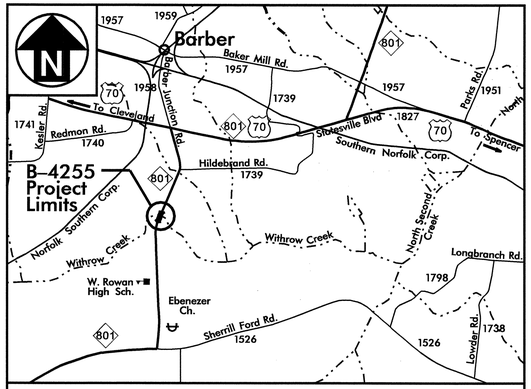
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–4255		

WBS NO.	F. A. PROJ. NO.	DESCRIPTION
33597.1.1	BRSTP–0801(3)	P.E.
33597.2.1	BRSTP–0801(3)	ROW, UTL
33597.3.1	BRSTP–0801(7)	CONSTR.

TIP PROJECT: B–4255

CONTRACT: C201474

STRUCTURE



VICINITY MAP
(NOT TO SCALE)

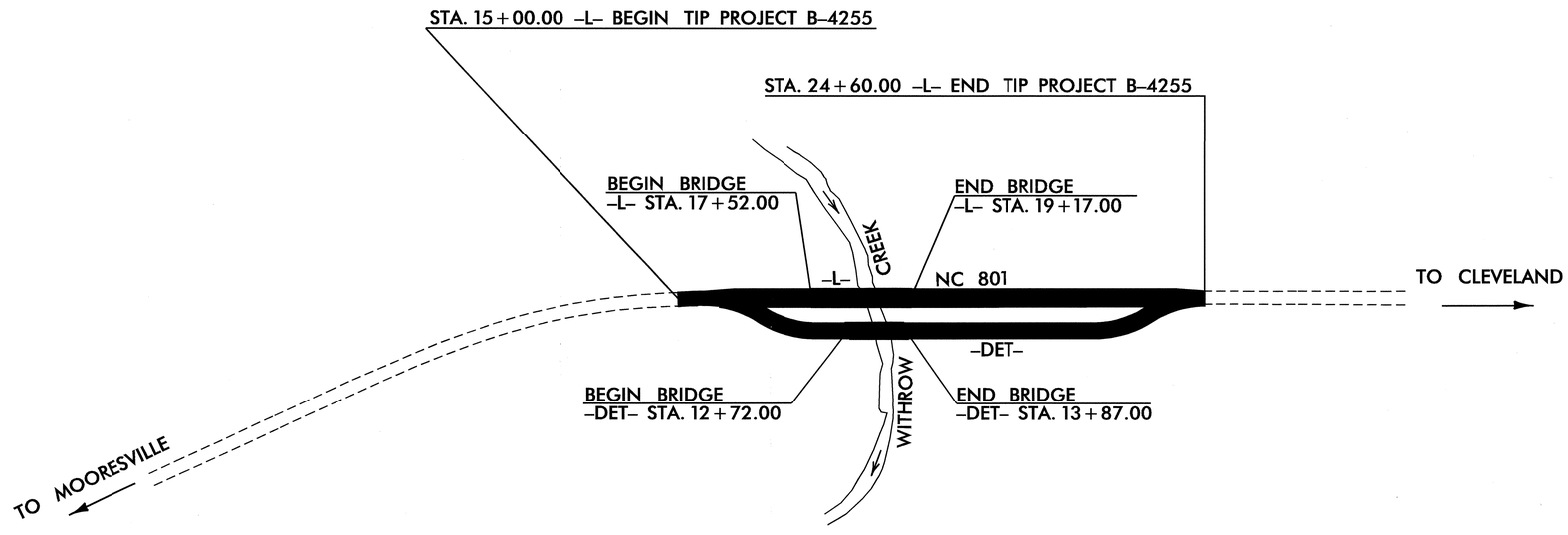
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROWAN COUNTY

LOCATION: BRIDGE NO. 28 OVER WITHROW CREEK
ON NC 801 (BEAR POPLAR RD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE

NC GRID
NAD 83



DESIGN DATA

ADT 2006 = 5,700
ADT 2026 = 10,300
DHV = 12 %
D = 55 %
T = 9 % *
V = 60 MPH
* TTST 3% DUAL 6%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B–4255 = 0.151 MILES
LENGTH STRUCTURE TIP PROJECT B–4255 = 0.031 MILES
TOTAL LENGTH STATE TIP PROJECT B–4255 = 0.182 MILES

Prepared In the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh, NC 27610

2006 STANDARD SPECIFICATIONS

LETTING DATE:
JULY 18, 2006

B. C. Hunt, PE
PROJECT ENGINEER

V. A. Patel, PE
PROJECT DESIGN ENGINEER

STRUCTURE DESIGN UNIT

NORTH CAROLINA PROFESSIONAL SEAL 14552 ENGINEER GREGORY R. PERFETTI
6-12-06

STATE BRIDGE DESIGN ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR *DATE*

09-JUN-2006 14:58
R:\STRUCTURE\B4255\Final Plans\B4255_sd_1sh_01.dgn
klayne

F.A.PROJECT NO.BRSTP-0801(7)

17+50 18+00 18+50 19+00

690 680 670 660

SPAN A SPAN B SPAN C

FILL FACE @ END BENT #1
STA. 17+52.00 -L-
GRADE POINT EL. 681.576

BEGIN FRONT SLOPE
STA. 17+45.89 -L-
GRADE POINT EL. 681.558

1'-0" EARTH BERM
NORMAL TO CAP

FIX

UNCLASSIFIED
STRUCTURE
EXCAVATION

1½:1 SLOPE

APPROXIMATE
EXISTING
GROUND LINE

1'-6"

HP 12 x 53
STEEL PILES

EL. 680.2±
EL. 680.3±
EL. 678.3±
EL. 671.1±

END BENT 1

EXP. EXP.

3'-6"Ø
DRILLED
PIERS

EL. 668.000
TOP OF DRILLED
PIER (TYP.)

EL. 670.0±
EL. 669.0±
EL. 666.5±
EL. 663.7±

BENT 1

HISTORICAL
H. W. EL. 674.9

N.W.S.
EL. 662.1
(6-22-04)

EL. 661.8±
EL. 661.3±
EL. 660.9±
EL. 661.1±
EL. 661.8±

+0.3000 % +4.6886 %
PI= 20+60.00 -L-
EL. = 682.50
VC = 600

GRADE DATA

EL. 667.000
TOP OF DRILLED
PIER (TYP.)

FIX EXP.

3'-6"Ø
DRILLED
PIERS

EL. 665.9±
EL. 667.7±
EL. 667.9±

BENT 2

EL. 670.9±
EL. 678.7±
EL. 680.3±

UNCLASSIFIED
STRUCTURE
EXCAVATION

1½:1 SLOPE

1'-0" EARTH BERM
NORMAL TO CAP

FIX

1'-6"

HP 12 x 53
STEEL PILES

FILL FACE @ END BENT #2
STA. 19+17.00 -L-
GRADE POINT EL. 682.972

BEGIN FRONT SLOPE
STA. 19+23.41 -L-
GRADE POINT EL. 683.067

EL. 680.6±

APPROXIMATE
EXISTING
GROUND LINE

END BENT 2

SECTION ALONG -L-

SECTION AT BENTS AND END BENTS TAKEN AT RIGHT ANGLES

NORMAL W.S.
EL. 662.1

20'-0"±

WORKPAD
(TYP. 1'-0"
CLASS I
RIP RAP)

CLASS II
RIP RAP

STREAM
BED

FLOW

2 :1

2 :1

DETAIL OF TEMPORARY CAUSEWAY

NOTES

ALL GRADING REQUIRED FOR ACCESS TO THE CAUSEWAY SHALL BE INCLUDED IN THE LUMP SUM BID PRICE FOR CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY ACCESS.

25' ±

20' ±

TEMPORARY
ROCK CAUSEWAY

2:1 SLOPE

WITHROW CREEK

2 :1 SLOPE

CLASS II
RIP RAP

1'-0" EARTH BERM
EL. 674.862

1'-0" EARTH BERM
EL. 676.160

2 :1 SLOPE

CLASS II
RIP RAP

EXISTING BRIDGE
(TO BE REMOVED)

FILL FACE @
END BENT #1

BEGIN FRONT SLOPE
STA. 17+45.89 -L-

TO SR 1526

STA.17+52.00 -L-
WORK POINT #1

STA.17+28.04 -L-
BEGIN APPROACH SLAB

1½:1 SLOPE
NORMAL
TO CAP

STA.18+07.00 -L-
WORK POINT #2

75°-00'-00"
(TYP.)

BENT 1
CONTROL LINE

BRIDGE IDENTITY
STA.18+34.50 -L-

-L-

WITHROW CREEK

STA.18+82.00 -L-
WORK POINT #3

BENT 2
CONTROL LINE

FILL FACE @
END BENT #2

BEGIN FRONT SLOPE
STA. 19+23.41 -L-

STA.19+17.00 -L-
WORK POINT #4

TO US 70

STA. 19+40.96 -L-
END APPROACH SLAB

1½:1 SLOPE
NORMAL
TO CAP

27'-6" 47'-6"

55'-0" 75'-0" 35'-0"

TOTAL LENGTH OF BRIDGE = 165'-0"(FILL FACE TO FILL FACE)

PLAN

PILES NOT SHOWN IN PLAN VIEW FOR CLARITY

NORTH CAROLINA PROFESSIONAL SEAL 009 ENGINEER BUCK CHARLES HUNT
6/7/06

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
6/7/06

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

SHEET 1 OF 3 REPLACES BRIDGE #28

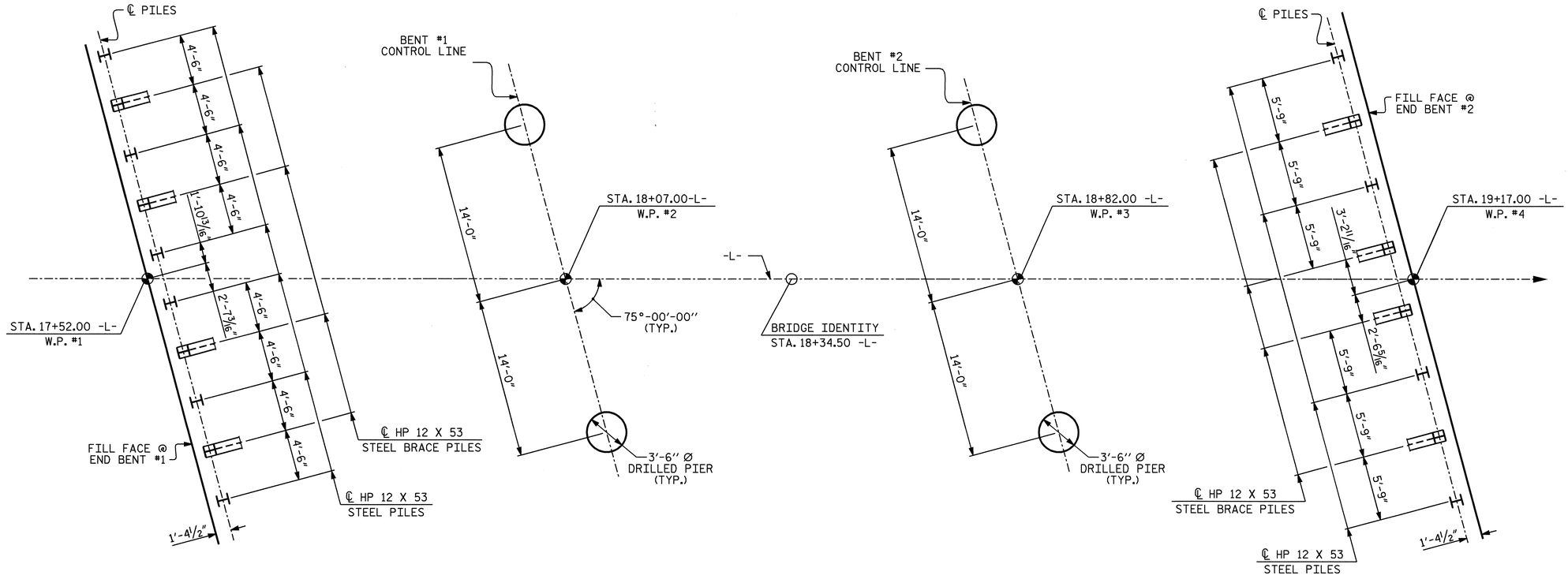
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOR BRIDGE OVER WITHROW CREEK ON NC 801 BETWEEN SR 1526 & US 70

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

DRAWN BY : KEITH D. LAYNE DATE : 10-07-05
CHECKED BY : VIPUL A. PATEL DATE : 11-16-05

07-JUN-2006 15:18
R:\Structures\B4255\Final Plans\B4255_sd_gd_01.dgn
klayne



BENT #1

END BENT #1

BENT #2

END BENT #2

FOUNDATION LAYOUT

DIMENSIONS LOCATING DRILLED PIERS ARE TO DRILLED PIER CENTER.
ALL PILES ARE HP 12 X 53.
END BENT BRACE PILES ARE BATTERED 3 : 12.
DIMENSIONS LOCATING PILES ARE TO THE CENTERLINE OF PILES.

NOTES

DRILLED PIERS AT BENT No. 1 AND BENT No. 2 ARE DESIGNED FOR BOTH SKIN FRICTION AND END BEARING. CHECK FIELD CONDITIONS FOR THE REQUIRED END BEARING CAPACITY OF 30 TSF.

DRILLED PIERS FOR BENT No. 1 ARE DESIGNED FOR AN APPLIED LOAD OF 289 TONS EACH AT TOP OF THE COLUMN.

DRILLED PIERS FOR BENT No. 2 ARE DESIGNED FOR AN APPLIED LOAD OF 258 TONS EACH AT TOP OF THE COLUMN.

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

DRILLED PIERS AT BENT No. 1 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 640.300 AND SATISFY THE REQUIRED END BEARING CAPACITY.

DRILLED PIERS AT BENT No. 2 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 646.000 AND SATISFY THE REQUIRED END BEARING CAPACITY.

THE SCOUR CRITICAL ELEVATION FOR BENT No. 1 IS ELEVATION 643.0 AND ELEVATION 650.7 FOR BENT No.2. SCOUR CRITICAL MAINTENANCE ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

FOR DRILLED PIERS, SEE DRILLED PIERS SPECIAL PROVISIONS.

DRIVE PILES AT END BENTS No. 1 AND No. 2 TO A REQUIRED BEARING CAPACITY OF 100 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 BENTS No.1 AND No.2 IS 50 TONS PER PILE.

SPT TESTING IS REQUIRED TO DETERMINE THE END BEARING CAPACITY OF THE DRILLED PIERS AT END BENTS No1 AND No2. SEE DRILLED PIERS SPECIAL PROVISION.

DO NOT DEWATER THE DRILLED PIER EXCAVATIONS AT BENTS No. 1 AND No. 2. CLEAN THE BOTTOM OF THE EXCAVATIONS WITH A SUBMERSIBLE PUMP OR AN AIRLIFT. WET PLACEMENT OF CONCRETE IS REQUIRED. SEE DRILLED PIERS SPECIAL PROVISION.

DO NOT USE SLURRY CONSTRUCTION FOR DRILLED PIERS AT BENT No. 1 AND No. 2.

SID INSPECTIONS MAYBE REQUIRED TO INSPECT THE BOTTOM CLEANLINESS OF THE DRILLED PIERS AT BENT No. 1 AND No. 2. SEE DRILLED PIERS SPECIAL PROVISION.

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.

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

6/9/06

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

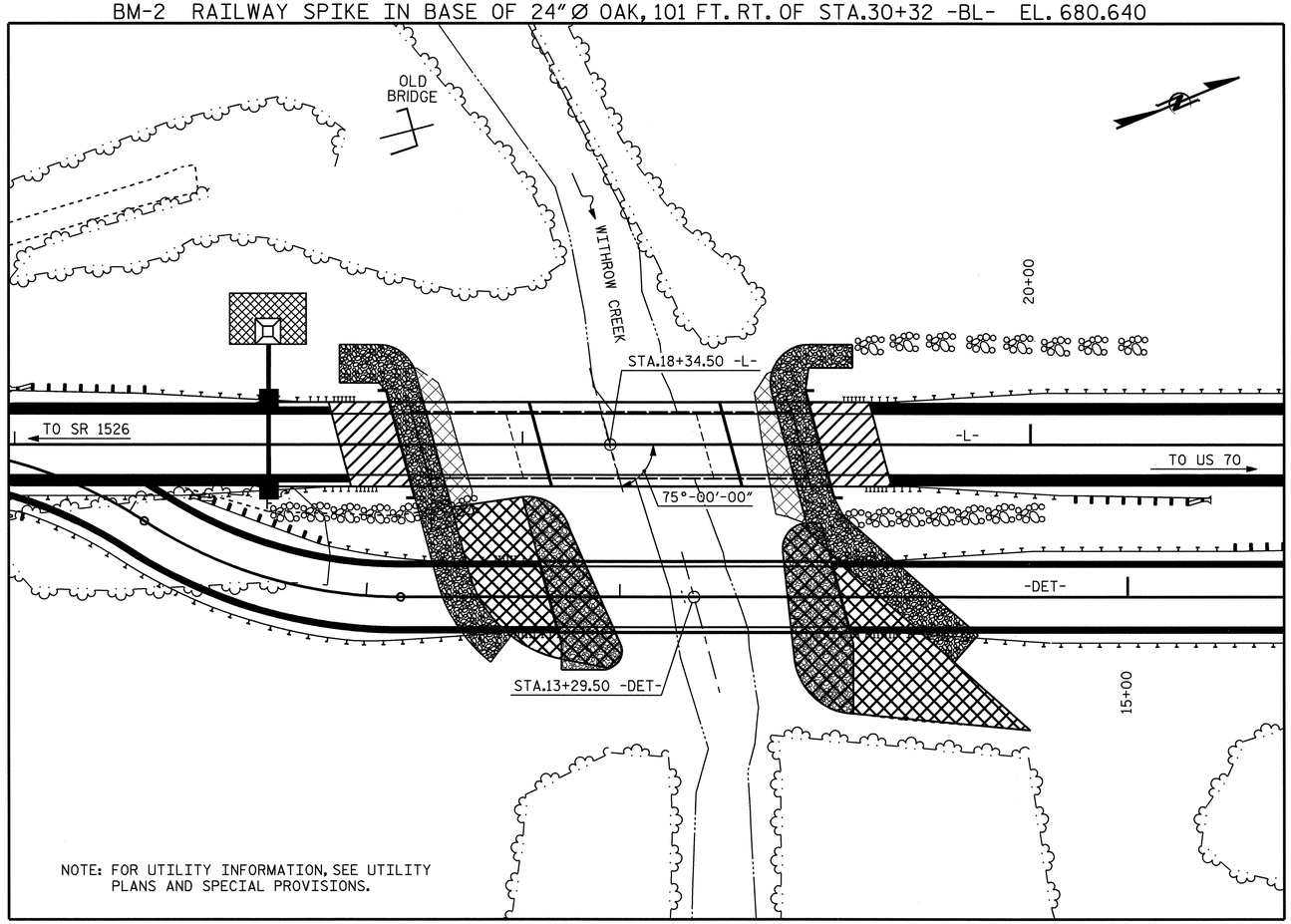
GENERAL DRAWING
FOR BRIDGE OVER
WITHROW CREEK ON
NC 801 BETWEEN
SR 1526 AND US 70

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

DRAWN BY : KEITH D. LAYNE DATE : 10-07-05
CHECKED BY : VIPUL A. PATEL DATE : 11-16-05

09-JUN-2006 14:27
R:\Structures\b4255\Final Plans\B4255_sd_gd_01.dgn
klayne

BM-2 RAILWAY SPIKE IN BASE OF 24"Ø OAK, 101 FT. RT. OF STA.30+32 -BL- EL. 680.640



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

LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING.

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

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

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

THE EXISTING STRUCTURE CONSISTING OF 4 SPANS (1 @ 37'-9", 2 @ 37'-6",& 1 @ 37'-9") AND HAS A REINFORCED CONCRETE DECK ON 4 LINES OF I-BEAMS WITH A CLEAR ROADWAY WIDTH OF 24.0' ON REINFORCED CONCRETE CAPS AND TIMBER PILES AT BENTS 1 AND 3 AND END BENTS POST AND BEAM AT BENT 2 AND LOCATED AT THE PROPOSED STRUCTURE SITE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STATION 18+34.50 -L- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 30 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THE ESTIMATED QUANTITY IS LESS THAN 500 CUBIC YARDS. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", NOVEMBER, 1995.

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

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

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

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN, AND AFTERWARDS REMOVE A TEMPORARY ACCESS AT STATION 18+34.50 -L- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS.

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 18+34.50 -L-.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMP. STRUCTURE	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMP. ACCESS	REMOVAL OF EXISTING STRUCTURE	3'-6" DIA. DRILLED PIERS IN SOIL	3'-6" DIA. DRILLED PIERS NOT IN SOIL	SID INSPECTION	SPT TESTING	CROSSHOLE SONIC LOGGING	UNCLASSIFIED STRUCTURE EXCAVATION	CONCRETE WEARING SURFACE	GROOVING BRIDGE FLOORS
	LUMP SUM	LUMP SUM	LUMP SUM	LIN FT.	LIN FT.	EACH	EACH	EACH	LUMP SUM	SQ. FT.	SQ. FT.
SUPERSTRUCTURE										5458.00	6361
END BENT #1											
BENT #1				44.4	11.0	2	2	1			
BENT #2				31.0	11.0	2	2	1			
END BENT #2											
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	75.4	22.0	4	4	2	LUMP SUM	5458.00	6361

	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	HP 12 X 53 STEEL PILES		TWO BAR METAL RAIL	1'-2" x 2'-11½" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS	3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAMS	
	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE		LUMP SUM					309.68	325.34			LUMP SUM	LUMP SUM	36	1,948.94
END BENT #1	18.5		3,133		10	250			325	361				
BENT #1	32.8		9,466	1,437										
BENT #2	34.0		8,958	1,232										
END BENT #2	19.1		3,094		8	240			400	444				
TOTAL	104.4	LUMP SUM	24,651	2,669	18	490	309.68	325.34	725	805	LUMP SUM	LUMP SUM	36	1,948.94

HYDRAULIC DATA

DESIGN DISCHARGE	6,800 CFS
FREQUENCY OF DESIGN FLOOD	50 YRS
DESIGN HIGH WATER ELEVATION	675.200
DRAINAGE AREA	45.1 SQ.MI.
BASIC DISCHARGE (Q100)	8,100 CFS
BASIC HIGH WATER ELEVATION	676.000

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	18,400 CFS
FREQUENCY OF OVERTOPPING FLOOD	500+ YRS
OVERTOPPING FLOOD ELEVATION	680.800

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
6/9/06

PROJECT NO. B-4255
ROWAN COUNTY
STATION: 18+34.50 -L-

SHEET 3 OF 3

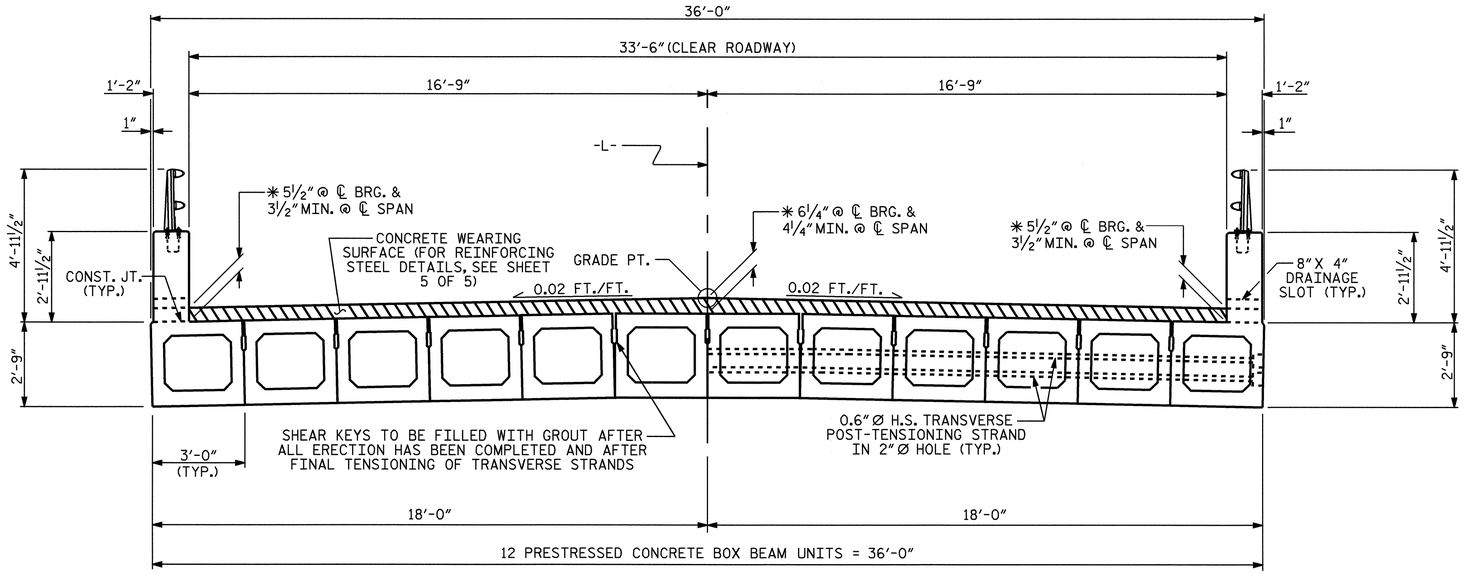
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOR BRIDGE OVER WITHROW CREEK ON NC 801 BETWEEN SR 1526 & US 70

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

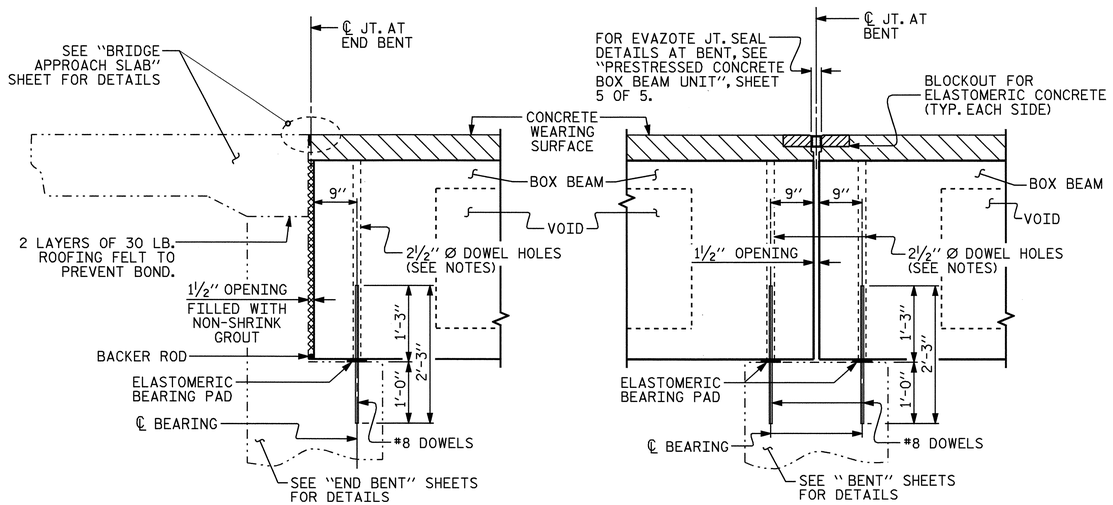
DRAWN BY : KEITH D. LAYNE DATE : 10-11-05
CHECKED BY : VIPUL A. PATEL DATE : 11-16-05

09-JUN-2006 14:27
R:\Structures\b4255\Final Plans\B4255_sd_gd_01.dgn
klayne



TYPICAL SECTION

* BASED ON PREDICTED CAMBER & THEORETICAL GRADE LINE ELEVATIONS.



