ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B,15B-1)P	PEORIA AND TAZEWELL	96	1
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT BR-F-49(42)		

R94-156-69

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PLANS FOR PROPOSED FEDERAL AID HIGHWAY

F.A. ROUTE 49
SECTION (15B,15B-1)P
PROJECT BR-F-49(42)
PEORIA-TAZEWELL COUNTIES

C-94-113-80

SUMMARY OF QUANTITIES

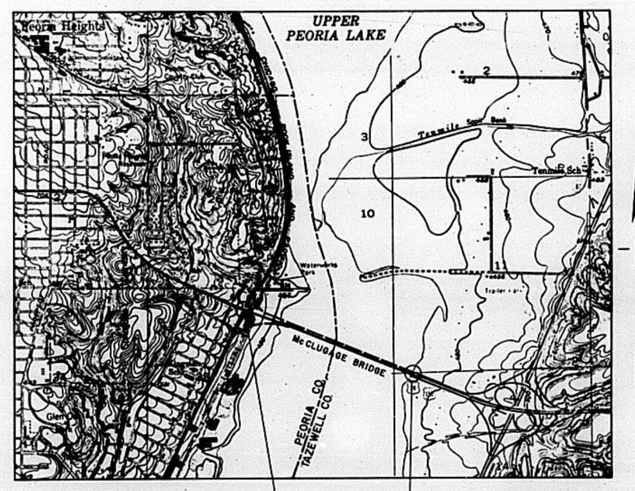
CONSTRUCTION TYPE CODE Y007 & *Y080

CODE NO.	PAY ITEM	UNIT	TOTAL
509003	CLEANING AND PAINTING STEEL BRIDGE	LUMPSUM	1
648007	TRAFFIC CONTROL AND PROTECTION STANDARD 2315	LUMPSUM	1
509001	PAINTING STRUCTURAL STEEL	LUMPSUM	1
* Z10527	TRAINEES	HOUR	1000
X04748	MOBILIZATION	LUMP SUM	1

NOTE SEE SHEET NO. 3 AND SHEET NO. 96 FOR QUANTITY BREAKDOWN BY COUNTIES

LIST OF STANDARDS

2298-5
2299-8
2300-2
2315-5



THE PROPOSED IMPROVEMENT INCLUDES THE CLEANING OF THE NEWLY ERECTED AND SHOP PAINTED STRUCTURAL STEEL, AND APPLYING THE INTERMEDIATE AND FINAL FIELD COATS OF PAINT. ALSO INCLUDED ARE CLEANING AND PAINTING OF THE OLD McCLUGGAGE BRIDGE

N

PROPOSED PROJECT BR-F-49(42) BEGINS STA. 199+00.77

PROPOSED PROJECT BR-F-49(42) ENDS STA. 246+46.02

NET LENGTH OF PROPOSED IMPROVEMENT
4745.25 LIN. FT. = 0.90 MI.

LAYOUT
SCALE = 1" = 2000'

LOCATION OF SECTION INDICATED THUS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED 1-20 19 81
J. E. Marland
DISTRICT ENGINEER

EXAMINED 2-17 19 81
W. H. Wilson
ENGINEER OF PLANS AND CONTRACTS

PASSED 2-17 19 81
Thomas R. Bright
ENGINEER OF DESIGN

APPROVED 2-17 19 81
Lee J. Rosenberger
DIRECTOR OF HIGHWAYS

SUBMITTED December 30, 1980
G. B. Burnham
DIST. DESIGN ENGR.

EXAMINED January 2, 1981
W. H. Wilson
DIST. CONST. ENGR.

EXAMINED December 30, 1980
A. C. Bauhies
DIST. MAINT. ENGR.

EXAMINED December 30, 1980
G. B. Burnham
DIST. TRAFFIC ENGR.

Entire section inspected and approved as to policy.

DATE 1-20-81 J. E. Marland
DISTRICT ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ADMINISTRATOR DATE

DESIGN DESIGNATION
3996 (94) MAJOR (PCC-20)

CONTRACT NO. 34927 SEC (15B, 15B-1)P Peoria - Tazewell

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA. 49	*	PEORIA AND TAZEWELL	96	2
FED. ROAD DIST. NO. 7		ILLINOIS PROJECT		

* SEC. (15B, 15B-1) - P

INDEX OF SHEETS

INDEX OF SHEETS

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC.(15B-1)-P
PEORIA & TAZEWELL COUNTIES

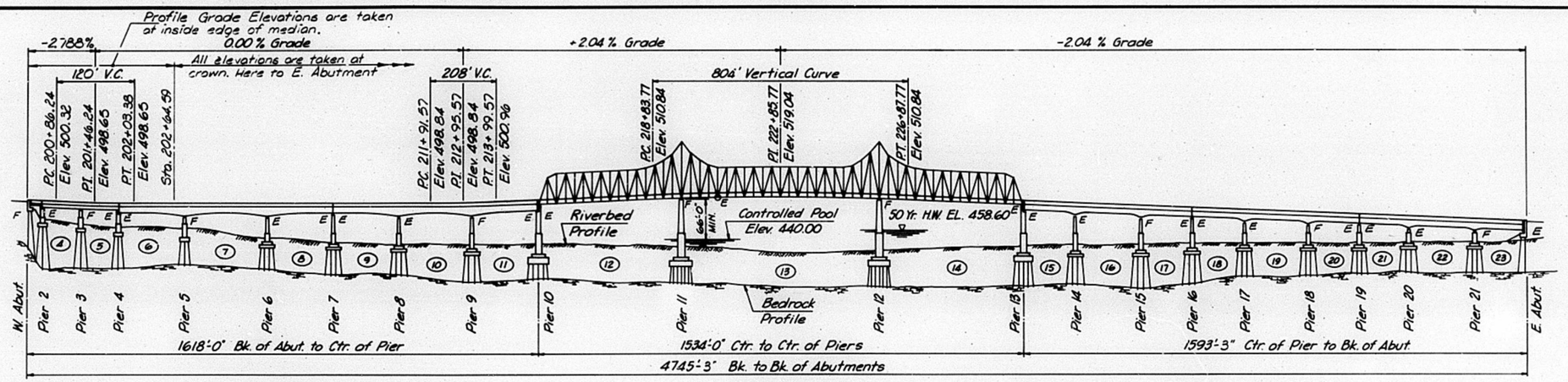
DESIGNED
CHECKED
DRAWN D.A.N.
CHECKED

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, PEORIA & ROCKFORD, ILLINOIS

FILE NO. 74001
DATE

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(158-1) -P	PEORIA AND TAZEWELL	96	3
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 1 of 93



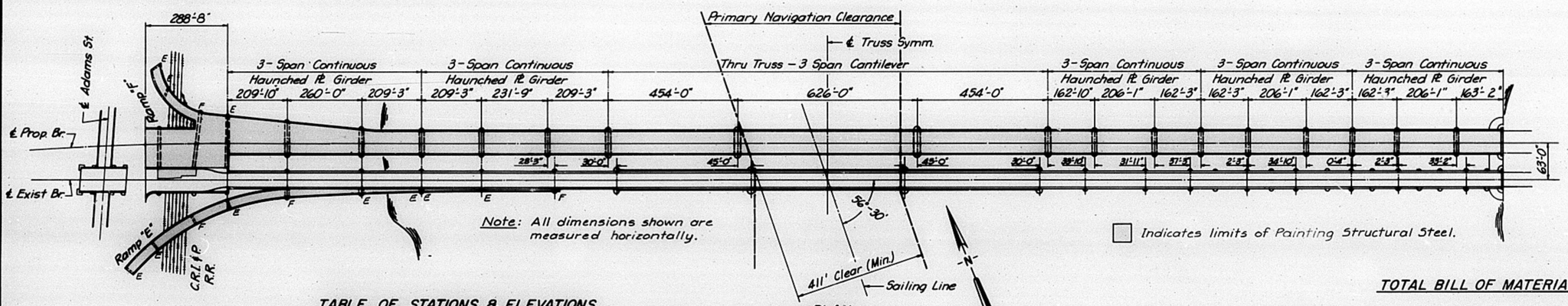
Note:
Station Equation
Sta. 201+67.45 Back =
Sta. 201+64.59 Forward

ELEVATION

GENERAL NOTES

The basic lead silico chromate paint system shall be used for all the field painting of Structural Steel and the navigation lighting safety cages. It shall also be used for the field painting of the steel railing.

The Bridge Plan Sheet No. 2 thru Sheet No. 93 are for information only, except specially noted.

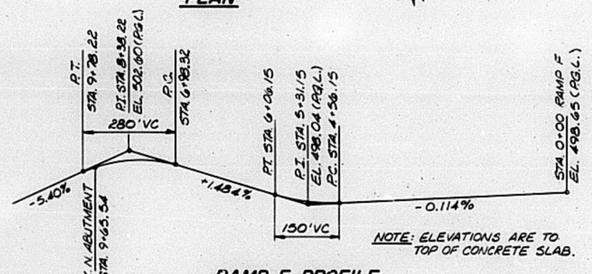


PLAN

TABLE OF STATIONS & ELEVATIONS

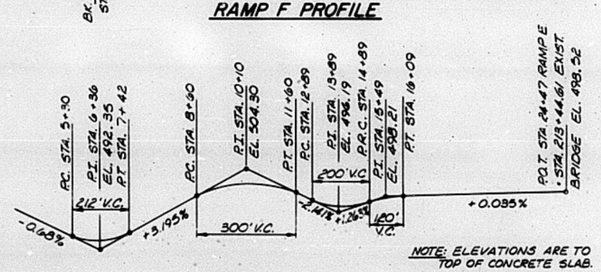
SUBSTRUCTURES	STATION	℄ RDWY. EL.	RG. EL.
BK. W. ABUTMENT	199+03.24		505.45
PIER 2	199+54.80		504.00
3	200+75.17		500.66
4	201+89.44		498.67
5	203+99.27	498.84	
6	206+59.27	498.84	
7	208+68.52	498.84	
8	210+77.77	498.84	
9	213+09.52	499.52	
10	215+18.77	503.89	
11	219+78.77	512.45	
12	225+98.77	512.45	
13	230+52.77	503.39	
14	232+15.60	500.07	
15	234+21.69	495.87	
16	235+83.94	492.56	
17	237+49.19	489.25	
18	239+52.27	485.04	
19	241+14.52	481.73	
20	242+76.77	478.42	
21	244+82.85	474.22	
BK. E. ABUTMENT	246+46.02	470.89	
BK. N. ABUTMENT	9+65.54		495.71
PIER 2F	8+65.80		499.81
BK. S. ABUTMENT	8+58.50		499.59
PIER 2E	9+93		502.31
3E	11+60		501.22
4E	12+92.88		498.57
5E	14+96.68		497.67
6E	17+56.74		498.41
7E	19+66.04		498.48
8E	21+75.33		498.55
9E	24+35.59		498.64

THESE ELEVATIONS ARE TO TOP OF CONCRETE SLAB.



NOTE: ELEVATIONS ARE TO TOP OF CONCRETE SLAB.

RAMP F PROFILE



NOTE: ELEVATIONS ARE TO TOP OF CONCRETE SLAB.

RAMP E PROFILE

TOTAL BILL OF MATERIAL

Item	Unit	Total	Peoria County	Tazewell County
Painting Structural Steel *	- Lump Sum	One	0.7	0.3

DESIGN STRESSES

STRUCTURAL STEEL THICKNESS OF PLATES t/8	M183 ALL 20,000 PS.I	M223 UP TO 2" 27,000 PS.I	M222 UP TO 4" 27,000 PS.I.
REINFORCEMENT BARS M31		f_y = 60,000 PS.I.	
CONCRETE f'c = 3500 PS.I.			

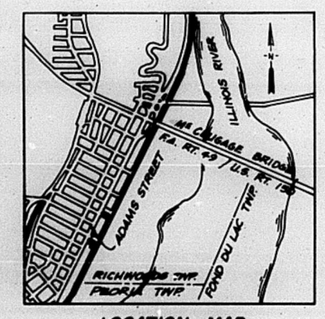
LOADING H5 20-44 & Future Wearing Surface of 25 lbs./Sq.Ft.
A.A.S.H.T.O. SPECIFICATIONS 1973 & INTERIM 1974.

EXAMINED BY
Carl E. Baumann
Engineer of Bridge & Traffic Structures

EUGENE R. WILLIAMSON 2980 REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS
Eugene R. Williamson
12-12-80

* Estimated weight structural steel 9675 Tons including bearings.

