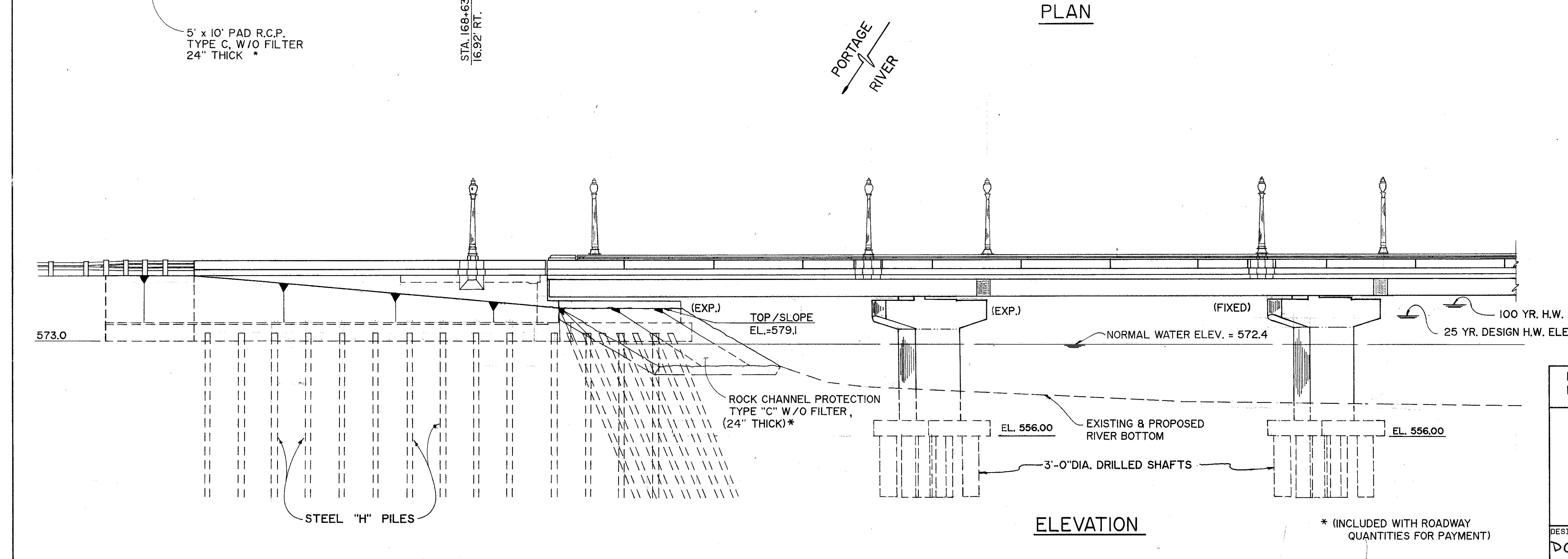
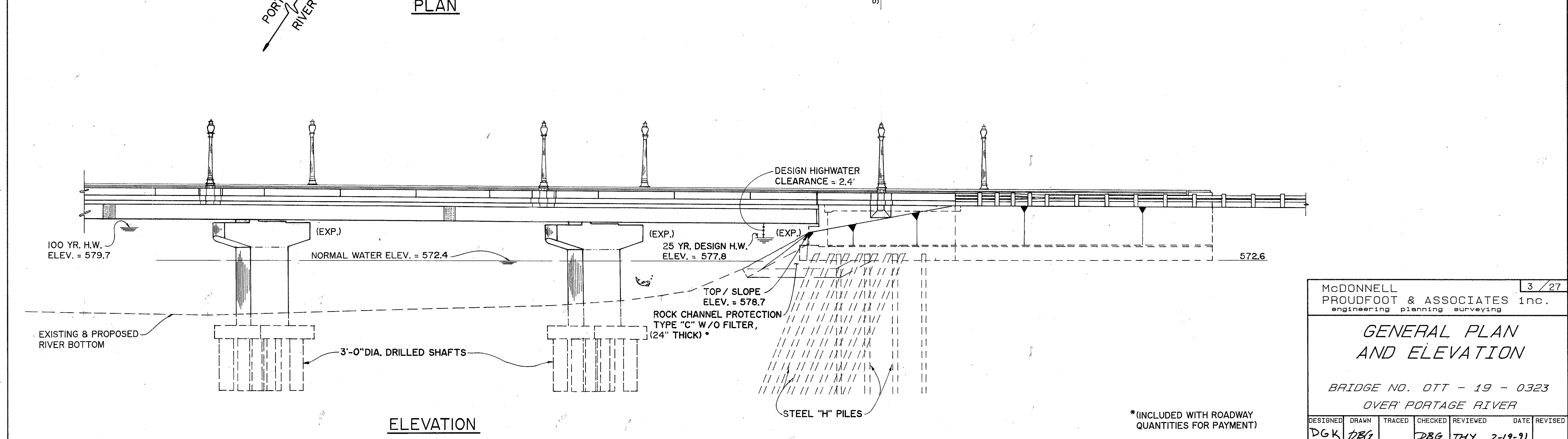
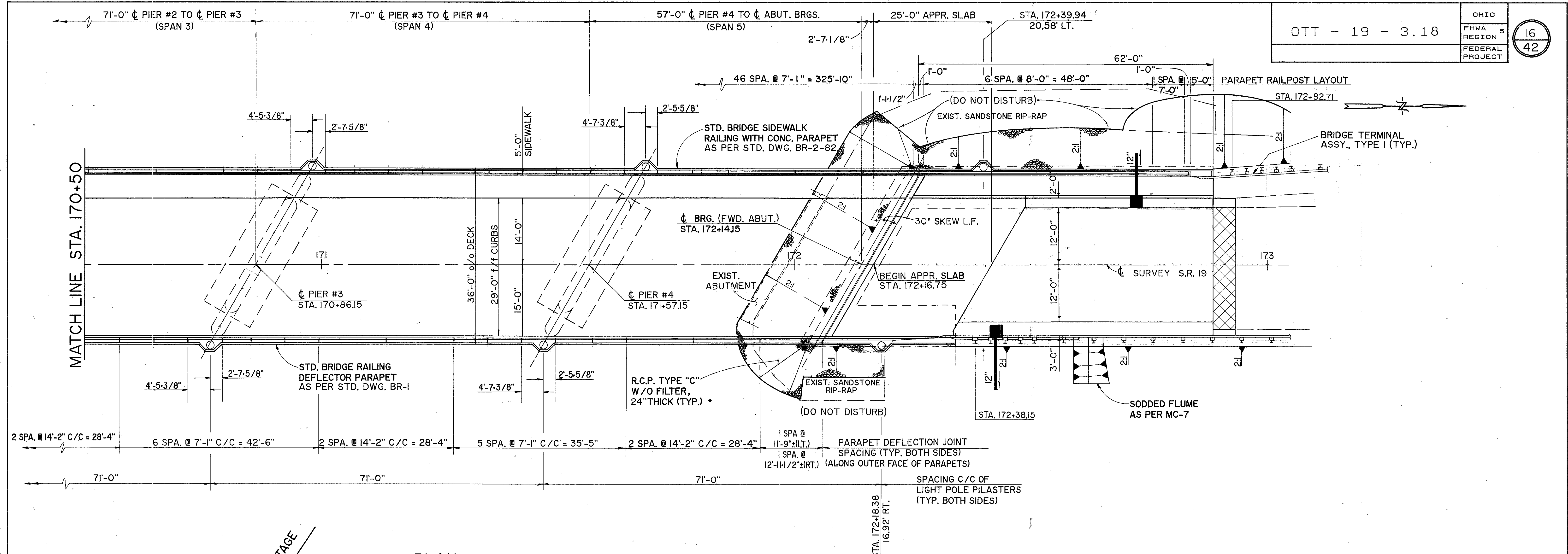


MATCH LINE STA. 170+50



McDONNELL PROUDFOOT & ASSOCIATES inc. engineering planning surveying		2 / 27	
<b>GENERAL PLAN AND ELEVATION</b>			
BRIDGE NO. OTT - 19 - 0323 OVER PORTAGE RIVER			
DESIGNED	DRAWN	TRACED	CHECKED
DGK	DBG		DBG
REVIEWED	DATE	REVISED	
THY	2-19-91		



McDONNELL PROUDFOOT & ASSOCIATES inc. 3/27  
 engineering planning surveying

**GENERAL PLAN AND ELEVATION**

BRIDGE NO. OTT - 19 - 0323  
 OVER PORTAGE RIVER

DESIGNED DRAWN TRACED CHECKED REVIEWED DATE REVISED  
 DGK DBG DBG THY 2-19-91

\*(INCLUDED WITH ROADWAY QUANTITIES FOR PAYMENT)

**STANDARD DRAWINGS**

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS

AS-1-81	DTD. 11-27-81	SD-1-69	DTD. 6-12-69
BR-2-82	DTD. 11-1-82	HL-20.14	DTD. 5-1-87
DBR-2-73	DTD. 4-10-73	HL-30.31	DTD. 5-1-87
EXJ-4-87	DTD. 1-5-89	HL-50.21	DTD. 5-1-87

AND TO SUPPLEMENTAL SPECIFICATIONS

836	DTD. 11-12-85	853	DTD. 6-26-78
852	DTD. 6-10-87	952	DTD. 6-10-87

**DESIGN SPECIFICATIONS**

THIS STRUCTURE CONFORMS TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION FOR STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 1989, INCLUDING THE 1990 INTERIM SPECIFICATIONS, AND THE OHIO "SUPPLEMENT" TO THESE SPECIFICATIONS.

**DESIGN DATA**

DESIGN LOADING	HS 20-44 CASE II AND THE ALTERNATE MILITARY LOADING
CONCRETE CLASS C	COMPRESSIVE STRENGTH 4000 P.S.I. (SUBSTRUCTURE)
CONCRETE CLASS S	COMPRESSIVE STRENGTH 4500 P.S.I. (SUPERSTRUCTURE)
REINFORCING STEEL	ASTM A615, A616, OR A617 : GRADE 60 MINIMUM YIELD STRENGTH = 60,000 P.S.I. SPIRAL REIN. MAY BE PLAIN ASTM A820 OR A615
STRUCTURAL STEEL	ASTM A588 MINIMUM YIELD STRENGTH = 50,000 P.S.I.

**REMOVAL AND DISPOSAL OF EXISTING BRIDGE**

WHEN NO LONGER REQUIRED TO MAINTAIN TRAFFIC, THE EXISTING STRUCTURE SHALL BE REMOVED AS PER 202.03 OF THE C.M.S. SUITABLE WASTE MASONRY MAY BE PLACED AS BANK PROTECTION AS DIRECTED BY THE ENGINEER.

**UTILITY LINES**

ALL EXPENSE INVOLVED IN RELOCATING THE AFFECTED UTILITY LINES SHALL BE BORNE BY THE OWNER(S). THE CONTRACTOR AND OWNER(S) ARE REQUESTED TO COOPERATE BY ARRANGING THEIR WORK IN SUCH A MANNER THAT INCONVENIENCE TO EITHER WILL BE HELD TO A MINIMUM.

**PILE INSTALLATION**

PILES SHALL BE DRIVEN TO REFUSAL ON BEDROCK. REFUSAL SHALL BE CONSIDERED AS OBTAINED BY PENETRATING SOFT BED-ROCK WITH A MINIMUM RESISTANCE OF 20 BLOWS PER INCH, OR REFUSAL SHALL BE CONSIDERED AS OBTAINED AFTER THE PILE HAS CONTACTED HARD BEDROCK AND THE PILE HAS THEN RECEIVED AT LEAST 20 BLOWS.

THE DESIGN LOAD IS 55 TONS PER PILE FOR THE ABUTMENT PILES.

SEE SHEET [12/27] FOR DETAILS OF ITEM SPECIAL, " 36 INCH DIAMETER DRILLED SHAFTS" TO BE USED FOR PIER FOUNDATIONS.

**PILE POINTS**

STEEL PILE POINTS SHALL BE USED TO PROTECT THE TIPS OF THE PROPOSED PILING. THE STEEL POINTS SHALL BE FURNISHED BY ASSOCIATED PILE AND FITTING CORPORATION, 262 RUTHERFORD BLVD., CLIFTON, NEW JERSEY 07014; INTERNATIONAL CONSTRUCTION EQUIP., INC., 301 WAREHOUSE DRIVE, MATTHEWS, NORTH CAROLINA 28015; DOUGHERTY FOUNDATION PRODUCTS, INC., P.O. BOX 688, FRANKLIN LAKES, NEW JERSEY 07417; VERSA STEEL INC., 3601 N.W. YEON AVE., P.O. BOX 10559, PORTLAND, OREGON 97210 OR BY A MANUFACTURER THAT CAN FURNISH A STEEL POINT THAT IS ACCEPTABLE TO THE DIRECTOR.

**DECK PROTECTION METHOD**

EPOXY COATED REINFORCING STEEL, TOP & BOTTOM MATS.

**ITEM SPECIAL, Sealing of Concrete Surfaces**

A CONCRETE SEALER SHALL BE APPLIED TO THE SURFACES INDICATED ON SHEETS [6/27], [7/27] & [18/27]. SEE THE PROPOSAL NOTE FOR SURFACE PREPARATION REQUIREMENTS, APPLICATION RATES, MATERIAL REQUIREMENTS AND APPLICATION PROCEDURES.

**PVC WATERSTOP**

THIS WORK SHALL CONSIST OF FURNISHING AND INSTALLING A CONTINUOUS WATERPROOF SEAL. POLYVINYL CHLORIDE WATERSTOP MINIMUM SIZE 6 INCHES WIDE BY 3/32 INCHES THICK CAPABLE OF ACCOMODATING 1/8" HORIZONTAL MOVEMENT WITHOUT STRESS OR STRAIN SHALL BE PROVIDED AT ALL LOCATIONS INDICATED AND AS DETAILED ON ABUTMENT DETAIL SHEET NO. [10/27] INSTALLATION INSTRUCTIONS OF THE MANUFACTURER SHALL BE FOLLOWED.

**MONOLITHIC WEARING SURFACE** IS

ASSUMED, FOR DESIGN PURPOSES, TO BE 1" THICK.

**POROUS BACKFILL,**

1'-6" THICK SHALL EXTEND UP TO THE PLANE OF THE SUBGRADE, TO ONE FOOT BELOW THE EMBANKMENT SURFACE. GEOTEXTILE FABRIC SHALL CONFORM WITH 712.09, TYPE A, AND BE INCLUDED WITH POROUS BACKFILL FOR PAYMENT.

**REMOVALS OVER WATER**

REASONABLE CARE SHALL BE USED BY THE CONTRACTOR TO PREVENT REMOVED MATERIALS FROM FALLING INTO THE WATER. ANY DROPPED MATERIALS SHALL BE IMMEDIATELY RECOVERED AND DISPOSED OF AWAY FROM THE SITE EXCEPT FOR APPROVED MASONRY MATERIAL WHICH MAY BE USED AS BANK PROTECTION AS DIRECTED BY THE ENGINEER.

**ITEM 517, RAILING (Concrete Parapet With Double Pipe Rail, Using Shrinkage Compensating Cement)**

SHALL CONFORM TO THE PERTINENT SECTIONS OF THE PROPOSAL NOTE FOR SHRINKAGE COMPENSATING CEMENT AND TO 517 OF THE C.M.S. PAYMENT FOR RAILING SHALL CONFORM WITH 517.07 OF THE C.M.S.

**DEFLECTOR PARAPETS**

CONCRETE PARAPETS ABOVE UPPER CONSTRUCTION JOINT SHALL BE PLACED IN ALTERNATE SECTIONS BY THE USE OF BULKHEADS. CLOSING SECTIONS SHALL BE PLACED AFTER REMOVAL OF BULKHEADS AND AFTER PLACEMENT OF EXPANSION JOINT FILLER. EXPOSED EDGES OF THE FILLER SHALL BE FLUSH WITH THE SURFACE OF CONCRETE AND SHALL BE FREE OF MORTAR.

QUANTITIES OF CONCRETE AND REINFORCING STEEL FOR PARAPET ARE INCLUDED WITH THEIR APPROPRIATE ITEM UNDER EITHER ABUTMENTS OR SUPERSTRUCTURE FOR PAYMENT.

REINFORCING STEEL IN DEFLECTOR PARAPETS SHALL BE EPOXY COATED IF SO SPECIFIED IN THE PROJECT PLANS.

**ITEM 511, CLASS S CONCRETE, SUPERSTRUCTURE**

AS PER PLAN: MEMBRANE CURING PER SUPPLEMENTAL SPECIFICATION 836 WILL NOT BE PERMITTED. CONCRETE SHALL BE CURED BY METHOD (A), WATER CURING.

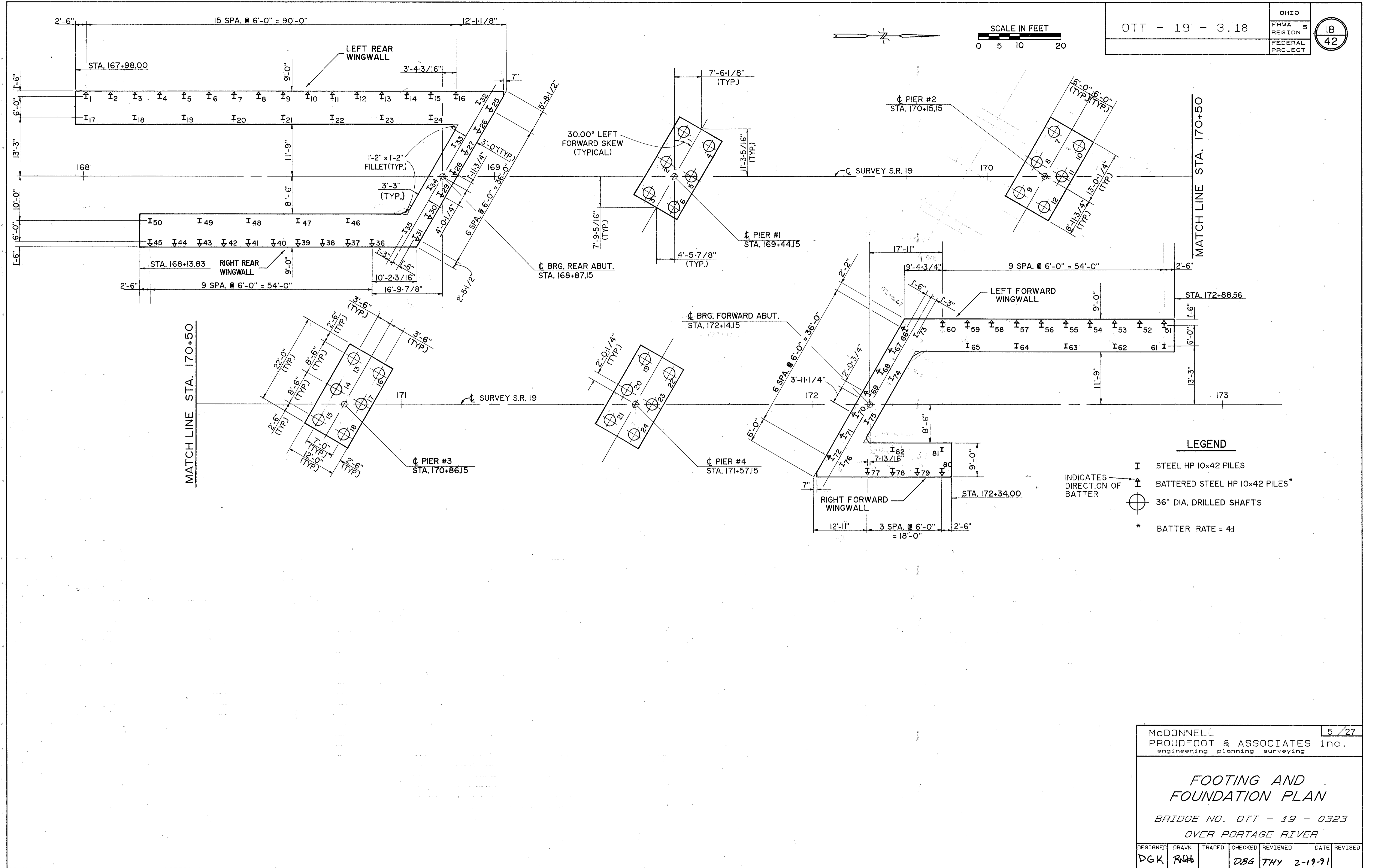
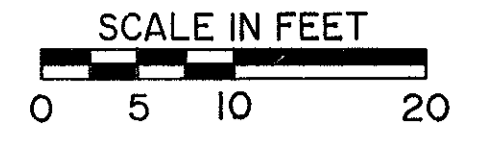
**ITEM 517, RAILING (Concrete Parapet With Double Pipe Rail), AS PER PLAN:**

MEMBRANE CURING PER SUPPLEMENTAL SPECIFICATION 836 WILL NOT BE PERMITTED. CONCRETE SHALL BE CURED BY METHOD (A), WATER CURING.

COMPILED BY <u>C</u> DATE <u>2/26/91</u>				ESTIMATED QUANTITIES		CHECKED BY <u>PBG</u> DATE <u>2-26-91</u>			
ITEM	ITEM EXT	TOTAL	UNIT	DESCRIPTION	ABUT.	SUPER.	PIER	GEN.	
202	11002	LUMP	SUM	STRUCTURE REMOVED, OVER 20 FOOT SPAN				LUMP	
503	11100	LUMP	SUM	COFFERDAMS, CRIBS AND SHEETING				LUMP	
503	21100	1454	C.Y.	UNCLASSIFIED EXCAVATION	1105		349		
505	11100	LUMP	SUM	PILE DRIVING EQUIPMENT MOBILIZATION	LUMP				
507	12200	2268	L.F.	STEEL PILES, HP 10 x 42	2268				
507	93300	82	EA.	STEEL POINT (OR SHOE)	82				
SPEC. 50794702	192	L.F.		DRILLED SHAFTS, 36" DIAMETER, ABOVE BEDROCK			192		
SPEC. 50794704	144	L.F.		DRILLED SHAFTS, 36" DIAMETER, INTO BEDROCK			144		
509	13400	87741	LB.	REINFORCING STEEL, GRADE 60			87741		
509	15800	133182	LB.	EPOXY COATED REINFORCING STEEL, GRADE 60	36225	96957			
511	31510	465	C.Y.	CLASS S CONCRETE, SUPERSTRUCTURE, AS PER PLAN		465			
511	33404	465	C.Y.	CLASS S CONCRETE, SUPERSTRUCTURE, USING SHRINKAGE COMPENSATING CEMENT **		465			
511	33410	LUMP	SUM	CLASS C CONCRETE, SUPERSTRUCTURE, USING SHRINKAGE COMPENSATING CEMENT, FOR PRE-POUR TESTING **		LUMP			
511	42000	234	C.Y.	CLASS C CONCRETE, PIER ABOVE FOOTINGS			234		
511	44100	167	C.Y.	CLASS C CONCRETE, ABUTMENT NOT INCLUDING FOOTING	167				
511	46000	40	C.Y.	CLASS C CONCRETE, RETAINING WALL OR WINGWALL	40				
511	46500	418	C.Y.	CLASS C CONCRETE, FOOTING	311		107		
SPEC. 51267500	1083	S.Y.		SEALING OF CONCRETE SURFACES *	182	901			
SPEC. 51267502	68	S.Y.		SEALING OF CONCRETE SURFACES (EPOXY) *	68				
513	11300	232111	LB.	STRUCTURAL STEEL, A588 AISC CATEGORY 1 *			232111		
513	20000	3060	EA.	WELDED STUD SHEAR CONNECTOR			3060		
514	02500	LUMP	SUM	FIELD PAINTING NEW STRUCTURAL STEEL, SYSTEM A			LUMP		
516	11210	80.5	L.F.	STRUCTURAL EXPANSION JOINT INCLUDING ELASTOMERIC STRIP SEAL		80.5			
516	13600	87	S.F.	1" PREFORMED EXPANSION JOINT FILLER	87				
516	13200	106	S.F.	1/2" PREFORMED EXPANSION JOINT FILLER	106				
516	30501	32	L.F.	PVC WATERSTOP, AS PER PLAN	32				
516	31010	50	L.F.	2" DEEP JOINT SEALER	50				
516	44000	4	EA.	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE) (1*1/4" x 13" x 18" WITH LOAD PLATE)			4		
516	44100	12	EA.	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE) (2*1/2" x 13" x 18" WITH LOAD PLATE) & (2*1/2" x 13" x 18" WITH BEVELED LOAD PLATE)			12		
516	44200	8	EA.	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE) (3*7/8" x 12" x 12" WITH BEVELED LOAD PLATE)	8				
517	71501	411.31	L.F.	RAILING (CONCRETE PARAPET WITH DOUBLE PIPE RAIL), AS PER PLAN	82	329.31			
517	71510	411.31	L.F.	RAILING (CONCRETE PARAPET WITH DOUBLE PIPE RAIL USING SHRINKAGE COMPENSATING CEMENT) *φ	82	329.31			
518	21101	133	C.Y.	POROUS BACKFILL, AS PER PLAN	133				
518	41100	324	L.F.	6" PERFORATED HELICAL CORRUGATED STEEL PIPE, 707.01	324				
518	41200	96	L.F.	6" NON-PERFORATED HELICAL CORRUGATED STEEL PIPE, INCLUDING SPECIALS, 707.01	96				
603	98300	1333	L.F.	4" TELEPHONE CONDUIT DUCT BUNDLE INCLUDING EXPANSION COUPLINGS (ON STRUCTURE) ≠	20	1313			
625	25721	333	L.F.	CONDUIT, AS PER PLAN (ON STRUCTURE) ≠	5	328			
625				SEE SHEET 13A OF 42 FOR LIGHTING SUMMARY					

- \* SEE PROPOSAL NOTE
- ≠ TO BE PAID FOR 100% BY GTE NORTH INC.
- ≠≠ TO BE PAID FOR 100% BY THE VILLAGE OF OAK HARBOR
- \*\* ALTERNATE BID ITEM: THESE TWO ITEMS SHALL CONSTITUTE ONE ALTERNATE BID TO CLASS S CONCRETE, SUPERSTRUCTURE, AS PER PLAN.
- φ ALTERNATE BID ITEM

McDONNELL PROUDFOOT & ASSOCIATES inc. <span style="float: right;">4/27</span>					
engineers planners surveyors					
GENERAL NOTES AND ESTIMATED QUANTITIES					
STRUCTURE NO. OTT-19-0323 OVER PORTAGE RIVER					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
286	JTH		JTY	THY	2-26-91



- LEGEND**
- I STEEL HP 10x42 PILES
  - △ BATTERED STEEL HP 10x42 PILES\*
  - ⊗ 36" DIA. DRILLED SHAFTS
  - \* BATTER RATE = 4:1
- INDICATES DIRECTION OF BATTER

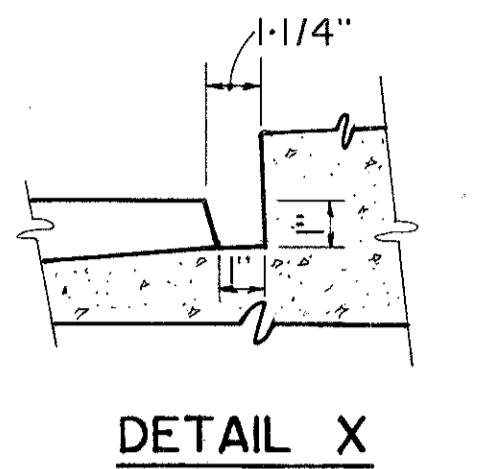
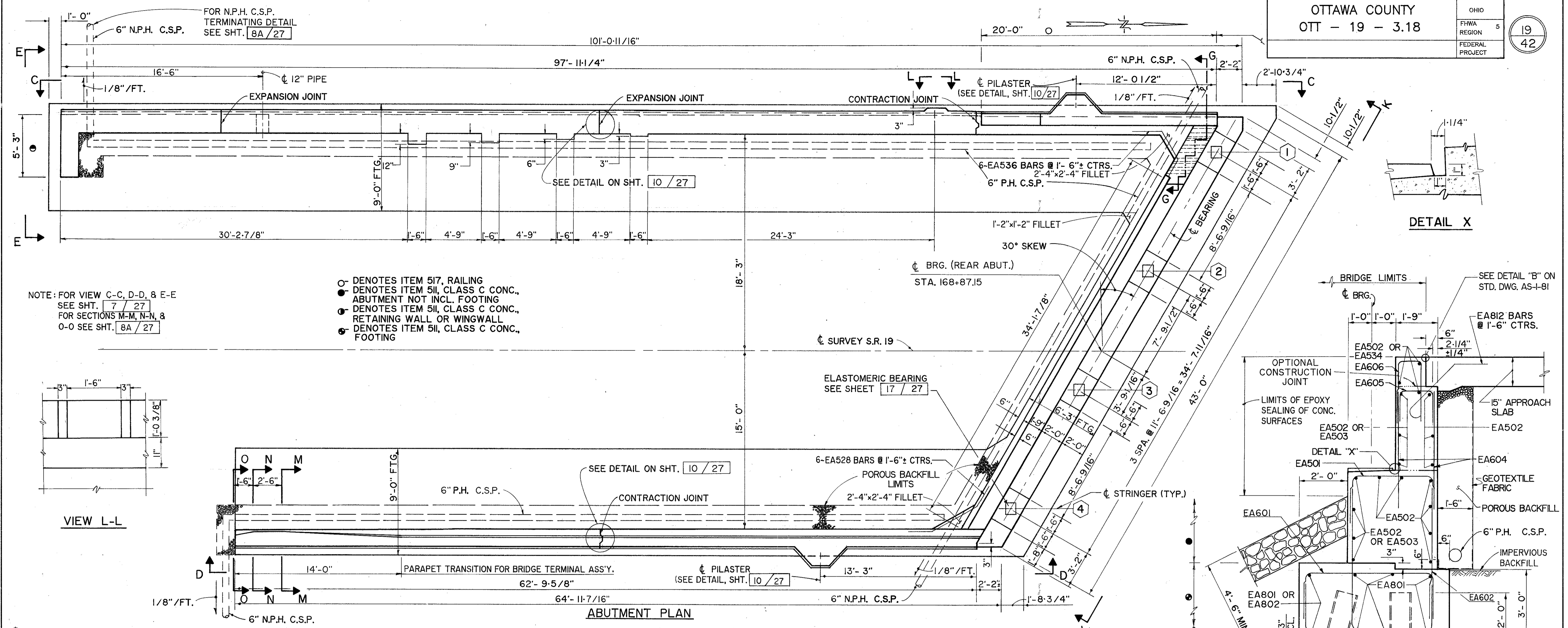
McDONNELL PROUDFOOT & ASSOCIATES inc.  
 engineering planning surveying

