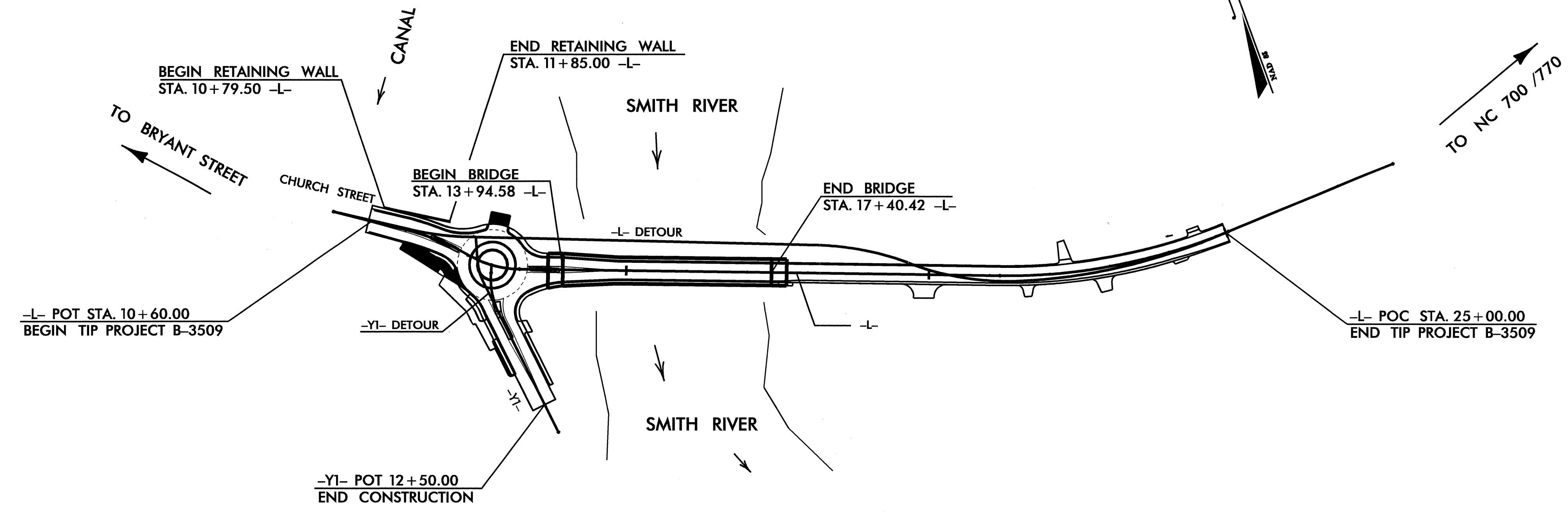
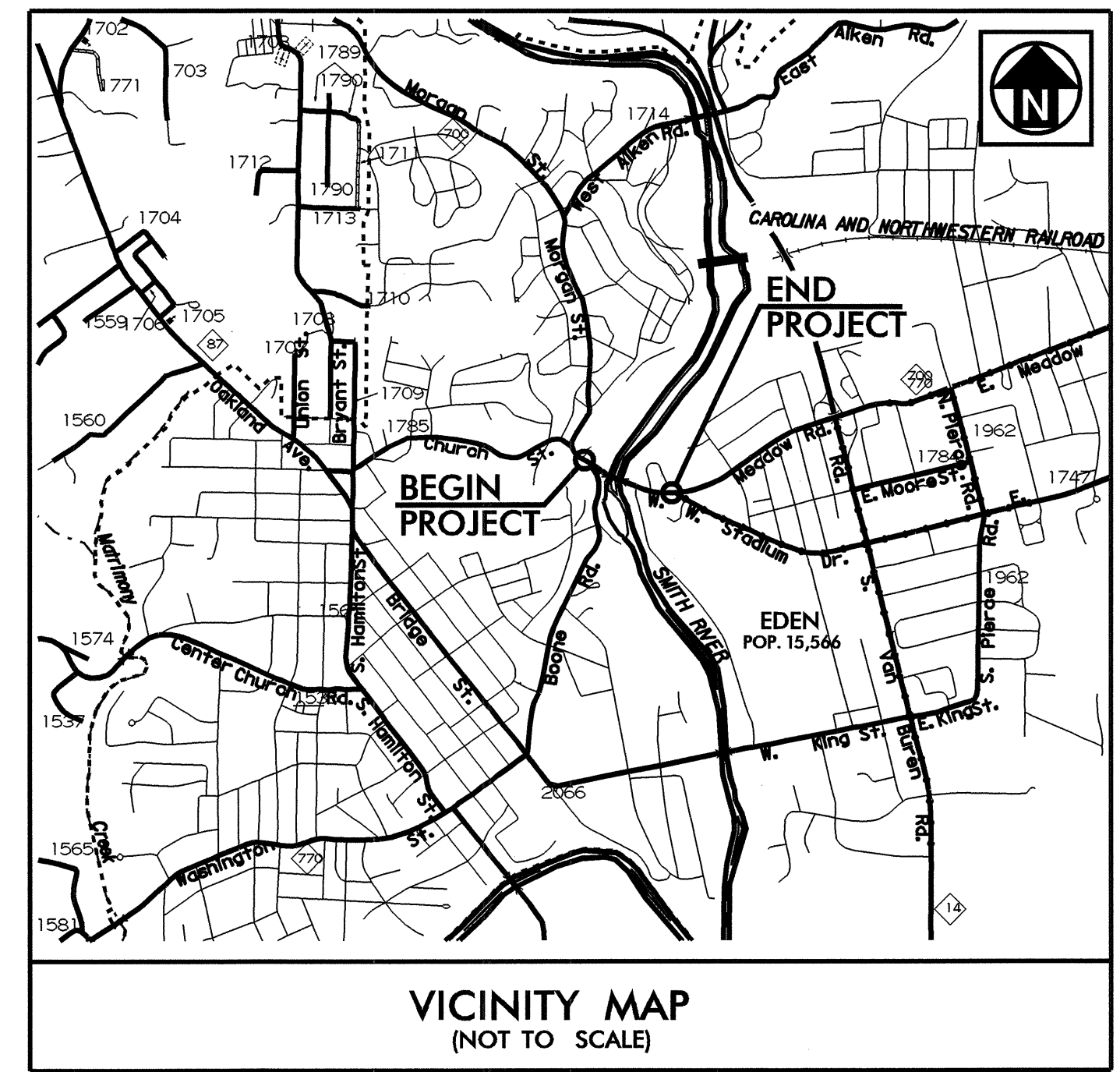


STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3509		
WBS NO.	F.A. PROJ. NO.	DESCRIPTION	
33122.1.1	BRSTP-700(1)	P.E.	
33122.2.2	BRSTP-700(1)	R/W, UTIL	
33122.3.2	BRSTP-700(2)	CONSTRUCTION	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROCKINGHAM COUNTY

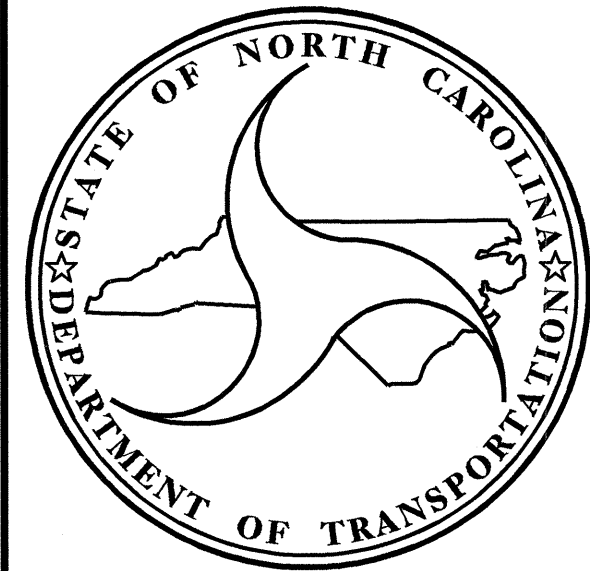
LOCATION: BRIDGE NO. 75 OVER SMITH RIVER AND APPROACHES ON SR 3003 (MEADOW ROAD)
TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURES, RETAINING WALL AND TEMPORARY SIGNAL



STRUCTURES

TIP: B-3509

CONTRACT: C201290



DESIGN DATA

ADT 2005 =	13,985
ADT 2025 =	17,835
DHV =	12%
D =	60%
T =	4% *
V =	40 mph

* (Duals = 3% + TTST = 1%)

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-3509	=	0.207 MILE
LENGTH STRUCTURES TIP PROJECT B-3509	=	0.065 MILE
TOTAL LENGTH TIP PROJECT B-3509	=	0.272 MILE

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

2002 STANDARD SPECIFICATIONS

R. M. GIROLAMI, P.E.
PROJECT ENGINEER

D. R. ANDERSON, P.E.
PROJECT DESIGN ENGINEER

LETTING DATE:
MAY 16, 2006

STRUCTURE DESIGN UNIT

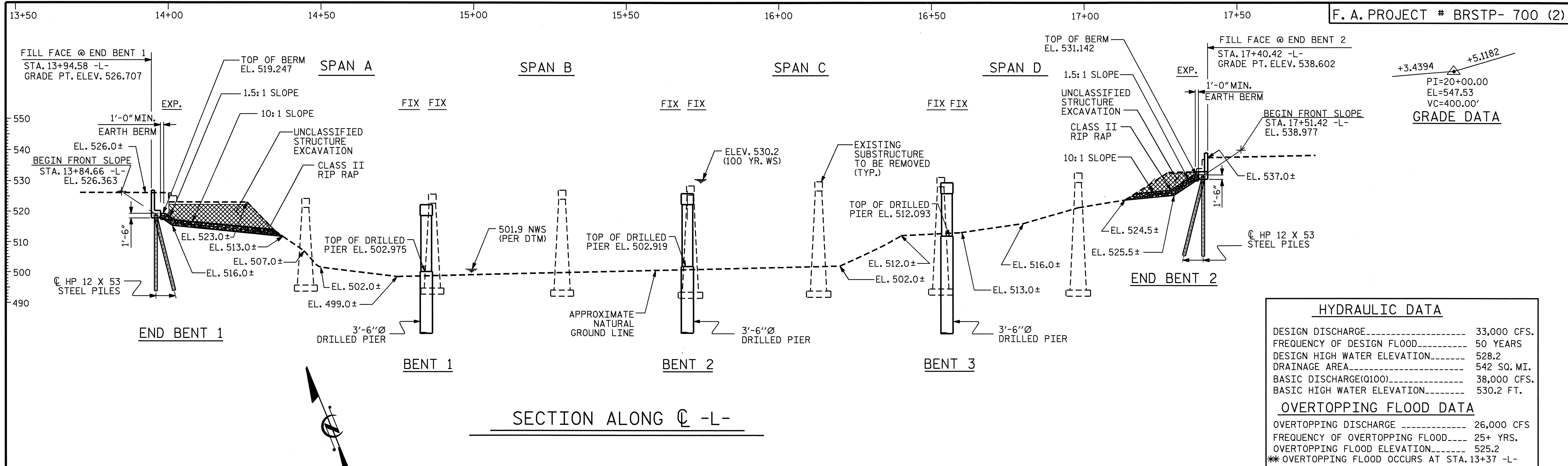
Gregory R. Perrett
4.4.06

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY ENGINEER - DESIGN
**DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION**

APPROVED FOR
DIVISION ADMINISTRATOR

DATE



GRADE DATA

PI=20+00.00	EL=547.53	VC=400.00'
+3.4394	+5.1182	

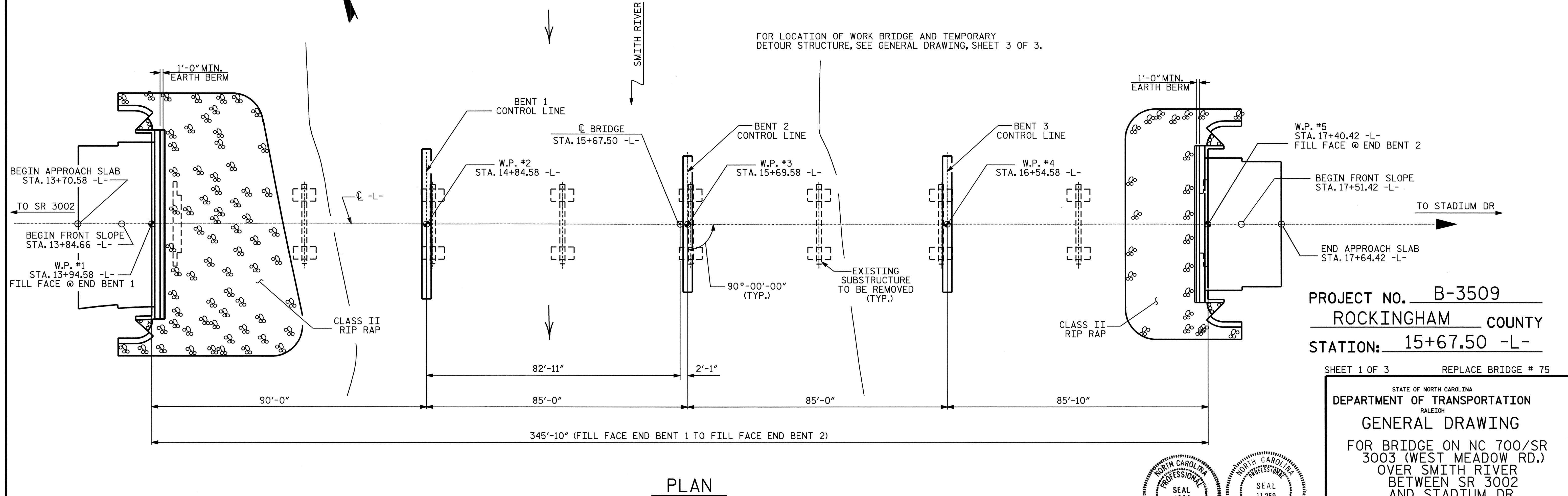
HYDRAULIC DATA

DESIGN DISCHARGE	33,000 CFS.
FREQUENCY OF DESIGN FLOOD	50 YEARS
DESIGN HIGH WATER ELEVATION	528.2
DRAINAGE AREA	542 SQ. MI.
BASIC DISCHARGE(Q100)	38,000 CFS.
BASIC HIGH WATER ELEVATION	530.2 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	26,000 CFS
FREQUENCY OF OVERTOPPING FLOOD	25+ YRS.
OVERTOPPING FLOOD ELEVATION	525.2

* OVERTOPPING FLOOD OCCURS AT STA. 13+37 -L-



PROJECT NO. B-3509
 ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

SHEET 1 OF 3 REPLACE BRIDGE # 75

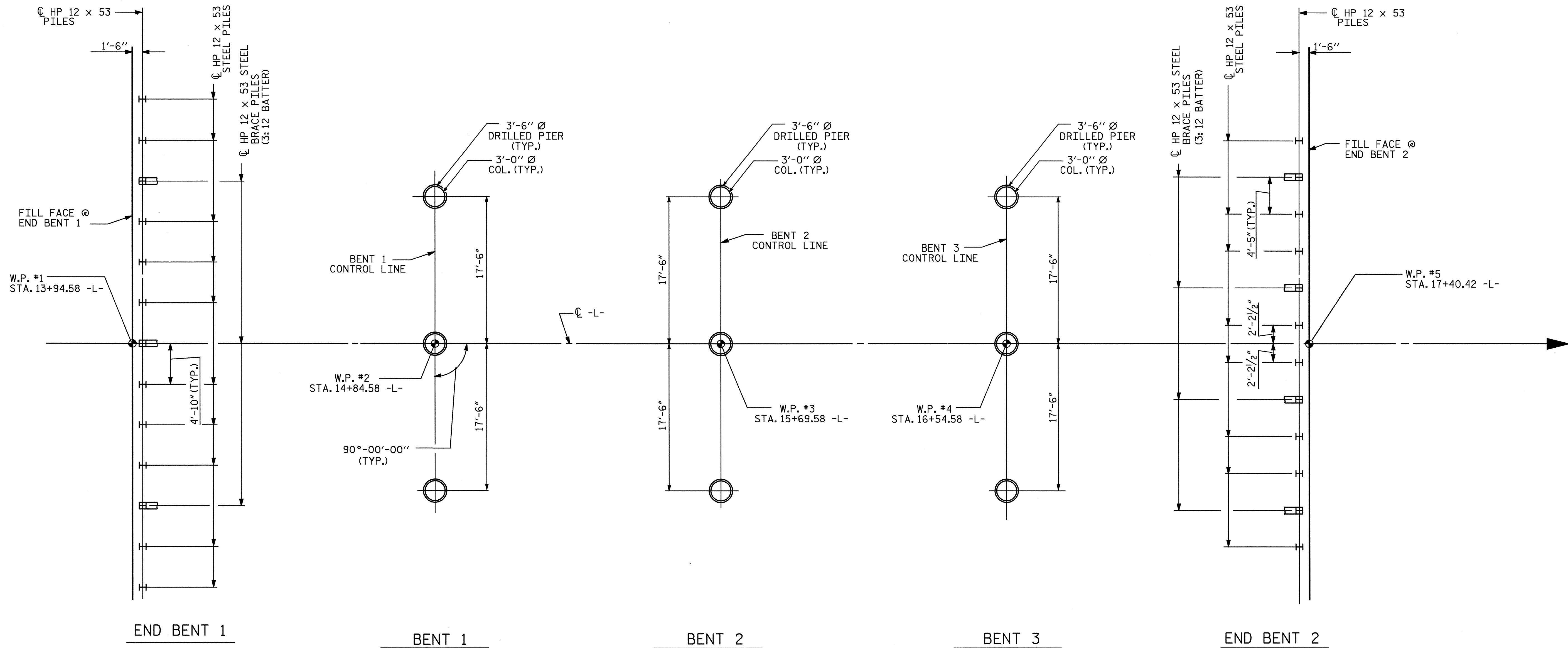
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON NC 700/SR
 3003 (WEST MEADOW RD.)
 OVER SMITH RIVER
 BETWEEN SR 3002
 AND STADIUM DR.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTALS
2			4			50

PROFESSIONAL ENGINEER
 SEAL 9804
 ROY M. BLOOM
 3-31-06

PROFESSIONAL ENGINEER
 SEAL 11259
 DAVID R. ANDERSON
 3/30/06

DRAWN BY : S.M. RASHIDI DATE : 8-12-03
 CHECKED BY : T. A. WALTER DATE : 9-16-03



FOUNDATION LAYOUT
 (DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE)

PROJECT NO. B-3509
ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-
 SHEET 2 OF 3



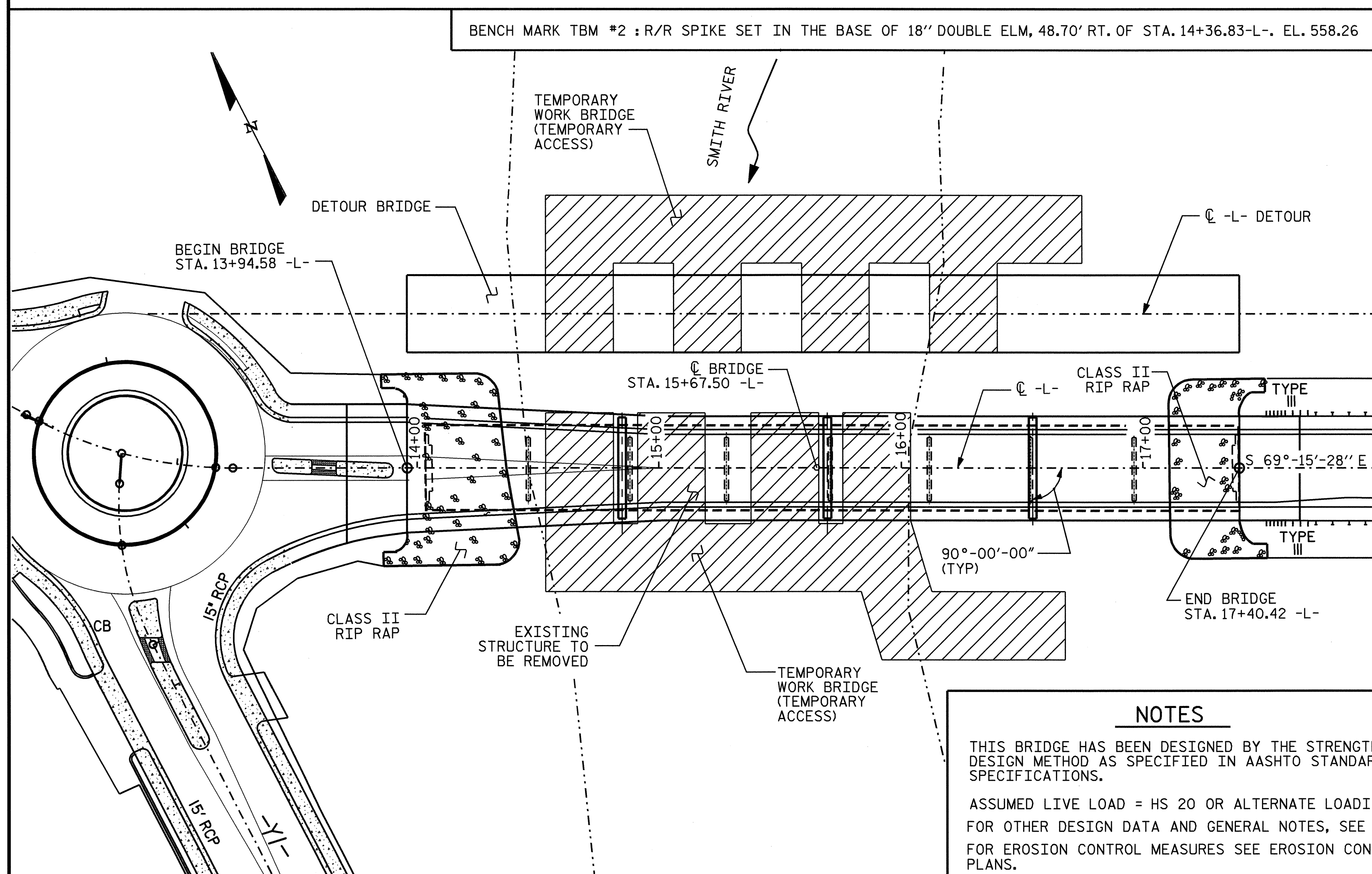
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON NC 700/SR
 3003 (WEST MEADOW RD.)
 OVER SMITH RIVER BETWEEN
 SR 3002 AND STADIUM DR.

DRAWN BY : N.Q. TRAN DATE : 10-04
 CHECKED BY : S.M. RASHIDI DATE : 1-16-05

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			5-2
2			4			TOTAL SHEETS 53

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE	CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	3'-6" DIA. DRILLED PIERS IN SOIL	3'-6" DIA. DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-6" DIA. DRILLED PIERS	SID INSPECTION	CROSSHOLE SONIC LOGGING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS	HP 12 X 53 STEEL PILES	PLAIN RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS	STRUCTURE DRAINAGE SYSTEM	TEMPORARY 8-INCH WATER MAIN	16-INCH WATER MAIN	FIBERGLASS TELEPHONE CONDUITS	CLASSIC CONCRETE BRIDGE RAIL	
	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	CU.YDS.	SQ. FT.	SQ. FT.	CU.YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	TONS	SQ. YARDS	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.
SUPERSTRUCTURE	LUMP SUM	LUMP SUM								16026.2	12060		LUMP SUM			20	1704.17				LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	687.70
END BENT NO. 1									477			35.3		5537			13	325	293	325							
BENT NO. 1				12	21	12	1	1				33.7		14696	1950												
BENT NO. 2				17	31	15	1	1				36.0		16714	2456												
BENT NO. 3				38	25	42						31.1		16417	2351												
END BENT NO. 2									124			30.1		4708			12	240	171	190							
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	67	77	69	2	2	601	16026.2	12060	166.2	LUMP SUM	58072	6757	20	1704.17	25	565	464	515	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	687.70



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

THE DRILLED PIERS AT BENT NO. 1, 2 AND 3 HAVE BEEN DESIGNED FOR BOTH SKIN FRICTION AND TIP BEARING. THE REQUIRED TIP BEARING CAPACITY IS 20 TONS/SF.

THE REQUIRED TIP BEARING CAPACITY FOR BENTS NO. 1, 2 AND 3 SHALL BE VERIFIED.

DRILLED PIERS FOR BENT NO. 1 HAVE BEEN DESIGNED FOR AN APPLIED LOAD OF 380 TONS EACH AT THE TOP OF THE COLUMN.

DRILLED PIERS FOR BENT NO. 2 AND 3 HAVE BEEN DESIGNED FOR AN APPLIED LOAD OF 365 TONS EACH AT THE TOP OF THE COLUMN.

PERMANENT STEEL CASING IS REQUIRED FOR DRILLED PIERS AT BENT NO. 1. THE CASING SHALL NOT EXTEND BELOW ELEVATION 499.0 FEET WITHOUT THE ENGINEER'S PERMISSION.

PERMANENT STEEL CASING IS REQUIRED FOR DRILLED PIERS AT BENT NO. 2. THE CASING SHALL NOT EXTEND BELOW ELEVATION 498.0 FEET WITHOUT THE ENGINEER'S PERMISSION.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 3. IF REQUIRED, THE CASING SHALL NOT EXTEND BELOW ELEVATION 498.0 FEET WITHOUT THE ENGINEER'S PERMISSION. THE NEED FOR PERMANENT STEEL CASING WILL BE DETERMINED BY THE ENGINEER.

ALL OF THE DRILLED PIERS SHALL HAVE A MINIMUM DIAMETER OF 42". THE INSIDE DIAMETER OF PERMANENT STEEL CASING SHALL BE LARGE ENOUGH TO PROVIDE FOR 42" DIAMETER DRILLED PIERS.

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

DRILLED PIERS AT BENT NO. 1 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 492.0 FEET. AND SATISFY THE REQUIRED TIP BEARING CAPACITY. AND HAVE A MINIMUM PENETRATION OF 7.0 FEET INTO ROCK AS DEFINED BY DRILLED PIERS SPECIAL PROVISIONS.

DRILLED PIERS AT BENT NO. 2 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 491.0 FEET. AND SATISFY THE REQUIRED TIP BEARING CAPACITY.

DRILLED PIERS AT BENT NO. 3 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 491.0 FEET. AND SATISFY THE REQUIRED TIP BEARING CAPACITY.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

THE SCOUR CRITICAL ELEVATION FOR BENTS NO. 1, 2 & 3 IS, RESPECTIVELY, ELEVATION 497.2, 493.1, AND 497.8 FT. THE SCOUR CRITICAL ELEVATION IS FOR USE BY MAINTENANCE FORCES TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

SPT TESTING IS NOT REQUIRED TO DETERMINE THE TIP BEARING CAPACITY OF THE DRILLED PIERS AT BENTS NO. 1, 2 AND 3.

SLURRY CONSTRUCTION WILL NOT BE USED FOR THIS PROJECT.

SID INSPECTIONS MAY BE REQUIRED TO DETERMINE THE BOTTOM CLEANLINESS OF THE DRILLED PIERS AT BENTS NO. 1, 2 AND 3. FOR SID INSPECTIONS, SEE DRILLED PIER SPECIAL PROVISIONS

CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR THE DRILLED PIERS AT BENTS NO. 1, 2 AND 3. SEE SPECIAL PROVISION FOR CROSSHOLE SONIC LOGGING.

PILES FOR END BENTS NO. 1 AND 2 SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 60 TONS EACH.

WHEN DRIVING PILES, THE MAXIMUM BLOW COUNT SHALL NOT BE EXCEEDED.

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 THE DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

THE EXISTING BRIDGE CONSISTING OF 8 SPANS @ 42.3 FT. REINFORCED CONCRETE GIRDERS WITH A CONCRETE DECK ON POST & BEAM BENTS WITH SPILL THROUGH ABUTMENTS, 28 FT. CLEAR ROADWAY AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 33 FT. AT END BENT 1 AND 28 FT. AT END BENT 2 EACH SIDE OF CENTERLINE ROADWAY AND AS DIRECTED BY ENGINEER. THIS WORK WILL BE MEASURED AND PAID FOR AS UNCLASSIFIED STRUCTURE EXCAVATION.

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN, AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STATION 15+67.50 -L- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE.

FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 15+67.50 -L-, SEE SPECIAL PROVISIONS.

FOR CRANE SAFTY, SEE SPECIAL PROVISIONS.

FOR STRUCTURE DRAINAGE SYSTEM, SEE SPECIAL PROVISIONS.

FOR TEMPORARY 8 INCH WATER MAIN, SEE SPECIAL PROVISIONS.

FOR 16 INCH WATER MAIN, SEE SPECIAL PROVISIONS.

FOR FIBERGLASS TELEPHONE CONDUITS, SEE SPECIAL PROVISIONS.

FOR CLASSIC CONCRETE BRIDGE RAIL, SEE SPECIAL PROVISIONS.

PROJECT NO. **B-3509**
ROCKINGHAM COUNTY
 STATION: **15+67.50 -L-**

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON NC 700/SR
 3003 (WEST MEADOW RD.)
 OVER SMITH RIVER BETWEEN
 SR 3002 AND STADIUM DR.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			53

NOTES

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

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 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 STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES FOR SEISMIC PERFORMANCE CATEGORY A.

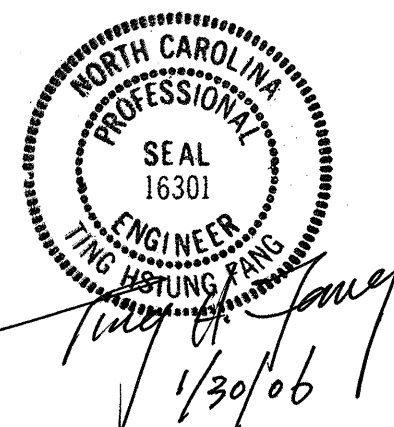
REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 402-3 OF THE STANDARD SPECIFICATIONS.

FOR STEEL H PILES, SEE SPECIAL PROVISIONS.

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 THIRTH BAR DIAMETERS.

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

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



DRAWN BY : N.Q. TRAN / THF DATE : 7-05
 CHECKED BY : M.A. ALLEN DATE : 7-05

20-144-2006-05-22
 C:\Structur\as\Temp\Microstation\350901bk.dgn
 dander son

NOTES

FOR FABRICATED METAL STAY-IN-PLACE FORMS, SEE SPECIAL PROVISIONS.

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE DIAPHRAGMS AND THE NUTS ON THE 1/4" DIA. TIE RODS SHALL BE FULLY TIGHTENED BEFORE THE DIAPHRAGMS ARE CAST. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED. THE TIE RODS SHALL BE RE-TIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.

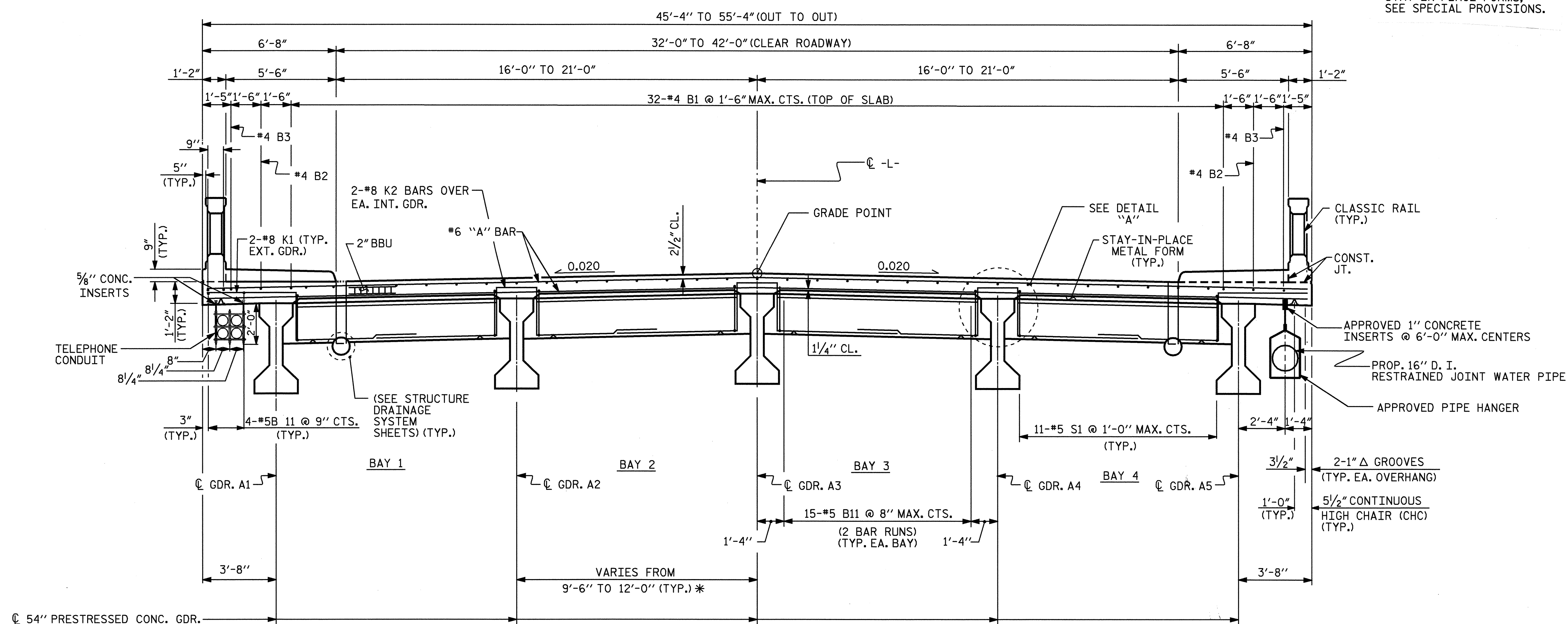
CLASSIC CONCRETE BRIDGE RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

CONCRETE IN INTERMEDIATE DIAPHRAGMS MAY BE CLASS A IN LIEU OF CLASS AA. PAYMENT SHALL BE MADE UNDER THE UNIT CONTRACT PRICE FOR REINFORCED CONCRETE DECK SLAB.

PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.

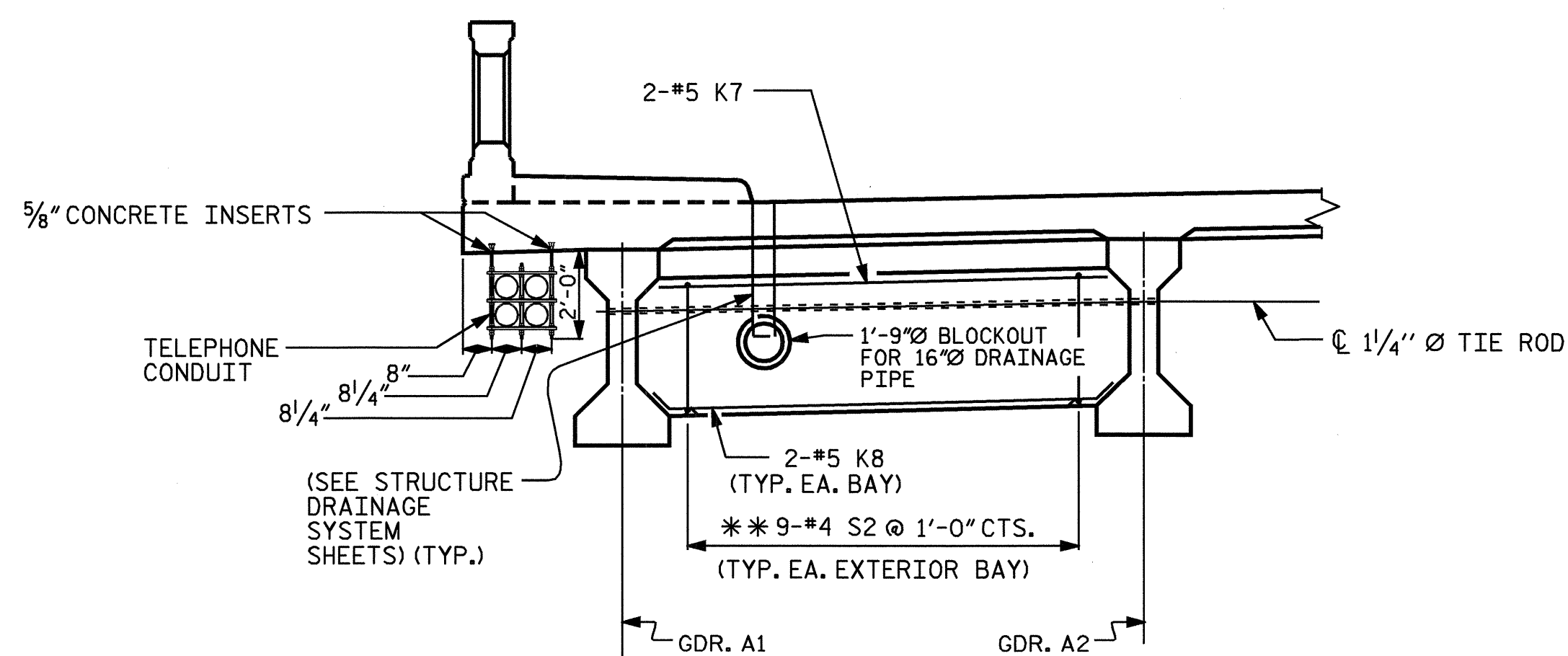
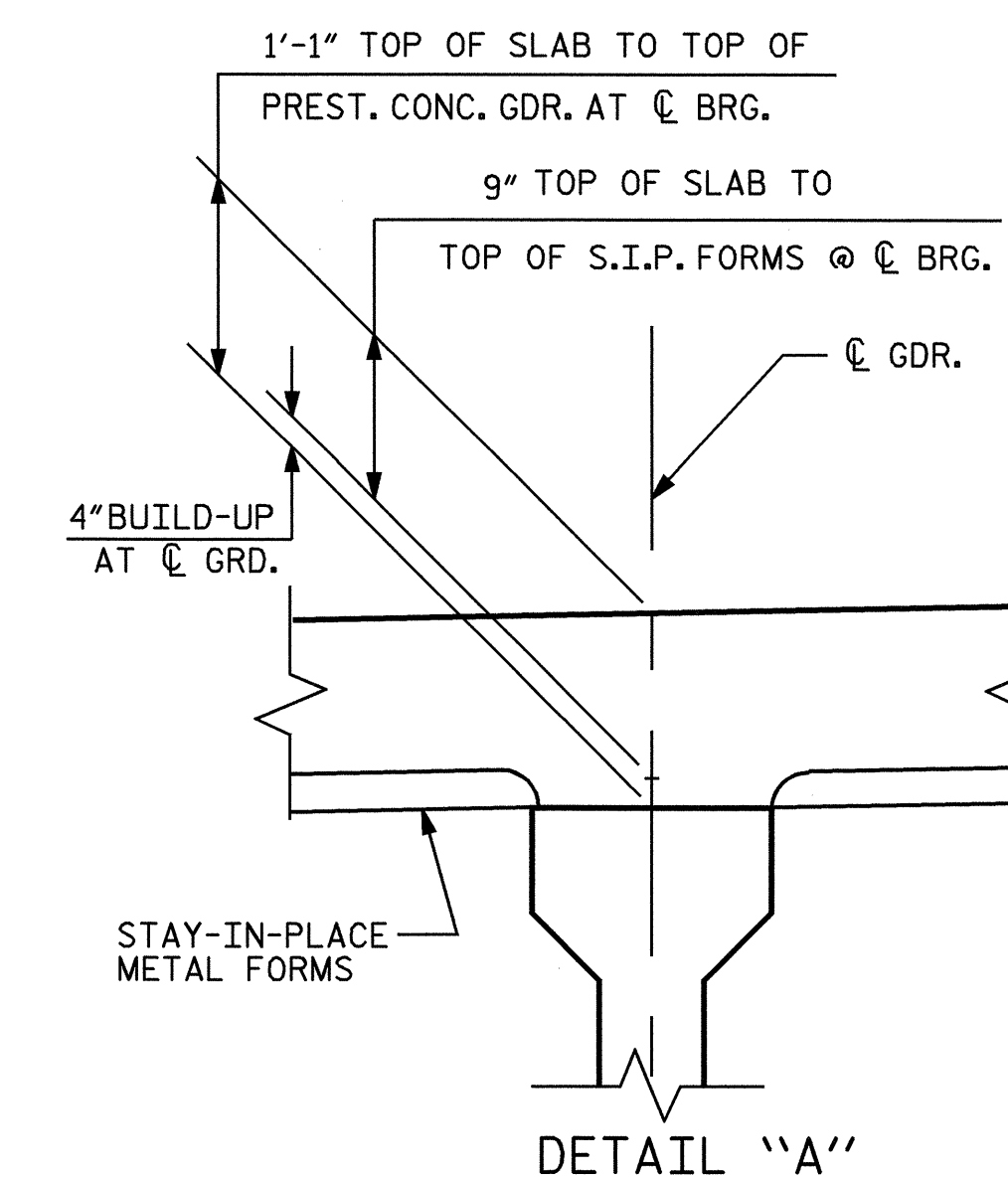
FOR CLASSIC CONCRETE BRIDGE RAIL REINFORCING STEEL AND DETAILS, SEE "CLASSIC CONCRETE BRIDGE RAIL" SHEETS.

CENTER STRUCTURAL DRAINAGE SYSTEM IN BLOCKOUTS IN BENT AND INTERMEDIATE DIAPHRAGMS AND FILL ANNULAR SPACE AROUND DRAIN PIPE WITH JOINT FILLER IN ACCORDANCE WITH STANDARD SPECIFICATIONS ARTICLE 1028-1.



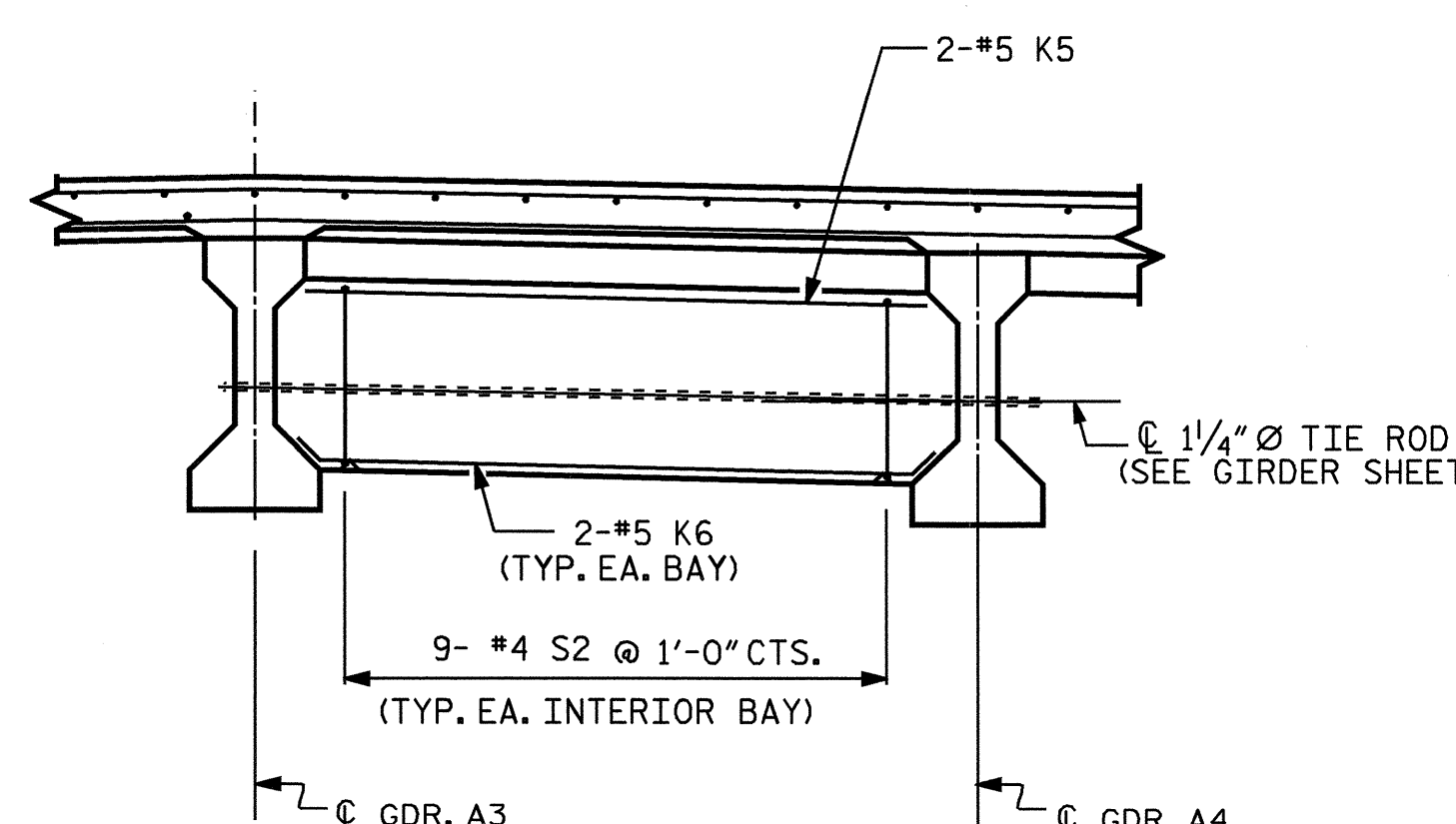
TYPICAL SECTION

SHOWING END BENT 1 DIAPHRAGMS
* DIMENSIONS SHOWN ARE AT C JOINT OF END BENT 1 & BENT 1 CONTROL LINE.



EXTERIOR

** S2 BARS MAY BE SHIFTED TO MISS DRAIN SYSTEM (LEFT SIDE SHOWN RIGHT SIDE SIM.)



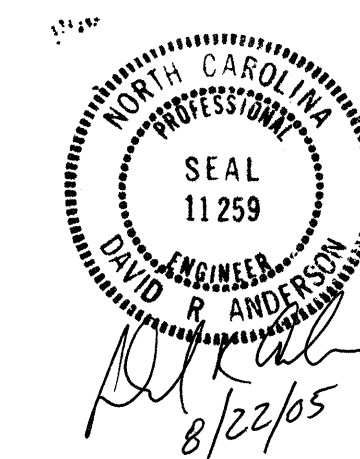
INTERIOR

PART TYPICAL SECTION

SHOWN SPAN A INTERMEDIATE DIAPHRAGM

DRAWN BY : S. M. RASHIDI DATE : 6/23/04
CHECKED BY : M. A. ALLEN DATE : 2-05

17-AUG-2005 07:53
RA\STRUCT\Ncarshid\MICROS\drawing\B-3509\22.DGN
mallen



PROJECT NO. B-3509
ROCKINGHAM COUNTY
STATION: 15+67.50 -L-

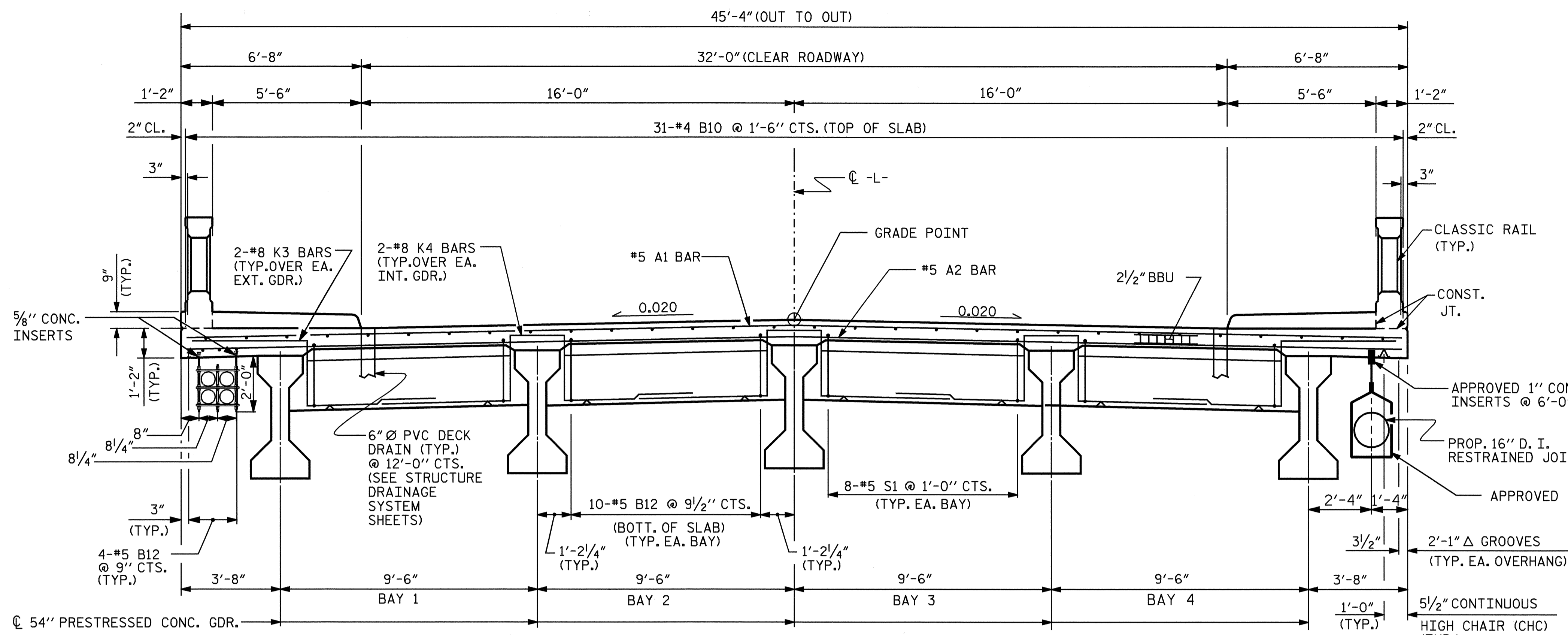
SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

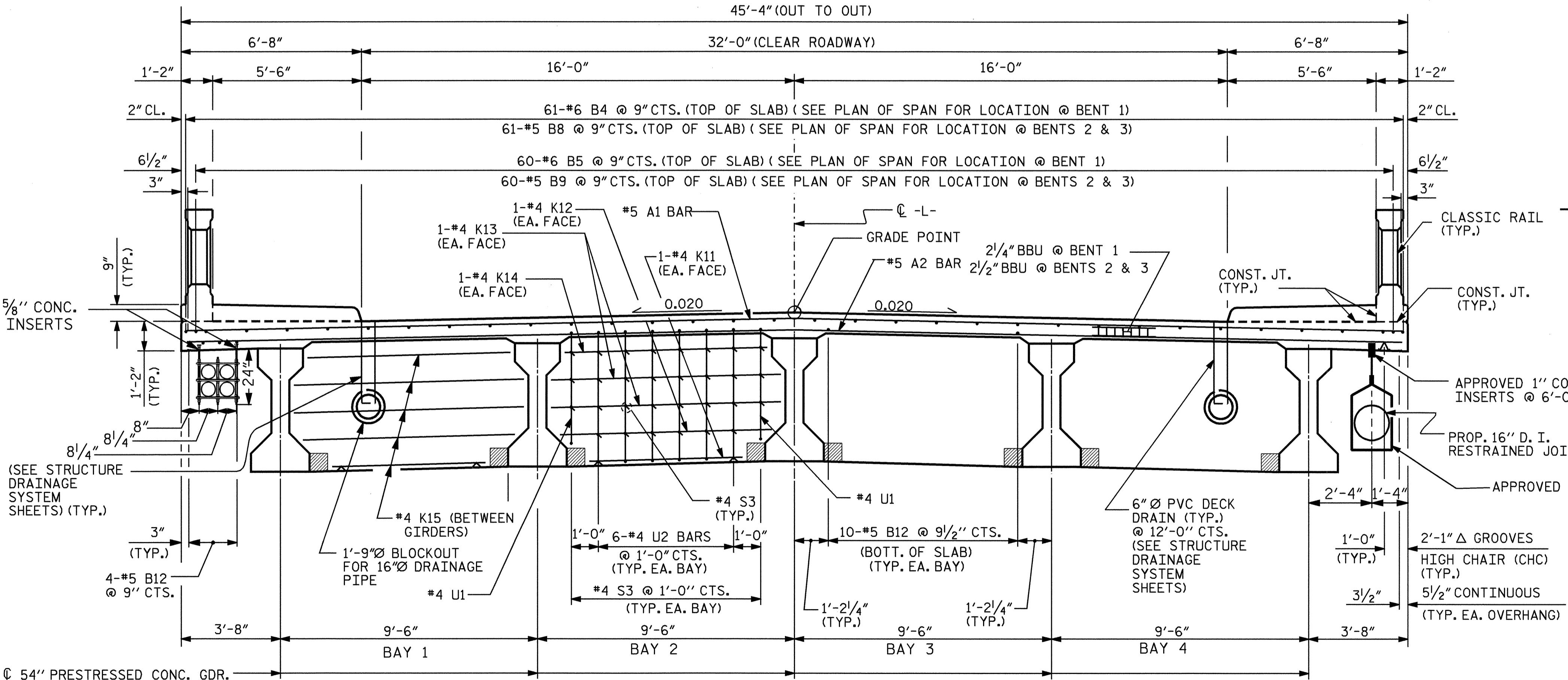
TYPICAL SECTION
SPAN A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			53

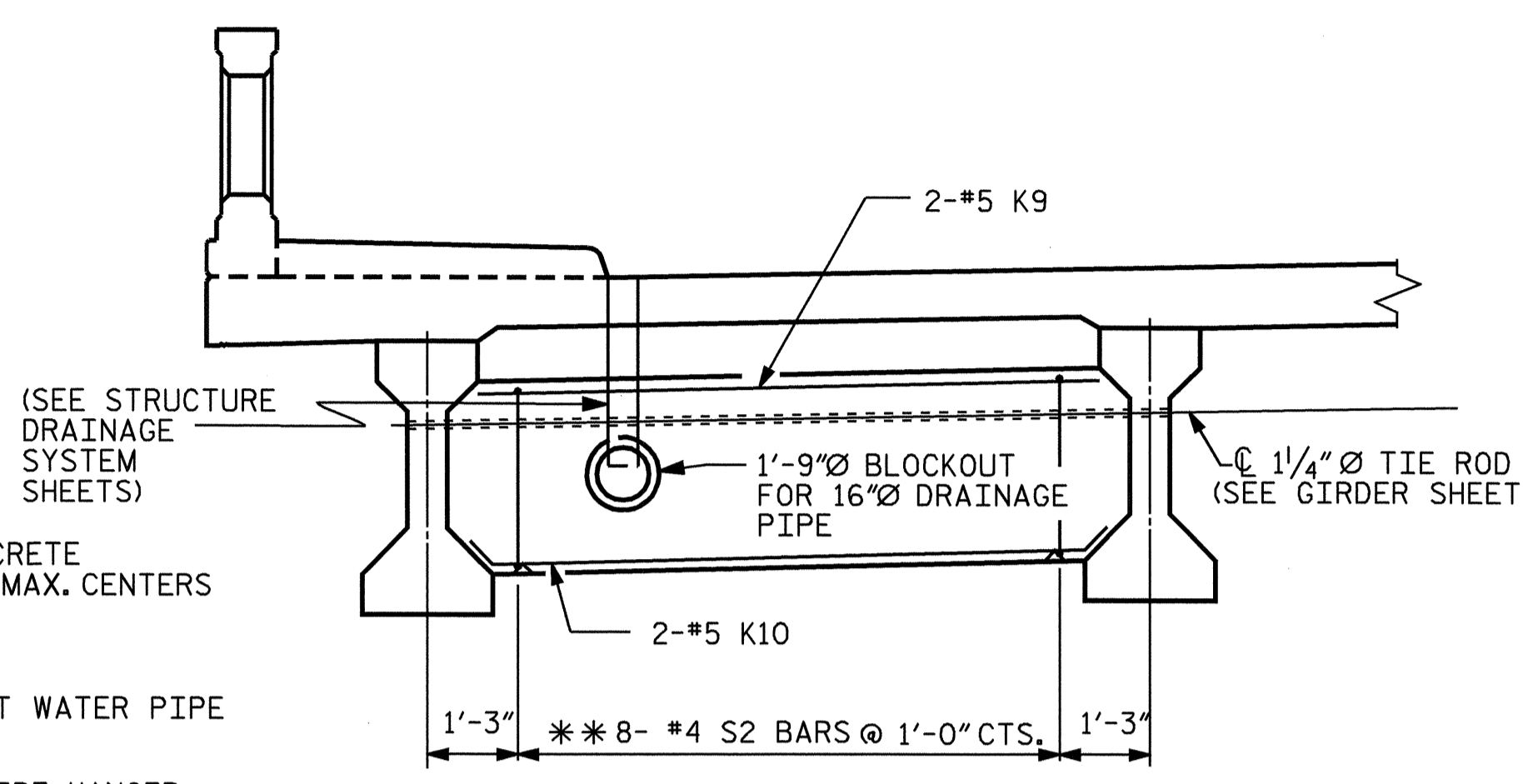
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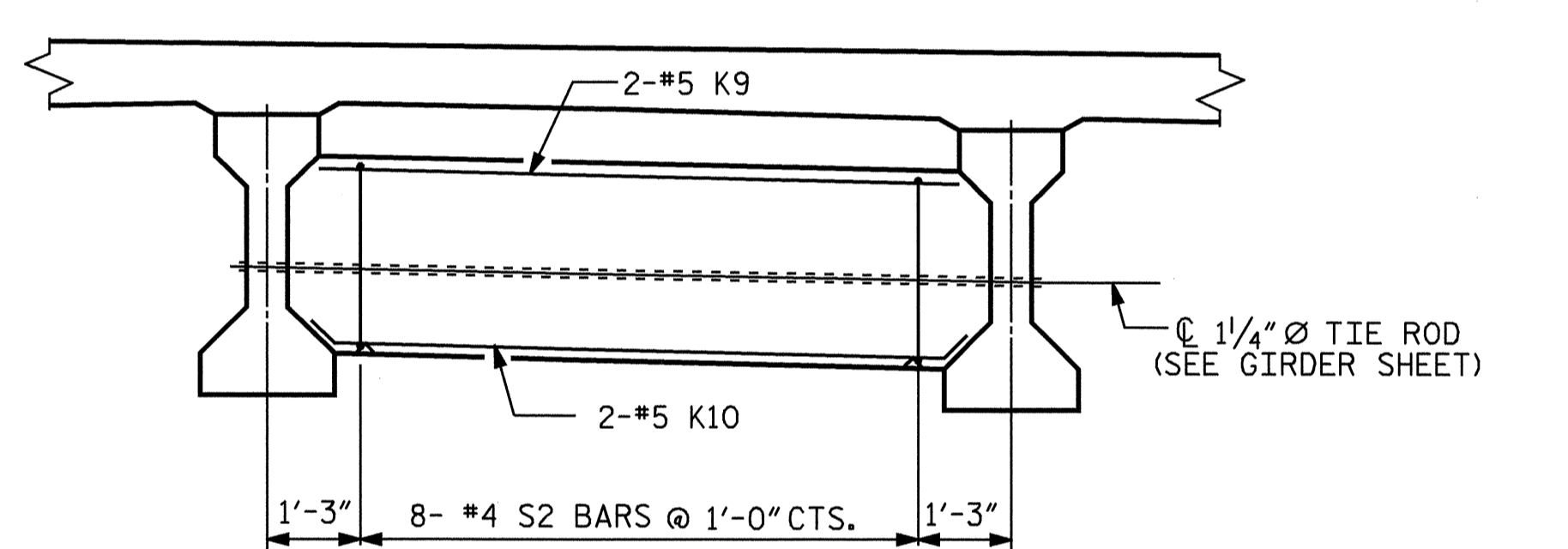
TYPICAL SECTION
SHOWING END BENT 2 DIAPHRAGMS



TYPICAL SECTION
SHOWING BENT DIAPHRAGMS
(REINFORCING STEEL IN BENT DIAPHRAGMS
MAY BE SHIFTED TO MISS DRAINAGE SYSTEM.)

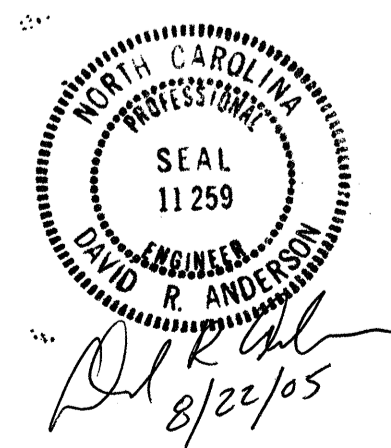


TYPICAL INTERMEDIATE DIAPHRAGM
EXTERIOR @ SPAN B & C
**S2 MAY BE SHIFTED TO MISS DRAIN SYSTEM.



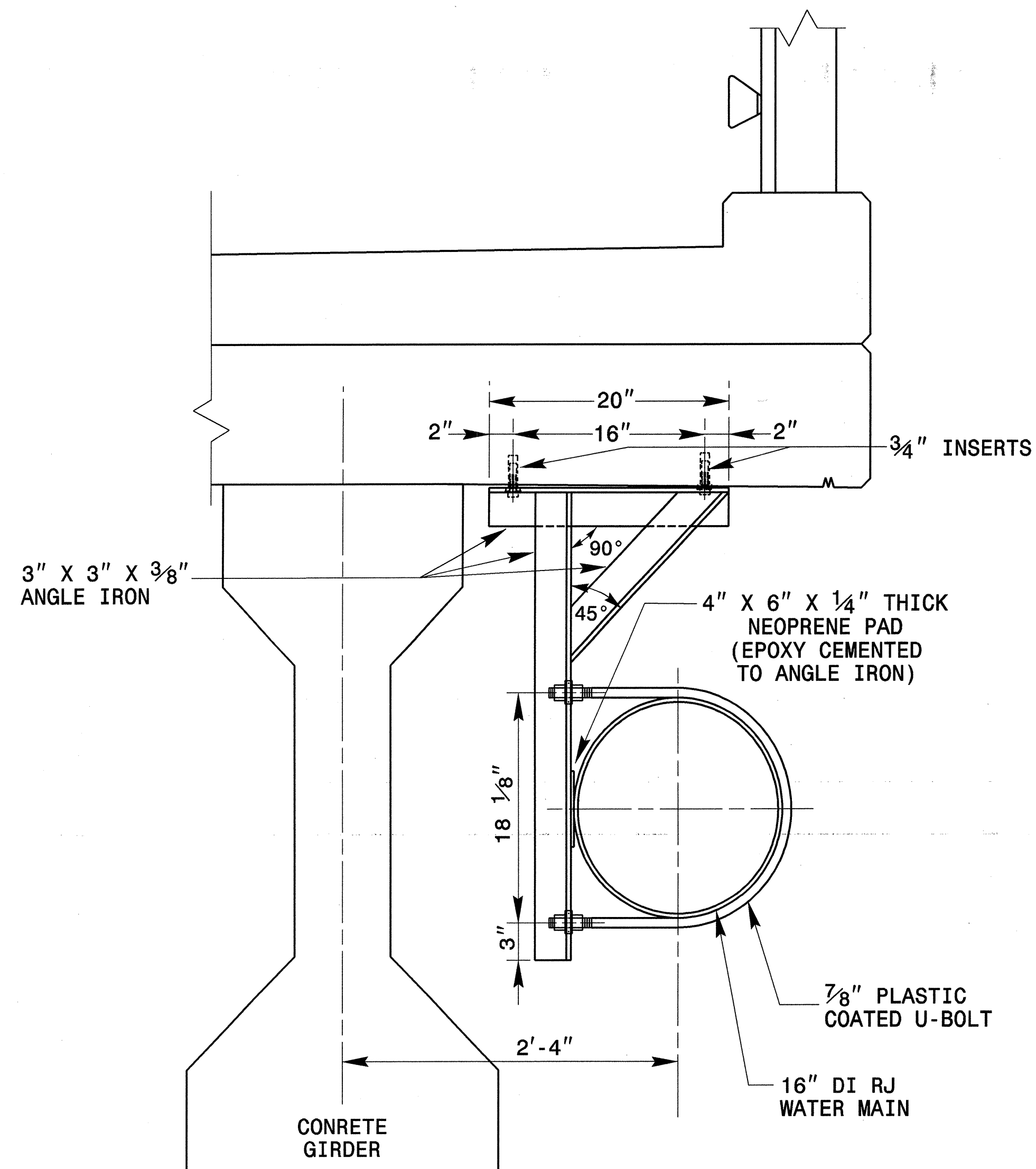
TYPICAL INTERMEDIATE DIAPHRAGM
INTERIOR @ SPAN B,C & D
EXTERIOR @ SPAN D

PROJECT NO. B-3509
ROCKINGHAM COUNTY
STATION: 15+67.50 -L-
SHEET 2 OF 3



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
TYPICAL SECTION SPANS B, C, & D					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-5
					TOTAL SHEETS 53

DRAWN BY: S. M. RASHIDI DATE: 6/23/04
CHECKED BY: M. A. ALLEN DATE: 2-05



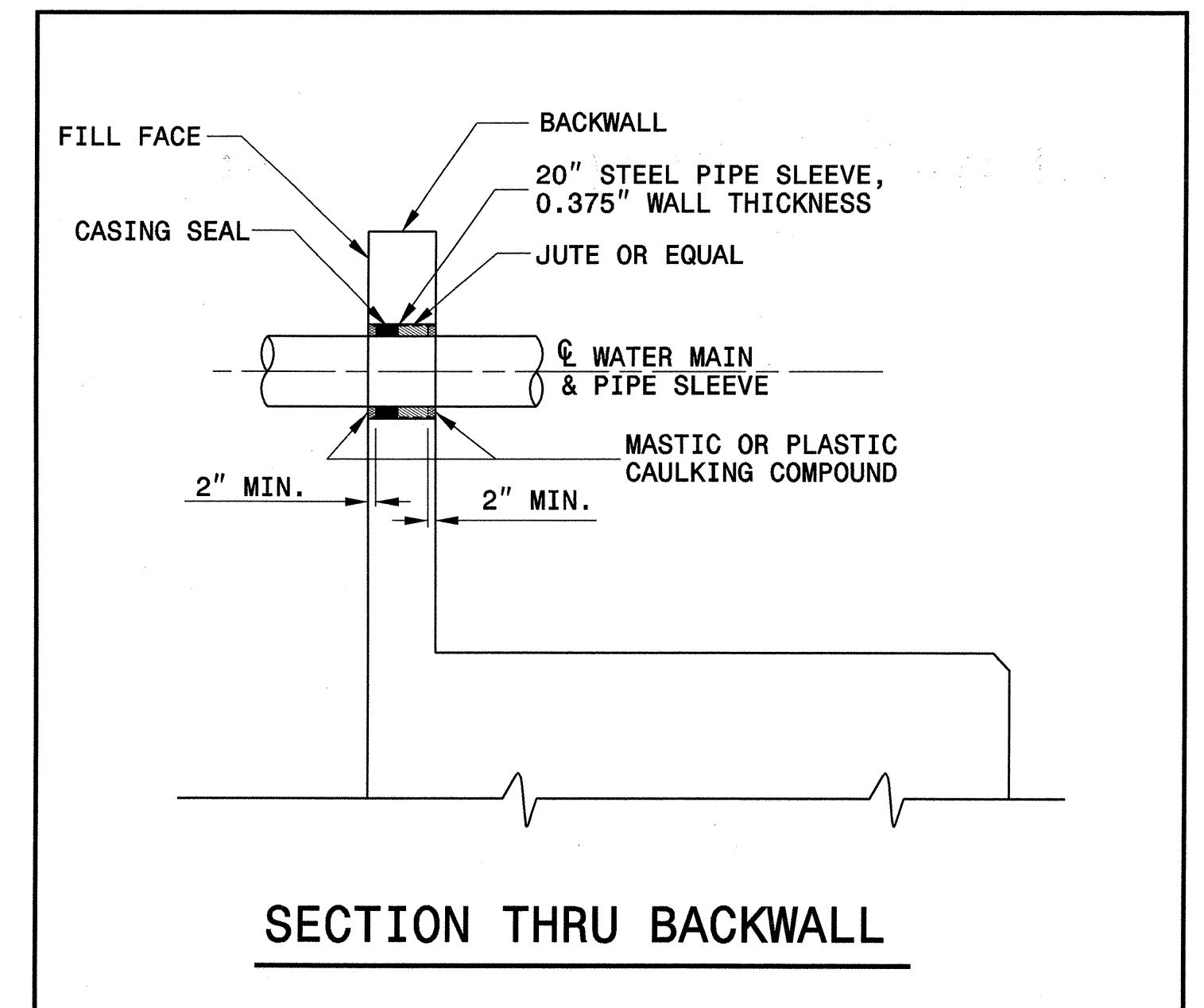
LATERAL BRACE DETAIL

NOTES

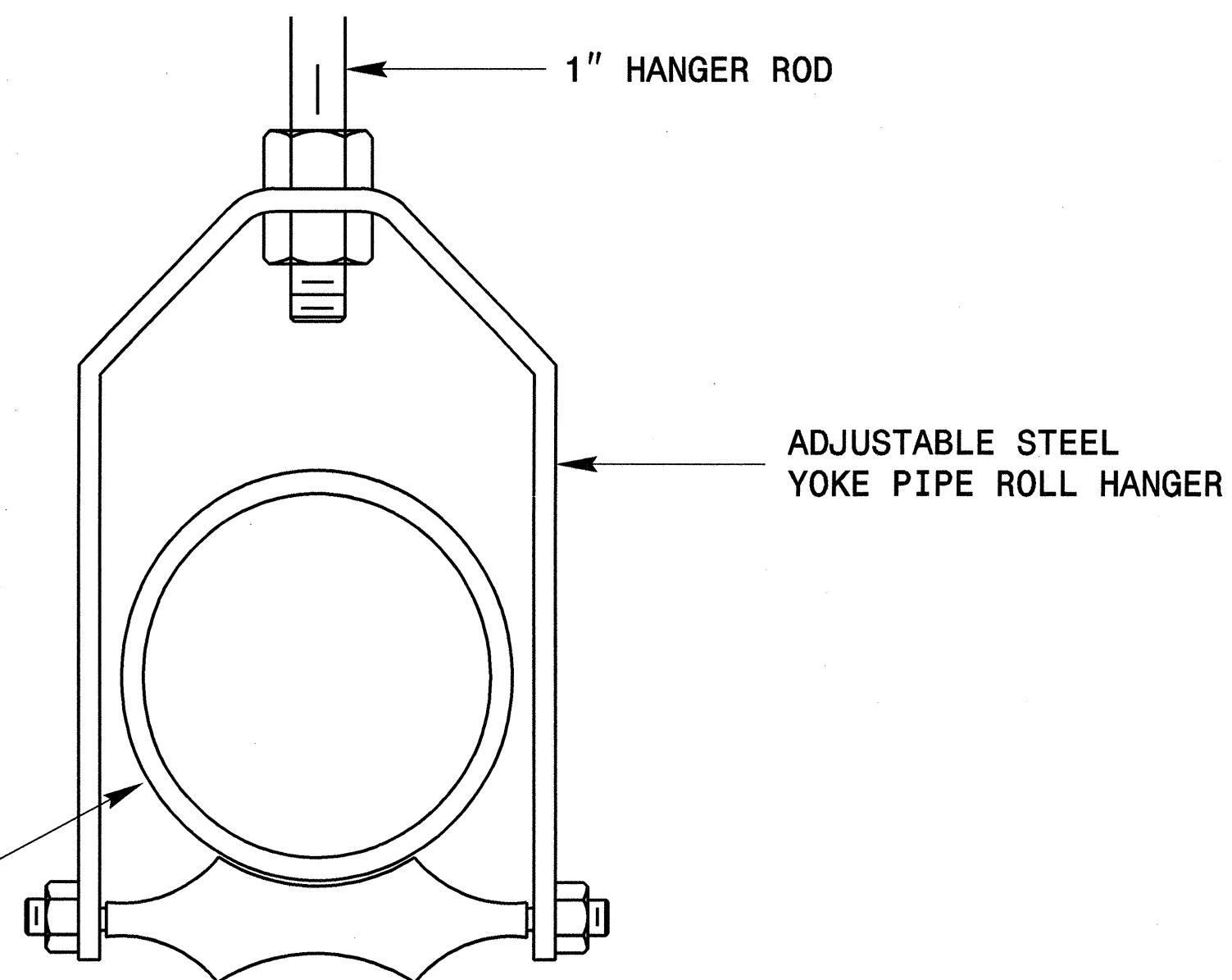
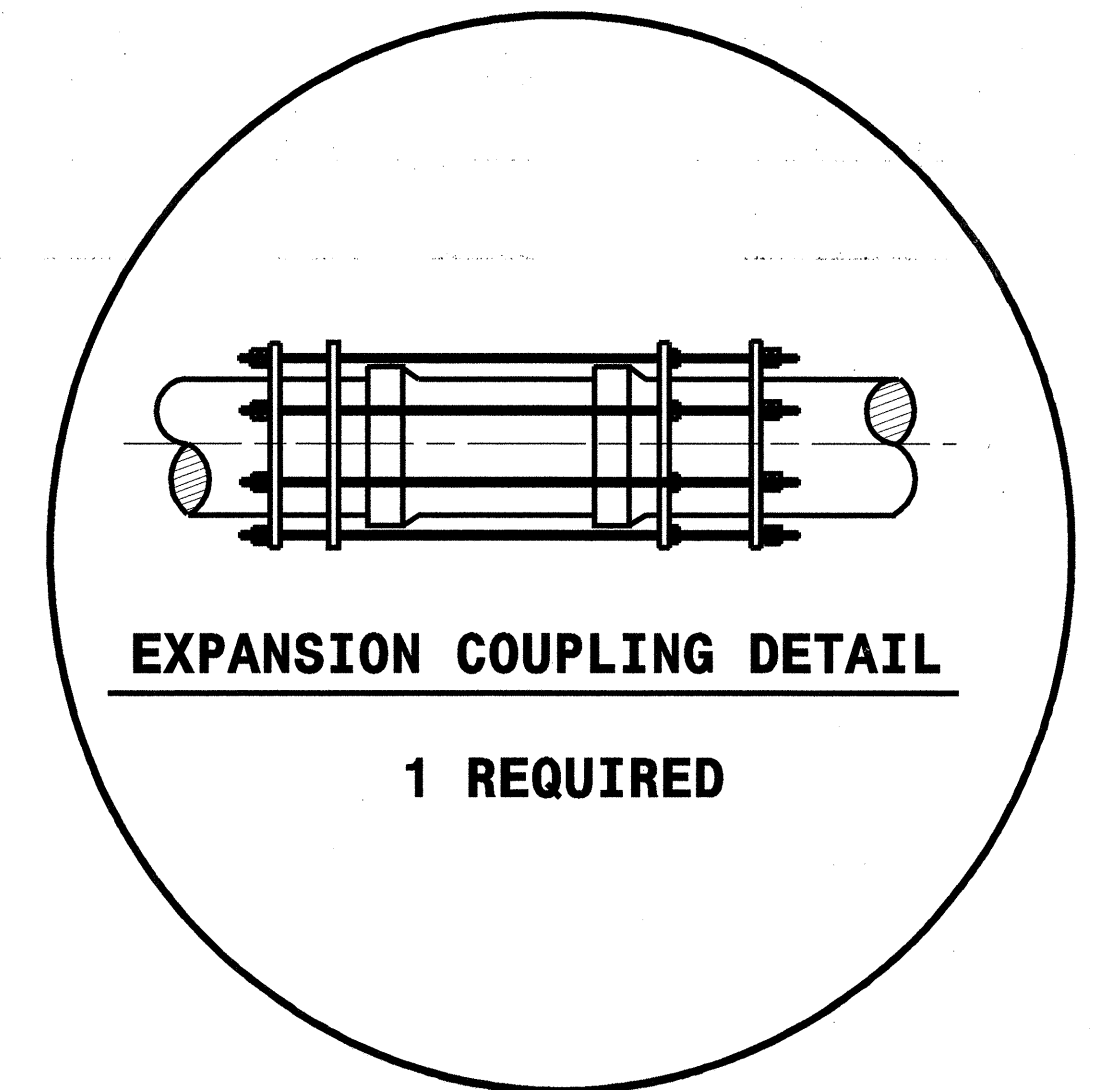
1. ANGLES SHALL BE CONNECTED BY ARC WELDING.
2. HOLES IN ANGLE IRON SHALL BE DRILLED $\frac{1}{16}$ " LARGER THAN U-BOLTS AND $\frac{3}{4}$ " INSERTS. NO BURNING OF HOLES WILL BE ALLOWED.
3. LATERAL BRACES SHALL BE INSTALLED ONE FOOT ON EITHER SIDE OF THE PIPE JOINT.

BILL OF MATERIALS FOR 16" WATER MAIN		
NO.	UNITS	ITEMS
1	2 EA	20" STEEL PIPE SLEEVE, 0.375" WALL THICKNESS, 1'-0" LENGTH (END BENTS)
2	58 EA	1" APPROVED CONCRETE INSERTS (HANGER RODS)
3	58 EA	APPROVED ADJ. STEEL YOKE PIPE ROLL HANGER FOR 16" DI RJ WATER PIPE WITH 1" HANGER RODS
4	392'	16" DI RESTRAINED JOINT WATER PIPE, PC 350
5	2 EA	APPROVED MODULAR TYPE CASING SEAL
6	50 lbs	JUTE
7	40 lbs	MASTIC OR PLASTIC CAULKING COMPOUND
8	2 EA	END PLUGS (OR CAPS) FOR 16" DI PIPE
9	18 EA	LATERAL BRACE ASSEMBLIES
10	36 EA	$\frac{3}{4}$ " APPROVED CONCRETE INSERTS (LATERAL BRACES)
11	1 EA	EXPANSION COUPLING
12	1 LOT	PAINT (AS REQUIRED)

THESE ARE ESTIMATED QUANTITIES ONLY.



SECTION THRU BACKWALL



PIPE HANGER DETAIL

NOTE: SHALL BE INSTALLED AT MAX. 6'-0" CENTERS.

PROJECT NO. B-3509
ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

SHEET 1 OF 1

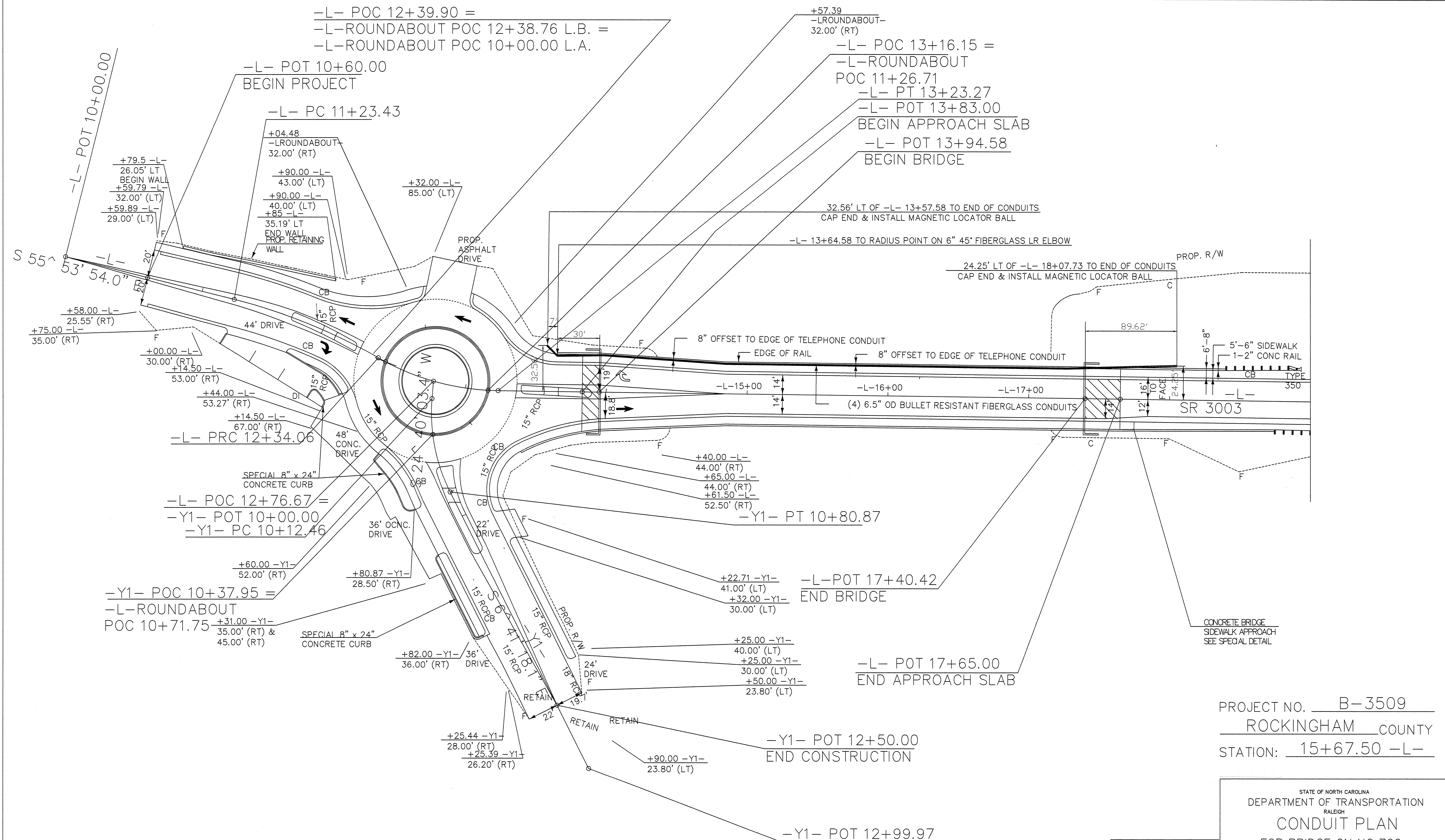


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

UTILITY ATTACHMENTS
 DETAIL SHEET
 (16" WATER LINE)

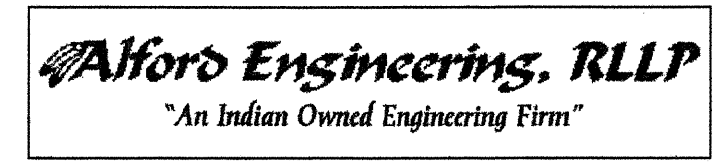
PREPARED IN THE OFFICE OF:
dmp DAVIS-MARTIN-POWELL AND ASSOCIATES, INC.
 6415 OLD PLANK ROAD
 HIGH POINT, NC 27265
 PHONE (336) 886-4821
 FAX (336) 886-4458

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-7
2			4			53

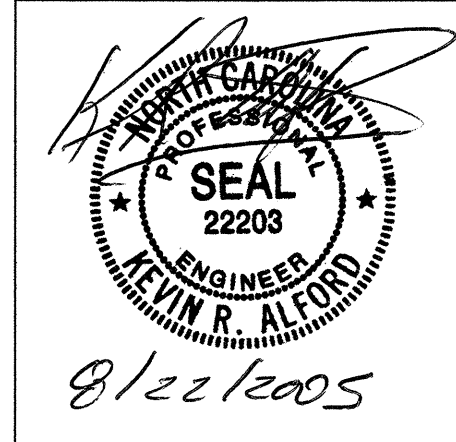


PROJECT NO. B-3509
ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
CONDUIT PLAN
 FOR BRIDGE ON NC 700
 AND SR 3003 (WEST MEADOW RD.)
 OVER SMITH RIVER BETWEEN
 SR 3002 AND STADIUM DR.



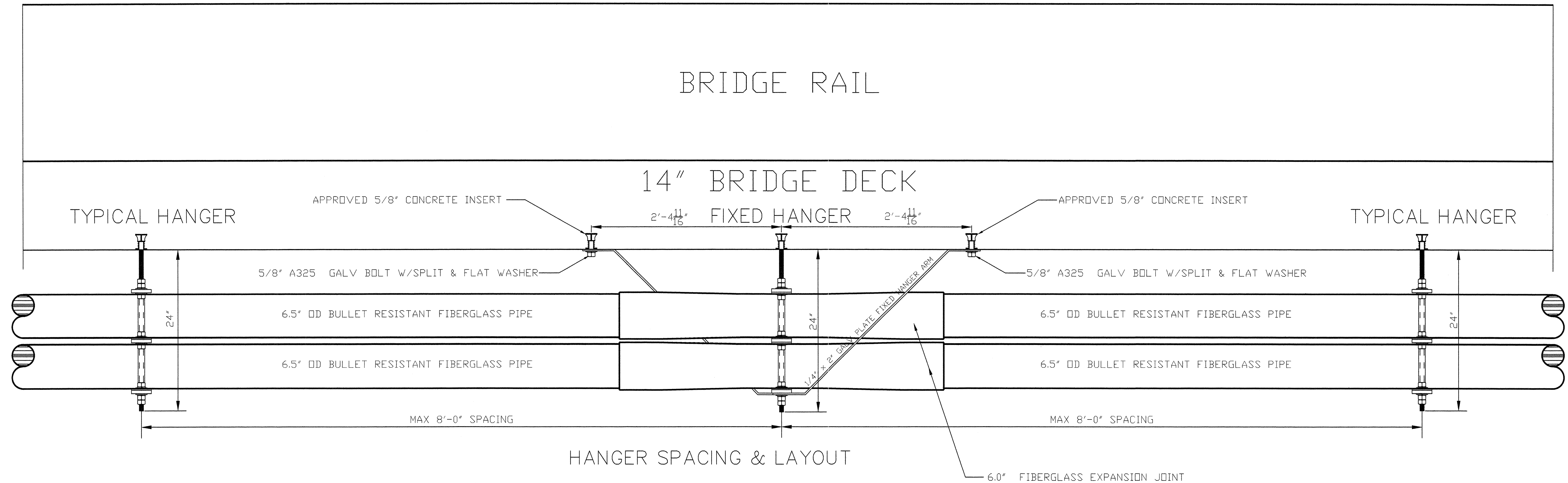
P.O. BOX 1930
 MAGGIE VALLEY, NORTH CAROLINA 28751
 PHONE: 828-926-8341 CELL: 828-506-3411
 E-MAIL: alfordk1@bellsouth.net
 WEB SITE: www.alfordengineering.net



REVISIONS						SHEET NO. 5-8 TOTAL SHEETS 53
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

DRAWN BY: K.R. ALFORD, PE DATE: 5-01-05
 CHECKED BY: K.R. ALFORD, PE DATE: 5-01-05

BRIDGE RAIL



HANGER SPACING & LAYOUT

FIXED HANGER QUANTITIES QTY FOR (2) FIXED HANGERS

QTY	DESCRIPTION
4	1/4" x 2" x 41" GALV. FIXED HANGER ARMS
48	5/8" A325 GALV. NUTS
36	5/8" A325 GALV. FLAT WASHERS
36	5/8" A325 GALV SPLIT WASHERS
12	1" OD x 5" FRE TUBES
4	5/8" x 25" A325 GALV. ALL-THREAD RODS
2	5/8" x 22.5" A325 GALV. ALL-THREAD RODS
8	1/4" x 3" x 20" FRE PLATES
6	1/2" x 3" x 20" GALV. PLATES

TYPICAL HANGER QUANTITIES QTY FOR (40) TYPICAL HANGERS

QTY	DESCRIPTION
960	5/8" A325 GALV. NUTS
720	5/8" A325 GALV. FLAT WASHERS
720	5/8" A325 GALV SPLIT WASHERS
240	1" OD x 5" FRE TUBES
80	5/8" x 25" A325 GALV. ALL-THREAD RODS
40	5/8" x 22.5" A325 GALV. ALL-THREAD RODS
80	1/4" x 3" x 20" FRE PLATES
120	1/2" x 3" x 20" GALV. PLATES

NOTE: 6.5" OD BULLET RESISTANT FIBERGLASS PIPE SHALL BE SUPPLIED WITH INTEGRALLY WOUND TAPERED BELL AND GROUND SPIGOT TO BE USED WITH AN ADHESIVE. THE JOINT SHALL WITHSTAND A JOINT PULL-OUT FORCE OF 1000 POUNDS. THE CONDUIT SHALL CONTAIN AN ULTRAVIOLET INHIBITOR. THE CONDUIT SHALL BE FILAMENT WOUND FIBERGLASS REINFORCED EPOXY AND SHALL BE FREE FROM DEFECTS. IT SHALL BE STRAIGHT AND THE ENDS SHALL BE CUT SQUARE TO THE INSIDE DIAMETER.

