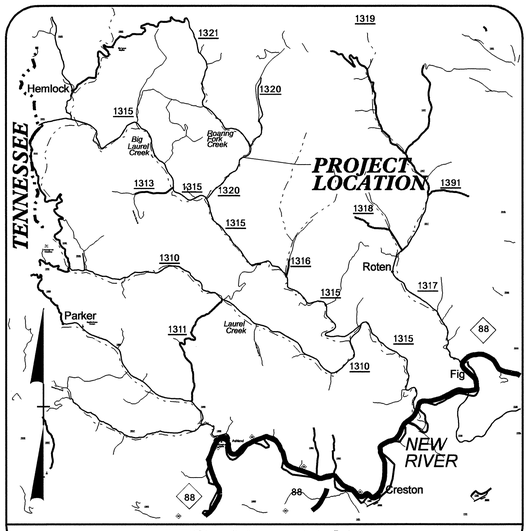
CONTRACT: C201635 TIP PROJECT: B-4013

STRUCTURE



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ASHE COUNTY

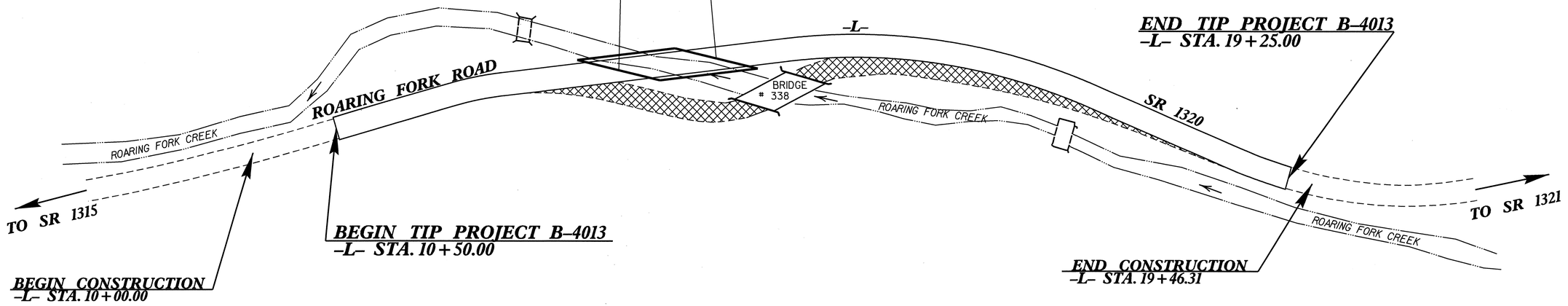
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4013		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33381.1.1	BRZ-1320(4)	P.E.
33381.2.1	BRZ-1320(4)	UTIL. & R/W
33381.3.1	BRZ-1320(4)	CONST.

LOCATION: BRIDGE NO. 338 OVER ROARING FORK CREEK ON SR 1320 (ROARING FORK RD.)

TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURE

NCGRID



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT 2006 = 465
ADT 2025 = 700
DHV = 12 %
D = 60 %
T = 3 % *
V = 30 MPH

* TTST 1% DUAL 2%

PROJECT LENGTH

LENGTH ROADWAY OF F.A. PROJECT = 0.150 MI
LENGTH STRUCTURE OF F.A. PROJECT = 0.016 MI
TOTAL LENGTH OF STATE PROJECT = 0.166 MI

Prepared In the Office of:

DIVISION OF HIGHWAYS

1000 Birch Ridge Dr., Raleigh, NC 27610

2006 STANDARD SPECIFICATIONS

LETTING DATE :

FEBRUARY 20, 2007

J. C. FRYE, P.E.
PROJECT ENGINEER

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

STRUCTURE DESIGN UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

NORTH CAROLINA PROFESSIONAL SEAL 14552 ENGINEER GREGORY R. PERFETTI

1-11-07

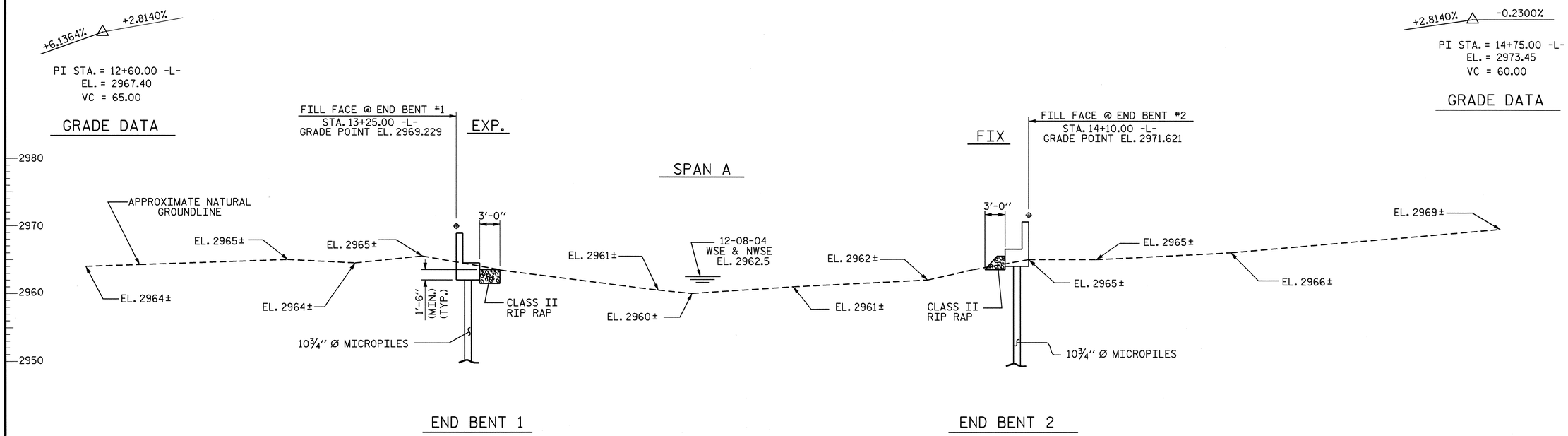
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

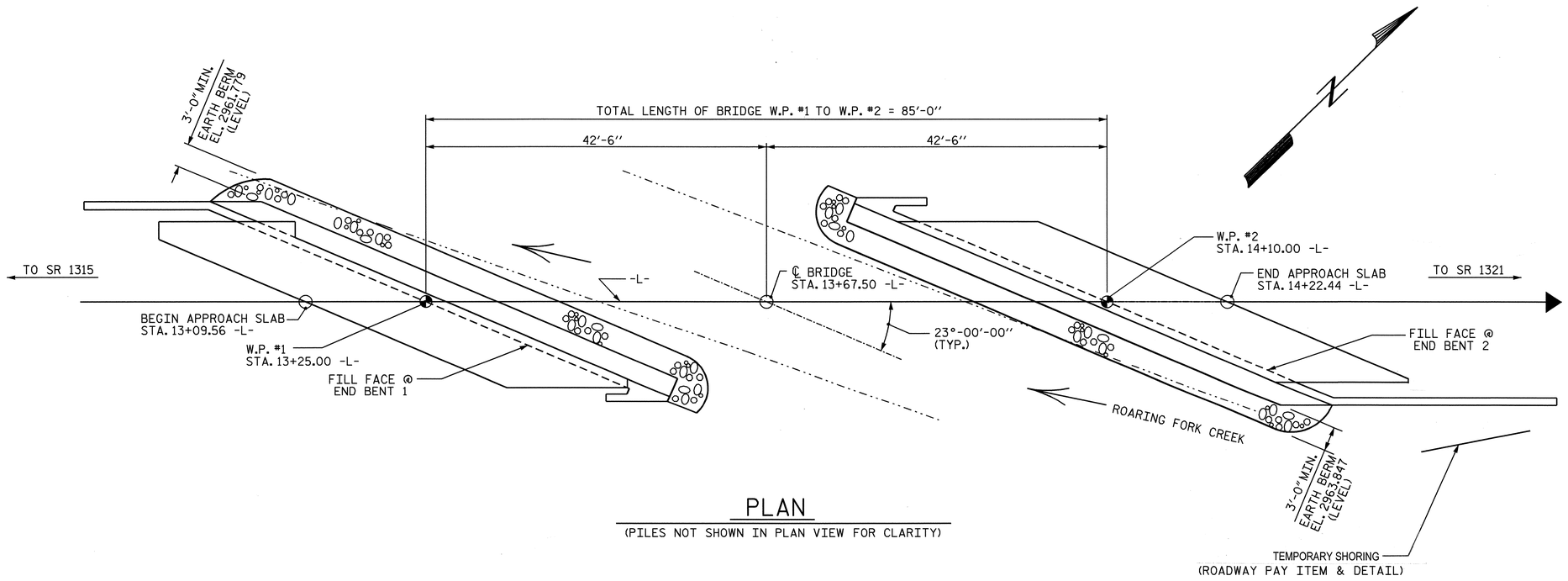
APPROVED
DIVISION ADMINISTRATOR *DATE*

F.A. PROJ. NO. BRZ-1320(4)



SECTION ALONG -L-

(SECTION TAKEN AT RIGHT ANGLES TO END BENTS AND RIP RAP)



PLAN

(PILES NOT SHOWN IN PLAN VIEW FOR CLARITY)

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
12/05/06

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN D. [illegible]
12/5/06

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 338

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER ROARING FORK CREEK ON SR 1320 BETWEEN SR 1315 AND SR 1321

ALTERNATE "A1"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : QT NGUYEN DATE : 8-06
CHECKED BY : T.H. FANG DATE : 10-06

04-DEC-2006 13:19
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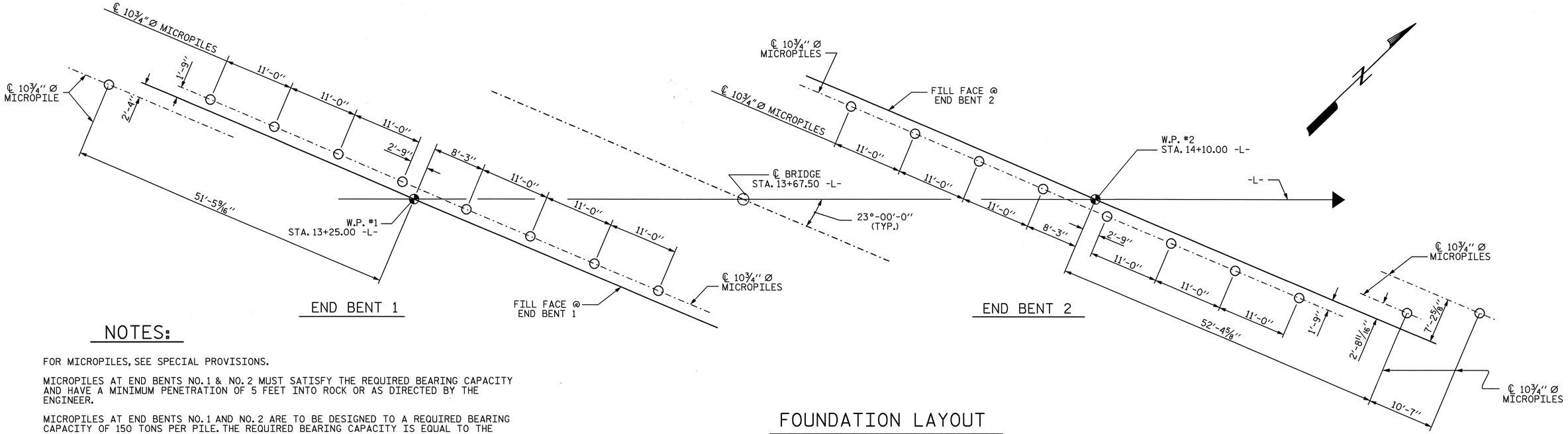

NOTES:

FOR MICROPILES, SEE SPECIAL PROVISIONS.

MICROPILES AT END BENTS NO. 1 & NO. 2 MUST SATISFY THE REQUIRED BEARING CAPACITY AND HAVE A MINIMUM PENETRATION OF 5 FEET INTO ROCK OR AS DIRECTED BY THE ENGINEER.

MICROPILES AT END BENTS NO. 1 AND NO. 2 ARE TO BE DESIGNED TO A REQUIRED BEARING CAPACITY OF 150 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF 2.5.

THE ALLOWABLE BEARING CAPACITY FOR MICROPILES AT END BENTS NO. 1 AND NO. 2 IS 60 TONS PER PILE.

CONSTRUCT MICROPILES ACCORDING TO THE SPECIAL PROVISIONS, DETAILS, PLANS AND AS DIRECTED BY THE ENGINEER.

BOND LENGTHS MUST BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR MUST SUBMIT COMPLETE COMPUTATION AND DETAILS TO THE DEPARTMENT FOR APPROVAL PRIOR TO ORDERING MATERIALS. (SEE MICROPILES SPECIAL PROVISIONS).

STEEL CASING MUST BE 10¾" DIAMETER (MIN.) AND ½" WALL THICKNESS OR EQUIVALENT.

THE ALLOWABLE LOAD APPLIED TO THE TOP OF EACH MICROPILE IS Pf = 120 KIPS (AXIAL MAX.), VL = 14 KIPS (SHEAR MAX.) AND ML = 20 KIP-FT (MOMENT MAX.)

FOR 10¾"Ø MICROPILE PROOF LOAD TEST, SEE MICROPILES SPECIAL PROVISIONS.

SPLICES IN THE PERMANENT CASING MUST BE DESIGNED FOR THE AXIAL LOAD, SHEAR LOAD AND MOMENT.

THE MICROPILES SHALL UTILIZE EITHER DEFORMED BARS OR THREADBARS IN THE DESIGN OF THE REINFORCEMENT CROSS SECTIONAL AREA. THE REINFORCEMENT MUST BE SIZED TO LIMIT THE STRESS TO 0.6 Fpu (60% G.U.T.S.). THE SINGLE REINFORCEMENT BAR SHOWN IN THE MICROPILE DETAIL IS FOR ILLUSTRATION ONLY. MULTIPLE REINFORCEMENT BARS MAY BE REQUIRED. (SEE MICROPILES SPECIAL PROVISIONS).

THE MICROPILES SHALL BE LOAD TESTED AS OUTLINED IN THE SPECIAL PROVISION. THE MAXIMUM DEFLECTION OF THE ANCHORAGE HEAD ASSEMBLY WHEN SUBJECTED TO DESIGN AXIAL LOADS MUST BE LESS THAN ¾".

MICROPILES AT END BENTS NO. 1 AND NO. 2 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 2950.0 FT AND 2949.0 FT. RESPECTIVELY, AND BOTH HAVE A 5 FOOT ROCK SOCKET.

MICROPILE CASINGS AT END BENTS NO. 1 AND NO. 2 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 2955.0 FT. AND 2954.0 FT. RESPECTIVELY.

THE SCOUR CRITICAL ELEVATION FOR END BENT NO. 1 IS ELEVATION 2954.3 FT., FOR END BENT NO. 2 IS ELEVATION 2953.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THE MINIMUM COMPRESSIVE STRENGTH OF THE GROUT SHALL BE 4000 PSI AND SHALL MEET THE REQUIREMENT OF THE MICROPILE SPECIAL PROVISION.

THE MINIMUM GROUT COVER IN THE MICROPILE CASING AND ROCK SOCKET SHALL BE MINIMUM OF 1½".

TENSILE REINFORCEMENT: Fpu THREADBAR RODS = 150,000 PSI (AASHTO M 275), Fu (REINF.) = 90,000 PSI; BENDING MEMBER: Fy STEEL CASING = 80,000 PSI, Fy ANCHORAGE PLATE = 50,000 PSI.

FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE)

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING FANG

01/10/07

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER ROARING FORK CREEK ON SR 1320 BETWEEN SR 1315 AND SR 1321

ALTERNATE "A1"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : QT NGUYEN DATE : 10-06
CHECKED BY : T.H. FANG DATE : 10-06

10-JAN-2007 15:45
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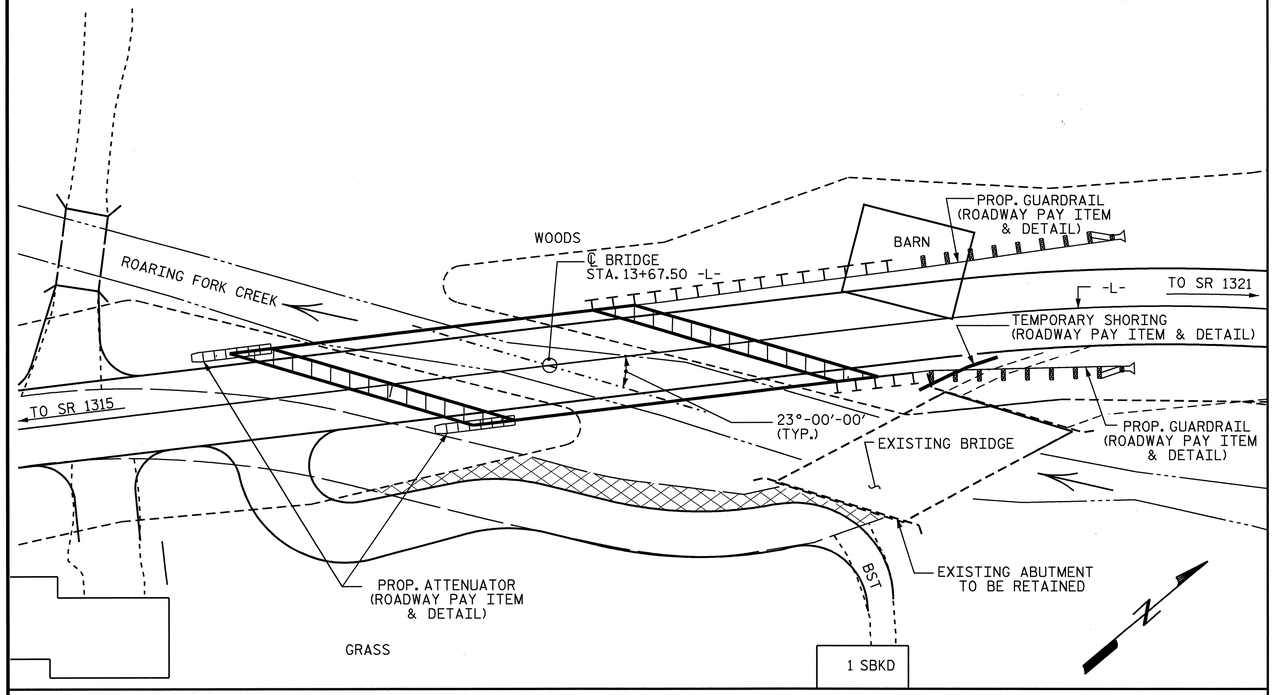
ttfang

BM #1: 8'' SPIKE IN ROOT OF 16'' WILD CHERRY 83.44' LEFT OF -L- STA. 11+52.06 EL. 2958.96



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

HYDRAULIC DATA

DESIGN DISCHARGE_____ 1050 CFS.
FREQUENCY OF DESIGN FLOOD_____ 25 YEARS
DESIGN HIGH WATER ELEVATION_____ 2969.8
DRAINAGE AREA_____ 4.3 SQ. MI.
BASIC DISCHARGE(Q100)_____ 1600 CFS.
BASIC HIGH WATER ELEVATION_____ 2971.2

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE_____ 1050 CFS.
FREQUENCY OF OVERTOPPING FLOOD_____ 25 YRS.
OVERTOPPING FLOOD ELEVATION_____ 2965.0

NOTES:

ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING, EXCEPT THAT THE GIRDERS HAVE BEEN DESIGNED FOR HS25.

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50 AND SHALL BE COATED. APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-ZN-1) THERMALSPRAY COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STRUCTURAL STEEL SURFACES, EXCEPT THE SHEAR STUDS, THE TOP FACE OF THE GIRDER TOP FLANGES, AND THE TOP FACE OF END BENT DIAPHRAGM CHANNELS SHALL RECEIVE A LIGHT THERMAL SPRAYED COATING FOR THE PURPOSE OF PREVENTING RUST BLEED ONTO THE GIRDER WEB AND BOTTOM FLANGES. THE SHEAR STUDS, THE TOP FACE OF THE GIRDER TOP FLANGES, AND THE TOP FACE OF END BENT DIAPHRAGM CHANNELS SHALL NOT HAVE A SEAL COAT. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF 1 SPAN @ 50'-8"; 24'-10" CLEAR ROADWAY WIDTH AND TIMBER FLOOR ON I-BEAMS; END BENTS: TIMBER CAPS ON TIMBER POSTS AND CONCRETE SILLS, AND LOCATED 100 FEET UPSTREAM FROM PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY, 2001.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES FOR SEISMIC PERFORMANCE CATEGORY A.

FOR LIMITS OF TEMPORARY SHORING, SEE TRAFFIC CONTROL PLANS. FOR TEMPORARY SHORING PAY ITEM, SEE ROADWAY PLANS.

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 13+67.50 -L-"

THE USE OF NEEDLE BEAMS TO SUPPORT THE OVERHANG FALSEWORK WILL ONLY BE ALLOWED IN THE ACUTE CORNERS OF THE SLAB.

THE CONTRACTOR SHALL NOT BEGIN THE FINISHING PROCESS FOR THE DECK CONCRETE UNTIL ALL THE DECK CONCRETE HAS BEEN PLACED.

FOR GROUT FOR STURCTURES, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSIUNG FANG
11/06/07

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	REINFORCING CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	STRUCTURAL STEEL	ONE BAR METAL RAIL	1'-0" x 1'-6" CONCRETE PARARET	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS	METALLIZATION	REINFORCING STEEL	PERMANENT STEEL CASING FOR 10¾" DIA. MICROPILES	10¾" DIA. MICROPILES		10¾" DIA. MICROPILE PROOF LOAD TEST
	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	APPROX. LBS.	LIN. FT.	LIN. FT.	TON	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM	LBS.	LIN. FT.	NO.	LIN. FT.	EACH
SUPERSTRUCTURE		2250.6	2540		LUMP SUM	66,400	139.20	154.20			LUMP SUM	LUMP SUM	LUMP SUM					
END BENT 1				45.9					29	32				6,585	81	9	126	1
END BENT 2				52.9					19	32				7,272	120	10	170	1
TOTAL	LUMP SUM	2250.6	2540	98.8	LUMP SUM	66,400	139.20	154.20	48	64	LUMP SUM	LUMP SUM	LUMP SUM	13,857	201	19	296	2

PROJECT NO. B-4013
ASHE COUNTY
STATION: 13+67.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER ROARING FORK CREEK ON SR 1320 BETWEEN SR 1315 AND SR 1321

ALTERNATE "A1"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : Q.T. NGUYEN DATE : 8-06
CHECKED BY : T.H. FANG DATE : 10-06

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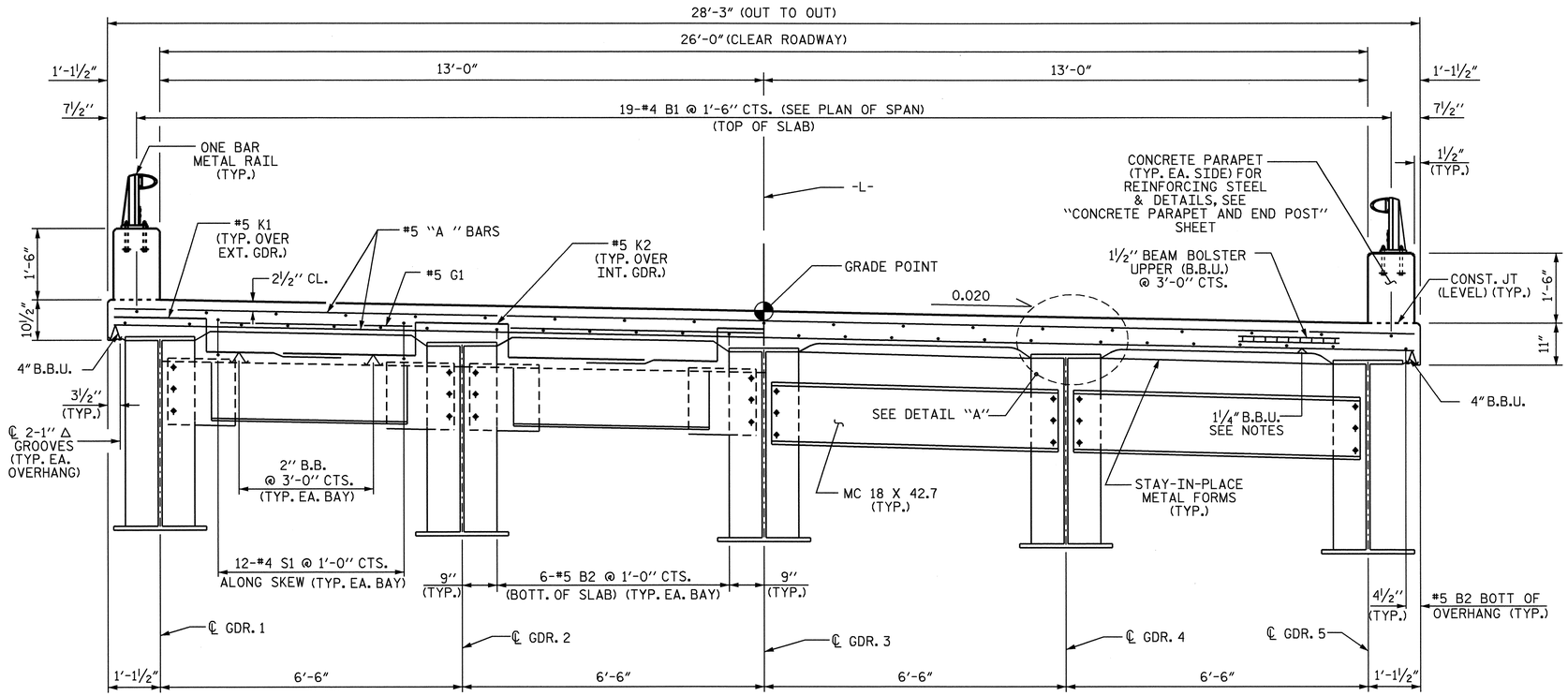


NOTES:

PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

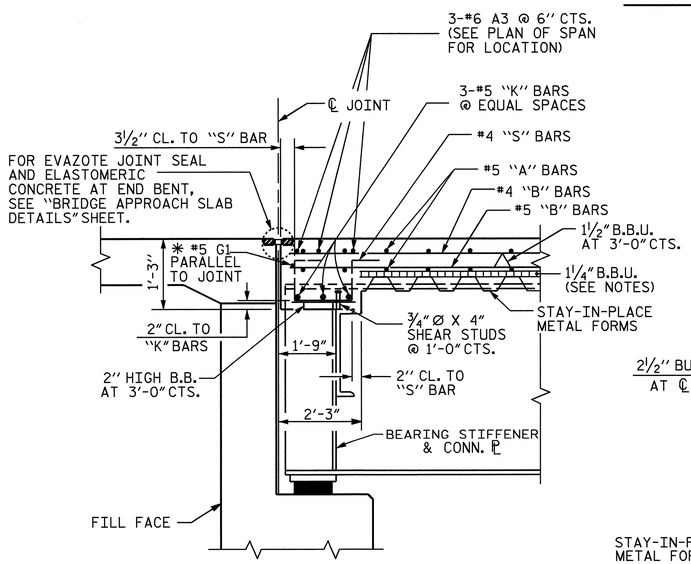
THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND BEAM/GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.