5/27

**FOOTING AND FOUNDATION PLAN**

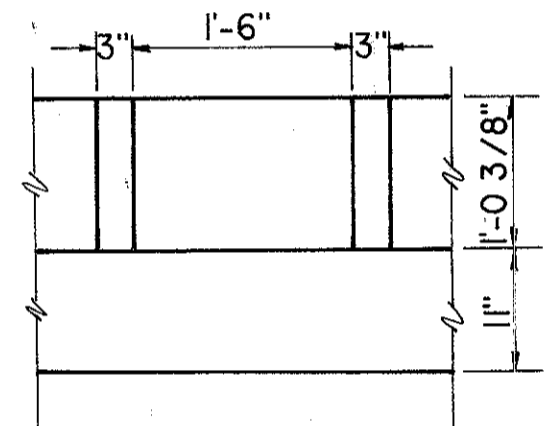
BRIDGE NO. OTT - 19 - 0323  
 OVER PORTAGE RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DGK	RMB		DBA	THY	2-19-91	

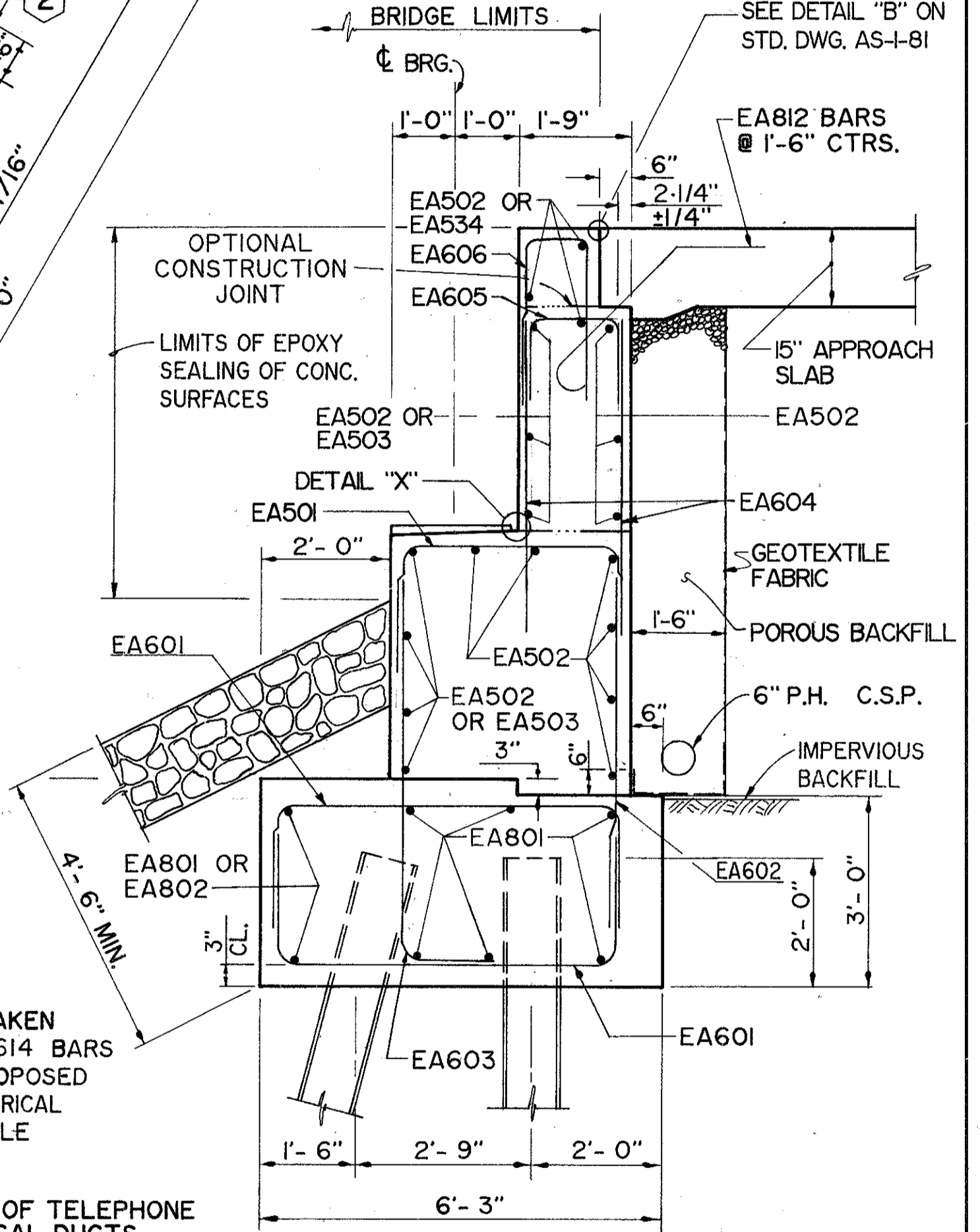
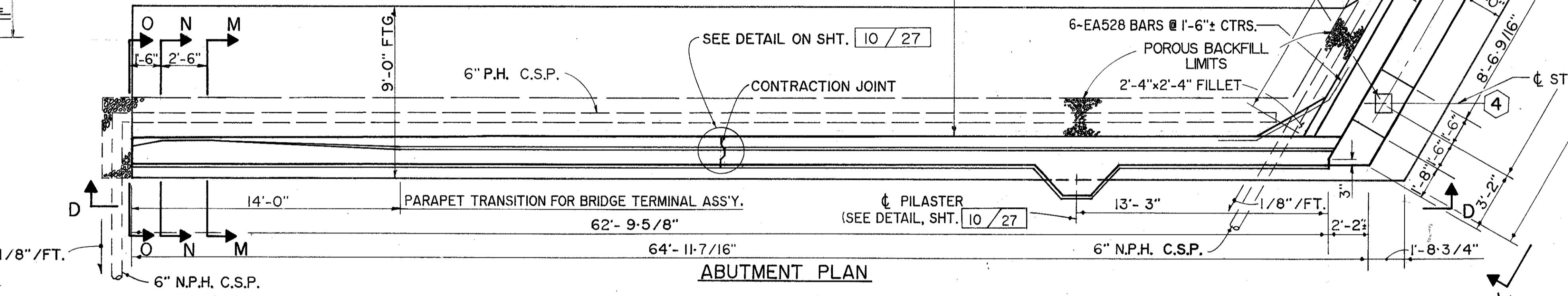


NOTE: FOR VIEW C-C, D-D, & E-E SEE SHT. 7 / 27  
FOR SECTIONS M-M, N-N, & O-O SEE SHT. 8A / 27

- DENOTES ITEM 517, RAILING
- DENOTES ITEM 511, CLASS C CONC., ABUTMENT NOT INCL. FOOTING
- DENOTES ITEM 511, CLASS C CONC., RETAINING WALL OR WINGWALL
- DENOTES ITEM 511, CLASS C CONC., FOOTING

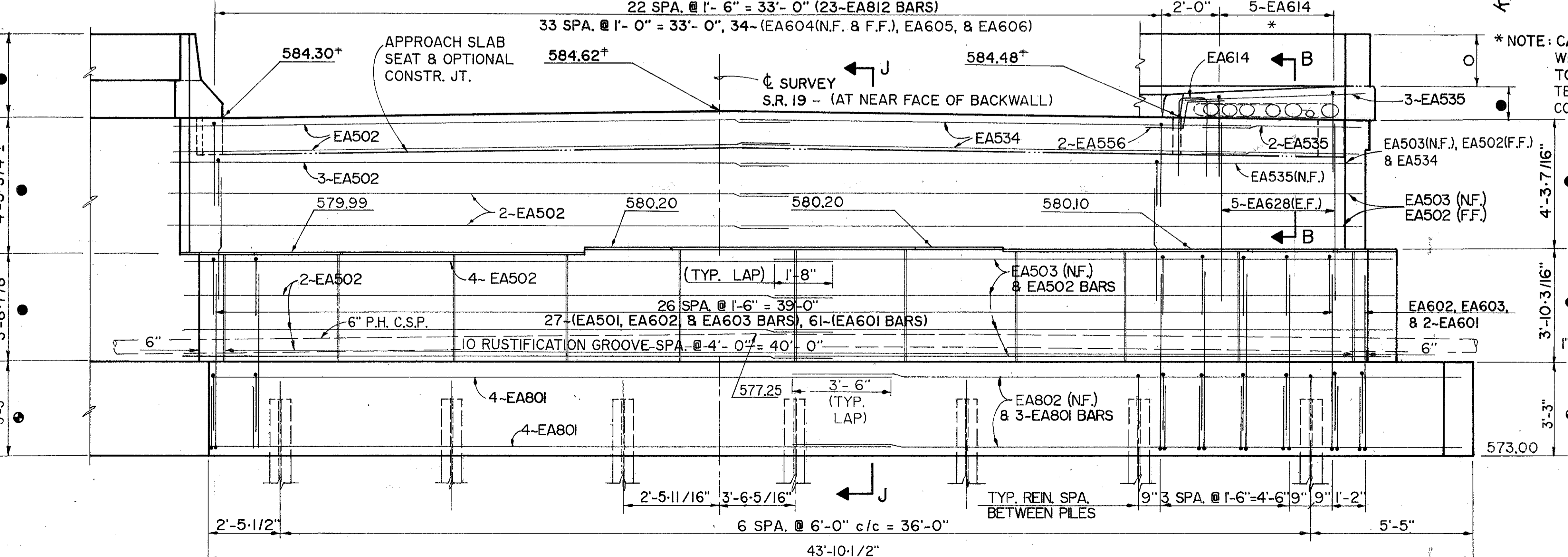


VIEW L-L



SECTION J - J

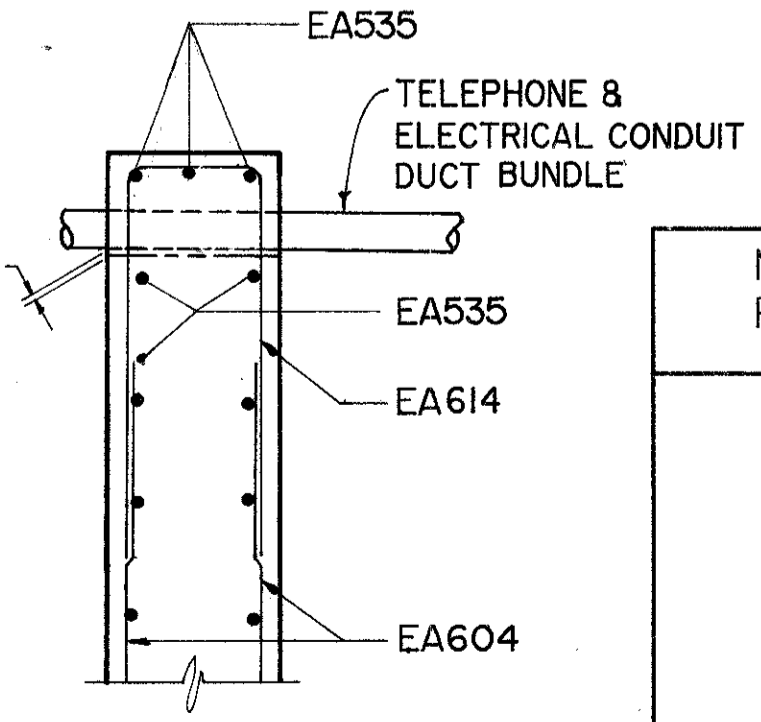
NOTE: ELEVATION GIVEN AT FACE OF BACKWALL



VIEW K-K - REAR ABUTMENT ELEVATION

\* NOTE: CARE SHALL BE TAKEN WHEN PLACING EA614 BARS TO ALLOW FOR PROPOSED TELEPHONE & ELECTRICAL CONDUIT DUCT BUNDLE

SEE DETAILS OF TELEPHONE AND ELECTRICAL DUCTS THROUGH ABUT., (VIEW G-G) ON SHT. 9 / 27



SECTION B-B

(N.F.) - DENOTES NEAR FACE  
(F.F.) - DENOTES FAR FACE  
(E.F.) - DENOTES EACH FACE  
P.H. C.S.P. - DENOTES PERFORATED HELICAL CORRUGATED STEEL PIPE  
NPH C.S.P. - DENOTES NON-PERFORATED HELICAL CORRUGATED STEEL PIPE

McDONNELL PROUDFOOT & ASSOCIATES inc.  
engineers planners surveyors

REAR ABUTMENT PLAN & ELEVATION

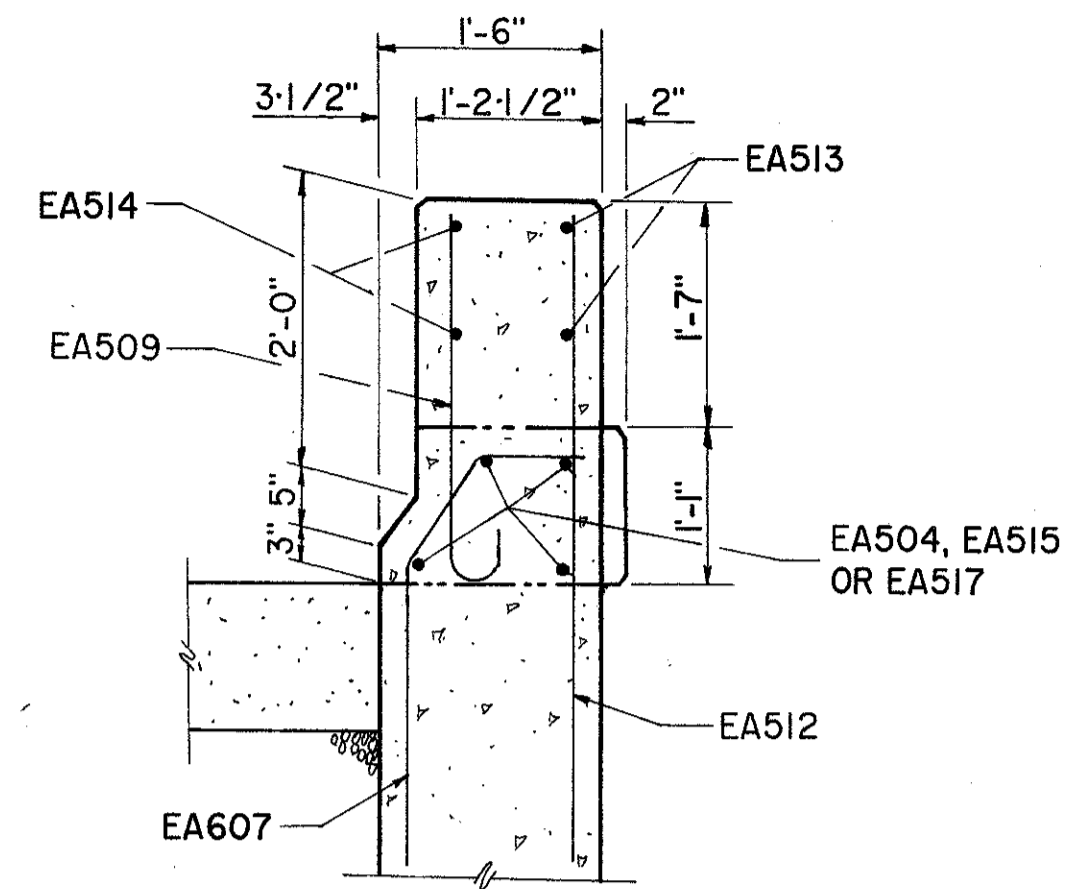
BRIDGE NO. OTT-19-0323  
OVER PORTAGE RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DGK	DBG		DBG	THY	2-20-91	

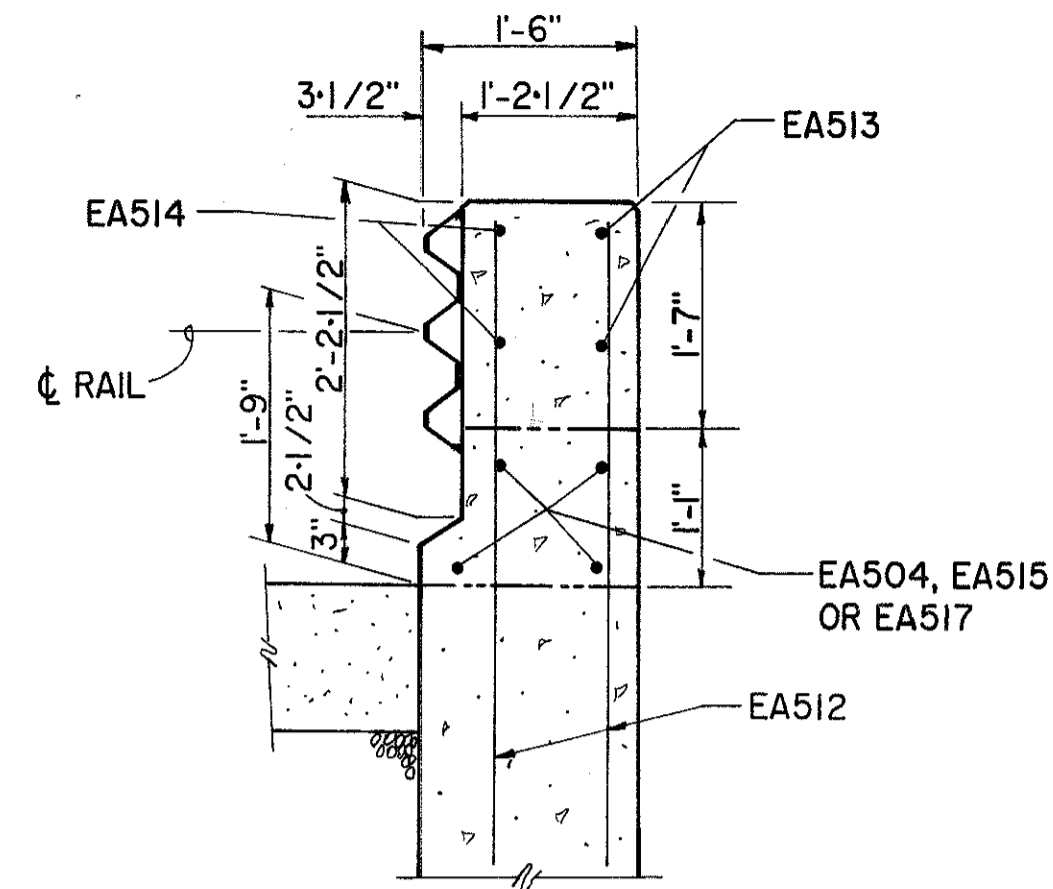




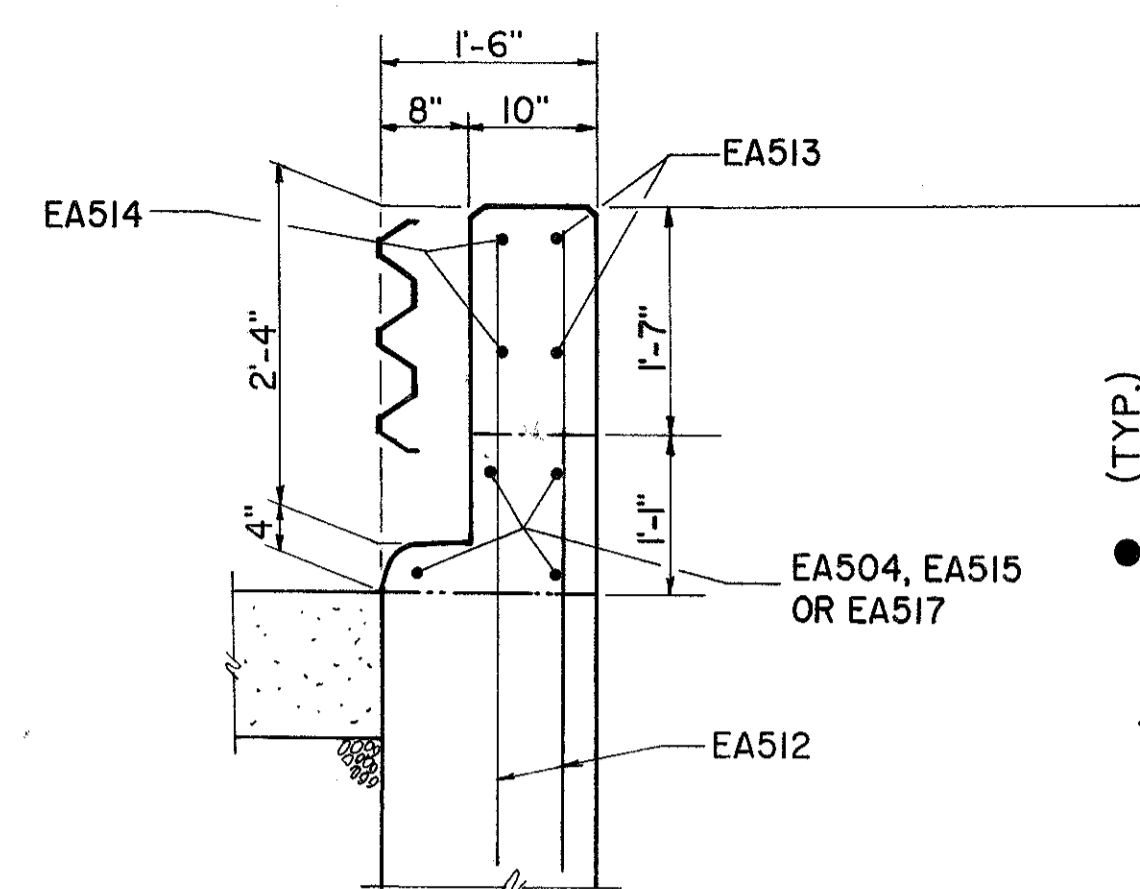




SECTION M - M



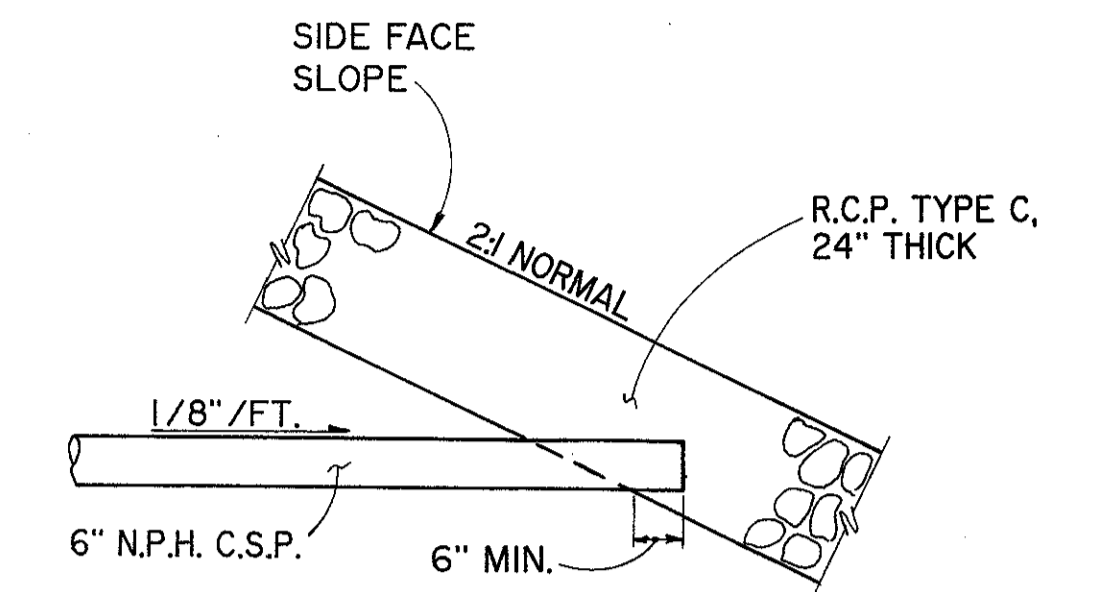
SECTION N - N



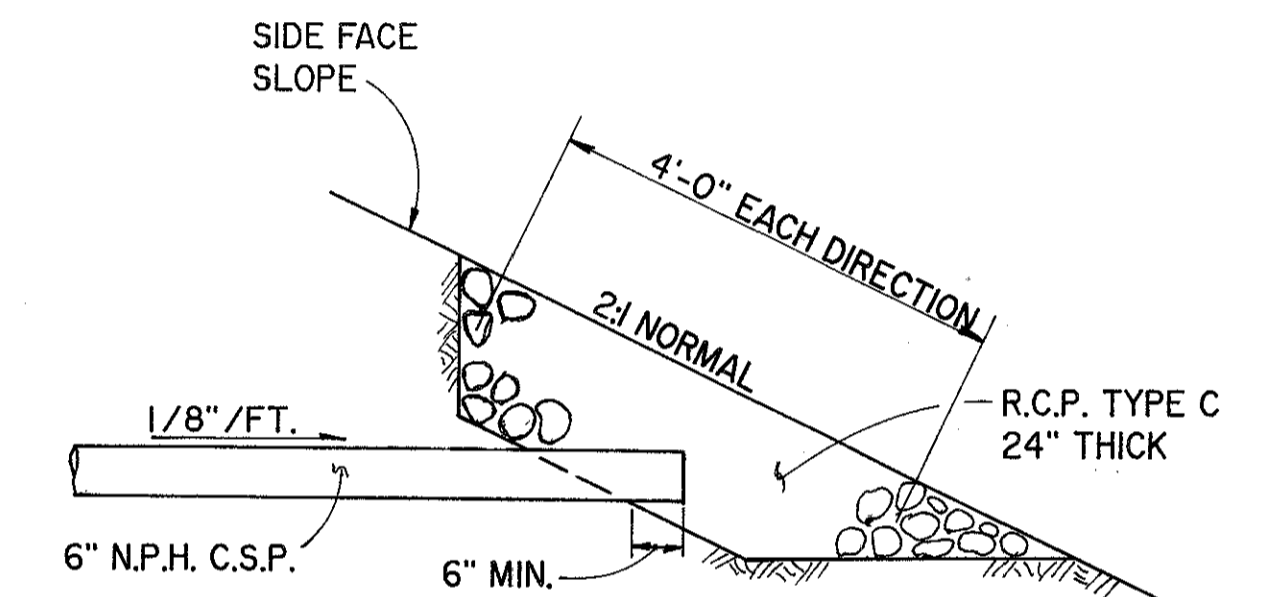
SECTION O - O

FOR LOCATION OF SECTIONS SEE SHT. 7/27 & 9/27

PARAPET DETAILS

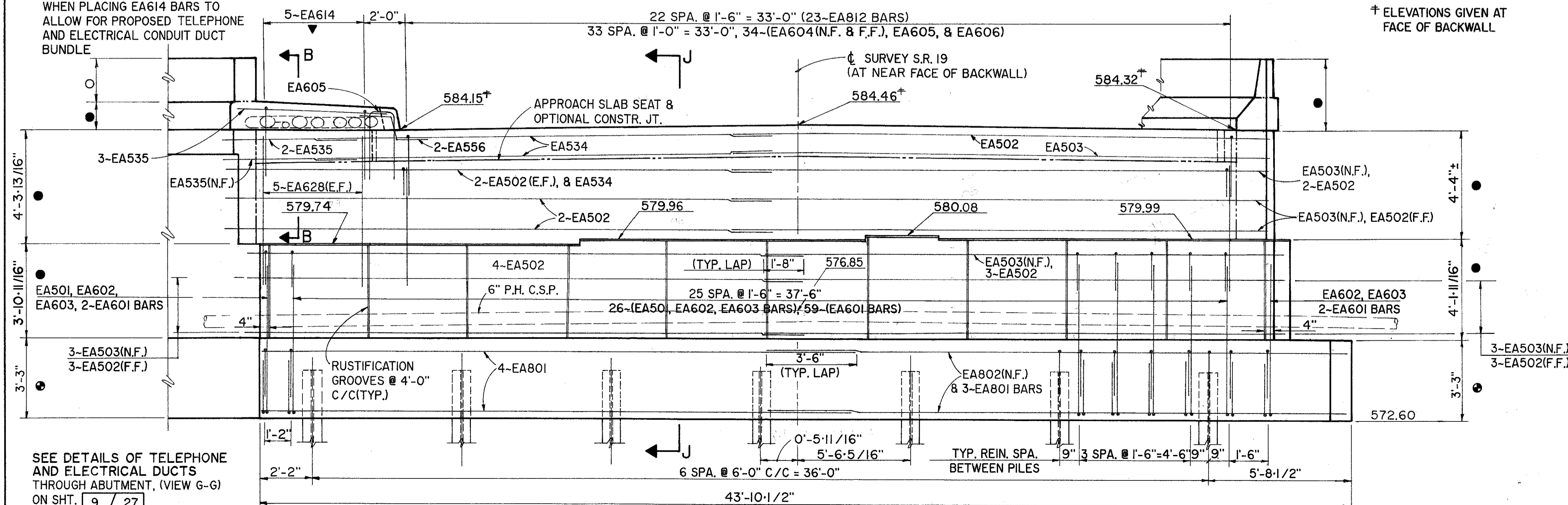


6" NON-PERFORATED HELICAL C.S.P.  
SIDE SLOPE TERMINATING DETAIL  
(TYPICAL, ALL LOCATIONS, EXCEPT FOR S.W. WINGWALL)



6" NON-PERFORATED HELICAL C.S.P.  
SIDE SLOPE TERMINATING DETAIL  
(S.W. WINGWALL)

NOTE: CARE SHOULD BE TAKEN WHEN PLACING EA614 BARS TO ALLOW FOR PROPOSED TELEPHONE AND ELECTRICAL CONDUIT DUCT BUNDLE



VIEW A - A

† ELEVATIONS GIVEN AT FACE OF BACKWALL

- DENOTES ITEM 517, RAILING
- DENOTES ITEM 511, CLASS C CONC., ABUTMENT NOT INCL. FOOTING
- ◐ DENOTES ITEM 511, CLASS C CONC., RETAINING WALL OR WINGWALL
- ◑ DENOTES ITEM 511, CLASS C CONC., FOOTING

