

DESIGN SPECIFICATIONS

AASHTO 1961 STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES AND ACCEPTED TENTATIVE REVISIONS.
A.W.S. "WELDED HIGHWAY AND RAILWAY BRIDGES" 6TH EDITION.

DESIGN DATA

LOADING - H-20-S16 AND ALTERNATE LOADING DESIGNATED IN R.P.M. 20-4, SECTION 4C.

F5 = 20,000 P.S.I. INTERMEDIATE GRADE BAR STEEL REINFORCEMENT.

F5 = 20,000 P.S.I. STRUCTURAL STEEL M.H.D. 3306

STRUCTURAL STEEL M.H.D. 3310

F5 = 27,000 P.S.I. 3/4" THICKNESS AND UNDER

F5 = 28,000 P.S.I. OVER 3/4" TO 1 1/2" THICKNESS INCL.

F5 = 22,000 P.S.I. OVER 1 1/2" TO 4" THICKNESS INCL.

FC = 16,000 P.S.I. 17" x 8" (SLAB)

PROJECT SHEET TOTAL
NUMBER SHEETS

SUMMARY OF QUANTITIES

ITEM NO.	ITEM	QUANTITY	UNIT	ITEM NO.	ITEM	QUANTITY	UNIT
2401.521	STRUCTURE EXCAVATION (CLASS WE)	435	CU. YD.	2401.539	REINFORCEMENT BARS DELIVERED	1,905,700	POUND
2401.521	STRUCTURE EXCAVATION (CLASS DE)	1460	CU. YD.	2401.540	REINFORCEMENT BARS PLACED	1,905,700	POUND
*401.626	PREPARATION OF FOUNDATION (PIER NO.2)	---	LUMP SUM	2402.532	FURNISHING STRUCTURAL STEEL (3306)	3,906,730	POUND
*401.626	PREPARATION OF FOUNDATION (PIER NO.3)	---	LUMP SUM	2402.532	FURNISHING STRUCTURAL STEEL (3310)	5,126,410	POUND
*401.626	PREPARATION OF FOUNDATION (PIER NO.4)	---	LUMP SUM	2402.533	ERECTING STRUCTURAL METALS	9,038,890	POUND
*401.651	PIER CONSTRUCTION (PIER NO.5)	---	LUMP SUM	2476.501	PAINTING METAL STRUCTURES	01E	STRUCTURE
*401.651	PIER CONSTRUCTION (PIER NO.6)	---	LUMP SUM	*402.651	HANGER BAR BEARING ASSEMBLIES (TYPE I)	16	ASSEMBLY
*401.651	PIER CONSTRUCTION (PIER NO.7)	---	LUMP SUM	2402.593	FIXED BEARING ASSEMBLIES (TYPE 1)	4	UNIT
*401.651	PIER CONSTRUCTION (PIER NO.8)	---	LUMP SUM	2402.593	FIXED BEARING ASSEMBLIES (TYPE 5)	4	UNIT
*401.651	PIER CONSTRUCTION (PIER NO.9)	---	LUMP SUM	2402.593	FIXED BEARING ASSEMBLIES (TYPE 7)	12	UNIT
*401.651	PIER CONSTRUCTION (PIER NO.10)	---	LUMP SUM	2402.594	EXPANSION BEARING ASSEMBLIES (TYPE 2)	4	UNIT
*401.651	PIER CONSTRUCTION (PIER NO.11)	---	LUMP SUM	2402.594	EXPANSION BEARING ASSEMBLIES (TYPE 3)	4	UNIT
2452.507	CAST-IN-PLACE CONCRETE PILING DEL.	23,730	LIN. FT.	2402.594	EXPANSION BEARING ASSEMBLIES (TYPE 4)	4	UNIT
2452.508	CAST-IN-PLACE CONCRETE PILING DRIVEN	23,391	LIN. FT.	2402.594	EXPANSION BEARING ASSEMBLIES (TYPE 6)	20	UNIT
2452.519	CAST-IN-PLACE CONCRETE TEST PILES IN PLACE, 100 FEET LONG	16	PILE	*402.691	EXPANSION ASSEMBLY (TYPE I)	01E	ASSEMBLY
2452.509	STEEL PILING DELIVERED	1,896,175	POUND	*402.691	EXPANSION ASSEMBLY (TYPE II)	01E	ASSEMBLY
2452.510	STEEL PILING DRIVEN	25,700	LIN. FT.	*402.691	EXPANSION ASSEMBLY (TYPE III)	2	ASSEMBLY
2452.520	STEEL TEST PILES IN PLACE, 120 FEET LONG	2	PILE	*502.671	DRAINAGE SYSTEM	01E	SYSTEM
2452.520	STEEL TEST PILES IN PLACE, 145 FEET LONG	2	PILE	2402.577	STANDARD NAME PLATES	2	UNIT
2452.520	STEEL TEST PILES IN PLACE, 155 FEET LONG	2	PILE	2545.501	ELECTRIC LIGHTING SYSTEM	01E	SYSTEM
2452.520	STEEL TEST PILES IN PLACE, 165 FEET LONG	2	PILE	2481.501	THREE-PLY JOINT WATER PROOFING	85	LIN. FT.
*2482.526	LOADING TESTS (200 TONS)	2	PILE	2512.501	HAND-PLACED RIPRAP	470	CU. YD.
2401.501	CONCRETE, MIX NO. 3Y6	5,627	CU. YD.	2402.532	FURNISHING STRUCTURAL STEEL (3306)	5750	POUND
2401.501	CONCRETE, MIX NO. 1A6	151	CU. YD.	2513.501	GEOUTED RIPRAP	65	CU. YD.
2401.501	CONCRETE, MIX NO. 3Y60	823	CU. YD.	2108.511	CHANNEL EXCAVATION (CLASS A)	58,719	CU. YD.
*2401.501	CONCRETE, MIX NO. 1X1-M	1297	CU. YD.	2101.501	CLEARING	5.0	ACRE
2401.501	CONCRETE, MIX NO. 1BB	710	CU. YD.	2101.506	GRUBBING	2.3	ACRE
2401.501	CONCRETE, MIX NO. 3AB	3731	CU. YD.	*402.650	WALKWAY GRATING (TYPE 1)	1532	SQ. FT.
				2506.506	CONSTRUCT MANHOLES DESIGN A OR F	9	LIN. FT.
				2506.516	FURNISH & INSTALL CASTING ASSEMBLIES	01E	ASSEMBLY
				2503.514	FURNISH & INSTALL 12" CORRUGATED METAL PIPE SEWER	100	LIN. FT.
				*402.631	MEDIAN BARRIER (TYPE, METAL)	2492	LIN. FT.

GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.
PAINT WITH ASPHALT OR APPROVED EQUAL TO BREAK BOND.
STRUCTURAL STEEL DETAILS BASED ON NORMAL TEMPERATURE OF 60°.
ALL DIMENSIONS SHOWN ARE IN A HORIZONTAL OR VERTICAL PLANE UNLESS OTHERWISE NOTED.
CAST IN PLACE CONCRETE PILING IN PIERS 5 - 11 INCL. SHALL BE DRIVEN TO A MINIMUM PENETRATION OF 65' BELOW LOW PILE CUTOFF.
THE "STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION," DATED JANUARY 1, 1964 SHALL GOVERN.
REINFORCEMENT BARS IN ABUTMENT BRIDGE SEATS AND IN TOP OF PIER CAP SHALL BE CAREFULLY PLACED TO AVOID INTERFERENCE WITH DRILLING OF ANCHOR BOLT HOLES.
PILE LENGTHS IN PIERS 5 THRU 11 SHALL BE BASED ON THE LOWEST PILE CUTOFF ELEVATION.
FOR CONCRETE JOINT SEALER PER M.H.D. 3725 SEE SPECIAL PROVISIONS.
FOR TREATMENT OF PIER CAPS SEE SPECIAL PROVISIONS.
ANCHOR BOLT HOLES TO BE DRILLED AND ANCHOR BOLTS SET IN PLACE AFTER GIRDERS HAVE BEEN ERECTED.
ALL BAR STEEL SHALL BE IMBEDDED 2" CL. UNLESS OTHERWISE SHOWN OR NOTED.
CAP BARS SHALL BE SPLICED IN A VERTICAL PLANE.

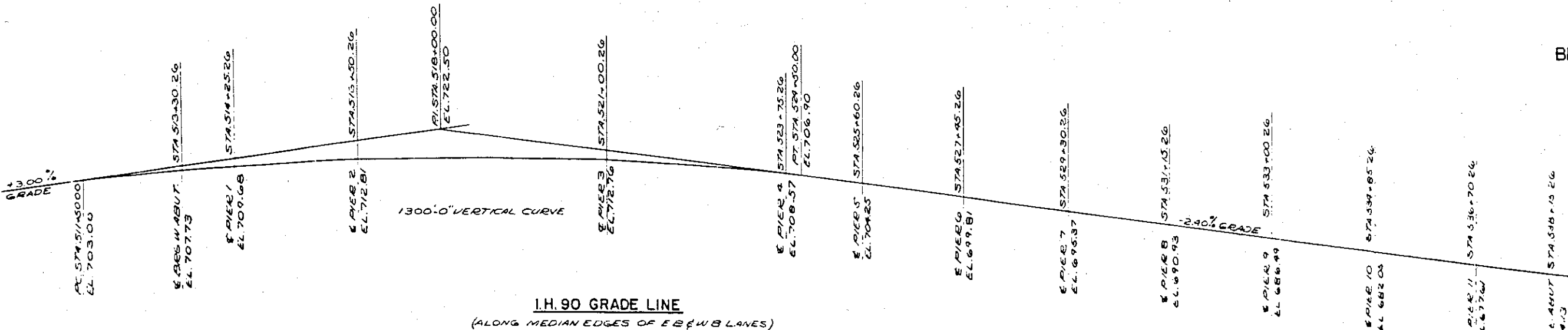
* SEE SPECIAL PROVISIONS

BM ELEV. 650.297 (M.S.L. 1929 A.D.)

"L39" BRONZE PLATE
R.R. SEMA TOWER
93' RT. STA. 175+95 N.B.

BM ELEV. 663.470 (M.S.L. 1929 A.D.)

"L38" BRONZE PLATE
N. ABUT. R.R. BR. 260
LT. STA. 476+65 E.B.



STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

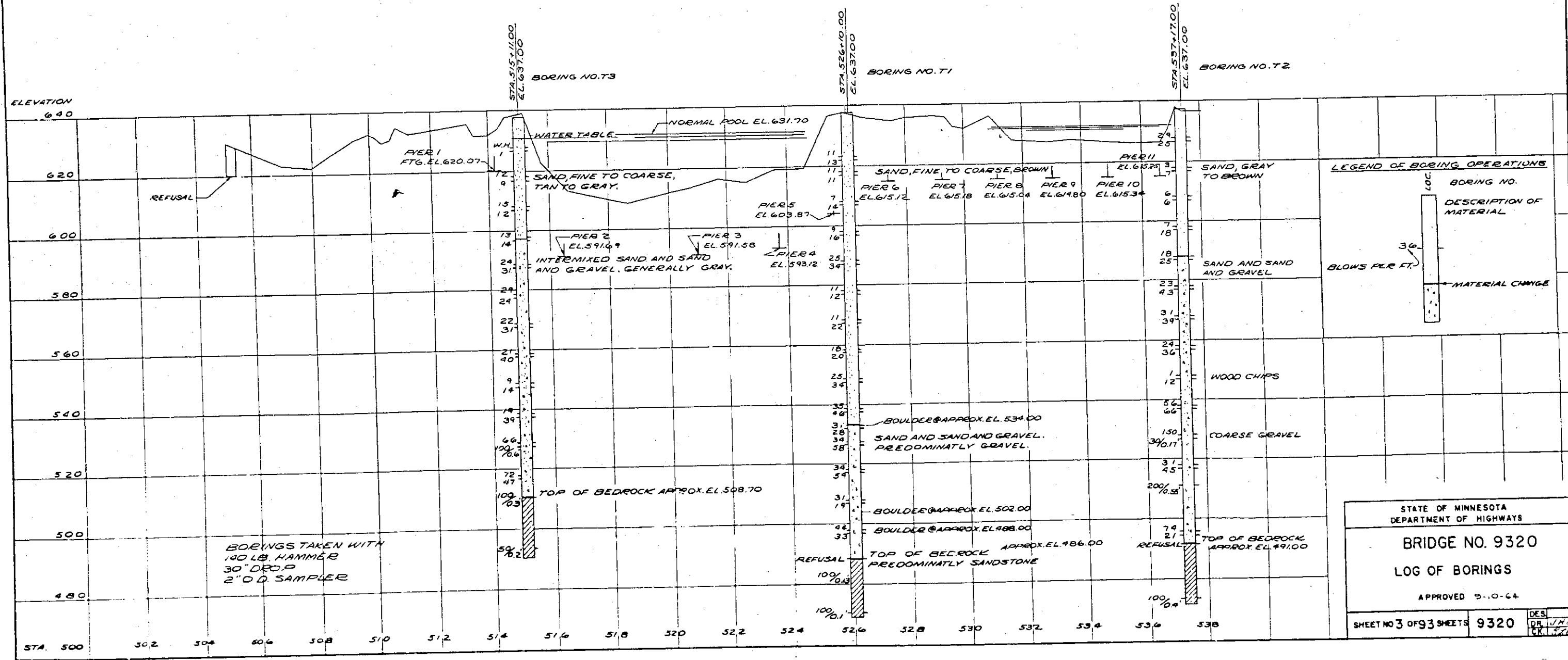
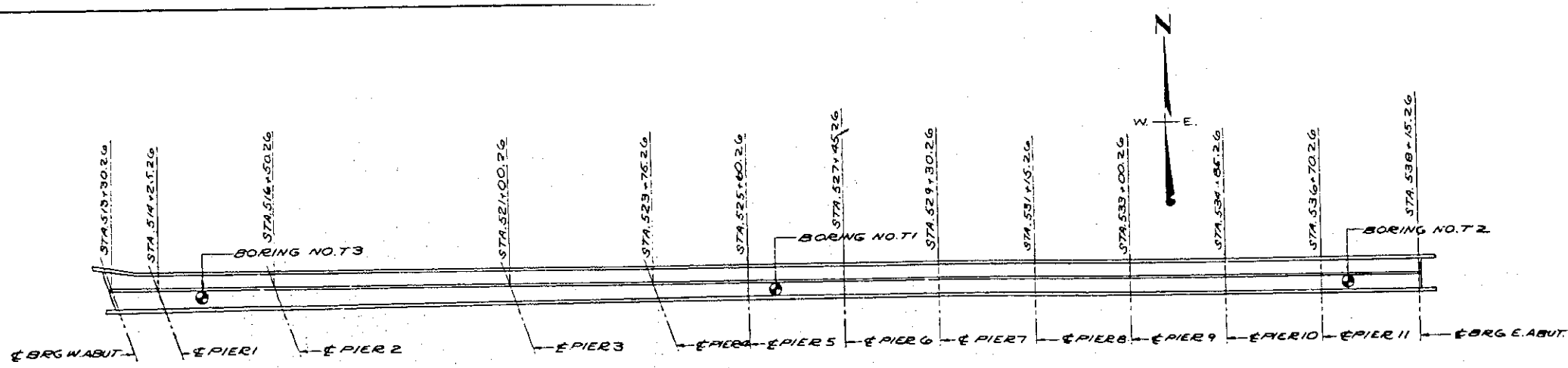
BRIDGE NO. 9320

QUANTITIES & GENERAL NOTES

APPROVED 10-10-64

SHEET NO. 2 OF 93 SHEETS 9320

DES. DR. J.A. CK. J.A.



STATE OF MINNESOTA
 DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320

LOG OF BORINGS

APPROVED 9-10-64

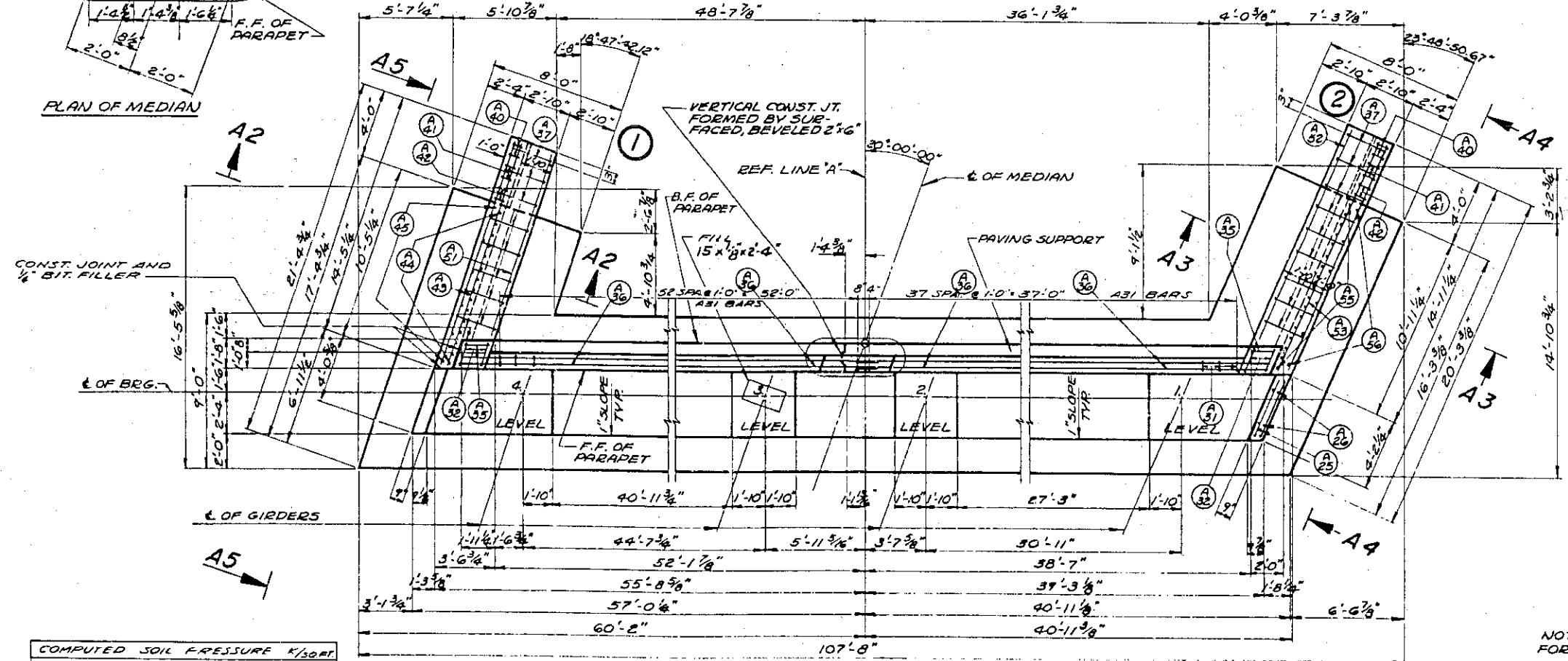
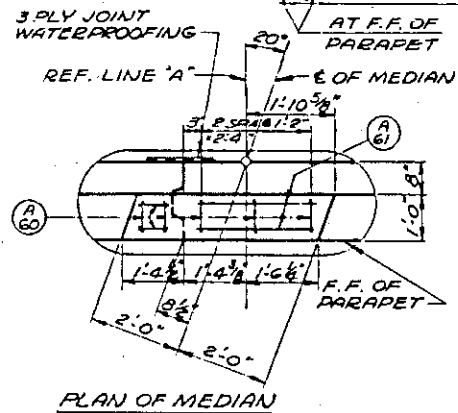
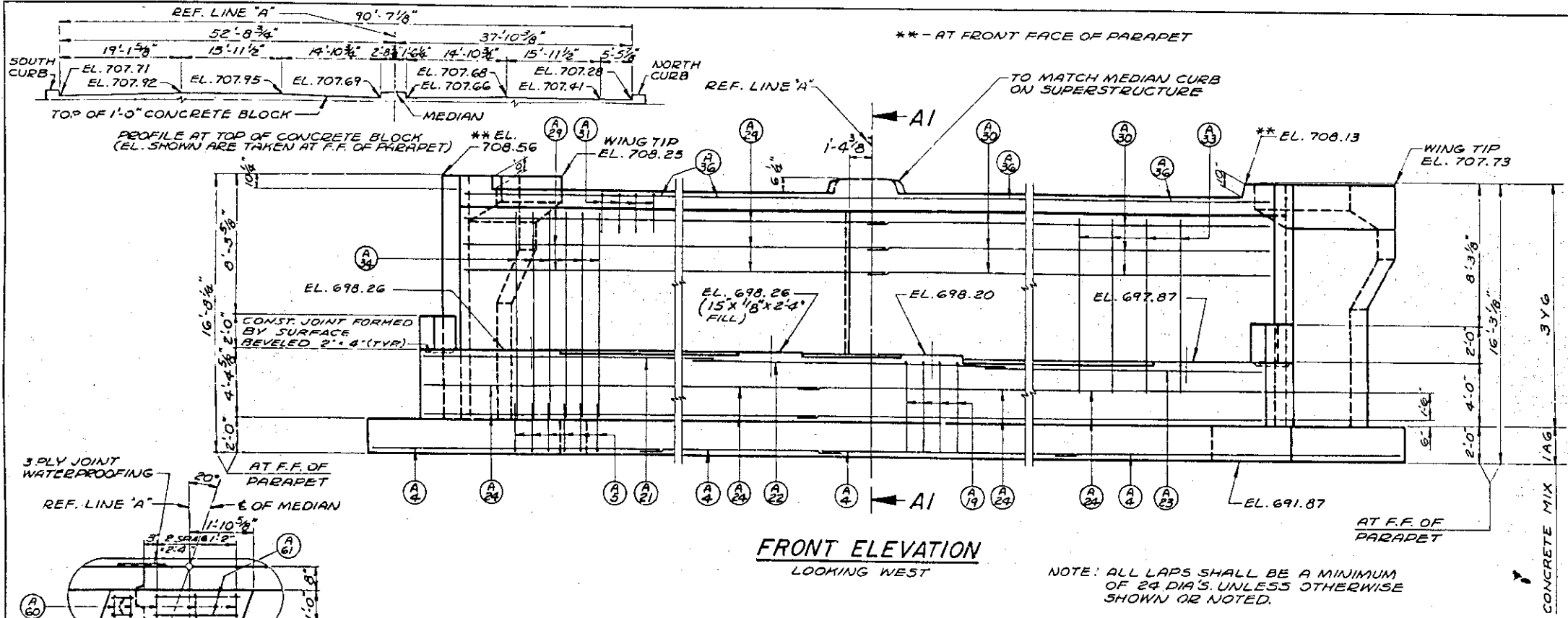
SHEET NO 3 OF 3 SHEETS 9320

DES. DR. J.H.G. 68. 577

BILL OF BARS 13,280

DIMENSIONS IN BENDING DETAILS ARE OUT TO OUT

POUR	MARK	NO.	SIZE	LENGTH	SPACING	LOCATION	DET.
FOOTING	A1	8	9	26-3	8 1/2	FOOTING - BOTTOM - TRANS.	
	A2	8	9	40-0	8 1/2	" " " "	
	A3	8	9	39-3	8 1/2	" " " "	
	A4	4	4	26-0	SHOWN	" " " "	
	A5	94	4	10-0	1-0	" " " " - LONG.	A
	A6	26	7	7-6	8	" " " " - WINGS	E
	A7	6	7	6-9	8	" " " " " "	A
	A8	2	4	15-9	SHOWN	" " " " - BOTTOM - WING 2	
	A9	1	4	9-0	SHOWN	" " " " - WING 2	
	A10	2	4	16-3	SHOWN	" " " " - WING 1	
	A11	1	4	8-0	SHOWN	" " " " - WING 1	
	A12	3	4	8-3	SHOWN	" " " " & BODY	A
	A13	1	4	6-0	SHOWN	" " " " " "	A
	A14	9	4	28-9	1-5	" " " " - TOP - TRANS.	
	A15	57	4	3-0	1-6	" " " " - LONG.	
	A16	4	4	10-9	2-0	" " " " - LONG. - WING 1	
	A17	4	4	12-3	2-0	" " " " - WING 2	
	A18	36	5	6-3	8	" " " " - TRANS.	
BODY	A19	86	4	11-9	SHOWN	BODY - TOP	B
	A20	3	4	10-3	SHOWN	" " " " - AT ENDS	B
	A21	7	9	45-3	10	" " " " - TRANS.	
	A22	7	9	24-0	10	" " " " " "	
	A23	7	9	33-9	10	" " " " " "	
	A24	16	4	24-9	SHOWN	" " " " - TRANS.	
	A25	4	4	6-6	SHOWN	BEARING GUARDS	A
	A26	8	4	3-0	SHOWN	" " " " " "	
	A27	20	4	5-0	SHOWN	GRID	A
PARAPET	A29	24	4	27-9	1-6	PARAPET - HORIZ. - F. & B. FACE	
	A30	24	4	21-3	1-6	" " " " " "	
	A31	91	5	5-0	1-0	" " " " - BLOCK	C
	A32	4	5	7-0	SHOWN	" " " " - AT ENDS	C
	A33	48	4	10-0	2-0	" " " " - VERT. - F. FACE	
	A34	95	6	12-3	1-0	" " " " - B. " "	
A35	2	4	1-6	SHOWN	" " " " - BLOCK - AT ENDS		
A36	8	4	24-3	SHOWN	" " " " - DO NOT LAP		
WINGS	A37	17	4	5-6	1-6	WING 1 & 2 - TOP	D
	A38	5	4	10-6	1-6	" " 2 - HORIZ. - F. FACE	
	A39	4	4	5-6	SHOWN	" " 1 & 2 - " "	
	A40	4	4	10-0	8	" " 1 & 2 - TOP	C
	A41	4	4	11-3	8	" " 1 & 2 - " "	C
	A42	4	4	12-6	8	" " 1 & 2 - " "	C
	A43	6	4	14-0	1-6	" " 1 - HORIZ. " "	
	A44	15	7	14-3	8	" " 1 - VERT. - B. FACE	
	A45	6	4	14-3	2-0	" " 1 - " - F. " "	
	A46	5	4	10-0	1-6	" " 1 - HORIZ. - F. " "	
	A47	5	4	7-3	1-6	" " 1 - " - B. " "	
	A48	1	4	8-3	1-6	" " 1 - " - B. " "	
	A49	1	4	10-9	1-6	" " 1 - " - F. " "	
	A50	2	4	11-3	1-6	" " 1 - " - B. " "	
A51	2	4	11-3	SHOWN	" " 1 - " - B. " " - TOP		
A52	2	4	13-6	SHOWN	" " 2 - " - B. " " - " "		
A53	6	4	14-6	1-6	" " 2 - " - " " " "		
A54	2	4	15-0	1-6	" " 2 - " - B. " " " "		
A55	17	7	13-9	8	" " 2 - VERT. - B. " " " "		
A56	6	4	13-9	2-0	" " 2 - " - F. " " " "		
A57	1	4	10-6	1-6	" " 2 - HORIZ. - B. " " " "		
A58	1	4	11-9	1-6	" " 2 - " - F. " " " "		
A59	3	4	9-3	1-6	" " 2 - " - B. " " " "		
MEDIAN	A60	7	5	4-6	SHOWN	MEDIAN	C
	A61	2	4	2-6	SHOWN	" " " "	



COMPUTED SOIL PRESSURE K/SQFT	
DL - EARTH PRESSURE	3.2
LIVE LOAD	5
TOTAL	8.7

PLAN

NOTE: SEE SHEET NOS. 5 & 6 FOR FOOTING & BODY REINF. STEEL.

SEE SHEET NO. 6 FOR TOTAL ESTIMATED QUANTITIES & BAR BENDING DETAILS.

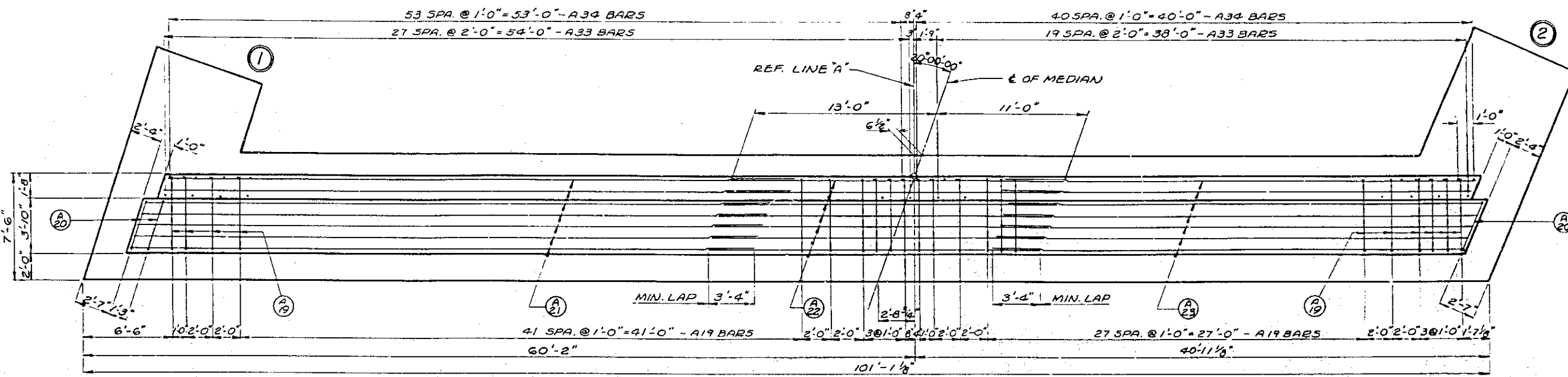
STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320
WEST ABUTMENT

APPROVED 3-10-64

SHEET NO. 4 OF 93 SHEETS 9320

DES. J. A. DR. C. C. A. CR. D. X. Z.



BODY PLAN
SHOWING TOP BODY REINF. STEEL

+ PREFORMED CORK JOINT FILLER

WD	SIZE	LOCATION
2	9'-1" x 1'-3"	CURBS
1	6'-1" x 2'-8"	MEDIAN
1	6'-1" x 1'-3"	MEDIAN
2	12'-1" x 9'-3"	END OF SLAB

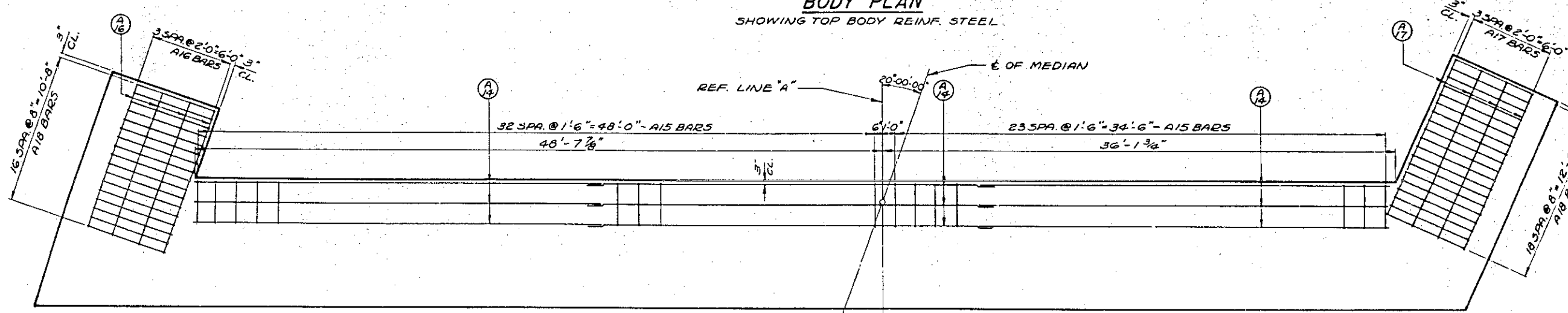
+ BITUMINOUS FELT JOINT FILLER

WD	SIZE	LOCATION
2	1'-0" x 1/2" x 4'-8"	WINGWALL-WABUT
2	1'-0" x 3/4" x 18'-8"	"
2	1'-8" x 1/4" x 18'-8"	"
2	1'-0" x 1/2" x 0'-0"	E ABUT
2	1'-0" x 1/2" x 16'-5"	"
2	1'-8" x 1/4" x 16'-5"	"
4	9'-1/2" x 2'-0"	E/WABUT

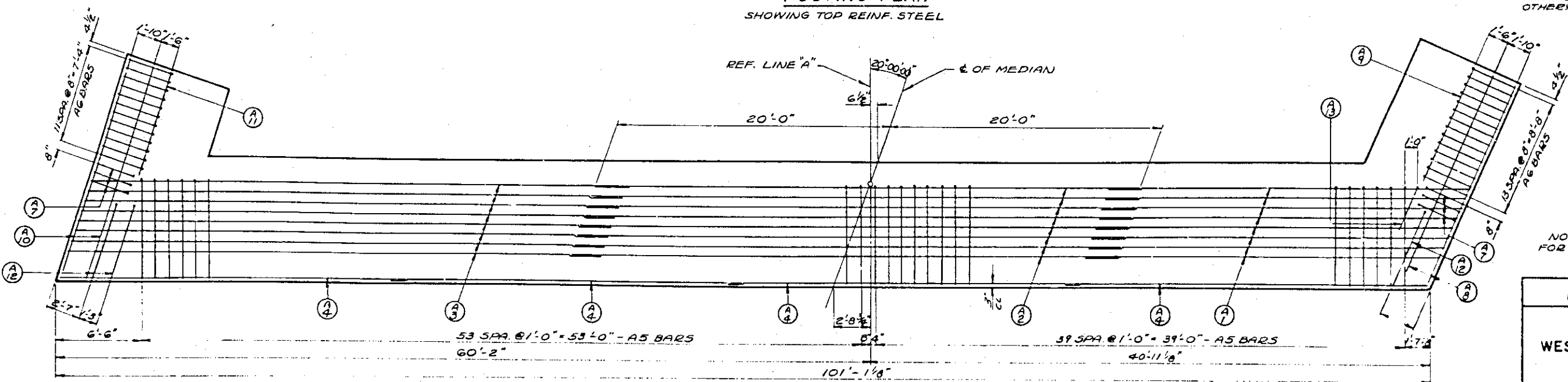
+ INCLUDED IN PRICE BID FOR OTHER ITEMS

CORK SHALL COMPLY WITH AASHO MISS TYPE I
BIT. FELT SHALL COMPLY WITH M.H.D. 3701.
SECURE CORK JOINT FILLER WITH 2 1/2" LONG 11 GA. COPPER NAILS AT 1'-6" CENTERS. NAILS TO BE INCLUDED IN PRICE BID FOR OTHER ITEMS. TRIM JOINT FILLER AS REQUIRED IN THE FIELD.
THE JOINT FILLER LIST IS FOR THE CONTRACTOR'S CONVENIENCE ONLY. ANY ADDITIONAL JOINT FILLER REQUIRED, AS SHOWN ON THE PLANS, SHALL BE FURNISHED BY THE CONTRACTOR WITH NO ADDITIONAL COMPENSATION.

NOTE: ALL LAPS SHALL BE A MINIMUM OF 24 DIAS. UNLESS OTHERWISE SHOWN OR NOTED.



FOOTING PLAN
SHOWING TOP REINF. STEEL



FOOTING PLAN
SHOWING BOTTOM REINF. STEEL

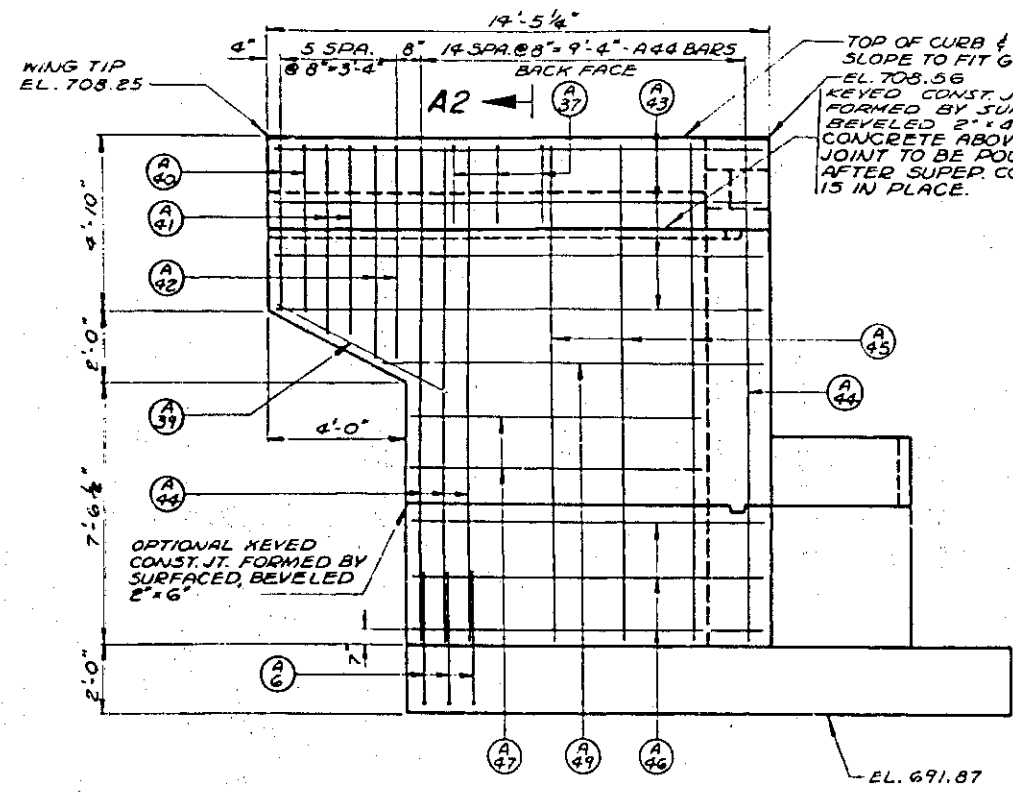
NOTE: SEE SHEET NO. 4 FOR FOOTING & WING DIMENSIONS

STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

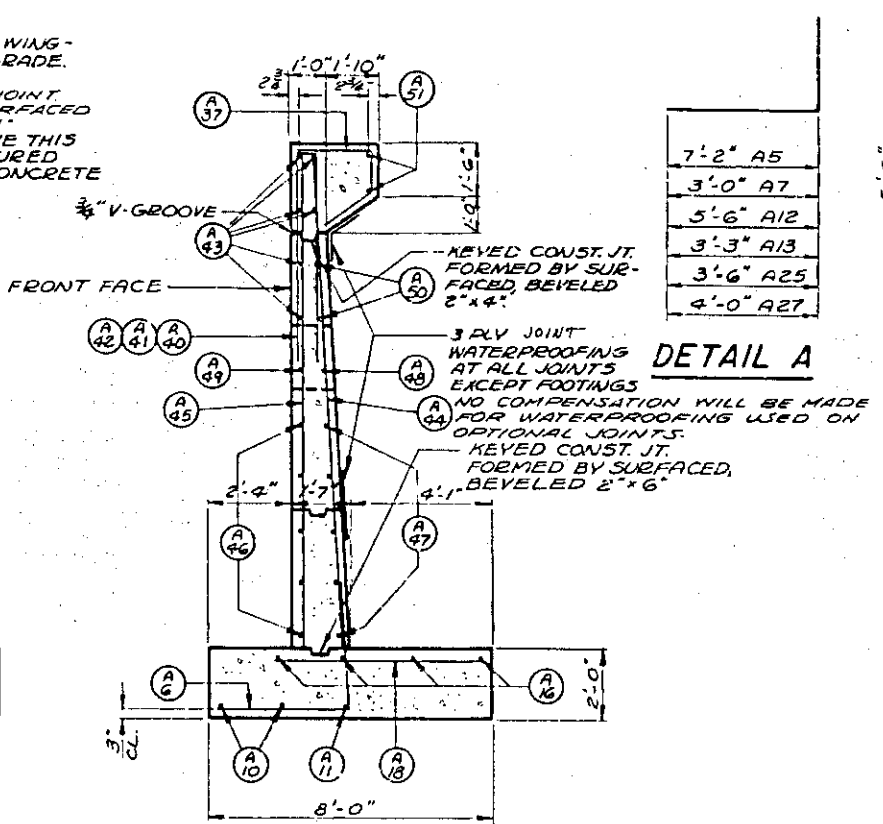
BRIDGE NO. 9320
WEST ABUTMENT DETAILS

APPROVED _____

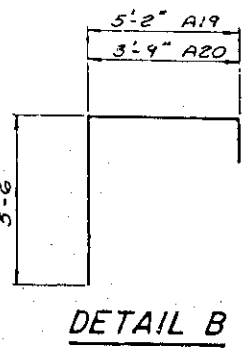
SHEET NO 5 OF 93 SHEETS	9320	CEC JAC CK
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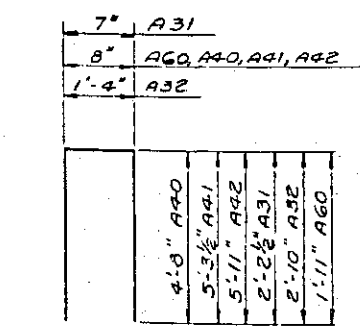
VIEW A2
FRONT FACE OF WING 1.
SHOWING FRONT & BACK FACE REINF. STEEL



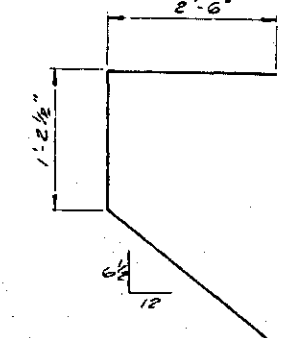
SECTION A2



DETAIL B



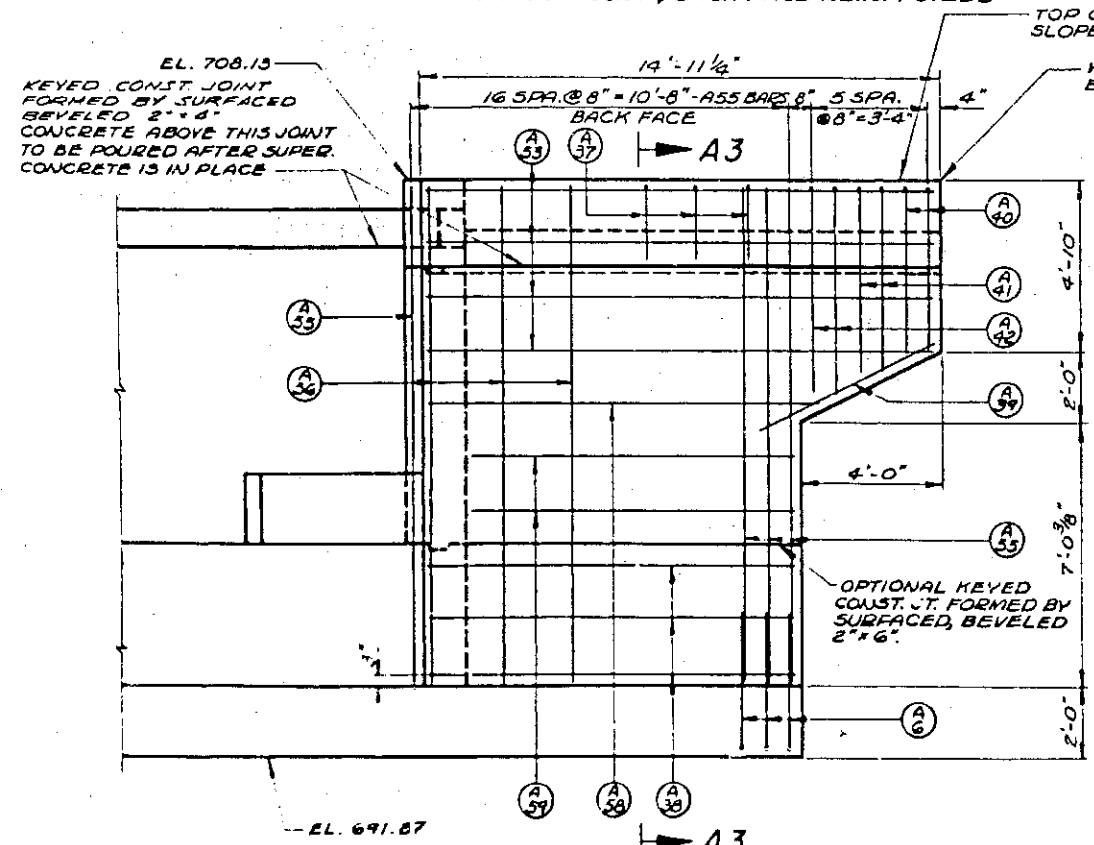
DETAIL C



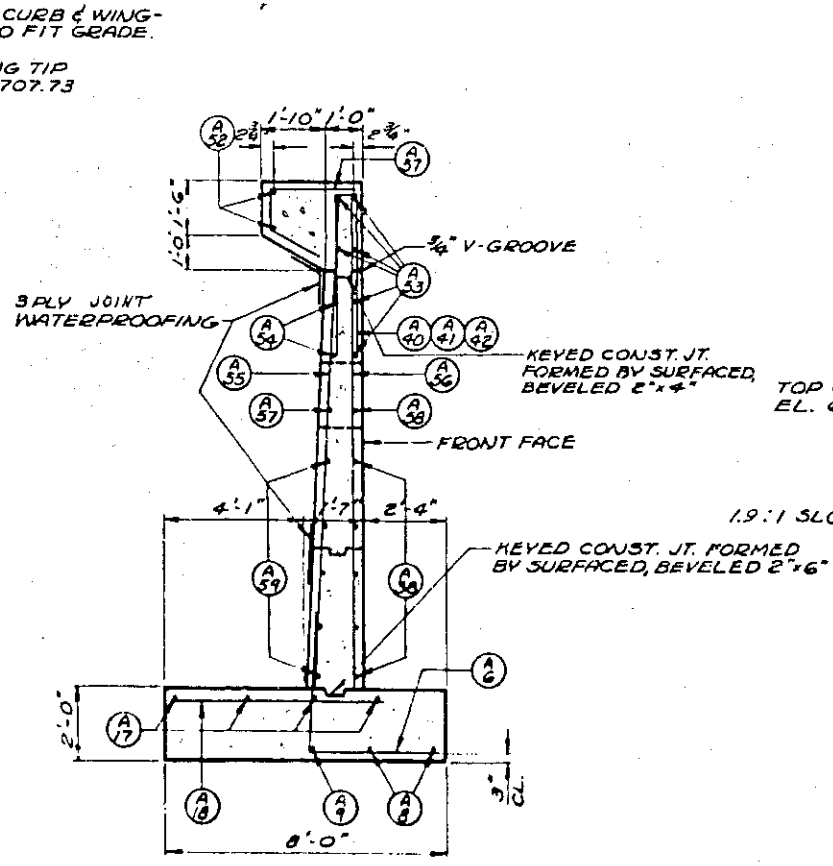
DETAIL D

TOTAL ESTIMATED QUANTITIES

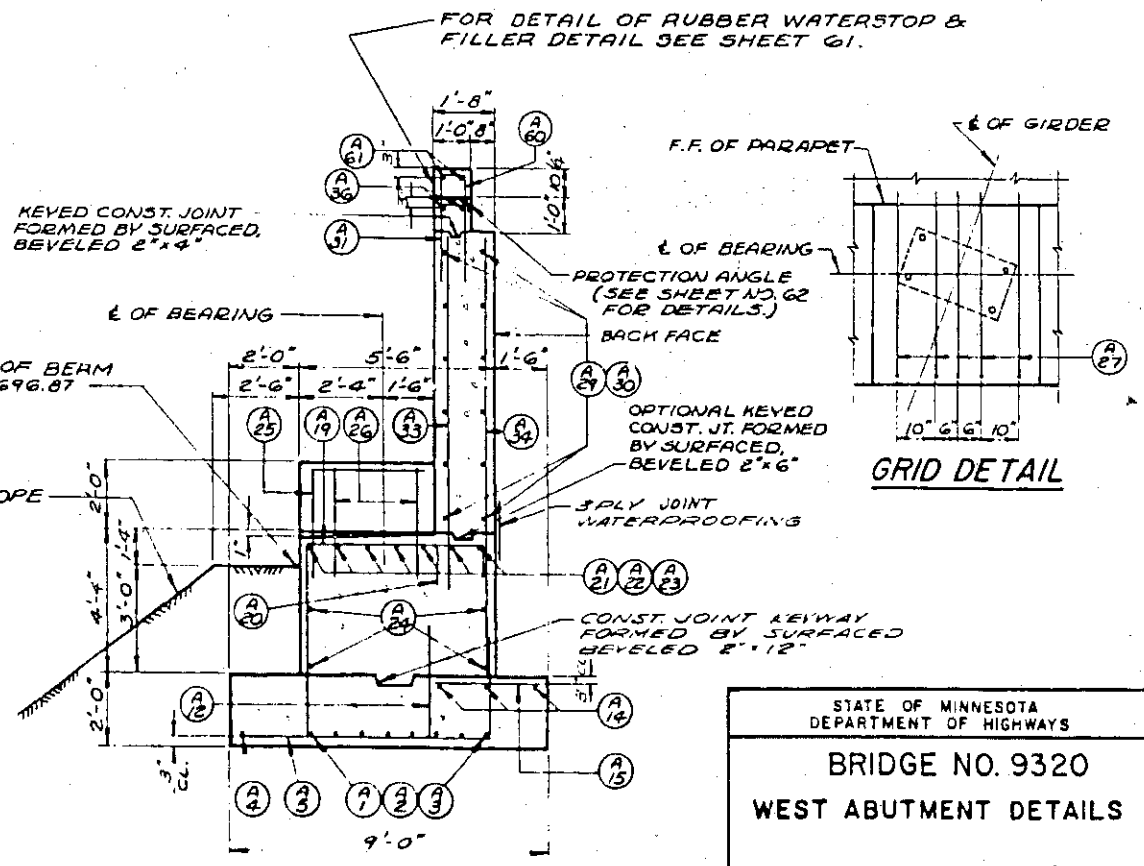
ITEM	QUANTITY	UNIT
STRUCTURE EXCAVATION (CLASS D E)	305	C.Y.
CONCRETE MIX NO. 3YG	156	C.Y.
CONCRETE MIX NO. 1AG	77	C.Y.
REINFORCEMENT BARS DELIVERED	13,280	LB.
REINFORCEMENT BARS PLACED	13,270	LB.
THREE-PLY JOINT WATERPROOFING	37	L.F.



VIEW A4
FRONT FACE OF WING 2.
SHOWING FRONT & BACK FACE REINF. STEEL

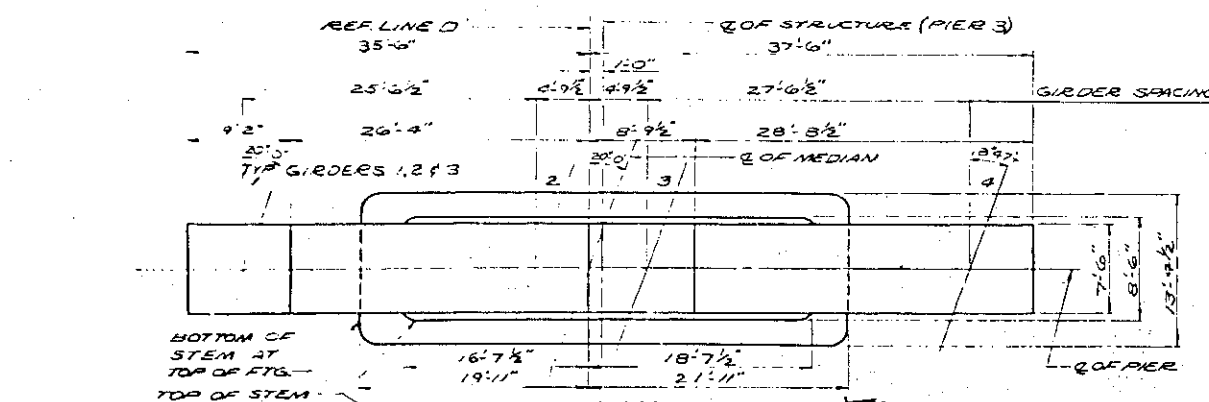


SECTION A3

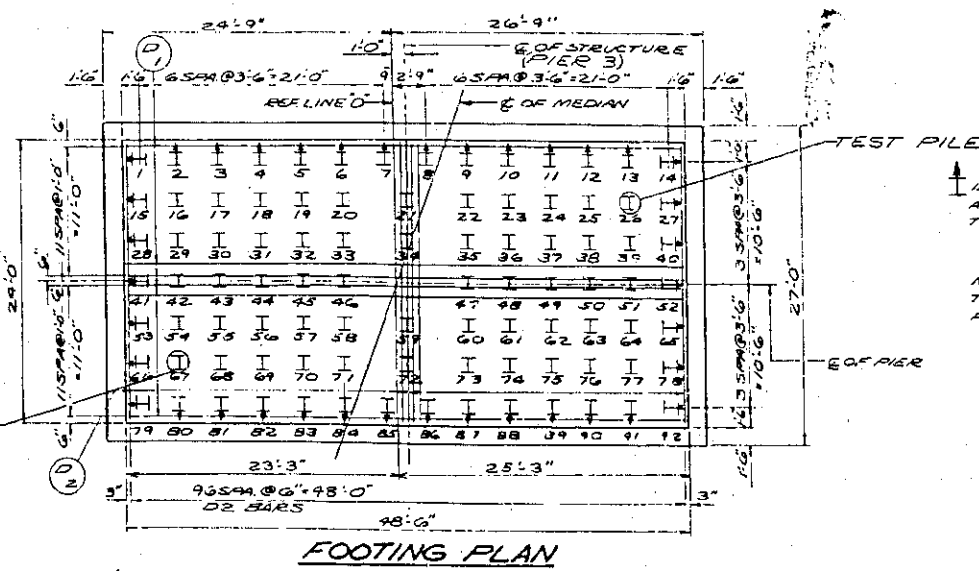


SECTION A1

GRID DETAIL

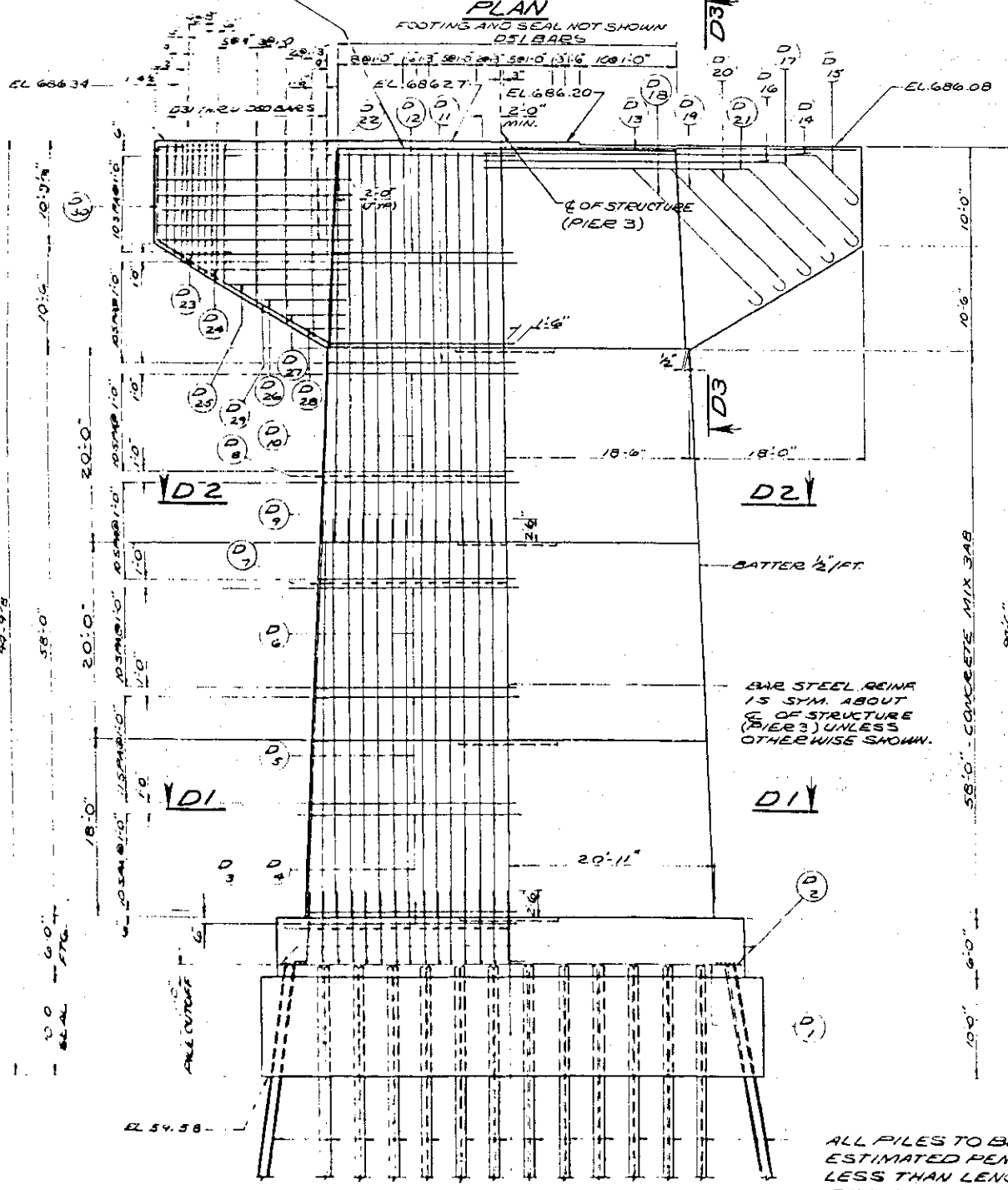


COMPUTED PILE LOADS T/PILE	
DEAD LOAD	73
DEAD LOAD + LIVE LOAD	85
DEAD LOAD + WIND	97



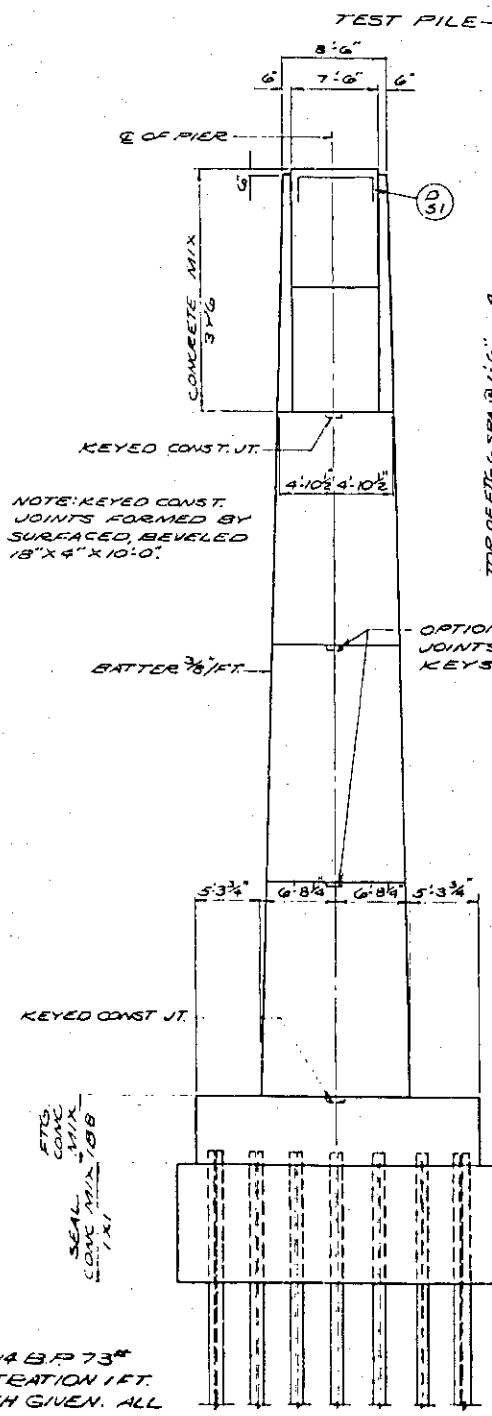
INDICATES BATTER OF 1/2 FT. AND THE DIRECTION OF THE BATTERED PILES.

NOTE: PILE SPACING IS TAKEN AT BOTTOM OF FOOTING.

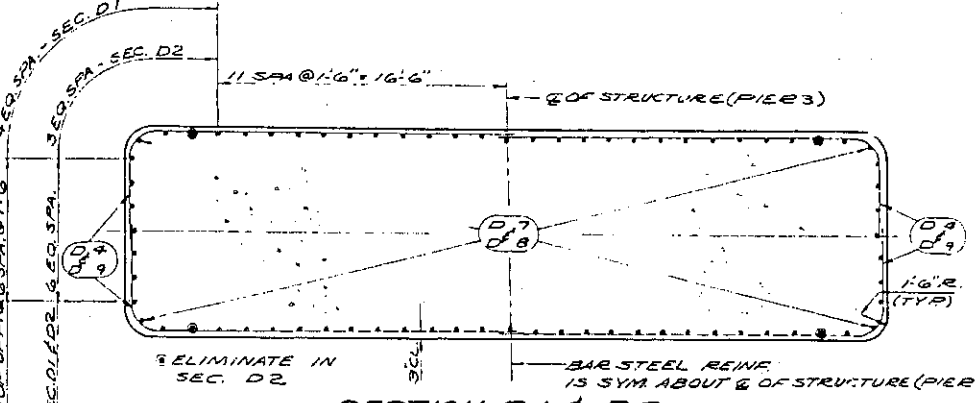


ELEVATION
LOOKING EAST

ALL PILES TO BE 14 BP 73# ESTIMATED PENETRATION 1 FT. LESS THAN LENGTH GIVEN. ALL PILING TO BE DRIVEN TO A MIN. BEARING VALUE OF 100 TWS/PILE.



END VIEW



SECTION D1 & D2

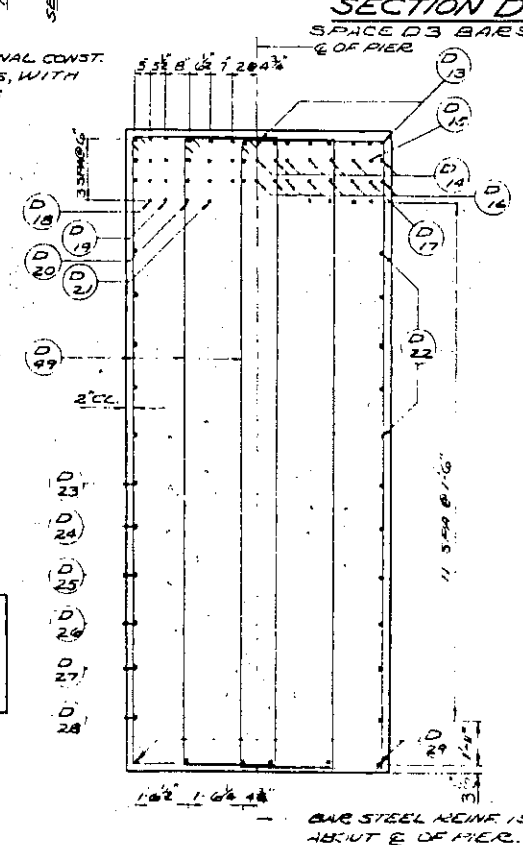
NOTE: ALL LAPS SHALL BE A MIN OF 24 DIAMETERS UNLESS OTHERWISE SHOWN OR NOTED.

ESTIMATED QUANTITIES

CONC. MIX	FOUR	QUANTITY
1 X 1-M SEAL		515 CY
1 B B FOOTING		259 CY
3 A B STEM		977 CY
3 Y G CAP		407 CY
TOTAL		2158 CY

PREPARATION OF FOUNDATION _____ 1 L.S.
 REINFORCEMENT STEEL DELIVERED _____ 79,210 LB.
 REINFORCEMENT STEEL PLACED _____ 79,210 LB.
 † STEEL PILING DELIVERED _____ 629,150 LB.
 STEEL TEST PILE IN PLACE 155'-0" LONG _____ 2 PILE
 † DOES NOT INCLUDE TEST PILES.

PILE NOTES:
 2 STEEL TEST PILING 155'-0" LONG
 90 STEEL PILING EST LENGTH 95'-0"
 92 STEEL PILING REQ'D FOR PIER 3



SECTION D3

SPACE D30 BARS SAME AS D29 BARS

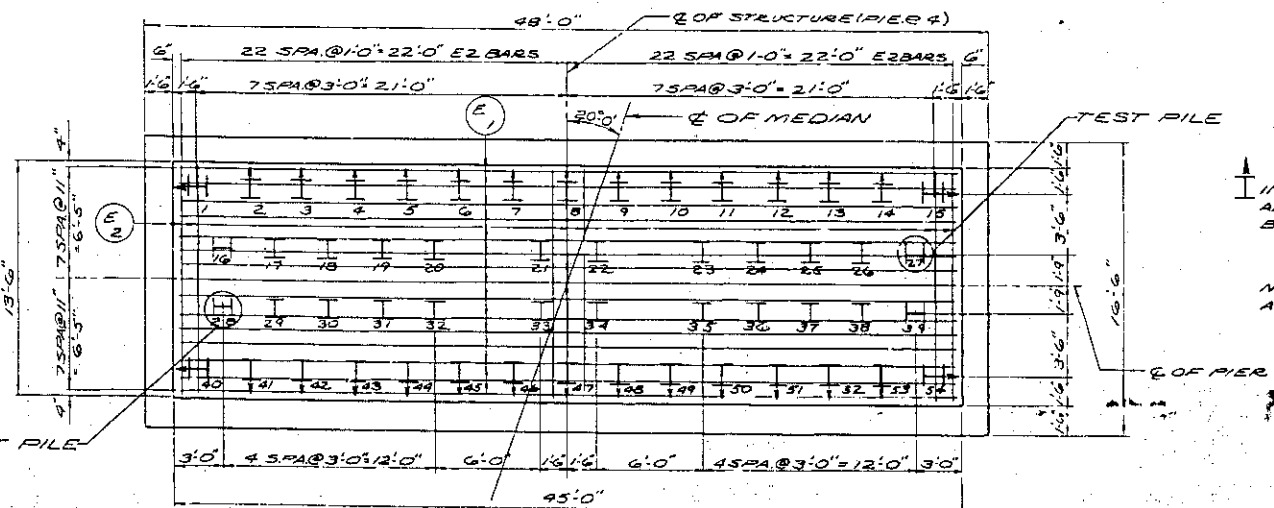
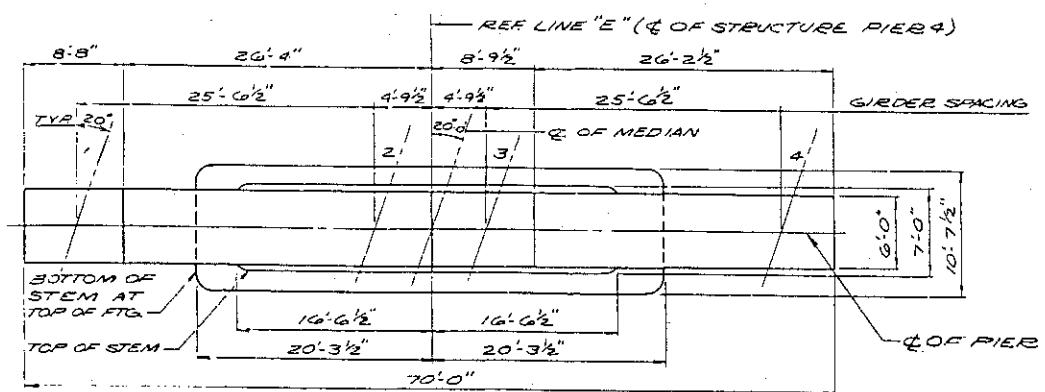
STATE OF MINNESOTA
 DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320

PIER 3

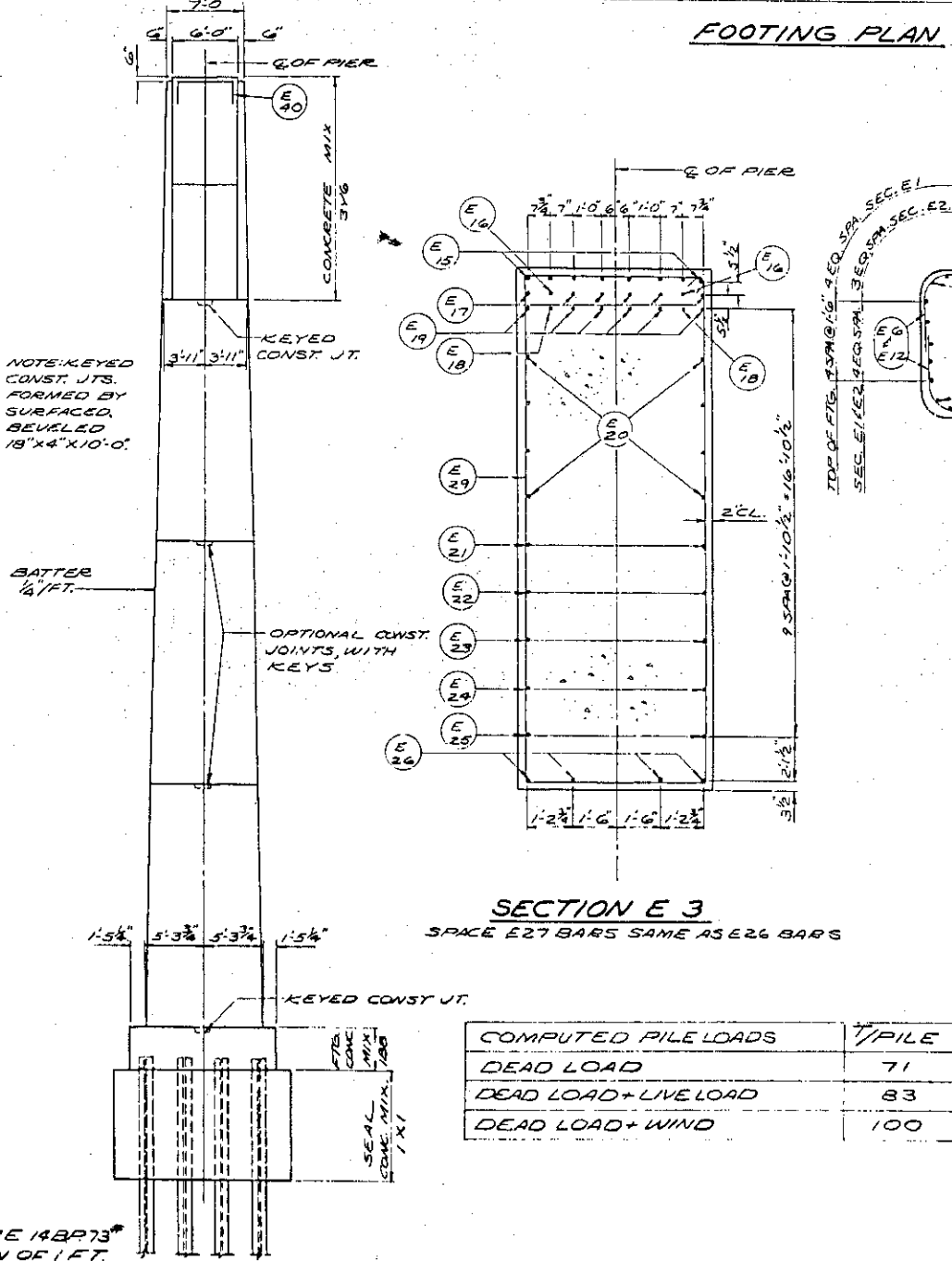
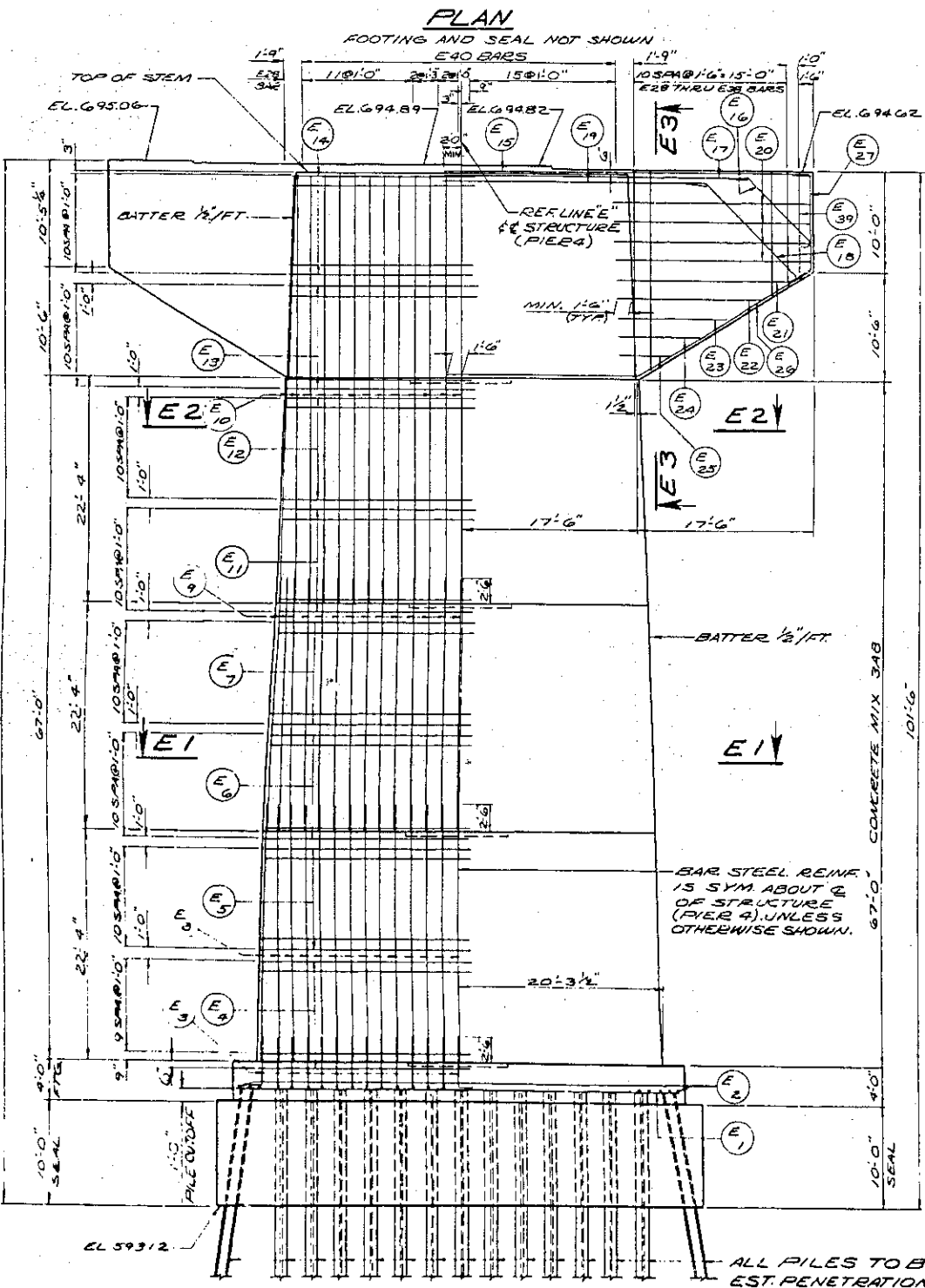
APPROVED 2-10-64

SHEET NO 9 OF 93 SHEETS	9320	DESIGNER D.L.H.S. C.K.G.M.E.
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INDICATES BATTER OF 1/2 FT. AND THE DIRECTION OF THE BATTERED PILES.

NOTE: PILE SPACING IS TAKEN AT THE BOTTOM OF FOOTING.



ESTIMATED QUANTITIES

CONC. MIX.	FOUR	QUANTITY
1 X 1-M SEAL		293 CY
1 B8	FOOTING	90 CY
3 A 8	STEM	863 CY
3 Y 6	CAP	315 CY
	TOTAL	1561 CY

PREPARATION OF FOUNDATION 1 L.S.

REINFORCEMENT BARS DELIVERED 43,640 LB.

REINFORCEMENT BARS PLACED 43,640 LB.

STEEL PILING DELIVERED 398,580 LB.

STEEL TEST PILE IN PLACE 165'-0" LONG - 2 PILE

1 DOES NOT INCLUDE TEST PILES

COMPUTED PILE LOADS

	T/PILE
DEAD LOAD	71
DEAD LOAD + LIVE LOAD	83
DEAD LOAD + WIND	100

FILE NOTES:

2 STEEL TEST PILES 165'-0" LONG

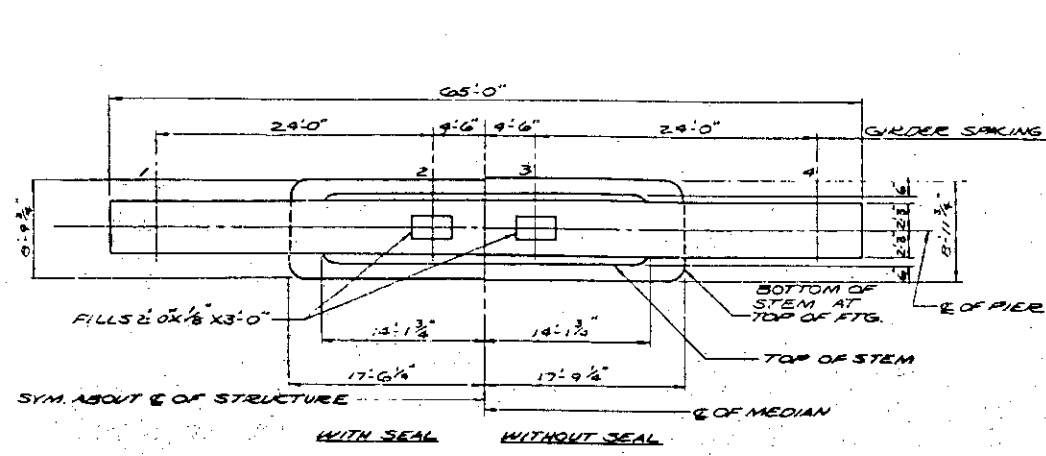
52 STEEL PILES EST. 105'-0" LONG

54 STEEL PILES REQ'D FOR PIER 4

ALL PILES TO BE 14BPT3 EST. PENETRATION OF 1 FT. LESS THAN LENGTH GIVEN. ALL PILING TO BE DRIVEN TO A MIN. BEARING OF 100 TONS PER PILE.

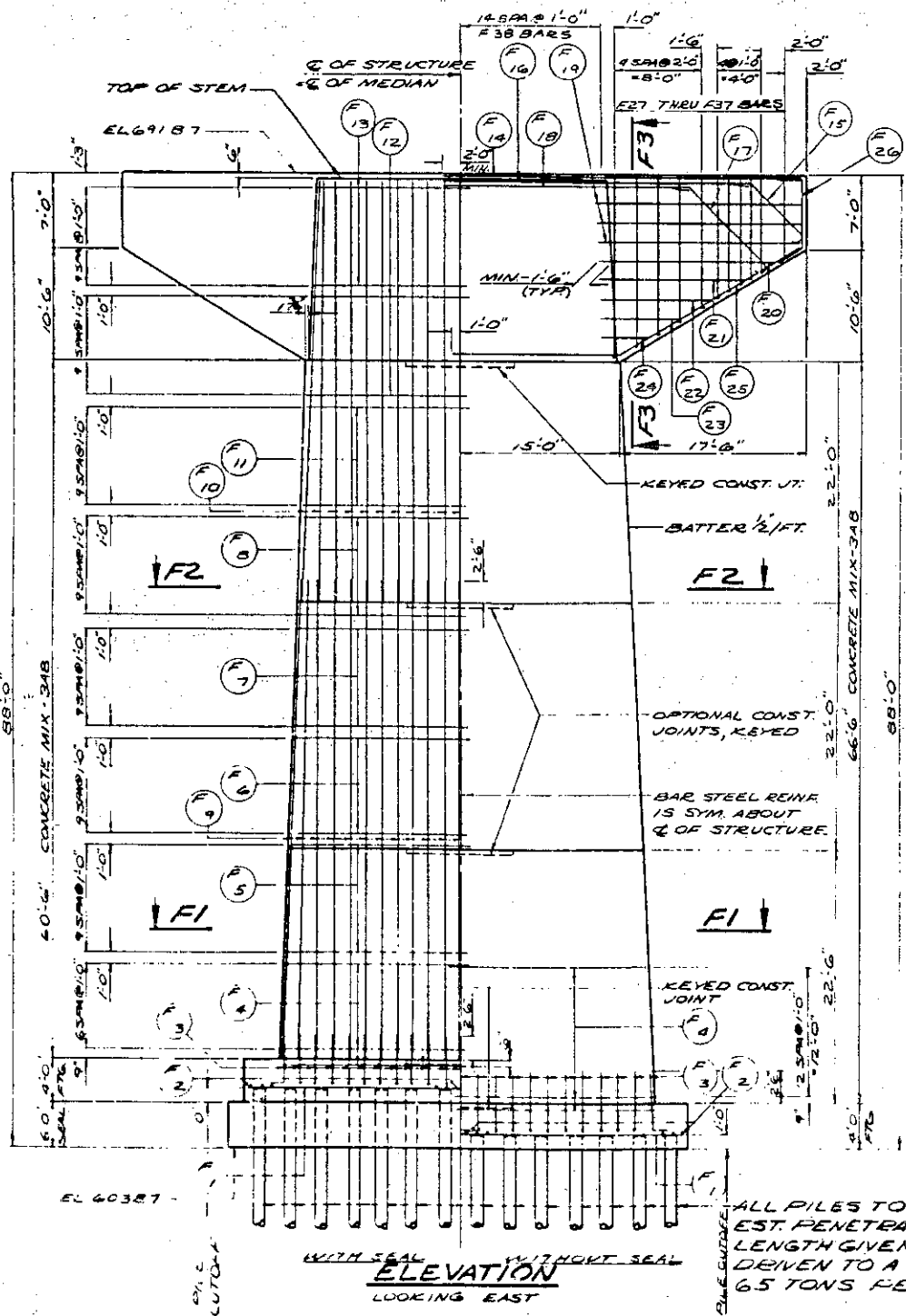
END VIEW

ELEVATION
LOOKING EAST

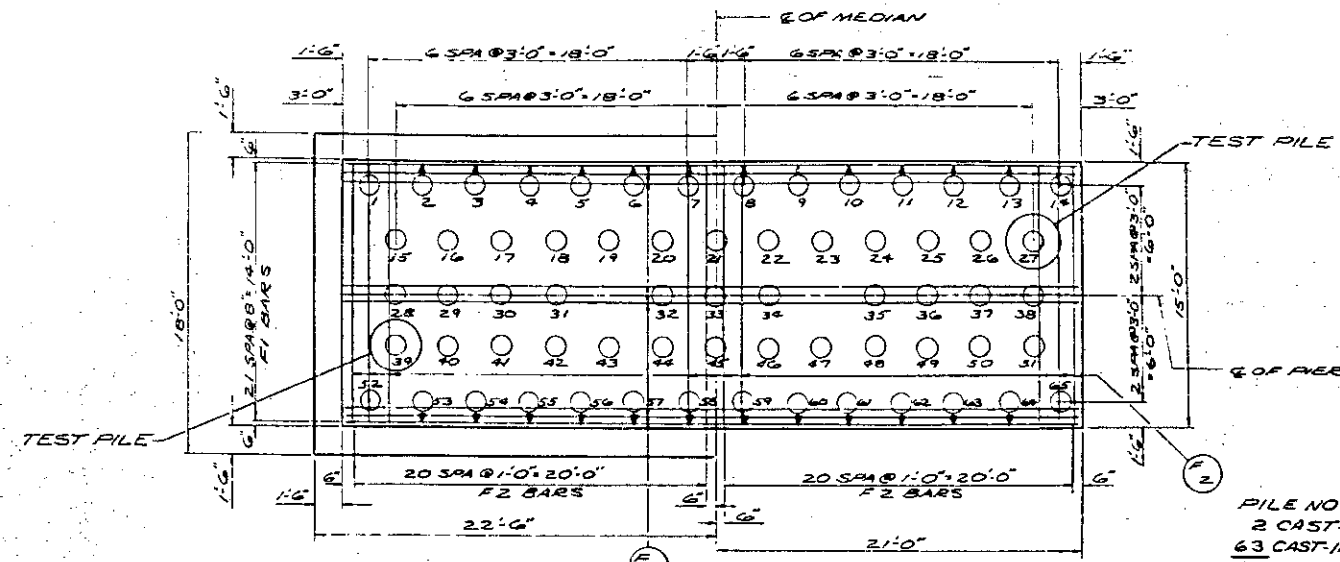


PLAN

FOOTINGS AND SEAL NOT SHOWN



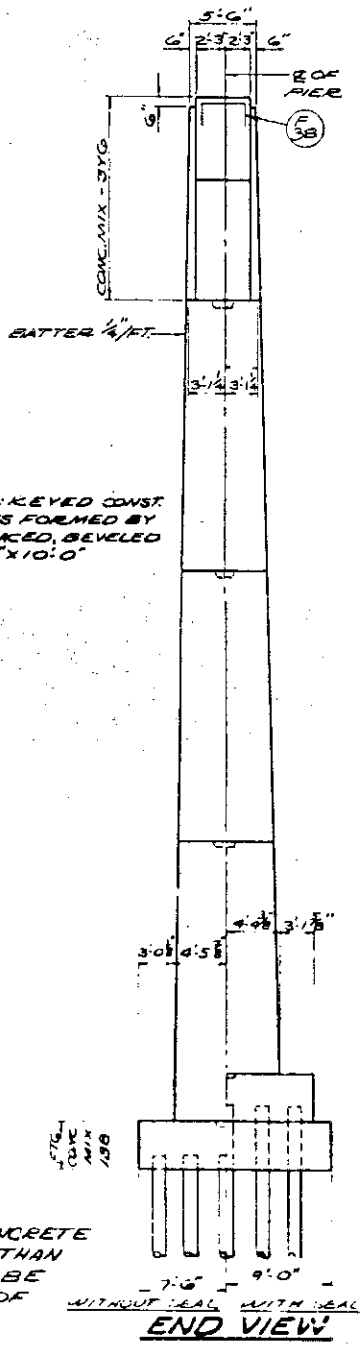
ELEVATION
LOOKING EAST



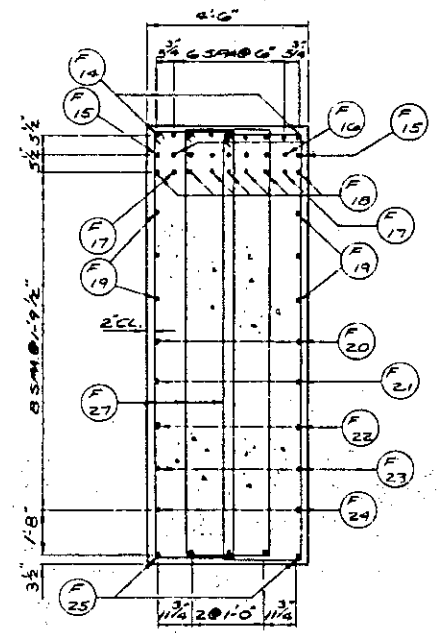
FOOTING PLAN

INDICATES BATTER OF 1/4"/FT. AND THE DIRECTION OF THE BATTERED PILES.
NOTE: PILE SPACING IS TAKEN AT BOTTOM OF FOOTING.

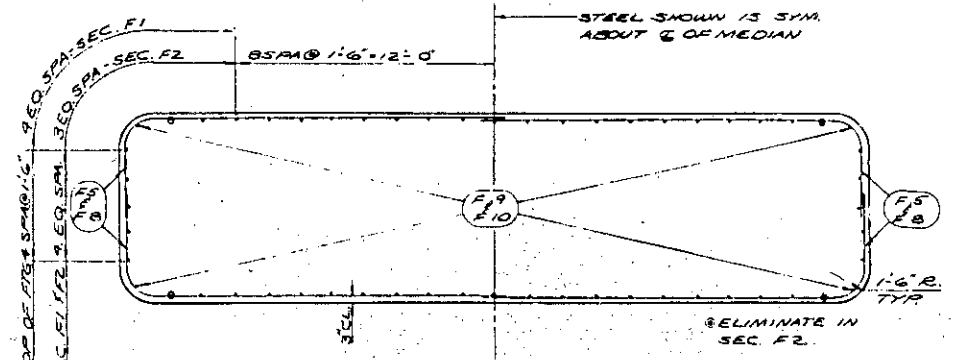
PILE NOTES:
2 CAST-IN-PLACE CONCRETE TEST PILES 100' LONG
63 CAST-IN-PLACE CONCRETE PILES EST. 70' LONG
65 CAST-IN-PLACE CONCRETE PILES REQ'D - PIER 5
PILE LENGTH IS COMPUTED TO LOWEST PILE CUTOFF REGARDLESS OF TYPE OF CONSTRUCTION.



END VIEW



SECTION F3
SPACE F2 @ 6" BARS WITH F25 BARS



SECTION F1 & F2
SPACE F3 BARS SAME AS F9 BARS
NOTE: ALL LAPS SHALL BE A MIN OF 24 DIAMETERS UNLESS OTHERWISE SHOWN OR NOTED.

ESTIMATED QUANTITIES (SID. ITEMS)
PIER CONSTRUCTION — 1 L.S.
CAST-IN-PLACE CONCRETE PILING DELIVERED — 4,410 L.F.
CAST-IN-PLACE CONCRETE TEST PILE 100' LONG — 2 PILE
* DOES NOT INCLUDE TEST PILES.

ESTIMATED CONCRETE MASONRY & BAR STEEL

CONCRETE MIX WITH SEAL		WITHOUT SEAL		CONCRETE MIX
1 X 1	SEAL — 180 CY	FOOTING — 91 CY		188
1 B B	FOOTING — 91 CY	STEM — 610 CY		348
3 A B	STEM — 547 CY	CAP — 183 CY		316
3 Y G	CAP — 183 CY	TOTAL	884 CY	
TOTAL		1001 CY		

BAR STEEL REINF. — 39,400 LB BAR STEEL REINF. — 41,200 LB

COMPUTED PILE LOADS	TYPE
DEAD LOAD	43
DEAD LOAD + LIVE LOAD	52
DEAD LOAD + WIND	65

ALL PILES TO BE 12 1/4" CIP CONCRETE EST. PENETRATION 1 FT. LESS THAN LENGTH GIVEN. ALL PILES TO BE DRIVEN TO A MIN. BEARING OF 6.5 TONS PER PILE.