TOTAL TELEPHONES FIBERGLASS CONDUIT QUANTITIES

QTY	UNIT	DESCRIPTION
4	EA	1/4" x 2" x 41" GALV. FIXED HANGER ARMS
1008	EA	5/8" A325 GALV. NUTS
756	EA	5/8" A325 GALV. FLAT WASHERS
756	EA	5/8" A325 GALV SPLIT WASHERS
252	LF	1" OD FRE TUBES
254	LF	5/8" A325 GALV. ALL-THREAD RODS
147	LF	1/4" x 3" FRE PLATE
126	EA	1/2" x 3" x 20" GALV. PLATES
2	EA	GALV. CONDUIT BACKWALL INSERTS
88	EA	5/8" CONCRETE INSERTS
8	EA	6.5" ID FIBERGLASS EXPANSION JOINTS
1720	LF	6.5" OD BULLET RESISTANT FIBERGLASS CONDUIT
4	EA	6" BULLET RESISTANT FIBERGLASS 45° ELBOWS
8	EA	6" FIBERGLASS END CAPS
2	EA	MAGNETIC LOCATOR BALLS

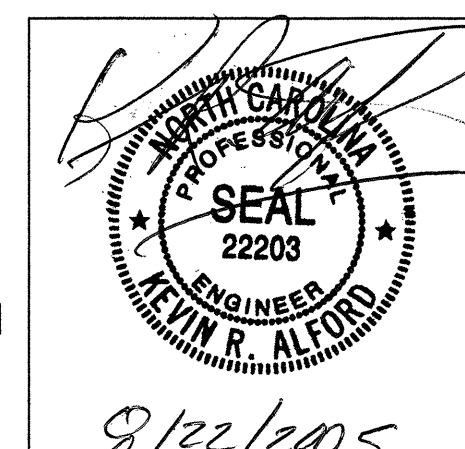
PROJECT NO. B-3509
ROCKINGHAM COUNTY

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

HANGER SPACING & QUANTITIES

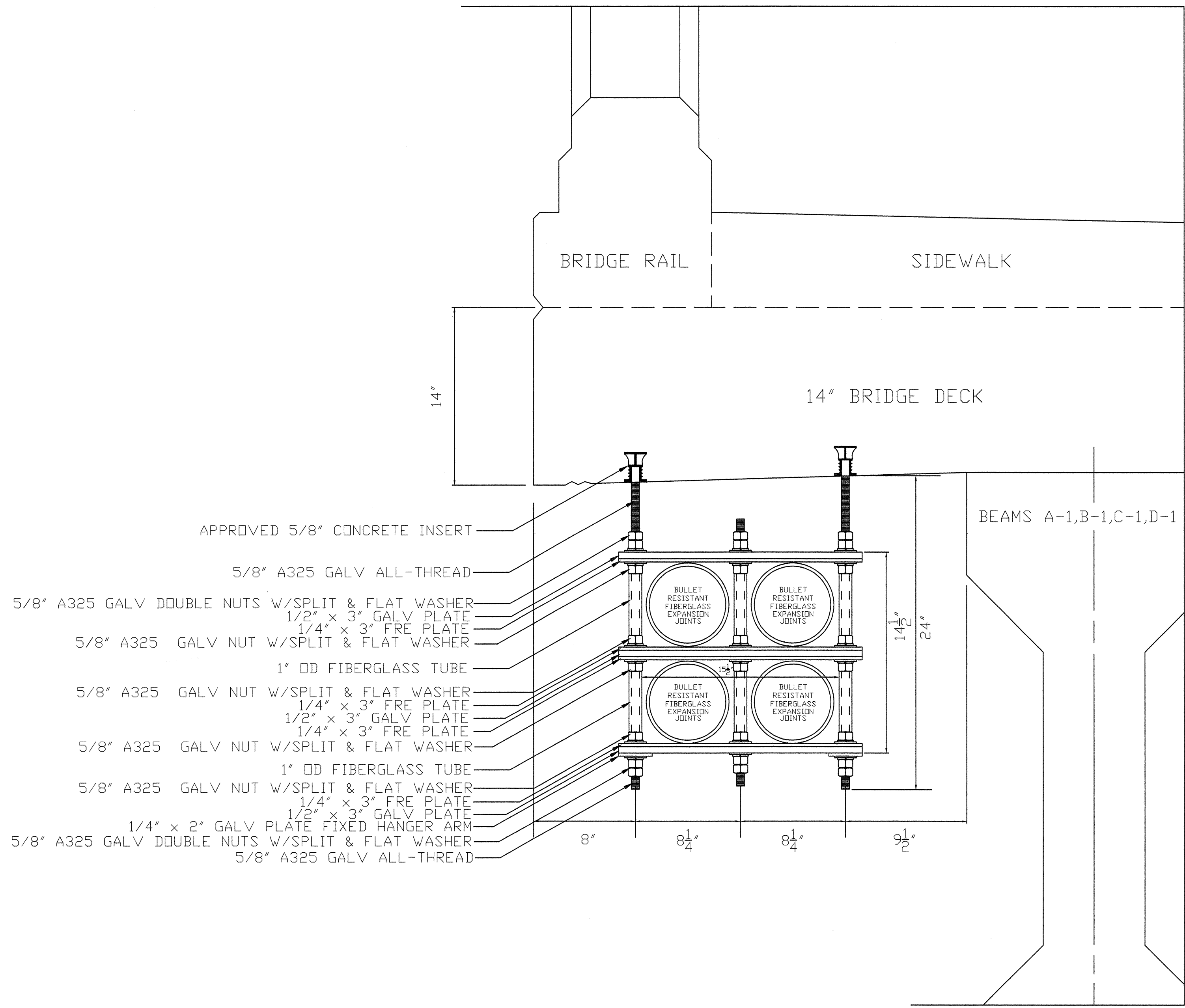
Alford Engineering, RLLP
"An Indian Owned Engineering Firm"

P.O. BOX 1930
MAGGIE VALLEY, NORTH CAROLINA 28751
PHONE: 828-926-8341 CELL: 828-506-3411
E-MAIL: alfordk1@bellsouth.net
WEB SITE: www.alfordengineering.net



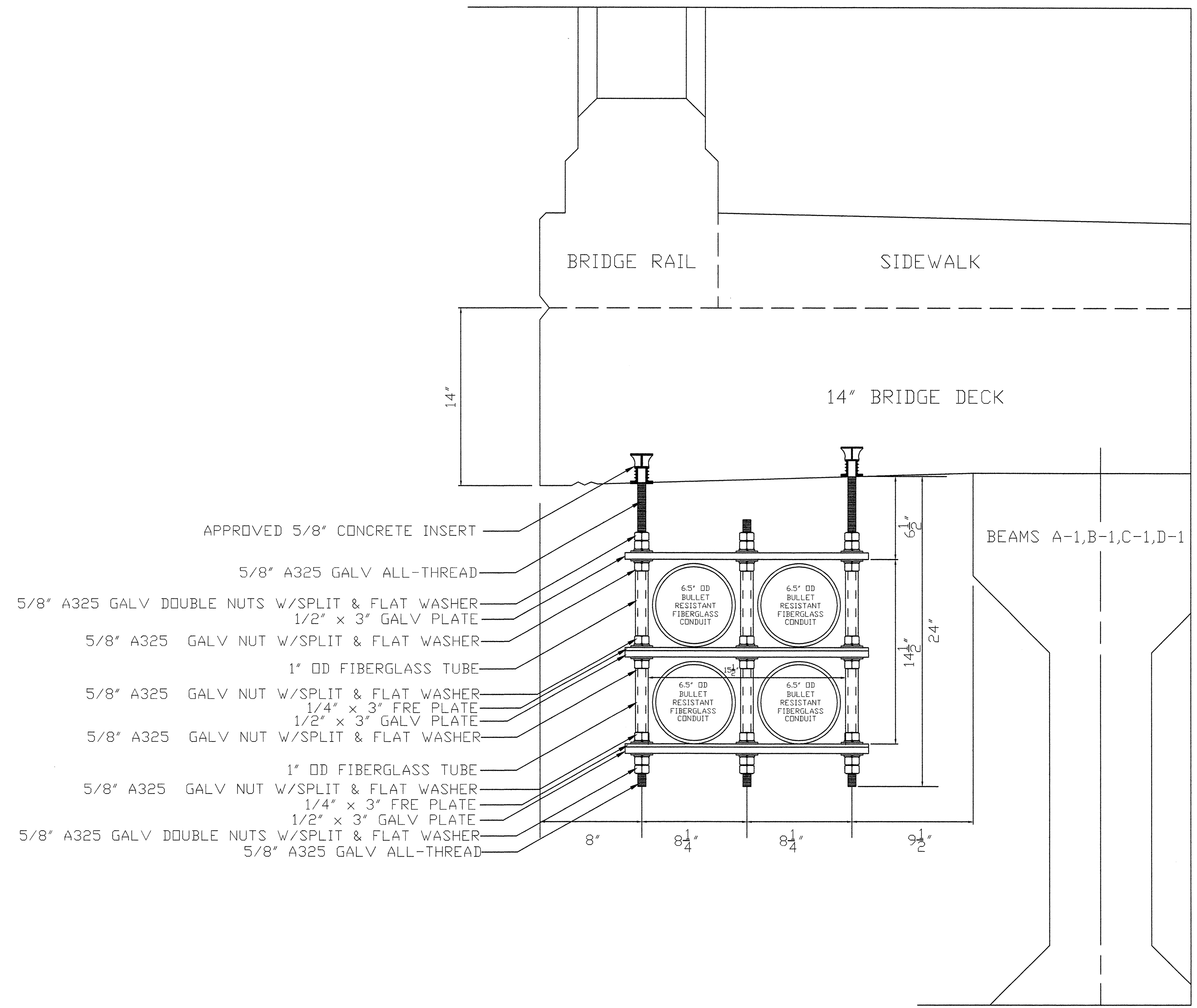
DRAWN BY: K R ALFORD, PE DATE: 5/1/05
CHECKED BY: K R ALFORD, PE DATE: 5/1/05

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			5-9
2			4			TOTAL SHEETS 53



- APPROVED 5/8" CONCRETE INSERT
- 5/8" A325 GALV ALL-THREAD
- 5/8" A325 GALV DOUBLE NUTS W/SPLIT & FLAT WASHER
- 1/2" x 3" GALV PLATE
- 1/4" x 3" FRE PLATE
- 5/8" A325 GALV NUT W/SPLIT & FLAT WASHER
- 1" OD FIBERGLASS TUBE
- 5/8" A325 GALV NUT W/SPLIT & FLAT WASHER
- 1/4" x 3" FRE PLATE
- 1/2" x 3" GALV PLATE
- 1/4" x 3" FRE PLATE
- 5/8" A325 GALV NUT W/SPLIT & FLAT WASHER
- 1" OD FIBERGLASS TUBE
- 5/8" A325 GALV NUT W/SPLIT & FLAT WASHER
- 1/4" x 3" FRE PLATE
- 1/2" x 3" GALV PLATE
- 1/4" x 2" GALV PLATE FIXED HANGER ARM
- 5/8" A325 GALV DOUBLE NUTS W/SPLIT & FLAT WASHER
- 5/8" A325 GALV ALL-THREAD

FIXED HANGER DETAIL
NOT TO SCALE



- APPROVED 5/8" CONCRETE INSERT
- 5/8" A325 GALV ALL-THREAD
- 5/8" A325 GALV DOUBLE NUTS W/SPLIT & FLAT WASHER
- 1/2" x 3" GALV PLATE
- 1/4" x 3" FRE PLATE
- 5/8" A325 GALV NUT W/SPLIT & FLAT WASHER
- 1" OD FIBERGLASS TUBE
- 5/8" A325 GALV NUT W/SPLIT & FLAT WASHER
- 1/4" x 3" FRE PLATE
- 1/2" x 3" GALV PLATE
- 1/4" x 3" FRE PLATE
- 5/8" A325 GALV NUT W/SPLIT & FLAT WASHER
- 1" OD FIBERGLASS TUBE
- 5/8" A325 GALV NUT W/SPLIT & FLAT WASHER
- 1/4" x 3" FRE PLATE
- 1/2" x 3" GALV PLATE
- 1/4" x 2" GALV PLATE FIXED HANGER ARM
- 5/8" A325 GALV DOUBLE NUTS W/SPLIT & FLAT WASHER
- 5/8" A325 GALV ALL-THREAD

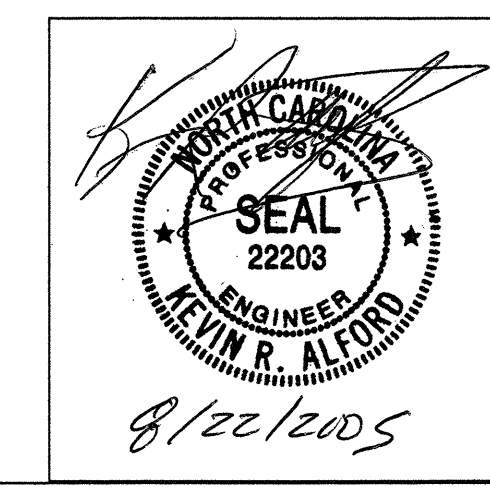
TYPICAL HANGER DETAIL
NOT TO SCALE

PROJECT NO. B-3509
ROCKINGHAM COUNTY

DRAWN BY: K R ALFORD, PE DATE: 5/1/05
CHECKED BY: K R ALFORD, PE DATE: 5/1/05



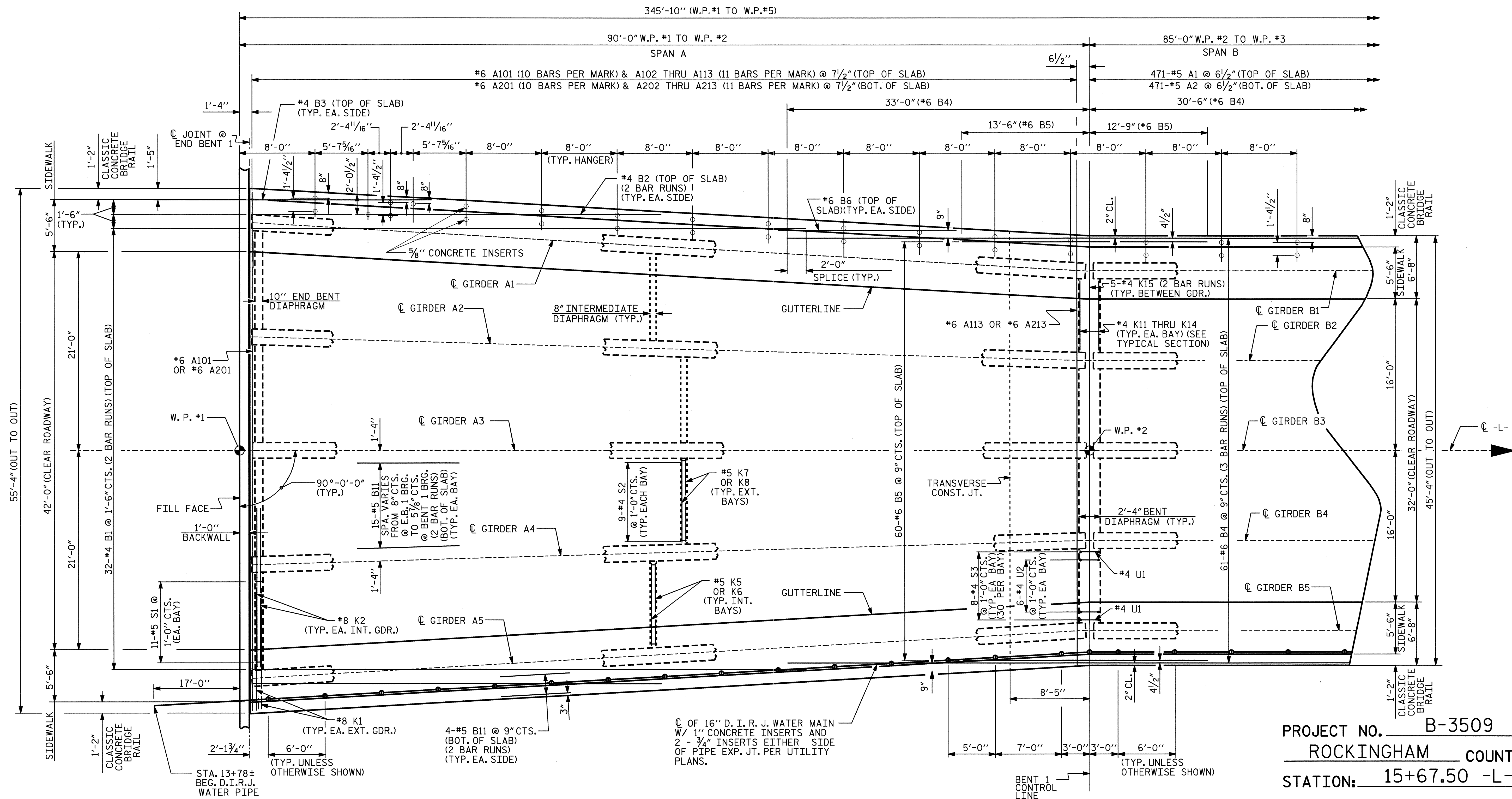
P.O. BOX 1930
MAGGIE VALLEY, NORTH CAROLINA 28751
PHONE: 828-926-8341 CELL: 828-506-3411
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

HANGER DETAILS
ELEVATIONS

REVISIONS						SHEET NO. 5-10
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 53
2			4			

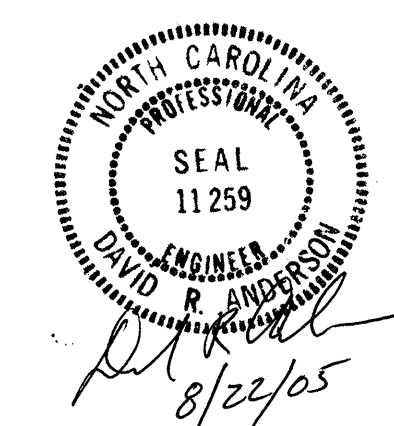


PLAN OF SPAN A

DECK DRAINS NOT SHOWN. FOR DECK DRAIN LOCATION AND DETAILS, SEE "SUPERSTRUCTURE STRUCTURE DRAINAGE SYSTEM" SHEETS.
 FOR LOCATION AND DETAIL OF TRANSVERSE CONST. JT. SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

PROJECT NO. **B-3509**
ROCKINGHAM COUNTY
 STATION: **15+67.50 -L-**

SHEET 1 OF 4



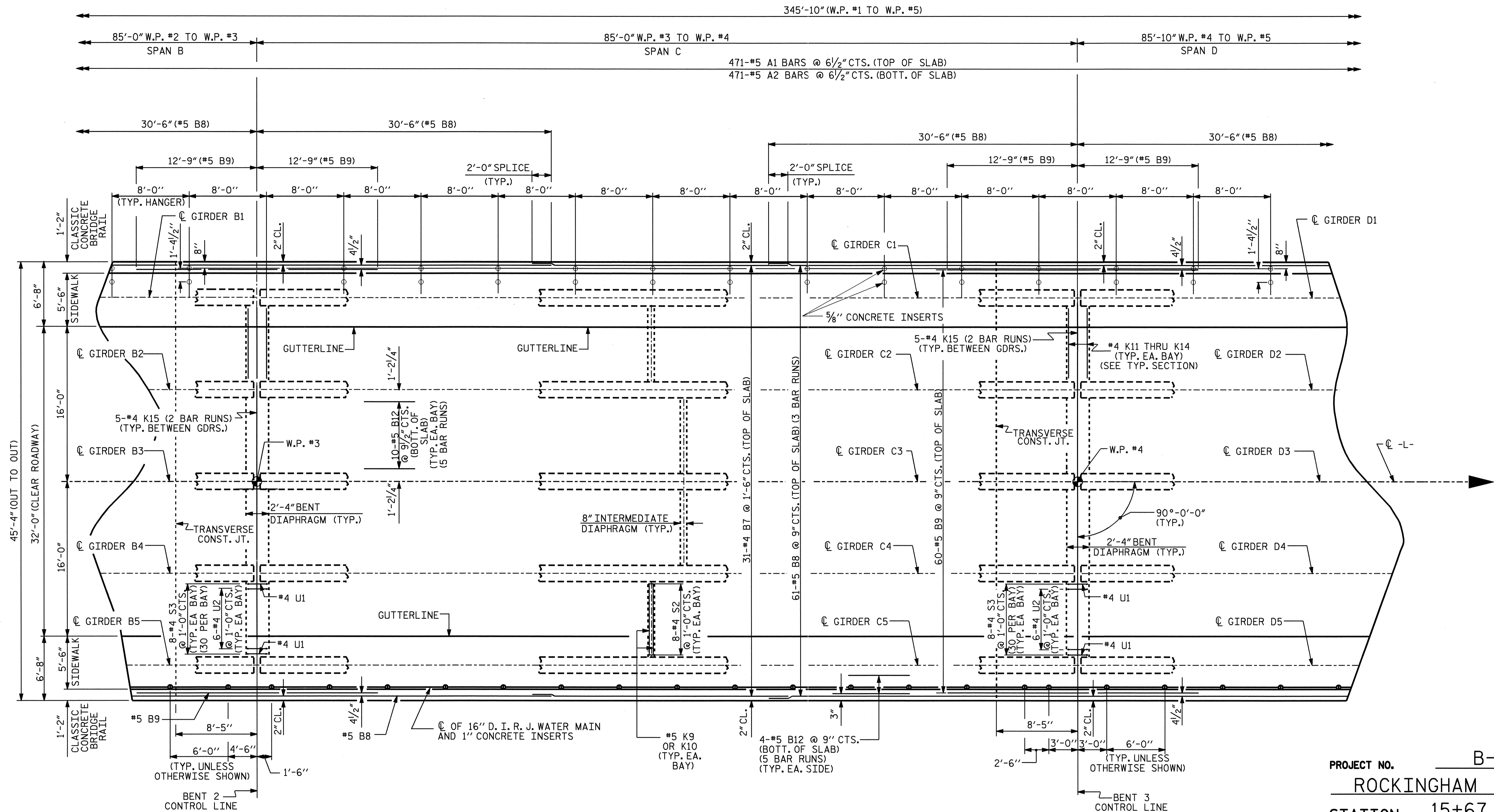
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 PLAN OF SPANS**

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

SHEET NO. S-11
 TOTAL SHEETS 53

DRAWN BY : **S. M. RASHIDI** DATE : **7/6/04**
 CHECKED BY : **M. A. ALLEN** DATE : **2-05**



PLAN OF SPAN C

DECK DRAINS NOT SHOWN, FOR DECK DRAIN LOCATION AND DETAILS, SEE "SUPERSTRUCTURE STRUCTURE DRAINAGE SYSTEM" SHEETS.

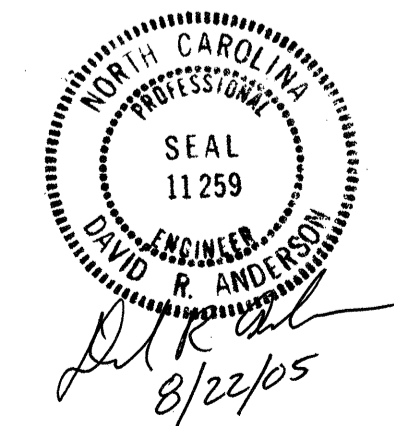
FOR LOCATION AND DETAIL OF TRANSVERSE CONST. JT. SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

PROJECT NO. B-3509
ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 PLAN OF SPANS

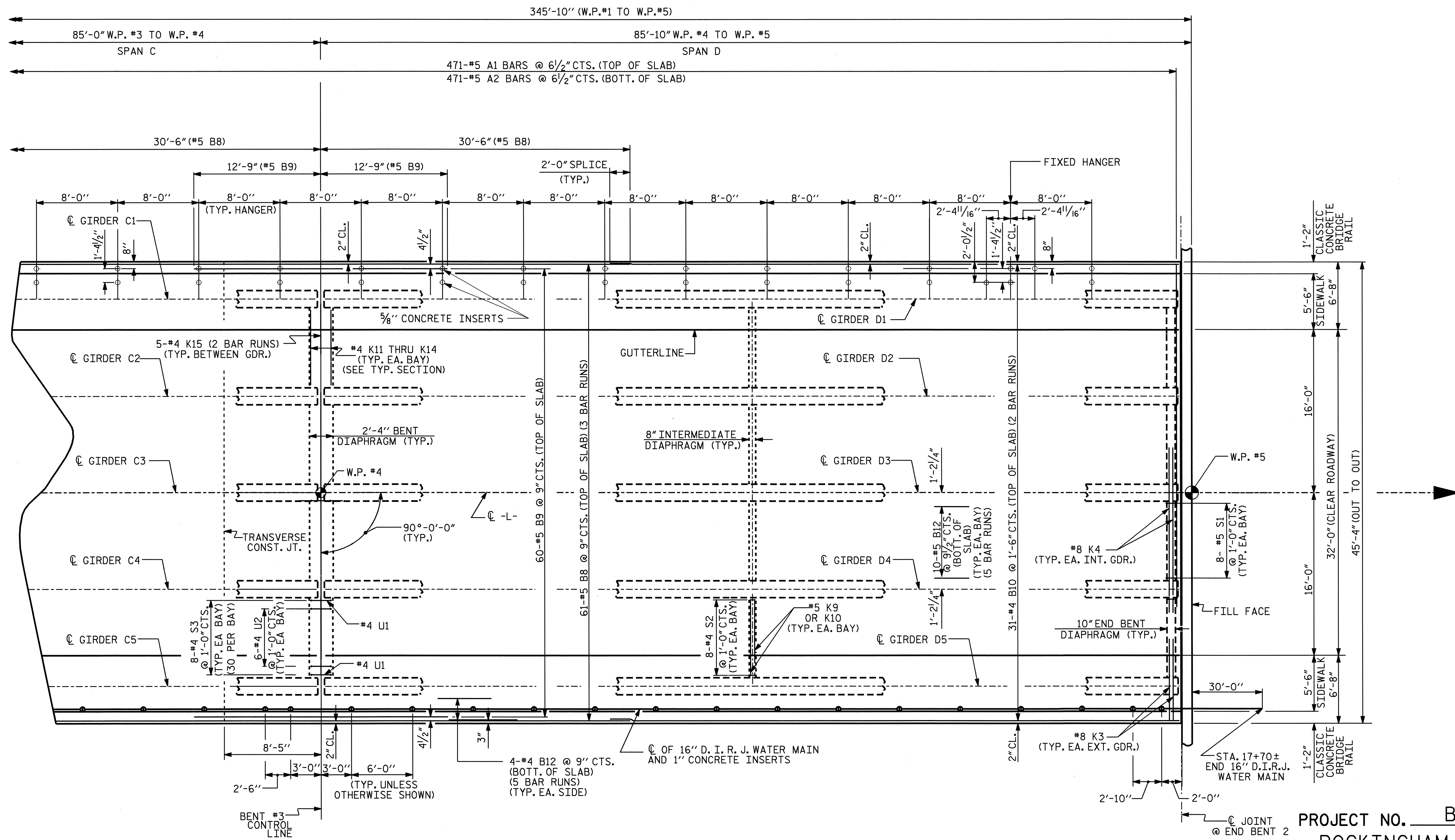


DRAWN BY: S. M. RASHIDI DATE: 7/6/04
 CHECKED BY: M. A. ALLEN DATE: 2-05

17-AUG-2005 07:54
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 maallen

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13	
1			3			TOTAL SHEETS	
2			4			53	

NC006



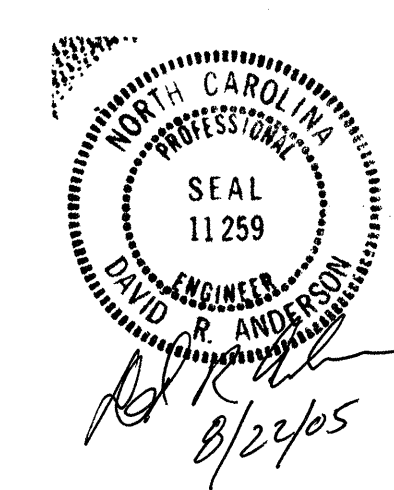
PLAN OF SPAN D

DECK DRAINS NOT SHOWN, FOR DECK DRAIN LOCATION AND DETAILS, SEE "SUPERSTRUCTURE STRUCTURE DRAINAGE SYSTEM" SHEETS.
 FOR LOCATION AND DETAIL OF TRANSVERSE CONST. JT. SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

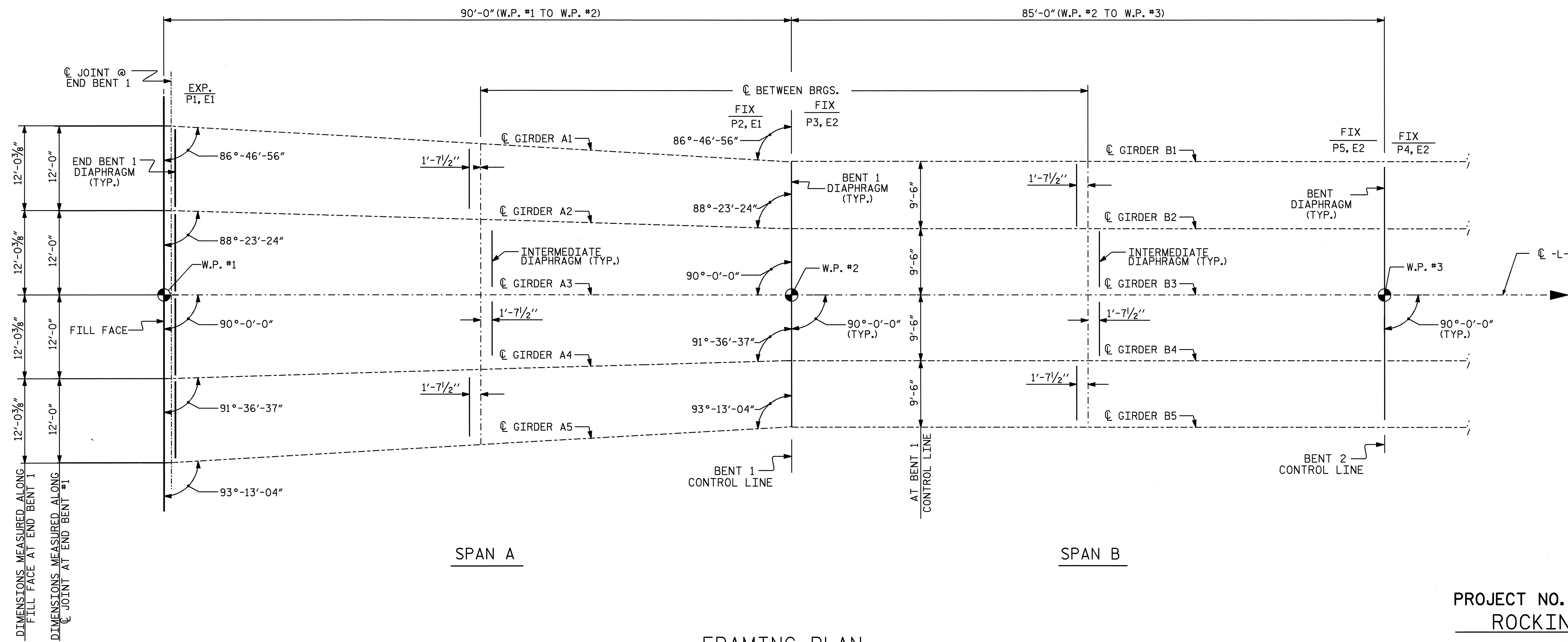
PROJECT NO. B-3509
 ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

SHEET 4 OF 4

REVISIONS						SHEET NO. S-14
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 53
2			4			



DRAWN BY: S. M. RASHIDI DATE: 7/6/04
 CHECKED BY: M. A. ALLEN DATE: 2-05



SPAN A

SPAN B

FRAMING PLAN

PROJECT NO. B-3509
ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

FRAMING PLAN
 SPANS A & B

Ting H. Jang
 8/19/05

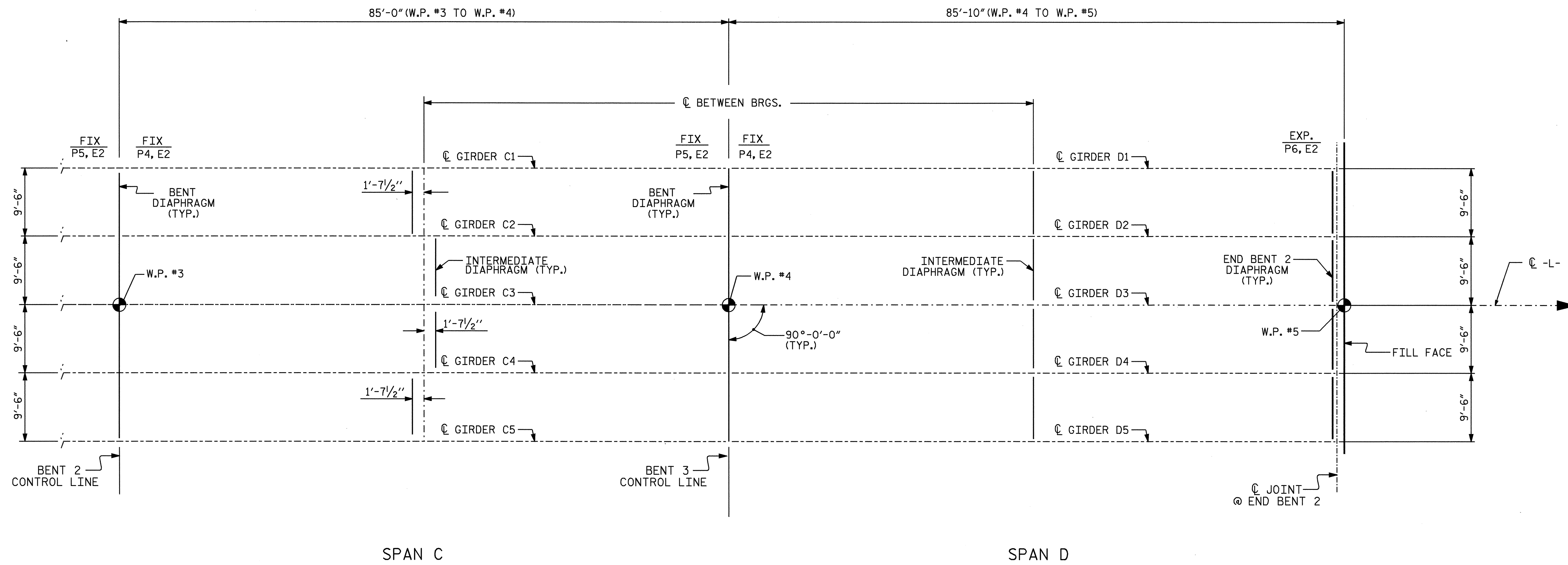


DRAWN BY : S. M. RASHIDI DATE : 7/6/04
 CHECKED BY : M. A. ALLEN DATE : 2-05

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 maillen

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			53

NC006



FRAMING PLAN

PROJECT NO. B-3509
ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

FRAMING PLAN
 SPANS C & D

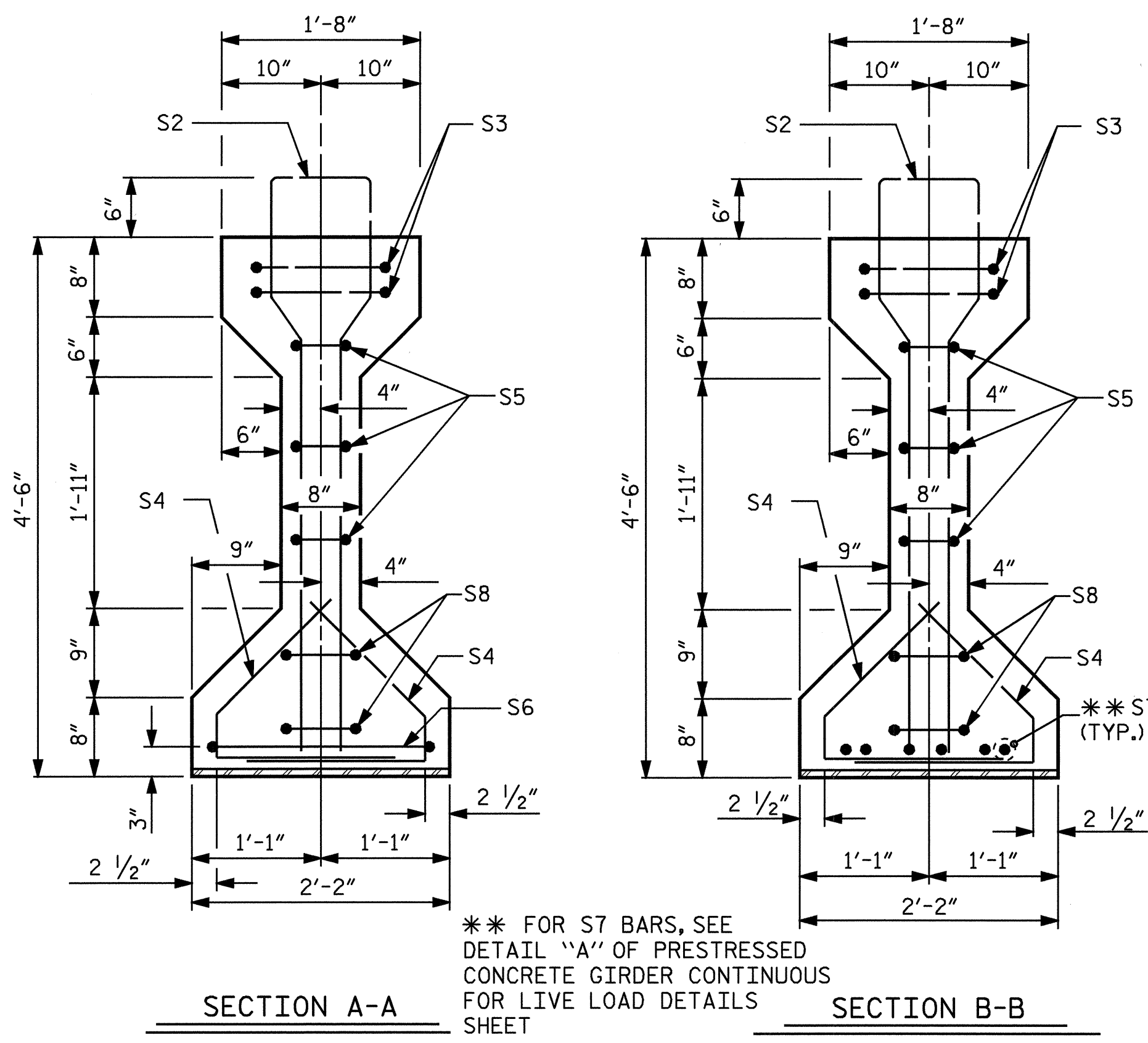
Ting H. Fang
 8/19/05

DRAWN BY : S. M. RASHIDI DATE : 7/6/04
 CHECKED BY : M. A. ALLEN DATE : 2-05

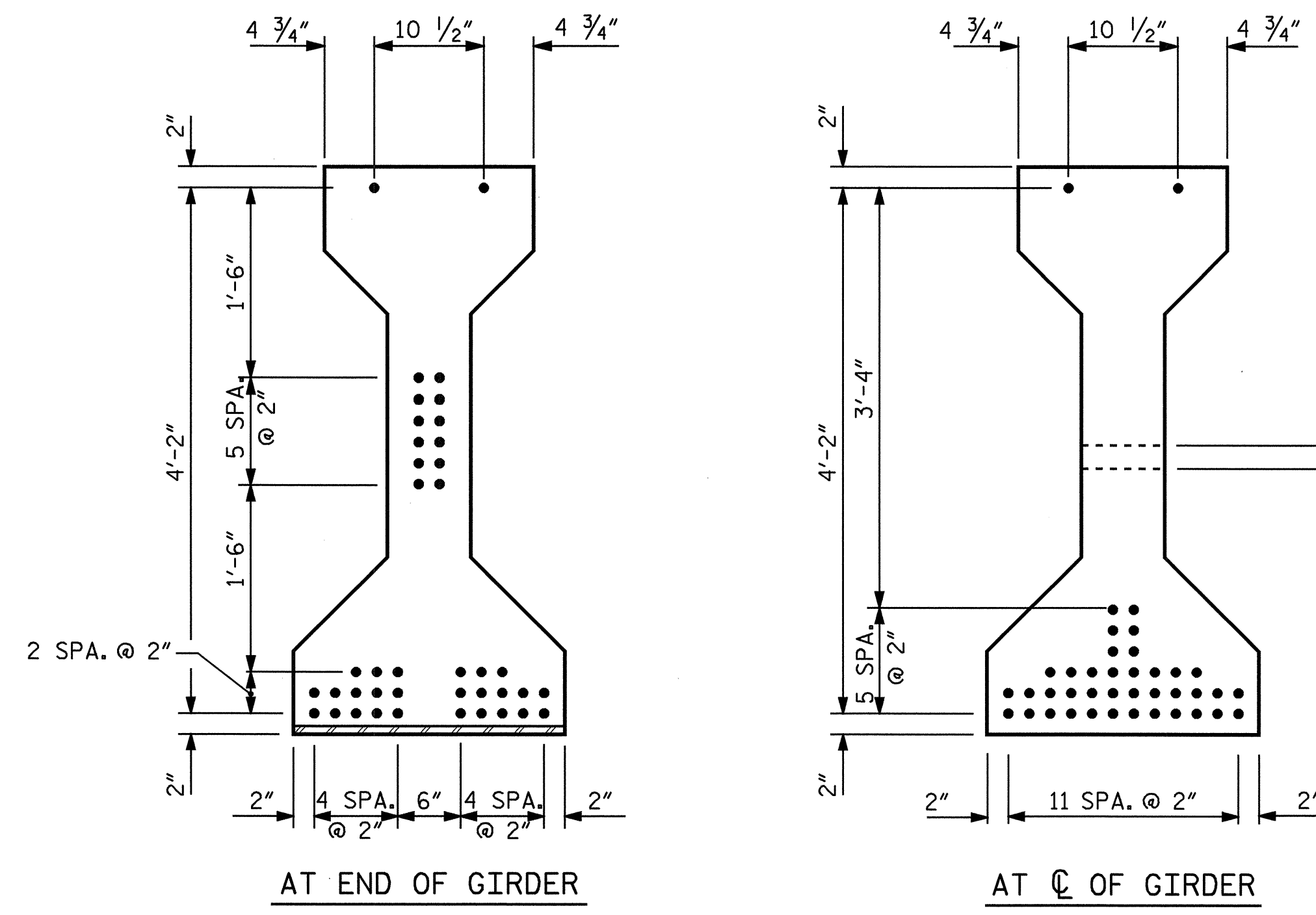
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 maallen

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			53

NC005



** FOR S7 BARS, SEE
DETAIL "A" OF PRESTRESSED
CONCRETE GIRDER CONTINUOUS
FOR LIVE LOAD DETAILS
SHEET



0.6" Ø LOW RELAXATION STRAND LAYOUT

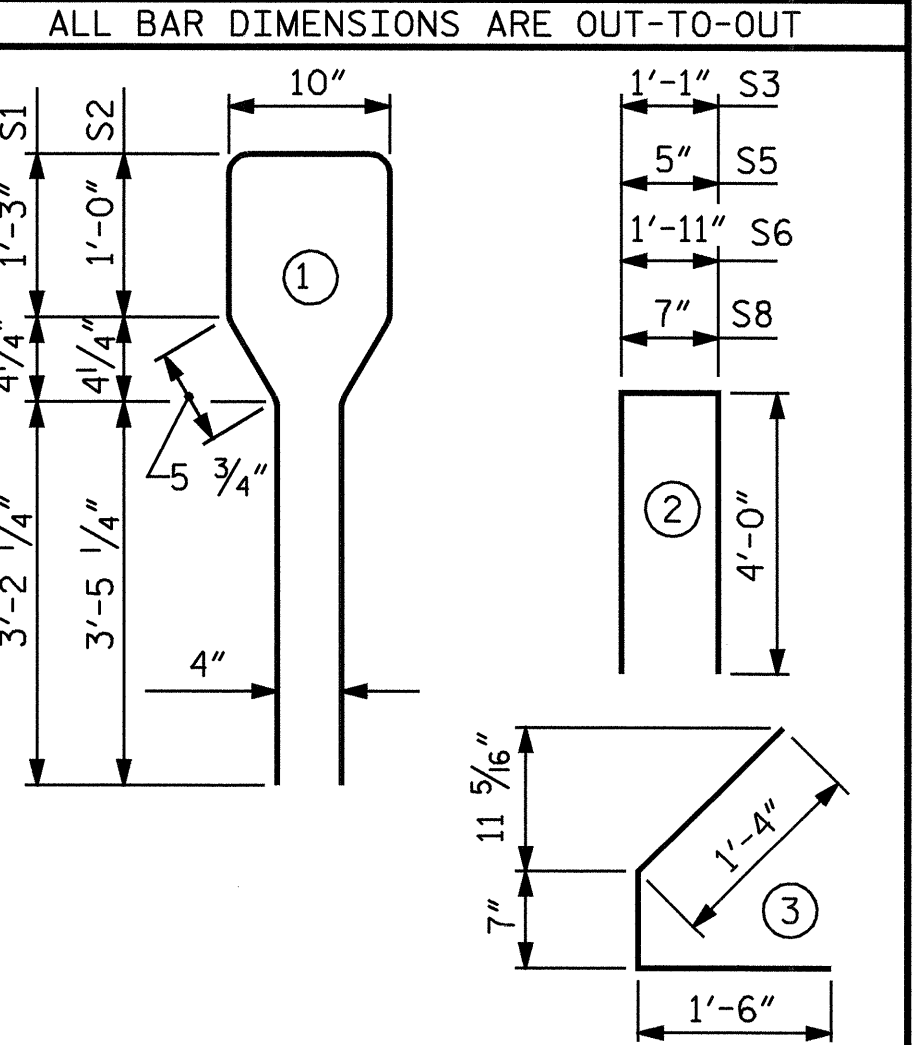
NOTE: 0.6" Ø L.R. STRANDS ARE TO BE USED ONLY IN SPAN A. 1/2" Ø L.R. STRANDS ARE TO BE USED IN SPANS B,C, AND D.

0.6" Ø L.R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	88	#4	1	10'-8"	627
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
**S7	6	#5	STR	3'-8"	23
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1

** NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



QUANTITIES FOR ONE GIRDER			
REINFORCING STEEL	8500 PSI CONCRETE	0.6" Ø L.R. STRAND	
LB.	C.Y.	No.	
1077	17.926	40	

GIRDERS REQUIRED

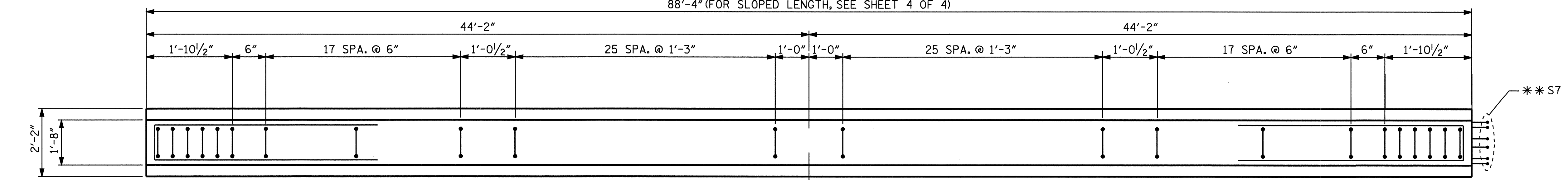
NUMBER	LENGTH	TOTAL LENGTH
5	88.333	441.665

PROJECT NO. B-3509
ROCKINGHAM COUNTY
STATION: 15+67.50 -L-

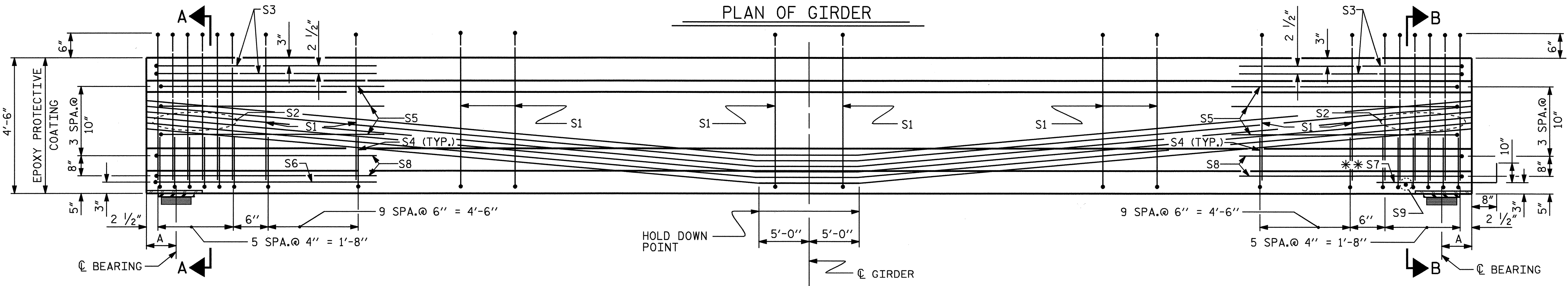
SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN A

STATE OF NORTH CAROLINA
PROFESSIONAL SEAL
16301
ENGINEER
TUNG H. JANG
8/19/05



PLAN OF GIRDER



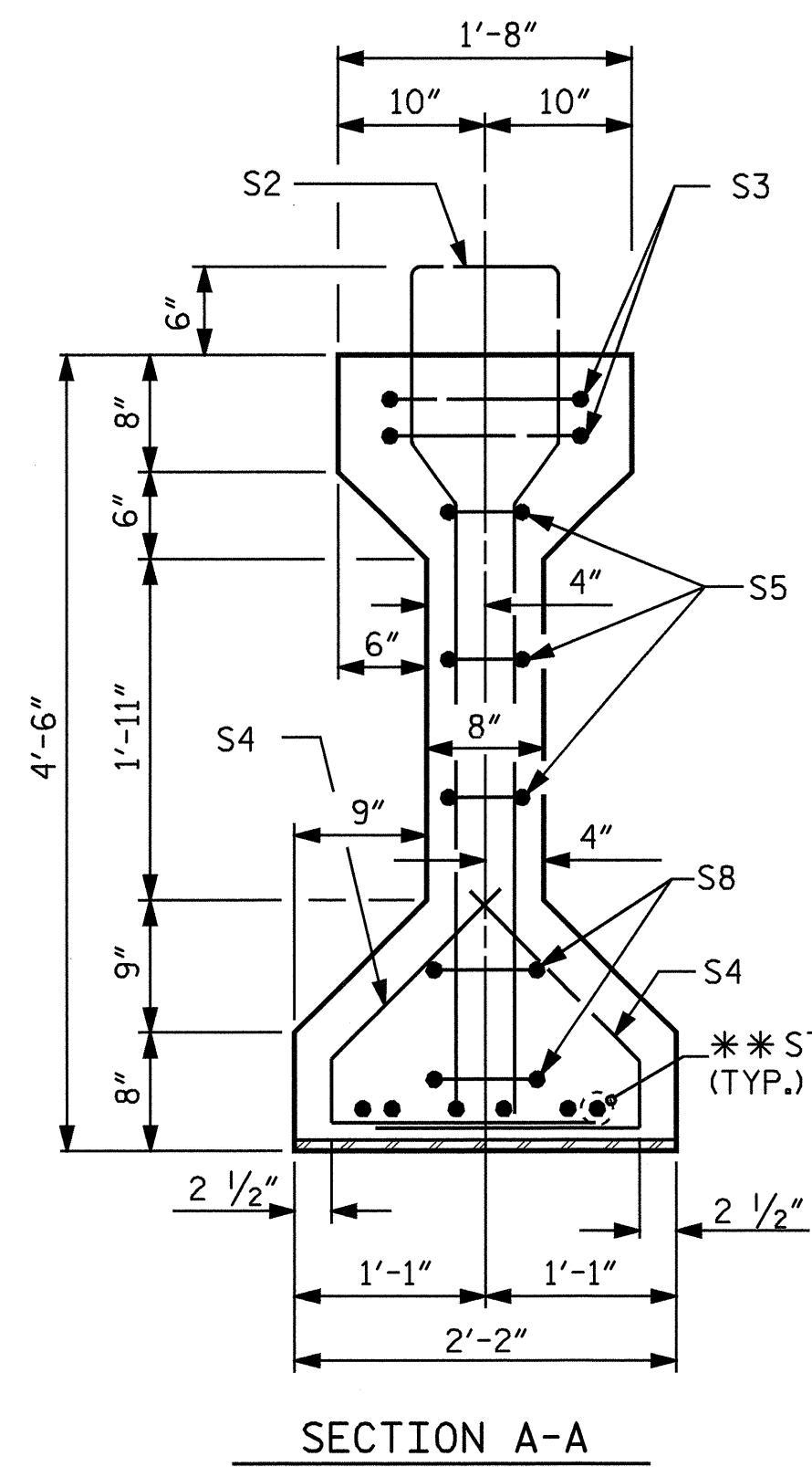
ELEVATION OF GIRDER

FOR LOCATION OF 3" Ø CORED OR FORMED HOLE, SEE "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAIL" SHEET.

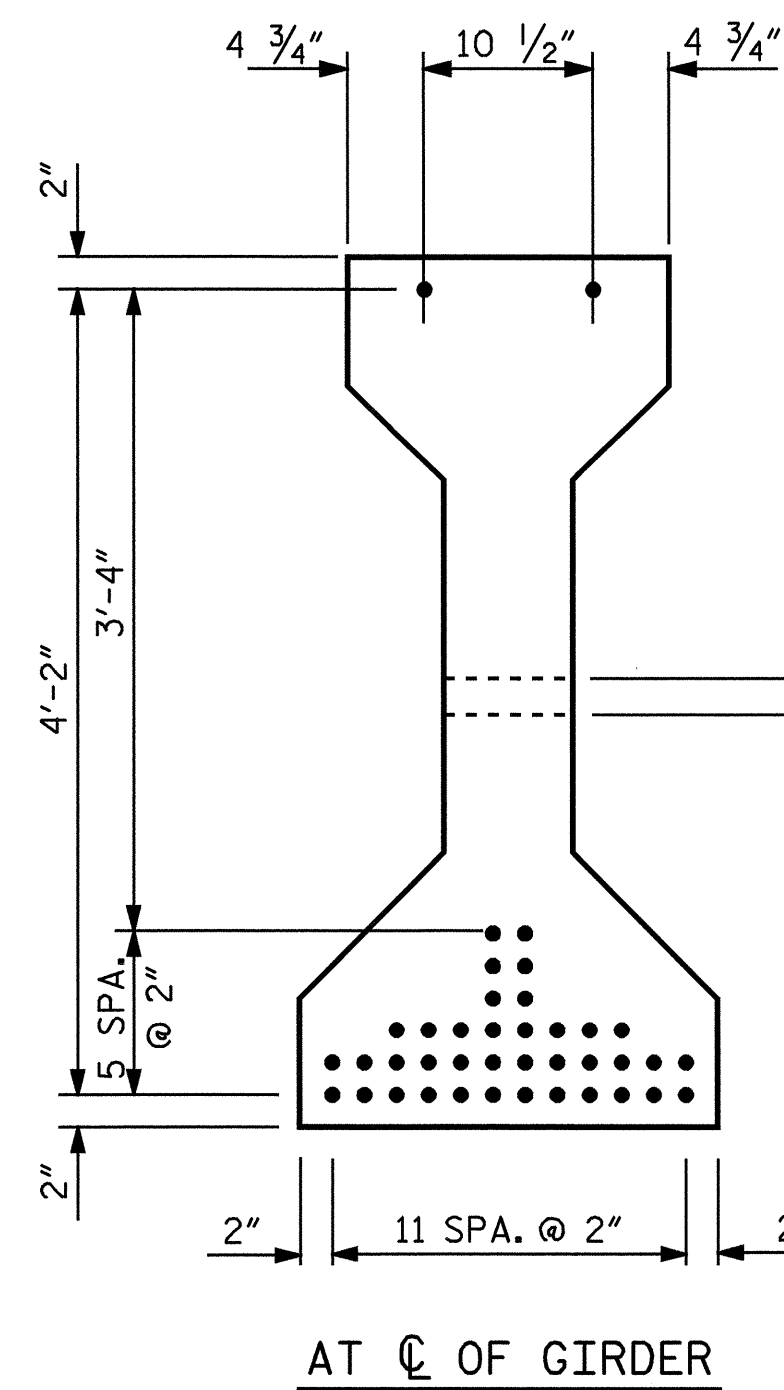
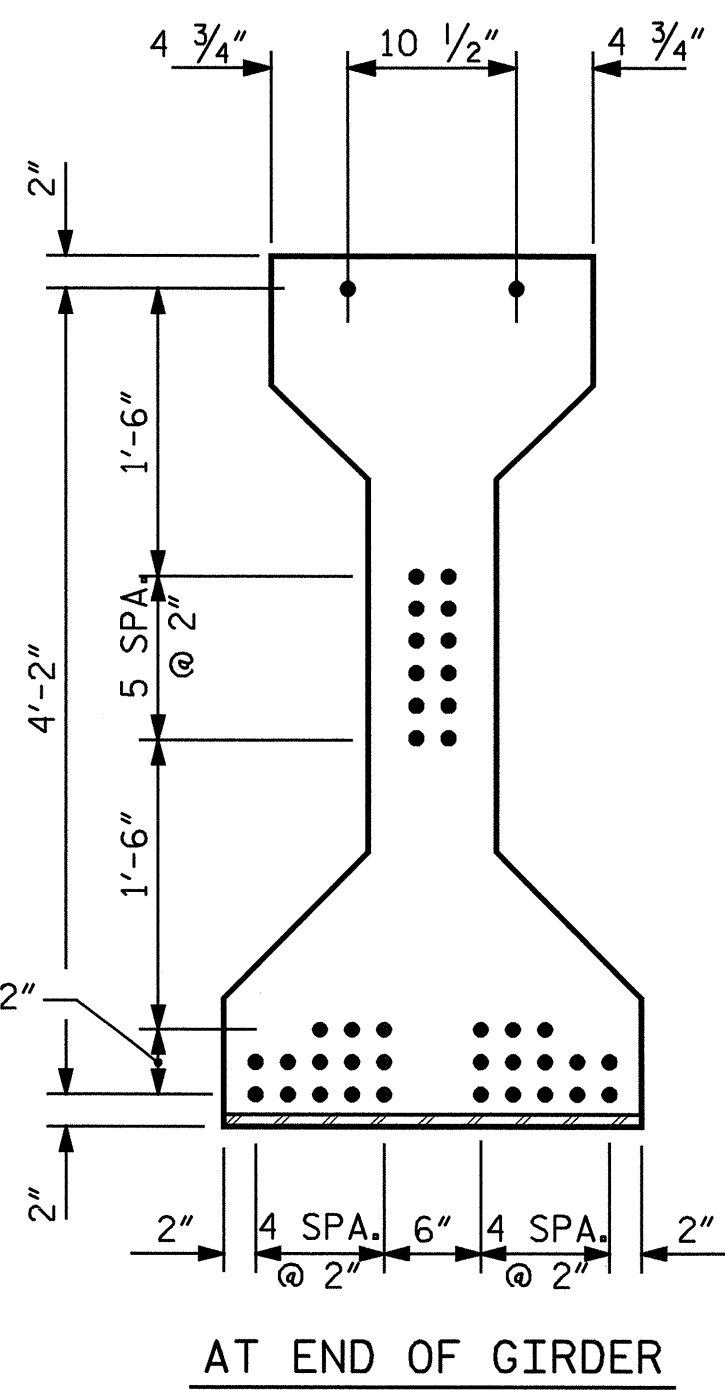
THE UPLIFT FORCE DUE TO THE DRAPED STRANDS IS 24.4 KIPS

SPAN A GIRDER DIMENSIONS			
GIRDER	GIRDER LENGTH	BRG. TO BRG.	DIMENSION A
GIRDER A1	88'-4"	87'-0 5/8"	7 11/16"
GIRDER A2	88'-4"	86'-11 1/2"	8 1/4"
GIRDER A3	88'-4"	86'-11"	8 1/2"
GIRDER A4	88'-4"	86'-11 1/2"	8 1/4"
GIRDER A5	88'-4"	87'-0 5/8"	7 11/16"

ASSEMBLED BY: S. M. RASHIDI DATE: 7/6/04
CHECKED BY: M. A. ALLEN DATE: 2-05
DRAWN BY: RB 2/97 REV. 10/99 MAB/LES
CHECKED BY: VP 2/97
CADD STANDARD



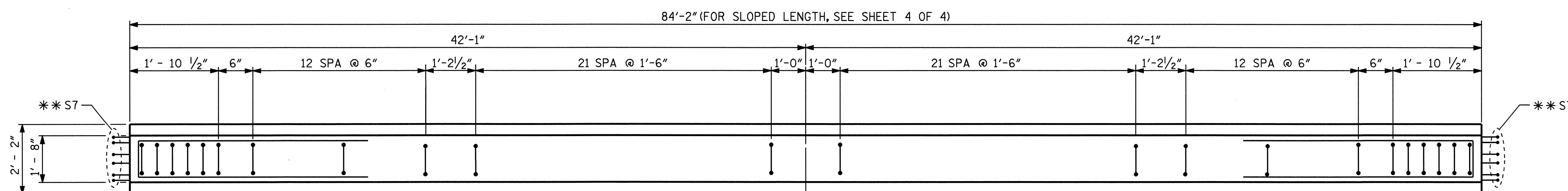
** FOR S7 BARS, SEE
DETAIL "A" OF PRESTRESSED
CONCRETE GIRDER CONTINUOUS
FOR LIVE LOAD DETAILS
SHEET



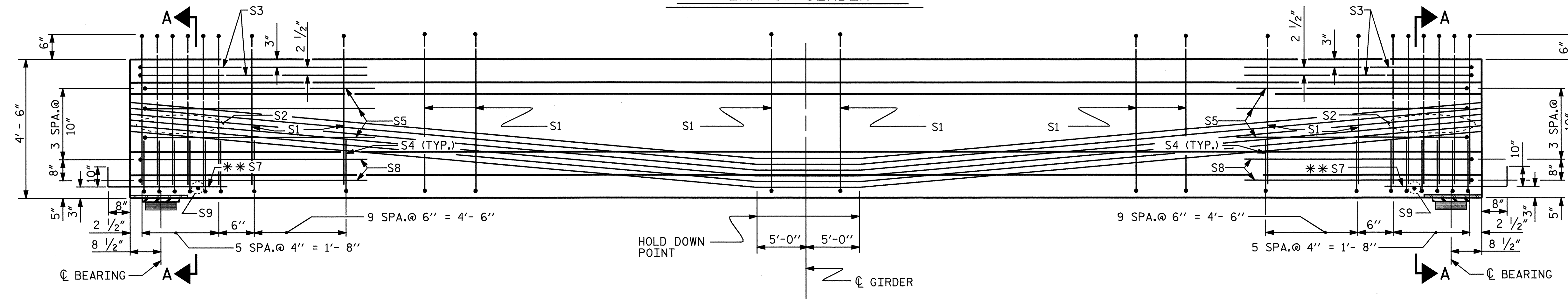
3" Ø CORED OR FORMED HOLE
SEE "PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
DETAILS" SHEET FOR LOCATION

NOTE: 0.6" Ø L.R. STRANDS ARE TO
BE USED ONLY IN SPAN A.
1/2" Ø L.R. STRANDS ARE TO BE
USED IN SPANS B, C, AND D.

1/2" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

FOR LOCATION OF 3" Ø CORED OR
FORMED HOLE, SEE "PRESTRESSED
CONCRETE GIRDER CONTINUOUS
FOR LIVE LOAD DETAIL" SHEET.

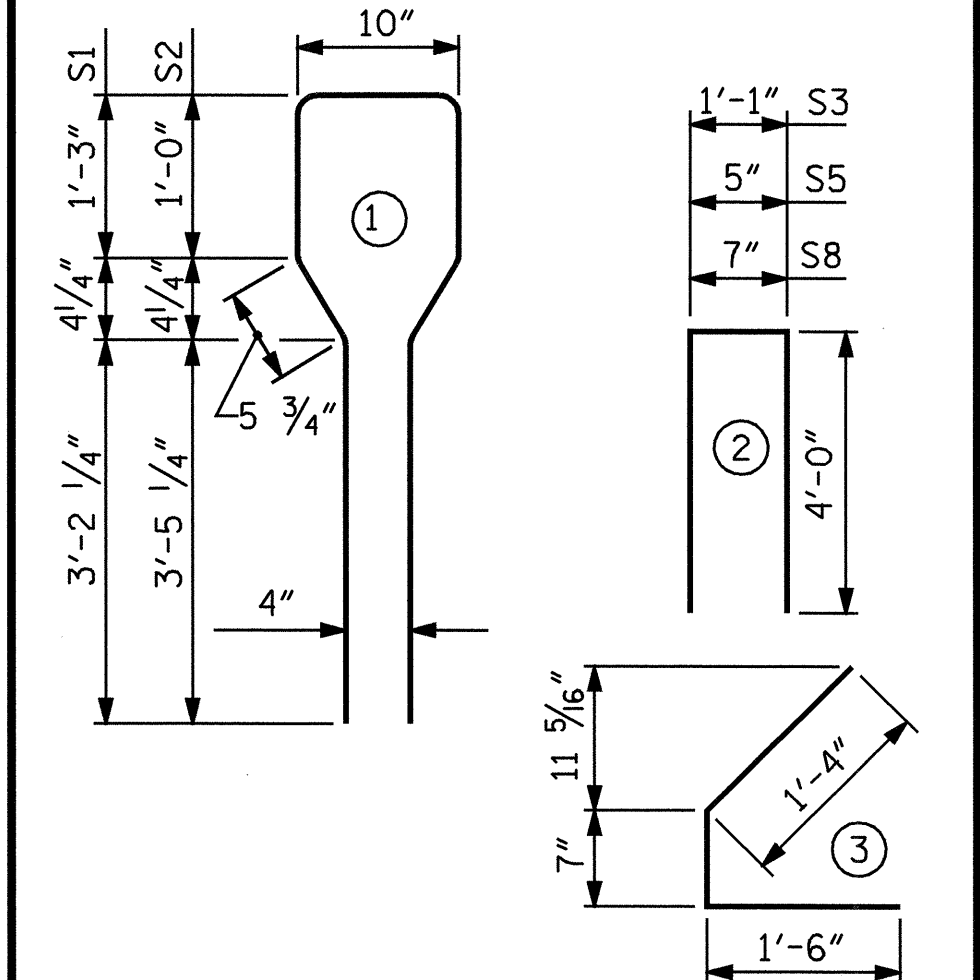
1/2" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.153	41,300	30,980

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	70	#4	1	10'-8"	499
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
**S7	12	#5	STR	3'-8"	46
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1

**NOTE: S7 BARS SHALL BE BENT BEFORE
SHIPMENT. HEAT BENDING SHALL
NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER			
REINFORCING STEEL LB.	8500 PSI CONCRETE C.Y.	1/2" Ø L.R. STRANDS No.	
965	17.080	40	

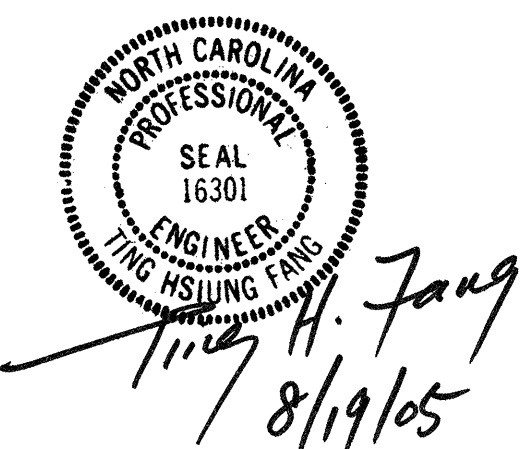
GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
10	84.167	841.670

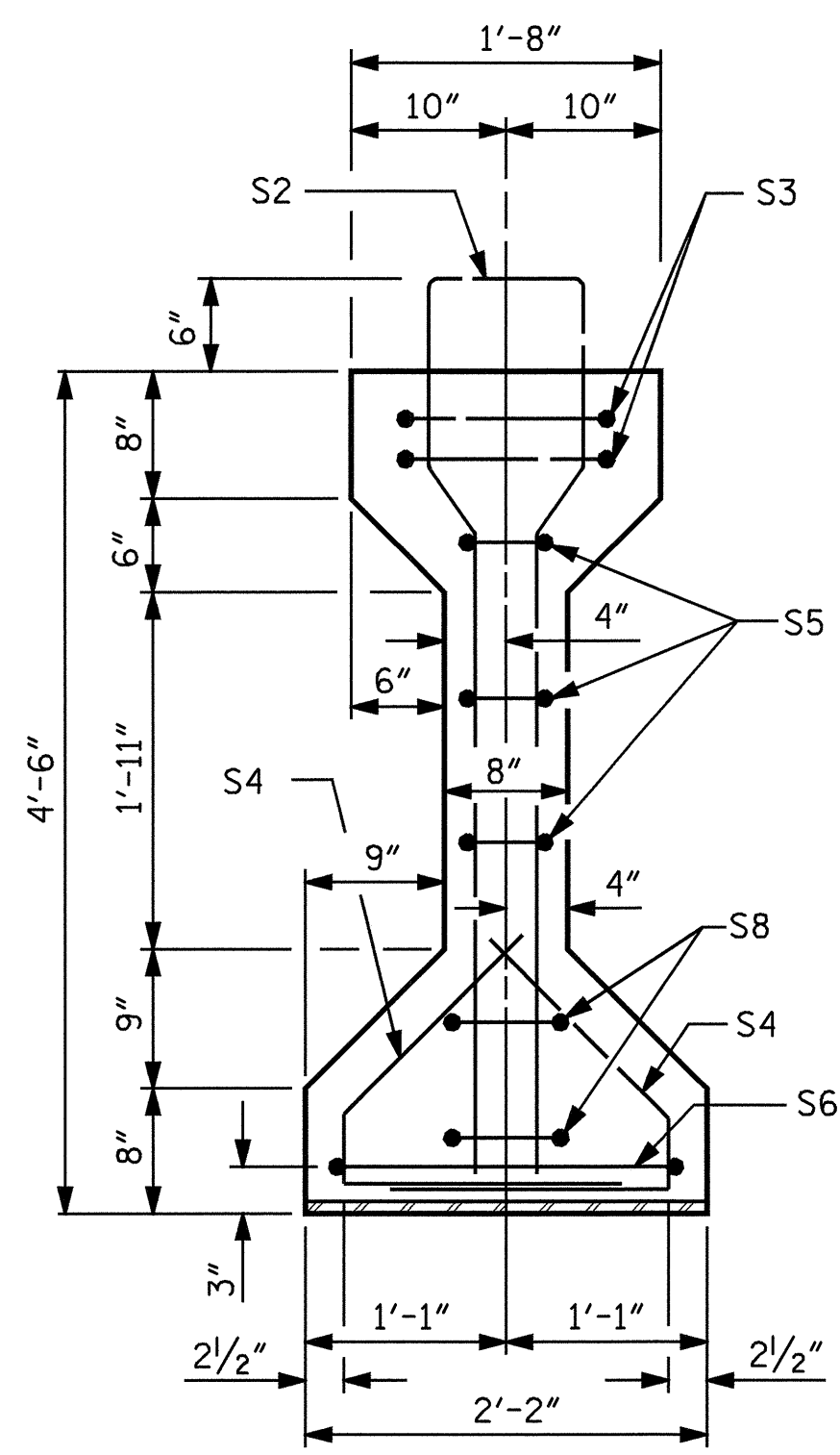
PROJECT NO. B-3509
ROCKINGHAM COUNTY
STATION: 15+67.50 -L-

SHEET 2 OF 4

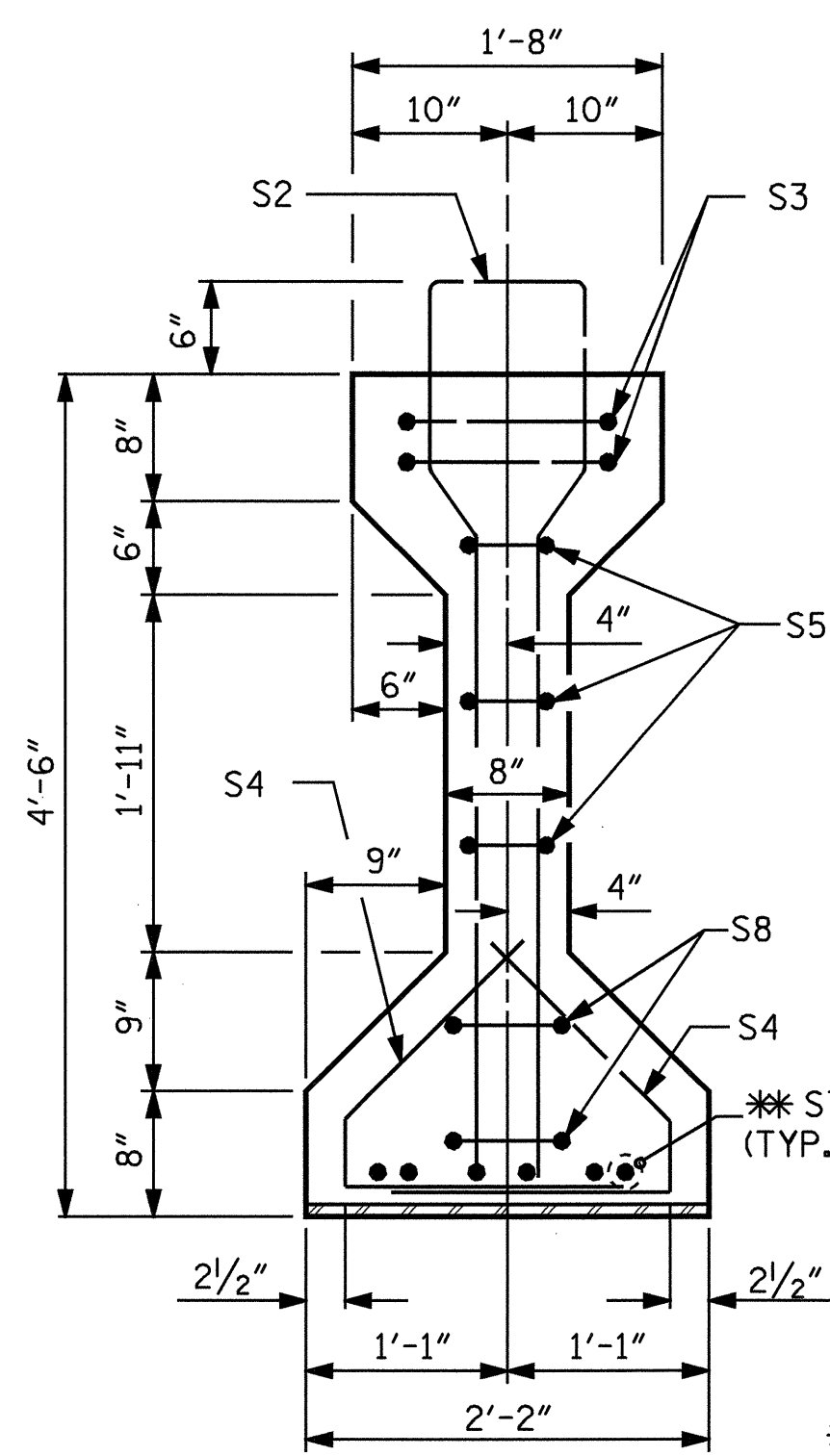
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPANS B & C



ASSEMBLED BY: S. M. RASHIDI	DATE: 7/6/04	CADD STANDARD
CHECKED BY: M. A. ALLEN	DATE: 2-05	
DRAWN BY: ARB 2/97	REV. 10/99	MAB/LES
CHECKED BY: EEM 2/97		

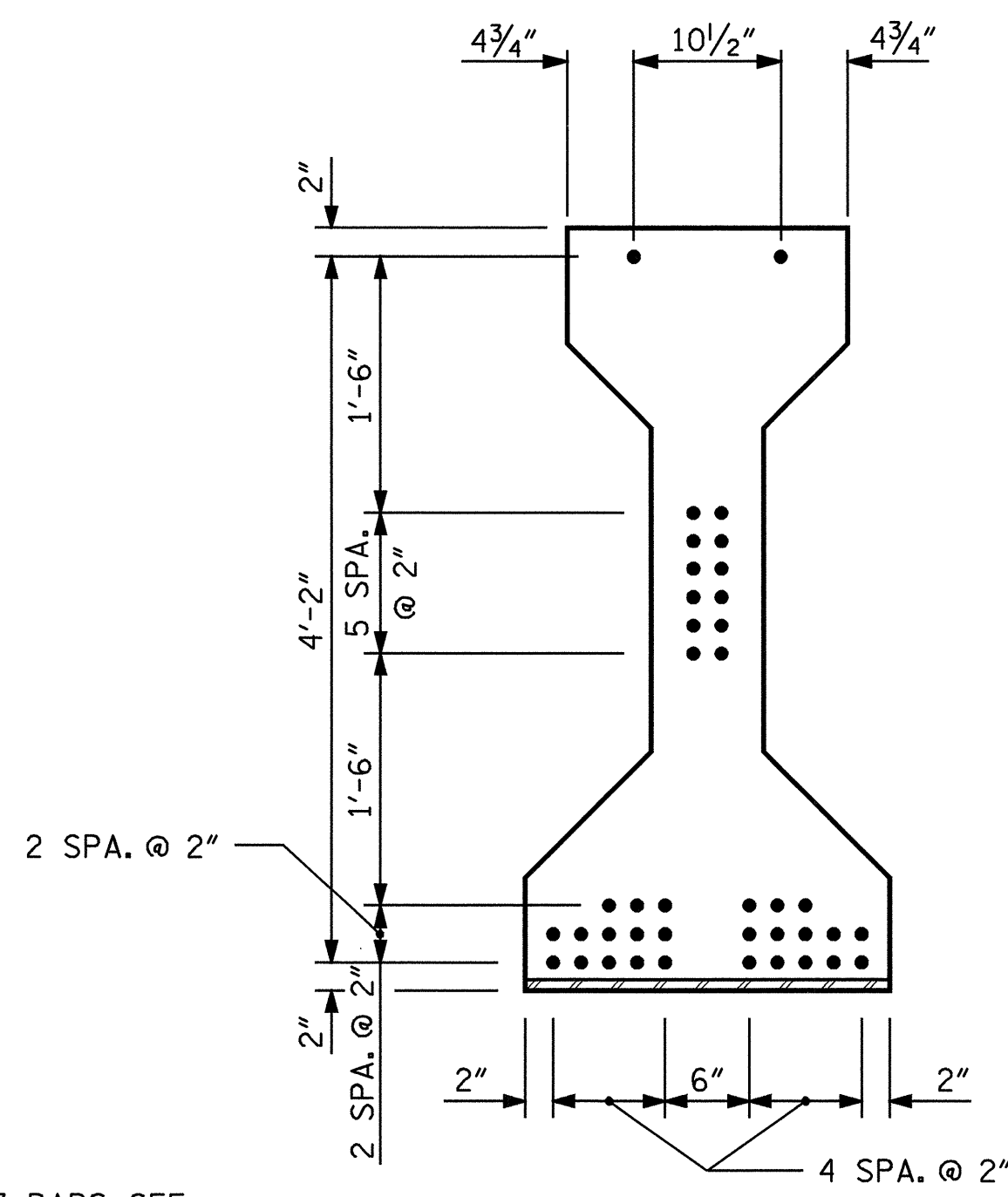


SECTION A-A

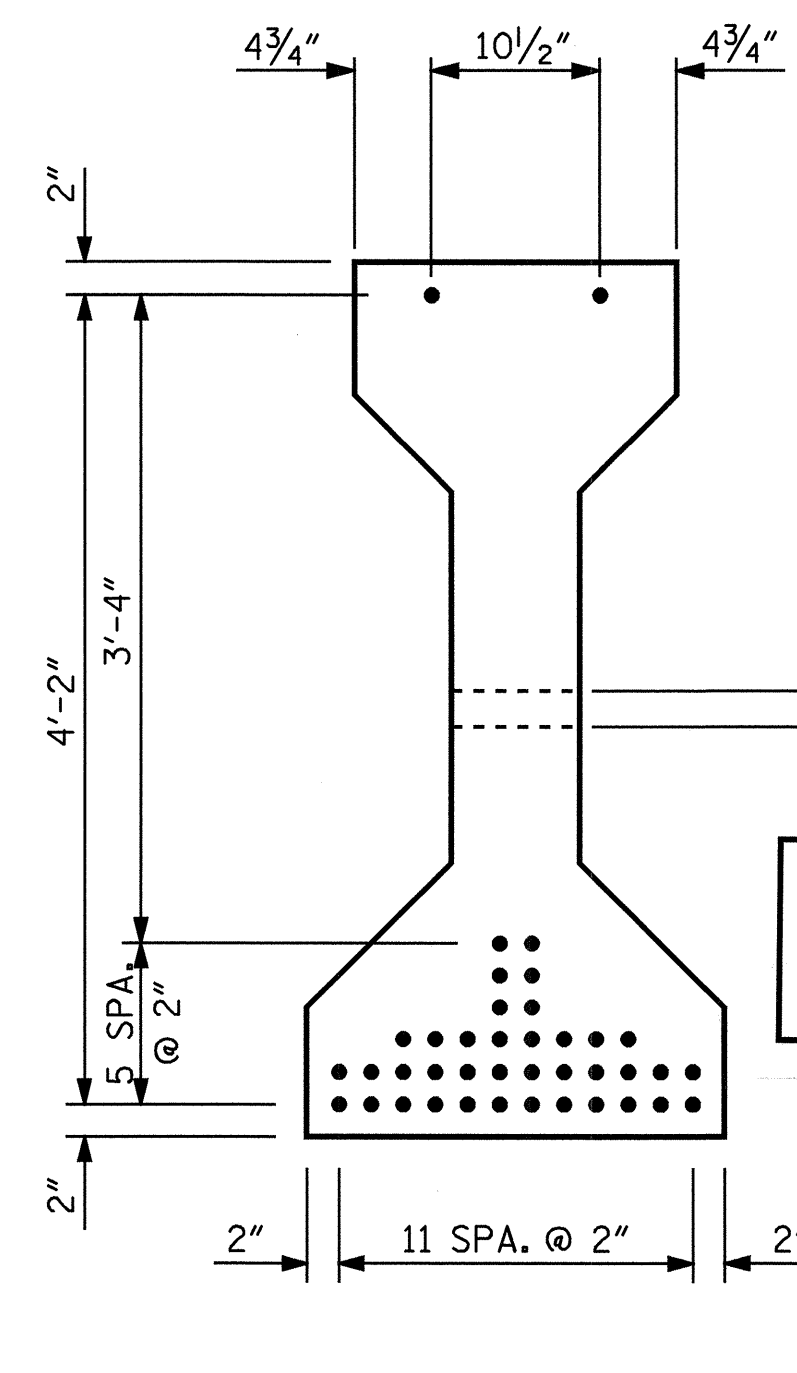


SECTION B-B

** FOR S7 BARS, SEE
DETAIL "A" OF PRESTRESSED
CONCRETE GIRDER CONTINUOUS
FOR LIVE LOAD DETAILS
SHEET



AT END OF GIRDER

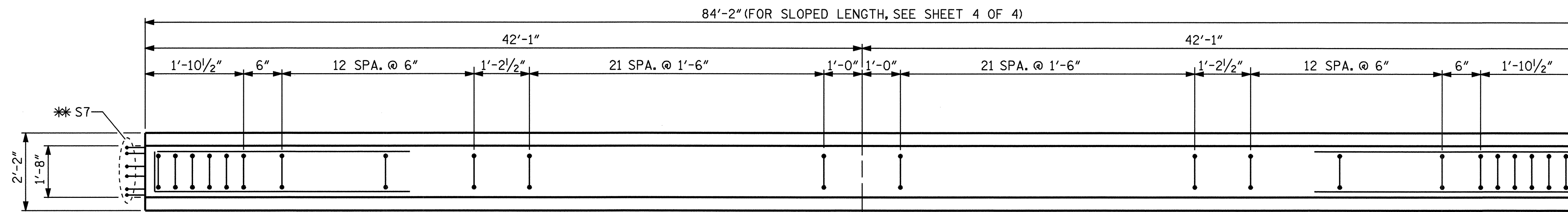


AT C OF GIRDER

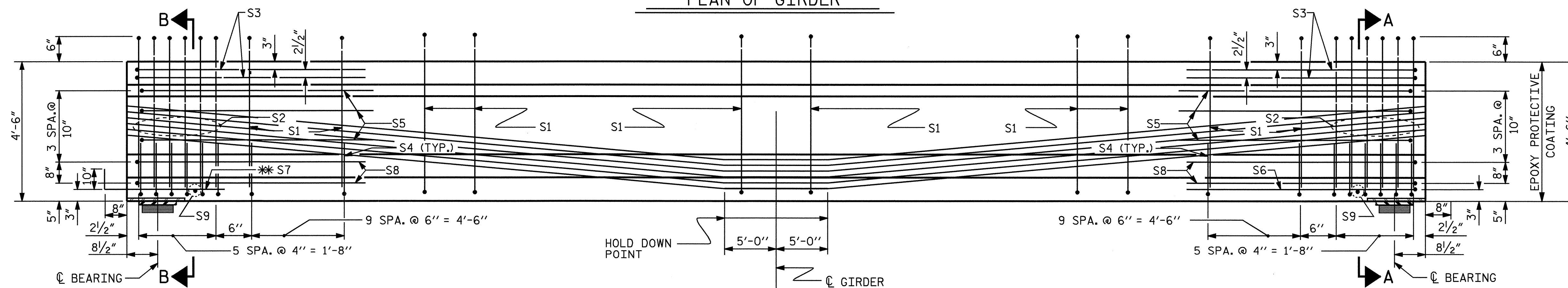
NOTE: 0.6" Ø L.R. STRANDS ARE TO
BE USED ONLY IN SPAN A.
1/2" Ø L.R. STRANDS ARE TO BE
USED IN SPANS B, C, AND D.

SEE "PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
DETAILS" SHEET FOR LOCATION
OF 3" Ø CORED OR FORMED HOLE

1/2" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

FOR LOCATION OF 3" Ø CORED OR
FORMED HOLE, SEE "PRESTRESSED
CONCRETE GIRDER CONTINUOUS
FOR LIVE LOAD DETAIL" SHEET.

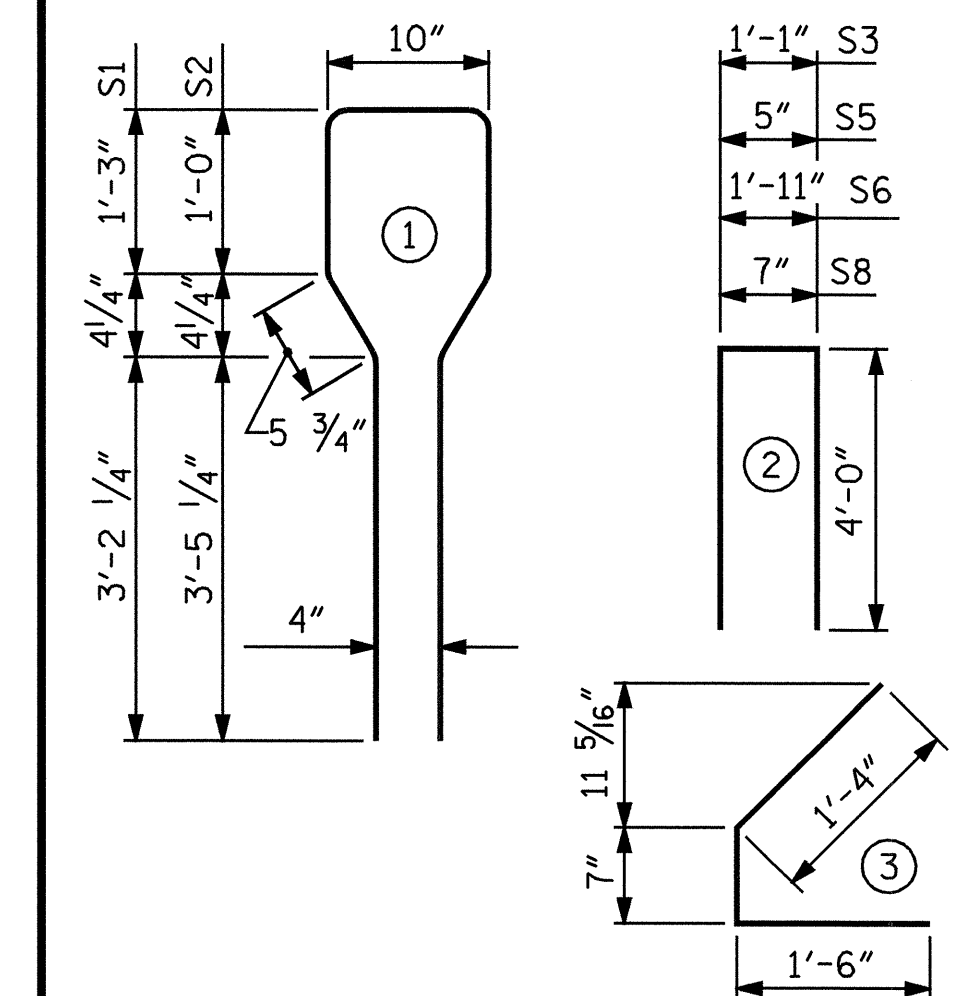
1/2" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.153	41,300	30,980

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	70	#4	1	10'-8"	499
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
*S7	6	#5	STR	3'-8"	23
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1

** NOTE: S7 BARS SHALL BE BENT BEFORE
SHIPMENT. HEAT BENDING SHALL
NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

REINFORCING STEEL LB.	8500 PSI CONCRETE C.Y.	1/2" Ø L.R. STRANDS No.
949	17.080	40

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	84.167	420.835

PROJECT NO. B-3509
ROCKINGHAM COUNTY
STATION: 15+67.50 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN D

NORTH CAROLINA
PROFESSIONAL
SEAL
16301
ENGINEER
TUNG HSIUNG FANG
Tung H. Fang
8/19/05

ASSEMBLED BY : S. M. RASHIDI	DATE : 7/6/04	CADD STANDARD
CHECKED BY : M. A. ALLEN	DATE : 2-05	
DRAWN BY : ARB 2/97	REV. 10/99	MAB/LES
CHECKED BY : EEM 2/97		

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

S-19
TOTAL
SHEETS
53

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.