THE CONCRETE PARAPET SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

PART TYPICAL SECTION
(SHOWING END BENT DIAPHRAGMS)

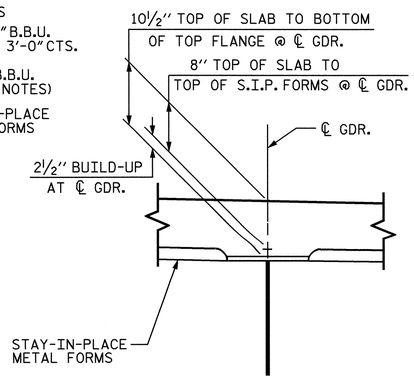
PART TYPICAL SECTION
(SHOWING INTERMEDIATE DIAPHRAGMS)

TYPICAL SECTION

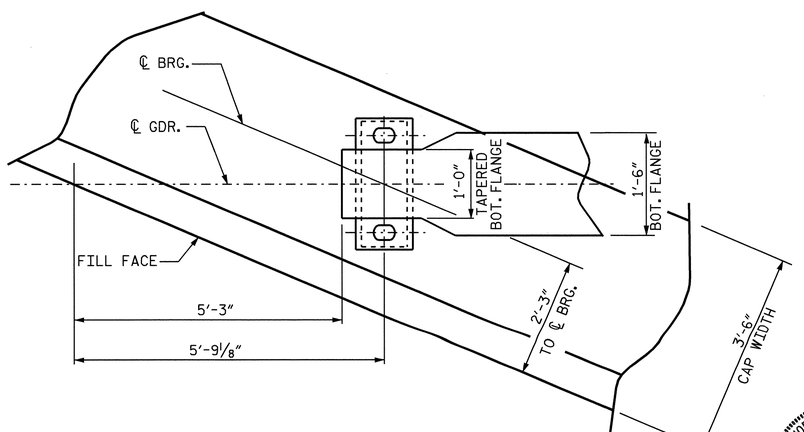


SECTION @ END BENT

* #5 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR DIAPHRAGM AND REINFORCING STEEL.



DETAIL "A"



PLAN OF GIRDER @ END BENT

PROJECT NO. B-4013
ASHE COUNTY
STATION: 13+67.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION AND DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-FANG KUO
12/29/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : QT NGUYEN DATE : 1-06
CHECKED BY : D.G. ELY DATE : 6-06

29-DEC-2006 11:43
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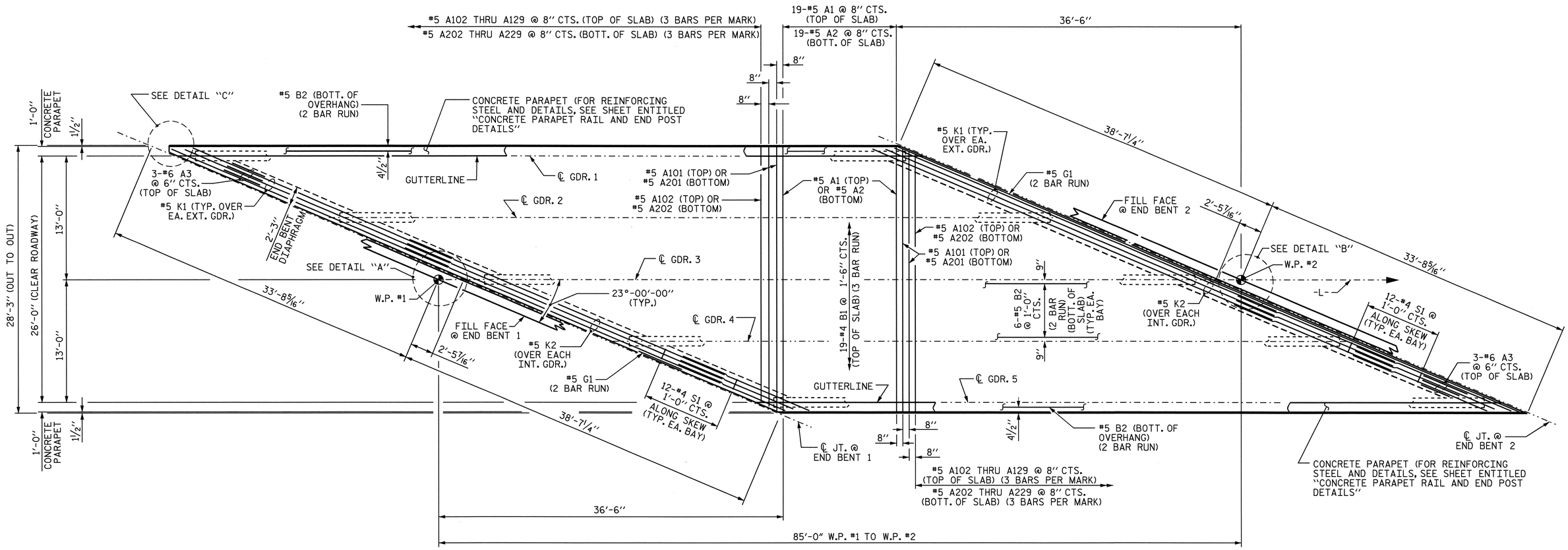
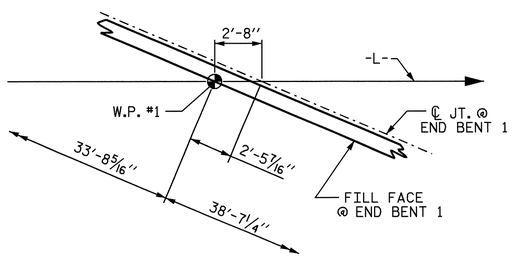
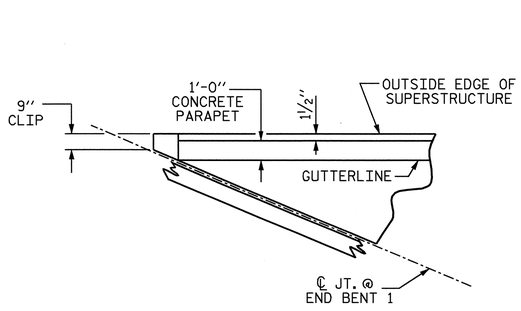


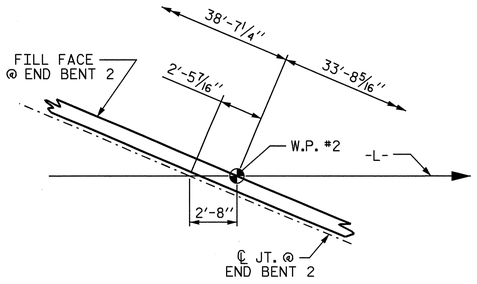
PLAN OF SPAN A



DETAIL "A"



DETAIL "C"



DETAIL "B"

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			35

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
12/05/06

DRAWN BY : QT NGUYEN DATE : 1-06
CHECKED BY : D.G. ELY DATE : 6-06

04-DEC-2006 13:20
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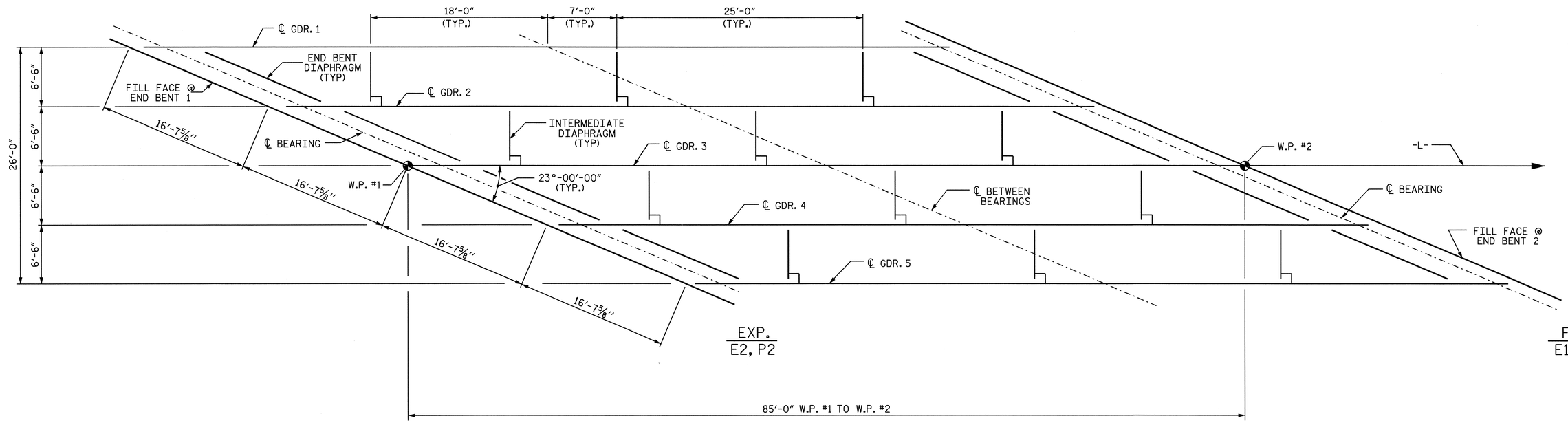
qtnguyen



FRAMING PLAN

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

12/05/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : QT NGUYEN DATE : 1-06
CHECKED BY : D.G. ELY DATE : 6-06

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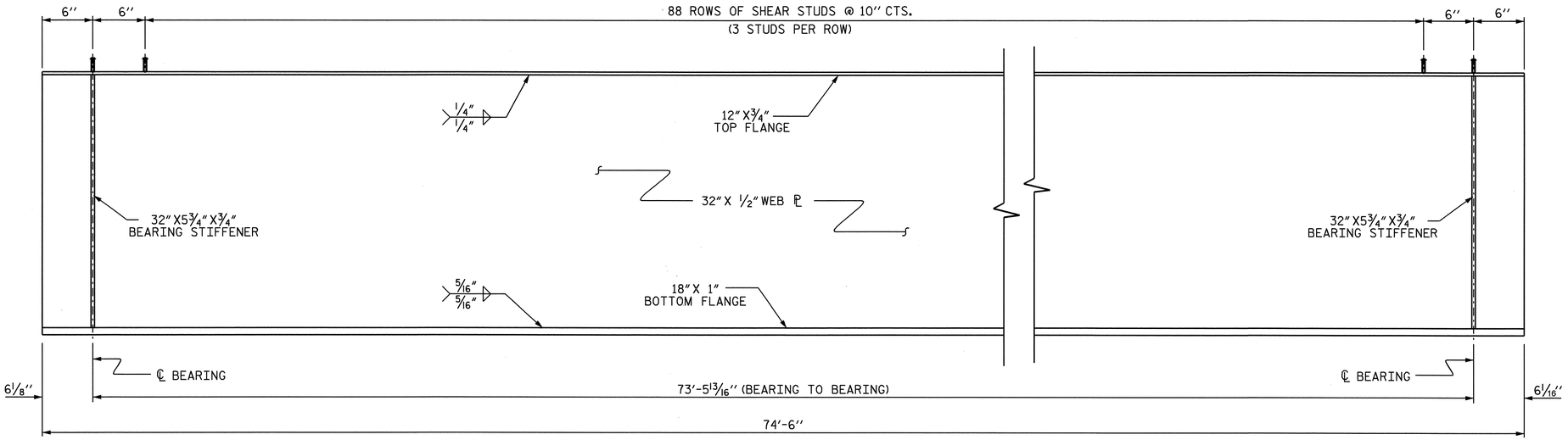
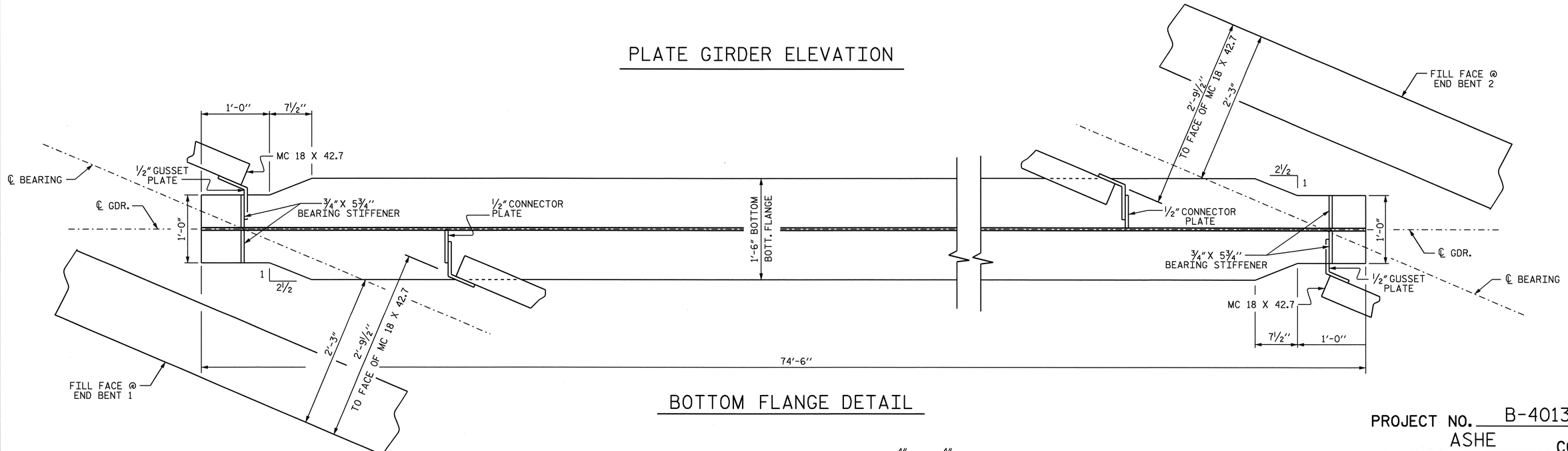
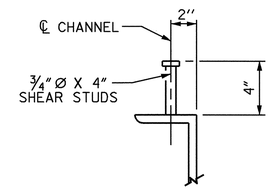


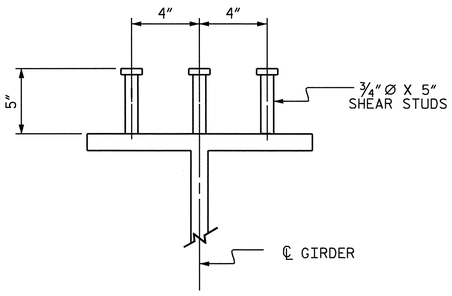
PLATE GIRDER ELEVATION



BOTTOM FLANGE DETAIL



SHEAR STUD DETAILS
(TYP. END BENT DIAPHRAGM)



SHEAR STUD DETAILS
(TYP. EA. GIRDER)

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
12/05/06

PROJECT NO. B-4013
ASHE COUNTY
STATION: 13+67.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : QT NGUYEN DATE : 1-06
CHECKED BY : D.G. ELY DATE : 6-06

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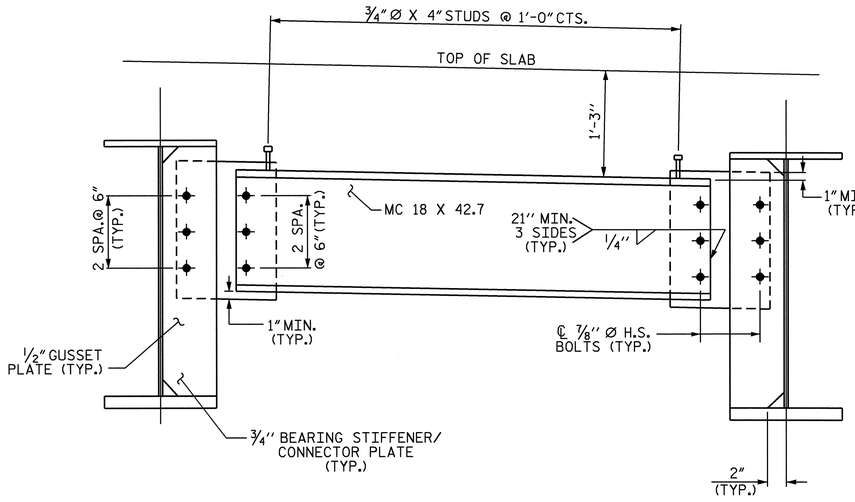
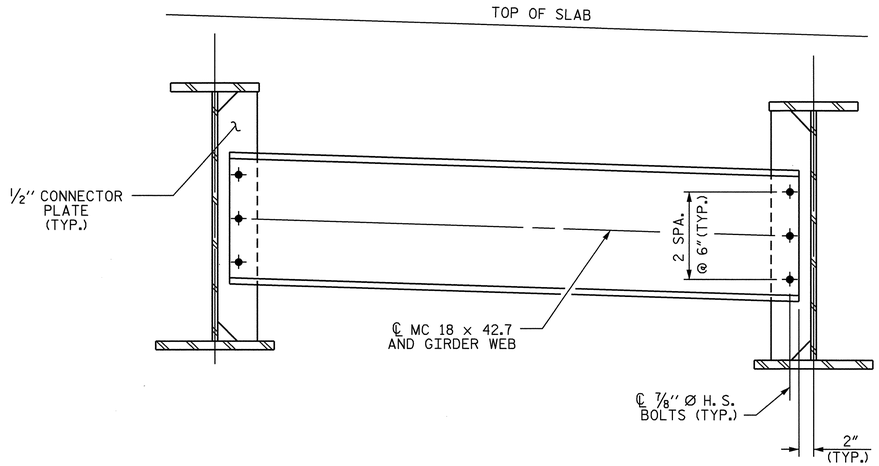
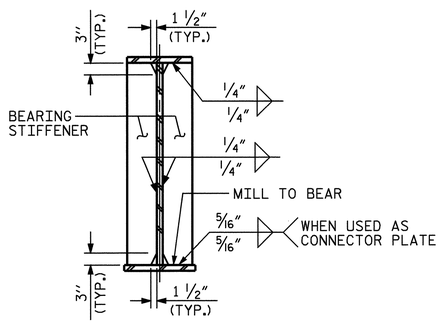


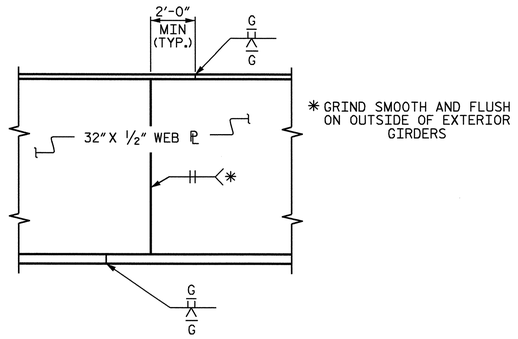
END BENT DIAPHRAGM



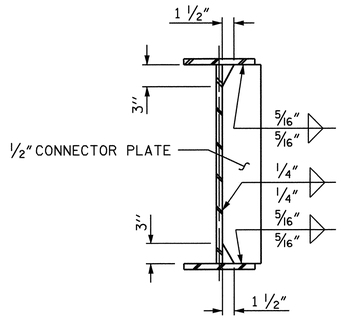
TYPICAL INTERMEDIATE DIAPHRAGM



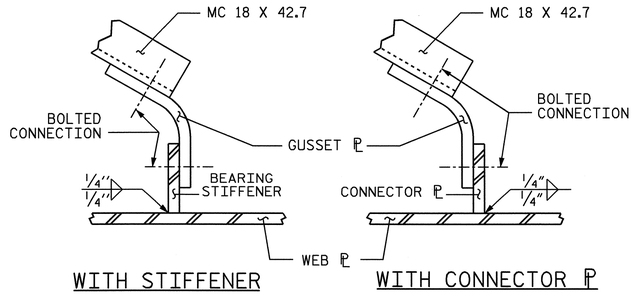
BEARING STIFFENER



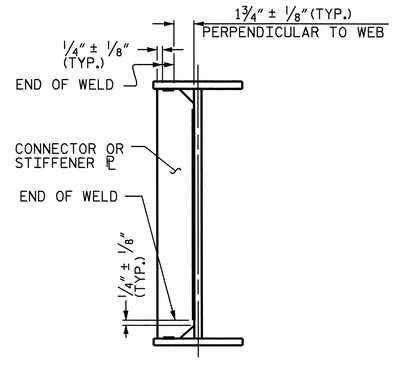
PERMISSIBLE SHOP FLANGE & WEB SPLICE



CONNECTOR PLATE DETAILS



GUSSET PLATE DETAIL



TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS

WELD TERMINATION DETAILS

NOTES

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50 AND SHALL BE COATED. APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-ZN-1) THERMAL SPRAY COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STRUCTURAL STEEL SURFACES, EXCEPT THE SHEAR STUDS, THE TOP FACE OF THE GIRDER TOP FLANGES, AND THE TOP FACE OF END BENT DIAPHRAGM CHANNELS SHALL RECEIVE A LIGHT THERMAL SPRAYED COATING FOR THE PURPOSE OF PREVENTING RUST BLEED ONTO THE GIRDER WEB AND BOTTOM FLANGES. THE SHEAR STUDS, THE TOP FACE OF THE GIRDER TOP FLANGES, AND THE TOP FACE OF END BENT DIAPHRAGM CHANNELS SHALL NOT HAVE A SEAL COAT. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

ALL FIELD CONNECTIONS TO BE ⅞" DIAMETER HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED. ALL BOLTS, NUTS AND WASHERS INCLUDING DIRECT TENSION INDICATORS ARE TO BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.

A CHARPY V-NOTCH TEST IS REQUIRED FOR WEB PLATES, AND BOTTOM FLANGE PLATES FOR ALL GIRDERS AND IN ACCORDANCE WITH ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS.

TENSION ON THE AASHTO M164 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

END OF GIRDERS SHALL BE PLUMB.

STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE TO AVOID INTERFERENCE WITH THE ANCHOR BOLT.

SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED FLANGE PIECE LENGTHS TO 60 FEET AND WEB PIECE LENGTHS TO 45 FEET. PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.