STATE OF MINNESOTA
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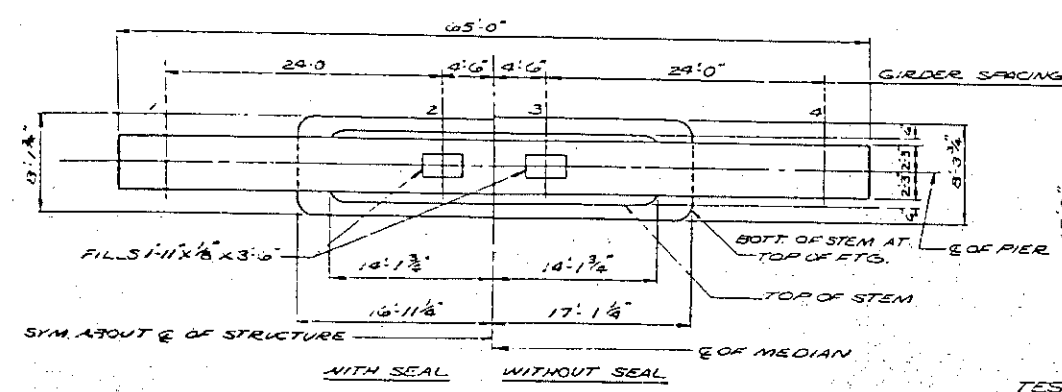
BRIDGE NO. 9320

PIER 5

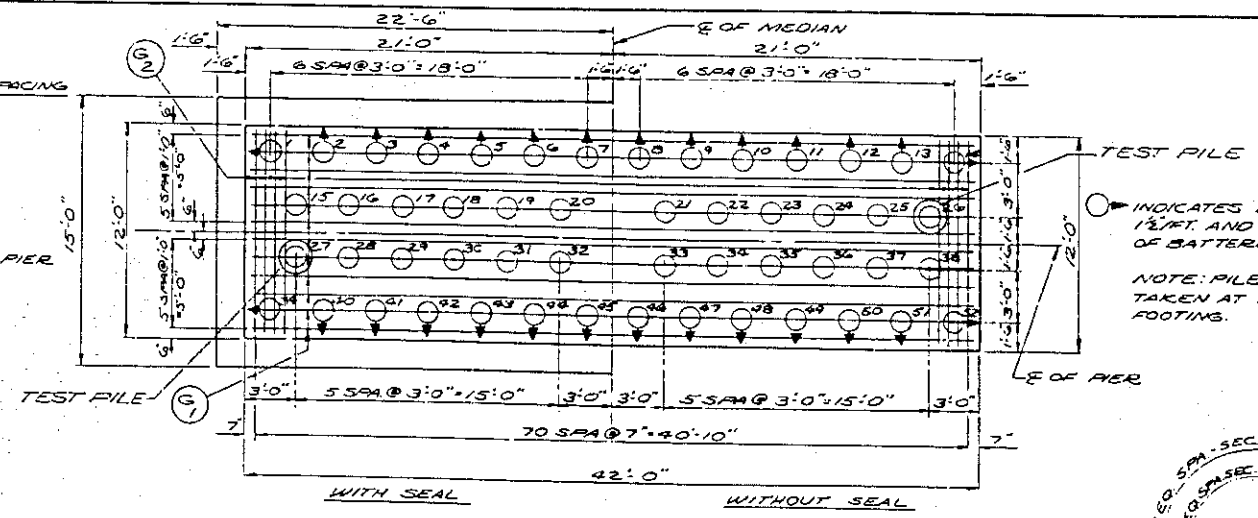
APPROVED 2-3-64

SHEET NO. 093 SHEETS 9320

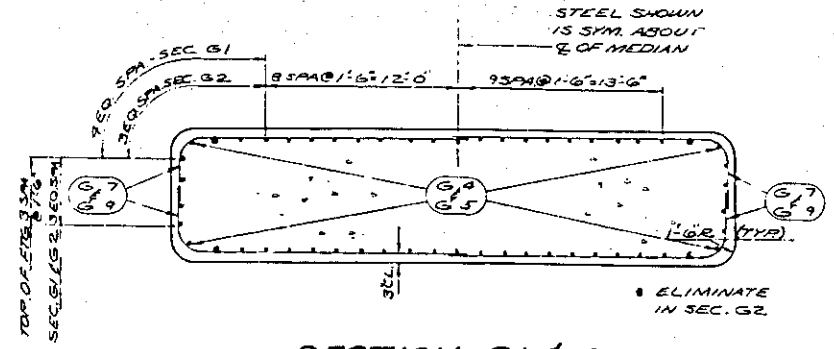
DIVISION	PROJECT	SHEET NO.	TOTAL SHEETS
4			



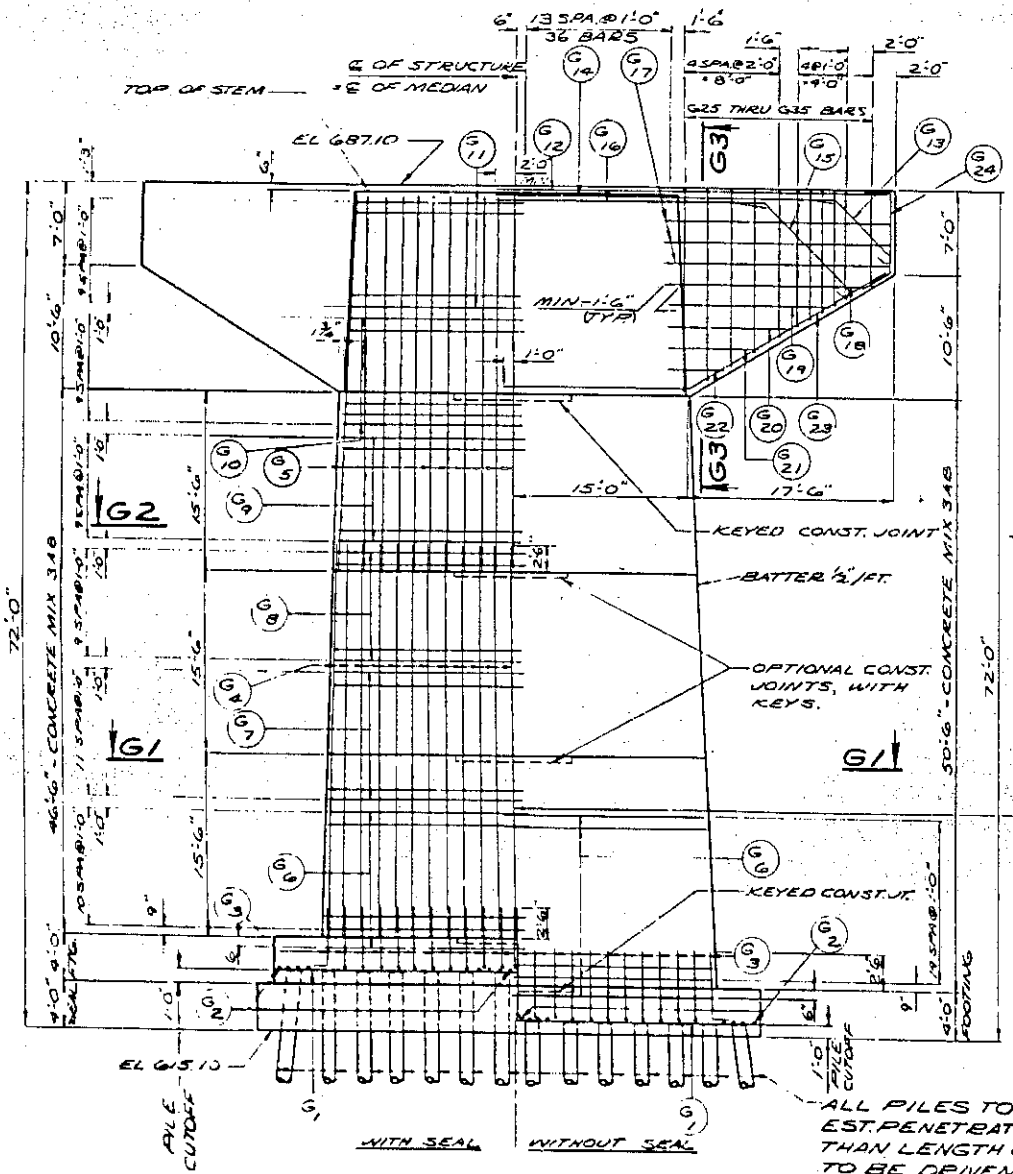
PLAN
FOOTING & SEAL NOT SHOWN



FOOTING PLAN



SECTION G1 & G2
SPACE G3 BARS SAME AS G4 BARS



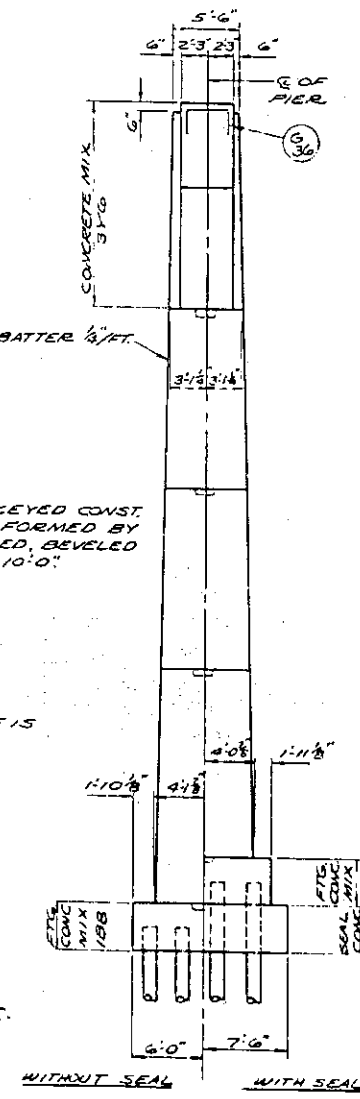
ELEVATION
LOOKING EAST

G2

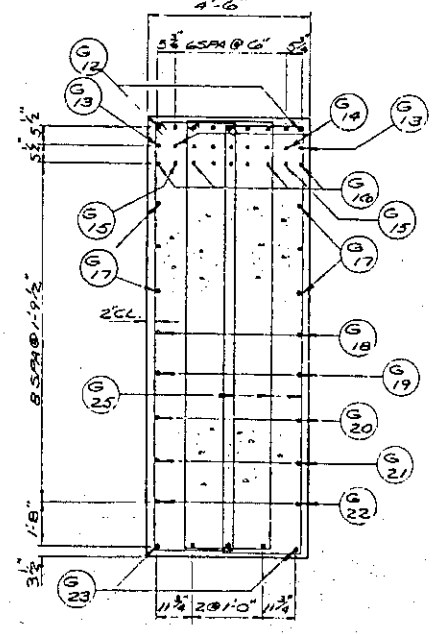
NOTE: KEYED CONST. JOINTS FORMED BY SURFACED, BEVELED 18" X 4" X 10" 0"

BAR STEEL REINF IS SYM ABOUT E OF STRUCTURE.

ALL PILES TO BE 12 3/4" C.I.P. CONC. EST. PENETRATION 1 FT. LESS THAN LENGTH GIVEN. ALL PILES TO BE DRIVEN TO A MINIMUM BEARING OF 65 TONS/PILE.



END VIEW



SECTION G3
SPACE G24 WITH G23 BARS

NOTE: ALL LAPS SHALL BE A MINIMUM OF 24 DIAMETERS UNLESS OTHERWISE SHOWN OR NOTED.

ESTIMATED QUANTITIES (BID ITEMS)

- PIER CONSTRUCTION _____ 1 L.S.
- † CAST-IN-PLACE CONCRETE PILING DELIVERED _____ 3500 L.F.
- CAST-IN-PLACE CONCRETE TEST PILE 100'-0" LONG - 2 PILE
- † DOES NOT INCLUDE TEST PILING

PILE NOTE:
2 C.I.P. CONCRETE TEST PILES 100 FT. LONG
50 C.I.P. CONCRETE PILES EST. 70 FT. LONG
52 C.I.P. CONCRETE PILES REQ'D FOR PIER G

NOTE:
PILE LENGTHS SHALL BE COMPUTED TO LOWEST PILE CUTOFF REGARDLESS OF TYPE OF CONSTRUCTION

ESTIMATED CONCRETE MASONRY & BAR STEEL

CONCRETE MIX	WITH SEAL	WITHOUT SEAL	CONCRETE MIX
1 X 1	SEAL — 92 C.Y.	FOOTING — 73 C.Y.	188
1 B	FOOTING — 73 C.Y.	STEM — 433 C.Y.	348
3 A	STEM — 392 C.Y.	CAP — 183 C.Y.	346
3 Y	CAP — 183 C.Y.	TOTAL — 689 C.Y.	
	TOTAL — 740 C.Y.		

BAR STEEL REINF. — 34,610 LB. BAR STEEL REINF. — 35,770 LB.

COMPUTED PILE LOADS	/PILE
DEAD LOAD	46
DEAD LOAD + LIVE LOAD	56
DEAD LOAD + WIND	57

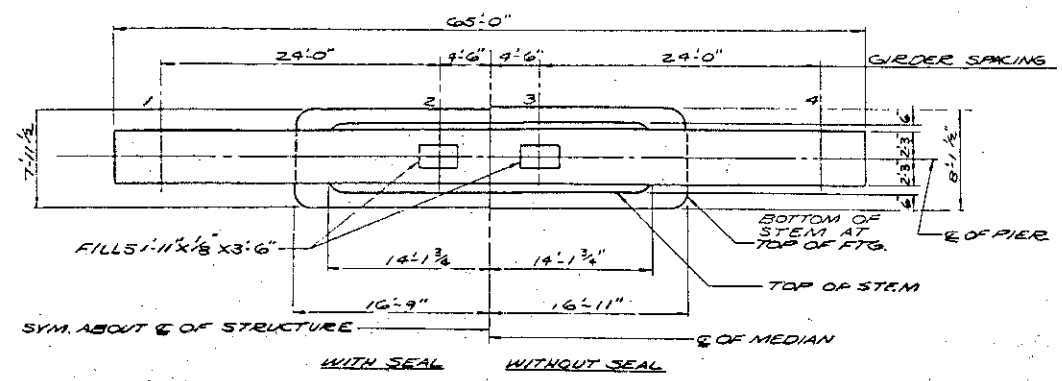
STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320

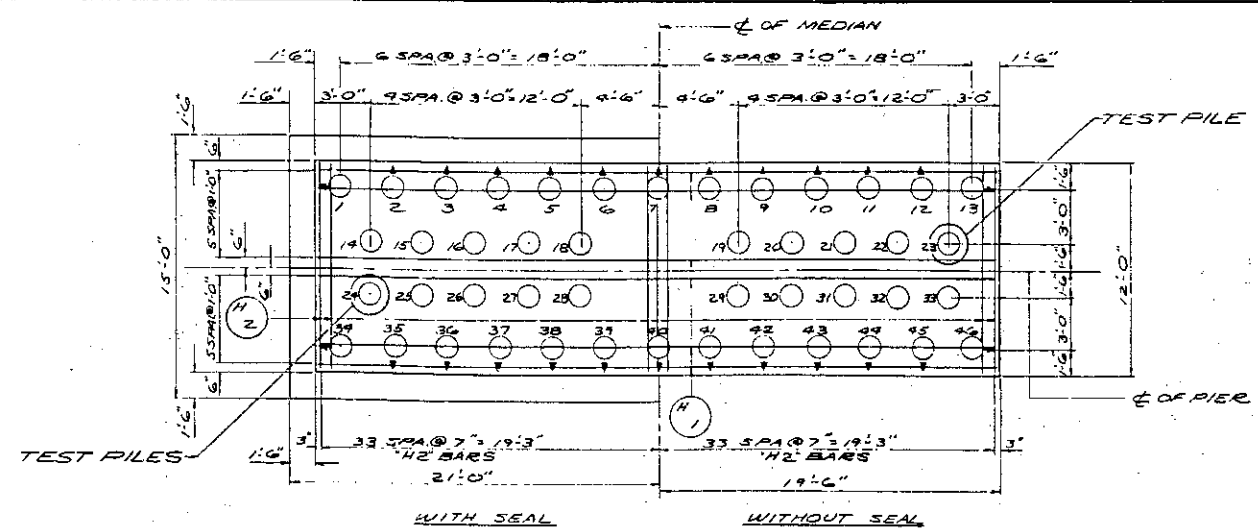
PIER 6

APPROVED 5-2-64

SHEET NO. 12 OF 93 SHEETS 9320



PLAN
FOOTING AND SEAL NOT SHOWN

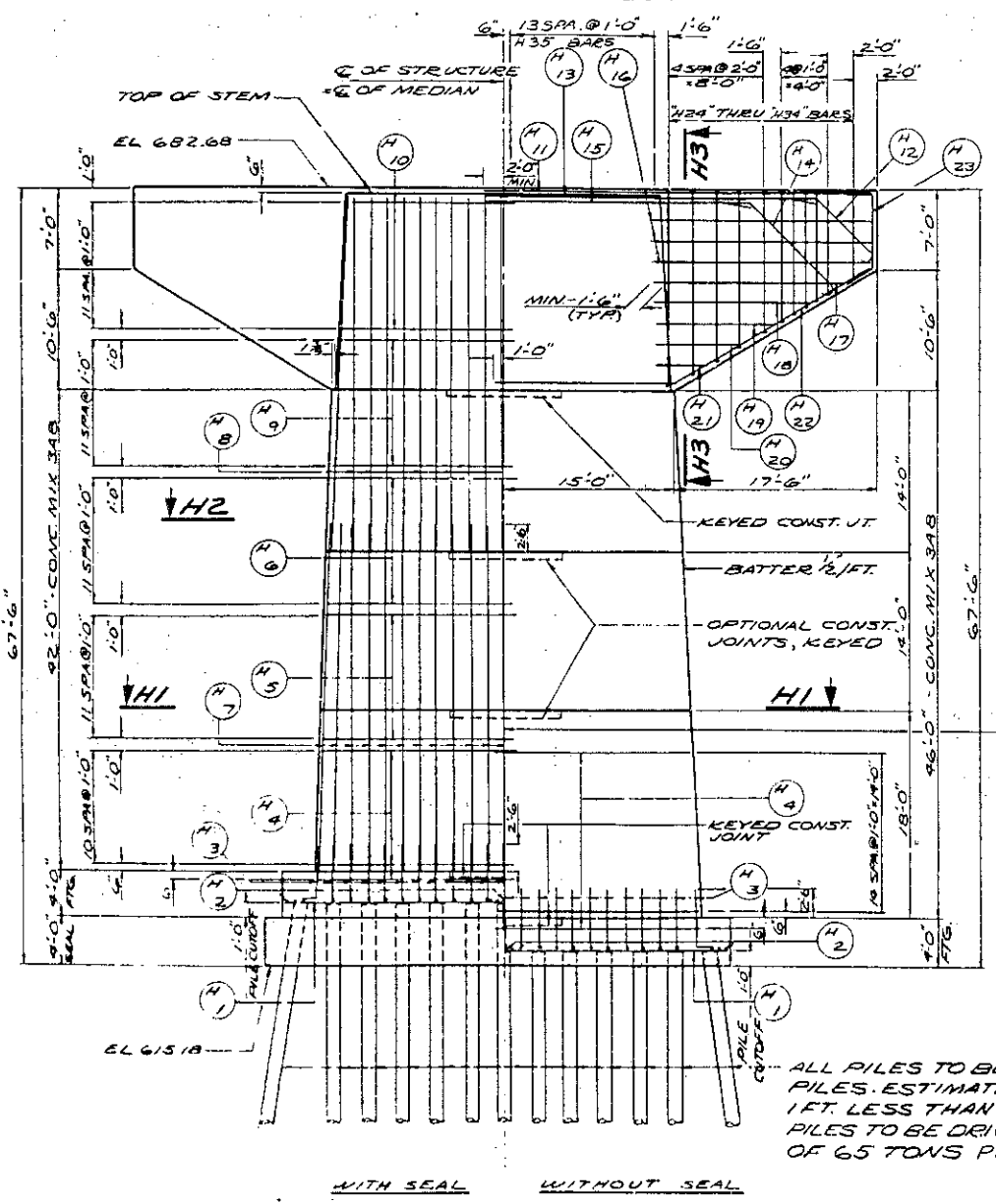


FOOTING PLAN

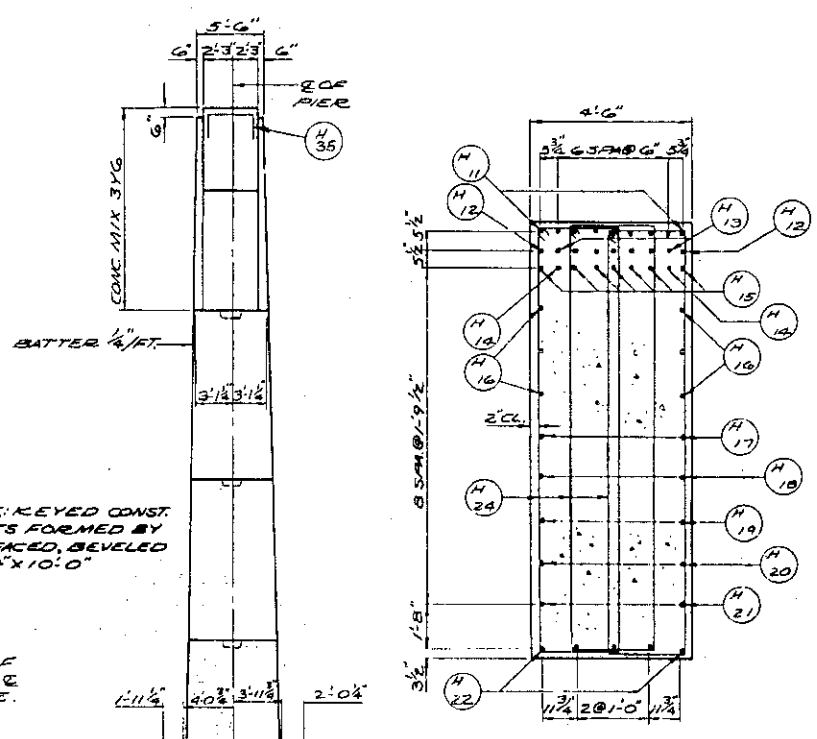
INDICATES BATTER OF 1/4" FT. AND THE DIRECTION OF THE BATTERED PILES.
NOTE: PILE SPACING IS TAKEN AT BOTTOM OF FOOTING.

NOTE: PILE LENGTH IS COMPUTED TO LOWEST PILE CUTOFF REGARDLESS OF TYPE OF CONSTRUCTION.

FILE NOTES:
2 C.I.P. CONCRETE TEST PILES 100 FT. LONG
44 C.I.P. CONCRETE PILES EST. 70 FT. LONG
76 C.I.P. CONCRETE PILES REQ'D FOR PIER 7



ELEVATION
LOOKING EAST

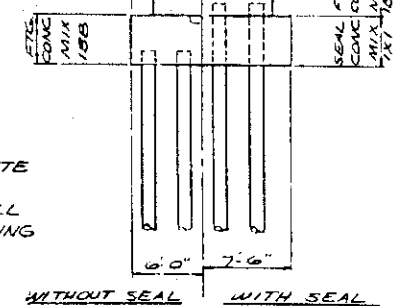


SECTION H1 & H2
SPACE H3 BARS SAME AS H7 BARS

SECTION H3

NOTE: KEYED CONST. JOINTS FORMED BY SURFACED, BEVELED 18" X 10" X 10"

ALL PILES TO BE 12 3/4" C.I.P. CONCRETE PILES. ESTIMATED PENETRATION 1 FT. LESS THAN LENGTH GIVEN. ALL PILES TO BE DRIVEN TO A MIN. BEARING OF 65 TONS PER PILE.



PLAN

ESTIMATED QUANTITIES (BID ITEMS)

PIER CONSTRUCTION _____ 1 L.S.
1 CAST-IN-PLACE CONCRETE PILING DELIVERED _____ 3,080 L.F.
CAST-IN-PLACE CONCRETE TEST PILE 100'-0" LONG - 2 PILE
1 DOES NOT INCLUDE TEST PILING

ESTIMATED CONCRETE MASONRY & BAR STEEL

CONCRETE MIX	WITH SEAL	WITHOUT SEAL	CONCRETE MIX
1 X 1	SEAL --- 86 CY	FOOTING --- 68 CY	1 B B
1 B B	FOOTING --- 68 CY	STEM --- 387 CY	3 A B
3 A B	STEM --- 347 CY	CAP --- 183 CY	3 Y G
3 Y G	CAP --- 183 CY	TOTAL	638 CY
	TOTAL		684 CY

BAR STEEL REINF. _____ 30,680 LB. BAR STEEL REINF. _____ 31,780 LB.

COMPUTED PILE LOADS	T/PILE
DEAD LOAD	48
DEAD LOAD + LIVE LOAD	62
DEAD LOAD + WIND	57

STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

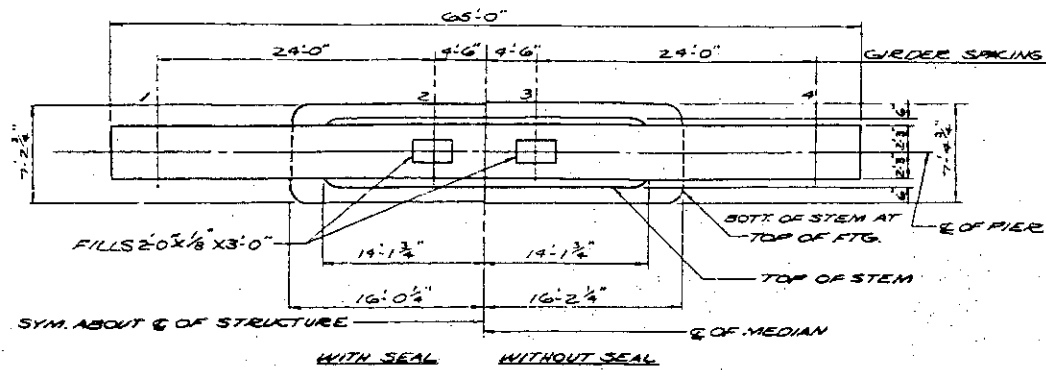
BRIDGE NO. 9320

PIER 7

APPROVED 3-10-44

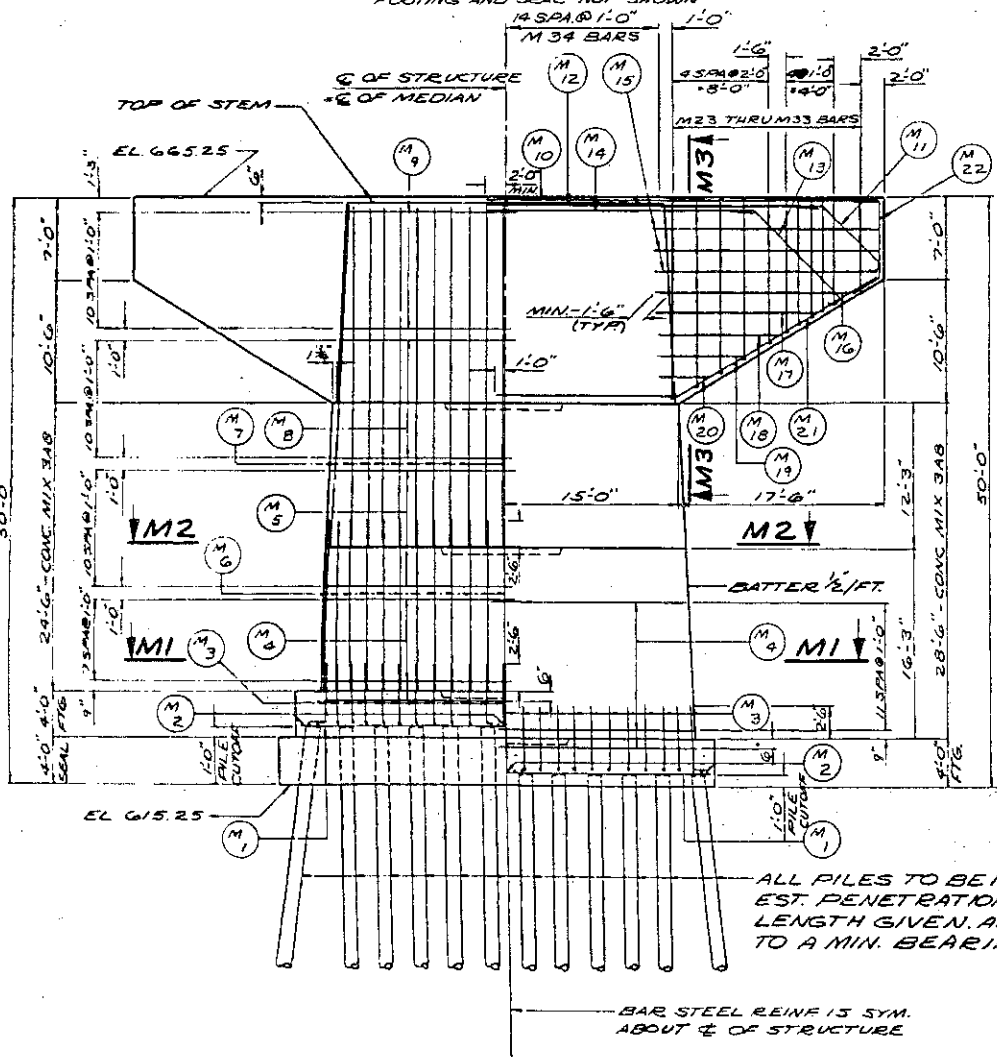
SHEET NO. 30 OF 93 SHEETS 9320

PROJECT	SHEET NUMBER	TOTAL SHEETS

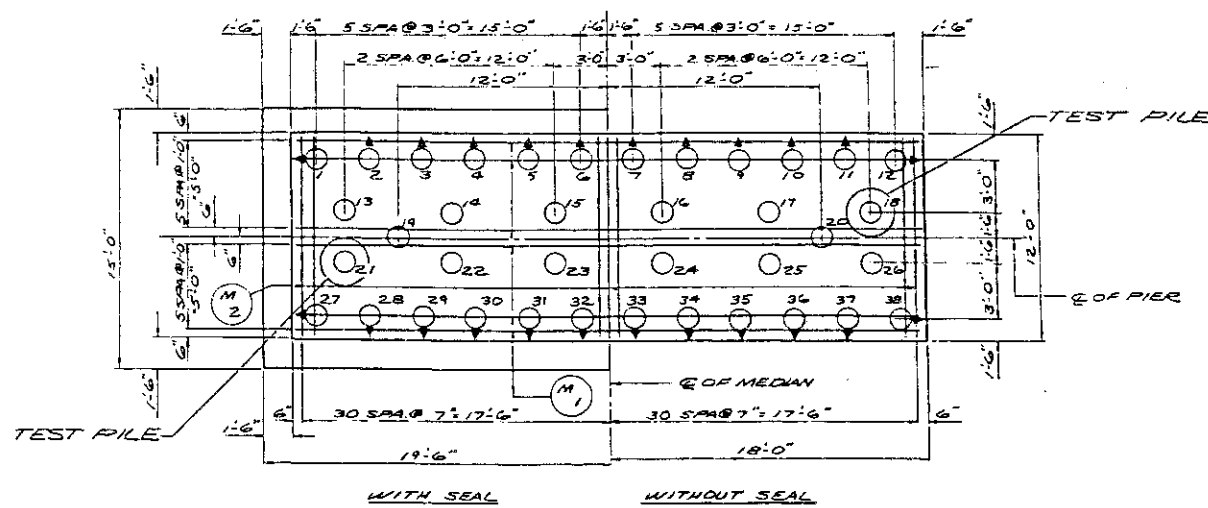


PLAN

FOOTING AND SEAL NOT SHOWN
14 SPA @ 1'-0" 1'-0"



ELEVATION
LOOKING EAST

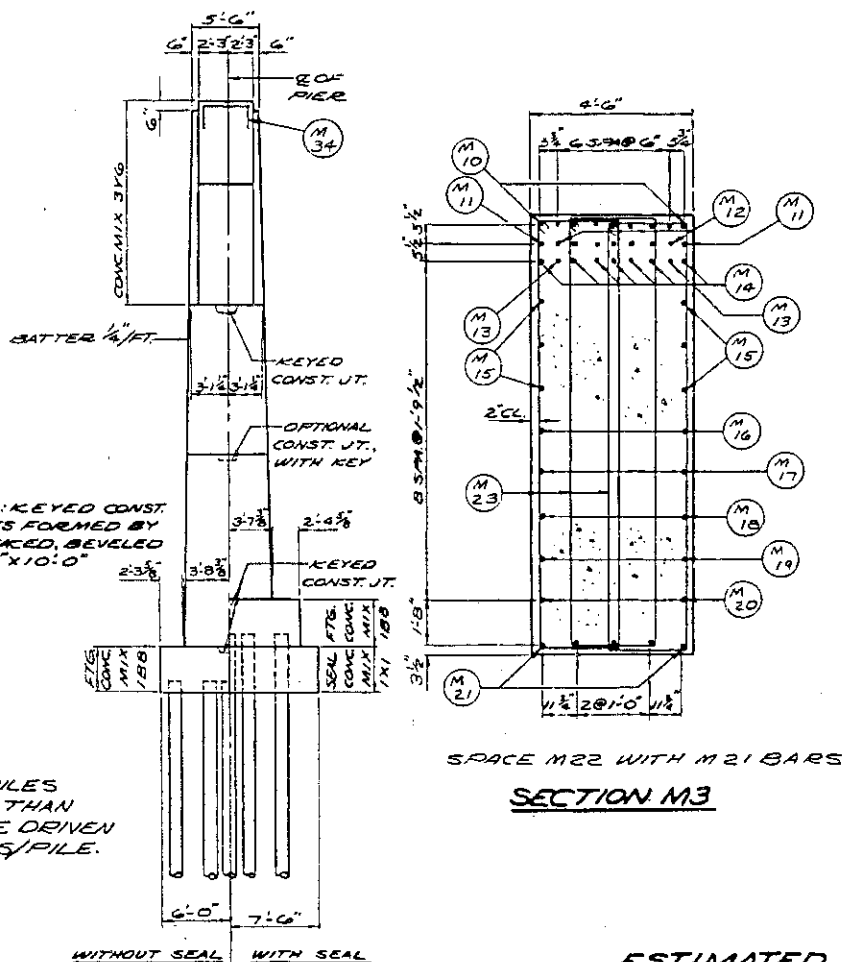


FOOTING PLAN

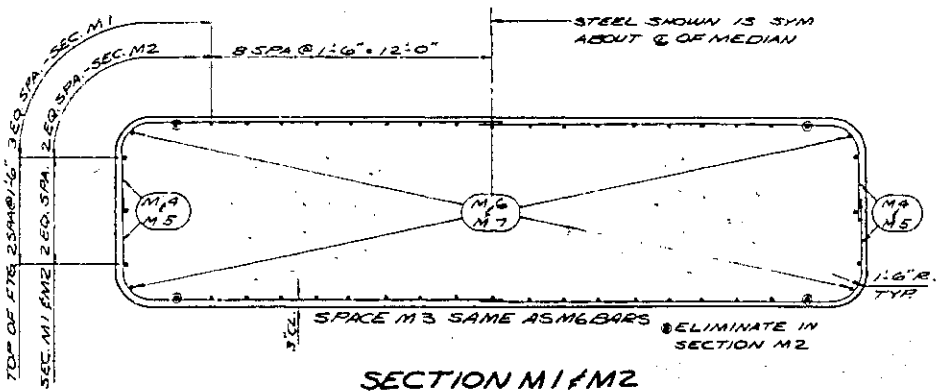
INDICATES BATTER OF 1/4" / FT. AND THE DIRECTION OF THE BATTERED PILES.
NOTE: PILE SPACING IS TAKEN AT BOTTOM OF FOOTING.

NOTE: PILE LENGTH IS COMPUTED TO LOWEST PILE CUTOFF REGARDLESS OF TYPE OF CONSTRUCTION.

FILE NOTES:
2 C.I.P. CONC. TEST PILES 100 FT. LONG
36 C.I.P. CONC. PILES EST. 70 FT. LONG
38 C.I.P. CONC. PILES REQ'D. FOR PIER 11



END VIEW



SECTION M1/M2

NOTE: ALL LAPS SHALL BE A MIN. OF 24 DIAMETERS UNLESS OTHERWISE SHOWN OR NOTED.

ESTIMATED QUANTITIES (BID ITEMS)

PIER CONSTRUCTION _____ L.F.
† CAST-IN-PLACE CONCRETE PILING DELIVERED 2,520 L.F.
CAST-IN-PLACE CONCRETE TEST PILE 100'-0" LONG - 2 PILE
† DOES NOT INCLUDE TEST PILES

ESTIMATED CONCRETE MASONRY & BAR STEEL

CONCRETE MIX WITH SEAL		WITHOUT SEAL		CONCRETE MIX
1X1	SEAL - 81 CY	FOOTING	63 CY	188
1B8	FOOTING - 63 CY	STEM	222 CY	3A8
3A8	STEM - 188 CY	CAP	183 CY	3YG
3YG	CAP - 183 CY	TOTAL	468 CY	
TOTAL 515 CY				
BAR STEEL REINF. 25,380 LB.		BAR STEEL REINF. 26,420 LB.		

COMPUTED FILE LOADS	T/PILE
DEAD LOAD	47
DEAD LOAD + LIVE LOAD	63
DEAD LOAD + WIND	65

STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

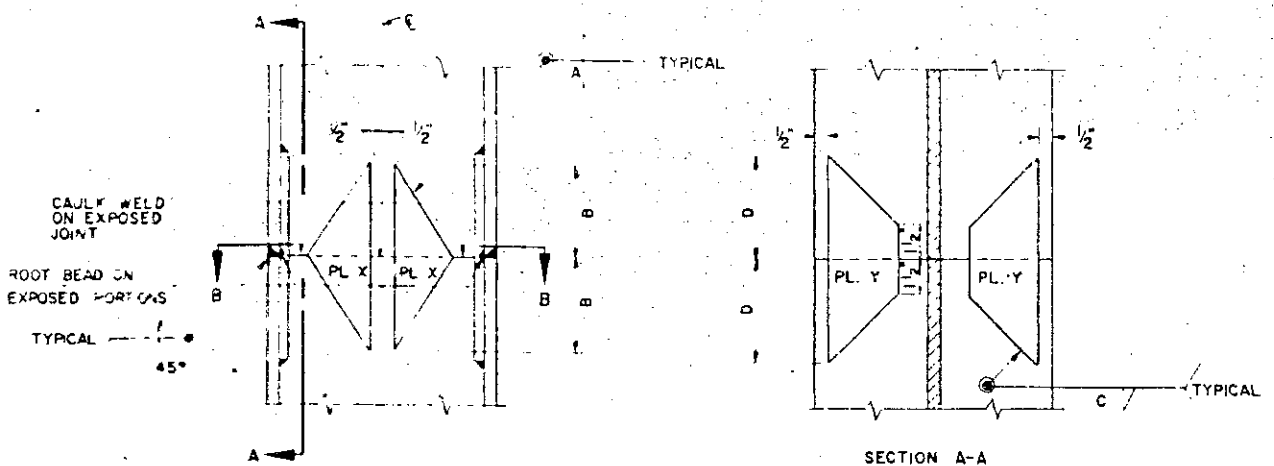
BRIDGE NO. 9320

PIER 11

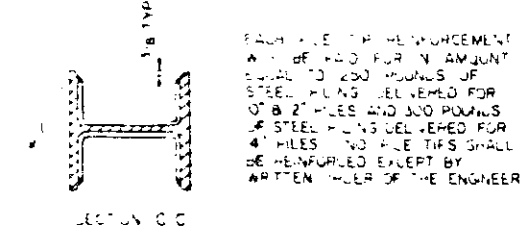
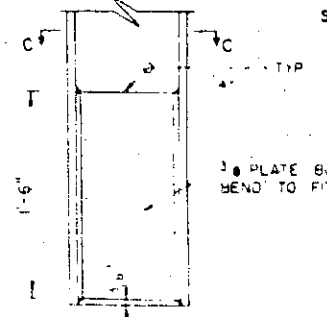
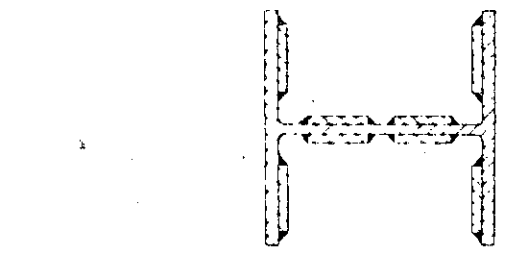
APPROVED 5-10-64

SHEET NO. 17 OF 93 SHEETS **9320**

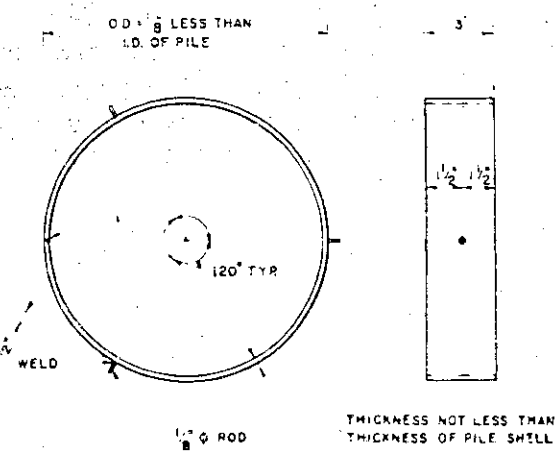
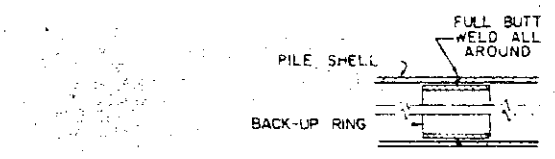
DESIGNED BY: M.M.C.
DRAWN BY: J.N.S.
CHECKED BY: G.H.Z.



PILE SECTION	PLATE X SIZE	A		PLATE Y SIZE	C		D
		1/4	4		3/8	4	
10BP42	2 1/2 x 3/8	1/4	4	3 x 3/8	3/8	4	
10BP57	2 1/2 x 1/2	5/16	4	3 x 1/2	5/16	5	
12BP53	3 1/2 x 3/8	1/4	5	4 x 3/8	5/16	5	
12BP74	3 1/2 x 1/2	5/16	6	4 x 1/2	5/16	6	
14BP73	4 1/2 x 3/8	1/4	7	5 x 3/8	5/16	6	
14BP89	4 1/2 x 1/2	5/16	7	5 x 1/2	5/16	7	
14BP102	4 1/2 x 1/2	5/16	7	5 x 9/16	3/8	7	
14BP117	4 1/2 x 9/16	3/8	7	5 x 5/8	3/8	8	



NOTES:
 PILE ENDS AT SPLICE TO BE SQUARE.
WELDING SEQUENCE
A PILES SPLICED ON SKIDS BEFORE DRIVING.
 1. BUTT WELD FLANGES
 2. WELD WEB SPLICE PLATES
 3. WELD FLANGE SPLICE PLATES
 4. MAKE CAULK WELDS & ROOT BEADS.
B PILES SPLICED IN LEADS
 1. WELD SPLICE PLATES TO EXTENSION BEFORE ASSEMBLY.
 2. CLAMP SECTIONS TOGETHER AND HOLD RIGID.
 3. BUTT WELD FLANGES.
 4. WELD SPLICE PLATES TO DRIVEN SECTION.
 5. MAKE CAULK WELDS & ROOT BEADS.
WELDING ELECTRODE M.H.D. 3339.
CLASSIFICATION A S T M E 6010.
 FOR USE WITH DC, REVERSE POLARITY (ELECTRODE POSITIVE) ONLY
CLASSIFICATION A S T M E 6012.
 FOR USE WITH DC STRAIGHT POLARITY (ELECTRODE NEGATIVE), OR AC
 ALL WELDING AS PER M.H.D. 2471.3J
 ALL MATERIAL SHALL CONFORM TO M.H.D. 3305.



ALL STRUCTURAL STEEL AS PER M.H.D. 3305
 ALL WELDING AS PER M.H.D. 2471.3J

STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS
 SPLICES FOR CAST IN PLACE CONCRETE PILES
 REVISIONS DETAIL NO. 6/2/59 1/17/64 B 220

APPROVED: 10/22/58
 STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS
 BRIDGE ENGINEER
 REVISIONS
 6-2-59
 7-31-62
 2-2-63
 DETAIL NO. B 221
 SPLICES FOR STEEL H BEARING PILES & PILE TIP REINFORCEMENT 10" TO 14"

STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS
 BRIDGE NO. 9320
 PILE SPLICE DETAILS
 10-64

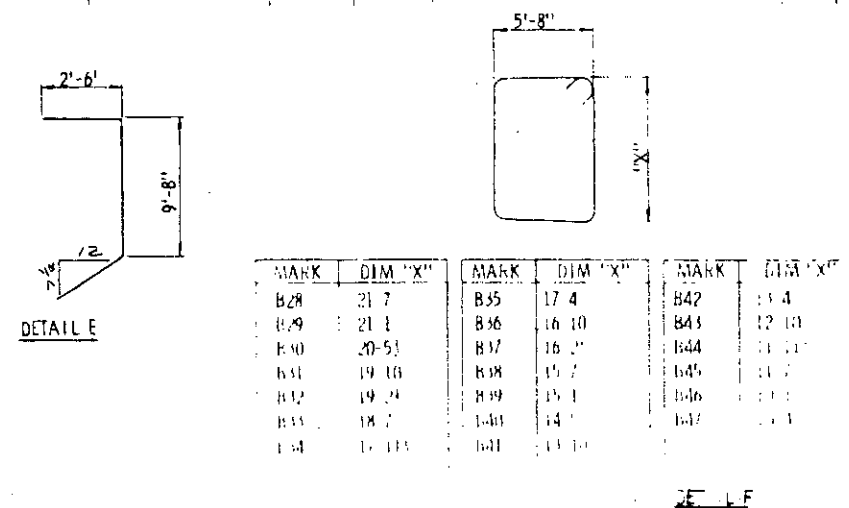
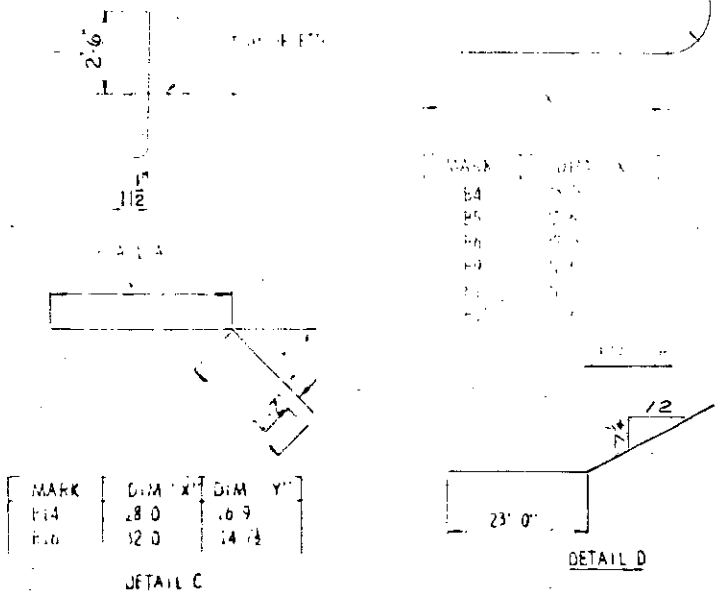
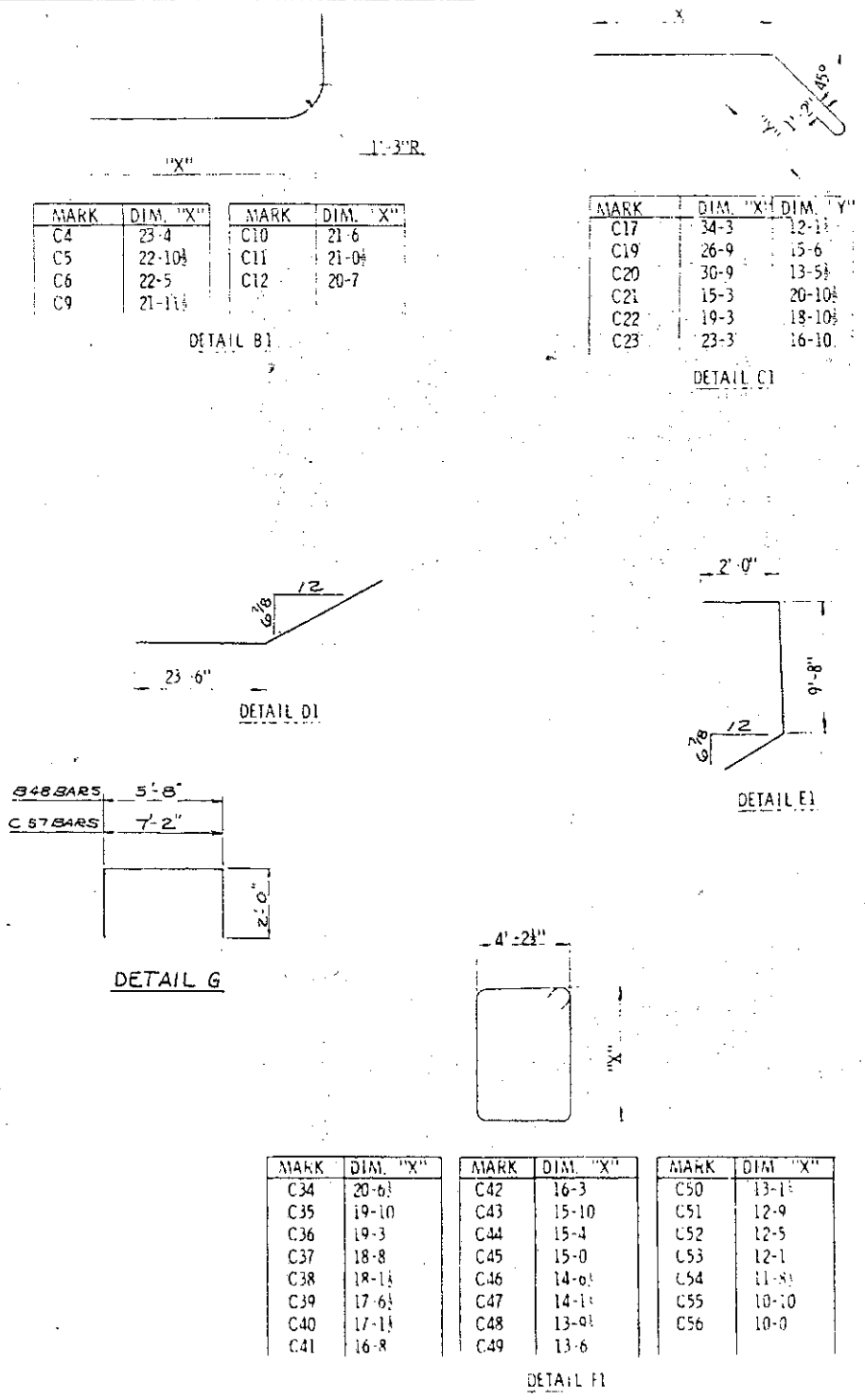
47,500#

PIER 2

82,530#

Mark	No.	Size	Length	Spacing	Location	Det.
B 1	15				FOOTING - TRANSVERSE	
B 2	14				FOOTING - LONGITUDINAL	
B 3	6-3				FOOTING - DOWEL BARS	A
B 4	52				STEM - HOOPS	B1
B 5	4				"	B1
B 6	4				"	B1
B 7	4				STEM - VERTICAL BARS	B
B 8	4				"	B
B 9	4				HOOPS	B
B 10	4				"	B
B 11	4				"	B
B 12	4				TOP OF CAP	B
B 13	4				"	B
B 14	4				"	C
B 15	4				"	C
B 16	4				"	C
B 17	4				"	C
B 18	4				ENDS OF CAP	E
B 19	4				BOTTOM OF CAP	D
B 20	4				SIDES OF CAP	D
B 21	4				"	D
B 22	4				"	D
B 23	4				"	D
B 24	4				"	D
B 25	4				"	D
B 26	4				"	D
B 27	4				"	D
B 28	2				CAP STIRRUPS	F
B 29	2				"	F
B 30	2				"	F
B 31	2				"	F
B 32	2				"	F
B 33	2				"	F
B 34	2				"	F
B 35	2				"	F
B 36	2				"	F
B 37	2				"	F
B 38	2				"	F
B 39	2				"	F
B 40	2				"	F
B 41	2				"	F
B 42	2				"	F
B 43	2				"	F
B 44	2				"	F
B 45	2				"	F
B 46	2				"	F
B 47	2				"	F
B 48	4				"	G

Mark	No.	Size	Length	Spacing	Location	Det.
C 1	23	9	51-6	11	FOOTING - TRANSVERSE	
C 2	62	9	20-6	10	FOOTING - LONGITUDINAL	
C 3	80	10	8-3	SHOWN	FOOTING - DOWEL BARS	A
C 4	48	4	31-0	1-0	STEM - HOOPS	B1
C 5	44	4	30-3	1-0	"	B1
C 6	44	4	29-6	1-0	"	B1
C 7	30	10	42-6	SHOWN	STEM - VERTICAL BARS	B
C 8	76	10	37-3	SHOWN	"	B
C 9	44	4	28-6	1-0	STEM - HOOPS	B1
C 10	44	4	27-9	1-0	"	B1
C 11	44	4	27-0	1-0	"	B1
C 12	44	4	26-3	1-0	"	B1
C 13	30	11	43-0	SHOWN	TOP OF CAP	
C 14	14	11	43-0	"	"	
C 15	16	11	36-6	"	"	
C 16	26	11	34-3	"	"	
C 17	4	11	48-0	"	"	C1
C 18	22	11	30-9	"	"	C1
C 19	4	11	44-0	"	"	C1
C 20	4	11	46-0	"	"	C1
C 21	4	11	37-9	"	"	C1
C 22	4	11	39-9	"	"	C1
C 23	4	11	41-9	"	"	C1
C 24	16	5	21-9	"	SIDES OF CAP	
C 25	4	5	20-9	"	"	
C 26	4	5	18-0	"	"	
C 27	4	5	15-3	"	"	
C 28	4	5	12-6	"	"	
C 29	4	5	10-0	"	"	
C 30	4	5	7-3	"	"	
C 31	4	5	4-9	"	"	
C 32	12	8	45-3	"	BOTTOM OF CAP	D1
C 33	12	8	13-9	"	ENDS OF CAP	E1
C 34	6	6	50-9	"	CAP - STIRRUPS	F1
C 35	6	6	49-3	"	"	F1
C 36	6	6	48-0	"	"	F1
C 37	6	6	47-0	"	"	F1
C 38	6	6	45-9	"	"	F1
C 39	6	6	44-9	"	"	F1
C 40	6	6	43-9	"	"	F1
C 41	6	6	43-0	"	"	F1
C 42	6	6	42-0	"	"	F1
C 43	6	6	41-3	"	"	F1
C 44	6	6	40-3	"	"	F1
C 45	6	6	39-6	"	"	F1
C 46	6	6	38-9	"	"	F1
C 47	6	6	38-0	SHOWN	CAP - STIRRUPS	F1
C 48	6	6	37-3	"	"	F1
C 49	6	6	36-6	"	"	F1
C 50	6	6	35-9	"	"	F1
C 51	6	6	35-0	"	"	F1
C 52	6	6	34-6	"	"	F1
C 53	6	6	33-9	"	"	F1
C 54	6	6	33-0	"	"	F1
C 55	6	6	31-3	"	"	F1
C 56	6	6	29-6	"	"	F1
C 57	42	6	11-3	"	"	G



STATE OF MICHIGAN
DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320

BILL OF BARS PIERS 1 & 2

APPROVED 9-10-64

Sheet 19 of 93 sheets **9320**

PIER 3

79,210#

Mark	No.	Size	Length	Spacing	Location	Det.
D 1	4	9	48-6	1-0	FOOTING - TRANSVERSE	
D 2	97	11	23-6	6	FOOTING - LONGITUDINAL	
D 3	72	10	8-3	SHOWN	FOOTING - DOWEL BARS	A
D 4	48	4	27-6	1-0	STEM - HOOPS	B
D 5	48	4	26-9	1-0	"	B
D 6	44	4	25-9	1-0	"	B
D 7	72	10	41-6	SHOWN	" - VERT.	
D 8	58	10	39-9	SHOWN	" - VERT.	
D 9	44	4	25-0	1-0	" - HOOPS	B
D10	44	4	24-3	1-0	"	B
D11	44	4	23-6	1-0	"	B
D12	44	4	22-9	1-0	"	B
D13	30	11	38-3	SHOWN	TOP OF CAP	
D14	26	11	33-6	SHOWN	"	
D15	4	11	41-9	SHOWN	"	C
D16	26	11	29-6	"	"	
D17	4	11	43-0	"	"	C
D18	4	11	36-0	"	"	C
D19	4	11	38-3	"	"	C
D20	4	11	40-3	"	"	C
D21	4	11	41-9	"	"	C
D22	20	8	20-6	"	SIDES OF CAP	
D23	4	8	19-3	"	"	
D24	4	8	16-3	"	"	
D25	4	8	13-9	"	"	
D26	4	8	11-0	"	"	
D27	4	8	8-6	"	"	
D28	4	8	5-9	"	"	
D29	12	8	40-6	"	BOTTOM OF CAP	D
D30	12	8	14-6	"	ENDS OF CAP	E
D31	6	6	30-3	"	CAP - STIRRUPS	F
D32	6	6	31-9	"	"	F
D33	6	6	32-6	"	"	F
D34	6	6	33-0	"	"	F
D35	6	6	33-9	"	"	F
D36	6	6	34-9	"	"	F
D37	6	6	35-6	"	"	F
D38	6	6	36-3	"	"	F
D39	6	6	36-9	"	"	F
D40	6	6	37-9	"	"	F
D41	6	6	38-6	"	"	F
D42	6	6	39-6	"	"	F
D43	6	6	40-6	"	"	F
D44	6	6	41-0	"	"	F
D45	6	6	42-3	"	"	F
D46	6	6	43-6	"	"	F
D47	6	6	44-9	"	"	F
D48	6	6	46-3	"	"	F
D49	6	6	47-6	"	"	F
D50	6	6	49-6	"	"	F
D51	35	6	11-3	"	"	G

PIER 4

43,640#

Mark	No.	Size	Length	Spacing	Location	Det.
E 1	15	6	44-6	11	FOOTING - TRANSVERSE	
E 2	45	6	13-0	1-0	FOOTING - LONGITUDINAL	
E 3	64	10	6-3	SHOWN	FOOTING - DOWEL BARS	A
E 4	44	4	25-6	1-0	STEM - HOOPS	B1
E 5	44	4	25-0	1-0	"	B1
E 6	44	4	24-3	1-0	"	B1
E 7	44	4	23-6	1-0	"	B1
E 8	64	10	24-9	SHOWN	STEM - VERT.	
E 9	64	10	24-9	"	"	
E10	60	10	42-3	"	"	
E11	44	4	22-9	1-0	STEM - HOOPS	B1
E12	44	4	22-3	1-0	"	B1
E13	44	4	21-6	1-0	"	B1
E14	44	4	20-9	1-0	"	B1
E15	16	11	36-9	SHOWN	TOP OF CAP	
E16	4	10	41-0	"	"	C1
E17	12	10	30-3	"	"	C1
E18	4	10	41-0	"	"	
E19	12	10	26-0	"	"	
E20	16	6	19-9	"	SIDES OF CAP	
E21	4	6	18-3	"	"	
E22	4	6	15-0	"	"	
E23	4	6	11-9	"	"	
E24	4	6	8-6	"	"	
E25	4	6	5-3	"	"	
E26	8	6	39-0	"	BOTTOM OF CAP	D1
E27	8	6	12-9	"	ENDS OF CAP	E1
E28	2	4	52-6	1-6	CAP - STIRRUPS	F1
E29	2	4	50-6	1-6	"	F1
E30	2	4	48-9	1-6	"	F1
E31	2	4	47-0	1-6	"	F1
E32	2	4	45-3	1-6	"	F1
E33	2	4	43-3	1-6	"	F1
E34	2	4	41-6	1-6	"	F1
E35	2	4	39-9	1-6	"	F1
E36	2	4	38-0	1-6	"	F1
E37	2	4	36-3	1-6	"	F1
E38	2	4	34-6	1-6	"	F1
E39	2	4	33-3	1-6	"	F1
E40	32	6	9-9	SHOWN	"	G

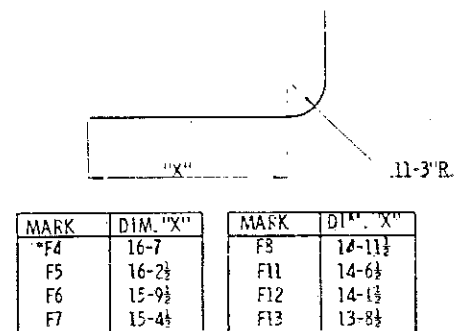
PIER 5 WITH SEAL

39,400#

Mark	No.	Size	Length	Spacing	Location	Det.
F 1	22	6	41-6	8	FOOTING TRANSVERSE	
F 2	42	9	14-6	1-0	FOOTING - LONGITUDINAL	
F 3	56	10	6-3	SHOWN	FOOTING DOWEL BARS	A
F 4	32	4	22-0	1-0	STEM-HOOPS (WITH SEAL)	B2
F 5	40	4	21-6	1-0	"	B2
F 6	40	4	20-9	1-0	"	B2
F 7	40	4	20-3	1-0	"	B2
F 8	40	4	19-6	1-0	"	B2
F 9	56	10	41-0	SHOWN	STEM-VERT. (WITH SEAL)	
F10	52	10	38-9	SHOWN	"	
F11	40	4	19-0	1-0	" - HOOPS	B2
F12	40	4	18-3	1-0	"	B2
F13	40	4	17-9	1-0	"	B2
F14	18	11	34-3	SHOWN	TOP OF CAP	
F15	4	11	37-9	"	"	C2
F16	14	11	29-3	"	"	
F17	4	11	35-9	"	"	C2
F18	14	11	23-0	"	"	
F19	12	6	19-9	"	SIDES OF CAP	
F20	4	6	17-3	"	"	
F21	4	6	14-3	"	"	
F22	4	6	11-3	"	"	
F23	4	6	8-3	"	"	
F24	4	6	5-3	"	"	
F25	10	6	36-0	"	BOTTOM OF CAP	D2
F26	10	6	10-6	"	ENDS OF CAP	E2
F27	6	4	39-6	"	CAP - STIRRUPS	F2
F28	6	4	37-0	"	"	F2
F29	6	4	34-6	"	"	F2
F30	6	4	32-3	"	"	F2
F31	6	4	30-0	"	"	F2
F32	6	4	28-0	"	"	F2
F33	6	4	26-9	"	"	F2
F34	6	4	25-6	"	"	F2
F35	6	4	24-6	"	"	F2
F36	6	4	23-3	"	"	F2
F37	6	4	21-0	"	"	F2
F38	29	6	8-3	"	"	G

PIER 5 WITHOUT SEAL

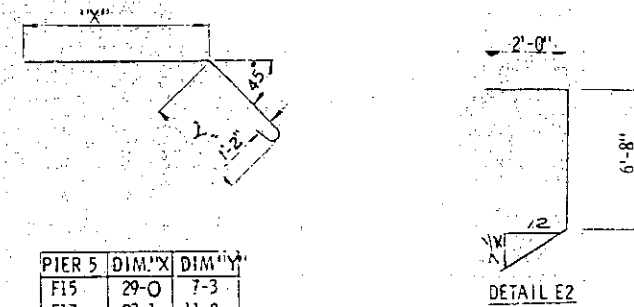
Bars for pier without seal are the same as bars for pier with seal except as shown below



MARK	DIM. "X"	MARK	DIM. "X"
*F4	16-7	F8	14-11
F5	16-2 1/2	F11	14-6 1/2
F6	15-9 1/2	F12	14-1 1/2
F7	15-4 1/2	F13	13-8 1/2

*F4 WITH SEAL
F4 WITHOUT SEAL-16'-9"

DETAIL B2

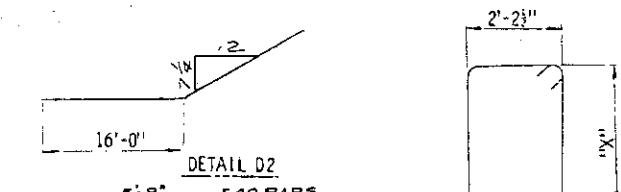


PIER 5	DIM. "X"	DIM. "Y"
F15	29-0	7-3
F17	23-1	11-0

DETAIL C2

41,200#

Mark	No.	Size	Length	Spacing	Location	Det.
F 9	56	10	47-0	SHOWN	STEM - VERT. (WITHOUT SEAL)	A
F 4	56	4	22-3	1-0	STEM-HOOPS (WITHOUT SEAL)	B2



MARK	DIM. "X"	DIM. "Y"
E40 BARS	17'-2"	11'-1"
D51 BARS	17'-2"	11'-1"
F38 BARS	17'-2"	11'-1"

DETAIL G

PIER 5	DIM. "X"
F27	17-0 1/2
F28	15-10 1/2
F29	14-7 1/2
F30	13-5 1/2
F31	12-3 1/2
F32	11-4 1/2
F33	10-9
F34	10-2
F35	9-6 1/2
F36	8-11 1/2
F37	7-9

DETAIL F2

NOTE: DIMENSIONS IN BENDING DETAILS ARE OUT TO OUT

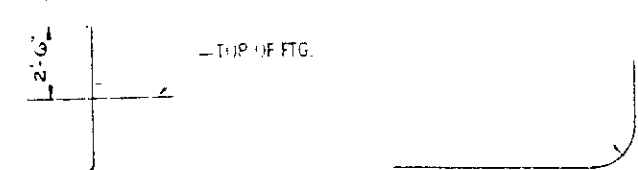
STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320

BILL OF BARS PIERS 3,4,85

DATE: 9-10-64

20-93 SHEET 9320



DETAIL A

MARK	DIM. "X"
D4	19-11
D5	19-5
D6	18-11
D9	13-6
D10	18-7
D11	17-7
D12	17-11

DETAIL E

MARK	DIM. "X"	DIM. "Y"
D15	34-0	6-3
D17	30-9	10-8
D18	15-3	19-1
D19	19-3	17-0
D20	23-3	14-10
D21	27-3	12-8

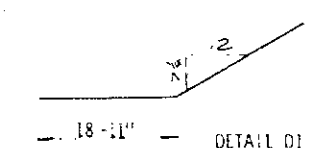
DETAIL C

MARK	DIM. "X"	MARK	DIM. "X"
E 4	13'-3"	E11	17'-5 1/2"
E 5	18'-10"	E12	17'-0"
E 6	18'-4 1/2"	E13	16'-6 1/2"
E 7	17'-11"	E14	16'-1"

DETAIL B1

MARK	DIM. "X"	MARK	DIM. "X"	MARK	DIM. "X"
D31	10-4 1/2	D38	13-5	D45	16-4
D32	11-1 1/2	D39	13-8 1/2	D46	16-11 1/2
D33	11-5 1/2	D40	14-1 1/2	D47	17-5 1/2
D34	11-10	D41	14-6	D48	18-3
D35	12-2	D42	14-11	D49	19-0
D36	12-7 1/2	D43	15-4 1/2	D50	19-10 1/2
D37	13-0	D44	15-9		

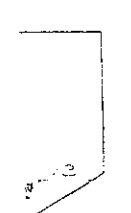
DETAIL F



DETAIL D1

MARK	DIM. "X"	DIM. "Y"
E16	30-4	9-3
E18	26-1	13-4

DETAIL C1



DETAIL D1

PIER 6 WITH SEAL 34,610#

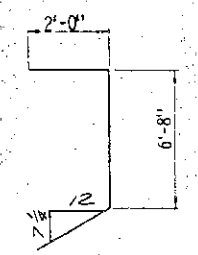
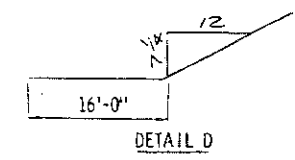
Mark	No.	Size	Length	Spacing	Location	Det.
G 1	12	10	41-6	1-0	FOOTING - TRANSVERSE	
G 2	71	6	11-6	7	FOOTING - LONGITUDINAL	
G 3	54	10	6-3	SHOWN	FOOTING-DOWEL BARS	A
G 4	54	10	33-6	"	STEM - VERT (WITH SEAL)	
G 5	50	10	32-3	"	"	
G 6	48	4	21-0	1-0	" - HOOPS (WITH SEAL)	B
G 7	48	4	20-3	1-0	"	B
G 8	40	4	19-6	1-0	"	B
G 9	40	4	19-0	1-0	"	B
G 10	40	4	18-3	1-0	"	B
G 11	40	4	17-6	1-0	"	B
G 12	18	11	34-3	SHOWN	TOP OF CAP	C
G 13	4	11	37-9	"	"	C
G 14	14	11	29-3	"	"	C
G 15	4	11	35-9	"	"	C
G 16	14	11	23-0	"	"	C
G 17	12	6	19-9	"	SIDES OF CAP	
G 18	4	6	17-3	"	"	
G 19	4	6	14-3	"	"	
G 20	4	6	11-3	"	"	
G 21	4	6	8-3	"	"	
G 22	4	6	5-3	"	"	
G 23	10	6	36-0	"	BOTTOM OF CAP	D
G 24	10	6	10-6	"	ENDS OF CAP	E
G 25	6	4	39-6	"	CAP - STIRRUPS	F
G 26	6	4	37-0	"	"	F
G 27	6	4	34-6	"	"	F
G 28	6	4	32-3	"	"	F
G 29	6	4	30-0	"	"	F
G 30	6	4	28-0	"	"	F
G 31	6	4	26-9	"	"	F
G 32	6	4	25-6	"	"	F
G 33	6	4	24-6	"	"	F
G 34	6	4	23-3	"	"	F
G 35	6	4	21-0	"	"	F
G 36	28	6	8-3	"	"	G

PIER 7 WITH SEAL 30,680#

Mark	No.	Size	Length	Spacing	Location	Det.
H 1	12	6	38-6	1-0	FOOTING - TRANSVERSE	
H 2	67	6	11-6	7	FOOTING - LONGITUDINAL	
H 3	50	10	6-3	SHOWN	FOOTING - DOWEL BARS	A
H 4	48	4	20-9	1-0	STEM - HOOPS - (WITH SEAL)	B1
H 5	48	4	20-0	1-0	"	B1
H 6	48	4	19-3	1-0	"	B1
H 7	50	10	30-6	SHOWN	STEM-VERT (WITH SEAL)	
H 8	46	10	30-9	"	"	
H 9	48	4	18-6	1-0	STEM-HOOPS	B1
H 10	48	4	17-9	1-0	"	B1
H 11	18	11	34-3	SHOWN	TOP OF CAP	
H 12	4	11	37-9	"	"	C
H 13	14	11	29-3	"	"	C
H 14	4	11	35-9	"	"	C
H 15	14	11	23-0	"	"	C
H 16	12	6	19-9	"	SIDES OF CAP	
H 17	4	6	17-3	"	"	
H 18	4	6	14-3	"	"	
H 19	4	6	11-3	"	"	
H 20	4	6	8-3	"	"	
H 21	4	6	5-3	"	"	
H 22	10	6	36-0	"	BOTTOM OF CAP	D
H 23	10	6	10-6	"	ENDS OF CAP	E
H 24	6	4	39-6	"	CAP-STIRRUPS	F
H 25	6	4	37-0	"	"	F
H 26	6	4	34-6	"	"	F
H 27	6	4	32-3	"	"	F
H 28	6	4	30-0	"	"	F
H 29	6	4	28-0	"	"	F
H 30	6	4	26-9	"	"	F
H 31	6	4	25-6	"	"	F
H 32	6	4	24-6	"	"	F
H 33	6	4	23-3	"	"	F
H 34	6	4	21-0	"	"	F
H 35	28	6	8-3	"	"	G

PIER 8 WITH SEAL 30,430#

Mark	No.	Size	Length	Spacing	Location	Det.
J 1	12	6	35-6	1-0	FOOTING - TRANSVERSE	
J 2	61	6	11-6	7	FOOTING LONGITUDINAL	
J 3	54	10	6-3	SHOWN	FOOTING DOWELS -	A
J 4	48	4	20-6	1-0	STEM HOOPS - (WITH SEAL)	B2
J 5	44	4	19-9	1-0	"	B2
J 6	54	10	19-6	SHOWN	STEM - VERTICAL (WITH SEAL)	
J 7	50	10	37-9	SHOWN	"	
J 8	44	4	19-0	1-0	STEM - HOOPS	B2
J 9	44	4	18-6	1-0	"	B2
J 10	44	4	17-9	1-0	"	B2
J 11	18	11	34-3	SHOWN	TOP OF CAP	
J 12	4	11	37-9	"	"	C
J 13	14	11	29-3	"	"	C
J 14	4	11	35-9	"	"	C
J 15	14	11	23-0	"	"	C
J 16	12	6	19-9	"	SIDES OF CAP	
J 17	4	6	17-3	"	"	
J 18	4	6	14-3	"	"	
J 19	4	6	11-3	"	"	
J 20	4	6	8-3	"	"	
J 21	4	6	5-3	"	"	
J 22	10	6	36-0	"	BOTTOM OF CAP	D
J 23	10	6	10-6	"	ENDS OF CAP	E
J 24	6	4	39-6	"	CAP STIRRUPS	F
J 25	6	4	37-0	"	"	F
J 26	6	4	34-6	"	"	F
J 27	6	4	32-3	"	"	F
J 28	6	4	30-0	"	"	F
J 29	6	4	28-0	"	"	F
J 30	6	4	26-9	"	"	F
J 31	6	4	25-6	"	"	F
J 32	6	4	24-6	"	"	F
J 33	6	4	23-3	"	"	F
J 34	6	4	21-0	"	"	F
J 35	29	6	8-3	"	"	G



PIER 6 WITHOUT SEAL

BARS FOR PIER WITHOUT SEAL ARE THE SAME AS BARS FOR PIER WITH SEAL EXCEPT AS SHOWN BELOW

Mark	No.	Size	Length	Spacing	Location	Det.
G 4	54	10	37-6	SHOWN	STEM VERT. - (WITHOUT SEAL)	
G 6	54	4	21-3	1-0	STEM - HOOPS - (WITHOUT SEAL)	B

PIER 7 WITHOUT SEAL

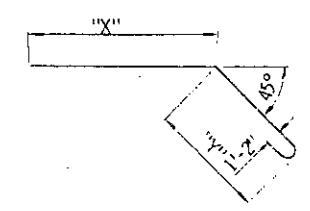
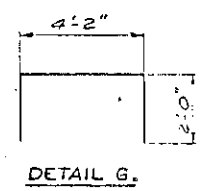
Bars for pier without seal are the same as bars for pier with seal except as shown below

Mark	No.	Size	Length	Spacing	Location	Det.
H 7	50	10	34-6	SHOWN	STEM VERT. - (WITHOUT SEAL)	
H 4	64	4	21-0	1-0	STEM HOOPS - (WITHOUT SEAL)	B1

PIER 8 WITHOUT SEAL

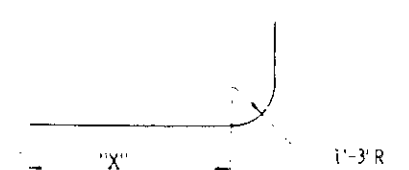
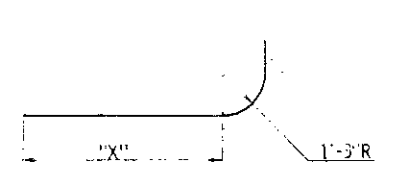
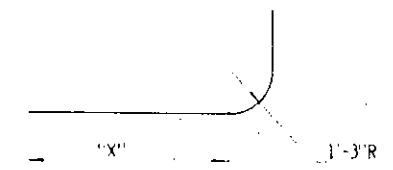
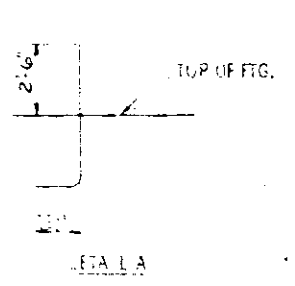
Bars for pier without seal are the same as bars for pier with seal except as shown below

Mark	No.	Size	Length	Spacing	Location	Det.
J 6	54	10	23-6	SHOWN	STEM VERT. - (WITHOUT SEAL)	
J 4	64	4	20-9	1-0	STEM - HOOPS - (WITHOUT SEAL)	B2



PIER 6	PIER 7	PIER 8	DIM. "X"
G 25	H 24	J 24	17-0 1/2
G 26	H 25	J 25	15-10 1/2
G 27	H 26	J 26	14-7 1/2
G 28	H 27	J 27	13-5 1/2
G 29	H 28	J 28	12-3 1/2
G 30	H 29	J 29	11-4 1/2
G 31	H 30	J 30	10-9
G 32	H 31	J 31	10-2
G 33	H 32	J 32	9-6 1/2
G 34	H 33	J 33	9-11 1/2
G 35	H 34	J 34	7-9

PIER 6	PIER 7	PIER 8	DIM. "X"	DIM. "Y"
G 13	H 12	J 12	29-0	7-3
G 15	H 14	J 14	23-1	11-0



MARK	DIM. "X"
G 6	15-11
G 7	15-5 1/2
G 8	14-11 1/2
G 9	14-6 1/2
G 10	14-1
G 11	13-8 1/2

G 4 WITH SEAL
G 5 WITHOUT SEAL 16'-1"

MARK	DIM. "X"
H 4	15-9
H 5	15-3
H 6	14-9
H 9	14-3
H 10	13-9

H 4 WITH SEAL
H 4 WITHOUT SEAL 15'-11"

MARK	DIM. "X"
J 4	15-7
J 5	15-1
J 8	14-8
J 9	14-2
J 10	13-9

J 4 WITH SEAL
J 4 WITHOUT SEAL 15'-0"

NOTE: DIMENSIONS IN BENDING DETAILS ARE OUT TO OUT

STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320

BILL OF BARS PIERS 6, 7, & 8

APPROVED 9-10-64

SHEET NO. 21 OF 93 SHEETS 9320 DES. DR. J.M.G. C.K. J.M.G.