TIE ROD ASSEMBLY SHALL BE AASHTO M270 GRADE 36 STRUCTURAL STEEL.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW. FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6500 PSI AT SPAN A AND 5200 PSI AT SPANS B, C, & D.

DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

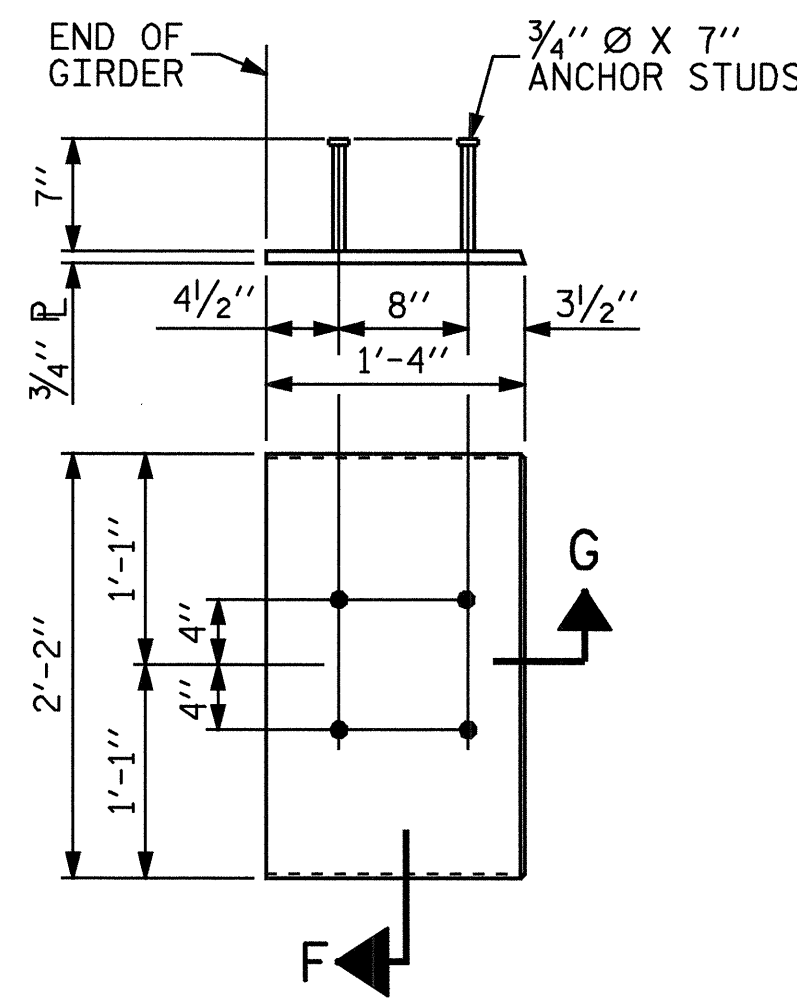
FOR VERTICAL CRACKS IN PRESTRESSED CONCRETE GIRDERS PRIOR TO DETENSIONING, SEE SPECIAL PROVISIONS.

ALL REINFORCING STEEL SHALL BE GRADE 60.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

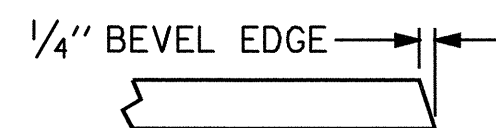
THE NEAR END OF SPAN A GIRDERS AND FAR END OF SPAN D GIRDERS SHALL BE PLUMB.

WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.

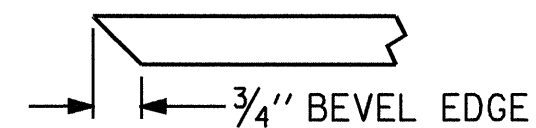


EMBEDDED PLATE "B-1" DETAILS

(2 REQ'D PER GIRDER)

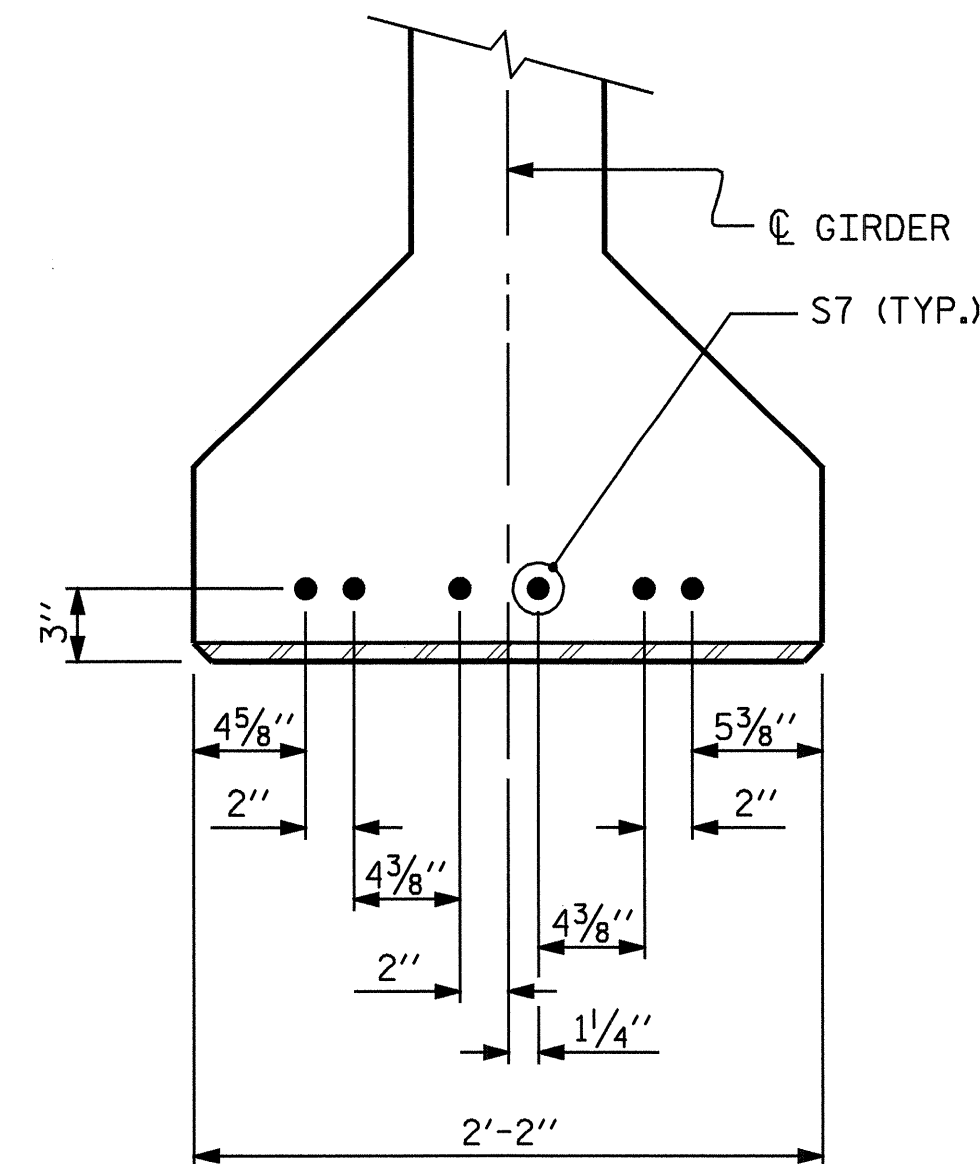


SECTION "G"



SECTION "F"

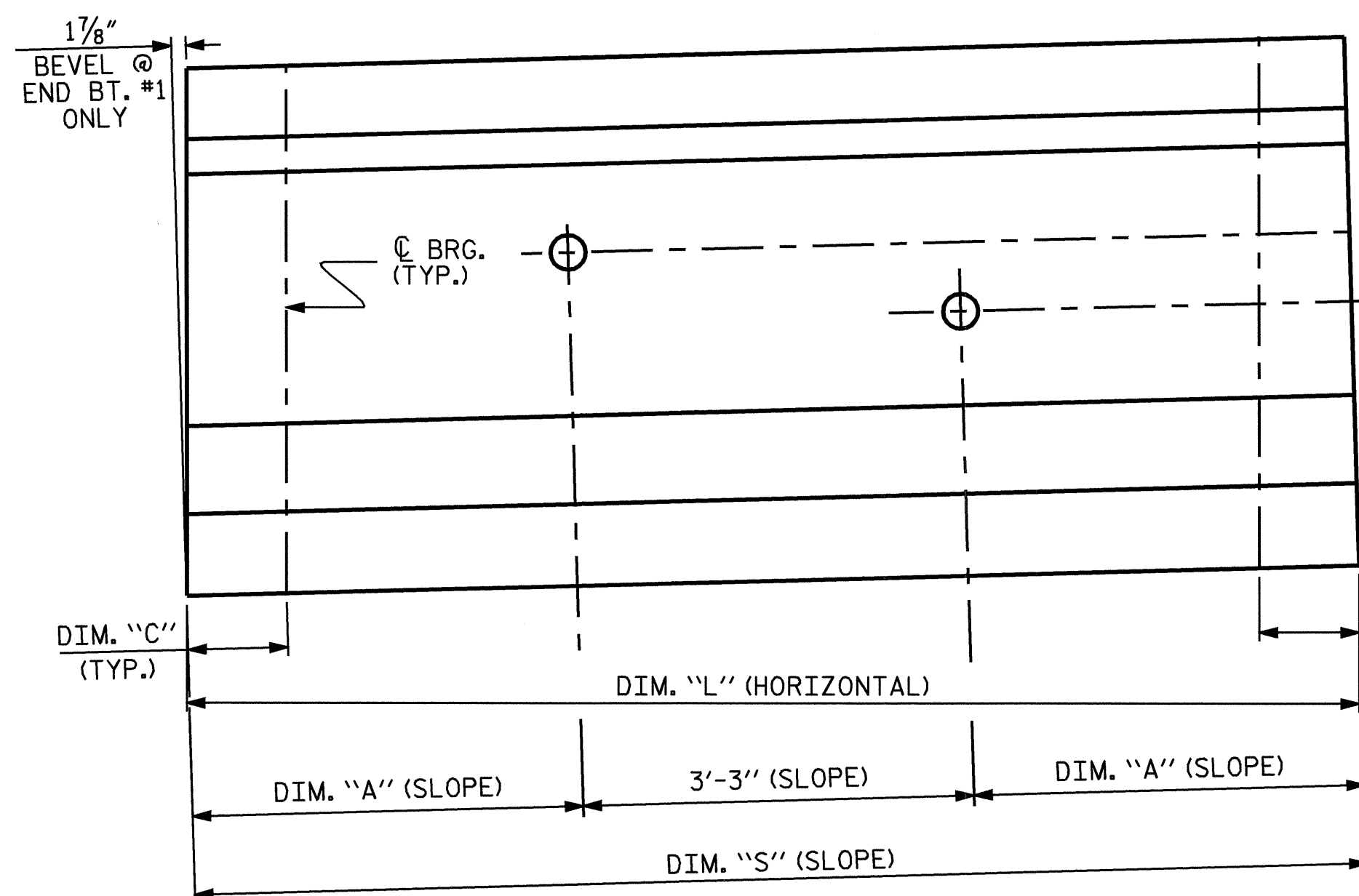
(SEE NOTES)



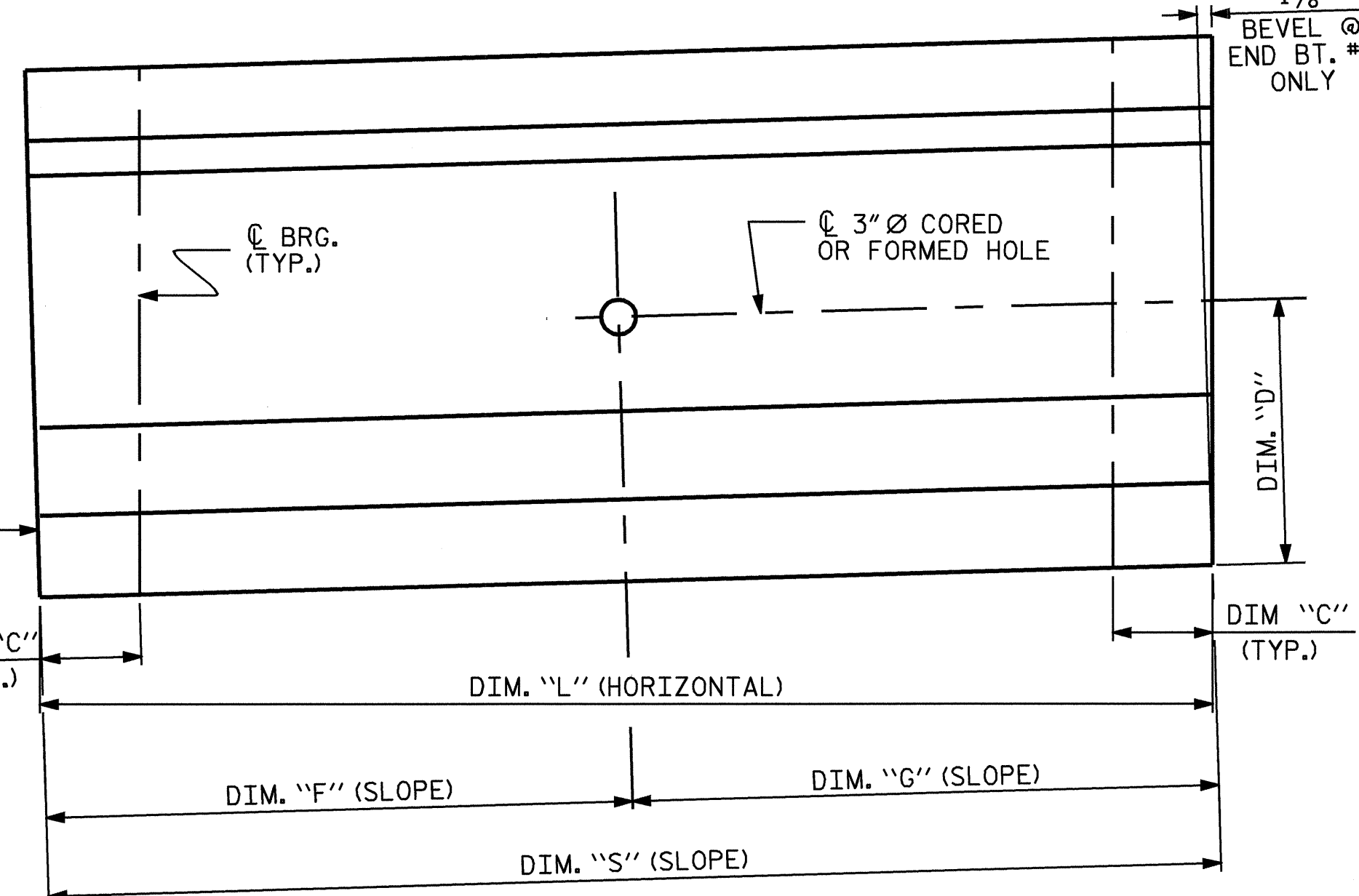
DETAIL "A"

UPSTATION

UPSTATION



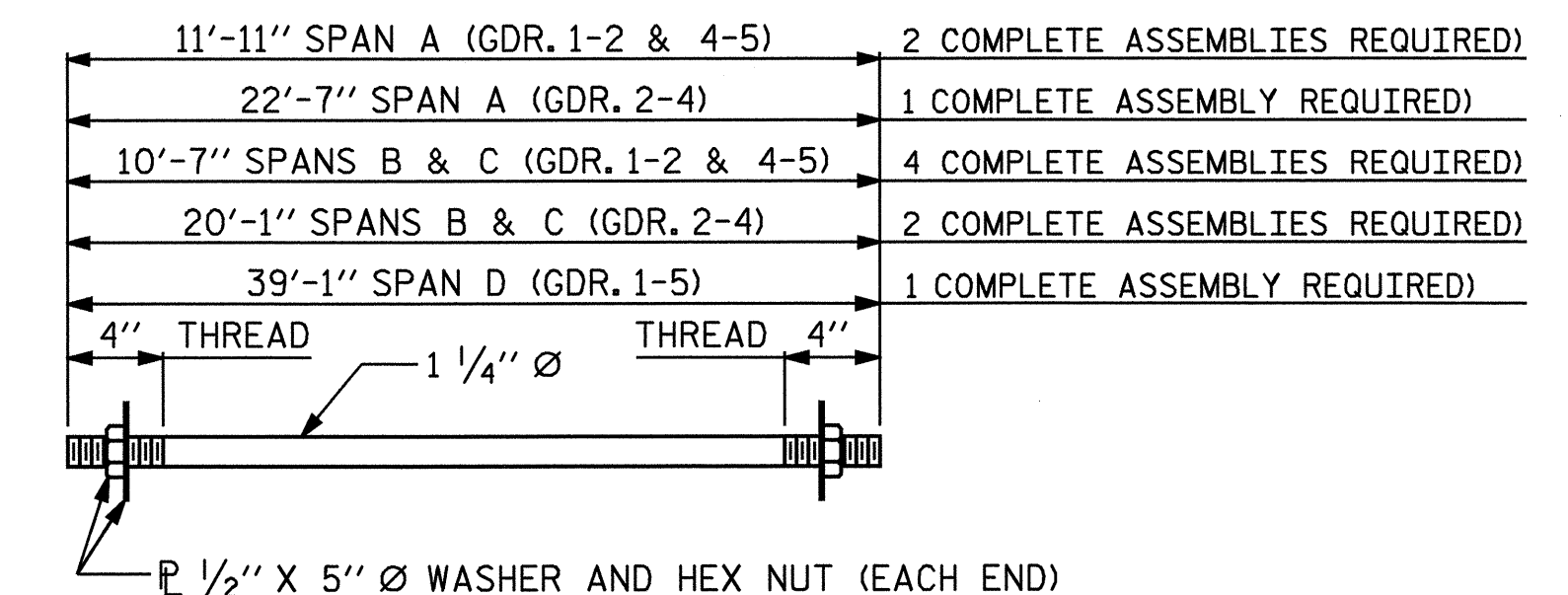
ELEVATION



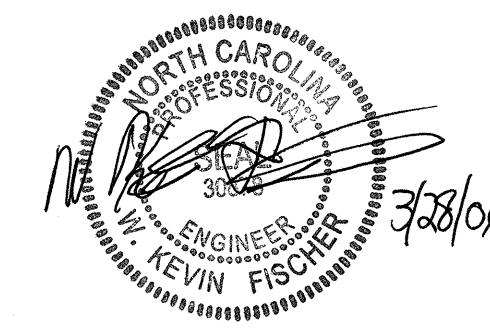
ELEVATION

TYPICAL GIRDER ELEVATIONS

SHOWING TIE ROD PLACEMENT AND HORIZONTAL / SLOPE DIMENSION



1/4" Ø TIE ROD ASSEMBLY



PROJECT NO. B-3509
 ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

SHEET 4 OF 4

TIE ROD PLACEMENT TABLE																
SPAN "A"							SPANS "B & C"					SPAN "D"				
GDR. #	DIM. "A"	DIM. "C"	DIM. "D"	DIM. "E"	DIM. "F"	DIM. "G"	GDR. #	DIM. "A"	DIM. "D"	DIM. "E"	DIM. "F"	DIM. "G"	GDR. #	DIM. "D"	DIM. "F"	DIM. "G"
A1	—	7 1/16"	2'-11"	—	42'-6 13/16"	45'-9 13/16"	B1 & C1	—	2'-11"	—	40'-5 13/16"	43'-8 13/16"	D1	2'-5"	42'-1 5/16"	42'-1 5/16"
A2	42'-6 13/16"	8 1/4"	2'-3"	2'-11"	—	—	B2 & C2	40'-5 13/16"	2'-3"	2'-11"	—	—	D2	2'-3"	42'-1 5/16"	42'-1 5/16"
A3	—	8 1/2"	2'-3"	—	45'-9 13/16"	42'-6 13/16"	B3 & C3	—	2'-3"	—	43'-8 13/16"	40'-5 13/16"	D3	2'-0 1/2"	42'-1 5/16"	42'-1 5/16"
A4	42'-6 13/16"	8 1/4"	2'-3"	2'-11"	—	—	B4 & C4	40'-5 13/16"	2'-3"	2'-11"	—	—	D4	2'-3"	42'-1 5/16"	42'-1 5/16"
A5	—	7 1/16"	2'-11"	—	42'-6 13/16"	45'-9 13/16"	B5 & C5	—	2'-11"	—	40'-5 13/16"	43'-8 13/16"	D5	2'-5"	42'-1 5/16"	42'-1 5/16"

PRESTRESSED GIRDER LENGTHS			
	DIM. "L"	DIM. "S"	DIM. "C"
SPAN "A"	88'-4"	88'-4 5/8"	SEE CHART
SPAN "B", "C" & "D"	84'-2"	84'-2 5/8"	8 1/2"

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 AASHTO TYPE IV
 PRESTRESSED CONCRETE GIRDER
 CONTINUOUS FOR LIVE LOAD
 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			50

DRAWN BY: S. M. RASHIDI DATE: 7-6-04
 CHECKED BY: M. A. ALLEN DATE: 2-05

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
0.6" Ø LOW RELAXATION	SPAN A																					
	GIRDERS 1 & 5											GIRDERS 2, 3 & 4										
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.117	0.221	0.302	0.354	0.372	0.354	0.302	0.221	0.117	0	0	0.117	0.220	0.302	0.353	0.371	0.353	0.302	0.220	0.117	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.041	0.078	0.107	0.126	0.132	0.126	0.107	0.078	0.041	0	0	0.046	0.086	0.118	0.138	0.145	0.138	0.118	0.086	0.046	0
FINAL CAMBER ↑	0	15/16"	1 1/16"	2 5/16"	2 3/4"	2 7/8"	2 3/4"	2 5/16"	1 1/16"	1 5/16"	0	0	7/8"	1 5/8"	2 3/16"	2 9/16"	2 1/16"	2 9/16"	2 3/16"	1 5/8"	7/8"	0
1/2" Ø LOW RELAXATION	SPANS B & C																					
	GIRDERS 1 & 5											GIRDERS 2, 3 & 4										
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.078	0.147	0.201	0.235	0.247	0.235	0.201	0.147	0.078	0	0	0.078	0.147	0.201	0.235	0.247	0.235	0.201	0.147	0.078	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.031	0.059	0.081	0.095	0.100	0.095	0.081	0.059	0.031	0	0	0.032	0.061	0.084	0.098	0.103	0.098	0.084	0.061	0.032	0
FINAL CAMBER ↑	0	9/16"	1 1/16"	1 7/16"	1 11/16"	1 3/4"	1 11/16"	1 7/16"	1 1/16"	9/16"	0	0	9/16"	1 1/16"	1 3/8"	1 5/8"	1 3/4"	1 5/8"	1 3/8"	1 1/16"	9/16"	0
1/2" Ø LOW RELAXATION	SPAN D																					
	GIRDERS 1 & 5											GIRDERS 2, 3 & 4										
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.078	0.147	0.201	0.235	0.247	0.235	0.201	0.147	0.078	0	0	0.078	0.147	0.201	0.235	0.247	0.235	0.201	0.147	0.078	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.031	0.059	0.081	0.095	0.100	0.095	0.081	0.059	0.031	0	0	0.032	0.061	0.084	0.099	0.104	0.099	0.084	0.061	0.032	0
FINAL CAMBER ↑	0	9/16"	1 1/16"	1 7/16"	1 11/16"	1 3/4"	1 11/16"	1 7/16"	1 1/16"	9/16"	0	0	9/16"	1 1/16"	1 3/8"	1 5/8"	1 11/16"	1 5/8"	1 3/8"	1 1/16"	9/16"	0

* INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. B-3509
ROCKINGHAM COUNTY
STATION: 15+67.50 -L-



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE DEAD LOAD DEFLECTIONS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					53

DRAWN BY : S. M. RASHIDI DATE : 7-6-04
CHECKED BY : M. A. ALLEN DATE : 2-05

NOTES

FOR ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

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

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

STEEL SOLE PLATES, ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACE SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

LOAD RATINGS

TYPE	MAX. DL+LL
TYPE V	207k
TYPE VI	253k



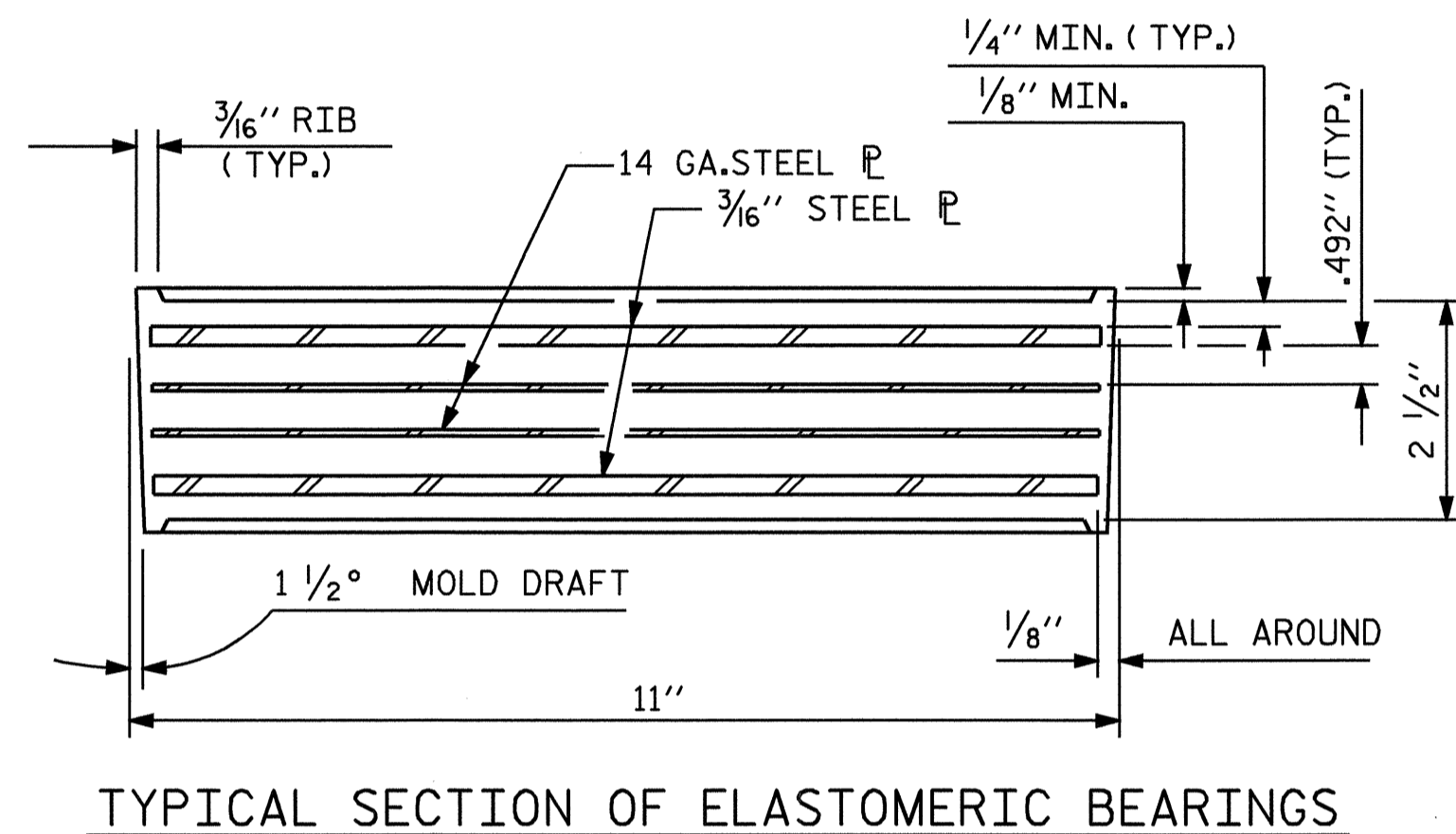
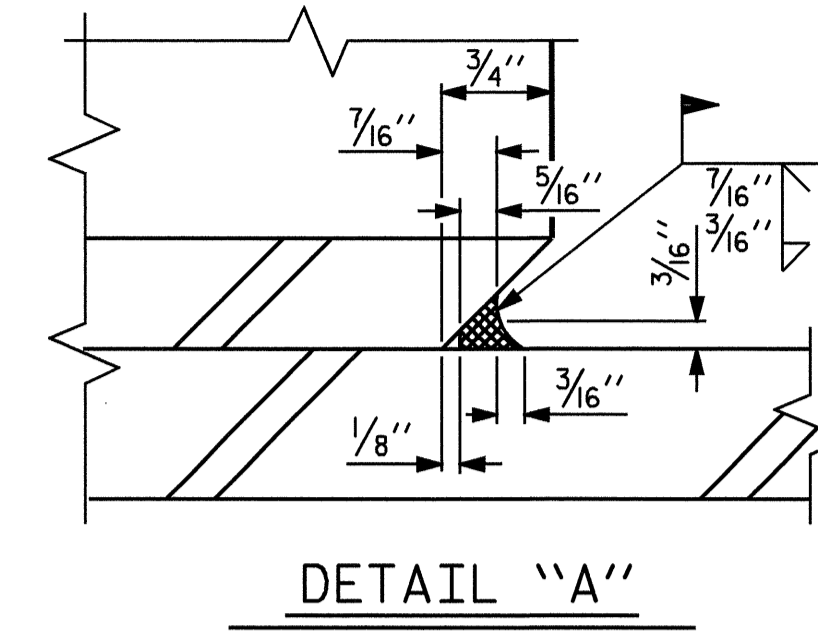
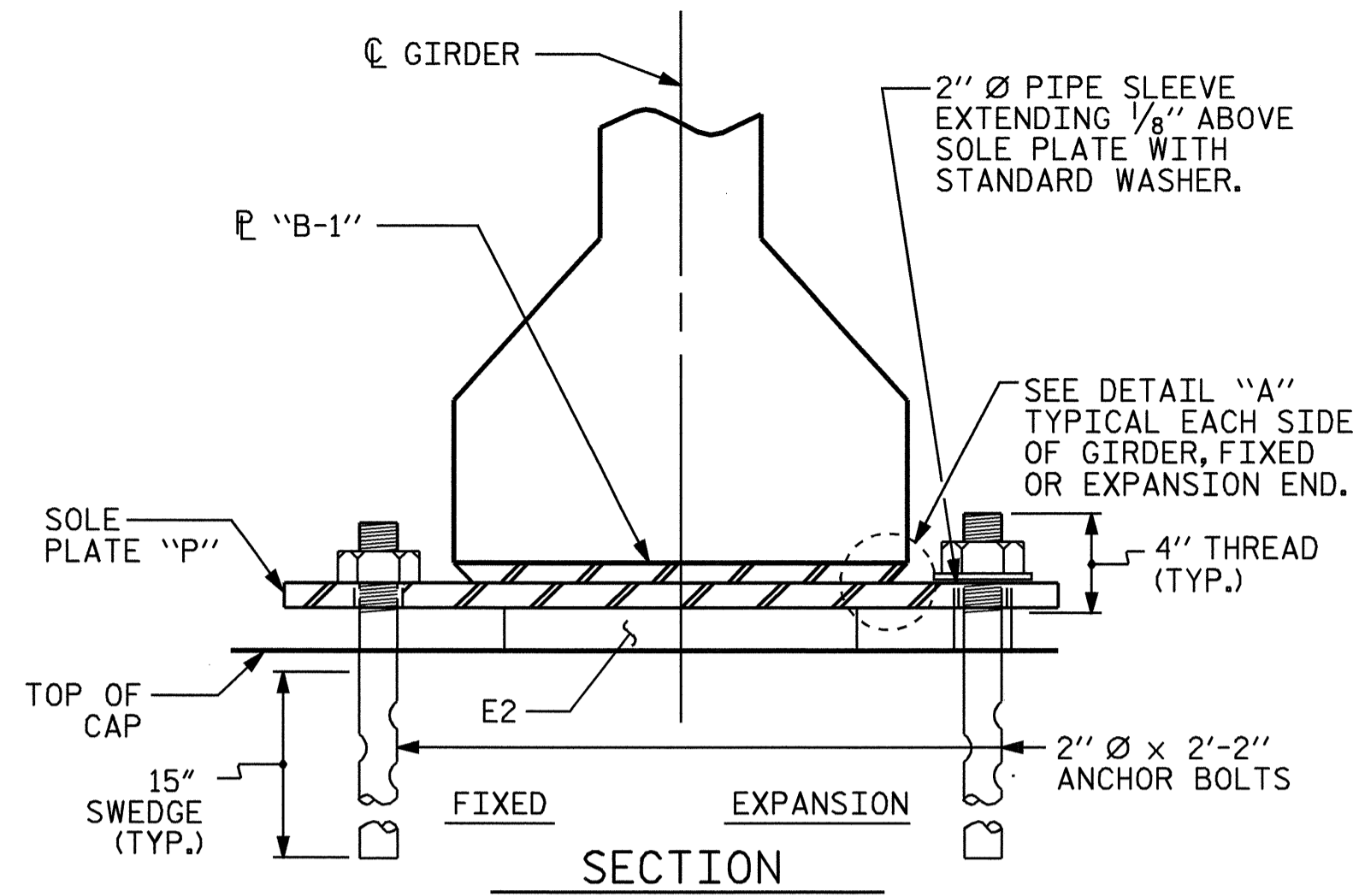
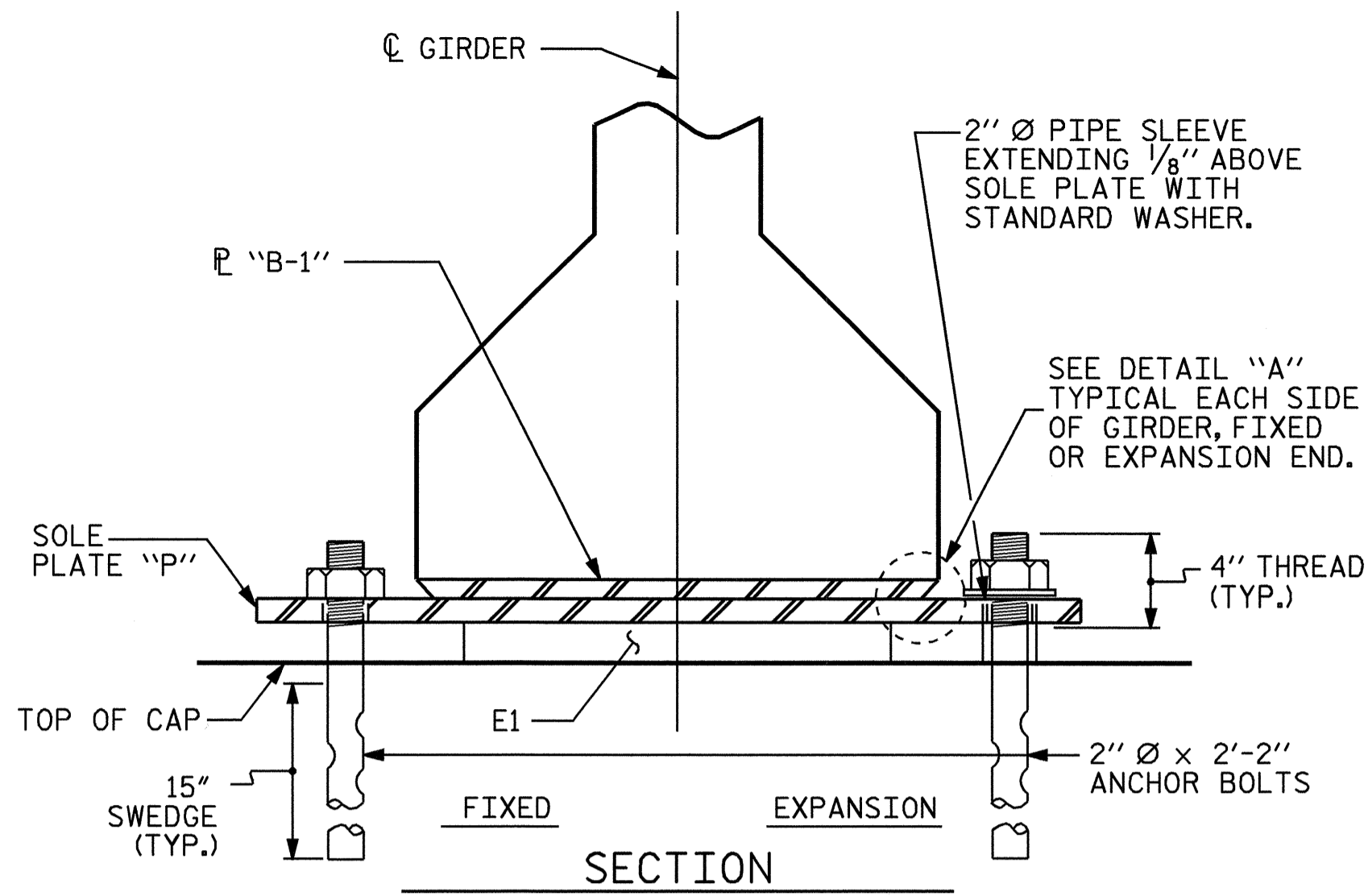
Ting H. Yang
10/19/05

PROJECT NO. B-3509
ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

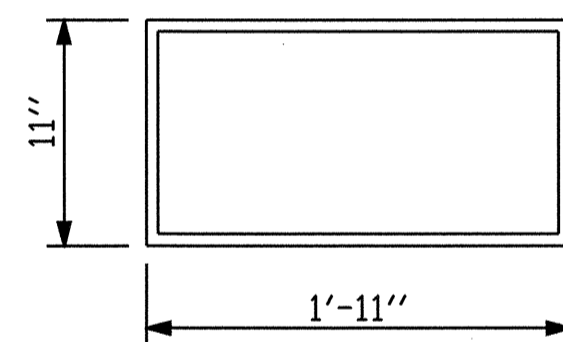
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**STANDARD
 ELASTOMERIC BEARING
 DETAILS**
 PRESTRESSED CONCRETE GIRDER
 SUPERSTRUCTURE

REVISIONS						SHEET NO. S-22
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 53
2			4			

NC005

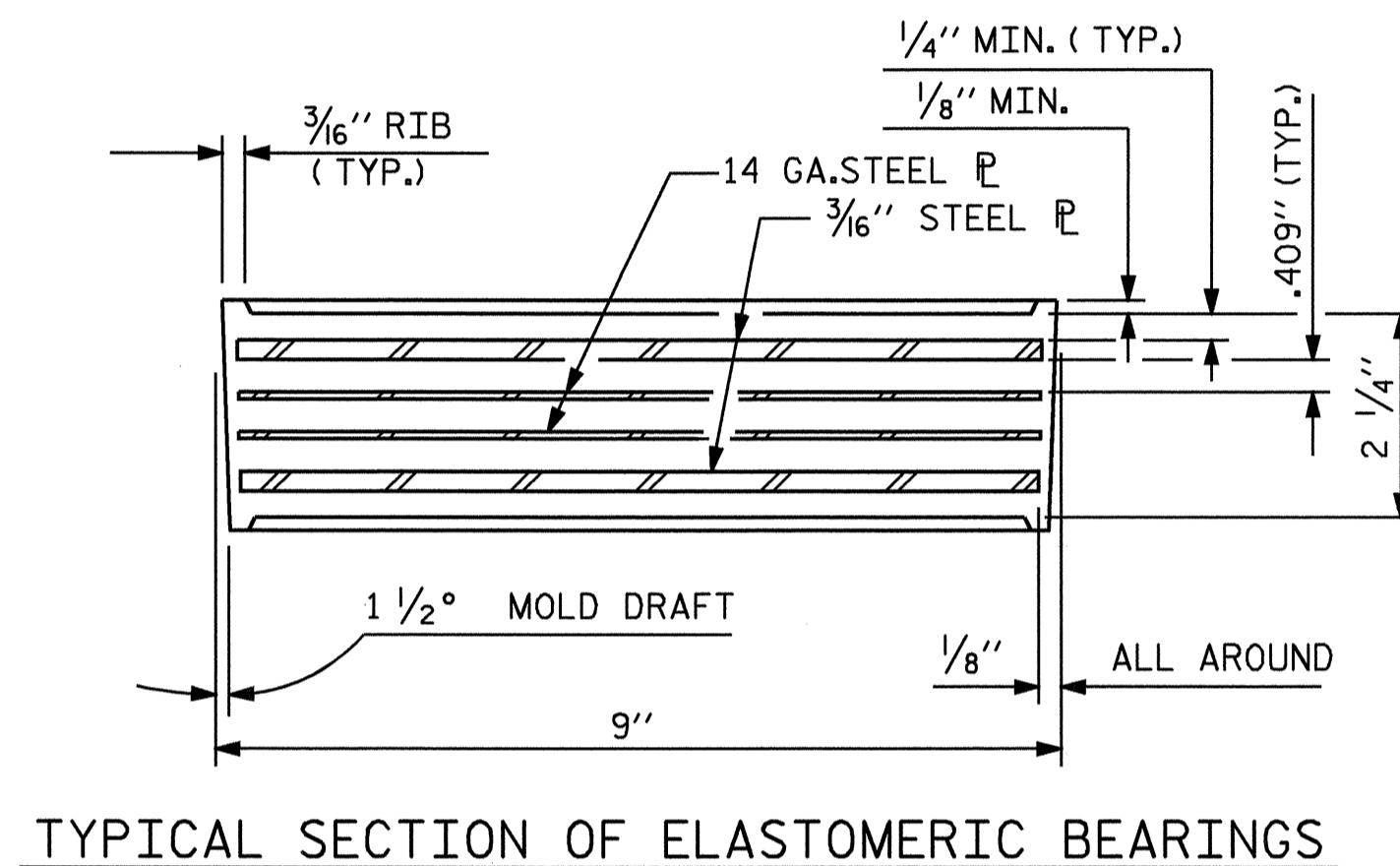


TYPICAL SECTION OF ELASTOMERIC BEARINGS

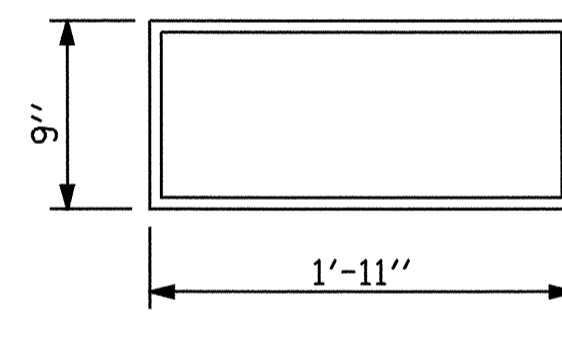


E1 (10 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING

TYPE VI

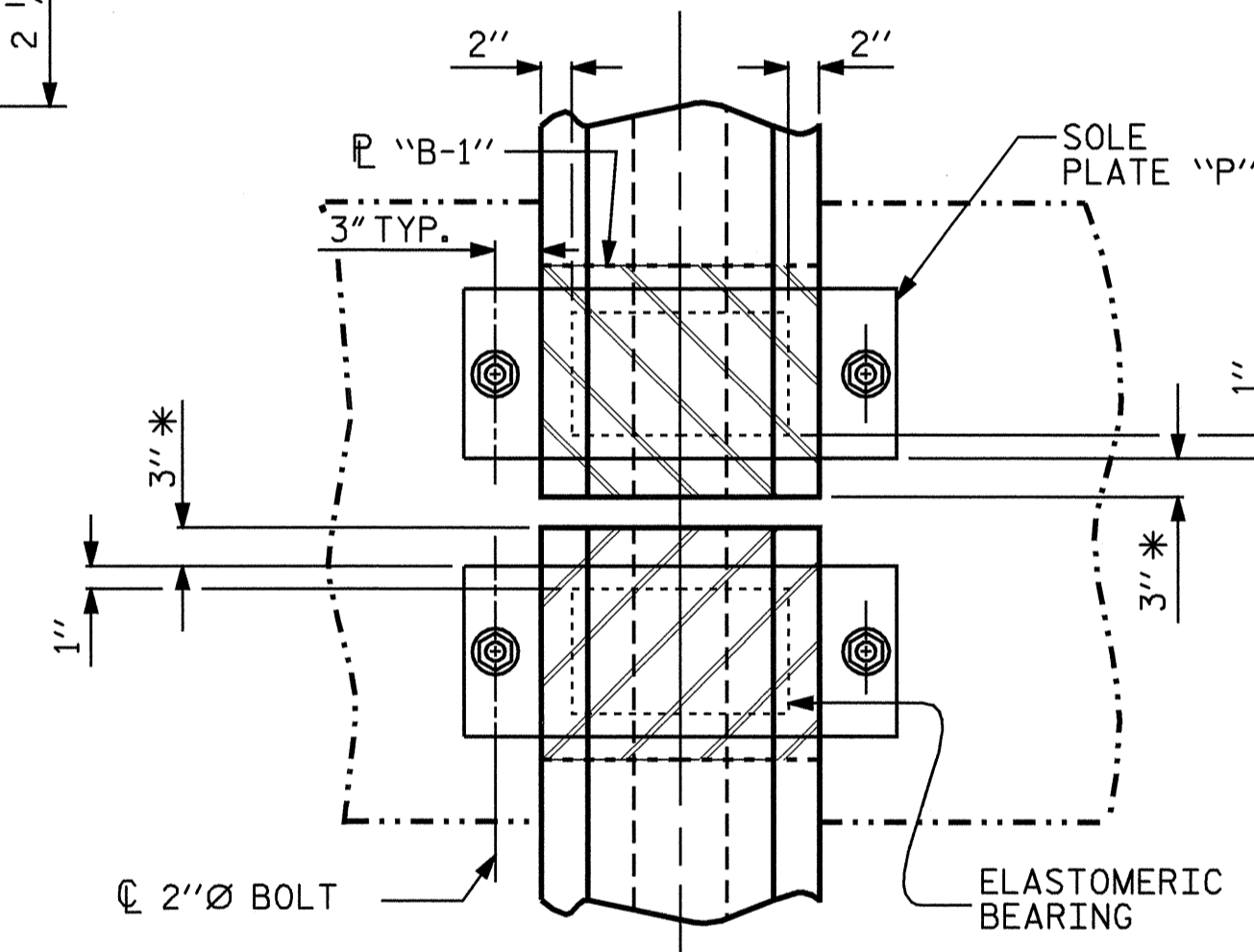


TYPICAL SECTION OF ELASTOMERIC BEARINGS



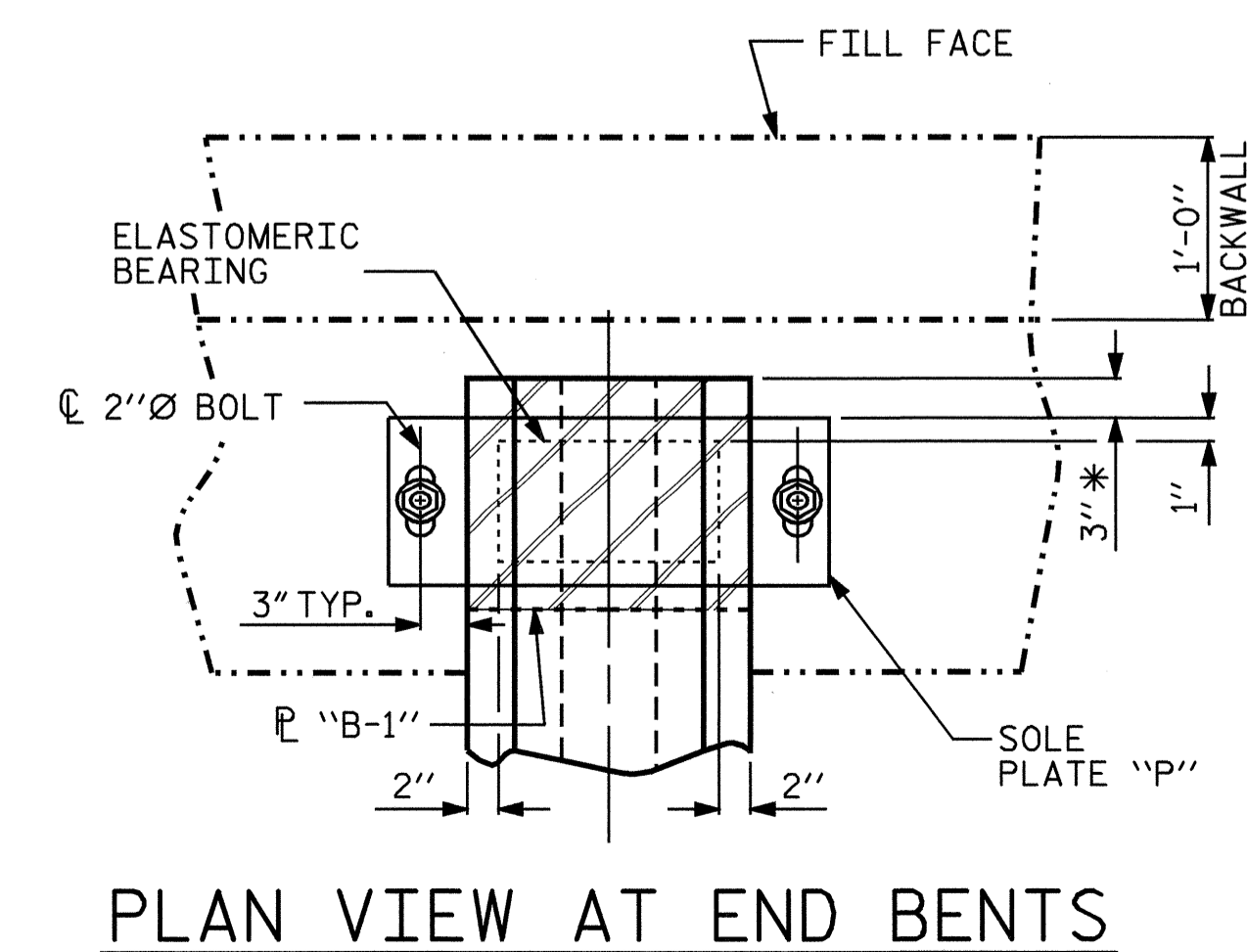
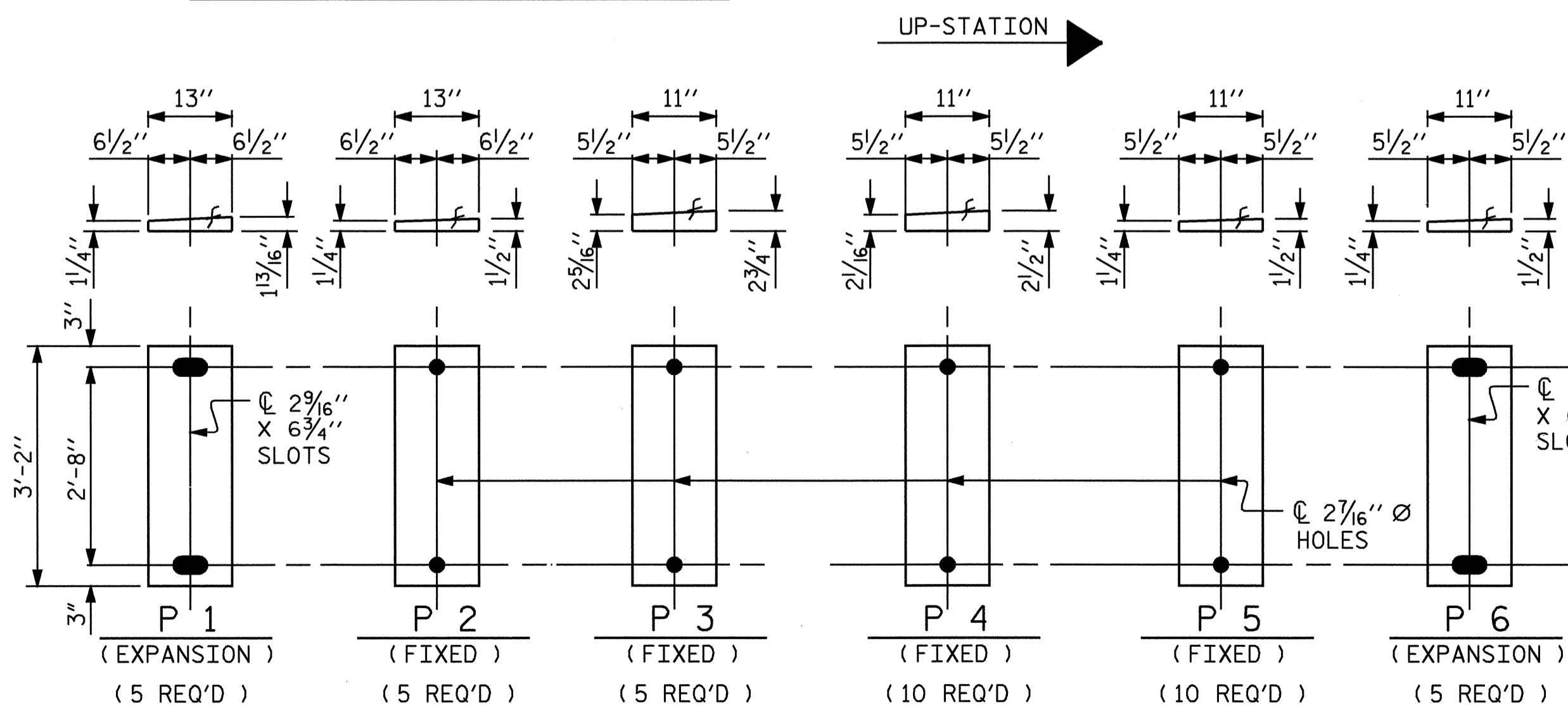
E2 (30 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING

TYPE V



PLAN VIEW AT BENTS

(FIXED)
* DIMENSION VARIES AT SPAN A

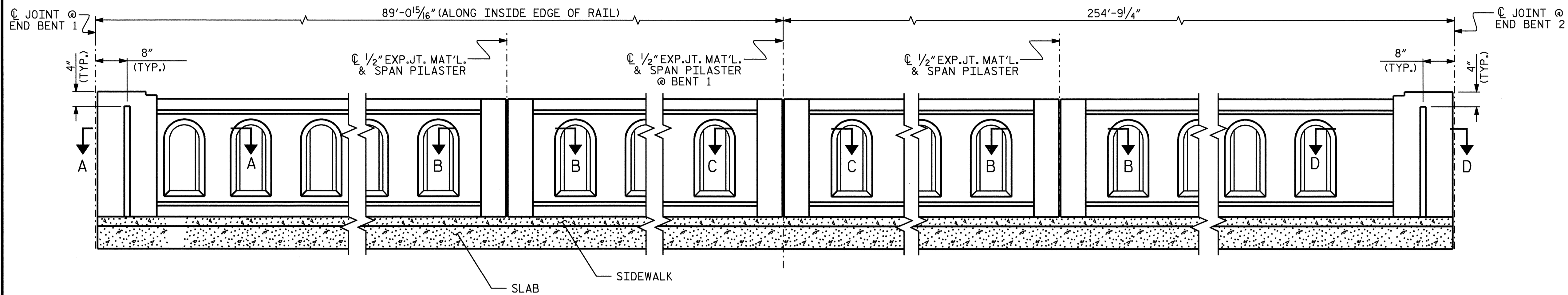


PLAN VIEW AT END BENTS

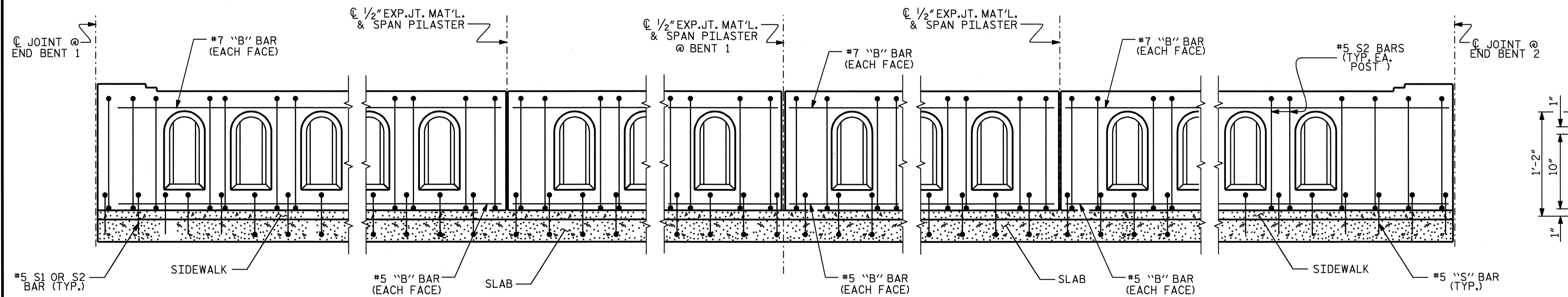
(EXPANSION)
* DIMENSION VARIES AT SPAN A

DRAWN BY: S. M. RASHIDI DATE: 7/6/04
 CHECKED BY: M. A. ALLEN DATE: 2-05

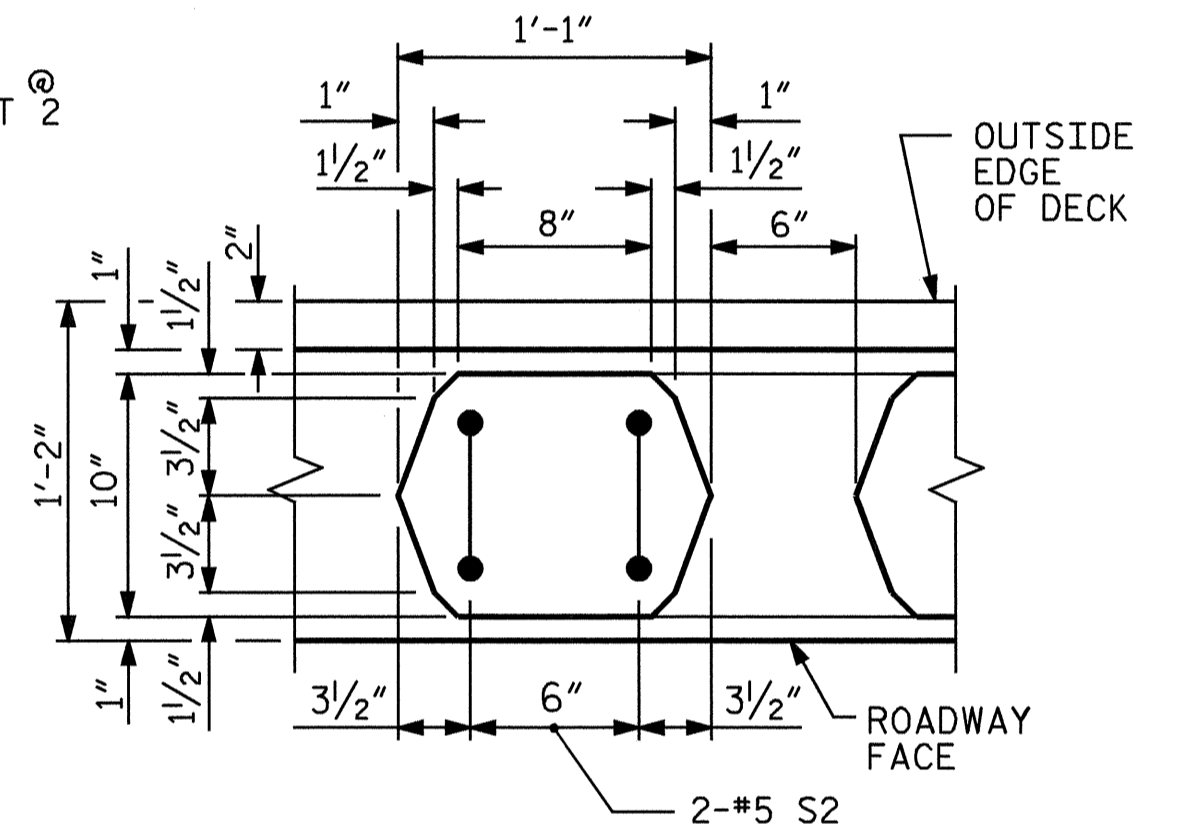
17-AUG-2005 07:56
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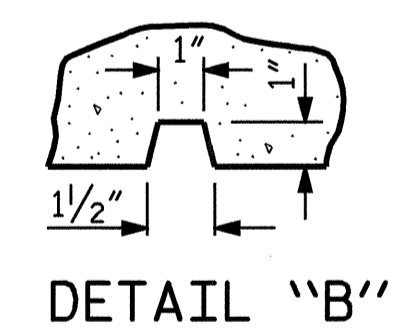
ROADWAY ELEVATION OF RAIL



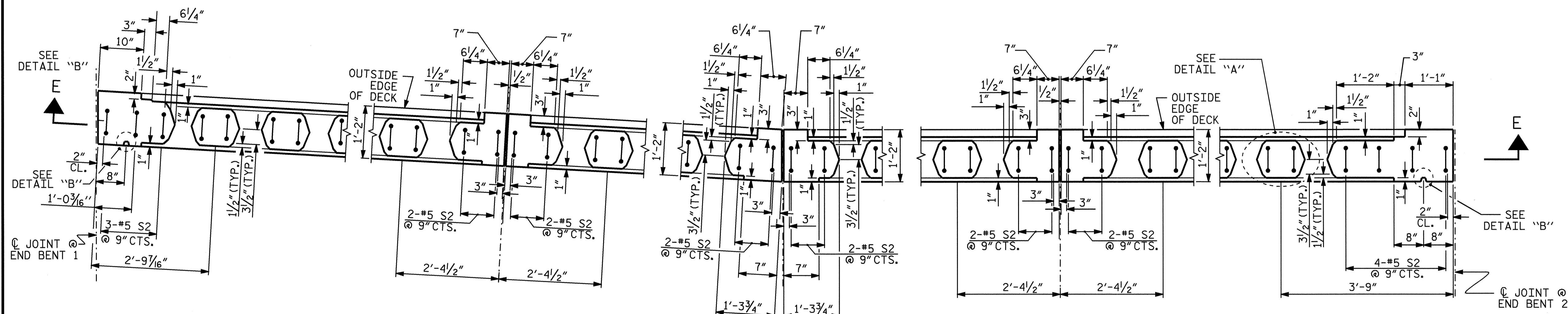
SECTION E-E



DETAIL "A"
(TYP. EACH POST)



DETAIL "B"



SECTION A-A
(PILASTER AT END BENT 1)

SECTION B-B
(SPAN PILASTER)

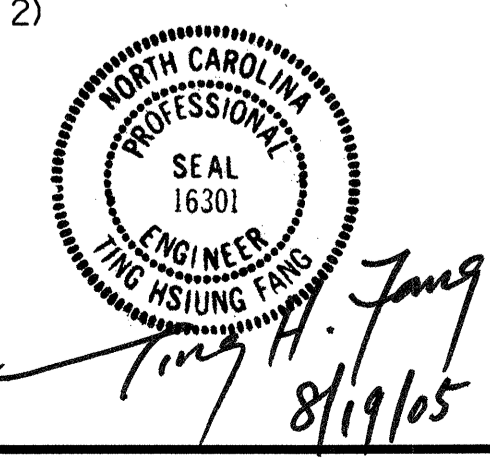
SECTION C-C
(SPAN PILASTER)
(AT BENT 1)

SECTION B-B
(SPAN PILASTER)

SECTION D-D
(PILASTER AT END BENT 2)

FOR THE DETAILS OF THE CLASSIC CONCRETE BRIDGE RAIL ON THE APPROACH SLABS, SEE "BRIDGE APPROACH SLAB" SHEETS.

NOTE: #5 S2 BARS SHOWN, OTHER BARS NOT SHOWN FOR CLARITY.

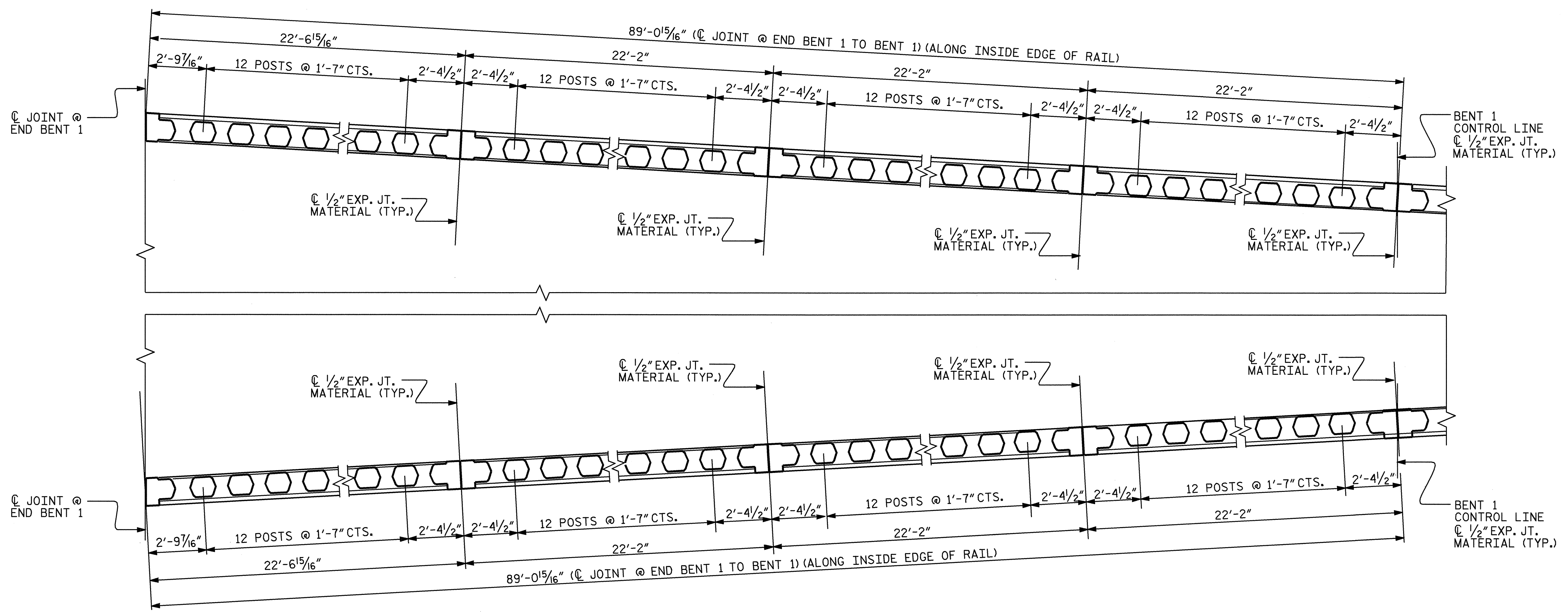


PROJECT NO. B-3509
ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					SHEET NO. S-23
CLASSIC CONCRETE BRIDGE RAIL					TOTAL SHEETS 53
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

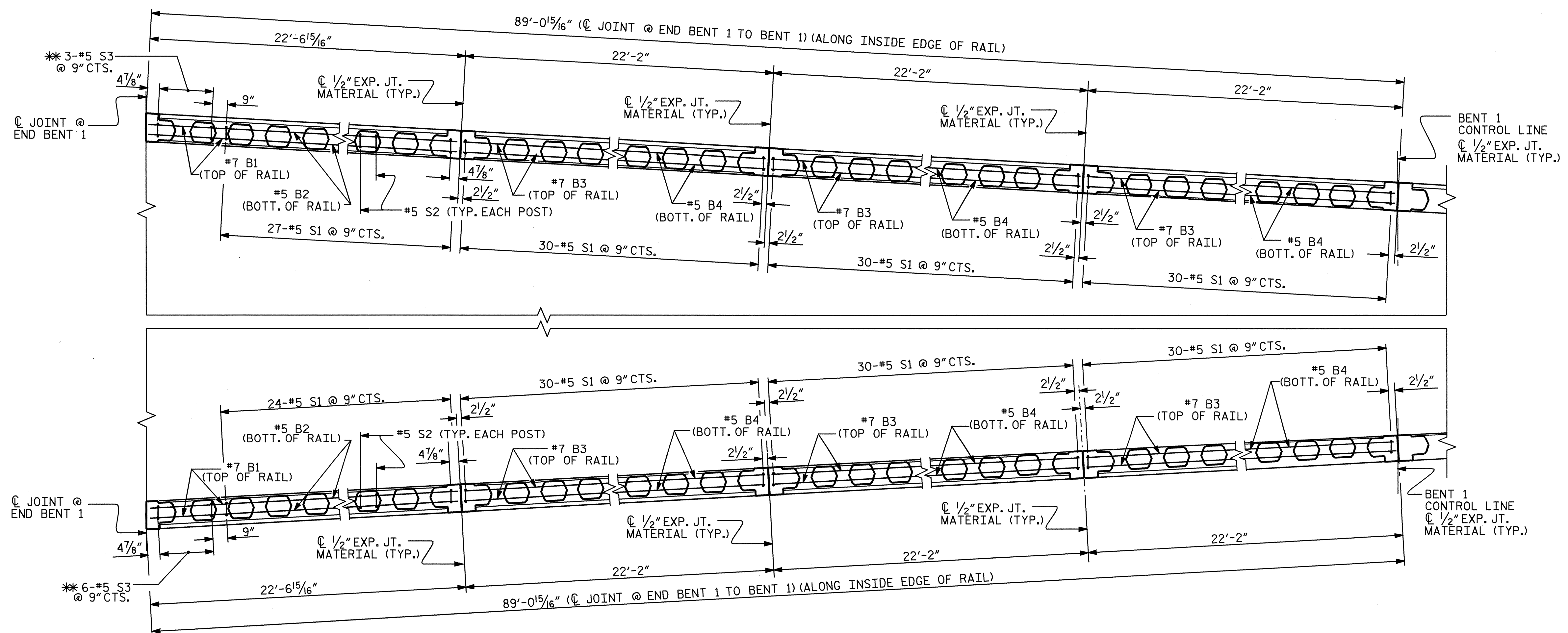
DRAWN BY: S. M. RASIDI DATE: 7-26-04
 CHECKED BY: M. A. ALLEN DATE: 2-05



FOR DETAILS OF CLASSIC RAIL ON APPROACH SLAB, SEE "BRIDGE APPROACH SLAB" SHEETS.

** #5 S3 SHALL BE INSTALLED USING AN ADHESIVE ANCHORING SYSTEM AFTER SAWING THE JOINT.

FOR PLACEMENT OF S2 BARS IN PILASTERS & PARTS SEE SHEET 1 OF 6.

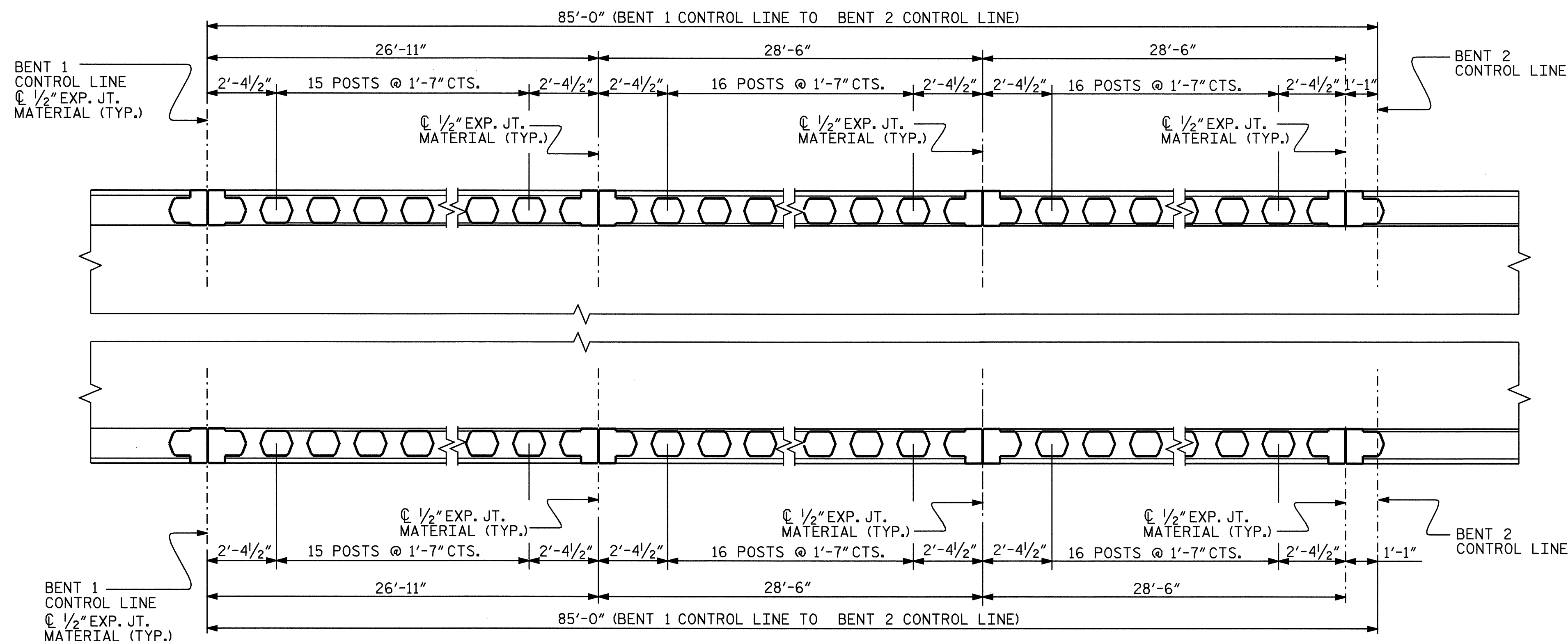


NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING H. JANG 8/19/05

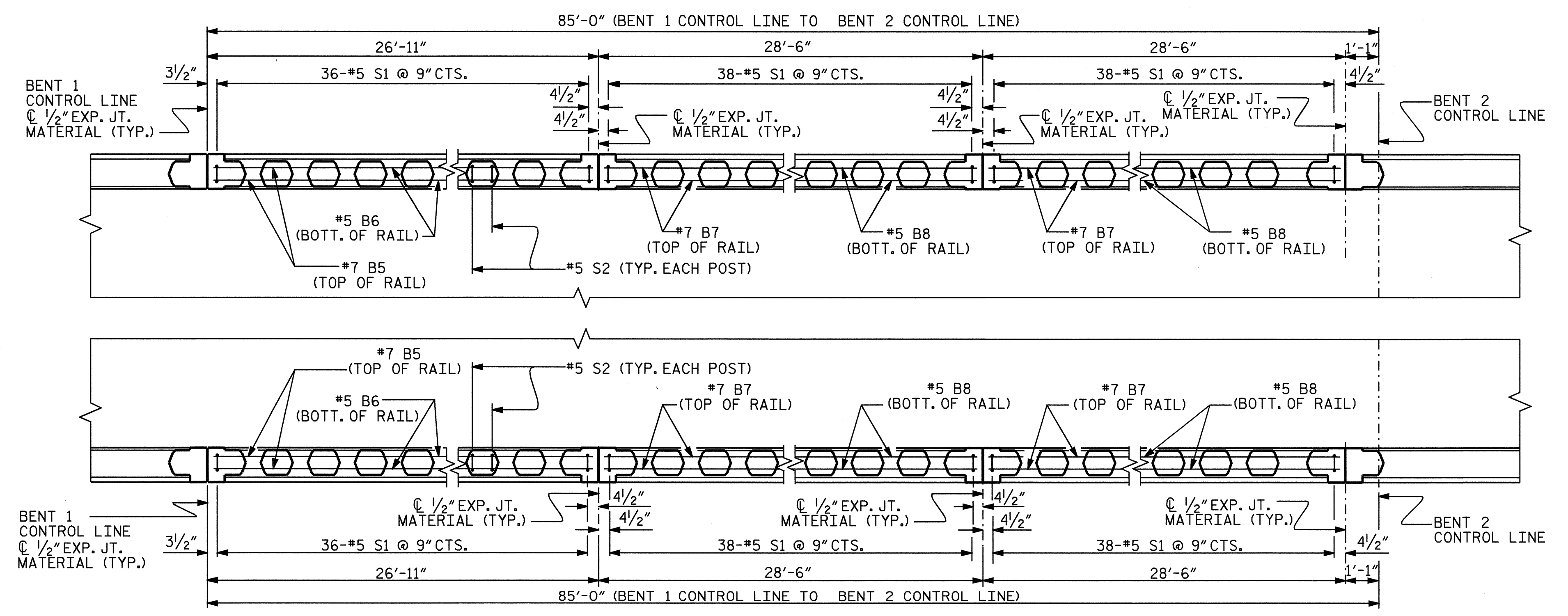
PROJECT NO. B-3509
ROCKINGHAM COUNTY
STATION: 15+67.50 -L-
SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
CLASSIC CONCRETE
BRIDGE RAIL
SPAN A

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24	
1			3			TOTAL SHEETS 53	
2			4				



RAIL POST SPACING



REINFORCING STEEL PLACEMENT

FOR PLACEMENT OF S2 BARS IN PILASTERS, & POST SEE SHEET 1 OF 6.

PROJECT NO. B-3509
ROCKINGHAM COUNTY
STATION: 15+67.50 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

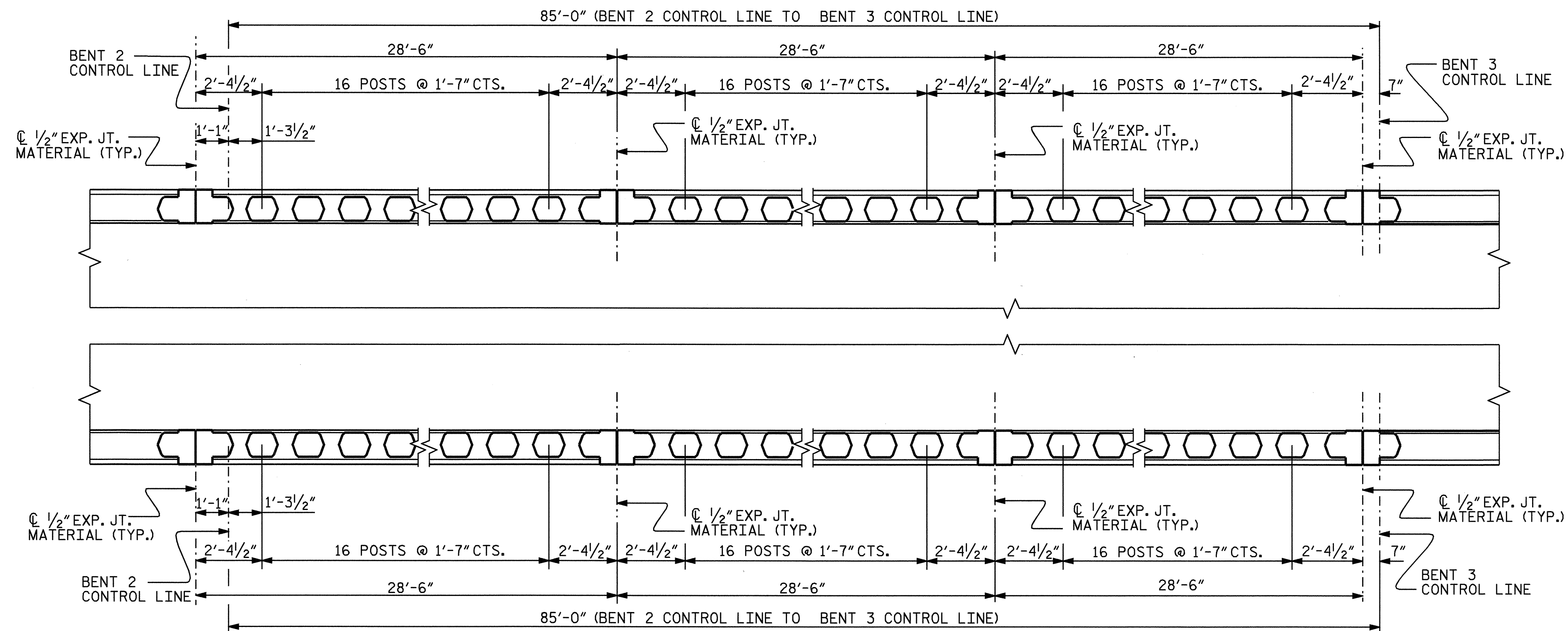
CLASSIC CONCRETE
BRIDGE RAIL
SPAN B



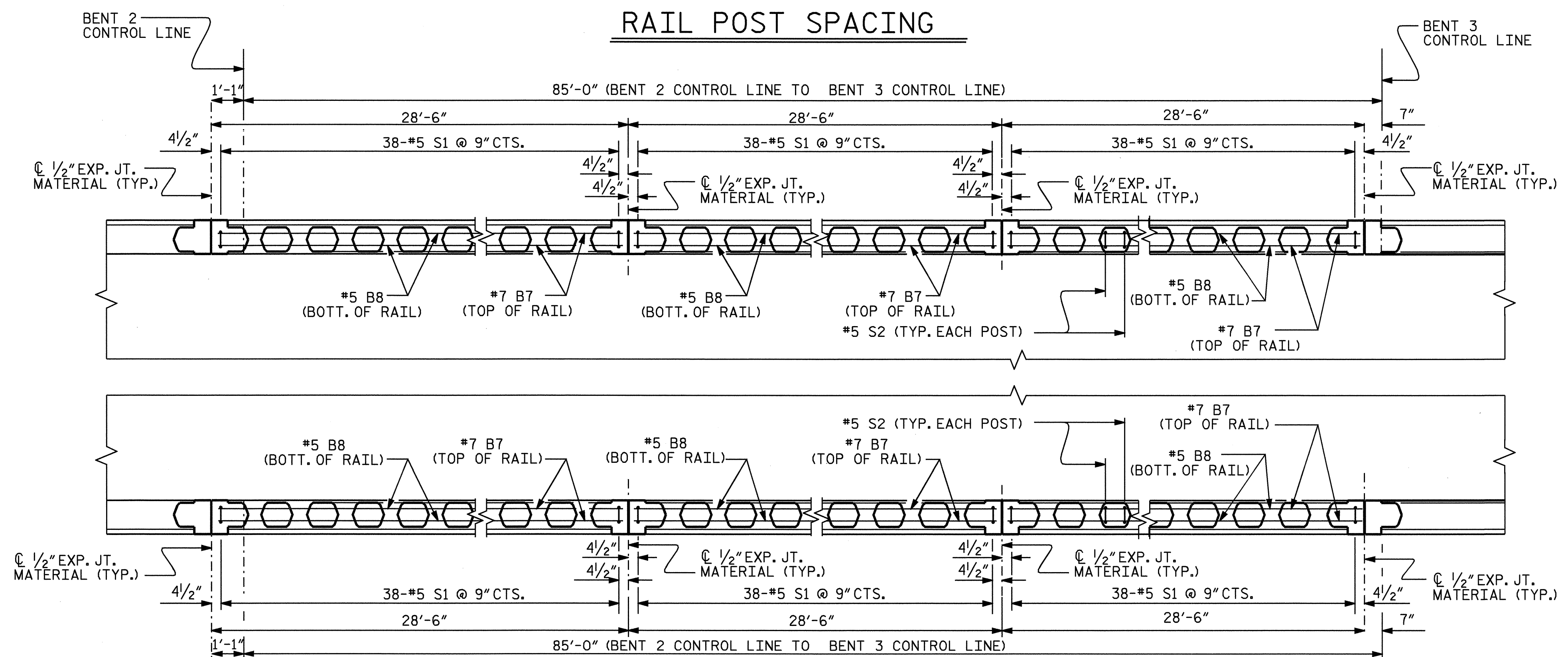
Ting H. Fang
8/19/05

DRAWN BY : S. M. RASHIDI DATE : 7-26-04
CHECKED BY : M. A. ALLEN DATE : 2-05

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25	
1			3			TOTAL	53
2			4			SHEETS	



RAIL POST SPACING



REINFORCING STEEL PLACEMENT

FOR PLACEMENT OF
S2 BARS IN PILASTERS,
& POST SEE SHEET 1 OF 6.

PROJECT NO. B-3509
ROCKINGHAM COUNTY
STATION: 15+67.50 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

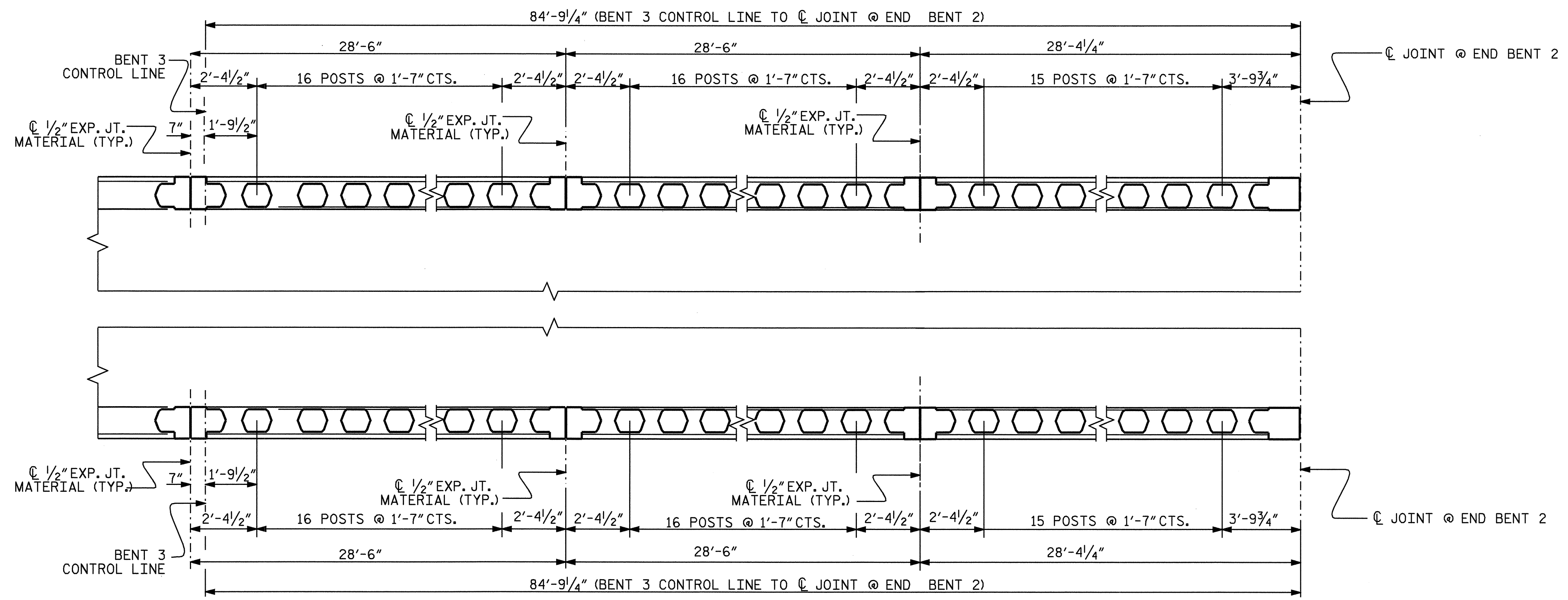
**CLASSIC CONCRETE
BRIDGE RAIL
SPAN C**

Ting H. Fang
8/19/05

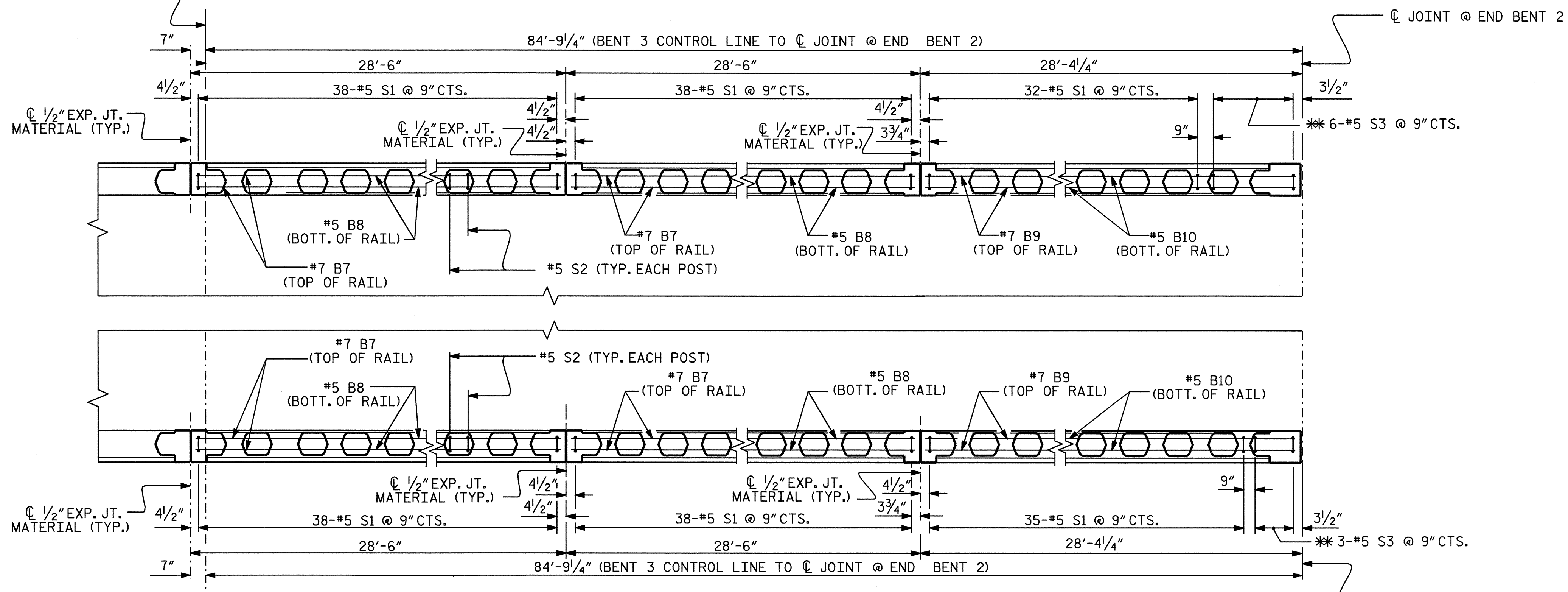


DRAWN BY: S. M. RASHIDI DATE: 7/26/04
CHECKED BY: M. A. ALLEN DATE: 2-05

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS 53
2			4			



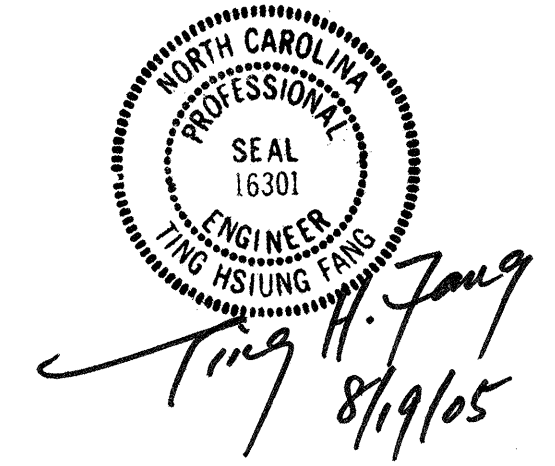
RAIL POST SPACING



REINFORCING STEEL PLACEMENT

FOR PLACEMENT OF S2 BARS IN PILASTERS, & POST SEE SHEET 1 OF 6.

