.50	LT.	23.77'	21.96'			13+42.50	3'-11"	6'-11"		25'-0"		1'-0"
-L-	12+83.79	13+40.04	RT.	56.25'			13+40.04		3'-11"	6'-11"	25'-0"		1'-0"	
-L-	14+49.96	14+99.96	LT.	50.00'			14+49.96		3'-11"	6'-11"	25'-0"		1'-0"	
-L-	14+42.50	14+92.50	RT.	50.00'				14+42.50	3'-11"	6'-11"		25'-0"		1'-0"
			PROJECT SUBTOTAL	180.02'	21.96'									
			LESS ANCHOR DEDUCTIONS	(-)150.00'	(-)6.25'									
			PROJECT TOTAL	30.02'	15.71'									
			SAY	50.00'	25.00	ADDITIONAL GUARDRAIL POSTS = 5 EACH								

SURVEY LINE / BEG. STA.	ANCHORS XI MOD	TYPE III	GRAU 350 TL-2	M-350	B-77	CAT-1	VI MOD	BIC	AT-1	IMPACT ATTENUATOR TYPE 350 EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-L- 13+13.73		1							1							SEE SHEET 2-A FOR TYPE III GUARDRAIL ANCHOR UNIT
-L- 12+83.79		1	1													SEE SHEET 2-A FOR TYPE III GUARDRAIL ANCHOR UNIT
-L- 14+49.96		1	1													SEE SHEET 2-A FOR TYPE III GUARDRAIL ANCHOR UNIT
-L- 14+42.50		1	1													SEE SHEET 2-A FOR TYPE III GUARDRAIL ANCHOR UNIT
PROJECT SUBTOTAL		4	3						1							

GUARDRAIL ANCHOR DEDUCTIONS
TYPE III = 4 @ 18.75' = 75'
GRAU 350 TL-2 = 3 @ 25' = 75'
AT-1 = 1 @ 6.25' = 6.25'
TOTAL DEDUCTIONS = 156.25'

PROJECT REFERENCE NO.	SHEET NO.
17BP.1.R.69	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21116 BOB A. MAY — 6/19/2015

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23454 ANNE D. GAMBER — 6/22/2015

WETHERILL ENGINEERING
559 Jones Franklin Rd. Suite 164
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

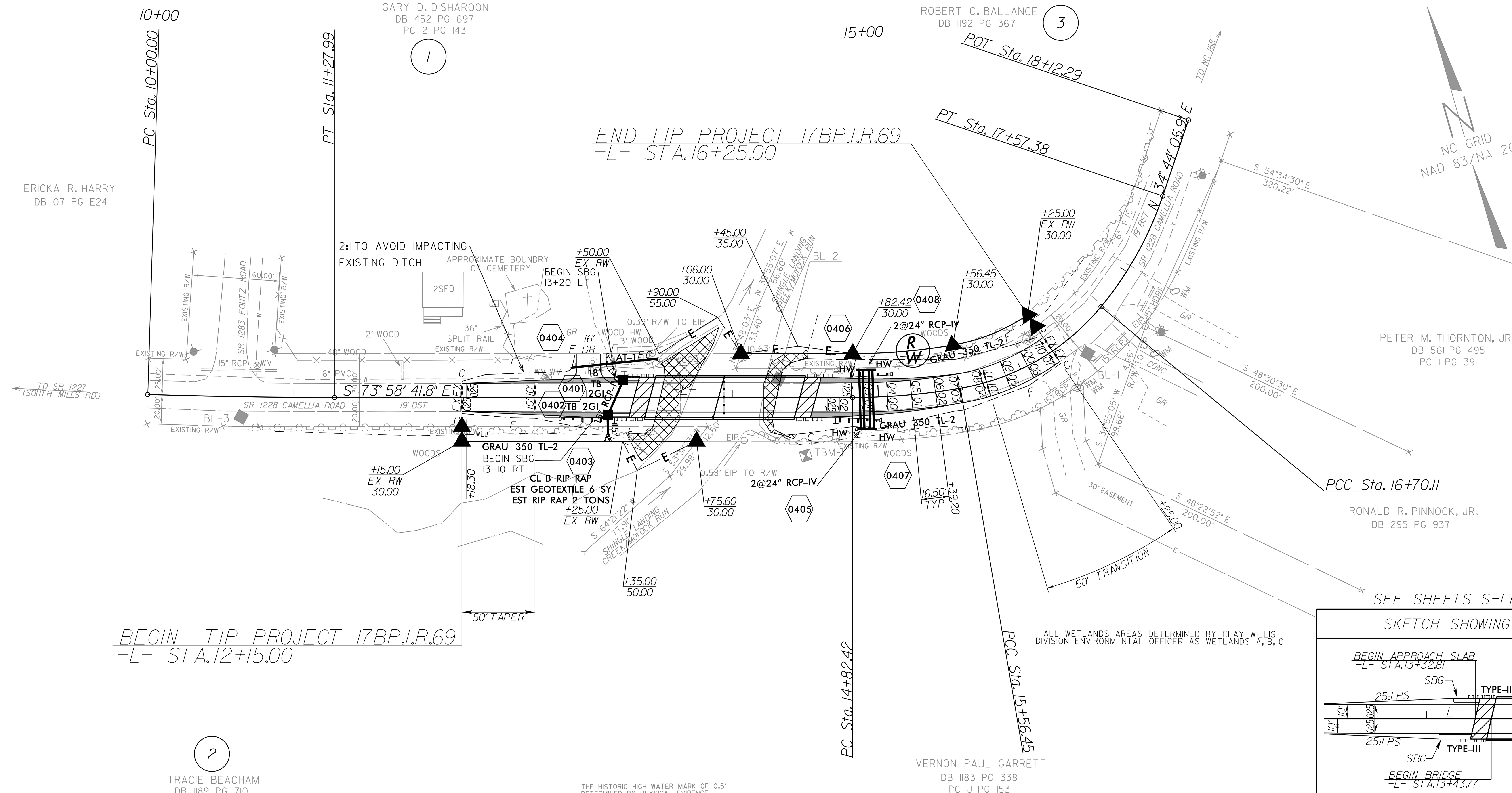
REVISIONS

-L-

PI Sta 10+64.00	PI Sta 15+19.52
△ = 1° 44' 54.8" (LT)	△ = 9° 45' 00.0" (LT)
D = 1° 21' 58.2"	D = 13° 10' 17.2"
L = 127.99'	L = 74.02'
T = 64.00'	T = 37.10'
R = 4,193.90'	R = 435.00'
SE = EXIST.	SE = 0.04 FT/FT
RO = N/A	RO = SEE PLANS

-L-

PI Sta 16+15.80	PI Sta 17+14.23
△ = 40° 42' 12.4" (LT)	△ = 20° 50' 00.0" (LT)
D = 35° 48' 35.5"	D = 23° 52' 23.7"
L = 113.67'	L = 87.27'
T = 59.35'	T = 44.12'
R = 160.00'	R = 240.00'
SE = EXIST.	SE = EXIST.
RO = SEE PLANS	RO = N/A

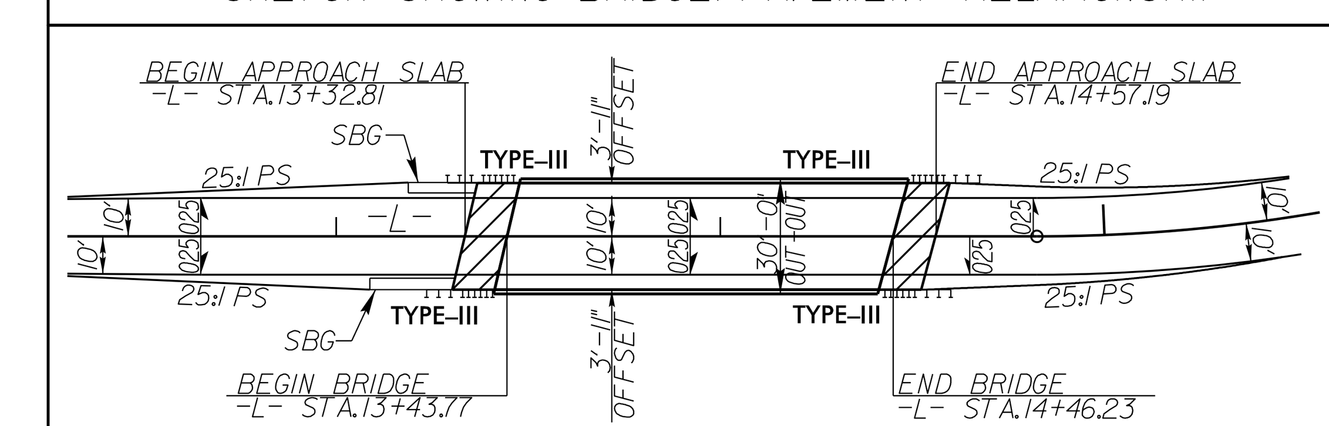


DATUM DESCRIPTION

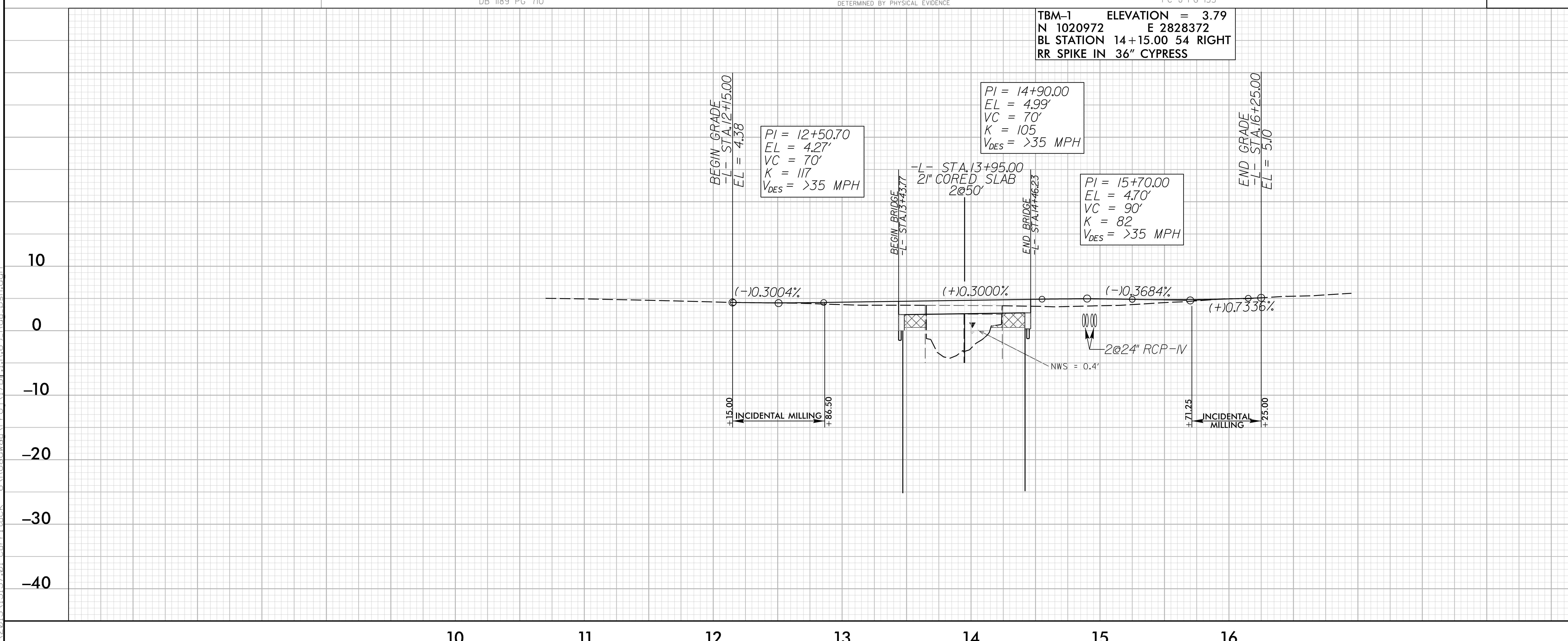
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY JOYNER/KEENY FOR MONUMENT "GPS BL-4"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 1021308.86(ft) EASTING: 2827516.93(ft)
ELEVATION: 8.08(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.000124749
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS BL-4" TO -L- STATION 12+15.00
S 69° 57' 54.78" E 681.39'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

SEE SHEETS S-1 THRU S-20 FOR STRUCTURE PLANS

SKETCH SHOWING BRIDGE/PAVEMENT RELATIONSHIP



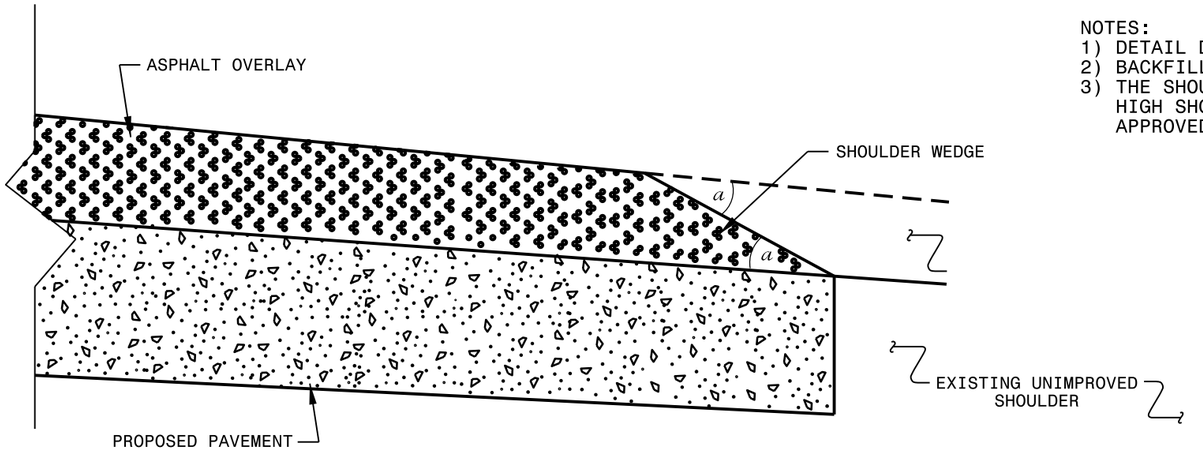
TBM-1 ELEVATION = 3.79
N 1020972 E 2828372
BL STATION 14+15.00 54 RIGHT
RR SPIKE IN 36" CYPRESS



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	1,270	CFS
DESIGN FREQUENCY	=	25	YRS
DESIGN HW ELEVATION	=	3.8	FT
BASE DISCHARGE	=	1,860	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	5.07	FT
OVERTOPPING DISCHARGE	=	1,520	CFS
OVERTOPPING FREQUENCY	=	50+	YRS
OVERTOPPING ELEVATION	=	4.5	FT
DATE OF SURVEY	=	1-16-2014	
W.S. ELEVATION AT DATE OF SURVEY	=	-0.21	FT

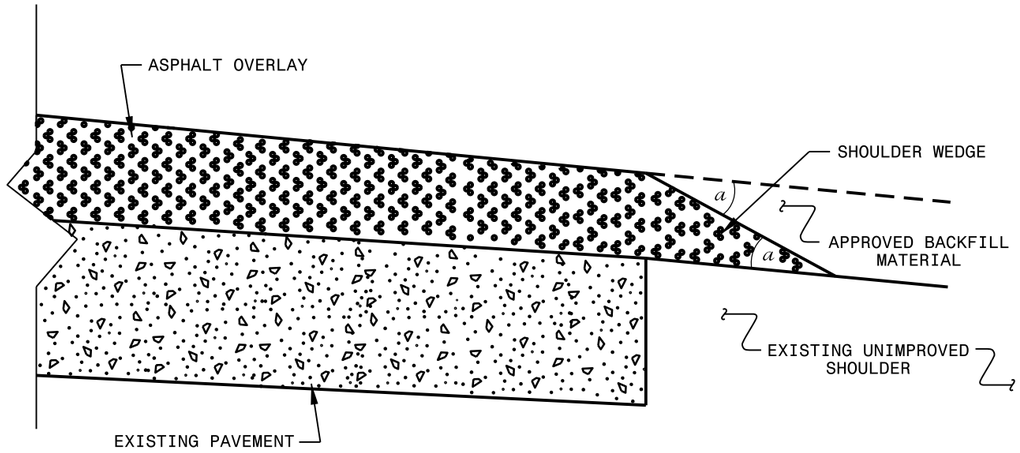
PROJECT REFERENCE NO.	SHEET NO.
17BP.1.R.69	



NOTES:
1) DETAIL DOES NOT APPLY TO OGAFC AND ULTRA-THIN BONDED WEARING COURSE.
2) BACKFILL SHOULDER WITH APPROVED MATERIAL.
3) THE SHOULDER WEDGE DEVICE MAY BE DISENGAGED AT PAVED DRIVEWAYS, SIDE STREETS, HIGH SHOULDERS, AND OTHER LOCATIONS NOT FEASIBLE TO CONSTRUCT AS APPROVED BY THE ENGINEER.

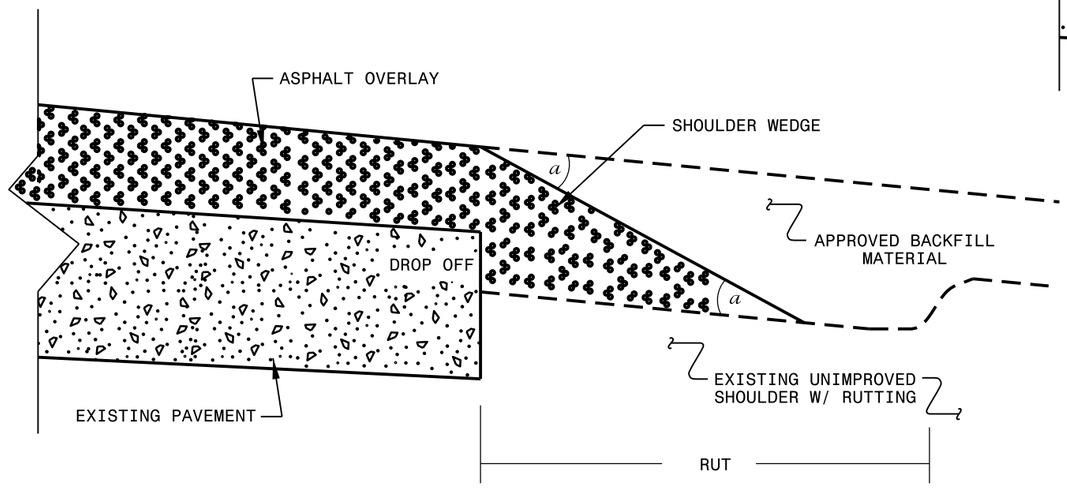
SHOULDER WEDGE DETAIL

(Resurfacing Projects w/ Widening or with Existing Paved Shoulder having no dropoffs)



SHOULDER WEDGE DETAIL

(Resurfacing Projects w/ NO Widening)



SHOULDER WEDGE DETAIL

(Resurfacing Adjacent to Rutted Shoulder)

- SHOULDER WEDGE ANGLE = 30°

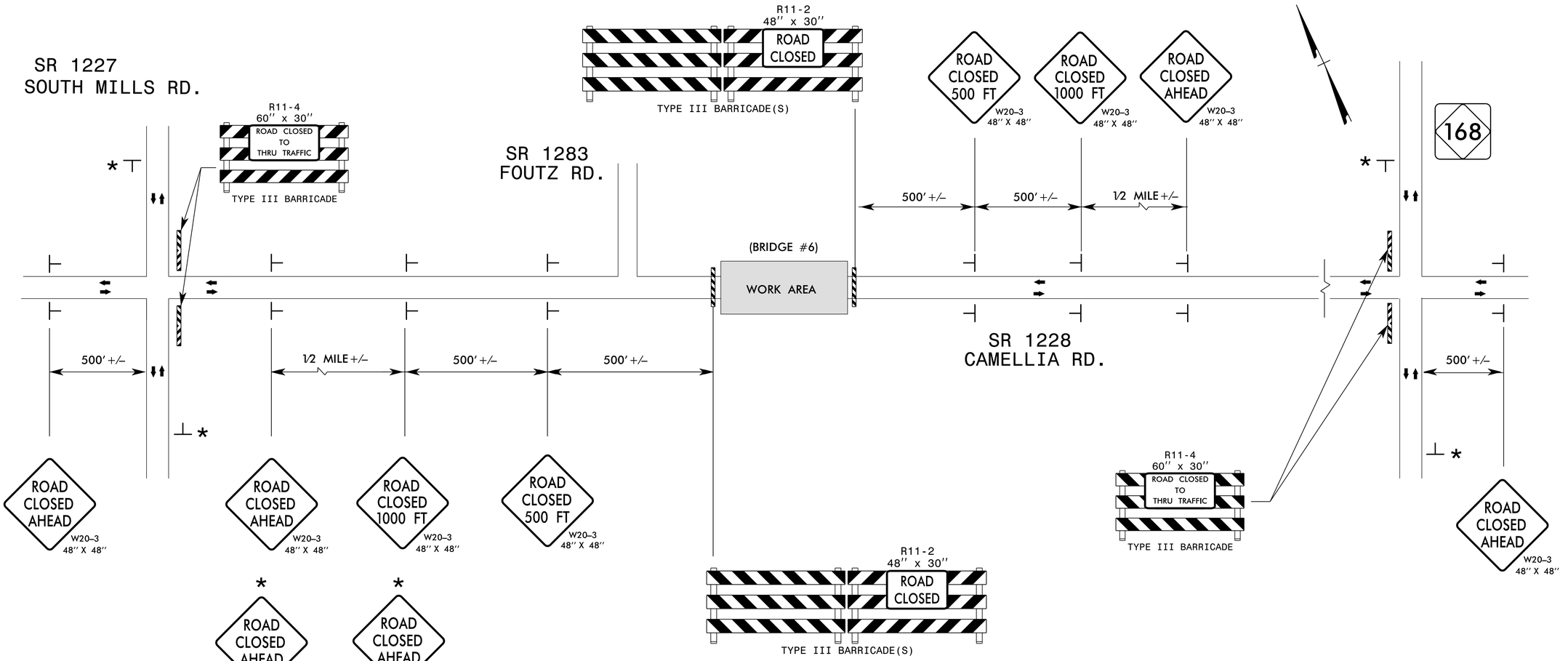
CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SHOULDER WEDGE DETAILS

ORIGINAL BY:	T.SPELL	DATE:	7-19-11
MODIFIED BY:		DATE:	2/2/16
CHECKED BY:		DATE:	
FILE SPEC.:	s:usr/details/stand/shoulderwedgedetail.dgn		

$$$$$$SYSTIME$$$$$
$$$$$$USERNAME$$$$$

PROJ. REFERENCE NO.	SHEET NO.
17BP.1.R.69	TCP-1



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
1101.04	TEMPORARY SHOULDER CLOSURES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1135.01	CONES
1145.01	BARRICADES
904.10	ORIENTATION OF GROUND MOUNTED SIGNS

GENERAL NOTES

1. INSTALLATION OF TEMPORARY ROUTE MARKERS, DESTINATION SIGNS, AND ANY NECESSARY MODIFICATIONS TO EXISTING OR PROPOSED REGULATORY OR WARNING SIGNS WILL BE MADE BY OTHERS (STATE OR CITY FORCES) UNLESS OTHERWISE DESIGNATED IN PLANS. PROVIDE A MINIMUM 21 CALENDAR DAY NOTICE TO STATE FORCES BEFORE A ROADWAY IS CLOSED TO TRAFFIC SUCH THAT THE NECESSARY PROVISIONS CAN BE MADE TO INFORM LOCAL EMERGENCY AND LAW ENFORCEMENT PERSONNEL, SCHOOLS OR ANY OTHER PARTIES AFFECTED BY THE ROAD CLOSURE.
2. INSTALL SIGNS BEFORE THE BARRICADES WHEN CLOSING THE ROADWAY TO TRAFFIC. REMOVE BARRICADES BEFORE SIGNS WHEN OPENING THE ROADWAY TO TRAFFIC. INSTALL/REMOVE SIGNS AND BARRICADES WITHIN THE SAME CALENDAR DAY.
3. POSITION WING BARRICADES ON THE SHOULDERS AND SLOPE THE STRIPES DOWNWARD IN THE DIRECTION TOWARD WHICH TRAFFIC MUST TURN IN DETOURING.
4. USE ADDITIONAL TYPE III BARRICADES IN STAGGERED LOCATIONS SUPPLEMENTED WITH SIGN R11-4 "ROAD CLOSED TO THRU TRAFFIC" IN THE EVENT THAT TRAFFIC MUST BE MAINTAINED BEYOND THE DETOUR POINT.
5. SEE STANDARD SPECIFICATION 1089-1 FOR WORK ZONE SIGNS.
6. SEE STANDARD SPECIFICATION 1089-2 FOR WORK ZONE SIGN SUPPORTS.

LEGEND

- DIRECTION OF TRAFFIC FLOW
- BARRICADE (TYPE III)
- STATIONARY MOUNTED SIGN

WETHERILL ENGINEERING
559 Jones Franklin Rd. Suite 164
Raleigh, N.C. 27606
Liscense No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

APPROVED: _____ DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER BOB A. MAY
6/19/2015

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

ROAD CLOSURE
SR 1228 CAMELLIA RD.

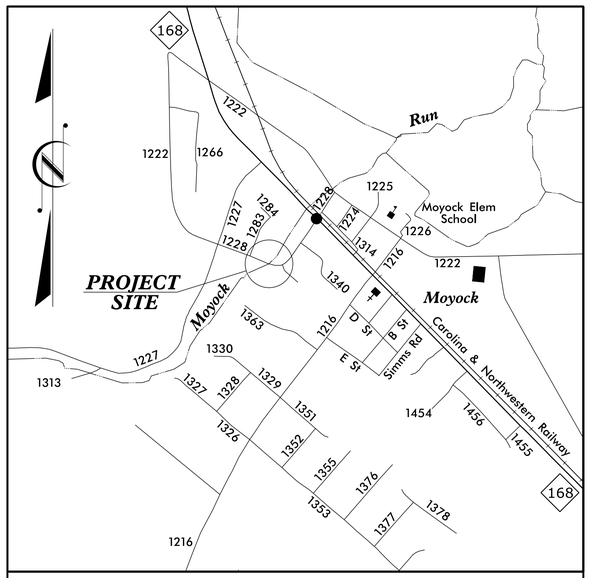
8/6/2014
11:08:02 AM
P:\2015\13537.01\Currituck *6\Traffic\TrafficControl\TCP\17BP.1.R.69_TC_TCP1.dgn

09/08/99

TIP PROJECT: 17BP.1.R.69

CONTRACT:

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



VICINITY MAP

ANNE D. GAMBER, PE, CFM
LEVEL IIIA NAME

3022
LEVEL IIIA CERTIFICATION NO.

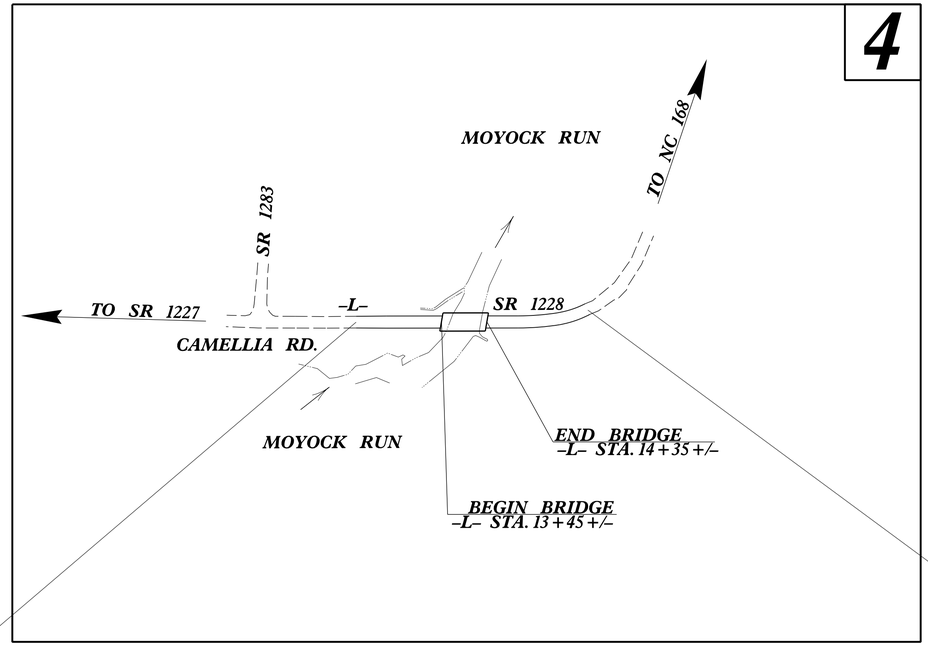
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

CURRITUCK COUNTY

LOCATION: BRIDGE NO. 6 OVER MOYOCK RUN ON SR 1228 (CAMELLIA ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURE



BEGIN TIP PROJECT 17BP.1.R.69
–L– STA. 12+15.00

END TIP PROJECT 17BP.1.R.69
–L– STA. 16+25.00

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.1.R.69	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.1.R.69		PE
		UTIL., RW
		CONST.

EROSION AND SEDIMENT CONTROL MEASURES

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

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

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2010 = 1000
ADT 2034 = 1750
DHV = 10 %
D = 60 %
T = 6 % *
V = 35 MPH
* TTST = 2% DUAL 4%
FUNC CLASS = LOCAL
SUBREGIONAL TIER

2012 STANDARD SPECIFICATIONS

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 3, 2011 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY.

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT 17BP.1.R.69 = 0.060 MILES
LENGTH STRUCTURE TIP PROJECT 17BP.1.R.69 = 0.018 MILES
TOTAL LENGTH TIP PROJECT 17BP.1.R.69 = 0.078 MILES

WETHERILL ENGINEERING

Prepared for the North Carolina Department of Transportation in the Office of:
559 JONES FRANKLIN ROAD
SUITE 164
Raleigh, N.C. 27606
license No. F-0277
Bus: 919 851 8077
Fax: 919 851 8107

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

LETTING DATE:

EDWARD G. WETHERILL, PE
PROJECT ENGINEER

BOB A. MAY, PE
PROJECT DESIGN ENGINEER

NCDOT CONTACT: JOHN S. ABEL, JR.
DIVISION 1 BRIDGE PROGRAM MANAGER

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

PROJECT REFERENCE NO.	SHEET NO.
17BP.1.R.69	EC-3

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.

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8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
17.BP.1.R.69	EC-04/CONST.04
R/W SHEET NO.	

WETHERILL ENGINEERING
559 Jones Franklin Rd. Suite 164
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Liscense No. F-0377
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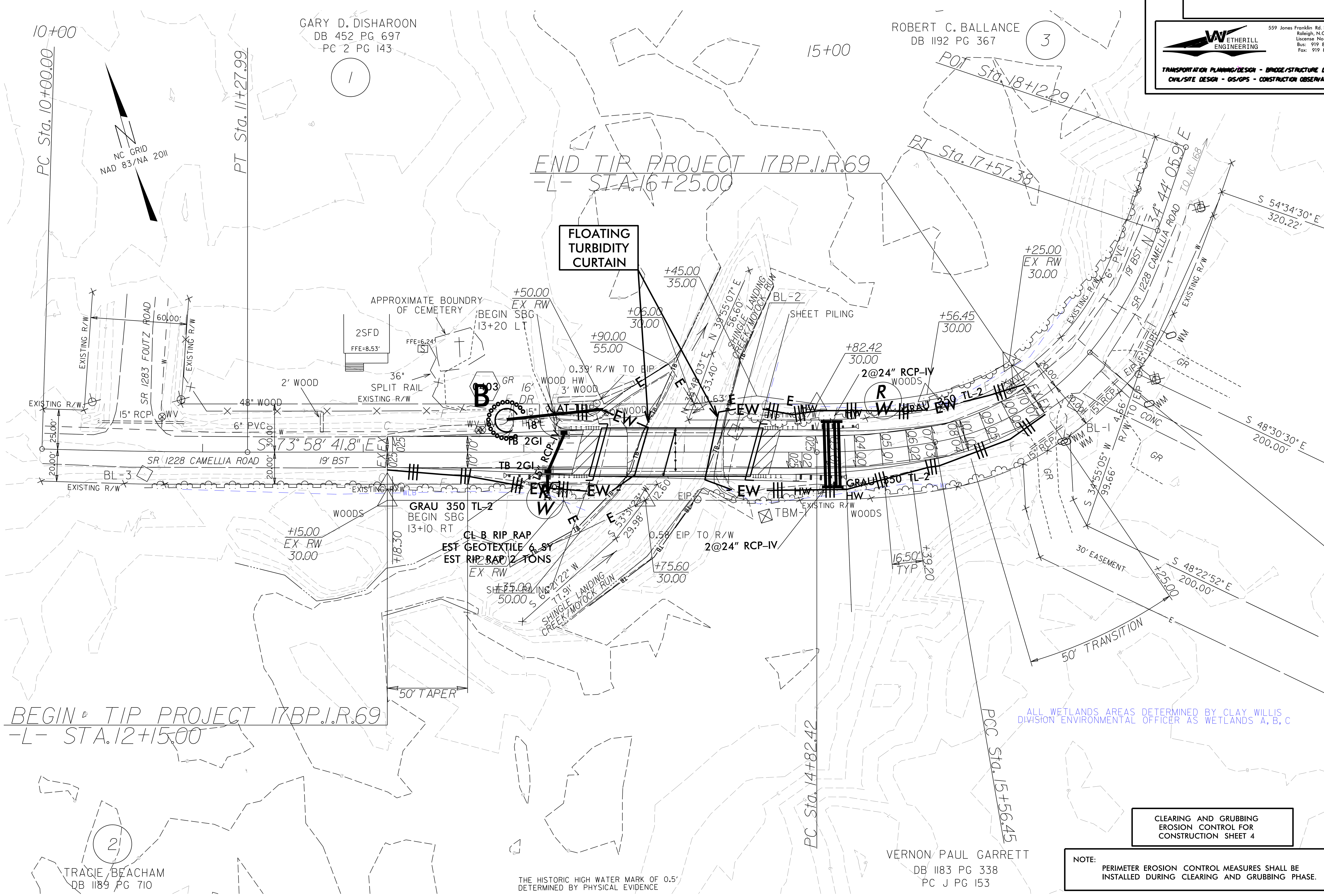
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

EROSION CONTROL PLAN



10+00
PC Sta. 10+00.00
PT Sta. 11+27.99
NC GRID
NAD 83/NA 2011
GARY D. DISHAROON
DB 452 PG 697
PC 2 PG 143
1
15+00
ROBERT C. BALLANCE
DB 1192 PG 367
3
POT Sta. 18+12.29
PT Sta. 17+57.38
END TIP PROJECT 17BP.1.R.69
-L- STA.16+25.00
FLOATING
TURBIDITY
CURTAIN
S 54°34'30" E
320.22'
APPROXIMATE BOUNDRY
OF CEMETERY
2SFD
FFE=8.53'
FFE=6.24'
BEGIN SBG
13+20 LT
+50.00
EX RW
+90.00
55.00
+06.00
30.00
+45.00
35.00
BL-2
SHEET PILING
+56.45
30.00
+82.42
30.00
2@24" RCP-IV
WOODS
+25.00
EX RW
30.00
SR 1228 CAMELLIA ROAD
SR 1283 FOUTZ ROAD
EXISTING R/W
60.00'
48" WOOD
2' WOOD
36" SPLIT RAIL
6" PVC
15" RCP
S 73° 58' 41.8" E
SR 1228 CAMELLIA ROAD
19' BST
BL-3
0.39' R/W TO EIP
WOOD HW
3' WOOD
TB 2GI
GRAU 350 TL-2
BEGIN SBG
13+10 RT
CL B RIP RAP
EST GEOTEXTILE 6 SY
EST RIP RAP 2 TONS
+15.00
EX RW
30.00
WOODS
+18.30
0.58' EIP TO R/W
2@24" RCP-IV
+75.60
30.00
+35.00
50.00
SHEET PILING
SHINGLE LANDING
CREEK/MOYOCK RUN
TBM-1
WOODS
16.50'
TYP
+39.20
BL-1
S 48°30'30" E
200.00'
S 48°22'52" E
200.00'
30' EASEMENT
+25.00
50' TRANSITION
50' TAPER
BEGIN TIP PROJECT 17BP.1.R.69
-L- STA.12+15.00
PC Sta. 14+82.42
PCC Sta. 15+56.45
ALL WETLANDS AREAS DETERMINED BY CLAY WILLIS
DIVISION ENVIRONMENTAL OFFICER AS WETLANDS A, B, C
2
TRACIE BEACHAM
DB 1189 PG 710
THE HISTORIC HIGH WATER MARK OF 0.5'
DETERMINED BY PHYSICAL EVIDENCE
VERNON PAUL GARRETT
DB 1183 PG 338
PC J PG 153

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

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

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

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8/17/99

REVISIONS

EROSION CONTROL PLAN

PROJECT REFERENCE NO.	SHEET NO.
17.BP.1.R.69	EC-05/CONST.04
R/W SHEET NO.	