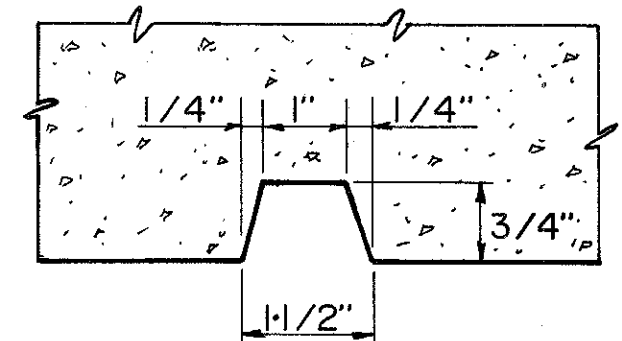
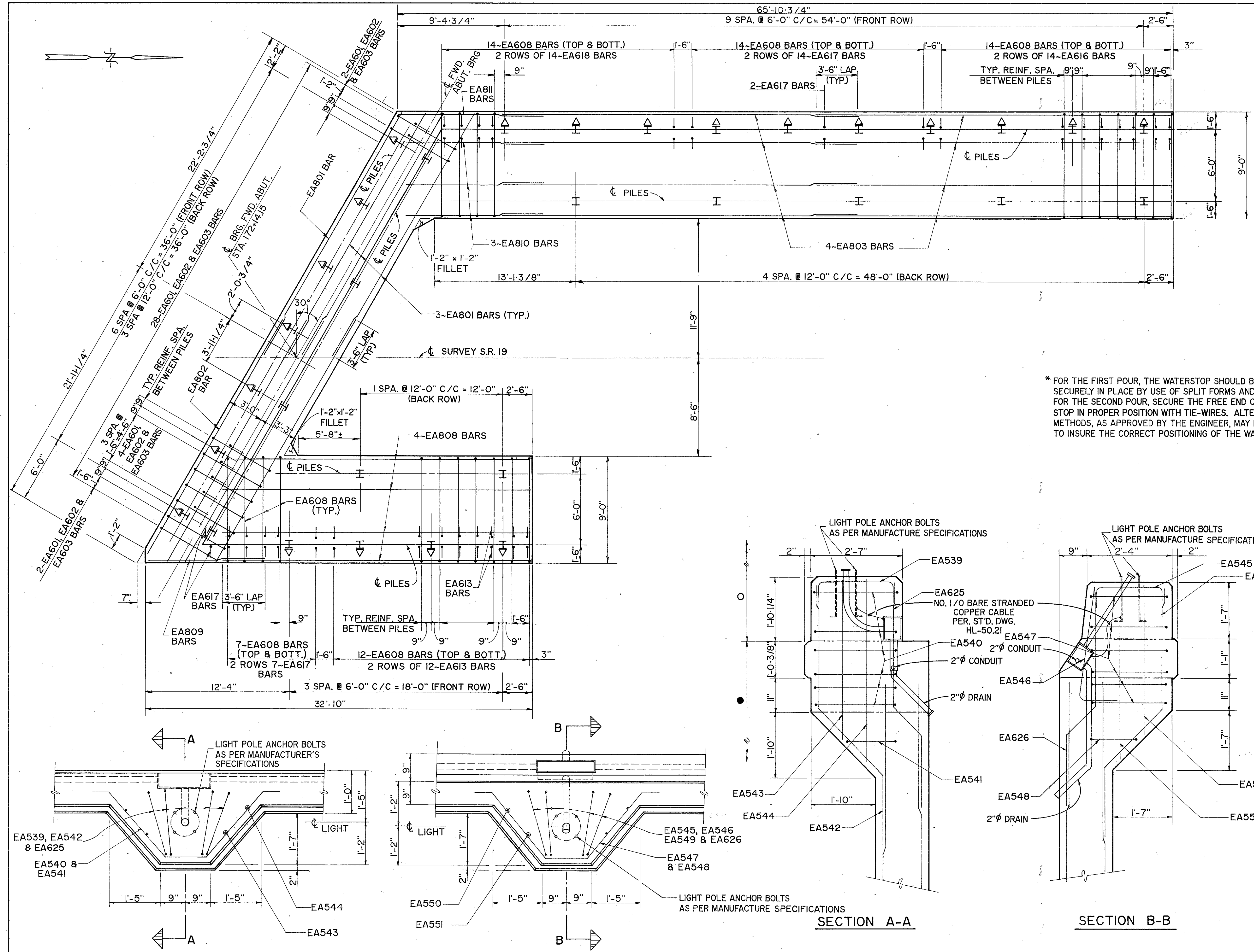
- N.P.H. C.S.P. - DENOTES NON-PERFORATED HELICAL CORRUGATED STEEL PIPE
- P.H. C.S.P. - DENOTES PERFORATED HELICAL CORRUGATED STEEL PIPE
- (N.F.) - DENOTES NEAR FACE
- (F.F.) - DENOTES FAR FACE
- (E.F.) - DENOTES EACH FACE

SEE DETAILS OF TELEPHONE AND ELECTRICAL DUCTS THROUGH ABUTMENT, (VIEW G-G) ON SHT. 9/27

NOTE: FOR SEC. B-B & J-J SEE SHT. 6/27

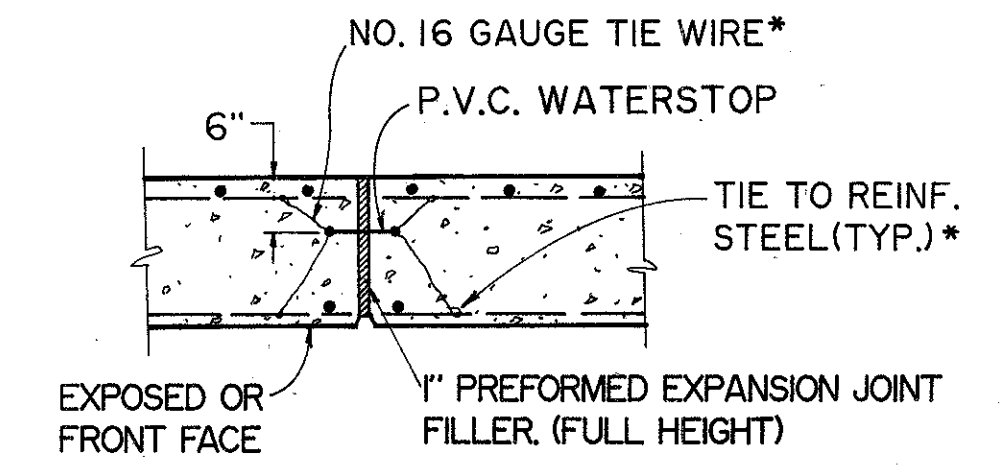
McDONNELL PROUDFOOT & ASSOCIATES inc. engineers planners surveyors		8A / 27
<p><b>FORWARD ABUTMENT ELEVATION &amp; PARAPET DETAILS</b> BRIDGE NO. OTT-19-0323 OVER PORTAGE RIVER</p>		
DESIGNED ORH	DRAWN JTY	TRACED DBG
CHECKED DBG	REVIEWED THY	DATE 8-28-91
REVISOR	REVISION	DATE



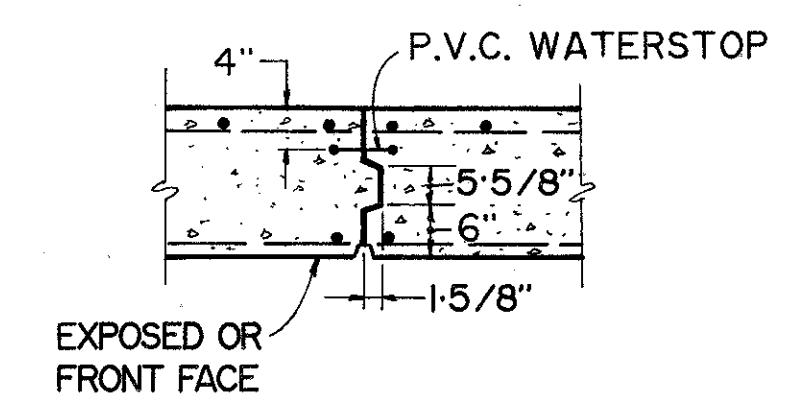


**VERTICAL RUSTIFICATION GROOVE**  
SPACED 4'-0" C/C

\* FOR THE FIRST POUR, THE WATERSTOP SHOULD BE HELD SECURELY IN PLACE BY USE OF SPLIT FORMS AND TIE-WIRES. FOR THE SECOND POUR, SECURE THE FREE END OF WATERSTOP IN PROPER POSITION WITH TIE-WIRES. ALTERNATE METHODS, AS APPROVED BY THE ENGINEER, MAY BE USED TO INSURE THE CORRECT POSITIONING OF THE WATERSTOP.

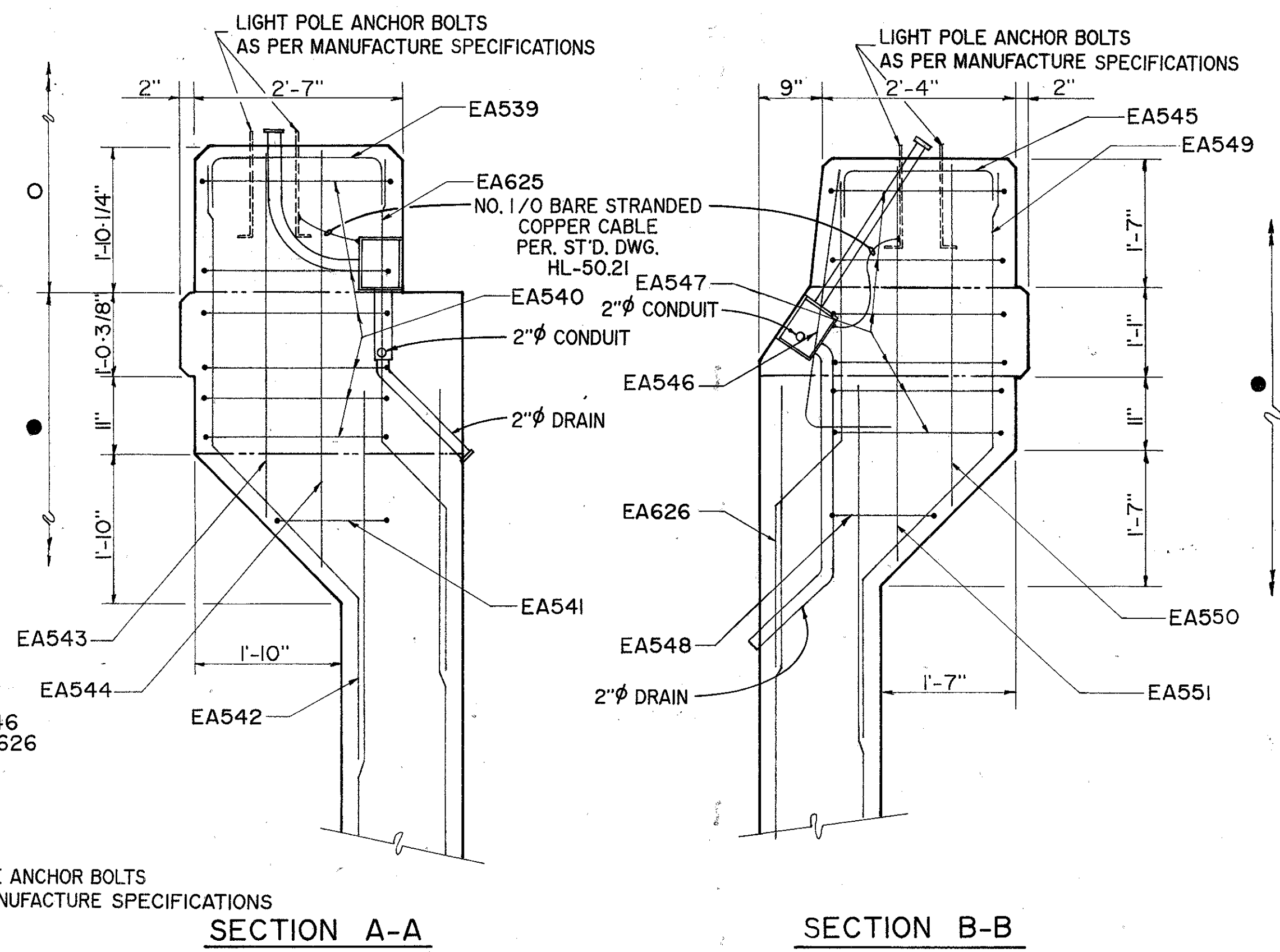


**EXPANSION JOINT DETAIL**



**CONTRACTION JOINT DETAIL**

○ DENOTES ITEM 517, RAILING  
● DENOTES ITEM 511, CLASS "C" CONC., ABUTMENT NOT INCLUDING FOOTING.



**LIGHT POLE PILASTER WITH SIDEWALK PARAPET**

**LIGHT POLE PILASTER WITH DEFLECTOR PARAPET**

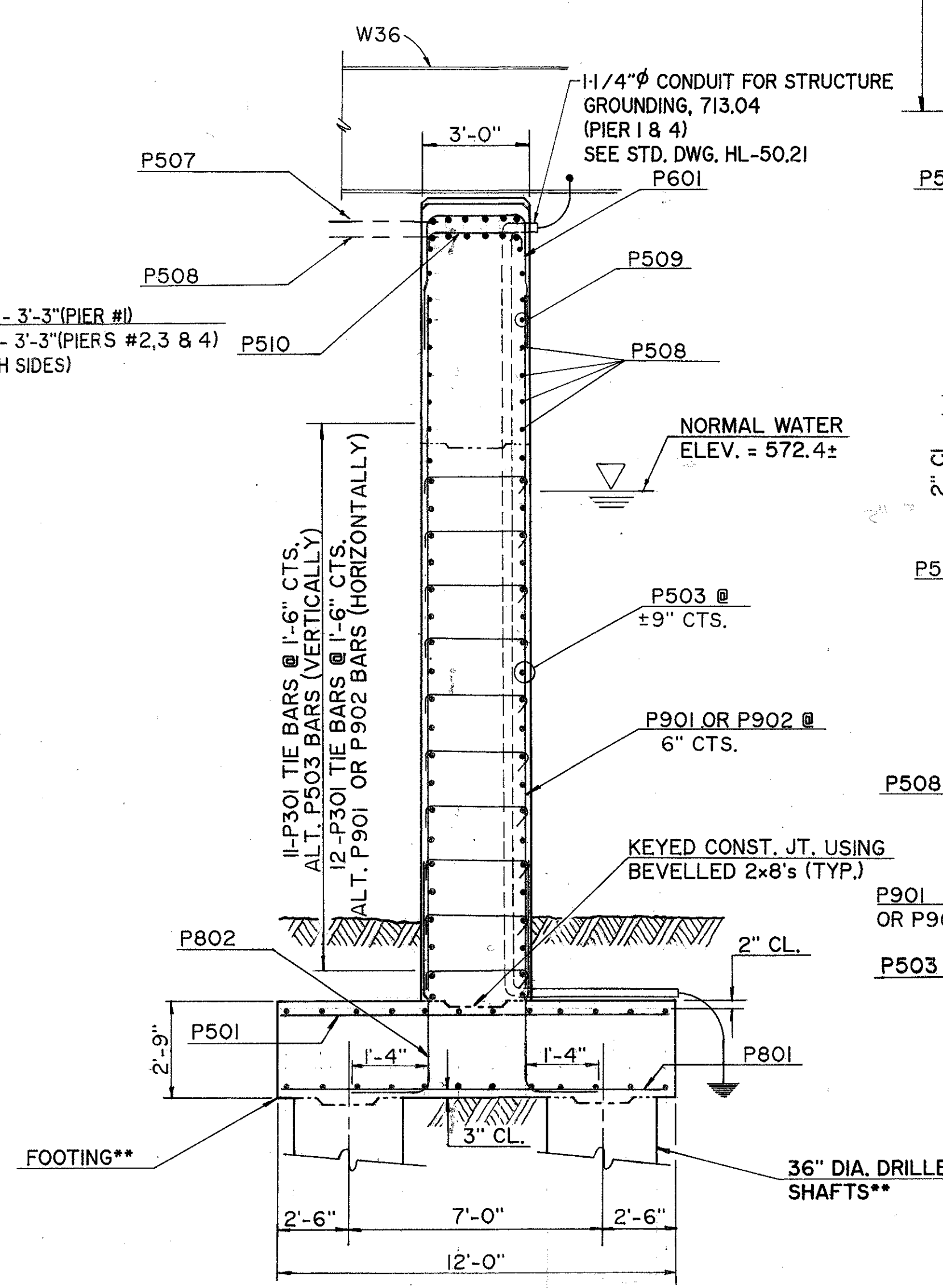
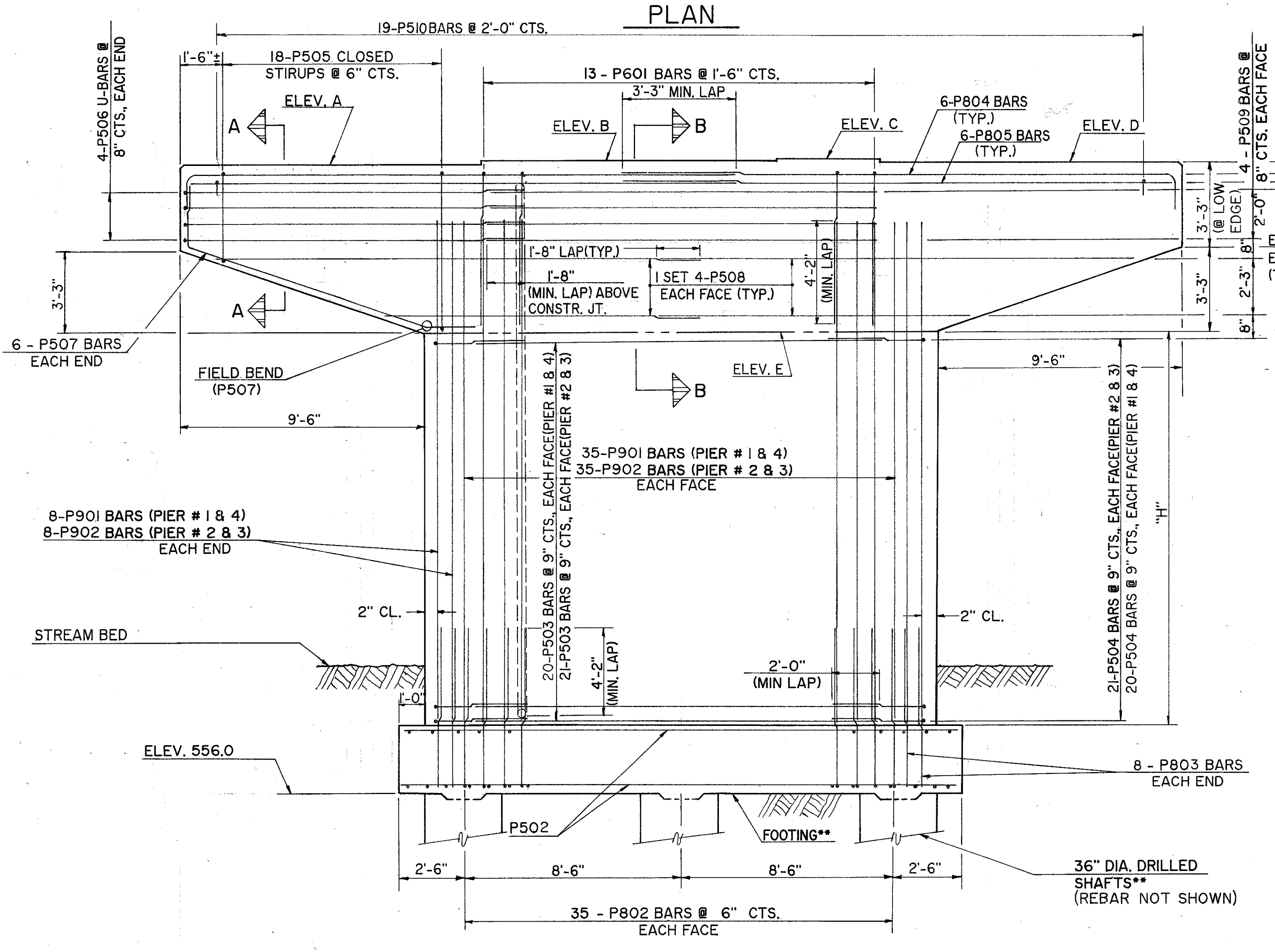
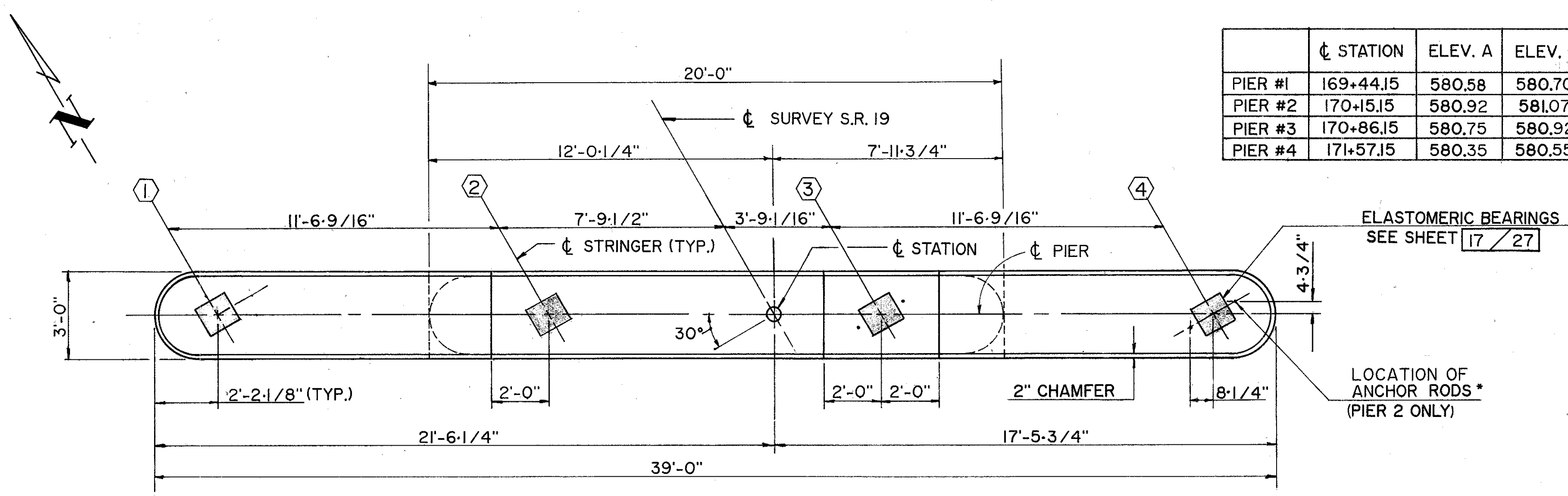
McDONNELL PROUDFOOT & ASSOCIATES inc.  
engineers planners surveyors

**FORWARD ABUTMENT DETAILS**

BRIDGE NO. OTT-19-0323  
OVER PORTAGE RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DGK	JTS					

	CL. STATION	ELEV. A	ELEV. B	ELEV. C	ELEV. D	ELEV. E	DIM. "H"
PIER #1	169+44.15	580.58	580.70	580.72	580.53	574.03	15'-3 3/8"
PIER #2	170+15.15	580.92	581.07	581.12	580.95	574.42	15'-8 1/16"
PIER #3	170+86.15	580.75	580.92	580.99	580.85	574.25	15'-6"
PIER #4	171+57.15	580.35	580.55	580.64	580.53	573.85	15'-1 3/16"



\* BEARING ANCHORS: AT THE OPTION OF THE CONTRACTOR, BEARING ANCHORS LOCATED & SUPPORTED BY TEMPLATES, MAY BE CAST-IN-PLACE.

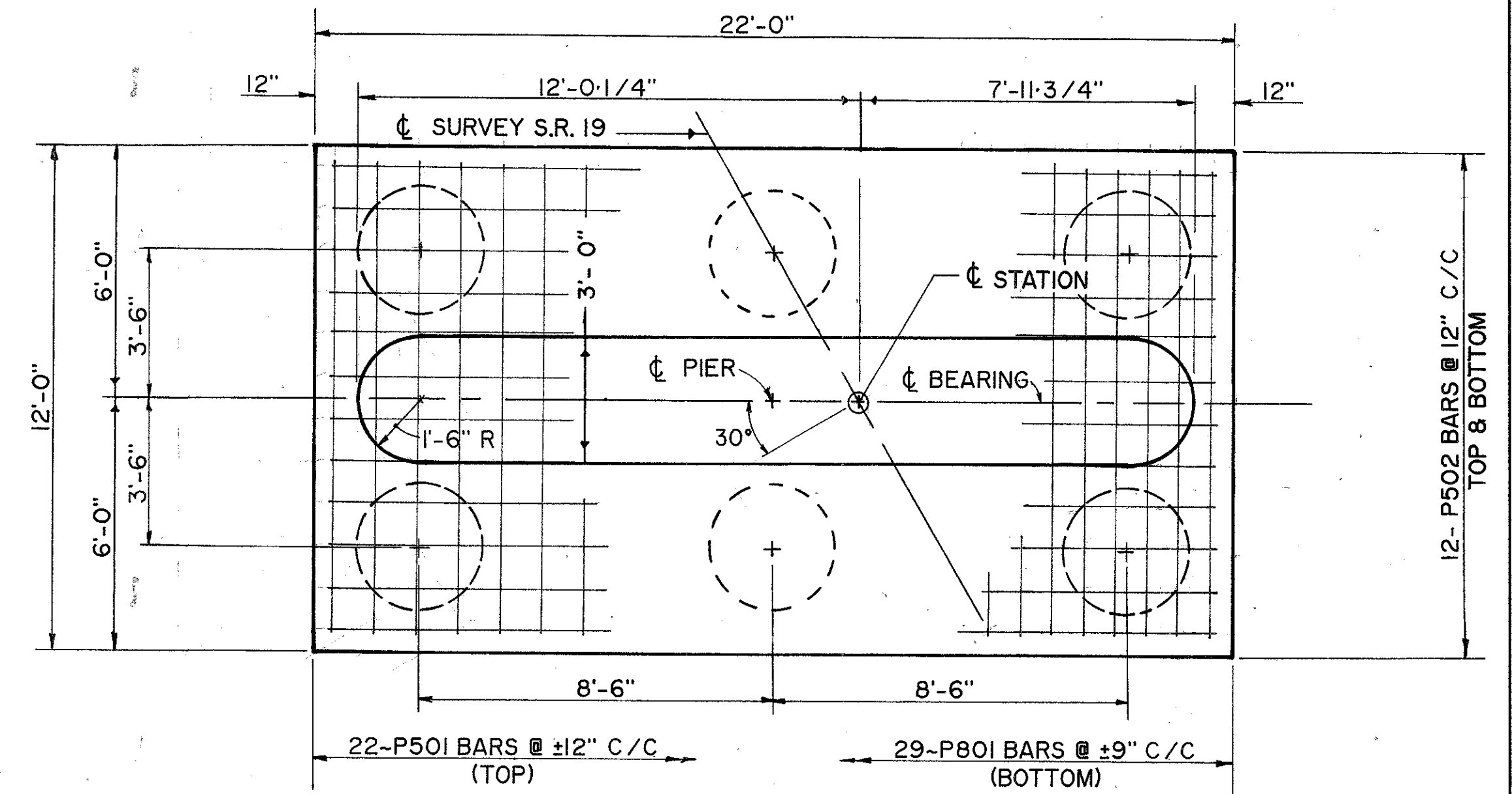
\*\*SEE SHEET 12/27 FOR FOOTING & DRILLED SHAFT DETAILS.

