TIP PROJECT: B-4469

WBS: 33718.3.1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

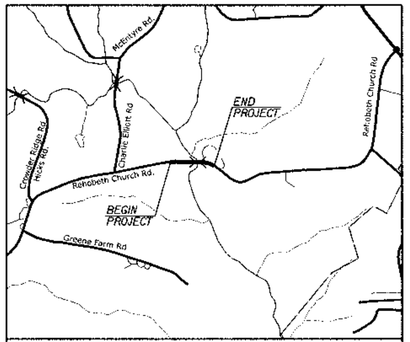
CLEVELAND COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4469	1	

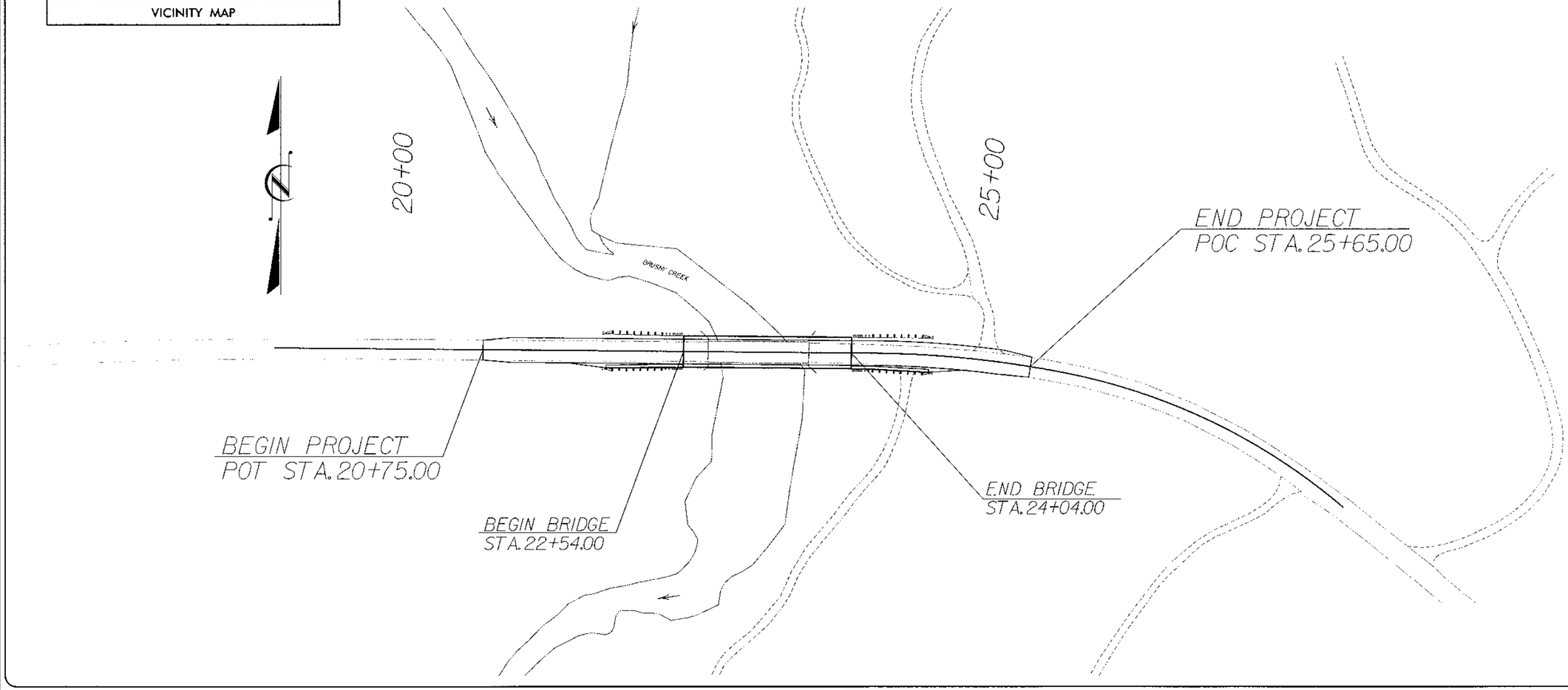
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33718.1.1	BRZ-1350(4)	P.E.
33718.3.1	BRZ-1350(4)	CONST.

LOCATION: BRIDGE NO. 219 ON SR 1350 OVER BRUSHY CREEK

TYPE OF WORK: BRIDGE REPLACEMENT WITH PRESTRESSED CONCRETE CORED SLAB AND BOX BEAM SPANS ON PILE END BENT AND END BENT ON SPREAD FOOTING WITH INTERIOR BENTS AND ROADWAY APPROACHES



VICINITY MAP



GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2003 = 600
ADT 2030 = 900
DHV = N.A.%
D = N.A.%
T = 3 % *
V = 25 MPH

* TTST 1% DUAL 2%

PROJECT LENGTH

ROADWAY	=	0.065	MI.
BRIDGE	=	0.028	MI.
TOTAL	=	0.093	MI.

Prepared In the Office of:

Stantec

Stantec Consulting Inc.
Suite 300, 801 Jones Franklin Road
Raleigh, NC U.S.A.
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Tel. 919.851.6866
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www.stantec.com

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

LETTING DATE:
OCT. 27, 2009

JOE KELVINGTON, PE
PROJECT ENGINEER

ROBERT WILLIAMS, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034257 ENGINEER C. W. GASKILL JR.

SIGNATURE: P.E. 9/3/09

PROJECT DESIGN ENGINEER

SEAL 30032 ENGINEER ROBERT A. WILLIAMS

SIGNATURE: P.E. 9/3/09

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

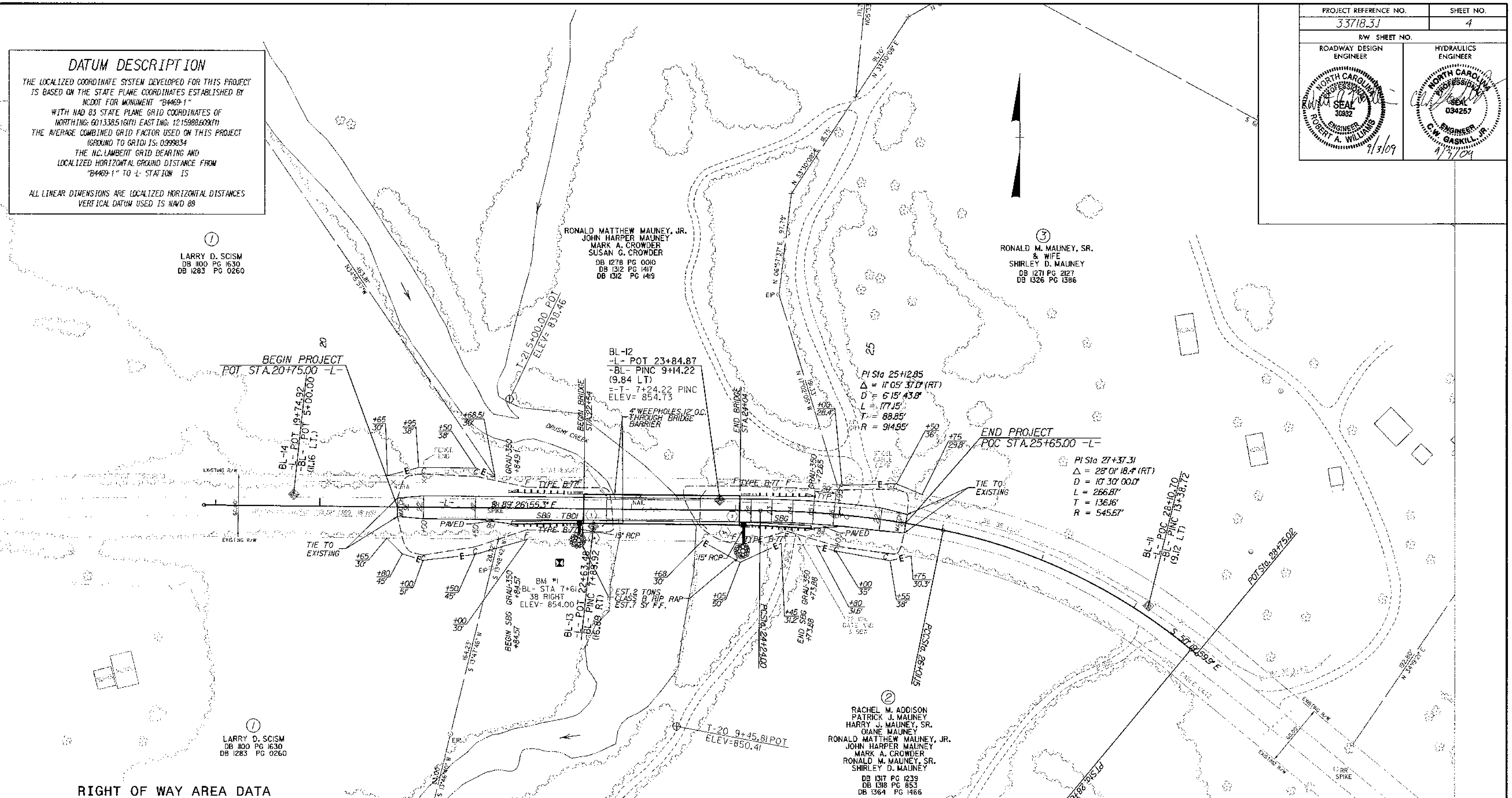
P.E.
STATE HIGHWAY DESIGN ENGINEER

PROJECT REFERENCE NO.	SHEET NO.
33718.3.1	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4469-1"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 601338.516(ft) EASTING: 1215988.609(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999834
THE NC. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4469-1" TO -L- STATION IS

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



LARRY D. SCISM
DB 1100 PG 1630
DB 1283 PG 0260
RONALD MATTHEW MAUNEY, JR.
JOHN HARPER MAUNEY
MARK A. CROWDER
SUSAN G. CROWDER
DB 1278 PG 0010
DB 1312 PG 1417
DB 1312 PG 1419
RONALD M. MAUNEY, SR.
& WIFE
SHIRLEY D. MAUNEY
DB 1271 PG 2127
DB 1326 PG 1386
BEGIN PROJECT
POT STA.20+75.00 -L-
END PROJECT
POC STA.25+65.00 -L-
BL-12
-L- POT 23+84.87
-BL- PINC 9+14.22
(9.84 LT)
-T- 7+24.22 PINC
ELEV= 854.73
PI Sta 25+12.85
Δ = 11°05' 37.0" (RT)
D = 6°15' 43.8"
L = 177.15'
T = 88.85'
R = 914.95'
PI Sta 27+37.31
Δ = 28°01' 18.4" (RT)
D = 10°30' 00.0"
L = 266.87'
T = 136.16'
R = 545.67'
T-21 5+00.00 POT
ELEV= 830.46
T-20 9+45.81 POT
ELEV=850.41
BM #1
ELEV= 854.00
EST. 2 TONS
CLASS B RIP RAP
EST. 7 SY F.F.
TIE TO EXISTING
PAVED
TYPE B-77
SBG
TBDI
15" RCP
4" WEEPHOLES 12' O.C. THROUGH BRIDGE BARRIER
BEGIN BRIDGE
END BRIDGE
RACHEL M. ADDISON
PATRICK J. MAUNEY
HARRY J. MAUNEY, SR.
DIANE MAUNEY
RONALD MATTHEW MAUNEY, JR.
JOHN HARPER MAUNEY
MARK A. CROWDER
RONALD M. MAUNEY, SR.
SHIRLEY D. MAUNEY
DB 1317 PG 1239
DB 1318 PG 853
DB 1364 PG 1466

RIGHT OF WAY AREA DATA

PARCEL NO.	PROPERTY OWNER	TOTAL ACRE.	AREA TAKEN	AREA REMAINING	CONSTR. EASEMENT
1	LARRY SCISM	-	0	-	2258 SF (.052 AC.)
2	RACHEL ADDISON PATRICK MAUNEY ET AL.	-	0	-	1257 SF (.029 AC.)
3	RONALD MAUNEY, JR	-	0	-	259 SF (.006 AC.)

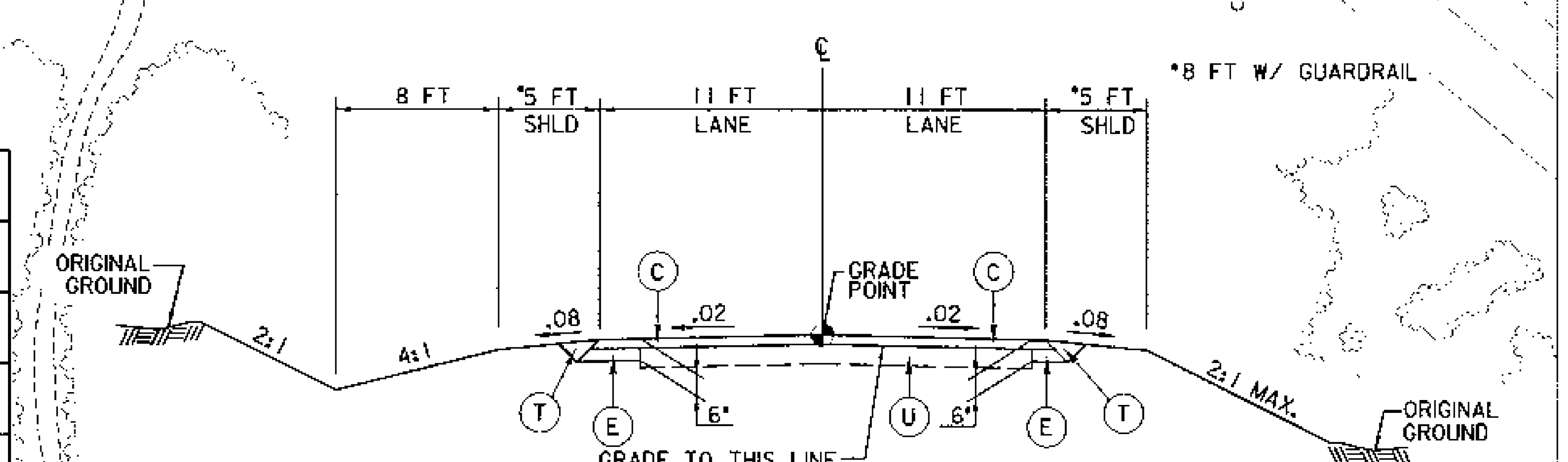
DRAINAGE SUMMARY

STRUCTURE NUMBER	TYPE	STA.	TOP ELEV.	INVERT IN	INVERT OUT
1	TBDI STD. 840.36	22+50 – RT	855.55	–	853.30
1A	PIPE OUTFALL	22+50 – RT	–	–	853.04
2	TBDI STD. 840.36	24+09 – RT	856.31	–	853.56
2A	PIPE OUTFALL	24+08 – RT	–	–	853.10

PAVEMENT SCHEDULE

C	2" SURFACE COURSE, TYPE SF9.5A
E	4" BASE COURSE, TYPE B25.0B
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.

50 25 0 50 100



ROADWAY TYPICAL SECTION

SEE CROSS SECTIONS

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
33718.3.1	5

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 30932 ENGINEER ROBERT A. WILLIAMS

9/3/09

HYDRAULICS ENGINEER

SCALES:
HORIZ. 1" = 50'
VERT. 1" = 10'

BM #1
-L- STA 22+31.42, 52.33 RT
-RL- STA 7+61.38 RT
ELEV= 854.00

PI = 19+45.00
EL = 873.00'

BEGIN PROJECT
STA 20+75

BEGIN GRADE
STA 21+00
EL = 860.15

PI = 21+20.00
EL = 855.64'
VC = 270'
K = 26

(-)9.97% PI

(-)9.97% PI

(+)0.3000%

FEATHER

CENTER OF BRIDGE
STA 23+29.00
ELEV. 856.21'

END GRADE
STA 25+40
EL = 862.35

PI = 24+90.00
EL = 856.75'
VC = 250'
K = 28

(+)0.3000%

(+)9.866%

(+)9.866%

END PROJECT
STA 25+65

PI = 26+55.00
EL = 871.91'

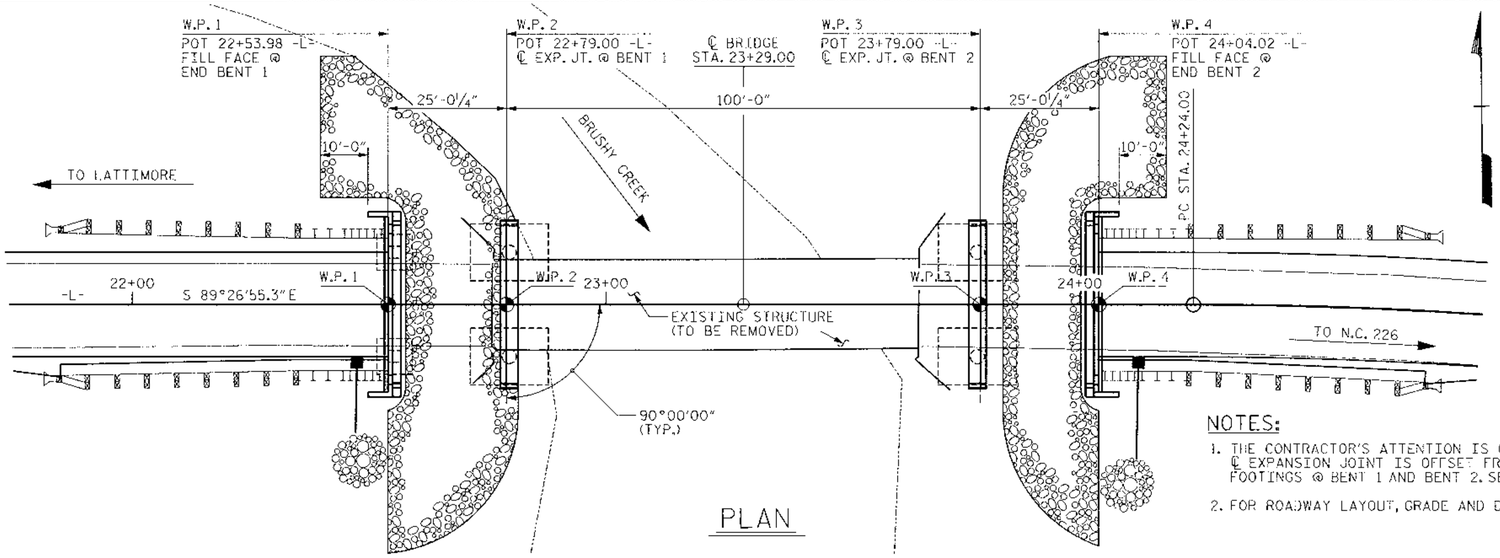
FEATHER

900
890
880
870
860
850
840
830
820
810
800

19 20 21 22 23 24 25 26 27 28

NOTES:

1. THE REQUIRED BEARING CAPACITIES FOR THE SPREAD FOOTINGS AT END BENT NO. 1 IS 12 TSF. CHECK FIELD CONDITIONS FOR THE REQUIRED END BEARING CAPACITY JUST PRIOR TO PLACING CONCRETE. THE ALLOWABLE BEARING CAPACITIES FOR SPREAD FOOTINGS AT END BENT NO. 1 IS 4 TSF.
2. CARRY IN SPREAD FOOTINGS AT END BENT NO. 1 AT LEAST 12 IN. INTO ROCK WITH MINIMUM THICKNESS AS SHOWN ON THE PLANS.
3. DRIVE PILES AT END BENT NO. 2 TO A REQUIRED BEARING CAPACITY OF 90 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO. THE ALLOWABLE BEARING CAPACITY FOR PILES AT END BENT NO. 2 IS 45 TONS PER PILE.
4. THE SCOUR CRITICAL ELEVATIONS FOR BENT NO. 1 AND BENT NO. 2 ARE THE BOTTOM OF FOOTING ELEVATION. BRIDGE MAINTENANCE USES THE SCOUR CRITICAL ELEVATIONS TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
5. THE REQUIRED BEARING CAPACITIES FOR THE SPREAD FOOTINGS AT BENT NO. 1 AND BENT NO. 2 ARE 15 TSF. CHECK FIELD CONDITIONS FOR THE REQUIRED END BEARING CAPACITY JUST PRIOR TO PLACING CONCRETE. THE ALLOWABLE BEARING CAPACITIES FOR SPREAD FOOTINGS AT BENT NO. 1 AND BENT NO. 2 ARE 5 TSF.
6. TO PROVIDE PROTECTION FROM POSSIBLE SCOUR, DO NOT CONSTRUCT SPREAD FOOTINGS AT BENT NO. 1 AND BENT NO. 2 AT ELEVATIONS HIGHER THAN SHOWN ON THE PLANS.
7. CARRY IN SPREAD FOOTINGS AT BENT NO. 1 AND BENT NO. 2 AT LEAST 12 IN. INTO ROCK WITH MINIMUM THICKNESS AS SHOWN ON THE PLANS.
8. THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.
9. 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.
10. THE MATERIAL SHOWN IN THE HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 20 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE PER CUBIC YARD FOR UNCLASSIFIED STRUCTURE EXCAVATION.
11. 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.
12. THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY, 2001.
13. THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES FOR SEISMIC PERFORMANCE CATEGORY A.
14. 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."
15. ASSUMED LIVE LOAD = HS20 OR ALTERNATE LOADING, EXCEPT THAT CORED SLAB AND BOX BEAM UNITS HAVE BEEN DESIGNED FOR HS25.
16. PLAIN RIP RAP CLASS II (2'-0" THICK)
    END BENT 1 = 240 TONS
    END BENT 2 = 200 TONS



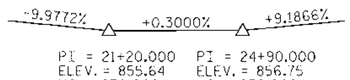
PLAN

BENCH MARK

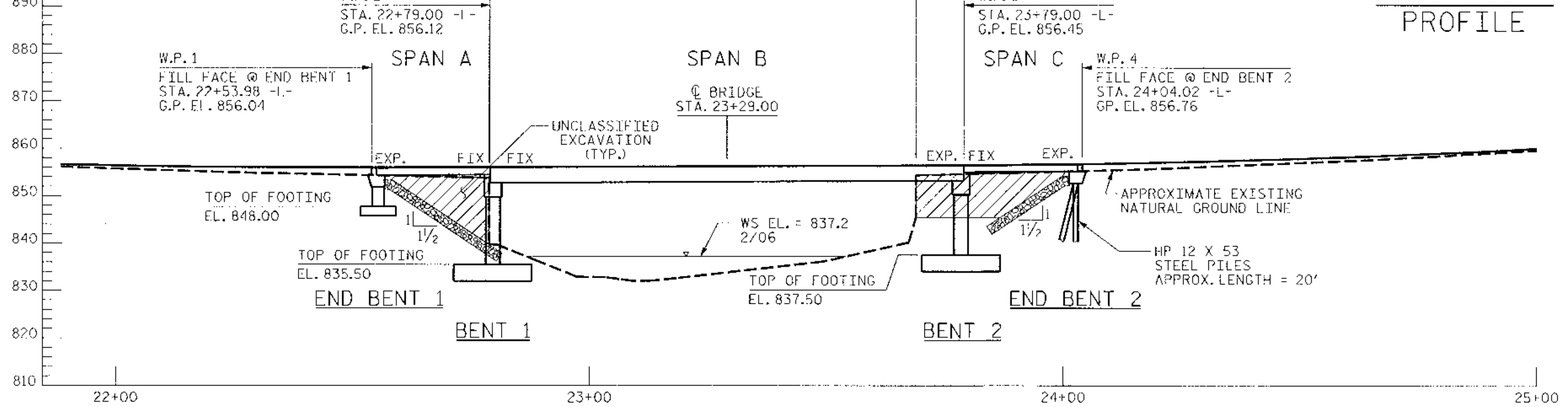
BM #1
-L- STA. 22+31.42, 53.33' RT
-BL- STA. 7+61.00, 38' RT
EL. 854.00

NOTES:

1. THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE ℄ EXPANSION JOINT IS OFFSET FROM THE ℄ CAP COLUMNS AND FOOTINGS @ BENT 1 AND BENT 2. SEE BENT DRAWINGS FOR DETAILS.
2. FOR ROADWAY LAYOUT, GRADE AND DETAILS SEE SHEET 16 AND 17.



