

CONSTRUCTION PLAN FOR DECK REPAIR BRIDGE NO. 02523

LIST OF SHEETS

SHT NO.	TITLE
1	TITLE
2	GENERAL PLAN & ELEVATION
3	APPROACH TAPER & TRAFFIC CONTROL
4	RECONSTRUCT EXP. JT., TYPE A AT ABUT'S.
5-6	RECONSTRUCT EXP. JT., TYPE F NEAR PIER 4
7	RECONSTRUCT EXP. JT., TYPE F NEAR PIER 6
8	DECK DRAINS
9	APPROACH & DRAIN DETAILS
10	WATERPROOF EXPANSION DEVICE
11-12	WIRE FENCE DESIGN S-1, S-2
13-14	DETAILS

SCHEDULE OF QUANTITIES

ITEM NO.	ITEM	UNIT	QUANTITY
2401.511	STRUCTURE CONCRETE 3X33	SQ. FT.	550
0433.601	SCARIFY BRIDGE DECK	SQ. FT.	51106 (P)
0433.601	SCARIFY CONCRETE APPROACHES	SQ. FT.	2730 (P)
2433.505	REMOVE SLAB TYPE 1	SQ. FT.	1100
2433.505	REMOVE SLAB TYPE 3	SQ. FT.	550
② 0404.603	OVERLAY CONCRETE 3U17A	SQ. FT.	53836
0433.607	RECONSTRUCT EXPANSION JOINT, TYPE A	LIN. FT.	121 (P)
0433.607	RECONSTRUCT EXPANSION JOINT, TYPE F	LIN. FT.	94 (P)
2402.591	EXPANSION JOINT DEVICES, TYPE MODULAR	LIN. FT.	47 (P)
2402.591	EXPANSION JOINT DEVICES, TYPE 4.0	LIN. FT.	157 (P)
2402.591	EXPANSION JOINT DEVICES, TYPE 8.0	LIN. FT.	7 (P)
① 2477.501	ZINC-RICH PAINT SYSTEM (COMPLETE)	LUMP SUM	ONE
① 2477.502	ZINC-RICH PAINT SYSTEM (PARTIAL)	SQ. FT.	6300 (P)
2402.595	BEARING ASSEMBLIES	EACH	10
2402.546	FLOOR DRAIN TYPE 1	EACH	4
0433.604	RECONSTRUCT, CLEAN DRAINAGE SYSTEM	LUMP SUM	ONE
0433.605	REMOVE AND REPLACE BEARING ASSEMBLIES	EACH	10
0404.603	SANDBLAST SPECIAL	SQ. FT.	53836 (P)
0563.601	TRAFFIC CONTROL	LUMP SUM	ONE
2402.546	FLOOR DRAIN TYPE 2	EACH	ONE
2557.501	WIRE FENCE DESIGN S-1	LIN. FT.	1150
2557.501	WIRE FENCE DESIGN S-2	LIN. FT.	1145

- ① SEE SPECIAL PROVISIONS
- ② COMPUTED VOLUME IS APPROX. 395 CU.YDS.

CONSTRUCTION NOTES

THE 1988 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

NO CUTTING WILL BE PERMITTED UNTIL THE CUTTING LIMITS HAVE BEEN OUTLINED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. REMOVAL AND RECONSTRUCTION SHALL CONFORM TO 2433.

PROVIDE SAW CUT IN CONCRETE WEARING COURSE OVER ALL CONSTRUCTION JOINTS IN EXISTING SLAB AND APPROACH PANELS. SEAL WITH CONCRETE JOINT SEALER PER SPEC. 3723.

THE CONTRACTOR SHALL MAKE FIELD MEASUREMENTS AS NECESSARY PRIOR TO FABRICATION OF THE EXPANSION JOINT DEVICES, SIDEWALK AND RAIL PLATES, TO ASSURE PROPER FIT IN THE FINAL WORK.

THE PRICE BID FOR BEARING ASSEMBLIES SHALL INCLUDE ALL MATERIAL (ANCHOR RODS, SHEET LEAD, BEARING) FOR EACH.

ANOKA COUNTY
 APPROVED *Paul L. Howard* 7/3/90
 COUNTY ENGINEER DATE

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
Robert R. Tomczyk
 DATE: 4-9-90 REG. NO. 6924

PLAN PREPARED BY
 ERICKSON ENGINEERING CO.
 3340 REPUBLIC AVE.
 ST. LOUIS PARK, MINNESOTA 55426

C.S.A.H. 2 ANOKA COUNTY
 MINNESOTA DEPARTMENT OF TRANSPORTATION

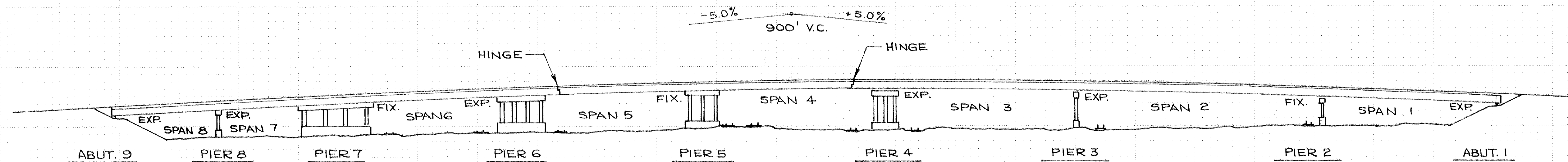
BRIDGE NO. 02523
 C.S.A.H. 2 OVER YARD TRACKS
 AT NORTHTOWN.
 CONCRETE OVERLAY AND JOINT REPAIR

TITLE SHEET

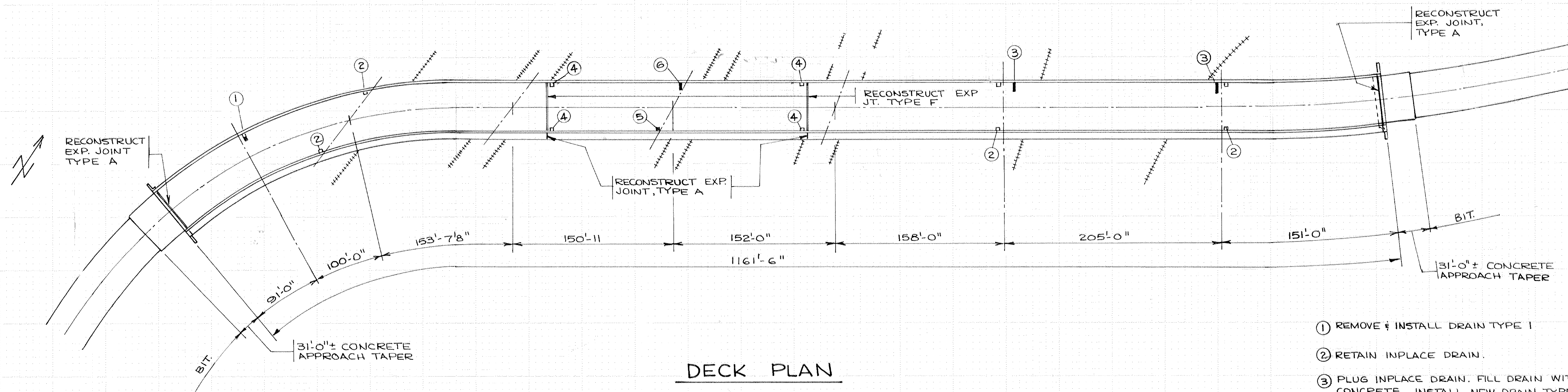
APPROVED: _____
 BRIDGE ENGINEER

DRN: GF 02523
 CHK: _____

SHEET NO. 1-A OF 14-A SHEETS

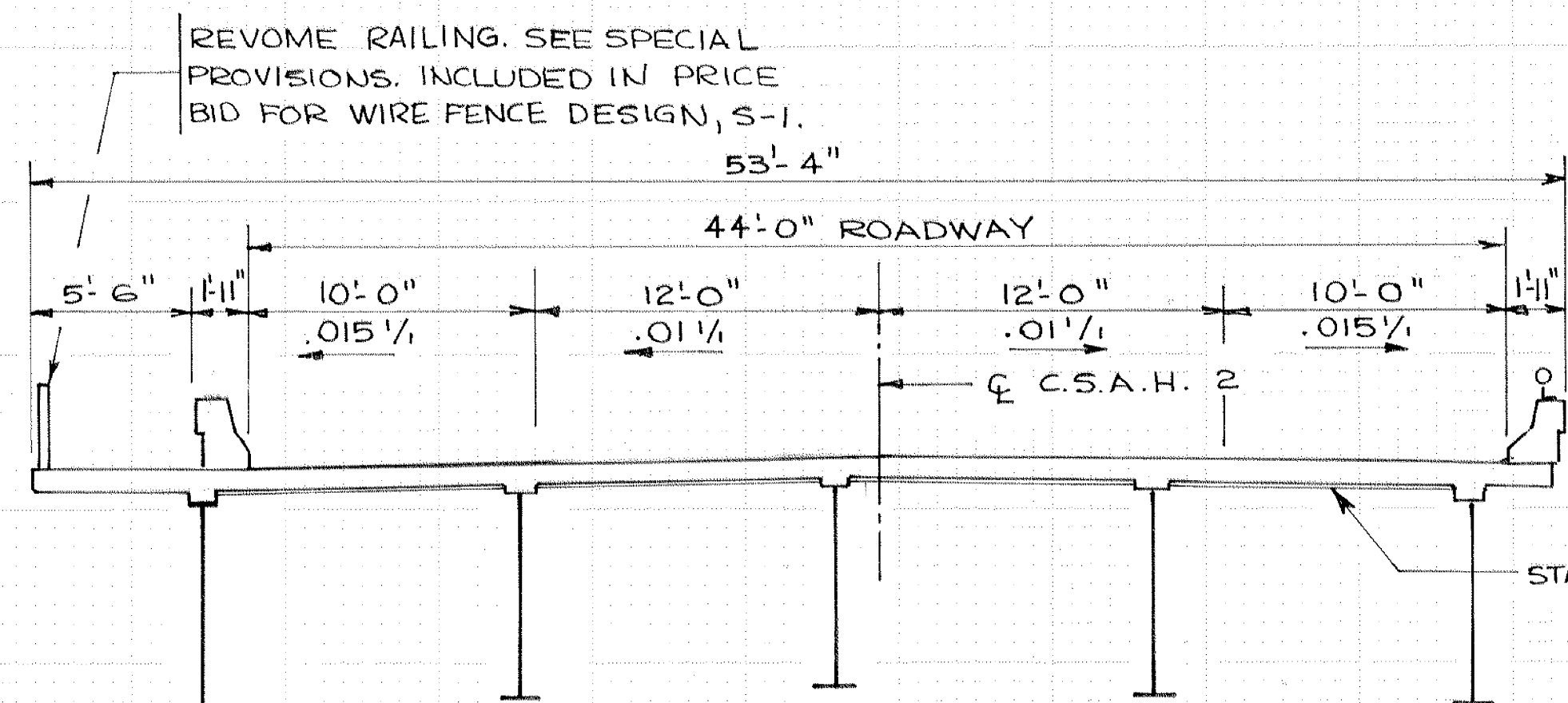


GENERAL ELEVATION

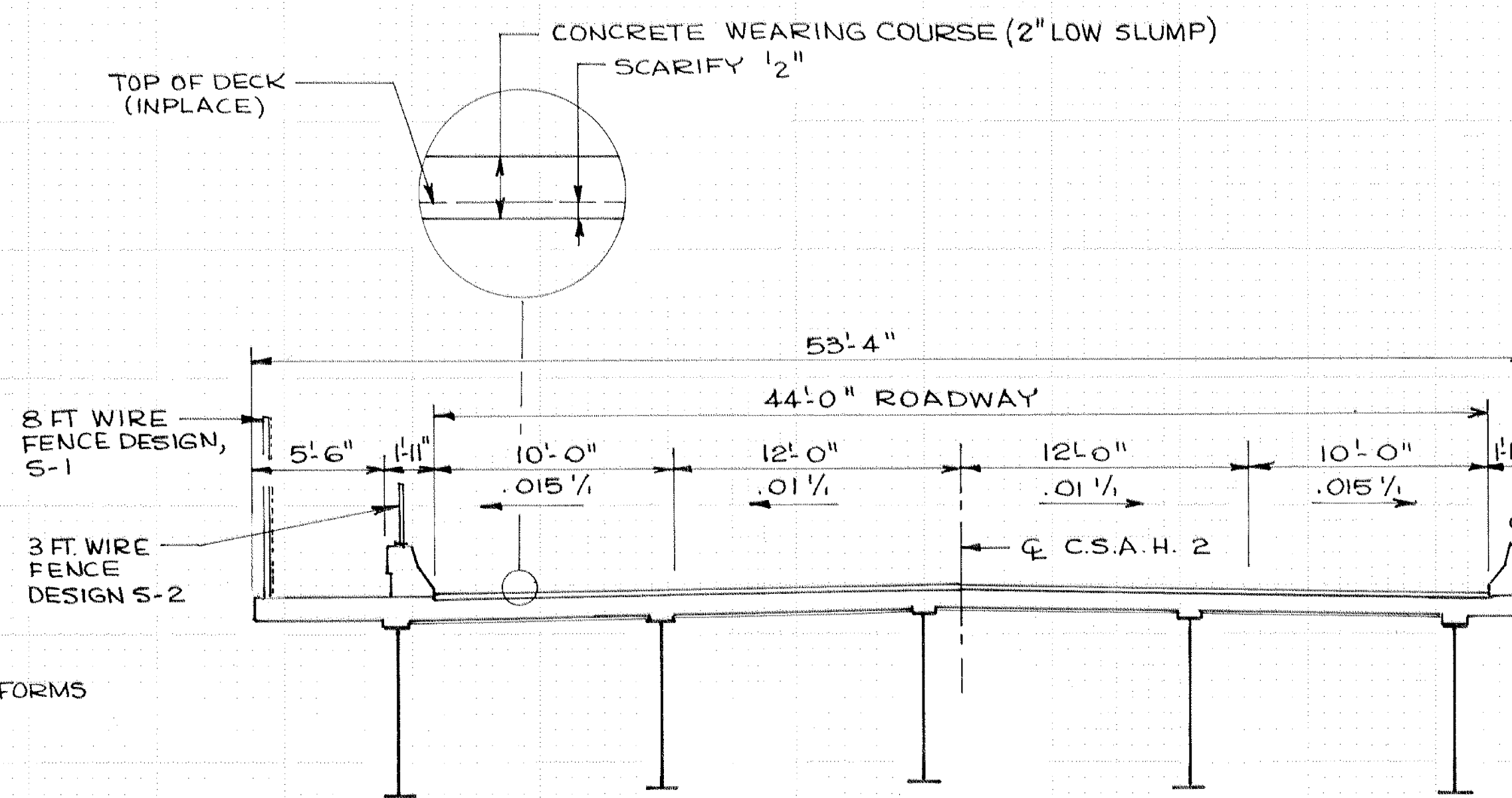


DECK PLAN

- ① REMOVE & INSTALL DRAIN TYPE 1
- ② RETAIN INPLACE DRAIN.
- ③ PLUG INPLACE DRAIN. FILL DRAIN WITH CONCRETE. INSTALL NEW DRAIN TYPE 1 APPROX. 5'-0" FROM INPLACE. WORK INCLUDED IN PRICE BID FOR 'RECONSTRUCT, CLEAN DRAINAGE SYSTEM'. SEE SPECIAL PROVISIONS. LOCATE TO AVOID INTERFERENCE WITH DIAPHRAGMS.
- ④ PLUG INPLACE DRAIN. FILL DRAIN WITH CONCRETE. ⑦
- ⑤ INSTALL DRAIN TYPE 2 ⑦
- ⑥ INSTALL DRAIN TYPE 1 ⑦
- ⑦ INCLUDED IN PRICE BID FOR 'RECONSTRUCT, CLEAN DRAINAGE SYSTEM'. SEE SPECIAL PROVISIONS.



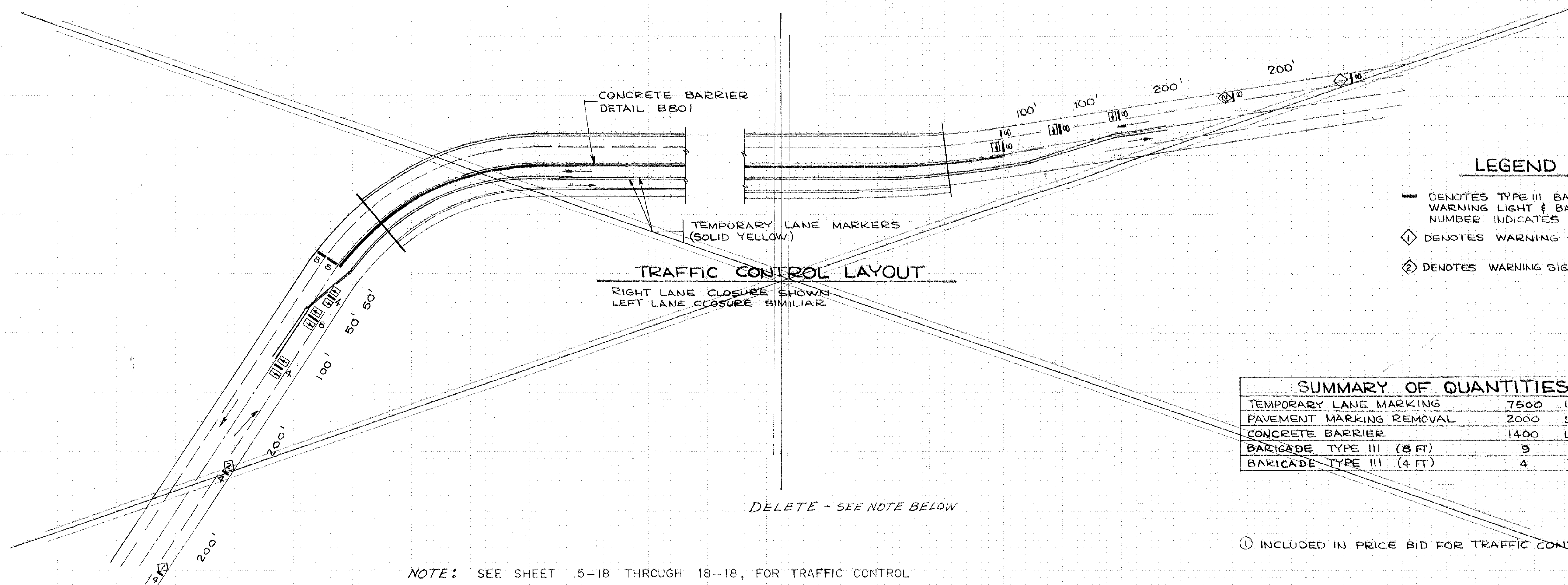
TYPICAL SECTION ~ INPLACE



TYPICAL SECTION ~ PROPOSED

GENERAL PLAN &
ELEVATION

DES:	DRN: GF	APPROVED:	BRIDGE NO. 02523
CHK:	CHK:		
SHEET NO. 2-A OF 14-A SHEETS			



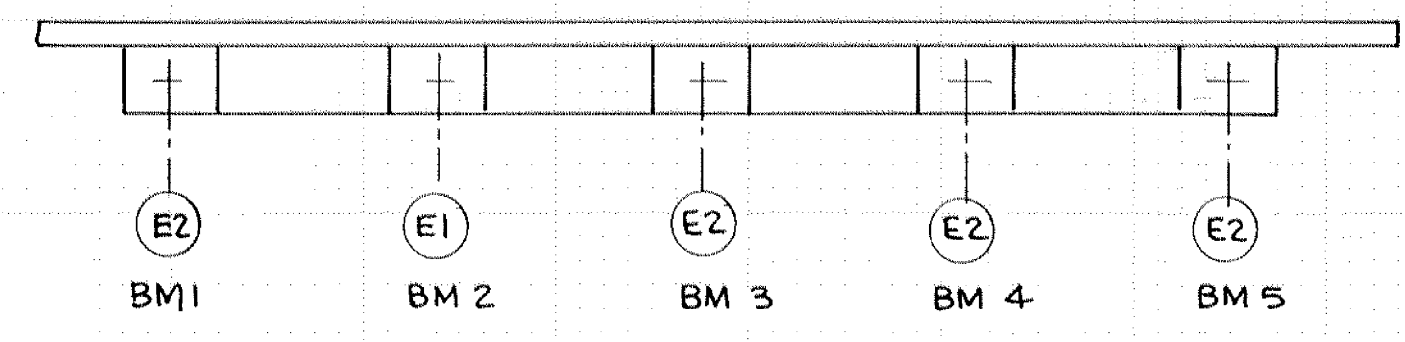
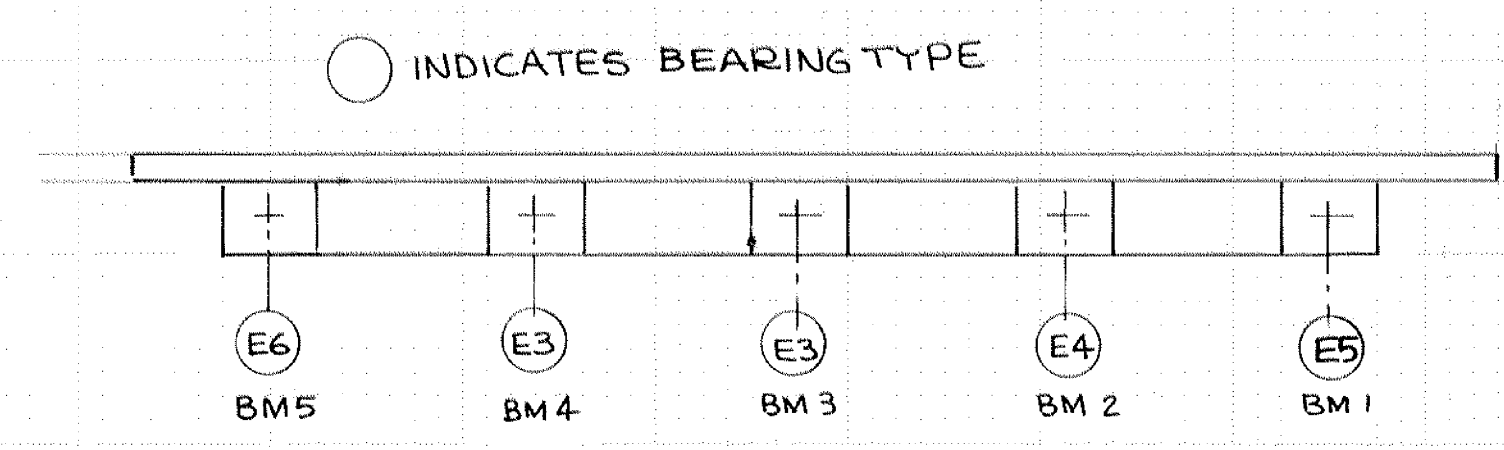
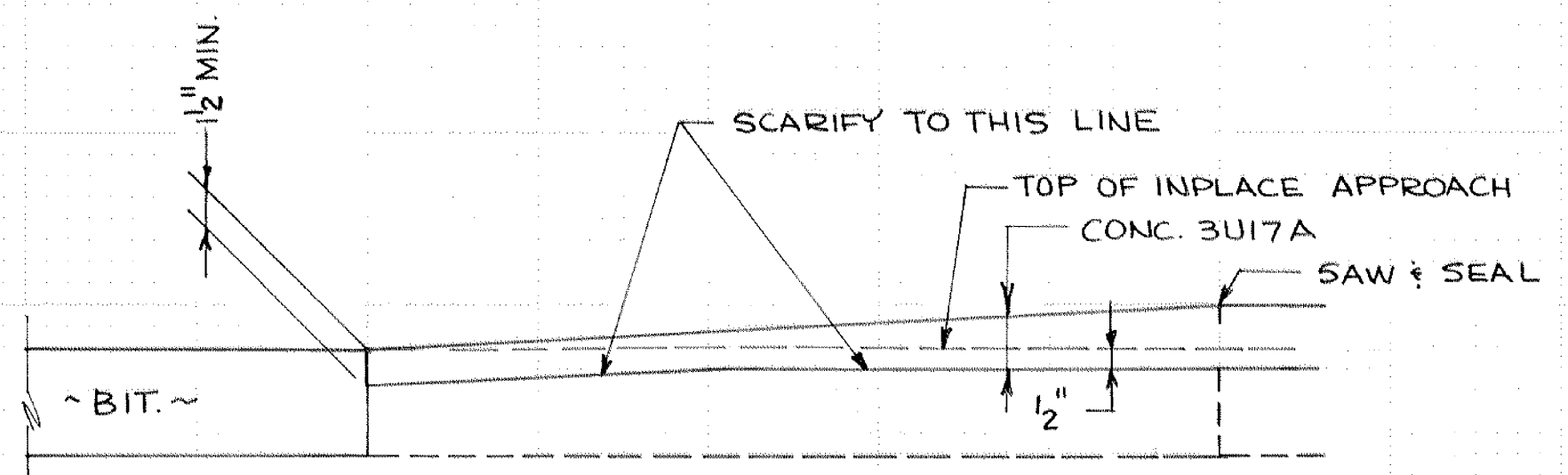
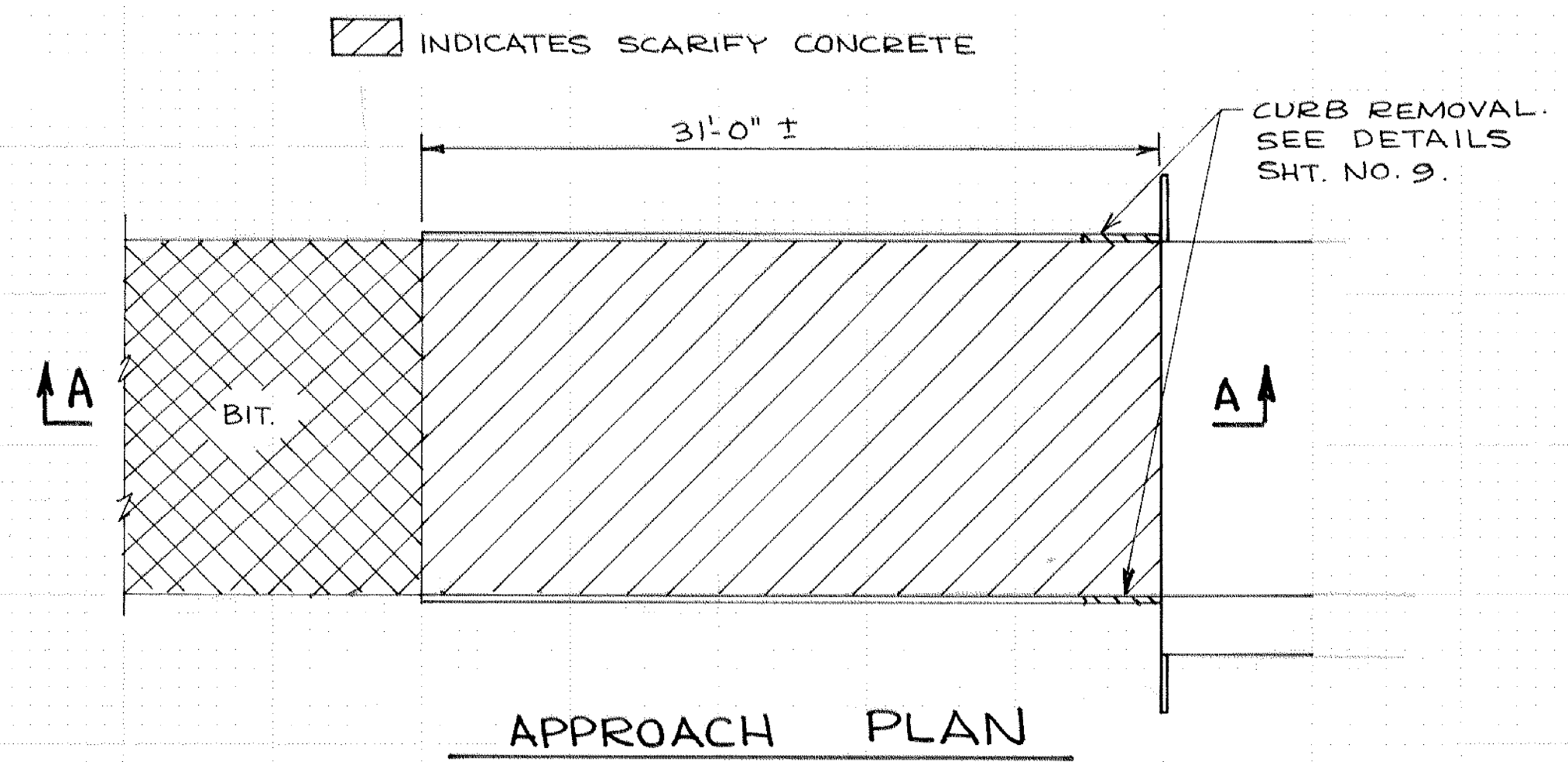
LEGEND

- DENOTES TYPE III BARRICADE WITH FLASHING WARNING LIGHT & BARRICADE WEIGHTS. NUMBER INDICATES SIZE
- ◇ DENOTES WARNING SIGN - ROAD WORK AHEAD
- ◇ DENOTES WARNING SIGN - ROAD NARROWS.

SUMMARY OF QUANTITIES ①		
TEMPORARY LANE MARKING	7500	LIN. FT.
PAVEMENT MARKING REMOVAL	2000	SQ. FT.
CONCRETE BARRIER	1400	LIN. FT.
BARRICADE TYPE III (8 FT)	9	EACH
BARRICADE TYPE III (4 FT)	4	EACH

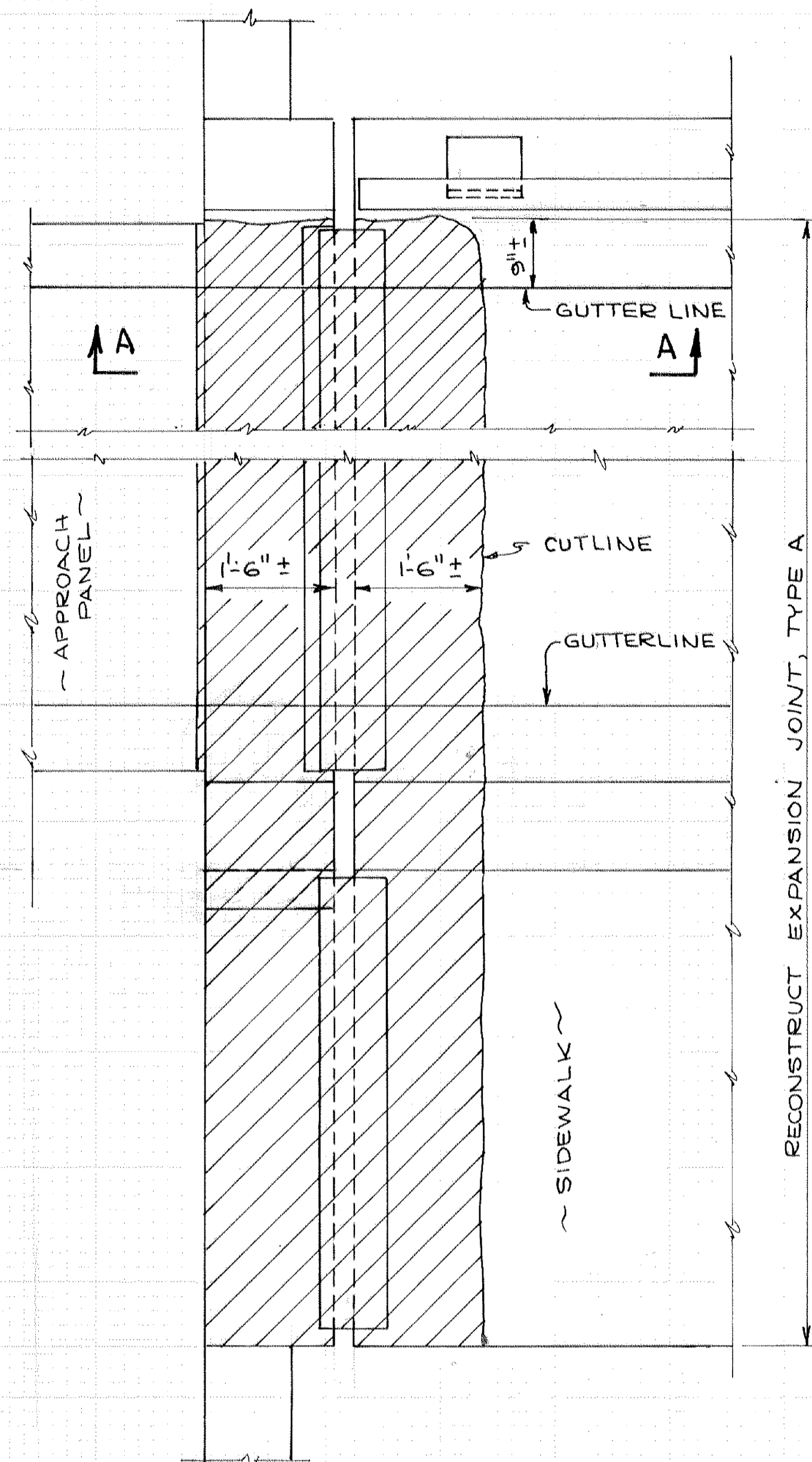
① INCLUDED IN PRICE BID FOR TRAFFIC CONTROL

NOTE: SEE SHEET 15-18 THROUGH 18-18, FOR TRAFFIC CONTROL



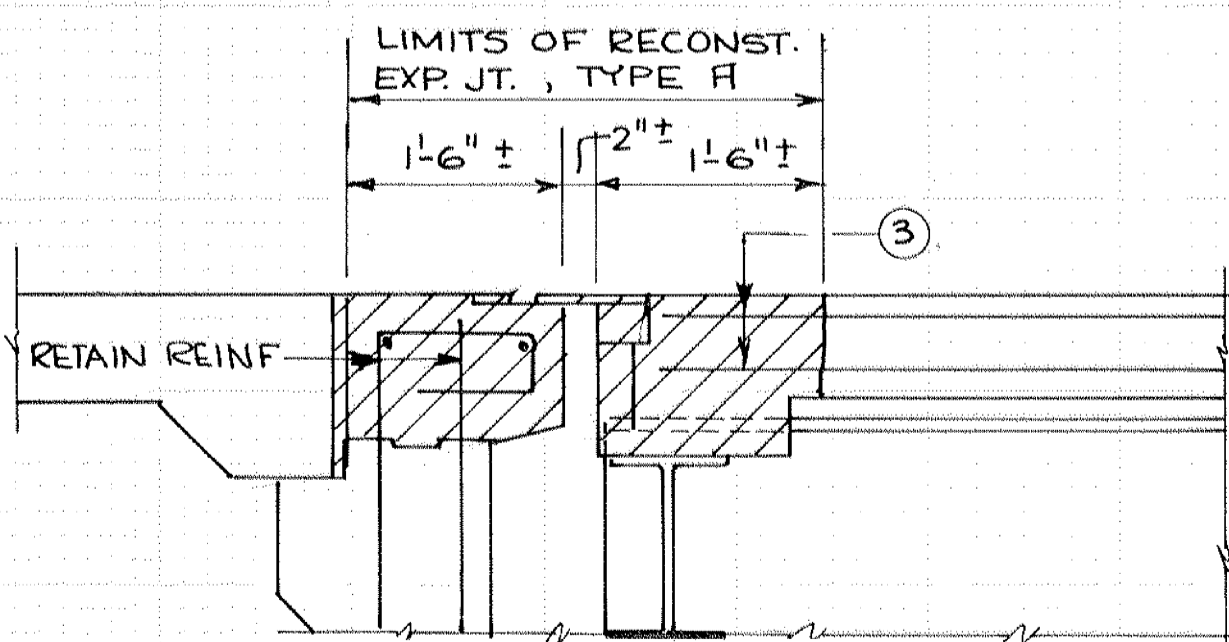
Note:
REPLACE INPLACE BEARINGS
SEE SPECIAL PROVISIONS.

