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

*DESIGN EXCEPTION:
SAG VERTICAL CURVE K
CREST VERTICAL CURVE K



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CONTRACT NO:

TIP: B-4579

EXISTING BRIDGE #134
25'-0" CLEAR ROADWAY
SPAN: 1 @ 30'-6"
TIMBER DECK ON I-BEAMS
END BENTS: TIMBER CAPS, POSTS
AND SILLS, TIMBER BULKHEADS

TBM #2:
RR SPIKE SET IN 30° OAK
STA. 16+82.58 -L-, 148.22' LT.
ELEV. 673.30'

HYDRAULIC DATA:

DESIGN DISCHARGE - 1373 CFS
FREQUENCY OF DESIGN FLOOD - 25 YEAR
DESIGN HIGH WATER ELEVATION - 676.9
DRAINAGE AREA - 4.3 SQ. MI.
BASIC DISCHARGE (Q 100) - 1392 CFS
BASIC HIGH WATER ELEVATION - 678.3

OVERTOPPING FLOOD DATA:

OVERTOPPING DISCHARGE - 5250 CFS
FREQUENCY OF OVERTOPPING FLOOD - 500+ YEAR
OVERTOPPING FLOOD ELEVATION - 683.3

NOTES

FOR PILES, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR CONSTRUCTION OF SUPERSTRUCTURE, SEE SPECIAL PROVISIONS.

FOR CONSTRUCTION OF SUBSTRUCTURE, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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 THE DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

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

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR SEISMIC PERFORMANCE ZONE 1.

IN AS MUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1, OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 16+97.50".

DRIVE PILES AT END BENTS NO. 1 AND NO. 2 TO A DRIVING RESISTANCE OF 158 KIPS PER PILE.

THE FACTORED RESISTANCE FOR PILES AT END BENTS NO. 1 AND NO. 2 IS 95 KIPS PER PILE. A RESISTANCE FACTOR OF 0.6 IS APPLIED.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS ELEVATION 671 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THE QUANTITY OF RIP RAP TO BE PAID FOR WILL BE THE ACTUAL NUMBER OF TONS OF EACH CLASS OF RIP RAP WHICH HAS BEEN INCORPORATED INTO THE COMPLETED AND ACCEPTED WORK. THE RIP RAP WILL BE MEASURED BY BEING WEIGHED IN TRUCKS ON CERTIFIED PLATFORM SCALES OR OTHER CERTIFIED WEIGHING DEVICES. THE QUANTITY OF RIP RAP WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER TON.

PLAIN RIP RAP CLASS II (2'-0" THICK) & FILTER FABRIC

END BENT #1	185 TONS &	205 SY FILTER FABRIC
END BENT #2	160 TONS &	180 SY FILTER FABRIC
TOTAL	345 TONS &	385 SY FILTER FABRIC

DRILLED PIER NOTES

DRILLED PIERS AT BENT NO. 1 ARE DESIGNED FOR BOTH SKIN FRICTION AND END BEARING. CHECK FIELD CONDITIONS FOR THE REQUIRED ULTIMATE END BEARING RESISTANCE OF 30 TSF.

DRILLED PIERS AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 600 KIPS EACH AT THE TOP OF THE COLUMN.

PERMANENT STEEL CASING WILL BE REQUIRED FOR DRILLED PIERS AT BENT NO. 1 DOWN TO ELEVATION 643 FT. DO NOT EXTEND PERMANENT CASING BELOW ELEVATION 643 FEET WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

INSTALL DRILLED PIERS AT BENT NO. 1 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 630 FEET AND SATISFY THE REQUIRED ULTIMATE RESISTANCE.

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

FOR DRILLED PIERS, SEE DRILLED PIER SPECIAL PROVISION.

WBS NO. 33417.3.1
MECKLENBURG COUNTY
STATION: 16+97.50 -L-

REPLACES BRIDGE NO. 134



PLANS PREPARED BY:

SIMPSON
ENGINEERS
& ASSOCIATES

5520 Dillard Drive
Suite 120
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com

LICENSURE NO. C2521

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
(BRIDGE ON SR 2025 OVER
MCINTYRE CREEK)

30' CLEAR ROADWAY - 120° SKEW

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

PLAN

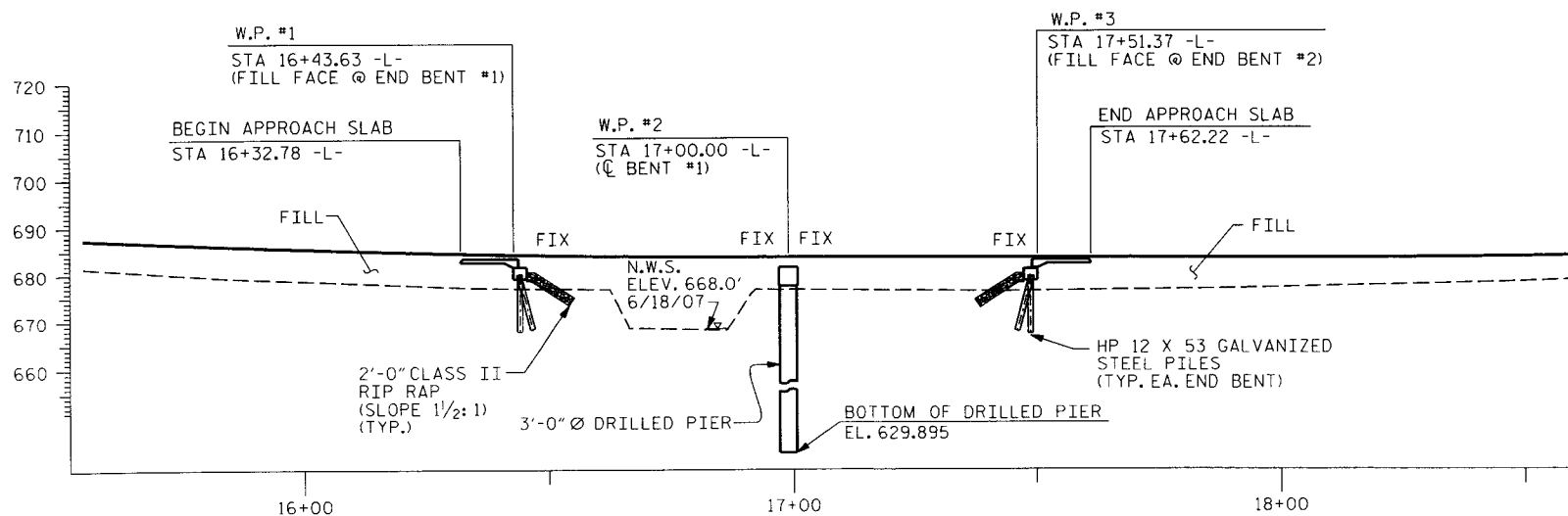
SCALE: 1"=20'

- ⊗ DENOTES GEO-TECH BORE HOLE LOCATIONS.
- * DENOTES GUARDRAIL CONNECTION REQ'D., SEE "GUARDRAIL ANCHOR UNIT" SHEET.

GRADE DATA -L- (S.R. #2025)

PVI STA. 15+60.00
ELEV. 684.03'
VC = 260'

(-10.0324%) (-10.3000%)



PROFILE ALONG C SURVEY

SCALE: 1"=20'

DRAWN BY: D. G. VESTER DATE: 10/10
CHECKED BY: M. A. AVERETTE DATE: 10/10

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

State Line	
County Line	
Township Line	
City Line	
Reservation Line	
Property Line	
Existing Iron Pin	EP
Property Corner	
Property Monument	EQM
Parcel/Sequence Number	(23)
Existing Fence Line	X-X-X
Proposed Woven Wire Fence	—○—
Proposed Chain Link Fence	—□—
Proposed Barbed Wire Fence	—◇—
Existing Wetland Boundary	WLB
Proposed Wetland Boundary	WLB
Existing Endangered Animal Boundary	EAB
Existing Endangered Plant Boundary	EPB

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○
Well	W
Small Mine	✕
Foundation	
Area Outline	
Cemetery	
Building	
School	
Church	
Dam	

HYDROLOGY:

Stream or Body of Water	
Hydro, Pool or Reservoir	
Jurisdictional Stream	JS
Buffer Zone 1	BZ 1
Buffer Zone 2	BZ 2
Flow Arrow	
Disappearing Stream	
Spring	
Wetland	
Proposed Lateral, Tail, Head Ditch	
False Sump	

RAILROADS:

Standard Gauge	CSX TRANSPORTATION
RR Signal Milepost	MILEPOST 35
Switch	SWITCH
RR Abandoned	
RR Dismantled	

RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	
Proposed Right of Way Line	—R—
Proposed Right of Way Line with Iron Pin and Cap Marker	—R—▲
Proposed Right of Way Line with Concrete or Granite Marker	—R—●
Existing Control of Access	—C/A—
Proposed Control of Access	—C/A—
Existing Easement Line	E
Proposed Temporary Construction Easement	E
Proposed Temporary Drainage Easement	TDE
Proposed Permanent Drainage Easement	PDE
Proposed Permanent Utility Easement	PUE

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	
Existing Curb	
Proposed Slope Stakes Cut	C
Proposed Slope Stakes Fill	F
Proposed Wheel Chair Ramp	WCR
Existing Metal Guardrail	
Proposed Guardrail	
Existing Cable Guiderail	
Proposed Cable Guiderail	
Equality Symbol	
Pavement Removal	

VEGETATION:

Single Tree	☼
Single Shrub	☼
Hedge	
Woods Line	
Orchard	
Vineyard	Vineyard

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	CONC
Bridge Wing Wall, Head Wall and End Wall	CONC WW
MINOR:	
Head and End Wall	CONC HW
Pipe Culvert	
Footbridge	
Drainage Box: Catch Basin, DI or JB	CB
Paved Ditch Gutter	
Storm Sewer Manhole	S
Storm Sewer	S

UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊕
Power Line Tower	⊗
Power Transformer	⊗
U/G Power Cable Hand Hole	PH
H-Frame Pole	●
Recorded U/G Power Line	P
Designated U/G Power Line (S.U.E.*)	P

TELEPHONE:

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

WATER:

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

TV:

TV Satellite Dish	⊕
TV Pedestal	⊕
TV Tower	⊕
U/G TV Cable Hand Hole	PH
Recorded U/G TV Cable	TV
Designated U/G TV Cable (S.U.E.*)	TV
Recorded U/G Fiber Optic Cable	TV FO
Designated U/G Fiber Optic Cable (S.U.E.*)	TV FO

GAS:

Gas Valve	◇
Gas Meter	⊕
Recorded U/G Gas Line	G
Designated U/G Gas Line (S.U.E.*)	G
Above Ground Gas Line	A/G Gas

SANITARY SEWER:

Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	SS
Above Ground Sanitary Sewer	A/G Sanitary Sewer
Recorded SS Forced Main Line	FSS
Designated SS Forced Main Line (S.U.E.*)	FSS

MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line	UTIL
U/G Tank; Water, Gas, Oil	
A/G Tank; Water, Gas, Oil	
U/G Test Hole (S.U.E.*)	⊕
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

GENERAL NOTES:

2006 SPECIFICATIONS
EFFECTIVE: 07-18-06
REVISED: 07-30-08

GRADE LINE:
GRADING AND SURFACING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

SUBSURFACE PLANS:

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

END BENTS:

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

UTILITIES:

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

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

PROJECT REFERENCE		SHEET NO.	
B-4579		4	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
GIBSON ENGINEERS, PC LICENSE C-2487			
Prepared in the Office of: 			

APPROXIMATE GUARDRAIL LENGTH				
STATION	LOCATION	STATION	LOCATION	LENGTH
-L- 14+23.16 +/-	RT	-L- 16+35.66 +/-	RT	212.5'
-L- 14+39.29 +/-	LT	-L- 16+51.79 +/-	LT	212.5'
-L- 17+43.18 +/-	RT	-L- 17+77.47 +/-	RT	50'
-L- 17+59.32 +/-	LT	-L- 19+71.82 +/-	LT	212.5'
SUBTOTAL				687.5
ANCHOR DEDUCTIONS				231.25'
TOTAL				456.25
SAY				462.5'

ANCHOR DEDUCTIONS		
GRAU-350	3 X 50'	150'
TYPE B-77	4 X 18.75'	75'
AT-1	1 X 6.25'	6.25'
TOTAL ANCHOR DEDUCTIONS		231.25'

APPROXIMATE GUARDRAIL LENGTH				
STATION	LOCATION	STATION	LOCATION	LENGTH
-L- 17+77.47 +/-	RT	SHOP CURVED		25'
SHOP CURVED TOTAL				25'
SAY				25'

2006 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated July 18, 2006 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.10	Reinforced Bridge Approach Fills
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
876.04	Drainage Ditches with Class 'B' Rip Rap

CREST VERTICAL CURVE K



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

FLEXIBLE PIPE

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

7-06

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
FILL HEIGHT TABLES

Round Corrugated Steel Pipe
2 2/3 x 1/2 corrugation **

Diameter (inches)	Minimum cover (inches)	(Ga)	16	14	12	10	8
12	12	204	256				
15	12	162	204				
18	12	135	169	239			
21	12	115	145	204			
24	12	100	126	178			
30	12	79	100	142			
36	12	65	83	117	152		
42	12	55	70	100	130	160	
48	12	48	61	87	113	139	
54	12		54	77	100	123	
60	12			69	90	111	
66	12				81	100	
72	12				74	91	
78	12					81	
84	12					89	

Round Corrugated Aluminum Pipe
2 2/3 x 1/2 corrugation **

Diameter (inches)	Minimum cover (inches)	(Ga)	16	14	12	10	8
12	12	123	153	218	281	344	
15	12	98	123	174	224	275	
18	12	81	102	144	187	228	
21	12	69	87	123	160	195	
24	12	60	76	108	139	171	
27	12		67	95	123	151	
30	12		60	85	111	136	
36	12		50	71	92	113	
42	12			60	78	96	
48	12			52	68	84	
54	12			46	50	74	
60	12				50	62	
66	12					51	
72	12					41	

** FOR DIFFERENT CORRUGATIONS AND ARCH PIPES REFER TO
ROADWAY DESIGN MANUAL OR MANUFACTURERS SPECIFICATION.

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

CSP - AASHTO M36
CAAP - AASHTO M196
HDPE - AASHTO M294
PVC - ASTM F949 or AASHTO M304

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING
AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

1' MINIMUM COVER FOR ALL SIDE DRAIN PIPE
IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

RIGID PIPE

RCP - * (Minimum fill) 1' for Class IV & CLASS V
2' for Class III & Class II

* (Maximum fill) 10' - Class II pipe
20' - Class III pipe
30' - Class IV pipe
40' - Class V pipe

(For fills > 40' & < 80' use LRFD Direct Design Method)

* FILL HEIGHT IS MEASURED FROM THE TOP OF THE PIPE
TO THE BOTTOM OF THE PAVEMENT STRUCTURE

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

RCP - AASHTO M170

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING
AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

1' MINIMUM COVER FOR ALL SIDE DRAIN PIPE
IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

SHEET 3 OF 3
300D01

SHEET 3 OF 3
300D01

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
FILL HEIGHT TABLES

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

7-06

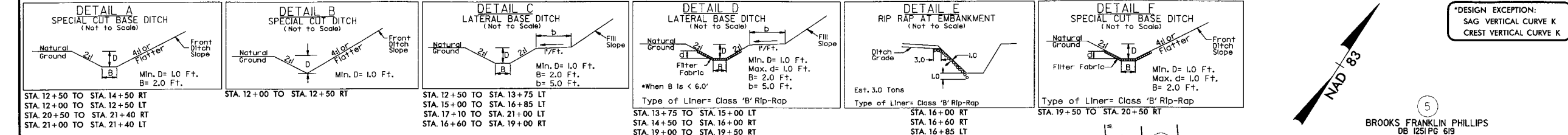
PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

SEE PLATE FOR TITLE

ORIGINAL BY: KKempf DATE: 5-15-09
MODIFIED BY: DATE:
CHECKED BY: DATE:
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PROJECT REFERENCE NO.
B-4579

SHEET NO.
7



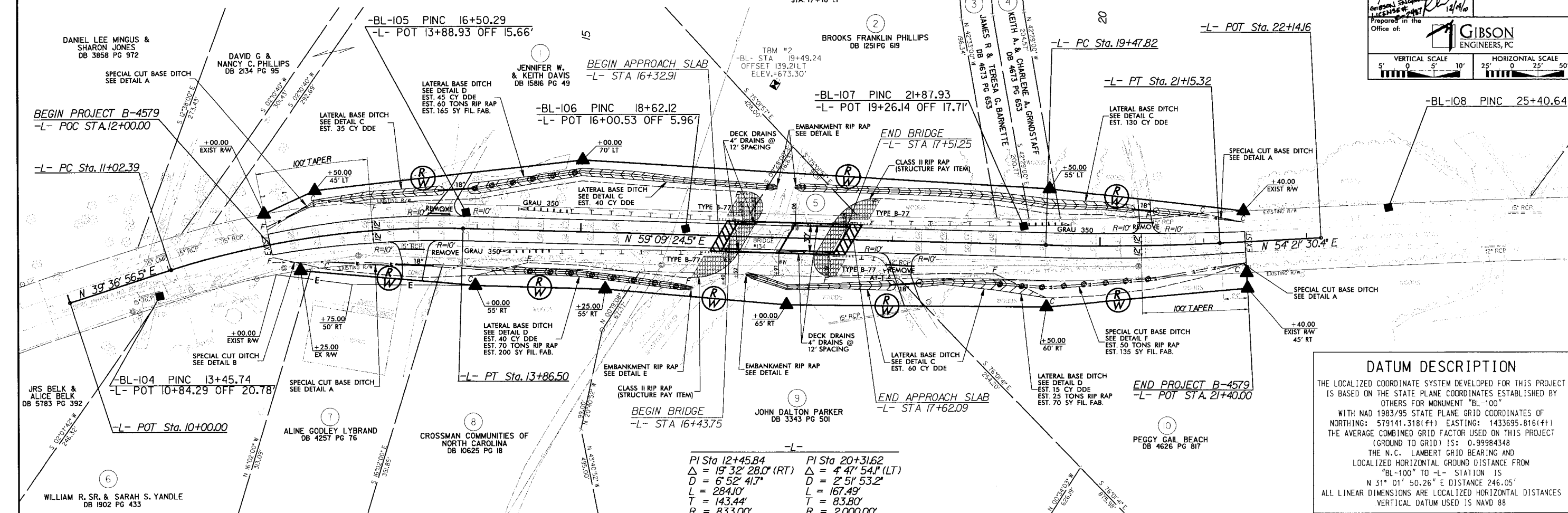
PROJECT REFERENCE
B-4579
ROADWAY DESIGN
ENGINEER
HYDRAULICS
ENGINEER

MICHAEL PHILLIPS
Professional Engineer
No. 27391
N.C.

GIBSON
ENGINEERS, PC

VERTICAL SCALE
5' 0' 5' 10'

HORIZONTAL SCALE
25' 0' 25' 50'



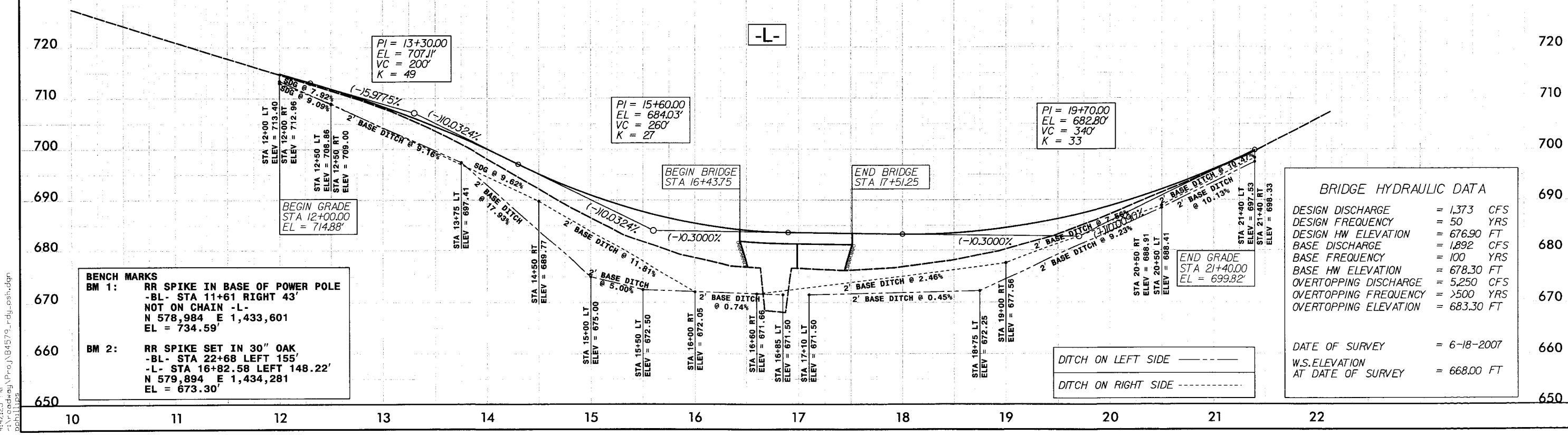
DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY OTHERS FOR MONUMENT "BL-100".

WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF:
NORTHING: 579141.318 (ft) EASTING: 1433695.816 (ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99984348

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BL-100" TO -L- STATION IS:
N 31° 01' 50.26" E DISTANCE 246.05'

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



BENCH MARKS

BM 1: RR SPIKE IN BASE OF POWER POLE
-BL- STA 11+61 RIGHT 43'
NOT ON CHAIN -L-
N 578,984 E 1,433,601
EL = 734.59'

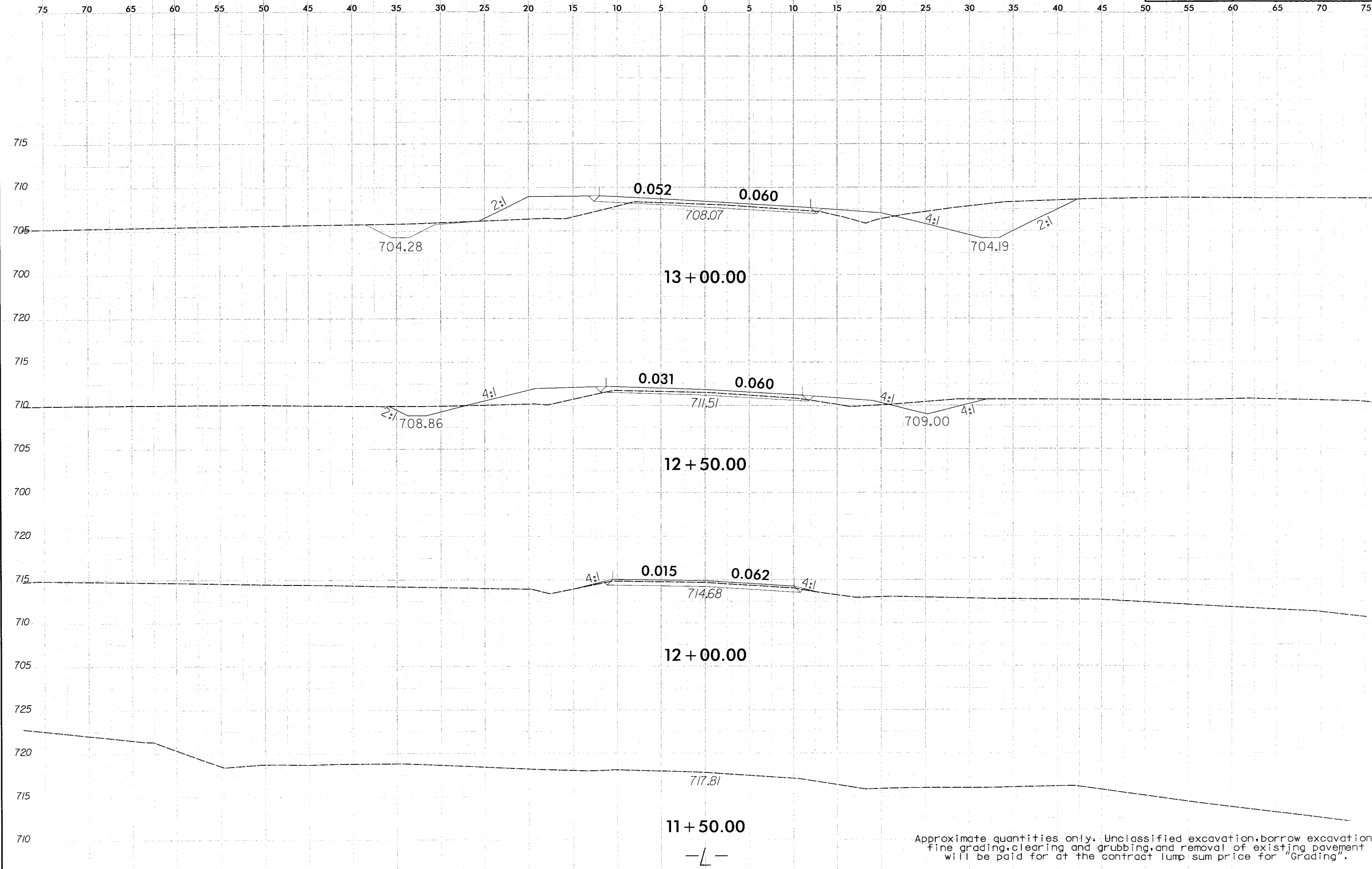
BM 2: RR SPIKE SET IN 30" OAK
-BL- STA 22+68 LEFT 155'
-L- STA 16+82.58 LEFT 148.22'
N 579,894 E 1,434,281
EL = 673.30'

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1,373 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 676.90 FT
BASE DISCHARGE	= 1,892 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 678.30 FT
OVERTOPPING DISCHARGE	= 5,250 CFS
OVERTOPPING FREQUENCY	= >500 YRS
OVERTOPPING ELEVATION	= 683.30 FT