SECTION AT END BENT

SECTION AT BENT

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 SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.

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

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

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 UNTIL THE CONCRETE HAS REACHED RELEASE STRENGTH. AT LEAST THREE WEEKS PRIOR TO CASTING BOX BEAMS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS AND CONCRETE WEARING SURFACE 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 EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 3 3/16" AT ALL BENTS.

PLACEMENT OF THE CONCRETE WEARING SURFACE SHALL OCCUR AFTER CASTING THE CONCRETE PARAPET. THE COST OF THE #3 BARS CAST WITH THE CONCRETE WEARING SURFACE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONCRETE WEARING SURFACE. FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.

THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

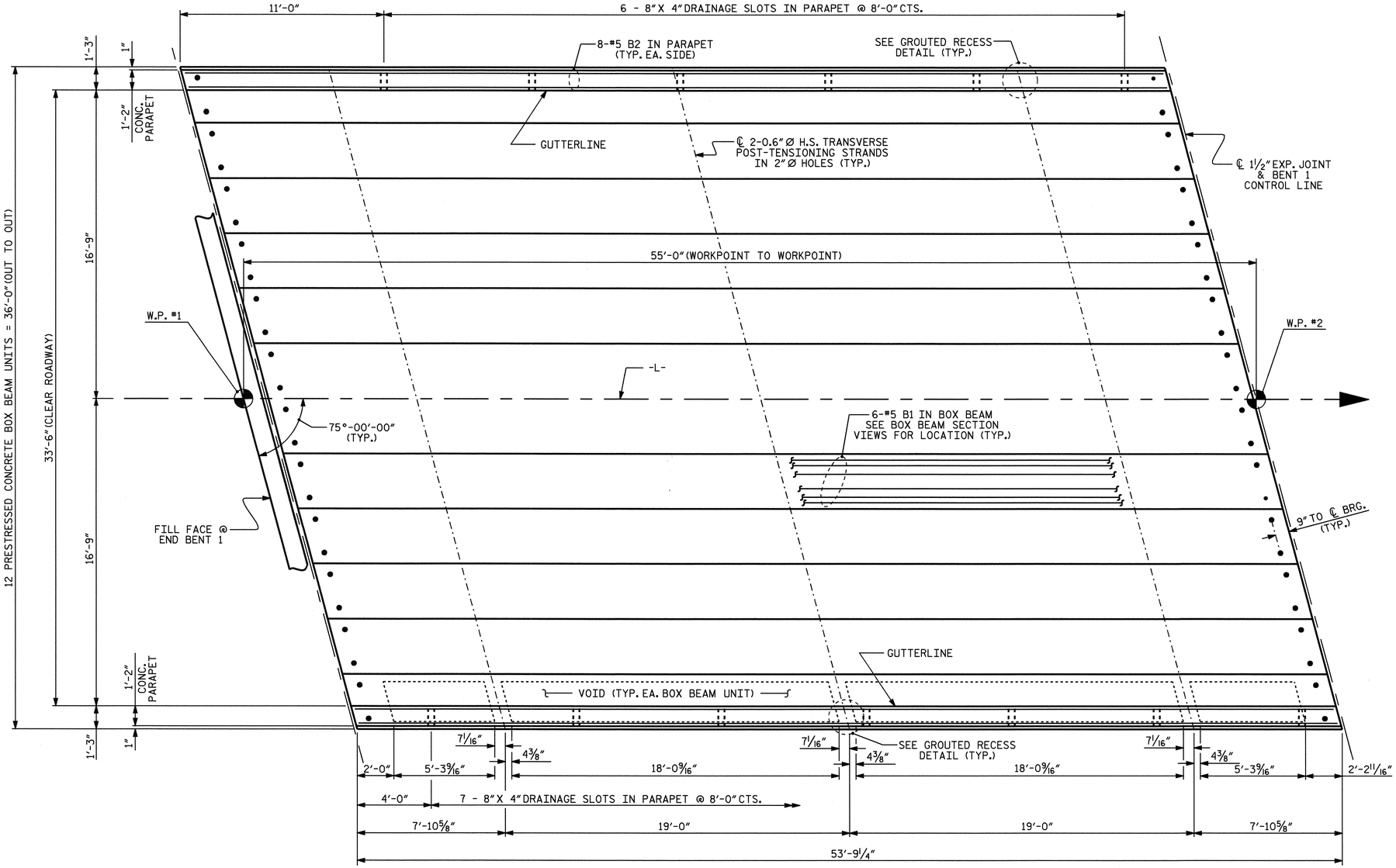
3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAM UNIT

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIRUL A. PATEL
6/9/06

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

ASSEMBLED BY : M.K. BEARD DATE : 11/17/05
CHECKED BY : S.H. SOCKWELL DATE : 12/05

09-JUN-2006 14:28
R:\Structures\b4255\Final Plans\B-4255_sd_SS_01.dgn
klayne



PLAN OF SPAN A

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

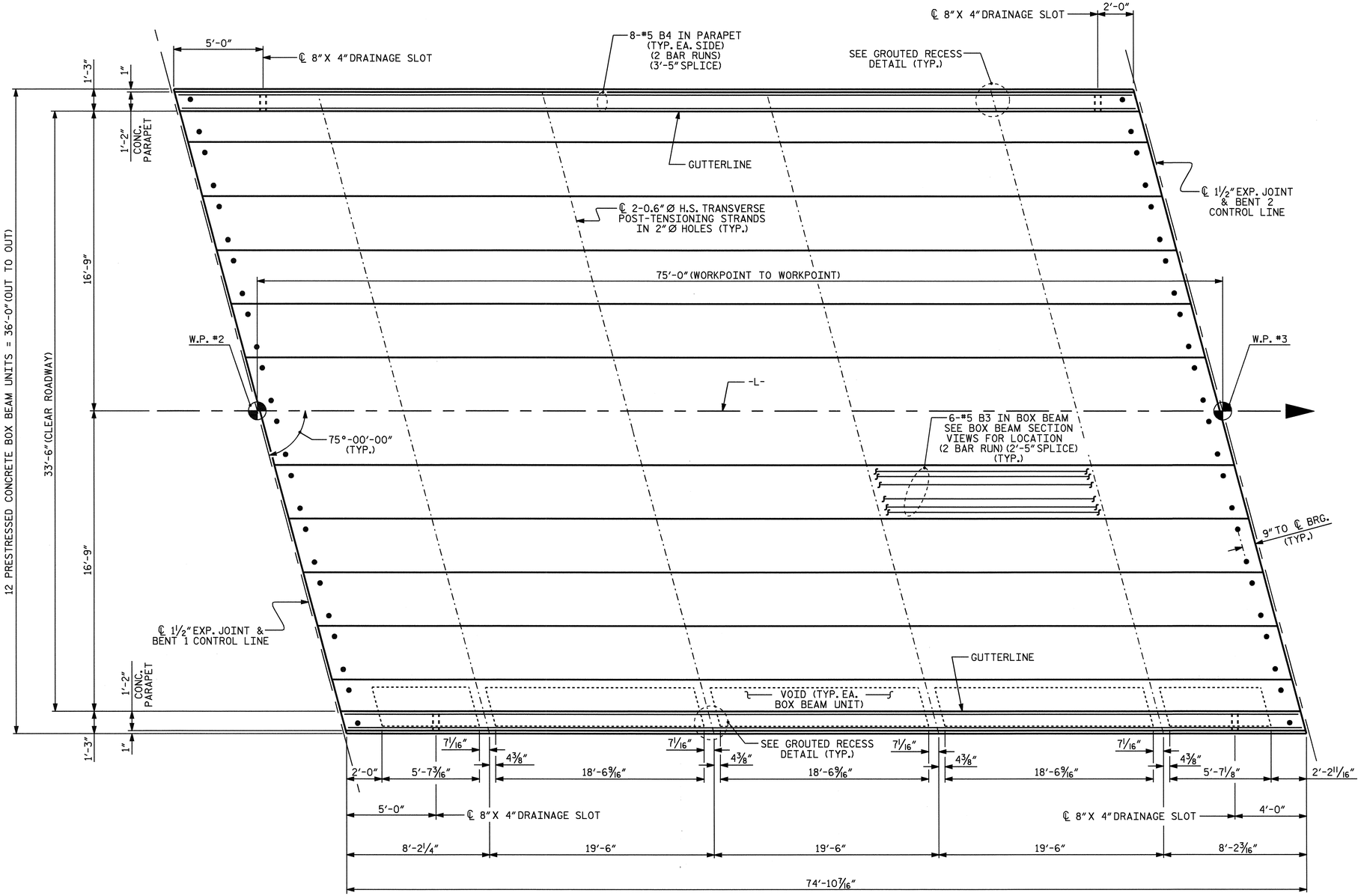
PLAN OF SPAN A

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
6/9/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : M.K. BEARD DATE : 4/27/05
CHECKED BY : S.H. SOCKWELL DATE : 12/05

09-JUN-2006 14:28
R:\Structures\B4255\Final Plans\B-4255_sd_SS_01.dgn
klayne



PLAN OF SPAN B

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

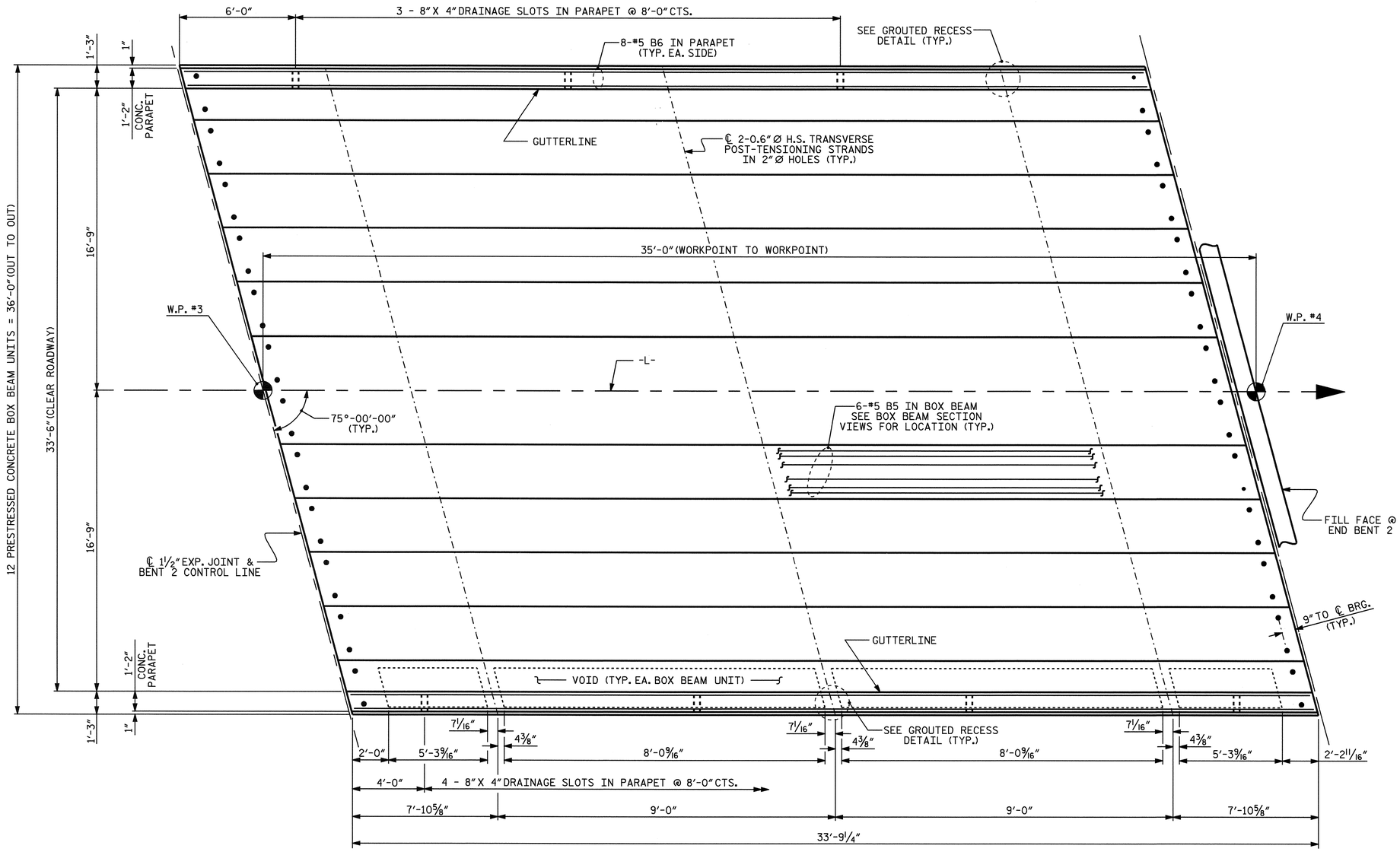
PLAN OF SPAN B

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
6/9/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : M.K. BEARD DATE : 4/27/05
CHECKED BY : S.H. SOCKWELL DATE : 12/05

09-JUN-2006 14:28
R:\Structures\b4255\Final Plans\B-4255_sd_SS_01.dgn
klayne



PLAN OF SPAN C

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN C

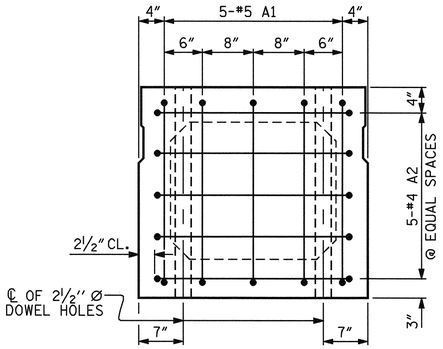
NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIRUL A. PATEL

6/9/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			30

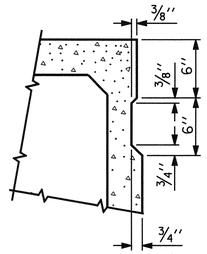
DRAWN BY : M.K. BEARD DATE : 4/28/05
CHECKED BY : S.H. SOCKWELL DATE : 12/05

09-JUN-2006 14:28
R:\Structures\b4255\Final Plans\B-4255_sd_SS_01.dgn
klayne



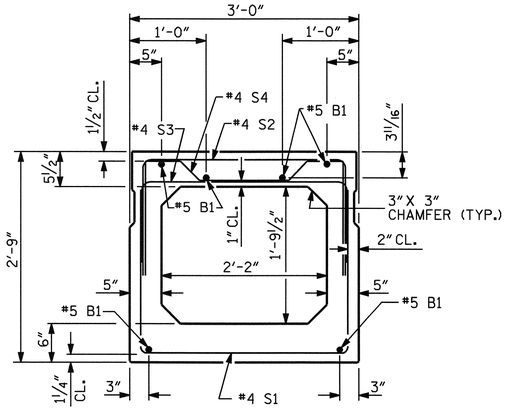
END ELEVATION

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.)



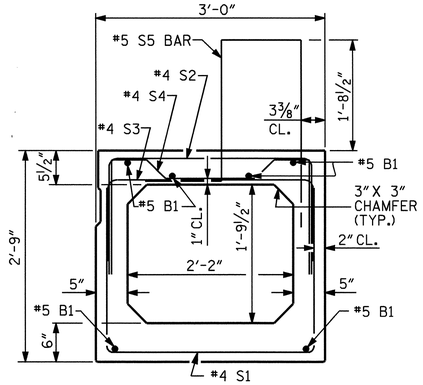
SHEAR KEY DETAIL

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



INTERIOR BOX BEAM SECTION

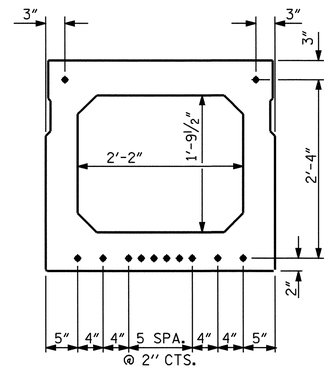
(STRAND LAYOUT NOT SHOWN)



EXTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)

0.6" Ø LOW RELAXATION STRAND LAYOUT



TYPICAL STRAND LOCATION

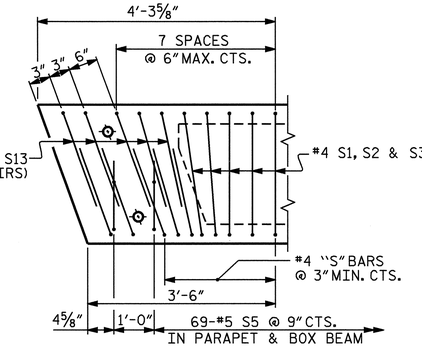
(12 STRANDS REQUIRED)

(INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION)

DEBONDING LEGEND

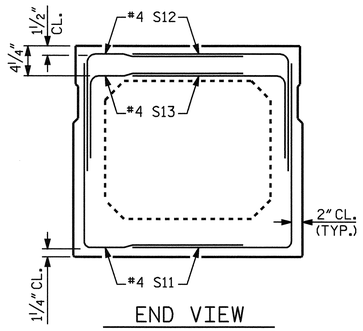
● FULLY BONDED STRANDS

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



DETAIL "B"

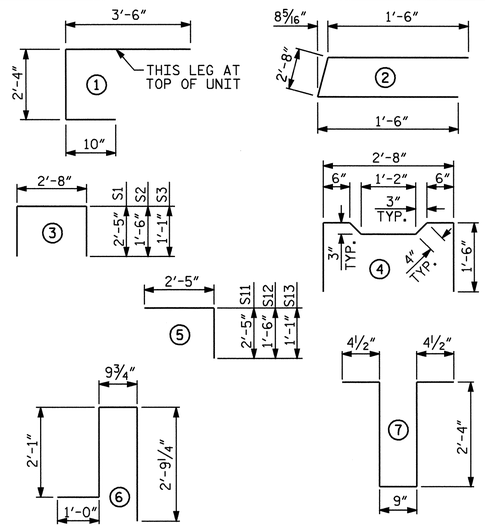
EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS. "B" BARS AND "A" BARS NOT SHOWN.



END VIEW

(SHOWING #4 "S" BARS IN END OF BEAM)

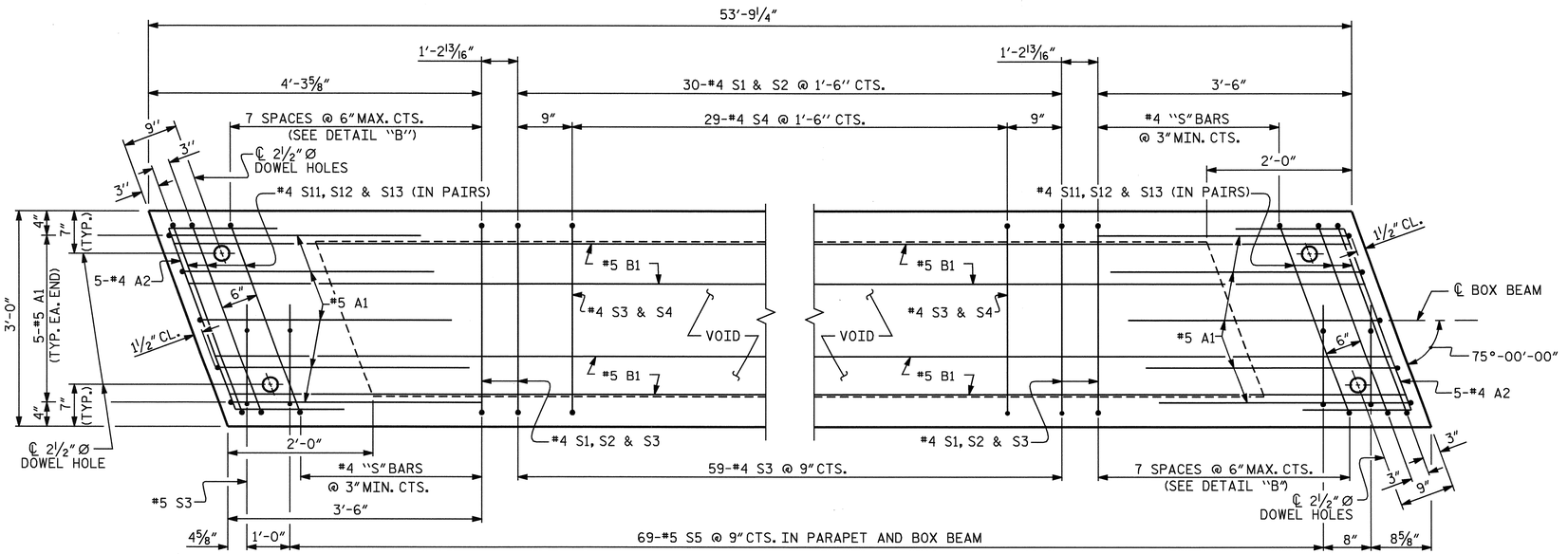
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE BOX BEAM SECTION

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	1	6'-8"	70	6'-8"	70
A2	28	#4	2	5'-8"	106	5'-8"	106
B1	6	#5	STR	53'-5"	334	53'-5"	334
K1	9	#4	7	6'-2"	37	6'-2"	37
K2	6	#4	STR	2'-8"	11	2'-8"	11
S1	40	#4	3	7'-6"	200	7'-6"	200
S2	40	#4	3	5'-8"	151	5'-8"	151
S3	69	#4	3	4'-10"	223	4'-10"	223
S4	29	#4	4	5'-10"	113	5'-10"	113
S11	20	#4	5	4'-10"	65	4'-10"	65
S12	20	#4	5	3'-11"	52	3'-11"	52
S13	20	#4	5	3'-6"	47	3'-6"	47
✳ S5	71	#5	6	6'-8"	494	--	--
REINFORCING STEEL					1409 LBS.		1409 LBS.
✳ EPOXY COATED REINF. STEEL					494 LBS.		
5000 P.S.I. CONCRETE					9.8 CU. YDS.		9.7 CU. YDS.
0.6" Ø L.R. STRANDS					No. 12		No. 12



PLAN OF BOX BEAM

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS.
FOR LOCATION OF DIAPHRAGMS, SEE PLAN OF SPANS.
FOR REINFORCING STEEL IN DIAPHRAGMS, SEE DIAPHRAGM DETAILS.