PIER 9 WITH SEAL

28,160#

Mark	No.	Size	Length	Spacing	Location	Det.
K 1	12	6	35-6	1-0	FOOTING - TRANSVERSE	
K 2	61	6	11-6	7	FOOTING - LONGITUDINAL	
K 3	50	10	6-3	SHOWN	FOOTING - DOWEL BARS	A
K 4	48	4	20-3	1-0	STEM HOOPS (WITH SEAL)	B
K 5	52	4	19-6	1-0	" "	B
K 6	52	4	18-9	1-0	" "	B
K 7	50	10	19-3	SHOWN	STEM VERT (WITH SEAL)	B
K 8	46	10	33-6	"	" "	B
K 9	52	4	17-9	1-0	" HOOPS	B
K10	18	11	34-3	SHOWN	TOP OF CAP	B
K11	4	11	37-9	"	" " "	C
K12	14	11	29-3	"	" " "	C
K13	4	11	35-9	"	" " "	C
K14	14	11	23-0	"	" " "	C
K15	12	6	19-9	"	SIDES OF CAP	
K16	4	6	17-3	"	" " "	
K17	4	6	14-3	"	" " "	
K18	4	6	11-3	"	" " "	
K19	4	6	8-3	"	" " "	
K20	4	6	5-3	"	" " "	
K21	10	6	36-0	"	BOTTOM OF CAP	D
K22	10	6	10-6	"	ENDS OF CAP	E
K23	6	4	39-6	"	CAP - STIRRUPS	F
K24	6	4	37-0	"	" " "	F
K25	6	4	34-6	"	" " "	F
K26	6	4	32-3	"	" " "	F
K27	6	4	30-0	"	" " "	F
K28	6	4	28-0	"	" " "	F
K29	6	4	26-9	"	" " "	F
K30	6	4	25-6	"	" " "	F
K31	6	4	24-6	"	" " "	F
K32	6	4	23-3	"	" " "	F
K33	6	4	21-0	"	" " "	F
K34	28	6	8-3	"	" " "	G

PIER 10 WITH SEAL

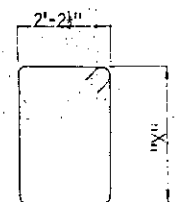
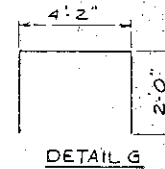
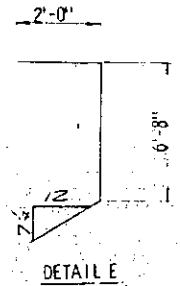
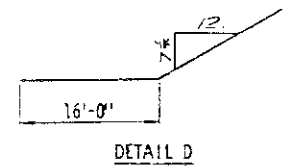
26,380

Mark	No.	Size	Length	Spacing	Location	Det.
L 1	12	6	35-6	1-0	FOOTING - TRANSVERSE	
L 2	61	6	11-6	7	FOOTING - LONGITUDINAL	
L 3	48	10	6-3	SHOWN	FOOTING - DOWEL BARS	A
L 4	40	4	19-9	1-0	STEM - HOOPS - (WITH SEAL)	BI
L 5	48	4	19-3	1-0	" "	BI
L 6	48	10	16-9	SHOWN	STEM - VERT (WITH SEAL)	
L 7	44	10	31-0	"	" " "	
L 8	48	4	18-6	1-0	" HOOPS	BI
L 9	48	4	17-9	1-0	" " "	BI
L10	18	11	34-3	SHOWN	TOP OF CAP	
L11	4	11	37-9	"	" " "	C
L12	14	11	29-3	"	" " "	C
L13	4	11	35-9	"	" " "	C
L14	14	11	23-0	"	" " "	
L15	12	6	19-9	"	SIDES OF CAP	
L16	4	6	17-3	"	" " "	
L17	4	6	14-3	"	" " "	
L18	4	6	11-3	"	" " "	
L19	4	6	8-3	"	" " "	
L20	4	6	5-3	"	" " "	
L21	10	6	36-0	"	BOTTOM OF CAP	D
L22	10	6	10-6	"	ENDS OF CAP	E
L23	6	4	39-6	"	CAP STIRRUPS	F
L24	6	4	37-0	"	" " "	F
L25	6	4	34-6	"	" " "	F
L26	6	4	32-3	"	" " "	F
L27	6	4	30-0	"	" " "	F
L28	6	4	28-0	"	" " "	F
L29	6	4	26-9	"	" " "	F
L30	6	4	25-6	"	" " "	F
L31	6	4	24-6	"	" " "	F
L32	6	4	23-3	"	" " "	F
L33	6	4	21-0	"	" " "	F
L34	28	6	8-3	"	" " "	G

PIER 11 WITH SEAL

25,380#

Mark	No.	Size	Length	Spacing	Location	Det.
M 1	12	6	35-6	1-0	FOOTING - TRANSVERSE	
M 2	61	6	11-6	7	FOOTING - LONGITUDINAL	
M 3	48	10	6-3	SHOWN	FOOTING - DOWEL BARS	A
M 4	36	4	19-6	1-0	STEM HOOPS - (WITH SEAL)	B2
M 5	44	4	19-0	1-0	" "	B2
M 6	48	10	14-9	SHOWN	STEM - VERT (WITH SEAL)	
M 7	44	10	29-0	SHOWN	" " "	
M 8	44	4	18-6	1-0	STEM HOOPS	B2
M 9	44	4	17-9	1-0	" " "	B2
M10	18	11	34-3	SHOWN	TOP OF CAP	
M11	4	11	37-9	"	" " "	C
M12	14	11	29-3	"	" " "	C
M13	4	11	35-9	"	" " "	C
M14	14	11	23-0	"	" " "	
M15	12	6	19-9	"	SIDES OF CAP	
M16	4	6	17-3	"	" " "	
M17	4	6	14-3	"	" " "	
M18	4	6	11-3	"	" " "	
M19	4	6	8-3	"	" " "	
M20	4	6	5-3	"	" " "	
M21	10	6	36-0	"	BOTTOM OF CAP	D
M22	10	6	10-6	"	ENDS OF CAP	E
M23	6	4	39-6	"	CAP STIRRUPS	F
M24	6	4	37-0	"	" " "	F
M25	6	4	34-6	"	" " "	F
M26	6	4	32-3	"	" " "	F
M27	6	4	30-0	"	" " "	F
M28	6	4	28-0	"	" " "	F
M29	6	4	26-9	"	" " "	F
M30	6	4	25-6	"	" " "	F
M31	6	4	24-6	"	" " "	F
M32	6	4	23-3	"	" " "	F
M33	6	4	21-0	"	" " "	F
M34	29	6	8-3	"	" " "	G



PIER 9 WITHOUT SEAL

29,250#

Bars for pier without seal are the same as bars for pier with seal except as shown below

Mark	No.	Size	Length	Spacing	Location	Det.
K 7	50	10	23-3	SHOWN	STEM VERT BARS - (WITHOUT SEAL)	A
K 4	64	4	20-6	1-0	STEM - HOOPS - (WITHOUT SEAL)	B

PIER 10 WITHOUT SEAL

27,420#

Bars for pier without seal are the same as bars for pier with seal except as shown below

Mark	No.	Size	Length	Spacing	Location	Det.
L 6	48	10	20-9	SHOWN	STEM VERT. BARS - (WITHOUT SEAL)	A
L 4	56	4	20-0	1-0	STEM - HOOPS - (WITHOUT SEAL)	BI

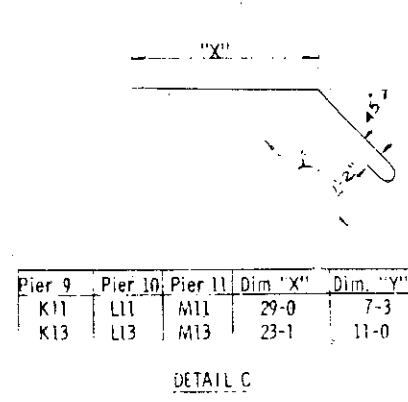
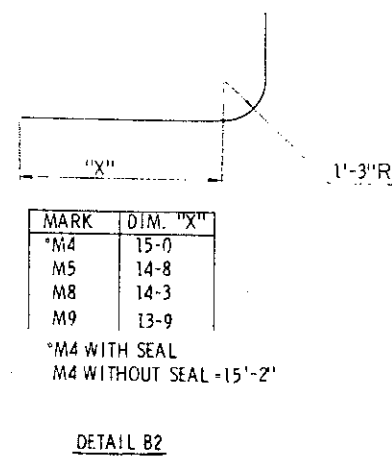
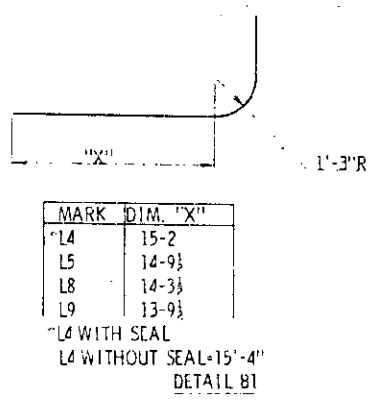
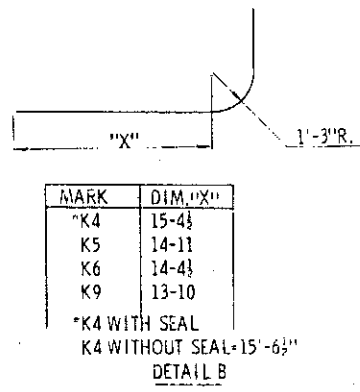
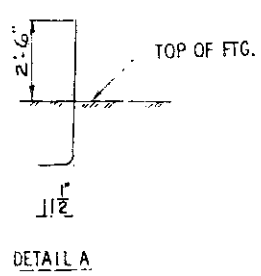
PIER 11 WITHOUT SEAL

26,420#

Bars for pier without seal are the same as bars for pier with seal except as shown below

Mark	No.	Size	Length	Spacing	Location	Det.
M 6	48	10	18-9	SHOWN	STEM VERT. BARS (WITHOUT SEAL)	A
M 4	52	4	19-9	1-0	STEM HOOPS (WITHOUT SEAL)	B2

Pier 9	Pier 10	Pier 11	Dim. 'X'
K23	L23	M23	17-0 1/2
K24	L24	M24	15-10 1/2
K25	L25	M25	14-7 1/2
K26	L26	M26	13-5 1/2
K27	L27	M27	12-3 1/2
K28	L28	M28	11-4 1/2
K29	L29	M29	10-9
K30	L30	M30	10-2
K31	L31	M31	9-6 1/2
K32	L32	M32	8-11 1/2
K33	L33	M33	7-9



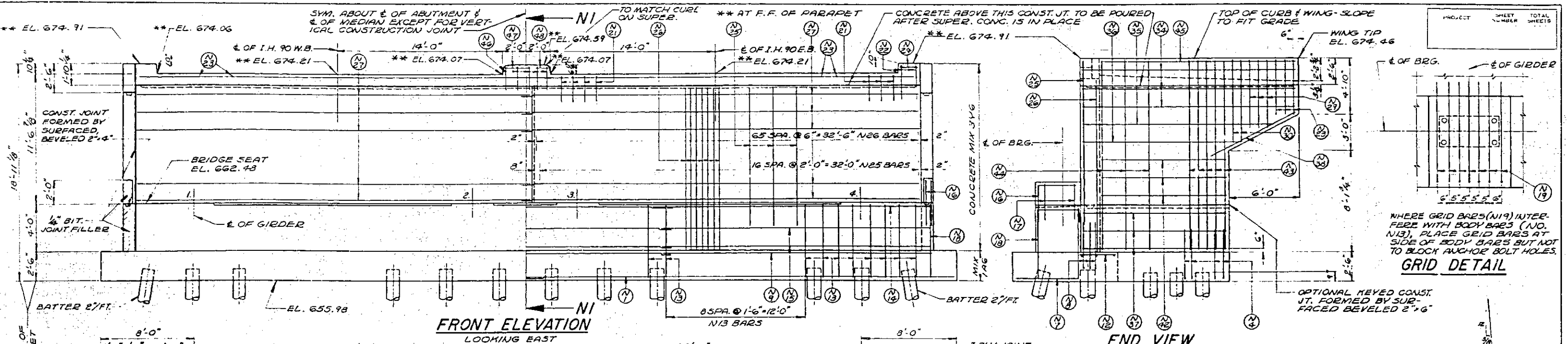
NOTE: DIMENSIONS IN BEARING DETAILS ARE CUT TO FIT

STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

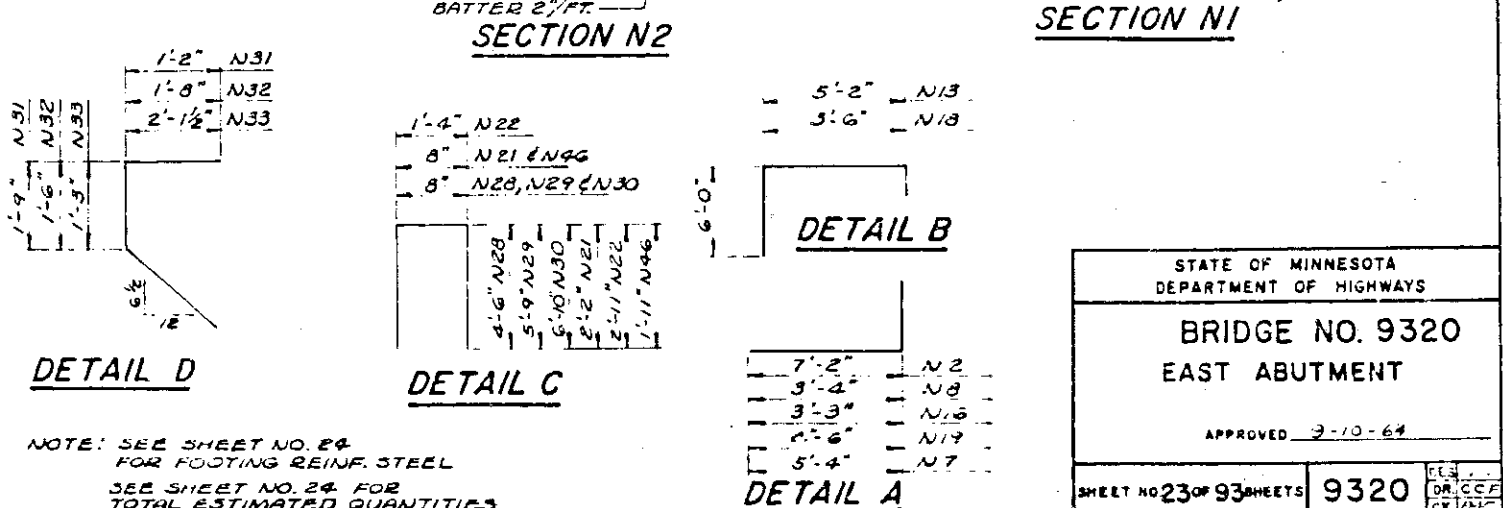
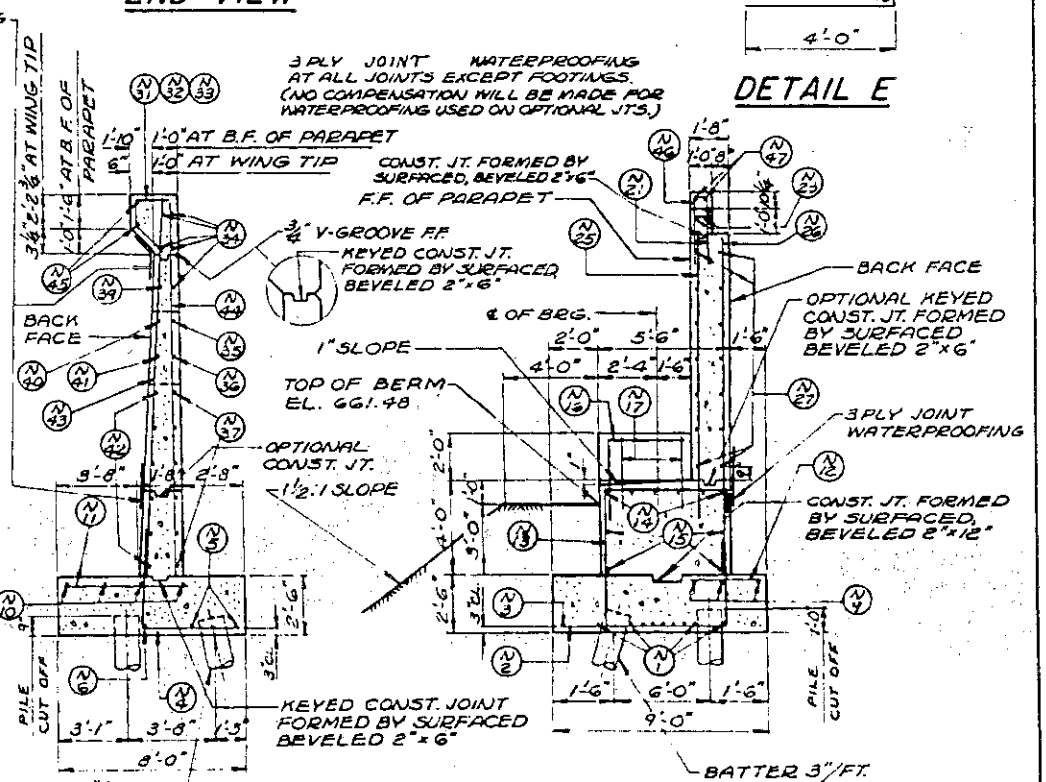
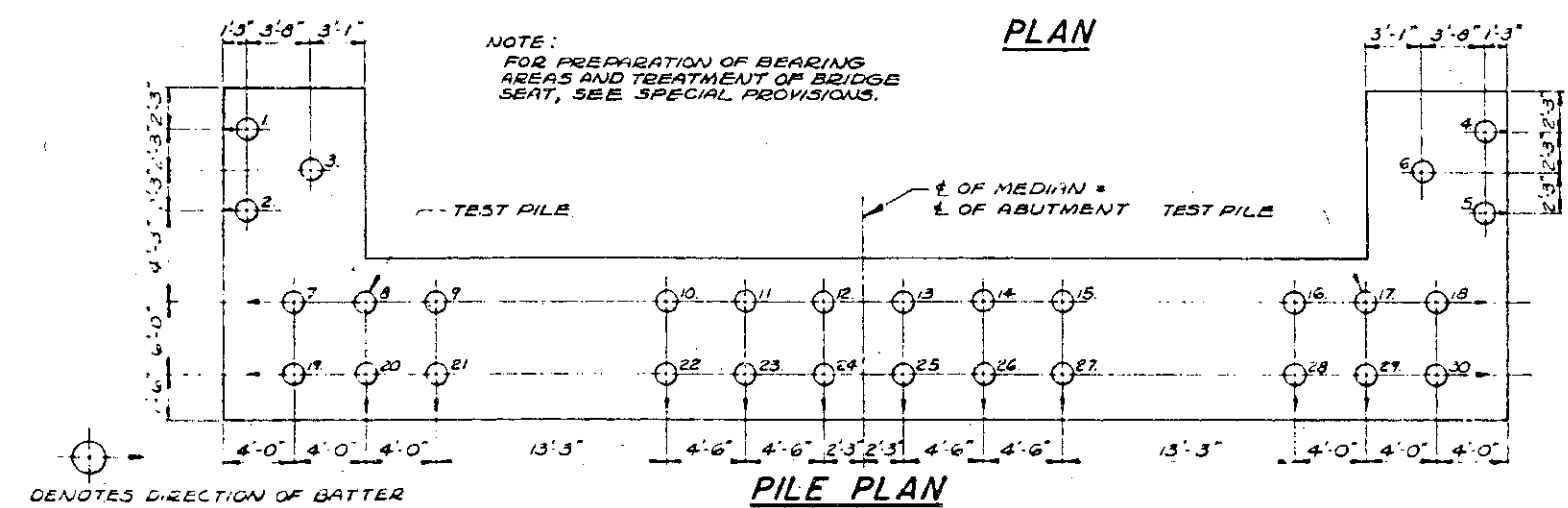
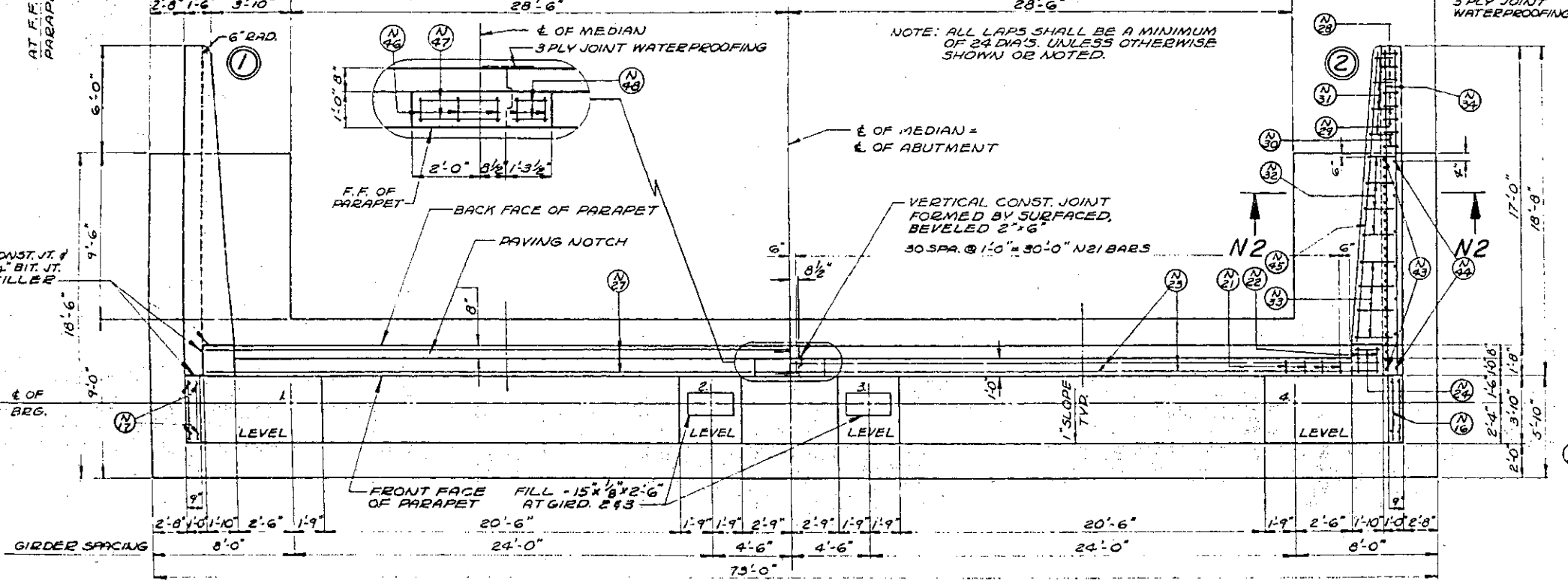
BRIDGE NO. 9320

BILL OF BARS PIERS 9,10,11

22-93 9320



WHERE GRID BARS (N19) INTERFERE WITH BODY BARS (NO. N13), PLACE GRID BARS AT SIDE OF BODY BARS BUT NOT TO BLOCK ANCHOR BOLT HOLES.
GRID DETAIL



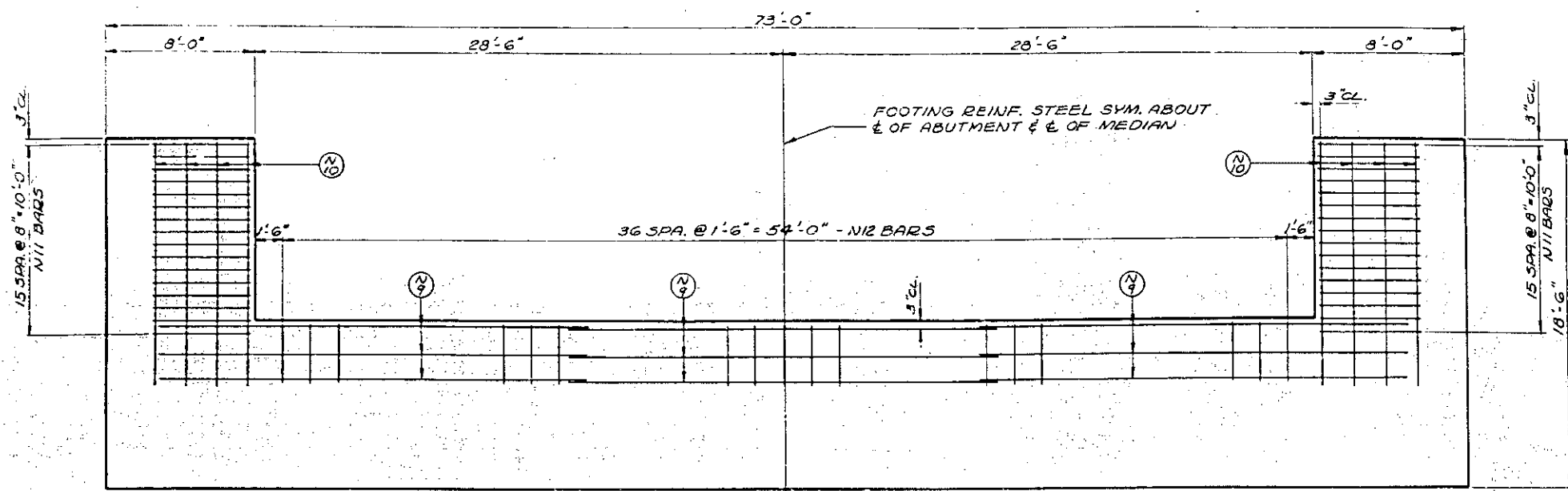
STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320
EAST ABUTMENT

APPROVED 3-10-64

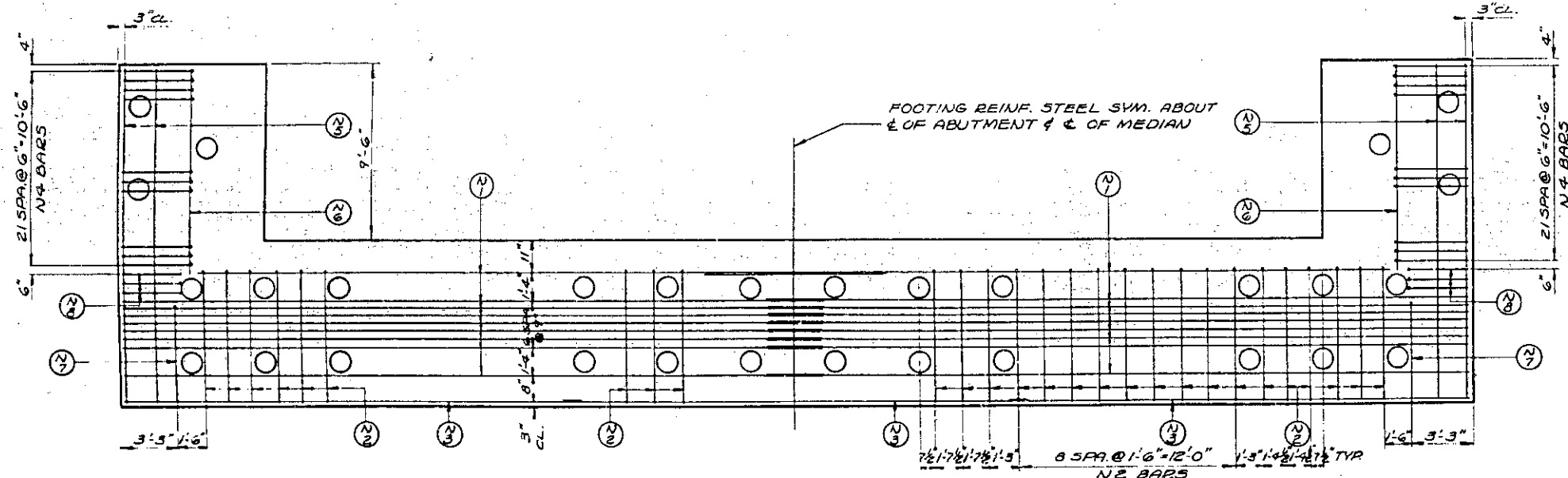
SHEET NO. 23 OF 93 SHEETS **9320**

DR. G. C. F. CRANE



FOOTING PLAN
SHOWING TOP REINFORCING STEEL

NOTE: ALL LAPS SHALL BE A MINIMUM OF 24 DIA'S, UNLESS OTHERWISE SHOWN OR NOTED.



FOOTING PLAN
SHOWING BOTTOM REINFORCING STEEL

BILL OF BARS 12,870#

DIMENSIONS IN BENDING DETAILS ARE OUT TO OUT

FOUR MARK	NO.	SIZE	LENGTH	SPACING	LOCATION	DET.
FOOTING						
N1	18	10	37-9	SHOWN	FOOTING - BOTTOM - TRANS.	
N2	45	4	10-6	SHOWN	" " - LONG.	A
N3	3	4	24-9	SHOWN	" " - TRANS.	
N4	44	7	8-0	6	" " - "	E
N5	4	4	18-0	SHOWN	" " - "	
N6	2	4	11-0	SHOWN	" " - "	
N7	2	4	11-3	SHOWN	" " - LONG.	A
N8	6	7	7-6	6	" " - "	A
N9	9	4	23-0	1-6	" " - TOP - TRANS.	
N10	8	4	12-9	1-6	" " - "	
N11	32	5	5-3	8	" " - "	
N12	37	4	3-0	1-6	" " - LONG.	
BODY						
N13	47	4	12-3	SHOWN	BODY & FOOTING	B
N14	18	7	23-6	1-0	" " - TOP - TRANS.	
N15	12	4	23-0	SHOWN	" " - TRANS.	
N16	4	4	6-9	SHOWN	BEARING GUARD	A
N17	8	4	2-9	SHOWN	" " - VERT.	
N18	2	4	10-6	SHOWN	BODY - VERT. - AT ENDS	B
N19	28	4	5-6	SHOWN	GRID	A
PARAPET						
N21	62	5	5-0	1-0	PARAPET - BLOCK	C
N22	4	5	7-0	1-0	" " - AT ENDS	C
N23	13	4	7-3	SHOWN	" " - (DO NOT LAP)	
N24	2	4	1-6	SHOWN	" " - AT ENDS	
N25	34	4	11-6	2-0	" " - VERT. - F. FACE	
N26	132	6	14-3	6	" " - B. "	
N27	28	4	33-3	1-6	" " - HORIZ. - F. & B. FACE	
WINGS						
N28	6	4	9-9	9	WINGS - TOP - VERT.	C
N29	6	4	12-3	9	" " - "	C
N30	4	4	14-3	9	" " - "	C
N31	8	4	4-3	1-6	" " - "	D
N32	8	4	5-0	1-6	" " - "	D
N33	8	4	5-9	1-6	" " - "	D
N34	10	4	18-3	1-6	" " - HORIZ. - F. & B. FACE	
N35	2	4	17-9	1-6	" " - F. FACE	
N36	2	4	14-9	1-6	" " - HORIZ. - F. FACE	
N37	12	4	12-3	1-6	" " - "	
N38	4	4	8-0	SHOWN	" " - F. & B. FACE	
N39	2	4	16-6	1-6	" " - HORIZ. - BACK FACE	
N40	2	4	16-0	1-6	" " - "	
N41	2	4	13-0	1-6	" " - "	
N42	12	4	10-6	1-6	" " - "	
N43	50	7	16-0	6	" " - VERT. - "	
N44	14	4	16-0	2-0	" " - F. FACE	
N45	4	4	16-6	SHOWN	" " - HORIZ. - B. "	
MEDIAN						
N46	5	5	4-6	SHOWN	MEDIAN - VERT.	C
N47	2	4	2-3	SHOWN	" " - HORIZ.	
N48	2	4	1-0	SHOWN	" " - "	

TOTAL ESTIMATED QUANTITIES

ITEM	QUANTITY
STRUCTURE EXCAVATION (CLASS D E)	360 C.Y.
CAST-IN-PLACE CONCRETE PILING DELIVERED	1960 L.F.
(DOES NOT INCLUDE TEST PILES)	
CAST-IN-PLACE CONCRETE TEST PILES	2 PILES
IN PLACE 100 FEET LONG (EACH)	
CONCRETE MIX NO. 3V6	130 C.Y.
CONCRETE MIX NO. 1A6	74 C.Y.
REINFORCEMENT BARS DELIVERED	12,870 LB.
REINFORCEMENT BARS PLACED	12,870 LB.
THREE-PLY JOINT WATERPROOFING	48 L.F.

SEE SHEET 23 FOR BAR BENDING DETAILS

COMPUTED PILE LOADS	TONS/PILE
D.L. + EARTH PRESSURE	51
LIVE LOADS	8
TOTAL	59

PILE NOTE:
 2 CAST-IN-PLACE CONCRETE TEST PILES 100 FT. LONG.
 28 CAST-IN-PLACE CONCRETE PILES, EST. LENGTH 70 FT.
 30 CAST-IN-PLACE CONCRETE PILES FOR EAST ABUTMENT.
 PILES TO HAVE A NOMINAL DIAMETER OF 12 3/4".
 FOR FABRICATION, MATERIAL & DRIVING SEE SPECIAL PROVISIONS.
 ESTIMATED PENETRATION 1'-0" LESS THAN LENGTH GIVEN.
 ALL PILES TO HAVE A MINIMUM BEARING OF 65 TONS PER PILE.

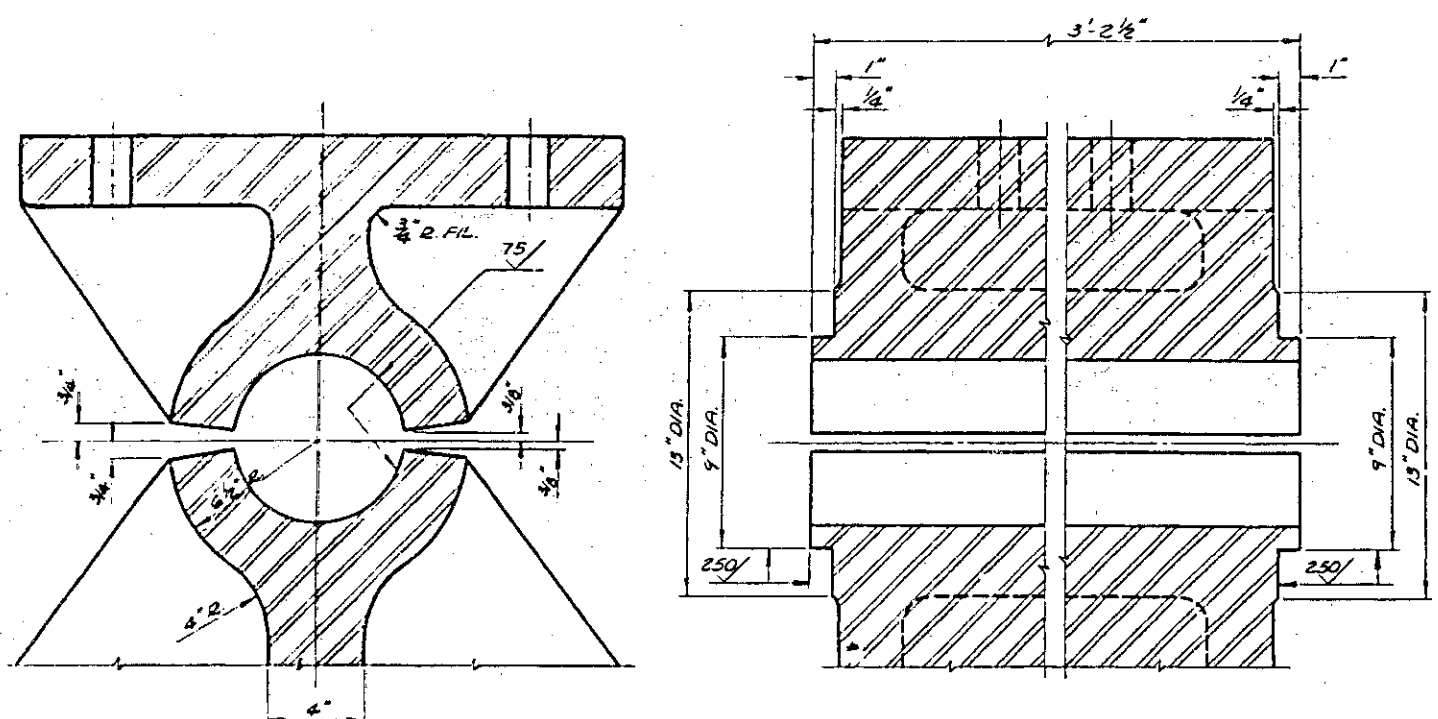
STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320
EAST ABUTMENT DETAILS

APPROVED 9-10-69

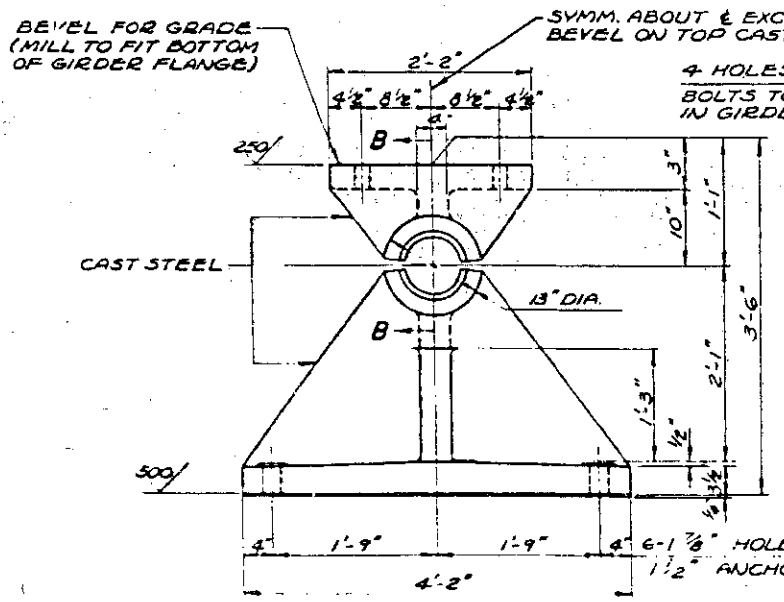
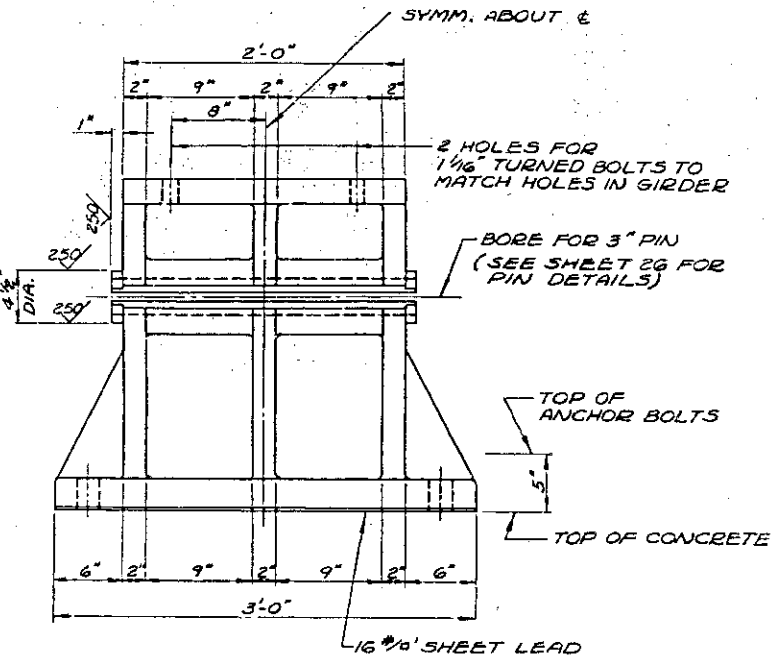
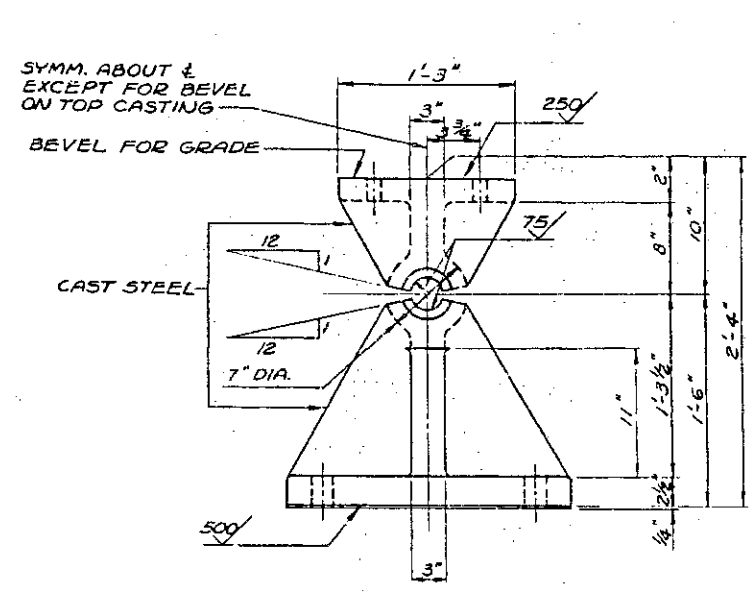
SHEET NC 24 OF 93 SHEETS 9320

DES. J.C.	CK. W.M.Z.
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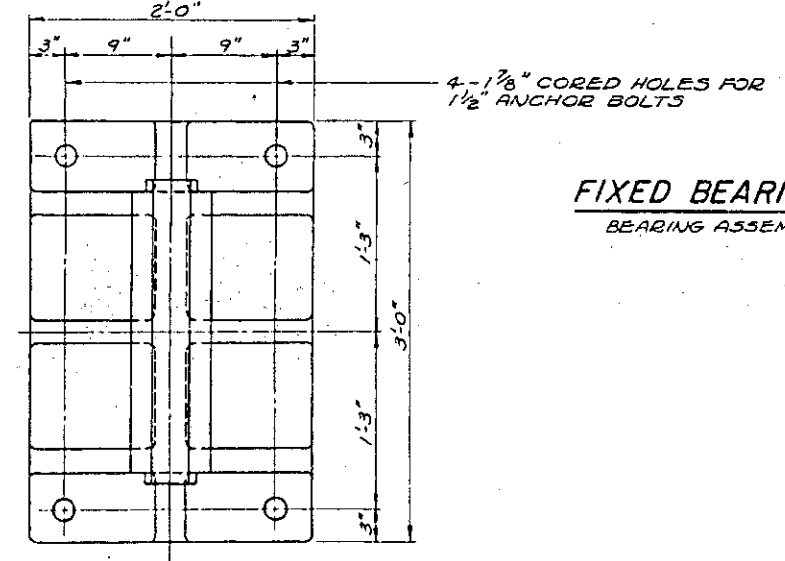
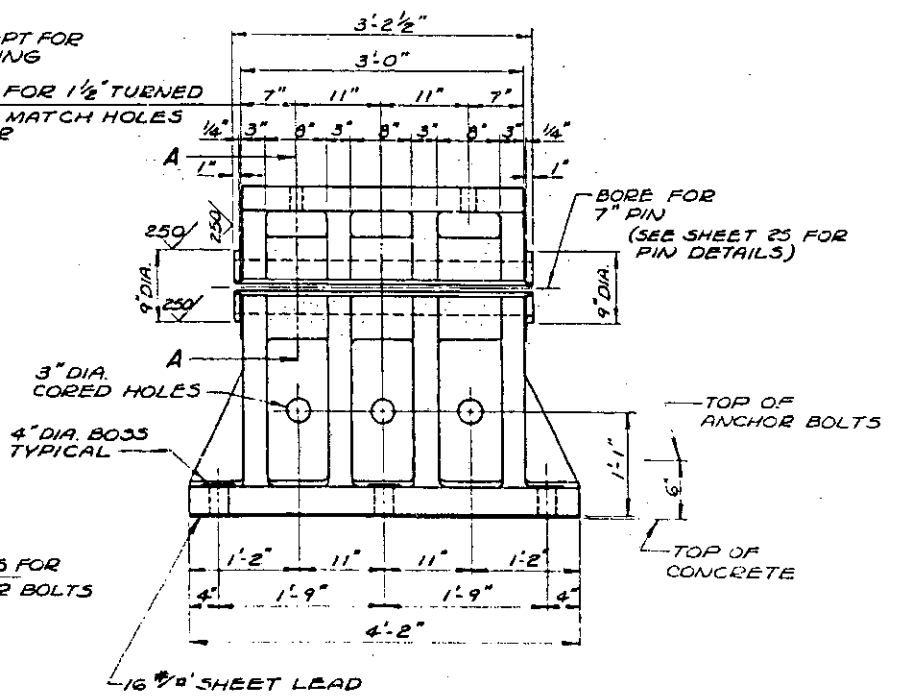


SECTION A A

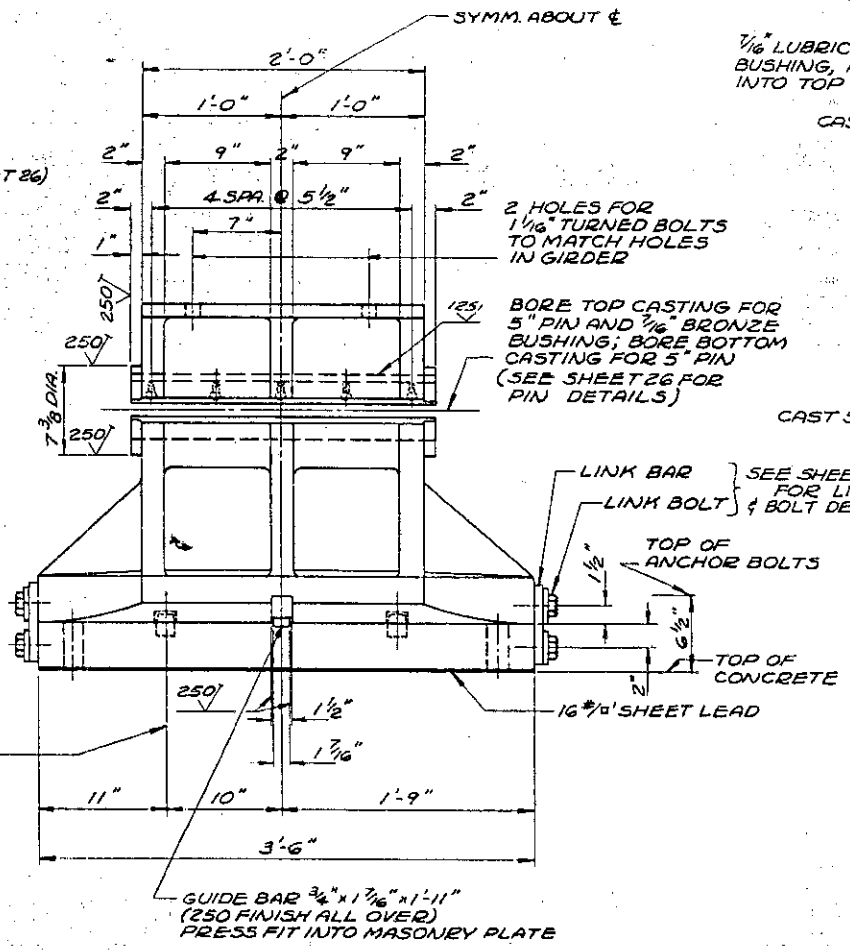
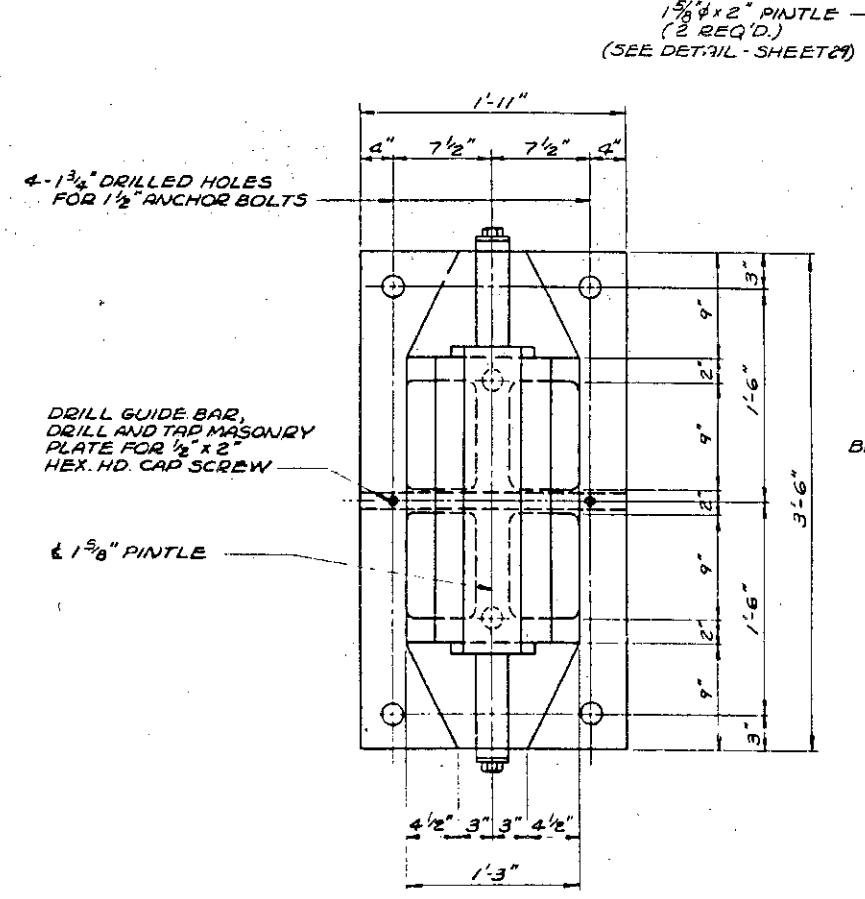
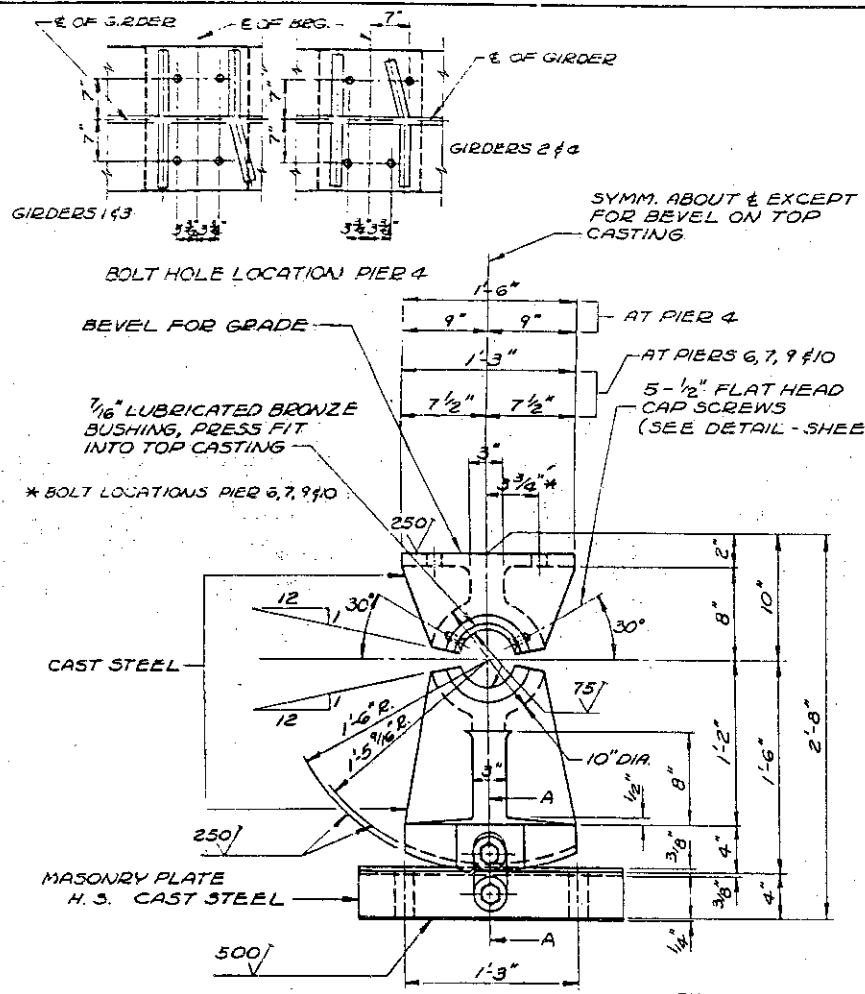
SECTION B B



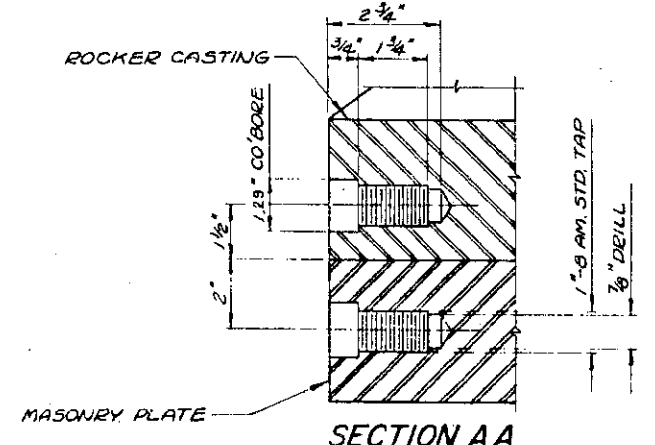
FIXED BEARING AT PIER 3
BEARING ASSEMBLIES, FIXED TYPE 5 - 4 REQ'D.



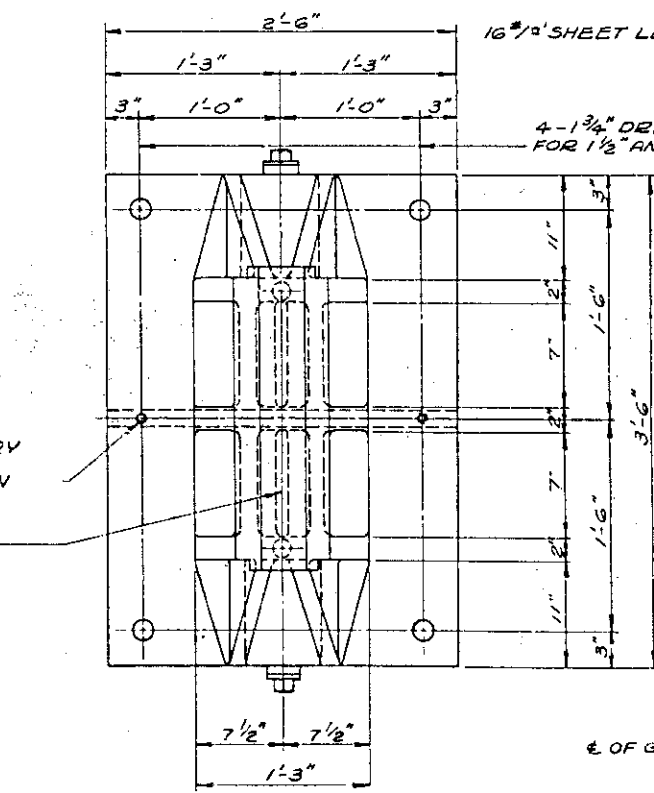
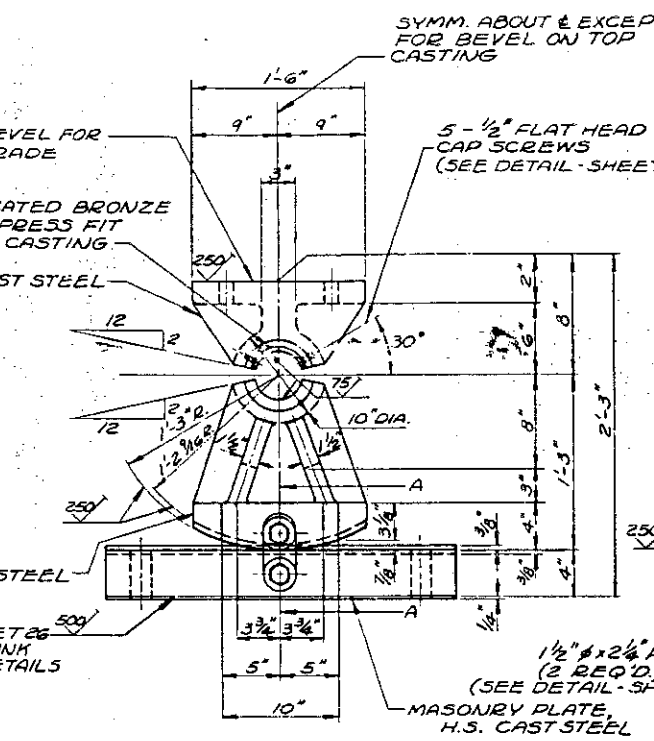
FIXED BEARING AT PIERS 5, 8, AND 11
BEARING ASSEMBLIES, FIXED TYPE 7 - 12 REQ'D.



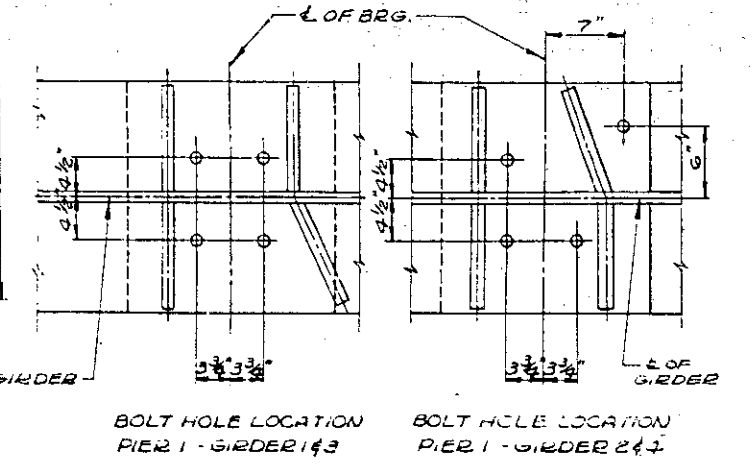
EXPANSION BEARING AT PIER 4, 6, 7, 9 AND 10
BEARING ASSEMBLIES, EXP. TYPE 6 - 20 REQ'D.



SECTION A A
SHOWING LINK BOLT HOLES IN ROCKER CASTING & MASONRY PLATE (SECTION APPLIES TO TYPES 3 & 6)



EXPANSION BEARING AT PIER 1
BEARING ASSEMBLIES, EXP. TYPE 3 - 4 REQ'D.
* SEE SHEET #6 FOR LINK & BOLT DETAILS.



BEARING PLACEMENT GUIDE (TEMPERATURE CORRECTIONS)

TEMP.	W. ABUT.	PIER 1	PIER 2	PIER 3	PIER 4	PIER 5	PIER 6	PIER 7	PIER 8	PIER 9	PIER 10	PIER 11	E. ABUT.
120°	0	+3 3/16"	+2 1/8"	0	+1 1/4"	0	+7/8"	+7/8"	0	+7/8"	+7/8"	0	+1 1/16"
100°	0	+2 1/8"	+1 3/8"	0	+7/8"	0	+9/16"	+3/16"	0	+9/16"	+9/16"	0	+7/16"
80°	0	+1 1/8"	+1 1/16"	0	+7/16"	0	+3/16"	+5/16"	0	+5/16"	+5/16"	0	+1/4"
60°	0	0	0	0	0	0	0	0	0	0	0	0	0
40°	0	-1 1/16"	-1 1/16"	0	-1/16"	0	-5/16"	-5/16"	0	-5/16"	-5/16"	0	-1/4"
20°	0	-2 1/8"	-1 3/8"	0	-7/8"	0	-9/16"	-3/16"	0	-9/16"	-9/16"	0	-7/16"
0°	0	-3 3/16"	-2 1/8"	0	-1 1/4"	0	-7/8"	-7/8"	0	-7/8"	-7/8"	0	-1 1/16"

+ SIGN INDICATES TIPPING OF BEARING AWAY FROM THE FIXED BEARING WITHIN A SUPERSTRUCTURE UNIT (TEMP. RISE)
 - SIGN INDICATES TIPPING OF BEARING TOWARD THE FIXED BEARING WITHIN A SUPERSTRUCTURE UNIT (TEMP. DROP)

BEARING ASSEMBLY NOTES

THE MICROINCH SYMBOL FOR FINISH SURFACES IS IN ACCORDANCE WITH A.S.A.

ALL CASTINGS DESIGNATED AS H.S. CAST STEEL SHALL BE CAST STEEL GRADE 90-60 ANNEALED AS PER M.H.D. 3323.

ALL CASTINGS DESIGNATED AS CAST STEEL SHALL BE CAST STEEL GRADE 70-36 ANNEALED AS PER M.H.D. 3322.

FOR MASONRY PLATES FOR EXPANSION BEARING ASSEMBLY TYPE 4, SEE SPECIAL PROVISIONS.

ALL FILLETS ON CASTINGS SHALL HAVE 3/4" RADIUS.

GUIDE BARS FOR EXPANSION SHOES MAY BE MACHINED FROM THE PARENT BASE PLATE IN LIEU OF INSERT AS SHOWN.

ANCHOR BOLTS SHALL CONFORM TO M.H.D. 3391A.

PINTLES TO BE COLD-FINISHED ALLOY BAR STEEL M.H.D. 3314 TYPE II.

LINK BOLTS AND TURNED BOLTS SHALL BE MADE OF COLD-FINISHED ALLOY STEEL AS PER M.H.D. 3391-F.

ALL STRUCTURAL STEEL, UNLESS OTHERWISE SHOWN OR NOTED, SHALL CONFORM TO STRUCTURAL STEEL M.H.D. 3305.

LUBRICATED BRONZE BUSHINGS SHALL CONFORM TO M.H.D. 3329 EXCEPT BUSHINGS TO BE ALUMINUM BRONZE A.S.T.M. DESIGNATION B148-52 ALLOY 9C OR 9D OR HIGH STRENGTH MANGANESE BRONZE A.S.T.M. DESIGNATION B147 ALLOY 8C.

STRUCTURAL STEEL M.H.D. 3318 MAY BE USED IN LIEU OF CAST STEEL GRADE 90-60 FOR MASONRY PLATES. MACHINE FINISH AS INDICATED ON THE PLAN.

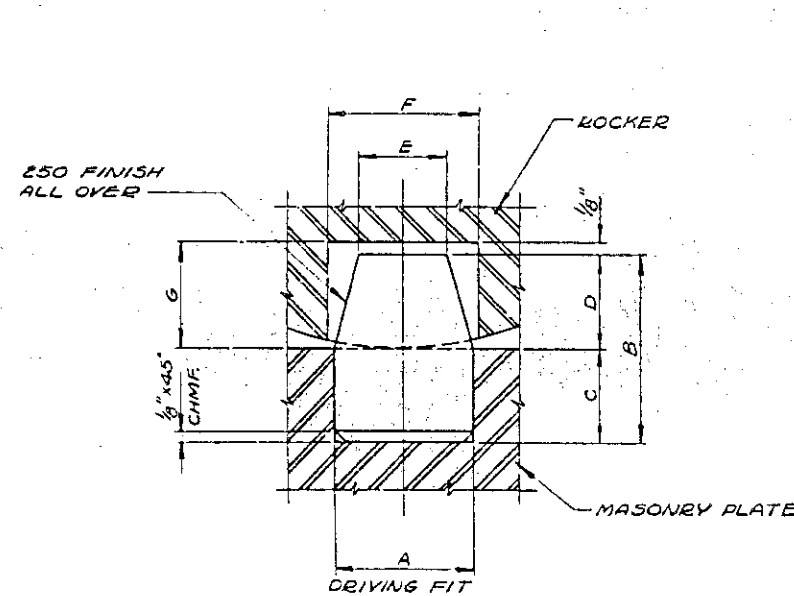
PINS SHALL CONFORM TO THE REQUIREMENTS OF M.H.D. 2471, 3DB, EXCEPT PINS HAVING A DIAMETER OF LESS THAN 6 INCHES SHALL BE HOT ROLLED ALLOY BAR STEEL AS PER M.H.D. 3313 TYPE II. PINS HAVING A DIAMETER OF 6 INCHES OR OVER SHALL BE MADE OF FORGED STEEL AS PER M.H.D. 3315 TYPE III (ALLOY STEEL FORGINGS).

ALL BASE PLATES AND SHOE CASTINGS SHALL BE SCRIBED WITH LONGITUDINAL AND TRANSVERSE CENTERLINES.

PAINT BEARING ASSEMBLIES SAME AS STRUCTURAL STEEL (SEE NOTE ON SHEET 40) EXCEPT PIN HOLES. PINS AND PIN HOLES AS PER M.H.D. 2476, 3B(5) AND (6).

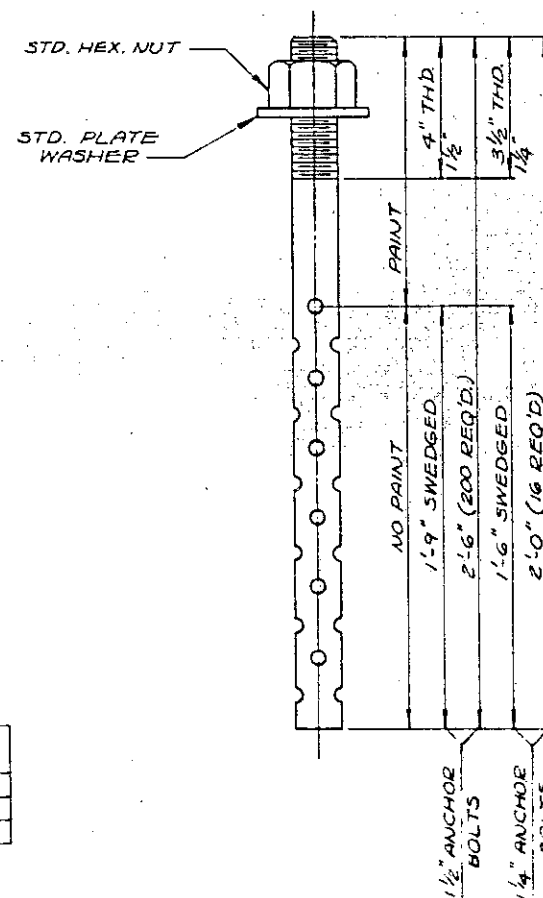
THE PRICE BID FOR BEARING ASSEMBLIES SHALL INCLUDE ALL MATERIALS (ANCHOR BOLTS, SHEET LEAD, FILLS, BEARINGS AND BOLTS FOR ATTACHING BEARINGS TO GIRDERS) FOR EACH TYPE AS SHOWN AND NOTED.

ALL FILL PLATES REQ'D. AT PIERS AND ABUTMENTS SHALL BE GALVANIZED.



PINTLE
COLD-FINISHED ALLOY BAR STEEL

	PINTLE			ROCKER				
	A	B	C	D	E	F		G
EXP. TYPE 2 - 8 REQ'D.	1 1/2"	2"	1"	1"	1 1/4"	1 5/8"	1 1/8"	EAST ABUTMENT
" " 3 - 5 "	1 1/2"	2 1/4"	1"	1 1/4"	1"	1 3/4"	1 3/8"	PIER 1
" " 4 & 6 - 48 "	1 1/2"	2"	1"	1"	1 1/4"	1 3/4"	1 1/8"	PIERS 2, 4, 5, 7, 9, #10



ANCHOR BOLT

STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320
BEARING DETAILS

APPROVED: 3-2-64

SHEET NO. 29 OF 93 SHEETS **9320**

DESIGNED BY: DR. CCF
CHECKED BY: CR. LZZ

LOAD	SPAN 2										SPAN 3										SPAN 4										LOAD						
	10	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10							
D.L.	-1829	+41	+635	-46	-2003	-5236	-9745	-15529	-22590	-30925	-40537	-4226	+2233	-20810	-29514	-38346	-47305	-56391	-65605	-75053	-84740	-94590	-10461	-11481	-12517	-13569	-14637	-15721	-16821	-17937	-19069	-20217	-21381	-22561	-23757	-24969	D.L.
C.L.	-531	-4	+240	+200	-123	-730	-1621	-2725	-4054	-5619	-7324	-9179	-11184	-13339	-15644	-18099	-20704	-23459	-26364	-29419	-32624	-35979	-39484	-43139	-46944	-50899	-55004	-59259	-63664	-68219	-72924	-77779	-82784	-87939	-93244	-98699	C.L.
E.D.L.-C.L.	-2360	+37	+975	+154	-2126	-5066	-11366	-21324	-34942	-52554	-74559	-101159	-13239	-16814	-20849	-25334	-30269	-35654	-41489	-47774	-54559	-61844	-69629	-77914	-86704	-96004	-105814	-116124	-126934	-138244	-149954	-162064	-174574	-187484	-200794	-214504	E.D.L.-C.L.
-LLM	-1701	-2396	-3432	-4868	-6508	-8353	-10403	-12658	-15119	-17786	-20659	-23739	-27024	-30514	-34209	-38104	-42199	-46494	-50989	-55684	-60579	-65674	-70969	-76464	-82159	-88054	-94149	-100444	-106934	-113614	-120484	-127544	-134794	-142244	-149934	-157864	-LLM
E-MOM	-4061	-2559	-2557	-6314	-7631	-10119	-13576	-18067	-23654	-30389	-38314	-47479	-57904	-69609	-82604	-96899	-112494	-129384	-147564	-167034	-187784	-209914	-233424	-258414	-284884	-322834	-362244	-403114	-445444	-489244	-534544	-581344	-629644	-679444	-730744	-783544	E-MOM
+LLM	+2875	+3938	+5008	+5513	+5490	+4934	+4068	+2993	+1829	+662	-1202	-2997	-5051	-7364	-9934	-12769	-15874	-19249	-22884	-26779	-30934	-35359	-40044	-44994	-50204	-55674	-61404	-67404	-73674	-80224	-87044	-94164	-101574	-109274	-117264	-125534	+LLM
E+MOM	-2360	-2312	+4813	+5162	-3387	-486	+6432	+1262	-2349	-3948	-5692	-7482	-9317	-11197	-13122	-15092	-17107	-19267	-21472	-23822	-26322	-28972	-31772	-34722	-37822	-41072	-44472	-48022	-51722	-55572	-59572	-63722	-68022	-72472	-77022	-81722	E+MOM
ELLM+C.L.																																					ELLM+C.L.

LOAD	SPAN 5										SPAN 6										SPAN 7										SPAN 8										LOAD
	40	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	
D.L.	-6551	-3218	-617	-1297	-2495	-2948	+2657	+620	-681	-3298	-6639	-3017	-748	-1854	-1788	+2055	+1655	+587	-7188	-3987	-1453	-764	+1890	+2349	+2141	+1266	-277	-2488	-5365	-2539	-361	+1150	+1994	+2171	+1679	+521	-1305	-3798	-6959	D.L.	
C.L.	-1879	-921	-177	+394	+769	+930	+877	+110	-202	-955	-1921	-627	+25	+487	+756	+334	+720	+414	-1728	-851	-167	+373	+665	+765	+675	+390	-95	-751	-1609	-787	-109	+377	+774	+635	+405	-68	-731	-1587	C.L.		
E.D.L.-C.L.	-8430	-4133	-798	+691	+3264	+3878	+3534	+2231	-883	-4253	-8580	-3648	-723	+1341	+2544	+2885	+2375	+1001	-8916	-4838	-1620	+1137	+2555	+3118	+2814	+1656	-362	-3239	-6974	-3326	-470	+1527	+2665	+2945	-2364	+926	-1373	-4529	-6546	E.D.L.-C.L.	
-LLM	-4491	-2322	-484	-217	-528	-855	-1184	-1532	-1779	-2824	-4678	-7704	-1074	-1764	-1697	-1634	-1587	-1499	-4285	-2692	-1986	-1587	-1248	-931	-603	-275	-252	-2025	-4103	-3461	-3237	-3013	-2790	-2564	-2342	-2118	-1895	-2854	-4779	-LLM	
E-MOM	-12921	-6455	-1278	+1474	+2734	+3023	+2350	+699	-2462	-7077	-13258	-6348	-2570	-423	-847	+1253	+808	+498	-13207	-7530	-3606	-450	+1307	+2183	+2211	+1381	-614	-5264	-11077	-6787	-3707	-1486	-125	+379	+22	-1192	-3268	-7383	-13325	E-MOM	
+LLM	451	+277	+70	+1077	+2194	+2891	+3026	+2890	+1452	+888	+615	+1426	+2026	+2875	+3363	+3467	+3182	+2514	+721	+1060	+1776	+2482	+2774	+2667	+2136	+1186	44	+234	+520	+1762	+2983	+3790	+4188	+4186	+3795	+3089	+1906	+1352	+1336	+LLM	
E+MOM	-7979	-3556	-724	+2768	+5458	+6719	+6560	+5011	+569	-3365	-7965	-799	+2051	+3362	+4119	+4301	+3902	+2928	-1007	+209	+1609	+2855	+3459	+3432	+2809	+1576	-41	-457	-1089	+975	+2874	-4167	+4859	-6960	-4480	+4434	+1838	+621	-251	E+MOM	
ELLM+C.L.																																								ELLM+C.L.	
D.L.																																								D.L.	
C.L.																																								C.L.	
E.D.L.-C.L.																																									E.D.L.-C.L.
-LLM																																									-LLM
E-MOM																																									E-MOM
+LLM																																									+LLM
E+MOM																																									E+MOM
ELLM+C.L.																																									ELLM+C.L.

LOAD	SPAN 9										SPAN 10										SPAN 11										SPAN 12										LOAD	
	80	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10		
D.L.	-6959	-3795	-1898	-531	+1692	+2186	+2013	+1173	-335	-2487	-5351	-2484	-277	+1268	+2154	+2379	+943	+847	-910	3527	-6405	-3401	+1060	+616	+628	+977	+1661	+682	-961	3269	-6840	-3519	-1796	-174	+1050	+1873	+2208	+2322	+1948	+1174	0	D.L.
C.L.	-1587	-721	-47	+436	+726	+826	+733	+449	-27	-751	-1622	-758	-86	+395	+684	+782	+688	+402	-75	-744	-1605	-755	-58	-429	+723	+826	+737	+457	+6	-679	-1535	-852	-286	-162	+492	+704	+799	+776	+635	+376	0	C.L.
E.D.L.-C.L.	-8546	-4516	-1345	+967	+2418	+3018	+2746	+1622	-362	-3238	-6973	-3242	-363	+1663	+2838	+3161	+2631	+1249	-985	-4071	-8010	-4136	+1118	+1045	+2351	+2803	+2308	+1139	-977	-3948	-7775	-4671	-2082	-12	+1542	+2577	+3098	+2583	+1550	0	E.D.L.-C.L.	
-LLM	-4779	-2867	-1935	-2110	-2307	-2534	-2734	-2933	-3152	-3475	-4018	-1979	-246	-252	-554	-855	-1163	-1479	-1845	-2540	-4111	-2400	-1596	-1468	-1381	-1308	-1220	-1133	-1123	-1994	-3736	-2447	-1838	-1608	-1378	-1149	-919	-689	-459	-230	0	-LLM
E-MOM	-12325	-7383	-3280	-1143	+111	+478	+12	-1311	3494	-6713	+1985	-5221	-609	+1411	+2284	+2306	+1466	-230	-2830	-6611	+12121	-6536	-2714	-423	+912	+1495	+1178	+6	-2100	-5947	-11511	-7118	-3920	-1620	+164	+1428	+2178	+2409	+2124	+1320	0	E-MOM
+LLM	+1336	+1381	+1966	+3065	+3918	+4186	+4170	+3752	+2921	+1844	+465	+266	-41	+1180	+2107	+2623	+279	+2413	+1771	+1071	+742	+973	+1651	+2514	+3022	+3147	+2883	+2236	+1488	+666	+482	+774	+1417	+2134	+2618	+2855	+2834	+2544	+2230	+185	0	+LLM
E+MOM	-7210	-3135	+621	+8232	+6230	+7198	+6916	+5374	+2559	-1394	-6508	-2976	-322	+2843	+4945	+5784	+5349	+3662	+786	-3000	-7268	-3163	+533	+3559	+3373	+3950	+3281	+3375	+511	-3282	-7293	-3897	-665	+2122	+4160	+5432	+5931	+5642	+4613	+2745	0	E+MOM
ELLM+C.L.	-251	+660	+1919	+3501	+4538	+5012	+4903	+4201	+2894	+1093	-1157	-492	-45	+1575	+2791	+3405	+3406	+2815	+1696	-327	-863	+233	+1523	+2943	+3745	+3978	+3620	+2693	+1472	-13	+1053	-78	+1131	+2240	+3110	+3559	+3633	+3320	+2665	+1571	0	ELLM+C.L.

TABLE OF DESIGN MOMENTS
(MOMENTS GIVEN AT 1/10 POINTS OF SPAN)
MOMENTS ARE GIVEN IN FT-KIPS
NEGATIVE MOMENT CAUSES TENSION
ON TOP FLANGE

DESIGNATIONS USED
D.L. = DEAD LOAD
C.L. = CURB LOAD
-LL = NEGATIVE LIVE LOAD
+LL = POSITIVE LIVE LOAD
WHOLE NUMBERS INDICATE PIERS 1, 2, 3, 4, ...

STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320

TABLE OF DESIGN MOMENTS

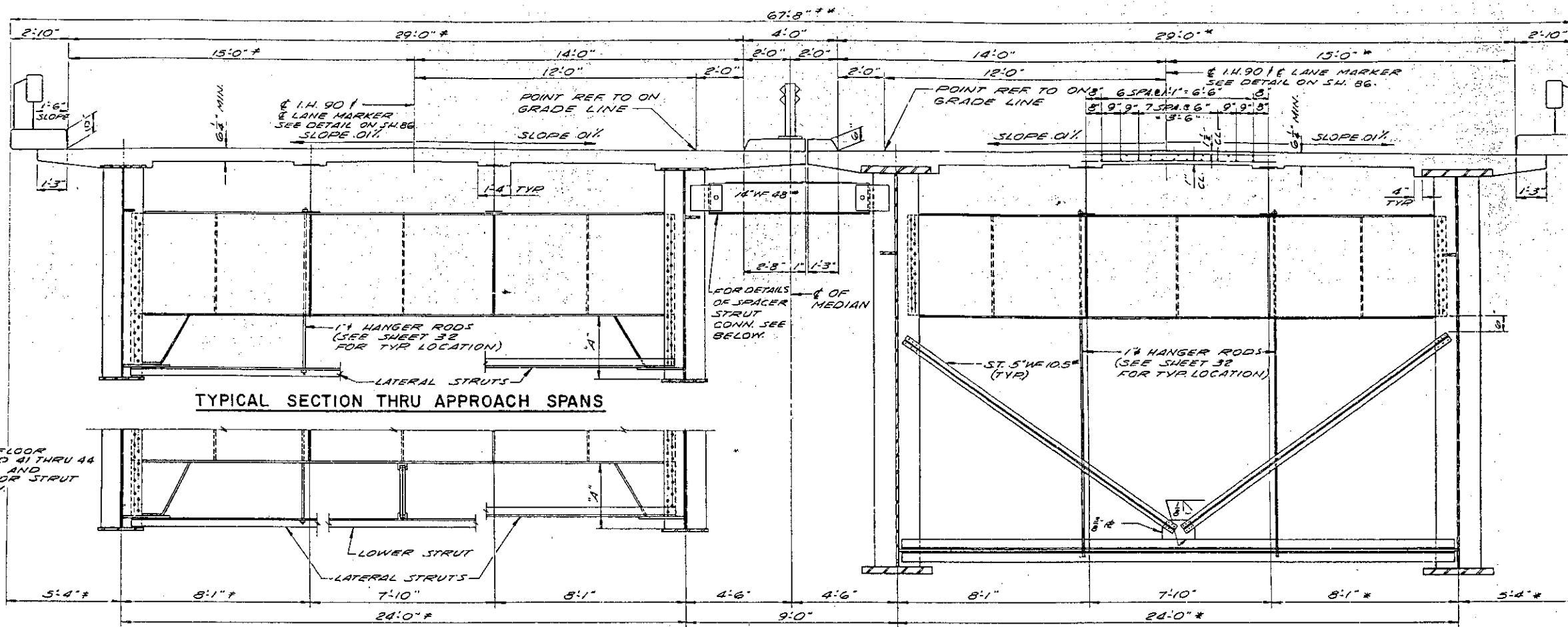
APPROVED 3 2 64

SHEET NO 30 OF 93 SHEETS 9320

CES 1-7
DR 424
CK JKA

* VARIABLE IN EAST BOUND LANE FROM WEST ABUTMENT TO FIELD SPlice 5 GIRDER NO. 4.
 † VARIABLE IN WEST BOUND LANE FROM WEST ABUTMENT TO HINGE 1.

PROJECT	SHEET NUMBER	TOTAL SHEETS



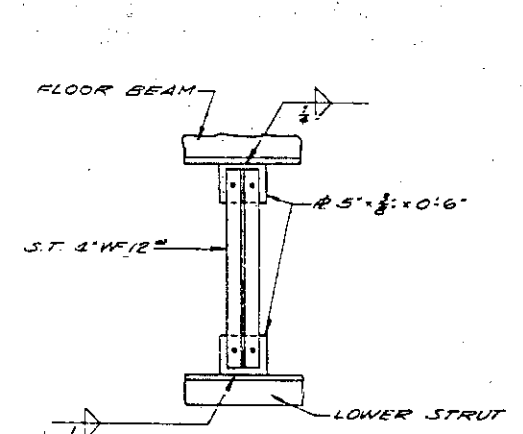
NOTES:
 FOR HAUNCH THICKNESS SEE SHEET 85.
 CONCRETE IN SLAB TO BE MIX NO. 3Y6.
 CONCRETE IN CURBS AND MEDIAN SHALL BE MIX NO. 3Y60.
 SEE SHEET 83 FOR CURB, MEDIAN AND RAILING DETAILS.
 SEE SHEETS 69 THRU 80 FOR SLAB REINFORCEMENT.
 WHEN DIMENSION 'A' IS LESS THAN 3'-6\"/>

PART SECTION AT FLOOR BEAMS 5 THRU 7 AND 41 THRU 44 W.B. AND 6 THRU 11 AND 42 THRU 45 E.B. FOR STRUT DETAIL SEE BELOW.

SECTION THRU SPANS 2 & 4
 LOOKING EAST

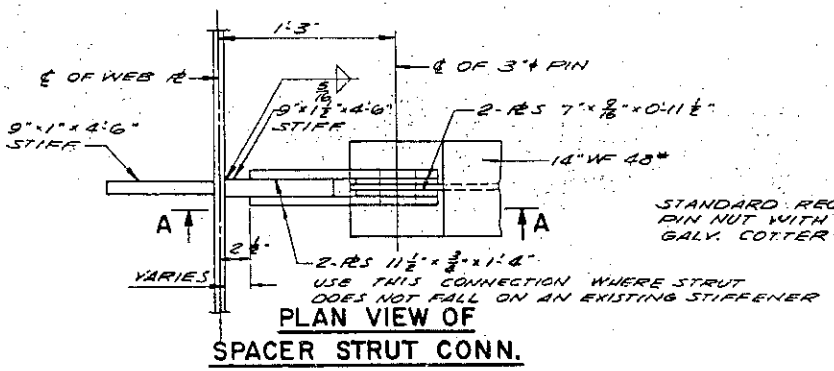
SECTION THRU ROADWAY SPANS 2, 3 & 4

CROSS FRAMING TYPICAL AT FLOOR BEAMS 8 THRU 13 AND 15 THRU 40 W.B. LANE AND FLOOR BEAMS 12 THRU 14 AND 16 THRU 41 E.B. LANE

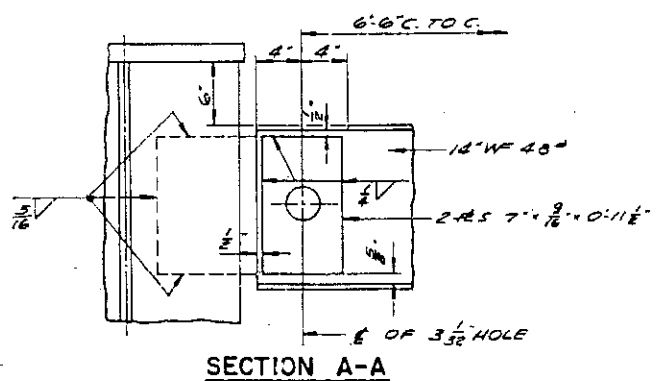


TYPICAL STRUT CONNECTION

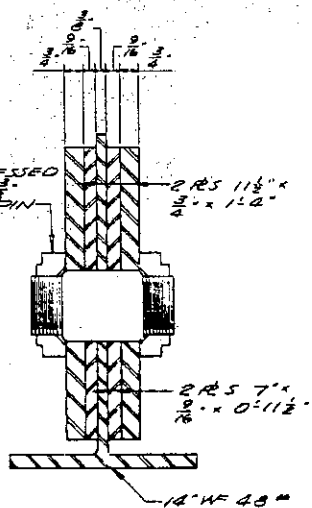
SPANS 2 & 4 WHERE CROSS FRAMES ARE NOT USED



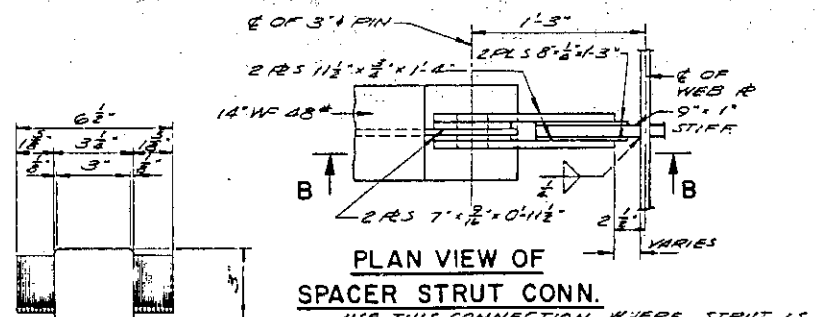
PLAN VIEW OF SPACER STRUT CONN.



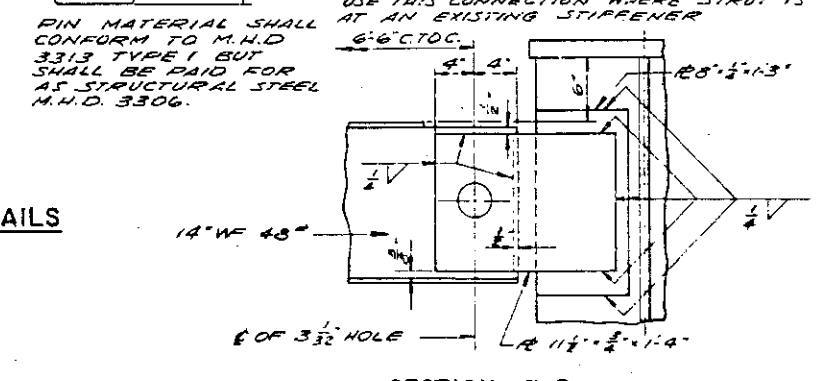
SECTION A-A



PIN DETAILS



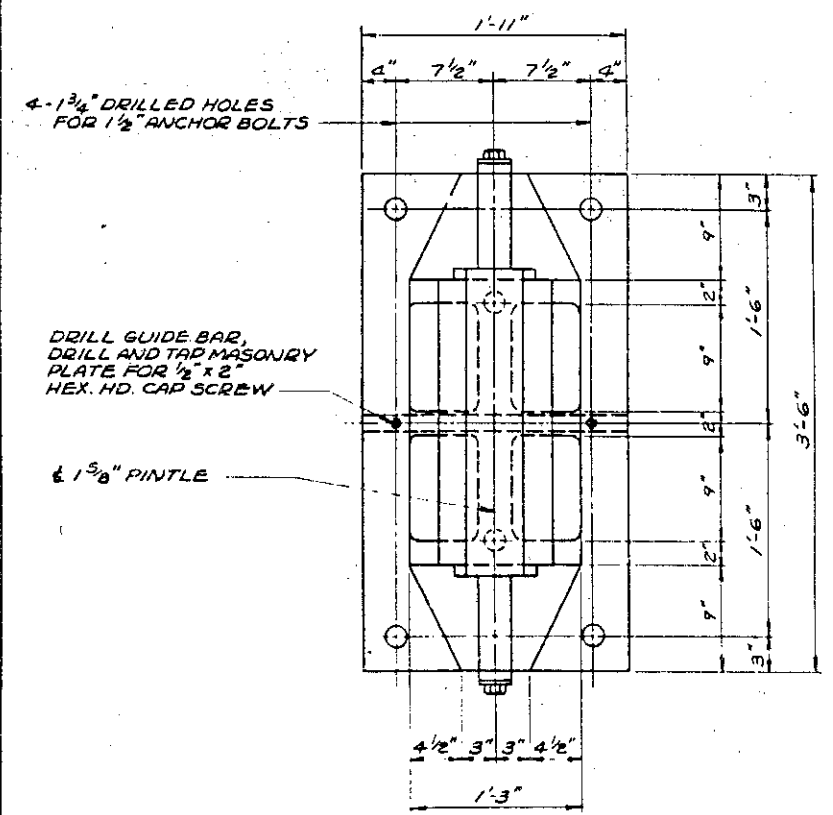
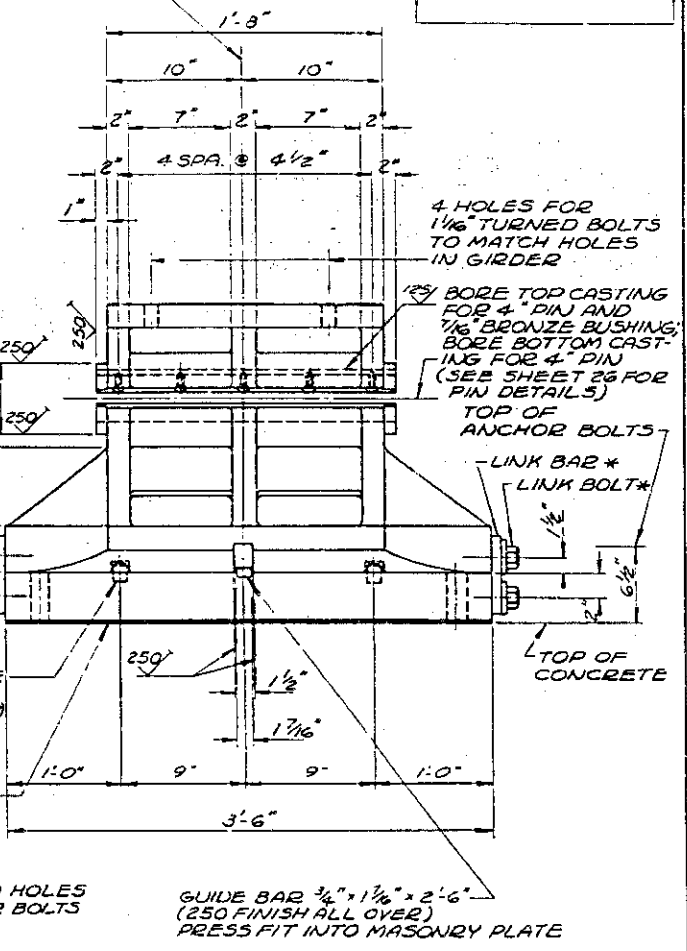
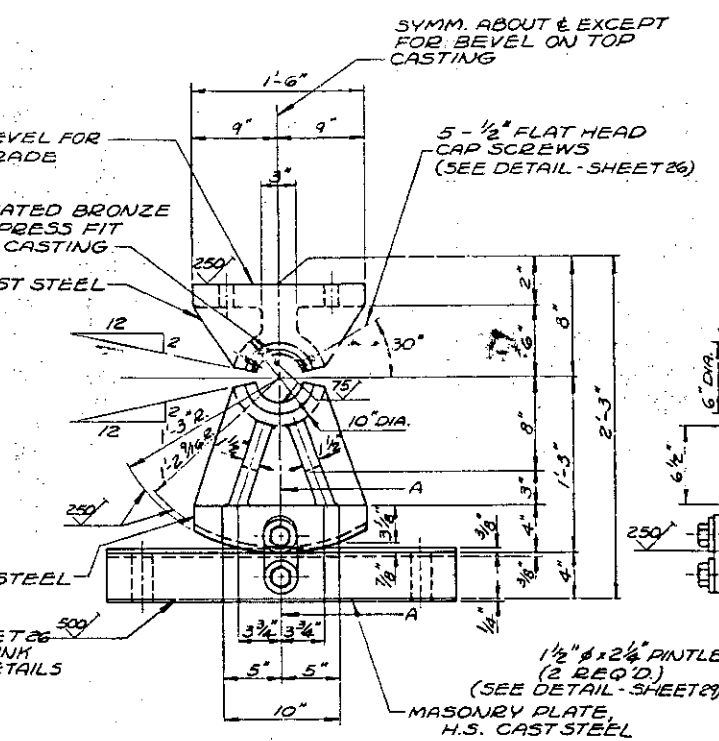
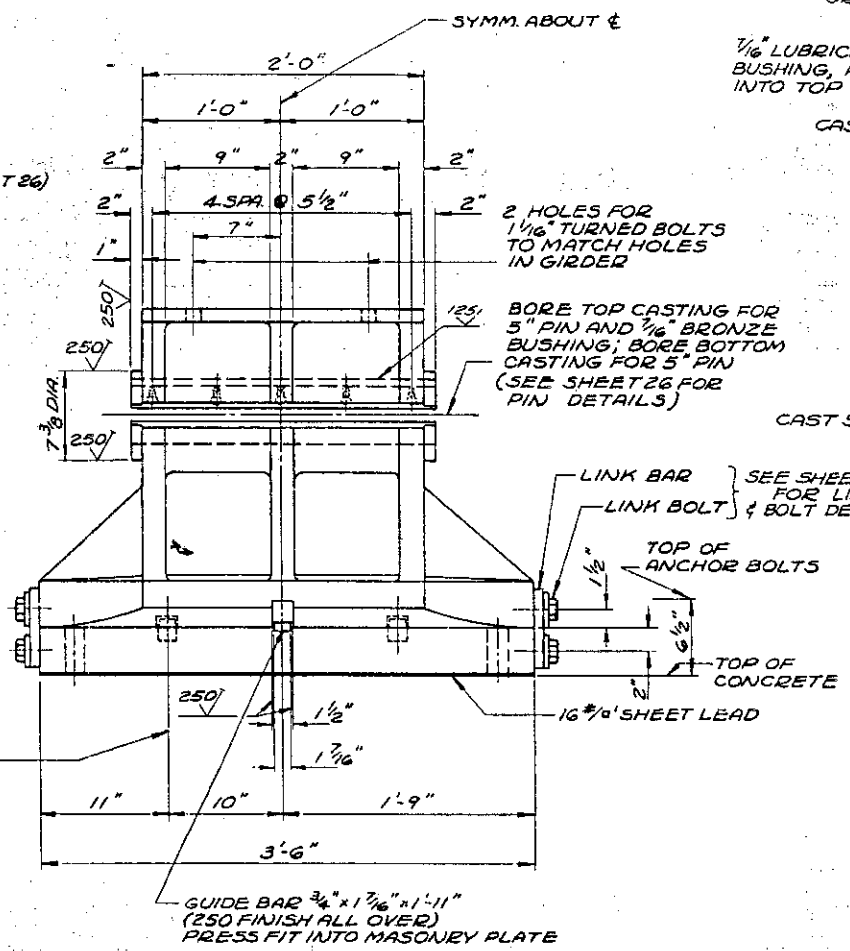
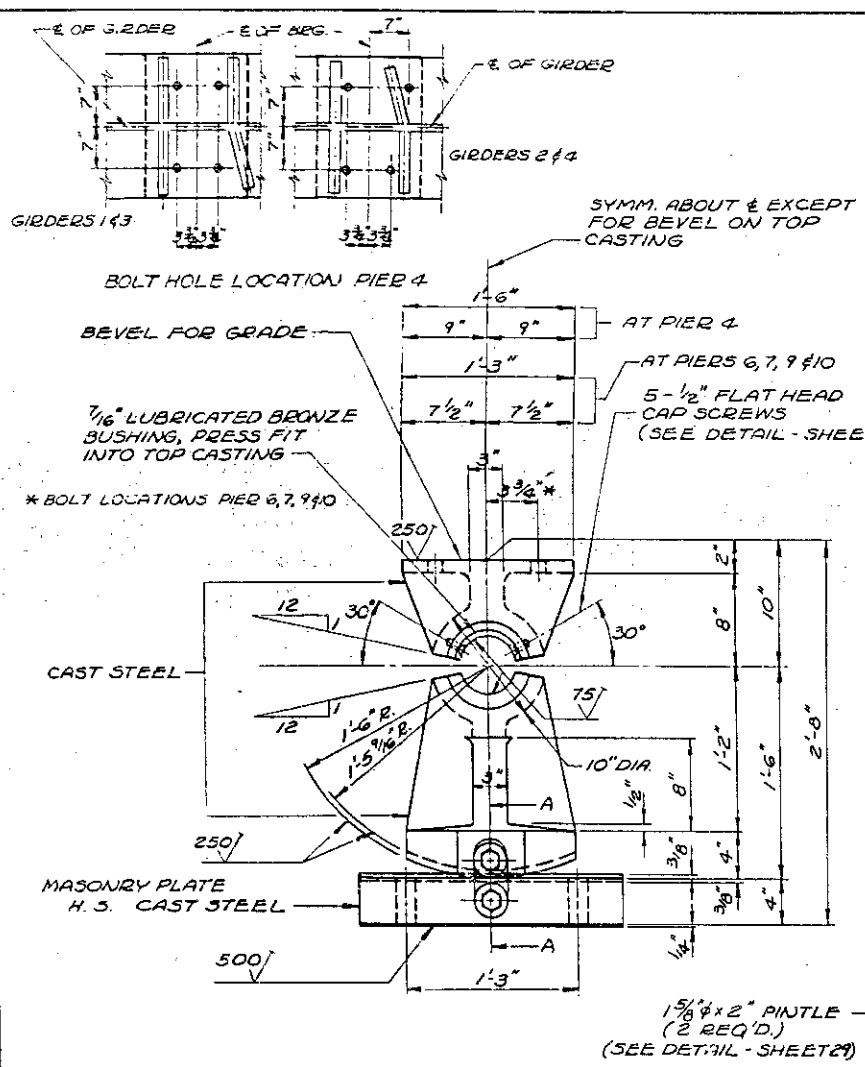
PLAN VIEW OF SPACER STRUT CONN.



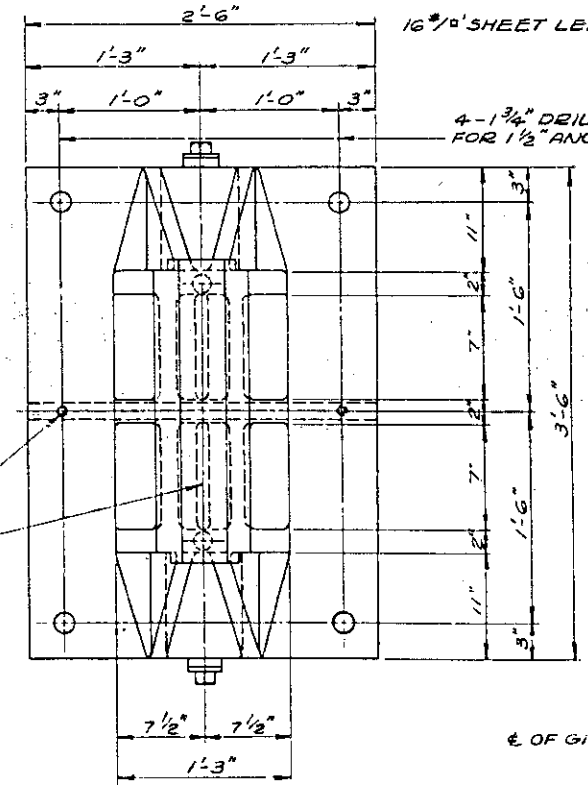
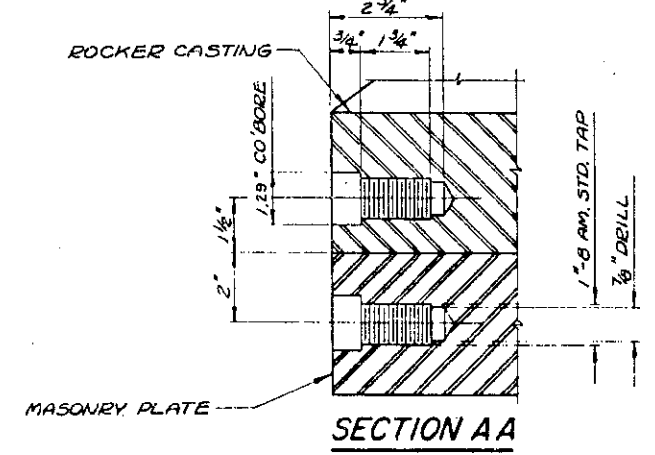
SECTION B-B

SPACER STRUT NOTES:
 SEE SHEETS 32 AND 33 FOR STRUT LOCATION, PIN PLATE, FILL & STRUT MATERIAL SHALL CONFORM TO M.H.D. 3306.
 STRUTS SHALL NOT BE PLACED UNTIL SUPERSTRUCTURE SLAB IS IN PLACE.
 CONNECTION PLATES ON ONE END OF SPACER STRUT SHALL BE FIELD WELDED.

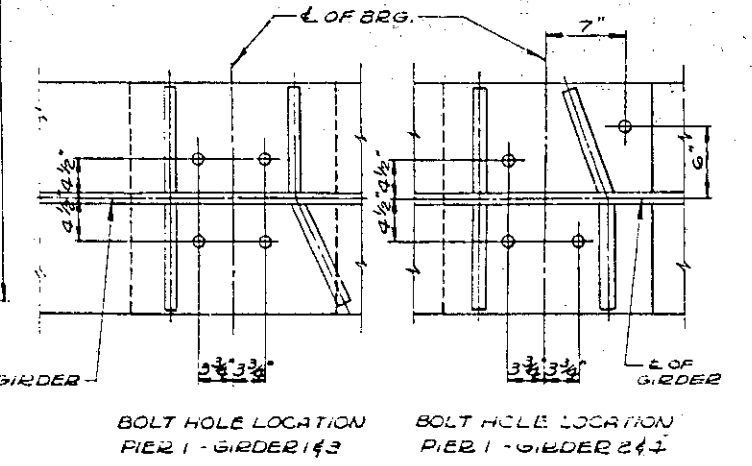
STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS	
BRIDGE NO. 9320 ROADWAY CROSS-SECTION	
APPROVED 9-10-04	
SHEET NO. 31 OF 93 SHEETS	9320



EXPANSION BEARING AT PIER 4, 6, 7, 9 AND 10
BEARING ASSEMBLIES, EXP. TYPE 6 - 20 REQ'D.



EXPANSION BEARING AT PIER 1
BEARING ASSEMBLIES, EXP. TYPE 3 - 4 REQ'D.
* SEE SHEET 26 FOR LINK & BOLT DETAILS.



BEARING PLACEMENT GUIDE (TEMPERATURE CORRECTIONS)

TEMP.	W. ABUT.	PIER 1	PIER 2	PIER 3	PIER 4	PIER 5	PIER 6	PIER 7	PIER 8	PIER 9	PIER 10	PIER 11	E. ABUT.
120°	0	+3 ³ / ₁₆ "	+2 ¹ / ₈ "	0	+1 ¹ / ₄ "	0	+7 ⁷ / ₈ "	+7 ⁷ / ₈ "	0	+7 ⁷ / ₈ "	+7 ⁷ / ₈ "	0	+1 ¹ / ₁₆ "
100°	0	+2 ¹ / ₈ "	+1 ³ / ₈ "	0	+7 ⁷ / ₈ "	0	+9 ⁹ / ₁₆ "	+9 ⁹ / ₁₆ "	0	+9 ⁹ / ₁₆ "	+9 ⁹ / ₁₆ "	0	+7 ⁷ / ₁₆ "
80°	0	+1 ¹ / ₁₆ "	+1 ¹ / ₁₆ "	0	+7 ⁷ / ₁₆ "	0	+5 ⁵ / ₁₆ "	+5 ⁵ / ₁₆ "	0	+5 ⁵ / ₁₆ "	+5 ⁵ / ₁₆ "	0	+1 ¹ / ₄ "
60°	0	0	0	0	0	0	0	0	0	0	0	0	0
40°	0	-1 ¹ / ₁₆ "	-1 ¹ / ₁₆ "	0	-7 ⁷ / ₁₆ "	0	-5 ⁵ / ₁₆ "	-5 ⁵ / ₁₆ "	0	-5 ⁵ / ₁₆ "	-5 ⁵ / ₁₆ "	0	-1 ¹ / ₄ "
20°	0	-2 ¹ / ₈ "	-1 ³ / ₈ "	0	-7 ⁷ / ₈ "	0	-9 ⁹ / ₁₆ "	-9 ⁹ / ₁₆ "	0	-9 ⁹ / ₁₆ "	-9 ⁹ / ₁₆ "	0	-7 ⁷ / ₁₆ "
0°	0	-3 ³ / ₁₆ "	-2 ¹ / ₈ "	0	-1 ¹ / ₄ "	0	-7 ⁷ / ₈ "	-7 ⁷ / ₈ "	0	-7 ⁷ / ₈ "	-7 ⁷ / ₈ "	0	-1 ¹ / ₁₆ "

+ SIGN INDICATES TIPPING OF BEARING AWAY FROM THE FIXED BEARING WITHIN A SUPERSTRUCTURE UNIT (TEMP. RISE)
 - SIGN INDICATES TIPPING OF BEARING TOWARD THE FIXED BEARING WITHIN A SUPERSTRUCTURE UNIT (TEMP. DROP)

BEARING ASSEMBLY NOTES

THE MICROINCH SYMBOL FOR FINISH SURFACES IS IN ACCORDANCE WITH A. S. A.