GRADE LINE
PROFILE



ELEVATION

EXISTING BRIDGE INFORMATION

TWO SPANS: 1 @ 45'-10½"
1 @ 45'-1½"
CLEAR ROADWAY WIDTH = 19'-2"
TIMBER DECK W/AWS ON 8 LINES
OF 1'-6" DEEP ROLLED BEAMS.
INTERIOR BENT: SOLID WALL PIER
ON SPREAD FOOTINGS
VERTICAL CONCRETE ABUTMENT WALLS
ENTIRE STRUCTURE TO BE REMOVED

PROJECT NO. 33718.3.1
CLEVELAND COUNTY
STATION: 23+29.00 -L-

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Stantec

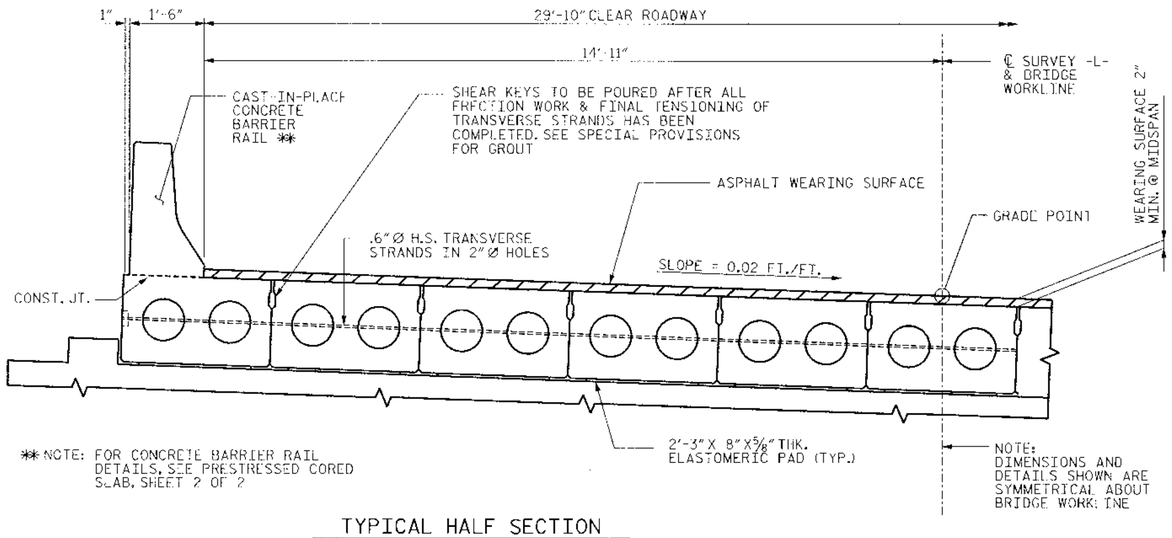
DRAWN BY : J. L. HENNEKES DATE : 5-7-07
CHECKED BY : J. T. KELVINGTON DATE : 6-13-07

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE NO. 219 ON SR 1350
OVER BRUSHY CREEK

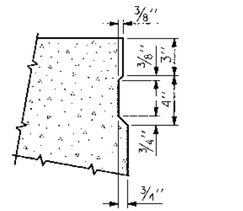
SEAL 13406 — NORTH CAROLINA — JOSEPH T. KELVINGTON — ENGINEER

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1
1			3			TOTAL SHEETS
2			4			15



** NOTE: FOR CONCRETE BARRIER RAIL DETAILS, SEE PRESTRESSED CORED SLAB, SHEET 2 OF 2

TYPICAL HALF SECTION



SHEAR KEY DETAIL

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

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.

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 GROUT. THE 2½"Ø DOWEL HOLES AT EXPANSION ENDS OF SLAB SECTIONS SHALL BE FILLED WITH JOINT SEALER MATERIAL TO 1½" ABOVE THE TOP OF DOWELS AND THEN FILLED WITH GROUT.

THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE SL LOW MODULUS SILICONE SEALANT. 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.

WHEN A CONCRETE WEARING SURFACE IS DETAILED ON THE CORED SLAB BRIDGE TYPICAL SECTION, THE TOP SURFACE OF THE CORED SLAB UNITS SHALL HAVE A ⅜" RAKED FINISH.

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.

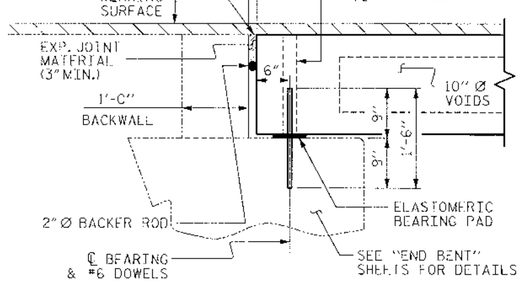
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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

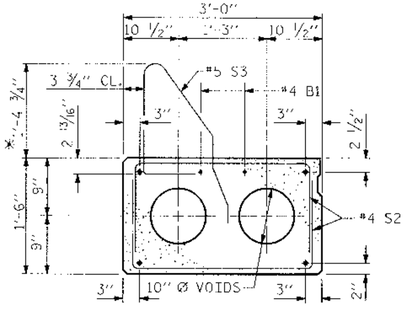
THE MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE FOR CORED SLABS SHALL NOT BE LESS THAN 5000 PSI.



SECTION AT END BENT

PART PLAN - SLAB SECTION

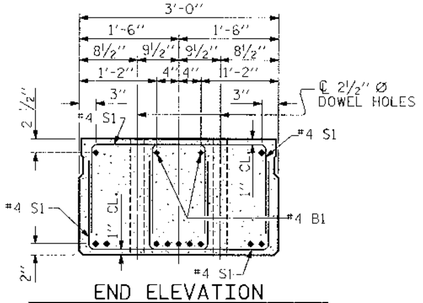
NOTE: DETAILS SHOWN ARE TYPICAL @ EA. END.
EXTERIOR UNIT SHOWN.
INTERIOR UNITS ARE TYP. EXCEPT FOR S3 BAR



EXTERIOR SLAB SECTION

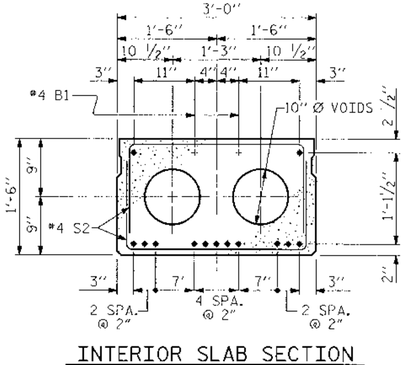
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION)

*BASED ON 2" ASPHALT- ADJUST AS NECESSARY



END ELEVATION

SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES
(+ DENOTES STRAND LAYOUT)
INTERIOR SLAB SECTION SHOWN-EXTERIOR SLAB SECTION SIMILAR EXCEPT SHEAR KEY LOCATION.



INTERIOR SLAB SECTION

½"Ø LOW RELAXATION STRAND LAYOUT

PROJECT NO. 33718.3.1

CLEVELAND COUNTY

STATION: 23+29.00 -L-

SHEET 1 of 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED CONCRETE CORED SLAB 25'-0" SPAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2
1			3			TOTAL SHEETS
2			4			15

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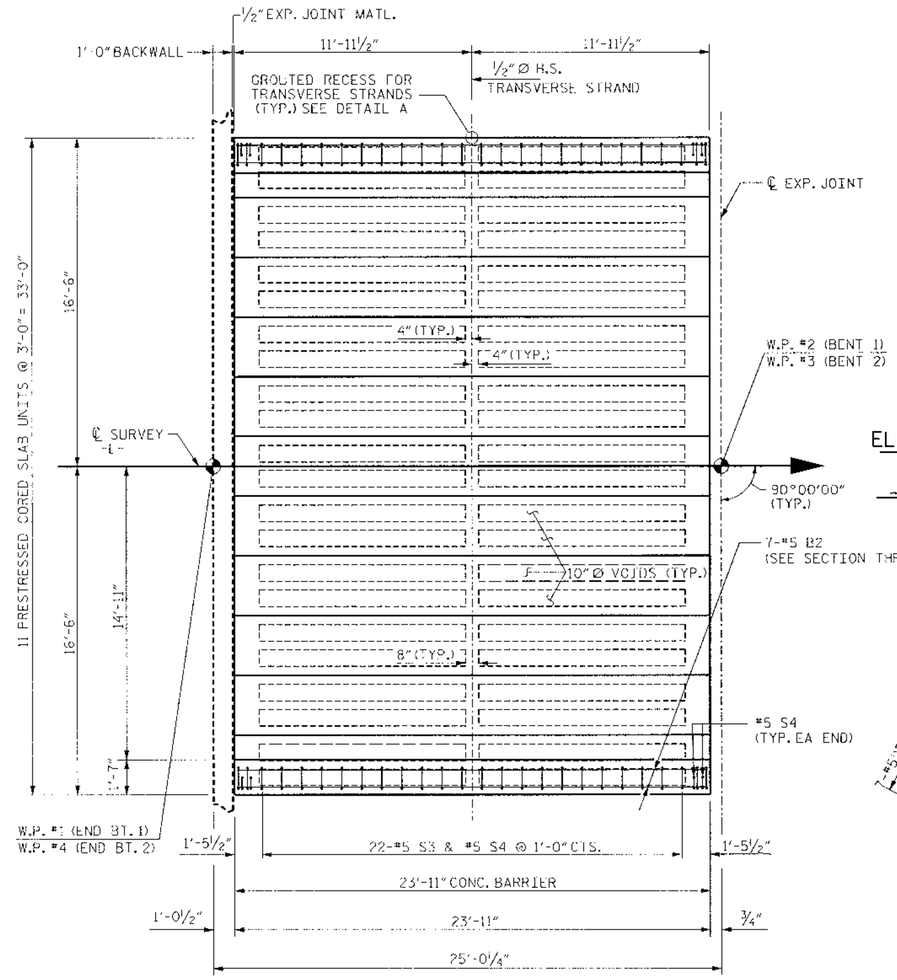
Stantec

DRAWN BY : B.J. ELLIOT DATE : 3-6-07
CHECKED BY : W.I. KELVINGTON DATE : 4-5-07

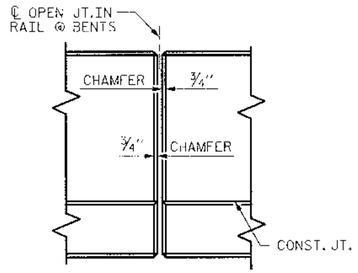
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 13406 ENGINEER WILLIAM I. KELVINGTON 4-5-07



25'-0" SPAN - PLAN OF SPAN

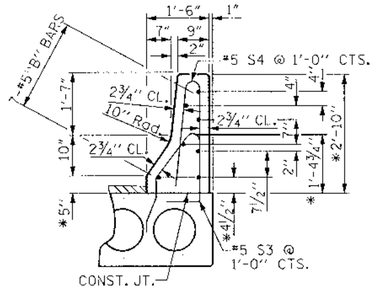
SPAN A SHOWN, SPAN C SIMILAR BY ROTATION

NOTE: ALL DIMENSIONS AND DETAILS SHOWN ARE SYMMETRICAL ABOUT ℄ SURVEY -L-



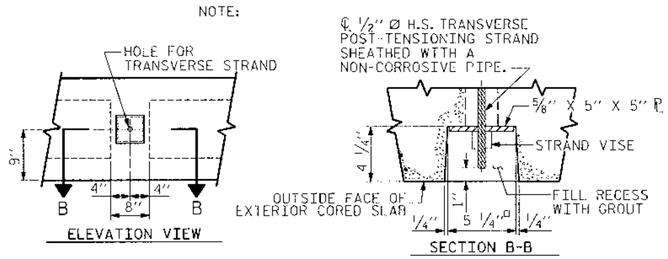
ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS



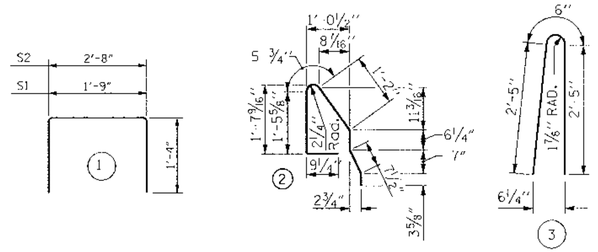
SECTION THRU RAIL

*BASED ON 2" MIN. WEARING SURFACE @ BARRIER FACE @ MID-SPAN



GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLABS

BAR TYPES



BILL OF MATERIAL FOR CORED SLAB SECTION

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	SIZE	TYPE	LENGTH	NUMBER	WEIGHT	NUMBER	WEIGHT
S1	#5	1	4'-5"	24	113	24	113
S2	#4	1	5'-4"	48	273	48	273
*S3	#5	2	5'-4"	26	145		
B1	#4	STR.	23'-7"	2	32	2	32
REINFORCING STEEL LBS.					418		418
*EPOXY COATED REINFORCING STEEL LBS.					145		0
5,000 P.S.I. CONCRETE CU. YDS.					3.1		3.1
½" Ø L.R. STRANDS NO.					13		13

GRADE 270 STRANDS

	½" Ø L.R.
AREA (SQUARE INCHES)	0.153
ULTIMATE STRENGTH (LBS. PER STRAND)	41,300
APPLIED PRESTRESS (LBS. PER STRAND)	30,980

BILL OF MATERIAL FOR CONCRETE BARRIER RAIL ON CORED SLABS

BAR	BARS PER SPAN		TOTAL NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	SPAN A	SPAN C					
*S4	52	52	104	#5	3	5' 4"	579
*B2	14	14	28	#5	STR.	23'-7"	688
*EPOXY COATED REINFORCING STEEL LBS. = 1267							
CLASS AA CONCRETE CU. YDS. = 10.5							
TOTAL LIN. FT. OF CONCRETE BARRIER RAIL = 95.67							

3'-0"x1'-6" CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	4	23'-11"	95'-8"
INTERIOR C.S.	18	23'-11"	430'-6"
TOTAL	22		526'-2"

3'-0" X 1'-6" CORED SLAB UNIT 23'-11"

CAMBER (SLAB UNIT ALONE IN PLACE)	⅜" ↑
DEFLECTION * (SUPERIMPOSED DEAD LOAD)	1/16" ↓
FINAL DEFLECTION	5/16" ↑

*INCLUDES FUTURE WEARING SURFACE

PROJECT NO. 33718.3.1

CLEVELAND COUNTY

STATION: 23+29.00 -L-

SHEET 2 of 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED CONCRETE CORED SLAB 25'-0" SPAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3
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2			4			15

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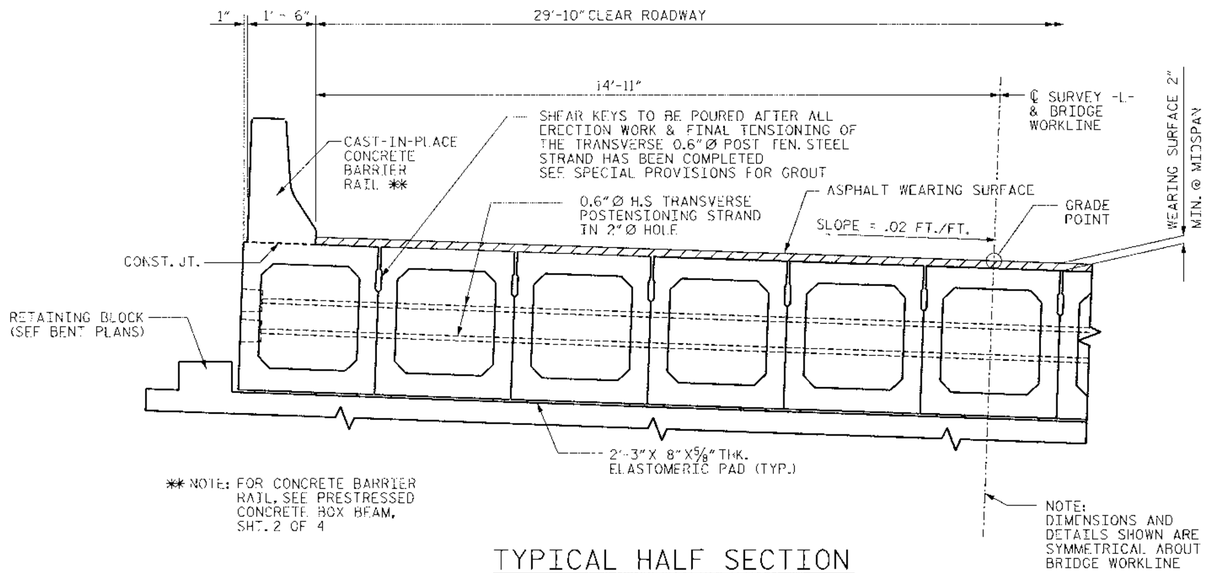
CHECKED BY : J.T. KELVINGTON DATE : 3-9-07

SEAL 13406 ENGINEER JOSEPH T. KELVINGTON NORTH CAROLINA PROFESSIONAL

3-9-07

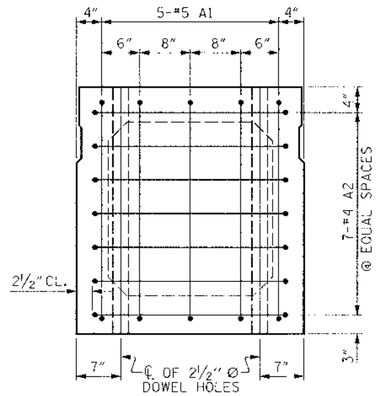
FOR NOTES, SEE PRESTRESSED CONCRETE BOX BEAM, SHEET 4 OF 4

FOR ADITIONAL BOX BEAM DETAILS, SEE PRESTRESSED BOX BEAM, SHEET 3 OF 4



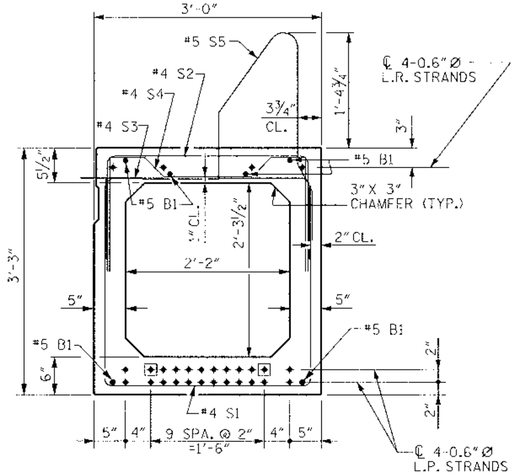
** NOTE: FOR CONCRETE BARRIER RAIL, SEE PRESTRESSED CONCRETE BOX BEAM, SHT. 2 OF 4

TYPICAL HALF SECTION



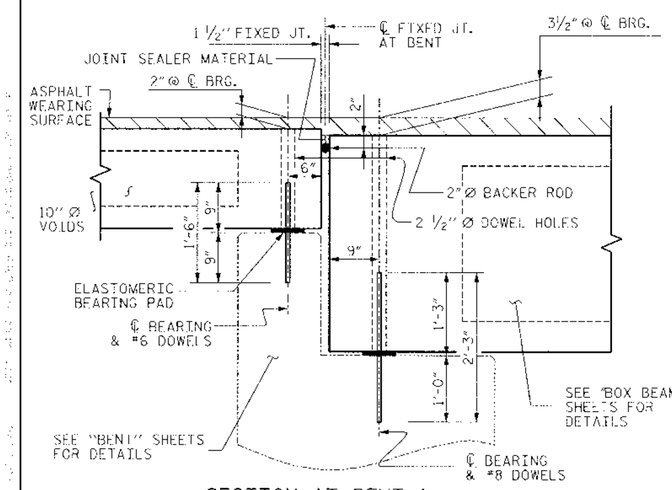
END ELEVATION

SHOWING PLACEMENT OF #5 & #4 "A" BARS AND LOCATION OF DOWEL HOLES.
(INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION. STRAND LAYOUT NOT SHOWN.)