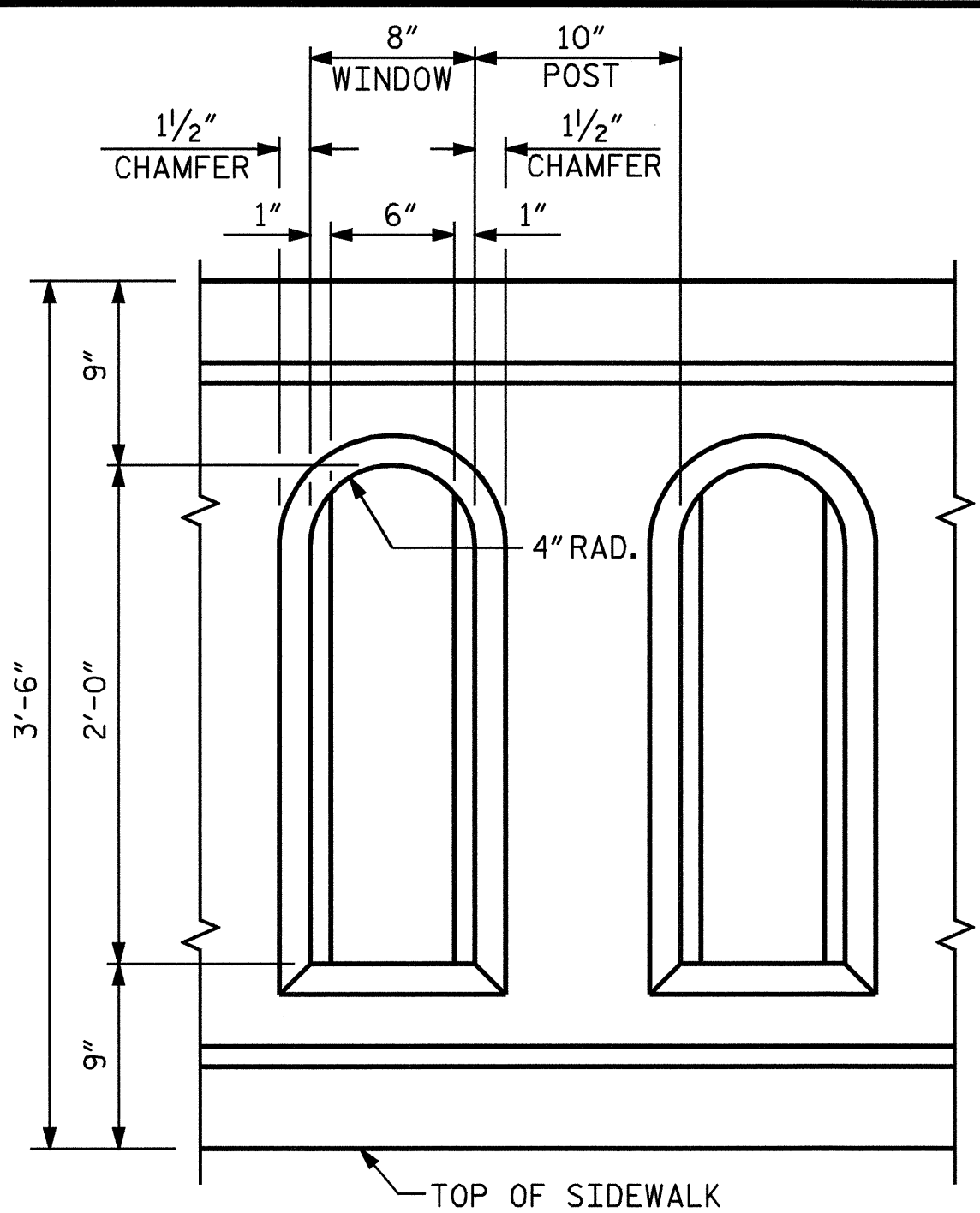
** #5 S3 SHALL BE INSTALLED USING AN ADHESIVE ANCHORING SYSTEM AFTER SAWING THE JOINT.



PROJECT NO. B-3509
ROCKINGHAM COUNTY
STATION: 15+67.50 -L-

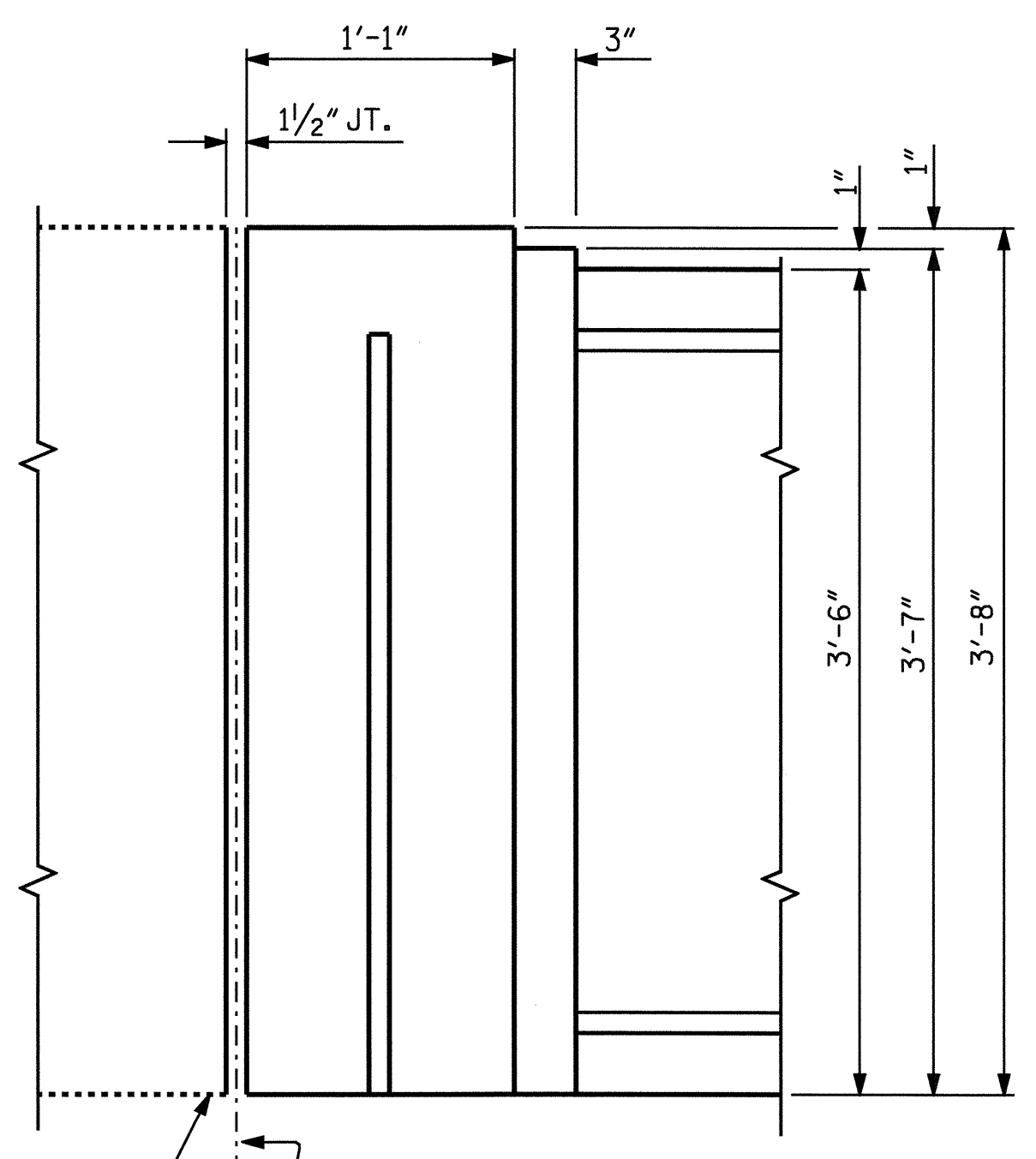
SHEET 5 OF 6

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			53

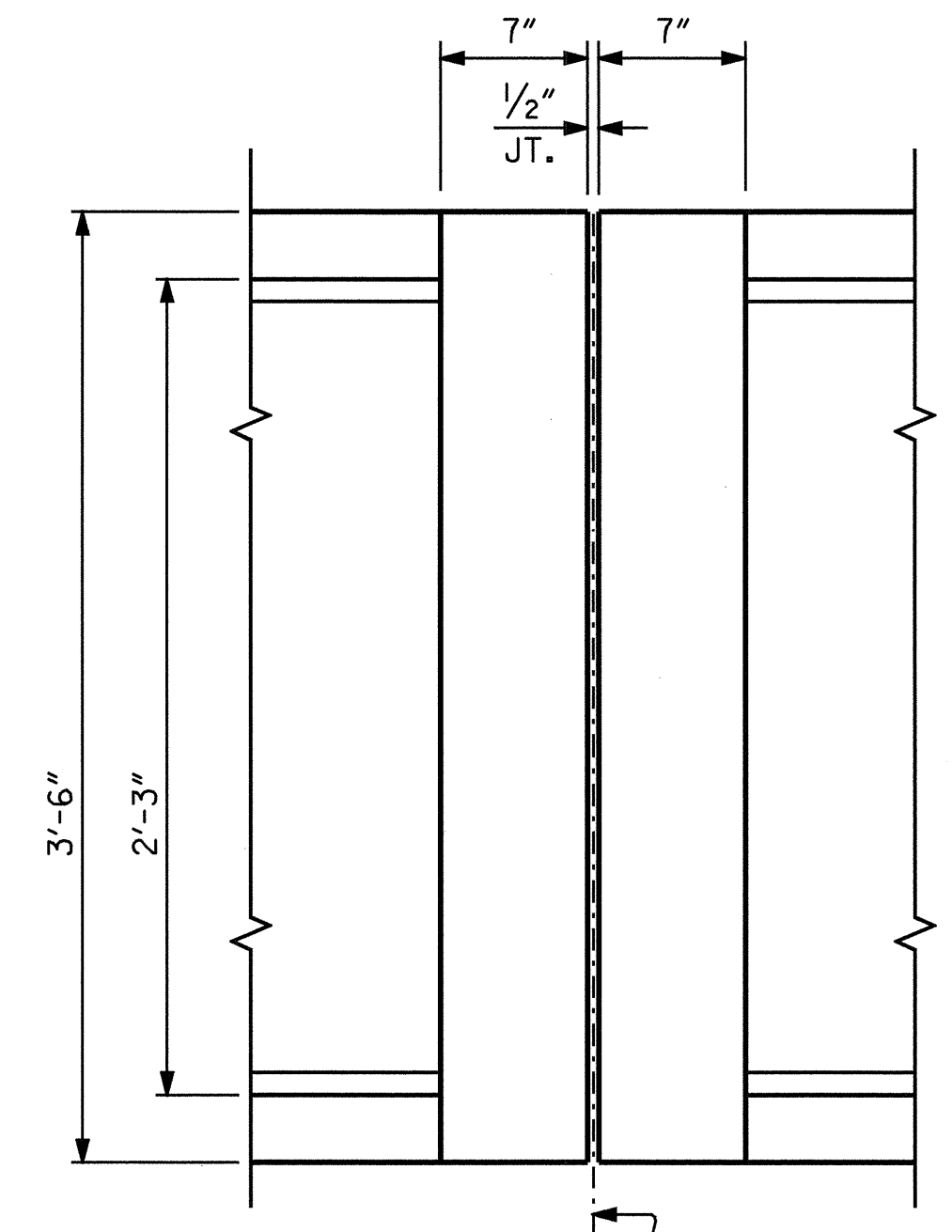


WINDOW DETAIL

FOR DETAILS OF CLASSIC RAIL ON APPROACH SLAB, SEE "BRIDGE APPROACH SLAB" SHEETS.



PILASTER AT END BENTS
(END BENT 1 SHOWN END BENT 2 SIM.)



SPAN PILASTER

EXTERIOR PILASTER ELEVATIONS

NOTES

CLASSIC CONCRETE BRIDGE RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

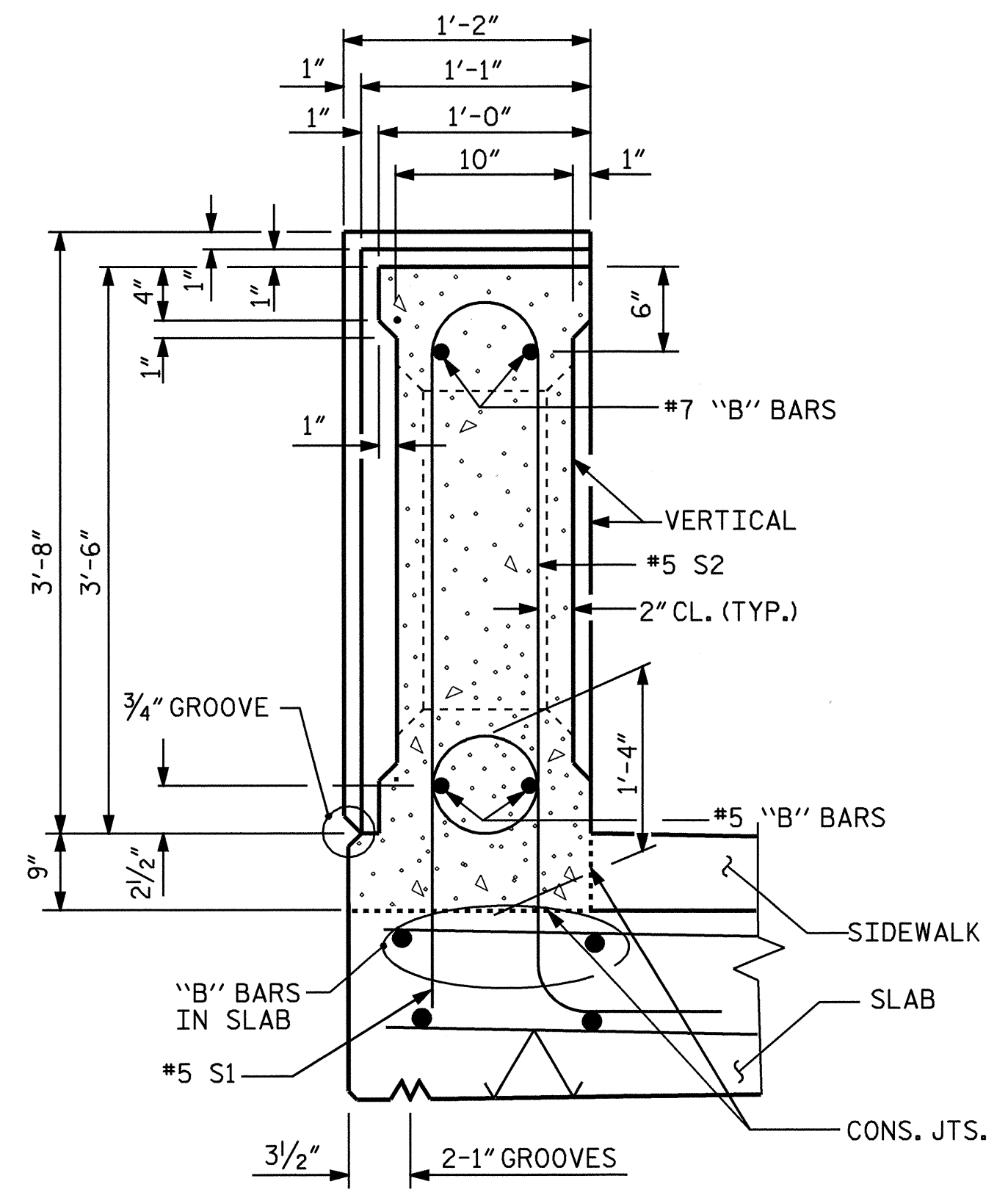
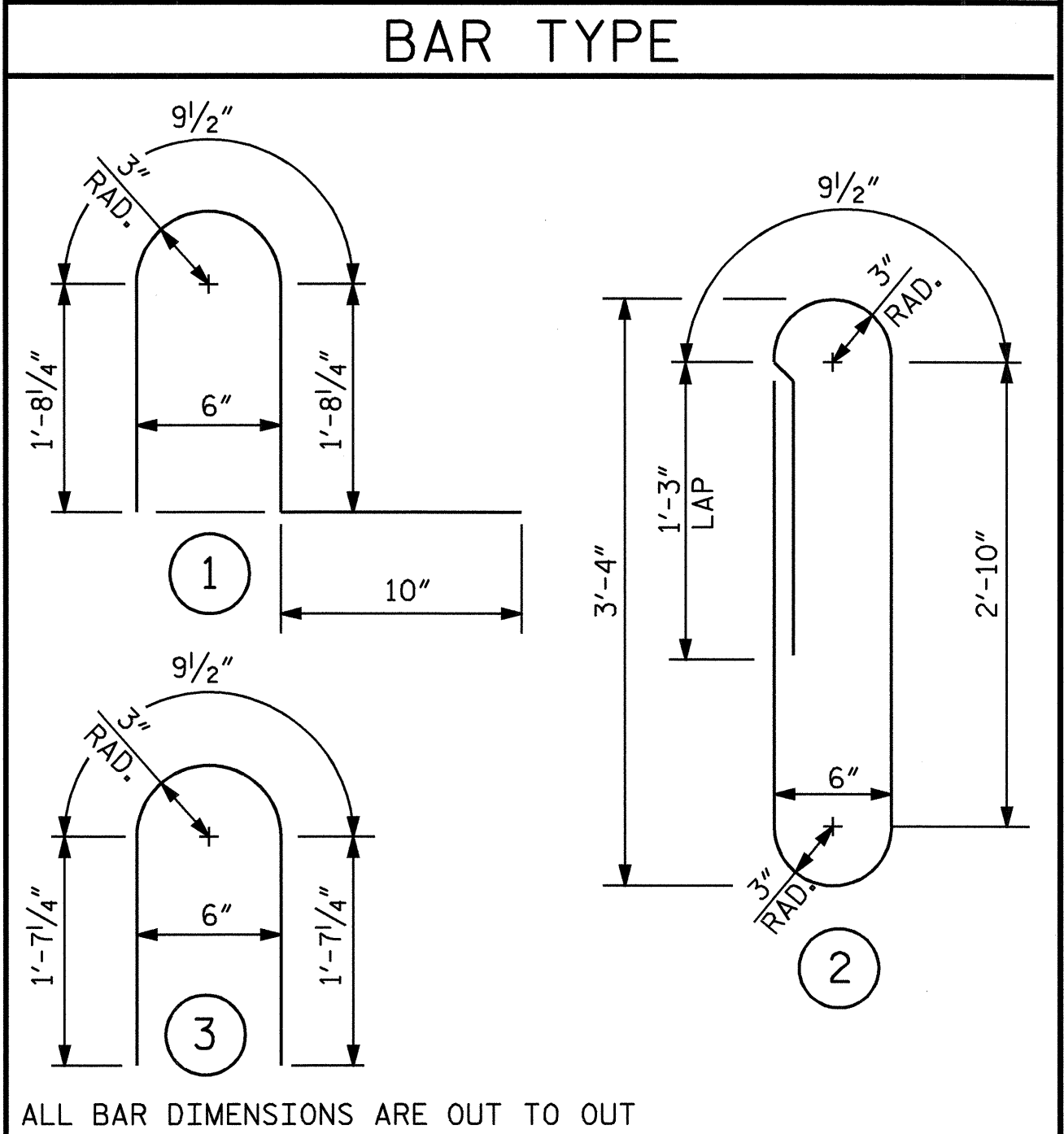
THE JOINT IN THE DECK FOR THE EVAZOTE JOINT SEAL SHALL BE SAWED PRIOR TO CASTING OF THE RAIL.

ALL REINFORCING STEEL IN THE CLASSIC CONCRETE BRIDGE RAIL SHALL BE EPOXY COATED.

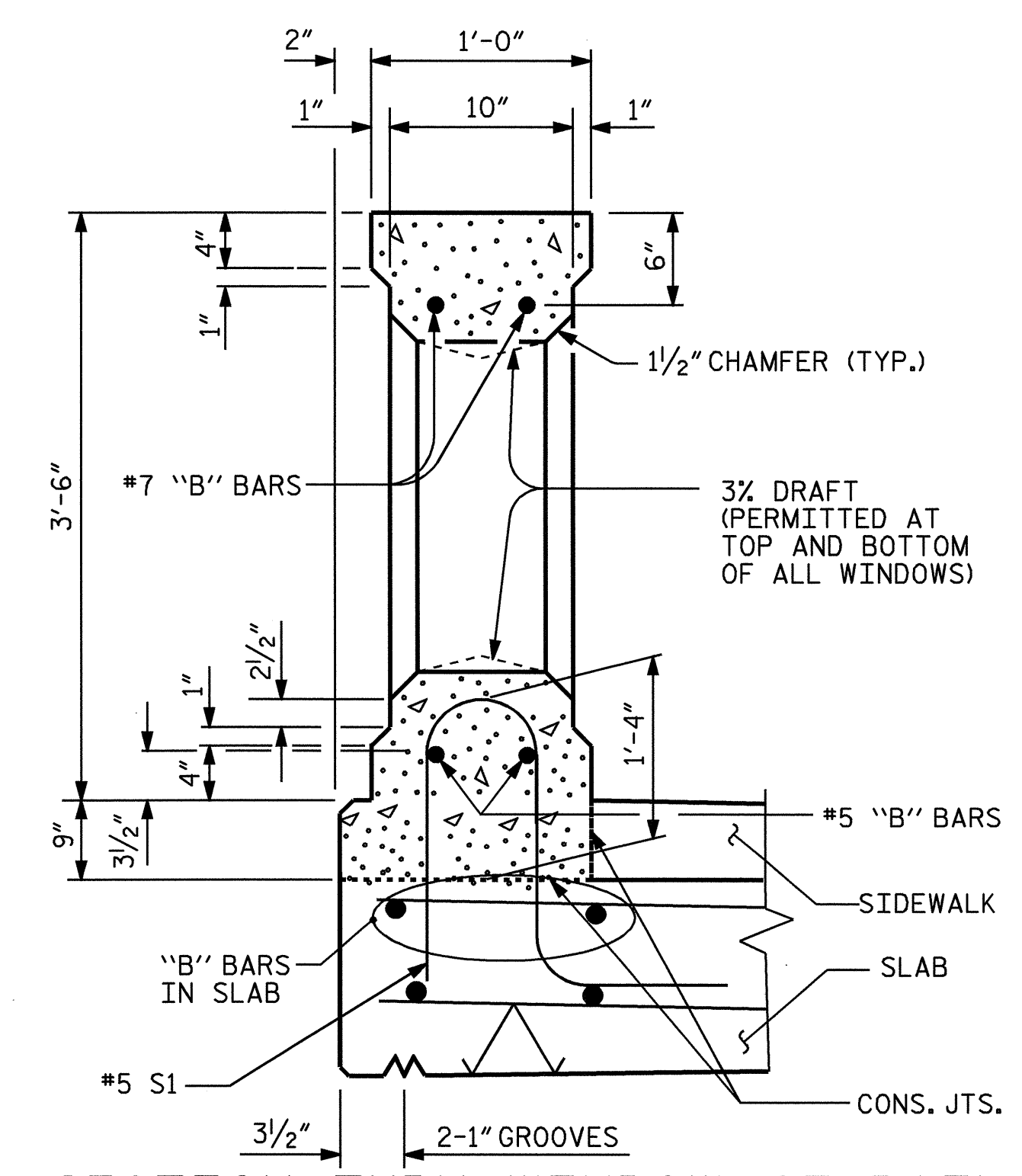
THE #5 S3 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING OF THE JOINT. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS. THE YIELD LOAD FOR THE #5 S3 BAR IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

BILL OF MATERIAL

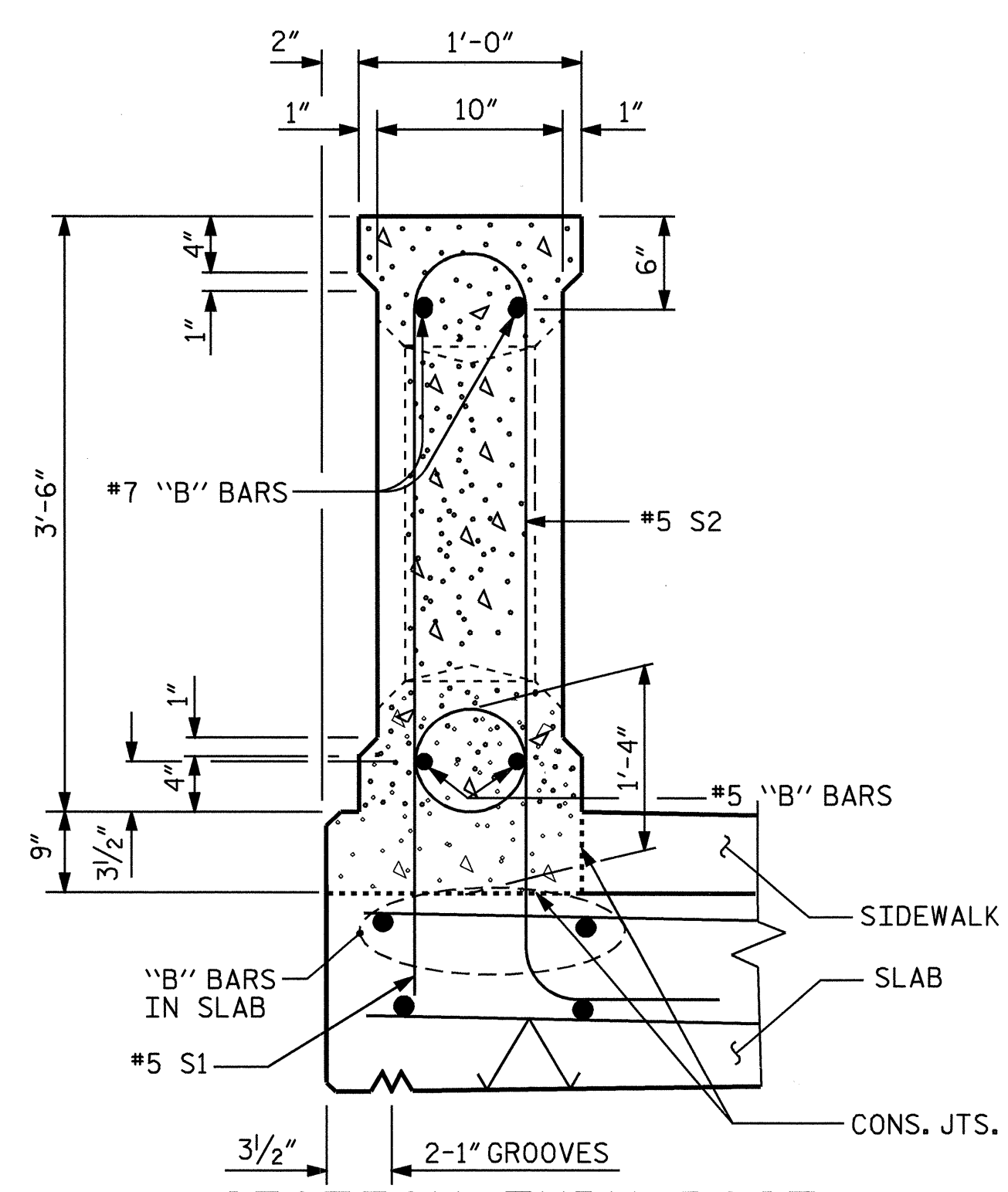
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	4	#7	STR	22'-1"	181
* B2	4	#5	STR	22'-1"	92
* B3	12	#7	STR	21'-9"	533
* B4	12	#5	STR	21'-9"	272
* B5	4	#7	STR	26'-6"	217
* B6	4	#5	STR	26'-6"	111
* B7	28	#7	STR	28'-1"	1607
* B8	28	#5	STR	28'-1"	820
* B9	4	#7	STR	27'-11"	228
* B10	4	#5	STR	27'-11"	116
* S1	902	#5	1	5'-0"	4704
* S2	870	#5	2	8'-6"	7713
* S3	18	#5	3	4'-0"	75
* EPOXY COATED REINF. STEEL					= 16,669 LBS.
CLASS AA CONCRETE					= 81.7 CU. YDS.
CLASSIC CONCRETE BRIDGE RAIL					= 687.70 LIN. FT.



SECTION THRU PILASTER
(AT END BENTS)



SECTION THRU WINDOW OF RAIL



SECTION THRU POST

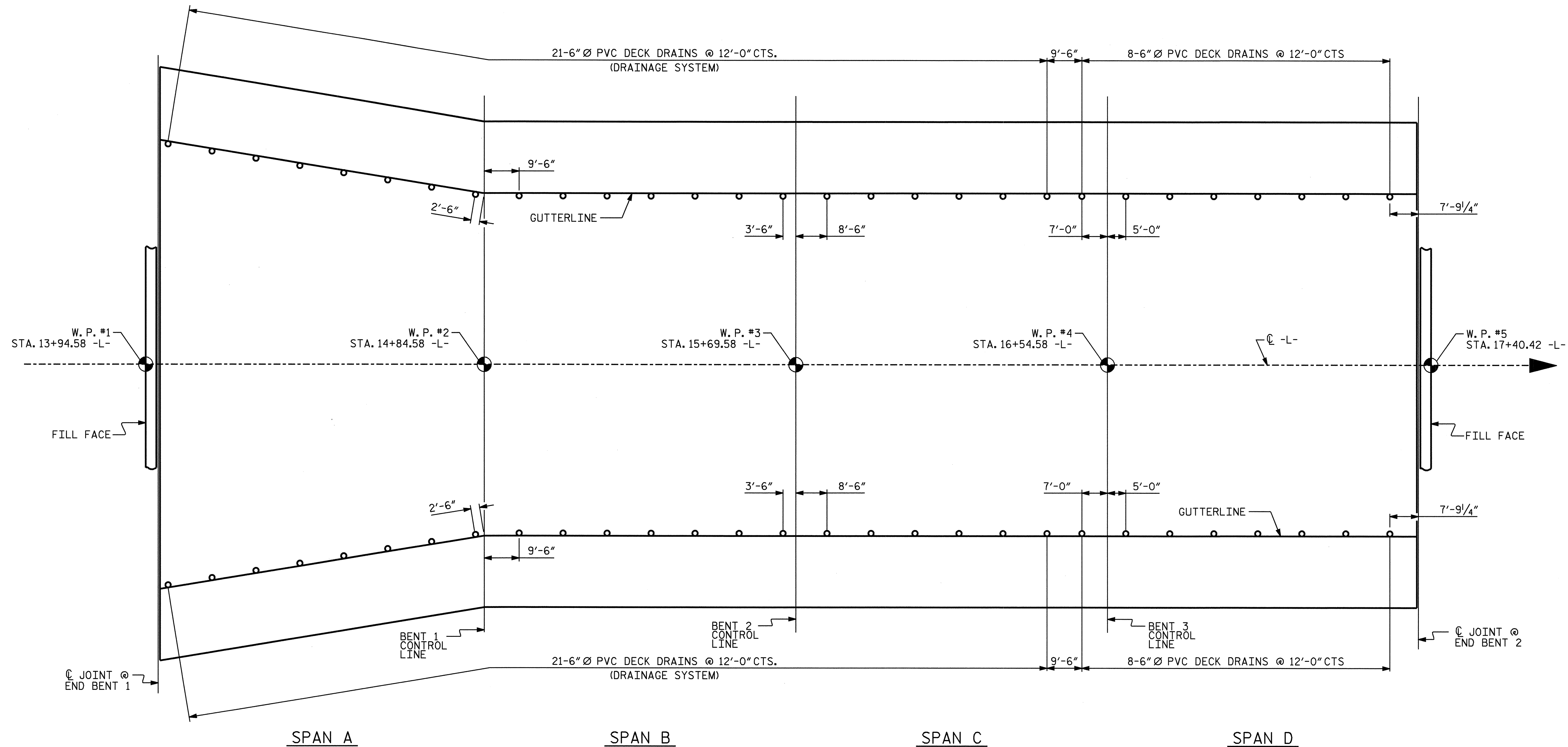
PROJECT NO. B-3509
 ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-
 SHEET 6 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

CLASSIC CONCRETE BRIDGE RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			53

NORTH CAROLINA PROFESSIONAL SEAL 16301
 ENGINEER
 TING HSIUNG FANG
 8/19/05



DECK DRAINAGE LAYOUT

PROJECT NO. B-3509
ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 STRUCTURE
 DRAINAGE SYSTEM



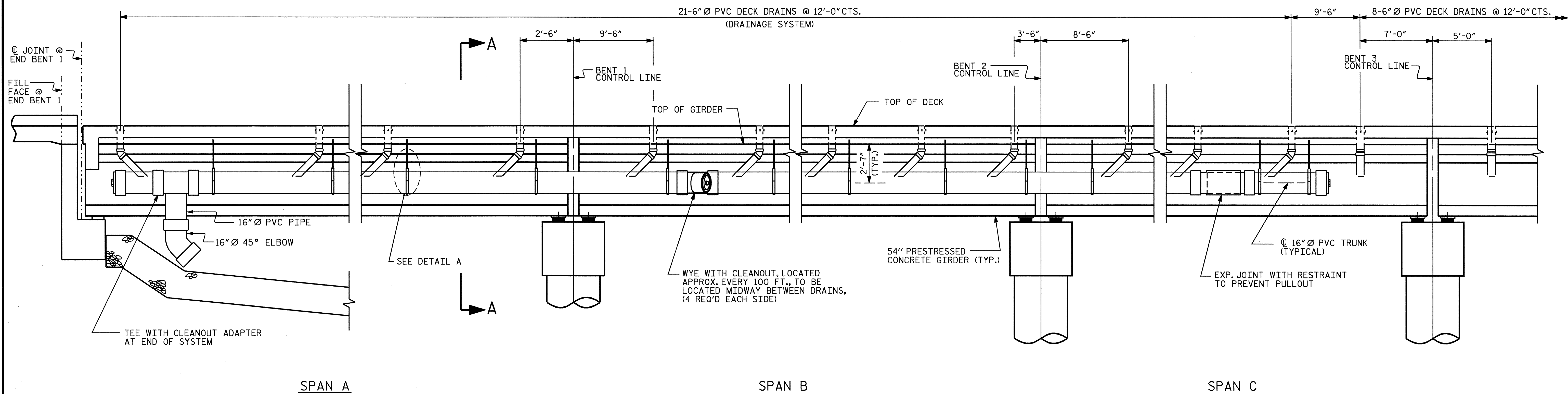
Ting H. Fang
 8/19/05

DRAWN BY : S. M. RASHIDI DATE : 7/6/04
 CHECKED BY : M. A. ALLEN DATE : 5-05

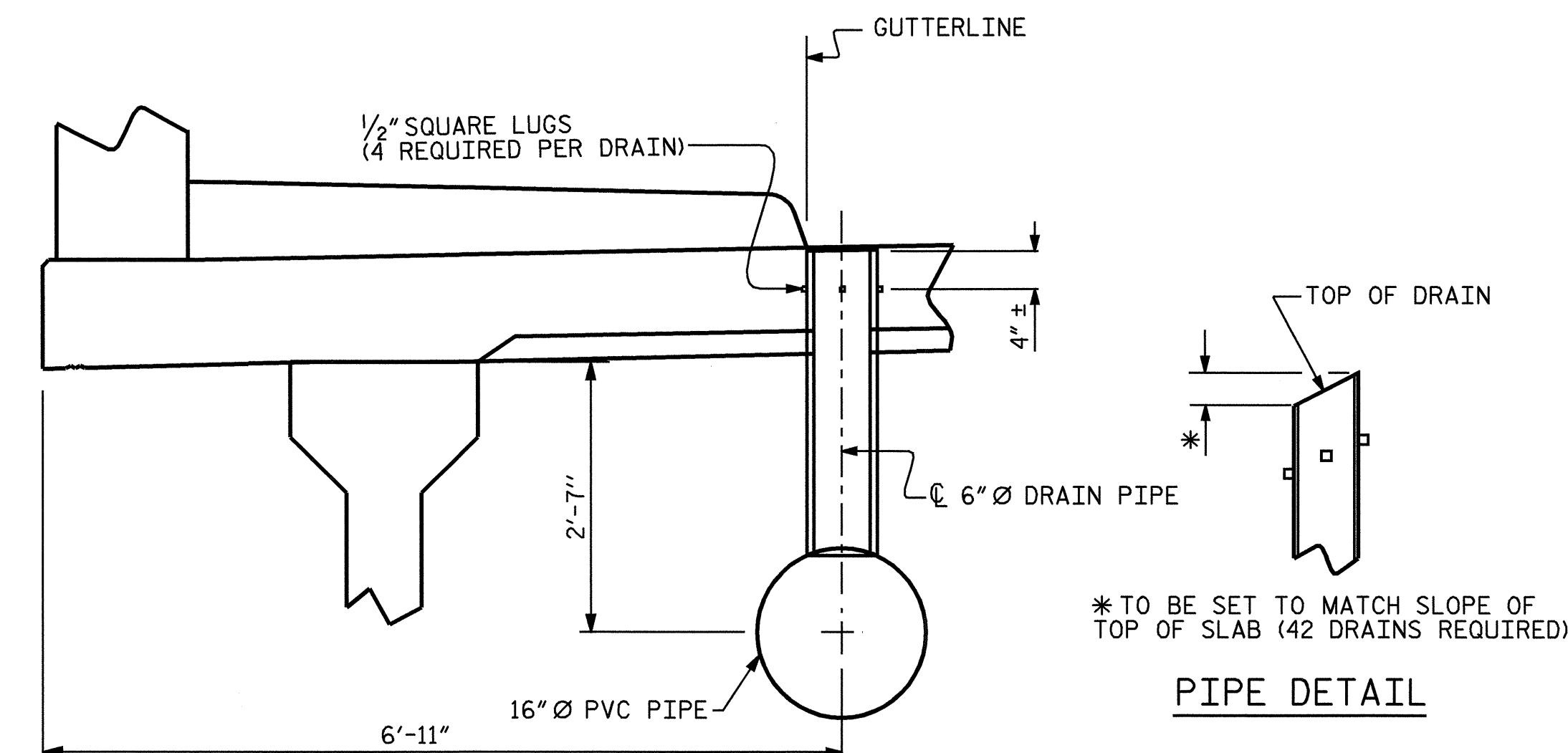
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 srashidi

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-30
1			3			TOTAL SHEETS
2			4			53

NC005



ELEVATION OF DRAINAGE SYSTEM



DRAINAGE SYSTEM DETAILS

TOP OF FLOOR DRAINS TO BE SET 3/8" BELOW SURFACE OF SLAB.
 4-1/2" SQUARE LUGS TO BE GLUED TO THE P.V.C. PIPE PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM TOP OF THE PIPE.
 THE 6" Ø PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.

PROJECT NO. B-3509
ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

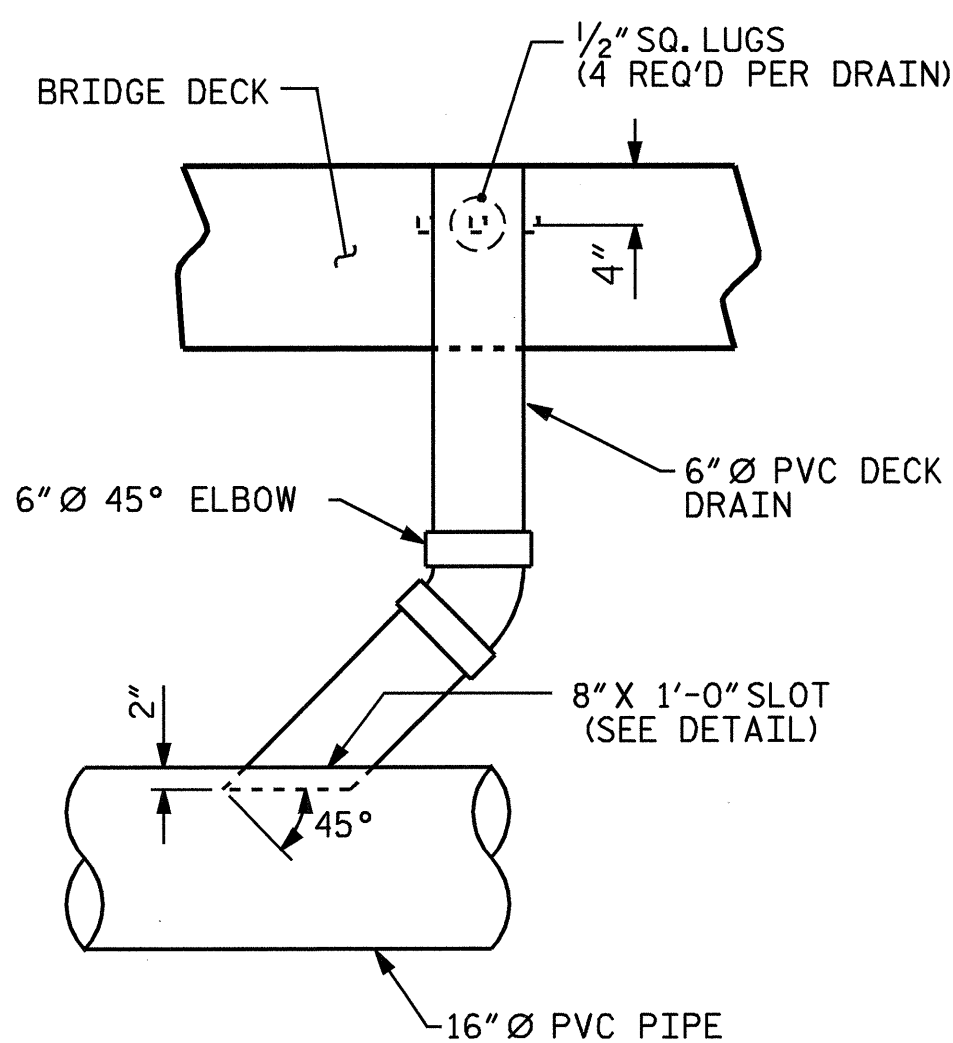
SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

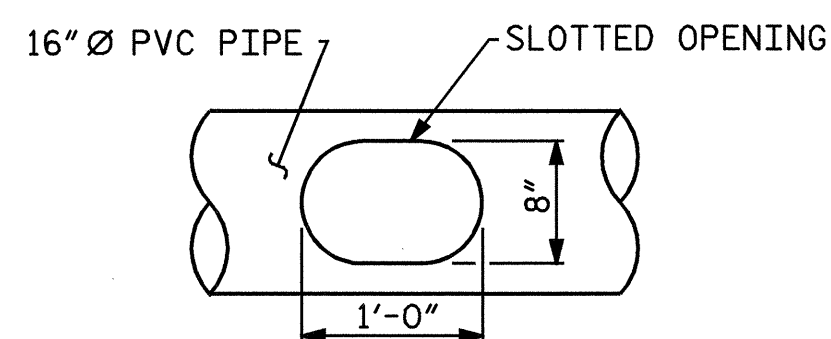
**SUPERSTRUCTURE
 STRUCTURE
 DRAINAGE SYSTEM**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			53

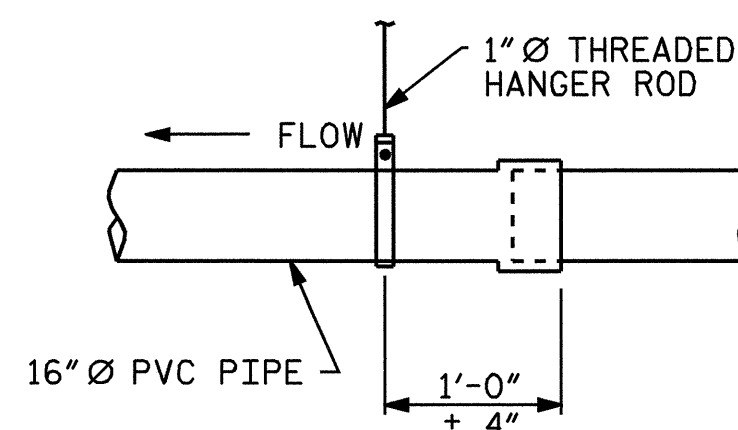
Professional Engineer Seal
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 16301
 TING HSUNG FANG
 8/19/05



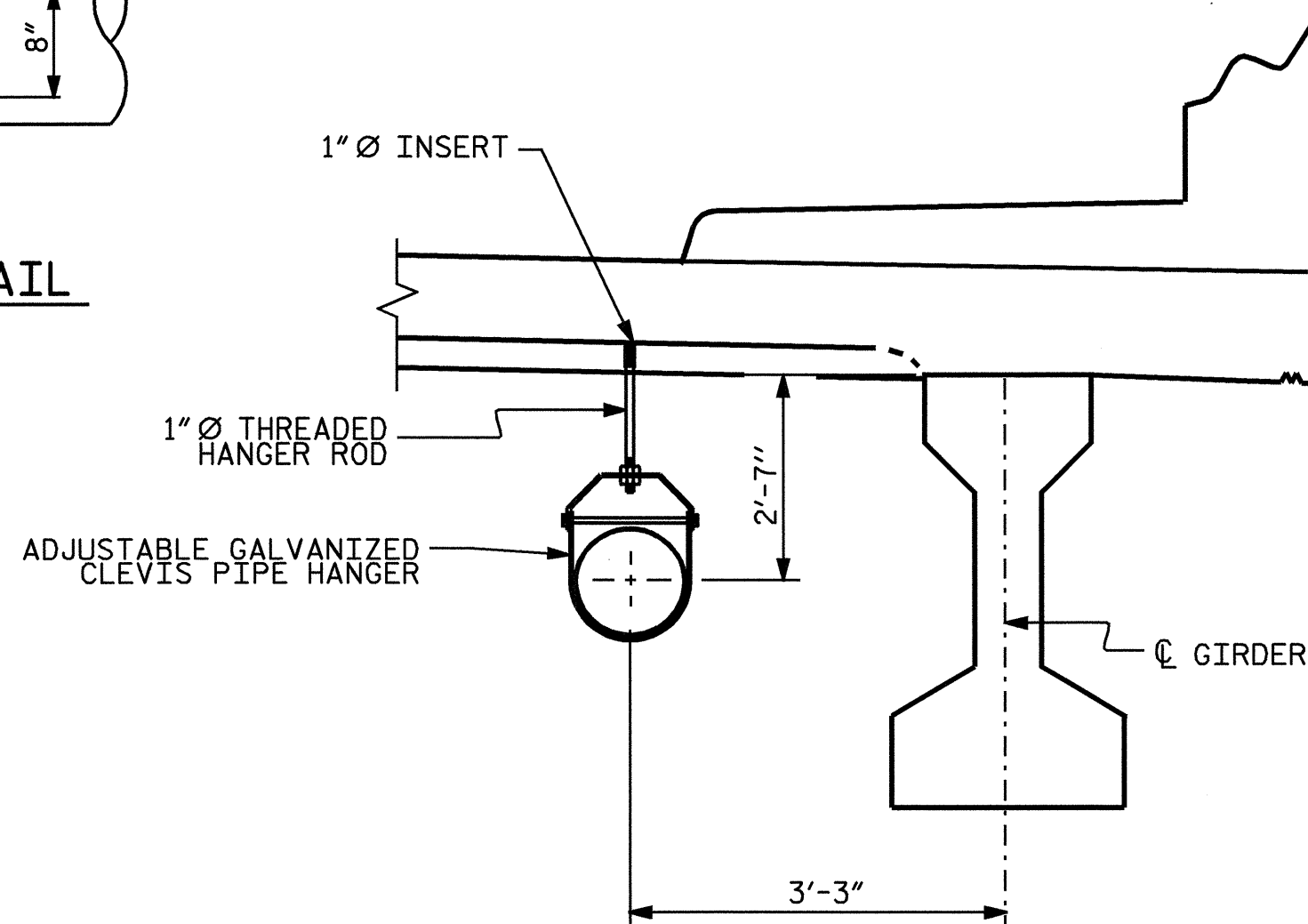
ELEVATION VIEW OF DECK DRAIN AND DRAIN LINE INTERSECTION



SLOT DETAIL



DETAIL 'A'



SECTION THRU DRAINAGE SYSTEM AT TYPICAL HANGER

DRAWN BY: S. M. RASHIDI DATE: 7/26/04
 CHECKED BY: M. A. ALLEN DATE: 5-05

NOTES

THE CONTRACTOR SHALL SUBMIT A PLAN FOR THE DRAINAGE SYSTEM, INCLUDING, BUT NOT LIMITED TO, ATTACHMENTS TO THE BRIDGE PIPE ALIGNMENT AND PIPE LENGTHS, AND ALL NECESSARY FITTINGS, ELBOWS, WYES, ADAPTERS, GUIDES AND JOINTS.

THE CONTRACTOR SHALL SUBMIT FOR ACCEPTANCE, PRIOR TO PURCHASE, A PLAN FOR THE PVC DRAINAGE SYSTEM, INCLUDING ATTACHMENTS TO THE BRIDGE SUPERSTRUCTURE.

DRAINAGE SYSTEM WILL BE PAID FOR UNDER THE PAY ITEM "STRUCTURE DRAINAGE SYSTEM".

FOR "STRUCTURE DRAINAGE SYSTEM", SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL DETERMINE THE QUANTITY OF FITTINGS, PIPE LENGTHS, GUIDES, AND ATTACHMENTS REQUIRED TO CARRY THE WATER FROM THE DECK DRAINS TO THE OUTLETS.

BOLTS, NUTS, AND WASHERS SHALL BE HIGH STRENGTH AND GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

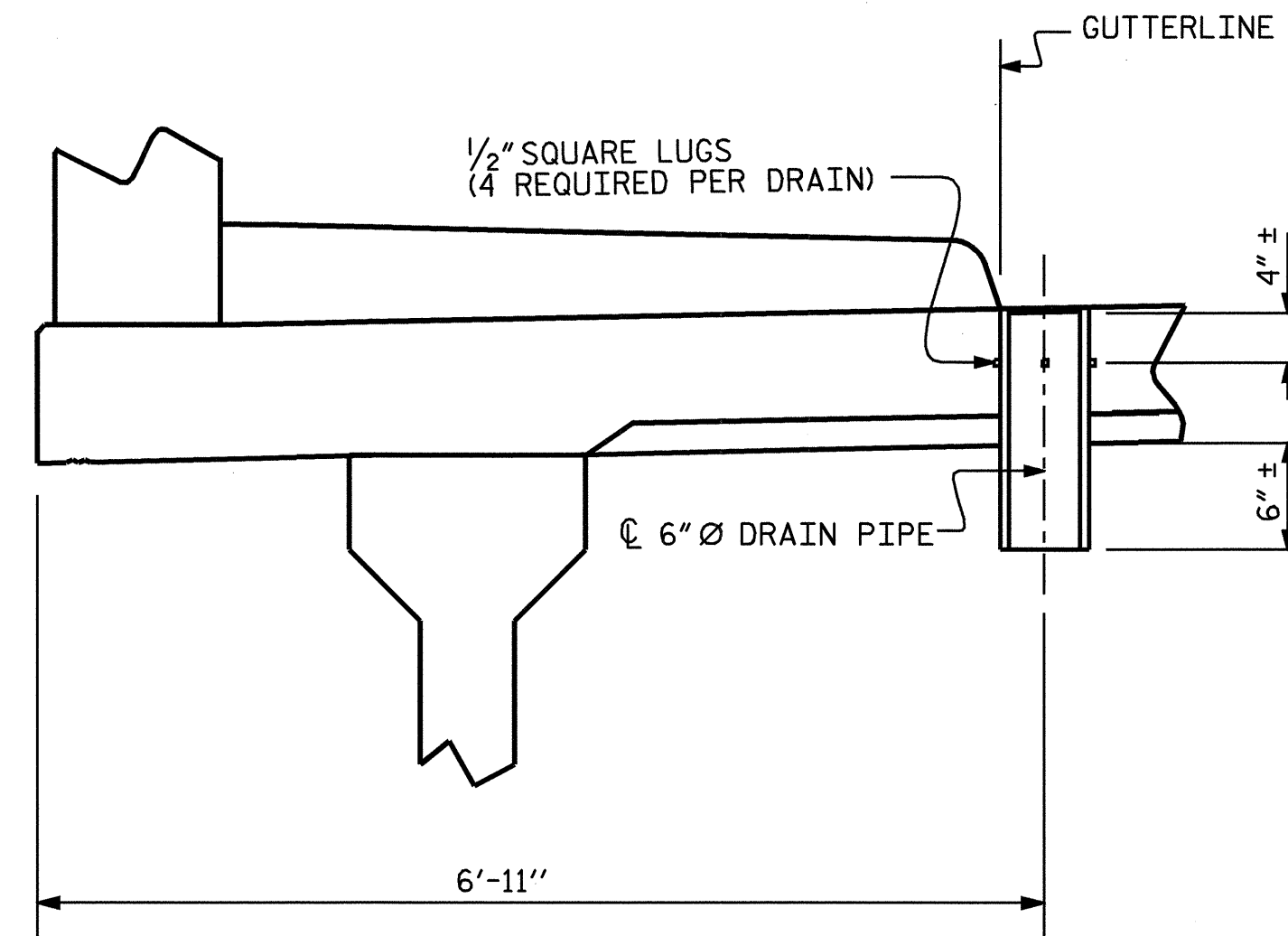
CONCRETE INSERTS SHALL BE OF AN APPROVED GALVANIZED TYPE HAVING A MINIMUM WORKING LOAD TENSION CAPACITY OF 4.2 KIPS.

IN LIEU OF CASTING INSERTS INTO THE DECK, RODS MAY BE ADHESIVELY ANCHORED TO THE DECK. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.

DRAINAGE SYSTEM SHALL BE PLACED TO PROVIDE A MINIMUM SLOPE OF 0.5% TOWARDS OUTLET.

FITTING JOINTS SHALL BE SOLVENT CEMENT TYPE.

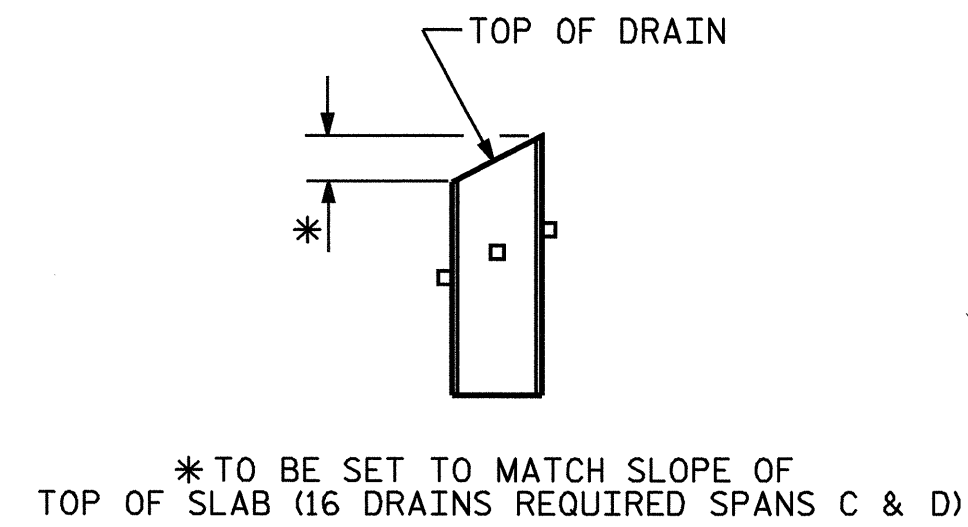
PIPE JOINTS SHALL BE ELASTOMERIC TYPE.



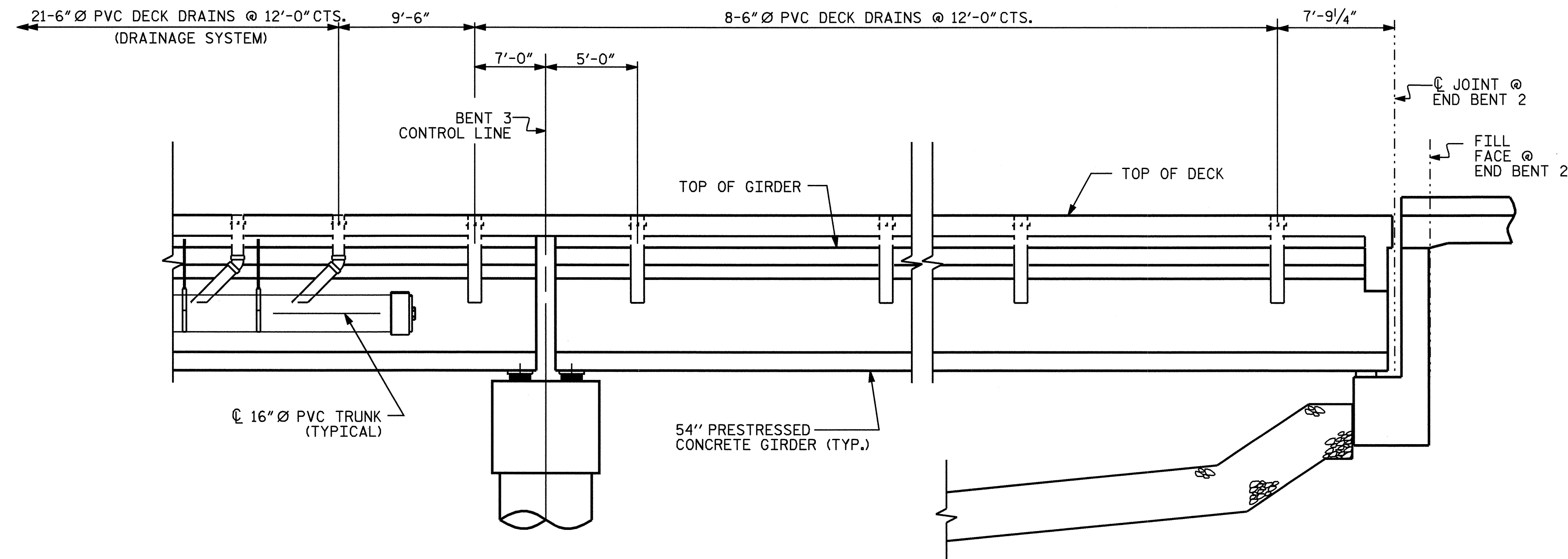
DRAIN DETAILS

TOP OF FLOOR DRAINS TO BE SET $\frac{3}{8}$ " BELOW SURFACE OF SLAB.
4-1/2" SQUARE LUGS TO BE GLUED TO THE P.V.C. PIPE PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM TOP OF THE PIPE.

THE 6" Ø PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.



PIPE DETAIL



SPAN C

SPAN D

ELEVATION OF DECK DRAINS

PROJECT NO. B-3509
ROCKINGHAM COUNTY
STATION: 15+67.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

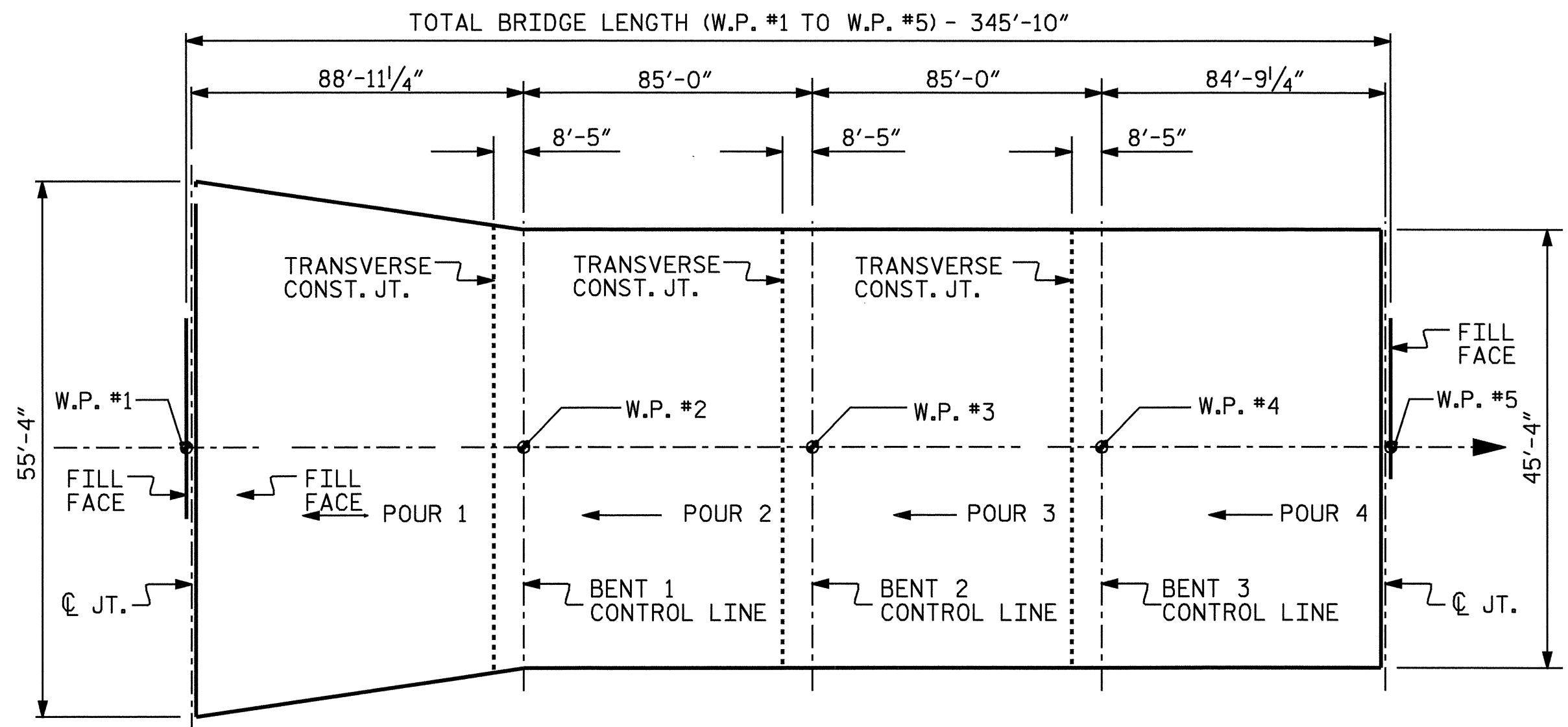
**SUPERSTRUCTURE
STRUCTURE
DRAINAGE SYSTEM**



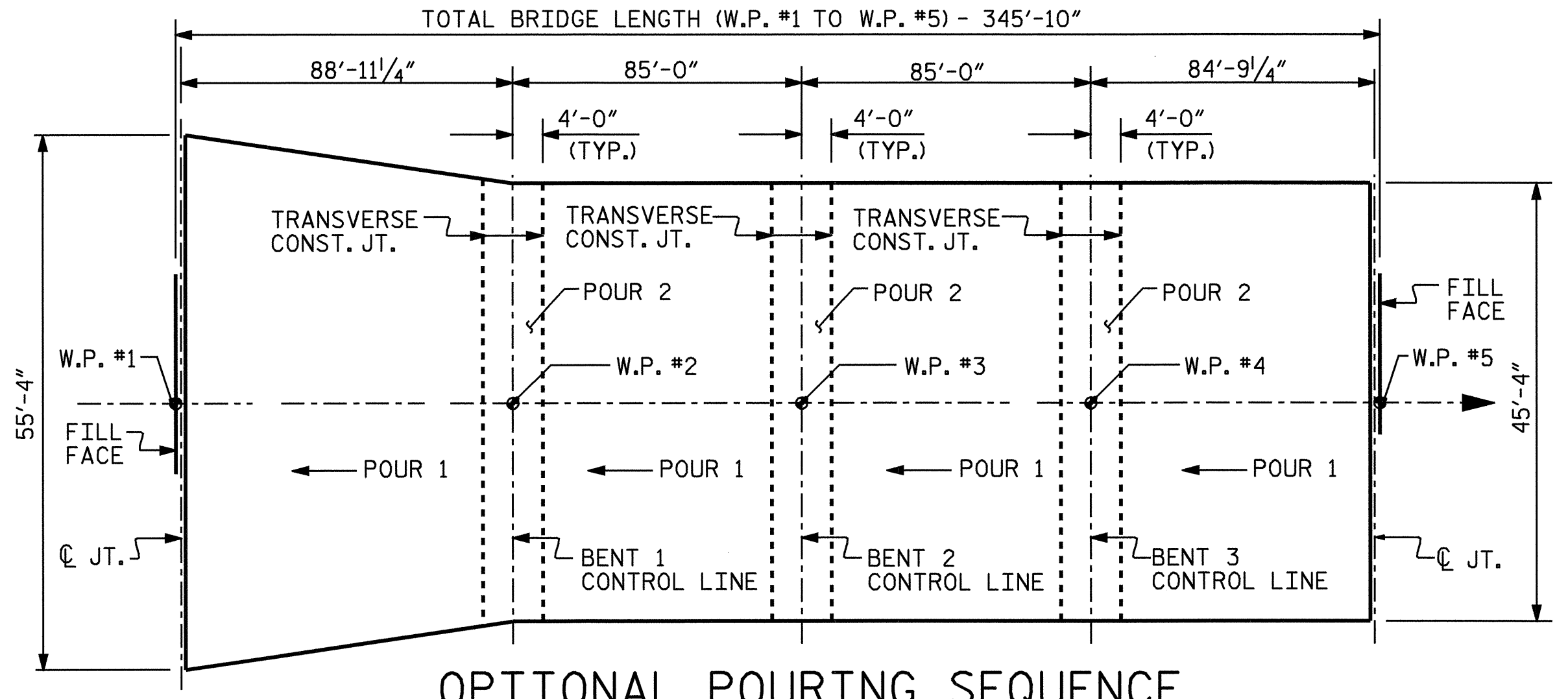
DRAWN BY : S. M. RASHIDI DATE : 7/26/04
CHECKED BY : M. A. ALLEN DATE : 5-05

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maallen

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			53

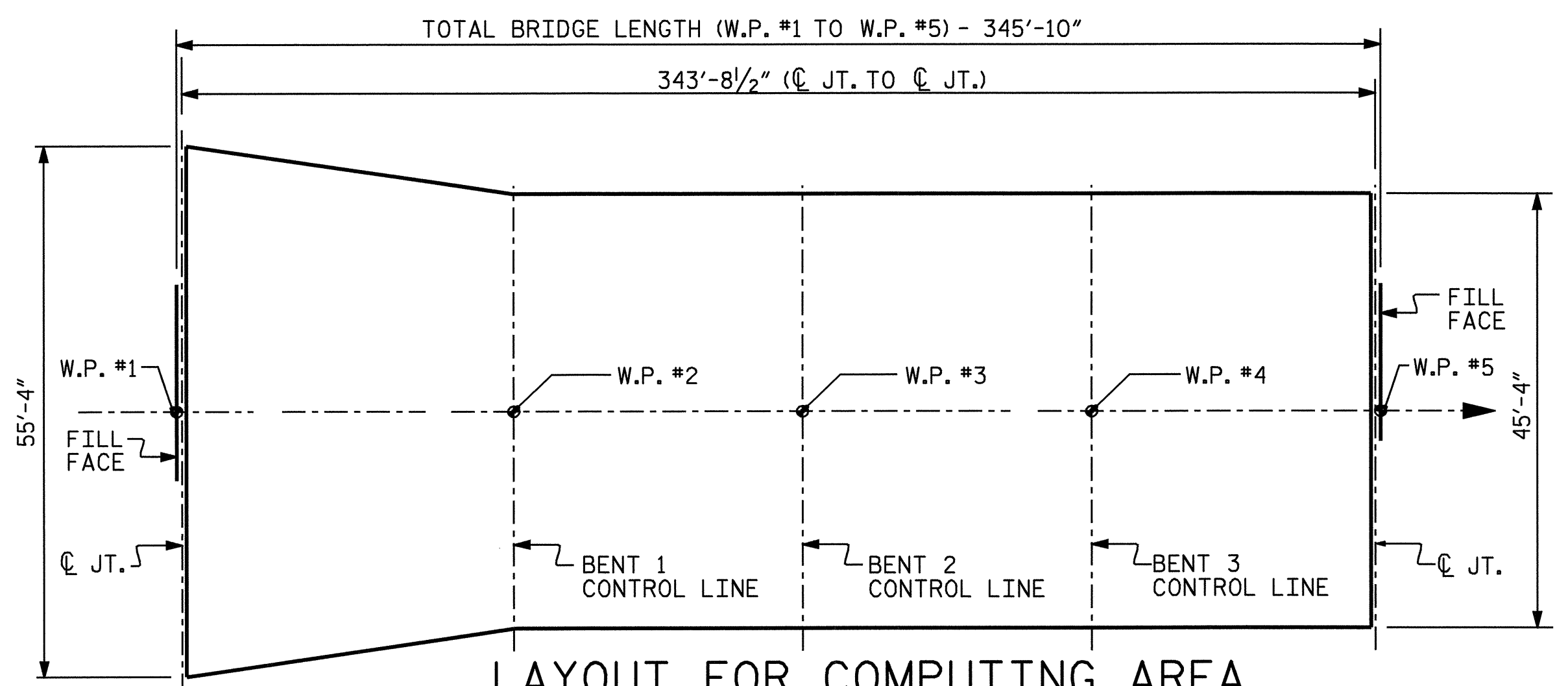


POURING SEQUENCE



OPTIONAL POURING SEQUENCE

NOTE: POUR 2 CAN NOT BE STARTED UNTIL BOTH ADJACENT POURS REACH A MINIMUM OF 3000 PSI.



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 16,026.2)

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	471	#5	STR	45'-0"	22106	B11	136	#5	STR	46'-11"	6655
*A101	10	#6	STR	54'-4"	816	B12	240	#5	STR	52'-11"	13246
*A102	11	#6	STR	53'-6"	884	*B13	130	#4	STR	28'-4"	2460
*A103	11	#6	STR	52'-9"	872	*D1	500	#4	STR	1'-0"	334
*A104	11	#6	STR	51'-3"	847	*G1	688	#4	STR	5'-0"	2298
*A106	11	#6	STR	50'-5"	833	*K1	4	#8	1	15'-0"	160
*A107	11	#6	STR	49'-8"	821	*K2	6	#8	2	23'-2"	371
*A108	11	#6	STR	48'-11"	808	*K3	4	#8	1	13'-10"	148
*A109	11	#6	STR	48'-1"	794	*K4	6	#8	2	20'-10"	334
*A110	11	#6	STR	47'-4"	782	K5	4	#5	STR	8'-11"	37
*A111	11	#6	STR	46'-7"	770	K6	4	#5	4	9'-5"	39
*A112	11	#6	STR	45'-10"	757	K7	4	#5	STR	8'-10"	37
*A113	11	#6	STR	45'-0"	743	K8	4	#5	4	9'-4"	39
A2	471	#5	STR	45'-0"	22106	K9	24	#5	STR	7'-8"	192
A201	10	#6	STR	54'-4"	816	K10	24	#5	4	8'-2"	204
A202	11	#6	STR	53'-6"	884	K11	24	#4	STR	5'-10"	94
A203	11	#6	STR	52'-9"	872	K12	24	#4	STR	7'-10"	126
A204	11	#6	STR	52'-0"	859	K13	48	#4	STR	8'-6"	273
A205	11	#6	STR	51'-3"	847	K14	24	#4	STR	7'-6"	120
A206	11	#6	STR	50'-5"	833	K15	30	#4	STR	20'-1"	402
A207	11	#6	STR	49'-8"	821	*S1	76	#5	5	5'-10"	462
A208	11	#6	STR	48'-11"	808	S2	132	#4	3	7'-3"	639
A209	11	#6	STR	48'-1"	794	S3	360	#4	6	2'-9"	661
A210	11	#6	STR	47'-4"	782	U1	24	#4	7	13'-6"	216
A211	11	#6	STR	46'-7"	770	U2	72	#4	7	15'-6"	745
A212	11	#6	STR	45'-10"	757						
A213	11	#6	STR	45'-0"	743						
*B1	64	#4	STR	30'-0"	1283						
*B2	4	#4	STR	25'-5"	68						
*B3	2	#4	STR	22'-0"	29						
*B4	183	#6	STR	23'-2"	6368						
*B5	60	#6	STR	26'-3"	2366						
*B6	2	#6	STR	19'-8"	59						
*B7	62	#4	STR	28'-0"	1160						
*B8	366	#5	STR	22'-0"	8398						
*B9	120	#5	STR	25'-6"	3192						
*B10	62	#4	STR	29'-1"	1205						

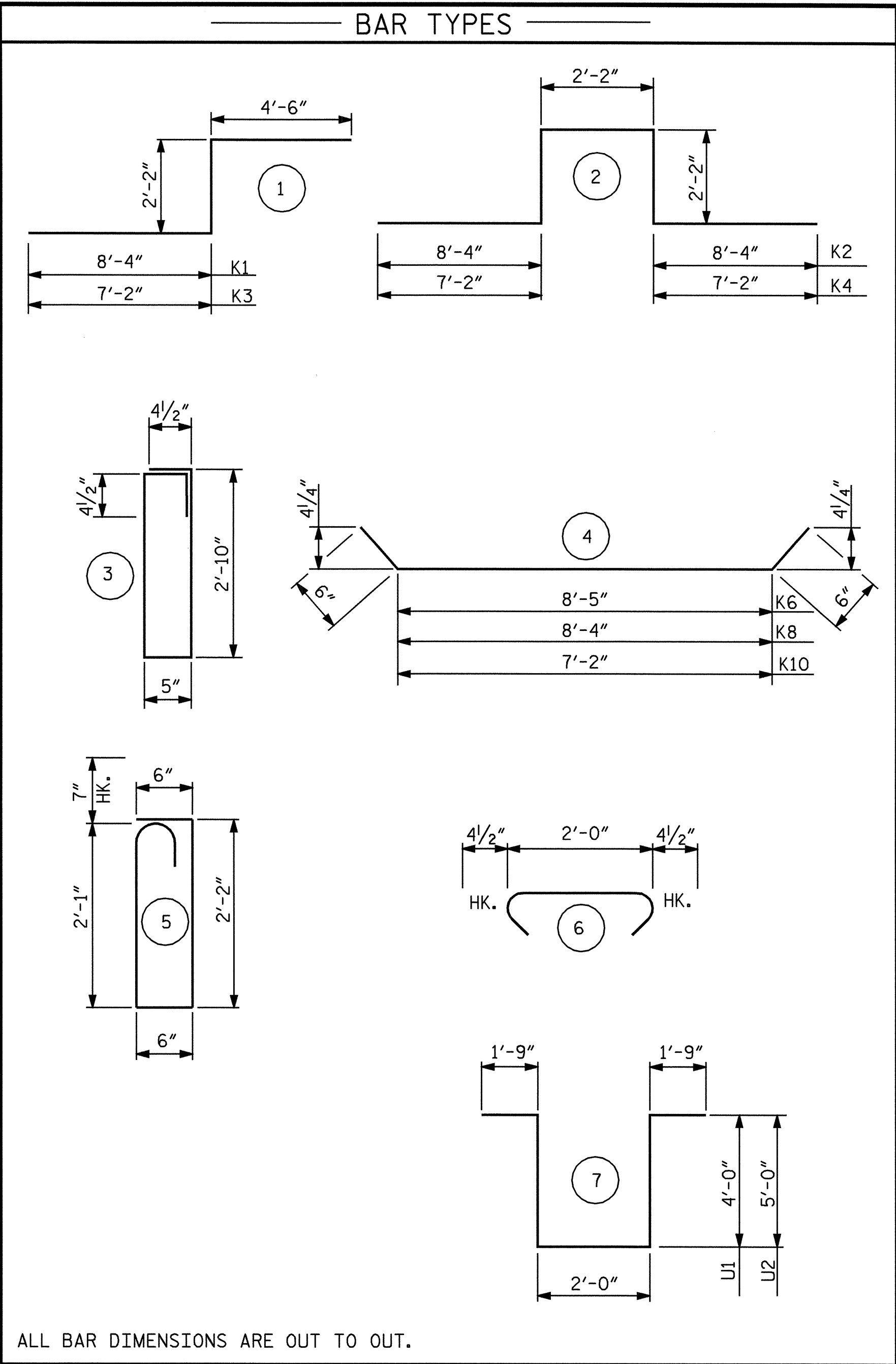
— SUPERSTRUCTURE BILL OF MATERIAL —

	CLASS AA CONCRETE				REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
	(CU. YDS.)					
	(POUR #1)	(POUR #2)	(POUR #3)	(POUR #4)		
SPANS A,B,C & D	143.6	149.7	149.6	164.1	56417	63387
SIDEWALK	86.3					
TOTAL **	693.3				56417	63387

— SUPERSTRUCTURE BILL OF MATERIAL —

	CLASS AA CONCRETE				REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
	(CU. YDS.)					
	(POUR #1)	(POUR #2)	(POUR #3)	(POUR #4)		
SPANS A,B,C & D	143.6	149.7	149.6	164.1	56417	63387
SIDEWALK	86.3					
TOTAL **	693.3				56417	63387

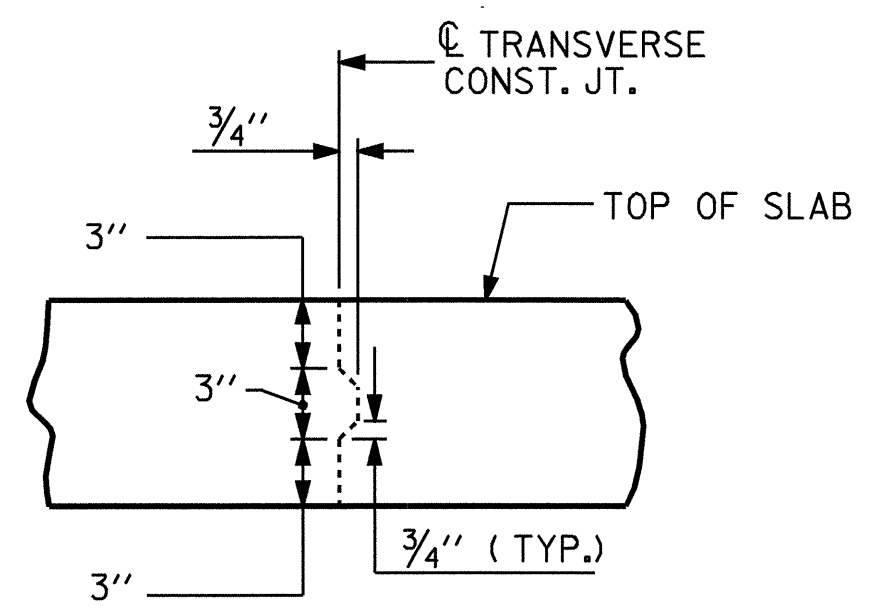
** QUANTITIES FOR BRIDGE RAIL NOT INCLUDED
 ■ QUANTITIES INCLUDED WITH SPAN TOTALS



ALL BAR DIMENSIONS ARE OUT TO OUT.

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

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

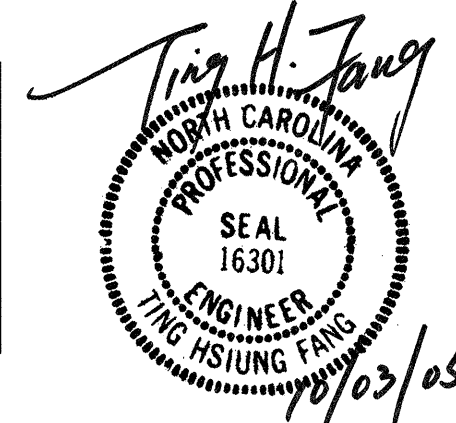


TRANSV. CONSTR. JOINT DETAIL

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

GROOVING BRIDGE FLOORS

	BRIDGE DECK	APPROACH SLABS	TOTAL
	10,394	1,666	12,060
	SQ. FT.	SQ. FT.	SQ. FT.



PROJECT NO. B-3509
 ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS 53
2			4			

DRAWN BY: S. M. RASHIDI DATE: 7/26/04
 CHECKED BY: M. A. ALLEN DATE: 2-05

NOTES

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

CENTER UTILITY IN BLOCKOUT AND FILL ANNULAR SPACE AROUND UTILITY PIPE WITH JOINT FILLER IN ACCORDANCE WITH STANDARD SPECIFICATION ARTICLE 1028-1.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 1/4" PER FOOT.

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

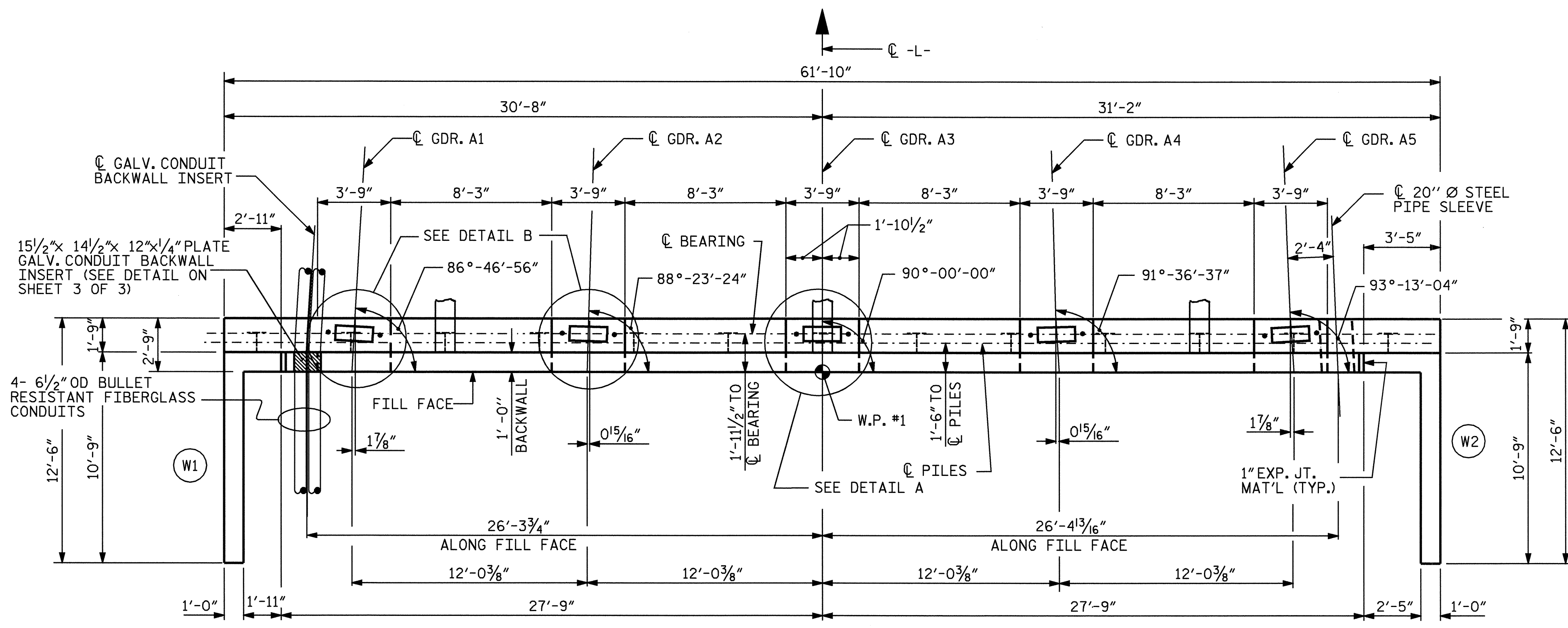
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR "TEMPORARY DRAINAGE AT END BENT" DETAIL SEE END BENT 2, SHEET 2 OF 3.

THE DIMENSIONS AND DETAILS SHOWN FOR THE STEEL PIPE SLEEVE ARE FOR THE CONTRACTOR'S BENEFIT IN PLACING THE SLEEVE AND SHOULD NOT BE AN APPROVAL FOR THE ATTACHMENT OF THE UTILITY TO THE STRUCTURE.

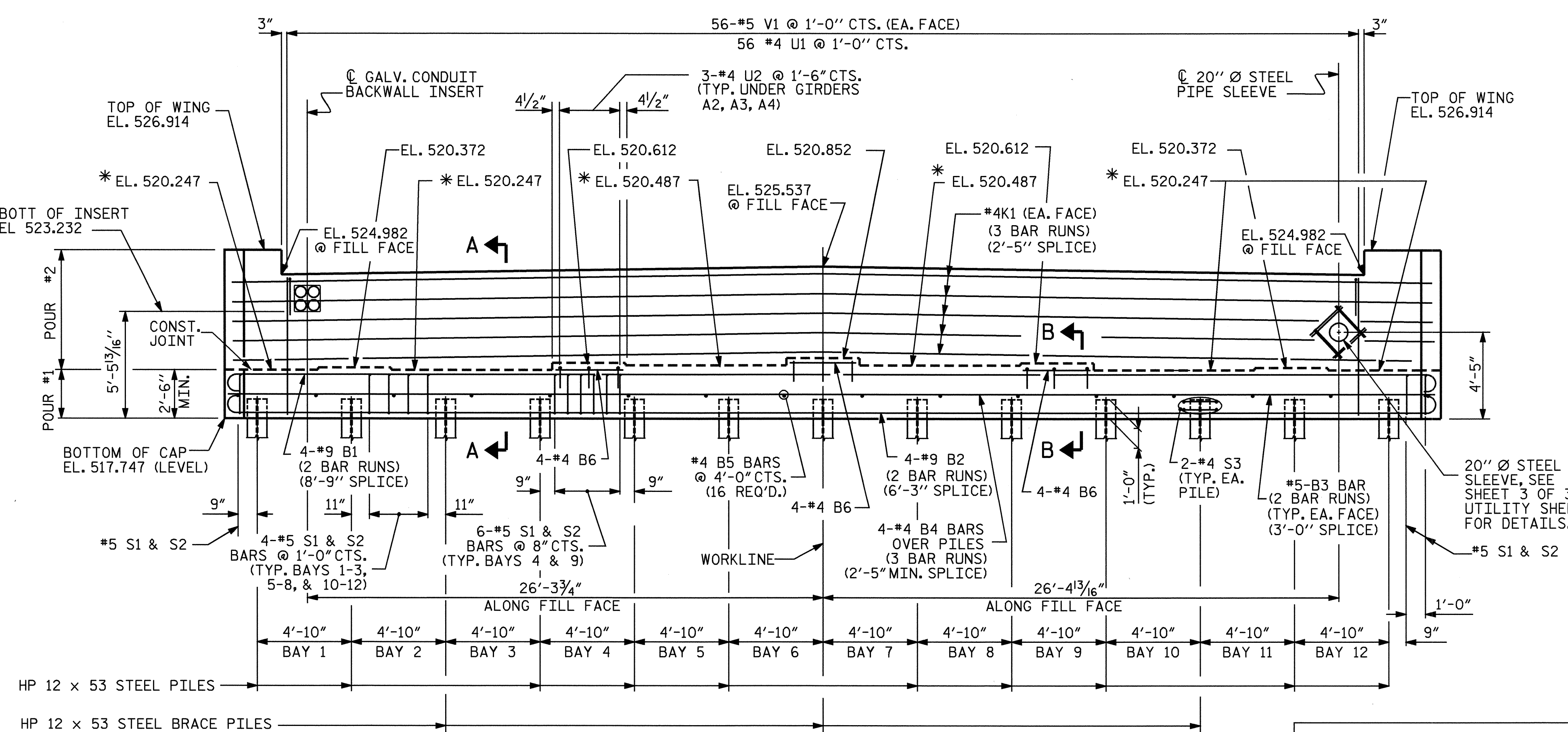
FOR RESPONSIBILITIES FOR FURNISHING AND PLACING STEEL PIPE SLEEVES, SEE UTILITY SPECIAL PROVISIONS.