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
3'-0" X 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT

SPAN "A"

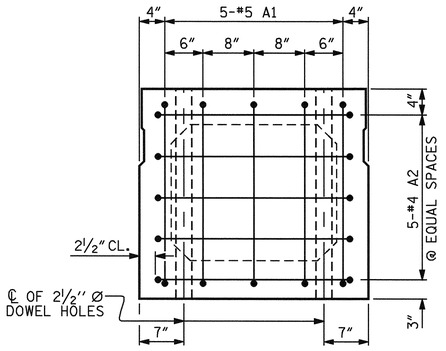
NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
6/7/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			30

ASSEMBLED BY : M.K. BEARD	DATE : 05/06/05
CHECKED BY : S.H. SOCKWELL	DATE : 12/05
DRAWN BY : TLA 5/05	ADDED 7/11/05
CHECKED BY : GM 6/05	

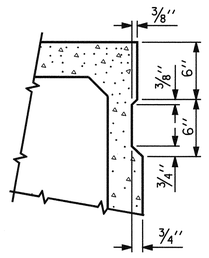
09-JUN-2006 14:28
R:\Structures\b4255\Final Plans\B-4255_sd_SS_01.dgn
klayne

STD. NO. PCBB4



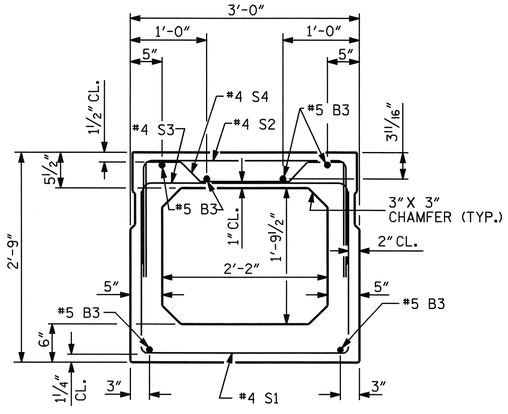
END ELEVATION

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.)



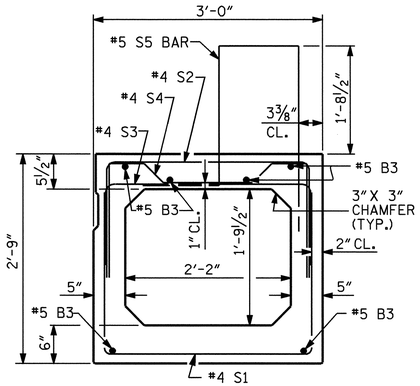
SHEAR KEY DETAIL

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



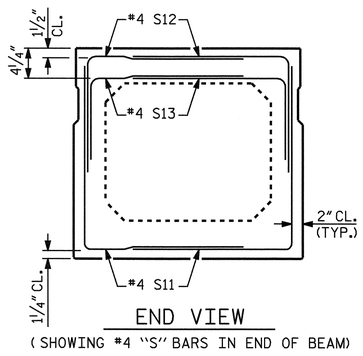
INTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)



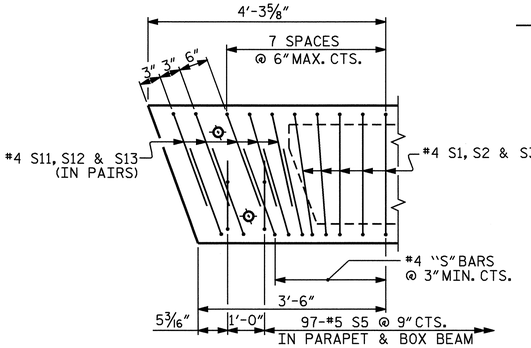
EXTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)



END VIEW

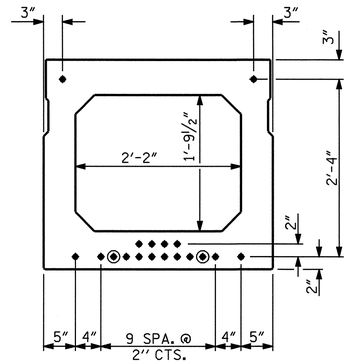
(SHOWING #4 "S" BARS IN END OF BEAM)



DETAIL "B"

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS. "B" BARS AND "A" BARS NOT SHOWN.

0.6" Ø LOW RELAXATION STRAND LAYOUT



TYPICAL STRAND LOCATION

(18 STRANDS REQUIRED)

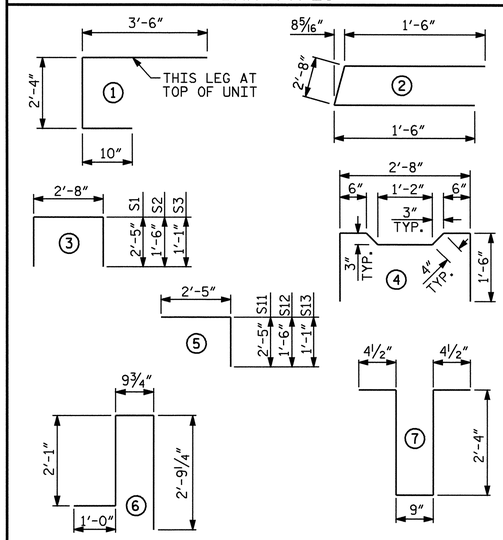
(INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION)

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ◉ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.

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

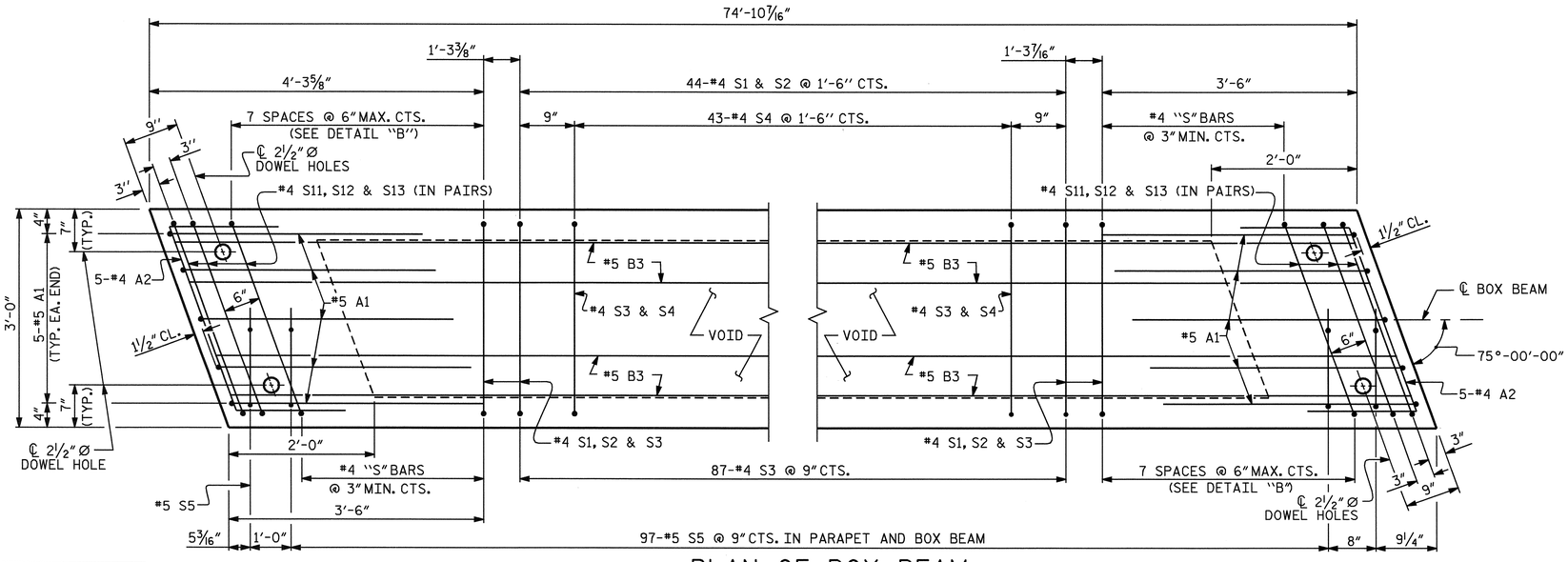
BAR TYPES



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	6'-8"	70	6'-8"	70
A2	34	#4	2	5'-8"	129	5'-8"	129
B3	12	#5	STR	38'-6"	482	38'-6"	482
K1	12	#4	7	6'-2"	49	6'-2"	49
K2	8	#4	STR	2'-8"	14	2'-8"	14
S1	54	#4	3	7'-6"	271	7'-6"	271
S2	54	#4	3	5'-8"	204	5'-8"	204
S3	97	#4	3	4'-10"	313	4'-10"	313
S4	43	#4	4	5'-10"	168	5'-10"	168
S11	20	#4	5	4'-10"	65	4'-10"	65
S12	20	#4	5	3'-11"	52	3'-11"	52
S13	20	#4	5	3'-6"	47	3'-6"	47
✳ S5	99	#5	6	6'-8"	688	--	--
REINFORCING STEEL					1864 LBS.		1864 LBS.
✳EPOXY COATED REINF. STEEL					688 LBS.		
5000 P.S.I. CONCRETE					13.4 CU. YDS.		13.3 CU. YDS.
0.6" Ø L.R. STRANDS					No. 18		No. 18



PLAN OF BOX BEAM

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS.
FOR LOCATION OF DIAPHRAGMS, SEE PLAN OF SPANS.
FOR REINFORCING STEEL IN DIAPHRAGMS, SEE DIAPHRAGM DETAILS.

PROJECT NO. B-4255
ROWAN COUNTY
STATION: 18+34.50 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
3'-0" X 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT

SPAN "B"

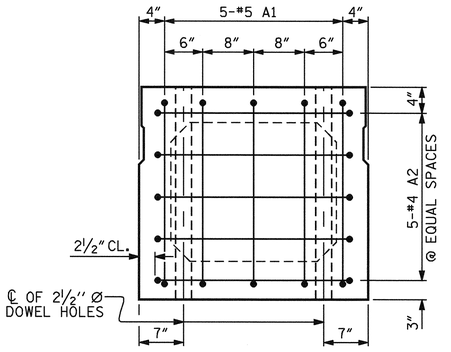
NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
6/9/06

ASSEMBLED BY : M.K. BEARD	DATE : 05/06/05
CHECKED BY : S.H. SOCKWELL	DATE : 12/05
DRAWN BY : TLA 5/05	ADDED 7/11/05
CHECKED BY : GM 6/05	

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			30

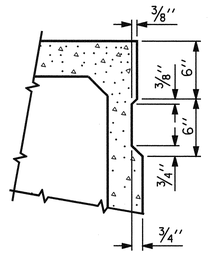
09-JUN-2006 14:28
R:\Structures\b4255\Final Plans\B-4255_sd_SS_01.dgn
klayne

STD. NO. PCBB4



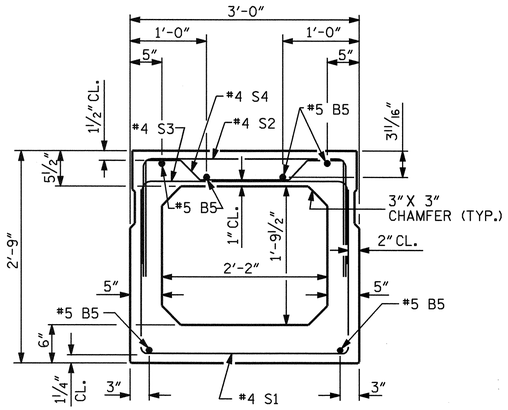
END ELEVATION

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.)



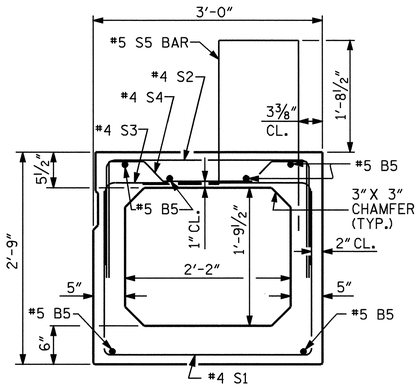
SHEAR KEY DETAIL

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



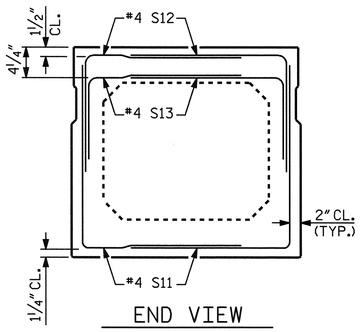
INTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)



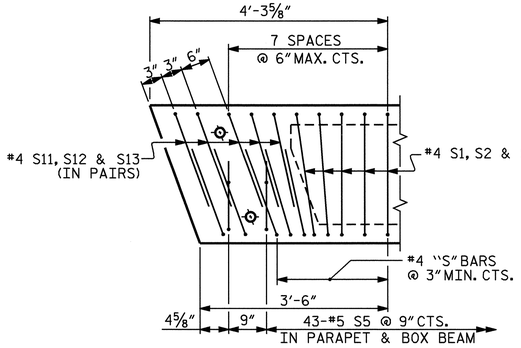
EXTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)



END VIEW

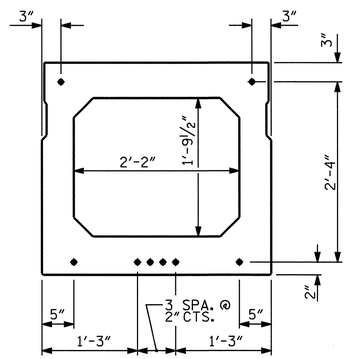
(SHOWING #4 "S" BARS IN END OF BEAM)



DETAIL "B"

EXTERIOR UNIT SHOWN, INTERIOR UNIT
SIMILAR EXCEPT OMIT #5 S5 BARS.
"B" BARS AND "A" BARS NOT SHOWN.

0.6" Ø LOW RELAXATION STRAND LAYOUT



TYPICAL STRAND LOCATION

(8 STRANDS REQUIRED)

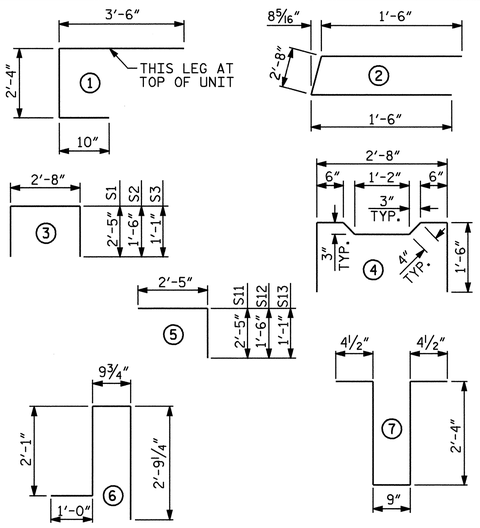
(INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR
SECTION SIMILAR EXCEPT SHEAR KEY LOCATION)

DEBONDING LEGEND

● FULLY BONDED STRANDS

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

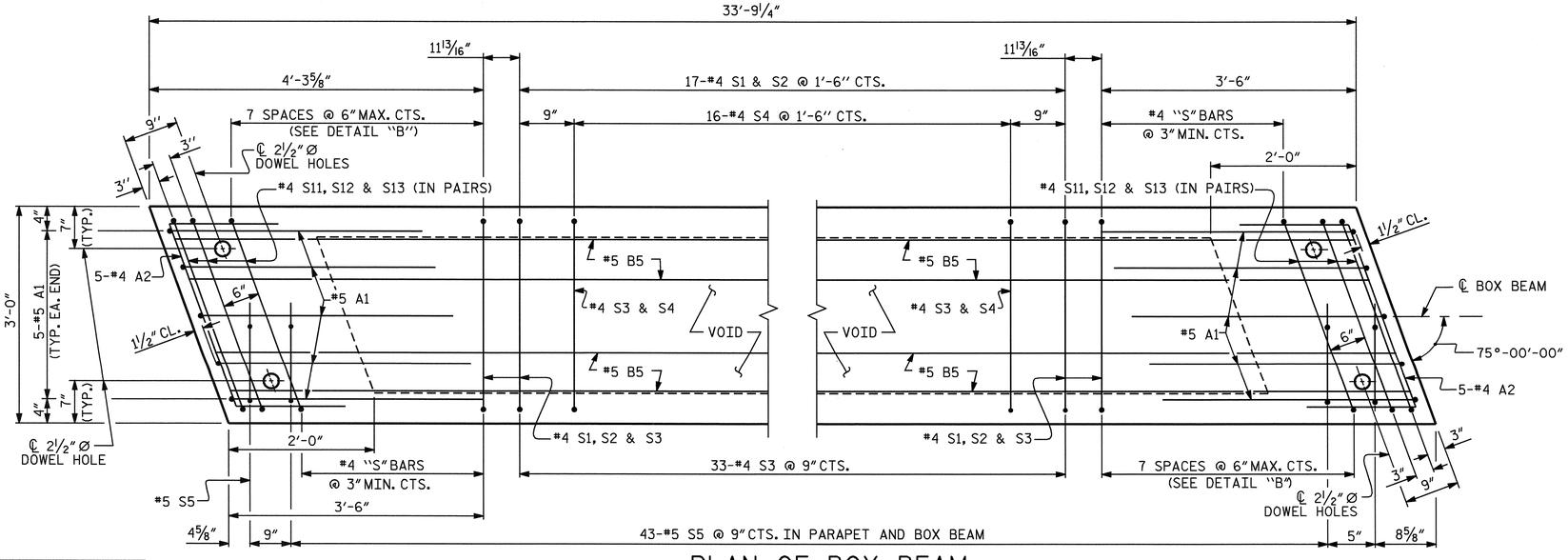
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE BOX BEAM SECTION

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	1	6'-8"	70	6'-8"	70
A2	28	#4	2	5'-8"	106	5'-8"	106
B5	6	#5	STR	33'-5"	209	33'-5"	209
K1	9	#4	7	6'-2"	37	6'-2"	37
K2	6	#4	STR	2'-8"	11	2'-8"	11
S1	27	#4	3	7'-6"	135	7'-6"	135
S2	27	#4	3	5'-8"	102	5'-8"	102
S3	43	#4	3	4'-10"	139	4'-10"	139
S4	16	#4	4	5'-10"	62	5'-10"	62
S11	20	#4	5	4'-10"	65	4'-10"	65
S12	20	#4	5	3'-11"	52	3'-11"	52
S13	20	#4	5	3'-6"	47	3'-6"	47
✳ S5	45	#5	6	6'-8"	313	--	--
REINFORCING STEEL					1035 LBS.		1035 LBS.
✳EPOXY COATED REINF. STEEL					313 LBS.		
5000 P.S.I. CONCRETE					6.5 CU. YDS.		6.4 CU. YDS.
0.6" Ø L.R. STRANDS					No. 8		No. 8



PLAN OF BOX BEAM

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS.
FOR LOCATION OF DIAPHRAGMS, SEE PLAN OF SPANS.
FOR REINFORCING STEEL IN DIAPHRAGMS, SEE DIAPHRAGM DETAILS.

ASSEMBLED BY : M.K. BEARD	DATE : 05/06/05
CHECKED BY : S.H. SOCKWELL	DATE : 12/05
DRAWN BY : TLA 5/05	ADDED 7/11/05
CHECKED BY : GM 6/05	

09-JUN-2006 14:28
R:\Structures\b4255\Final Plans\B-4255_sd_SS_01.dgn
klayne

PROJECT NO. B-4255
ROWAN COUNTY
STATION: 18+34.50 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

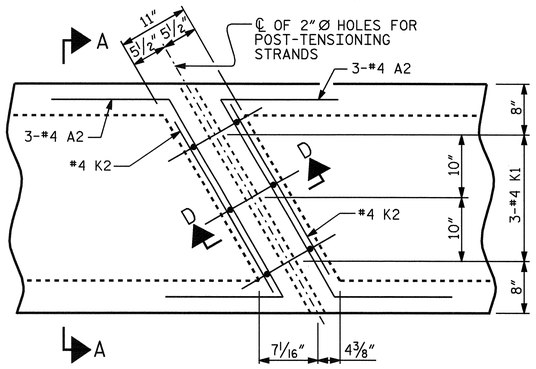
STANDARD
3'-0" X 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT

SPAN "C"

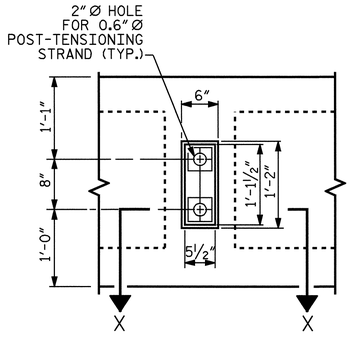
NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER PAUL A. PATE
6/9/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			30

STD. NO. PCBB4

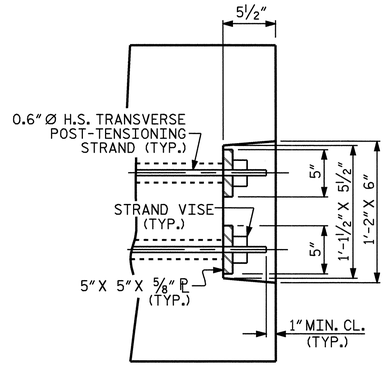


PLAN

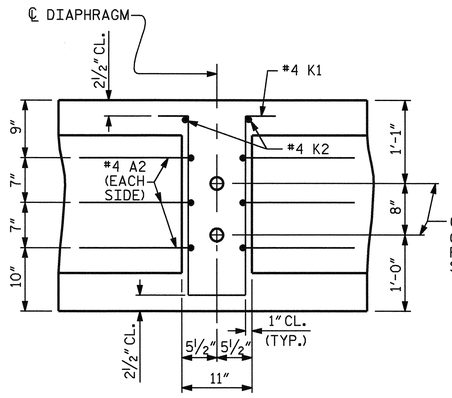


VIEW Y-Y

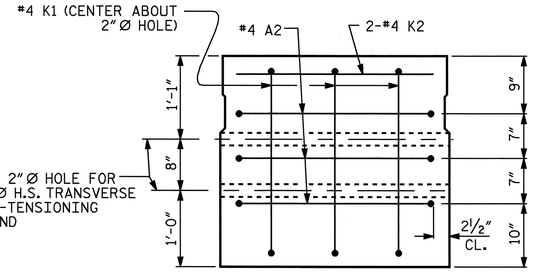
SHOWING ELEVATION VIEW OF GROUTED RECESS



DETAIL "C"

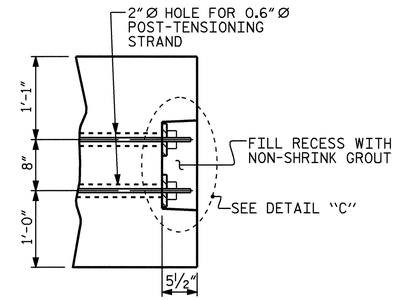


SECTION D-D

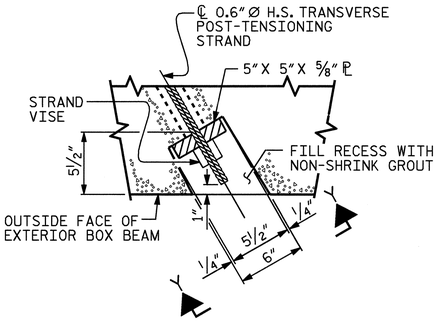


SECTION A-A

VOIDS NOT SHOWN



PART SECTION AT RECESS



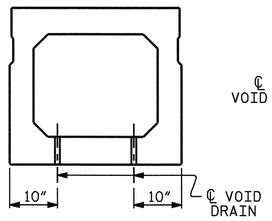
SECTION X-X

SHOWING PLAN VIEW OF GROUTED RECESS

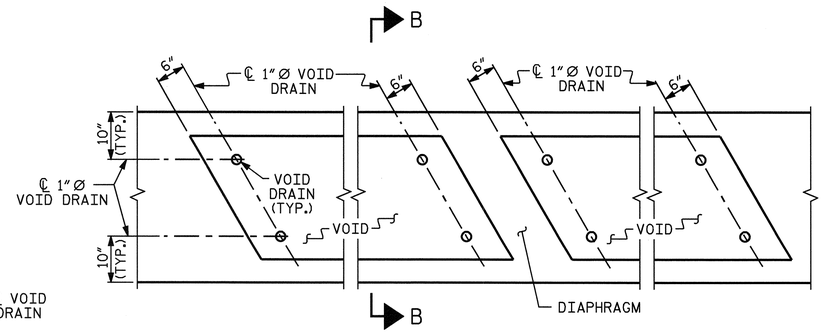
GROUTED RECESS DETAIL AT END OF POST-TENSIONED STRANDS OF EXTERIOR BOX BEAM

DOUBLE DIAPHRAGM DETAILS

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



SECTION B-B



PART PLAN

VOID DRAIN DETAILS

(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)

DEAD LOAD DEFLECTION AND CAMBER			
	3'-0"x 2'-9" 0.6"Ø L.R. STRAND		
	SPAN "A"	SPAN "B"	SPAN "C"
CAMBER (BEAM ALONE IN PLACE) ↑	7/8"	2 1/4"	3/16"
DEFLECTION DUE TO CONCRETE WEARING SURFACE ↓	1/8"	3/8"	0
FINAL CAMBER ↑	3/4"	1 7/8"	3/16"