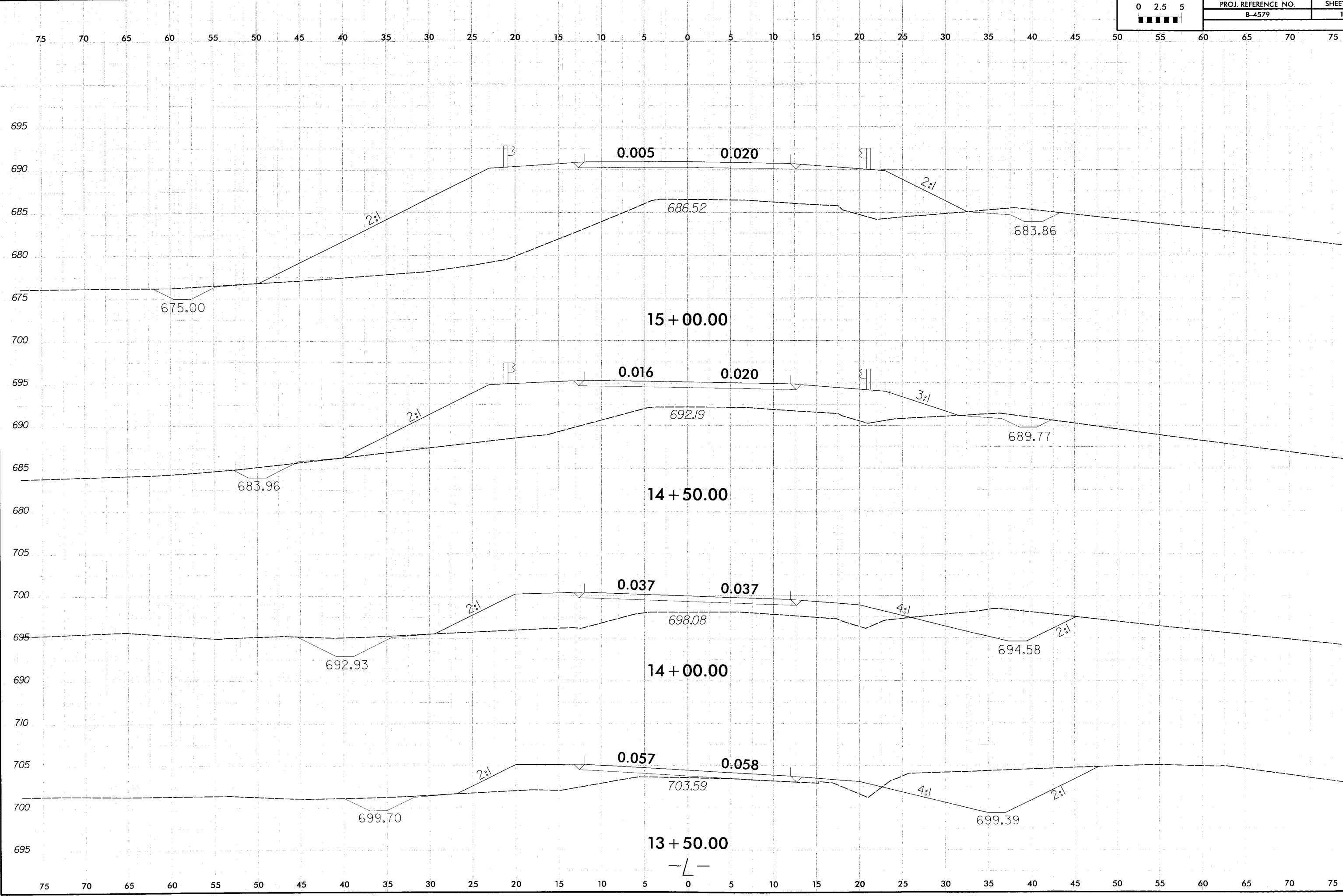
DATE OF SURVEY = 6-18-2007
W.S. ELEVATION AT DATE OF SURVEY = 668.00 FT

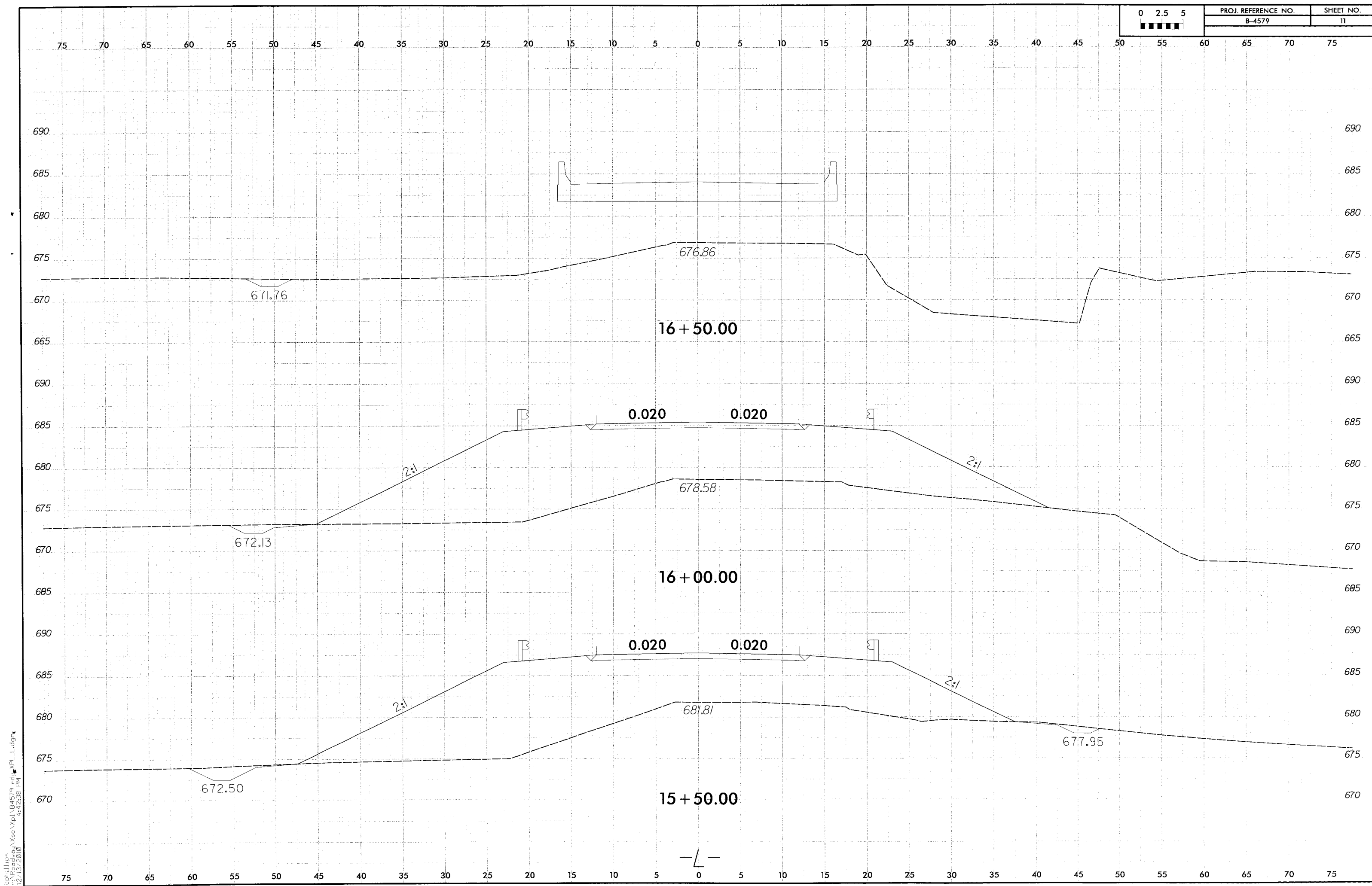
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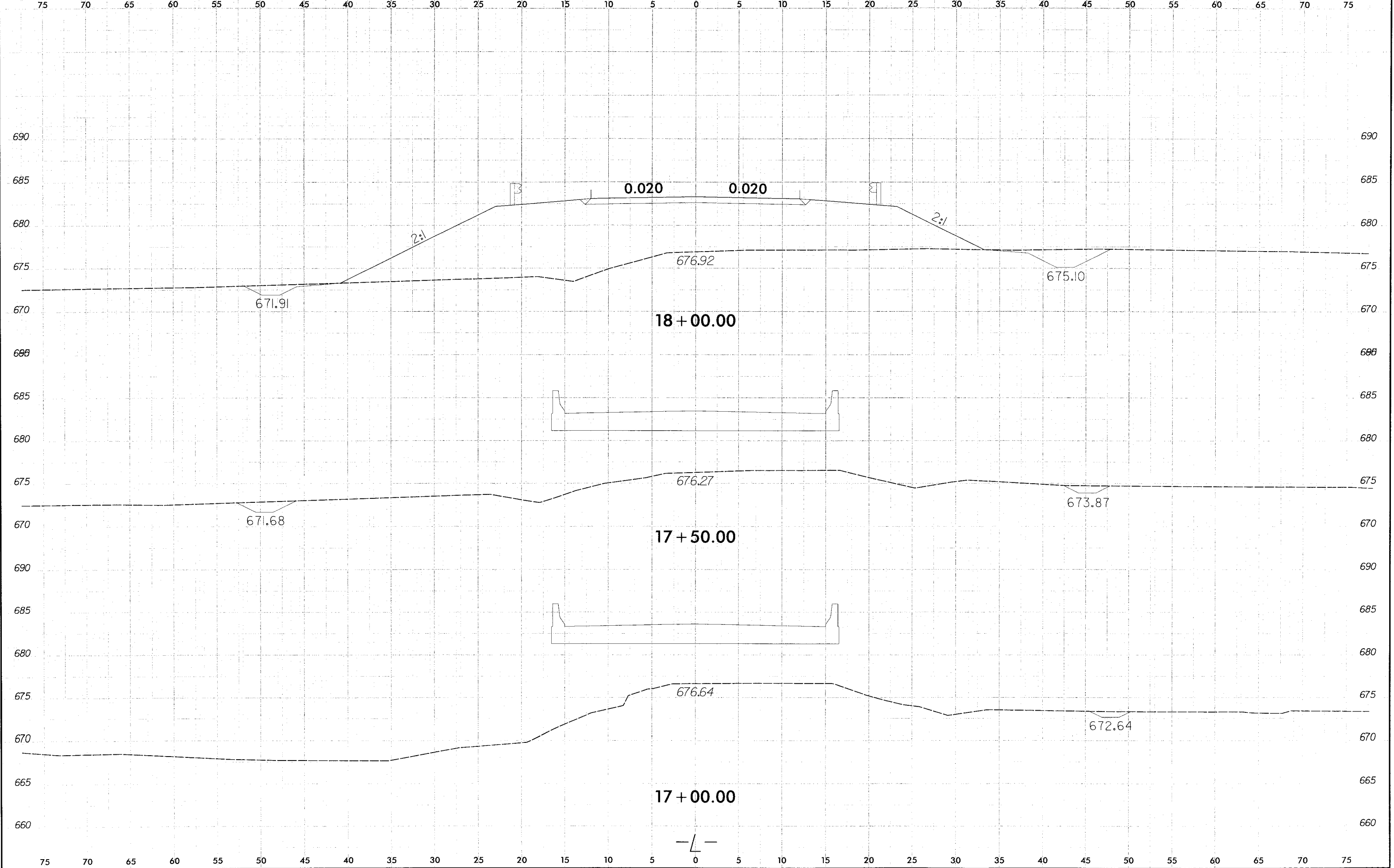


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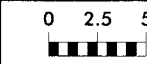
Approximate quantities only. Unclassified excavation, borrow excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the contract lump sum price for "Grading".





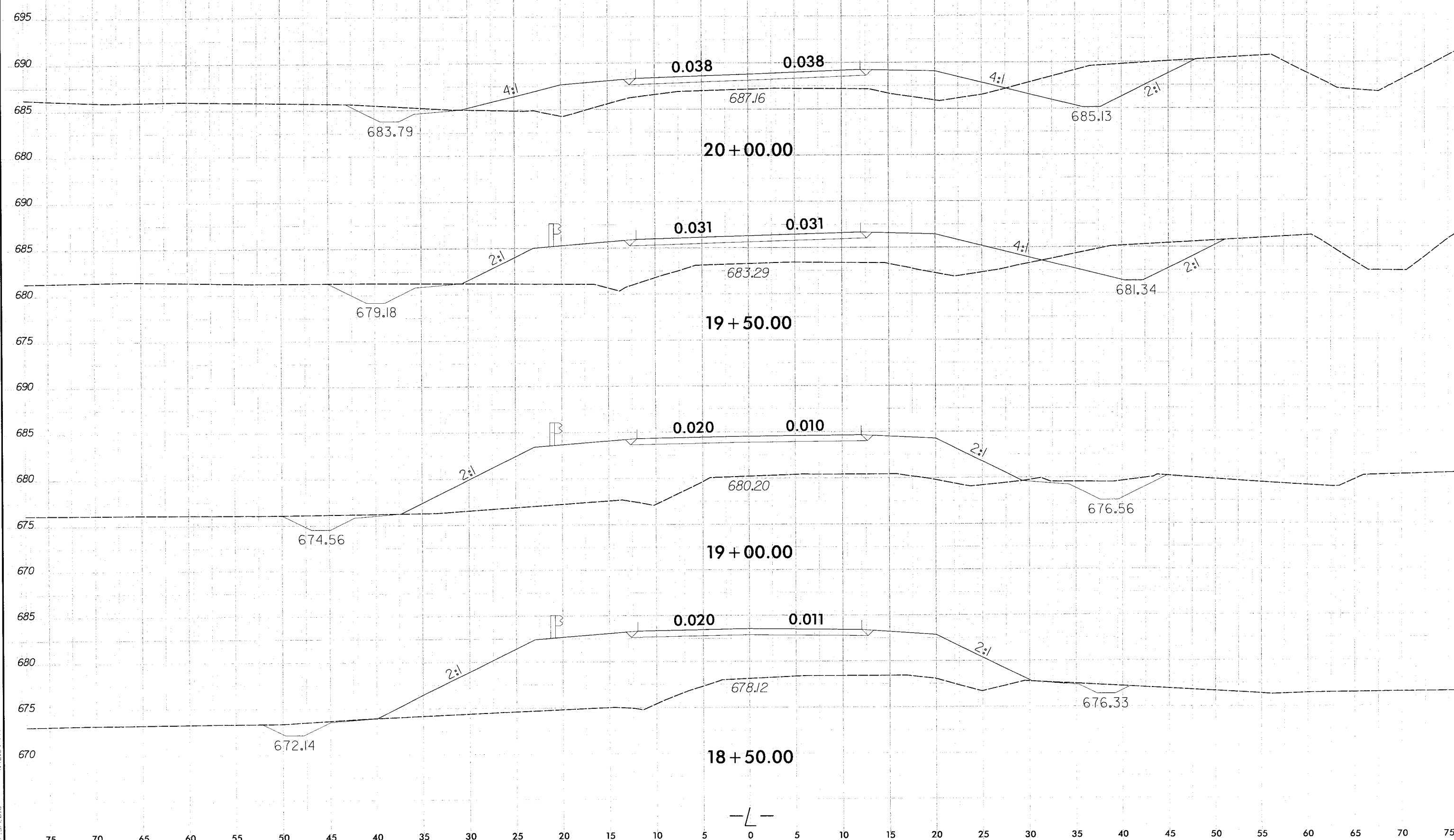


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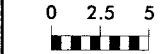


PROJ. REFERENCE NO.	SHEET NO.
B-4579	13

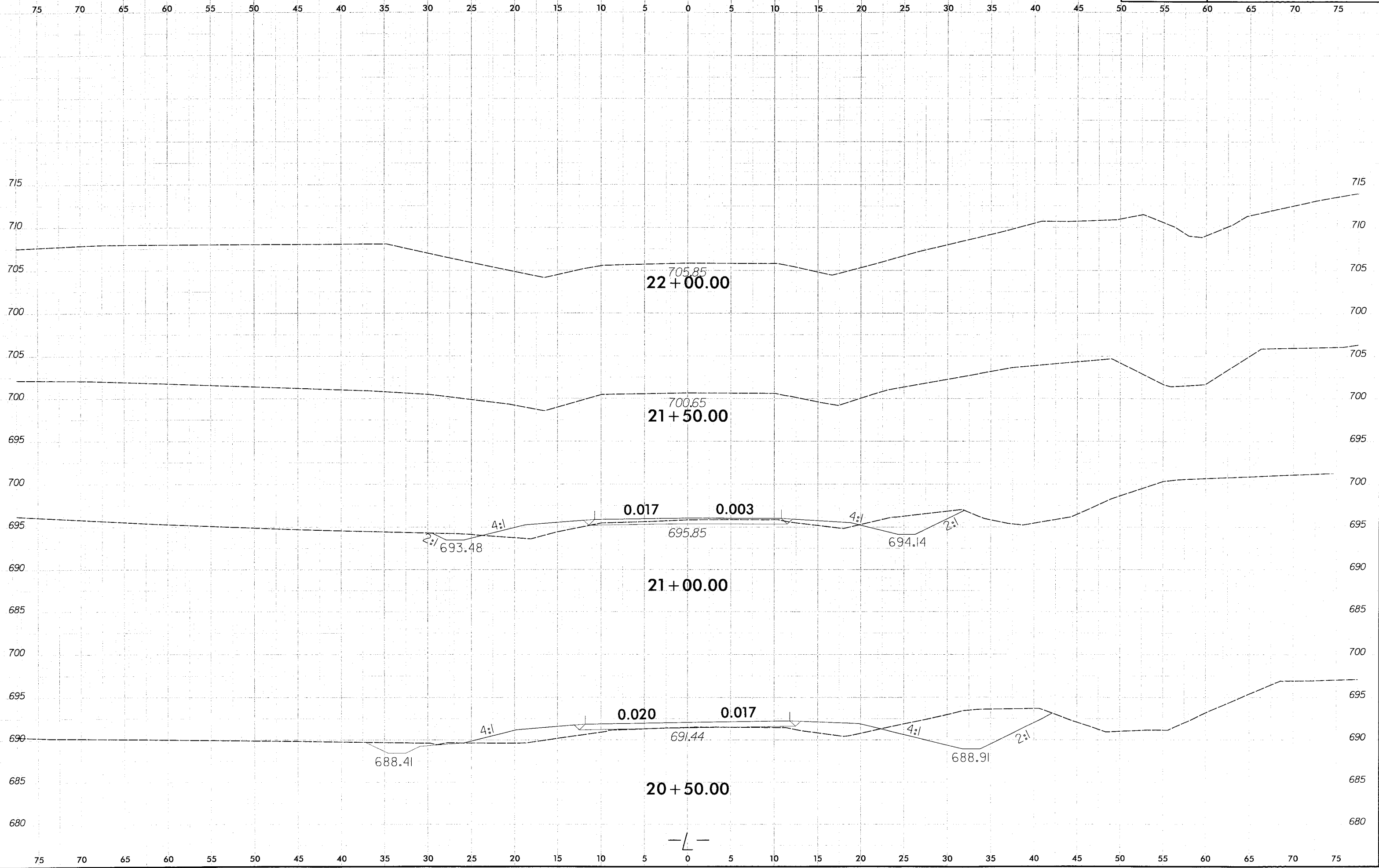
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PROJ. REFERENCE NO.	SHEET NO.
B-4579	14



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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 × RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER		
						LIVE-LOAD FACTORS (γ _{LL})	MOMENT					SHEAR					LIVE-LOAD FACTORS (γ _{LL})	MOMENT						
							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)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION		DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	⬡1	1.09	--	1.75	0.265	1.09	B	I	25.0	0.6	1.20	B	I	5	0.80	0.297	1.46	B	EL	25	1	
	HL-93 (OPERATING)	N/A		1.42	--	1.35	0.265	1.42	B	I	25.0	0.6	1.55	B	I	5	N/A	--	--	--	--	--	1	
	HS-20 (INVENTORY)	36.000	⬡2	1.35	48.6	1.75	0.265	1.35	B	I	25.0	0.6	1.87	B	I	5	0.80	0.297	1.81	B	EL	25	1	
	HS-20 (OPERATING)	36.000		1.75	63.0	1.35	0.265	1.75	B	I	25.0	0.6	2.43	B	I	5	N/A	--	--	--	--	--	1	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.44	46.4	1.40	0.265	3.44	B	I	25.0	0.6	6.09	B	I	5	0.80	0.297	3.68	B	EL	25	1
		SNGARBS2	20.000		2.72	54.4	1.40	0.265	2.72	B	I	25.0	0.6	4.39	B	I	5	0.80	0.297	2.91	B	EL	25	1
		SNAGRIS2	22.000		2.65	58.3	1.40	0.265	2.65	B	I	25.0	0.6	4.08	B	I	5	0.80	0.297	2.83	B	EL	25	1
		SNCOTTS3	27.250		1.72	46.9	1.40	0.265	1.72	B	I	25.0	0.6	2.69	B	I	5	0.80	0.297	1.84	B	EL	25	1
		SNAGGRS4	34.925		1.49	52.0	1.40	0.265	1.49	B	I	25.0	0.6	2.22	B	I	5	0.80	0.297	1.60	B	EL	25	1
		SNS5A	35.550		1.46	51.9	1.40	0.265	1.46	B	I	25.0	0.6	2.31	B	I	5	0.80	0.297	1.56	B	EL	25	1
		SNS6A	39.950		1.36	54.3	1.40	0.265	1.36	B	I	25.0	0.6	1.97	B	I	5	0.80	0.297	1.46	B	EL	25	1
		SNS7B	42.000		1.30	54.6	1.40	0.265	1.30	B	I	25.0	0.6	1.90	B	I	5	0.80	0.297	1.39	B	EL	25	1
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.67	55.1	1.40	0.265	1.67	B	I	25.0	0.6	2.60	B	I	5	0.80	0.297	1.79	B	EL	25	1
		TNT4A	33.075		1.68	55.6	1.40	0.265	1.68	B	I	25.0	0.6	2.46	B	I	5	0.80	0.297	1.80	B	EL	25	1
		TNT6A	41.600		1.40	58.2	1.40	0.265	1.40	B	I	25.0	0.6	2.36	B	I	5	0.80	0.297	1.50	B	EL	25	1
		TNT7A	42.000		1.42	59.6	1.40	0.265	1.42	B	I	25.0	0.6	2.07	B	I	5	0.80	0.297	1.52	B	EL	25	1
		TNT7B	42.000		1.48	62.2	1.40	0.265	1.48	B	I	25.0	0.6	1.76	B	I	5	0.80	0.297	1.59	B	EL	25	1
		TNAGRIT4	43.000		1.41	60.6	1.40	0.265	1.41	B	I	25.0	0.6	1.57	B	I	5	0.80	0.297	1.51	B	EL	25	1
TNAGT5A		45.000		1.31	59.0	1.40	0.265	1.31	B	I	25.0	0.6	1.66	B	I	5	0.80	0.297	1.41	B	EL	25	1	
TNAGT5B		45.000	⬡3	1.29	58.1	1.40	0.265	1.29	B	I	25.0	0.6	1.36	B	I	5	0.80	0.297	1.38	B	EL	25	1	

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			
FUTURE			

NOTES:

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

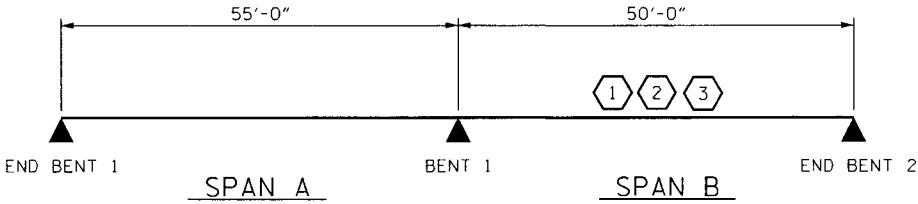
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

1. LEFT AND RIGHT EXTERIOR SLABS HAVE THE SAME RATING.

2.
3.
4.

#	CONTROLLING LOAD RATING
①	DESIGN LOAD RATING (HL-93)
②	DESIGN LOAD RATING (HS-20)
③	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER EL - EXTERIOR LEFT GIRDER ER - EXTERIOR RIGHT GIRDER	



LRFR SUMMARY

WBS NO. 33417.3.1
MECKLENBURG COUNTY
STATION: 16+97.50 -L-

REPLACES BRIDGE NO.134



PLANS PREPARED BY:

SEMPSON & ASSOCIATES
ENGINEERS

5520 Dillard Drive
Suite 120
Cory, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.sempsonengr.com

LICENSURE NO. C2521

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR
PRESTRESSED
CORED SLABS
(NON-INTERSTATE TRAFFIC)
30' CLEAR ROADWAY - 120° SKEW

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

ASSEMBLED BY : D. G. VESTER	DATE : 2/11
CHECKED BY : M. A. AVERETTE	DATE : 2/11
DRAWN BY : MAA	1/08
CHECKED BY : GM/DI	2/08

REV. 11/12/08RR MAA/GM

GENERAL NOTES

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.
 CONCRETE = f'_c - 7000psi 55' SPAN ONLY (MIN. COMP. STRENGTH @ 28 DAYS).
 f'_c - 5500psi 55' SPAN ONLY (MIN. COMP. STRENGTH @ TRANSFER OF STRESSING FORCE).
 CONCRETE = f'_c - 5000psi 50' SPAN ONLY (MIN. COMP. STRENGTH @ 28 DAYS).
 f'_c - 4000psi 50' SPAN ONLY (MIN. COMP. STRENGTH @ TRANSFER OF STRESSING FORCE).

ALL PRESTRESSING STRANDS SHALL MEET THE REQUIREMENTS OF ASTM A416.
 ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE HIGH STRENGTH CABLES IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

SIZE	TYPE	AREA	ULTIMATE STR.	APPLIED FORCE
0.6" Ø	HIGH STR.	0.217 SQ. IN. PER CABLE	58,600 LBS.	43,950 LBS. PER CABLE

EXP. JT. MAT'L. SHALL MEET THE REQUIREMENTS OF AASHTO SPECIFICATION M153 TYPE I, II, OR III.

JOINT SEALER SHALL BE LOW MODULUS SILICONE SEALANT. SEE SECTION 1028-4 OF THE STANDARD SPECIFICATIONS.

STRUCTURAL STEEL ITEMS SHALL BE OF A GRADE CONFORMING TO EITHER ASTM A36 OR A373, EXCEPT HIGH STRENGTH BOLTS. HIGH STRENGTH BOLTS SHALL BE ASTM A325. ALL STRUCTURAL STEEL SHALL BE GALVANIZED AS PER THE SPECIFICATION.

ALL MATERIAL AND WORKMANSHIP SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES OF THE NC DEPARTMENT OF TRANSPORTATION DATED JULY 2006 AND WITH THE SPECIAL PROVISIONS.

THE CONTRACTOR, AT HIS OPTION, MAY USE STRESS RELIEVED STRANDS IN LIEU OF LOW RELAXATION STRANDS. DESIGN AND STRAND PATTERN MUST PROVIDE AT LEAST THE SAME NET COMPRESSIVE STRESS AFTER THE LOSSES.

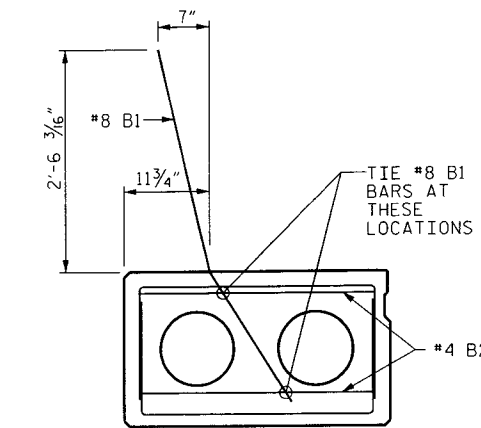
THE ULTIMATE STRENGTH OF THE CORED SLAB UNIT MUST MEET THE REQUIREMENTS OF THE APPLICABLE AASHTO SPECIFICATIONS. STRESS RELIEVED STRANDS SHALL BE TENSIONED AND ANCHORED AT A LOAD EQUAL TO 70% OF ITS ULTIMATE STRENGTH. THIS APPLIED PRESTRESSED FORCE SHALL BE SHOWN ON THE PLANS. SIZE OF STRESS RELIEVED STRANDS SHALL NOT BE SMALLER THAN THOSE SHOWN FOR LOW RELAXATION STRANDS. DESIGN AND DETAIL PLANS USING STRESS RELIEVED STRANDS MUST BE SUBMITTED TO THE ENGINEER. ANY ADDITIONAL COST DUE TO THE USE OF STRESS RELIEVED STRANDS WILL BE PAID FOR BY THE CONTRACTOR. STRANDS SHALL BE CUT FLUSH WITH THE ENDS OF THE SLABS AND EPOXY COATED. SEE SPECIAL PROVISIONS.