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



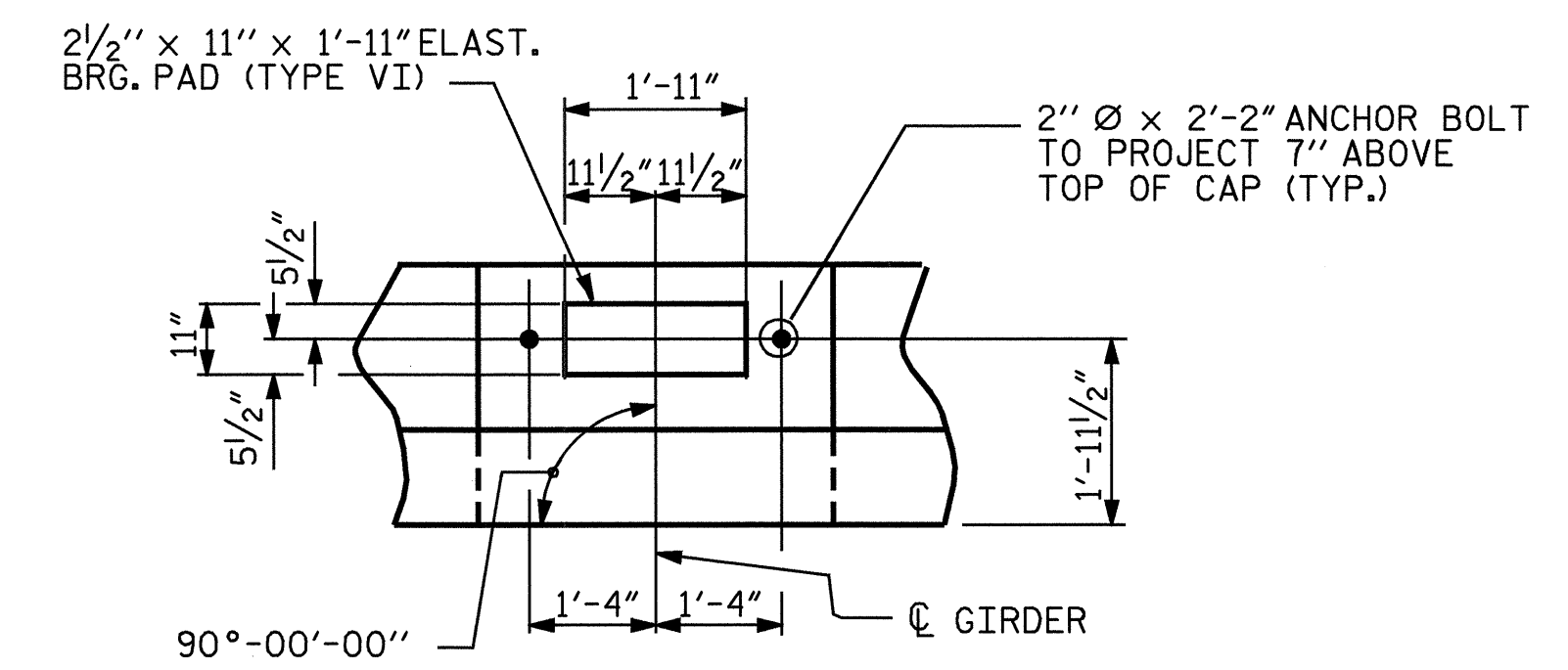
PLAN

NOTE: #5 V1 & #4 K1 & U1 BARS IN BACKWALL MAY BE CUT OR SHIFTED AS NECESSARY TO CLEAR GALVANIZED CONDUIT BACKWALL INSERT.



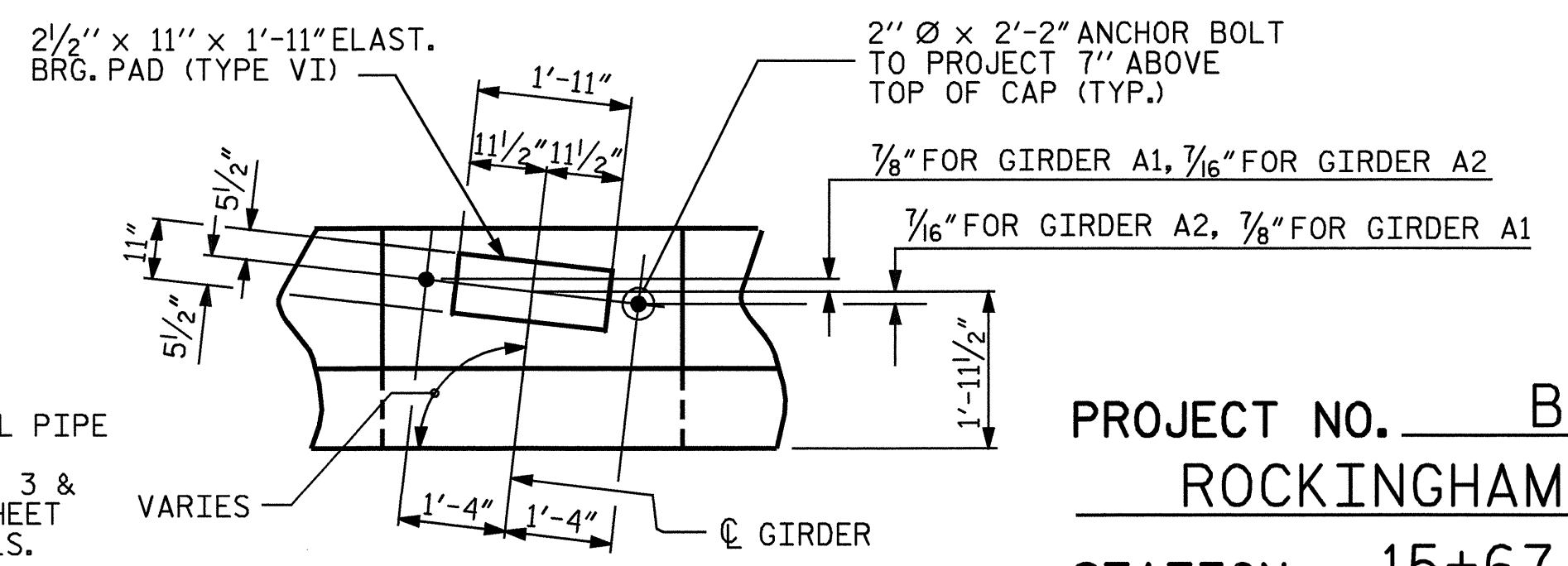
ELEVATION

* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEATS, SEE SECTIONS A-A, AND B-B, SHEET 3 OF 3



DETAIL A

(FOR SEATS UNDER GIRDER A3 ONLY)



DETAIL B

FOR SEAT UNDER GIRDERS A1 & A2 SHOWN. (GIRDERS A4 & A5 SIMILAR BY ROTATION)

PROJECT NO. B-3509
ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

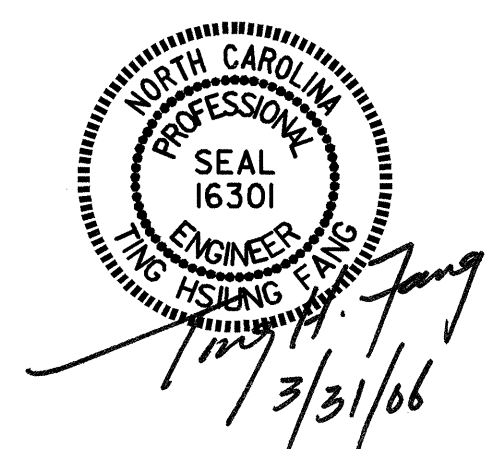
SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

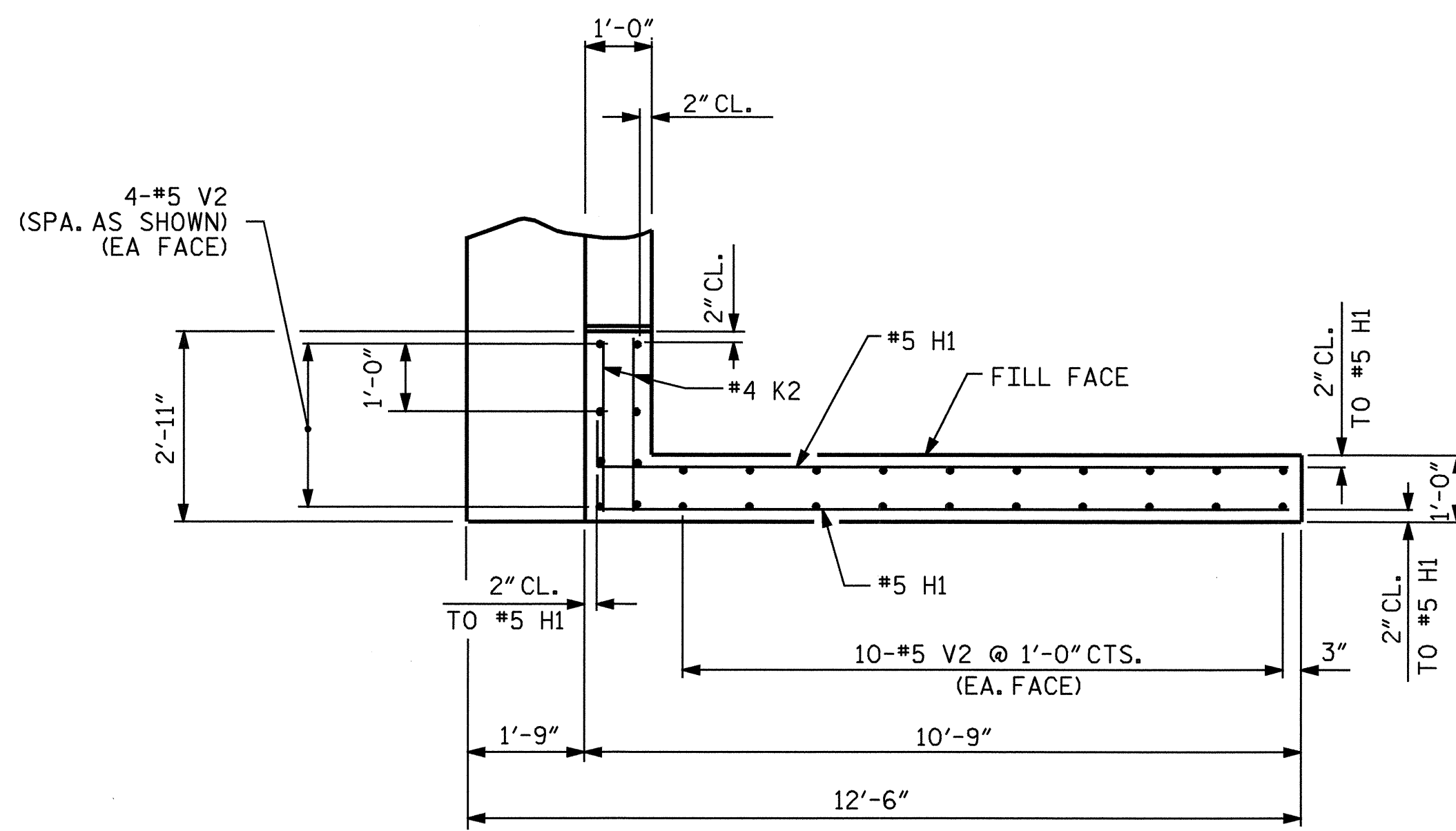
END BENT 1

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34	
1			3			TOTAL SHEETS 53	
2			4				

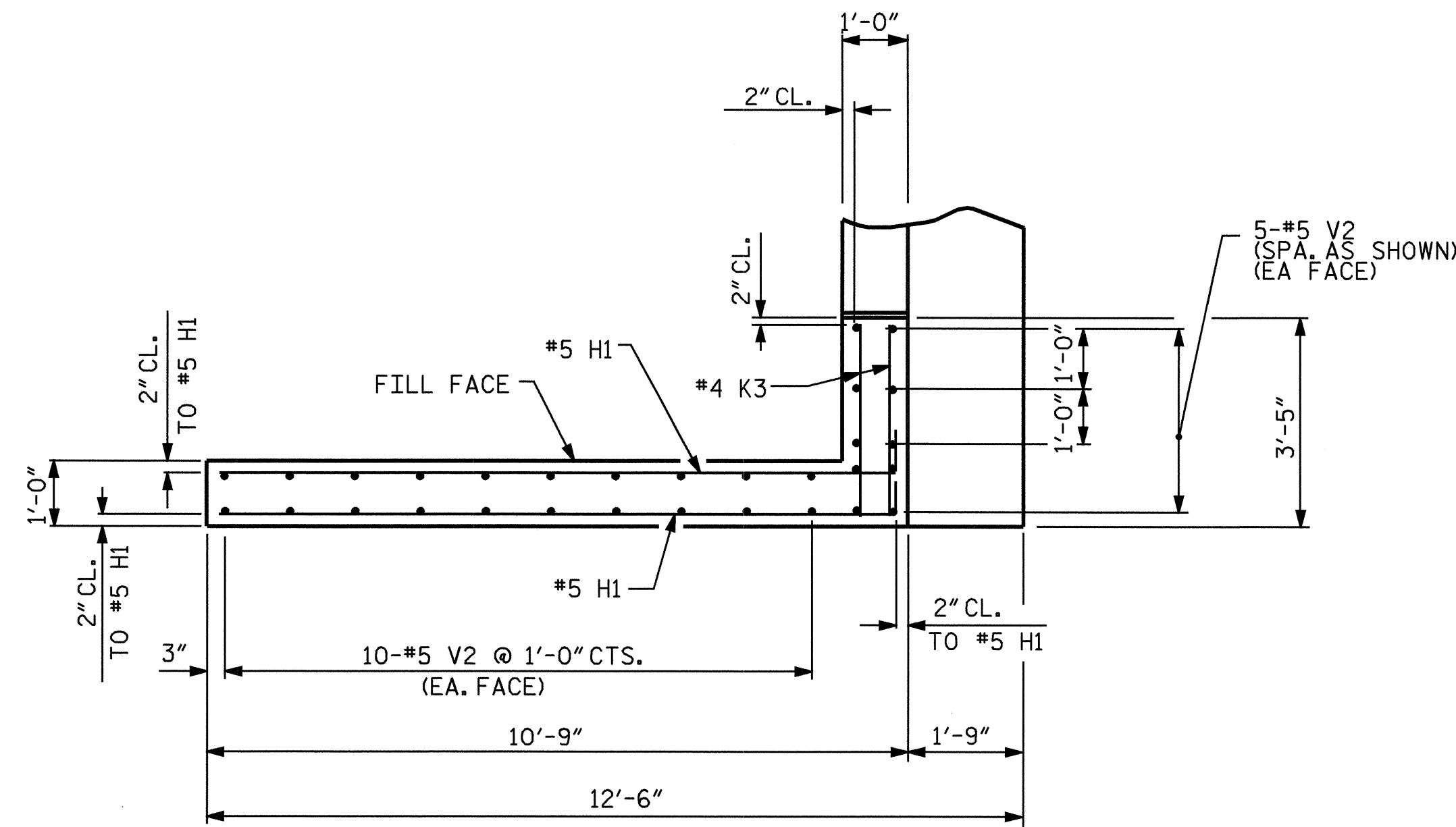


NOTE:
 20" Ø STEEL PIPE SLEEVE AND GALV. CONDUIT BACKWALL INSERT ARE TO BE FLUSH WITH BOTH SIDES OF BACK WALL. THEY ARE TO BE PLACED SO THAT OPENINGS ARE PARALLEL TO BEAMS.

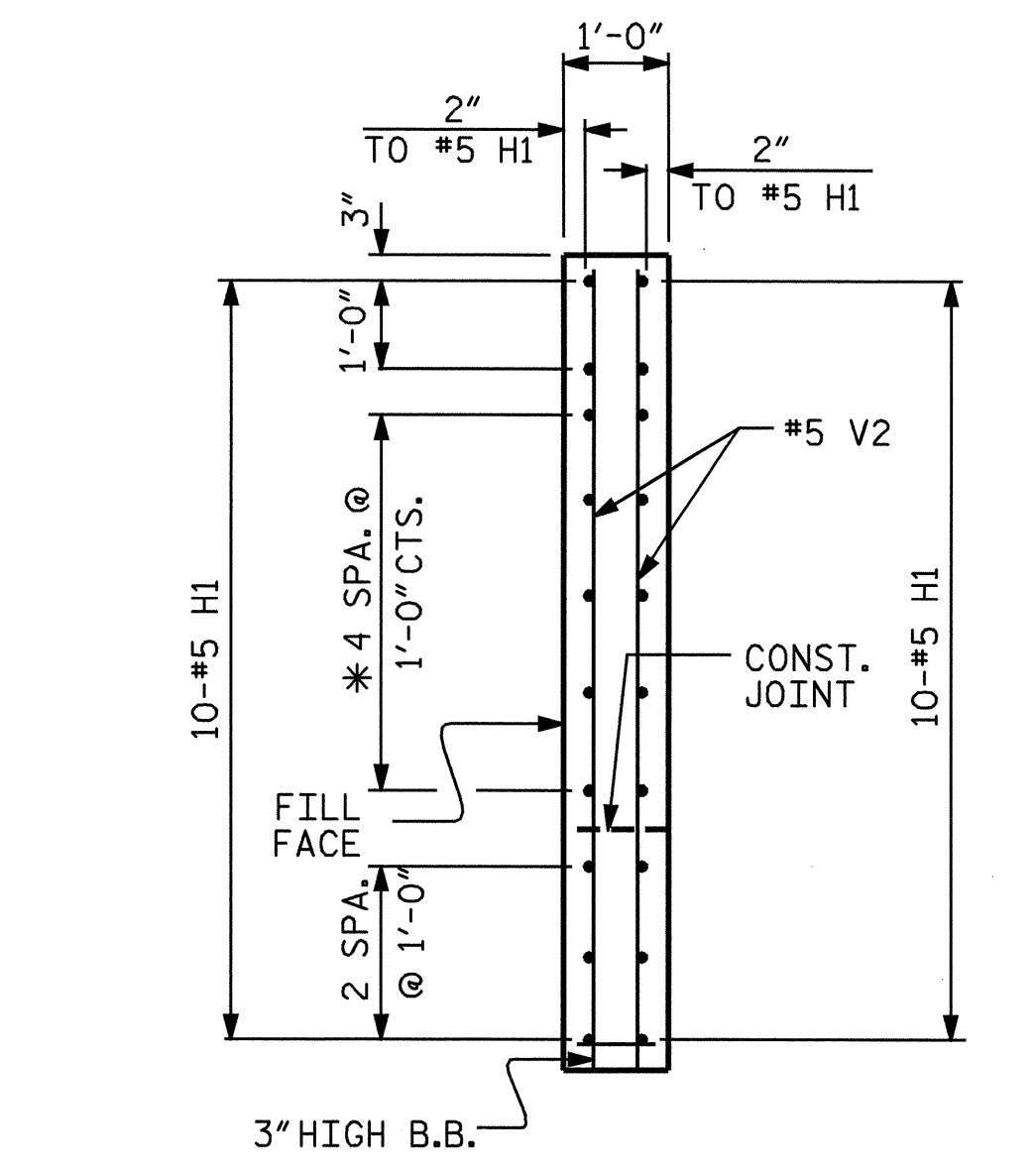
DRAWN BY: N.Q. TRAN DATE: JUN. 2004
 CHECKED BY: M.A. ALLEN DATE: 07-2004



PLAN OF WING - W1

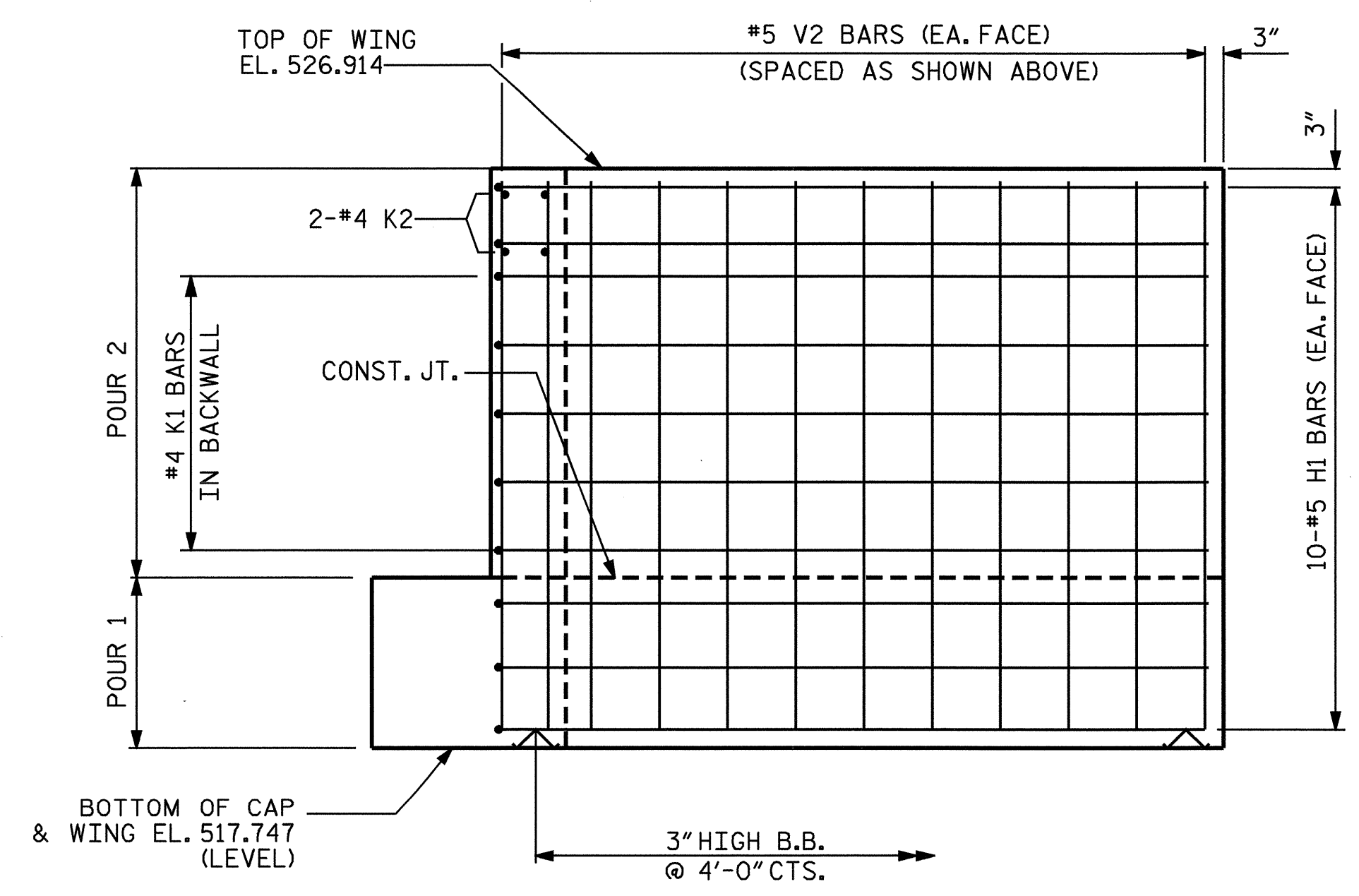
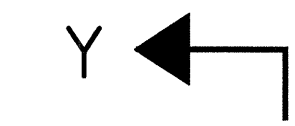
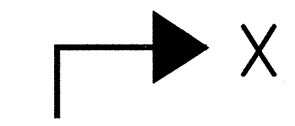


PLAN OF WING - W2

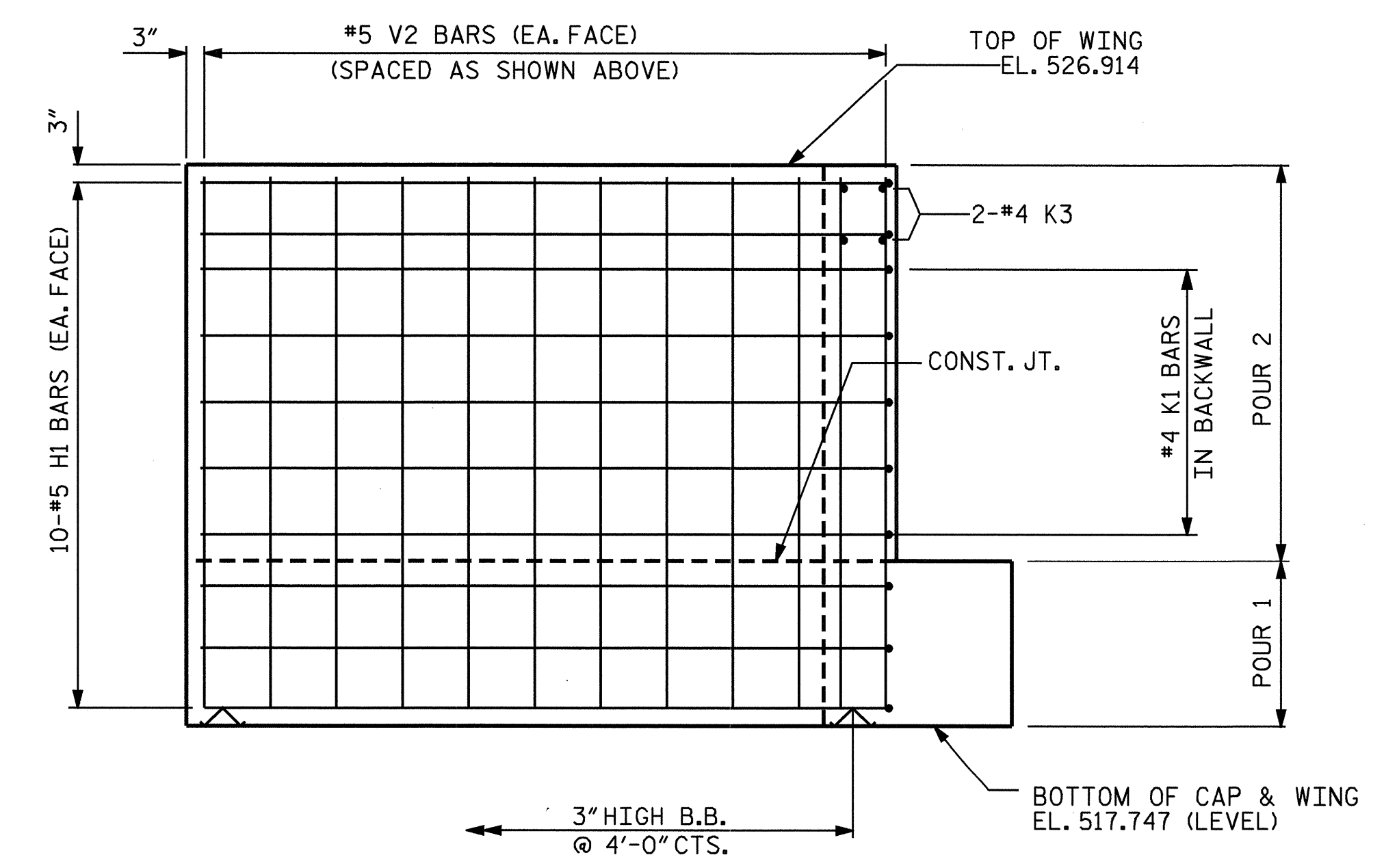


SECTION X-X

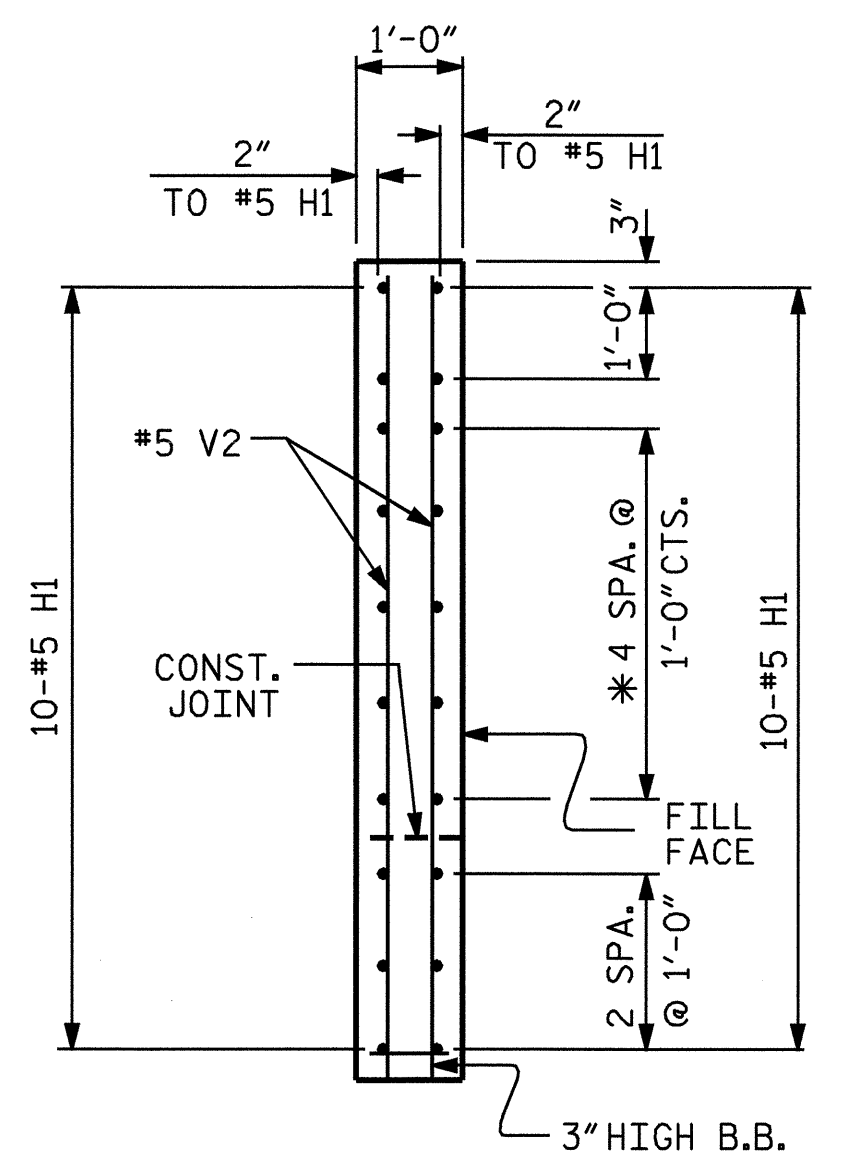
* MATCH "H" BARS WITH "K" BARS IN BACKWALL



ELEVATION OF WING - W1



ELEVATION OF WING - W2



SECTION Y-Y

* MATCH "H" BARS WITH "K" BARS IN BACKWALL

PROJECT NO. B-3509
 ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

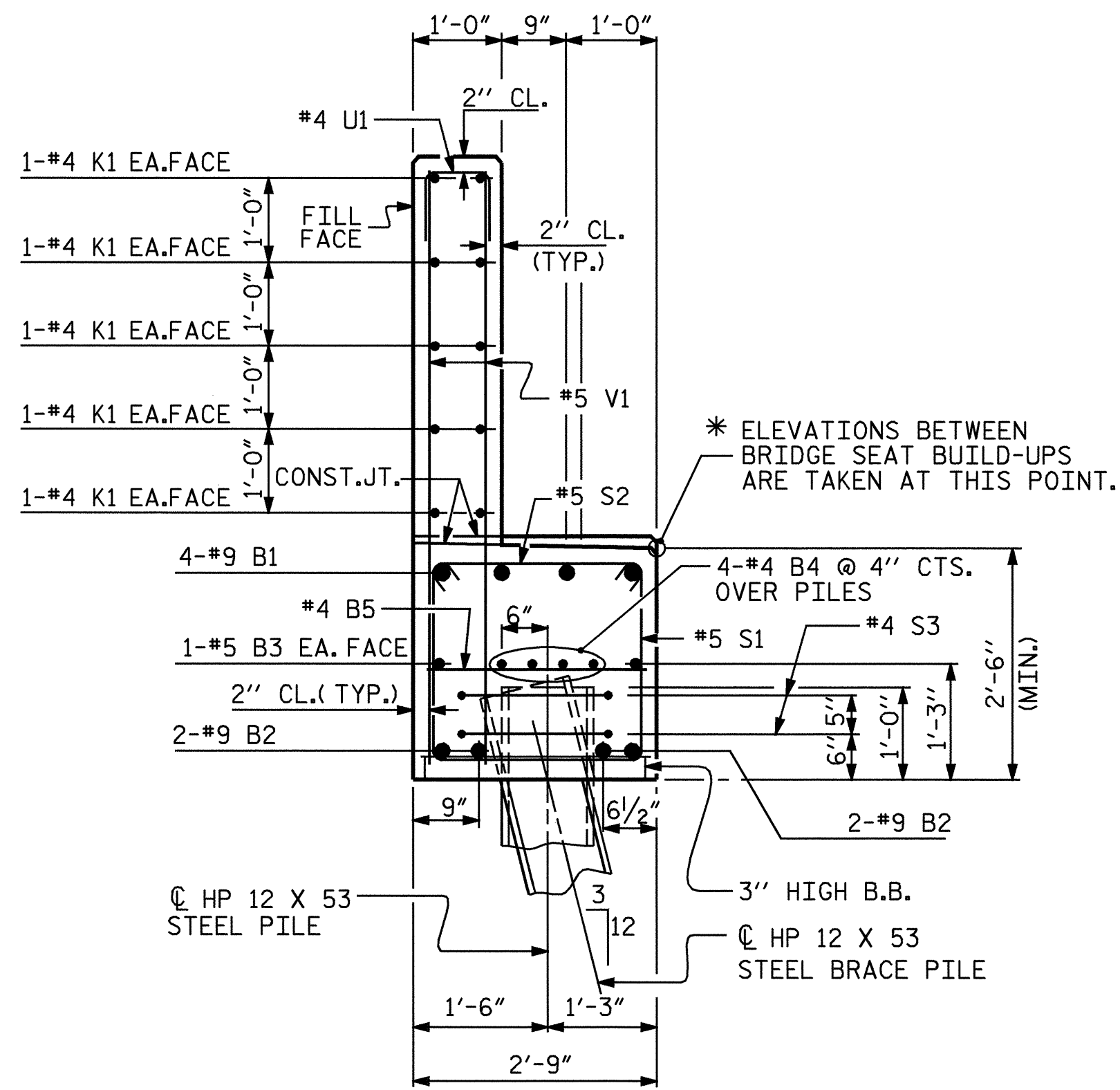
SUBSTRUCTURE
 END BENT 1

Ting H. Fang
 8/19/05

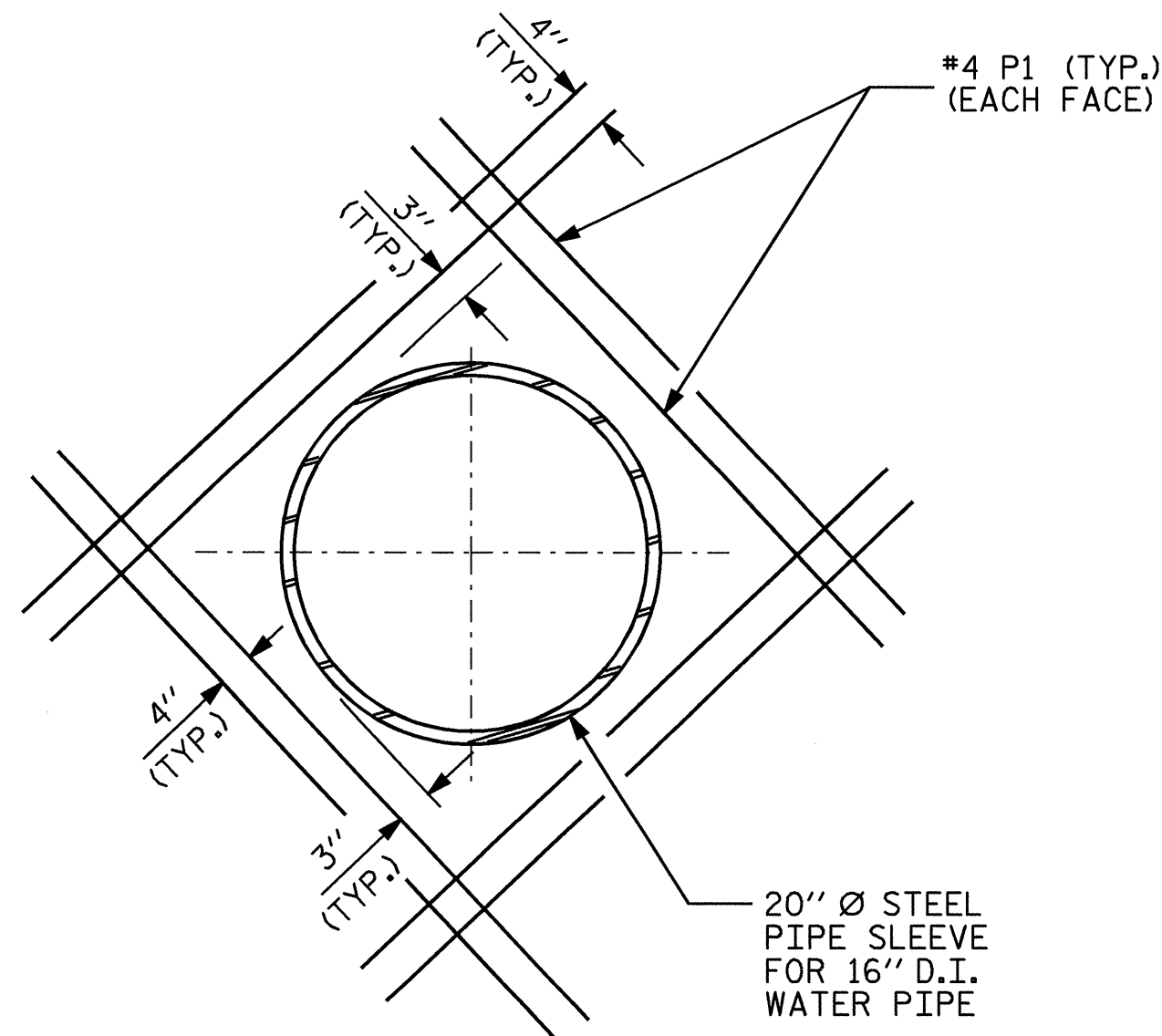
DRAWN BY : N. Q. TRAN DATE : JUN. 2004
 CHECKED BY : M. A. ALLEN DATE : 07-2004

16-AUG-2005 14:53
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			53

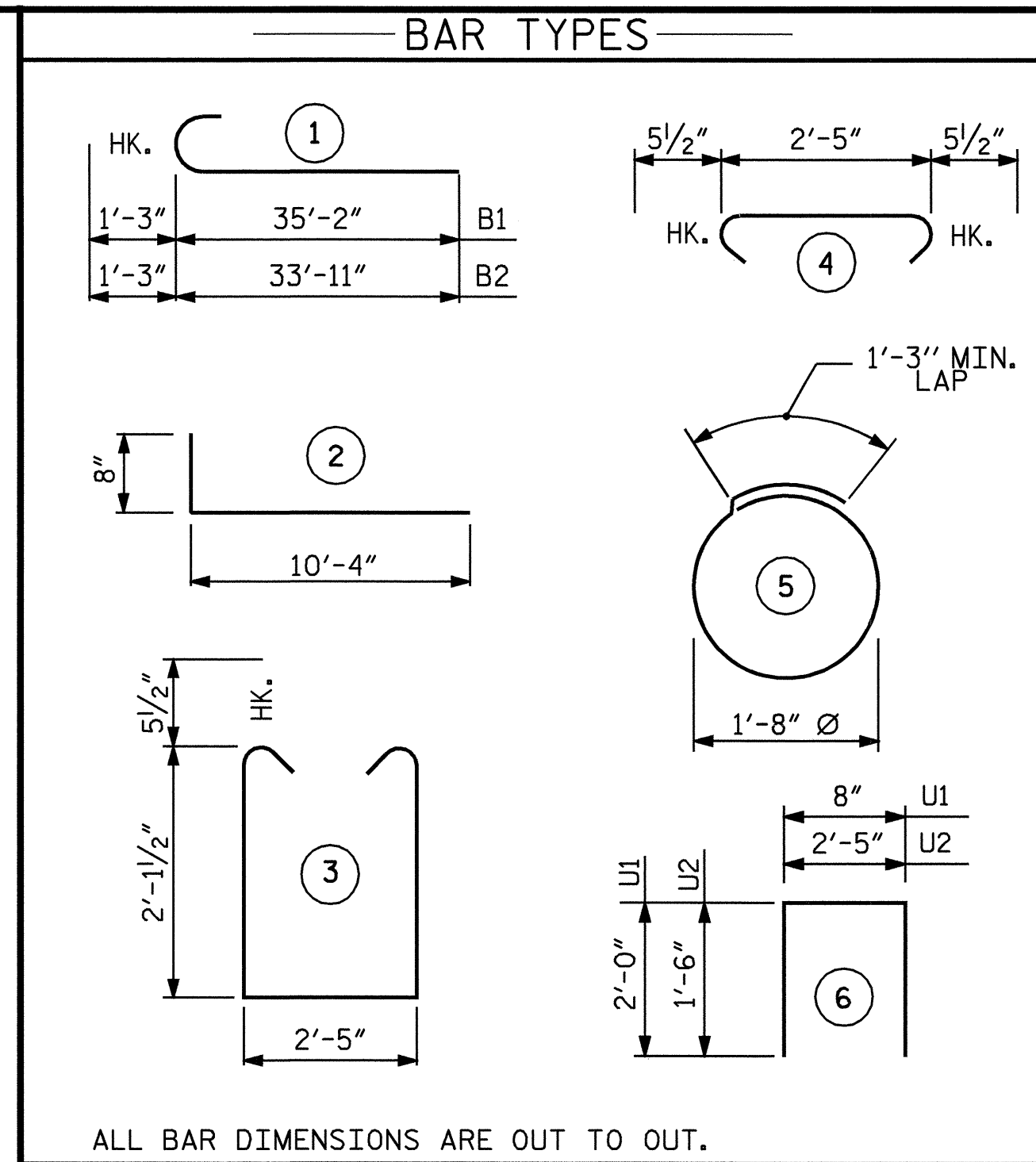


SECTION A-A

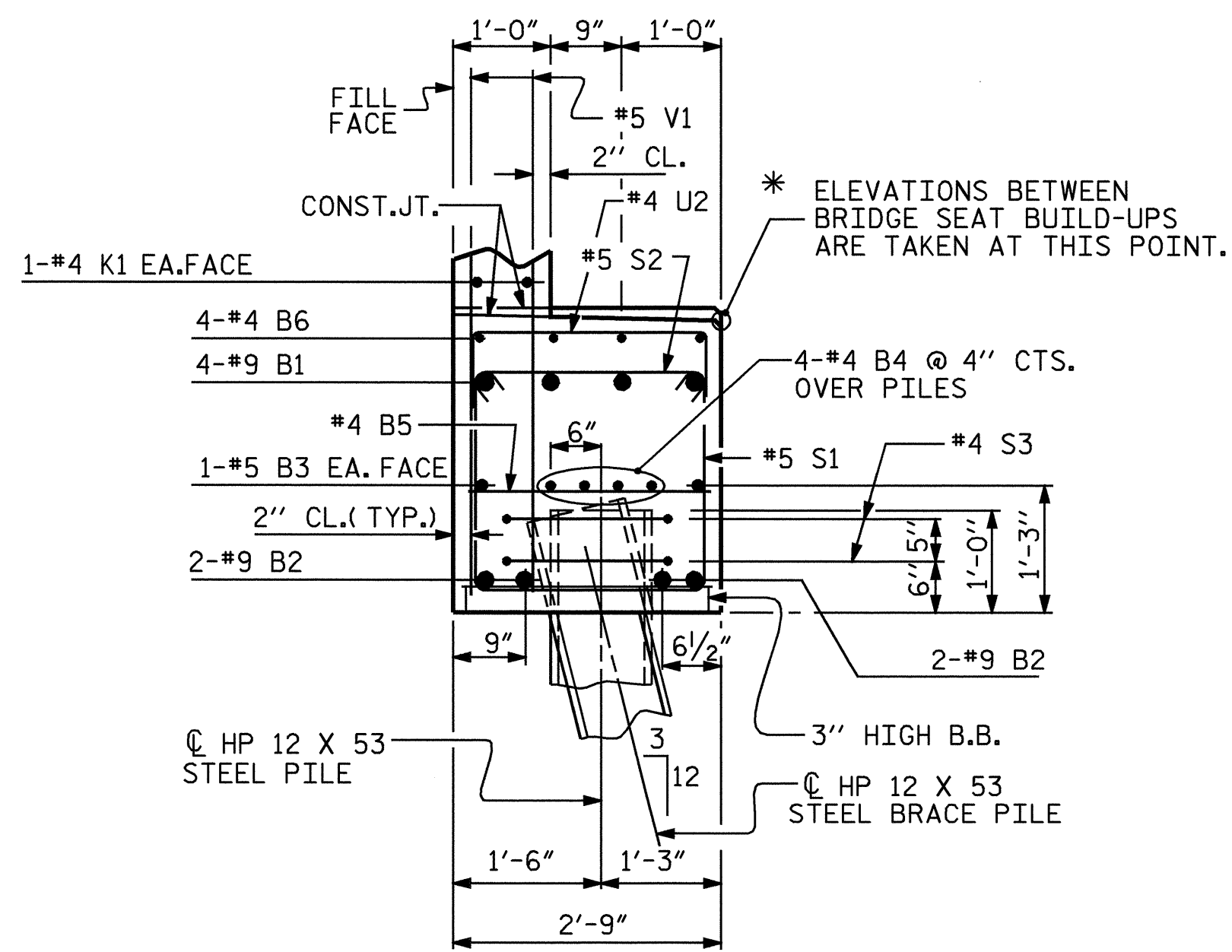


20" Ø STEEL PIPE SLEEVE DETAIL

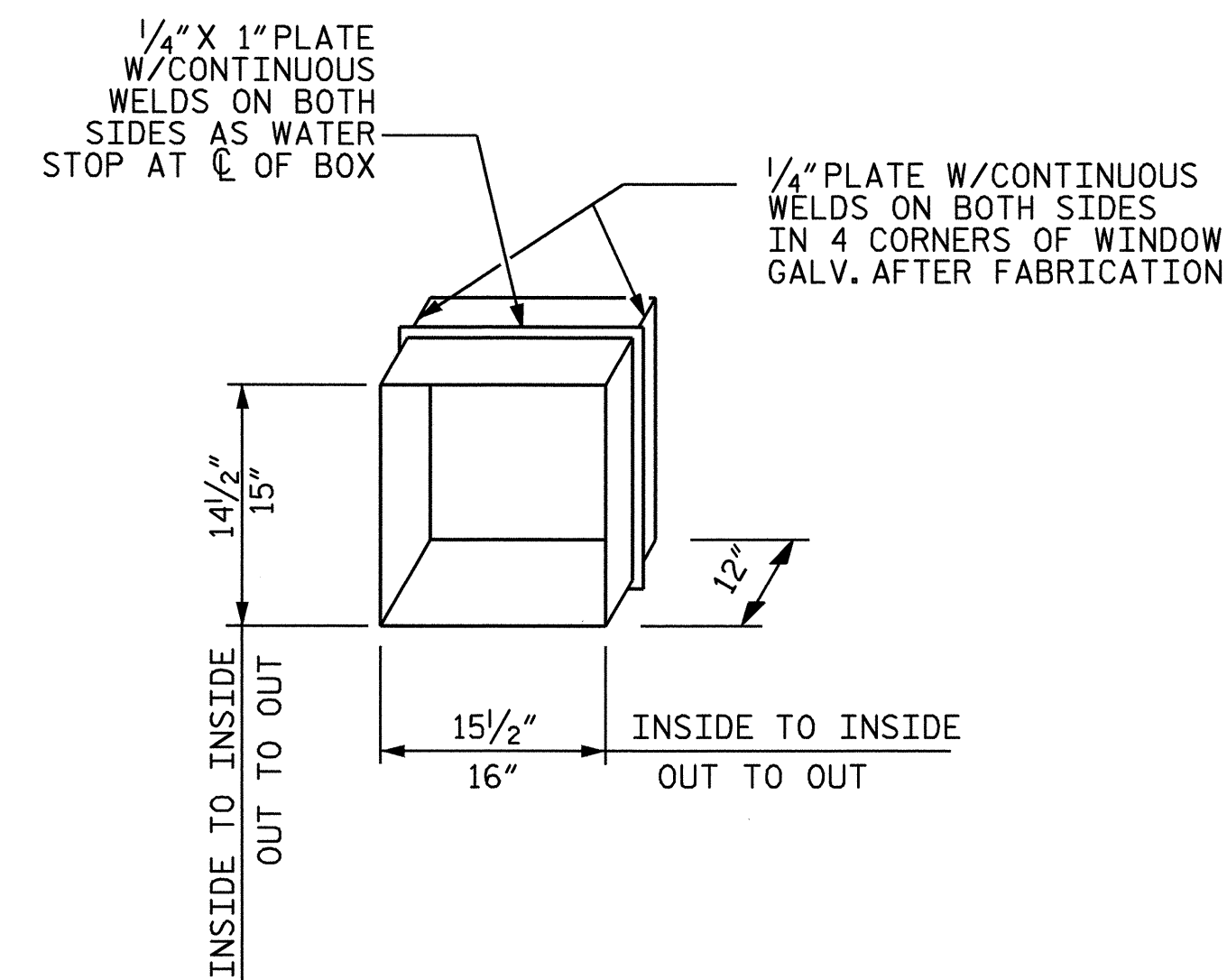
THE REINFORCING STEEL IN BACKWALL WILL BE CUT AND FIELD BENT AS NECESSARY TO CLEAR STEEL PIPE SLEEVE.



BILL OF MATERIAL					
END BENT 1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	8	9	1	36'-5"	991
B2	8	9	1	35'-2"	957
B3	4	5	STR	32'-3"	135
B4	12	4	STR	22'-2"	178
B5	16	4	STR	2'-5"	26
B6	12	4	STR	3'-5"	27
H1	40	5	2	11'-0"	459
K1	30	4	STR	21'-6"	431
K2	4	4	STR	2'-7"	7
K3	4	4	STR	3'-1"	8
P1	16	4	STR	3'-2"	34
S1	55	5	3	7'-7"	435
S2	55	5	4	3'-4"	191
S3	26	4	5	6'-6"	113
U1	56	4	6	4'-8"	175
U2	9	4	6	5'-5"	33
V1	112	5	STR	6'-11"	808
V2	58	5	STR	8'-9"	529
REINFORCING STEEL				LBS.	5,537
CLASS A CONCRETE					
POUR #1 CAP & LOWER PORTION OF WINGS				18.8 CU. YD.	
POUR #2 BACKWALL & UPPER PORTION OF WINGS				16.5 CU. YD.	
TOTAL CLASS A CONCRETE				35.3 CU. YD.	
HP 12 X 53 STEEL PILES					
NO. 13				LIN. FEET	325

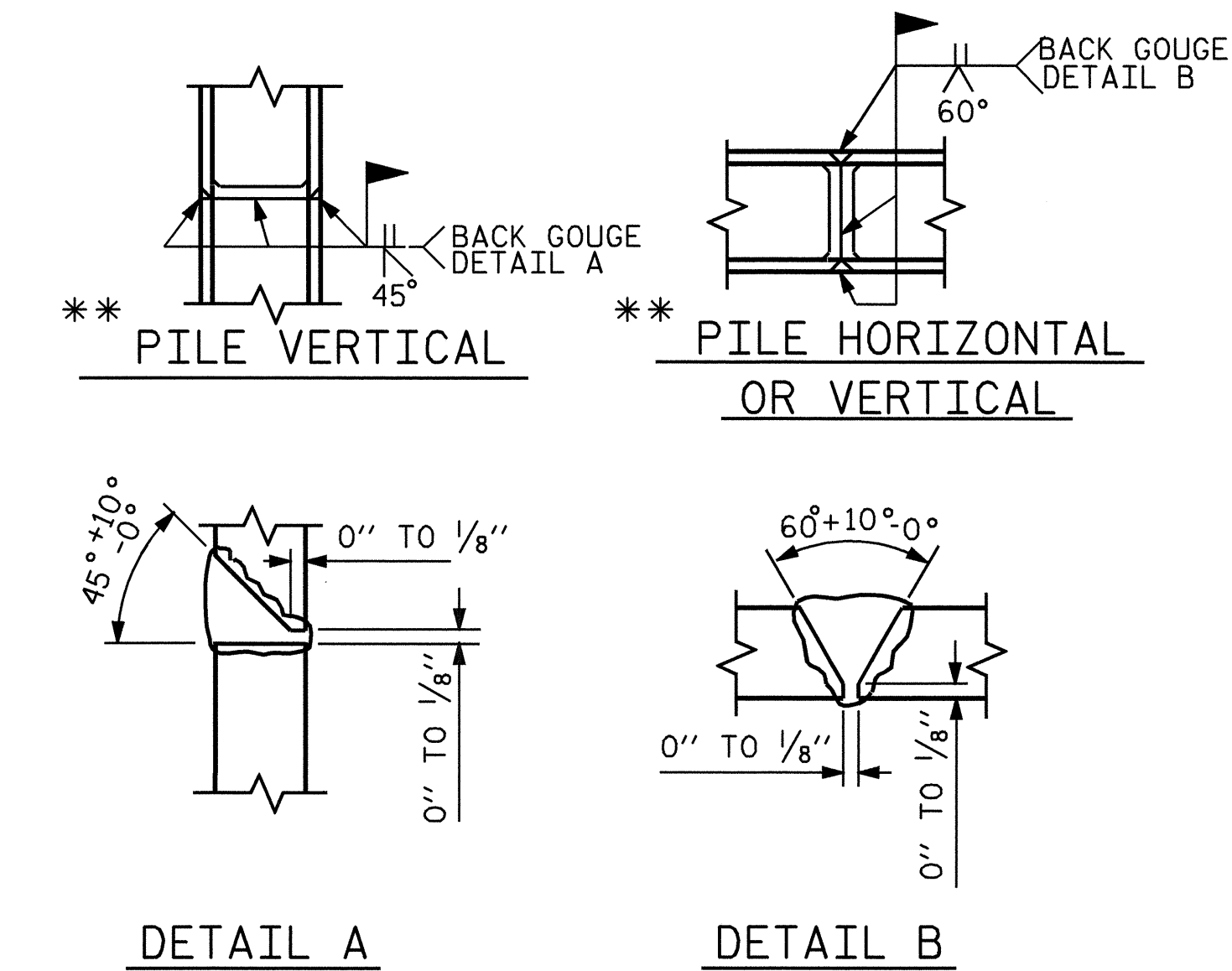


SECTION B-B



GALV. CONDUIT BACKWALL INSERT DETAIL

NOT TO SCALE



DETAIL A

DETAIL B

** POSITION OF PILE DURING WELDING.

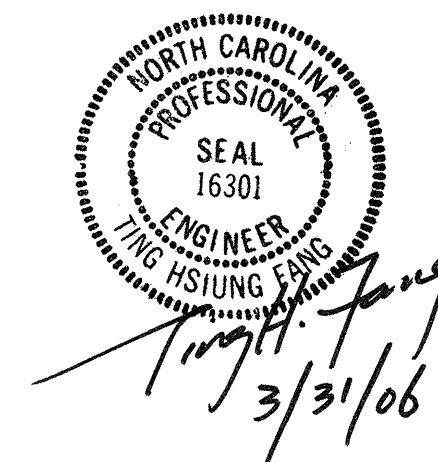
PILE SPLICE DETAILS

PROJECT NO. B-3509
 ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 1



DRAWN BY : N. Q. TRAN DATE : JUN. 2004
 CHECKED BY : M. A. ALLEN DATE : 7-2004

30-MAR-2006 08:42
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REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS 53

NOTES:

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
THE CONTRACTOR SHALL ALIGN THE "V" & "M" BARS AS SHOWN IN THE PLAN OF DRILLED PIERS AND COLUMNS.

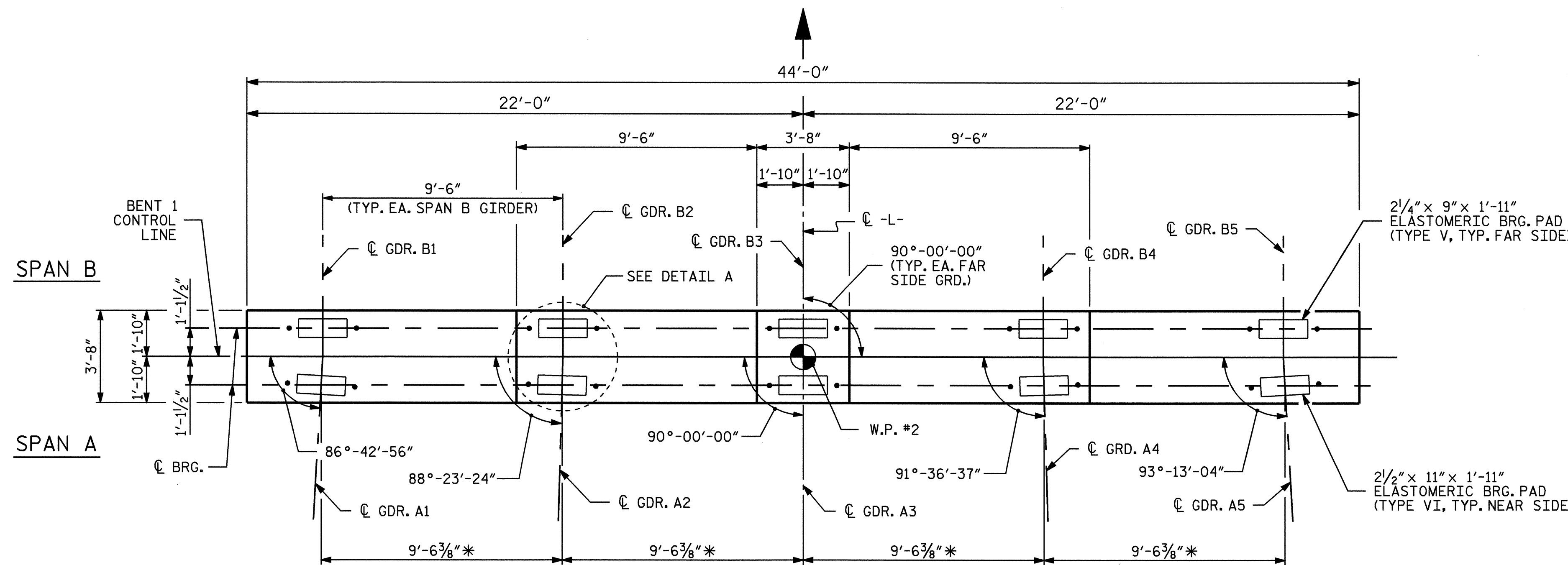
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR REINFORCING STEEL AND SPIRAL COLUMN REINFORCING STEEL.

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

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIER IS DETAILED WITH 3'-0" OF EXTRA LENGTH.

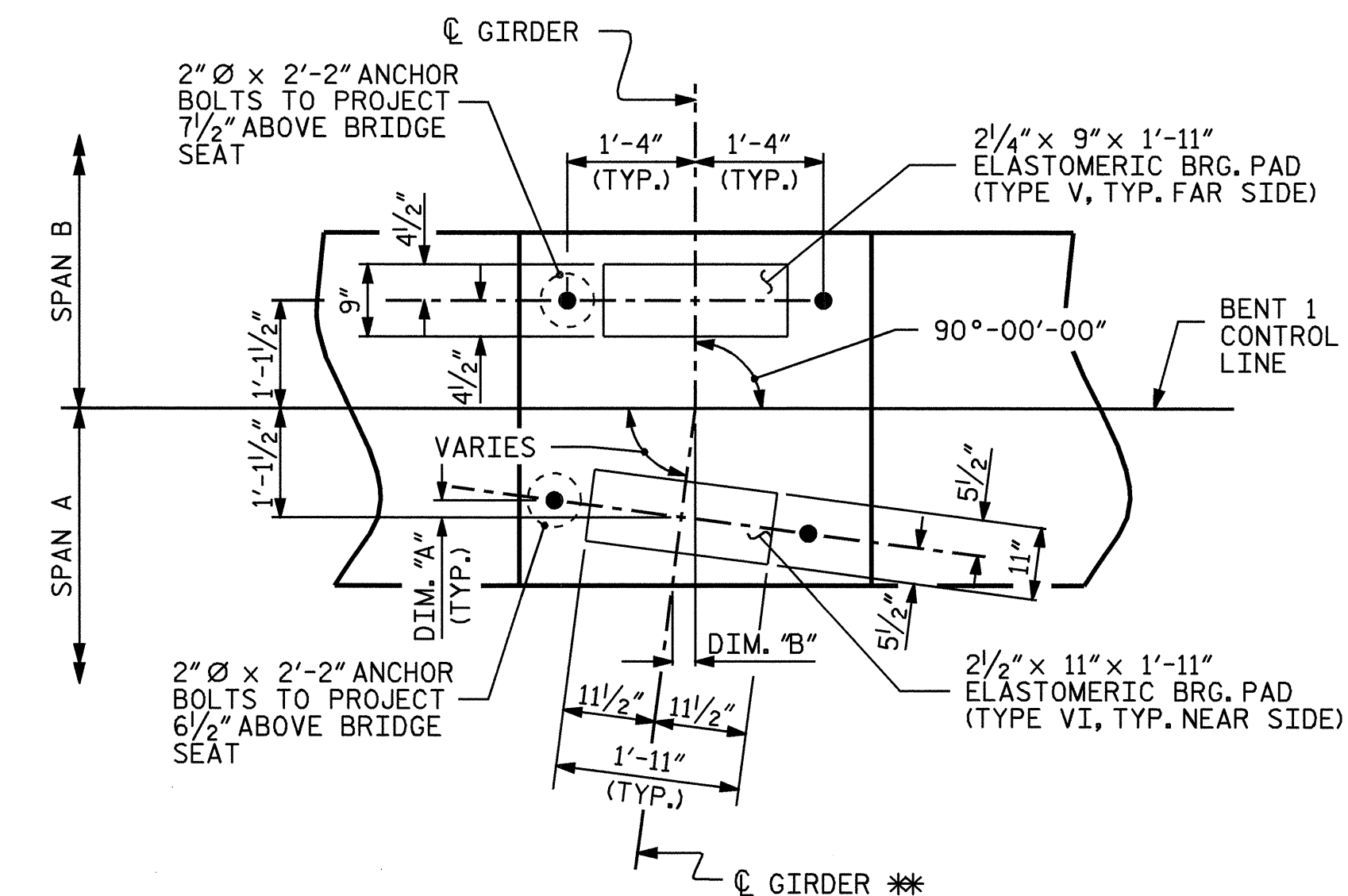
FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

IT IS ANTICIPATED THAT THE FOOTINGS FROM THE EXISTING BRIDGE WILL NOT CONFLICT WITH THE PROPOSED DRILLED PIERS. HOWEVER, SHOULD THERE BE A CONFLICT AND IT IS NECESSARY TO GO THRU THE EXISTING FOOTINGS, FOR THAT PORTION OF DRILLED PIER, THE CONTRACTOR WILL BE PAID FOR THE PRICE OF DRILLED PIER NOT IN SOIL.



PLAN

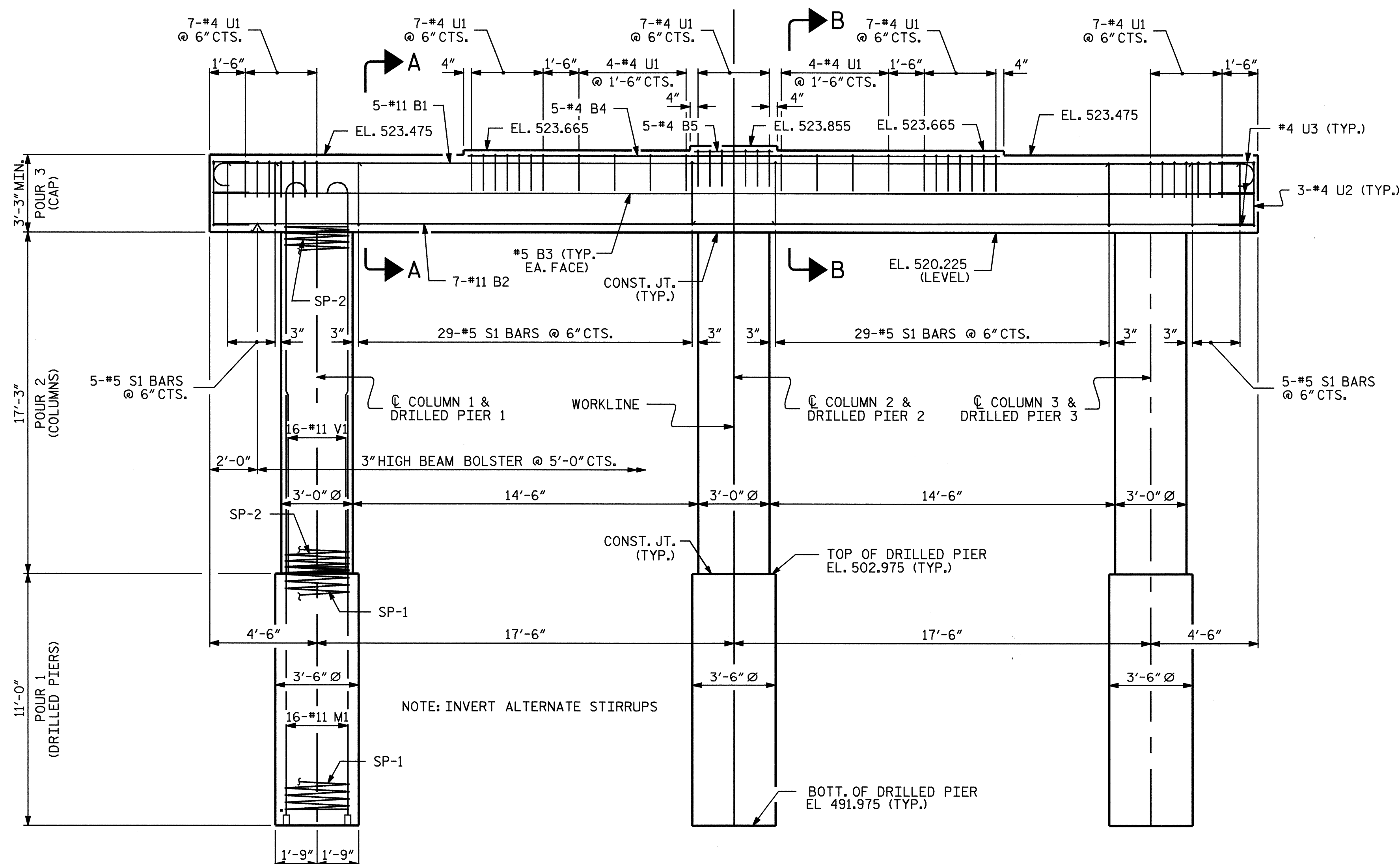
* MEASURED BETWEEN C. BRGS.
FOR GIRDER OFFSETS IN SPAN A, SEE OFFSET DIMENSIONS IN DETAIL A



DETAIL A

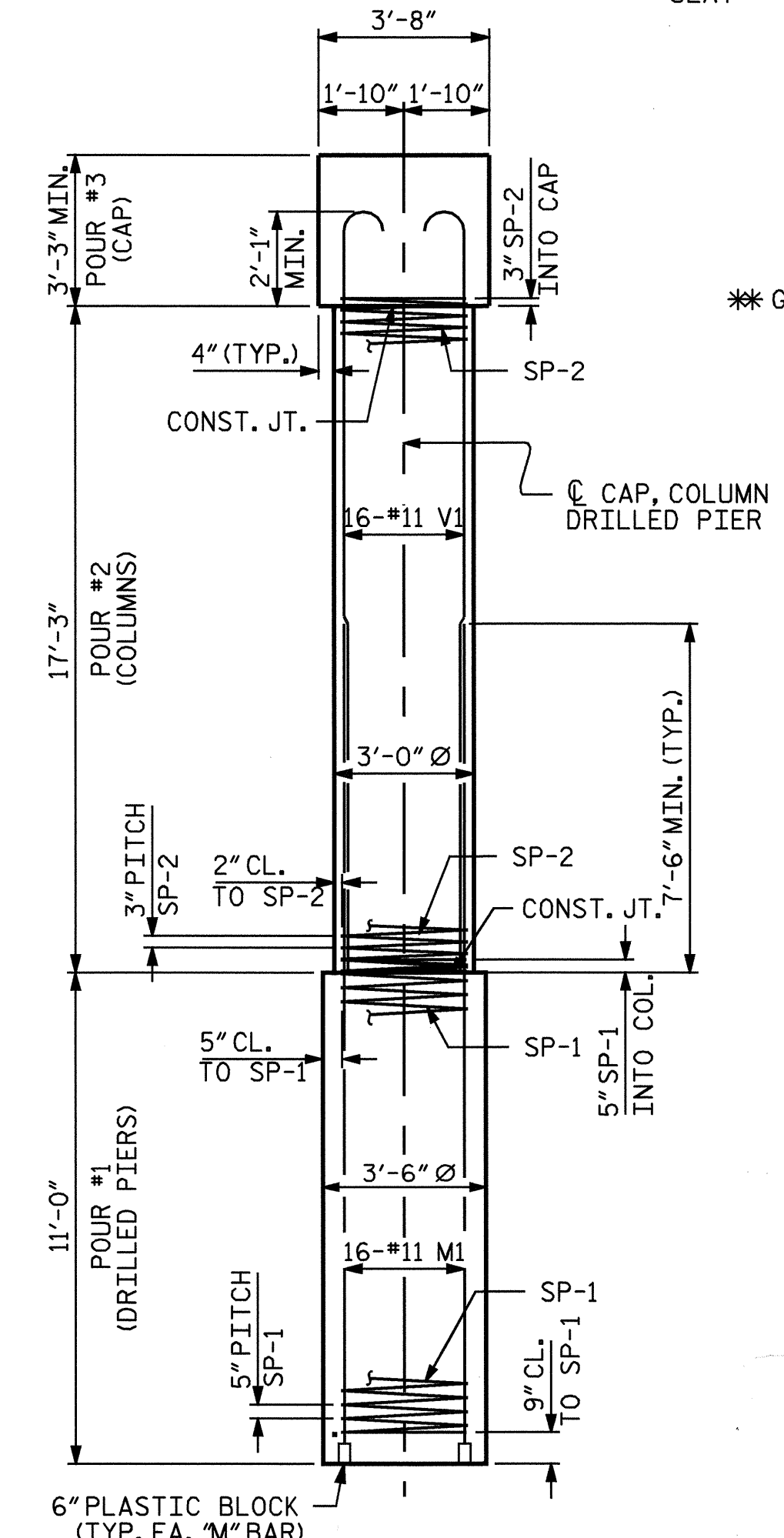
* GIRDERS A1 & A2 SHOWN, GIRDERS A4 & A5 SIMILAR BY ROTATION

GIRDER NO.	DIM. "A"	DIM. "B"
A1	7/8"	1 1/4"
A2	7/16"	5/8"
A3	0"	0"
A4	7/16"	5/8"
A5	7/8"	1 1/4"



ELEVATION

COLUMN AND DRILLED PIER REINFORCING STEEL TYPICAL FOR ALL COLUMNS AND PIERS.



END ELEVATION

DRAWN BY: W.K. FISCHER DATE: 8/13/04
CHECKED BY: N.O. TRAN DATE: 9/19/04

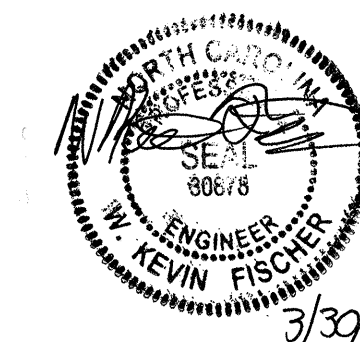
30-MAR-2006 08:52
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moallen

PROJECT NO. B-3509
ROCKINGHAM COUNTY
STATION: 15+67.50 -L-

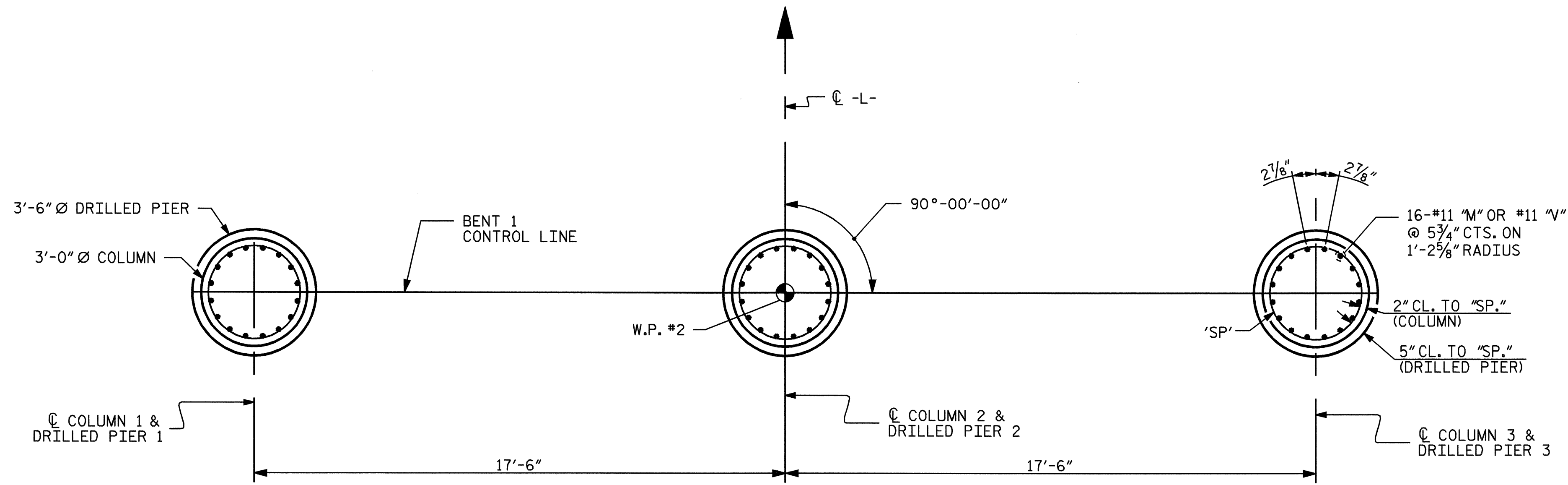
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1

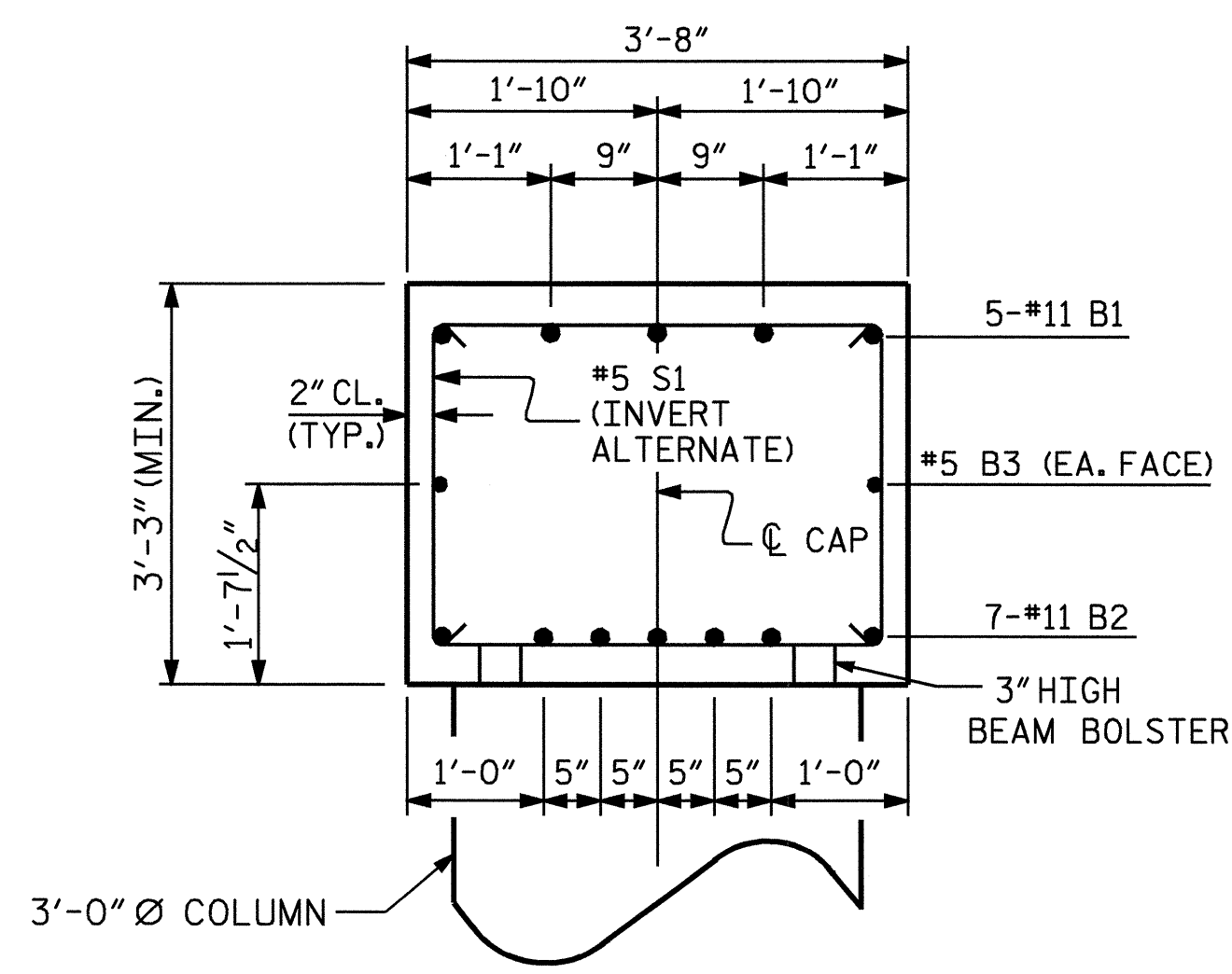


REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			53
2			4			

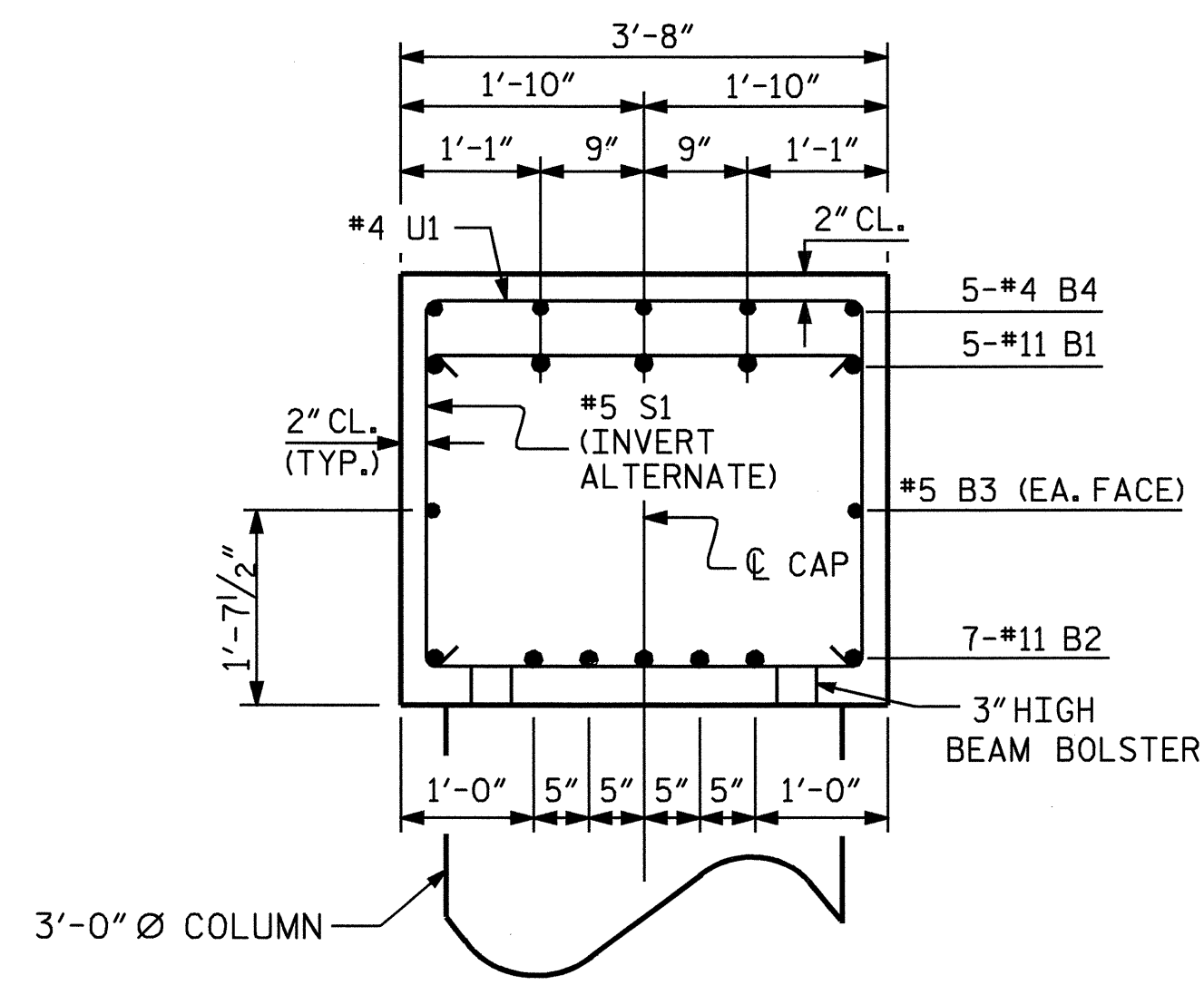


PLAN OF COLUMNS AND DRILLED PIERS

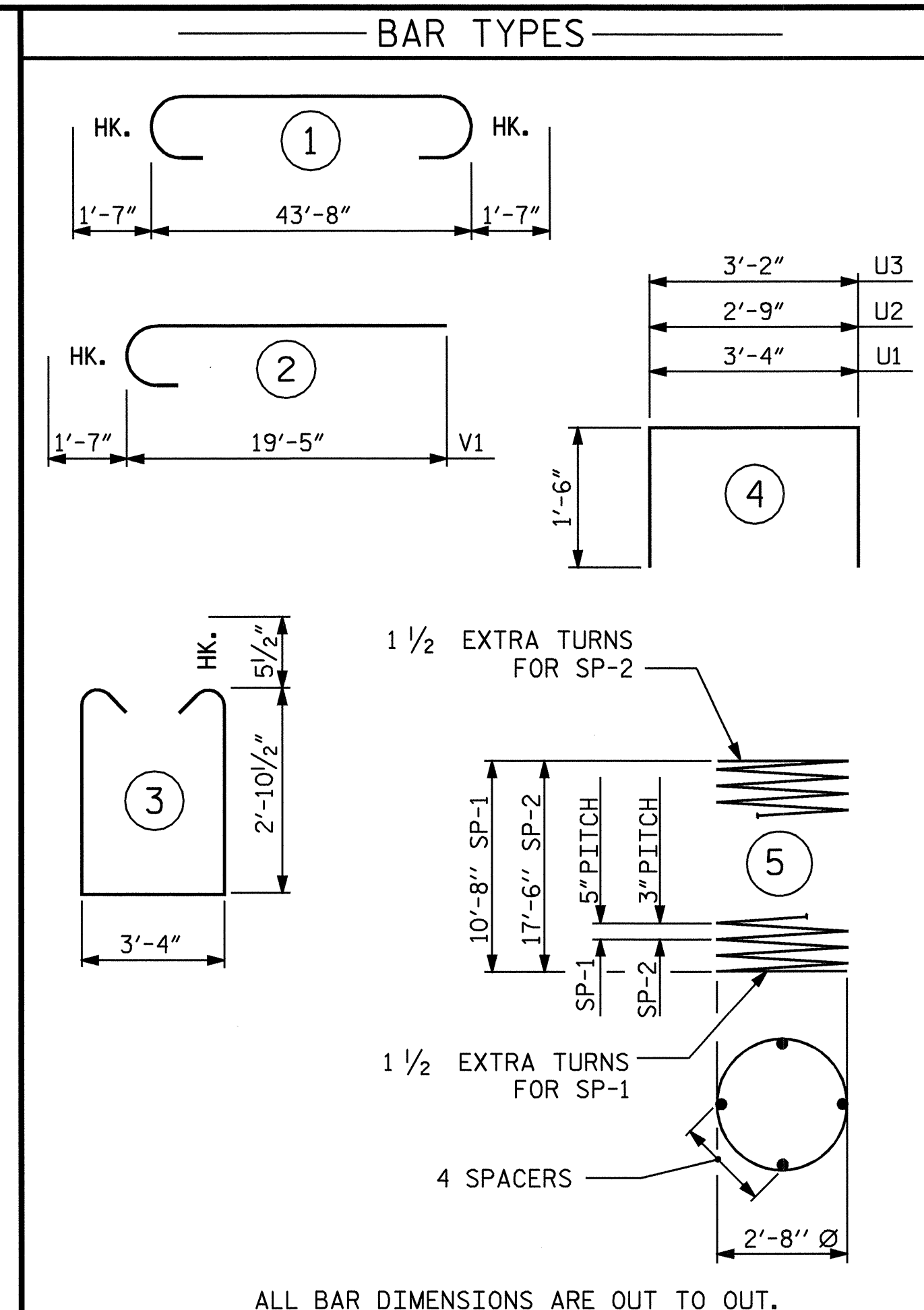
(ALL DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR ALL COLUMNS AND DRILLED PIERS)



SECTION A-A

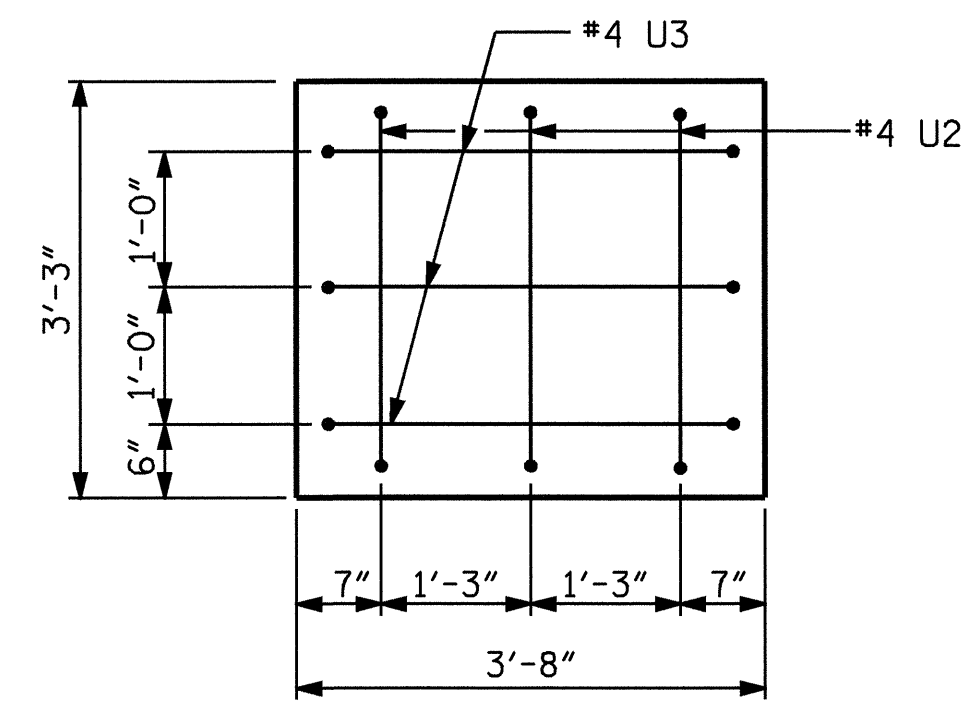


SECTION B-B



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

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



END VIEW
(TYP. EA. END)