FOR SHIPPING STEEL STRUCTURAL MEMBERS, SEE SPECIAL PROVISIONS.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

1/08/07

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : QT NGUYEN DATE : 1-06
CHECKED BY : D.G. ELY DATE : 4-06

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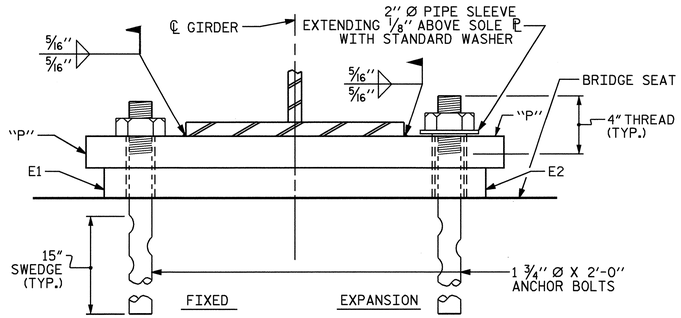
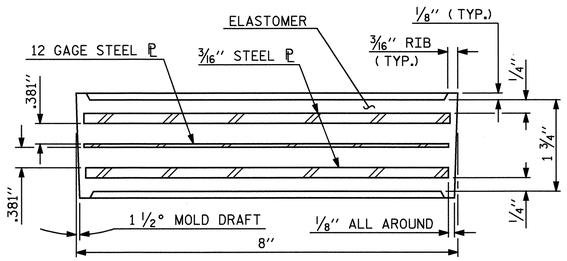
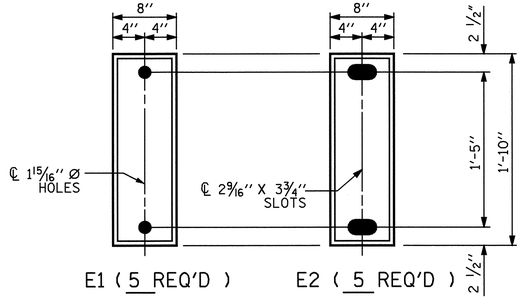


END VIEW

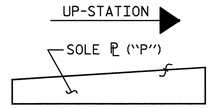


TYPICAL SECTION OF ELASTOMERIC BEARINGS

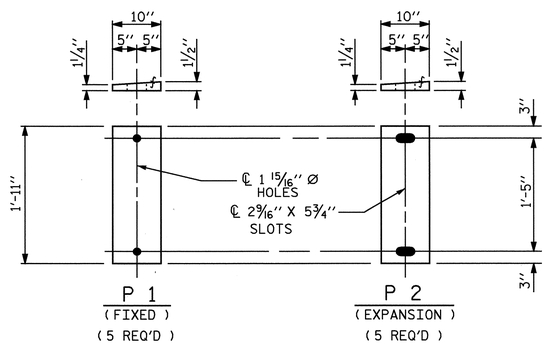


PLAN VIEW OF ELASTOMERIC BEARING

TYPE I



SOLE ℙ PLACEMENT DETAIL



SOLE PLATE DETAILS ("P")

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

SOLE PLATES, BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS OR MAY HAVE A THERMAL SPRAY COATING AS NOTED IN THE PLANS AND IN THE SPECIAL PROVISION, THERMAL SPRAYED COATINGS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

WHEN FIELD WELDING THE SOLE PLATE TO THE GIRDER FLANGE, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

LOAD RATINGS

	MAX.D.L.+L.L.
TYPE I	91 K

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ELASTOMERIC BEARING DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

12/05/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			35

ASSEMBLED BY : QT NGUYEN		DATE :	1-06
CHECKED BY : D.G. ELY		DATE :	4-06
DRAWN BY : JMB 11/87	REV. 7/17/98		RWW/LES
CHECKED BY : ARB 11/87	REV. 8/16/99		MAB/LES
	REV. 10/17/00		RWW/LES

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tfang

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	GIRDER #1 & #5											GIRDER #2, #3 & #4										
TENTH POINTS	BRG.	.1	.2	.3	.4	.5	.6	.7	.8	.9	BRG.	BRG.	.1	.2	.3	.4	.5	.6	.7	.8	.9	BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	-0.012	-0.022	-0.030	-0.035	-0.037	-0.035	-0.030	-0.022	-0.012	0	0	-0.012	-0.022	-0.030	-0.035	-0.037	-0.035	-0.030	-0.022	-0.012	0
✳ DEFLECTION DUE TO WEIGHT OF SLAB ↓	0	-0.006	-0.027	-0.044	-0.055	-0.058	-0.055	-0.044	-0.027	-0.006	0	0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	0
DEFLECTION DUE TO WEIGHT OF PARAPET ↓	0	-0.004	-0.007	-0.009	-0.011	-0.011	-0.011	-0.009	-0.007	-0.004	0	0	-0.003	-0.006	-0.008	-0.009	-0.010	-0.009	-0.008	-0.006	-0.003	0
TOTAL DEAD LOAD DEFLECTION ↓	0	-0.022	-0.056	-0.083	-0.101	-0.106	-0.101	-0.083	-0.056	-0.022	0	0	-0.015	-0.028	-0.038	-0.044	-0.047	-0.044	-0.038	-0.028	-0.015	0
REQUIRED CAMBER ↑	0	1/4''	11/16''	1''	1 3/16''	1 1/4''	1 3/16''	1''	11/16''	1/4''	0	0	3/16"	5/16''	7/16''	1/2''	9/16''	1/2''	7/16''	5/16''	3/16"	0

NOTES: ✳ INCLUDES SLAB, BUILD UPS & STAY-IN-PLACE FORMS

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

Ting H. Fang 12/05/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : QT NGUYEN DATE : 1-06
CHECKED BY : D.G. ELY DATE : 6-06

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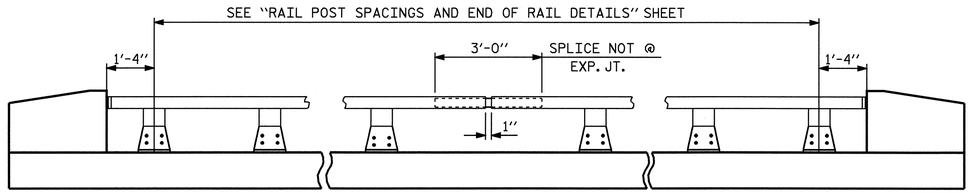
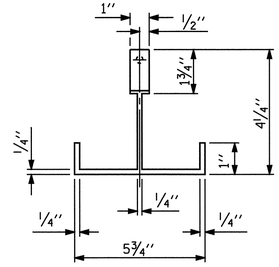
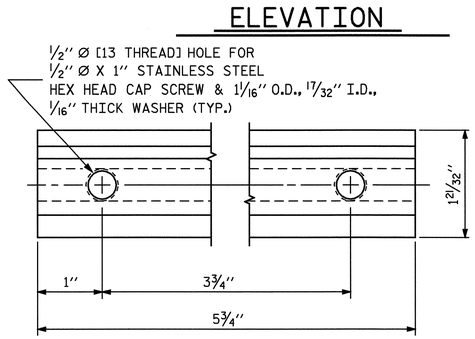


NOTE:
FOR ATTACHMENT OF METAL RAIL TO END POST, SEE SHEET 2 OF 2

ELEVATION

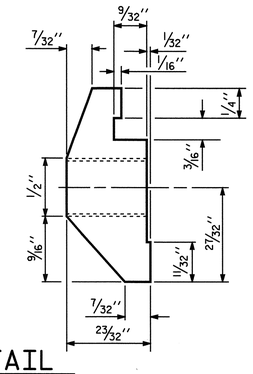


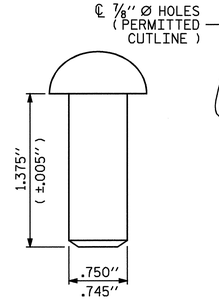
PLAN



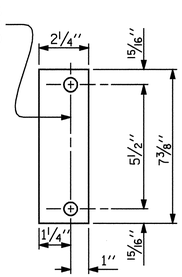
CLAMP BAR DETAIL

(2 REQUIRED PER POST)

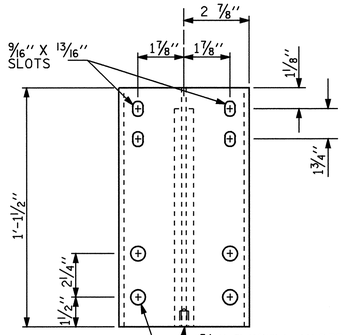




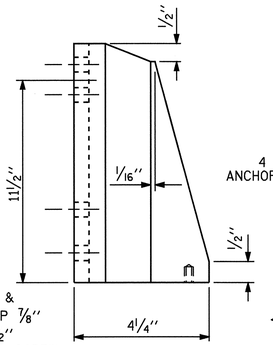
RIVET DETAIL



REAR PLATE

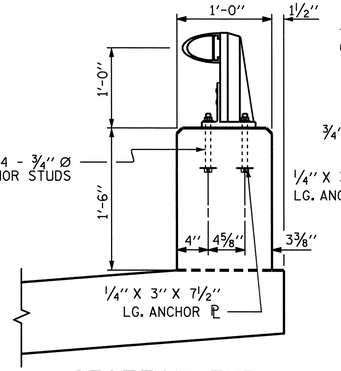


FRONT ELEVATION

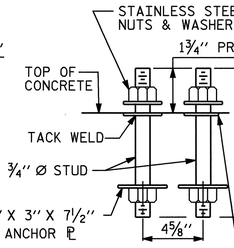


SIDE ELEVATION

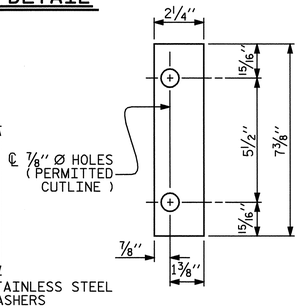
DETAILS OF POST



SECTION THRU PARAPET AND RAIL



ANCHOR ASSEMBLY



FRONT PLATE

SHIM DETAILS

NOTE : SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.

NOTES

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B221 ALLOY 6061-T6.

MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

GALVANIZED STEEL RAILS

MATERIALS AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

CLOSURE PLATES: CLOSURE PLATES SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

MATERIAL FOR ANCHOR STUDS SHALL BE ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. STUDS TO BE EMBEDDED 7" IN CONCRETE. NUTS SHALL BE AMERICAN STANDARD FINISHED HEXAGON THICK, CLASS 2B THREAD, AND MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ANCHOR ℄ SHALL BE AASHTO M270 GRADE 36.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

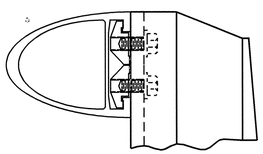
ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

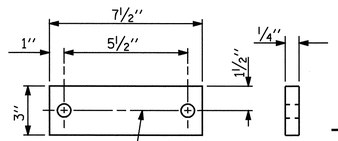
THE CONTRACTOR, AT HIS OPTION, MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN LIEU OF THE ANCHOR ASSEMBLY. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS REQUIRED.

WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS, NUTS AND WASHERS SHALL MEET THE SAME REQUIREMENTS AS THE ANCHOR STUDS, NUTS AND WASHERS FOR USE WITH THE ANCHOR ASSEMBLY.

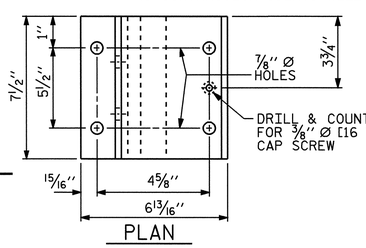
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8FT. TO 10FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.



CLAMP & RAIL ASSEMBLY

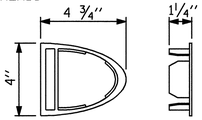


ANCHOR PLATE



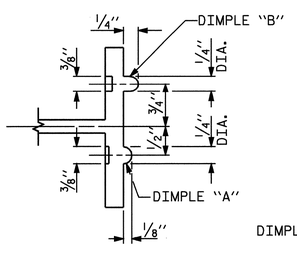
PLAN

PAY LENGTH = 139.20 LIN. FT.

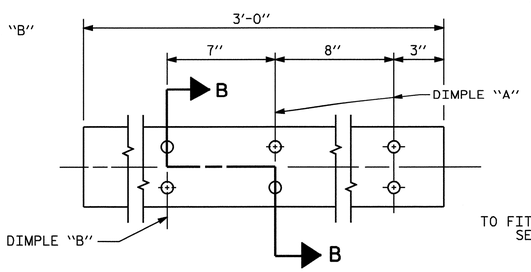


RAIL CAP

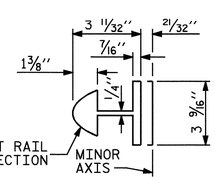
NOTE : BASE CAN BE SUPPLIED AS ONE EXTRUSION OR TWO EXTRUSIONS WELDED TOGETHER AS SHOWN.



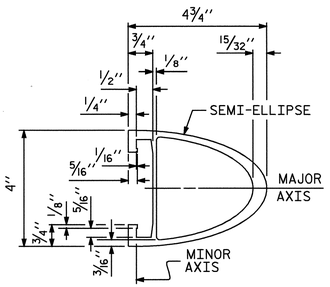
SECTION B-B



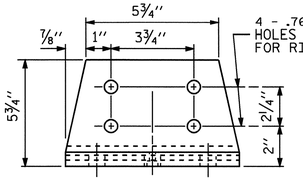
EXPANSION BAR DETAILS



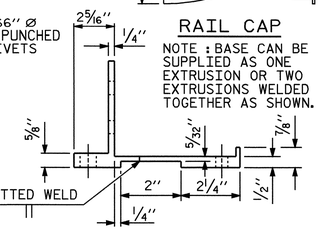
BAR SECTION



RAIL SECTION



FRONT ELEVATION



SIDE ELEVATION

POST BASE DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSIUNG FANG
12/05/06

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

1 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			35

ASSEMBLED BY :	QT NGUYEN	DATE :	1-06
CHECKED BY :	D.G. ELY	DATE :	6-06
DRAWN BY : FCJ 1/88	REV. 8/16/99		RWW/LES
CHECKED BY : CRK 3/89	REV. 10/17/00		LES/RDR
	REV. 5/7/03R		RWW/JTE

05-DEC-2006 11:42
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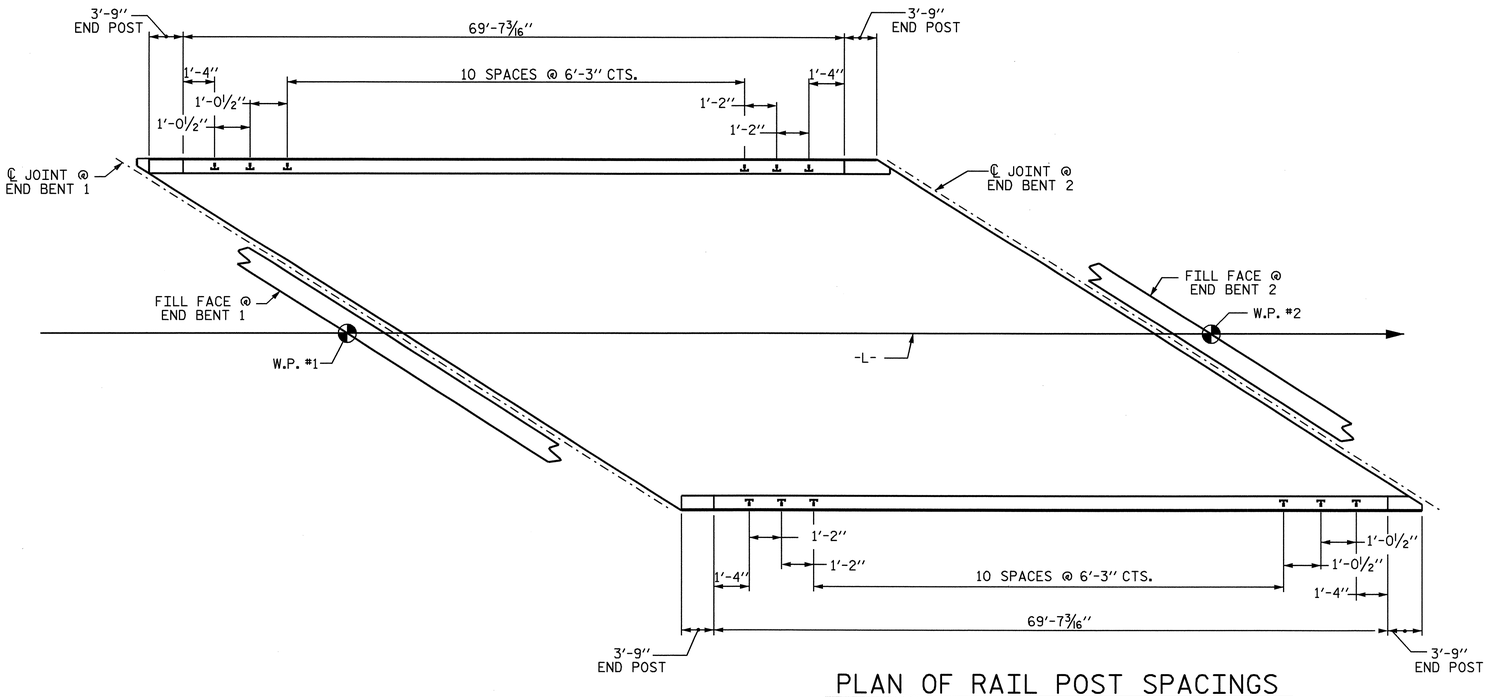
qtnguyen

STD. NO. BMR1



PLAN OF RAIL POST SPACINGS

NOTES
STRUCTURAL CONCRETE INSERT

THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1½".

B. 1 - ¾" Ø X 1⅝" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE ¾" Ø X 1⅝" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES
METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. ½" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

B. ¾" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A ¾"Ø X 1⅝" BOLT WITH 2" O.D. WASHER IN PLACE. THE ¾"Ø X 1⅝" BOLT SHALL HAVE N. C. THREADS.

C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.

D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).

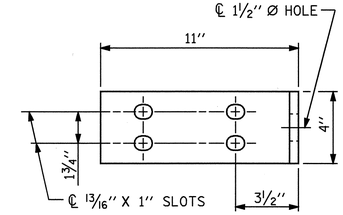
E. ½" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.

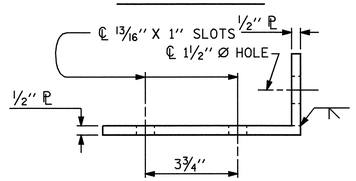
THE ¾" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE ¾" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE ½" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

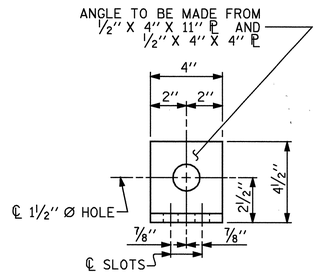
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾" Ø X 1⅝" BOLT WITH WASHER SHALL BE REPLACED WITH A ¾"Ø X 6½" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE ¾" Ø X 1⅝" BOLT SHALL APPLY TO THE ¾"Ø X 6 ½" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



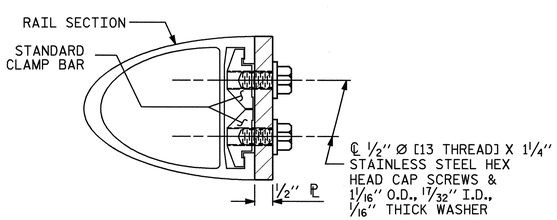
ELEVATION



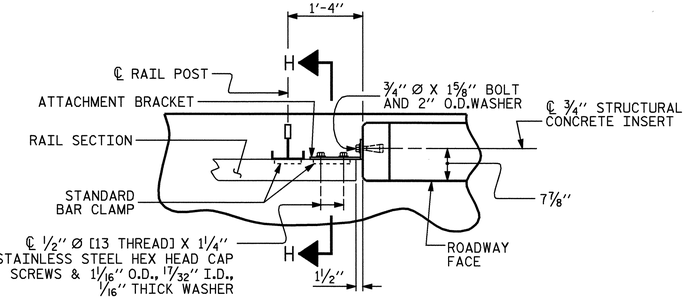
TOP VIEW



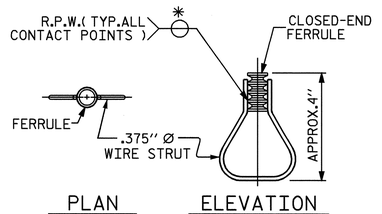
END VIEW



SECTION H-H



PLAN - RAIL AND END POST



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

DETAILS FOR ATTACHING METAL RAIL TO END POST

ASSEMBLED BY : QT NGUYEN	DATE : 1-06		
CHECKED BY : D.G. ELY	DATE : 6-06		
DRAWN BY : FCJ 1/88	REV. 8/16/99	RWW/LES	
CHECKED BY : CRK 3/89	REV. 10/17/00	LES/RDR	
	REV. 5/7/03	RWW/JTE	

05-DEC-2006 11:42
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qtnguyen

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
Ting H. Fang 12/05/06

PROJECT NO. B-4013
ASHE COUNTY
STATION: 13+67.50 -L-

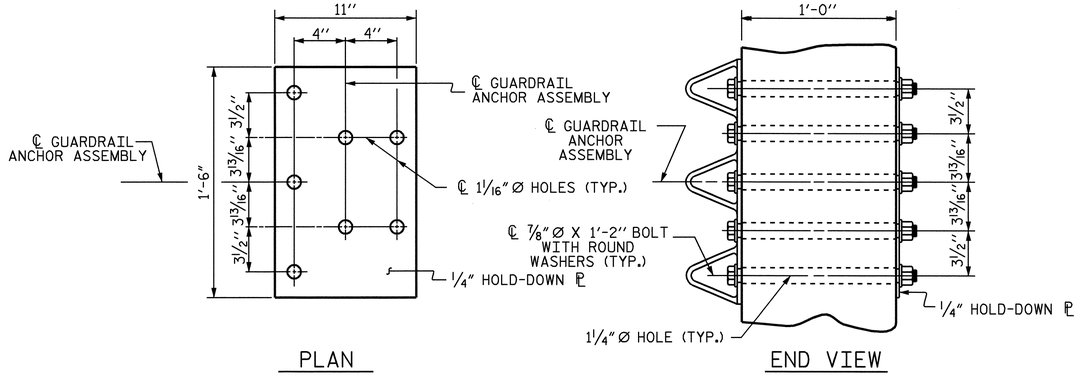
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RAIL POST SPACINGS AND END OF RAIL DETAILS FOR ONE BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			35

STD. NO. BMR2



GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A ¼'' HOLD DOWN PLATE AND 7 - ⅞'' 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.

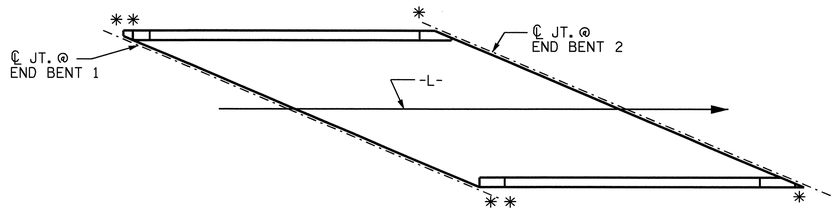
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE ⅞'' Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

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

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

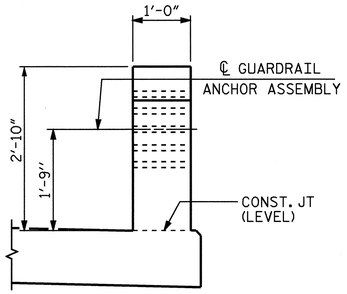
THE 1¼'' Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



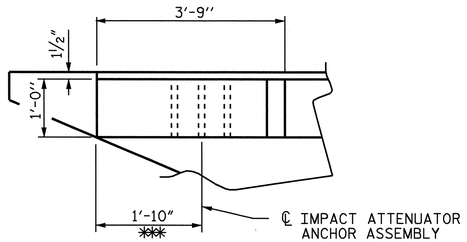
SKETCH SHOWING POINTS OF ATTACHMENT

*LOCATION OF GUARDRAIL ATTACHMENT

**LOCATION OF IMPACT ATTENUATOR ATTACHMENT

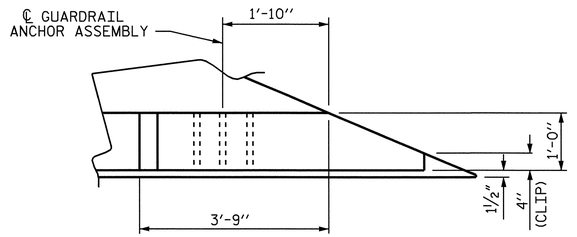


END VIEW
(ONE BAR METAL RAIL)



*** DIMENSION ADJUSTED IN THE FIELD UPON APPROVAL BY THE ENGINEER.

PLAN
@ END BENT #1
(TYPE I END POST)



PLAN
@ END BENT #2
(TYPE II END POST)

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

ASSEMBLED BY :	QT NGUYEN	DATE :	1-06			
CHECKED BY :	D.G. ELY	DATE :	6-06			
DRAWN BY : EEM	6/94	REV. 8/16/99	RWW/LES			
CHECKED BY : RGW	6/94	REV. 10/17/00	RWW/LES			
		REV. 5/7/03	RWW/JTE			

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			35

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

12/05/06

STD. NO. BMR8

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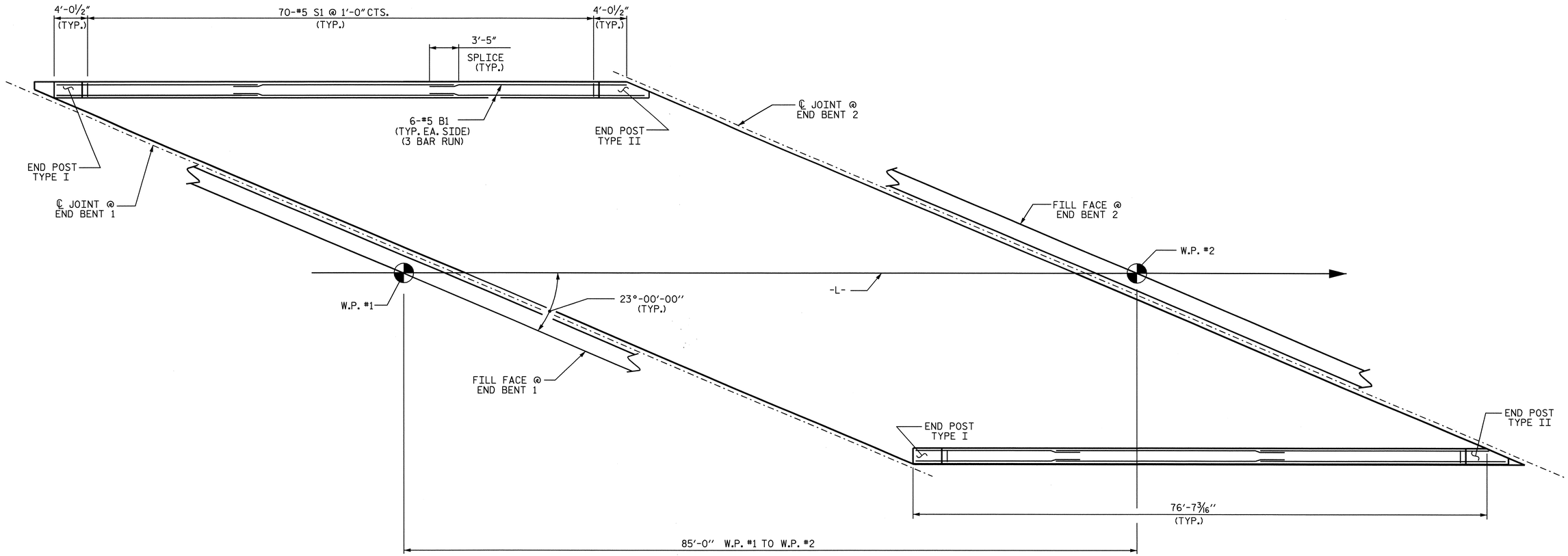
qtnguyen