ALL CASTINGS DESIGNATED AS H. S. CAST STEEL SHALL BE CAST STEEL GRADE 90-60 ANNEALED AS PER M.H.D. 3323.

ALL CASTINGS DESIGNATED AS CAST STEEL SHALL BE CAST STEEL GRADE 70-36 ANNEALED AS PER M.H.D. 3322.

FOR MASONRY PLATES FOR EXPANSION BEARING ASSEMBLY TYPE 4, SEE SPECIAL PROVISIONS.

ALL FILLETS ON CASTINGS SHALL HAVE 3/4" RADIUS.

GUIDE BARS FOR EXPANSION SHOES MAY BE MACHINED FROM THE PARENT BASE PLATE IN LIEU OF INSERT AS SHOWN.

ANCHOR BOLTS SHALL CONFORM TO M.H.D. 3331A.

PINTLES TO BE COLD-FINISHED ALLOY BAR STEEL M.H.D. 3314 TYPE II.

LINK BOLTS AND TURNED BOLTS SHALL BE MADE OF COLD-FINISHED ALLOY STEEL AS PER M.H.D. 3331-F.

ALL STRUCTURAL STEEL, UNLESS OTHERWISE SHOWN OR NOTED, SHALL CONFORM TO STRUCTURAL STEEL M.H.D. 3307.

LUBRICATED BRONZE BUSHINGS SHALL CONFORM TO M.H.D. 3329 EXCEPT BUSHINGS TO BE ALUMINUM BRONZE A.S.T.M. DESIGNATION B148-52 ALLOY 9C OR 9D OR HIGH STRENGTH MANGANESE BRONZE A.S.T.M. DESIGNATION B147 ALLOY 8C.

STRUCTURAL STEEL M.H.D. 3318 MAY BE USED IN LIEU OF CAST STEEL GRADE 90-60 FOR MASONRY PLATES. MACHINE FINISH AS INDICATED ON THE PLAN.

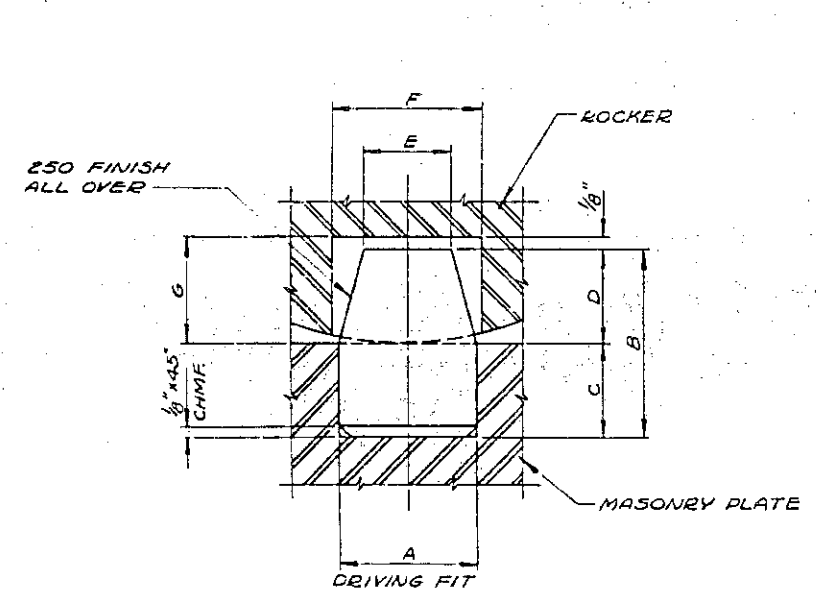
PINS SHALL CONFORM TO THE REQUIREMENTS OF M.H.D. 2471.3DB, EXCEPT PINS HAVING A DIAMETER OF LESS THAN 6 INCHES SHALL BE HOT ROLLED ALLOY BAR STEEL AS PER M.H.D. 3313 TYPE II. PINS HAVING A DIAMETER OF 6 INCHES OR OVER SHALL BE MADE OF FORGED STEEL AS PER M.H.D. 3315 TYPE III (ALLOY STEEL FORGINGS).

ALL BASE PLATES AND SHOE CASTINGS SHALL BE SCRIBED WITH LONGITUDINAL AND TRANSVERSE CENTERLINES.

PAINT BEARING ASSEMBLIES SAME AS STRUCTURAL STEEL (SEE NOTE ON SHEET 40) EXCEPT PIN HOLES. PINS AND PIN HOLES AS PER M.H.D. 2476. 3B2(5) AND (6).

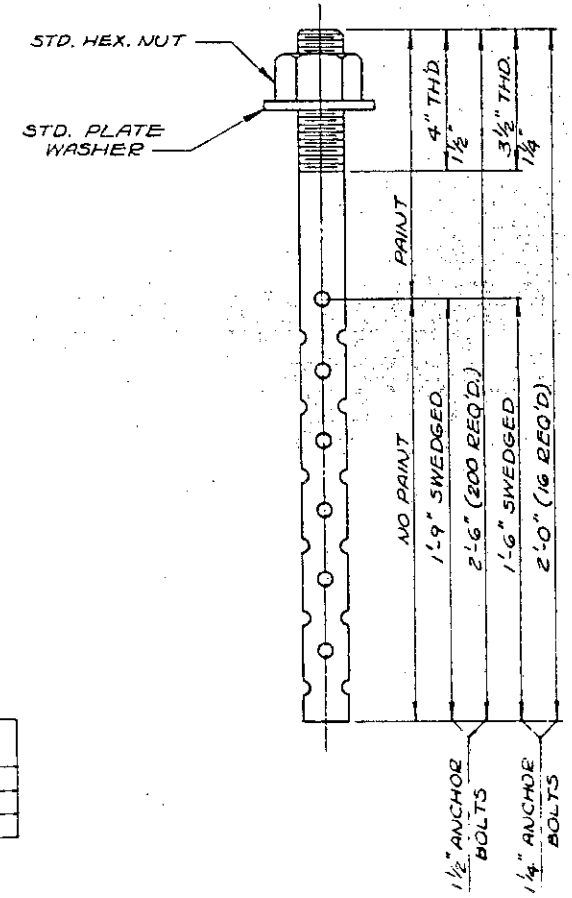
THE PRICE BID FOR BEARING ASSEMBLIES SHALL INCLUDE ALL MATERIALS (ANCHOR BOLTS, SHEET LEAD, FILLS, BEARINGS AND BOLTS FOR ATTACHING BEARINGS TO GIRDERS) FOR EACH TYPE AS SHOWN AND NOTED.

ALL FILL PLATES REQ'D. AT PIERS AND ABUTMENTS SHALL BE GALVANIZED.



PINTLE
COLD-FINISHED ALLOY BAR STEEL

	PINTLE			ROCKER				
	A	B	C	D	E	F		G
EXP. TYPE 2 - 8 REQ'D.	1 1/2"	2"	1"	1"	1 1/4"	1 3/8"	1 1/8"	EAST ABUTMENT
" " 3 - 3	1 1/2"	2 1/4"	1"	1 1/4"	1"	1 3/8"	1 3/8"	PIER 1
" " 4 & 48	1 3/8"	2"	1"	1"	1 1/4"	1 3/4"	1 1/8"	PIERS 2, 4, 6, 7, 9, 10



ANCHOR BOLT

STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320
BEARING DETAILS

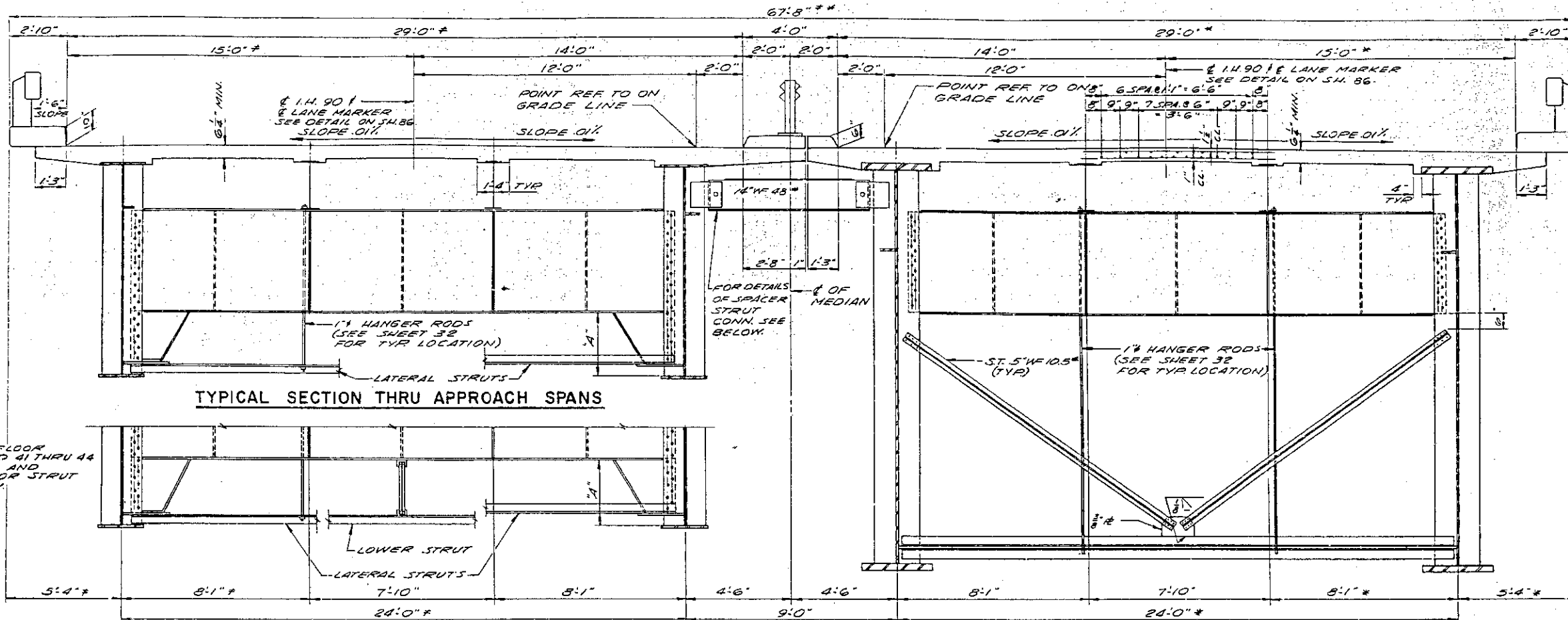
APPROVED: 3-2-49

SHEET NO. 29 OF 93 SHEETS **9320**

DESIGNED BY: [Signature]
CHECKED BY: [Signature]

* VARIABLE IN EAST BOUND LANE FROM WEST ABUTMENT TO FIELD SPALICE 3 GIRDER NO. 4.
 * VARIABLE IN WEST BOUND LANE FROM WEST ABUTMENT TO HINGE 1.

PROJECT	SHEET NUMBER	TOTAL SHEETS

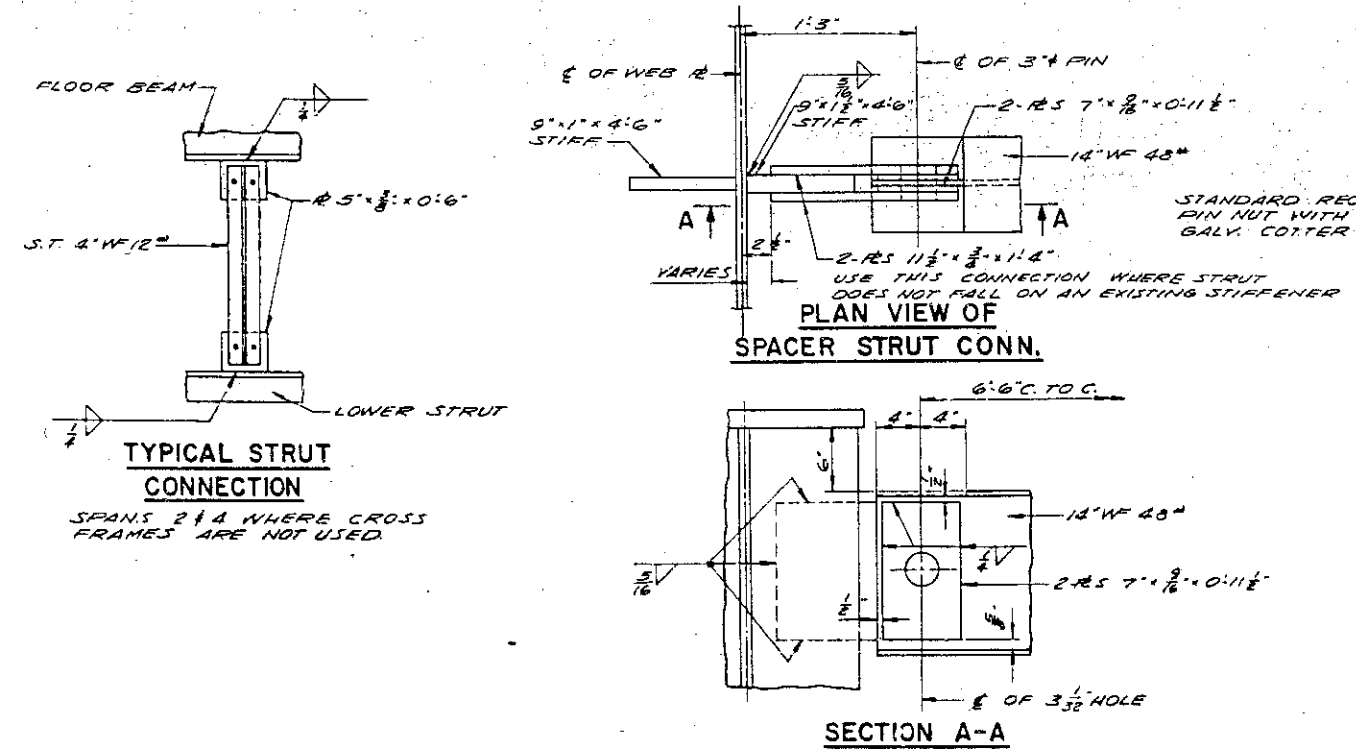


NOTES:
 FOR HAUNCH THICKNESS SEE SHEET 85.
 CONCRETE IN SLAB TO BE MIX NO. 316.
 CONCRETE IN CURBS AND MEDIAN SHALL BE MIX NO. 3160.
 SEE SHEET 83 FOR CURB, MEDIAN AND RAILING DETAILS.
 SEE SHEETS 69 THRU 80 FOR SLAB REINFORCEMENT.
 WHEN DIMENSION "A" IS LESS THAN 3'-6" NO LOWER STRUT IS USED BETWEEN GIRDERS. WHEN DIMENSION "A" IS GREATER THAN 3'-6" A LOWER STRUT IS USED BETWEEN GIRDERS. SEE SHEETS 32 AND 33.

PART SECTION AT FLOOR BEAMS 5 THRU 7 AND 41 THRU 44 W.B. AND 8 THRU 11 AND 42 THRU 45 E.B. FOR STRUT DETAIL SEE BELOW.

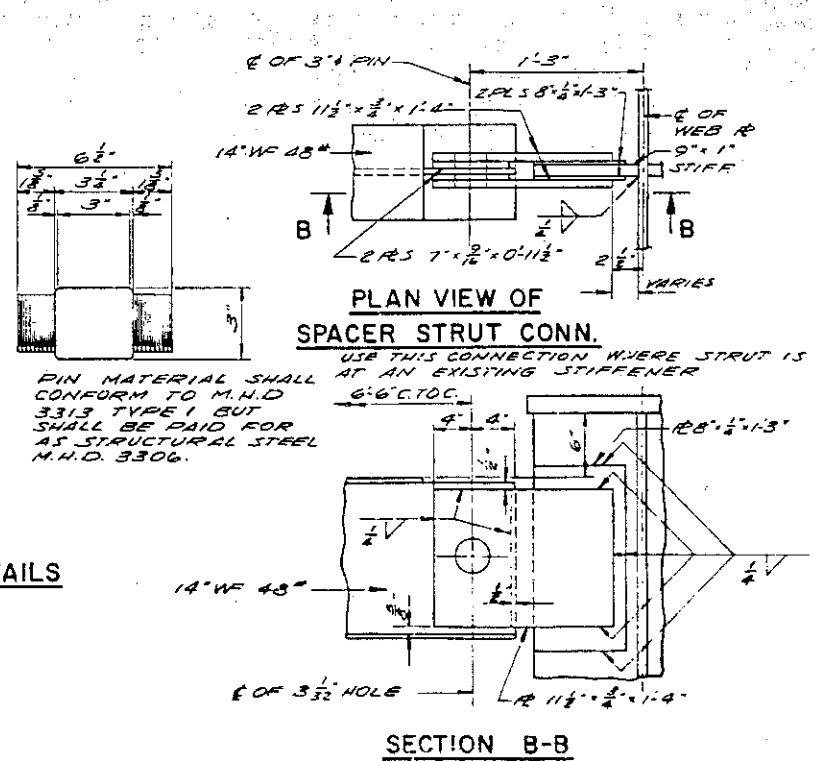
TYPICAL SECTION THRU APPROACH SPANS

SECTION THRU SPANS 2 & 4
 LOOKING EAST



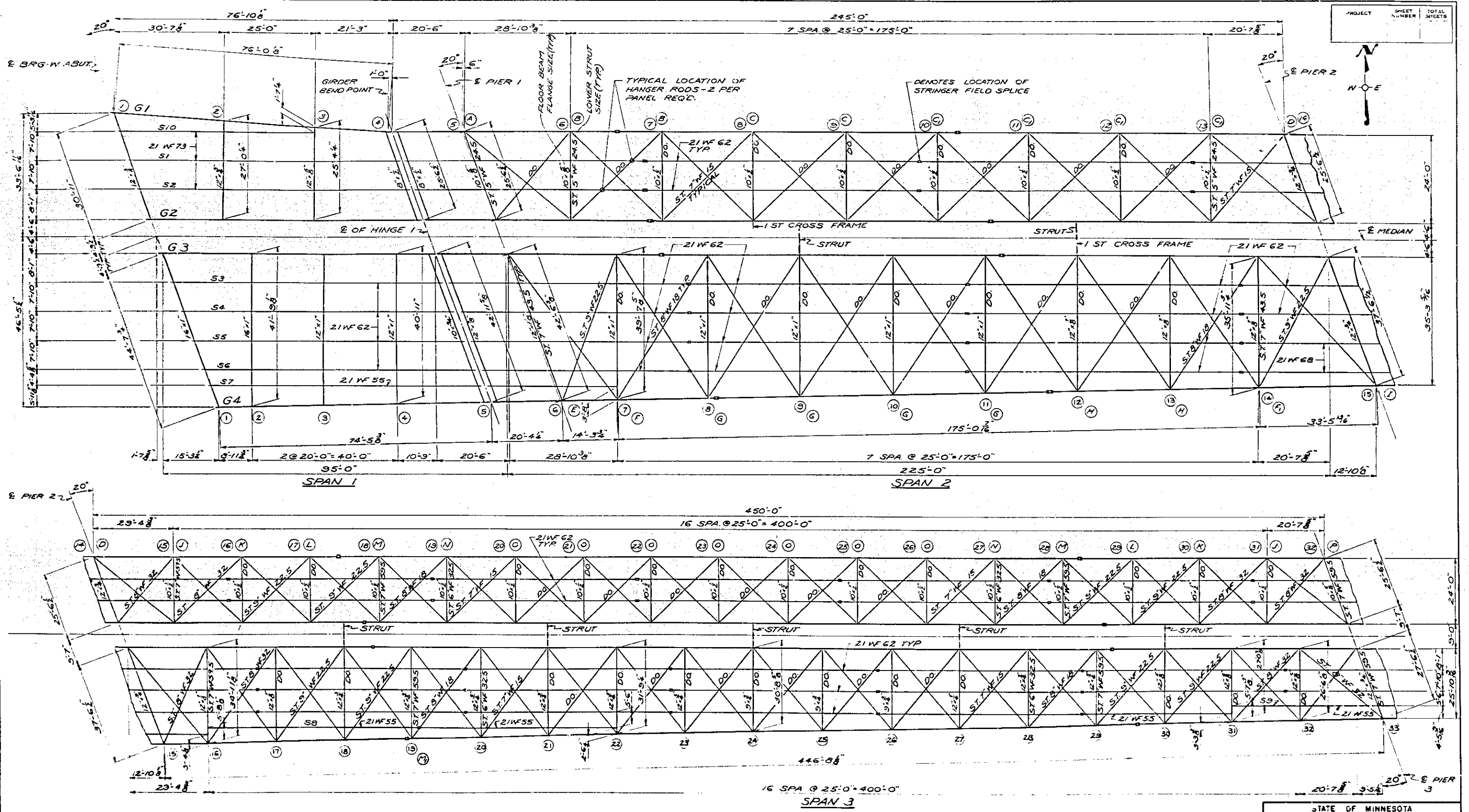
SECTION THRU ROADWAY SPANS 2, 3 & 4

CROSS FRAMING TYPICAL AT FLOOR BEAMS 8 THRU 13 AND 15 THRU 40 W.B. LANE AND FLOOR BEAMS 12 THRU 14 AND 16 THRU 41 E.B. LANE



SPACER STRUT NOTES:
 SEE SHEETS 32 AND 33 FOR STRUT LOCATION, PIN PLATE, FILL & STRUT MATERIAL SHALL CONFORM TO M.H.D. 3306. STRUTS SHALL NOT BE PLACED UNTIL SUPERSTRUCTURE SLAB IS IN PLACE. CONNECTION PLATES ON ONE END OF SPACER STRUT SHALL BE FIELD WELDED.

STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS	
BRIDGE NO. 9320	
ROADWAY CROSS-SECTION	
APPROVED 9-10-04	
SHEET NO. 31 OF 93 SHEETS	9320



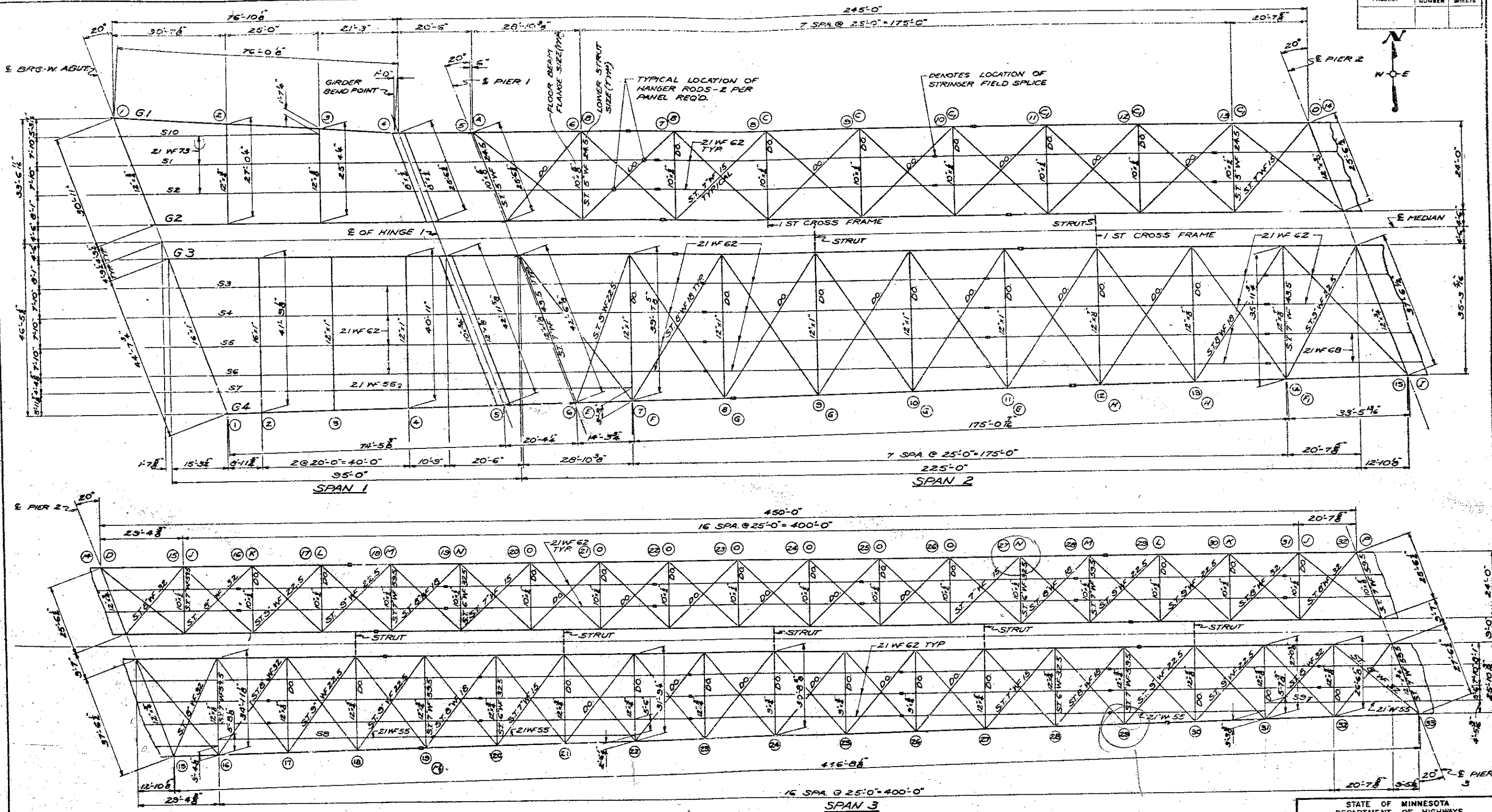
ALL STRUCTURAL STEEL EXCEPT FOR MAIN GIRDERS SHALL CONFORM TO M.H.D. 3306.
 FLOOR BEAMS 3 THRU 26 IN EAST BOUND LANE HAVE 63"x8" WEB. ALL OTHER FLOOR BEAMS HAVE 50"x6" WEBS UNLESS OTHERWISE SHOWN OR NOTED. FOR FLOOR BEAM DETAILS SEE SHEETS 44-49.
 FOR LATERAL CONN DETAILS SEE SHEETS 50 & 51. FIELD SPLICES IN STRINGERS SHALL BE AT 2 POINT OF SPAN UNLESS OTHERWISE SHOWN.

UNLESS OTHERWISE NOTED LATERAL CONNECTIONS IN E.B. LANE ARE SIMILAR TO THOSE SHOWN FOR W.B. LANE WITH EQUIVALENT LATERAL MEMBERS.

* EXCEPT FB #15 E.B. WHICH HAS A 230" WEB.

CIRCLED NUMBER THUS (1) DENOTES FLOOR BEAM NUMBER
 CIRCLED LETTER THUS (A) DENOTES LATERAL CONN DETAIL

STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS	
BRIDGE NO. 9320	
FRAMING PLAN	
APPROVED 3-10-64	
SHEET 32 OF 93 SHEETS	9320



ALL STRUCTURAL STEEL EXCEPT FOR MAIN GIRDERS SHALL CONFORM TO M.A.D. 3306.
 FLOOR BEAMS #3 THRU 26 IN EAST BOUND LANE HAVE 63"x36" WEBS. ALL OTHER FLOOR BEAMS HAVE 50"x36" WEBS UNLESS OTHERWISE SHOWN OR NOTED.
 FOR FLOOR BEAM DETAILS SEE SHEETS 44-43.
 FOR LATERAL CONN. DETAILS SEE SHEETS 50 & 51.
 FIELD SPLICES IN STRINGERS SHALL BE AT 2 POINT OF SPAN UNLESS OTHERWISE SHOWN.

UNLESS OTHERWISE NOTED LATERAL CONNECTIONS IN E.B. LANE ARE SIMILAR TO THOSE SHOWN FOR W.B. LANE WITH EQUIVALENT LATERAL MEMBERS.
 * EXCEPT F.B. #15 E.B. WHICH HAS A 230" WEB.

CIRCLED NUMBER THUS (1) DENOTES FLOOR BEAM NUMBER
 CIRCLED LETTER THUS (A) DENOTES LATERAL CONN. DETAIL

STATE OF MINNESOTA
 DEPARTMENT OF HIGHWAYS

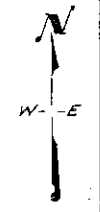
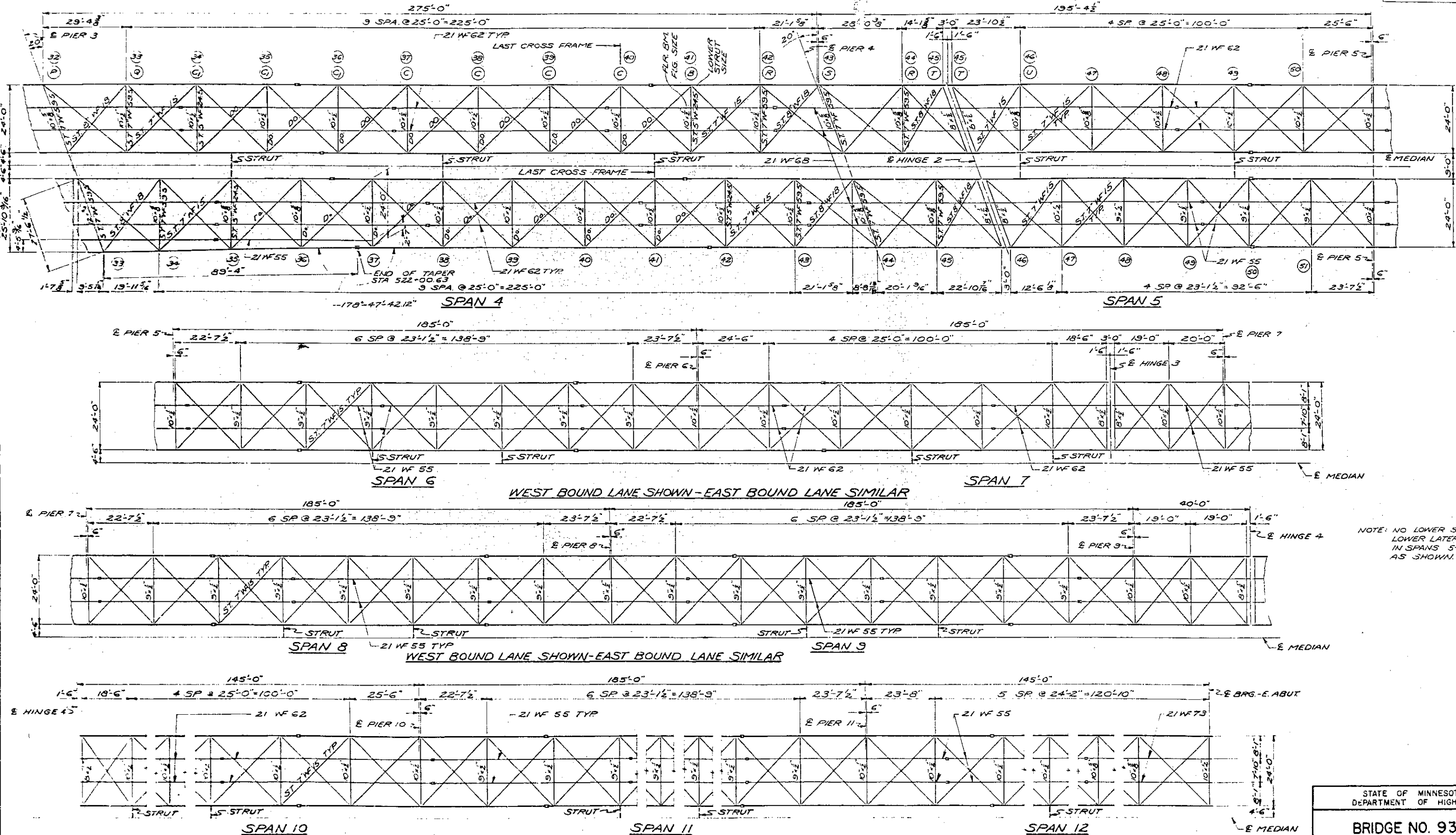
BRIDGE NO. 9320

FRAMING PLAN

APPROVED 9-10-64

SHEET NO 32 OF 93 SHEETS 9320

DES. DR. CR. 3W 4.7

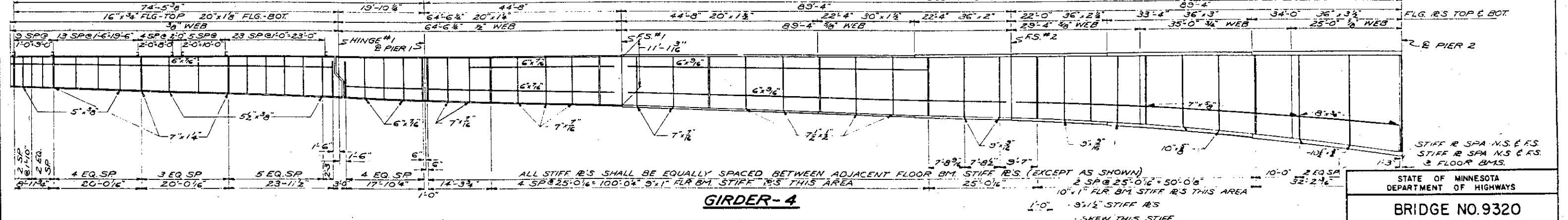
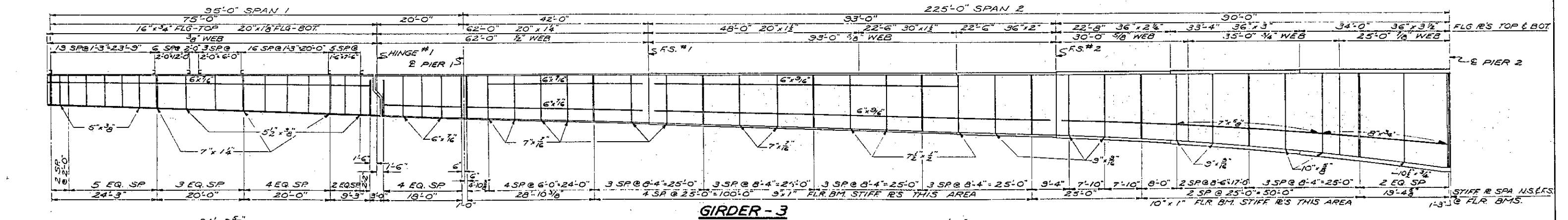
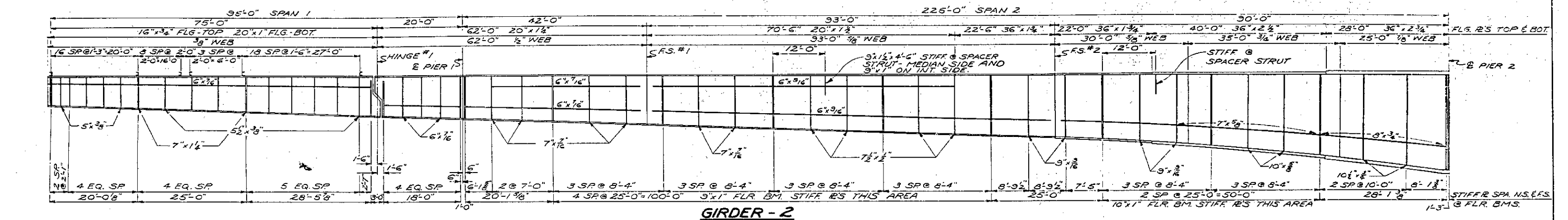
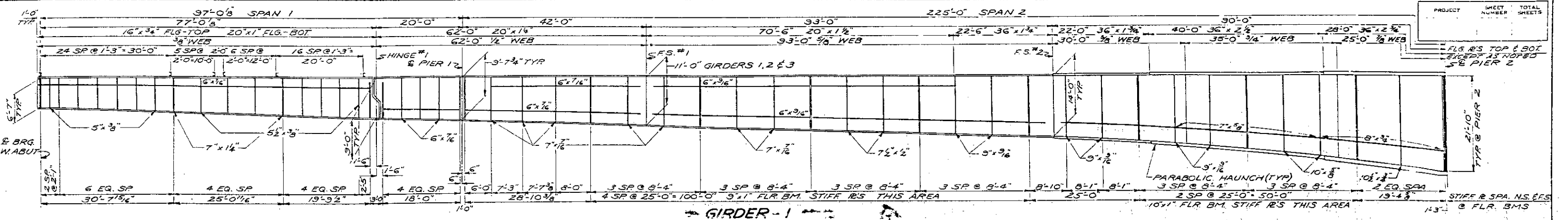


ALL STRUCTURAL STEEL EXCEPT FOR MAIN GIRDERS SHALL CONFORM TO MHD 3306 FOR FLOOR BEAM DETAILS SEE SHEETS 44-49 FOR LATERAL CONNECTION DETAILS SEE SHEETS 50 & 51

NOTE: FIELD SPLICES IN STRINGERS SHALL BE LOCATED AT APPROXIMATELY THE .2 POINT OF THE SPAN IN WHICH THEY ARE SHOWN, EXCEPT AS NOTED.

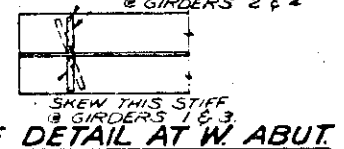
FRAMING PLAN

STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS	
BRIDGE NO. 9320	
FRAMING PLAN	
APPROVED 9-10-64	
SHEET NO 33 OF 93 SHEETS	9320



NOTE: ALL GIRDER FLANGES AND WEBS FROM E OF HINGE 1 TO PIER 2 SHALL CONFORM TO M.H.D. 3310. ALL OTHER STRUCTURAL STEEL SHALL CONFORM TO M.H.D. 3306 UNLESS OTHERWISE SHOWN OR NOTED. SEE SHEET 38 FOR DETAILS OF PARABOLIC HAUNCH, WELD SIZES AND SHEAR LUG DETAILS.

NOTE: LONG STIFFENERS SHALL BE PLACED AT 1/5 OF THE WEB DEPTH FROM FLANGES AS SHOWN. LONG STIFFENERS SHALL BE PLACED ON THE INSIDE FACE OF EXTERIOR GIRDER WEBS AND ON THE MEDIAN SIDE OF INTERIOR GIRDERS. END OF GIRDERS AT ABUTS. TO BE CUT VERTICAL.



NOTE FOR BRG STIFFENERS AT PIERS 1 & 2 SEE SHEET 36.

STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

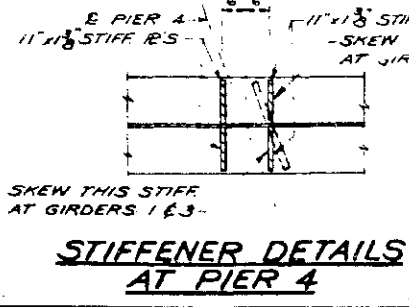
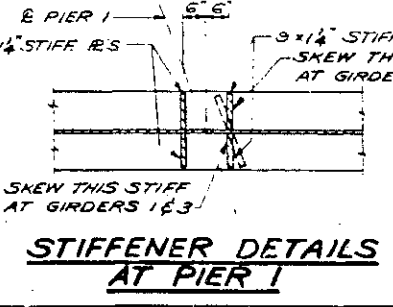
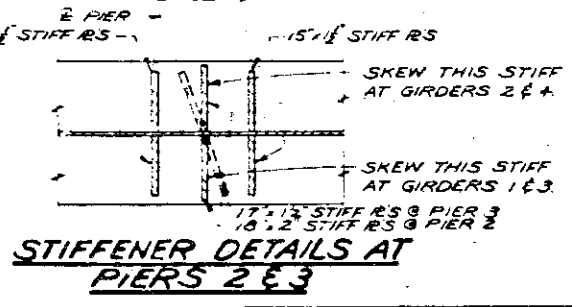
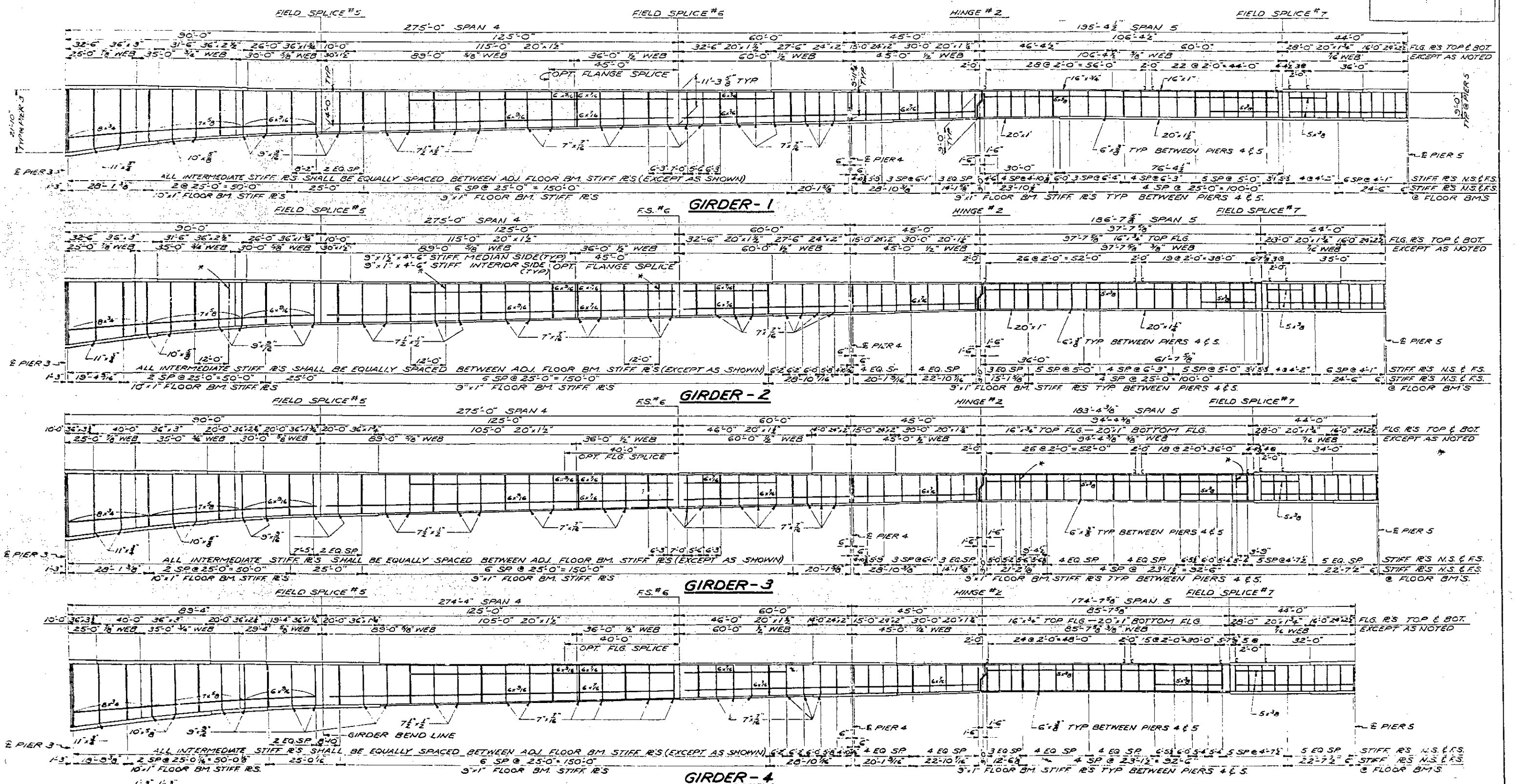
BRIDGE NO. 9320

GIRDERS SPANS 1 & 2

APPROVED 9-10-64

SHEET NO. 34 OF 93 SHEETS | 9320

DES.	DR.	BY



SEE SHEET #0 FOR GENERAL NOTES.
 ALL FLANGES AND WEBS FROM E PIER 3 TO E HINGE 2 AND FROM FIELD SPLICE #7 TO PIER 5 SHALL CONFORM TO M.H.D. 3310. ALL OTHER STRUCTURAL STEEL SHALL CONFORM TO M.H.D. 3306 UNLESS OTHERWISE SHOWN OR NOTED.

* DENOTES STIFFENER AT SPACER STRUT.

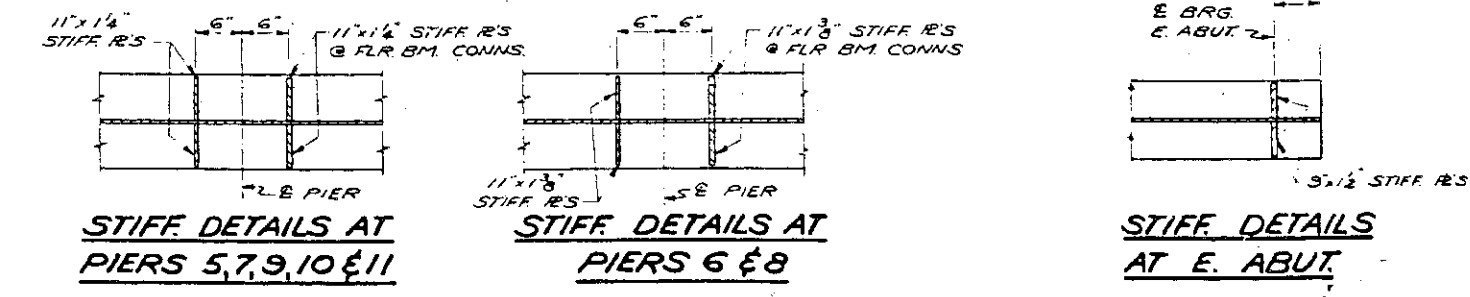
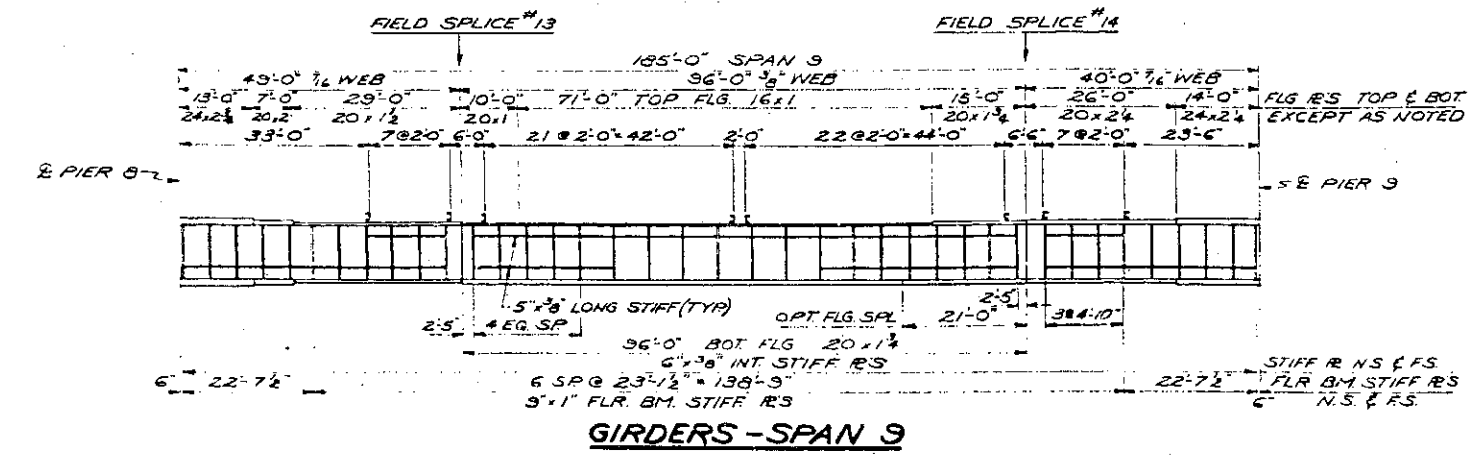
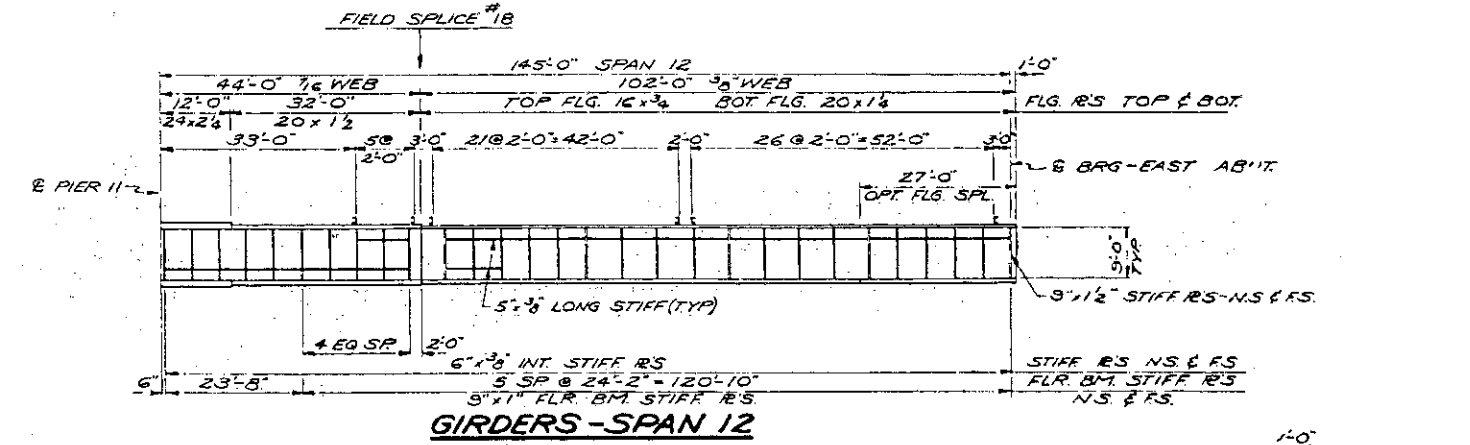
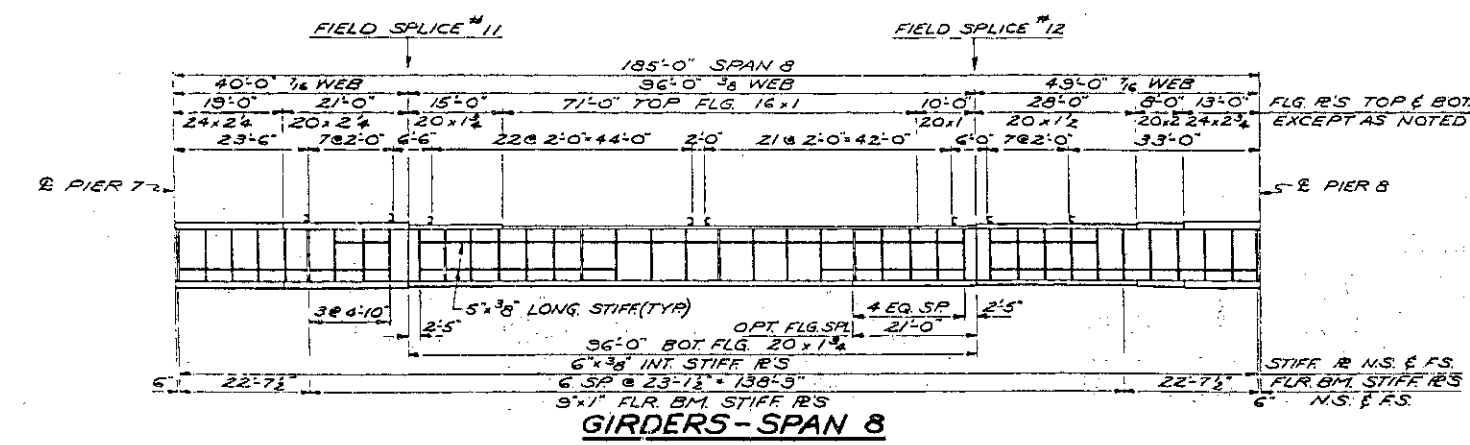
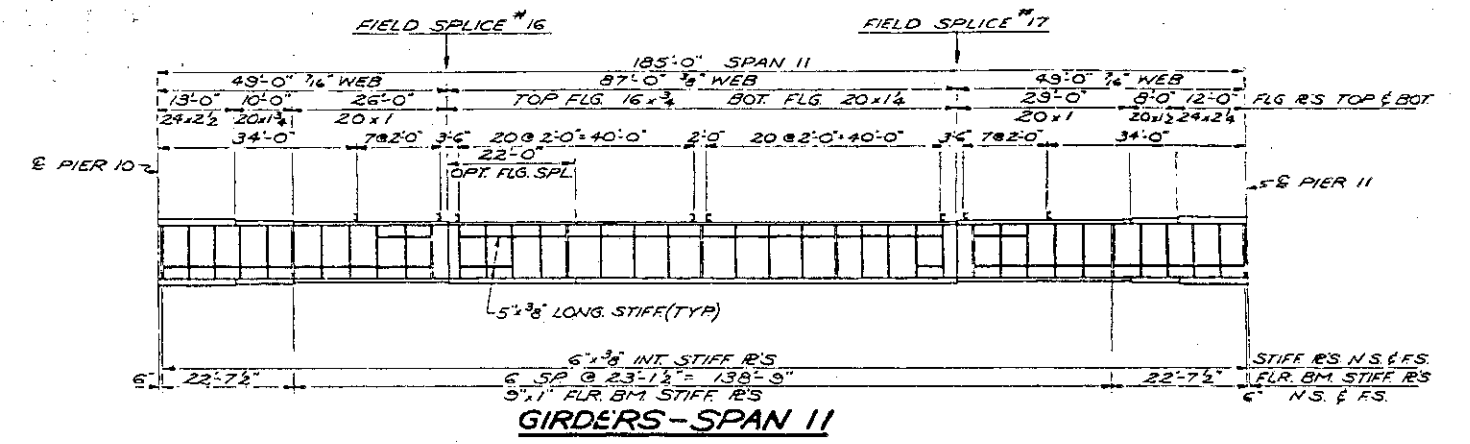
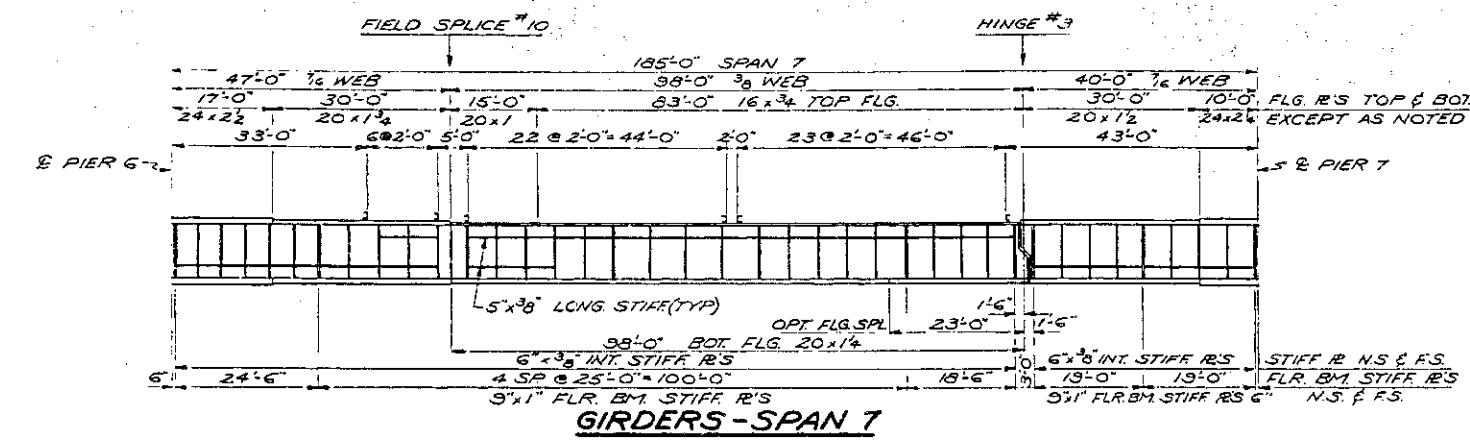
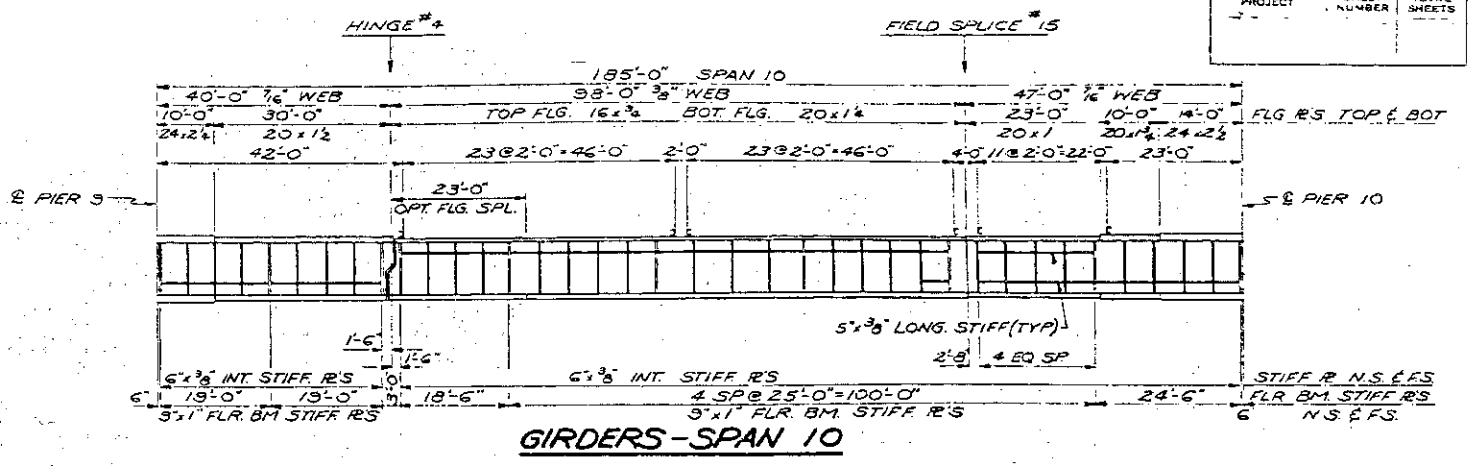
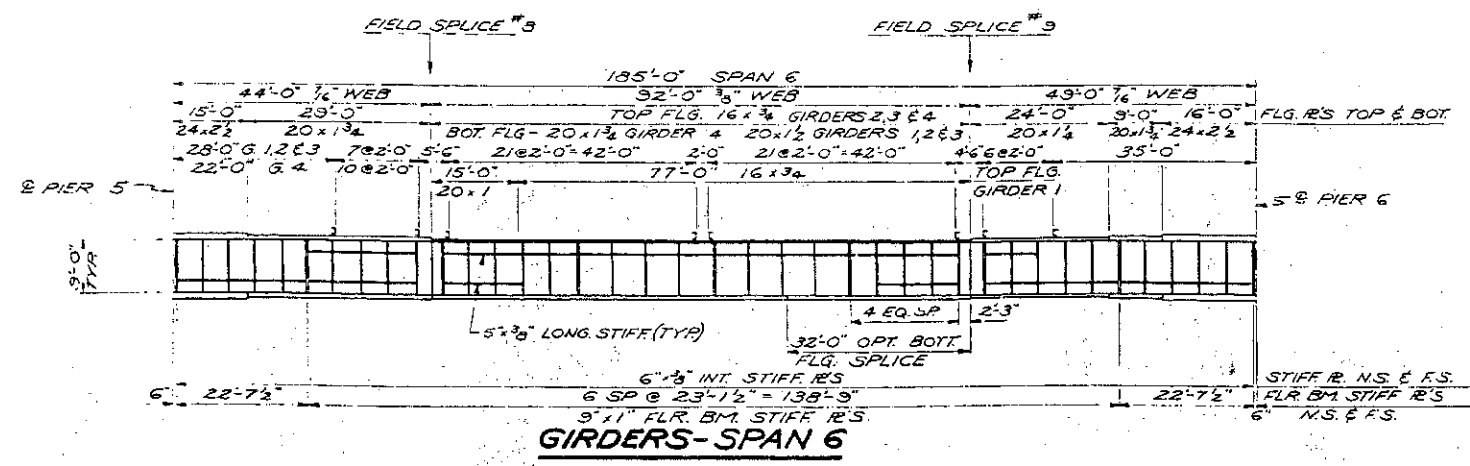
STATE OF MINNESOTA
 DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320

GIRDERS SPANS 4&5

APPROVED 9-10-64

SHEET NO 36 OF 93 SHEETS	9320	DESIGNED BY	DR	CHK
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NOTE: ALL INTERMEDIATE STIFFENER PLATES SHALL BE EQUALLY SPACED BETWEEN ADJACENT FLOOR BEAM STIFFENER PLATES (EXCEPT AS SHOWN).

SEE SHEET 40 FOR GENERAL NOTES. ALL FLANGES AND WEBS FROM FIELD SPLICE TO FIELD SPLICE OR FROM HINGE TO FIELD SPLICE IN THE SECTION OVER THE PIERS SHALL CONFORM TO MHD STRUCTURAL STEEL 3310 ALL OTHER STRUCTURAL STEEL SHALL CONFORM TO MHD 3306 UNLESS OTHERWISE SHOWN OR NOTED.

STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320

GIRDERS SPANS 6-12

APPROVED 3-13-64

SHEET NO 37 OF 93 SHEETS	9320	DES. J.M. DR. B.W. CR. J.A.
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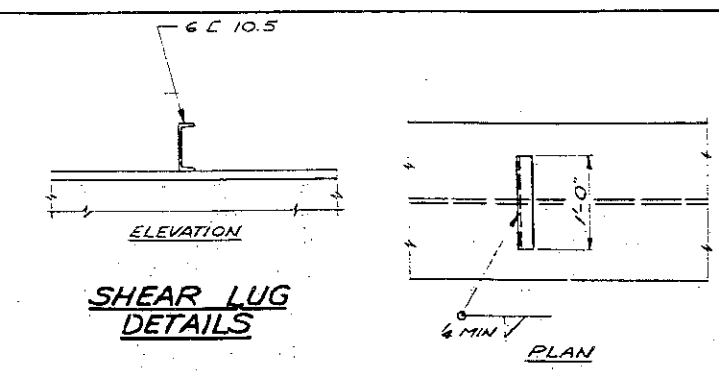
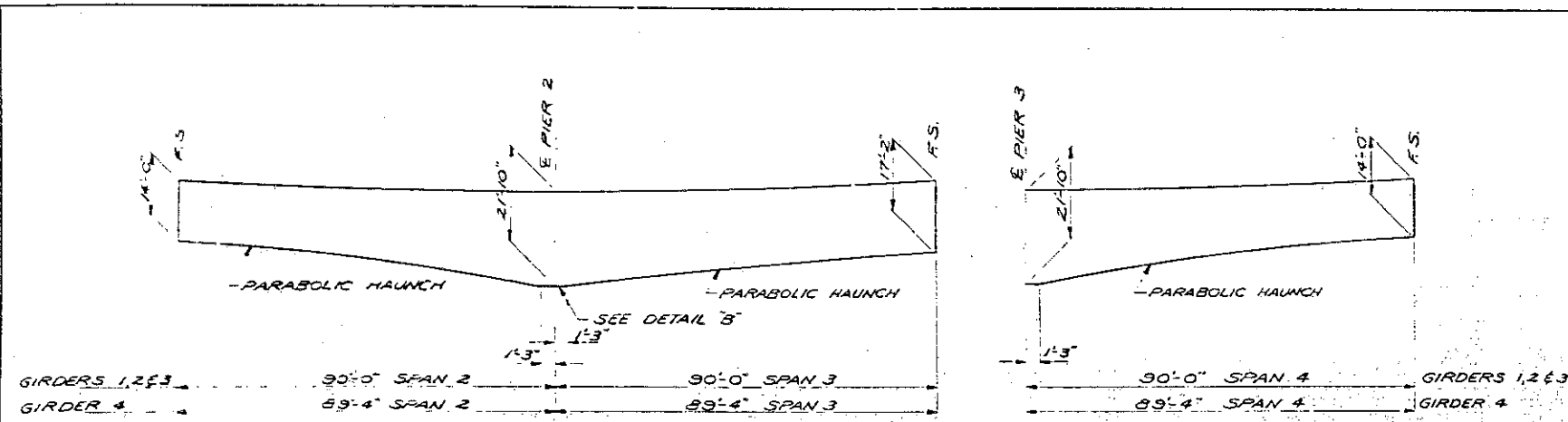
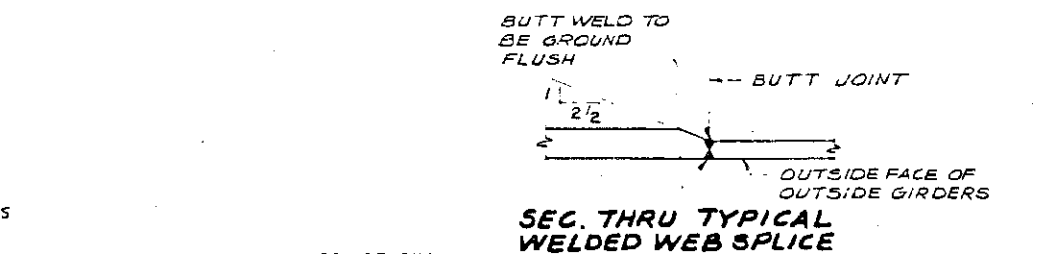
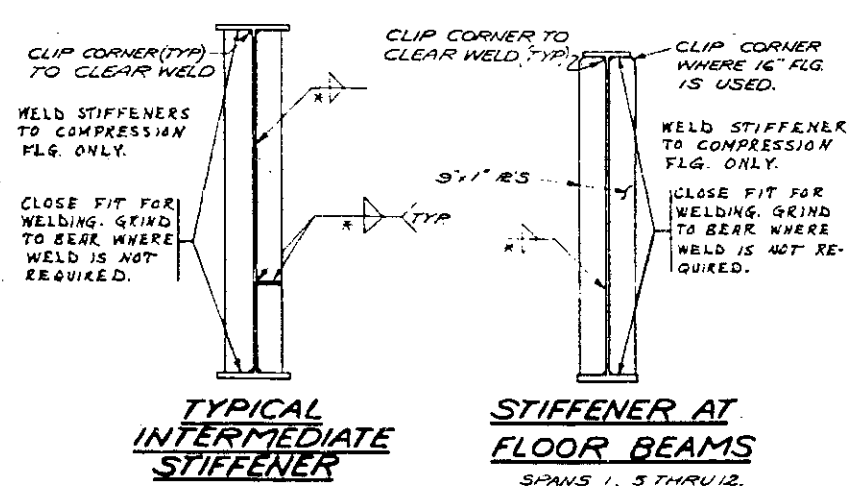
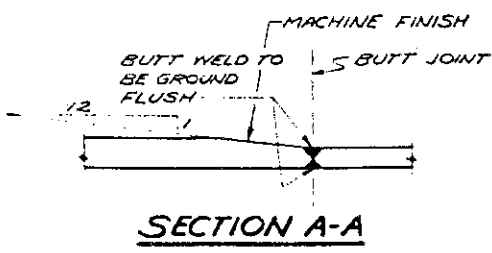
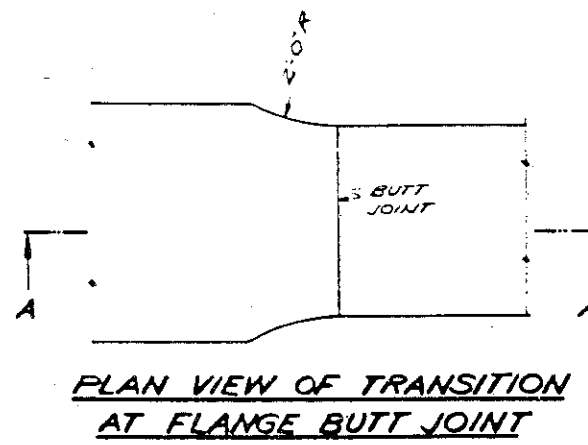
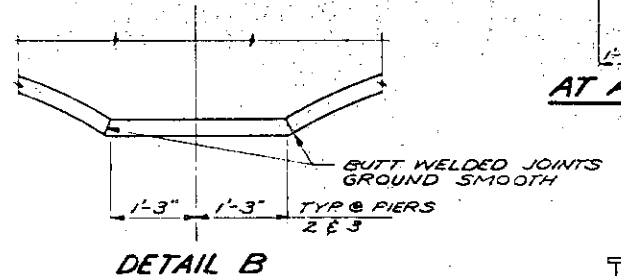
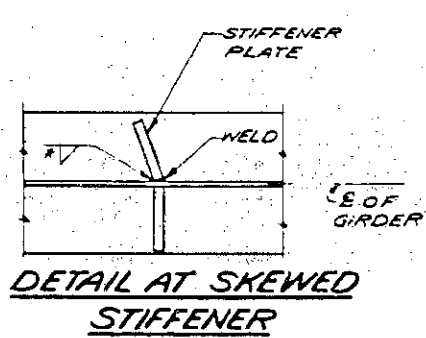
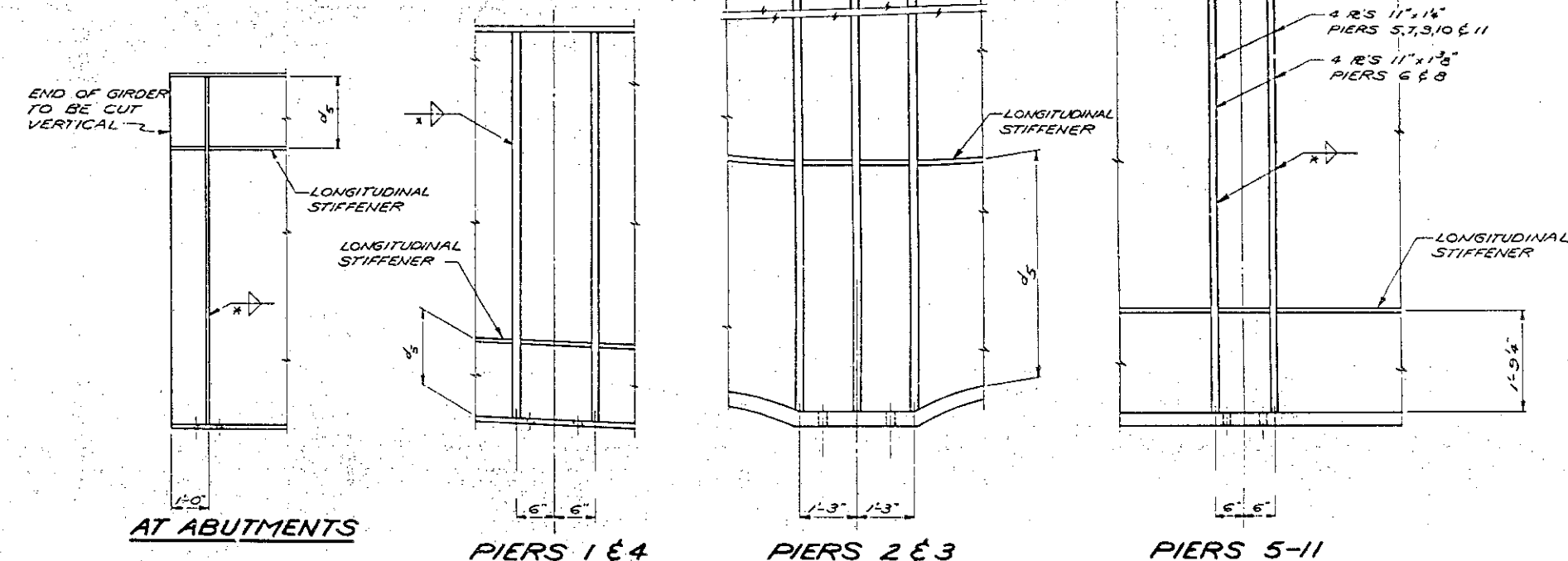


TABLE OF WEB DEPTHS AT HAUNCH

	SPAN 2 GIRDERS 1,2&3	SPAN 2 GIRDER 4	SPAN 3 GIRDERS 1,2&3	SPAN 3 GIRDER 4	SPAN 4 GIRDERS 1,2&3	SPAN 4 GIRDER 4
0	14-0	14-0	17-2	17-2	14-0	14-0
10'-0"	14-4 ⁵ / ₈	14-4 ¹ / ₁₆	17-2 ¹ / ₁₆	17-2 ³ / ₄	14-3 ¹ / ₂	14-3 ¹ / ₂
20'-0"	14-10 ³ / ₈	14-10 ³ / ₈	17-4 ³ / ₈	17-4 ³ / ₈	14-8 ³ / ₁₆	14-8 ³ / ₈
30'-0"	15-6 ¹ / ₁₆	15-6 ⁵ / ₈	17-8 ³ / ₈	17-8 ³ / ₈	15-3 ³ / ₈	15-4 ¹ / ₁₆
40'-0"	16-3 ³ / ₁₆	16-3 ³ / ₈	18-1 ³ / ₈	18-1 ³ / ₈	16-0 ¹³ / ₁₆	16-1 ¹ / ₁₆
50'-0"	17-2 ¹ / ₄	17-2 ¹ / ₁₆	18-7 ¹³ / ₁₆	18-8 ¹ / ₁₆	16-11 ¹ / ₂	16-11 ³ / ₈
60'-0"	18-2 ¹ / ₁₆	18-3 ¹ / ₁₆	19-3 ³ / ₈	19-4	18-0	18-0 ³ / ₁₆
70'-0"	19-4 ³ / ₁₆	19-4 ⁵ / ₁₆	20-0 ³ / ₈	20-1 ³ / ₈	19-2 ³ / ₁₆	19-3 ¹ / ₁₆
80'-0"	20-7 ¹ / ₁₆	20-8 ³ / ₁₆	20-11 ¹ / ₂	21-0 ¹ / ₄	20-6 ¹ / ₁₆	20-7 ¹ / ₁₆
88'-9"	21-10		21-10		21-10	
90'-0"	21-10		21-10		21-10	
88'-1"		21-10		21-10		21-10
89'-4"		21-10		21-10		21-10



* SEE TABLE OF WELD SIZES BELOW
LONGITUDINAL STIFFENERS TO BE PLACED AT 1/3 OF THE
WEB DEPTH AND IN LOCATIONS AS SHOWN ON SHEETS 34-37
BEARING STIFFENERS AT PIERS SHALL BE MILLED TO
BEAR TOP & BOTTOM.

TABLE OF FILLET WELD SIZES

MATERIAL THICKNESS OF THICKER PART JOINED	FILLET WELD SIZE IN INCHES
TO 2" INCL.	3/16
OVER 2" TO 3"	1/4
OVER 3" TO 12"	5/16
OVER 12" TO 24"	3/8
OVER 24" TO 6"	1/2

STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320

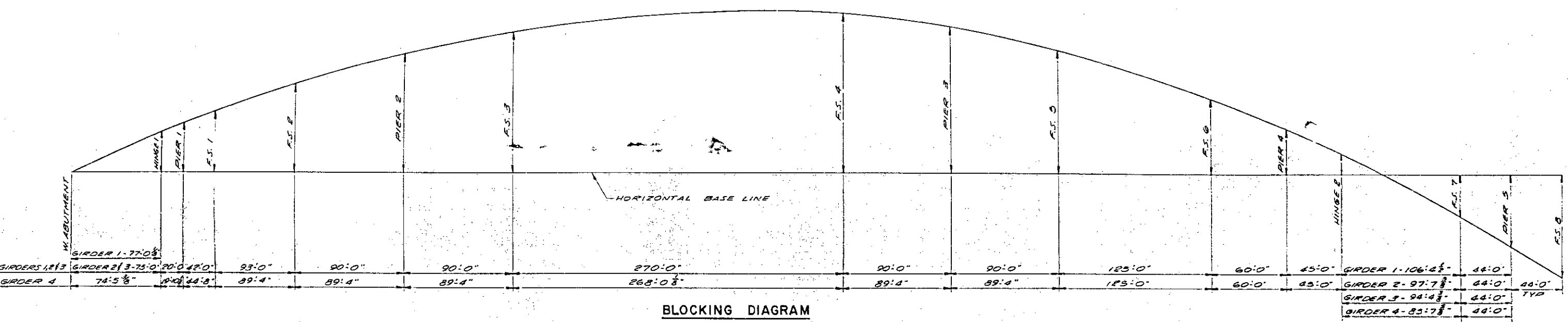
GIRDER DETAILS

APPROVED 3-10-64

SHEET NO. 38 OF 39 SHEETS 9320

DES. RR	DR. SW
CK. JLF	

THE ADJOINING TABLE
APPLIES TO ALL FILLET
WELDS UNLESS OTHER-
WISE SHOWN OR NOTED.



BLOCKING DIAGRAM

TABLE OF BLOCKING DIMENSIONS

GIRD. NO.	WABUT.	HINGE 1	PIER 1	F.S. 1	F.S. 2	PIER 2	F.S. 3	F.S. 4	PIER 3	F.S. 5	F.S. 6	PIER 4	HINGE 2	F.S. 7	PIER 5	F.S. 8
1	0	1'9 1/2"	2'1 3/8"	2'9 3/8"	4'1 1/4"	5'4"	6'7 1/8"	6'8 3/8"	5'5 3/8"	4'3 3/4"	2'6 3/8"	1'5"	7 3/16"	-1'10 1/8"	-3'0 1/2"	-4'0"
2	0	1'7 1/8"	1'11 1/2"	2'7 3/8"	3'10 1/2"	5'1 1/2"	6'3 3/8"	6'3 3/8"	5'0 1/2"	3'10 3/8"	2'1 1/2"	11"	1 1/2"	-2'2 3/8"	-3'4 3/8"	-4'4 3/8"
3	0	1'7 1/8"	1'11 3/8"	2'8"	3'11 3/8"	5'0 3/8"	6'2 3/8"	6'2 3/8"	4'11 3/8"	3'8 3/8"	1'11 1/8"	9 1/2"	1 1/2"	-2'3 3/8"	-3'5 3/8"	-4'5 3/8"
4	0	1'6 1/8"	1'10 1/8"	2'7 3/8"	3'10 1/2"	4'11 3/8"	6'2 3/8"	6'1 1/8"	4'10 1/2"	3'7"	1'9 1/8"	7"	-3 3/8"	-2'3 3/8"	-3'5 3/8"	-4'5 3/8"

SUPERSTRUCTURE NOTES

PAINT ALL STRUCTURAL STEEL EXCEPT GALVANIZED MATERIAL AS FOLLOWS:
 SHOP COAT RED LEAD, M.H.D. 3506
 FIRST FIELD COAT ALUMINUM M.H.D. 3527
 SECOND FIELD COAT ALUMINUM M.H.D. 3528

RADIOGRAPHIC AND MAGNETIC PARTICLE INSPECTION OF WELDS WILL BE REQUIRED

FULL ASSEMBLY REAMING WILL BE REQUIRED AS PER M.H.D. 2471.3E1D EXCEPT FOR STRINGERS AND EXPANSION DEVICES. NO ASSEMBLED COMBINATION WILL BE REQUIRED TO EXCEED 635'0"

ALL STIFFENERS SHALL BE PLACED NORMAL TO THE TOP FLANGE.
 ALL CONNECTIONS TO BE MADE WITH 7/8" RIVETS M.H.D. 3316 TYPE I OR 3/4" HIGH STRENGTH STRUCTURAL STEEL BOLTS M.H.D. 3391B STYLE II
 ALL STRUCTURAL STEEL UNLESS OTHERWISE SHOWN OR NOTED SHALL CONFORM TO M.H.D. 3306.

GIRDER WEBS IN SPAN 5 FROM HINGE 2 TO FIELD SPLICE 7 SHALL BE CAMBERED FOR TOTAL DEAD LOAD DEFLECTION.
 ALL OTHER GIRDER WEBS SHALL BE CAMBERED SUCH THAT UNDER TOTAL DEAD LOAD DEFLECTION THE TOP OF GIRDER WEB WILL PARALLEL FINISHED ROADWAY GRADE.

FLOOR BEAMS AND LOWER STRUTS SHALL BE HORIZONTAL.
 BLOCKING DIMENSIONS SHOWN ABOVE INCLUDE CORRECTION FOR TOTAL DEFLECTION.

WEB PLATES SHALL BE FURNISHED IN AVAILABLE MILL LENGTHS. LOCATION OF WEB SPLICES SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.
 LONGITUDINAL STIFFENERS SHALL TERMINATE 3' CL. OF WEB SPLICE PLATES.

NO FLANGE SPLICES WILL BE PERMITTED IN FLANGE PLATES AT PIERS EXCEPT FOR BUTT WELDED JOINTS SHOWN IN THE BOTTOM FLANGE AT PIERS 2 AND 3.

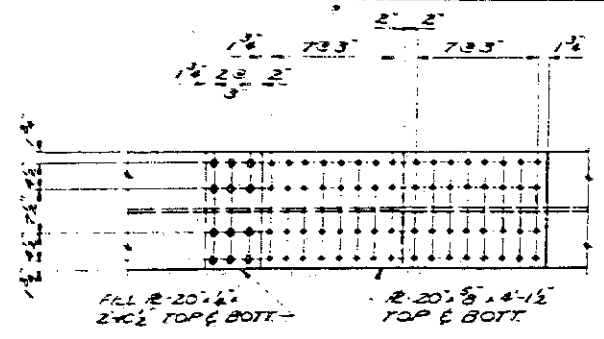
FILL PLATES UNDER STRINGERS AT FLOOR BEAMS SHALL BE WELDED TO FLOOR BEAM FLANGES WITH 3/16" FILLET WELD.
 WHERE FLANGE PLATES AT FIELD SPLICES ARE UNEQUAL IN WIDTH THE WIDER FLANGE SHALL BE TAPERED AT A 12:1 SLOPE TO MEET THE WIDTH OF THE NARROWER PLATE.

STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

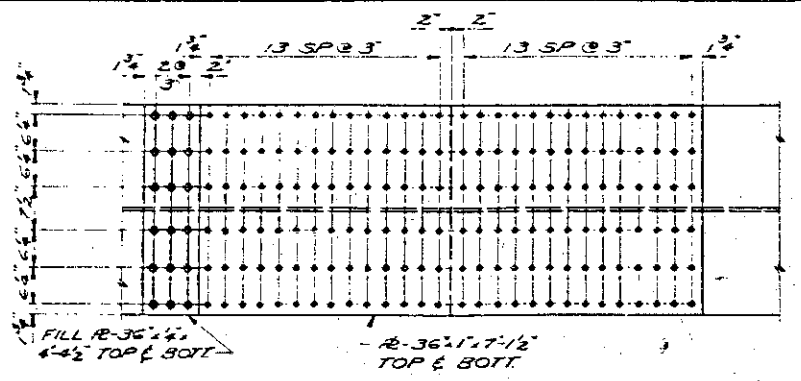
BRIDGE NO. 9320
BLOCKING DIAGRAM

APPROVED 3.2.24

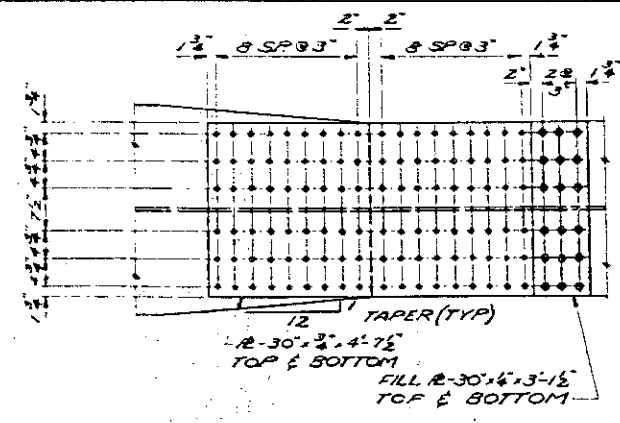
SHEET NO 4 OF 93 SHEETS **9320**



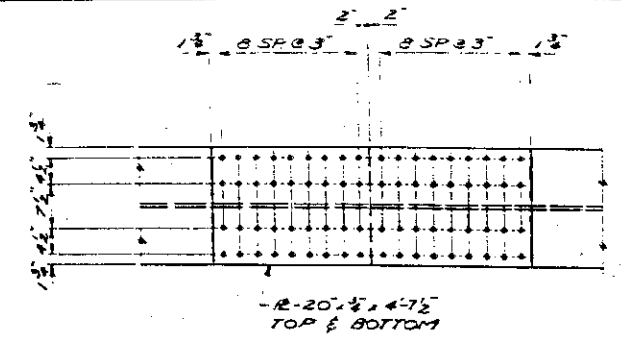
F.S. 1 - ALL GIRDERS



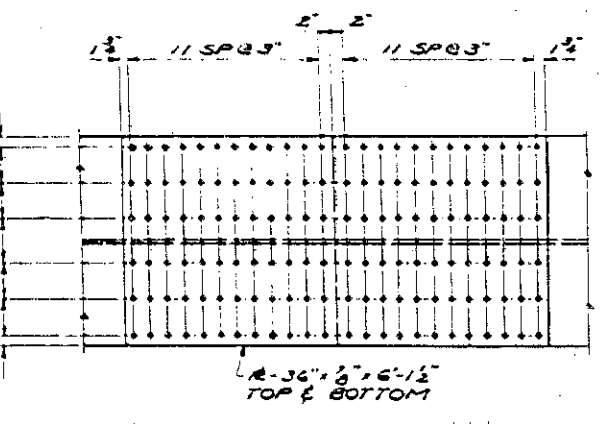
F.S. 2 - GIRDERS 3 & 4



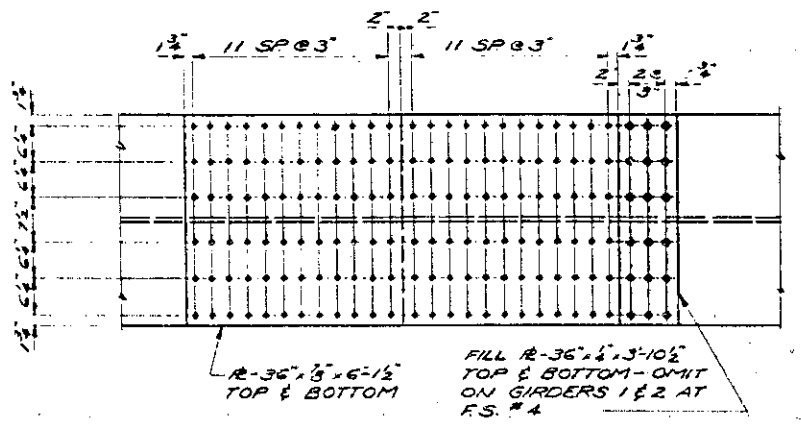
F.S. 5 - GIRDERS 1 & 2



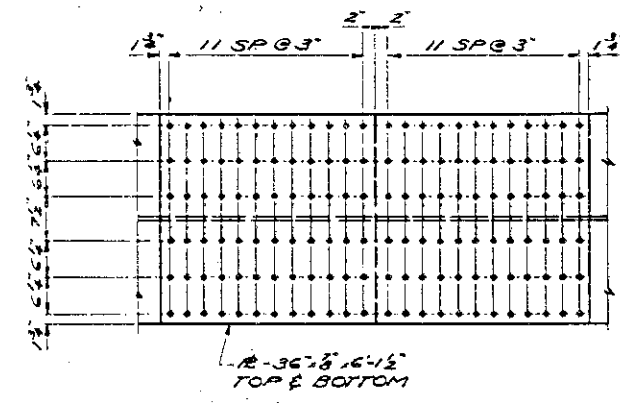
F.S. 6 - ALL GIRDERS



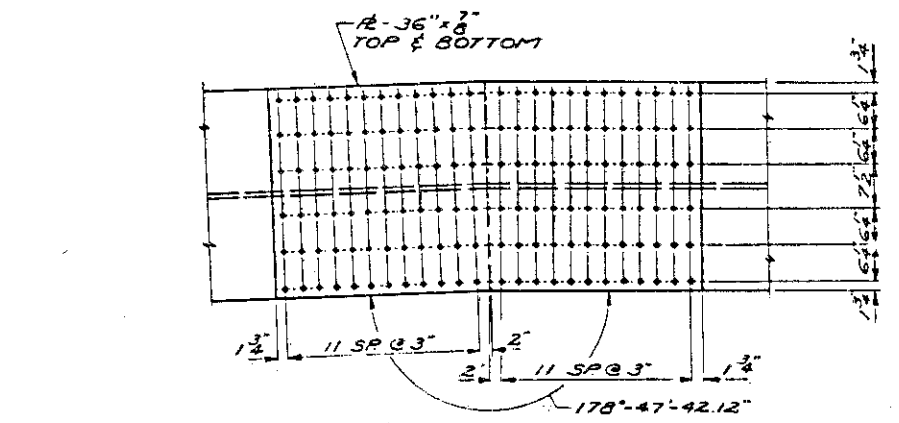
F.S. 2 - GIRDERS 1 & 2



F.S. 3 & 4 - ALL GIRDERS

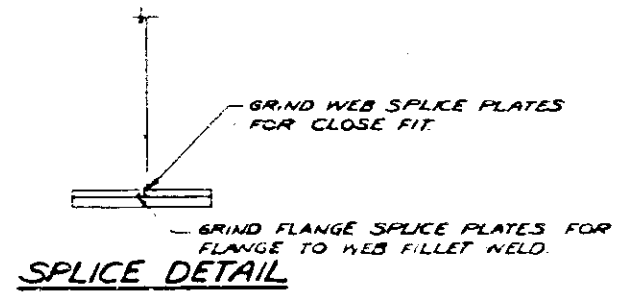


F.S. 5 - GIRDER 3

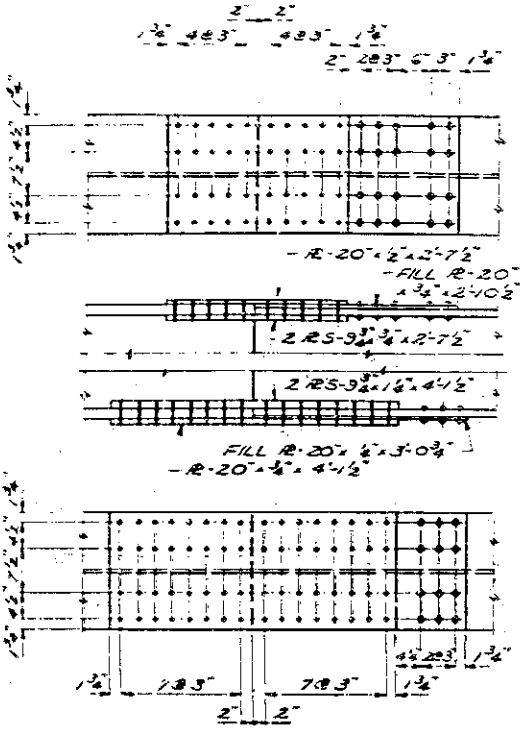


F.S. 5 - GIRDER 4

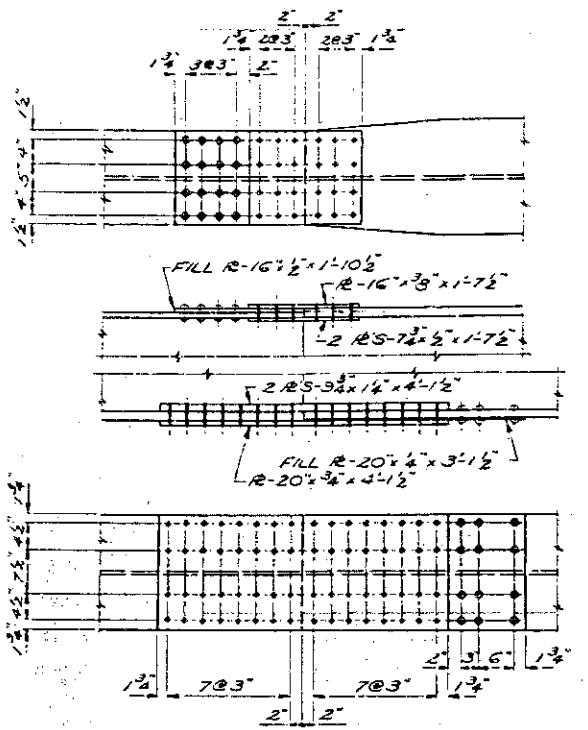
NOTE: FIELD SPLICE RS OF GIRDER SPLICES 1-6 SHALL BE MADE OF MATERIAL CONFORMING TO MHD 3310 ALL OTHER SPLICE MATERIAL SHALL CONFORM TO MHD 3306 A MAXIMUM OPENING OF 3" WILL BE ALLOWED BETWEEN GIRDER ENDS AT ALL GIRDER SPLICES ALL CONNECTIONS TO BE MADE WITH 5/8" RIVETS MHD 3316 TYPE 1 OR 5/8" HIGH STRENGTH STRUCTURAL STEEL BOLTS MHD 3391 B STYLE I



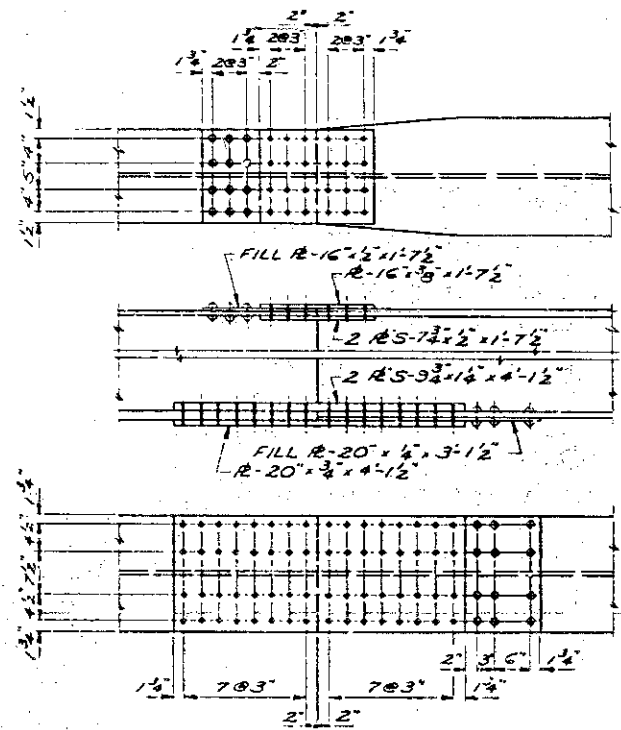
STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS	
BRIDGE NO. 9320	
GIRDER FIELD SPLICES	
APPROVED 3-2-64	
SHEET NO 41 OF 93 SHEETS	9320
DESIGNED BY	CK



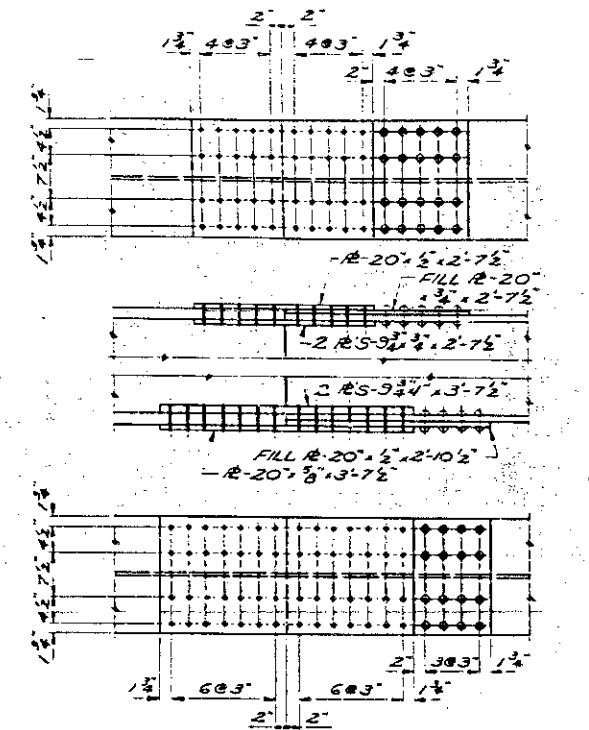
FIELD SPLICE #8-GIRDER 1



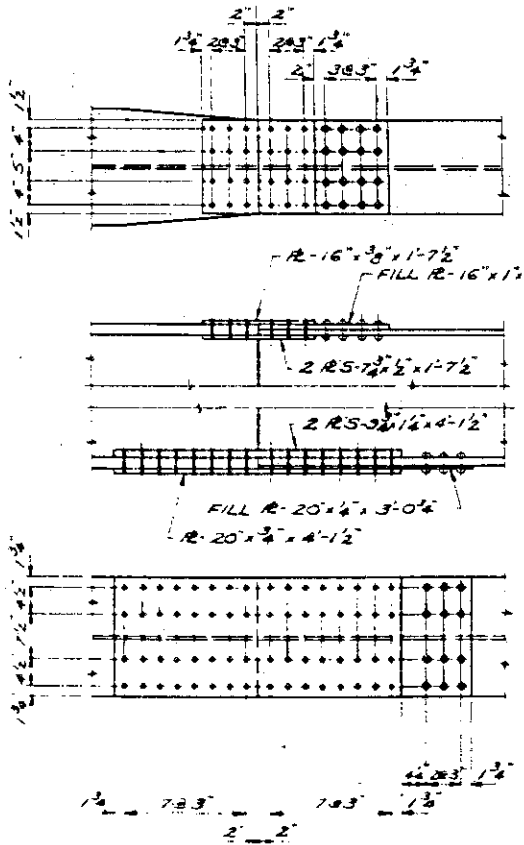
FIELD SPLICE #9-GIRDER 1



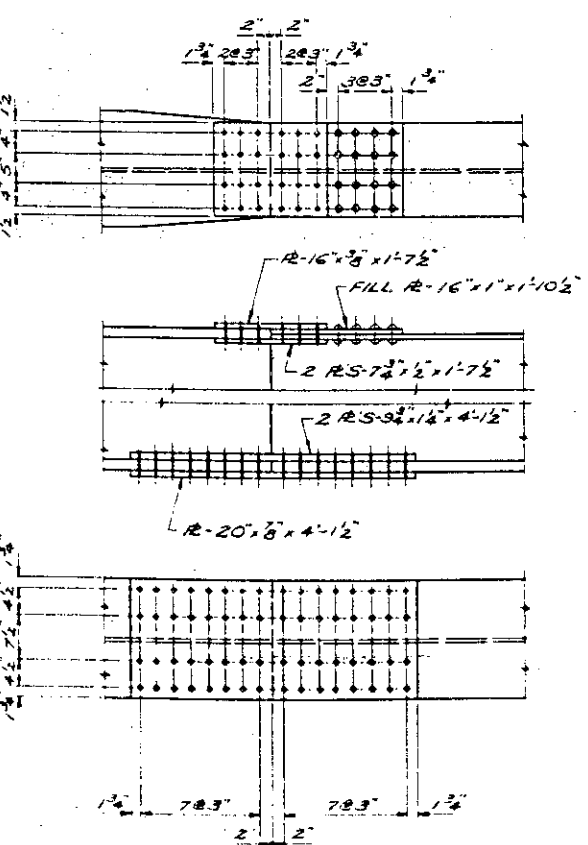
FIELD SPLICE #9-GIRDERS 2 & 3



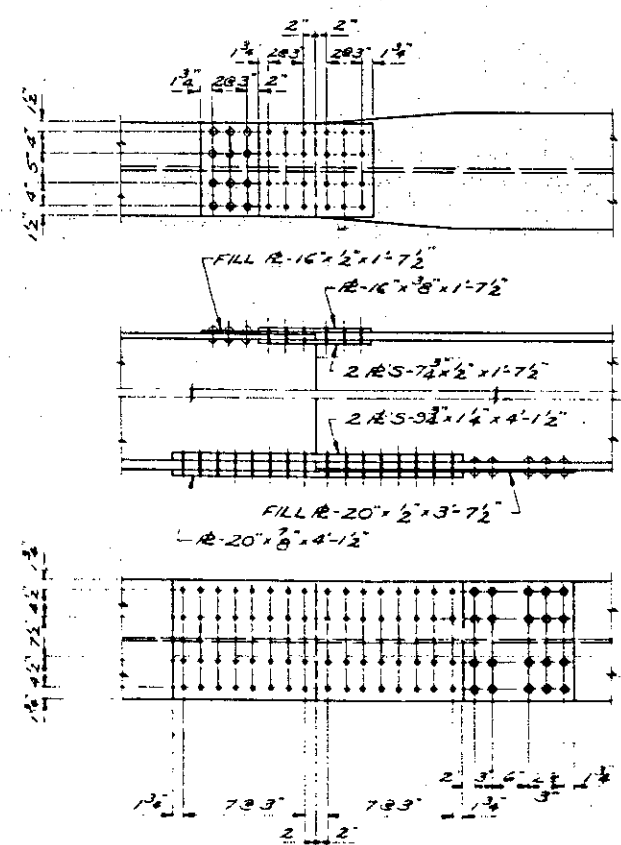
FIELD SPLICE #10-ALL GIRDERS



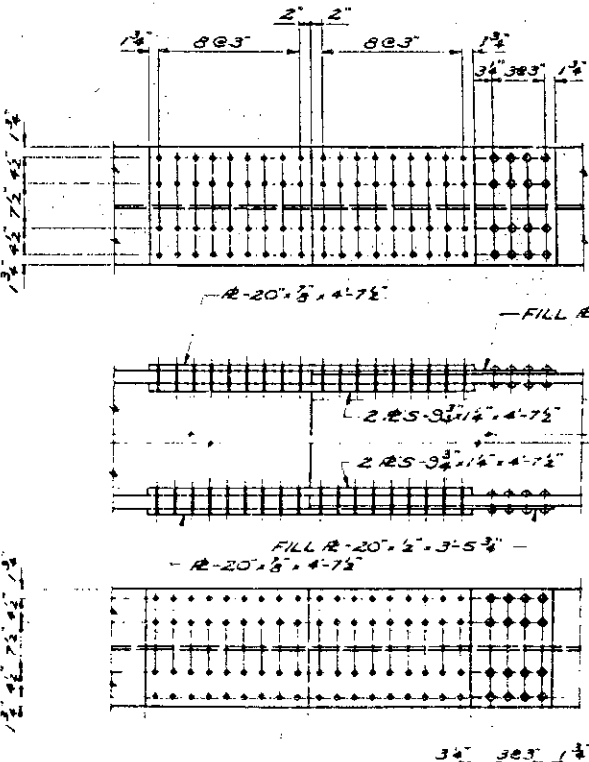
FIELD SPLICE #8-GIRDERS 2 & 3



FIELD SPLICE #8-GIRDER 4

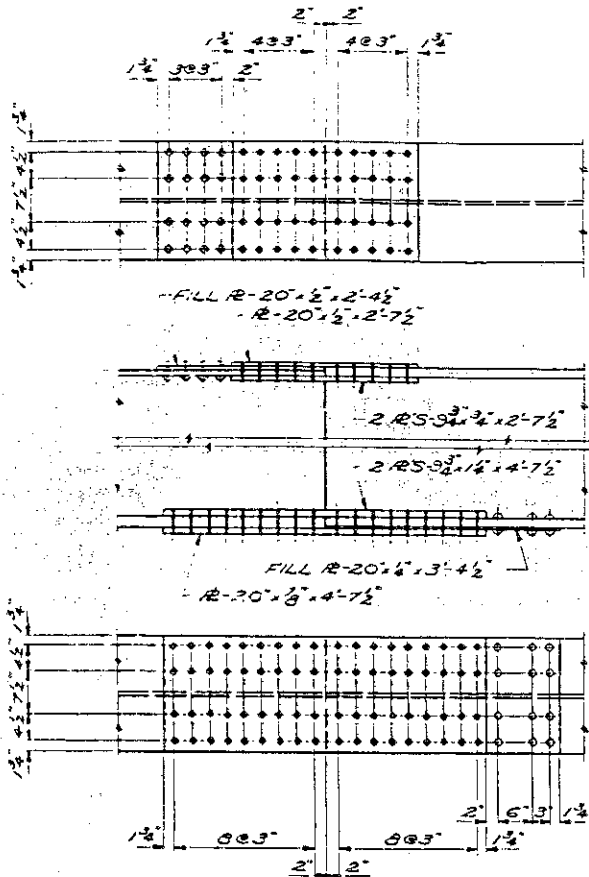


FIELD SPLICE #9-GIRDER 4

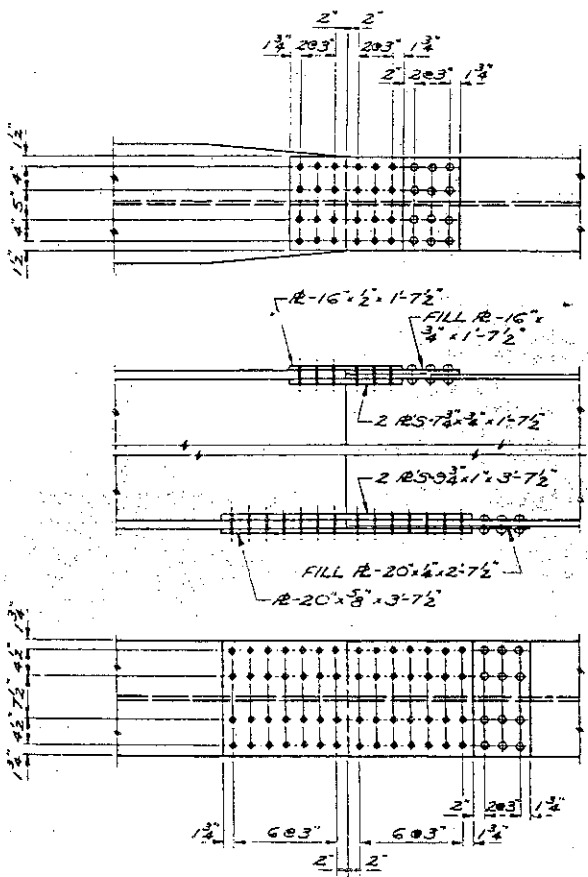


**FIELD SPLICES #11 & 14
ALL GIRDERS**

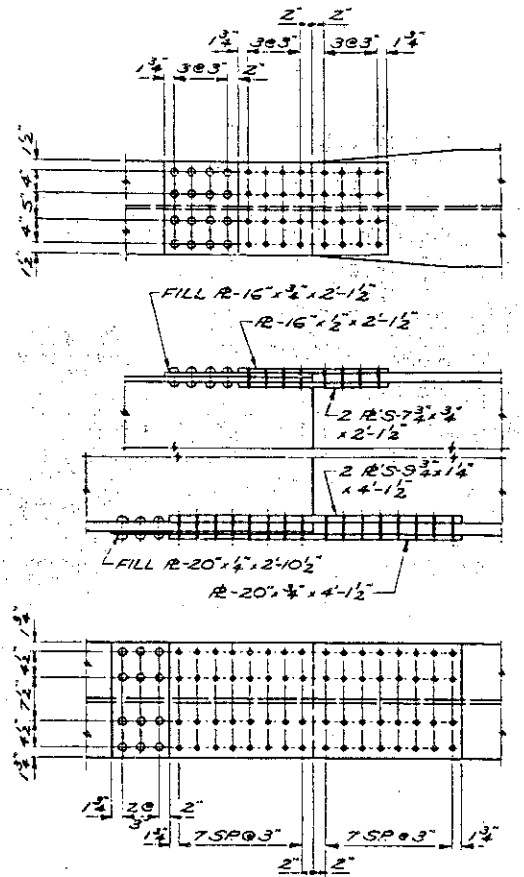
STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS	
BRIDGE NO.	
GIRDER FIELD SPLICES	
APPROVED: 3/2/64	
SHEET NO 42 OF 93 SHEETS	9320
EFS. JIM DR. GW CK. JJM	



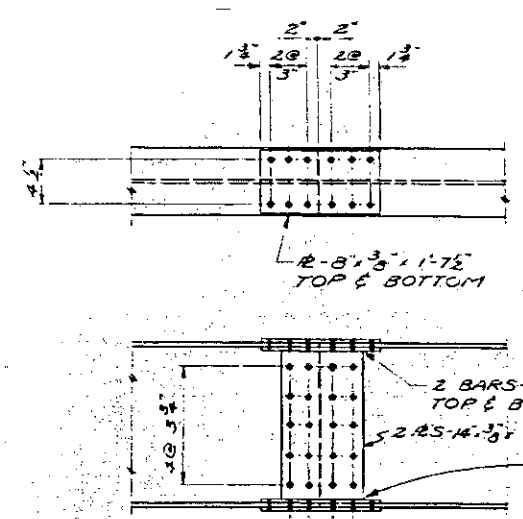
**FIELD SPLICES 12 & 13
ALL GIRDERS**



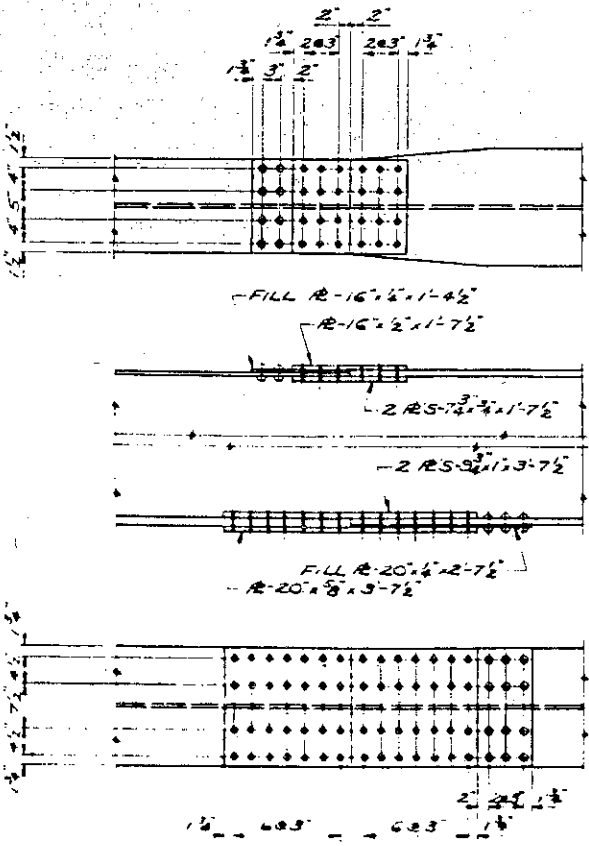
**FIELD SPLICE 18
ALL GIRDERS**



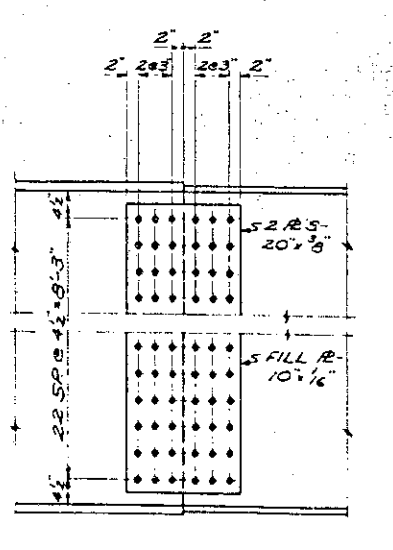
F.S. 7-GIRDER 1



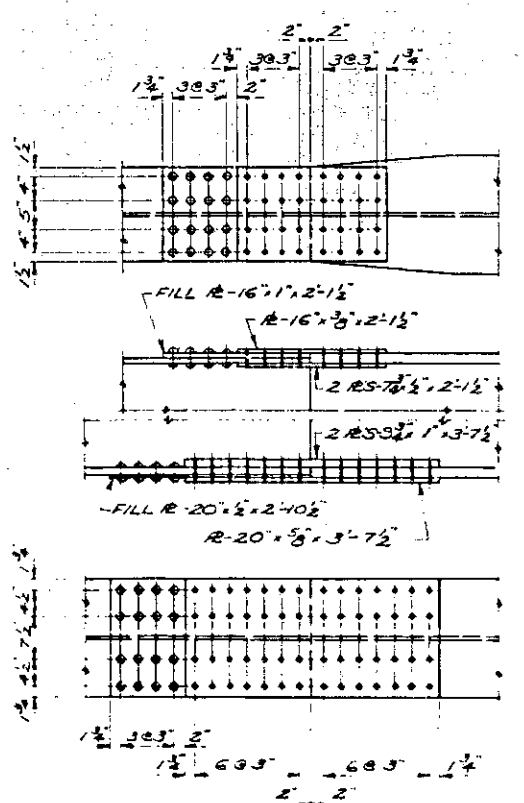
**TYPICAL STRINGER
SPLICE DETAIL
USE FILL RS AS REQD.**



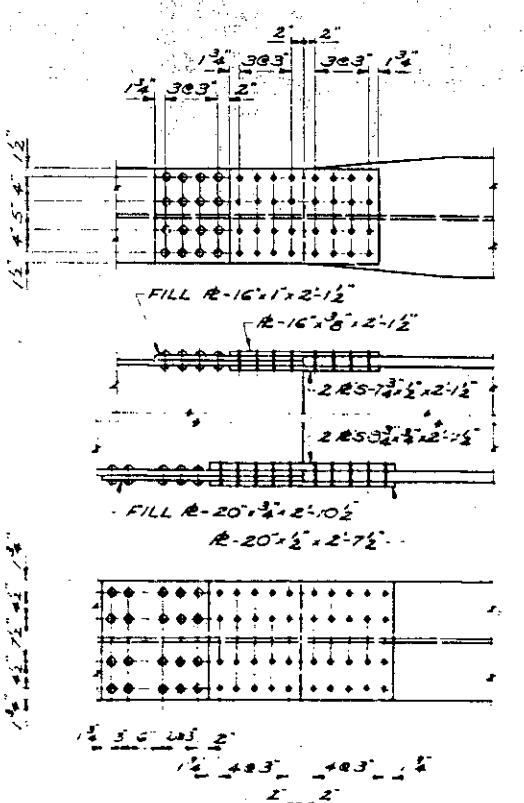
FIELD SPLICES 15, 16 & 17 - ALL GIRDERS



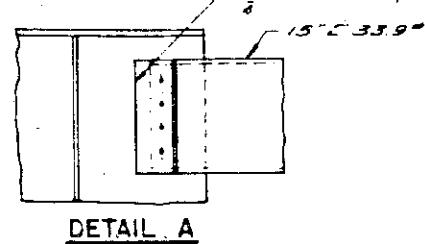
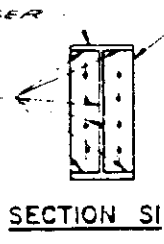
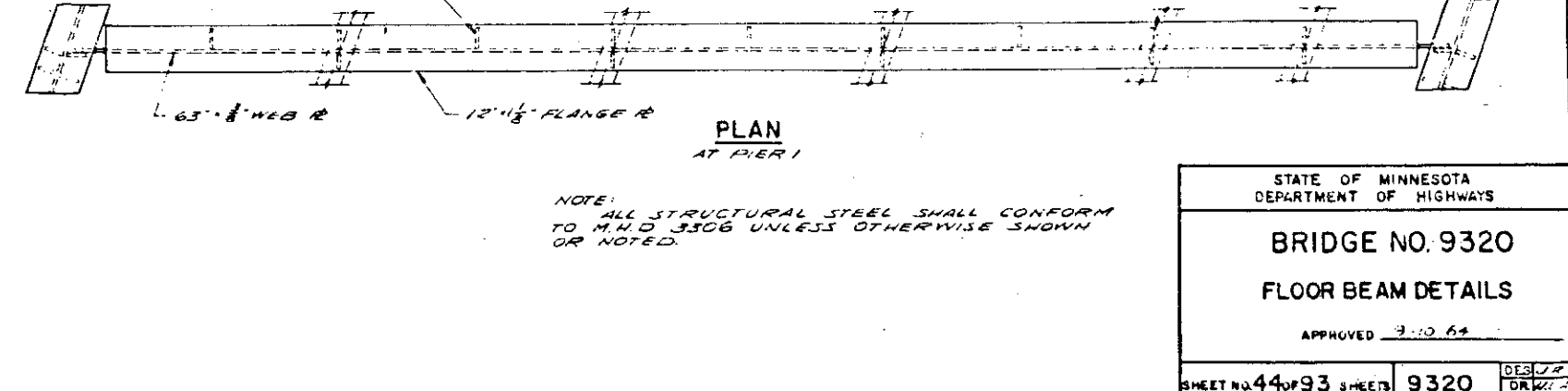
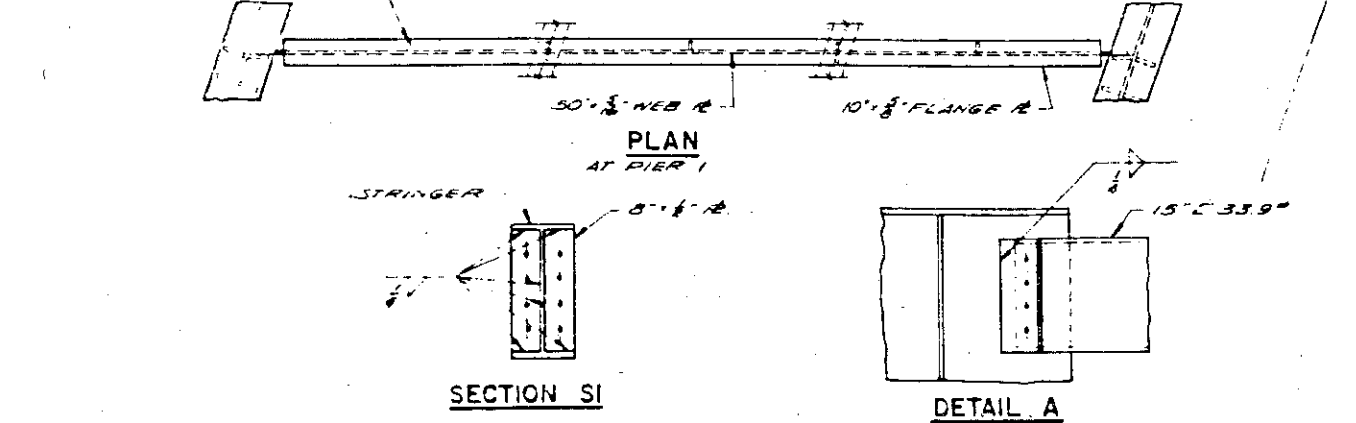
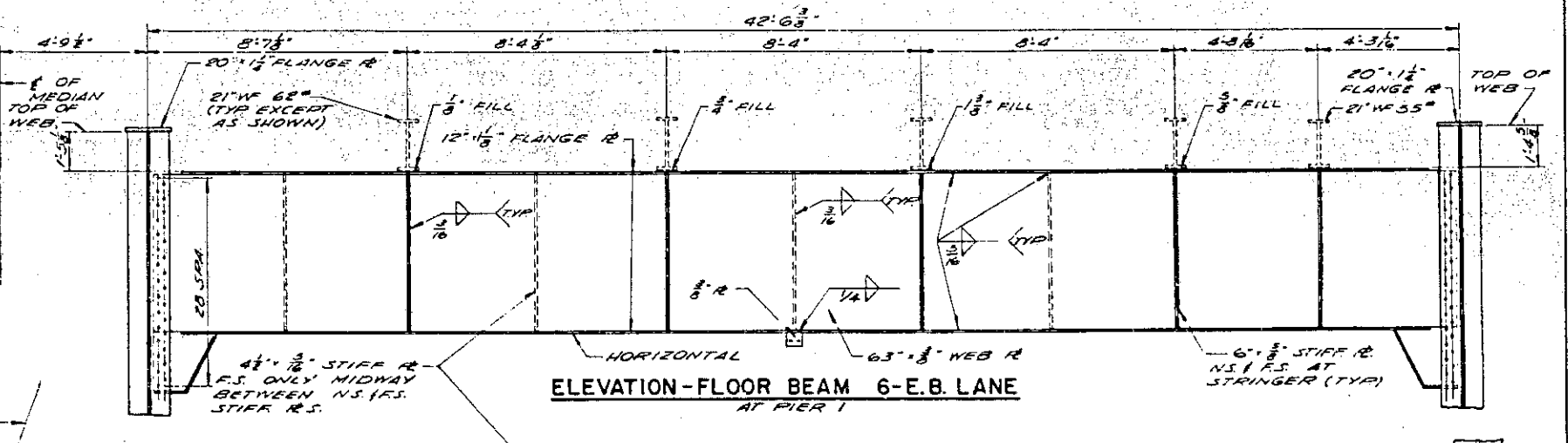
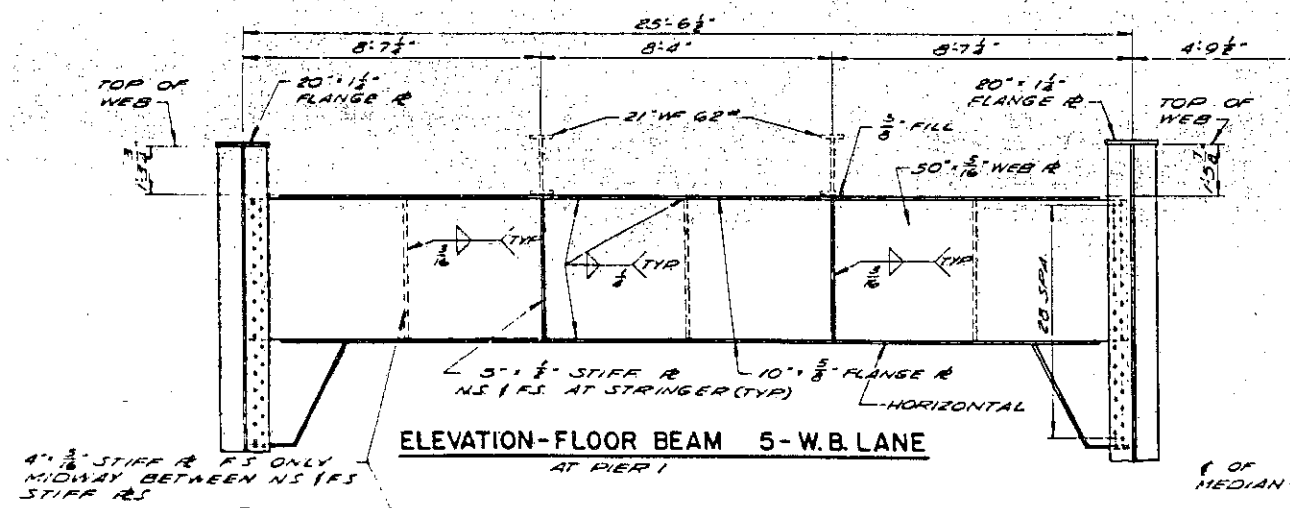
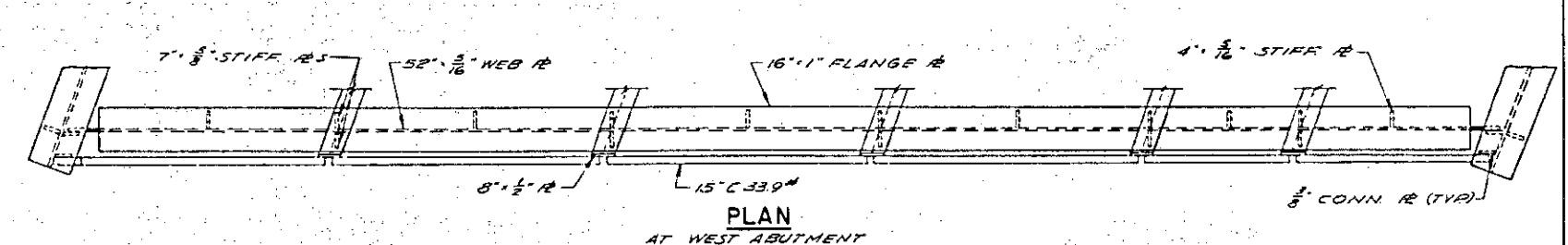
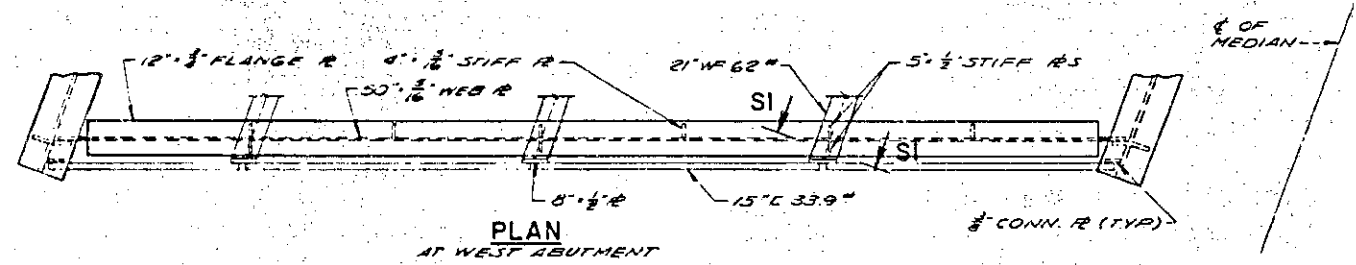
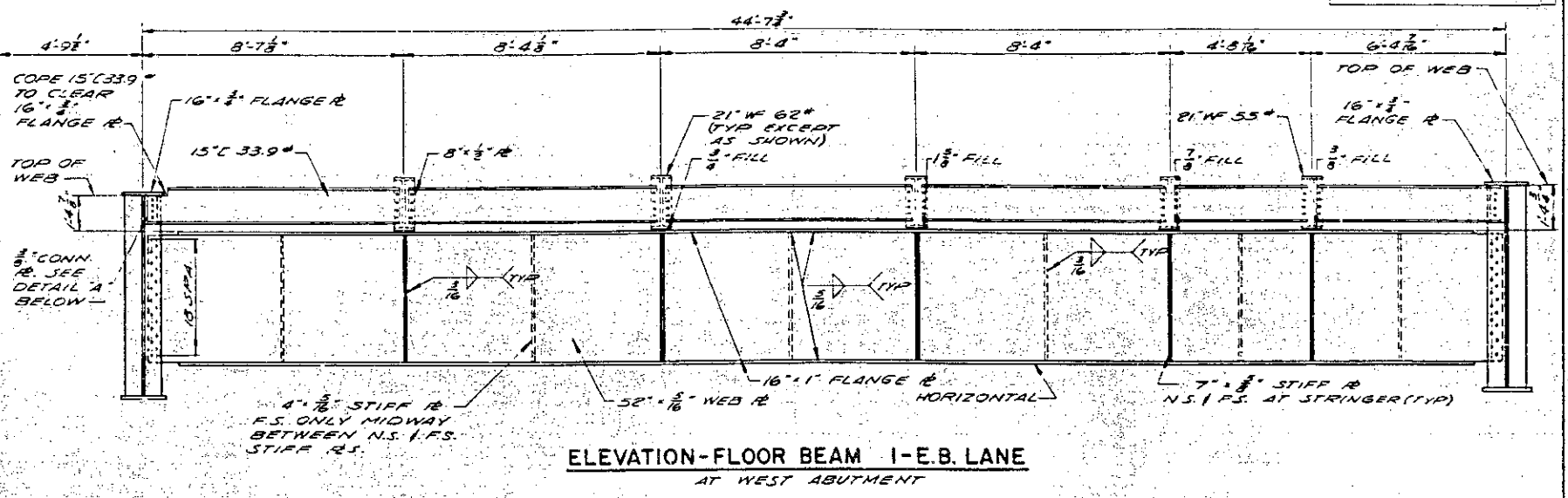
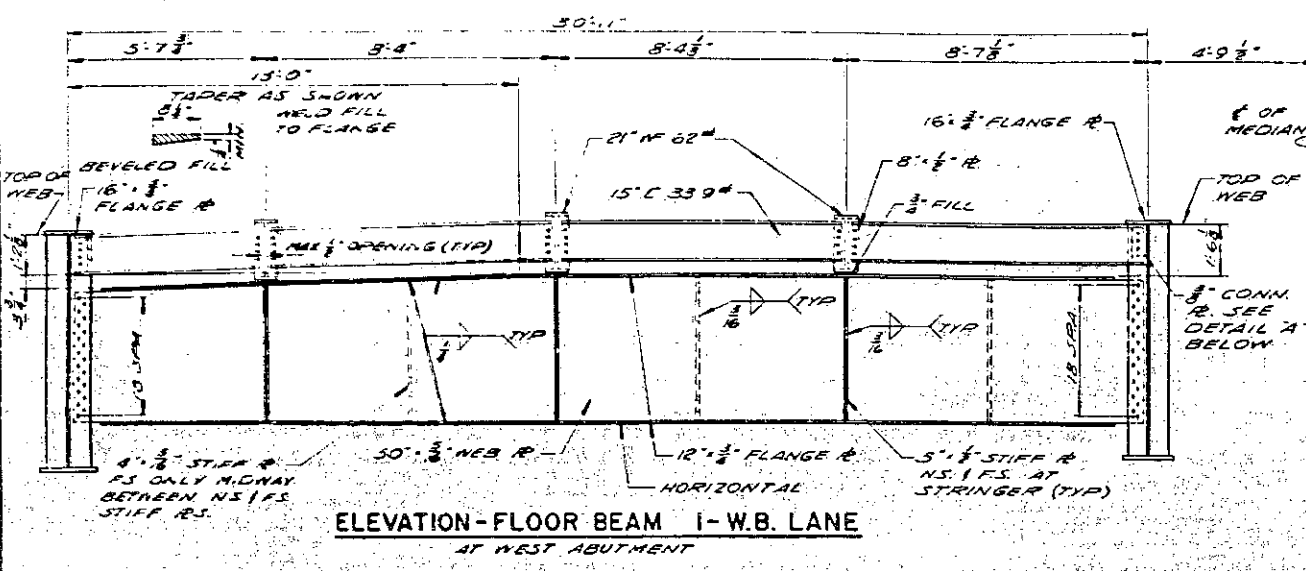
**TYPICAL WEB SPLICE
F.S. 7 THRU 18**



F.S. 7-GIRDER 2

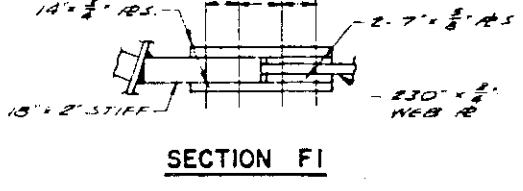
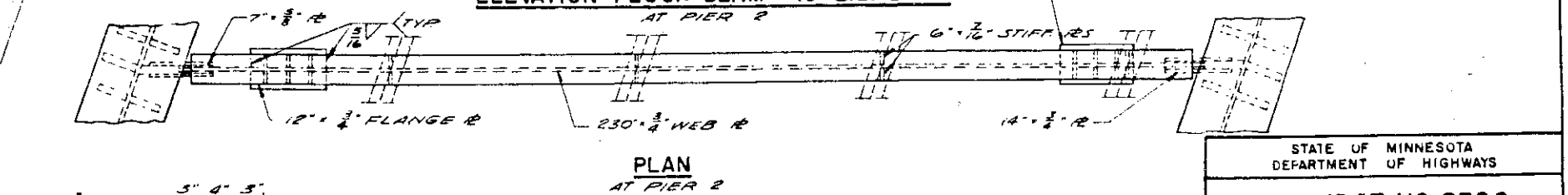
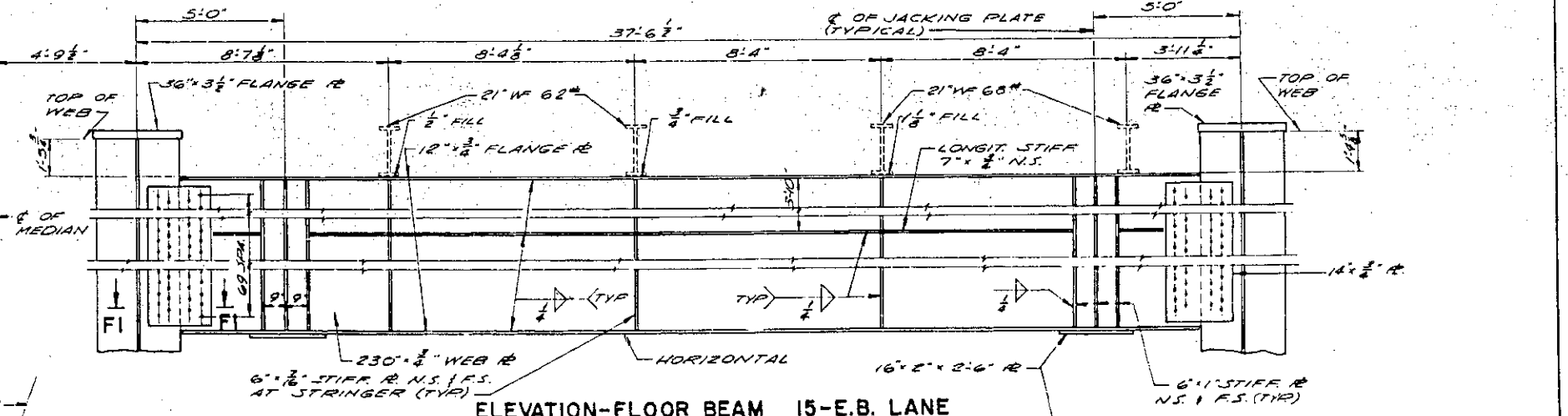
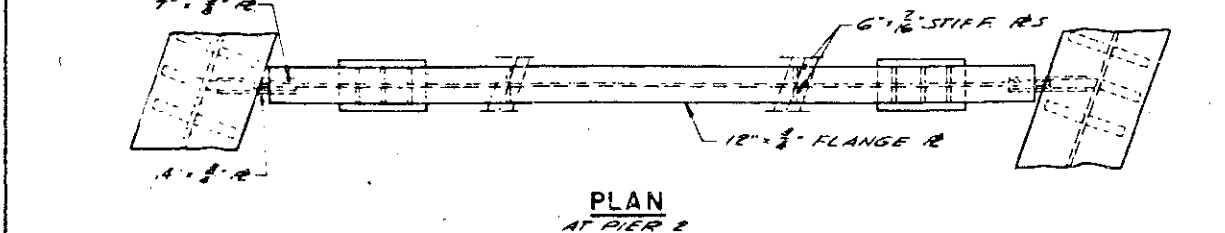
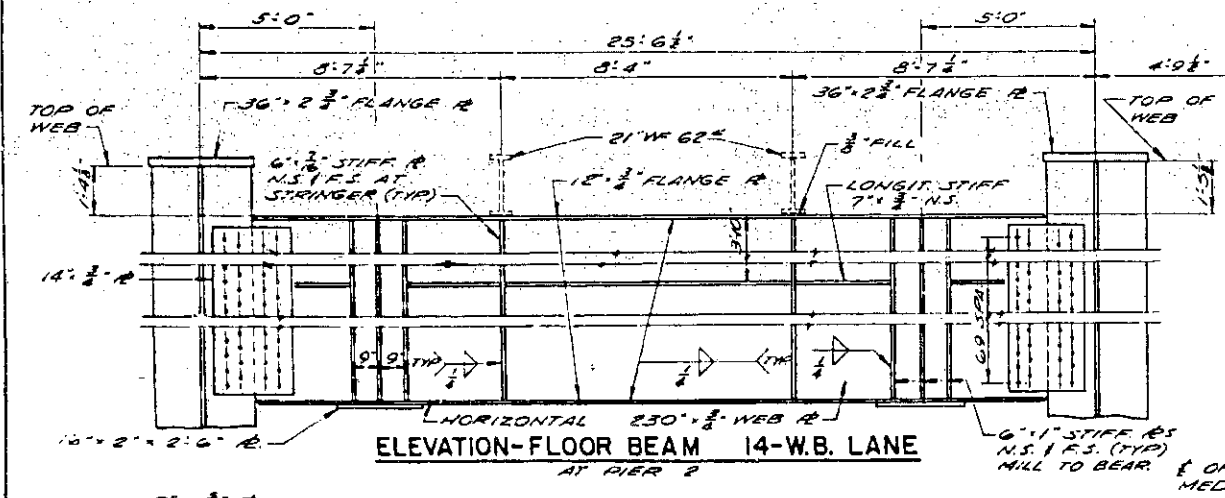
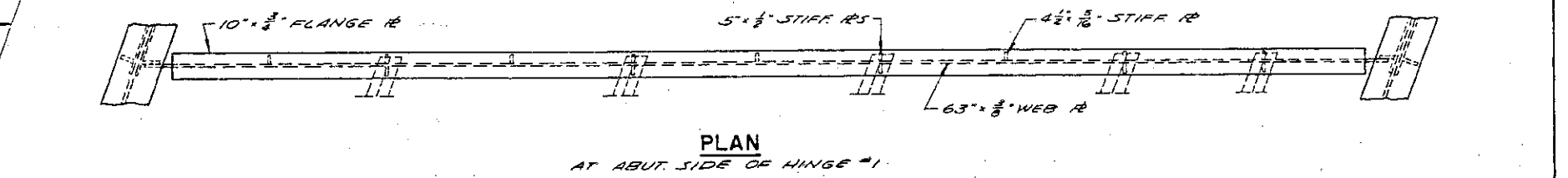
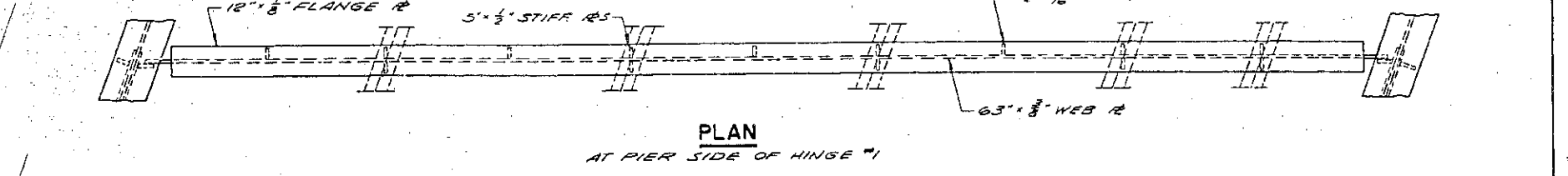
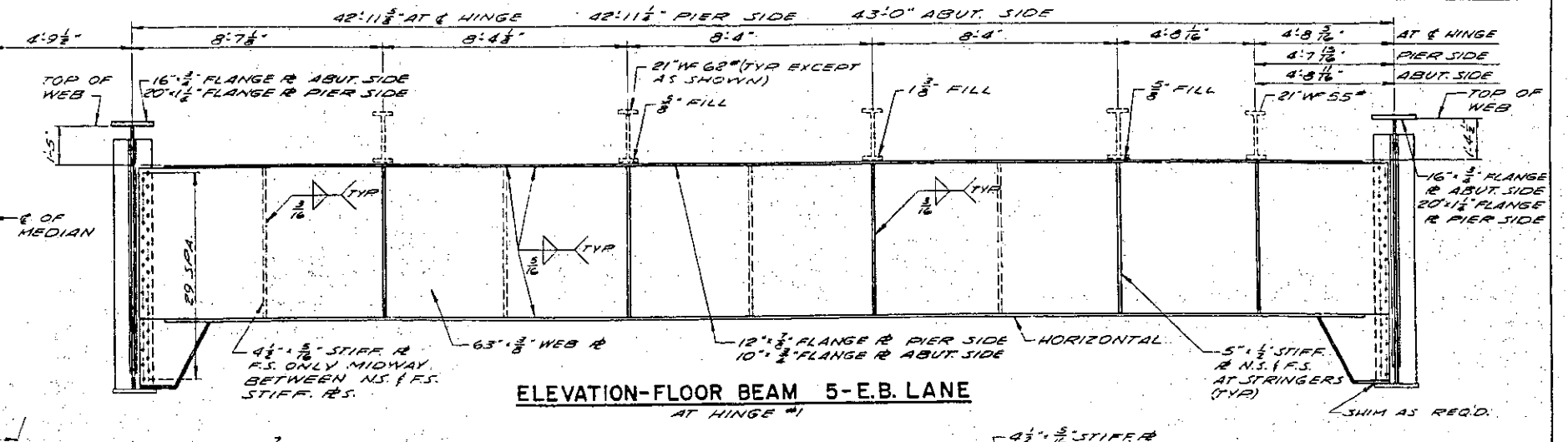
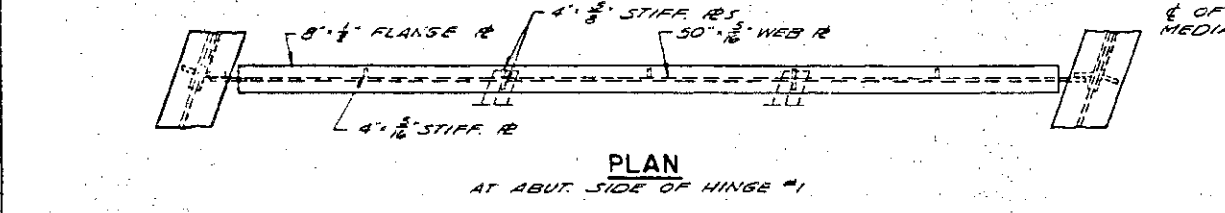
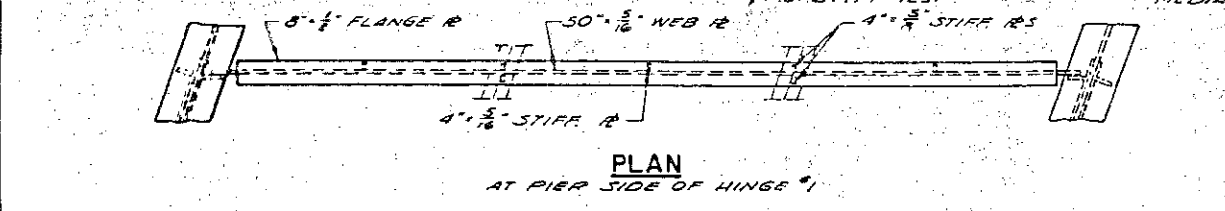
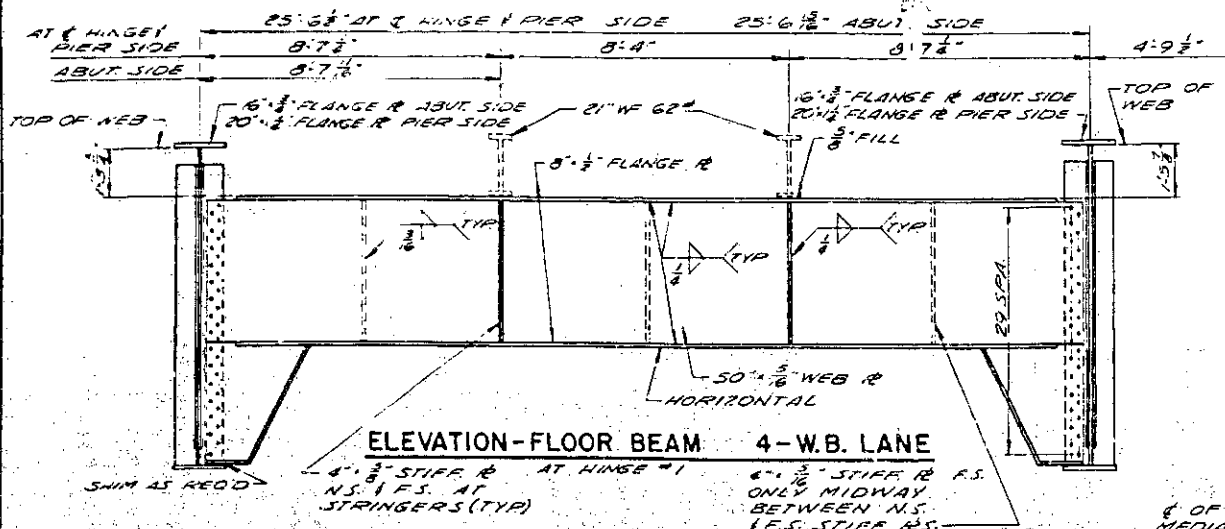


F.S. 7-GIRDERS 3 & 4

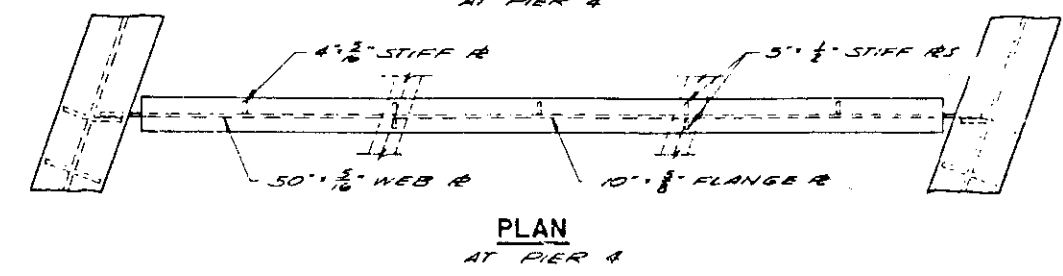
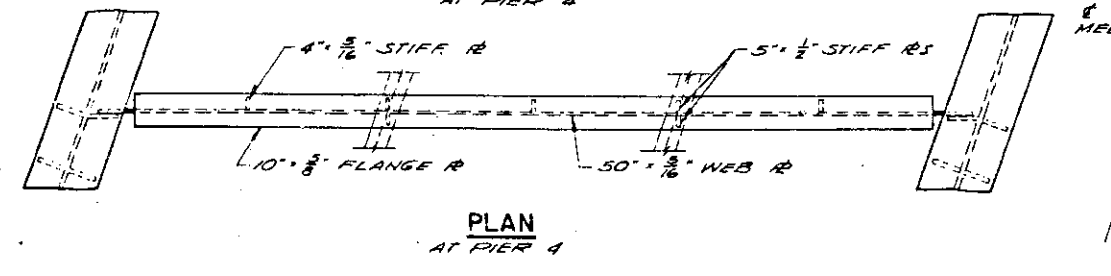
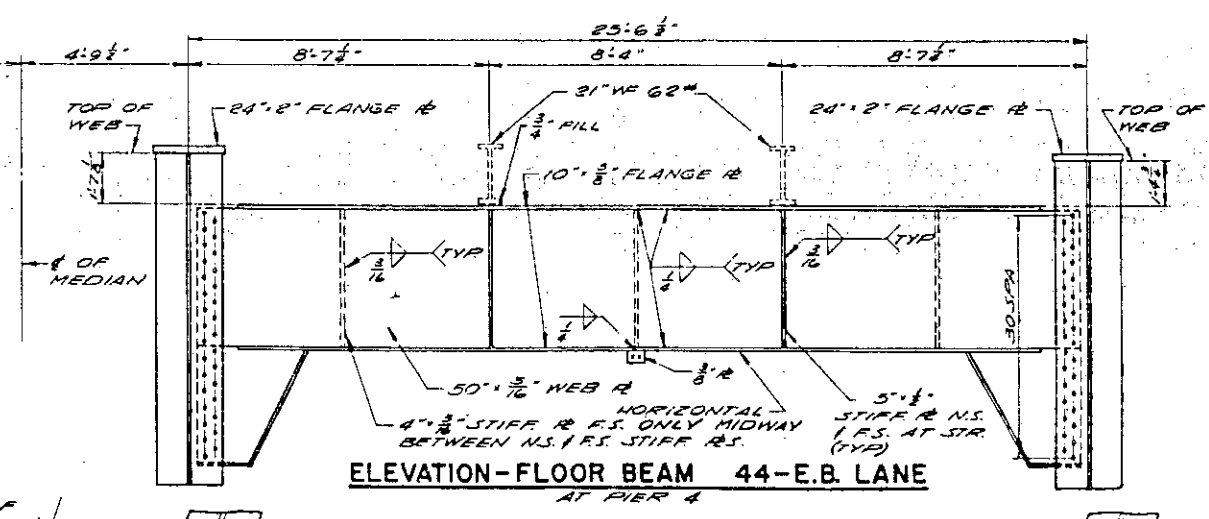
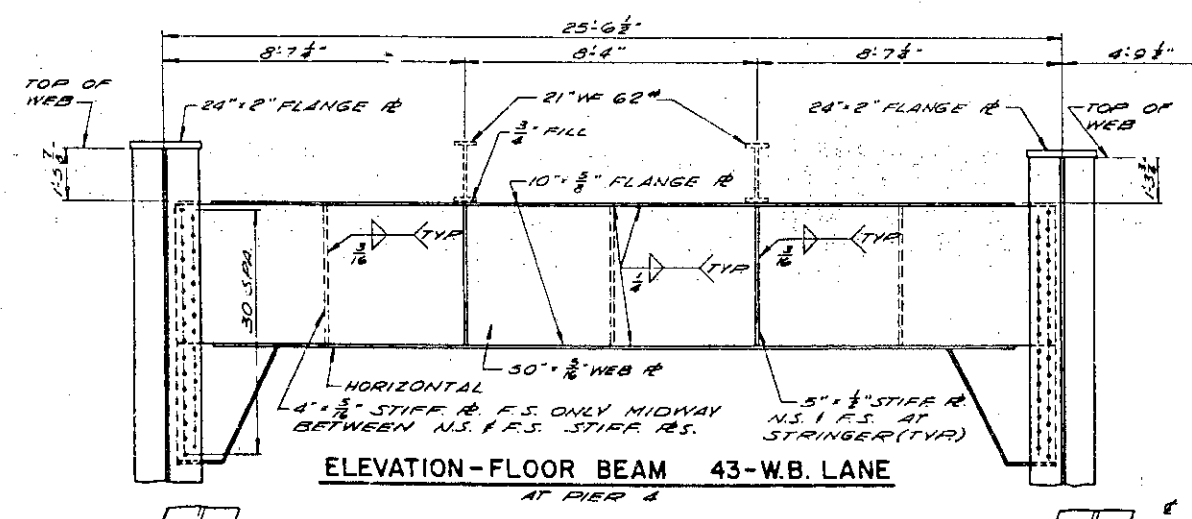
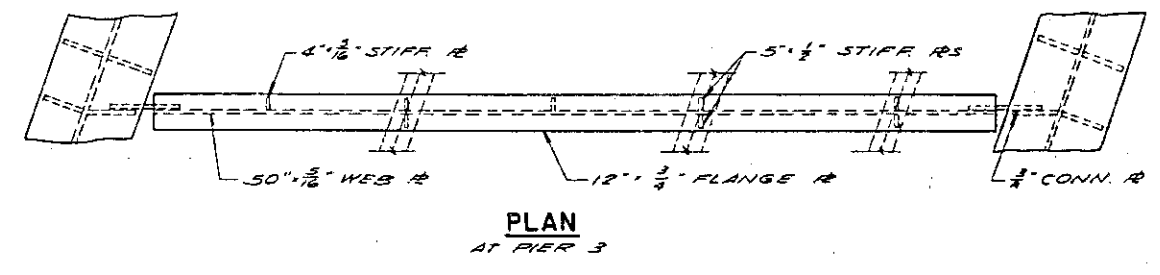
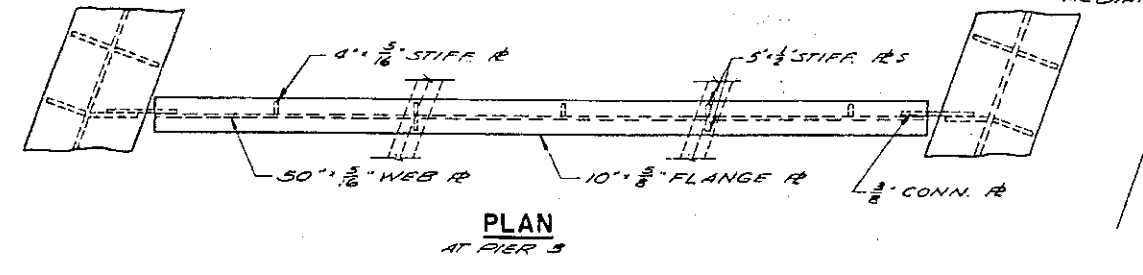
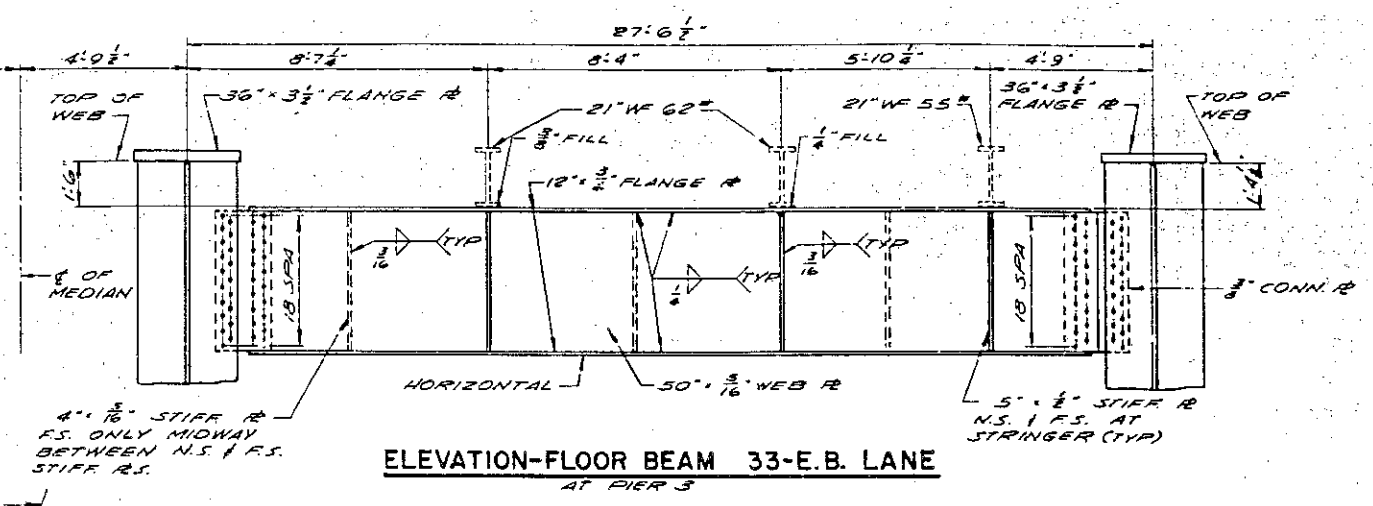
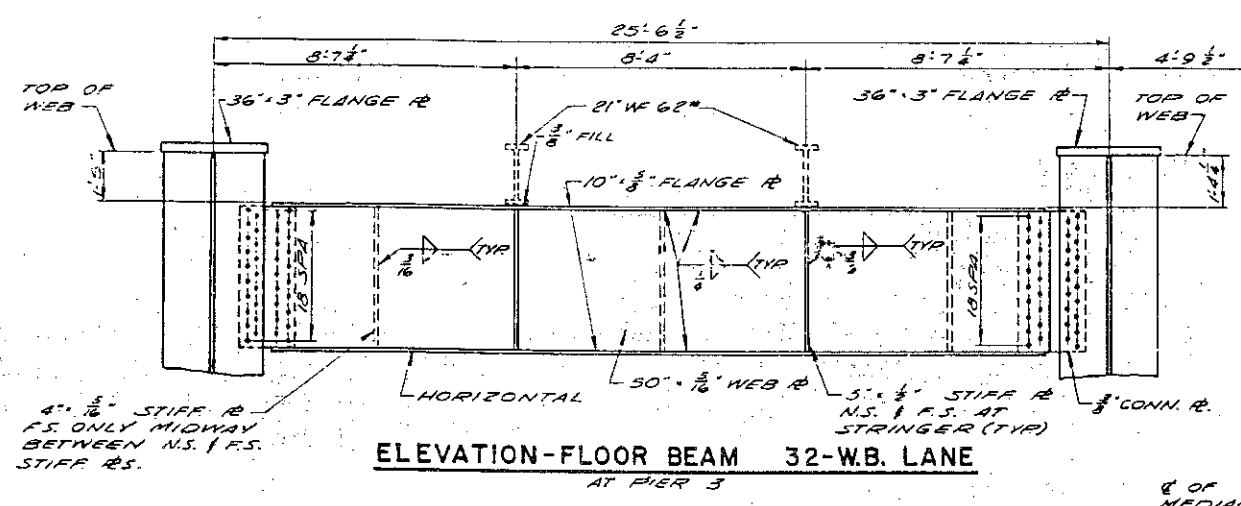


NOTE: ALL STRUCTURAL STEEL SHALL CONFORM TO M.H.D. 3306 UNLESS OTHERWISE SHOWN OR NOTED.

STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS	
BRIDGE NO. 9320	
FLOOR BEAM DETAILS	
APPROVED 3-10-64	
SHEET NO. 44 OF 93 SHEETS	9320



FIELD CONNECTIONS AT PIER 2 SHALL BE MADE WITH 5/8" HIGH STRENGTH BOLTS H.N.D. 3391 B STYLE II



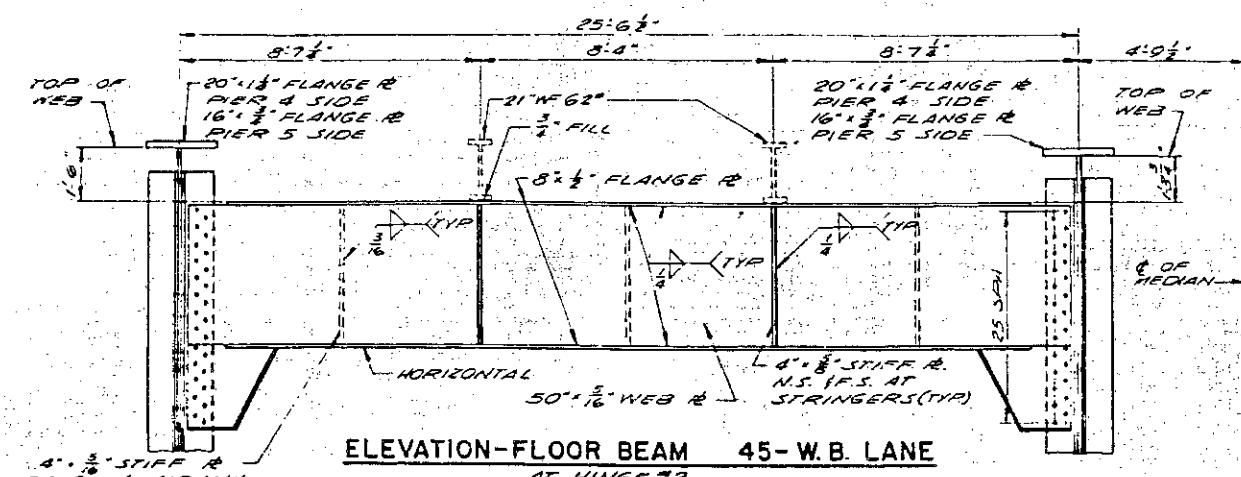
NOTE
ALL STRUCTURAL STEEL SHALL CONFORM
TO M.H.D. 3306 UNLESS OTHERWISE SHOWN
OR NOTED

STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

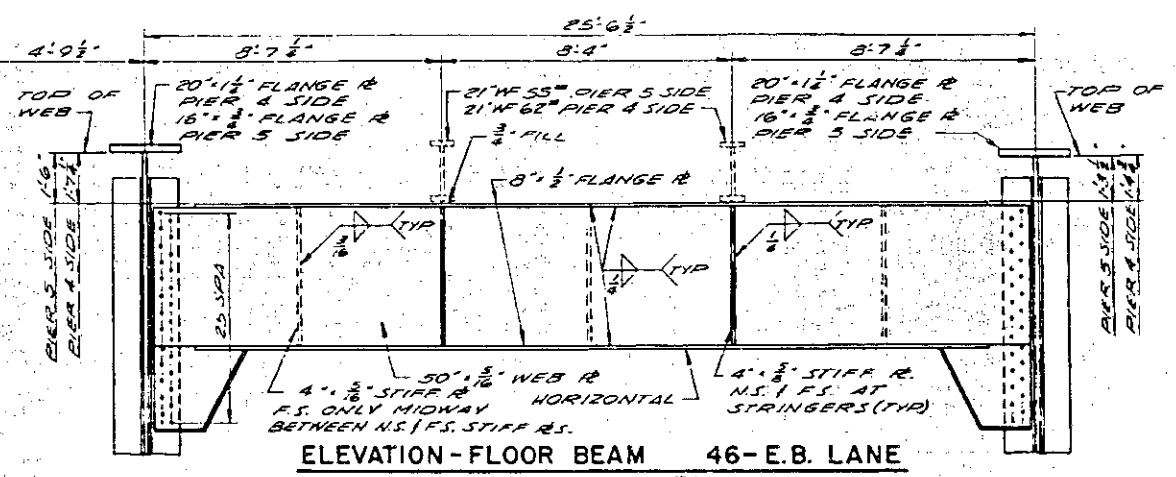
BRIDGE NO. 9320
FLOOR BEAM DETAILS

APPROVED 3-2-64

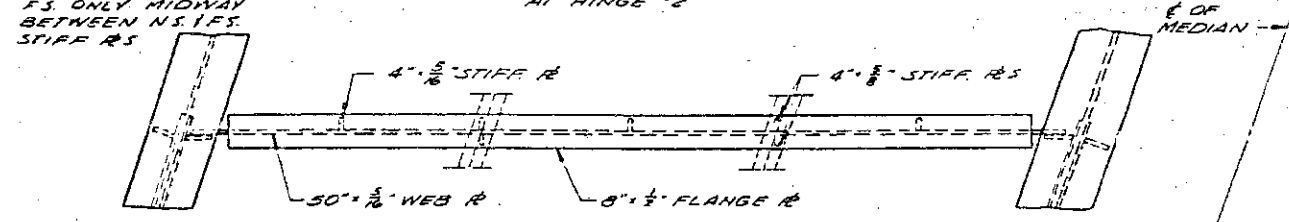
SHEET NO. 46 OF 93 SHEETS 9320



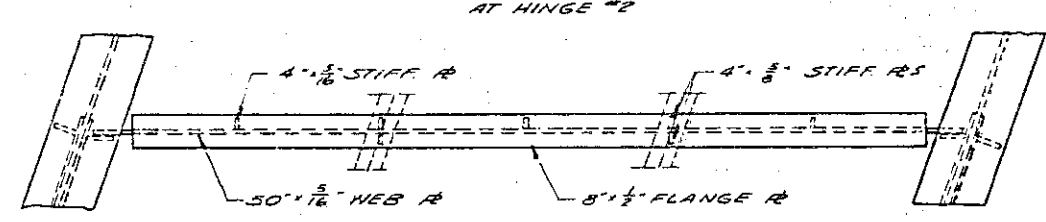
ELEVATION-FLOOR BEAM 45-W.B. LANE AT HINGE #2



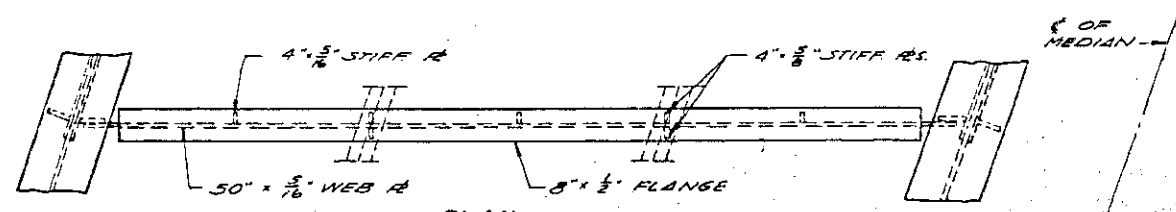
ELEVATION-FLOOR BEAM 46-E.B. LANE AT HINGE #2



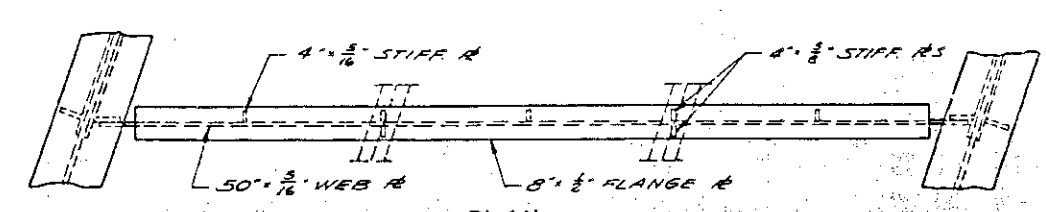
PLAN AT PIER 5 SIDE OF HINGE #2



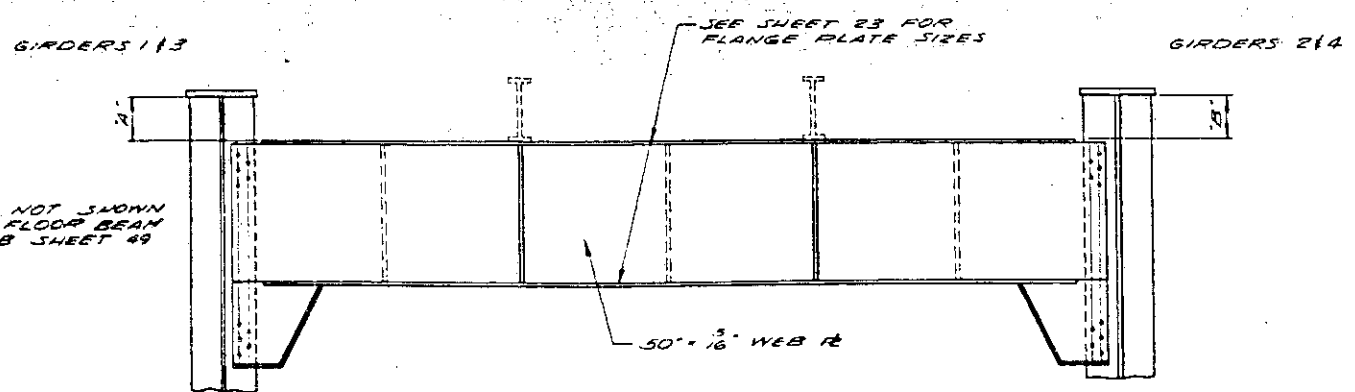
PLAN AT PIER 5 SIDE OF HINGE #2



PLAN AT PIER 4 SIDE OF HINGE #2



PLAN AT PIER 4 SIDE OF HINGE #2



ELEVATION-FLOOR BEAMS 46-49 W.B. LANE 47-50 E.B. LANE

WEST BOUND LANE		EAST BOUND LANE			
FLBM	A'	B'	FLBM	A'	B'
46	1'-4 3/8"	1'-4 1/4"	47	1'-4 3/8"	1'-4 1/4"
47	1'-4 1/2"	1'-5"	48	1'-5"	1'-4 3/4"
48	1'-5"	1'-5 1/8"	49	1'-5 1/8"	1'-5 1/8"
49	1'-5 1/8"	1'-5 1/4"	50	1'-5 1/4"	1'-5 1/4"

FOR DETAILS NOT SHOWN SEE TYPICAL FLOOR BEAM WITH 50" WEB SHEET 49

NOTE ALL STEEL SHALL BE A36 UNLESS OTHERWISE SHOWN OR NOTED

STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

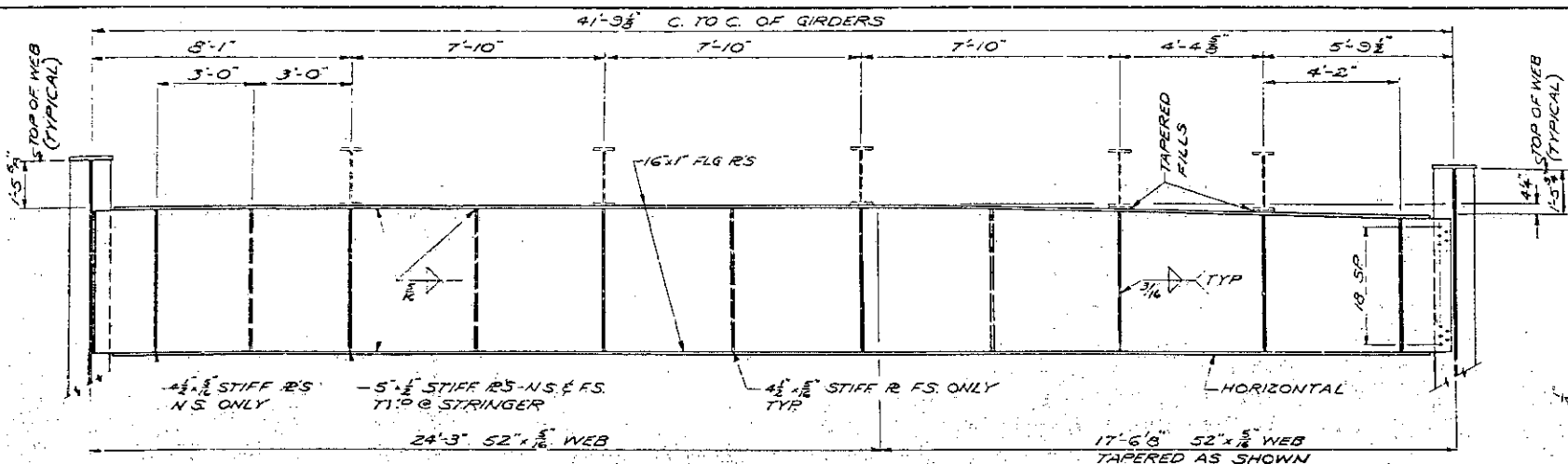
BRIDGE NO. 9320

FLOOR BEAM DETAILS

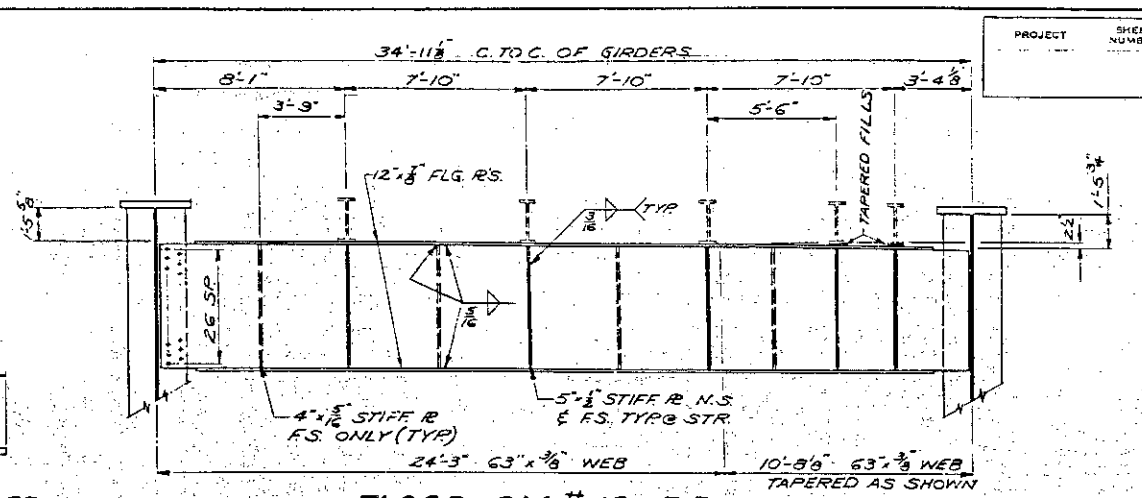
APPROVED 3-10-64

SHEET NO 47 OF 93 SHEETS 9320

DESIGNED BY
DRAWN BY
CHECKED BY

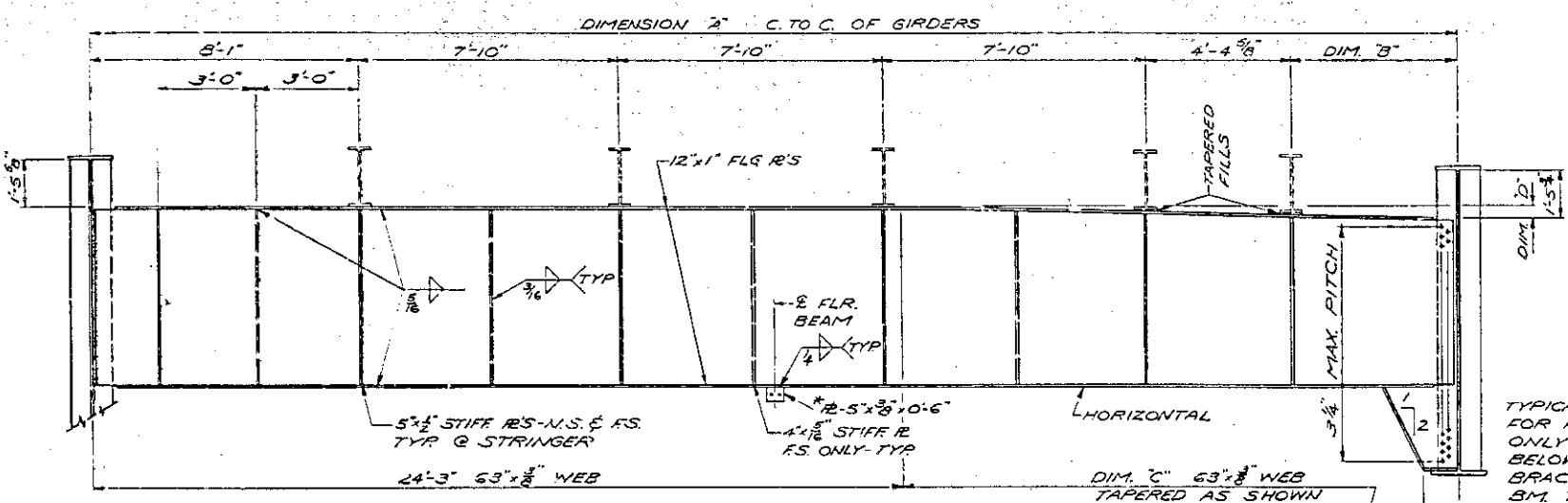


FLOOR BM. # 2 E.B.
LOOKING EAST



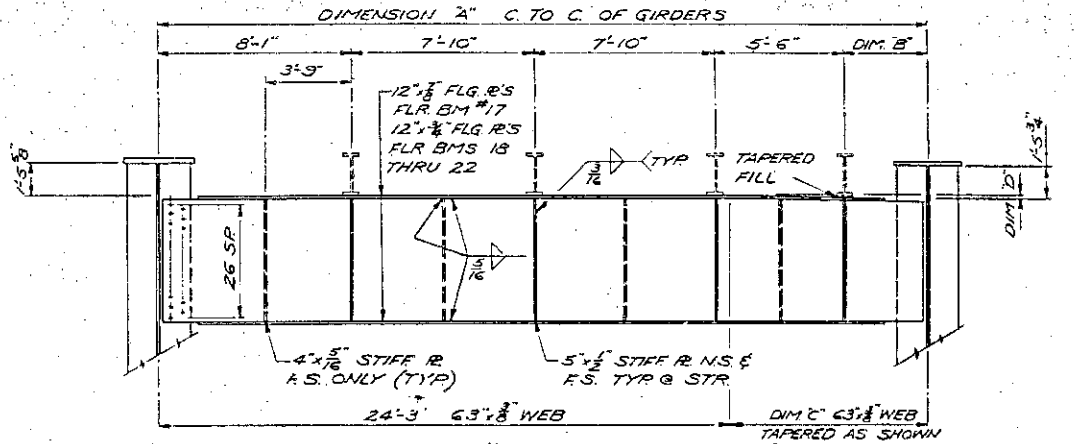
FLOOR BM. # 16 E.B.
LOOKING EAST

TAPERED SHIM DETAIL

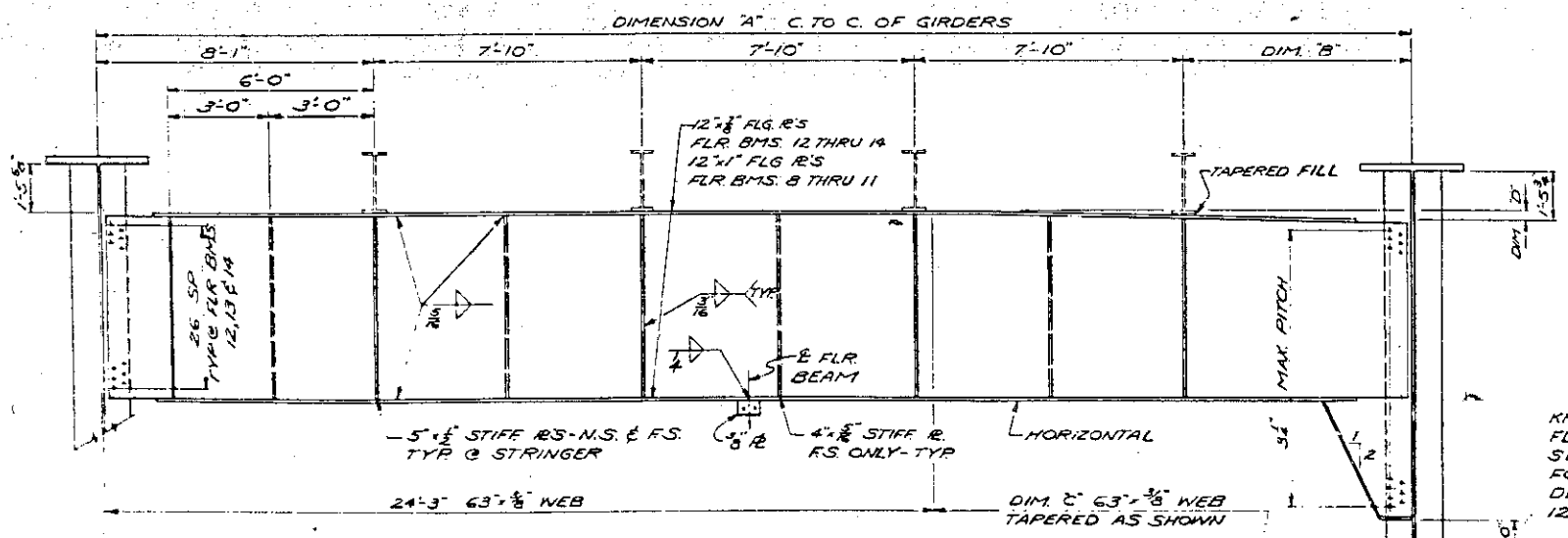


FLOOR BMS. # 3, 4 & 7 E.B.
LOOKING EAST

TYPICAL KNEE BRACE FOR FLR. BMS 3 & 4 ONLY (SEE DETAIL BELOW FOR KNEE-BRACE AT FLR. BM. 7)



FLOOR BMS. # 17, 18, 19, 20, 21 & 22 E.B.
LOOKING EAST



FLOOR BMS. # 8, 9, 10, 11, 12, 13 & 14 E.B.
LOOKING EAST

KNEE BRACE TYPICAL AT FLR. BMS. 7, 8, 9, 10 & 11. SEE SHEET 31 FOR CROSS FRAME DETAILS AT FLR. BMS 12, 13 & 14.

NOTE: ALL STIFFENERS SHOWN ON FS OF FLR. BM. SHALL BE PLACED MIDWAY BETWEEN STRINGERS EXCEPT AS SHOWN.
ALL STRUCTURAL STEEL SHALL CONFORM TO M.H.D. 3306 UNLESS OTHERWISE SHOWN OR NOTED.

TABLE OF DIMENSIONS E.B.