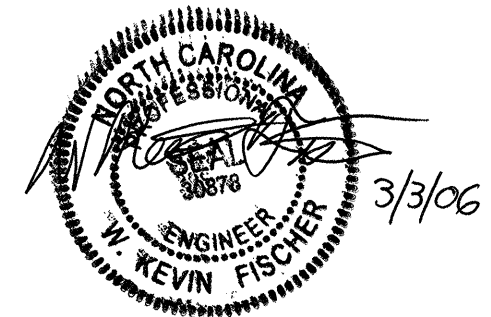
BILL OF MATERIAL					
BENT 1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	5	11	46'-10"	1244	
B2	7	11	STR 43'-8"	1624	
B3	2	5	STR 43'-8"	91	
B4	5	4	STR 22'-4"	75	
B5	5	4	STR 3'-4"	11	
M1	48	11	STR 21'-0"	5356	
S1	68	5	3	10'-0"	709
U1	43	4	4	6'-4"	182
U2	6	4	4	5'-9"	23
U3	6	4	4	6'-2"	25
V1	48	11	2	21'-0"	5356
REINFORCING STEEL		LBS.		14696	
SP-1	3	*	5	238'-0"	745
SP-2	3	**	5	601'-1"	1205
SPIRAL COLUMN REINFORCING STEEL		LBS.		1950	
CLASS 'A' CONCRETE		CU. YD.		13.6	
POUR #2 (COLUMNS)		CU. YD.		20.1	
POUR #3 (BENT CAP)		CU. YD.		33.7	
TOTAL:		CU. YD.			
DRILLED PIER QUANTITIES					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS)		C.Y.		11.8	
3'-6" Ø DRILLED PIERS IN SOIL, LIN. FT.		=		12.0	
3'-6" Ø DRILLED PIERS NOT IN SOIL, LIN. FT.		=		21.0	
3'-6" Ø PERMANENT STEEL CASING, LIN. FT.		=		12.0	
CSL TUBES, LIN. FT.		=		162.0	

PROJECT NO. B-3509
ROCKINGHAM COUNTY
STATION: 15+67.50 -L-

SHEET 2 OF 2

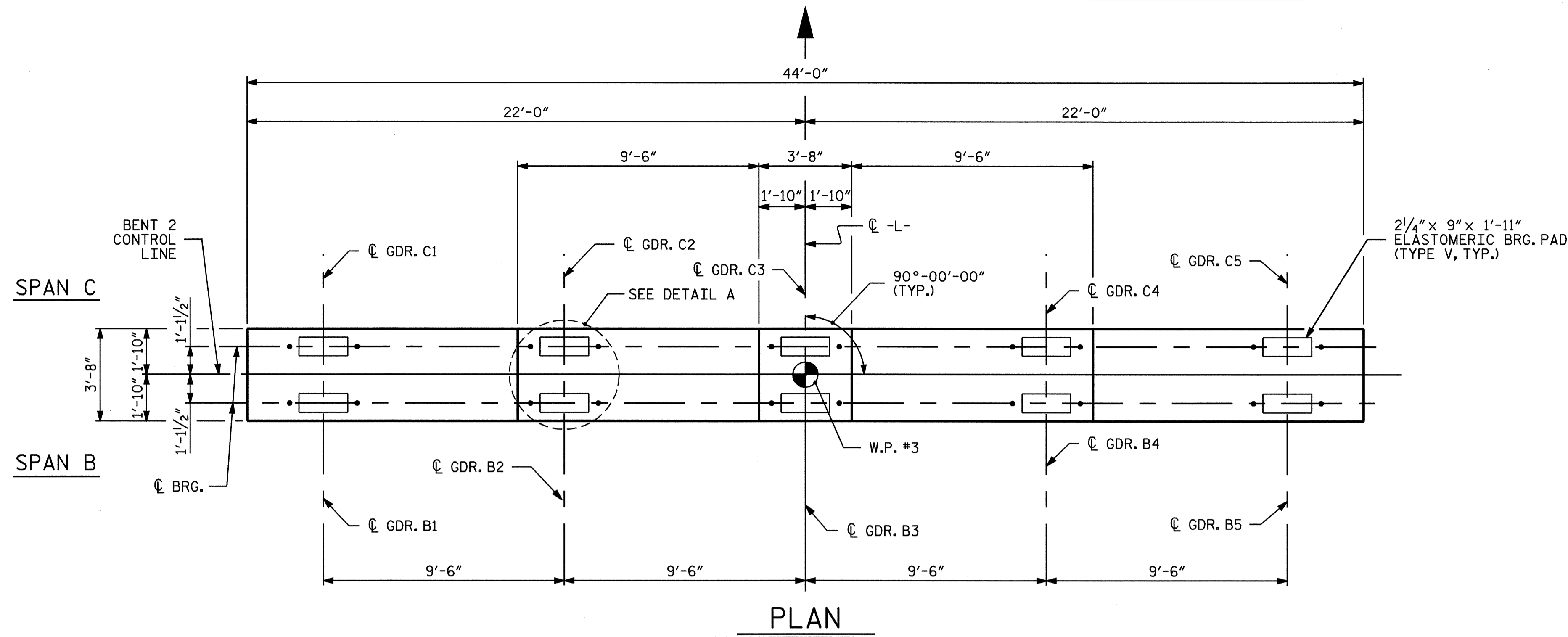
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1

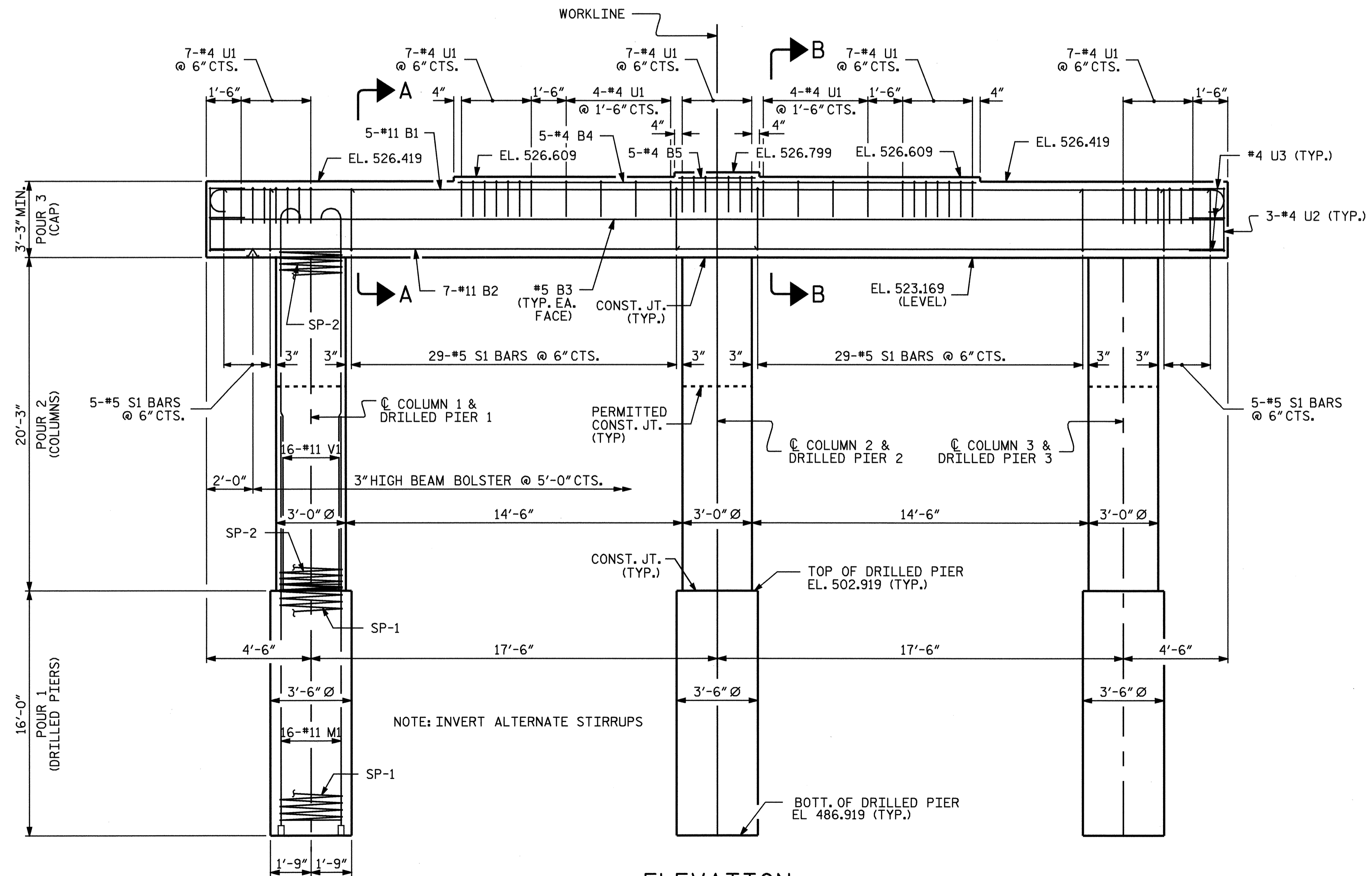


REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 53

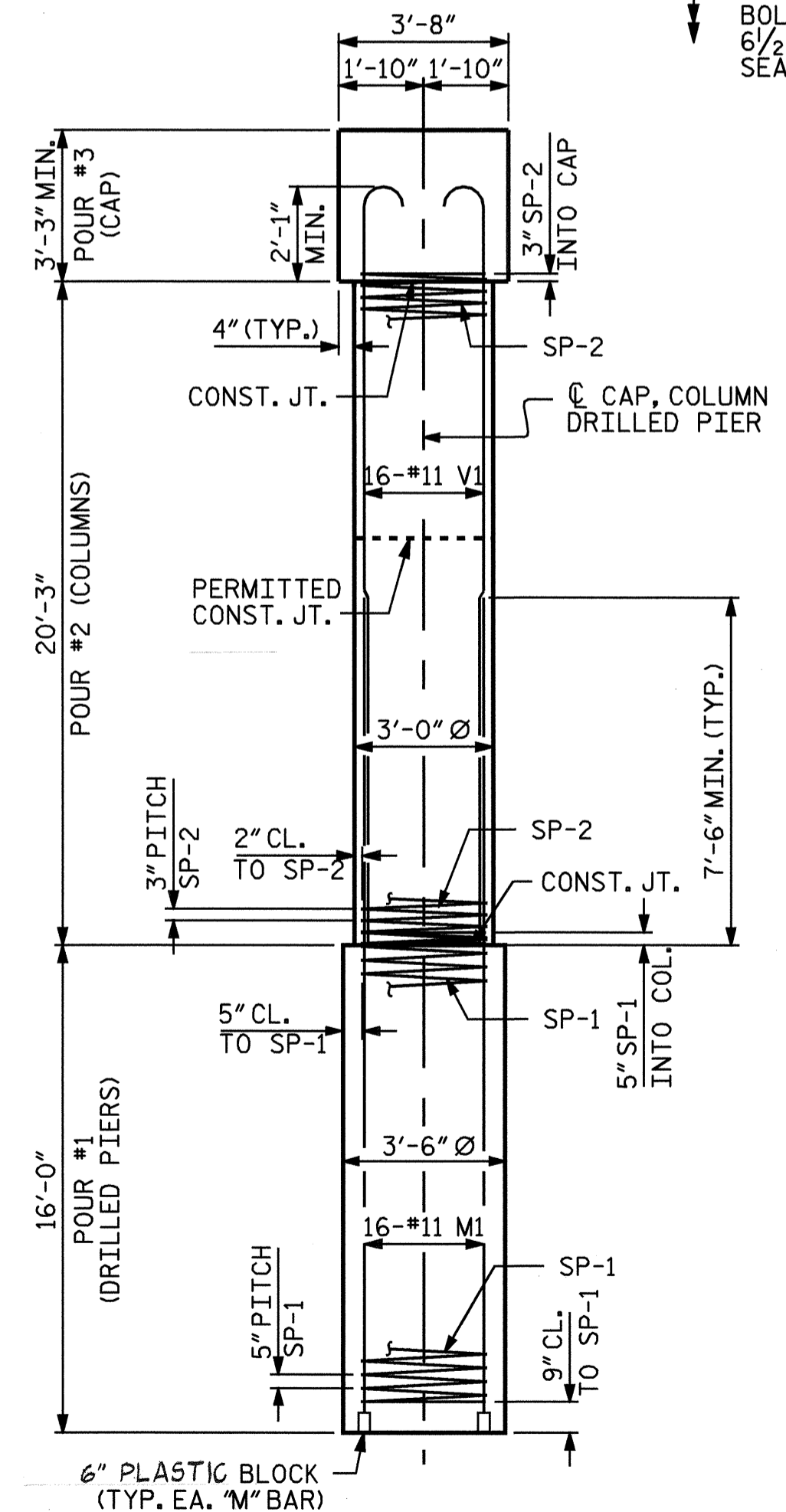


PLAN



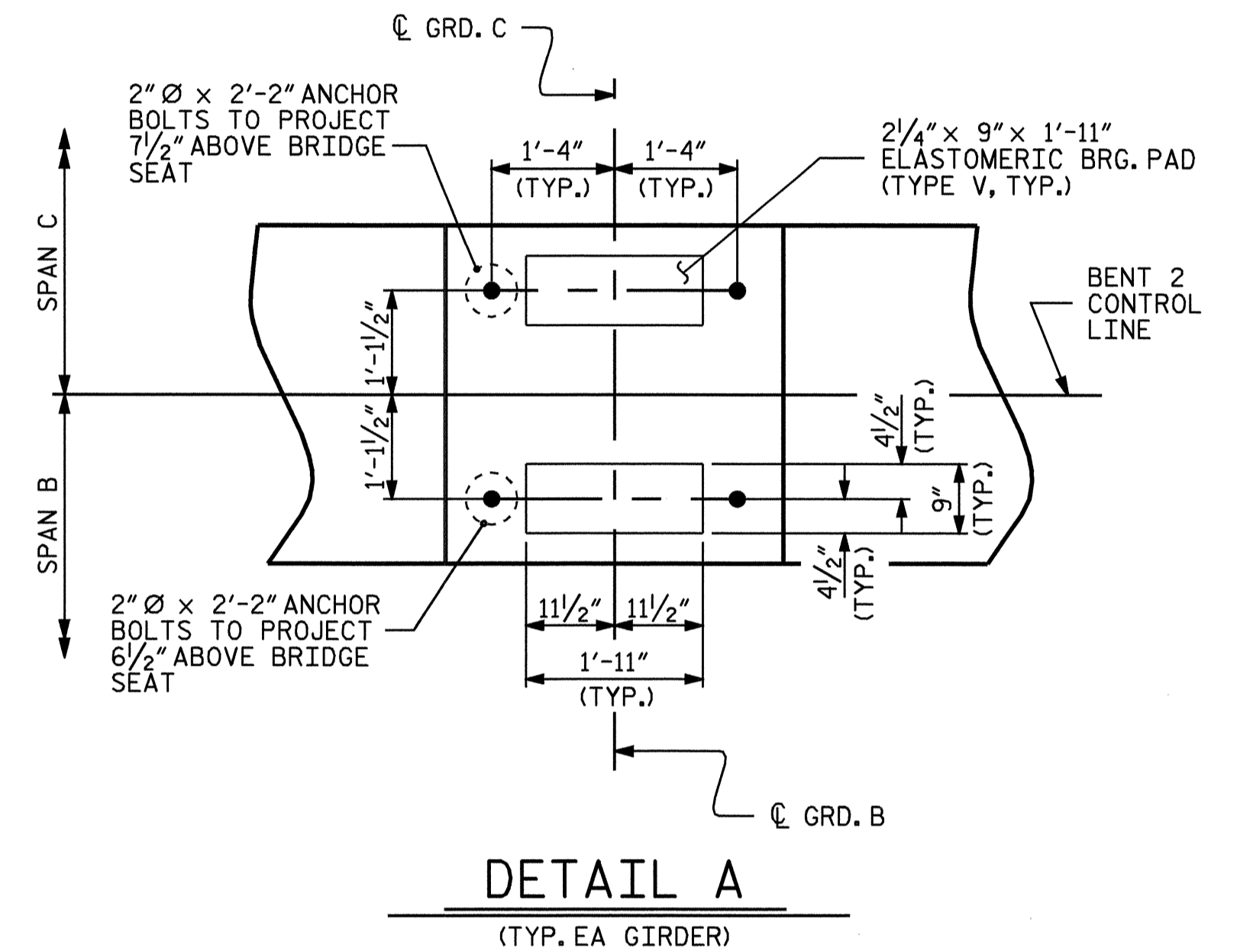
ELEVATION

COLUMN AND DRILLED PIER REINFORCING STEEL TYPICAL FOR ALL COLUMNS AND DRILLED PIERS.



END ELEVATION

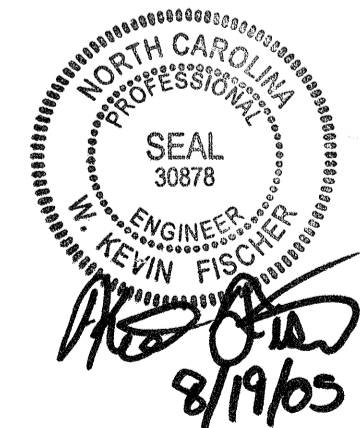
NOTES:
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 THE CONTRACTOR SHALL ALIGN THE "V" & "M" BARS AS SHOWN IN THE PLAN OF DRILLED PIERS AND COLUMNS.
 ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR REINFORCING STEEL AND SPIRAL COLUMN REINFORCING STEEL.
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIER IS DETAILED WITH 3'-0" OF EXTRA LENGTH.
 FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.
 IT IS ANTICIPATED THAT THE FOOTINGS FROM THE EXISTING BRIDGE WILL NOT CONFLICT WITH THE PROPOSED DRILLED PIERS. HOWEVER, SHOULD THERE BE A CONFLICT AND IT IS NECESSARY TO GO THRU THE EXISTING FOOTINGS, FOR THAT PORTION OF DRILLED PIER, THE CONTRACTOR WILL BE PAID FOR THE PRICE OF DRILLED PIER NOT IN SOIL.



DETAIL A
(TYP. EA GIRDER)

PROJECT NO. B-3509
 ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

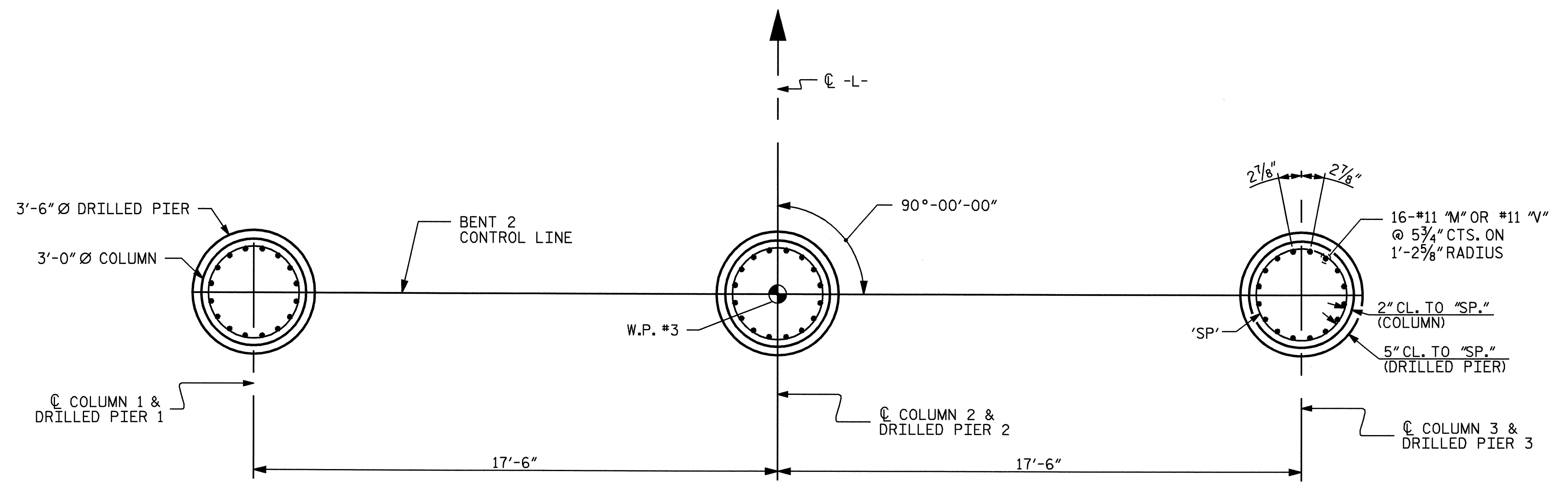
SHEET 1 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 2

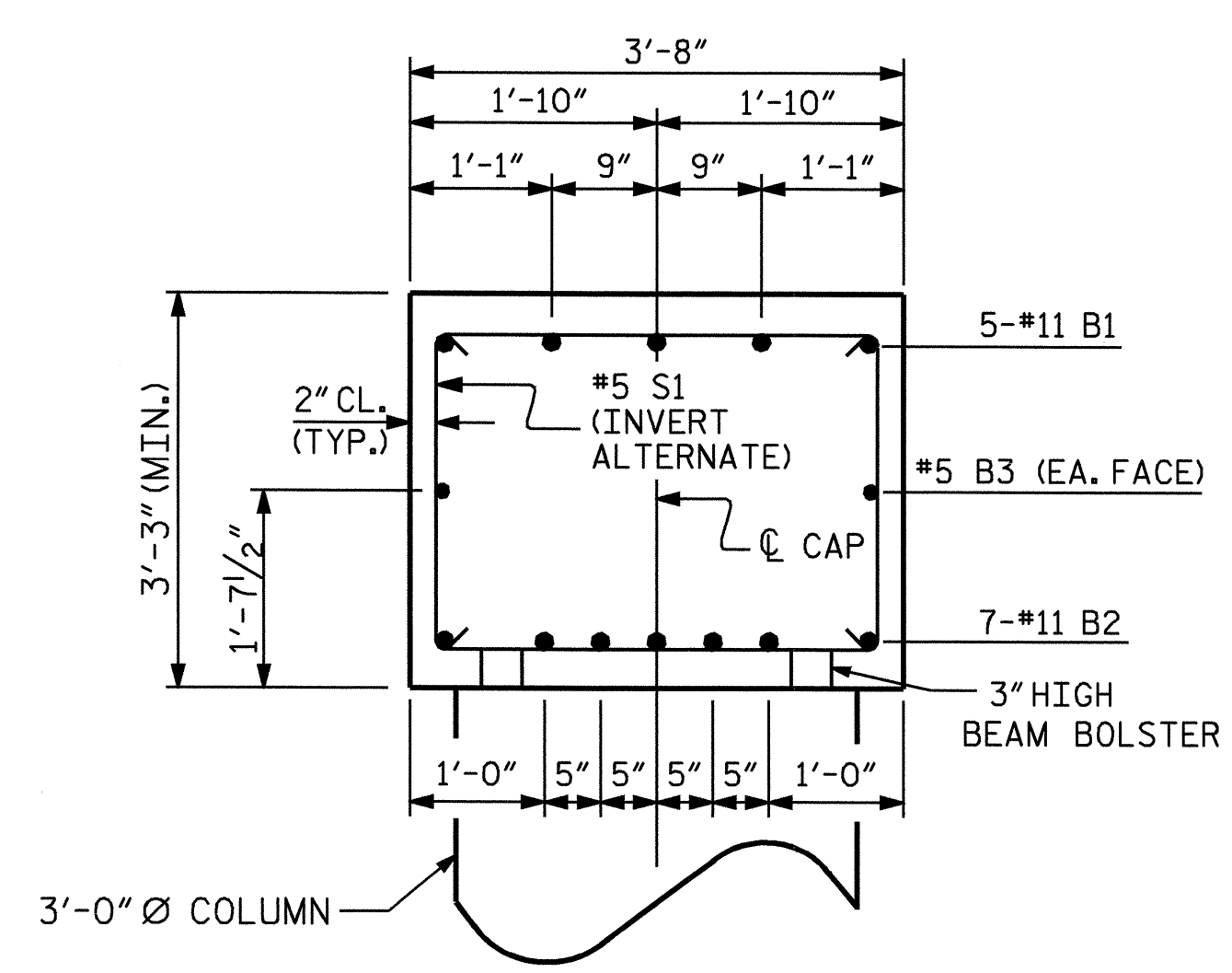
DRAWN BY: W.K. FISCHER DATE: 8/13/04
 CHECKED BY: N.O. TRAN DATE: 9/19/04

REVISIONS						SHEET NO. S-39
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 53
2			4			

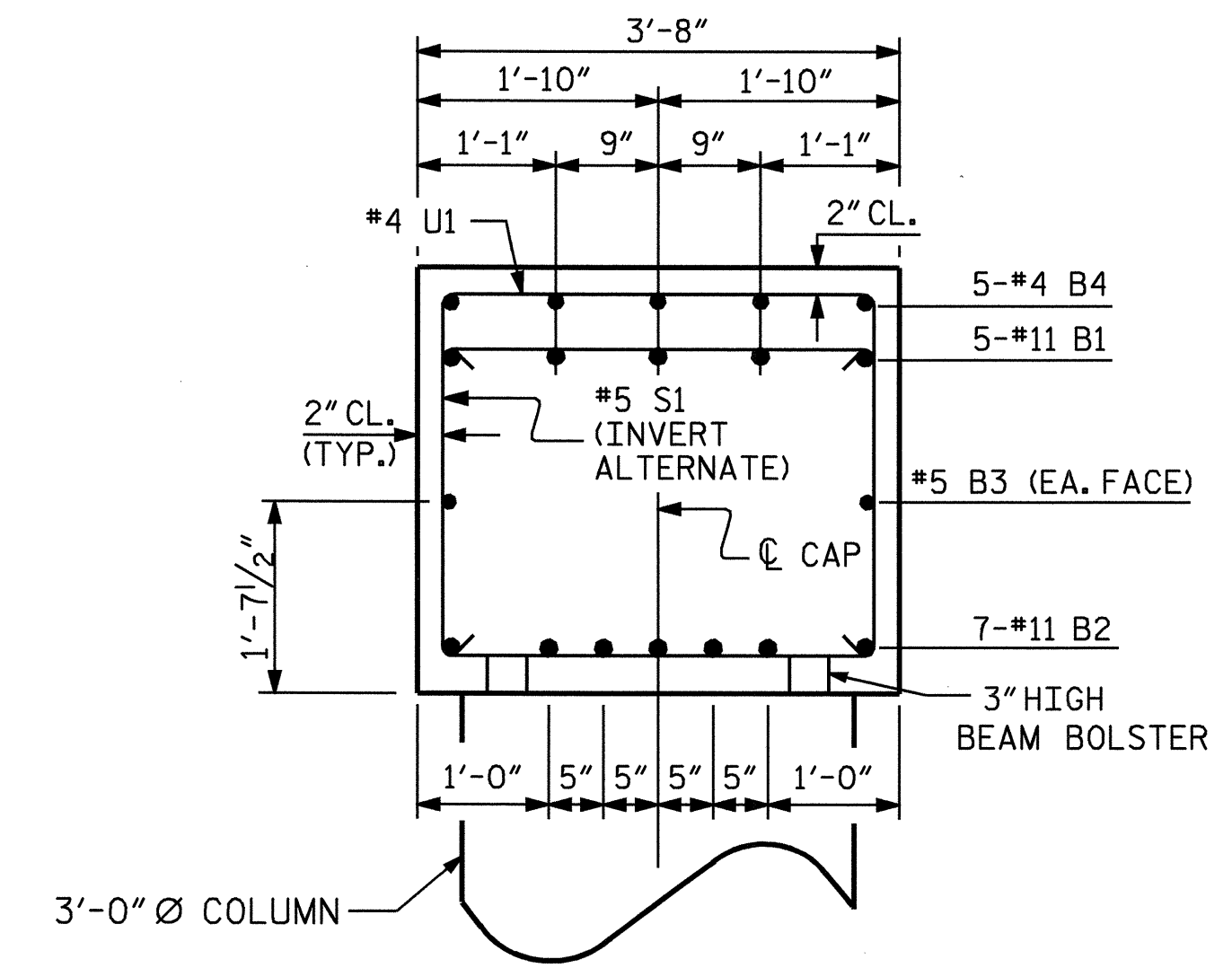


PLAN OF COLUMNS AND DRILLED PIERS

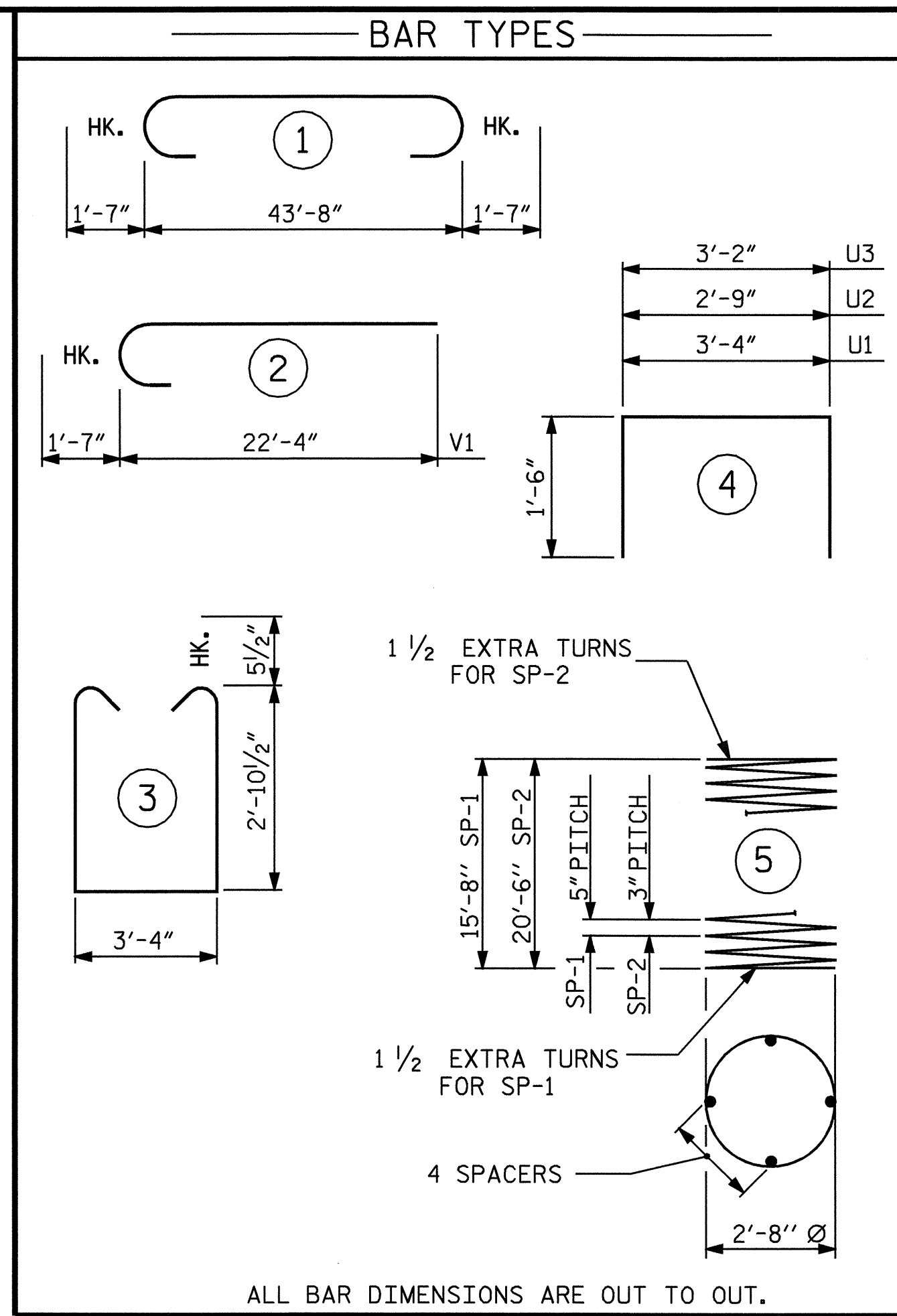
(ALL DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR ALL COLUMNS AND DRILLED PIERS)



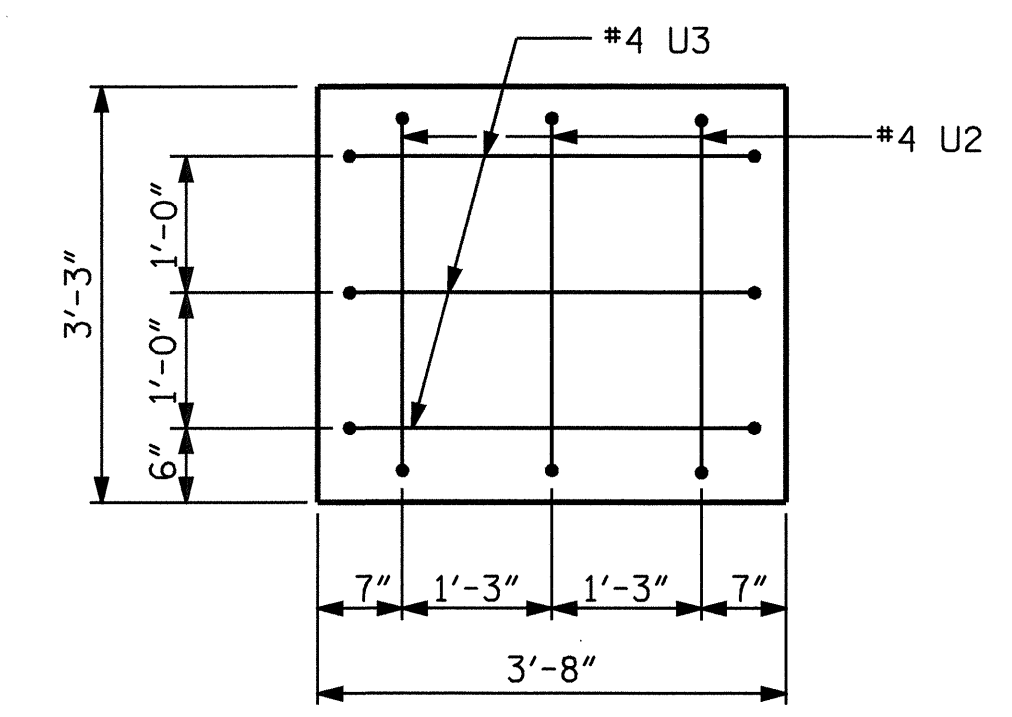
SECTION A-A



SECTION B-B



ALL BAR DIMENSIONS ARE OUT TO OUT.
* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.
* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.



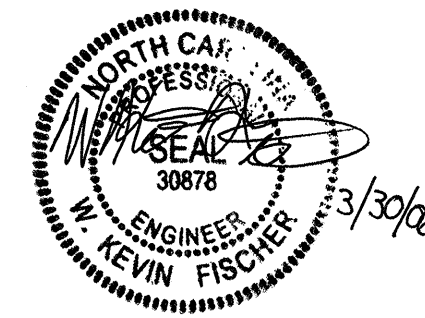
END VIEW

BILL OF MATERIAL					
BENT 2					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	5	11	1	46'-10"	1244
B2	7	11	STR	43'-8"	1624
B3	2	5	STR	43'-8"	91
B4	5	4	STR	22'-4"	75
B5	5	4	STR	3'-4"	11
M1	48	11	STR	26'-0"	6631
S1	68	5	3	10'-0"	709
U1	43	4	4	6'-4"	182
U2	6	4	4	5'-9"	23
U3	6	4	4	6'-2"	25
V1	48	11	2	23'-11"	6099
REINFORCING STEEL				LBS.	16714
SP-1	3	*	5	336'-6"	1053
SP-2	3	**	5	700'-0"	1403
SPIRAL COLUMN REINFORCING STEEL				LBS.	2456
CLASS 'A' CONCRETE POUR #2 (COLUMNS)				CU. YD.	15.9
POUR #3 (BENT CAP)				CU. YD.	20.1
TOTAL:				CU. YD.	36.0
DRILLED PIER QUANTITIES					
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)				C.Y.	17.1
3'-6" Ø DRILLED PIERS IN SOIL, LIN. FT.				=	17.0
3'-6" Ø DRILLED PIERS NOT IN SOIL, LIN. FT.				=	31.0
3'-6" Ø PERMANENT STEEL CASING, LIN. FT.				=	15.0
CSL TUBES, LIN. FT.				=	222.0

PROJECT NO. B-3509
ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-
 SHEET 2 OF 2

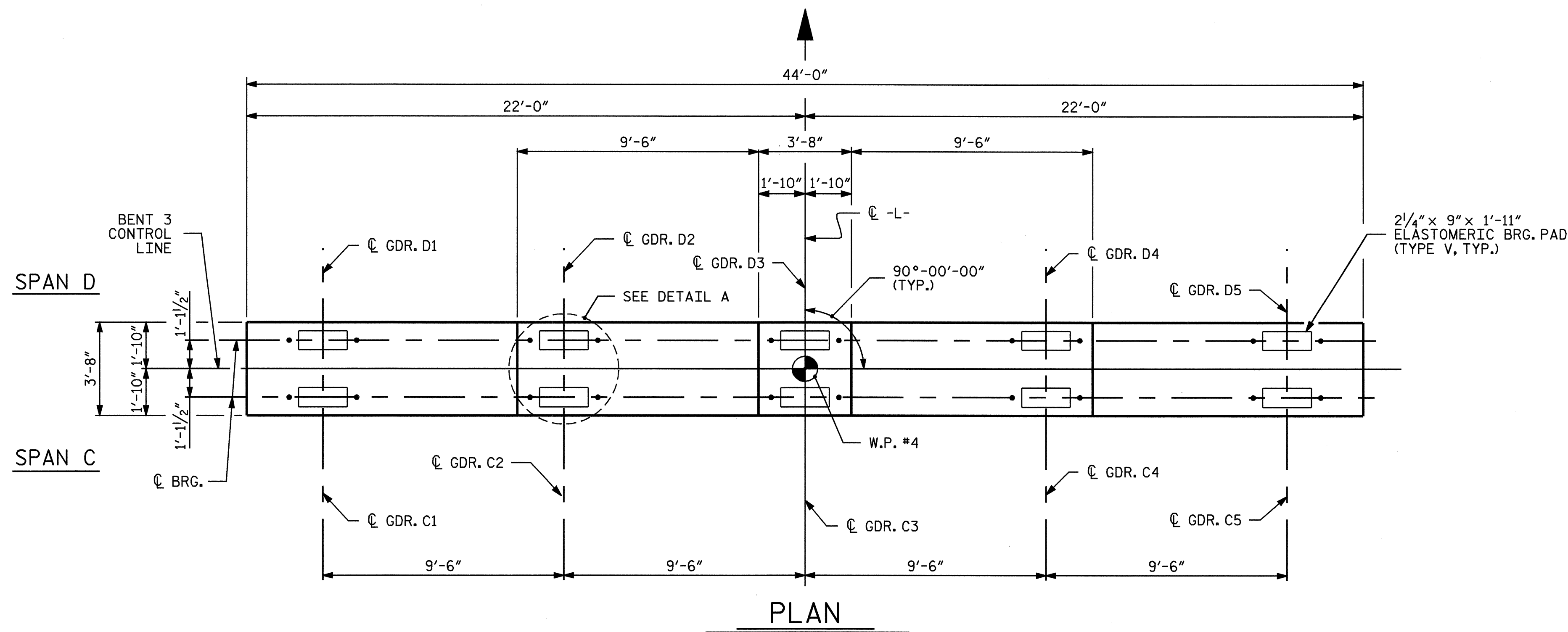
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT 2

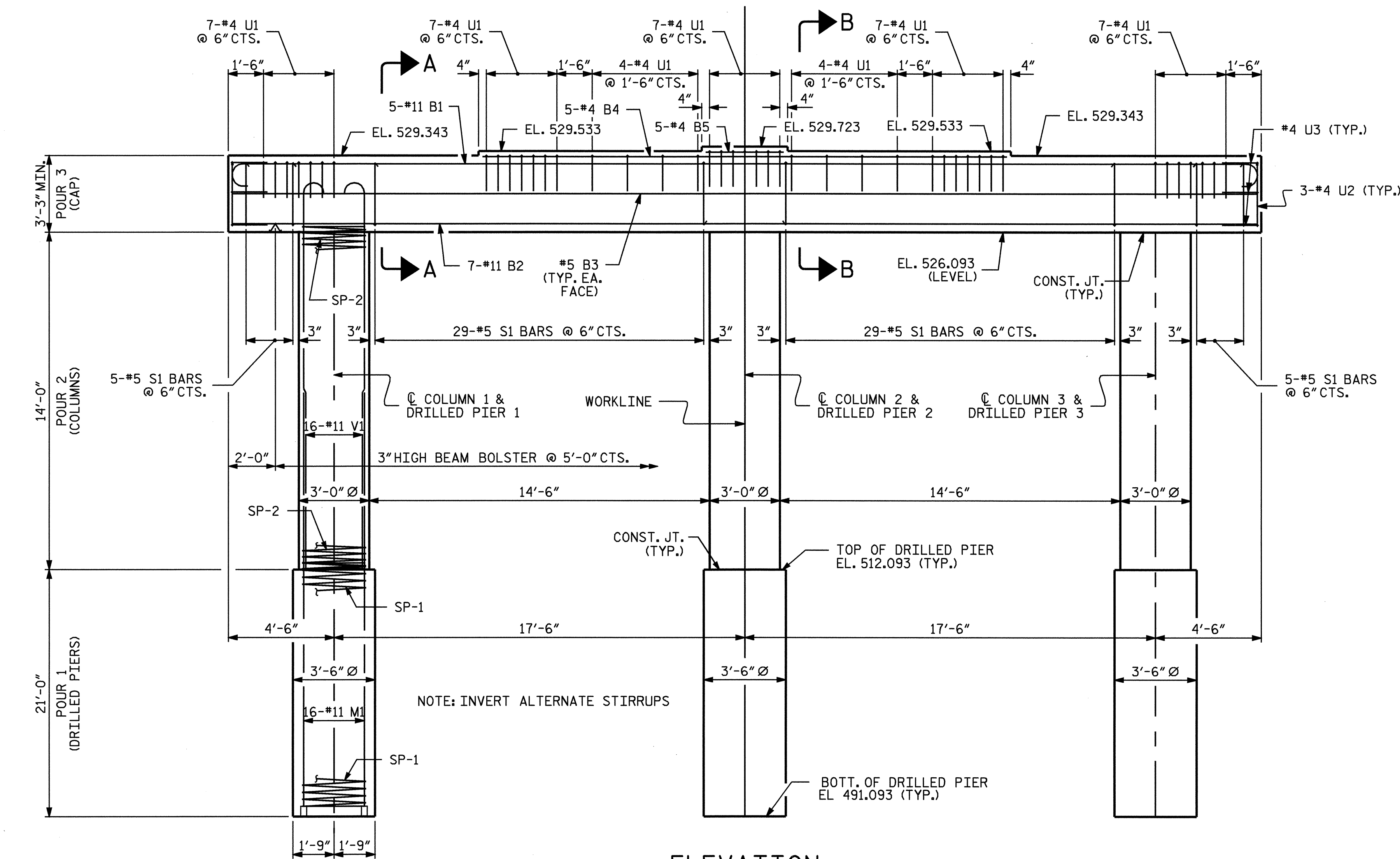


DRAWN BY: W.K. FISCHER DATE: 8/17/04
 CHECKED BY: N.Q. TRAN DATE: 9/17/04

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40	
1			3			TOTAL SHEETS	
2			4			53	

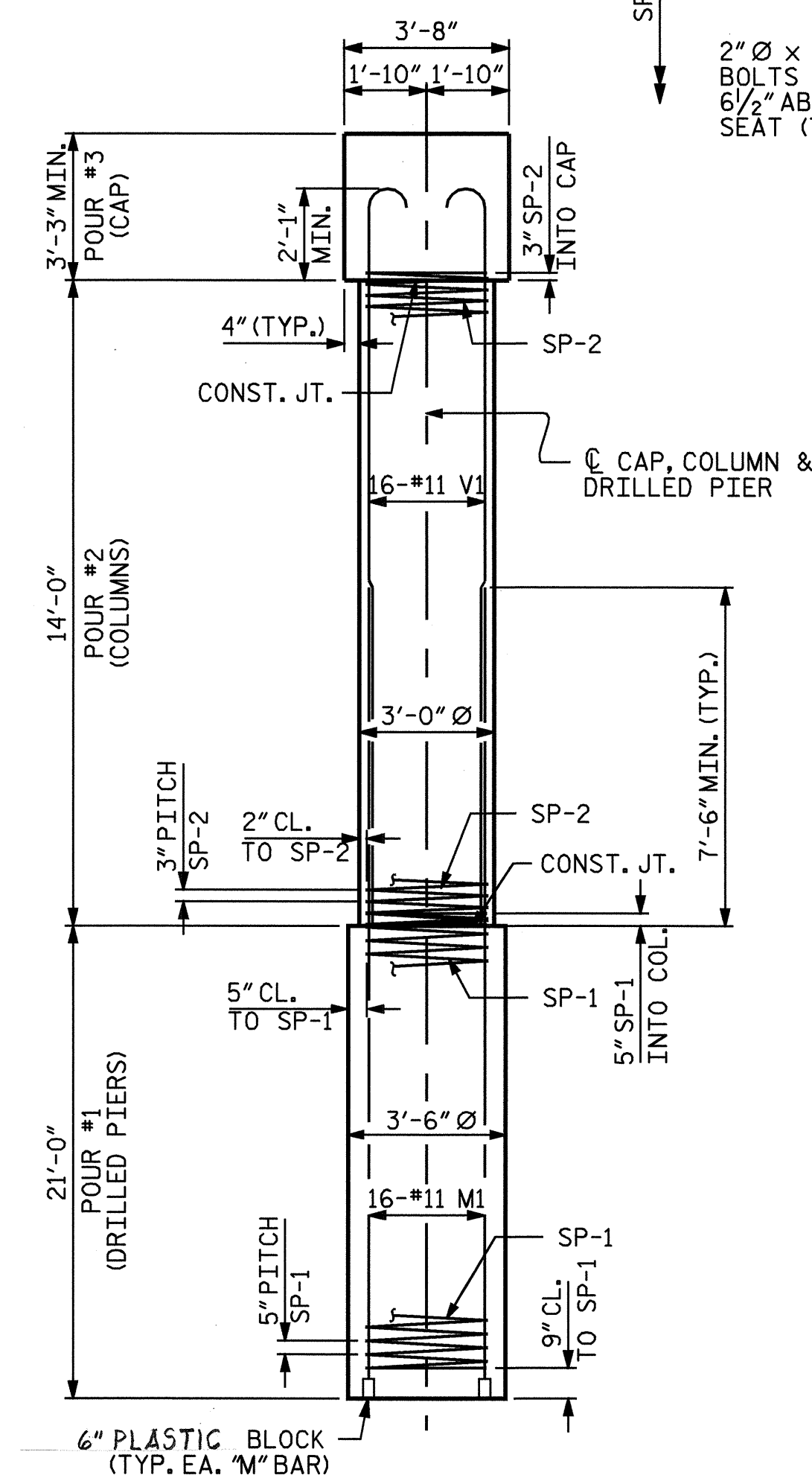


PLAN



ELEVATION

COLUMN AND DRILLED PIER REINFORCING STEEL TYPICAL FOR ALL COLUMNS AND DRILLED PIERS.



END ELEVATION

NOTES:

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

THE CONTRACTOR SHALL ALIGN THE "V" & "M" BARS AS SHOWN IN THE PLAN OF DRILLED PIERS AND COLUMNS.

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

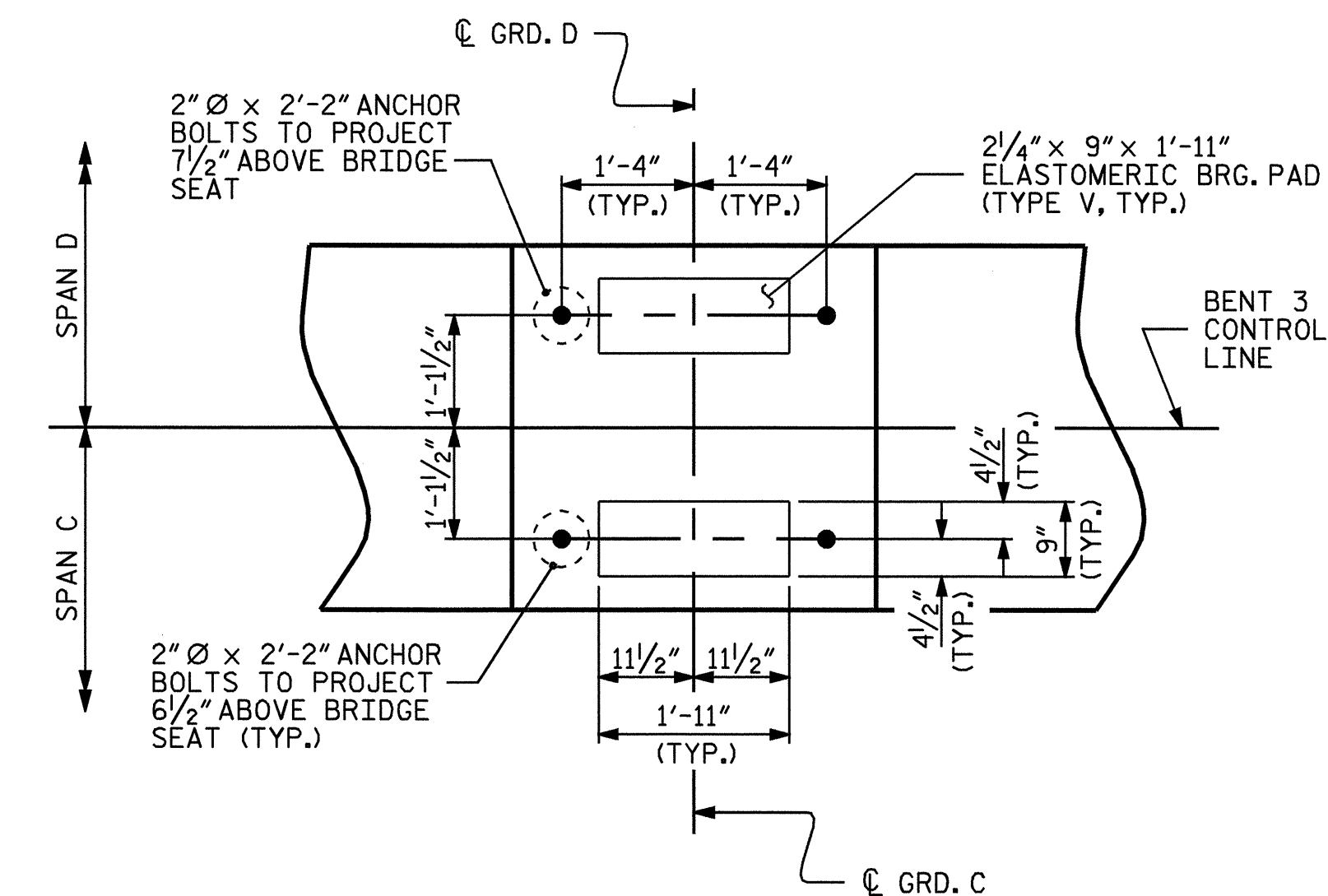
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIER IS DETAILED WITH 3'-0" OF EXTRA LENGTH.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

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.

IT IS ANTICIPATED THAT THE FOOTINGS FROM THE EXISTING BRIDGE WILL NOT CONFLICT WITH THE PROPOSED DRILLED PIERS. HOWEVER, SHOULD THERE BE A CONFLICT AND IT IS NECESSARY TO GO THRU THE EXISTING FOOTINGS, FOR THAT PORTION OF DRILLED PIER, THE CONTRACTOR WILL BE PAID FOR THE PRICE OF DRILLED PIER NOT IN SOIL.



DETAIL A
(TYP. EA GIRDER)

PROJECT NO. B-3509
 ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

SHEET 1 OF 2

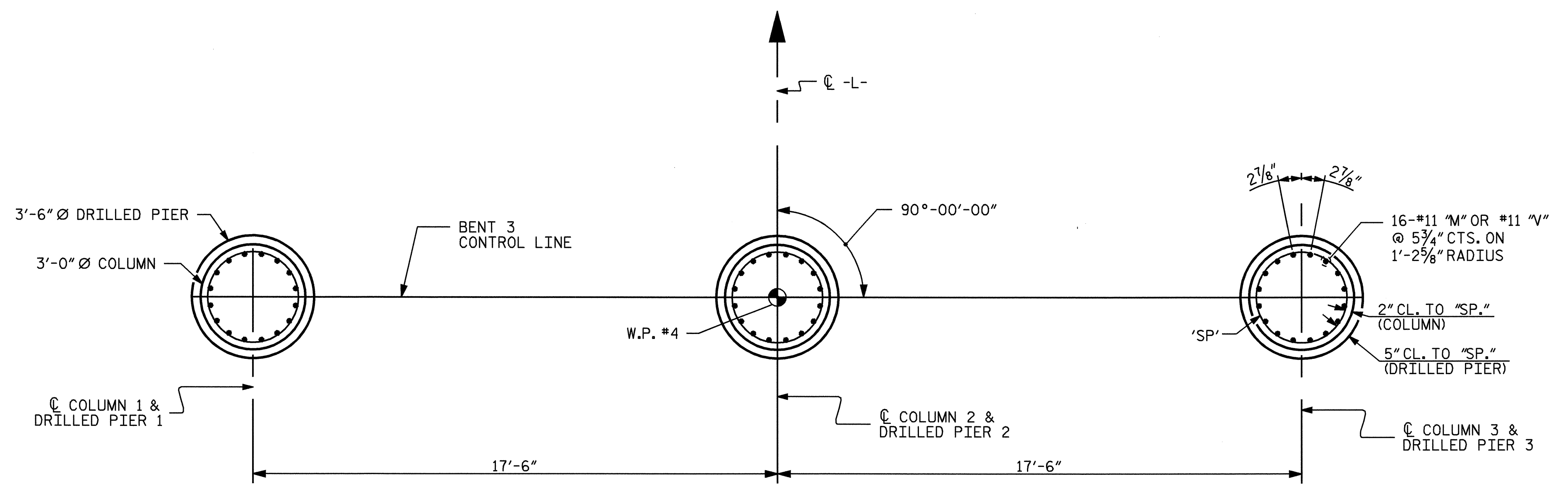


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT 3

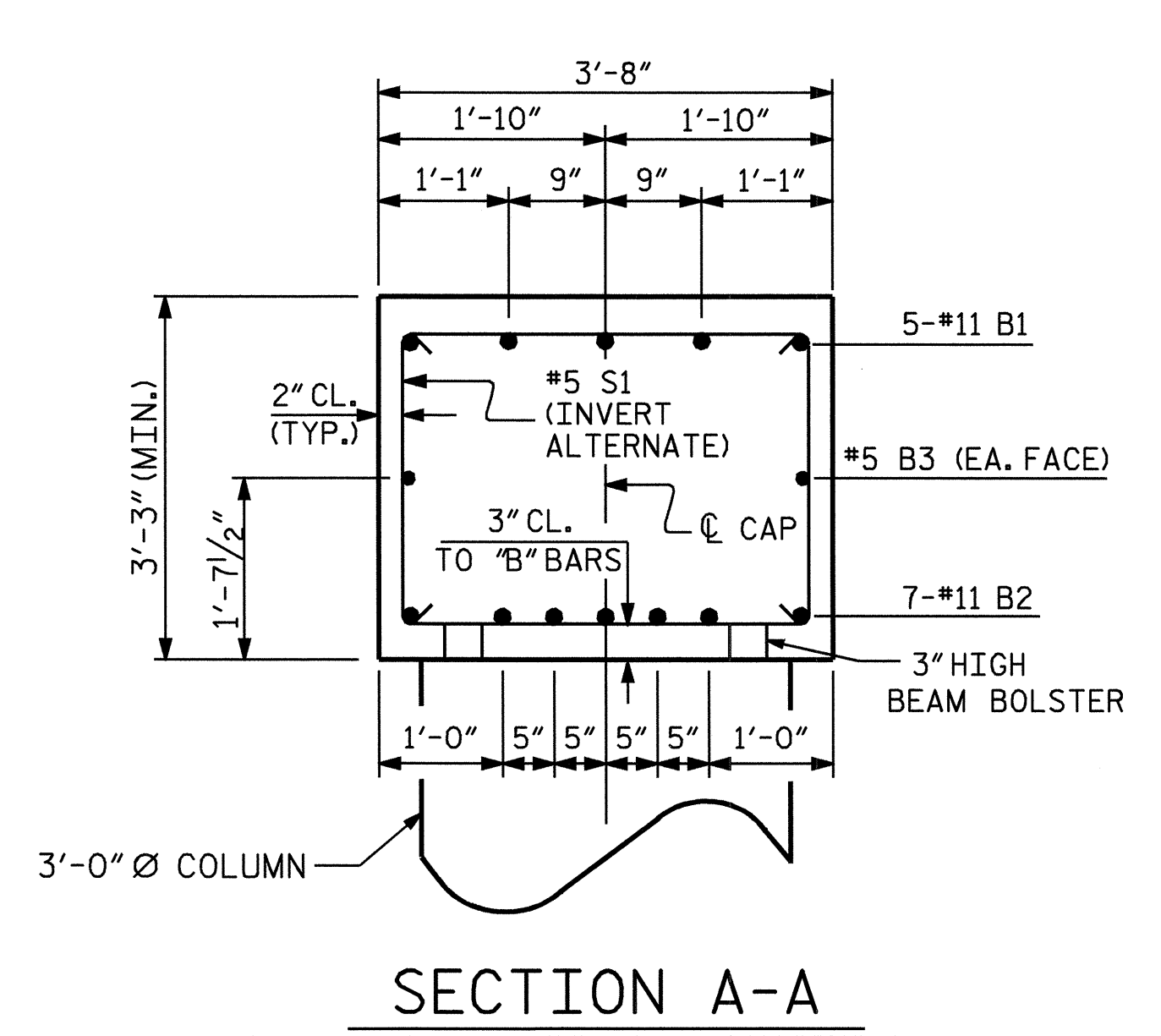
DRAWN BY: W.K. FISCHER DATE: 8/13/04
 CHECKED BY: N.O. TRAN DATE: 9/19/04

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			53

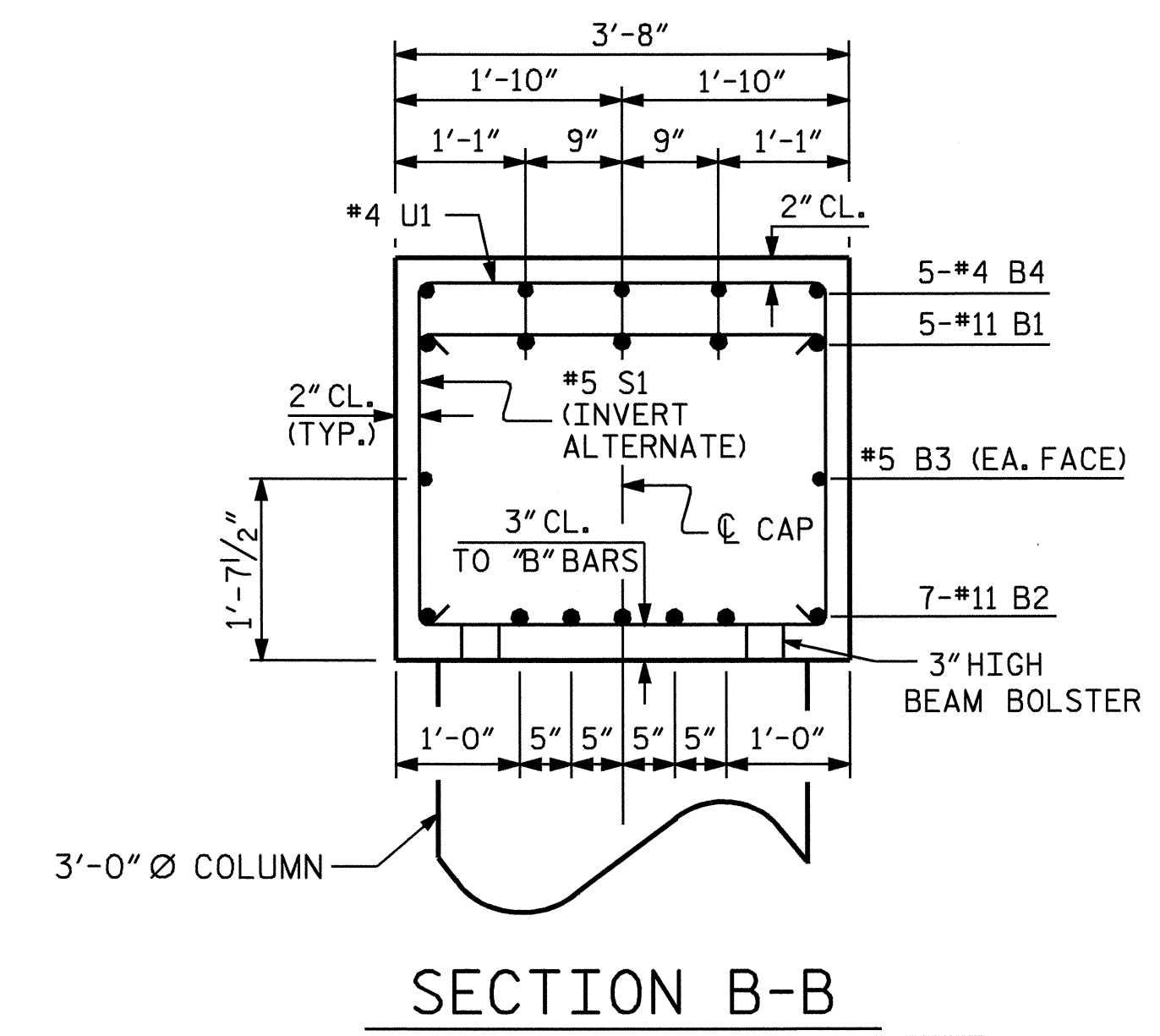


PLAN OF COLUMNS AND DRILLED PIERS

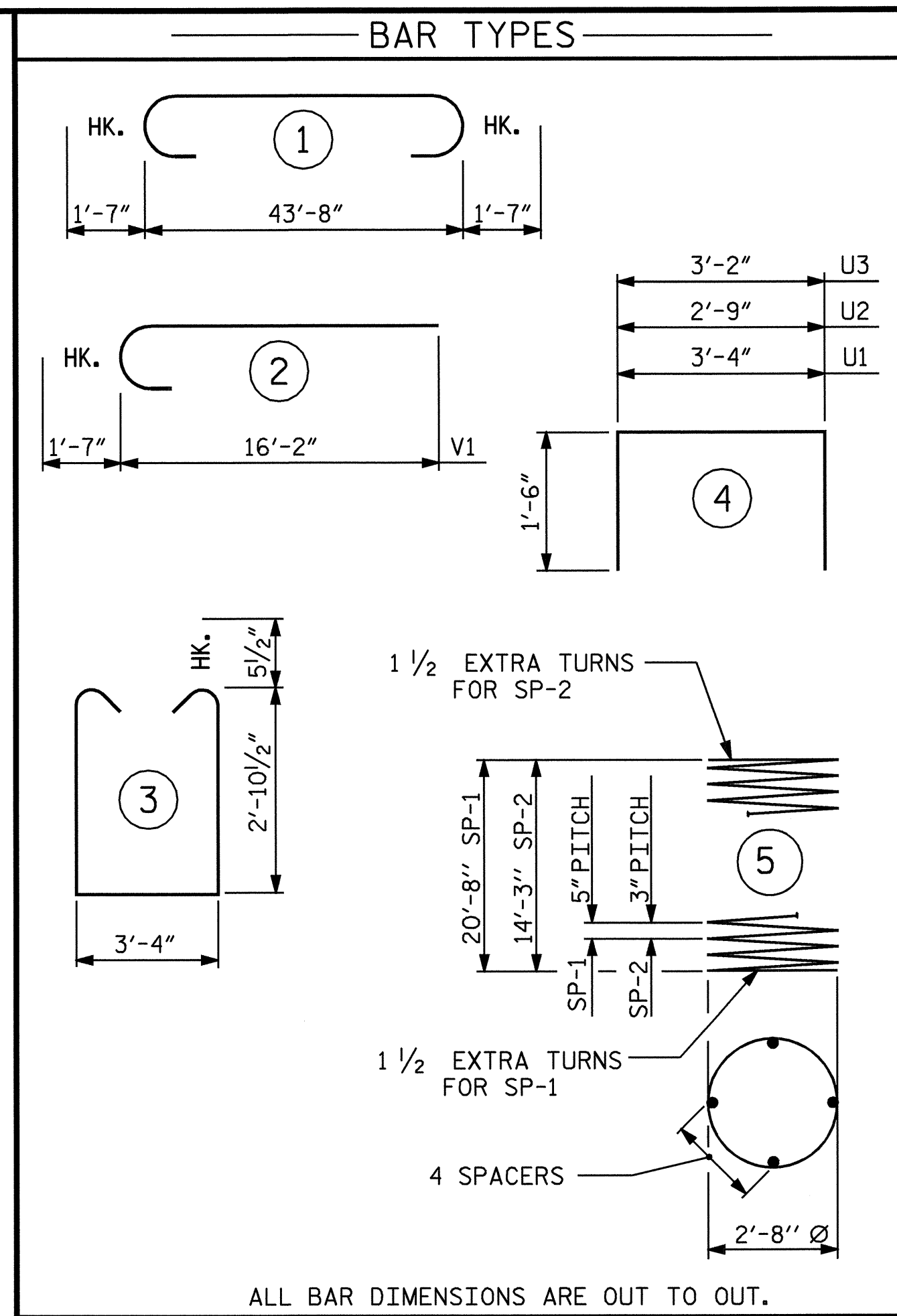
(ALL DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR ALL COLUMNS AND DRILLED PIERS)



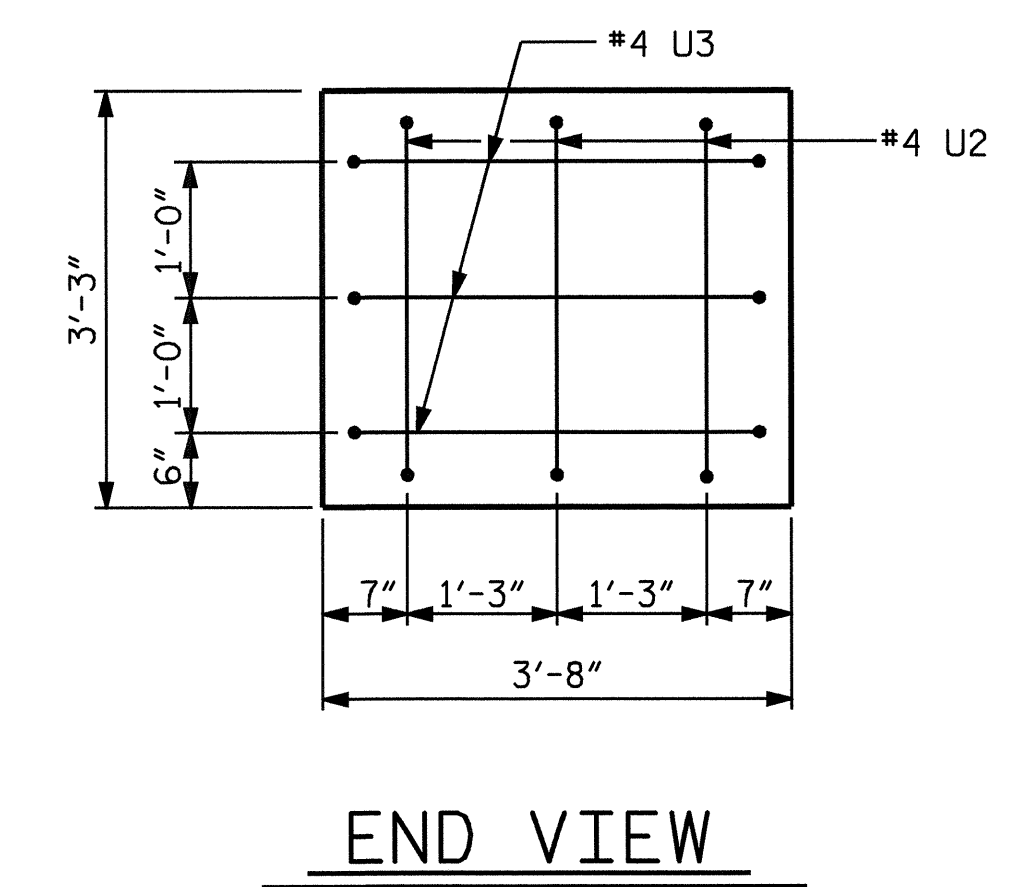
SECTION A-A



SECTION B-B

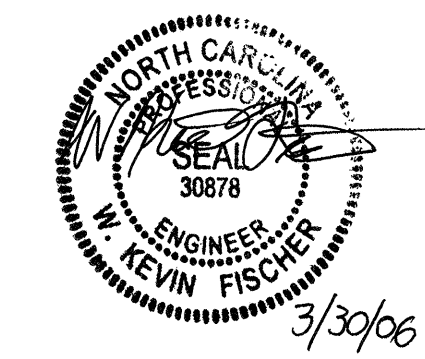


ALL BAR DIMENSIONS ARE OUT TO OUT.
* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.
* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.



END VIEW

BILL OF MATERIAL					
BENT 3					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	5	11	1	46'-10"	1244
B2	7	11	STR	43'-8"	1624
B3	2	5	STR	43'-8"	91
B4	5	4	STR	22'-4"	75
B5	5	4	STR	3'-4"	11
M1	48	11	STR	31'-0"	7906
S1	68	5	3	10'-0"	709
U1	43	4	4	6'-4"	182
U2	6	4	4	5'-9"	23
U3	6	4	4	6'-2"	25
V1	48	11	2	17'-9"	4527
REINFORCING STEEL				LBS.	16417
SP-1	3	*	5	435'-0"	1361
SP-2	3	**	5	494'-0"	990
SPIRAL COLUMN REINFORCING STEEL				LBS.	2351
CLASS 'A' CONCRETE					
POUR #2 (COLUMNS)				CU. YD.	11.0
POUR #3 (BENT CAP)				CU. YD.	20.1
TOTAL:				CU. YD.	31.1
DRILLED PIER QUANTITIES					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS)				C.Y.	22.4
3'-6" Ø DRILLED PIERS IN SOIL, LIN. FT.				=	38.0
3'-6" Ø DRILLED PIERS NOT IN SOIL, LIN. FT.				=	25.0
3'-6" Ø PERMANENT STEEL CASING, LIN. FT.				=	42.0
CSL TUBES, LIN. FT.				=	282.0



PROJECT NO. B-3509
ROCKINGHAM COUNTY
STATION: 15+67.50 -L-
SHEET 2 OF 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			53

NOTES

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

CENTER UTILITY IN BLOCKOUT AND FILL ANNULAR SPACE AROUND UTILITY PIPE WITH JOINT FILLER IN ACCORDANCE WITH STANDARD SPECIFICATION ARTICLE 1028-1.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 1/4" PER FOOT.

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

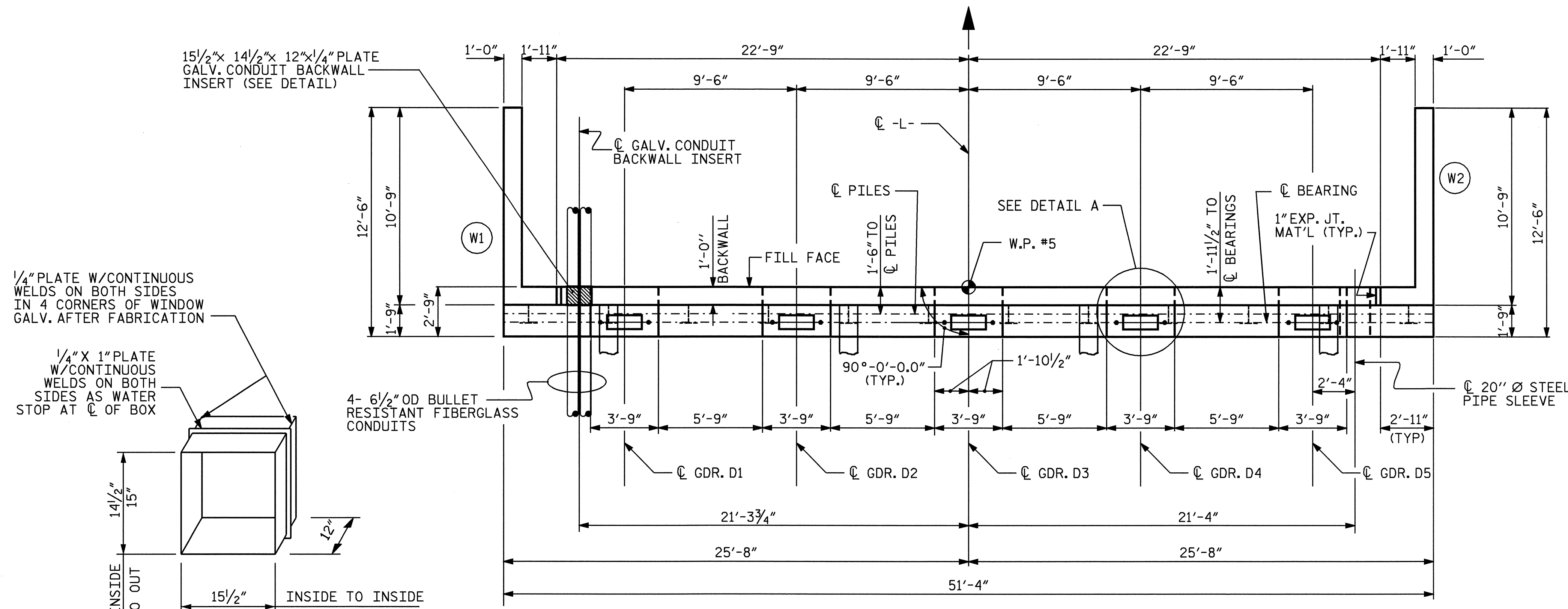
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR "TEMPORARY DRAINAGE AT END BENT" DETAIL SEE SHEET 2 OF 3.

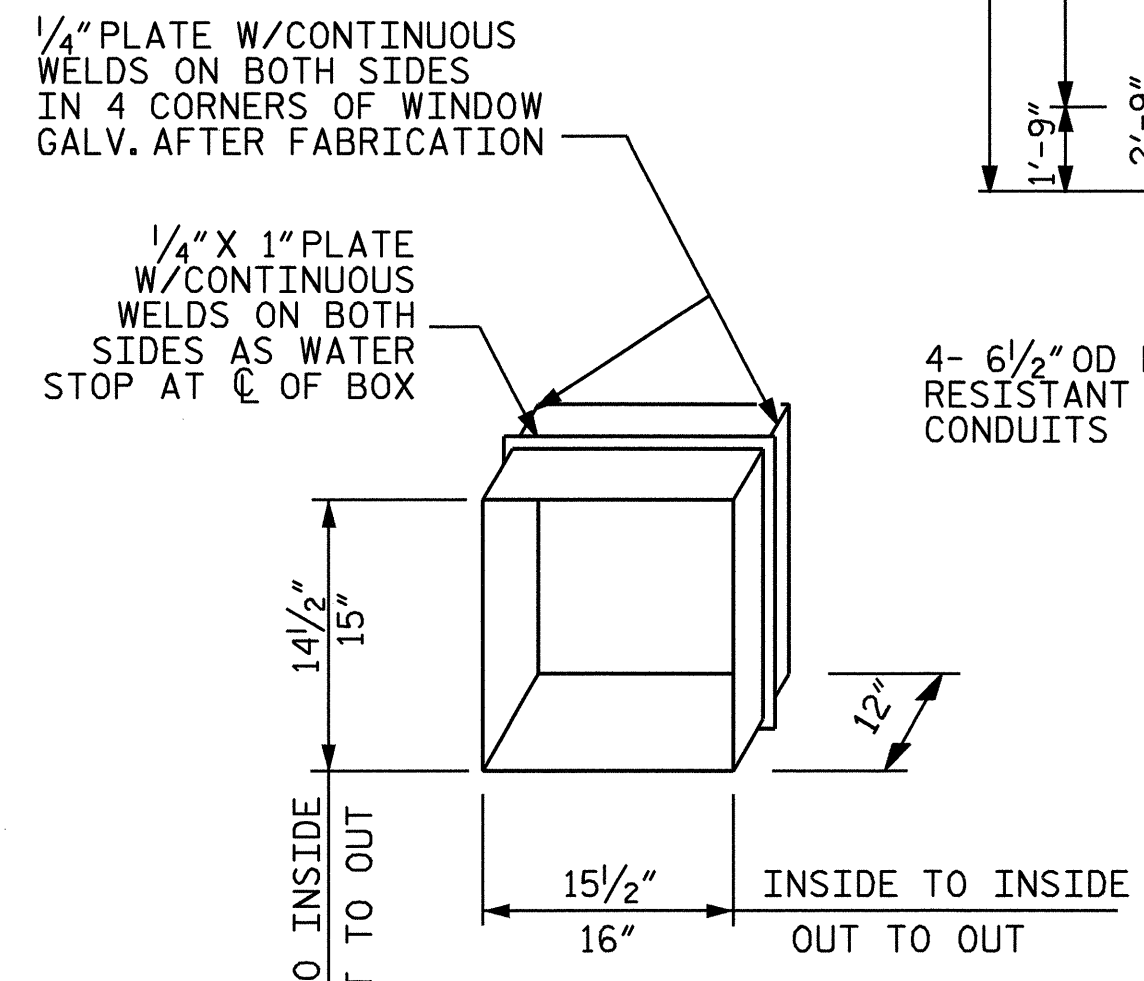
THE DIMENSIONS AND DETAILS SHOWN FOR THE STEEL PIPE SLEEVE ARE FOR THE CONTRACTOR'S BENEFIT IN PLACING THE SLEEVE AND SHOULD NOT BE CONSTRUED TO BE AN APPROVAL FOR THE ATTACHMENT OF THE UTILITY TO THE STRUCTURE.

FOR RESPONSIBILITIES FOR FURNISHING AND PLACING STEEL PIPE SLEEVES, SEE UTILITY SPECIAL PROVISIONS.

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

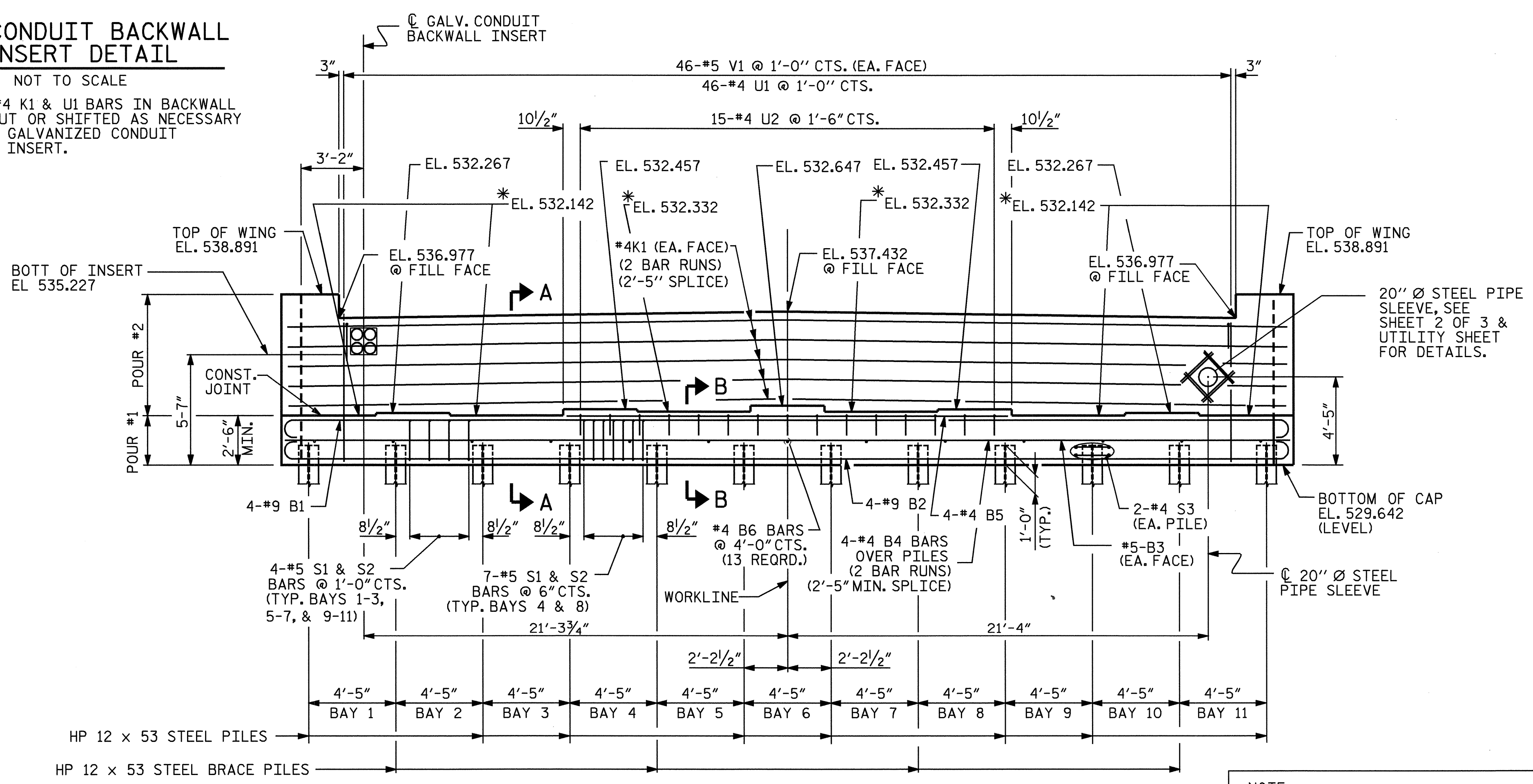


PLAN



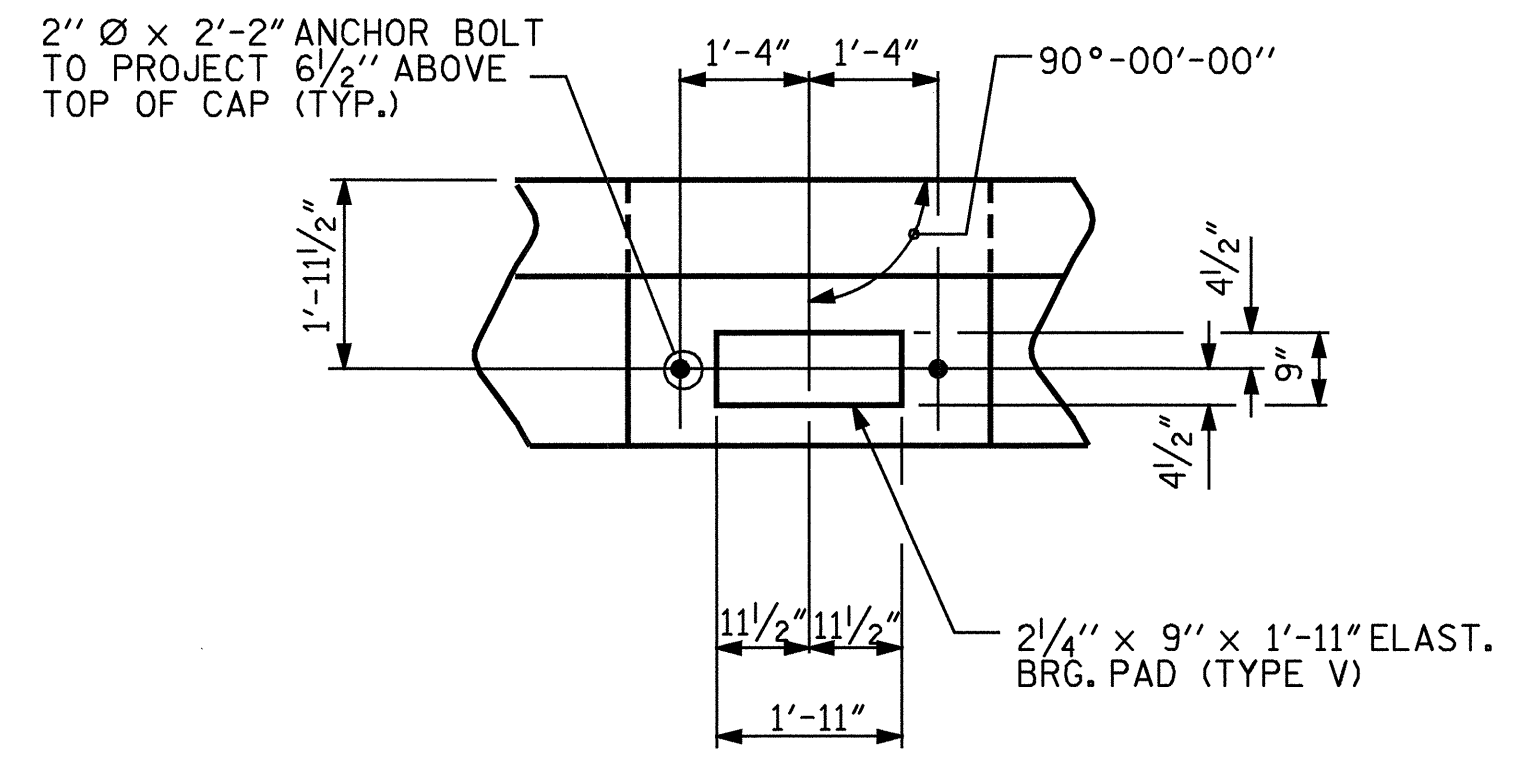
GALV CONDUIT BACKWALL INSERT DETAIL
NOT TO SCALE

#5 V1 & #4 K1 & U1 BARS IN BACKWALL MAY BE CUT OR SHIFTED AS NECESSARY TO CLEAR GALVANIZED CONDUIT BACKWALL INSERT.



ELEVATION

* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEATS, SEE SECTIONS A-A, AND B-B, SHEET 3 OF 3



DETAIL A
(TYP. EA. GIRDER)

NOTE:
20" Ø STEEL PIPE SLEEVE AND GALV. CONDUIT BACKWALL INSERT ARE TO BE FLUSH WITH BOTH SIDES OF BACK WALL. THEY ARE TO BE PLACED SO THAT OPENINGS ARE PARALLEL TO BEAMS.