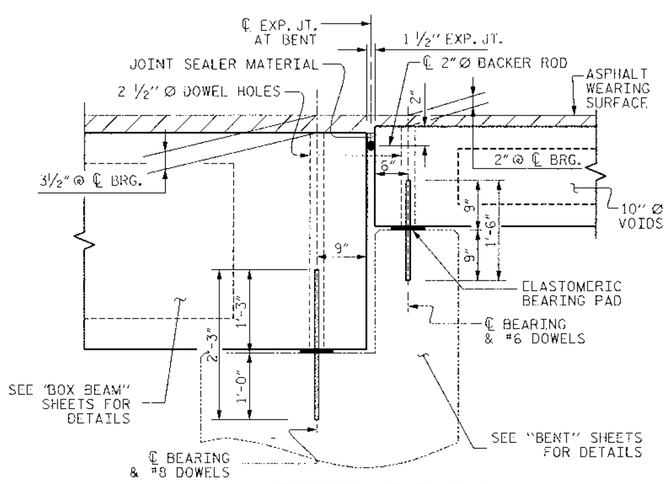
EXTERIOR BOX BEAM SECTION

28 TOTAL STRANDS REQUIRED
● DENOTES 0.6" H.S. STRANDS DEBONDED 6'-0" FROM EA. END



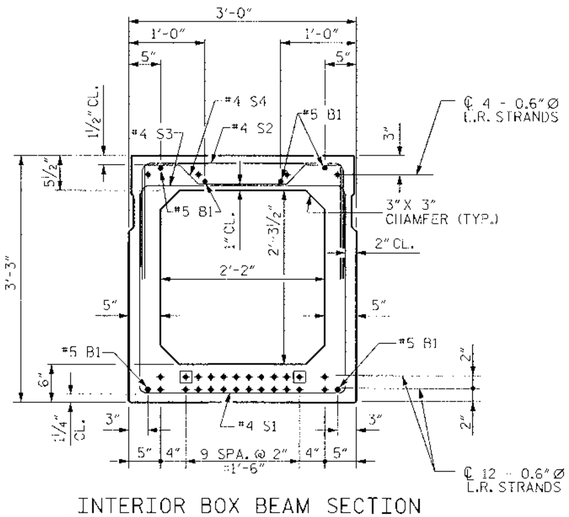
SECTION AT BENT 1

FIXED JOINT



SECTION AT BENT 2

EXPANSION JOINT



INTERIOR BOX BEAM SECTION

28 TOTAL STRANDS REQUIRED
● DENOTES 0.6" H.S. STRANDS DEBONDED 6'-0" FROM EA. END

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CLEVELAND COUNTY

STATION: 23+29.00 -L-

SHEET 1 of 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED CONCRETE BOX BEAM 100' SPAN

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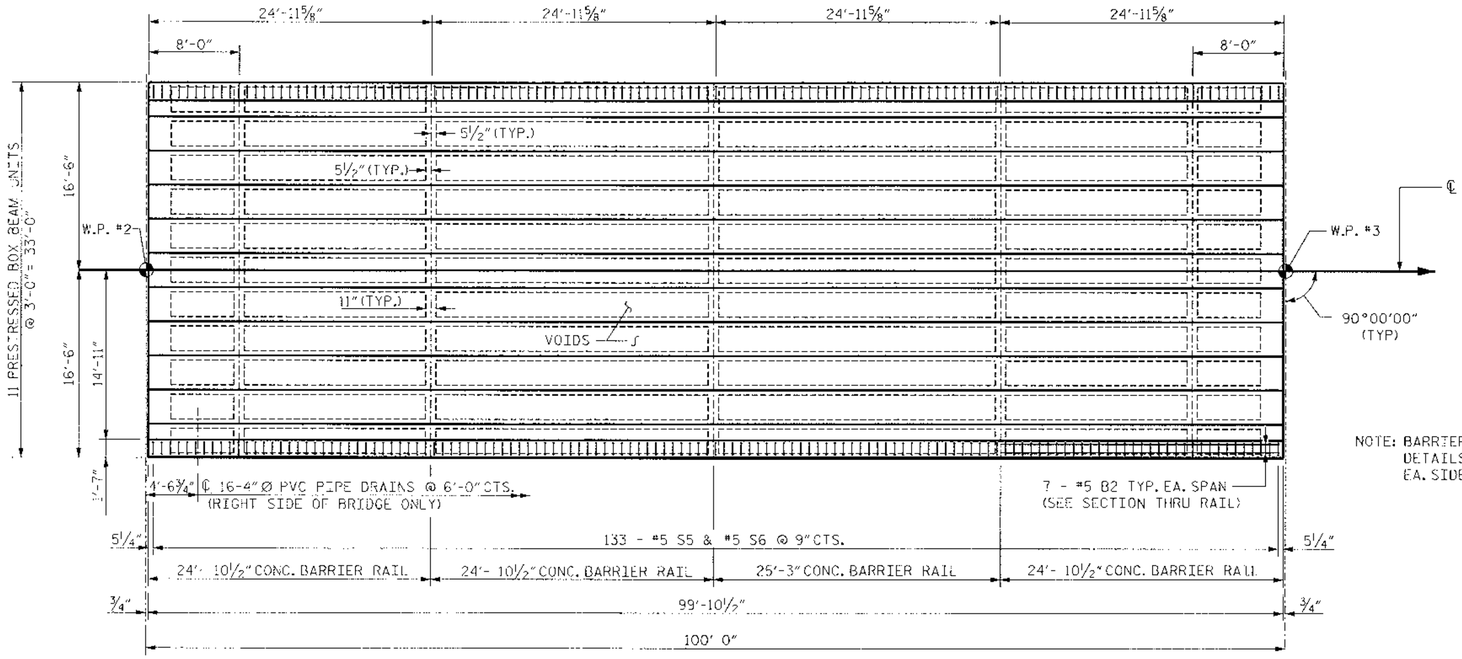
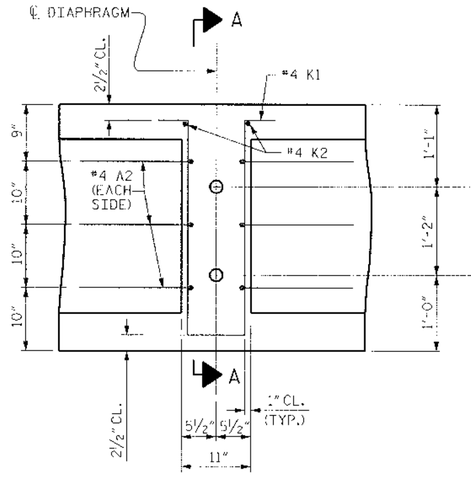
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4
1			3			TOTAL SHEETS
2			4			15



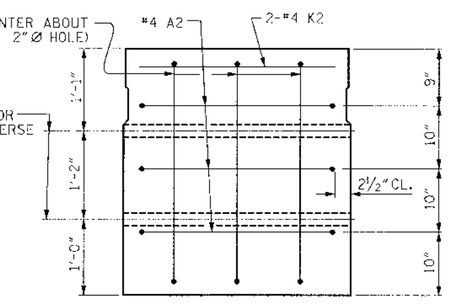
100'-0" SPAN - PLAN OF SPAN

NOTE: #5 S5 AND #4 "S" BARS IN EXTERIOR UNITS MAY BE REPOSITIONED AS REQUIRED TO CLEAR BLOCKOUTS FOR GROUTED RECESSES



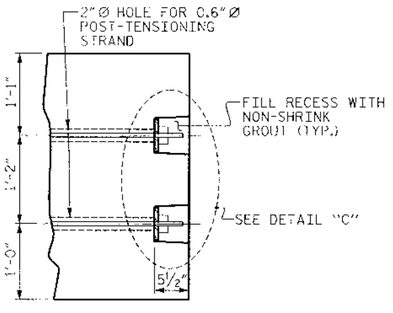
DIAPHRAGM DETAIL

#4 "S" BARS NOT SHOWN.
#4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2" Ø HOLE.



SECTION A-A

VOIDS NOT SHOWN



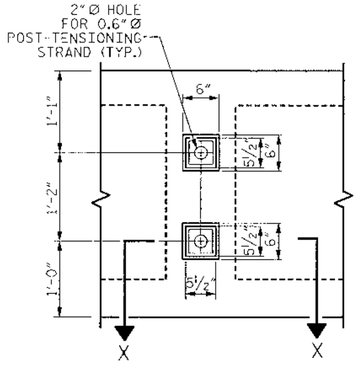
PART SECTION AT RECESS

PIPE DRAIN DETAIL

16 REQ'D

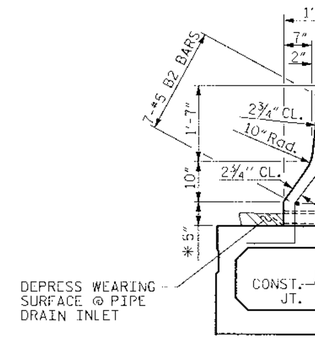
NOTE: 4" Ø PVC DRAIN PIPES SHALL CONFORM TO REQUIREMENTS OF ASTM D-1785.

NO SEPARATE PAYMENT FOR 4" Ø PVC PIPE SHALL BE MADE. COSTS FOR FURNISHING AND INSTALLING PVC DRAINS SHALL BE INCLUDED IN THE COSTS FOR THE SEVERAL PAY ITEMS.

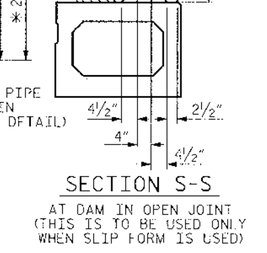


VIEW Y-Y

SHOWING ELEVATION VIEW OF GROUTED RECESS

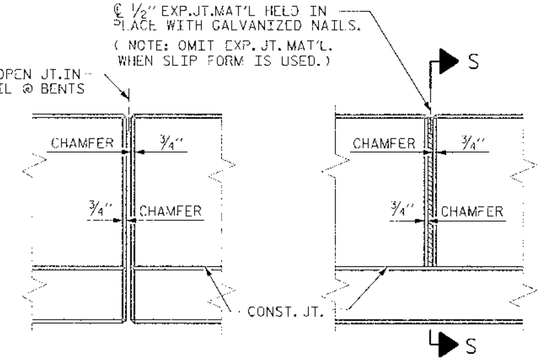


SECTION THRU RAIL



SECTION S-S

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



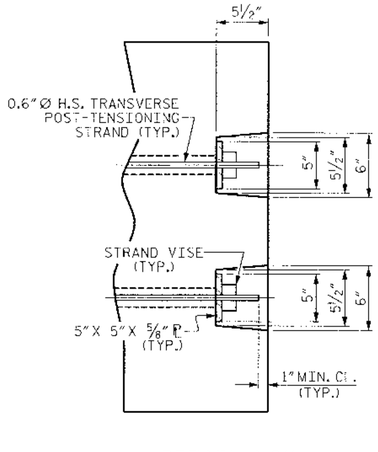
ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

NOTE: BARRIER RAIL REINFORCING DETAILS SHOWN ARE TYPICAL EA. SIDE OF BRIDGE

BARRIER RAIL DETAILS

*BASED ON 2" MIN. WEARING SURFACE @ BARRIER FACE @ MID-SPAN



DETAIL "C"

PROJECT NO. 33718.3.1

CLEVELAND COUNTY

STATION: 23+29.00 -L-

SHEET 2 of 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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PRESTRESSED CONCRETE BOX BEAM 100' SPAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5
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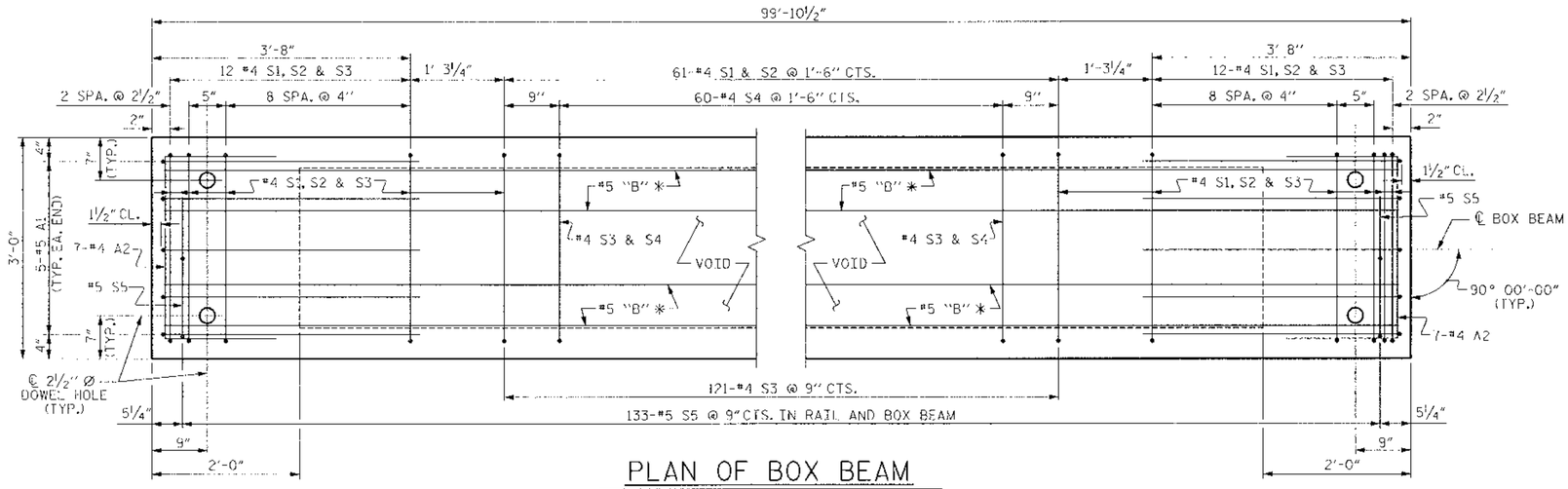
CHECKED BY : T.R. DUDECK DATE : 3-8-07

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 13406 JOSEPH T. KELVINGTON

Preliminary for Review Purposes Only

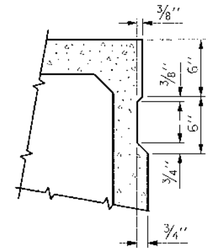
FOR BOX BEAM BILL OF MATERIAL, SEE PRESTRESSED CONCRETE BOX BEAM, SHEET 4 OF 4.



PLAN OF BOX BEAM

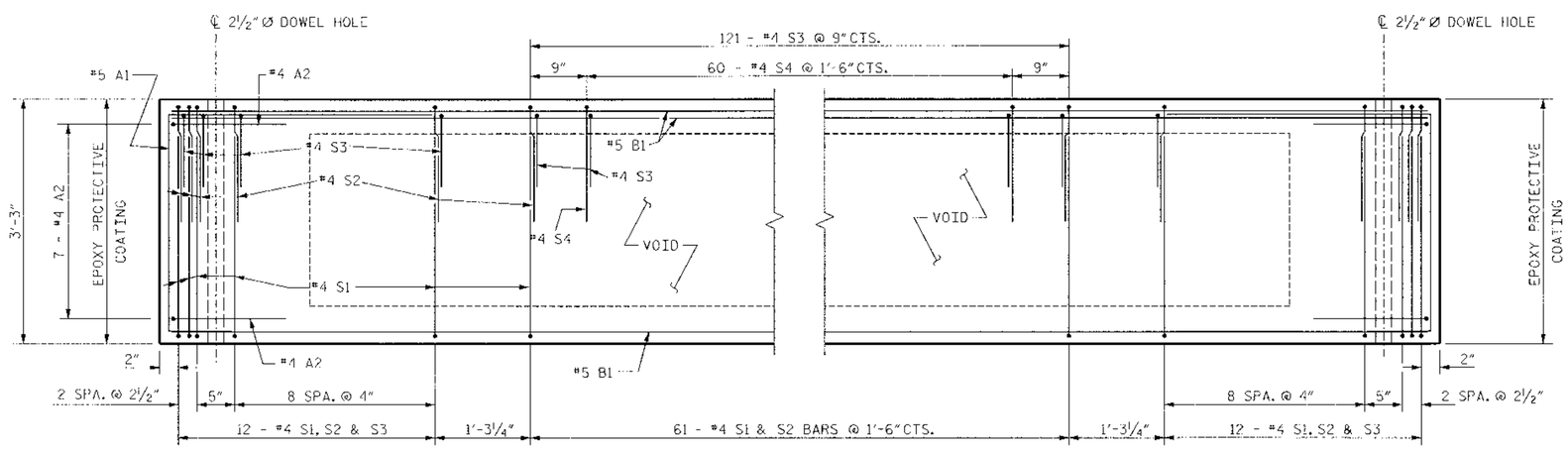
EXTERIOR BEAM SHOWN. INTERIOR TYPICAL EXCEPT FOR #5 S5 BAR (SEE PRESTRESSED CONCRETE BOX BEAM, SHT 2 OF 4).

* #5 B1 (2 BAR RUN) W/ 1'-8" MIN. LAP SPLICE (50'-7" LG.)



SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.



ELEVATION OF BOX BEAM

NOTE: REINFORCING STEEL SHOWN IS TYPICAL @ EA. END
#4 S1, S2, S3, AND S4 BARS MAY BE REPOSITIONED AS NECESSARY TO CLEAR DUCTS FOR TRANSVERSE POST-TENSIONING STRANDS.

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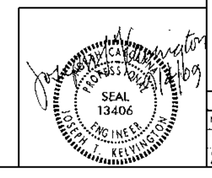
CHECKED BY : T.R. DUDECK DATE : 3-13-07



PROJECT NO. 33718.3.1

CLEVELAND COUNTY

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SHEET 3 of 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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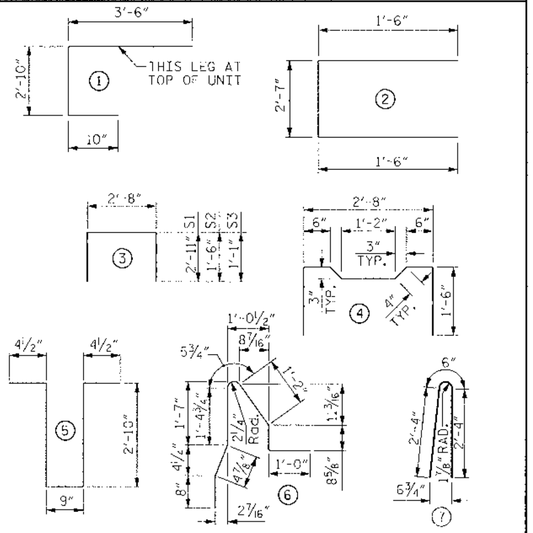
PRESTRESSED CONCRETE BOX BEAM 100' SPAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6
1			3			TOTAL SHEETS
2			4			15

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE BOX BEAM SECTION

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
A1	10	#5	1	7'-2"	75	7'-2"	75
A2	44	#4	2	5'-7"	164	5'-7"	164
B1	12	#5	STR	50'-7"	633	50'-7"	633
K1	15	#4	5	7'-2"	72	7'-2"	72
K2	10	#4	STR	2'-7"	17	2'-7"	17
S1	85	#4	3	8'-6"	482	8'-6"	482
S2	85	#4	3	5'-8"	322	5'-8"	322
S3	145	#4	3	4'-10"	468	4'-10"	468
S4	60	#4	4	5'-10"	350	5'-10"	350
* S5	133	#5	6	5'-10"	809	--	--
REINFORCING STEEL				2583	LBS.	2583	LBS.
* EPOXY COATED REINF. STEEL				809	LBS.	--	LBS.
7000 P.S.I. CONCRETE				19.5	CU. YDS.	19.4	CU. YDS.

0.6" Ø L.R. STRANDS No. 28

BILL OF MATERIAL FOR CONCRETE BARRIER RAIL ON BOX BEAMS

BAR	BARS PER SPAN SPAN B	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
* B2	56	56	#5	STR	24'-6"	1431
* S6	266	266	#5	7	5'-2"	1434
* EPOXY COATED REINFORCING STEEL LBS.					2865	
CLASS AA CONCRETE CU.YDS.					21.9	
TOTAL LIN. FT. OF CONCRETE BARRIER RAIL					199.75	

BOX BEAMS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	99'-10½"	199'-9 "
INTERIOR B.B.	9	99'-10½"	898'-10½"
TOTAL	11		1098'-7½"

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

3'-0" X 3'-3" BOX BEAM UNIT	99'-10½"
CAMBER (BOX BEAM UNIT ALONE IN PLACE)	2¼" (UP)
DEFLECTION (SUPERIMPOSED DEAD LOAD)	¾" (DOWN)
FINAL DEFLECTION	1½" (UP)

* INCLUDES FUTURE WEARING SURFACE

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 BOX BEAM SECTION SHALL BE GRADE 60.

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

THE 2 ½"Ø DOWEL HOLES AT FIXED ENDS OF THE SLAB SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT. THE 2 ½"Ø DOWEL HOLES AT EXPANSION ENDS OF SLAB SECTIONS SHALL BE FILLED WITH JOINT SEALER MATERIAL TO 1 ½" ABOVE THE TOP OF DOWELS AND THEN FILLED WITH GROUT.

THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE SL LOW MODULUS SILICONE SEALANT. THE 2"Ø BACKER ROD SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN BOX BEAMS 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 UNIL THE CONCRETE HAS REACHED RELEASE STRENGTH. AT LEAST THREE WEEKS PRIOR TO CASTING BOX BEAMS, THE CONTRACTOR SHALL SUBMIT THO 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 BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS. FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

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

ASPHALT WEARING SURFACE SHALL BE PLACED AFTER CAST-IN-PLACE CONCRETE BARRIER RAIL HAS BEEN CAST AND CURED.

THE MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE FOR BOX BEAMS SHALL NOT BE LESS THAN 7000 PSI.

PROJECT NO. 33718.3.1

CLEVELAND COUNTY

STATION: 23+29.00 -L-

SHEET 4 of 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED CONCRETE BOX BEAM

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DRAWN BY : BRANDON ELLIOT DATE : 3-7-07
CHECKED BY : T.R. DUDECK DATE : 3-13-07

SEAL 13406
JOSEPH T. KELVINGTON
ENGINEER
PROFESSIONAL ENGINEER
7-1-09

REVISIONS						SHEET NO.
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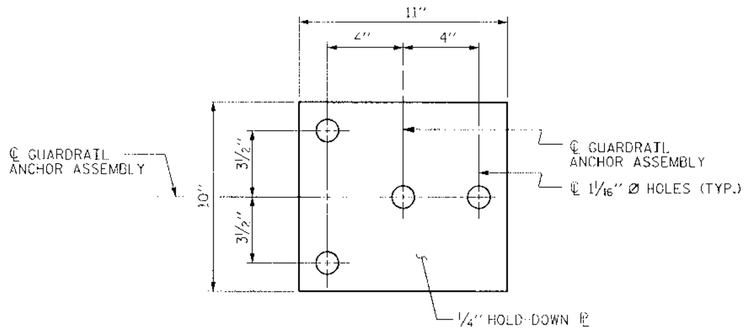
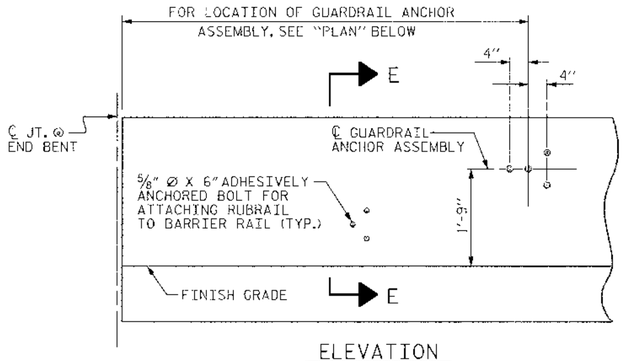
1			3			TOTAL SHEETS
2			4			15

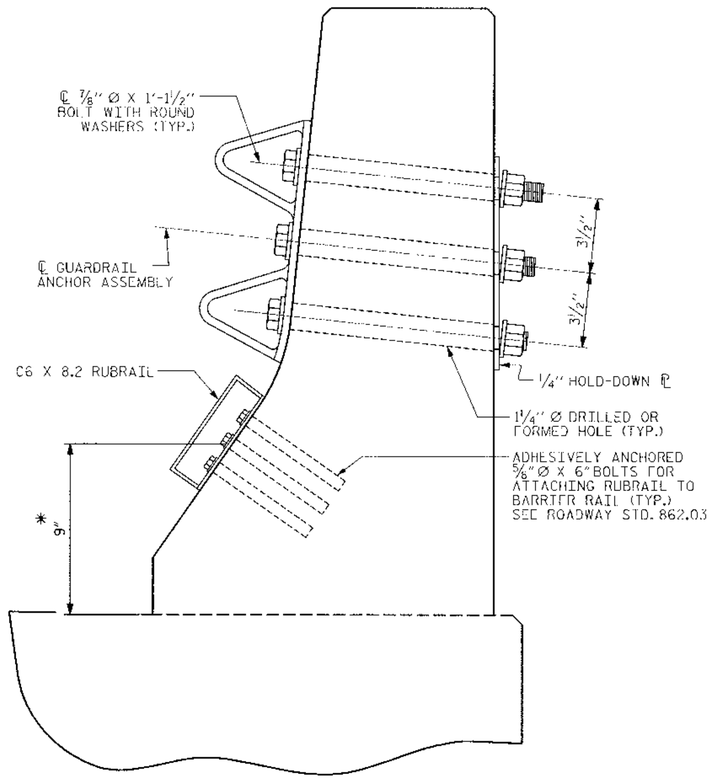


PLAN



ELEVATION

FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS

* 9" DIMENSION IS FROM TOP OF RIDING SURFACE.
FOR BOX BEAM & CORED SLAB ADJUST DIMENSION FOR WEARING SURFACE.