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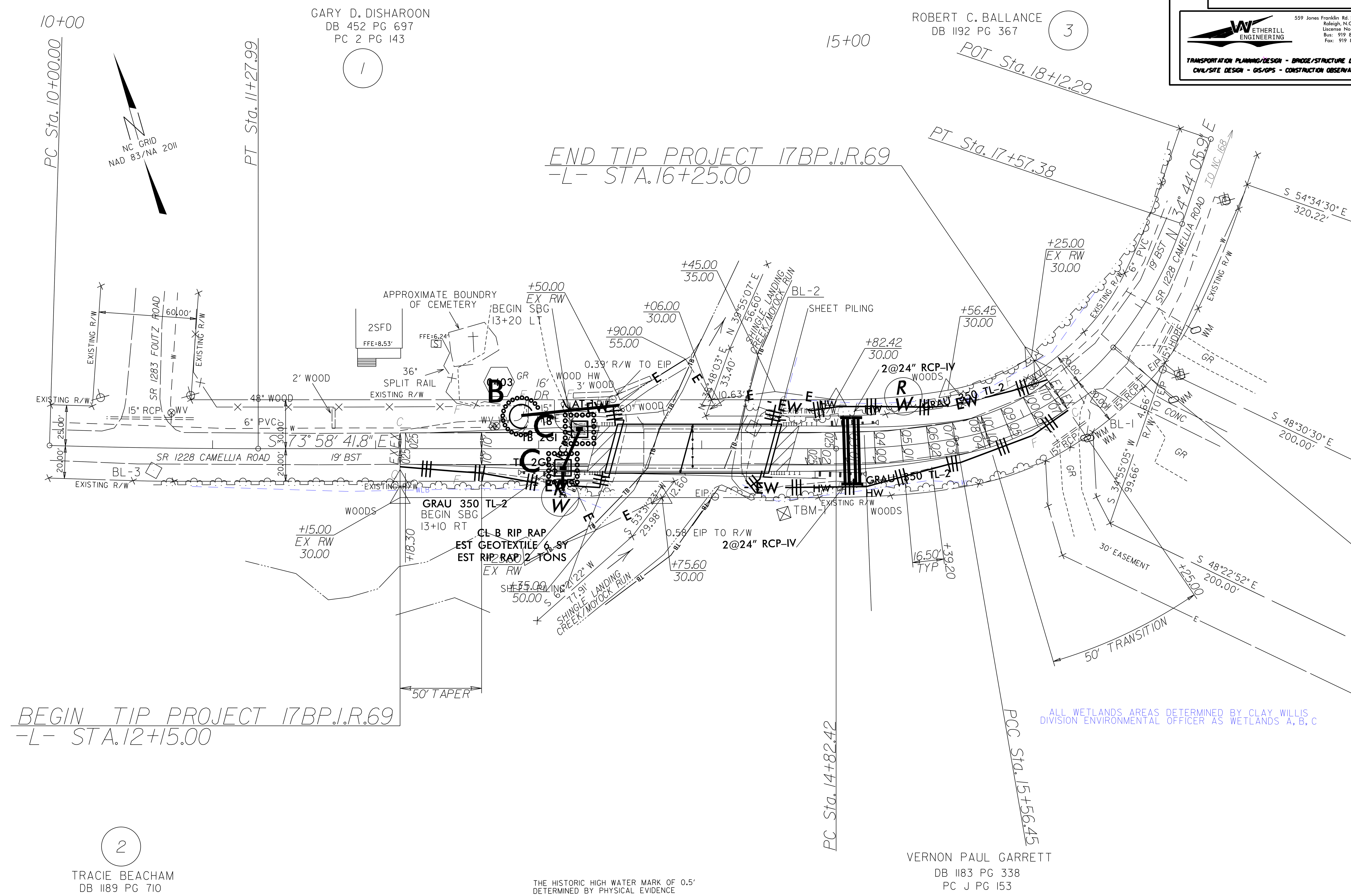
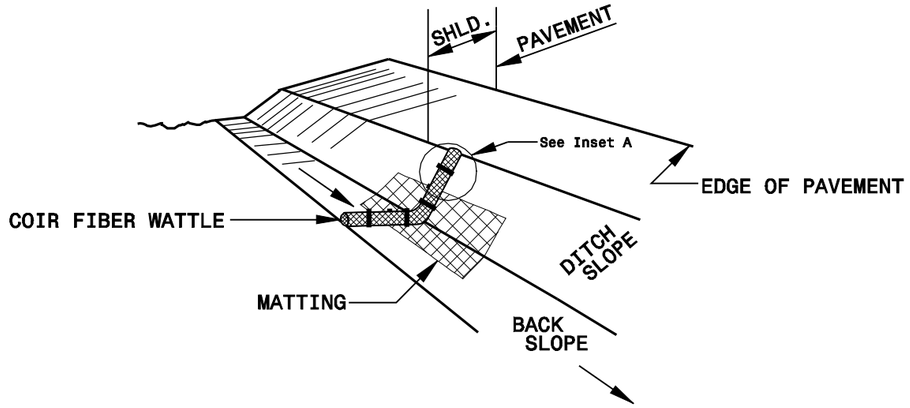

10+00
15+00
GARY D. DISHAROON
DB 452 PG 697
PC 2 PG 143
1
ROBERT C. BALLANCE
DB 1192 PG 367
3
POT Sta. 18+12.29
PT Sta. 17+57.38
PC Sta. 10+00.00
PT Sta. 11+27.99
NC GRID
NAD 83/NA 2011
END TIP PROJECT 17BP.1.R.69
-L- STA.16+25.00
BEGIN TIP PROJECT 17BP.1.R.69
-L- STA.12+15.00
APPROXIMATE BOUNDRY OF CEMETERY
BEGIN SBG
13+20 LT
2SFD
FFE=8.53'
FFE=6.24'
36" SPLIT RAIL
2' WOOD
48" WOOD
6" PVC
15" RCP
EXISTING R/W
SR 1283 FOUTZ ROAD
60.00'
S 73° 58' 41.8" E
SR 1228 CAMELLIA ROAD
19' BST
BL-3
WOODS
GRAU 350 TL-2
BEGIN SBG
13+10 RT
CL B RIP RAP
EST GEOTEXTILE 6 SY
EST RIP RAP 2 TONS
+15.00
EX RW
30.00
+50.00
EX RW
+06.00
30.00
+45.00
35.00
+90.00
55.00
0.39' R/W TO EIP
WOOD HW
3' WOOD
N 39°55'07" E
56.60'
N 48°03' E
33.40'
SHINGLE LANDING CREEK/MOYOCK RUN
BL-2
SHEET PILING
+56.45
30.00
+82.42
30.00
2@24" RCP-IV
WOODS
+25.00
EX RW
30.00
19' BST
SR 1228 CAMELLIA ROAD
TO NC 168
S 54°34'30" E
320.22'
S 48°30'30" E
200.00'
BL-1
CONC
GR
WM
S 34°55'05" W
99.66'
30' EASEMENT
S 48°22'52" E
200.00'
+25.00
50' TRANSITION
16.50'
TYP
+39.20
0.58' EIP TO R/W
2@24" RCP-IV
+75.60
30.00
TBM-1
S 53°31'23" W
29.98'
+35.00
50.00
SHEET PILING
S 62°21'22" W
77.91'
+18.30
50' TAPER
PC Sta. 14+82.42
PCC Sta. 15+56.45
ALL WETLANDS AREAS DETERMINED BY CLAY WILLIS
DIVISION ENVIRONMENTAL OFFICER AS WETLANDS A, B, C
2
TRACIE BEACHAM
DB 1189 PG 710
THE HISTORIC HIGH WATER MARK OF 0.5'
DETERMINED BY PHYSICAL EVIDENCE
VERNON PAUL GARRETT
DB 1183 PG 338
PC J PG 153

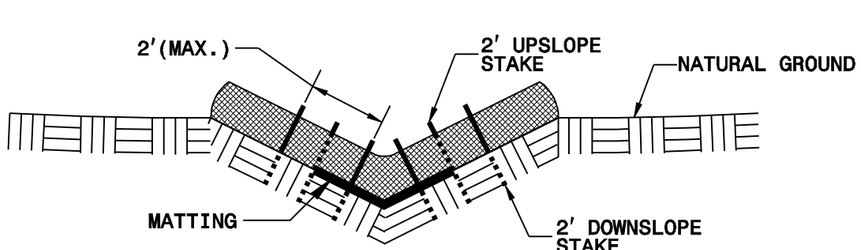
$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
17BP.1.1.96	EC -6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

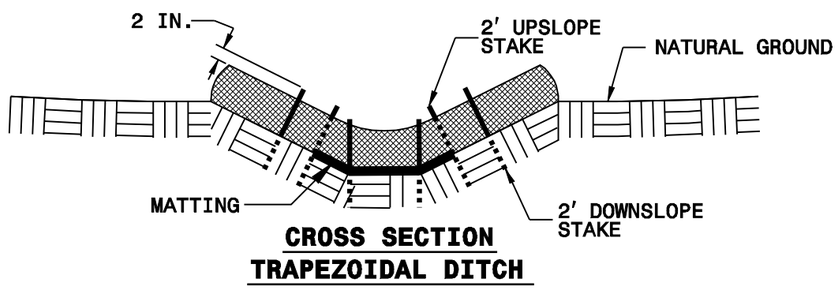
COIR FIBER WATTLE DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

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

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

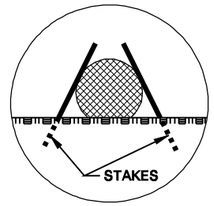
ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

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

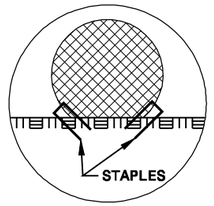
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

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

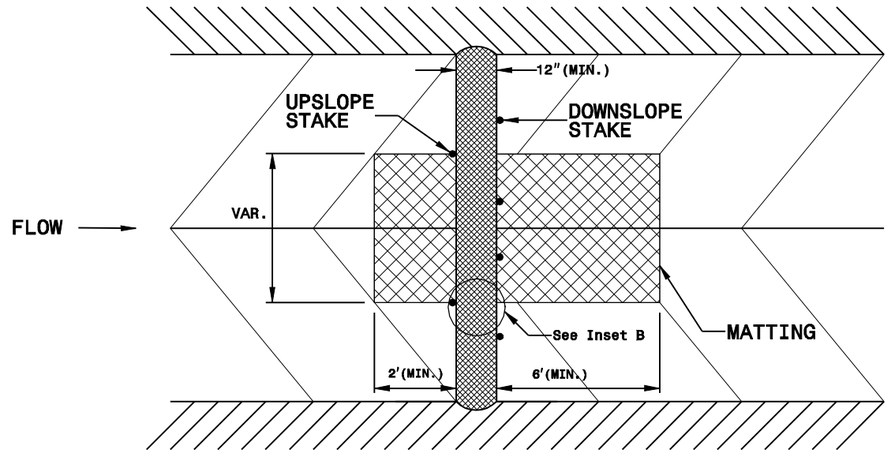
INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.



INSET A



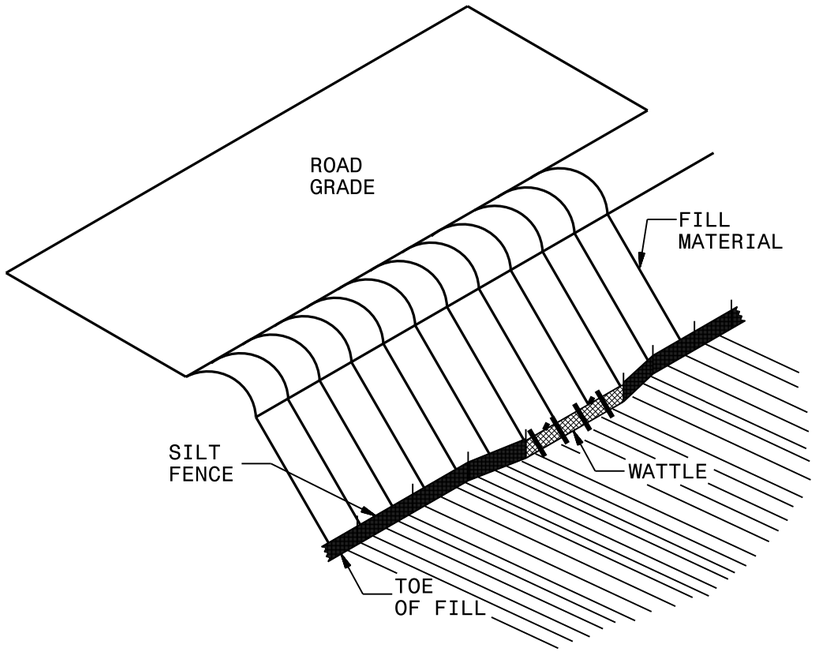
INSET B



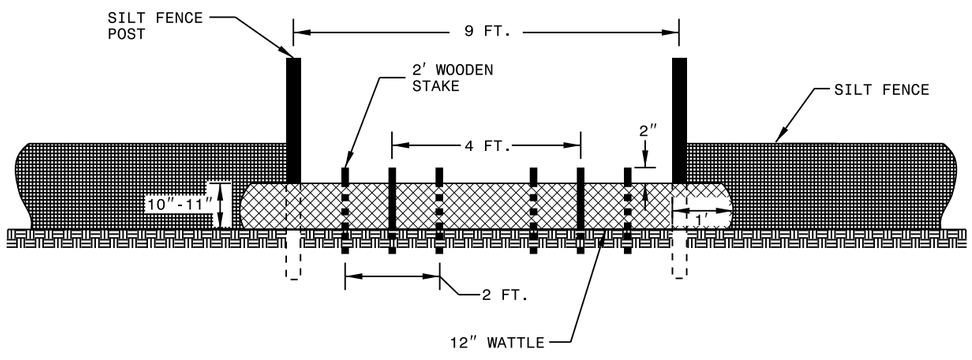
TOP VIEW

SILT FENCE COIR FIBER WATTLE BREAK DETAIL

PROJECT REFERENCE NO.	SHEET NO.
17BP.1.R.69	EC - 7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



ISOMETRIC VIEW



VIEW FROM SLOPE

NOTES:

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

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

DO NOT PLACE WATTLE ON TOE OF SLOPE.

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

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

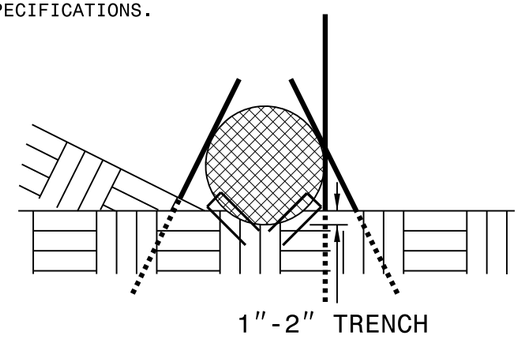
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

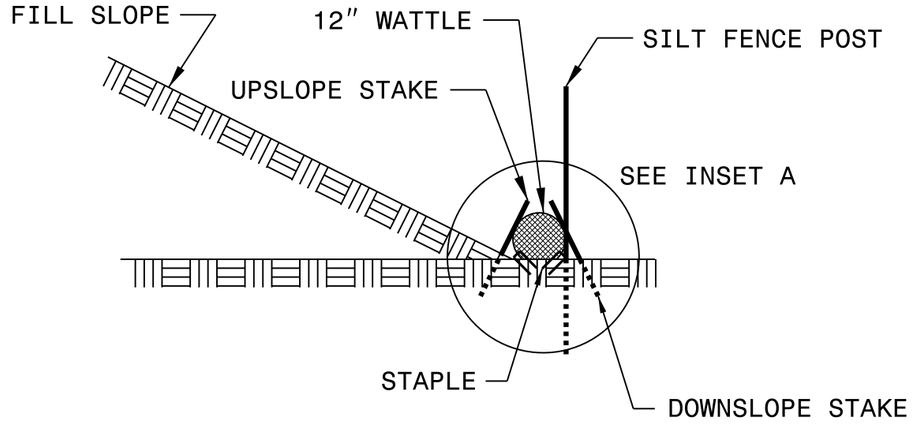
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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

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

INSET A

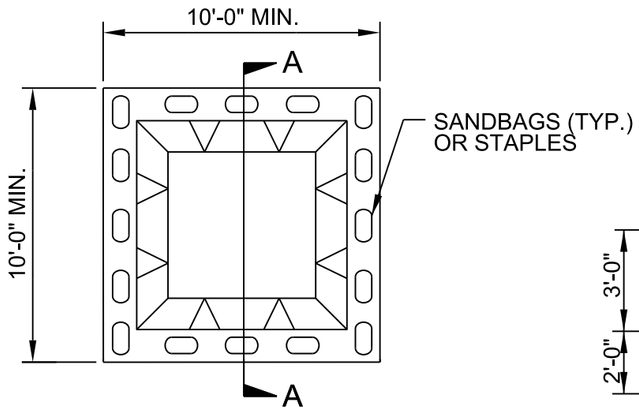


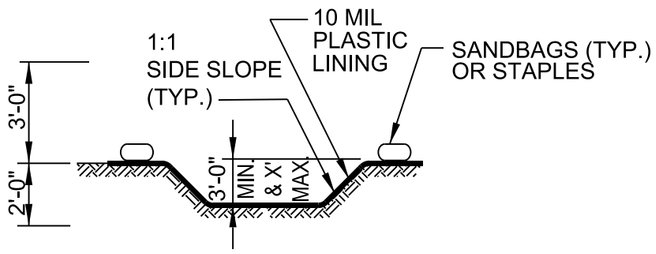


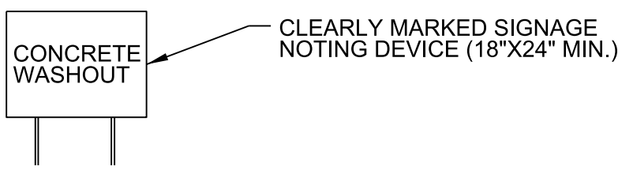
SIDE VIEW

WITH LINER, NO GRAVEL APPROACH

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER







PLAN

SECTION A-A

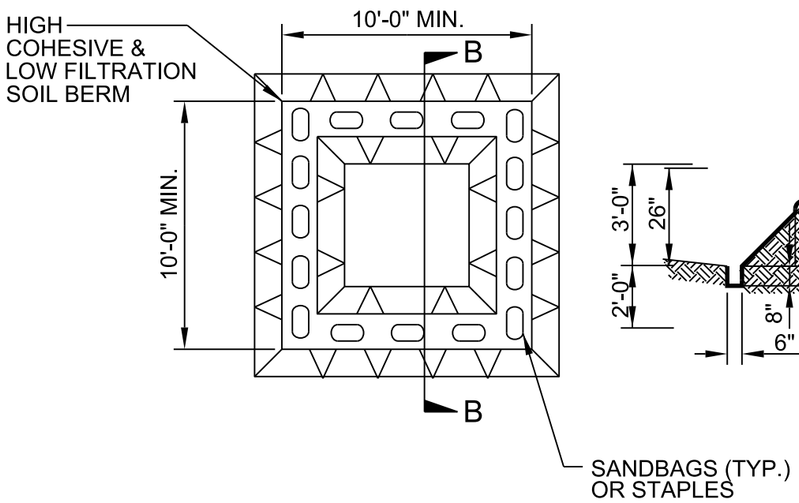
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

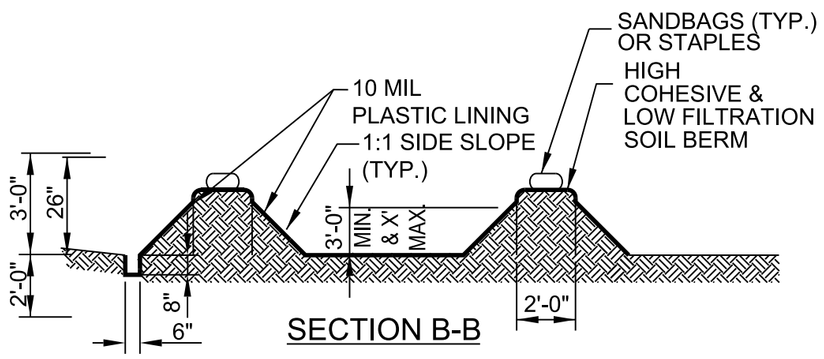
2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY.

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

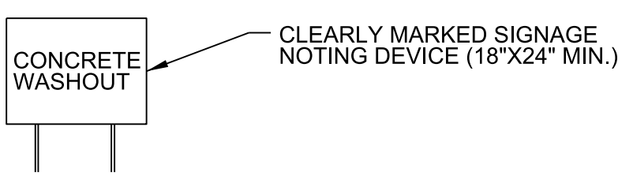
BELOW GRADE WASHOUT STRUCTURE

NOT TO SCALE





SECTION B-B



PLAN

NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.

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

ABOVE GRADE WASHOUT STRUCTURE

NOT TO SCALE

		PRELIMINARY DESIGN NOT FOR CONSTRUCTION

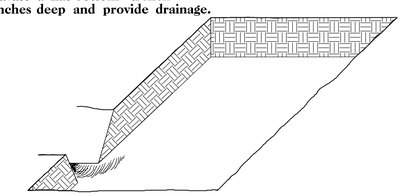
PLANTING DETAILS

SEEDLING / LINER BAREROOT PLANTING DETAIL

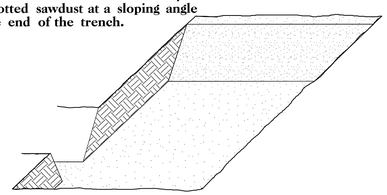
HEALING IN

1. Locate a healing–in site in a shady, well protected area.

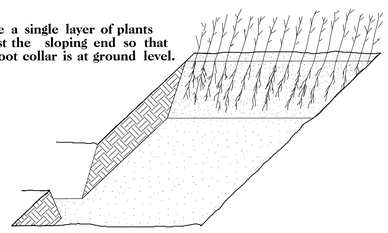
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



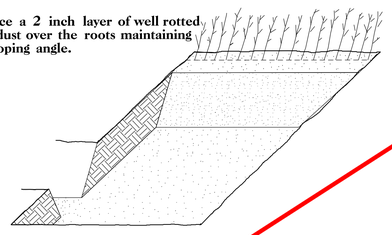
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



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

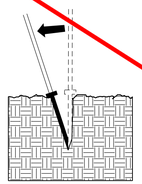


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

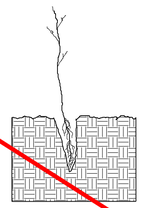


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

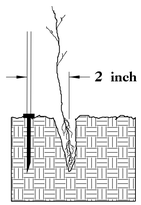
DIBBLE PLANTING METHOD USING THE KBC PLANTING BAR



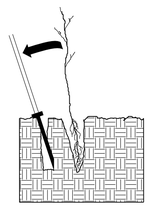
1. Insert planting bar as shown and pull handle toward planter.



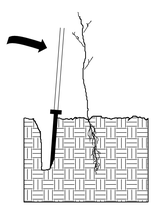
2. Remove planting bar and place seedling at correct depth.



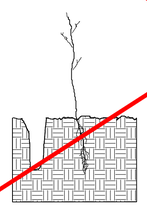
3. Insert planting bar 2 inches toward planter from seedling.



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



5. Push handle forward firming soil at top.



6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

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

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

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.1.R.69	RF–1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

REFORESTATION

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

REFORESTATION

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

25%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in – 18 in BR
25%	PLATANUS OCCIDENTALIS	SYCAMORE	12 in – 18 in BR
25%	FRAXINUS PENNSYLVANICA	GREEN ASH	12 in – 18 in BR
25%	BETULA NIGRA	RIVER BIRCH	12 in – 18 in BR

REFORESTATION DETAIL SHEET

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

PROJ. REFERENCE NO.	SHEET NO.
17BP.1.R.69	X-1A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY

NOTE: EMBANKMENT COLUMN INCLUDES DOES NOT BACKFILL FOR UNDERCUT

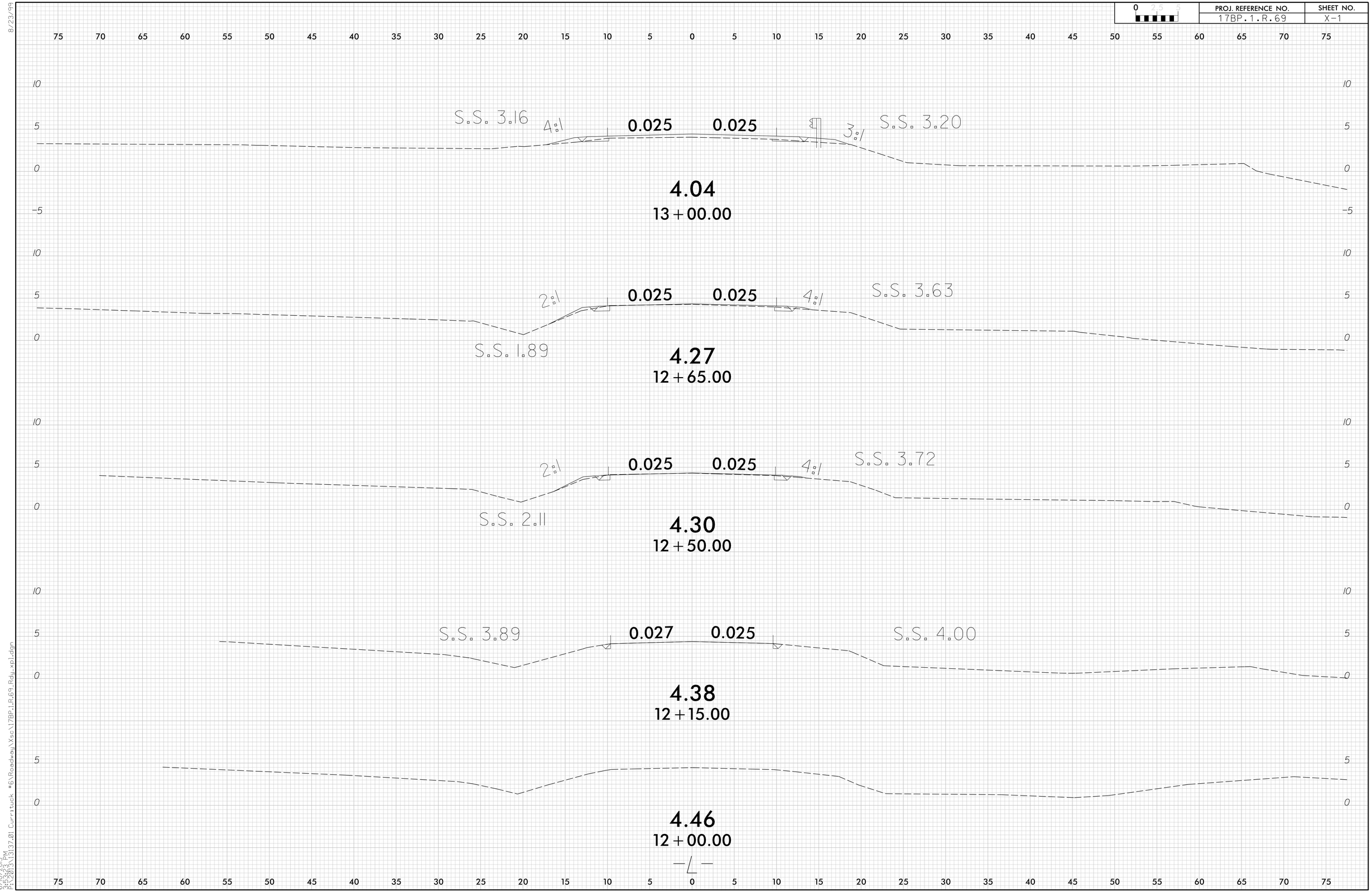
Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
12+15.00	0	0
12+50.00	2	1
12+65.00	1	1
13+00.00	2	3
13+21.00	1	8
13+30.00	1	7
13+40.00	0	10
13+42.00	0	2
13+43.77	0	2

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
14+46.23	0	0
14+50.00	0	4
14+82.42	0	31
15+00.00	0	16
15+50.00	0	31
15+56.45	0	2
16+00.00	2	6
16+25.00	1	1

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

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
17BP.1.R.69	X-1



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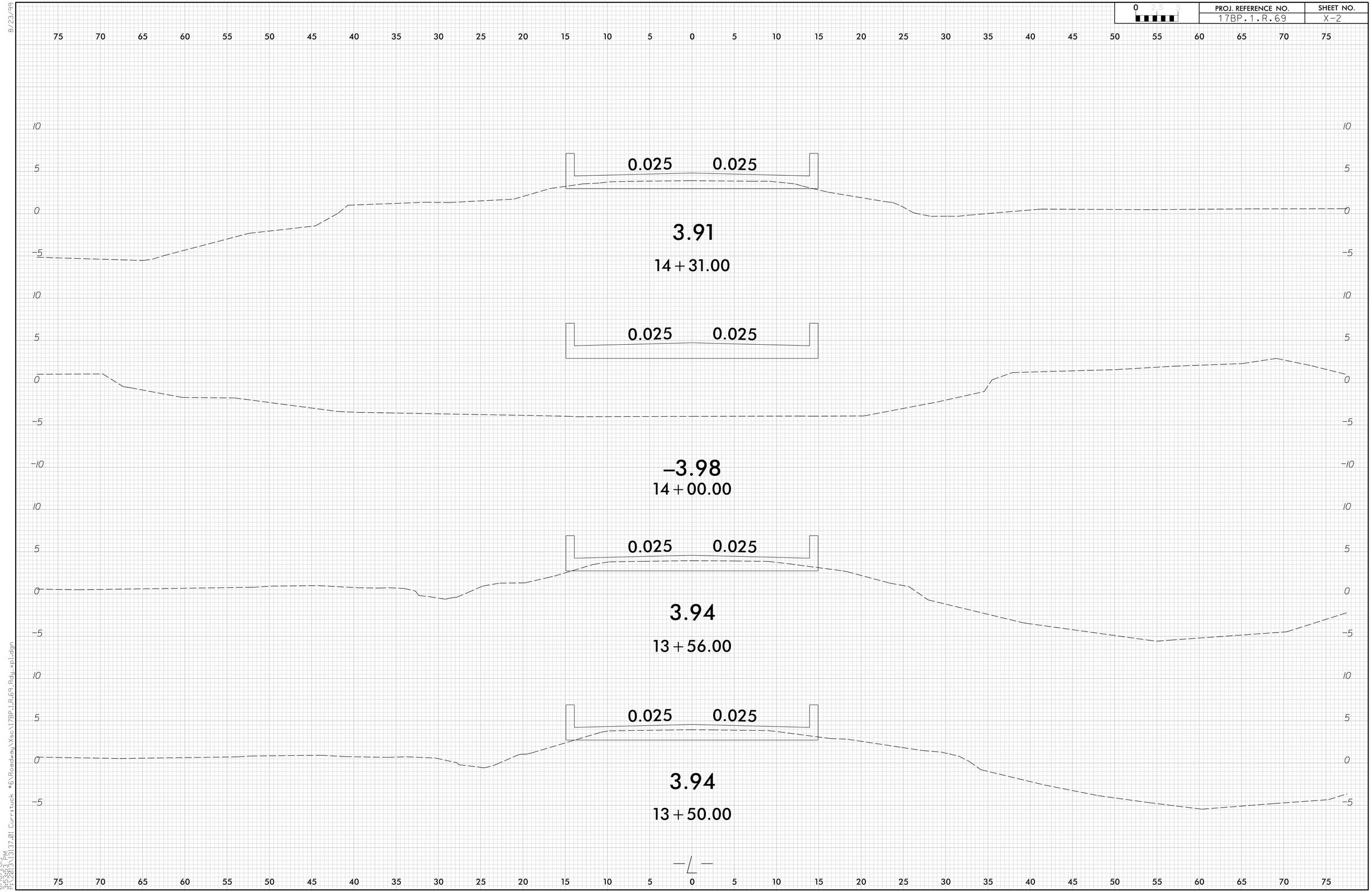
8/23/99

PROJ. REFERENCE NO.	SHEET NO.
17BP.1.R.69	X-2



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8/23/99

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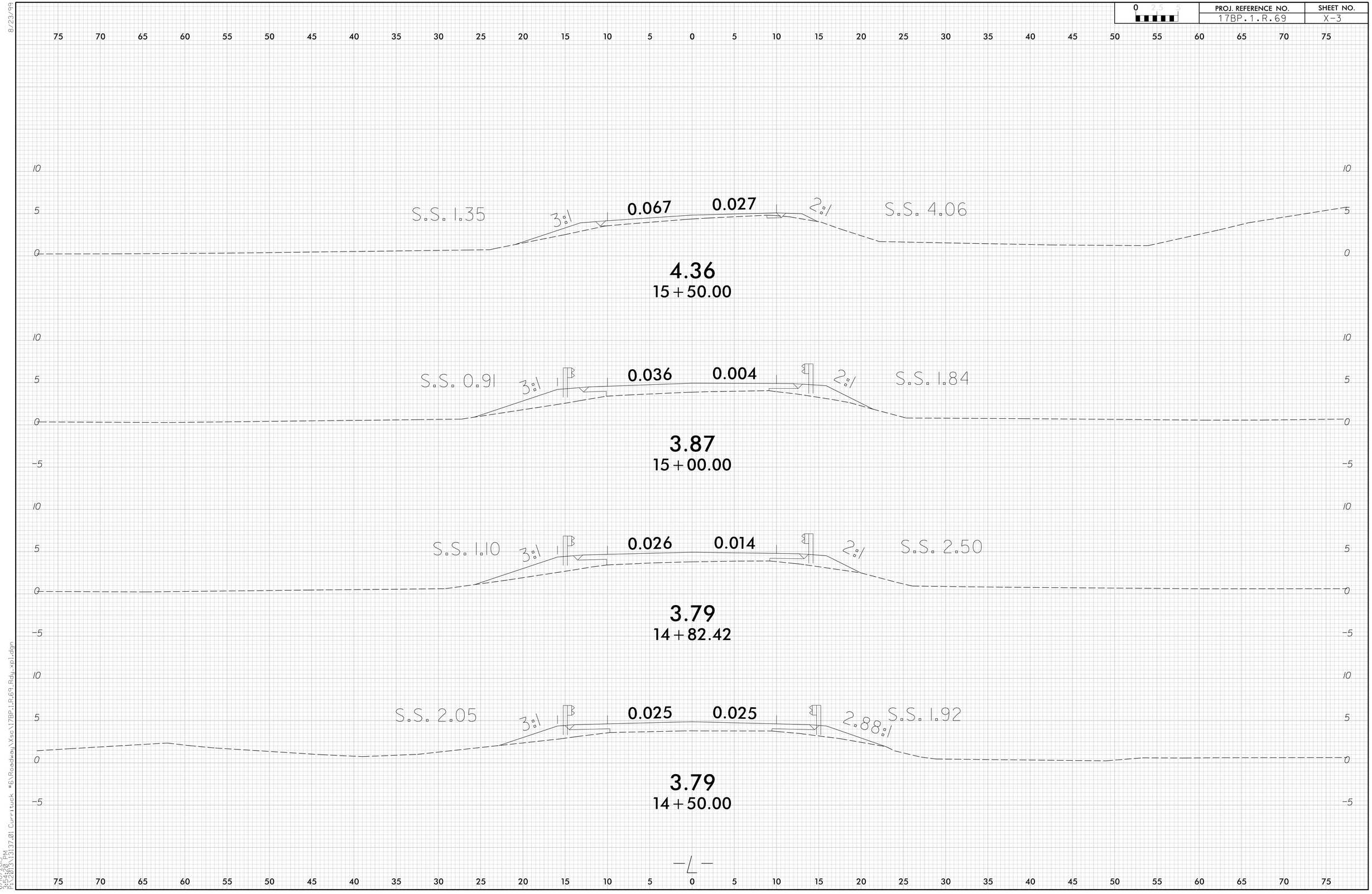

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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.1.R.69	X-4

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

10 5 0

5.35
16+50.00

10 5 0

S.S. 2.26 3:1 0.097 0.057 3:1 S.S. 5.42

4.95
16+00.00

10 5 0

S.S. 1.50 3:1 0.070 0.030 2.56:1 S.S. 4.22

4.42
15+56.45

—℄—

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

6/10/2015
3:54:47 PM
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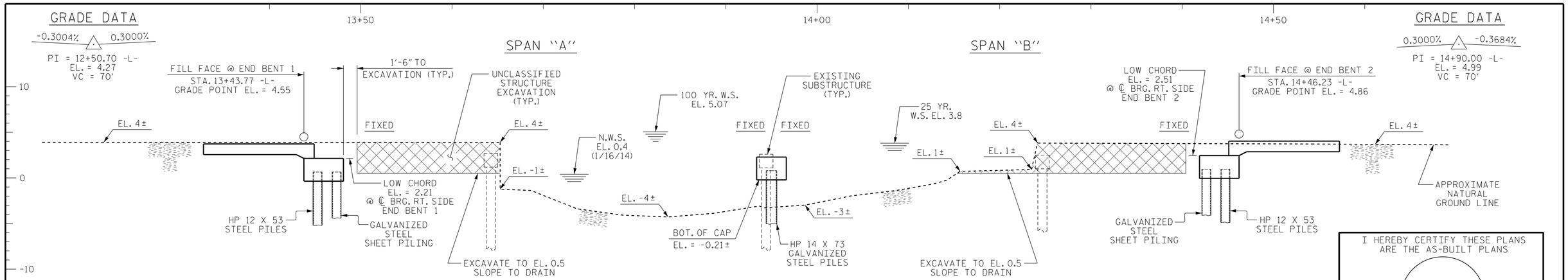
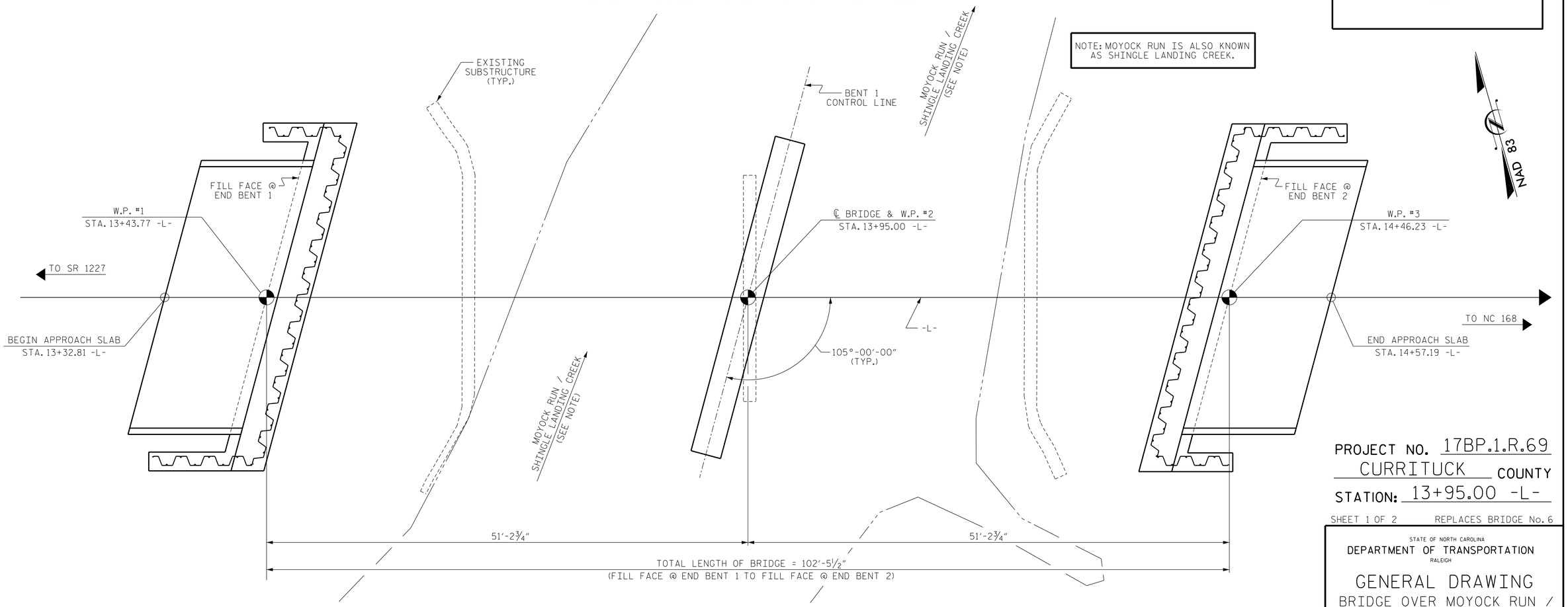


SECTION ALONG -L-

SECTIONS AT END BENTS AND BENT ARE TAKEN AT RIGHT ANGLES

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

NOTE: MOYOCK RUN IS ALSO KNOWN AS SHINGLE LANDING CREEK.