Peoria County	Tazewell County
6318	3357



LOCATION MAP

GENERAL PLAN & ELEVATION

McCLUGAGE BRIDGE OVER THE ILLINOIS RIVER

F.A. ROUTE 49 SEC.(158-1)-P

PEORIA & TAZEWELL COUNTIES

DESIGNED C.R.N.
CHECKED R.A.H.
DRAWN R.A.H.
CHECKED C.R.N.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD ILLINOIS PEORIA ILLINOIS

FILE NO. 74001
DATE

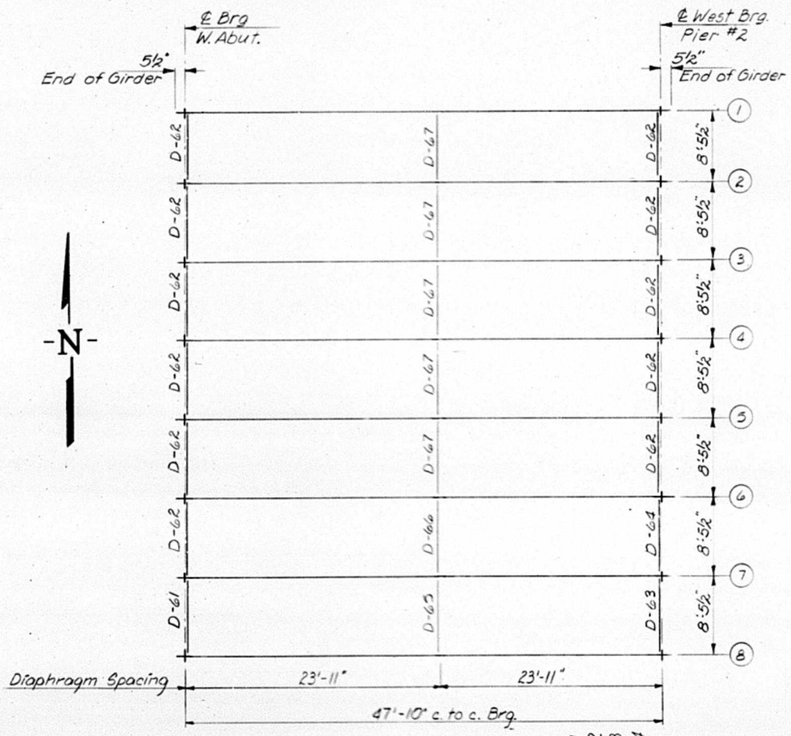
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA-49	(15B-1) -P	Peoria & Tazewell	96	4
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 2 of 93

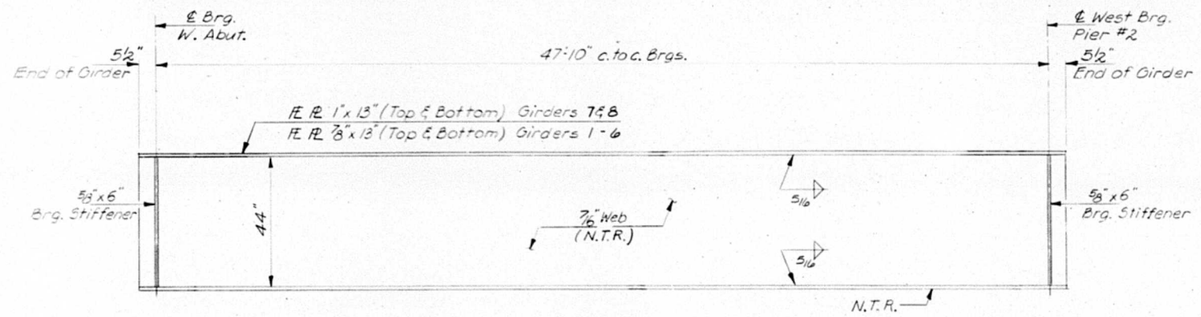
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Note: All dimensions shown are measured horizontally.

Note: The designation "N.T.R." signifies main load carrying members that are subject to the Supplemental Requirements for Notch Toughness.



FRAMING PLAN

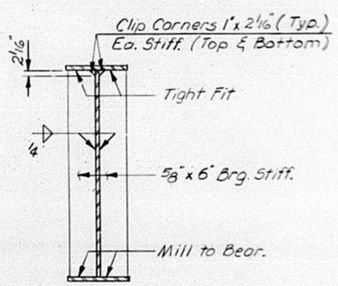


GIRDER ELEVATION

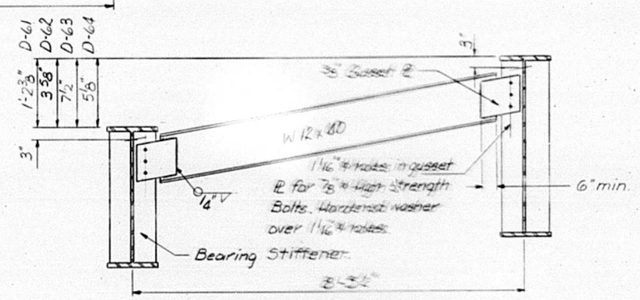
TOP OF WEB ELEVATIONS								
Girder Number	1	2	3	4	5	6	7	8
℄ Brg-W. Abut.	506.353	506.063	505.763	505.463	505.173	504.883	504.584	503.135
℄ West Brg. - Pier 2	504.906	504.606	504.306	504.006	503.706	503.406	502.844	501.858

GIRDER 8 REACTION TABLE		
Item	West Abut.	Pier #2
R ℄ (k)	36	36
R ℄ (k)	46	46
Imp. (k)	13	13
R TOTAL (k)	95	95

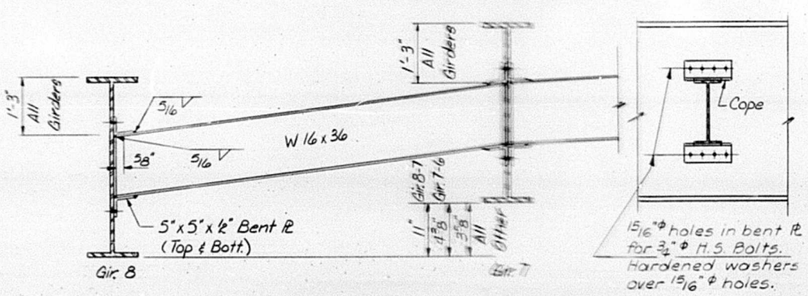
Note: Reaction Table for Girder 8 is based on a concrete Dead Load weight of 227 #/sq.ft. This includes both slab and a future median and weight of structural steel.



BEARING STIFFENER



DIAPHRAGMS D-61, D-62, D-63, & D-64



DIAPHRAGMS D-65, D-66, & D-67

MOMENT TABLE FOR GIRDERS 7 & 8		0.5 Point Span
I	(in.⁴)	16270
℄	(K/')	1.51
M ℄	('K)	432
M ℄	('K)	475
Imp.	('K)	138
M TOTAL	('K)	1045
fs	(KSI)	18

Note: Moment Table for Girders 7 & 8 is based on a Dead Load of 212 #/sq.ft. of Concrete Slab and future Concrete Median plus the weight of Structural Steel.

MOMENT TABLE FOR GIRDERS 1-6		0.5 Point Span
I	(in.⁴)	14,561
℄	(K/')	1.21
M ℄	('K)	346
M ℄	('K)	460
Imp.	('K)	134
M TOTAL	('K)	940
fs	(KSI)	17.5

Note: Moment Table for Girders 1 thru 6 is based on a Dead Load of 25 #/sq.ft. of future Cl.1 Surfacing and 94 #/sq.ft. of Concrete Slab plus weight of structural steel.

GIRDERS 1 THRU 7 REACTION TABLE		
Item	West Abut.	Pier #2
R ℄ (k)	29	29
R ℄ (K)	43	43
Imp. (K)	13	13
R TOTAL (K)	85	85

Note: Reaction Table for Girders 2 thru 6 is based on a Dead Load of 25 #/sq.ft. of future Cl.1 Surfacing & 94 #/s.f. of Concrete Slab plus weight of structural steel.

Steel Specifications this sheet:
Diaphragms - AASHTO M183
Diaphragm Bolts - AASHTO M164
Steel Plate - AASHTO M183

STRUCTURAL STEEL
SPAN 3

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED C.R.N.
CHECKED S.C.O.
DRAWN DAN
CHECKED C.R.N.

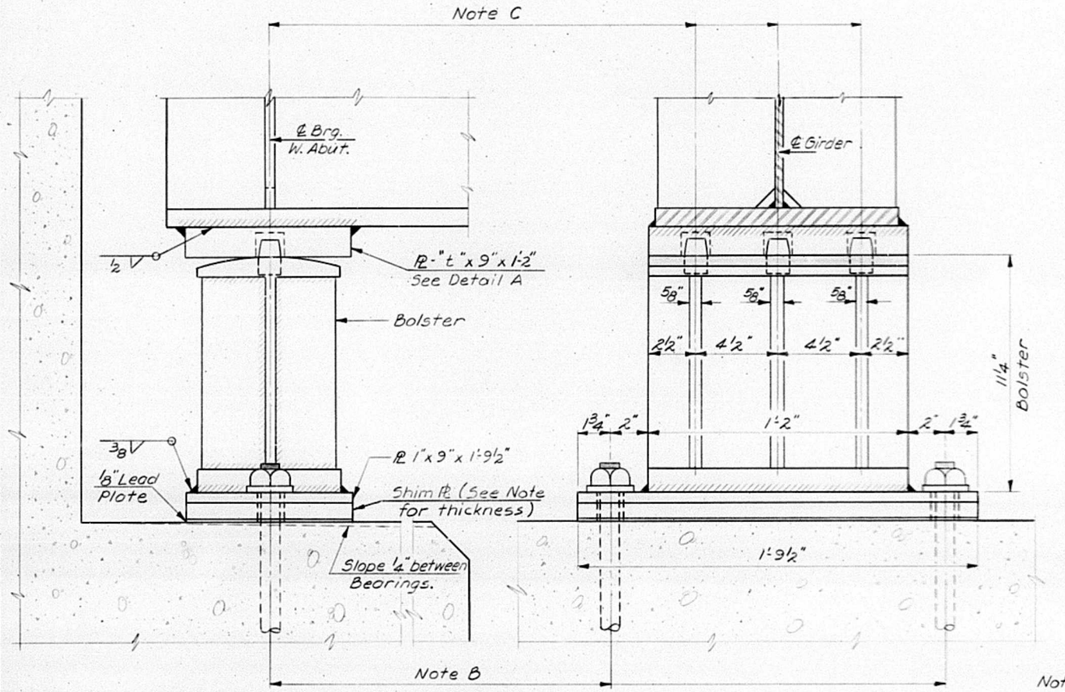
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

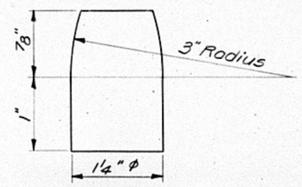
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA-49	(15B-1) -P	Peoria & Tazewell	96	5
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 3 of 93

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS



BEARING DETAILS AT WEST ABUTMENT

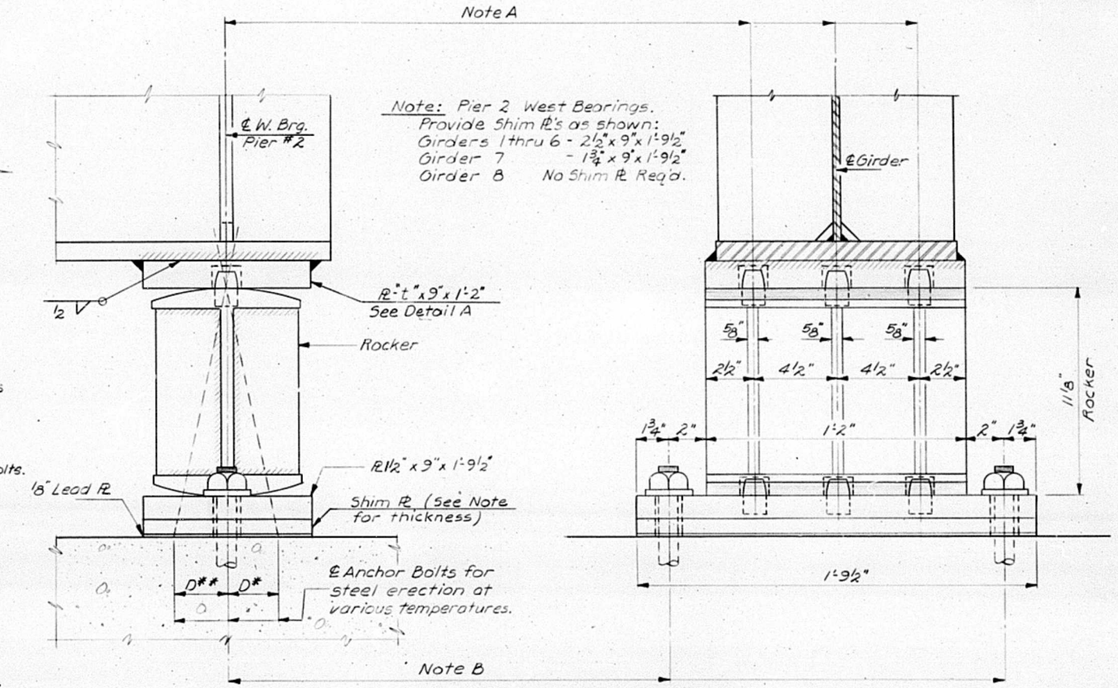


PINTLE DETAIL

NOTE A
1 3/8" Φ Holes - 1" deep in top PL for pintles. Thread or press fit pintles into bottom PL.

NOTE B
1 1/2" Φ Holes for 1" Φ x 12" anchor bolts. 5/16" x 2 1/2" x 2 1/2" PL. Washers under nuts.

