CONTRACT: C202167 PROJECT: B-3928

STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3928		

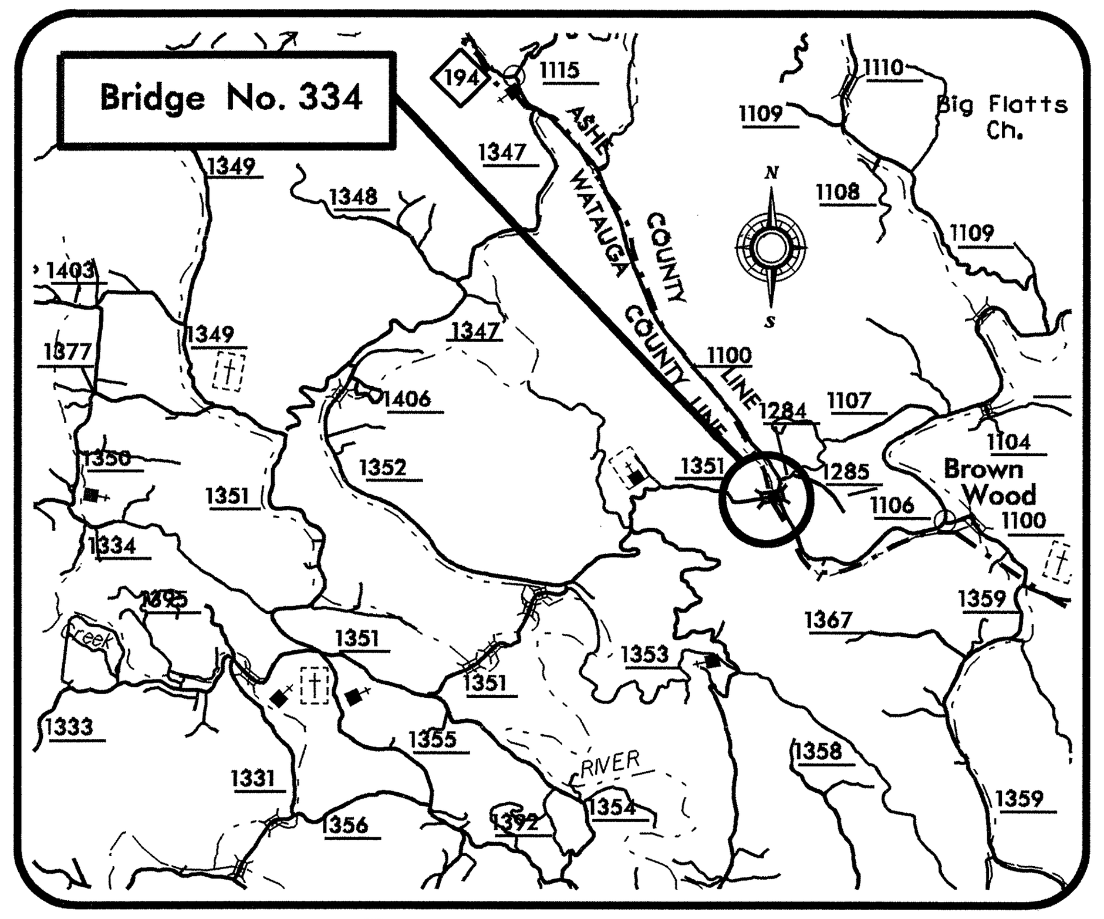
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33361.1.1	BRZ-1351(1)	PE
33361.2.2	BRZ-1351(1)	R/W, UTILITY
33361.3.1	BRZ-1351(1)	CONST.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

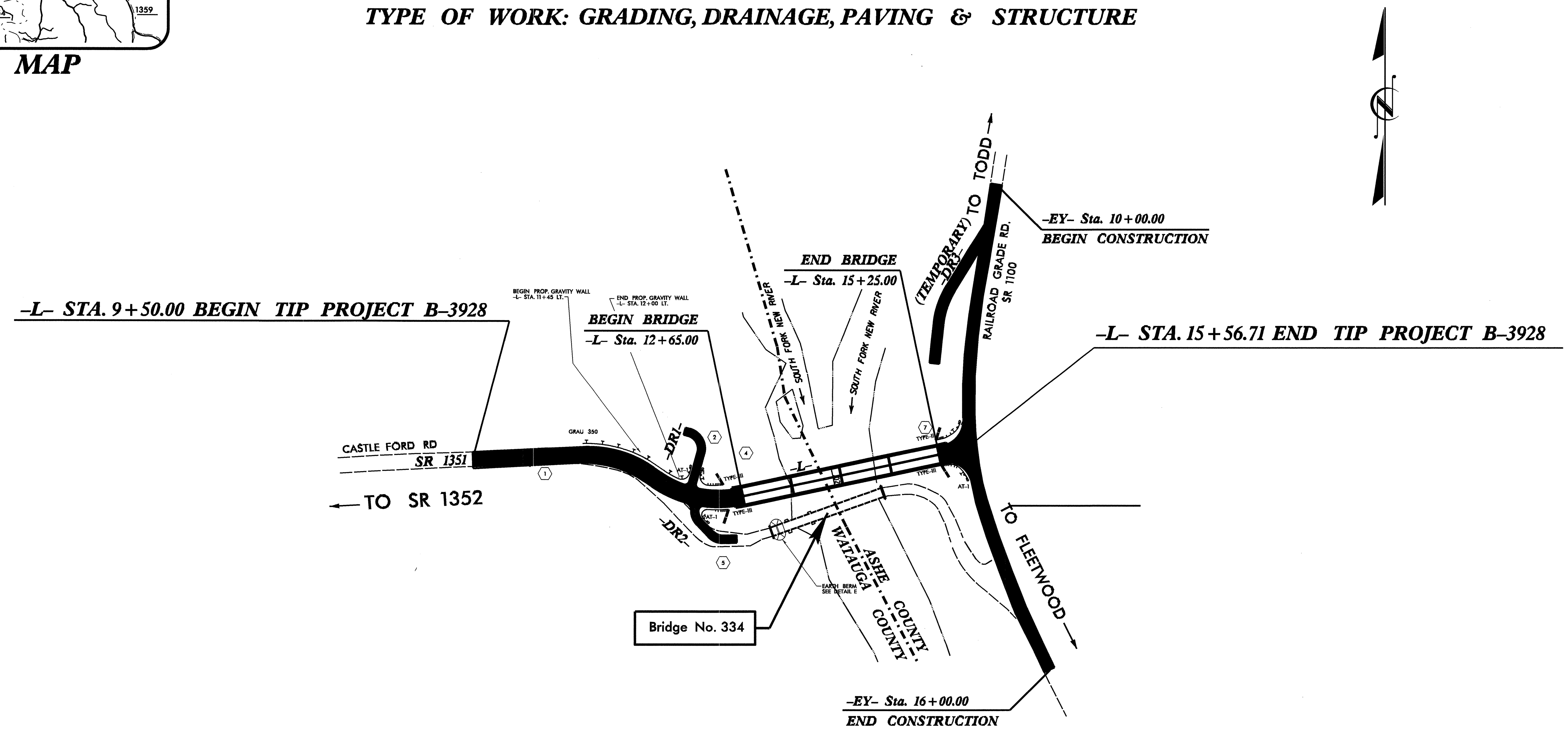
WATAUGA /ASHE COUNTIES

LOCATION: Bridge No. 334 over South Fork New River on SR 1351 (Castle Ford Road).

TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURE



VICINITY MAP



DESIGN DATA	
ADT 2008	= 194
ADT 2029	= 330
DHV	= 13 %
D	= 60 %
* T	= 3 %
V	= 20 MPH
* (1 % TTST & 2% DUAL)	
FUNC CLASS	= LOCAL

PROJECT LENGTH

Length Roadway TIP Project B-3928....... 0.066mi.

Length Structure TIP Project B-3928....... 0.049 mi.

Ttotal Length of TIP Project B-3928 .... 0.115 mi.

PREPARED BY THE OFFICE OF:
DIVISION OF HIGHWAYS

2006 STANDARD SPECIFICATIONS

LETTING DATE:
FEBRURAY 16, 2010

Q.H. NGUYEN, P.E.
PROJECT ENGINEER

J.R. DUGGINS, JR., P.E.
PROJECT DESIGN ENGINEER

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

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

11-JAN-2010 11:34
$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
dahodge

F. A. PROJECT: BRZ-1351(1)

12+00 12+50 13+00 13+50 14+00 14+50 15+00 15+50

-4.0200% 3.0914%

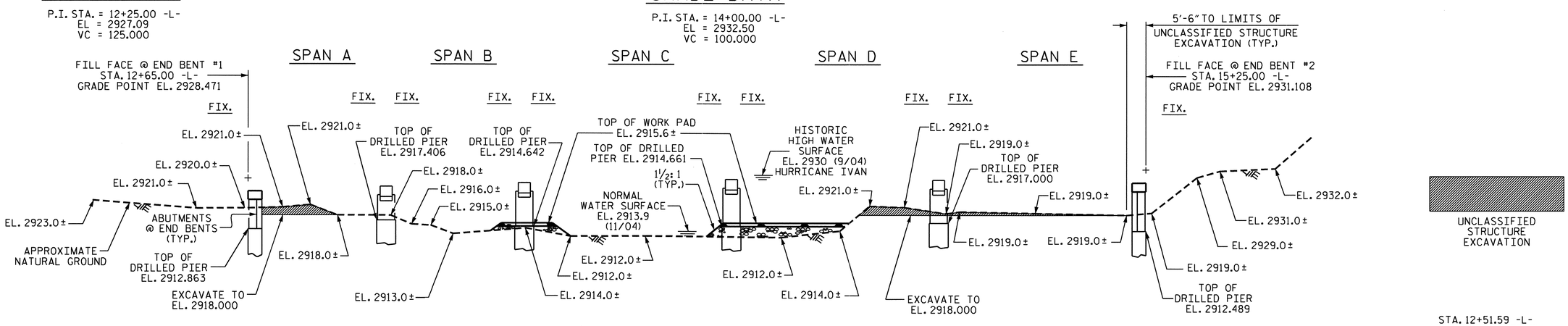
GRADE DATA

P.I. STA. = 12+25.00 -L-
EL = 2927.09
VC = 125.000

3.0914% -1.1135%

GRADE DATA

P.I. STA. = 14+00.00 -L-
EL = 2932.50
VC = 100.000

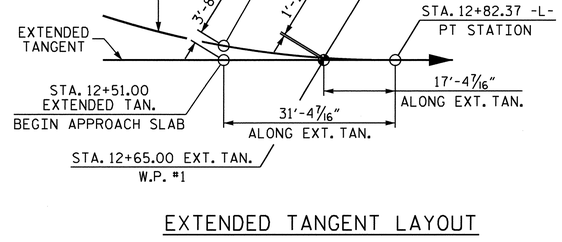


UNCLASSIFIED STRUCTURE EXCAVATION

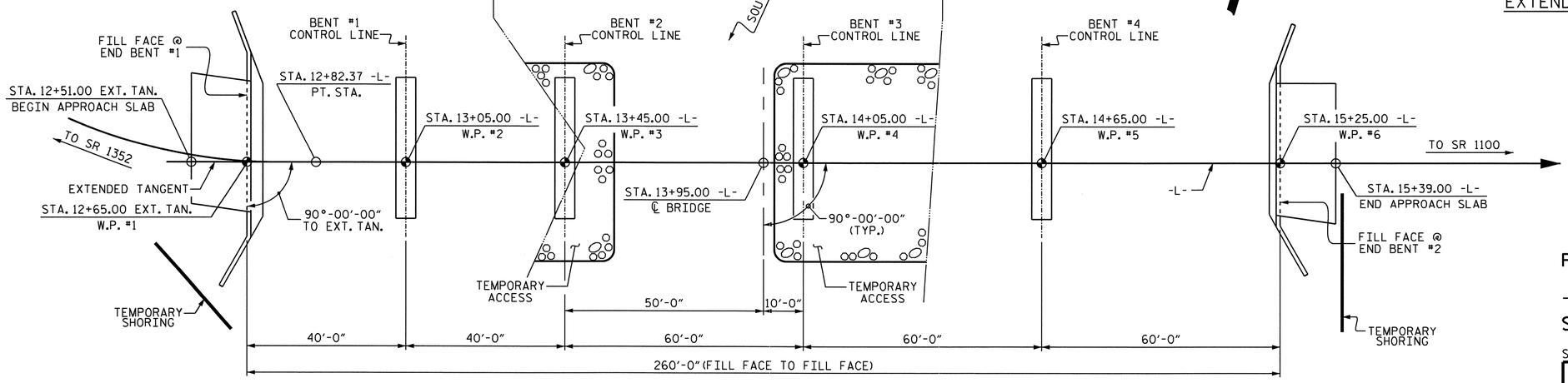
SECTION ALONG -L-

HORIZONTAL CURVE DATA

P.I. STA. = 12+32.54 -L-
Δ = 46°-41'-20" (LT)
D = 44°-04'-25.2"
L = 105.93
T = 56.11
R = 130.00



EXTENDED TANGENT LAYOUT



PLAN

DRILLED PIERS NOT SHOWN FOR CLARITY

PROJECT NO. B-3928
WATAUGA/ASHE COUNTY
STATION: 13+95.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE #334

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON SR 1351
OVER SOUTHFORK NEW RIVER
BETWEEN SR 1352 AND SR 1100

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

NORTH CAROLINA PROFESSIONAL SEAL 13014 ENGINEER QUANG H. NGUYEN
1-11-10

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS JR.
01/11/10

DRAWN BY : A. SORSENGINH DATE : 11/09
CHECKED BY : J.R. DUGGINS DATE : 11/09

11-JAN-2010 11:33
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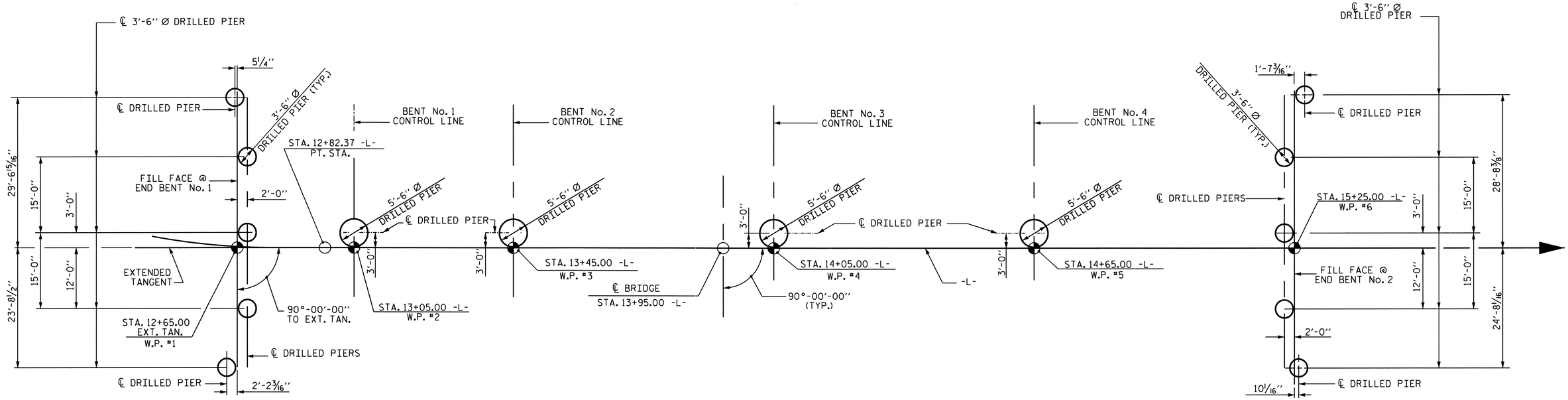
dahodge

NC80DS



END BENT No. 1 | BENT No. 1 | BENT No. 2 | BENT No. 3 | BENT No. 4 | END BENT No. 2

FOUNDATION LAYOUT

NOTES

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

DRILLED PIERS AT END BENT No. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 195 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 25 TSF.

DRILLED PIERS AT BENT No. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 455 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 30 TSF.

DRILLED PIERS AT BENT No. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 545 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 30 TSF.

DRILLED PIERS AT BENT No. 3 ARE DESIGNED FOR A FACTORED RESISTANCE OF 615 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 30 TSF.

DRILLED PIERS AT BENT No. 4 ARE DESIGNED FOR A FACTORED RESISTANCE OF 600 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 30 TSF.

DRILLED PIERS AT END BENT No. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 225 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 30 TSF.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT No. 1. DO NOT EXTEND CASING BELOW ELEVATION 2908 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

PERMANENT STEEL CASING IS REQUIRED FOR DRILLED PIERS AT BENT No. 2. DO NOT EXTEND CASING BELOW ELEVATION 2910 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

PERMANENT STEEL CASING IS REQUIRED FOR DRILLED PIERS AT BENT No. 3. DO NOT EXTEND CASING BELOW ELEVATION 2906 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT No. 4. DO NOT EXTEND CASING BELOW ELEVATION 2904 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

INSTALL DRILLED PIERS AT END BENT No. 1 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 2895 FT AND SATISFY THE REQUIRED TIP RESISTANCE.

PERMANENT STEEL CASING IS NOT REQUIRED FOR DRILLED PIERS AT END BENT No. 1 AND END BENT No 2.

INSTALL DRILLED PIERS AT BENT No .1 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 2893 FT AND SATISFY THE REQUIRED TIP RESISTANCE.

INSTALL DRILLED PIERS AT BENT No. 2 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 2894 FT AND SATISFY THE REQUIRED TIP RESISTANCE.

INSTALL DRILLED PIERS AT BENT No. 3 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 2890 FT AND SATISFY THE REQUIRED TIP RESISTANCE.

INSTALL DRILLED PIERS AT BENT No. 4 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 2892 FT AND SATISFY THE REQUIRED TIP RESISTANCE.

INSTALL DRILLED PIERS AT END BENT No. 2 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 2904 FT AND SATISFY THE REQUIRED TIP RESISTANCE.

THE SCOUR CRITICAL ELEVATION FOR BENT No. 1 IS ELEVATION 2900 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THE SCOUR CRITICAL ELEVATION FOR BENT No. 2 IS ELEVATION 2906 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THE SCOUR CRITICAL ELEVATION FOR BENT No. 3 IS ELEVATION 2905 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THE SCOUR CRITICAL ELEVATION FOR BENT No. 4 IS ELEVATION 2902 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. 1 AND END BENT No. 2 IS THE BOTTOM OF THE WALL ELEVATION. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS.

CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CROSSHOLE SONIC LOGGING, SEE SPECIAL PROVISIONS.

SPT TESTING IS REQUIRED FOR DRILLED PIERS AT BENT NO. 3.

PROJECT NO. B-3928

WATAUGA/ASHE COUNTY

STATION: 13+95.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON SR 1351
OVER SOUTHFORK NEW RIVER
BETWEEN SR 1352 AND SR 1100

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
2011 11 10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			37

DRAWN BY : M. POOLE DATE : 07/09
CHECKED BY : J.R. DUGGINS DATE : 11/09

11-JAN-2010 11:33
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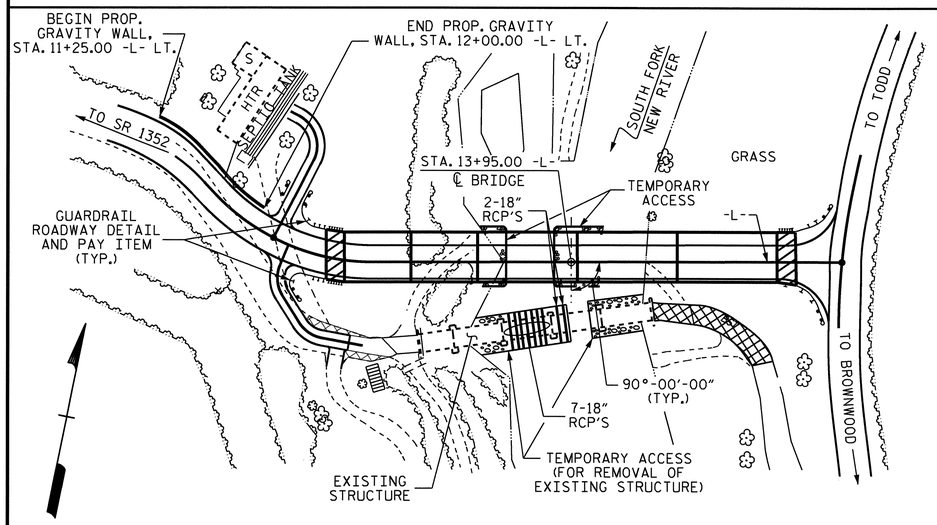
dahodge

BENCH MARK #2: - CHISELED X ON THE SOUTHEAST END WALL ON EXIST. BRIDGE, STA. 14+50.31 -L- (36.70' RT.), ELEV. 2917.83



LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE	= 11,600 CFS.
FREQUENCY OF DESIGN FLOOD	= 25 YRS.
DESIGN HIGH WATER ELEVATION	= 2926.9
DRAINAGE AREA	= 102.30 SQ. MI.
BASIC DISCHARGE (Q100)	= 19,169 CFS.
BASIC HIGH WATER ELEVATION	= 2931.3

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 14,000 CFS.
FREQUENCY OF OVERTOPPING FLOOD	= <50 YRS.
OVERTOPPING FLOOD ELEVATION	= 2928.2

NOTE: FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

NOTES

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONSTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXSITING STRUCTURE CONSISTING OF 5 SPANS,1 @ 20'-10", 3 @ 30'-1" AND 1 @ 30'-10" WITH A TIMBER DECK ON A STEEL I-BEAMS SUPERSTRUCTURE AND A CLEAR ROADWAY WIDTH OF 11'-2" ON A SUBSTRUCTURE CONSISTING OF REINFORCED CONCRETE ABUTMENTS AND PIERS AND LOCATED APPROXIMATELY 25' DOWN STREAM FROM THE PROPOSED STRUCTURE SITE 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. SEE SPECIAL PROVISION FOR REMOVAL OF EXISTING STRUCTURE.

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 MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 25 FEET. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE 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 TRANSPORTAION 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.

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

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

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.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMORARY ACCESS, SEE SPECIAL PROVISION.

INTEGRALLY COLORED CONCRETE SHALL BE USED IN ALL BENT COLUMNS AND CAPS, BOTH END BENT CAPS AND WINGS. ALL PRESTRESSED CONCRETE CORED SLABS, THE CONCRETE PARAPETS AND END POSTS.

FOR INTEGRALLY COLORED CONCRETE, SEE SPECIAL PROVISION.

FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT, SEE SPECIAL PROVISION.

FOR SPECIAL STEEL 2-BAR METAL RAIL, SEE SPECIAL PROVISION.

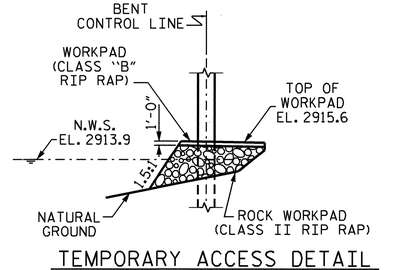
FOR CURING CONCRETE, SEE SPECIAL PROVISION.

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE & REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	5'-6"Ø DRILLED PIERS IN SOIL	3'-6"Ø DRILLED PIERS IN SOIL	5'-6"Ø DRILLED PIERS NOT IN SOIL	3'-6"Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 5'-6"Ø DRILLED PIER	SID INSPECTION	SPT TESTING	CROSSHOLE SONIC LOGGING
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH
SUPERSTRUCTURE										
END BENT NO. 1				55.00		35.00				
BENT NO. 1			11.50		13.00		9.40			
BENT NO. 2			4.67		16.00		4.67			
BENT NO. 3			6.67		18.00		8.67		1	
BENT NO. 4			13.00		12.00		13.00			
END BENT NO. 2				4.50		38.00				
TOTAL	LUMP SUM	LUMP SUM	35.84	59.50	59.00	73.00	35.74	2	1	4

TOTAL BILL OF MATERIAL

	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	1'-8"X 9" CONCRETE PARAPET	ELASTOMERIC BEARINGS	3'-0"X 1'-9" PRESTRESSED CONCRETE CORED SLABS		SPECIAL STEEL 2-BAR METAL RAIL	ARCHITECTURAL CONCRETE SURFACE TREATMENT
	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	LBS.	LIN. FT.	LUMP SUM	NO.	LIN. FT.	LIN. FT.	SQ. FT.
SUPERSTRUCTURE			LUMP SUM			515.75	LUMP SUM	55	2829.75	500.25	
END BENT NO. 1	LUMP SUM	82.5		23840	3302						700
BENT NO. 1		28.8		8118	1033						
BENT NO. 2		31.7		8134	1049						
BENT NO. 3		32.6		8636	1242						
BENT NO. 4		30.7		8421	1155						
END BENT NO. 2	LUMP SUM	99.6		25960	2605						915
TOTAL	LUMP SUM	305.9	LUMP SUM	83109	10386	515.75	LUMP SUM	55	2829.75	500.25	1615



TEMPORARY ACCESS DETAIL
(NOT TO SCALE)

PROJECT NO. B-3928
WATAUGA/ASHE COUNTY
STATION: 13+95.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON SR 1351
OVER SOUTHFORK NEW RIVER
BETWEEN SR 1352 AND SR 1100

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			37

DRAWN BY : A. SORSENGINH DATE : 11/09
CHECKED BY : J.R. DUGGINS DATE : 11/09

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dahodge

NCDOT

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.11	--	1.75	0.270	1.33	C	ER	29.438	0.536	1.11	A	ER	1.891	0.80	0.270	1.31	C	ER	29.438	
		HL-93 (OPERATING)	N/A		1.44	--	1.35	0.270	1.72	C	ER	29.438	0.536	1.44	A	ER	1.891	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	2	1.25	45.16	1.75	0.270	1.64	C	ER	29.438	0.536	1.25	A	ER	1.891	0.80	0.270	1.34	C	ER	29.438	
		HS-20 (OPERATING)	36.000		1.67	60.21	1.35	0.270	2.18	C	ER	29.438	0.536	1.67	A	ER	1.891	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.67	36.02	1.40	0.270	3.53	C	ER	29.438	0.536	2.67	A	ER	1.891	0.80	0.270	2.88	C	ER	29.438	
		SNGARBS2	20.000		1.99	39.83	1.40	0.270	2.70	C	ER	29.438	0.536	1.99	A	ER	1.891	0.80	0.270	2.20	C	ER	29.438	
		SNAGRIS2	22.000		1.56	41.51	1.40	0.270	1.91	C	ER	29.438	0.536	1.89	A	ER	1.891	0.80	0.270	1.56	C	ER	29.438	
		SNCOTTS3	27.250		1.34	36.55	1.40	0.270	1.83	C	ER	29.438	0.536	1.34	A	ER	1.891	0.80	0.270	1.49	C	ER	29.438	
		SNAGGRS4	34.925		1.18	41.22	1.40	0.270	1.50	C	ER	29.438	0.536	1.18	A	ER	1.891	0.80	0.270	1.23	C	ER	29.438	
		SNS5A	35.550		1.19	42.31	1.40	0.270	1.46	C	ER	29.438	0.536	1.23	A	ER	1.891	0.80	0.270	1.19	C	ER	29.438	
		SNS6A	39.950		1.10	43.95	1.40	0.270	1.35	C	ER	29.438	0.536	1.16	A	ER	1.891	0.80	0.270	1.10	C	ER	29.438	
		SNS7B	42.000		1.05	44.12	1.40	0.270	1.29	C	ER	29.438	0.536	1.18	A	ER	1.891	0.80	0.270	1.05	C	ER	29.438	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.35	44.65	1.40	0.270	1.66	C	ER	29.438	0.536	1.35	A	ER	1.891	0.80	0.270	1.35	C	ER	29.438	
		TNT4A	33.075		1.20	44.64	1.40	0.270	1.47	C	ER	29.438	0.536	1.28	A	ER	1.891	0.80	0.270	1.20	C	ER	29.438	
		TNT6A	41.600		1.26	52.44	1.40	0.270	2.17	C	ER	29.438	0.536	1.26	A	ER	1.891	0.80	0.270	1.78	C	ER	29.438	
		TNT7A	42.000		1.11	46.16	1.40	0.270	1.37	C	ER	29.438	0.536	1.16	A	ER	1.891	0.80	0.270	1.11	C	ER	29.438	
		TNT7B	42.000		1.12	47.08	1.40	0.270	1.38	C	ER	29.438	0.536	1.12	A	ER	1.891	0.80	0.270	1.13	C	ER	29.438	
		TNAGRIT4	43.000		1.07	46.19	1.40	0.270	1.45	C	ER	29.438	0.536	1.07	A	ER	1.891	0.80	0.270	1.18	C	ER	29.438	
		TNAGT5A	45.000		1.12	50.33	1.40	0.270	1.74	C	ER	29.438	0.536	1.12	A	ER	1.891	0.80	0.270	1.41	C	ER	29.438	
		TNAGT5B	45.000	3	1.02	45.73	1.40	0.270	2.01	C	ER	29.438	0.536	1.02	A	ER	1.891	0.80	0.270	1.68	C	ER	29.438	

LOAD FACTORS:

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

	YEAR	ADTT
CURRENT	2008	4
FUTURE	2029	6

NOTES:

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

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

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

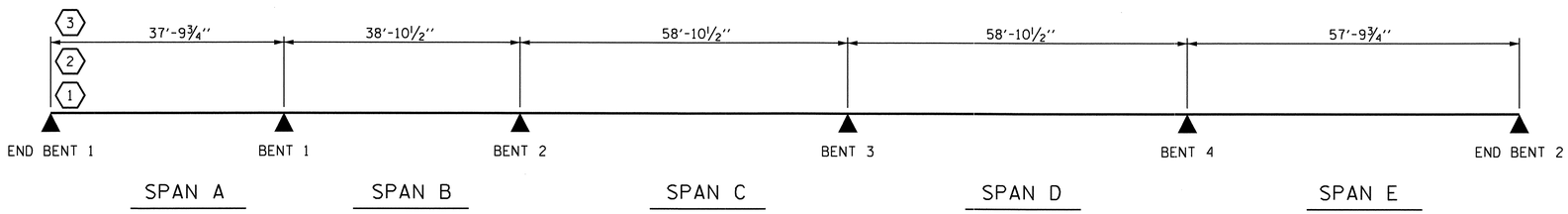
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. B-3928

WATAUGA/ASHE COUNTY

STATION: 13+95.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			37

ASSEMBLED BY : M. POOLE DATE : 11/09
CHECKED BY : J.R. DUGGINS DATE : 11/09
DRAWN BY : MAA 1/08
CHECKED BY : GM/DI 2/08
REV. 11/12/08RR MAA/GM

11-JAN-2010 11:31
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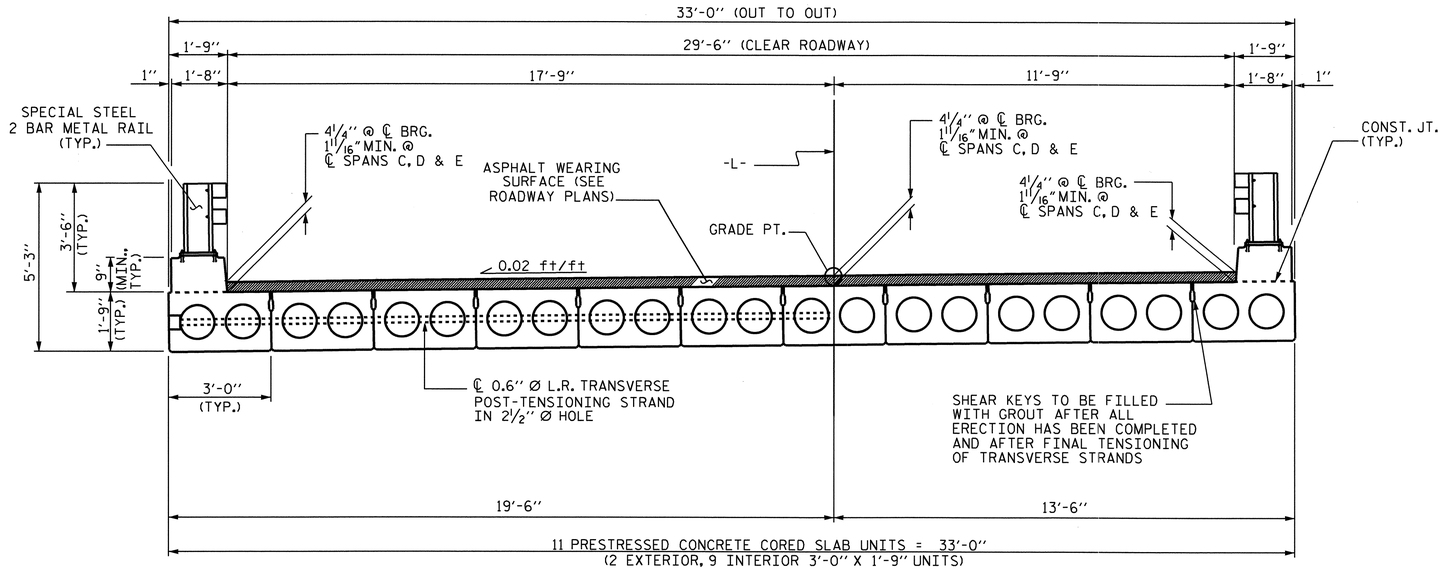
dahodge