PLAN

(HP PILES NOT SHOWN FOR CLARITY)

PROJECT NO. 17BP.1.R.69

CURRITUCK COUNTY

STATION: 13+95.00 -L-

SHEET 1 OF 2 REPLACES BRIDGE No. 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER MOYOCK RUN / SHINGLE LANDING CREEK ON SR 1228 BETWEEN SR 1227 & NC 168

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			20

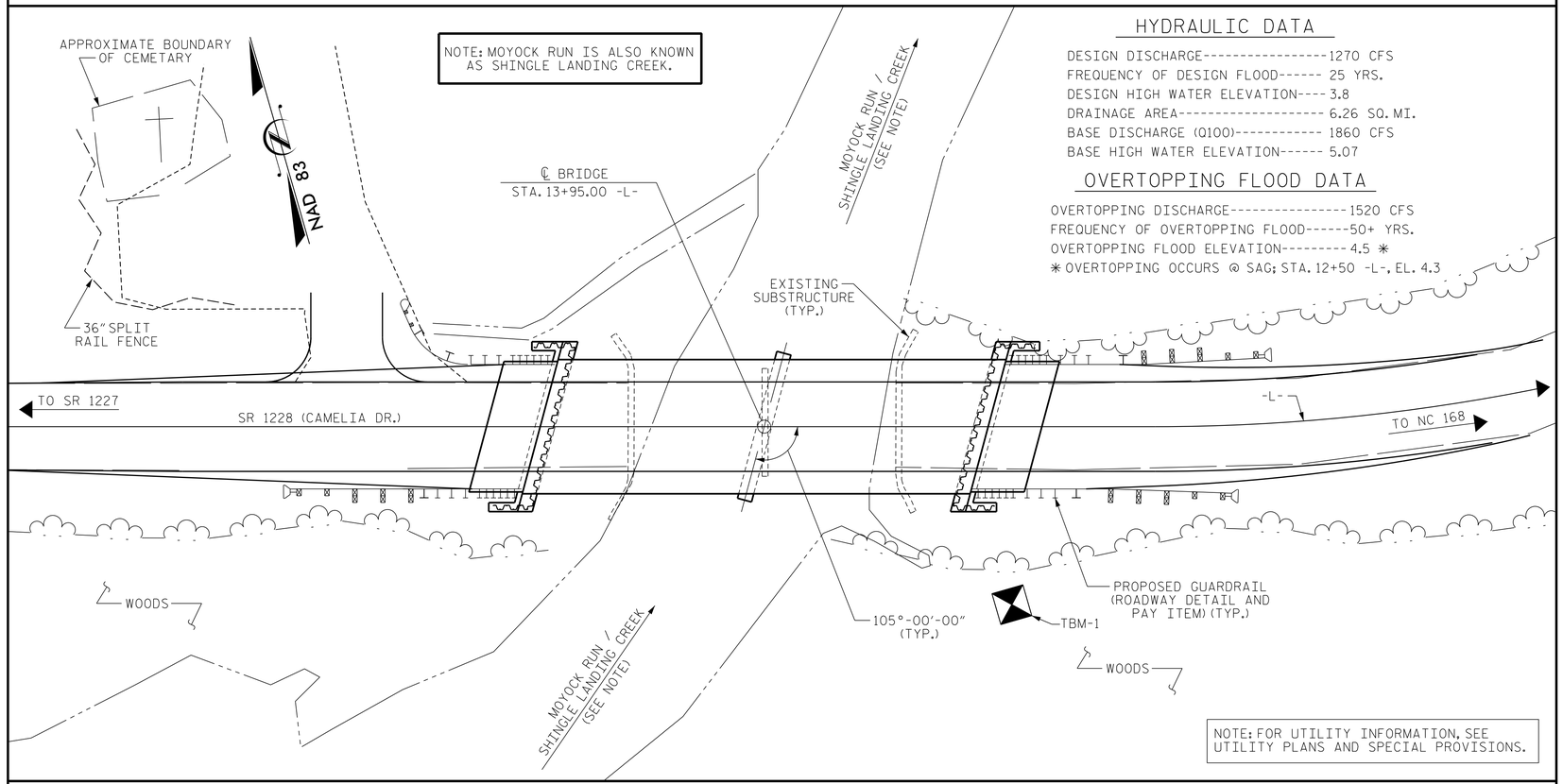
NORTH CAROLINA PROFESSIONAL SEAL 22072 ENGINEER JOHN ARTHUR DILWORTH 6/18/2015

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
Bus: 919 851 8077
Fax: 919 851 8107
License: F-0377
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

$TIME$
$FILE$
$DATE$

DRAWN BY : J. PENDERGRAFT DATE : 6-15
CHECKED BY: J.A. DILWORTH DATE : 6-15
DESIGN ENGINEER OF RECORD: J. A. DILWORTH DATE : 6-15

TBM-1: RR SPIKE IN 36" CYPRESS, 38.4' RT. OF STA. 14+51.14 -L-, (N 1020972; E 2828372) EL. 3.79



HYDRAULIC DATA

DESIGN DISCHARGE	1270 CFS
FREQUENCY OF DESIGN FLOOD	25 YRS.
DESIGN HIGH WATER ELEVATION	3.8
DRAINAGE AREA	6.26 SQ. MI.
BASE DISCHARGE (Q100)	1860 CFS
BASE HIGH WATER ELEVATION	5.07

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	1520 CFS
FREQUENCY OF OVERTOPPING FLOOD	50+ YRS.
OVERTOPPING FLOOD ELEVATION	4.5 ✳

✳ OVERTOPPING OCCURS @ SAG; STA. 12+50 -L-, EL. 4.3

LOCATION SKETCH

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	HP 12 x 53 STEEL PILES		HP 14 x 73 GALVANIZED STEEL PILES		PILE REDRIVES	VERTICAL CONCRETE BARRIER RAIL	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS		STEEL SHEET PILES
	LUMP SUM	EACH	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	EACH	LIN. FT.	LUMP SUM	NO.	LIN. FT.	SQ. FT.
SUPERSTRUCTURE					LUMP SUM							200.25	LUMP SUM	20	1000.00	
END BENT 1			LUMP SUM	18.4		3047	5	350			3					1014
BENT 1				10.6		2102			7	525	4					
END BENT 2			LUMP SUM	18.4		3047	5	350			3					1066
TOTAL	LUMP SUM	2	LUMP SUM	47.4	LUMP SUM	8196	10	700	7	525	10	200.25	LUMP SUM	20	1000.00	2080

NOTES :

ASSUMED LIVE LOAD = HL93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

THE EXISTING STRUCTURE CONSISTING OF 2 SPANS @ 30'-0" WITH AN ASHPHALT WEARING SURFACE ON PRESTRESSED CONCRETE CHANNELS AND A CLEAR ROADWAY WIDTH OF 24'-0" ON A SUBSTRUCTURE CONSISTING OF PRESTRESSED PRECAST CONCRETE CAPS ON TIMBER PILES AND LOCATED AT THE PROPOSED STRUCTURE LOCATION SHALL BE REMOVED.

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 DIFFERENCE BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

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.

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

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

FOUNDATION NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 85 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 145 TONS PER PILE.

PILES AT INTERIOR BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE. DRIVE PILES TO A REQUIRED RESISTANCE OF 205 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

INSTALL PILES AT INTERIOR BENT 1 TO TIP ELEVATION NO HIGHER THAN -41.0 FEET.

THE SCOUR CRITICAL ELEVATION FOR INTERIOR BENT 1 IS ELEVATION -12 FEET. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

TESTING THE FIRST PRODUCTION PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS AND FOR PILE DRIVING CRITERIA, SEE PILE DRIVING CRITERIA PROVISION.

INSTALL PZ-27 OR EQUIVALENT SHEETING TO A TIP ELEVATION NO HIGHER THAN -18.5 FEET AT END BENTS 1 AND 2.

STEEL SHEET PILES SHALL BE GALVANIZED, FOR STEEL SHEET PILES, SEE SPECIAL PROVISION.

PROJECT NO. 17BP.1.R.69

CURRITUCK COUNTY

STATION: 13+95.00 -L-

SHEET 2 OF 2

$TIME$

$FILE$

$DATE$

DRAWN BY : J. PENDERGRAFT DATE : 6-15

CHECKED BY: J.A. DILWORTH DATE : 6-15

DESIGN ENGINEER OF RECORD: J. A. DILWORTH DATE : 6-15

NORTH CAROLINA PROFESSIONAL SEAL 22072 ENGINEER JOHN ARTHUR DILWORTH 6/18/2015

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
Bus: 919 851 8077
Fax: 919 851 8107
License: F-0377

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER MOYOCK RUN / SHINGLE LANDING CREEK ON SR 1228 BETWEEN SR 1227 & NC 168

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			20

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 (γ_{LL})	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 (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	**1**	1.205	--	1.75	0.271	1.59	50′	EL	24.482	0.616	**1.20**	50′	EL	**4.896**	0.80	0.271	1.46	50′	EL	24.482	
		HL-93(Opr)	N/A	--	1.562	--	1.35	0.271	2.06	50′	EL	24.482	0.616	1.56	50′	EL	4.896	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	**2**	1.434	51.614	1.75	0.271	1.97	50′	EL	24.482	0.616	**1.43**	50′	EL	**4.896**	0.80	0.271	1.81	50′	EL	24.482	
		HS-20(Opr)	36.000	--	1.859	66.906	1.35	0.271	2.56	50′	EL	24.482	0.616	1.86	50′	EL	4.896	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	3.678	49.655	1.40	0.271	5.02	50′	EL	24.482	0.616	4.00	50′	EL	4.896	0.80	0.271	3.68	50′	EL	24.482	
		SNGARBS2	20.000	--	2.905	58.101	1.40	0.271	3.97	50′	EL	24.482	0.616	2.93	50′	EL	4.896	0.80	0.271	2.91	50′	EL	24.482	
		SNAGRIS2	22.000	--	2.748	60.456	1.40	0.271	3.83	50′	EL	19.586	0.616	2.75	50′	EL	4.896	0.80	0.271	2.81	50′	EL	24.482	
		SNCOTTS3	27.250	--	1.835	49.998	1.40	0.271	2.50	50′	EL	24.482	0.616	2.01	50′	EL	4.896	0.80	0.271	1.83	50′	EL	24.482	
		SNAGGRS4	34.925	--	1.595	55.714	1.40	0.271	2.18	50′	EL	24.482	0.616	1.72	50′	EL	4.896	0.80	0.271	1.60	50′	EL	24.482	
		SNS5A	35.550	--	1.556	55.303	1.40	0.271	2.12	50′	EL	24.482	0.616	1.77	50′	EL	4.896	0.80	0.271	1.56	50′	EL	24.482	
		SNS6A	39.950	--	1.455	58.112	1.40	0.271	1.99	50′	EL	24.482	0.616	1.64	50′	EL	4.896	0.80	0.271	1.45	50′	EL	24.482	
		SNS7B	42.000	--	1.386	58.224	1.40	0.271	1.89	50′	EL	24.482	0.616	1.65	50′	EL	4.896	0.80	0.271	1.39	50′	EL	24.482	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	1.782	58.809	1.40	0.271	2.43	50′	EL	24.482	0.616	1.94	50′	EL	4.896	0.80	0.271	1.78	50′	EL	24.482	
		TNT4A	33.075	--	1.798	59.458	1.40	0.271	2.45	50′	EL	24.482	0.616	1.86	50′	EL	4.896	0.80	0.271	1.80	50′	EL	24.482	
		TNT6A	41.600	--	1.497	62.293	1.40	0.271	2.04	50′	EL	24.482	0.616	1.80	50′	EL	4.896	0.80	0.271	1.50	50′	EL	24.482	
		TNT7A	42.000	--	1.520	63.842	1.40	0.271	2.08	50′	EL	24.482	0.616	1.67	50′	EL	4.896	0.80	0.271	1.52	50′	EL	24.482	
		TNT7B	42.000	--	1.585	66.559	1.40	0.271	2.16	50′	EL	24.482	0.616	1.59	50′	EL	4.896	0.80	0.271	1.58	50′	EL	24.482	
		TNAGRIT4	43.000	--	1.504	64.667	1.40	0.271	2.05	50′	EL	24.482	0.616	1.53	50′	EL	4.896	0.80	0.271	1.50	50′	EL	24.482	
		TNAGT5A	45.000	--	1.405	63.217	1.40	0.271	1.92	50′	EL	24.482	0.616	1.56	50′	EL	4.896	0.80	0.271	1.40	50′	EL	24.482	
		TNAGT5B	45.000	**3**	1.376	61.936	1.40	0.271	1.88	50′	EL	24.482	0.616	1.45	50′	EL	4.896	0.80	0.271	**1.38**	50′	EL	**24.482**	

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

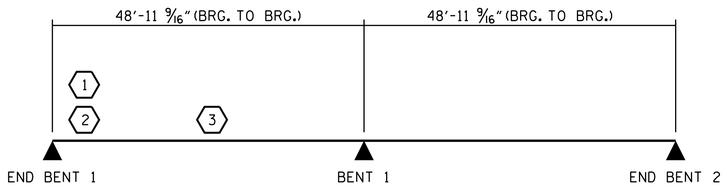
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

FOR SPAN '50'

PROJECT NO. 17BP.1.R.69

CURRITUCK COUNTY

STATION: 13+95.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F8B6AD6DB2FC48F...

6/8/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDER (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			20

ASSEMBLED BY : R. CAREATHERS	DATE : 5/22/15
CHECKED BY : N. RUFFIN	DATE : 5/26/15
DRAWN BY : CVC 6/10	
CHECKED BY : DNS 6/10	

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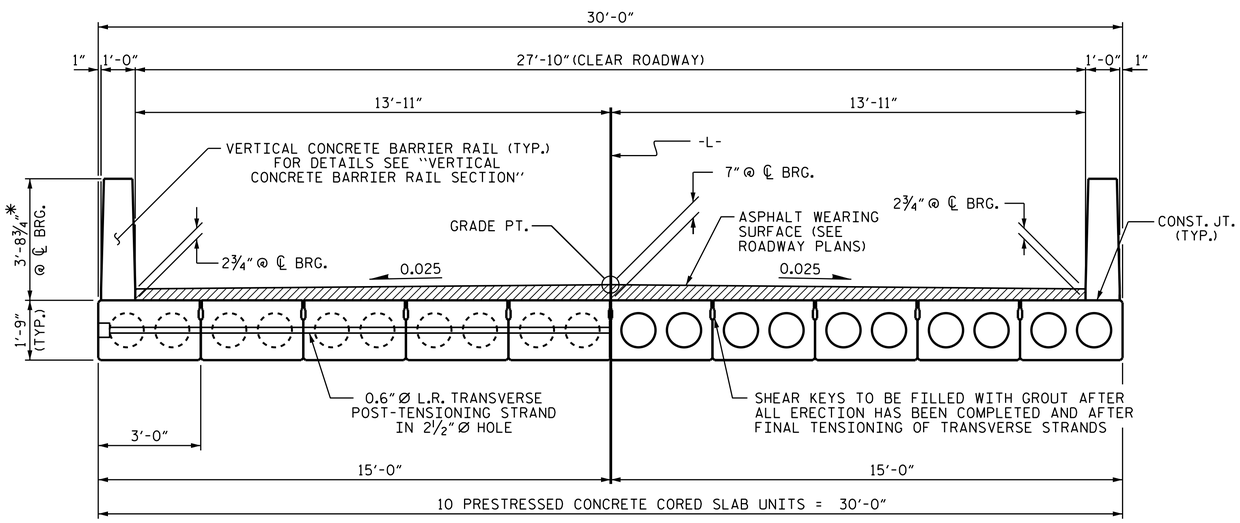
kpaschal

STD. NO. 21LRFR1_75&105S_50L

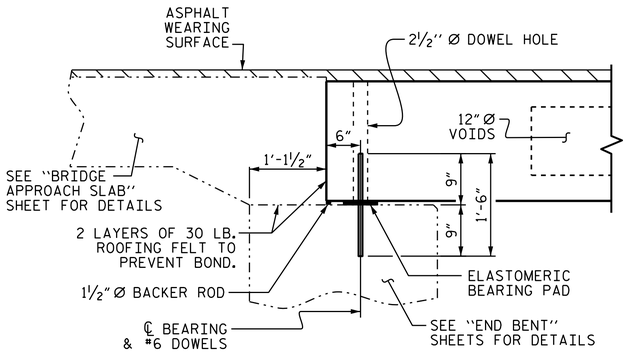


HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

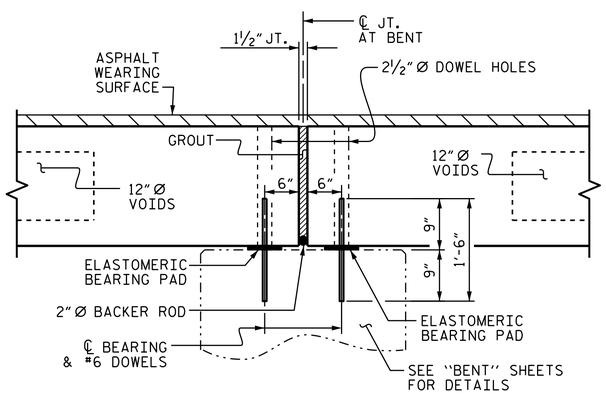
HALF SECTION
THROUGH VOIDS

TYPICAL SECTION

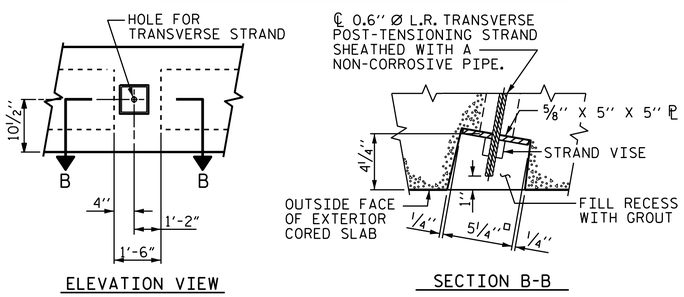
* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.



SECTION AT END BENT



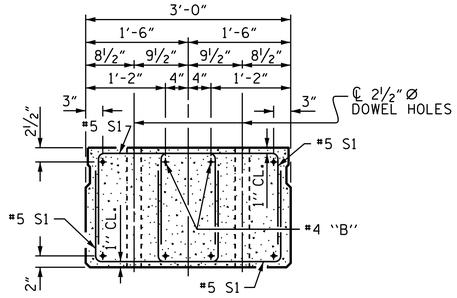
SECTION AT BENT



ELEVATION VIEW

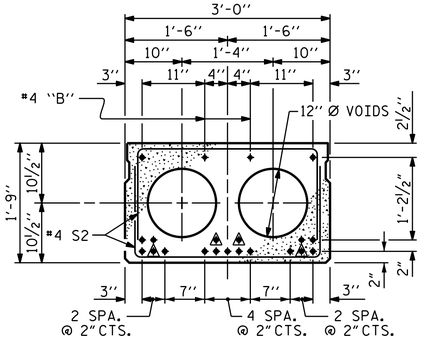
SECTION B-B

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



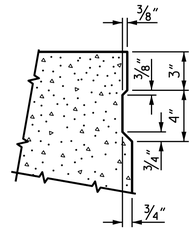
END ELEVATION

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.



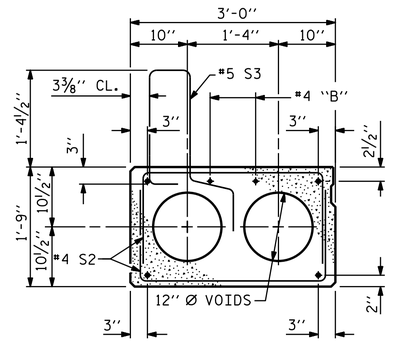
INTERIOR SLAB SECTION
(50' UNIT)
(19 STRANDS REQUIRED)

0.6'' Ø LOW RELAXATION STRAND LAYOUT



SHEAR KEY DETAIL

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

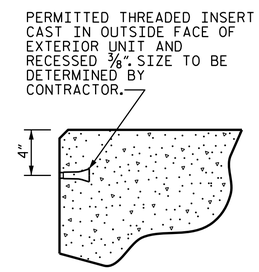


EXT. SLAB SECTION

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

△ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND



THREADED INSERT DETAIL

PROJECT NO. 17BP.1.R.69
CURRITUCK COUNTY
STATION: 13+95.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD 3'-0'' X 1'-9'' PRESTRESSED CONCRETE CORED SLAB UNIT 105° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F8B6AD6DB2FC48F...

6/8/2015

ASSEMBLED BY : R. CAREATHERS	DATE : 5/22/15
CHECKED BY : N. RUFFIN	DATE : 5/26/15
DRAWN BY : DGE 5/09	REV. 8/14 MAA/TMG
CHECKED BY : BCH 6/09	

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

SHEET NO. S-4
TOTAL SHEETS 20

STD. NO. 21"PCS3_30_105S

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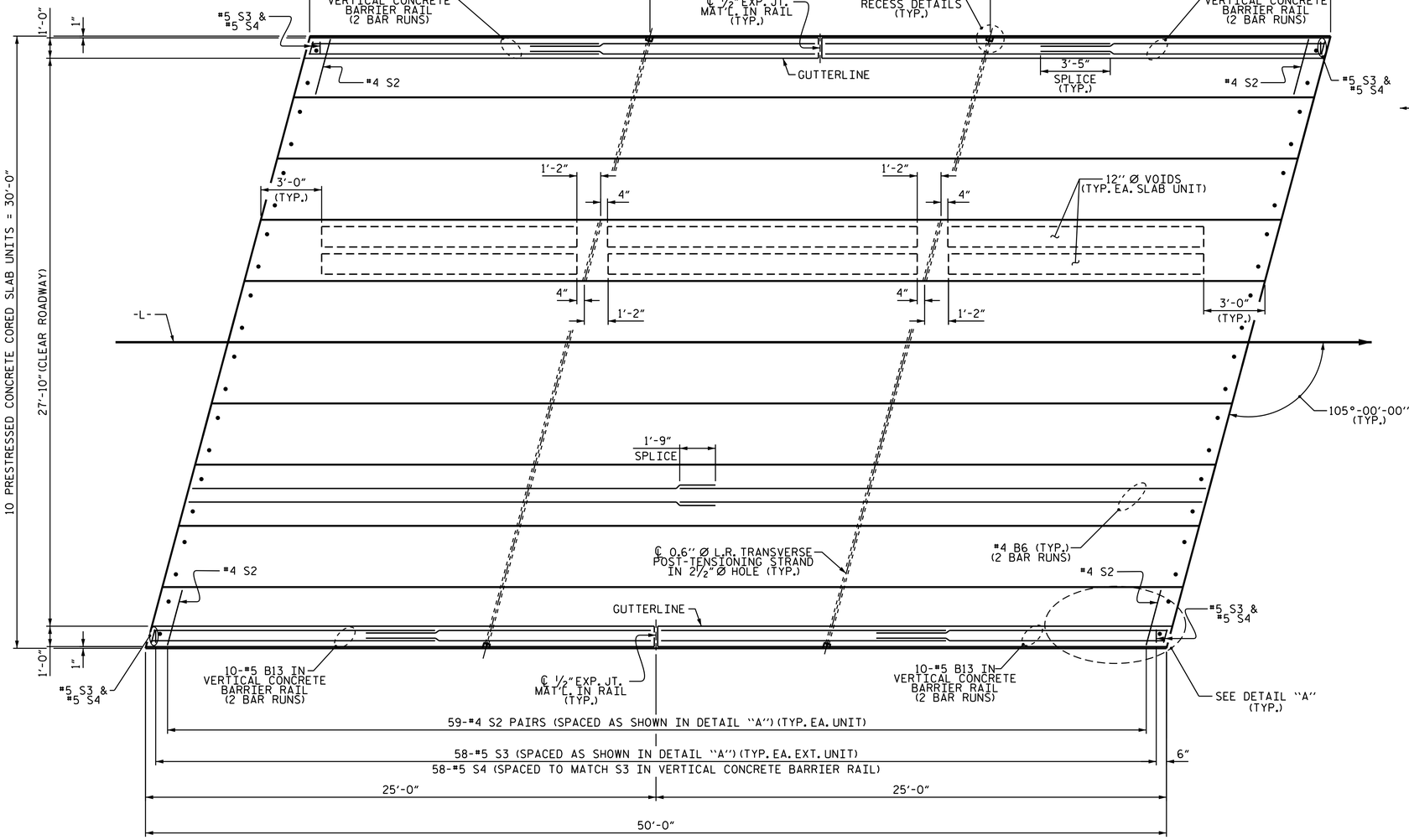
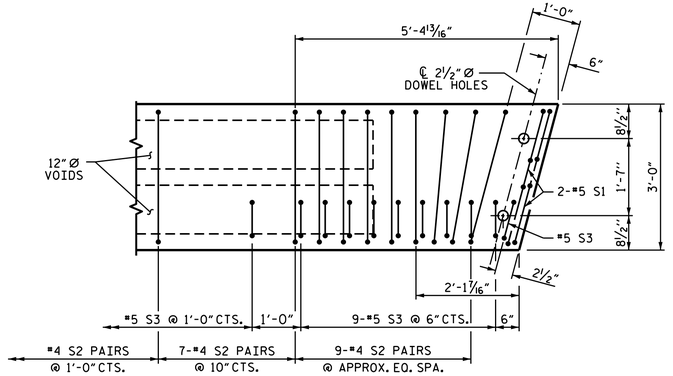
kpaschal





DETAIL "A"

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

PLAN OF UNIT

PROJECT NO. 17BP.1.R.69

CURRITUCK COUNTY

STATION: 13+95.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 50' UNIT 27'-10" CLEAR ROADWAY 105° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F8B6AD6DB2FC48F...

6/8/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			20

ASSEMBLED BY : R. CAREATHERS		DATE : 5/22/2015		
CHECKED BY : N. RUFFIN		DATE : 5/26/15		
DRAWN BY : DGE	5/09	REV. 12/5/11	MAA/AAC	
CHECKED BY: BCH	6/09	REV. 8/14	MAA/TMG	

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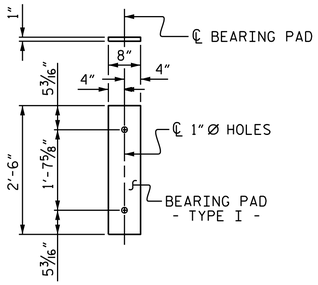
kpaschal

STD. NO. 21"PCS_30_105S_50L



FIXED END
(TYPE I - 40 REQ'D)

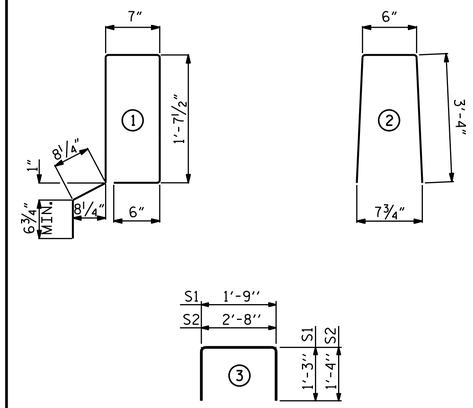
ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.

BILL OF MATERIAL FOR ONE 50' CORED SLAB UNIT

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B6	4	#4	STR	25'-9"	69	25'-9"	69
S1	8	#5	3	4'-3"	35	4'-3"	35
S2	118	#4	3	5'-4"	420	5'-4"	420
✱ S3	60	#5	1	5'-7"	349		
REINFORCING STEEL			LBS.		524		524
✱ EPOXY COATED REINFORCING STEEL			LBS.		349		
6500 P.S.I. CONCRETE			CU. YDS.		7.3		7.3
0.6" Ø L.R. STRANDS			No.		19		19

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

NOTES

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

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

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

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

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

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

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

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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

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

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

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

CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
50' UNIT			
EXTERIOR C.S.	4	50'-0"	200'-0"
INTERIOR C.S.	16	50'-0"	800'-0"
TOTAL	20	50'-0"	1000'-0"

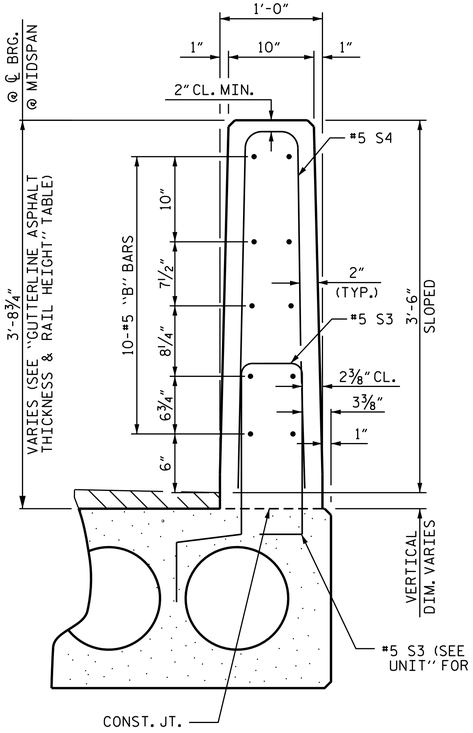
DEAD LOAD DEFLECTION AND CAMBER

	3'-0" x 1'-9"
50' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1½" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD✱✱	⅜" ↓
FINAL CAMBER	1⅛" ↑

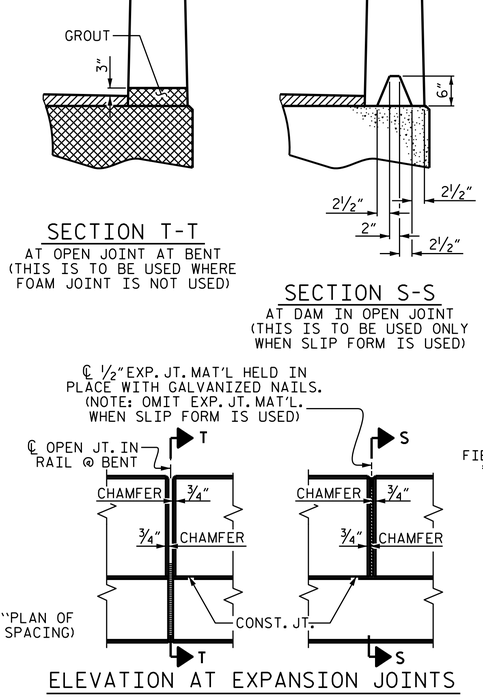
✱✱ INCLUDES FUTURE WEARING SURFACE

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

	ASPHALT OVERLAY THICKNESS	RAIL HEIGHT
	@ MID-SPAN	@ MID-SPAN
50' UNITS	1⅝"	3'-7⅝"



VERTICAL CONCRETE BARRIER RAIL SECTION



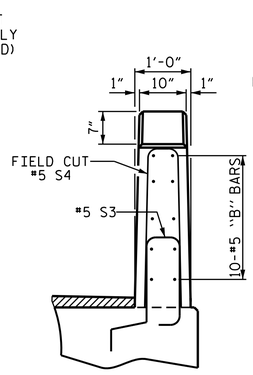
SECTION T-T
AT OPEN JOINT AT BENT
(THIS IS TO BE USED WHERE FOAM JOINT IS NOT USED)

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

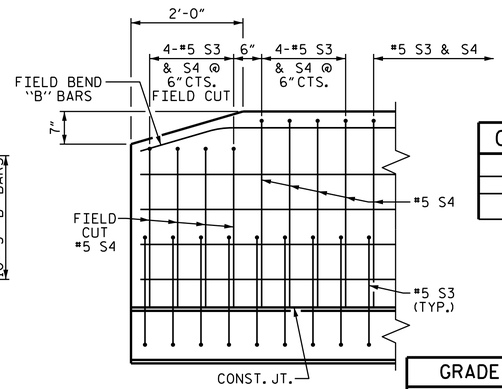
ELEVATION AT EXPANSION JOINTS

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	50' UNIT					
✱B13	80	160	#5	STR	14'-2"	2364
✱ S4	120	240	#5	2	7'-2"	1794
✱ EPOXY COATED REINFORCING STEEL				LBS.		4158
CLASS AA CONCRETE				CU.YDS.		25.6
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		200.25



END VIEW



SIDE VIEW

END OF RAIL DETAILS

CONCRETE RELEASE STRENGTH

UNIT	PSI
50'	4900

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

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F8B6AD6DB2FC48F...

6/17/2015

PROJECT NO. 17BP.1.R.69
CURRITUCK COUNTY
STATION: 13+95.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD 3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT 105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			20

ASSEMBLED BY : R. CAREATHERS DATE : 5/22/2015
CHECKED BY : N. RUFFIN DATE : 5/26/15
DRAWN BY : DGE 5/09
CHECKED BY : BCH 6/09
REV. 11/14 MAA/TMG

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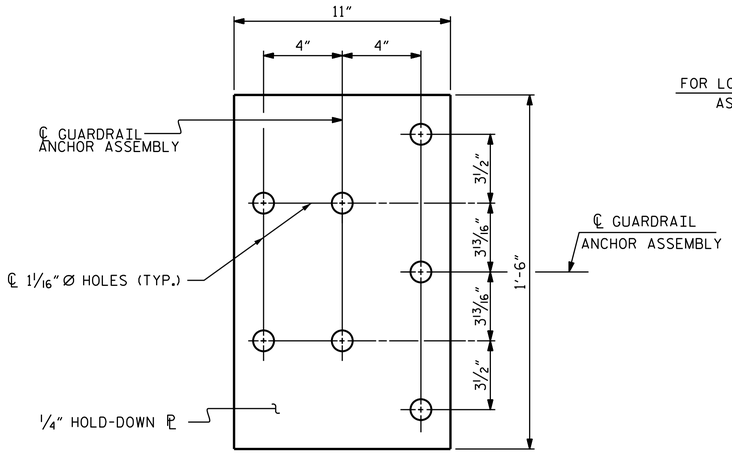
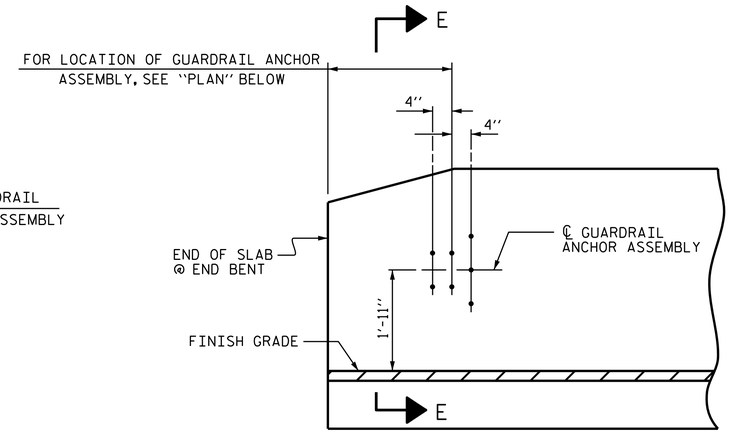
STD. NO. 21"PCS3_30_105S



PLAN



ELEVATION

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.)

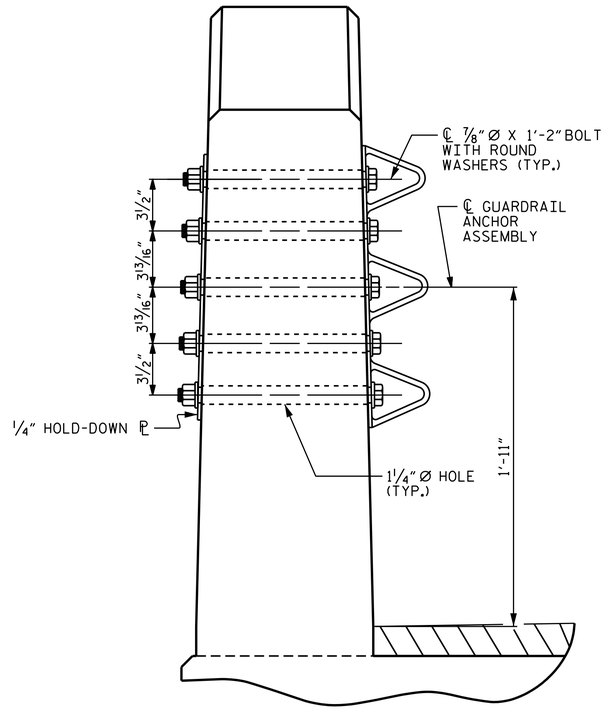
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

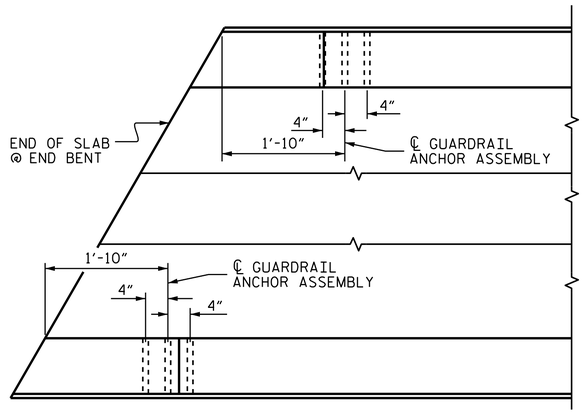
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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.



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



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. 17BP.1.R.69

CURRITUCK COUNTY

STATION: 13+95.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F8B6AD6DB2FC48F...

6/8/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE FOR VERTICAL CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			20

ASSEMBLED BY R. CAREATHERS	DATE : 5/22/15		
CHECKED BY : N. RUFFIN	DATE : 5/26/15		
DRAWN BY : MAA 5/10	REV. 10/1/11	MAA/GM	
CHECKED BY : GM 5/10	REV. 12/5/11	MAA/GM	
	REV. 6/13	MAA/GM	

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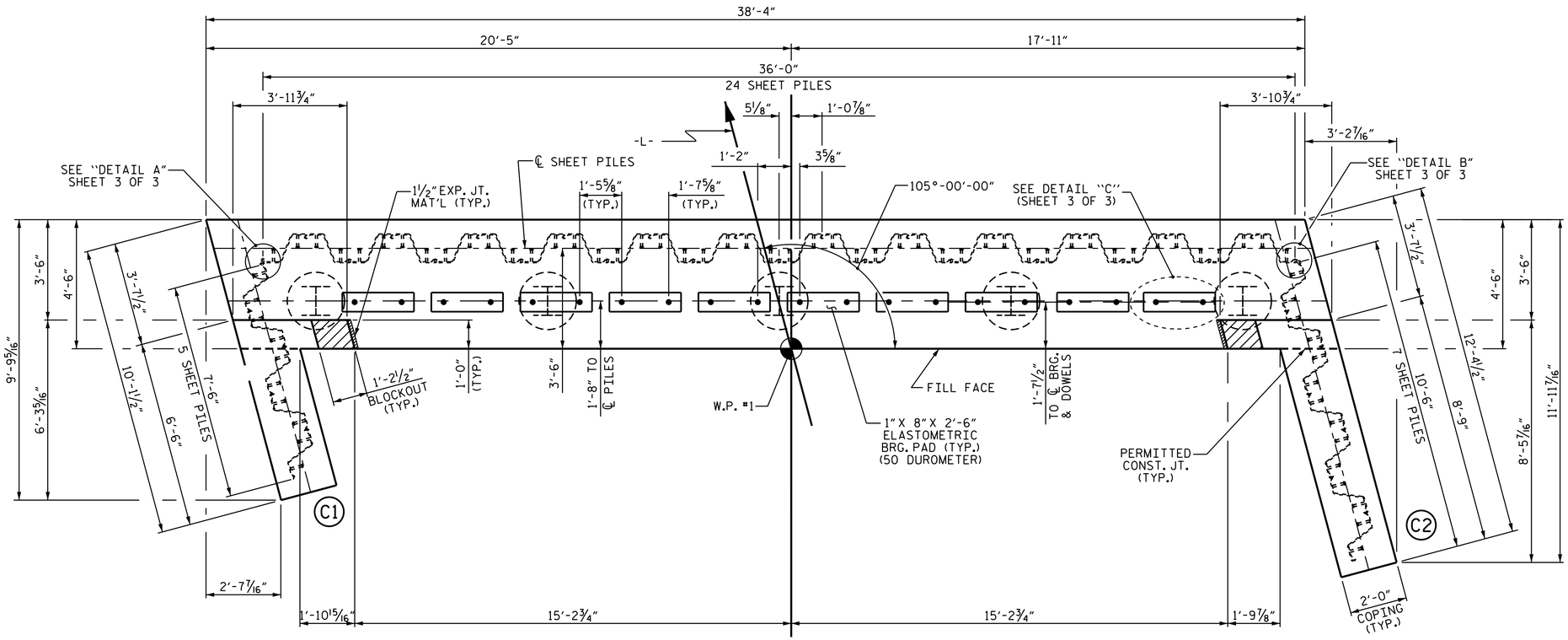
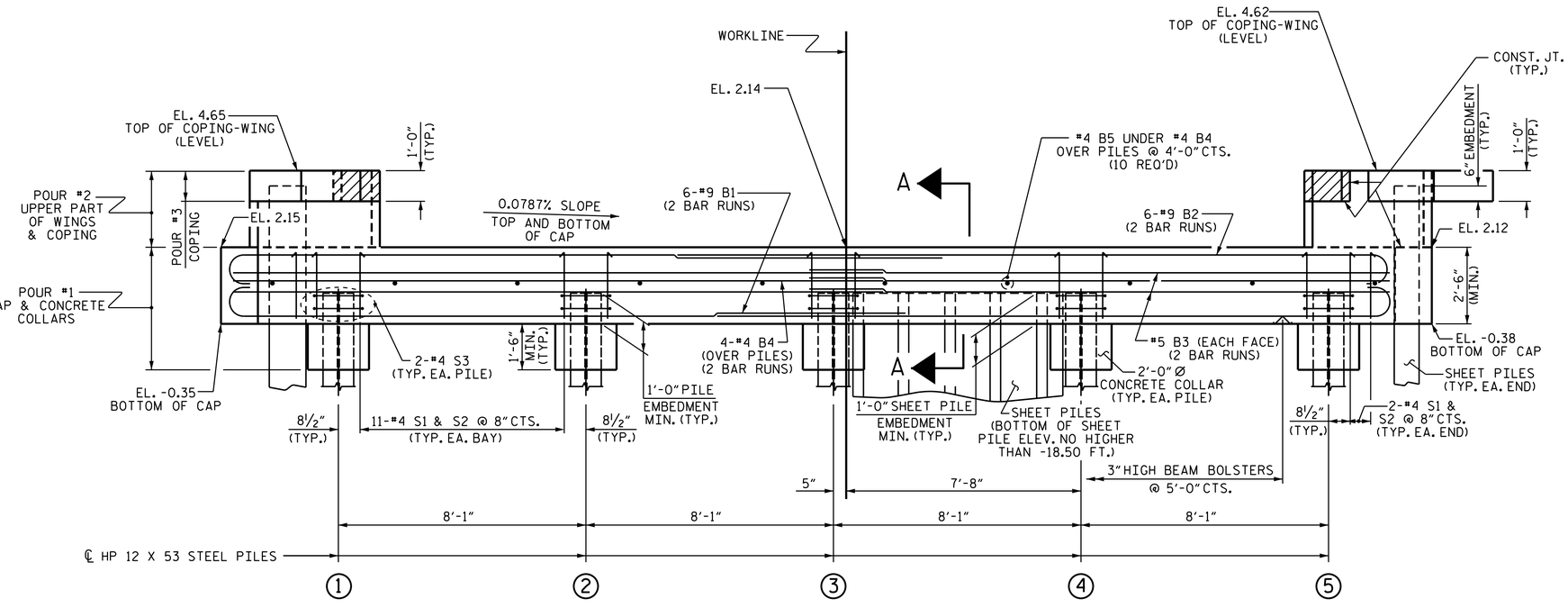
kpaschal

(SHT 2) STD. NO. GRA3



PLAN



ELEVATION

FOR SECTION A-A, SEE SHEET 3 OF 3.
SHEET PILING PARTIALLY OMITTED IN ELEVATION VIEW FOR CLARITY.