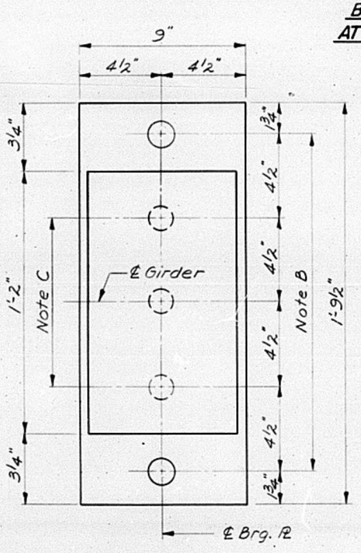
NOTE C
1 3/8" Φ Holes 1" deep in top PL only for 1 1/4" Φ pintles



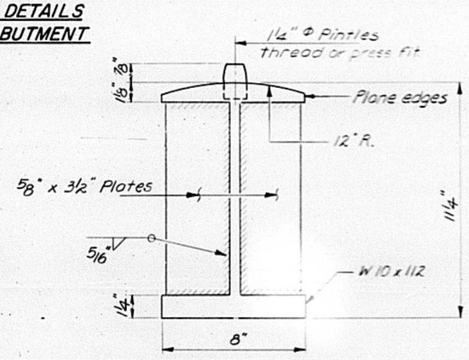
Note: Pier 2 West Bearings.
Provide Shim PL's as shown:
Girders 1 thru 6 - 2 1/2" x 9" x 1'-9 1/2"
Girder 7 - 1 3/4" x 9" x 1'-9 1/2"
Girder 8 No Shim PL Req'd.

WEST BEARING DETAILS AT PIER 2

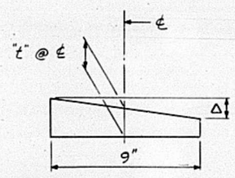
Note: West Abutment Bearings.
Provide 2 1/4" Shim PL @ Girder 8
Provide 2" Shim PL's @ Girders 1 to 7 incl.



PLAN AT WEST ABUTMENT



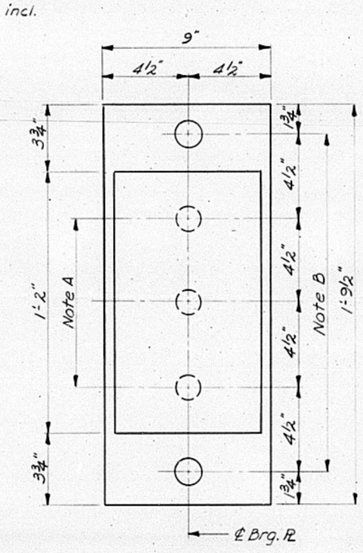
DETAIL OF BOLSTER AT WEST ABUTMENT



For Brgs. at Girders 1 thru 6 & 8
W. Abut. & W. Brg. Pier 2
"t" = 1 5/8"
Δ = 1/4"

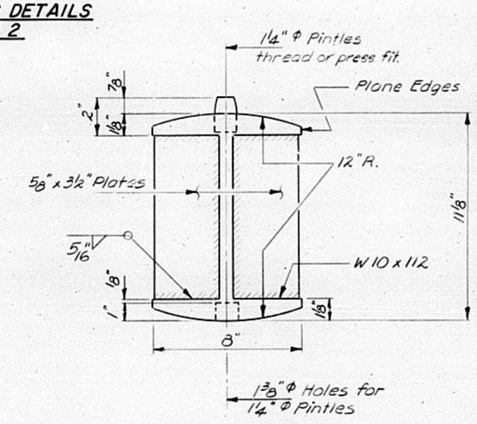
For Brgs. at Girder 7
W. Abut. & W. Brg. Pier 2
"t" = 1 5/8"
Δ = 5/16"

DETAIL A



PLAN AT WEST BEARING OF PIER 2

Steel Specifications this sheet:
Bearing Plate Material — AASHTO M183



DETAIL OF ROCKER AT WEST BEARING OF PIER 2

NOTES FOR SETTING OF ANCHOR BOLTS AT EXPANSION BEARINGS

a) D* (Side of Bearing away from Fixed Bearing.)
D* = 1/8" per each 100' of expansion for every 15° fall below the Normal Temperature of 50°F.

D** (Side of Bearing toward Fixed Bearing.)
D** = 1/8" per each 100' of expansion for every 15° above the Normal Temperature of 50°F.

b.) After Girders have been erected and dimensions D* & D** determined, holes shall be drilled & anchor bolts shall be grouted in place. All fixed anchor bolts may be built into the masonry.

BEARINGS - SPAN 3

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED C.R.N.
CHECKED S.C.O.
DRAWN DAN
CHECKED C.R.N.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA-49	(15B-1)-P	Peoria & Tazewell	96	6
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 4 of 93

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

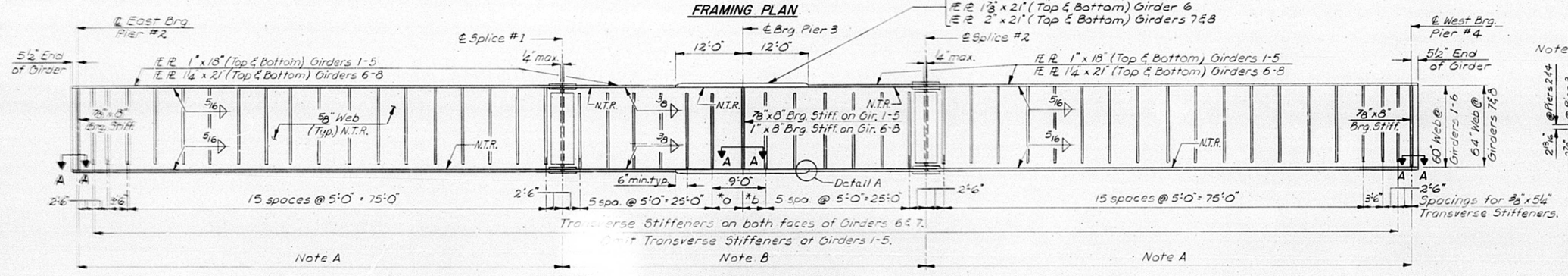
Note: All dimensions shown are measured horizontally.

TABLE OF SPAN LENGTHS & SPLICE DISTANCES **

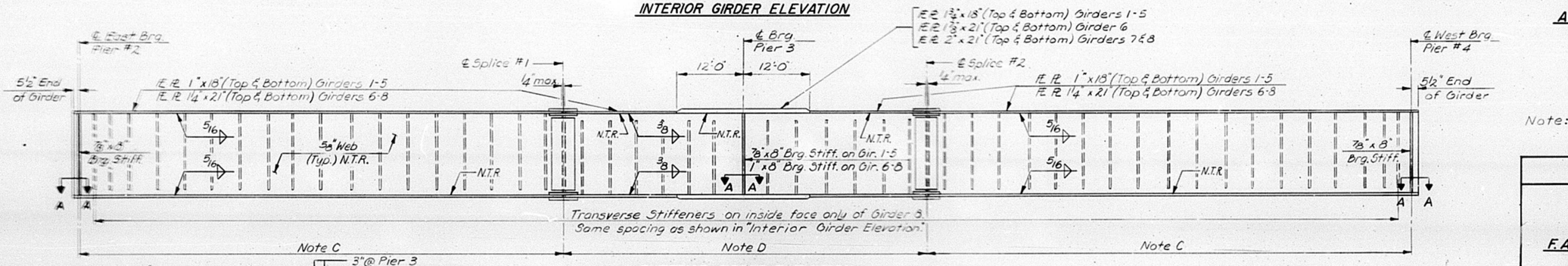
** Note: Lengths given along ℄ of girder.

Girder No.	1	2	3	4	5	6	7	8
℄ E. Brg. P.2 to ℄ Brg. P.3	120'-9 9/16"	120'-5 1/4"	120'-0 1/2"	119'-7 13/16"	119'-3 1/4"	118'-10 9/16"	118'-5 5/8"	118'-0 7/8"
℄ Brg. P.3 to ℄ W. Brg. P.4	115'-2 3/8"	115'-6 13/16"	115'-11 1/2"	116'-4 3/16"	116'-8 9/16"	117'-1 11/16"	117'-6 3/8"	117'-11 1/8"
℄ E. Brg. P.2 to ℄ Spl. 1	86'-0"	86'-0"	86'-0"	86'-0"	86'-0"	86'-0"	86'-0"	86'-0"
℄ Spl. 1 to ℄ Brg. P.3	34'-9 15/16"	34'-5 1/4"	34'-0 1/2"	33'-7 13/16"	33'-3 1/16"	32'-10 9/16"	32'-5 5/8"	32'-0 7/8"
℄ Brg. P.3 to ℄ Spl. 2	29'-2 1/16"	29'-6 3/8"	29'-11 1/2"	30'-4 3/16"	30'-8 9/16"	31'-1 11/16"	31'-6 3/8"	31'-11 1/8"
℄ Spl. 2 to ℄ W. Brg. P.4	86'-0 5/16"	86'-0 1/16"	86'-0"	86'-0"	86'-0"	86'-0"	86'-0"	86'-0"

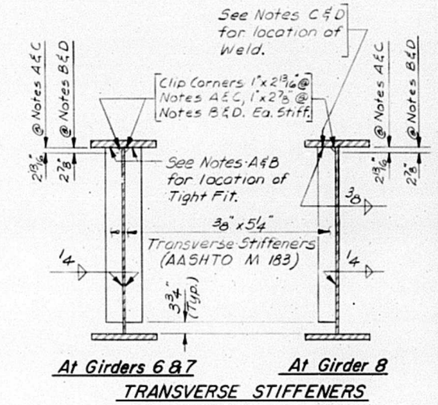
FRAMING PLAN



INTERIOR GIRDER ELEVATION



EXTERIOR GIRDER ELEVATION



At Girders 6 & 7 — At Girder 8

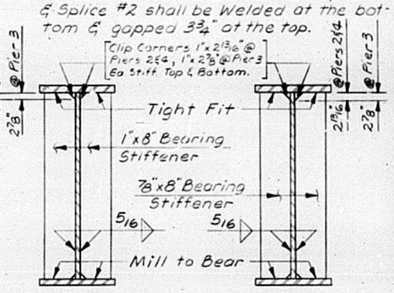
TRANSVERSE STIFFENERS

Note A: Transverse Stiffeners between Pier #2 & Splice #1 and between Splice #2 & Pier #4 shall be Tight Fit at the top & gapped 3 3/4" at the bottom.

Note B: Transverse Stiffeners between Splice #1 & Splice #2 shall be Tight Fit at the bottom and gapped 3 3/4" at the top.

Note C: Transverse Stiffeners between Pier #2 & Splice #1 and between Splice #2 & Pier #4 shall be Welded at the top & gapped 3 3/4" at the bottom.

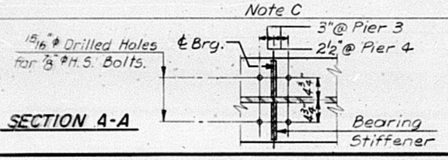
Note D: Transverse Stiffeners between Splice #1 & Splice #2 shall be Welded at the bottom & gapped 3 3/4" at the top.



At Pier 3 (Gir. 6-8) — At Piers 2 & 4 At Pier 3 (Gir. 1-5)

BEARING STIFFENERS

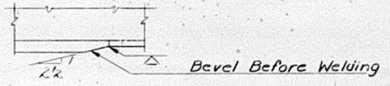
Note: All structural steel shall conform to AASHTO M223 unless otherwise noted.



SECTION A-A

* TABLE FOR DIMENSIONS a & b

	Girder No. 1	2	3	4	5	6	7	8
a	—	—	—	—	—	5'-4 5/16"	4'-11 5/8"	4'-6 7/8"
b	—	—	—	—	—	3'-7 11/16"	4'-0 3/8"	4'-5 1/8"



DETAIL A

STRUCTURAL STEEL
SPANS 4 & 5

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED D.L.B.
CHECKED S.C.O.
DRAWN D.A.N.
CHECKED S.C.O.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

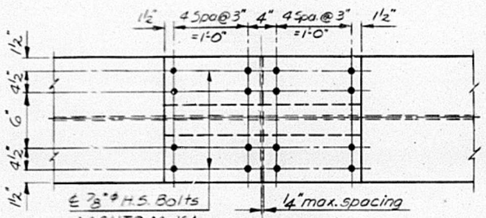
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA 49	(15B-1)-P	Peoria & Tazewell	96	7
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 5 of 93

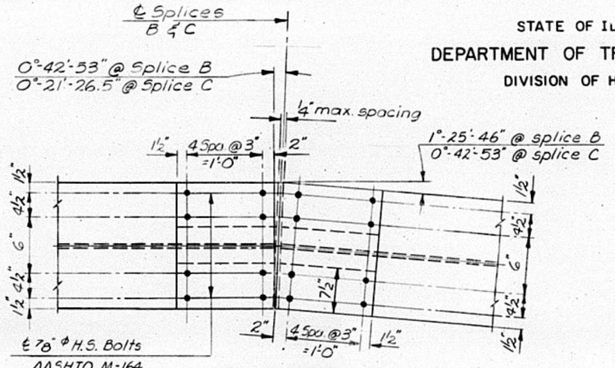
Notes

The designation N.T.R. signifies main load carrying members that are subject to the Supplemental Requirements for Notch Toughness.

All structural steel shall conform to AASHTO M223 unless otherwise noted.