A POSITIVE HOLD-DOWN SYSTEM MUST BE EMPLOYED TO PREVENT VOIDS FROM RISING.

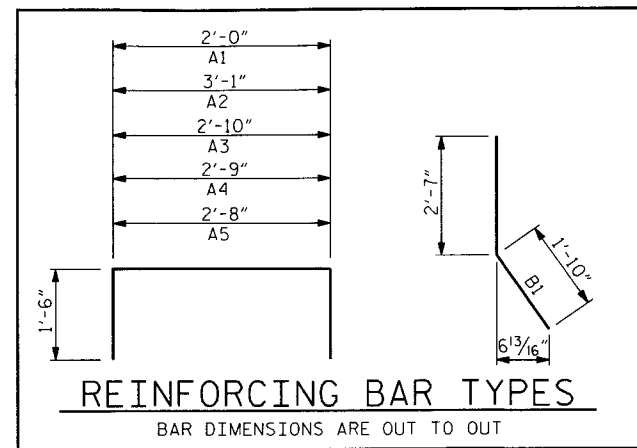
SPIRAL WIRE REINFORCEMENT MAY BE USED IN LIEU OF DEFORMED BARS FOR STIRRUPS. (MIN. W3.5 x 6" PITCH).

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 1/4".

FOR DEFLECTION TABLE, SEE "PRECAST CONCRETE BARRIER RAIL SECTIONS" SHEET.



TIE LOCATION FOR #8 B1



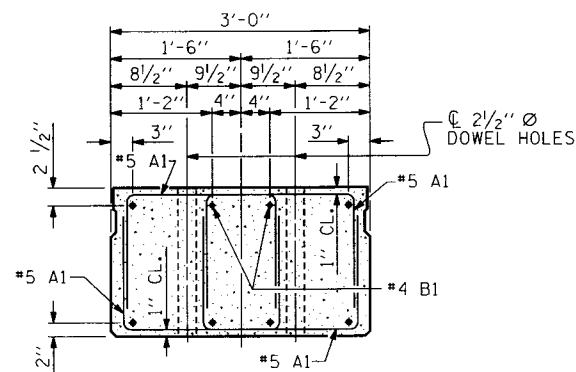
REINFORCING BAR TYPES

BAR DIMENSIONS ARE OUT TO OUT

SHEATH CHART		
SPAN LENGTH	NUMBER OF SHEATHED STRANDS PER EXTERIOR SLAB SECTIONS	NUMBER OF SHEATHED STRANDS PER INTERIOR SLAB SECTIONS
* 55'	5	5
** 50'	8	8

* BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 5'-0" FROM END OF SLAB.

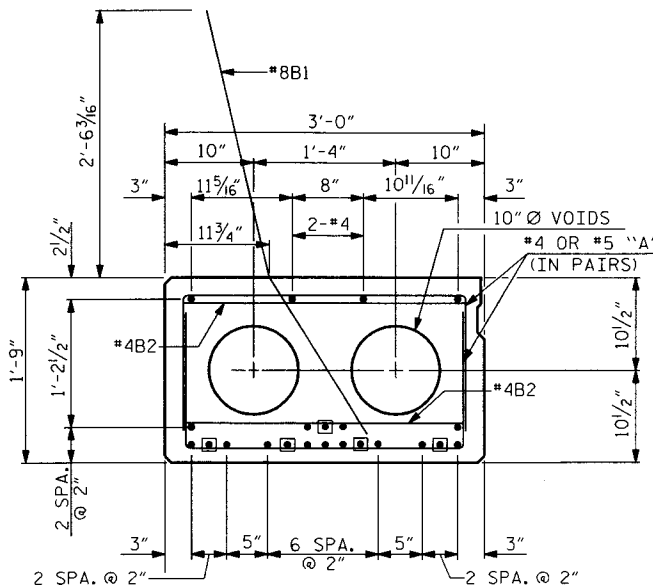
** BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 8'-0" FROM END OF SLAB.



END ELEVATION

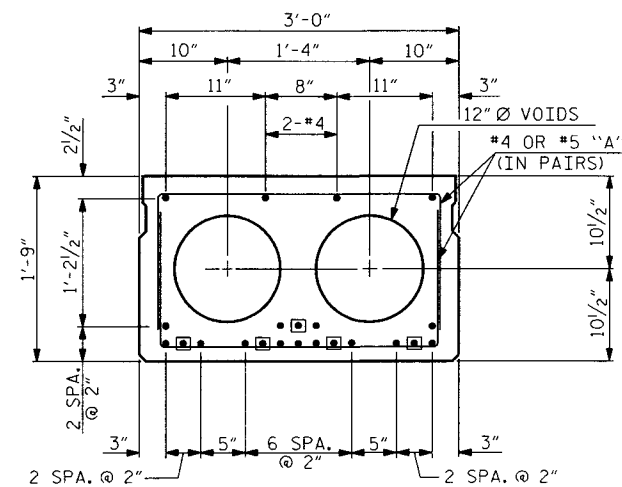
SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.)

INTERIOR SLAB SECTION SHOWN-EXTERIOR SLAB SECTION SIMILAR EXCEPT SHEAR KEY LOCATION. THE 2 1/2" Ø DOWEL HOLES OF SLAB SECTIONS SHALL BE FILLED WITH GROUT. SEE SPECIAL PROVISIONS.



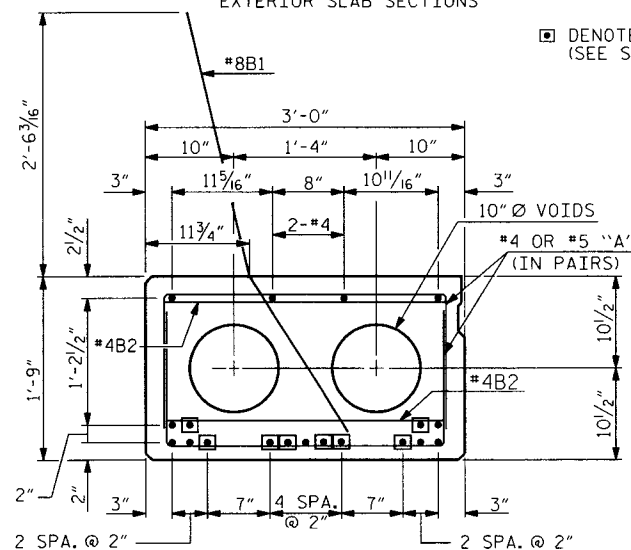
55' SPAN

20 - 0.6" Ø H.S. STRANDS EXTERIOR SLAB SECTIONS



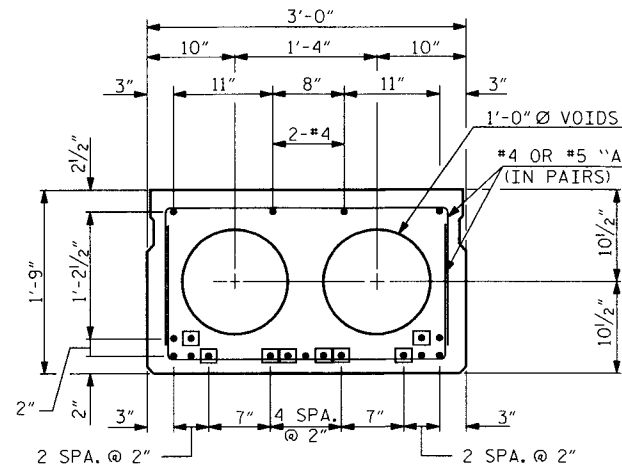
55' SPAN

20 - 0.6" Ø H.S. STRANDS INTERIOR SLAB SECTIONS



50' SPAN

17 - 0.6" Ø H.S. STRANDS EXTERIOR SLAB SECTIONS



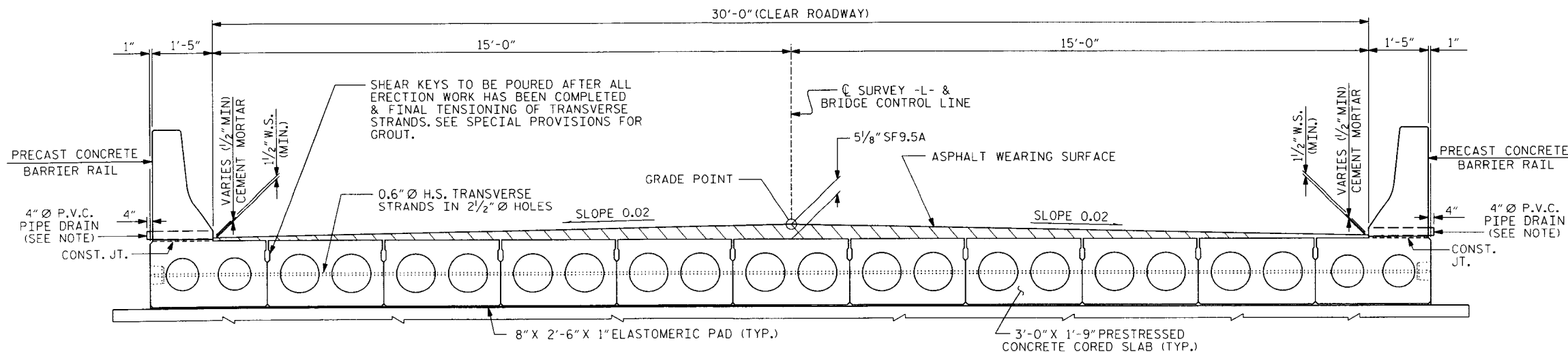
50' SPAN

17 - 0.6" Ø H.S. STRANDS INTERIOR SLAB SECTIONS

□ DENOTES SHEATHED STRAND (SEE SHEATH CHART)

SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE OF EXTERIOR CORED SLAB



TYPICAL SECTION

NOTE: 4" Ø PVC DRAINS THROUGH THE PRECAST BARRIER RAIL ARE REQUIRED ON BOTH SIDES OF BRIDGE. NO DECK DRAINS ARE ALLOWED OVER OPEN WATER.

WBS NO. 33417.3.1

MECKLENBURG COUNTY

STATION: 16+97.50 -L-

REPLACES BRIDGE NO. 134



PLANS PREPARED BY:

S&A ENGINEERS ASSOCIATES

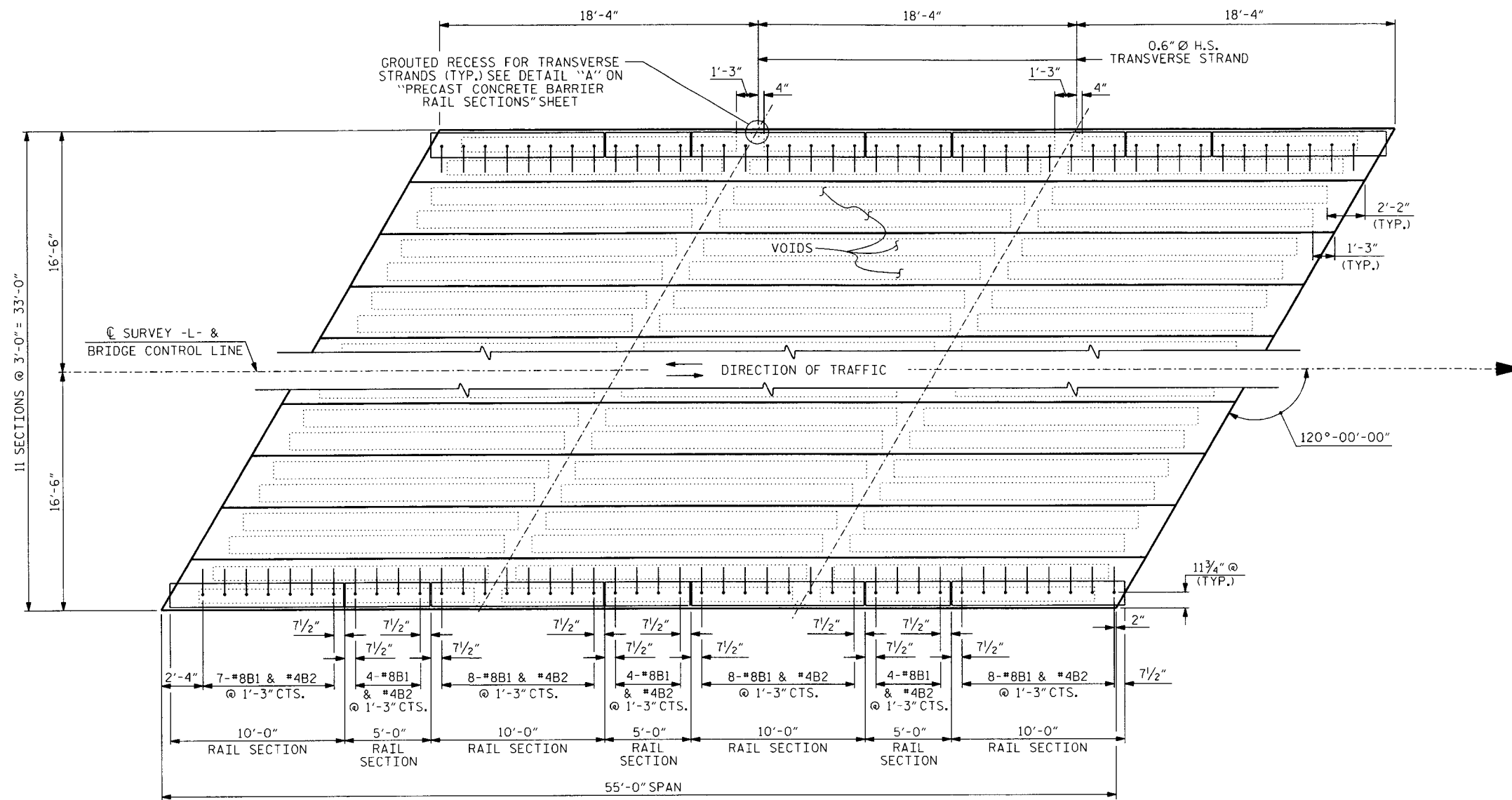
5520 Dillard Drive
 Suite 120
 Cary, NC 27518
 (919) 852-0468
 (919) 852-0598 (Fax)
 www.simpsonengr.com
 LICENSURE NO. C2521

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

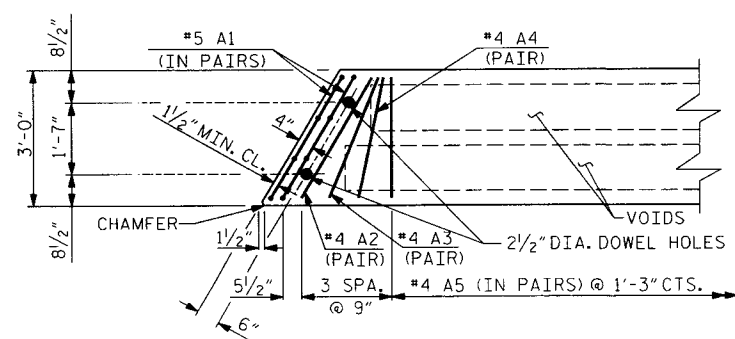
PRESTRESSED CORED
 SLAB DETAILS
 55' & 50' SPANS

30' CLEAR ROADWAY - 120° SKEW

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



PLAN OF SPAN



PART PLAN - SLAB SECTION

WBS NO. 33417.3.1
MECKLENBURG COUNTY
STATION: 16+97.50 -L-

REPLACES BRIDGE NO. 134



PLANS PREPARED BY:
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			17
2			4			TOTAL SHEETS 35

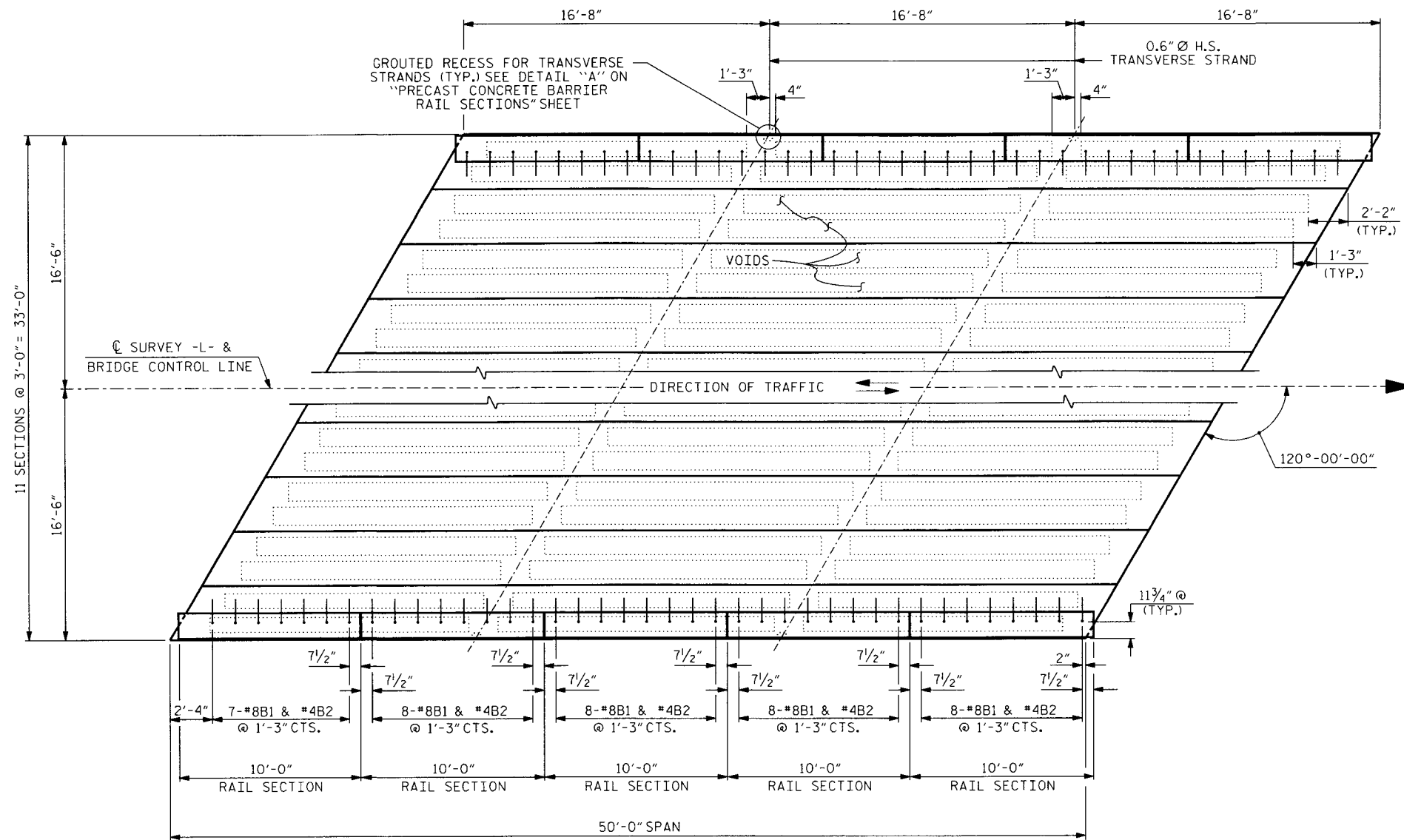
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
**PRESTRESSED
CORED SLAB
55' SPAN**

30' CLEAR ROADWAY - 120° SKEW

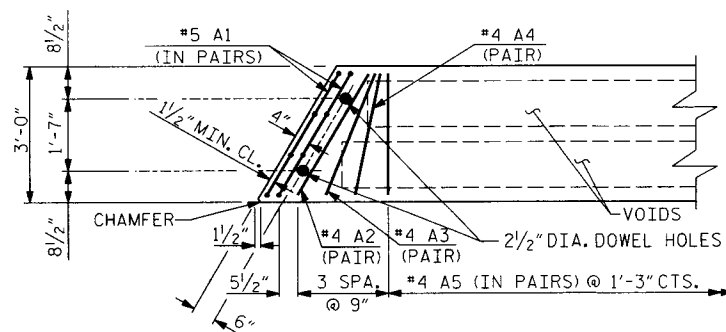
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DRAWN BY: D.G. VESTER DATE: 2/11
CHECKED BY: M.A. AVERETTE DATE: 2/11

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PLAN OF SPAN



PART PLAN - SLAB SECTION

WBS NO. 33417.3.1
MECKLENBURG COUNTY
STATION: 16+97.50 -L-

REPLACES BRIDGE NO. 134



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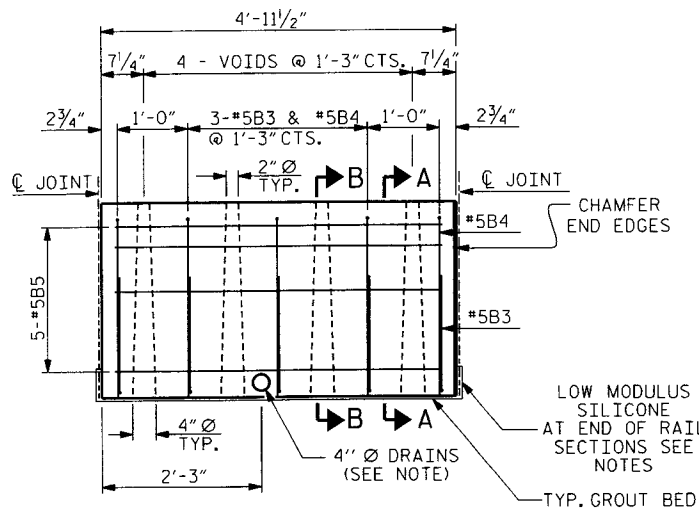
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED
CORED SLAB
50' SPAN

30' CLEAR ROADWAY - 120° SKEW

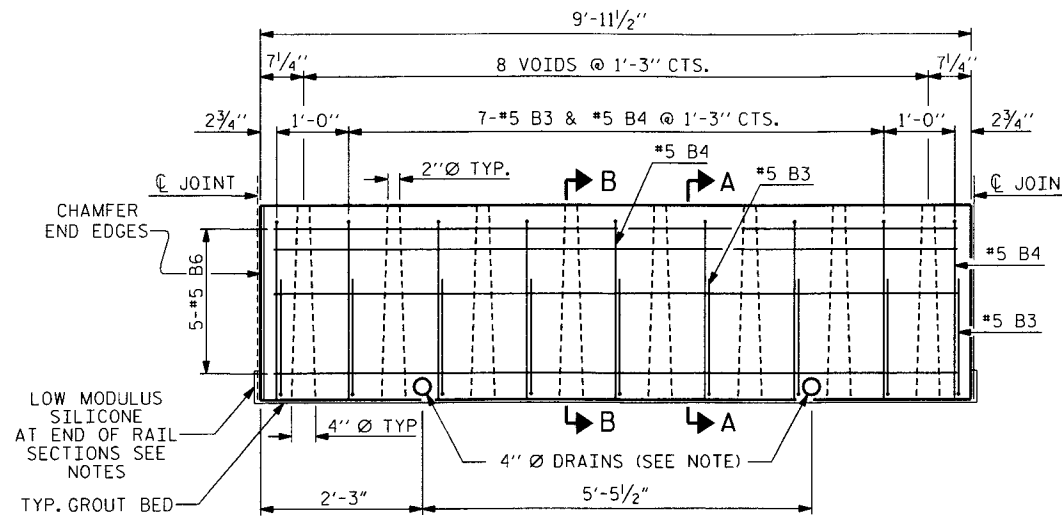
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			18
2			4			TOTAL SHEETS 35

DRAWN BY: D.G. VESTER DATE: 2/11
CHECKED BY: M.A. AVERETTE DATE: 2/11



TYPICAL 5'-0" PRECAST UNIT

NOTE: 4" Ø PVC DRAINS THROUGH THE PRECAST BARRIER RAIL ARE REQUIRED ON BOTH SIDES OF THE BRIDGE. NO DECK DRAINS ARE ALLOWED OVER OPEN WATER.



TYPICAL 10'-0" PRECAST UNIT

NOTE: 4" Ø PVC DRAINS THROUGH THE PRECAST BARRIER RAIL ARE REQUIRED ON BOTH SIDES OF THE BRIDGE. NO DECK DRAINS ARE ALLOWED OVER OPEN WATER.

NOTES

EACH PRECAST RAIL UNIT SHALL BE CAST WITH CLASS AA CONCRETE.

RAIL TO BE FLUSH WITH CORED SLAB UNITS AT EACH END OF SPAN.

GROUT SHALL BE 1" ABOVE DRAINS BETWEEN RAIL SECTIONS EXCEPT AT BENTS WHERE LOW MODULUS SILICONE SHALL BE SUBSTITUTED IN PLACE OF GROUT.

EACH PRECAST RAIL UNIT SHALL BE SUPPLIED WITH LIFTING DEVICE(S). NO CABLES ARE TO BE WRAPPED AROUND THE RAIL UNITS FOR LIFTING.

THE EXPANSION JOINT SEALER SHALL BE LOW MODULUS SILICONE SEALANT. SEE SECTION 1028-4 OF THE STANDARD SPECIFICATIONS.

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 ON PLANS.