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.

INSTALL THE 4" Ø DRAIN PIPE THROUGH THE SHEET PILES AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

ALL 2" Ø MAX. HOLES IN STEEL SHEET PILING TO BE DRILLED AND NOT BURNED.

STEEL SHEET PILES SHALL BE GALVANIZED. FOR STEEL SHEET PILES, SEE SPECIAL PROVISIONS.

THE STEEL SHEET PILING SHALL HAVE A MINIMUM SECTION MODULUS OF 30.2 IN.³/FT.

TOP OF PILE ELEVATIONS	
① THRU ⑤	0.65

PROJECT NO. 17BP.1.R.69

CURRITUCK COUNTY

STATION: 13+95.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F8B6AD6DB2FC48F...

6/8/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			20

DRAWN BY :	R. CAREATHERS	DATE :	5/22/15
CHECKED BY :	N. RUFFIN	DATE :	5/27/15
DESIGN ENGINEER OF RECORD :	K. P. SEDAI	DATE :	6/3/15

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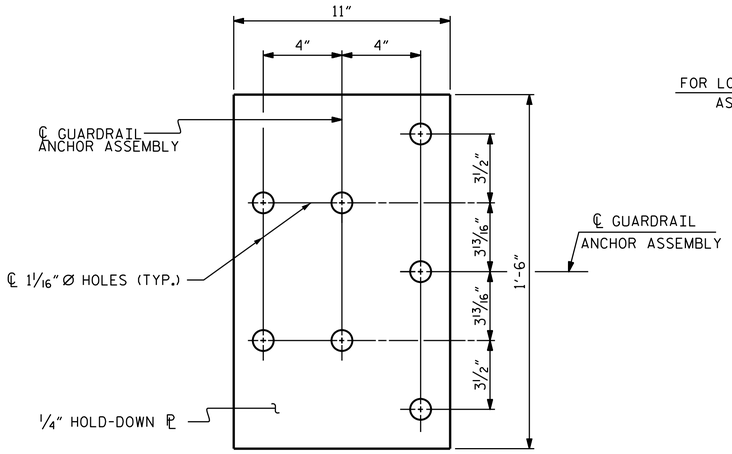
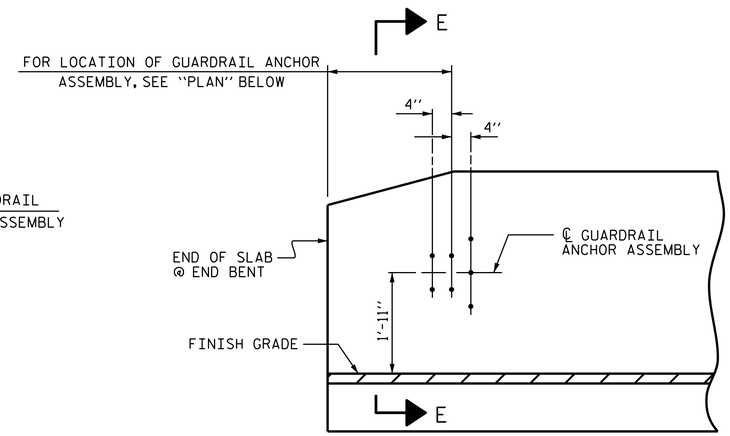
kpaschal



PLAN



ELEVATION

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.)

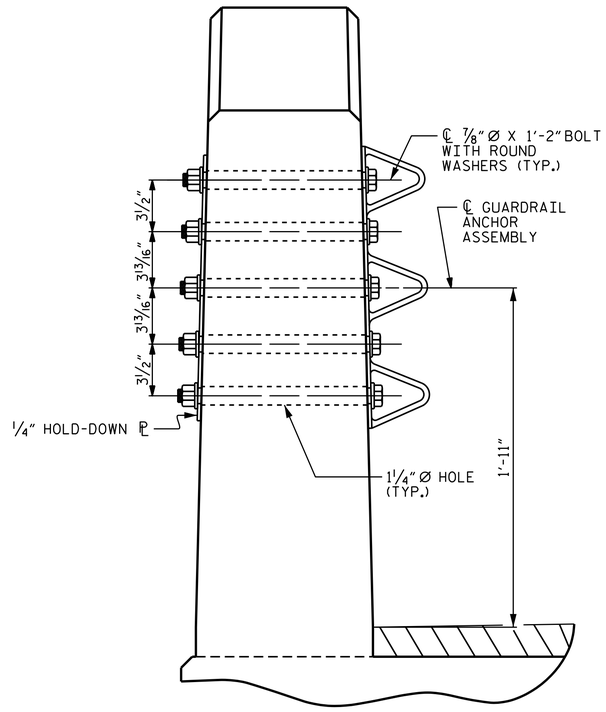
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

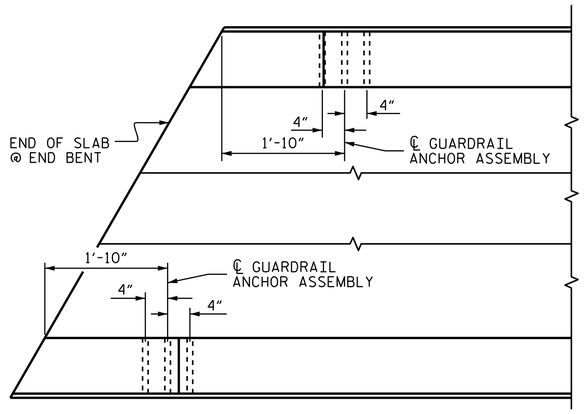
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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.



SECTION E-E

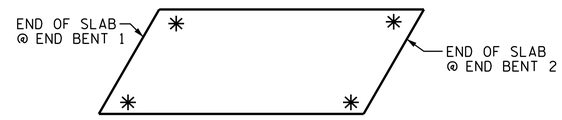
GUARDRAIL ANCHOR ASSEMBLY DETAILS



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. 17BP.1.R.69

CURRITUCK COUNTY

STATION: 13+90.70 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE FOR VERTICAL CONCRETE BARRIER RAIL

ASSEMBLED BY : K. P. SEDAI	DATE : 8/15/14
CHECKED BY : REZA KOUCHEKI	DATE : 8/25/14
DRAWN BY : MAA 5/10	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/10	REV. 12/5/11 MAA/GM
	REV. 6/13 MAA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			20

21-NOV-2014 14:34
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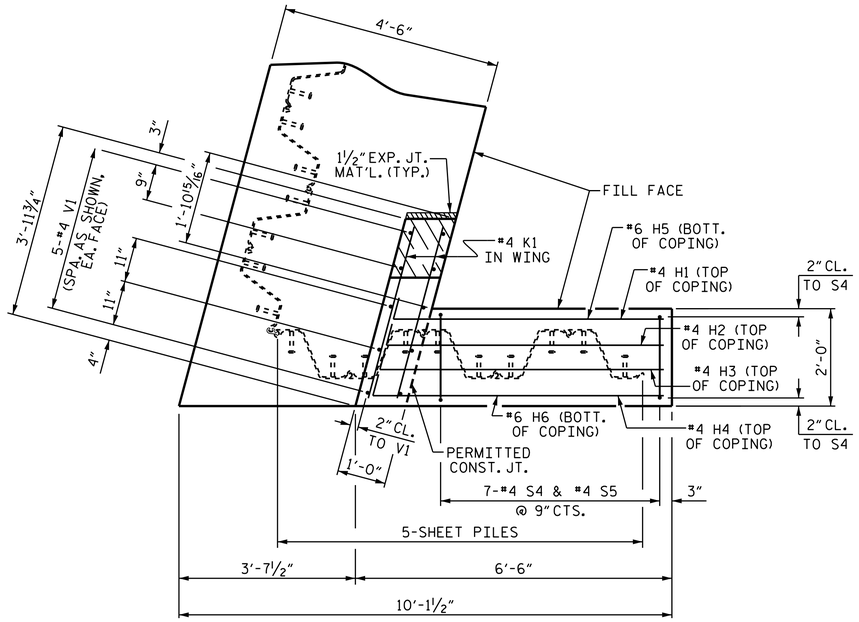
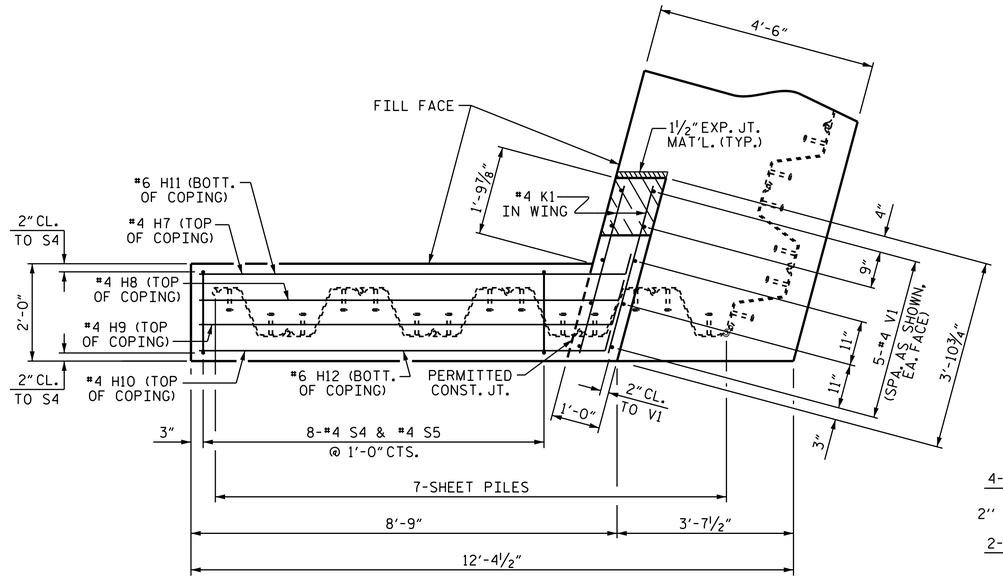
(SHT 2) STD. NO. GRA3



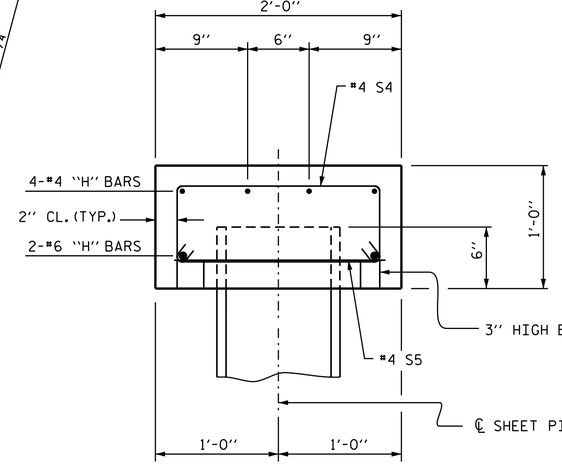
PLAN - COPING (C1)

DRILL 2" Ø MAX. HOLE IN SHEET PILES FOR #9 B1, #4 K1, AND #4 S5 BARS



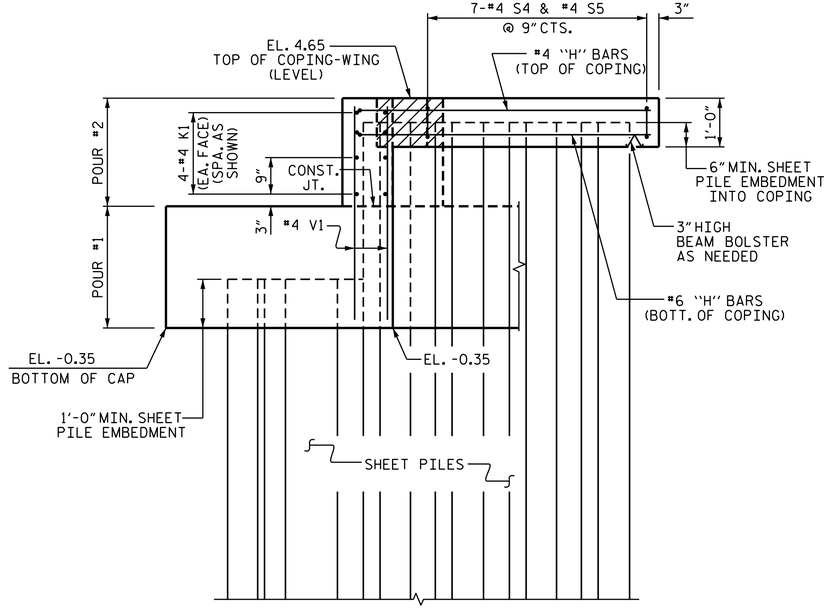
PLAN - COPING (C2)

DRILL 2" Ø MAX. HOLE IN SHEET PILES FOR #9 B1, #4 K1, AND #4 S5 BARS



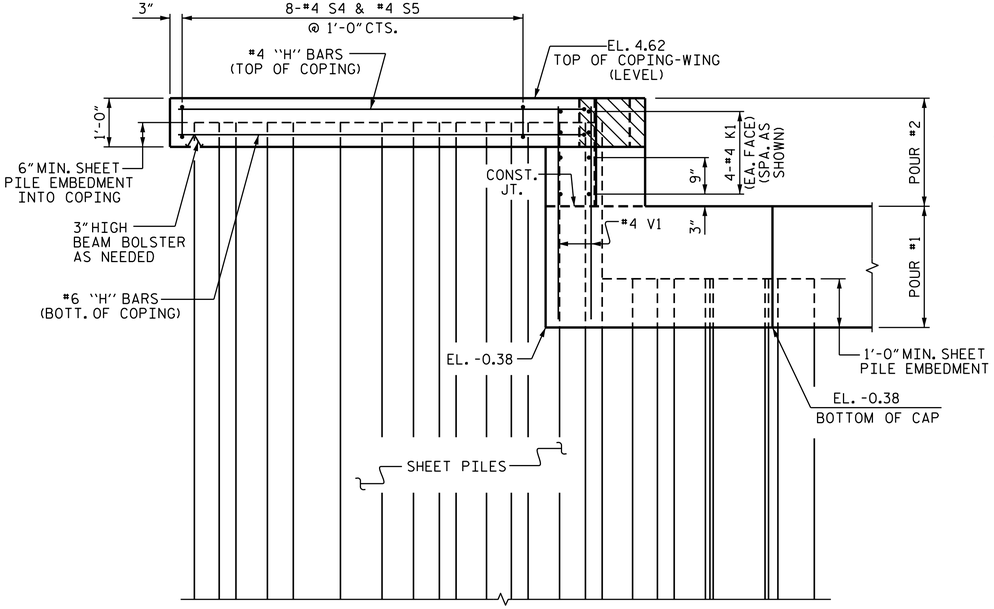
SECTION THRU COPING

DRILL 2" Ø MAX HOLE IN SHEET PILES FOR #4 S5 BAR



ELEVATION - COPING (C1)

DRILL 2" Ø MAX. HOLE IN SHEET PILES FOR #9 B1, #4 K1, AND #4 S5 BARS
"V" BARS MAY BE SHIFTED SLIGHTLY TO AVOID SHEET PILES



ELEVATION - COPING (C2)

DRILL 2" Ø MAX. HOLE IN SHEET PILES FOR #9 B1, #4 K1, AND #4 S5 BARS
"V" BARS MAY BE SHIFTED SLIGHTLY TO AVOID SHEET PILES

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F8B6AD6DB2FC48F...

6/8/2015

PROJECT NO. 17BP.1.R.69

CURRITUCK COUNTY

STATION: 13+95.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : R. CAREATHERS DATE : 5/22/15
CHECKED BY : N. RUFFIN DATE : 5/27/15
DESIGN ENGINEER OF RECORD : K. P. SEDAI DATE : 6/3/15

08-JUN-2015 12:04
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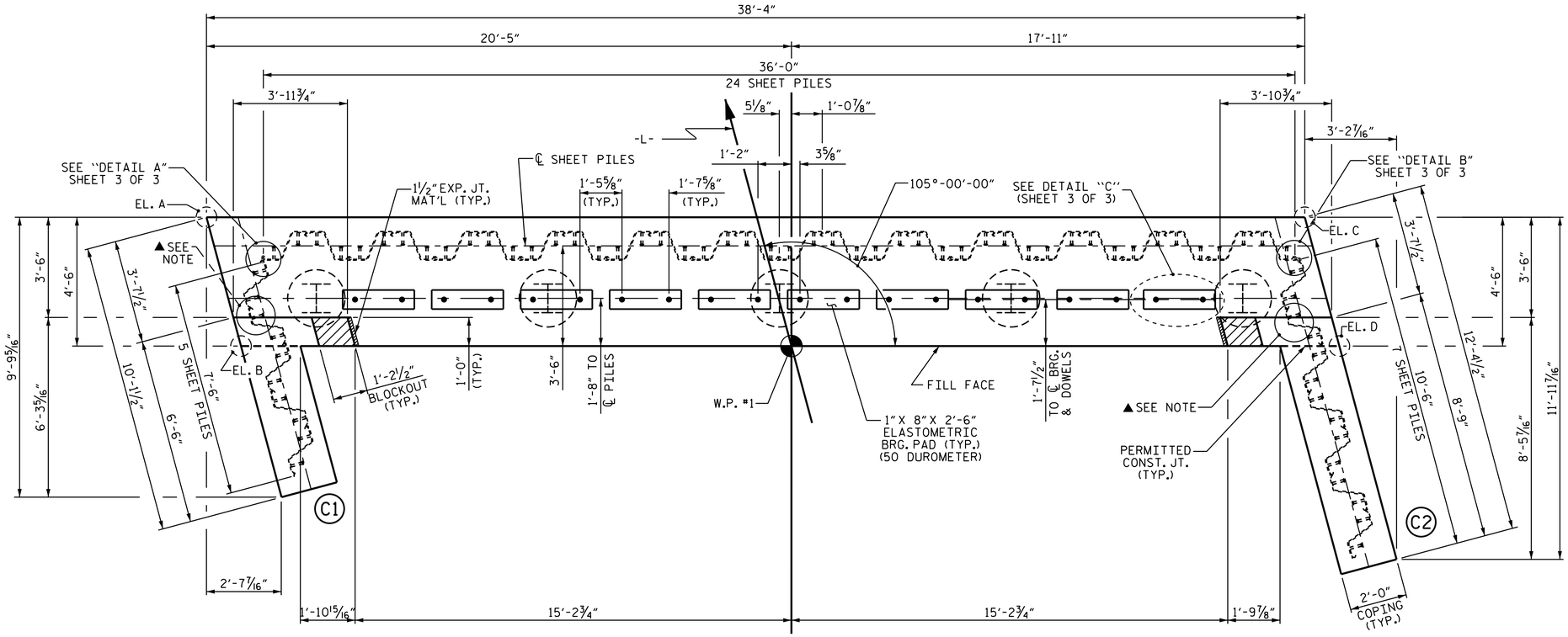
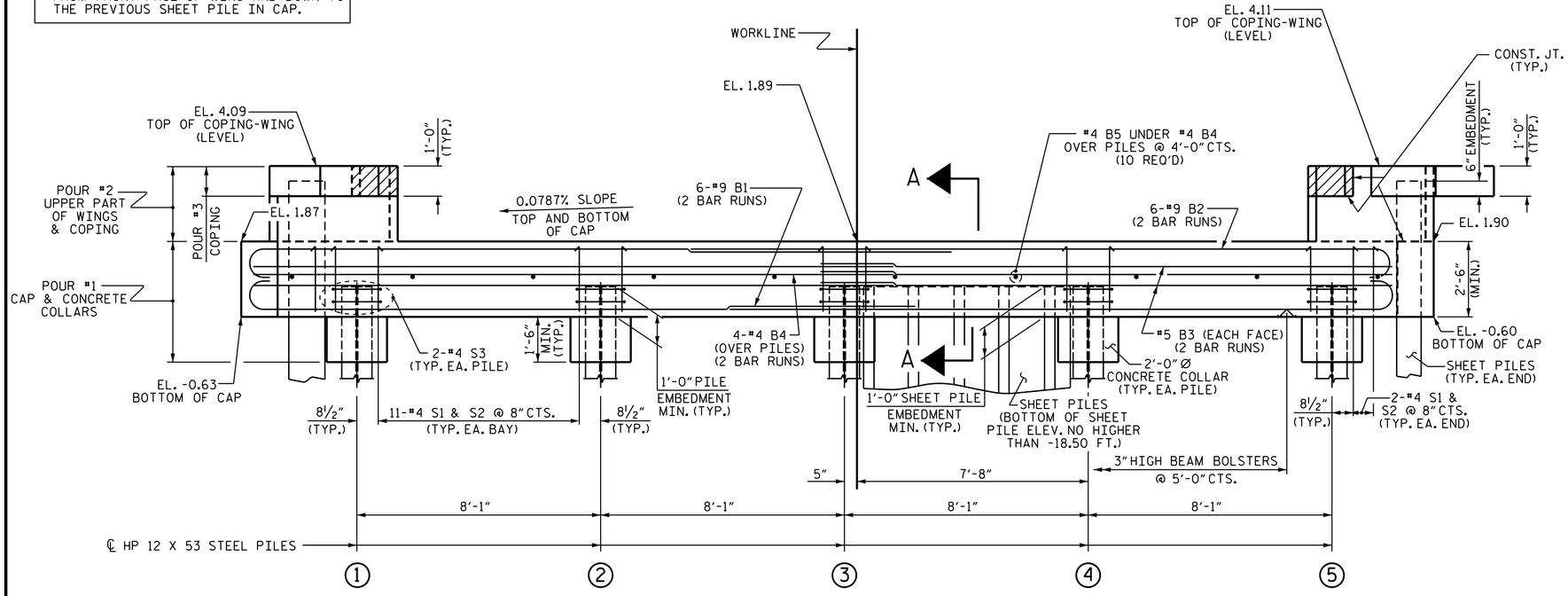
kpaschal



PLAN

▲TOP OF SHEET PILE ELEV. = 3.59 @ C1 AND ELEV. 3.61 @ C2. BOTTOM OF SHEET PILE ELEV. = -18.50. TRIM BACK TO 6" FROM FRONT FACE OF WING AND DOWN TO THE PREVIOUS SHEET PILE IN CAP.



ELEVATION

FOR SECTION A-A, SEE SHEET 3 OF 3.
SHEET PILING PARTIALLY OMITTED IN ELEVATION VIEW FOR CLARITY.

NOTES

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FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

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THE STEEL SHEET PILING SHALL HAVE A MINIMUM SECTION MODULUS OF 30.2 IN.³/FT.

TOP OF CAP ELEVATIONS	
POINT	EL.
Ⓐ	1.87
Ⓑ	1.87
Ⓒ	1.89
Ⓓ	1.90

TOP OF PILE ELEVATIONS	
① THRU ⑤	0.40

PROJECT NO. 17BP.1.R.69
CURRITUCK COUNTY
STATION: 13+90.70 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : K. P. SEDAI DATE : 8/20/14
CHECKED BY : REZA KOUCHEKI DATE : 9/2/14
DESIGN ENGINEER OF RECORD : K. P. SEDAI DATE : 9/3/14

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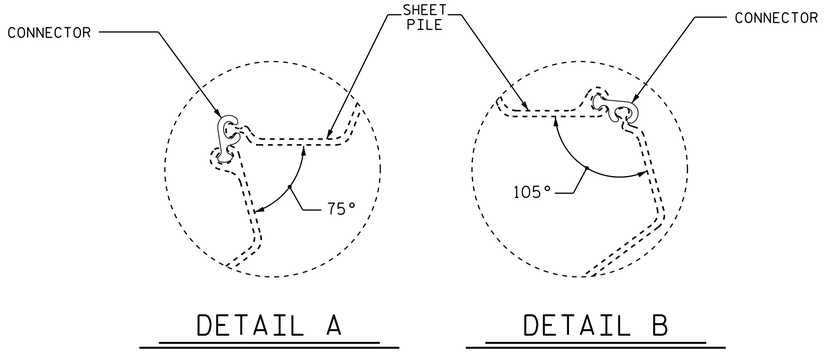
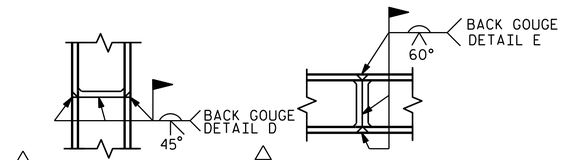


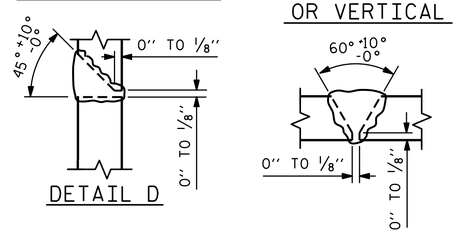
DETAIL A

DETAIL B



△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



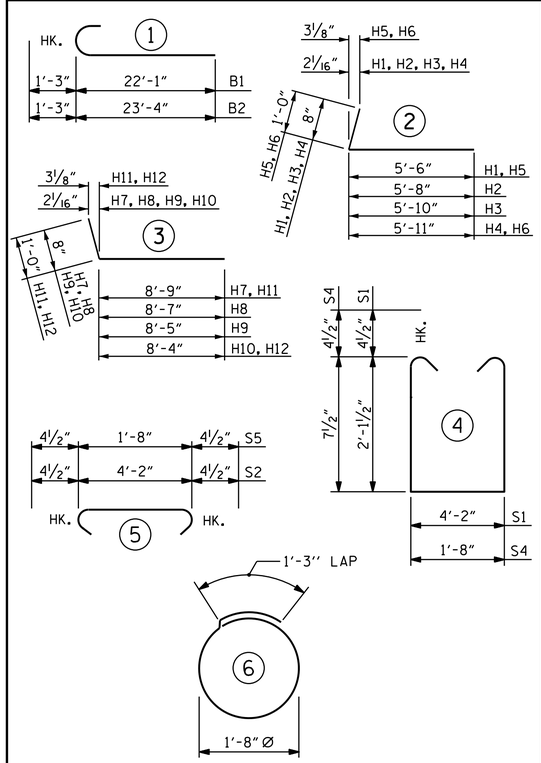
DETAIL D

DETAIL E

△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT No. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	23'-4"	952
B2	12	#9	1	24'-7"	1003
B3	8	#5	STR	20'-6"	171
B4	8	#4	STR	20'-3"	108
B5	10	#4	STR	4'-2"	28
D1	20	#6	STR	1'-6"	45
H1	1	#4	2	6'-2"	4
H2	1	#4	2	6'-4"	4
H3	1	#4	2	6'-6"	4
H4	1	#4	2	6'-7"	4
H5	1	#6	2	6'-6"	10
H6	1	#6	2	6'-11"	10
H7	1	#4	3	9'-5"	6
H8	1	#4	3	9'-3"	6
H9	1	#4	3	9'-1"	6
H10	1	#4	3	9'-0"	6
H11	1	#6	3	9'-9"	15
H12	1	#6	3	9'-4"	14
K1	16	#4	STR	3'-6"	37
S1	48	#4	4	9'-2"	294
S2	48	#4	5	4'-11"	158
S3	10	#4	6	6'-6"	43
S4	15	#4	4	3'-8"	37
S5	15	#4	5	2'-5"	24
V1	20	#4	STR	4'-4"	58

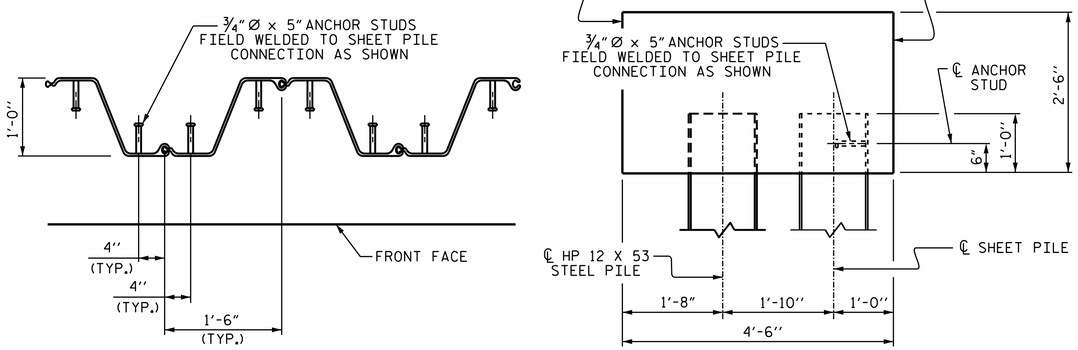
REINFORCING STEEL LBS 3047

CLASS A CONCRETE:

POUR #1: CAP & COLLARS	16.8 C.Y.
POUR #2: UPPER PART OF WINGS	0.6 C.Y.
POUR #3: COPING	1.0 C.Y.
TOTAL	18.4 C.Y.

HP 12 X 53 STEEL PILES
NO: 5 LIN. FT. = 350
PILE REDRIVES EA. 3

STEEL SHEET PILES
NO = 36 SO. FT. 1002
NO. CONNECTOR = 2 SO. FT. 12
TOTAL NO. = 38 SO. FT. 1014



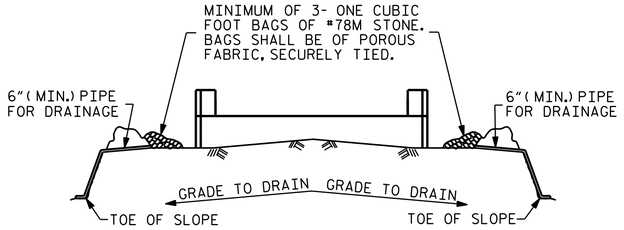
PLAN

SECTION

SPLICE CHART

#9 B1	6'-3"
#9 B2	8'-9"
#5 B3	3'-0"
#4 B4	2'-5"

SHEET PILE ANCHOR STUD DETAILS

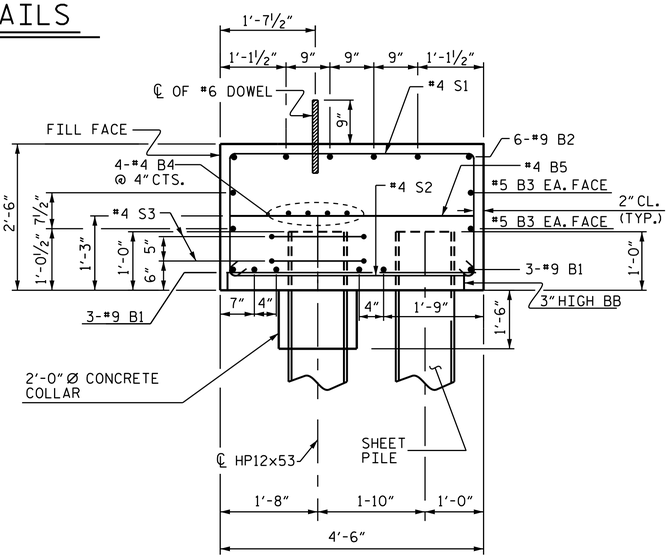


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

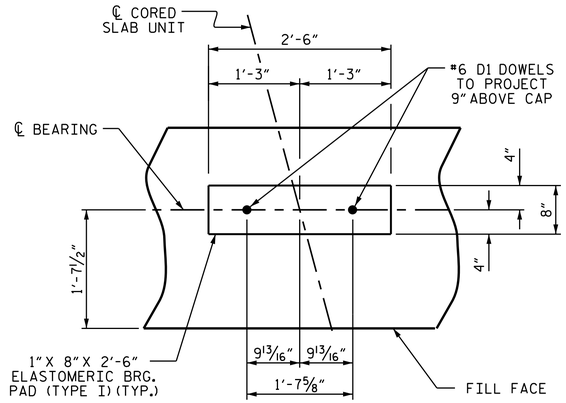
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



SECTION A-A

DRILL 2'' Ø MAX. HOLE IN SHEET PILES FOR #9 B1 AND #5 S2 BARS



DETAIL ''C''

DIMENSIONS FOR EACH BEARING PAD ARE TYPICAL FOR EACH CORED SLAB UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1

PROJECT NO. 17BP.1.R.69
CURRITUCK COUNTY
STATION: 13+95.00 -L-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F8B6AD6DB2FC48F...