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

3'-0"X 2'-9" PRESTRESSED CONCRETE BOX BEAM UNIT

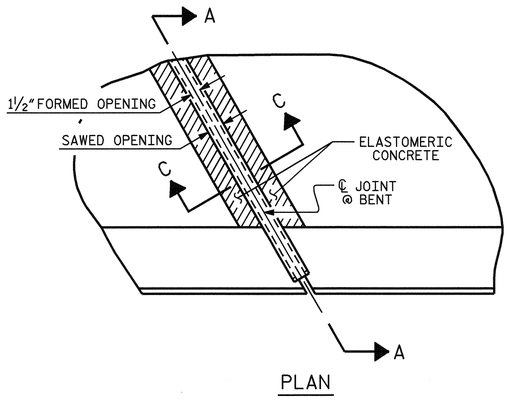
NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
6/9/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			30

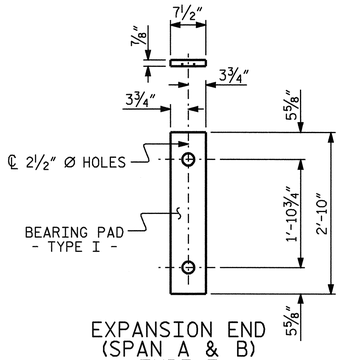
ASSEMBLED BY : M.K.BEARD	DATE : 4/29/05
CHECKED BY : S.H. SOCKWELL	DATE : 12/05
DRAWN BY : TLA 5/05	ADDED 7/11/05
CHECKED BY : GM 6/05	

09-JUN-2006 14:28
R:\Structures\b4255\Final Plans\B-4255_sd_SS_01.dgn
klayne

STD. NO. PCBB5

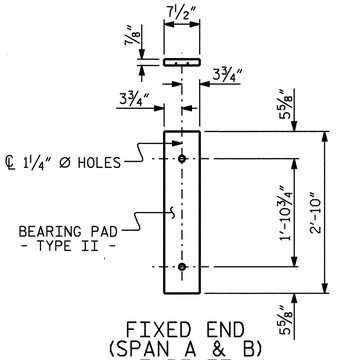


PLAN



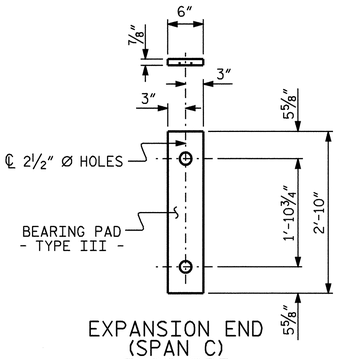
EXPANSION END (SPAN A & B) TYPE I

(24 REQUIRED)



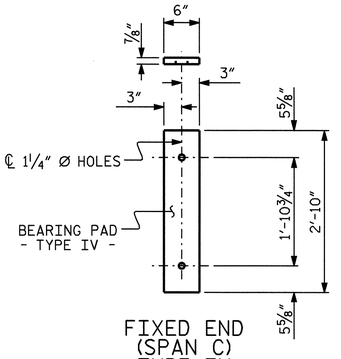
FIXED END (SPAN A & B) TYPE II

(24 REQUIRED)



EXPANSION END (SPAN C) TYPE III

(12 REQUIRED)



FIXED END (SPAN C) TYPE IV

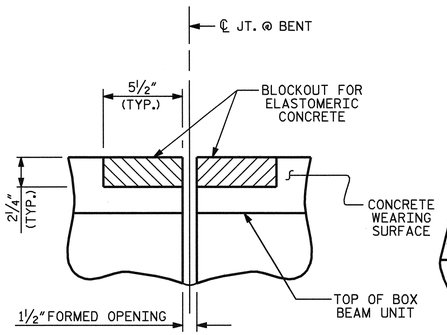
(12 REQUIRED)

BOX BEAM UNITS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
SPAN A			
EXTERIOR	2	53'-9¼"	107'-6½"
INTERIOR	10	53'-9¼"	537'-8½"
SPAN B			
EXTERIOR	2	74'-10⁷⁄₁₆"	149'-8⅞"
INTERIOR	10	74'-10⁷⁄₁₆"	748'-8⅜"
SPAN C			
EXTERIOR	2	33'-9¼"	67'-6½"
INTERIOR	10	33'-9¼"	337'-8½"
TOTAL	36	———	1948'-11¼"

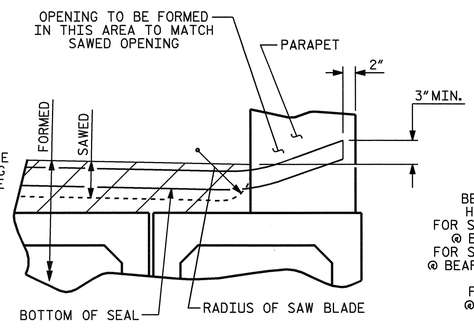
GROOVING BRIDGE FLOORS

APPROACH SLABS	1446.0	SQ.FT.
BRIDGE DECK	4915.0	SQ.FT.
TOTAL	6361.0	SQ.FT.

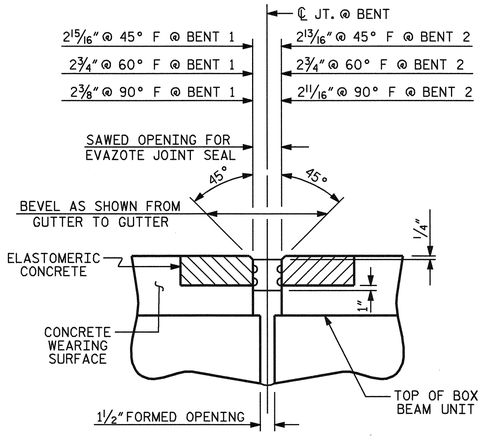


SECTION C-C

EVAZOTE JOINT SEAL (PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)



SECTION A-A



SECTION C-C

EVAZOTE JOINT SEAL

ELASTOMERIC CONCRETE

BENT NO.	ELASTOMERIC CONCRETE (CU. FT.)
1	6.0
2	6.0
TOTAL	12.0

NOTES

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 3⁷⁄₁₆" AT BENT 1 & BENT 2.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

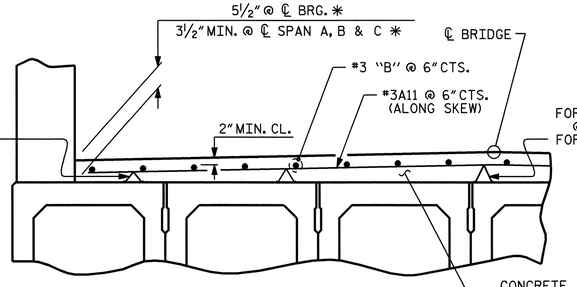
JOINT SEAL DETAILS AT BENT

(SHOWING PARTIAL DEPTH BLOCKOUT)

ELASTOMERIC BEARING DETAILS

60 DUROMETER

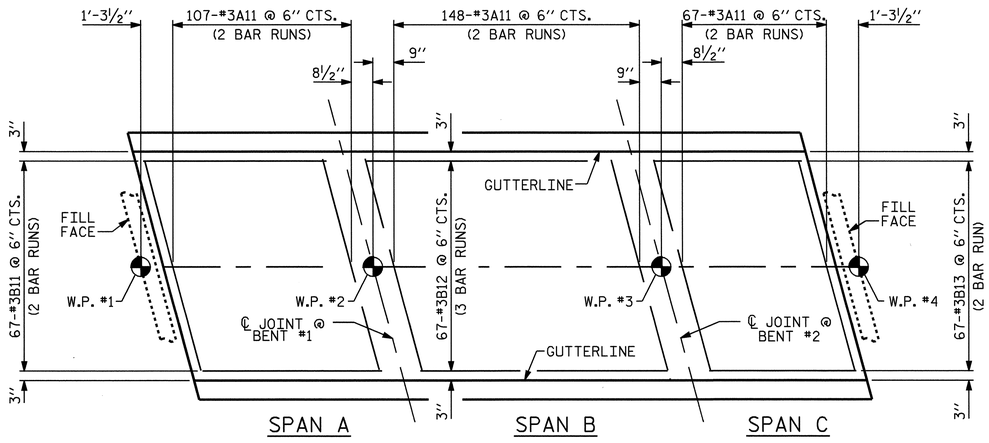
BEAM BOLSTER OR CONTINUOUS HIGH CHAIR @ 2'-0" CENTERS. FOR SPAN A HEIGHTS VARY FROM 2½" @ BEARINGS TO 1¾" @ MID-SPAN. FOR SPAN B HEIGHTS VARY FROM 2½" @ BEARINGS TO 1" @ 7'-0" TO LEFT AND RIGHT OF MID-SPAN. FOR SPAN C HEIGHT IS 2½" @ BEARINGS AND @ MID-SPAN. (SHOWN NEAR GUTTERLINE)



BEAM BOLSTER OR CONTINUOUS HIGH CHAIR @ 2'-0" CENTERS. FOR SPAN A HEIGHTS VARY FROM 3¼" @ BEARINGS TO 2½" @ MID-SPAN. FOR SPAN B HEIGHTS VARY FROM 3¼" @ BEARINGS TO 1½" MID-SPAN. FOR SPAN C HEIGHT IS 3¼" @ BEARINGS AND @ MID-SPAN. (SHOWN NEAR ℄ BRIDGE)

REINFORCING FOR CONCRETE WEARING SURFACE

*BASED ON PREDICTED CAMBER & THEORETICAL GRADE LINE ELEVATIONS.



PLAN OF REINFORCING STEEL FOR CONCRETE WEARING SURFACE

SPLICE LENGTH CHART

BAR SIZE	EPOXY COATED
#3	1'-3"

BILL OF MATERIAL CONCRETE WEARING SURFACE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A11	644	#3	STR	17'-10"	4318
*B11	134	#3	STR	27'-3"	1373
*B12	201	#3	STR	25'-5"	1921
*B13	134	#3	STR	17'-2"	865
* EPOXY COATED REINFORCING STEEL					8477 LBS.
CONCRETE WEARING SURFACE (APPROX. CLASS AA CONCRETE					5458 SQ. FT. 90.0 CU. YDS.)

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL 6/12/06

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAM UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			30

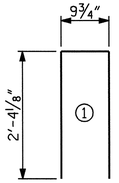
ASSEMBLED BY : M.K. BEARD/JPA DATE :05/06/05
CHECKED BY : S.H. SOCKWELL DATE : 12/05

DRAWN BY : TLA 3/05 | ADDED
CHECKED BY :

12-JUN-2006 10:23
R:\STRUCTØ1\b4255\FINALPØ1\B-4255Ø1.DGN
kbeard

STD. NO. PCBB8

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

PARAPETS & FOUR END POSTS

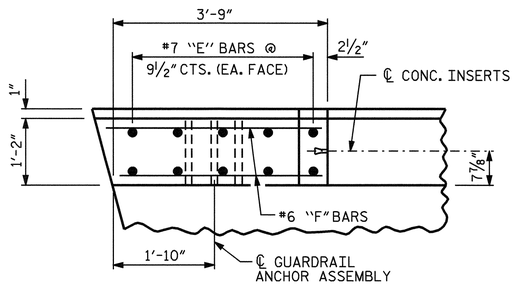
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B2	16	#5	STR	53'-5"	891
✳B4	32	#5	STR	39'-0"	1302
✳B6	16	#5	STR	33'-5"	558
✳E1	8	#7	STR	3'-2"	52
✳E2	8	#7	STR	3'-7"	59
✳E3	8	#7	STR	3'-11"	64
✳E4	8	#7	STR	4'-5"	72
✳E5	8	#7	STR	4'-9"	78
✳F1	8	#6	STR	2'-2"	26
✳F2	4	#6	STR	3'-5"	21
✳F3	8	#6	STR	3'-7"	43
✳F4	4	#6	STR	3'-10"	23
✳S6	430	#5	1	5'-6"	2467

✳EPOXY COATED REINF. STEEL = 5656 LBS.

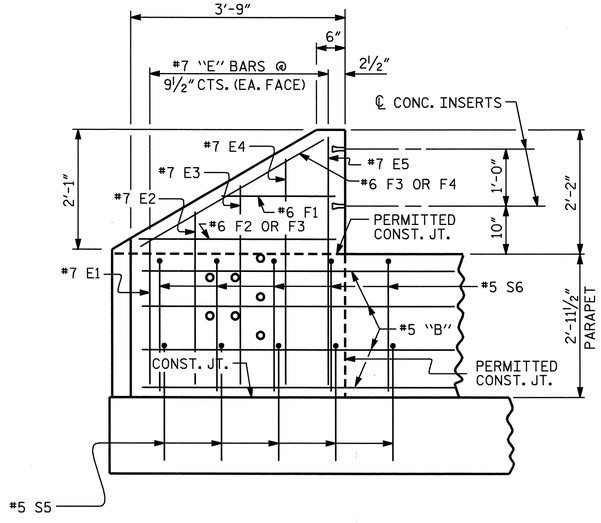
CLASS "AA" CONCRETE 42.4 C.Y.

1'-2" X 2'-11½" CONCRETE PARAPET 325.34 L.F.

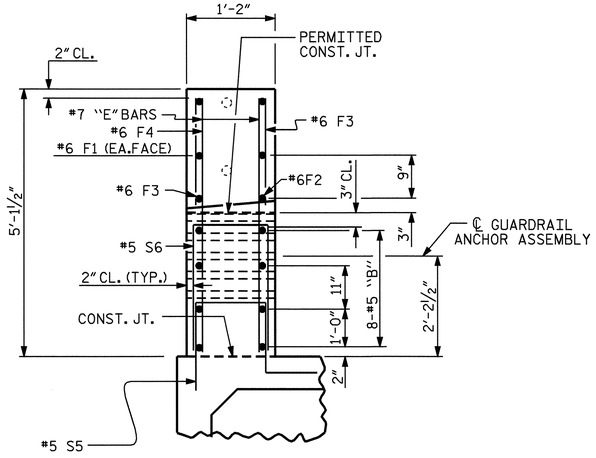
✳THESE BARS ARE EPOXY COATED



PLAN OF END POST



ELEVATION



END VIEW

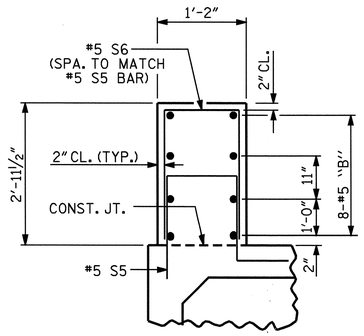
NOTES

ALL REINFORCING STEEL IN PARAPET SHALL BE EPOXY COATED.

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

REINFORCING STEEL IN THE PARAPET MAY BE SHIFTED OR FIELD CUT TO CLEAR 8"X 4"DRAINAGE SLOTS.

PARAPET AND END POST FOR TWO BAR RAIL



SECTION THRU PARAPET

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE PARAPET AND RAIL END POST DETAILS

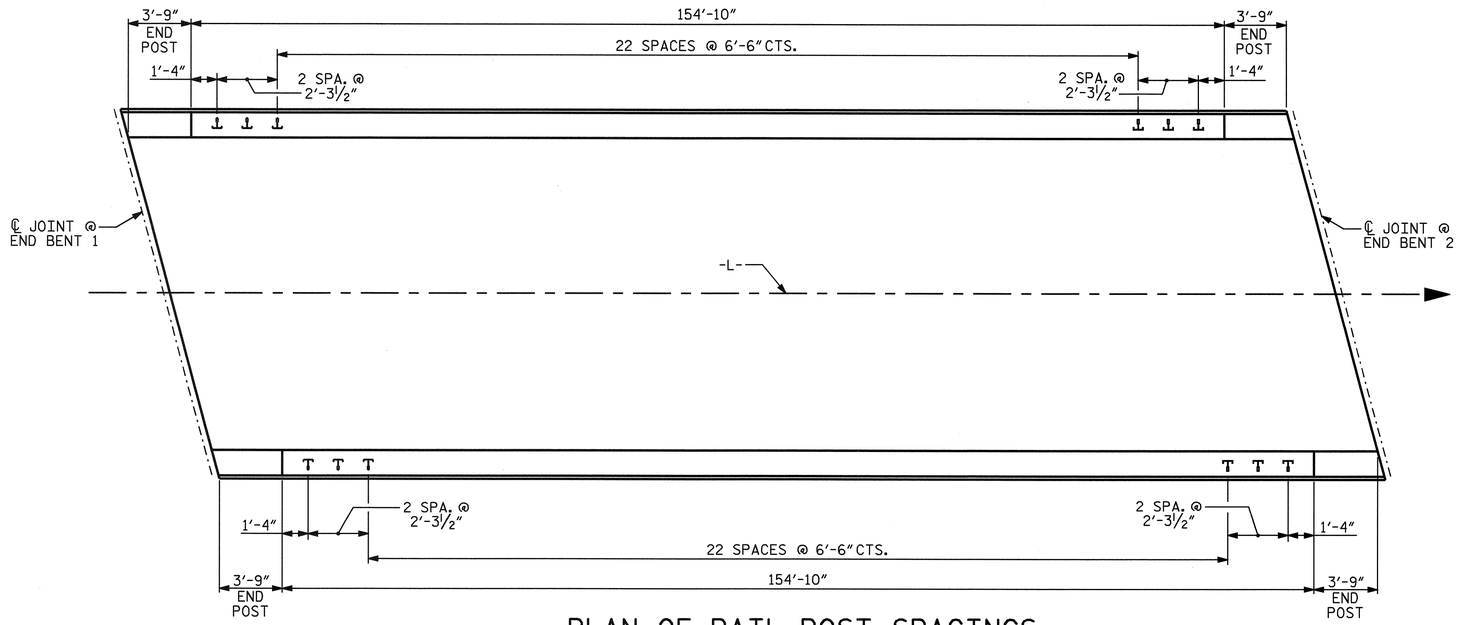
FOR TWO BAR METAL RAILS

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
6/12/06

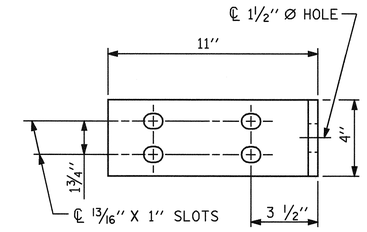
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : M.K. BEARD DATE : 11/22/05
CHECKED BY : S.H. SOCKWELL DATE : 12/05

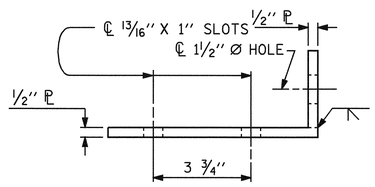
12-JUN-2006 09:36
R:\STRUCTØ1\B4255\FINALPØ1\B-4255Ø1.DGN
kbeard



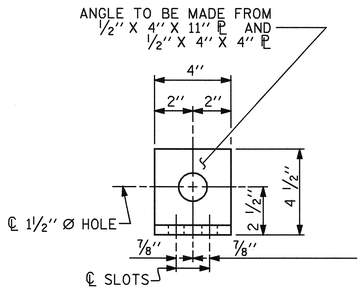
PLAN OF RAIL POST SPACINGS



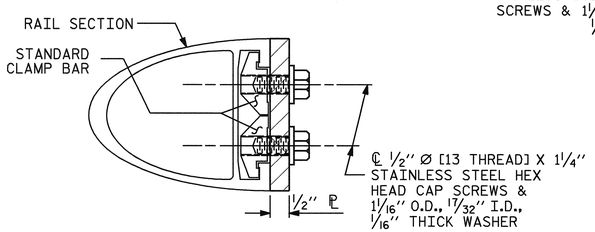
ELEVATION



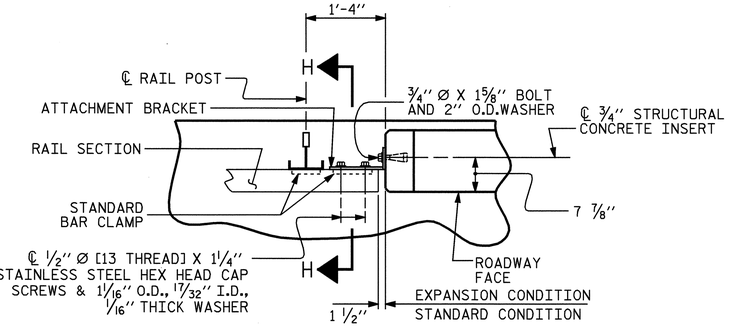
TOP VIEW



END VIEW



SECTION H-H



PLAN - RAIL AND END POST

DETAILS FOR ATTACHING METAL RAIL TO END POST

NOTES

STRUCTURAL CONCRETE INSERT

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

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

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

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

NOTES

METAL RAIL TO END POST CONNECTION

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

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

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

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

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

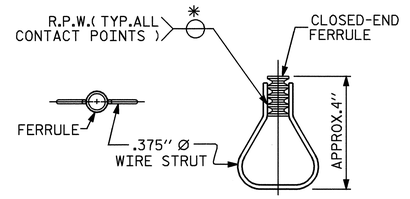
E. ½" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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

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

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

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



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

NORTH CAROLINA PROFESSIONAL SEAL 23376 ENGINEER VIPUL A. PATEL
6/9/06

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

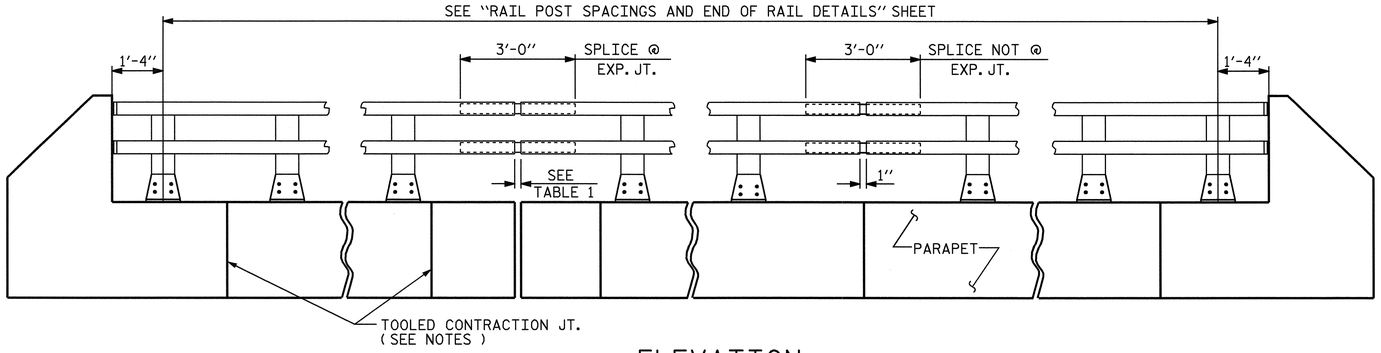
RAIL POST SPACINGS AND END OF RAIL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			30

ASSEMBLED BY : M.K. BEARD	DATE : 11/22/05	
CHECKED BY : S.H. SOCKWELL	DATE : 12/05	
DRAWN BY : FCJ 1/88	REV. 8/16/99	RWW/LES
CHECKED BY : CRK 3/89	REV. 10/17/00	LES/RDR
	REV. 5/7/03	RWW/JTE

09-JUN-2006 14:28
R:\Structures\b4255\Final Plans\B-4255_sd_SS_01.dgn
klayne

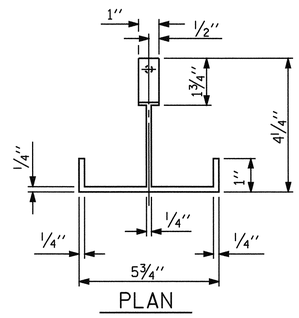
STD. NO. BMR2



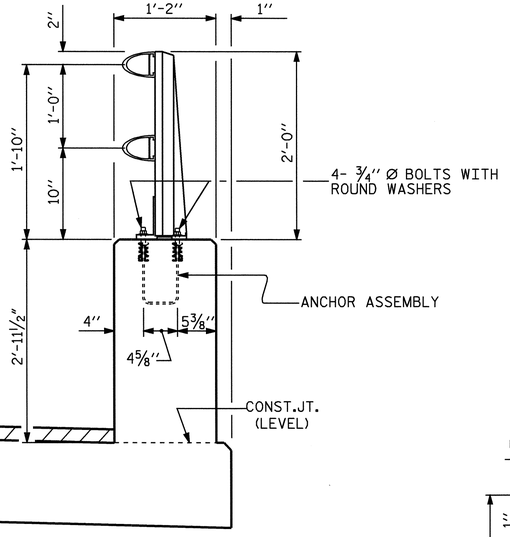
ELEVATION

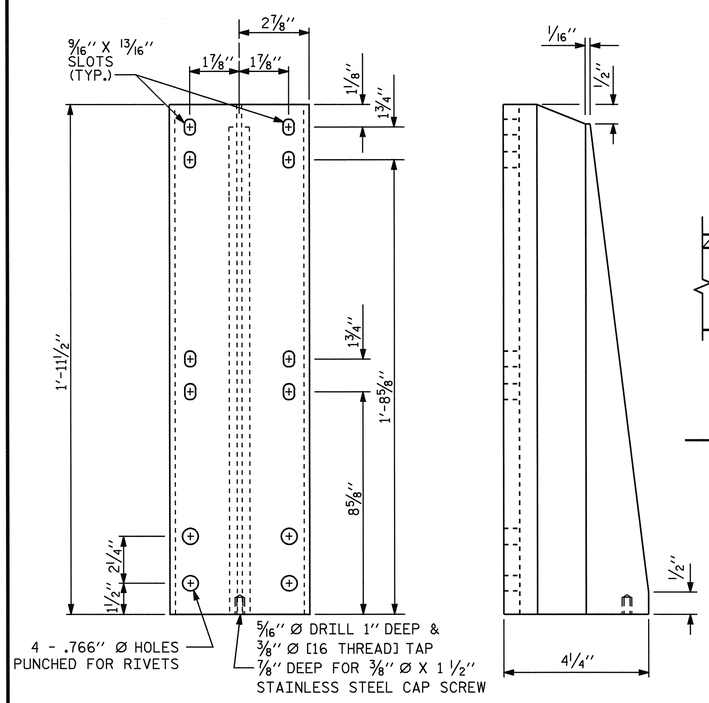
NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.