LOCATION	DIM. 'A'	DIM. 'B'	DIM. 'C'	DIM. 'D'
FLOOR BM. #3	41-4 1/2	5-4 1/2	17-1 3/8	4'8"
4	40-11	4-11 3/8	16-8	4'
7	39-7 3/8	3-8	15-4 5/8	3 3/4
8	39-1 3/8	7-6 3/8	14-10 3/8	3 3/8
9	38-7 1/2	7-0 1/2	14-4 1/4	3 1/2
10	38-1	6-6	13-10	3 3/8
11	37-6 3/8	5-11 3/8	13-3 3/8	3 1/4
12	37-0 3/8	5-5 3/8	12-9 3/8	3 3/8
13	36-6	4-11	12-3	3
14	35-11 3/8	4-4 3/8	11-8 3/4	2 3/8
17	34-4 3/8	5-1 3/8	10-1 3/4	2 3/8
18	33-10 1/2	4-7 1/2	9-7 1/2	2 1/4
19	33-4 3/8	4-1 3/8	9-1 3/8	2 3/8
20	32-9 3/8	3-6 3/8	8-6 3/8	2
21	32-3 1/2	3-0 1/2	8-0 1/2	1 3/8
22	31-3 1/4	2-6 1/4	7-6 1/4	1 3/4

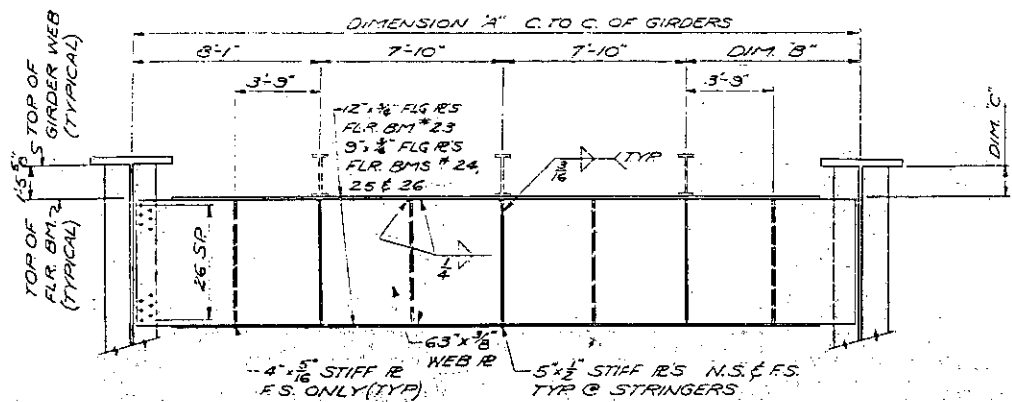
STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320

FLOOR BEAM DETAILS

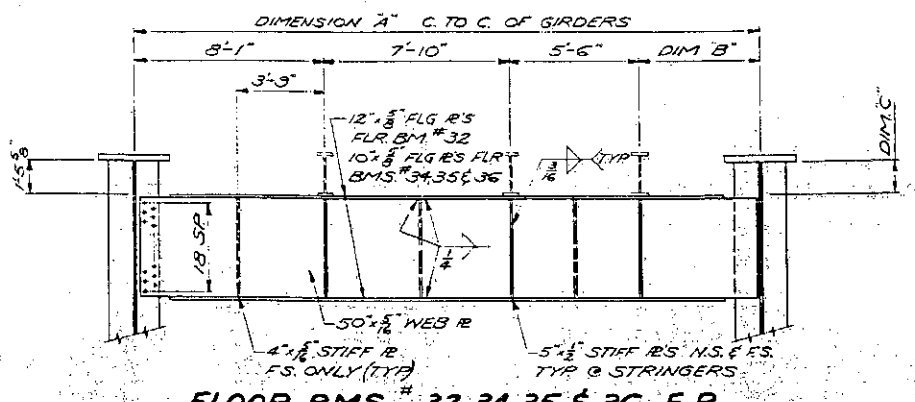
APPROVED 9/10/24

SHEET NO. 48 OF 93 SHEETS 9320



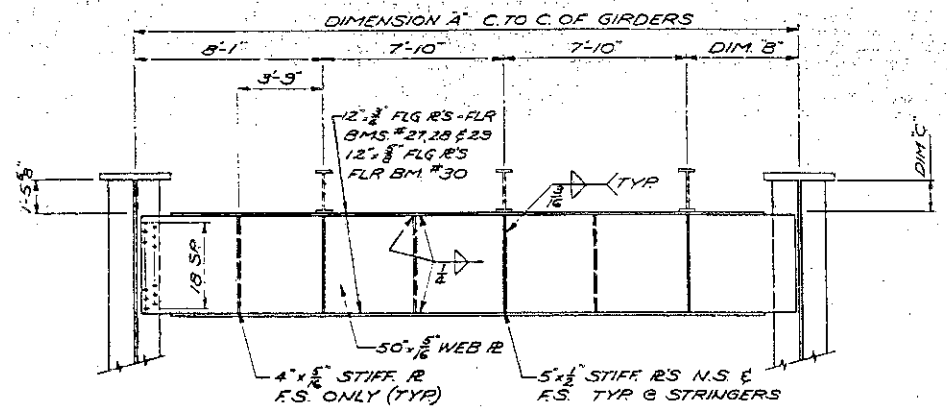
FLOOR BMS. # 23, 24, 25 & 26 - E.B.

LOOKING EAST



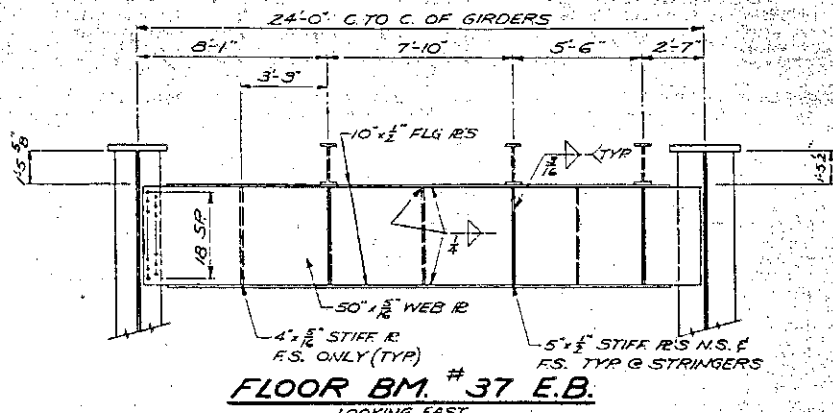
FLOOR BMS. # 32, 34, 35 & 36 E.B.

LOOKING EAST



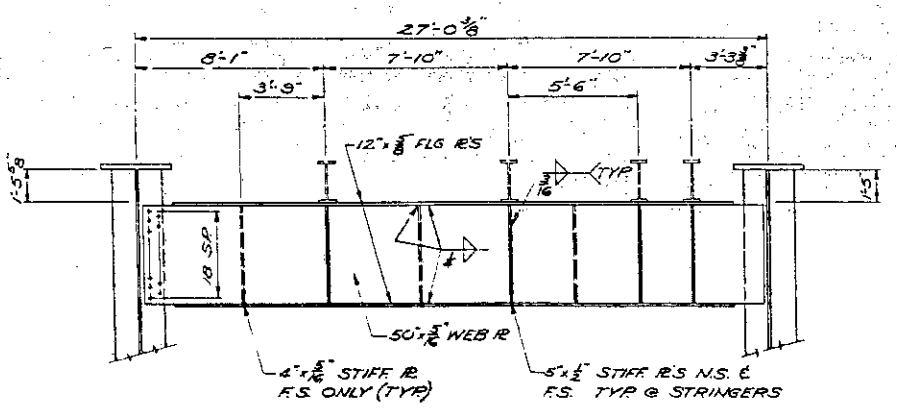
FLOOR BMS. # 27, 28, 29 & 30 - E.B.

LOOKING EAST



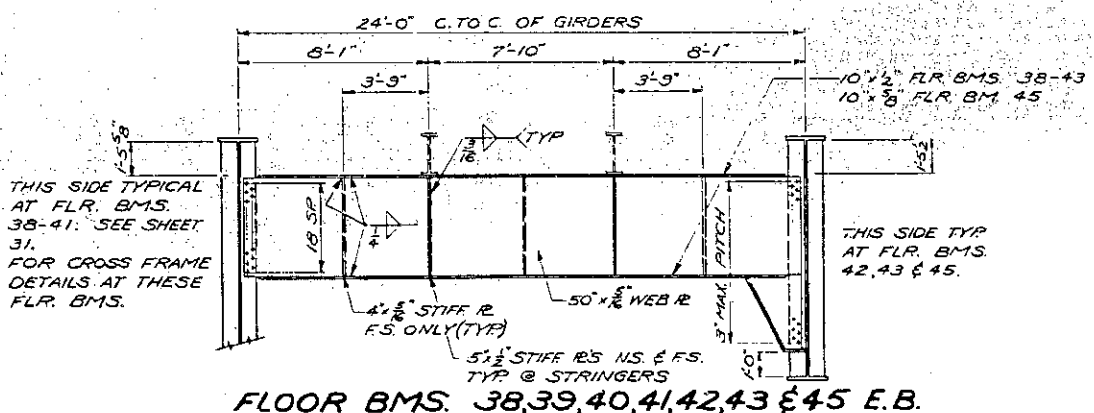
FLOOR BM. # 37 E.B.

LOOKING EAST



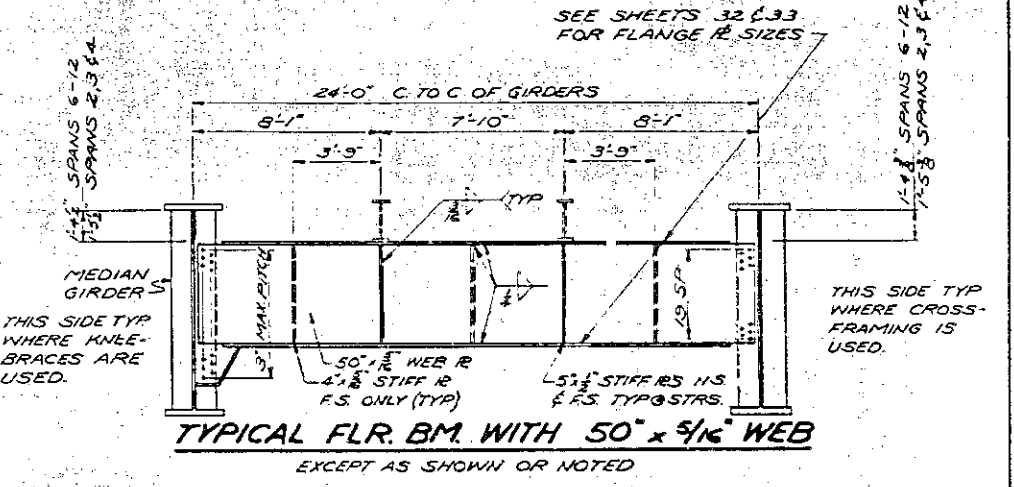
FLOOR BM. # 31 - E.B.

LOOKING EAST



FLOOR BMS. 38, 39, 40, 41, 42, 43 & 45 E.B.

LOOKING EAST

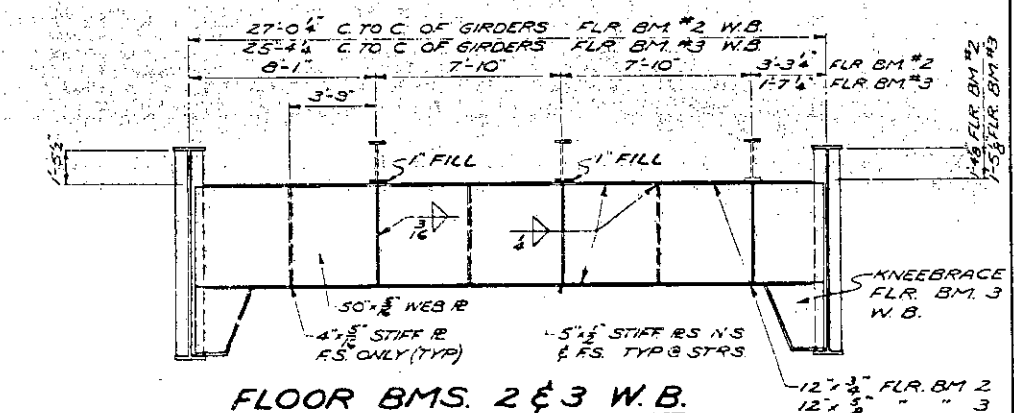


TYPICAL FLR. BM WITH 50" x 3/16" WEB

EXCEPT AS SHOWN OR NOTED

THIS SIDE TYP WHERE KNEE-BRACES ARE USED.

THIS SIDE TYP WHERE CROSS-FRAMING IS USED.



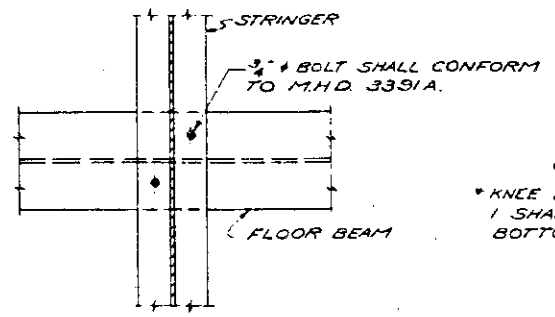
FLOOR BMS. 2 & 3 W.B.

LOOKING WEST

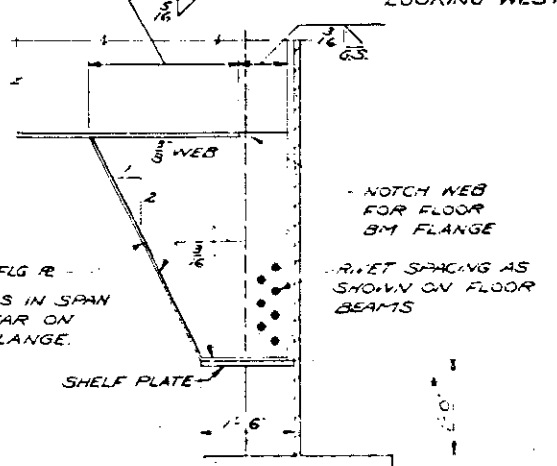
TABLE OF DIMENSIONS

LOCATION	DIM A	DIM B	DIM C
FLOOR BM # 23	31-2 1/2	7-5 1/2	1-4
24	30-8 1/2	6-11 1/2	1-4 1/2
25	30-2 1/2	6-5 1/2	1-4 1/2
26	29-8	5-11	1-4 1/2
27	29-1 1/2	5-4 1/2	1-4 1/2
28	28-7 1/2	4-10 1/2	1-4 1/2
29	28-1	4-4	1-4 1/2
30	27-6 1/2	3-9 1/2	1-4 1/2
32	26-6 1/2	5-1 1/2	1-5 1/2
34	25-5 1/2	4-0 1/2	1-5 1/2
35	24-1 1/2	3-6 1/2	1-5 1/2
36	24-4 1/2	2-1 1/2	1-5 1/2

FLOOR BEAMS 9 THRU 13 AND 15 THRU 40 IN WEST BOUND LANE HAVE CROSS FRAMES.
FLOOR BEAMS 12 THRU 14 AND 16 THRU 41 IN EAST BOUND LANE HAVE CROSS FRAME DIAPHRAGMS.
ALL FLOOR BEAMS IN WEST BOUND LANE HAVE A 50" x 3/16" WEB R EXCEPT FOR FLR BM 14.
ALL FLR BMS IN EAST BOUND LANE NOT SHOWN HAVE A 50" x 3/16" WEB R.



TYPICAL STRINGER TO BEAM CONNECTION



TYPICAL KNEE BRACE DETAIL

NOTE ALL STIFFENERS SHOWN ON F.S. OF FLR BM SHALL BE PLACED MIDWAY BETWEEN STRINGERS EXCEPT AS SHOWN.
ALL STRUCTURAL STEEL SHALL CONFORM TO M.H.D. 3306 UNLESS OTHERWISE SHOWN OR NOTED.

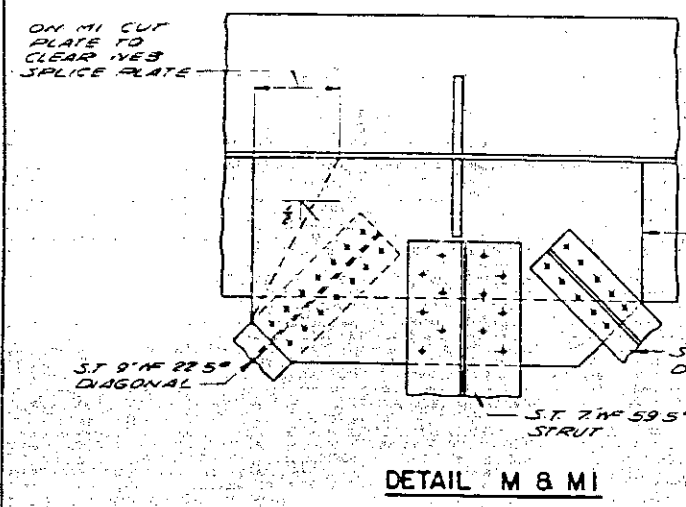
STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320

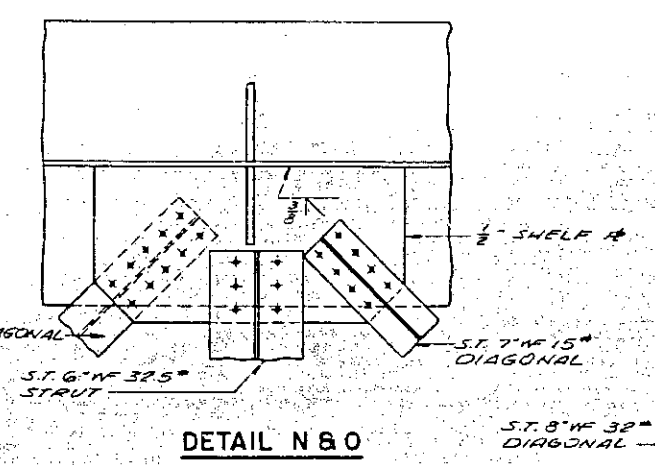
FLOOR BEAM DETAILS

APPROVED 9-10-24

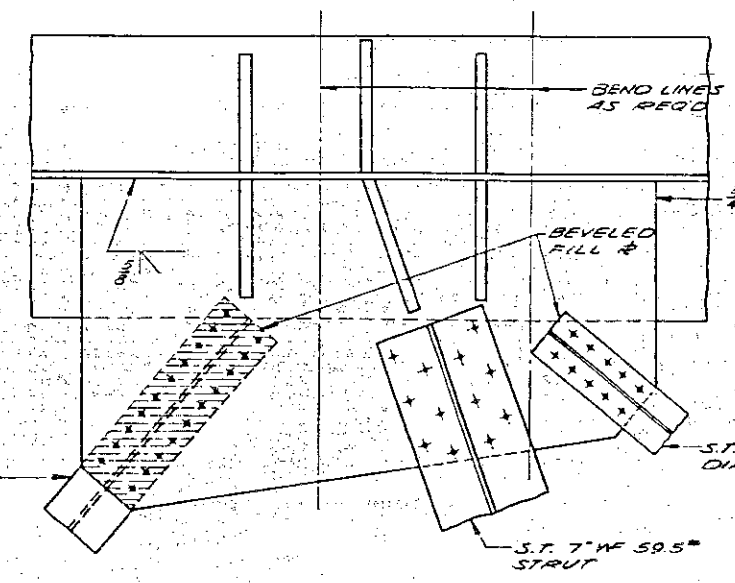
SHEET NO 49 OF 93 SHEETS 9320



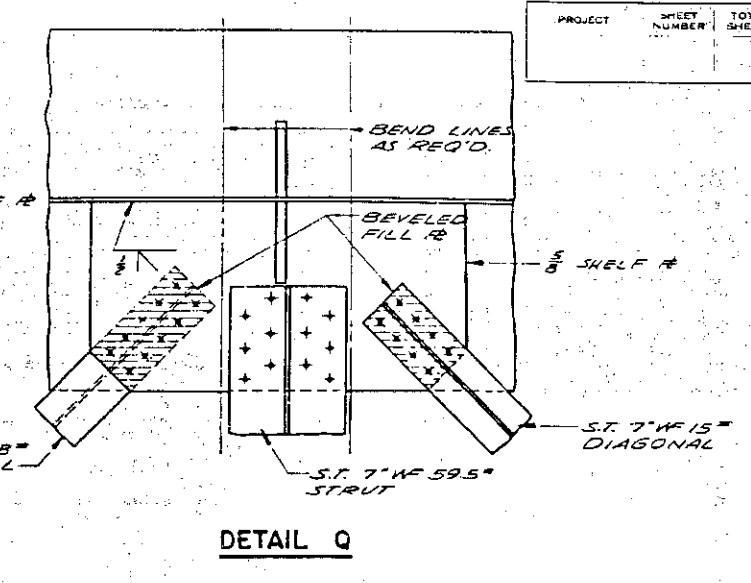
DETAIL M & MI



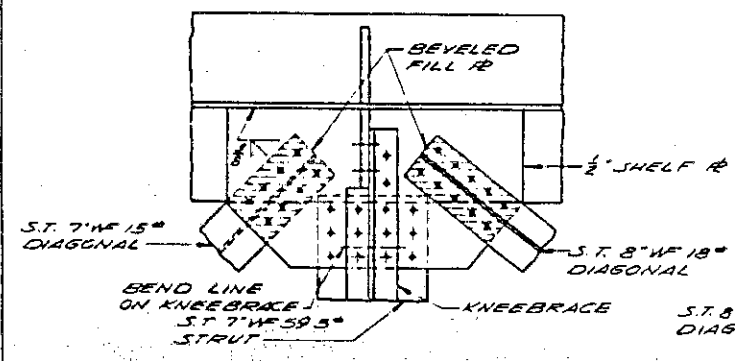
DETAIL N & O



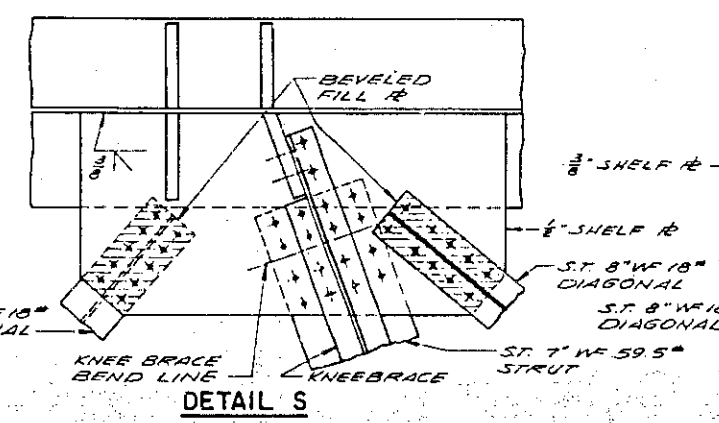
DETAIL P



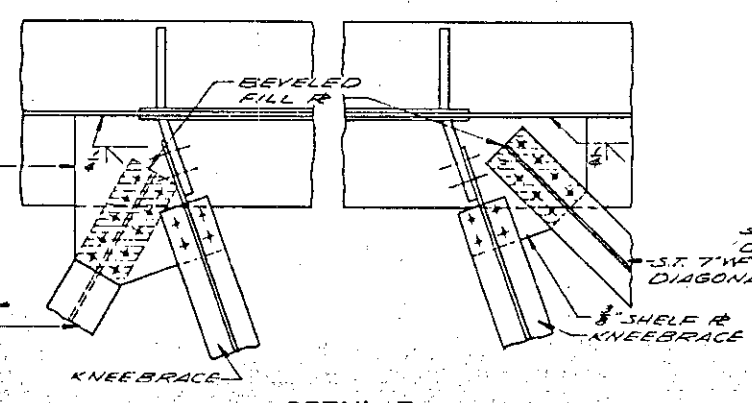
DETAIL Q



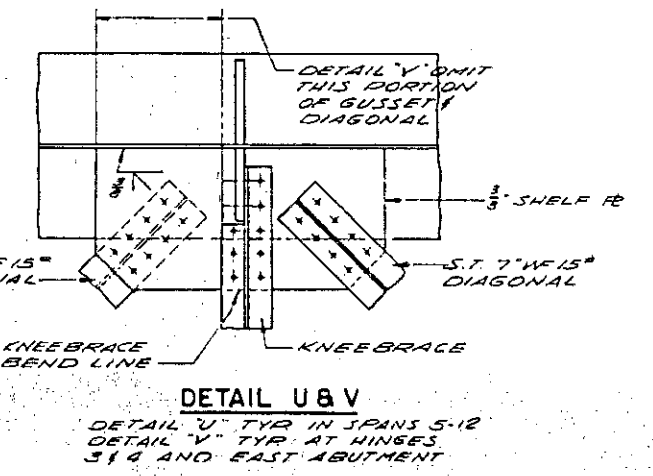
DETAIL R



DETAIL S

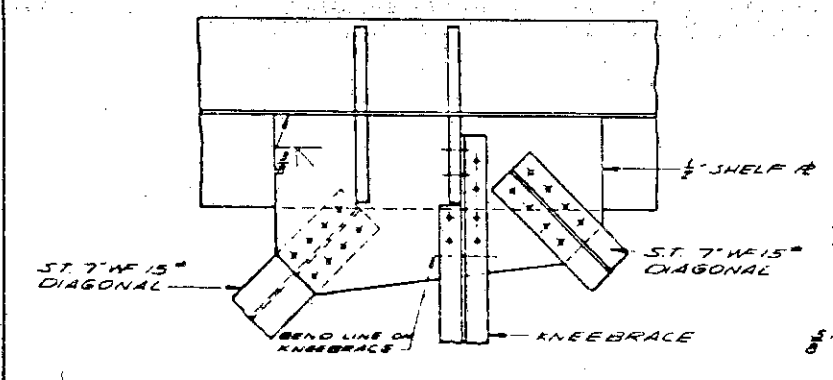


DETAIL T

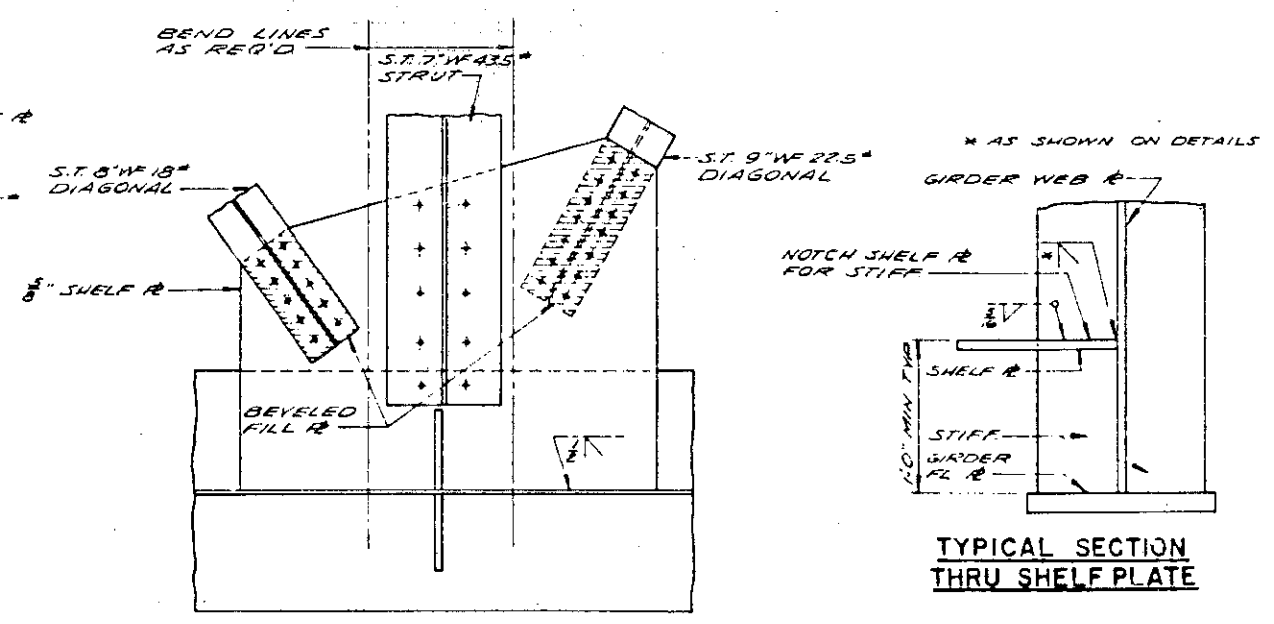


DETAIL U & V

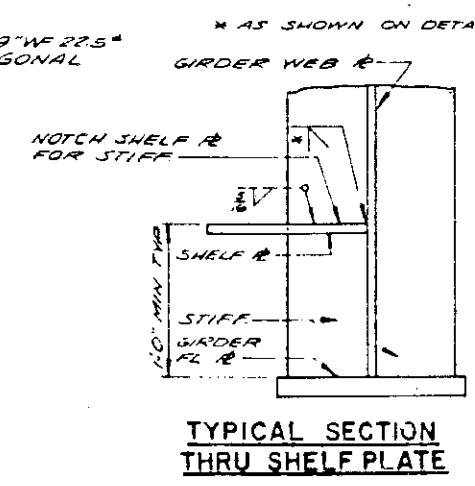
DETAIL U TYR IN SPANS 5-12
DETAIL V TYR AT HINGES 3 & 4 AND EAST ABUTMENT



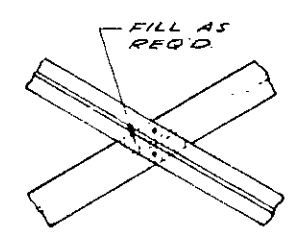
DETAIL W
TYPICAL PIERS 5-11



DETAIL FI

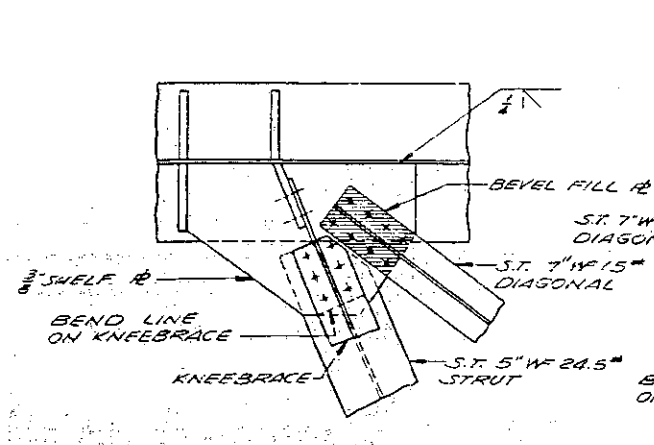


TYPICAL SECTION THRU SHELF PLATE

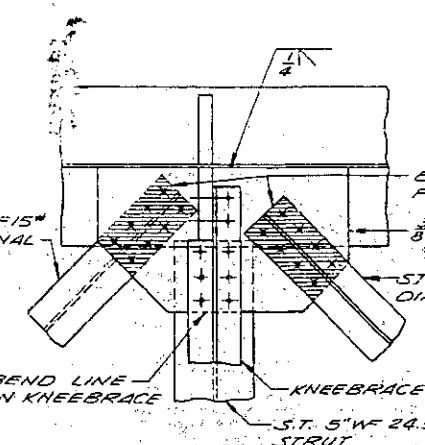


TYPICAL DIAGONAL CONNECTION DETAIL

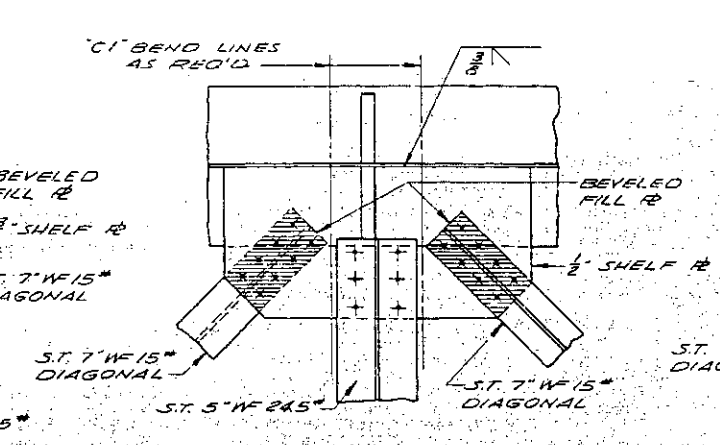
NOTES:
LATERAL CONNECTIONS NOT DESIGNATED ARE SIMILAR TO THOSE SHOWN.
BEVELED SHIM PLATES AND BEND LINES ON SHELF PLATES TO BE USED AS REQUIRED.
ALL CONNECTIONS TO BE 7/8 RIVETS.
M.H.D. 3316 TYPE I OR 2 1/4 HIGH STRENGTH STRUCTURAL STEEL BOLTS M.H.D. 3391B STYLE II.
ALL STRUTS, DIAGONALS AND SHELF PLATES SHALL CONFORM TO M.H.D. 3306 STEEL.
BOTTOM STRUTS SHALL BE HORIZONTAL.



DETAIL A

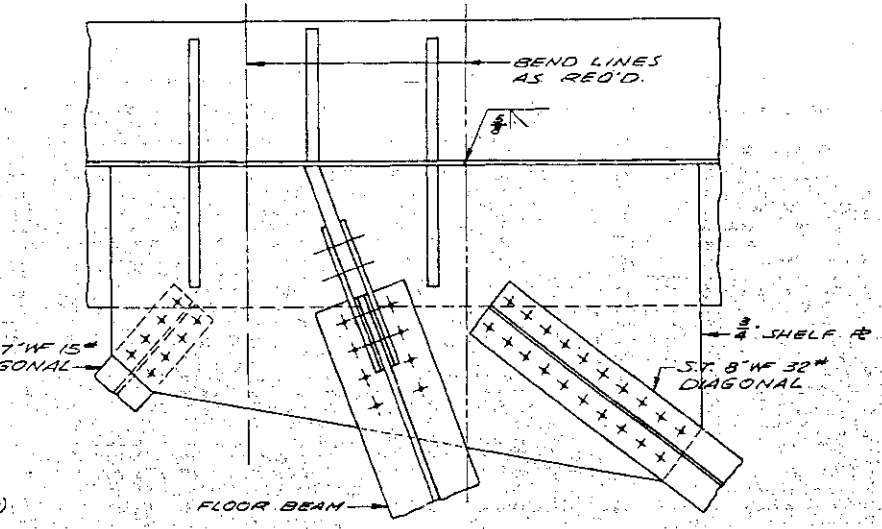


DETAIL B

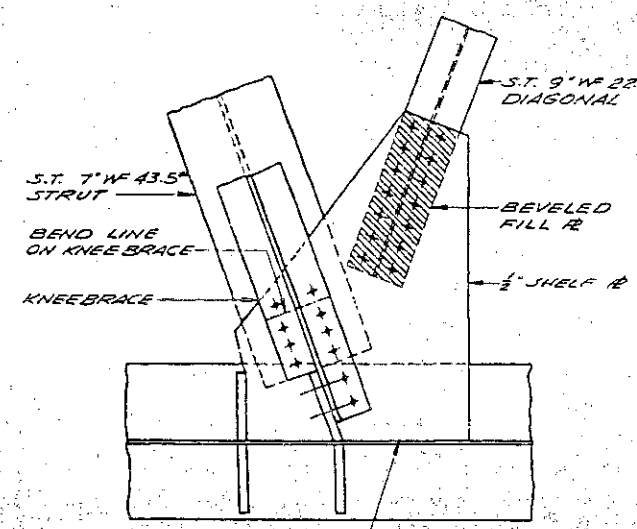


DETAIL C & C1

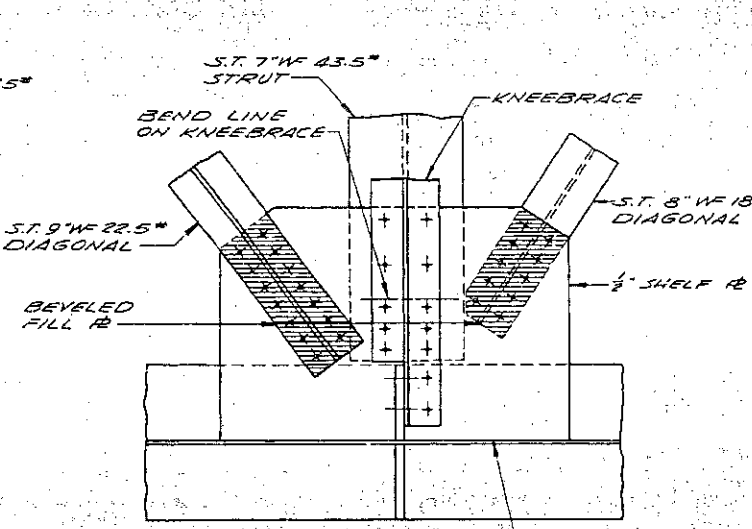
NOTCH SHELF PLATE FOR STIFFENER AND FILLET WELD (TYP. ALL CONNECTIONS)



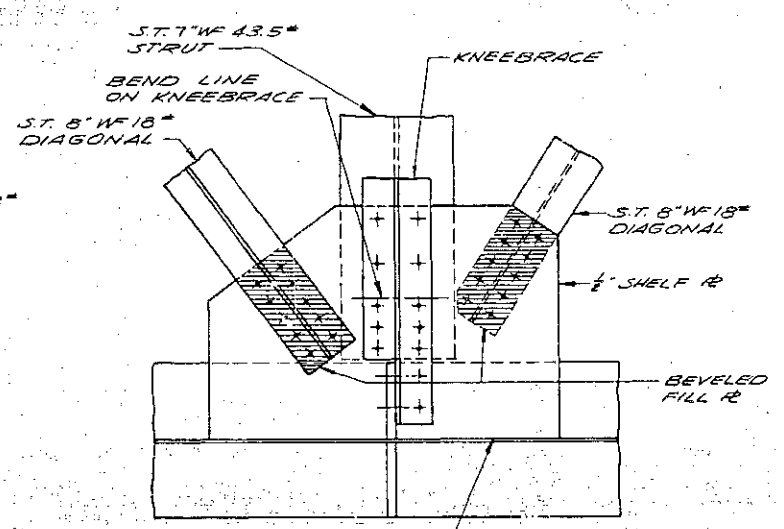
DETAIL D



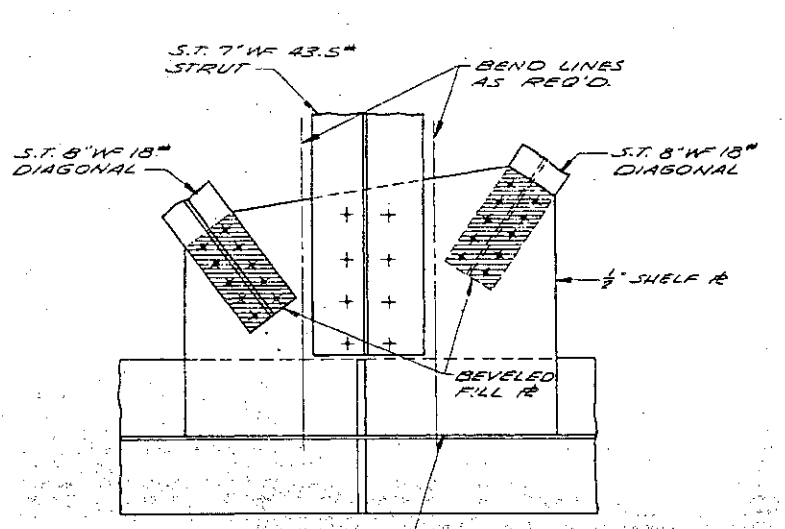
DETAIL E



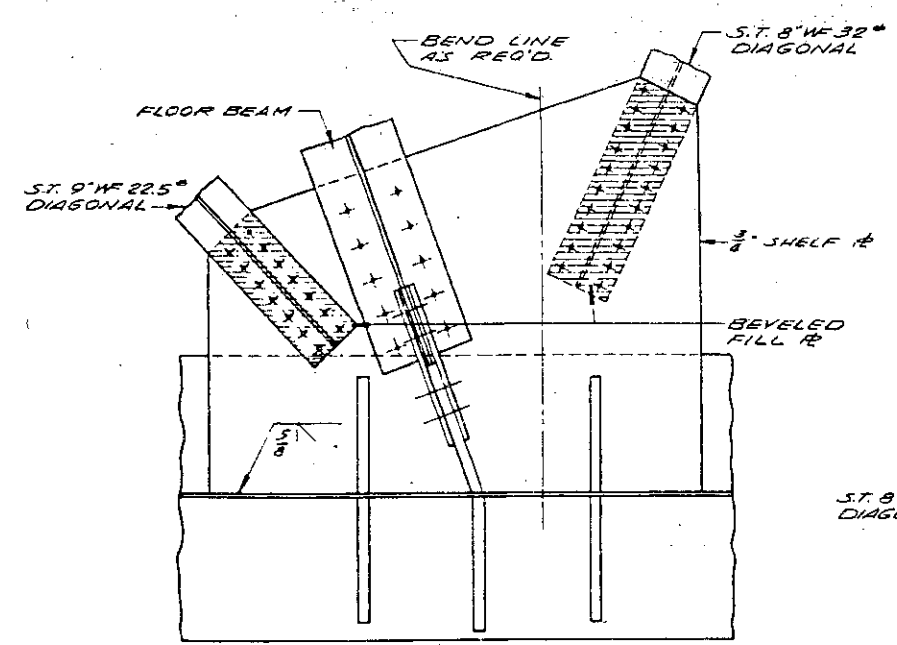
DETAIL F



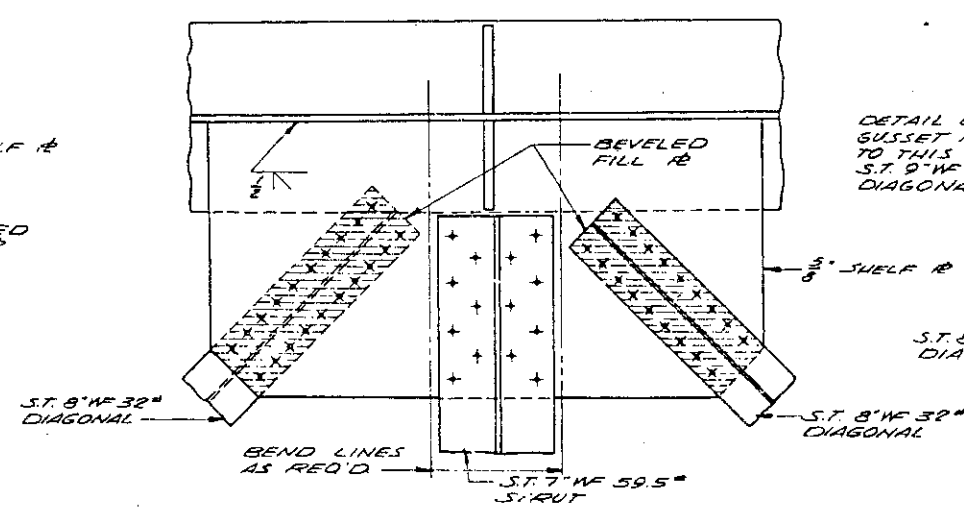
DETAIL G



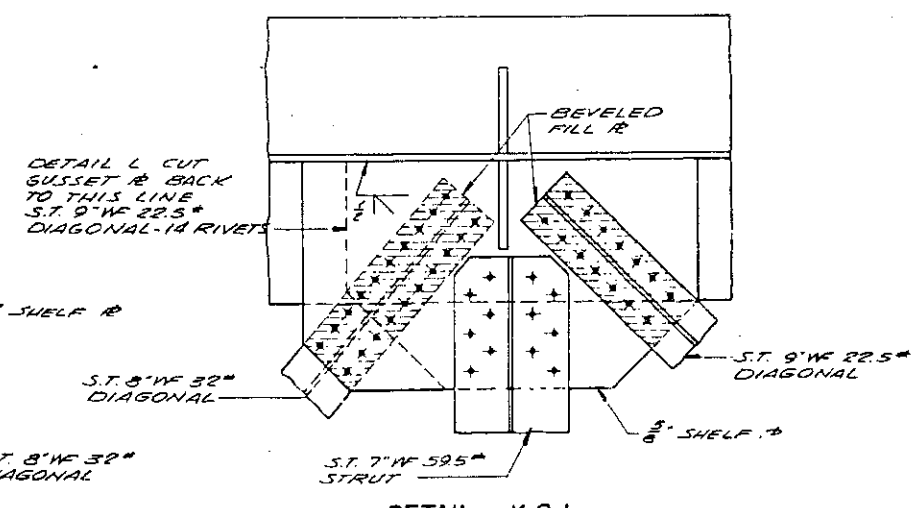
DETAIL H



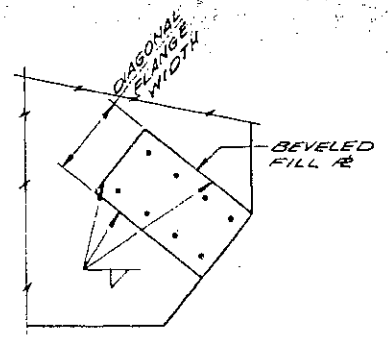
DETAIL I



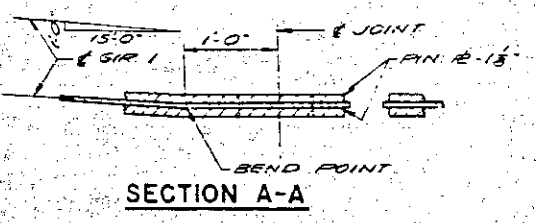
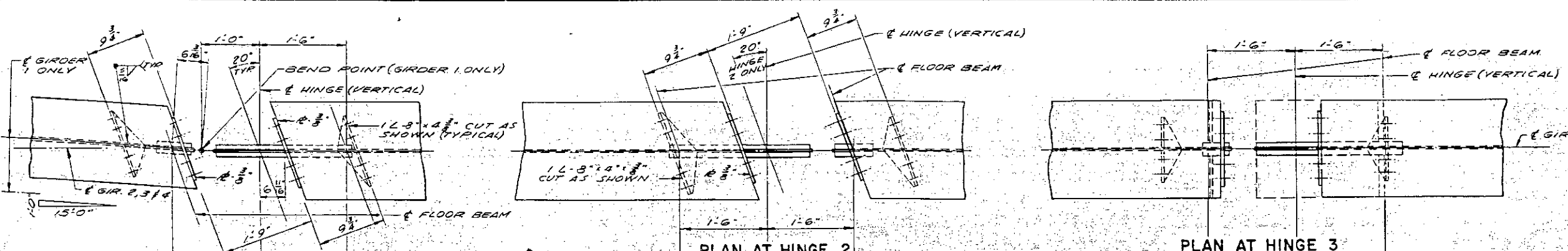
DETAIL J



DETAIL K & L

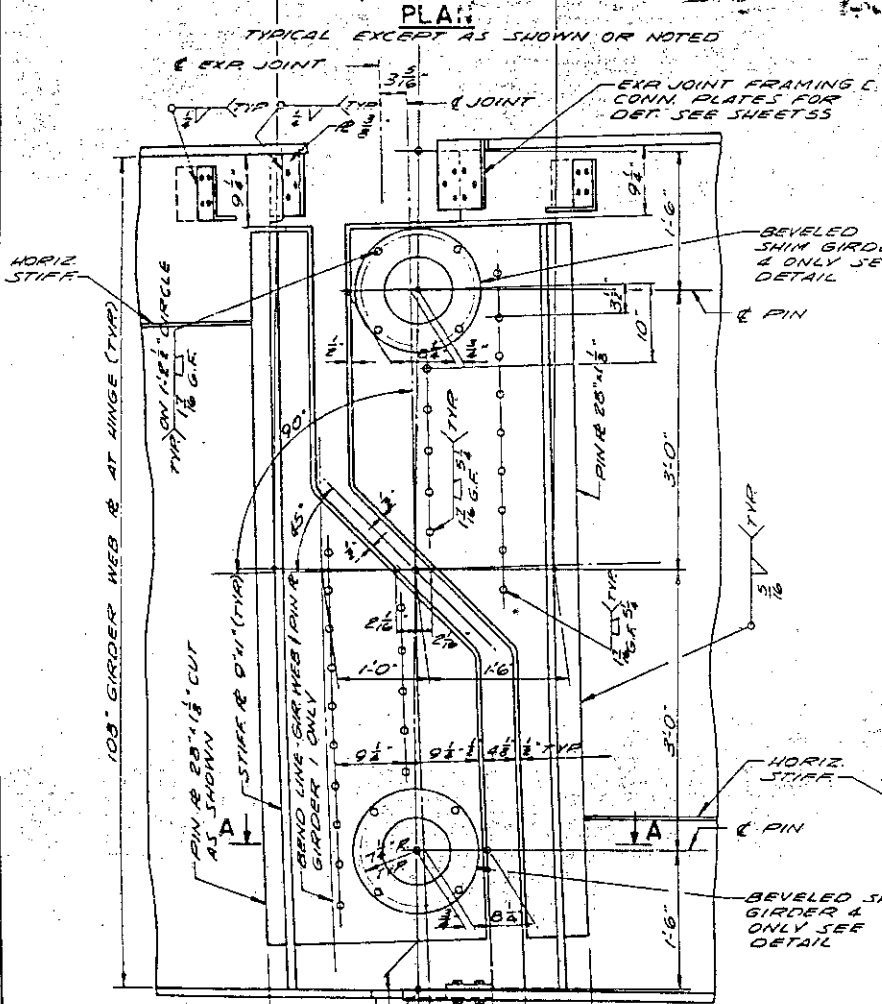


BEVELED FILL PLATE DETAIL

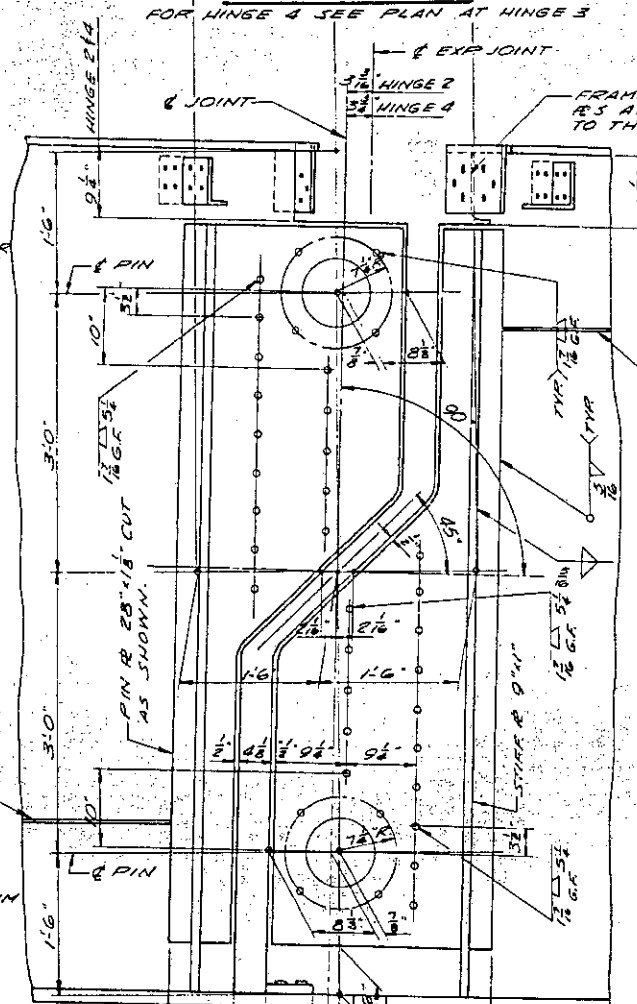


SECTION A-A

NOTE A:
ALL MATERIALS BETWEEN THE LIMITS SHOWN SHALL BE METALLIZED AFTER FABRICATION EXCEPT LATERAL BRACING ASSEMBLY, PINS, INSIDE OF PIN HOLES, DIAPHRAGMS AND EXPANSION ASSEMBLY SUPPORTS. PAINT METALLIZED MATERIAL SAME AS STRUCTURAL STEEL.

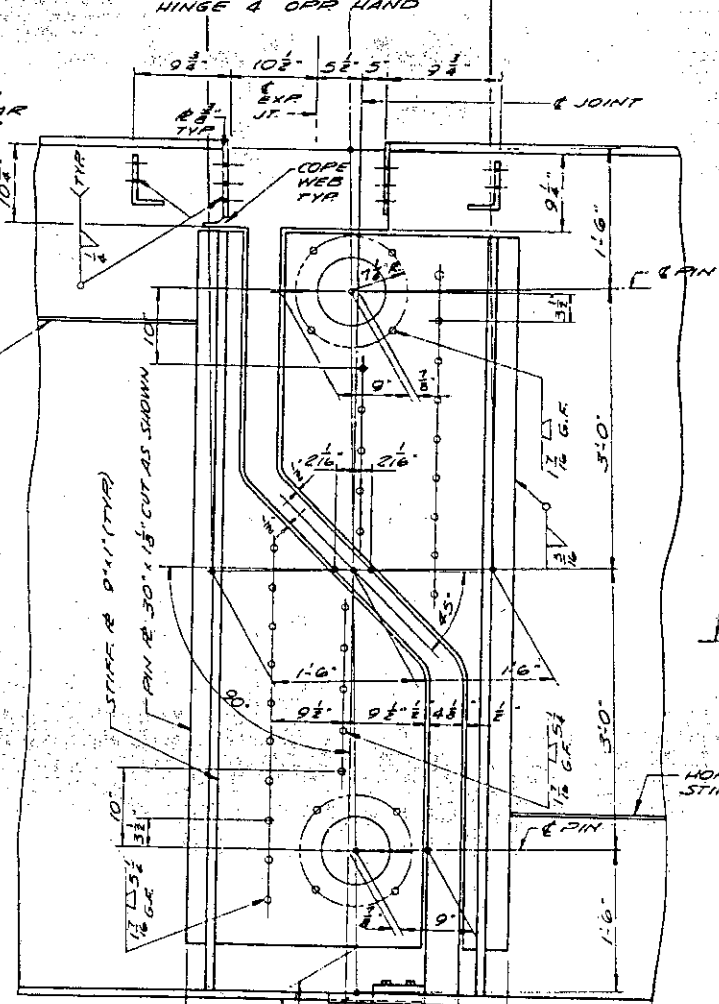


DETAIL AT HINGE 1

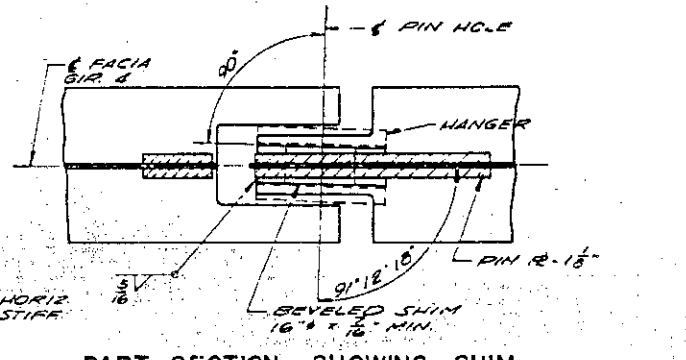


DETAIL AT HINGE 2

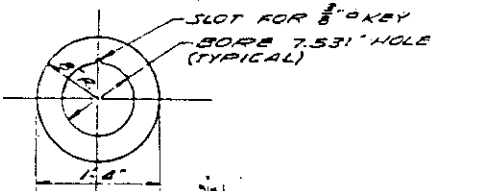
NOTE: ALL HORIZONTAL OPENING DIMENSIONS ARE @ 60°F.



DETAIL AT HINGE 3

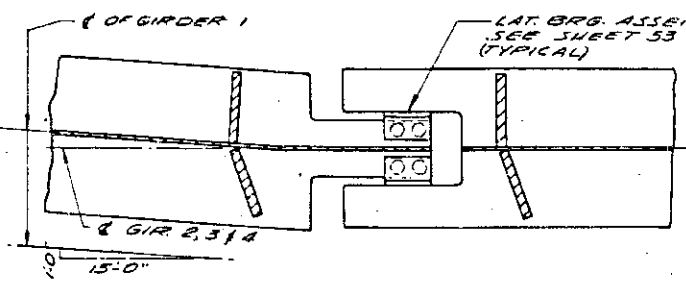


PART SECTION SHOWING SHIM

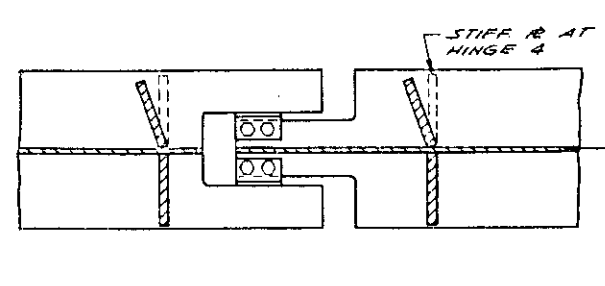


SHIM DETAIL

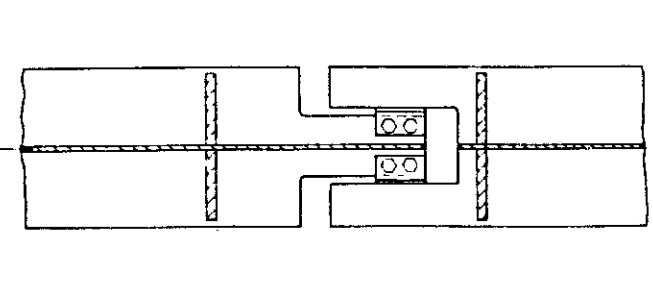
DETAIL AT HINGE 1 GIRDER 4



BOTTOM FLANGE DETAIL

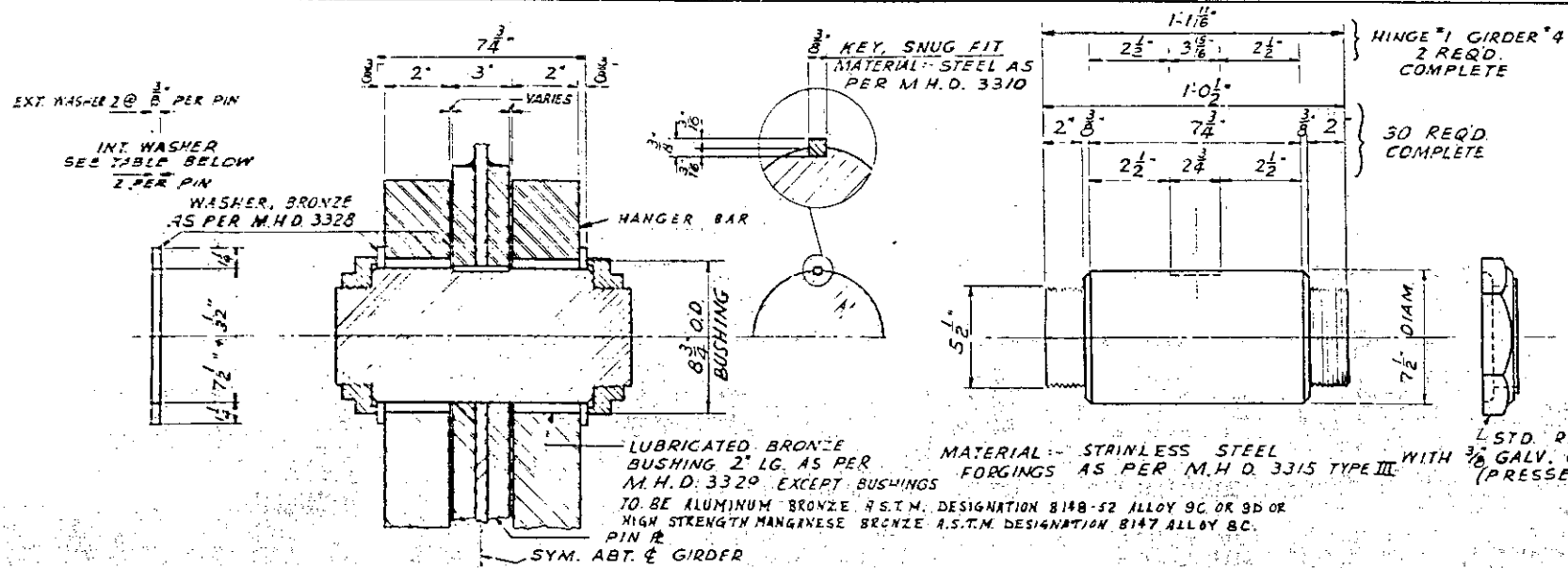


BOTTOM FLANGE DETAIL



BOTTOM FLANGE DETAIL

STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS	
BRIDGE NO. 9320	
HINGE DETAILS	
APPROVED 9-13-54	
SHEET NO. 52 OF 93 SHEETS	9320
DES. J. J. M.	EA. J. E. A.
CR. J. J. M.	CR. J. J. M.



SECTION A-A PIN DETAILS

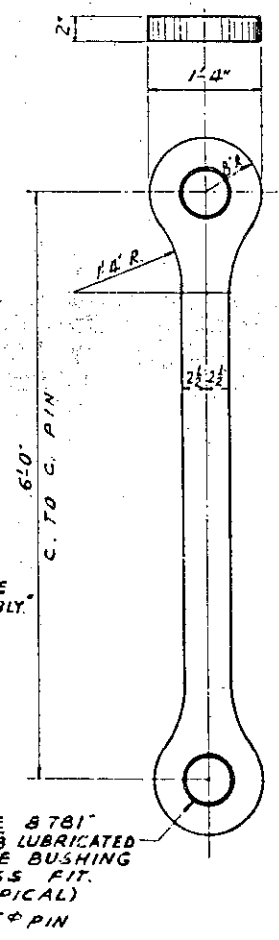
INTERIOR WASHER THICKNESS

HINGE	1	2	3	4
TOP PIN	1/8"	7/8"	5/32"	5/32"
BOTT PIN	3/16"	3/16"	3/16"	3/16"

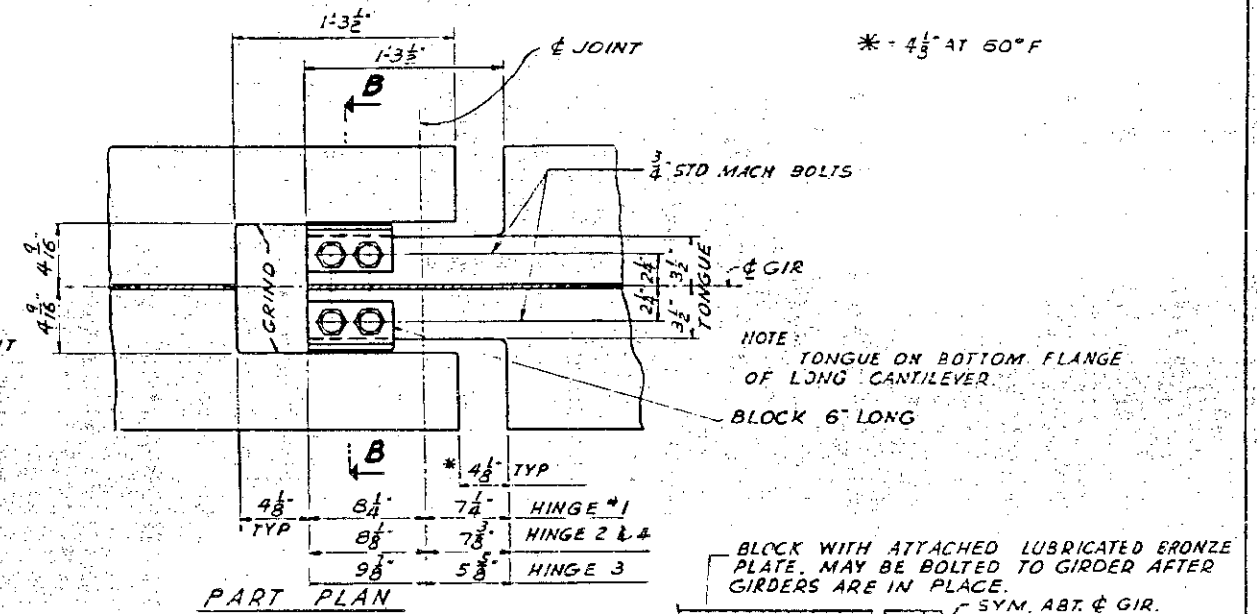
HINGE OPENINGS

TEMP. ERATURE	GAP DIMENSIONS			
	HINGE 1	HINGE 2	HINGE 3	HINGE 4
120°F	1/2"	1 7/8"	1 7/16"	1 1/16"
60°F	4 1/8"	4 3/8"	4 1/8"	4 1/8"
-30°F	9 1/2"	7 3/16"	8 1/16"	7 3/16"

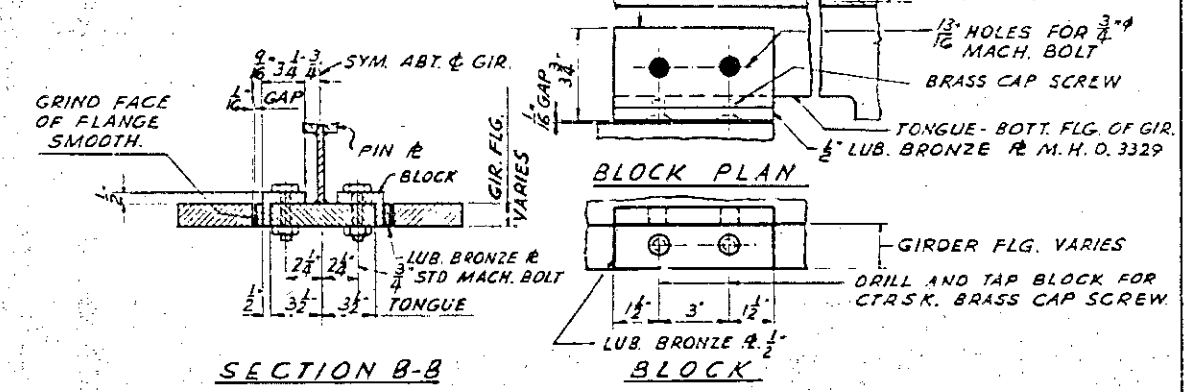
NOTE -
MODIFY OPENINGS BY 5/64 FOR 10° TEMPERATURE CHANGE PER 100 FT. LENGTH.
ONE HANGER BAR BEARING ASSEMBLY INCLUDES 2 STEEL HANGER BARS WITH 4 LUBRICATED BRONZE BUSHINGS, 2 PINS, 2 KEYS, 8 BRONZE WASHERS, 4 PIN NUTS, AND 4 COTTER PINS. PAYMENT FOR ABOVE ITEMS SHALL BE INCLUDED IN THE PRICE BID FOR "HANGER BAR BEARING ASSEMBLY."



HANGER BAR DETAIL
MATERIAL - M.H.D. 3318
TYPE A, B OR C



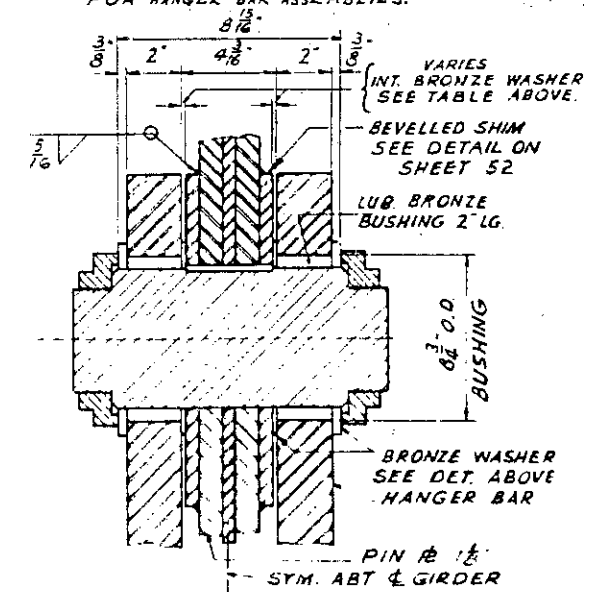
PART PLAN



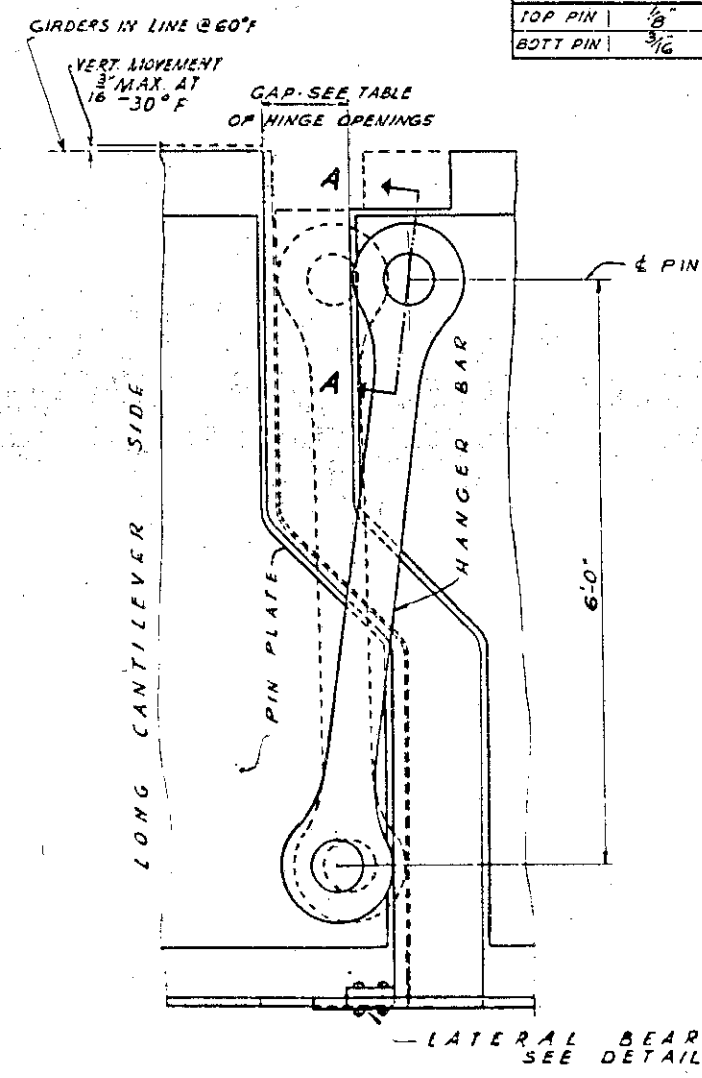
SECTION B-B

LATERAL BEARING DETAIL

LATERAL BEARING ASSEMBLY INCLUDES 2 LUBRICATED BRONZE BEARING PLATES AND THEIR FASTENING. PAYMENT FOR ASSEMBLY TO BE INCLUDED IN THE PRICE BID FOR HANGER BAR ASSEMBLIES.

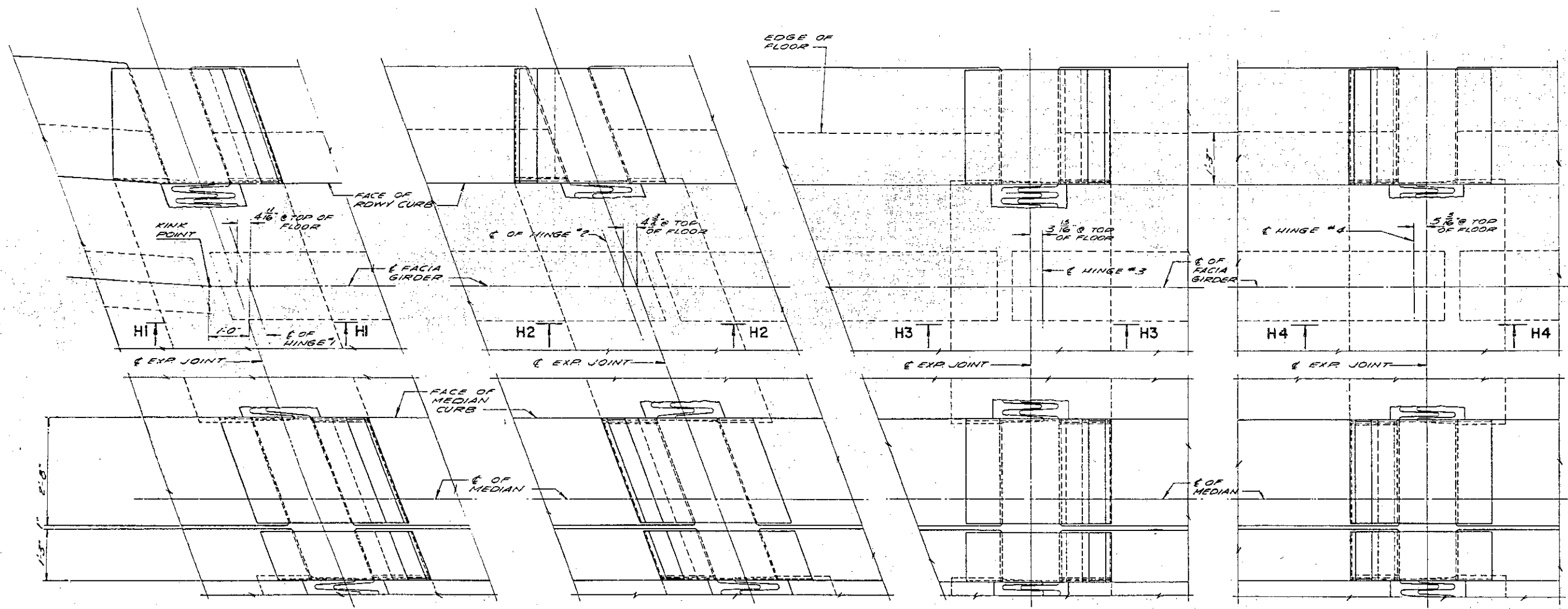


SECTION A-A HINGE #1 GIRDER #4

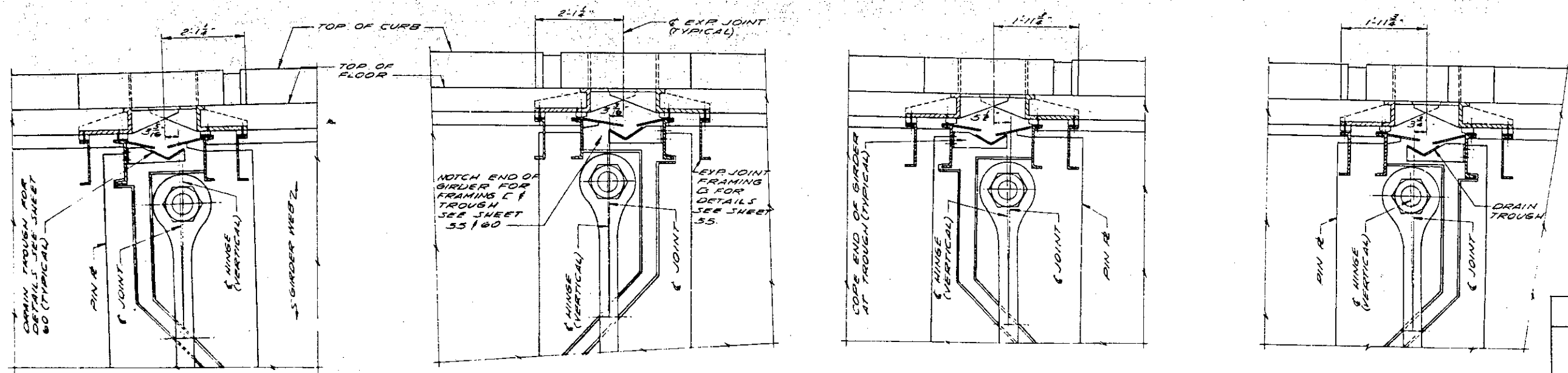


EXTREME HINGE POSITION

PROJECT	SHEET NUMBER	TOTAL SHEETS



PART PLAN AT HINGES W.B. LANE
EAST BOUND LANE SIMILAR



NOTE: DIMENSIONS SHOWN ARE @ 60° F

SECTION H1

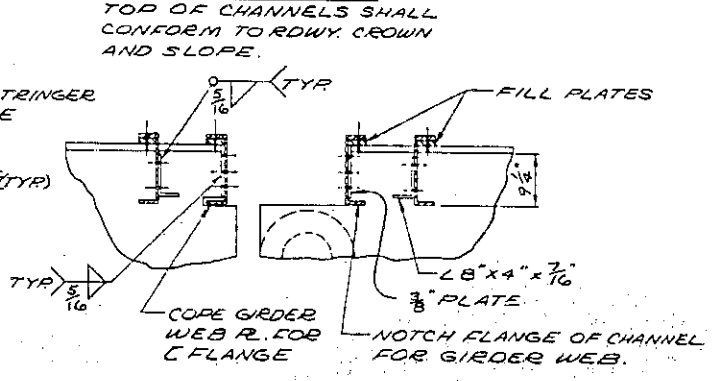
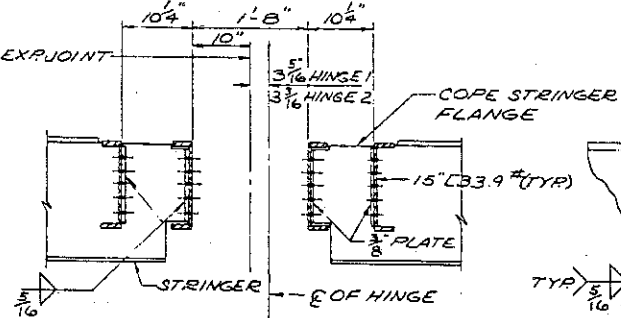
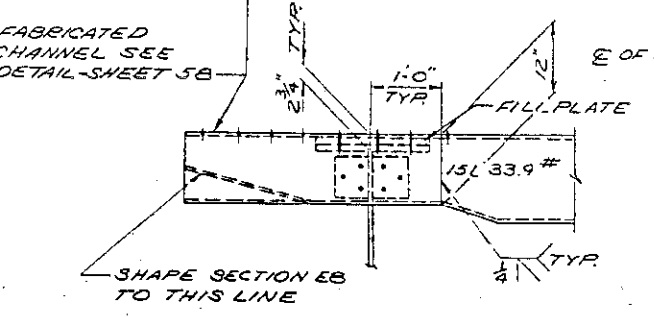
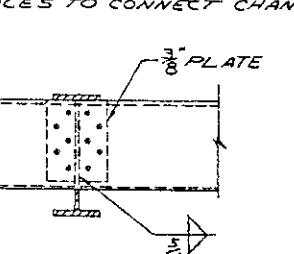
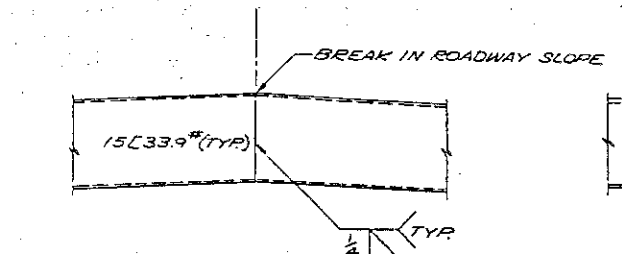
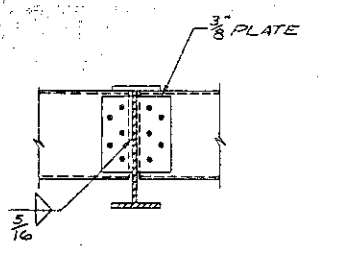
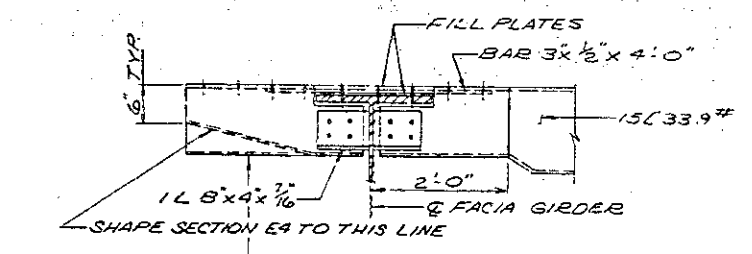
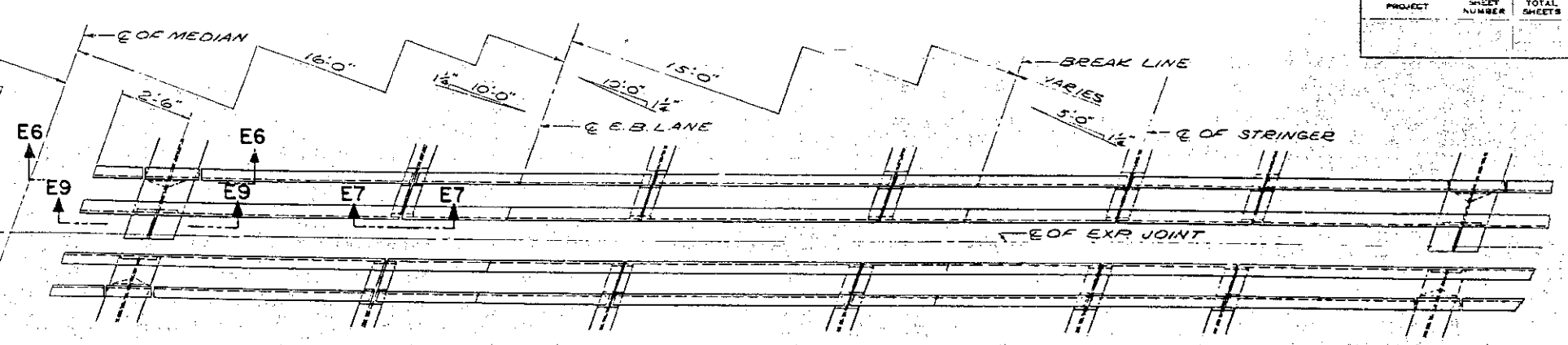
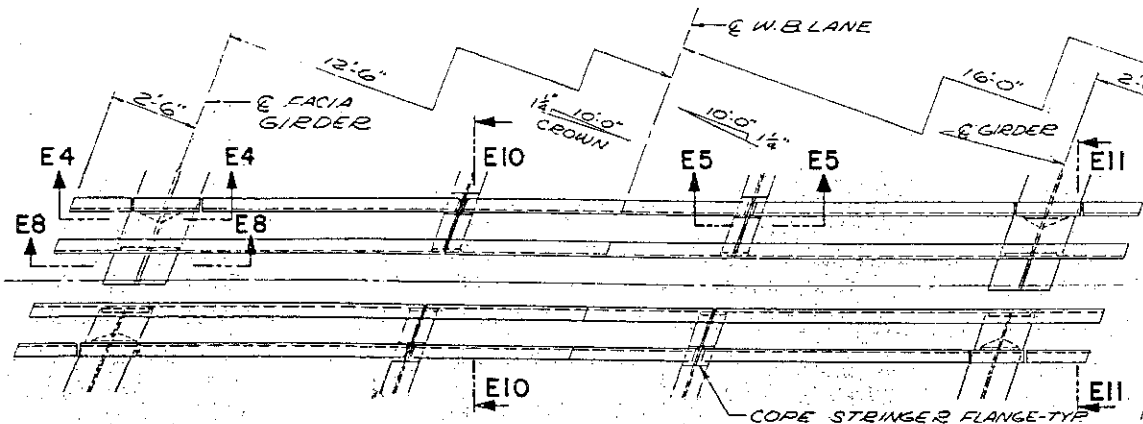
SECTION H2

SECTION H3

SECTION H4

STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS	
BRIDGE NO. 9320	
JOINT DETAILS	
APPROVED 9-10-64	
SHEET NO. 54 OF 93 SHEETS	9320
DES. J.P.P.	OR. W.E.A.
CK. J.P.P.	

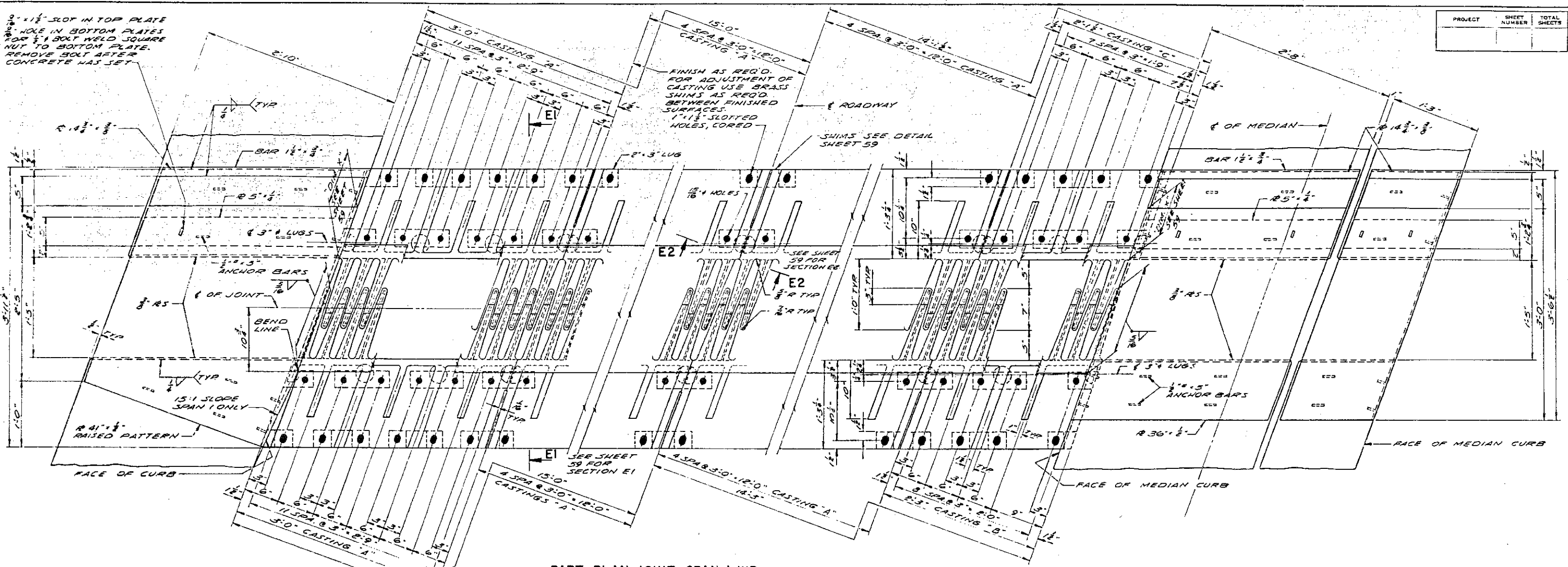
PROJECT	SHEET NUMBER	TOTAL SHEETS



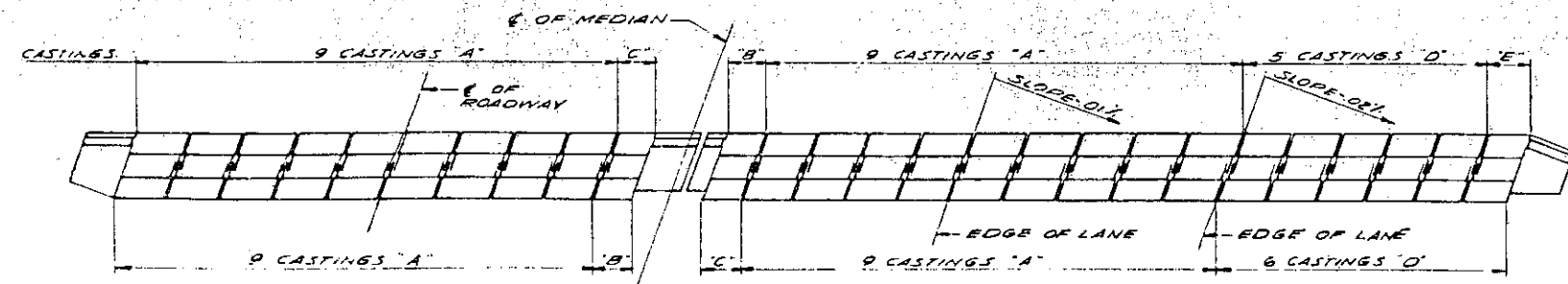
STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS	
BRIDGE NO. 9320 FRAMING PLAN-HINGES 1&2	
APPROVED 5-17-64	
SHEET NO. 55 OF 93 SHEETS	9320

PROJECT	SHEET NUMBER	TOTAL SHEETS

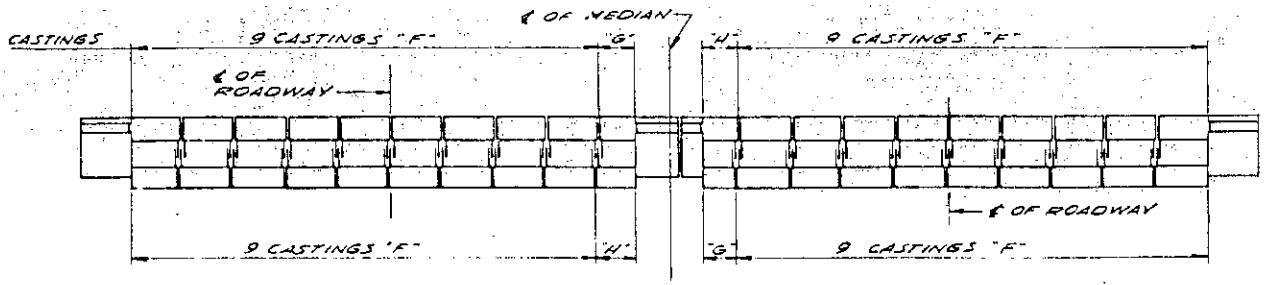
2" x 1 1/2" SLOT IN TOP PLATE
 HOLE IN BOTTOM PLATES
 FOR 3/4" BOLT WELD SQUARE
 NUT TO BOTTOM PLATE.
 REMOVE BOLT AFTER
 CONCRETE HAS SET



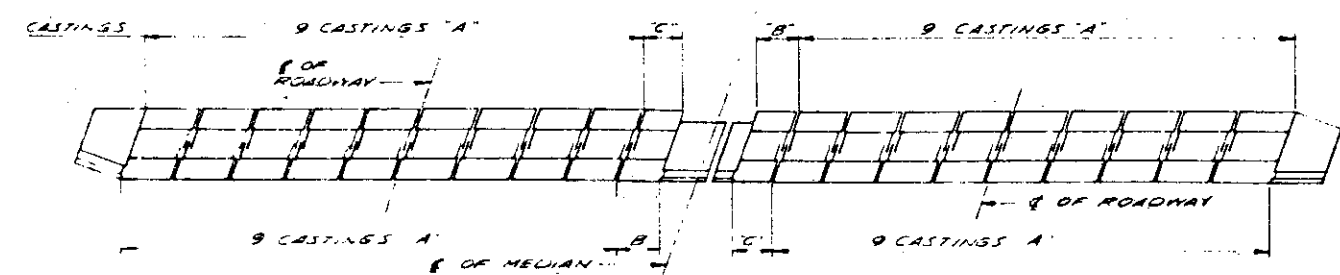
PART PLAN JOINT SPAN I WB.



CASTING ASSEMBLY SPAN I



CASTING ASSEMBLY SPANS 7
 CASTINGS SPAN 10 SYM. BY ROTATION
 OF 180° EXCEPT FOR MEDIAN PLATES



CASTING ASSEMBLY SPAN 5

CASTINGS REQ'D.