6/8/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : R. CAREATHERS DATE : 5/22/15
CHECKED BY : N. RUFFIN DATE : 5/27/15
DESIGN ENGINEER OF RECORD : K. P. SEDAI DATE : 6/3/15

08-JUN-2015 12:04
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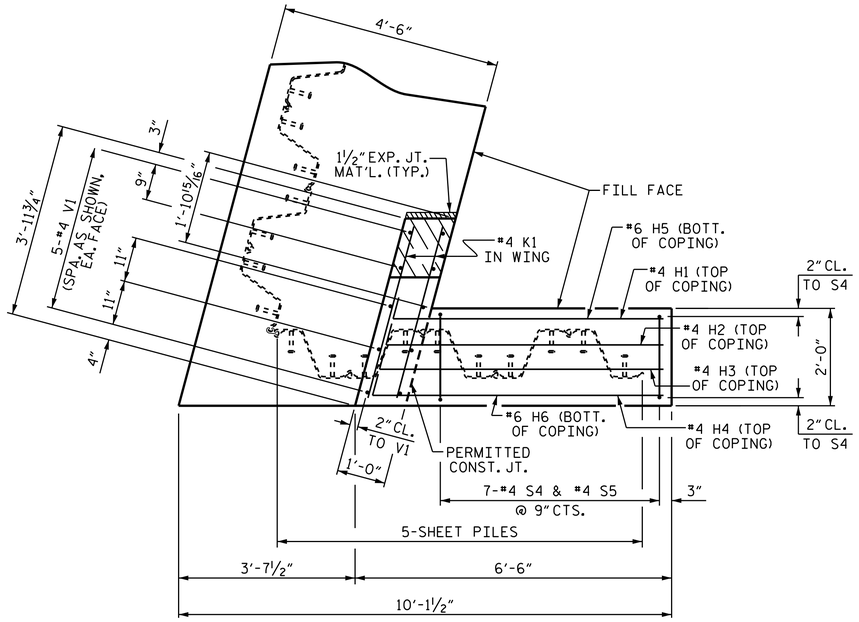
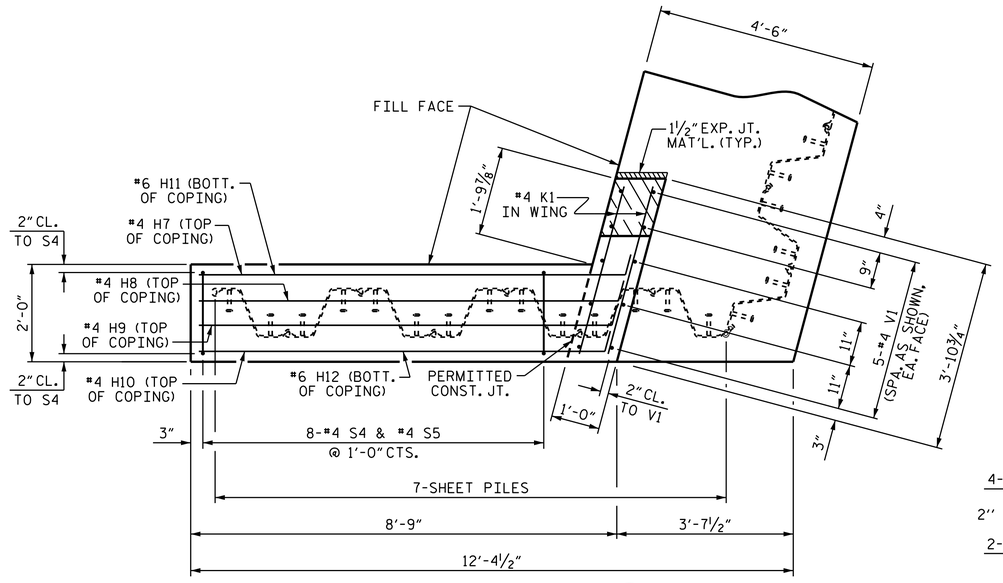
kpaschal



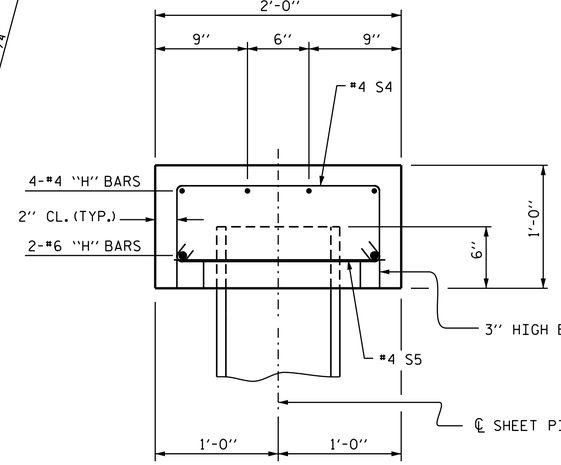
PLAN - COPING (C1)

DRILL 2'' Ø MAX. HOLE IN SHEET PILES FOR #9 B1, #4 K1, AND #4 S5 BARS



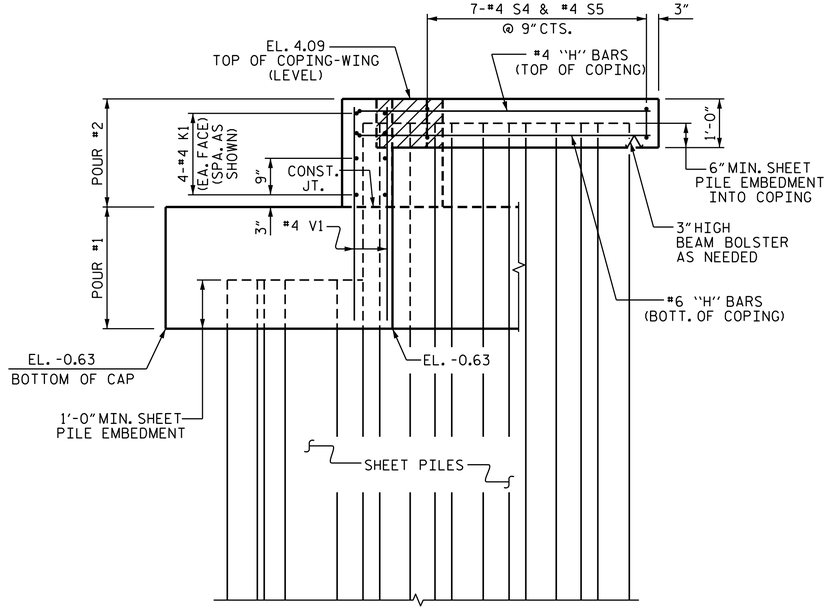
PLAN - COPING (C2)

DRILL 2'' Ø MAX. HOLE IN SHEET PILES FOR #9 B1, #4 K1, AND #4 S5 BARS



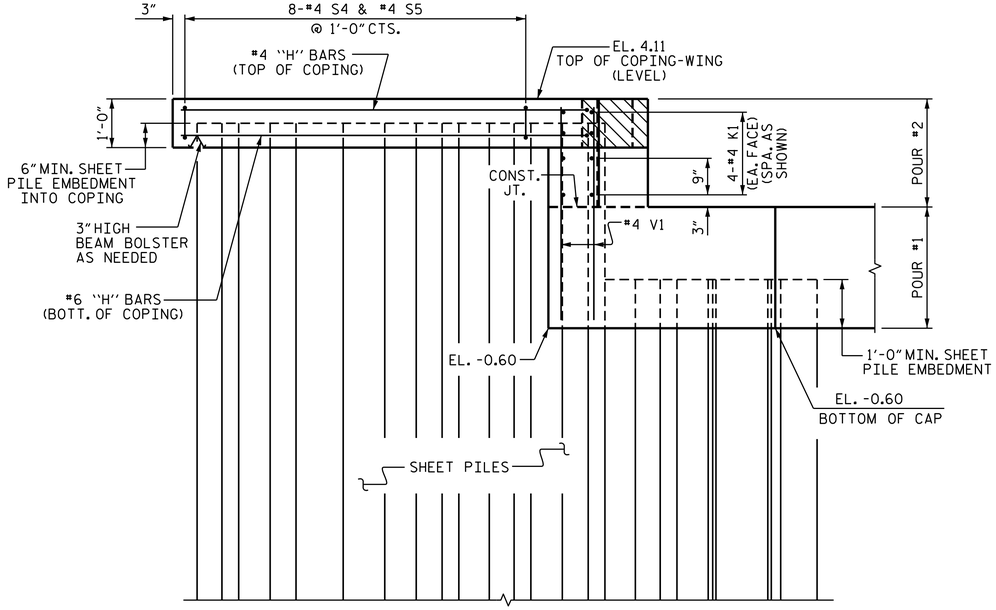
SECTION THRU COPING

DRILL 2'' Ø MAX HOLE IN SHEET PILES FOR #4 S5 BAR



ELEVATION - COPING (C1)

DRILL 2'' Ø MAX. HOLE IN SHEET PILES FOR #9 B1, #4 K1, AND #4 S5 BARS
"V" BARS MAY BE SHIFTED SLIGHTLY TO AVOID SHEET PILES



ELEVATION - COPING (C2)

DRILL 2'' Ø MAX. HOLE IN SHEET PILES FOR #9 B1, #4 K1, AND #4 S5 BARS
"V" BARS MAY BE SHIFTED SLIGHTLY TO AVOID SHEET PILES

PROJECT NO. 17BP.1.R.69

CURRITUCK COUNTY

STATION: 13+90.70 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : K. P. SEDAI DATE : 8/25/14
CHECKED BY : REZA KOUCHEKI DATE : 9/2/14
DESIGN ENGINEER OF RECORD : K. P. SEDAI DATE : 9/3/14

21-NOV-2014 14:34
S:\DPGI\Division1\17BP.1.R.69\Final Plans and Special Provisions\DigitSign\400_000_SD_17BP.1.R.69_S01.dgn
mruffin

NOTES

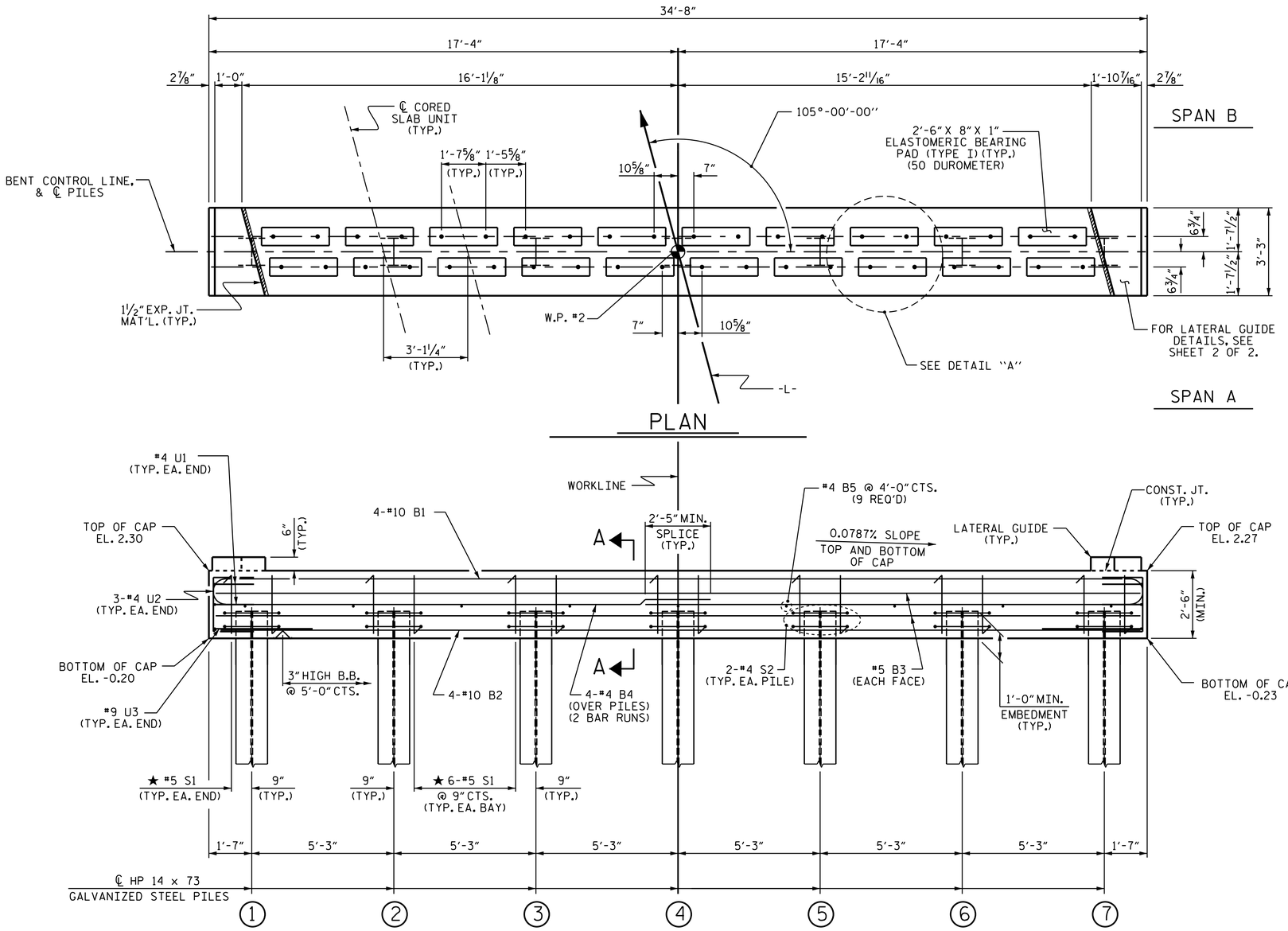
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

★ INVERT ALTERNATE STIRRUPS.

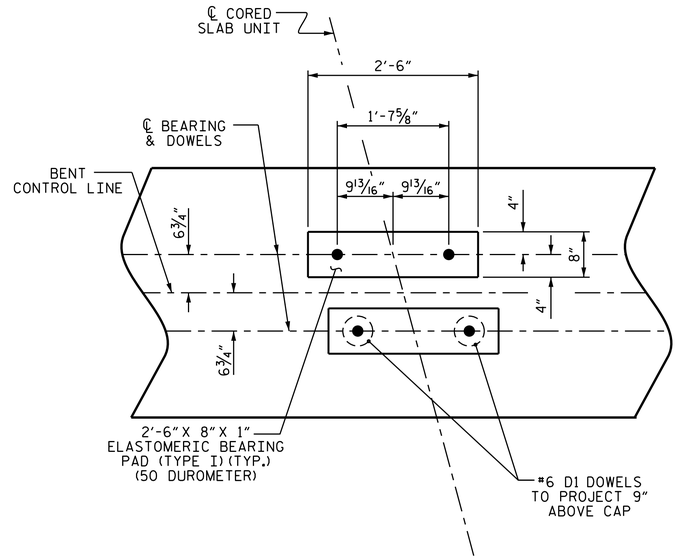
GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 25.0 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.



ELEVATION

FOR SECTION A-A, SEE SHEET 2 OF 2



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

TOP OF PILE ELEVATIONS	
① THRU ⑦	0.80

THE CONTRACTOR MAY CHOOSE PRECAST BENT CAP OVER CAST-IN-PLACE BENT CAP IN ACCORDANCE WITH THE INCLUDED PLANS AT NO ADDITIONAL COST TO THE DEPARTMENT AND THE PAYMENT WILL BE MADE AT THE CONTRACT PRICES BID FOR ITEMS ASSOCIATED WITH THE CAST-IN-PLACE BENT CAP.

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F886AD6DB2FC48F...

6/8/2015

PROJECT NO. 17BP.1.R.69

CURRITUCK COUNTY

STATION: 13+95.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			20

ASSEMBLED BY : R. CAREATHERS	DATE : 5/22/15
CHECKED BY : N. RUFFIN	DATE : 5/27/15
DRAWN BY : DGE 5/10	
CHECKED BY : MKT 5/10	

08-JUN-2015 12:04
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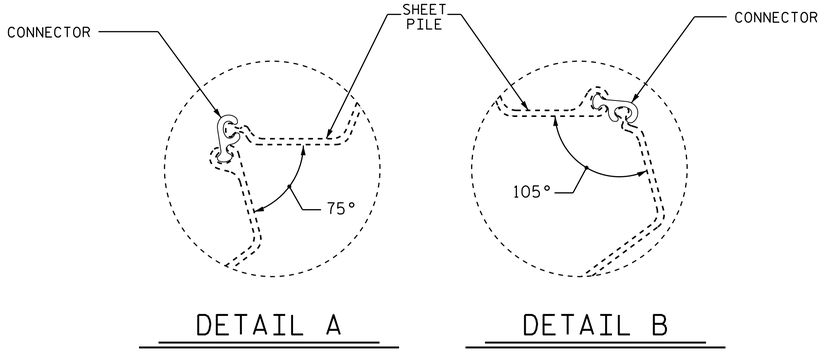
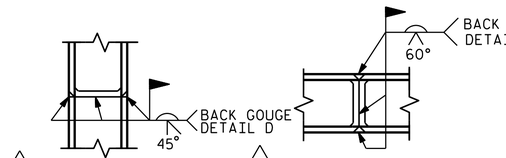
kpaschal

STD. NO. 14" HP_BT_30_105S_<60'



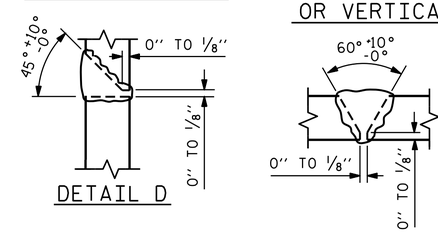
DETAIL A

DETAIL B



△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



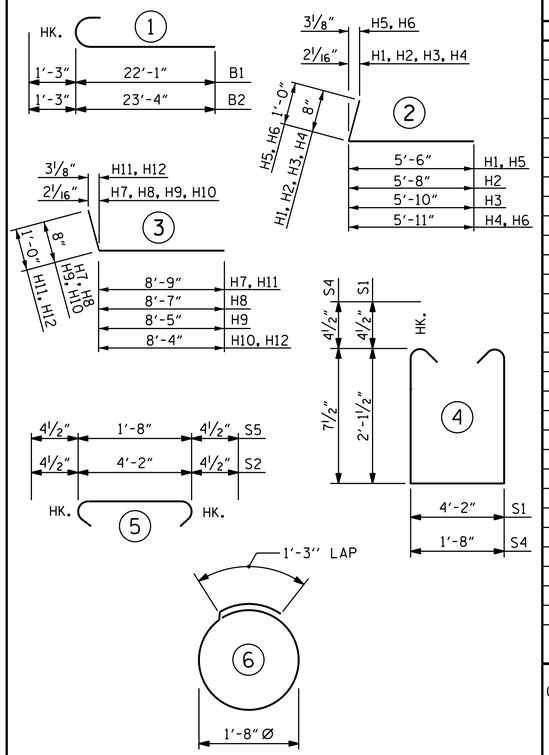
DETAIL D

DETAIL E

△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT No. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	23'-4"	952
B2	12	#9	1	24'-7"	1003
B3	8	#5	STR	20'-6"	171
B4	8	#4	STR	20'-3"	108
B5	10	#4	STR	4'-2"	28
D1	20	#6	STR	1'-6"	45
H1	1	#4	2	6'-2"	4
H2	1	#4	2	6'-4"	4
H3	1	#4	2	6'-6"	4
H4	1	#4	2	6'-7"	4
H5	1	#6	2	6'-6"	10
H6	1	#6	2	6'-11"	10
H7	1	#4	3	9'-5"	6
H8	1	#4	3	9'-3"	6
H9	1	#4	3	9'-1"	6
H10	1	#4	3	9'-0"	6
H11	1	#6	3	9'-9"	15
H12	1	#6	3	9'-4"	14
K1	16	#4	STR	3'-6"	37
S1	48	#4	4	9'-2"	294
S2	48	#4	5	4'-11"	158
S3	10	#4	6	6'-6"	43
S4	15	#4	4	3'-8"	37
S5	15	#4	5	2'-5"	24
V1	20	#4	STR	4'-4"	58

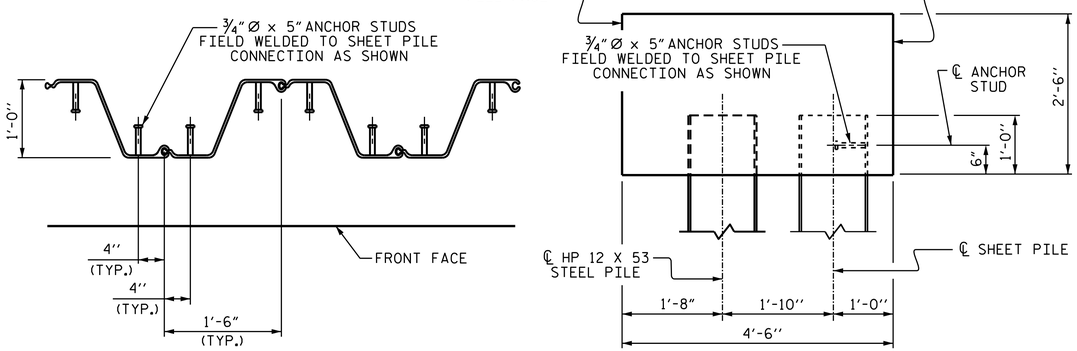
REINFORCING STEEL LBS 3047

CLASS A CONCRETE:

POUR #1: CAP & COLLARS	16.8 C.Y.
POUR #2: UPPER PART OF WINGS	0.6 C.Y.
POUR #3: COPING	1.0 C.Y.
TOTAL	18.4 C.Y.

HP 12 X 53 STEEL PILES
NO: 5 LIN. FT. = 350
PILE REDRIVES EA. 3

STEEL SHEET PILES
NO = 36 SO. FT. 1002
NO. CONNECTOR = 2 SO. FT. 12
TOTAL NO. = 38 SO. FT. 1014

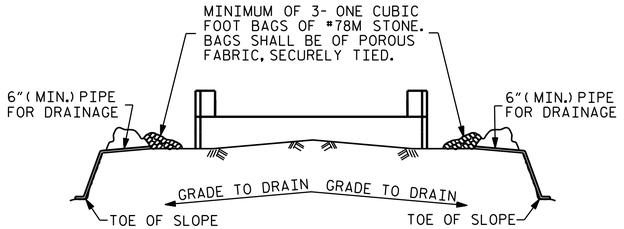


PLAN

SECTION

SPLICE CHART	
#9 B1	6'-3"
#9 B2	8'-9"
#5 B3	3'-0"
#4 B4	2'-5"

SHEET PILE ANCHOR STUD DETAILS

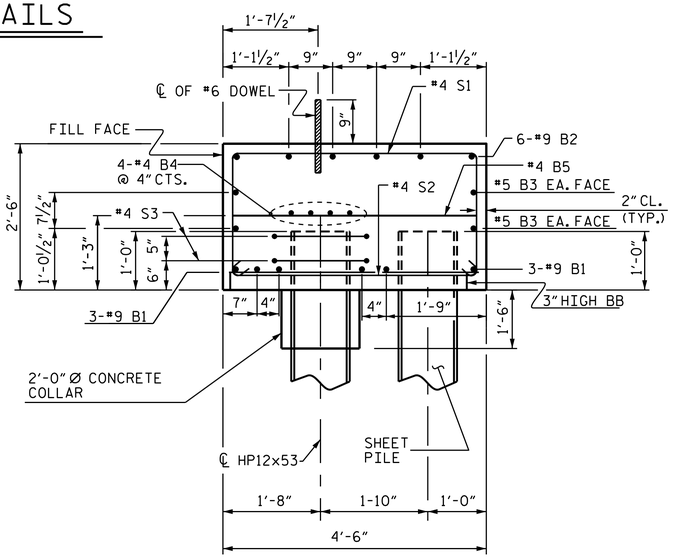


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

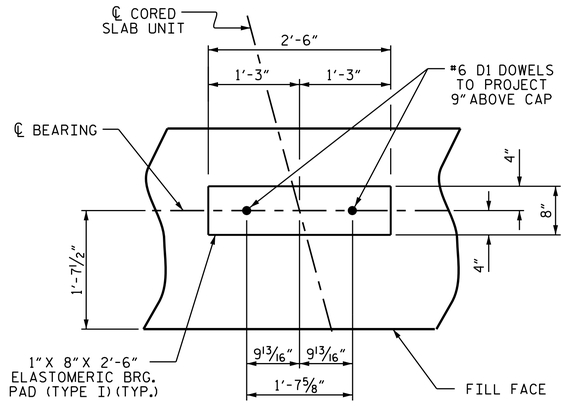
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



SECTION A-A

DRILL 2" Ø MAX. HOLE IN SHEET PILES FOR #9 B1 AND #5 S2 BARS



DETAIL "C"

DIMENSIONS FOR EACH BEARING PAD ARE TYPICAL FOR EACH CORED SLAB UNIT

PROJECT NO. 17BP.1.R.69

CURRITUCK COUNTY

STATION: 13+90.70 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : K. P. SEDAI DATE : 8/25/14
CHECKED BY : REZA KOUCHEKI DATE : 9/2/14
DESIGN ENGINEER OF RECORD : K. P. SEDAI DATE : 9/3/14

21-NOV-2014 14:34
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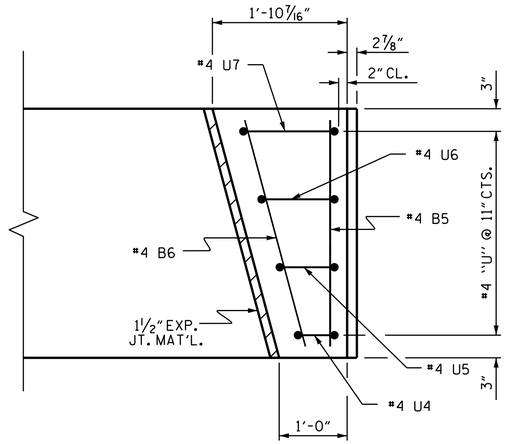
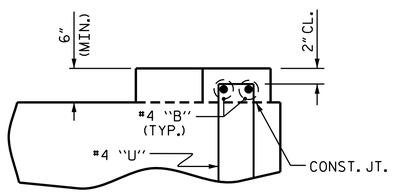


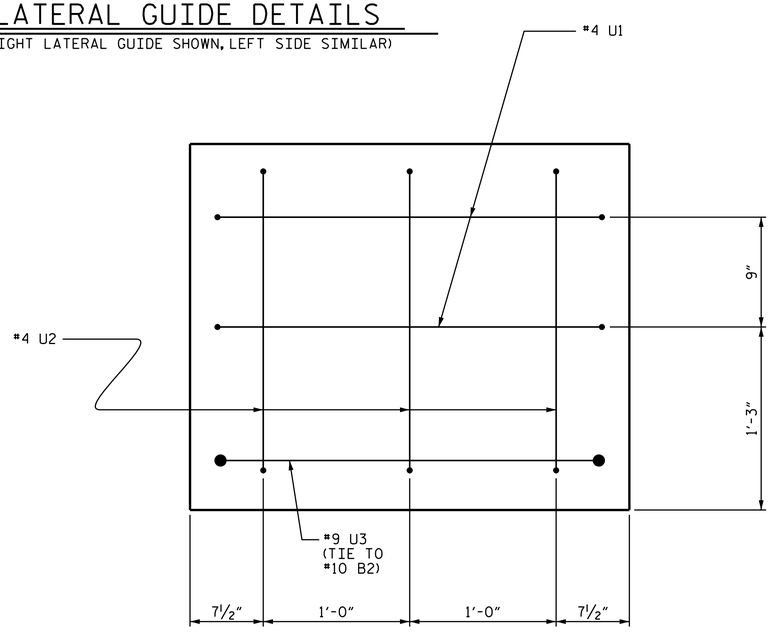
PLAN



ELEVATION

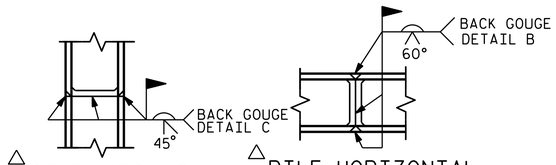
LATERAL GUIDE DETAILS

(RIGHT LATERAL GUIDE SHOWN, LEFT SIDE SIMILAR)



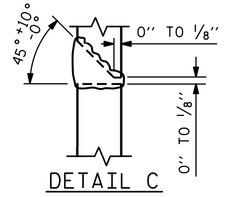
END OF CAP VIEW

(TYPICAL BOTH ENDS)

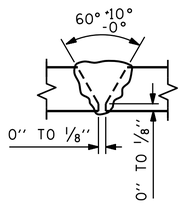


△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



DETAIL C

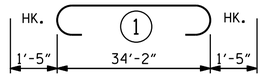


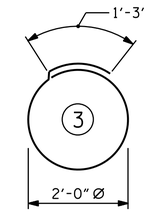
DETAIL B

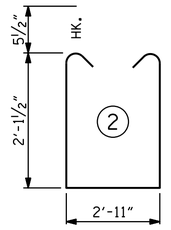
△ POSITION OF PILE DURING WELDING.

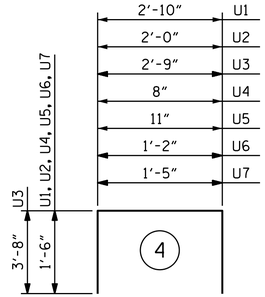
PILE SPLICE DETAILS

BAR TYPES

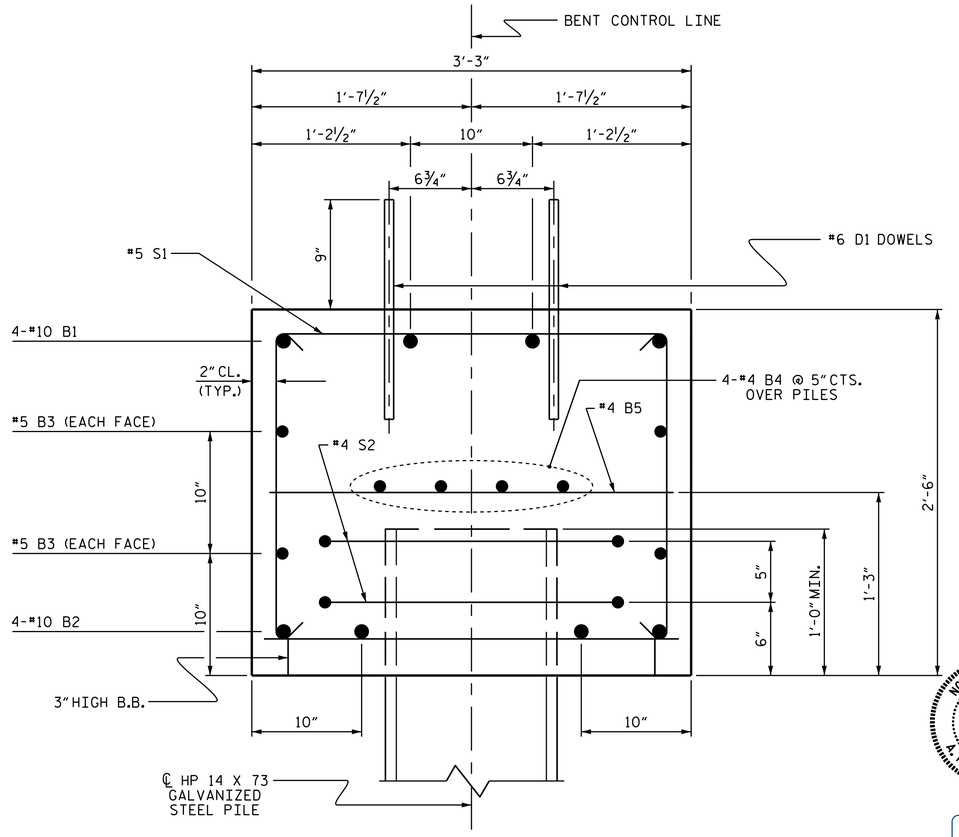








ALL BAR DIMENSIONS ARE OUT TO OUT.



SECTION A-A

BILL OF MATERIAL

FOR ONE BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	37'-0"	637
B2	4	#10	STR	34'-4"	591
B3	4	#5	STR	34'-4"	143
B4	8	#4	STR	18'-5"	98
B5	11	#4	STR	2'-11"	21
B6	2	#4	STR	3'-0"	4
D1	40	#6	STR	1'-6"	90
S1	38	#5	2	8'-1"	320
S2	14	#4	3	7'-7"	71
U1	4	#4	4	5'-10"	16
U2	6	#4	4	5'-0"	20
U3	2	#9	4	10'-1"	69
U4	2	#4	4	3'-8"	5
U5	2	#4	4	3'-11"	5
U6	2	#4	4	4'-2"	6
U7	2	#4	4	4'-5"	6

REINFORCING STEEL (FOR ONE BENT) 2102 LBS

CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)

POUR #1 (CAP)	10.4 C.Y.
POUR #2 (LATERAL GUIDES)	0.2 C.Y.
TOTAL CLASS A CONCRETE	10.6 C.Y.

HP 14 X 73 GALVANIZED STEEL PILES (FOR ONE BENT)

No. 7	LIN. FT.	525
PILE REDRIVES	EA.	4

PROJECT NO. 17BP.1.R.69

CURRITUCK COUNTY

STATION: 13+95.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F8B6AD6DB2FC48F...

6/8/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : R. CAREATHERS DATE : 5/22/15
CHECKED BY : N. RUFFIN DATE : 5/27/15

DRAWN BY : DGE 05/10
CHECKED BY : MKT 05/10

08-JUN-2015 12:04
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kpaschal

STD. NO. 14"HP_BT_30_105S_<60'

NOTES

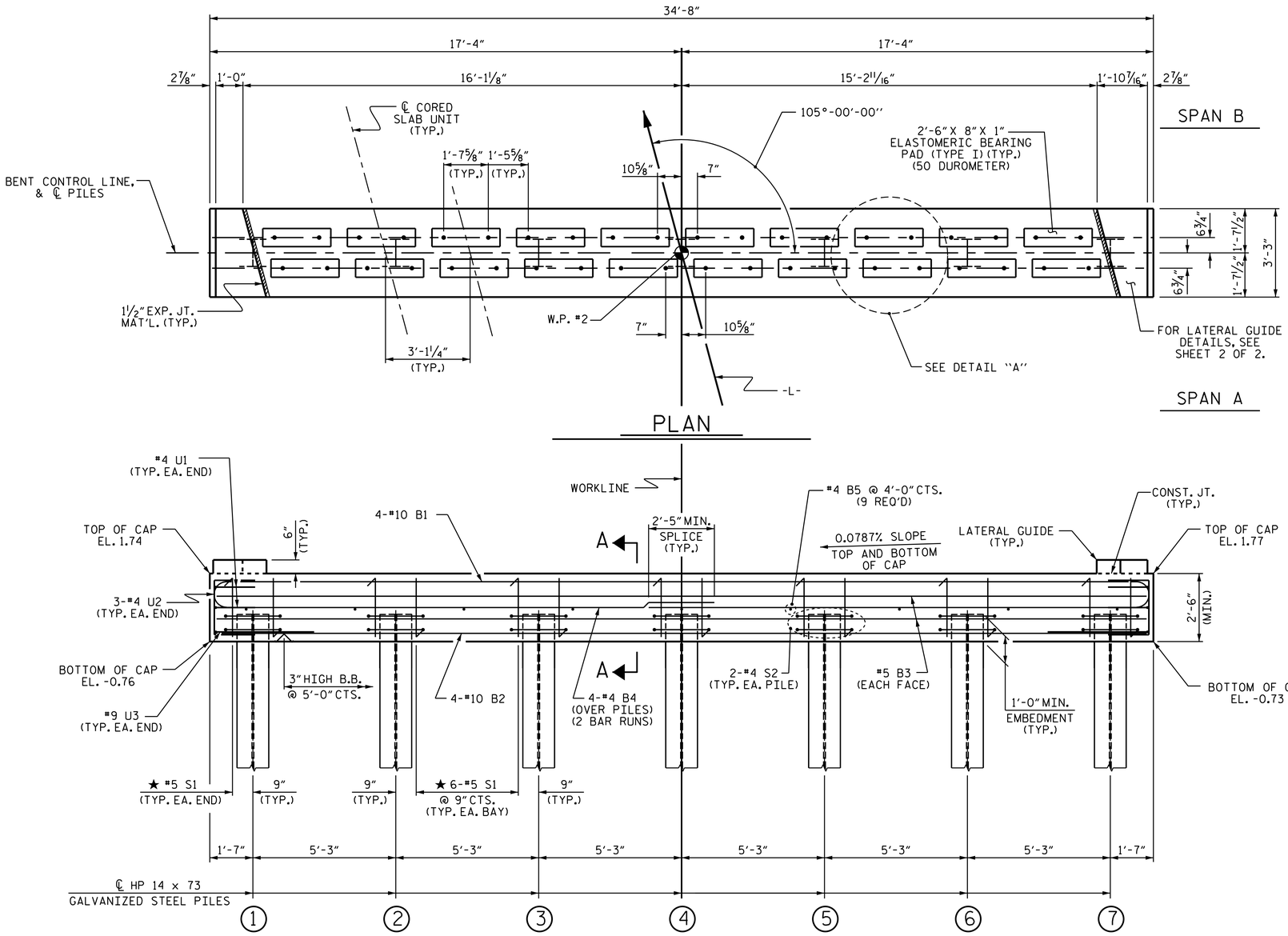
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

★ INVERT ALTERNATE STIRRUPS.

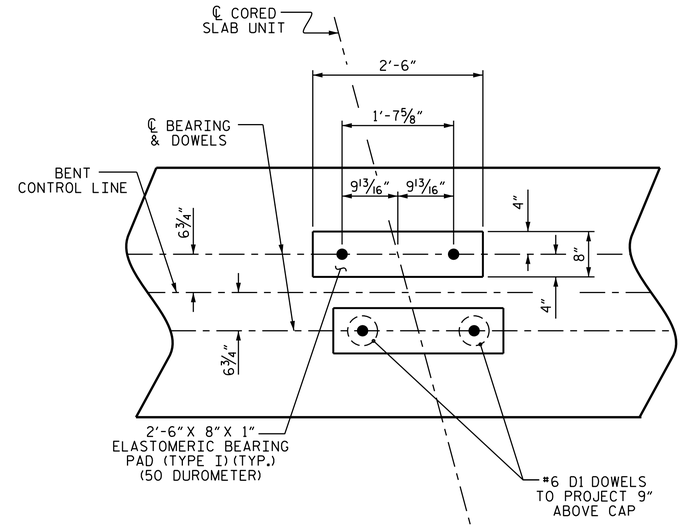
GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 25.0 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.



ELEVATION

FOR SECTION A-A, SEE SHEET 2 OF 2



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

TOP OF PILE ELEVATIONS	
① THRU ⑦	0.27

THE CONTRACTOR MAY CHOOSE PRECAST BENT CAP OVER CAST-IN-PLACE BENT CAP IN ACCORDANCE WITH THE INCLUDED PLANS AT NO ADDITIONAL COST TO THE DEPARTMENT AND THE PAYMENT WILL BE MADE AT THE CONTRACT PRICES BID FOR ITEMS ASSOCIATED WITH THE CAST-IN-PLACE BENT CAP.

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

PROJECT NO. 17BP.1.R.69

CURRITUCK COUNTY

STATION: 13+90.70 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			20

ASSEMBLED BY : K. P. SEDAI DATE : 8/12/14
CHECKED BY : REZA KOUCHEKI DATE : 8/18/14

DRAWN BY : DGE 5/10
CHECKED BY : MKT 5/10

21-NOV-2014 14:34
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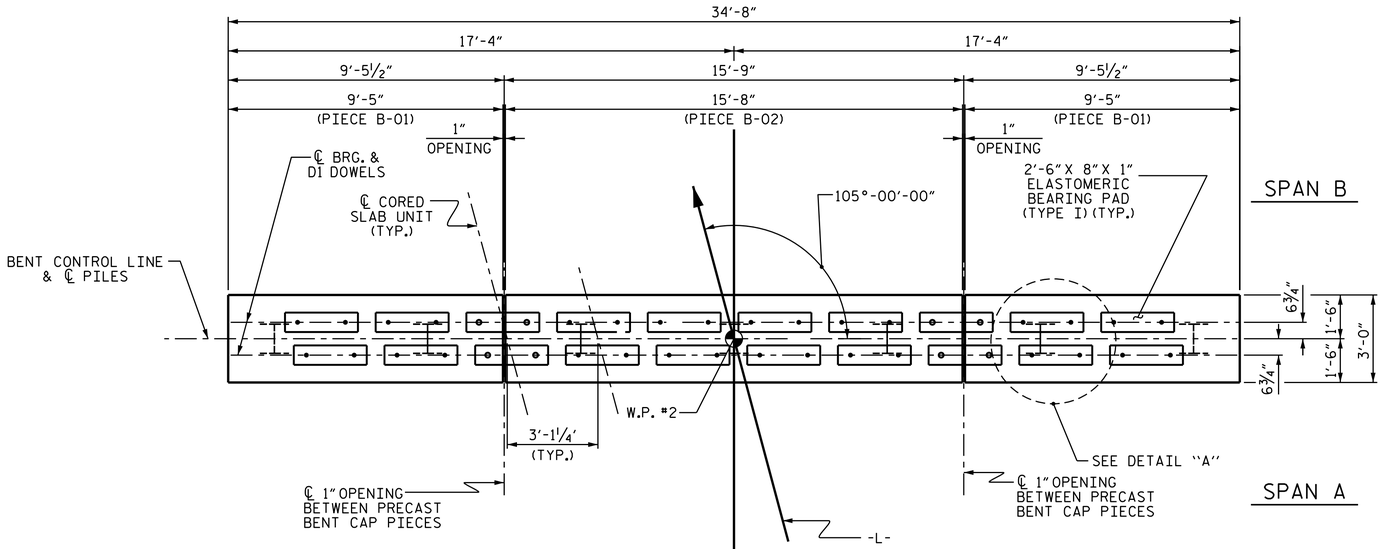
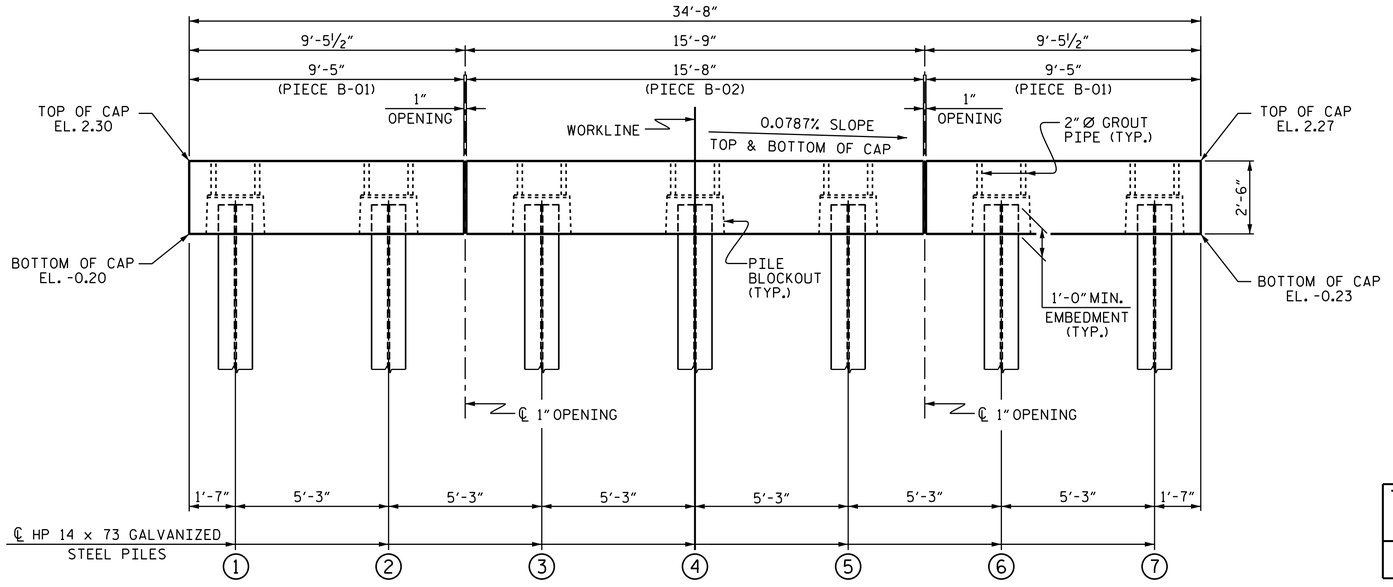
mruffin

STD. NO. 14"HP_BT_30_105S_<60'



PLAN

(PILE BLOCKOUTS AND GROUT PIPES NOT SHOWN FOR CLARITY)



ELEVATION

FOR 2"Ø GROUT PIPE AND PILE BLOCKOUT DETAILS, SEE SHEET 4 OF 4

TOP OF PILE ELEVATIONS	
① THRU ⑦	0.80

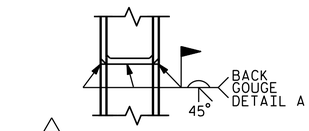
NOTES

FOR PRECAST CAP DETAILS AND BILL OF MATERIAL, SEE "PIECE B-01" & "PIECE B-02" SHEETS.