BILL OF MATERIAL FOR ONE 5'-0" RAIL SECTION

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B3	5	#5	1	2'-8"	14
B4	5	#5	2	4'-11"	26
B5	5	#5	STR.	4'-7"	24

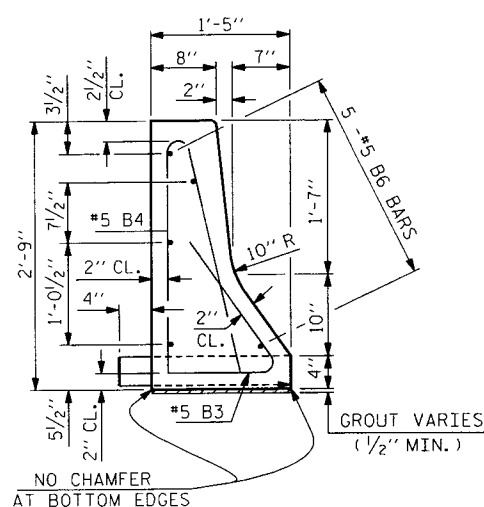
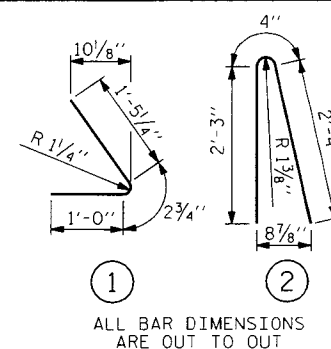
REINFORCING STEEL LBS. = 64
CLASS AA CONCRETE CU. YDS. = 0.5

BILL OF MATERIAL FOR ONE 10'-0" RAIL SECTION

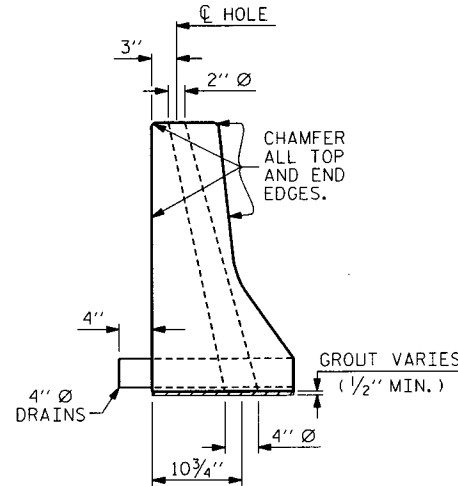
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B3	9	#5	1	2'-8"	25
B4	9	#5	2	4'-11"	46
B6	5	#5	STR.	9'-7"	50

REINFORCING STEEL LBS. = 121
CLASS AA CONCRETE CU. YDS. = 1.0

BAR TYPES



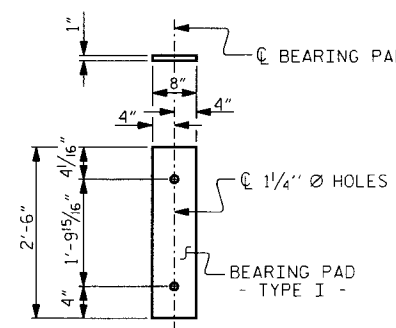
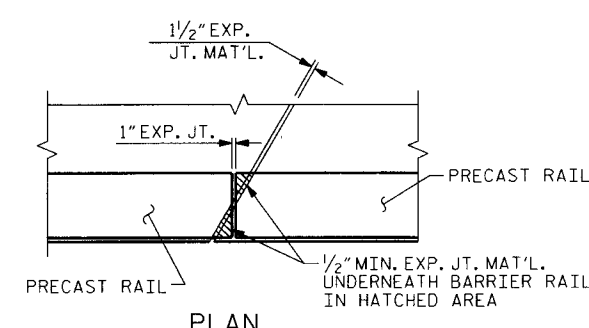
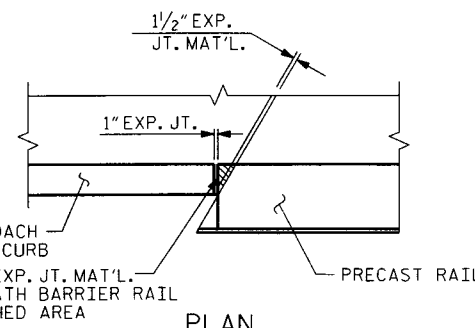
SECTION A-A



SECTION B-B

INTERIOR SLAB UNIT	50'	55'
CAMBER (SLAB UNIT ALONE IN PLACE)	1 13/16" (UP)	2 11/16" (UP)
DEFLECTION (SUPERIMPOSED DEAD LOAD)	1/2" (DOWN)	9/16" (DOWN)
FINAL DEFLECTION	1 5/16" (UP)	2 1/8" (UP)
* INCLUDES FUTURE WEARING SURFACE		

EXTERIOR SLAB UNIT	50'	55'
CAMBER (SLAB UNIT ALONE IN PLACE)	1 9/16" (UP)	2 3/8" (UP)
DEFLECTION (SUPERIMPOSED DEAD LOAD)	7/16" (DOWN)	9/16" (DOWN)
FINAL DEFLECTION	1 1/8" (UP)	1 13/16" (UP)
* INCLUDES FUTURE WEARING SURFACE		



FIXED END

(TYPE I - 44 REQ'D)

ELASTOMERIC BEARING DETAILS

WBS NO. 33417.3.1

MECKLENBURG COUNTY

STATION: 16+97.50 -L-

REPLACES BRIDGE NO. 134



PLANS PREPARED BY:

SE & A
IMPSON ENGINEERS & ASSOCIATES

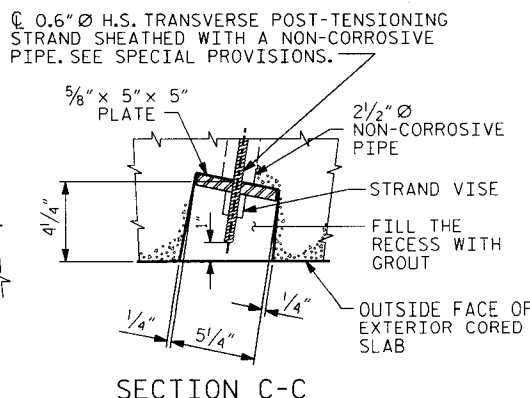
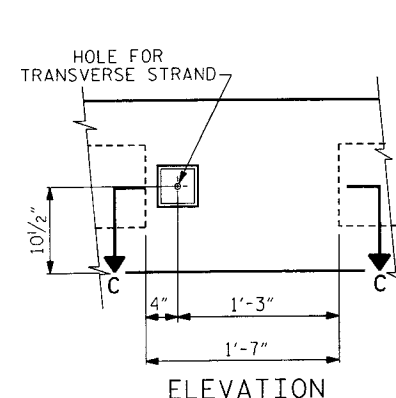
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DEPARTMENT OF TRANSPORTATION
RALEIGH

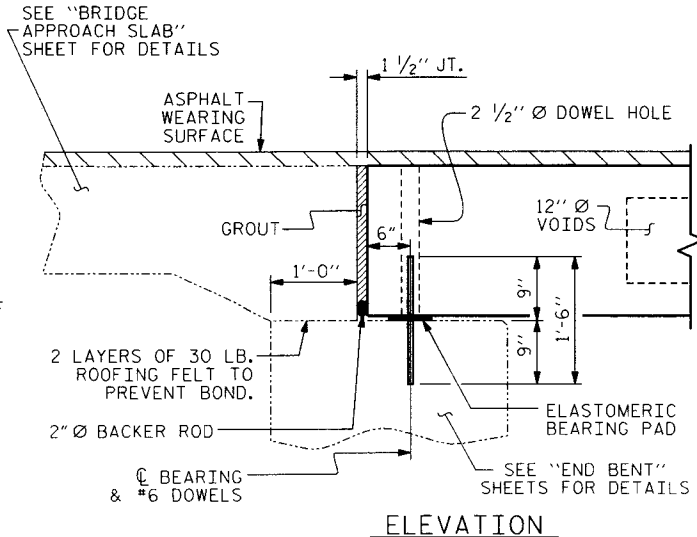
PRECAST CONCRETE
BARRIER RAIL SECTIONS
55' & 50' SPANS

30' CLEAR ROADWAY - 120° SKEW

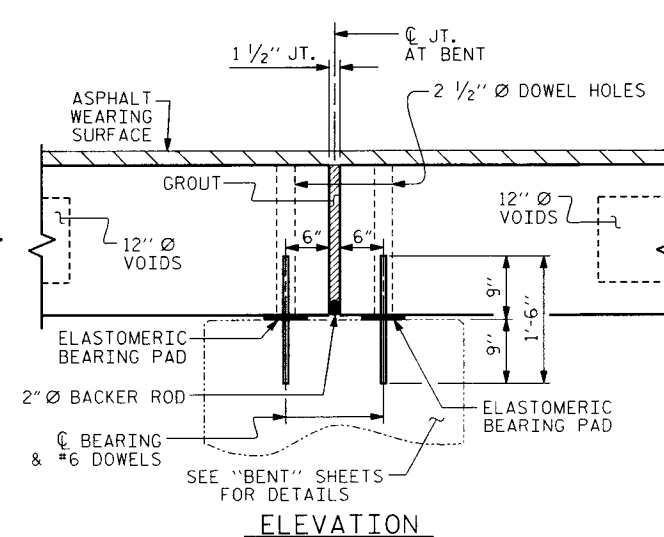
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			19
2			4			35



DETAIL A GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLAB



SECTION AT END BENT



SECTION AT BENT

DRAWN BY: D.G. VESTER DATE: 2/11
CHECKED BY: M.A. AVERETTE DATE: 2/11

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 4 - 1/8" Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

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 1/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

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

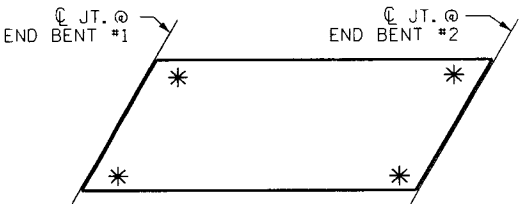
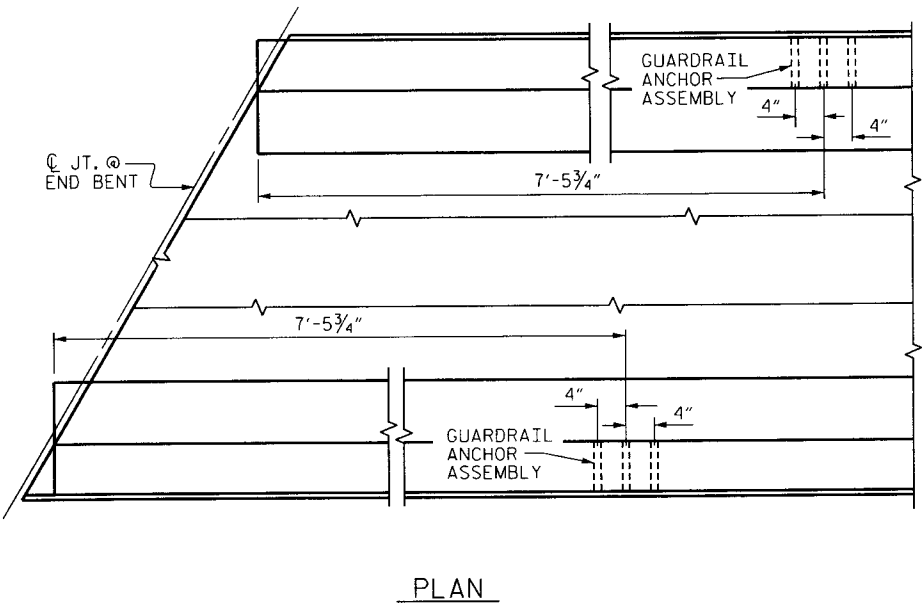
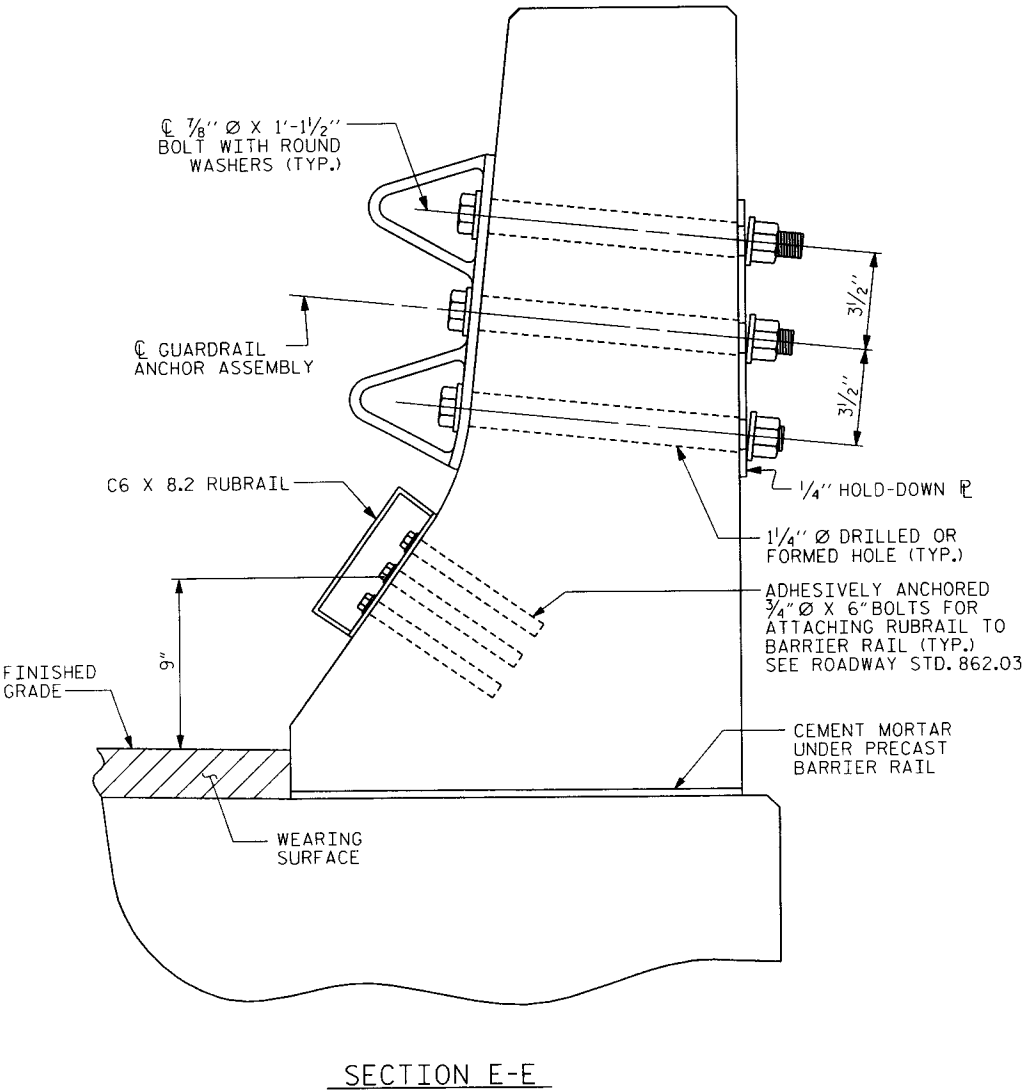
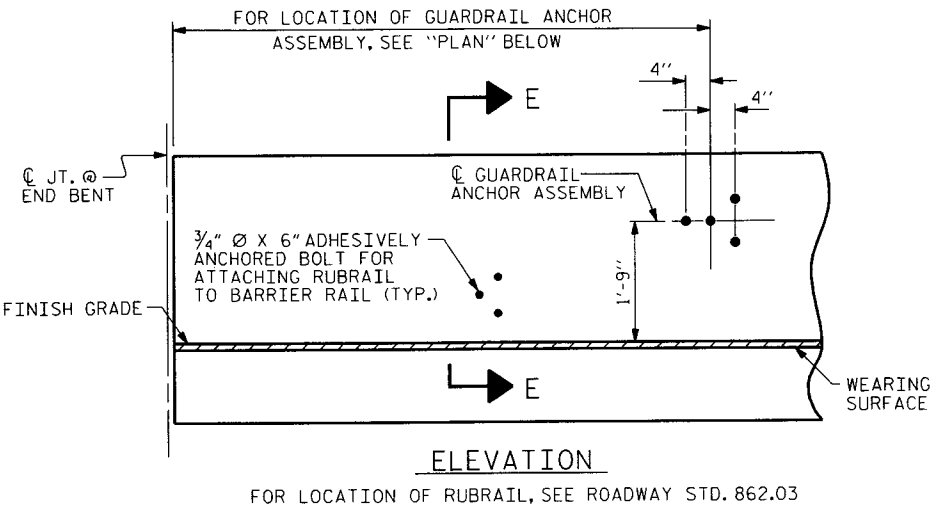
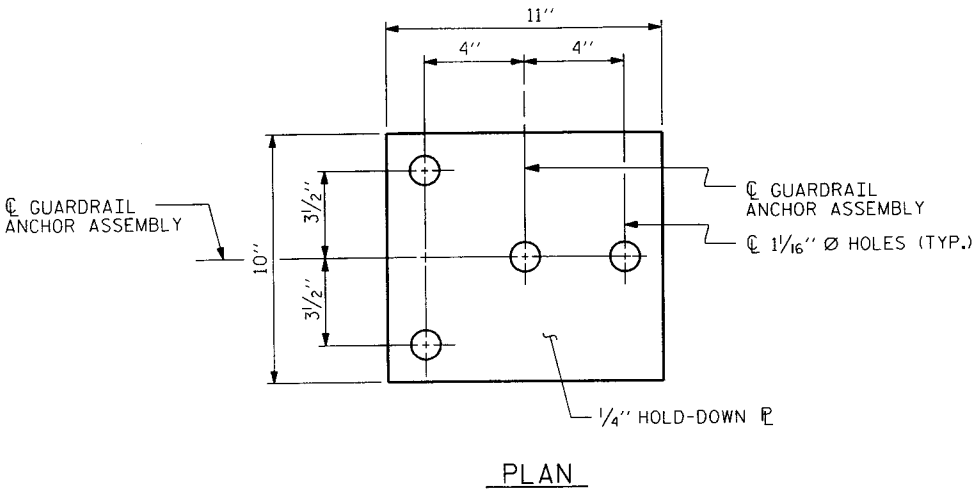
AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR GUARDRAIL ANCHOR UNIT TYPE B-77.

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

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.

FOR ADDITIONAL GUARDRAIL INFORMATION, SEE "GUARDRAIL ANCHOR UNIT" SHEET.



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.

WBS NO. 33417.3.1
MECKLENBURG COUNTY
STATION: 16+97.50 -L-

REPLACES BRIDGE NO. 134



PLANS PREPARED BY:

SIMPSON ENGINEERS & ASSOCIATES

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

30' CLEAR ROADWAY - 120° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			20
2			4			35

DRAWN BY : D.G. VESTER DATE : 2/11
CHECKED BY : M.A. AVERETTE DATE : 2/11

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APPROACH SLAB GROOVING IS NOT REQUIRED.



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30' CLEAR ROADWAY - 120° SKEW						
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	21
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2			4			35

STATE OF
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

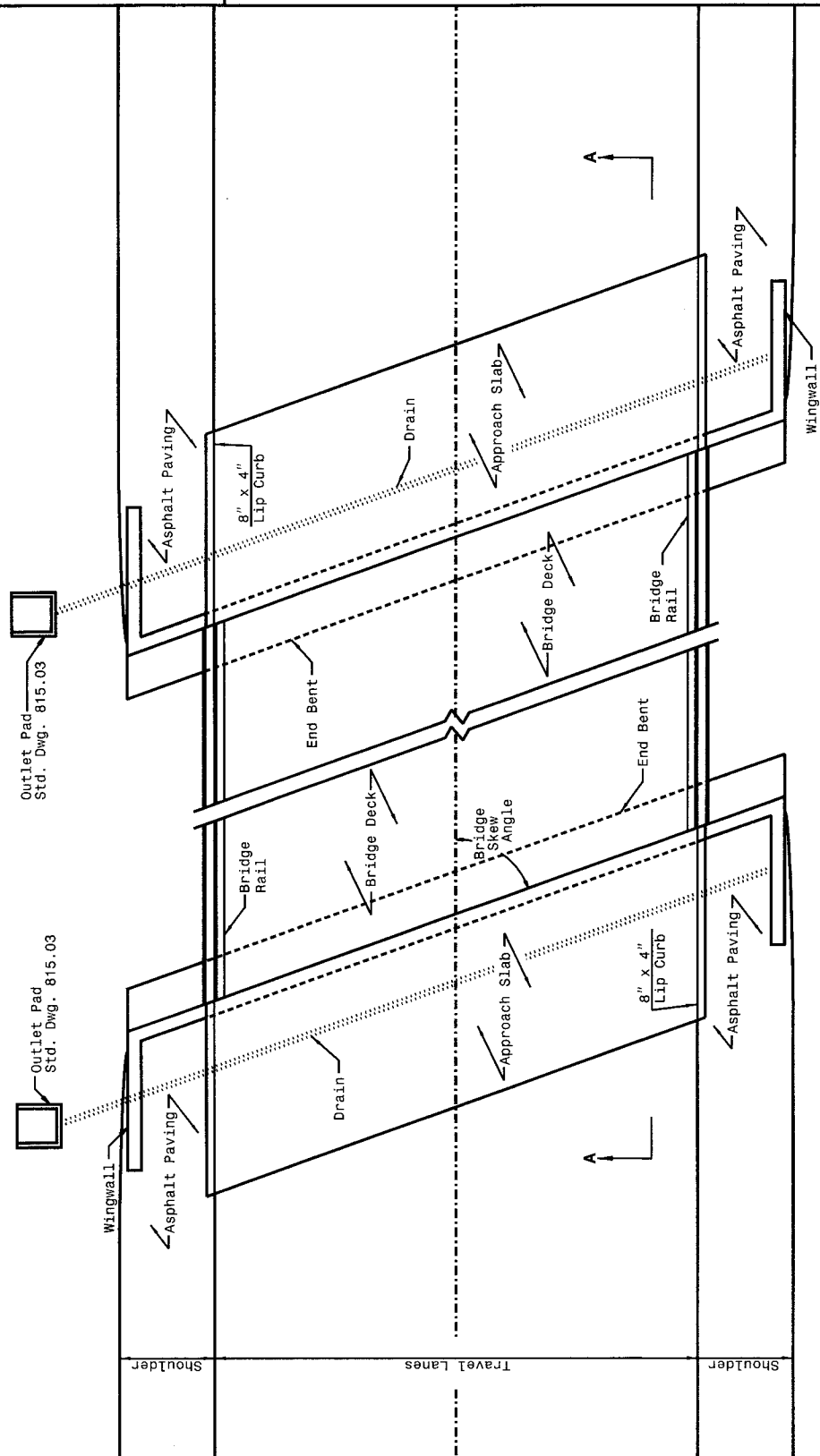
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BRIDGE APPROACH FILLS
CORED SLAB & BOX BEAM BRIDGES
SUB REGIONAL TIER

SHEET 1 OF 2
422D11

STATE OF
NORTH CAROLINA
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ENGLISH DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
CORED SLAB & BOX BEAM BRIDGES
SUB REGIONAL TIER

SHEET 1 OF 2
422D11



PLAN VIEW
12' APPROACH SLAB

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

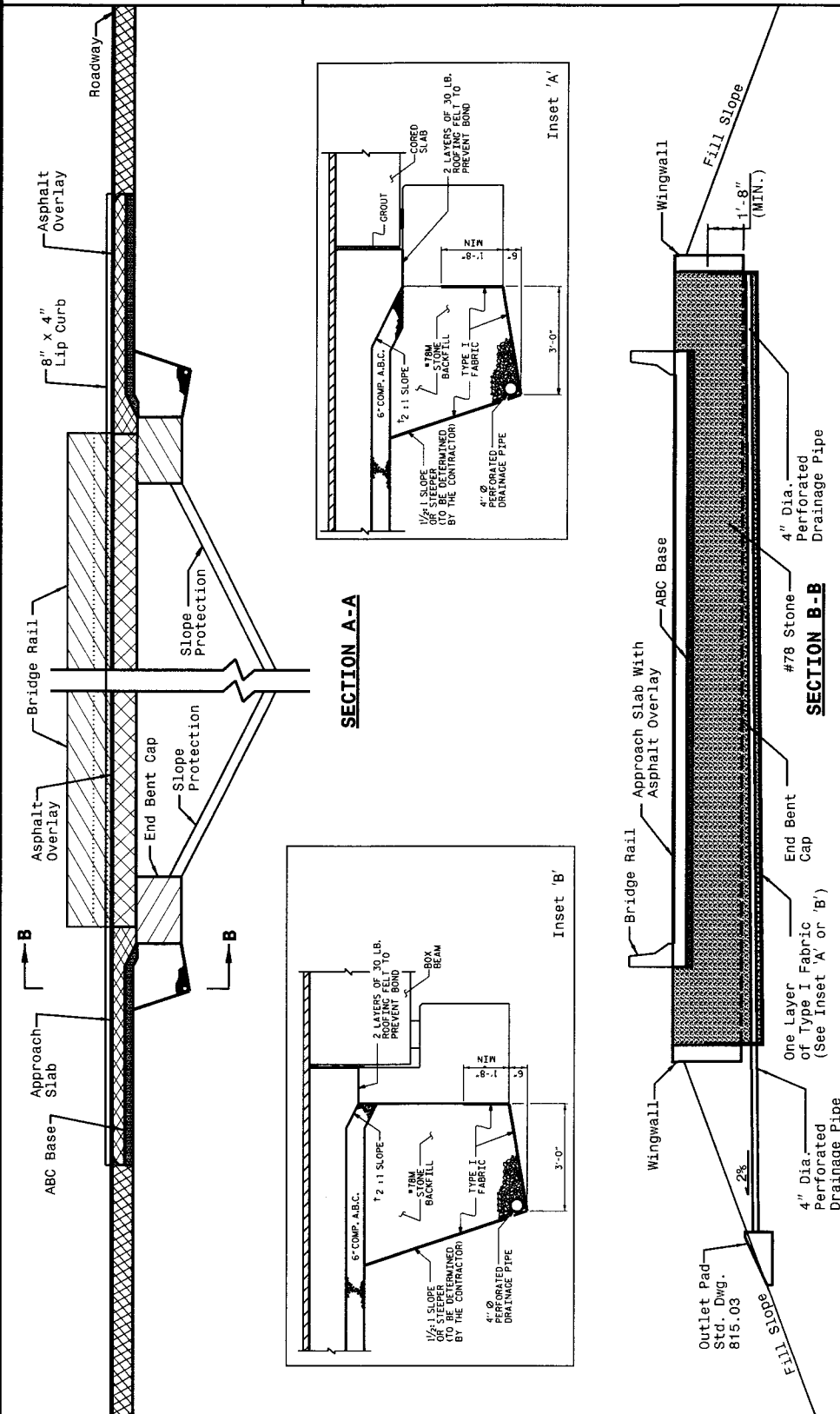
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BRIDGE APPROACH FILLS
CORED SLAB & BOX BEAM BRIDGES
SUB REGIONAL TIER

SHEET 2 OF 2
422D11

STATE OF
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RALEIGH, N.C.