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A ¼" HOLD DOWN PLATE AND 4 - ⅞" 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 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.)

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 SHEET NO. 1.

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 LUMP SUM PRICE BID FOR GUARDRAIL.

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.

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE ⅝" Ø X 6" BOLTS WITH WASHERS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.

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DRAWN BY : J. L. HENNEKES DATE : 5-01-07
CHECKED BY : J. T. KELVINGTON DATE : 5-30-07

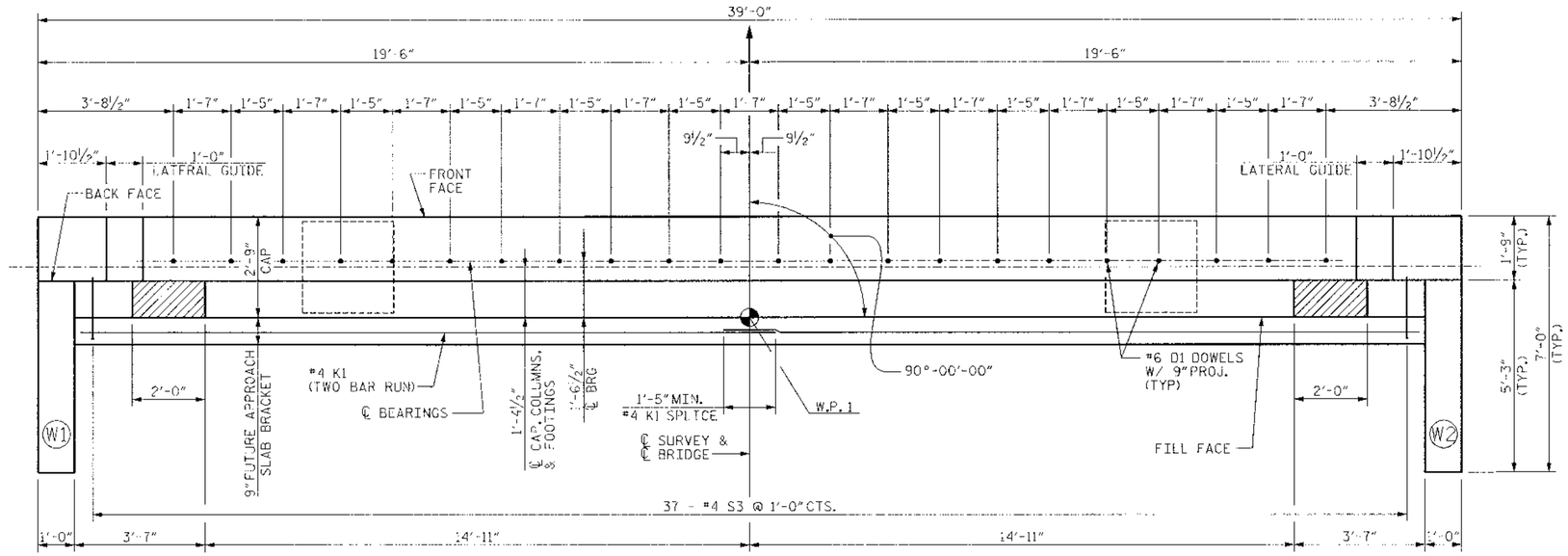
PROJECT NO. 33718.3.1
CLEVELAND COUNTY
STATION: 23+29.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON
5/30/09

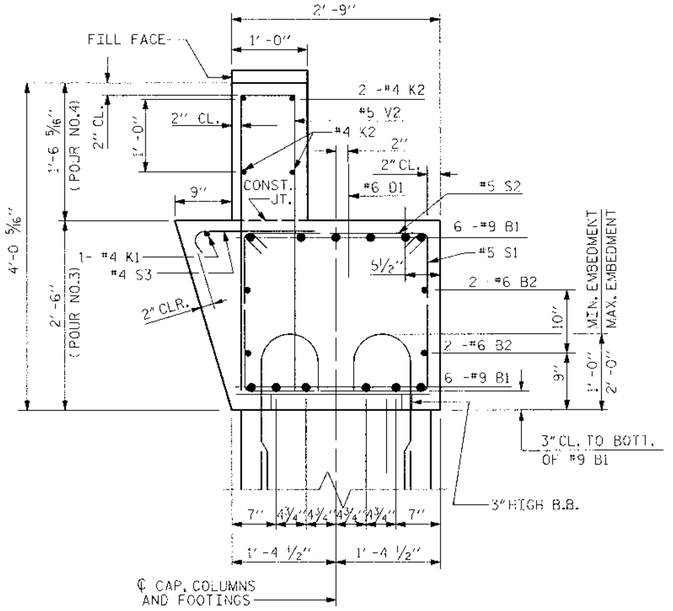
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S8
1			3			TOTAL SHEETS
2			4			15

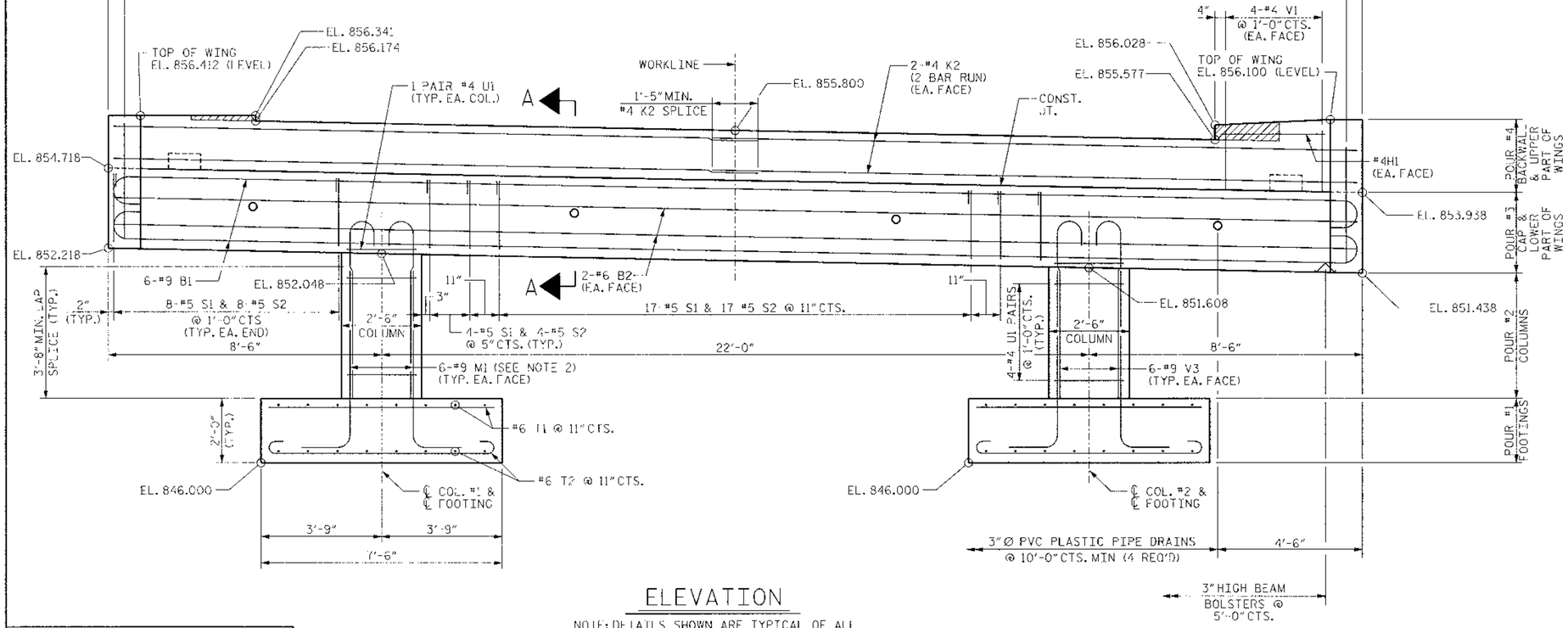


PLAN



SECTION A-A

(COLUMN REFORCING NOT SHOWN FOR CLARITY)



ELEVATION

NOTE: DETAILS SHOWN ARE TYPICAL OF ALL COLUMNS & FOOTINGS UNLESS OTHERWISE NOTED.

NOTES:

1. THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL COLUMN REINFORCEMENT IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
2. FIELD CUT #9 M1 TO OBTAIN MINIMUM SPLICE AND #9 V3 EMBEDMENT IN END BENT CAP.
3. HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
4. STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
5. FOR MATERIAL LISTS, SEE "END BENT DETAILS," SHT. 2 OF 2.

"M" & "V" SPLICE		
COL. #1	COL. #2	
4.048'	3.608'	MIN.
7.048'	6.608'	MAX.

▨ CONCRETE BLOCKOUT TO BE POURED AFTER SLIP FORMING FOR BARRIER IS COMPLETE. CUT REINF. AS REQ'D.

PROJECT NO. 33718.3.1

CLEVELAND COUNTY

STATION: 23+29.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

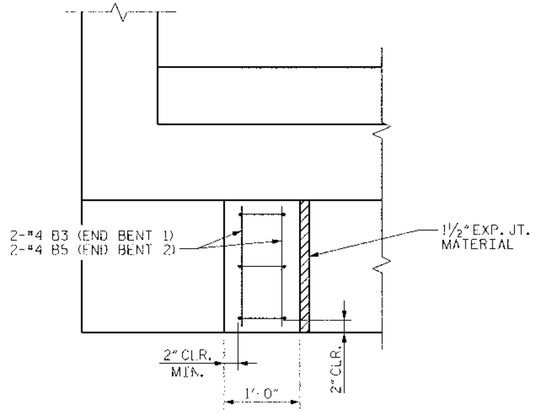
SUBSTRUCTURE
END BENT 1

Stantec
Stantec Consulting Services Inc.
Suite 300, 801 Jones Franklin Road
Raleigh, NC
27606
Tel. 919.851.6866
Fax. 919.851.7024
www.stantec.com

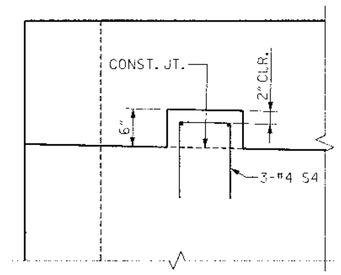
DRAWN BY : T.R. DUDECK DATE : 4-12-07
CHECKED BY : J.T. KELVINGTON DATE : 4-27-07

SEAL 13406 JOSEPH T. KELVINGTON ENGINEER

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S9
1			3			TOTAL SHEETS
2			4			15

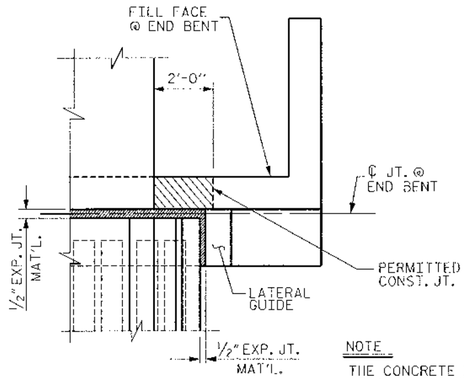


PLAN



ELEVATION

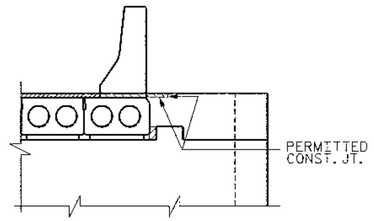
LATERAL GUIDE



PLAN

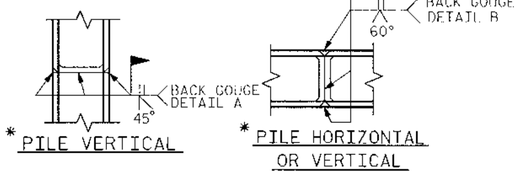
NOTE

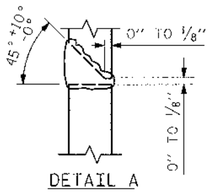
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.



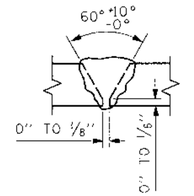
ELEVATION

BLOCKOUT IN WING WALL





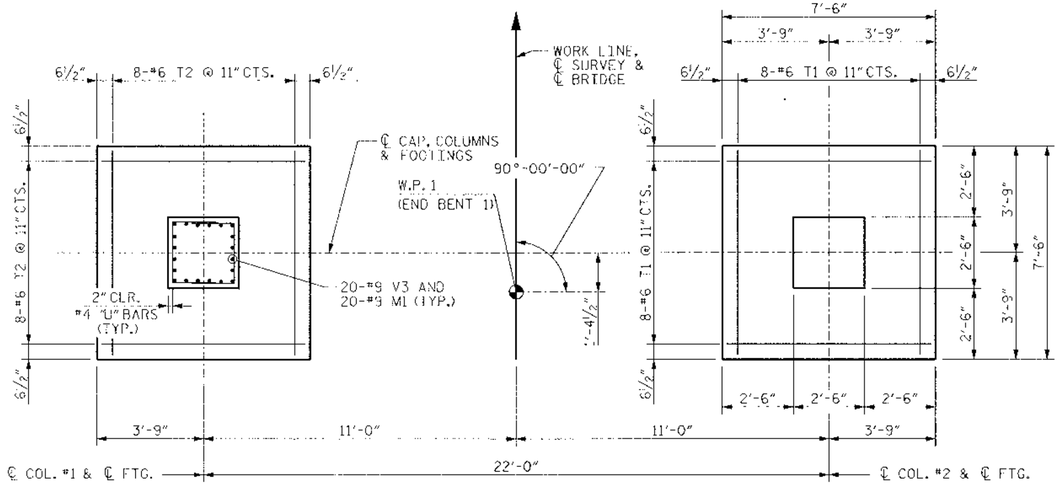
DETAIL A



DETAIL B

PILE SPLICE DETAILS

*POSITION OF PILE DURING WELDING.



BOTTOM TOP

PLAN OF FOOTINGS - END BENT 1

(FOOTING DIMENSIONS AND DETAILS SHOWN ARE TYPICAL FOR EACH FOOTING)

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Fax. 919.851.7024
www.stantec.com

DRAWN BY : J. L. HENNEKES DATE : 5-3-07
CHECKED BY : T. R. DUDECK DATE : 5-5-07

PROJECT NO. 33718.3.1
CLEVELAND COUNTY
STATION: 23+29.00 -L-

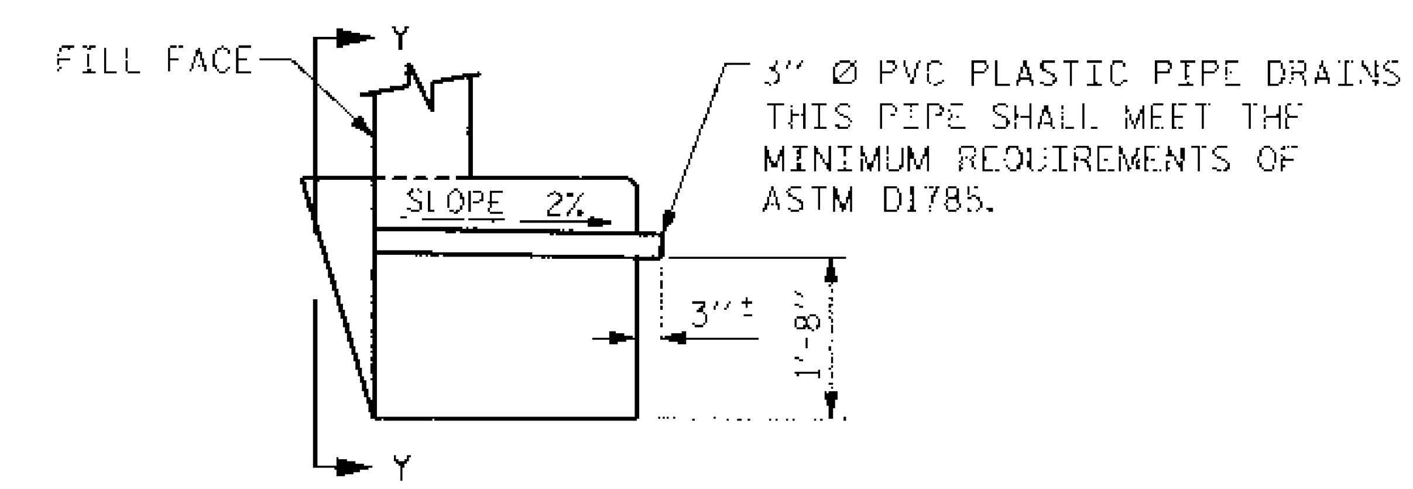
SHEET 1 of 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

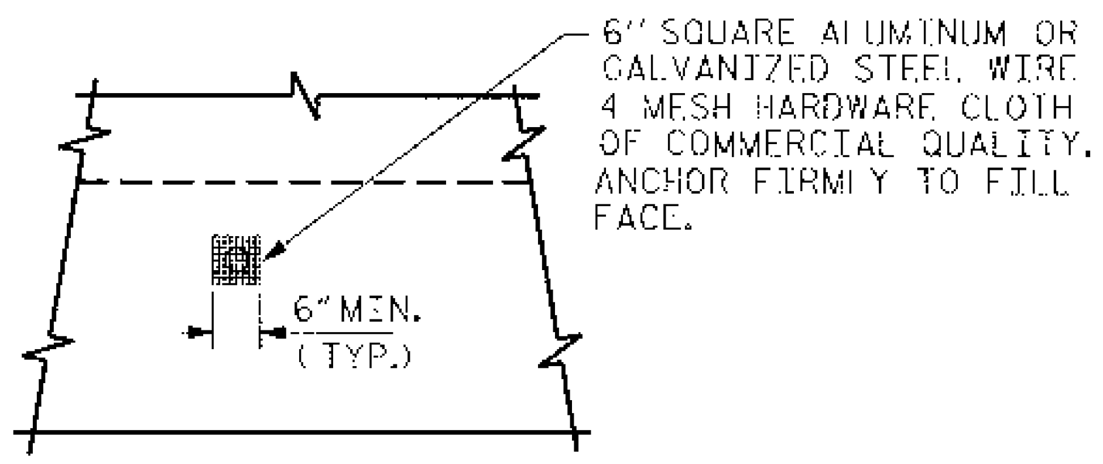
SUBSTRUCTURE
END BENT DETAILS

SEAL 13406 ENGINEER JOSEPH T. KELVINGTON NORTH CAROLINA PROFESSIONAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S10
1			3			TOTAL SHEETS
2			4			15



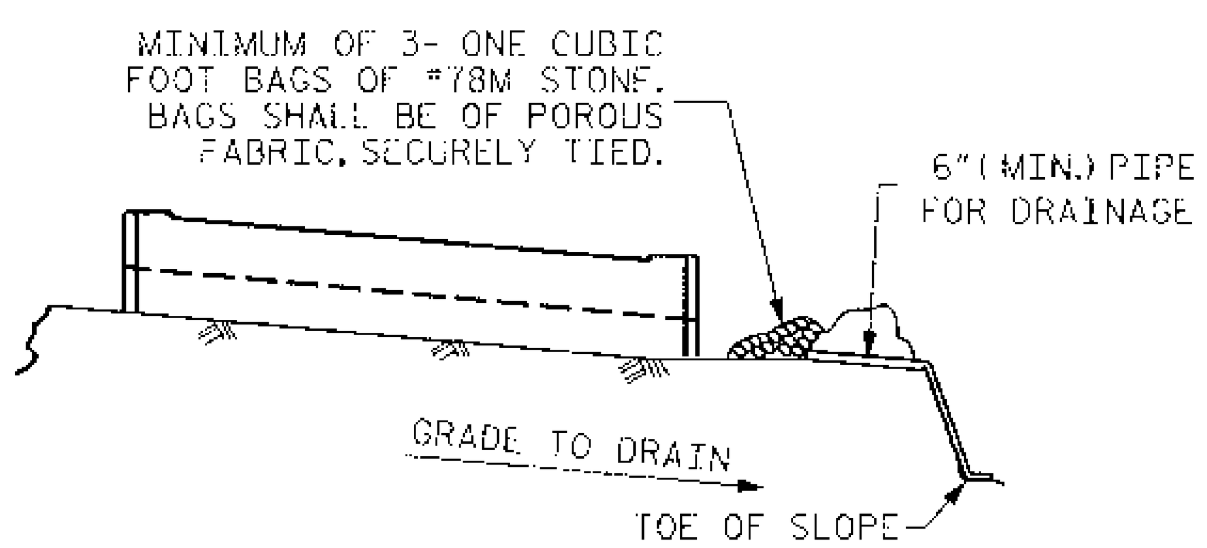
SECTION THRU CAP



VIEW Y-Y

NOTE: NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE PVC PLASTIC PIPE DRAINS, HARDWARE CLOTH AND FASTENERS. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