TRAFFIC CONTROL APPROACH TAPER		DES:	DEN: GRF	APPROVED:	BRIDGE NO. 02523
		CHK:	CHK:		
SHEET NO. 3A OF 14-A SHEETS					

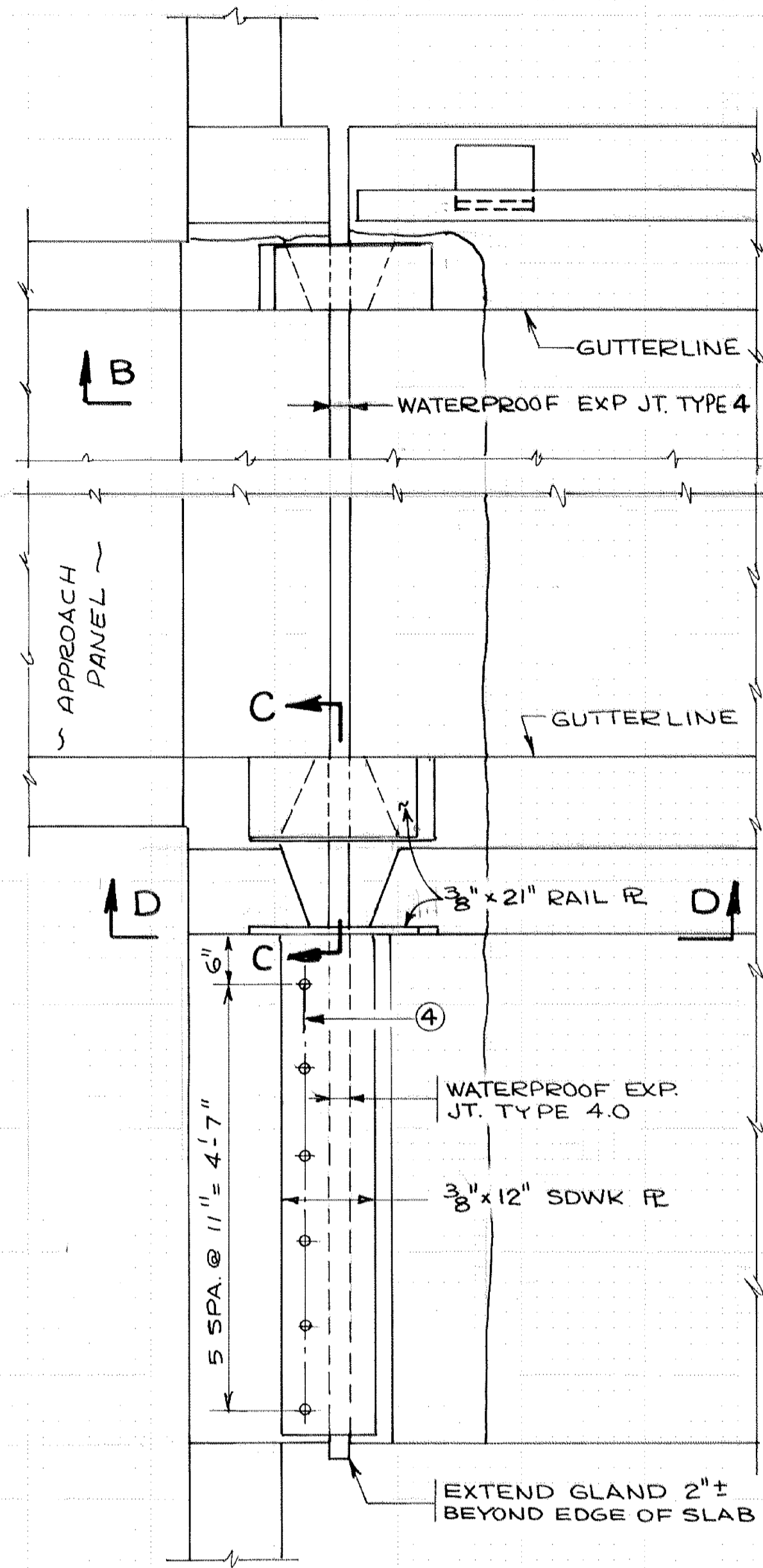


INPLACE PLAN

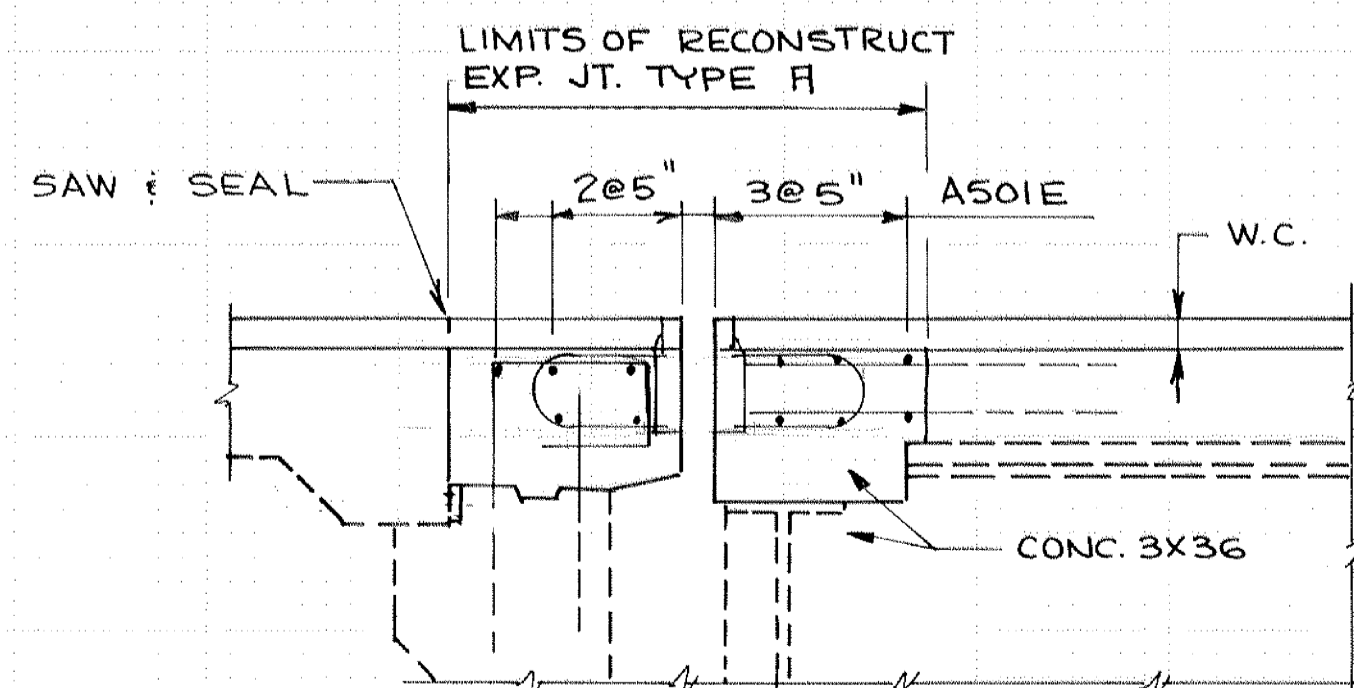
HATCHED AREA INDICATES CONCRETE REMOVAL.
SALVAGE GUARDRAIL CONNECTION R.



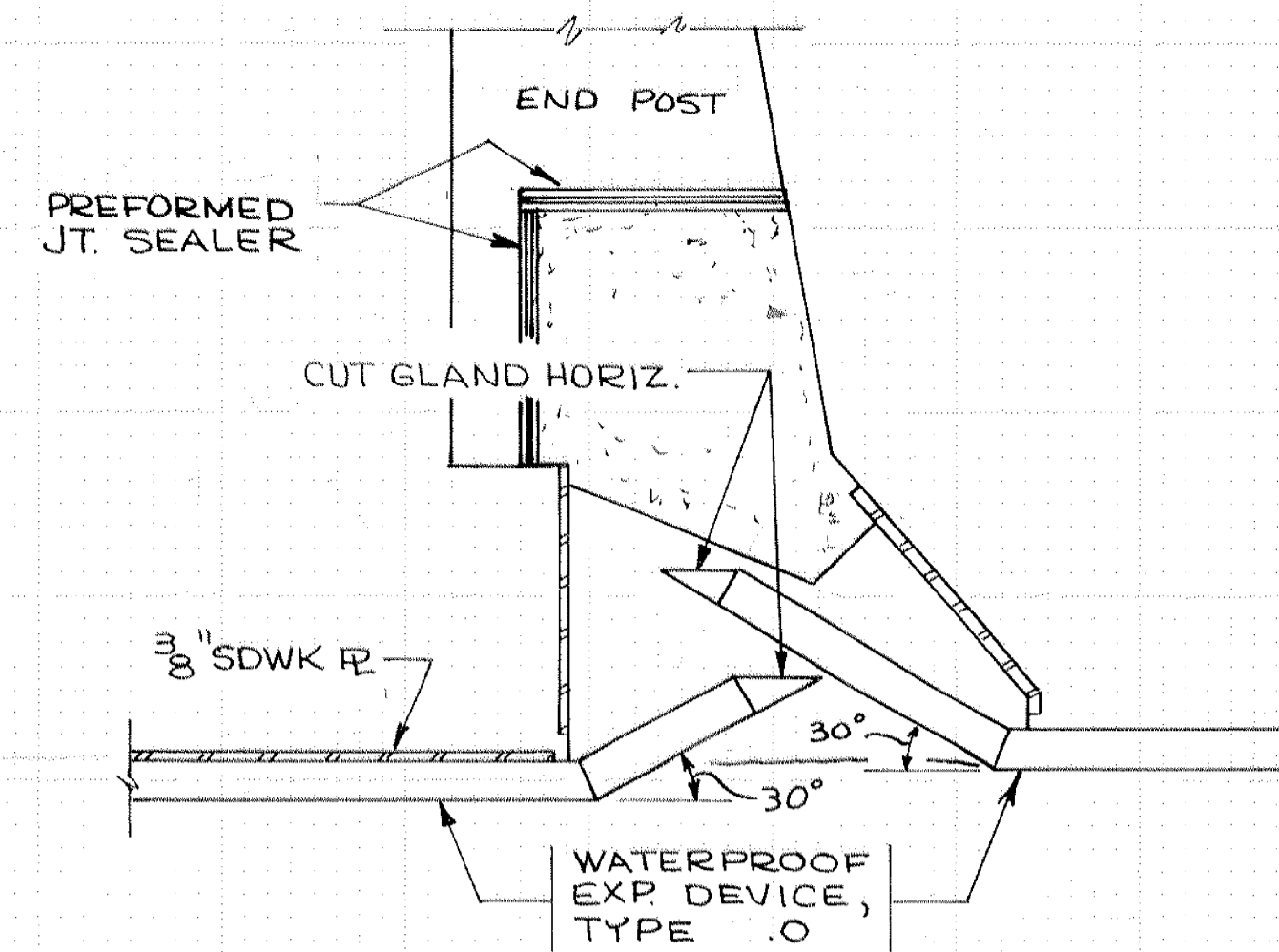
SECTION A-A



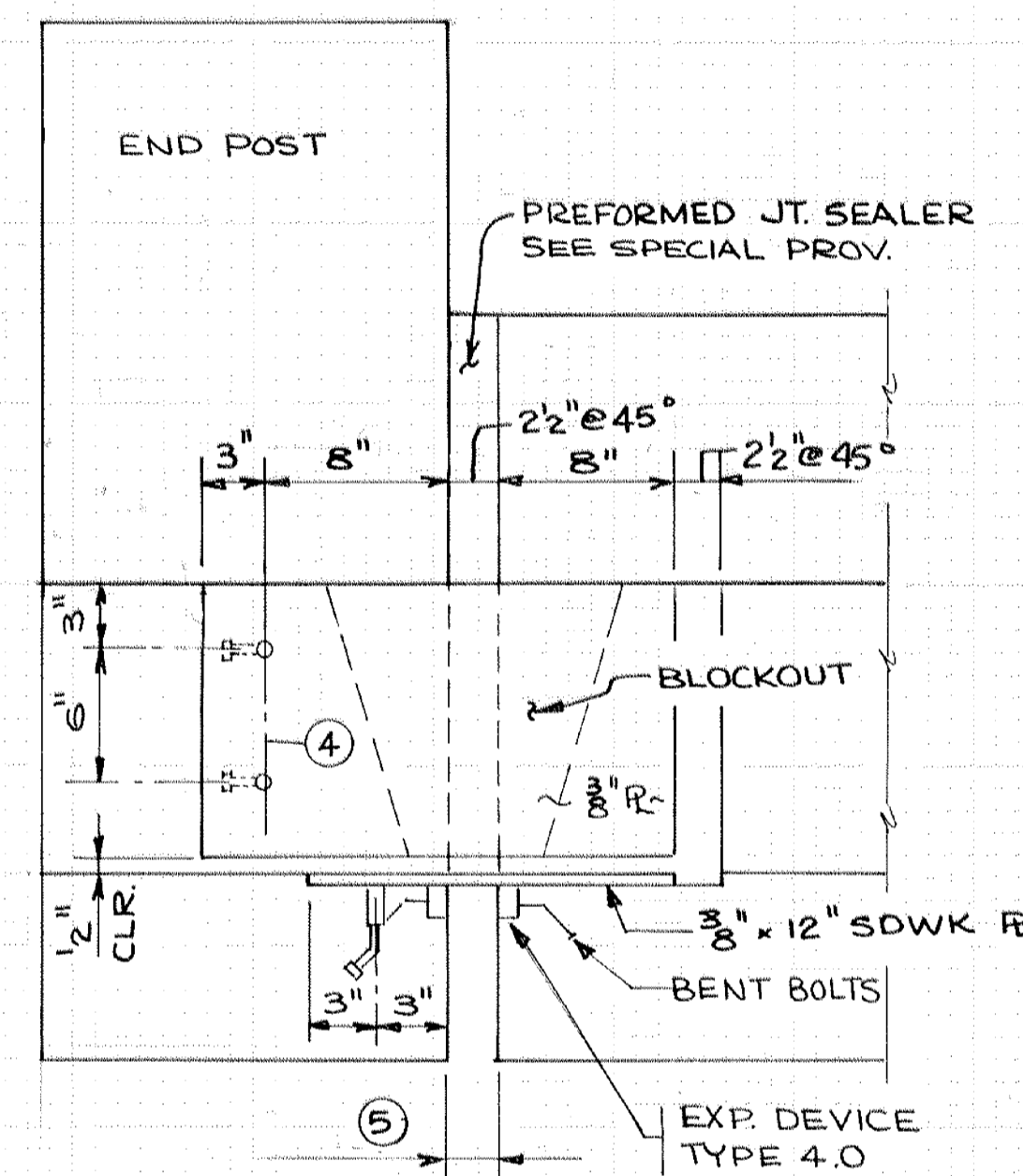
PROPOSED PLAN



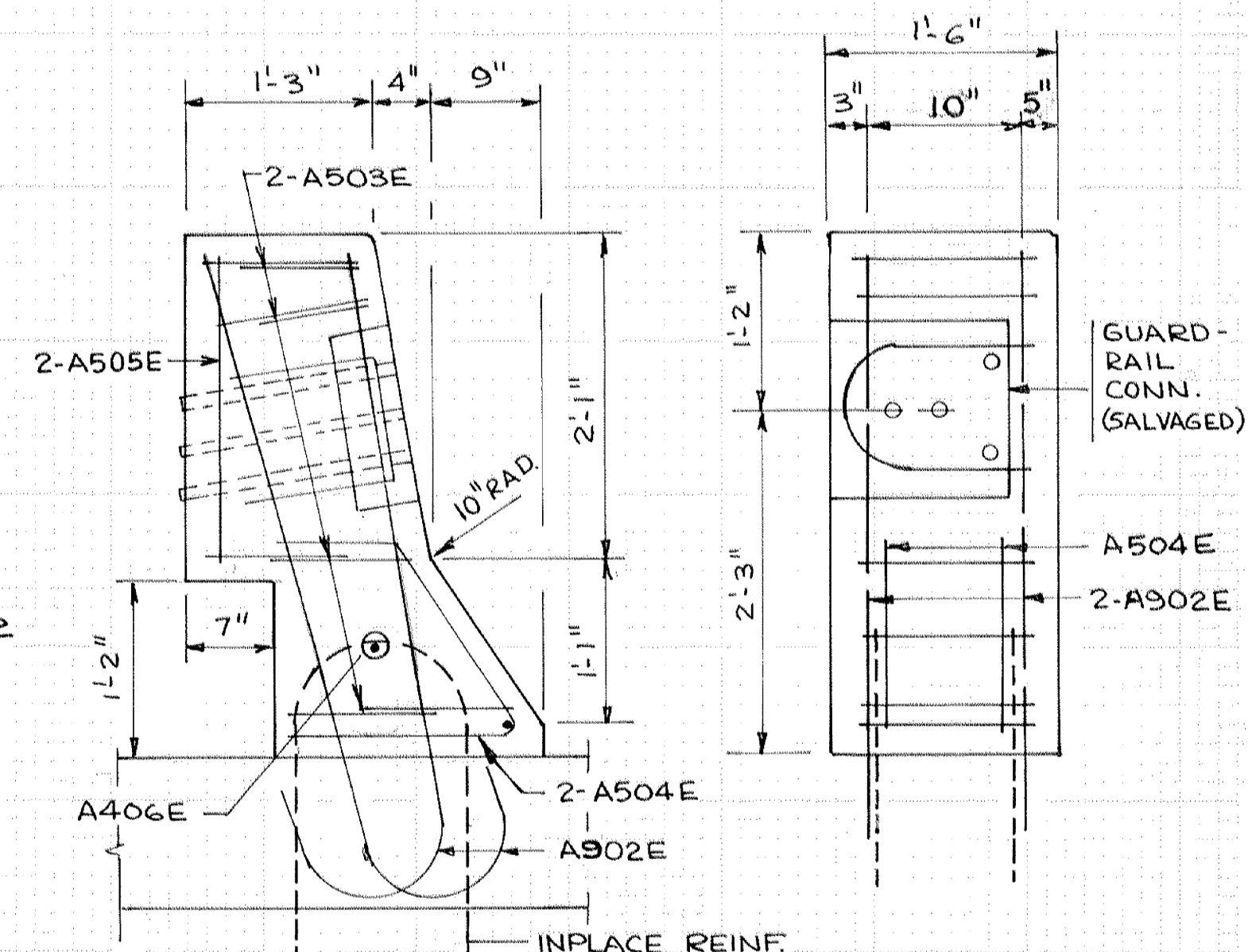
SECTION B-B



SECTION C-C



SECTION D-D



END VIEW INSIDE ELEV.

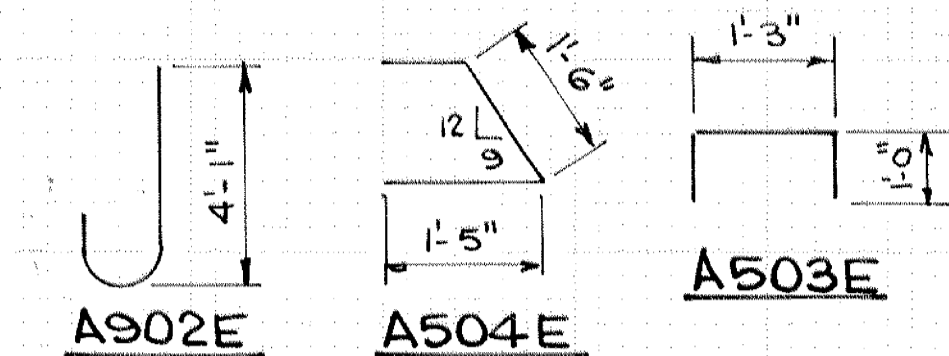
END POST DETAIL

BILL OF REINFORCEMENT ①

BAR	NO	LENGTH	SHAPE	LOCATION
A501E	44	27'-8"	STRT.	TRANSVERSE
A902E	8	5'-4"	BENT	END POST
A503E	16	3'-3"	BENT	" "
A504E	4	3'-11"	BENT	" "
A505E	4	1'-10"	STRT.	" "
A406E	4	1'-0"	STRT.	" "

① INCLUDED IN PRICE BID FOR RECONSTRUCT EXP. JOINT, TYPE A

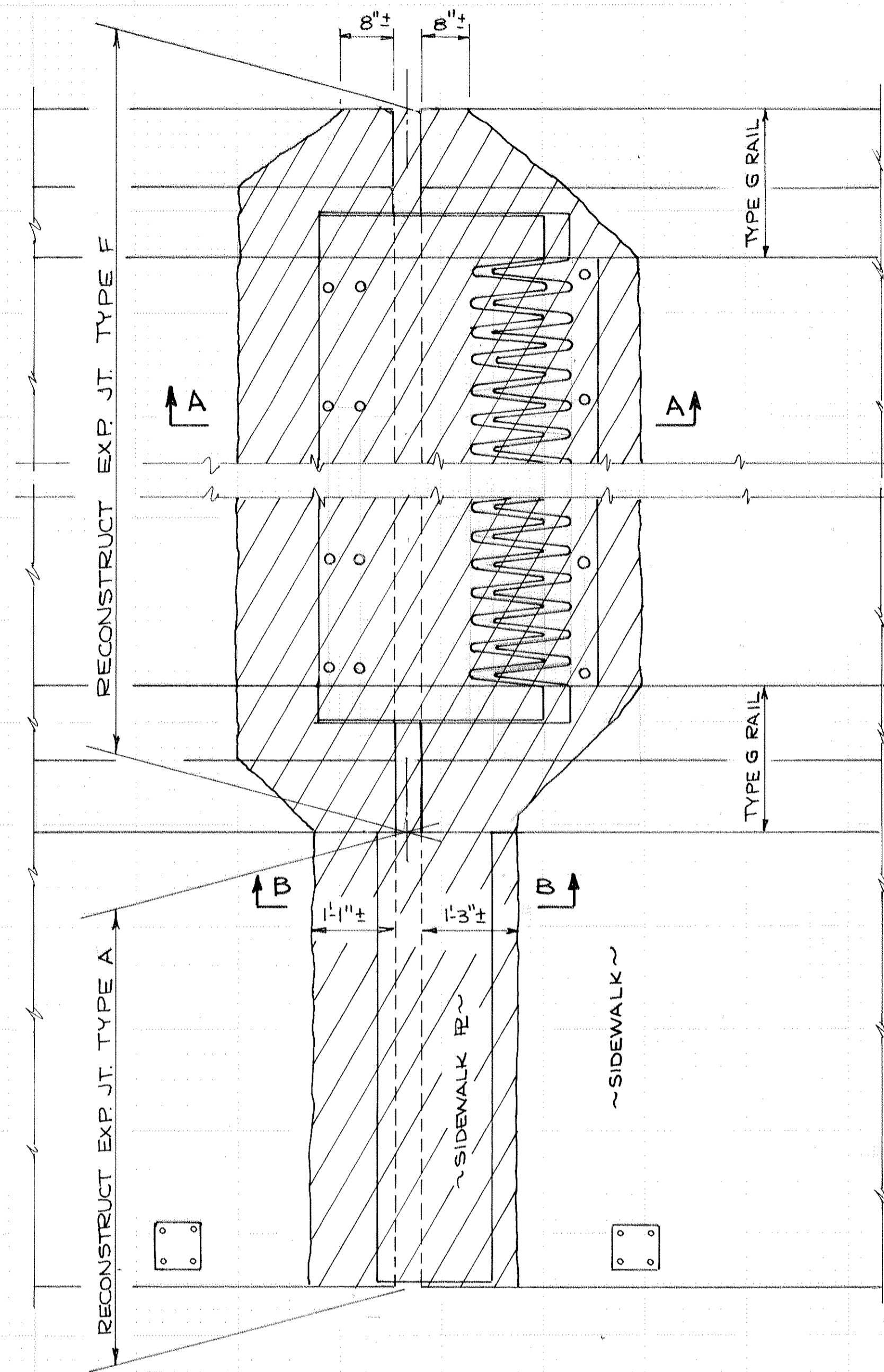
② CUT IN FIELD TO FIT. 2'-2" MIN. LAP.



③ INPLACE LONGITUDINAL REINF. TO BE RETAINED, CLEANED AND STRAIGHTENED.

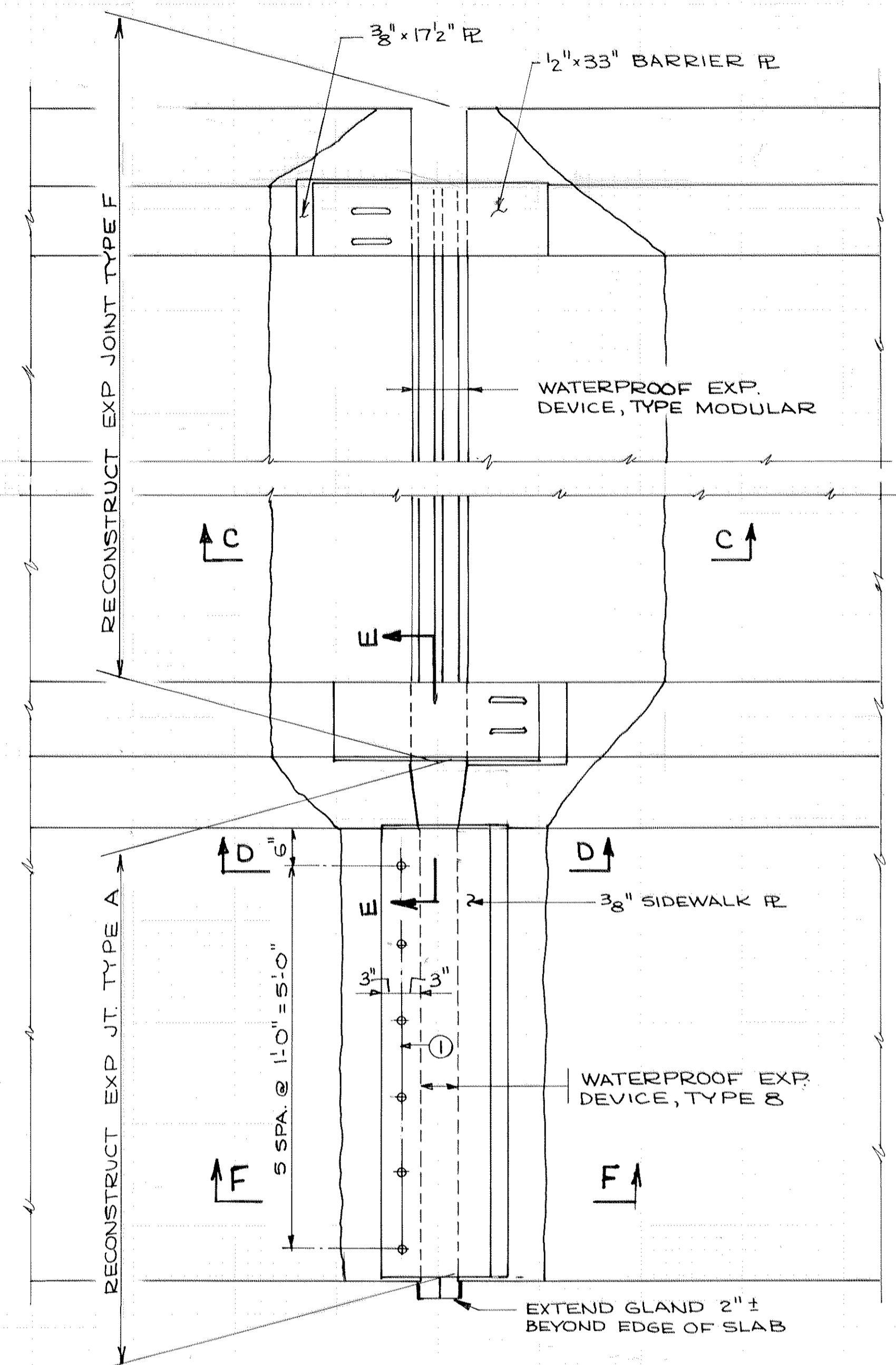
④ 3/4" Ø x 1" CSK. CAP SCREWS, 2" LONG HEX NUT AND 3/4" Ø x 4" BENT BOLT.

⑤ SEE SHOP DRAWINGS FOR OPENING WIDTH.

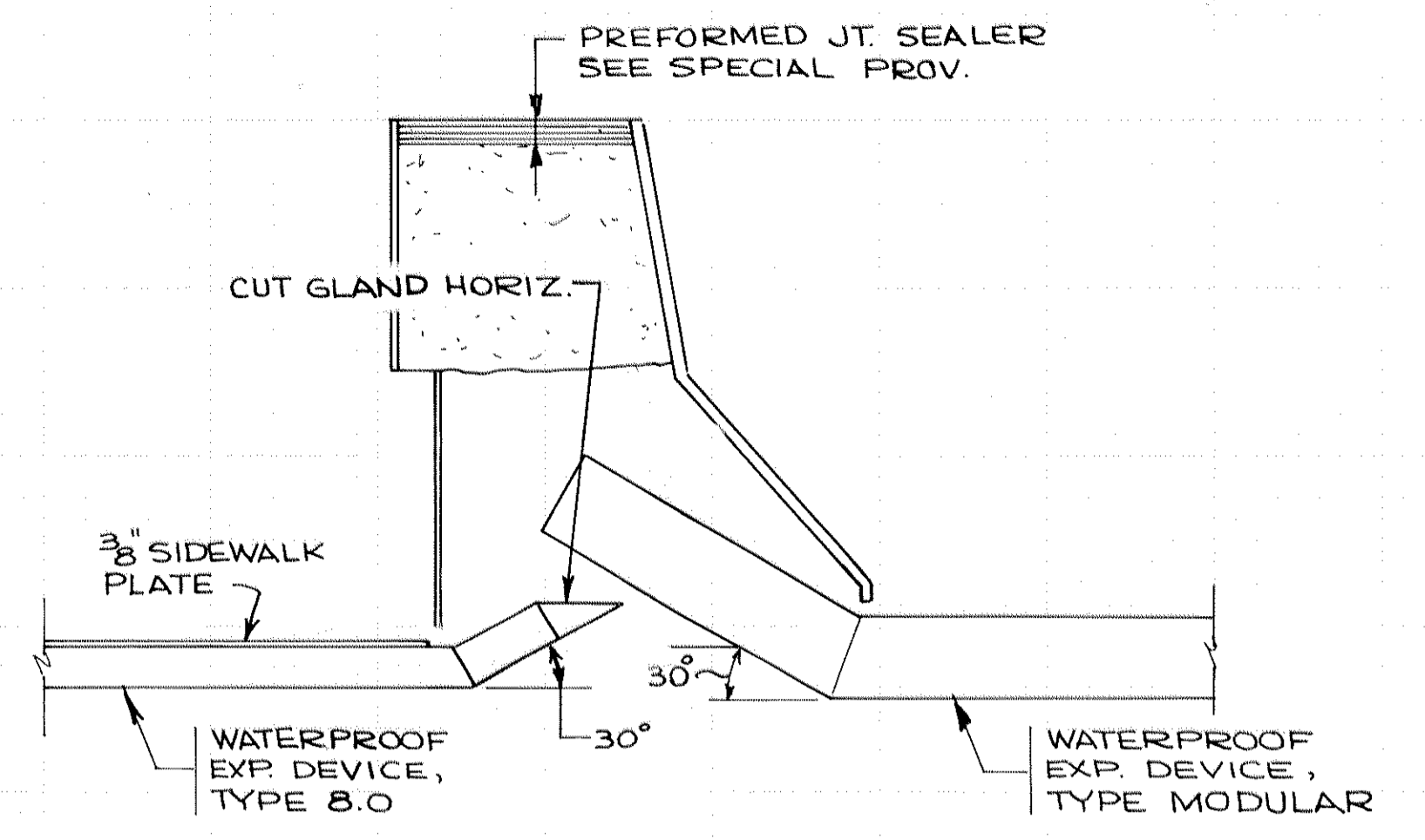


INPLACE PLAN

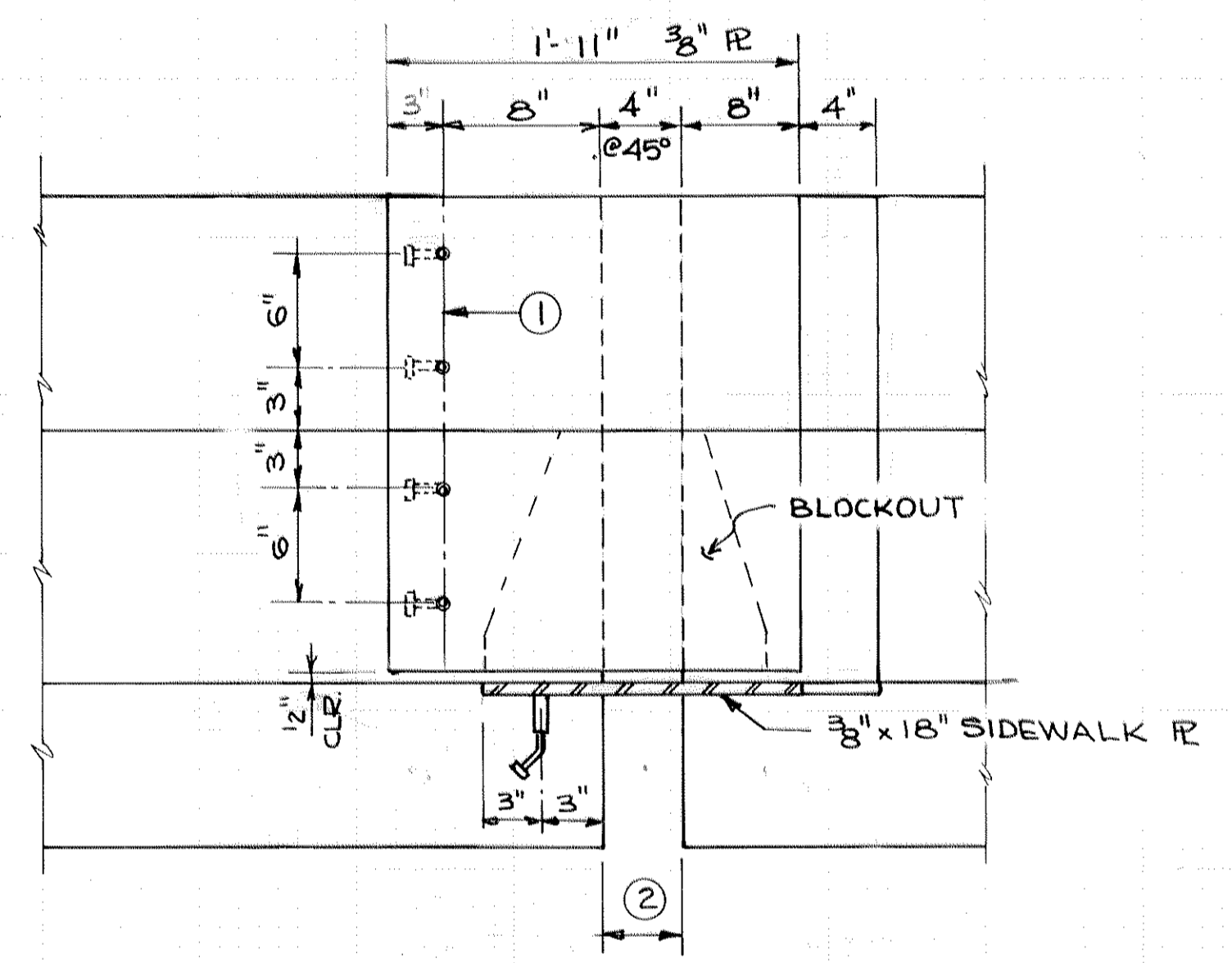
HATCHED AREA INDICATES REMOVAL. RETAIN LONGITUDINAL REINF.