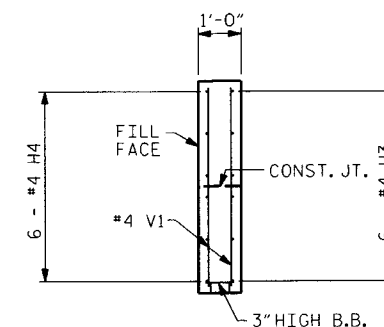
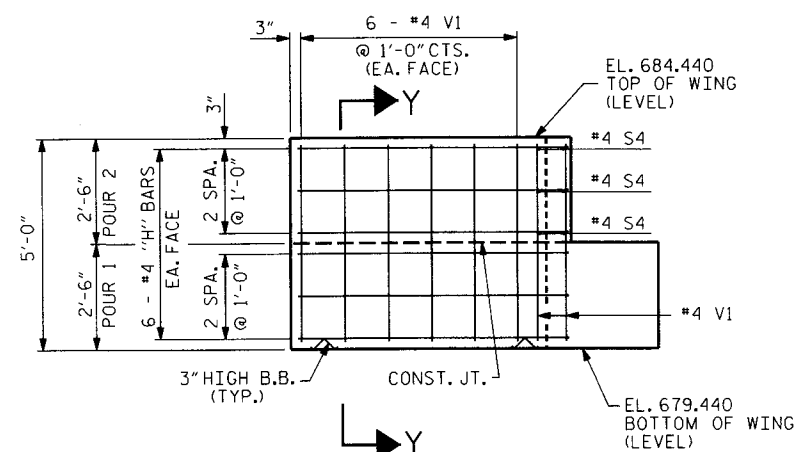
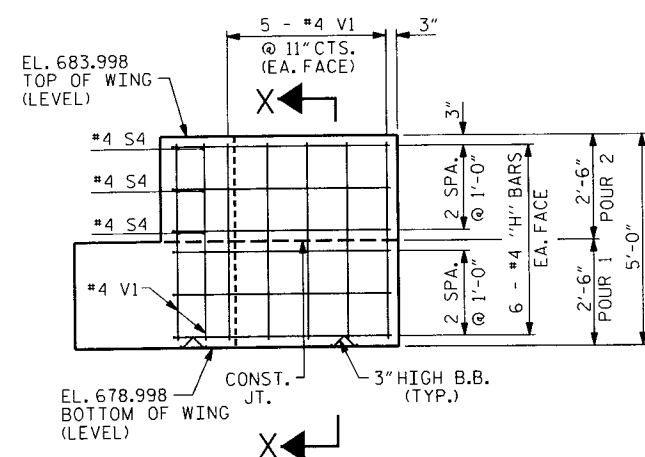
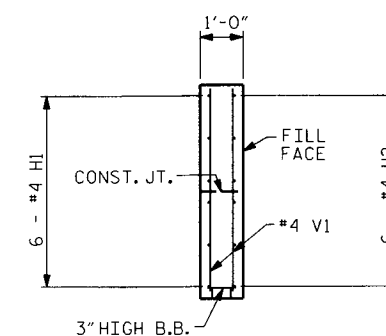
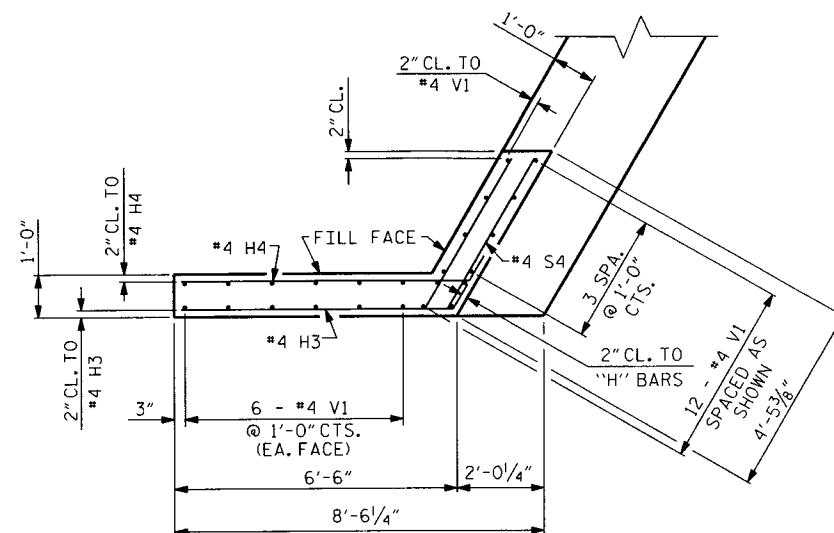
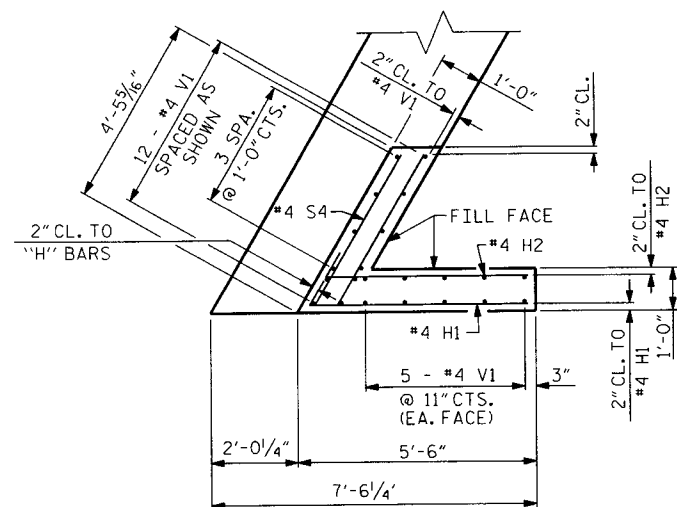
ENGLISH DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
CORED SLAB & BOX BEAM BRIDGES
SUB REGIONAL TIER

SHEET 2 OF 2
422D11



SECTION A-A

SECTION B-B



WBS NO. 33417.3.1
MECKLENBURG COUNTY
 STATION: 16+97.50 -L-

REPLACES BRIDGE NO. 134 SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END BENT #1

30' CLEAR ROADWAY - 120° SKEW

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

PLANS PREPARED BY:



**SIMPSON
& ASSOCIATES**
ENGINEERS

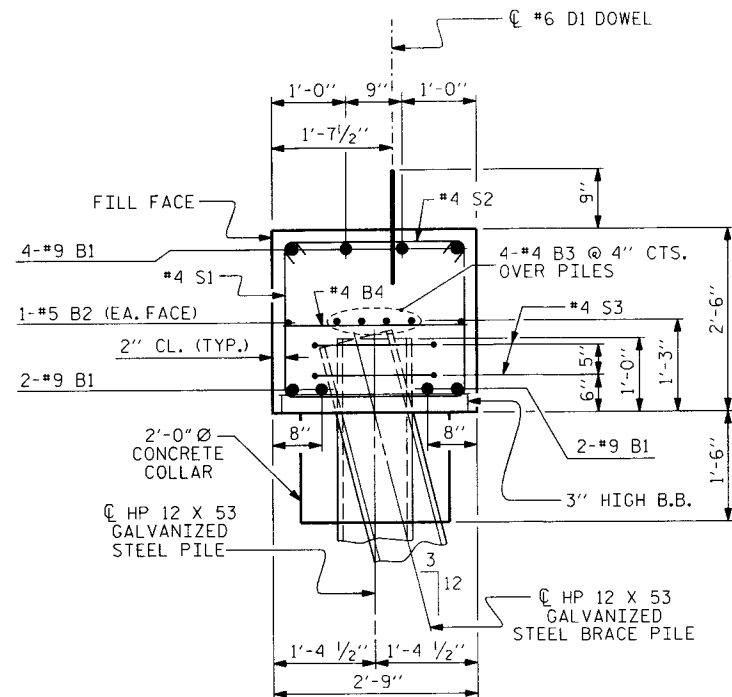
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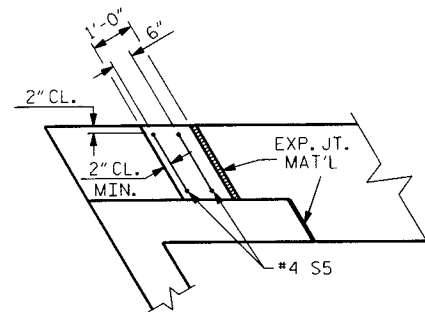
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CHECKED BY : M.A. AVERETTE DATE : 2/11

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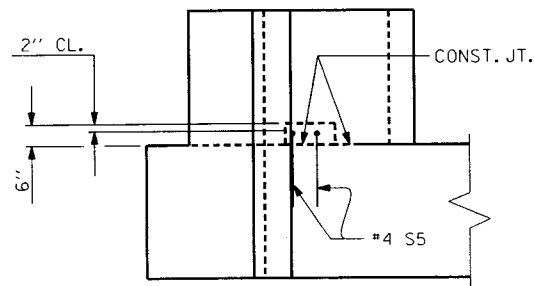
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SECTION A-A

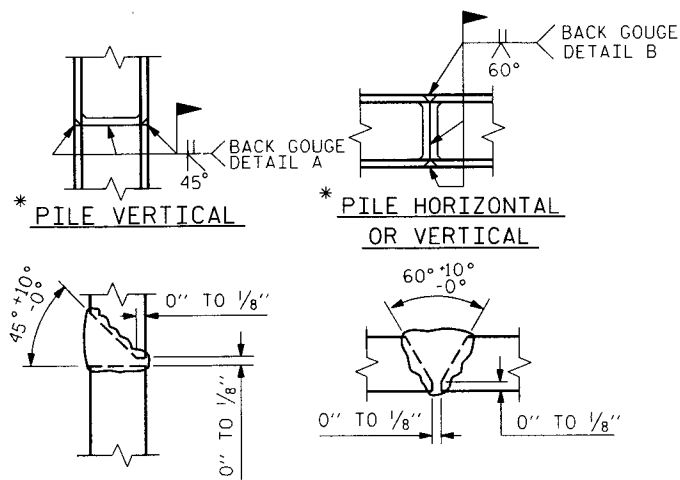


PLAN



ELEVATION

LATERAL GUIDE DETAILS



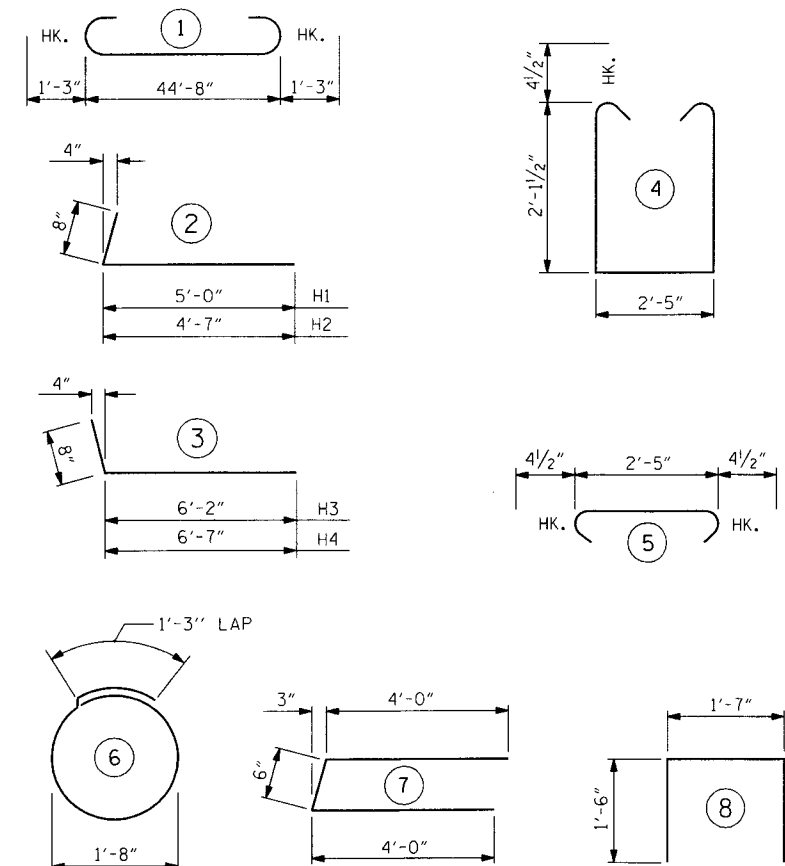
DETAIL A

DETAIL B

PILE SPLICE DETAILS

* POSITION OF PILE DURING WELDING.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	1	47'-2"	1283
B2	2	5	STR	44'-8"	93
B3	8	4	STR	23'-7"	126
B4	12	4	STR	2'-5"	19
D1	22	6	STR	1'-6"	50
H1	6	4	2	5'-8"	23
H2	6	4	2	5'-3"	21
H3	6	4	3	6'-10"	27
H4	6	4	3	7'-3"	29
S1	44	4	4	7'-5"	218
S2	44	4	5	3'-2"	93
S3	16	4	6	6'-6"	69
S4	6	4	7	8'-6"	34
S5	4	4	8	4'-7"	12
V1	46	4	STR	4'-7"	141
TOTAL REINFORCING STEEL					2238 LBS.
CLASS "A" CONCRETE BREAKDOWN					
POUR #1				12.4 CU. YDS.	
POUR #2				1.8 CU. YDS.	
TOTAL				14.2 CU. YDS.	
HP 12 X 53 GALVANIZED STEEL PILES					
8 PILES REQUIRED				LIN. FEET 200.0	
STEEL PILE POINTS - NO. 8					

WBS NO. 33417.3.1
MECKLENBURG COUNTY
STATION: 16+97.50 -L-

REPLACES BRIDGE NO. 134 SHEET 3 OF 3



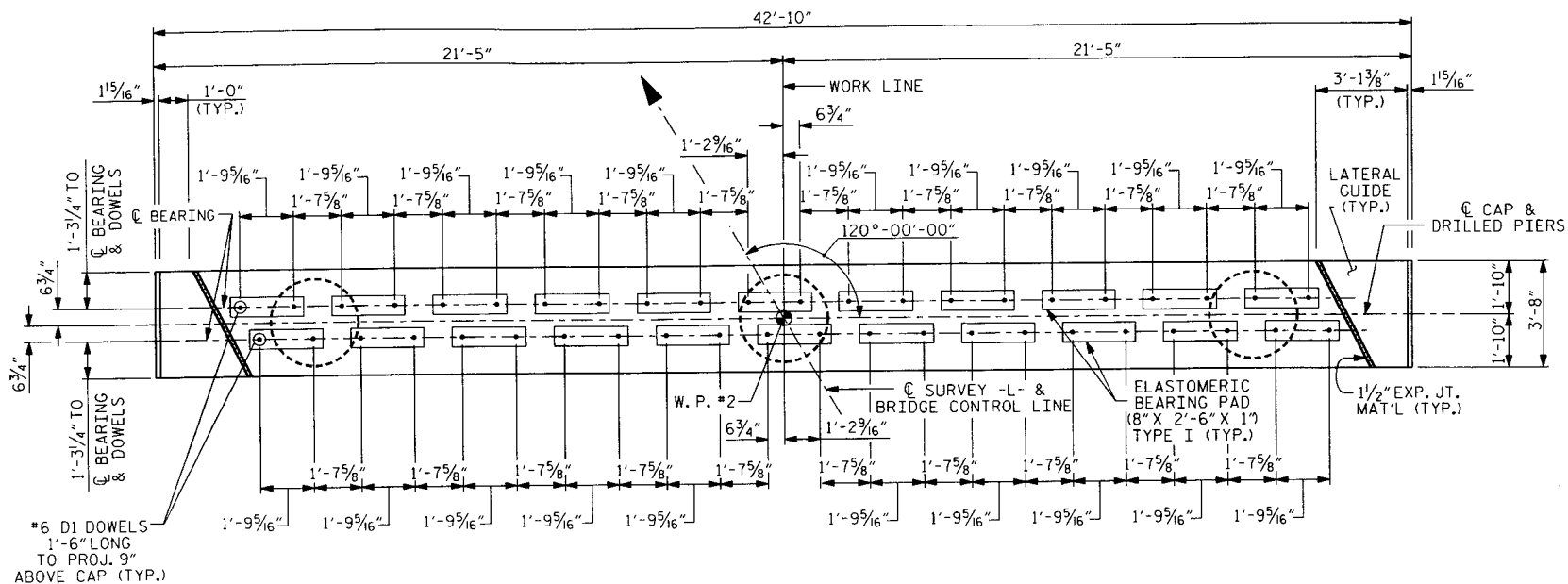
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END BENT #1

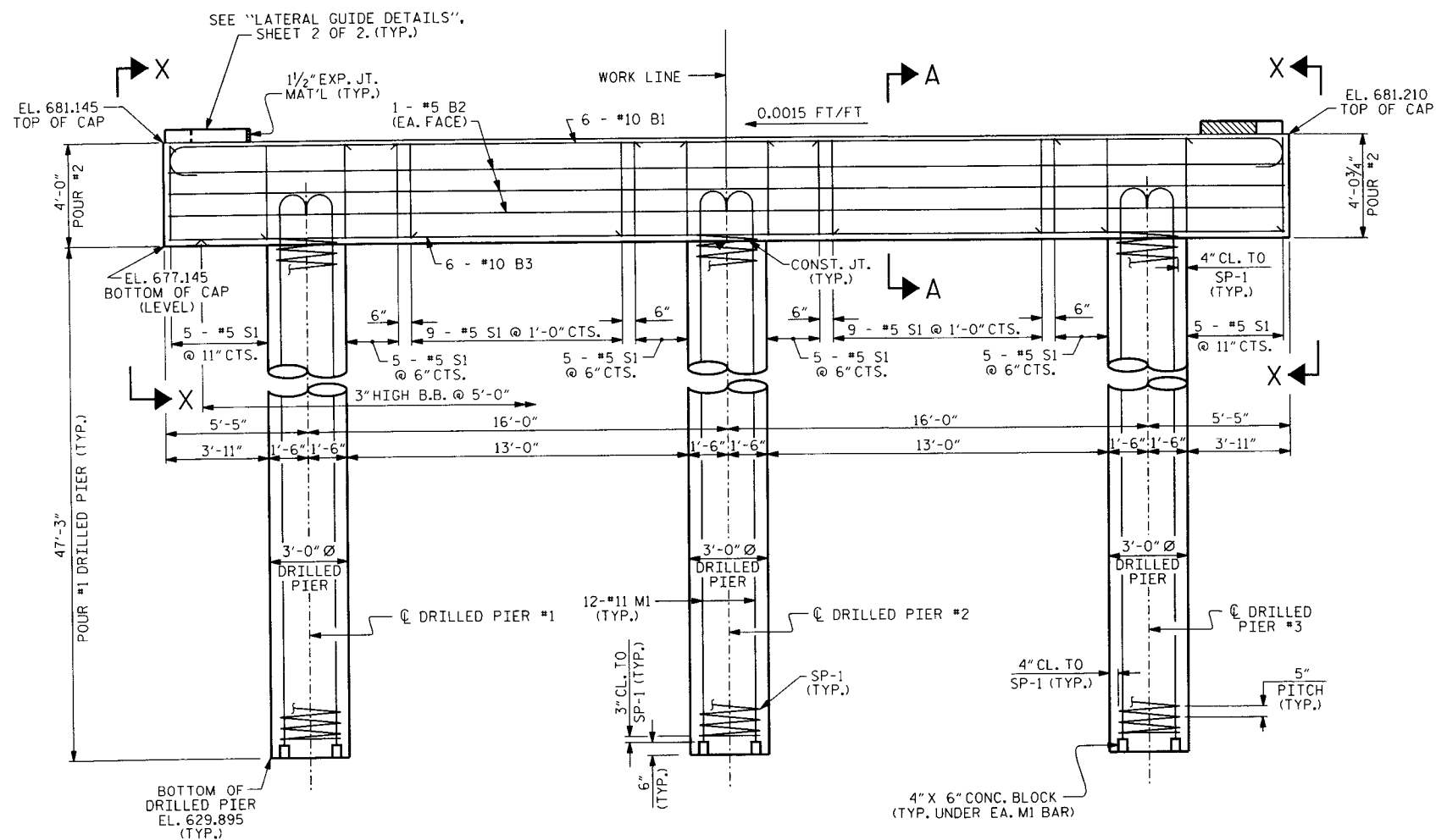
30' CLEAR ROADWAY - 120° SKEW

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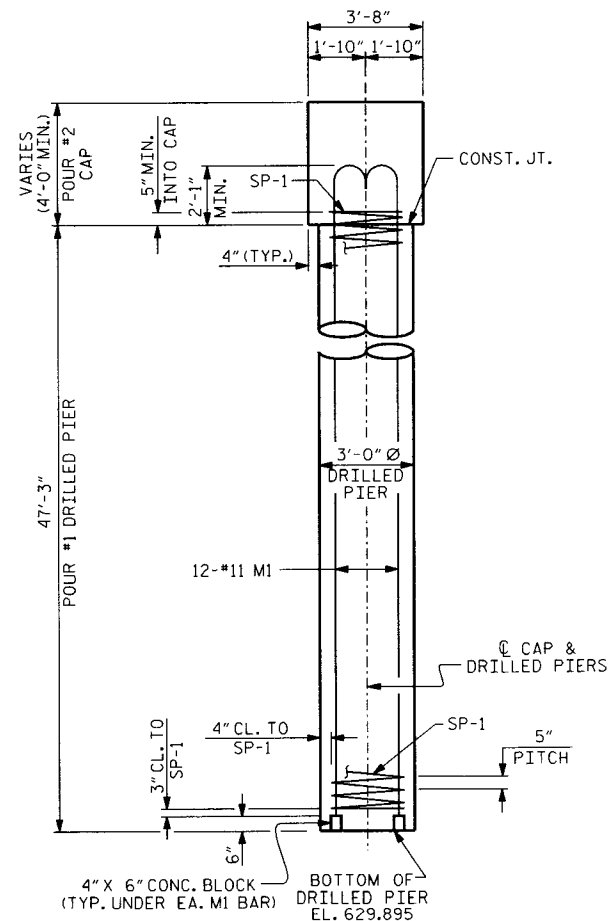
DRAWN BY : D.G. VESTER DATE : 2/11
CHECKED BY : M.A. AVERETTE DATE : 2/11



PLAN



ELEVATION



END ELEVATION

NOTES:

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

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

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

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

FOR PERMANENT STEEL CASING, SEE SPECIAL PROVISIONS FOR DRILLED PIERS.

INVERT ALTERNATE STIRRUPS.

NO SEPARATE PAYMENT SHALL BE MADE FOR ANY ADDITIONAL STEEL REQUIRED IN CONSTRUCTION OF THE DRILLED PIER AS THIS IS CONSIDERED INCIDENTAL TO THE LINEAR FOOT PRICE FOR DRILLED PIER.

THE CONTRACTORS ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIER IS DETAILED WITH THREE FEET OF EXTRA LENGTH.

WBS NO. 33417.3.1
MECKLENBURG COUNTY
STATION: 16+97.50 -L-

REPLACES BRIDGE NO. 134 SHEET 1 OF 2



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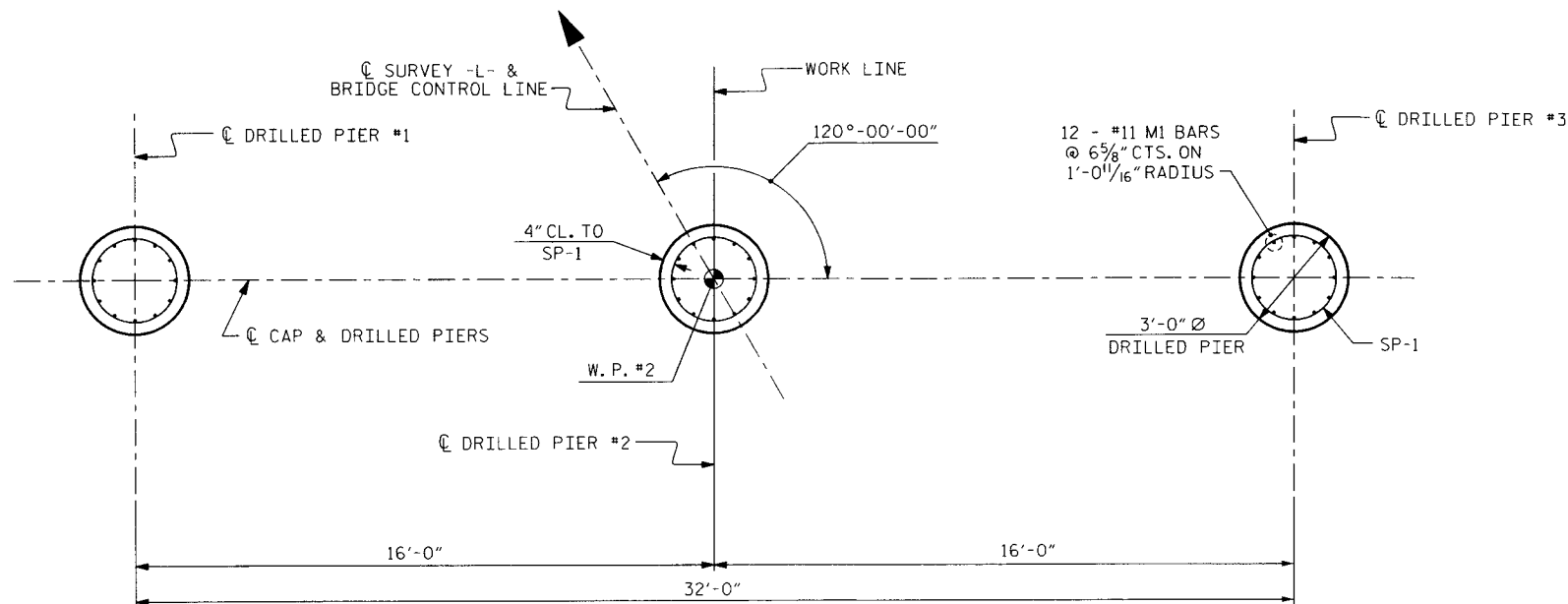
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

BENT #1

30' CLEAR ROADWAY - 120° SKEW

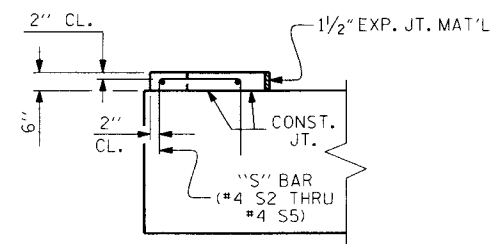
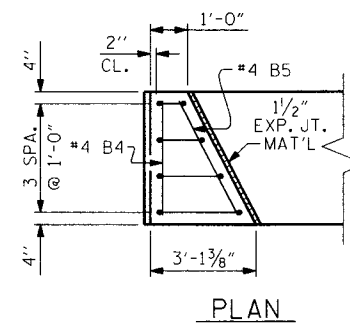
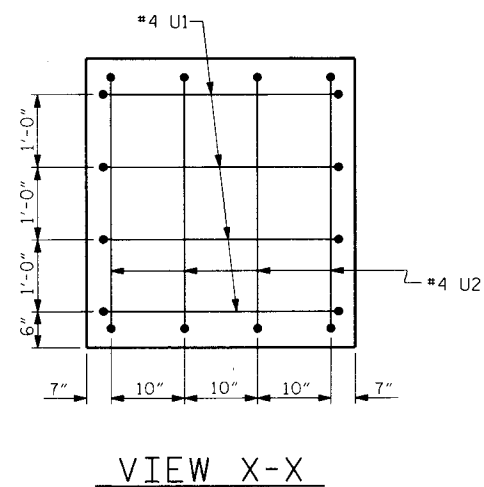
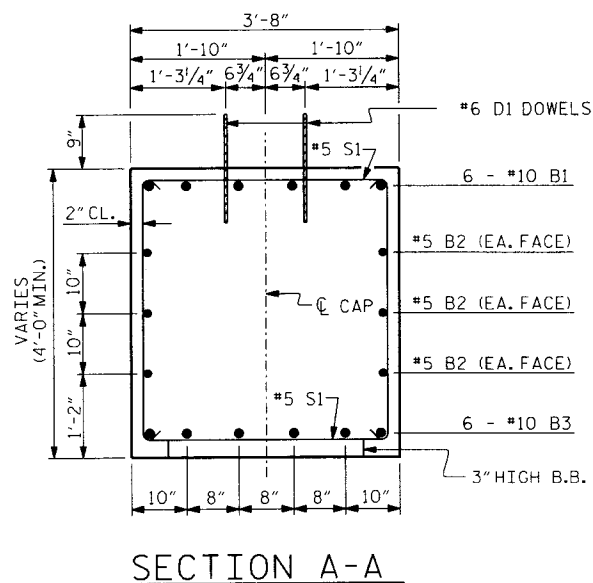
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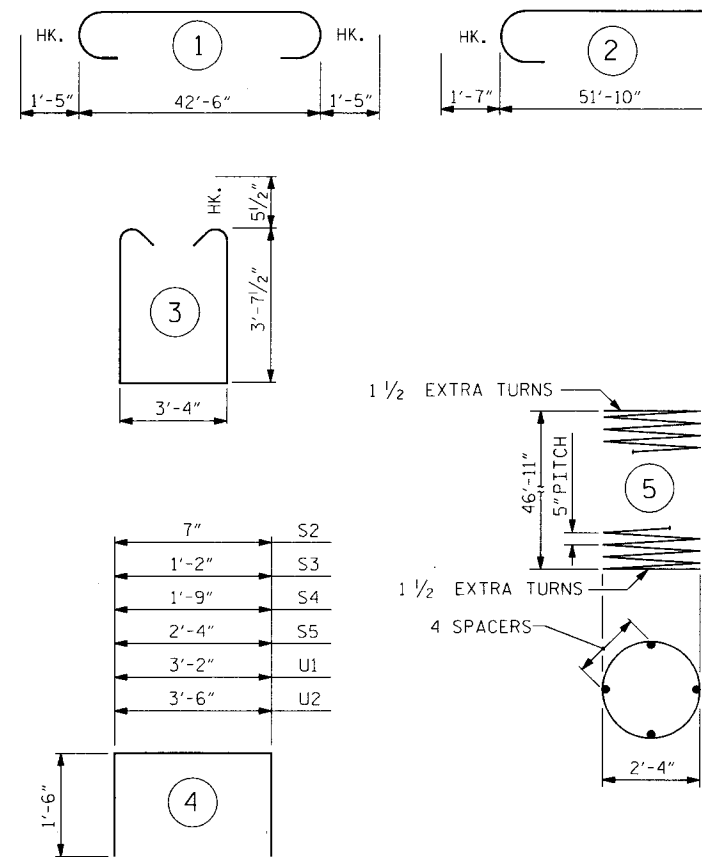
PLAN OF DRILLED PIERS

NOTE: REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR ALL DRILLED PIERS.