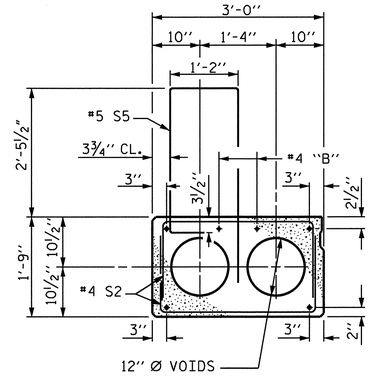
STD. NO. LRFR1



HALF SECTION @ POST TENSIONING LOCATION

HALF SECTION @ END BENT & BENT

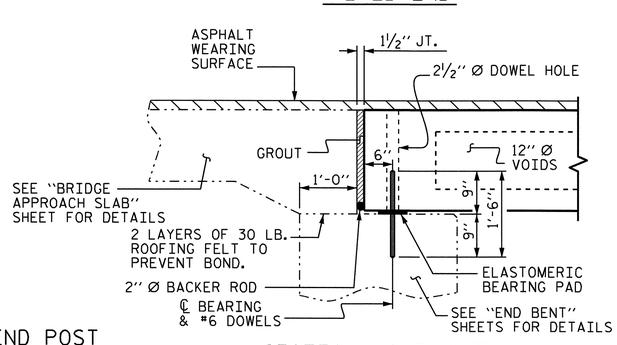
TYPICAL SECTION



EXTERIOR SLAB SECTION @ END POST

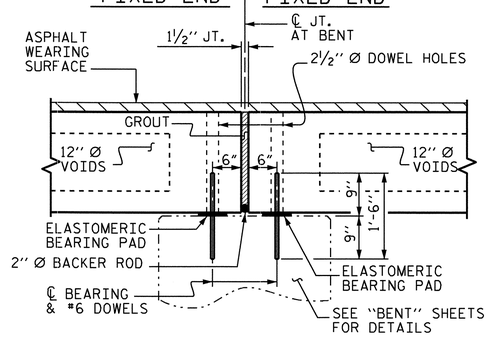
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)

FIXED END



SECTION AT END BENT

FIXED END | FIXED END



SECTION AT BENT

EXTERIOR SLAB SECTION @ PARAPET

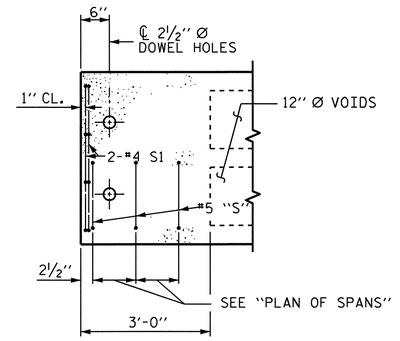
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)

INTERIOR SLAB SECTION
0.6" Ø LOW RELAXATION STRAND LAYOUT
SPANS A & B

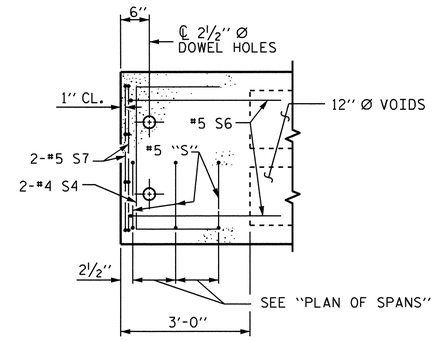
■ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-0" FROM END OF CORED SLAB UNIT, SEE STANDARD SPECIFICATIONS ARTICLE 1078-7

INTERIOR SLAB SECTION
0.6" Ø LOW RELAXATION STRAND LAYOUT
SPANS C, D, & E

■ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-0" FROM END OF CORED SLAB UNIT, SEE STANDARD SPECIFICATIONS ARTICLE 1078-7



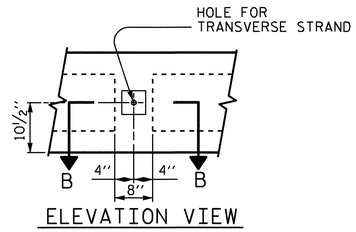
SPANS A & B



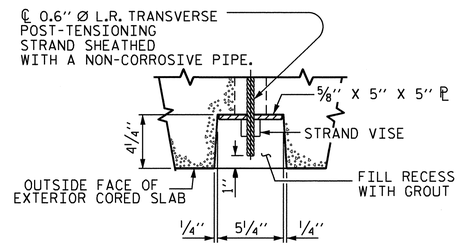
SPANS C, D & E

PART PLAN-EXTERIOR SECTION

NOTE: EXTERIOR SECTION SHOWN-INTERIOR SECTION SIMILAR EXCEPT OMIT "S" BARS.

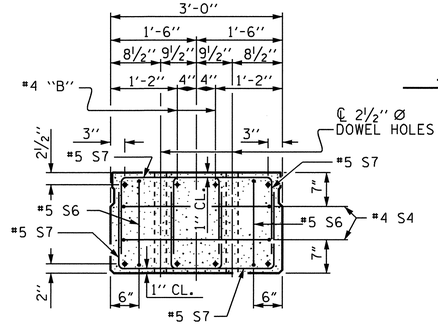


ELEVATION VIEW

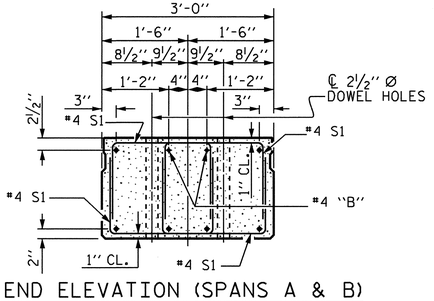


SECTION B-B

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

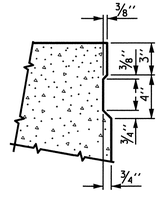


END ELEVATION (SPANS C, D & E)



END ELEVATION (SPANS A & B)

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



SHEAR KEY DETAIL

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

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.

6/11/10

PROJECT NO. B-3928

WATAUGA/ASHE COUNTY

STATION: 13+95.00 -L-

SHEET 1 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			37

DRAWN BY : M. POOLE DATE : 01/09
CHECKED BY : A. SORSENGINH DATE : 09/09

11-JAN-2010 11:30
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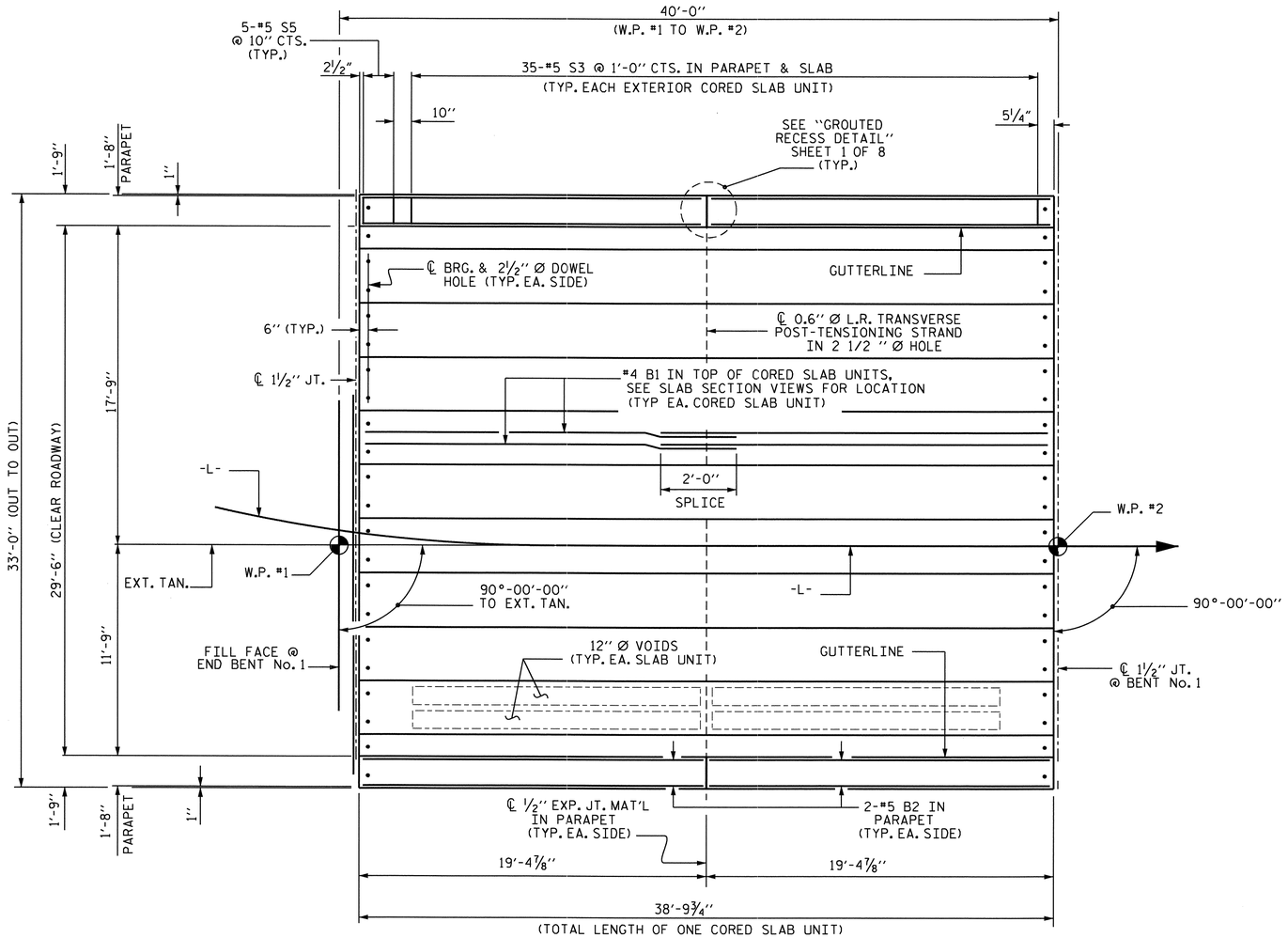
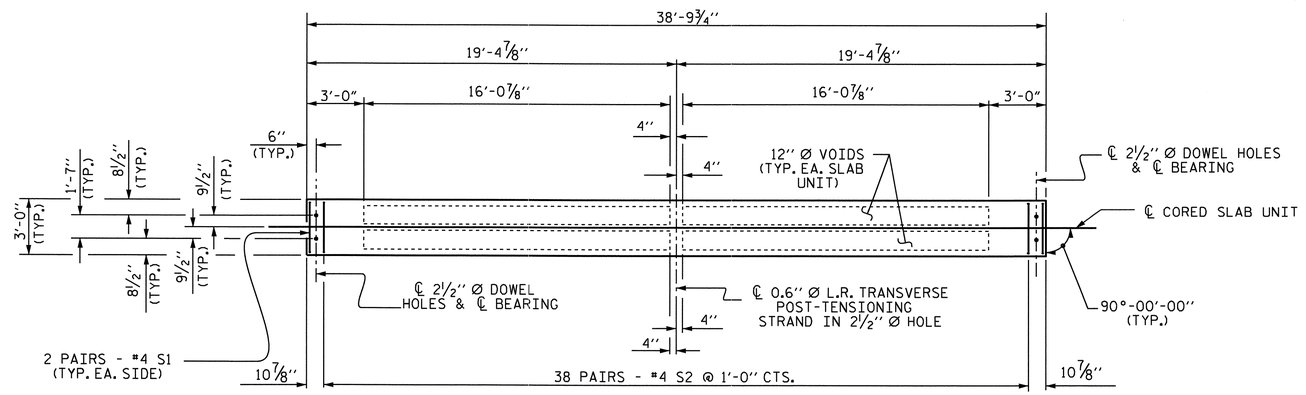
dahodge

NC005



SPAN A



PLAN OF INTERIOR CORED SLAB UNIT - SPAN A

PROJECT NO. B-3928

WATAUGA/ASHE COUNTY

STATION: 13+95.00 -L-

SHEET 2 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			37

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS JR.
01/11/10

DRAWN BY : M. POOLE DATE : 09/09
CHECKED BY : A. SORSENGINH DATE : 09/09

11-JAN-2010 11:29
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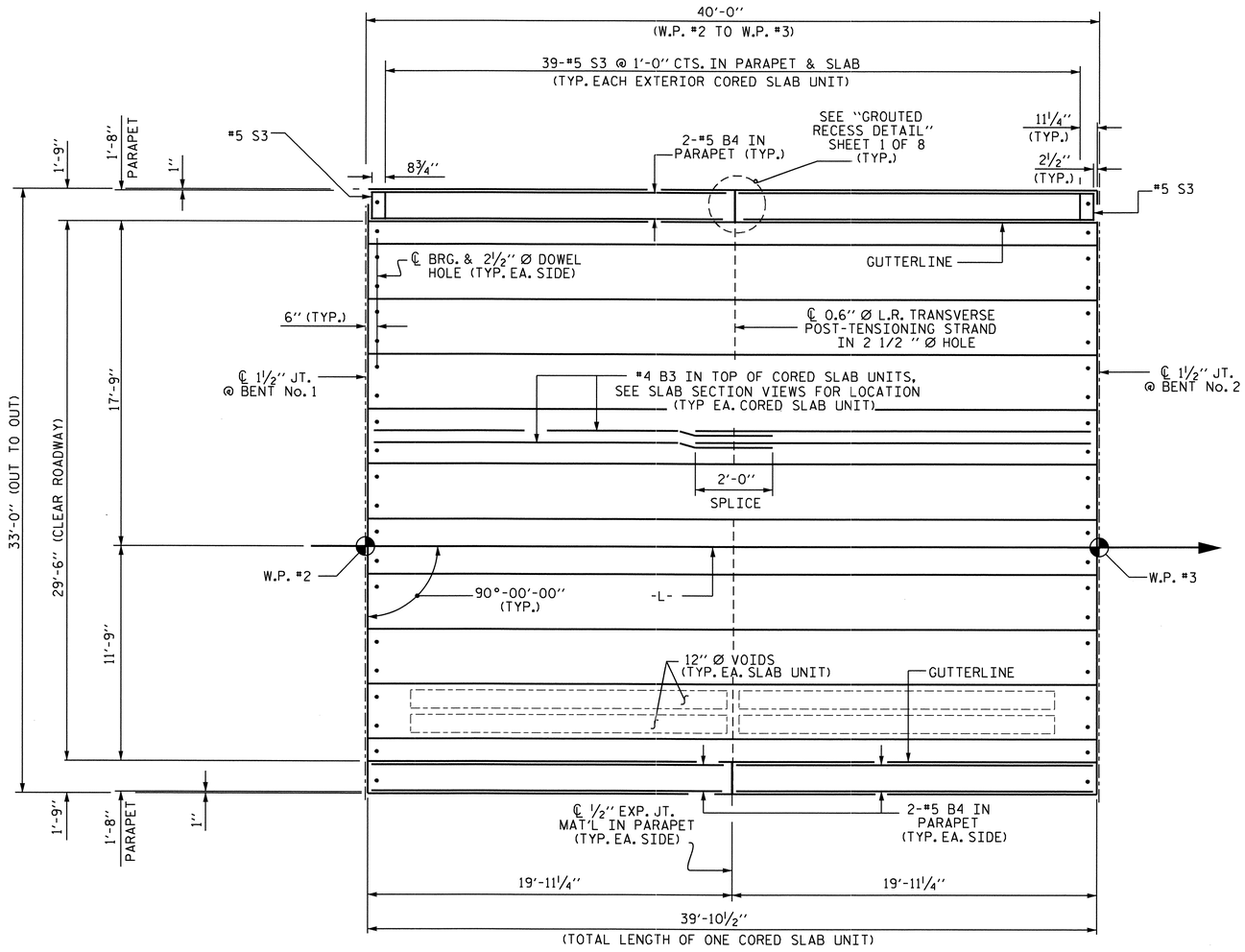
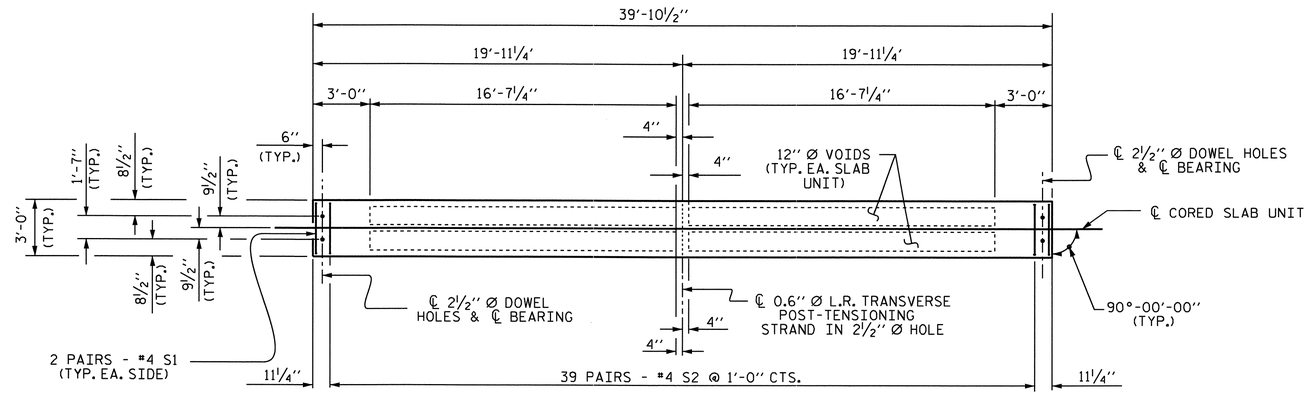
dahodge

NCDOT



SPAN B



PLAN OF INTERIOR CORED SLAB UNIT - SPAN B

PROJECT NO. B-3928

WATAUGA/ASHE COUNTY

STATION: 13+95.00 -L-

SHEET 3 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			37

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

DRAWN BY : M. POOLE DATE : 09/09
CHECKED BY : A. SORSENGINH DATE : 09/09

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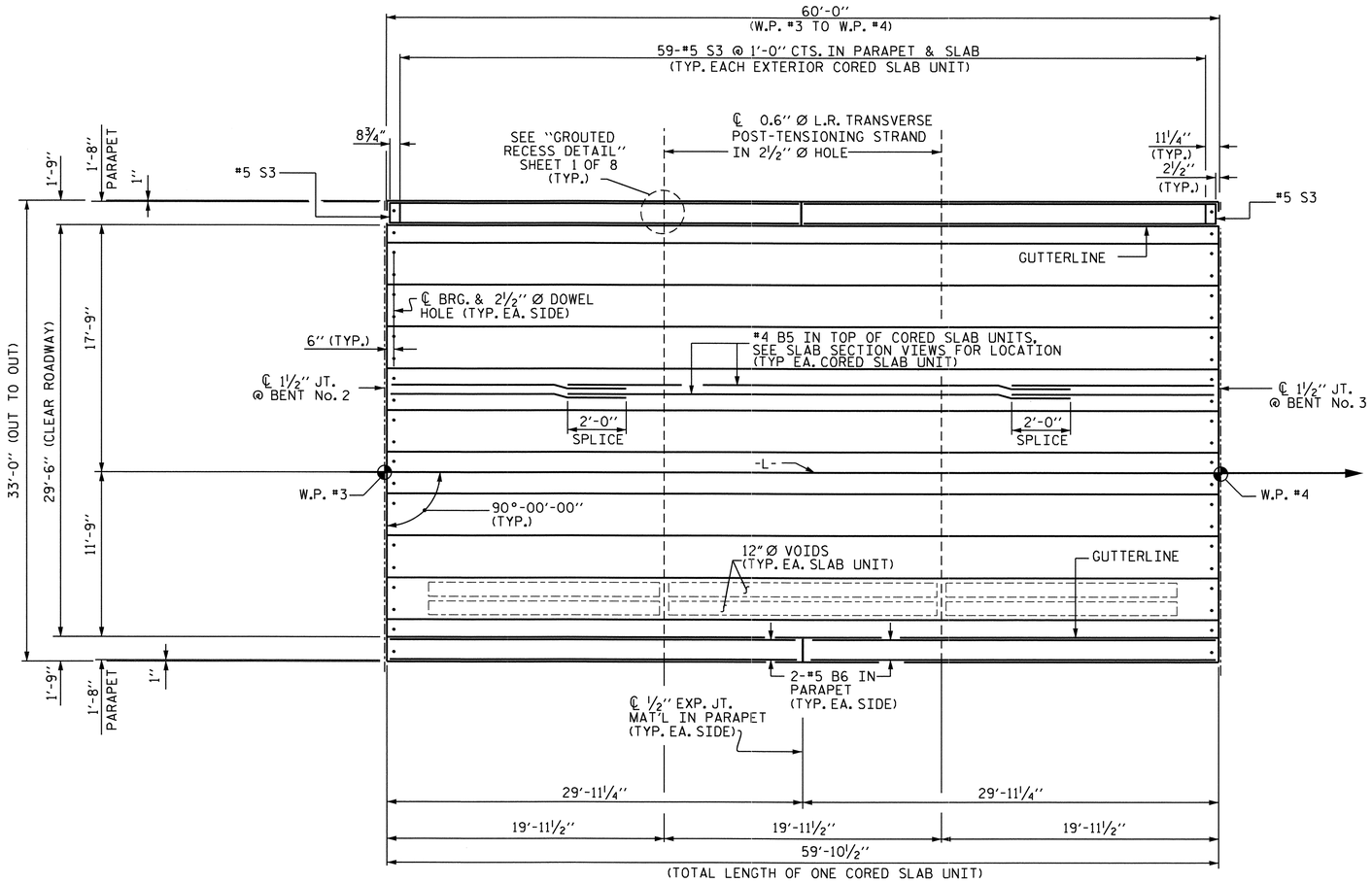
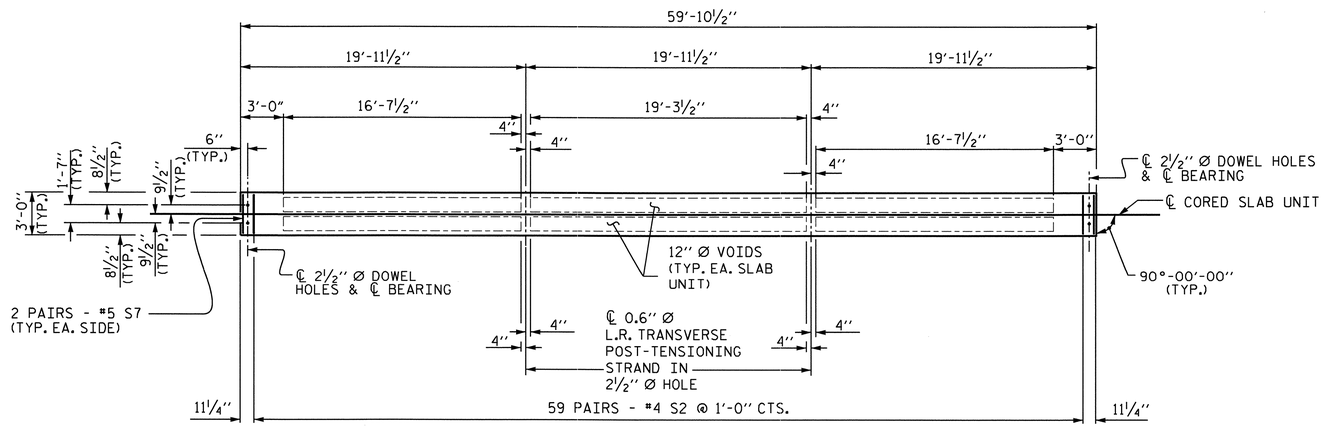
dahodge

NC605



SPAN C



PLAN OF INTERIOR CORED SLAB UNIT - SPAN C

PROJECT NO. B-3928
WATAUGA/ASHE COUNTY
STATION: 13+95.00 -L-

SHEET 4 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN C

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			37

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

DRAWN BY : M. POOLE DATE : 01/09
CHECKED BY : A. SORSENGINH DATE : 09/09

11-JAN-2010 11:29
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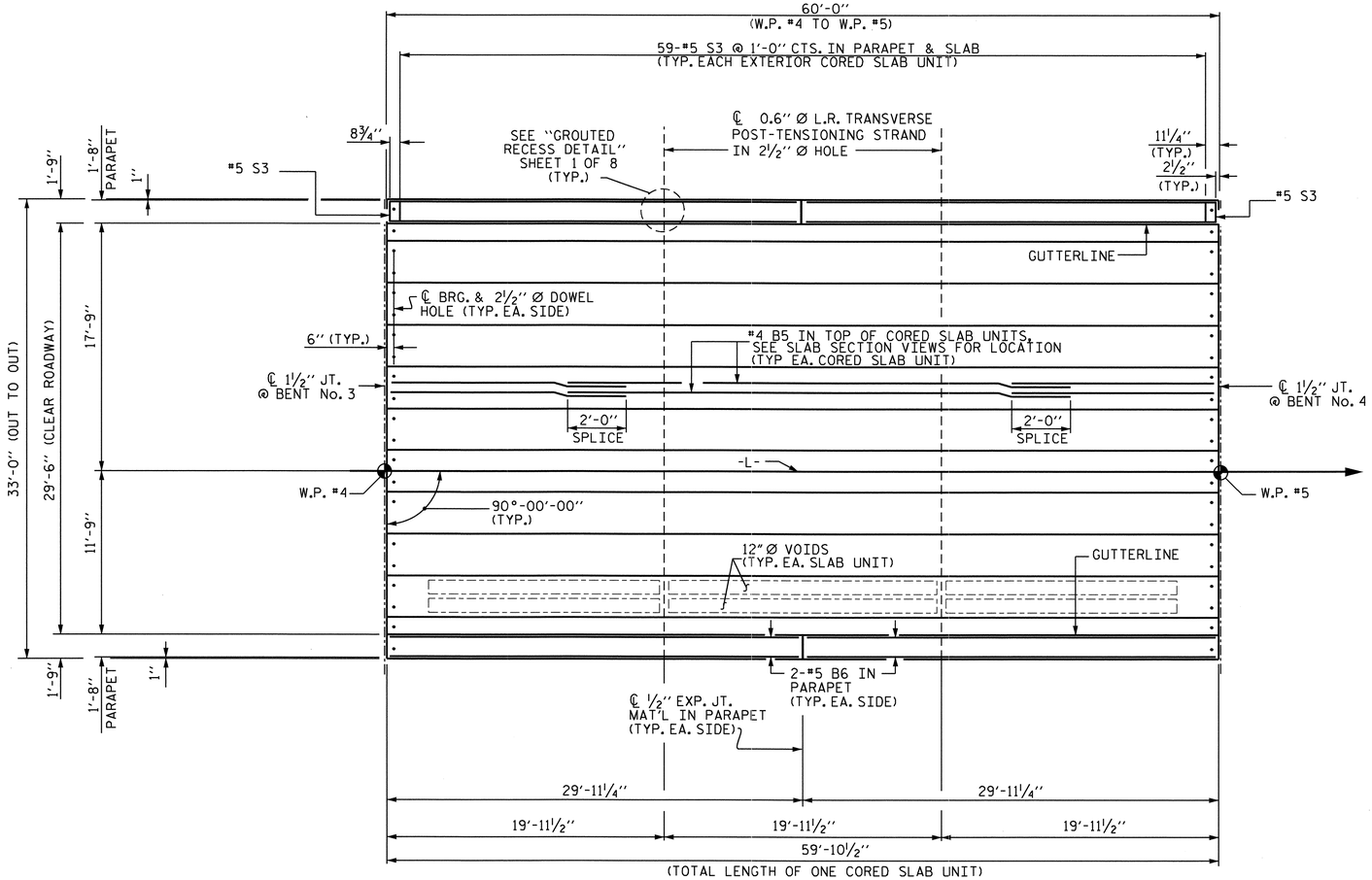
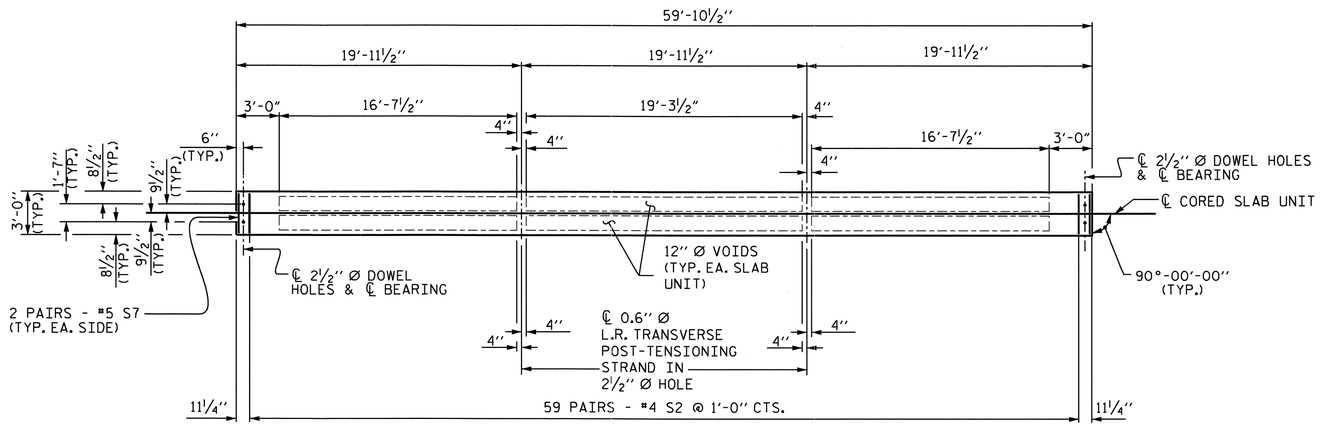