PROPOSED PLAN

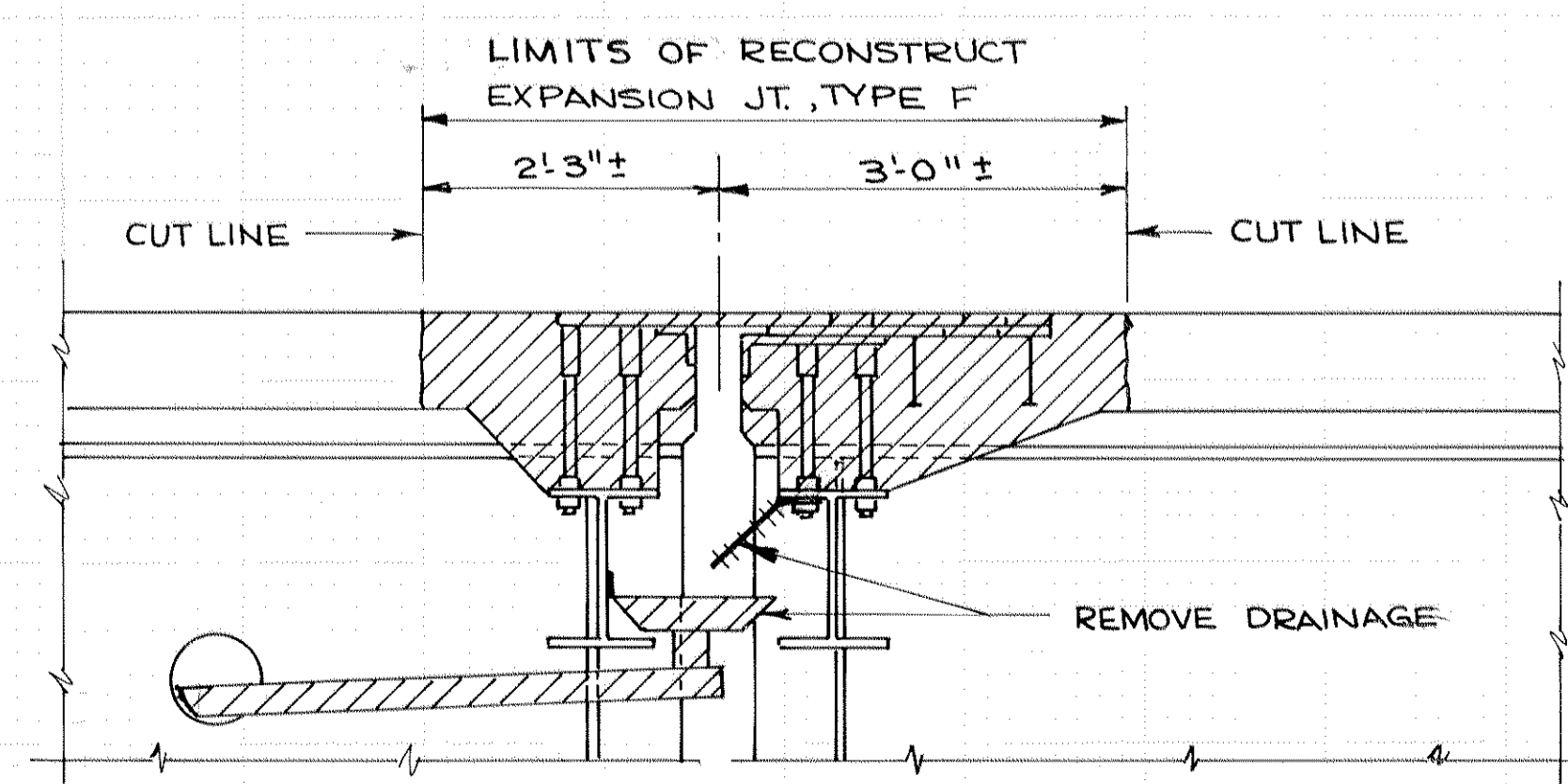


SECTION E-E

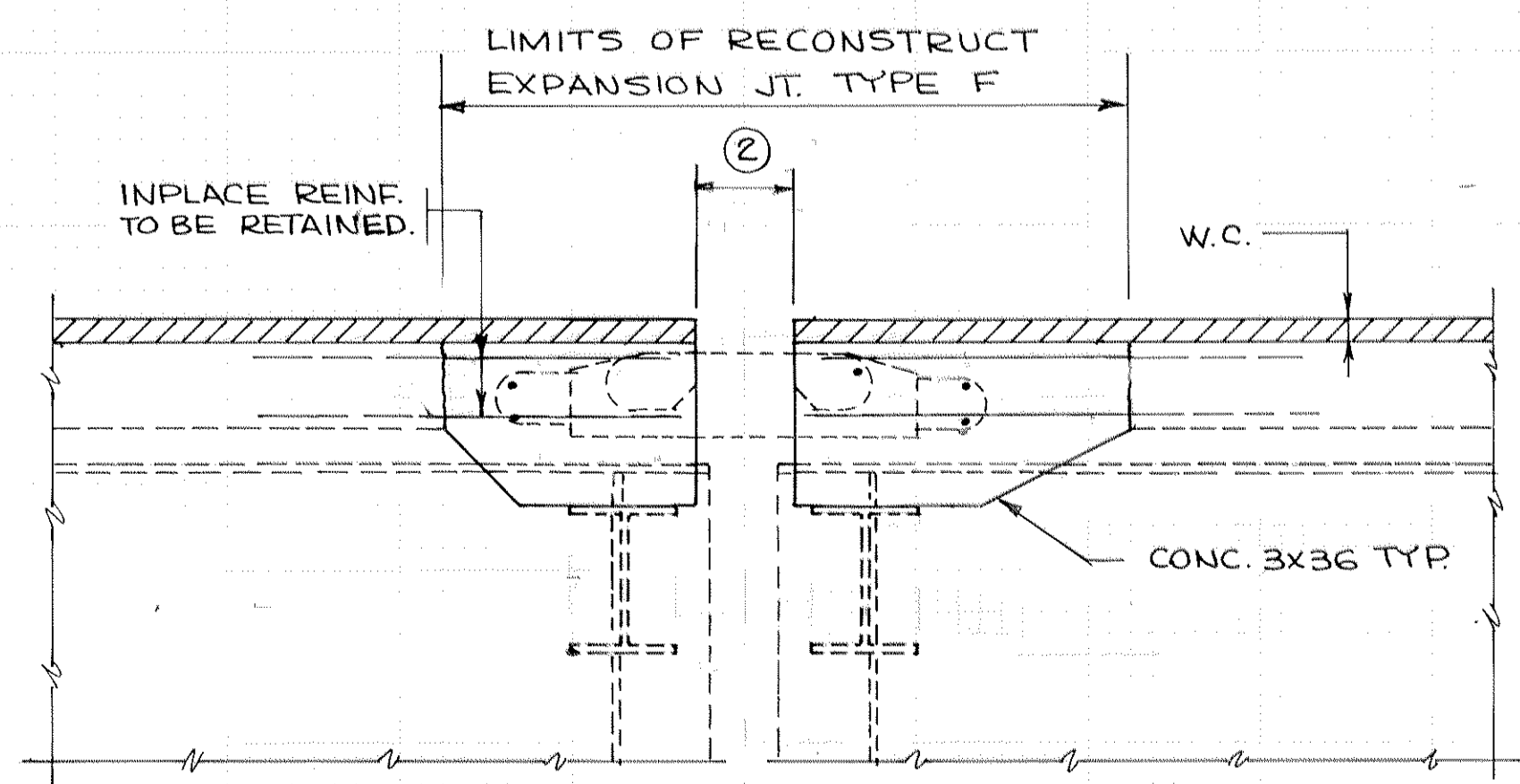


SECTION D-D

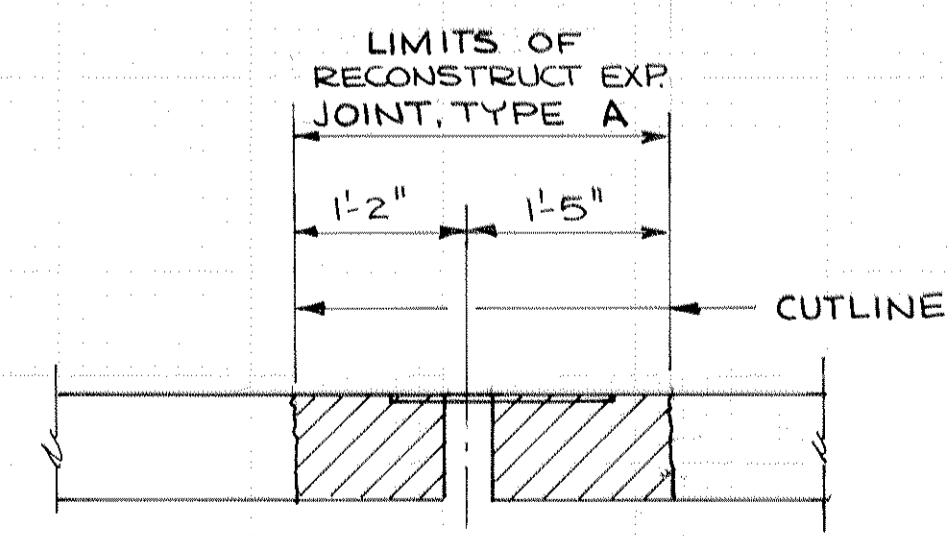
WATERPROOF EXP. DEVICE NOT SHOWN



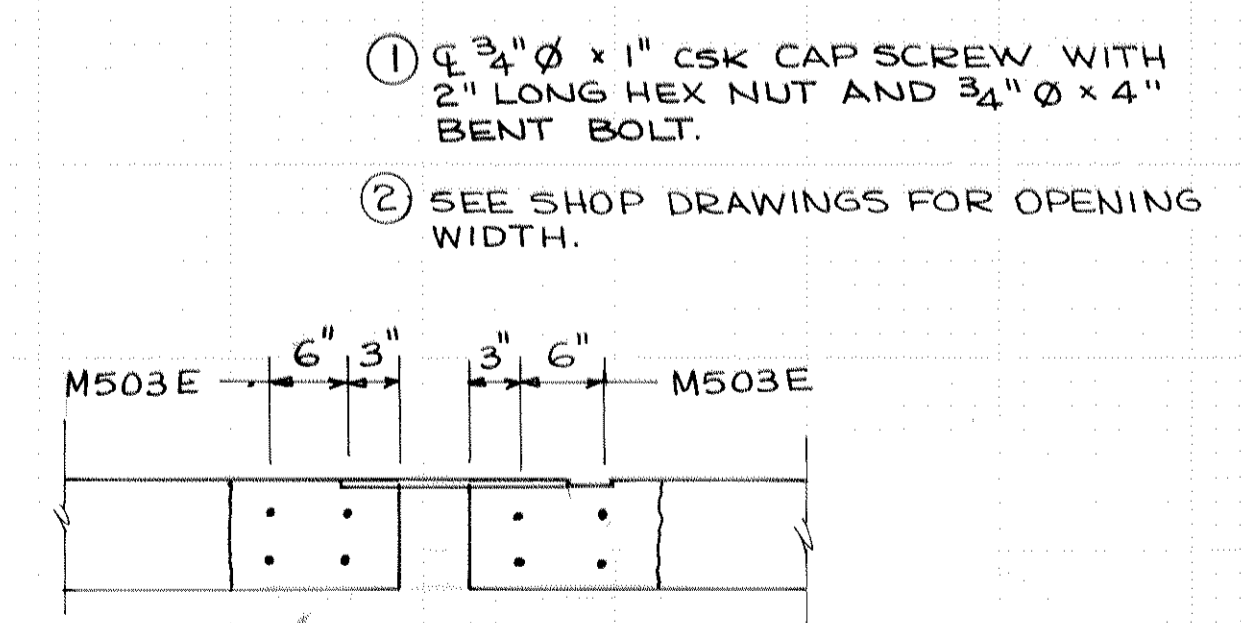
SECTION A-A



SECTION C-C



SECTION B-B



SECTION F-F

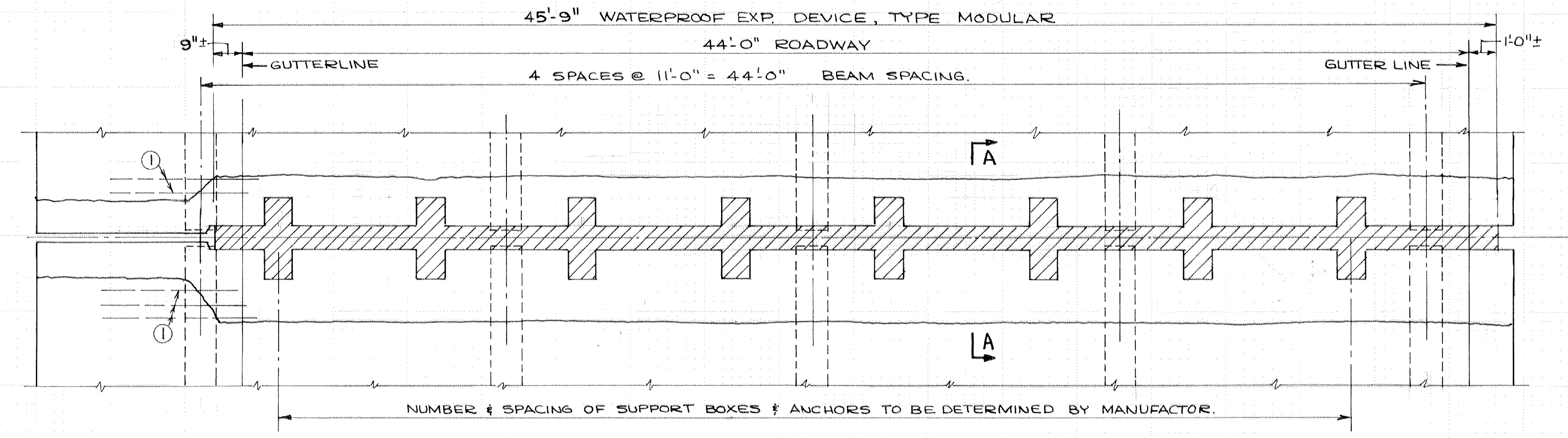
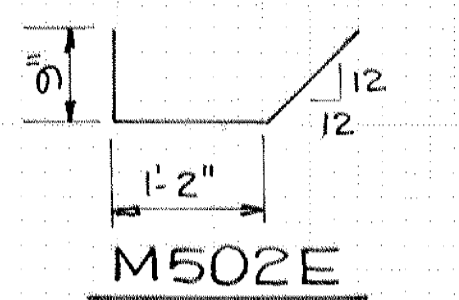
- ① 1/2" x 3/4" x 1" CSK CAP SCREW WITH 2" LONG HEX NUT AND 3/4" x 4" BENT BOLT.
- ② SEE SHOP DRAWINGS FOR OPENING WIDTH.

RECONSTRUCT EXP. JT. TYPE F NEAR PIER 4 (1 OF 2)	DES:	DRN: G F	APPROVED:	BRIDGE NO. 02523
	CHK:	CHK:		
SHEET NO. 5-A OF 14 SHEETS				

BILL OF REINFORCEMENT FOR HINGE NEAR PIER 3

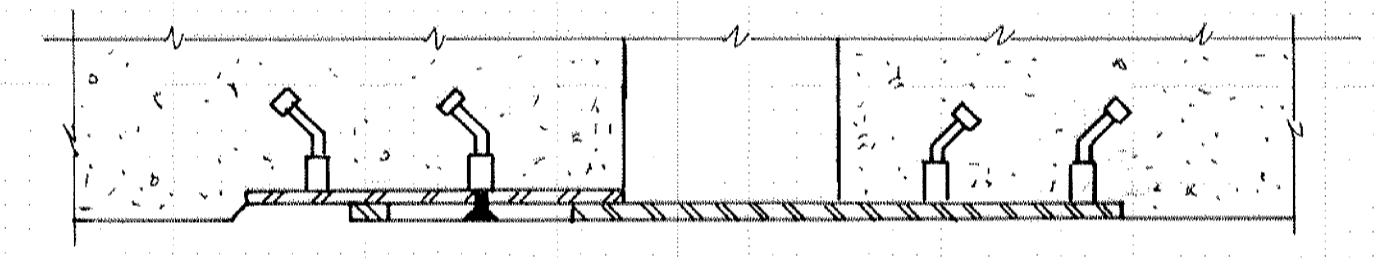
BAR	NO	LENGTH	SHAPE	LOCATION
M501E	32	25'-0"	STRT.	TRANSVERSE
M502E	88	3'-1"	BENT.	BETWEEN BEAMS
M503E	8	7'-6"	STRT.	TRANSV.-SDWK

③ INCLUDED IN PRICE BID FOR RECONSTRUCT EXP. JOINT.

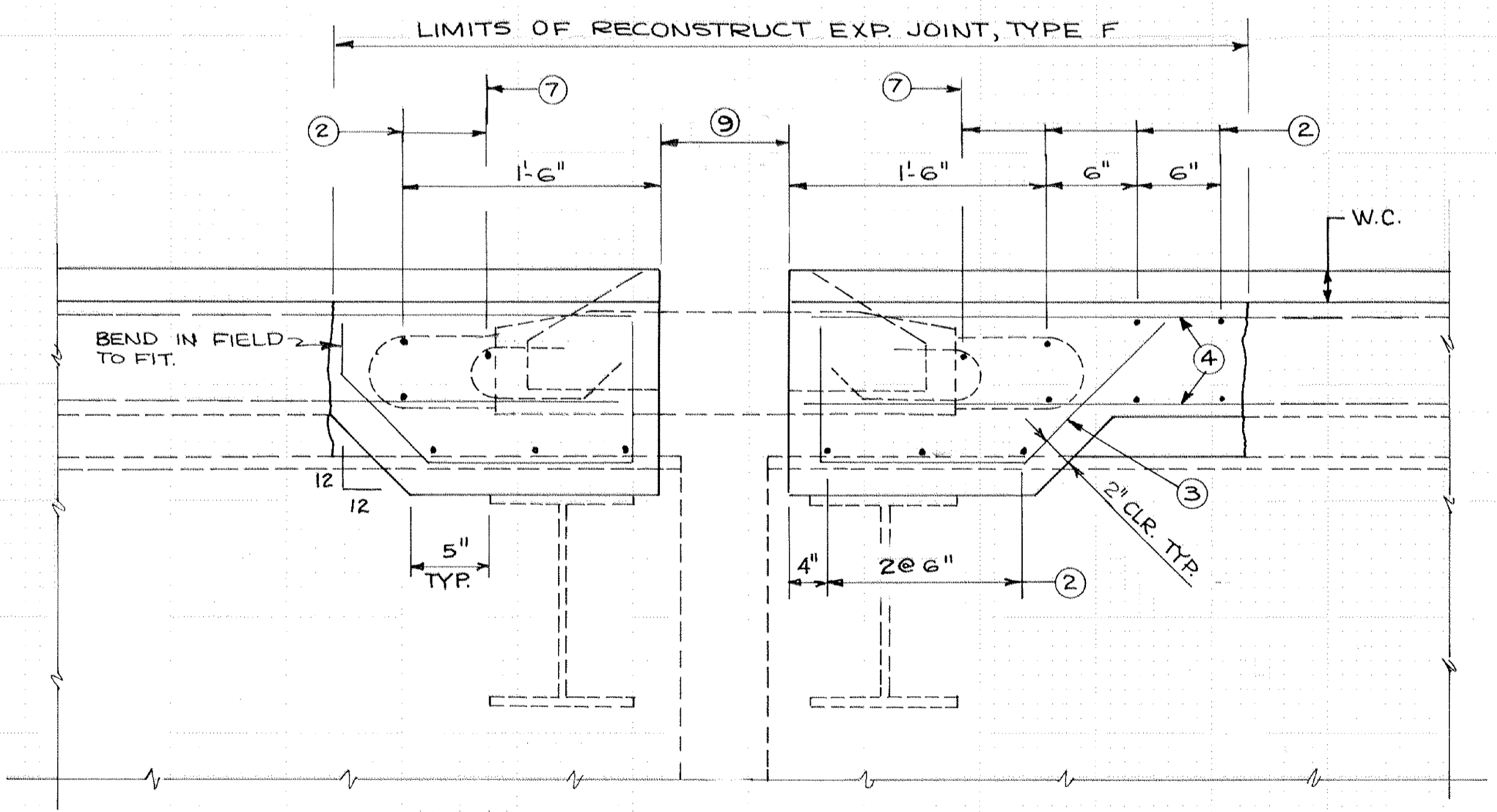


PLAN AT HINGE ~ NEAR PIER 3

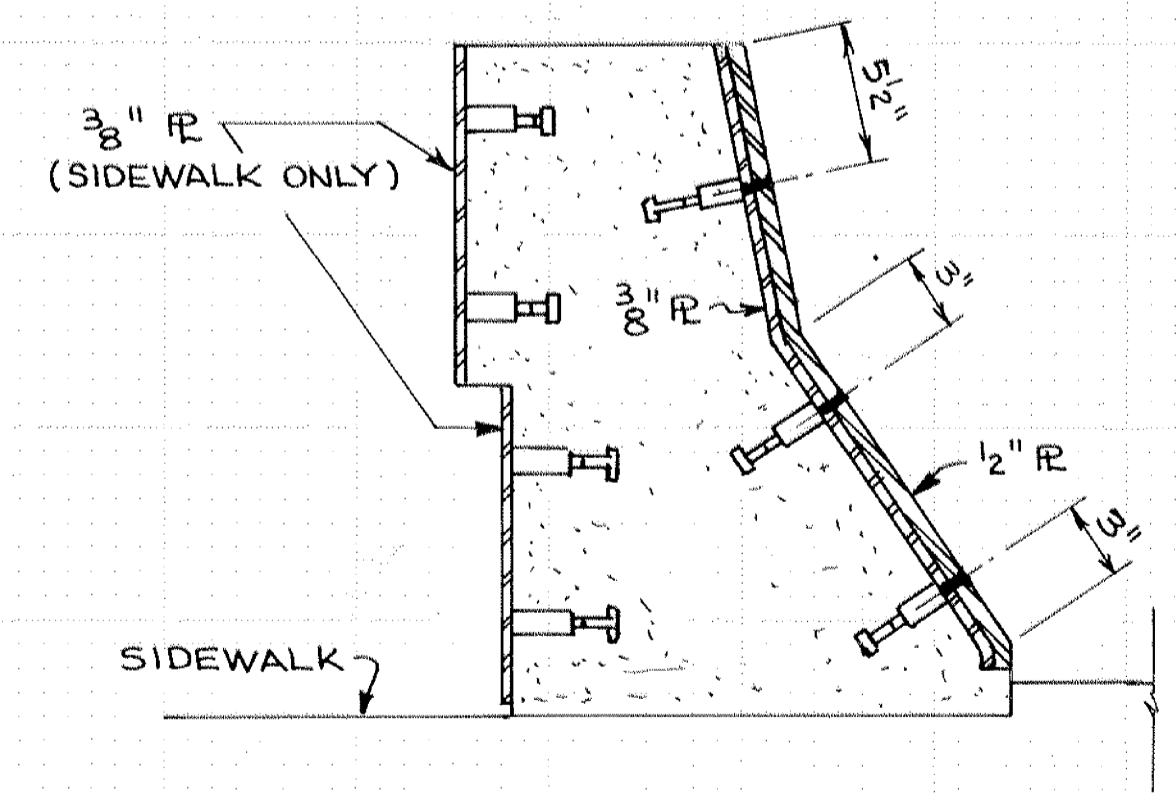
- ① INPLACE TRANSVERSE REINF. TO BE CLEANED AND STRAIGHTENED AND EXTEND 2'-0" MIN. INTO NEW WORK.
- ② 2-M501E PER BAR LINE W/ 2'-2" MIN. LAP
- ③ M502E SPACED AT ABOUT 1'-0" SPACING BETWEEN BEAMS. ADJUST SPACING FOR 2" CLR. @ SUPPORT BOXES.
- ④ INPLACE LONGIT. REINF. TO BE RETAINED, CLEANED AND STRAIGHTENED. 3" CLEAR AT OPEN JOINT.
- ⑤ 3/4" Ø x 1" CSK. CAP SCREW, 2" LONG HEX NUT & 3/4" Ø x 4" BENT BOLT.
- ⑥ 1" Ø x 8" LONG SLOTTED HOLE FOR 3/4" x 1 1/2" CSK. CAP SCREW WITH 2" LONG HEX NUT & 3/4" Ø x 4" BENT BOLT. DO NOT TIGHTEN DOWN CAP SCREW. SEE 'DETAIL E' SHT. NO. 9 FOR ADDITIONAL DETAILS.
- ⑦ CUT IN FIELD AS NECESSARY LOCATION DETERMINED BY DEVICE.
- ⑧ SEE SHOP DRAWINGS FOR OPENING WIDTH.



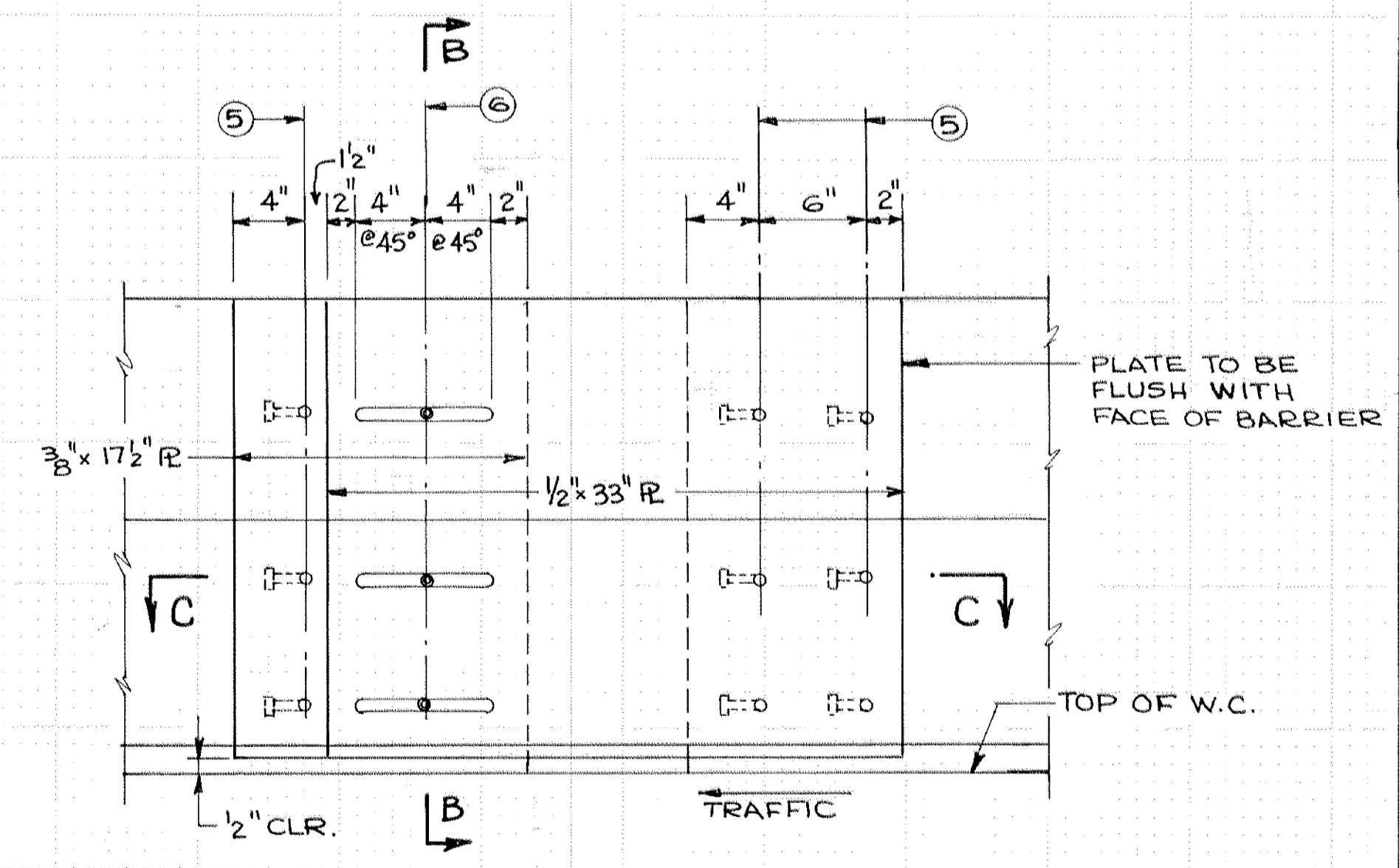
SECTION C-C



SECTION A-A



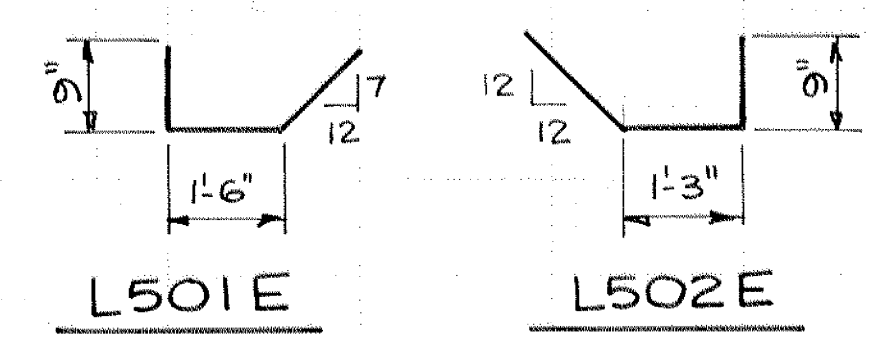
SECTION B-B



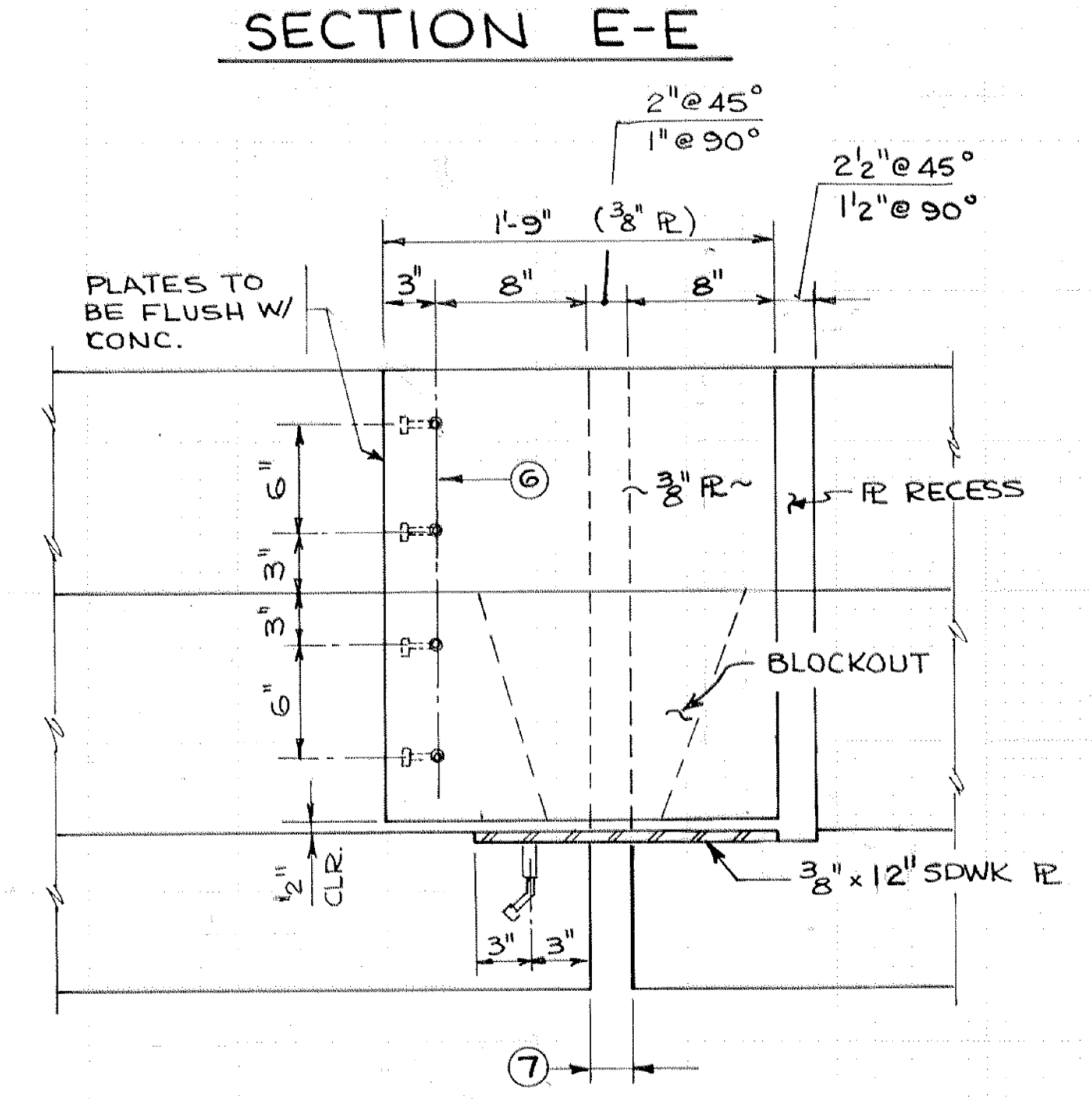
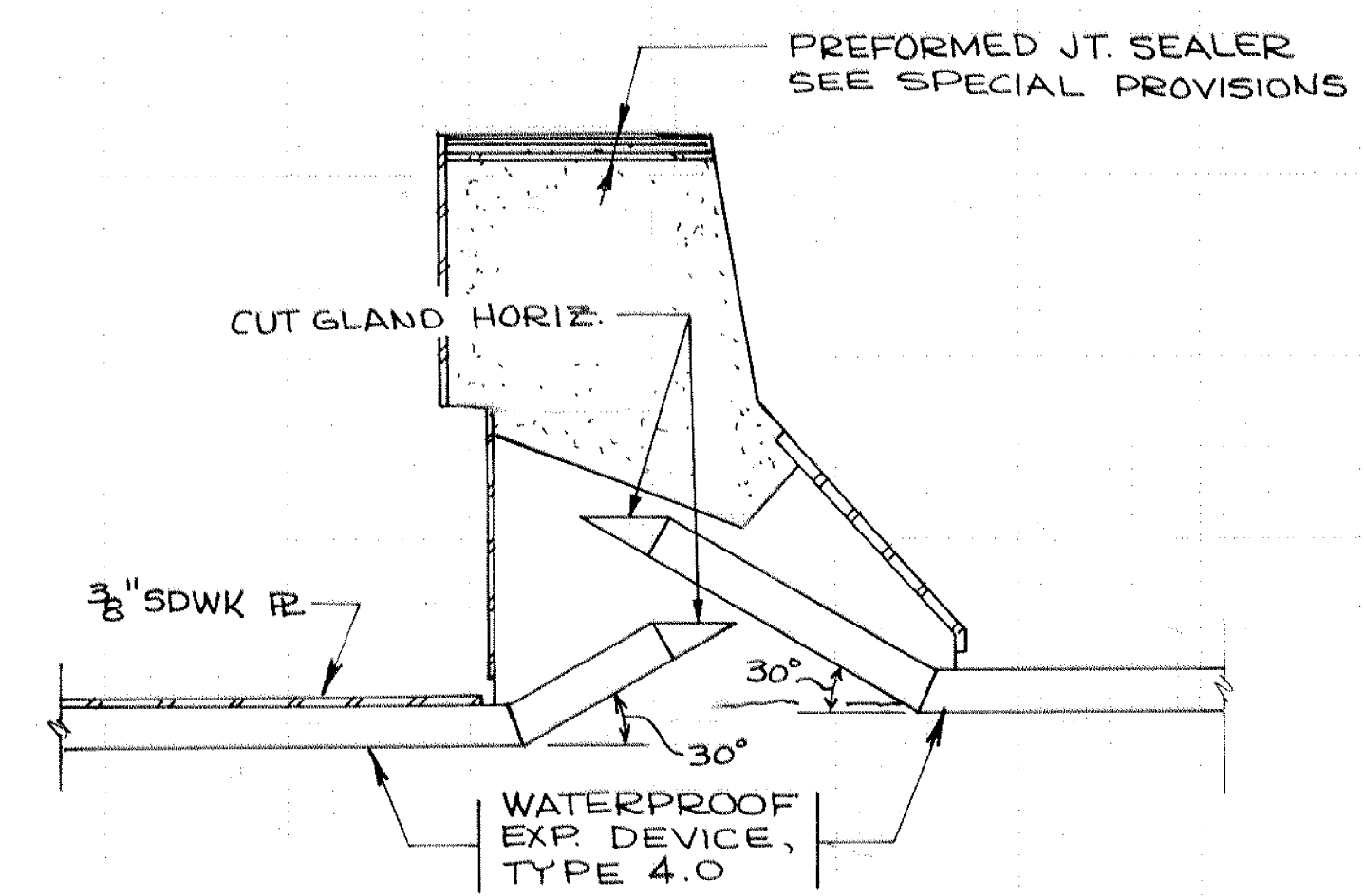
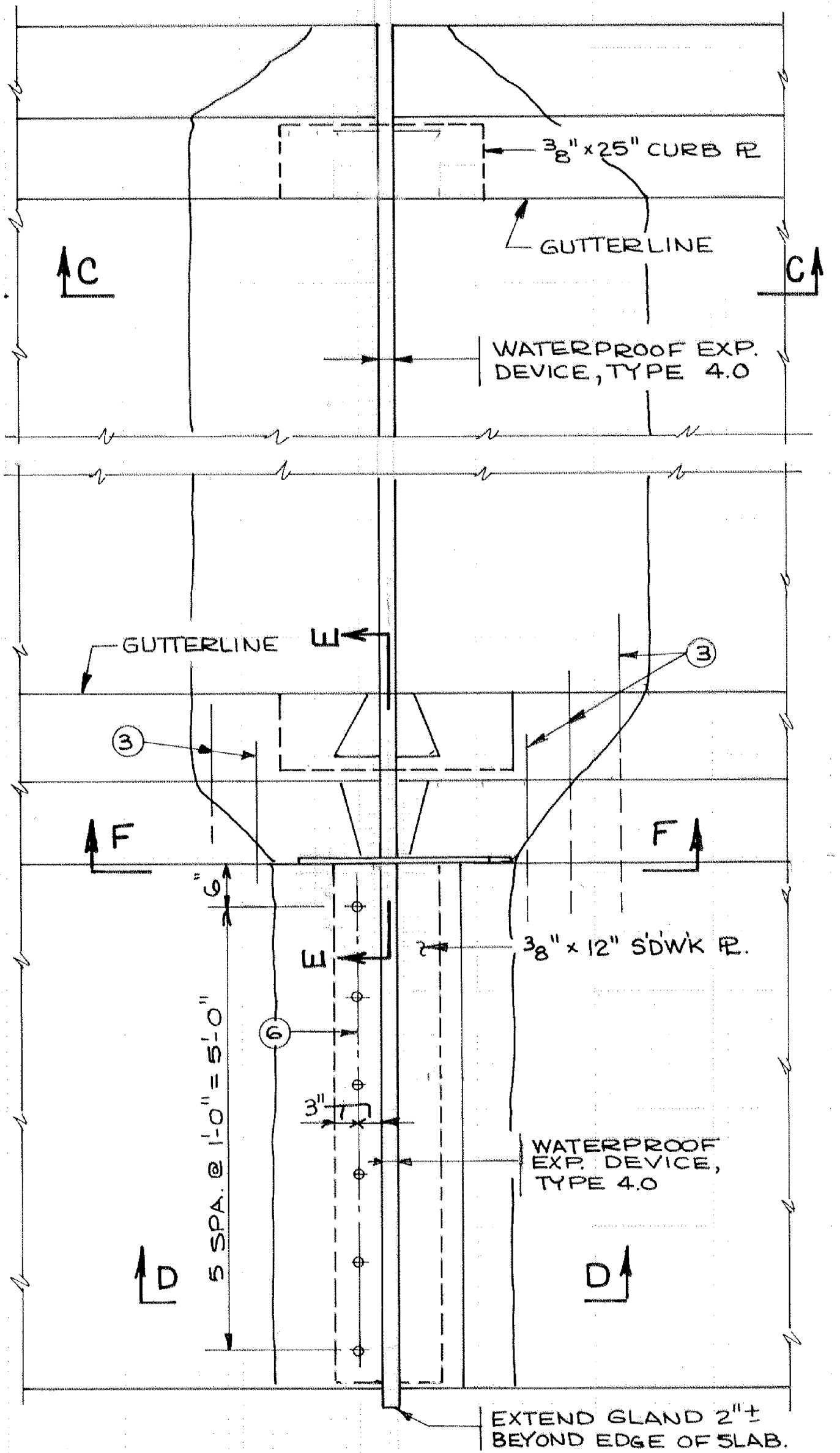
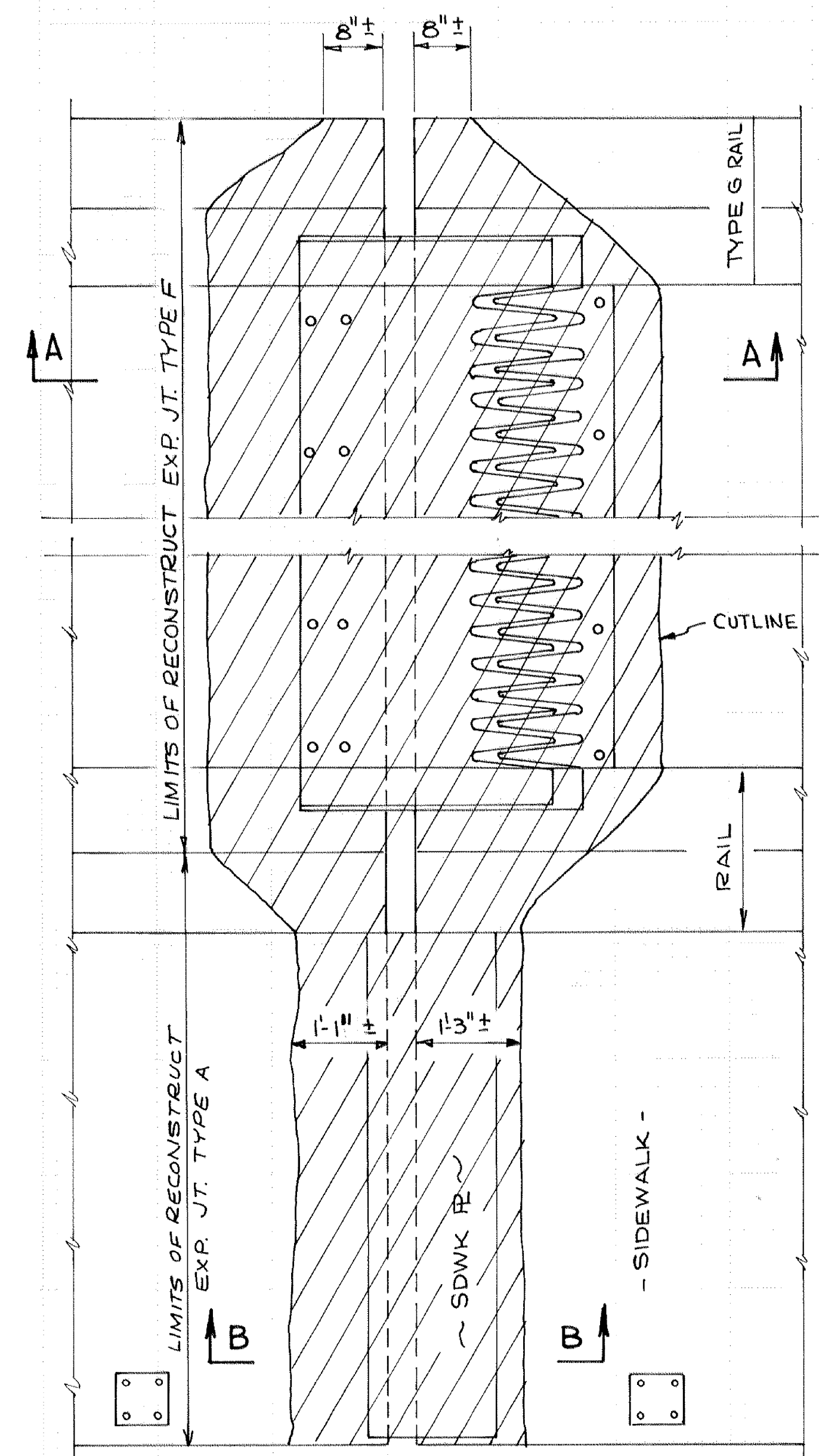
ELEVATION - RDWY BARRIER

BILL OF REINFORCEMENT ①				
BAR	NO	LENGTH	SHAPE	LOCATION
L501E	44	3'-6"	BENT	BETWEEN BEAMS
L502E	44	3'-0"	BENT	"
L503E	36	25'-0"	STRT	TRANSVERSE
L504E	8	7'-6"	STRT	" SDWK

- ② CUT IN FIELD TO FIT. 2'-2" MIN. LAP.
- ① INCLUDED IN PRICE BID FOR RECONSTRUCT EXP. JT., TYPE .