TOP FLANGE



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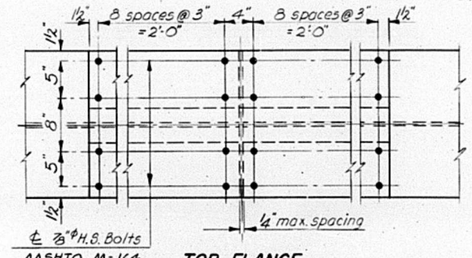

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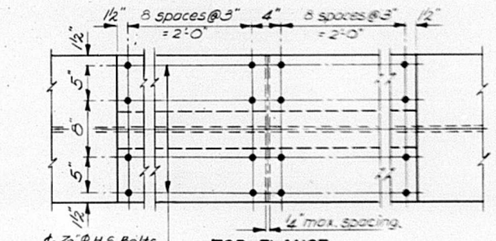

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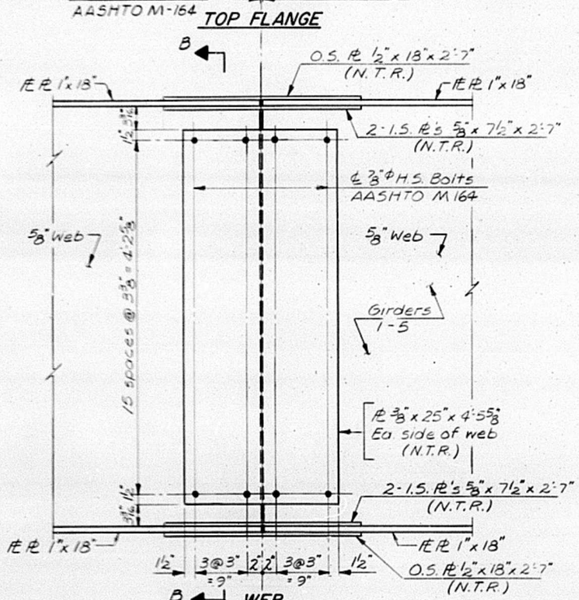

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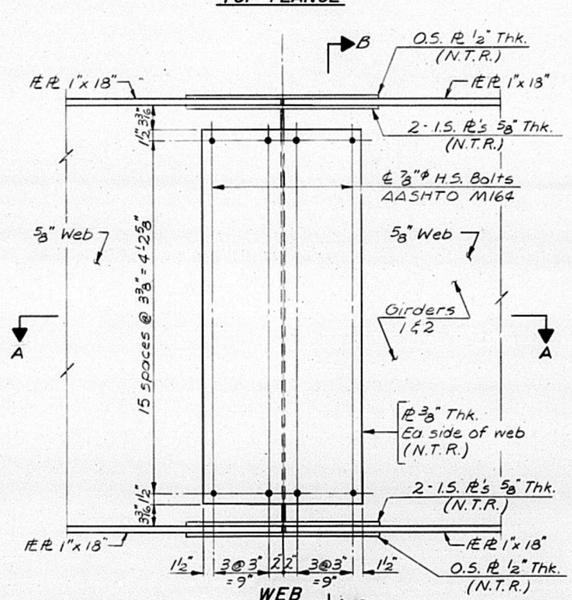

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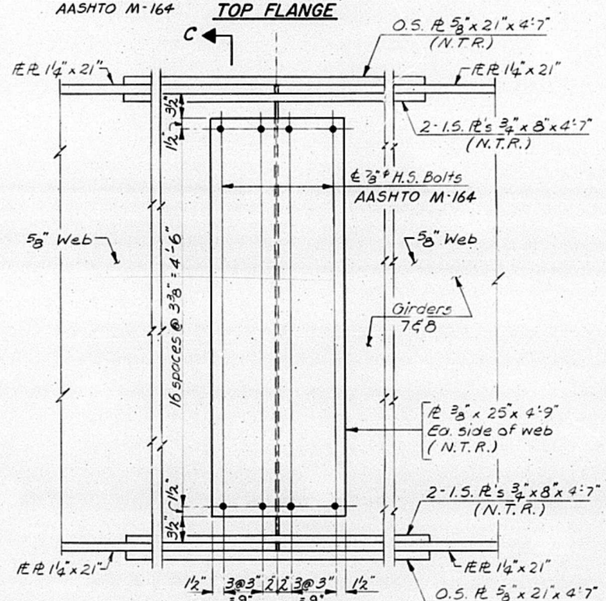

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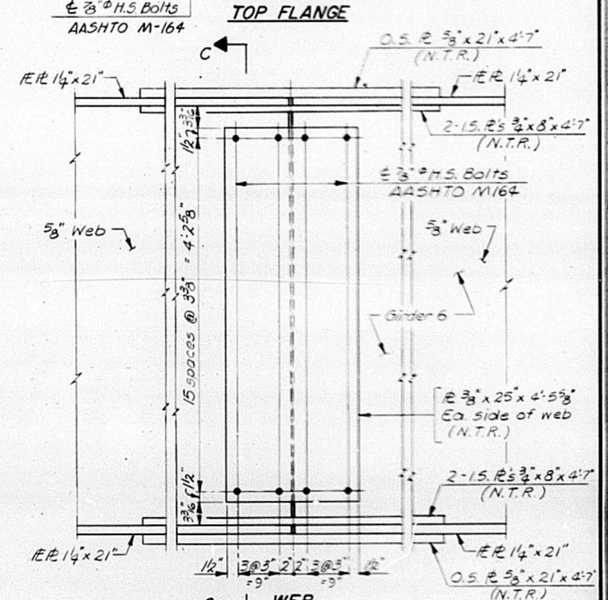

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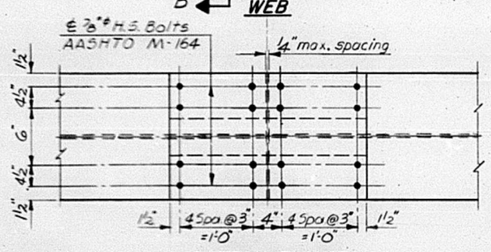
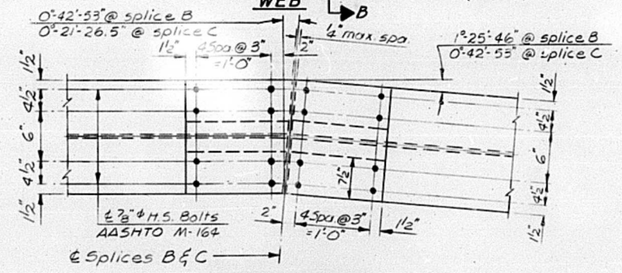
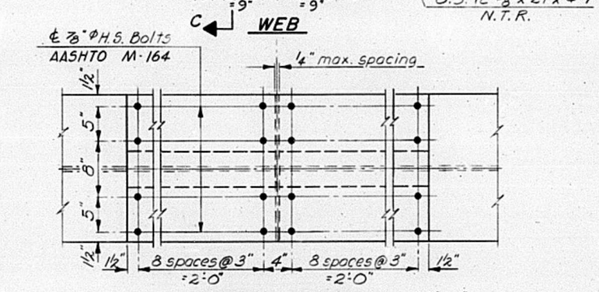


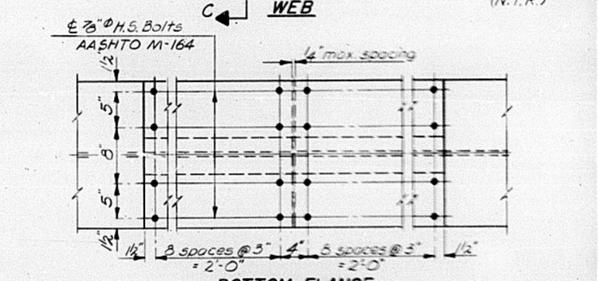
BOTTOM FLANGE
SPLICE DETAIL A



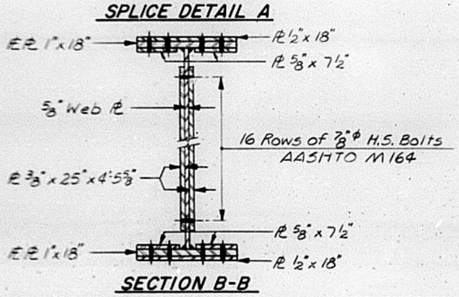
BOTTOM FLANGE
SPLICE DETAILS B&C



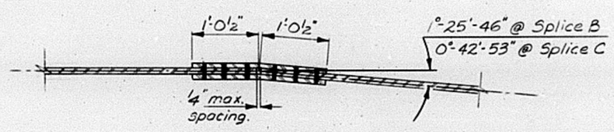
BOTTOM FLANGE
SPLICE DETAIL E



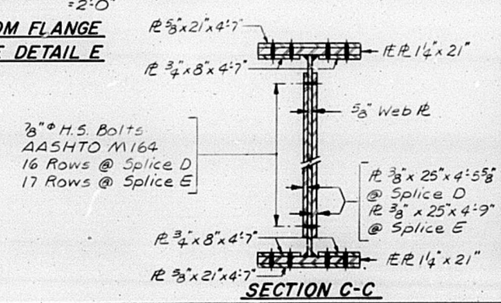
BOTTOM FLANGE
SPLICE DETAIL D



SECTION B-B



SECTION A-A



SECTION C-C

GIRDER SPLICE DETAILS
SPANS 4 & 5

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED D.L.B.
CHECKED S.C.O.
DRAWN DAN
CHECKED S.C.O.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.-49	(158-1) -P	PEORIA & TAZEWELL	96	8
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

TOP OF WEB ELEVATIONS

Girder No.	℄ East Brg. Pier 2	℄ Splice Span 4	℄ Brg. Pier 3	℄ Splice Span 5	℄ West Brg. Pier 4
1	504.787	502.339	501.044	500.340	498.546
2	504.487	501.980	500.924	500.171	498.390
3	504.188	501.674	500.627	499.857	498.247
4	503.890	501.367	500.328	499.547	498.087
5	503.590	501.061	500.031	499.236	497.926
6	503.261	500.691	499.681	498.861	497.735
7	502.693	500.727	499.686	498.906	497.967
8	501.666	500.843	499.762	499.040	498.297

Note: These elevations include camber for dead load deflections and are for fabrication only.

MOMENT TABLE GIRDERS 1 THRU 5

		.4pt. Span 4 or .6pt. Span 5	Pier 3
I	(in⁴)	44,742	71,322
D	(k/1)	1.314	1.421
M D	(1k)	1,257	2,800
M L	(1k)	1,141	1,328
Imp.	(1k)	240	279
M TOTAL	(1k)	2,638	4,407
fs	(ksi)	21.9	23.5

REACTION TABLE GIRDERS 1 THRU 5

		Pier 2 or 4	Pier 3
R D	(k)	57.5	215.2
R L	(k)	49.8	94.6
Imp.	(k)	10.5	19.9
R TOTAL	(k)	117.8	329.7

MOMENT TABLE GIRDER 6

		Crossover Stage		Final Stage	
		.4pt. Span 4 or .6pt. Span 5	Pier 3	.4pt. Span 4 or .6pt. Span 5	Pier 3
I	(in⁴)	60,496	86,647	60,496	86,647
D	(k/1)	1.845	1.934	1.385	1.474
M D	(1k)	1,765	3,812	1,325	2,905
M L	(1k)	1,141	1,328	1,141	1,328
Imp.	(1k)	240	279	240	279
M TOTAL	(1k)	3,146	5,419	2,706	4,512
fs	(ksi)	19.5	23.9	16.8	19.9

REACTION TABLE GIRDER 6

		Crossover Stage		Final Stage	
		Pier 2 or 4	Pier 3	Pier 2 or 4	Pier 3
R D	(k)	80.6	293.0	60.5	223.2
R L	(k)	49.8	94.6	49.8	94.6
Imp.	(k)	10.5	19.9	10.5	19.9
R TOTAL	(k)	140.9	407.5	120.8	337.7

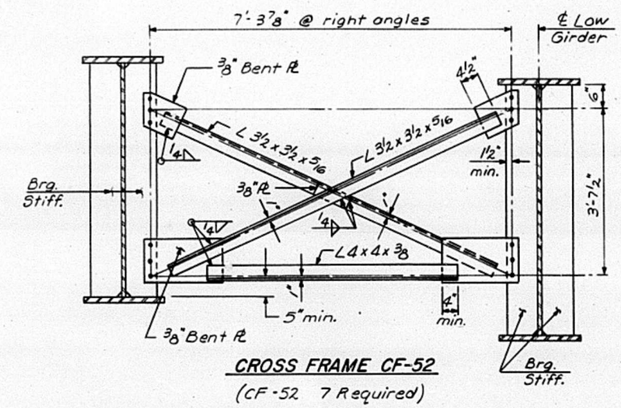
MOMENT TABLE GIRDERS 7 & 8

		Crossover Stage		Final Stage	
		.4pt. Span 4 or .6pt. Span 5	Pier 3	.4pt. Span 4 or .6pt. Span 5	Pier 3
I	(in⁴)	69,541	105,157	69,541	105,157
D	(k/1)	2.433	2.541	1.393	1.501
M D	(1k)	2,174	5,005	1,244	2,957
M L	(1k)	1,116	1,328	1,116	1,328
Imp.	(1k)	234	279	234	279
M TOTAL	(1k)	3,524	6,612	2,594	4,564
fs	(ksi)	20.2	25.7	14.9	17.7

REACTION TABLE GIRDERS 7 & 8

		Crossover Stage		Final Stage	
		Pier 2 or 4	Pier 3	Pier 2 or 4	Pier 3
R D	(k)	102.9	384.5	59.0	227.2
R L	(k)	49.7	94.6	49.7	94.6
Imp.	(k)	10.4	19.9	10.4	19.9
R TOTAL	(k)	163.0	499.0	119.1	341.7

Note: Reaction and Moment Tables are based on a Dead Load of 25#/sq.ft. of Cl. I surfacing and 94#/sq.ft. of concrete slab plus the weight of the structural steel.