- A-- 72
- B-- 4
- C-- 4
- D-- 11
- E-- 1
- F-- 72
- G-- 4
- H-- 4

STATE OF MINNESOTA
 DEPARTMENT OF HIGHWAYS

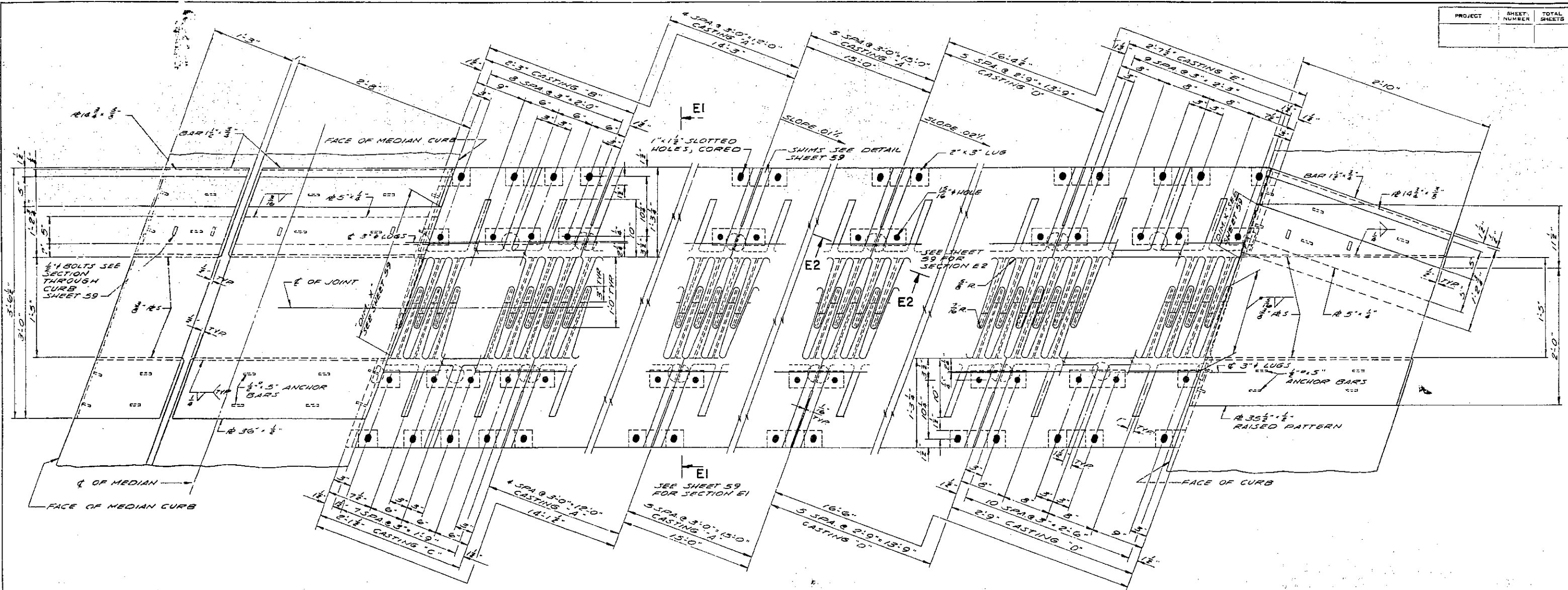
BRIDGE NO. 9320

EXPANSION JOINT HINGES 1 & 2

APPROVED *[Signature]*

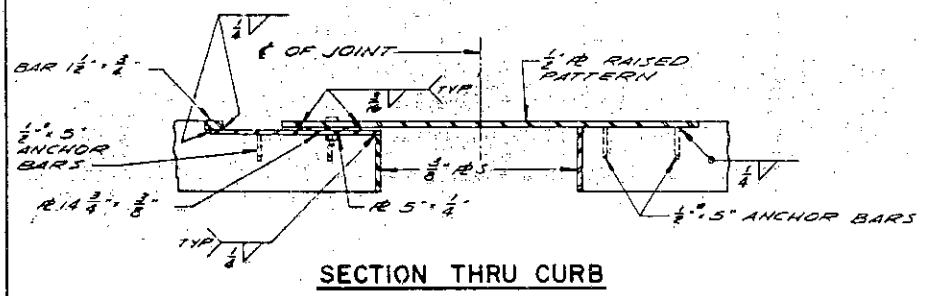
SHEET NO. 56 OF 93 SHEETS	9320	DES. <i>[Signature]</i>	CK. <i>[Signature]</i>
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PROJECT	SHEET NUMBER	TOTAL SHEETS



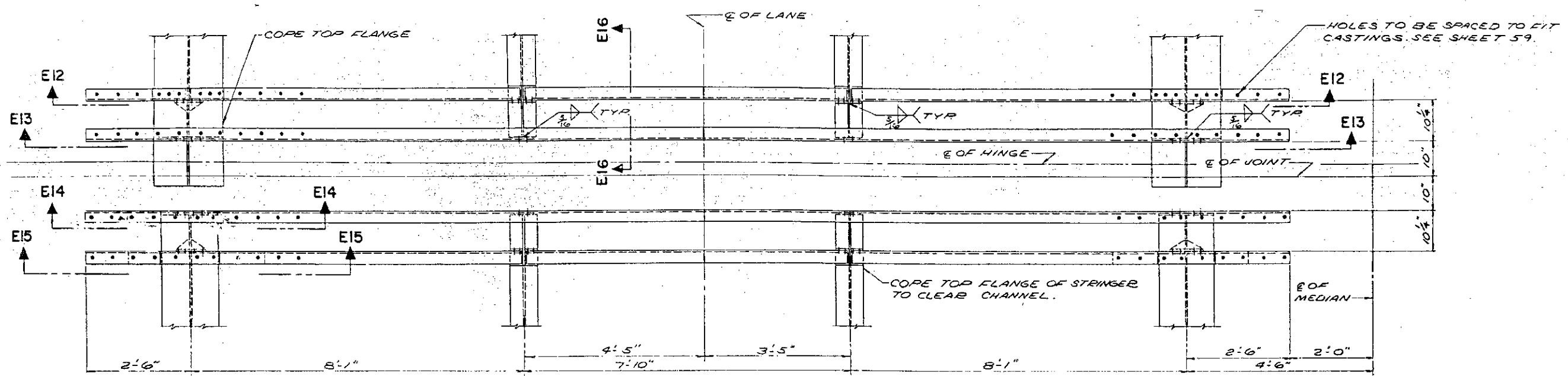
PART PLAN JOINT SPAN I
EAST BOUND LANE

EXPANSION JOINT IN SPAN 1 SHALL BE PAID FOR AS EXPANSION ASSEMBLY TYPE I.
 EXPANSION JOINT IN SPAN 5 SHALL BE PAID FOR AS EXPANSION ASSEMBLY TYPE II.
 EXPANSION JOINTS IN SPANS 7 AND 10 SHALL BE PAID FOR AS EXPANSION ASSEMBLY TYPE III.
 EXPANSION ASSEMBLIES SHALL CONSIST OF ALL STEEL CASTINGS, CURB PLATES, ADJUSTING FILLS, AND CONNECTING BOLTS.
 CASTINGS SHALL BE CARBON STEEL CASTINGS CONFORMING TO M.H.D. 3322 GRADE 70-36. ALL OTHER MATERIAL IN JOINT ASSEMBLY SHALL CONFORM TO M.H.D. 3306.
 COMPLETE EXPANSION ASSEMBLIES EXCEPT FOR FILLS TO BE GALVANIZED AFTER FABRICATION AS PER M.H.D. 3394.

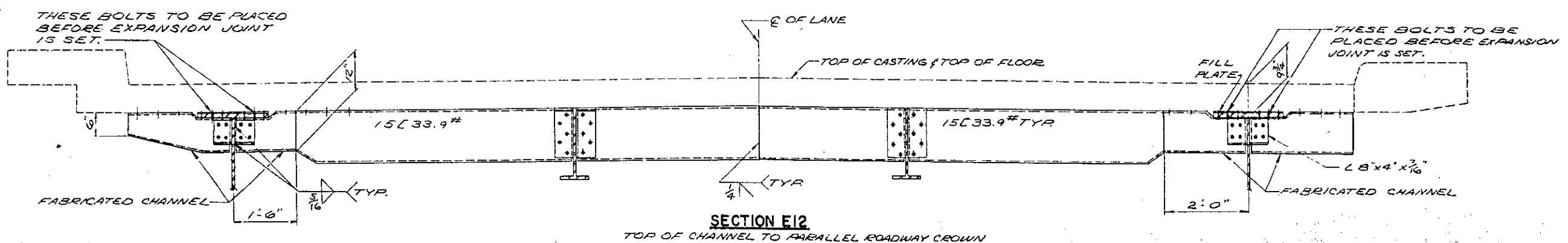


SECTION THRU CURB

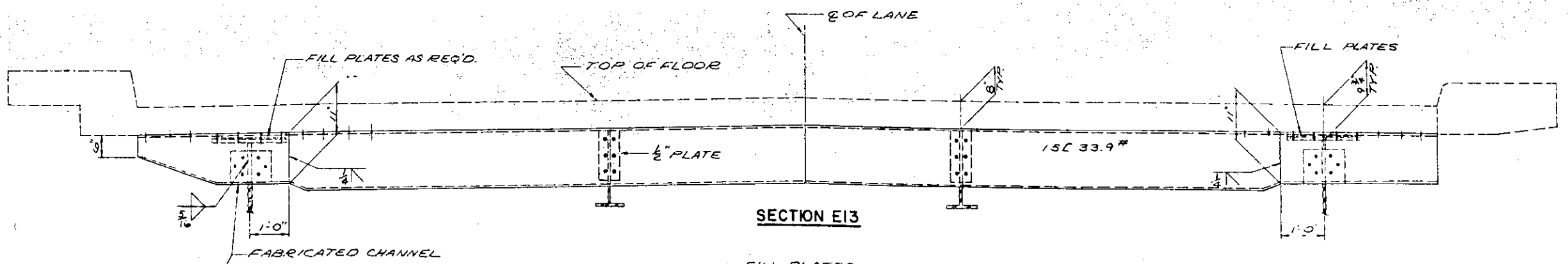
STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS	
BRIDGE NO. 9320 EXPANSION JOINT HINGE I	
APPROVED 9 17 64	
SHEET NO 57 OF 93 SHEETS	9320
DES. RA. CK.	W.E.J. R.P.P.



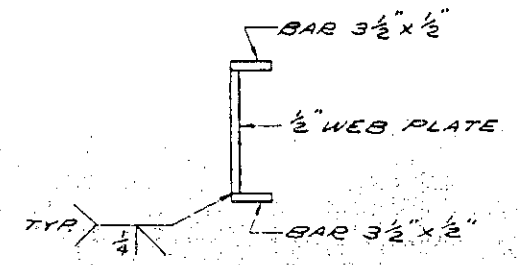
TYPICAL FRAMING PLAN SPANS 7 & 10
 2 REQ'D. AS SHOWN, 2 REQ'D. OPPOSITE HAND



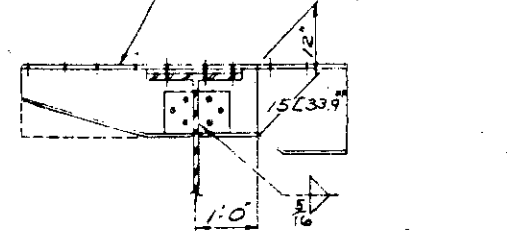
SECTION E12
 TOP OF CHANNEL TO PARALLEL ROADWAY CROWN



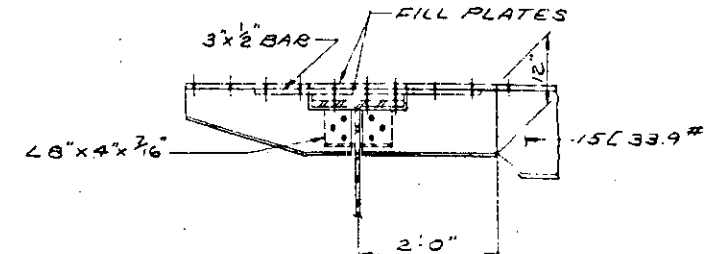
SECTION E13



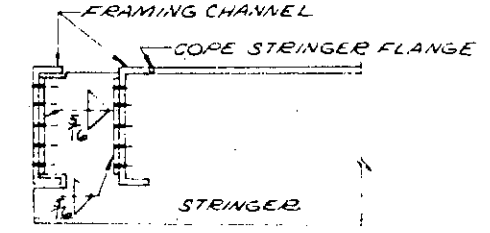
TYP. FABRICATED CHANNEL SECTION



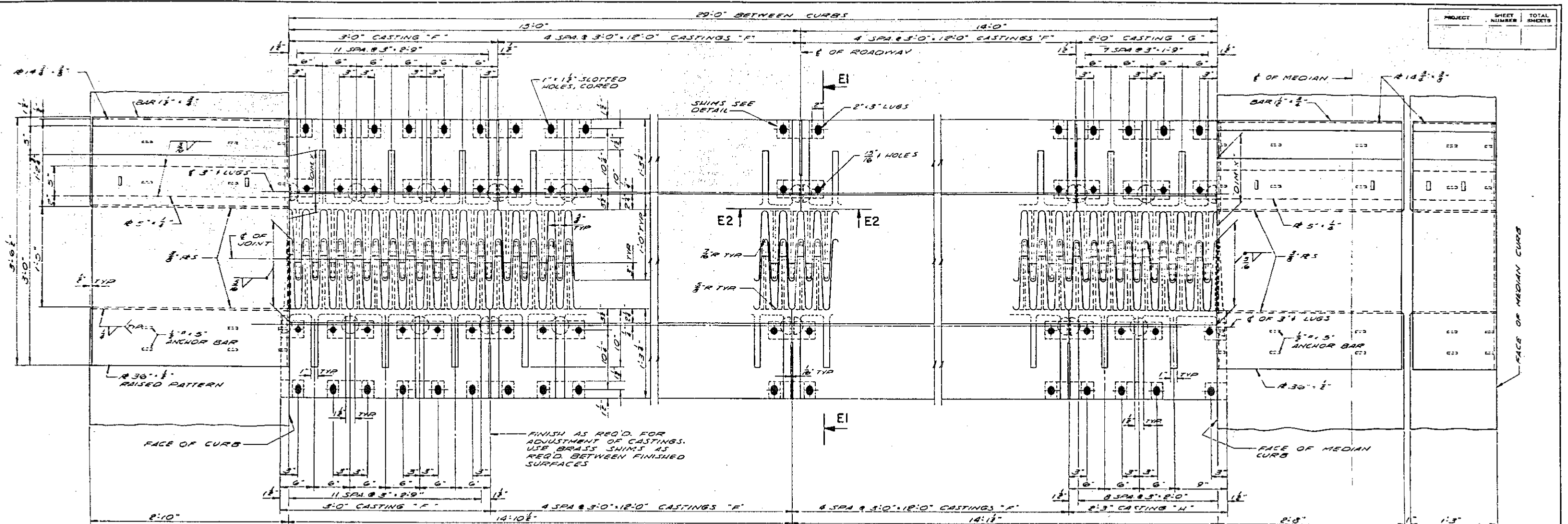
SECTION E14



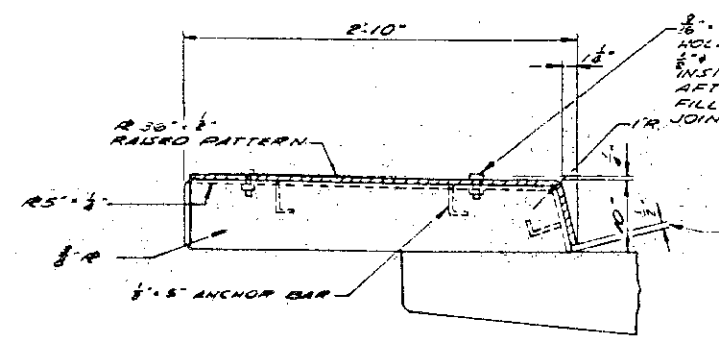
SECTION E15



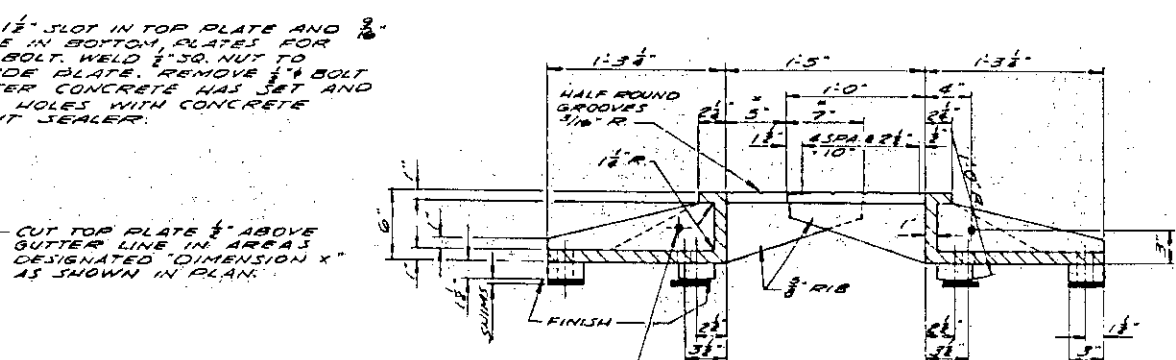
SECTION E16



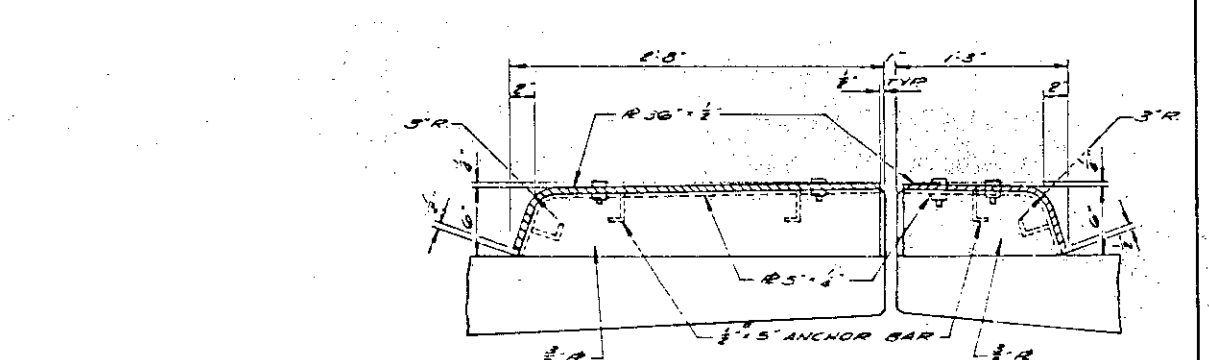
PART PLAN JOINT SPAN 7 & 10
 SEE SHEET 56 FOR CASTING ASSEMBLY LAYOUT.



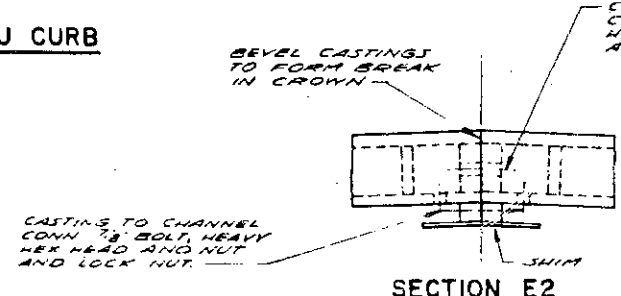
SECTION THRU CURB



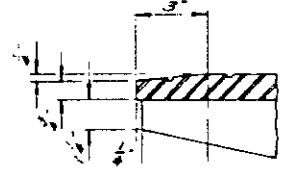
SECTION E1
 ALL DIMENSIONS @ 60°F



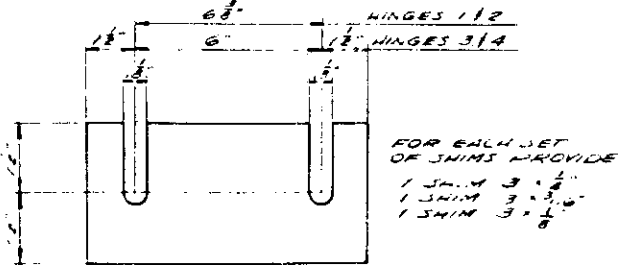
SECTION THRU MEDIAN



SECTION E2



SECTION THRU TOOTH



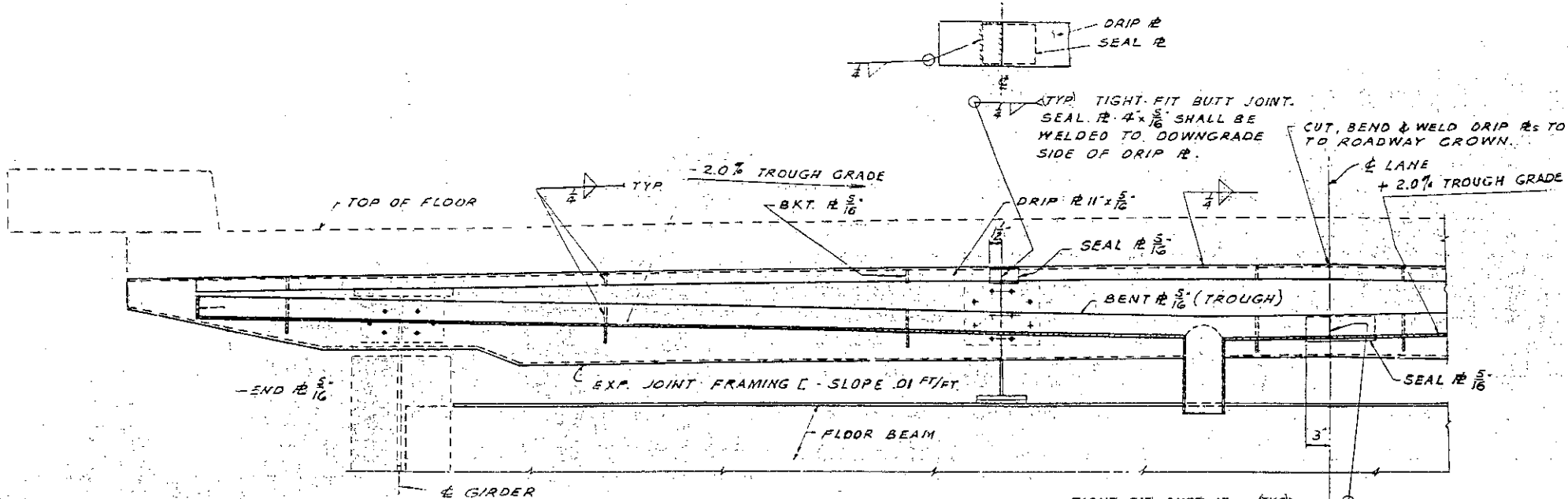
SHIM DETAIL

THE SLOTTED HOLES FOR CONNECTING THE CASTING TO THE SUPPORTING CHANNELS SHALL BE USED FOR THE PURPOSE OF ADJUSTMENT. AFTER ALL ADJUSTMENT IS SATISFACTORILY COMPLETED THE CONNECTION HOLES IN THE CHANNELS BELOW THE 5/16\"/>

USE HALF SHIMS AT CURBS INTERCHANGE SHIMS AS REQ'D SHOP PAINT ONE COAT OF RED LEAD

STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS
BRIDGE NO 9320
EXPANSION JOINT HINGES 3 & 4
APPROVED <u>3/1/64</u>
SHEET NO 59 OF 93 SHEETS 9320

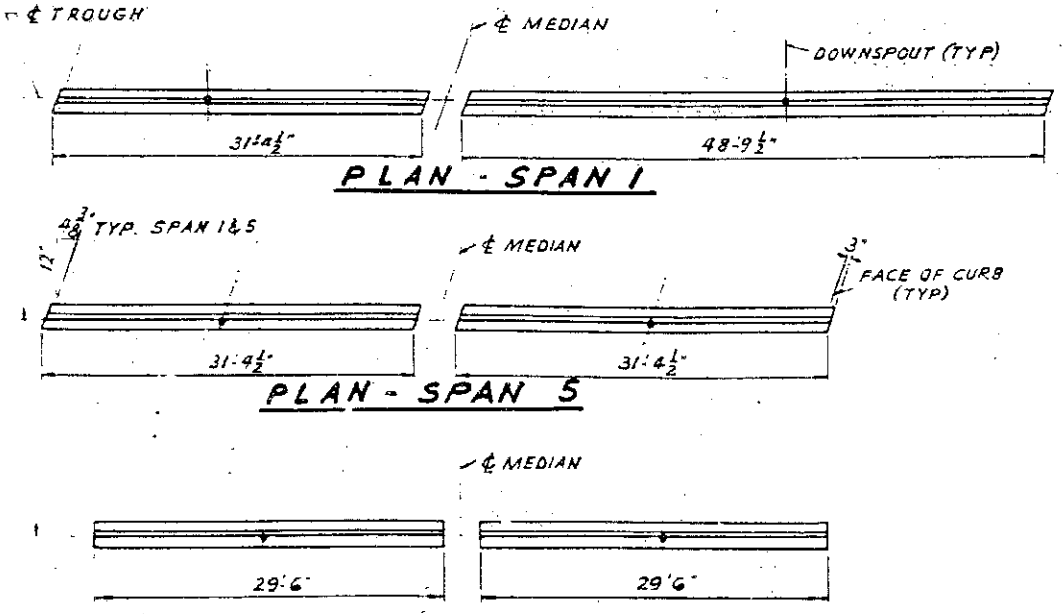
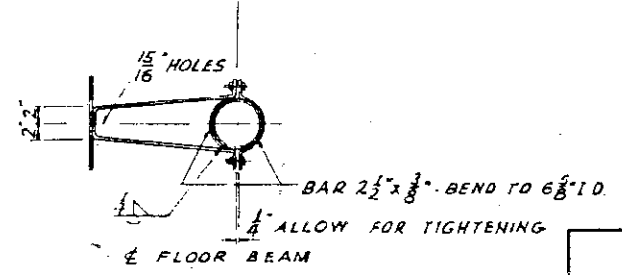
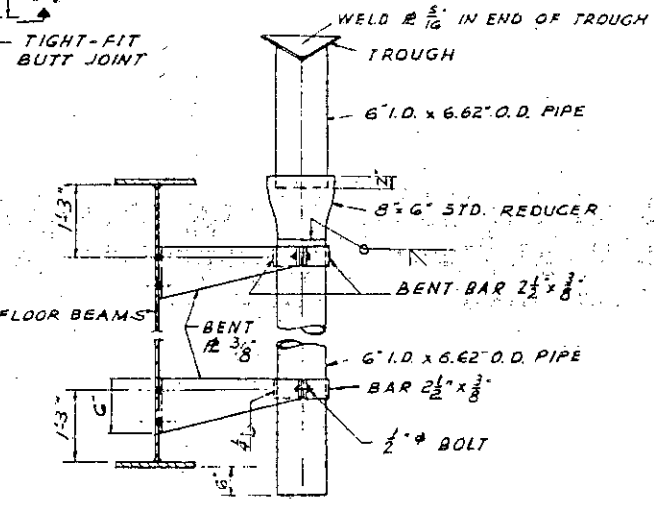
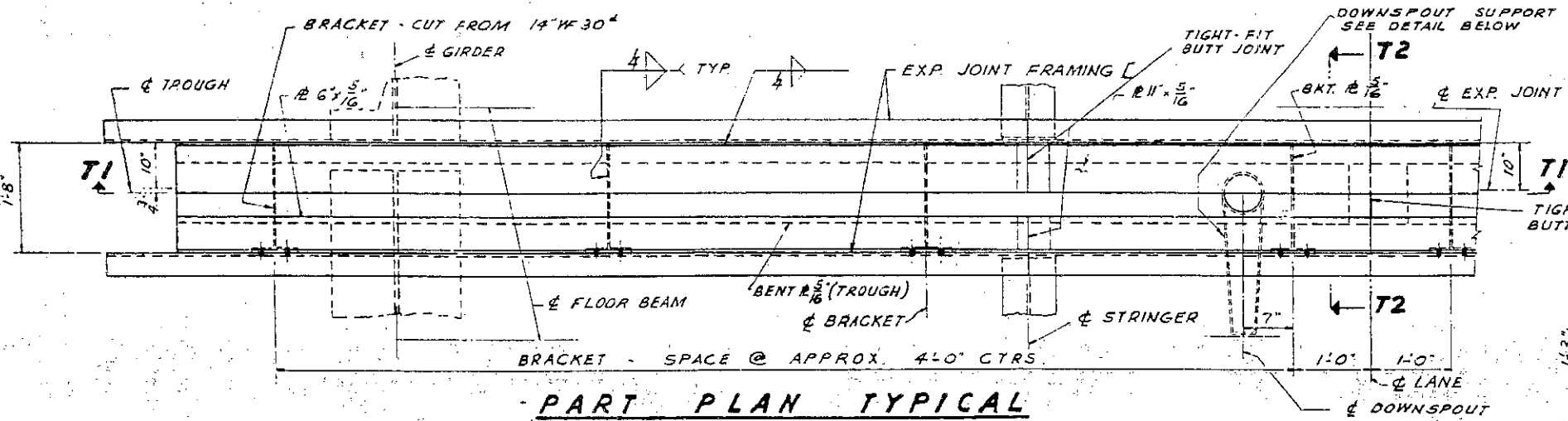
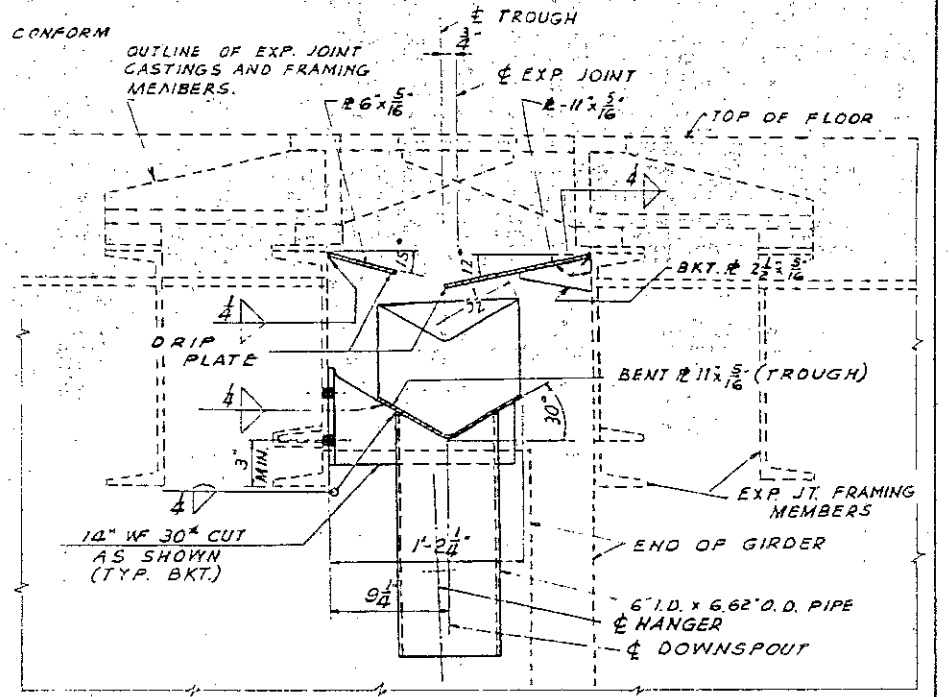
PROJECT	SHEET NUMBER	TOTAL SHEETS
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TYP. TIGHT-FIT BUTT JOINT. SEAL $\# 4 \times \frac{5}{16}$ SHALL BE WELDED TO DOWNGRADE SIDE OF DRIP $\#$.

CUT, BEND & WELD DRIP $\#$ s TO CONFORM TO ROADWAY CROWN.

TIGHT FIT BUTT JT. (TYP.) BENT SEAL $\# 12 \times \frac{5}{16} \times 11$ SHALL BE WELDED TO DOWNGRADE SIDE OF TROUGH.



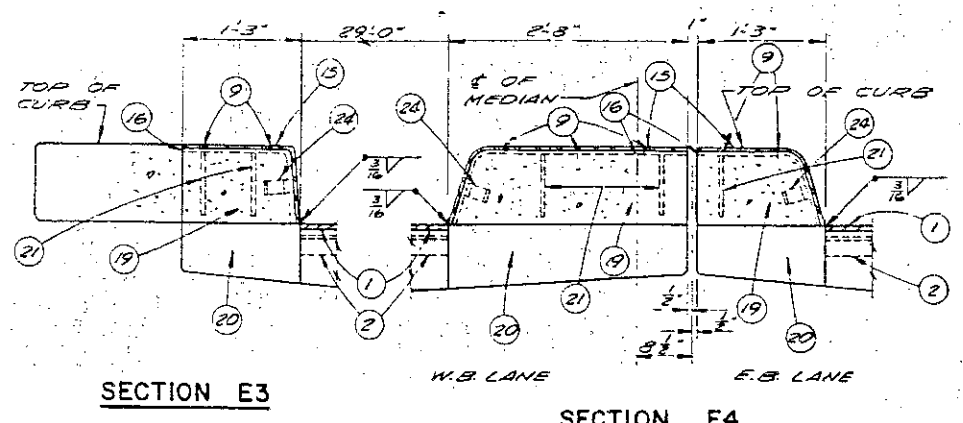
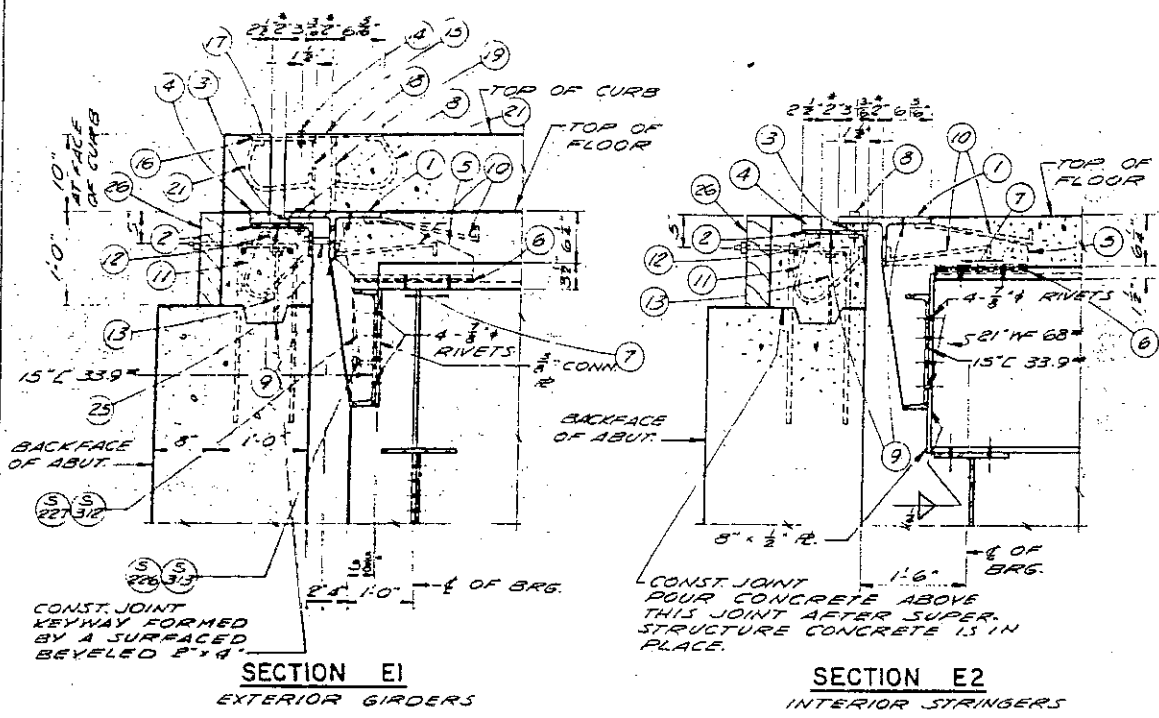
NOTE - MATERIAL IN BENT PLATES, TROUGHS, PIPES AND SUPPORTS SHALL CONFORM TO M.H.D. 3309. THE BID ITEM "DRAINAGE SYSTEM" SHALL INCLUDE TROUGHS, BENT PLATES, PIPES, SUPPORTS AND ITEMS SHOWN ON FLOOR DRAIN SHEET # 68. EXPANSION JOINT DRAINS TO BE PAINTED THE SAME AS STRUCTURAL STEEL.

DOWNSPOUT DETAIL

STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS	
BRIDGE NO. 9320	
EXPANSION JOINT DRAIN	
APPROVED 9/12/04	
SHEET NO. 60 OF 93 SHEETS	9320
DES. DR. J.J.P.	CR. J.J.P.

*2" OPENING AT 60° F

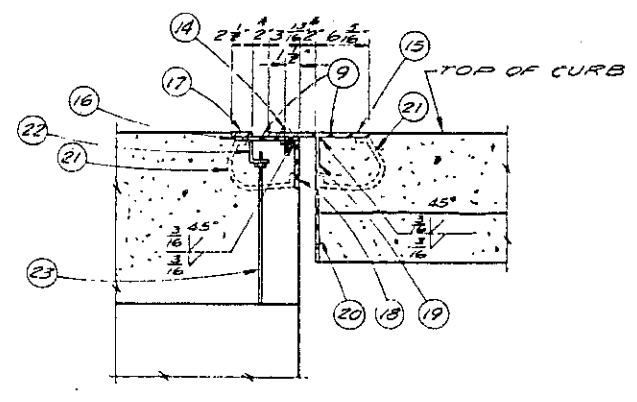
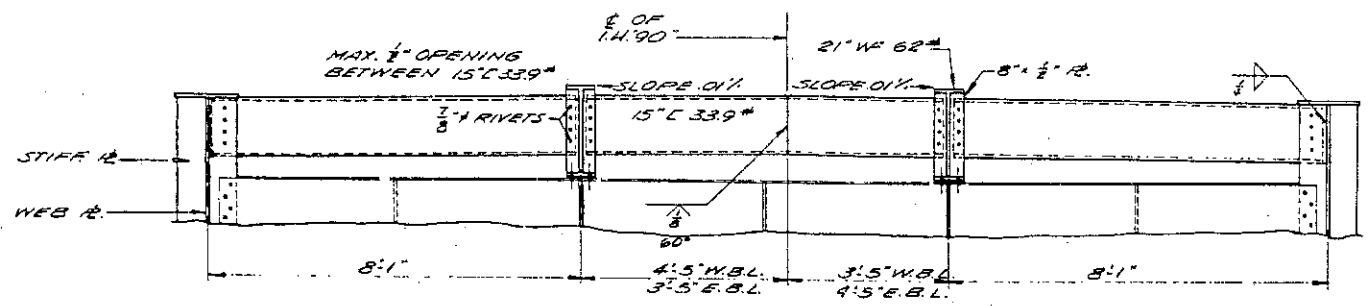
PROJECT	SHEET NUMBER	TOTAL SHEETS



NOTE: PAINT OUTER FACE LOOKING EAST OF RS #15 & #17.

LEGEND

- * 1. ST. 6" W 395" X ROADWAY WIDTH.
- * 2. L 8" X 14" X ROADWAY WIDTH.
- * 3. BAR 2" X 1/2" X ROADWAY WIDTH. WELD TO L#2 WITH 2 LINES OF 1/2" FILLET WELD. 2#6.
- * 4. BAR 2 1/2" X 1/2" X ROADWAY WIDTH. WELD TO L#2 WITH 2 LINES OF 1/2" FILLET WELD. 2#6.
- * 5. FABRICATE FROM 3/8" WELDED R. WELD TO STEM AND FLANGE OF ST. #1 WITH 1/2" FILLET WELD NEAR SIDE AND FAR SIDE.
- * 6. 3/8" MIN. LAMINATED AND SLOTTED SHIM.
- * 7. DRILL HOLES IN STRINGER FLANGE IN FIELD FOR 4-3/8" ERECTION BOLTS.
- * 8. 1/2" BOLT WITH 50 NUT & 2" O. CTRS. TACK WELD NUT TO L#2. GREASE FOR EASY REMOVAL. 1/2" X 1/2" SLOTTED HOLE IN ST. #1. LONG DIMENSION OF SLOTTED HOLE TO BE PARALLEL TO C OF RDWY. 1/2" HOLE IN BAR #3 AND L#2.
- * 9. VENT HOLES 1/2" PLACED 2" O. CTRS. ON L#2 AND ST. #1 AND AT 9 CTRS. ON 2 1/2" X 1/2" #16.
- * 10. 3/8" BENT BAR @ 0"9" ALTERNATE CTRS. BETWEEN STRINGERS. 1-1/2" LONG. WELD TO ST. #1.
- * 11. 3/8" BENT BAR @ 1"0" CTRS. 2"0" LONG. WELD TO L#2.
- * 12. 3/8" X 2 1/2" X 1/2" X 0"3" @ 3"0" CTRS. WELD TO L#2.
- * PROVIDE 1/2" HOLE IN 2 1/2" LEG FOR BOLT #13. WELD TO R#16.
- * 13. 1/2" BOLT X 11" LONG AND NUT. TACK WELD NUT TO L#2.
- * 14. 1/2" BOLT. SAME AS BOLT #8 EXCEPT FOR LENGTH.
- * 15. 1/2" X 1/2" X 1/2" - BEND DOWN FLUSH WITH FACE OF CURB AS SHOWN. WELD TO R#19 AS SHOWN. FIELD WELD TO ST. #1.
- * 16. 1/2" X 1/2" X 1/2" - BEND DOWN FLUSH WITH FACE OF CURB AS SHOWN. WELD TO R#18 AS SHOWN.
- * 17. 1/2" X 1/2" X 1/2" - BEND DOWN FLUSH WITH FACE OF CURB AS SHOWN. WELD TO R#16 WITH ONE LINE OF 1/2" FILLET WELD FIELD WELD TO BAR #4.
- * 18. 6" X 1/2" R. CUT TO CURB LIMITS AS SHOWN.
- * 19. 3/8" R. CUT TO CURB LIMITS AS SHOWN. FIELD WELD TO R#20.
- * 20. 1/2" R. CUT TO CURB LIMITS AS SHOWN. SHOP WELD TO ST. #1 AND SUPPORT #5.
- * 21. 3/8" BENT BAR. 1-1/2" LONG. WELD TO RS #16 & #18 AND RS #15 AND #19 WITH 1/2" FILLET WELDS ALL AROUND.
- * 22. L 3" X 2 1/2" X 1/2" @ 0"3". WELD TO RL #16.
- * 23. 1/2" BOLT X 1-7" LONG AND NUT. TACK WELD NUT TO L#22.
- * 24. ANCHOR BAR. 2 1/2" X 1/2" X 1-0" WELD TO RS #15 AND #16.
- * 25. BLOCK AND BOLT FOR SHIPMENT WITH PIPE SLEEVE AND 1/2" BOLT. PROVIDE 2" HOLES AT 3"0" CTRS. IN ST. #1 AND L#2 FOR 1/2" BOLT.
- * 26. PROVIDE HARDWOOD 3" X 18" PLANK LENGTH OF RDWY. ATTACH PLANK TO RAVING BLOCK WITH 8" X 3/4" BOLTS AT APPROX. 3"0" CENTERS. REMOVE PLANK AND CUT BOLTS OFF WHEN PLACING APPROACH SLAB CONCRETE. (NON-BID ITEM)



EXPANSION JOINT SHALL BE BUILT TO CONFORM TO ROADWAY CROWN & GRADE.

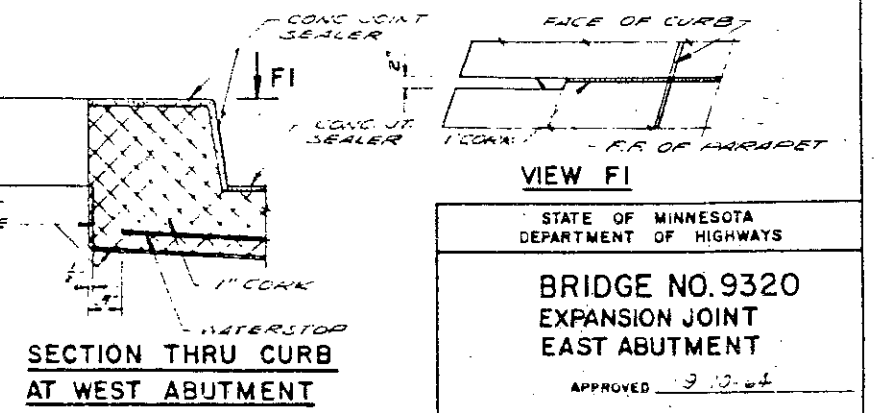
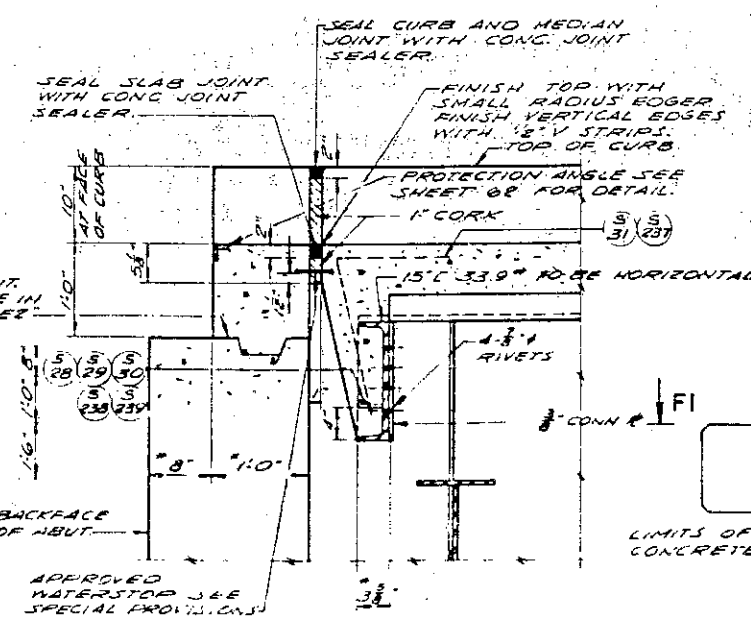
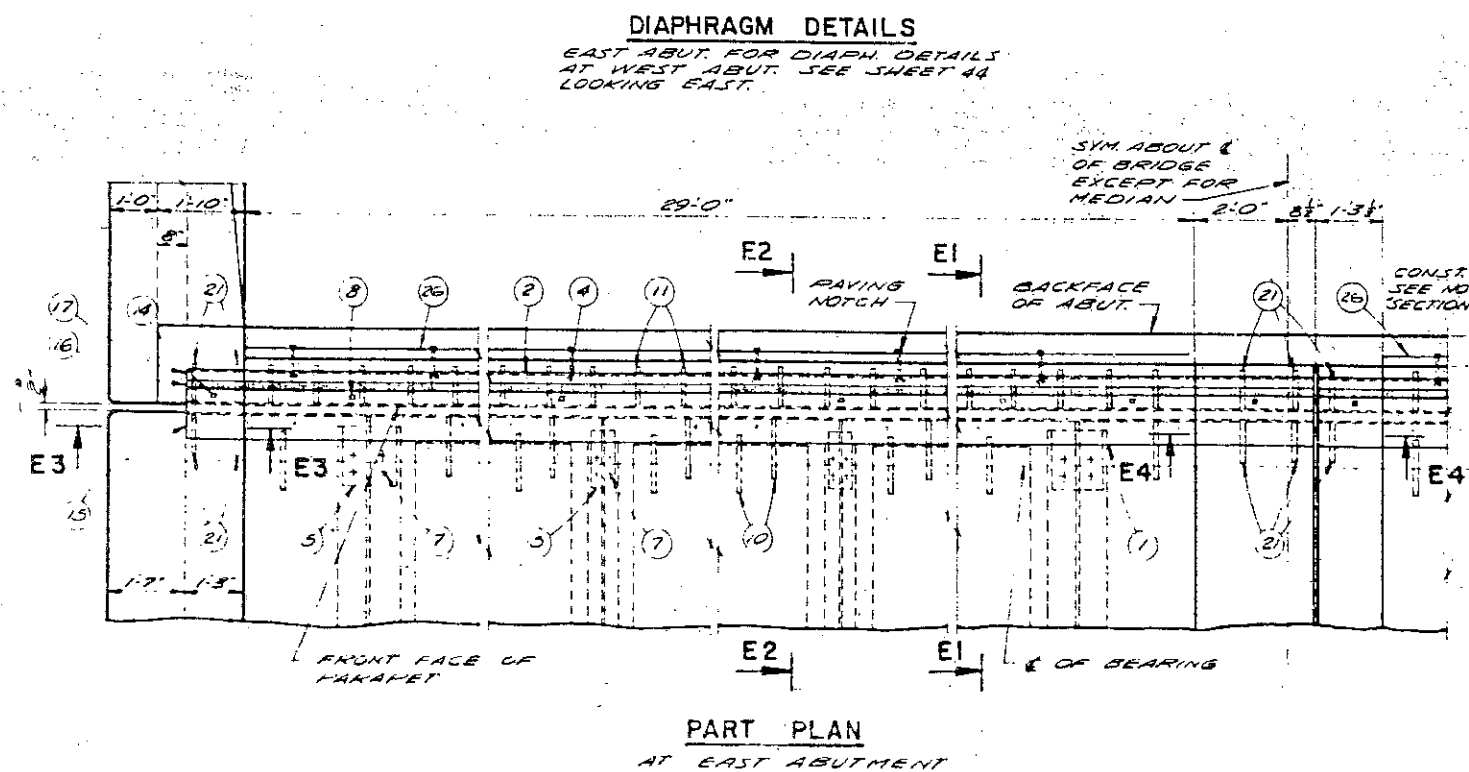
ALL ITEMS, MARKED #, SHALL BE MADE OF STRUCTURAL STEEL CONFORMING TO M.H.D. 3309.

ALL MATERIAL IN EXPANSION JOINT SHALL BE PAID FOR AS STRUCTURAL STEEL M.H.D. 3309.

AFTER CONCRETE HAS SET REMOVE BOLTS NO. 8 & NO. 14 AND FILL HOLES WITH HOT POURED ELASTIC TYPE JOINT SEALER WHICH COMPLIES WITH M.H.D. 3723 OR COLD TYPE M.H.D. 3725. NO PAINT SHALL BE APPLIED TO EXPANSION JOINT, EXCEPT AS NOTED.

AFTER CONCRETE HAS SET THE JOINT OPENING SHALL BE THOROUGHLY CLEANED.

APPLY 1" COAT OF KOPPER'S BITUMASTIC NO. 50 OR APPROVED EQUAL TO METAL SURFACES FORMING THE JOINT AND FILL WITH HOT POURED ELASTIC TYPE JOINT SEALER AS PER M.H.D. 3723.

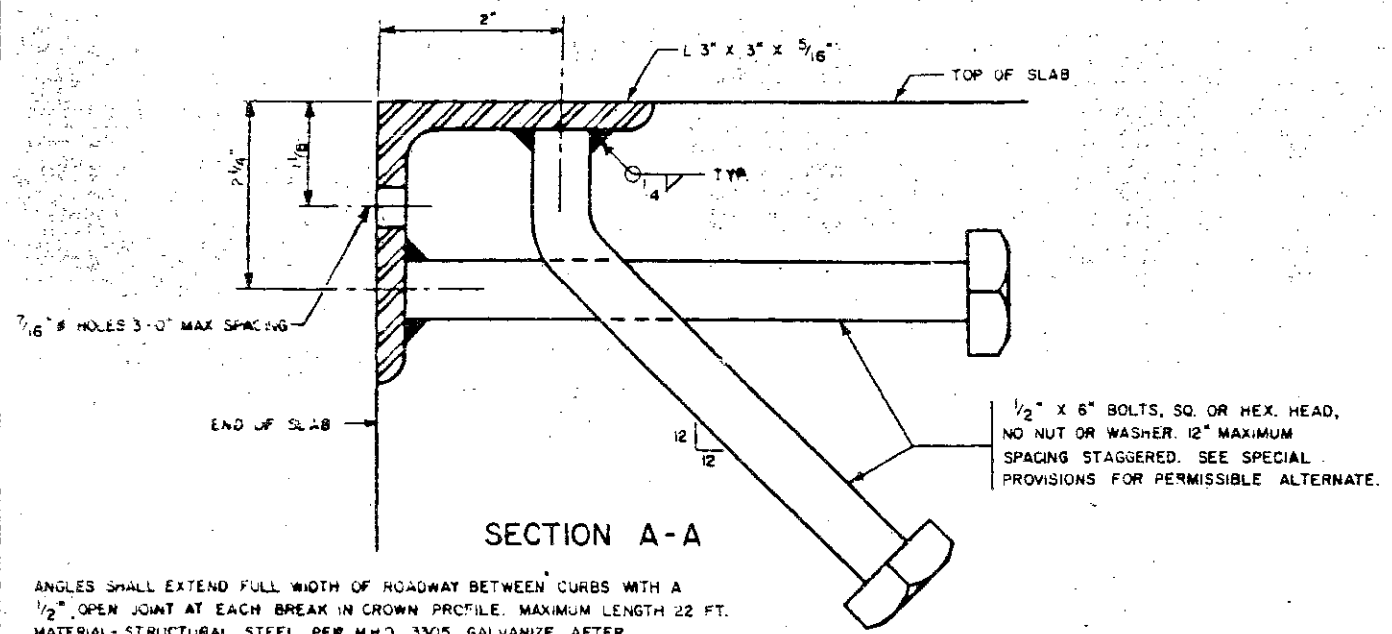


STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320
EXPANSION JOINT
EAST ABUTMENT

APPROVED 9.12.04

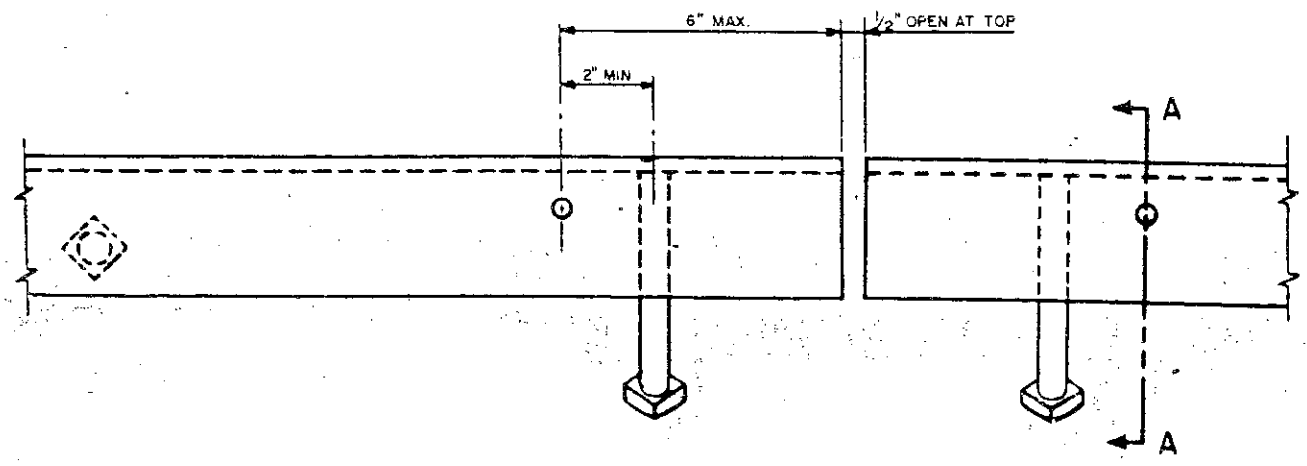
SHEET NO. 61 OF 93 SHEETS 9320



ANGLES SHALL EXTEND FULL WIDTH OF ROADWAY BETWEEN CURBS WITH A 1/2\"/>

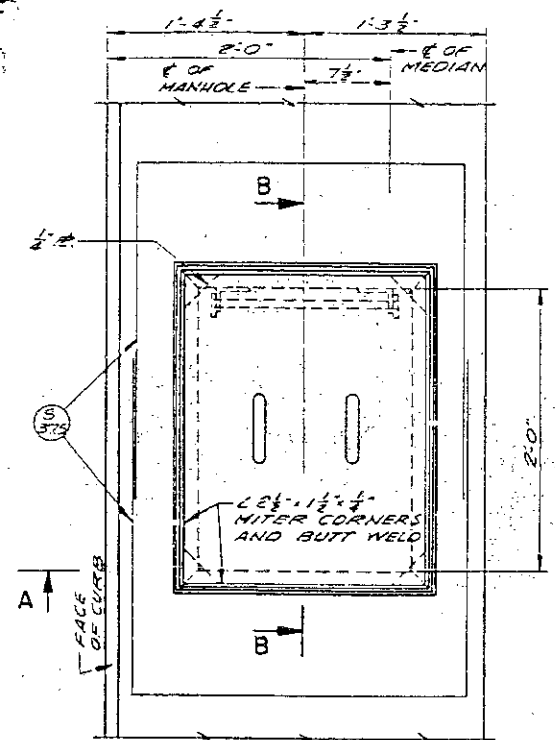
MATERIAL- STRUCTURAL STEEL PER M.H.D. 3305. GALVANIZE AFTER FABRICATION PER M.H.D. 3394

FURNISHING AND INSTALLING PROTECTION ANGLE SHALL BE PAID FOR

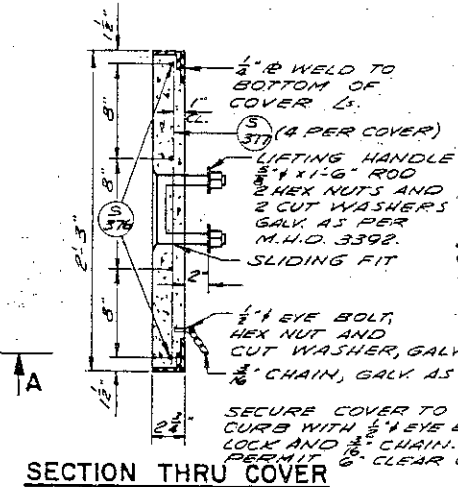


ELEVATION

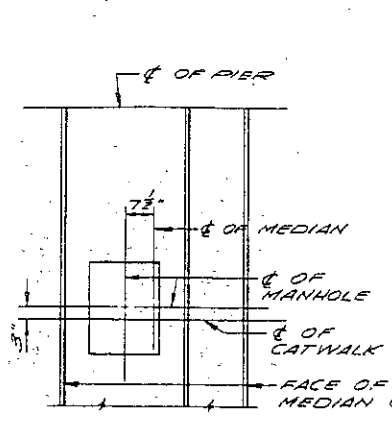
APPROVED 	STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS PROTECTION ANGLE FOR END OF SLAB	REVISIONS	DETAIL NO B209
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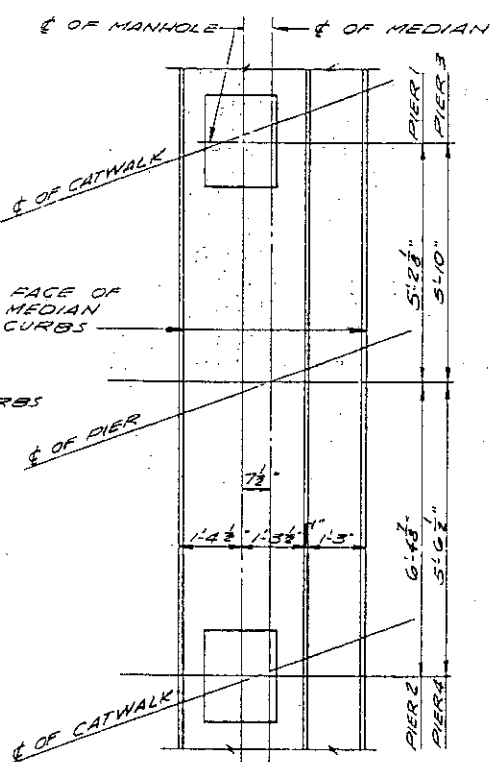
GALVANIZE MANHOLE FRAME AND COVER FRAME AFTER FABRICATION AS PER M.H.D. 3394.



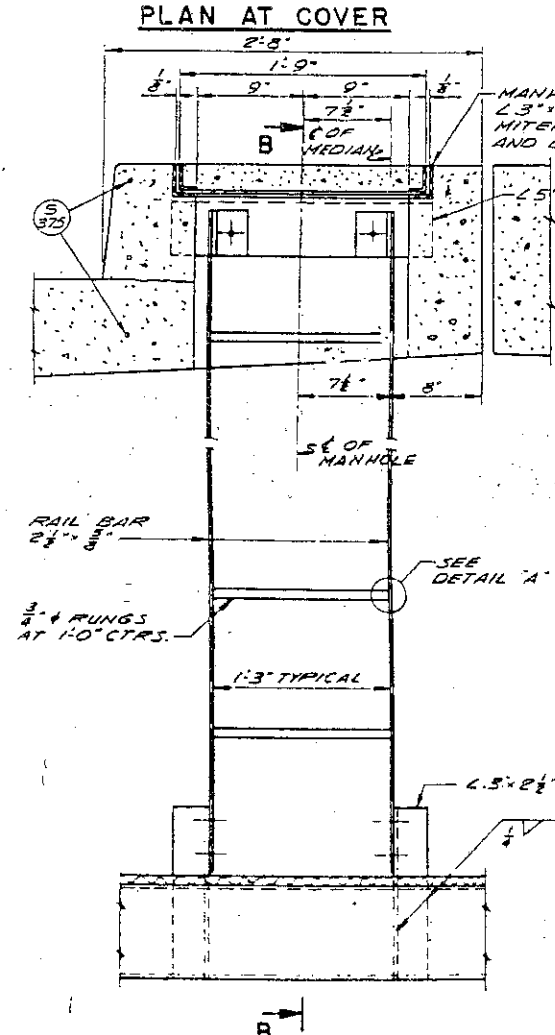
SECTION THRU COVER



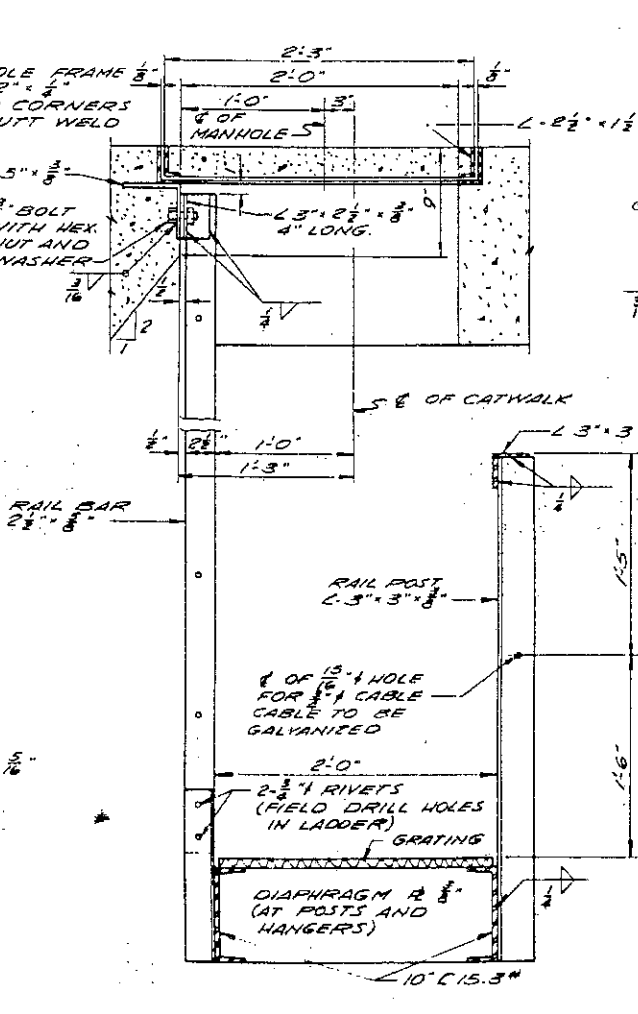
PART PLAN AT PIERS 5-11
CATWALKS TO BE PLACED ON WEST SIDE OF PIERS. (LOOKING EAST)



PART PLAN AT PIERS 1-4
CATWALK ON EAST SIDE OF PIERS 1 & 3 AND WEST " " 2 & 4 (LOOKING EAST)

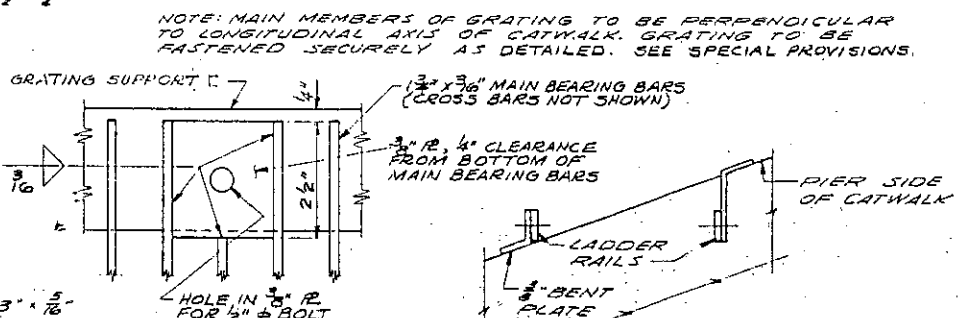


SECTION A-A
(LOOKING EAST)



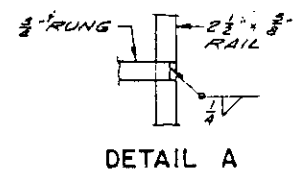
SECTION B-B

NOTE: LOWER LADDER CONNECTION AT CATWALK TYPICAL AT PIERS 5-11 ONLY RAILING IS TYP AT ALL PIERS

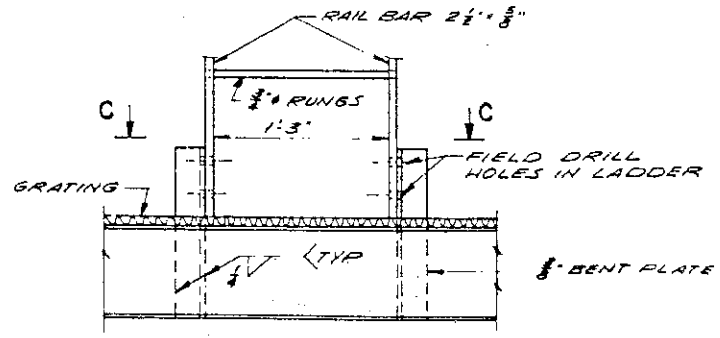


SECTION C-C

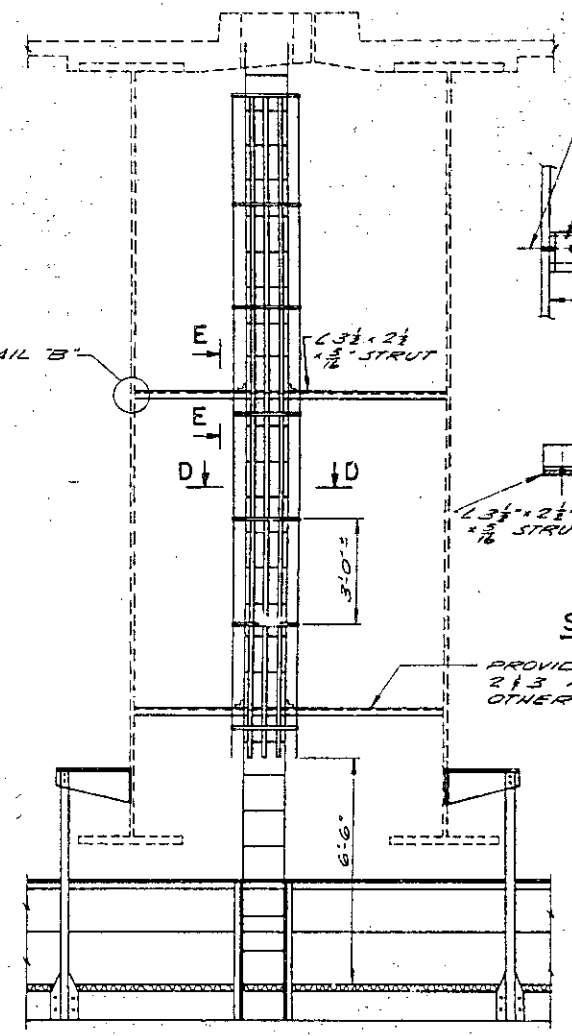
BOLTED GRATING FASTENER



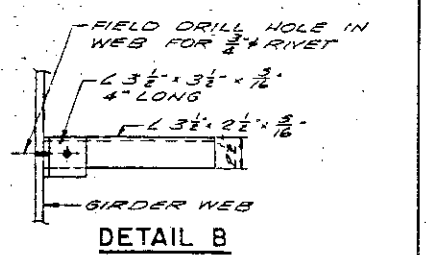
DETAIL A



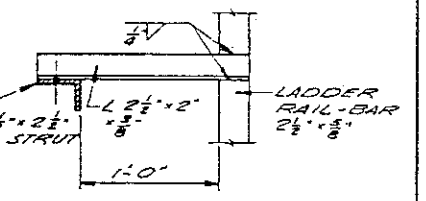
TYPICAL LADDER CONNECTION
AT PIERS 1-4



ELEVATION AT PIERS 2 & 3

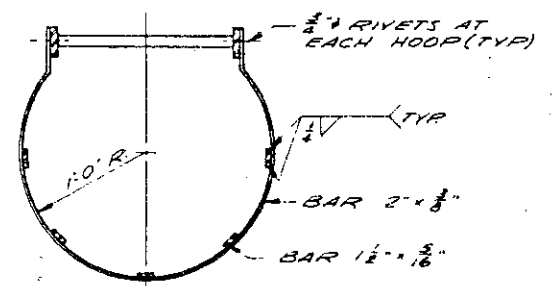


DETAIL B



SECTION E-E

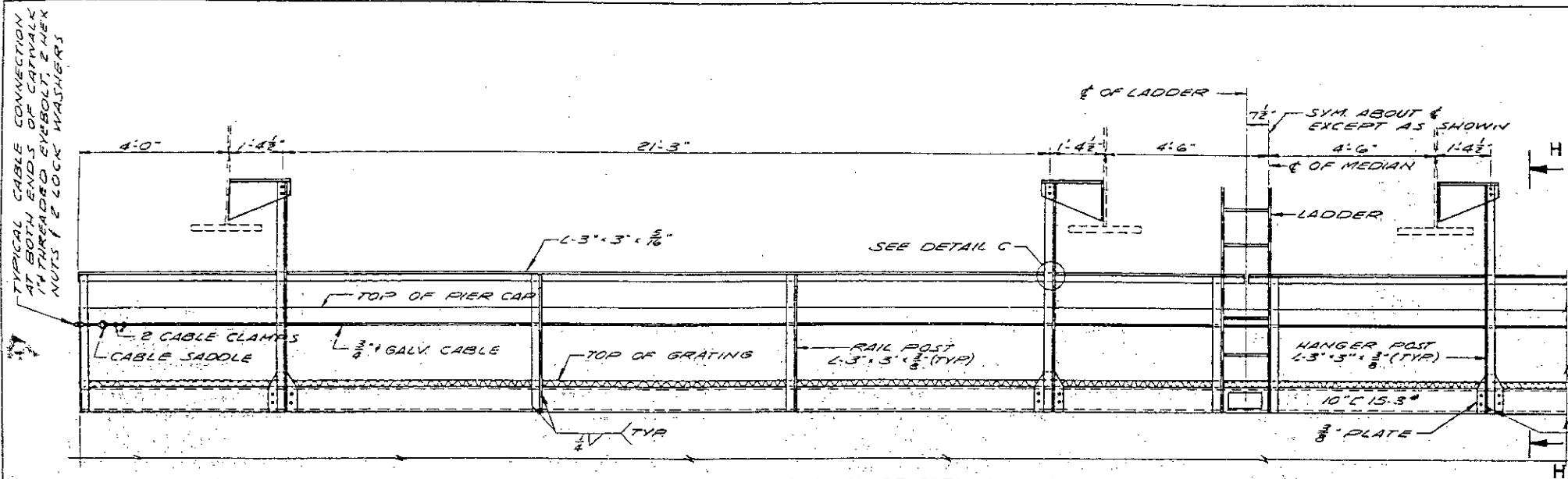
PROVIDE 2 STRUTS AT PIERS 2 & 3 AND 1 STRUT AT ALL OTHER PIERS



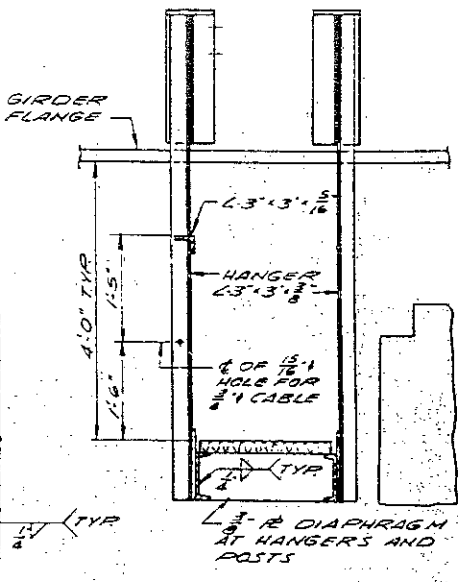
SECTION D-D

CAGE AT PIERS 2 & 3 ONLY. GALVANIZE LADDERS AND CAGES AFTER FABRICATION AS PER M.H.D. 3394.

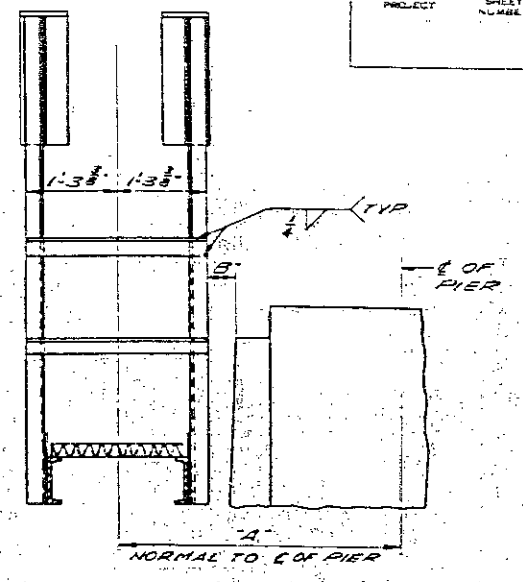
STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS	
BRIDGE NO. 9320	
CATWALK DETAILS	
APPROVED 9.10.4	
SHEET NO 63 OF 93 SHEETS	9320
DES. J.Z.	DR. W.F.A.
C.K. 8422	



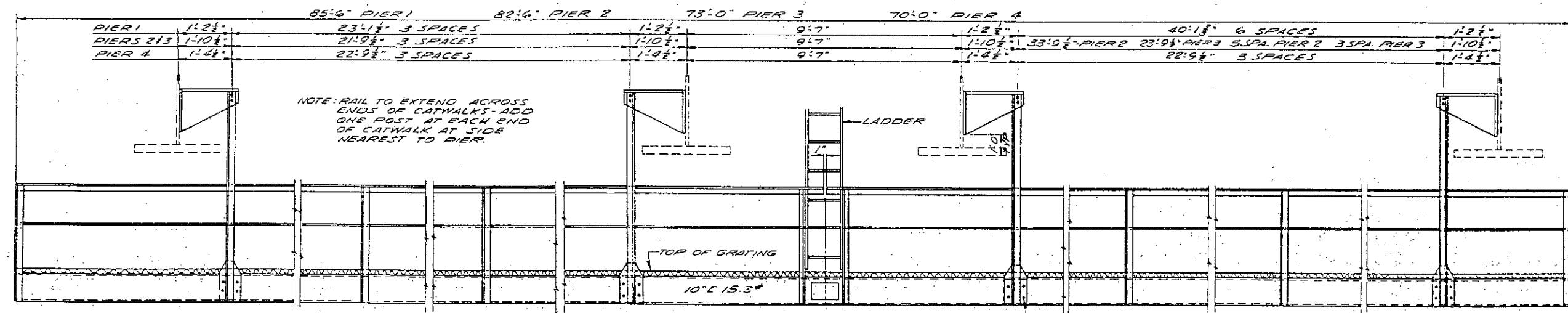
PART ELEVATION OF CATWALK AT PIERS 5-11



SECTION H-H



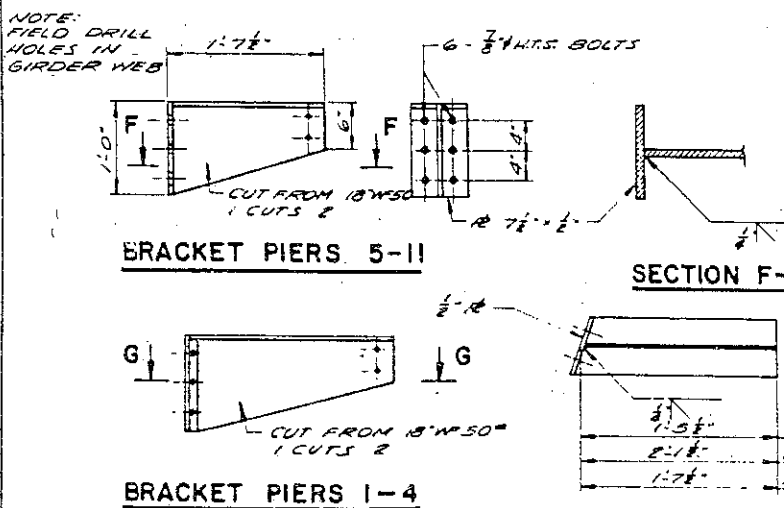
END VIEW



ELEVATION OF CATWALK PIERS 1-4

AT 60'

PIERS	A'	B'
1	51 1/2'	4 1/2'
2	50 1/2'	4 1/2'
3	59 1/2'	3'
4	50 1/2'	3 1/2'
5	42 1/2'	2'
6	42 1/2'	2 1/2'
7	43 1/2'	2 1/2'
8	42 1/2'	2'
9	42 1/2'	2 1/2'
10	43 1/2'	2 1/2'
11	42 1/2'	2'

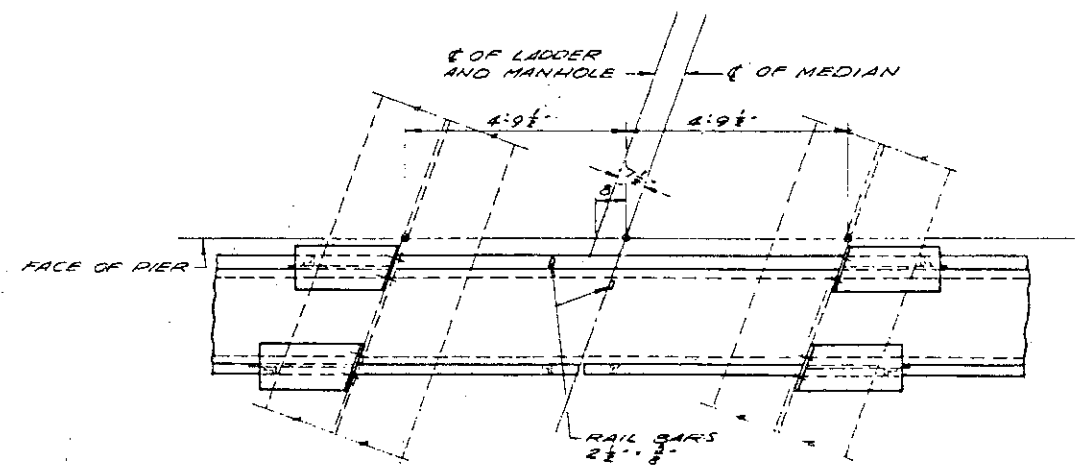


BRACKET PIERS 5-11

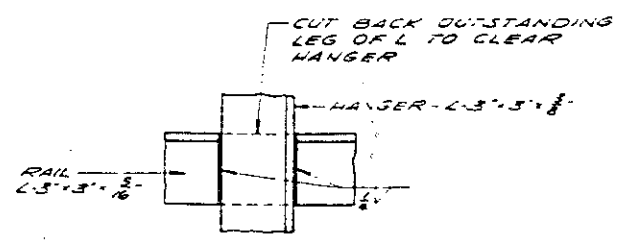
BRACKET PIERS 1-4

SECTION F-F

SECTION G-G



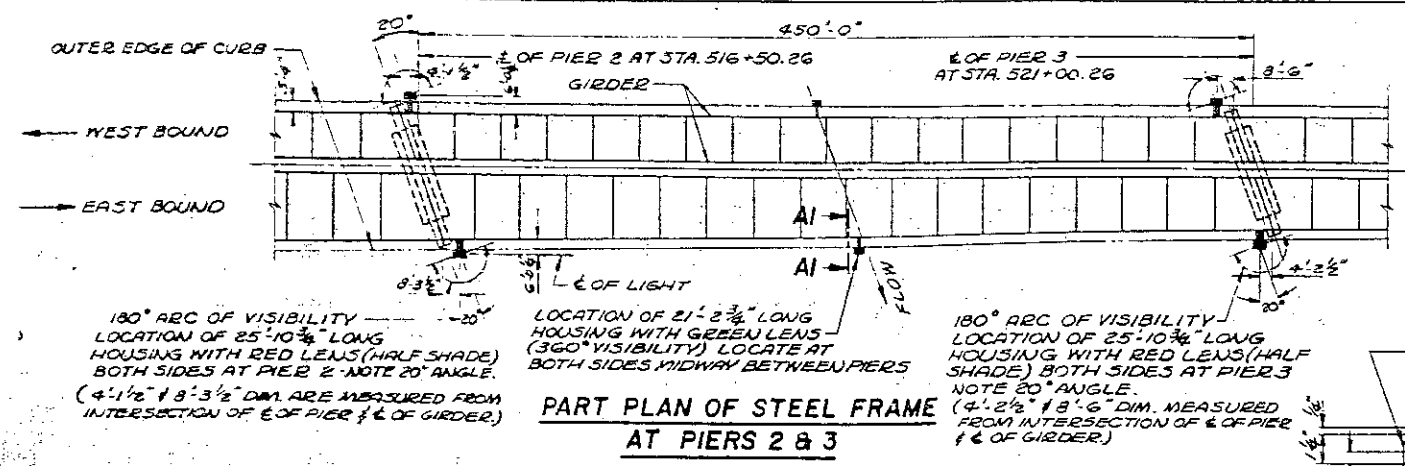
PART PLAN AT PIER 2



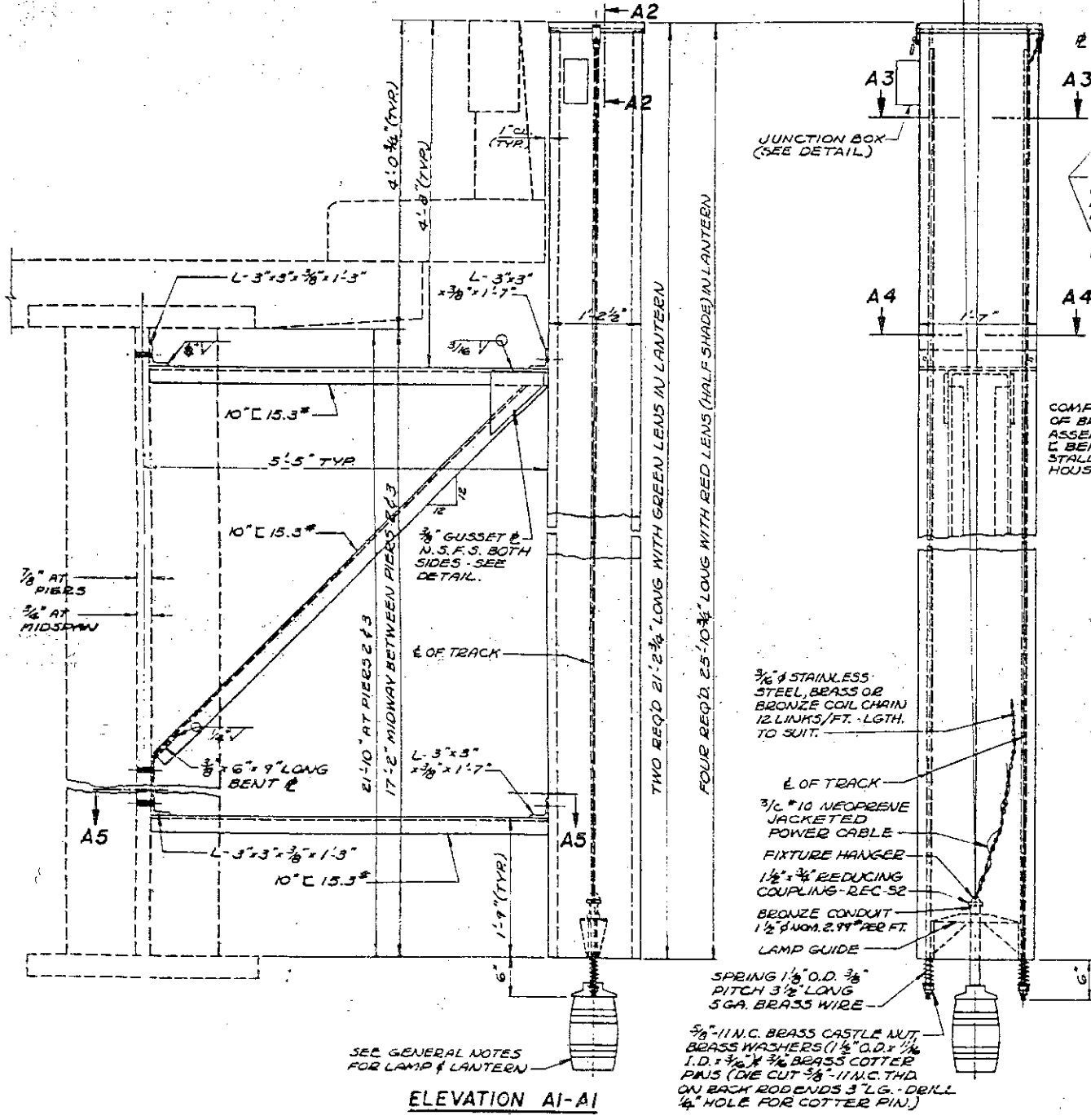
DETAIL C

PLAN AT PIERS 1, 3 & 4 SIMILAR
LOOKING EAST FOR PIERS 2 & 1 WEST FOR PIERS 1 & 3

PROJECT	SHEET NUMBER	TOTAL SHEETS



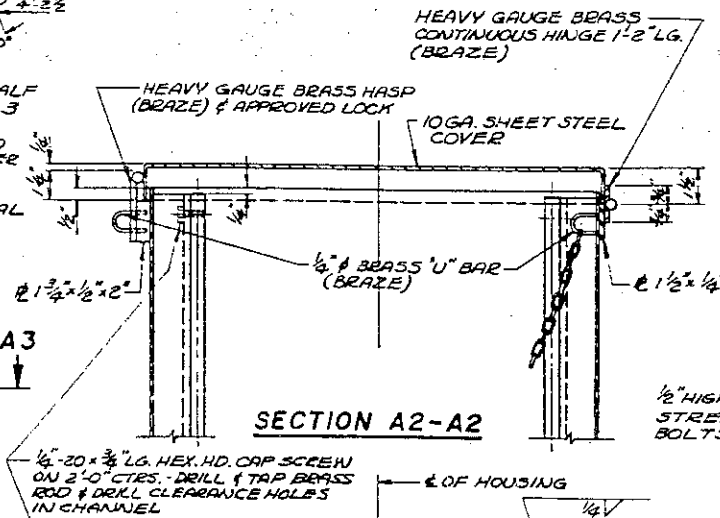
PART PLAN OF STEEL FRAME AT PIERS 2 & 3
SHOWING LOCATION OF NAVIGATION LIGHTS
▽ SYMBOL INDICATES NAVIGATION LIGHTS



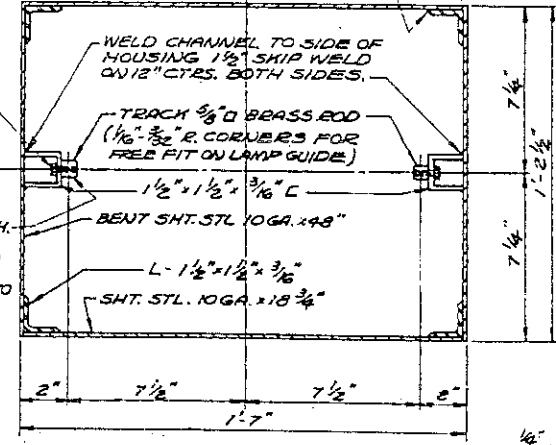
SEC GENERAL NOTES FOR LAMP & LANTERN

MAINTAIN CLEARANCE BETWEEN CURB & HOUSINGS

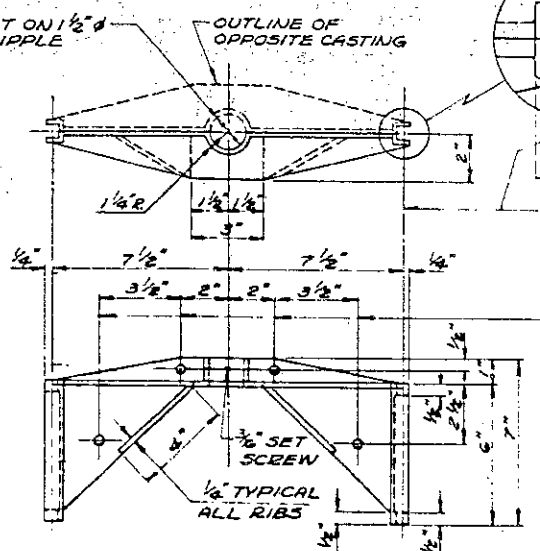
FRONT ELEVATION



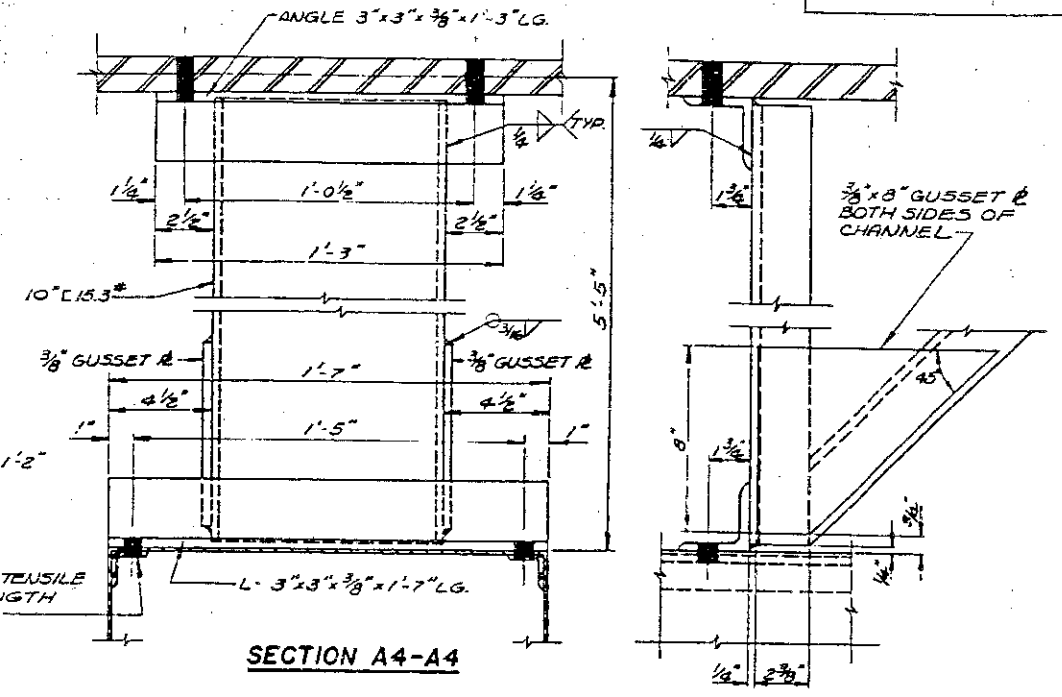
SECTION A2-A2



SECTION A3-A3



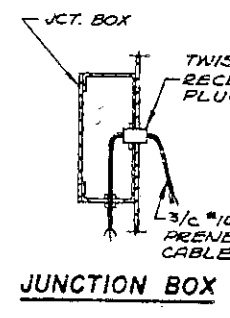
LAMP GUIDE CASTING
TWELVE CASTINGS REQ'D. (SEE NOTE)



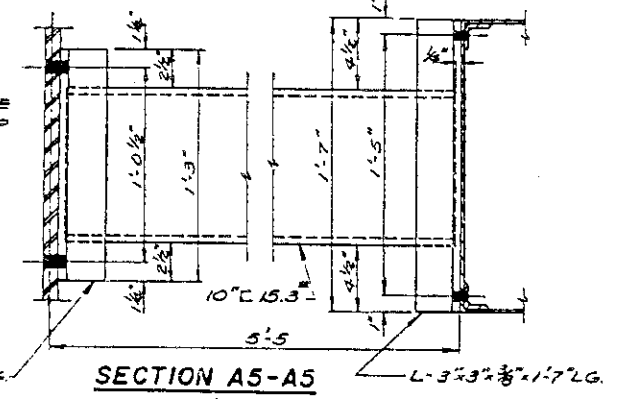
SECTION A4-A4

TOP VIEW OF HOUSING HANGER BRKT. SIX REQ'D. AS SHOWN

PART VIEW OF SIDE OF HOUSING HANGER BRACKET



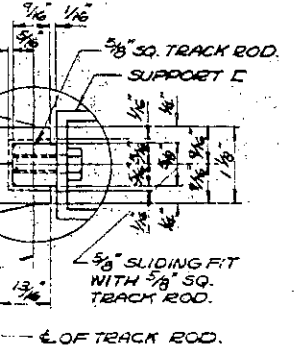
JUNCTION BOX



SECTION A5-A5

GENERAL NOTES

- LANTERN SHALL BE PRESSEL LENS LANTERN WITH 4 PLACE LAMPCHANGER AND WATER TIGHT CONSTRUCTION.
- LIGHTING CIRCUIT WILL BE CONTROLLED BY A PHOTOELECTRIC CONTROLLER WHICH COMPLIES WITH U.S. COAST GUARD REQUIREMENTS.
- COLOR OF LANTERN LENS SHOWN IN PLAN. LENS SHALL HAVE SHADE TO LIMIT VISIBILITY AS SHOWN IN PLAN.
- HOOD ON LANTERN IS NOT REQUIRED.
- ONE NAVIGATION LIGHT FIXTURE SHALL INCLUDE LAMP, LANTERN, CABLE TO JUNCTION BOX, JUNCTION BOX, RECEPTACLE PLUG, LAMP GUIDE, SPRINGS, NUTS, WASHERS, COTTER PINS, CHAIN, HOUSING, HOUSING HANGER BRACKET, & LOCK.
- NAVIGATION LIGHT FIXTURES TO BE INCLUDED IN PRICE BID FOR ELECTRICAL SYSTEM. SEE SHEET NO. G 6.
- PAINT STEEL ITEMS SAME AS SUPERSTRUCTURE STRUCTURAL STEEL.