- ③ INPLACE TRANSVERSE REINF. TO BE CLEANED AND STRAIGHTENED AND EXTEND 2'-0" MIN. INTO NEW WORK.
- ④ INPLACE LONGITUDINAL REINF. TO BE RETAINED, CLEANED AND STRAIGHTENED.
- ⑤ L501E & L502E SPACED AT ABOUT 1'-0" SPA. BETWEEN BEAMS.
- ⑥ ϕ 3/4" \times 1" CSK. CAP SCREW, 2" LONG HEX NUT AND 3/4" ϕ \times 4" BENT BOLT.
- ⑦ SEE SHOP DRAWINGS FOR OPENING WIDTH.

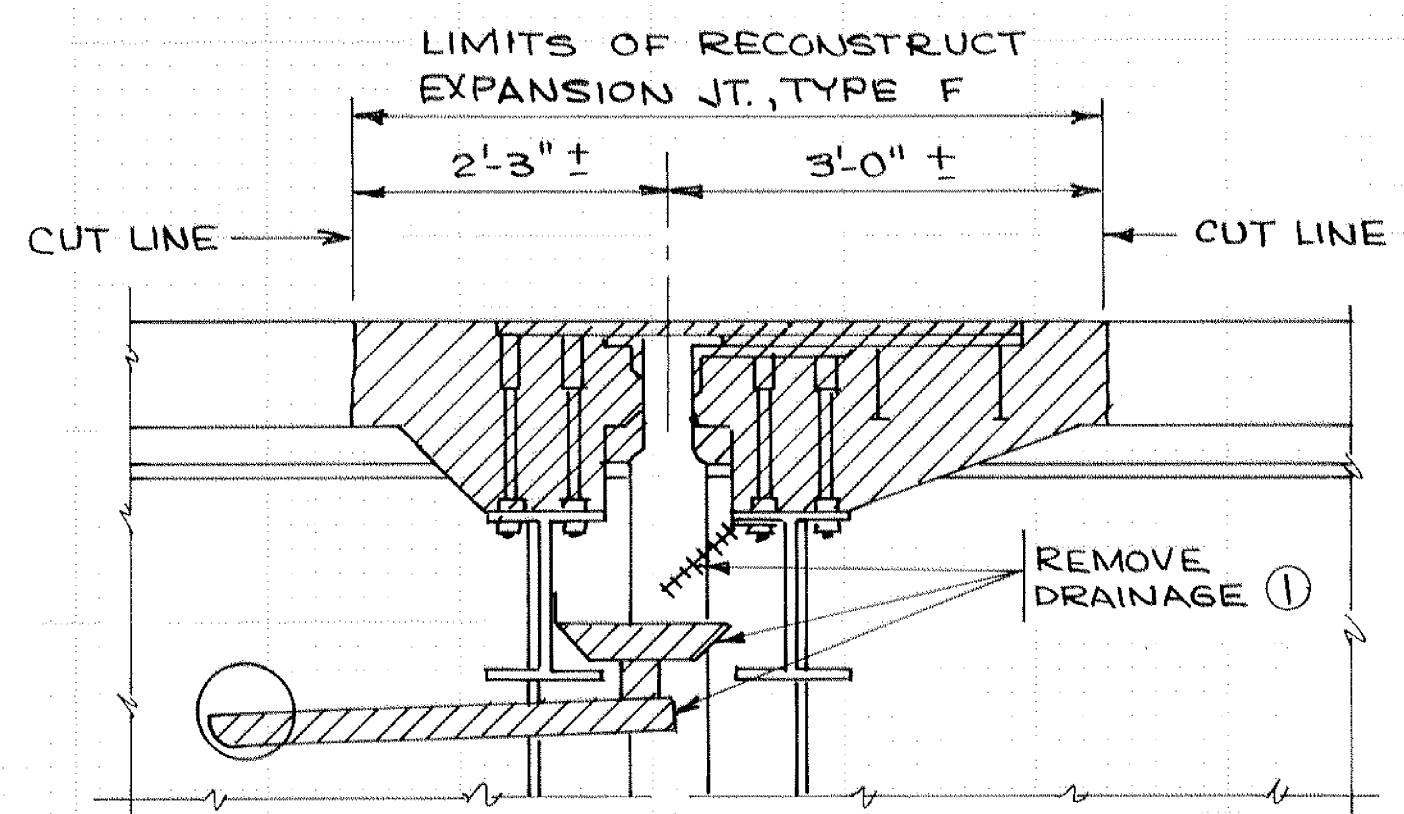


SECTION F-F
WATERPROOF EXP. DEVICE NOT SHOWN.

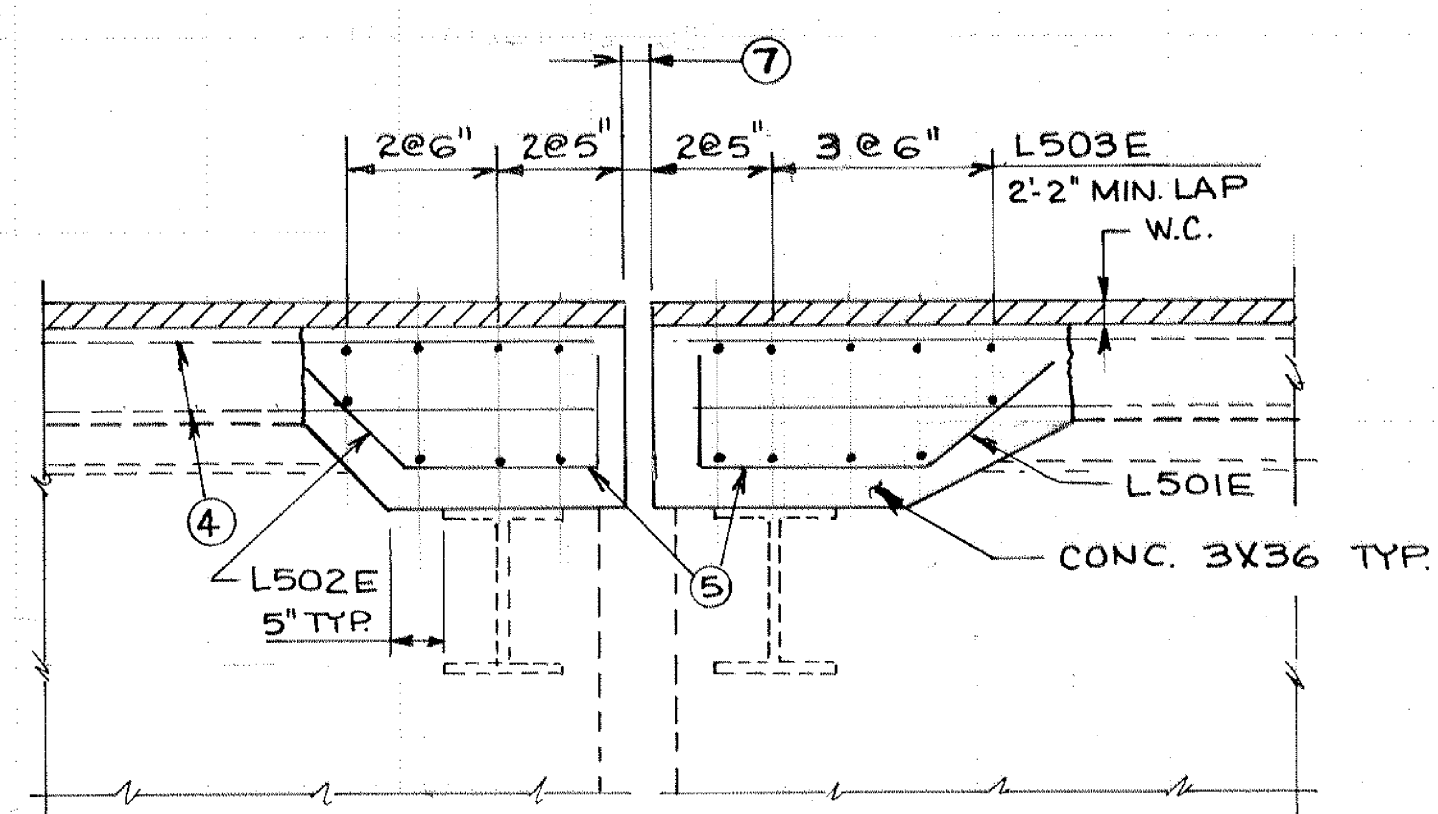
INPLACE PLAN

HATCHED AREA INDICATES REMOVAL. RETAIN LONGITUDINAL REINF.

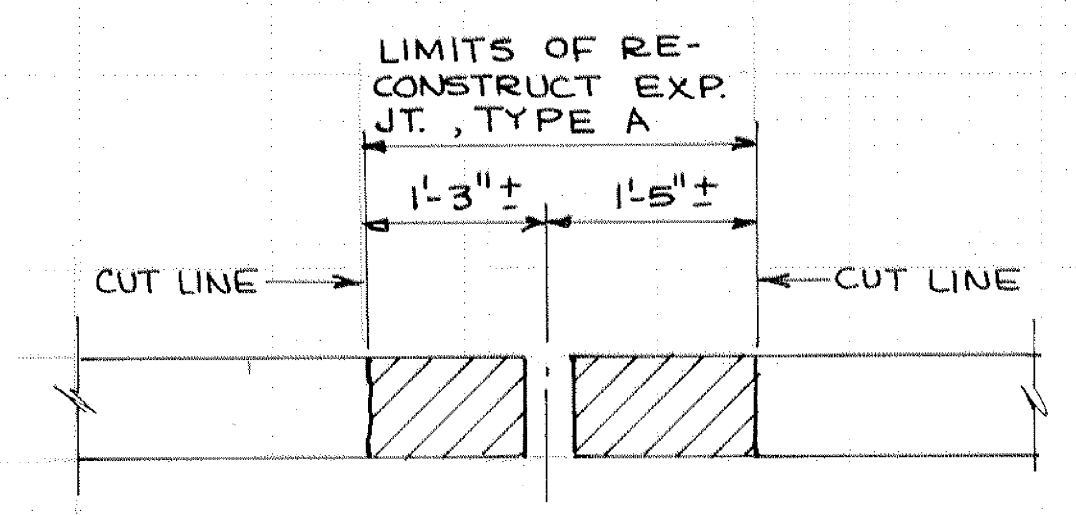
PROPOSED PLAN



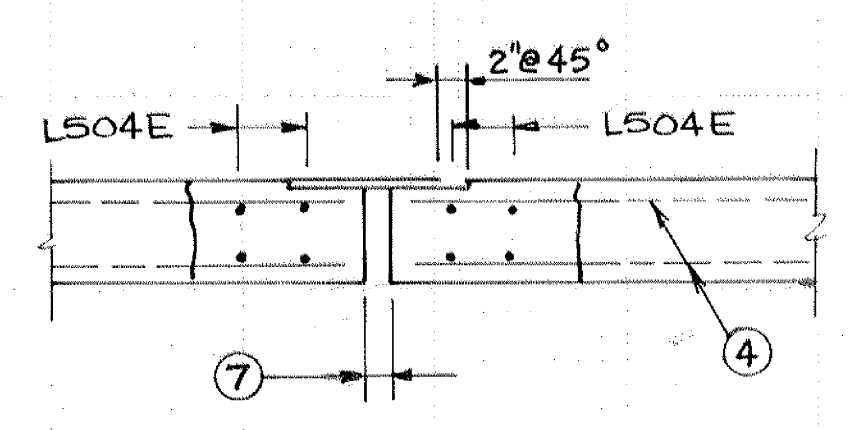
SECTION A-A



SECTION C-C

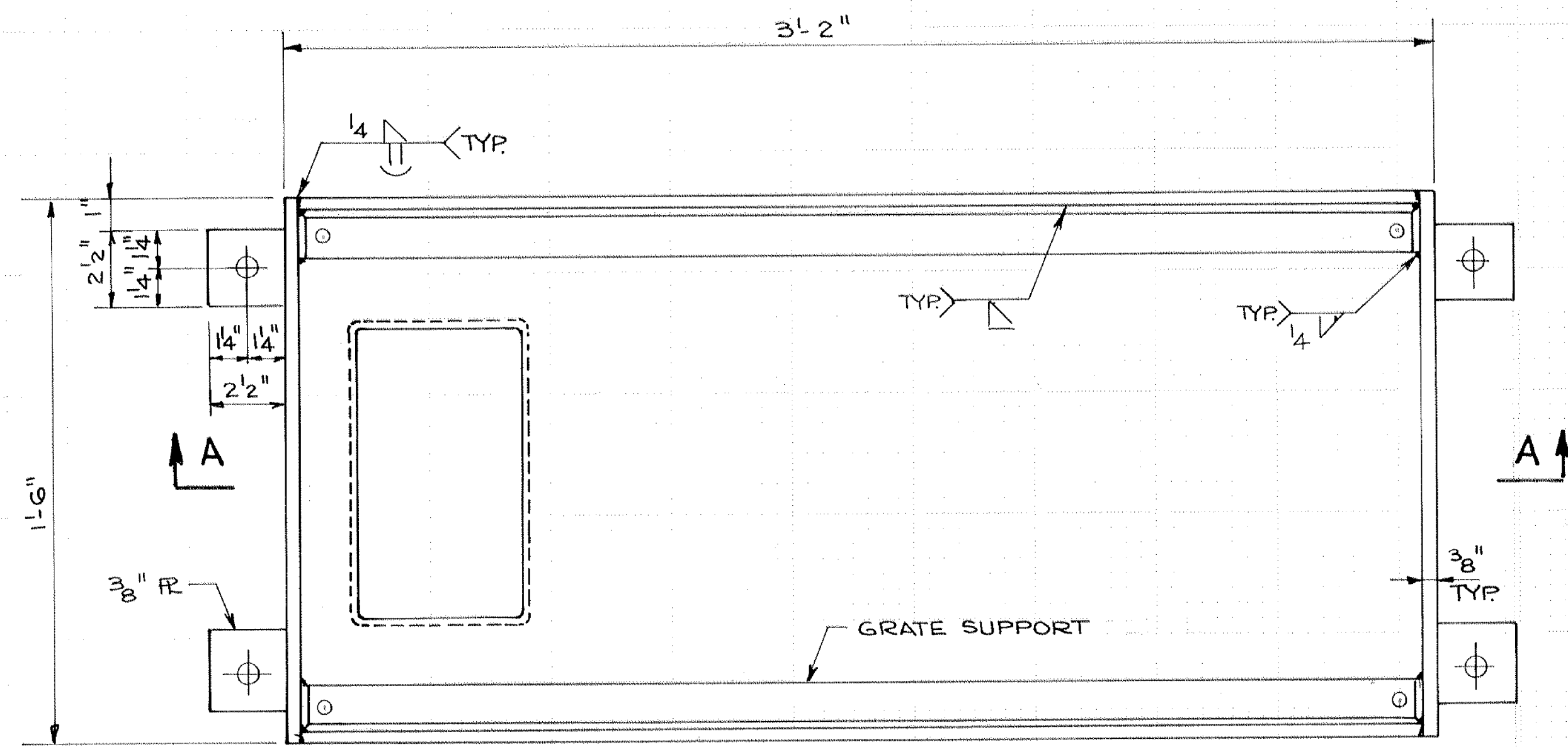


SECTION B-B

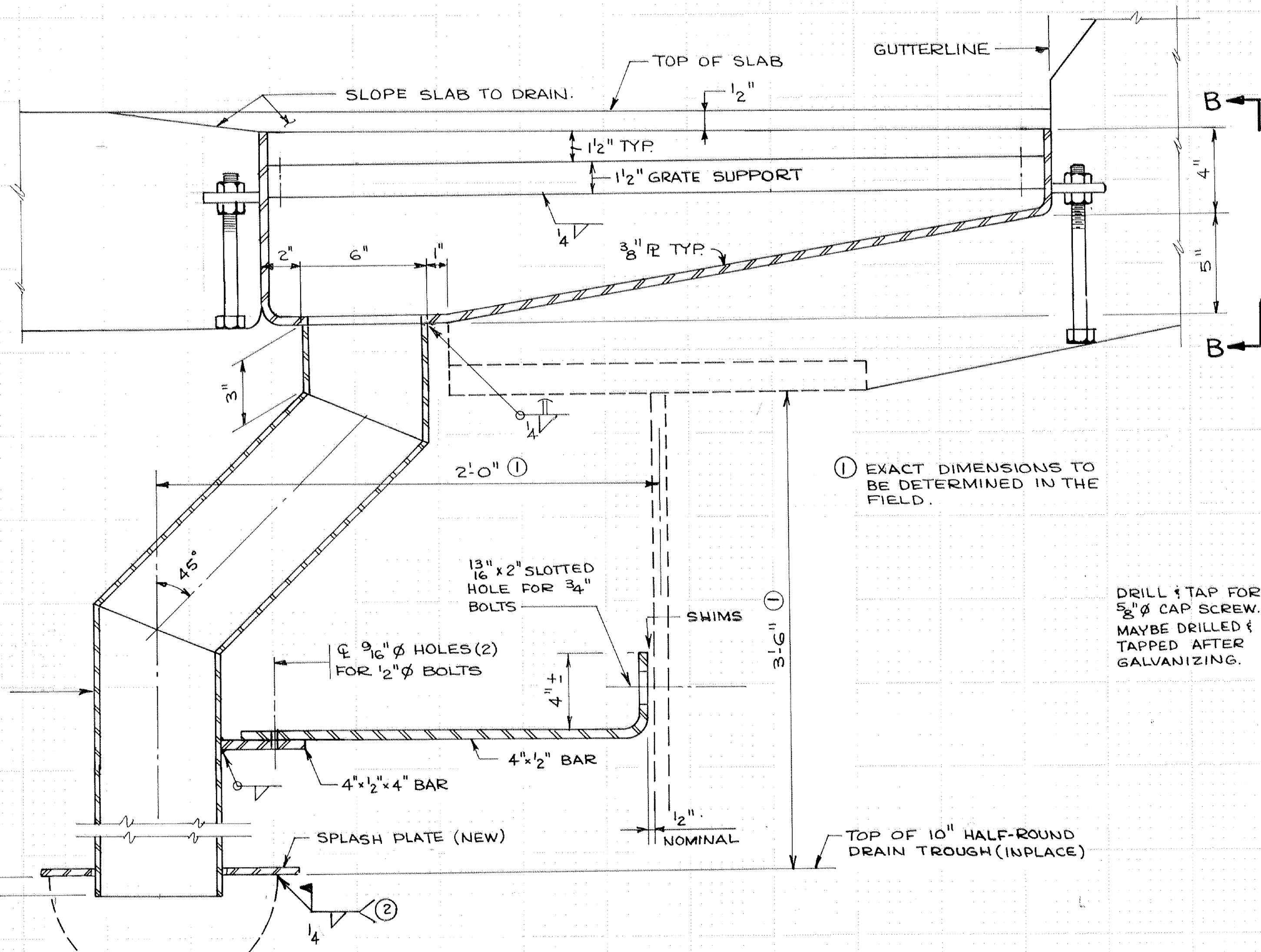
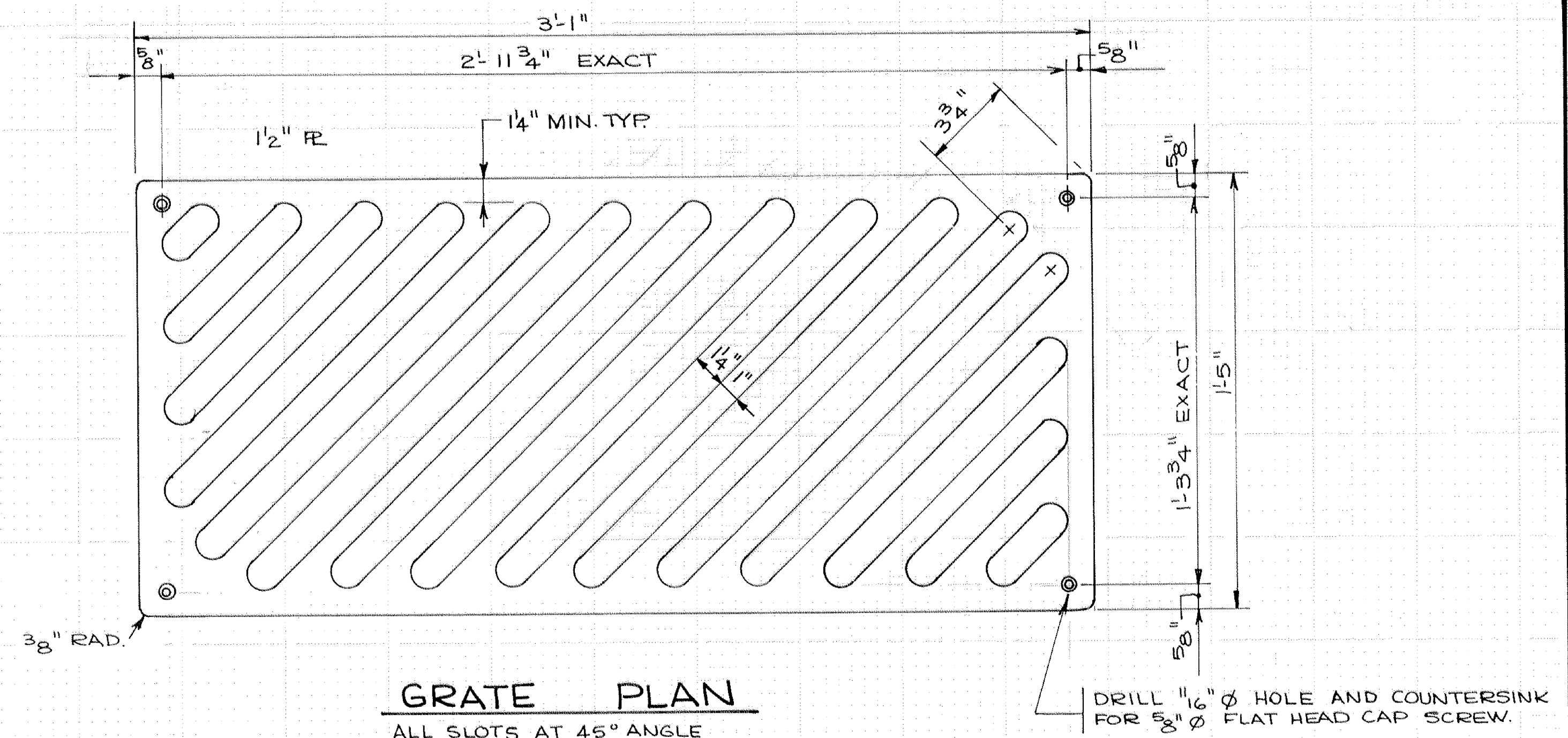


SECTION D-D

DES:	DRN: GF	APPROVED:	BRIDGE NO.
CHK:	CHK:		02523
RECONSTRUCT EXP. JT. TYPE F NEAR PIER 6			
SHEET NO. 7 A OF 14 SHEETS			



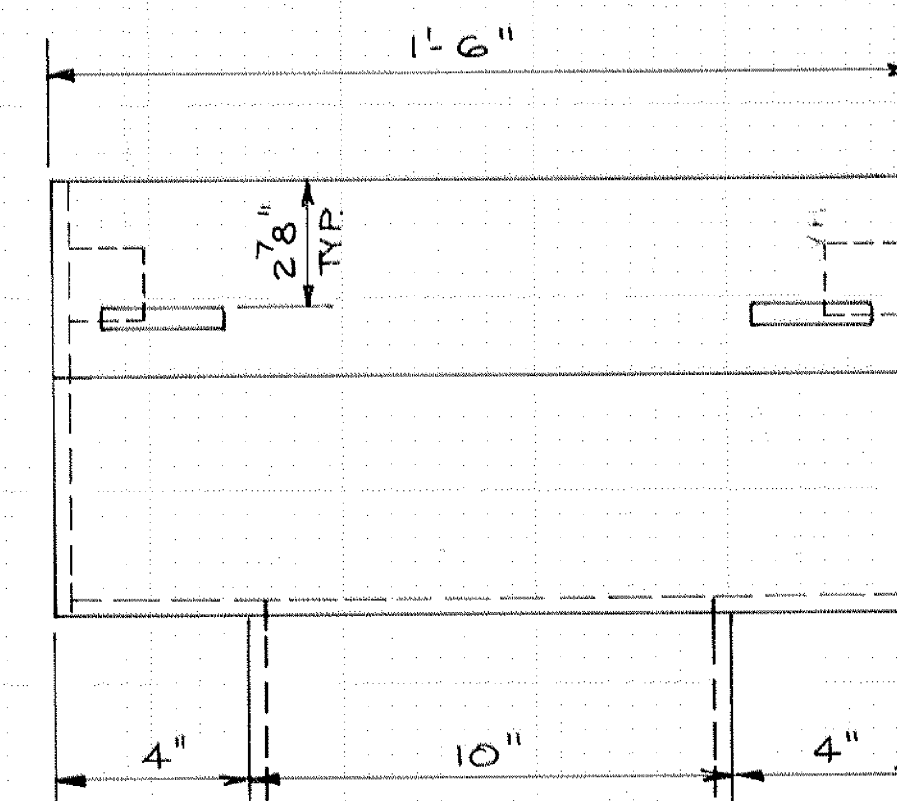
PLAN



② INCLUDED IN PRICE BID FOR RECONSTRUCT, CLEAN DRAIN SYSTEM

SECTION A-A

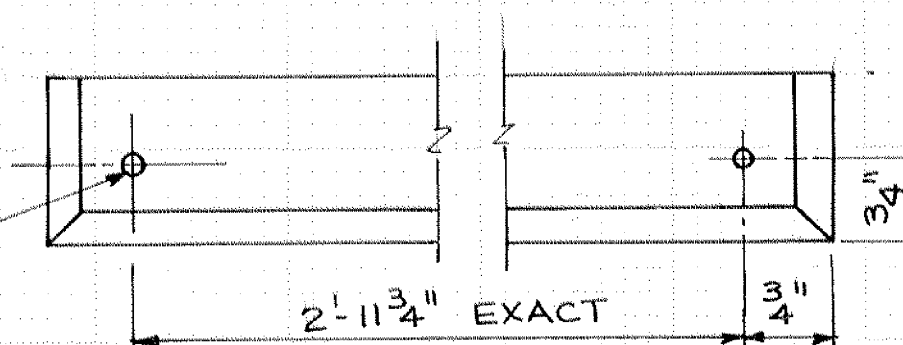
TYP. EXCEPT AT PIER 5 SEE SHT NO. 9



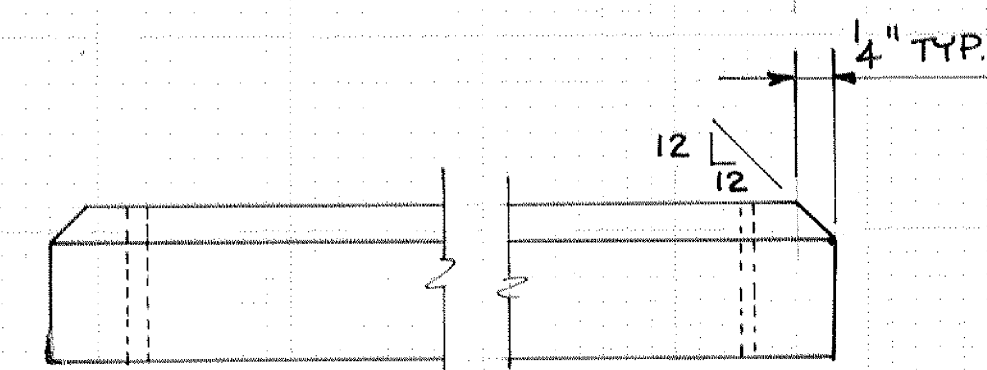
VIEW B-B

(ONLY DRAIN SHOWN)

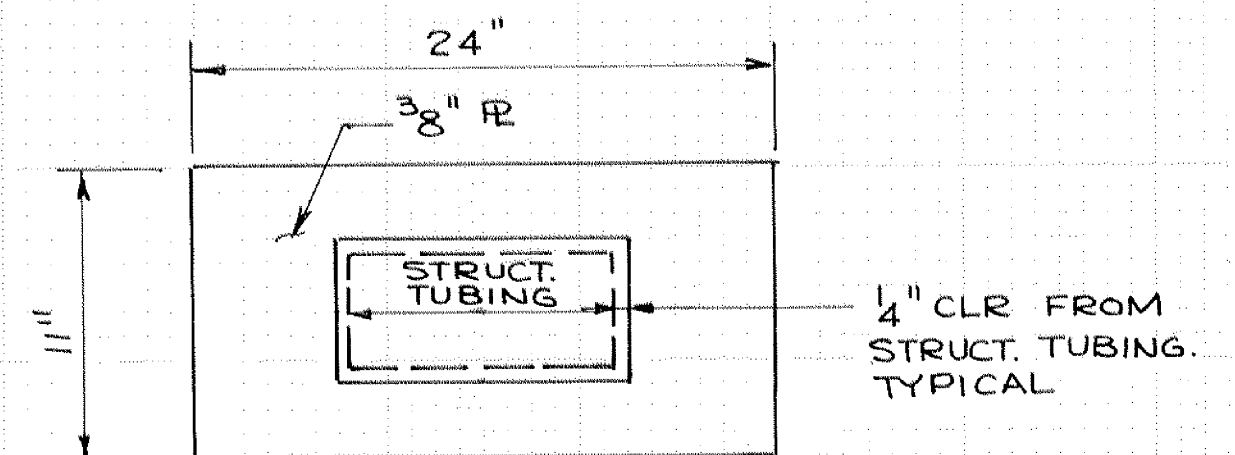
DRILL & TAP FOR 5/8" Ø CAP SCREW. MAYBE DRILLED & TAPPED AFTER GALVANIZING.



GRATE SUPPORT - TOP



GRATE SUPPORT - SIDE



SPLASH PLATE

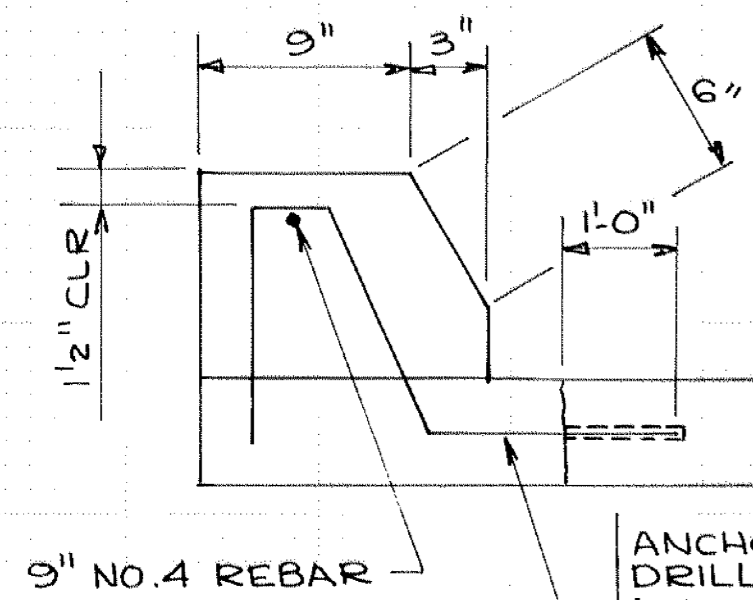
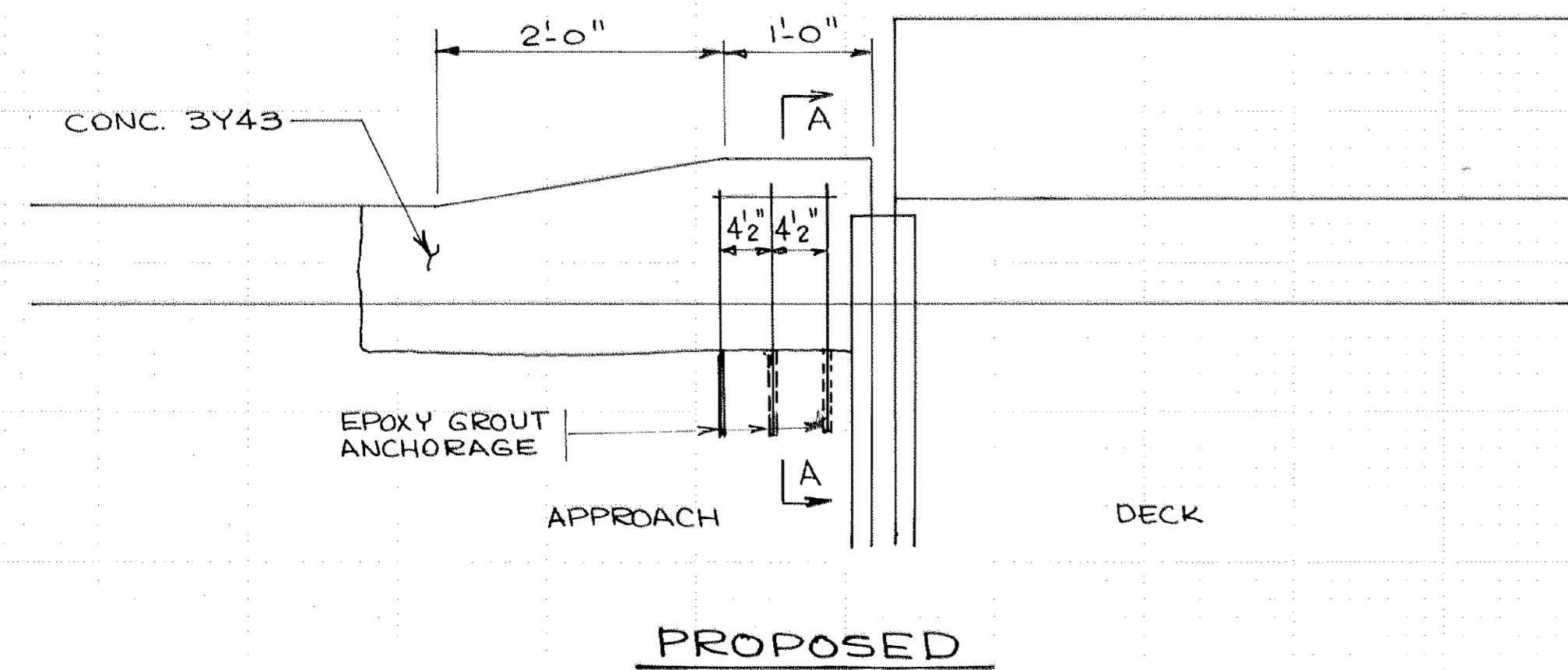
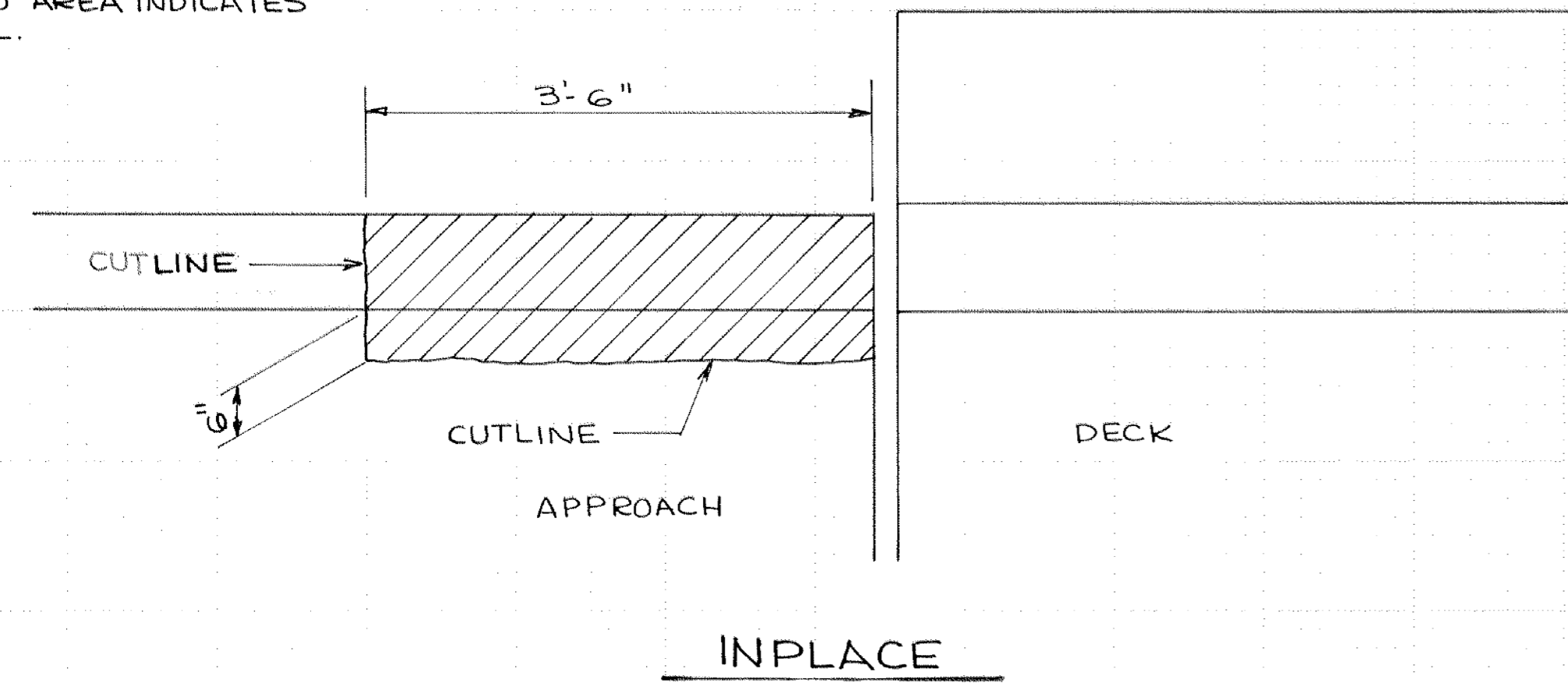
NOTES

- ALL STEEL PLATES PER MW/DOT 3306. FABRICATE GRATE USING AUTOMATICALLY CONTROLLED CUTTING TORCH.
- WORKMANSHIP AND FABRICATION PER SPEC. 2471.
- BLAST CLEAN SCUPPER AND GRATE AFTER FABRICATION.
- GALVANIZE SUPPER AND GRATE AS PER SPEC. 3394
- GALVANIZE HARDWARE AS PER SPEC. 3392.
- PAYMENT FOR FLOOR DRAIN TYPE I SHALL INCLUDE ALL MATERIAL SHOWN ON THIS DETAIL.