LATERAL GUIDE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

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

BILL OF MATERIAL

FOR BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	10	1	45'-4"	1170
B2	6	5	STR	42'-6"	266
B3	6	10	STR	42'-6"	1097
B4	2	4	STR	3'-3"	4
B5	2	4	STR	3'-9"	5
D1	44	6	STR	1'-6"	99
M1	36	11	2	53'-5"	10217
S1	48	5	3	11'-6"	576
S2	2	4	4	3'-7"	5
S3	2	4	4	4'-2"	6
S4	2	4	4	4'-9"	6
S5	2	4	4	5'-4"	7
U1	8	4	4	6'-2"	33
U2	8	4	4	6'-6"	35
SP-1	3	**	5	829'-11"	2597
REINFORCING STEEL					13526 LBS.
SPIRAL REINFORCING STEEL					2597 LBS.
CLASS "A" CONCRETE BREAKDOWN					
POUR #2 (CAP)					23.7 CU. YDS.
DRILLED PIER QUANTITIES					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIER)					37.1 CU. YDS.
3'-0" Ø DRILLED PIERS IN SOIL					141.75 LIN. FT.
3'-0" Ø PERMANENT STEEL CASING					102.4 LIN. FT.
CSL TUBES					597 LIN. FT.

WBS NO. 33417.3.1
MECKLENBURG COUNTY
STATION: 16+97.50 -L-

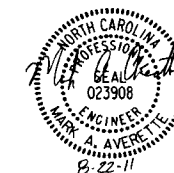
REPLACES BRIDGE NO. 134 SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

BENT #1

30' CLEAR ROADWAY - 120° SKEW

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

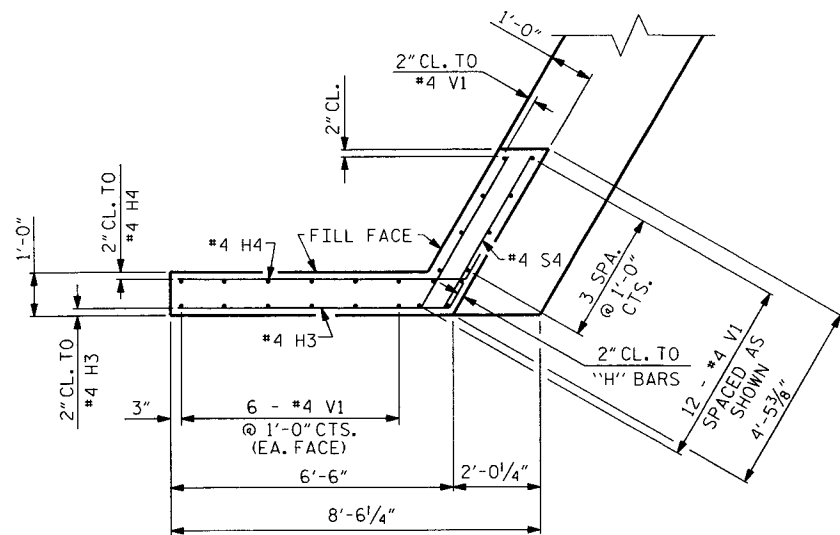


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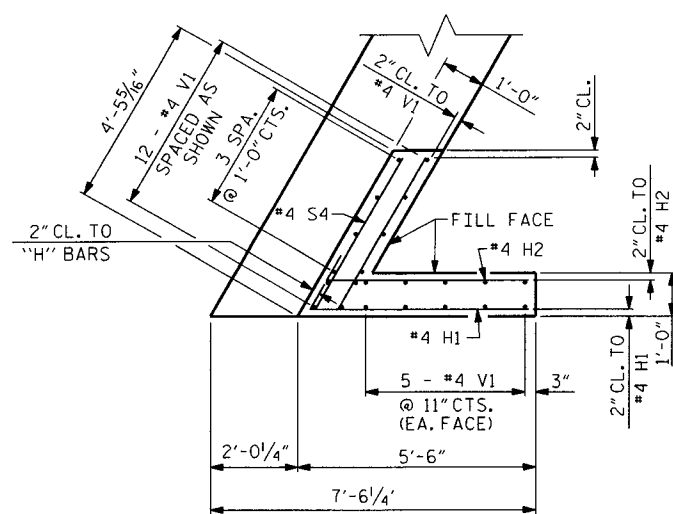
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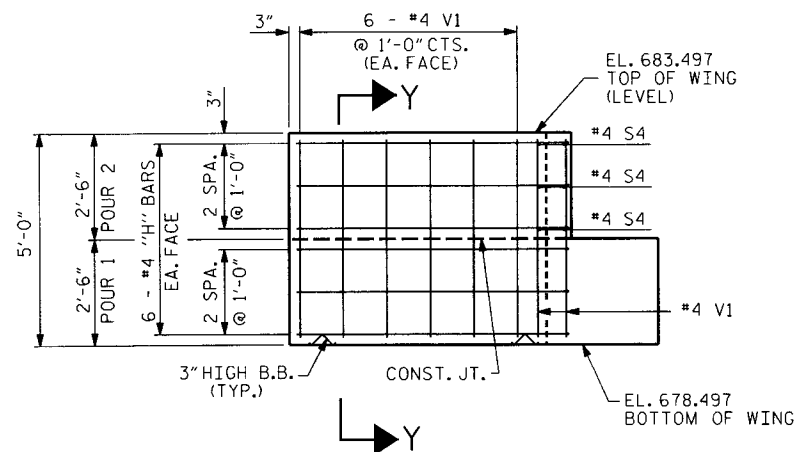
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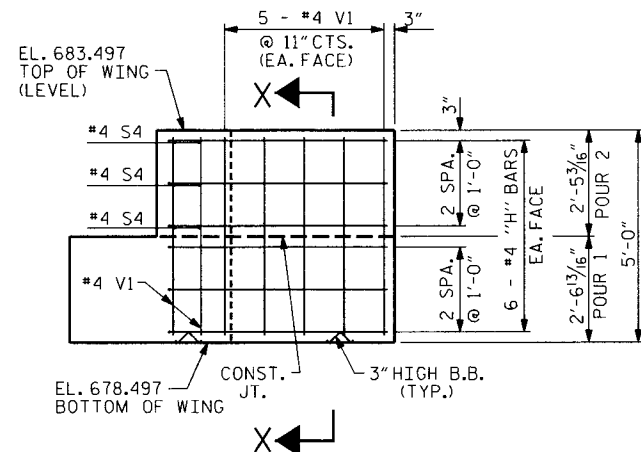
W1 PLAN OF LEFT WING



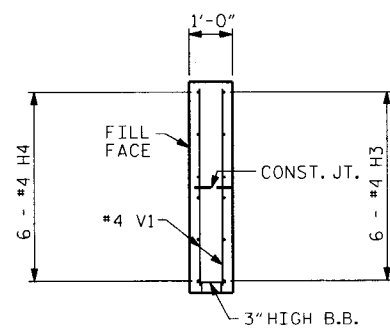
W2 PLAN OF RIGHT WING



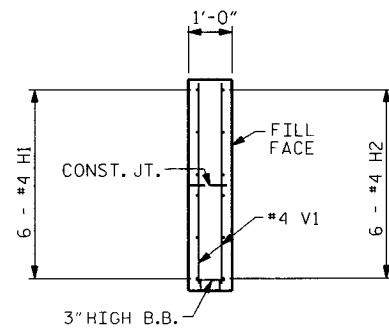
W1 ELEVATION OF LEFT WING



W2 ELEVATION OF RIGHT WING



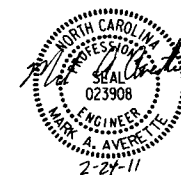
SECTION Y-Y



SECTION X-X

WBS NO. 33417.3.1
MECKLENBURG COUNTY
STATION: 16+97.50 -L-

REPLACES BRIDGE NO. 134 SHEET 2 OF 3



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DEPARTMENT OF TRANSPORTATION
RALEIGH

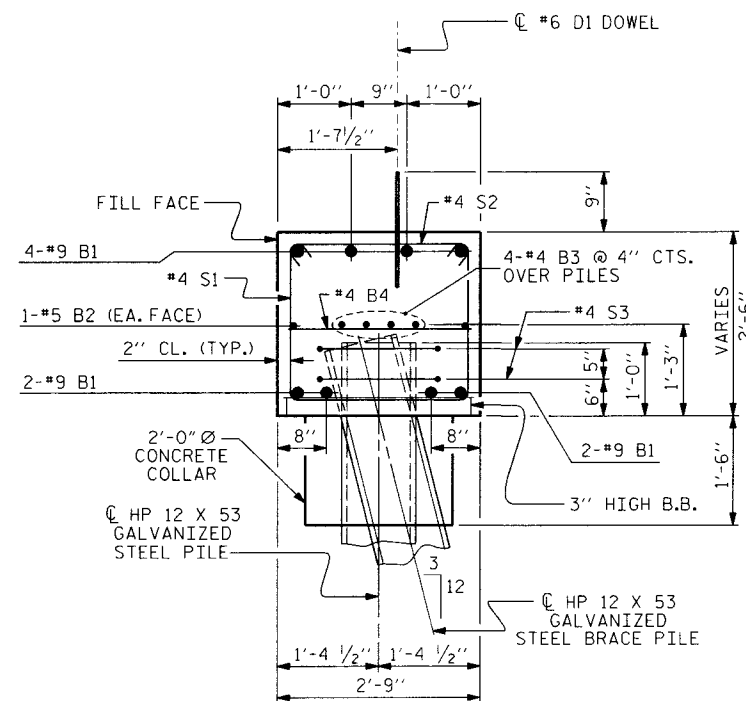
END BENT #2

30' CLEAR ROADWAY - 120° SKEW

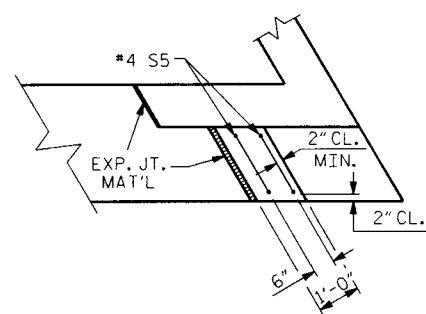
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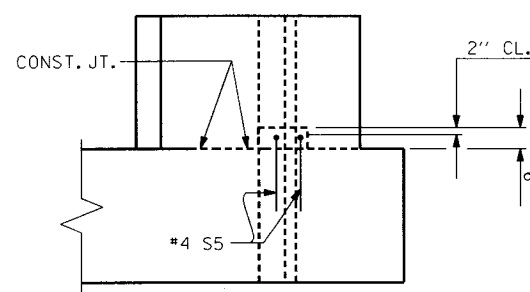
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SECTION A-A

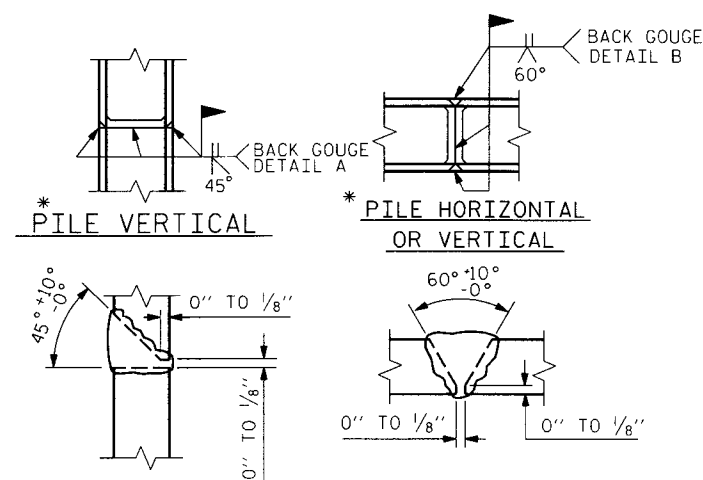


PLAN



ELEVATION

LATERAL GUIDE DETAILS



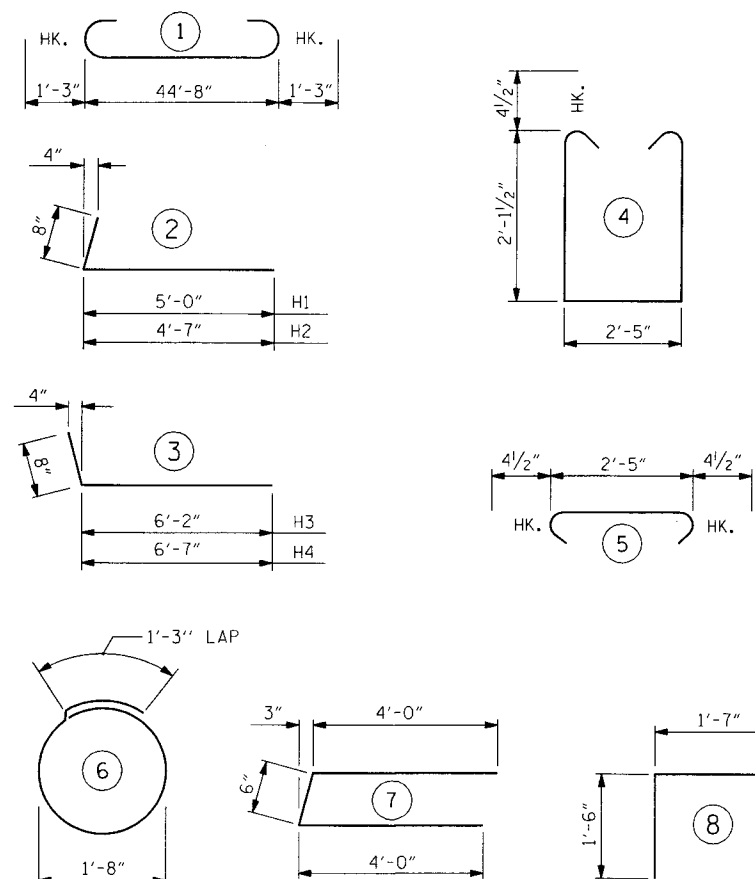
DETAIL A DETAIL B

DETAIL B

PILE SPLICE DETAILS

* POSITION OF PILE DURING WELDING.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	1	47'-2"	1283
B2	2	5	STR	44'-8"	93
B3	8	4	STR	23'-7"	126
B4	12	4	STR	2'-5"	19
D1	22	6	STR	1'-6"	50
H1	6	4	2	5'-8"	23
H2	6	4	2	5'-3"	21
H3	6	4	3	6'-10"	27
H4	6	4	3	7'-3"	29
S1	44	4	4	7'-5"	218
S2	44	4	5	3'-2"	93
S3	16	4	6	6'-6"	69
S4	6	4	7	8'-6"	34
S5	4	4	8	4'-7"	12
V1	46	4	STR	4'-7"	141

TOTAL REINFORCING STEEL	2238	LBS.
-------------------------	------	------

CLASS "A" CONCRETE BREAKDOWN	
1	100%
2	100%
3	100%
4	100%
5	100%
6	100%
7	100%
8	100%
9	100%
10	100%
11	100%
12	100%
13	100%
14	100%
15	100%
16	100%
17	100%
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89	100%
90	100%
91	100%
92	100%
93	100%
94	100%
95	100%
96	100%
97	100%
98	100%
99	100%
100	100%

POUR #1	12.6 CU. YDS.
---------	---------------

POUR #2	1.7 CU. YDS.
---------	--------------

TOTAL	14.3 CU. YDS.
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HP 12 X 53 GALVANIZED STEEL PILES

8 PILES REQUIRED	-	LIN. FEET	160.0
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STEEL PILE POINTS - NO. 8

WBS NO. 33417.3.1
MECKLENBURG COUNTY
 STATION: 16+97.50 -L-

REPLACES BRIDGE NO. 134 SHEET 3 OF 3



PLANS PREPARED BY:



SIMPSON
ENGINEERS
& ASSOCIATES

5520 Dillard Drive
Suite 120
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
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LICENSURE NO. C2521

LICENSURE NO. C2521

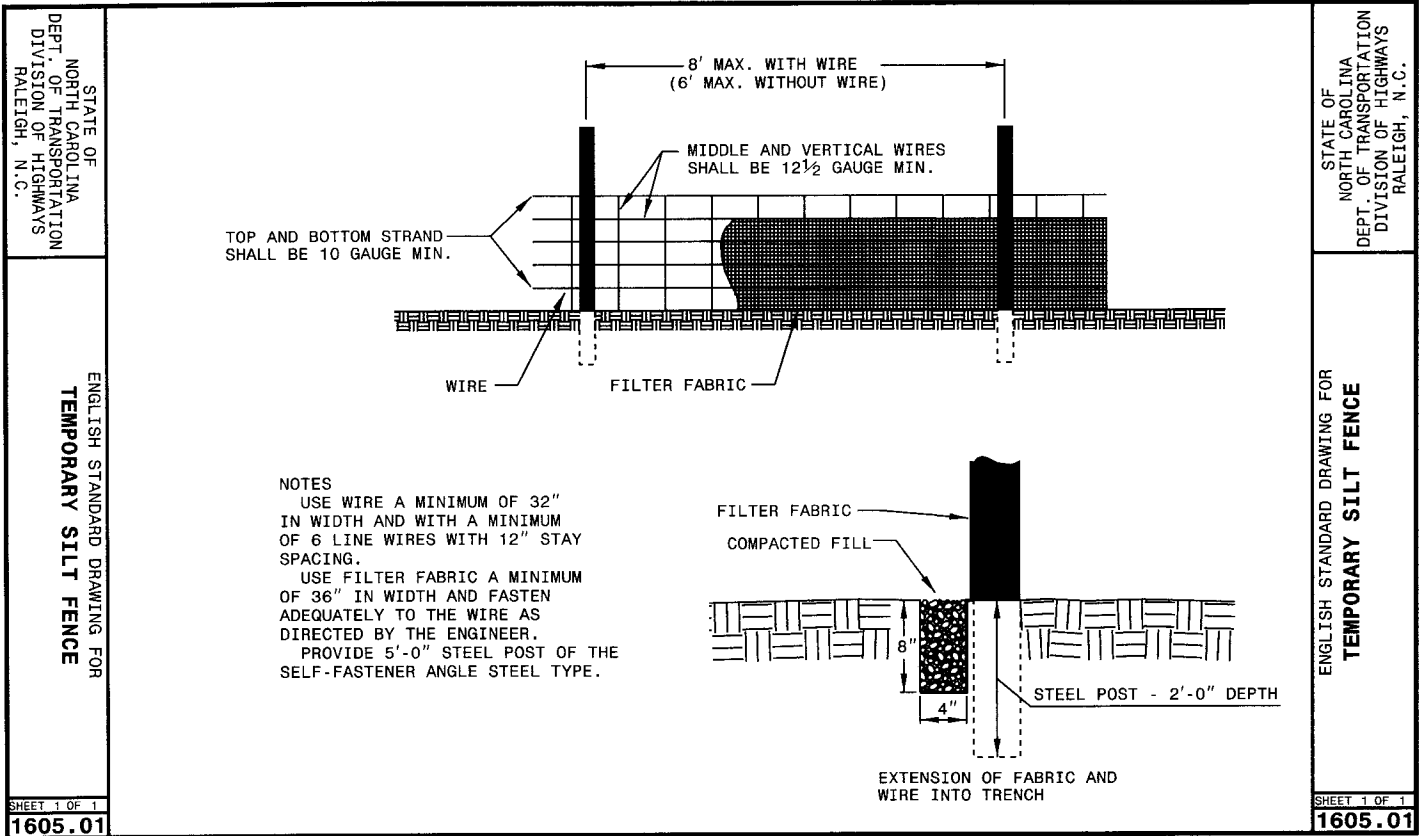
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END BENT #2

30' CLEAR ROADWAY - 120° SKEW

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

EROSION CONTROL PLAN



Special Sediment Control Fence:

Description:

The work covered by this section consists of the construction, maintenance, and removal of special sediment control fence. Place special sediment control fence as shown on the plans or as directed by the Engineer.

Materials:

(A) Posts:

Steel posts shall be at least 5 feet in length, approximately 1 3/8 inches wide measured parallel to the fence, and have a minimum weight of 1.25 lb./ft. of length. The post shall be equipped with an anchor plate having a minimum area of 14.0 square inches, and shall have a means of retaining wire in the desired position without displacement.

(B) 1/4 inch Hardware Cloth:

Hardware cloth shall have 1/4 inch openings constructed from #24 gauge wire. Install hardware cloth according to the detail shown on the plans.

(C) Sediment Control Stone:

Sediment control stone shall meet the requirements of Section 1005. Install stone according to the detail shown on the plans.

Maintenance and Removal:

The Contractor shall maintain the special sediment control fence until the project is accepted or until the fence is removed, and shall remove and dispose of silt accumulations at the fence when so directed by the Engineer in accordance with Section 1630.

The quantity of posts, sediment control stone and hardware cloth as measured above will be paid for at the contract price for "Lump Sum for Erosion Control". Such price and payment will be full compensation for all work covered by this provision, including but not limited to, furnishing all materials, installation, and removal and disposal of silt accumulations and materials.

SAFETY FENCE:

Description:

Safety Fence shall consist of furnishing, installing and maintaining polyethylene or polypropylene fence along the outside riparian buffer, wetland, or water boundary located within the construction corridor to mark the areas that have been approved to infringe within the buffer, wetland or water. The fence shall be installed prior to any land disturbing activities.

Materials:

Polyethylene or polypropylene fence shall be a highly visible preconstructed safety fence approved by the Engineer.

Either wood posts or steel posts may be used. Wood posts shall be nominal 2" x 4" or 4" x 4" lengths as required, structural light framing, grade No. 2, Southern Pine. Steel posts shall be at least 5 ft. in length, approximately 1 3/8" wide measured parallel to the fence, and have a minimum weight of 1.25 lb./ft. of length. The steel post shall be equipped with an anchor plate having a minimum area of 14 square inches.

Construction Methods:

No additional clearing and grubbing is anticipated for the installation of this fence; however, if any clearing and grubbing is required, it will be the minimum required for the installation of the safety fence. Such clearing shall include satisfactory removal and disposal of all trees, brush, stumps and other objectionable material.

The fence shall be erected to conform to the general contour of the ground. When determined necessary, minor grading along the fence line shall be performed to meet this requirement provided no obstructions to proper drainage are created.

Posts shall be set and maintained in a vertical position and may be hand set or set with a post driver. If hand set, all backfill material shall be thoroughly tamped. Wood posts may be sharpened to a dull point if power driven. Posts damaged by power driving shall be removed and replaced prior to final acceptance. The tops of all wood posts shall be cut at a 30-degree angle. The wood posts may, at the option of the Contractor, be cut at this angle either before or after the posts are erected.

The fence fabric shall be attached to the wood posts with one 2" galvanized wire staple across each cable or to the steel posts with wire or other acceptable means.

The Contractor shall be required to maintain the safety fence in a satisfactory condition for the duration of the project as determined by the Engineer.

Measurement and Payment:

Safety Fence will be paid for at the contract price for "Lump Sum for Erosion Control". Such payment will be full compensation including but not limited to clearing and grading, furnishing and installing fence fabric with necessary posts and post bracing, staples, tie wires, tools, equipment and incidentals necessary to complete this work.