SPAN D



PLAN OF INTERIOR CORED SLAB UNIT - SPAN D

PROJECT NO. B-3928
WATAUGA/ASHE COUNTY
STATION: 13+95.00 -L-

SHEET 5 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN D

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			37

DRAWN BY : M. POOLE DATE : 01/09
CHECKED BY : A. SORSENGINH DATE : 09/09

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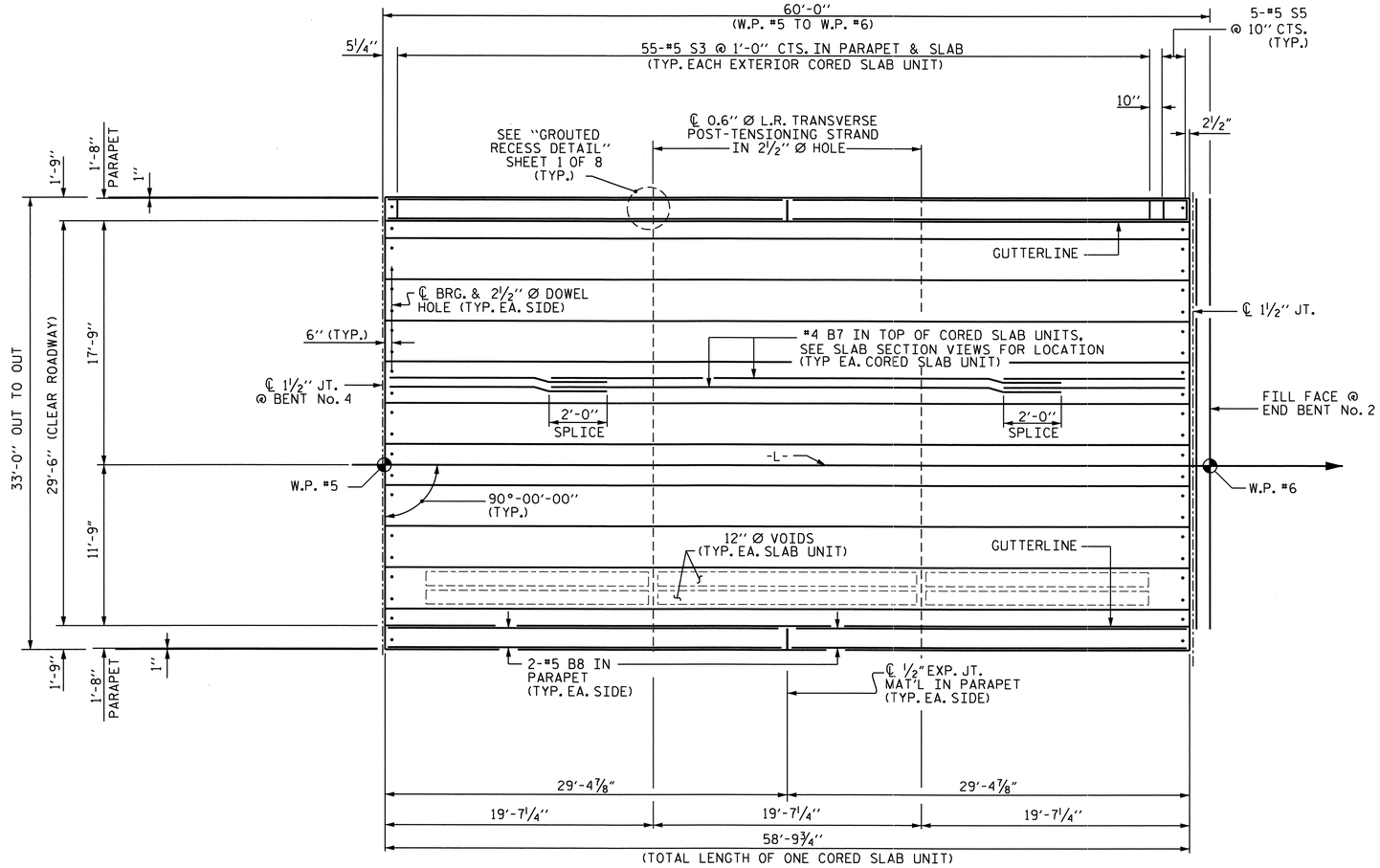
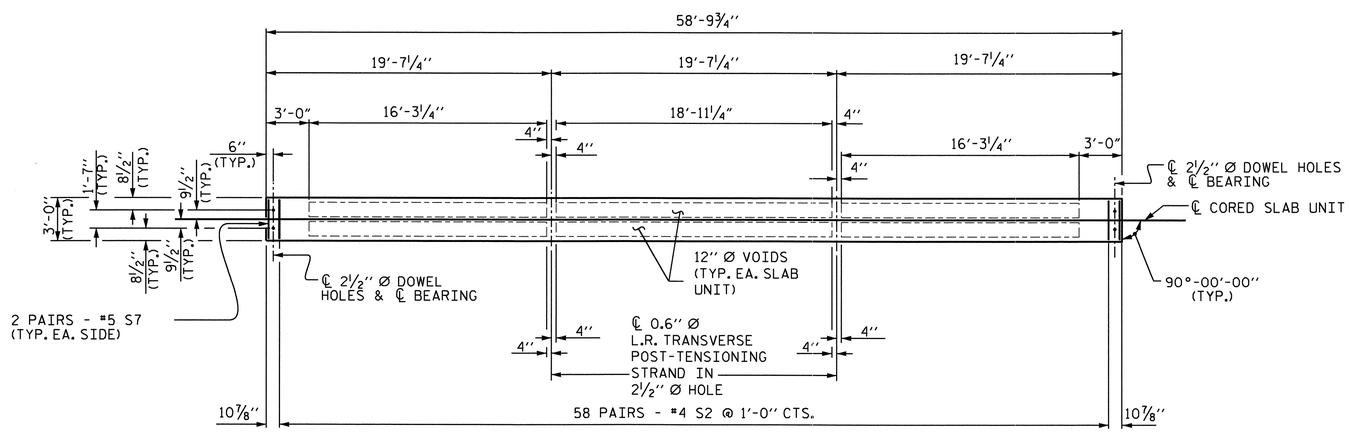


SPAN E



PLAN OF INTERIOR CORED SLAB UNIT - SPAN E

PROJECT NO. B-3928
WATAUGA/ASHE COUNTY
STATION: 13+95.00 -L-

SHEET 6 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN E

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			37

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

DRAWN BY : M. POOLE DATE : 01/09
CHECKED BY : A. SORSENGINH DATE : 09/09

11-JAN-2010 11:28
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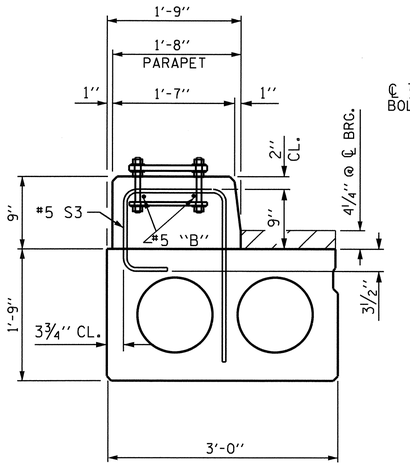
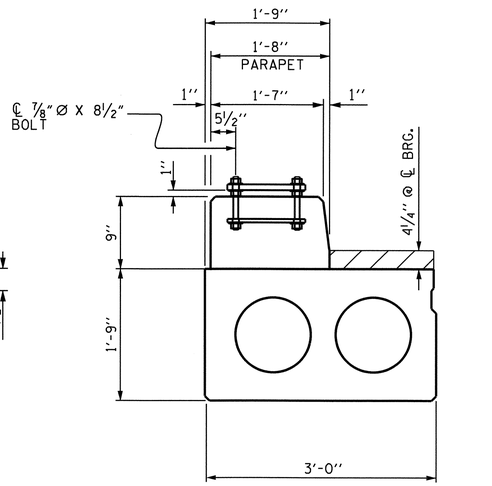
dahodge



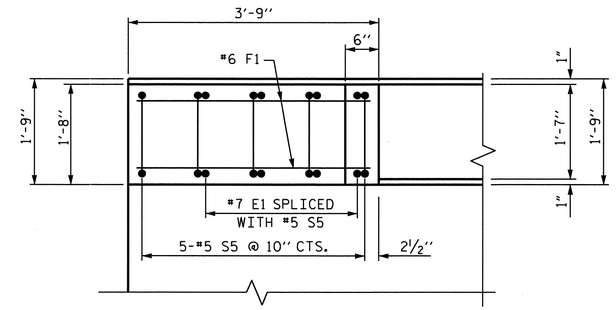
PARAPET DETAILS



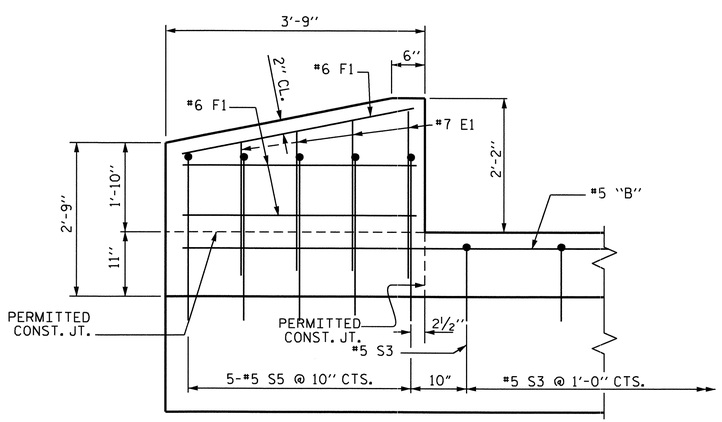
ANCHOR DETAILS

#5 "B" BARS MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR ASSEMBLY

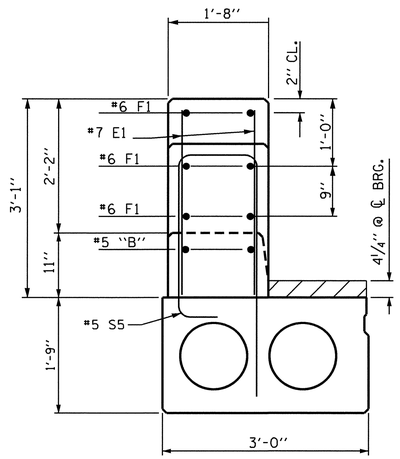
NOTE: THE MINIMUM HEIGHT OF THE PARAPETS SHOWN. THE HEIGHT OF THE PARAPET VARIES WHILE THE TOP OF THE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE.



PLAN OF END POST



ELEVATION



END VIEW

PARAPET AND END POST DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

PROJECT NO. B-3928
WATAUGA/ASHE COUNTY
STATION: 13+95.00 -L-

SHEET 7 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE PARAPET DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			37

ASSEMBLED BY : M. POOLE DATE : 01/09
CHECKED BY : A. SORSENGINH DATE : 09/09

11-JAN-2010 11:28
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dahodge

BILL OF MATERIAL FOR ONE CORED SLAB SECTION

SPAN A

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
B1	4	4	STR	20'-3''	54	20'-3''	54
S1	8	4	3	4'-3''	23	4'-3''	23
S2	76	4	3	5'-4''	271	5'-4''	271
✱ S3	35	5	1	5'-0''	183		
✱ S5	5	5	2	8'-5''	44		
REINFORCING STEEL				LBS.	348		348
✱EPOXY COATED REINFORCING STEEL				LBS.	227		
5000 P.S.I. CONCRETE				CU. YDS.	5.6		5.6
0.6"Ø L.R. STRANDS				No.	11		11

SPAN B

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
B3	4	4	STR	20'-10''	56	20'-10''	56
S1	8	4	3	4'-3''	23	4'-3''	23
S2	78	4	3	5'-4''	278	5'-4''	278
✱ S3	41	5	1	5'-0''	214		
REINFORCING STEEL				LBS.	357		357
✱EPOXY COATED REINFORCING STEEL				LBS.	214		
5000 P.S.I. CONCRETE				CU. YDS.	5.7		5.7
0.6"Ø L.R. STRANDS				No.	11		11

SPANS C & D

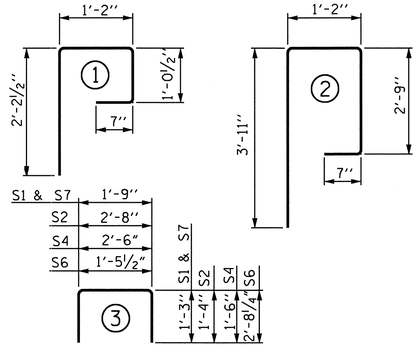
BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
B5	6	4	STR	21'-3''	85	21'-3''	85
S2	118	4	3	5'-4''	420	5'-4''	420
✱ S3	61	5	1	5'-0''	318		
S4	4	4	3	5'-6''	15	5'-6''	15
S6	4	5	3	6'-10''	29	6'-10''	29
S7	8	5	3	4'-3''	35	4'-3''	35
REINFORCING STEEL				LBS.	584		584
✱EPOXY COATED REINFORCING STEEL				LBS.	318		
8000 P.S.I. CONCRETE				CU. YDS.	8.5		8.5
0.6"Ø L.R. STRANDS				No.	22		22

SPAN E

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
B7	6	4	STR	20'-10''	84	20'-10''	84
S2	116	4	3	5'-4''	413	5'-4''	413
✱ S3	55	5	1	5'-0''	287		
S4	4	4	3	5'-6''	15	5'-6''	15
✱ S5	5	5	2	8'-5''	44		
S6	4	5	3	6'-10''	29	6'-10''	29
S7	8	5	3	4'-3''	35	4'-3''	35
REINFORCING STEEL				LBS.	576		576
✱EPOXY COATED REINFORCING STEEL				LBS.	331		
8000 P.S.I. CONCRETE				CU. YDS.	8.3		8.3
0.6"Ø L.R. STRANDS				No.	22		22

✱ THESE BARS ARE EPOXY COATED

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR PARAPETS & END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ B2	8	5	STR	19''-0''	175
✱ B4	8	5	STR	19'-7''	179
✱ B6	16	5	STR	29'-7''	562
✱ B8	8	5	STR	29'-0''	273
✱ E1	32	7	STR	2'-8"	174
✱ F1	24	6	STR	3'-5"	128
✱EPOXY COATED REINFORCING STEEL				LBS.	1491
CLASS AA CONCRETE				CU.YDS.	28.7
1'-8"X 9"CONCRETE PARAPET				LIN. FT.	515.75

✱ THESE BARS ARE EPOXY COATED

NOTES

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

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

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

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

THE 2'' Ø BACKER ROD SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, A POSITIVE HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. THIS SYSTEM SHALL BE DESIGNED TO BE LEFT IN PLACE UNTIL THE CONCRETE HAS REACHED RELEASE STRENGTH. AT LEAST THREE WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 PSI AT SPANS A AND B AND 5900 PSI AT SPANS C, D, AND E.

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

ALL REINFORCING STEEL IN THE PARAPET AND END POSTS SHALL BE EPOXY COATED.

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

CORED SLABS REQUIRED SPAN A

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	38'-9¾''	77'-7½''
INTERIOR C.S.	9	38'-9¾''	349'-3¾''
TOTAL	11		426'-11¼''

CORED SLABS REQUIRED SPAN B

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	39'-10½''	79'-9''
INTERIOR C.S.	9	39'-10½''	358'-10½''
TOTAL	11		438'-7½''

CORED SLABS REQUIRED SPANS C & D ✱✱✱

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	59'-10½''	119'-9''
INTERIOR C.S.	9	59'-10½''	538'-10½''
TOTAL	11		658'-7½''

✱✱✱EACH SPAN

CORED SLABS REQUIRED SPAN E

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	58'-9¾''	117'-7½''
INTERIOR C.S.	9	58'-9¾''	529'-3¾''
TOTAL	11		646'-11¼''

TOTAL CORED SLABS REQUIRED

	NUMBER	TOTAL LENGTH
TOTAL	55	2829.75

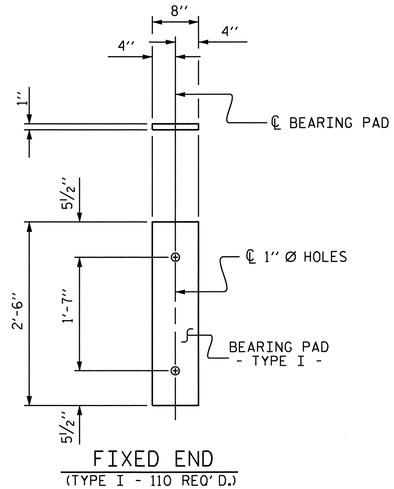
GRADE 270 STRANDS

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

DEAD LOAD DEFLECTION AND CAMBER

	SPANS A & B	SPANS C, D & E
CAMBER (SLAB ALONE IN PLACE)	↑ 1 3/16''	↑ 3/16''
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD ✱✱	↓ 1/8''	↓ 1/2''
FINAL CAMBER	↑ 11/16''	↑ 2 9/16''

✱✱ INCLUDES FUTURE WEARING SURFACE



ELASTOMERIC BEARING DETAILS

(USE 50 DUROMETER ELASTOMERIC PAD)

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. PUGGINS, JR.
01/11/10

PROJECT NO. B-3928
WATUAGA/ASHE COUNTY
STATION: 13+95.00 -L-

SHEET 8 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			37

DRAWN BY : M. POOLE DATE : 01/09
CHECKED BY : A. SORSENGINH DATE : 09/09

11-JAN-2010 11:27
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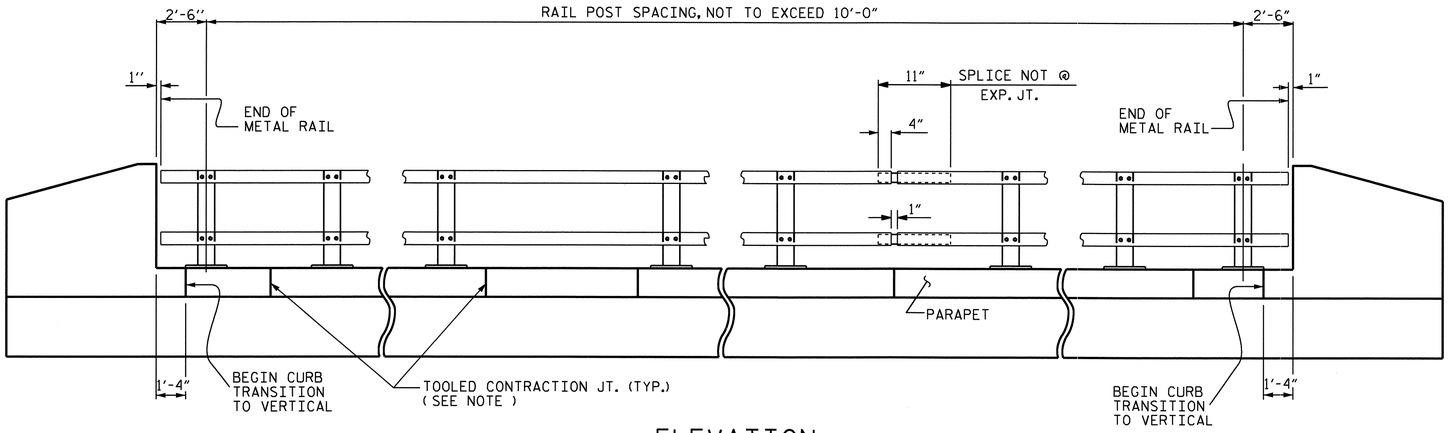
dahodge



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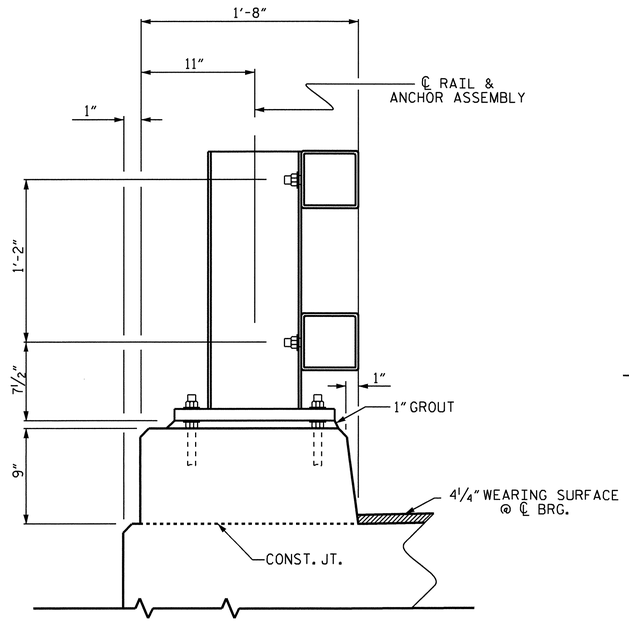
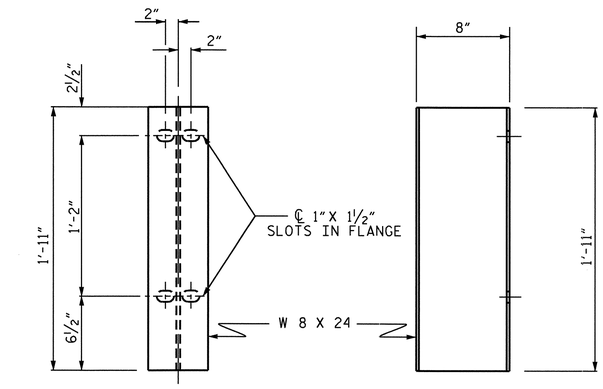


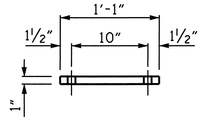
SECTION THRU RAIL

THE MINIMUM HEIGHT OF THE PARAPETS SHOWN. THE HEIGHT OF THE PARAPET VARIES WHILE THE TOP OF THE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE.



FRONT ELEVATION SIDE ELEVATION

DETAILS OF POST



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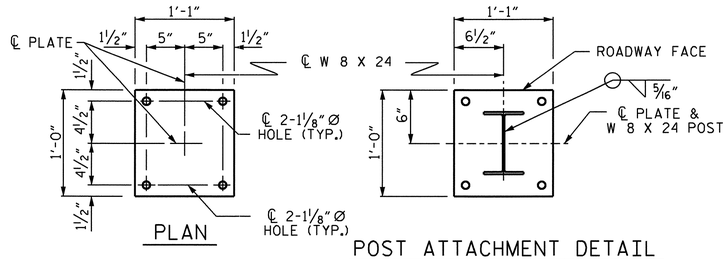

PLAN

POST ATTACHMENT DETAIL

POST BASE DETAILS

NOTES

FOR SPECIAL STEEL 2 BAR METAL RAIL, SEE SPECIAL PROVISIONS.

METAL RAIL SHALL BE PAINTED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS.

PAINTED STEEL RAILS

RAILS SHALL MEET ASTM A500, A501 OR A618.

ANCHOR PLATES, POSTS, POST BASES AND RAIL SPLICE BARS SHALL MEET AASHTO M270 GRADE 250 STRUCTURAL STEEL.

SHIMS AND RAIL CAPS SHALL MEET ASTM A570 FOR GRADE 230 OR A611 FOR GRADE C.

REDUCED BASE WELDED STUDS SHALL MEET ASTM A108.

ANCHOR BOLTS SHALL CONFORM TO ASTM A325, NUTS TO ASTM A563 DH, AND WASHERS TO ASTM A436. ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED.

ALL RAIL COMPONENTS, EXCEPT FOR THE WELDED STUDS AND THE GALVANIZED ANCHOR BOLTS, NUTS, AND WASHERS, SHALL BE SHOP PAINTED IN ACCORDANCE WITH THE SPECIAL PROVISIONS FOR SPECIAL STEEL 2 BAR METAL RAIL.

AFTER INSTALLATION OF METAL RAILS, PAINT 2 COATS OF ACRYLIC BROWN PAINT TO ALL EXPOSED STUDS, ANCHOR BOLTS, NUTS AND WASHERS.

GENERAL NOTES

1. 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.
2. FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE "PLAN - RAIL AND END POST", SHEET 3 OF 4.
3. CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.
4. METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.
5. METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.
6. CURVED RAIL USAGE: WHERE RAILS ARE LOCATED IN AREAS OF 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.
7. 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, BUT REMAINS VISIBLE AFTER RAIL PLACEMENT.
8. MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.
9. GROOVED CONTRACTION JOINTS, ½" 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 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FT. IN LENGTH.
10. THE GROUT BED SHALL BE PLACED PRIOR TO INSTALLING THE END POSTS. GROUT SHALL BE NON-SHRINK, NON-METALLIC GROUT, SEE SPECIAL PROVISIONS.
11. TORQUE NUTS ON REDUCED BASE WELDED STUDS TO 100 FT. LBS.

PAY LENGTH = 500.25 LIN. FT.

PROJECT NO. B-3928
WATAUGA/ASHE COUNTY
STATION: 13+95.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SPECIAL STEEL 2 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			37

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DIGGINS, JR.
01/11/10

DRAWN BY :	M. POOLE	DATE : 01-09
CHECKED BY :	D. HODGE	DATE : 11-09

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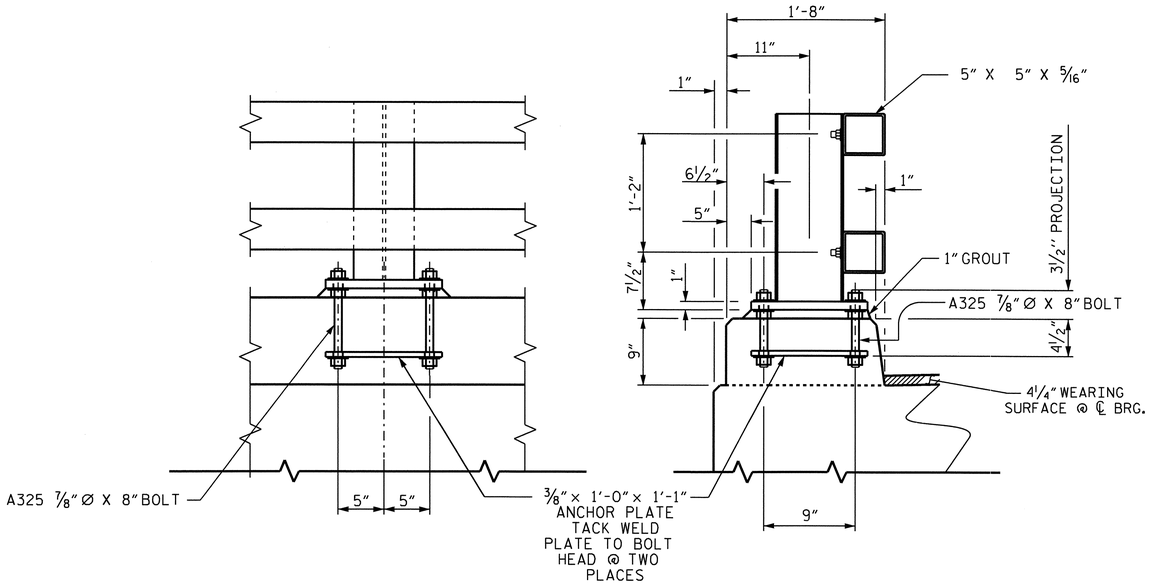
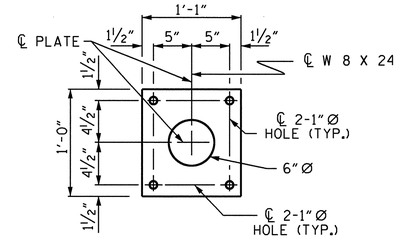
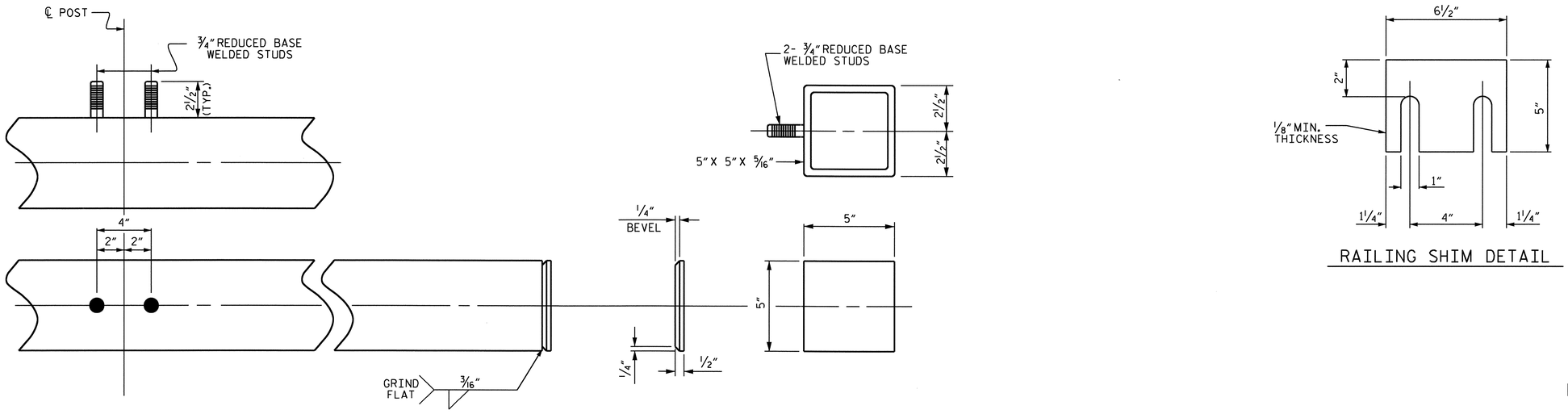


RAIL POST ATTACHMENT DETAILS

THE MINIMUM HEIGHT OF THE PARAPETS SHOWN. THE HEIGHT OF THE PARAPET VARIES WHILE THE TOP OF THE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE.



ANCHOR PLATE DETAILS



RAIL CAP AND ATTACHMENT STUD DETAILS

RAILING SHIM DETAIL

SECTION S-S

RAIL WELDED SPLICE DETAILS

RAIL SPLICE DETAILS

* - DIMENSION AFTER GRINDING RADIUS ON CORNERS TO MATCH INSIDE OF METAL RAIL.

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

PROJECT NO. B-3928
WATAUGA/ASHE COUNTY
STATION: 13+95.00 -L-
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SPECIAL STEEL 2 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			37

DRAWN BY : M. POOLE DATE : 01-09
CHECKED BY : D. HODGE DATE : 11-09

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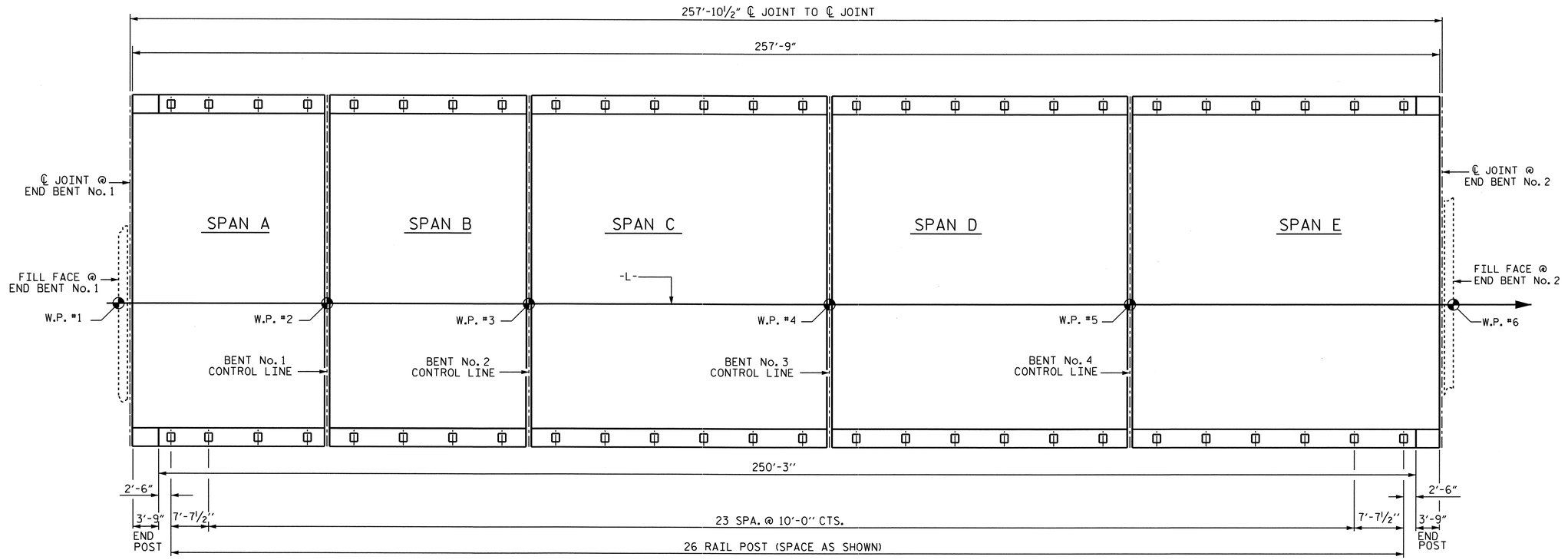

PLAN OF RAIL POST SPACINGS

RAIL POST DIMENSIONS TYPICAL EACH SIDE

PROJECT NO. B-3928

WATAUGA/ASHE COUNTY

STATION: 13+95.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RAIL POST SPACINGS

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			37

DRAWN BY : M. POOLE DATE : 01/09
CHECKED BY : D. HODGE DATE : 11/09

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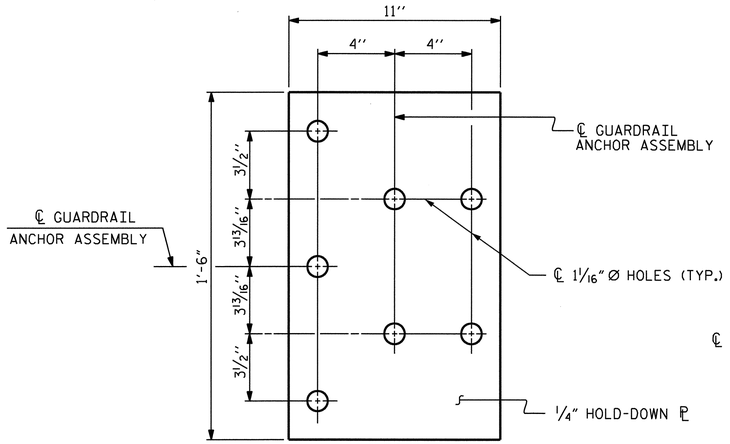
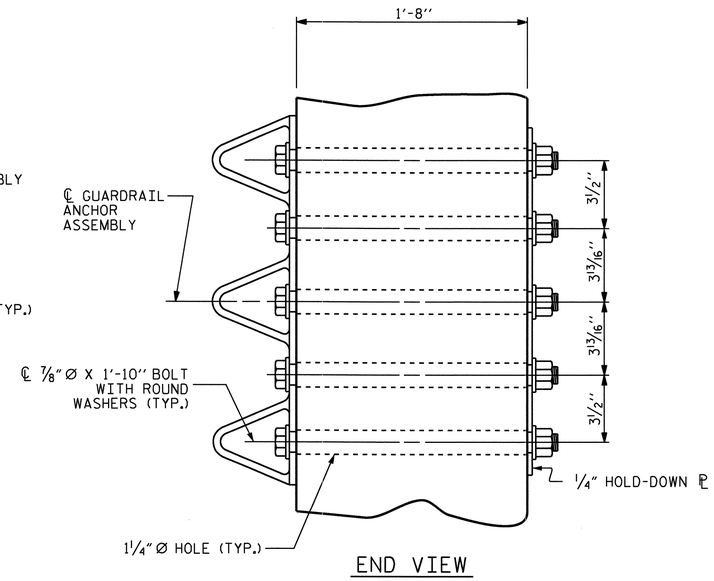


PLAN



END VIEW

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.