FLOOR DRAIN DETAIL
TYPE I

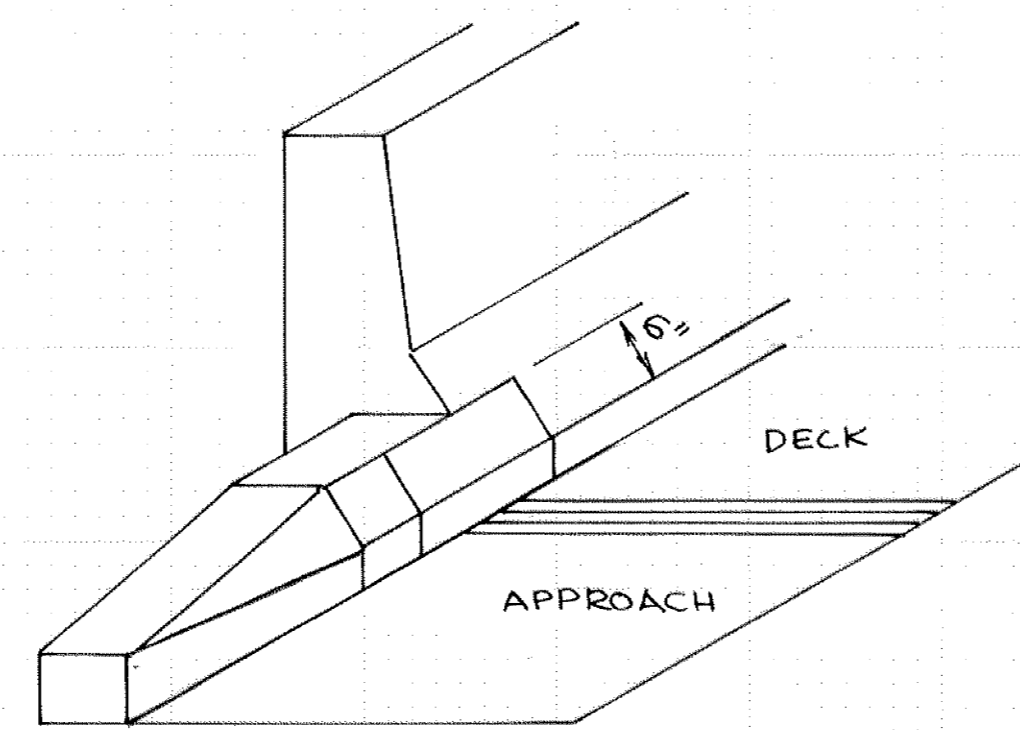
DRN: GF	APPROVED:	BRIDGE NO.
CHK:		02523
SHEET NO. 8-A OF 14-A SHEETS		

HATCHED AREA INDICATES REMOVAL.



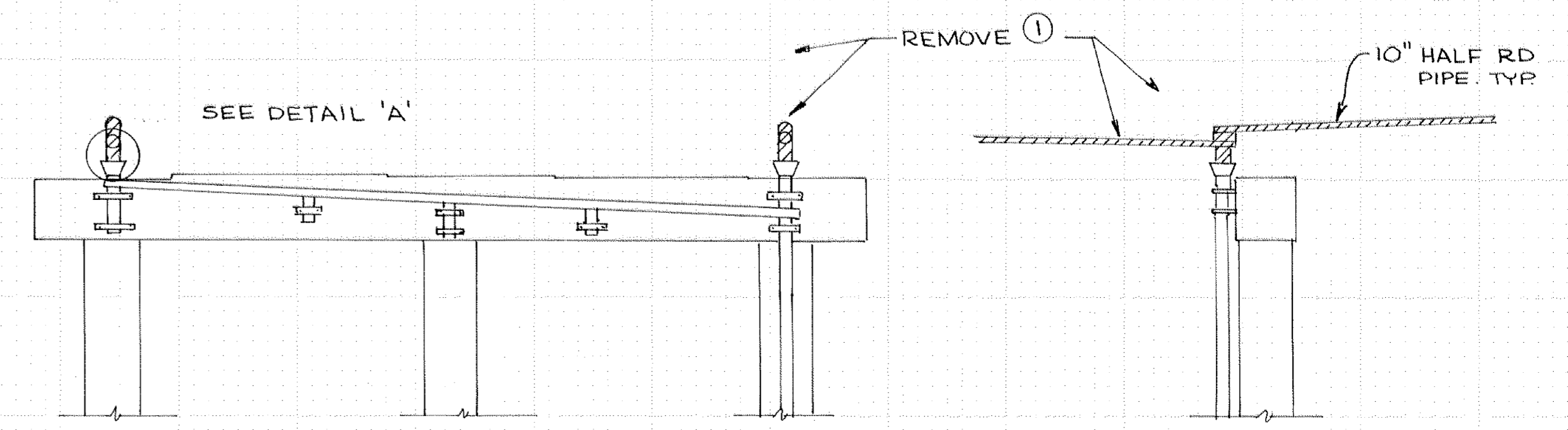
ANCHORAGE
DRILL AND NON-SHRINK GROUT
A NO.5 REBAR 4 1/2" LONG IN
PLACE. BEND BAR IN FIELD.
SEE SPECIAL PROVISIONS.

SECTION A-A



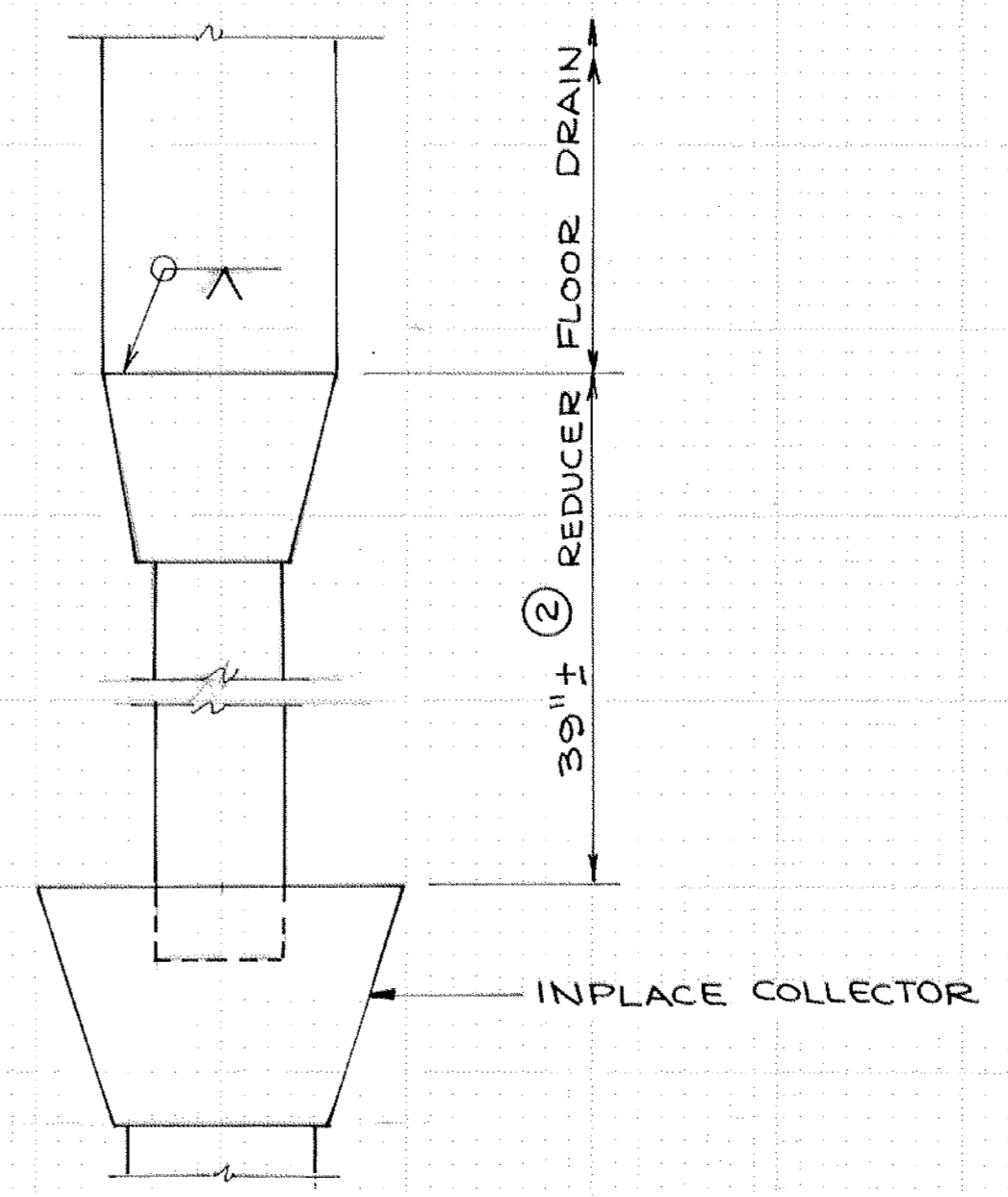
PERSPECTIVE

APPROACH DETAILS
INCLUDED IN PRICE BID FOR 'RECONSTRUCT
EXPANSION JOINTS, TYPE A'.



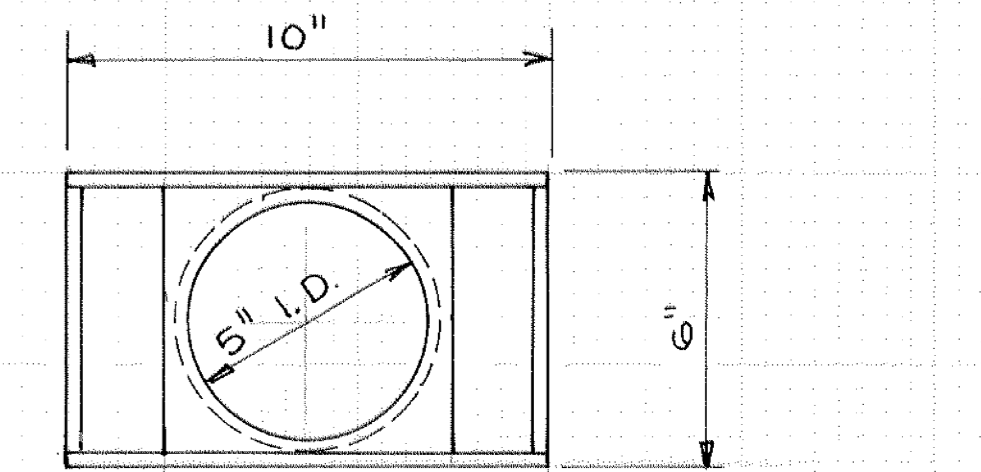
ELEVATION
PIER 5

END ELEVATION

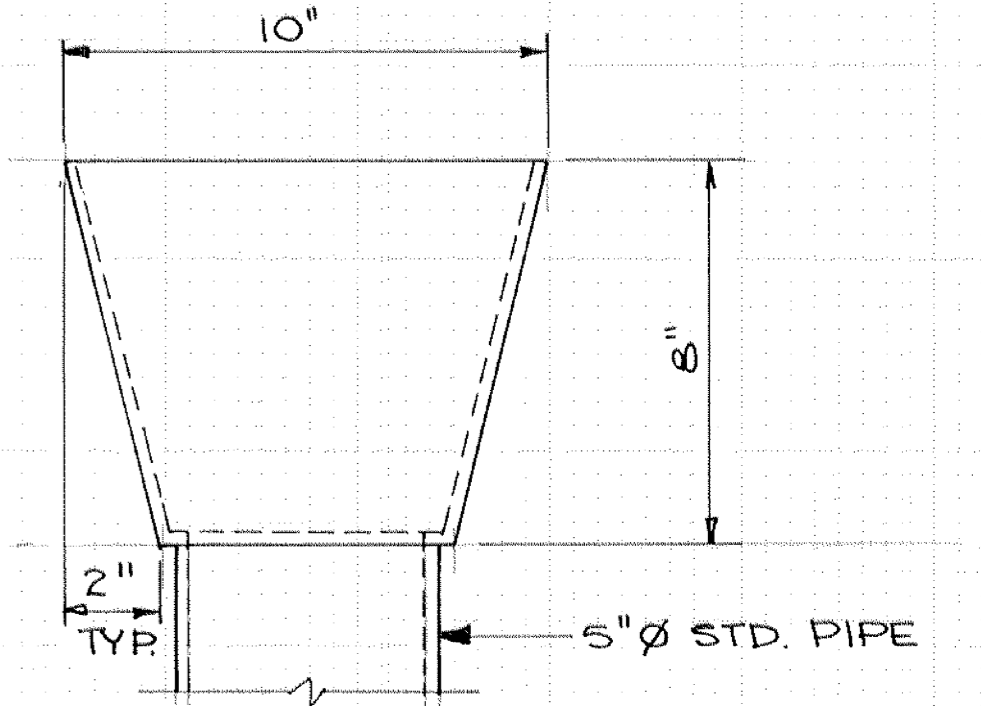


DETAIL A

- ① REMOVAL INCLUDED IN PRICE BID FOR 'RECONSTRUCT, CLEAN DRAINAGE SYSTEM. SEE SPECIAL PROVISIONS.
- ② EXACT DIMENSIONS TO BE DETERMINED IN THE FIELD.



PLAN

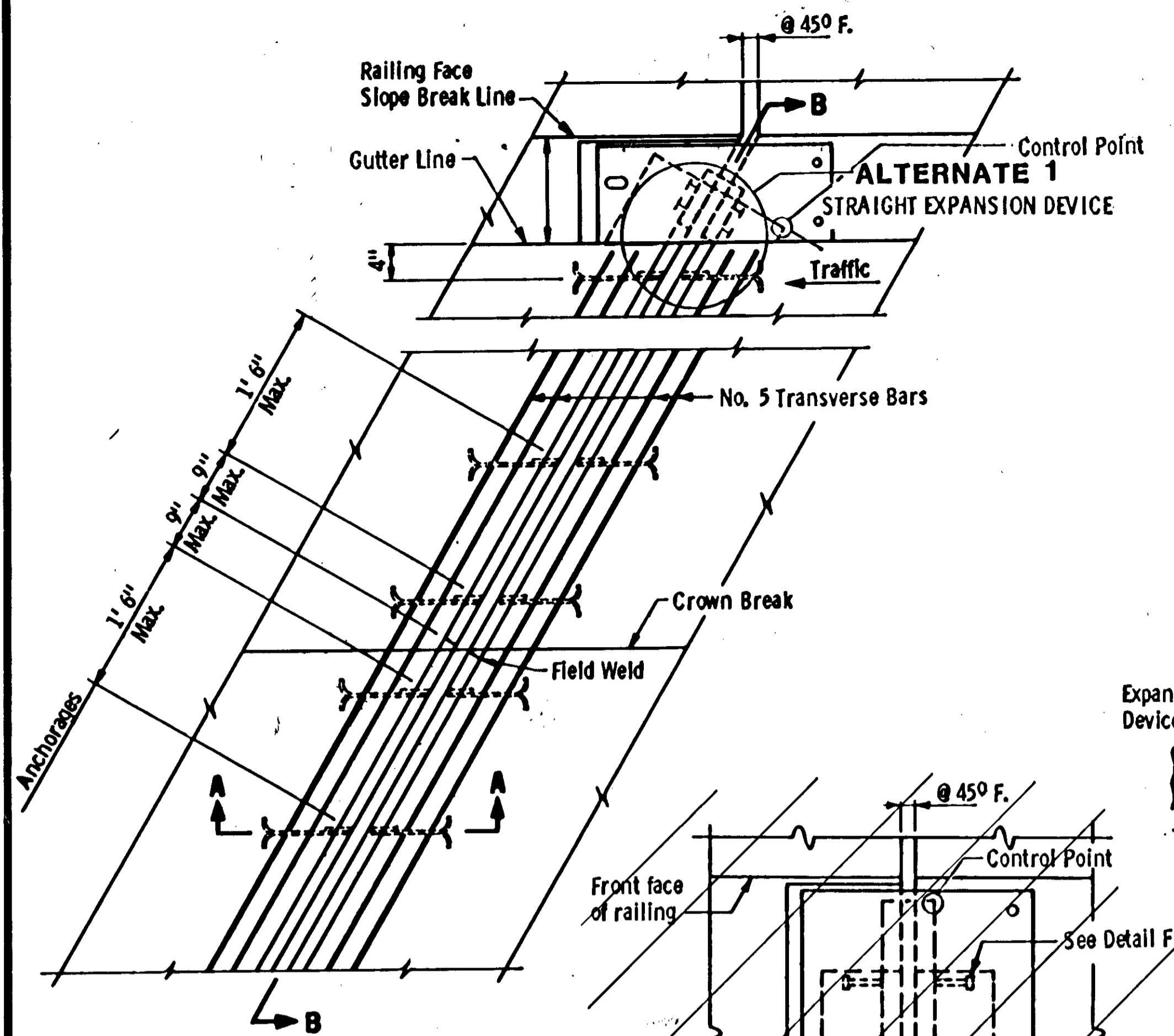


ELEVATION

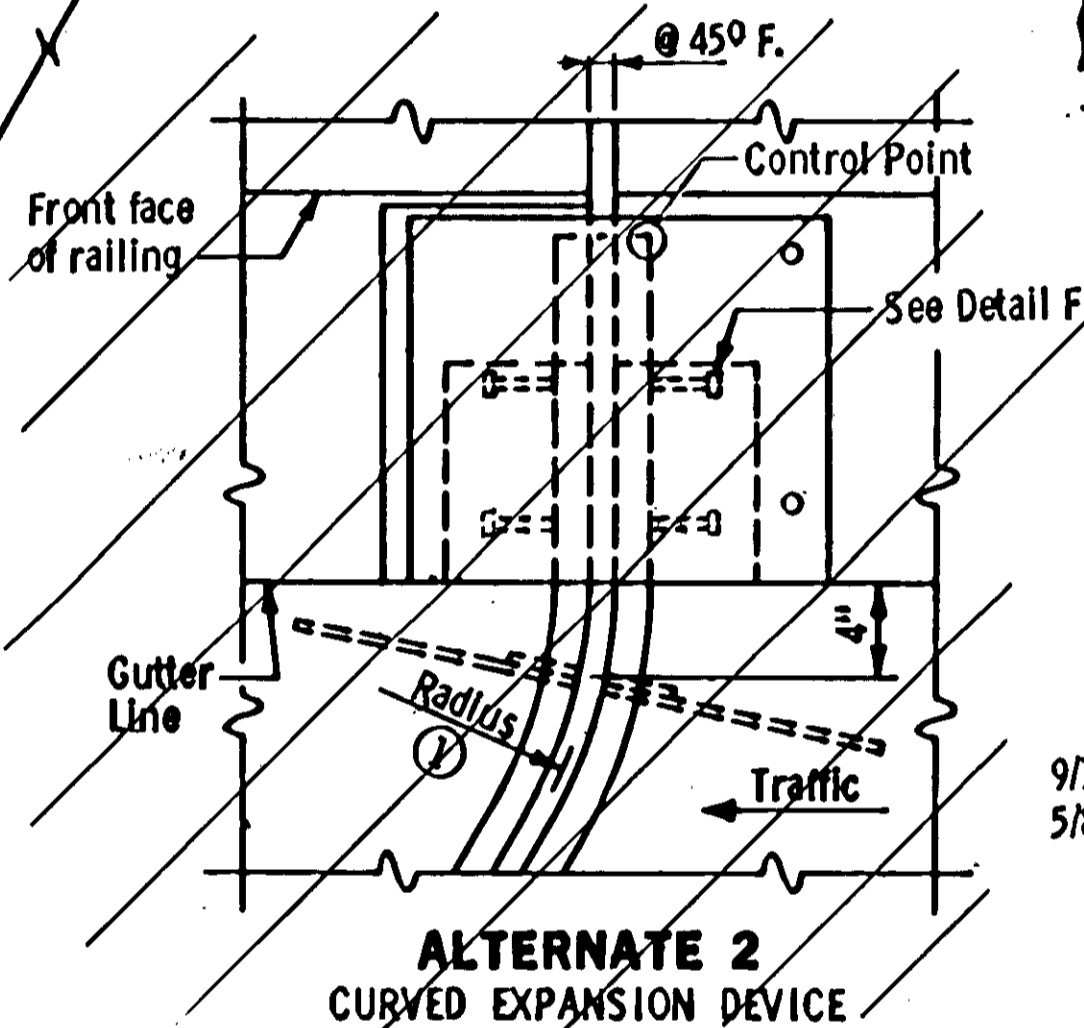
REDUCER DETAILS

PIER 5 DRAINAGE DETAILS

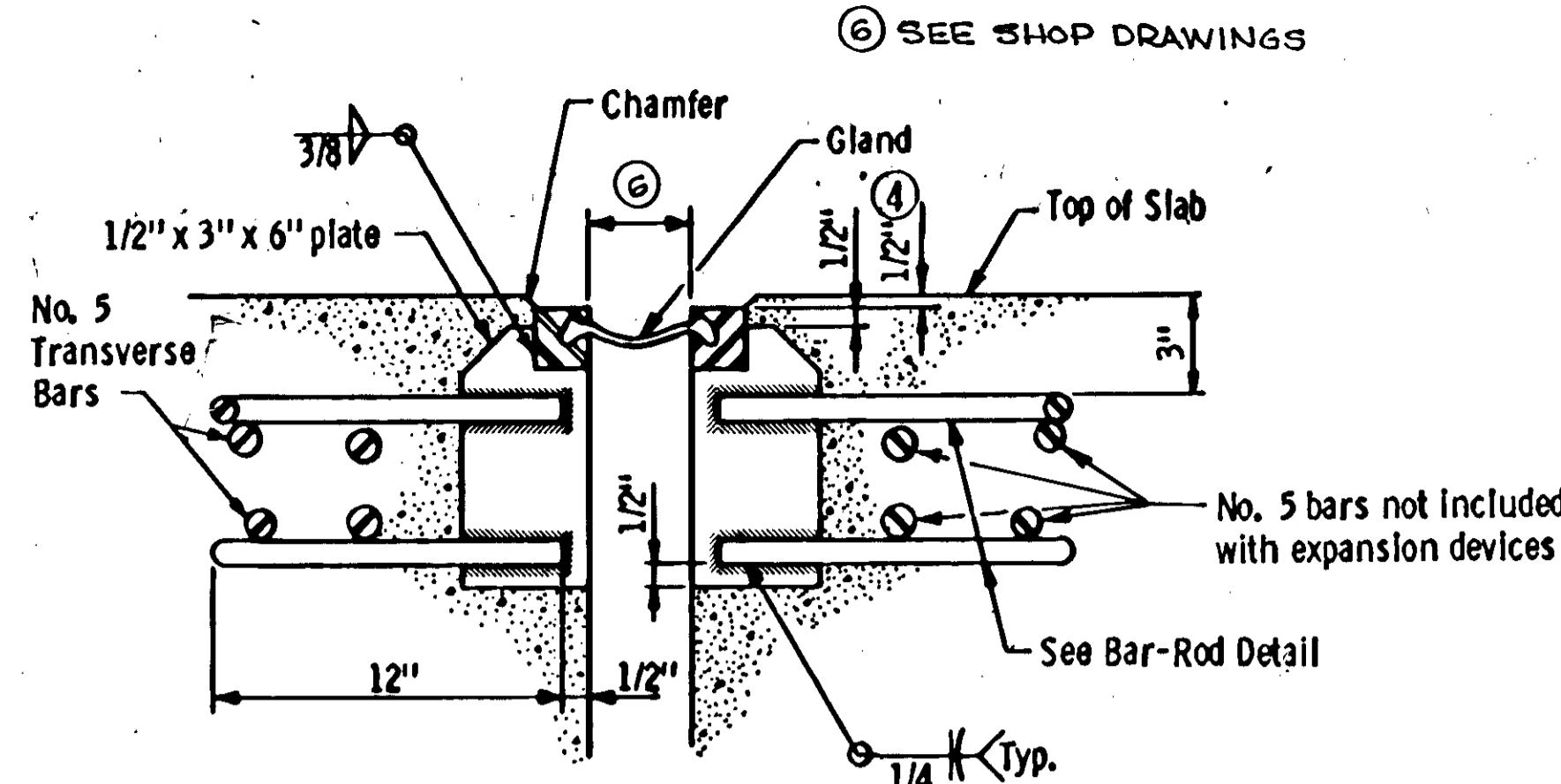
APPROACH DETAILS DRAIN DETAILS	DES:	DRN: GF	APPROVED:	BRIDGE NO. 02523
	CHK:	CHK:		
SHEET NO. 9-A OF 14-A SHEETS				



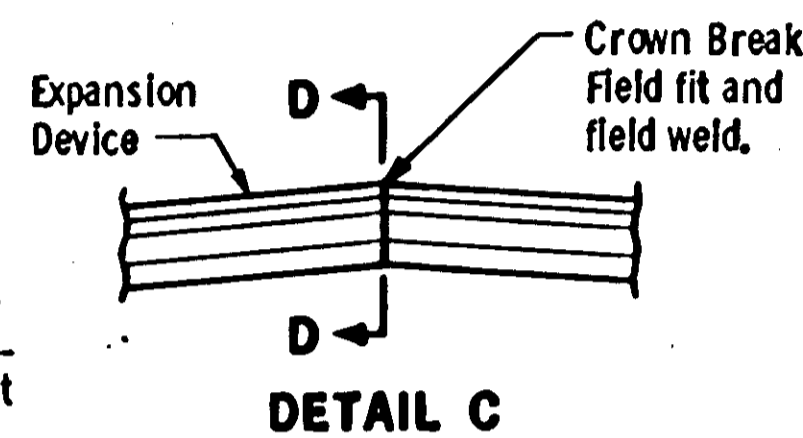
PLAN VIEW AT EXPANSION DEVICE
STRAIGHT EXPANSION DEVICE SHOWN



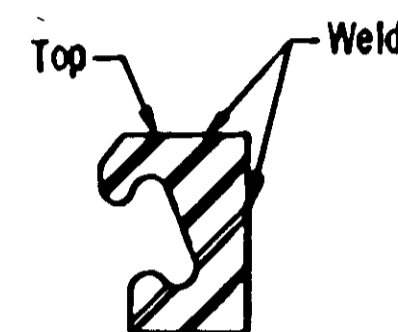
ALTERNATE 2
CURVED EXPANSION DEVICE



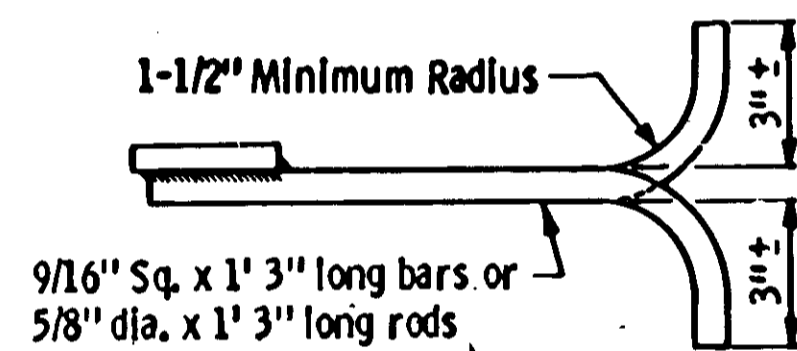
SECTION A-A
ANCHORAGE WITH ROD OPTION SHOWN



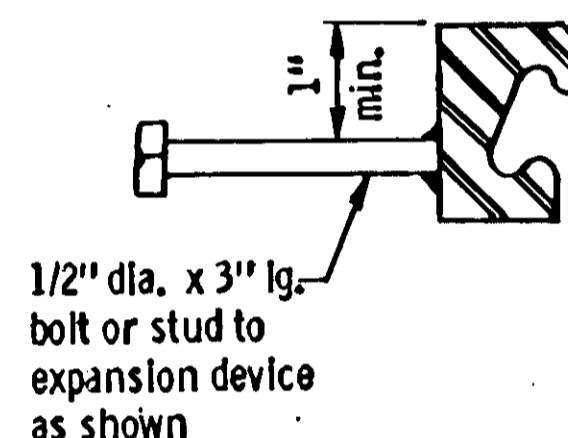
DETAIL C



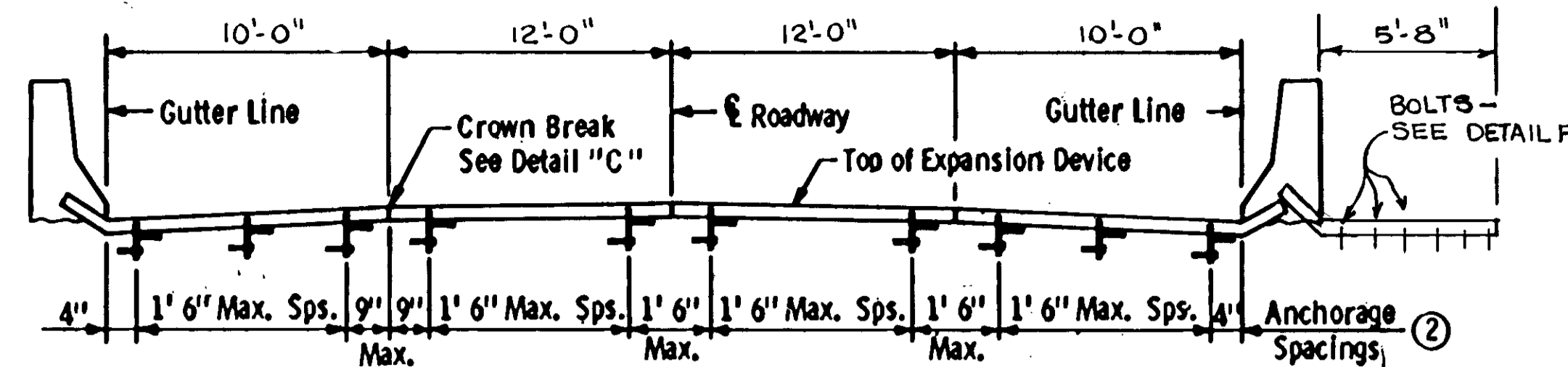
SECTION D-D



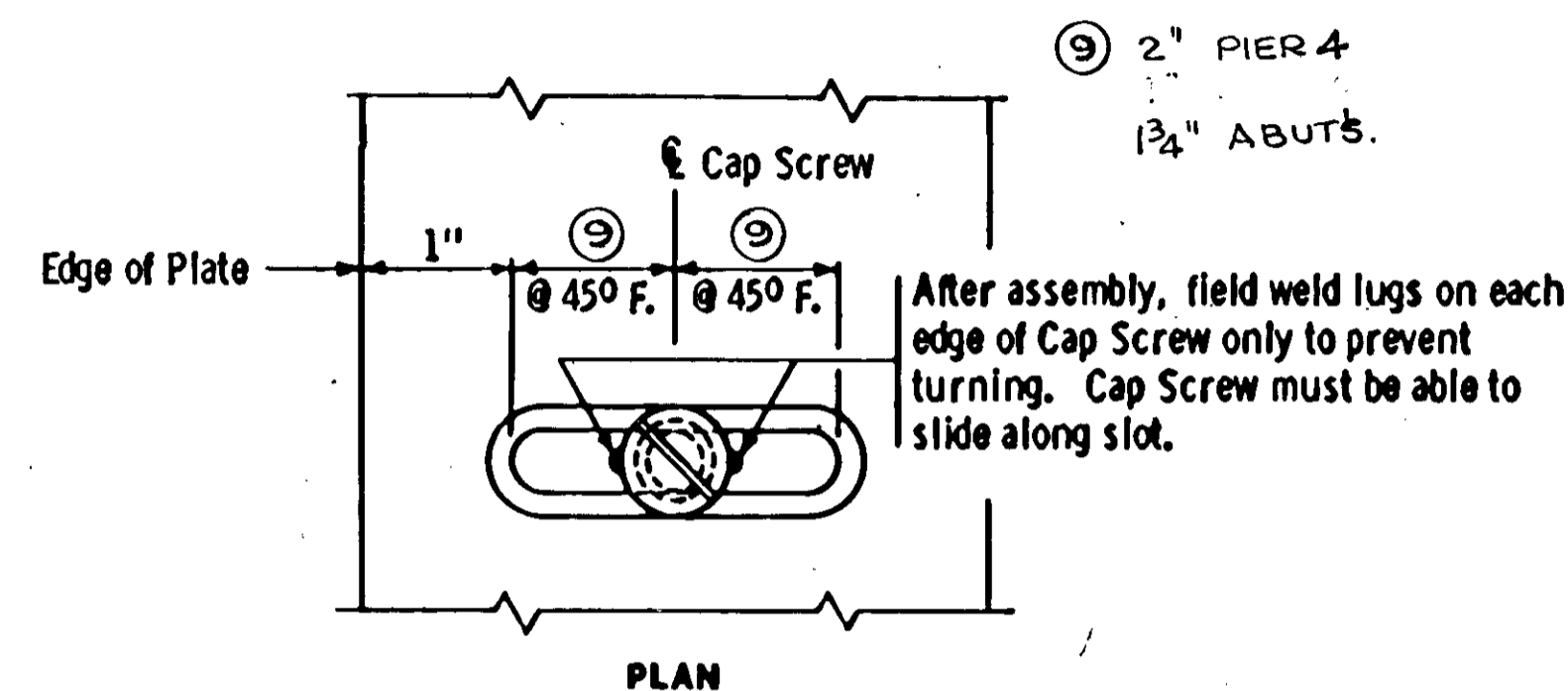
BAR-ROD DETAIL



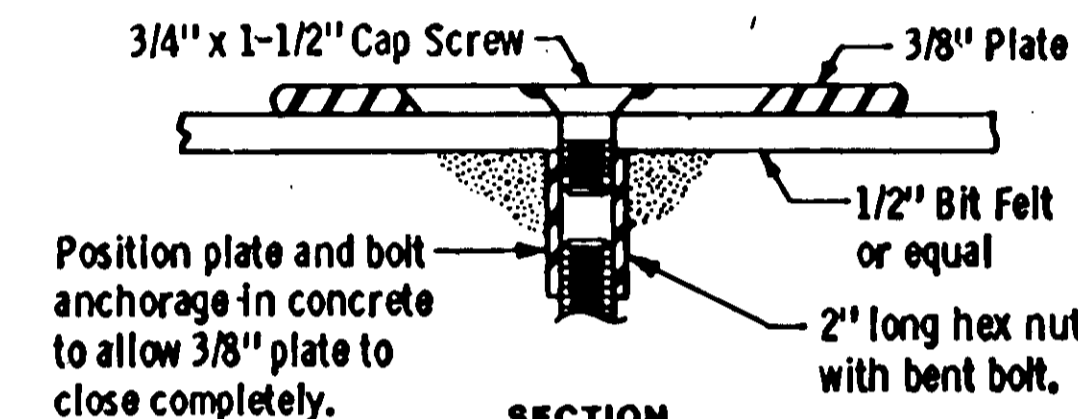
DETAIL F



SECTION B-B



PLAN



SECTION
DETAIL E
SLOTTED HOLE & CAP SCREW

NOTES:
Galvanize structural steel after fabrication as per Spec. 3394.

Joints in roadway plate or extrusion shall be located at breaks in transverse profile and as otherwise required. Joints shall be close fit and welded. Repair after welding as per Spec. 2471.3L.

Structural steel shall comply with Spec. 3306, Spec. 3307 & Spec. 3309.