PLAN OF PARAPET

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

1'-0" X 1'-6" CONCRETE PARAPET AND END POSTS

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

12/05/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS 35
2			4			

DRAWN BY : QT NGUYEN DATE : 10-06
CHECKED BY : T.H. FANG DATE : 10-06

05-DEC-2006 11:48
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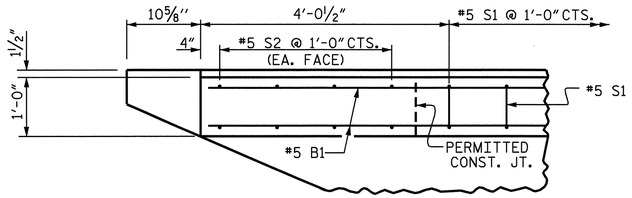
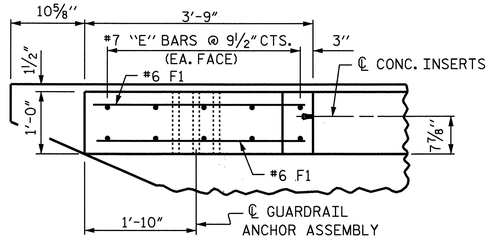
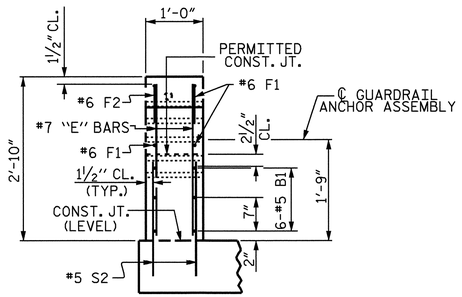
qtnguyen



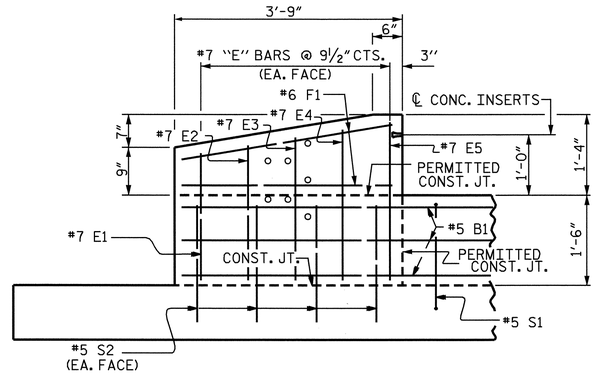
PLAN OF PARAPET



PLAN OF END POST



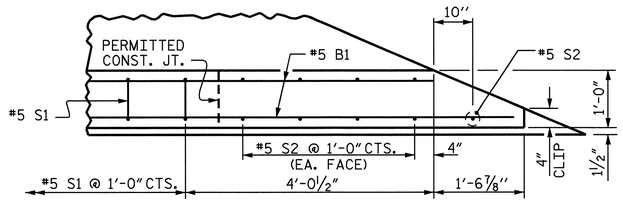
END VIEW



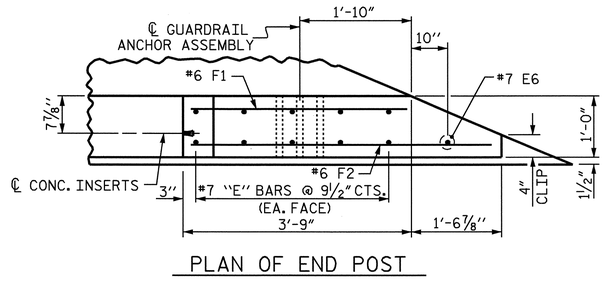
ELEVATION

PARAPET AND END POST FOR ONE BAR RAIL

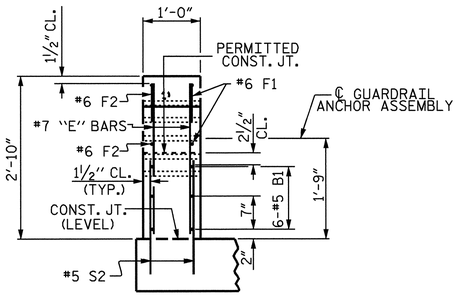
TYPE I



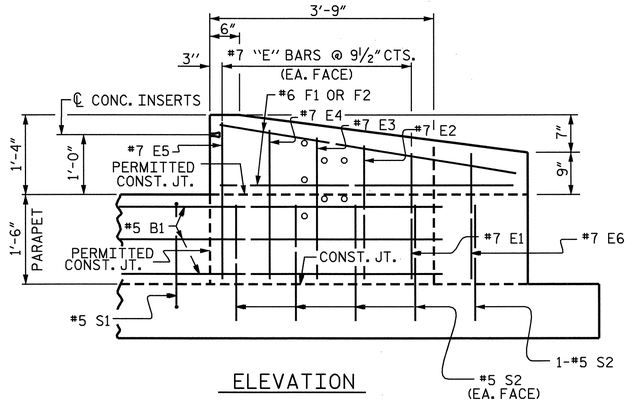
PLAN OF PARAPET



PLAN OF END POST



END VIEW



ELEVATION

PARAPET AND END POST FOR ONE BAR RAIL

TYPE II

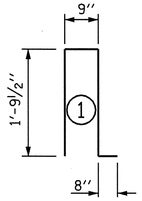
NOTES:

ALL REINFORCING STEEL IN PARAPETS AND END POSTS SHALL BE EXPOXY COATED.

FOR DETAIL OF CONCRETE INSERT AND GUARDRAIL ANCHOR ASSEMBLY, SEE "RAIL POST SPACINGS AND END OF RAIL DETAIL" SHEET.

THE #5 S2 BARS SHALL BE INSTALLED USING AN ADHESIVE ANCHORING SYSTEM AFTER SAWING THE JOINT. THE YIELD LOAD OF THE #5 S2 BARS IS 18.6 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SUSTEM IS NOT REQUIRED.

BAR TYPE



BAR DIMENSION IS OUT TO OUT

BILL OF MATERIAL

FOR 2 PARAPETS AND 4 END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ B1	36	#5	STR	28'-4"	1064
✳ E1	8	#7	STR	2'-0"	33
✳ E2	8	#7	STR	2'-2"	35
✳ E3	8	#7	STR	2'-4"	38
✳ E4	8	#7	STR	2'-6"	41
✳ E5	8	#7	STR	2'-7"	42
✳ E6	2	#7	STR	1'-11"	10
✳ F1	12	#6	STR	3'-9"	62
✳ F2	4	#6	STR	5'-3"	30
✳ S1	140	#5	1	5'-0"	730
✳ S2	34	#5	STR	2'-0"	71

✳ EPOXY COATED REINFORCING STEEL 2156 LBS.

CLASS AA CONCRETE

CONCRETE PARAPET	7.7	CU. YDS.
END POSTS	1.7	CU. YDS.
TOTAL	9.4	CU. YDS.

CONCRETE PARAPET 154.20 LIN. FT.

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

1'-0" X 1'-6" CONCRETE PARAPET AND END POSTS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : QT NGUYEN DATE : 10-06

CHECKED BY : T.H. FANG DATE : 10-06

29-DEC-2006 08:16
F:\B4013\Structures\B4013\FINAL_PLANS\B4013_sd_CPR.dgn
tfang

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	19	#5	STR	27'-11"	553	A206	6	#5	STR	23'-3"	146
A2	19	#5	STR	27'-11"	553	A207	6	#5	STR	22'-5"	140
✳ A3	6	#6	STR	20'-6"	185	A208	6	#5	STR	21'-6"	135
						A209	6	#5	STR	20'-8"	129
✳ A101	4	#5	STR	27'-6"	115	A210	6	#5	STR	19'-10"	124
✳ A102	6	#5	STR	26'-8"	167	A211	6	#5	STR	19'-0"	119
✳ A103	6	#5	STR	25'-9"	161	A212	6	#5	STR	18'-2"	114
✳ A104	6	#5	STR	24'-11"	156	A213	6	#5	STR	17'-4"	108
✳ A105	6	#5	STR	24'-1"	151	A214	6	#5	STR	16'-5"	103
✳ A106	6	#5	STR	23'-3"	146	A215	6	#5	STR	15'-7"	98
✳ A107	6	#5	STR	22'-5"	140	A216	6	#5	STR	14'-9"	92
✳ A108	6	#5	STR	21'-6"	135	A217	6	#5	STR	13'-11"	87
✳ A109	6	#5	STR	20'-8"	129	A218	6	#5	STR	13'-1"	82
✳ A110	6	#5	STR	19'-10"	124	A219	6	#5	STR	12'-2"	76
✳ A111	6	#5	STR	19'-0"	119	A220	6	#5	STR	11'-4"	71
✳ A112	6	#5	STR	18'-2"	114	A221	6	#5	STR	10'-6"	66
✳ A113	6	#5	STR	17'-4"	108	A222	6	#5	STR	9'-8"	60
✳ A114	6	#5	STR	16'-5"	103	A223	6	#5	STR	8'-10"	55
✳ A115	6	#5	STR	15'-7"	98	A224	6	#5	STR	7'-11"	50
✳ A116	6	#5	STR	14'-9"	92	A225	6	#5	STR	7'-1"	44
✳ A117	6	#5	STR	13'-11"	87	A226	6	#5	STR	6'-3"	39
✳ A118	6	#5	STR	13'-1"	82	A227	6	#5	STR	5'-5"	34
✳ A119	6	#5	STR	12'-2"	76	A228	6	#5	STR	4'-7"	29
✳ A120	6	#5	STR	11'-4"	71	A229	6	#5	STR	3'-8"	23
✳ A121	6	#5	STR	10'-6"	66						
✳ A122	6	#5	STR	9'-8"	60	✳ B1	57	#4	STR	27'-7"	1050
✳ A123	6	#5	STR	8'-10"	55	B2	52	#5	STR	40'-6"	2197
✳ A124	6	#5	STR	7'-11"	50						
✳ A125	6	#5	STR	7'-1"	44	✳ G1	4	#5	STR	37'-0"	154
✳ A126	6	#5	STR	6'-3"	39						
✳ A127	6	#5	STR	5'-5"	34	✳ K1	12	#5	1	12'-10"	161
✳ A128	6	#5	STR	4'-7"	29	✳ K2	18	#5	2	20'-10"	391
✳ A129	6	#5	STR	3'-8"	23						
						✳ S1	96	#4	3	4'-1"	262
A201	4	#5	STR	27'-6"	115						
A202	6	#5	STR	26'-8"	167						
A203	6	#5	STR	25'-9"	161						
A204	6	#5	STR	24'-11"	156	REINFORCING STEEL = 5523 LBS.					
A205	6	#5	STR	24'-1"	151	✳ EPOXY COATED REINF. STEEL = 5529 LBS.					

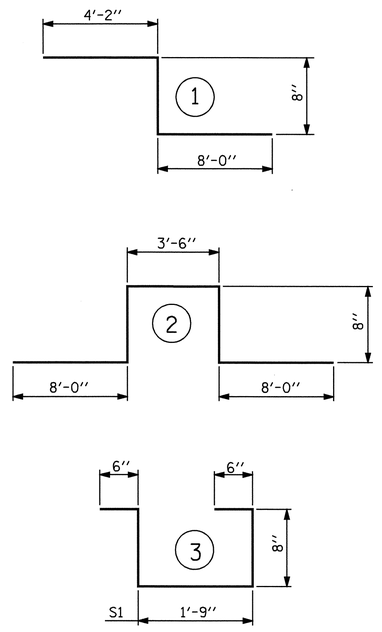
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"		4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

GROOVING BRIDGE FLOORS

APPROACH SLABS	719 SQ.FT.
BRIDGE DECK	1821 SQ.FT.
TOTAL	2540 SQ.FT.

BAR TYPES



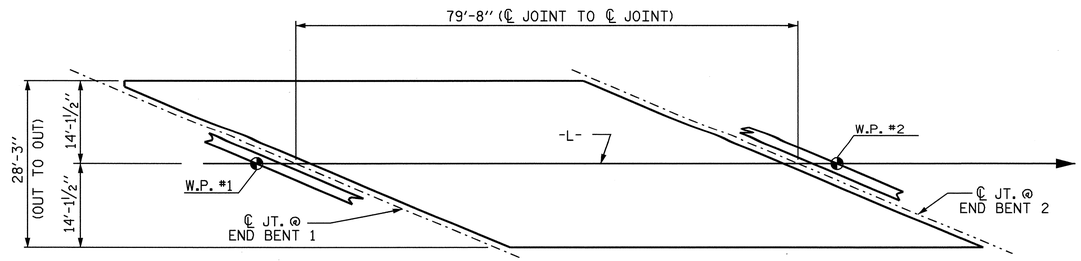
ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU.YDS.)	(LBS.)	(LBS.)
SPAN "A"	60.3	5523	5529
TOTALS**	60.3	5523	5529

**QUANTITIES FOR PARAPET RAIL ARE NOT INCLUDED

THE CONTRACTOR SHALL NOT BEGIN THE FINISHING PROCESS FOR THE DECK CONCRETE UNTIL ALL THE DECK CONCRETE HAS BEEN PLACED.



LAYOUT FOR COMPUTING AREA
OF REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 2250.6)

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
Ting H. Fang 12/05/06

PROJECT NO. B-4013
ASHE COUNTY
STATION: 13+67.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

REVISIONS						SHEET NO. S-16
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 35
2			4			

STD. NO. BOM1

ASSEMBLED BY : QT NGUYEN	DATE : 1-06		
CHECKED BY : D.G. ELY	DATE : 6-06		
DRAWN BY : JMB 5/87	REV. 6/1/94	EEM/GRP	
CHECKED BY : SJD 9/87	REV. 8/16/99	RWW/LES	

05-DEC-2006 11:42
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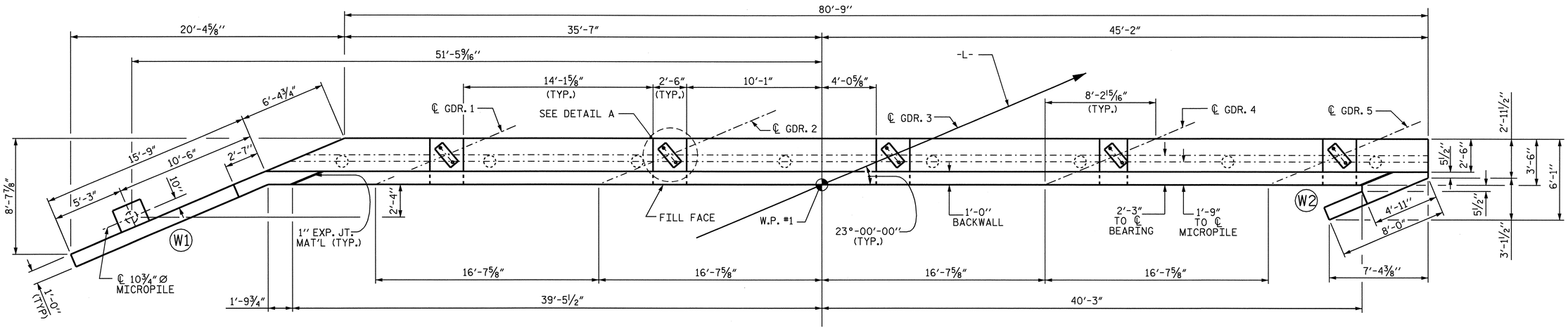
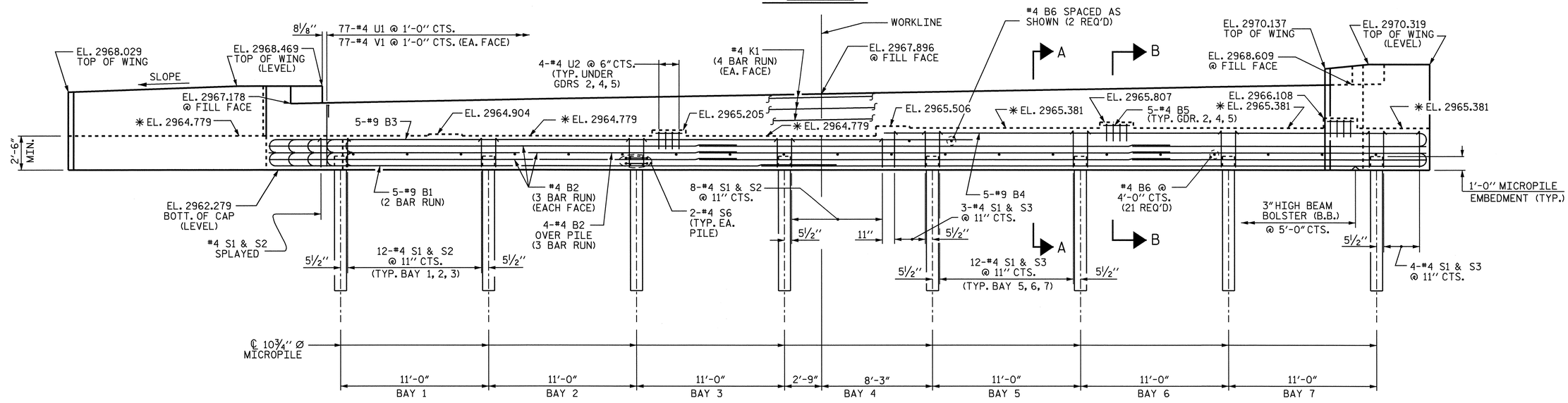
qtnguyen

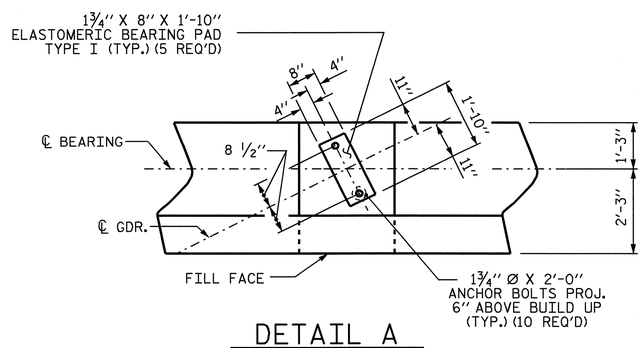


PLAN



ELEVATION

MICROPILE IN LEFT WING WALL NOT SHOWN FOR CLARITY



DETAIL A

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
ALTERNATE "A1"

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD
1-2-07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : QT NGUYEN DATE : 9-06
CHECKED BY : KW ALFORD DATE : 10-06

02-JAN-2007 11:55
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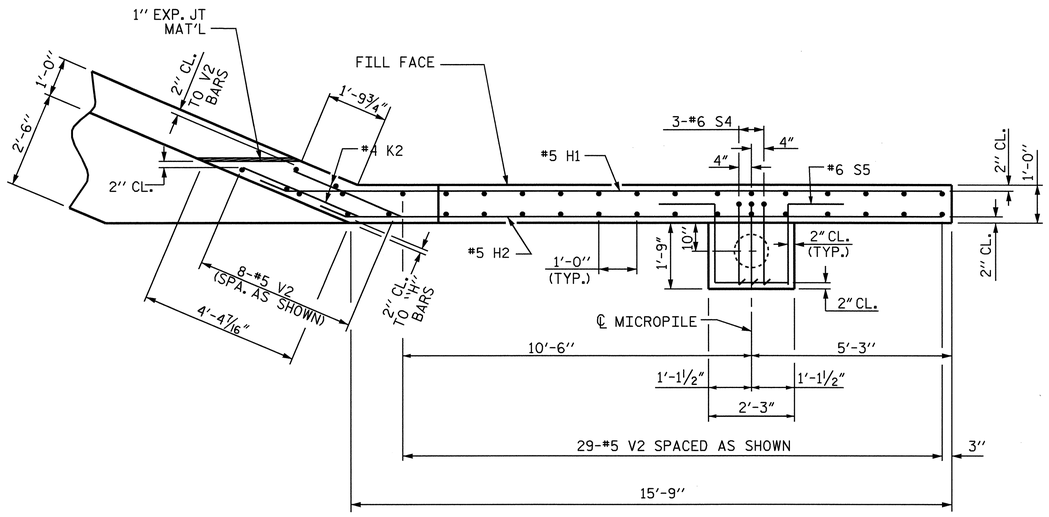
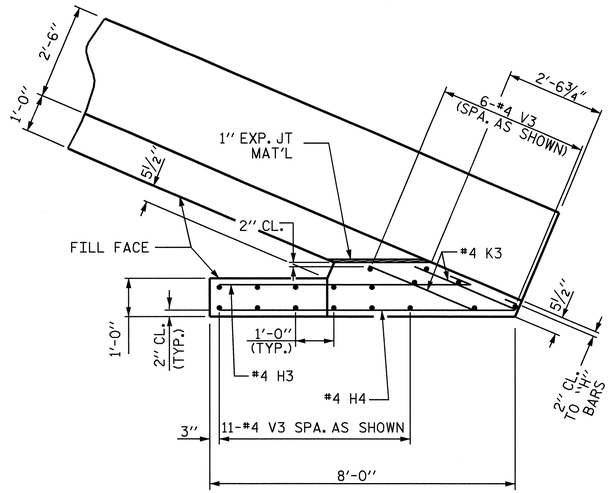
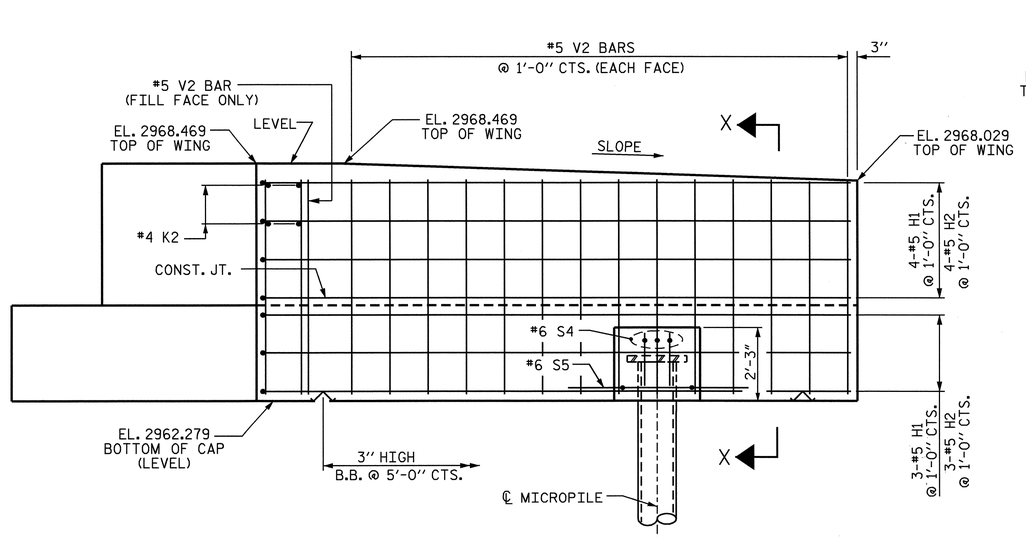
ttfang



PLAN OF LEFT WING W1



PLAN OF RIGHT WING W2



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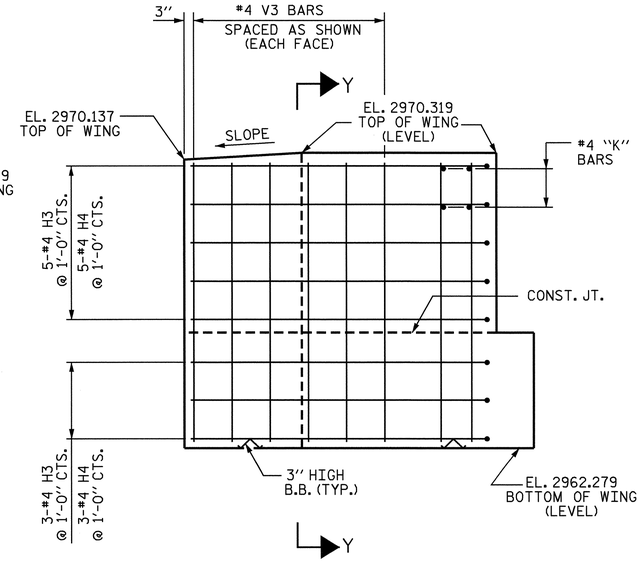

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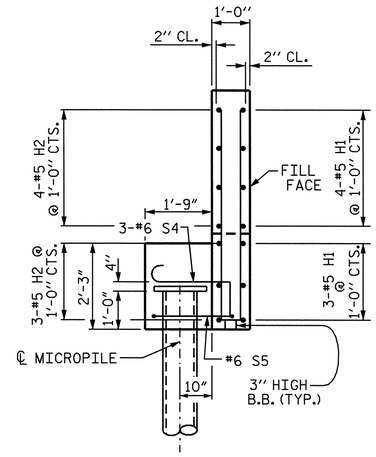
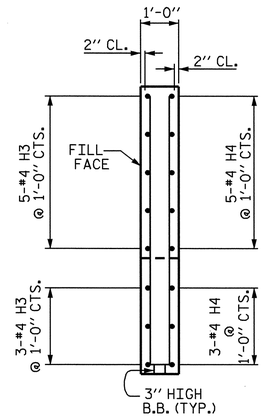


SECTION X-X



SECTION Y-Y

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
ALTERNATE "A1"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			35