PIPE DRAIN DETAILS

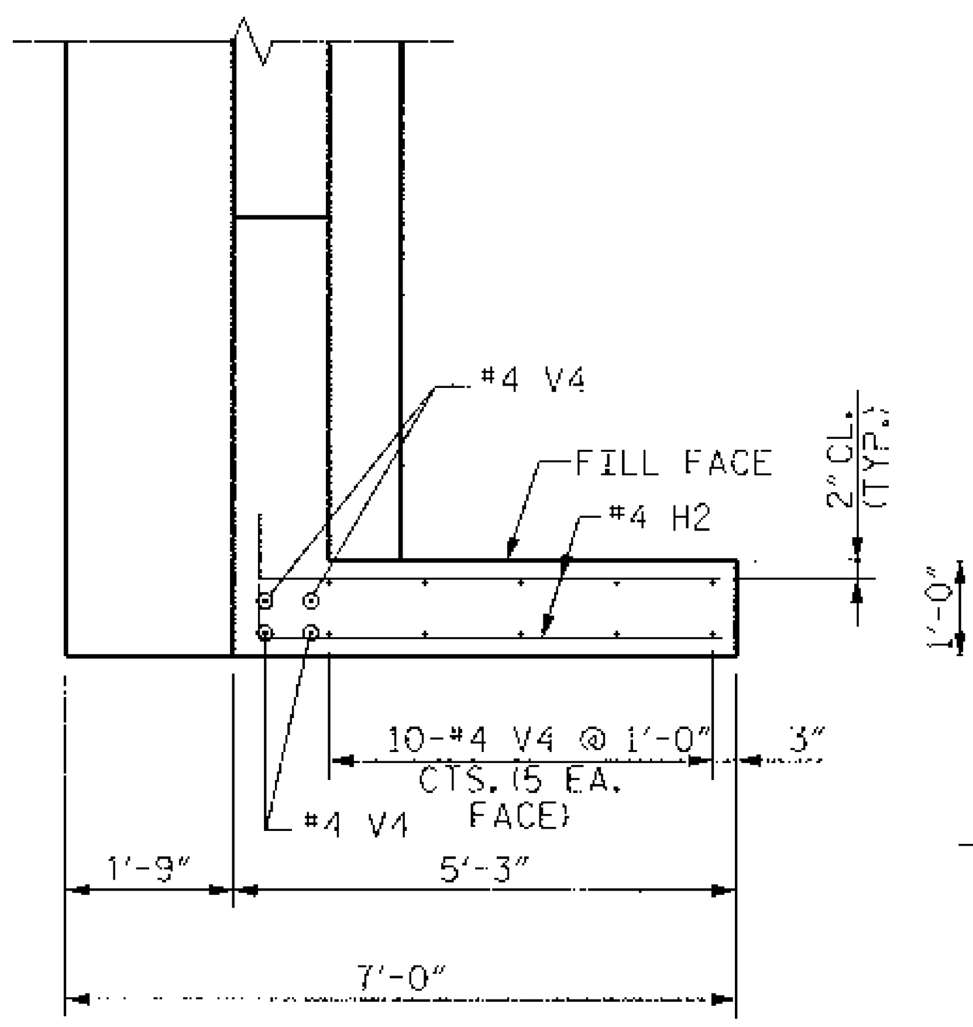


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

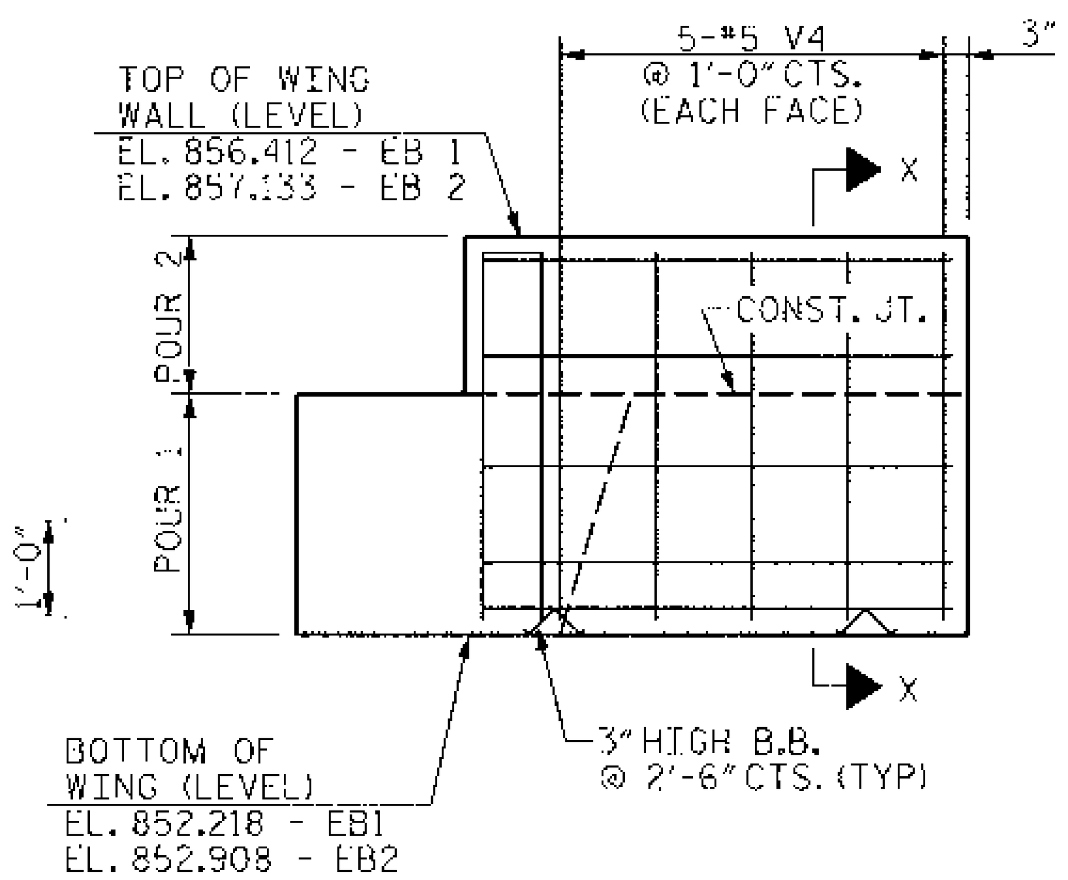
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

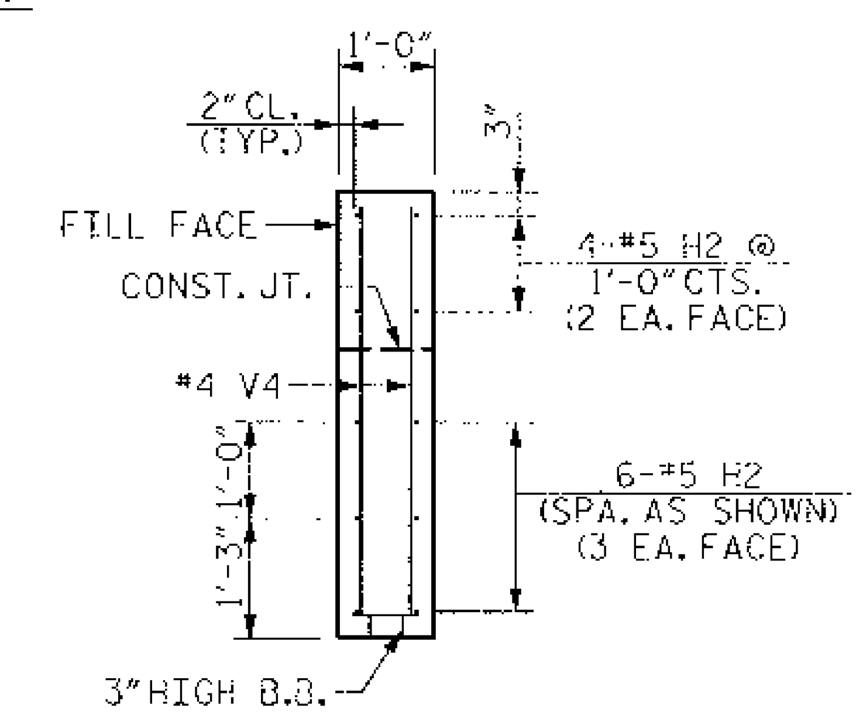


PLAN OF WING - W1, W3

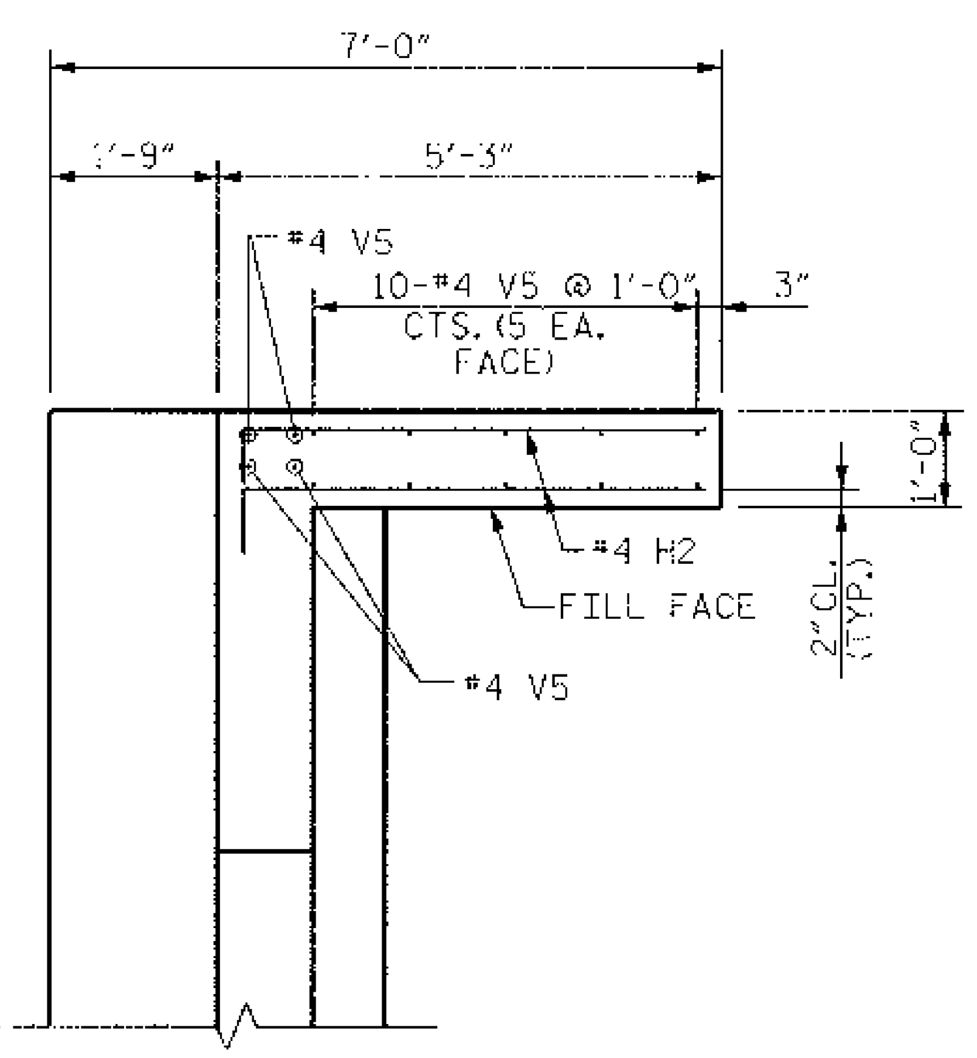
NOTE: BACKWALL REINFORCEMENT NOT SHOWN FOR CLARITY



ELEVATION OF WING - W1, W3

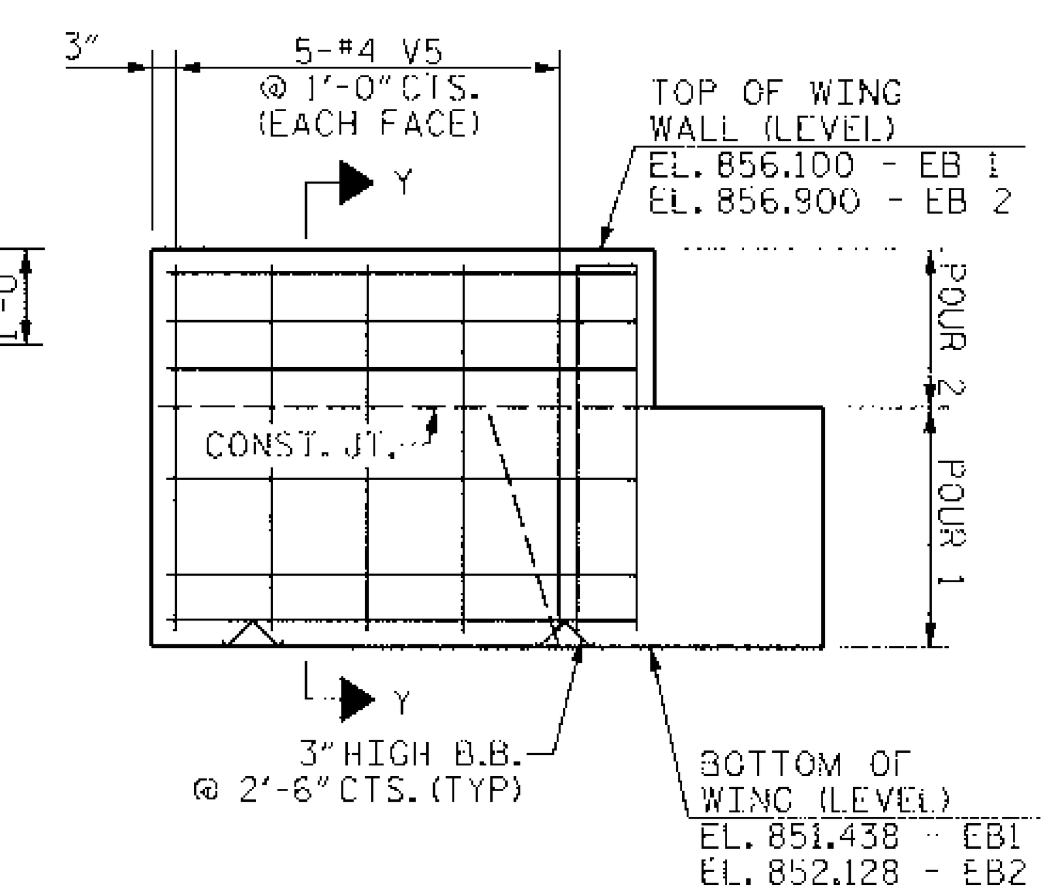


SECTION X-X

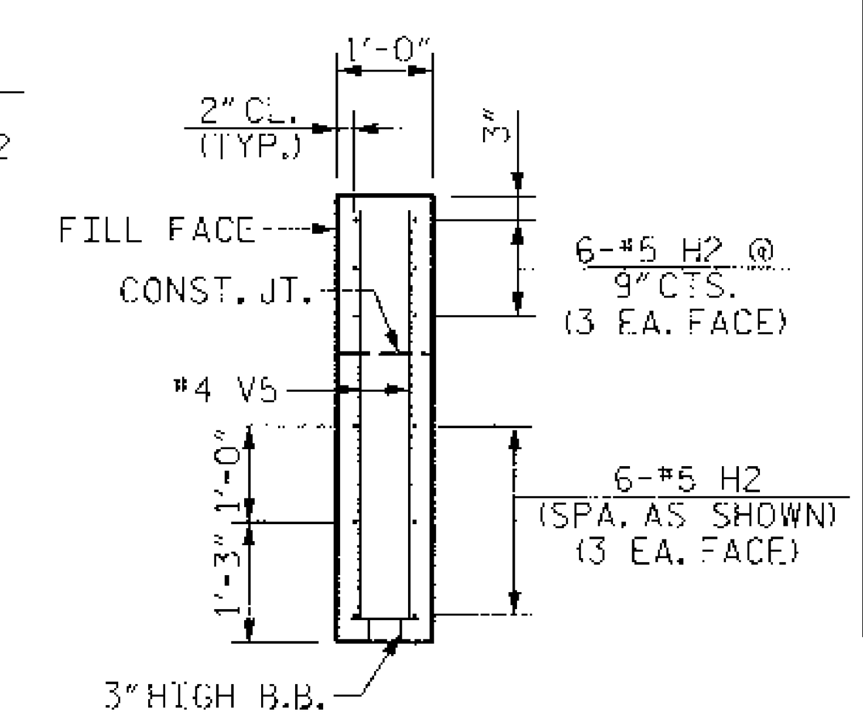


PLAN OF WING - W2, W4

NOTE: BACKWALL REINFORCEMENT NOT SHOWN FOR CLARITY



ELEVATION OF WING - W2, W4



SECTION Y-Y

BILL OF MATERIAL
END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	41'-0"	1673
B2	4	#6	STR.	38'-8"	232
B3	4	#4	STR.	1'-5"	4
D1	22	#6	STR.	1'-6"	50
H1	2	#4	STR.	3'-3"	4
H2	22	#5	2	5'-9"	132
K1	2	#4	STR.	19'-3"	26
K2	8	#4	STR.	20'-1"	107
M1	40	#9	2	10'-5"	1417
S1	41	#5	3	7'-7"	324
S2	41	#5	4	3'-4"	143
S3	37	#4	8	2'-7"	64
S4	6	#4	6	3'-8"	15
T1	32	#6	STR.	7'-2"	345
T2	32	#6	1	9'-2"	441
U1	20	#4	6	6'-6"	87
V1	8	#4	STR.	1'-10"	10
V2	39	#5	6	7'-11"	322
V3	40	#9	7	6'-9"	918
V4	14	#4	STR.	3'-9"	35
V5	14	#4	STR.	4'-3"	40

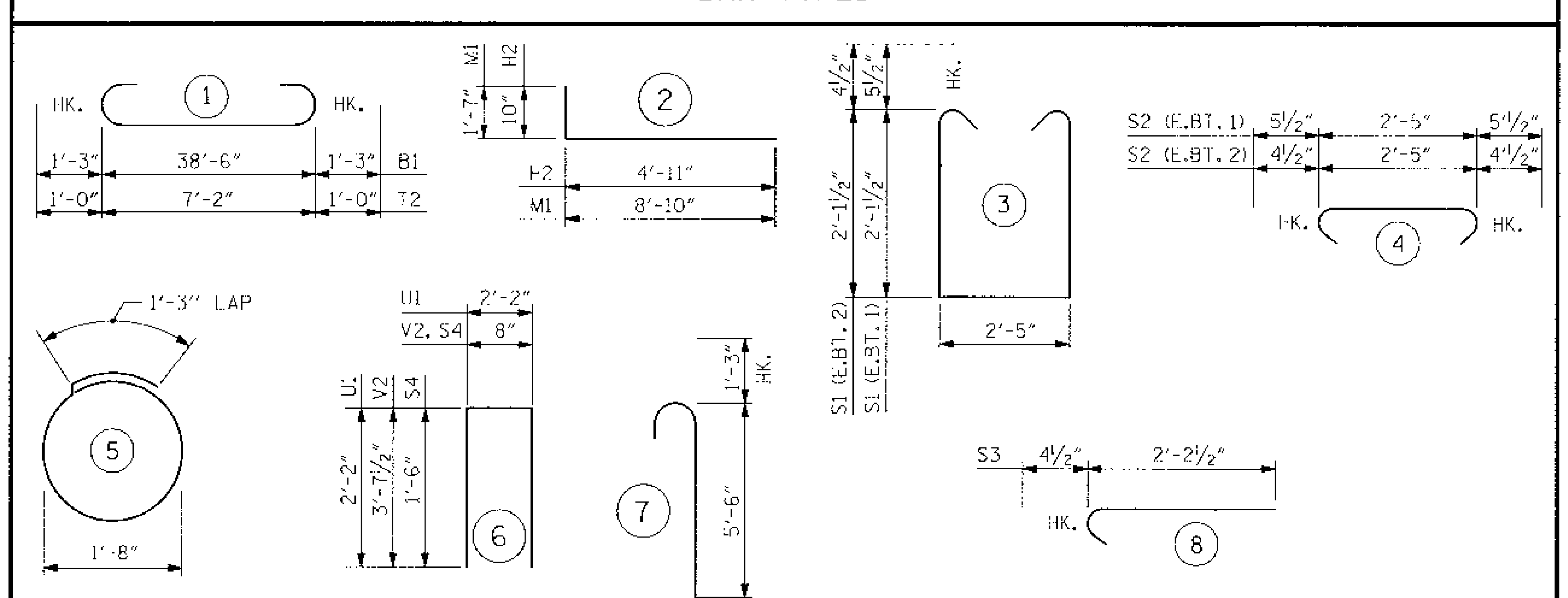
REINFORCING STEEL	LBS 6389
CLASS A CONCRETE BREAKDOWN	
POUR 1	
(FOOTINGS)	CU. YDS. 8.3
POUR 2	
(COLUMNS)	CU. YDS. 1.7
POUR 3	
(CAP & BOT. OF WINGS)	CU. YDS. 12.1
POUR 4	
(BACKWALL & TOP OF WINGS)	CU. YDS. 3.0
CLASS A CONCRETE TOTAL	CU. YDS. 25.1

BILL OF MATERIAL
END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	41'-0"	1115
B2	4	#5	STR.	38'-6"	161
B3	12	#4	STR.	13'-10"	111
B4	10	#4	STR.	2'-7"	17
B5	4	#4	STR.	1'-5"	4
D1	22	#6	STR.	1'-6"	50
H1	2	#4	STR.	3'-3"	4
H2	22	#5	2	5'-9"	132
K1	2	#4	STR.	19'-3"	26
K2	8	#4	STR.	20'-1"	107
S1	36	#4	3	7'-5"	178
S2	36	#4	4	3'-2"	76
S3	37	#4	8	2'-7"	64
S4	6	#4	6	3'-8"	15
S5	10	#4	5	6'-6"	43
V1	8	#4	STR.	1'-10"	10
V2	39	#5	6	7'-11"	322
V4	14	#4	STR.	3'-9"	35
V5	14	#4	STR.	4'-3"	40

REINFORCING STEEL	LBS 2510
CLASS A CONCRETE BREAKDOWN	
POUR 1	
(CAP & BOT. OF WINGS)	CU. YDS. 12.1
POUR 2	
(BACKWALL & TOP OF WINGS)	CU. YDS. 3.0
CLASS A CONCRETE TOTAL	CU. YDS. 15.1
HP 12x53 STEEL PILES	
NO. 5	LIN. FT. 100