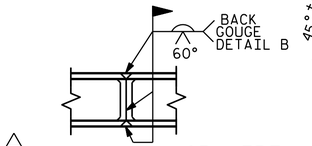
GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 25.0 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

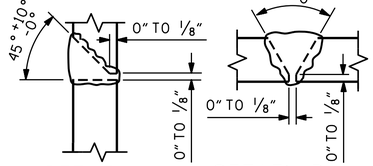
FOR 3'-0" x 2'-6" PRESTRESSED CONCRETE BENT CAPS, SEE SPECIAL PROVISIONS.



△ PILE VERTICAL



△ PILE HORIZ. OR VERT.



DETAIL A DETAIL B

PILE SPLICE DETAILS

△ POSITION OF PILE DURING WELDING.

DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. 17BP.1.R.69

CURRITUCK COUNTY

STATION: 13+95.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT No. 1
(OPTIONAL PRECAST)

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F8B6AD6DB2FC48F...

6/8/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			20

ASSEMBLED BY : R. CAREATHERS	DATE : 5/22/15
CHECKED BY : N. RUFFIN	DATE : 5/27/15
DRAWN BY : MAA 3/12	
CHECKED BY : SHS 6/12	

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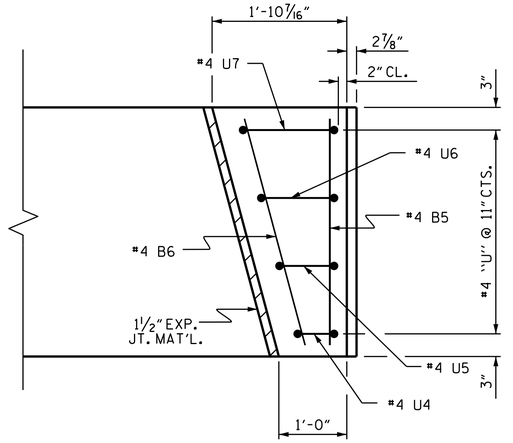
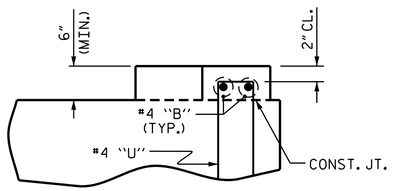
kpaschal

STD. NO. 14"HP_PSBT_30_105S_<60'



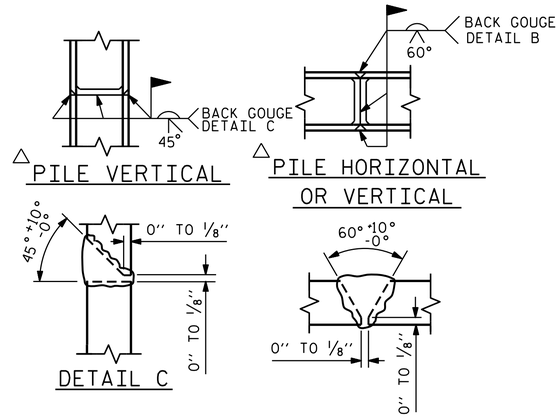
PLAN



ELEVATION

LATERAL GUIDE DETAILS

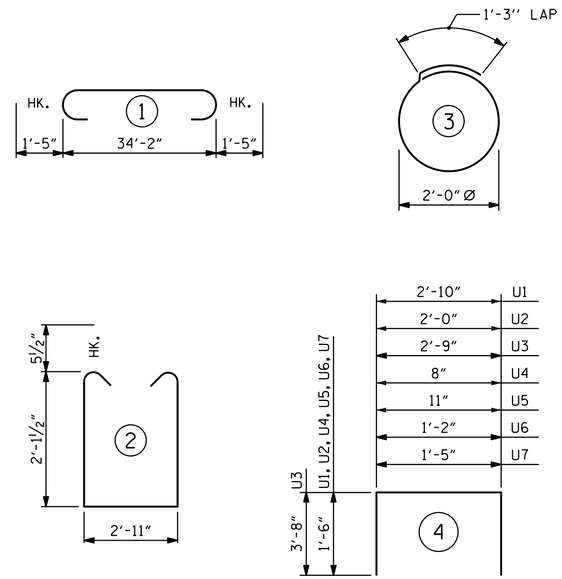
(RIGHT LATERAL GUIDE SHOWN, LEFT SIDE SIMILAR)



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR ONE BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	37'-0"	637
B2	4	#10	STR	34'-4"	591
B3	4	#5	STR	34'-4"	143
B4	8	#4	STR	18'-5"	98
B5	11	#4	STR	2'-11"	21
B6	2	#4	STR	3'-0"	4
D1	40	#6	STR	1'-6"	90
S1	38	#5	2	8'-1"	320
S2	14	#4	3	7'-7"	71
U1	4	#4	4	5'-10"	16
U2	6	#4	4	5'-0"	20
U3	2	#9	4	10'-1"	69
U4	2	#4	4	3'-8"	5
U5	2	#4	4	3'-11"	5
U6	2	#4	4	4'-2"	6
U7	2	#4	4	4'-5"	6

REINFORCING STEEL (FOR ONE BENT) 2102 LBS

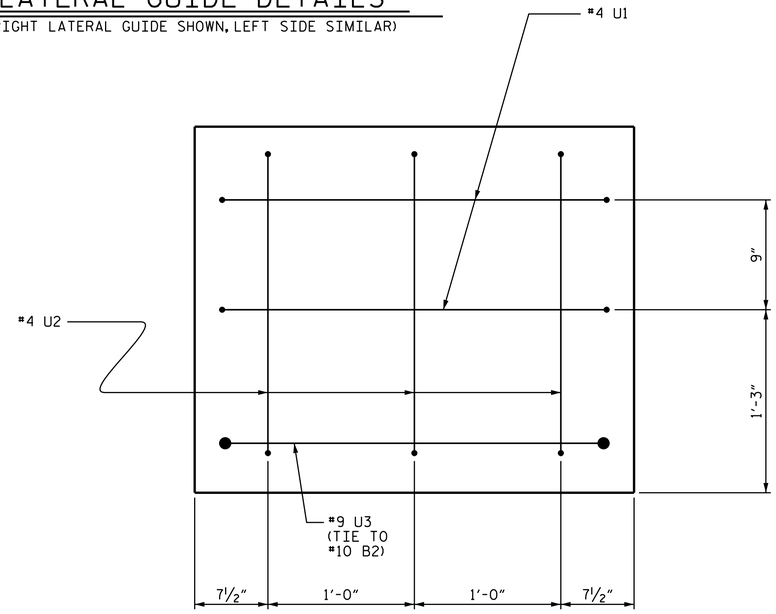
CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)

POUR #1 (CAP)	10.4 C.Y.
POUR #2 (LATERAL GUIDES)	0.2 C.Y.
TOTAL CLASS A CONCRETE	10.6 C.Y.

HP 14 X 73 GALVANIZED STEEL PILES (FOR ONE BENT)

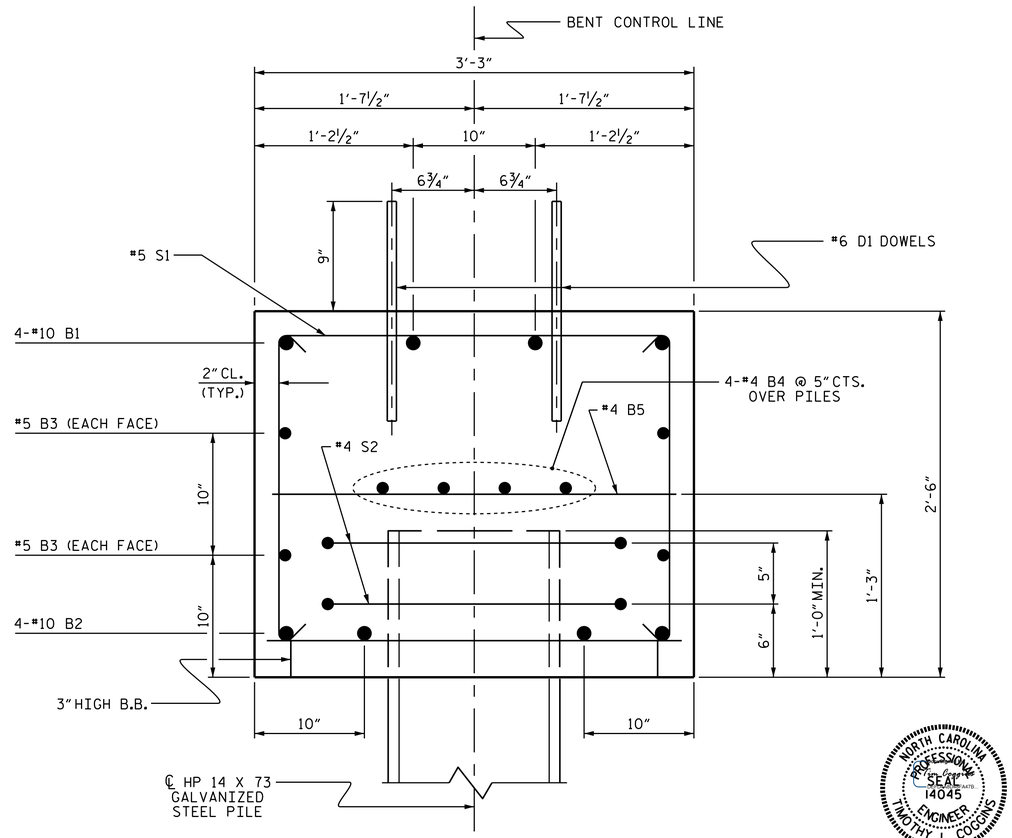
No. 7 LIN. FT. 525

PILE REDRIVES EA. 4



END OF CAP VIEW

(TYPICAL BOTH ENDS)



SECTION A-A

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

PROJECT NO. 17BP.1.R.69

CURRITUCK COUNTY

STATION: 13+90.70 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : K. P. SEDAI DATE : 8/12/14
CHECKED BY : REZA KOUCHEKI DATE : 8/25/14

DRAWN BY : DGE 05/10
CHECKED BY : MKT 05/10

21-NOV-2014 14:34
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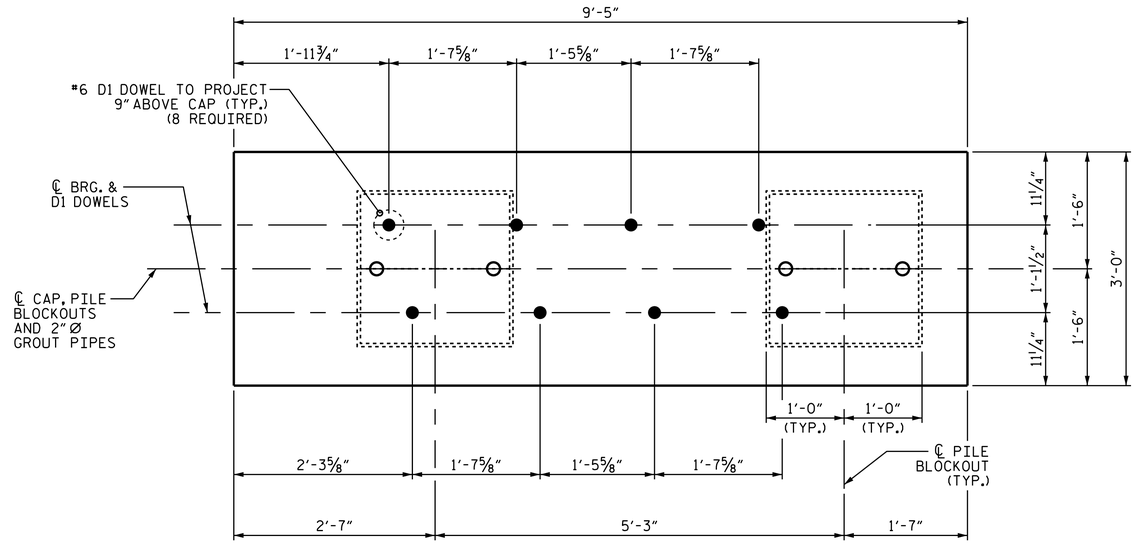
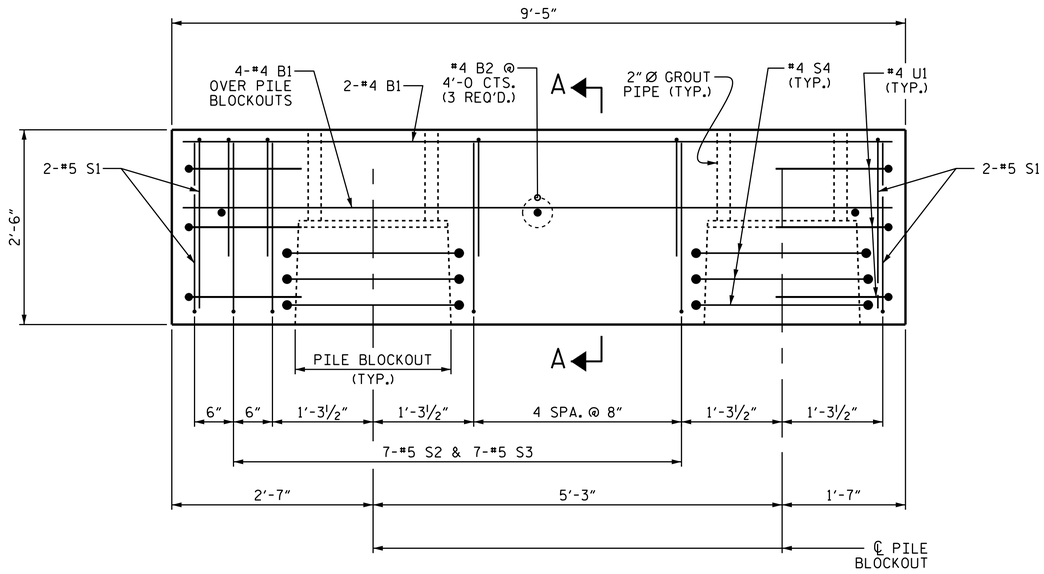
STD. NO. 14"HP_BT_30_105S_<60'



PLAN

(FOR PILE BLOCKOUT DETAILS, SEE SHEET 4 OF 4)



ELEVATION

(#6 D1 DOWELS NOT SHOWN FOR CLARITY)
FOR SECTION A-A, SEE SHEET 4 OF 4.

BILL OF MATERIAL

FOR ONE PIECE B-01

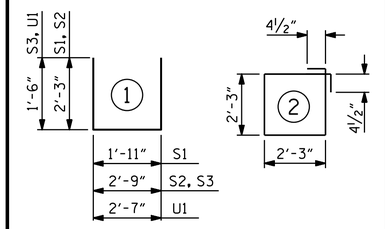
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#4	STR	9'-1"	36
B2	3	#4	STR	2'-8"	5
D1	8	#6	STR	1'-6"	18
S1	8	#5	1	6'-5"	54
S2	7	#5	1	7'-3"	53
S3	7	#5	1	5'-9"	42
S4	6	#4	2	9'-9"	39
U1	6	#4	1	5'-7"	22

REINFORCING STEEL 269 LBS

4000 PSI PRESTRESS CONCRETE 2.3 C.Y.
PILE BLOCKOUT GROUT 0.4 C.Y.

0.6" Ø L.R. STRANDS No. 12

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

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

PROJECT NO. 17BP.1.R.69
CURRITUCK COUNTY
STATION: 13+95.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

PRECAST PIECE B-01 (OPTIONAL PRECAST)

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F8B6AD6DB2FC48F...

6/8/2015

REVISIONS						SHEET NO.
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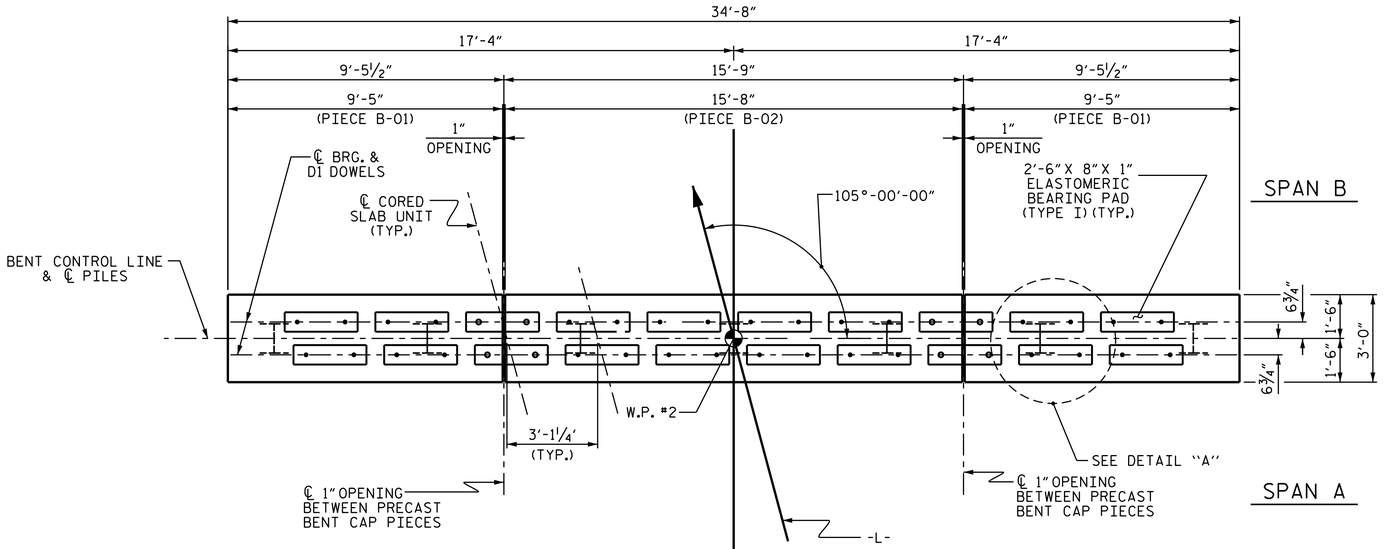
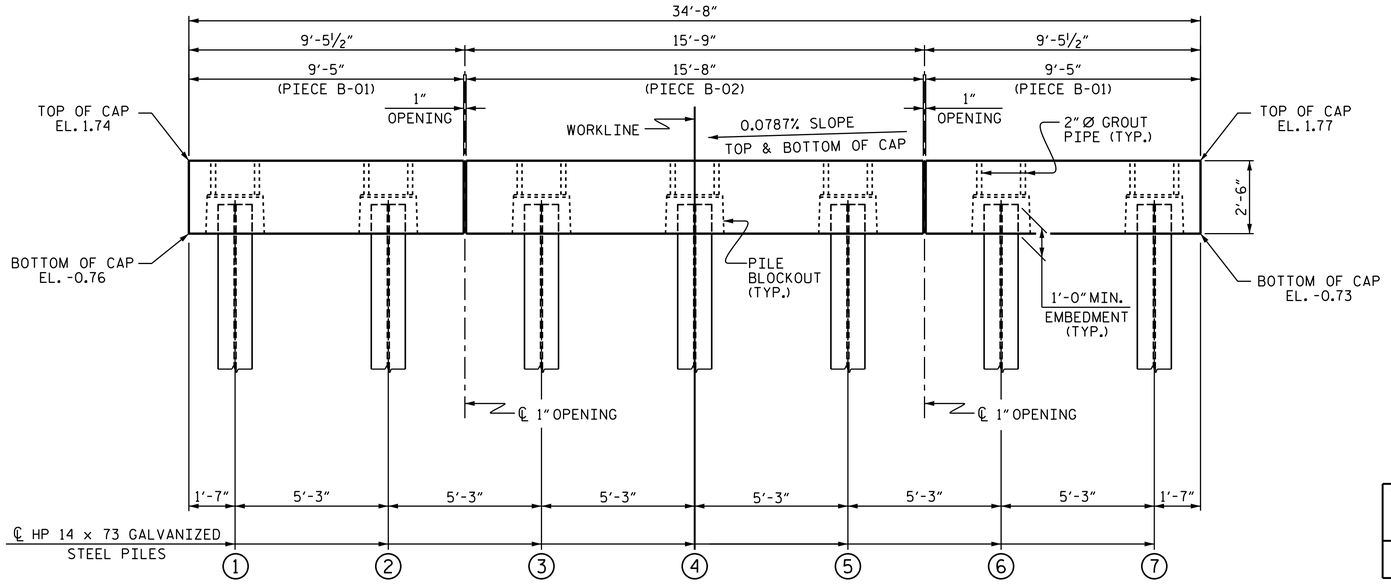
kpaschal

STD. NO. 14" HP_PSBT_30_105S_<60'



PLAN

(PILE BLOCKOUTS AND GROUT PIPES NOT SHOWN FOR CLARITY)



ELEVATION

FOR 2"Ø GROUT PIPE AND PILE BLOCKOUT DETAILS, SEE SHEET 4 OF 4

TOP OF PILE ELEVATIONS	
① THRU ⑦	0.27

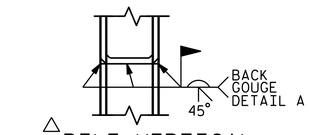
NOTES

FOR PRECAST CAP DETAILS AND BILL OF MATERIAL, SEE "PIECE B-01" & "PIECE B-02" SHEETS.

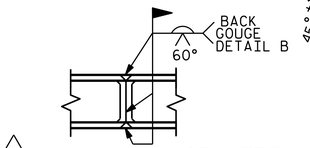
GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 25.0 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

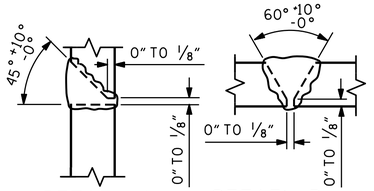
FOR 3'-0" x 2'-6" PRESTRESSED CONCRETE BENT CAPS, SEE SPECIAL PROVISIONS.



△ PILE VERTICAL



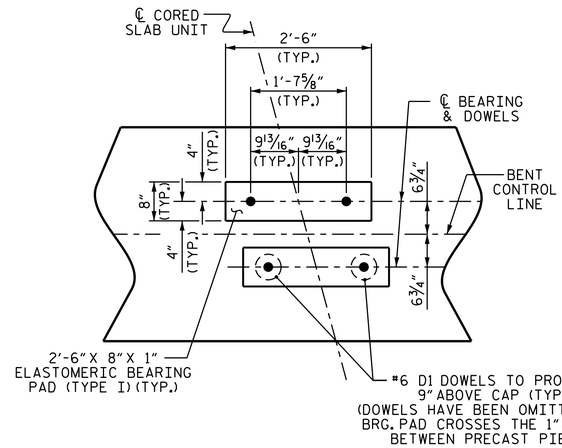
△ PILE HORIZ. OR VERT.



DETAIL A DETAIL B

PILE SPLICE DETAILS

△ POSITION OF PILE DURING WELDING.



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. 17BP.1.R.69

CURRITUCK COUNTY

STATION: 13+90.70 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1

(OPTIONAL PRECAST)

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

REVISIONS						SHEET NO.
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CHECKED BY : T. L. COGGINS	DATE : 10/16/14	
DRAWN BY : MAA 3/12		
CHECKED BY : SHS 6/12		

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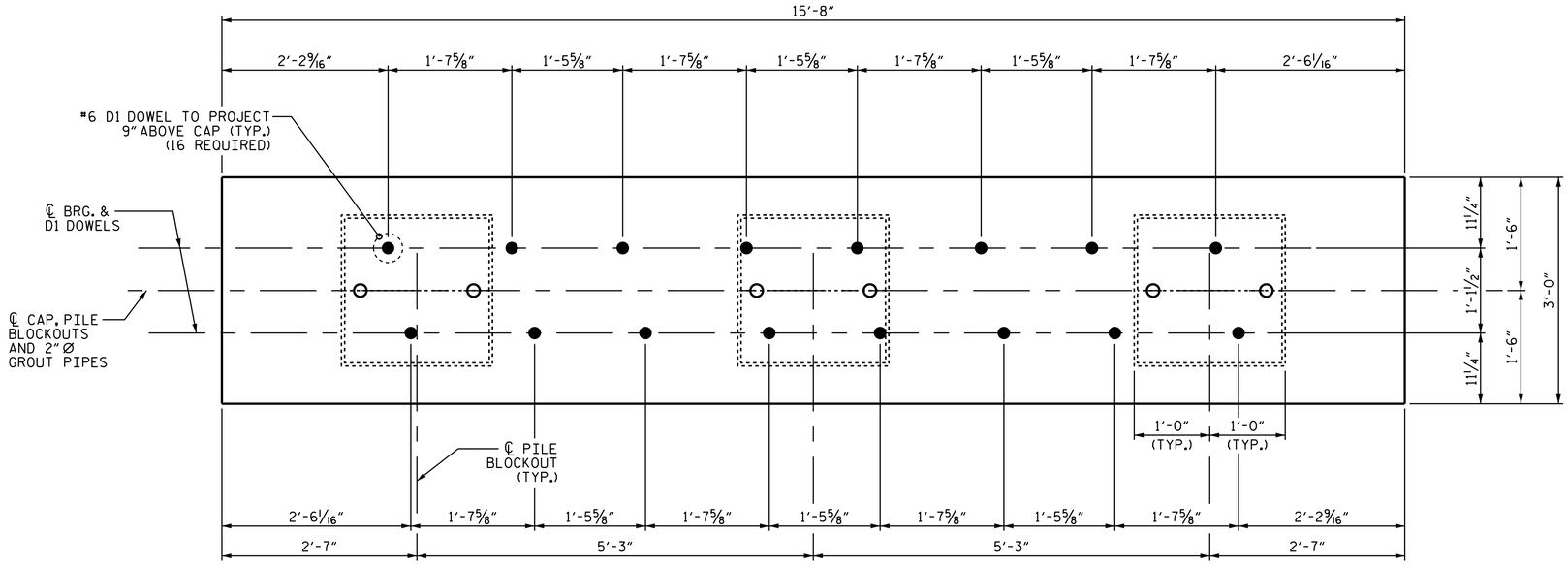
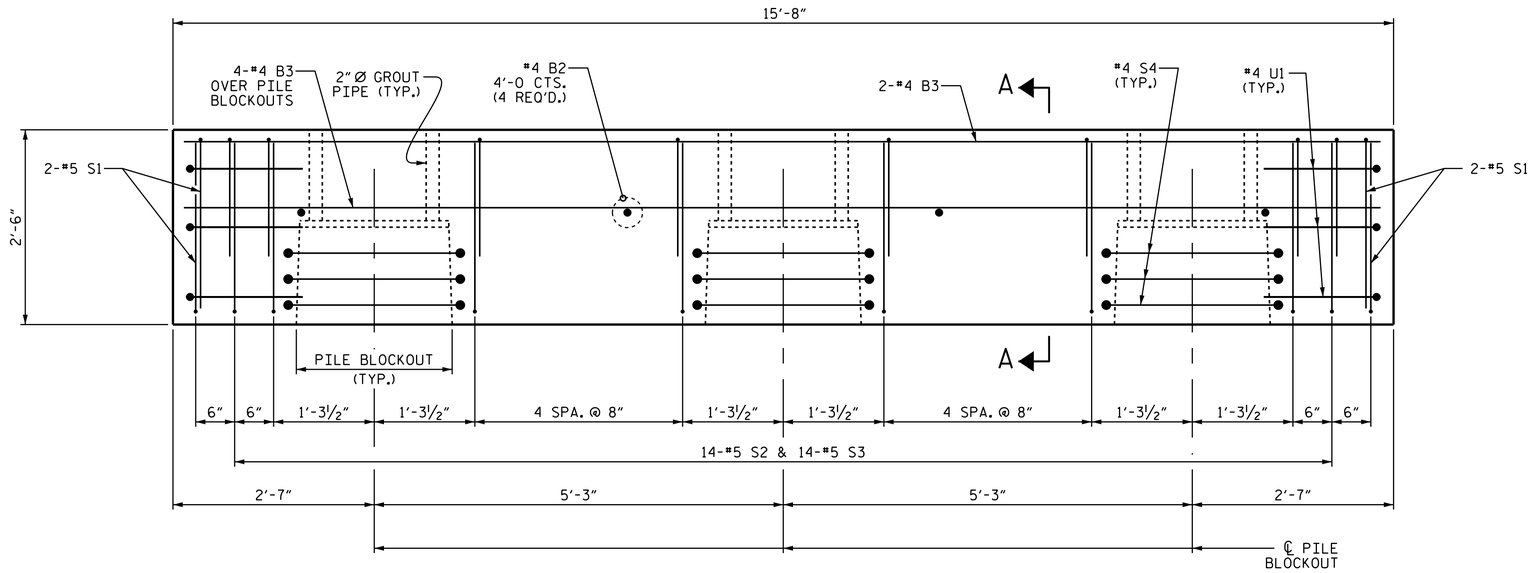
gruffin

STD. NO. 14"HP_PSBT_30_105S_<60'



PLAN

(FOR PILE BLOCKOUT DETAILS, SEE SHEET 4 OF 4)



ELEVATION

(#6 D1 DOWELS NOT SHOWN FOR CLARITY)
FOR SECTION A-A, SEE SHEET 4 OF 4.

BILL OF MATERIAL
FOR ONE PIECE B-02

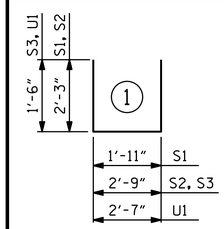
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B2	4	#4	STR	2'-8"	7
B3	6	#4	STR	15'-4"	61
D1	16	#6	STR	1'-6"	36
S1	8	#5	1	6'-5"	54
S2	14	#5	1	7'-3"	106
S3	14	#5	1	5'-9"	84
S4	9	#4	2	9'-9"	59
U1	6	#4	1	5'-7"	22

REINFORCING STEEL 429 LBS

4000 PSI PRESTRESS CONCRETE 3.8 C.Y.
PILE BLOCKOUT GROUT 0.6 C.Y.

0.6" Ø L.R. STRANDS No. 12

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

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

PROJECT NO. 17BP.1.R.69
CURRITUCK COUNTY
STATION: 13+95.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

PRECAST PIECE B-02 (OPTIONAL PRECAST)

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F8B6AD6DB2FC48F...

6/8/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
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ASSEMBLED BY R. CAREATHERS DATE : 5/22/15
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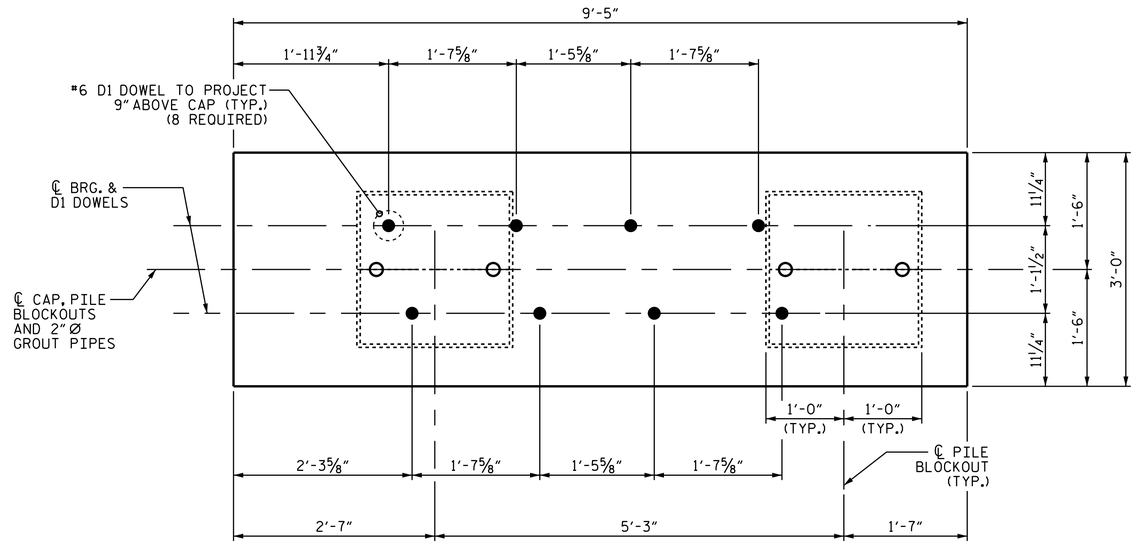
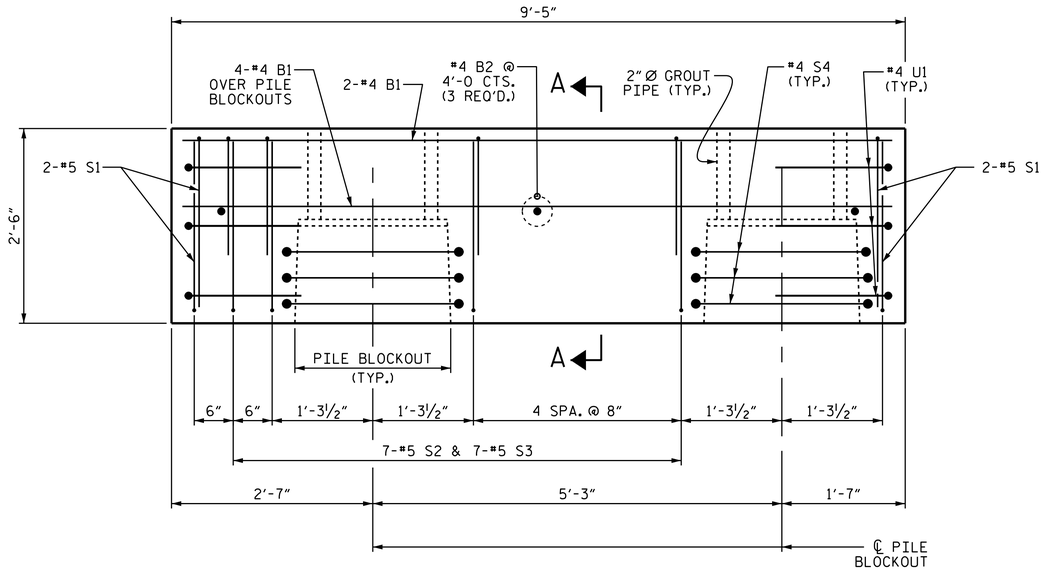
kpaschal

STD. NO. 14" HP_PSBT_30_105S_<60'



PLAN

(FOR PILE BLOCKOUT DETAILS, SEE SHEET 4 OF 4)



ELEVATION

(#6 D1 DOWELS NOT SHOWN FOR CLARITY)
FOR SECTION A-A, SEE SHEET 4 OF 4.

BILL OF MATERIAL

FOR ONE PIECE B-01

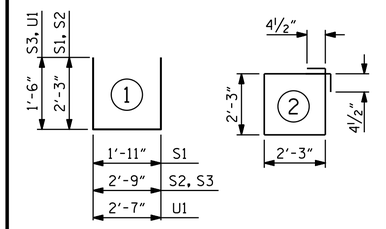
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#4	STR	9′-1″	36
B2	3	#4	STR	2′-8″	5
D1	8	#6	STR	1′-6″	18
S1	8	#5	1	6′-5″	54
S2	7	#5	1	7′-3″	53
S3	7	#5	1	5′-9″	42
S4	6	#4	2	9′-9″	39
U1	6	#4	1	5′-7″	22

REINFORCING STEEL 269 LBS

4000 PSI PRESTRESS CONCRETE 2.3 C.Y.
PILE BLOCKOUT GROUT 0.4 C.Y.

0.6″Ø L.R. STRANDS No. 12

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

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

PROJECT NO. 17BP.1.R.69
CURRITUCK COUNTY
STATION: 13+90.70 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

PRECAST PIECE B-01 (OPTIONAL PRECAST)

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

REVISIONS						SHEET NO.
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DRAWN BY : MAA 3/12
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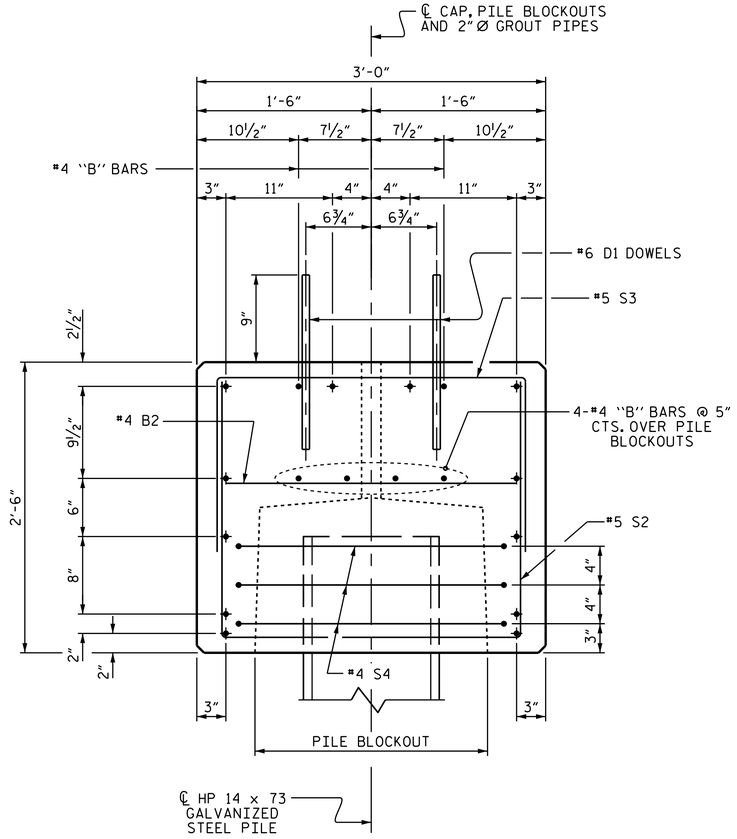
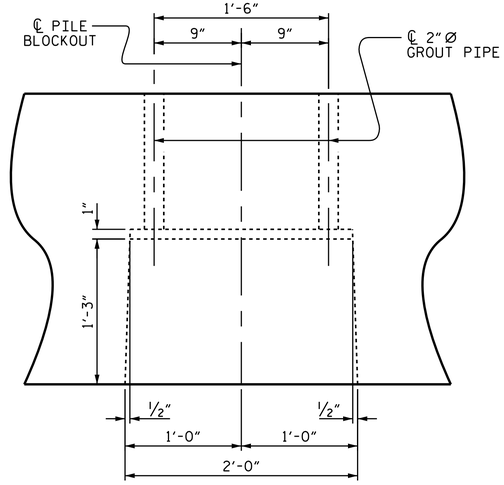
STD. NO. 14″HP_PSBT_30_105S_<60′

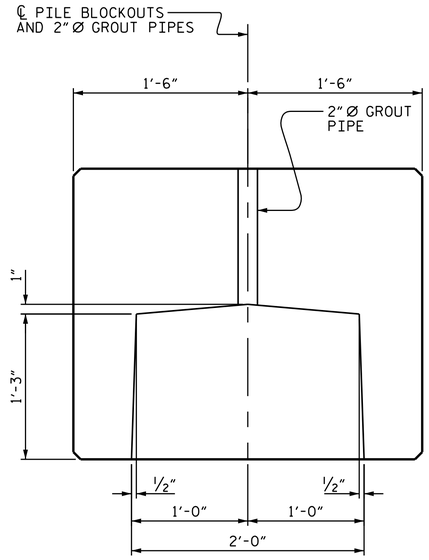


SECTION A-A

(SHOWING 0.6"Ø LOW RELAXATION STRAND LAYOUT)
(12 STRANDS)



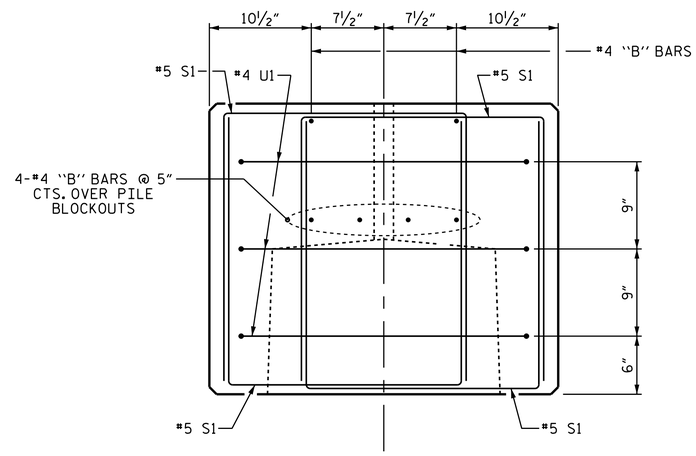
ELEVATION



SECTION

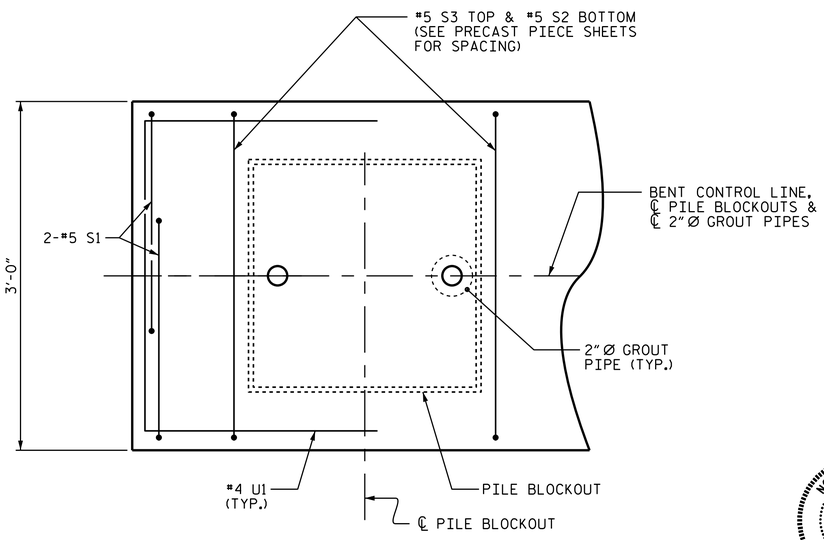
PILE BLOCKOUT DETAILS

(DIMENSIONS ARE TYPICAL EACH BLOCKOUT)



END OF CAP VIEW

(TYPICAL BOTH ENDS)



PART PLAN-END OF CAP

(TYPICAL BOTH ENDS)

NOTES

STIRRUPS IN PRECAST PIECES MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS AND GROUT PIPES.