TABLE 1	
℄ EXP. JT. @	RAIL OPENING
BENT No. 1	1½"
BENT No. 2	1½"



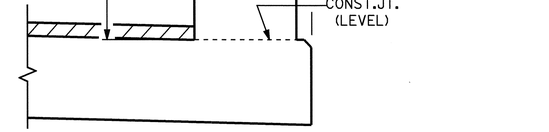
PLAN



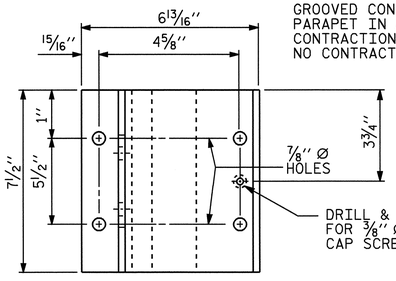


FRONT ELEVATION SIDE ELEVATION

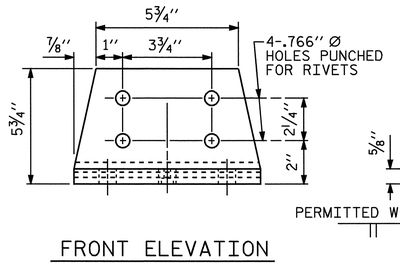
DETAILS OF POST



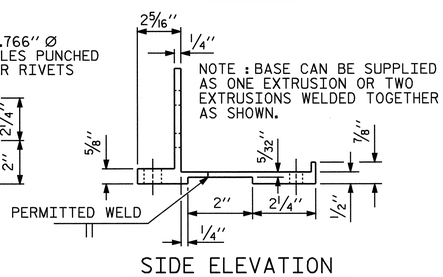
SECTION THRU PARAPET AND RAIL



PLAN

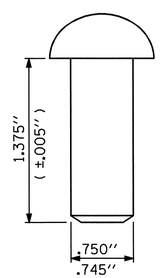


FRONT ELEVATION



SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

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

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6.

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

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

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

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

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

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

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8FT. TO 10FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

PAY LENGTH = 309.68 LIN. FT.

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

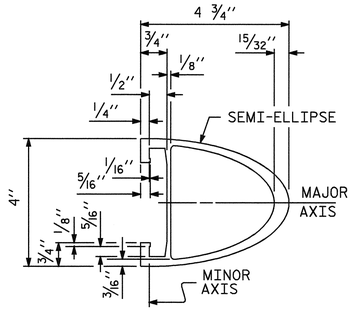
2 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			30

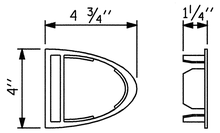
STD. NO. BMR3

ASSEMBLED BY : M.K. BEARD	DATE : 11/22/05	
CHECKED BY : S.H. SOCKWELL	DATE : 12/05	
DRAWN BY : EEM 6/94	REV. 8/16/99	RWW/LES
CHECKED BY : RGW 6/94	REV. 10/17/00	LES/RDR
	REV. 5/7/03R	RWW/JTE

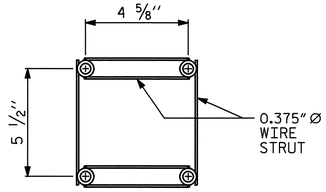
09-JUN-2006 14:28
R:\Structures\b4255\Final Plans\B-4255_sd_SS_01.dgn
klayne



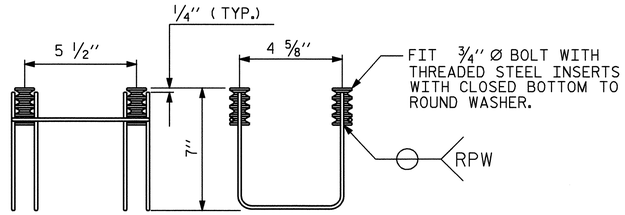
RAIL SECTION



RAIL CAP



PLAN



SIDE VIEW ELEVATION

MINIMUM LENGTH OF THREADS IN INSERT (FERRULE): 1 3/4''

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(54 ASSEMBLIES REQUIRED)

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2'' FOR 3/4'' FERRULES.

B. 4 - 3/4'' Ø X 2 1/2'' BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4'' Ø X 2 1/2'' GALVANIZED BOLTS 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.

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

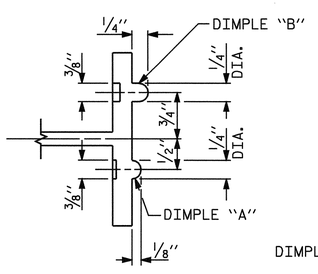
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.

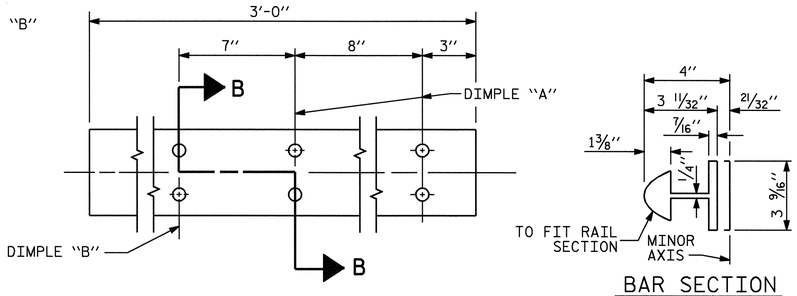
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

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

WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

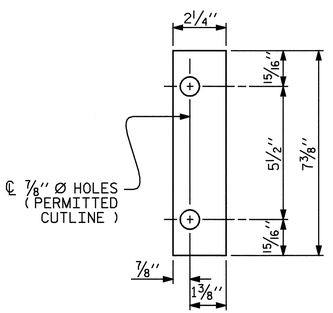


SECTION B - B

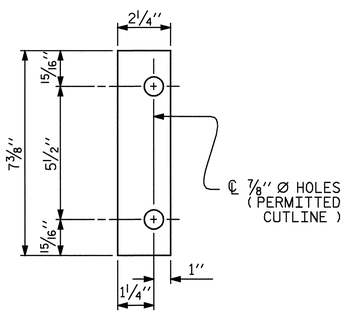


BAR SECTION

EXPANSION BAR DETAILS



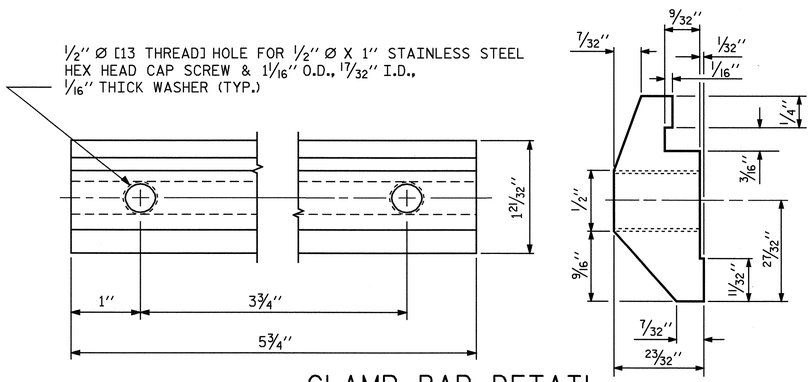
FRONT PLATE



REAR PLATE

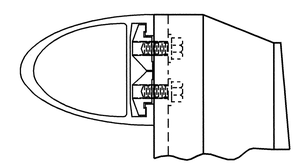
SHIM DETAILS

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



CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
6/9/06

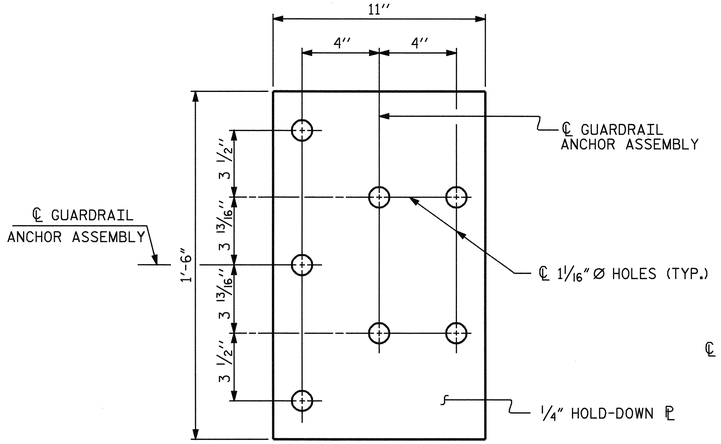
ASSEMBLED BY : M.K. BEARD	DATE : 11/22/05
CHECKED BY : S.H. SOCKWELL	DATE : 12/05

DRAWN BY : EEM	6/94	REV. 2/6/97 EEM/RGW
CHECKED BY : RGW	6/94	REV. 8/16/99 MAB/LES
		REV. 5/7/03 RWW/JTE

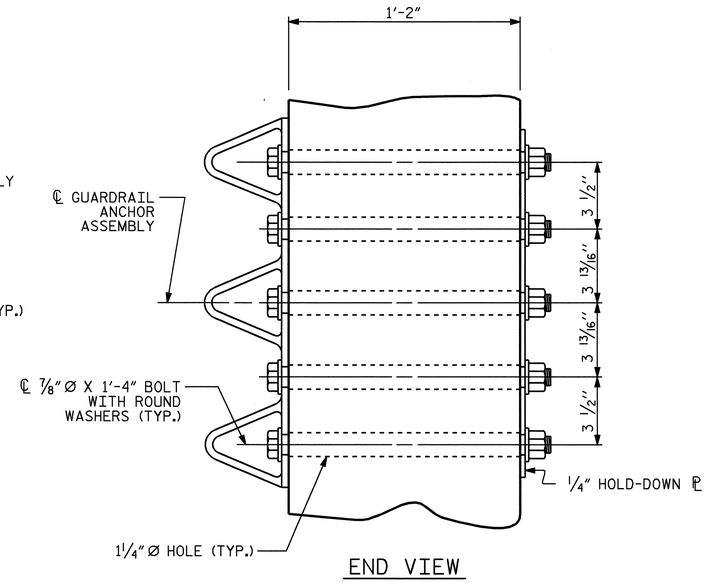
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			30

09-JUN-2006 14:28
R:\Structures\B4255\Final Plans\B-4255_sd_SS_01.dgn
klayne

STD. NO. BMR4



PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4'' HOLD DOWN PLATE AND 7 - 7/8'' Ø BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

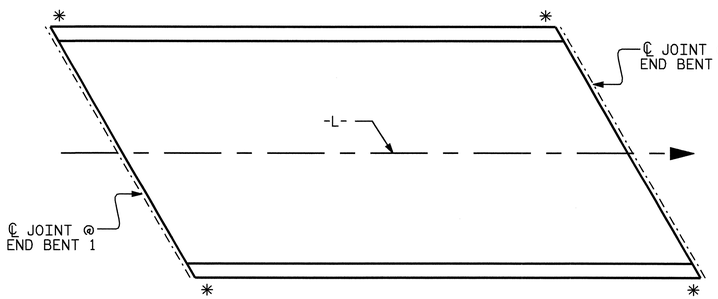
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8'' Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

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

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

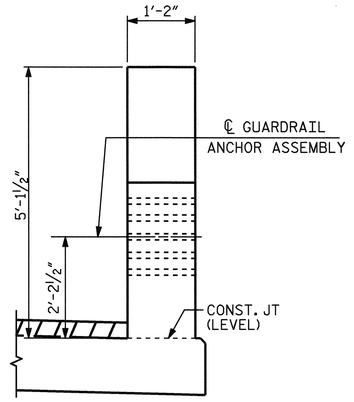
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

THE 1 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.

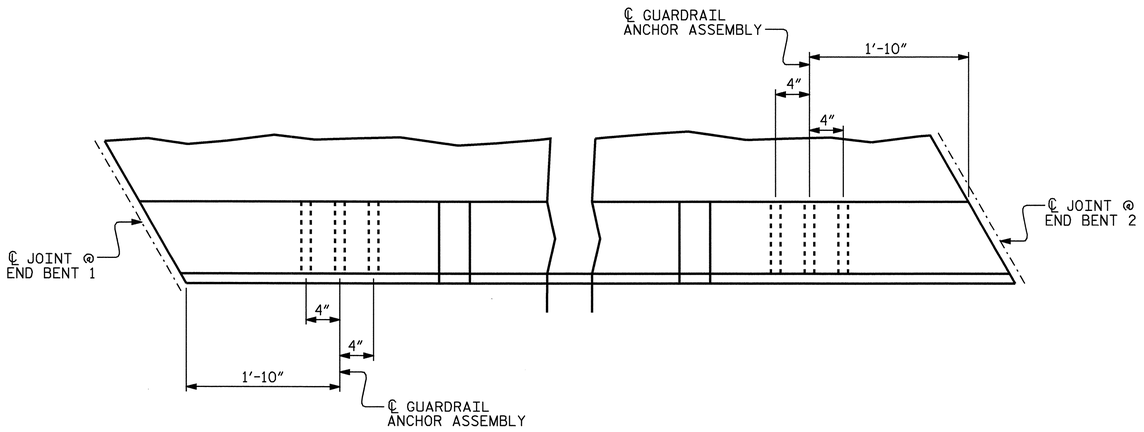


SKETCH SHOWING POINTS OF ATTACHMENT

*LOCATION OF GUARDRAIL ATTACHMENT



END VIEW
(TWO BAR METAL RAIL)



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE DETAILS

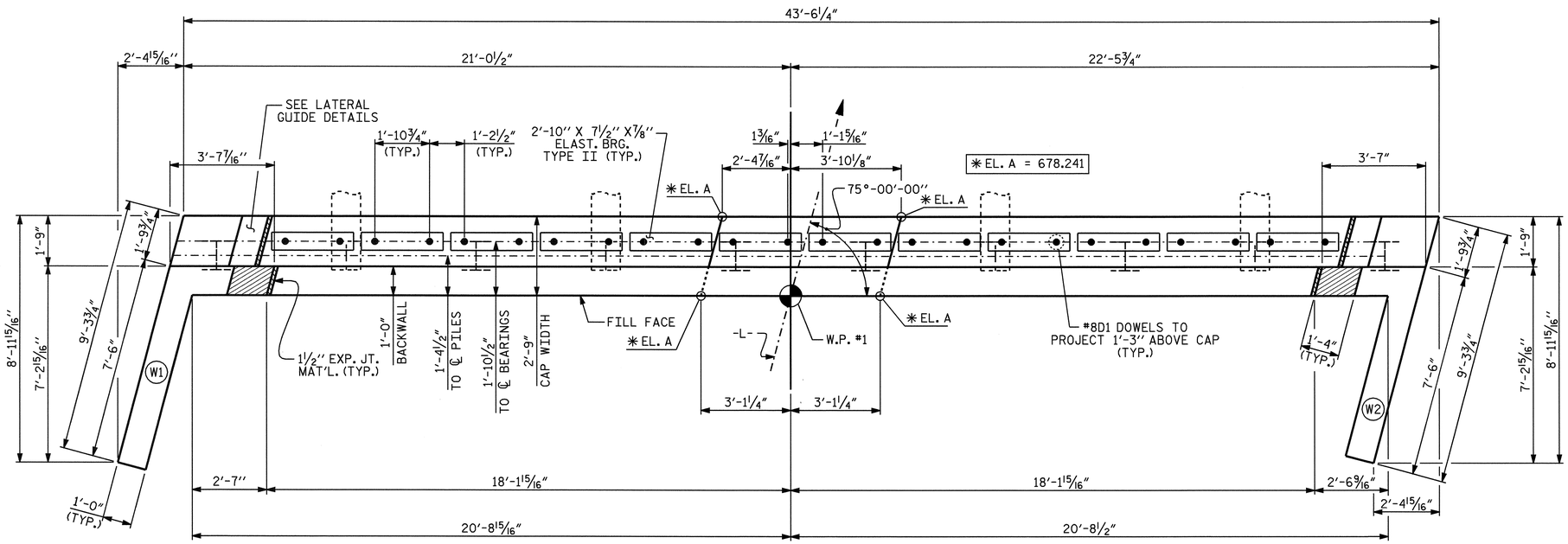
NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
6/7/06

ASSEMBLED BY : M.K. BEARD	DATE : 11/22/05
CHECKED BY : S.H. SOCKWELL	DATE : 12/05
DRAWN BY : EEM 6/94	REV. 8/16/99 RWW/LES
CHECKED BY : RGW 6/94	REV. 10/17/00 RWW/LES
	REV. 5/7/03 RWW/JTE

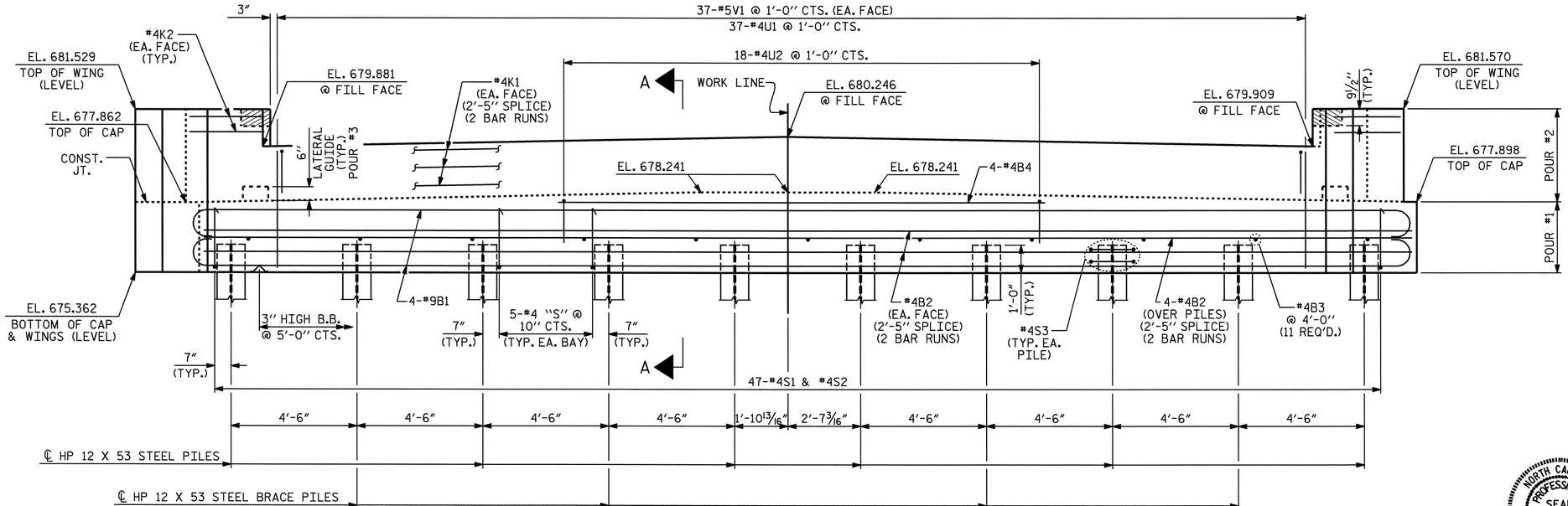
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			30

STD. NO. BMR8

09-JUN-2006 14:28
R:\Structures\b4255\Final Plans\B-4255_sd_SS_01.dgn
klayne



PLAN



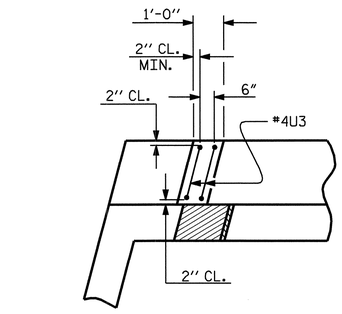
ELEVATION

NOTES

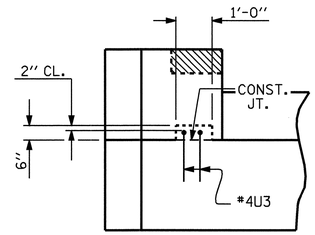
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #8 DOWELS.

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

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



PLAN



ELEVATION

LATERAL GUIDE DETAILS

(EACH END SIMILAR)

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #1

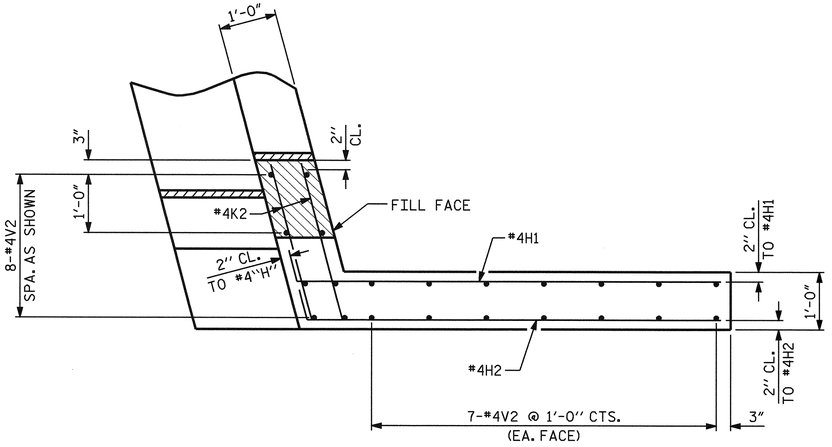
NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIRUL A. PATEL

6/9/06

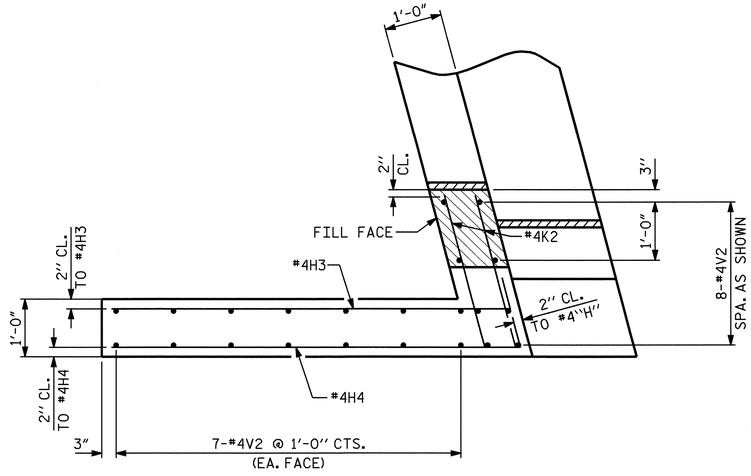
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : J.P. ADAMS DATE : 9/15/05
CHECKED BY : S.H. SOCKWELL DATE : 9/28/05

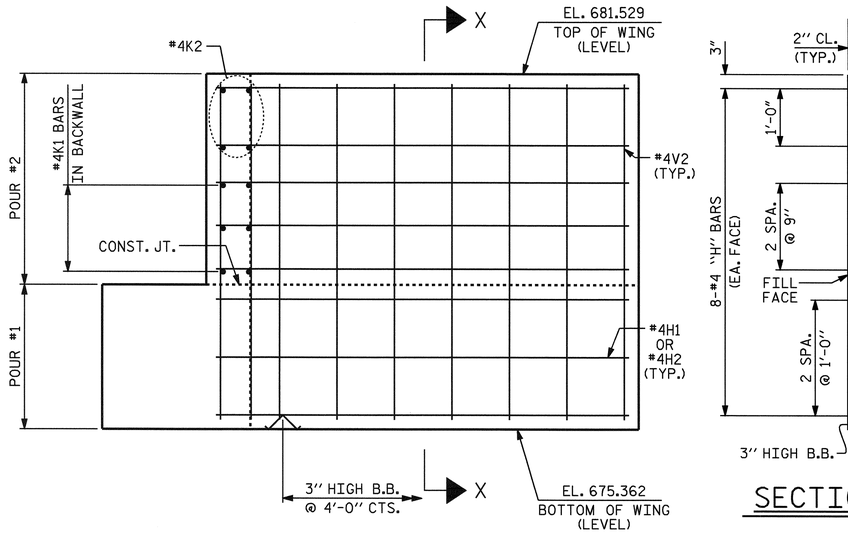
09-JUN-2006 14:26
R:\Structures\b4255\Final Plans\B-4255_sd_EBTS_01.dgn
klayne