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD
12/5/06

DRAWN BY : QT NGUYEN DATE : 9-06
CHECKED BY : KW ALFORD DATE : 10-06

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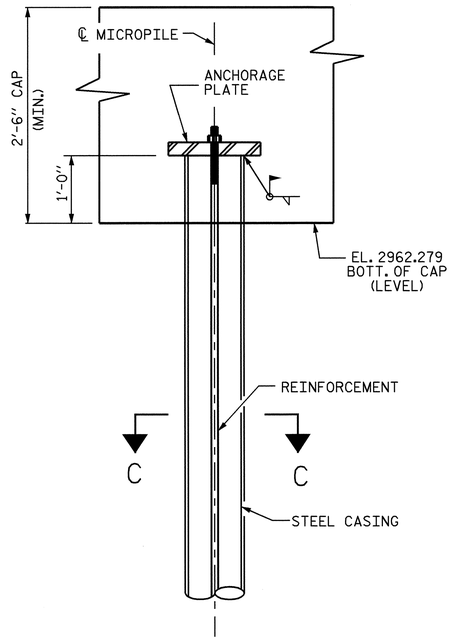
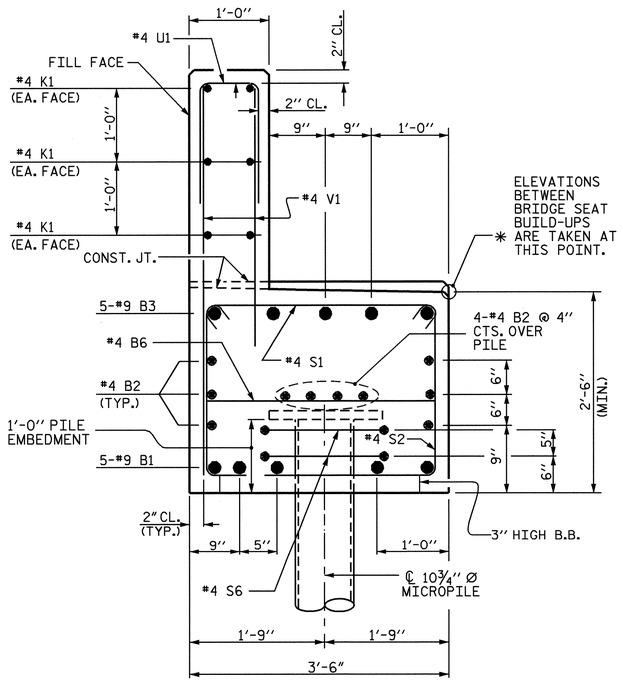
qtnguyen



MICROPILE DETAIL

(TYP. EACH MICROPILE)



SECTION THRU CAP

NOTES

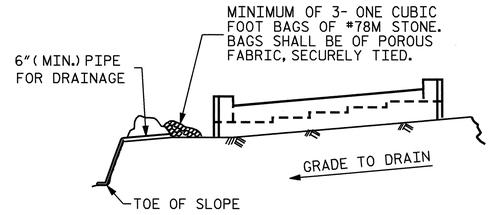
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

* THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



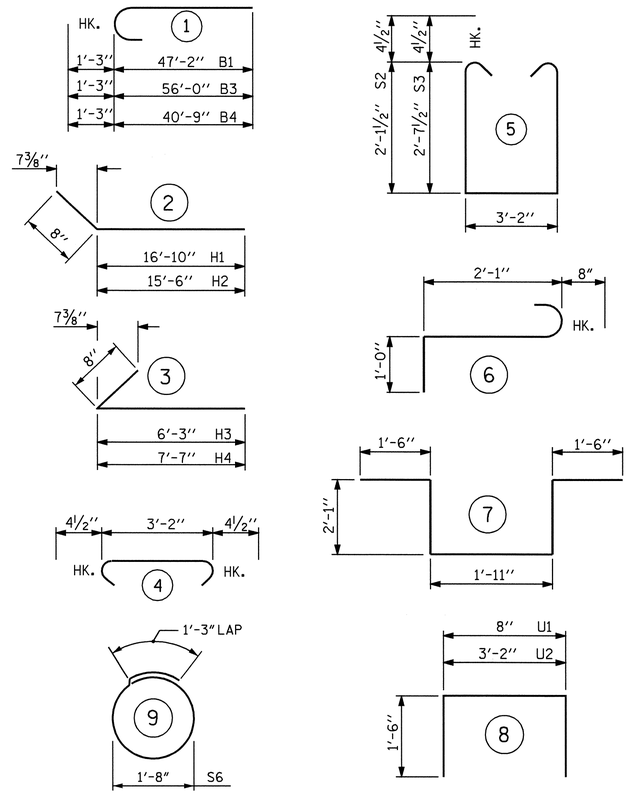
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	48'-5"	1646
B2	30	#4	STR	31'-0"	621
B3	5	#9	1	57'-3"	973
B4	5	#9	1	42'-0"	714
B5	15	#4	STR	2'-2"	22
B6	23	#4	STR	3'-2"	49
H1	7	#5	2	17'-6"	128
H2	7	#5	2	16'-2"	118
H3	8	#4	3	6'-11"	37
H4	8	#4	3	8'-3"	44
K1	24	#4	STR	23'-4"	374
K2	4	#4	STR	3'-6"	9
K3	4	#4	STR	2'-8"	7
S1	89	#4	4	3'-11"	233
S2	45	#4	5	8'-2"	245
S3	44	#4	5	9'-2"	269
S4	3	#6	6	3'-9"	17
S5	1	#6	7	9'-1"	14
S6	16	#4	9	6'-6"	70
U1	77	#4	8	3'-8"	189
U2	12	#4	8	6'-2"	49
V1	154	#4	STR	4'-6"	463
V2	37	#5	STR	5'-5"	209
V3	17	#4	STR	7'-6"	85

REINFORCING STEEL = 6585 LBS

CONCRETE QUANTITIES

CLASS "A" CONCRETE BREAKDOWN

POUR #1:
CAP, LOWER PART OF WINGS 33.6 C.Y.

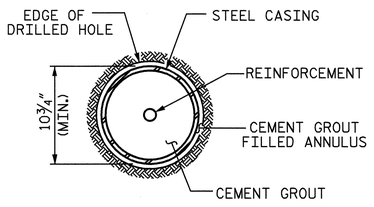
POUR #2:
BACKWALL, UPPER PART OF WINGS 12.3 C.Y.

TOTAL 45.9 C.Y.

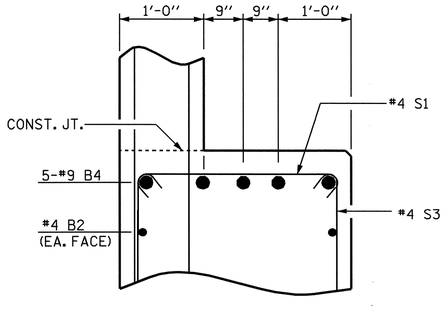
10¾" MICROPILES
NO. 9 LIN. FEET 126

PERMANENT STEEL CASING
LIN. FEET 81

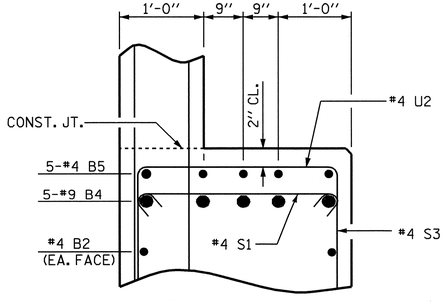
SPLICE CHART	
BARS	MIN. SPLICE LENGTH
#9 B1	6'-3"
#4	2'-5"
#9 B3	8'-9"



SECTION C-C



PARTIAL SECTION A-A



PARTIAL SECTION B-B

PROJECT NO. B-4013
ASHE COUNTY
STATION: 13+67.50 -L-

SHEET 3 OF 3

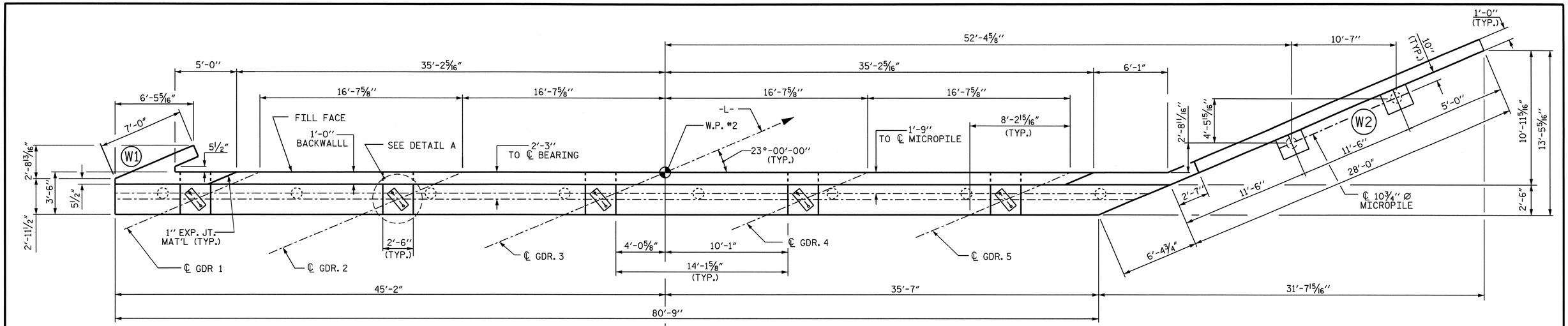
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
ALTERNATE "A1"

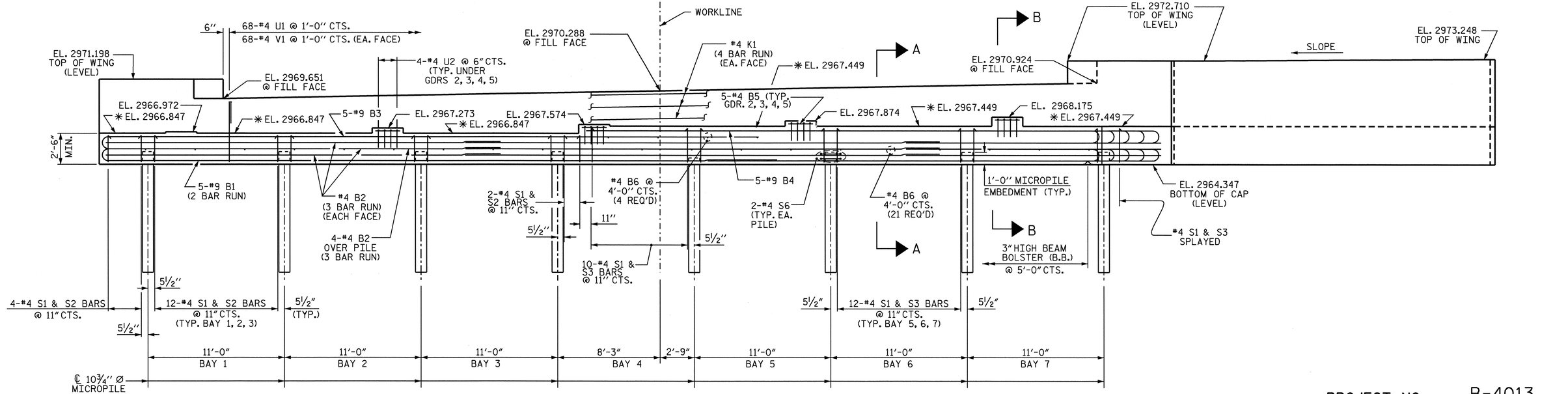
NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD
1-2-07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : QT NGUYEN DATE : 9-06
CHECKED BY : KW ALFORD DATE : 10-06

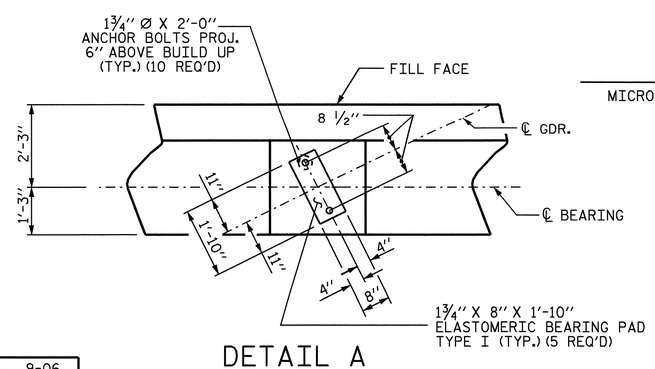


PLAN



ELEVATION

MICROPILE IN RIGHT WING WALL NOT SHOWN FOR CLARITY



DETAIL A

DRAWN BY : QT NGUYEN DATE : 9-06
CHECKED BY : KW ALFORD DATE : 10-06

02-JAN-2007 12:10
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tfang

PROJECT NO. B-4013
ASHE COUNTY
STATION: 13+67.50 -L-

SHEET 1 OF 3

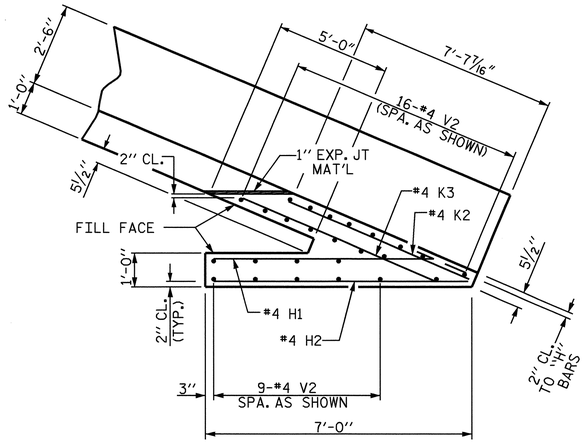
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
ALTERNATE "A1"

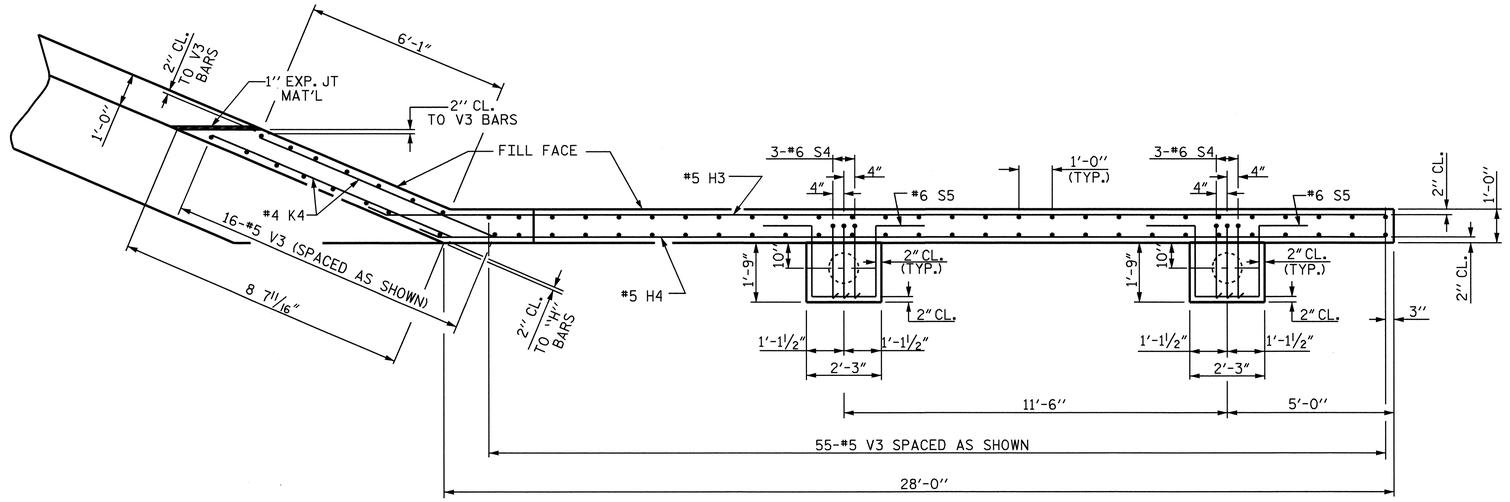
NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD
1-2-07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			35

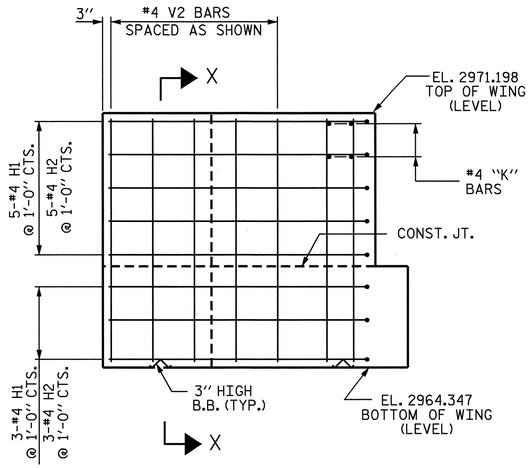
NCDOT



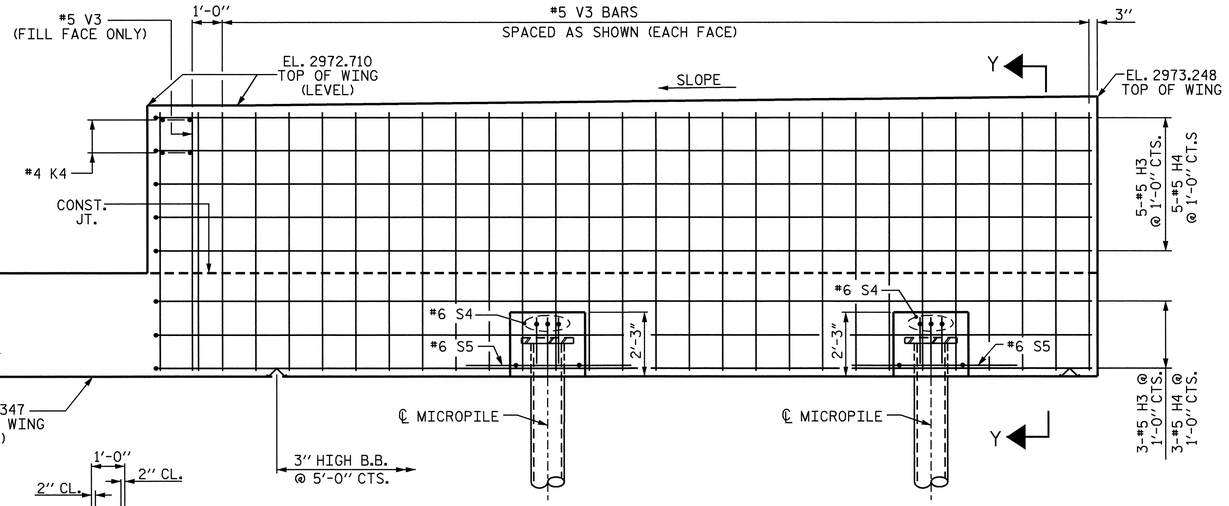
PLAN OF LEFT WING W1



PLAN OF RIGHT WING W2



ELEVATION OF LEFT WING W1



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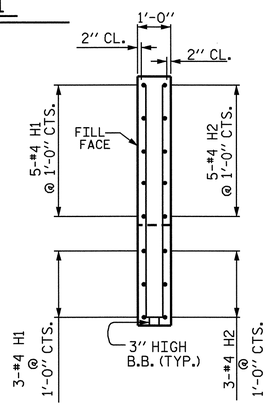

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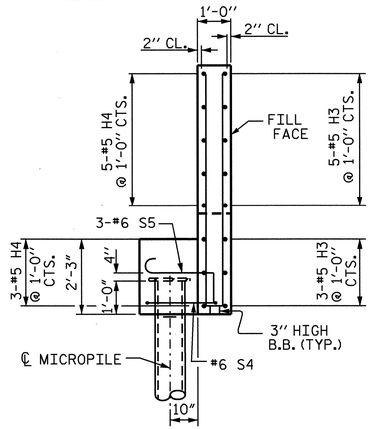


SECTION Y-Y

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

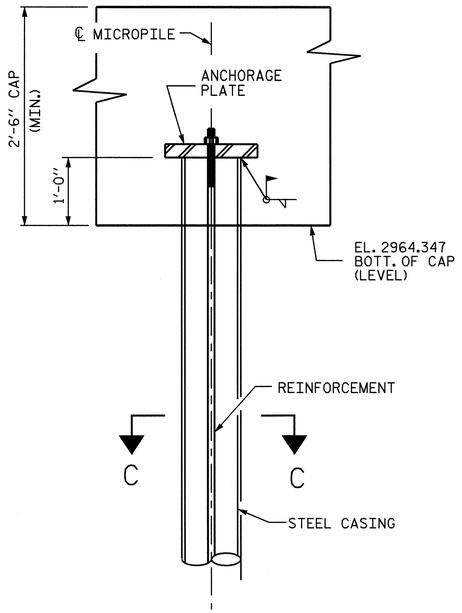
SUBSTRUCTURE
END BENT 2
ALTERNATE "A1"

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD
12/5/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : QT NGUYEN DATE : 9-06
CHECKED BY : KW ALFORD DATE : 10-06

05-DEC-2006 10:43
R:\STRUCTØ1\B4013\FINAL_Ø1\B4013_Ø3.DGN
qtnguyen



MICROPILE DETAIL

(TYP. EACH MICROPILE)

NOTES

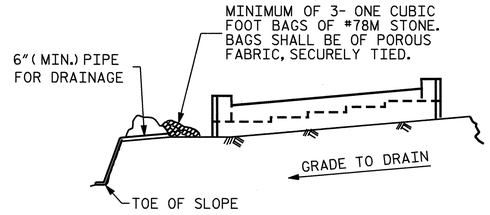
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

* THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



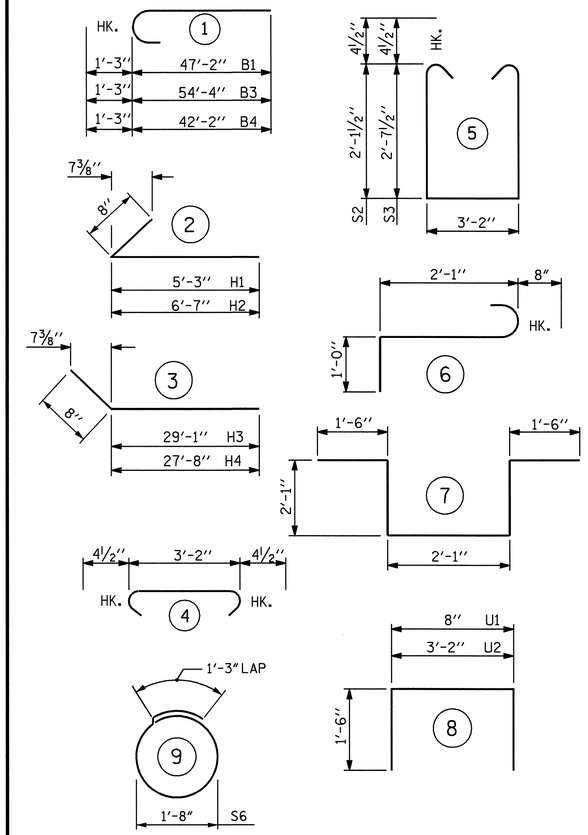
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	48'-5"	1646
B2	30	#4	STR	31'-0"	621
B3	5	#9	1	55'-7"	945
B4	5	#9	1	43'-5"	738
B5	20	#4	STR	2'-2"	29
B6	25	#4	STR	3'-2"	53
H1	8	#4	2	5'-11"	32
H2	8	#4	2	7'-3"	39
H3	8	#5	3	29'-9"	248
H4	8	#5	3	28'-4"	236
K1	24	#4	STR	23'-10"	382
K2	2	#4	STR	7'-4"	10
K3	2	#4	STR	7'-10"	10
K4	4	#4	STR	7'-9"	21
S1	89	#4	4	3'-11"	233
S2	42	#4	5	8'-2"	229
S3	47	#4	5	9'-2"	288
S4	6	#6	6	3'-9"	34
S5	2	#6	7	9'-1"	27
S6	16	#4	9	6'-6"	70
U1	68	#4	8	3'-8"	167
U2	16	#4	8	6'-2"	66
V1	136	#4	STR	4'-11"	447
V2	25	#4	STR	6'-6"	109
V3	71	#5	STR	8'-0"	592

REINFORCING STEEL = 7272 LBS

CONCRETE QUANTITIES

CLASS "A" CONCRETE BREAKDOWN

POUR #1:
CAP, LOWER PART OF WINGS 35.5 C.Y.

POUR #2:
BACKWALL, UPPER PART OF WINGS 17.4 C.Y.

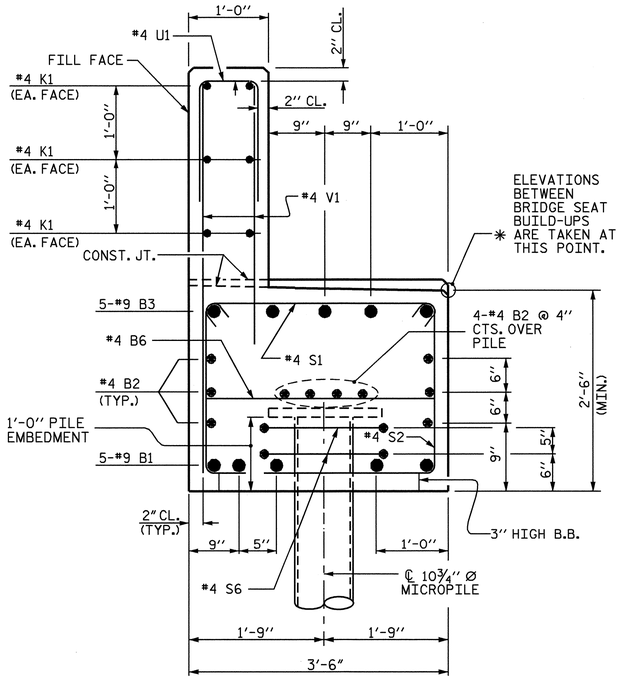
TOTAL 52.9 C.Y.