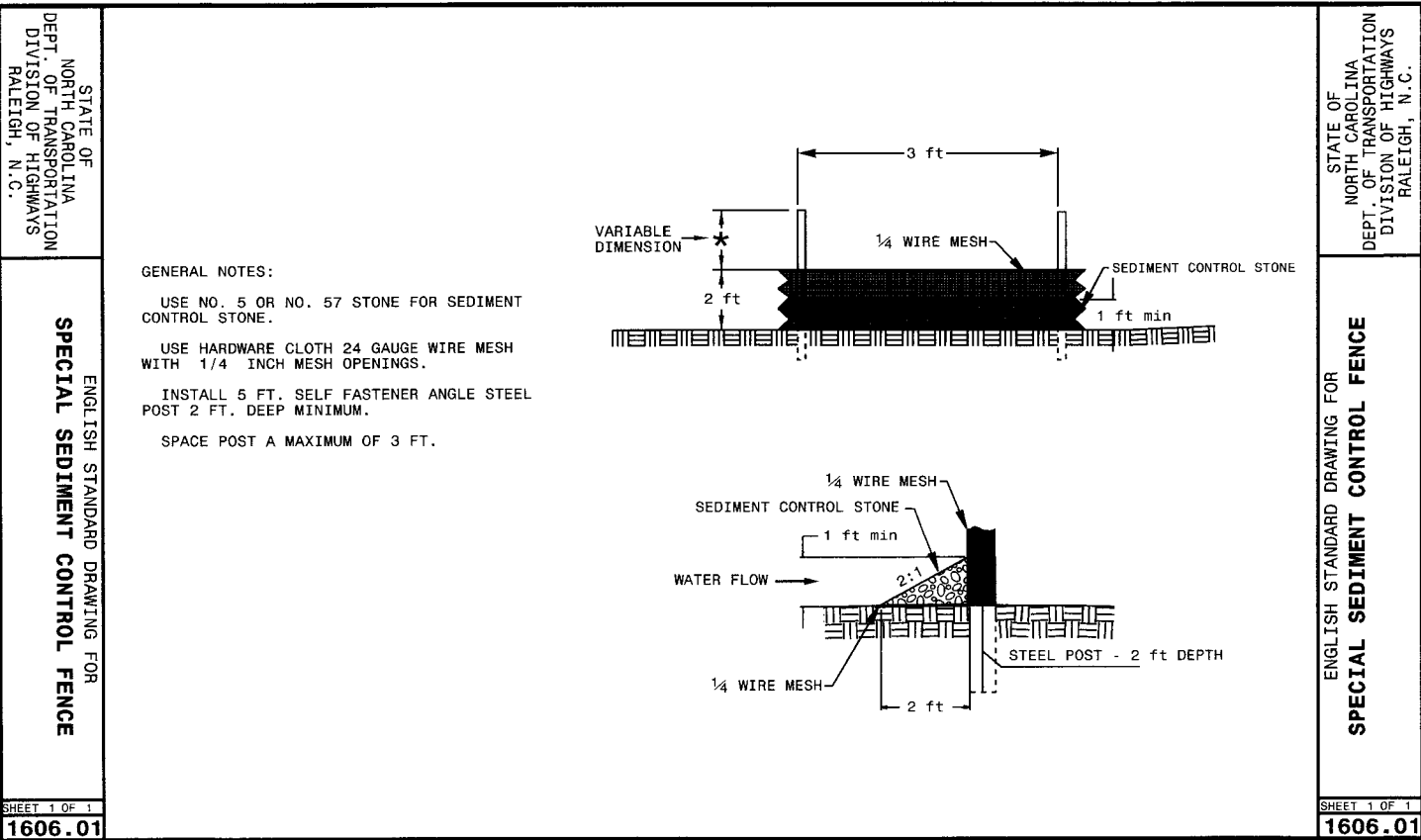
ROADSIDE ENVIRONMENTAL UNIT DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

RALEIGH, N.C.

2006 STANDARD SPECIFICATIONS

NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.



WBS NO. 33417.3.1
MECKLENBURG COUNTY
STATION: 16+97.50 -L-

REPLACES BRIDGE NO. 134

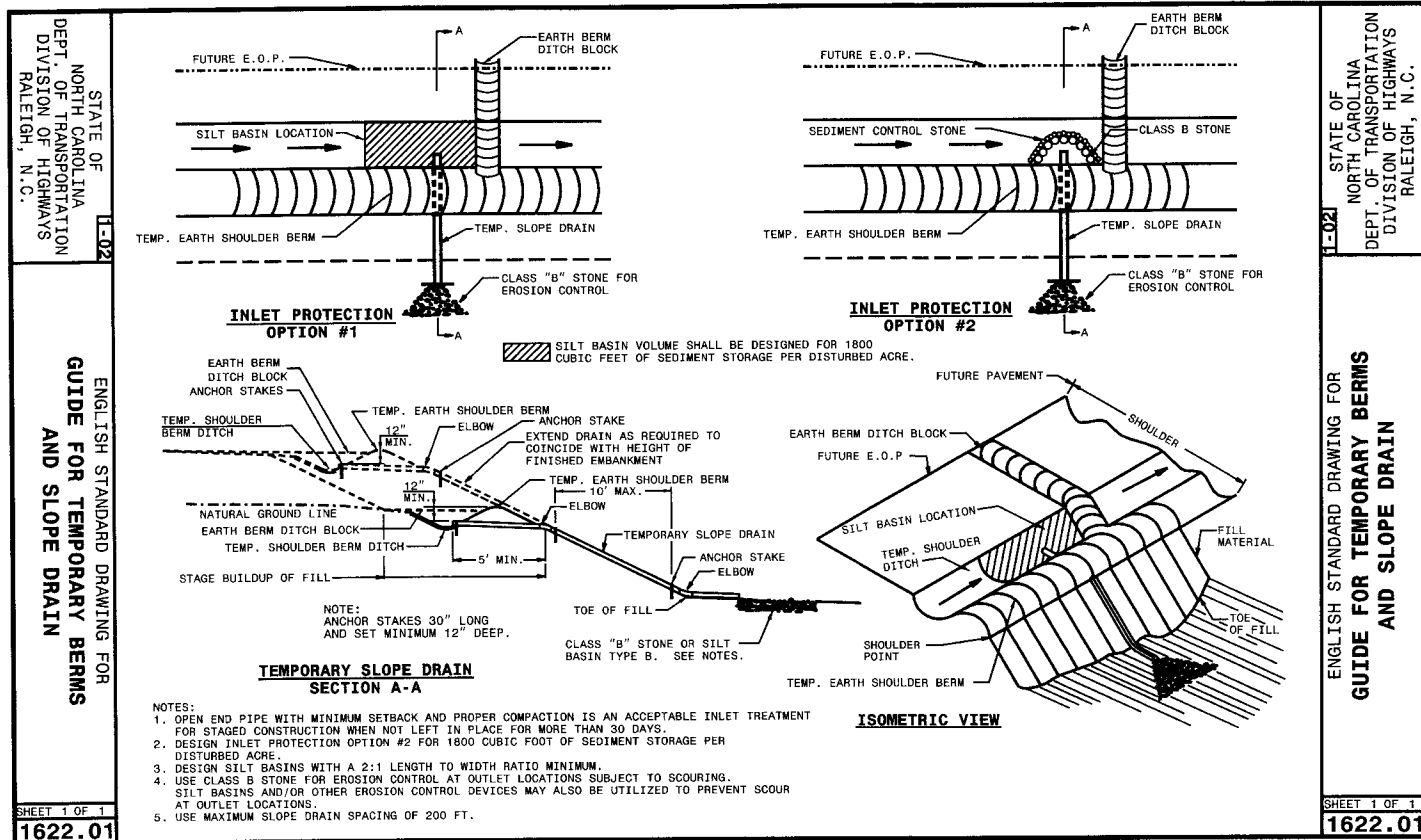
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

EROSION CONTROL

30' CLEAR ROADWAY - 120° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			31
2			4			35

EROSION CONTROL PLAN



Special Stilling Basin(s):

The work covered by this section consists of furnishing, placing, and removing a special stilling basin(s) as directed by the Engineer. The special stilling basin(s) shall be used to filter pumped water during the drilled pier operation, footing excavation, and/or culvert or pipe construction.

The filter fabric shall meet the requirements of Section 1056 for Type 2 Fabric.

Sediment control stone shall meet the requirements of Section 1005 and shall be clean of dirt and debris. Install stone according to the detail shown on the plans.

The special stilling basin(s) shall be a water permeable fabric bag that traps sand, silt, and fines as sediment laden water is pumped into it. This device shall be constructed such that it is portable and can be used adjacent to the drilled pier operation, footing excavation, and/or culvert or pipe construction.

The special stilling basin(s) shall be a bag constructed to a minimum size of 10' x 15' made from a nonwoven fabric. It shall have a sewn-in 8 in. (maximum) spout for receiving pump discharge. The bag seams shall be sewn with a double needle machine using a high strength thread. The seams shall have a minimum wide width strength as follows:

Test Method	Minimum Specifications
ASTM D-4884	60 lb/in

The fabric used to construct the bag shall be stabilized to provide resistance to ultra-violet degradation and meet the following specifications for flow rates, strength, and permeability:

Property	Test Method	Units	Min. Specifications
Weight	ASTM D-3776	oz/yd	8.0
Grab tensile	ASTM D-4632	lb	200.0
Puncture	ASTM D-4833	lb	130.0
Flow rate	ASTM D-4491	gal/min/ft	80.0
Permittivity	ASTM D-4991	1/sec	1.2
UV Resistance	ASTM D-4355	%	70.0

The Contractor shall install the special stilling basin in accordance with the details in the plans and at locations as directed by the Engineer.

The special stilling basin(s) shall be placed so the incoming water flows into and through the bag without causing erosion. The neck or spout of the bag shall be tied off tightly to stop the water from flowing out of the bag without going through the walls.

The special stilling basin(s) shall be replaced and disposed of when it is 3/4 full of sediment or when it is impractical for the bag to filter the sediment out at a reasonable flow rate. Prior approval from the Engineer must be received before removal and replacement.

The Contractor shall be responsible for providing a sufficient quantity of bags to contain silt from pumped effluent during the drilled pier operation, footing excavation, and/or culvert or pipe construction.

The quantity of sediment control stone, filter fabric for drainage, and special stilling basin(s) as measured above will be paid for at contract price for "Lump Sum" for Erosion Control". Such price and payment will be full compensation for all work covered by this provision, including but not limited to, furnishing all materials, placing and maintaining the special stilling basin(s), and removal and disposal of silt accumulations and bag.

WBS NO. 33417.3.1
MECKLENBURG COUNTY
STATION: 16+97.50 -L-

REPLACES BRIDGE NO. 134

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

EROSION CONTROL

30' CLEAR ROADWAY - 120° SKEW

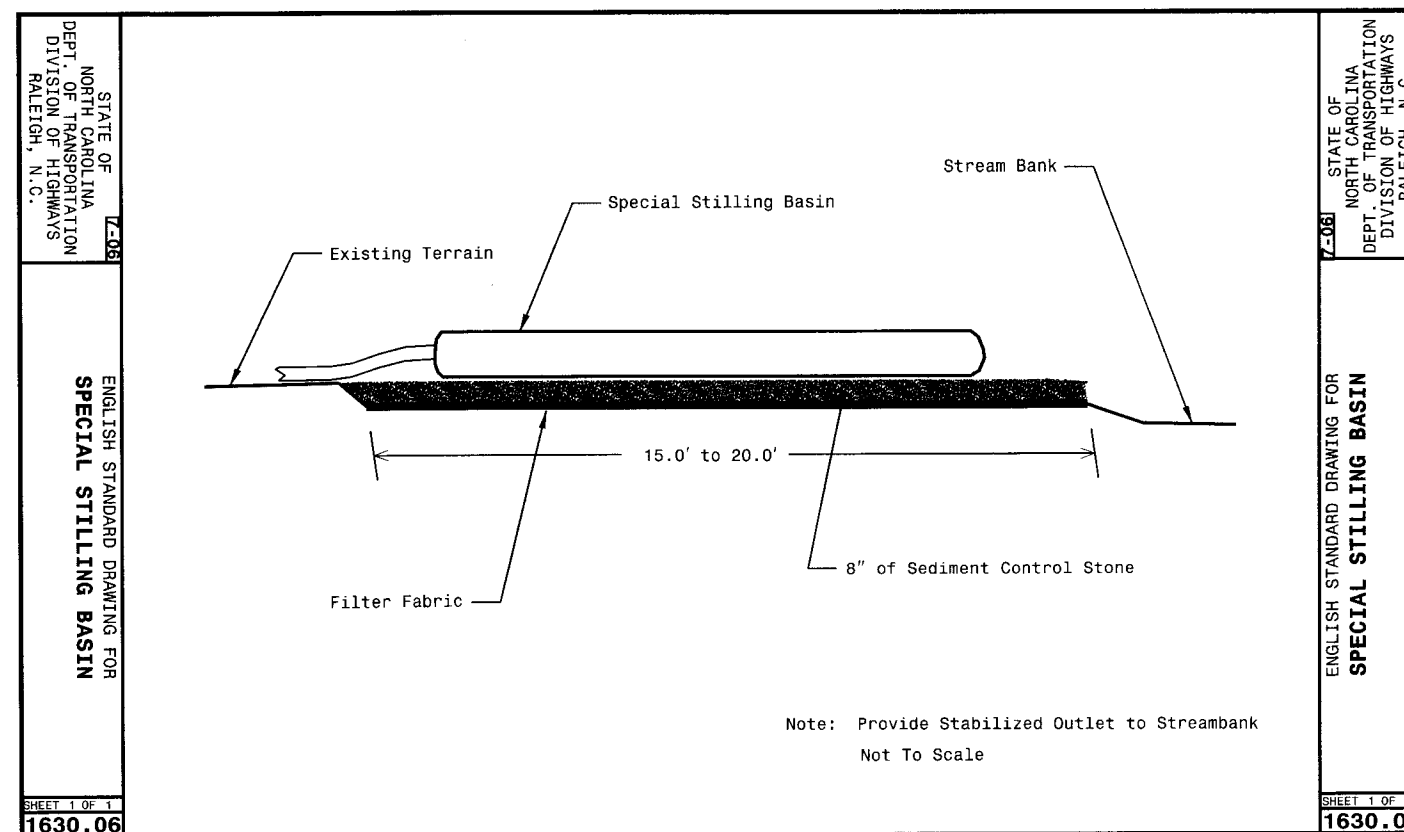
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			32
2			4			35

ROADSIDE ENVIRONMENTAL UNIT
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

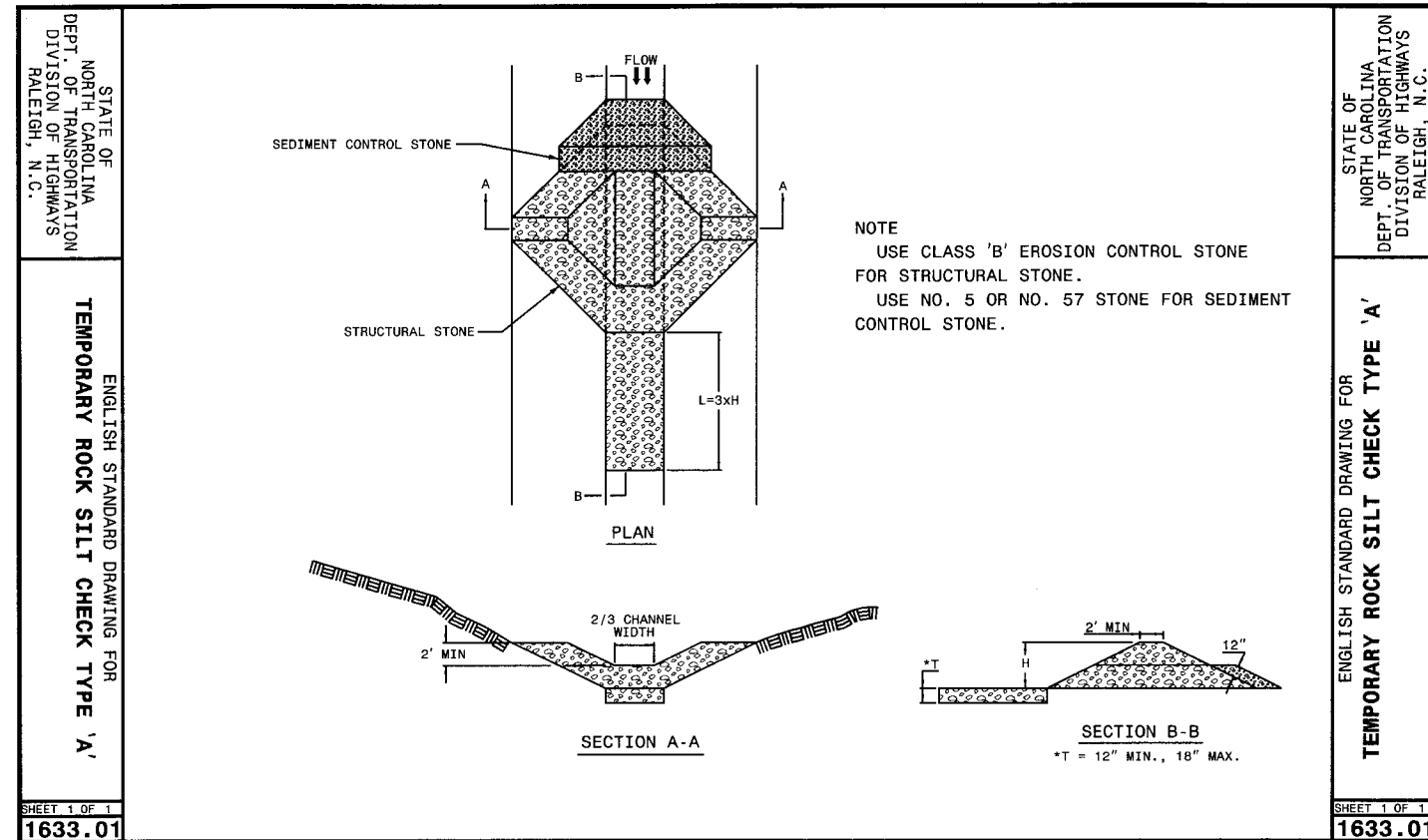
2006 STANDARD SPECIFICATIONS

NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.



EROSION CONTROL PLAN

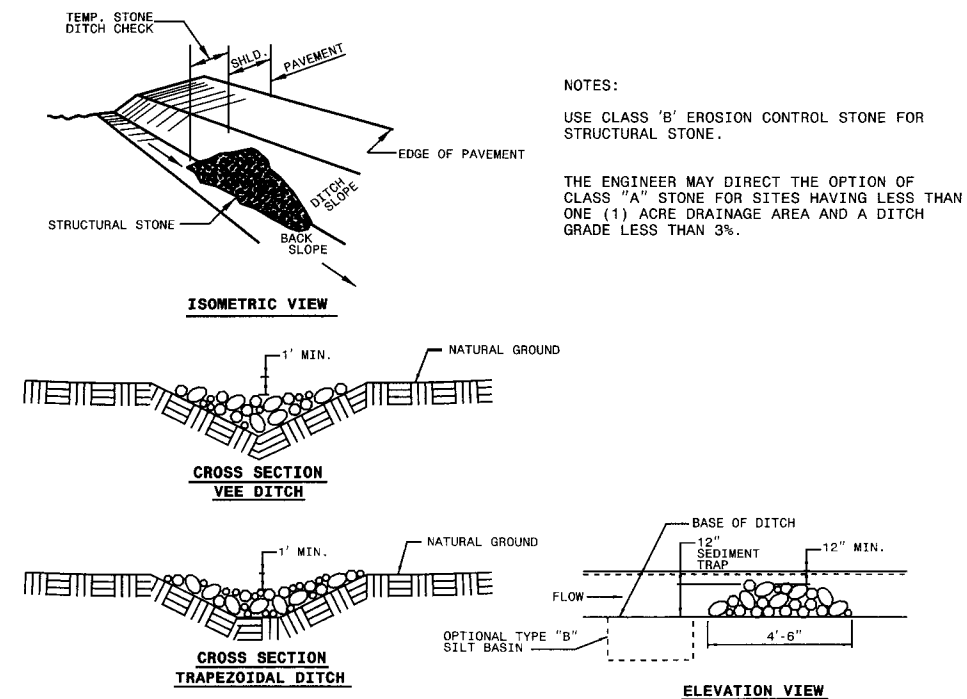


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2006 STANDARD SPECIFICATIONS

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ENGINEER.

TEMPORARY ROCK SILT CHECK TYPE 'B' DETAIL



WBS NO. 33417.3.1
MECKLENBURG COUNTY
STATION: 16+97.50 -L-

REPLACES BRIDGE NO. 134

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

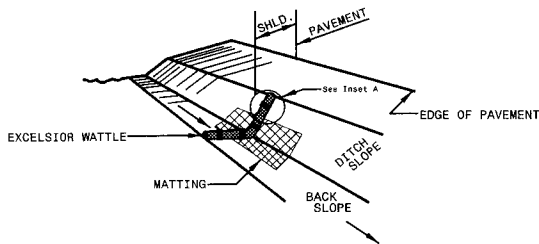
EROSION CONTROL

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

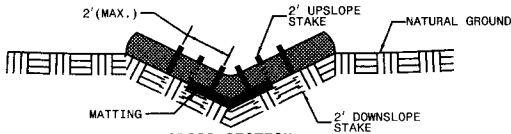
30' CLEAR ROADWAY - 120° SKEW

EROSION CONTROL PLAN

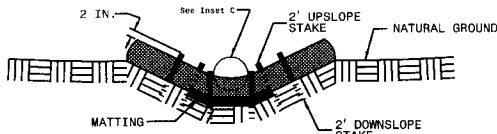
WATTLE WITH POLYACRYLAMIDE DETAIL



ISOMETRIC VIEW

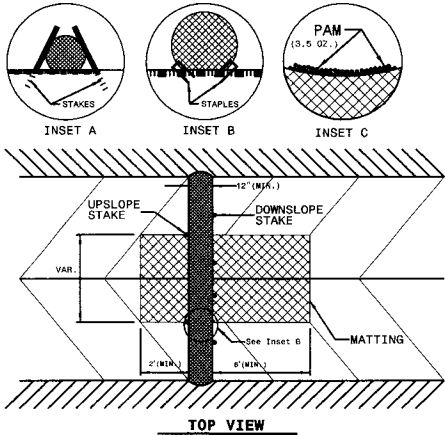


CROSS SECTION
VEE DITCH



CROSS SECTION
TRAPEZOIDAL DITCH

NOTES:
USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.
USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. CROSS SECTION.
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.
INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.
INITIALLY APPLY 3.5 OUNCES OF ANIONIC OR NEUTRALLY CHARGED POLYACRYLAMIDE (PAM) OVER WATTLE WHERE WATER WILL FLOW AND AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.25 IN.



TOP VIEW

WATTLES WITH POLYACRYLAMIDE (PAM):

Description

Wattles are tubular products consisting of excelsior fibers encased in polyethylene netting. Wattles are used on slopes or channels to intercept runoff and act as a velocity break. Wattles are to be placed at locations shown on the plans or as directed. Installation shall follow the detail provided in the plans and as directed. Work includes furnishing materials, installation of wattles, matting installation, PAM application, and removing wattles.

Materials

Wattle shall meet the following specifications:

100% Curled Wood(Excelsior) Fibers
Minimum Diameter - 12 in.
Minimum Density - 2.6 lb/ft³ +/- 10%
Net Material - Polyethylene
Net Openings - 1 in. x 1 in.
Net Configuration - Totally Encased
Minimum Weight - 20 lb. +/- 10% per 10 ft. length

Anchors: Stakes shall be used as anchors.

Wooden Stakes:

Provide hardwood stakes a minimum of 2-ft. long with a 2 in. x 2 in. nominal square cross section. One end of the stake must be sharpened or beveled to facilitate driving down into the underlying soil.

Matting shall meet the requirements of section 1060-8 of the Standard Specifications, or shall meet specifications provided elsewhere in this contract.

Provide staples made of 0.125" diameter new steel wire formed into a U shape not less than 12" in length with a throat of 1" in width.

Polyacrylamide (PAM) shall be applied in powder form and shall be anionic or neutrally charged. Soil samples shall be obtained in areas where the wattles will be placed and analyzed for the appropriate PAM flocculant to be utilized with each wattle.

Construction Methods

Wattles shall be secured to the soil by wire staples approximately every 1 linear foot and at the end of each section of wattle. A minimum of 4 stakes shall be installed on the downstream side of the wattle with a maximum spacing of 2 linear feet along the wattle, and according to the detail. Install a minimum of 2 stakes on the upstream side of the wattle according to the detail provided in the plans. Stakes shall be driven into the ground a minimum of 10 in. with no more than 2 in. projecting from the top of the wattle. Drive stakes at an angle according to the detail provided in the plans.

Install wattles to the top of the ditch according to the detail provided in the plans. Overlap adjoining sections of wattles a minimum of 6 in.

Installation of matting shall be in accordance with the detail provided in the plans, and in accordance with section 1631-3(B) of the Standard Specifications, or in accordance with specifications provided elsewhere in this contract.

Apply PAM over the lower center portion of the wattle where the water is going to flow over at a rate of 3.5 ounces per wattle. PAM applications shall be done during construction activities after every rainfall event that is equal to or exceeds 0.25 in.

The Contractor shall maintain the wattles until the project is accepted or until the wattles are removed, and shall remove and dispose of silt accumulations at the wattles when so directed in accordance with the requirements of Section 1630 of the Standard Specifications.

The quantity of wattle(s), wooden stakes, staples, matting and PAM as measured above will be paid for at contract price for "Lump Sum for Erosion Control". Such price and payment will be full compensation for all work covered by this provision, including but not limited to, furnishing all materials, placing and maintaining the wattle(s), and removal and disposal of silt accumulations and wattle.

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2006 STANDARD SPECIFICATIONS

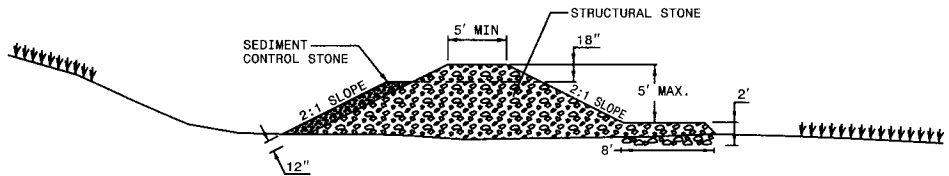
NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

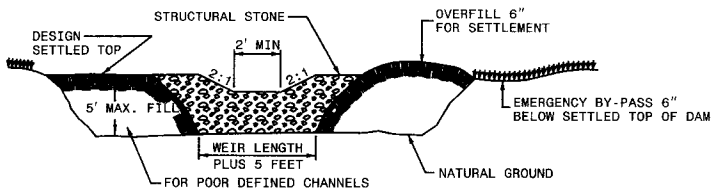
STATE OF NORTH CAROLINA
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
TEMPORARY ROCK SEDIMENT DAM TYPE 'B'

SHEET 1 OF 1
1634.02



PROFILE SECTION



CROSS SECTION

DRAINAGE AREA (ACRES)	WEIR LENGTH (FT)
1	4.0
2	6.0
3	8.0
4	10.0
5	12.0

NOTES:
USE CLASS 'B' EROSION CONTROL STONE FOR STRUCTURAL STONE.
USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.
DIKE MAY EXTEND ALONG MORE THAN ONE SIDE OF THE TRAP AREA. PROVIDE A TOTAL SEDIMENT STORAGE VOLUME OF 1800± CUBIC FEET PER ACRE OF DISTURBED AREA. SOME OF THE REQUIRED VOLUME MAY BE PROVIDED BY OTHER UP OR DOWNSTREAM CONTROLS.
AN UNDERLAY OF STRUCTURAL STONE WITH FILTER FABRIC MAY BE REQUIRED BY THE ENGINEER.