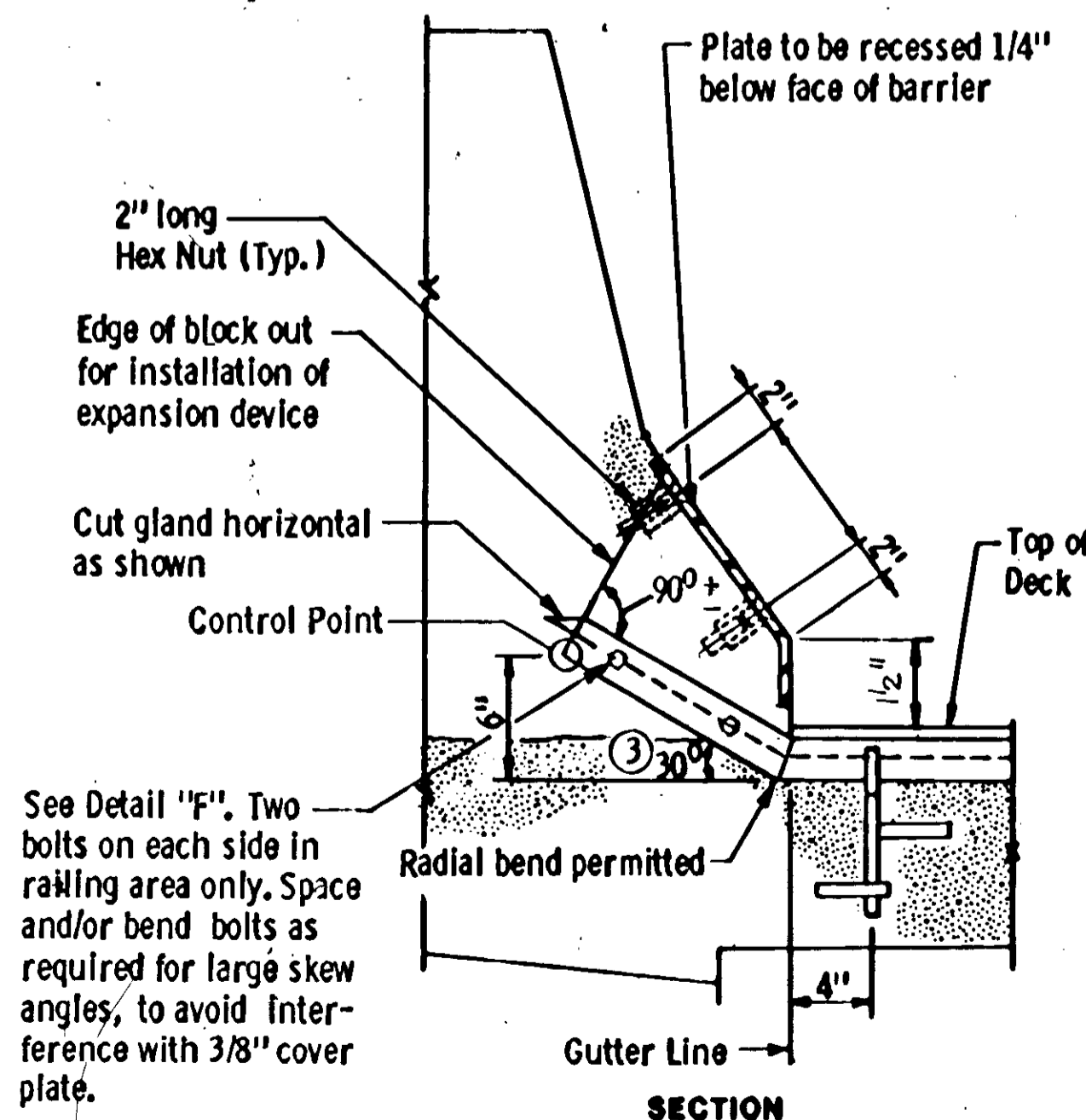
Expansion device shall be straightened to a tolerance of 1/8" in 10 ft.

Cap screws shall be countersunk 1/16" below top of plate.

Galvanize screws and nuts as per Spec. 3392. New reinforcement bars are to have the same treatment as the in-place slab reinforcement.

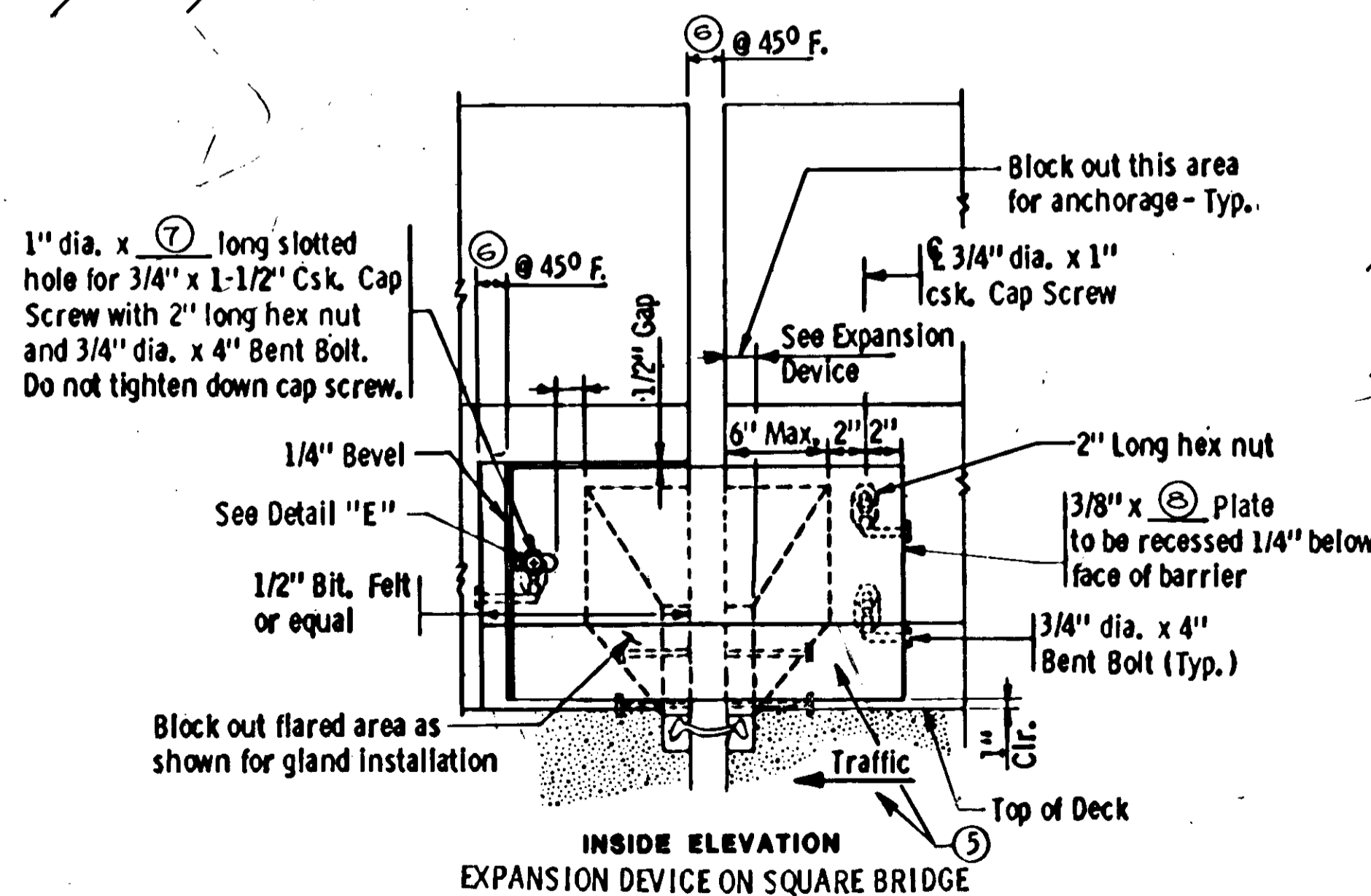
When expansion devices are used at ends of bridge, the bridge contractor shall furnish expansion device and gland. The roadway contractor shall install the part of the expansion device which includes the gland as shown on this sheet.

- ① Varies 18" to 24"
- ② Dimension along centerline of joint.
- ③ For roadway skews over 25° use 45°.
- ④ 1/2" (5/8" max.) when Snowplow Fingers are used. 1/8" (1/4" max.) when Snowplow Fingers are not used.
- ⑤ Replace or add concrete as shown adjacent to expansion device, except for block out area.



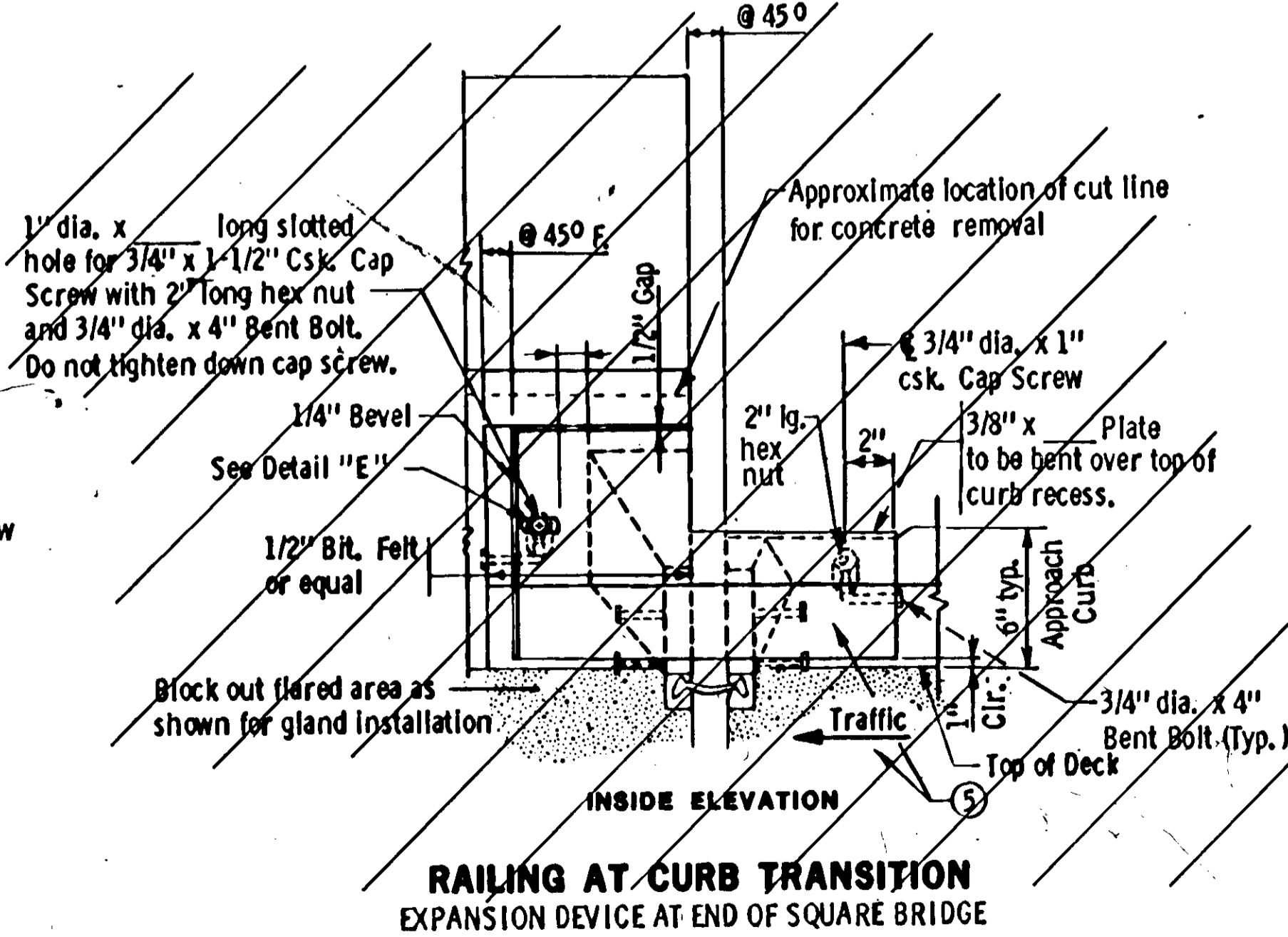
SECTION

RAILING OR MEDIAN
SQUARE BRIDGE APPLICATION



INSIDE ELEVATION
EXPANSION DEVICE ON SQUARE BRIDGE

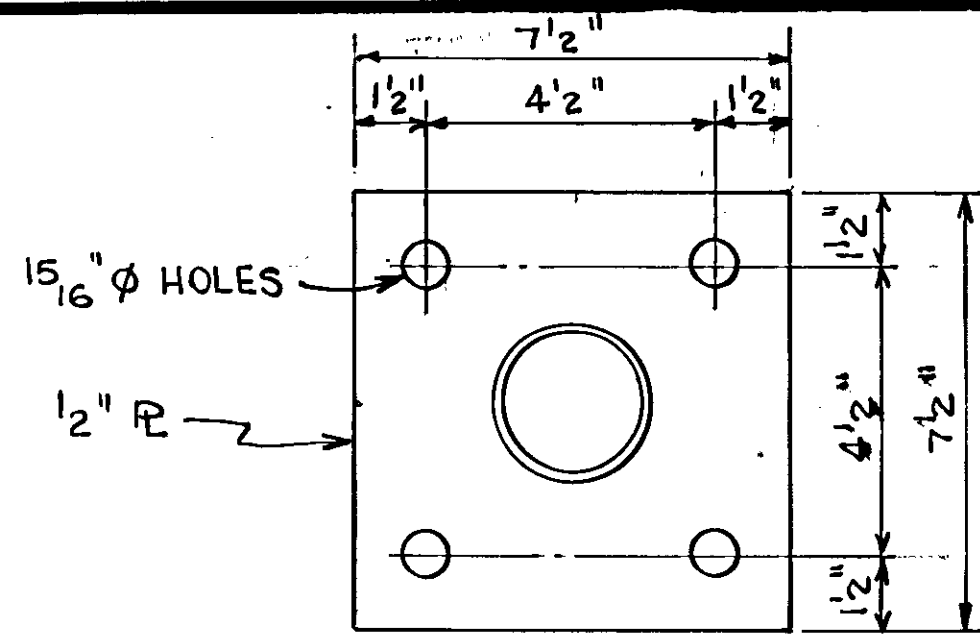
- ⑦ 4" PIER 6
3 1/2" ABUT'S
- ⑧ 2-1" PIER 6
1-9" ABUT'S



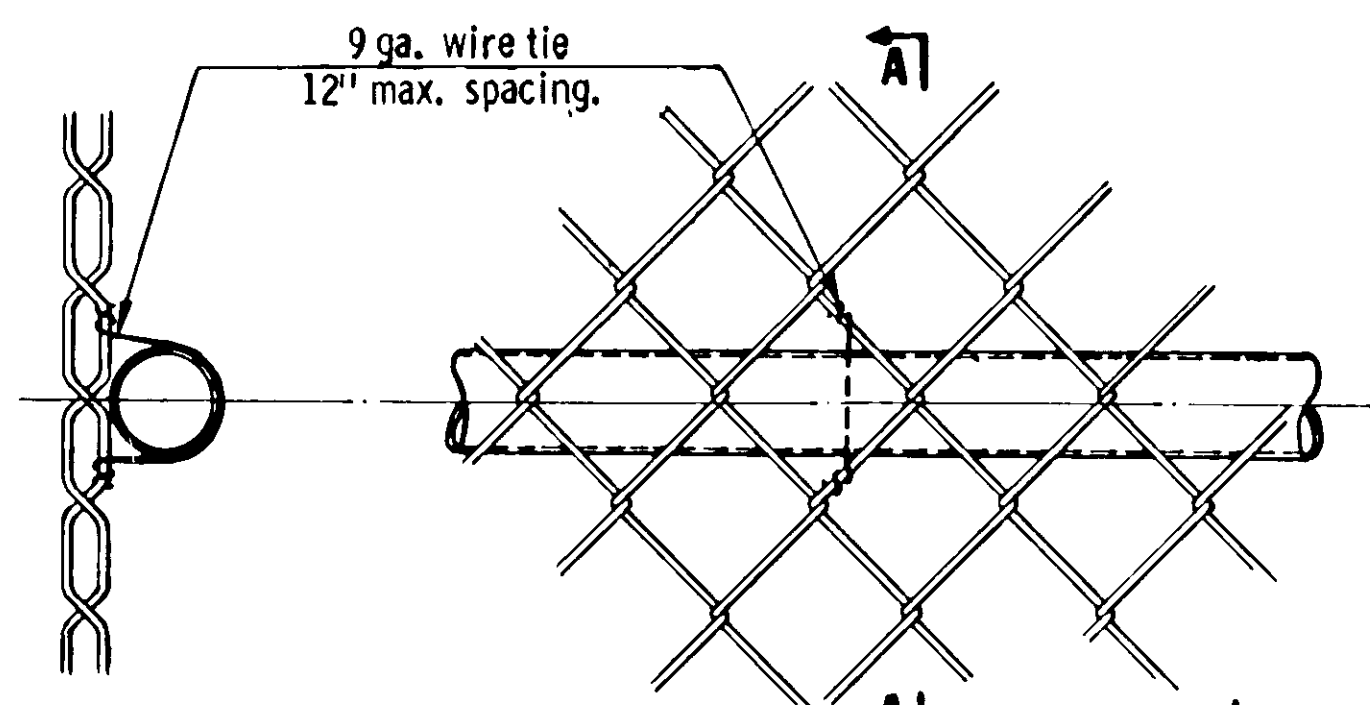
RAILING AT CURB TRANSITION
EXPANSION DEVICE AT END OF SQUARE BRIDGE

TITLE: WATERPROOF EXPANSION DEVICE FOR REPAIR WORK WITH TYPE J BARRIER	DES:	DN:	APPROVED:	Bridge No. 02523
	CHK:	CHK:		
Sheet No. 10-A of 14-A Sheets				

FIG. 5-397.629
Approved: Nov. 1, 1983



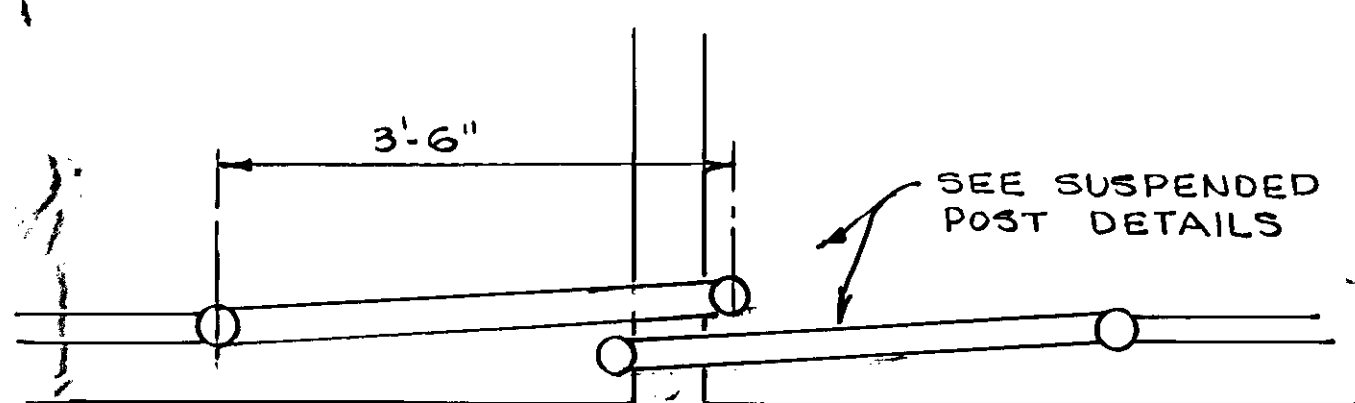
FENCE POST PLATE



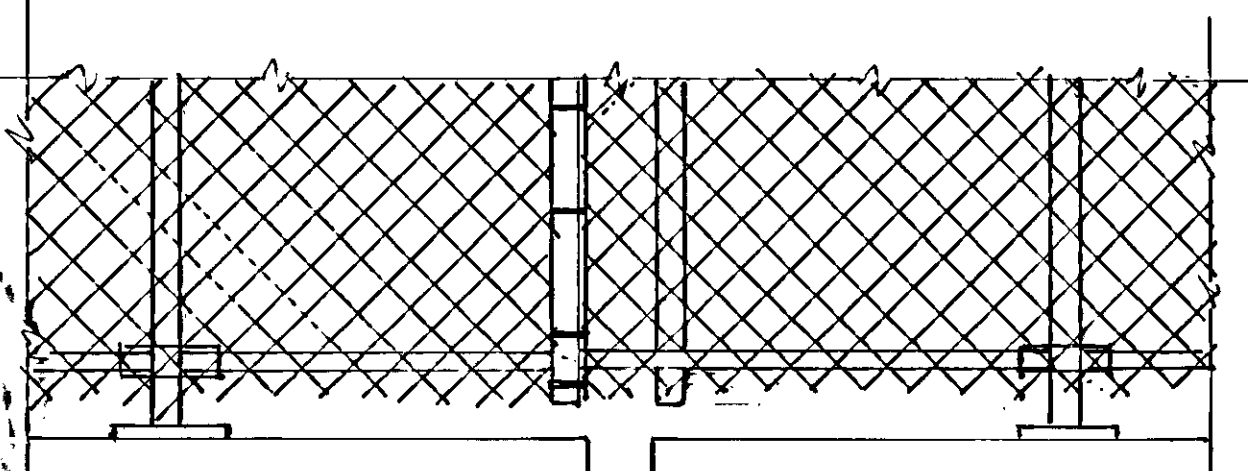
SECTION A-A

PART ELEVATION

FABRIC TIE

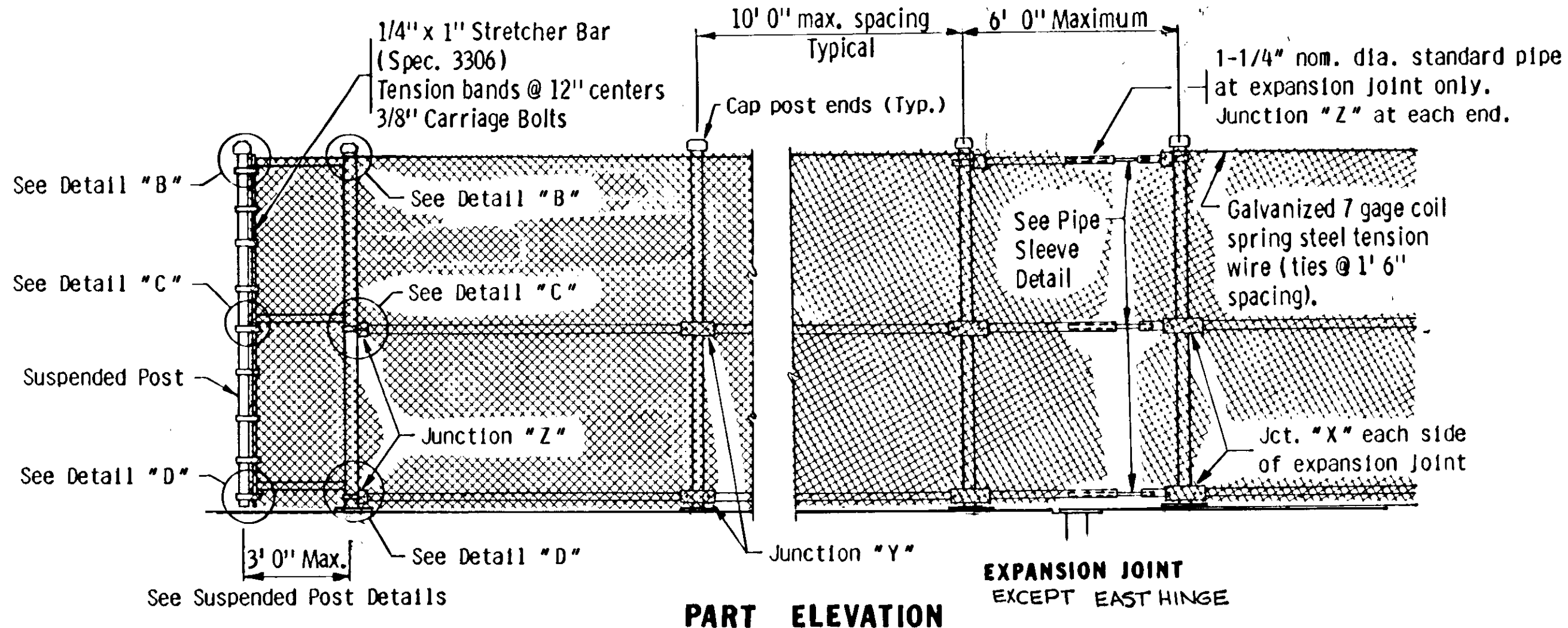


PLAN



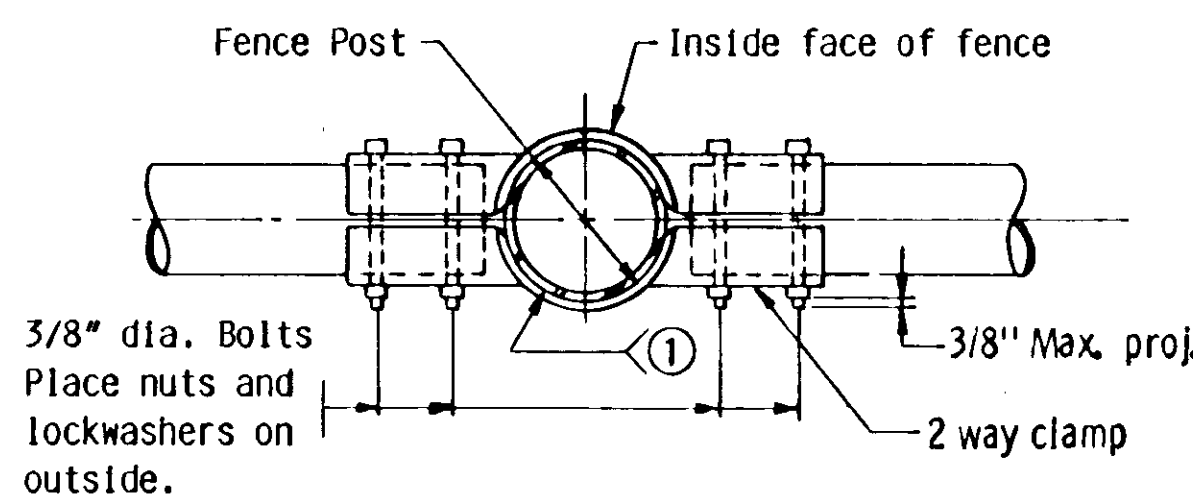
ELEV

EXPANSION JOINT EAST HINGE

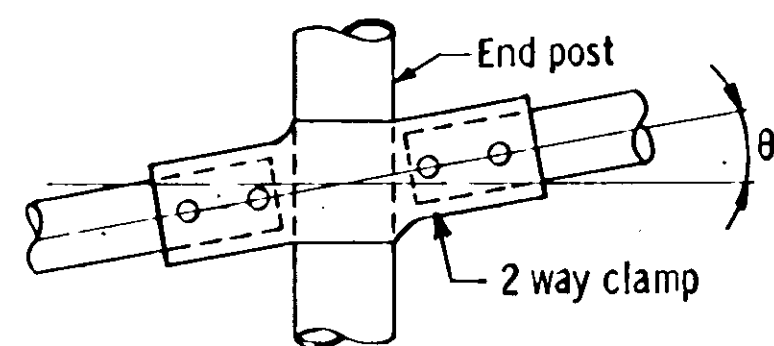


PART ELEVATION

EXPANSION JOINT EXCEPT EAST HINGE



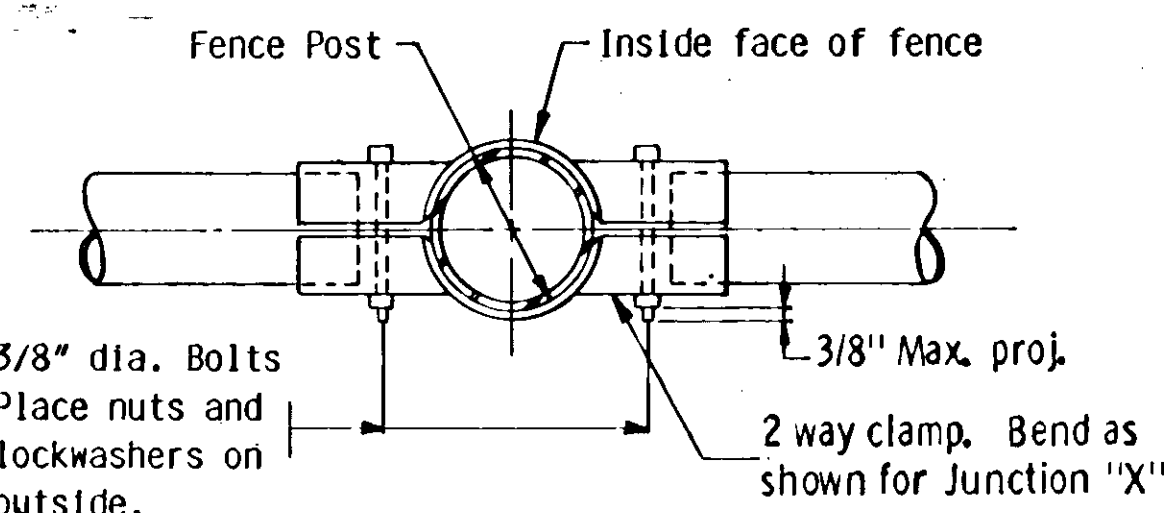
PLAN VIEW



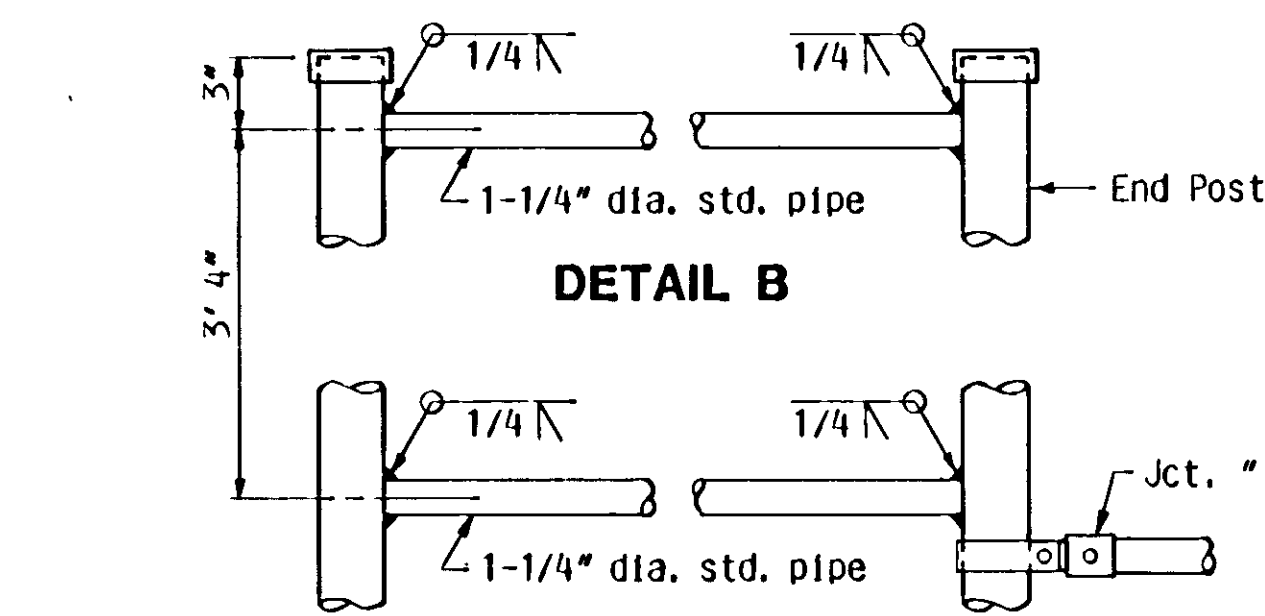
ELEVATION JUNCTION "X"

2-WAY CLAMP BENDING TABLE

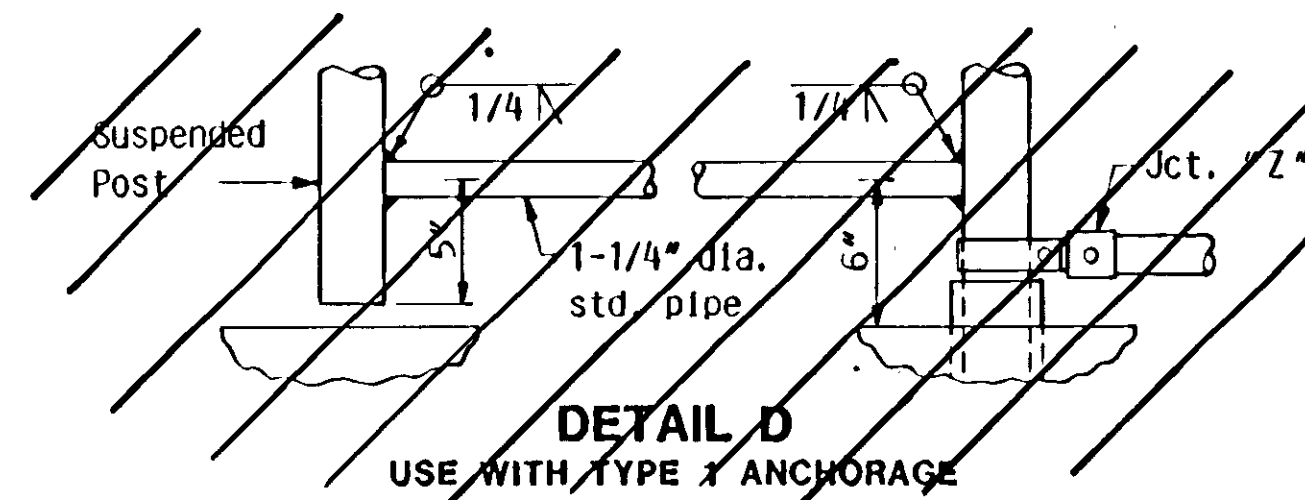
GRADE OF FENCE	θ
0° to 2°	0°
2° to 6°	4°
6° to 10°	8°



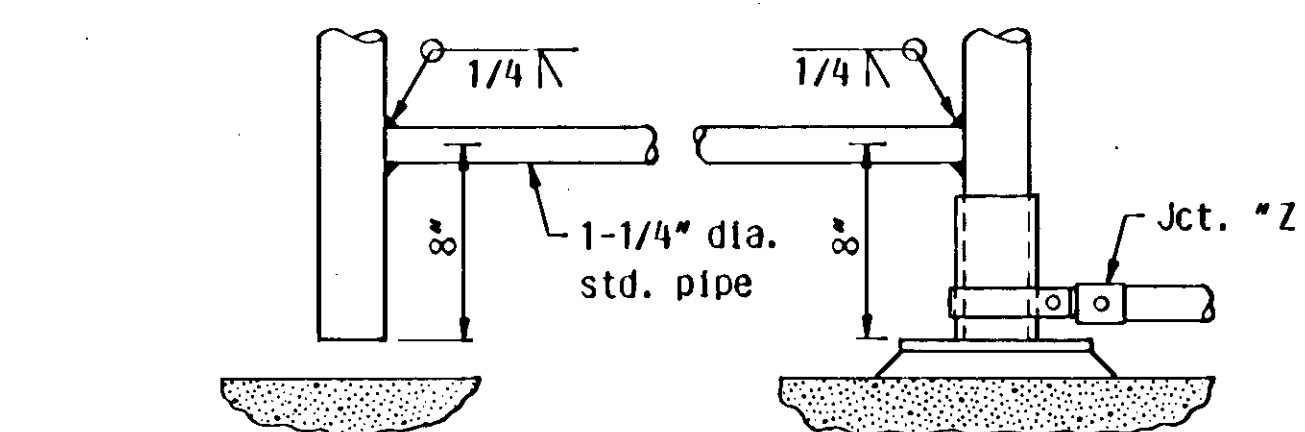
JUNCTION "Y"



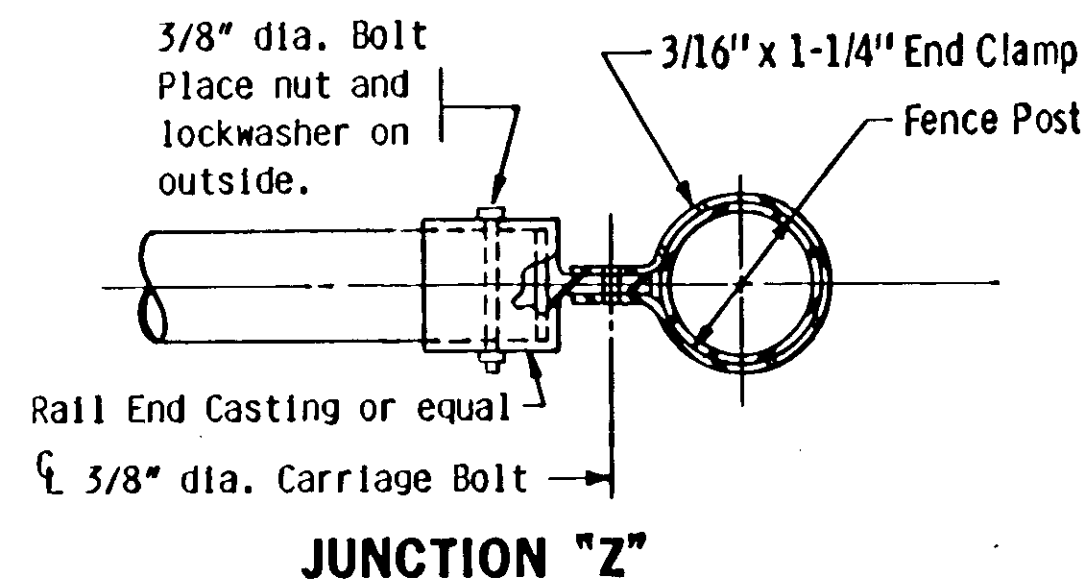
DETAIL B



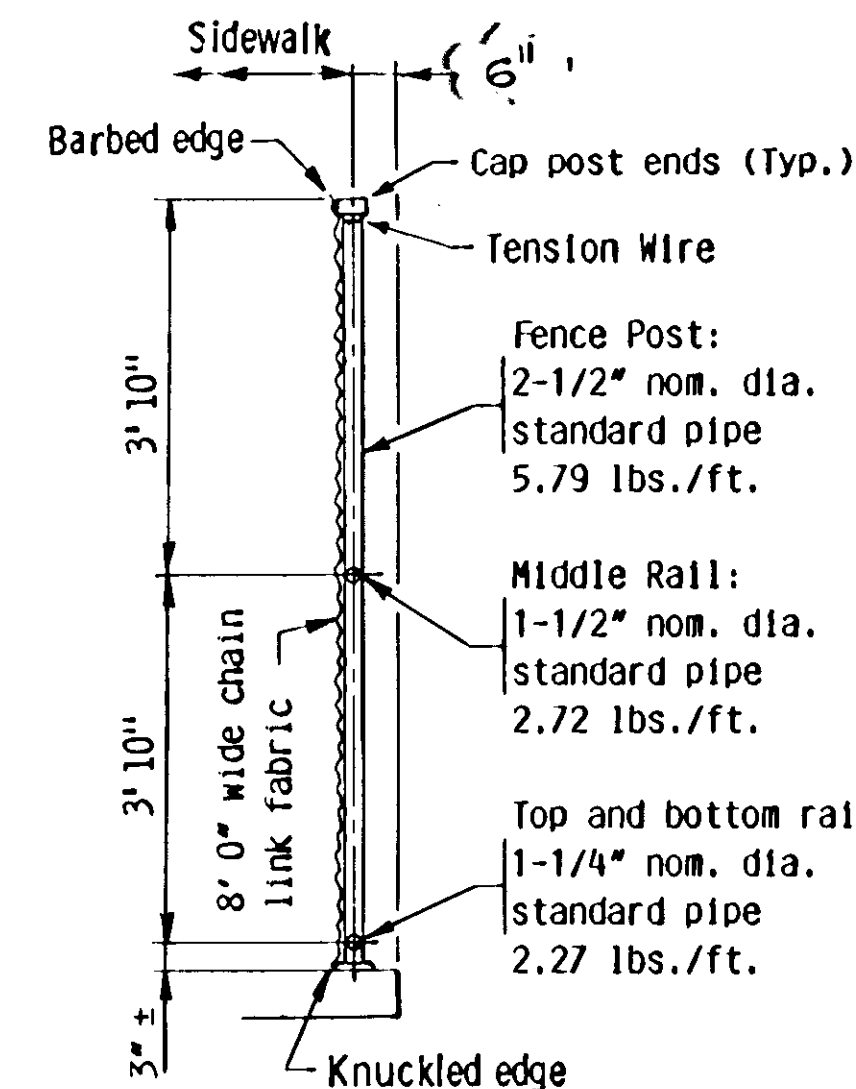
DETAIL C



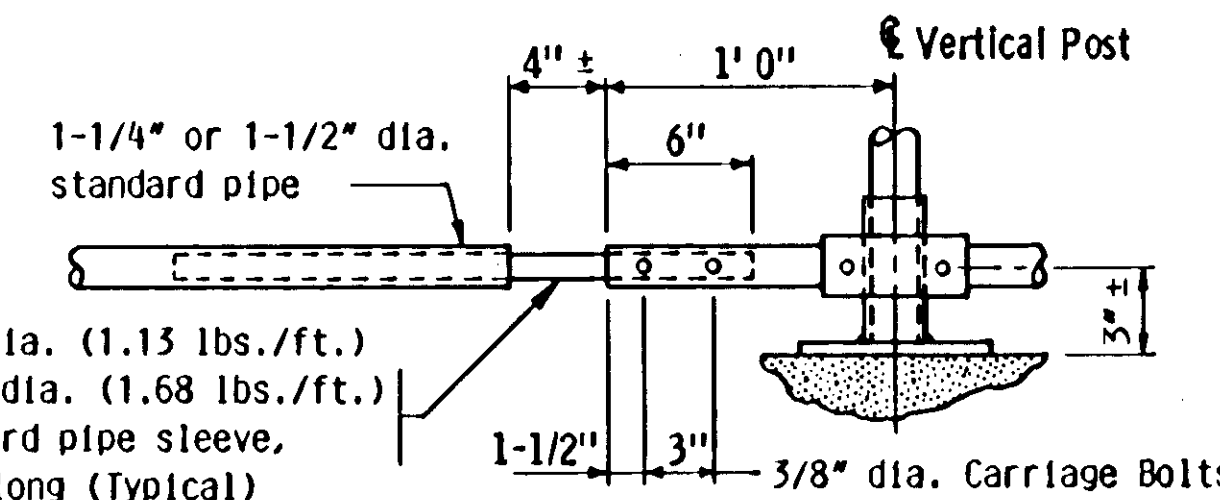
DETAIL D USE WITH ALTERNATE ANCHORAGE SUSPENDED POST DETAILS



JUNCTION "Z"



TYPICAL SECTION THRU FENCE



PIPE SLEEVE DETAIL For 4" maximum bridge expansion

GENERAL NOTES:

For alternate to Type 1 anchorages, see Detail No. 0905, Type A End Posts.
 SPACE POSTS AT INPLACE RAIL ANCHORAGES.
 For post spacing, location, type of anchorages & other details, see sheet no. _____

Maximum spacing for 2 1/2" standard pipe posts - 10' 0". Post spacings of 10' 0" are desired for efficient use of standard pipe lengths.