CROSS FRAME CF-52
(CF-52 7 Required)

STRUCTURAL STEEL DETAILS
SPANS 4 & 5

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC.(158-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.Q.
CHECKED W.D.L.
DRAWN D.A.N.
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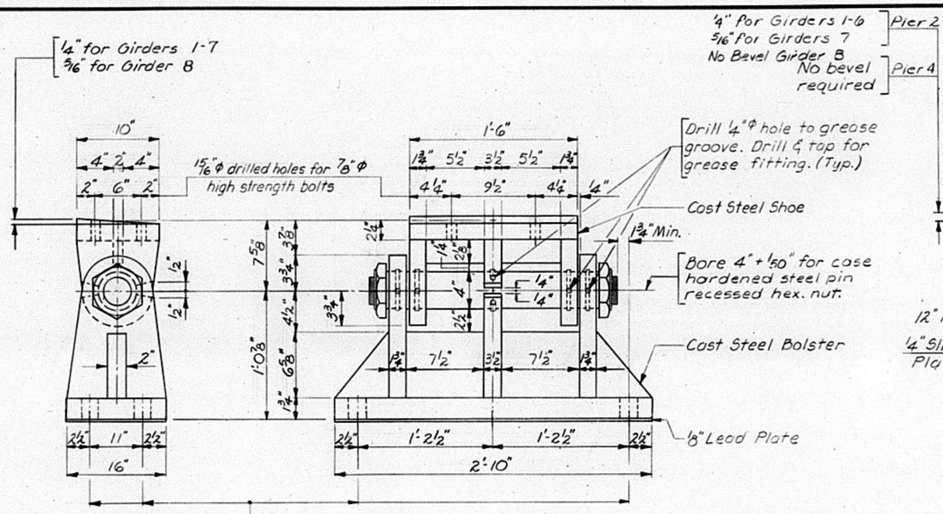
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1)-P	Peoria & Tazewell	96	9
FED. RD. DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 7 of 93

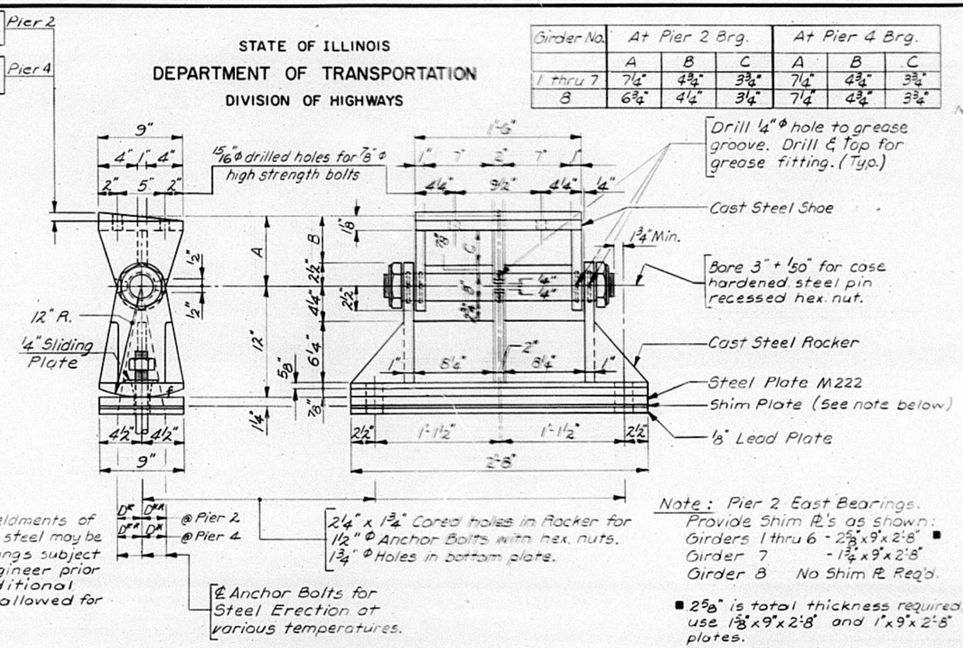
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS



BEARING AT PIER 3

1/4" for Girders 1-6 — Pier 2
3/16" for Girders 7
No Bevel Girder 8 — Pier 4
No bevel required

Girder No.	At Pier 2 Brg.			At Pier 4 Brg.		
	A	B	C	A	B	C
1 thru 7	7 1/4"	4 3/4"	3 3/4"	7 1/4"	4 3/4"	3 3/4"
8	6 3/4"	4 1/4"	3 1/4"	7 1/4"	4 3/4"	3 3/4"



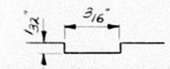
BEARING AT PIERS 2 & 4

Note: Cast steel shoes, rockers and bolsters shall meet requirements of A.A.S.H.T.O. M-192 Class 90

Note: Structural steel weldments of AASHTO M-222 or M-223 steel may be substituted for the castings subject to approval by the Engineer prior to fabrication. No additional compensation will be allowed for this substitution.

Note: Pier 2 East Bearings.
Provide Shim Pl's as shown:
Girders 1 thru 6 - 2 5/8" x 9" x 2'-8" ■
Girder 7 - 1 3/4" x 9" x 2'-8"
Girder 8 No Shim Pl Req'd.

■ 2 5/8" is total thickness required; use 1 3/8" x 9" x 2'-8" and 1" x 9" x 2'-8" plates.



GREASE GROOVE ON SADDLE

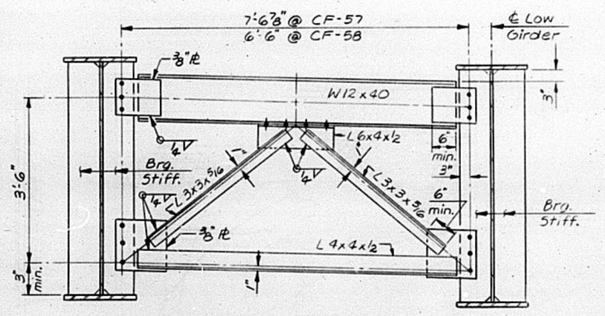
Note: Grease bearing assembly with molybdenum grease before installation.

NOTES FOR SETTING OF ANCHOR BOLTS AT EXPANSION BEARINGS

a) D* (Side of Bearing away from Fixed Bearing.)
D* = 1/8" per each 100° of contraction for every 15° fall below the Normal Temperature of 50°F.

D** (Side of Bearing toward Fixed Bearing.)
D** = 1/8" per each 100° of expansion for every 15° rise above the Normal Temperature of 50°F.

b.) After Girders have been erected and dimensions D* & D** determined, holes shall be drilled & anchor bolts shall be grouted in place. All fixed anchor bolts may be built into the masonry.



Note: 15/16" Φ holes in gusset Pl's for 3/4" Φ bolts. Hardened washers shall be required over holes in gusset Pl's.

CROSS FRAMES CF-57 & CF-58
(CF-57 12 Required)
(CF-58 2 Required)

Pier 2 W. Brg. Girders 1 thru 8 as shown.

Pier 4 E. Brg. Girders 1 thru 6 as shown.
Girders 7 & 8 opposite hand.

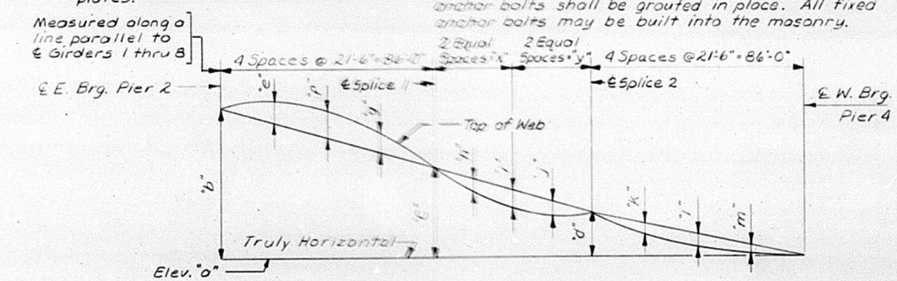
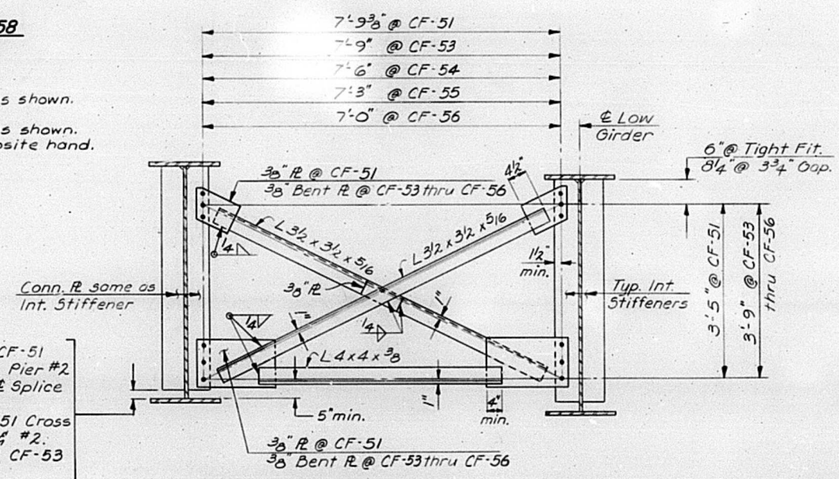


TABLE OF CAMBER DIMENSIONS

Gir. No.	"x"	"y"	Elev. "o"	"b"	"c"	"d"	"e"	"f"	"g"	"h"	"i"	"j"	"k"	"l"	"m"
1	34'-9 15/16"	29'-2 1/16"	498.546	6'-2 7/8"	3'-9 1/2"	11'-9 1/2"	1/8"	1 5/8"	1 3/16"	3/4"	2 1/2"	1 3/4"	0"	1/16"	0"
2	34'-5 1/4"	29'-6 3/4"	498.390	6'-1 5/8"	3'-7 11/16"	11'-3 3/8"	3/4"	1"	11/16"	5/8"	1"	7/8"	1/2"	1 11/16"	7/8"
3	34'-0 1/2"	29'-11 1/2"	498.247	5'-11 5/16"	3'-5 5/8"	11'-7 7/8"	11/16"	1"	11/16"	5/8"	1 9/16"	7/8"	5/8"	1 1/8"	7/8"
4	33'-7 13/16"	30'-4 3/16"	498.087	5'-9 5/8"	3'-3 3/8"	11'-5 1/2"	11/16"	1"	11/16"	5/8"	1 9/16"	7/8"	7/8"	1 1/4"	1"
5	33'-3 1/4"	30'-8 15/16"	497.926	5'-8"	3'-1 1/8"	11'-3 3/4"	11/16"	1"	11/16"	5/8"	1 5/16"	7/8"	1 1/8"	7/16"	1 1/16"
6	32'-10 9/16"	31'-1 11/16"	497.735	5'-6 5/16"	2'-11 1/2"	11'-1 1/2"	1/2"	11/16"	1/2"	9/16"	7/8"	3/4"	1 9/16"	1 15/16"	1 7/16"
7	32'-5 5/8"	31'-6 3/8"	497.967	4'-8 11/16"	2'-3 3/8"	11'-1/4"	-2 1/8"	-4 1/8"	-1 15/16"	-3/16"	1 9/16"	1 5/8"	1/8"	1/4"	7/8"
8	32'-0 7/8"	31'-11 1/8"	498.297	3'-4 7/16"	2'-6 7/16"	3'-9 9/16"	5/8"	1 1/2"	1/2"	-1 1/8"	2 1/8"	2 5/8"	1/2"	3/8"	1/8"

CAMBER DIAGRAM
GIRDERS 1 THRU 8



3 3/4" Gap @ Bottom for all CF-51 Cross Frames between ℄ Brg. Pier #2 & ℄ Splice #1 and between ℄ Splice #2 & ℄ Brg. Pier #4.
3 3/4" Gap @ Top for all CF-51 Cross Frames between Splices #1 & #2.
3 3/4" Gap @ Bottom for all CF-53 thru CF-56 Cross Frames.

CROSS FRAMES CF-51 & CF-53 Thru CF-56
(CF-51 62 Required) (CF-55 2 Required)
(CF-53 2 Required) (CF-56 2 Required)
(CF-54 2 Required)

Steel Specifications This Sheet:
Bearing Plate Material - AASHTO M-222
Cross Frames & Diaphragms - AASHTO M-183
Cross Frame & Diaphragm Bolts - AASHTO M-164

BEARINGS & CROSS FRAMES
SPANS 4 & 5

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED S.C.Q.
DRAWN D.A.N.
CHECKED W.D.L.