BAR TYPES



PROJECT NO. 33718.3.1

CLEVELAND COUNTY

STATION: 23+29.00 -L-

SHEET 2 of 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT DETAILS

SEAL 13406 — PROFESSIONAL ENGINEER — JOSEPH KELVINGTON — 09

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

SHEET NO. S11

TOTAL SHEETS 15

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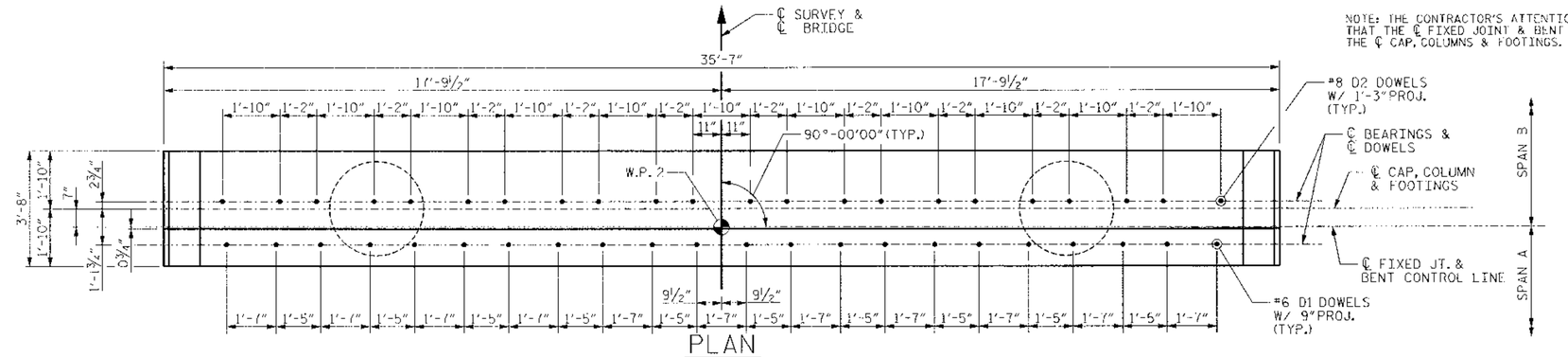
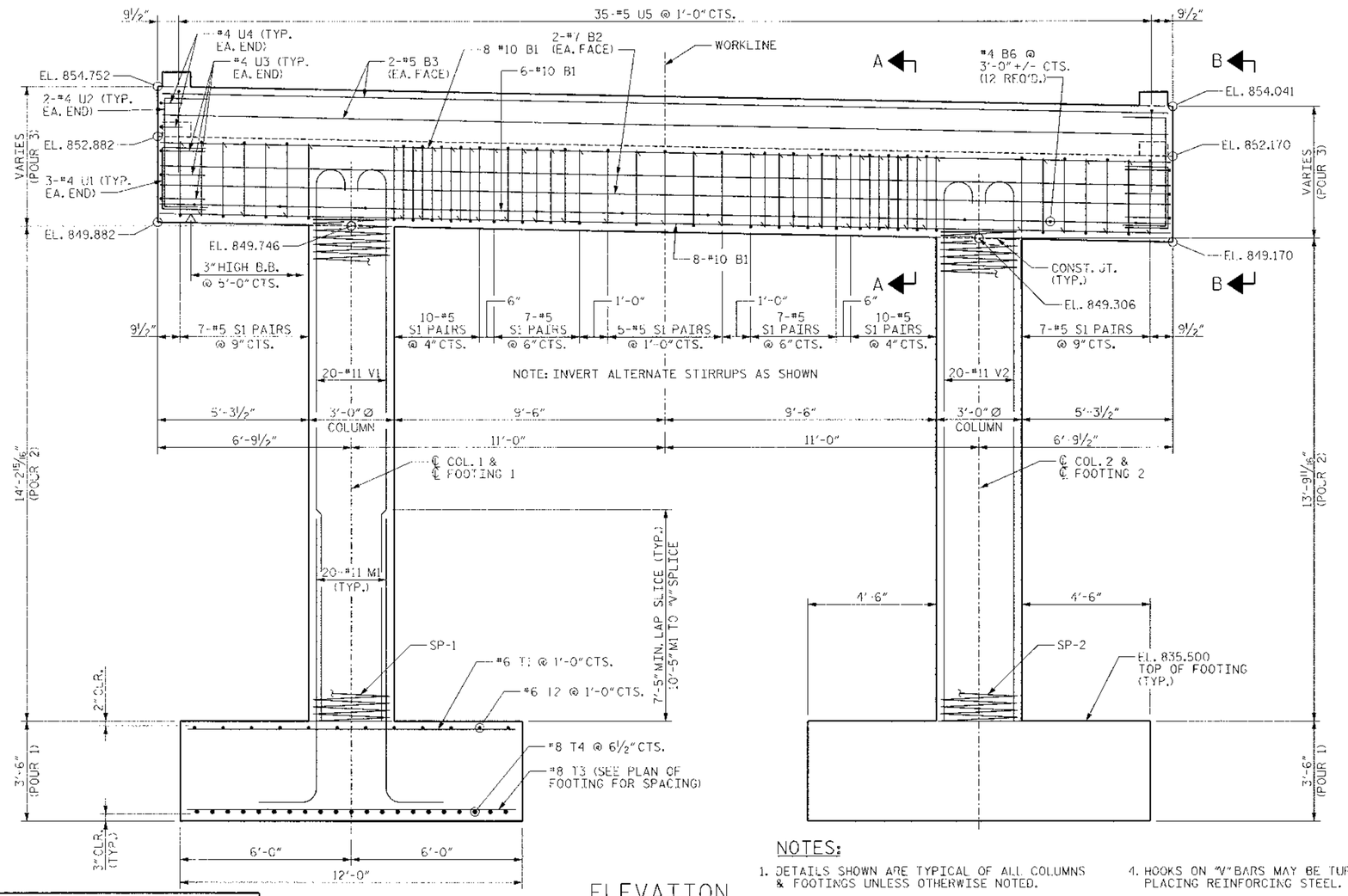
DRAWN BY : J.L. HENNEKES DATE : 5-3-07
CHECKED BY : T.R. DUDECK DATE : 5 4 07

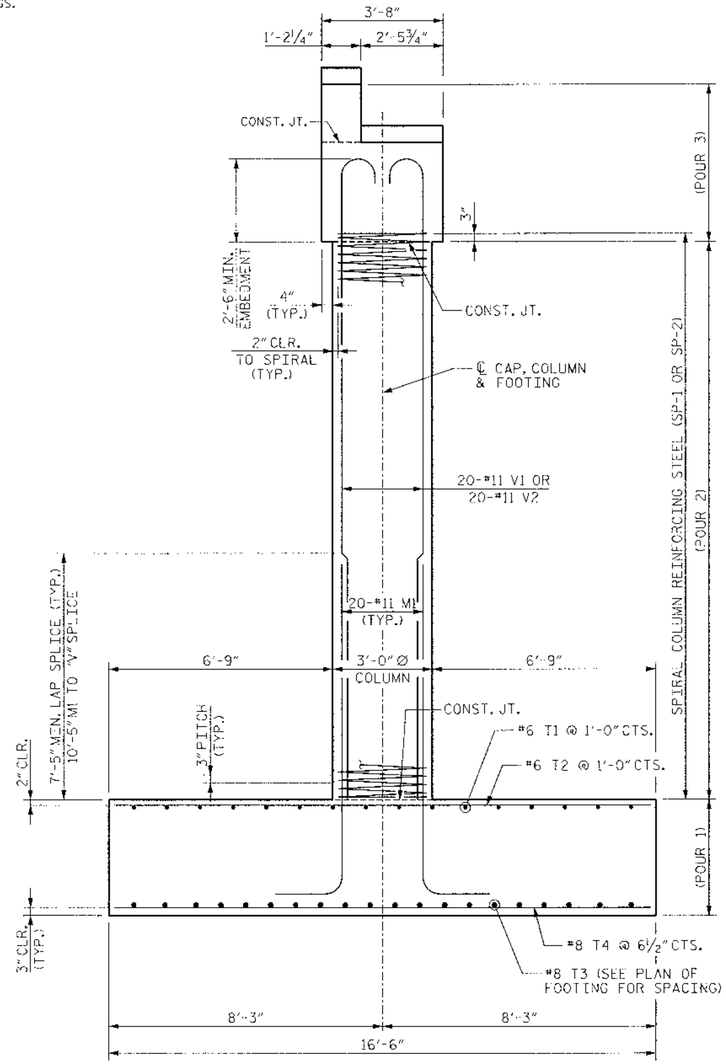


PLAN

NOTE: THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE ℄ FIXED JOINT & BENT CONTROL LINE IS OFFSET FROM THE ℄ CAP, COLUMNS & FOOTINGS.



ELEVATION



END ELEVATION

NOTES:

1. DETAILS SHOWN ARE TYPICAL OF ALL COLUMNS & FOOTINGS UNLESS OTHERWISE NOTED.
2. SEE "SUBSTRUCTURE INTERIOR BENT DETAILS" SHEET FOR SECTION A-A & B-B.
3. THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE COLUMN IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
4. HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
5. STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

PROJECT NO. 33718.3.1

CLEVELAND COUNTY

STATION: 23+29.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE INTERIOR BENT 1

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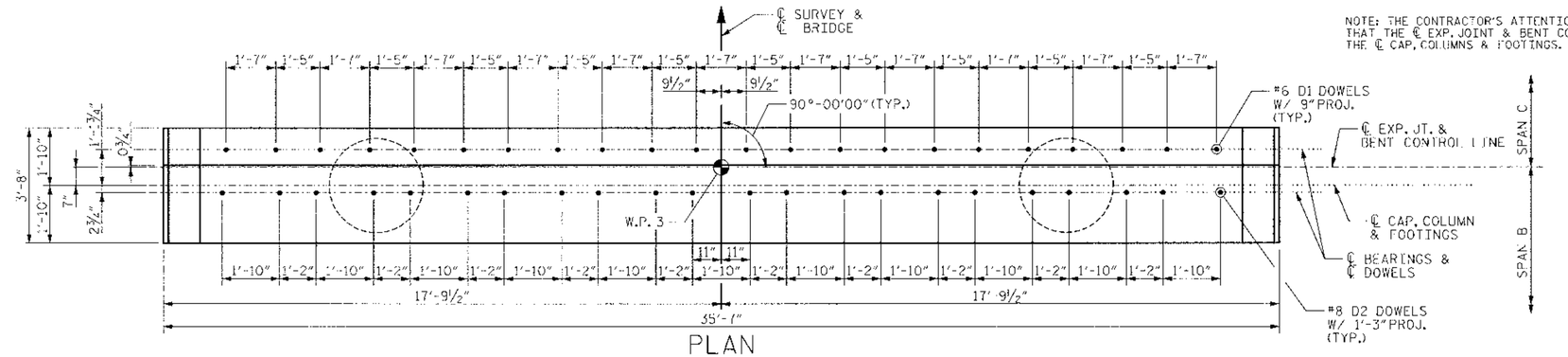
DRAWN BY : J. L. HENNEKES DATE : 4-26-07
CHECKED BY : T. R. DUDECK DATE : 4-30-07

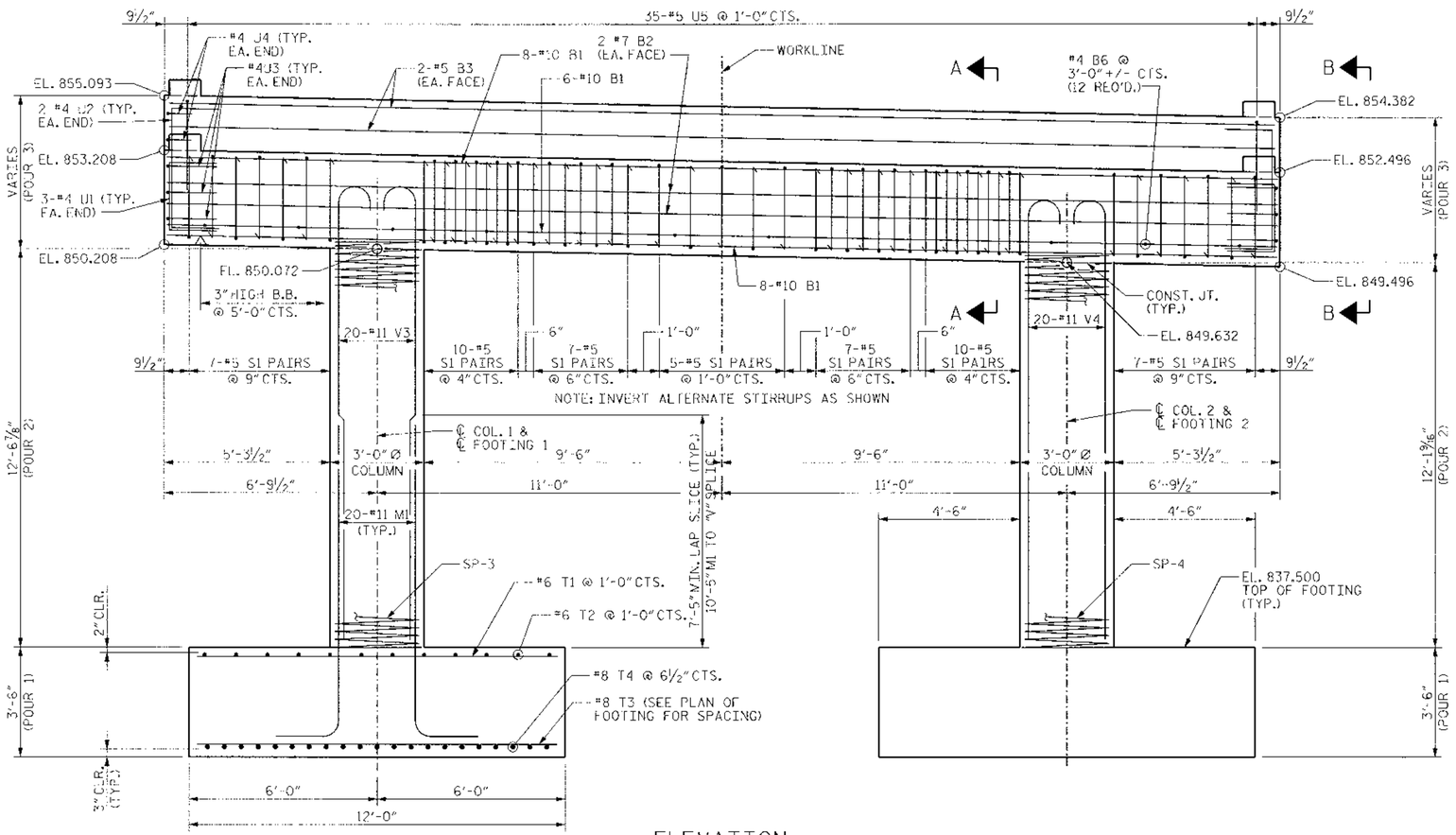
PROFESSIONAL ENGINEER SEAL 13406 JOSEPH T. KELVINGTON 4/30/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S12
1			3			TOTAL SHEETS
2			4			15

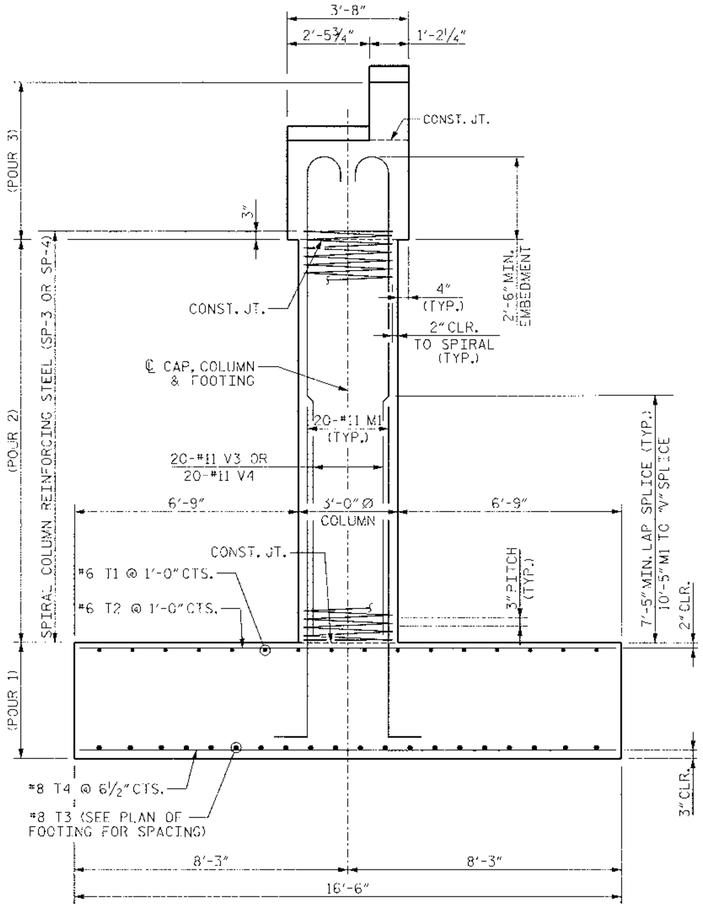


PLAN

NOTE: THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE ℄ EXP. JOINT & BENT CONTROL LINE IS OFFSET FROM THE ℄ CAP, COLUMNS & FOOTINGS.



ELEVATION



END ELEVATION

NOTES:

1. DETAILS SHOWN ARE TYPICAL OF ALL COLUMNS & FOOTINGS UNLESS OTHERWISE NOTED.
2. SEE "SUBSTRUCTURE INTERIOR BENT DETAILS" SHEET FOR SECTION A-A & B-B.
3. THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE COLUMN IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
4. HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
5. STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

PROJECT NO. 33718.3.1

CLEVELAND COUNTY

STATION: 23+29.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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SUBSTRUCTURE INTERIOR BENT 2

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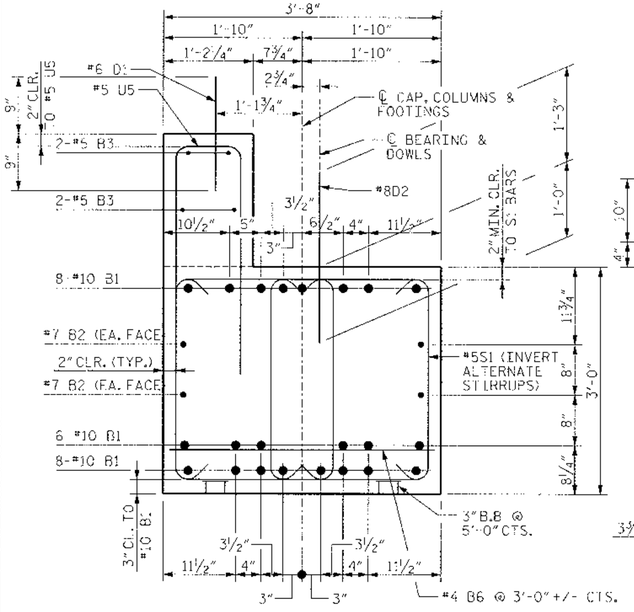
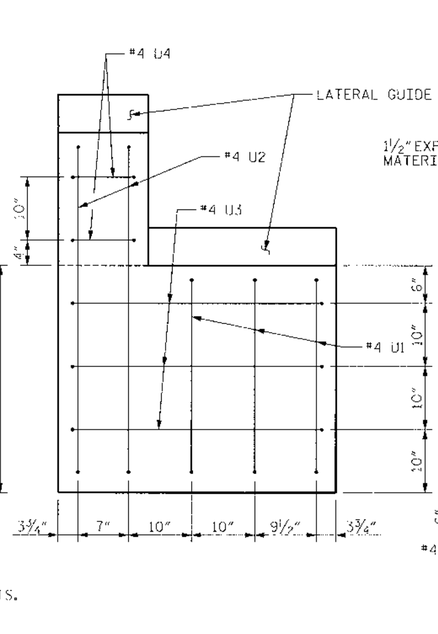
DRAWN BY : J. L. HENNEKES DATE : 4-26-07
CHECKED BY : T. R. DUDECK DATE : 4-30-07

SEAL 13406 ENGINEER KELVINGTON

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S13
1			3			TOTAL SHEETS
2			4			15

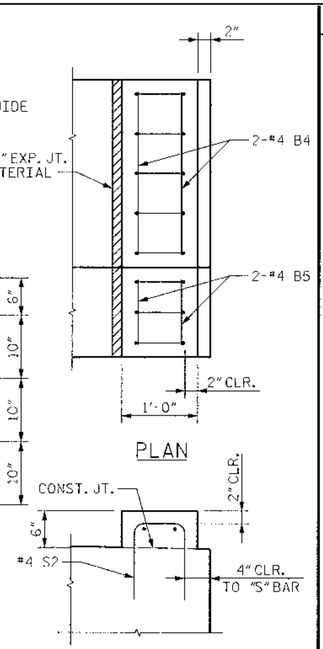


SECTION A-A

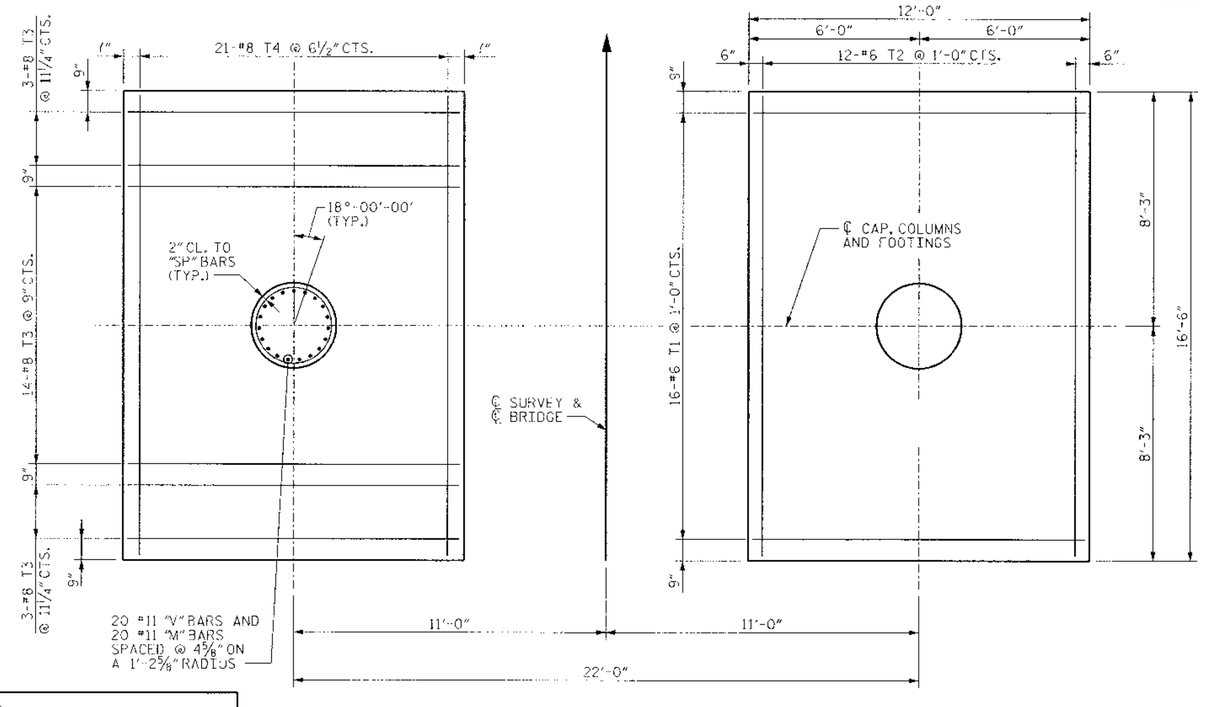


VIEW B-B

(TYP. EA. END)