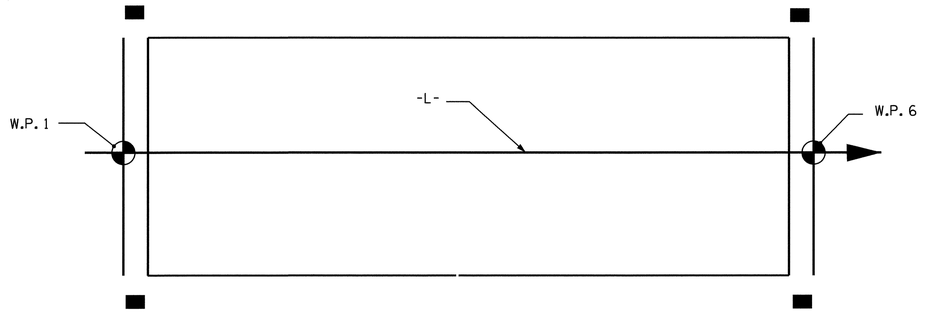
AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

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.

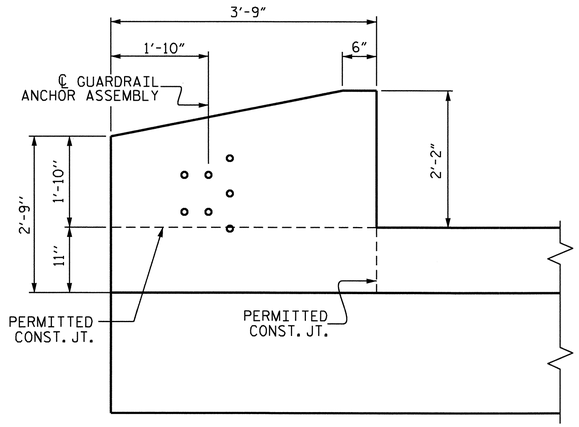
THE 1 ¼'' Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

AFTER INSTALLATION OF THE GUARDRAIL ANCHOR ASSEMBLY, PAINT A MINMUM TWO COATS OF ACRYLIC BROWN TO THE HOLD-DOWN PLATE AND ALL EXPOSED BOLTS, NUTS AND WASHERS.



SKETCH SHOWING POINTS OF ATTACHMENT

■ LOCATION OF GUARDRAIL ATTACHMENT



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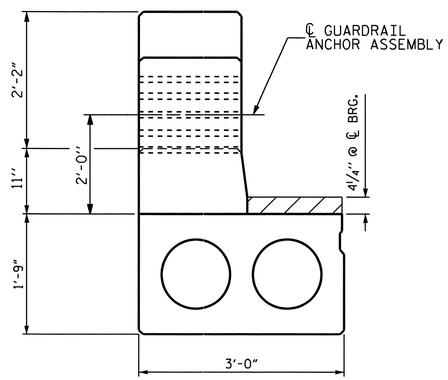

END VIEW

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-3928

WATAUGA/ASHE COUNTY

STATION: 13+95.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DIGGINS, JR.

01/11/10

ASSEMBLED BY : M. POOLE	DATE : 11/09
CHECKED BY : D. HODGE	DATE : 11/09
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-16
1			3			TOTAL SHEETS
2			4			37

11-JAN-2010 11:25
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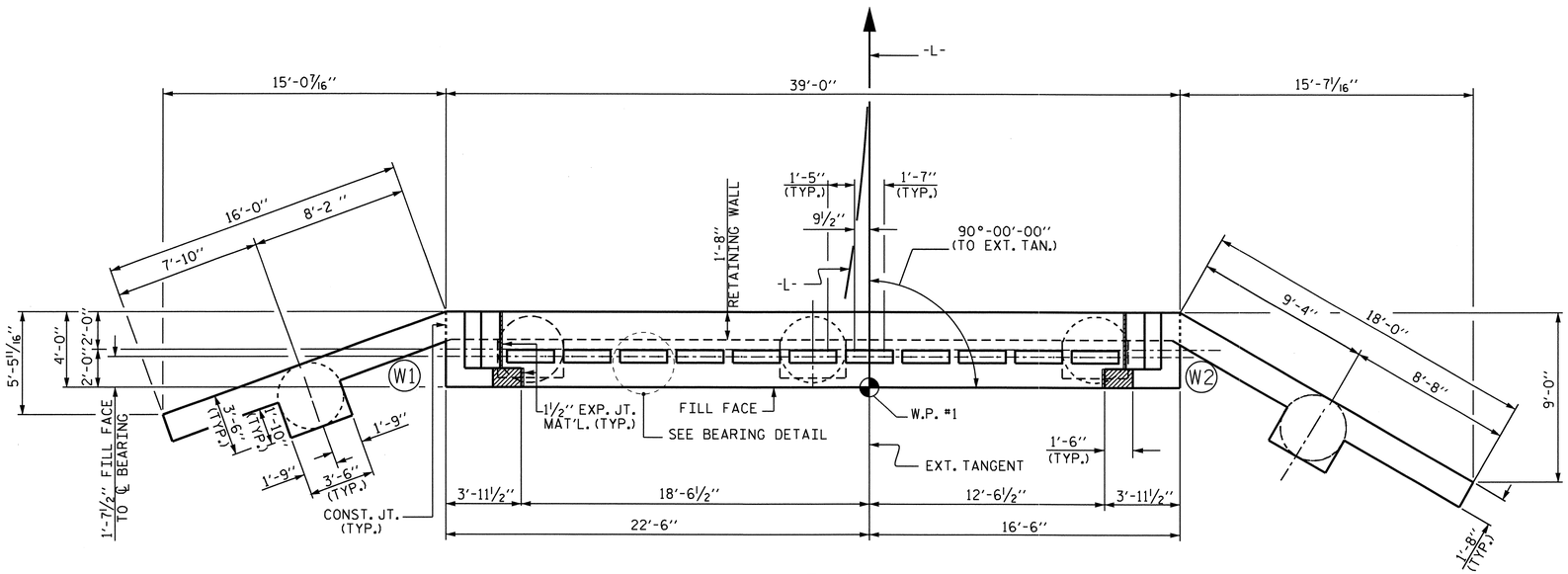
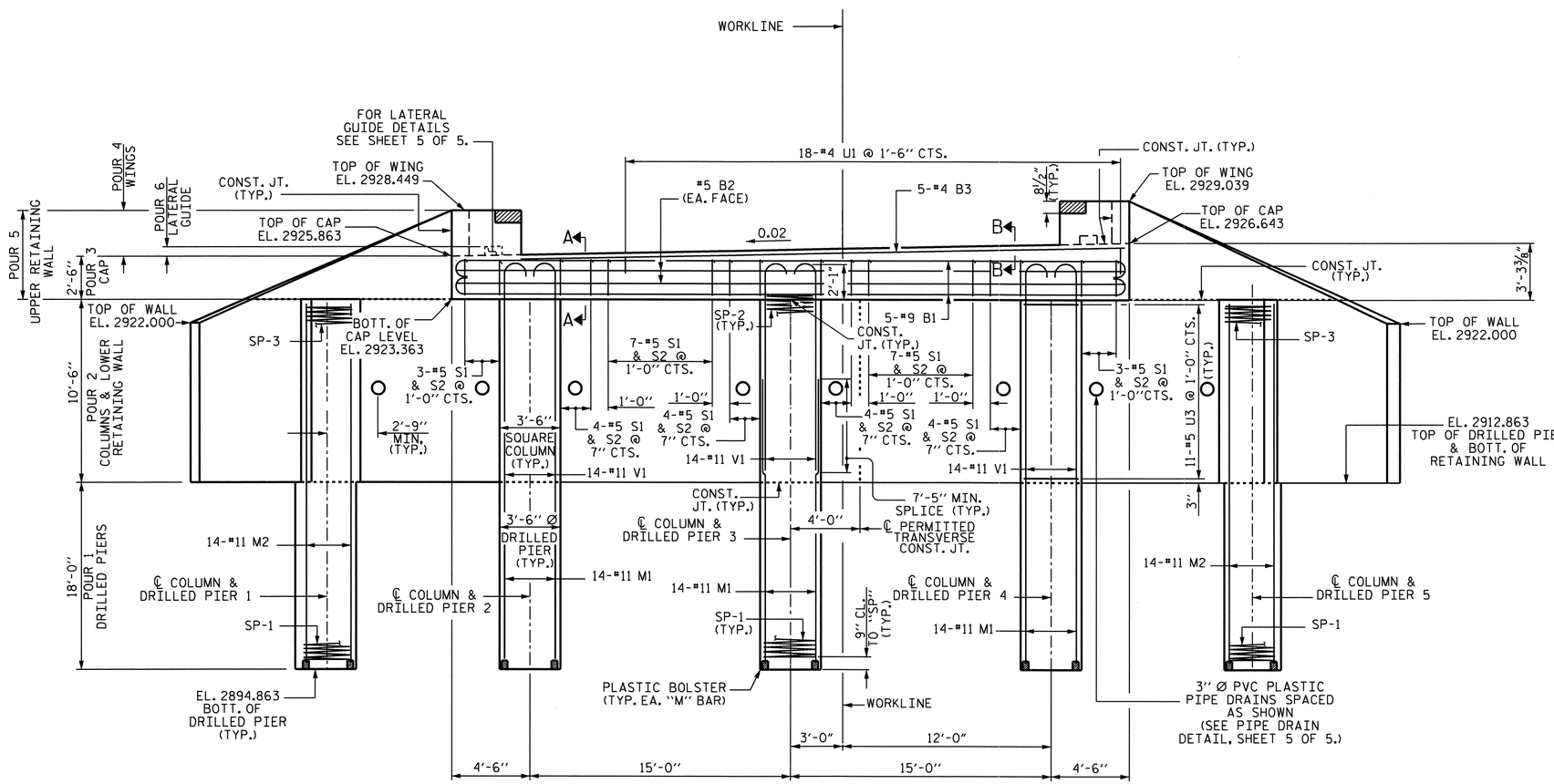


PLAN



ELEVATION

FOR "SECTION A-A" & "SECTION B-B", SEE SHEET 3 OF 5.

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #6 D1 DOWELS.

PIPE DRAINS IN WALL MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING, STEEL.

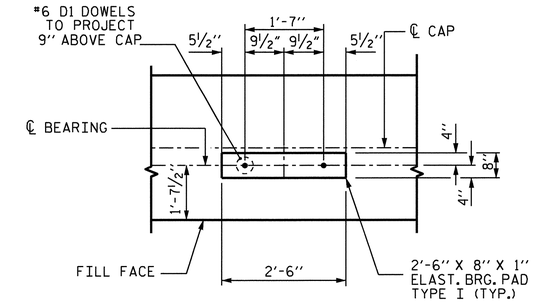
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.

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

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

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



BEARING DETAIL

PROJECT NO. B-3928

WATAUGA/ASHE COUNTY

STATION: 13+95.00 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			37

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

DRAWN BY : M. POOLE DATE : 09/09
CHECKED BY : J.R. DUGGINS DATE : 11/09

11-JAN-2010 11:23
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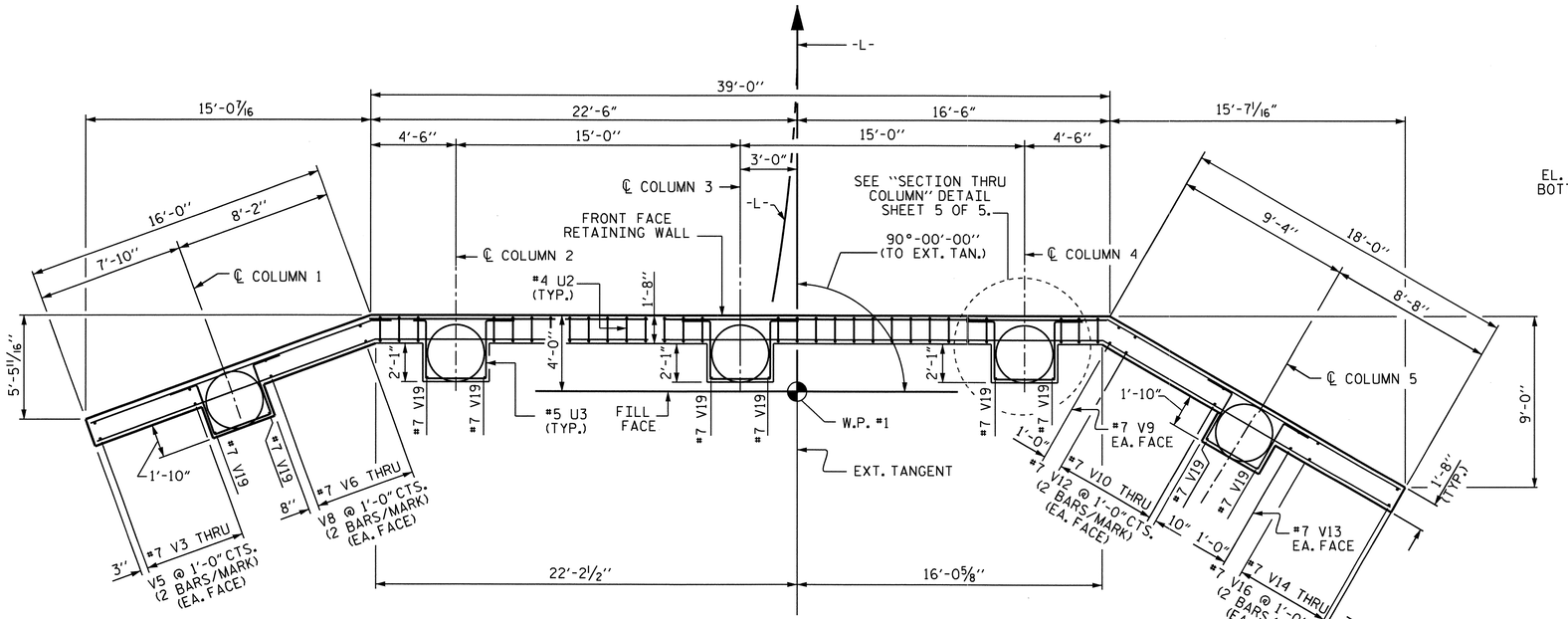
STR. #1



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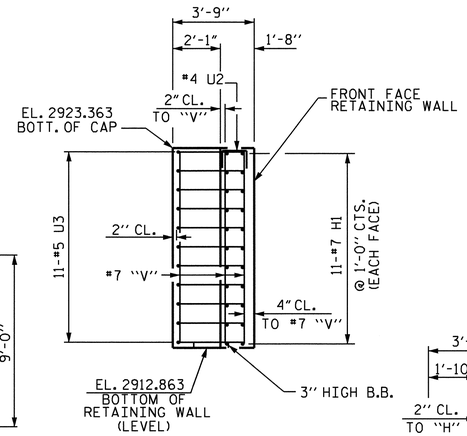
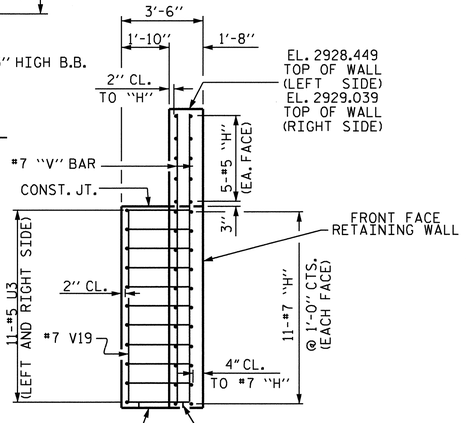
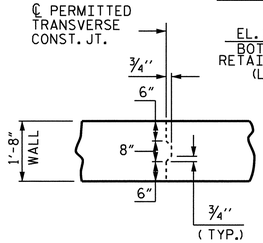


SECTION X-X



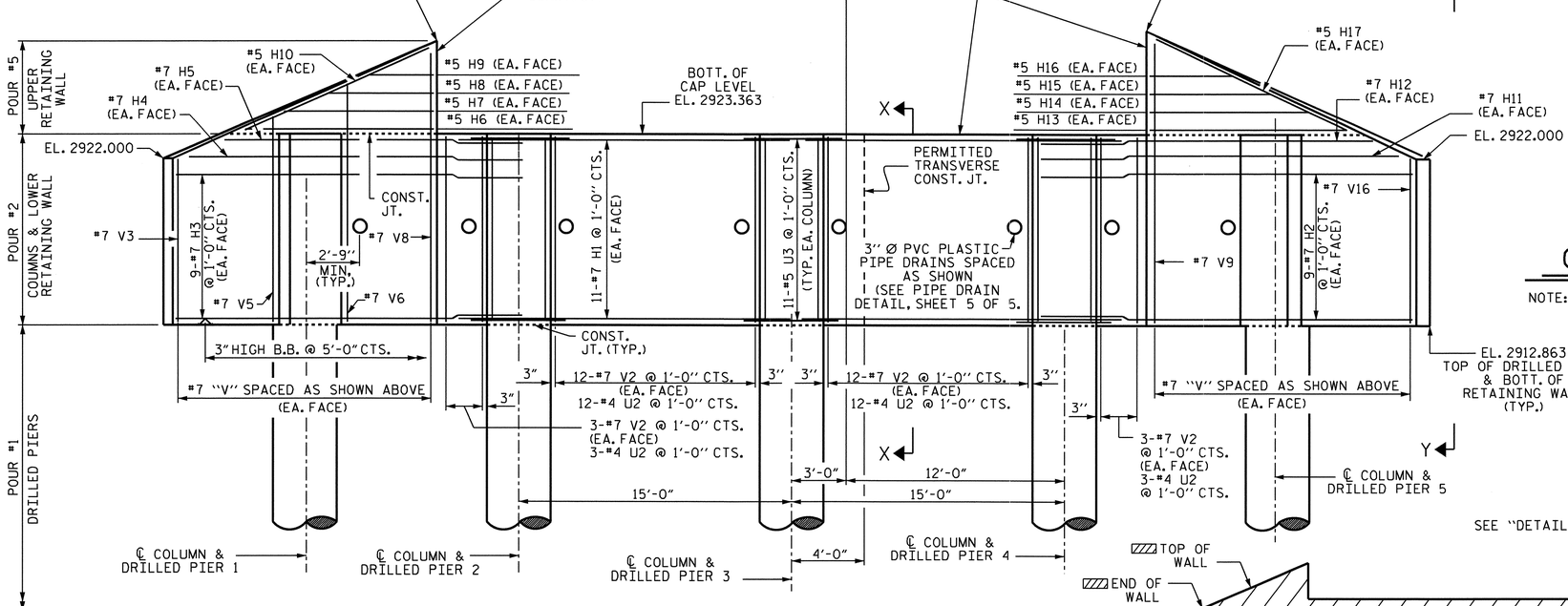
SECTION Y-Y

SPLICE LENGTH
#5 "H" = 3'-0"
#7 "H" = 5'-3"
#7 "V" = 3'-9"

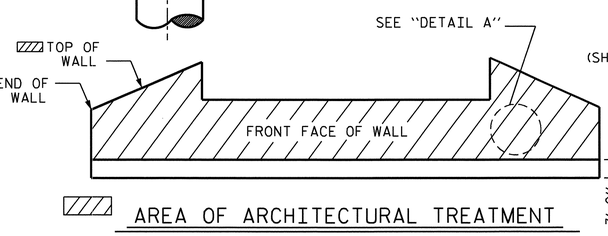


PERMITTED TRANSVERSE CONSTRUCTION JOINT DETAIL

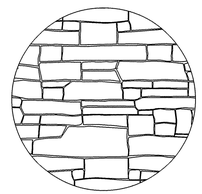
NOTE: REINFORCING STEEL IN WALL NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT



ELEVATION



AREA OF ARCHITECTURAL TREATMENT



DETAIL A
(SHOWING SIMULATED STONE "DRY STACK" PATTERN)

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

PROJECT NO. B-3928
WATAUGA/ASHE COUNTY
STATION: 13+95.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

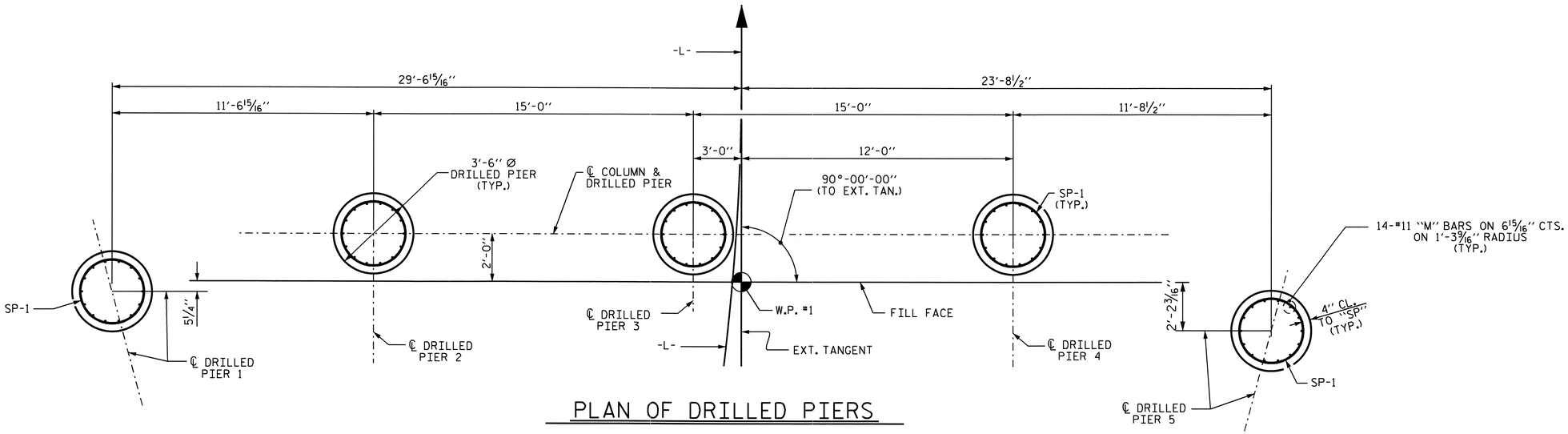
SUBSTRUCTURE
END BENT No. 1
RETAINING WALL
LAYOUT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			37

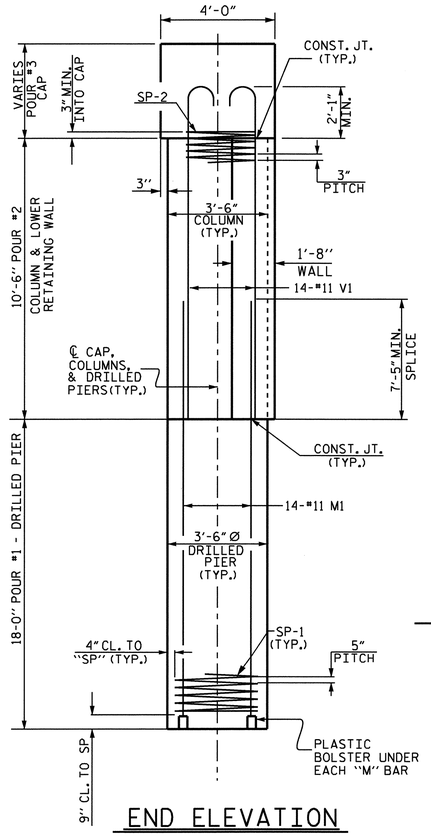
DRAWN BY : M. POOLE DATE : 09/09
CHECKED BY : J.R. DUGGINS DATE : 12/09

11-JAN-2010 11:23
R:\Structures\B-3928\mpoole\B3928_SD_AB_01.dgn
dahodge

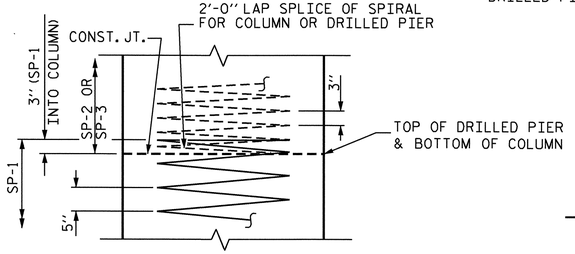
STR. #1



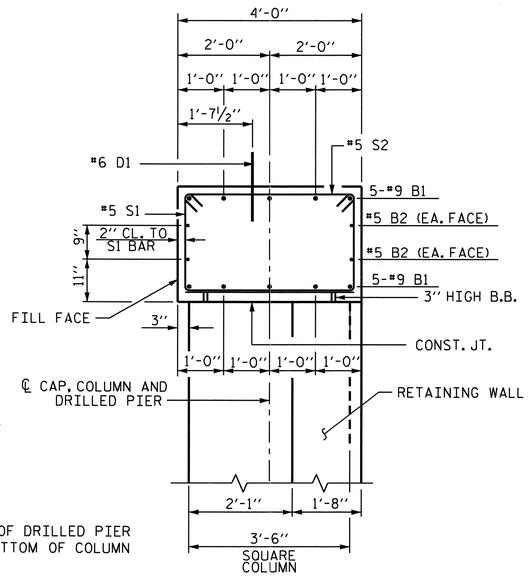
PLAN OF DRILLED PIERS



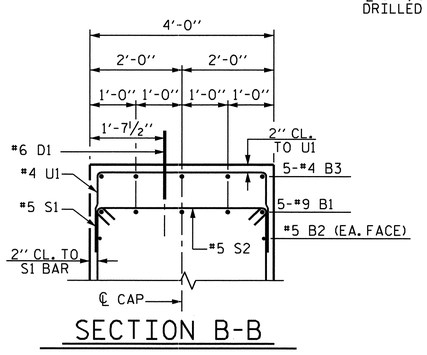
END ELEVATION



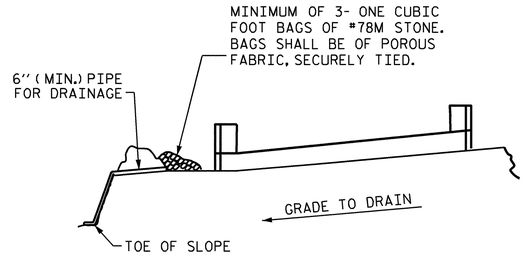
CONSTRUCTION JOINT DETAIL



SECTION A-A



SECTION B-B

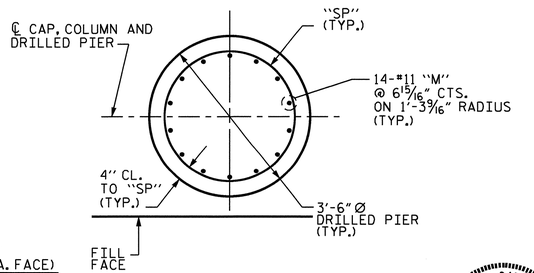


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

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



PLAN

NOTE: #11 "M" BARS TO BE PLACED IN DRILLED PIERS AS SHOWN.

PROJECT NO. B-3928

WATAUGA/ASHE COUNTY

STATION: 13+95.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			37

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
1/11/10

DRAWN BY : M. POOLE DATE : 10/09
CHECKED BY : J.R. DUGGINS DATE : 11/09

11-JAN-2010 11:22
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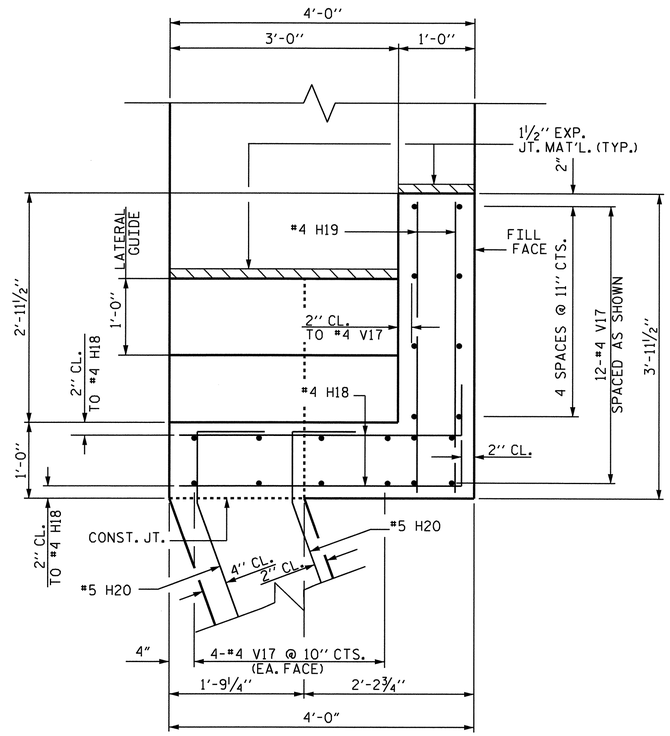
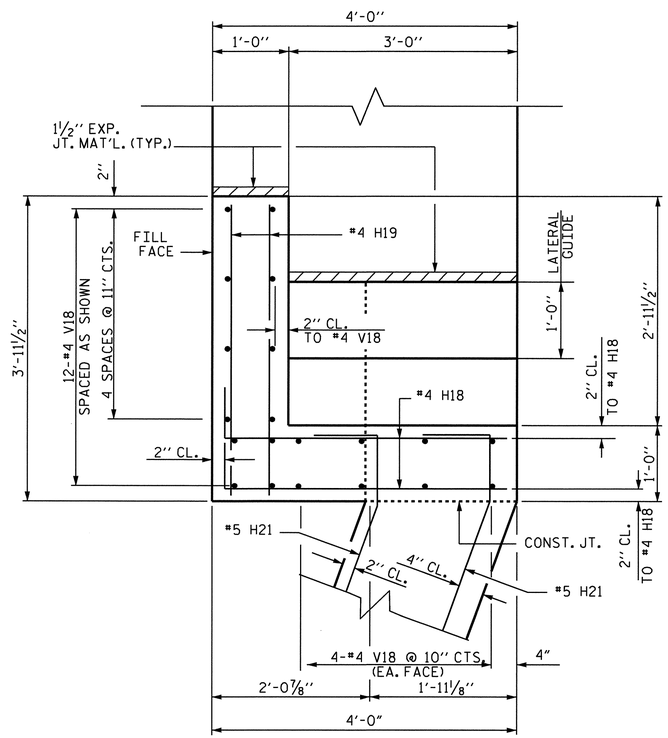
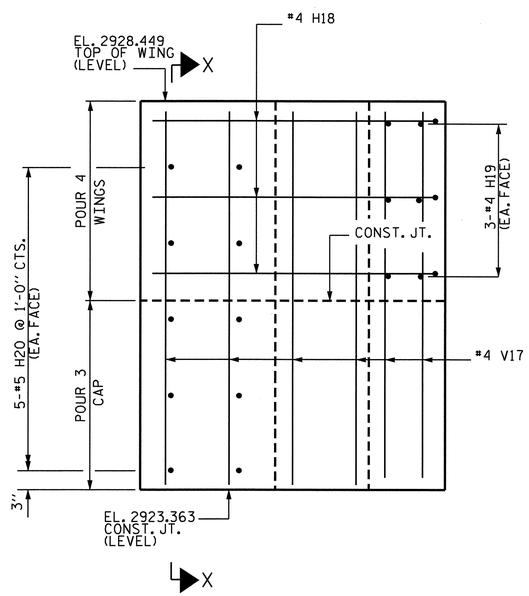
dahodge



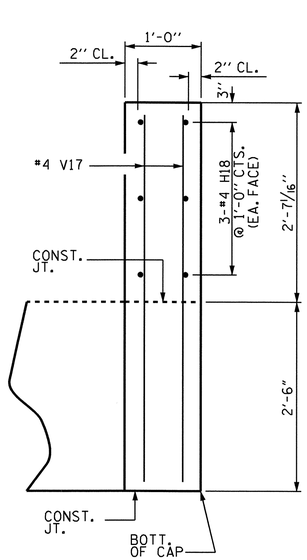
PLAN OF WING - W1



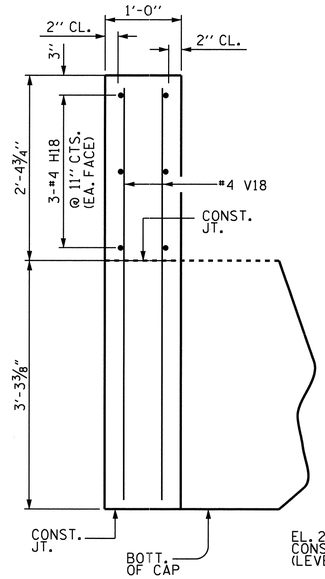
PLAN OF WING - W2



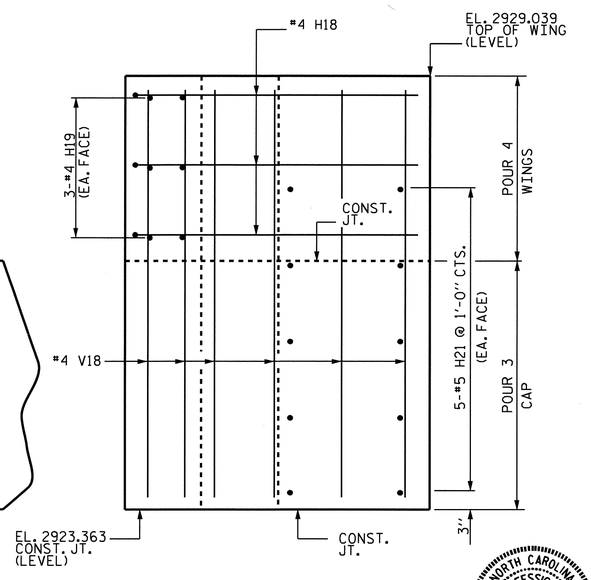
ELEVATION OF WING - W1



SECTION X-X



SECTION Y-Y



ELEVATION OF WING - W2

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

PROJECT NO. B-3928
WATAUGA/ASHE COUNTY
STATION: 13+95.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			37