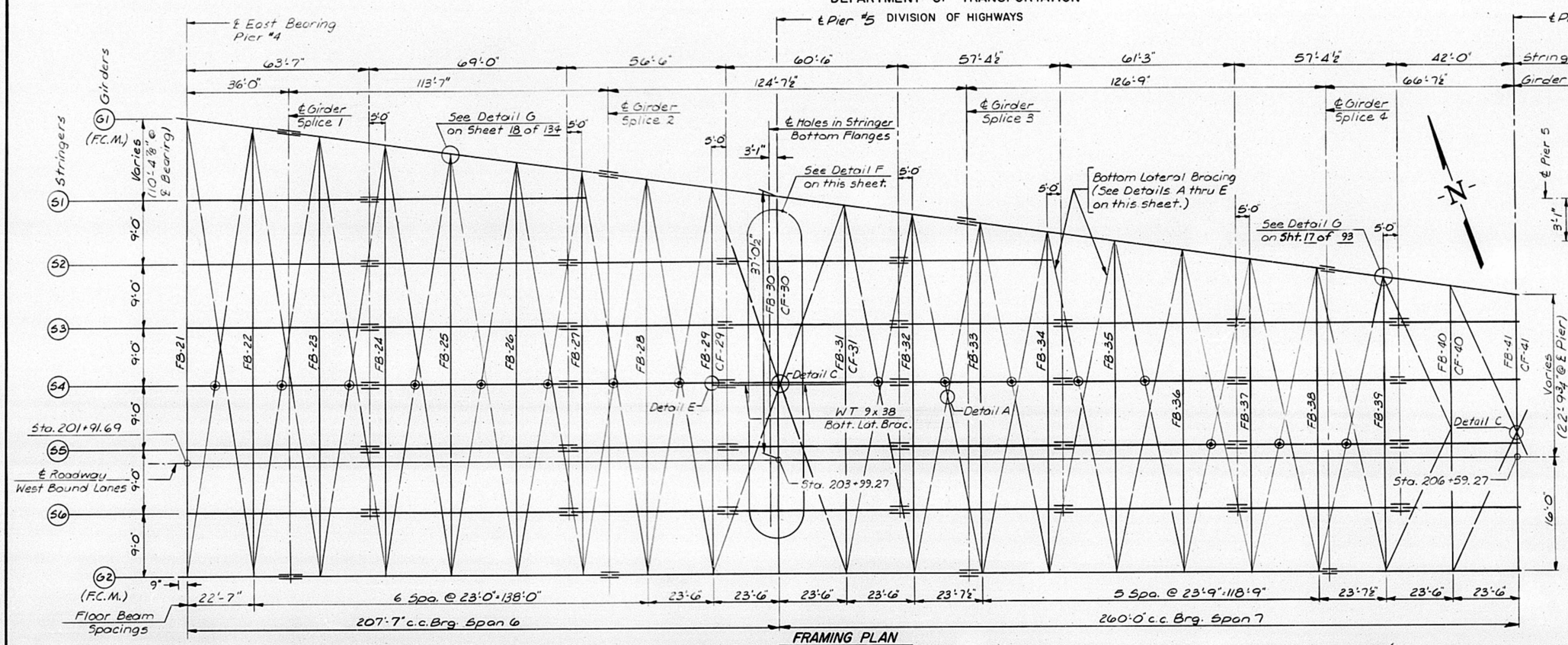
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001

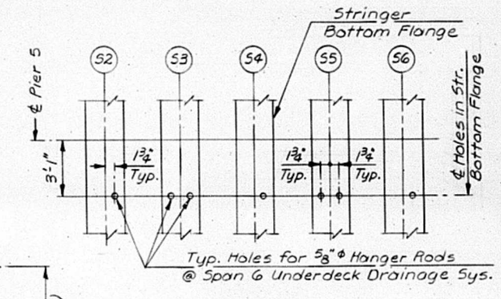
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1)-P	PEORIA & TAZEWELL	96	10
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

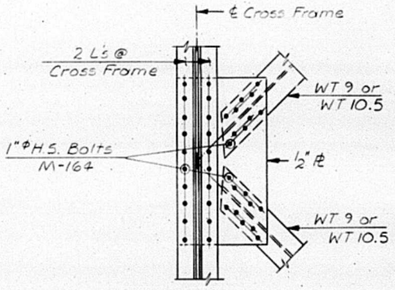
Sheet 8 of 93



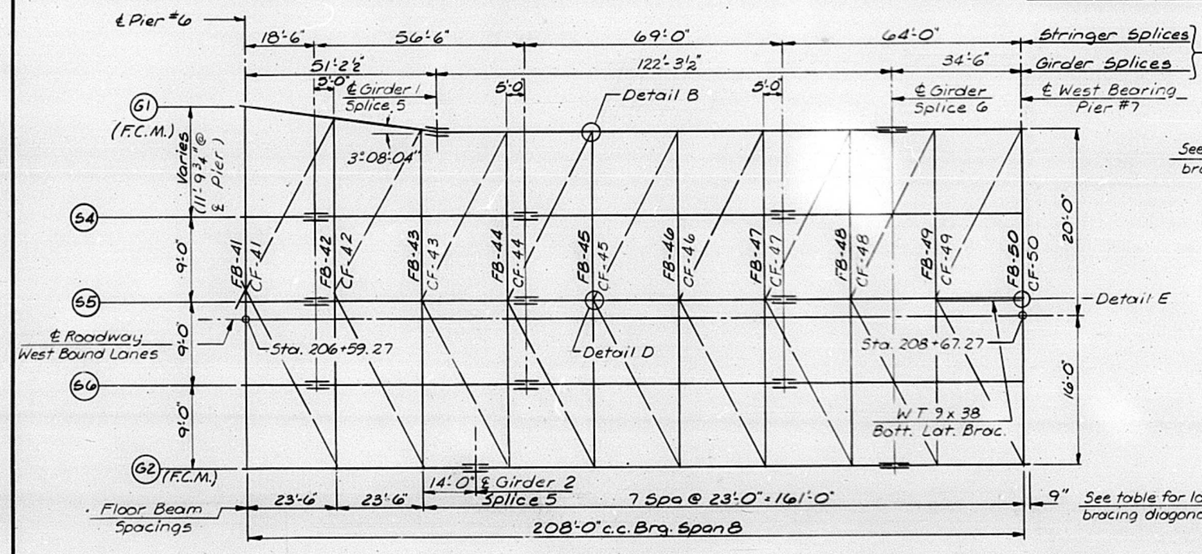
FRAMING PLAN



DETAIL F

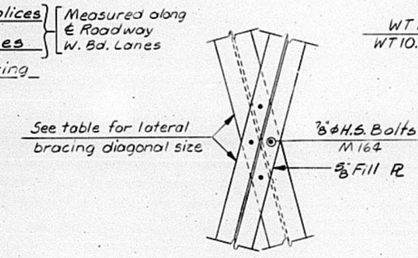


DETAIL D

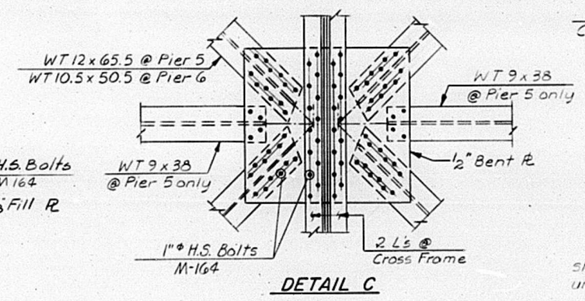


FRAMING PLAN

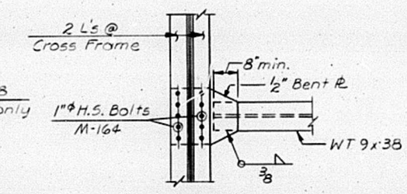
Location	Bottom Lateral Bracing Diagonal
FB 21 thru FB 31	WT 12 x 65.5
FB 31 thru FB 39	WT 9 x 38
FB 39 thru FB 44	WT 10.5 x 50.5
FB 44 thru FB 50	WT 9 x 38



DETAIL A



DETAIL C



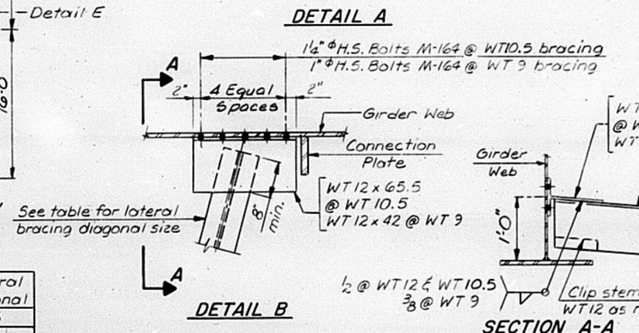
DETAIL E

Notes:

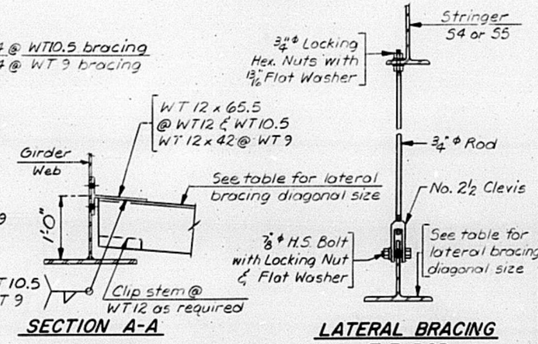
Structural steel for bottom lateral bracing shall meet the requirements for AASHTO M-183 unless otherwise noted.

⊙ On the framing plan indicates the general location of the tie rod hanger between the stringer & lateral bracing system.

All dimensions shown in framing plan are measured horizontally.



DETAIL B



SECTION A-A

LATERAL BRACING TIE ROD

BOTTOM LATERAL BRACING DETAILS

STRUCTURAL STEEL PLAN
SPANS 6, 7 & 8

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O.
CHECKED W.D.L.
DRAWN P.M.
CHECKED W.D.L.

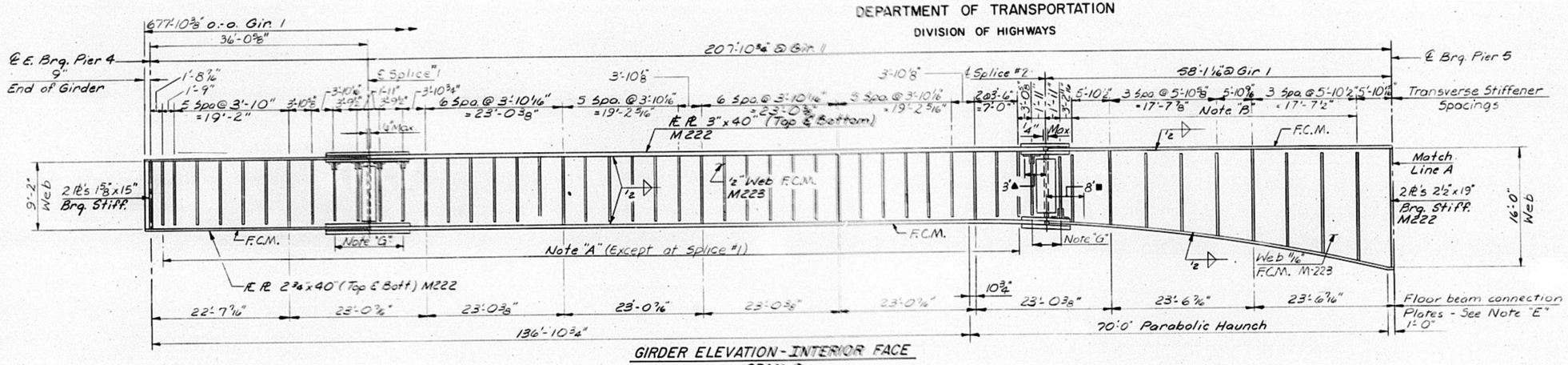
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA-49	(15B-1)-P	PEORIA & TAZEWELL	96	11
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 9 of 93



GIRDER ELEVATION - INTERIOR FACE
SPAN 6

Note "A": 5/8"x10" Transverse Stiffeners with 1/2" or 3/8" fillet welds at top flange & 3" gap at bottom flange.

Note "B": 11/16"x11" Transverse Stiffeners with 1/2" fillet welds at bottom flange & 4 1/8" gap at top flange.

Note "C": 9/16"x8 1/2" Transverse Stiffeners with 3/8" fillet welds at top flange & 3" gap at bottom flange.