PROJECT NO. B-3509
ROCKINGHAM COUNTY
STATION: 15+67.50 -L-

SHEET 1 OF 3

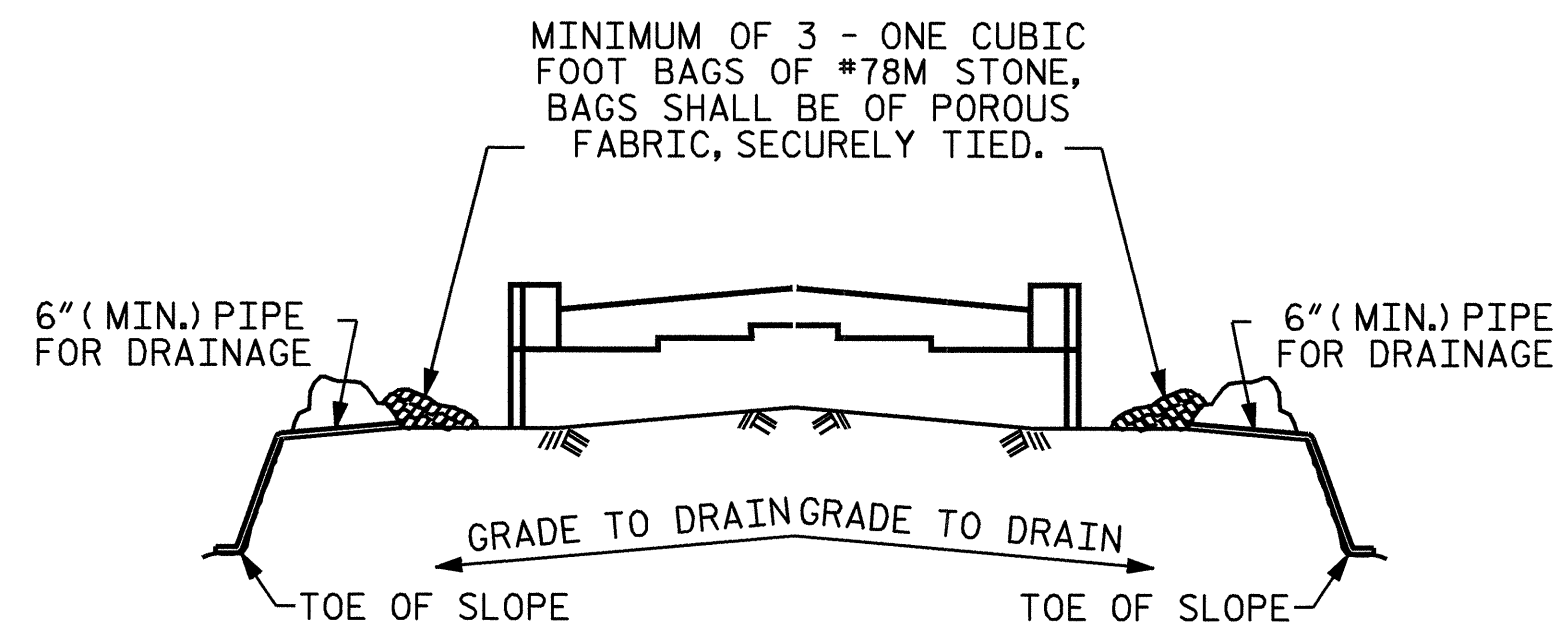
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

Professional Engineer Seal
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 16301
TING HSUNG FANG
8/19/05

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-43
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : N.Q. TRAN DATE : JUN. 04
CHECKED BY : M.A. ALLEN DATE : 7-04

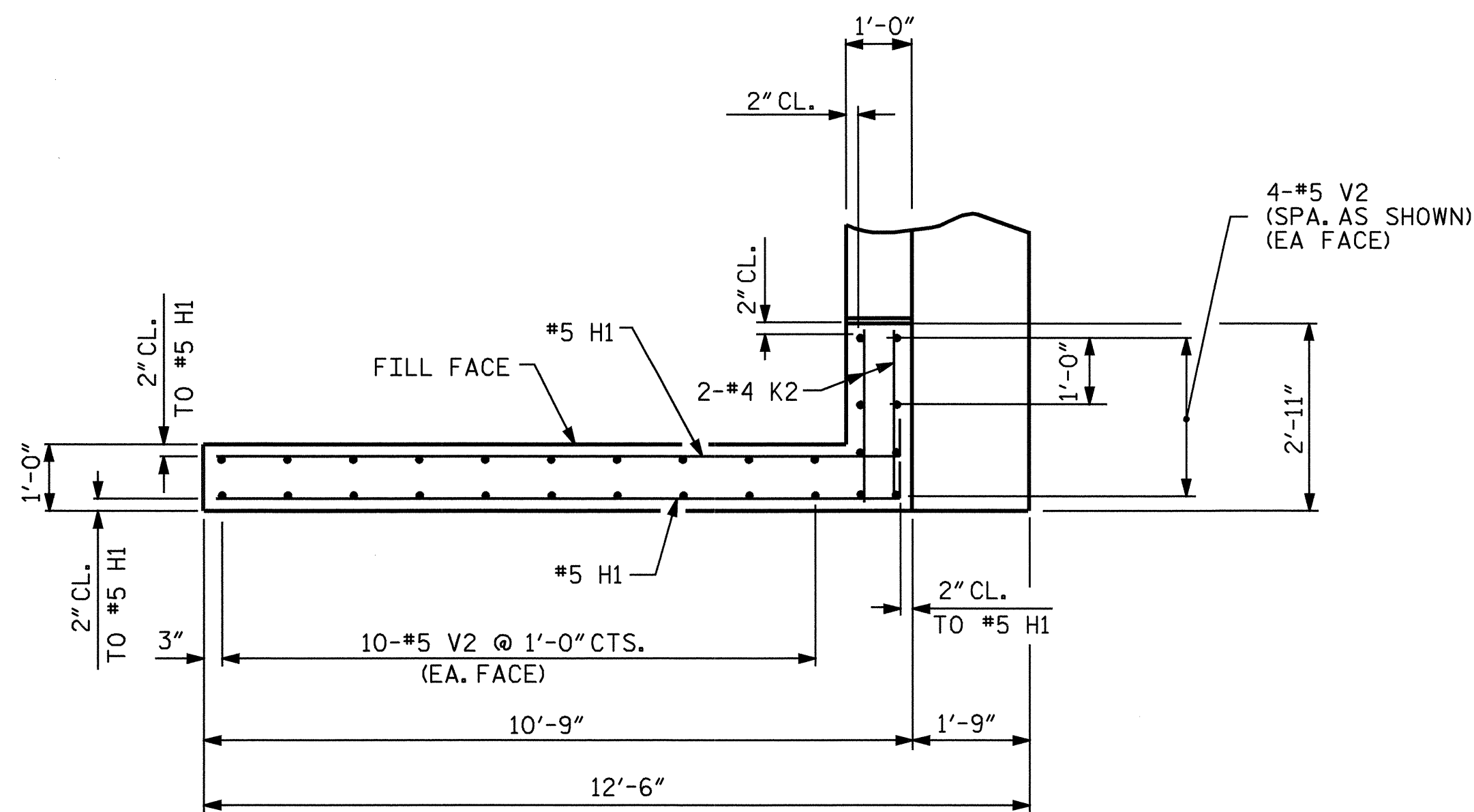


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

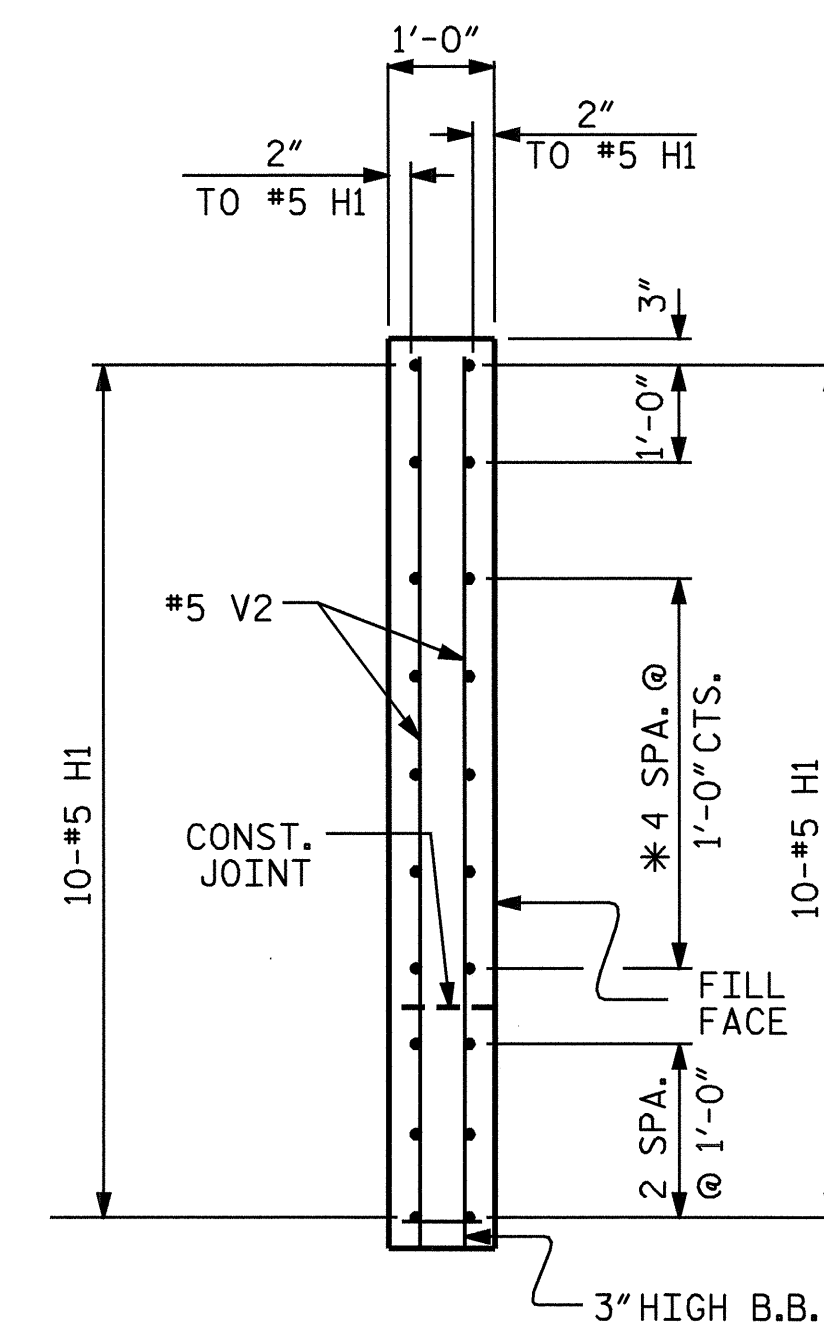
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



PLAN OF LEFT WING - W1

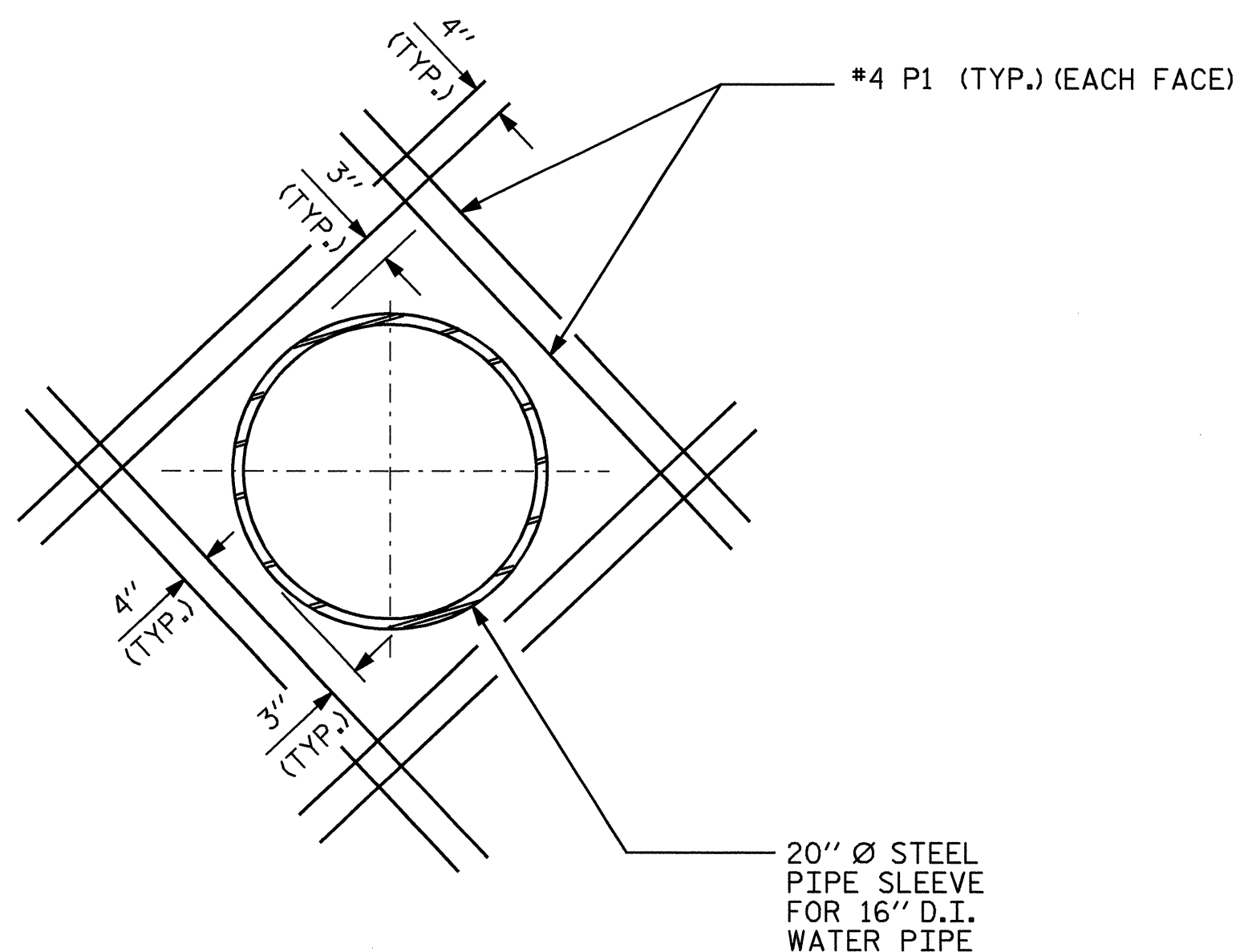
(PLAN OF RIGHT WING-W2 SIMILAR)



SECTION X-X

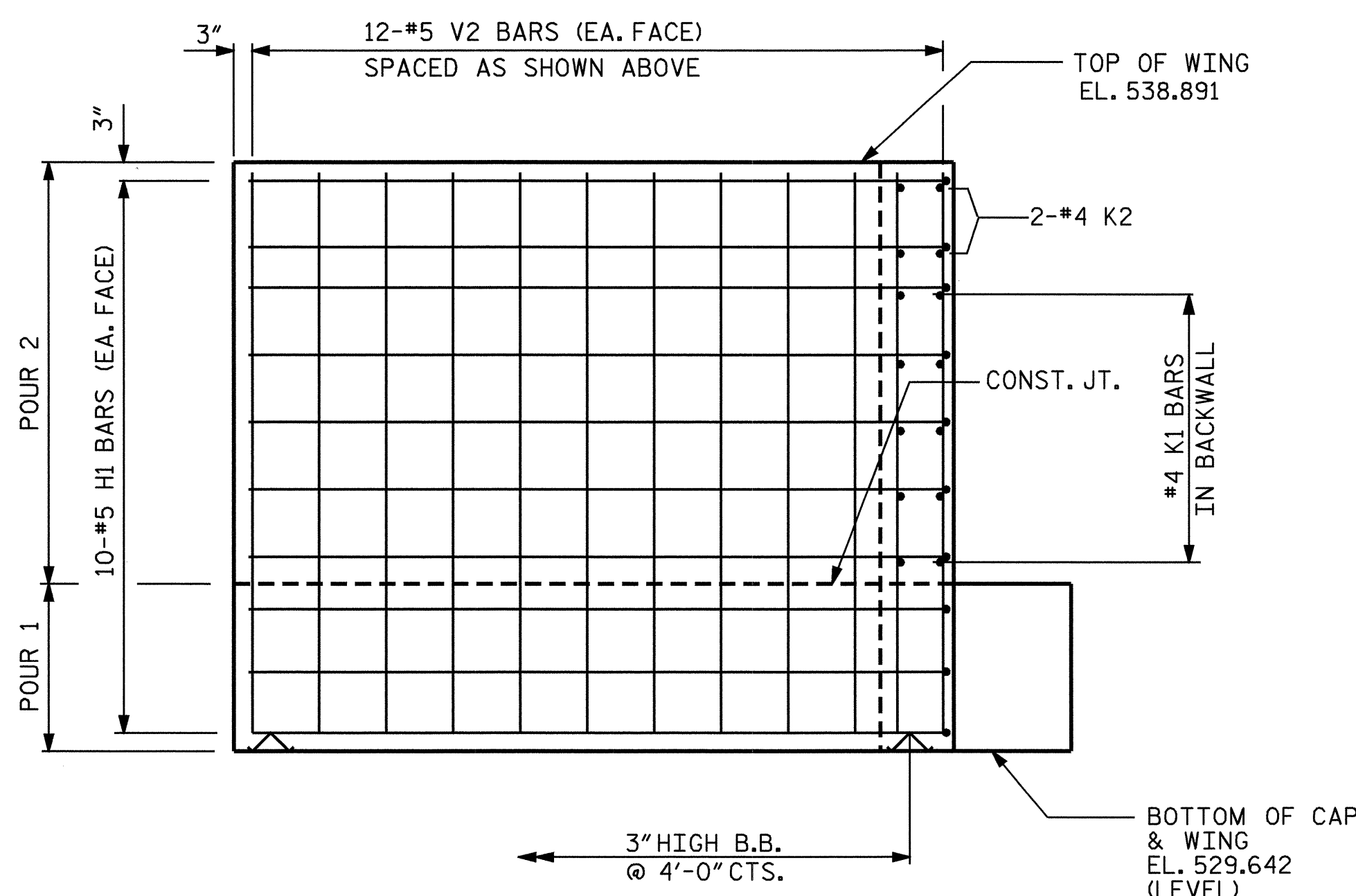
* MATCH "H" BARS WITH "K" BARS IN BACKWALL

X ←



20" Ø STEEL PIPE SLEEVE DETAIL

THE REINFORCING STEEL IN BACKWALL WILL BE CUT AND FIELD BENT AS NECESSARY TO CLEAR STEEL PIPE SLEEVE.



ELEVATION OF LEFT WING - W1

(ELEVATION OF RIGHT WING - W2 SIMILAR)

X ←

PROJECT NO. B-3509
ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

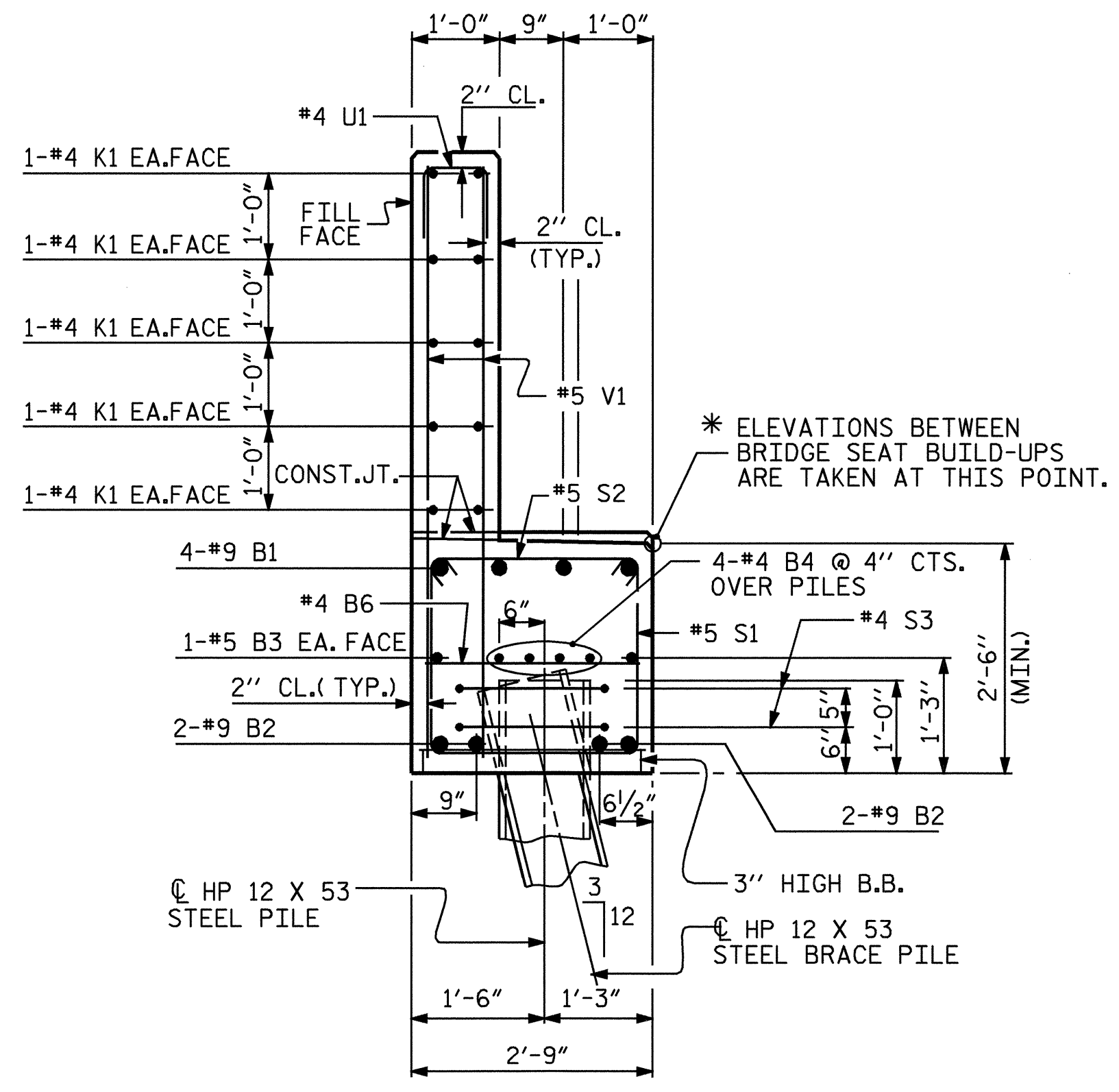
SUBSTRUCTURE
 END BENT 2



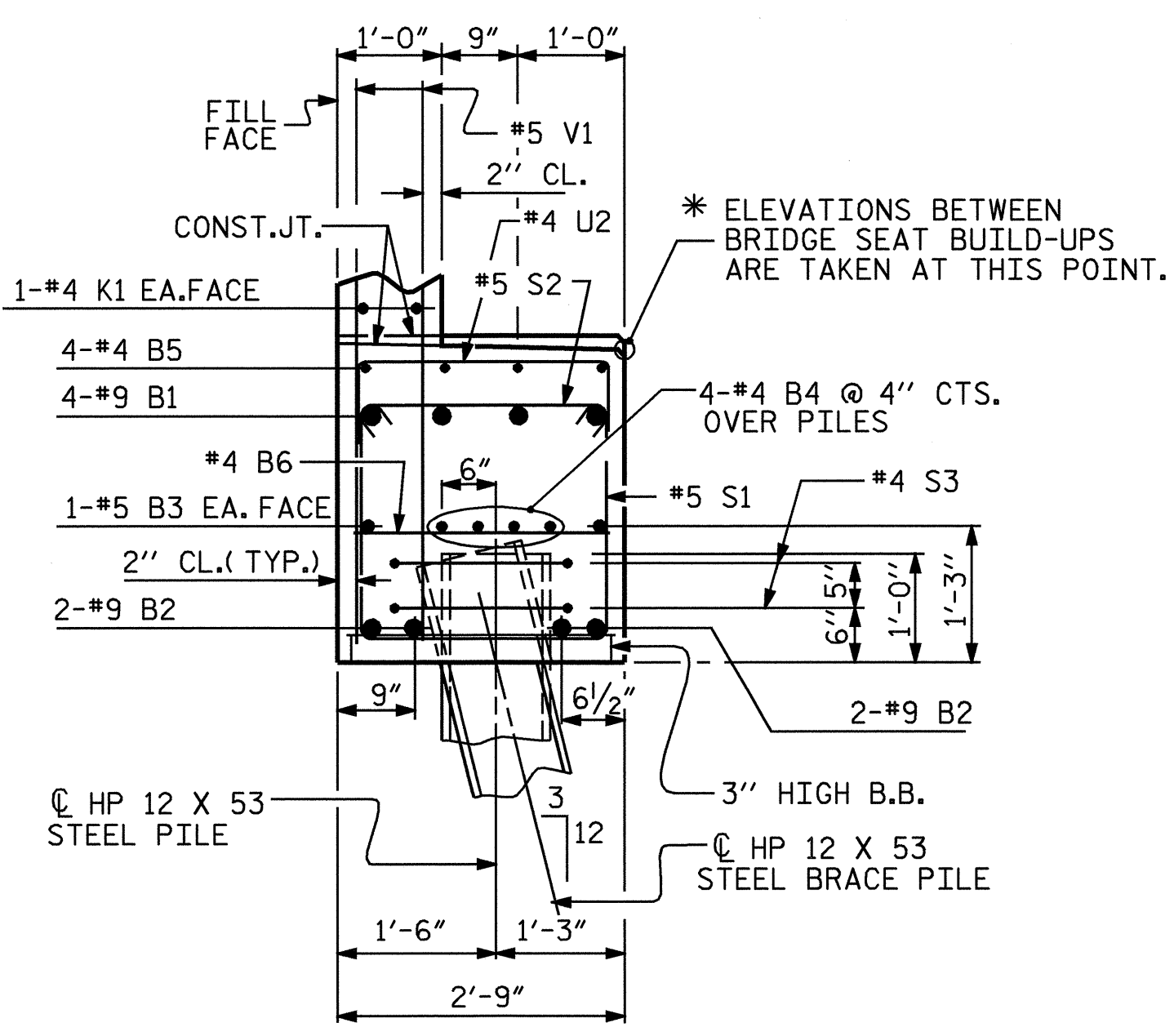
Hsiung Fang
 3/21/06

DRAWN BY: N. Q. TRAN DATE: JUN. 2004
 CHECKED BY: M. A. ALLEN DATE: 7-2004

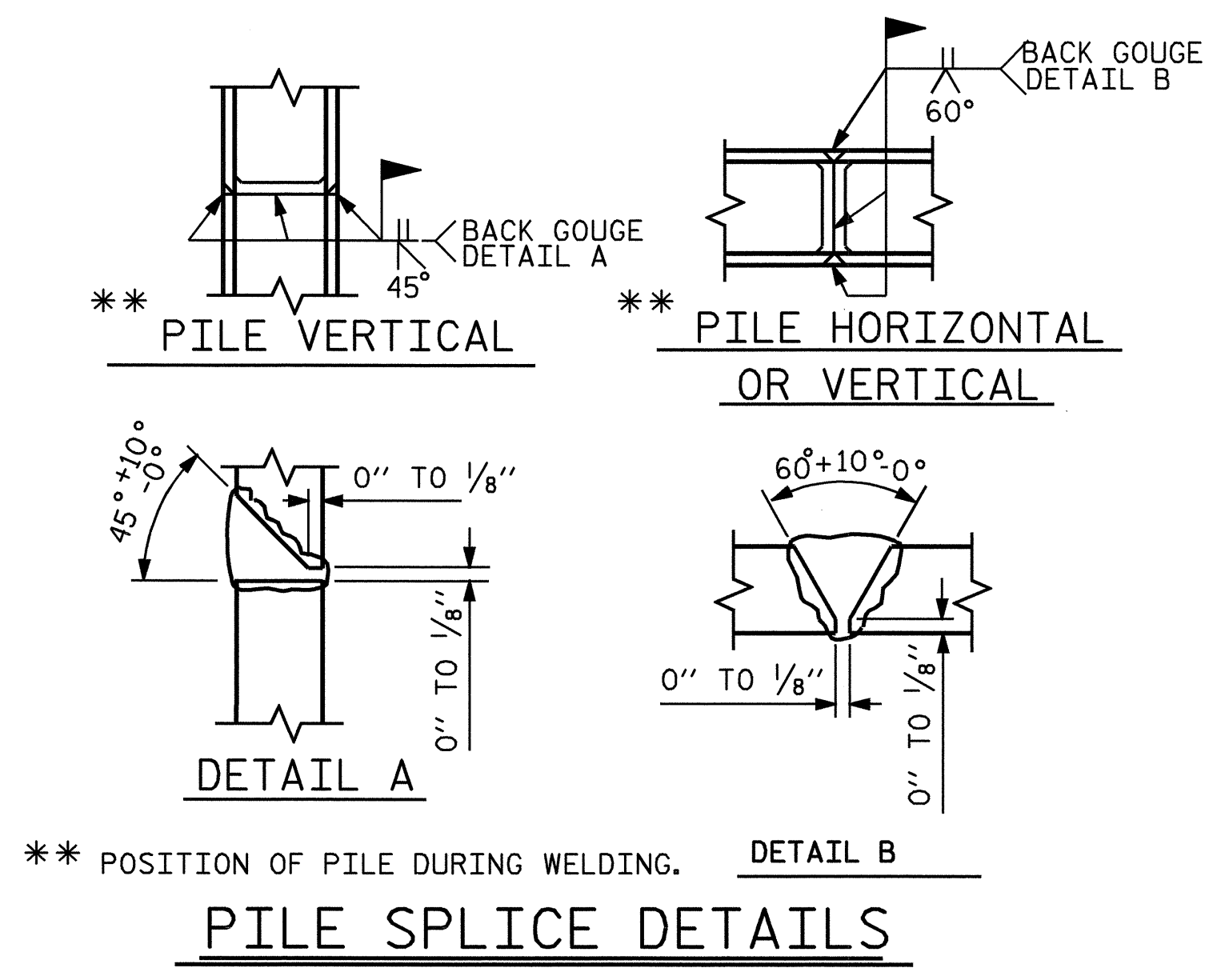
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			53



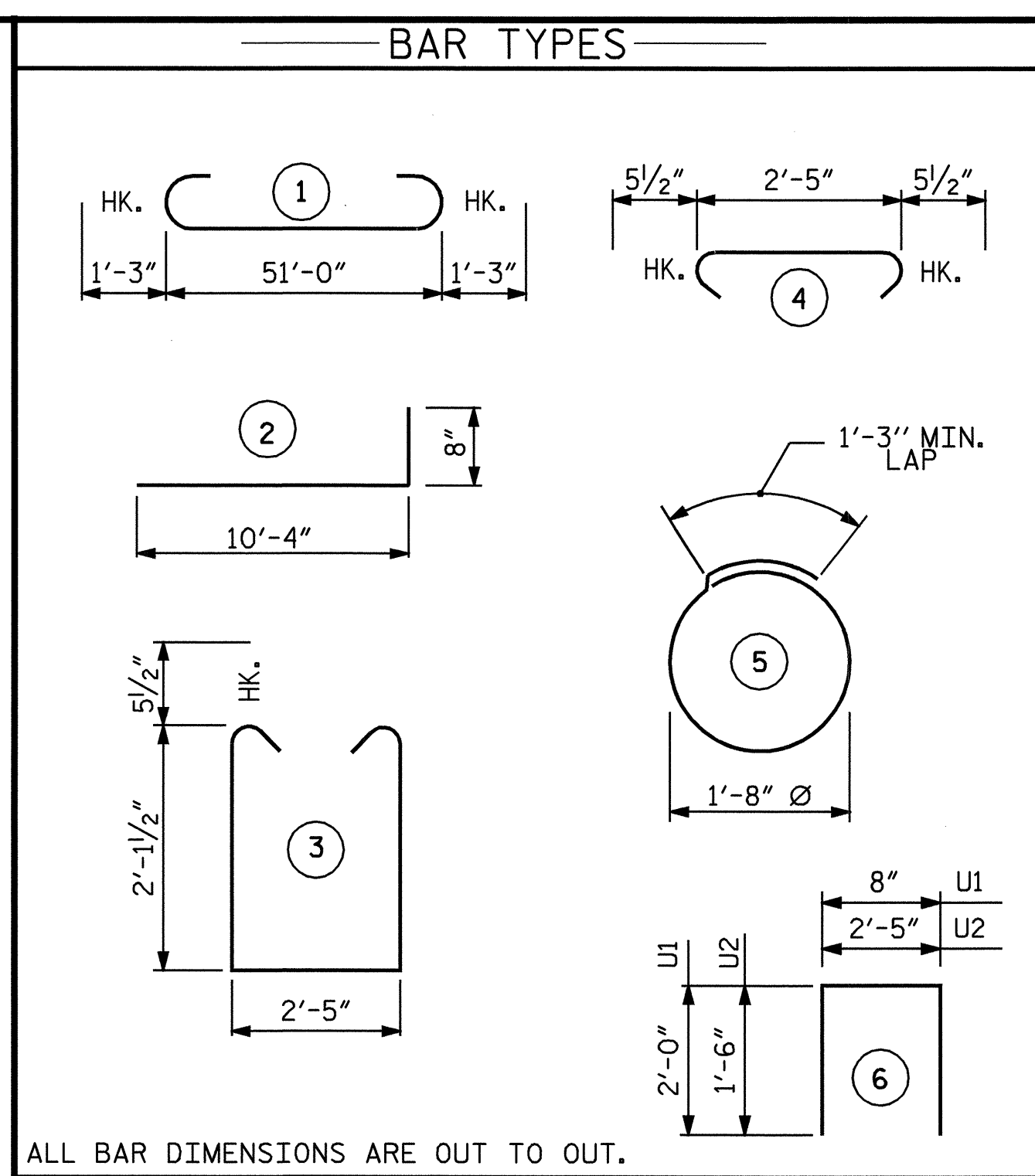
SECTION A-A



SECTION B-B



PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL						
END BENT 2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	4	9	1	53'-6"	728	
B2	4	9	1	53'-6"	728	
B3	2	5	STR	51'-0"	106	
B4	8	4	STR	26'-9"	143	
B5	4	4	STR	22'-5"	60	
B6	13	4	STR	2'-5"	21	
H1	40	5	2	11'-0"	459	
K1	20	4	STR	26'-9"	357	
K2	8	4	STR	2'-7"	14	
P1	16	4	STR	3'-2"	34	
S1	50	5	3	7'-7"	395	
S2	50	5	4	3'-4"	174	
S3	24	4	5	6'-6"	104	
U1	46	4	6	4'-8"	143	
U2	15	4	6	5'-5"	54	
V1	92	5	STR	7'-0"	672	
V2	56	5	STR	8'-10"	516	
REINFORCING STEEL				LBS.	4,708	
CLASS A CONCRETE						
POUR #1 CAP & LOWER						
PORTION OF WINGS				15.6 CU. YD.		
POUR #2 BACKWALL & UPPER						
PORTION OF WINGS				14.5 CU. YD.		
TOTAL CLASS A CONCRETE				30.1 CU. YD.		
HP 12 X 53 STEEL PILES						
NO. 12 LIN. FEET				240		

PROJECT NO. B-3509
ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 2

Tung H. Fang
 8/19/05

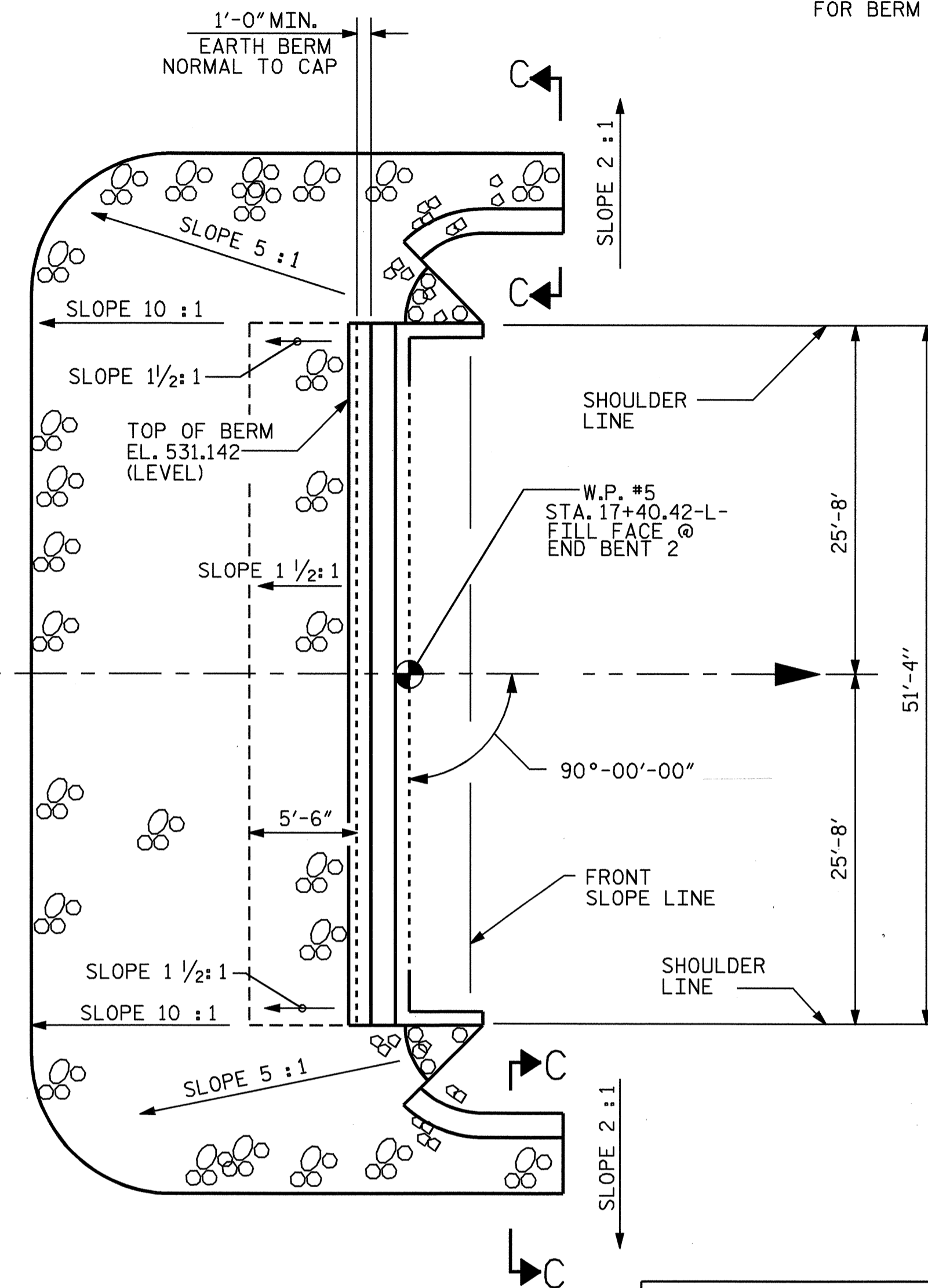
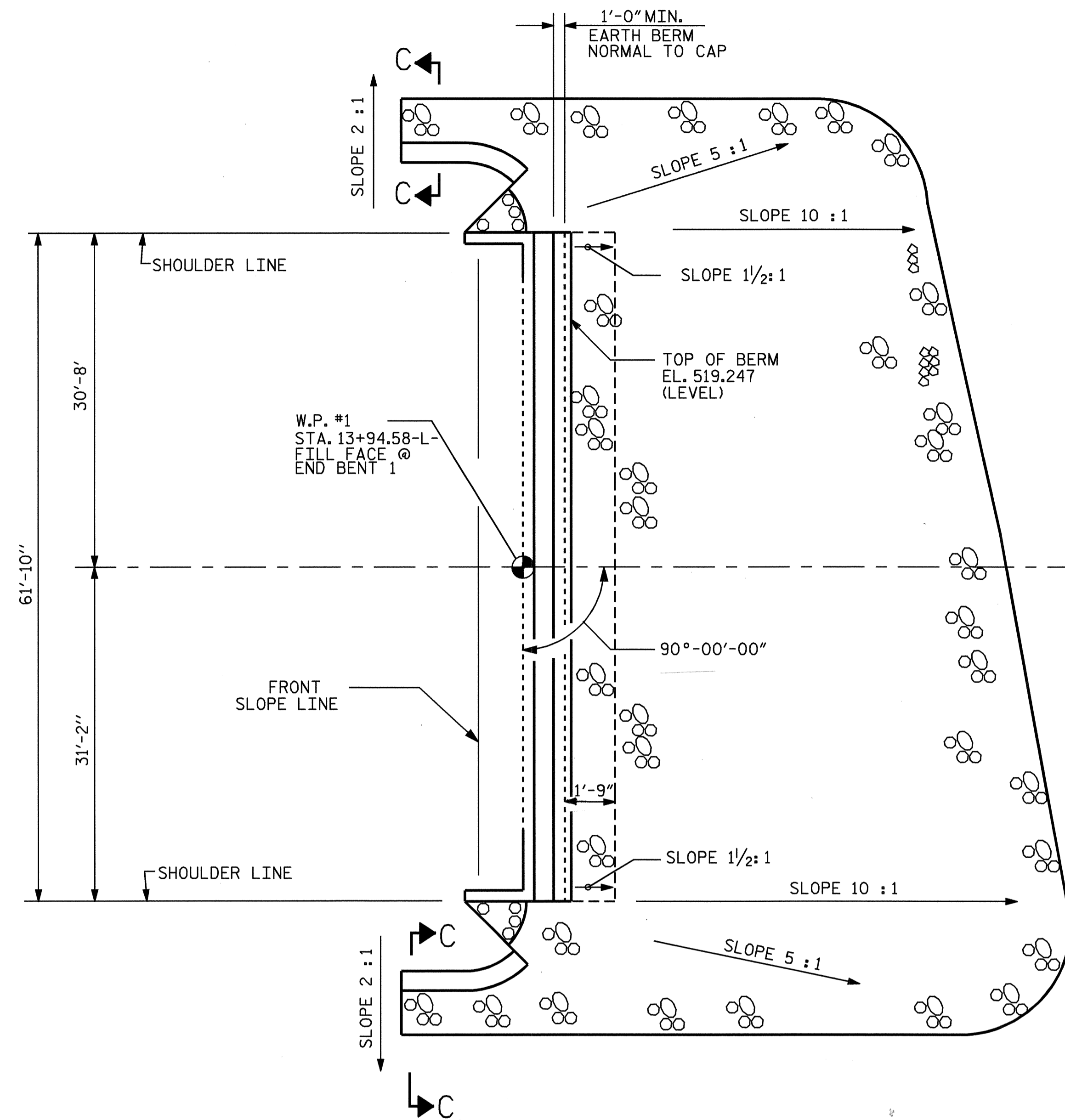
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 53

DRAWN BY : N. Q. TRAN DATE : JUN. 2004
 CHECKED BY : M. A. ALLEN DATE : 7-2004

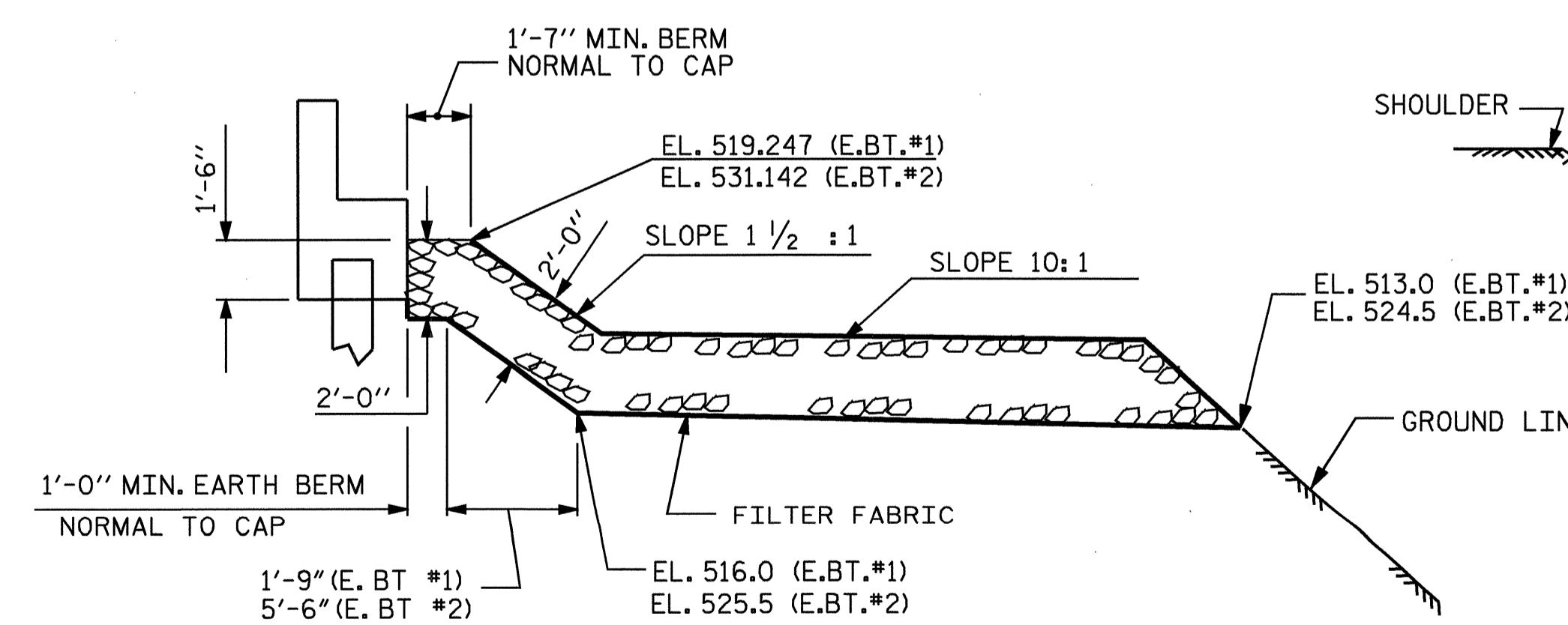
29-JUL-2005 15:25
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NOTES :
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.



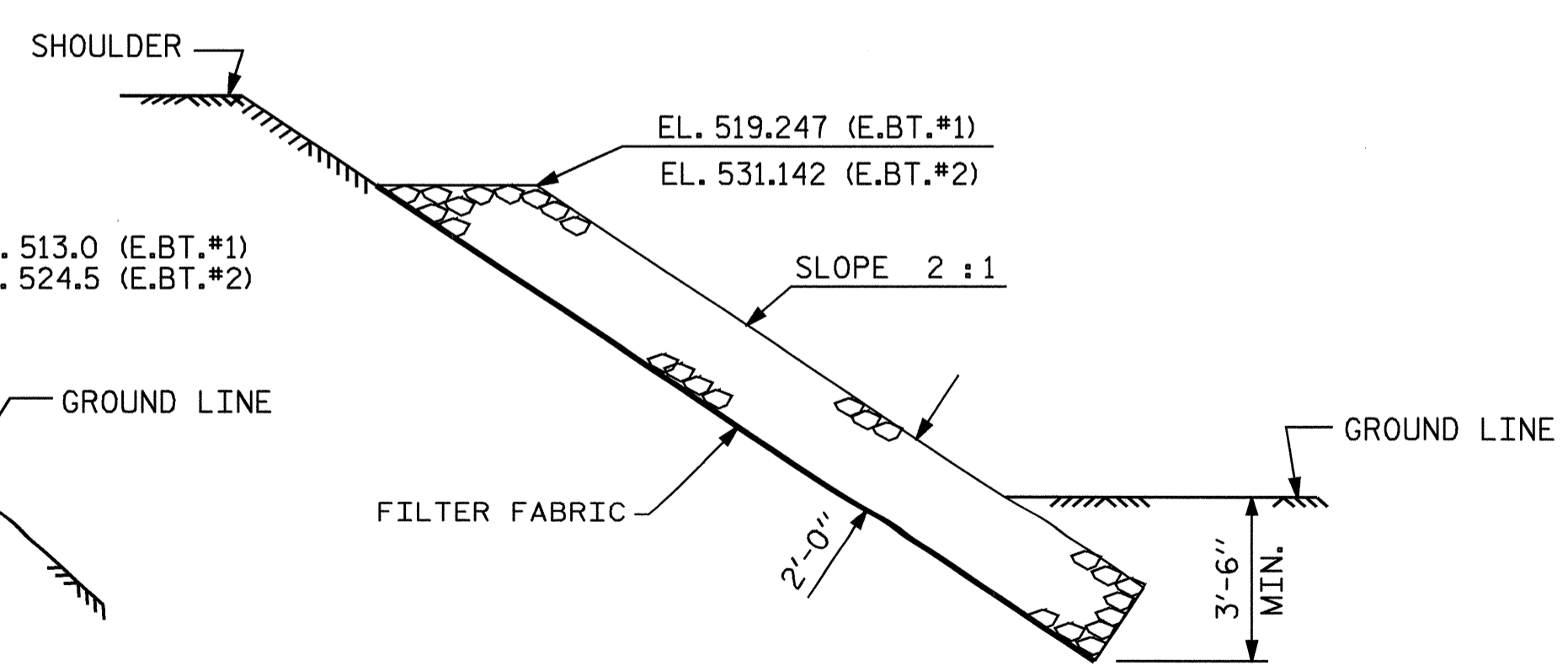
PLAN OF RIP RAP

ESTIMATED QUANTITIES		
BRIDGE @ STA. 15+67.50 -L-	PLAIN RIP RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	293	325
END BENT 2	171	190



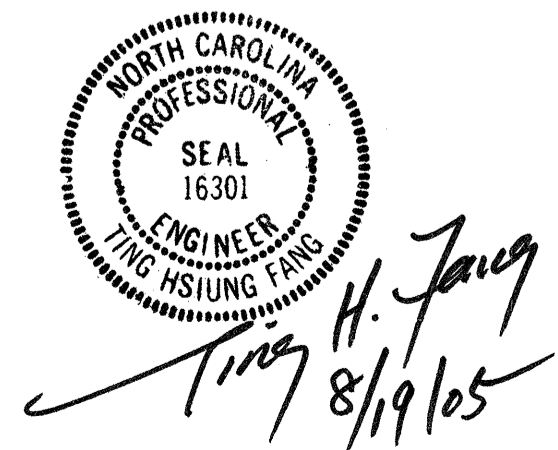
SECTION C-C
BERM RIP RAPPED

NOTE : FILTER FABRIC SHALL BE PLACED UNDER ENTIRE AREA OF RIP RAP



SECTION C-C

PROJECT NO. B-3509
ROCKINGHAM COUNTY
STATION: 15+67.50 -L-

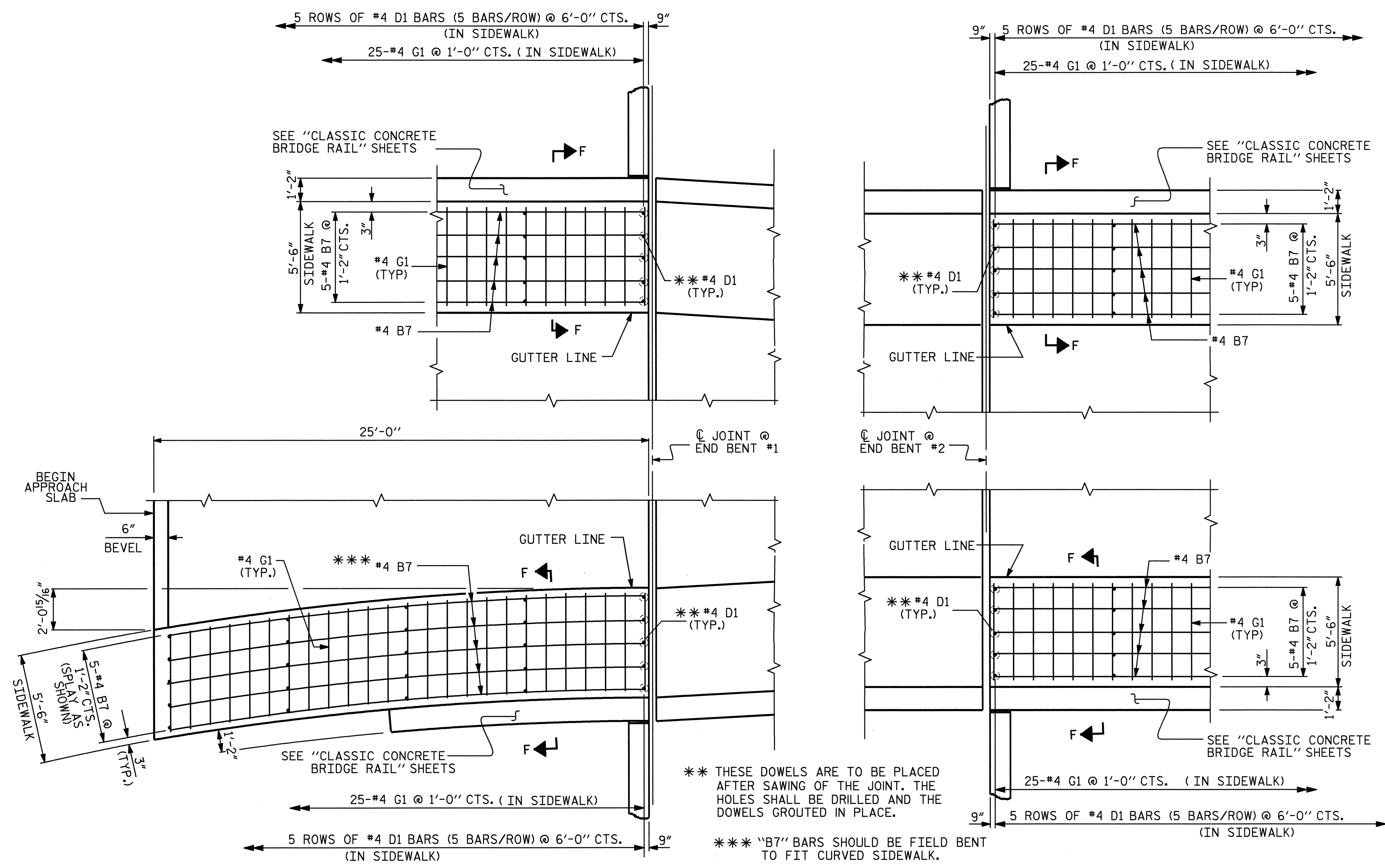


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-46
2			4			53

DRAWN BY : N. Q. TRAN DATE : 10-20-04
CHECKED BY : S. M. RASHIDI DATE : 10-21-04



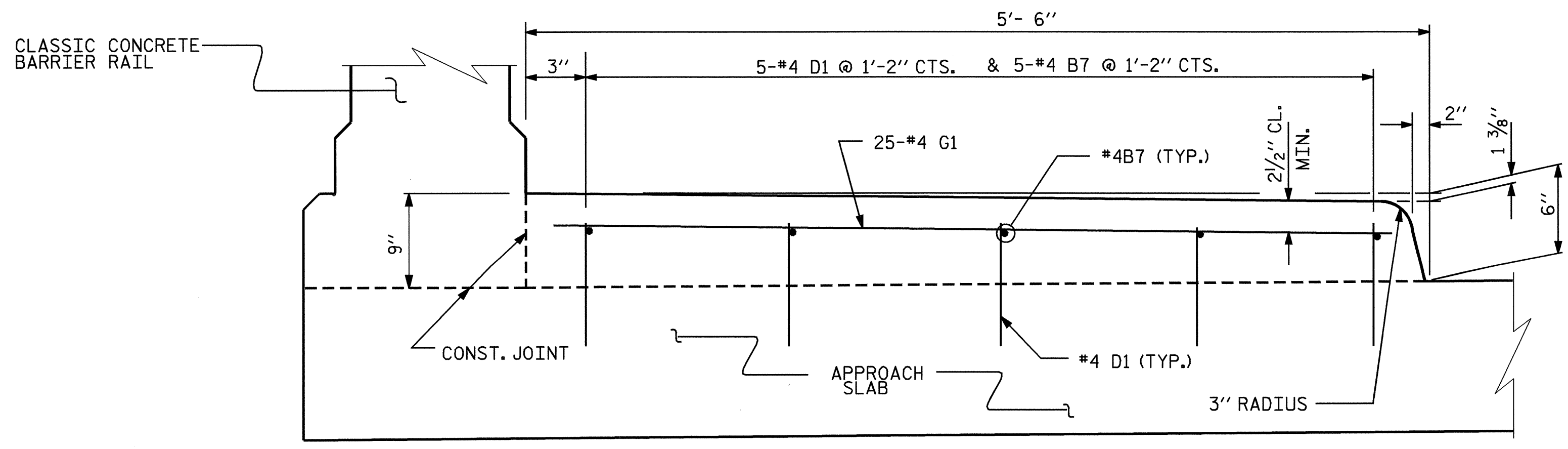
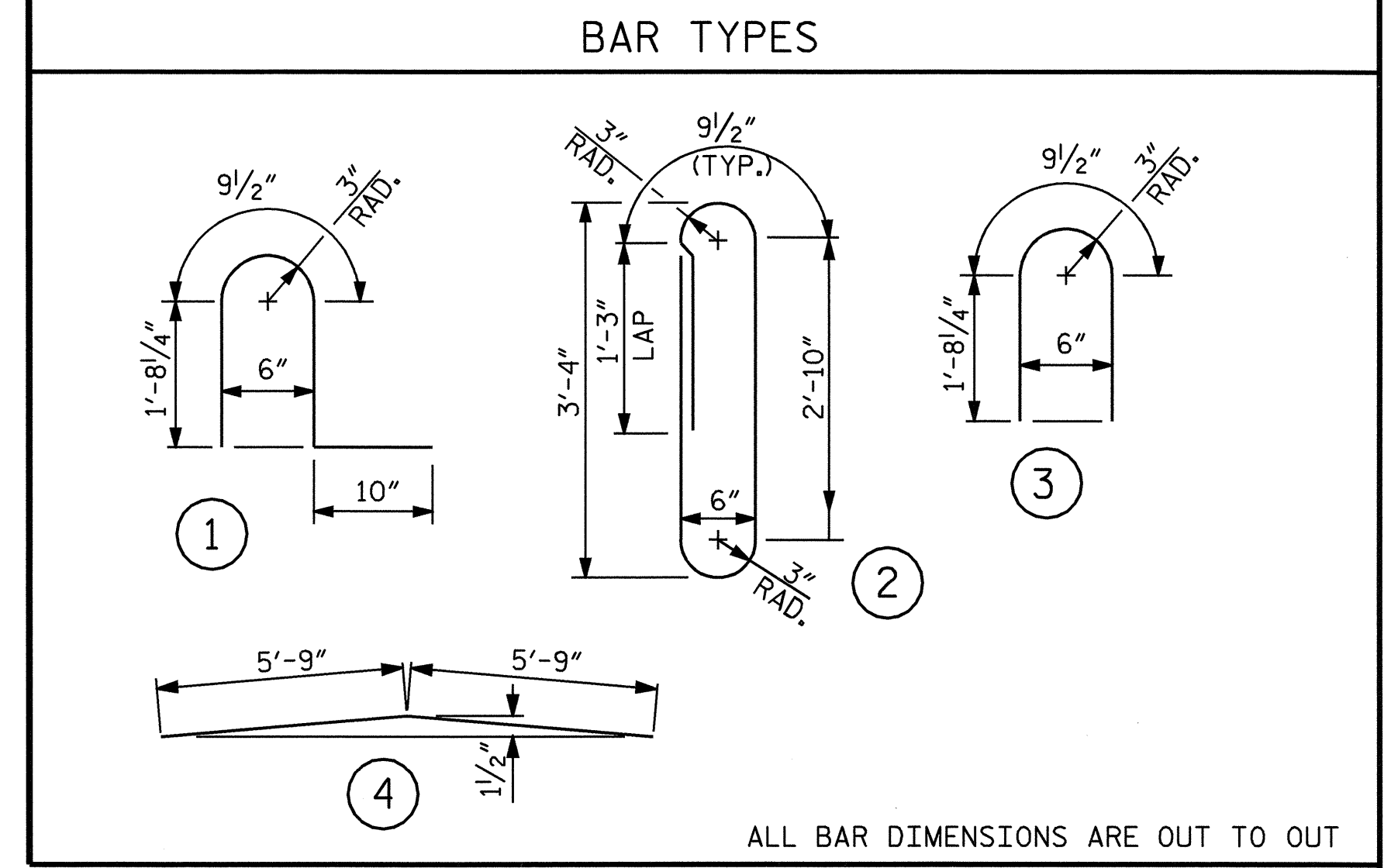
SIDEWALK DETAILS

** THESE DOWELS ARE TO BE PLACED AFTER SAWING OF THE JOINT. THE HOLES SHALL BE DRILLED AND THE DOWELS GROUTED IN PLACE.

*** "B7" BARS SHOULD BE FIELD BENT TO FIT CURVED SIDEWALK.

BILL OF MATERIAL

APPROACH SLAB AT END BENT 1						APPROACH SLAB AT END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	98	#5	STR	28'-9"	3066	*A3	98	#5	STR	23'-11"	2445
A2	98	#4	STR	28'-4"	1855	A4	98	#4	STR	23'-7"	1544
*B1	106	#6	STR	24'-1"	3834	*B1	86	#6	STR	24'-1"	3111
*B2	6	#6	STR	11'-6"	104	*B2	6	#6	STR	11'-6"	104
B3	106	#8	STR	24'-6"	6934	B3	86	#8	STR	24'-6"	5626
B4	6	#8	STR	11'-6"	184	B4	6	#8	STR	11'-6"	184
*B5	2	#7	STR	11'-6"	47	*B5	4	#7	STR	11'-6"	94
*B6	4	#5	STR	11'-6"	48	*B6	4	#5	STR	11'-6"	48
*B7	10	#4	STR	24'-6"	164	*B7	10	#4	STR	24'-6"	164
*B8	2	#7	STR	11'-6"	47						
*D1	50	#4	STR	1'-0"	33	*D1	50	#4	STR	1'-0"	33
*G1	50	#4	STR	5'-0"	167	*G1	50	#4	STR	5'-0"	167
*S1	24	#5	1	5'-0"	125	*S1	24	#5	1	5'-0"	125
*S2	34	#5	2	8'-6"	301	*S2	34	#5	2	8'-6"	301
*S3	10	#5	3	4'-2"	43	*S3	10	#5	3	4'-2"	43
REINFORCING STEEL LBS. 8973						REINFORCING STEEL LBS. 7354					
*EPOXY COATED REINFORCING STEEL LBS. 7979						*EPOXY COATED REINFORCING STEEL LBS. 6635					
CLASS AA CONCRETE BREAKDOWN						CLASS AA CONCRETE BREAKDOWN					
POUR 1	APPROACH SLAB	C. Y.	53.5			POUR 1	APPROACH SLAB	C. Y.	41.5		
POUR 2	SIDEWALK	C. Y.	6.3			POUR 2	SIDEWALK	C. Y.	6.3		
POUR 3	CLASSIC CONC. BRIDGE RAIL	C. Y.	3.5			POUR 3	CLASSIC CONC. BRIDGE RAIL	C. Y.	3.5		
TOTAL CLASS AA CONCRETE C. Y. 63.3						TOTAL CLASS AA CONCRETE C. Y. 51.3					

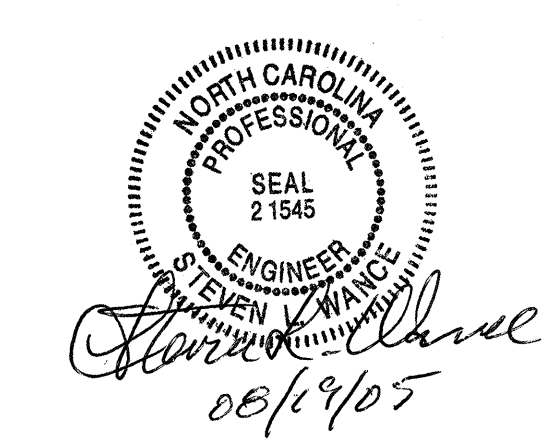


SECTION F-F

#4 D1 DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER APPROACH SLAB HAS BEEN SCREEDED OFF.

SPLICE LENGTH CHART

BAR	SIZE	SPLICE LENGTH
A1	#5	2'-6"
A2	#4	1'-9"



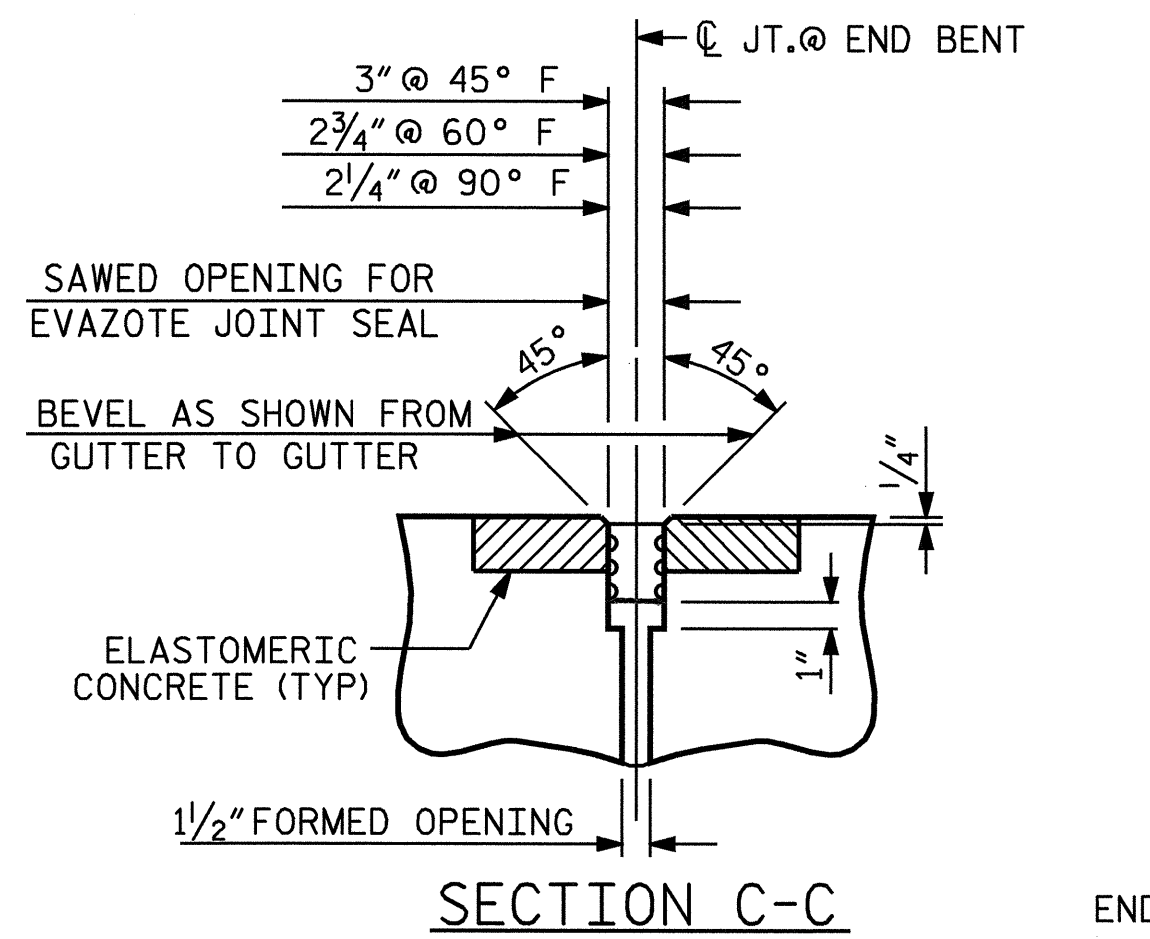
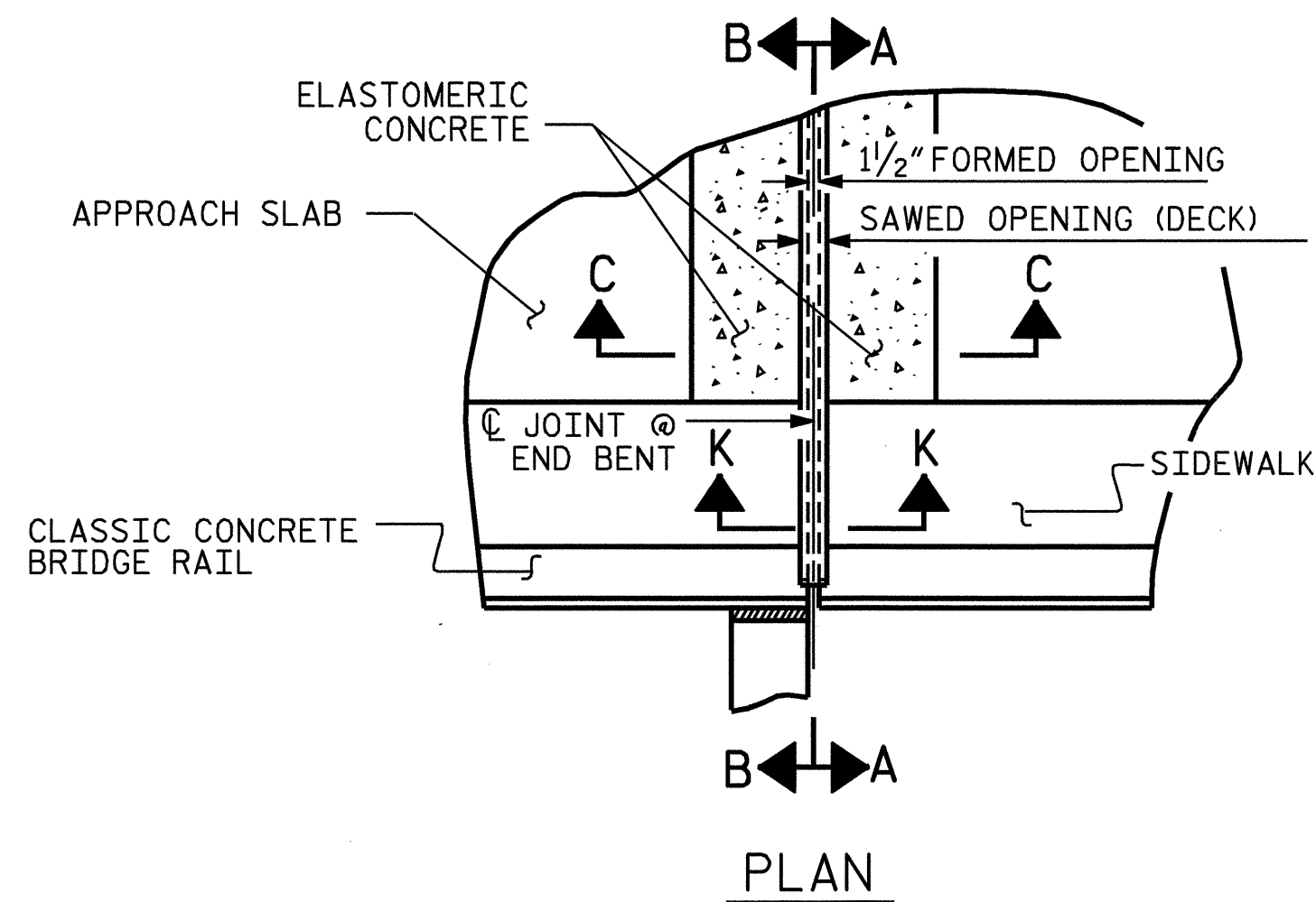
PROJECT NO. B-3509
 ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-
 SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

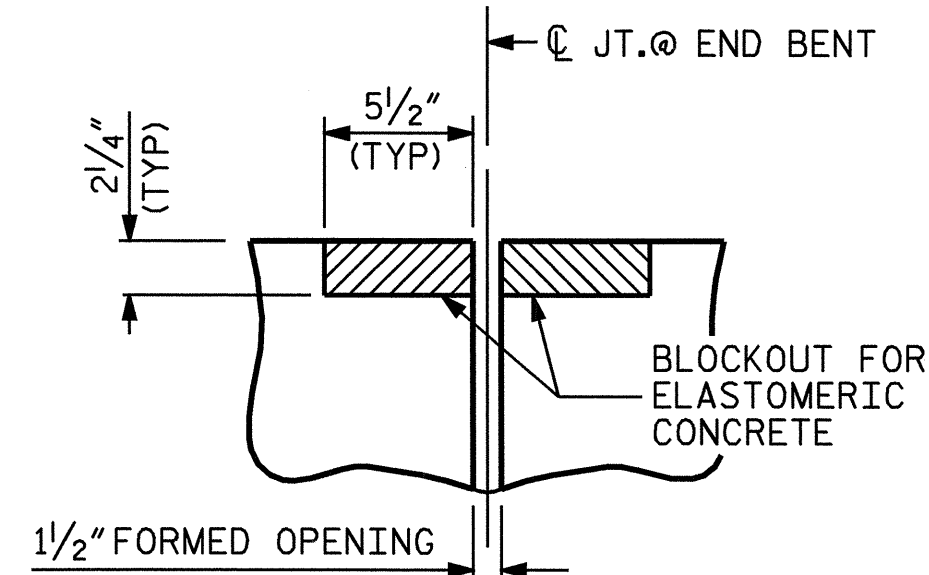
SIDEWALK ON BRIDGE APPROACH SLAB

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			5-49
2			4			TOTAL SHEETS 57

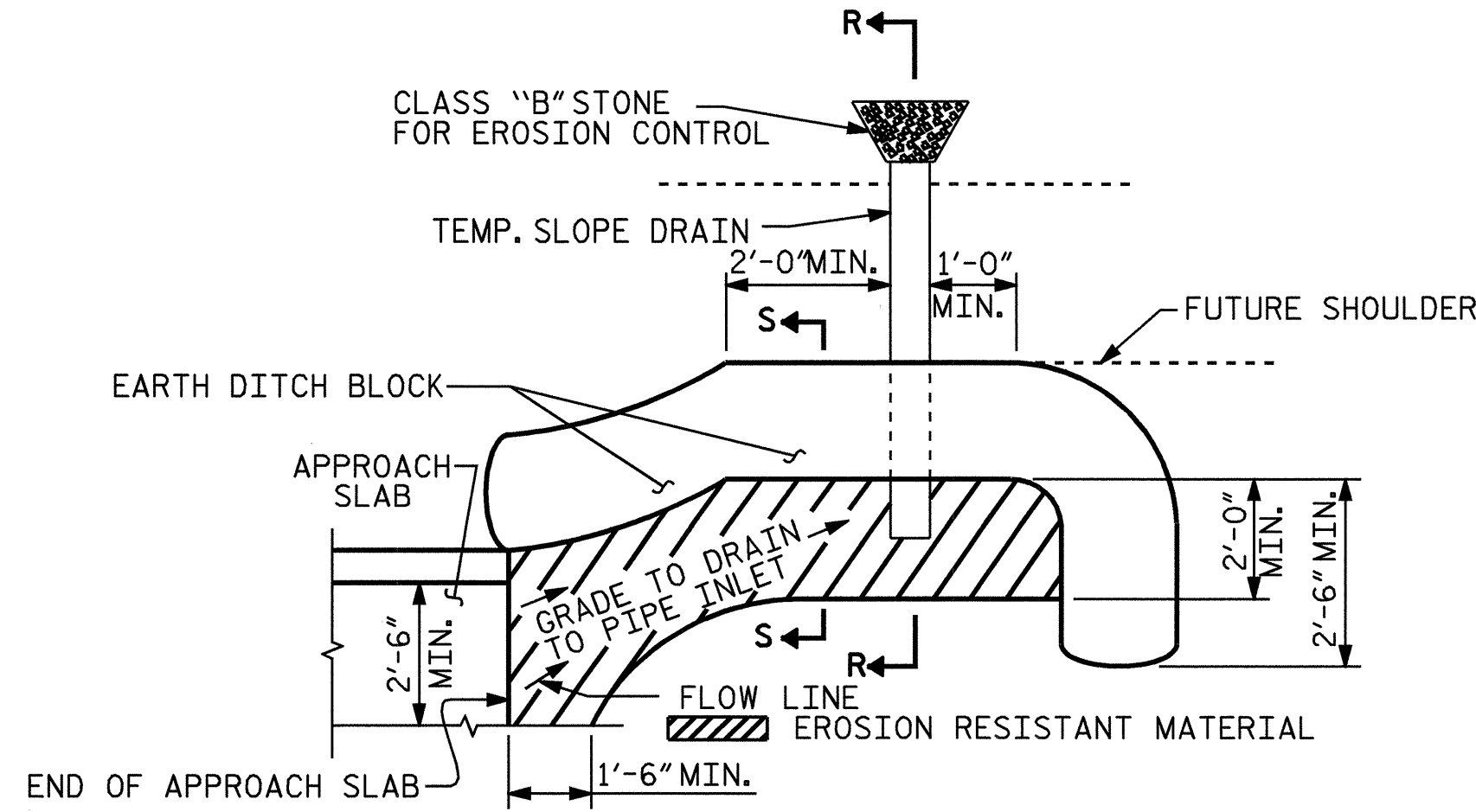
DRAWN BY : N. Q. TRAN DATE : JUN.-04
 CHECKED BY : SWANcPE DATE : 8-27-04



SECTION C-C
EVAZOTE JOINT SEAL
(FOR EVAZOTE JOINT SEAL, SEE SPECIAL PROVISIONS)

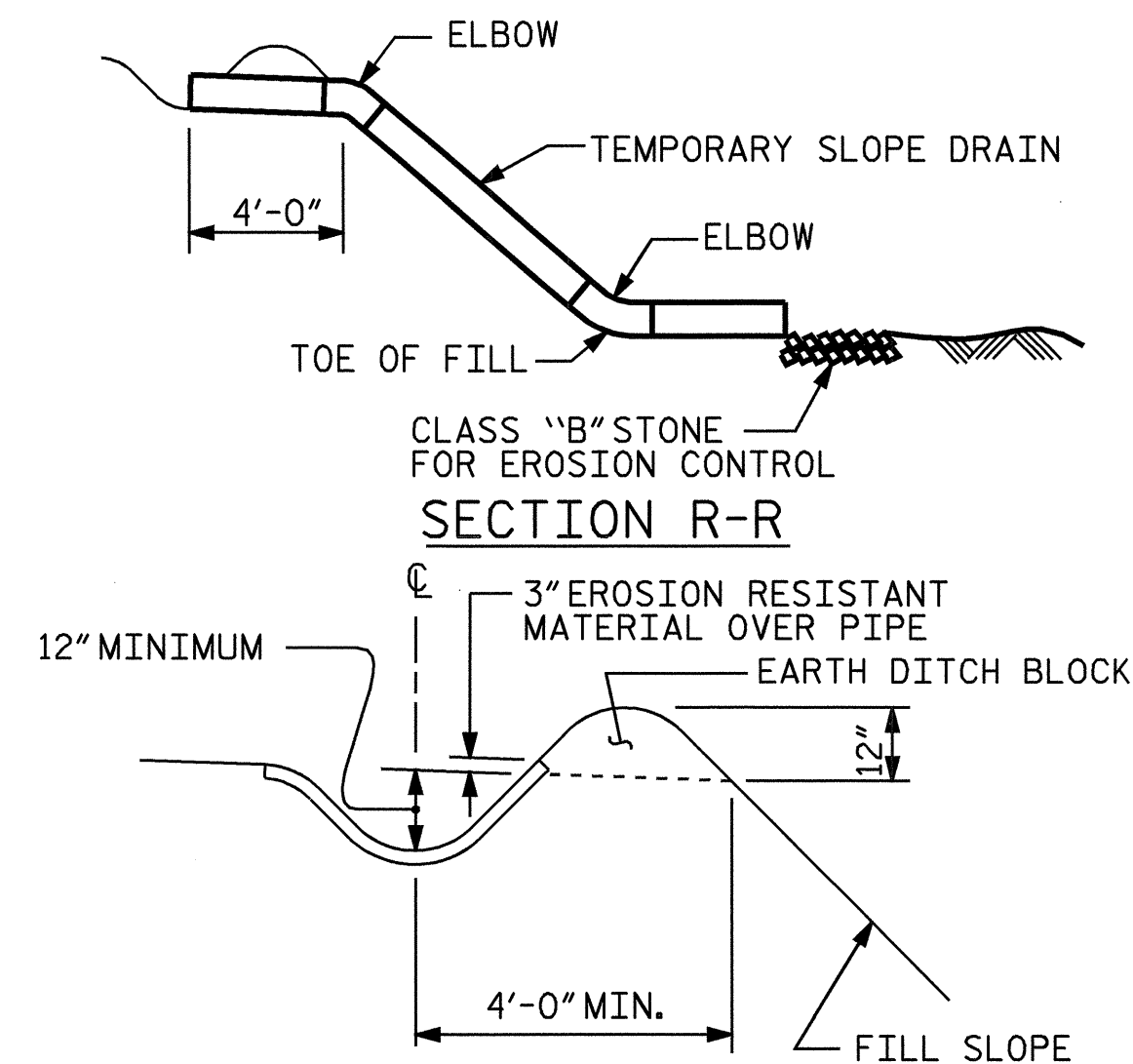


SECTION C-C
EVAZOTE JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)

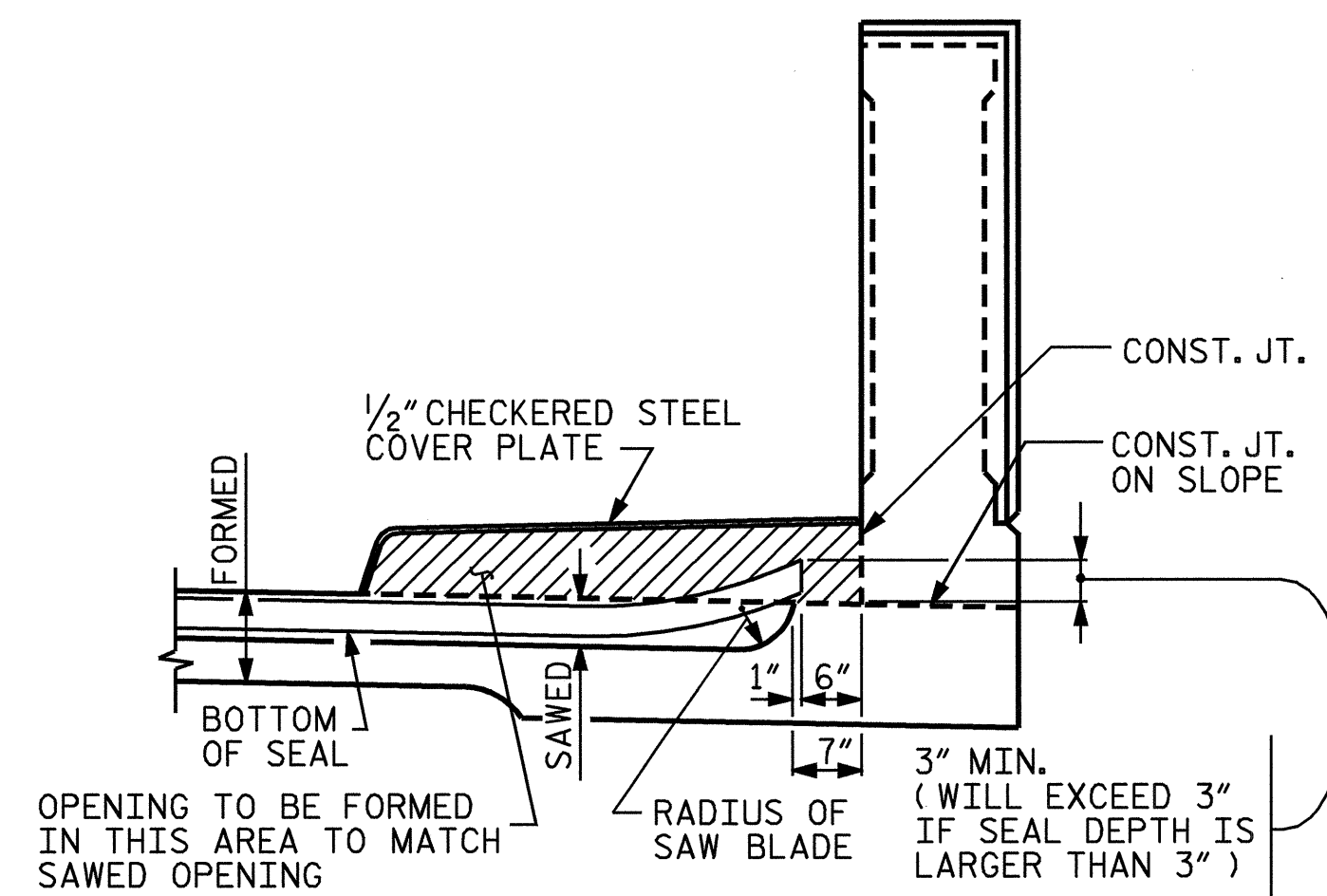


PLAN VIEW

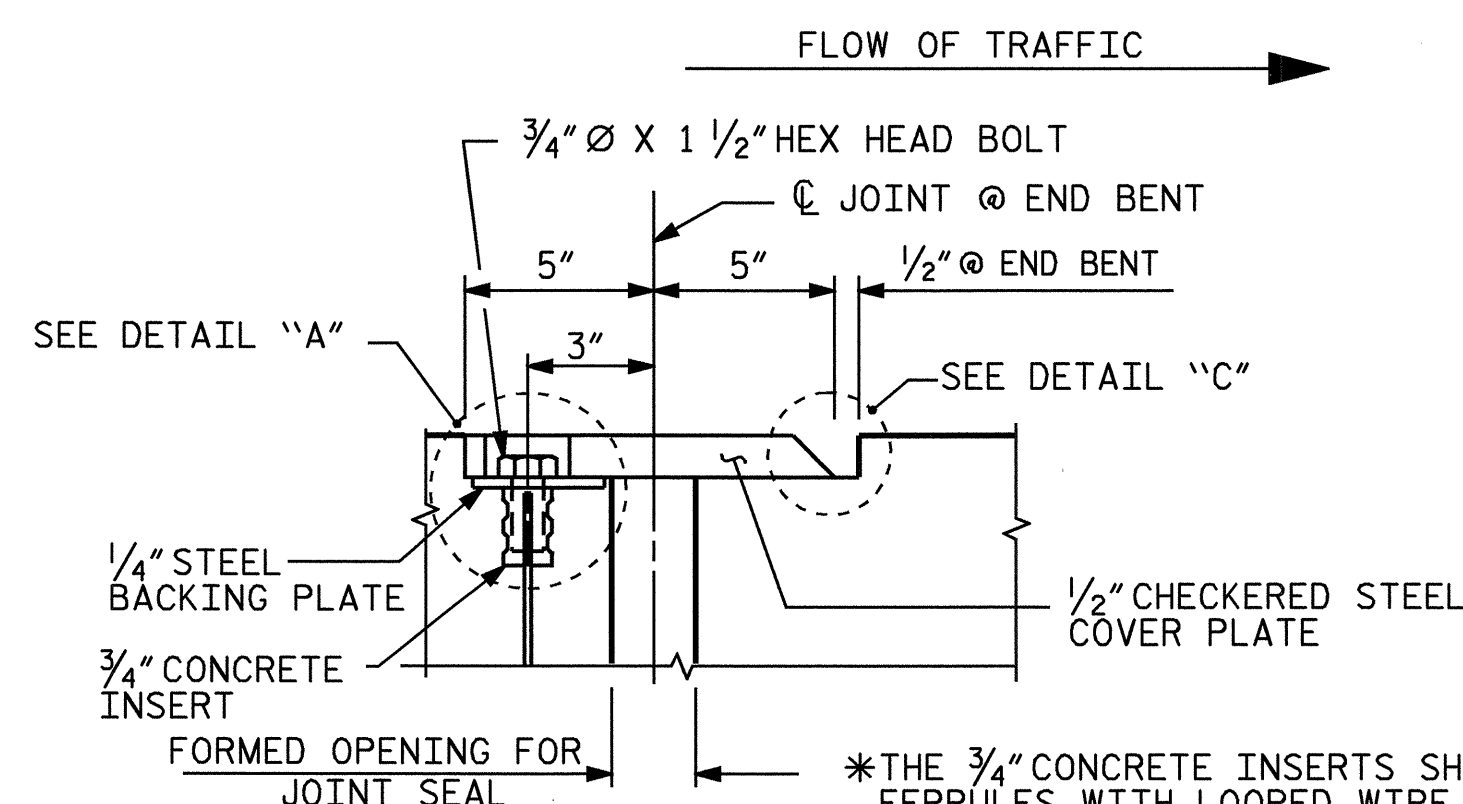
TEMPORARY BERM AND SLOPE DRAIN DETAILS



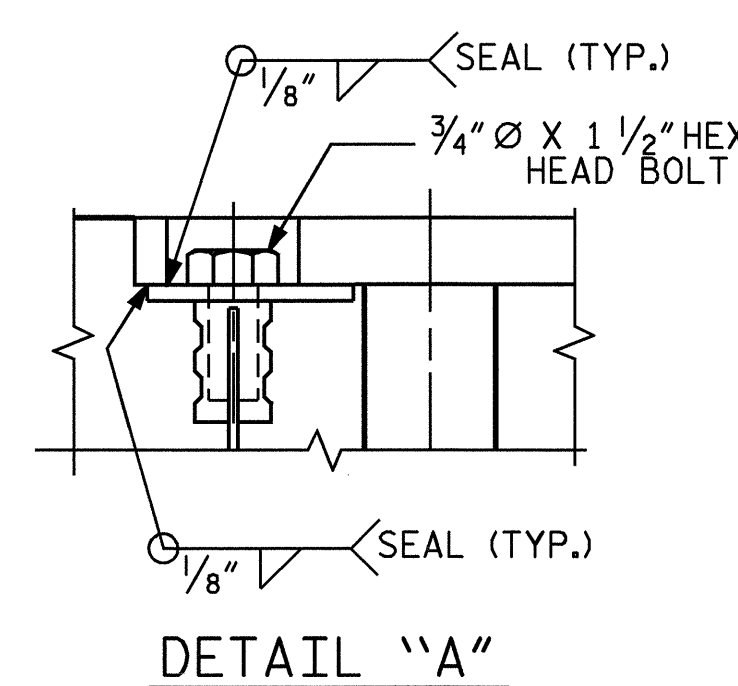
SECTION S-S



SECTION A-A

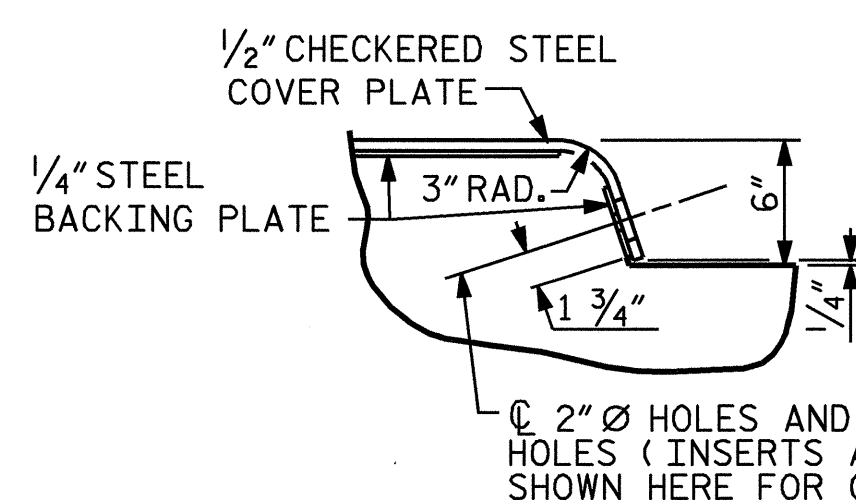


SECTION K-K

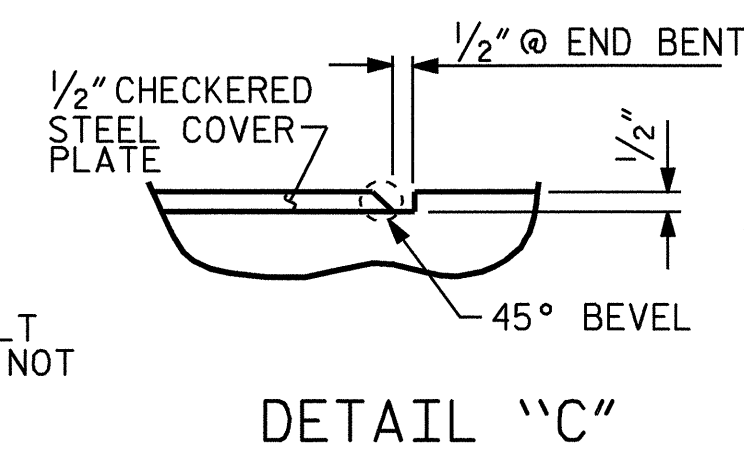


DETAIL "A"

*THE 3/4" CONCRETE INSERTS SHALL BE CLOSED-END FERRULES WITH LOOPED WIRE STRUTS ATTACHED TO THEM. THE INSERTS SHALL CONFORM TO AASHTO M169, GRADE 12L14 AND SHALL HAVE A TENSILE WORKING LOAD CAPACITY OF 3000 LBS.