LATERAL GUIDE

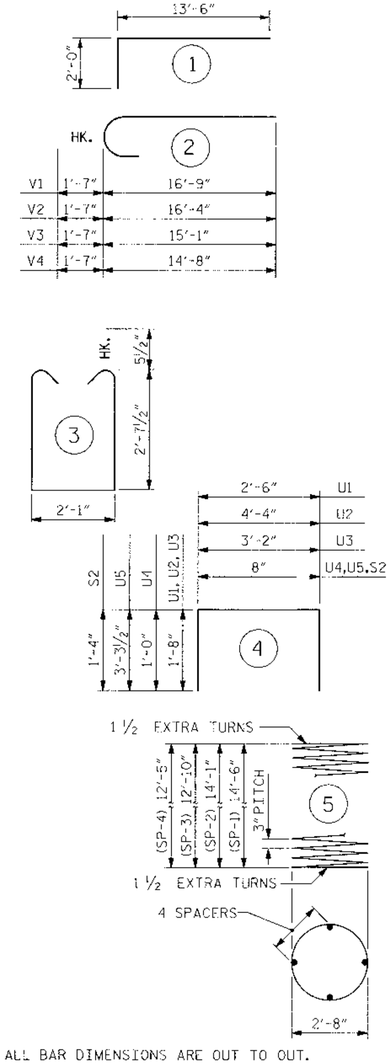


BOTTOM TOP

PLAN OF FOOTINGS

DETAILS SHOWN ARE TYPICAL FOR ALL FOOTINGS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	22	#10	STR	35'-1"	3,321
B2	4	#7	STR	35'-1"	287
B3	4	#5	STR	35'-1"	146
B4	4	#4	STR	2'-2"	6
B5	4	#4	STR	0'-11"	2
B6	12	#4	STR	3'-6"	28
D1	22	#6	STR	1'-6"	50
D2	22	#8	STR	2'-3"	132
M1	40	#11	1	15'-6"	3,294
S1	106	#5	3	8'-3"	912
S2	16	#4	4	3'-4"	36
T1	32	#6	STR	11'-6"	553
T2	24	#6	STR	16'-0"	577
T3	40	#8	STR	11'-6"	1,228
T4	42	#8	STR	16'-0"	1,794
U1	6	#4	4	5'-10"	23
U2	4	#4	4	7'-8"	20
U3	6	#4	4	6'-6"	26
U4	4	#4	4	2'-8"	7
U5	35	#5	4	7'-3"	265
V1	20	#11	2	18'-4"	1,948
V2	20	#11	2	17'-11"	1,904
SP-1	1	**	5	503'-4"	336
SP-2	1	**	5	488'-9"	326

REINFORCING STEEL LBS. 16,559
SPIRAL COLUMN REINF. STEEL LBS. 662

CLASS A CONCRETE BREAKDOWN:

POUR #1 FOOTINGS	CU. YDS.	51.3
POUR #2 COLUMNS	CU. YDS.	7.3
POUR #3 CAP	CU. YDS.	17.6
TOTAL	CU. YDS.	76.2

FOUNDATION EXCAVATION LUMP SUM

BILL OF MATERIAL BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	22	#10	STR	35'-1"	3,321
B2	4	#7	STR	35'-1"	287
B3	4	#5	STR	35'-1"	146
B4	4	#4	STR	2'-2"	6
B5	4	#4	STR	0'-11"	2
B6	12	#4	STR	3'-6"	28
D1	22	#6	STR	1'-6"	50
D2	22	#8	STR	2'-3"	132
M1	40	#11	1	15'-6"	3,294
S1	106	#5	3	8'-3"	912
S2	16	#4	4	3'-4"	36
T1	32	#6	STR	11'-6"	553
T2	24	#6	STR	16'-0"	577
T3	40	#8	STR	11'-6"	1,228
T4	42	#8	STR	16'-0"	1,794
U1	6	#4	4	5'-10"	23
U2	4	#4	4	7'-8"	20
U3	6	#4	4	6'-6"	26
U4	4	#4	4	2'-8"	7
U5	35	#5	4	7'-3"	265
V3	20	#11	2	16'-8"	1,771
V4	20	#11	2	16'-3"	1,727
SP-3	1	**	5	448'-0"	299
SP-4	1	**	5	433'-5"	290

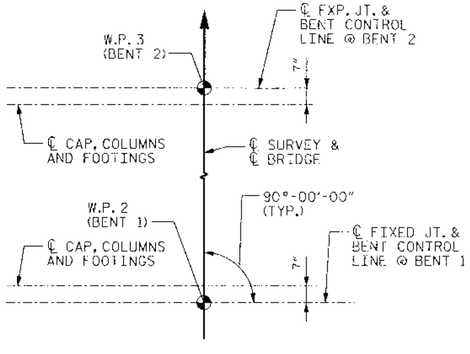
REINFORCING STEEL LBS. 16,205
SPIRAL COLUMN REINF. STEEL LBS. 589

CLASS A CONCRETE BREAKDOWN:

POUR #1 FOOTINGS	CU. YDS.	51.3
POUR #2 COLUMNS	CU. YDS.	6.4
POUR #3 CAP	CU. YDS.	17.6
TOTAL	CU. YDS.	75.3

FOUNDATION EXCAVATION LUMP SUM

** THE SP-1, SP-2, SP-3 & SP-4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.



FOOTING LAYOUT SKETCH

(N.T.S.)

PROJECT NO. 33718.3.1

CLEVELAND COUNTY

STATION: 23+29.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

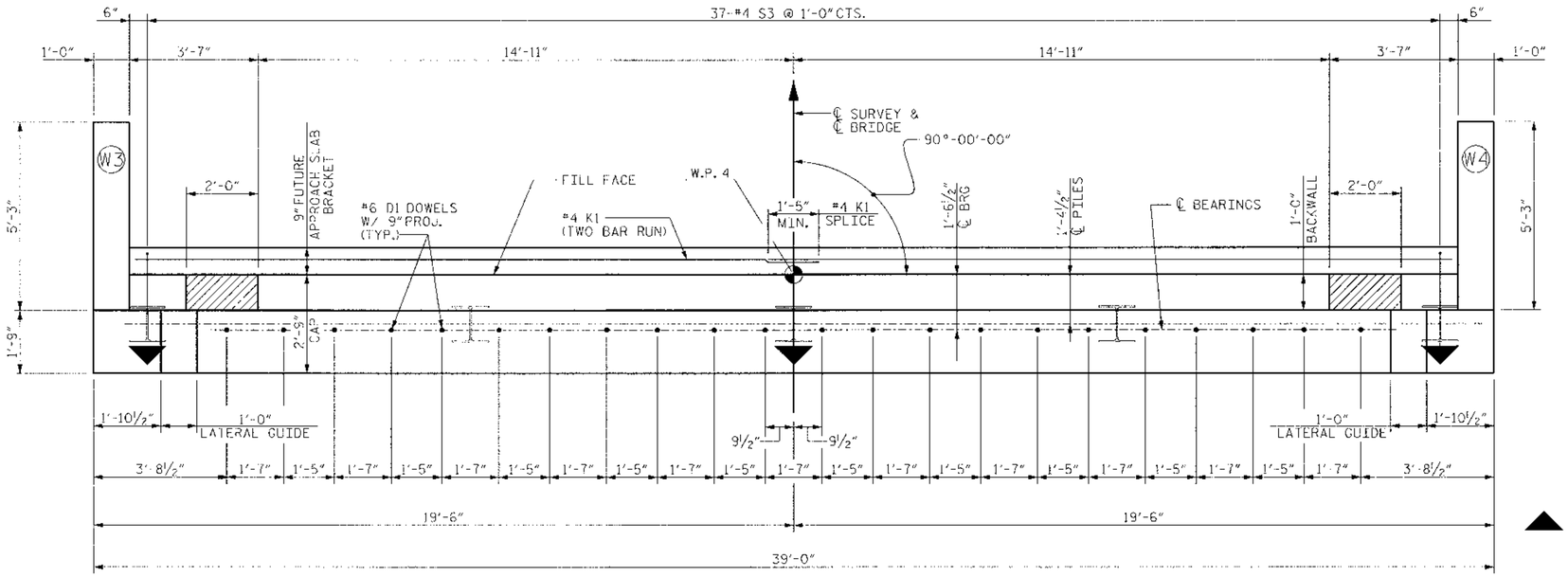
SUBSTRUCTURE INTERIOR BENT DETAILS

Stantec Consulting Services Inc.
Suite 300, 801 Jones Franklin Road
Raleigh, NC
27606
Tel. 919.851.6666
Fax. 919.851.7024
www.stantec.com

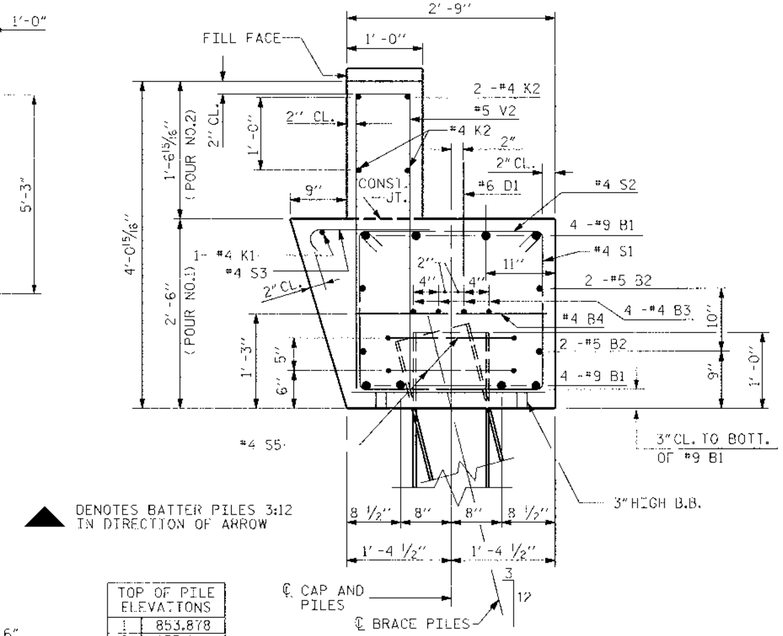
DRAWN BY : J. L. HENNEKES DATE : 4-27-07
CHECKED BY : T. R. DUDECK DATE : 5-2-07

SEAL 13406 — NORTH CAROLINA PROFESSIONAL ENGINEER — STEVEN K. KELVINGTON

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S14
1			3			TOTAL SHEETS
2			4			15



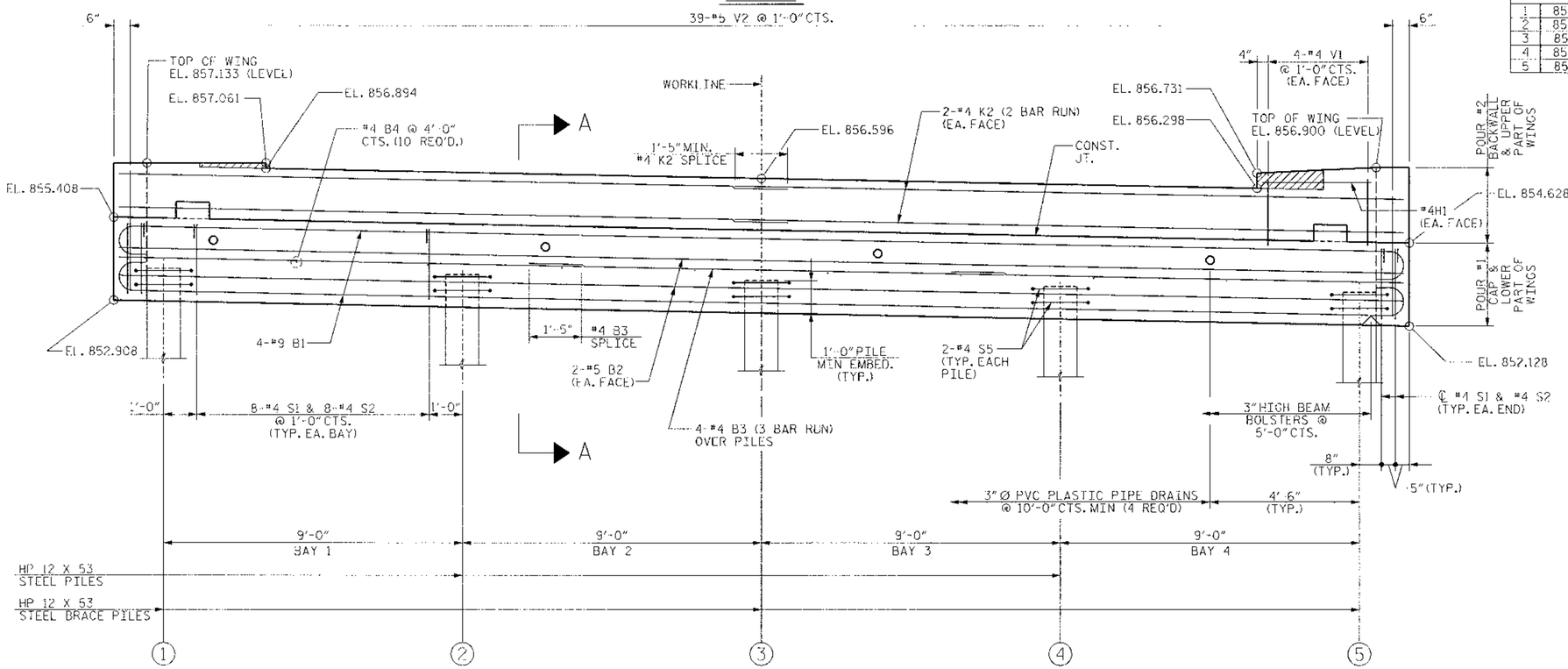
PLAN



▲ DENOTES BATTER PILES 3:12 IN DIRECTION OF ARROW

TOP OF PILE ELEVATIONS	
1	853.878
2	853.698
3	853.518
4	853.338
5	853.158

SECTION A-A



ELEVATION

NOTES:

1. FOR LATERAL GUIDE DETAILS, SEE "END BENT DETAILS," SHT. 1 OF 2.
2. FOR WING WALL BLOCKOUT DETAILS, SEE "END BENT DETAILS," SHT. 1 OF 2.
3. FOR PILE SPLICE DETAILS, SEE "END BENT DETAILS," SHT. 1 OF 2.
4. STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
5. FOR MATERIAL LISTS, SEE "END BENT DETAILS," SHT. 2 OF 2.
6. FOR WING WALL DETAILS, SEE "END BENT DETAILS," SHT. 2 OF 2.

▨ CONCRETE BLOCKOUT TO BE POURED AFTER SLIP FORMING FOR BARRIER IS COMPLETE. CUT REINF. AS REQ'D.

PROJECT NO. 33718.3.1

CLEVELAND COUNTY

STATION: 23+29.00 -L-

SHEET 1 of 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT 2

Stantec
Stantec Consulting Services Inc.
Suite 600, 801 Jones Franklin Road
Raleigh, NC
27606
Tel. 919.851.6866
Fax. 919.851.7024
www.stantec.com

DRAWN BY : T.R. DUDECK DATE : 2-12-07
CHECKED BY : J. T. KELVINGTON DATE : 4-26-07

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 13406 JOSEPH T. KELVINGTON

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15
1			3			TOTAL SHEETS
2			4			15

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4469	EC-1	

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

TIP PROJECT: B-4469

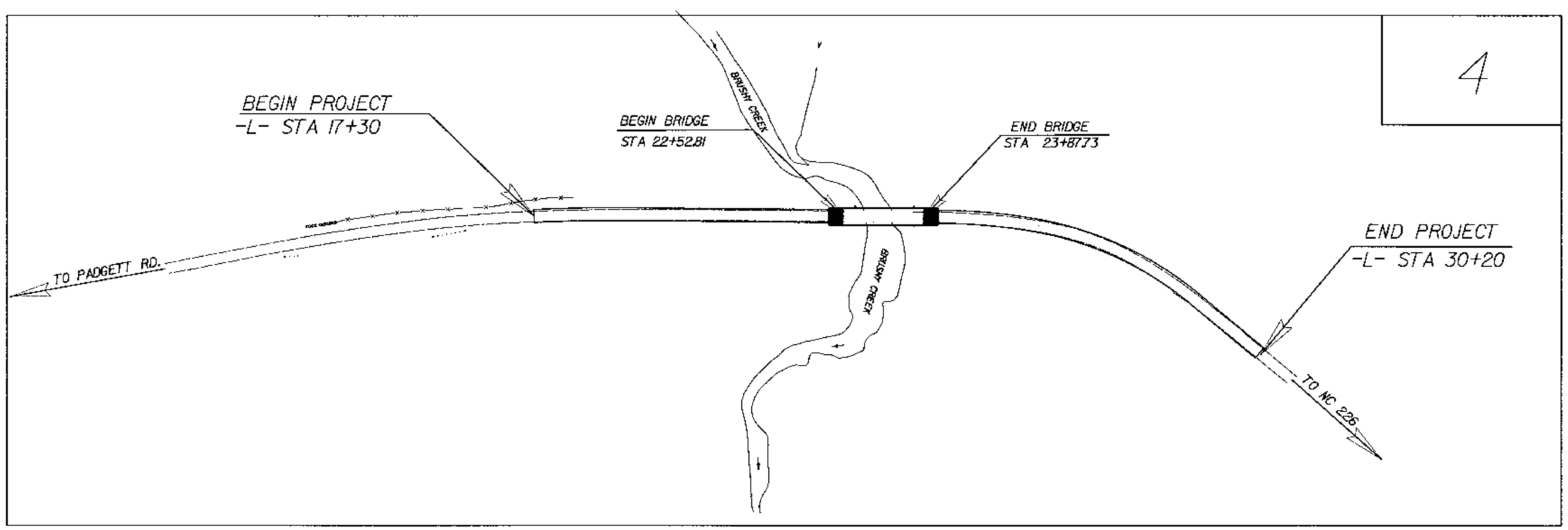
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

CLEVELAND COUNTY

LOCATION: BRIDGE 219 OVER BRUSHY CREEK ON SR 1350

TYPE OF WORK: GRADING, DRAINAGE, PAVING, MARKERS THERMOPLASTIC PAVEMENT MARKERS



EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	
1630.05	Temporary Diversion	
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.01	Riser Basin	
	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-B	
	Wattle	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1630.04	Stilling Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	
	Tiered Skimmer Basin	
	Infiltration Basin	

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

GRAPHIC SCALE

0
PLANS

0
PROFILE (HORIZONTAL)

0
PROFILE (VERTICAL)

ROADSIDE ENVIRONMENTAL UNIT
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

Prepared in the Office of:

ROADSIDE ENVIRONMENTAL UNIT
1 South Wilmington St.
Raleigh, NC 27611

2006 STANDARD SPECIFICATIONS

Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"-- Roadway Design Unit – N. C. Department of Transportation – Raleigh, N. C., dated July 18, 2006 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

1605.01 Temporary Silt Fence
1607.01 Gravel Construction Entrance
1632.03 Rock Inlet Sediment Trap Type C
1633.01 Temporary Rock Silt Check Type A
1634.02 Temporary Rock Sediment Dam Type B

9/3/2009

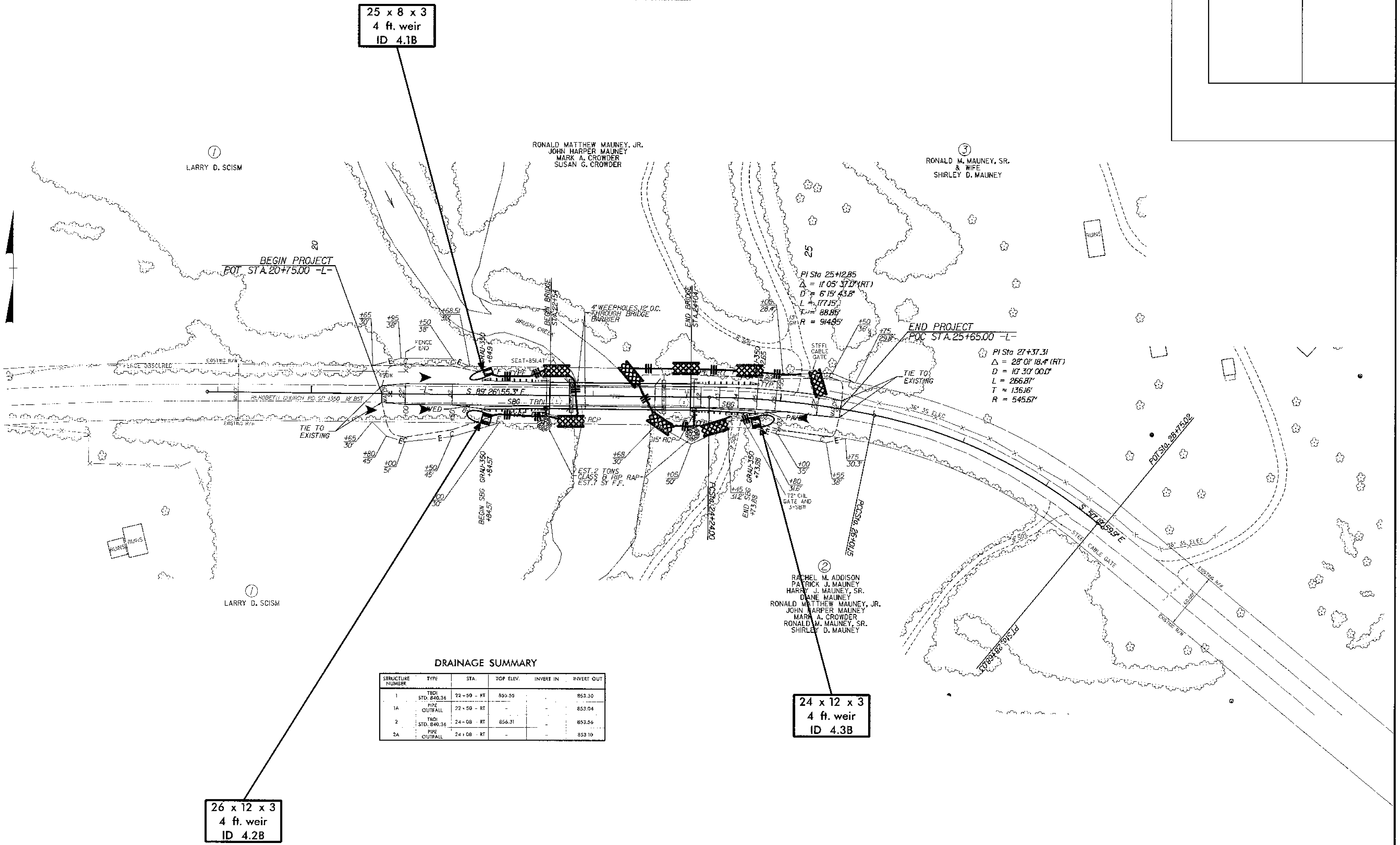
8/17/99

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 4

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

NOTE:
UTILIZE TEMPORARY ROCK SEDIMENT DAM TYPE – B AND TEMPORARY ROCK SILT CHECK TYPE – A AS STILLING BASIN WHERE APPLICABLE.