DRAWN BY : M. POOLE DATE : 10/09
CHECKED BY : J.R. DUGGINS DATE : 11/09

11-JAN-2010 11:22
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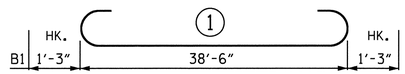
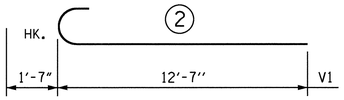
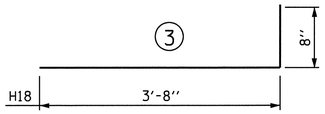
dahodge

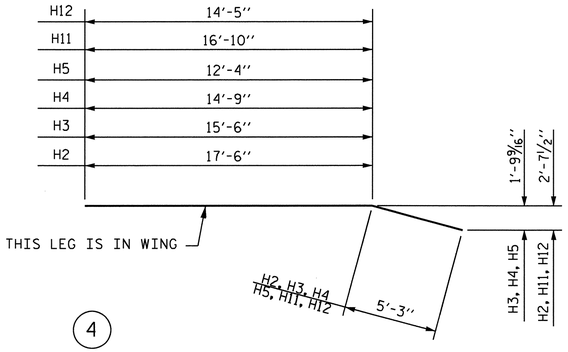
STR. #1

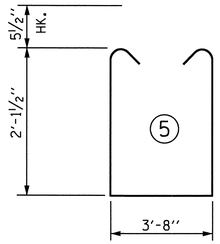
BAR TYPES

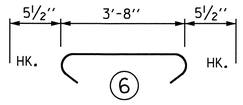


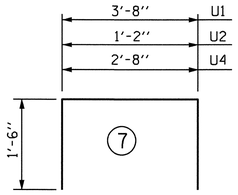


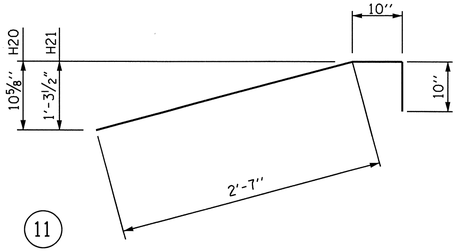


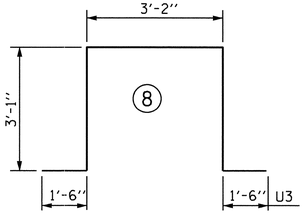


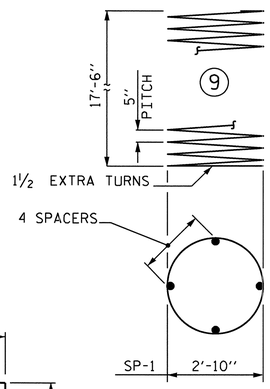


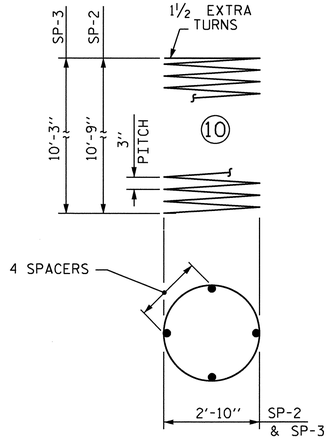












ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT No. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	41'-0"	1394
B2	4	#5	STR	38'-8"	161
B3	5	#4	STR	29'-0"	97
D1	22	#6	STR	1'-6"	50
H1	22	#7	STR	38'-8"	1739
H2	18	#7	4	22'-9"	837
H3	18	#7	4	20'-9"	763
H4	2	#7	4	20'-0"	82
H5	2	#7	4	17'-7"	72
H6	2	#5	STR	10'-9"	22
H7	2	#5	STR	8'-4"	17
H8	2	#5	STR	5'-11"	12
H9	2	#5	STR	3'-6"	7
H10	2	#5	STR	11'-8"	24
H11	2	#7	4	22'-1"	90
H12	2	#7	4	19'-8"	80
H13	2	#5	STR	12'-4"	26
H14	2	#5	STR	9'-10"	21
H15	2	#5	STR	7'-4"	15
H16	2	#5	STR	4'-10"	10
H17	2	#5	STR	13'-3"	28
H18	12	#4	3	4'-4"	35
H19	12	#4	STR	3'-7"	29
H20	10	#5	11	4'-3"	44
H21	10	#5	11	4'-3"	44
M1	42	#11	STR	27'-11"	6229
M2	28	#11	STR	30'-6"	4537
S1	36	#5	5	8'-10"	332
S2	36	#5	6	4'-7"	172
U1	18	#4	7	6'-8"	80
U2	30	#4	7	4'-2"	84
U3	55	#5	8	12'-4"	707
U4	4	#4	7	5'-8"	15

▲ NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT PRICE BID FOR DRILLED PIERS

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
V1	42	#11	2	14'-2"	3161
V2	60	#7	STR	10'-1"	1237
V3	4	#7	STR	8'-8"	71
V4	4	#7	STR	9'-6"	78
V5	4	#7	STR	10'-4"	84
V6	4	#7	STR	12'-9"	104
V7	4	#7	STR	13'-7"	111
V8	4	#7	STR	14'-5"	118
V9	2	#7	STR	15'-6"	63
V10	4	#7	STR	14'-8"	120
V11	4	#7	STR	13'-11"	114
V12	4	#7	STR	13'-1"	107
V13	2	#7	STR	11'-1"	45
V14	4	#7	STR	10'-3"	84
V15	4	#7	STR	9'-6"	78
V16	4	#7	STR	8'-8"	71
V17	20	#4	STR	4'-8"	62
V18	20	#4	STR	5'-4"	71
V19	10	#7	STR	10'-1"	206
REINFORCING STEEL					LBS. 23840

SP-1	5	*	9	384'-11"	2007
SP-2	3	**	10	394'-10"	791
SP-3	2	**	10	377'-4"	504
SPIRAL COLUMN REINFORCING STEEL					LBS. 3302

CLASS A CONCRETE BREAKDOWN

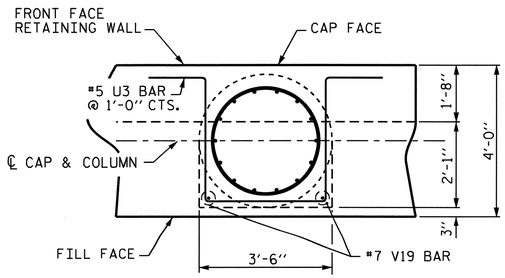
POUR 2 LOWER RETAINING WALL AND COLUMNS	60.1 C.Y.
POUR 3 CAP	16.7 C.Y.
POUR 4 WINGS	1.3 C.Y.
POUR 5 UPPER RETAINING WALL	4.3 C.Y.
POUR 6 LATERAL GUIDES	0.1 C.Y.
TOTAL CLASS A CONCRETE	82.5 C.Y.

3'-6" Ø DRILLED PIER QUANTITIES

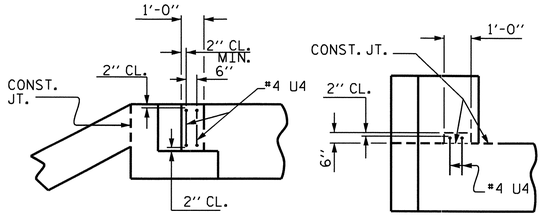
DRILLED PIER CONCRETE

POUR 1 DRILLED PIERS	32.1 C.Y.
3'-6" Ø DRILLED PIER NOT IN SOIL:	35.00 LIN. FT.
3'-6" Ø DRILLED PIER IN SOIL:	55.00 LIN. FT.
▲ CSL TUBES	410.00 LIN. FT.

ARCHITECTURAL CONCRETE SURFACE TREATMENT	700 SQ. FT.

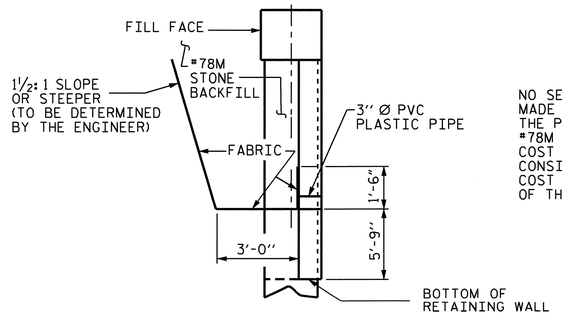


SECTION THRU COLUMN



LATERAL GUIDE DETAILS

(EACH END SIMILAR)



PIPE DRAIN DETAIL

NOTES : THE 3" Ø PVC PLASTIC PIPE SHALL MEET THE MINIMUM REQUIREMENTS OF ASTM D1785

FABRIC SHALL BE TYPE I ENGINEERING FABRIC IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

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

#78 STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE PIPE DRAIN TO OUTSIDE PIPE DRAIN

NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE PVC PIPE DRAIN, FABRIC AND #78M STONE BACKFILL. THE ENTIRE COST OF THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE COST FOR CONSTRUCTION OF THE END BENT.

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

PROJECT NO. B-3928

WATAUGA/ASHE COUNTY

STATION: 13+95.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

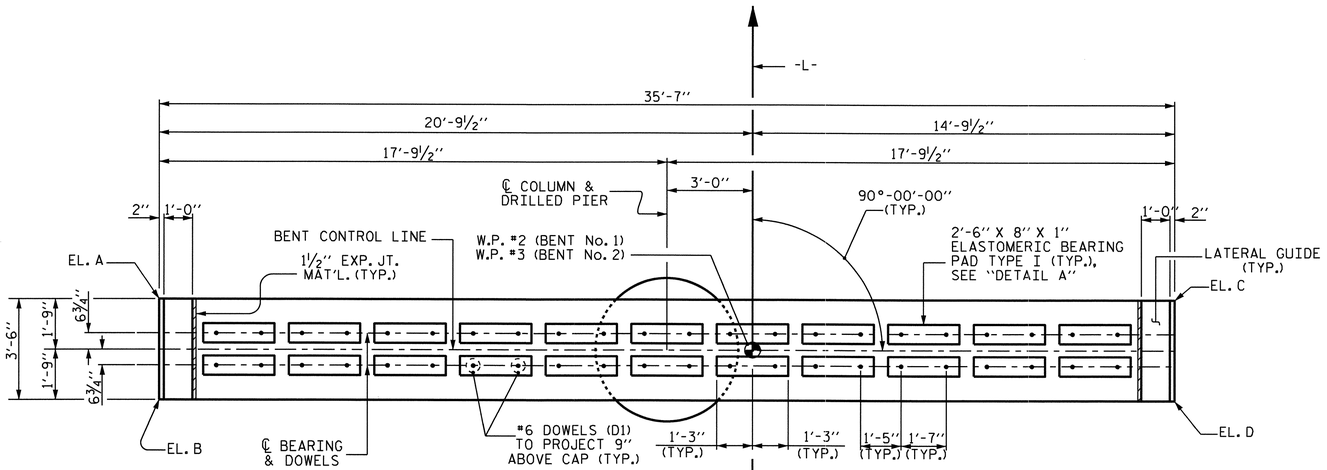
SUBSTRUCTURE
END BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			37

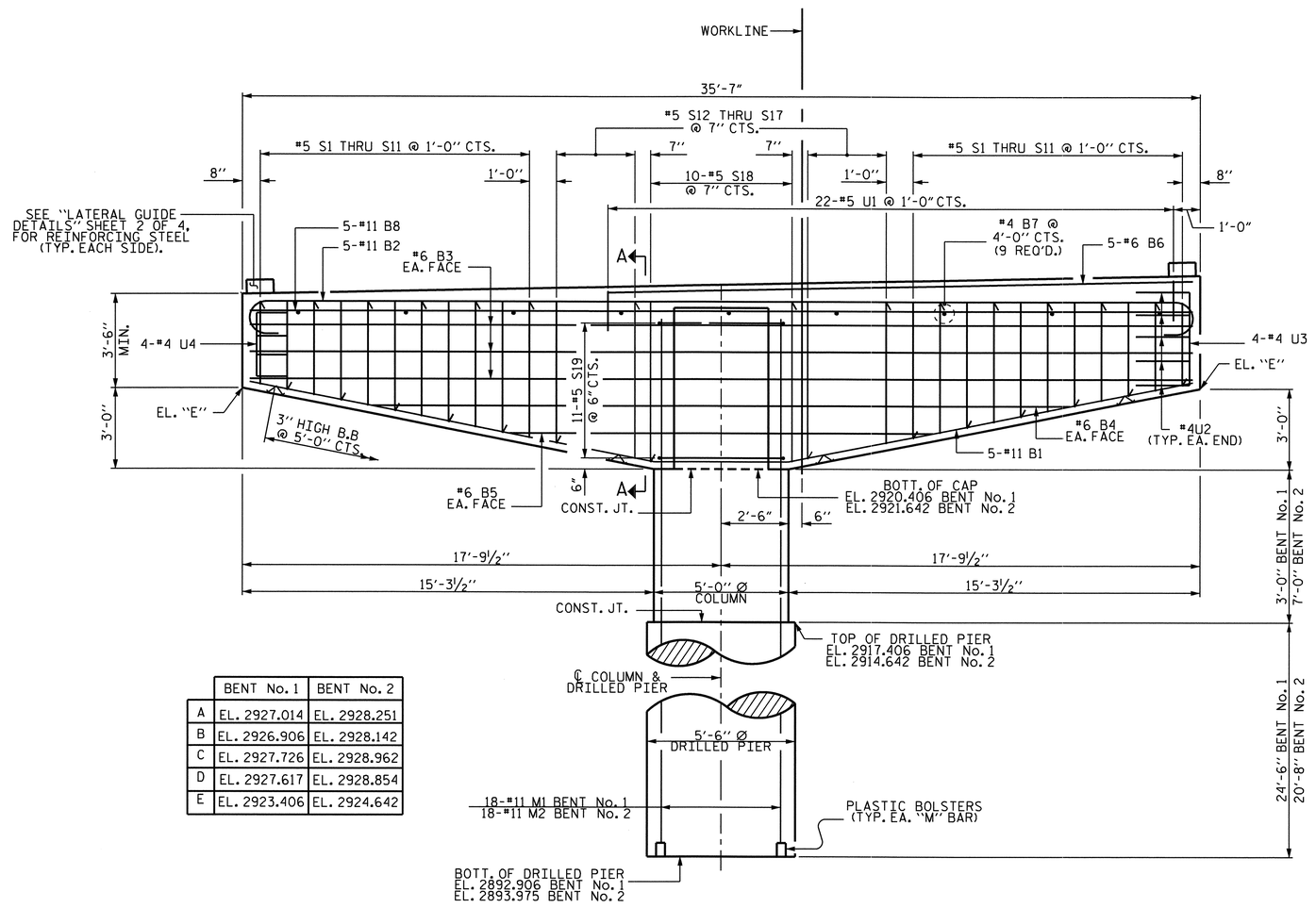
DRAWN BY : M. POOLE DATE : 10/09
CHECKED BY : J.R. DUGGINS DATE : 11/09

11-JAN-2010 11:21
R:\Structures\B-3928\mpoole\B3928_SD_AB_01.dgn
dahodge

STR. #1



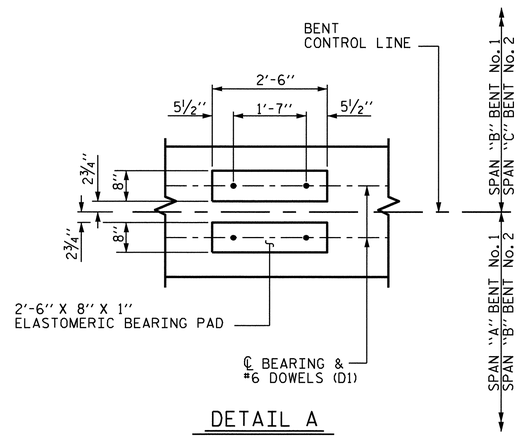
PLAN



	BENT No. 1	BENT No. 2
A	EL. 2927.014	EL. 2928.251
B	EL. 2926.906	EL. 2928.142
C	EL. 2927.726	EL. 2928.962
D	EL. 2927.617	EL. 2928.854
E	EL. 2923.406	EL. 2924.642

ELEVATION

FOR REINFORCING STEEL IN COLUMN & DRILLED PIER, SEE SHEET 2 OF 4
INVERT ALTERNATE STIRRUPS



DETAIL A

NOTES

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

DETAILED DRAWINGS FOR FALSEWORK AND FORMS FOR THIS HAMMERHEAD BENT SHALL BE SUBMITTED. SEE SHEET SN.

ALL STEEL IN THE DRILLED PIER IS INCLUDED IN THE PAY ITEMS FOR ''REINFORCING STEEL'' AND ''SPIRAL COLUMN REINFORCING STEEL''.

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

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

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIER IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

PROJECT NO. B-3928
WATAUGA/ASHE COUNTY
STATION: 13+95.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENTS No. 1 & 2

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			37

DRAWN BY : M. POOLE DATE : 07/09
CHECKED BY : D. HODGE DATE : 12/09

11-JAN-2010 11:20
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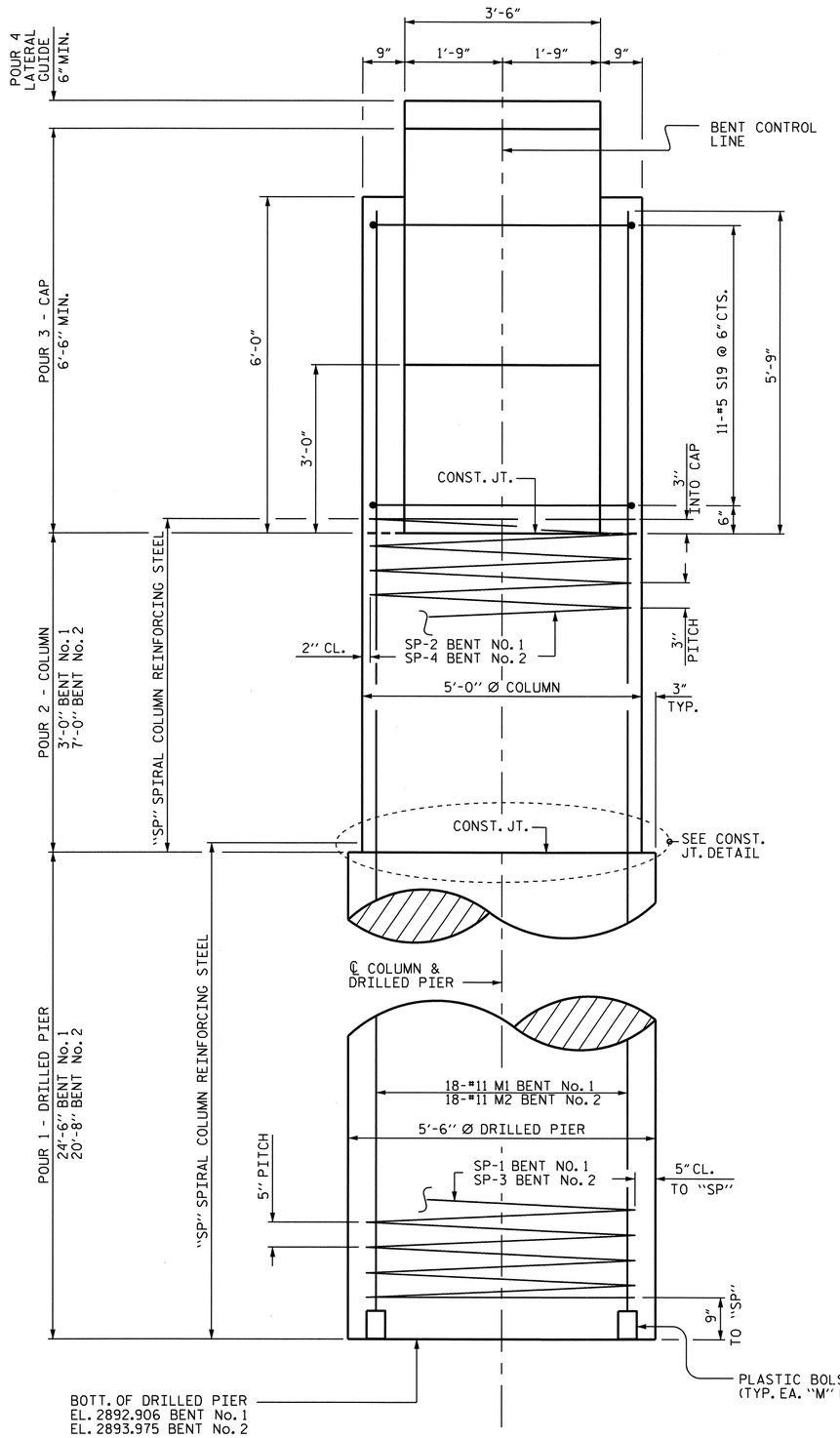
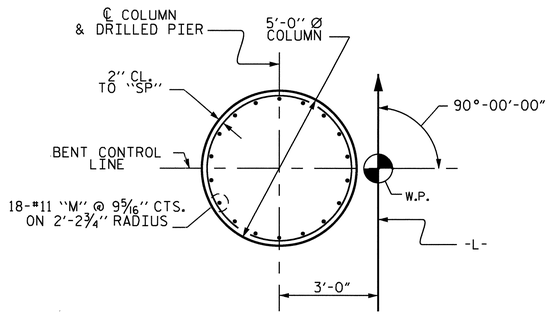
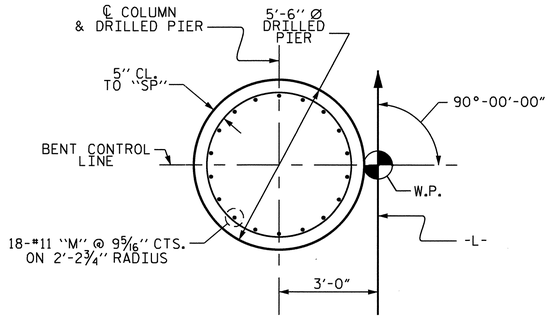
dahodge



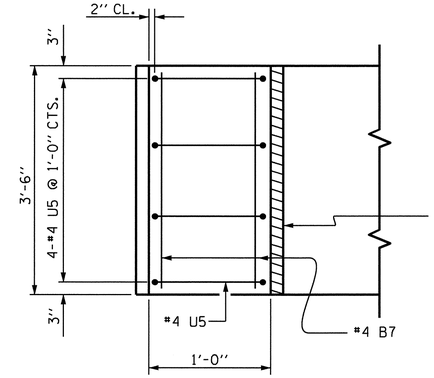
END ELEVATION



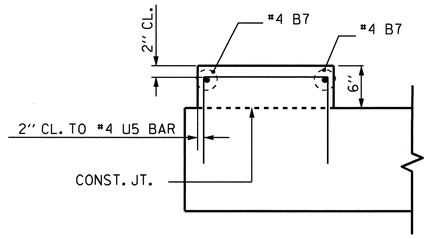
PLAN OF COLUMN



PLAN OF DRILLED PIER



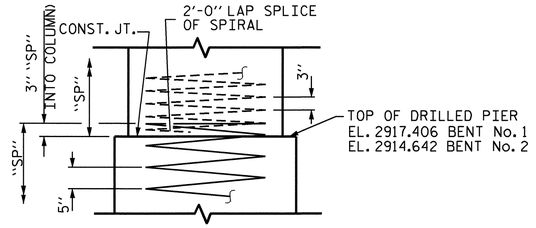
PLAN



ELEVATION

LATERAL GUIDE DETAILS

(EACH END SIMILAR)



CONSTRUCTION JOINT DETAIL

PROJECT NO. B-3928
WATAUGA/ASHE COUNTY
STATION: 13+95.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENTS No. 1 & 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			37

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

DRAWN BY : M. POOLE DATE : 07/09
CHECKED BY : D. HODGE DATE : 12/09

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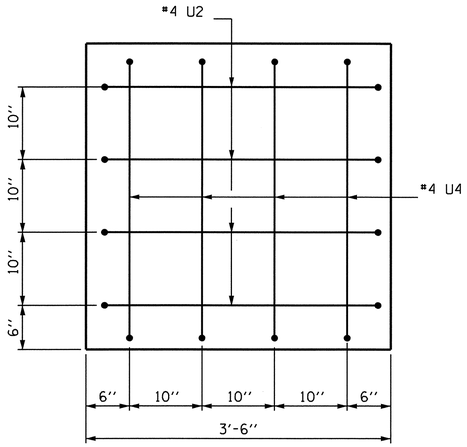
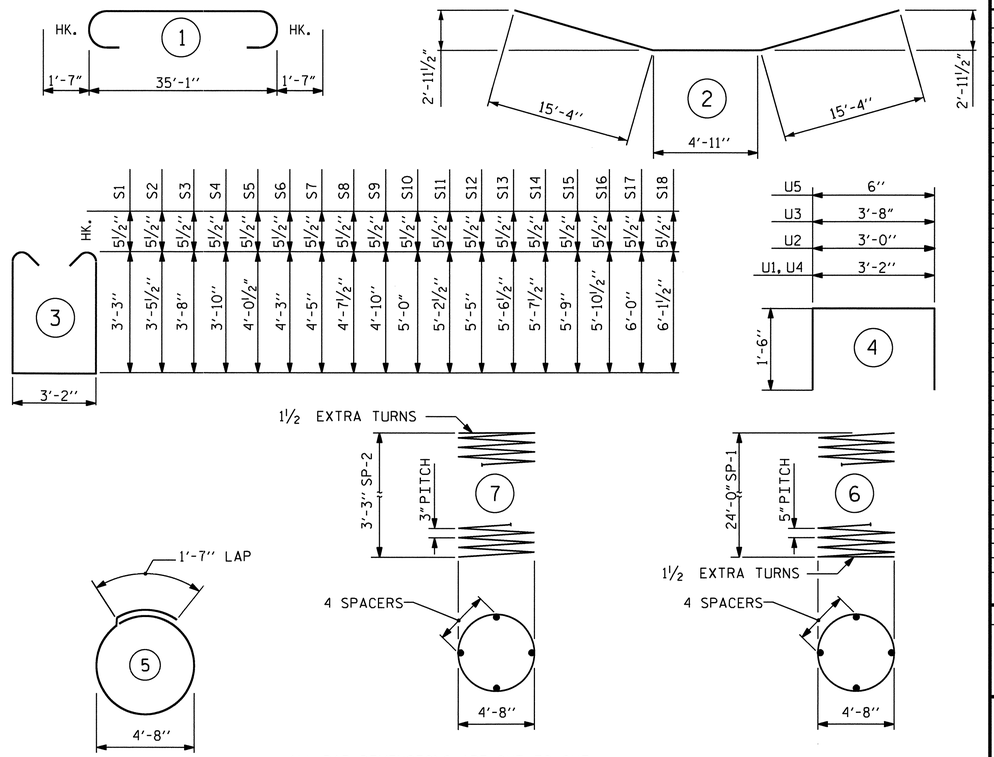


END ELEVATION
LEFT SIDE

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL
BENT No. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	11	2	35'-7''	945
B2	5	11	1	38'-3''	1016
B3	6	6	STR	35'-3''	318
B4	2	6	STR	25'-11''	78
B5	2	6	STR	15'-9''	47
B6	5	6	STR	21'-9''	163
B7	13	4	STR	3'-2''	27
B8	5	11	STR	35'-3''	936
D1	44	6	STR	1'-6''	99
M1	18	11	STR	35'-9"	3419
S1	2	5	3	10'-7''	22
S2	2	5	3	11'-0''	23
S3	2	5	3	11'-5''	24
S4	2	5	3	11'-9''	25
S5	2	5	3	12'-2''	25
S6	2	5	3	12'-7''	26
S7	2	5	3	12'-11''	27
S8	2	5	3	13'-4''	28
S9	2	5	3	13'-9''	29
S10	2	5	3	14'-1''	29
S11	2	5	3	14'-6''	30
S12	2	5	3	14'-11''	31
S13	2	5	3	15'-2''	32
S14	2	5	3	15'-4''	32
S15	2	5	3	15'-7''	33
S16	2	5	3	15'-10''	33
S17	2	5	3	16'-1''	34
S18	10	5	3	16'-4''	170
S19	11	5	5	16'-3"	186
U1	22	5	4	6'-2''	142
U2	9	4	4	6'-0''	36
U3	4	4	4	6'-8''	18
U4	4	4	4	6'-2''	16
U5	8	4	4	3'-6''	19
REINFORCING STEEL				LBS.	8118

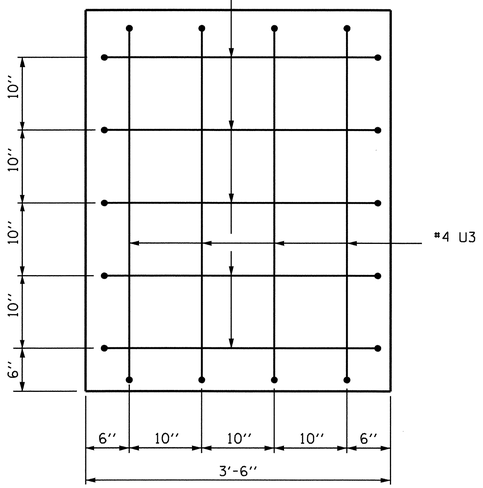
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
SP-1	1	**	6	856'-3''	893
SP-2	1	*	7	210'-0''	140
SPIRAL COLUMN REINFORCING STEEL				LBS.	1033

CLASS A CONCRETE BREAKDOWN BENT No. 1

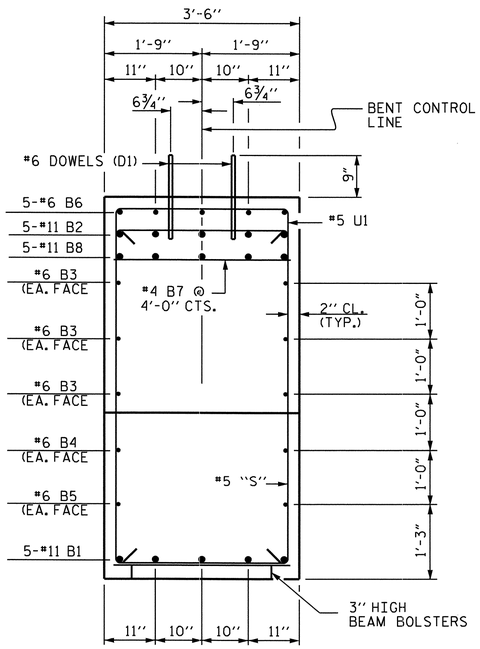
POUR 2 COLUMN	2.2 CY
POUR 3 CAP	26.5 CY
POUR 4 LATERAL GUIDE	0.1 CY
TOTAL	28.8 CY

DRILLED PIER QUANTITIES

DRILLED PIER CONCRETE POUR 1 DRILLED PIER	21.6 CY
5'-6" Ø DRILLED PIER NOT IN SOIL	13.00 LIN. FT.
5'-6" Ø DRILLED PIER IN SOIL	11.50 LIN. FT.
▲ CSL TUBES	162.00 LIN. FT.
PERMANENT STEEL CASING	9.40 LIN. FT.



END ELEVATION
RIGHT SIDE



SECTION A-A

* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

▲ NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT PRICE BID FOR DRILLED PIER.