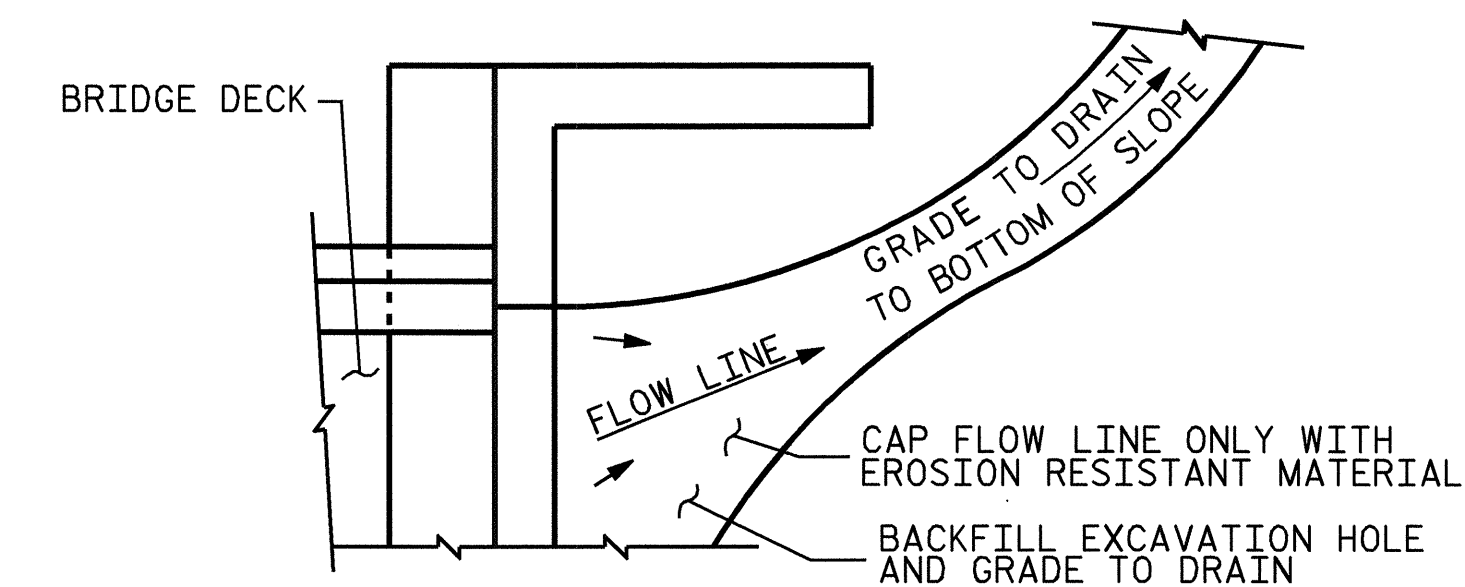


DETAIL "B"



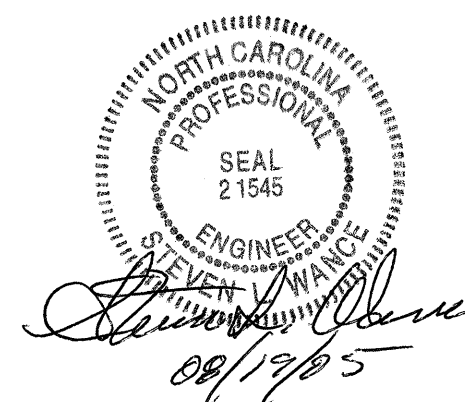
DETAIL "C"

JOINT SEAL DETAILS @ END BENT
(FOR SIDEWALK)



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

TEMPORARY DRAINAGE DETAIL



PROJECT NO. B-3509
ROCKINGHAM COUNTY
STATION: 15+67.50 -L-

SHEET 4 OF 4

BILL OF MATERIAL	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT)
1	9.1
2	7.4
TOTAL	16.5

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
CLASSIC CONCRETE
BRIDGE RAIL
ON APPROACH SLAB

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

TOTAL SHEETS 53

ASSEMBLED BY : N. Q. TRAN	DATE : JUN.-04
CHECKED BY : SWANcPE	DATE : 8-27-04
DRAWN BY : FCJ 11/88	REV. 7/17/98 RWW/LES
CHECKED BY : ARB 11/88	REV. 8/16/99 MAB/LES
	REV. 10/17/00R RWW/LES

OVERHANG BRACKET CALCULATION INSTRUCTIONS

AASHTO SHAPES - TYPES III, IV, V, AND VI

- RECORD KNOWN INFORMATION ON "BRIDGE OVERHANG BRACKET SUMMARY" ON SHEET 2
- CALCULATE THE MAXIMUM SCREED LOAD PER BRACKET (SLPB) WITH AN ESTIMATED $R = 1.5$. $SLPB = R \times W$. ROUND VALUE UP TO NEAREST SLPB VALUE INDICATED ON APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4.
- WITH THE ESTIMATED SLPB, OVERHANG SLAB THICKNESS, "K" VALUE, AND 45° HANGER SAFE WORKING LOAD (SWL), ENTER THE APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4 (BASED ON OVERHANG DIMENSION) AND DETERMINE THE BRACKET SPACING, S.
- CALCULATE S/D1 AND S/D2, ROUNDING UP TO NEAREST VALUE IN TABLE 2. ENTER TABLE 2 AND DETERMINE R VALUE.
- CALCULATE REVISED SLPB. ROUND VALUE UP TO NEAREST SLPB VALUE INDICATED ON APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4.
- WITH THE REVISED SLPB, OVERHANG SLAB THICKNESS, "K" VALUE AND 45° HANGER SAFE WORKING LOAD (SWL), ENTER THE APPROPRIATE TABLE 1-1, 1-2, 1-3 OR 1-4 (BASED ON OVERHANG DIMENSION) AND DETERMINE REVISED BRACKET SPACING, S.
- CONTINUE ITERATIONS OF STEPS 4-6 UNTIL THE REVISED BRACKET SPACING, S, IS THE SAME AS THE PREVIOUS S VALUE.
- CHECK LUMBER JOIST SPACING: WITH BRACKET SPACING VALUE, S, ROUND THIS VALUE UP TO THE NEAREST VALUE OF ALLOWABLE SPAN LENGTH OF JOIST OF TABLE 3. USING THIS VALUE, ALONG WITH THE AVERAGE OVERHANG SLAB THICKNESS AND THE LUMBER JOIST SIZE, DETERMINE JOIST SPACING FROM TABLE 3. IF NECESSARY, ADJUST LUMBER JOIST SIZE AND/OR JOIST SPACING TO MEET ALLOWABLE SPAN LENGTH OF JOIST.
- CONVERSELY, IF THE DESIRED JOIST SPACING IS KNOWN, USE THIS ALONG WITH THE AVERAGE OVERHANG SLAB THICKNESS AND THE LUMBER JOIST SIZE TO DETERMINE IF ALLOWABLE SPAN LENGTH OF JOIST IS GREATER THAN THE BRACKET SPACING, S. IF NECESSARY, ADJUST LUMBER JOIST SIZE TO MEET REQUIREMENTS OF ALLOWABLE SPAN LENGTH OF JOIST AND JOIST SPACING.
- RECORD REMAINING INFORMATION ON "BRIDGE OVERHANG BRACKET SUMMARY" FORM.
- SUBMIT FORM AND CALCULATIONS FOR REVIEW AND APPROVAL.

TABLE 1-1 (FOR USE ON UP TO 2'-0" OVERHANG & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS (in)	BRACKET DIMENSION (in)	SCREED LOAD PER BRACKET								45° HANGER SWL (lbs)
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	
10	30	2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	4000		
	40	3'-6"	4'-0"	4'-5"	4'-9"	5'-1"	5'-3"	5'-5"	5'-7"	6'-7"
	50	3'-6"	4'-0"	4'-5"	4'-9"	5'-1"	5'-3"	5'-5"	5'-7"	6'-7"
12	30	2'-4"	2'-10"	3'-4"	3'-9"	5'-2"	4000			
	40	3'-2"	3'-7"	4'-1"	4'-7"	5'-0"	5'-2"	5'-4"	5'-7"	6'-5"
	50	3'-2"	3'-7"	4'-1"	4'-7"	5'-0"	5'-2"	5'-4"	5'-7"	6'-5"
14	30	2'-10"	3'-4"	3'-9"	4'-2"	4'-7"	5'-0"	5'-4"	5'-7"	6'-4"
	40	2'-10"	3'-4"	3'-9"	4'-2"	4'-7"	5'-0"	5'-4"	5'-7"	6'-4"
	50	2'-10"	3'-4"	3'-9"	4'-2"	4'-7"	5'-0"	5'-4"	5'-7"	6'-4"
16	30	2'-8"	3'-0"	3'-5"	3'-10"	4'-3"	4'-7"	5'-0"	5'-5"	6'-3"
	40	2'-8"	3'-0"	3'-5"	3'-10"	4'-3"	4'-7"	5'-0"	5'-5"	6'-3"
	50	2'-8"	3'-0"	3'-5"	3'-10"	4'-3"	4'-7"	5'-0"	5'-5"	6'-3"

TABLE 1-2 (FOR USE ON OVER 2'-0" TO 2'-6" OVERHANG & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS (in)	BRACKET DIMENSION (in)	SCREED LOAD PER BRACKET								45° HANGER SWL (lbs)
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	
10	30	3'-1"	3'-6"	4'-0"	4'-5"	4'-11"	5'-3"	5'-5"	5'-7"	6'-7"
	40	3'-1"	3'-6"	4'-0"	4'-5"	4'-11"	5'-3"	5'-5"	5'-7"	6'-7"
	50	3'-1"	3'-6"	4'-0"	4'-5"	4'-11"	5'-3"	5'-5"	5'-7"	6'-7"
12	30	2'-9"	3'-2"	3'-7"	4'-0"	2'-1"	2'-6"	2'-11"	3'-4"	4'-6"
	40	2'-9"	3'-2"	3'-7"	4'-0"	2'-1"	2'-6"	2'-11"	3'-4"	4'-6"
	50	2'-9"	3'-2"	3'-7"	4'-0"	2'-1"	2'-6"	2'-11"	3'-4"	4'-6"
14	30	2'-6"	2'-10"	3'-3"	3'-7"	4'-0"	4'-4"	4'-9"	5'-1"	6'-3"
	40	2'-6"	2'-10"	3'-3"	3'-7"	4'-0"	4'-4"	4'-9"	5'-1"	6'-3"
	50	2'-6"	2'-10"	3'-3"	3'-7"	4'-0"	4'-4"	4'-9"	5'-1"	6'-3"
16	30	2'-3"	2'-7"	2'-11"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"	5'-8"
	40	2'-3"	2'-7"	2'-11"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"	5'-8"
	50	2'-3"	2'-7"	2'-11"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"	5'-8"

TABLE 1-3 (FOR USE ON OVER 2'-6" TO 3'-0" OVERHANG & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS (in)	BRACKET DIMENSION (in)	SCREED LOAD PER BRACKET								45° HANGER SWL (lbs)
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	
10	30					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"
	40					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"
	50					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"
12	30					3'-11"	4'-3"	4'-8"	5'-0"	6'-1"
	40	2'-5"	2'-10"	3'-2"	3'-6"	3'-11"	4'-3"	4'-8"	5'-0"	6'-1"
	50	2'-5"	2'-10"	3'-2"	3'-6"	3'-11"	4'-3"	4'-8"	5'-0"	6'-1"
14	30					3'-2"	3'-6"	3'-10"	4'-2"	4'-6"
	40	2'-2"	2'-6"	2'-10"	3'-2"	3'-6"	3'-10"	4'-2"	4'-6"	5'-6"
	50	2'-2"	2'-6"	2'-10"	3'-2"	3'-6"	3'-10"	4'-2"	4'-6"	5'-6"
16	30					2'-11"	3'-2"	3'-6"	3'-10"	4'-1"
	40	2'-0"	2'-4"	2'-7"	2'-11"	3'-2"	3'-6"	3'-10"	4'-1"	5'-0"
	50	2'-0"	2'-4"	2'-7"	2'-11"	3'-2"	3'-6"	3'-10"	4'-1"	5'-0"

TABLE 1-4 (FOR USE ON OVER 3'-0" TO 3'-6" OVERHANG & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS (in)	BRACKET DIMENSION (in)	SCREED LOAD PER BRACKET								45° HANGER SWL (lbs)
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	
10	30						2'-3"	2'-1"	2'-5"	2'-9"
	40						2'-3"	2'-1"	2'-5"	2'-9"
	50						2'-3"	2'-1"	2'-5"	2'-9"
12	30						2'-1"	2'-8"	3'-4"	3'-11"
	40						2'-1"	2'-8"	3'-4"	3'-11"
	50						2'-1"	2'-8"	3'-4"	3'-11"
14	30						2'-0"	2'-6"	3'-1"	3'-8"
	40						2'-0"	2'-6"	3'-1"	3'-8"
	50						2'-0"	2'-6"	3'-1"	3'-8"
16	30						2'-2"	2'-5"	2'-8"	3'-3"
	40						2'-2"	2'-5"	2'-8"	3'-3"
	50						2'-2"	2'-5"	2'-8"	3'-3"

DEFINITIONS

- SLPB = SCREED LOAD PER BRACKET (R x W)
- R = SCREED LOAD FACTOR, OBTAINED FROM TABLE 2
- W = WHEEL LOAD
- S = BRACKET SPACING
- T = AVERAGE SLAB THICKNESS
- SWL = SAFE WORKING LOAD
- K = DIMENSION DEFINED ON "BRIDGE OVERHANG BRACKET SUMMARY" ON SHEET 2
- L = OVERHANG MEASURED FROM EDGE OF TOP FLANGE TO EDGE OF SUPERSTRUCTURE

PROJECT NO. B-3509
ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD OVERHANG FALSEWORK
 AASHTO TYPES
 III, IV, V, AND VI

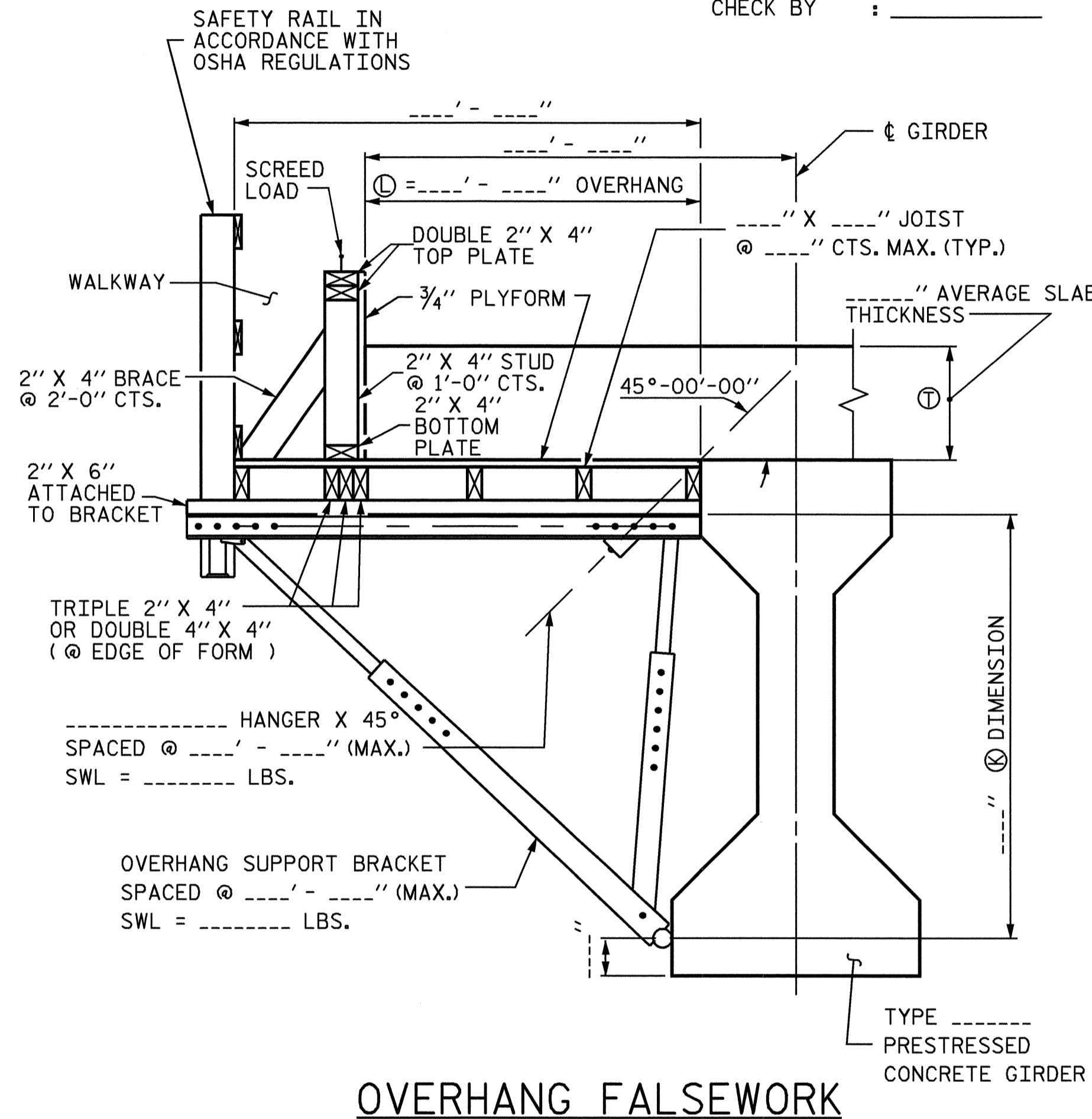


REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			5-51
2			4			TOTAL SHEETS 53

ASSEMBLED BY:	DATE:
CHECKED BY:	DATE:
DRAWN BY: R. WRIGHT 06/04	REV.
CHECKED BY: C. V. CHAO 06/04	

BRIDGE OVERHANG BRACKET SUMMARY

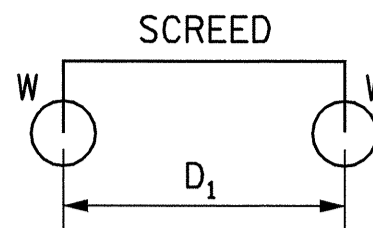
TOTAL SCREED WEIGHT = _____ LBS. PROJECT No. : _____
 NUMBER OF SCREED WHEELS = _____ COUNTY : _____
 SCREED WHEEL LOAD (W) = _____ LBS. STATION : _____
 SCREED LOAD PER BRACKET = _____ LBS. DESCRIPTION : _____
 DATE : _____
 DESIGN BY : _____
 CHECK BY : _____



OVERHANG FALSEWORK

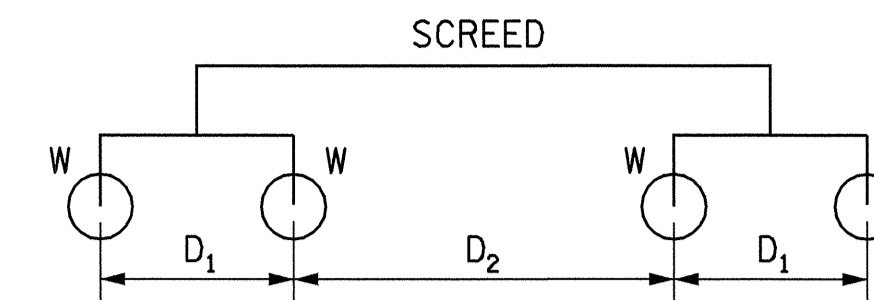
NOTES

DESIGN INCLUDES CONSTRUCTION LIVE LOAD 20 PSF ON THE AREA SUPPORTED AND 75 PLF AT THE OUTSIDE DECK OF OVERHANGS.
 REQUIRED MINIMUM DIAGONAL LEG CAPACITY: 3600 LB WORKING LOAD
 THE CONTRACTOR HAS THE OPTION OF SUBMITTING HIS OWN DESIGN FOR OVERHANG FALSEWORK IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
 SUBMITTALS UTILIZING THE INSTRUCTIONS AND PROCEDURES DESCRIBED ON SHEET 1 OF 3 SHALL BE IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF THE SPECIFICATIONS AND SPECIAL PROVISIONS, EXCEPT THAT CALCULATIONS FOR OVERHANG FALSEWORK NEED NOT BE SEALED BY A REGISTERED ENGINEER.
 FOR OVERHANG FALSEWORK BRACING DESIGN, SEE SHEET 3 OF 3.



4-WHEEL MACHINE

4 WHEEL MACHINE	
S/D1	R
<= 1.0	1.00
1.1	1.09
1.2	1.17
1.3	1.23
1.4	1.29
1.5	1.33
1.6	1.38
1.7	1.41
1.8	1.44
1.9	1.47
2.0	1.50
2.2	1.55
2.4	1.58
2.6	1.62
2.8	1.64
3.0	1.67
3.5	1.71
4.0	1.75



8-WHEEL MACHINE

TABLE 2: SCREED LOAD FACTOR "R"

		THE SCREED LOAD FACTOR R (FOR 8 WHEEL MACHINE)																	
		S/D ₂																	
		<= 1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.2	2.4	2.6	2.8	3.0	3.5	4.0
S/D ₁	<= 1.0	1.00	1.09	1.17	1.23	1.29	1.33	1.38	1.41	1.44	1.47	1.50	1.55	1.58	1.62	1.64	1.67	1.71	1.75
	1.1	1.09	1.18	1.26	1.32	1.38	1.42	1.47	1.50	1.54	1.56	1.59	1.64	1.67	1.71	1.73	1.76	1.81	1.84
	1.2	1.17	1.26	1.33	1.40	1.45	1.50	1.54	1.58	1.61	1.64	1.67	1.71	1.75	1.78	1.81	1.83	1.88	1.92
	1.3	1.23	1.32	1.40	1.46	1.52	1.56	1.61	1.64	1.68	1.70	1.73	1.78	1.81	1.85	1.87	1.90	1.95	1.98
	1.4	1.29	1.38	1.45	1.52	1.57	1.62	1.66	1.70	1.73	1.76	1.79	1.83	1.87	1.90	1.93	1.95	2.00	2.07
	1.5	1.33	1.42	1.50	1.56	1.62	1.67	1.71	1.75	1.78	1.81	1.83	1.88	1.92	1.95	1.98	2.00	2.10	2.17
	1.6	1.38	1.47	1.54	1.61	1.66	1.71	1.75	1.79	1.82	1.85	1.88	1.92	1.96	1.99	2.04	2.08	2.18	2.25
	1.7	1.41	1.50	1.58	1.64	1.70	1.75	1.79	1.82	1.86	1.89	1.91	1.96	2.00	2.05	2.11	2.16	2.25	2.32
	1.8	1.44	1.54	1.61	1.68	1.73	1.78	1.82	1.86	1.89	1.92	1.94	1.99	2.06	2.12	2.17	2.22	2.32	2.39
	1.9	1.47	1.56	1.64	1.70	1.76	1.81	1.85	1.89	1.92	1.95	1.97	2.04	2.11	2.18	2.23	2.28	2.38	2.45
	2.0	1.50	1.59	1.67	1.73	1.79	1.83	1.88	1.91	1.94	1.97	2.00	2.09	2.17	2.23	2.29	2.33	2.43	2.50
	2.2	1.55	1.64	1.71	1.78	1.83	1.88	1.92	1.96	1.99	2.04	2.09	2.18	2.26	2.32	2.38	2.42	2.52	2.59
2.4	1.58	1.67	1.75	1.81	1.87	1.92	1.96	2.00	2.06	2.11	2.17	2.26	2.33	2.40	2.45	2.50	2.60	2.67	
2.6	1.62	1.71	1.78	1.85	1.90	1.95	1.99	2.05	2.12	2.18	2.23	2.32	2.40	2.46	2.52	2.56	2.66	2.73	
2.8	1.64	1.73	1.81	1.87	1.93	1.98	2.04	2.11	2.17	2.23	2.29	2.38	2.45	2.52	2.57	2.62	2.71	2.79	
3.0	1.67	1.76	1.83	1.90	1.95	2.00	2.08	2.16	2.22	2.28	2.33	2.42	2.50	2.56	2.62	2.67	2.76	2.83	
3.5	1.71	1.81	1.88	1.95	2.00	2.10	2.18	2.25	2.32	2.38	2.43	2.52	2.60	2.66	2.71	2.76	2.86	2.93	
4.0	1.75	1.84	1.92	1.98	2.07	2.17	2.25	2.32	2.39	2.45	2.50	2.59	2.67	2.73	2.79	2.83	2.93	3.00	

TABLE 3: ALLOWABLE SPAN LENGTH OF JOISTS AND JOIST SPACINGS

AVG. SLAB THICKNESS (IN)	LUMBER JOIST SIZE (IN X IN)	JOIST SPACINGS			
		15 IN	12 IN	10 IN	8 IN
		THE ALLOWABLE SPAN LENGTH OF JOISTS			
10	2 X 4	—	4' - 6"	4' - 9"	5' - 0"
	4 X 4	5' - 9"	6' - 3"	6' - 6"	6' - 7"
12	2 X 4	—	4' - 3"	4' - 9"	5' - 0"
	4 X 4	5' - 3"	6' - 0"	6' - 3"	6' - 5"
14	2 X 4	—	4' - 0"	4' - 6"	5' - 0"
	4 X 4	—	5' - 6"	6' - 0"	6' - 4"
16	2 X 4	—	4' - 0"	4' - 3"	4' - 9"
	4 X 4	—	5' - 3"	5' - 9"	6' - 3"

PROJECT NO. B-3509
ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

SHEET 2 OF 3

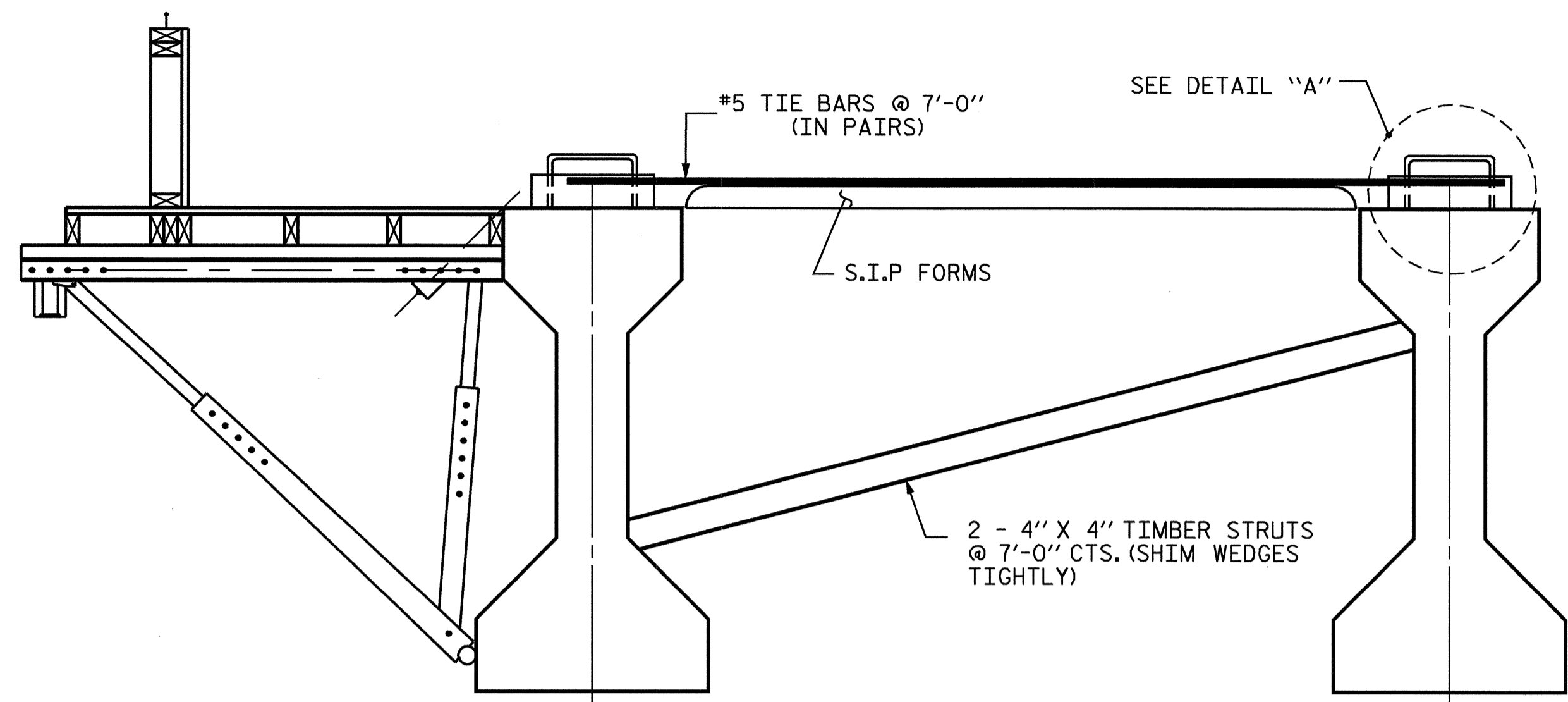
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD OVERHANG FALSEWORK
 AASHTO TYPES III, IV, V, AND VI

Chang-Chuan V. Chao
 8-18-2005

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			5-52
2			4			TOTAL SHEETS 53

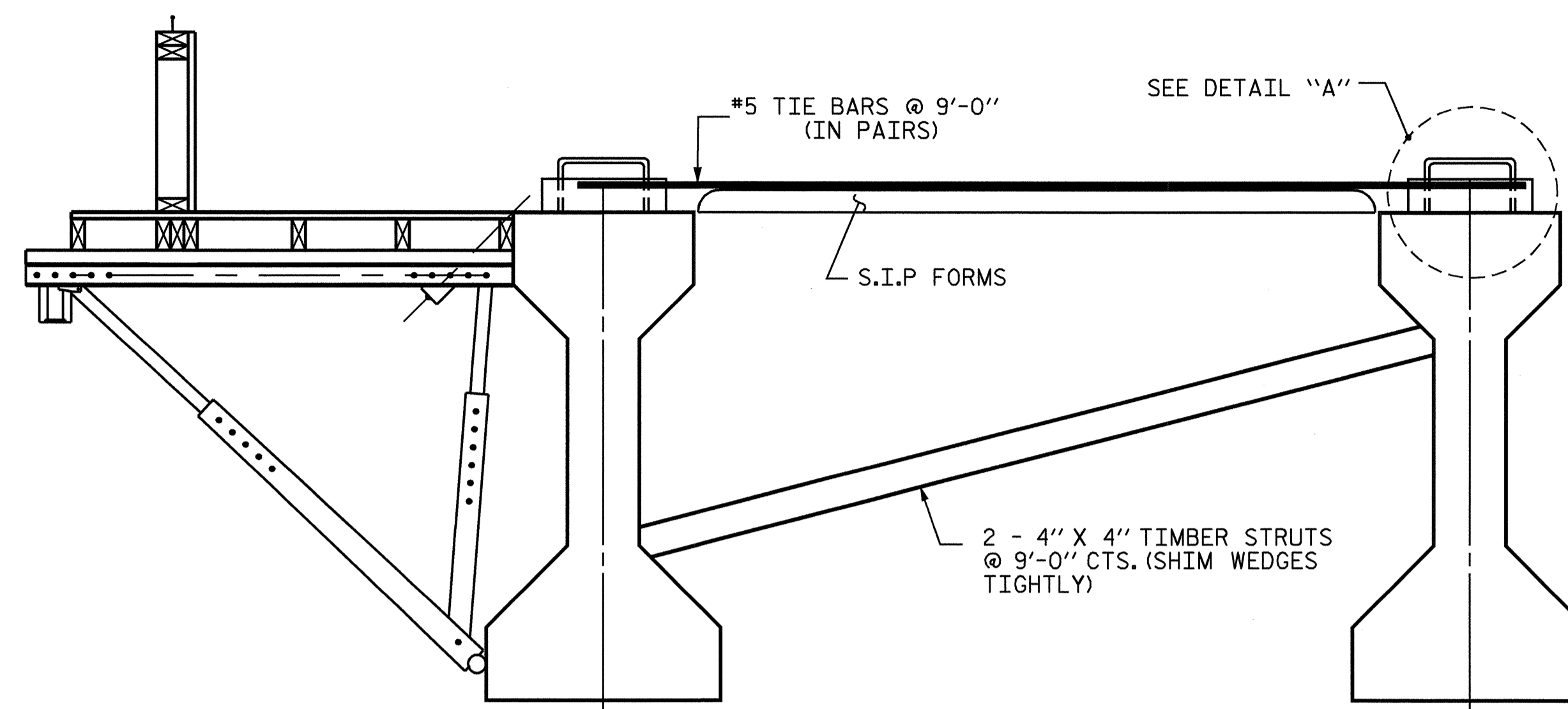
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DRAWN BY: R. WRIGHT 06/04	REV.
CHECKED BY: C. V. CHAO 06/04	



EXTERIOR GIRDER

INTERIOR GIRDER

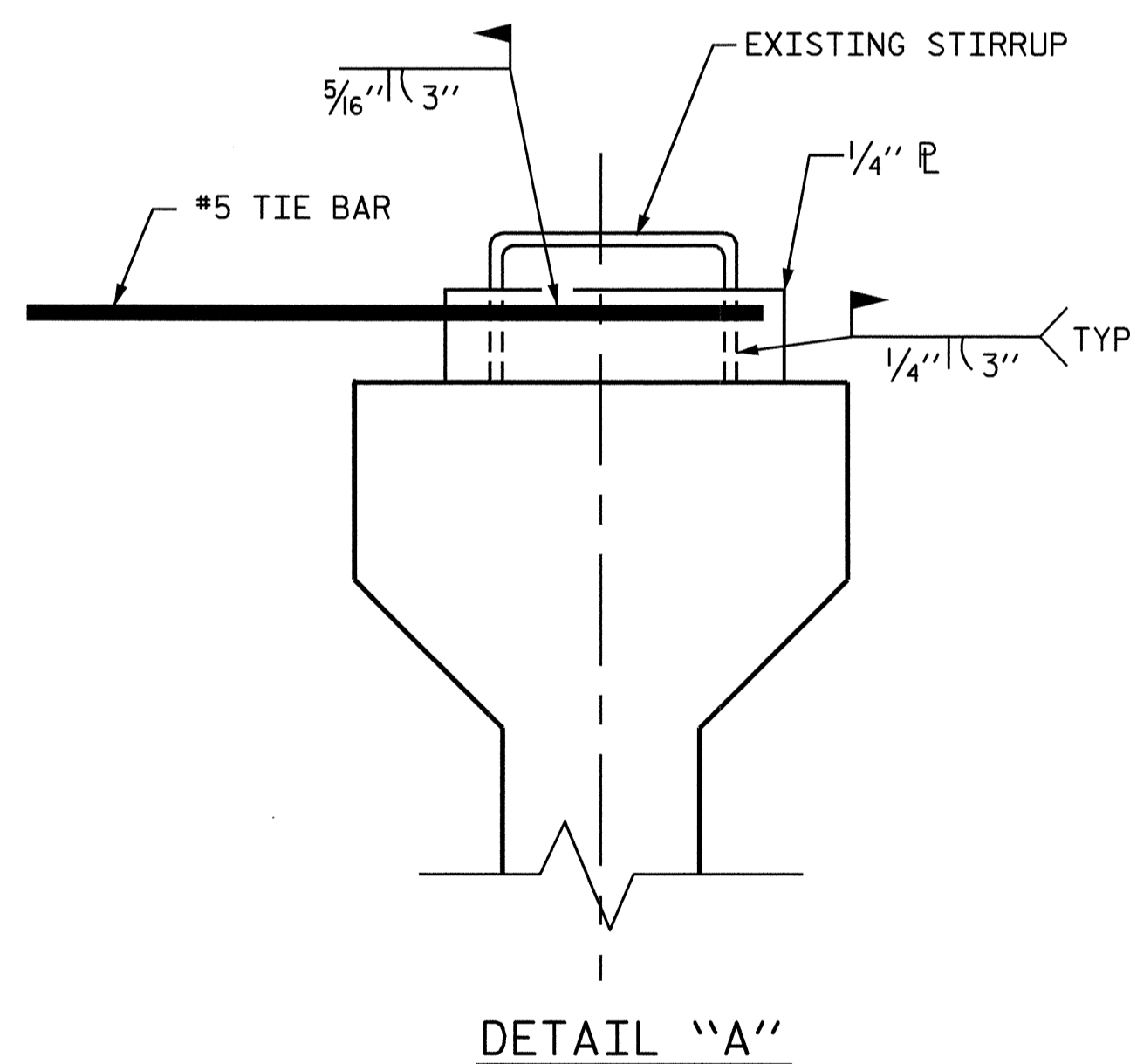
DETAIL OF REQUIRED OVERHANG
FALSEWORK BRACING SYSTEM - SPAN A



EXTERIOR GIRDER

INTERIOR GIRDER

DETAIL OF REQUIRED OVERHANG
FALSEWORK BRACING SYSTEM - SPANS B, C, & D



DETAIL "A"

NOTES:

EACH #5 TIE BAR SHALL BE WELDED TO ONE STIRRUP LOOP AS SHOWN IN DETAIL "A". #5 TIE BARS SHALL BE WELDED TO TWO ADJACENT STIRRUPS OF THE EXTERIOR GIRDER AND THE ADJACENT INTERIOR GIRDER BETWEEN PERMANENT DIAPHRAGMS. WELD STEEL PLATES IN BETWEEN THE TIE BARS AND THE STIRRUP LOOP. WELDING TWO TIE BARS TO THE SAME STIRRUP LOOP SHALL NOT BE PERMITTED.

MAXIMUM SPACING BETWEEN THE BRACING (TIE BARS-TIMBER STRUT) ARE 7'-0" CTS. FOR SPAN A AND 9'-0" CTS. FOR SPANS B, C, AND D. #5 TIE BARS SHALL BE LOCATED OVER A TIMBER STRUT.

INSTALL TIE BARS AND TIMBER STRUTS PRIOR TO PLACEMENT OF CONCRETE OR SCREED WEIGHT ONTO THE OVERHANG FALSEWORK.

PROJECT NO. B-3509
ROCKINGHAM COUNTY
 STATION: 15+67.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
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 RALEIGH

STANDARD OVERHANG FALSEWORK
 AASHTO TYPES
 III, IV, V, AND VI

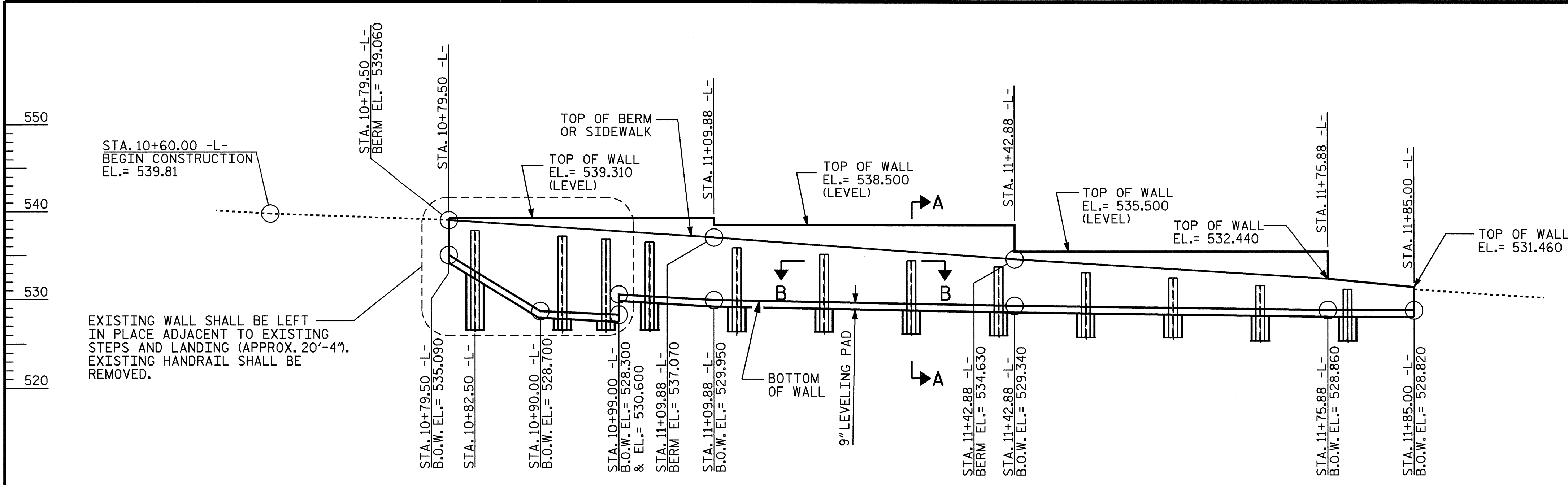


Chang-Chuan V. Chao
 8-18-2005

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1			3			TOTAL SHEETS
2			4			53

DRAWN BY: R. WRIGHT 06/04 DATE : _____
 CHECKED BY: C. V. CHAO 06/04 DATE : _____

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ELEVATION OF RETAINING WALL

SEE SHEET 3 OF 4 FOR SECTION A AND SECTION B
BERM ELEVATIONS ARE GIVEN AT THE TRAFFIC FACE OF PROPOSED RETAINING WALL

NOTES:

FOR PILE RETAINING WALL WITH CAST IN PLACE FACE, SEE SPECIAL PROVISIONS.

CLASS A CONCRETE SHALL BE USED IN ALL CAST-IN-PLACE FACE AND LEVELING PADS.

DRILLED PIER CONCRETE SHALL BE USED IN ALL CONCRETE ENCASEMENT OF THE SOLDIER PILES

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

GROOVED CONTRACTION JOINTS 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF RETAINING WALL IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET.

"W" BARS MAY BE SHIFTED AS NECESSARY TO CLEAR THE 4 1/2" Ø FORMED HOLES FOR THE HANDRAILS.

PROPOSED RETAINING WALL IS TO RUN STRAIGHT ALONG THE ENTIRE LENGTH OF WALL. LOCATE BEGINNING AND END POINTS OF PROPOSED WALL SUCH THAT CENTERLINE OF PROPOSED PILE TO TRAFFIC FACE OF EXISTING WALL IS 1'-2". SEE SECTION A, SHEET 3 OF 4.

THE CONCRETE RETAINING WALL IS TO BE COLORED TO CLOSELY MATCH THE EXISTING WALL IT IS TO REPLACE. BEFORE ANY CONCRETE IS PLACED, THE ENGINEER AND PROPERTY OWNER OF THE SPRAY COTTON MILL ARE TO AGREE ON THE FINAL COLOR SELECTION. THE CONCRETE WILL THEN BE EITHER TINTED OR STAINED TO THE COLOR CHOSEN. THE COST OF COLORING THE CONCRETE WILL BE INCIDENTAL TO THE PAY ITEM "PILE RETAINING WALL WITH CAST-IN-PLACE FACE".

PILES SHALL BE INSTALLED BY DRILLING OR CORING. THE EXCAVATED HOLE SHALL BE 24 INCH MINIMUM DIAMETER AND BACKFILLED WITH CONCRETE TO ELEVATIONS SHOWN ON PLANS. SEE PILE RETAINING WALL WITH CAST-IN-PLACE FACE SPECIAL PROVISION FOR SPECIFIED CONCRETE DETAILS.

THE TOP OF THE INSTALLED PILES SHALL BE WITHIN 2" OF THEIR PLAN LOCATION IN ANY DIRECTION.

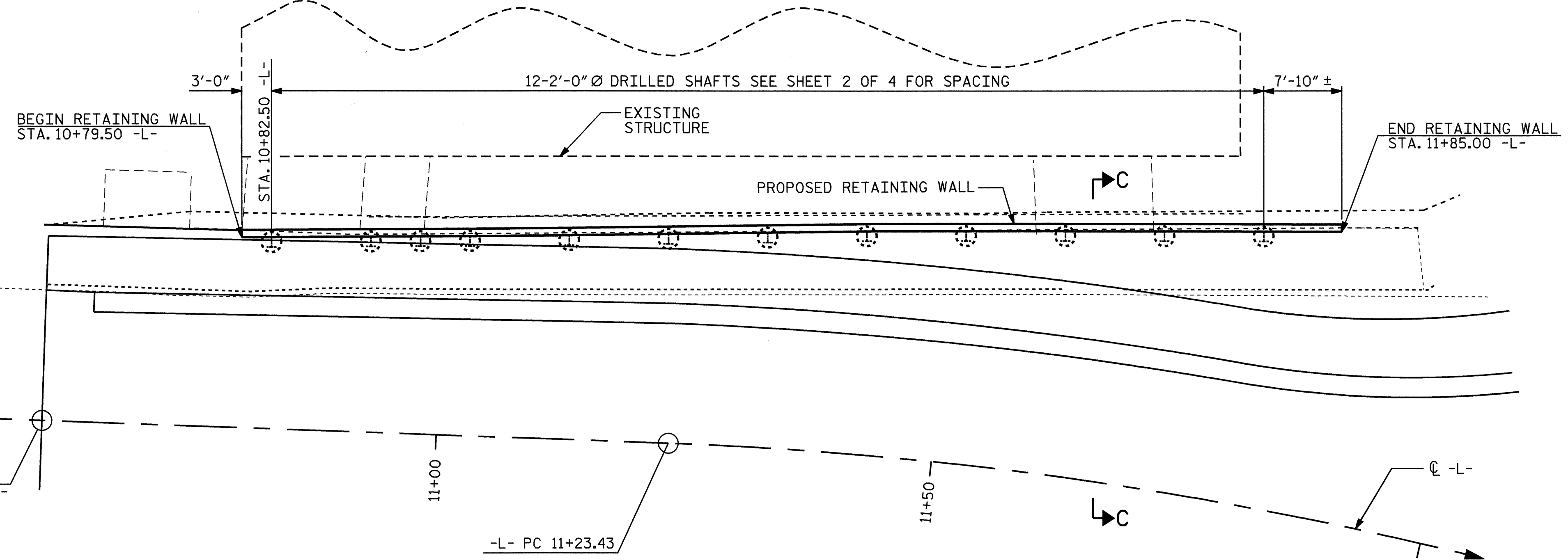
TIMBER LAGGING SHALL BE HELD SECURELY AGAINST PILES UNTIL BACKFILL IS PLACED, SEE SPECIAL PROVISIONS.

TOP OF WALL ELEVATIONS AT BOTH ENDS ARE ESTIMATED VALUES. THESE ELEVATIONS MAY BE ADJUSTED IN THE FIELD UPON APPROVAL BY THE ENGINEER TO ENSURE THAT BOTH ENDS OF THE WALL ARE TIED-IN/ZERO OUT WITH THE PROPOSED SIDEWALK.

BACKFILL MATERIAL BEHIND THE TIMBER LAGGING AND BETWEEN THE LEAN SAND GROUT AROUND THE PILES SHALL BE SELECT MATERIAL CLASS VI AND COMPACTED AS REQUIRED BY THE ENGINEER. THE SELECT MATERIAL SHALL BE RODDED AND SPREAD IN ORDER TO FILL ALL VOIDS AND INSURE MAXIMUM DENSITY. FLUSHING THE SELECT MATERIAL WITH WATER WILL NOT BE ALLOWED.

ALL STRUCTURE EXCAVATION NECESSARY FOR THE CONSTRUCTION OF THE RETAINING WALL IS INCIDENTAL TO THE COST OF THE WALL.

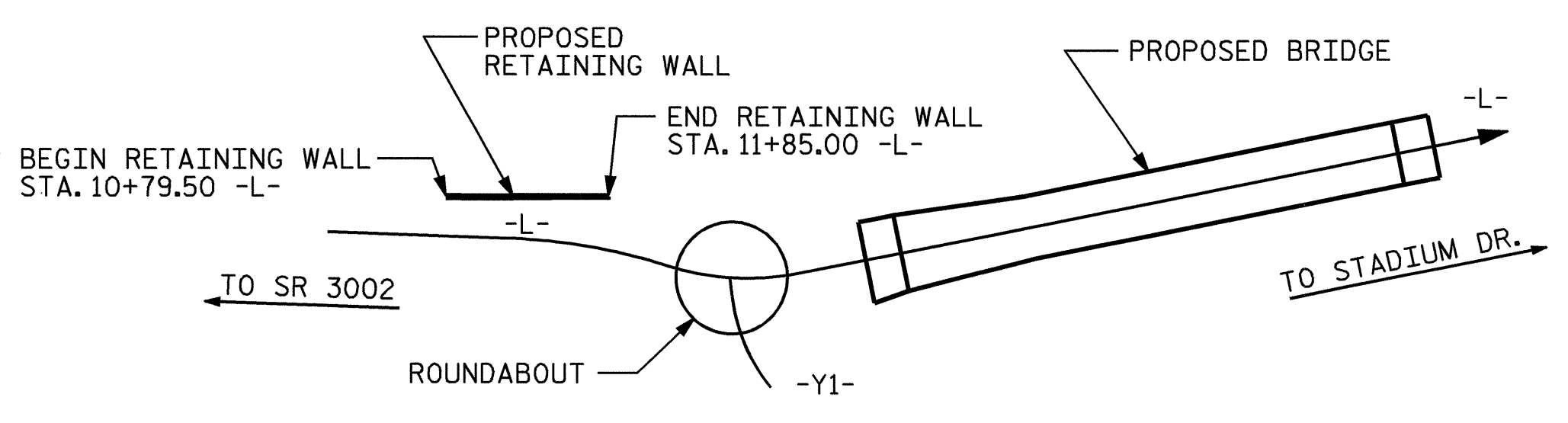
FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.



PLAN OF RETAINING WALL

SEE SHEET 3 OF 4 FOR SECTION C

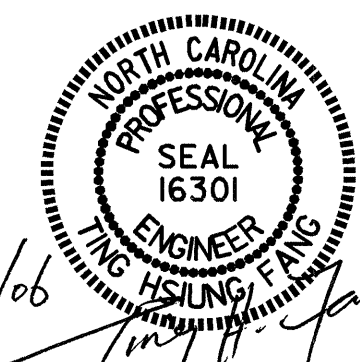
STRUCTURE QUANTITIES	
PILE RETAINING WALL WITH CAST-IN-PLACE FACE	LUMP SUM



LOCATION SKETCH

DRAWN BY : M.A. ALLEN DATE : 7/05
CHECKED BY : T.H. FANG DATE : 8/05

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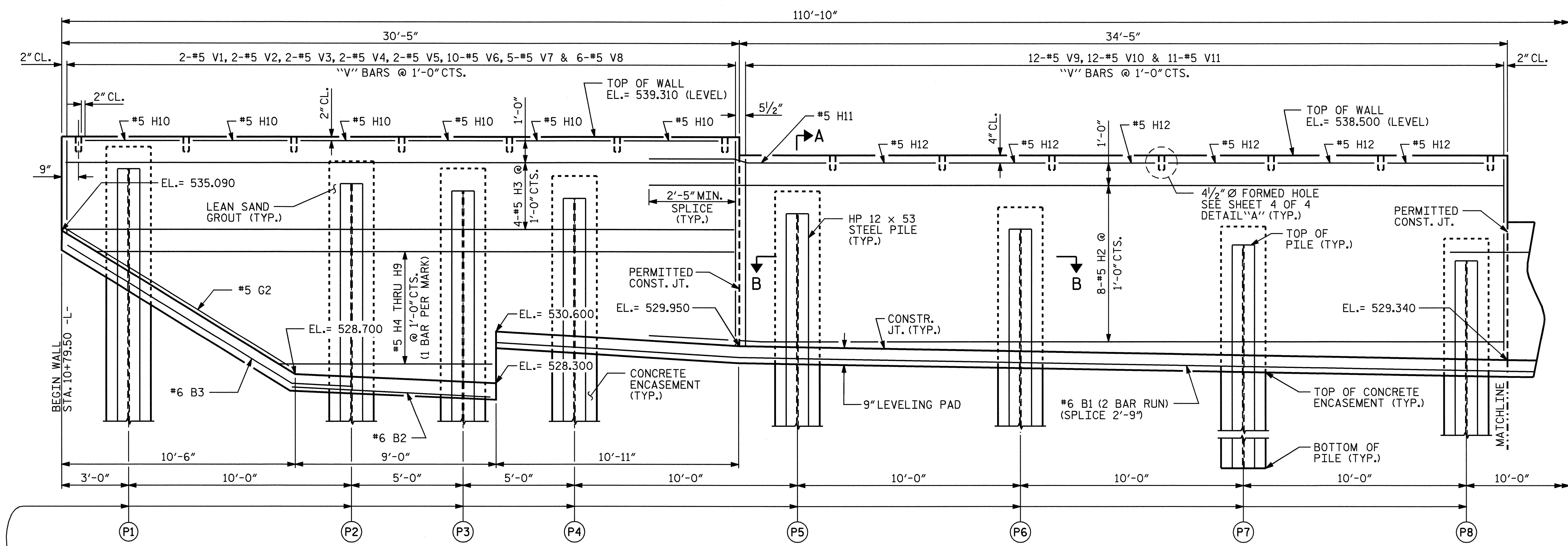
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SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

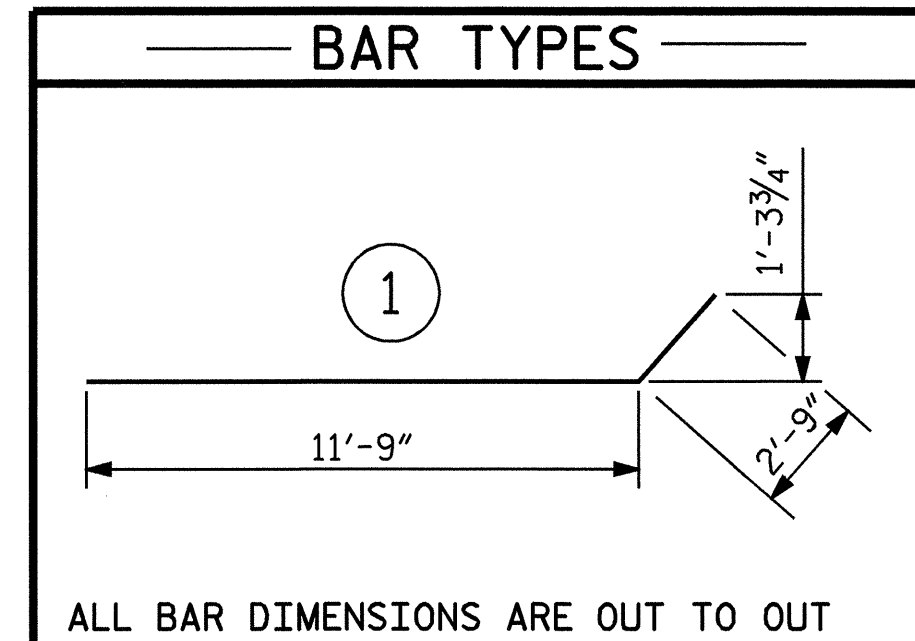
RETAINING WALL

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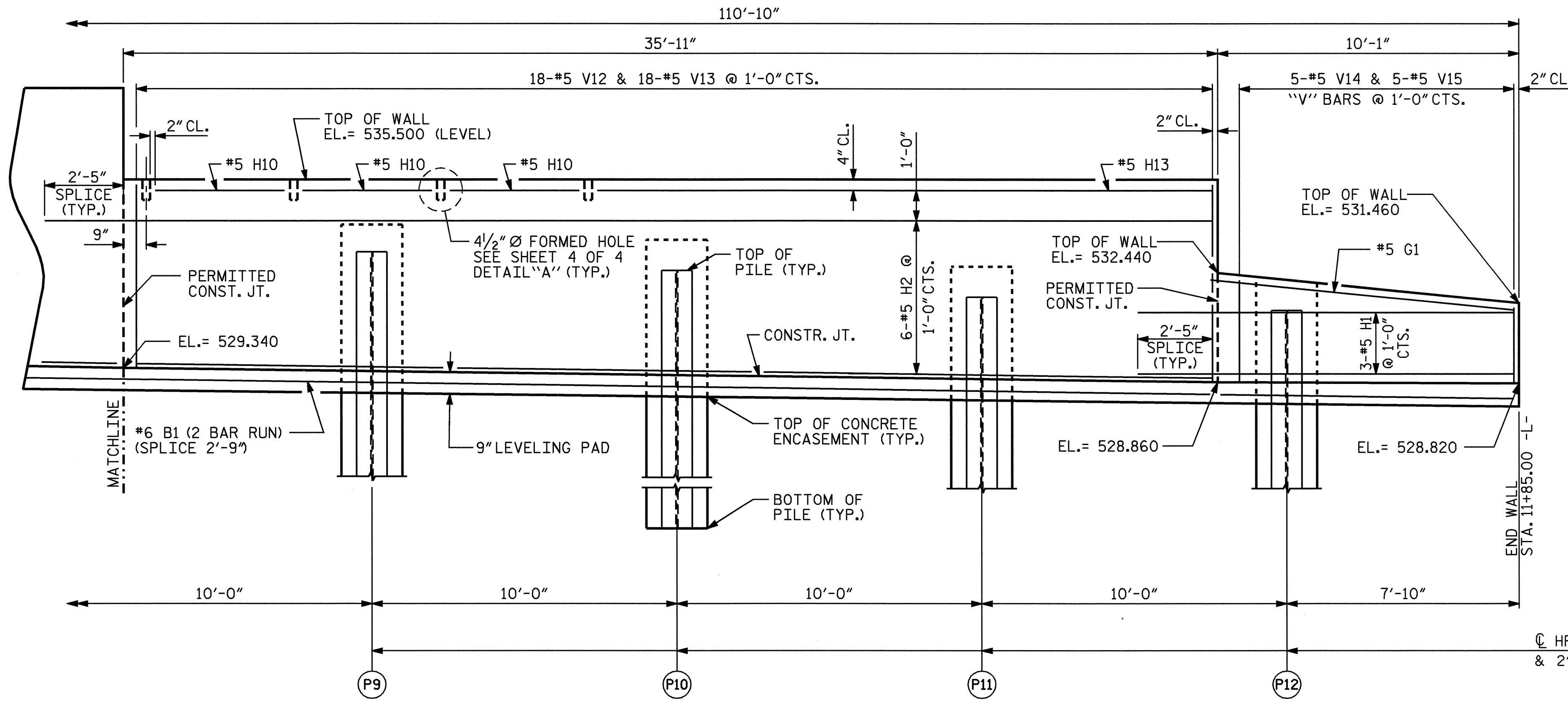
PARTIAL ELEVATION

SEE SHEET 3 OF 3 FOR SECTION A AND SECTION B



ALL BAR DIMENSIONS ARE OUT TO OUT

PILE	TOP OF PILE ELEVATION	BOTTOM OF PILE ELEVATION	PILE LENGTH	TOP OF CONCRETE ENCASEMENT ELEVATION
P1	537.860	524.360	13.50'	533.810
P2	537.210	513.710	23.50'	527.950
P3	536.880	515.380	21.50'	527.750
P4	536.550	513.050	23.50'	527.550
P5	535.880	516.380	19.50'	529.150
P6	535.140	517.140	18.00'	528.970
P7	534.400	517.400	17.00'	528.780
P8	533.660	517.660	16.00'	528.600
P9	532.990	518.490	14.50'	528.450
P10	532.330	518.830	13.50'	528.300
P11	531.660	519.660	12.00'	528.160
P12	531.210	520.210	11.00'	528.110



PARTIAL ELEVATION

BILL OF MATERIAL

RETAINING WALL					
BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
B1	4	6	STR	47'-3"	284
B2	2	6	STR	8'-11"	27
B3	2	6	1	14'-6"	44
G1	1	5	STR	10'-0"	10
G2	1	5	STR	12'-2"	13
H1	3	5	STR	12'-4"	39
H2	14	5	STR	38'-4"	560
H3	4	5	STR	30'-0"	125
H4	1	5	STR	28'-7"	30
H5	1	5	STR	26'-11"	28
H6	1	5	STR	25'-4"	26
H7	1	5	STR	23'-8"	25
H8	1	5	STR	11'-2"	12
H9	1	5	STR	9'-7"	10
H10	9	5	STR	4'-3"	40
H11	1	5	STR	6'-7"	7
H12	6	5	STR	4'-4"	27
H13	1	5	STR	20'-2"	21
V1	2	5	STR	4'-2"	9
V2	2	5	STR	5'-5"	11
V3	2	5	STR	6'-7"	14
V4	2	5	STR	7'-10"	16
V5	2	5	STR	9'-0"	19
V6	10	5	STR	10'-5"	109
V7	5	5	STR	8'-7"	45
V8	6	5	STR	8'-11"	56
V9	12	5	STR	8'-4"	104
V10	12	5	STR	8'-7"	107
V11	11	5	STR	8'-9"	100
V12	18	5	STR	6'-0"	113
V13	18	5	STR	6'-3"	117
V14	5	5	STR	2'-11"	15
V15	5	5	STR	2'-6"	13
REINFORCING STEEL					LBS. 2176
CLASS A CONCRETE					
LEVELING PAD					3.1 CU. YD.
RETAINING WALL					23.3 CU. YD.
TOTAL CLASS A CONCRETE					26.4 CU. YD.
SELECT MATERIAL CLASS VI					15.0 CU. YD.
TOTAL LEAN SAND GROUT					7.2 CU. YD.
TIMBER LAGGING				SQ. FEET	580
HP 12 X 53 STEEL PILES NO. 12			LIN. FEET		203.5
3" Ø GALVANIZED STEEL PIPE RAIL			LIN. FEET		77.83
DRILLED PIER					
DRILLED PIER CONCRETE					15.5 CU. YD.
2'-0" Ø DRILLED SHAFTS IN SOIL				LIN. FEET	133.3

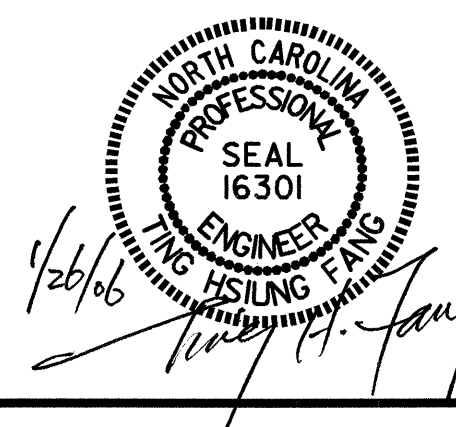
PROJECT NO. B-3509
ROCKINGHAM COUNTY
 STATION: 11+32.25 -L-
 SHEET 2 OF 4

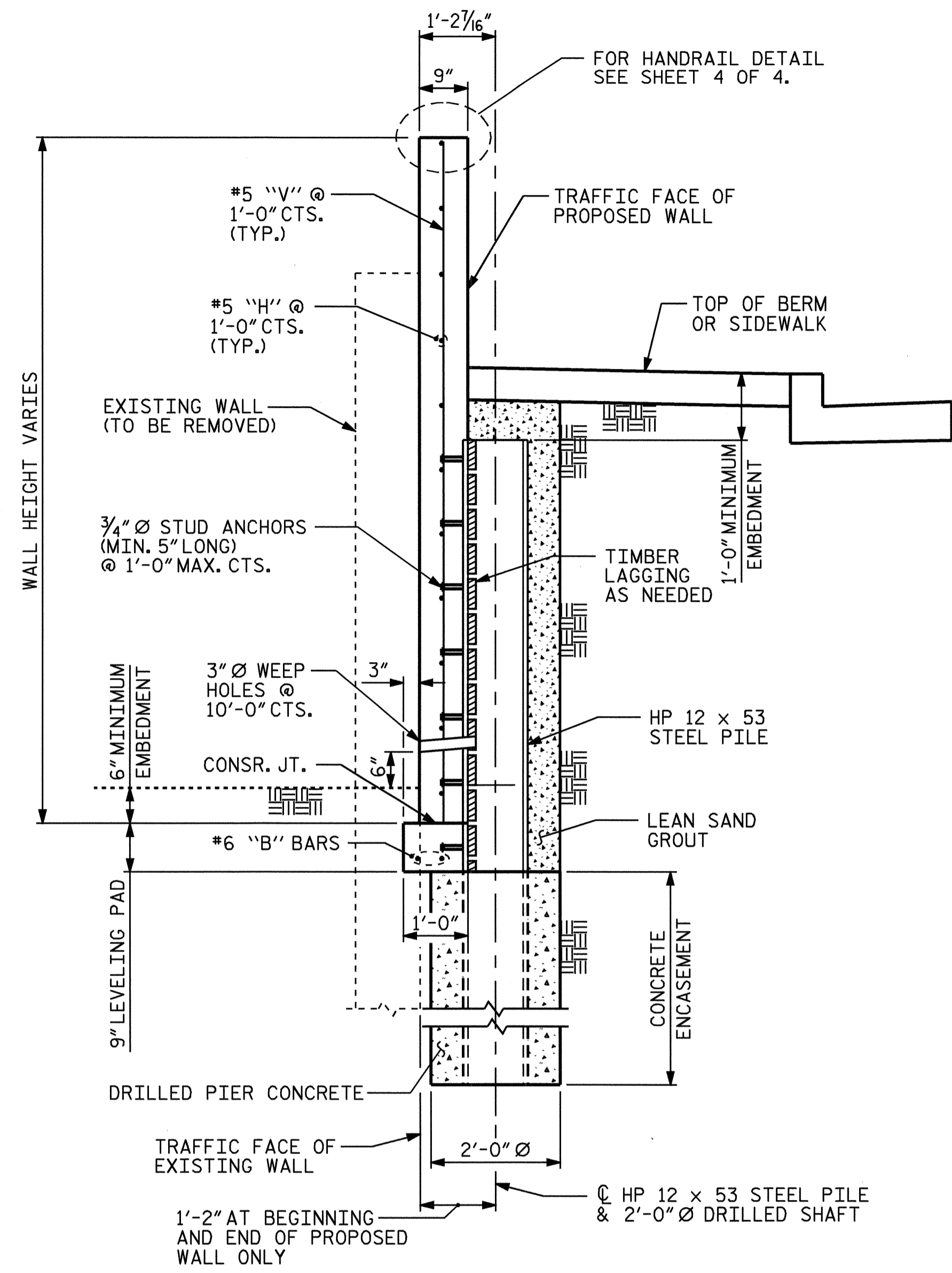
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

RETAINING WALL

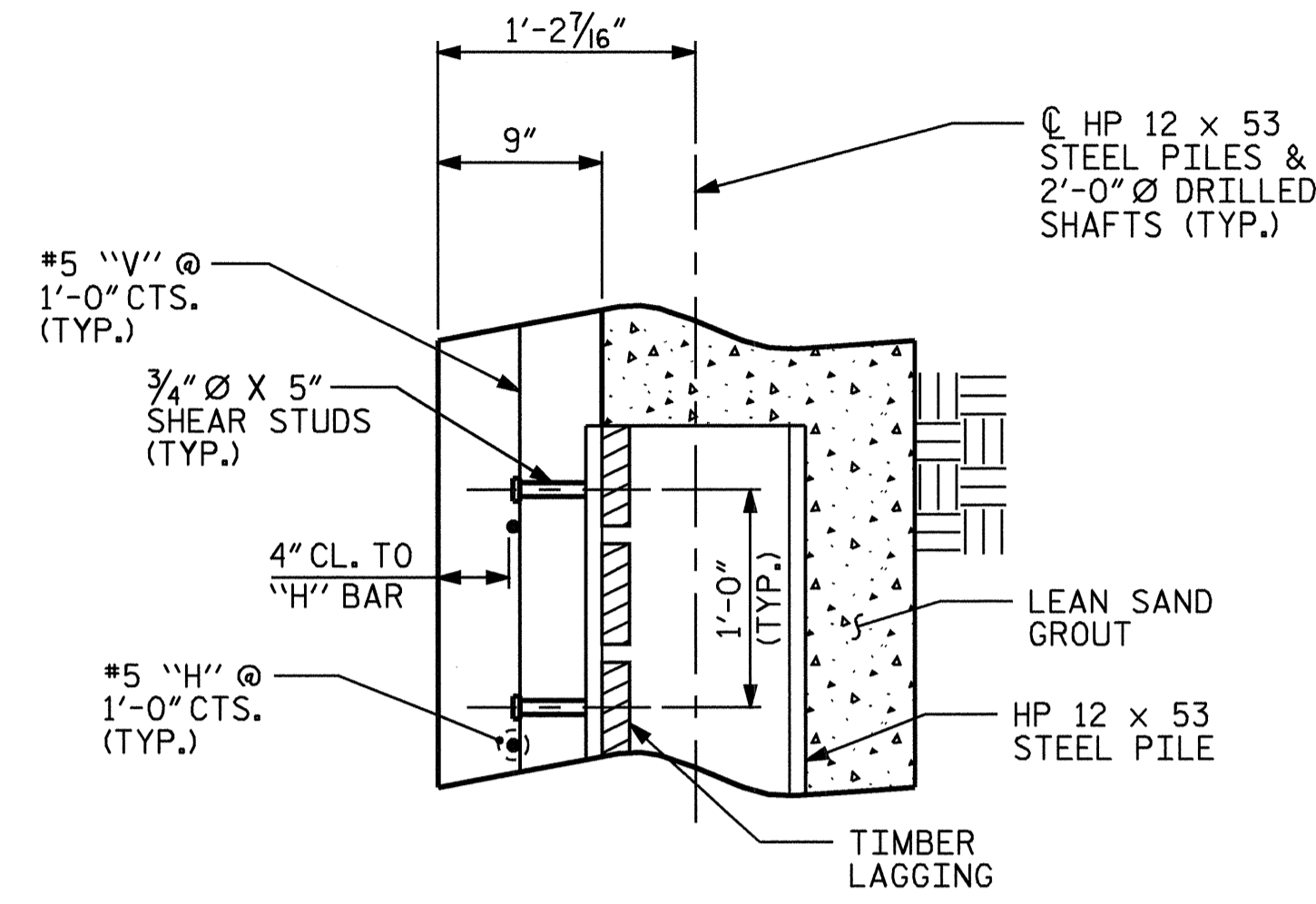
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 CHECKED BY: T.H. FANG DATE: 8/05

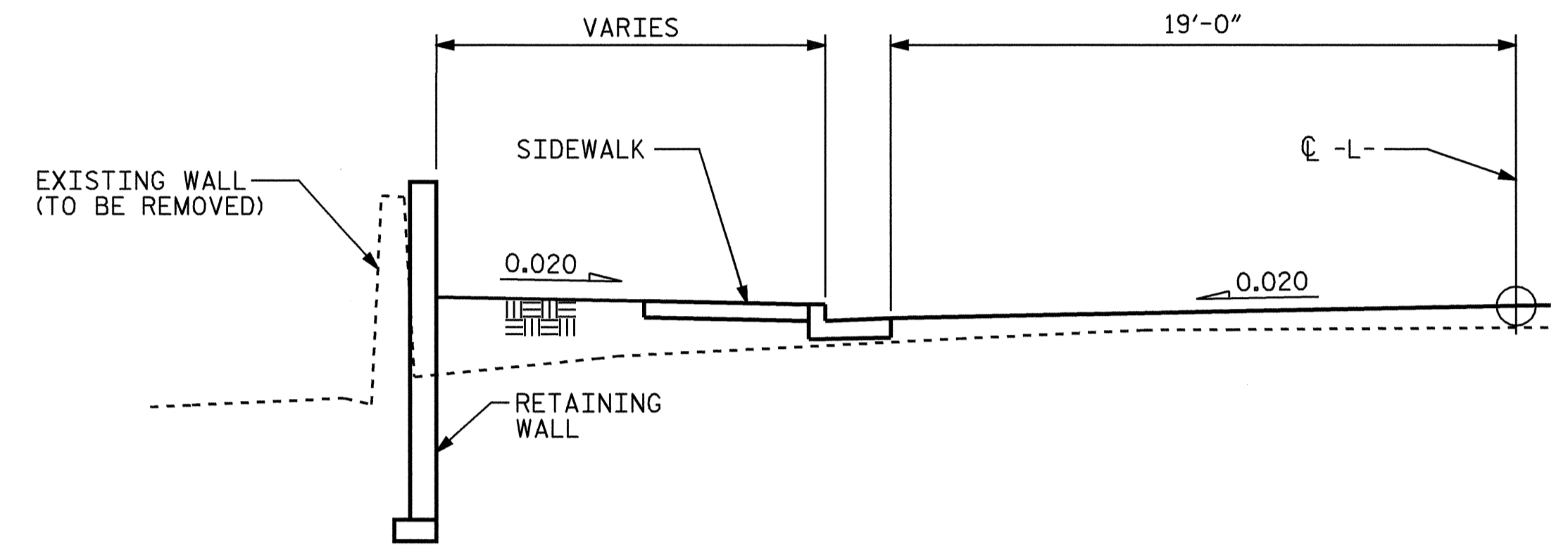




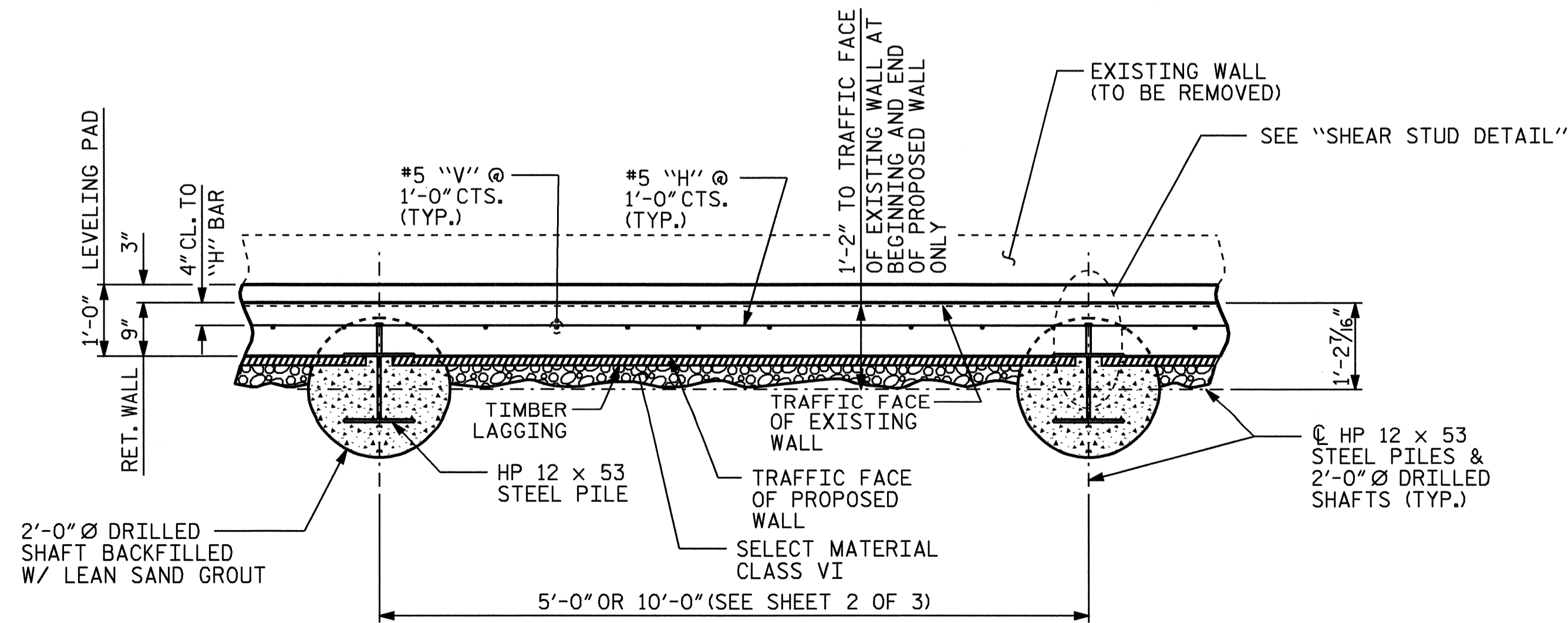
SECTION A



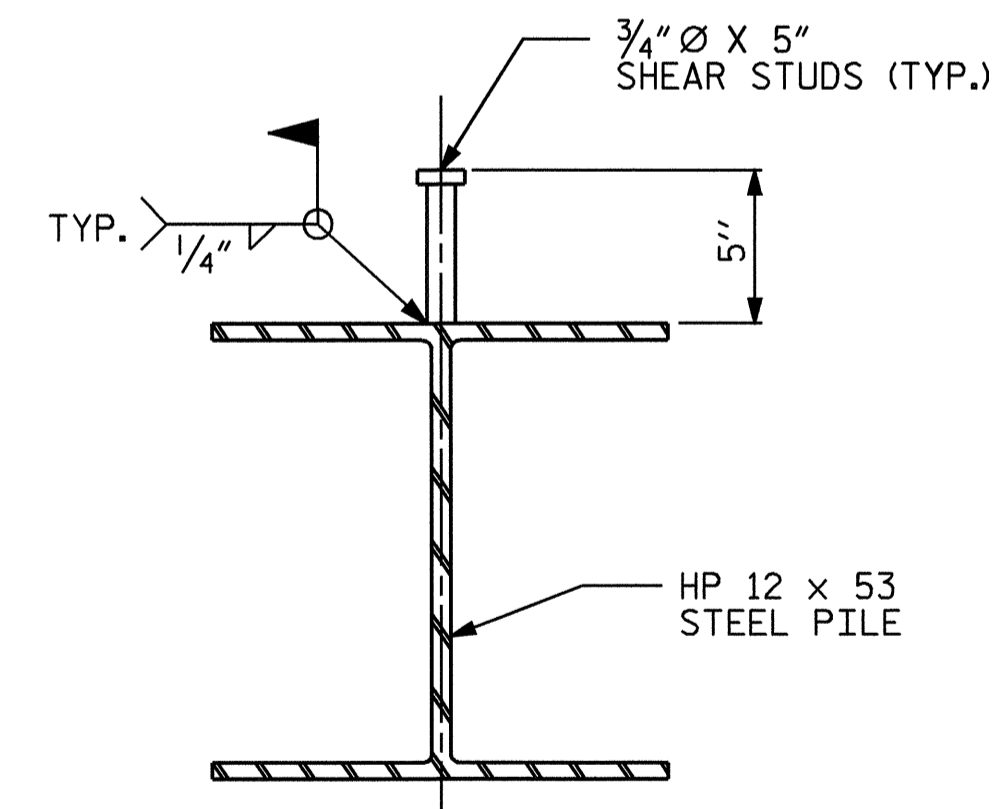
WALL DETAIL



SECTION C
(STA. 10+79.50 -L- TO STA. 11+85.00 -L-)



SECTION B



SHEAR STUD DETAIL

PROJECT NO. B-3509
ROCKINGHAM COUNTY
 STATION: 11+32.25 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
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RETAINING WALL

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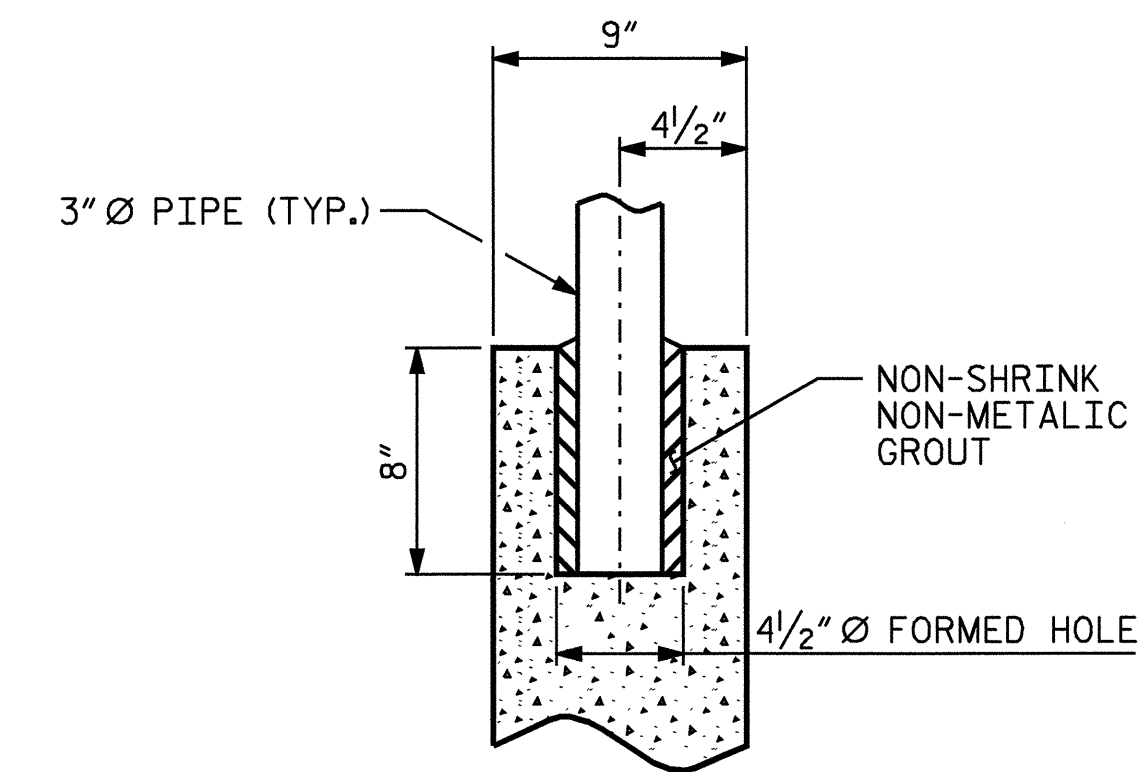
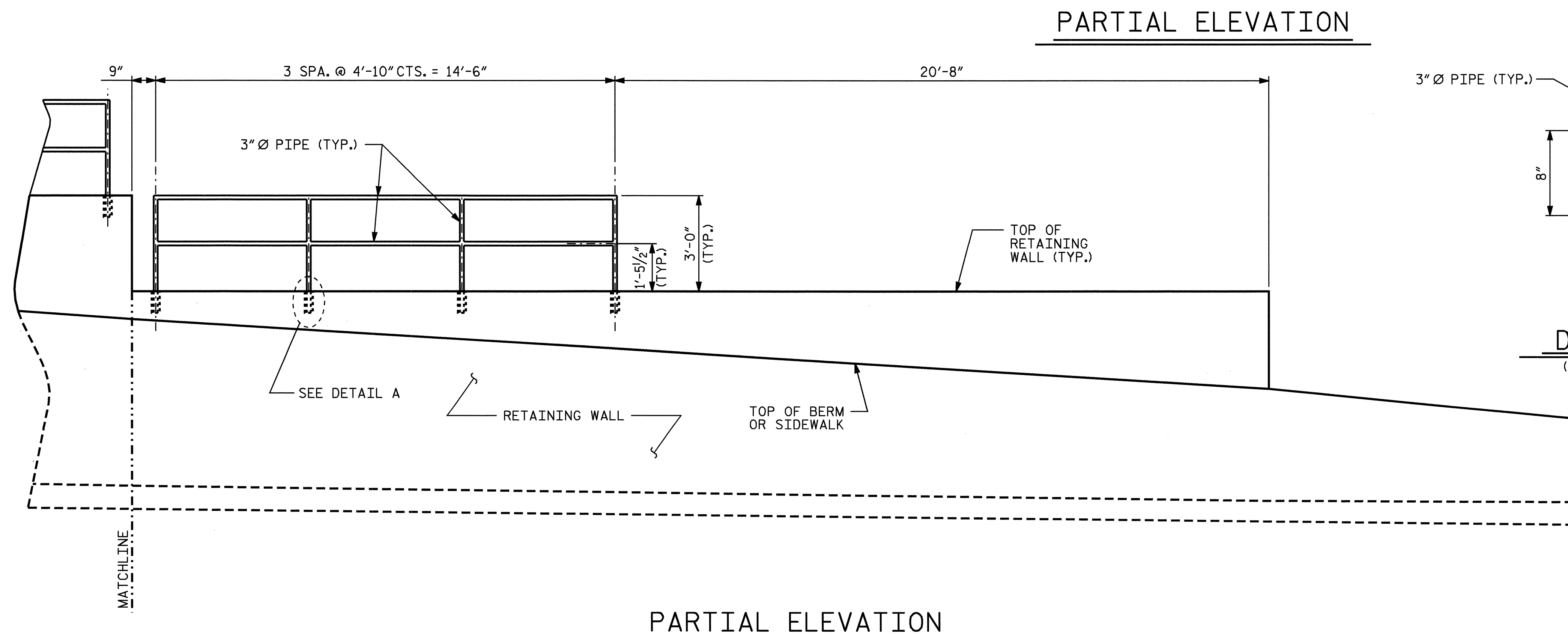
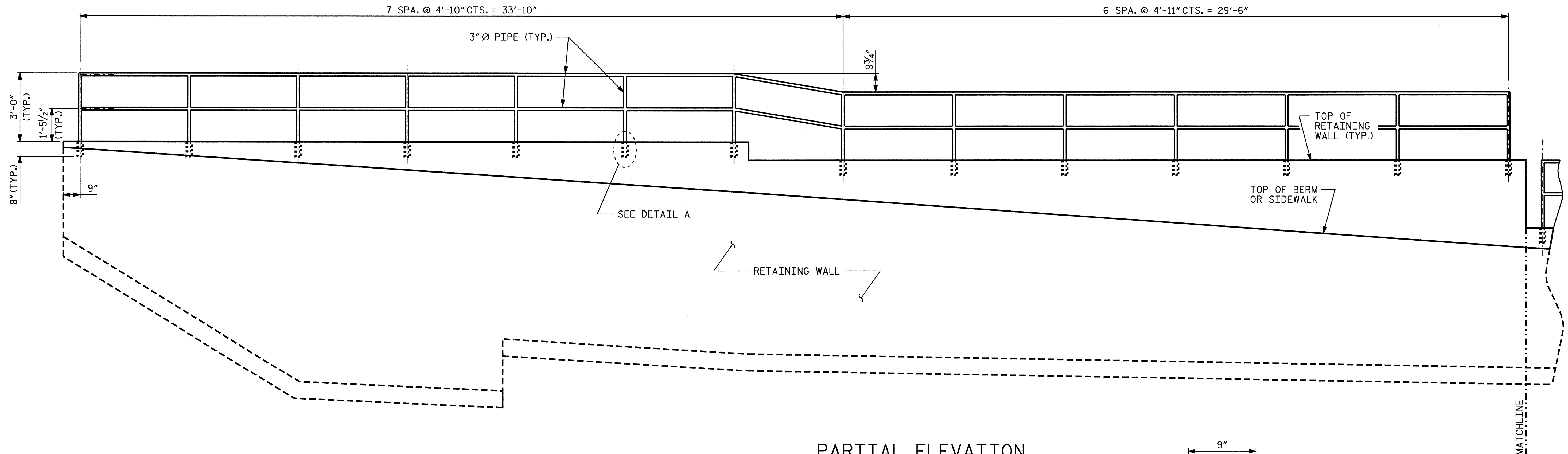
NOTES:

THE 3" Ø STEEL PIPE SHALL MEET THE REQUIREMENTS OF ASTM A53 FOR STANDARD WEIGHT PIPE AND SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

POSTS AND VERTICAL ELEMENTS OF THE RAIL SHALL BE PLUMB.

THE PIPE RAIL POSTS SHALL BE GROUTED IN PLACE USING NON-SHRINK, NON-METALLIC GROUT AS APPROVED BY THE ENGINEER.

THE METAL RAIL ATTACHED TO THE TOP OF THE CONCRETE RETAINING WALL IS TO BE PAINTED TO A COLOR CLOSELY MATCHING THAT OF THE EXISTING RAIL. THE ENGINEER AND THE OWNER OF THE SPRAY COTTON MILL WILL AGREE ON THE COLOR PAINT TO BE USED. THE PAINT USED WILL BE COMPATIBLE WITH THE GALVANIZING ON THE RAIL. THE COST OF PAINTING THE RAIL WILL BE INCLUDED IN THE PRICE BID FOR "3" DIA. GALVANIZED STEEL PIPE RAIL."



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SHEET 4 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
RETAINING WALL					
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