PROJECT REFERENCE NO.	SHEET NO.
33718.3J	EC-4/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



25 x 8 x 3
4 ft. weir
ID 4.1B
26 x 12 x 3
4 ft. weir
ID 4.2B
24 x 12 x 3
4 ft. weir
ID 4.3B
LARRY D. SCISM
RONALD MATTHEW MAUNEY, JR.
JOHN HARPER MAUNEY
MARK A. CROWDER
SUSAN G. CROWDER
RONALD M. MAUNEY, SR.
& WIFE
SHIRLEY D. MAUNEY
BEGIN PROJECT
POT STA 20+75.00 -L-
END PROJECT
POC STA 25+65.00 -L-
PI Sta 25+12.85
PI Sta 27+37.31
TIE TO EXISTING
BRUSH CREEK
BEGIN BRIDGE
END BRIDGE
4" WEEPHOLES 12' O.C. THROUGH BRIDGE BARRIER
EST. 2 TONS CLASS B RIP RAP
EST. 7 SY F.F.
RACHEL M. ADDISON
PATRICK J. MAUNEY
HARRY J. MAUNEY, SR.
DIANE MAUNEY
RONALD MATTHEW MAUNEY, JR.
JOHN HARPER MAUNEY
MARK A. CROWDER
RONALD M. MAUNEY, SR.
SHIRLEY D. MAUNEY
LARRY D. SCISM

DRAINAGE SUMMARY

STRUCTURE NUMBER	TYPE	STA.	TOP ELEV.	INVERT IN	INVERT OUT
1	TBDI STD. 840.36	22+50 – RT	855.55	.	853.30
1A	PIPE OUTFALL	22+50 – RT	–	–	853.04
2	TBDI STD. 840.36	24+08 – RT	856.31	–	853.56
2A	PIPE OUTFALL	24+08 – RT	–	–	853.10

9/3/2009
U:\Roadway\080409_Erosion Control Plans from NCDOT\B 4469 Erosion Control plan\b4469_EC_C&C_psh04.dgn

PROJECT REFERENCE NO.	SHEET NO.
33718.3.1	EC-3

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

PERMANENT SOIL REINFORCEMNT MAT

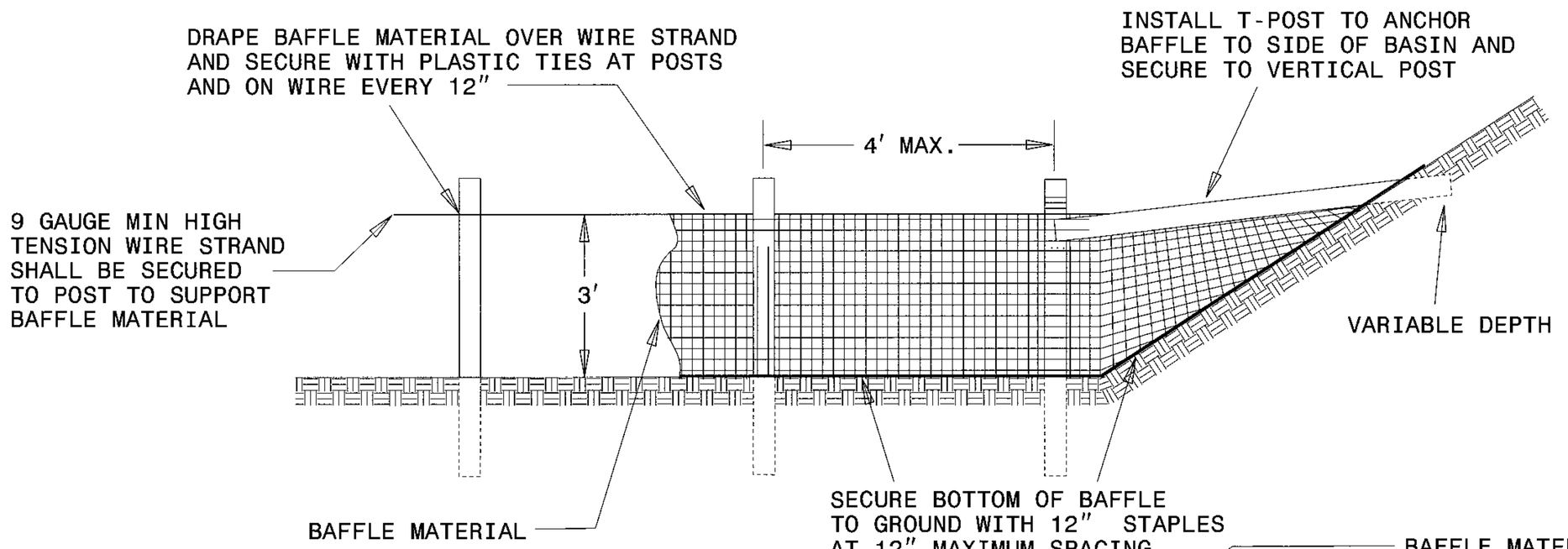
CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	L	20+75	21+50	RT	55
4	L	20+75	21+50	LT	55
4	L	25+00	25+65	RT	50
				SUBTOTAL	160
	ADDITIONAL PSRM TO BE INSTALLED				0
				TOTAL	160
				SAY	160

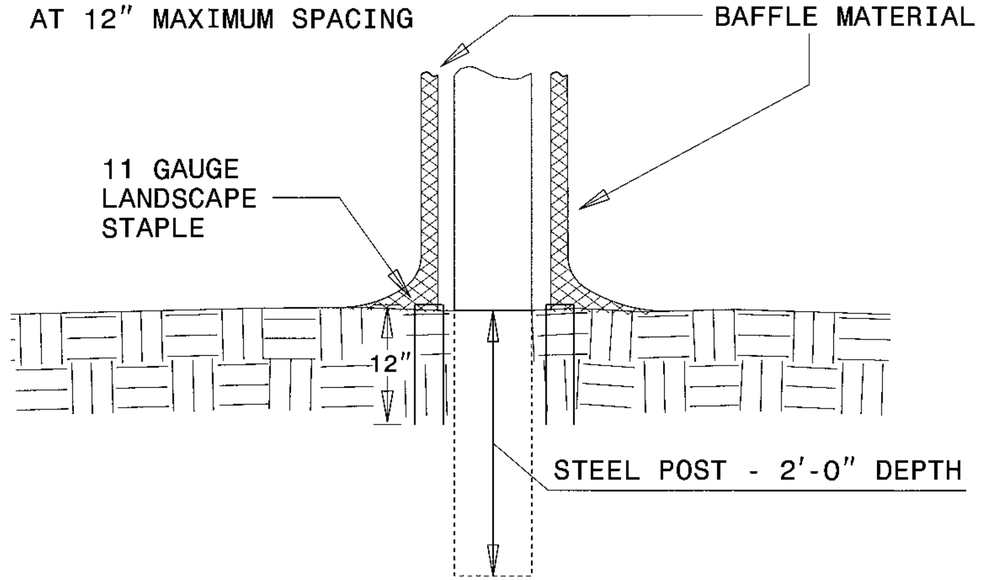
PERMANENT SOIL REINFORCEMENT MAT

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

PROJECT REFERENCE NO.	SHEET NO.
33718.31	EC-2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

COIR FIBER BAFFLE DETAIL



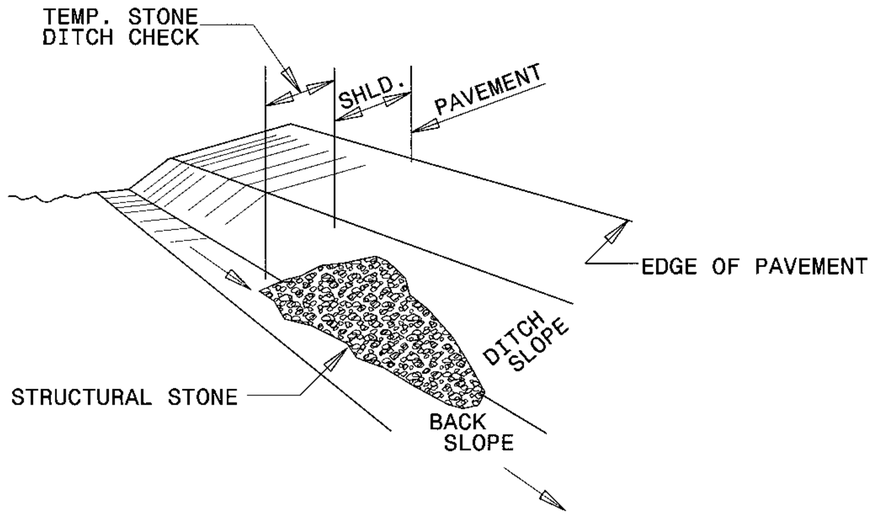


BAFFLE MATERIAL SHALL BE SECURED TO THE BOTTOM AND SIDES OF BASIN USING 12" LANDSCAPE STAPLES

NOTE: INSTALL THREE(3) COIR FIBER BAFFLES IN SILT BASINS AND SEDIMENT DAMS AT DRAINAGE OUTLETS WITH A SPACING OF ¼ THE BASIN LENGTH. TWO(2) COIR FIBER BAFFLES CAN BE INSTALLED IN SILT BASINS AND DAMS LESS THAN 20 FT. IN LENGTH WITH A SPACING OF 1/3 THE BASIN LENGTH.

PROJECT REFERENCE NO.	SHEET NO.
33718.3.1	EC-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

TEMPORARY ROCK SILT CHECK TYPE 'B' DETAIL

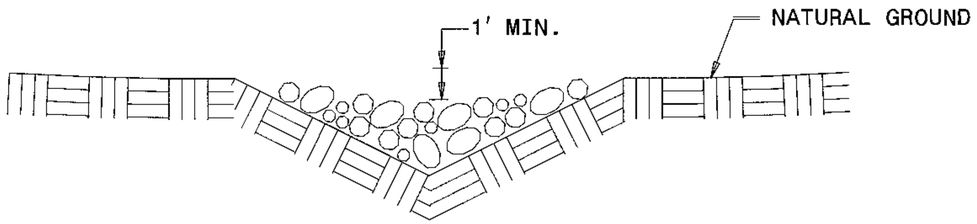


ISOMETRIC VIEW

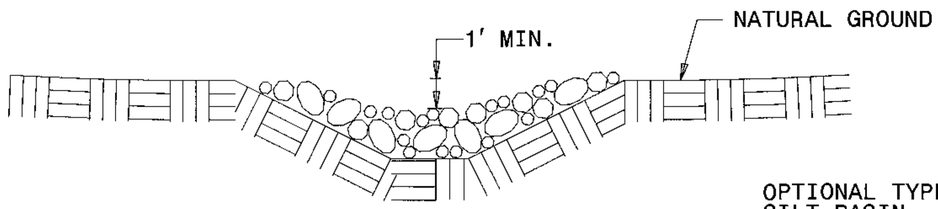
NOTES:

USE CLASS 'B' EROSION CONTROL STONE FOR STRUCTURAL STONE.

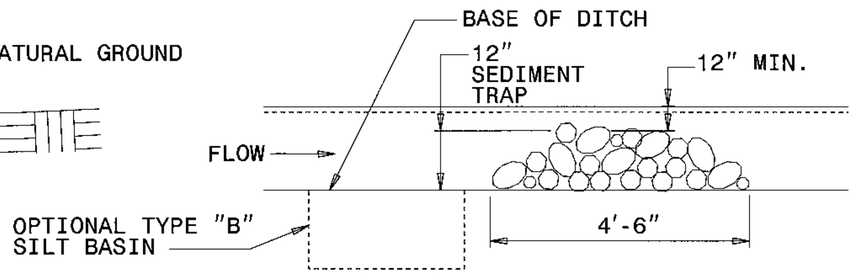
THE ENGINEER MAY DIRECT THE OPTION OF CLASS "A" STONE FOR SITES HAVING LESS THAN ONE (1) ACRE DRAINAGE AREA AND A DITCH GRADE LESS THAN 3%.



CROSS SECTION VEE DITCH



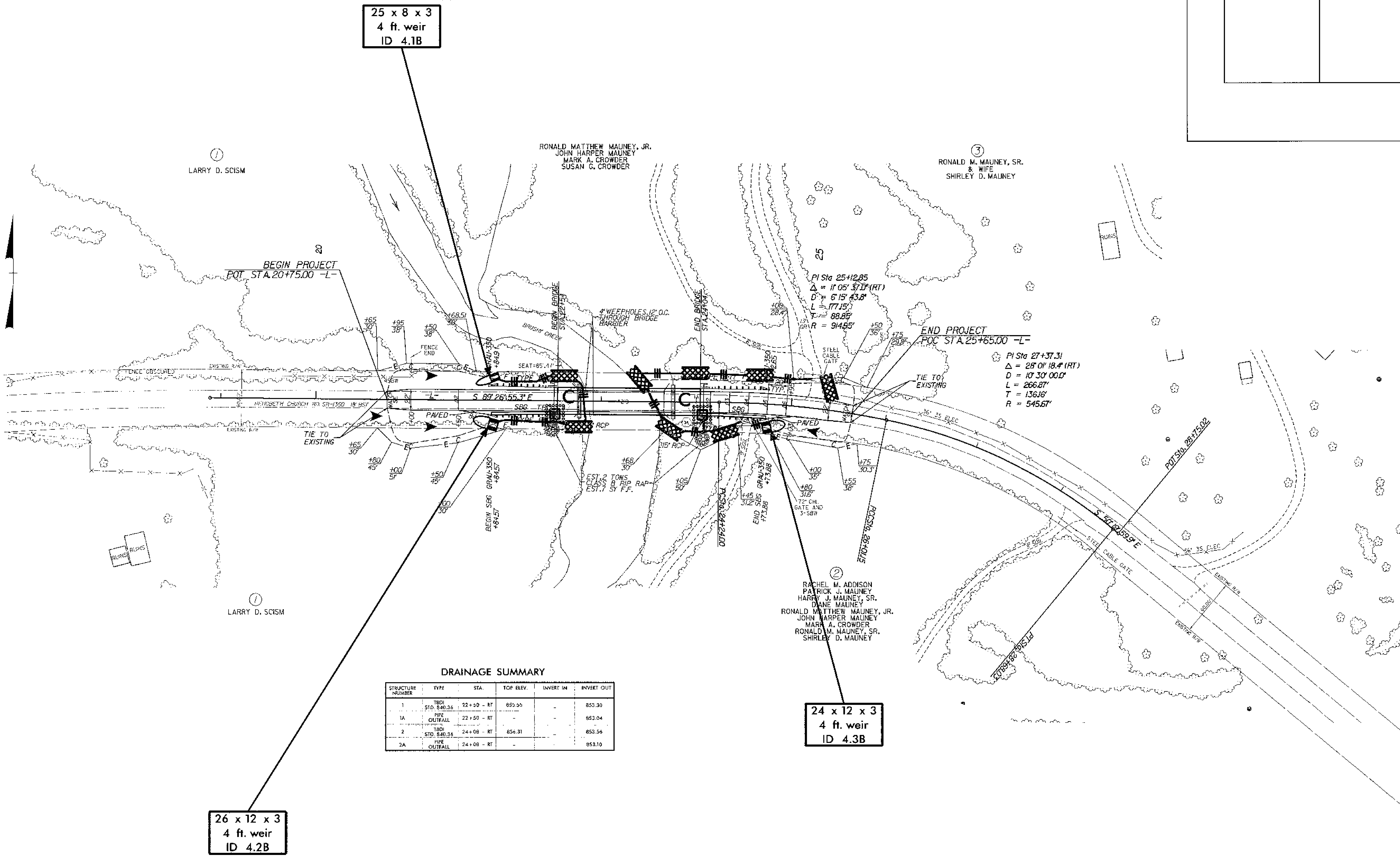
CROSS SECTION TRAPEZOIDAL DITCH



ELEVATION VIEW

PROJECT REFERENCE NO.	SHEET NO.
33718.3.1	EC-5/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NOTE: UTILIZE TEMPORARY ROCK SEDIMENT DAM TYPE – B AND TEMPORARY ROCK SILT CHECK TYPE – A AS STILLING BASIN WHERE APPLICABLE.



DRAINAGE SUMMARY

STRUCTURE NUMBER	TYPE	STA.	TOP ELEV.	INVERT IN	INVERT OUT
1	TBDI STD. 840.36	22+50 – RT	855.55	–	853.30
1A	PIPE OUTFALL	22+50 – RT	–	–	853.04
2	TBDI STD. 840.36	24+08 – RT	856.31	–	853.56
2A	PIPE OUTFALL	24+08 – RT	–	–	853.10

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	33718.3.1	X-1

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

870
865
860
855

S.S. 861.738

2%

0.0047

860.75

0.0235

4%

S.S. 868.532

2%

860.03

857.780

857.496

21+00.00

EXIST.

EXIST.

861.42

20+75.00

863.24

20+50.00

"QUANTITIES ARE APPROXIMATE ONLY. THE RESIDENT ENGINEER WILL RECROSS-SECTION THE WORK ACCURATELY WHEN THE PROJECT IS STAKED OUT. THESE CROSS-SECTION NOTES WILL BE USED IN COMPUTING THE FINAL QUANTITIES FOR WHICH THE CONTRACTOR WILL BE PAID."

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	33718.3.1	X-6

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

870
865
860
855

EXIST. EXIST.

863.90

25+65.00

S.S. 865.549

4:1 4:1

0.0600 0.0600

863.07

862.90

S.S. 864.056

4:1 2:1

861.612

859.986

25+50.00

865.02

865
860
855

4:1

0.0600 0.0600

S.S. 858.771

859.66

S.S. 859.693

4:1 2:1

866.913

25+00.00

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

PROJ. REFERENCE NO.	SHEET NO.
33718.3.1	X-5

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	33718.3.1	X-4

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

865 860 855 850 845 840 835

0.0200 856.33 0.0200

837.07

23+50.00

860 855 850 845 840 835

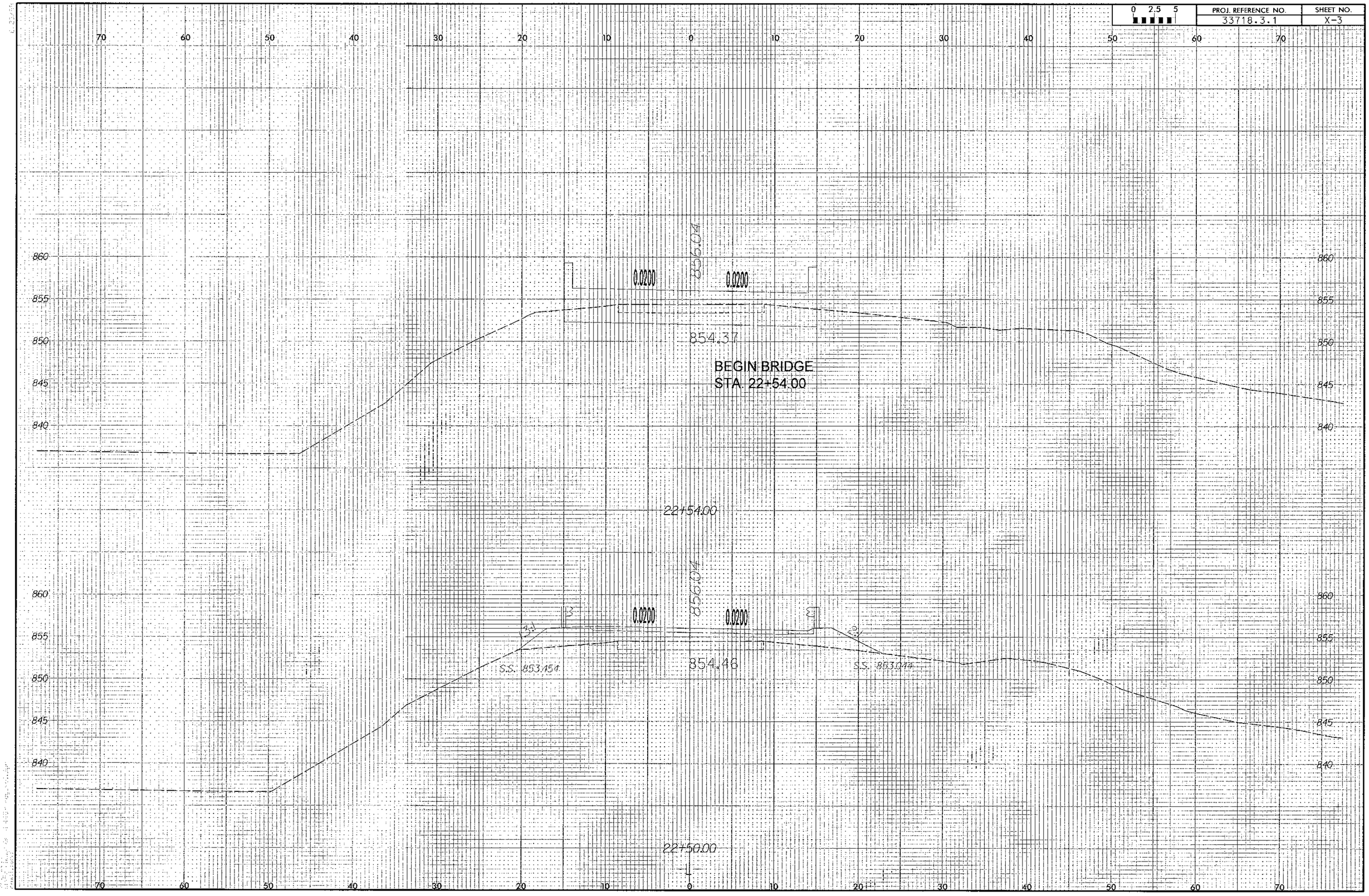
0.0200 856.18 0.0200

836.82

23+00.00

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	33718.3.1	X-3




0 2.5 5
PROJ. REFERENCE NO.
33718.3.1
SHEET NO.
X-2
856.45
0.0200
0.0200
S.S. 854.990
855.80
S.S. 854.663
22+00.00
S.S. 862.020
S.S. 858.928
857.83
0.0200
0.0200
857.63
855.850
855.210
21+50.00
-L-

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	33718.3.1	X-7

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

875

870

865

866.67

26+00.00

875

870

865

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70