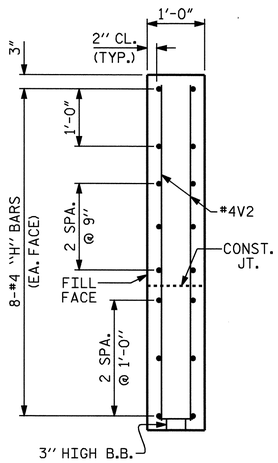
PLAN OF LEFT WING - W1



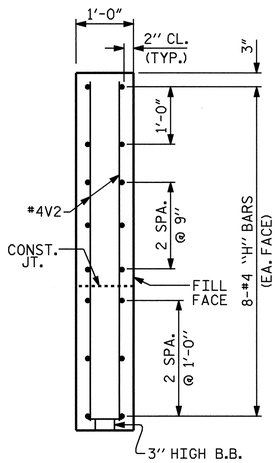
PLAN OF RIGHT WING - W2



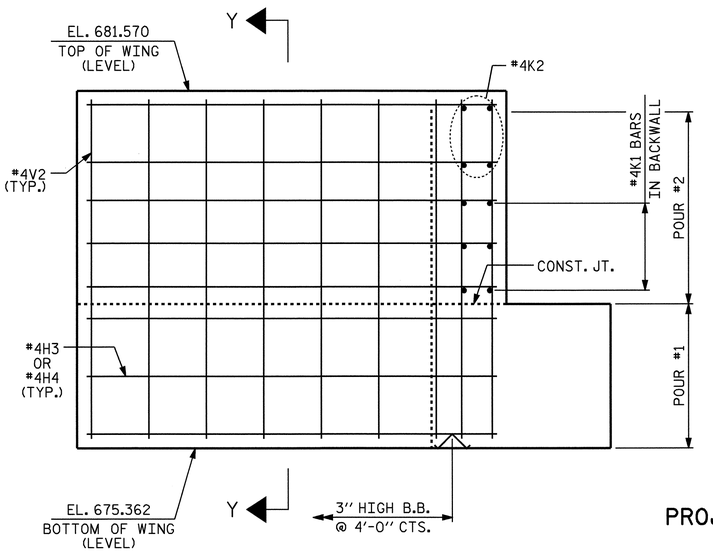
ELEVATION OF LEFT WING - W1



SECTION X-X



SECTION Y-Y



ELEVATION OF RIGHT WING - W2

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

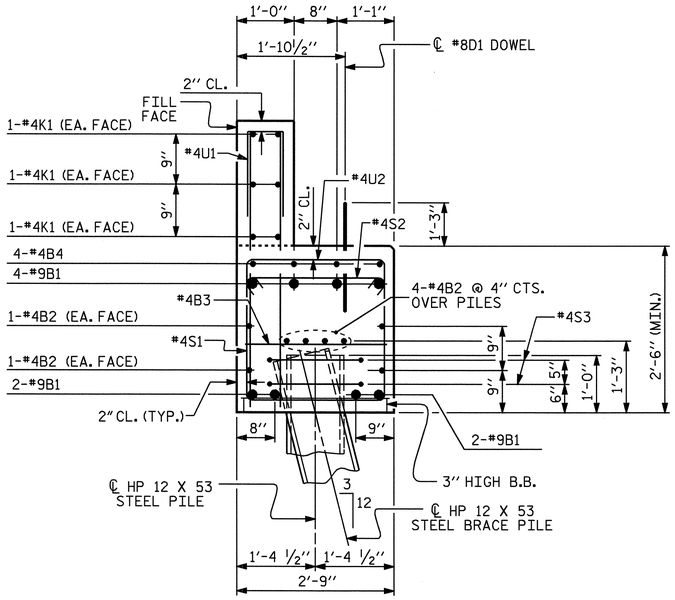
END BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
6/9/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			30

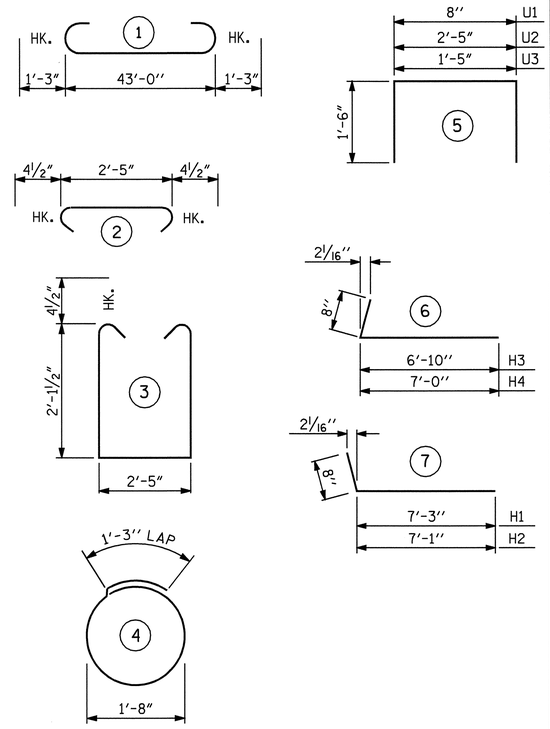
DRAWN BY : J.P. ADAMS DATE : 9/16/05
CHECKED BY : S.H. SOCKWELL DATE : 9/28/05

09-JUN-2006 14:26
R:\Structures\b4255\Final Plans\B-4255_sd_EBTS_01.dgn
klayne



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #1

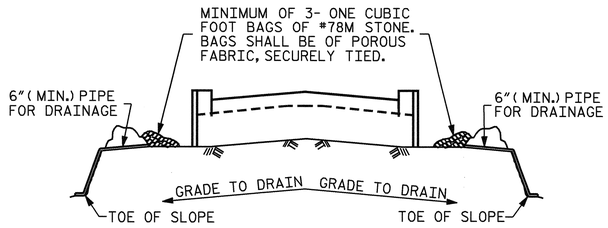
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	1	45'-6"	1238
B2	16	4	STR	22'-10"	244
B3	11	4	STR	2'-5"	18
B4	4	4	STR	17'-5"	47
D1	24	8	STR	2'-3"	144
H1	8	4	7	7'-11"	42
H2	8	4	7	7'-9"	41
H3	8	4	6	7'-6"	40
H4	8	4	6	7'-8"	41
K1	12	4	STR	22'-10"	183
K2	8	4	STR	3'-2"	17
S1	47	4	3	7'-5"	233
S2	47	4	2	3'-2"	99
S3	20	4	4	6'-6"	87
U1	37	4	5	3'-8"	91
U2	18	4	5	5'-5"	65
U3	4	4	5	4'-5"	12
V1	74	5	STR	4'-2"	322
V2	44	4	STR	5'-9"	169

REINFORCING STEEL 3133 LBS.

CLASS "A" CONCRETE BREAKDOWN

POUR #1 CAP & LOWER PART OF WINGS
CU. YDS. 13.2
POUR #2 UPPER WINGS & BACKWALL
CU. YDS. 5.2
POUR #3 LATERAL GUIDES
CU. YDS. 0.1
CLASS "A" CONCRETE TOTAL
CU. YDS. 18.5

HP 12 X 53 STEEL PILES
NO. 10 250 LIN. FT.

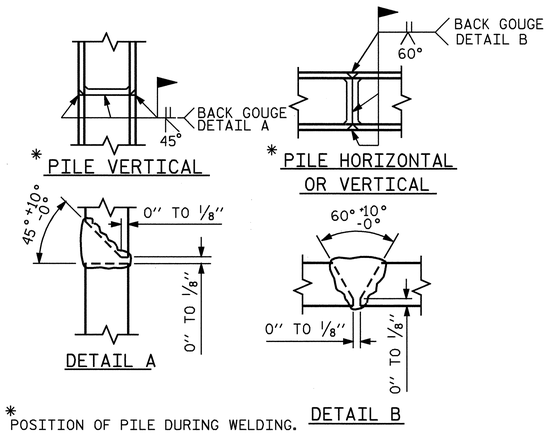


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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



* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
6/9/06

PROJECT NO. B-4255
ROWAN COUNTY
STATION: 18+34.50 -L-

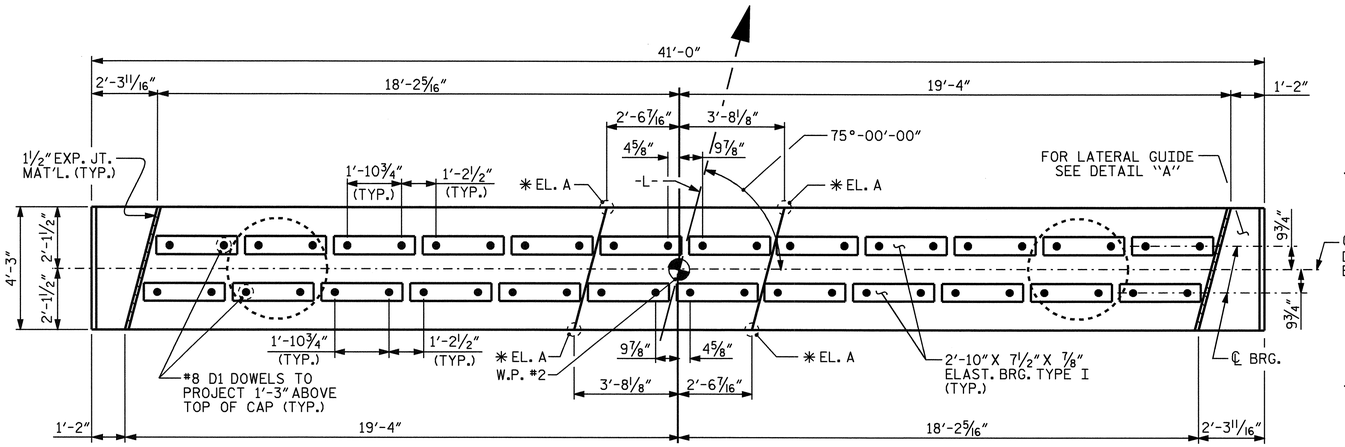
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #1

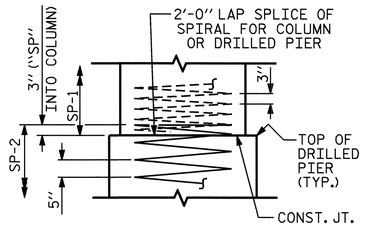
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : J.P. ADAMS DATE : 9/16/05
CHECKED BY : S.H. SOCKWELL DATE : 9/28/05



PLAN

℄ EL. A = 678.475



DETAIL "B"

NOTES

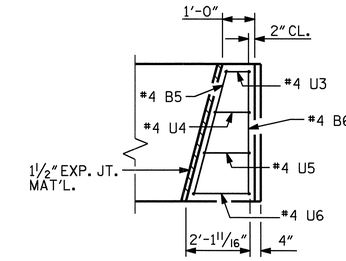
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

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

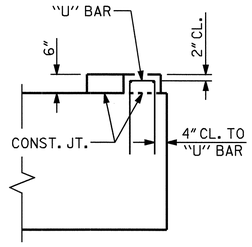
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

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

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

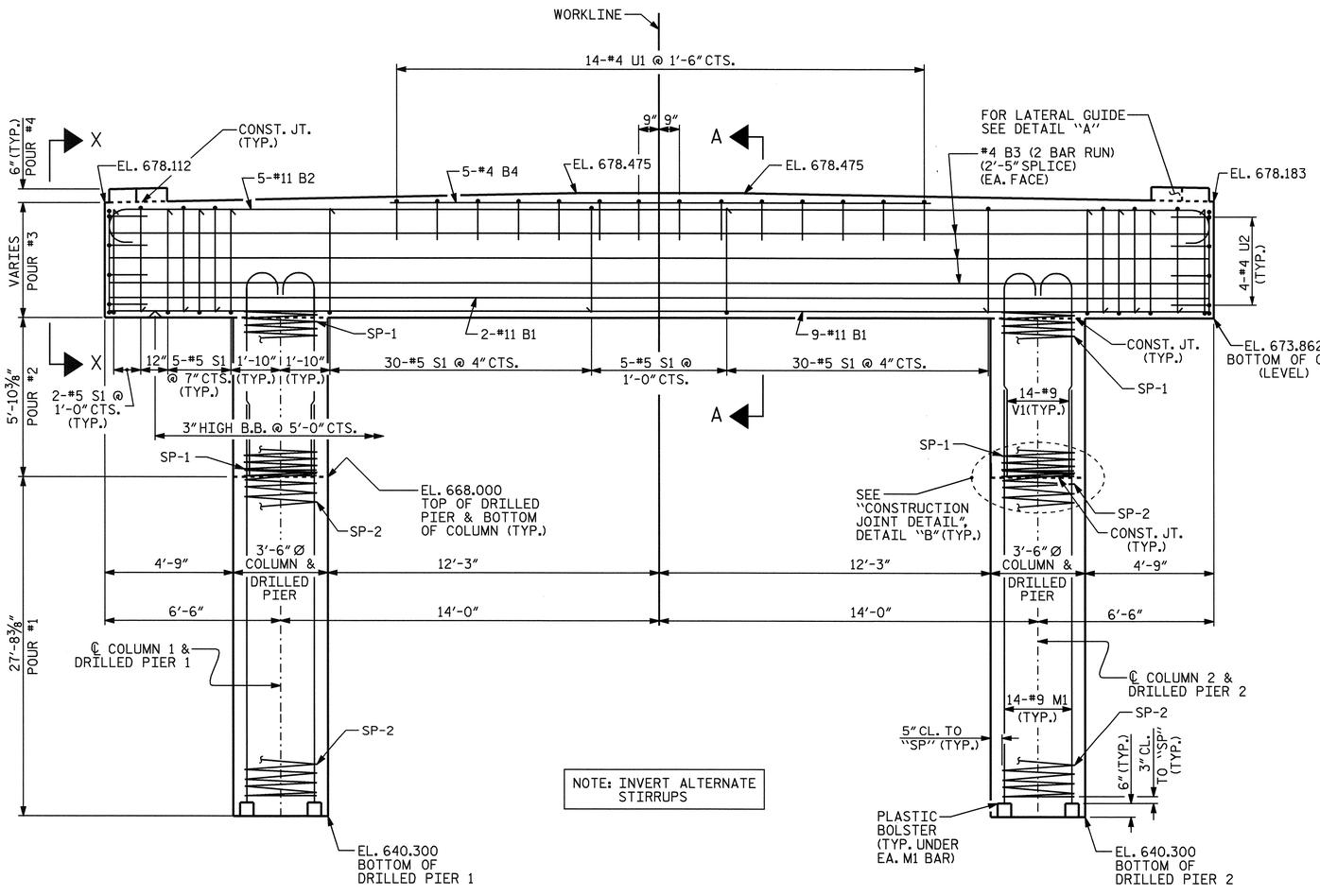


PLAN



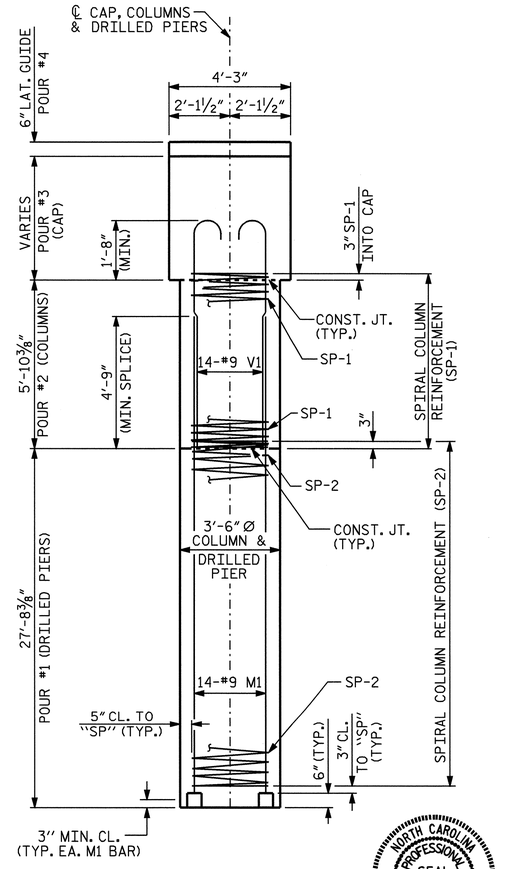
ELEVATION

DETAIL "A"



NOTE: INVERT ALTERNATE STIRRUPS

ELEVATION



END ELEVATION

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER PAUL A. PATEL
6/9/06

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

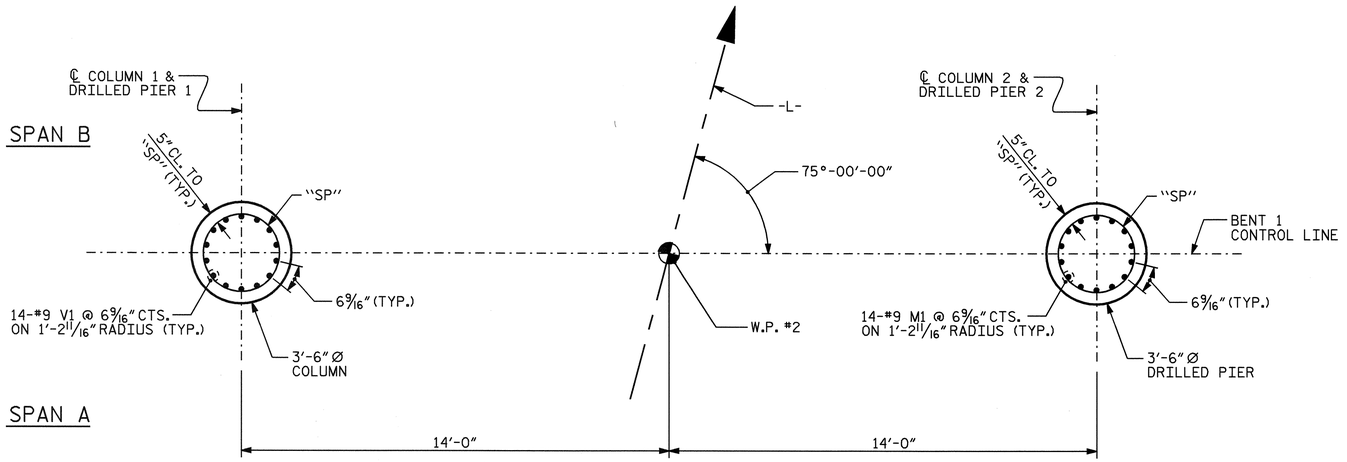
SUBSTRUCTURE

BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : M.K. BEARD DATE : 09/05
CHECKED BY : K.D. LAYNE DATE : 4/19/06

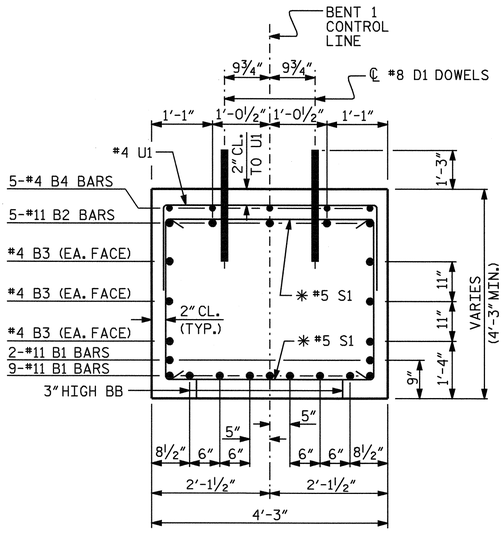
09-JUN-2006 14:26
R:\Structures\b4255\Final Plans\B-4255_sd_BTS_01.dgn
klayne



PARTIAL PLAN OF COLUMNS

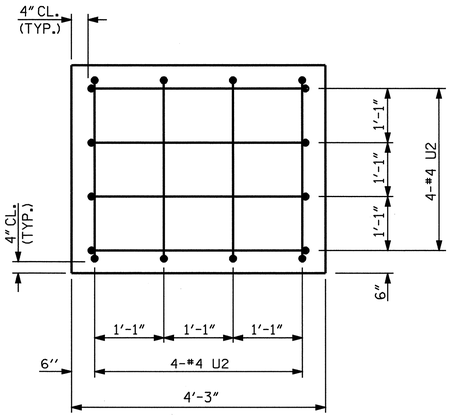
PARTIAL PLAN OF DRILLED PIERS

PLAN OF COLUMNS & DRILLED PIERS



SECTION A-A

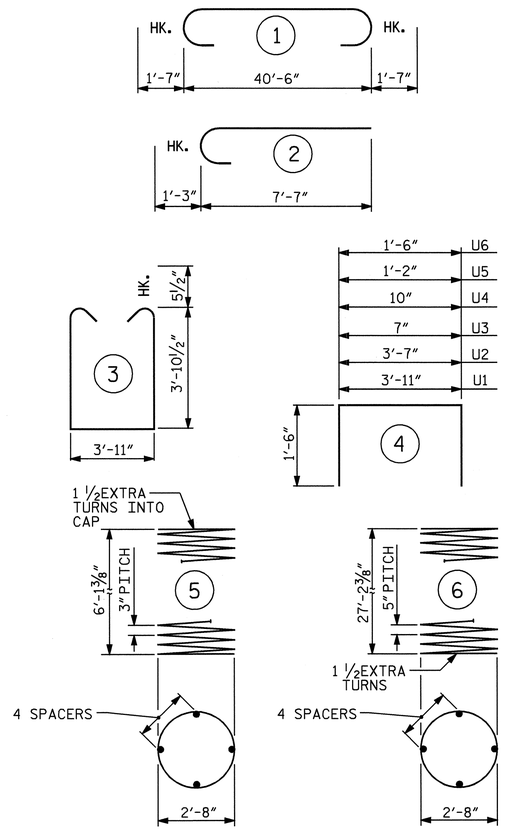
✱ INVERT ALTERNATE STIRRUPS



VIEW X-X

(TYP. EA. END)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

✱✱ THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

✱✱✱ THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

BILL OF MATERIAL BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	11	11	STR	40'-8"	2377
B2	5	11	1	43'-8"	1160
B3	12	4	STR	21'-7"	173
B4	5	4	STR	20'-0"	67
B5	2	4	STR	4'-0"	5
B6	2	4	STR	3'-11"	5
D1	48	8	STR	2'-3"	288
M1	28	9	STR	35'-3"	3356
S1	79	5	3	12'-7"	1037
U1	14	4	4	6'-11"	65
U2	16	4	4	6'-7"	70
U3	2	4	4	3'-7"	5
U4	2	4	4	3'-10"	5
U5	2	4	4	4'-2"	6
U6	2	4	4	4'-6"	6
V1	28	9	2	8'-10"	841
TOTAL REINFORCING STEEL LBS.					9466
SP-1	2	✱✱✱	6	214'-7"	287
SP-2	2	✱✱	5	551'-1"	1150
TOTAL SPIRAL COLUMN REINFORCING STEEL LBS.					1437

CLASS A CONCRETE BREAKDOWN

POUR #2 (COLUMNS)	4.2 C.Y.
POUR #3 (BENT CAP)	28.4 C.Y.
POUR #4 (LAT. GUIDE)	0.2 C.Y.
TOTAL	32.8 C.Y.