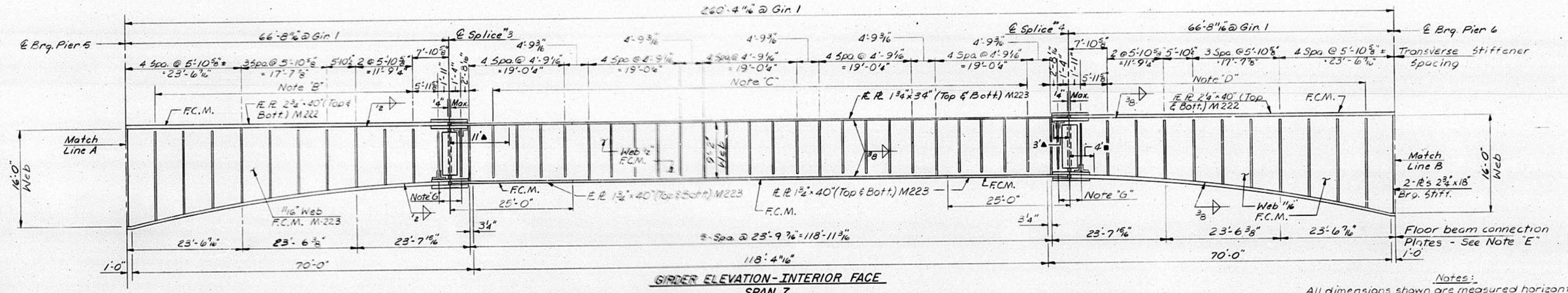
Note "D": 5/8"x10" Transverse Stiffeners with 3/8" fillet welds at bottom flange & 4 1/8" gap at top flange.

Note "E": 1 3/4"x10" Floor beam connection plates (M-223) on each side of web. Groove weld to web & both flanges.

Note "F": 1 1/4"x18" Transverse Stiffeners on each side of web with fillet welds to both flanges & web.

Note "G": 7/8"x10" Transverse Stiffeners with fillet weld to web & bolted connection to flanges. See Splice Details for Pl details.

Note "H": 1 1/4"x18" Transverse Stiffeners with fillet weld to web & bolted connection to both flanges. See Splice 5 Details.



GIRDER ELEVATION - INTERIOR FACE
SPAN 7

Notes:

All dimensions shown are measured horizontally and along ℄ of Girder.

All structural steel shown on this sheet shall be AASHTO M-183 unless otherwise noted.

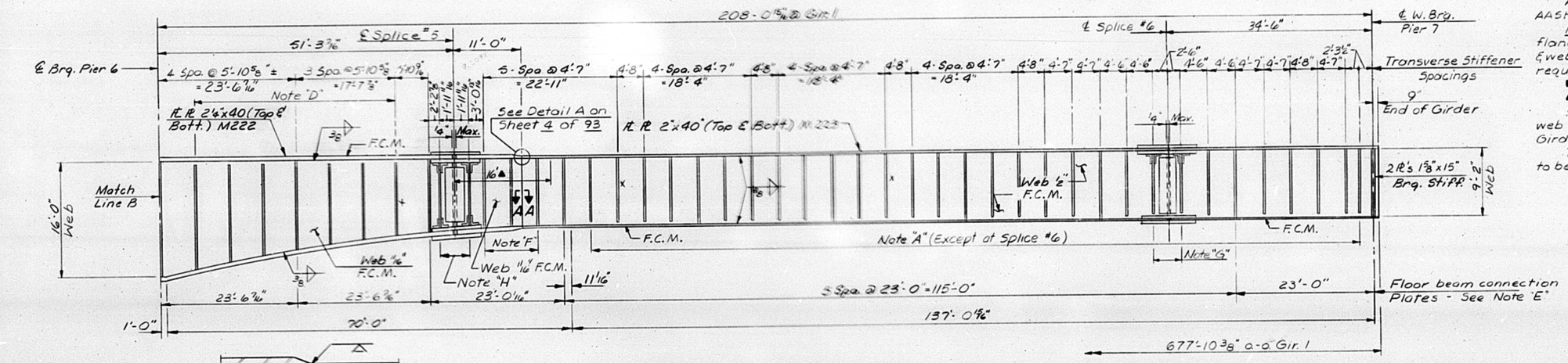
F.C.M. denotes Fracture Critical Member. Girder flanges as shown, webs, bearing stiffeners, & flange & web splice plates for Spans 6, 7 & 8 shall meet the requirements for fracture critical members.

■ F.C.M. @ lower girder flange this region.

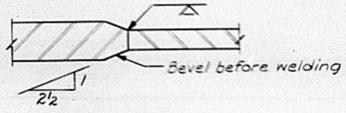
▲ F.C.M. @ upper girder flange this region.

Inside face for Girder 1 shown on this sheet. For web haunch details & stiffeners on outside face of Girder 1 see Sheet 11 of 93.

The inside connecting plates @ floor beams are to be welded normal to ℄ Roadway. See Sht. 15 of 93



GIRDER ELEVATION - INTERIOR FACE
SPAN 8



SECTION A-A

TRANSVERSE STIFFENER LOCATIONS
GIRDER 1 - SPANS 6, 7, & 8

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC.(15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED S.C.O.
DRAWN B.J.D.
CHECKED W.D.L.

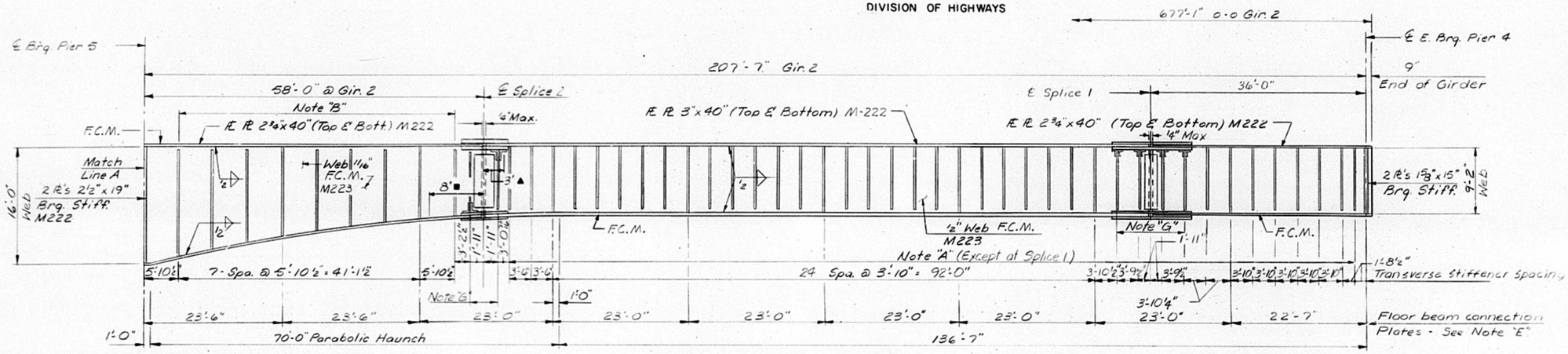
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

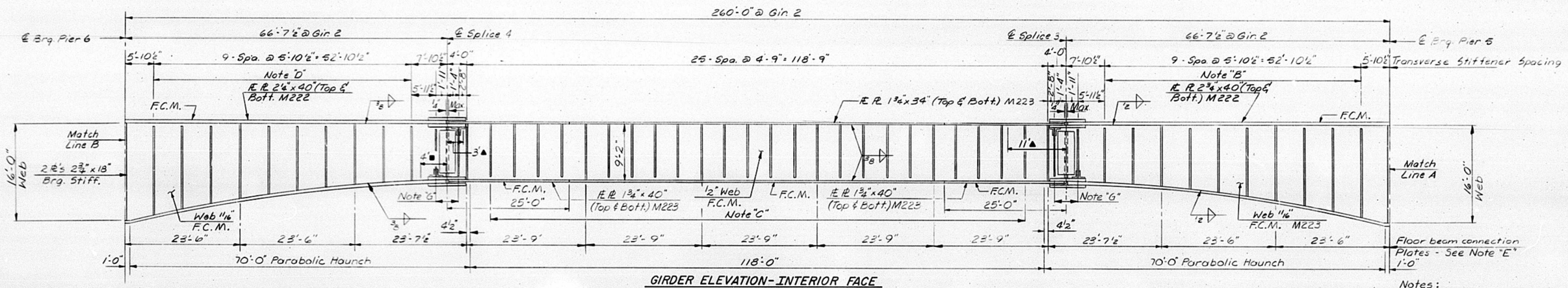
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA-49	(15B-1)-P	PEORIA & TAZEWELL	96	12
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

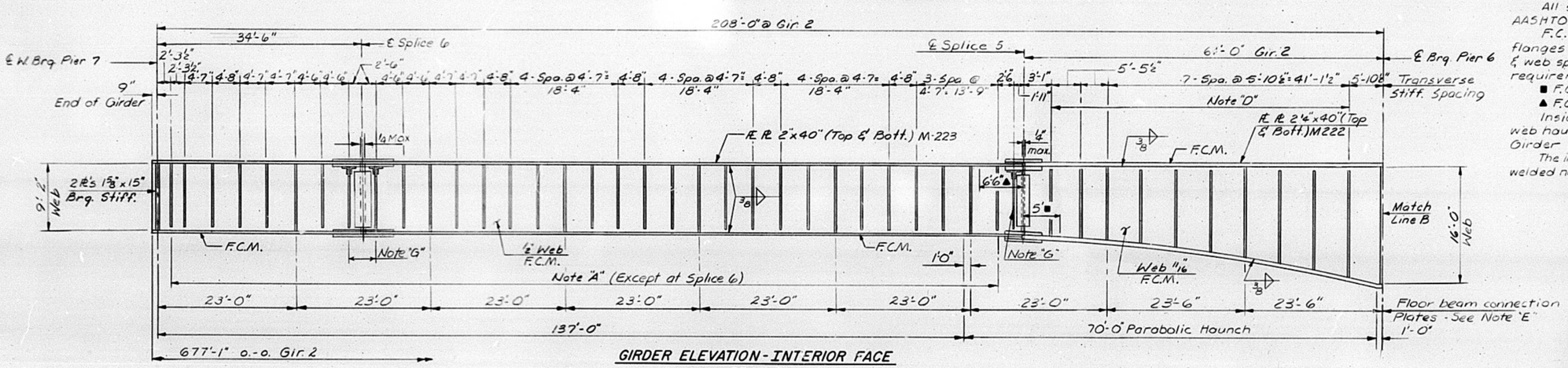
Sheet 10 of 93



GIRDER ELEVATION - INTERIOR FACE
SPAN 6



GIRDER ELEVATION - INTERIOR FACE
SPAN 7



GIRDER ELEVATION - INTERIOR FACE
SPAN 8

Note "A": ⅝"x10" Transverse Stiffeners with ½" or ⅝" Fillet Welds at top flange & 3" Gap at bottom flange.

Note "B": 11/16"x11" Transverse Stiffeners with ½" Fillet Welds at bottom & 4½" Gap at top flange.

Note "C": 9/16"x8½" Transverse Stiffeners with ⅜" Fillet Welds at top flange & 3" Gap at bottom flange.

Note "D": ⅝"x10" Transverse Stiffeners with ⅜" Fillet Welds at bottom & 4½" Gap at top flange.

Note "E": 1¾"x10" Floor beam connection Pl's (M-223) on each side of web. Groove weld to web & both flanges.

Note "G": ⅞"x10" Transverse Stiffeners with fillet welds to web & bolted connection to flanges. See Splice Details.

Notes:

All dimensions shown are measured horizontally and along ℄ Girder.

All structural steel shown on this sheet shall be AASHTO M-183 unless otherwise noted.

F.C.M. denotes Fracture Critical Member. Girder flanges as shown, webs, bearing stiffeners, & flange & web splice plates for Spans 6, 7 & 8 shall meet the requirements for fracture critical members.

■ F.C.M. @ lower girder flange this region.

▲ F.C.M. @ upper girder flange this region.

Inside face of Girder 2 shown on this sheet. For web haunch details & stiffeners on outside face of Girder 2 see Sheet 11 of 93

The inside connecting plates @ floor beams are to be welded normal to ℄ Roadway. See Sheet 15 of 93.

TRANSVERSE STIFFENER LOCATIONS
GIRDER 2 - SPANS 6, 7, & 8

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED S.C.O.
DRAWN B.J.D.
CHECKED W.D.L.

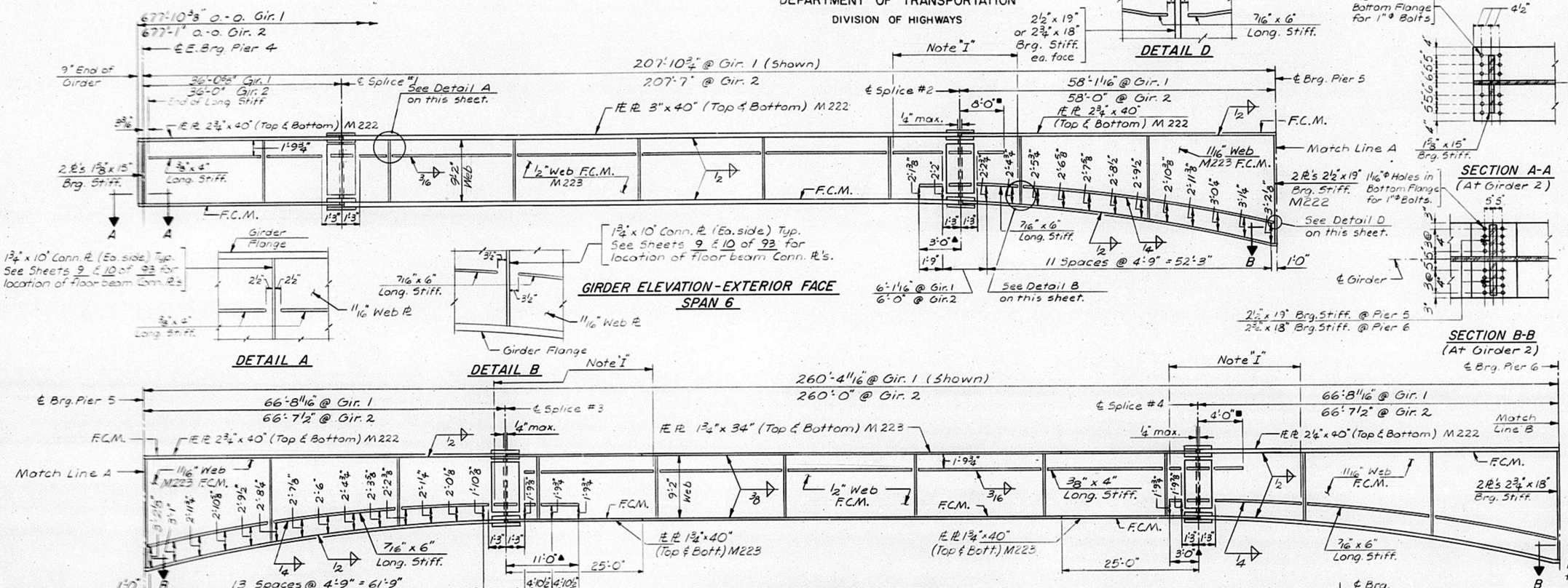
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA.-49	(15B-1) -P	PEORIA & TAZEWELL	96	13
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 11 of 93



Notes:

All dimensions shown are measured horizontally & along ℄ Girder.