McDONNELL PROUDFOOT & ASSOCIATES inc.  
engineering planning surveying

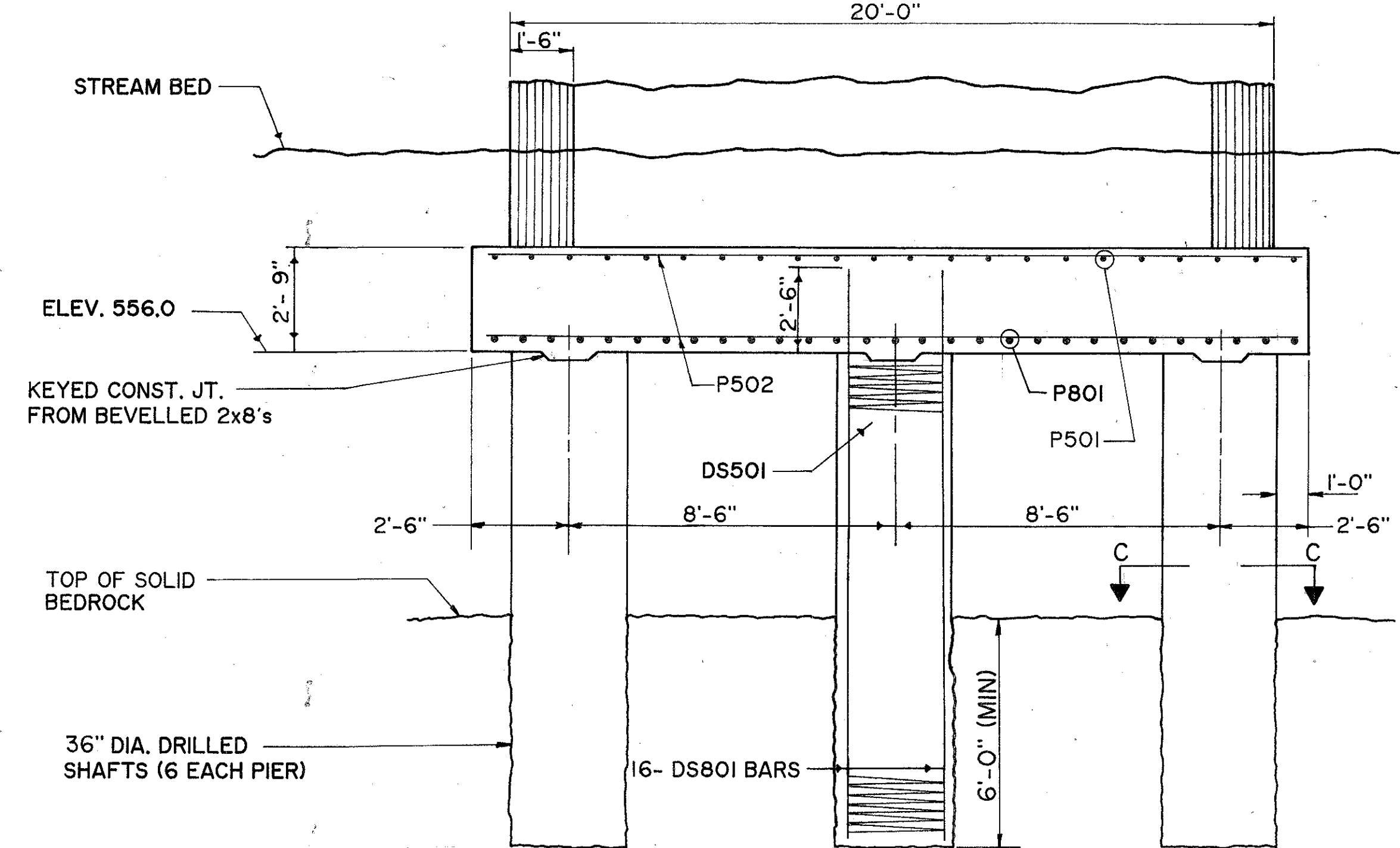
PIER PLAN & ELEVATION

BRIDGE NO. OTT - 19 - 0323  
OVER PORTAGE RIVER

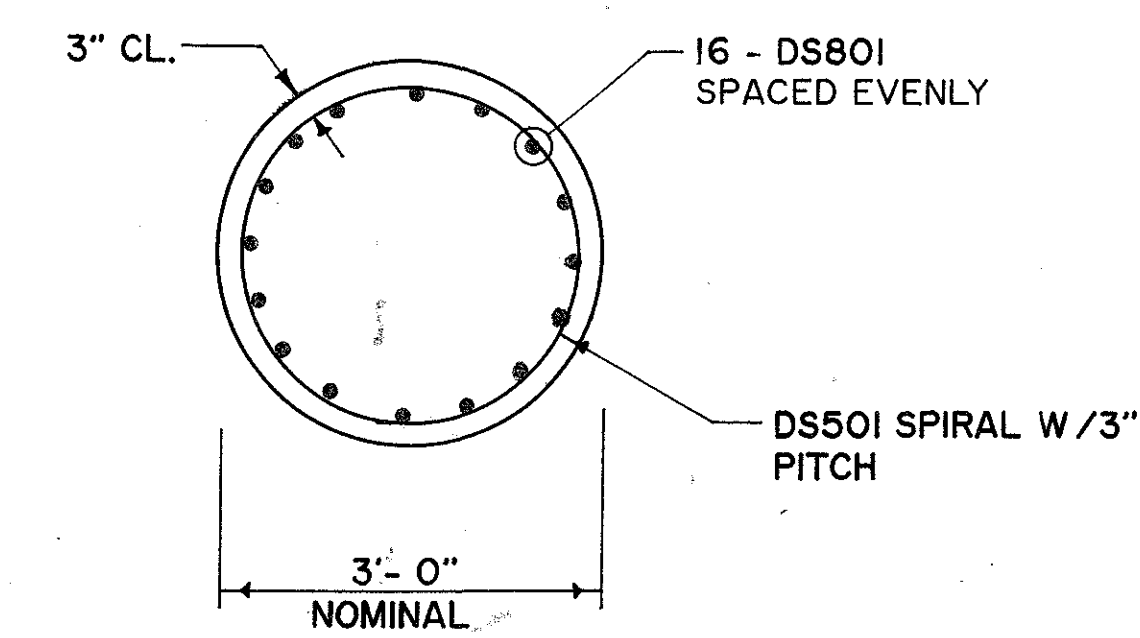
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**FOOTING PLAN**



**FOOTING ELEVATION**



**SECTION C - C**

McDONNELL PROUDFOOT & ASSOCIATES inc.		12 / 27	
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<b>PIER FOOTING</b>			
BRIDGE NO. OTT-19-0323 OVER PORTAGE RIVER			
DESIGNED	DRAWN	TRACED	CHECKED
DGK	RMB		DBG
REVIEWED	DATE	REVISED	
THY	2-19-91		



# INSPECTION RECORD FOR DRILLED SHAFTS

OTT - 19 - 3.18

OHIO  
FHWA REGION 5  
FEDERAL PROJECT

27  
42

2  
2

SUBSTRUCTURE UNIT		DATE AND TIME OF DRILLING		APPROX. ELEVATION OF TOP OF OVER BURDEN	LENGTH OF DRILLED SHAFTS ABOVE BEDROCK SOCKET				OBSTRUCTIONS ENCOUNTERED			LENGTH OF DRILLED SHAFTS IN BEDROCK SOCKET			STEEL CASING			REINFORCING STEEL				CONCRETE					TOLERANCES			PLAN SHAFT DIAMETER (INCH)	CONSTRUCTED SHAFT DIAMETER (INCH)												
																																VERTICAL		SPIRAL		SLUMP TEST RESULT (INCH)	CYLINDER STRENGTH f <sub>c</sub> (PSI)	AIR TEMP. (F)	TIME NEEDED TO PLACE CONCRETE (HR.)	QUANTITY (CU. YD.)	DEVIATION FROM PLUMB		DEVIATION OF COLUMN TOP CENTER FROM PLAN LOCATION HORIZONTALLY (INCH)
																																BAR SIZE NO.	NO. OF REBARS	BAR SIZE NO.	PITCH (INCH)						N - S (INCH)	E - W (INCH)	
PIER	SHAFT NO.	STARTED DATE	FINISHED DATE	THROUGH AIR (FEET)	THROUGH WATER (FEET)	THROUGH OVER BURDEN (FEET)	PAY LENGTH (FEET)	NUMBER	SIZE (INCH)	ELAPSED TIME FOR REMOVAL (HR.)	APPROX. ELEVATION OF TOP OF BEDROCK	ELEV. OF BOTT. OF BEDROCK SOCKET	LENGTH OF BEDROCK SOCKET	LENGTH (FEET)	CASING GAUGE	WAS CASING LEFT IN PLACE ?	BAR SIZE NO.	NO. OF REBARS	BAR SIZE NO.	PITCH (INCH)	SLUMP TEST RESULT (INCH)	CYLINDER STRENGTH f <sub>c</sub> (PSI)	AIR TEMP. (F)	TIME NEEDED TO PLACE CONCRETE (HR.)	QUANTITY (CU. YD.)	N - S (INCH)	E - W (INCH)	DEVIATION OF COLUMN TOP CENTER FROM PLAN LOCATION HORIZONTALLY (INCH)	PLAN SHAFT DIAMETER (INCH)	CONSTRUCTED SHAFT DIAMETER (INCH)													
#3	13	/	/																																								
#3	14	/	/																																								
#3	15	/	/																																								
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PROJECT ENGINEER COMMENTS

1. LOCATION AND EXTENT OF CAVITIES

2. PROCEDURES FOR CONTROLLING WATER

3. WERE UNEXPECTED SUBSURFACE CONDITIONS ENCOUNTERED

4. ANY SUGGESTIONS FOR IMPROVING THE PLANS

MISCELLANEOUS NOTES

LOCATION	DATE	COMMENTS	LOCATION	DATE	COMMENTS

THIS SHEET IS TO BE USED ONLY FOR RECORDING "AS-BUILT" INFORMATION

SUBMIT A COPY TO THE BUREAU OF BRIDGES  
ATTN: FOUNDATION ENGINEER

McDONNELL PROUDFOOT & ASSOCIATES inc. 14 / 27  
engineers planners surveyors

DRILLED SHAFTS  
INSPECTION RECORDS

BRIDGE NO. OTT-19-0323  
OVER PORTAGE RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	RH					

# DRILLED SHAFT NOTES

**ITEM SPECIAL - DRILLED SHAFTS**

**DESCRIPTION**

THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING DRILLED SHAFTS OF THE TYPE AND SIZE SPECIFIED IN THE PLANS. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL, AND APPURTENANCES REQUIRED TO COMPLETE THE WORK AS SPECIFIED. THE LENGTH(S) OF THE DRILLED SHAFTS SHOWN IN THESE PLANS HAS BEEN ESTIMATED FROM AVAILABLE SUBSURFACE INFORMATION. THE CONTRACTOR IS EXPECTED TO FURNISH THE PROPOSED DRILLED SHAFTS AS PER THESE PLAN REQUIREMENTS, WITH THE UNDERSTANDING THAT THE ACTUAL LENGTH REQUIRED BASED ON CONDITIONS ENCOUNTERED DURING CONSTRUCTION, MAY DIFFER FROM THE ESTIMATED LENGTH SHOWN IN THE PLANS.

THE LIMITS OF EACH DRILLED SHAFT SHALL BE DEFINED AT THE TOP BY THE PLAN ELEVATION AND AT THE BOTTOM BY THE ELEVATION OF THE BOTTOM OF THE BEDROCK SOCKET AS APPROVED BY THE ENGINEER.

A CASING WILL BE NECESSARY FOR THE CONSTRUCTION OF EACH PIER DRILLED SHAFT AND THE CASINGS SHALL BE LEFT IN PLACE.

**CONTRACTOR QUALIFICATION**

THE CONTRACTOR SHALL SUBMIT INFORMATION TO THE ENGINEER TO DOCUMENT THAT HIS PERSONNEL ARE EXPERIENCED IN THE CONSTRUCTION OF DRILLED SHAFTS OF THE TYPE AND SIZE SPECIFIED ON THE PLANS. THIS INFORMATION SHALL BE SUBMITTED AT THE PRECONSTRUCTION CONFERENCE. THE PROJECT ENGINEER IS REQUESTED TO INFORM BUREAU OF BRIDGES, ATTENTION : FOUNDATION ENGINEER (TEL. 614-466-2399) OF THE DATES WHEN THE CONTRACTOR WILL BE CONSTRUCTING THE DRILLED SHAFTS.

**CASING**

THE CASINGS SHALL BE MADE OF STEEL, SHALL BE WATER TIGHT AND SHALL BE OF AMPLE STRENGTH TO WITHSTAND HANDLING STRESSES AND EXTERNAL SUBSURFACE PRESSURES. THE CASINGS SHALL BE SEATED INTO THE BEDROCK, THUS ATTEMPTING TO SEAL OUT INCOMING WATER. THE CASING LENGTH SHALL BE AS NECESSARY TO CONSTRUCT EACH DRILLED SHAFT.

THE DIAMETER OF THE FURNISHED CASING(S) SHALL BE LARGE ENOUGH TO ALLOW THE CONSTRUCTION OF A BEDROCK SOCKET WITH A DIAMETER EQUAL TO OR GREATER THAN THE PLAN DIAMETER.

**EXCAVATION**

WHEN OBJECTS SUCH AS LARGE BOULDERS ARE ENCOUNTERED, THEY SHALL BE REMOVED. BLASTING METHODS MAY BE USED, AND WHEN USED, SHALL BE CONSTRUCTED SO AS TO AVOID DISTURBANCE TO THE BEDROCK FORMATION BELOW AND OUTSIDE THE LIMITS OF THE PROPOSED DRILLED SHAFT EXCAVATIONS. THE DRILLED SHAFTS SHALL PENETRATE INTO SOLID BEDROCK TO A DEPTH THAT PROVIDES A BEDROCK SOCKET LENGTH THAT IS NOT LESS THAN THE BEDROCK SOCKET LENGTH SHOWN IN THE PLANS. WHEN A CASING WHICH EXTENDS DOWN TO BEDROCK IS USED, THE BEDROCK SOCKET SHALL BE MEASURED FROM THE BOTTOM OF THE CASING TO THE BOTTOM OF THE DRILLED BEDROCK EXCAVATION. WHEN THE ENGINEER IS ASSURED THAT A PORTION OF THE METAL CASING IS EMBEDDED IN SOLID BEDROCK, UPON THE ENGINEER'S CONCURRENCE, THE EMBEDDED DISTANCE MAY BE INCLUDED AS PART OF THE BEDROCK SOCKET.

**DEWATERING**

THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROLLING ANY INCOMING WATER TO THE EXTENT THAT THE SHAFT EXCAVATION IS MAINTAINED DRY ENOUGH FOR PERFORMANCE OF THE REQUIRED INSPECTION OPERATION. THE PREFERRED METHOD OF CONSTRUCTION IS TO PLACE THE CONCRETE IN A CLEAN, DRY EXCAVATION. THE CONTRACTOR IS EXPECTED TO MAKE A REASONABLE ATTEMPT TO SEAL WATER OUT OF THE DRILLED SHAFT EXCAVATION.

**BOTTOM CLEANOUT**

THE BOTTOM OF THE DRILLED SHAFT EXCAVATION SHALL BE AS CLEAN AS IS PRACTICABLE (NO MORE THAN ONE INCH OF LOOSE MATERIAL ON THE BOTTOM) PRIOR TO CONCRETE PLACEMENT. DRILLING SPOILS THAT ADHERE TO THE VERTICAL SIDES OF THE BEDROCK SOCKETS ARE TO BE REMOVED.

**APPROVAL BEFORE CONCRETE PLACEMENT**

CONCRETE SHALL NOT BE PLACED IN ANY DRILLED SHAFT EXCAVATION WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE DRILLED SHAFT EXCAVATION SHALL BE INSPECTED IMMEDIATELY BEFORE THE CONCRETE IS PLACED. A LIGHT POWERFUL ENOUGH TO THOROUGHLY INSPECT THE SIDES, BOTTOM AND REINFORCING STEEL CAGE OF THE DRILLED SHAFT IS REQUIRED. CONCRETE SHALL NOT BE PLACED DURING INCLEMENT WEATHER CONDITIONS WHICH PREVENT A THOROUGH INSPECTION.

**CONCRETE PLACEMENT**

THE CONCRETE FOR THE DRILLED SHAFTS SHALL BE PLACED AS PER 511 EXCEPT AS MODIFIED BY THE PLANS. THE CONCRETE PLACEMENT OPERATION SHALL BE CONTINUOUS FROM START TO FINISH. THE CONCRETE FOR THE BEDROCK SOCKET SHALL BE PLACED AGAINST THE INSITU BEDROCK AND SHALL BE PLACED PROMPTLY AFTER THE FINAL INSPECTION OF THE SHAFT. IF PRACTICABLE, THE CONCRETE SHALL BE PLACED IN A CLEAN DRY EXCAVATION. CARE SHALL BE TAKEN TO ENSURE THAT CONCRETE IS NOT BEING PLACED IN MOVING WATER. THE CONCRETE CAN BE PLACED IN DRY DRILLED SHAFT EXCAVATION BY THE FREE FALL METHOD PROVIDED THE CONCRETE FALLS TO ITS FINAL POSITION THROUGH AIR WITHOUT STRIKING THE SIDES OF THE HOLE, THE REINFORCING STEEL CAGE, OR ANY OTHER OBSTRUCTION. THE FREE FALL METHOD ALLOWS THE CONCRETE TO BE DROPPED FROM THE TOP THROUGH A CENTERING CHUTE TO THE CONCRETE'S FINAL POSITION.

IF THE ENGINEER DETERMINES THAT DEWATERING IS NOT PRACTICABLE, THE CONTRACTOR WILL BE GIVEN PERMISSION TO PLACE THE CONCRETE UNDER WATER. TO PLACE CONCRETE UNDER WATER, THE DRILLED SHAFT EXCAVATION SHALL BE FILLED WITH WATER TO SUCH A DEPTH THAT ALL WATER MOTION HAS CEASED. THE CONCRETE SHALL THEN BE PLACED BY MEANS OF A CONCRETE PUMP. THE CONCRETE PUMP PIPE SHALL HAVE A DIAMETER THAT IS NOT LESS THAN 4 INCHES. THE CONCRETE PUMP EQUIPMENT SHALL BE SO ARRANGED THAT NO VIBRATIONS RESULT WHICH MIGHT DAMAGE FRESH CONCRETE. PIPES CARRYING CONCRETE FROM THE PUMP TO THE SHAFT SHOULD BE ARRANGED WITH A MINIMUM NUMBER OF BENDS. THE PIPE USED TO CONVEY THE CONCRETE TO THE BOTTOM OF THE DRILLED SHAFT EXCAVATION SHALL BE ANCHORED TO THE STEEL CASING TO PREVENT THE PIPE FROM UNDULATING DURING THE INITIAL PLACEMENT OF THE CONCRETE.

THE PUMPING EQUIPMENT SHALL BE SUITABLE IN KIND AND ADEQUATE IN CAPACITY FOR THE WORK REQUIRED. THE USE OF ALUMINUM PIPE AS A CONVEYANCE FOR THE CONCRETE WILL NOT BE PERMITTED. AN ADEQUATE QUANTITY OF GROUT, MORTAR OR CONCRETE WITH COARSE AGGREGATE OMITTED SHALL BE PUMPED THROUGH THE EQUIPMENT AHEAD OF THE SPECIFICATION CONCRETE TO PROVIDE LUBRICATION TO THE PUMPING SYSTEM. THE CONCRETE USED FOR LUBRICATION SHALL NOT BE PLACED IN THE SHAFT. THE LUBRICATION PROCESS WILL NOT BE REPEATED AS LONG AS THE PUMPING OPERATIONS ARE CONTINUOUS. THE OPERATION OF THE PUMP SHALL BE SUCH THAT A CONTINUOUS STREAM OF CONCRETE WITHOUT AIR POCKETS IS PRODUCED, IN ORDER TO PREVENT THE CONTAMINATION OF THE CONCRETE PLACED INITIALLY AT THE BOTTOM OF THE SHAFT. THE OUTLET END OF THE PUMPING PIPE SHALL BE SEALED WITH A DIAPHRAGM OR PLUG THAT IS FLUSHED OUT WHEN THE HYDROSTATIC PRESSURE FROM THE COLUMN OF CONCRETE EXCEEDS THAT OF THE WATER IN THE SHAFT. THE INITIAL RATE OF CONCRETE PLACEMENT MUST BE CAREFULLY CONTROLLED SO AS NOT TO LIFT OR DISPLACE THE CAGE OF REINFORCING STEEL. THE CONVEYING SYSTEM SHALL BE WATER TIGHT AND THE OUTLET END SHALL ALWAYS REMAIN WELL BELOW THE TOP OF THE FRESHLY PLACED CONCRETE. THE PREFERRED CONCRETE PLACEMENT PROCEDURE IS TO MAINTAIN THE OUTLET END OF THE PUMPING SYSTEM AT APPROXIMATELY 15 FEET BELOW THE TOP OF THE FRESH CONCRETE. WHEN THE CONCRETE REACHES THE TOP OF THE DRILLED SHAFT COLUMN ALL LAITANCE SHALL BE REMOVED.

**TOLERANCES**

THE CONTRACTOR SHALL LOCATE AND CONSTRUCT THE TOP CENTER OF THE PIER DRILLED SHAFTS WITHIN A TWO-INCH RADIUS OF THE POSITION INDICATED BY THE PLANS. THE SHAFTS ARE TO BE INSTALLED VERTICALLY AND MUST BE WITHIN 1.0 PERCENT OF PLUMB FOR THE TOTAL LENGTH OF THE DRILLED SHAFT.

**CONCRETE**

CONCRETE FOR ALL DRILLED SHAFTS SHALL BE CLASS S CONCRETE AND SHALL BE IN ACCORDANCE WITH 511, EXCEPT AS MODIFIED AND SUPPLEMENTED HEREIN. THE REQUIRED SLUMP IS SIX (6) INCHES, PLUS OR MINUS ONE-HALF INCH. THE MAXIMUM WATER TO CEMENT RATIO SHALL BE 0.50. IF CONCRETE IS PLACED UNDER WATER, THE REQUIREMENTS OF ADDING 10 PERCENT MORE CEMENT TO THE CONCRETE MIX SHALL BE WAIVED. THE TOP 5 TO 10 FEET OF CONCRETE IN THE DRILLED SHAFTS ARE REQUIRED TO BE VIBRATED. ONLY A MINIMAL VIBRATORY EFFORT IS NECESSARY. SPECIAL CARE SHALL BE TAKEN NOT TO OVER-VIBRATE THE DRILLED SHAFT CONCRETE.

**REINFORCING STEEL**

REINFORCING STEEL SHALL MEET THE REQUIREMENTS OF 509. THE REINFORCING STEEL SHALL BE GRADE 60. THE SPIRAL REINFORCING STEEL MAY BE PLAIN BARS ASTM A82 OR A615. THE REINFORCING STEEL CAGE SHALL BE COMPLETELY ASSEMBLED PRIOR TO PLACEMENT AND THE LENGTH SHALL BE AS NECESSARY TO CONSTRUCT EACH DRILLED SHAFT. SEE PLAN SHEETS FOR DETAILS OF REINFORCING STEEL. NOTE THAT THE LENGTHS PROVIDED IN THE REINFORCING STEEL LIST ARE ESTIMATED LENGTHS. THE REINFORCING STEEL SHOULD BE PLACED AT PLAN LOCATION.

**INSPECTION**

THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SUITABLE MEANS FOR ACCESS AND SAFE DESCENT INTO ALL DRILLED SHAFT EXCAVATIONS THAT ARE PROTECTED BY A CASING AND HAVE A DIAMETER THAT IS LARGE ENOUGH TO ALLOW A PERSON TO SAFELY ENTER AND PERFORM THE REQUIRED INSPECTION. ACCESS MAY BE PROVIDED BY A POSITIVE FORWARD AND REVERSE HYDRAULIC WINCH OR POWER-UP AND POWER-DOWN HOIST ON A CRANE. THE METHOD CHOSEN FOR ENTERING OR LEAVING THE SHAFT SHALL BE CONVENIENT, SAFE AND NOT UNCOMFORTABLE FOR THE USER. THE CONTRACTOR SHALL ALSO PROVIDE PROTECTIVE CLOTHING FOR THOSE MAKING AN INSPECTION OF THE SHAFT.

AN INSPECTION RECORD CHART HAS BEEN INCLUDED WITH THE PLANS ON SHTS. AND OF AND SHOULD BE COMPLETED BY THE ENGINEER. MEASUREMENTS SHOULD BE OBTAINED PRIOR TO PLACING CONCRETE. THE CONTRACTOR SHOULD PROVIDE ALL NECESSARY EQUIPMENT NEEDED TO OBTAIN MEASUREMENTS FOR COMPLETING THE CHART. THE CONTRACTOR SHALL ASSIST THE ENGINEER IN OBTAINING THESE MEASUREMENTS. WHEN THE INSPECTION RECORD CHART IS COMPLETED, THE PROJECT ENGINEER SHOULD SUBMIT A COPY TO THE BUREAU OF BRIDGES : ATTENTION : FOUNDATION ENGINEER.

**SAFETY PROVISIONS**

THE CONTRACTOR SHALL HAVE AT THE JOB SITE ALL EQUIPMENT AND MATERIALS NEEDED TO PROVIDE SAFE CONSTRUCTION AND INSPECTION OF THE DRILLED SHAFTS AS REQUIRED BY CITY, STATE AND FEDERAL SAFETY REQUIREMENTS.

SAFETY PROVISIONS SHALL INCLUDE, BUT NOT BE LIMITED TO THE REQUIREMENTS SPECIFIED BY THE PLANS, SPECIAL PROVISIONS, AND PROPOSAL.

THE CONTRACTOR SHALL PROVIDE CONTINUOUS SURVEILLANCE OF ALL PERSONS IN THE DRILLED SHAFT EXCAVATIONS. AT ALL TIMES WHEN A PERSON IS IN THE DRILLED SHAFT EXCAVATION, PROVISIONS SHALL BE MADE FOR PUMPING FRESH AIR TO SAID PERSON. ALL LIGHTING SHALL BE WITH ELECTRICAL LIGHTS. MECHANICAL EQUIPMENT USED INSIDE THE SHAFTS SHALL BE OPERATED BY AIR OR ELECTRICITY. THE USE OF GASOLINE ENGINES OR OTHER TYPES OF EQUIPMENT PRODUCING FUMES THAT MAY ENTER THE EXCAVATION WILL NOT BE PERMITTED. THE CONTRACTOR SHALL PROVIDE GAS DETECTION AND OXYGEN ANALYZERS, AND SHALL TEST THE DRILLED SHAFT EXCAVATION ATMOSPHERE QUALITATIVELY THROUGHOUT THE COLUMN'S ENTIRE LENGTH AND ASSURE THAT THE QUANTITIES OF GASES AND OXYGEN PRESENT ARE IN SAFE AMOUNT AND SAFE PROPORTION PRIOR TO PERMITTING ANY PERSON TO ENTER THE SHAFT.

<b>McDONNELL PROUDFOOT &amp; ASSOCIATES inc.</b>		15 / 27
engineers planners surveyors		
<b>DRILLED SHAFT NOTES</b>		
BRIDGE NO. OTT-19-0323. OVER PORTAGE RIVER		
DESIGNED	DRAWN	TRACED
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CHECKED	REVIEWED	DATE
<i>DBG</i>	<i>THY</i>	<i>2-25-91</i>



# DRILLED SHAFT NOTES

**METHOD OF MEASUREMENT**

THE TOTAL PAY LENGTH OF EACH DRILLED SHAFT SHALL BE THE COMPLETED AND ACCEPTED LENGTH MEASURED ALONG THE AXIS OF THE DRILLED SHAFT FROM THE BOTTOM OF THE BEDROCK SOCKET TO THE PROPOSED TOP ELEVATION, AS PER PLAN. THE REINFORCING STEEL THAT PROJECTS FROM THE DRILLED SHAFT INTO THE PIER COLUMN OR THE ABUTMENT FOOTING AS SPECIFIED BY THE PLANS IS INCLUDED WITH THE DRILLED SHAFT FOR PAYMENT, BUT SHALL NOT BE INCLUDED IN THE MEASURED LENGTH OF THE DRILLED SHAFT.

THE TOTAL LENGTH OF EACH DRILLED SHAFT SHALL BE DIVIDED INTO TWO SEGMENTS. THE LENGTH OF THE LOWER SEGMENT IS THE LENGTH OF THE BEDROCK SOCKET AND THE LENGTH OF THE UPPER SEGMENT IS THE LENGTH OF THE DRILLED SHAFT ABOVE THE BEDROCK SOCKET.

**BASIS OF PAYMENT**

PAYMENT FOR FURNISHING AND INSTALLING DRILLED SHAFTS WILL BE MADE AT THE CONTRACT UNIT PRICE PER LINEAR FOOT OF ACCEPTED SHAFT LENGTH AS PER ITEM SPECIAL 36" DIAMETER DRILLED SHAFTS ABOVE THE BEDROCK SOCKET AND ITEM SPECIAL 36" DIAMETER DRILLED SHAFTS IN BEDROCK, WHICH SHALL INCLUDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THE ITEMS AS SPECIFIED.

**DESIGN PARAMETERS**

THE DESIGN LOAD TO BE SUPPORTED BY EACH DRILLED SHAFT IS 105 TONS AT THE PIER. THE ALLOWABLE END BEARING PRESSURE IS 15 TONS PER SQUARE FOOT.

McDONNELL & ASSOCIATES inc. 16 / 27  
engineers planners surveyors

*DRILLED SHAFT  
NOTES*

BRIDGE NO. OTT-19-0323  
OVER PORTAGE RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	DM		DBG	THY	2-25-91	

**BEARING NOTES**

**ELASTOMERIC MATERIAL:** THE ELASTOMER LAYERS SHALL BE 60 DUROMETER HARDNESS AT ALL PIERS AND SHALL BE 50 DUROMETER HARDNESS AT BOTH ABUTMENTS. OTHERWISE THEY SHALL MEET THE REQUIREMENTS OF 711.23 OF THE ODOT C.M.S. ALSO THE BEARING PADS SHALL BE MARKED PERMANENTLY TO INDICATE THEIR SPECIFIC LOCATION.

**LOAD PLATES:** THE STEEL LOAD PLATES SHALL BE ASTM A588 UNPAINTED AND BONDED BY VULCANIZATION TO THE ELASTOMER DURING THE MOLDING PROCESS. WELDING OF THE LOAD PLATE TO THE SUPERSTRUCTURE SHALL BE CONTROLLED SO THAT THE PLATE TEMPERATURE AT THE ELASTOMER BONDED SURFACE SHALL NOT EXCEED 400°F AS DETERMINED BY THE USE OF PYROMETRIC STICKS OR OTHER TEMPERATURE MONITORING DEVICES.