DRILLED PIER QUANTITIES

DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	19.7 C.Y.
3'-6" Ø DRILLED PIERS IN SOIL	44.4 LIN. FT.
3'-6" Ø DRILLED PIERS NOT IN SOIL	11.0 LIN. FT.
CSL TUBES:	242.0 LIN. FT.
SID INSPECTION :	2 EACH
SPT TESTING :	2 EACH
CROSSHOLE SONIC LOGGING :	1 EACH

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

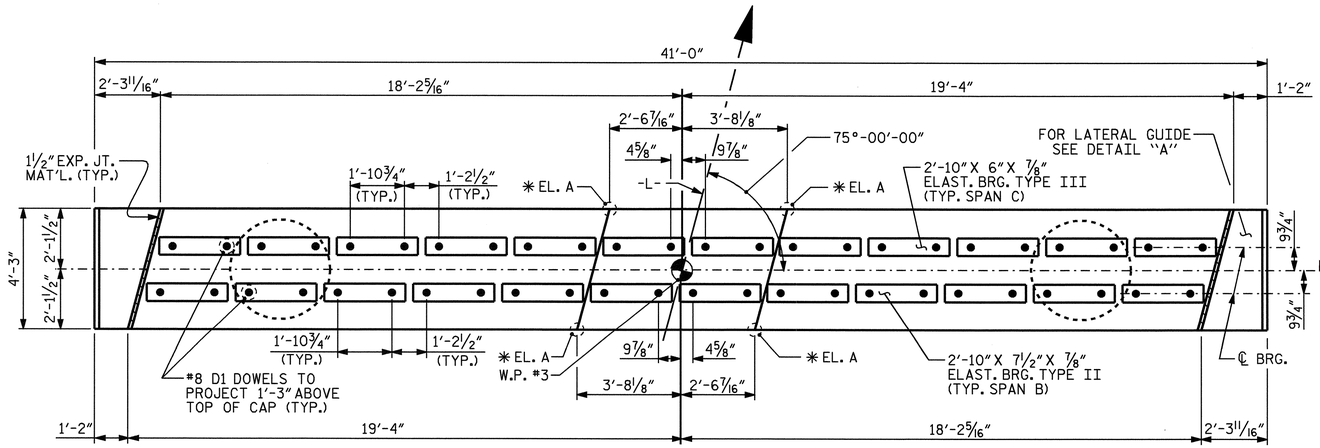
SUBSTRUCTURE

BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
6/7/06

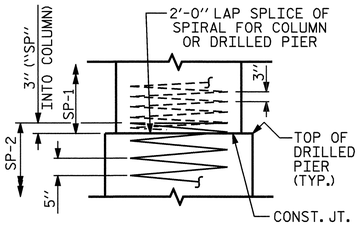
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : M.K. BEARD DATE : 09/05
CHECKED BY : J.P. ADAMS DATE : 10/5/05



PLAN

* EL. A = 679.160



DETAIL "B"

NOTES

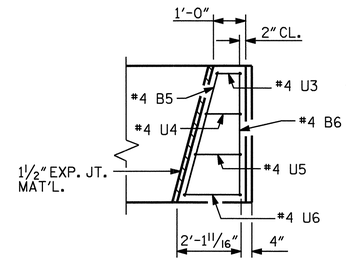
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

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

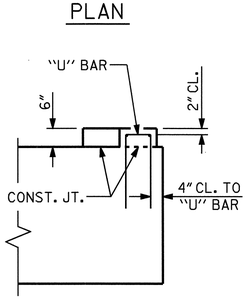
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

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

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

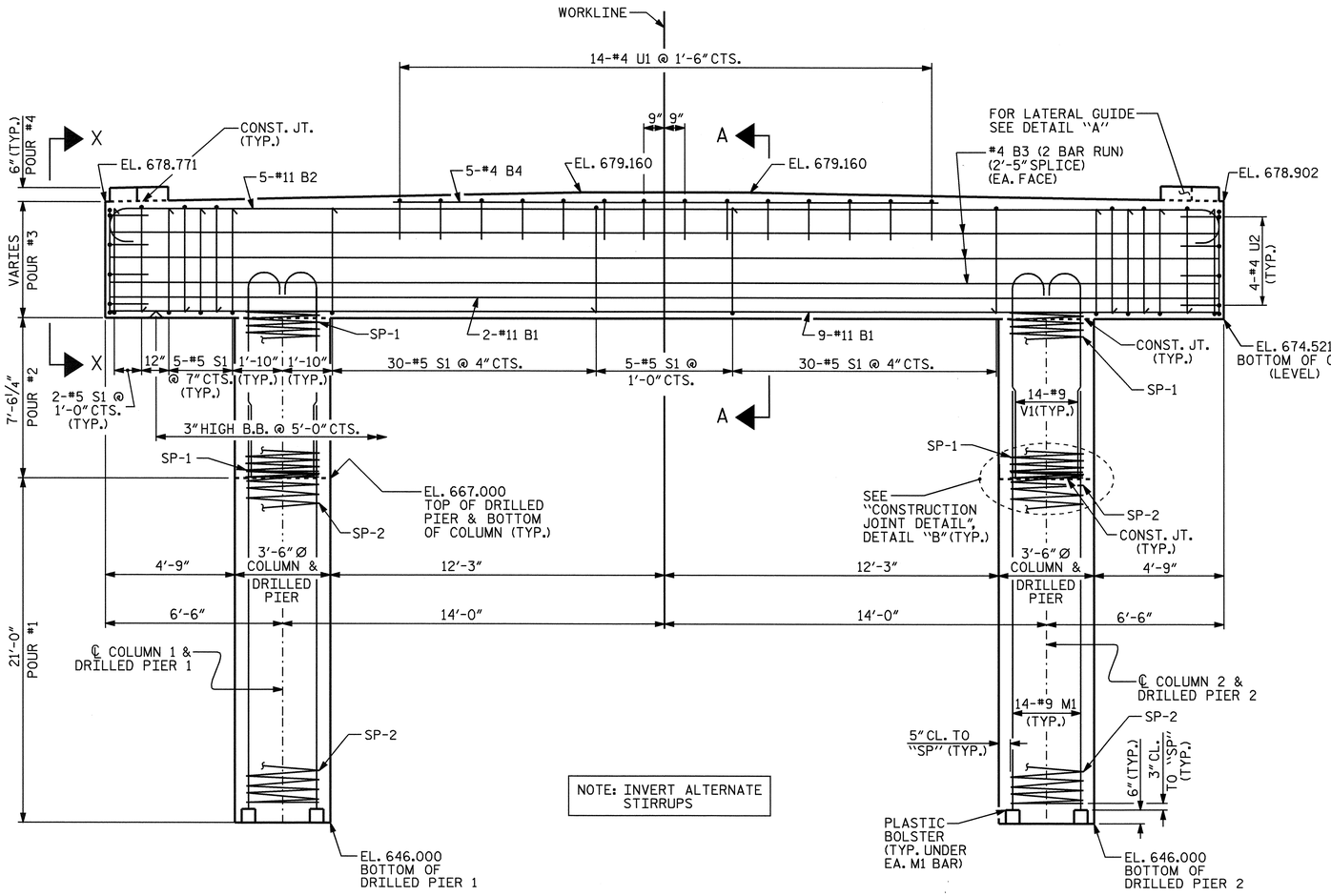


PLAN



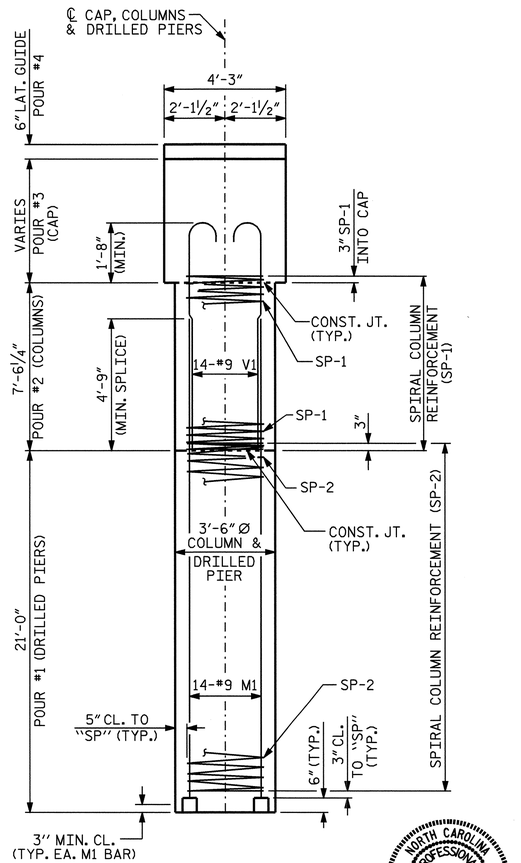
ELEVATION

DETAIL "A"



NOTE: INVERT ALTERNATE STIRRUPS

ELEVATION



END ELEVATION

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIMAL A. PATEL 6/9/06

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

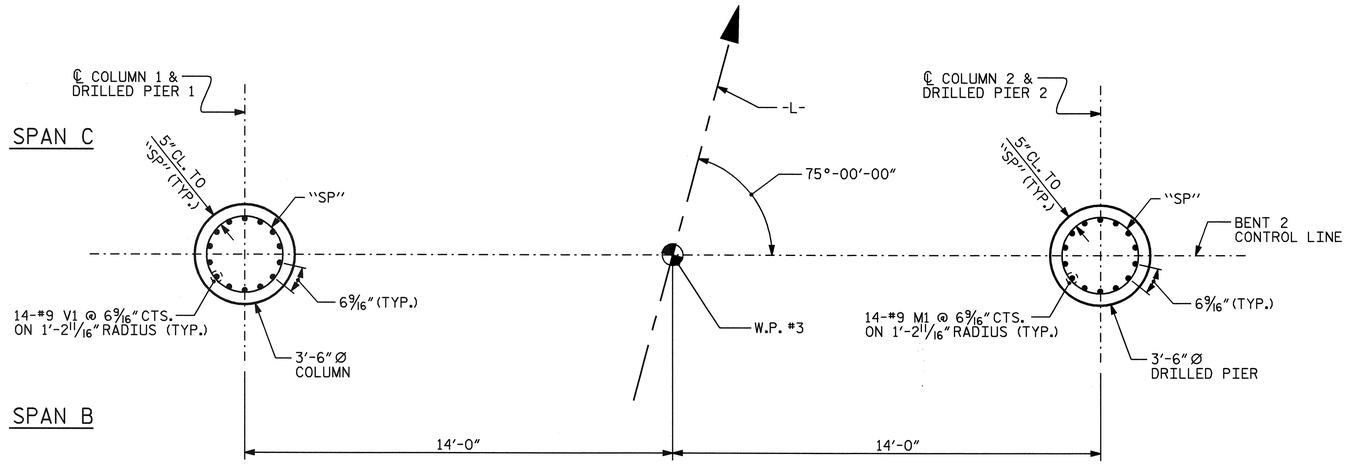
BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : M.K. BEARD DATE : 09/05

CHECKED BY : K.D. LAYNE DATE : 4/19/06

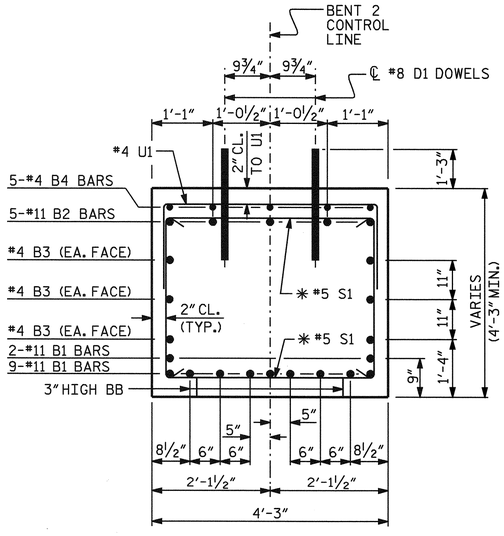
09-JUN-2006 14:26
R:\Structures\b4255\Final Plans\B-4255_sd_BTS_01.dgn
klayne



PARTIAL PLAN OF COLUMNS

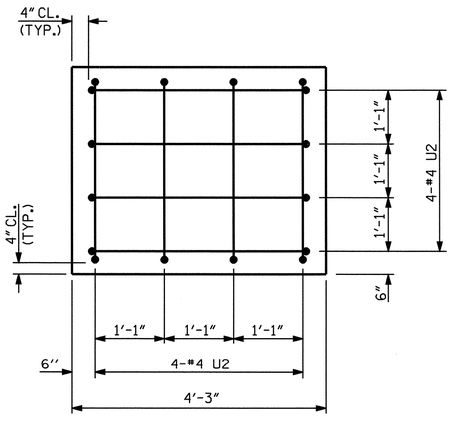
PARTIAL PLAN OF DRILLED PIERS

PLAN OF COLUMNS & DRILLED PIERS



SECTION A-A

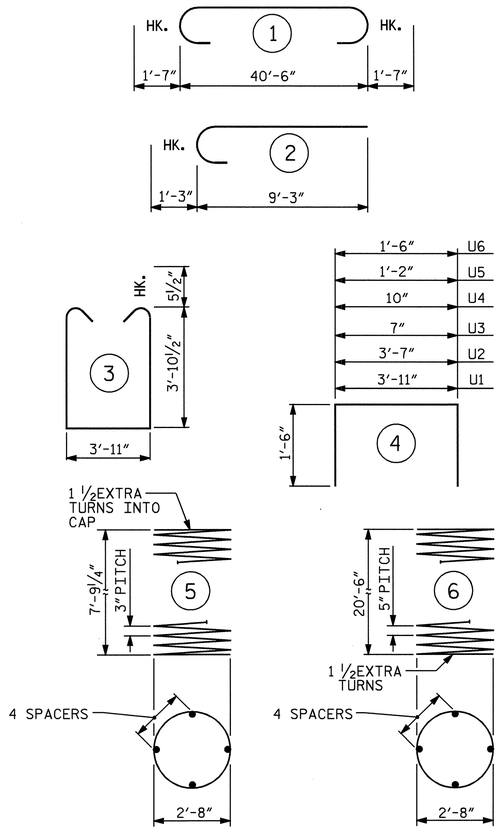
* INVERT ALTERNATE STIRRUPS



VIEW X-X

(TYP. EA. END)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

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

BILL OF MATERIAL BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	11	11	STR	40'-8"	2377
B2	5	11	1	43'-8"	1160
B3	12	4	STR	21'-7'	173
B4	5	4	STR	20'-0"	67
B5	2	4	STR	4'-0"	5
B6	2	4	STR	3'-11"	5
D1	48	8	STR	2'-3"	288
M1	28	9	STR	28'-3"	2689
S1	79	5	3	12'-7"	1037
U1	14	4	4	6'-11"	65
U2	16	4	4	6'-7"	70
U3	2	4	4	3'-7"	5
U4	2	4	4	3'-10"	5
U5	2	4	4	4'-2"	6
U6	2	4	4	4'-6"	6
V1	28	9	2	10'-6"	1000
TOTAL REINFORCING STEEL LBS.					8958
SP-1	2	***	6	270'-3"	361
SP-2	2	**	5	417'-5"	871
TOTAL SPIRAL COLUMN REINFORCING STEEL LBS.					1232

CLASS A CONCRETE BREAKDOWN

POUR #2 (COLUMNS)	5.4 C.Y.
POUR #3 (BENT CAP)	28.4 C.Y.
POUR #4 (LAT. GUIDE)	0.2 C.Y.
TOTAL	34.0 C.Y.

DRILLED PIER QUANTITIES

DRILLED PIER CONCRETE

POUR #1 (DRILLED PIERS)	15.0 C.Y.
3'-6" Ø DRILLED PIERS IN SOIL	31.0 LIN. FT.
3'-6" Ø DRILLED PIERS NOT IN SOIL	11.0 LIN. FT.
CSL TUBES:	188.0 LIN. FT.
SID INSPECTION :	2 EACH
SPT TESTING :	2 EACH
CROSSHOLE SONIC LOGGING :	1 EACH

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

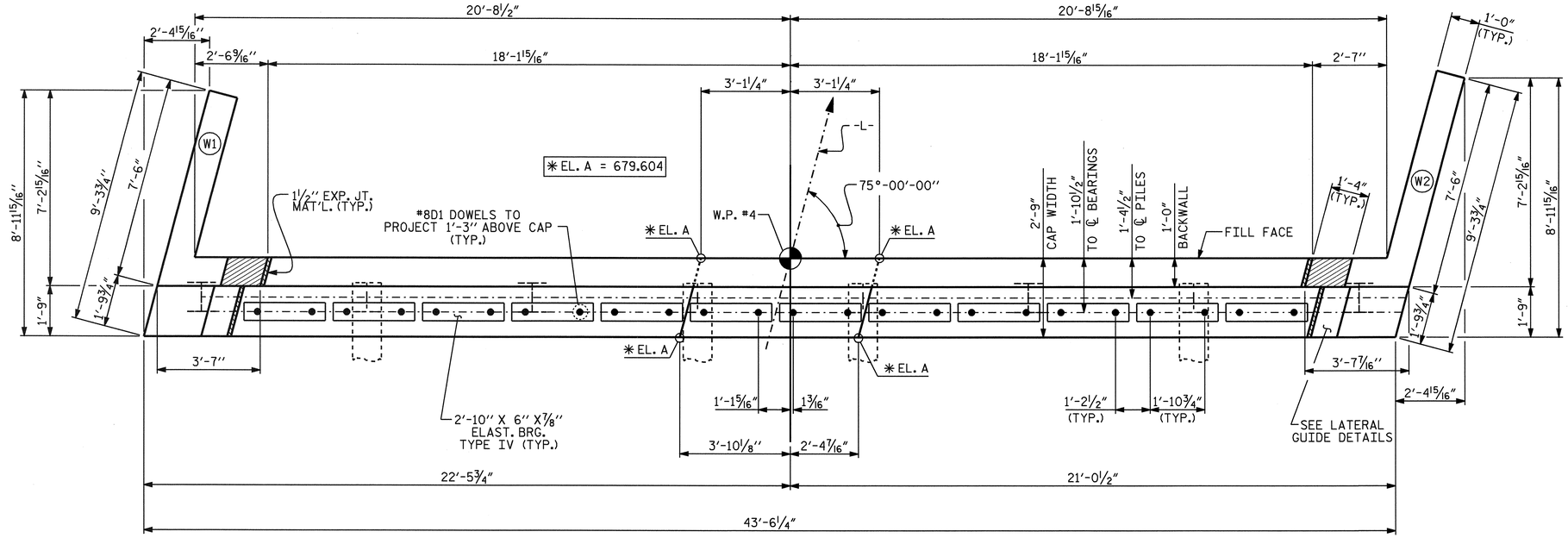
SUBSTRUCTURE

BENT 2

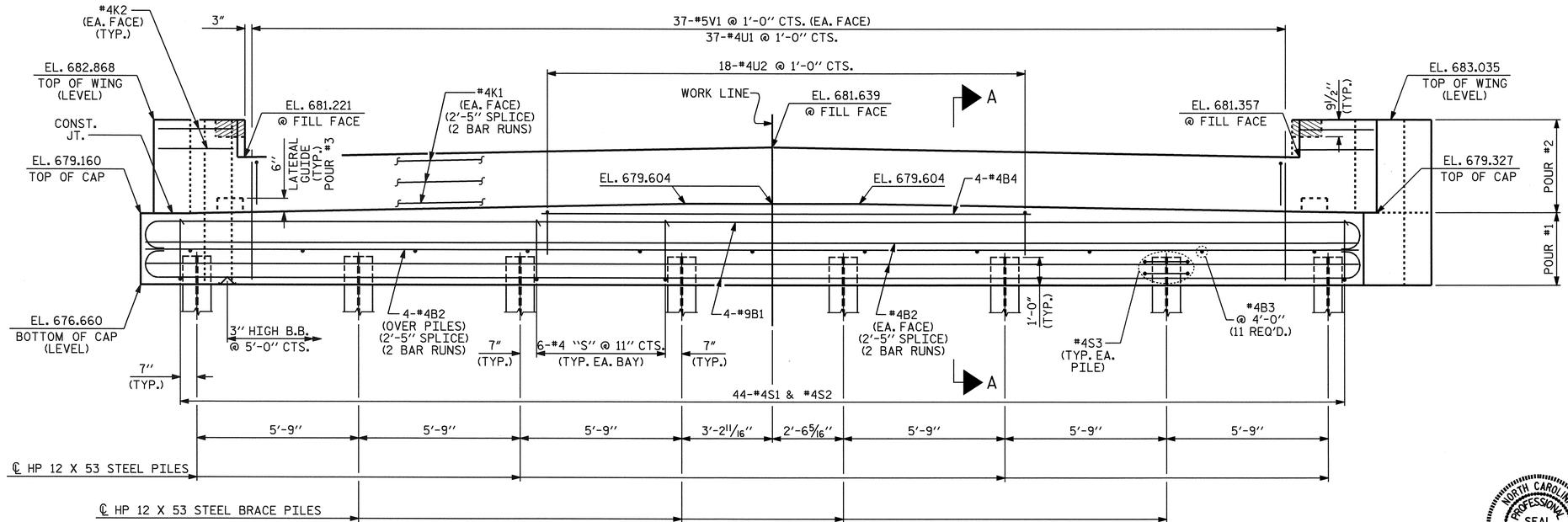
NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VARUL A. PATEL
6/9/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : M.K. BEARD DATE : 09/05
CHECKED BY : K.D. LAYNE DATE : 4/19/06



PLAN



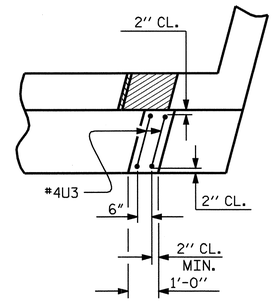
ELEVATION

NOTES

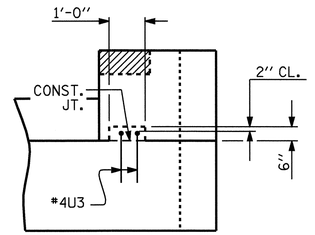
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #8 DOWELS.

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

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



PLAN



ELEVATION

LATERAL GUIDE DETAILS

(EACH END SIMILAR)

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

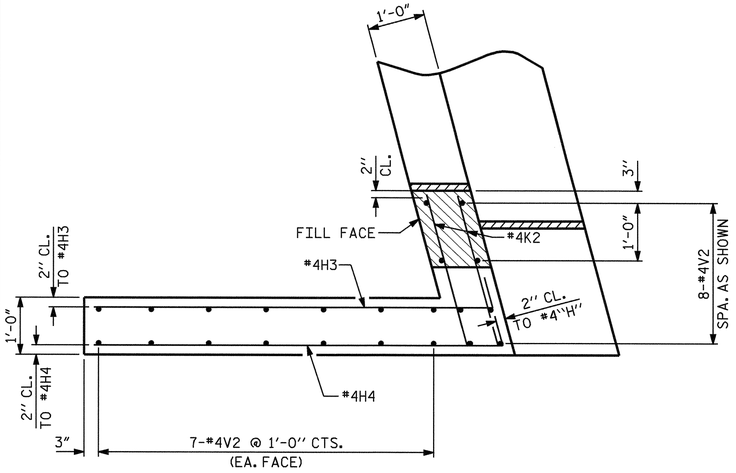
END BENT #2

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
6/9/06

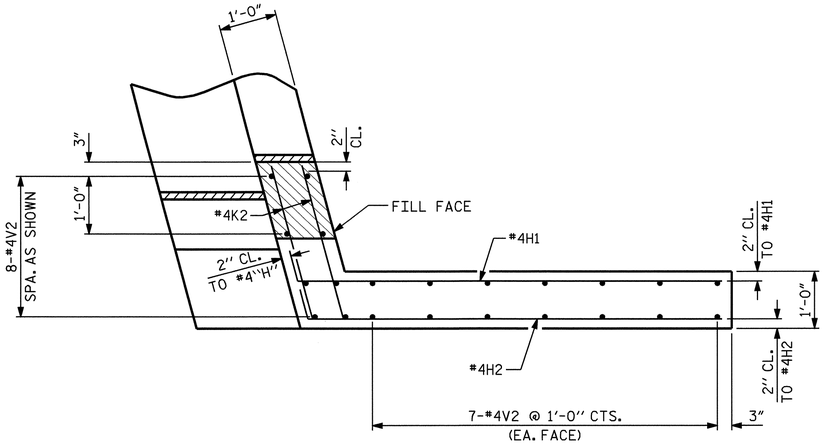
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : J.P. ADAMS DATE : 9/15/05
CHECKED BY : S.H. SOCKWELL DATE : 9/28/05

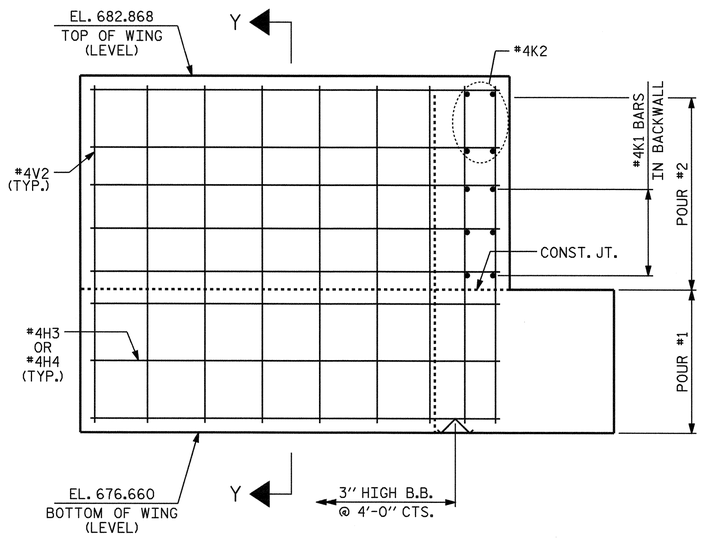
09-JUN-2006 14:27
R:\Structures\b4255\Final Plans\B-4255_sd_EBTS_01.dgn
klayne