10¾" MICROPILES
NO. 10 LIN. FEET 170

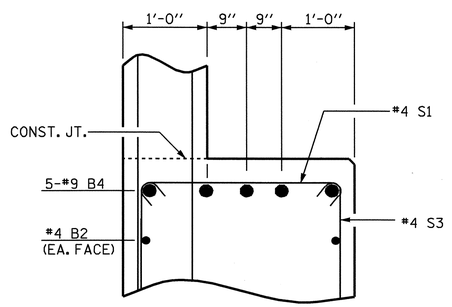
PERMANENT STEEL CASING
LIN. FEET 120

SPLICE CHART

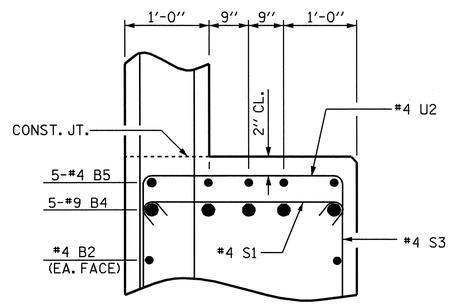
BARS	MIN. SPLICE LENGTH
#9 B1	6'-3"
#4	2'-5"
#9 B3	8'-9"



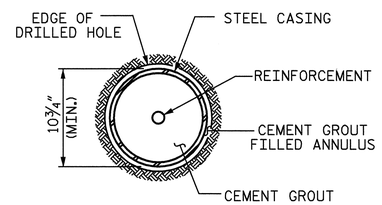
SECTION THRU CAP



PARTIAL SECTION A-A



PARTIAL SECTION B-B



SECTION C-C

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
ALTERNATE "A1"

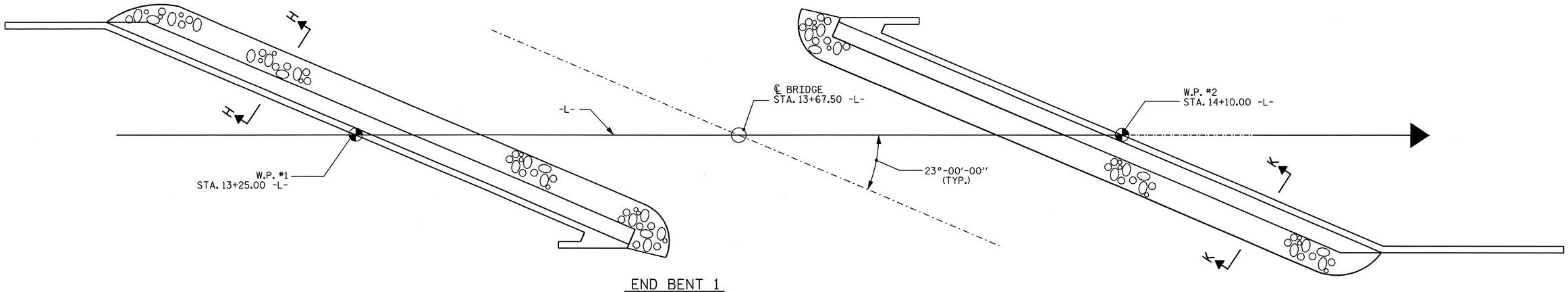
NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTI W. ALFORD
1-2-07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : QT NGUYEN DATE : 9-06
CHECKED BY : KW ALFORD DATE : 10-06

NOTES :

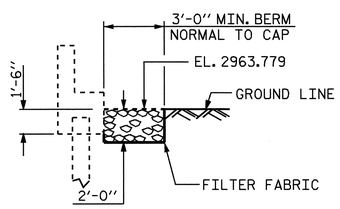
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.



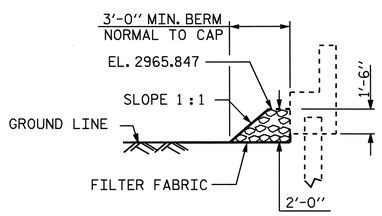
END BENT 1

PLAN

END BENT 2



SECTION H-H



SECTION K-K

ESTIMATED QUANTITIES		
	RIP RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	29	32
END BENT 2	19	32

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

Ting H. Fang 12/05/06

ASSEMBLED BY : QT NGUYEN	DATE : 8-06
CHECKED BY : T.H FANG	DATE : 10-06
DRAWN BY : REK 1/84	REV. 8/16/99 RWW/LES
CHECKED BY : RDU 1/84	REV. 10/17/00 RWW/LES
	REV. 5/1/06 TLA/GM

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

SHEET NO. S-23

TOTAL SHEETS 25

SKEW < 90°

STD. NO. RR1

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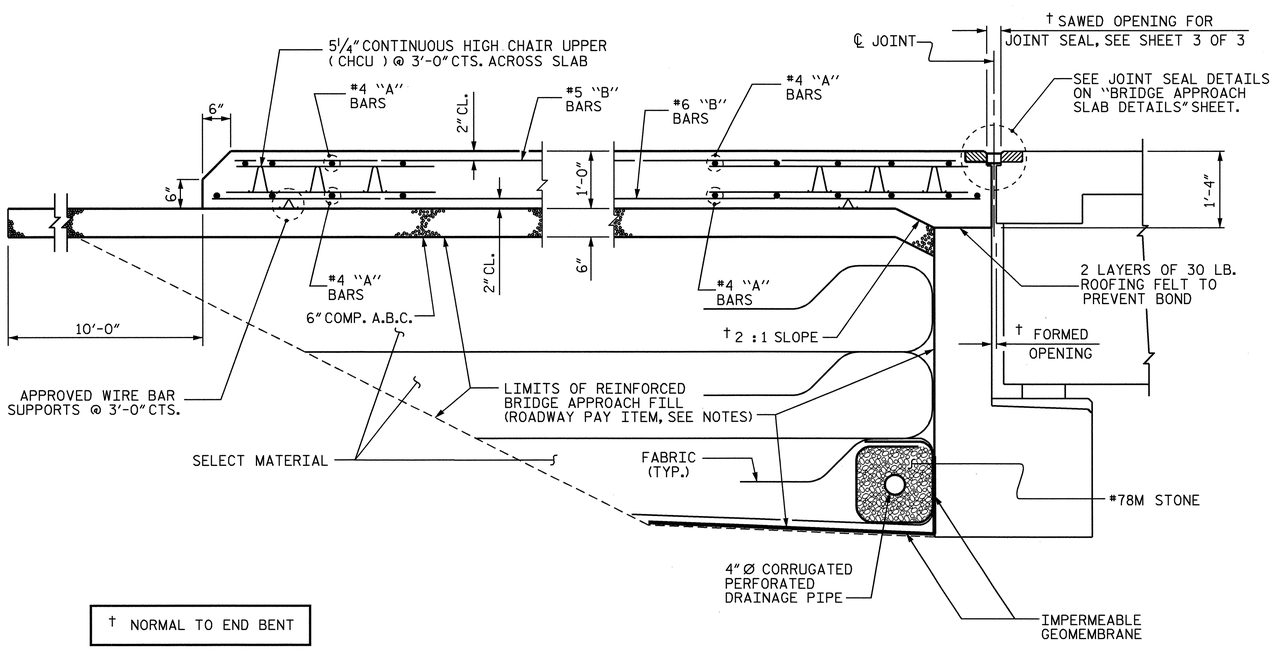
dtnguyen

FOR PLAN OF APPROACH SLAB
SEE SHEET 2 OF 3



† NORMAL TO END BENT

SECTION THRU SLAB

NOTES

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING FABRIC, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #79M STONE, AND SECLECT MATERIAL, SEE ROADWAY PLANS.

TEMPORARY DRAINAGE AND TEMPORARY BERM AND SLOPE DRAINS WILL BE PAID FOR UNDER THE LUMP SUM PRICE FOR BRIDGE APPROACH SLAB.

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

THE 6" COMP. A.B.C. SHALL EXTEND 10'-0" BEYOND THE END OF THE APPROACH SLAB AND 1'-0" OUTSIDE OF EACH EDGE OF SLAB.

THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL EXTEND 1'-0" BEYOND THE END OF THE APPROACH SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL EXTEND 1'-0" BEYOND THE END OF THE APPROACH SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE PARAPET OR END POST.

WITH EVAZOTE JOINT SEAL

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2 ½" AT END BENTS NO. 1 AND NO. 2..

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

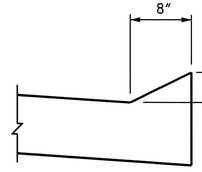
BILL OF MATERIAL

APPROACH SLAB AT END BENT 1

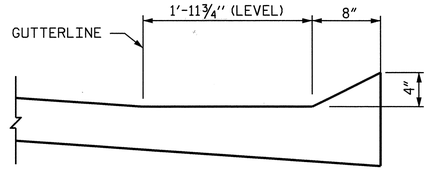
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	54	#4	STR	27'-6"	992
A2	54	#4	STR	27'-4"	986
✱B1	43	#5	STR	15'-9"	706
B2	62	#6	STR	17'-2"	1599
✱B3	10	#5	STR	17'-2"	179
✱B4	9	#6	STR	17'-2"	232
✱B8	12	#4	STR	2'-6"	20
REINFORCING STEEL				LBS.	2585
✱EPOXY COATED REINFORCING STEEL				LBS.	2129
CLASS AA CONCRETE				C.Y.	27.0

APPROACH SLAB AT END BENT 2

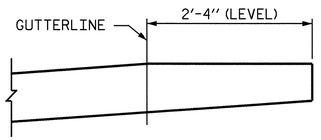
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A3	45	#4	STR	24'-4"	731
A4	45	#4	STR	24'-2"	726
✱B5	43	#5	STR	12'-9"	572
B6	54	#6	STR	14'-2"	1149
✱B7	12	#5	STR	14'-2"	177
REINFORCING STEEL				LBS.	1875
✱EPOXY COATED REINFORCING STEEL				LBS.	1481
CLASS AA CONCRETE				C.Y.	20.1



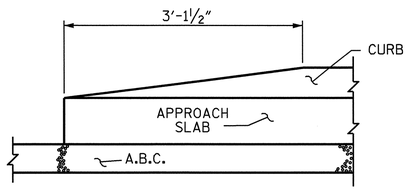
SECTION L-L
(FOR LOCATION OF SECTION ARROW, SEE SHEET 2 OF 3)



SECTION N-N
(FOR LOCATION OF SECTION ARROW, SEE SHEET 2 OF 3)



SECTION M-M
(FOR LOCATION OF SECTION ARROW, SEE SHEET 2 OF 3)



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
Ting H. Fang 12/05/06

PROJECT NO. B-4013
ASHE COUNTY
STATION: 13+67.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			35

STD. NO. BAS4

ASSEMBLED BY : QT NGUYEN	DATE : 11-05	REV. 10/17/00	RWW/LES
CHECKED BY : D.G. ELY	DATE : 12-05	REV. 7/10/01	LES/RDR
DRAWN BY : EEM 3/95		REV. 5/7/03R	RWW/JTE
CHECKED BY : VAP 3/95			

05-DEC-2006 12:03
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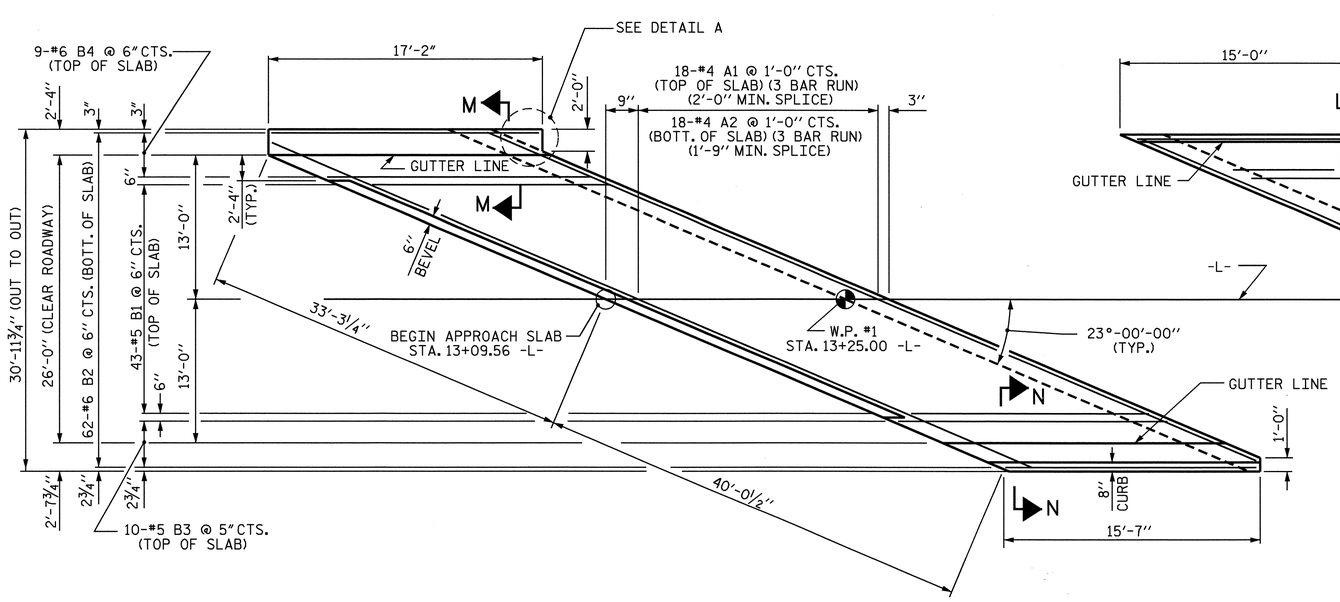
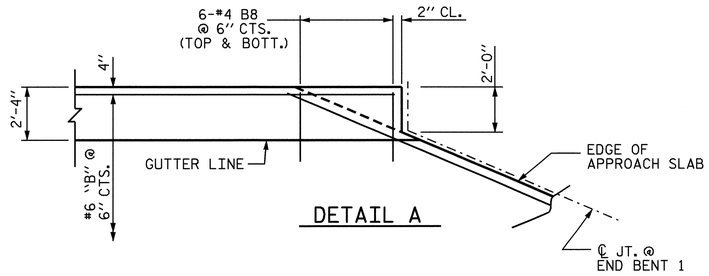
qtnguyen

NOTE: "B" BARS IN ACUTE CORNERS MAY BE CUT IN FIELD AS NECESSARY TO FIT INTO APPROACH SLABS.



PLAN @ END BENT 1

PLAN @ END BENT 2



DETAIL A

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
12/05/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : QT NGUYEN DATE : 10-06
CHECKED BY : T.H. FANG DATE : 10-06

05-DEC-2006 12:03
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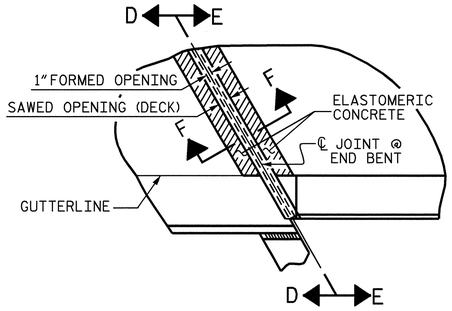
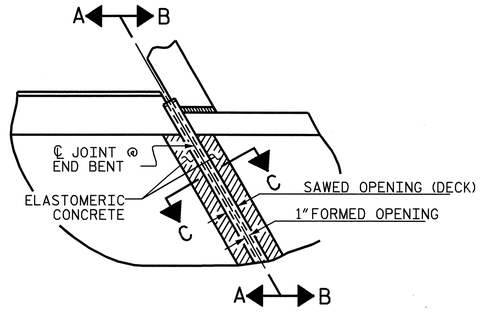
qtnguyen



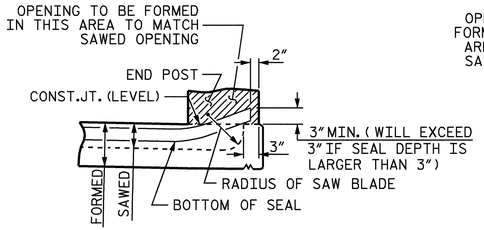
PLAN

@ END BENT 1

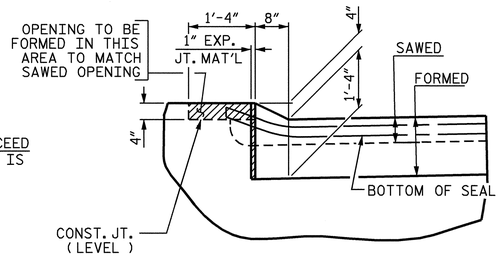


PLAN

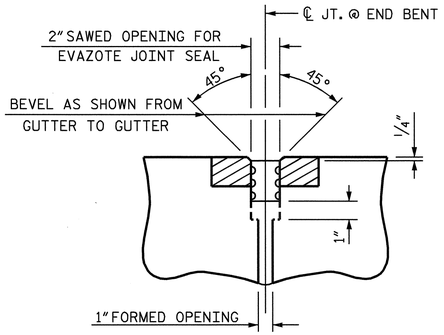
@ END BENT 2



SECTION A-A

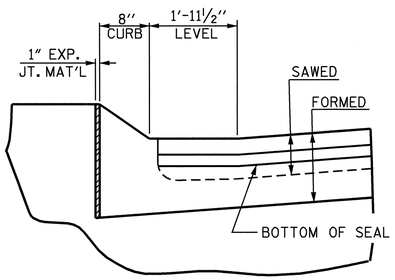


SECTION B-B

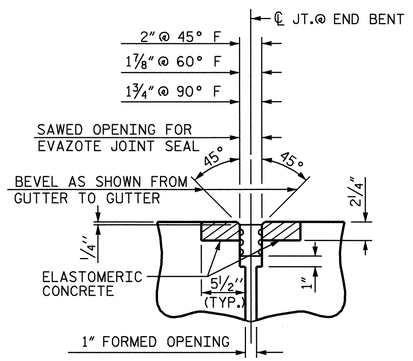


SECTION C-C

EVAZOTE JOINT SEAL @ FIXED END

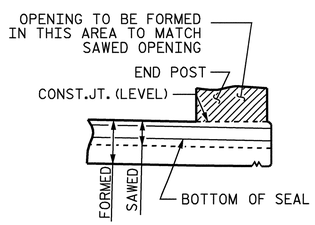


SECTION D-D

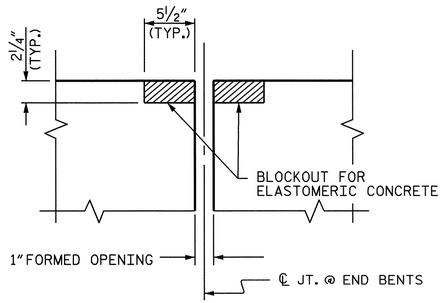


SECTION F-F

EVAZOTE JOINT SEAL @ EXPANSION END



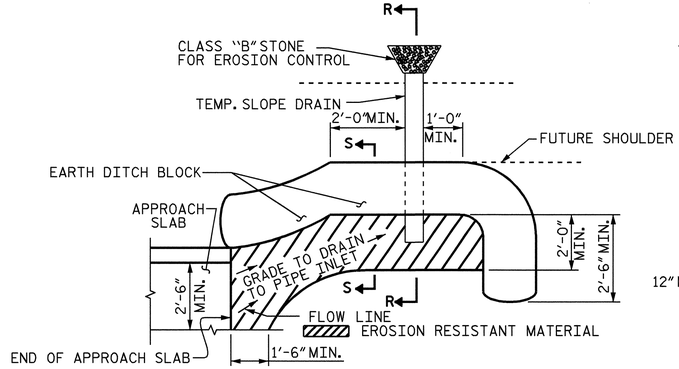
SECTION E-E



SECTION OF CONCRETE

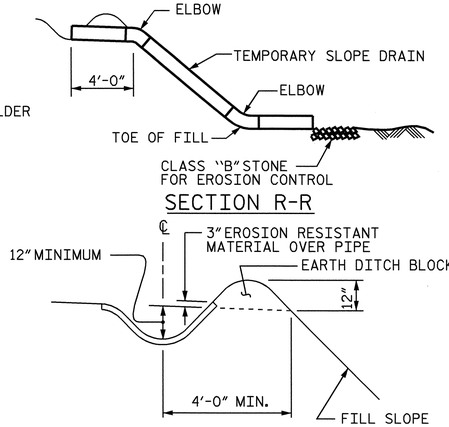
EVAZOTE JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)

JOINT SEAL DETAILS @ END BENT



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

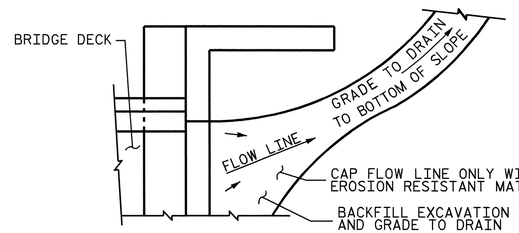


SECTION R-R

SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

BILL OF MATERIAL	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	11.4
2	11.4

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			35

ASSEMBLED BY :	QT NGUYEN	DATE :	11-05
CHECKED BY :	D.G. ELY	DATE :	12-05
DRAWN BY : FCJ	11/88	REV. 8/16/99	MAB/LES
CHECKED BY : ARB	11/88	REV. 10/17/00	RWW/LES
		REV. 5/7/03	RWW/JTE

05-DEC-2006 12:03
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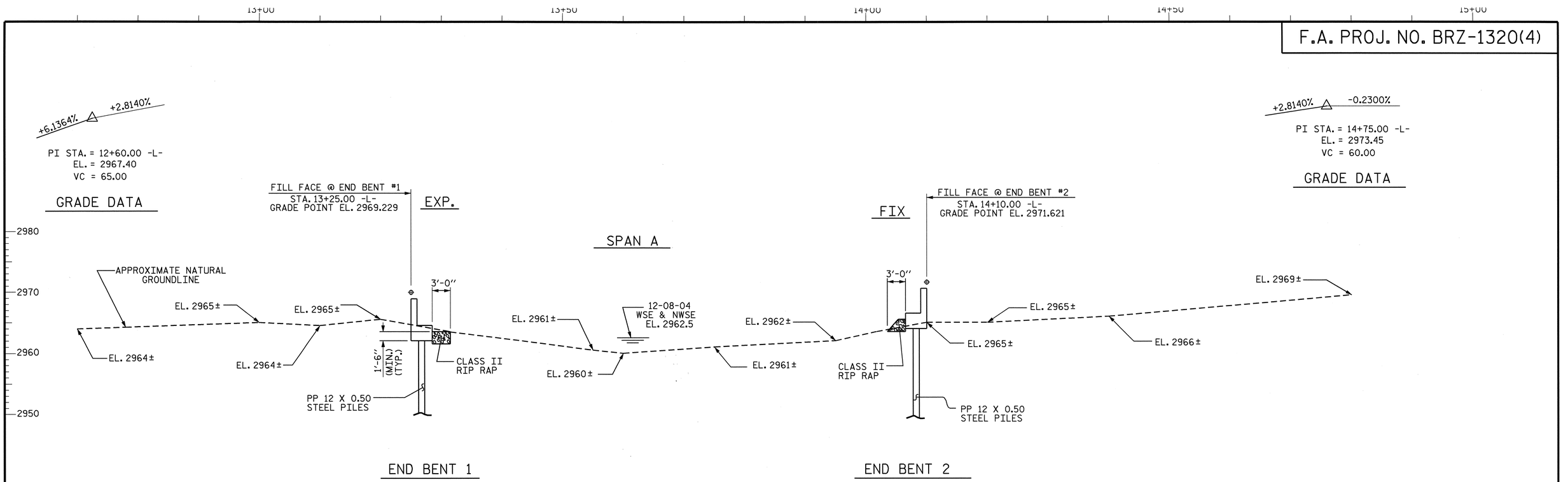
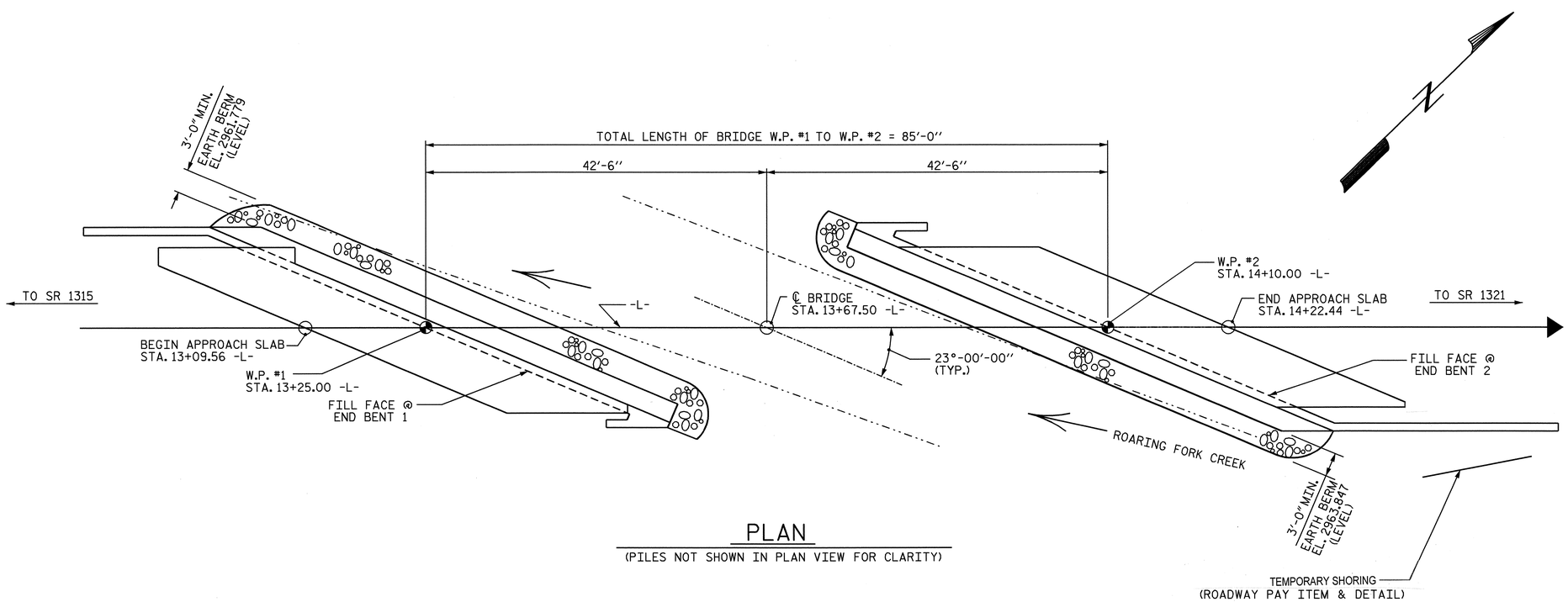
qtnguyen

F.A. PROJ. NO. BRZ-1320(4)



SECTION ALONG -L-

(SECTION TAKEN AT RIGHT ANGLES TO END BENTS AND RIP RAP)



PLAN

(PILES NOT SHOWN IN PLAN VIEW FOR CLARITY)

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
12/05/06

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN C. FOX
12/5/06

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 338

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER ROARING FORK CREEK ON SR 1320 BETWEEN SR 1315 AND SR 1321

ALTERNATE "A2"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : QT NGUYEN DATE : 8-06
CHECKED BY : T.H. FANG DATE : 10-06

04-DEC-2006 13:19
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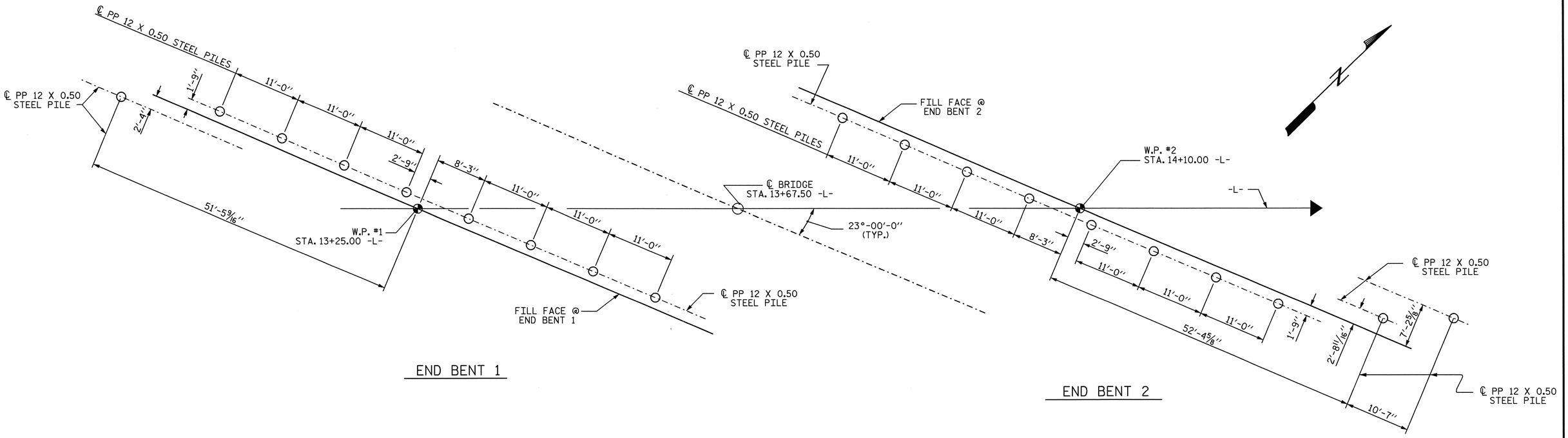
qtnguyen



FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE)

NOTES:

PIPE PILES AT END BENTS NO. 1 AND 2 MUST SATISFY THE REQUIRED BEARING CAPACITY OF 120 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING WITH A MINIMUM FACTOR OF SAFETY OF TWO.