**TOLERANCES:** THE INDIVIDUAL LAYERS OF THE ELASTOMER SHALL BE WITHIN ±20% OF THE DESIGN PLAN VALUES, OTHERWISE:

- PLAN DIMENSIONS .....-0, +1/4"
- TOTAL THICKNESS .....-0, +1/4"
- EDGE COVER .....-0, +1/8"

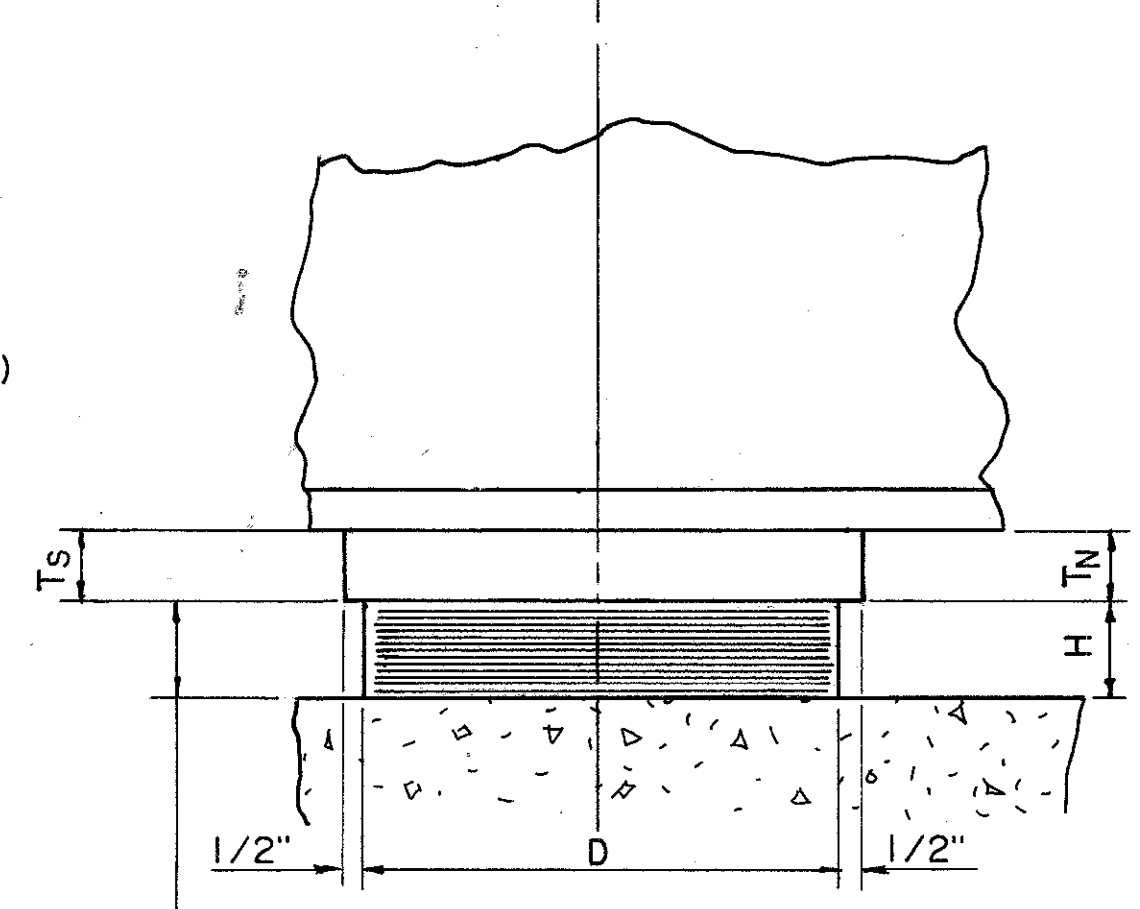
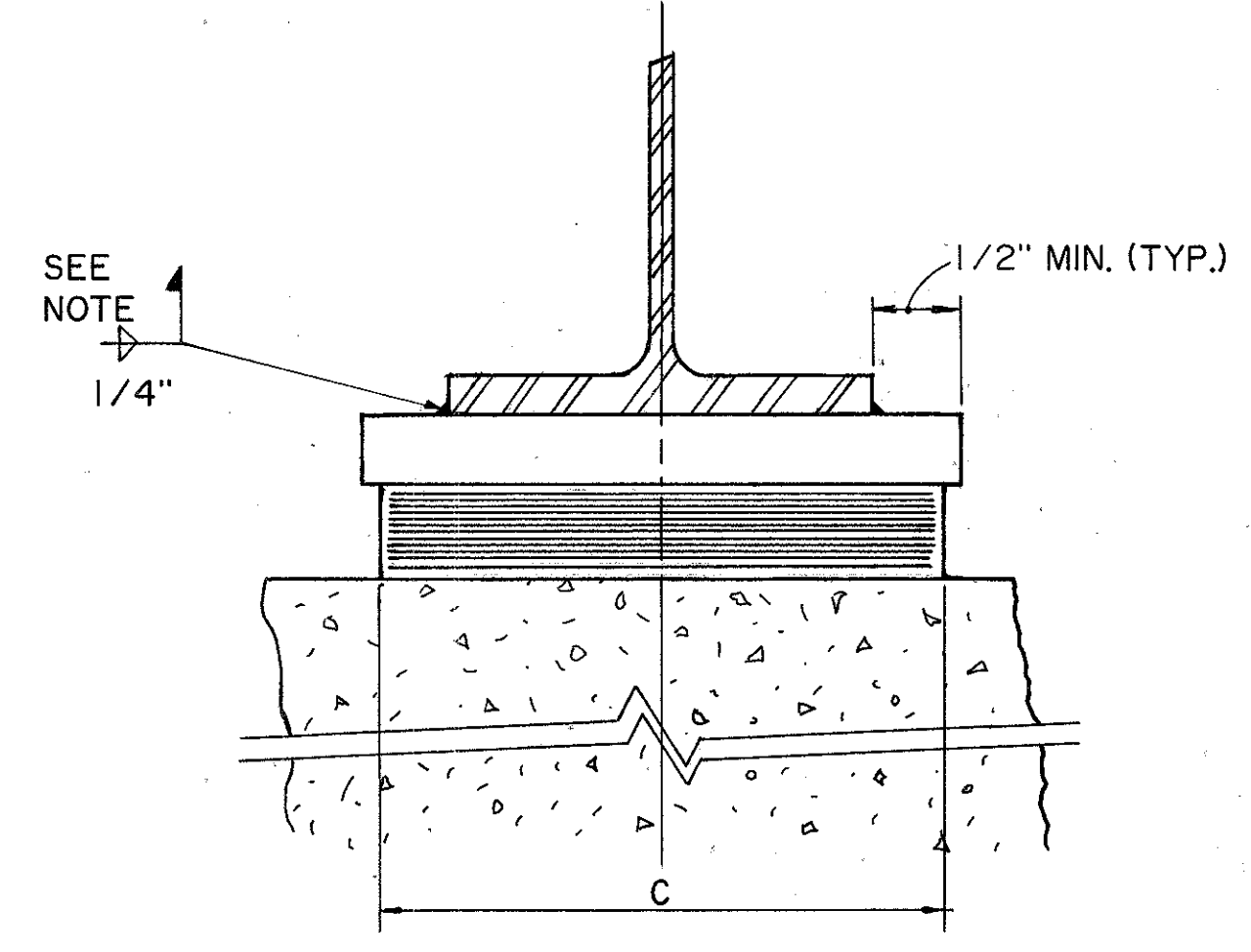
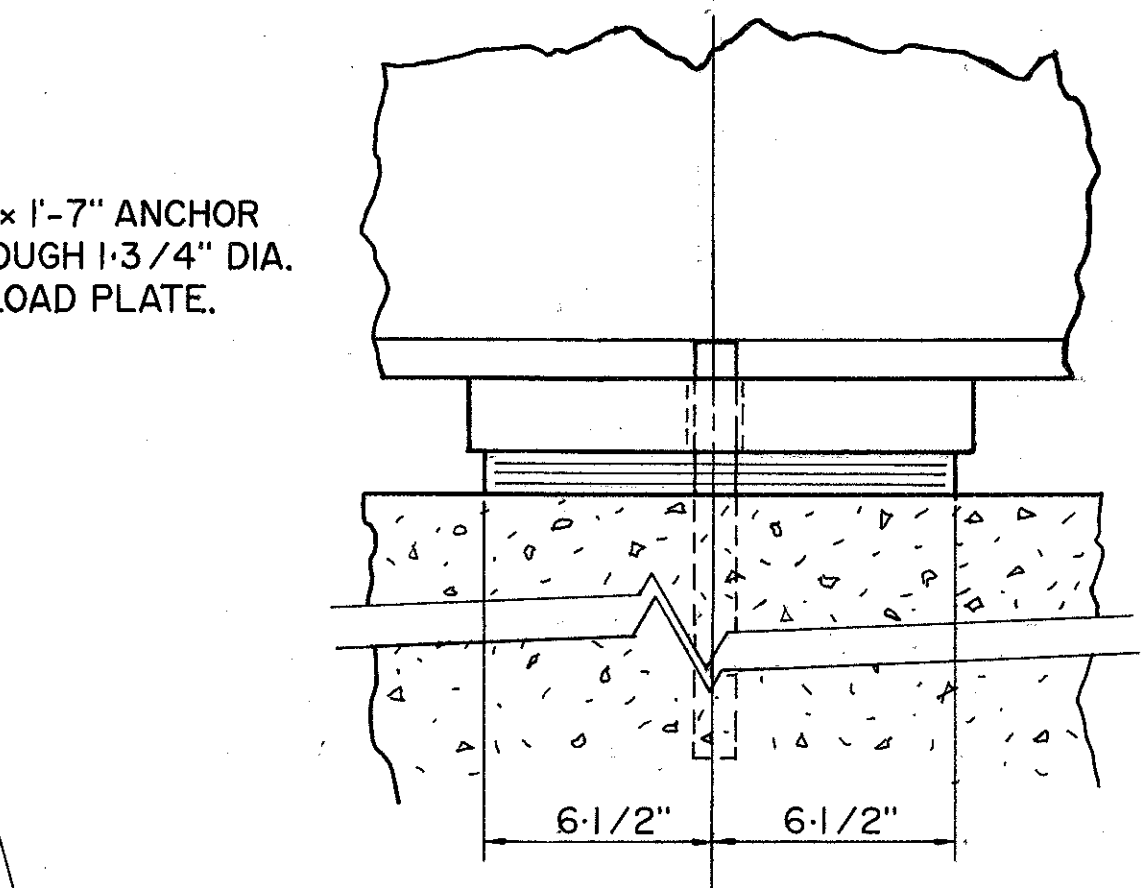
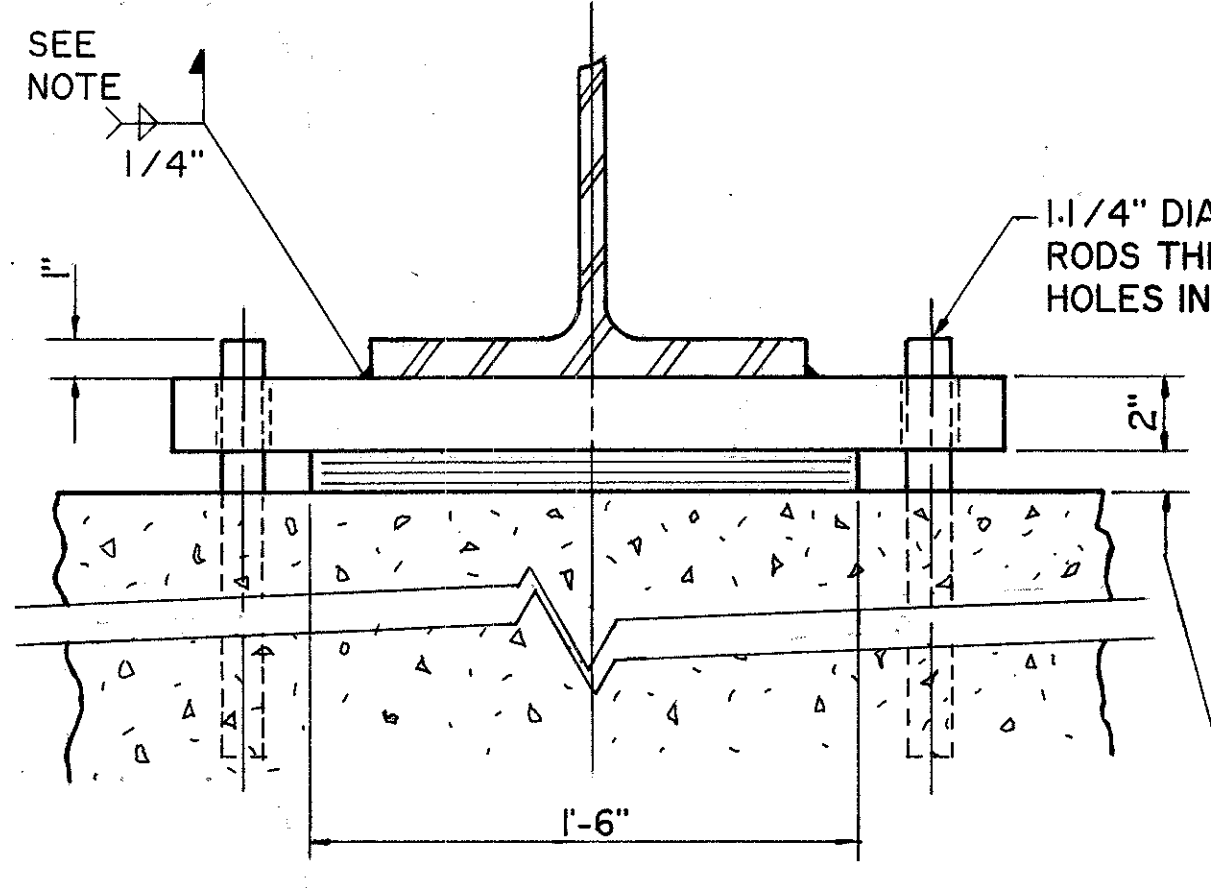
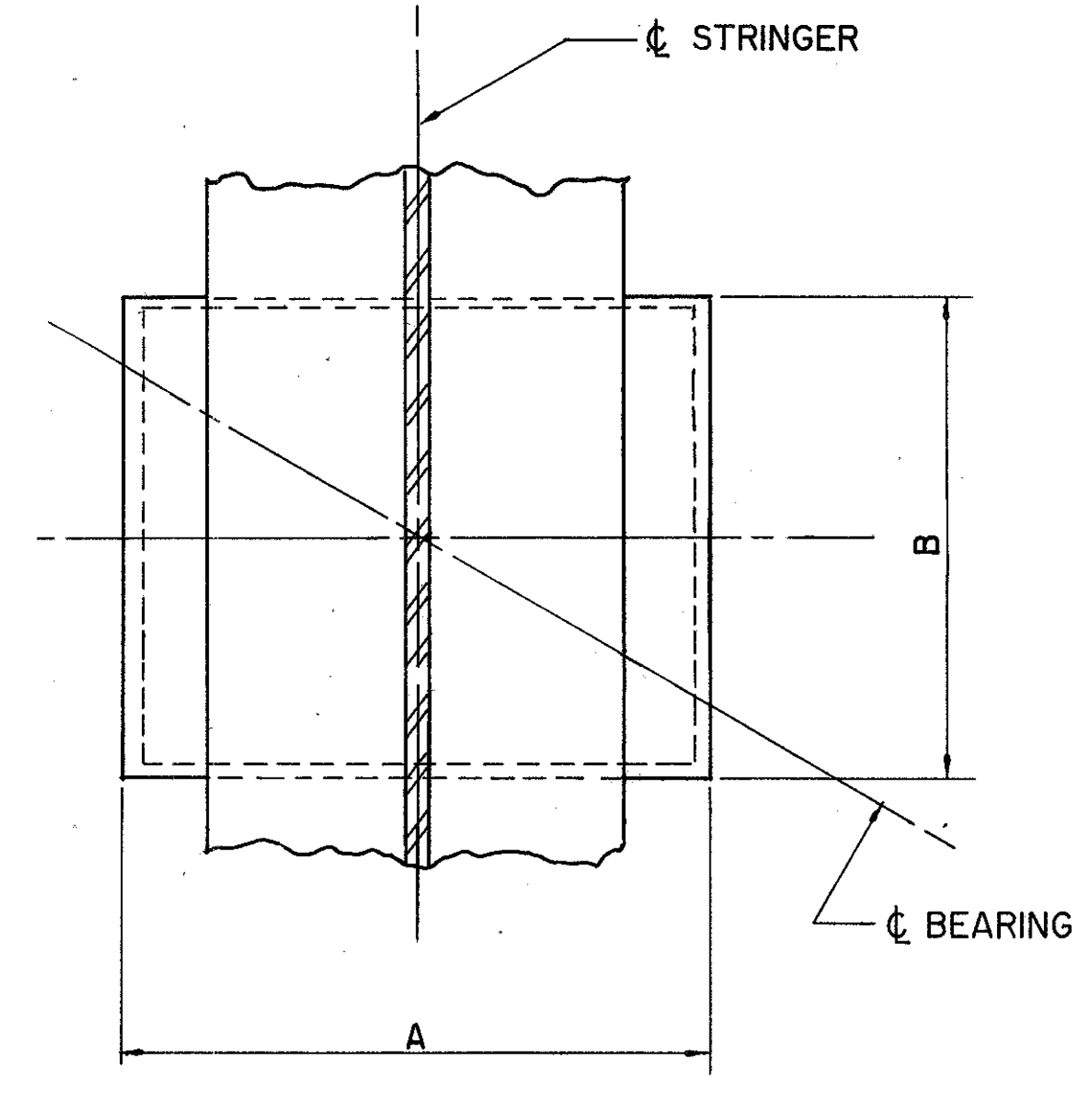
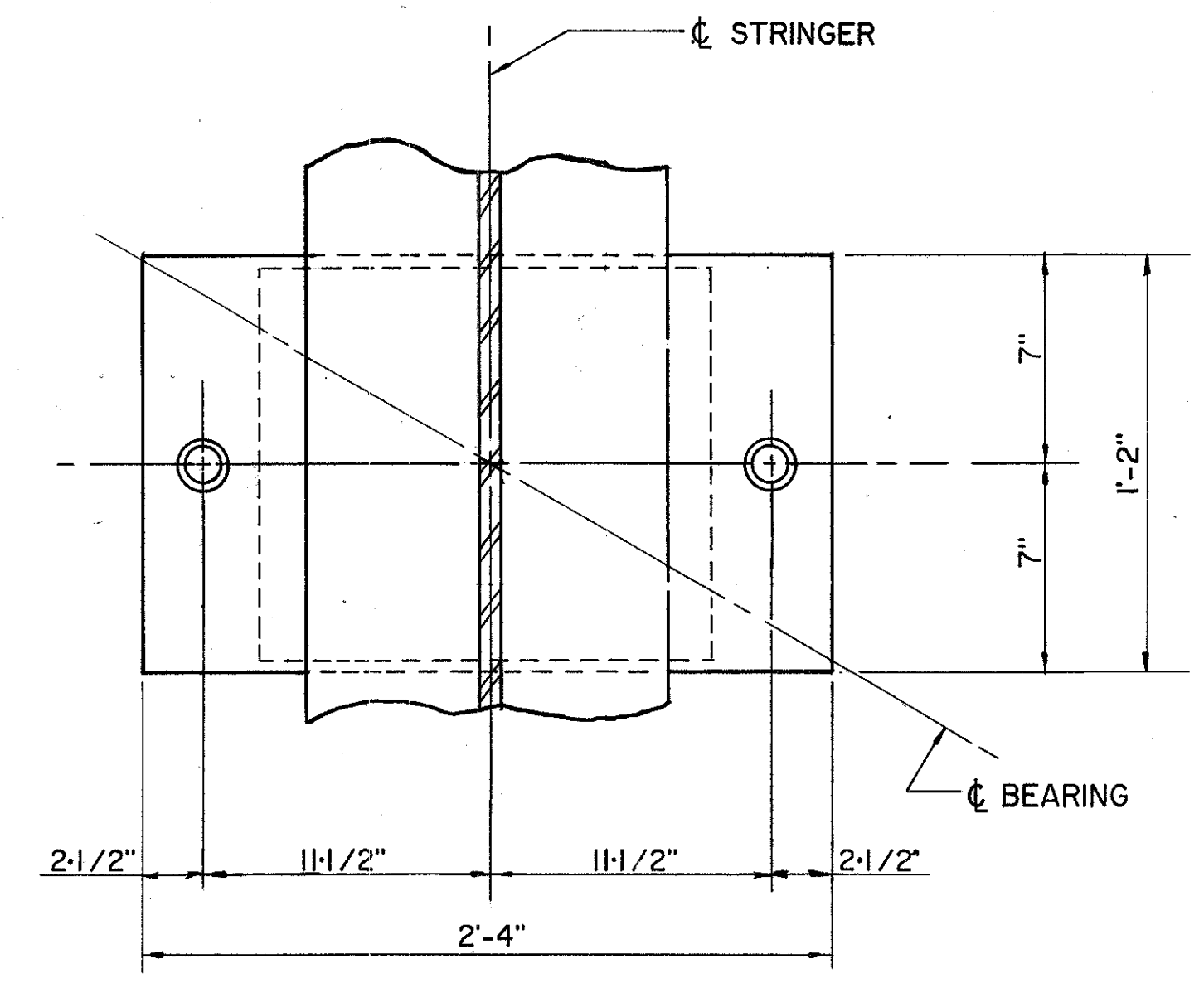
**FIXED BEARING ANCHOR ROD:** THE STEEL ANCHOR RODS SHALL BE ASTM A588 GALVANIZED IN ACCORDANCE WITH 711.02 AND INSTALLED IN ACCORDANCE WITH 510. AT THE OPTION OF THE CONTRACTOR, THE ANCHOR RODS (OR FORMED HOLES), LOCATED AND SUPPORTED BY TEMPLATES, MAY BE CAST-IN-PLACE. INCLUDE DOWEL HOLES AND ANCHOR RODS WITH ITEM 516 FOR PAYMENT.

**BRIDGE SEAT DETAILS:** SEE THE PIER AND ABUTMENT DRAWINGS FOR FURTHER DETAILS OF THE BEARING LAYOUTS AND SEAT REINFORCING. (SHEETS 6/27, 9/27 AND 11/27)

**BEARING REPOSITIONING:** IF DECK CONCRETE IS PLACED AT AN AMBIENT TEMPERATURE HIGHER THAN 80°F OR LOWER THAN 40°F AND THE BEARING SHEAR DEFLECTION EXCEEDS ONE-SIXTH OF THE BEARING HEIGHT AT 60°F ±10°F. THE BEAMS OR GIRDERS SHALL BE RAISED TO ALLOW THE BEARINGS TO RETURN TO THEIR UNDEFORMED SHAPE AT 60°F ±10°F.

**BASIS OF PAYMENT:** THE UNIT BID PRICE SHALL INCLUDE ALL MATERIALS, LABOR, EQUIPMENT AND INCIDENTALS NECESSARY TO FURNISH AND INSTALL THE ELASTOMERIC BEARINGS EITHER FIXED OR EXPANSION. PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICES FOR ITEMS 516 ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE LESS THAN 2" THICK) AND 516 ELASTOMERIC BEARING PAD WITH INTERNAL LAMINATES AND LOAD PLATE.

**ELASTOMERIC TEST PAD:** THE ELASTOMERIC BEARING MANUFACTURER SHALL SUPPLY A PLAIN ELASTOMERIC PAD FOR TESTING PURPOSES. THE PAD SHALL BE FURNISHED FROM THE SAME BATCH OF NEOPRENE THAT IS USED IN THE FABRICATION OF THE LAMINATED ELASTOMERIC BEARINGS AND THE FABRICATOR SHALL CERTIFY THE IDENTITY OF THE ELASTOMER. THE PAD SHALL HAVE A 1/2 INCH THICKNESS, AND SHALL HAVE MINIMUM LENGTH AND WIDTH DIMENSIONS OF 6 INCHES. PAYMENT FOR THE TEST PAD WILL BE INCLUDED IN THE PRICE BID FOR THE BEARINGS.



ELASTOMERIC LAYERS ARE 1/4" THICK AT PIERS AND 3/16" THICK AT ABUTMENTS.  
N=NUMBER OF GAGE 14 REINFORCING STEEL PLATES IS (N-1)

**DETAIL A**  
FIXED BEARING - PIER #2

1-1/4" LAMINATED ELASTOMERIC BEARING  
4 - 1/4" THICK ELASTOMERIC LAYERS  
3 - 0.074" THICK STEEL REINFORCING PLATES

**DETAIL B**  
EXPANSION BEARING - PIERS #1, #3, 8 #4  
- REAR & FWD. ABUT'S

BEARING DESIGN INFORMATION											
MARK†	LOCATION	R <sub>D</sub>	R <sub>L</sub>	A	B	C	D	T <sub>S</sub> *	T <sub>N</sub> **	N***	H
RA	REAR ABUTMENT	40.5 K	53.0 K	13"	10-1/2"	12"	9-1/2"	1-1/2"	1-5/8"	15	3-7/8"
P1	PIER #1	133.2 K	67.5 K	19"	14"	18"	13"	2"	2-3/32"	8	2-1/2"
P2	PIER #2	133.8 K	69.9 K								
P3	PIER #3	133.8 K	69.9 K	19"	14"	18"	13"	2"	2"	8	2-1/2"
P4	PIER #4	133.2 K	67.5 K	19"	14"	18"	13"	2-3/32"	2"	8	2-1/2"
FA	FORWARD ABUTMENT	40.5 K	53.0 K	13"	10-1/2"	12"	9-1/2"	1-21/32"	1-1/2"	15	3-7/8"

- \* LOAD PLATE THICKNESS AT REAR EDGE.
- \*\* LOAD PLATE THICKNESS AT FORWARD EDGE
- \*\*\* N REPRESENTS THE TOTAL NUMBER OF ELASTOMERIC LAYERS

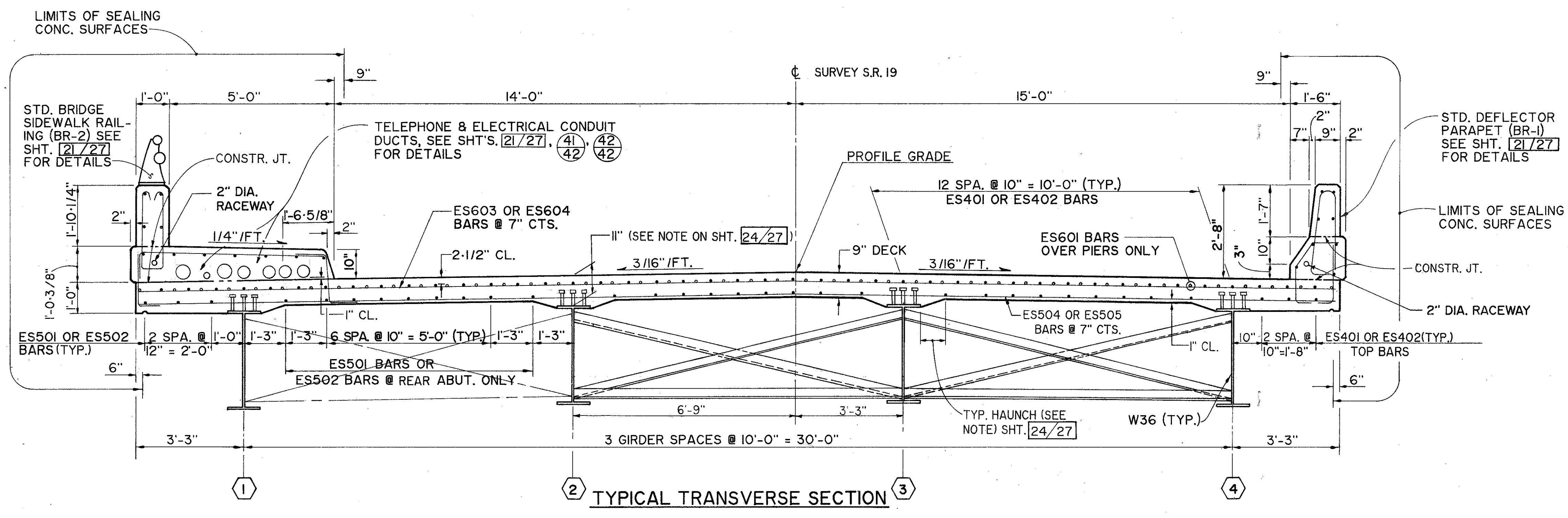
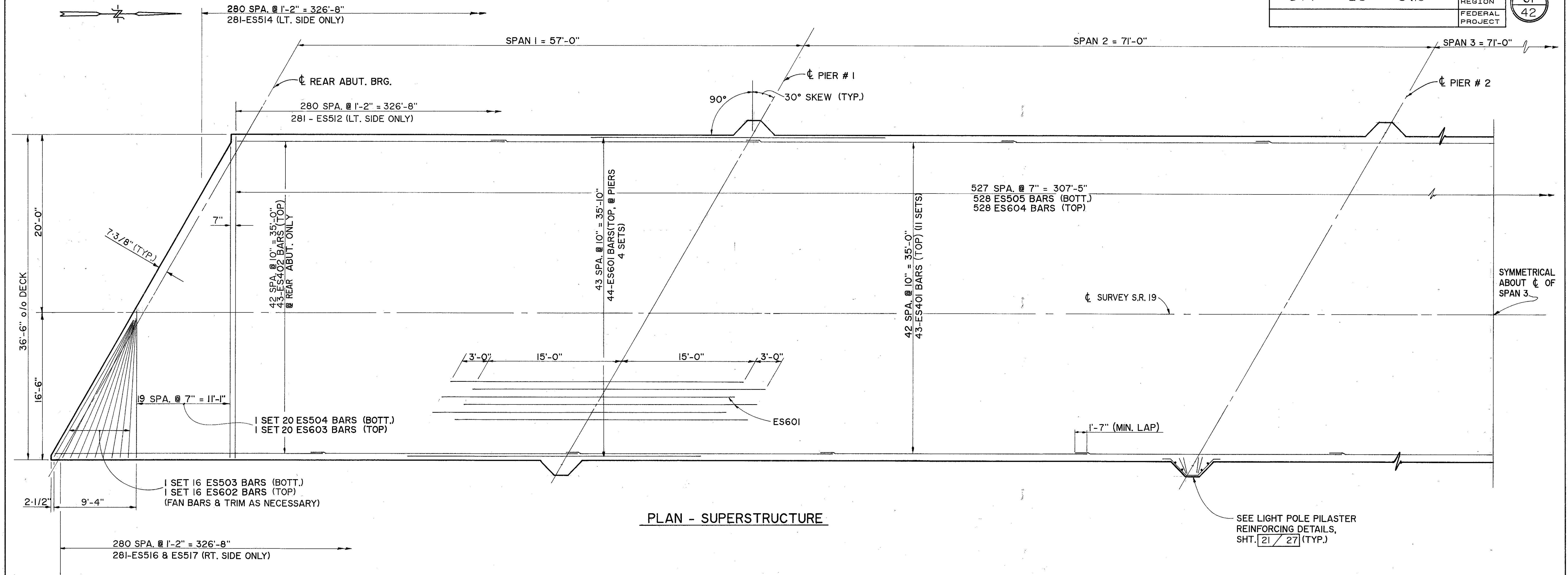
† NOTE: EACH BEARING SHALL BE PERMANENTLY MARKED AS DESIGNATED IN ORDER TO FACILITATE TRACKING OF THE VARIOUS BEARINGS. CARE SHALL BE TAKEN TO ENSURE THAT EACH BEARING IS IN ITS PROPER LOCATION AND WITH THE TAPERED LOAD PLATE PLACED PARALLEL TO THE ROADWAY GRADIENT.