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 BENT CAP SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRECAST BENT CAPS.

WHEN BENT CAPS ARE CAST, A HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING BENT CAPS, 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.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE ENDS OF THE BENT CAP SEGMENTS.

APPLY EPOXY PROTECTIVE COATING TO THE ENDS OF THE BENT CAP SEGMENTS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BENT CAPS SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 3000 PSI.

THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL A METHOD TO LIFT AND SUPPORT THE PRECAST CAP PIECES IN THE PROPER LOCATION AND ELEVATION AS SHOWN ON THE PLANS PRIOR TO PLACEMENT AND CURING OF THE GROUT IN THE PILE BLOCKOUTS. THE METHOD CHOSEN SHALL PROVIDE FOR A WATERTIGHT SEAL AT THE BOTTOM OF THE CAP UNTIL THE GROUT HAS HARDENED SO NO GROUT COMES IN CONTACT WITH THE STREAM.

PRESTRESSED CONCRETE BENT CAPS (FOR ONE BENT)			
PIECE	LENGTH	NUMBER	TOTAL LENGTH
B-01	9'-5"	2	18'-10"
B-02	15'-8"	1	15'-8"
TOTAL		3	34.50'

HP 14 X 73 GALVANIZED STEEL PILES (FOR ONE BENT)		
No. 7	LIN. FT.	525
PILE REDRIVES	EA.	4

PROJECT NO. 17BP.1.R.69

CURRITUCK COUNTY

STATION: 13+95.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1
(OPTIONAL PRECAST)

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by:
A. Keith Paschal
F8B6ADED82FC48F...

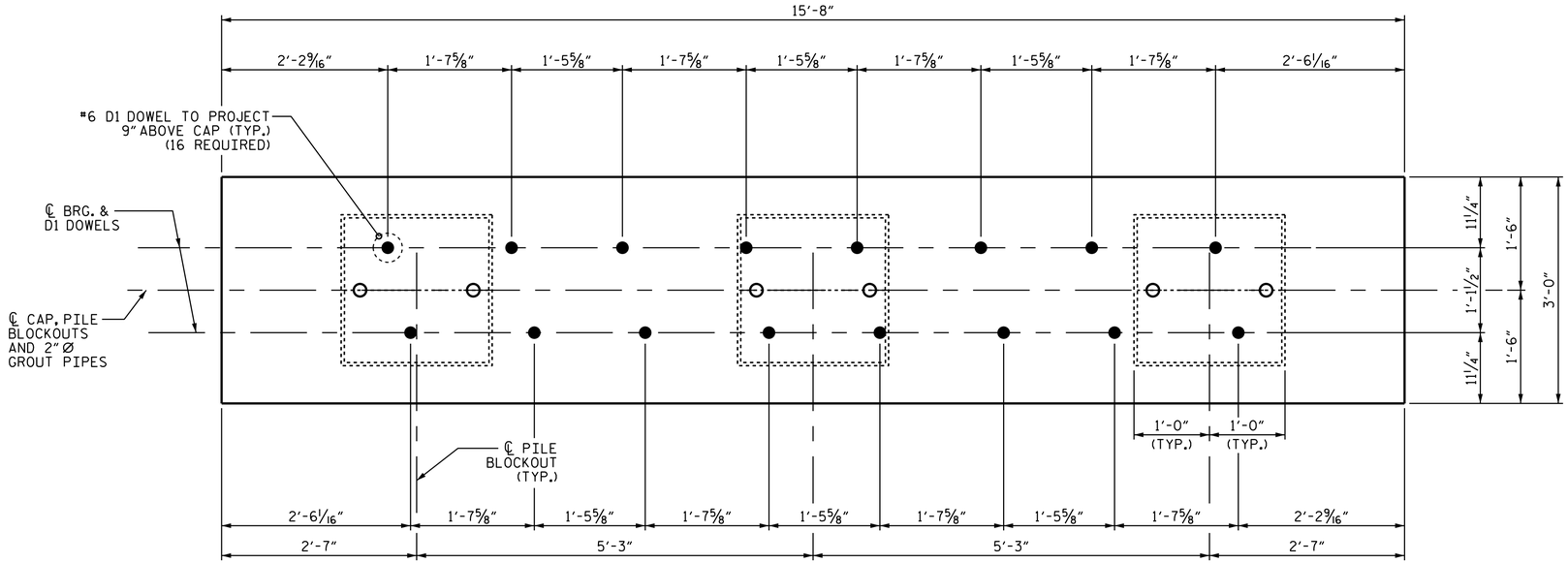
6/8/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			20

ASSEMBLED BY : R. CAREATHERS	DATE : 5/22/15
CHECKED BY : N. RUFFIN	DATE : 5/27/15
DRAWN BY : MAA 3/12	
CHECKED BY : SHS 6/12	

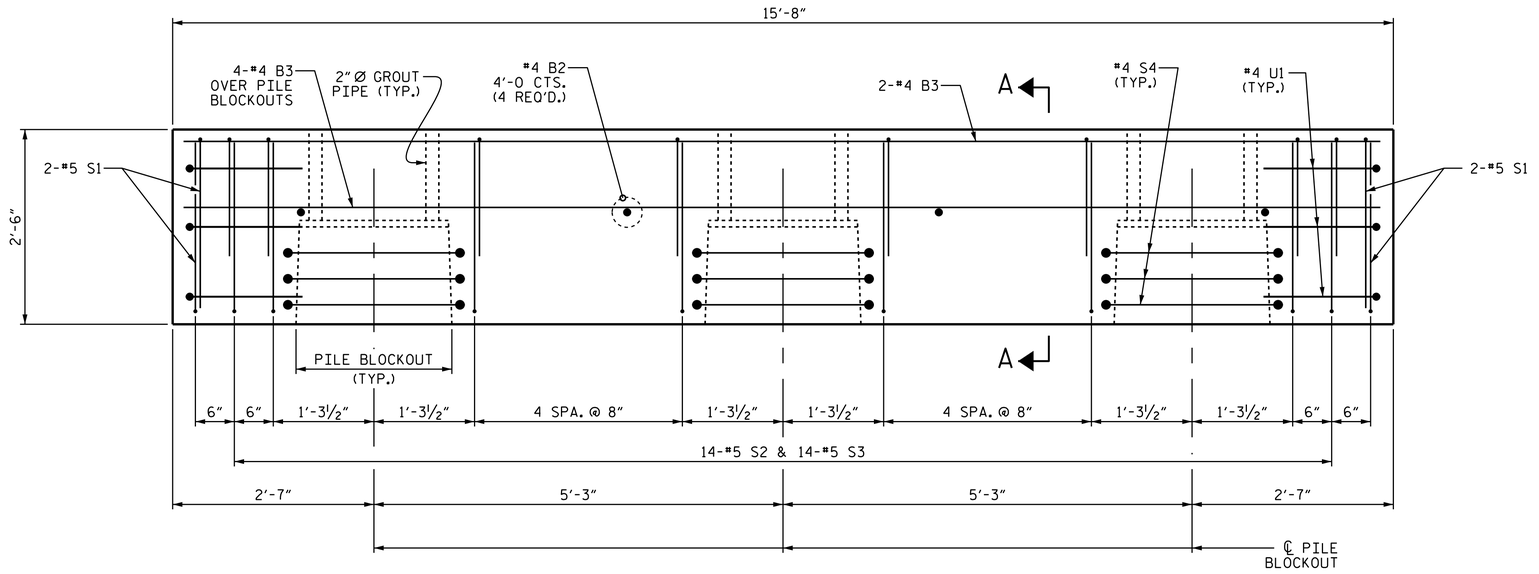
08-JUN-2015 12:04
S:\DPG1\Division1\17BP.1.R.69\Regan\17BP1R69_Plans_Final.dgn
kpaschal

STD. NO. 14" HP_PSBT_30_75/105S_<60'



PLAN

(FOR PILE BLOCKOUT DETAILS, SEE SHEET 4 OF 4)



ELEVATION

(#6 D1 DOWELS NOT SHOWN FOR CLARITY)
FOR SECTION A-A, SEE SHEET 4 OF 4.

BILL OF MATERIAL

FOR ONE PIECE B-02

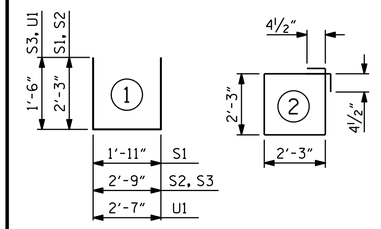
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B2	4	#4	STR	2′-8″	7
B3	6	#4	STR	15′-4″	61
D1	16	#6	STR	1′-6″	36
S1	8	#5	1	6′-5″	54
S2	14	#5	1	7′-3″	106
S3	14	#5	1	5′-9″	84
S4	9	#4	2	9′-9″	59
U1	6	#4	1	5′-7″	22

REINFORCING STEEL 429 LBS

4000 PSI PRESTRESS CONCRETE 3.8 C.Y.
PILE BLOCKOUT GROUT 0.6 C.Y.

0.6″Ø L.R. STRANDS No. 12

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

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

PROJECT NO. 17BP.1.R.69
CURRITUCK COUNTY
STATION: 13+90.70 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

PRECAST PIECE B-02 (OPTIONAL PRECAST)

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			20

ASSEMBLED BY : K. P. SEDAI DATE : 10/16/14
CHECKED BY : T. L. COGGINS DATE : 10/16/14
DRAWN BY : MAA 3/12
CHECKED BY : SHS 6/12

21-NOV-2014 14:34
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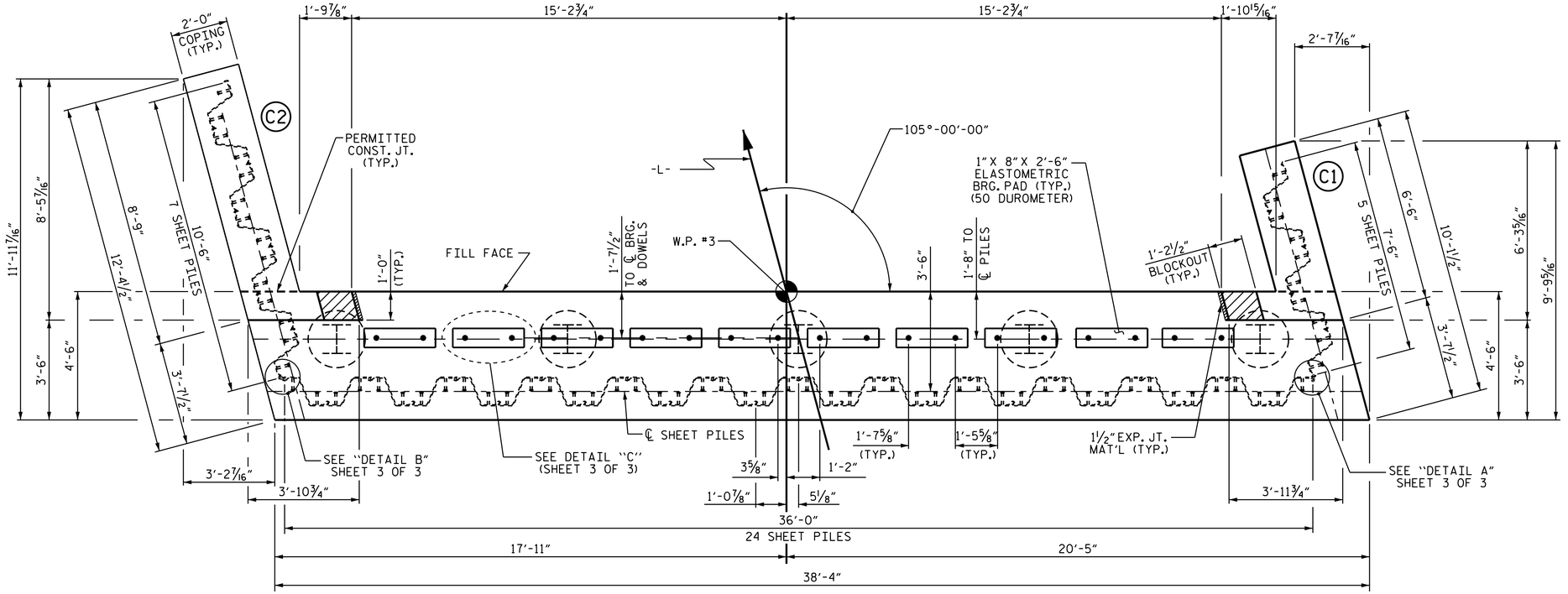
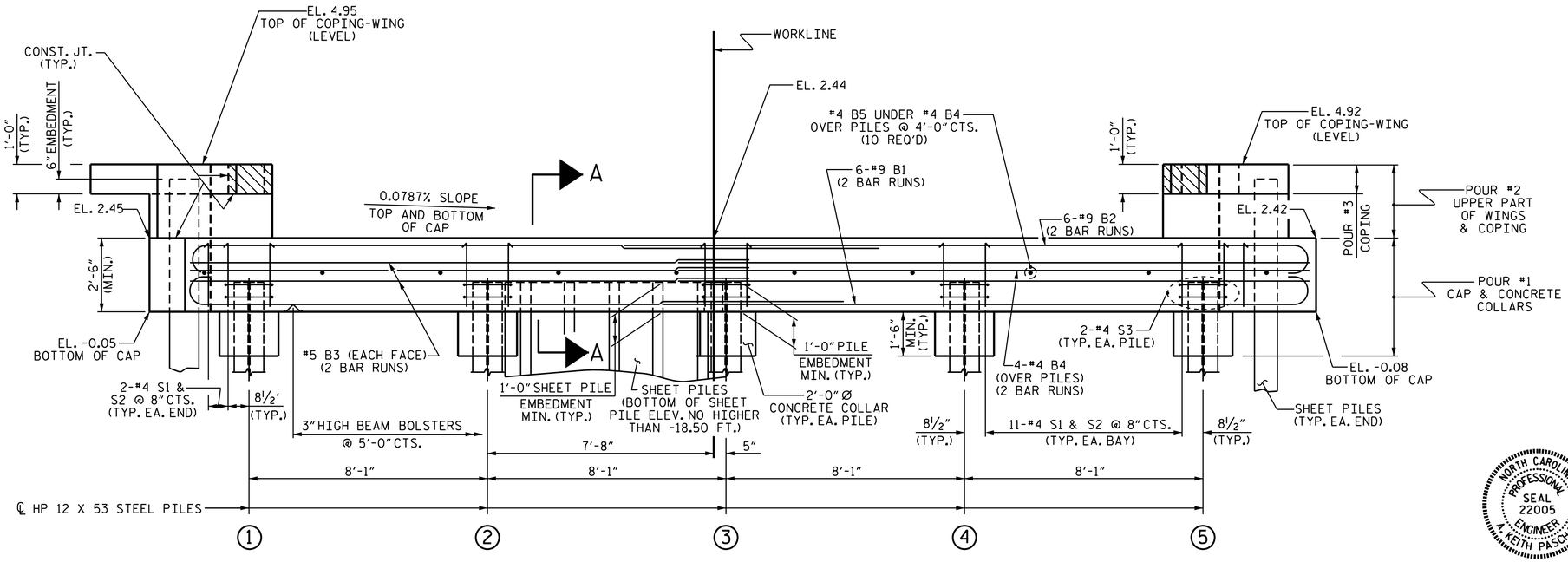
nruffin

STD. NO. 14″HP_PSBT_30_105S_<60′



PLAN



ELEVATION

FOR SECTION A-A, SEE SHEET 3 OF 3.
SHEET PILING PARTIALLY OMITTED IN ELEVATION VIEW FOR CLARITY.

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.

INSTALL THE 4" Ø DRAIN PIPE THROUGH THE SHEET PILES AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

ALL 2" Ø MAX. HOLES IN STEEL SHEET PILING TO BE DRILLED AND NOT BURNED.

STEEL SHEET PILES SHALL BE GALVANIZED. FOR STEEL SHEET PILES, SEE SPECIAL PROVISIONS.

THE STEEL SHEET PILING SHALL HAVE A MINIMUM SECTION MODULUS OF 30.2 IN.³/FT.

TOP OF PILE ELEVATIONS	
① THRU ⑤	0.95

PROJECT NO. 17BP.1.R.69

CURRITUCK COUNTY

STATION: 13+95.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal
F8B6AD6DB2FC48F...

6/8/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			20

DRAWN BY :	R. CAREATHERS	DATE :	5/22/15
CHECKED BY :	N. RUFFIN	DATE :	5/27/15
DESIGN ENGINEER OF RECORD :	K. P. SEDAI	DATE :	6/3/15

08-JUN-2015 12:04
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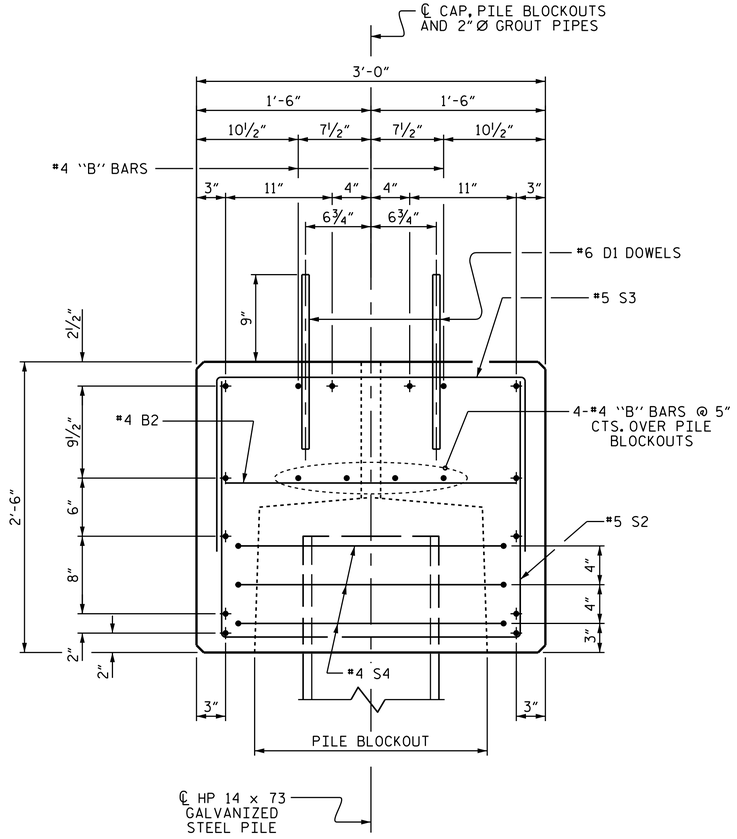
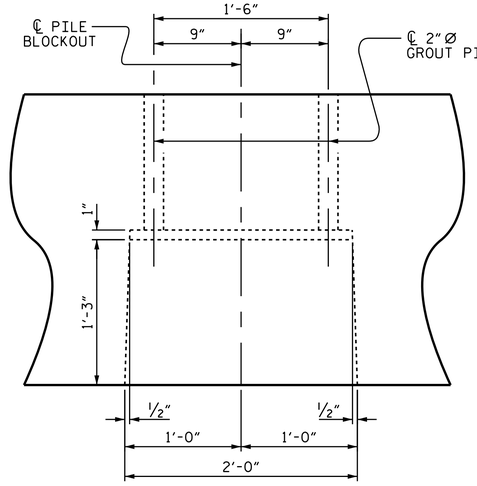
kpaschal

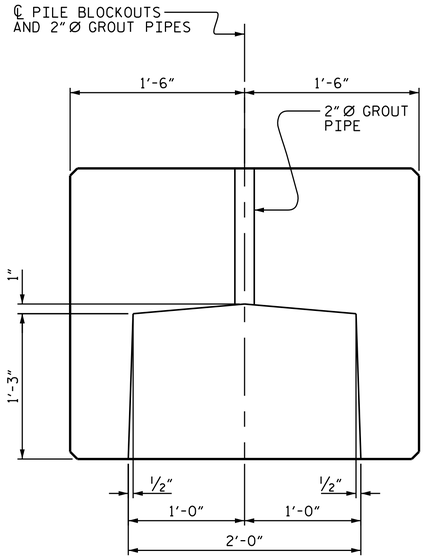


SECTION A-A

(SHOWING 0.6"Ø LOW RELAXATION STRAND LAYOUT)
(12 STRANDS)



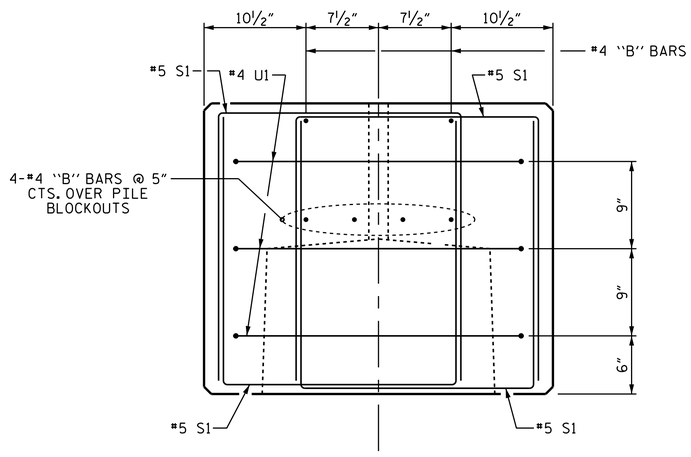
ELEVATION



SECTION

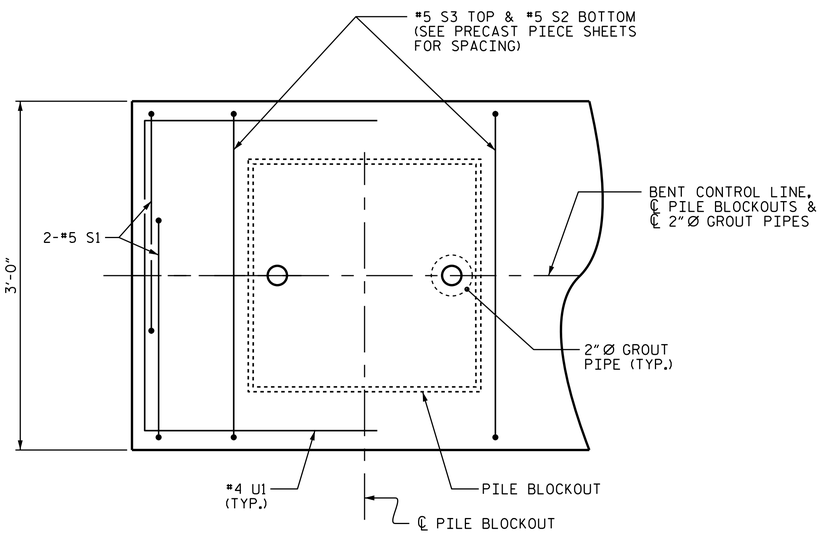
PILE BLOCKOUT DETAILS

(DIMENSIONS ARE TYPICAL EACH BLOCKOUT)



END OF CAP VIEW

(TYPICAL BOTH ENDS)



PART PLAN-END OF CAP

(TYPICAL BOTH ENDS)

NOTES

STIRRUPS IN PRECAST PIECES MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS AND GROUT PIPES.

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 BENT CAP SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRECAST BENT CAPS.

WHEN BENT CAPS ARE CAST, A HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING BENT CAPS, 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.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE ENDS OF THE BENT CAP SEGMENTS.

APPLY EPOXY PROTECTIVE COATING TO THE ENDS OF THE BENT CAP SEGMENTS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BENT CAPS SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 3000 PSI.

THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL A METHOD TO LIFT AND SUPPORT THE PRECAST CAP PIECES IN THE PROPER LOCATION AND ELEVATION AS SHOWN ON THE PLANS PRIOR TO PLACEMENT AND CURING OF THE GROUT IN THE PILE BLOCKOUTS. THE METHOD CHOSEN SHALL PROVIDE FOR A WATERTIGHT SEAL AT THE BOTTOM OF THE CAP UNTIL THE GROUT HAS HARDENED SO NO GROUT COMES IN CONTACT WITH THE STREAM.

PRESTRESSED CONCRETE BENT CAPS (FOR ONE BENT)			
PIECE	LENGTH	NUMBER	TOTAL LENGTH
B-01	9'-5"	2	18'-10"
B-02	15'-8"	1	15'-8"
TOTAL		3	34.50'

HP 14 X 73 GALVANIZED STEEL PILES (FOR ONE BENT)		
No. 7	LIN. FT.	525
PILE REDRIVES	EA.	4

PROJECT NO. 17BP.1.R.69

CURRITUCK COUNTY

STATION: 13+90.70 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1
(OPTIONAL PRECAST)

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			20

ASSEMBLED BY : K. P. SEDAI	DATE : 10/16/14
CHECKED BY : T. L. COGGINS	DATE : 10/16/14
DRAWN BY : MAA 3/12	
CHECKED BY : SHS 6/12	

21-NOV-2014 14:34
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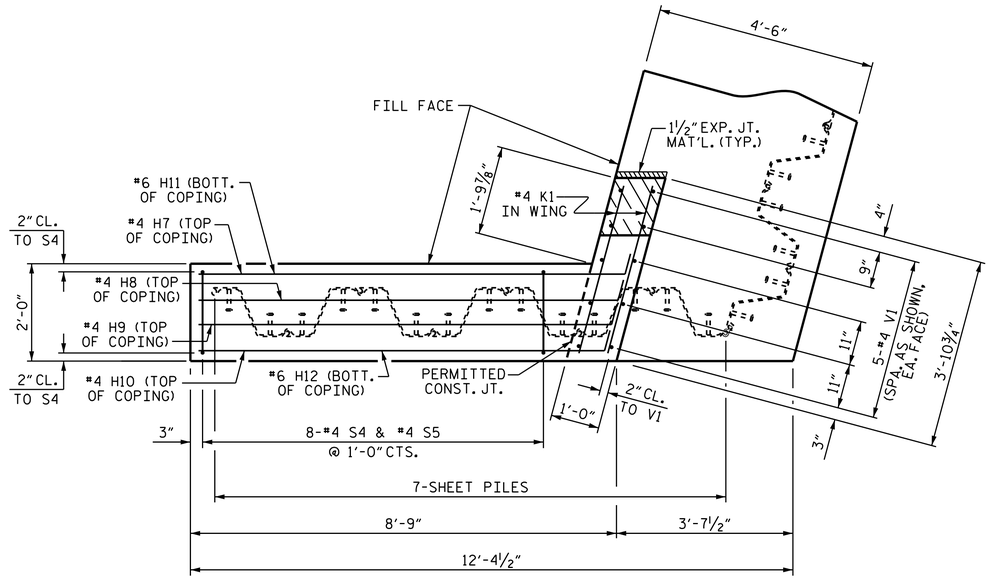
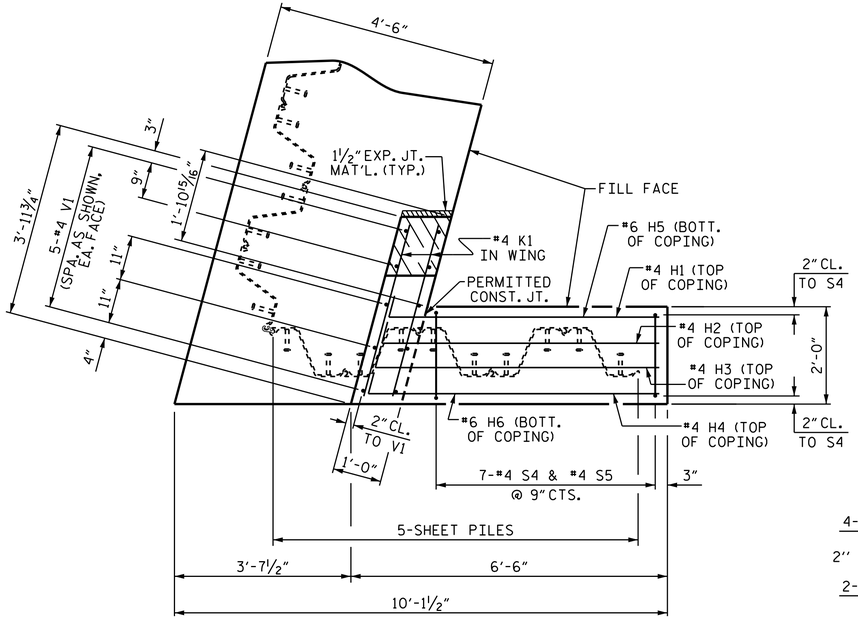
STD. NO. 14" HP_PSBT_30_75/105S_<60'



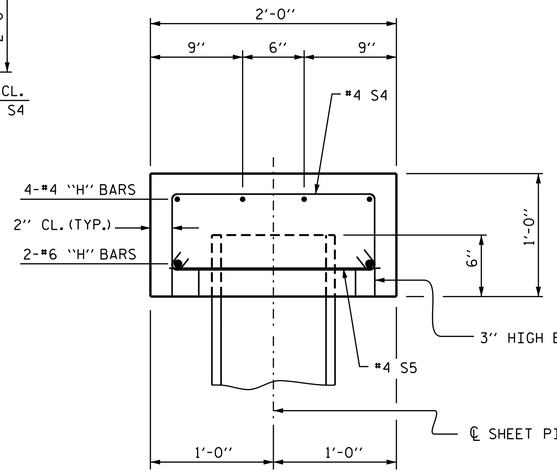
PLAN - COPING (C2)

DRILL 2" Ø MAX. HOLE IN SHEET PILES FOR #9 B1, #4 K1, AND #4 S5 BARS



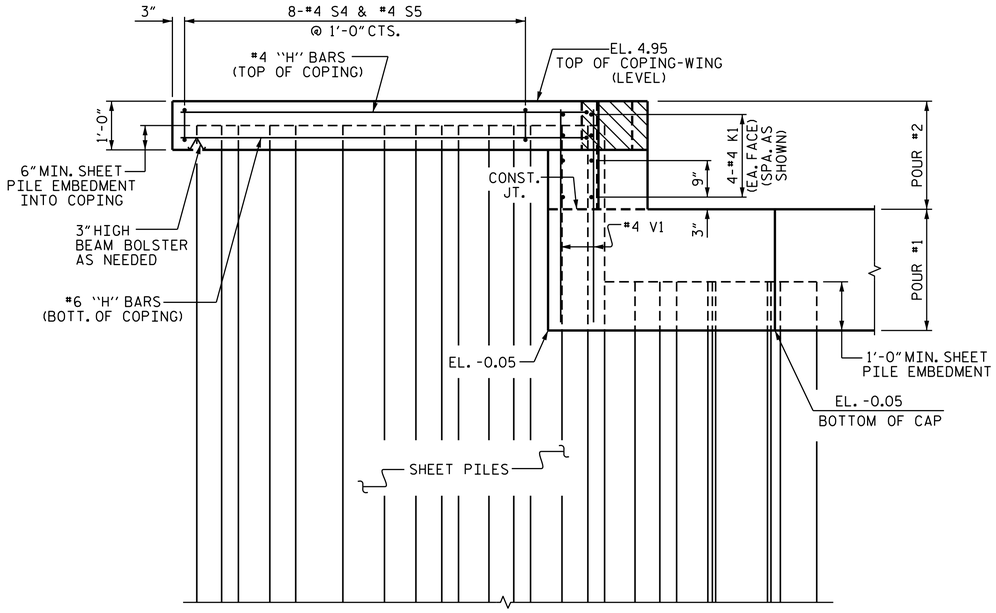
PLAN - COPING (C1)

DRILL 2" Ø MAX. HOLE IN SHEET PILES FOR #9 B1, #4 K1, AND #4 S5 BARS



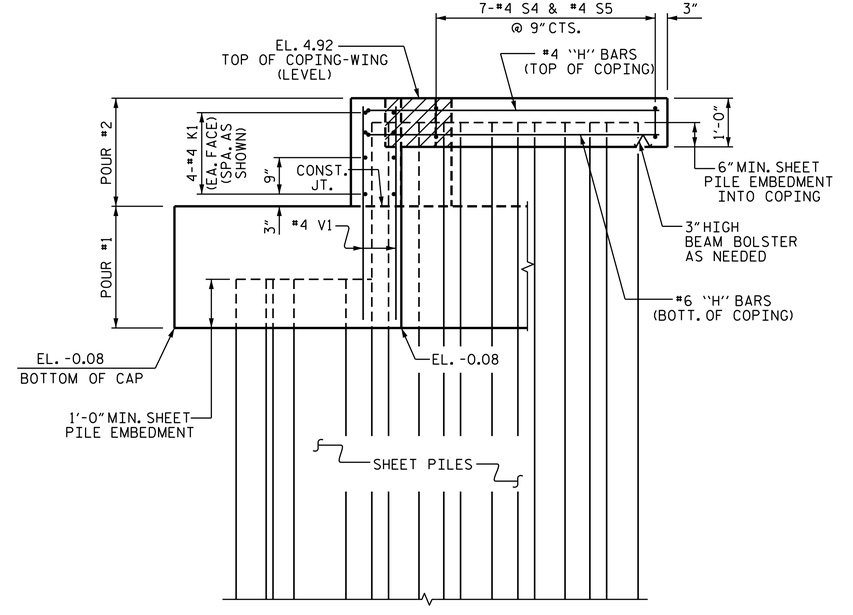
SECTION THRU COPING

DRILL 2" Ø MAX HOLE IN SHEET PILES FOR #4 S5 BAR



ELEVATION - COPING (C2)

DRILL 2" Ø MAX. HOLE IN SHEET PILES FOR #9 B1, #4 K1, AND #4 S5 BARS
"V" BARS MAY BE SHIFTED SLIGHTLY TO AVOID SHEET PILES



ELEVATION - COPING (C1)

DRILL 2" Ø MAX. HOLE IN SHEET PILES FOR #9 B1, #4 K1, AND #4 S5 BARS
"V" BARS MAY BE SHIFTED SLIGHTLY TO AVOID SHEET PILES

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F8B6AD6DB2FC48F...

6/8/2015

PROJECT NO. 17BP.1.R.69

CURRITUCK COUNTY

STATION: 13+95.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : R. CAREATHERS DATE : 5/22/15
CHECKED BY : N. RUFFIN DATE : 5/27/15
DESIGN ENGINEER OF RECORD : K. P. SEDAI DATE : 6/3/15

08-JUN-2015 12:04
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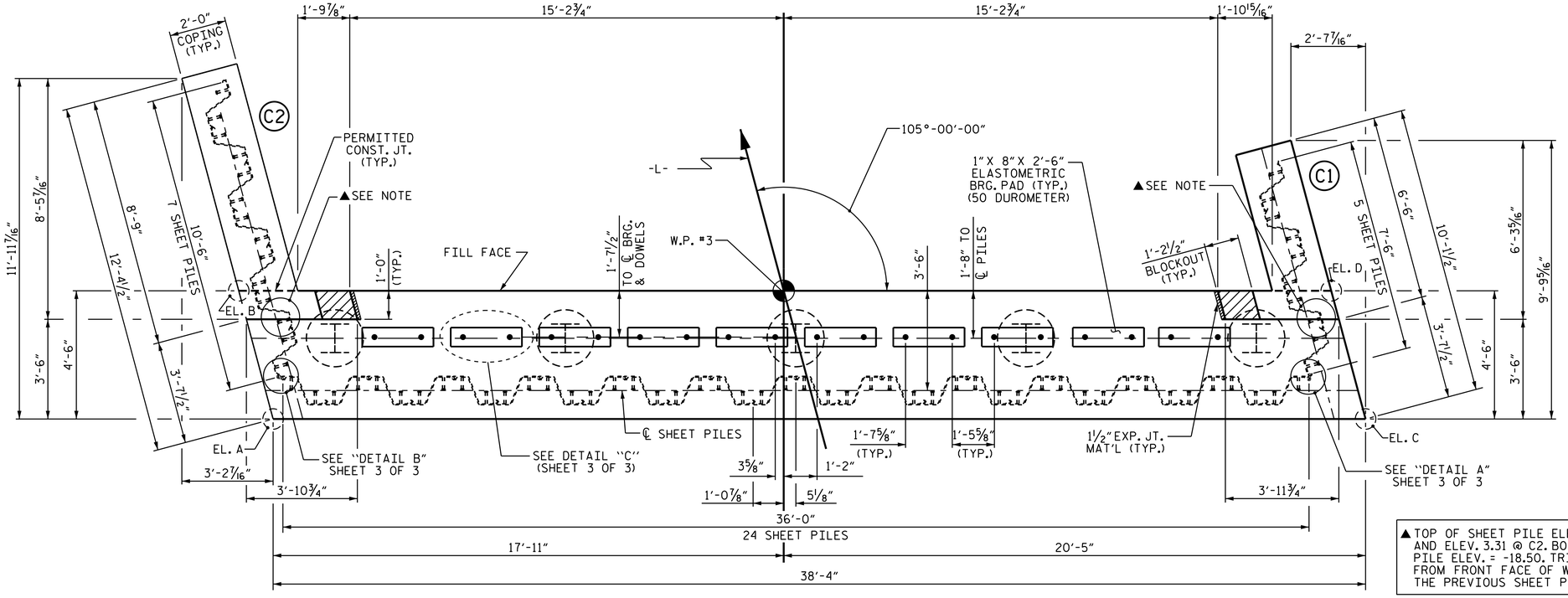
kpaschal



PLAN

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.