PROJECT NO. B-3928
WATAUGA/ASHE COUNTY
STATION: 13+95.00 -L-

SHEET 3 OF 4

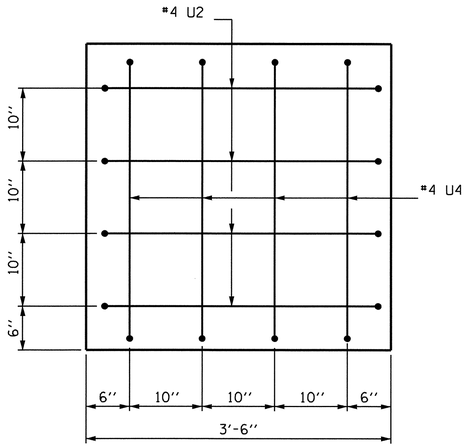
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

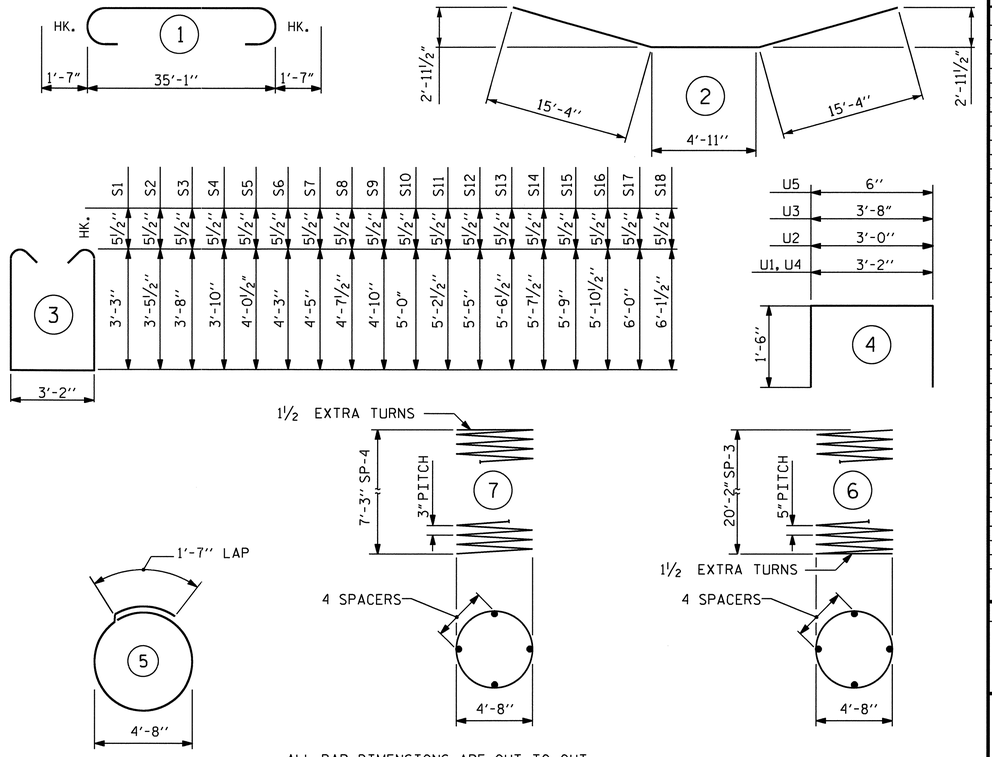
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			37

DRAWN BY : M. POOLE DATE : 07/09
CHECKED BY : D. HODGE DATE : 12/09



END ELEVATION
LEFT SIDE

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL
BENT No. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	11	2	35'-7''	945
B2	5	11	1	38'-3''	1016
B3	6	6	STR	35'-3''	318
B4	2	6	STR	25'-11''	78
B5	2	6	STR	15'-9''	47
B6	5	6	STR	21'-9''	163
B7	13	4	STR	3'-2''	27
B8	5	11	STR	35'-3''	936
D1	44	6	STR	1'-6''	99
M2	18	11	SIR	35'-11''	3435
S1	2	5	3	10'-7''	22
S2	2	5	3	11'-0''	23
S3	2	5	3	11'-5''	24
S4	2	5	3	11'-9''	25
S5	2	5	3	12'-2''	25
S6	2	5	3	12'-7''	26
S7	2	5	3	12'-11''	27
S8	2	5	3	13'-4''	28
S9	2	5	3	13'-9''	29
S10	2	5	3	14'-1''	29
S11	2	5	3	14'-6''	30
S12	2	5	3	14'-11''	31
S13	2	5	3	15'-2''	32
S14	2	5	3	15'-4''	32
S15	2	5	3	15'-7''	33
S16	2	5	3	15'-10''	33
S17	2	5	3	16'-1''	34
S18	10	5	3	16'-4''	170
S19	11	5	5	16'-3''	186
U1	22	5	4	6'-2''	142
U2	9	4	4	6'-0''	36
U3	4	4	4	6'-8''	18
U4	4	4	4	6'-2''	16
U5	8	4	4	3'-6''	19
REINFORCING STEEL				LBS.	8134

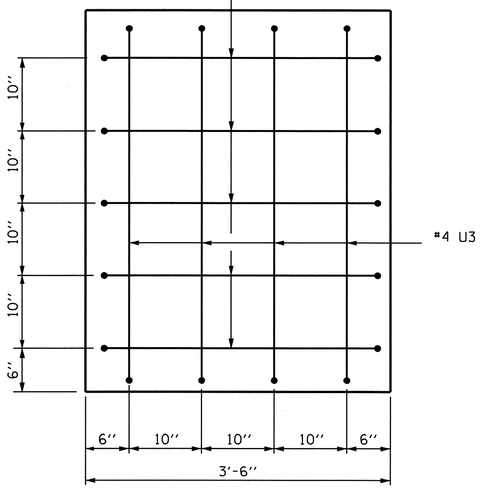
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
SP-3	1	**	6	722'-11''	754
SP-4	1	*	7	441'-9''	295
SPIRAL COLUMN REINFORCING STEEL				LBS.	1049

CLASS A CONCRETE BREAKDOWN BENT No. 2

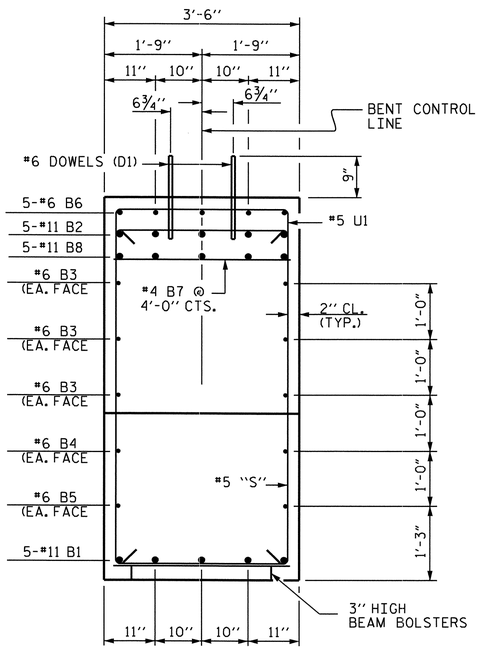
POUR 2 COLUMN	5.1 CY
POUR 3 CAP	26.5 CY
POUR 4 LATERAL GUIDE	0.1 CY
TOTAL	31.7 CY

DRILLED PIER QUANTITIES

DRILLED PIER CONCRETE POUR 1 DRILLED PIER	18.2 CY
5'-6" Ø DRILLED PIER NOT IN SOIL	16.00 LIN. FT.
5'-6" Ø DRILLED PIER IN SOIL	4.67 LIN. FT.
▲ CSL TUBES	139.00 LIN. FT.
PERMANENT STEEL CASING	4.67 LIN. FT.



END ELEVATION
RIGHT SIDE



SECTION A-A

* THE SP-4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

** THE SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

▲ NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT PRICE BID FOR DRILLED PIER.

PROJECT NO. B-3928
WATAUGA/ASHE COUNTY
STATION: 13+95.00 -L-

SHEET 4 OF 4

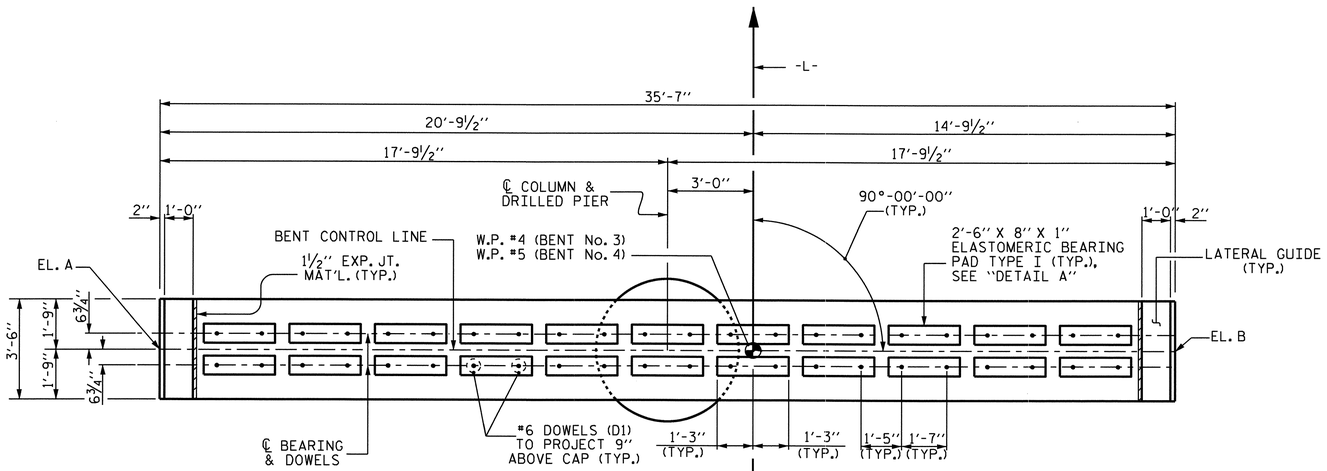
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT No. 2

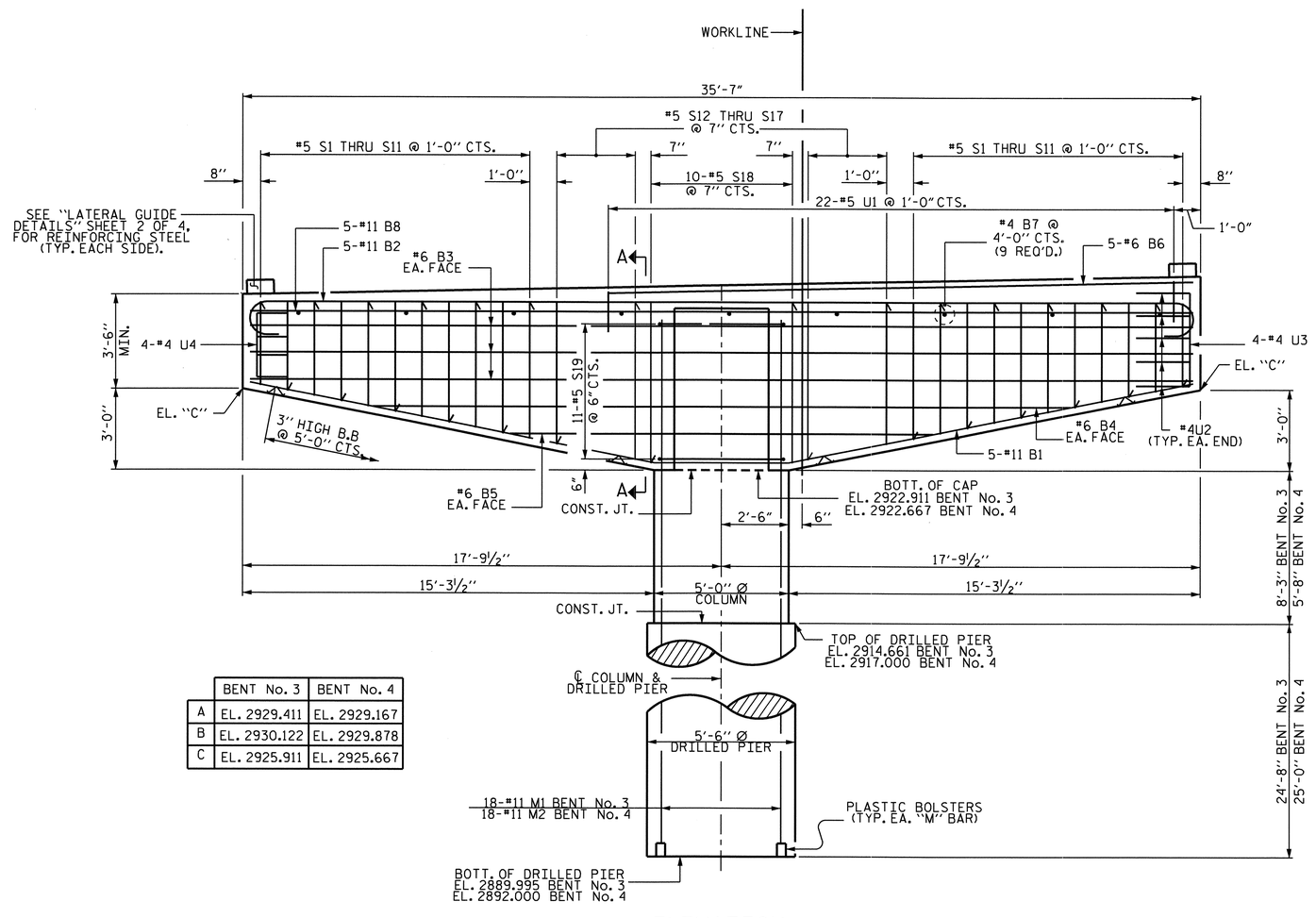
NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DIGGINS, JR.
01/11/10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			37

DRAWN BY : M. POOLE DATE : 07/09
CHECKED BY : D. HODGE DATE : 12/09



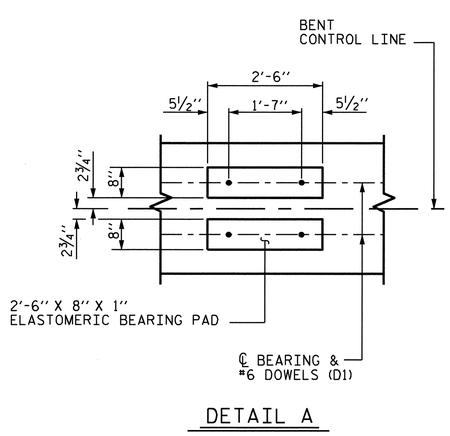
PLAN



	BENT No. 3	BENT No. 4
A	EL. 2929.411	EL. 2929.167
B	EL. 2930.122	EL. 2929.878
C	EL. 2925.911	EL. 2925.667

ELEVATION

FOR REINFORCING STEEL IN COLUMN & DRILLED PIER, SEE SHEET 2 OF 4
INVERT ALTERNATE STIRRUPS



DETAIL A

NOTES

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

DETAILED DRAWINGS FOR FALSEWORK AND FORMS FOR THIS HAMMERHEAD BENT SHALL BE SUBMITTED. SEE SHEET SN.

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

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

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

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIER IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

PROJECT NO. B-3928
WATAUGA/ASHE COUNTY
STATION: 13+95.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENTS No. 3 & 4

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			37

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

DRAWN BY : M. POOLE DATE : 07/09
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11-JAN-2010 11:18
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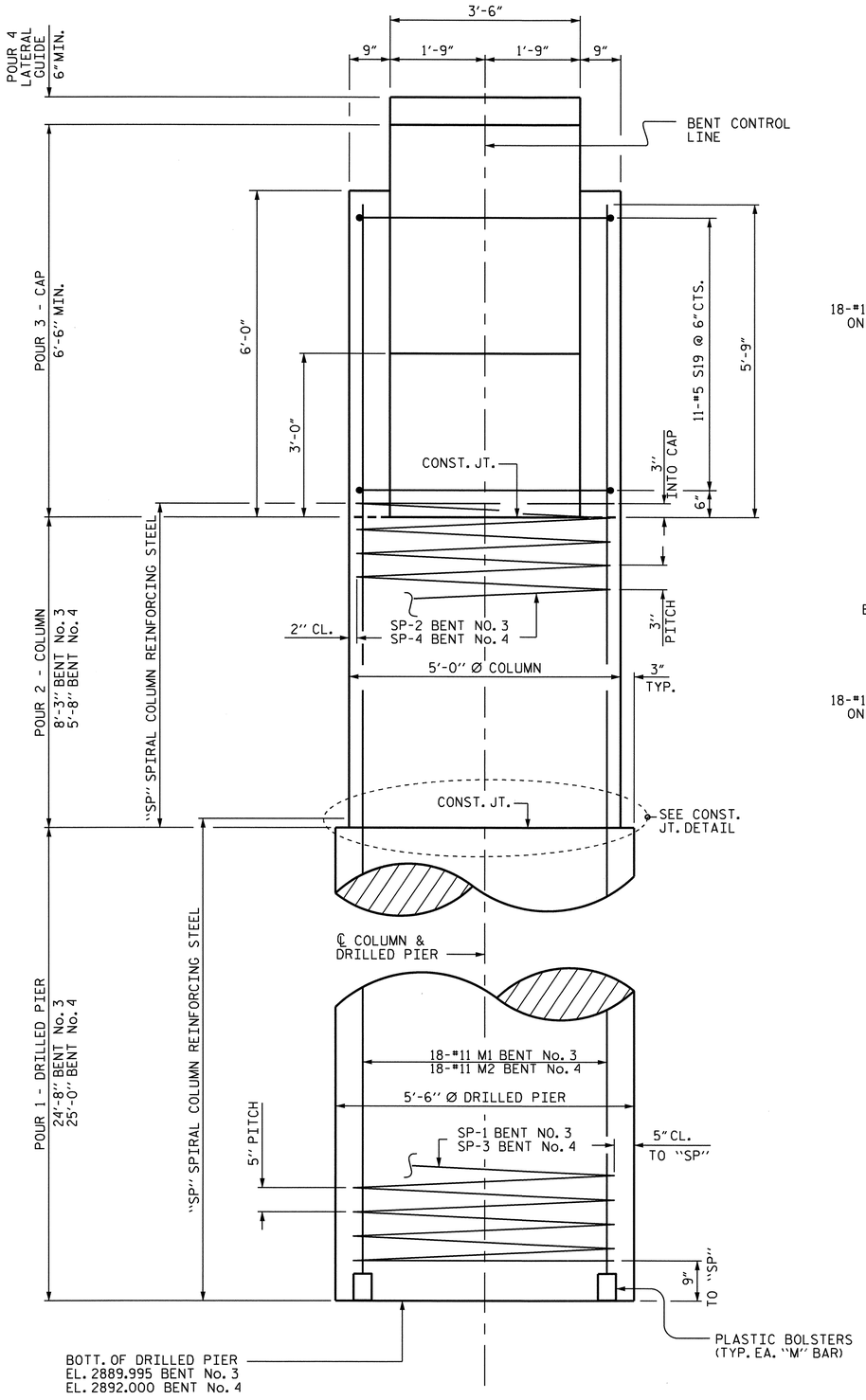
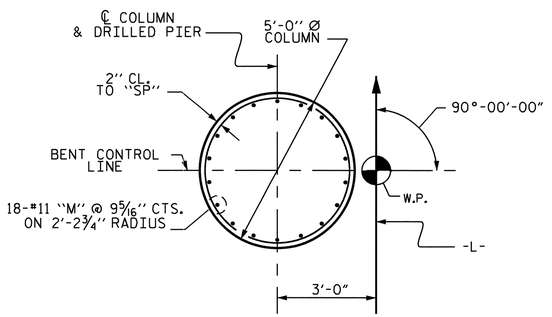
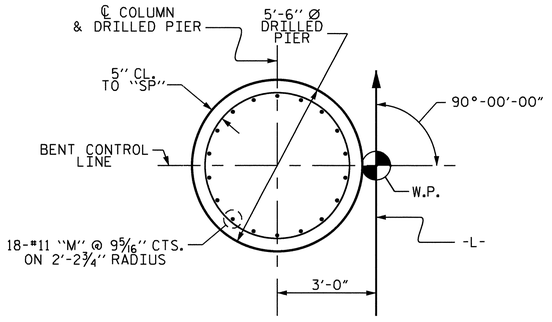
dahodge



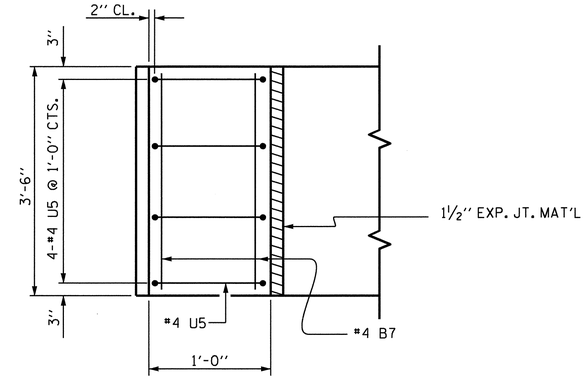
END ELEVATION



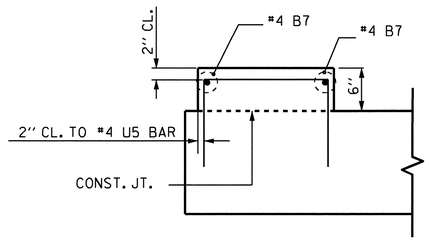
PLAN OF COLUMN



PLAN OF DRILLED PIER



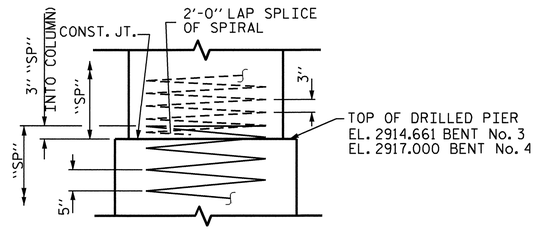
PLAN



ELEVATION

LATERAL GUIDE DETAILS

(EACH END SIMILAR)



CONSTRUCTION JOINT DETAIL

PROJECT NO. B-3928
WATAUGA/ASHE COUNTY
STATION: 13+95.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENTS No. 3 & 4

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			37

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

DRAWN BY : M. POOLE DATE : 07/09
CHECKED BY : D. HODGE DATE : 12/09

11-JAN-2010 11:18
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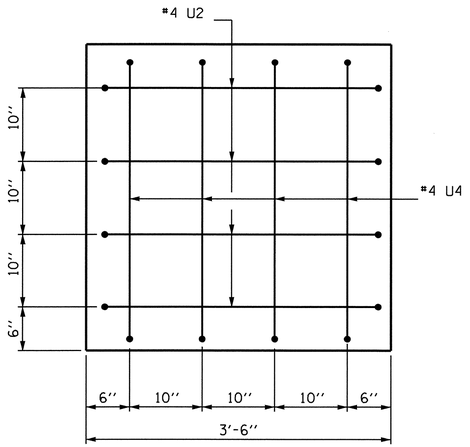
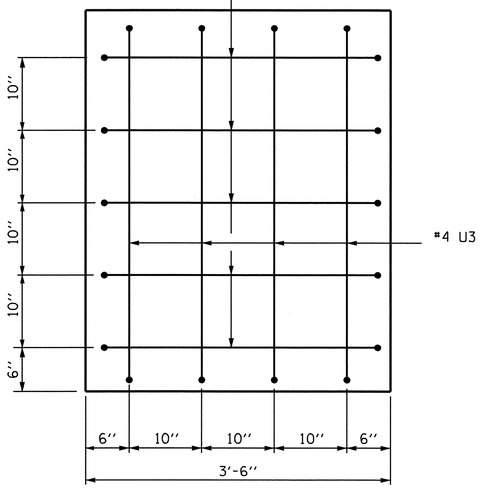
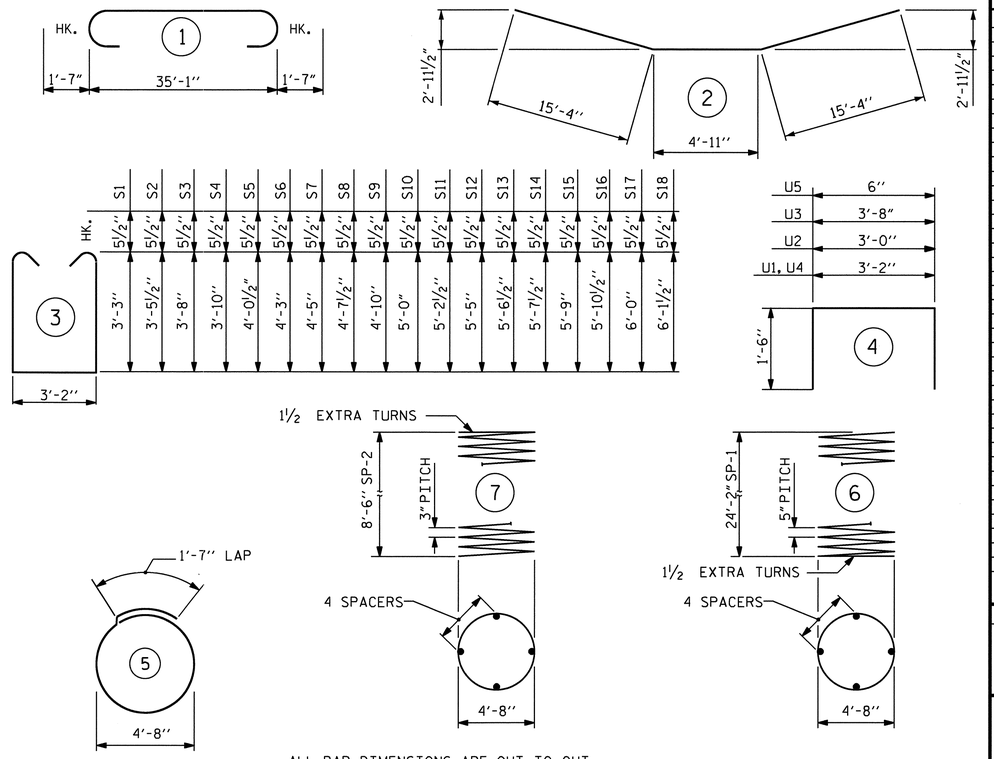


END ELEVATION
LEFT SIDE

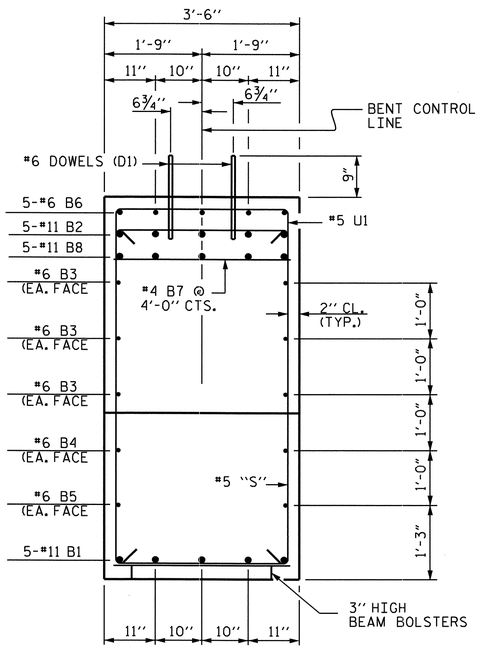


END ELEVATION
RIGHT SIDE

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



SECTION A-A

* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

▲ NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT PRICE BID FOR DRILLED PIER.

BILL OF MATERIAL BENT No. 3

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	11	2	35'-7''	945
B2	5	11	1	38'-3''	1016
B3	6	6	STR	35'-3''	318
B4	2	6	STR	25'-11''	78
B5	2	6	STR	15'-9''	47
B6	5	6	STR	21'-9''	163
B7	13	4	STR	3'-2''	27
B8	5	11	STR	35'-3''	936
D1	44	6	STR	1'-6''	99
M1	18	11	STR	41'-2''	3937
S1	2	5	3	10'-7''	22
S2	2	5	3	11'-0''	23
S3	2	5	3	11'-5''	24
S4	2	5	3	11'-9''	25
S5	2	5	3	12'-2''	25
S6	2	5	3	12'-7''	26
S7	2	5	3	12'-11''	27
S8	2	5	3	13'-4''	28
S9	2	5	3	13'-9''	29
S10	2	5	3	14'-1''	29
S11	2	5	3	14'-6''	30
S12	2	5	3	14'-11''	31
S13	2	5	3	15'-2''	32
S14	2	5	3	15'-4''	32
S15	2	5	3	15'-7''	33
S16	2	5	3	15'-10''	33
S17	2	5	3	16'-1''	34
S18	10	5	3	16'-4''	170
S19	11	5	5	16'-3''	186
U1	22	5	4	6'-2''	142
U2	9	4	4	6'-0''	36
U3	4	4	4	6'-8''	18
U4	4	4	4	6'-2''	16
U5	8	4	4	3'-6''	19
REINFORCING STEEL				LBS.	8636

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
SP-1	1	**	6	862'-0''	899
SP-2	1	*	7	514'-2''	343
SPIRAL COLUMN REINFORCING STEEL				LBS.	1242

CLASS A CONCRETE BREAKDOWN BENT No. 3	
POUR 2 COLUMN	6.0 CY
POUR 3 CAP	26.5 CY
POUR 4 LATERAL GUIDE	0.1 CY
TOTAL	32.6 CY

DRILLED PIER QUANTITIES	
DRILLED PIER CONCRETE POUR 1 DRILLED PIER	21.7 CY
5'-6" Ø DRILLED PIER NOT IN SOIL	18.00 LIN. FT.
5'-6" Ø DRILLED PIER IN SOIL	6.67 LIN. FT.
▲ CSL TUBES	163.00 LIN. FT.
PERMANENT STEEL CASING	8.67 LIN. FT.

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WATAUGA/ASHE COUNTY
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SHEET 3 OF 4

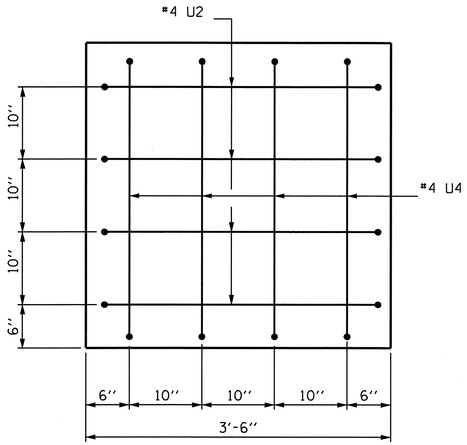
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT No. 3

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

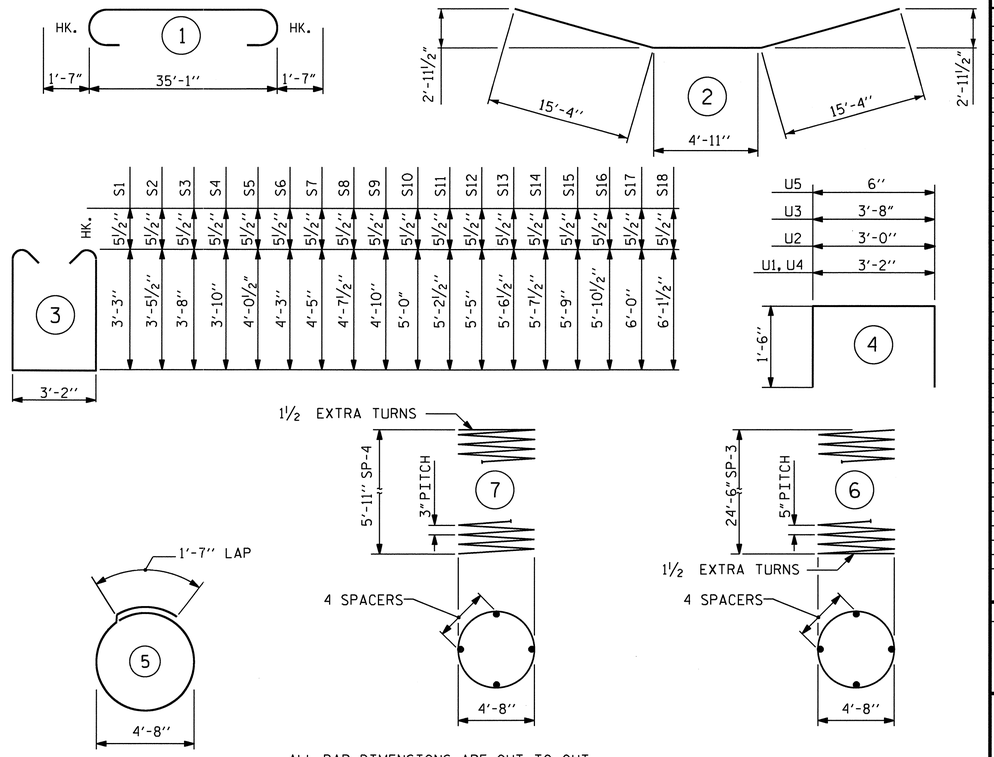
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			37

DRAWN BY : M. POOLE DATE : 07/09
CHECKED BY : D. HODGE DATE : 12/09



END ELEVATION
LEFT SIDE

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL
BENT No. 4

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	11	2	35'-7''	945
B2	5	11	1	38'-3''	1016
B3	6	6	STR	35'-3''	318
B4	2	6	STR	25'-11''	78
B5	2	6	STR	15'-9''	47
B6	5	6	STR	21'-9''	163
B7	13	4	STR	3'-2''	27
B8	5	11	STR	35'-3''	936
D1	44	6	STR	1'-6''	99
M2	18	11	STR	38'-11"	3722
S1	2	5	3	10'-7''	22
S2	2	5	3	11'-0''	23
S3	2	5	3	11'-5''	24
S4	2	5	3	11'-9''	25
S5	2	5	3	12'-2''	25
S6	2	5	3	12'-7''	26
S7	2	5	3	12'-11''	27
S8	2	5	3	13'-4''	28
S9	2	5	3	13'-9''	29
S10	2	5	3	14'-1''	29
S11	2	5	3	14'-6''	30
S12	2	5	3	14'-11''	31
S13	2	5	3	15'-2''	32
S14	2	5	3	15'-4''	32
S15	2	5	3	15'-7''	33
S16	2	5	3	15'-10''	33
S17	2	5	3	16'-1''	34
S18	10	5	3	16'-4''	170
S19	11	5	5	16'-3"	186
U1	22	5	4	6'-2''	142
U2	9	4	4	6'-0''	36
U3	4	4	4	6'-8''	18
U4	4	4	4	6'-2''	16
U5	8	4	4	3'-6''	19
REINFORCING STEEL				LBS.	8421

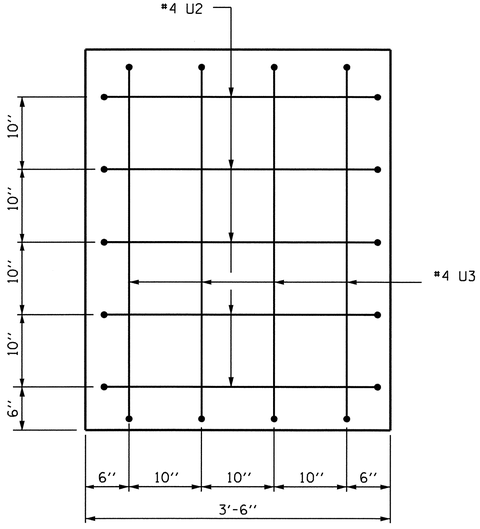
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
SP-3	1	**	6	873'-7''	911
SP-4	1	*	7	365'-0''	244
SPIRAL COLUMN REINFORCING STEEL				LBS.	1155

CLASS A CONCRETE BREAKDOWN BENT No. 4

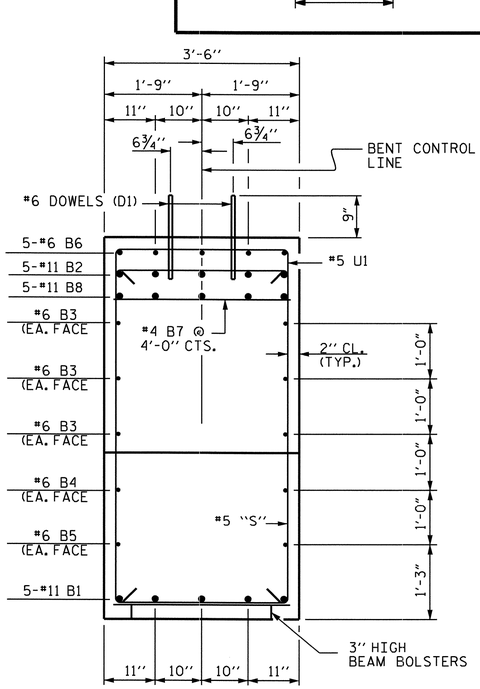
POUR 2 COLUMN	4.1 CY
POUR 3 CAP	26.5 CY
POUR 4 LATERAL GUIDE	0.1 CY
TOTAL	30.7 CY

DRILLED PIER QUANTITIES

DRILLED PIER CONCRETE POUR 1 DRILLED PIER	22.0 CY
5'-6" Ø DRILLED PIER NOT IN SOIL	12.00 LIN. FT.
5'-6" Ø DRILLED PIER IN SOIL	13.00 LIN. FT.
▲ CSL TUBES	165.00 LIN. FT.
PERMANENT STEEL CASING	13.00 LIN. FT.