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**ELASTOMERIC BEARING DETAILS**

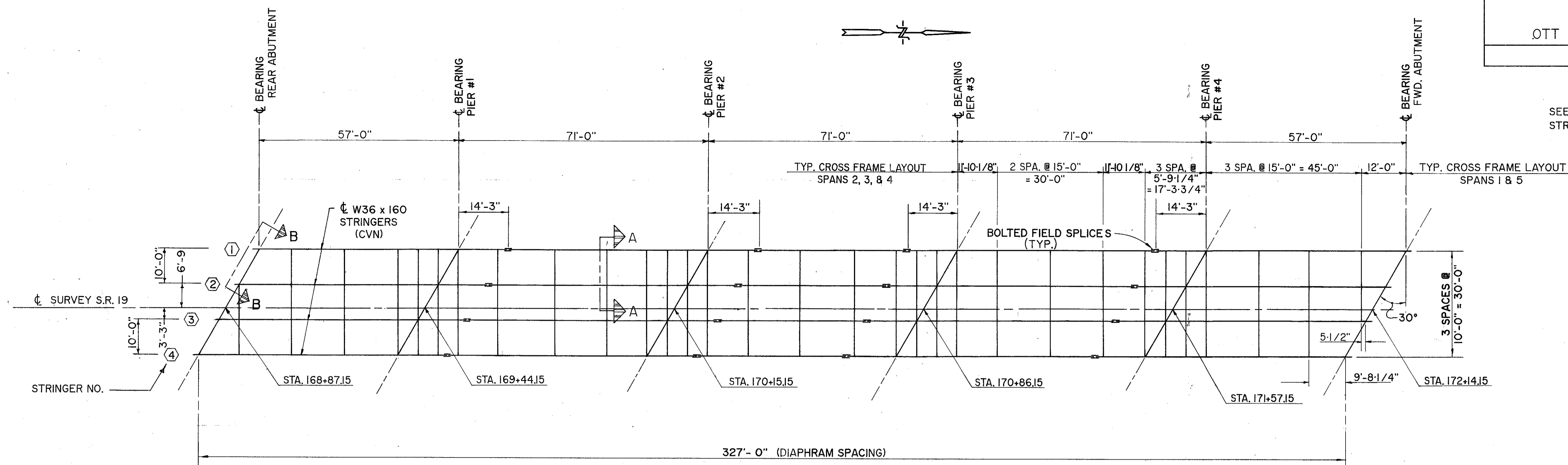
BRIDGE NO. OTT-19-0323  
OVER PORTAGE RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DGK	RNH		DBG	THY	2-22-91	

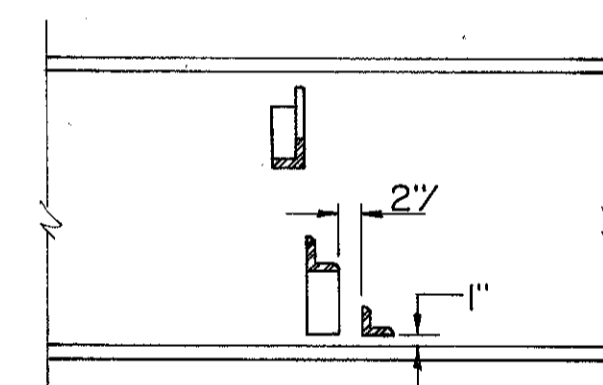


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<b>SUPERSTRUCTURE DETAILS</b>		
BRIDGE NO. OTT-19-0320 OVER PORTAGE RIVER		
DESIGNED	DRAWN	TRACED
DGK	DBG	DBG
CHECKED	REVIEWED	DATE
DBG	THY	2-21-91
REVISED		

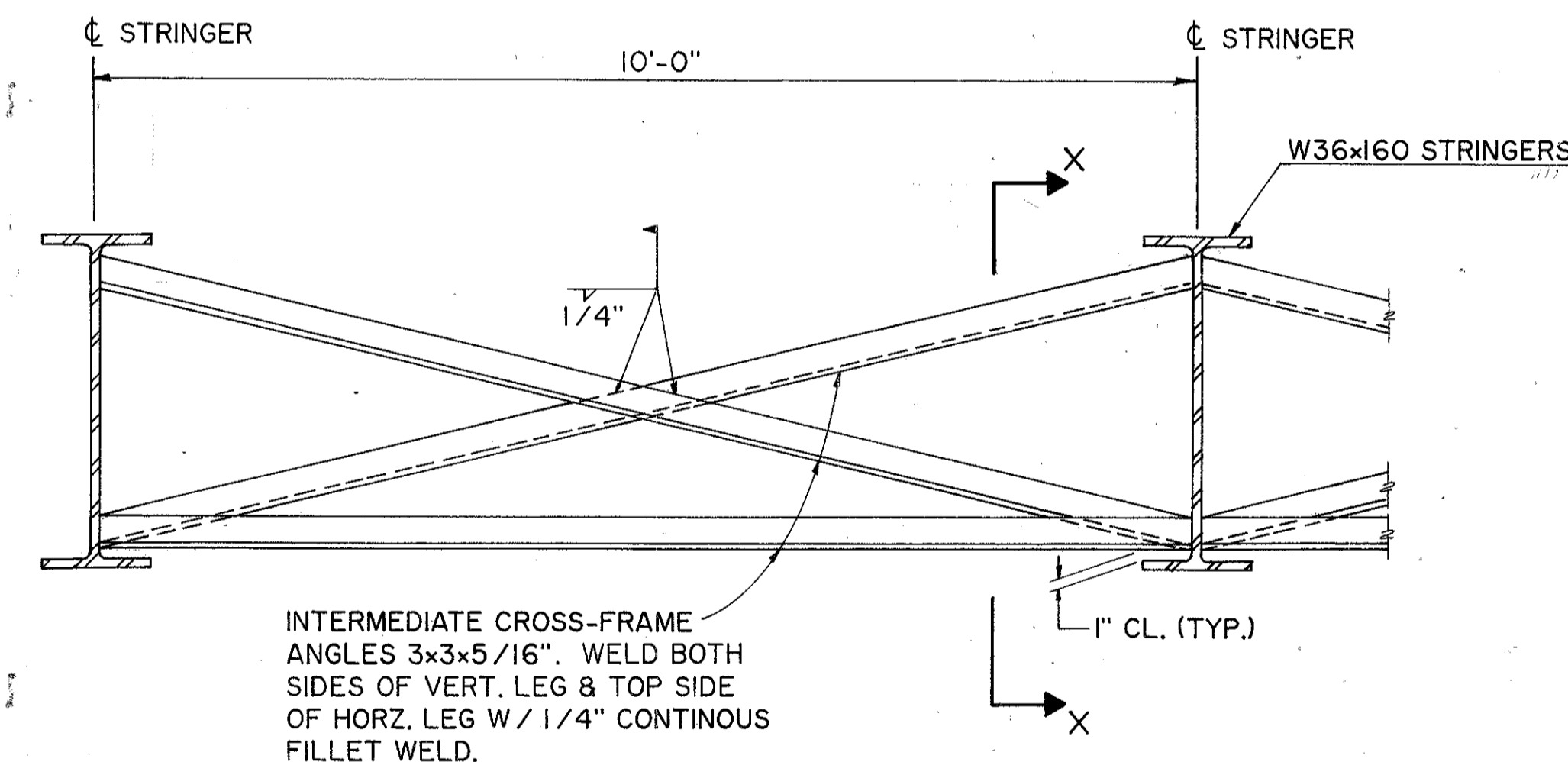
SEE SHEET 20/27 FOR STRUCTURAL STEEL NOTES



STEEL FRAMING PLAN



SECTION X-X

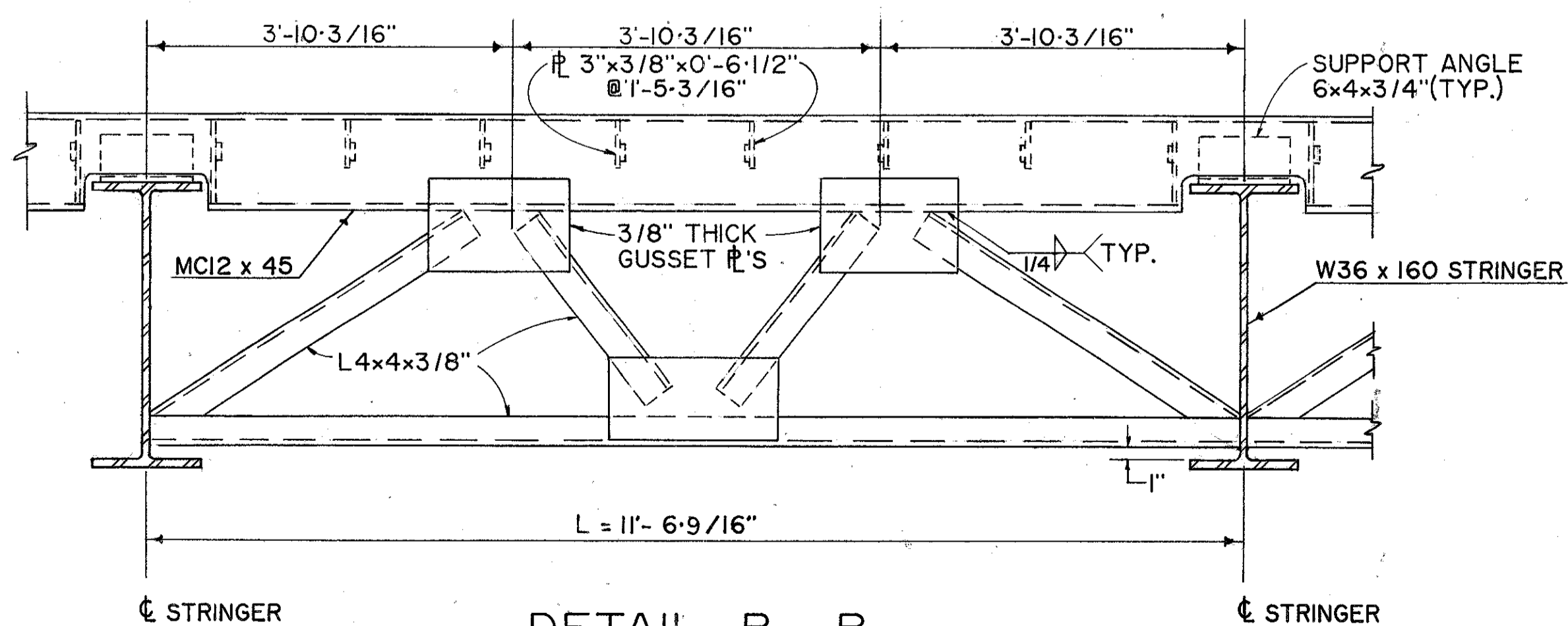


INTERMEDIATE CROSS-FRAME ANGLES 3x3x5/16". WELD BOTH SIDES OF VERT. LEG & TOP SIDE OF HORZ. LEG W/ 1/4" CONTINUOUS FILLET WELD.

DETAIL A - A  
INTERMEDIATE DIAPHRAM

INTERIOR STRINGER DESIGN DATA

	0.4 SPAN 1 OR 0.6 SPAN 5	PIER #1 OR PIER #4	0.5 SPAN 2 OR 0.5 SPAN 4	PIER #2 OR PIER #3	0.5 SPAN 3
I <sub>s</sub> (in <sup>4</sup> )	9750	9750	9750	9750	9750
I <sub>c</sub> (in <sup>4</sup> )	28124	14119	28124	14119	28124
S <sub>s</sub> (in <sup>3</sup> )	542	542	542	542	542
S <sub>c</sub> (in <sup>3</sup> )	821.9	627.0	821.9	627.0	821.9
D (k/ft.)	1.325	1.325	1.325	1.325	1.325
1.3M <sub>sp</sub> (ft.-k)	386.6	-712.3	366.3	-725.9	359.6
① f <sub>s</sub> (ksi)	8.56	15.77	8.11	16.07	7.96
S <sub>D</sub> (k/ft.)	0.556	0.556	0.556	0.556	0.556
1.3M <sub>sp</sub> (ft.-k)	177.1	-260.5	187.2	-274.3	180.3
2.71 M <sub>L</sub> + I (ft.-k)	1980.6	-1384.2	2118.5	-1510.4	2138.0
② f <sub>s</sub> (ksi)	31.50	31.03	33.66	33.67	33.85
③ M <sub>u</sub> (ft.-k)	2544.3	-2357.0	2672.0	-2510.7	2677.8
f <sub>s</sub> TOTAL (ksi)	40.06	46.80	41.77	49.74	41.81
④ VR (k)	74.5	79.0	61.4	80.3	59.2



DETAIL B - B

END DIAPHRAM AT FWD. & REAR ABUTMENT  
FOR FURTHER NOTES & DETAILS  
SEE STD. DRAWING EXJ-4-87  
8 SD-I-69

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STEEL FRAMING PLAN & DETAILS

BRIDGE NO. OTT-19-0323  
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DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DGK	Rhh		DBG	THY	2-21-91	

① NON-COMPOSITE STRESS IN EXTREME FIBER OF STEEL "I" BEAM.  
② COMPOSITE STRESS IN EXTREME FIBER OF STEEL "I" BEAM.  
③  $M_u = 1.3(M_{sp} + M_{sd} + 1.25(1.67)(M_L + I))$   
④  $VR = \frac{1}{2} + I$  SHEAR RANGE USED TO DETERMINE SHEAR STUD SPACING.

**STRUCTURAL STEEL NOTES**

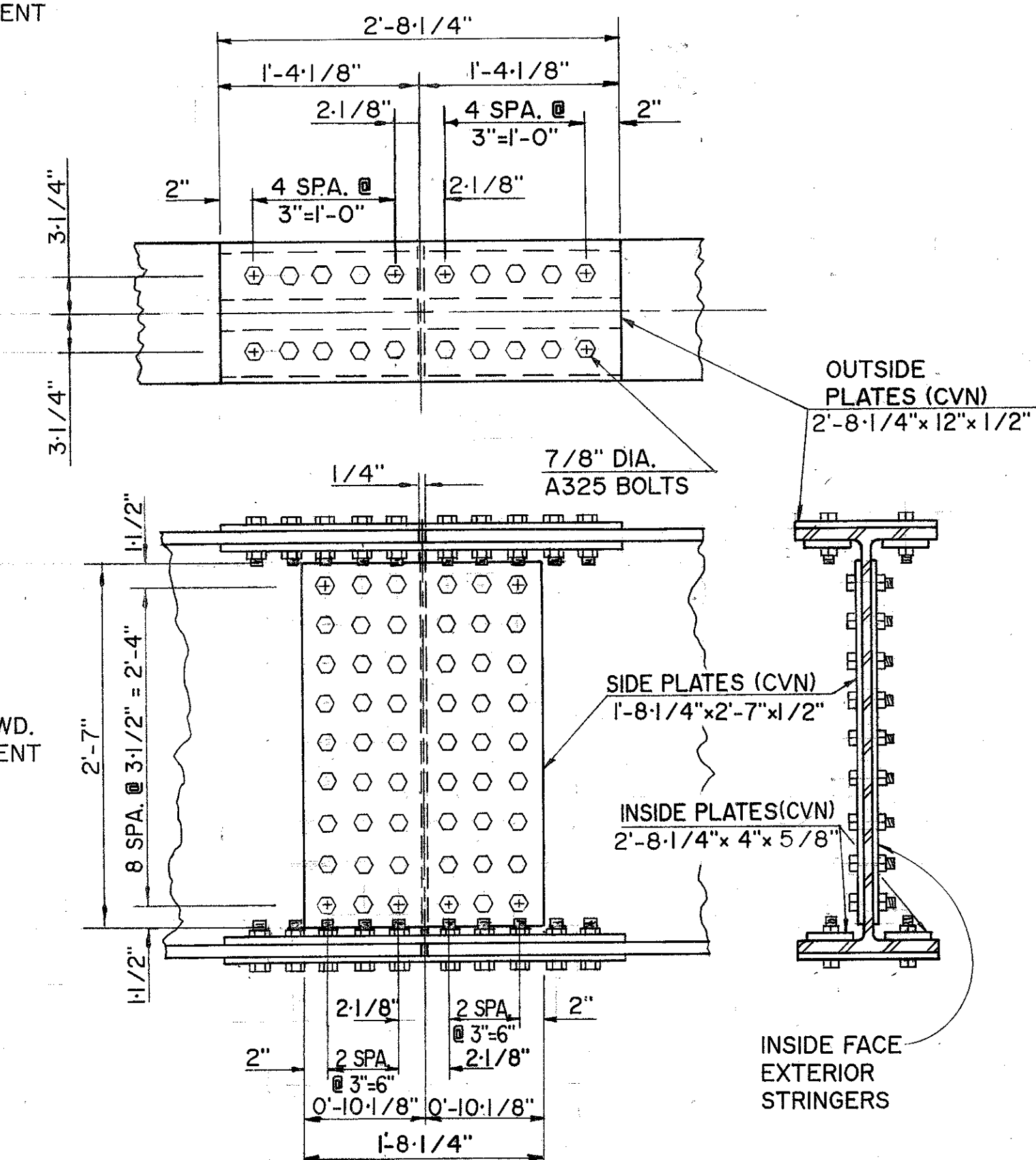
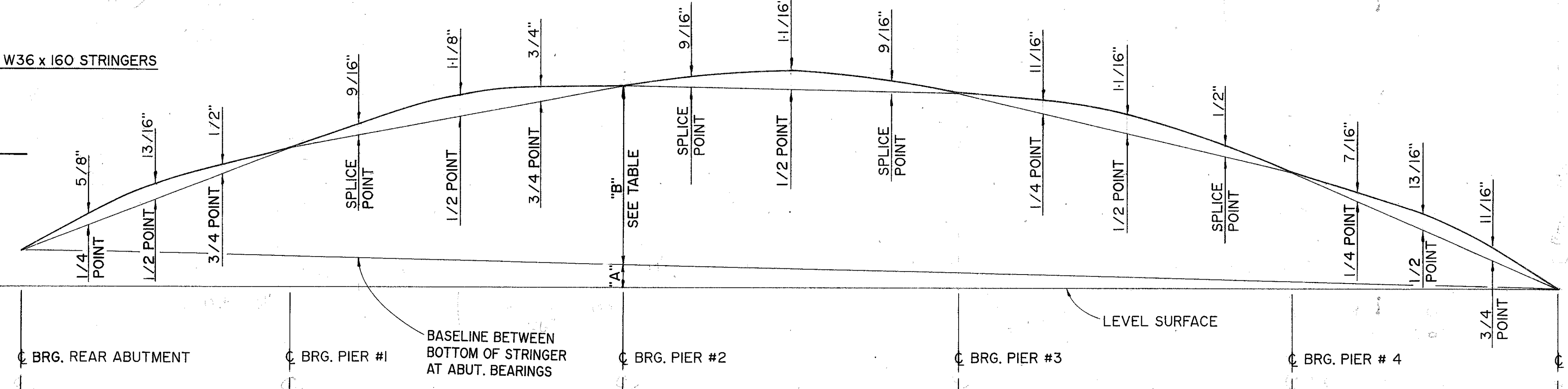
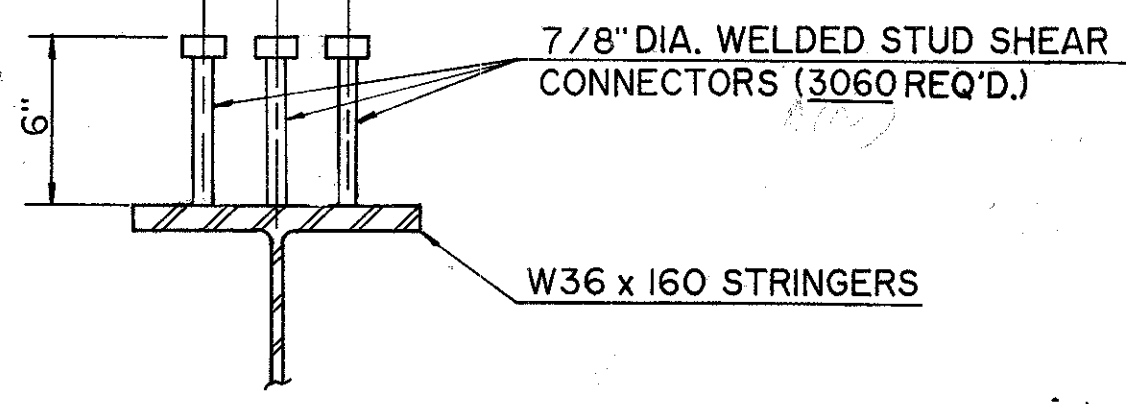
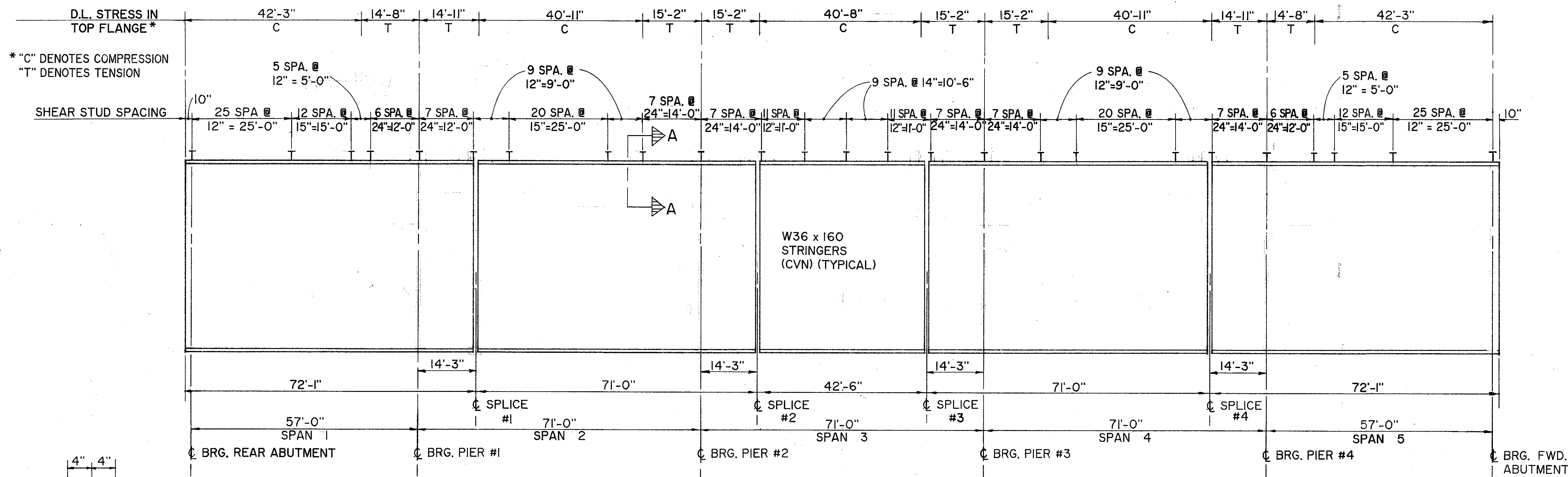
ALL STEEL PLATES, BARS, AND SHAPES SHALL CONFORM TO THE REQUIREMENTS OF A.S.T.M. A-588. WHERE A SHAPE OR PLATE IS DESIGNATED (CVN) THE MATERIAL SHALL MEET SPECIFIED MINIMUM NOTCH TOUGHNESS REQUIREMENTS AS SPECIFIED IN 711.01 OF CMS.

HIGH STRENGTH BOLTS SHALL BE 7/8" DIAMETER A325 UNLESS OTHERWISE NOTED. (THREADS EXCLUDED FROM SHEAR PLANE)

WELDED ATTACHMENT OF SUPPORTS FOR CONCRETE DECK FINISHING MACHINE MAY BE MADE TO AREAS OF THE FASCIA STRINGER FLANGES DESIGNATED "COMPRESSION". ATTACHMENTS SHALL NOT BE MADE TO AREAS DESIGNATED "TENSION". FILLET WELDS TO COMPRESSION FLANGES SHALL BE NOT CLOSER THAN 1" FROM EDGE OF FLANGE, BE NOT MORE THAN 2" LONG, AND BE NOT SMALLER THAN THE MINIMUM SIZE REQUIRED BY AASHTO.

A588 STEEL IS TO BE LEFT UNPAINTED EXCEPT AS OTHERWISE SHOWN OR NOTED. SEE CMS 513.221 AND 513.222 FOR CLEANING REQUIREMENTS.

AN EIGHT (8) FOOT LENGTH OF ENDS OF THE STRINGERS ADJACENT TO THE ABUTMENTS AND ALL OTHER A588 STEEL (DIAPHRAGMS, BRG. STIFFENERS, BRG'S.) WITHIN THESE LIMITS SHALL BE PAINTED. PAINT SHALL BE 514, SYSTEM A. THE PRIME COAT SHALL BE 70817. THE TOP COAT SHALL BE 70818 EXCEPT THAT THE COLOR SHALL CLOSELY APPROACH FEDERAL STANDARD NO. 595a-20045 OR 20059. PAYMENT SHALL BE MADE FOR ITEM 514, LUMP SUM FIELD PAINTING NEW STRUCTURAL STEEL, SYSTEM A.



**DEFLECTION AND CAMBER DATA**

	SPAN 1			SPAN 2			SPAN 3			SPAN 4			SPAN 5		
	1/4 POINT	1/2 POINT	3/4 POINT	SPLICE POINT	1/2 POINT	3/4 POINT	SPLICE POINT	1/2 POINT	SPLICE POINT	1/4 POINT	1/2 POINT	SPLICE POINT	1/4 POINT	1/2 POINT	3/4 POINT
DEFLECTION DUE TO WEIGHT OF STEEL BEAM	1/16"	1/16"	0	0	1/16"	1/16"	1/16"	1/16"	0	1/16"	1/16"	0	0	1/16"	1/16"
DEFLECTION DUE TO REMAINING DEAD LOADS	3/8"	7/16"	3/16"	1/4"	9/16"	5/16"	1/4"	9/16"	1/4"	5/16"	9/16"	1/4"	3/16"	7/16"	3/8"
ADJUSTMENT REQUIRED FOR VERTICAL CURVE	3/16"	5/16"	1/4"	5/16"	1/2"	3/8"	5/16"	7/16"	5/16"	5/16"	7/16"	1/4"	3/16"	5/16"	1/4"
REQUIRED SHOP CAMBER	5/8"	13/16"	1/2"	9/16"	11/8"	3/4"	9/16"	11/16"	9/16"	11/16"	11/16"	1/2"	7/16"	13/16"	11/16"

**BLOCKING DIMENSIONS TABLE**

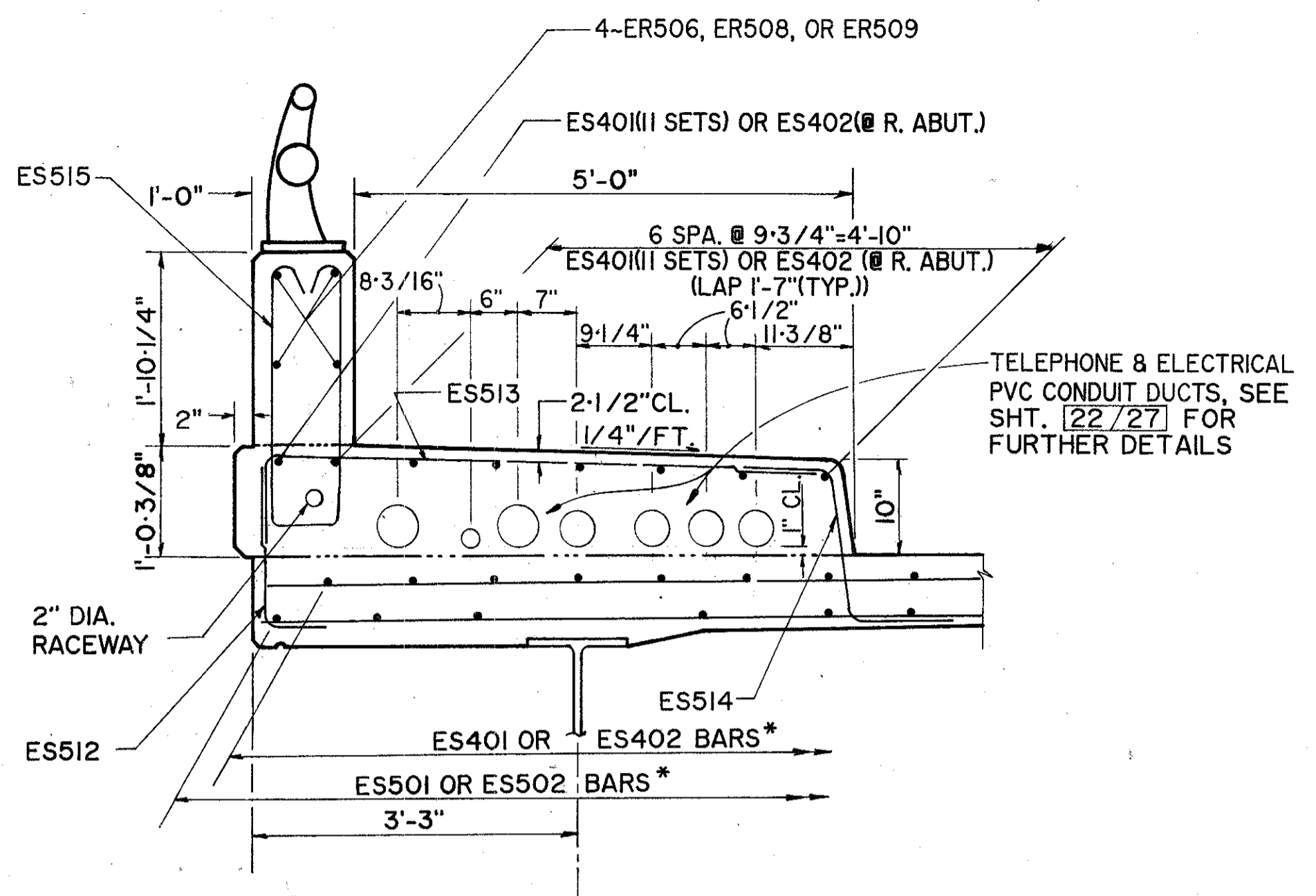
LOCATION		GIRDER #1	GIRDER #2	GIRDER #3	GIRDER #4
BRG. REAR ABUT.	A	4.5/16"	2.7/8"	1.7/16"	0.1/16"
	B	0	0	0	0
BRG. PIER #1	A	3.9/16"	2.3/8"	1.3/16"	0.1/16"
	B	5.3/4"	5.3/4"	5.3/4"	5.3/4"
BRG. PIER #2	A	2.5/8"	1.3/4"	0.7/8"	0.1/16"
	B	9.1/2"	9.1/2"	9.1/2"	9.1/2"
BRG. PIER #3	A	1.11/16"	1.1/8"	0.9/16"	0
	B	9.1/2"	9.1/2"	9.1/2"	9.1/2"
BRG. PIER #4	A	0.3/4"	0.1/2"	0.1/4"	0.1/8"
	B	5.3/4"	5.3/4"	5.3/4"	5.3/4"
BRG. FWD. ABUT.	A	0	0	0	0
	B	0	0	0	0