STATE OF NORTH CAROLINA
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RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
TEMPORARY ROCK SEDIMENT DAM TYPE 'B'

SHEET 1 OF 1
1634.02

WBS NO. 33417.3.1
MECKLENBURG COUNTY
STATION: 16+97.50 -L-

REPLACES BRIDGE NO. 134

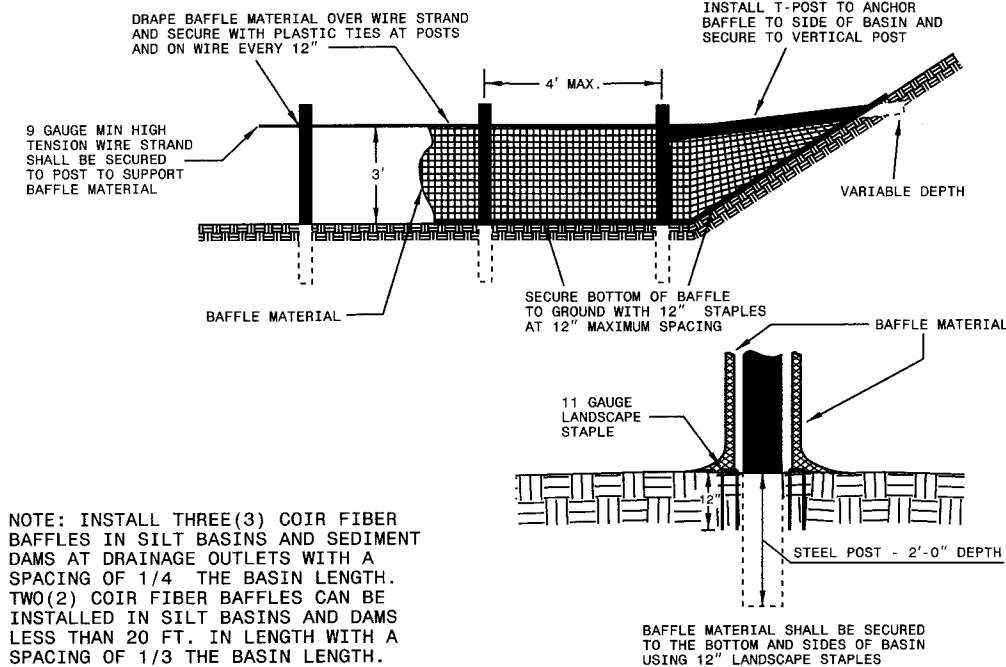
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

EROSION CONTROL

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

EROSION CONTROL PLAN

COIR FIBER BAFFLE DETAIL



COIR FIBER BAFFLE:

Description

Furnish material, install and maintain coir fiber baffles according to the details in the plans or in locations as directed. Coir Fiber Baffles shall be installed in silt basins and sediment dams at drainage outlets. Work includes providing all materials, placing, securing, excavating and backfilling of Coir Fiber Baffles.

Materials

(A) Coir Fiber Mat

Matting: Provide matting to meet the following requirements:

100% coconut fiber (coir) twine woven into high strength matrix
Thickness - 0.30 in. minimum
Tensile Strength 1348 x 626 lb/ft minimum
Elongation 34% x 38% maximum
Flexibility (mg-cm) 65030 x 29590
Flow Velocity Observed 11 ft/sec
Weight 20 oz/SY
Size 6.6 x 164 ft (120 SY)
C Factor 0.002
Open Area (measured) 50%

(B) Staples

Provide staples made of 0.125 in. diameter new steel wire formed into a u shape not less than 12" in length with a throat of 1" in width.

(C) Posts

Steel posts shall be at least 5 ft. in length, approximately 1 3/8" wide measured parallel to the fence, and have a minimum weight of 1.25 lb/ft of length. The post shall be equipped with an anchor plate having a minimum area of 14.0 square inches, and shall be of the self-fastener angle steel type to have a means of retaining wire and coir fiber mat in the desired position without displacement.

(D) Wire

Provide 9-gauge high-tension wire strand of variable lengths.

Construction Methods

Place the coir fiber baffles immediately upon excavation of basins. Install three (3) baffles in basins with a spacing of one fourth (1/4) the basin length and according to the detail sheets. Two (2) coir fiber baffles shall be installed in basins less than 20 ft. in length with a spacing of one third (1/3) the basin length.

Steel posts shall be placed at a depth of 2 ft. below the basin surface, with a maximum spacing of 4 ft. Attach an 9-gauge high tension wire strand to the steel posts at a height of 3 ft. with plastic ties or wire fasteners. Install a steel post into side of the basin at a variable depth and a height of 3 ft. from the bottom of the basin to anchor coir fiber mat. Secure anchor post to the upright steel post in basin with wire fasteners.

The coir fiber mat shall be draped over the wire strand to a minimum of 3 ft. of material on each side of the strand. Secure the coir fiber mat to the wire strand with plastic ties or wire fasteners. Place staples across the matting at ends and junctions approximately 1 ft. apart at the bottom and side slopes of basin. Overlap matting at least 6" where 2 or more widths of matting are installed side by side.

Refer to details in the plan sheets. The Engineer may require adjustments in the stapling requirements to fit individual site conditions.

Measurement and Payment

Payment for Coir Fiber Baffles will be included in the contract bid price for Lump Sum for Erosion Control. Such price and payment will be full compensation for all work covered by this section, including, but not limited to, furnishing all materials, labor, equipment and incidentals necessary to install the coir fiber baffles.

ROADSIDE ENVIRONMENTAL UNIT
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RALEIGH, N.C.
2006 STANDARD SPECIFICATIONS

NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL
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ADDITIONAL EROSION CONTROL DEVICES MAY
NEED TO BE INSTALLED AS DIRECTED BY THE
ENGINEER.

WBS NO. 33417.3.1
MECKLENBURG COUNTY
STATION: 16+97.50 -L-

REPLACES BRIDGE NO. 134

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

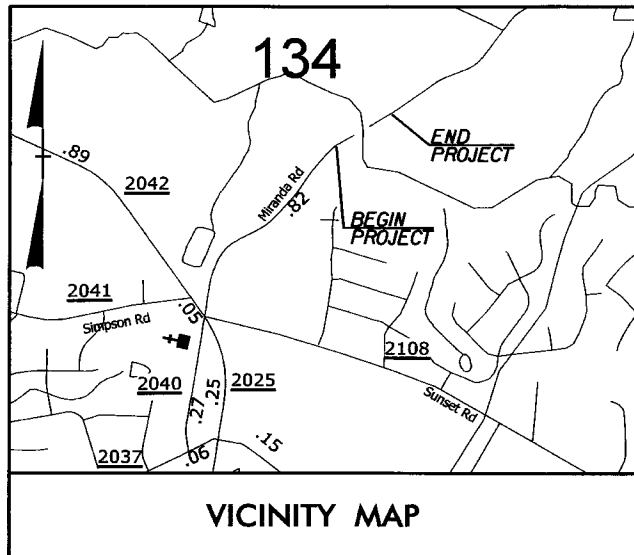
EROSION CONTROL

30' CLEAR ROADWAY - 120° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			35
2			4			35

TIP PROJECT: B-4579

WBS:

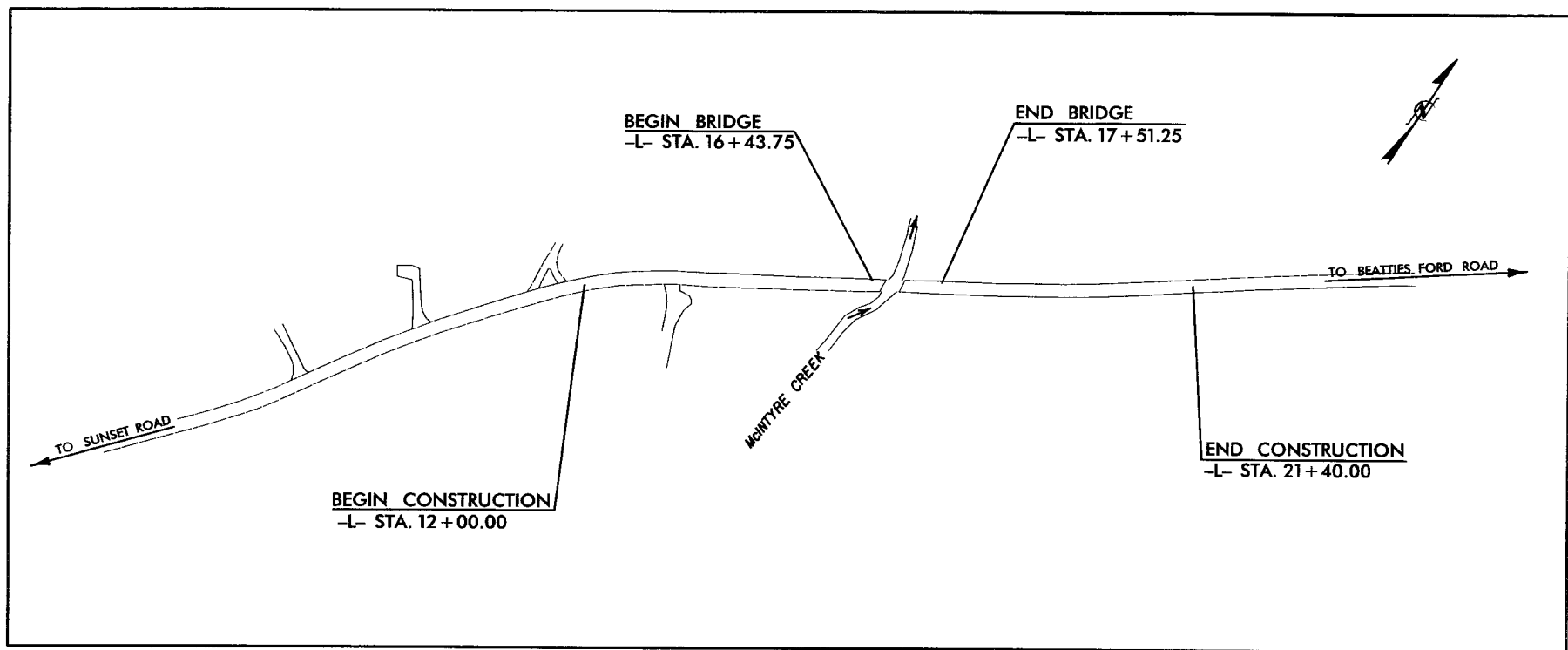


VICINITY MAP

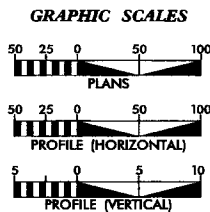
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
MECKLENBURG COUNTY

LOCATION: SR 2025 BRIDGE NO. 134 OVER MCINTYRE CREEK
UTILITY CONSTRUCTION

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4579	UC-1	



LOCATION SKETCH



PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT = 0.158 MILE
LENGTH STRUCTURE TIP PROJECT = 0.020 MILE
TOTAL LENGTH TIP PROJECT = 0.178 MILE

INDEX OF SHEETS

SHEET No.	DESCRIPTION
UC-1	TITLE SHEET
UC-2	UTILITY CONSTRUCTION PLAN SHEET
UC-3	UTILITY CONSTRUCTION PROFILE
UC-4	UTILITY CONSTRUCTION DETAILS
UC-5	UTILITY CONSTRUCTION DETAILS
UC-6	UTILITY CONSTRUCTION DETAILS
UC-7	UTILITY CONSTRUCTION DETAILS
UC-8	UTILITY CONSTRUCTION DETAILS

UTILITY OWNERS ON PROJECT

(1.) CHARLOTTE-MECKLENBURG UTILITIES (WATER)
(SEWER)

PREPARED BY

LICENSE NUMBER: C-0281

Municipal Services **Engineering Company, P.A.**

P.O. BOX 97 GARNER, N.C. 27529 (919) 772-5393
P.O. BOX 349 BOONE, N.C. 28607 (828) 262-1767

LICENSE NUMBER: C-0281

UTILITY DESIGN ENGINEER **BILLY DIXON** P.E.

NOTE: PROPOSED GRADES ARE PROVIDED FOR REFERENCE ONLY. CONTRACTOR SHALL FIELD VERIFY TO MATCH PROPOSED GRADE.

PROJECT REFERENCE NO.
B-4579

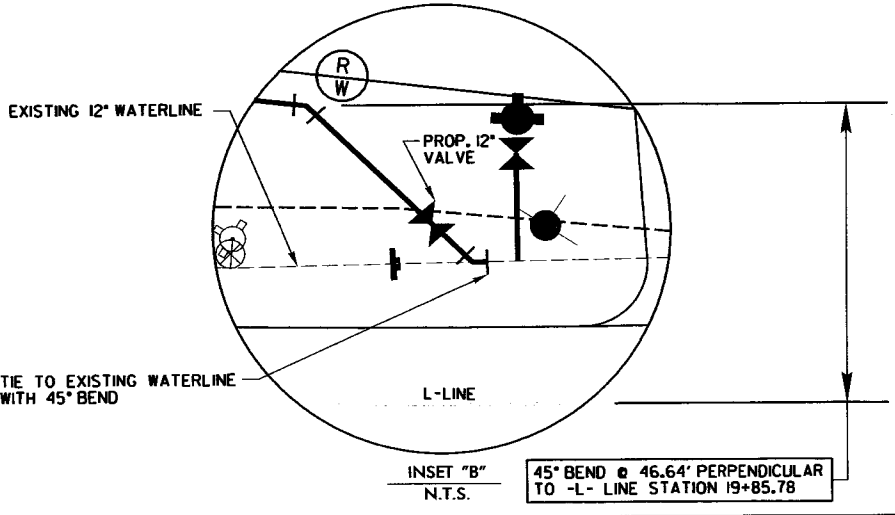
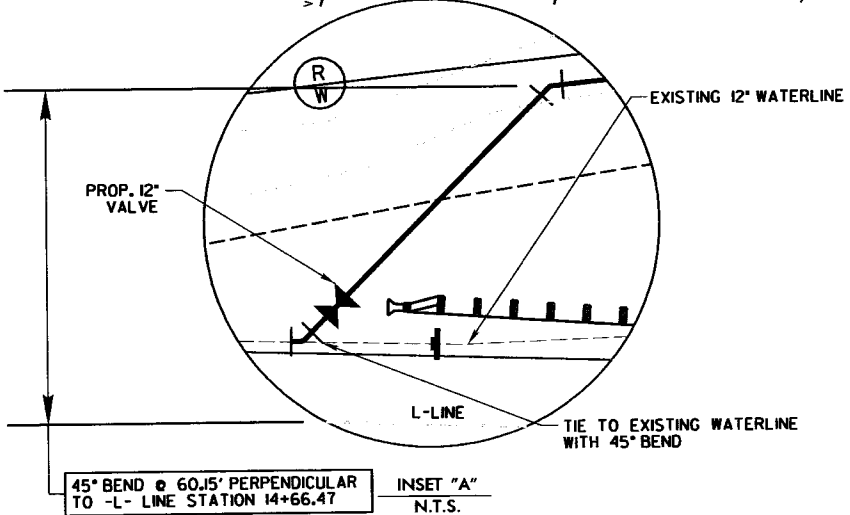
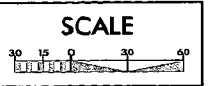
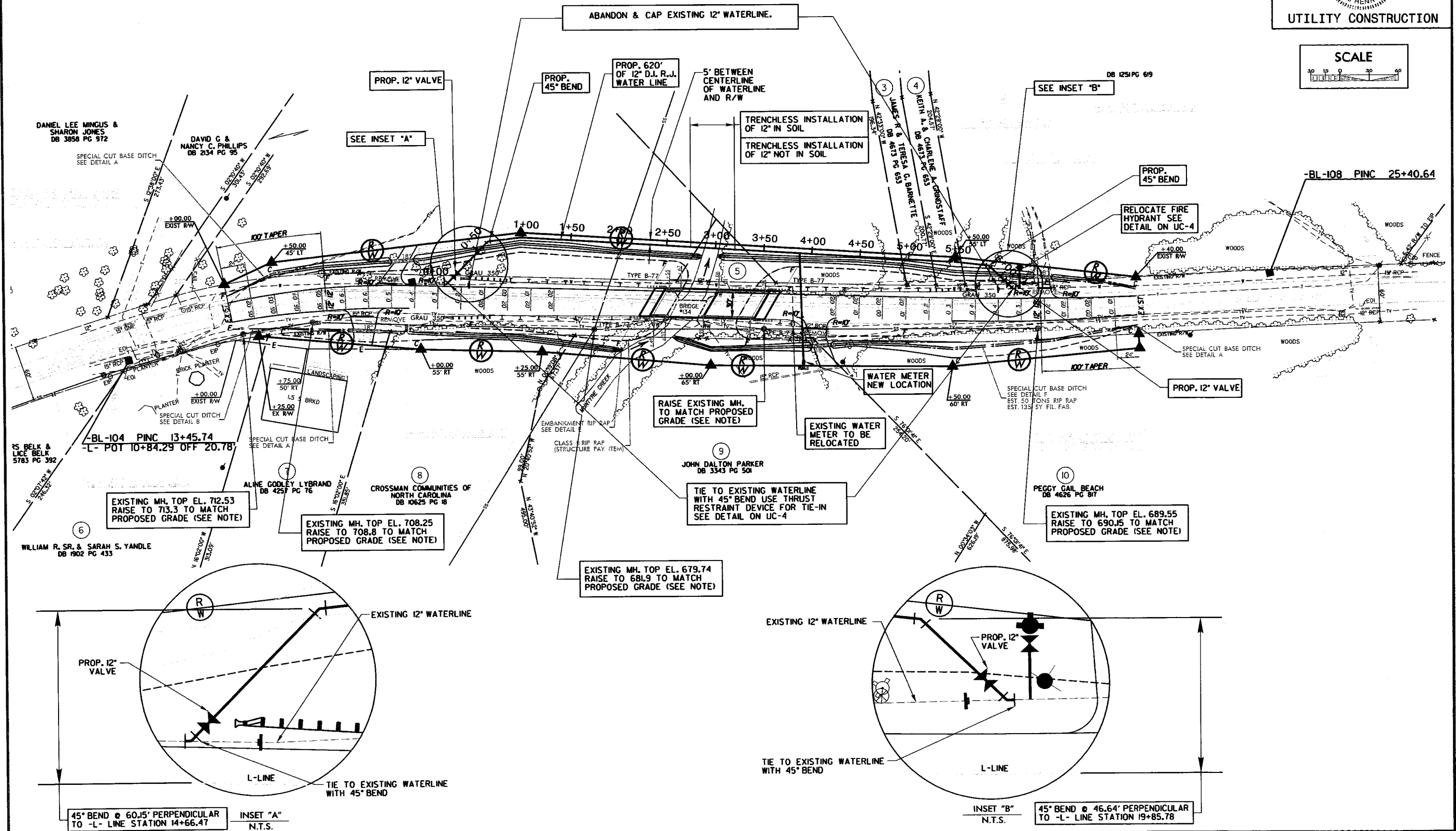
SHEET NO.
UC-2

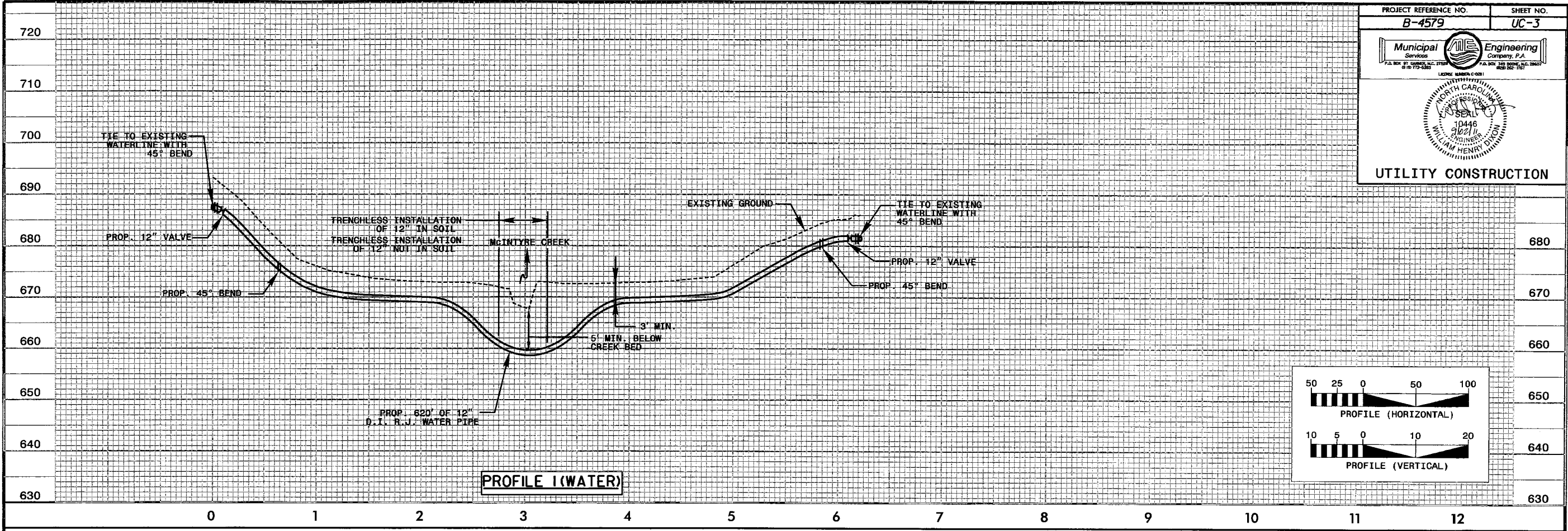
Municipal Engineering
Services
P.A. INC. 37 GARDEN LANE, SUITE 200
DURHAM, NC 27705
919.286.5000

Engineering
Company, P.A.
P.A. INC. 340 BOWNE, N.C. 28007
919.286.1707

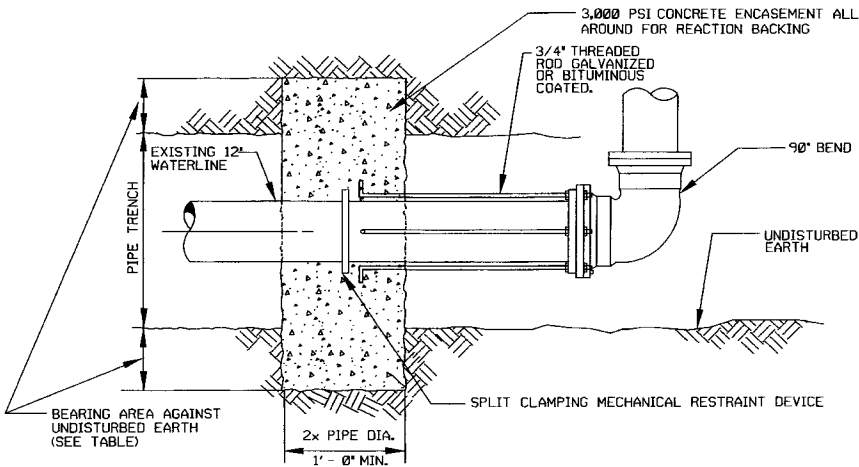
PROFESSIONAL
ENGINEER
10446
9/10/21
WILLIAM HENRY DAVIS

UTILITY CONSTRUCTION





PROJECT REFERENCE NO. B-4579	SHEET NO. UC-3
Municipal Services Engineering Company, P.A. 10446 202111 ENGINEER WILLIAM HENRY DUBOIS	
UTILITY CONSTRUCTION	



PIPE SIZE	MIN. BEARING AREA (SQ. FT.)					
	SOFT CLAY	SILT	SANDY SILT	SAND	SAND CLAY	HARD CLAY
12	21	14	6.8	5.1	3.4	2.3

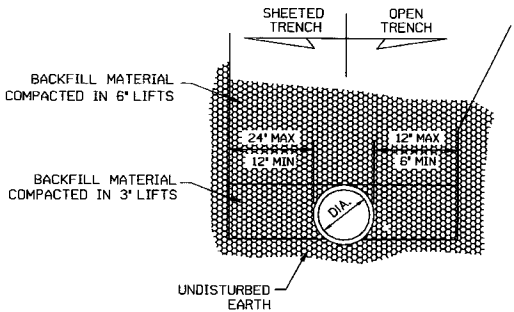
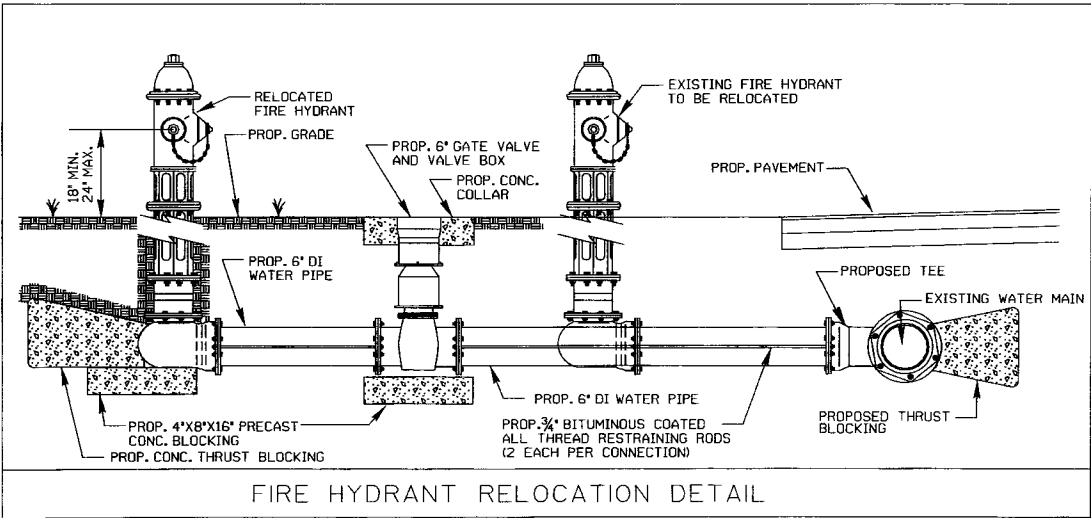
NOTE: ALTERNATE METHOD OF RESTRAINT SHOULD BE CONSIDERED FOR SITUATIONS FALLING WITHIN OUTLINED AREA.

NOTE: 1. MIN. BEARING AREAS ARE BASED UPON THE TABLE ABOVE. FOR SOILS HAVING BEARING CAPACITIES DIFFERENT THAN THAT SHOWN ADJUST AREA AS NECESSARY TO PROVIDE EQUIVALENT RESTRAINT.

2. THRUST RESTRAINT DEVICE SHALL BE CONSTRUCTED AND CONCRETE CURED BEFORE CUTTING AND CAPPING EXISTING WATERLINE.

SOIL	BEARING LOAD (lb/sq.ft.)
MUCKY	
SOFT CLAY	1,000
SILT	1,500
SANDY SILT	3,000
SAND	4,000
SANDY CLAY	6,000
HARD CLAY	9,000

THRUST RESTRAINT DEVICE FOR TYING TO EXISTING WATERLINE



TYPICAL TRENCH DETAIL
MAXIMUM TRENCH WIDTH AT TOP OF PIPE

NOTES:
CONSTRUCTION OF TRENCHES SHALL BE IN ACCORDANCE WITH THE LATEST OSHA REGULATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE REGULATIONS. NO BOULDERS OR STONES IN EXCESS OF 4\"/>