Fence posts and anchorages shall be set vertical, unless otherwise noted.

See special provisions for requirements not included on this sheet and for basis of payment.

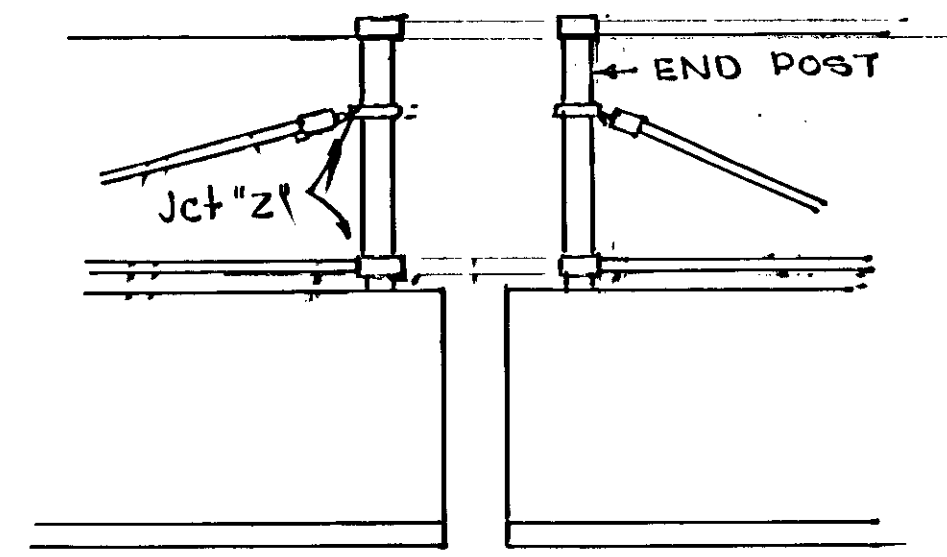
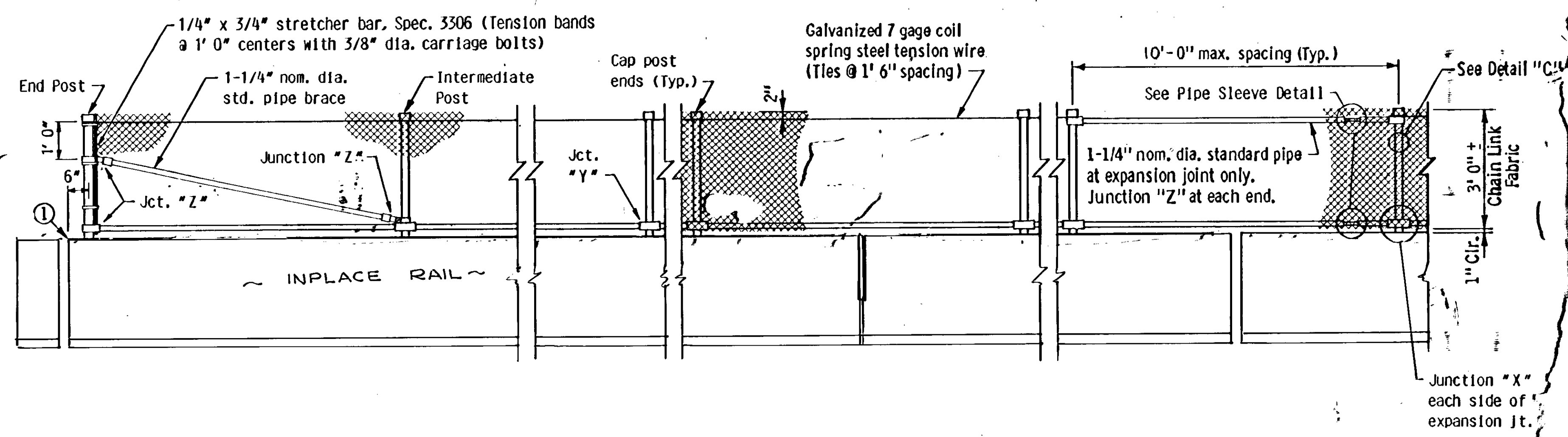
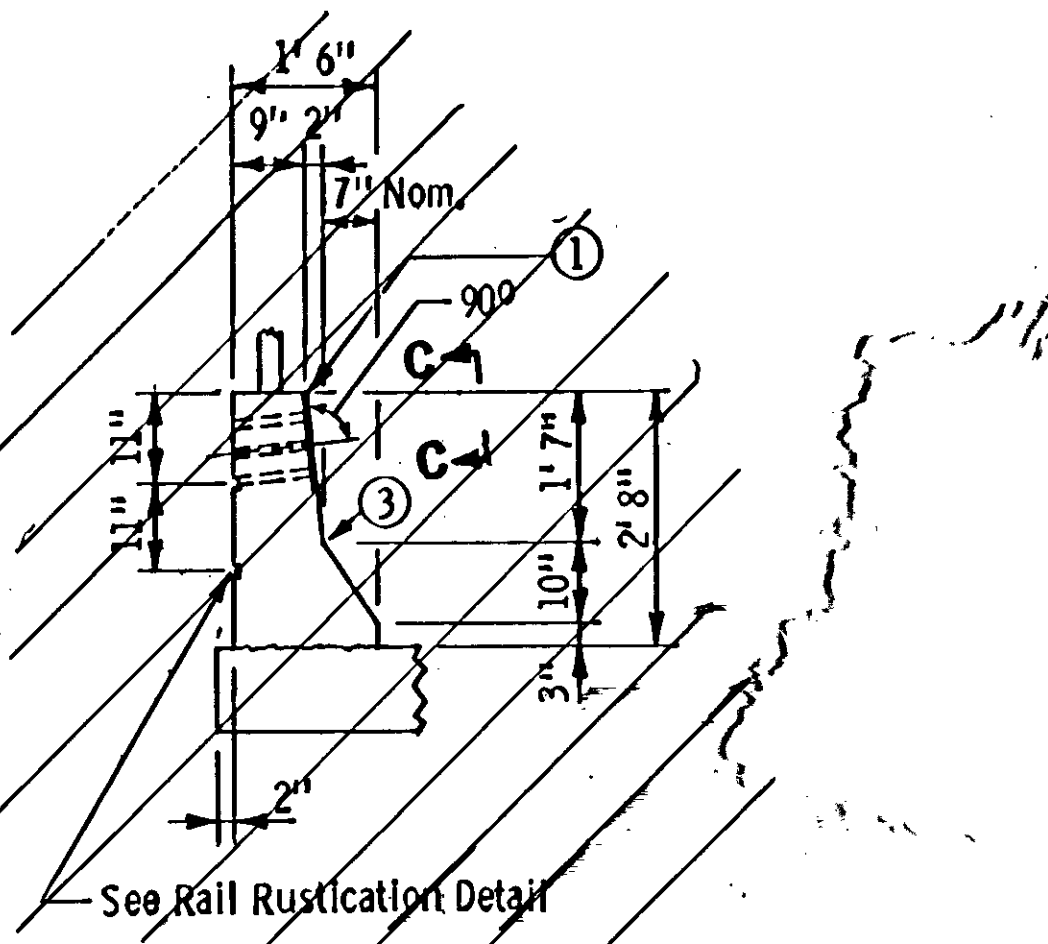
All posts shall have a means to securely hold the top tension wire in position and allow for the removal and replacement of a post without damaging the top wire.

Wire ties may be 9 gage galvanized steel or 0.179" minimum aluminum alloy conforming to ASTM B211, Alloy 1100-H18. Use 12-1/2 gage galvanized hog rings for tension wire ties.

MODIFIED

REVISED: _____ APPROVED: Nov. 26, 1985 FIG. 5-397.205

TITLE: **8 FT. WIRE FENCE FOR PEDESTRIAN WALKS DESIGN S-1**
 DES: _____ DR: GF APPROVED: _____
 CHK: _____ CHK: _____
 Sheet No. 11-A of 14-A Sheets Bridge No. 02523



EXP. JT. EAST HINGE

BILL OF REINFORCEMENT FOR RAILING

BAR NO	LENGTH	SHAPE	LOCATION
R501E	6' 1"	Bent	Rail Vertical
R502E	5' 6"	Bent	Rail Vertical
R703E	6' 6"	Bent	Integral End Post
R704E	5' 6"	Bent	Integral End Post
R405E		Straight	Rail Longitudinal
R406E		Straight	Rail Longitudinal

Conc. Railing = 0.100 Cu. Yds. per ft. and 405 lbs. per ft.

END VIEW

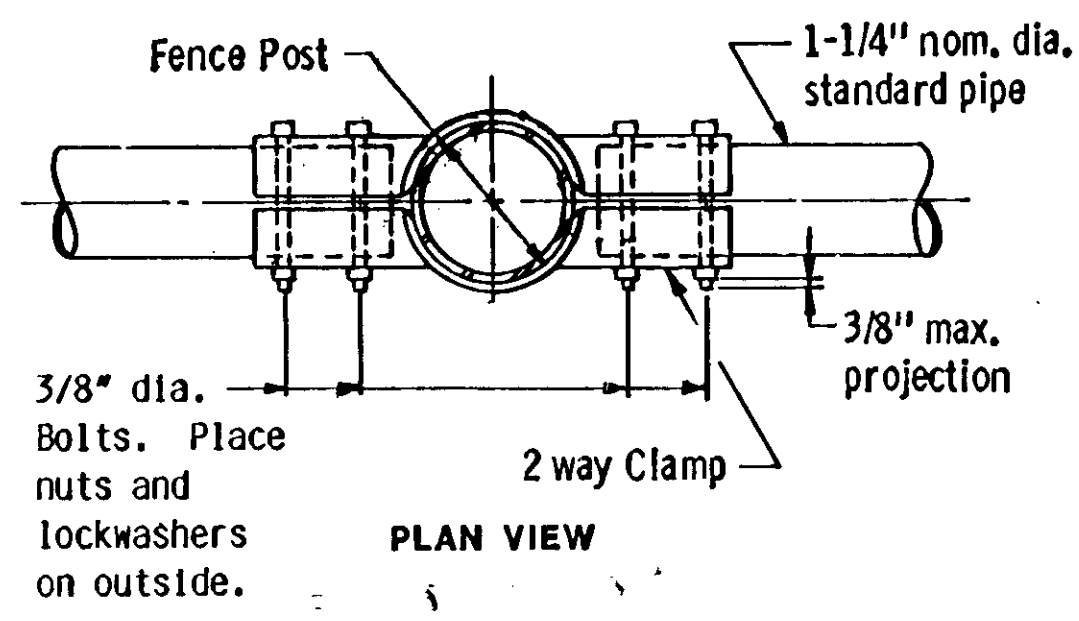
DEFLECTION JOINT

EXPANSION JOINT

(EXPANSION DEVICE NOT SHOWN)

An expansion joint is required only if an expansion device is used. Provide pipe sleeve in span between the vertical posts at expansion joint. See Superstructure Sheets for location.

INSIDE ELEVATION OF RAILING INTEGRAL END POST



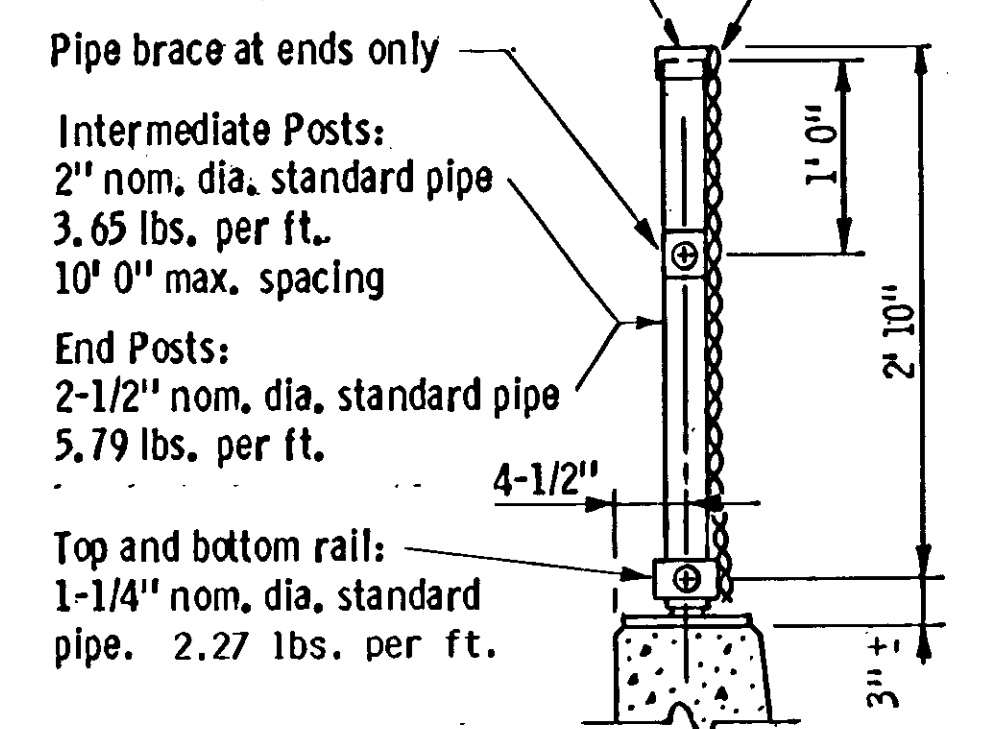
PLAN VIEW

- ① See guardrail connection detail
- ② Top of approach curb
- ③ 6" Minimum, 10" Maximum Radius

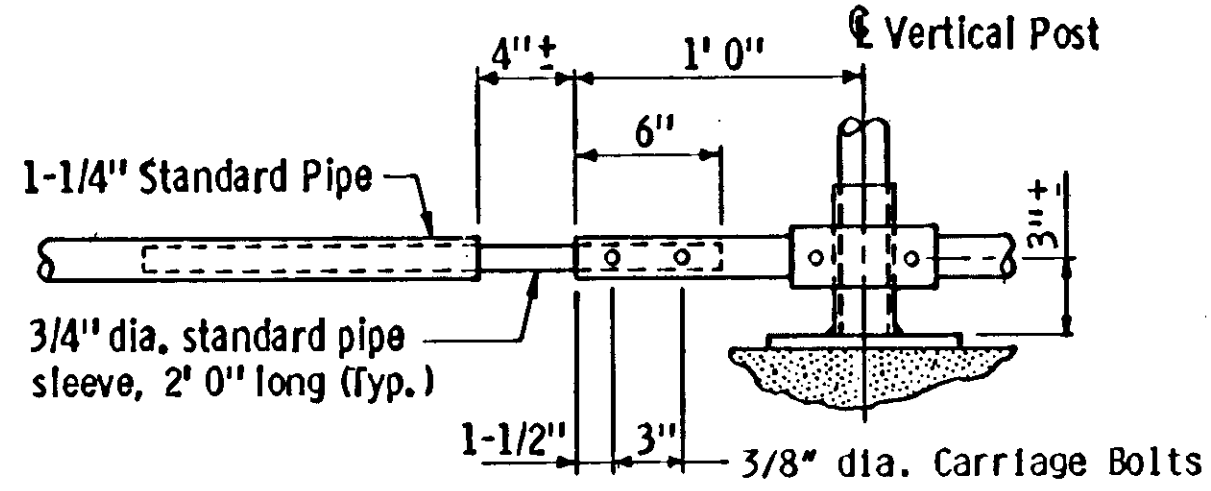


RAIL RUSTICATION

3' 0" wide Chain Link Fabric
Knuckle selvage top & bottom



TYPICAL SECTION THRU FENCE (Intermediate Post Shown)



PIPE SLEEVE DETAIL

For 4" maximum bridge expansion

NOTE:
THE IN-PLACE LIGHT STD. ANCHORAGES ARE TO REMAIN IN PLACE. THE CONTRACTOR WILL BE REQUIRED TO PROVIDE DOUBLE POSTS AND BRACING FOR THE OPENINGS AS DIRECTED BY THE ENGINEER.

GENERAL NOTES

Bars marked with the suffix "E" shall be epoxy coated in accordance with Spec. 3301.

Finish all edges of rail with 1/2" vee except where otherwise noted.

Fence post anchorages shall be Type B. See Standard Detail B905 "Fence Post Anchorage"

All posts shall have a means to securely hold the top tension wire in position and allow for the removal and replacement of a post without damaging the top wire.

Wire ties may be 9 gage galvanized steel or 0.179" minimum aluminum alloy conforming to ASTM B211, Alloy 1100-H18. Use 12-1/2 gage galvanized hog rings for tension wire ties.

End Post bracing is not to exceed 500 ft. maximum interval.

Concrete in the rail base shall be Mix No. 3X46

All material in the concrete base is included in the superstructure quantities.

For spacing of fence posts, joints and electrical grounds, see superstructure sheets.

Fence posts & anchorages shall be set vertical, unless otherwise noted.

See special provisions for requirements not included on this sheet and for basis of payment.

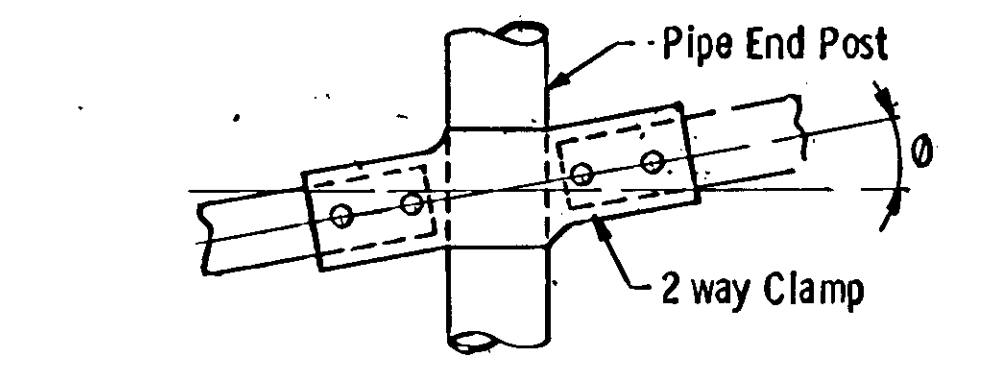
Guardrail connection shall be Structural Steel Spec. 3306 and galvanized after fabrication per Spec. 3304

The guard rail connection is included in the price bid for other items. Maximum spacing of deflection joints shall be 20' 0"

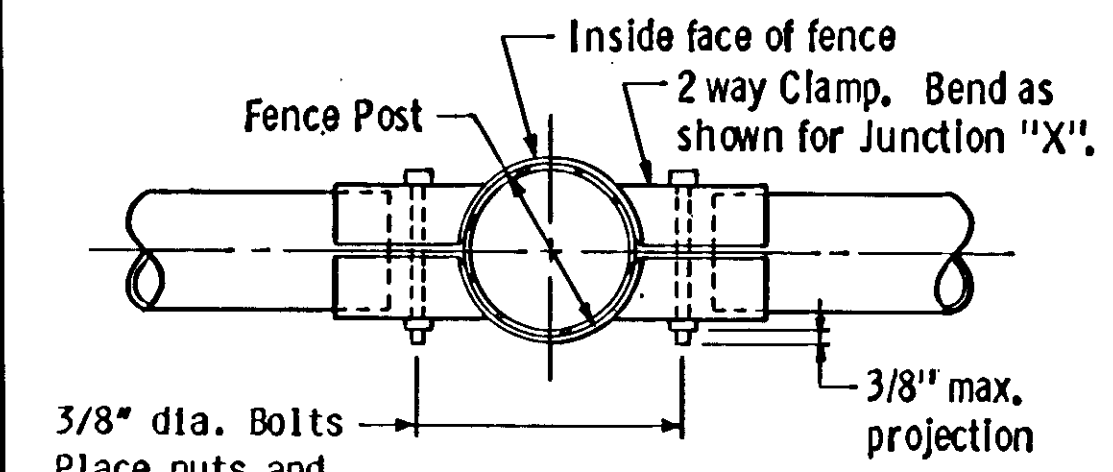
The length of railing concrete is to be measured for payment between the outside faces of railing.

℄ of fence post anchorage shall be a minimum of 6" from joints.

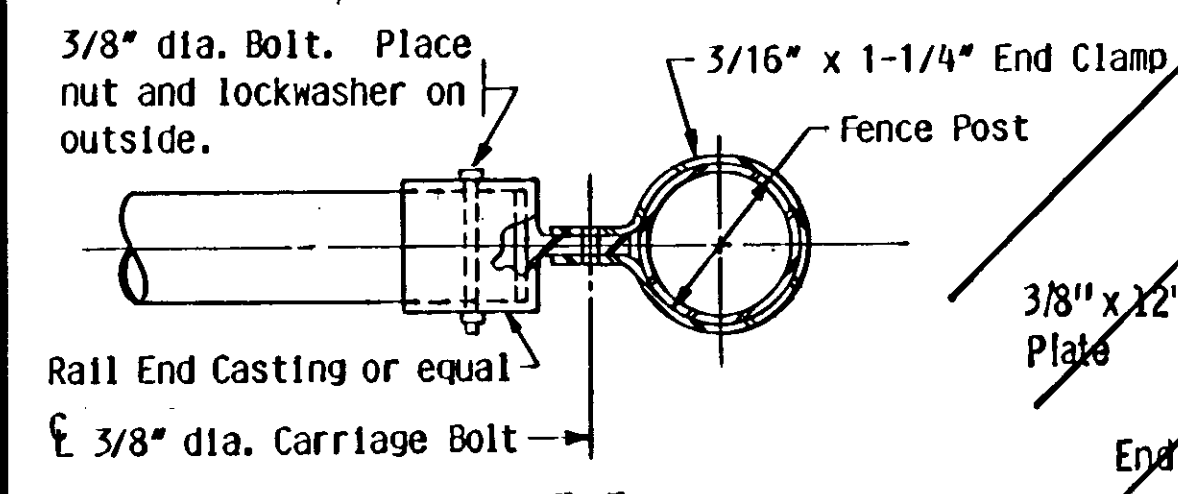
FENCE POST SPACING TO BE 10'-0" EXCEPT AS NOTED OR SHOWN



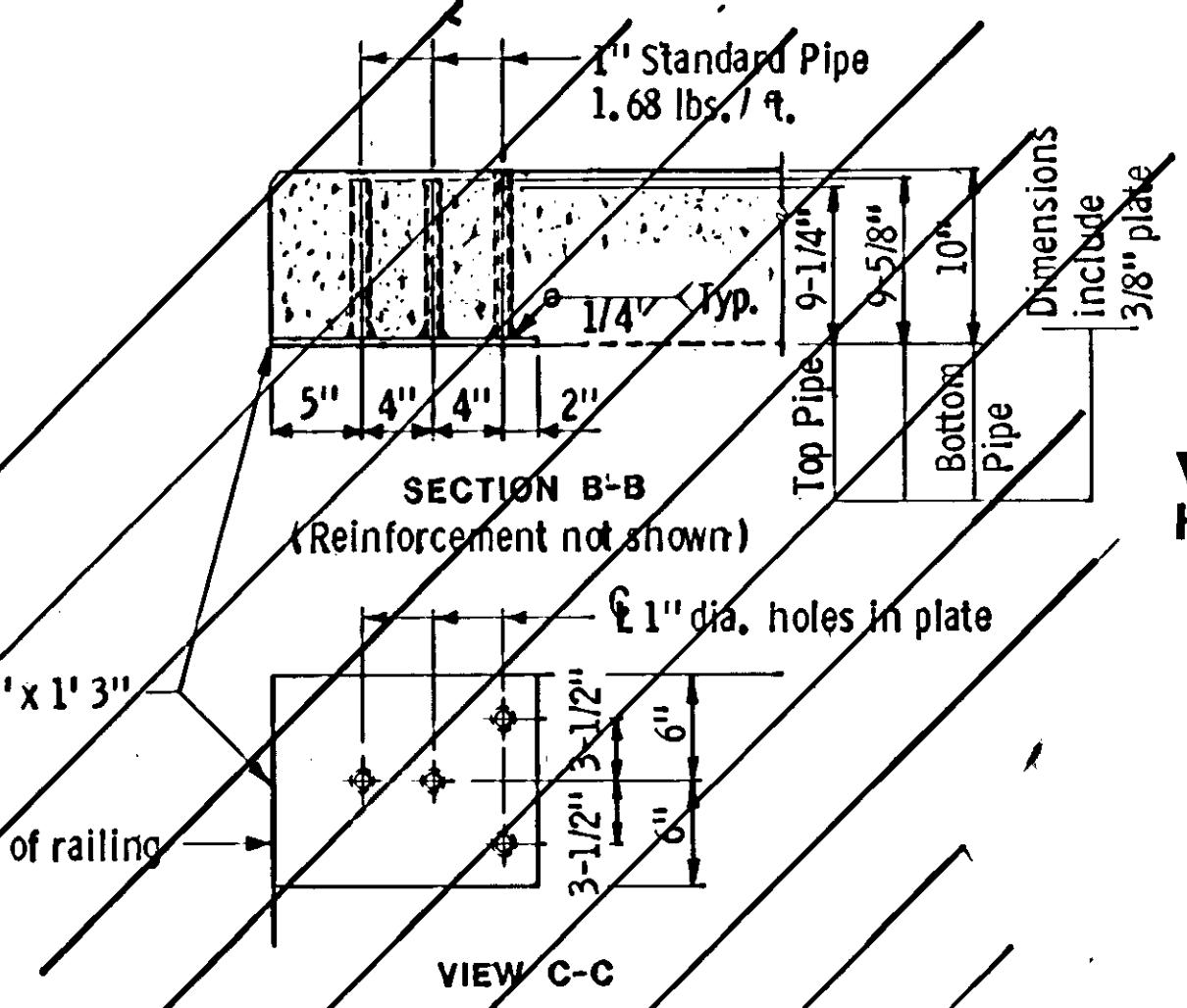
ELEVATION JUNCTION "X"



JUNCTION "Y"

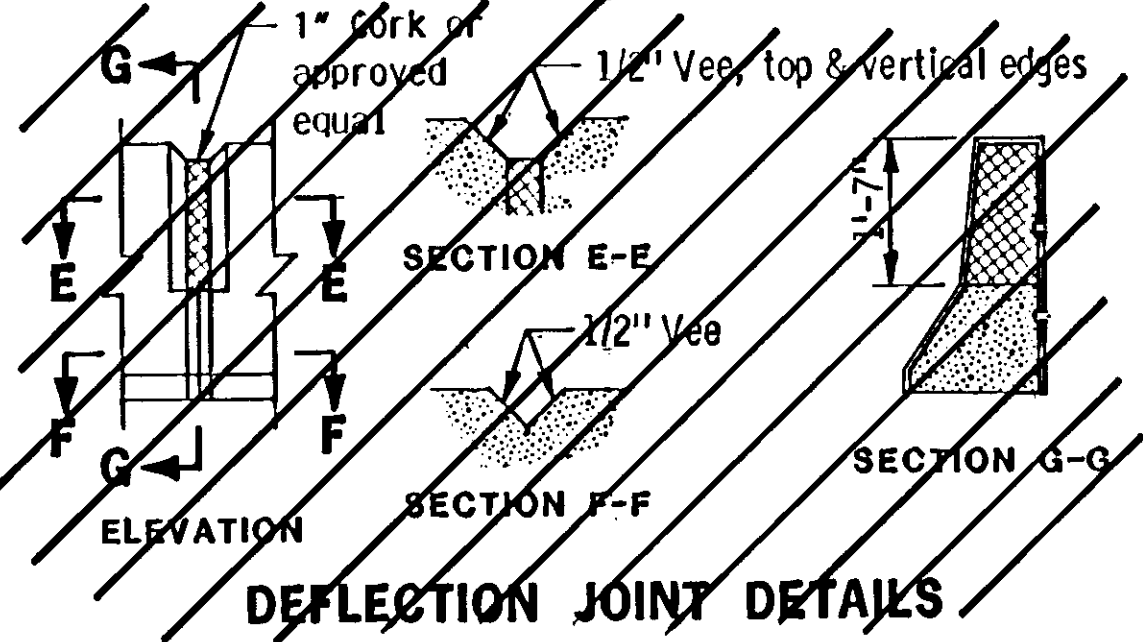


JUNCTION "Z"

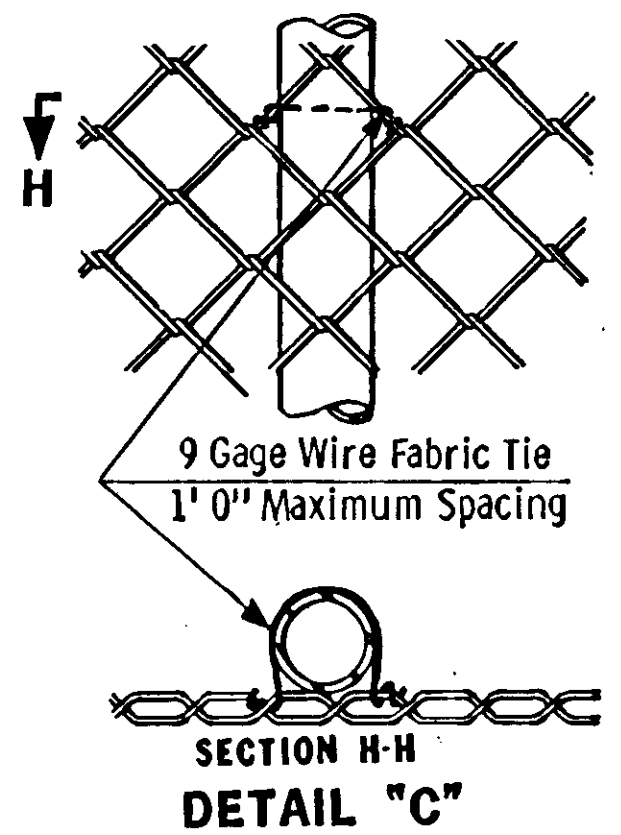


GUARDRAIL CONNECTION DETAIL

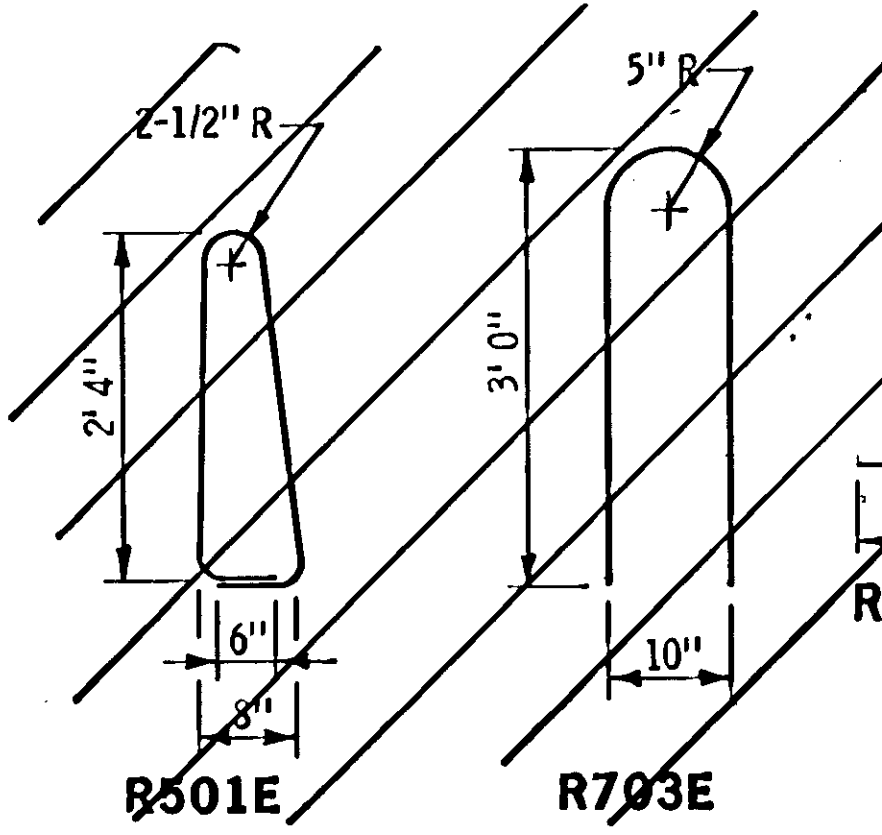
Estimated Weight = 24 lbs.