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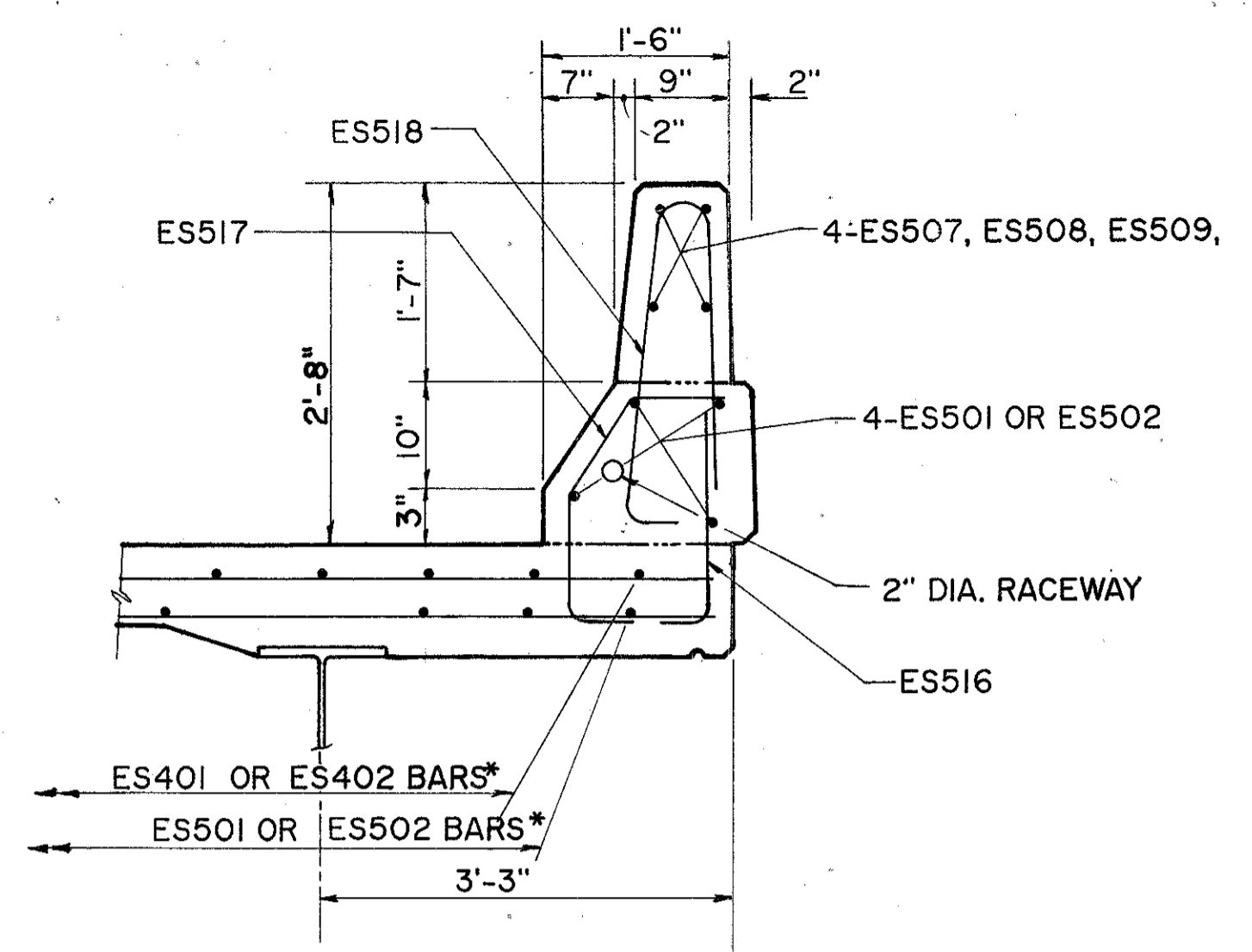
**STEEL STRINGER DETAILS**

BRIDGE NO. OTT-19-0323  
OVER PORTAGE RIVER

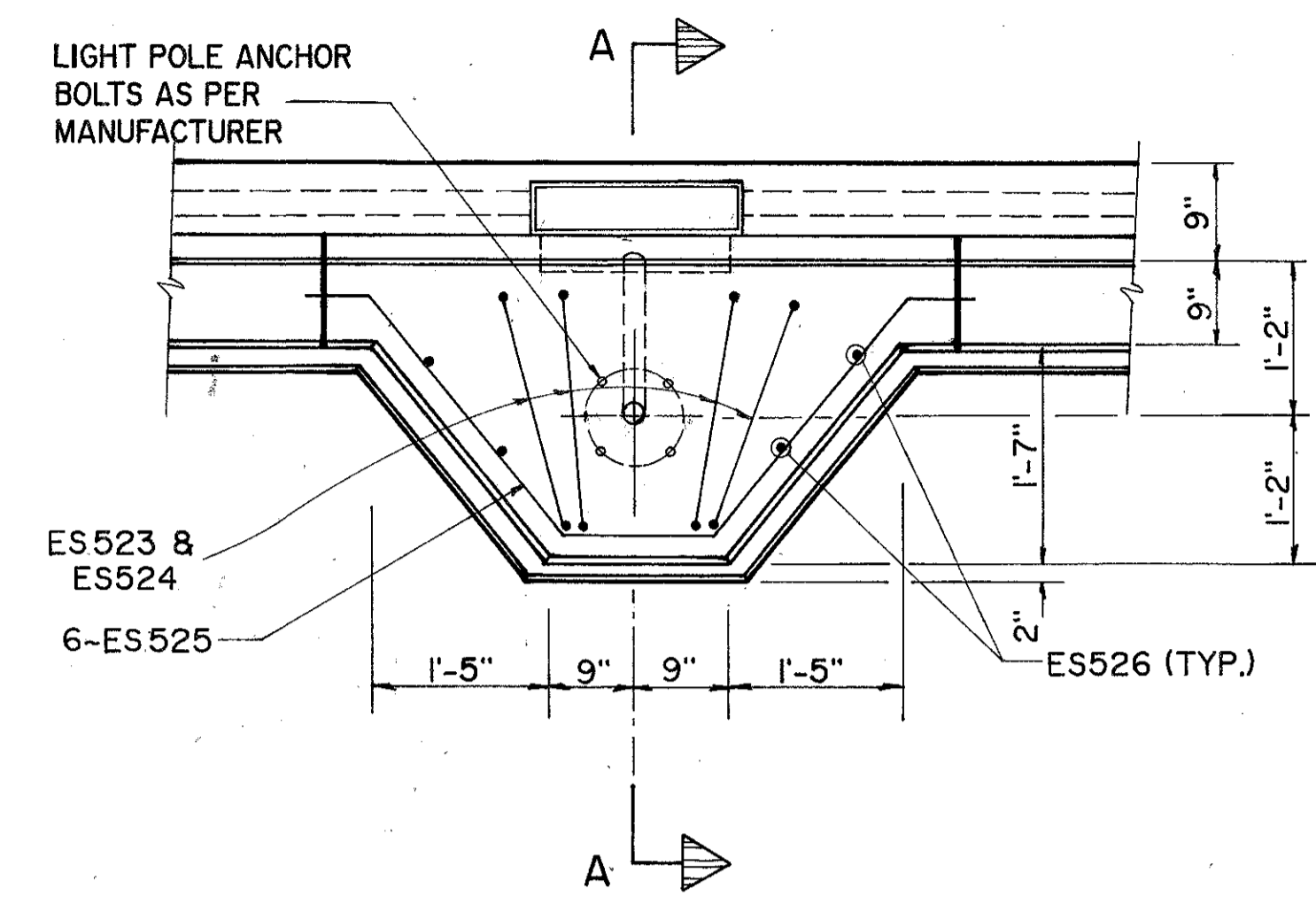
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DGK	RHB		DGK	TMV	2-25-91	



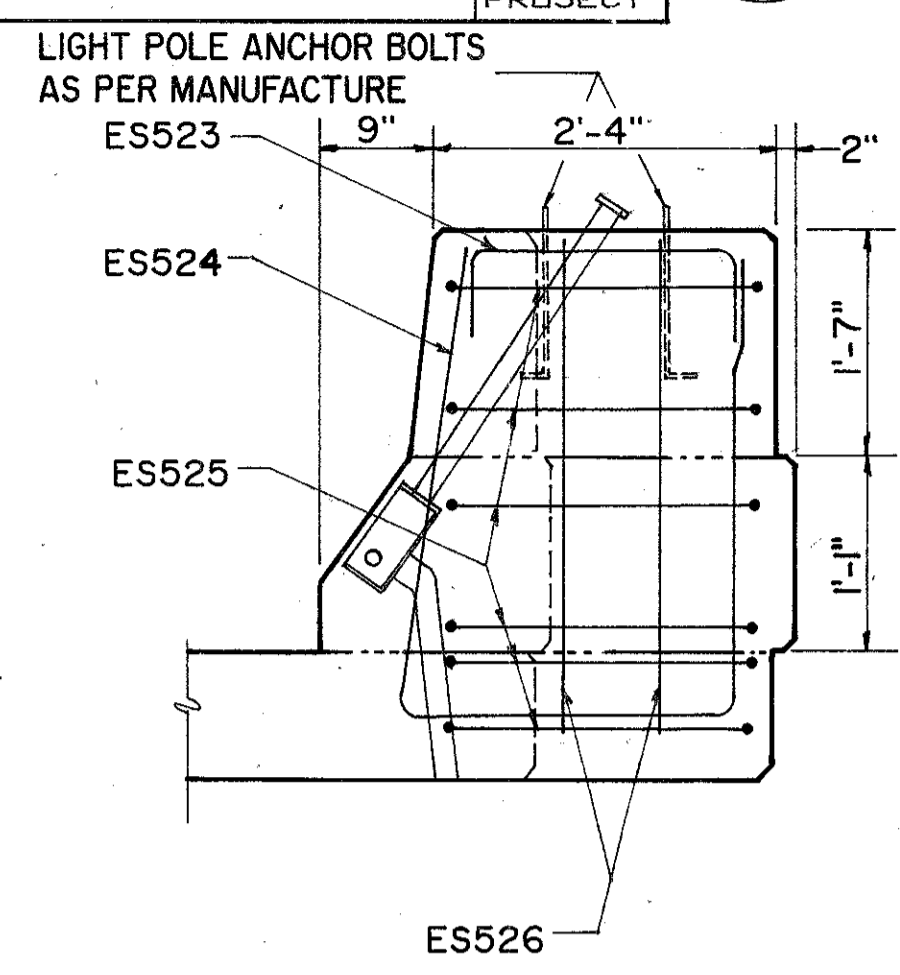
TYPICAL SIDEWALK DETAIL



TYPICAL DEFLECTOR PARAPET DETAIL

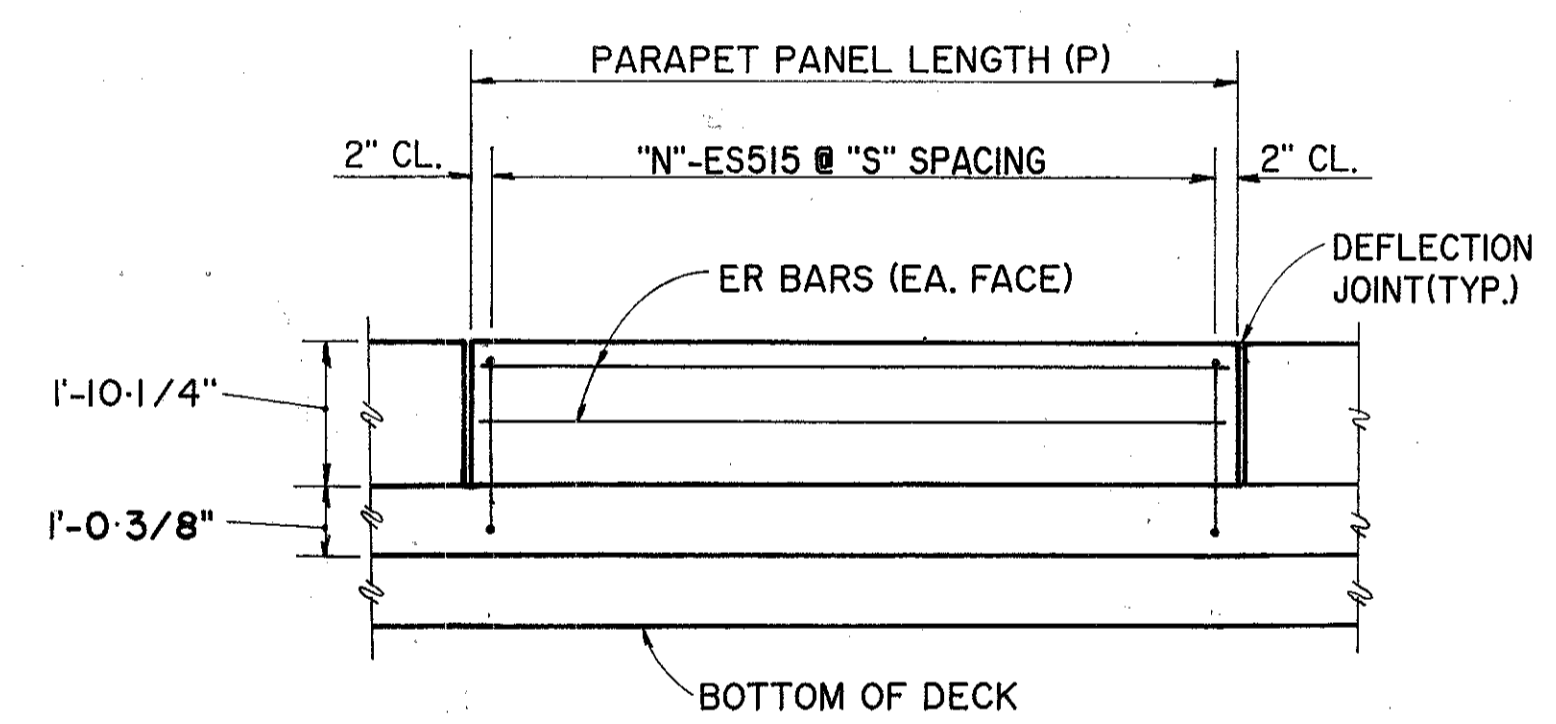


LIGHT POLE PILASTER\*\*  
WITH DEFLECTOR PARAPET

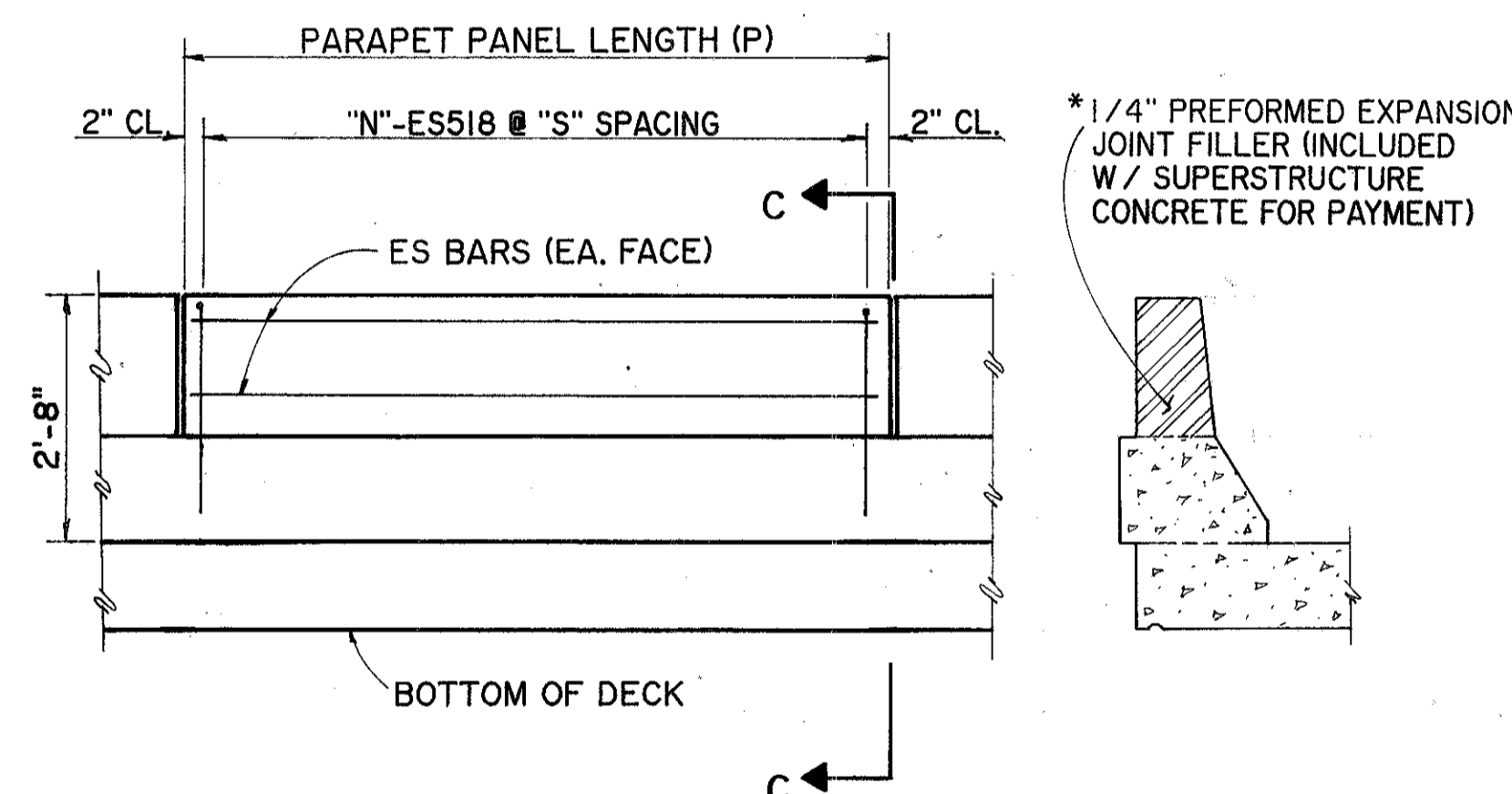


SECTION A-A

\*SEE TRANSVERSE DECK SECTION, SHT. 18/27

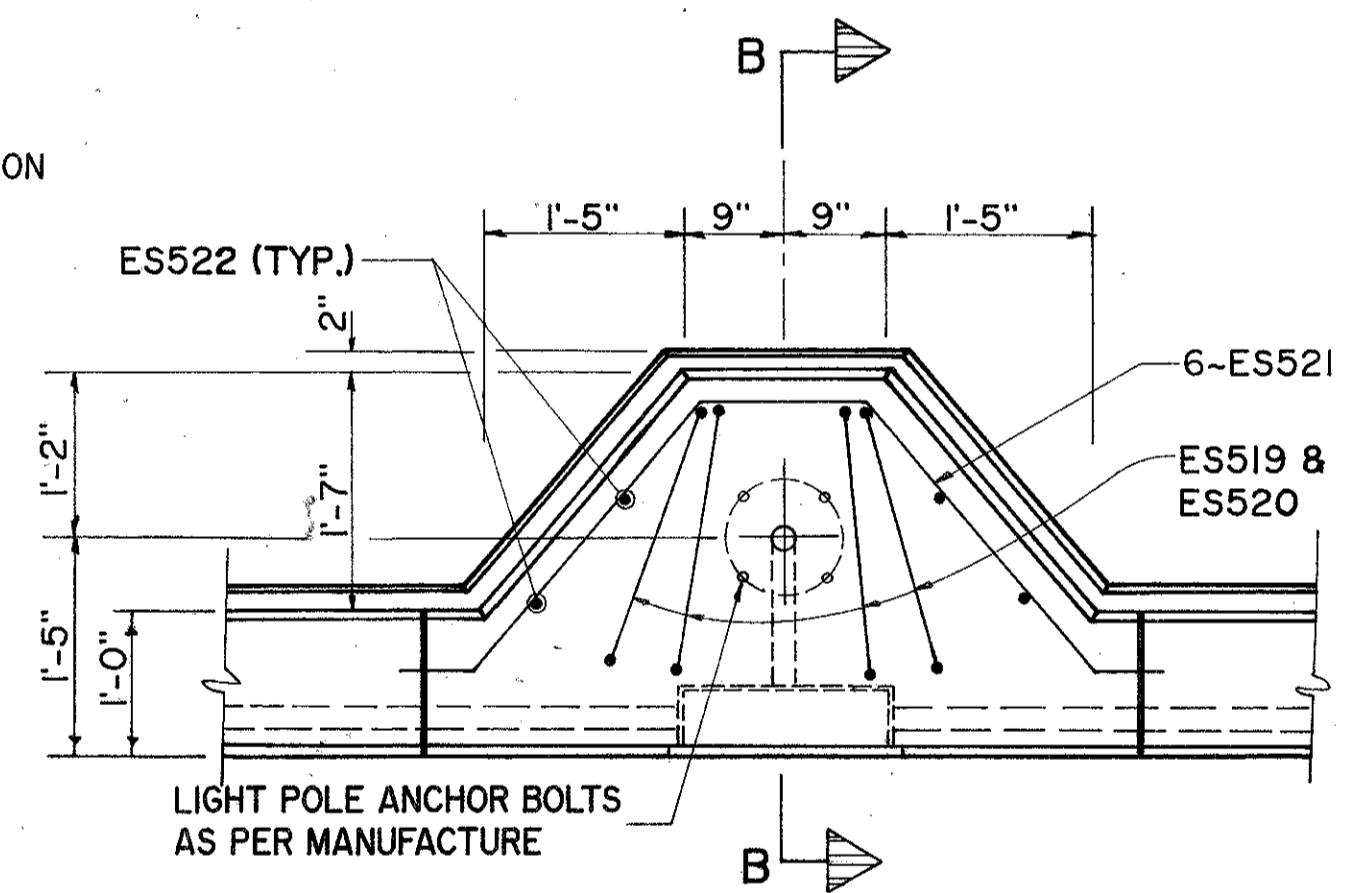


TYPICAL SIDEWALK PARAPET PANEL

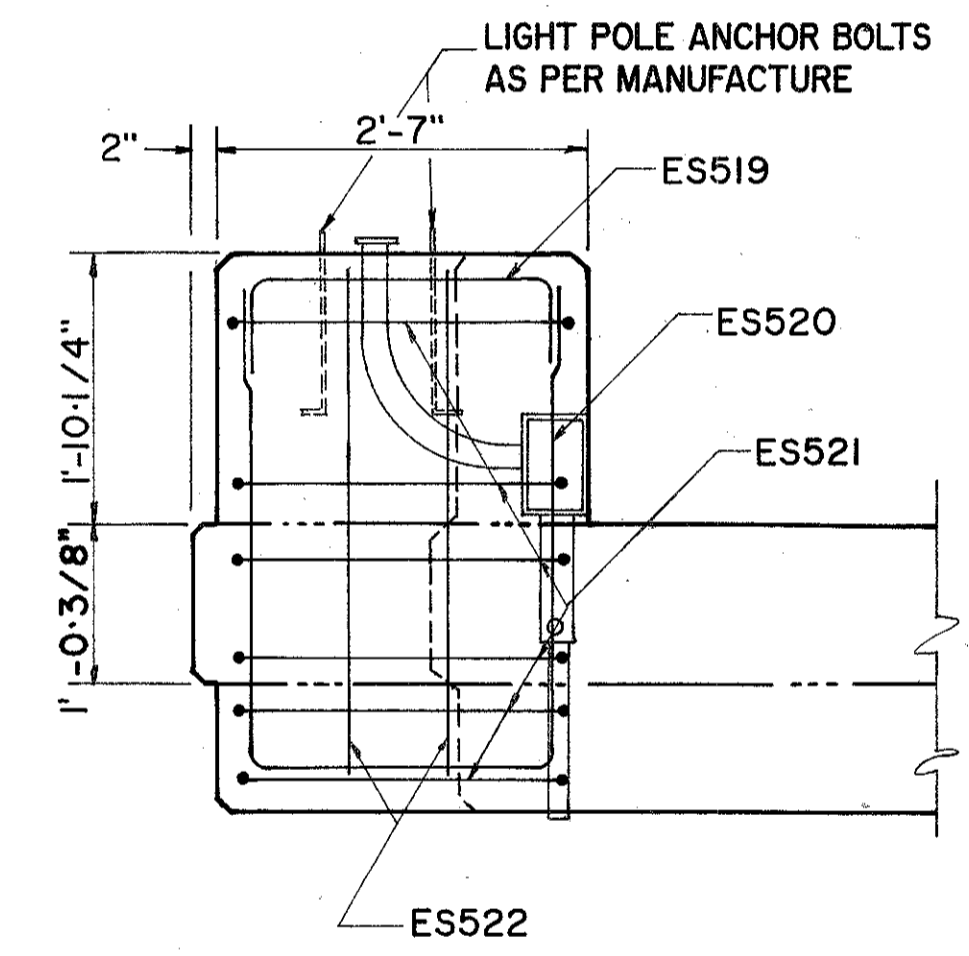


TYPICAL DEFLECTOR PARAPET PANEL

\* PREFORMED EXPANSION JOINT FILLER IN THE PARAPET DEFLECTION JOINTS MAY BE EITHER 1/4\"/>



LIGHT POLE PILASTER\*\*  
WITH SIDEWALK PARAPET



SECTION B-B

\*\* REFER TO STD. DWG. HL-20.14 FOR FURTHER DETAILS

PAN'L MARK	PANEL LENGTH P	NO. OF PANELS	ER BAR MARK	NO. OF BARS "N"	SPACING "S"
P <sub>1</sub>	11'-9"	2	ER501	11	1'-1-3/4"(-)
P <sub>2</sub>	14'-2"	10	ER502	13	1'-1-7/8"(-)
P <sub>3</sub>	7'-1"	23	ER503	7	1'-1-1/2"

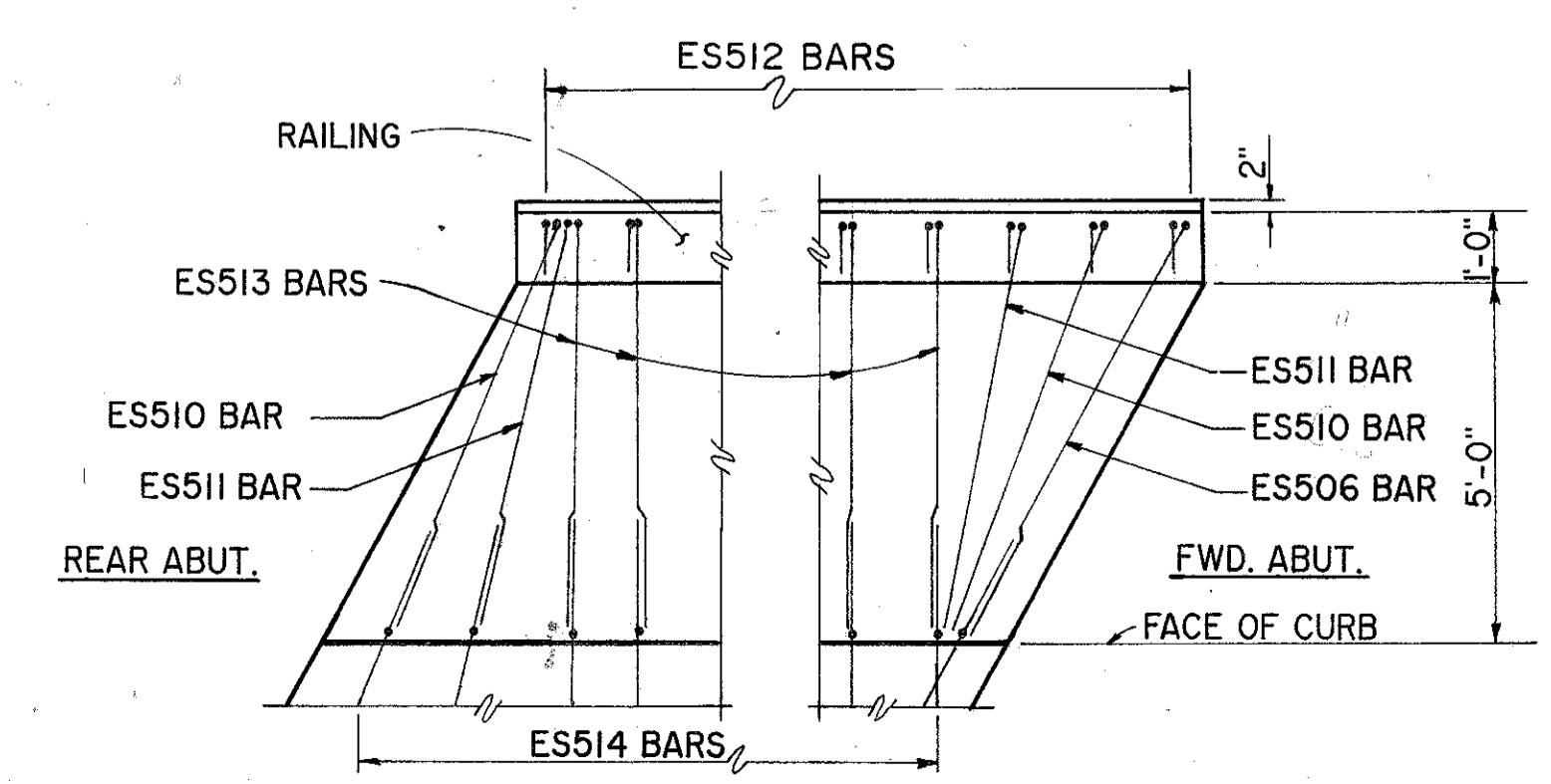
SIDEWALK PARAPET DATA

FOR FURTHER INFORMATION, SEE GENERAL PLAN AND ELEVATION SHEET 2/27 & 3/27

PAN'L MARK	PANEL LENGTH P	NO. OF PANELS	ES BAR MARK	NO. OF "N" BARS	SPACING "S"
P <sub>1</sub>	10'-6-3/8"	1	ES507	10	1'-1-5/8"(-)
P <sub>2</sub>	14'-2"	10	ES508	13	1'-1-7/8"(-)
P <sub>3</sub>	7'-1"	23	ES509	7	1'-1-1/2"
P <sub>4</sub>	12'-11-1/2"	1	ES527	12	1'-1-3/4"

DEFLECTOR PARAPET DATA

FOR FURTHER INFORMATION, SEE GENERAL PLAN AND ELEVATION SHEET 2/27 & 3/27



SIDEWALK END DETAIL

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**SIDEWALK & PARAPET DETAILS**

BRIDGE NO. OTT-19-0323  
OVER PORTAGE RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DGK	JTY		DBG	THY	2-22-91	

**NOTES:**

INSTALLATION OF SEAL:  
DURING INSTALLATION OF THE SUPPORT ARMOR FOR THE SUPERSTRUCTURE SIDE OF THE EXPANSION JOINT SEAL, THE SEATING OF THE BEAMS ON THE BEARING SHALL BE CAREFULLY OBSERVED TO ASSURE THAT POSITIVE BEARING IS MAINTAINED. PROPER VERTICAL FIT OF THE SUPPORT ARMOR ON THE BEAMS SHALL BE ACHIEVED BY POSITIONING OF THE BEVEL FILL PLATES RATHER THAN BY CLAMPING FORCE.