END ELEVATION
RIGHT SIDE



SECTION A-A

* THE SP-4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

** THE SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

▲ NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT PRICE BID FOR DRILLED PIER.

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WATAUGA/ASHE COUNTY
STATION: 13+95.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT No. 4

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			37

DRAWN BY : M. POOLE DATE : 07/09
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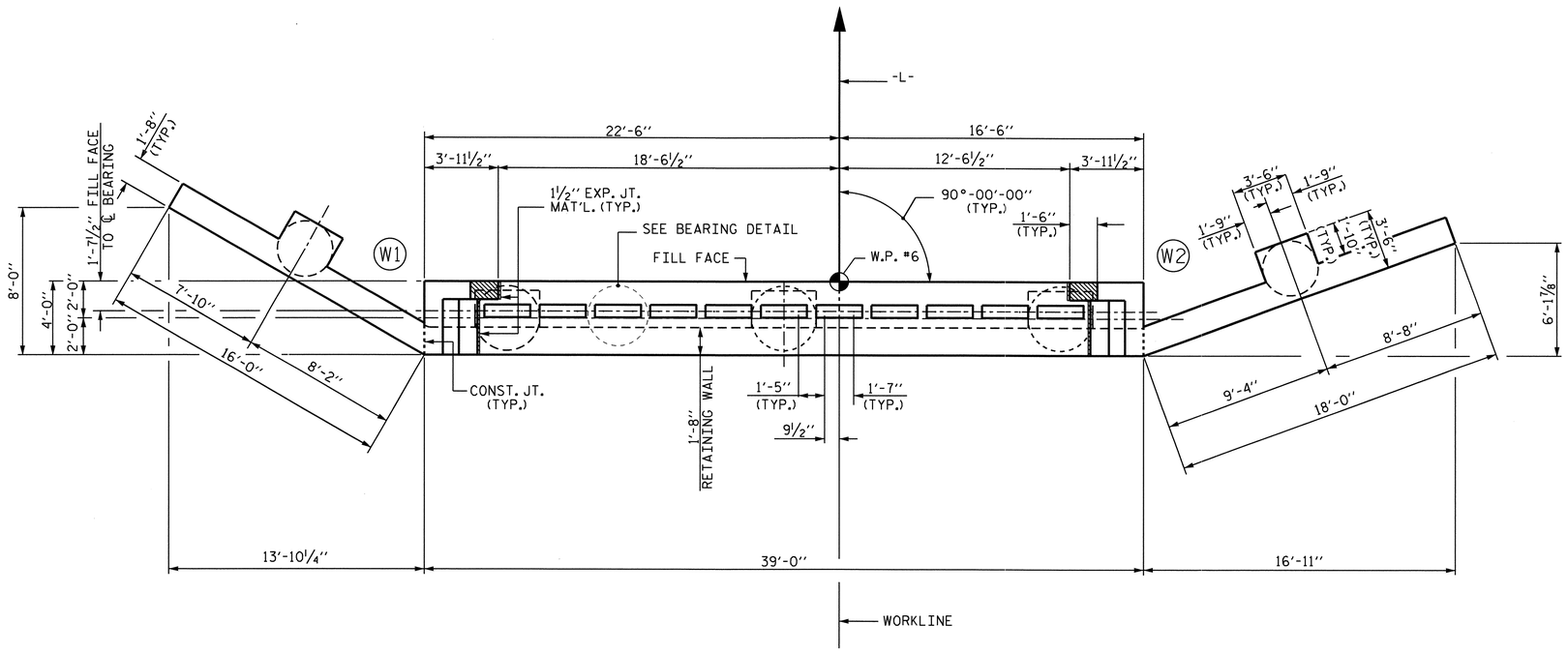
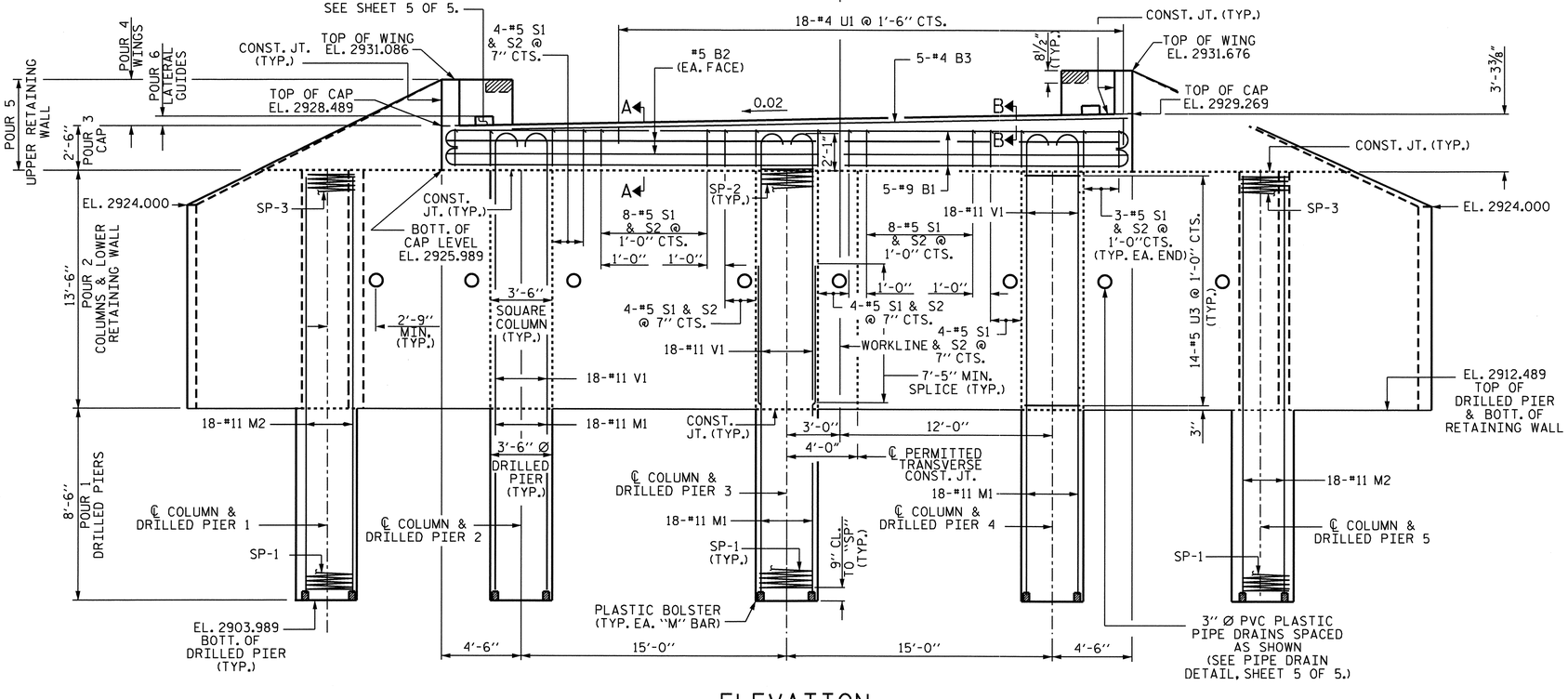


PLAN



ELEVATION

FOR "SECTION A-A" & "SECTION B-B", SEE SHEET 3 OF 5.

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #6 D1 DOWELS.

PIPE DRAINS IN WALL MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING STEEL.

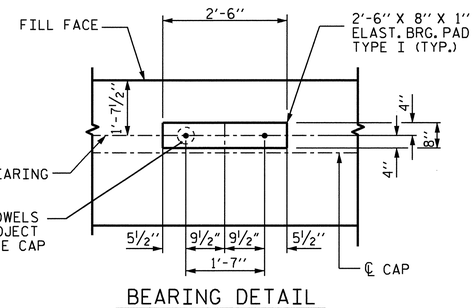
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.

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

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

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



BEARING DETAIL

PROJECT NO. B-3928

WATAUGA/ASHE COUNTY

STATION: 13+95.00 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3a
1			3			TOTAL SHEETS
2			4			37

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
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DRAWN BY : M. POOLE DATE : 09/09
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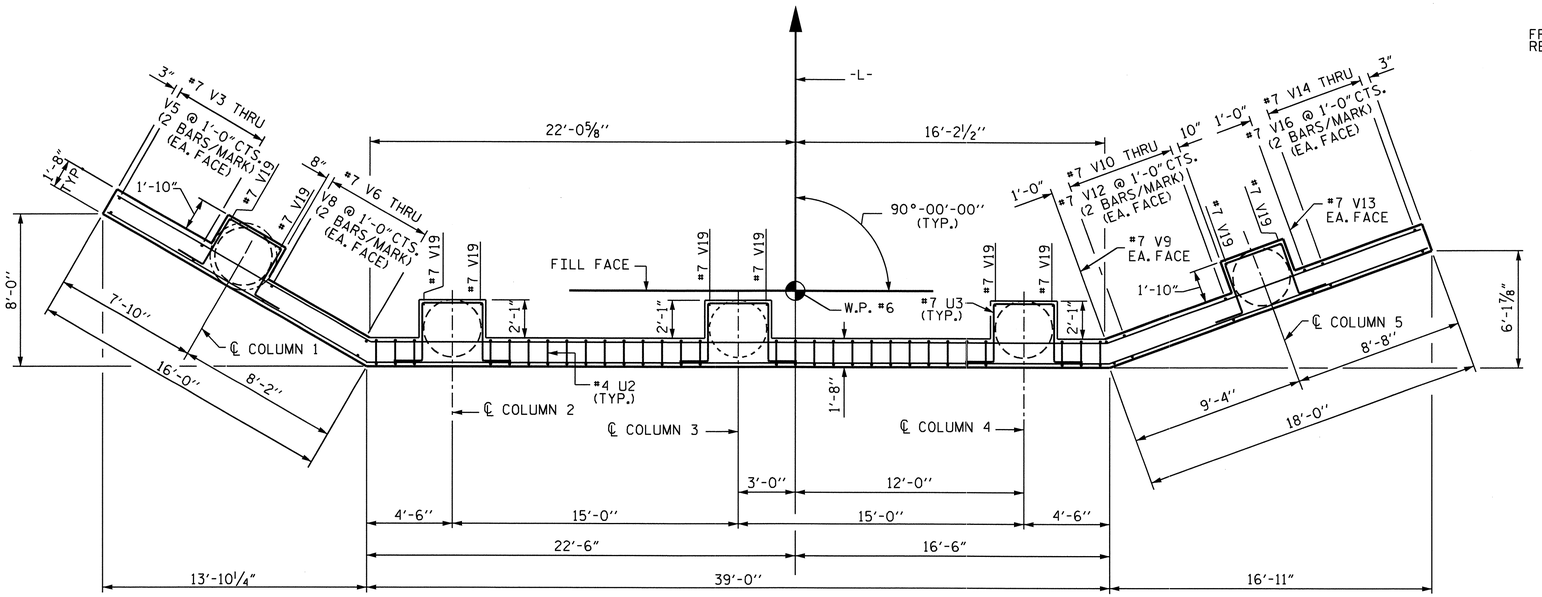
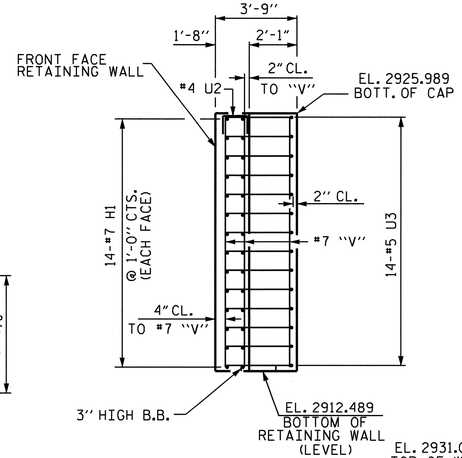
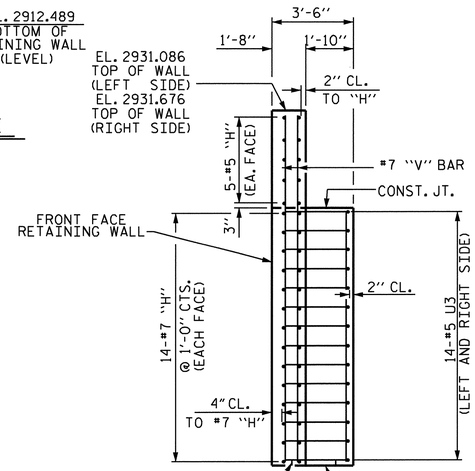
STR. #1



PLAN



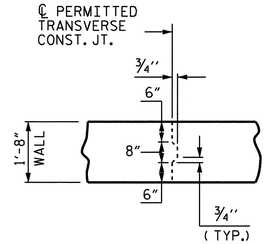
SECTION X-X



SECTION Y-Y

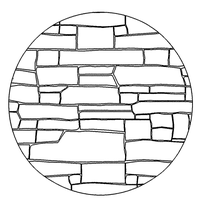
SPLICE LENGTH

#5 "H" = 3'-0"
#7 "H" = 5'-3"
#7 "V" = 3'-9"



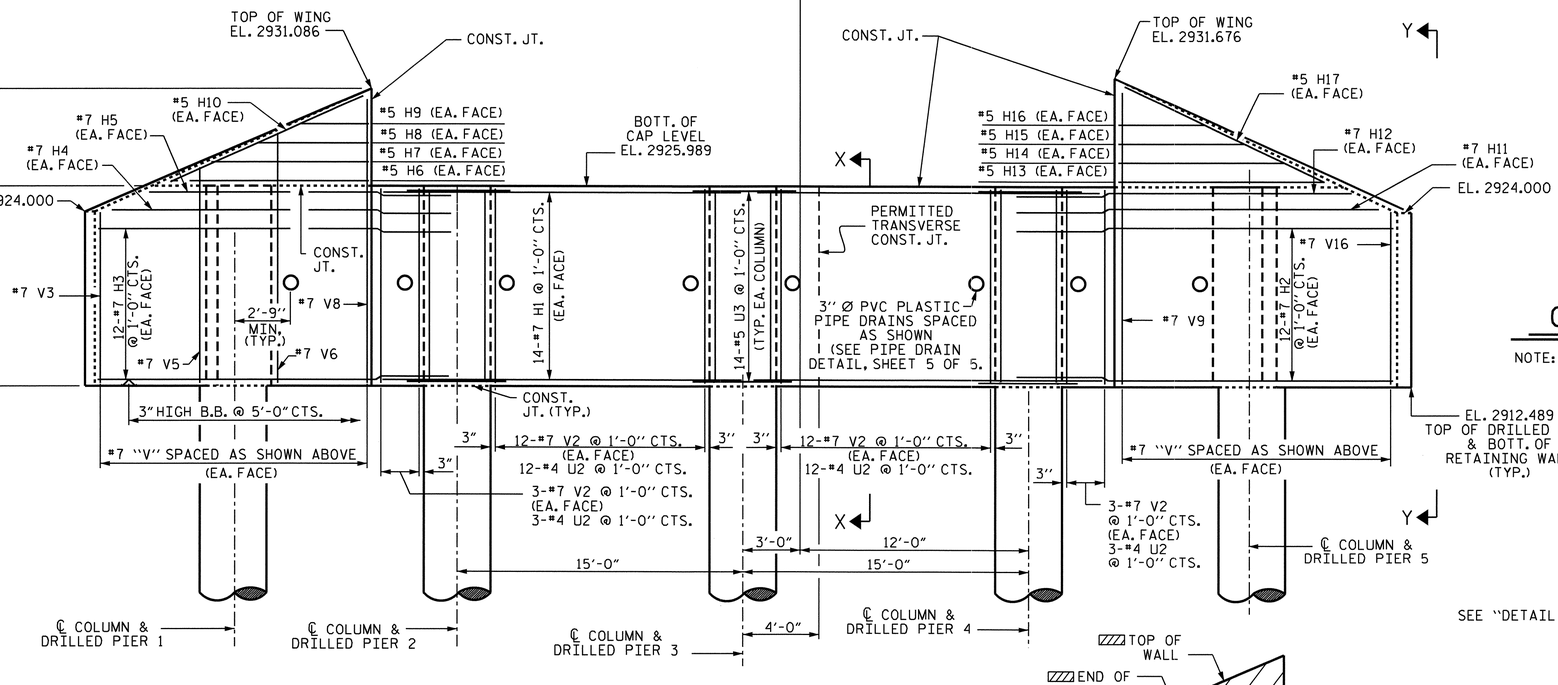
PERMITTED TRANSVERSE CONSTRUCTION JOINT DETAIL

NOTE: REINFORCING STEEL IN WALL NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT

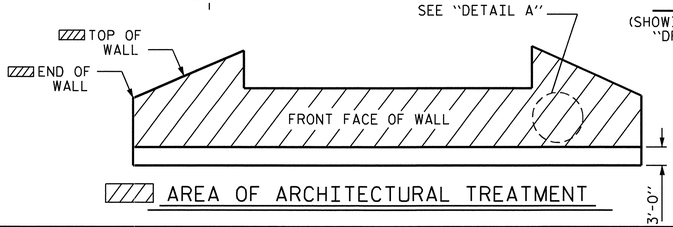


DETAIL A

(SHOWING SIMULATED STONE "DRY STACK" PATTERN)



ELEVATION



AREA OF ARCHITECTURAL TREATMENT

PROJECT NO. B-3928
WATAUGA/ASHE COUNTY
STATION: 13+95.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2
RETAINING WALL LAYOUT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			37

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
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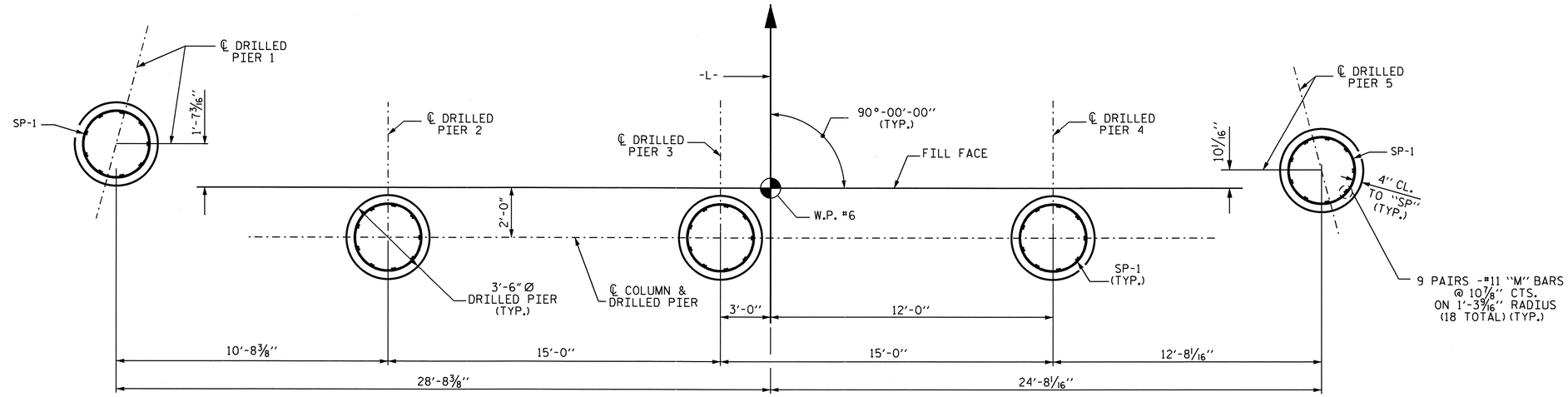
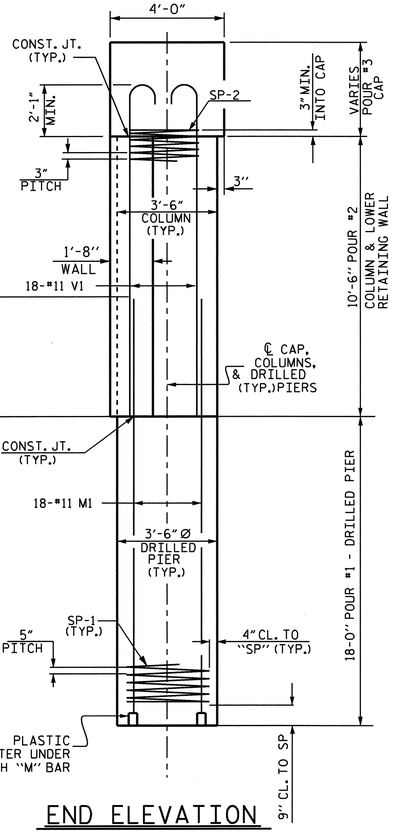
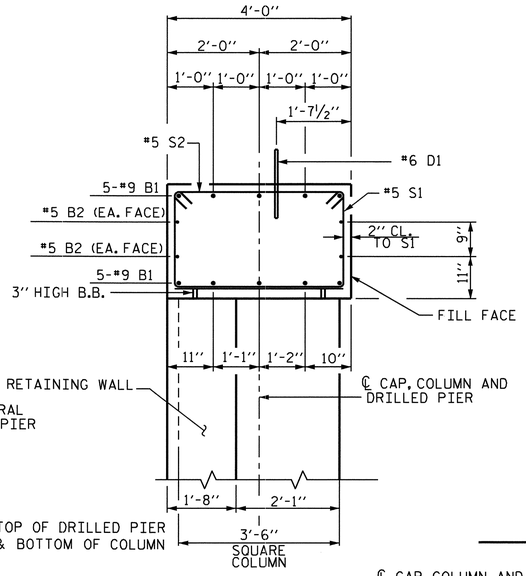
STR. #1



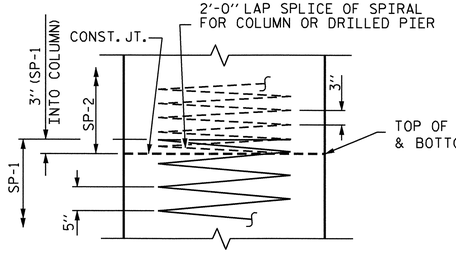
PLAN OF DRILLED PIERS



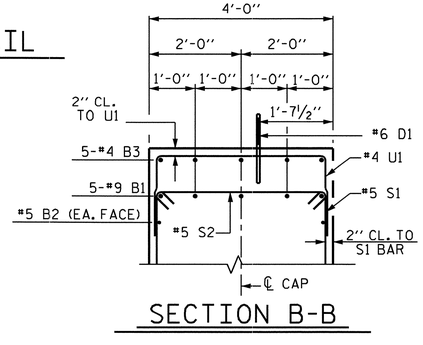
END ELEVATION



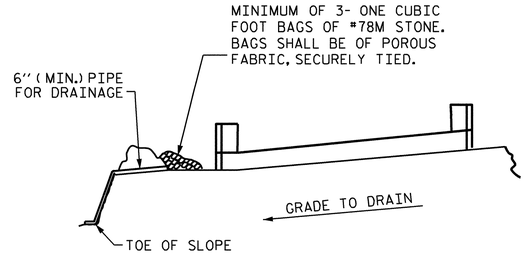
SECTION A-A



CONSTRUCTION JOINT DETAIL



SECTION B-B

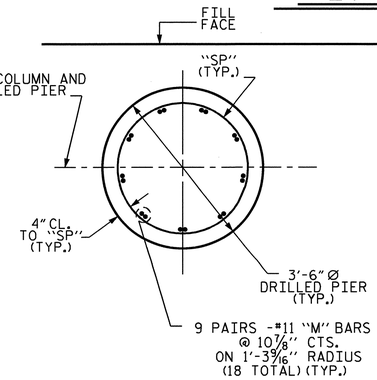


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

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



PLAN

NOTE: #11 "M" BARS TO BE PLACED IN DRILLED PIERS AS SHOWN.

PROJECT NO. B-3928

WATAUGA/ASHE COUNTY

STATION: 13+95.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			37

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

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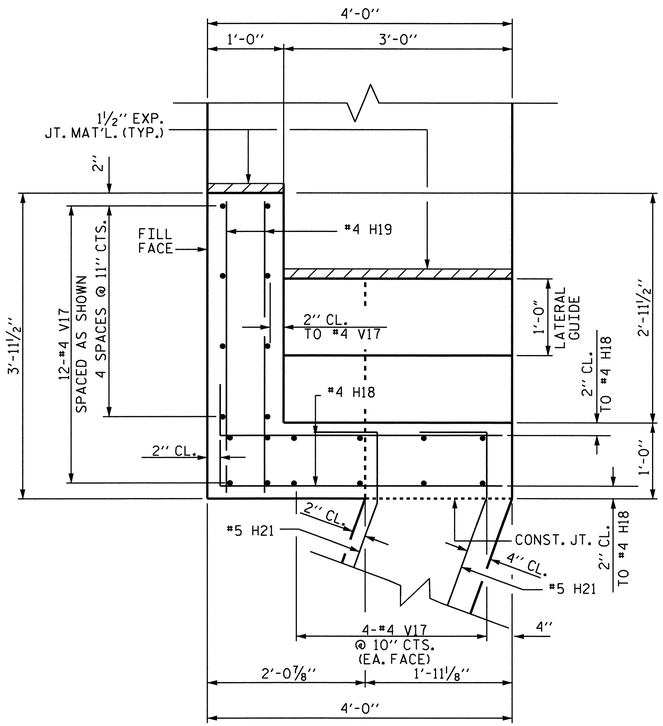
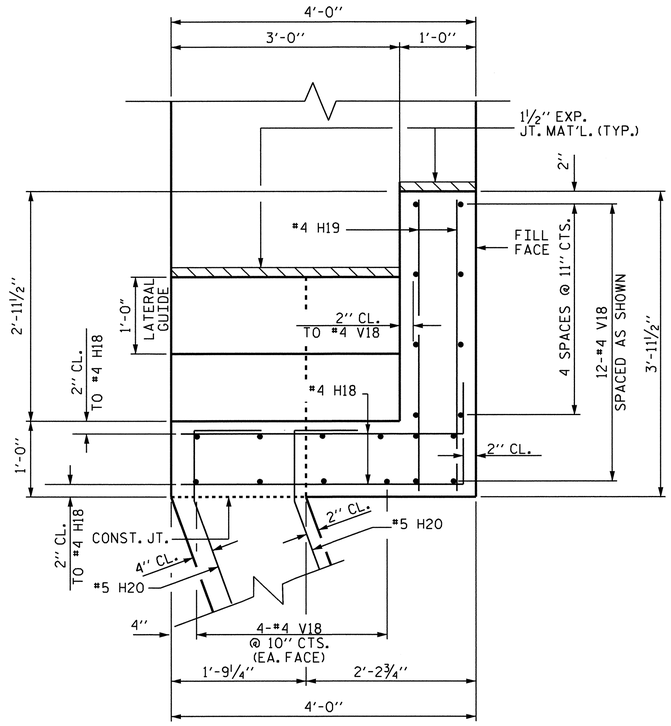
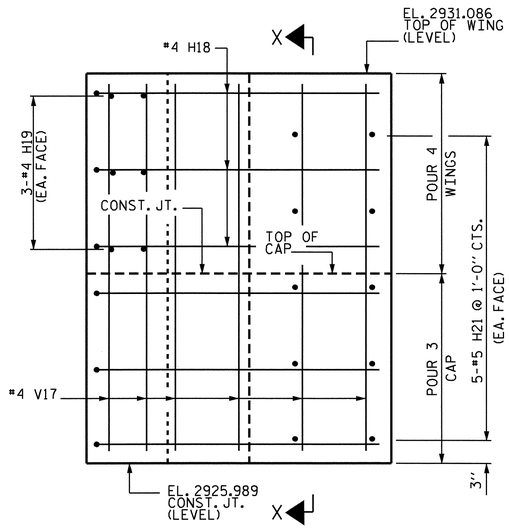
STR. #1



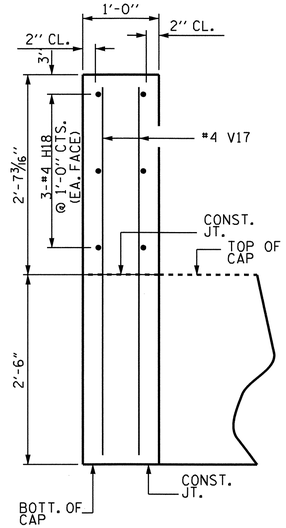
PLAN OF WING - W1



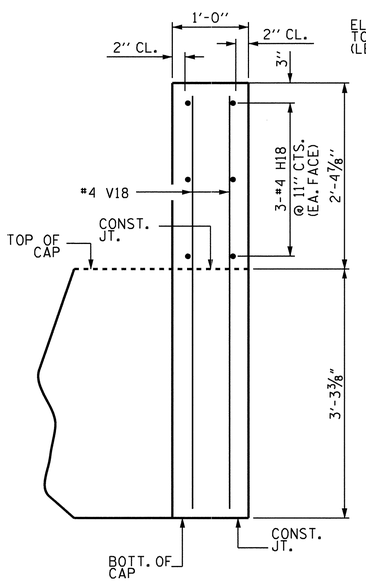
PLAN OF WING - W2



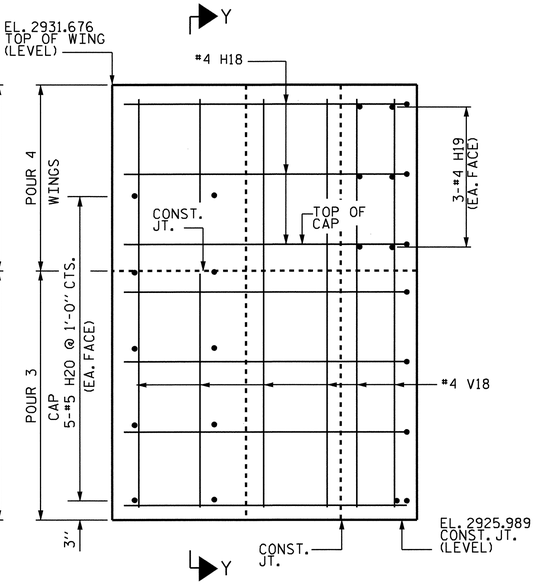
ELEVATION OF WING - W1



SECTION X-X



SECTION Y-Y



ELEVATION OF WING - W2

PROJECT NO. B-3928
WATAUGA/ASHE COUNTY
STATION: 13+95.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			37