DEFLECTION JOINT DETAILS

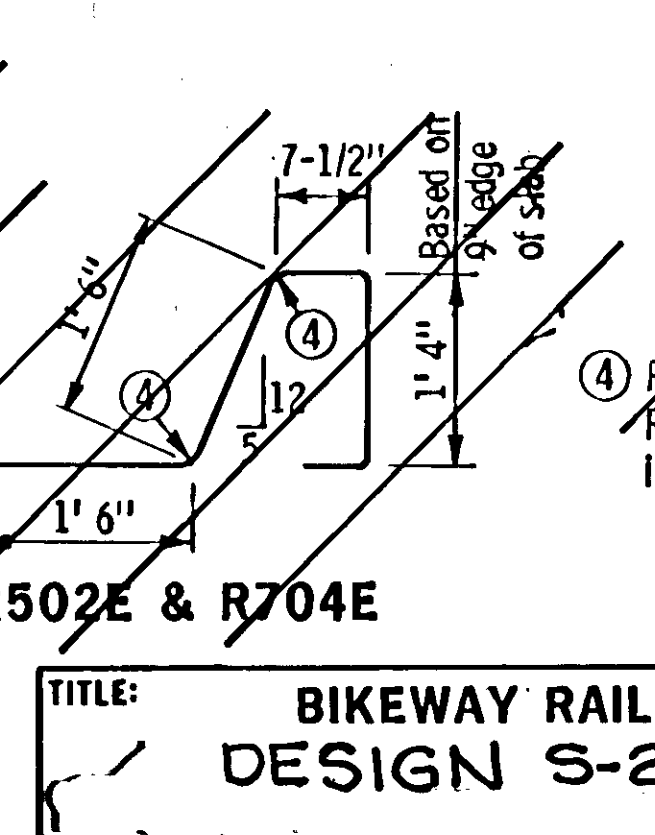


DETAIL "C"



R501E

R703E



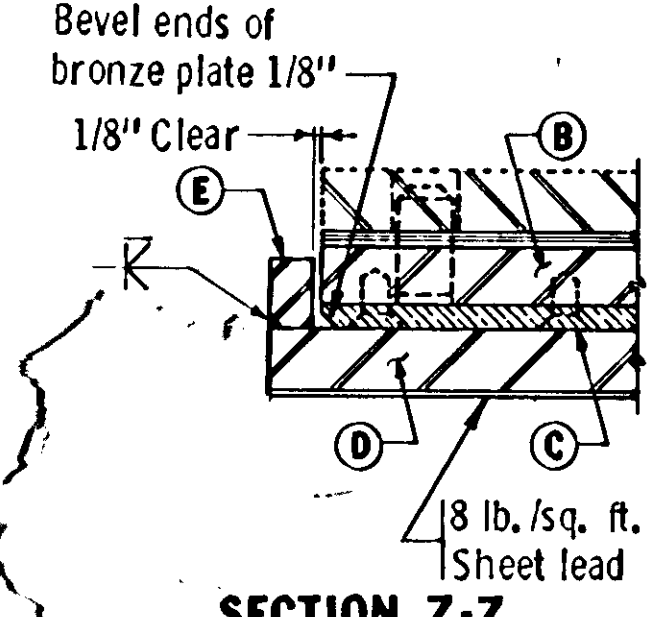
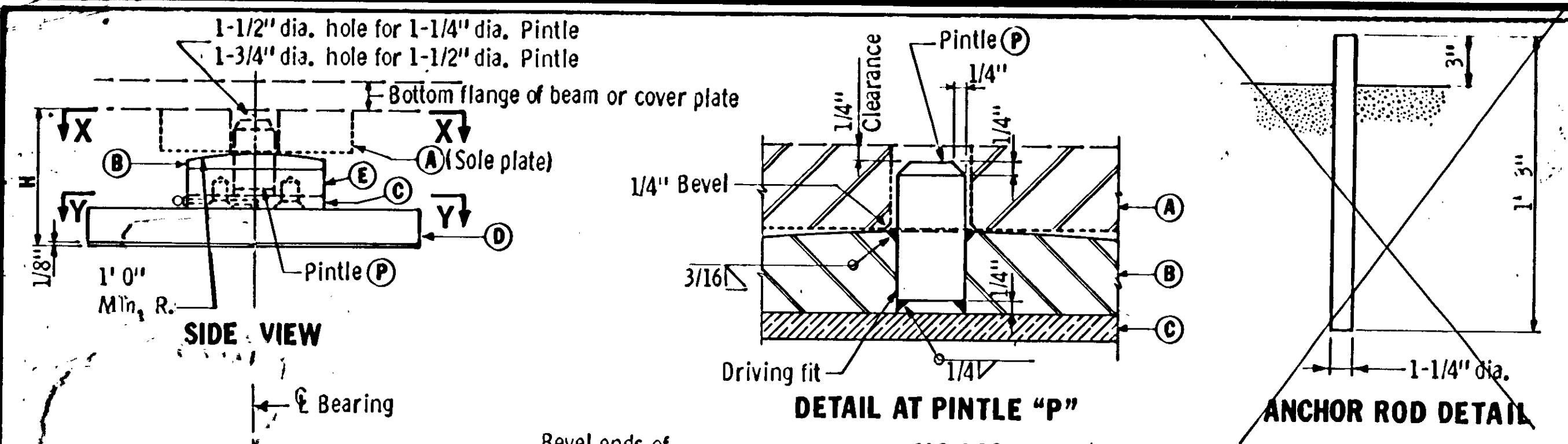
R502E & R704E

④ R502E = 5-3/4"
R704E = 5-1/4"
Inside dia.

TITLE: BIKEWAY RAILING FENCE DESIGN S-2

REVISED:	APPROVED:	MODIFIED
	Nov. 26, 1985	FIG. 5-397.156
DES: CHK:	DR: CHK:	APPROVED:
Sheet No. 12-A of 14-A Sheets		Bridge No. 02523

VERIFY PINTLE LOCATION



NOTES:

- 1/8" deep x 1/4" wide grease grooves in bottom of plate "C".
- Locate at 1/3 points of plate "C" or 1/2" min. from edge of screw head.
- 7/32" dia. hole to 1/8" beyond center of bearing. Tap end of hole for 1/4"-28NF straight zerk fitting.
- 1/4" dia. hole from grease groove to hole (3).

Pintle "P" shall comply with Spec. 3314, Type II. All other structural steel shall comply with Spec. 3306, except as noted.

On top of plate "B" finish center 3" to 250 Micro. Thickness of plate "B" may be 1/16" less than shown.

Galvanize anchor rods per Spec. 3394. Galvanize other structural steel except plate "A" per Spec. 3394 after fabrication.

Plates shall be flat after fabrication and welding.

Bottom of plate "A" shall be at right angles to web of beam. Plate "A" shall be shop welded to the beam, and same steel as the beam.

Plate "C" shall be lubricated bronze per Spec. 3329. The lubricated surface is on the bottom.

Machine finish sliding surfaces of bronze plate "C" and masonry plate "D" to 125 Micro in direction of movement.

Plate "A" is included in weight of structural steel. All other material on this detail is included in bearing assembly for payment.

Flexible filler material shall be an approved sponge rubber installed so as to prevent the flow of grout under the 3/4" lug plate.

MACHINE SCREW DETAIL

LOAD (KIPS)	PLATE A	PLATE B	PLATE C	PLATE D	BAR E	PINTLE P	DIM. H	DIM. W	TOTAL MOV.
97	5"x1-1/2"x1' 0"	5"x1-1/2"x1' 0"	5"x1/2"x1' 0"	12"x1-1/4"x1' 2"	7/8"x1-1/2"x0' 8"	1-1/4" x 2-1/2"	4-7/8"	9"	2-1/2"
121	7"x1-1/2"x1' 3"	5"x1-1/2"x1' 3"	5"x1/2"x1' 3"	12"x1-1/4"x1' 5"	7/8"x1-1/2"x0' 8"	1-1/4" x 2-1/2"	4-7/8"	10-1/2"	2-1/2"
151	8"x1-1/2"x1' 3"	6"x1-3/4"x1' 3"	6"x1/2"x1' 3"	15"x1-1/2"x1' 5"	7/8"x1-1/2"x0' 9"	1-1/4" x 2-3/4"	5-3/8"	10-1/2"	2-1/2"
180	8"x1-1/2"x1' 3"	7"x2-1/4"x1' 3"	7"x1/2"x1' 3"	16"x1-1/2"x1' 5"	7/8"x1-1/2"x0' 9"	1-1/4" x 3-1/4"	5-7/8"	10-1/2"	2"

FOR BEAMS WITH 11 1/2" TO 12" FLANGES									
116	5"x1-1/2"x1' 2"	5"x1-1/2"x1' 2"	5"x1/2"x1' 2"	12"x1-1/4"x1' 4"	7/8"x1-1/2"x0' 8"	1-1/4" x 2-1/2"	4-7/8"	10"	2-1/2"
150	7"x1-1/2"x1' 6"	5"x1-1/2"x1' 6"	5"x1/2"x1' 6"	12"x1-1/2"x1' 8"	7/8"x1-1/2"x0' 8"	1-1/4" x 2-1/2"	5-1/8"	12"	2-1/2"
185	8"x1-1/2"x1' 6"	6"x1-3/4"x1' 6"	6"x1/2"x1' 6"	15"x1-1/2"x1' 8"	7/8"x1-1/2"x0' 9"	1-1/4" x 2-3/4"	5-3/8"	12"	2-1/2"
221	8"x1-1/2"x1' 6"	7"x2-1/4"x1' 6"	7"x1/2"x1' 6"	16"x1-1/2"x1' 8"	7/8"x1-1/2"x0' 9"	1-1/2" x 3-1/4"	5-7/8"	12"	2"

FOR BEAMS WITH 15" TO 16" FLANGES									
140	5"x1-1/2"x1' 5"	5"x1-1/2"x1' 5"	5"x1/2"x1' 5"	13"x1-1/4"x1' 7"	7/8"x1-1/2"x0' 8"	1-1/4" x 2-1/2"	4-7/8"	11-1/2"	3"
184	8"x1-1/2"x1' 10"	5"x1-1/2"x1' 10"	5"x1/2"x1' 10"	13"x1-1/2"x2' 0"	7/8"x1-1/2"x0' 8"	1-1/4" x 2-1/2"	5-1/8"	1' 2"	3"
227	8"x1-1/2"x1' 10"	6"x1-3/4"x1' 10"	6"x1/2"x1' 10"	15"x1-1/2"x2' 0"	7/8"x1-1/2"x0' 9"	1-1/2" x 2-3/4"	5-3/8"	1' 2"	3"
271	8"x1-3/4"x1' 10"	7"x2-1/4"x1' 10"	7"x1/2"x1' 10"	17"x1-3/4"x2' 0"	7/8"x1-1/2"x0' 10"	1-1/2" x 3-1/2"	6-3/8"	1' 2"	2-1/2"
303	8"x2"x1' 11"	7-1/2"x2-1/4"x1' 11"	7-1/2"x1/2"x1' 11"	19"x2"x2' 1"	7/8"x1-1/2"x0' 10"	1-1/2" x 3-3/4"	6-7/8"	1' 2-1/2"	2-1/2"

REQ'D	MK	FOR BEAMS WITH 16" TO 20" FLANGES									
2	E3	200	8"x1 1/2" x 1'-9"	6"x1 3/4" x 1'-9"	6"x1 1/2" x 1'-9"	15"x1 3/4" x 1'-11"	3/4"x1 1/2" x 0'-9"	1 1/2" x 2 3/4"	5 3/8"	11 1/2"	3"
1	E4	200	8"x1 1/2" x 1'-9"	6"x1 3/4" x 1'-9"	6"x1 1/2" x 1'-9"	15"x1 1/2" x 1'-11"	3/4"x1 1/2" x 0'-9"	1 1/2" x 2 3/4"	5 3/8"	11 1/2"	3"

APPROVED: January 29, 1979

Developed by: BRIDGE STANDARDS & BRIDGE AND STRUCTURES SECTION

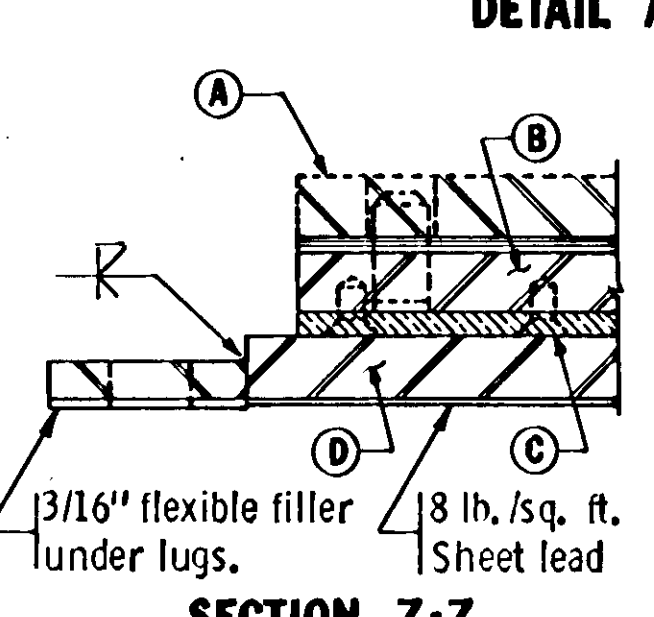
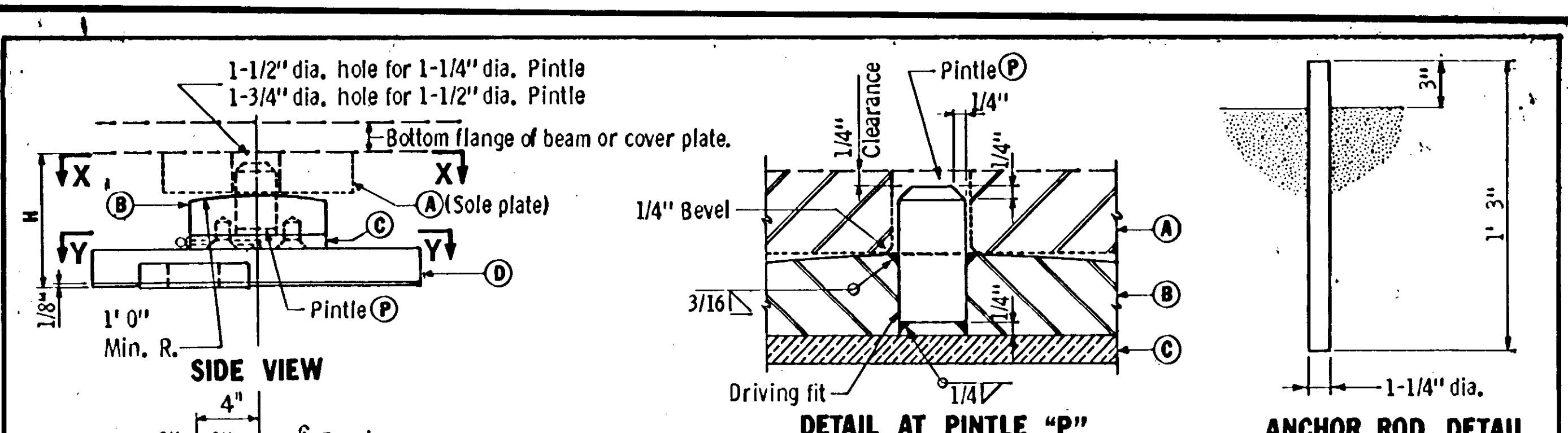
Issued by: ENGINEERING STANDARDS SECTION

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
BEARING ASSEMBLIES
STEEL BEAMS
(EXPANSION W/GUIDE BARS)

REVISION
April 9, 1981

DETAIL NO.
B352
MODIFIED

VERIFY PINTLE LOCATION



NOTES:

- 1/8" deep x 1/4" wide grease grooves in bottom of plate "C".
- Locate at 1/3 points of plate "C" or 1/2" min. from edge of screw head.
- 7/32" dia. hole to 1/8" beyond center of bearing. Tap end of hole for 1/4"-28NF straight zerk fitting.
- 1/4" dia. hole from grease groove to hole (3).

Pintle "P" shall comply with Spec. 3314, Type II. All other structural steel shall comply with Spec. 3306, except as noted.

On top of plate "B" finish center 3" to 250 Micro. Thickness of plate "B" may be 1/16" less than shown.

Galvanize anchor rods per Spec. 3394. Galvanize other structural steel except plate "A" per Spec. 3394 after fabrication.

Plates shall be flat after fabrication and welding.

Bottom of plate "A" shall be at right angles to web of beam. Plate "A" shall be shop welded to the beam, and same steel as the beam.

Plate "C" shall be lubricated bronze per Spec. 3329. The lubricated surface is on the bottom.

Machine finish sliding surfaces of bronze plate "C" and masonry plate "D" to 125 Micro in direction of movement.

Plate "A" is included in weight of structural steel. All other material on this detail is included in bearing assembly for payment.

Flexible filler material shall be an approved sponge rubber installed so as to prevent the flow of grout under the 3/4" lug plate.

MACHINE SCREW DETAIL

LOAD (KIPS)	PLATE A	PLATE B	PLATE C	PLATE D	BAR E	PINTLE P	DIM. H	DIM. W	TOTAL MOV.
99	5"x1-1/2"x1' 0"	5"x1-1/2"x1' 0"	5"x1/2"x1' 0"	12"x1-1/4"x1' 2"	7/8"x1-1/2"x0' 8"	1-1/4" x 2-1/2"	4-7/8"	9"	2-1/2"
124	7"x1-1/2"x1' 3"	5"x1-1/2"x1' 3"	5"x1/2"x1' 3"	12"x1-1/4"x1' 5"	7/8"x1-1/2"x0' 8"	1-1/4" x 2-1/2"	4-7/8"	10-1/2"	2-1/2"
154	8"x1-1/2"x1' 3"	6"x1-3/4"x1' 3"	6"x1/2"x1' 3"	15"x1-1/2"x1' 5"	7/8"x1-1/2"x0' 9"	1-1/4" x 2-3/4"	5-3/8"	10-1/2"	2-1/2"
184	8"x1-1/2"x1' 3"	7"x2-1/4"x1' 3"	7"x1/2"x1' 3"	16"x1-1/2"x1' 5"	7/8"x1-1/2"x0' 9"	1-1/4" x 3-1/4"	5-7/8"	10-1/2"	2"

FOR BEAMS WITH 11 1/2" TO 12" FLANGES									
118	5"x1-1/2"x1' 2"	5"x1-1/2"x1' 2"	5"x1/2"x1' 2"	12"x1-1/4"x1' 4"	7/8"x1-1/2"x0' 8"	1-1/4" x 2-1/2"	4-7/8"	10"	2-1/2"
152	7"x1-1/2"x1' 6"	5"x1-1/2"x1' 6"	5"x1/2"x1' 6"	12"x1-1/2"x1' 8"	7/8"x1-1/2"x0' 8"	1-1/4" x 2-1/2"	5-1/8"	12"	2-1/2"
188	8"x1-1/2"x1' 6"	6"x1-3/4"x1' 6"	6"x1/2"x1' 6"	15"x1-1/2"x1' 8"	7/8"x1-1/2"x0' 9"	1-1/4" x 2-3/4"	5-3/8"	12"	2-1/2"
224	8"x1-1/2"x1' 6"	7"x2-1/4"x1' 6"	7"x1/2"x1' 6"	16"x1-1/2"x1' 8"	7/8"x1-1/2"x0' 9"	1-1/2" x 3-1/4"	5-7/8"	12"	2"

FOR BEAMS WITH 15" TO 16" FLANGES									
143	5"x1-1/2"x1' 5"	5"x1-1/2"x1' 5"	5"x1/2"x1' 5"	13"x1-1/4"x1' 7"	7/8"x1-1/2"x0' 8"	1-1/4" x 2-1/2"	4-7/8"	11-1/2"	3"
186	8"x1-1/2"x1' 10"	5"x1-1/2"x1' 10"	5"x1/2"x1' 10"	13"x1-1/2"x2' 0"	7/8"x1-1/2"x0' 8"	1-1/4" x 2-1/2"	5-1/8"	1' 2"	3"
230	8"x1-1/2"x1' 10"	6"x1-3/4"x1' 10"	6"x1/2"x1' 10"	15"x1-1/2"x2' 0"	7/8"x1-1/2"x0' 9"	1-1/2" x 2-3/4"	5-3/8"	1' 2"	3"
274	8"x1-3/4"x1' 10"	7"x2-1/4"x1' 10"	7"x1/2"x1' 10"	17"x1-3/4"x2' 0"	7/8"x1-1/2"x0' 10"	1-1/2" x 3-1/2"	6-3/8"	1' 2"	2-1/2"
307	8"x2"x1' 11"	7-1/2"x2-1/4"x1' 11"	7-1/2"x1/2"x1' 11"	19"x2"x2' 1"	7/8"x1-1/2"x0' 10"	1-1/2" x 3-3/4"	6-7/8"	1' 2-1/2"	2-1/2"

REQ'D	MK	FOR BEAMS WITH 16" TO 20" FLANGES								
1	E5	200	8"x1 1/2" x 1'-9"	6"x1 3/4" x 1'-9"	6"x1 1/2" x 0'-9"	15"x1 3/4" x 1'-11"	1 1/2" x 2 3/4"	5 3/8"	11 1/2"	3"
1	E6	200	8"x1 1/2" x 1'-9"	6"x1 3/4" x 1'-9"	6"x1 1/2" x 0'-9"	15"x1 3/4" x 1'-11"	1 1/2" x 2 3/4"	5 3/8"	11 1/2"	3"

APPROVED: January 29, 1979

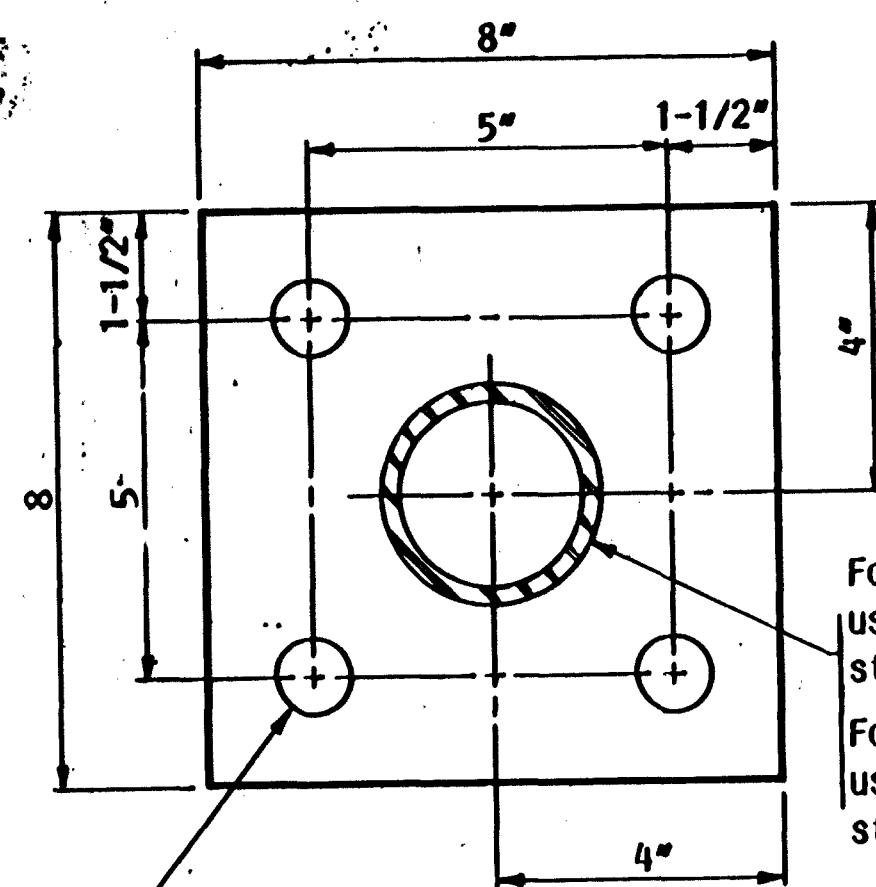
Developed by: BRIDGE STANDARDS & BRIDGE AND STRUCTURES SECTION

Issued by: ENGINEERING STANDARDS SECTION

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
BEARING ASSEMBLIES
STEEL BEAMS
(EXPANSION W/O GUIDE BARS)

REVISION
April 9, 1981

DETAIL NO.
B353
MODIFIED



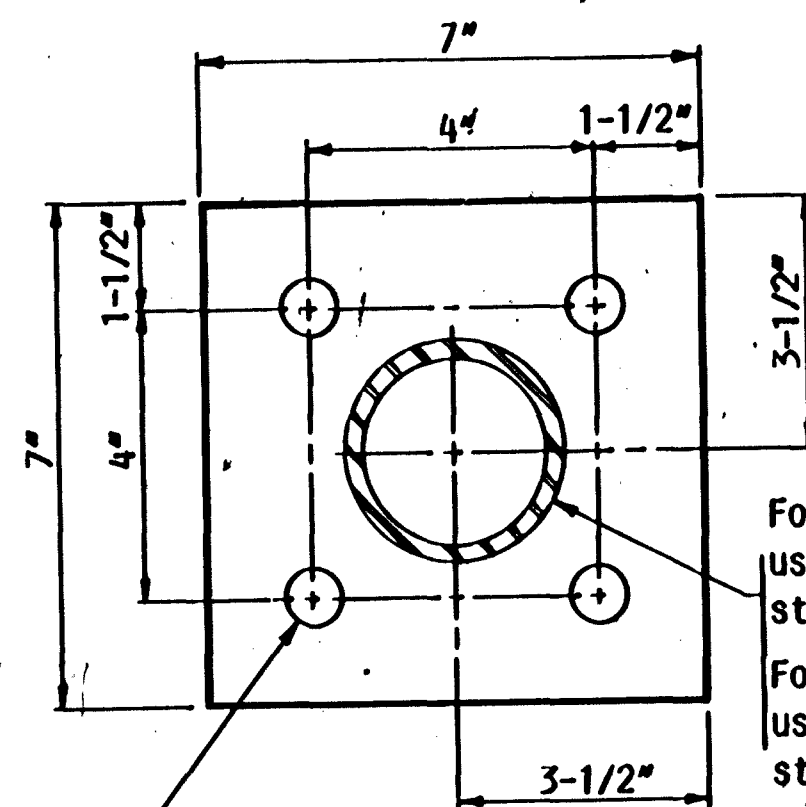
For Intermediate Posts use 2-1/2" nom. dia. standard pipe sleeve.
For End Posts use 3" nom. dia. standard pipe sleeve.

1-1/16" dia. holes, 3/4" dia. bolts, nuts, washers, lockwashers & approved conc. anchorage. See special provisions. Ultimate pull out strength = 16 Kips min.

PLAN VIEW

TYPE A

Estimated Weight = 11 or 12 lbs.



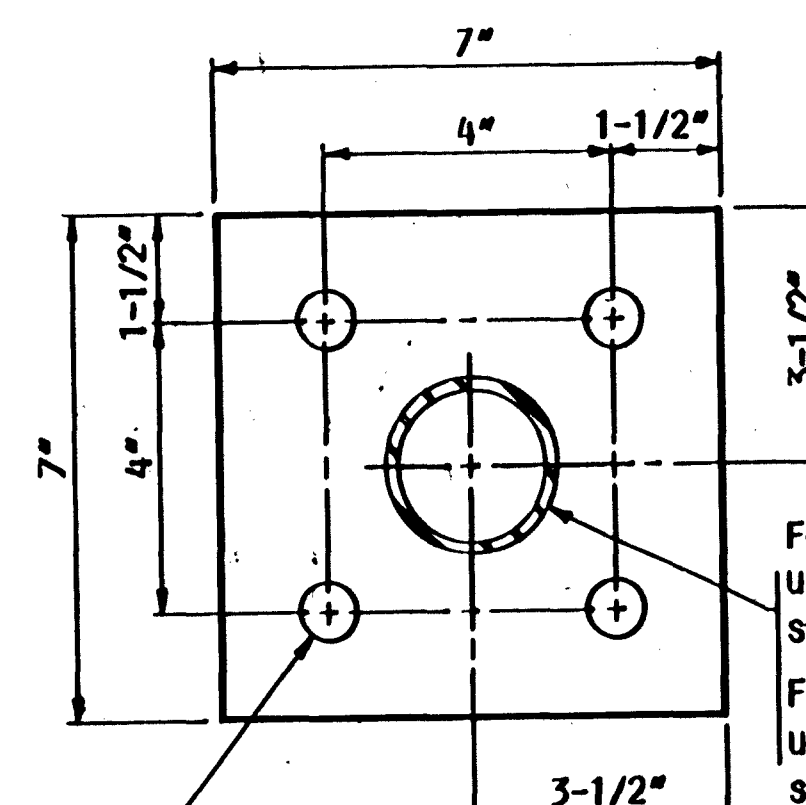
For Intermediate Posts use 2-1/2" nom. dia. standard pipe sleeve.
For End Posts use 3" nom. dia. standard pipe sleeve.

3/4" dia. holes, 1/2" dia. bolts, nuts, washers, lockwashers & approved conc. anchorage. See special provisions. Ultimate pull out strength = 8 Kips min.

PLAN VIEW

TYPE B

Estimated Weight = 10 or 11 lbs.



For Intermediate Posts use 2" nom. dia. standard pipe sleeve.
For End Posts use 2-1/2" nom. dia. standard pipe sleeve.

3/4" dia. holes, 1/2" dia. bolts, nuts, washers, lockwashers & approved conc. anchorage. See special provisions. Ultimate pull out strength = 8 Kips min.

PLAN VIEW

TYPE C

Estimated Weight = 9 or 10 lbs.

NOTES:

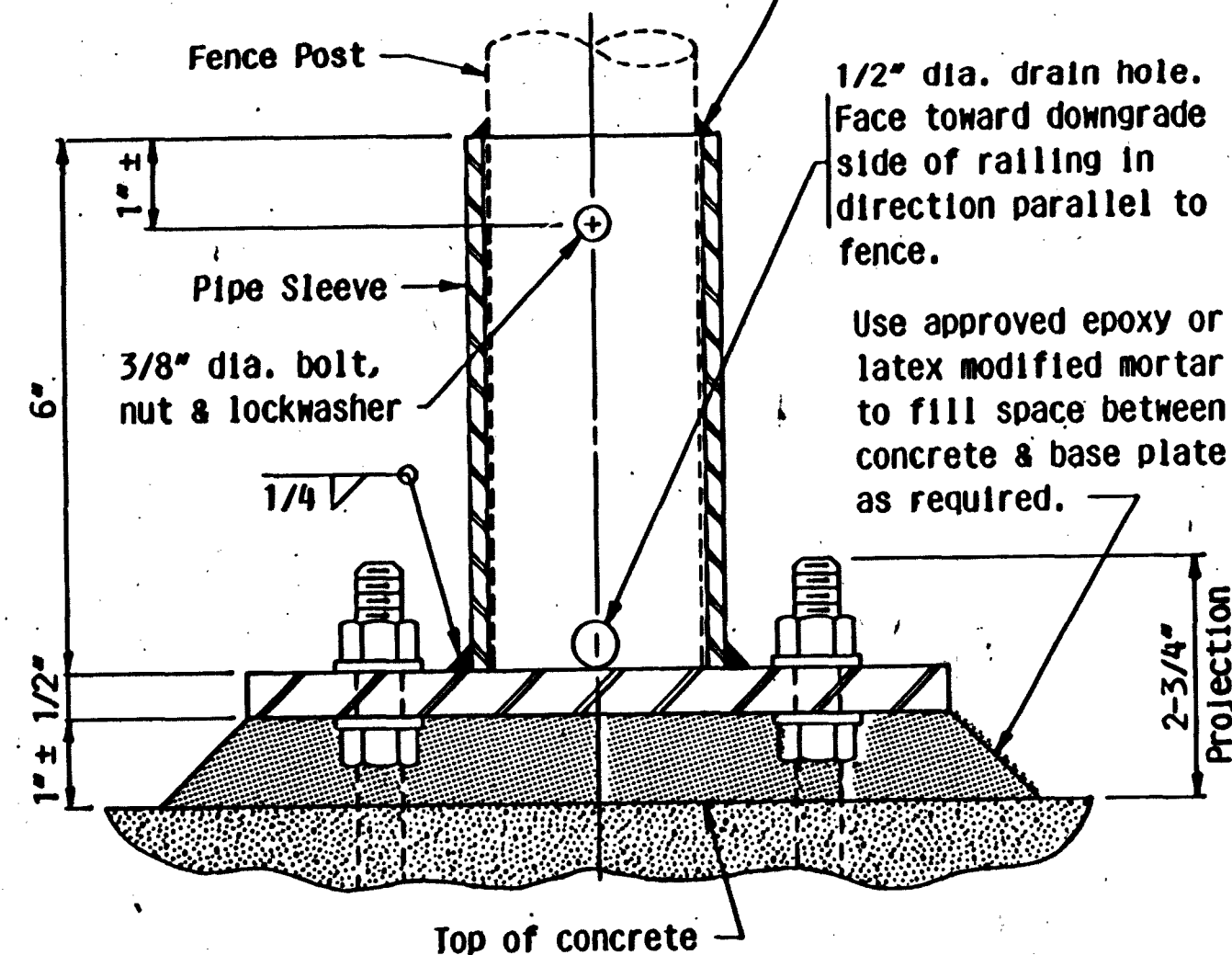
Structural Steel per Spec. 3306
Structural Pipe per Spec. 3362

Galvanize the fence post anchorage after fabrication per Spec. 3394. Galvanize the fasteners per Spec. 3392

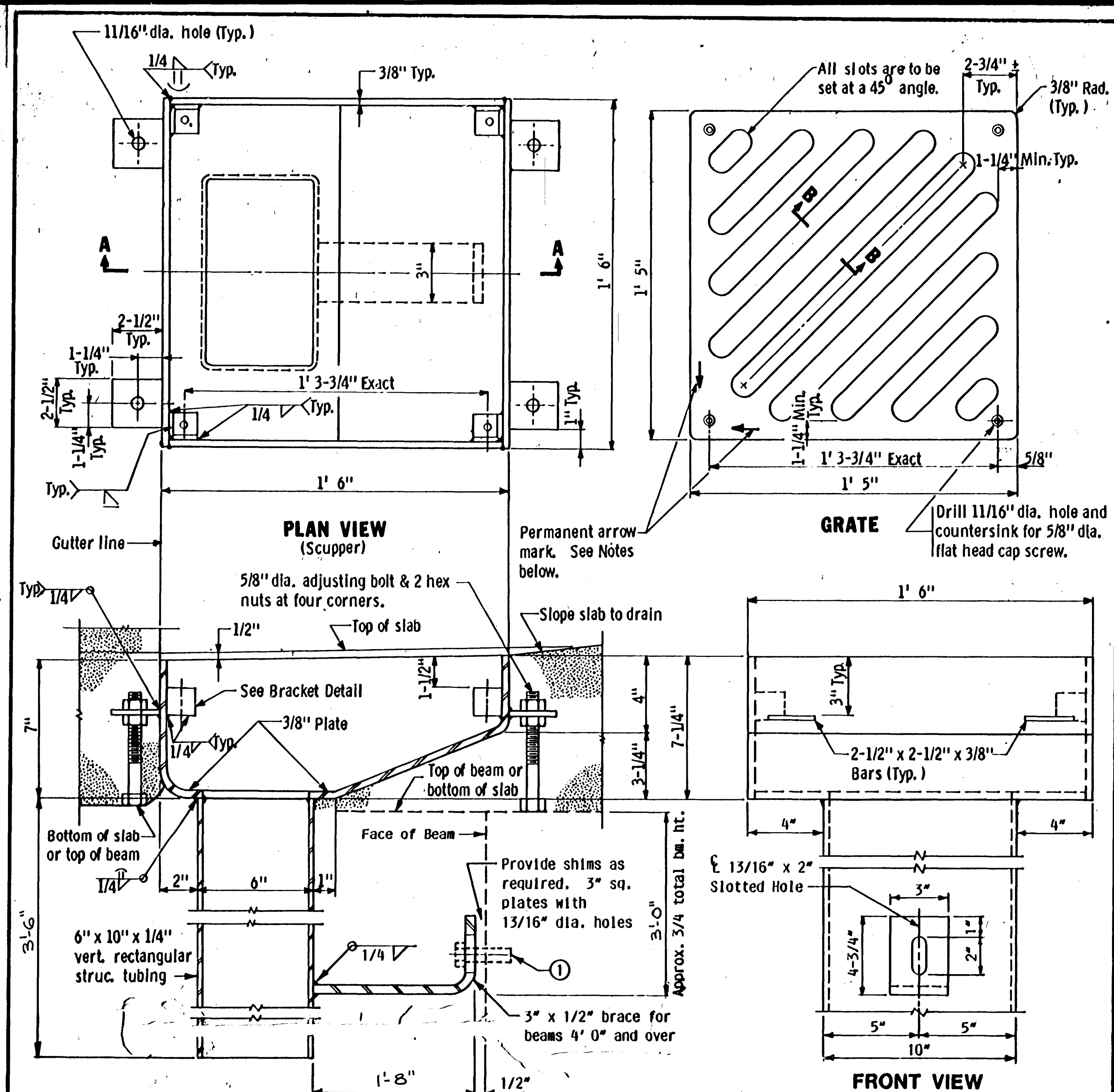
STANDARD PIPE WEIGHTS:

2" nom. dia. = 3.65 lbs./ft.
2-1/2" nom. dia. = 5.79 lbs./ft.
3" nom. dia. = 7.58 lbs./ft.

Post shall be caulked 1" deep with silicone rubber or asphaltic caulking compound.



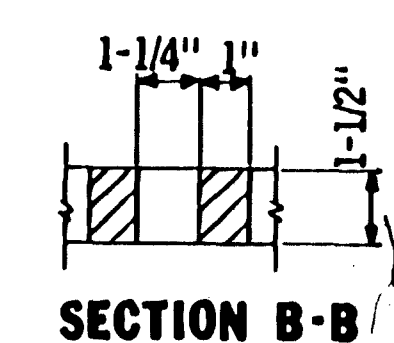
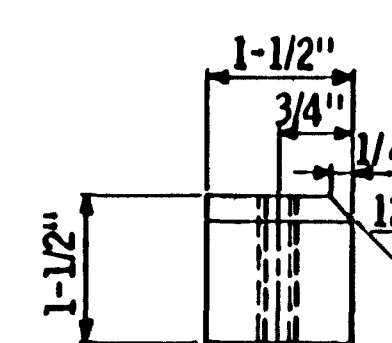
TYPICAL SECTION



PLAN VIEW (Scupper)

SECTION A-A (Steel Beam Shown)

FRONT VIEW



BRACKET DETAIL

SECTION B-B

NOTES:

- All steel plates per Spec. 3306. Cast iron may be used as an alternate. Fabricate grate using automatically controlled cutting torch.
- Cast iron grate as per Spec. 3321, Class 35B.
- Workmanship and fabrication per Spec. 2471.
- Blast clean scupper and grate after fabrication. Galvanize, except cast iron, per Spec. 3394
- Galvanize hardware per Spec. 3392
- Install grate with arrow on curb side & in direction of flow.
- Payment for Floor Drain, Type 2 shall include all material on this detail.
- Grate opening area is 110 sq. in.
- ① Attach to beam with 3/4" dia. bolt, lockwasher and nut as required. See Special Provisions for approved anchorage required for conc. beams. Anchorage to miss draped strands.

APPROVED: Nov. 26, 1985	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO.
Developed by: ENGINEERING STANDARDS & BRIDGES AND STRUCTURES OFFICES	FENCE POST ANCHORAGE		B905
Issued by: OFFICE OF ENGINEERING STANDARDS			

APPROVED: September 6, 1988	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO.
Developed by: ENGINEERING STANDARDS and BRIDGES & STRUCTURES	BRIDGE FLOOR DRAIN TYPE 2 WELDED BOX		MODIFIED B701
Issued by: ENGINEERING STANDARDS			

TITLE: DETAILS	DES: _____	DR: _____	APPROVED: _____	Bridge No. 02523
	CHK: _____	CHK: _____		
	Sheet No. 14-A of 14-A Sheets			