INSTALL THE 4"Ø DRAIN PIPE THROUGH THE SHEET PILES AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

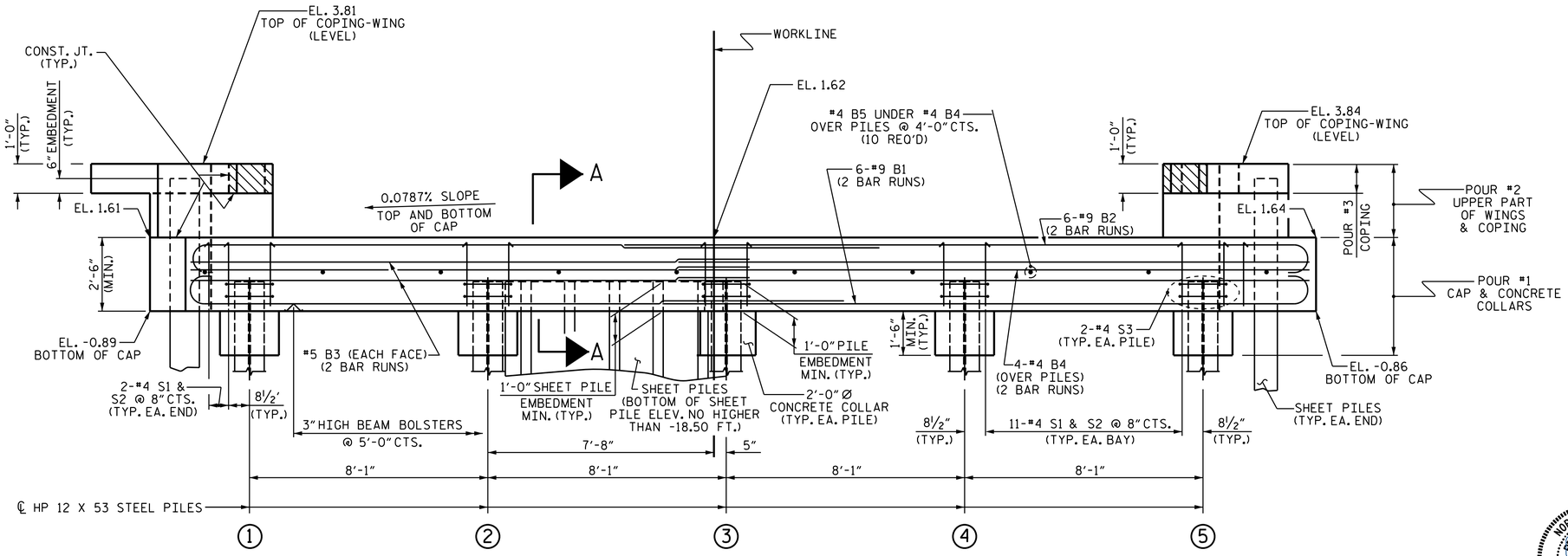
ALL 2"Ø MAX. HOLES IN STEEL SHEET PILING TO BE DRILLED AND NOT BURNED.

STEEL SHEET PILES SHALL BE GALVANIZED. FOR STEEL SHEET PILES, SEE SPECIAL PROVISIONS.

THE STEEL SHEET PILING SHALL HAVE A MINIMUM SECTION MODULUS OF 30.2 IN.³/FT.

TOP OF CAP ELEVATIONS	
POINT	EL.
Ⓐ	1.61
Ⓑ	1.61
Ⓒ	1.64
Ⓓ	1.64

▲TOP OF SHEET PILE ELEV. = 3.34 @ C1 AND ELEV. 3.31 @ C2. BOTTOM OF SHEET PILE ELEV. = -18.50. TRIM BACK TO 6" FROM FRONT FACE OF WING AND DOWN TO THE PREVIOUS SHEET PILE IN CAP.



ELEVATION

FOR SECTION A-A, SEE SHEET 3 OF 3.
SHEET PILING PARTIALLY OMITTED IN ELEVATION VIEW FOR CLARITY.

TOP OF PILE ELEVATIONS	
① THRU ⑤	0.14

PROJECT NO. 17BP.1.R.69
CURRITUCK COUNTY
STATION: 13+90.70 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : K. P. SEDAI DATE : 8/20/14
CHECKED BY : REZA KOUCHEKI DATE : 9/2/14
DESIGN ENGINEER OF RECORD : K. P. SEDAI DATE : 9/3/14

21-NOV-2014 14:34
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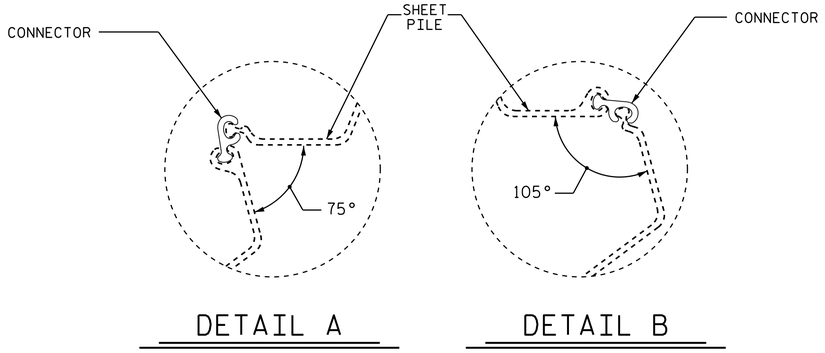
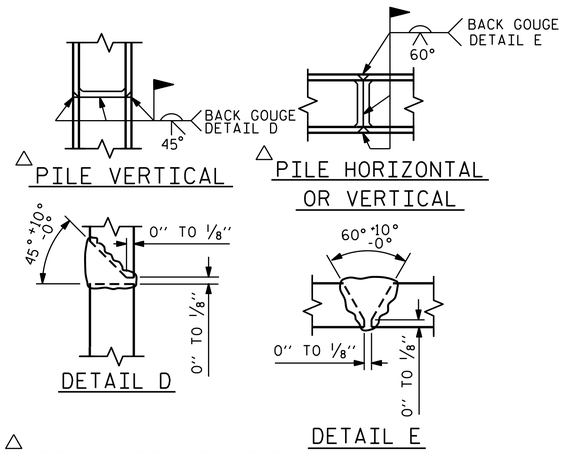
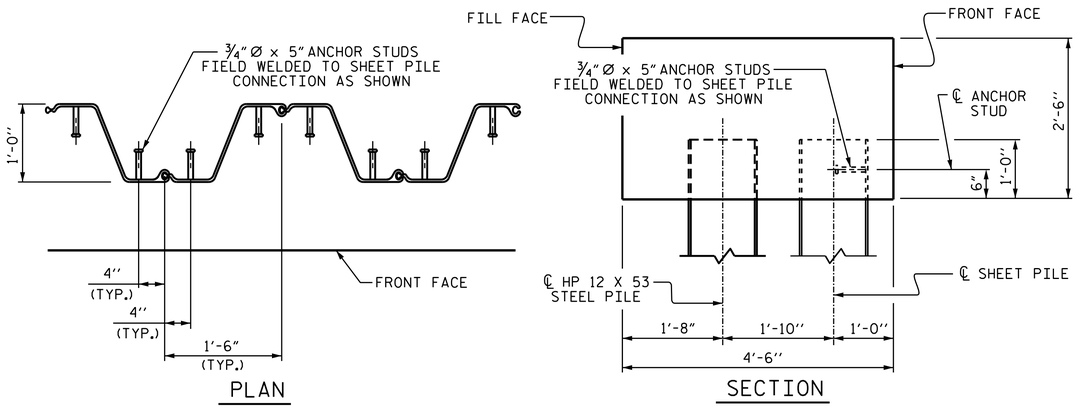


DETAIL A

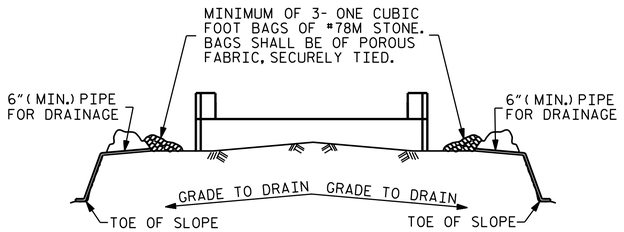
DETAIL B



PILE SPLICE DETAILS



SHEET PILE ANCHOR STUD DETAILS



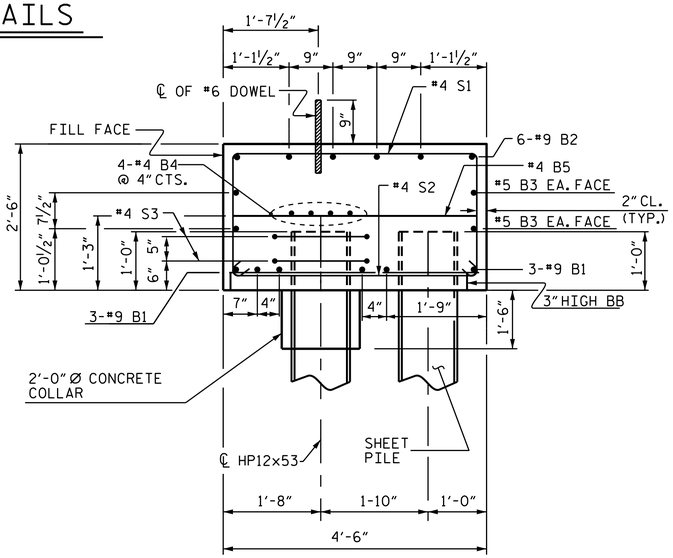
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

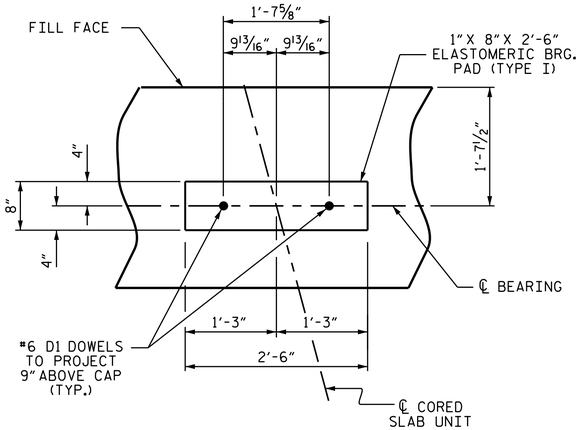
TEMPORARY DRAINAGE AT END BENT

SPLICE CHART	
#9 B1	6'-3"
#9 B2	8'-9"
#5 B3	3'-0"
#4 B4	2'-5"



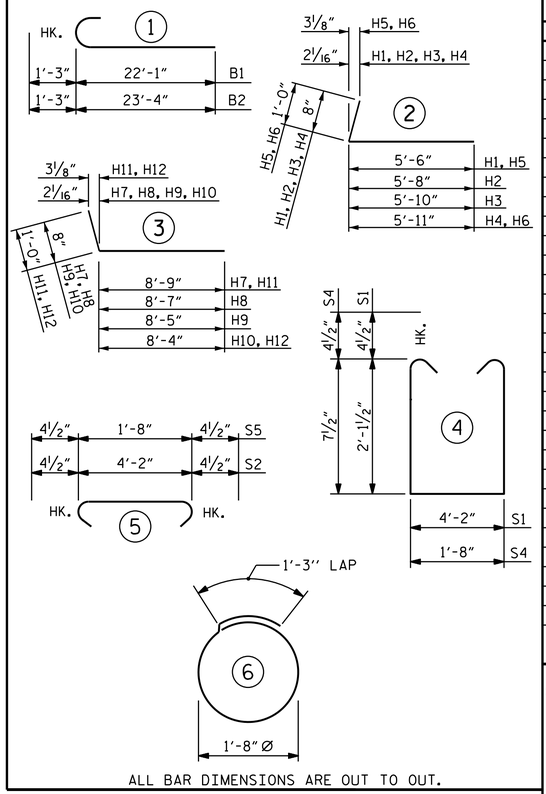
SECTION A-A

DRILL 2" Ø MAX. HOLE IN SHEET PILES FOR #9 B1 AND #5 S2 BARS



DETAIL "C"

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL
END BENT No. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	23'-4"	952
B2	12	#9	1	24'-7"	1003
B3	8	#5	STR	20'-6"	171
B4	8	#4	STR	20'-3"	108
B5	10	#4	STR	4'-2"	28
D1	20	#6	STR	1'-6"	45
H1	1	#4	2	6'-2"	4
H2	1	#4	2	6'-4"	4
H3	1	#4	2	6'-6"	4
H4	1	#4	2	6'-7"	4
H5	1	#6	2	6'-6"	10
H6	1	#6	2	6'-11"	10
H7	1	#4	3	9'-5"	6
H8	1	#4	3	9'-3"	6
H9	1	#4	3	9'-1"	6
H10	1	#4	3	9'-0"	6
H11	1	#6	3	9'-9"	15
H12	1	#6	3	9'-4"	14
K1	16	#4	STR	3'-6"	37
S1	48	#4	4	9'-2"	294
S2	48	#4	5	4'-11"	158
S3	10	#4	6	6'-6"	43
S4	15	#4	4	3'-8"	37
S5	15	#4	5	2'-5"	24
V1	20	#4	STR	4'-4"	58

REINFORCING STEEL LBS 3047

CLASS A CONCRETE:

POUR #1: CAP & COLLARS	16.8 C.Y.
POUR #2: UPPER PART OF WINGS	0.6 C.Y.
POUR #3: COPING	1.0 C.Y.
TOTAL	18.4 C.Y.

HP 12 X 53 STEEL PILES
NO: 5 LIN. FT. = 350
PILE REDRIVES EA. 3

STEEL SHEET PILES
NO = 36 SQ. FT. 1054
NO. CONNECTOR = 2 SQ. FT. 12
TOTAL NO. = 38 SQ. FT. 1066

PROJECT NO. 17BP.1.R.69
CURRITUCK COUNTY
STATION: 13+95.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F8B6AD6DB2FC48F...

6/8/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : R. CAREATHERS DATE : 5/22/15
CHECKED BY : N. RUFFIN DATE : 5/27/15
DESIGN ENGINEER OF RECORD : K. P. SEDAI DATE : 6/3/15

08-JUN-2015 12:04
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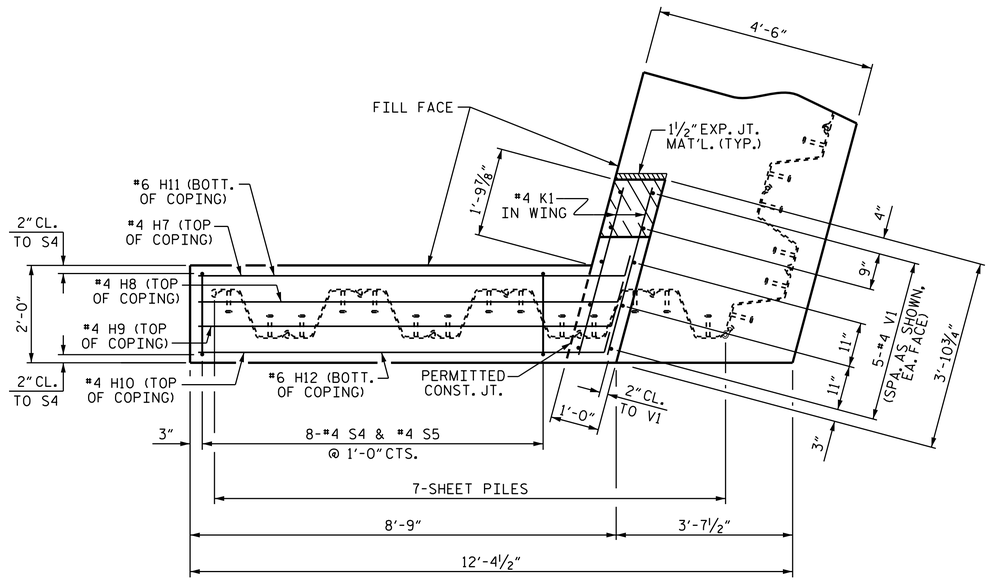
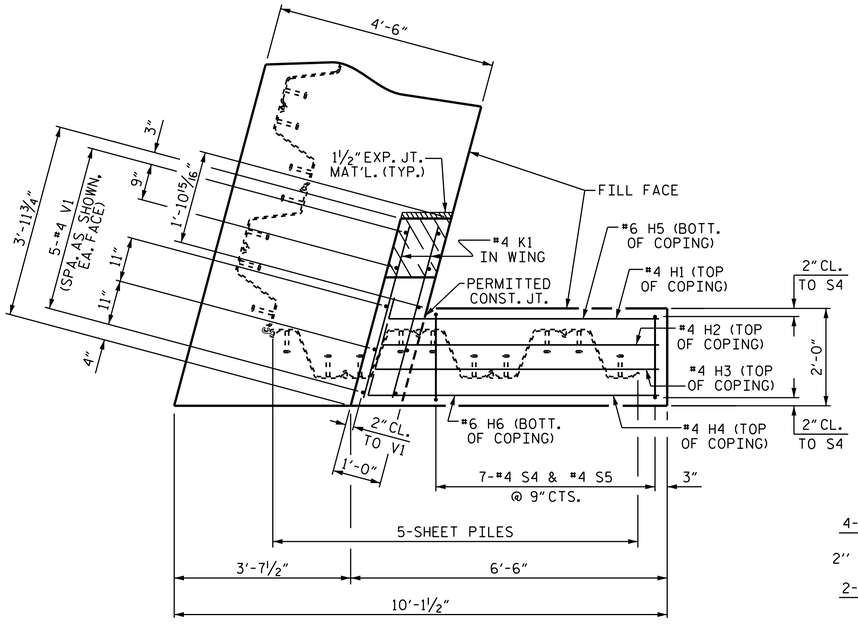
kpaschal



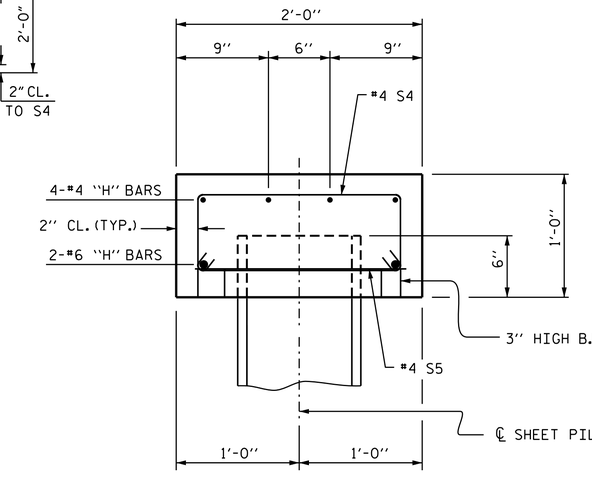
PLAN - COPING (C2)

DRILL 2" Ø MAX. HOLE IN SHEET PILES FOR #9 B1, #4 K1, AND #4 S5 BARS



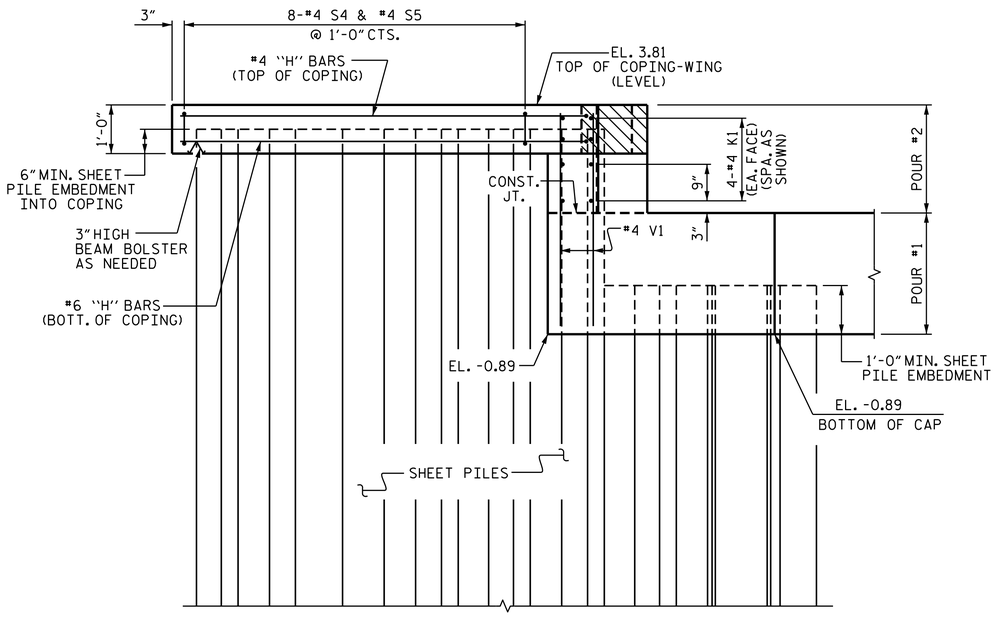
PLAN - COPING (C1)

DRILL 2" Ø MAX. HOLE IN SHEET PILES FOR #9 B1, #4 K1, AND #4 S5 BARS



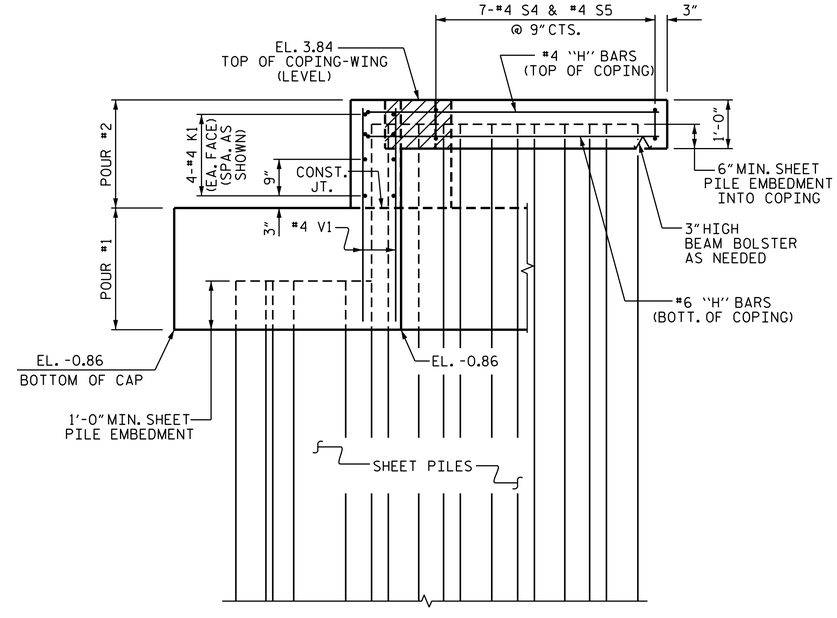
SECTION THRU COPING

DRILL 2" Ø MAX HOLE IN SHEET PILES FOR #4 S5 BAR



ELEVATION - COPING (C2)

DRILL 2" Ø MAX. HOLE IN SHEET PILES FOR #9 B1, #4 K1, AND #4 S5 BARS
"V" BARS MAY BE SHIFTED SLIGHTLY TO AVOID SHEET PILES



ELEVATION - COPING (C1)

DRILL 2" Ø MAX. HOLE IN SHEET PILES FOR #9 B1, #4 K1, AND #4 S5 BARS
"V" BARS MAY BE SHIFTED SLIGHTLY TO AVOID SHEET PILES

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

PROJECT NO. 17BP.1.R.69
CURRITUCK COUNTY
STATION: 13+90.70 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : K. P. SEDAI DATE : 8/25/14
CHECKED BY : REZA KOUCHEKI DATE : 9/2/14
DESIGN ENGINEER OF RECORD : K. P. SEDAI DATE : 9/3/14

21-NOV-2014 14:34
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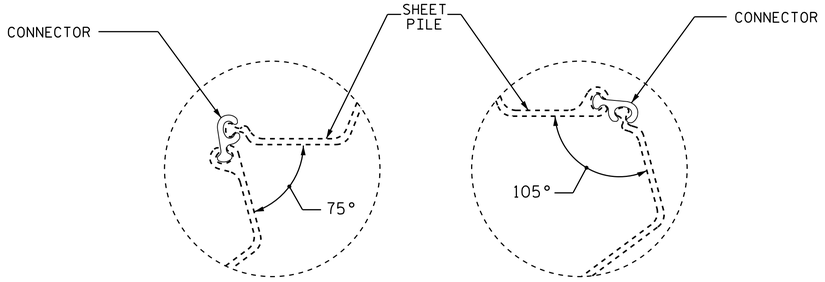
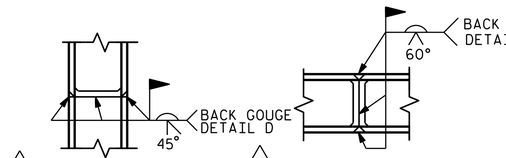


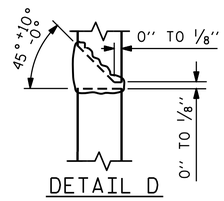
DETAIL A

DETAIL B

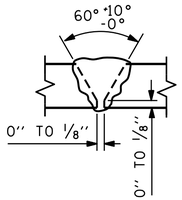


△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



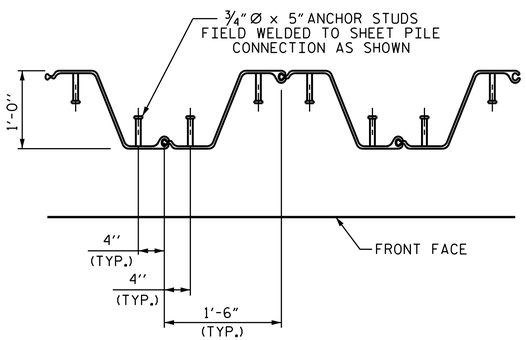
DETAIL D



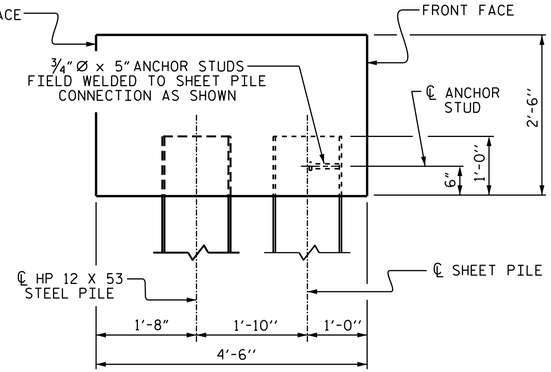
DETAIL E

△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



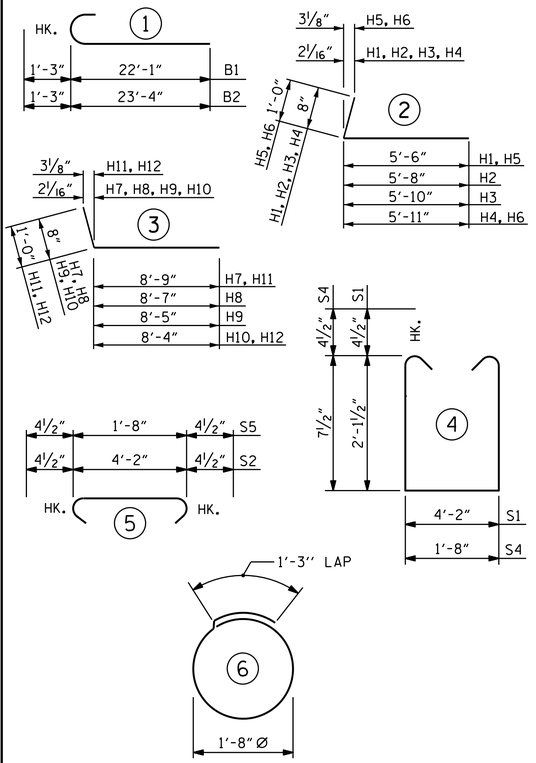
PLAN



SECTION

SPLICE CHART	
#9 B1	6'-3"
#9 B2	8'-9"
#5 B3	3'-0"
#4 B4	2'-5"

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL
END BENT No. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	23'-4"	952
B2	12	#9	1	24'-7"	1003
B3	8	#5	STR	20'-6"	171
B4	8	#4	STR	20'-3"	108
B5	10	#4	STR	4'-2"	28
D1	20	#6	STR	1'-6"	45
H1	1	#4	2	6'-2"	4
H2	1	#4	2	6'-4"	4
H3	1	#4	2	6'-6"	4
H4	1	#4	2	6'-7"	4
H5	1	#6	2	6'-6"	10
H6	1	#6	2	6'-11"	10
H7	1	#4	3	9'-5"	6
H8	1	#4	3	9'-3"	6
H9	1	#4	3	9'-1"	6
H10	1	#4	3	9'-0"	6
H11	1	#6	3	9'-9"	15
H12	1	#6	3	9'-4"	14
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S1	48	#4	4	9'-2"	294
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V1	20	#4	STR	4'-4"	58

REINFORCING STEEL LBS 3047

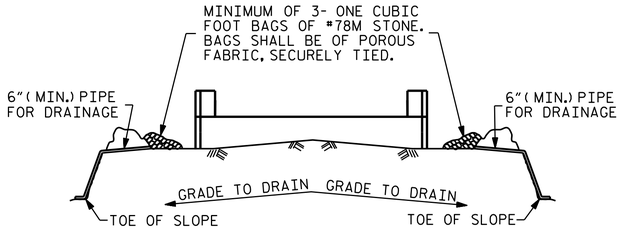
CLASS A CONCRETE:

POUR #1: CAP & COLLARS	16.8 C.Y.
POUR #2: UPPER PART OF WINGS	0.6 C.Y.
POUR #3: COPING	1.0 C.Y.
TOTAL	18.4 C.Y.

HP 12 X 53 STEEL PILES
NO: 5 LIN. FT. = 350
PILE REDRIVES EA. 3

STEEL SHEET PILES
NO = 36 SO. FT. 1054
NO. CONNECTOR = 2 SO. FT. 12
TOTAL NO. = 38 SO. FT. 1066

SHEET PILE ANCHOR STUD DETAILS

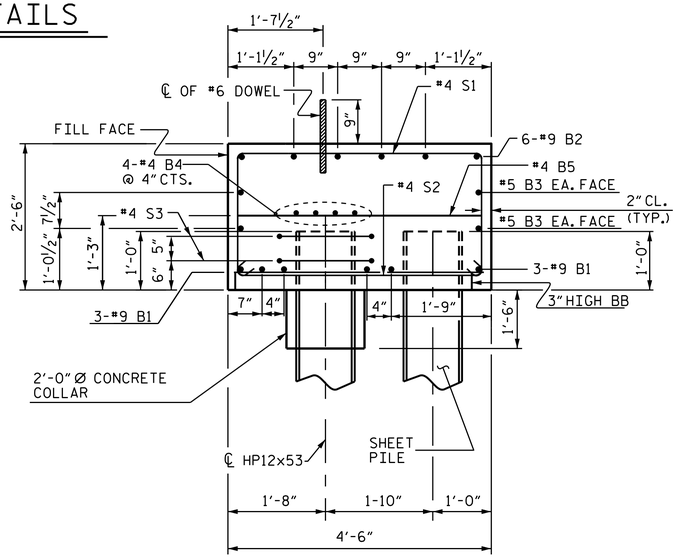


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

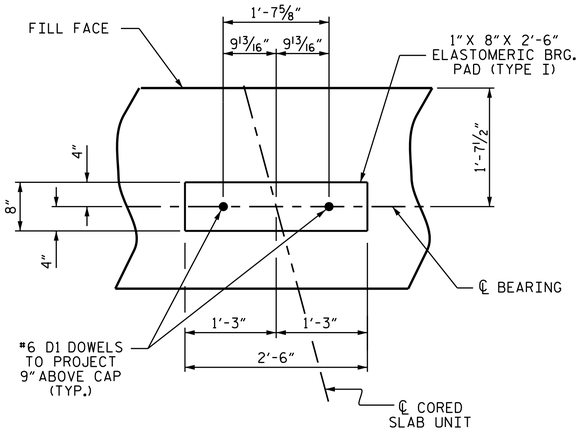
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



SECTION A-A

DRILL 2" Ø MAX. HOLE IN SHEET PILES FOR #9 B1 AND #5 S2 BARS



DETAIL "C"

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

PROJECT NO. 17BP.1.R.69

CURRITUCK COUNTY

STATION: 13+90.70 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : K. P. SEDAI DATE : 8/25/14
CHECKED BY : REZA KOUCHEKI DATE : 9/2/14
DESIGN ENGINEER OF RECORD : K. P. SEDAI DATE : 9/3/14

21-NOV-2014 14:34
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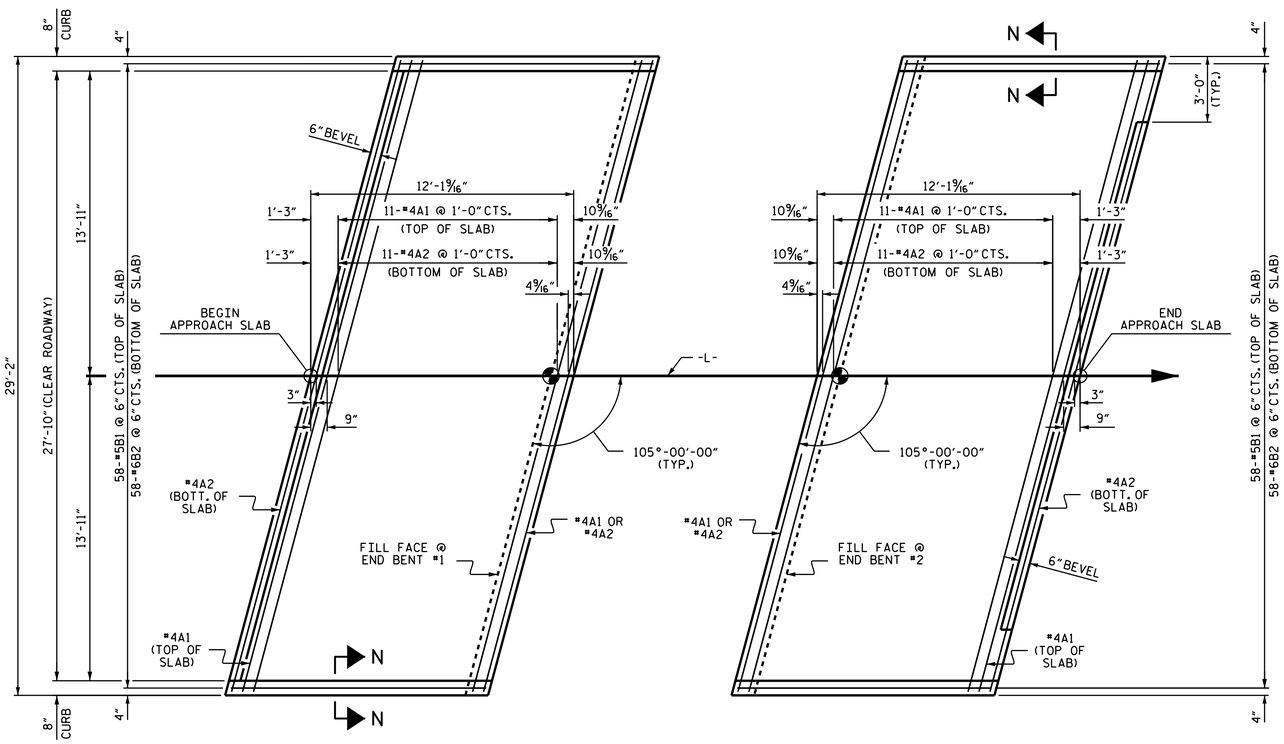
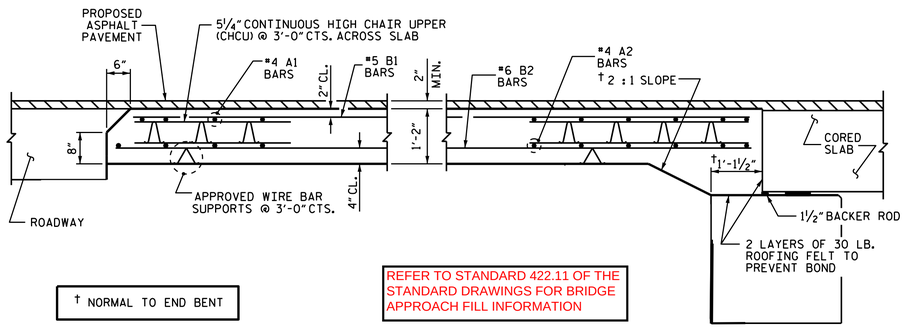


PLAN @ END BENT #1

PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



† NORMAL TO END BENT

REFER TO STANDARD 422.11 OF THE STANDARD DRAWINGS FOR BRIDGE APPROACH FILL INFORMATION

SECTION THRU SLAB

NOTES

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

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.

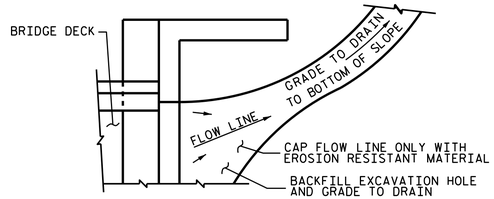
BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	29'-10"	259
A2	13	#4	STR	29'-10"	259
* B1	58	#5	STR	11'-1"	670
B2	58	#6	STR	11'-7"	1009
REINFORCING STEEL				LBS.	1268
* EPOXY COATED REINFORCING STEEL				LBS.	929
CLASS AA CONCRETE				C.Y.	16.4

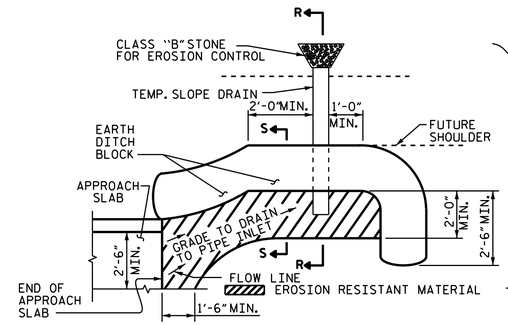
APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	29'-10"	259
A2	13	#4	STR	29'-10"	259
* B1	58	#5	STR	11'-1"	670
B2	58	#6	STR	11'-7"	1009
REINFORCING STEEL				LBS.	1268
* EPOXY COATED REINFORCING STEEL				LBS.	929
CLASS AA CONCRETE				C.Y.	16.4



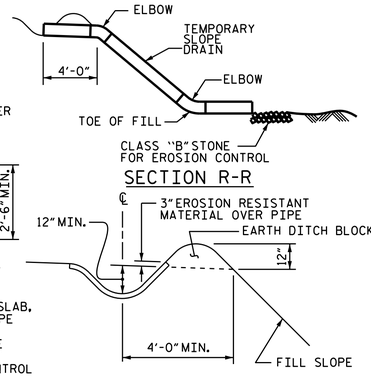
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

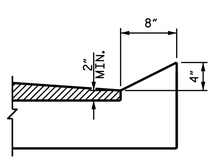


SECTION R-R

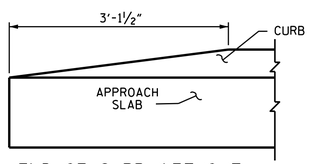
SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

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

PROJECT NO. 17BP.1.R.69

CURRITUCK COUNTY

STATION: 13+90.70 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
BRIDGE APPROACH SLAB
FOR PRESTRESSED CONCRETE
CORED SLAB UNIT
(SUB-REGIONAL TIER)
105° SKEW

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

SHEET NO. S-20

TOTAL SHEETS 20

ASSEMBLED BY : K. P. SEDAI	DATE : 8/26/14	
CHECKED BY : REZA KOUCHEKI	DATE : 8/27/14	
DRAWN BY : SHS/MAA 5-09	REV. 12-11	MAA/AAC
CHECKED BY : BCH 5-09	REV. 08-14	MAA/TMG

21-NOV-2014 14:34
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