ASSEMBLE HALVES AND DRILL 4-13/32" HOLES. INSTALL 3/8-16 N.C. x 1" BRASS HEX. HD. BOLTS, NUTS & WASHERS. BORE 1/2" CENTER HOLE TO FIT NIPPLE

NOTE: ONE ASSEMBLY INCLUDES TWO CASTINGS BOLTED. ASSEMBLE IN PAIRS & MATCH MARK. CASTINGS SHALL BE BRONZE AS PER M.H.D. 3327 TYPE 2.

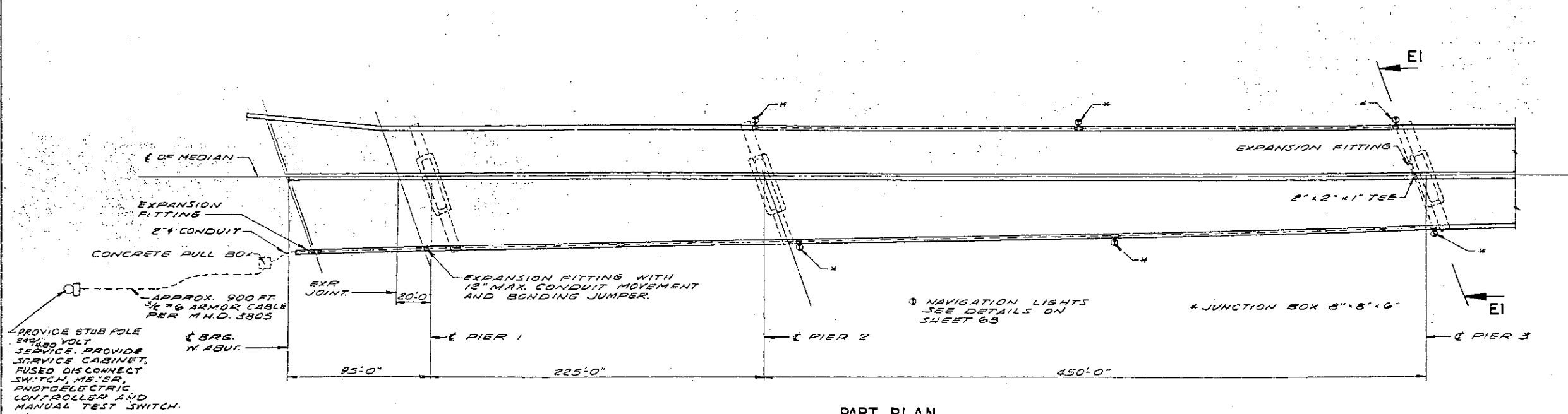
STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320
NAVIGATION LIGHTS
AND DETAILS

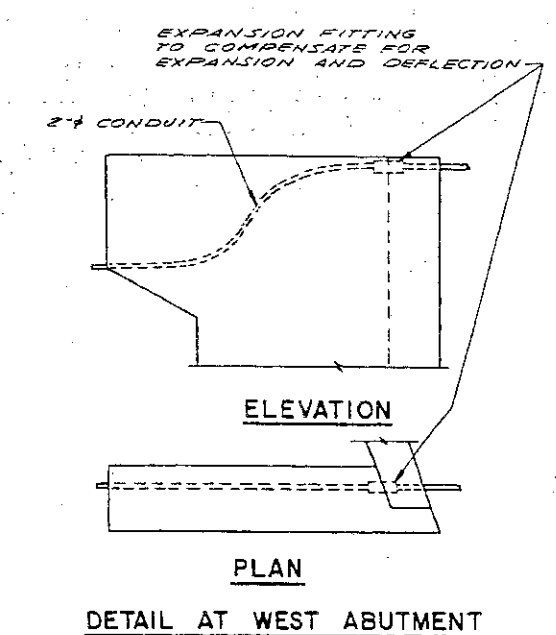
APPROVED 9-10-24

SHEET NO 65 OF 93 SHEETS	9320	DES.	DR.	C.C.F.
		CR.	CR.	CR.

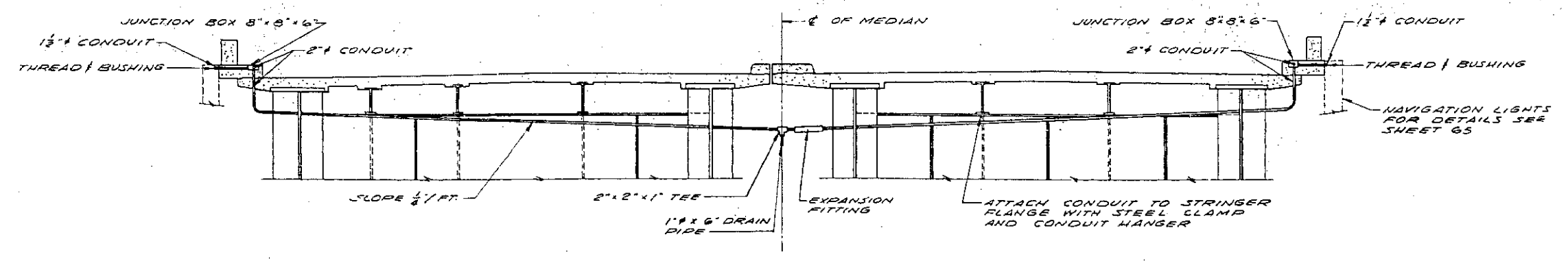
PROJECT	SHEET NUMBER	TOTAL SHEETS



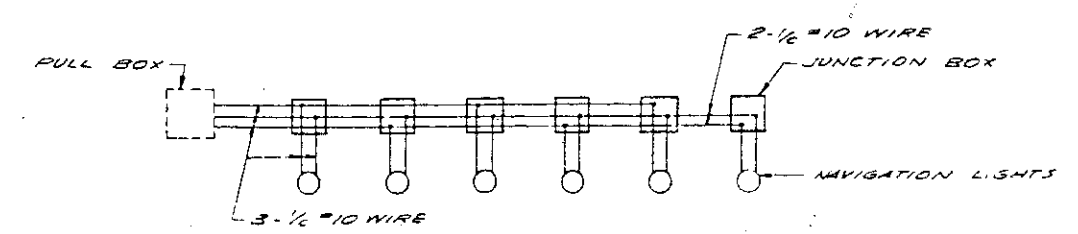
PART PLAN



DETAIL AT WEST ABUTMENT



SECTION E1



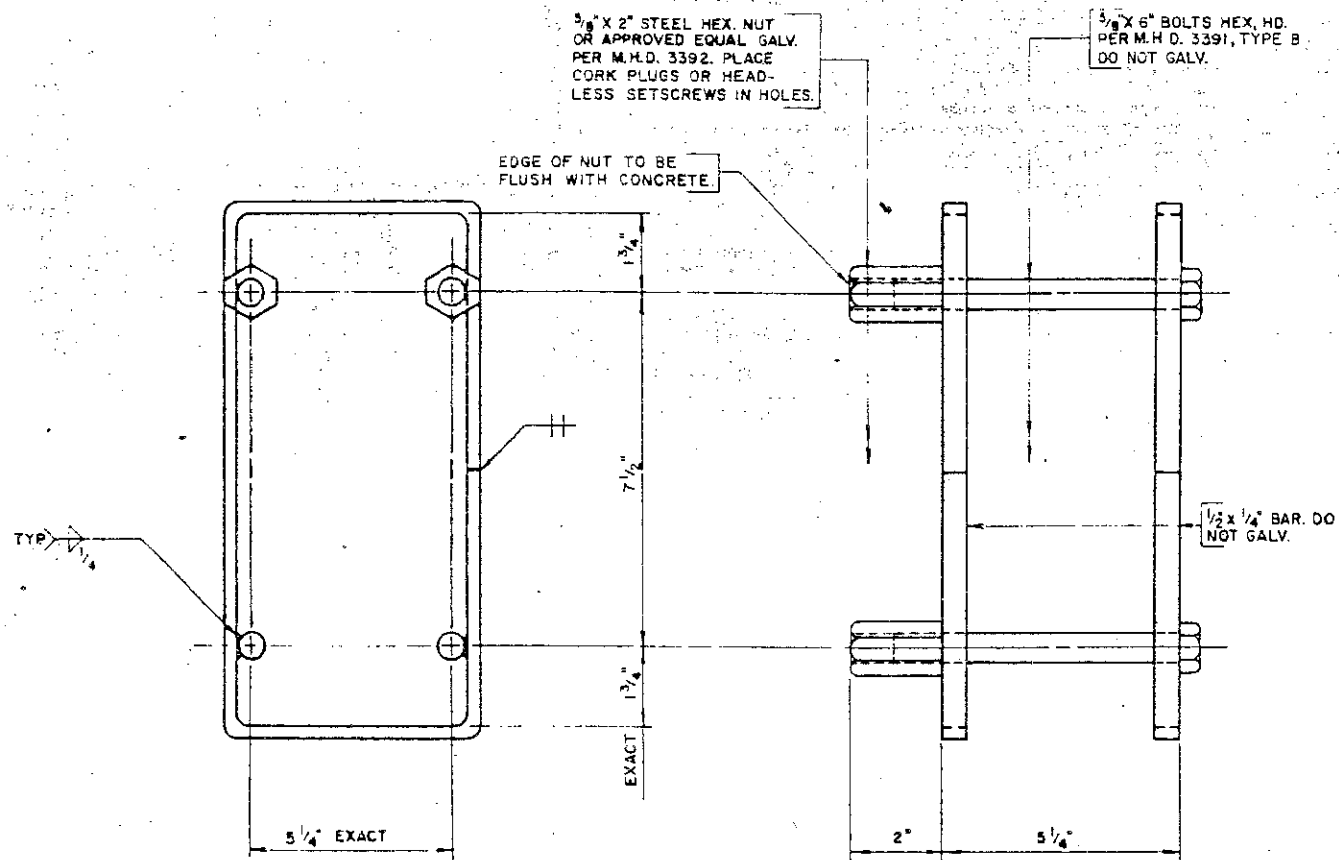
SCHEMATIC DIAGRAM

STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320
ELECTRICAL SYSTEM

APPROVED 9-11-47

SHEET NO. 66 OF 93	SHEETS	9320	DES. DR. WEA CRD. BPR
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3/8 X 2" STEEL HEX NUT OR APPROVED EQUAL GALV. PER M.H.D. 3392. PLACE CORK PLUGS OR HEAD-LESS SETSCREWS IN HOLES.

3/8 X 6" BOLTS HEX. HD. PER M.H.D. 3391, TYPE B. DO NOT GALV.

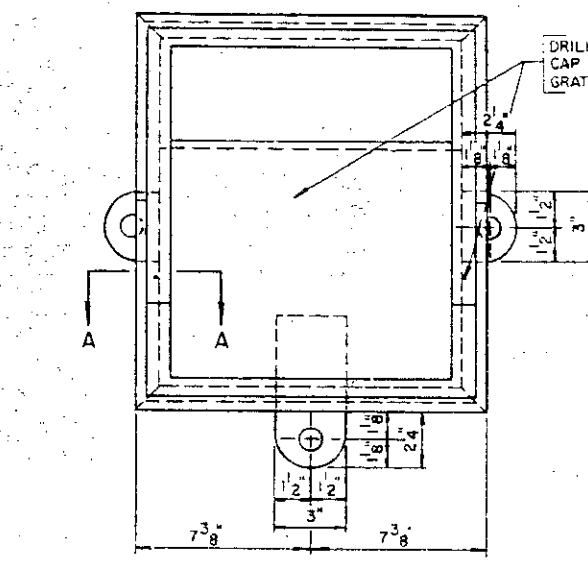
EDGE OF NUT TO BE FLUSH WITH CONCRETE.

1/2 X 1/4" BAR. DO NOT GALV.

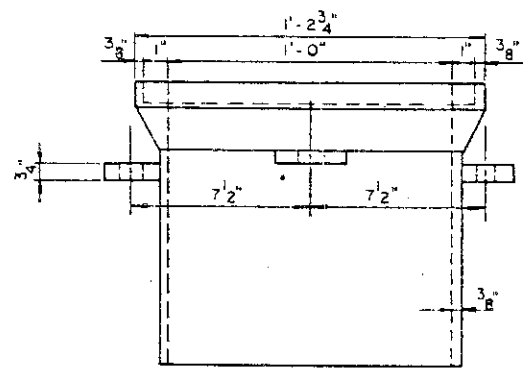
NOTE: 1/2 X 1/4" BAR TO BE M.H.D. SPEC. 3305 "BLACK IRON".

ESTIMATED WT 7 LBS.

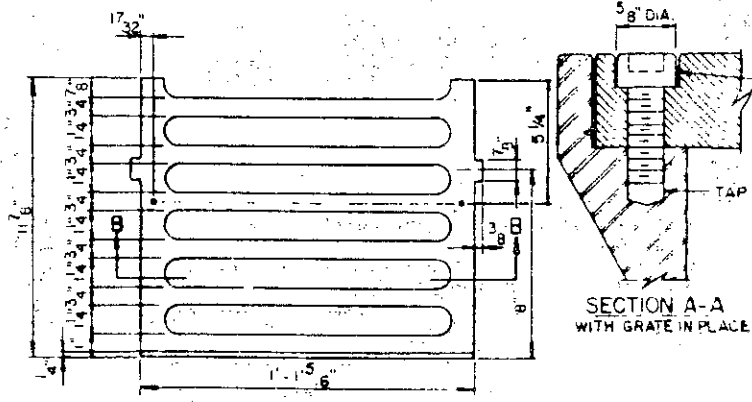
FURNISHING AND PLACING INSERT SHALL BE PAID FOR AS STRUCTURAL STEEL PER M.H.D. 3306.



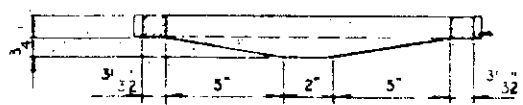
PLAN



FRONT VIEW

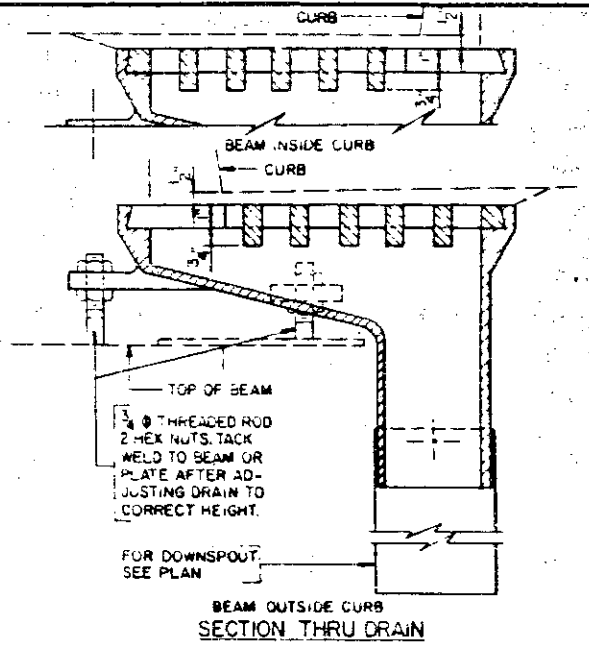


SECTION A-A WITH GRATE IN PLACE

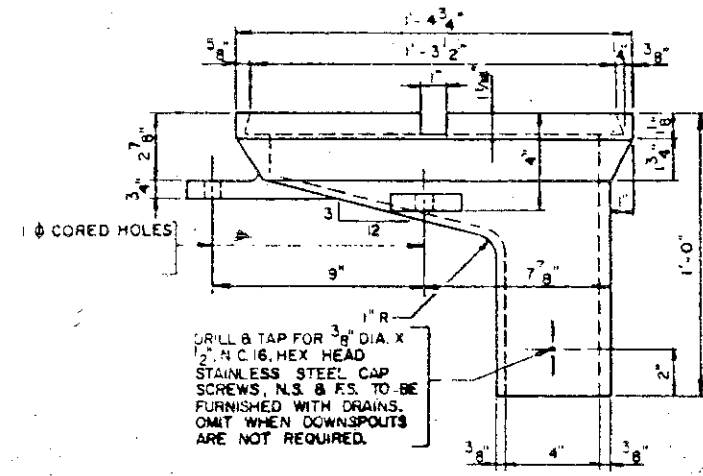


SECTION B-B

GRIND LOWER CORNER OF LUG TO PERMIT PLACING GRATE



SECTION THRU DRAIN



SIDE VIEW

DRILL & TAP FOR 3/8" DIA. X 2" N.C. 16, HEX HEAD STAINLESS STEEL CAP SCREWS, N.S. & F.S. TO BE FURNISHED WITH DRAINS. OMIT WHEN DOWNSPOUTS ARE NOT REQUIRED.

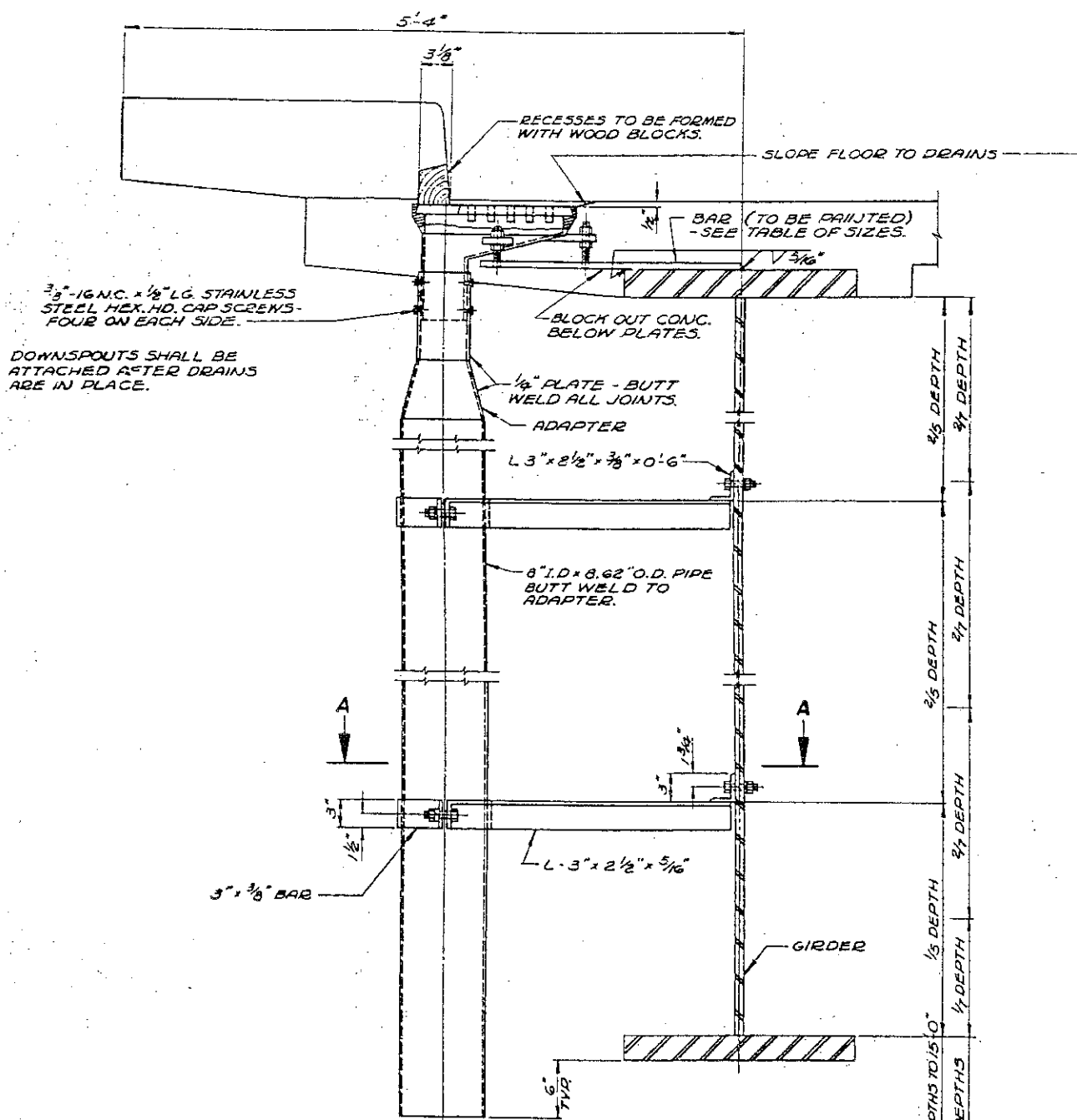
3/8" DIA. X 1" LG. STAINLESS STEEL SOCKET HD. CAP SCREW PER M.H.D. 3391 TYPE E. INCLUDED WITH DRAINS.

NOTES: DRAINS AND GRATES TO BE HOT DIPPED GALVANIZED PER M.H.D. 3394. SHOP INSPECTION BY M.H.D. BEFORE AND AFTER GALVANIZING.

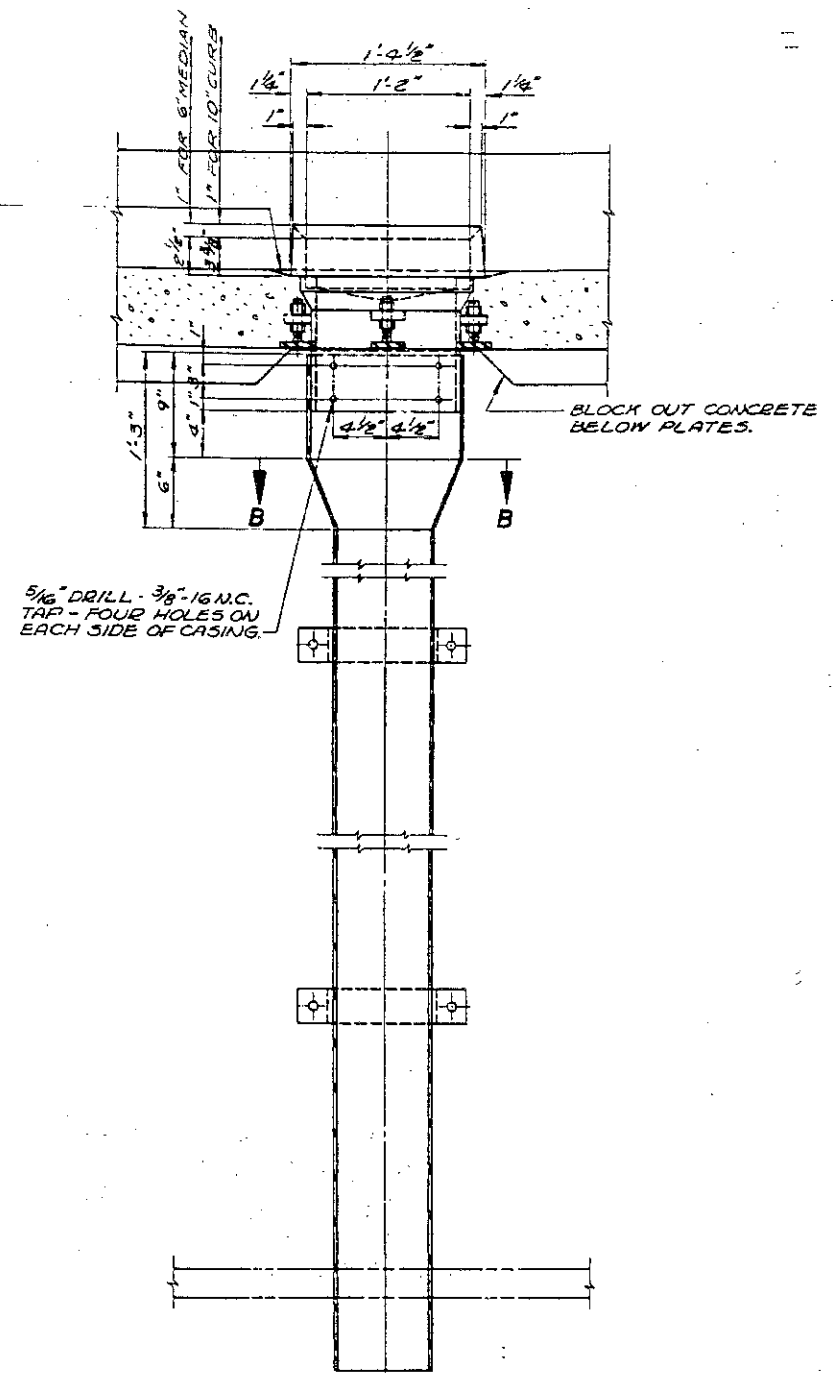
SPEC. FOR REFERENCE FOR CAST IRON FRAMES AND GRATES M.H.D. 3321, CLASS 25. THREADED ROD AND HEX NUTS TO BE STRUCTURAL STEEL PER M.H.D. 3305.

APPROVED... SEPT 2 1963	STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS	REV'SONS 2-2-63 7-30-64 8-5-64 8-14-64	DETAIL NO. B 46
INSERT FOR PLATE BEAM GUARD RAIL CONNECTION			

APPROVED... SEPT 2 1962	STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS	REV'SONS 3-6-63	DETAIL NO. B 3
CAST IRON FLOOR DRAIN			



SECTION THRU DRAIN & DOWNSPOUT AT CURB
DRAINS AT MEDIANS ARE SIMILAR



SECTION THRU DRAIN

NOTES

STEEL FOR ADAPTER AND FITTINGS SHALL CONFORM TO M.H.D. 3309. ALL OTHER STEEL TO BE STRUCTURAL STEEL M.H.D. 3306, UNLESS OTHERWISE NOTED.

ALL PIPE AND PIPE FITTINGS SHALL CONFORM TO M.H.D. 3362, EXCEPT MATERIAL SHALL CONFORM TO M.H.D. 3309.

8" PIPE TO BE 8.62" O.D., .27" WALL THICKNESS AND WEIGHT 24.7 LBS. PER FT.

LOCK NUTS TO BE McLEAN-FOGG NO. 1 OR APPROVED EQUAL.

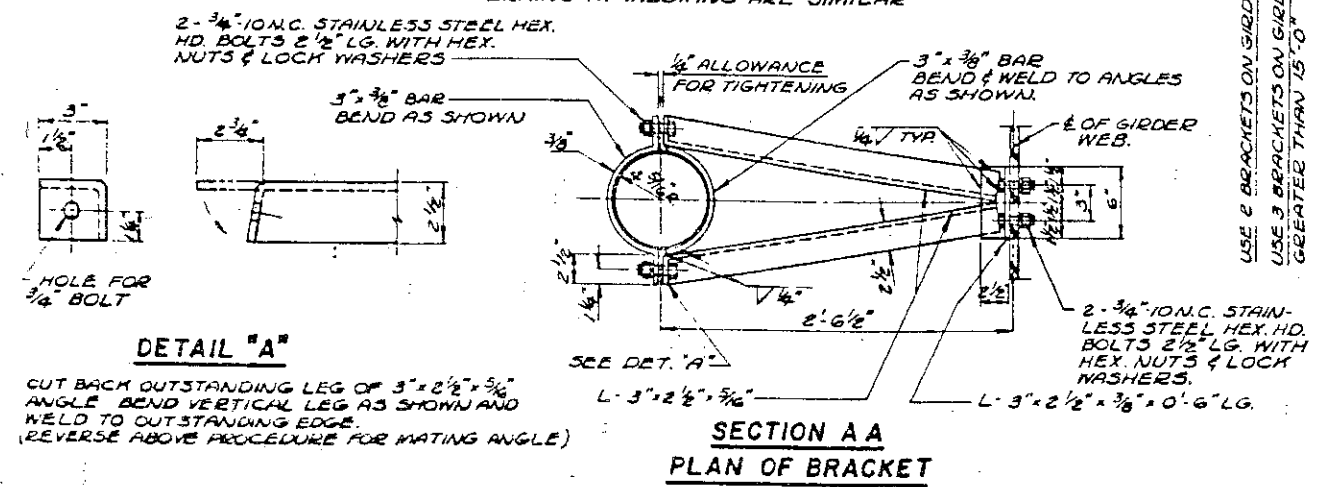
THREADED RODS AND NUTS TO BE GALVANIZED AFTER FABRICATION AS PER M.H.D. 3392. ALL OTHER MATERIAL TO BE GALVANIZED AFTER FABRICATION AS PER M.H.D. 3394, EXCEPT AS NOTED TO BE PAINTED. PAINT MATERIAL NOTED TO BE PAINTED SAME AS STRUCTURAL STEEL.

THE BID ITEM "DRAINAGE SYSTEM" SHALL INCLUDE FLOOR DRAINS, DOWNSPOUTS, GRATING, BRACKETS, SUPPORT BARS, ITEM LISTED ON SHEET 60, AND ALL OTHER REQUIRED MATERIAL FOR THE COMPLETE DRAINAGE AS SHOWN ON THIS SHEET AND ON SHEETS 60, 67 AND 84.

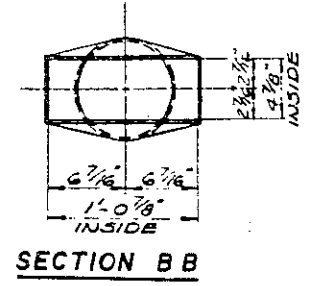
STAINLESS STEEL BOLTS NOT REQUIRED TO BE GALVANIZED OR PAINTED.

TABLE OF DRAIN SUPPORT BARS

FLANGE WIDTH	BAR SIZE	APPROX. LGTH.	NO. REQ'D PER DRAIN
16" & 20"	3" x 3/8"	2'-3"	2 @ 2'-3"
24" & 30"	3" x 5/8"	2'-3"	1 @ 1'-6"
36"	3" x 1/2"	1'-6"	2 @ 1'-6"
40" & 42"	3" x 1/2"	1'-5"	2 @ 1'-3"



SECTION A A
PLAN OF BRACKET



SECTION B B

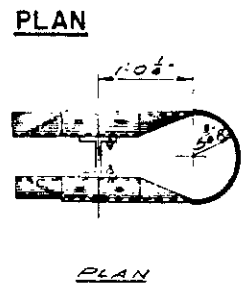
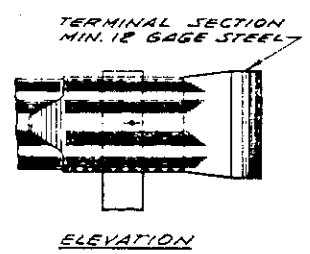
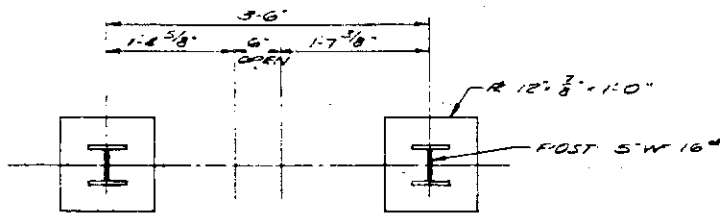
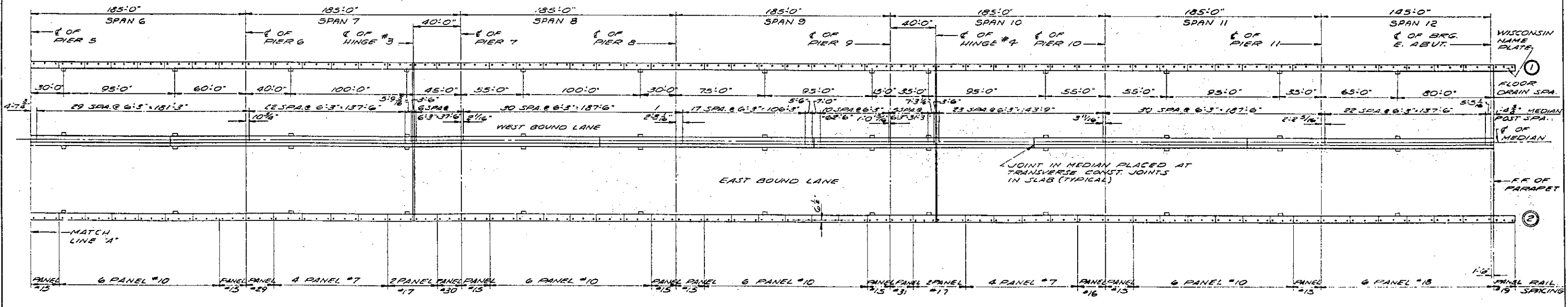
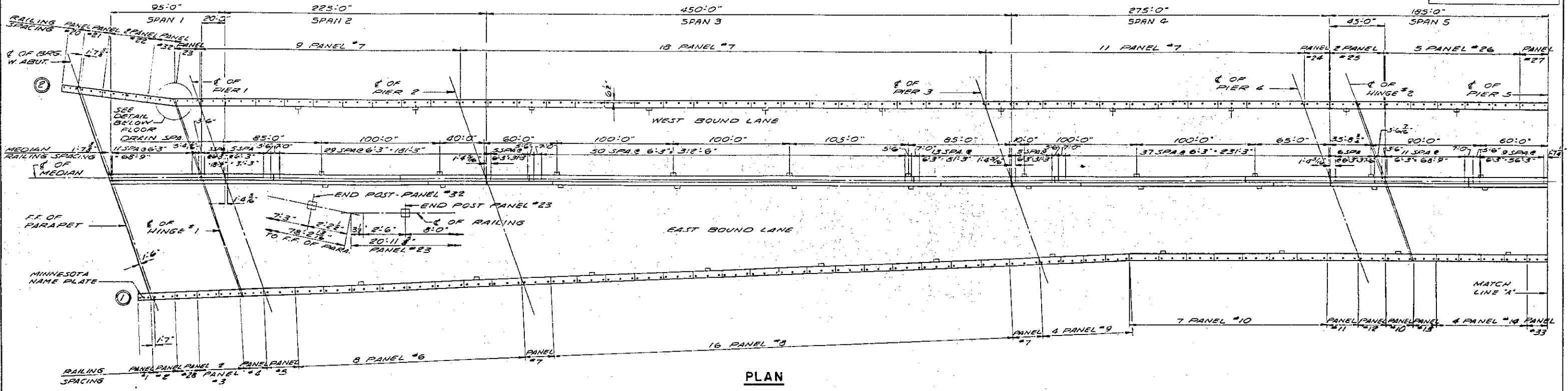
SEE SHEET NO. 67 FOR FLOOR DRAINS & DETAILS.

STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320
DOWNSPOUT AND DETAILS

APPROVED _____

SHEET NO. 68 OF 93 SHEETS	9320	DES. DR. CCF
		CK. BHC



NOTES:
POST SPACING SHOWN IS MEASURED ALONG
& OF POSTS.

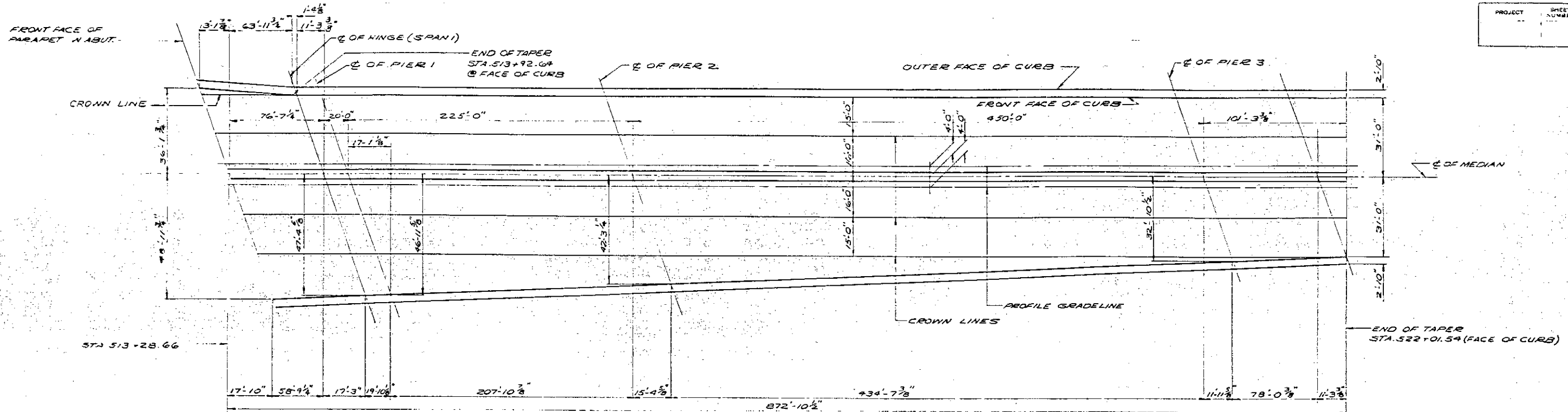
STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320
RAIL POST AND DRAIN SPACING

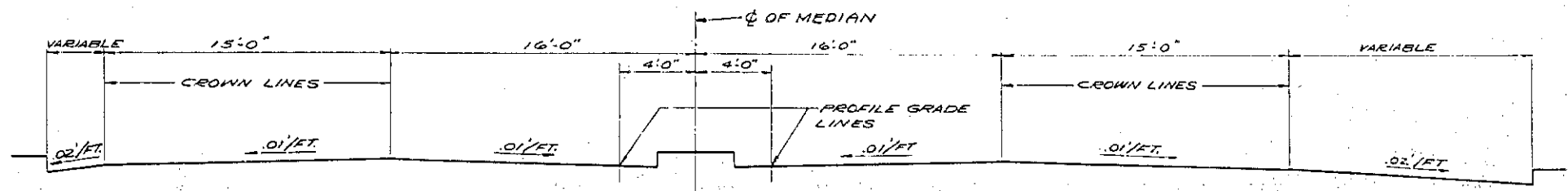
APPROVED _____

SHEET NO. 84 OF 93 SHEETS 9320

CES
OR
CK



PLAN OF FLARED SECTION



SECTION THRU ROADWAY
TAKEN IN SPAN 1 LOOKING EAST

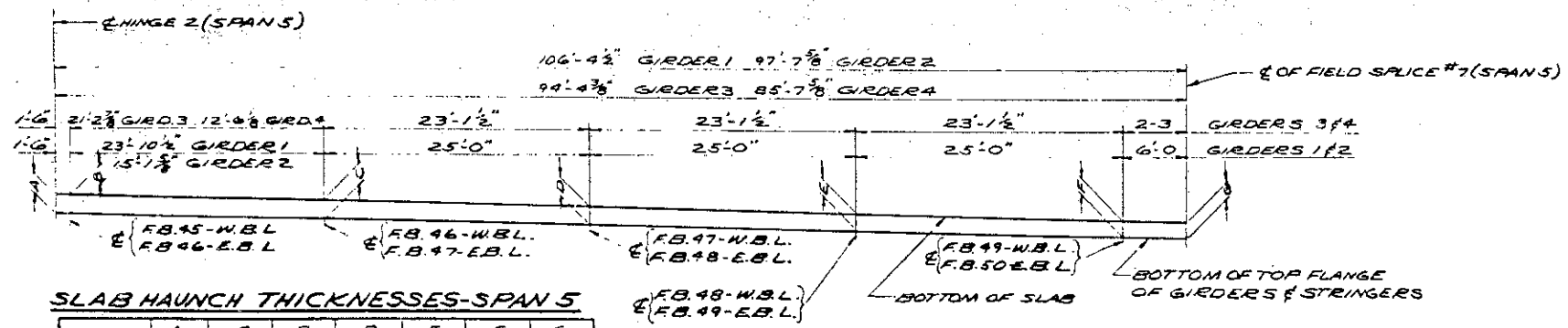


TABLE OF SLAB HAUNCH THICKNESSES

GIRDER 1	4 1/2"	FROM E. BRG. W. ABUT. - Q HINGE 2	3 1/2" F.S. #7 TO E. ABUT.
STRINGER 10	1 1/2"	" " " " " " " " " " " "	- END OF STRINGER
"	1 1/2"	" " " " " " " " " " " "	- Q HINGE 2
"	2	" " " " " " " " " " " "	1 1/2" F.S. #7 TO E. ABUT.
GIRDER 2	4 1/2"	" " " " " " " " " " " "	3 1/2" " " " " " "
GIRDER 3	4 1/2"	" " " " " " " " " " " "	3 1/2" " " " " " "
STRINGER 3	2 3/4"	" " " " " " " " " " " "	1 5/8" " " " " " "
"	4	" " " " " " " " " " " "	1 1/2" " " " " " "
"	5	" " " " " " " " " " " "	- END OF STRINGER
"	6	" " " " " " " " " " " "	" " " " " " " "
"	7	" " " " " " " " " " " "	" " " " " " " "
"	8	1 1/2" FULL LENGTH OF STRINGER	" " " " " " " "
"	9	" " " " " " " " " " " "	" " " " " " " "
GIRDER 4	4 1/2"	Q BRG. W. ABUT. - Q HINGE 2	3 1/2" F.S. #7 - E. ABUT.

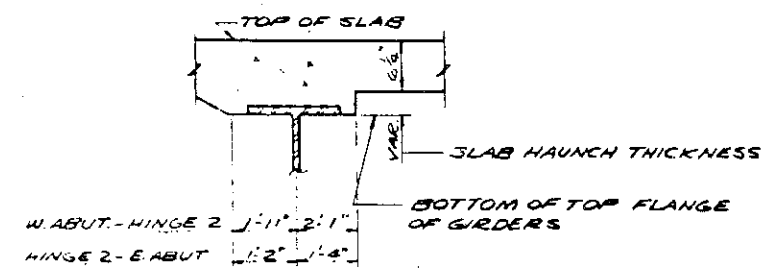
SLAB HAUNCH THICKNESSES-SPAN 5

	A	B	C	D	E	F	G
GIRDER 1	4 1/2	4 1/2	4 1/2	4 1/2	3 3/8	3 3/8	3 1/2
STRINGER 1	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	
STRINGER 2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	
GIRDER 2	4 1/2	4 1/2	4 1/2	4 1/2	3 3/8	3 3/8	3 1/2
GIRDER 3	4 1/2	4 1/2	4 1/2	4 1/2	3 3/8	3 3/8	3 1/2
STRINGER 3	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	
STRINGER 4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	
GIRDER 4	4 1/2	4 1/2	4 1/2	4 1/2	3 3/8	3 3/8	3 1/2

NOTE: ALL SLAB HAUNCH DEPTHS ARE AT Q OF GIRDER OR STRINGER.

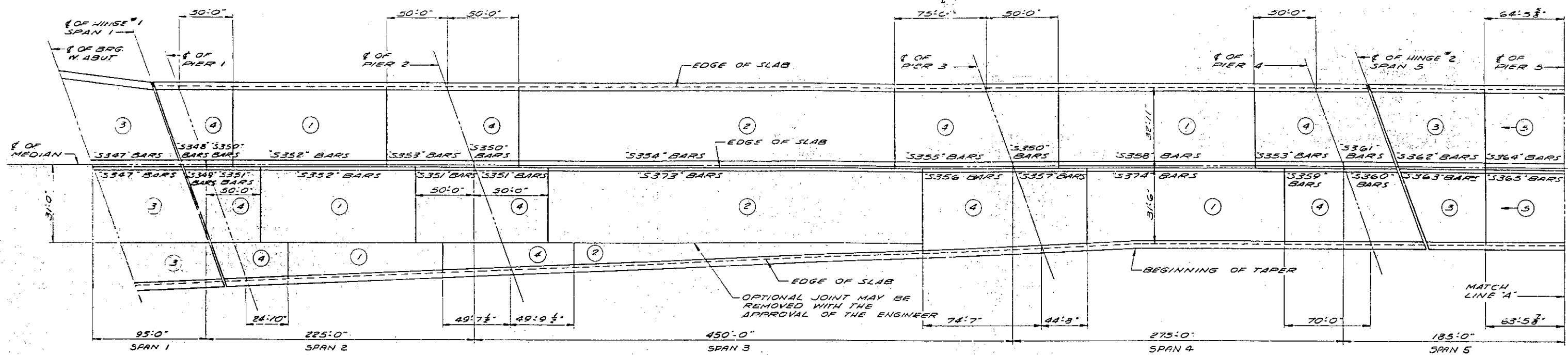
NOTE: DIMENSIONS B THRU F ARE AT Q OF FLOOR BEAMS (F.B.).

SLAB HAUNCH TRANSITION-SPAN 5

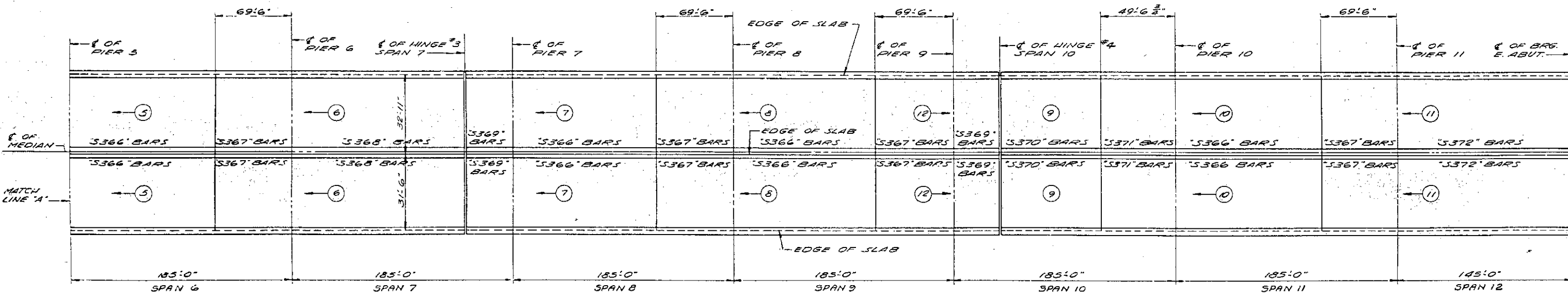


NOTE: SEE SHEET 32 OF FRAMING PLAN FOR LOCATION OF STRINGERS IN FLARED SECTION.

HAUNCH THICKNESSES GIVEN IN TABLE ARE THEORETICAL. THE ENGINEER WILL TAKE ELEVATIONS AT TOP OF BEAMS AFTER ERECTION AND WILL ALLOW FOR DEFLECTIONS SHOWN ON SHT 39 TO ENABLE CONTRACTOR TO BUILD FORMS TO CORRECT GRADE AND SPECIFIED SLAB THICKNESS.



PLAN

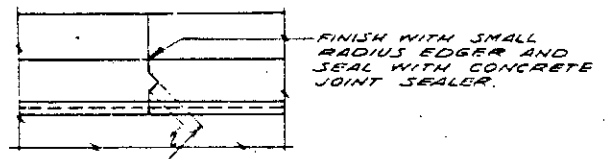


PLAN

EST. OF QUANTITIES FOR SUPERSTRUCTURE

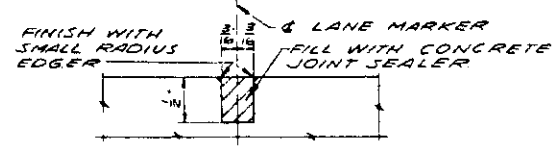
STRUCTURAL STEEL (M.H.D. 3306)	3 906 730 LBS.
STRUCTURAL STEEL (M.H.D. 3303)	5 750 LBS.
STRUCTURAL STEEL (M.H.D. 3310)	5 126 410 LBS.
CONCRETE MIX 316	3 782 C.Y.
3160	823 C.Y.
BAR STEEL REINFORCEMENT DELIVERED	1 626 470 LBS.
BAR STEEL REINFORCEMENT PLACED	1 626 670 LBS.

CIRCLED NOS. THUS DENOTE POURING SEQUENCE NO. DESIGNATES DIRECTION OF POUR WHERE APPLICABLE



CONST. JOINT IN ROADWAY SLAB

SEE SPECIAL PROVISIONS



LANE MARKER DETAIL

AS AN ALTERNATE CONTRACTOR WILL BE PERMITTED TO SAW IN LANE MARKER AFTER CONCRETE IS CURED.

NOTES:

ALL POURS WITH THE SAME SEQUENCE NUMBER SHALL BE MADE BEFORE SUCCEEDING POURS ARE MADE. THE CONTRACTOR MAY SUBMIT FOR USE, AN ALTERNATE POURING SEQUENCE DIAGRAM. USE OF SUCH A POURING SEQUENCE SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.

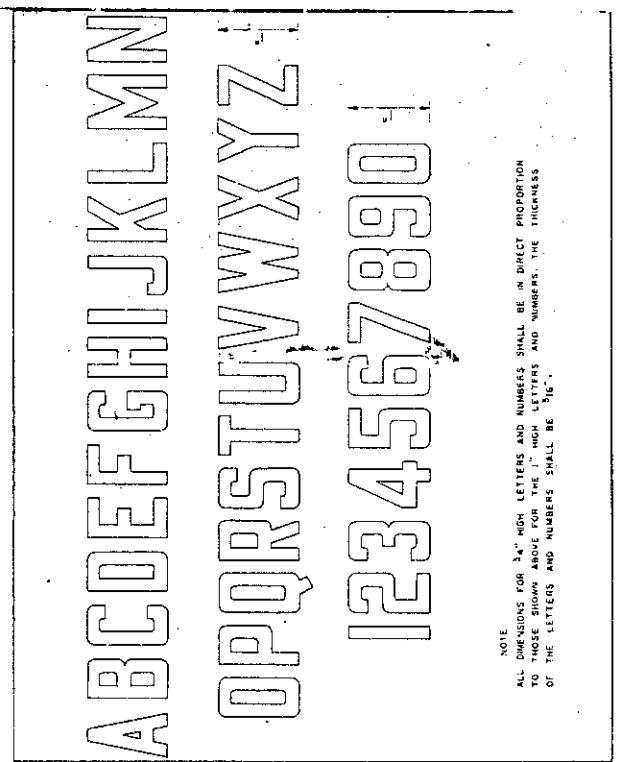
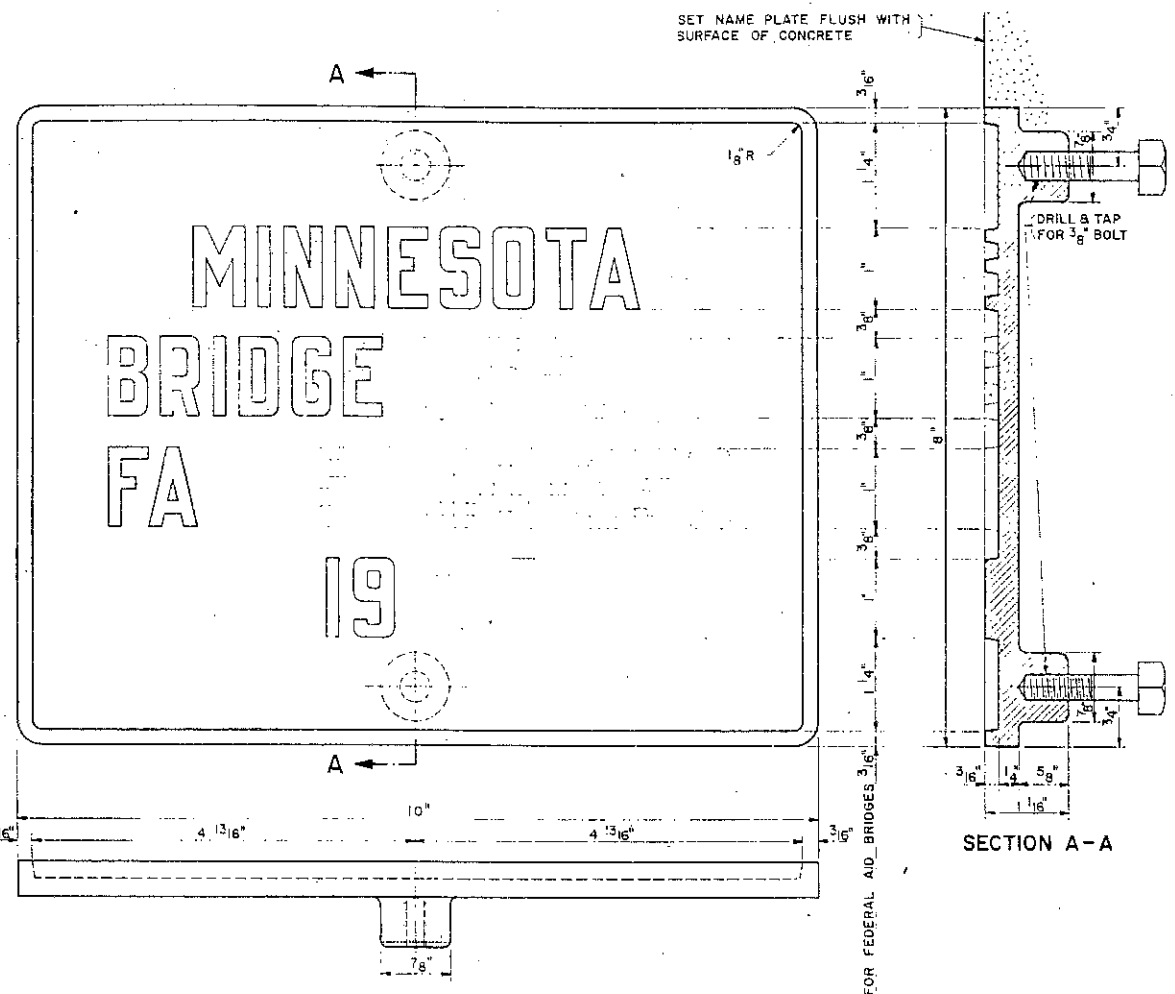
THE SLAB POURING SEQUENCE SHALL BE AS INDICATED ON THE PLAN EXCEPT THAT THE TWO ROADWAYS MAY BE POURED INDEPENDENT OF EACH OTHER.

AFTER ENTIRE ROADWAY SLAB ON ONE SIDE OF THE BRIDGE IS IN PLACE THE CURB AND RAILING ON THAT SIDE OF THE BRIDGE MAY BE PLACED EXCEPT THE CURB AND RAILING FROM WEST ABUTMENT TO & HINGE 2 MAY BE PLACED AFTER POUR 5 ON THAT SIDE OF THE BRIDGE IS IN PLACE. THE CURB AND RAILING FROM & HINGE 2 TO EAST ABUTMENT SHALL NOT BE PLACED UNTIL ENTIRE ROADWAY SLAB ON THAT SIDE OF THE BRIDGE IS IN PLACE.

DO NOT PLACE MEDIAN UNTIL ENTIRE ROADWAY SLAB IS IN PLACE EXCEPT MEDIAN FROM WEST ABUTMENT TO & HINGE 2 MAY BE PLACED AFTER POUR 5 ON BOTH ROADWAYS IS IN PLACE. THE MEDIAN FROM & HINGE 2 TO EAST ABUTMENT SHALL NOT BE PLACED UNTIL ENTIRE ROADWAY IS IN PLACE. WIDER PORTIONS OF MEDIAN SHALL BE PLACED FIRST.

POURS ADJACENT TO HINGES SHALL STOP 10' EACH SIDE OF & HINGE. THE 10' POUR ON EACH SIDE OF & HINGE SHALL BE PLACED AFTER HINGES ARE DEFLECTED AND EXPANSION CASTINGS HAVE BEEN ADJUSTED AND SECURED.

STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS	
BRIDGE NO. 9320	
POURING DIAGRAM	
APPROVED _____	
SHEET NO. 86 OF 93 SHEETS	9320
DES. DR. WEA. CK. BAZ.	



APPROVED 7/3 1959	STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS	REVISIONS (DETAIL NO)
<i>A. E. LaRonde</i> BRIDGE ENGINEER	LETTERS FOR BRIDGE NAME PLATES	2102

LETTERS FOR M.H.D. NAME PLATE ONLY.

NOTE:
ONE BRIDGE NAME P.L. THUS
FOR BRIDGE 9320
P.R.I. 090-B-4
DATED 1966

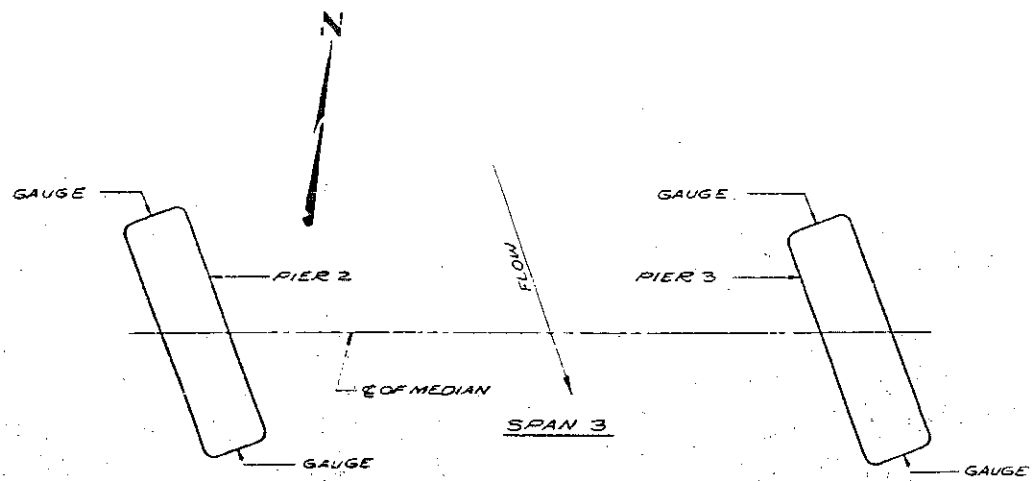
NOTES:
NUMBERS AND LETTERS SHALL CONFORM TO THOSE SHOWN ON DETAIL NO. 2102. DRAFT ON LETTERS SHALL NOT BE MORE THAN 3" IN 12". HORIZONTAL SPACING OF LETTERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN. TOP SURFACE OF LETTERS AND FRAMES SHALL BE BURNISHED. BACKGROUND OF PLATE SHALL HAVE A DEEP BROWN OXIDIZED FINISH. FURNISH 2 STEEL BOLTS 3/8" x 3" LONG WITH EACH PLATE. PLATES ORDERED IN PAIRS SHALL BE CAST FROM THE SAME HEAT. NUMBERS AND LETTERS SHOWN DOTTED ARE TO BE OBTAINED FROM BRIDGE PLANS.

SPECIFICATION REFERENCE 2471.3 H, 3327 (BRONZE CASTINGS TYPE 2)

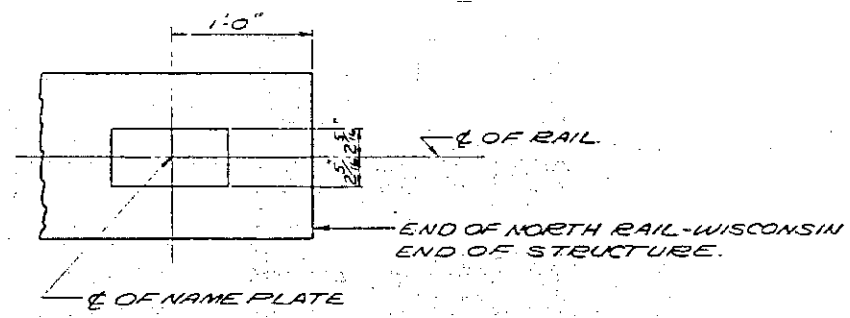
APPROVED 7/3 1959	STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS	REVISIONS	DETAIL NO.
<i>A. E. LaRonde</i> BRIDGE ENGINEER	BRIDGE NAME PLATE FOR TRUNK HIGHWAY BRIDGES		2100

STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS
BRIDGE NO. 9320 NAME PLATE DETAILS

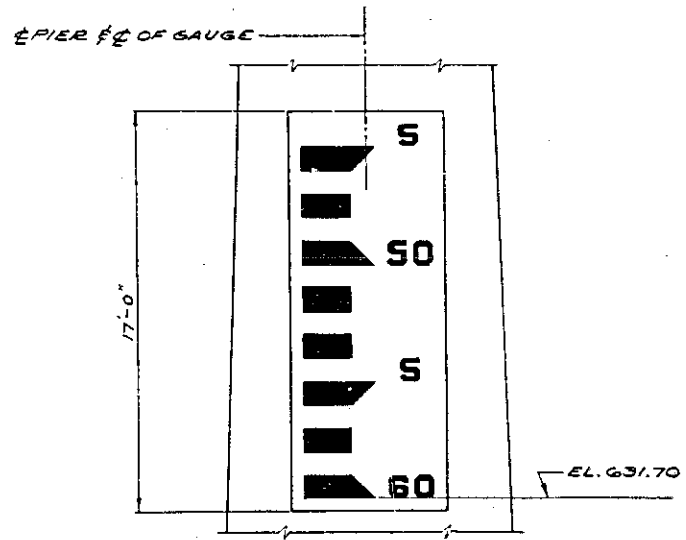
PROJECT	SHEET NUMBER	TOTAL SHEETS



LOCATION OF GAUGES

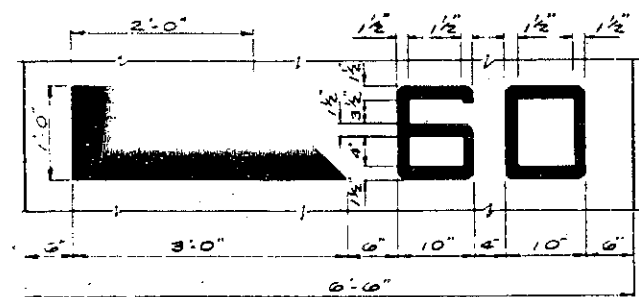


WISCONSIN NAME PLATE LOCATION



NOTE: FOR PAINTING SEE SPECIAL PROVISIONS.

END VIEW OF VERTICAL CLEARANCE GAUGE

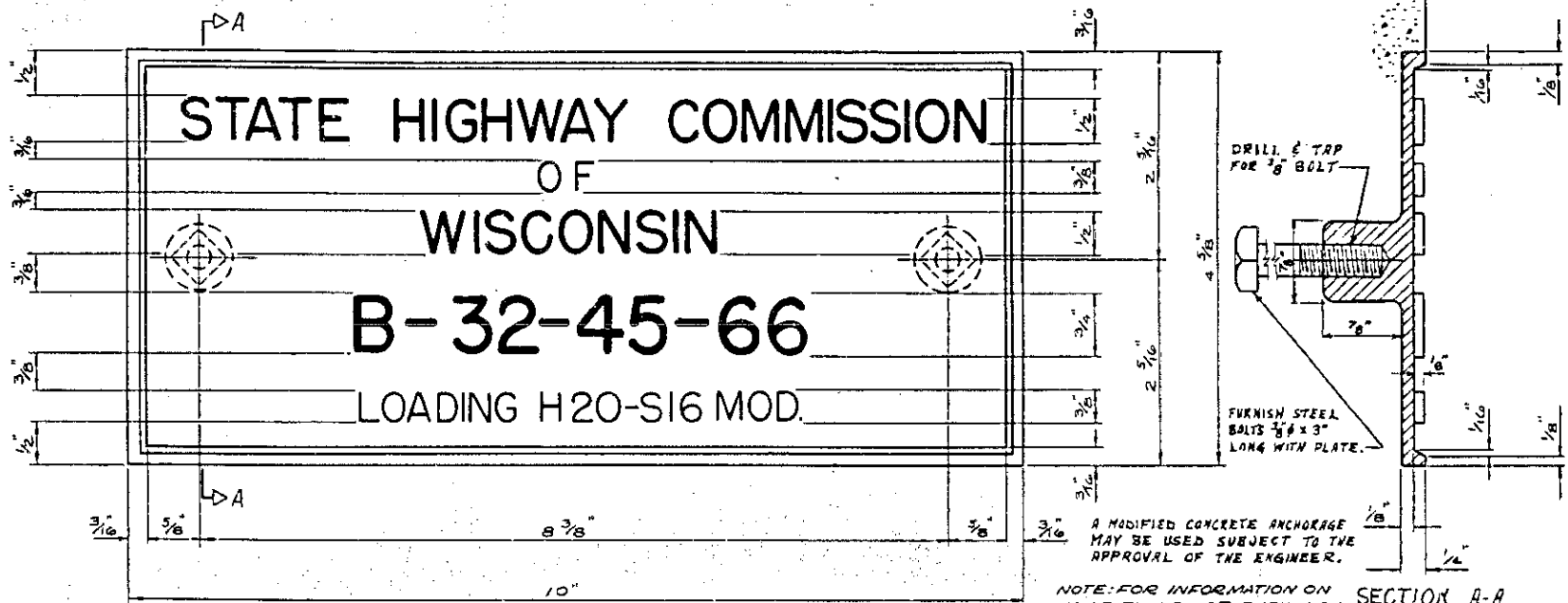


TYPICAL DETAIL OF MARKING

THE GRADUATIONS ON THE GAUGE SHALL BE 1'-0" IN TRUE VERTICAL PROJECTION. GRADUATIONS AND NUMERALS TO BE BLACK PAINTED OVER A WHITE BACKGROUND.

PAINT FOR GAUGES SHALL BE TWO COATS OF RUBBER BASE EMULSION PAINT EQUAL TO FARWELL, OZMAN, KIEK AND CO "XW-67" (FOR WHITE BACKGROUND) AND "XW-67" (FOR BLACK NUMERALS AND MARKINGS). THE FIRST COAT OF EACH COLOR SHALL BE SLIGHTLY TINTED. ALLOW 48 HOURS DRYING TIME BETWEEN SUCCESSIVE COATS. ALL DUST AND OTHER DEBRIS SHALL BE REMOVED WITH A WIRE BRUSH OR OTHER MEANS APPROVED BY THE ENGINEER BEFORE PAINTING.

NOTE: COMPENSATION FOR PROVIDING CLEARANCE GAUGE MARKINGS TO BE INCLUDED IN PRICE BID FOR OTHER ITEMS.

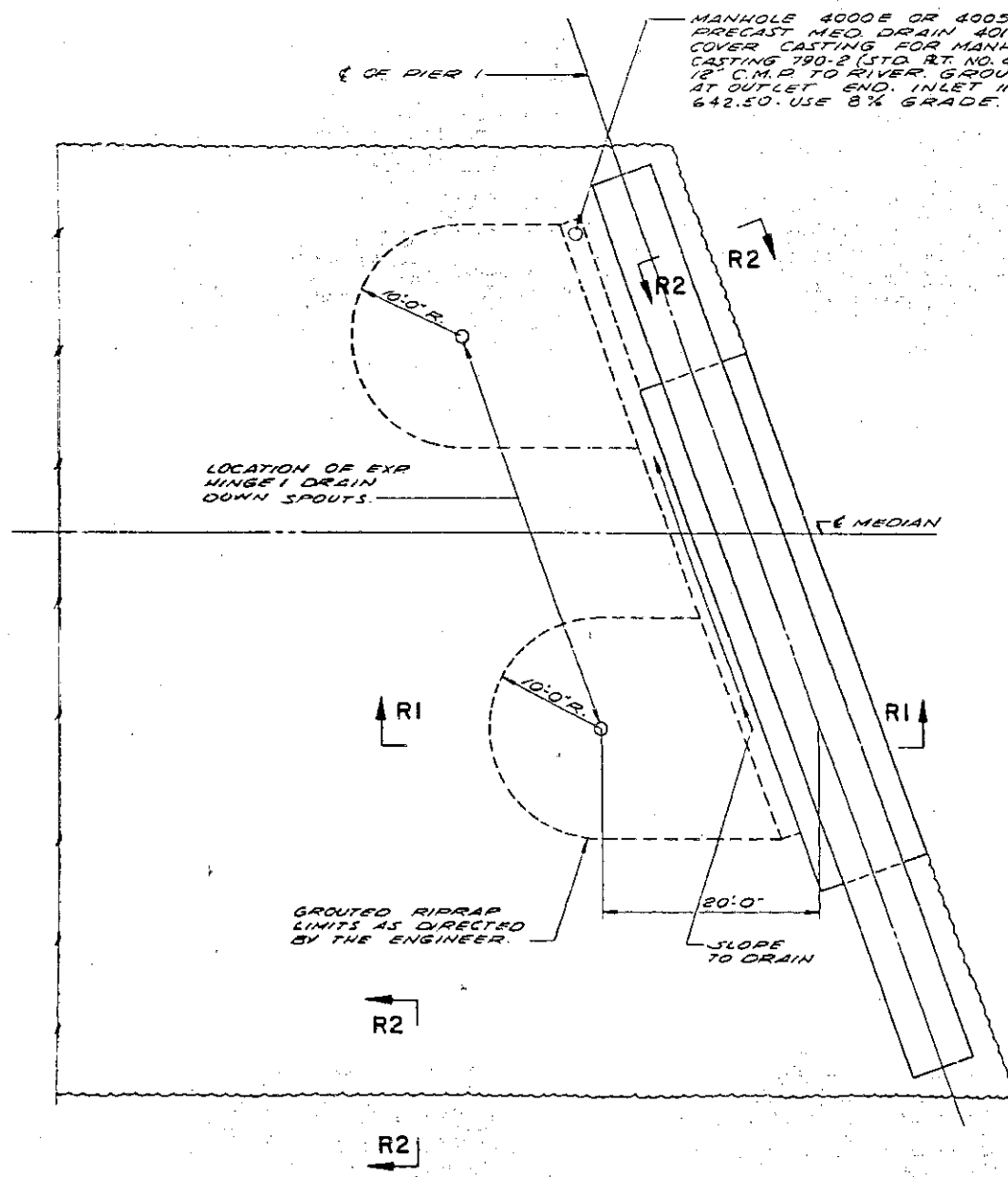


NOTE: FOR INFORMATION ON NAME PLATE NOT SHOWN ON THIS SHEET SEE SPECIAL PROVISIONS.

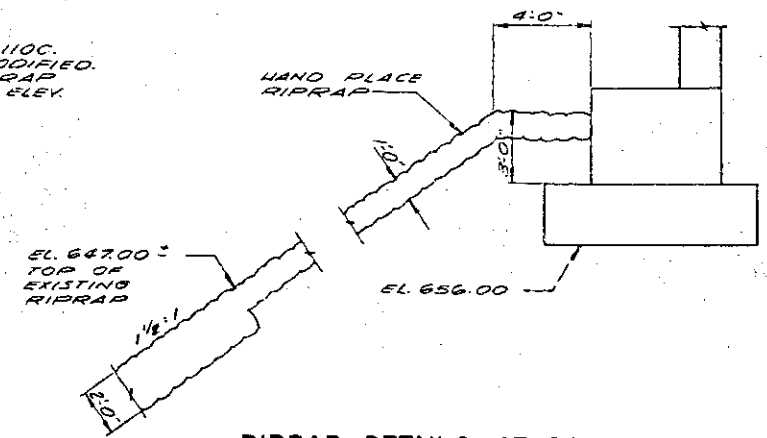
DETAIL OF NAME PLATE LOCATED AT EAST END OF STRUCTURE

STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS	
BRIDGE NO. 9320	
GAUGE & NAME PLATE DETAILS	
APPROVED _____	
SHEET NO. 88 OF 93 SHEETS	9320
DES. DR. J.A.S.	CK. J.A.S.

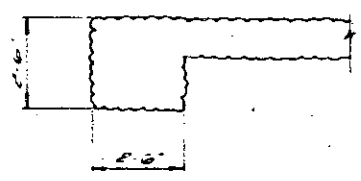
PROJECT	SHEET NUMBER	TOTAL SHEETS



RIPRAP LAYOUT AT PIER 1

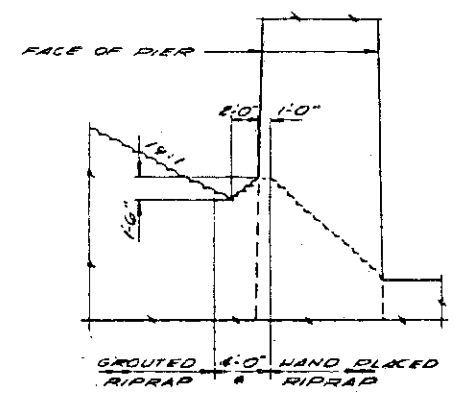


RIPRAP DETAILS AT EAST ABUTMENT



SECTION R2

TYPICAL § EDGES OF RIPRAP AND AT TOE ADJACENT TO PIER STEM



SECTION R1

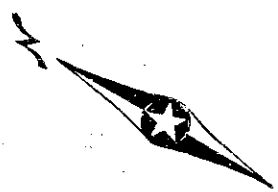
§ GROUTED RIPRAP OR CONCRETE 3/8" OF EQUAL THICKNESS

STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS

BRIDGE NO. 9320
RIPRAP LAYOUT

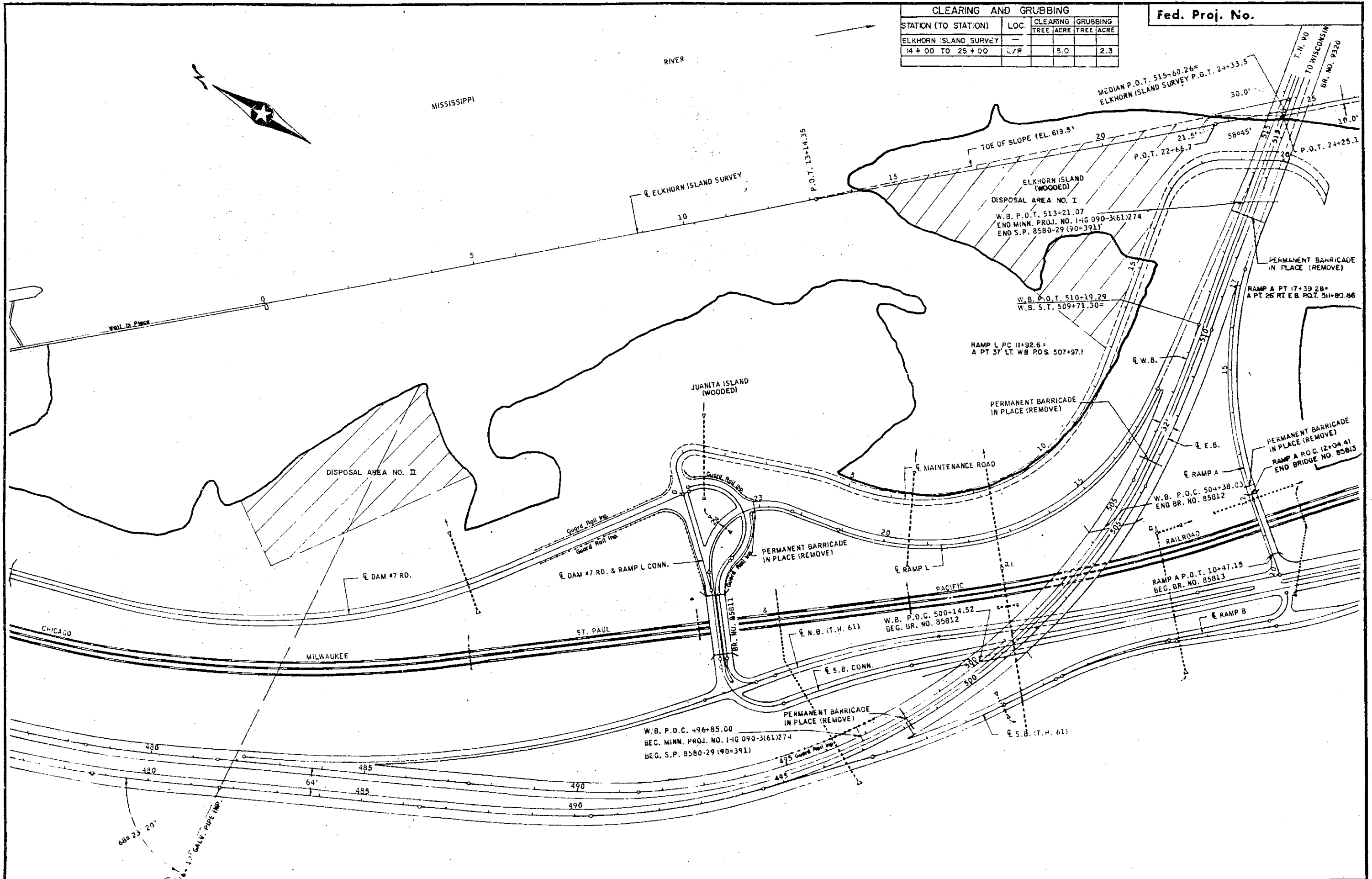
APPROVED _____

SHEET NO. 69 OF 93 SHEETS **9320** DES. —
DR. WFA CR. BPC

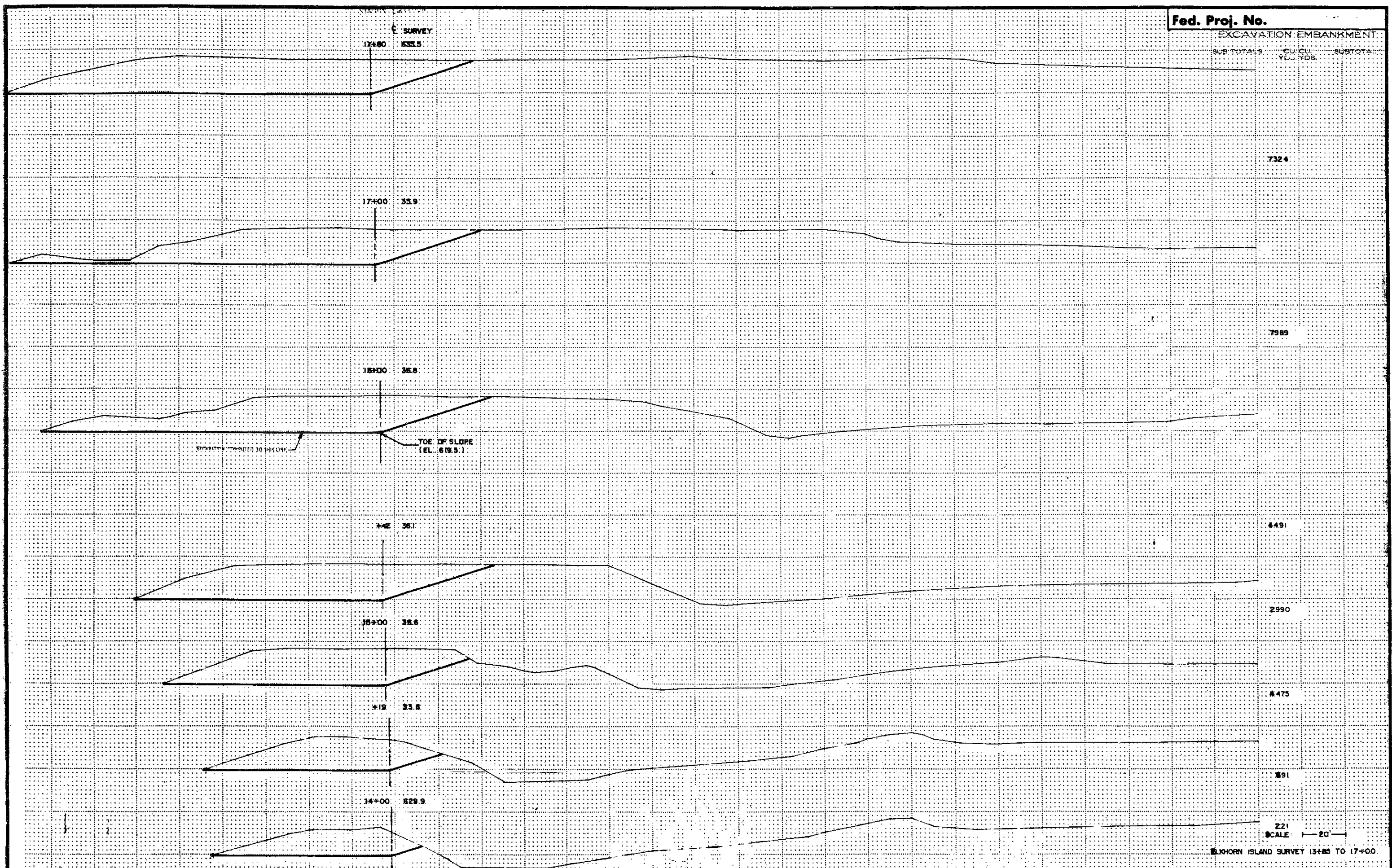


CLEARING AND GRUBBING			
STATION (TO STATION)	LOC.	CLEARING TREE ACRE	GRUBBING TREE ACRE
ELKHORN ISLAND SURVEY			
14 + 00 TO 25 + 00	L/R	5.0	2.3

Fed. Proj. No.



SUB TOTALS CU. YDS. CU. YDS. SUBTOTAL



7324

7589

6491

2990

6475

691

221

17+00 635.5

17+00 633.9

16+00 635.8

14+02 636.1

15+00 638.6

14+12 633.5

14+00 629.9

TOE OF SLOPE (EL. 619.5)

EXCAVATION COMPUTED TO 10 MINUTE

STA 13+85 - BEGIN EXCAVATION

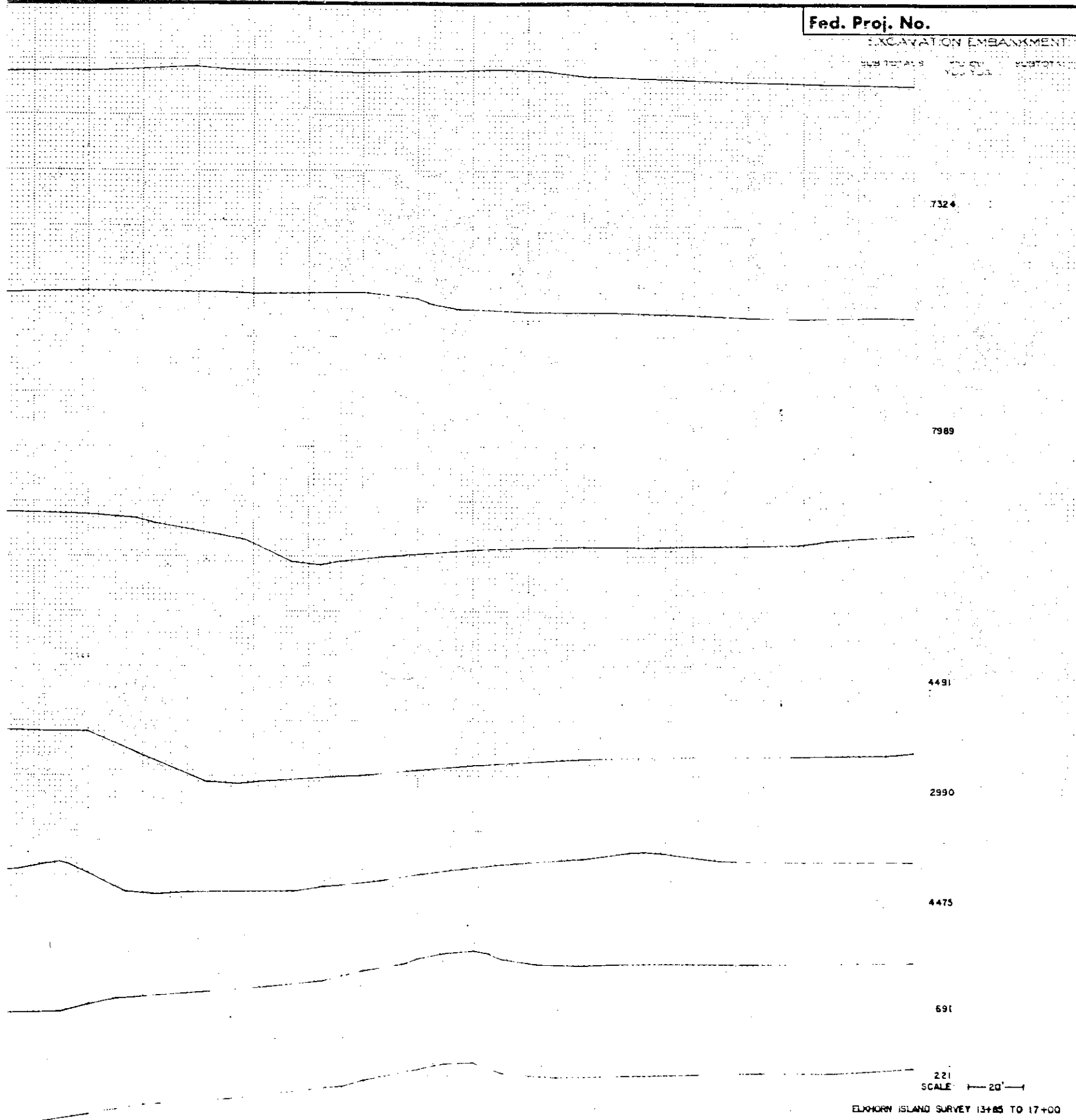
BLK HORN ISLAND SURVEY 13+85 TO 17+00

SCALE 1" = 20'

Fed. Proj. No.

EXCAVATION EMBANKMENT

SUB TOTALS CIRCUM. SUBTOTALS
YDS. YDS.



221
SCALE 20'

ELKHORN ISLAND SURVEY 13+00 TO 17+00

CHANNEL EXCAVATION

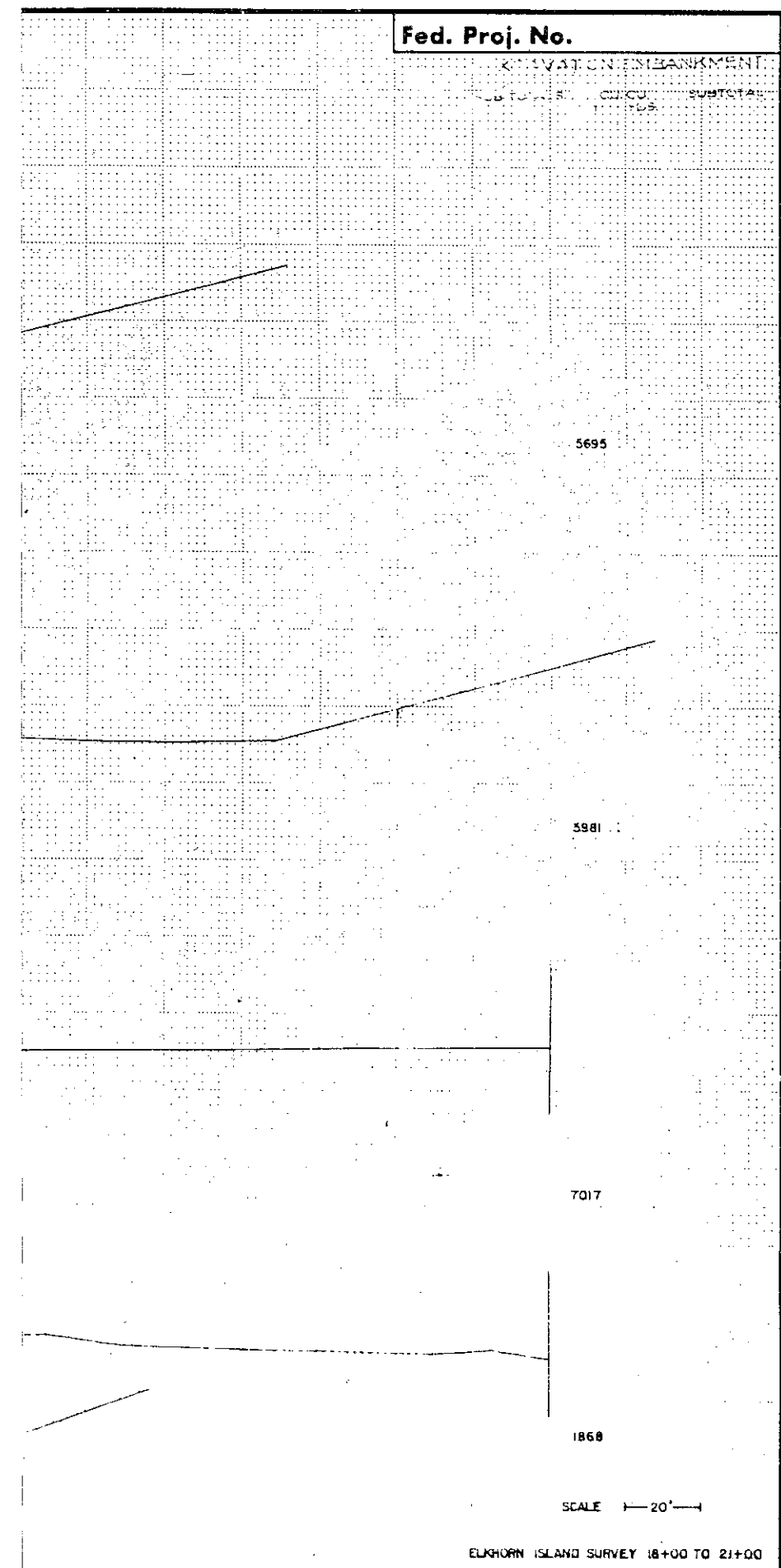
9320

Sheet No. 91 of 93 Sheets

Fed. Proj. No.

EXCAVATION EMBANKMENT

SUB TOTALS CIRCUM. SUBTOTALS
YDS. YDS.



SCALE 20'

ELKHORN ISLAND SURVEY 18+00 TO 21+00

CAVATION

9320

Sheet No. 92 of 93 Sheets

68,719

822

1998

2861

8296

SURVEY

25+00 619.0

M.P. 100' RT. E.B.R.
STA. 515+00

24+00 616.8

M.P. 18' LT. E.B.R.
STA. 515+00

M.P. 43' RT. E.B.R.
STA. 514+00

23+00 614.3

M.P. 74' LT. E.B.R.
STA. 514+00

22+00 613.9

M.P. 192' LT. E.B.R.
STA. 514+00

TOE OF SLOPE
(E.L. 619.5)

SCALE 1" = 20'

ELKHORN ISLAND SURVEY 22+00 TO 29+00