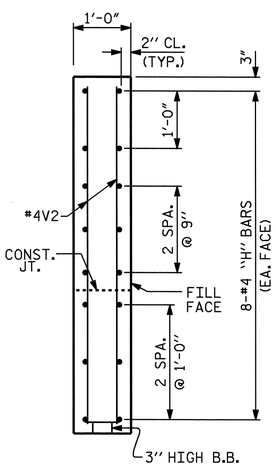
PLAN OF LEFT WING - W1



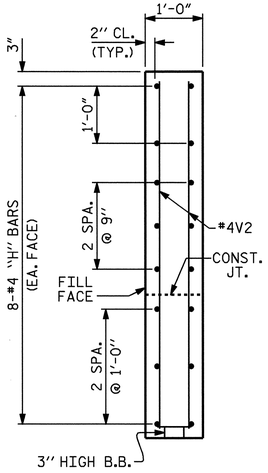
PLAN OF LEFT WING - W2



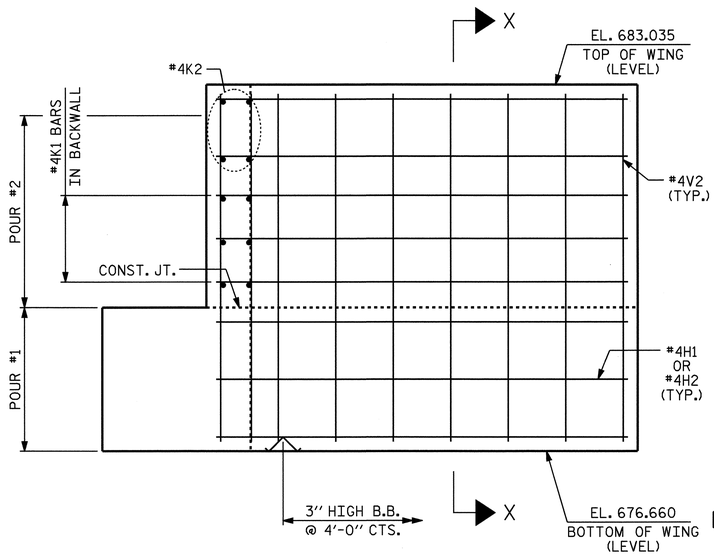
ELEVATION OF LEFT WING - W1



SECTION Y-Y



SECTION X-X



ELEVATION OF RIGHT WING - W2

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

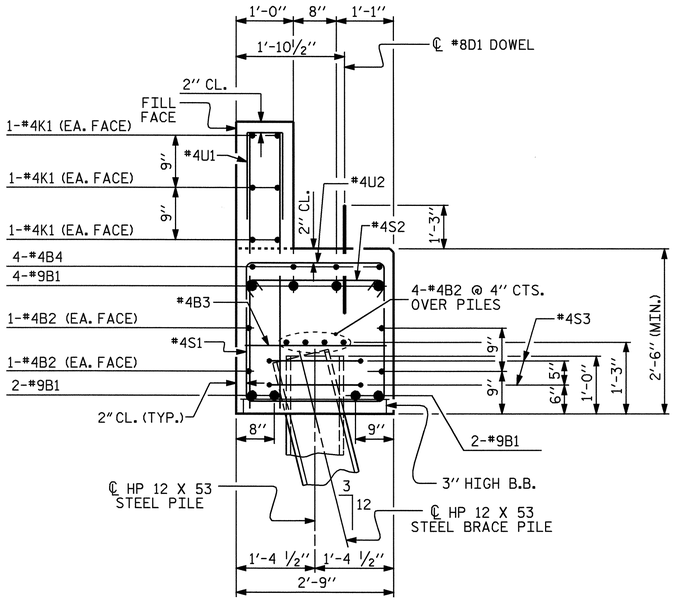
END BENT #2

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
6/9/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			30

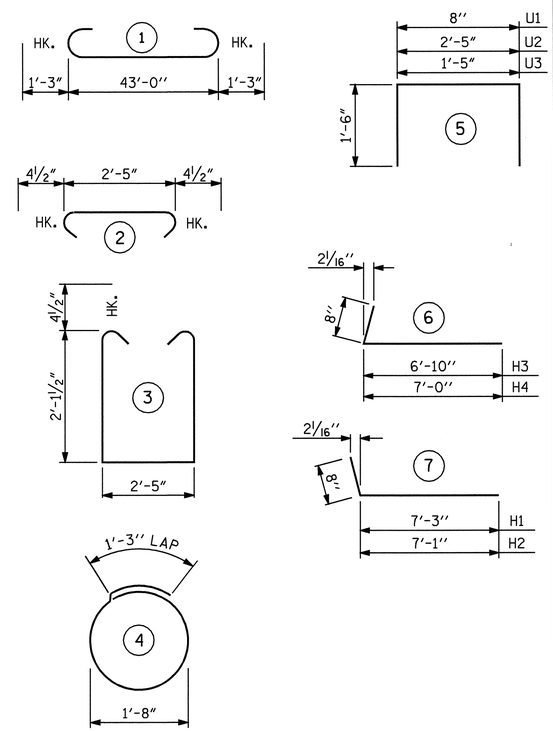
DRAWN BY : J.P. ADAMS DATE : 9/16/05
CHECKED BY : S.H. SOCKWELL DATE : 9/28/05

09-JUN-2006 14:27
R:\Structures\b4255\Final Plans\B-4255_sd_EBTS_01.dgn
klayne



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

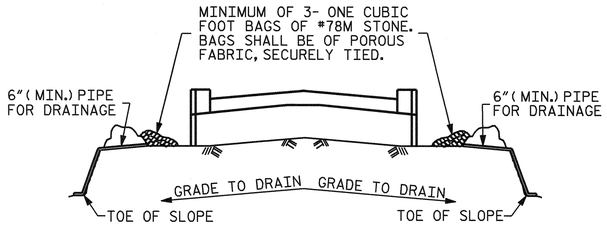
END BENT #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	1	45'-6"	1238
B2	16	4	STR	22'-10"	244
B3	11	4	STR	2'-5"	18
B4	4	4	STR	17'-5"	47
D1	24	8	STR	2'-3"	144
H1	8	4	7	7'-11"	42
H2	8	4	7	7'-9"	41
H3	8	4	6	7'-6"	40
H4	8	4	6	7'-8"	41
K1	12	4	STR	22'-10"	183
K2	8	4	STR	3'-2"	17
S1	44	4	3	7'-5"	218
S2	44	4	2	3'-2"	93
S3	16	4	4	6'-6"	69
U1	37	4	5	3'-8"	91
U2	18	4	5	5'-5"	65
U3	4	4	5	4'-5"	12
V1	74	5	STR	4'-2"	322
V2	44	4	STR	5'-9"	169

REINFORCING STEEL 3094 LBS

CLASS "A" CONCRETE BREAKDOWN
POUR #1 CAP & LOWER PART OF WINGS
CU. YDS. 13.6
POUR #2 UPPER WINGS & BACKWALL
CU. YDS. 5.4
POUR #3 LATERAL GUIDES
CU. YDS. 0.1
CLASS "A" CONCRETE TOTAL
CU. YDS. 19.1

HP 12 X 53 STEEL PILES
NO. 8 240 LIN. FT.

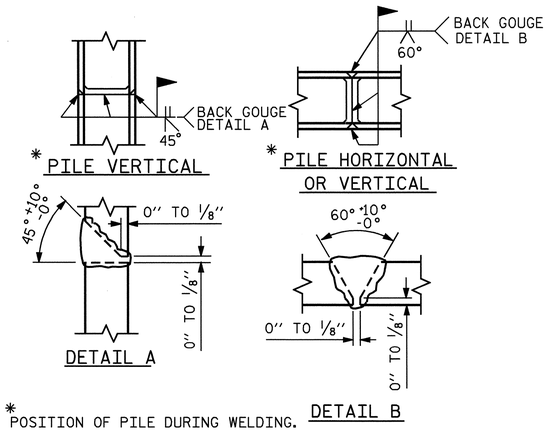


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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



* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 12337 ENGINEER VIPUL A. PATEL
6/9/06

PROJECT NO. B-4255
ROWAN COUNTY
STATION: 18+34.50 -L-

SHEET 3 OF 3

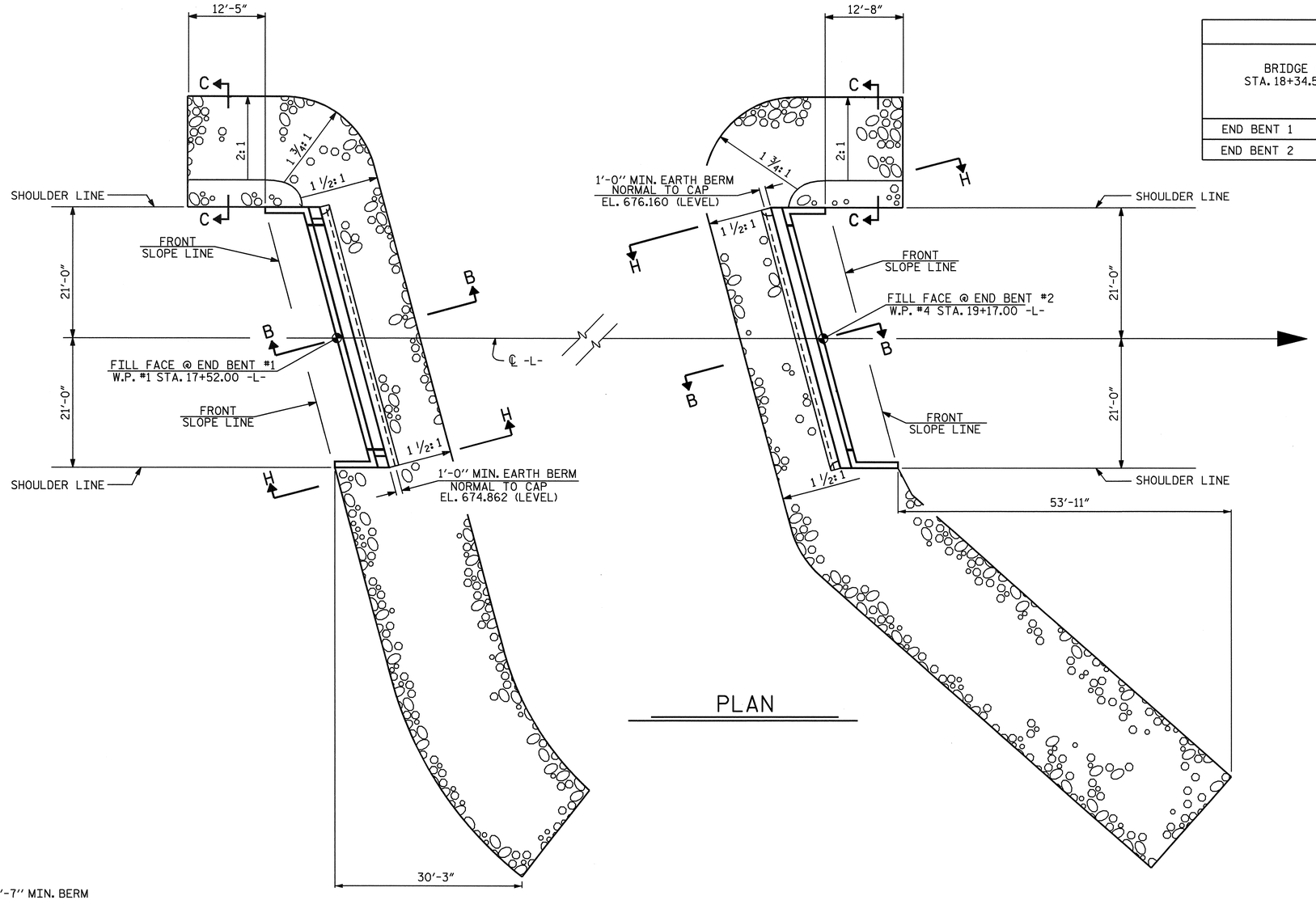
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #2

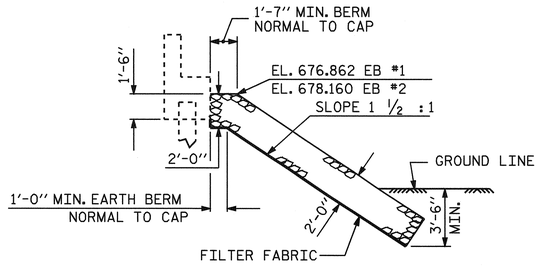
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : J.P. ADAMS DATE : 9/16/05
CHECKED BY : S.H. SOCKWELL DATE : 9/28/05

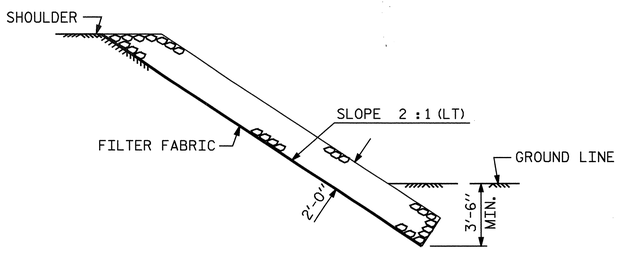
ESTIMATED QUANTITIES		
BRIDGE @ STA. 18+34.50 -L-	PLAIN RIP RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	325	361
END BENT 2	400	444



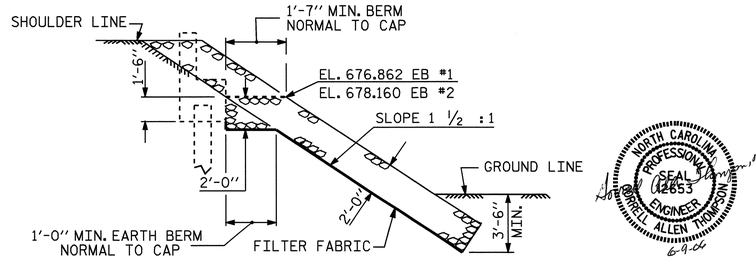
PLAN



SECTION B-B



SECTION C-C



SECTION H-H

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

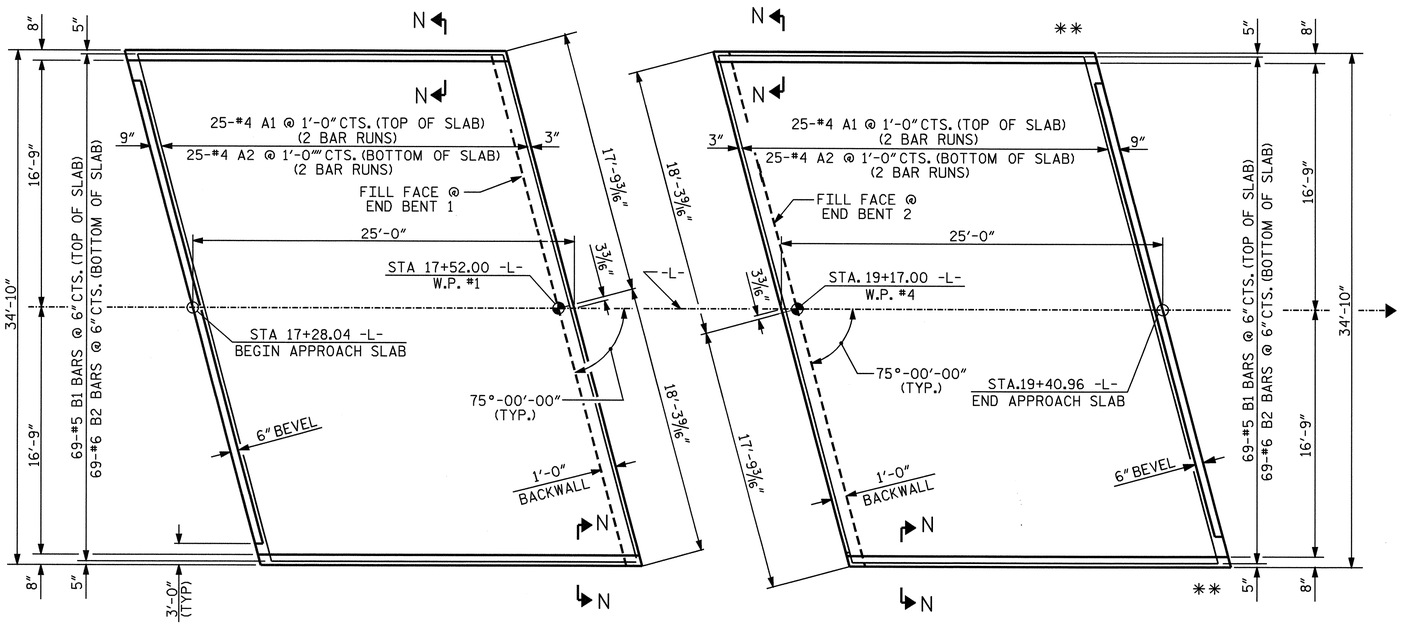
STANDARD

RIP RAP DETAILS

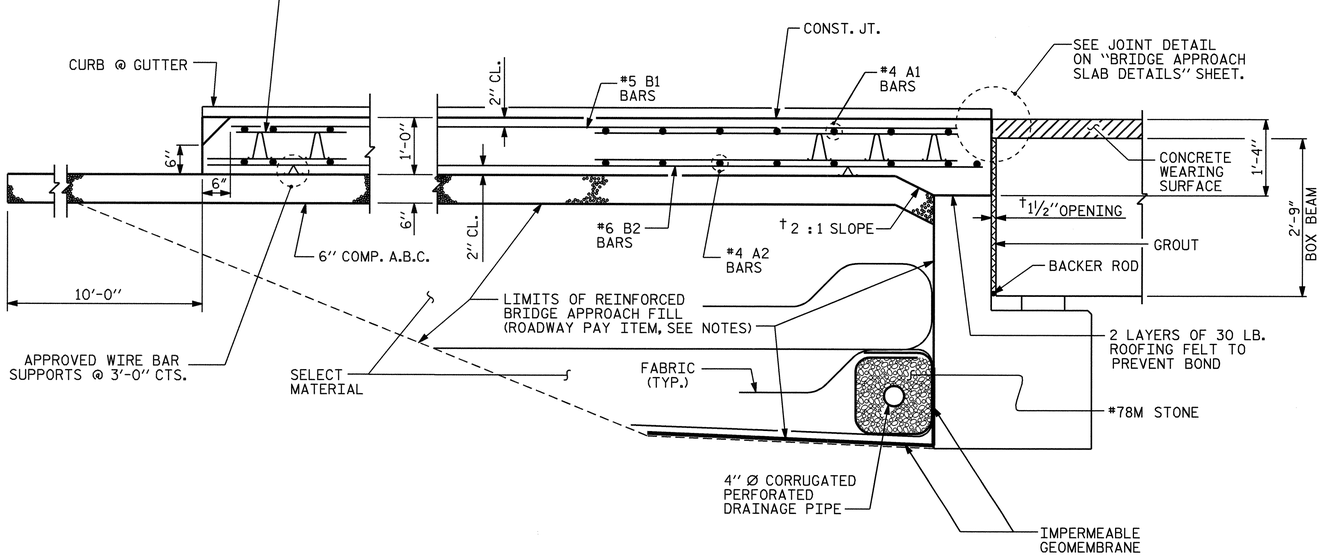
NORTH CAROLINA PROFESSIONAL SEAL 12653 ENGINEER DARRELL ALLEN THOMPSON 6-9-06

ASSEMBLED BY : T. R. PETERSON	DATE : 04/13/06
CHECKED BY : G. A. THOMPSON	DATE : 04/17/06
DRAWN BY : REK 1/84	REV. 7/17/98 REK/RWW
CHECKED BY : RDU 1/84	REV. 8/16/99 RWW/LES
	REV. 10/17/00 RWW/LES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			30



PLAN



† NORMAL TO END BENT

SECTION THRU SLAB

NOTES

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

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

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

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

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

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

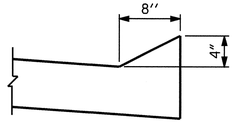
THE CONTRACTOR MAY USE 5″ CLASS "A" CONCRETE BASE IN LIEU OF 6″ COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL EXTEND 1′-0″ BEYOND THE END OF THE APPROACH SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF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

APPROACH SLAB SHALL BE POURED AFTER CONCRETE OVERLAY IS POURED.

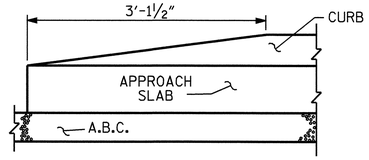
BILL OF MATERIAL
FOR 1 APPROACH SLAB
(2 REQUIRED)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	50	#4	STR	18′-11″	632 .
A2	50	#4	STR	18′-9″	626 .
.	.	.	.	.	.
* B1	69	#5	STR	24′-1″	1733 .
B2	69	#6	STR	24′-7″	2548 .
REINFORCING STEEL				LBS.	3174 .
* EPOXY COATED . REINFORCING STEEL				LBS.	2365 .
CLASS AA CONCRETE				C. Y.	33.0

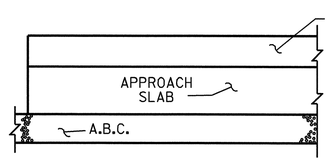
SPLICE CHART	
#4 A1	2′-0″
#4 A2	1′-9″



SECTION N-N



** END OF CURB WITHOUT SHOULDER BERM GUTTER



END OF CURB WITH SHOULDER BERM GUTTER

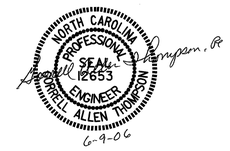
CURB DETAILS

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

SHEET 1 OF 2



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

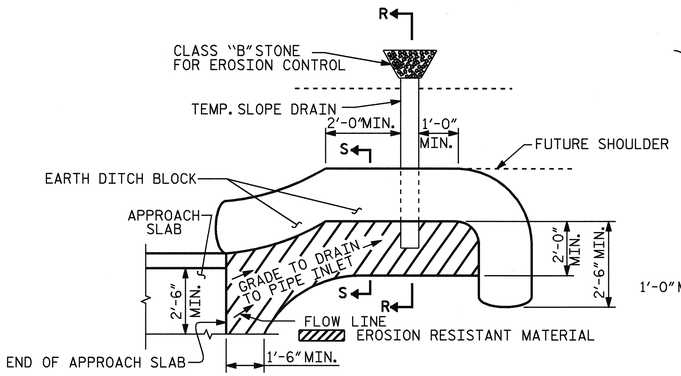
BRIDGE APPROACH SLAB
FOR PRESTRESSED CONCRETE
BOX BEAM
WITH BARRIER RAIL

ASSEMBLED BY : G. A. THOMPSON	DATE : 8/05
CHECKED BY : M. K. BEARD	DATE : 9/05
DRAWN BY : LES 8/01	REV. 5/7/03R RWW/JTE
CHECKED BY : RDR 8/01	.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			30

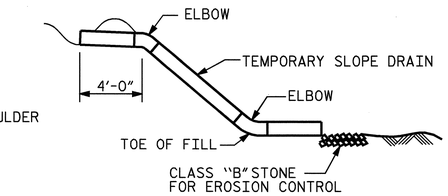
09-JUN-2006 13:32

REV. STD. NO. BA55

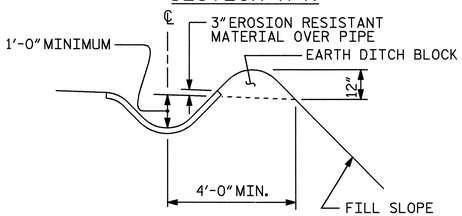


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

PLAN VIEW

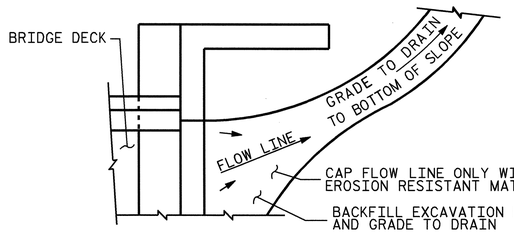


SECTION R-R



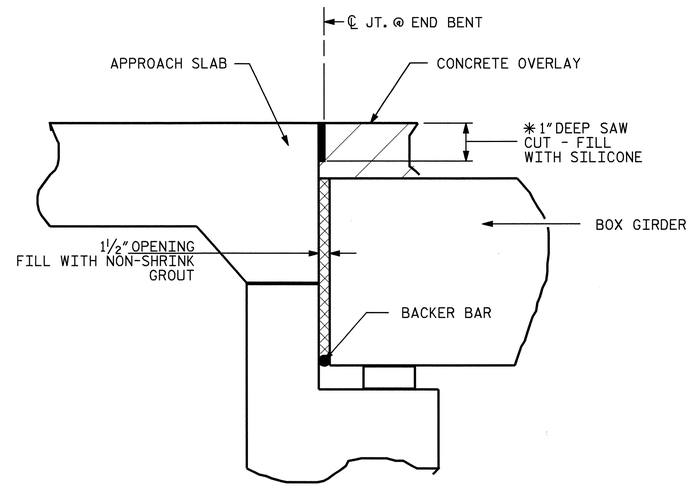
SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL



JOINT DETAIL

* SAW JOINT WITHIN 24 HOURS OF POURING APPROACH SLAB

PROJECT NO. B-4255

ROWAN COUNTY

STATION: 18+34.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 12662 ENGINEER DARRELL ALLEN THOMPSON
6-9-06

ASSEMBLED BY : G. A. THOMPSON	DATE : 8/05
CHECKED BY : M. K. BEARD	DATE : 10/05

DRAWN BY : FCJ	11/88	REV. 8/16/99	MAB/LES
CHECKED BY : ARB	11/88	REV. 10/17/00	RWW/LES
		REV. 5/7/03	RWW/JTE

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

09-JUN-2006 13:32
L:\STRUCTØ1\b4255\FINALPØ1\B-4255Ø2.DGN
athompson

STD. NO. BAS10

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF	
STRUCTURAL STEEL - AASHTO M270 GRADE 36	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION GRADE 60	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR UNTREATED - EXTREME FIBER STRESS	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2002 STANDARD SPECIFICATIONS "FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED WITH THE EXCEPTION OF #2 BARS WHICH MAY BE FABRICATED FROM COLD DRAWN STEEL WIRE. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

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

STRUCTURAL STEEL:

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

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN

REV. 6-16-95 EEM ω RGW REV. 6-27-02 RWW ω JTE
REV. 9-16-99 RWW ω LES