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

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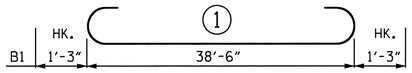
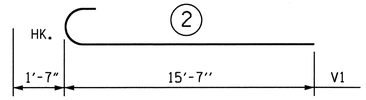
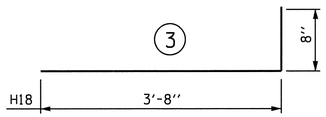
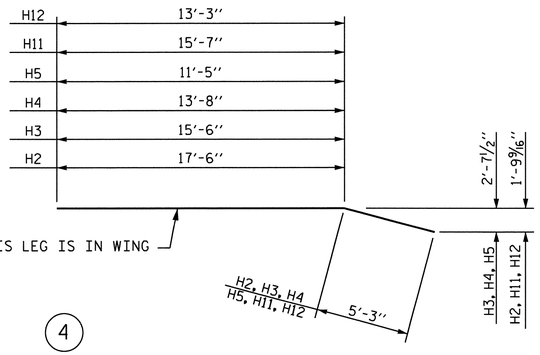
STR. #1

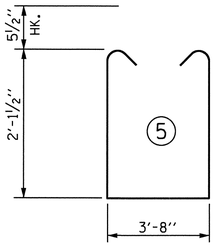
BAR TYPES

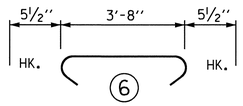


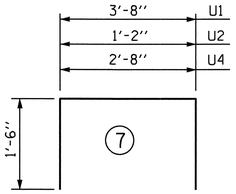


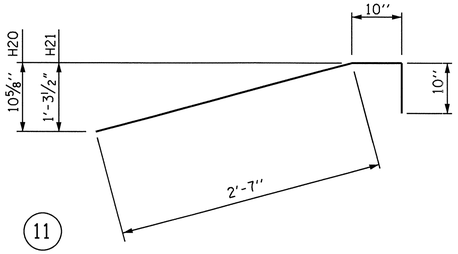


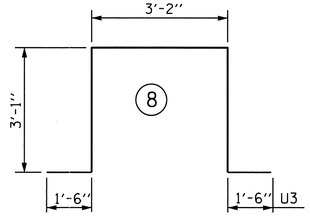


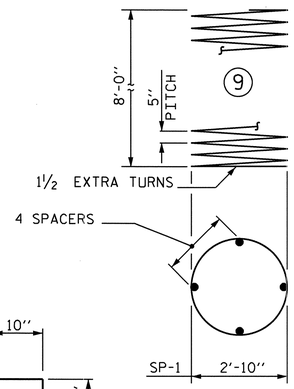


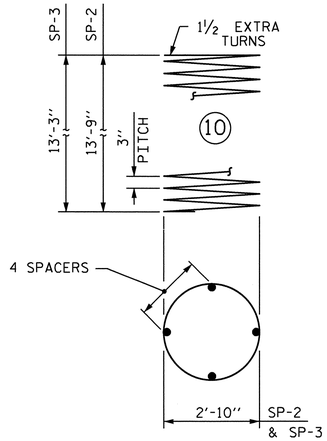












ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT No. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	41'-0"	1394
B2	4	#5	STR	38'-8"	161
B3	5	#4	STR	29'-0"	97
D1	22	#6	STR	1'-6"	50
H1	28	#7	STR	38'-8"	2213
H2	24	#7	4	22'-9"	1116
H3	24	#7	4	20'-9"	1018
H4	2	#7	4	18'-11"	77
H5	2	#7	4	16'-8"	68
H6	2	#5	STR	10'-3"	21
H7	2	#5	STR	8'-0"	17
H8	2	#5	STR	5'-9"	12
H9	2	#5	STR	3'-6"	7
H10	2	#5	STR	11'-0"	23
H11	2	#5	7	20'-10"	43
H12	2	#5	7	18'-6"	39
H13	2	#5	STR	12'-1"	25
H14	2	#5	STR	9'-9"	20
H15	2	#5	STR	7'-5"	15
H16	2	#5	STR	5'-0"	10
H17	2	#5	STR	12'-10"	27
H18	12	#4	3	4'-4"	35
H19	12	#4	STR	3'-7"	29
H20	10	#5	11	4'-3"	44
H21	10	#5	11	4'-3"	44
M1	54	#11	STR	18'-5"	5284
M2	36	#11	STR	21'-0"	4017
S1	36	#5	5	8'-10"	332
S2	36	#5	6	4'-7"	172
U1	18	#4	7	6'-8"	80
U2	30	#4	7	4'-2"	84
U3	70	#5	8	12'-4"	900
U4	4	#4	7	5'-8"	15

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
V1	54	#11	2	17'-2"	4925
V2	60	#7	STR	13'-2"	1615
V3	4	#7	STR	11'-2"	91
V4	4	#7	STR	12'-0"	98
V5	4	#7	STR	12'-11"	106
V6	4	#7	STR	15'-7"	127
V7	4	#7	STR	16'-5"	134
V8	4	#7	STR	17'-4"	142
V9	2	#7	STR	18'-5"	75
V10	4	#7	STR	17'-6"	143
V11	4	#7	STR	16'-8"	136
V12	4	#7	STR	15'-10"	129
V13	2	#7	STR	13'-8"	56
V14	4	#7	STR	12'-10"	105
V15	4	#7	STR	12'-0"	98
V16	4	#7	STR	11'-2"	91
V17	20	#4	STR	4'-8"	62
V18	20	#4	STR	5'-4"	71
V19	10	#7	STR	13'-1"	267
REINFORCING STEEL					LBS. 25960

SP-1	5	*	9	183'-9"	958
SP-2	3	**	10	500'-2"	1002
SP-3	2	**	10	482'-7"	645
SPIRAL COLUMN REINFORCING STEEL					LBS. 2605

CLASS A CONCRETE BREAKDOWN

POUR 2 LOWER RETAINING WALL AND COLUMNS	77.3 C.Y.
POUR 3 CAP	16.7 C.Y.
POUR 4 WINGS	1.3 C.Y.
POUR 5 UPPER RETAINING WALL	4.2 C.Y.
POUR 6 LATERAL GUIDE	0.1 C.Y.
TOTAL CLASS A CONCRETE	99.6 C.Y.

3'-6"Ø DRILLED PIER QUANTITIES

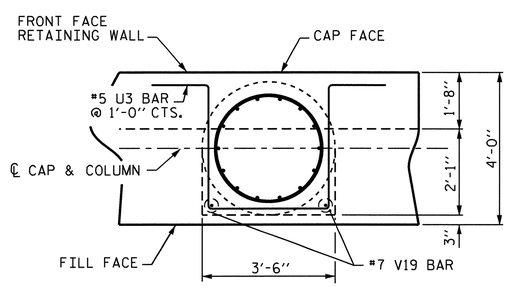
DRILLED PIER CONCRETE	
POUR 1 DRILLED PIERS	15.1 C.Y.
3'-6"Ø DRILLED PIER NOT IN SOIL:	38.00 LIN. FT.
3'-6"Ø DRILLED PIER IN SOIL:	4.50 LIN. FT.
▲ CSL TUBES	220 LIN. FT.

ARCHITECTURAL CONCRETE SURFACE TREATMENT	915 SQ. FT.

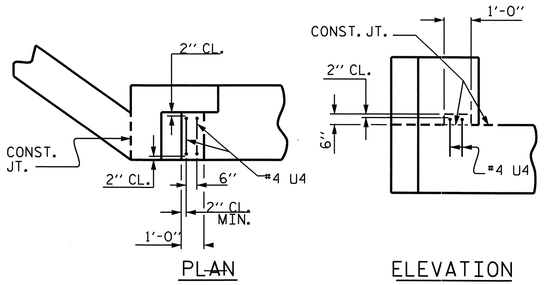
▲ NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT PRICE BID FOR DRILLED PIERS

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.



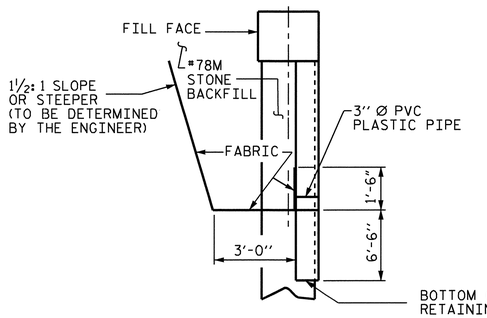
SECTION THRU COLUMN



PLAN ELEVATION

LATERAL GUIDE DETAILS

(EACH END SIMILAR)



PIPE DRAIN DETAIL

NOTES : THE 3" Ø PVC PLASTIC PIPE SHALL MEET THE MINIMUM REQUIREMENTS OF ASTM D1785

FABRIC SHALL BE TYPE I ENGINEERING FABRIC IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

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

#78 STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE PIPE DRAIN TO OUTSIDE PIPE DRAIN

NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE PVC PIPE DRAIN, FABRIC AND #78M STONE BACKFILL. THE ENTIRE COST OF THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE COST FOR CONSTRUCTION OF THE END BENT.

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

PROJECT NO. B-3928

WATAUGA/ASHE COUNTY

STATION: 13+95.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			37

DRAWN BY : M. POOLE DATE : 10/09
CHECKED BY : J.R. DUGGINS DATE : 11/09

11-JAN-2010 11:14
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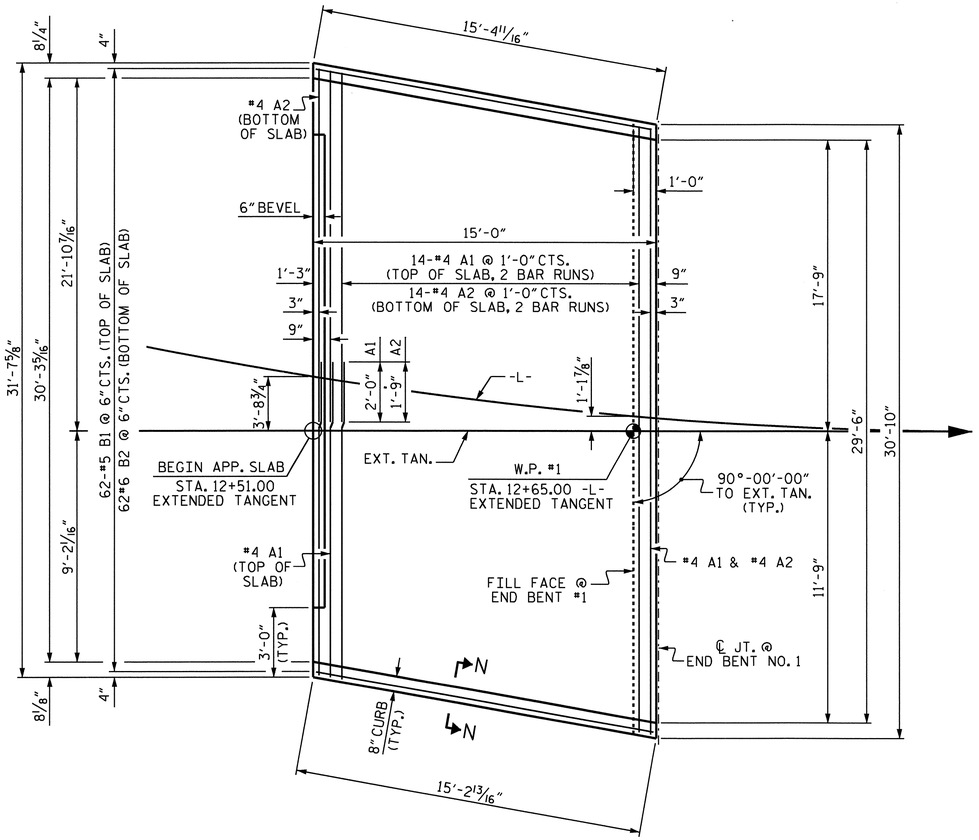
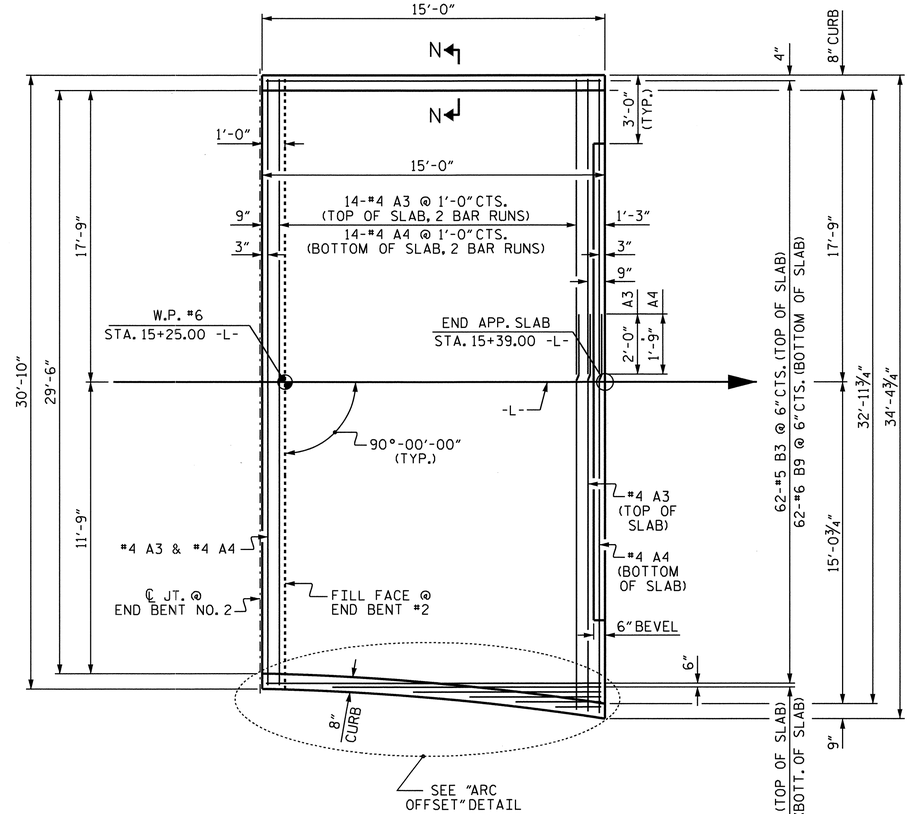
STR. #1



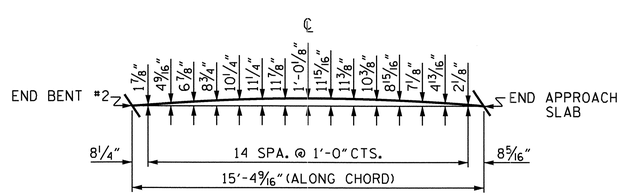
PLAN @ END BENT #1

NOTE: FOR EXTENDED TANGENT LAYOUT SEE GENERAL DRAWING SHEET 1 OF 3.

NOTE: FOR SECTION N-N SEE SHEET 2 OF 3.



PLAN @ END BENT #2



ARC OFFSETS - RIGHT SIDE

AT END BENT NO. 2 ONLY

PROJECT NO. B-3928

WATAUGA/ASHE COUNTY

STATION: 13+95.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.

01/11/10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			37

DRAWN BY : A. SORSENGINH DATE : 3/31/09

CHECKED BY : J.R. DUGGINS DATE : 12/09

11-JAN-2010 11:13
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NOTES

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

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 BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB AND SHALL EXTEND 1'-0" OUTSIDE OF EACH EDGE OF THE APPROACH 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 BE FLUSH WITH THE ROADWAY 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 BE FLUSH WITH THE ROADWAY 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.

FOR JOINT DETAILS, SEE "PRESTRESSED CONCRETE CORED SLAB UNIT" SHEETS.

THE JOINT AT THE END BENT SHALL BE GROUTED AS SOON AS PRACTICAL AFTER THE CONSTRUCTION OF THE APPROACH SLABS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

FOR #78M STONE BACKFILL INCLUDING FABRIC, SEE PIPE DRAIN DETAIL ON END BENTS SHEET 5 OF 5.

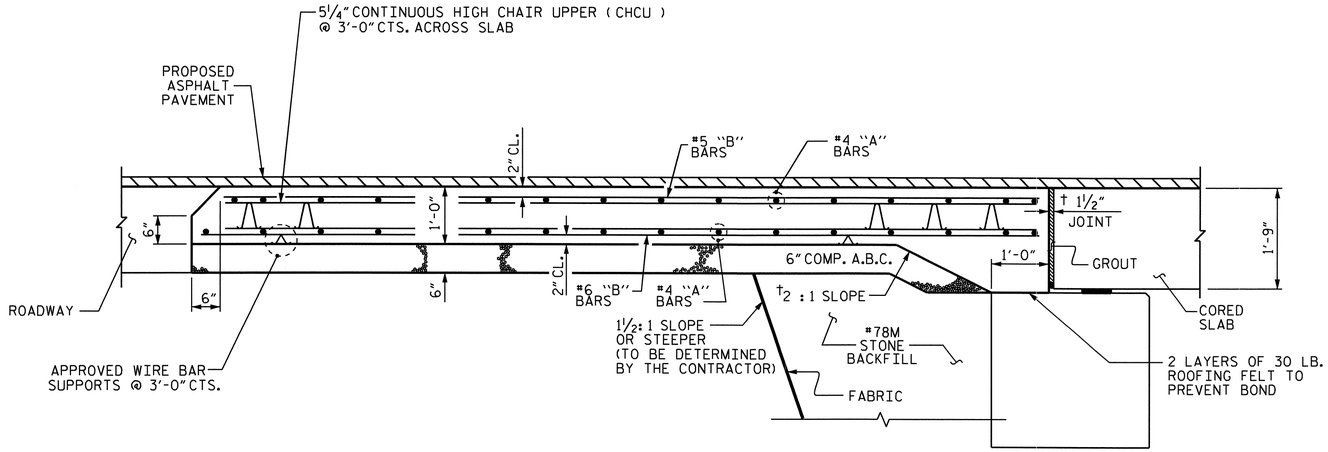
BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	32	#4	STR	16'-10"	360
A2	32	#4	STR	16'-8"	356
* B1	62	#5	STR	14'-4"	927
B2	62	#6	STR	14'-10"	1381
REINFORCING STEEL				LBS.	1737
* EPOXY COATED REINFORCING STEEL				LBS.	1287
CLASS AA CONCRETE				C.Y.	19.0

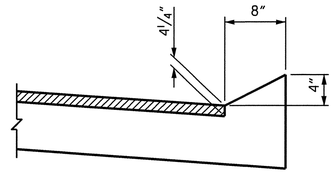
APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	32	#4	STR	17'-10"	381
A4	32	#4	STR	17'-8"	378
* B3	62	#5	STR	14'-4"	927
* B4	1	#5	STR	8'-9"	9
* B5	1	#5	STR	6'-6"	7
* B6	1	#5	STR	4'-9"	5
* B7	1	#5	STR	3'-3"	3
* B8	1	#5	STR	2'-0"	2
B9	62	#6	STR	14'-10"	1381
B10	1	#6	STR	9'-1"	14
B11	1	#6	STR	6'-6"	10
B12	1	#6	STR	4'-9"	7
B13	1	#6	STR	3'-3"	5
B14	1	#6	STR	2'-0"	3
REINFORCING STEEL				LBS.	1798
* EPOXY COATED REINFORCING STEEL				LBS.	1334
CLASS AA CONCRETE				C.Y.	19.4

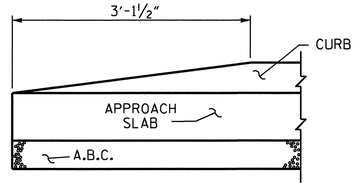


† NORMAL TO END BENT

SECTION THRU SLAB



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

PROJECT NO. B-3928

WATAUGA/ASHE COUNTY

STATION: 13+95.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED SLAB

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS
2			4			37

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
01/11/10

ASSEMBLED BY : A. SORSENGINH	DATE : 3/31/09	REV. 7/10/01	LES/RDR
CHECKED BY : J.R. DUGGINS	DATE : 12/09	REV. 5/7/03R	RWW/JTE
DRAWN BY : FCJ 6/87		REV. 5/1/06R	KMM/GM
CHECKED BY : EGA 6/87			

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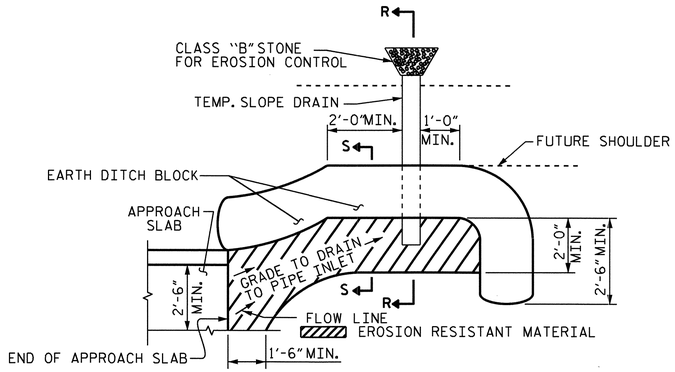
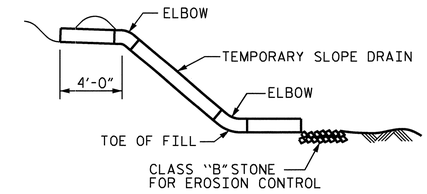
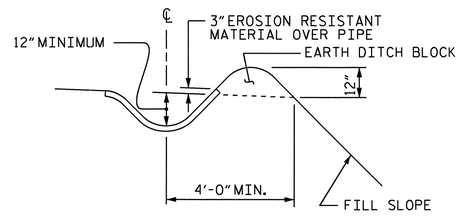


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 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



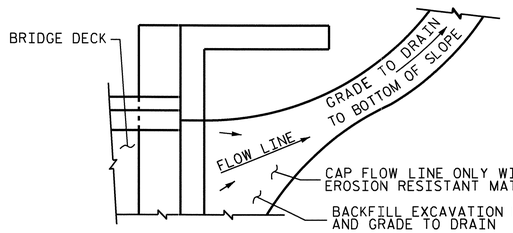
SECTION R-R



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

PROJECT NO. B-3928

WATAUGA/ASHE COUNTY

STATION: 13+95.00 -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-37
1			3			TOTAL SHEETS
2			4			37

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.

ASSEMBLED BY : A. SORSENGINH		DATE :	4/1/09
CHECKED BY : J.R. DUGGINS		DATE :	12/09
DRAWN BY : FCJ	11/88	REV. 10/17/00	RWW/LES
CHECKED BY : ARB	11/88	REV. 5/7/03	RWW/JTE
		REV. 5/1/06R	MAA/KMM

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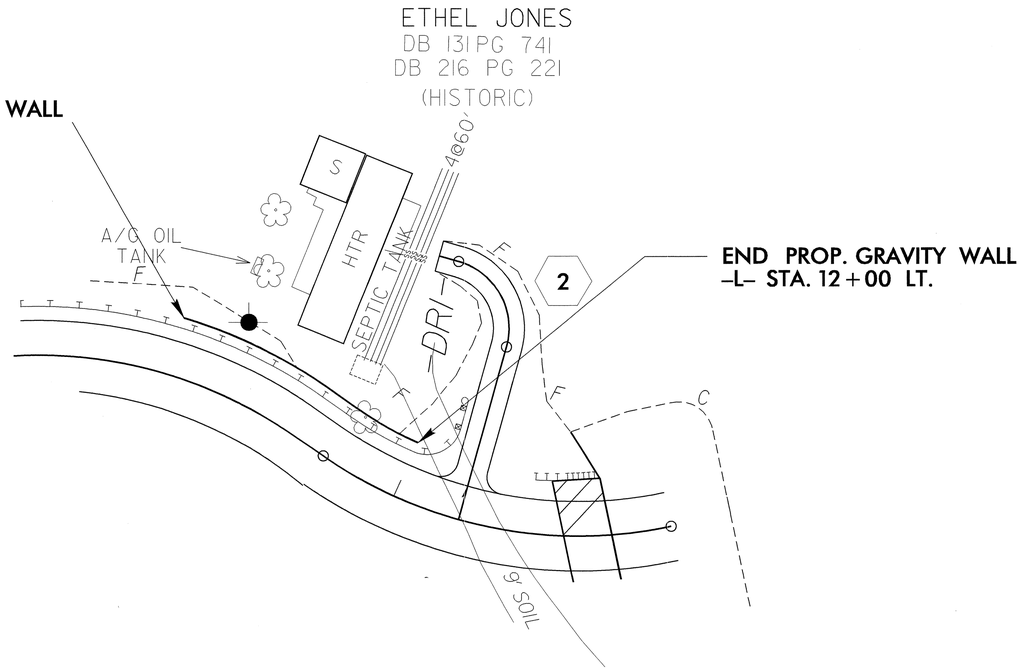
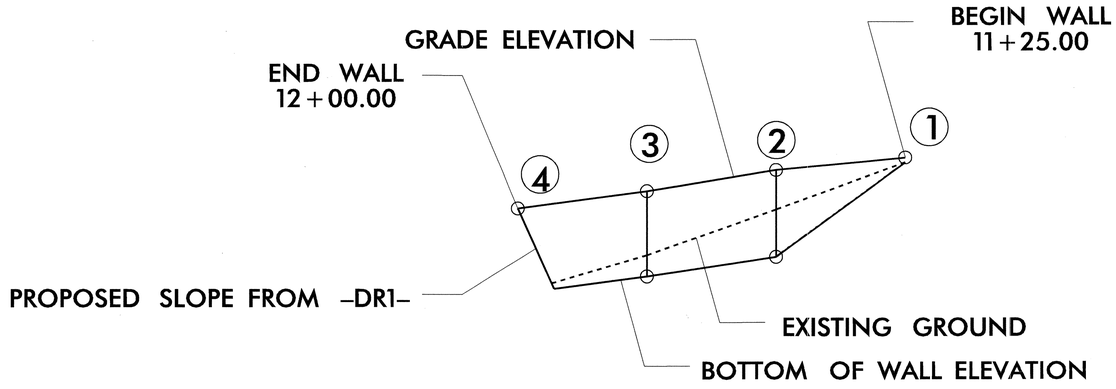
STD. NO. BAS10

GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26962 ENGINEER ERIC N. WILLIAMS SIGNATURE 11/9/09 DATE	SIGNATURE DATE



PLAN VIEW

SEGMENTAL GRAVITY RETAINING WALL 280 SF



FRONT FACE ELEVATION VIEW

PI#	–L– STA.	–L– OFFSET	ELEVATION GRADE	ELEVATION BOTTOM
1	11+25	– 17.00′	2930.58′	2930.58′
2	11+50	– 17.00′	2929.95′	2925.75′
3	11+75	– 17.00′	2928.93′	2924.80′
4	12+00	– 17.00′	2928.08′	2928.08′

PROJECT NO.: 33361.1.1 (B-3928)

WATAUGA *COUNTY*

STATION: 11+25 TO 12+00 -L-

SHEET 1 OF 2

PREPARED BY: E. WILLIAMS, PE	DATE: 9/09
REVIEWED BY: D. TEAGUE, PE	DATE: 9/09

GEOTECHNICAL ENGINEERING UNIT

☐ *EASTERN REGIONAL OFFICE*

☐ *WESTERN REGIONAL OFFICE*

☒ *CONTRACT OFFICE*

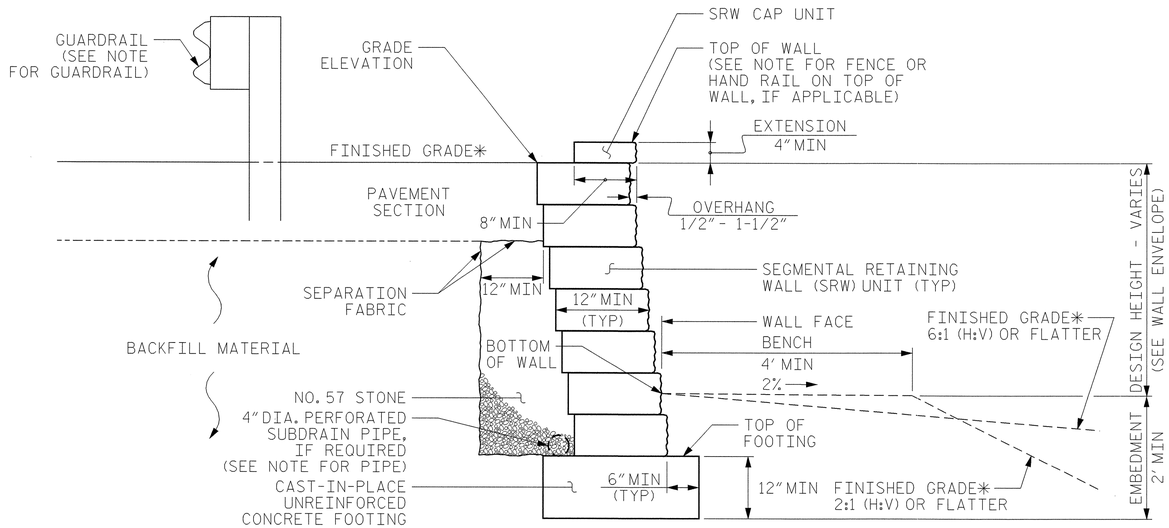
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SEGMENTAL GRAVITY WALL
PLAN AND ELEVATION VIEW

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-1
1			3			TOTAL SHEETS
2			4			2

GEC242749 11/9/2009 b3928_geo_rwal_segmentalgravity_eng ewilliams GEC-Oce860-34bond

GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26962 ENGINEER ERIC N. WILLIAMS SIGNATURE 11/9/09 DATE	SIGNATURE DATE



SEGMENTAL GRAVITY WALL WITH SRW CAP UNIT TYPICAL SECTION

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.

NOTES

FOR SEGMENTAL GRAVITY RETAINING WALLS, SEE SEGMENTAL GRAVITY RETAINING WALLS PROVISION.

FOR GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.

FREEZE-THAW DURABLE SEGMENTAL RETAINING WALL UNITS ARE REQUIRED IN ACCORDANCE WITH THE SEGMENTAL GRAVITY RETAINING WALLS PROVISION.

A SUBDRAIN PIPE IS NOT REQUIRED FOR RETAINING WALL.

BEFORE BEGINNING SEGMENTAL GRAVITY WALL DESIGN, SURVEY EXISTING GROUND ELEVATIONS SHOWN ON THE WALL PROFILE VIEW (WALL ENVELOPE) AND SUBMIT A REVISED WALL ENVELOPE FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THIS ENVELOPE IS ACCEPTED.

DESIGN RETAINING WALL FOR WALL HEIGHTS EQUAL TO THE DESIGN HEIGHT PLUS DEPTH TO TOP OF FOOTING (DIFFERENCE BETWEEN GRADE ELEVATION AND TOP OF FOOTING ELEVATION).

DESIGN RETAINING WALL FOR THE FOLLOWING:
1) MINIMUM SERVICE LIFE = 75 YEARS
2) ALLOWABLE BEARING CAPACITY = 2000 PSF
3) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (gamma) PCF	FRICTION ANGLE (phi) DEGREES	COHESION (c) PSF
BACKFILL	120	30	0
FOUNDATION	120	30	0

DESIGN RETAINING WALL FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

DO NOT PLACE CONCRETE FOR FOOTINGS FOR RETAINING WALL UNTIL OBTAINING APPROVAL OF THE EXCAVATION DEPTH AND FOUNDATION MATERIAL.

USE SRW CAP UNITS AT TOP OF WALLS.

PREPARED BY: E. WILLIAMS, PE	DATE: 9/09
REVIEWED BY: D. TEAGUE, PE	DATE: 9/09

PROJECT NO.: 33361.1.1 (B-3928)

WATAUGA ***COUNTY***

STATION: 11+25 TO 12+00 -L-

SHEET 2 OF 2

GEOTECHNICAL ENGINEERING UNIT

☐ ***EASTERN REGIONAL OFFICE***
☐ ***WESTERN REGIONAL OFFICE***
☒ ***CONTRACT OFFICE***

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

SEGMENTAL GRAVITY WALL W/ SURCHARGE AND GUARDRAIL TYPICALS, & NOTES

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-2
1			3			TOTAL SHEETS
2			4			2

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 2006 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN

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

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