THE ALLOWABLE BEARING CAPACITY FOR PIPE PILES AT END BENT NO. 1 AND 2 IS 60 TONS PER PIPE PILE.

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT NO. 1. EXCAVATE HOLES TO ELEVATION 2950.0 FT. SEE PILE EXCAVATION SPECIAL PROVISION.

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT NO. 2. EXCAVATE HOLES TO ELEVATION 2949.0 FT. SEE PILE EXCAVATION SPECIAL PROVISION.

THE SCOUR CRITICAL ELEVATION FOR END BENT NO. 1 IS ELEVATION 2954.3 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THE SCOUR CRITICAL ELEVATION FOR END BENT NO. 2 IS ELEVATION 2953.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSIUNG FANG
01/08/07

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER ROARING FORK CREEK ON SR 1320 BETWEEN SR 1315 AND SR 1321

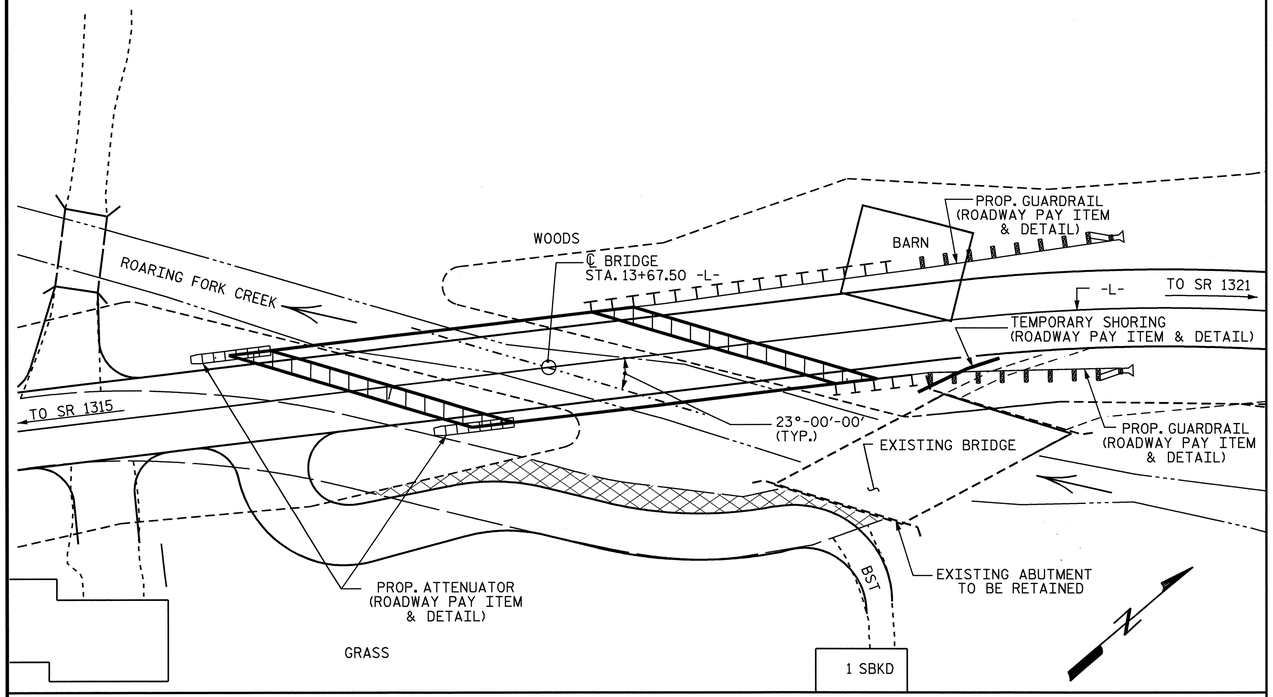
ALTERNATE "A2"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : QT NGUYEN DATE : 10-06
CHECKED BY : T.H. FANG DATE : 10-06

08-JAN-2007 14:49
F:\B4013\Structures\B4013\FINAL_PLANS\B4013_sd_GD.dgn
tfang

BM #1: 8'' SPIKE IN ROOT OF 16'' WILD CHERRY 83.44' LEFT OF -L- STA. 11+52.06 EL. 2958.96



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

HYDRAULIC DATA

DESIGN DISCHARGE_____ 1050 CFS.
FREQUENCY OF DESIGN FLOOD_____ 25 YEARS
DESIGN HIGH WATER ELEVATION_____ 2969.8
DRAINAGE AREA_____ 4.3 SQ. MI.
BASIC DISCHARGE(Q100)_____ 1600 CFS.
BASIC HIGH WATER ELEVATION_____ 2971.2

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE_____ 1050 CFS.
FREQUENCY OF OVERTOPPING FLOOD_____ 25 YRS.
OVERTOPPING FLOOD ELEVATION_____ 2965.0

NOTES:

ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING, EXCEPT THAT THE GIRDERS HAVE BEEN DESIGNED FOR HS25.

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50 AND SHALL BE COATED. APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-ZN-1) THERMALSPRAY COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STRUCTURAL STEEL SURFACES, EXCEPT THE SHEAR STUDS, THE TOP FACE OF THE GIRDER TOP FLANGES, AND THE TOP FACE OF END BENT DIAPHRAGM CHANNELS SHALL RECEIVE A LIGHT THERMAL SPRAYED COATING FOR THE PURPOSE OF PREVENTING RUST BLEED ONTO THE GIRDER WEB AND BOTTOM FLANGES. THE SHEAR STUDS, THE TOP FACE OF THE GIRDER TOP FLANGES, AND THE TOP FACE OF END BENT DIAPHRAGM CHANNELS SHALL NOT HAVE A SEAL COAT. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF 1 SPAN @ 50'-8"; 24'-10" CLEAR ROADWAY WIDTH AND TIMBER FLOOR ON I-BEAMS; END BENTS: TIMBER CAPS ON TIMBER POSTS AND CONCRETE SILLS, AND LOCATED 100 FEET UPSTREAM FROM PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY, 2001.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES FOR SEISMIC PERFORMANCE CATEGORY A.

FOR LIMITS OF TEMPORARY SHORING , SEE TRAFFIC CONTROL PLANS. FOR TEMPORARY SHORING PAY ITEM, SEE ROADWAY PLANS.

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 13+67.50 -L-"

THE USE OF NEEDLE BEAMS TO SUPPORT THE OVERHANG FALSEWORK WILL ONLY BE ALLOWED IN THE ACUTE CORNERS OF THE SLAB.

THE CONTRACTOR SHALL NOT BEGIN THE FINISHING PROCESS FOR THE DECK CONCRETE UNTIL ALL THE DECK CONCRETE HAS BEEN PLACED.

FOR PILE EXCAVATION, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	REINFORCING CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	STRUCTURAL STEEL	ONE BAR METAL RAIL	1'-0" X 1'-6" CONCRETE PARARET	PLAIN RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS	METALLIZATION	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	REINFORCING STEEL	PP 12 X 0.50 STEEL PILES	
	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	APPROX. LBS.	LIN. FT.	LIN. FT.	TON	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LBS.	NO.	LIN. FT.
SUPERSTRUCTURE		2250.6	2540		LUMP SUM	66,400	139.20	154.20			LUMP SUM	LUMP SUM	LUMP SUM					
END BENT 1				45.9					29	32				45	63	6,527	9	126
END BENT 2				52.9					19	32				50	90	7,212	10	170
TOTAL	LUMP SUM	2250.6	2540	98.8	LUMP SUM	66,400	139.20	154.20	48	64	LUMP SUM	LUMP SUM	LUMP SUM	95	153	13,739	19	296

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
01/08/07

PROJECT NO. B-4013
ASHE COUNTY
STATION: 13+67.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER ROARING FORK CREEK ON SR 1320 BETWEEN SR 1315 AND SR 1321

ALTERNATE "A2"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : Q.T. NGUYEN DATE : 8-06
CHECKED BY : T.H. FANG DATE : 10-06

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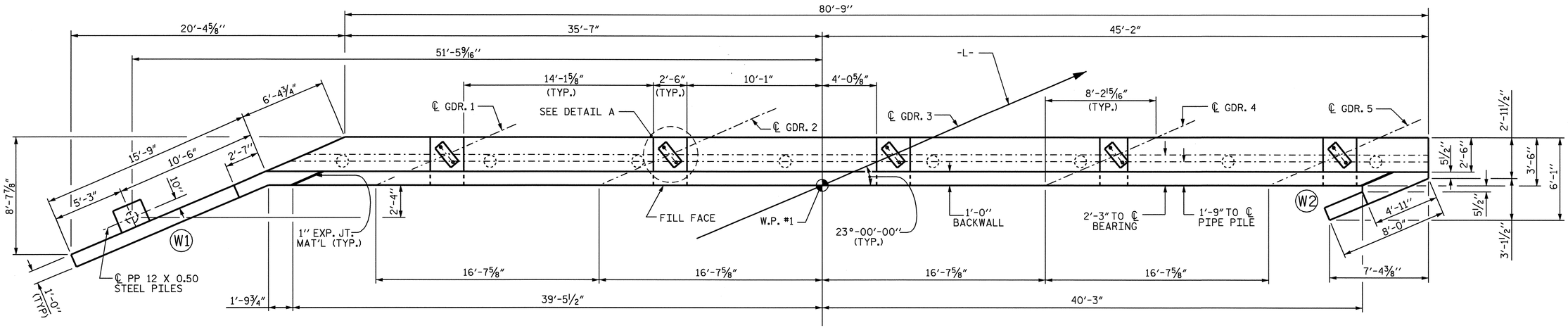
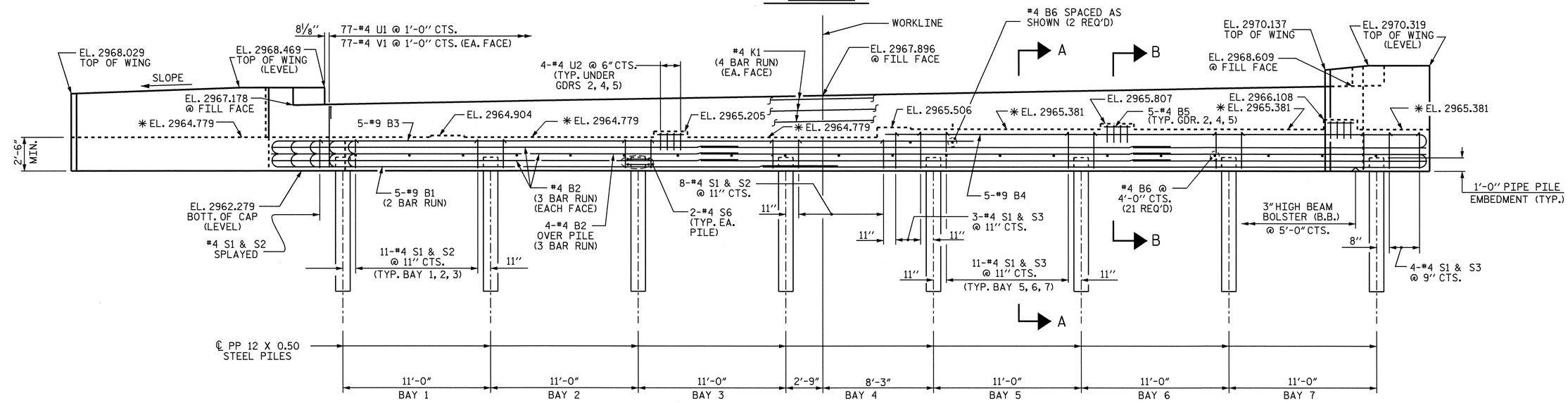
tfang

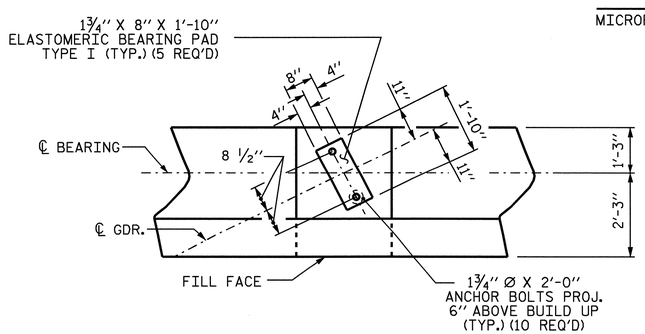


PLAN



ELEVATION

MICROPILE IN LEFT WING WALL NOT SHOWN FOR CLARITY



DETAIL A

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

ALTERNATE "A2"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			35

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD
1-2-07

DRAWN BY : QT NGUYEN DATE : 9-06
CHECKED BY : KW ALFORD DATE : 10-06

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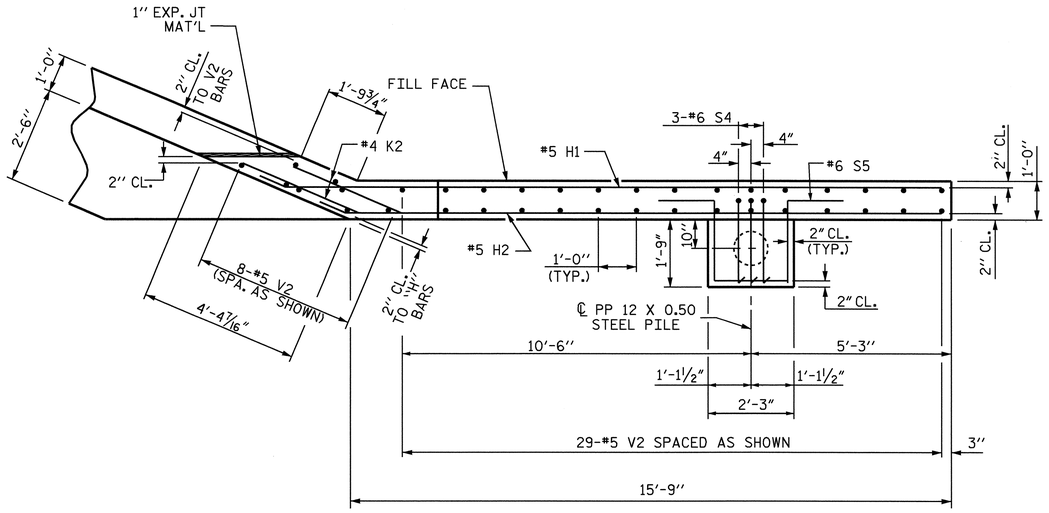
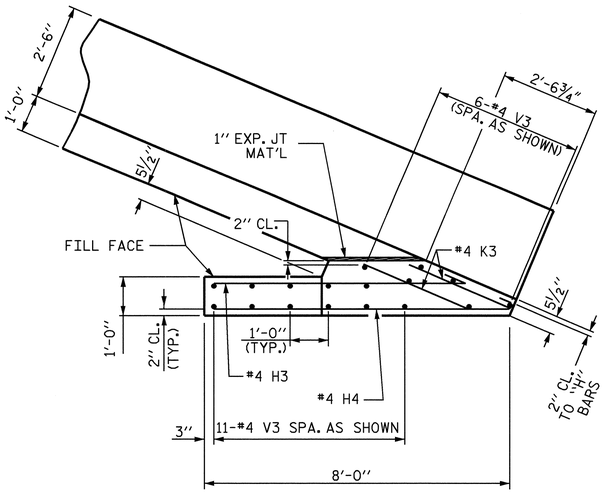
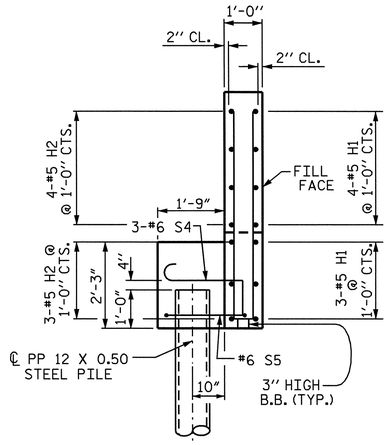


PLAN OF LEFT WING W1



PLAN OF RIGHT WING W2



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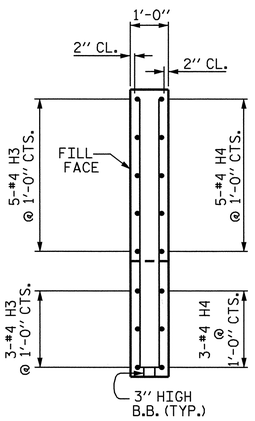
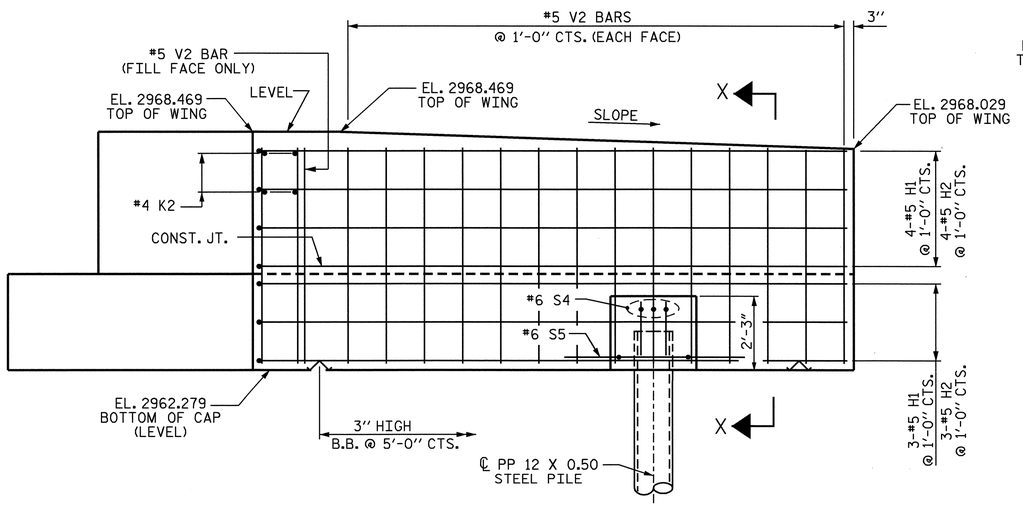
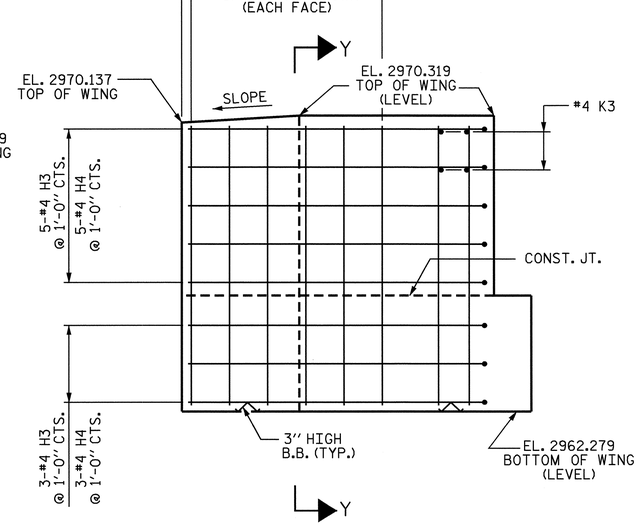


SECTION Y-Y



ELEVATION OF LEFT WING W1



ELEVATION OF RIGHT WING W2

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
ALTERNATE "A2"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			35

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD
12/5/06

DRAWN BY : QT NGUYEN DATE : 9-06
CHECKED BY : KW ALFORD DATE : 10-06

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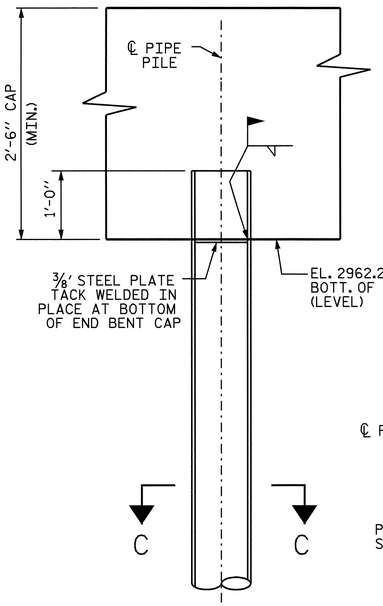
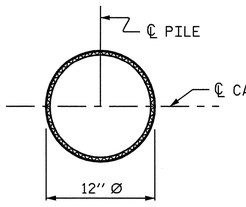
qtnguyen

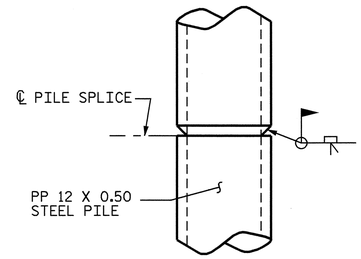


PIPE PILE DETAIL

(TYP. EACH OPEN END PIPE PILE)



SECTION C-C



PIPE PILE SPLICE DETAIL

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

* THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO BACK FACE AT A RATE OF 2%.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

STEEL PIPE PILES SHALL BE OF UNIFORM DIAMETER AND MEET THE REQUIREMENTS OF ASTM A252, GRADE 3 MODIFIED (50,000 PSI YIELD STRENGTH).

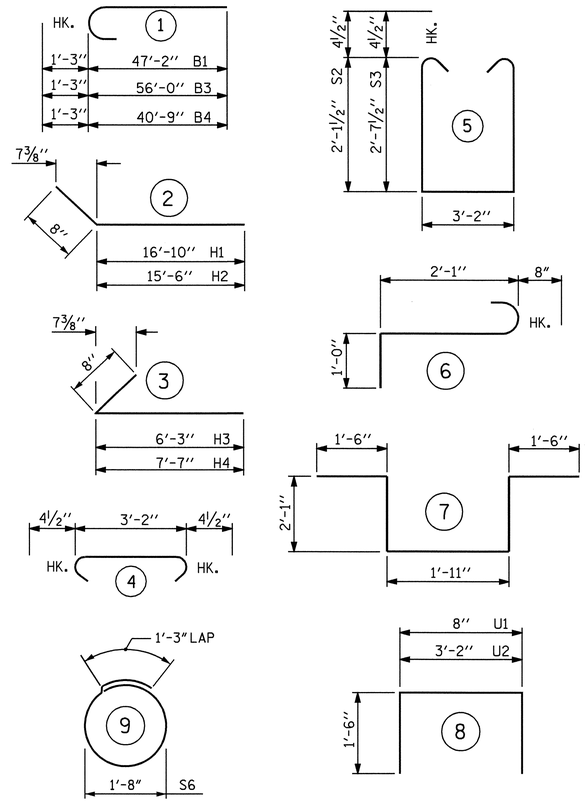
REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

THE CONTRACTOR MAY PROPOSE AN ALTERNATE METHOD FOR PLUGGING THE STEEL PIPE PILE, SUBJECT TO APPROVAL BY THE ENGINEER.

PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.

THE CONTRACTOR WILL NOT BE REQUIRED TO REMOVE THE SOIL FROM WITHIN THE PILES AFTER DRIVING EXCEPT FOR THAT PORTION THAT IS ABOVE THE BOTTOM OF THE END BENT CAP.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	48'-5"	1646
B2	30	#4	STR	31'-0"	621
B3	5	#9	1	57'-3"	973
B4	5	#9	1	42'-0"	714
B5	15	#4	STR	2'-2"	22
B6	23	#4	STR	3'-2"	49
H1	7	#5	2	17'-6"	128
H2	7	#5	2	16'-2"	118
H3	8	#4	3	6'-11"	37
H4	8	#4	3	8'-3"	44
K1	24	#4	STR	23'-4"	374
K2	4	#4	STR	3'-6"	9
K3	4	#4	STR	2'-8"	7
S1	82	#4	4	3'-11"	215
S2	42	#4	5	8'-2"	229
S3	40	#4	5	9'-2"	245
S4	3	#6	6	3'-9"	17
S5	1	#6	7	9'-1"	14
S6	16	#4	9	6'-6"	70
U1	77	#4	8	3'-8"	189
U2	12	#4	8	6'-2"	49
V1	154	#4	STR	4'-6"	463
V2	37	#5	STR	5'-5"	209
V3	17	#4	STR	7'-6"	85

REINFORCING STEEL = 6527 LBS

CONCRETE QUANTITIES

CLASS "A" CONCRETE BREAKDOWN

POUR #1:
CAP, LOWER PART OF WINGS 33.6 C.Y.

POUR #2:
BACKWALL, UPPER PART OF WINGS 12.3 C.Y.

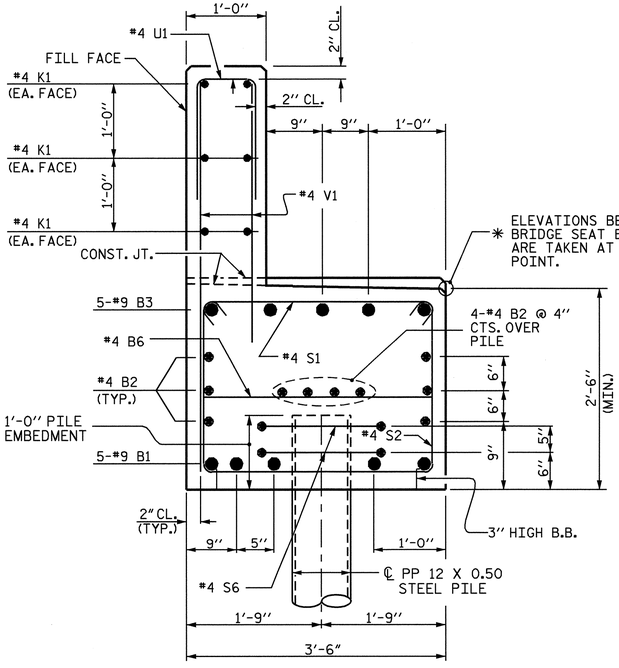
TOTAL 45.9 C.Y.

PP 12 X 0.50 STEEL PIPES (OPEN END)
NO. 9 LIN. FEET 126

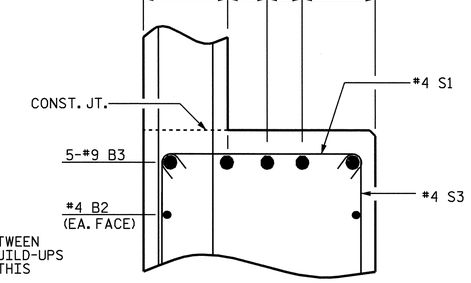
PILE EXCAVATION QUANTITIES

PILE EXCAVATION IN SOIL
LIN. FEET 45

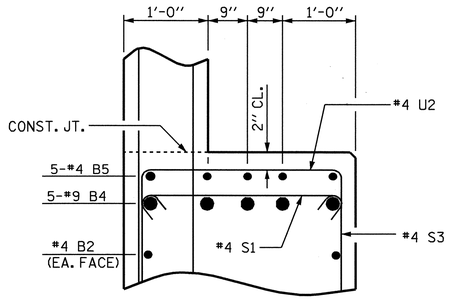
PILE EXCAVATION NOT IN SOIL
LIN. FEET 63



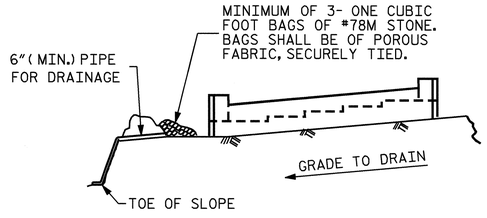
SECTION THRU CAP



PARTIAL SECTION A-A



PARTIAL SECTION B-B



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.

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TEMPORARY DRAINAGE AT END BENT

SPLICE CHART	
BARS	MIN. SPLICE LENGTH
#9 B1	6'-3"
#4	2'-5"
#9 B3	8'-9"

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

SHEET 3 OF 3

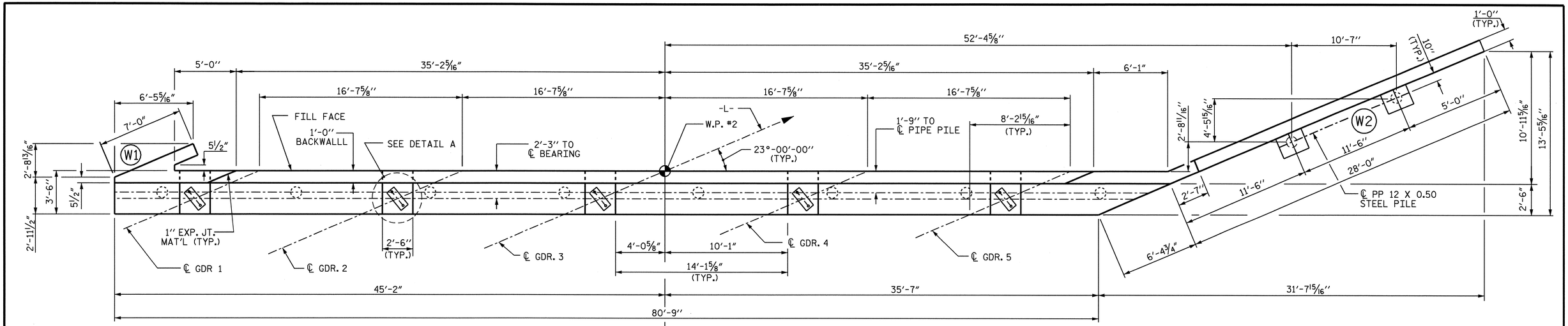
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
ALTERNATE "A2"

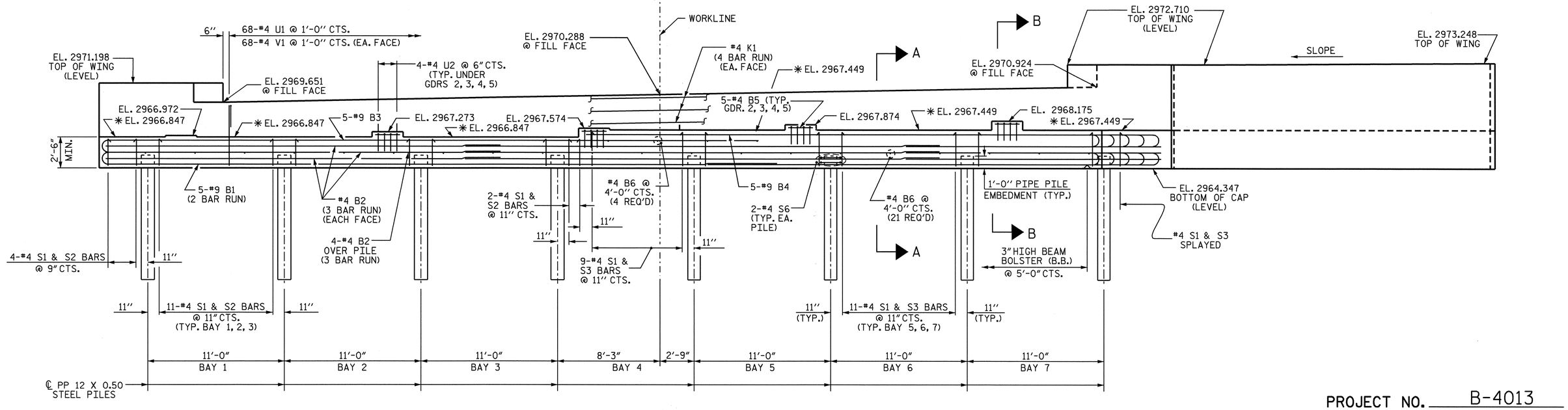
NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTI W. ALFORD
1-2-07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : QT NGUYEN DATE : 9-06
CHECKED BY : KW ALFORD DATE : 10-06

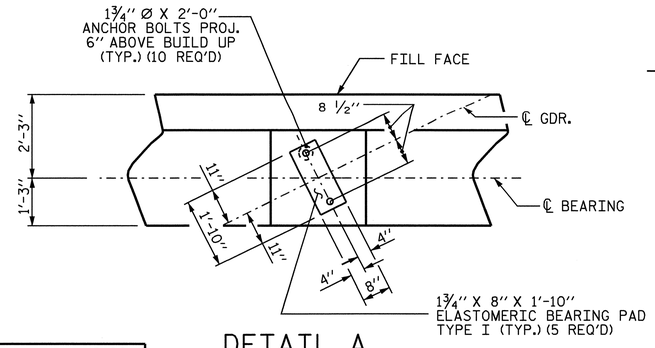


PLAN



ELEVATION

MICROPILE IN RIGHT WING WALL NOT SHOWN FOR CLARITY



DETAIL A

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CHECKED BY : KW ALFORD DATE : 10-06

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PROJECT NO. B-4013
ASHE COUNTY
STATION: 13+67.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
ALTERNATE "A2"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			35

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD
1-2-07

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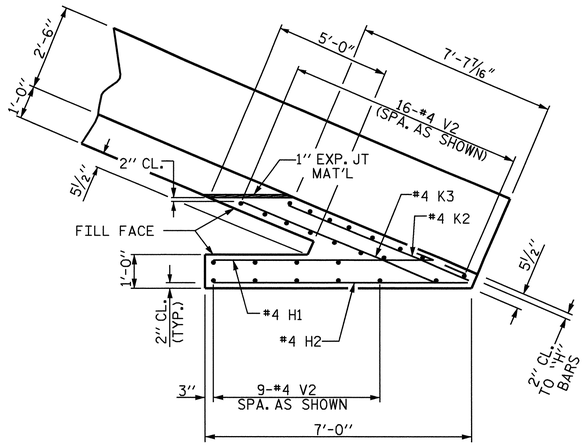
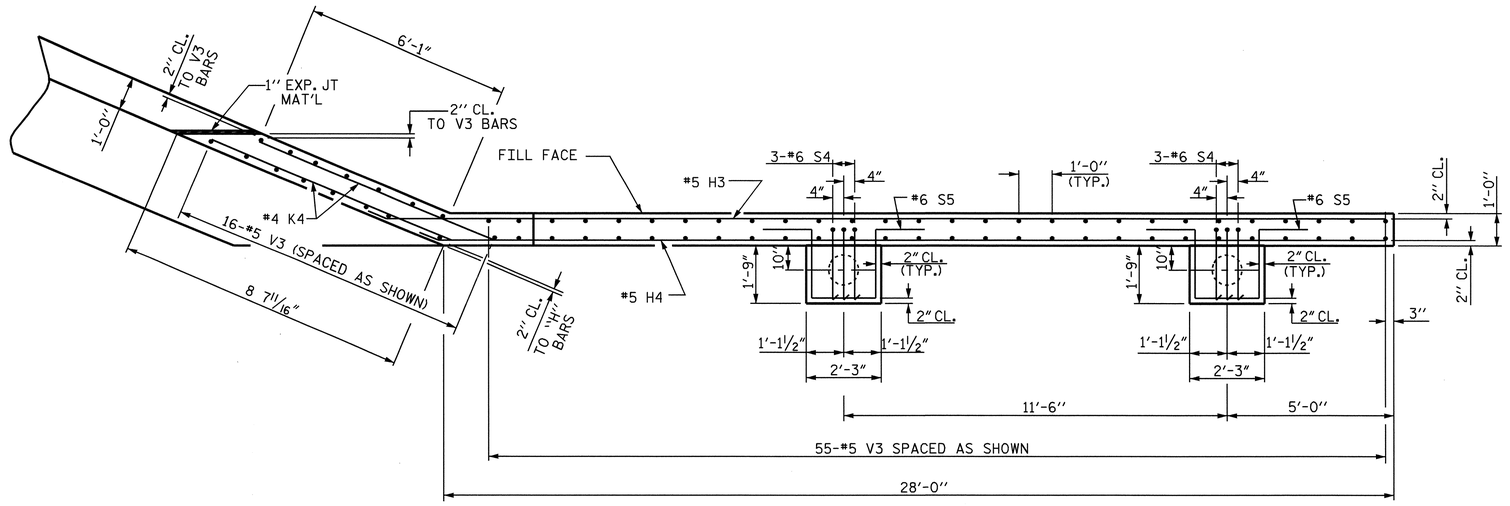


PLAN OF LEFT WING W1



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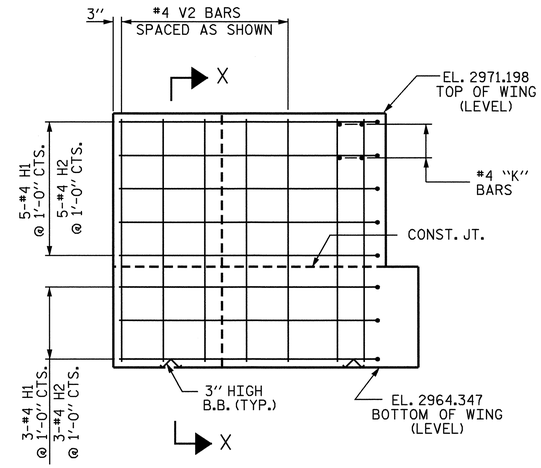
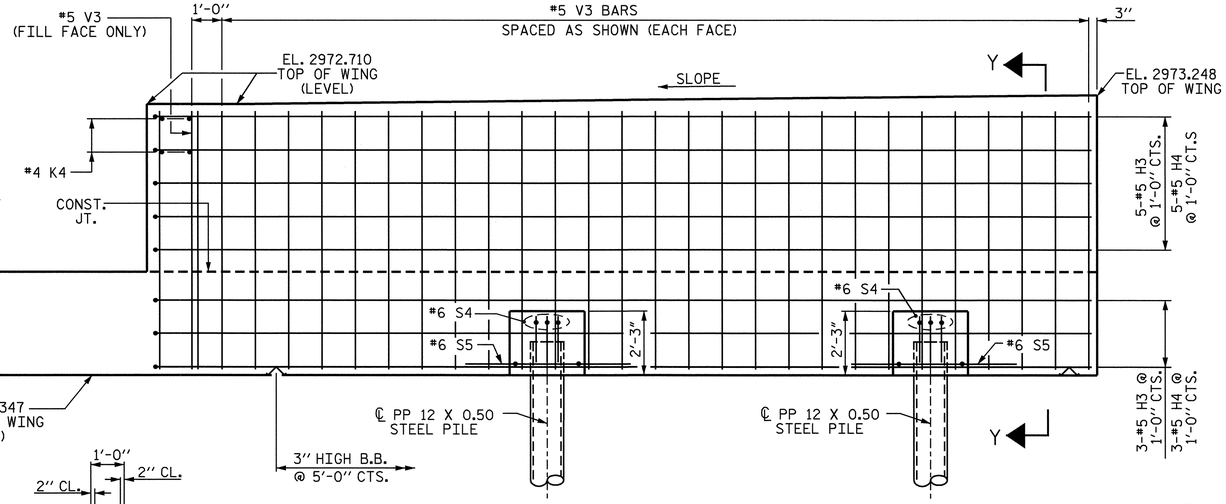


ELEVATION OF LEFT WING W1



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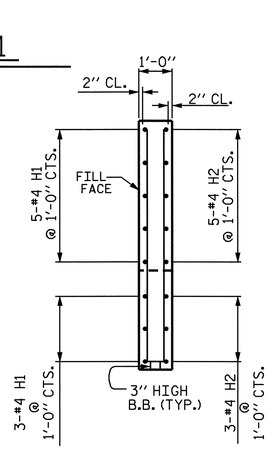
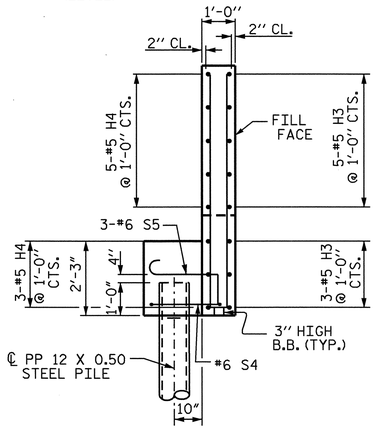


SECTION X-X



SECTION Y-Y

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
ALTERNATE "A2"

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD
12/5/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : QT NGUYEN DATE : 9-06
CHECKED BY : KW ALFORD DATE : 10-06

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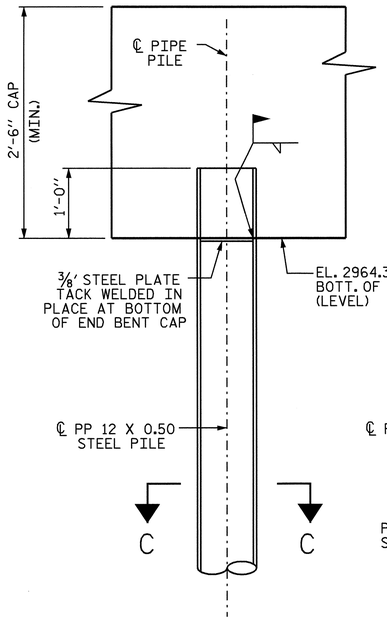
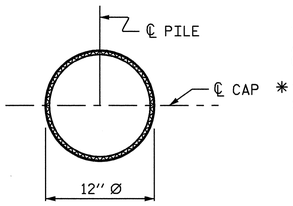
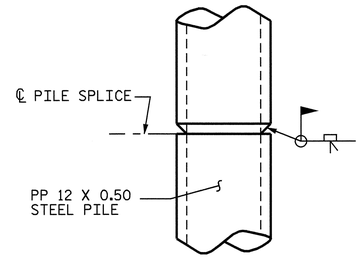


PIPE PILE DETAIL

(TYP. EACH OPEN END PIPE PILE)



SECTION C-C



PIPE PILE SPLICE DETAIL

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

* THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO BACK FACE AT A RATE OF 2%.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

STEEL PIPE PILES SHALL BE OF UNIFORM DIAMETER AND MEET THE REQUIREMENTS OF ASTM A252, GRADE 3 MODIFIED (50,000 PSI YIELD STRENGTH).

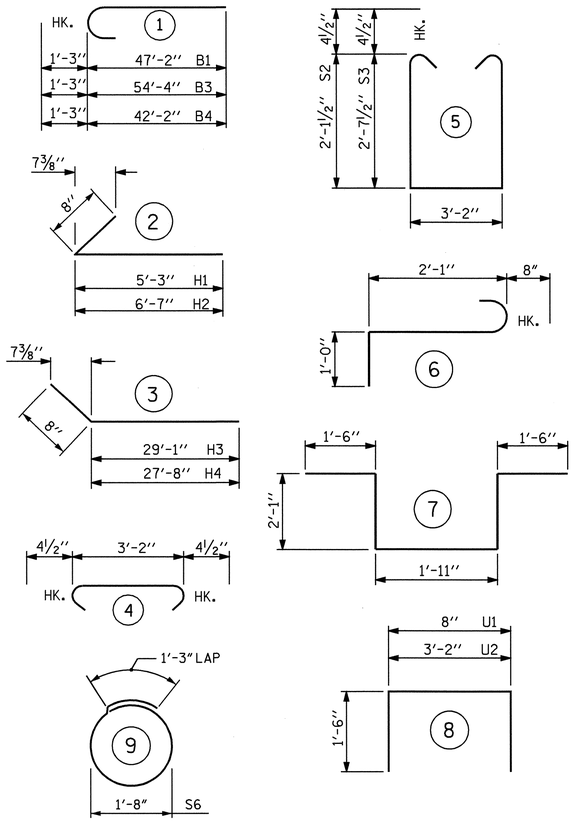
REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

THE CONTRACTOR MAY PROPOSE AN ALTERNATE METHOD FOR PLUGGING THE STEEL PIPE PILE, SUBJECT TO APPROVAL BY THE ENGINEER.

PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.

THE CONTRACTOR WILL NOT BE REQUIRED TO REMOVE THE SOIL FROM WITHIN THE PILES AFTER DRIVING EXCEPT FOR THAT PORTION THAT IS ABOVE THE BOTTOM OF THE END BENT CAP.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	48'-5"	1646
B2	30	#4	STR	31'-0"	621
B3	5	#9	1	57'-7"	945
B4	5	#9	1	43'-5"	738
B5	20	#4	STR	2'-2"	29
B6	25	#4	STR	3'-2"	53
H1	8	#4	2	5'-11"	32
H2	8	#4	2	7'-3"	39
H3	8	#5	3	29'-9"	248
H4	8	#5	3	28'-4"	236
K1	24	#4	STR	23'-10"	382
K2	2	#4	STR	7'-4"	10
K3	2	#4	STR	7'-10"	10
K4	4	#4	STR	7'-9"	21
S1	82	#4	4	3'-11"	215
S2	39	#4	5	8'-2"	213
S3	43	#4	5	9'-2"	263
S4	6	#6	6	3'-9"	17
S5	2	#6	7	9'-1"	14
S6	16	#4	9	6'-6"	70
U1	68	#4	8	3'-8"	167
U2	16	#4	8	6'-2"	66
V1	136	#4	STR	4'-11"	447
V2	25	#4	STR	6'-6"	109
V3	71	#5	STR	8'-0"	592

REINFORCING STEEL = 7212 LBS

CONCRETE QUANTITIES

CLASS "A" CONCRETE BREAKDOWN

POUR #1:
CAP, LOWER PART OF WINGS 35.5 C.Y.

POUR #2:
BACKWALL, UPPER PART OF WINGS 17.4 C.Y.

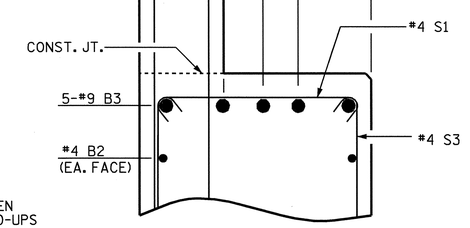
TOTAL 52.9 C.Y.

PP 12 X 0.50 STEEL PIPES (OPEN END)
NO. 10 LIN. FEET 170

PILE EXCAVATION QUANTITIES

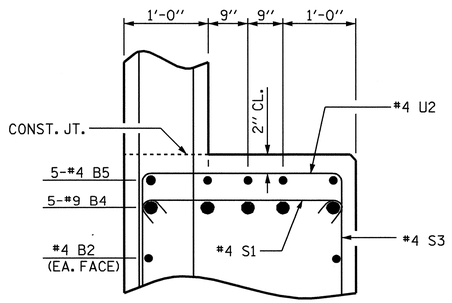
PILE EXCAVATION IN SOIL
LIN. FEET 50

PILE EXCAVATION NOT IN SOIL
LIN. FEET 90



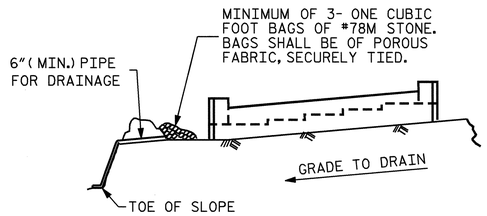
SECTION THRU CAP

PARTIAL SECTION A-A



PARTIAL SECTION B-B

SPLICE CHART	
BARS	MIN. SPLICE LENGTH
#9 B1	6'-3"
#4	2'-5"
#9 B3	8'-9"



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TEMPORARY DRAINAGE AT END BENT

PROJECT NO. B-4013

ASHE COUNTY

STATION: 13+67.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
ALTERNATE "A2"

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD
1-2-07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : QT NGUYEN DATE : 9-06
CHECKED BY : KW ALFORD DATE : 10-06

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 2002 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; CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP; AND CLASS S SHALL BE USED FOR UNDERWATER FOOTING SEALS.

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 WITH THE EXCEPTION OF #2 BARS WHICH MAY BE FABRICATED FROM COLD DRAWN STEEL WIRE. 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.

PLACEMENT OF BEAM OR GIRDER MEMBERS ON TRUCKS FOR HAULING SHALL BE DONE IN COMPLIANCE WITH LIMITS SHOWN ON SKETCHES PROVIDED TO THE MATERIALS AND TEST UNIT APPROVED BY THE STRUCTURE DESIGN UNIT DATED MAY 8, 1991. THESE SKETCHES PRIMARILY LIMIT THE UNSUPPORTED CANTILEVER LENGTH OF MEMBERS. WHEN THE CONTRACTOR WISHES TO PLACE MEMBERS ON TRUCKS NOT IN ACCORDANCE WITH THESE LIMITS, TO SHIP BY RAIL, TO ATTACH SHIPPING RESTRAINTS TO THE MEMBERS OR TO INVERT MEMBERS, HE SHALL SUBMIT A SKETCH FOR APPROVAL PRIOR TO SHIPPING. SEE ALSO ARTICLE 1072-11.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

JANUARY, 1990