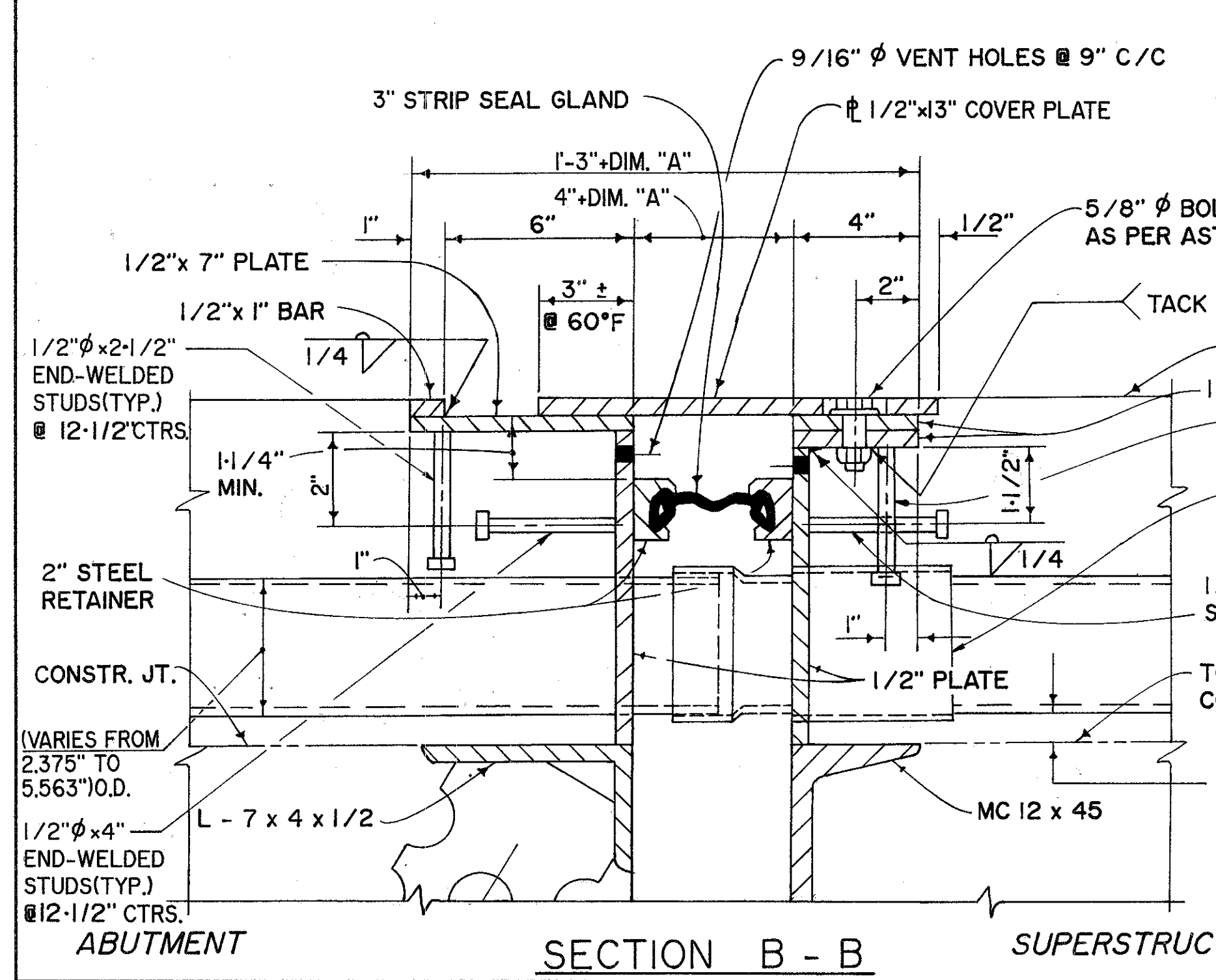
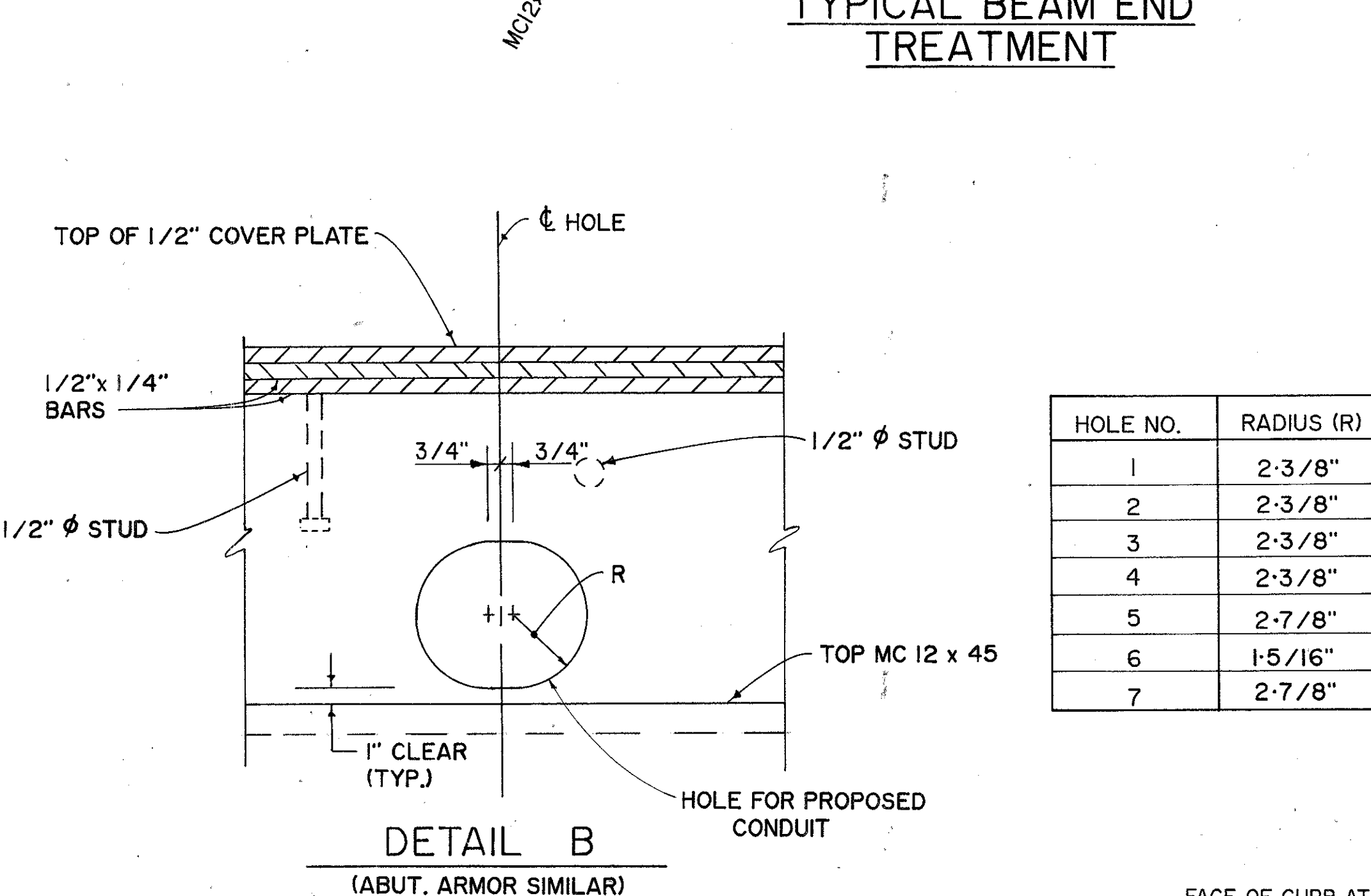
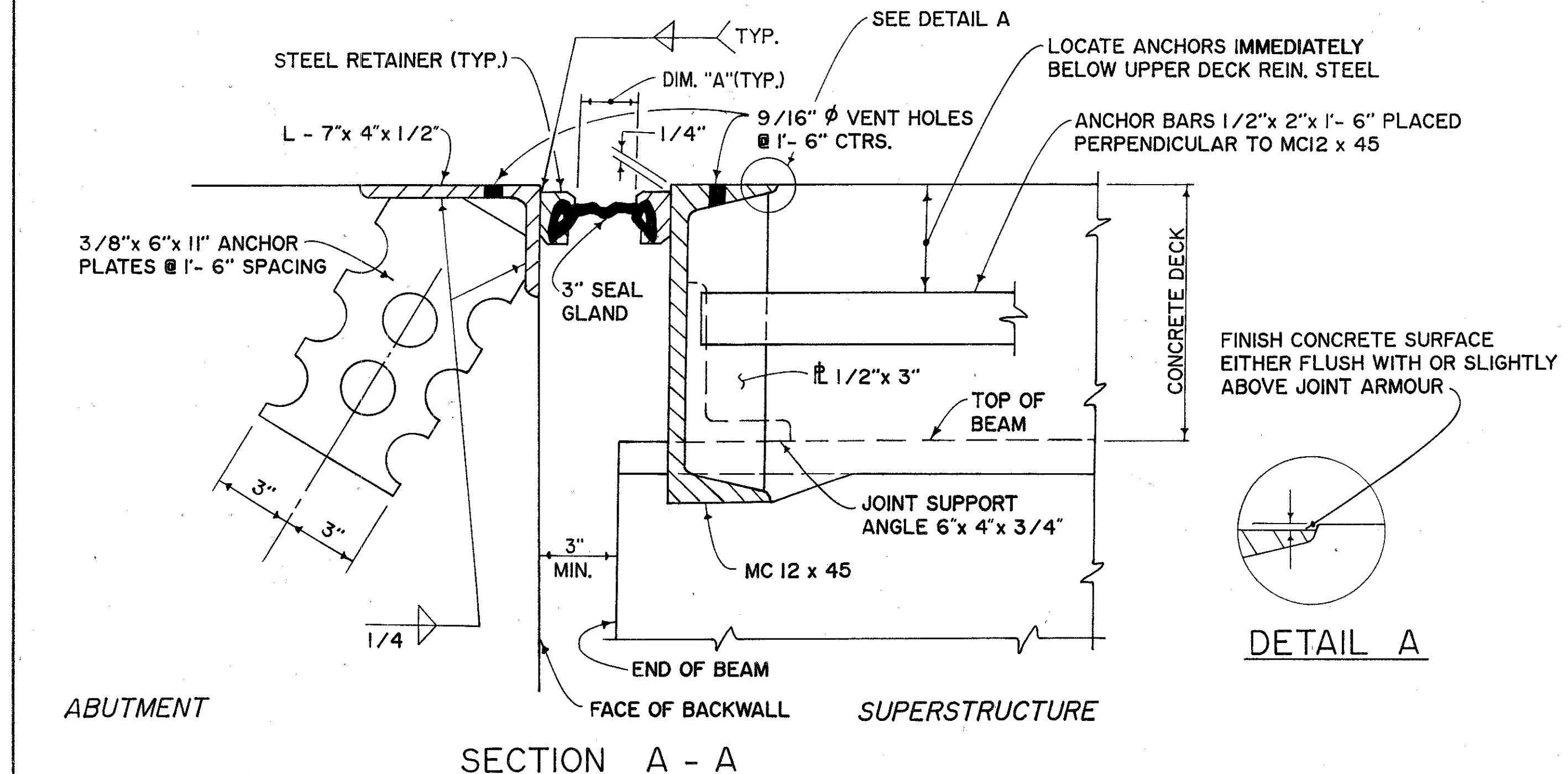
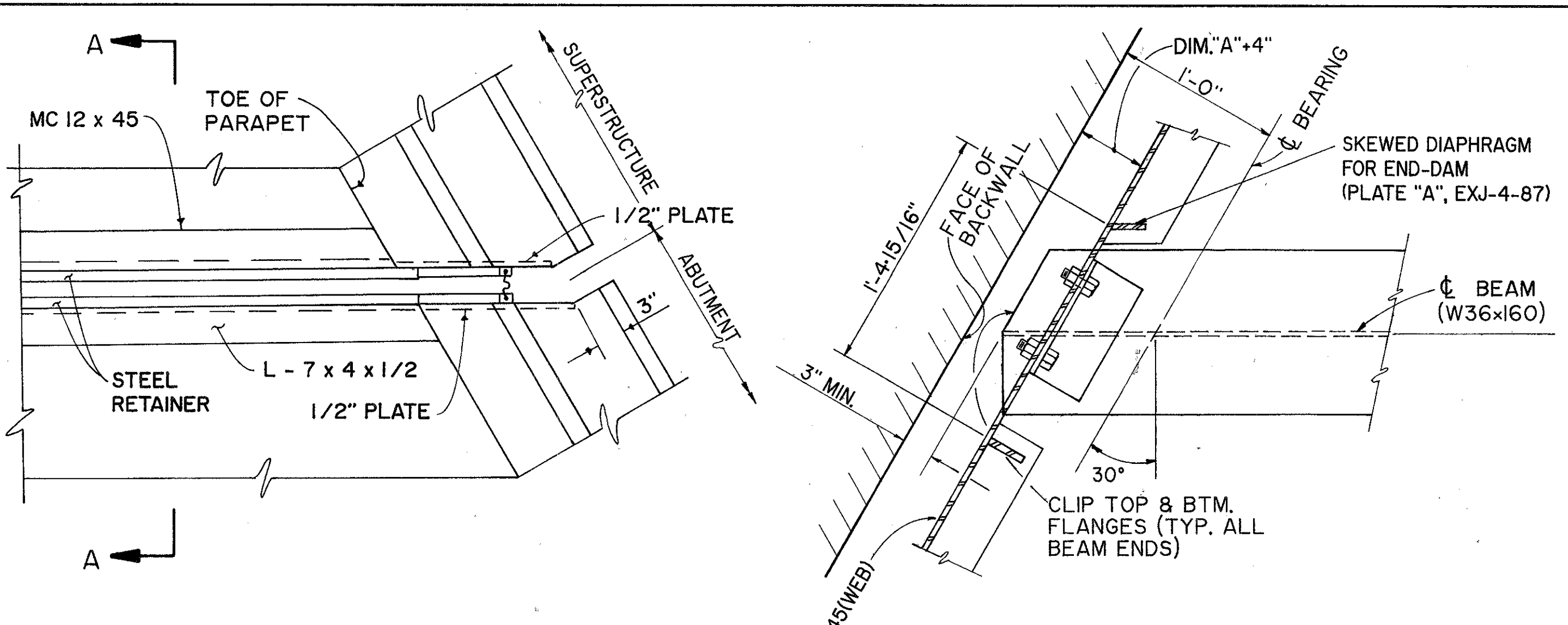
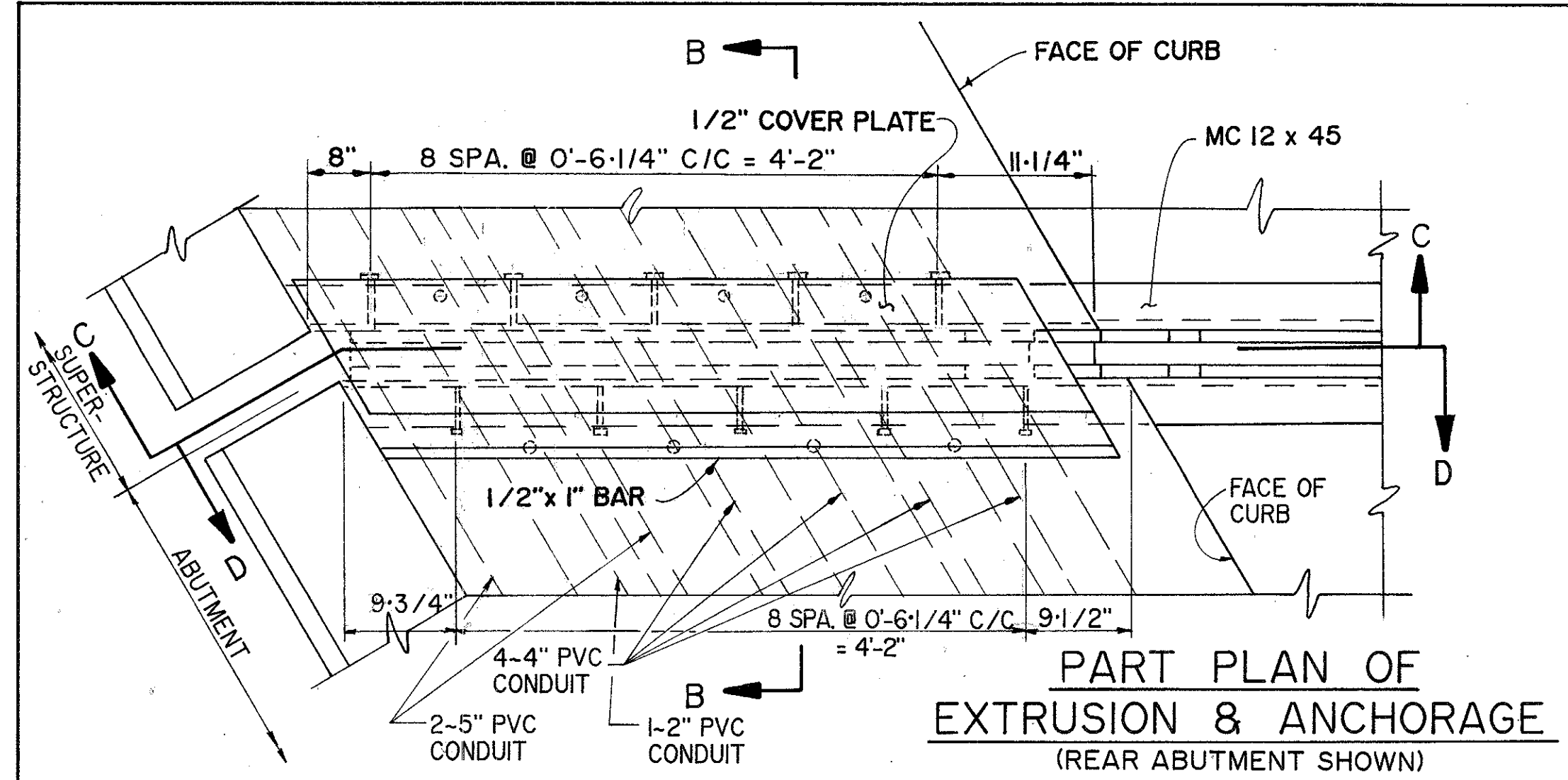
ALL WELDING SHALL CONFIRM WITH AWS AND AASHTO SPECIFICATIONS FOR WELDED HIGHWAY AND RAILWAY BRIDGES.

CONTINUOUS STRIP SEAL SHALL BE AS MANUFACTURED BY WATSON BOWMAN AND ACME (W.B. & A), D.S. BROWN (D.S.B.) OR APPROVED EQUAL (W.B. & A.): SE300, (D.S.B.): A300 OR APPROVED EQUAL.

PAYMENT SHALL BE MADE FOR ITEM 516, LIN. FT. STRUCTURAL EXPANSION JOINTS INCLUDING ELASTOMERIC STRIP SEALS (3"), AS PER PLAN. PAYMENT SHALL INCLUDE ALL LABOR, MATERIALS & EQUIPMENT NECESSARY TO COMPLETE THE JOINT IN PLACE, WHICH INCLUDES THE JOINT ARMOR, RETAINERS, GLANDS, ANCHORING DEVICES, TEMPORARY SUPPORTS AND END CROSSFRAME GUSSET PLATES.

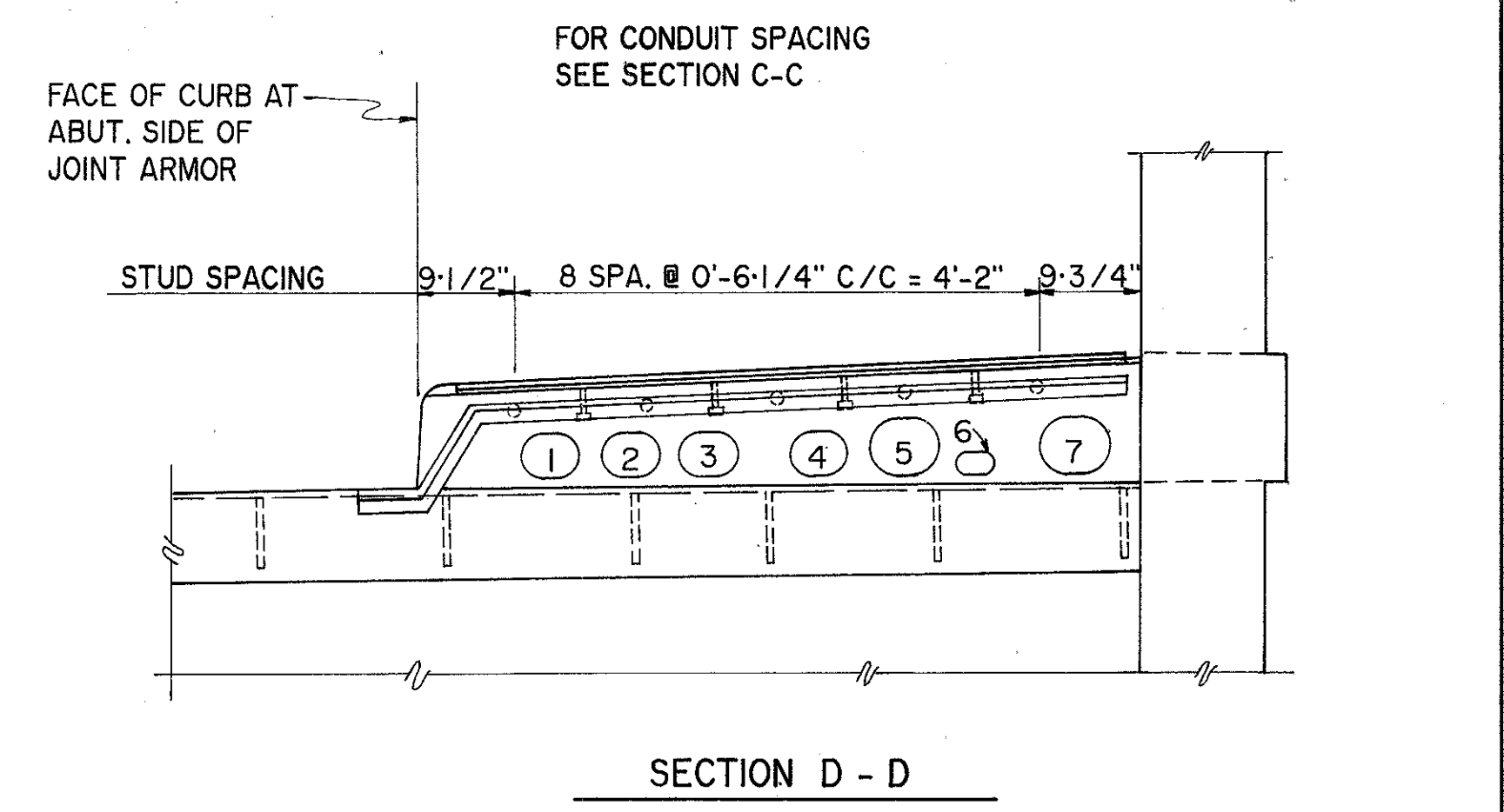
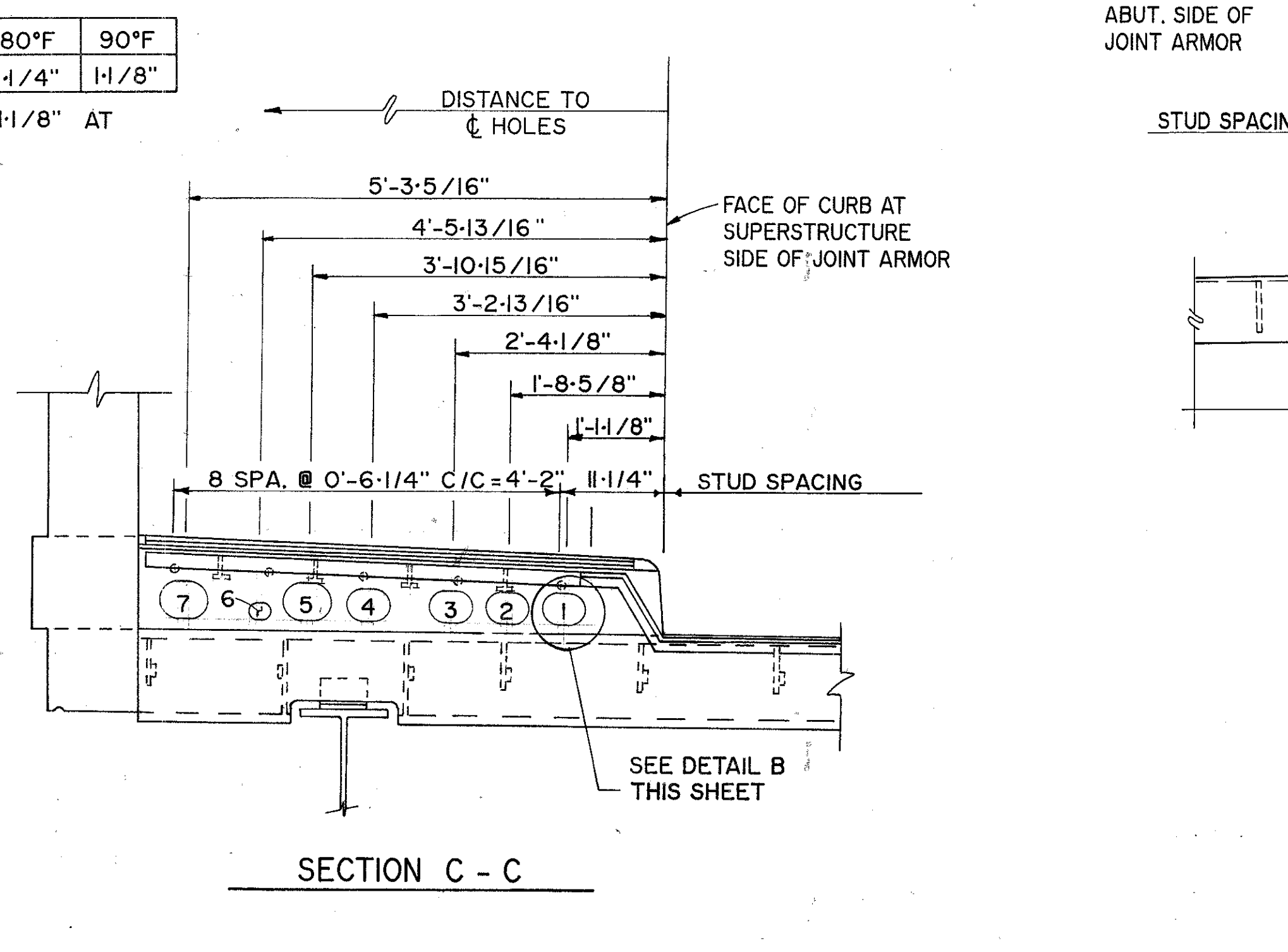
STUD ANCHORS SHALL BE LOW CARBON STEEL ASTM A-108.

NOTE: 1/2" PLATES LOCATED IN SIDEWALK ARMOR SHALL BE SLOTTED TO ACCOMMODATE THE PROPOSED TELEPHONE & ELECTRICAL CONDUIT BUNDLE AS SHOWN ON THE PLANS



TEMPERATURE	30°F	40°F	50°F	60°F	70°F	80°F	90°F
DIM "A"	1-7/8"	1-13/16"	1-11/16"	1-5/8"	1-3/8"	1-1/4"	1-1/8"

MIN. JOINT WIDTH AT TIME OF INSTALLATION SHALL BE 1-1/8" AT TEMPERATURES OF 90°F AND ABOVE.



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**SUPERSTRUCTURE DETAILS**

BRIDGE NO. OTT-19-0323  
OVER PORTAGE RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DBG	R.L.T.		JTY	THY	2-20-91	