All structural steel shown on this sheet shall be AASHTO M-183 unless otherwise noted.

F.C.M. denotes Fracture Critical Members.

Outside face of Girders 1 & 2 shown on this sheet.

For inside face of Girders 1 & 2 see Sheets 9 & 10 of 93.

■ F.C.M. lower girder flange this region.

▲ F.C.M. upper girder flange this region.

Note "I": Limits of F.C.M. for longitudinal stiffeners.

Note "F": 1 1/4" x 18" Transverse Stiffeners with fillet welds to both flanges and web. (Gir. 1 only)

Note "H": 1 1/4" x 18" Transverse Stiffeners with fillet weld to web and bolted connection to both flanges. See Splice 5 Details. (Gir. 1 only)

STRUCTURAL STEEL GIRDERS
SPANS 6, 7 & 8

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1) -P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O.
CHECKED W.D.L.
DRAWN D.A.N.
CHECKED S.C.O.

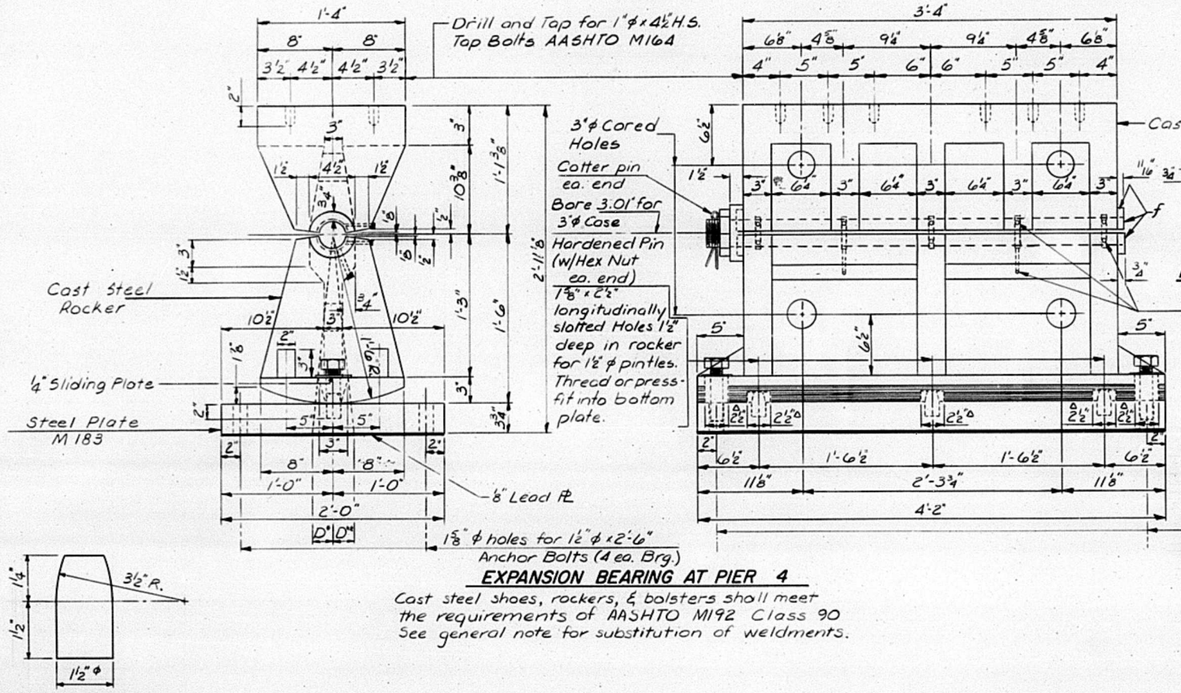
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) -P	PEORIA & TAZEWELL	96	14
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 12 of 93

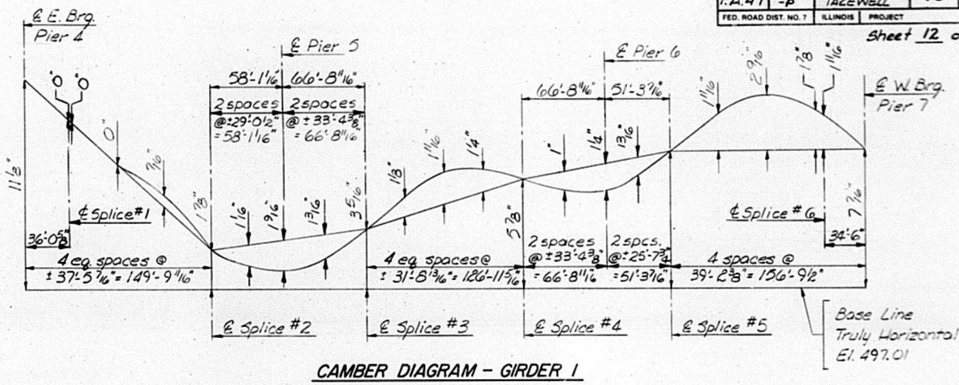


EXPANSION BEARING AT PIER 4

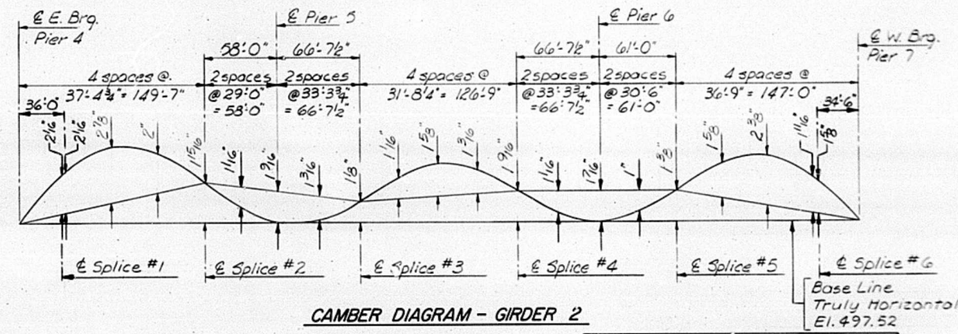
Cast steel shoes, rockers, & bolsters shall meet the requirements of AASHTO M192 Class 90 See general note for substitution of weldments.

PINTLE DETAIL

Pintles shall meet the requirements of AASHTO M-223.



CAMBER DIAGRAM - GIRDER 1



CAMBER DIAGRAM - GIRDER 2

NOTES:

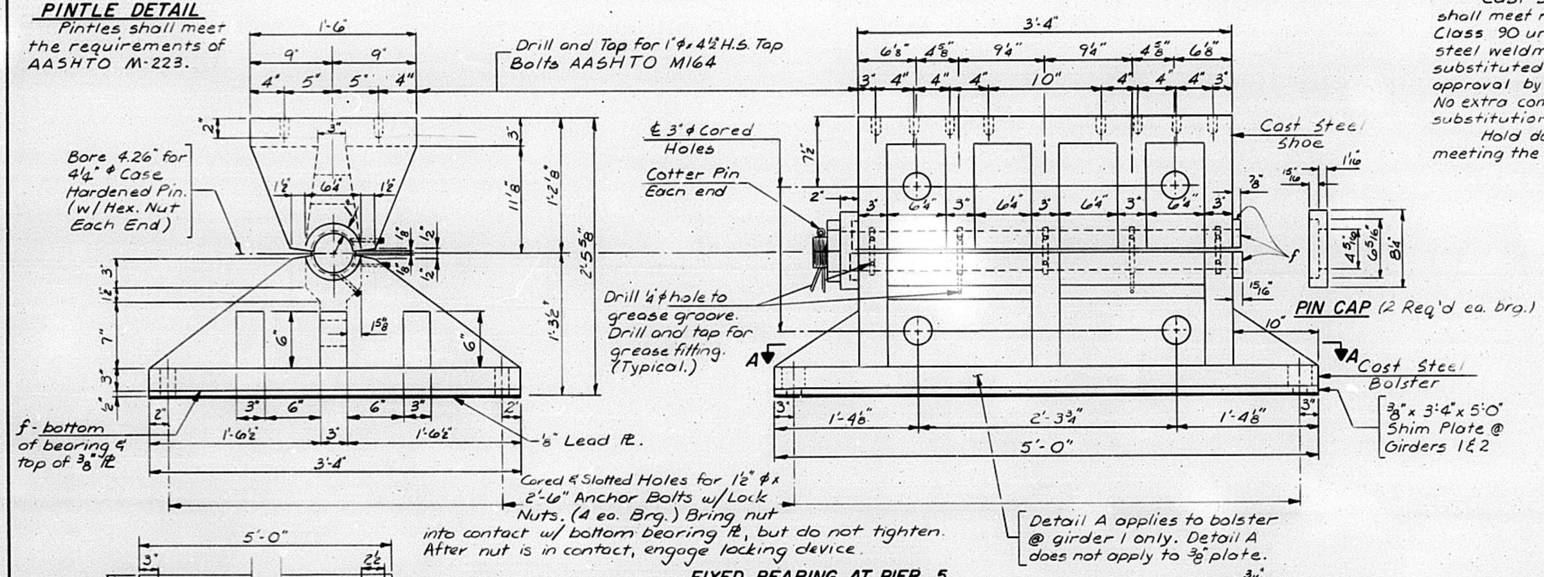
Cast steel shoes, rockers, & bolsters shall meet requirements of AASHTO M192 Class 90 unless noted otherwise. Structural steel weldments of M222 or M223 may be substituted for the castings subject to approval by the Engineer prior to fabrication. No extra compensation will be allowed for the substitution.

Hold down bolts, Pier 4, shall be high strength meeting the requirements of AASHTO M-164.

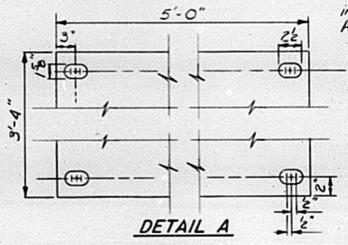
TOP OF WEB ELEVATIONS

Location	Girder 1	Girder 2
Pier 4, E. Brg.	497.94	497.52
Splice #1	497.75	497.56
Splice #2	497.17	497.68
Pier 5 Brg.	497.09	497.52
Splice #3	497.29	497.61
Splice #4	497.50	497.65
Pier 6 Brg.	497.45	497.52
Splice #5	497.60	497.63
Splice #6	497.62	497.55
Pier 7, W. Brg.	497.63	497.52

Note: Elevations include camber for dead load deflection and are for fabrication only.

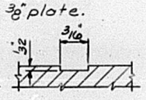


FIXED BEARING AT PIER 5



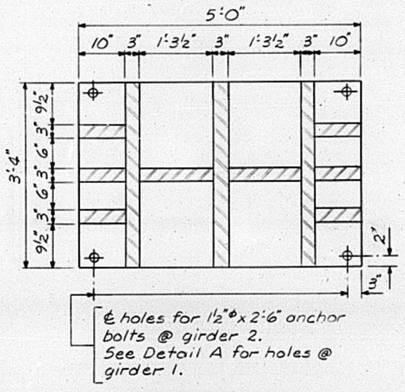
DETAIL A

Note: Detail A applies to girder 1 only.



GREASE GROOVE ON SADDLE

Grease bearing assembly with molybdenum grease before installation.



SECTION A-A

NOTES FOR SETTING OF ANCHOR BOLTS AT EXPANSION BEARINGS

A.) D* (Side of Bearing away from fixed Bearing)
D* = ⅛" per each 100' of expansion for every 15° fall below the Normal Temperature of 50°F.
D** (Side of Bearing toward fixed Bearing)
D** = ⅛" per each 100' of expansion for every 15° rise above the Normal Temperature of 50°F.

B.) After Girders have been erected and dimensions D* and D** determined, holes shall be drilled and anchor bolts shall be grouted in place. All fixed anchor bolts may be built into the masonry.

BEARINGS & CAMBER DIAGRAMS SPANS 6, 7 & 8

McCLUGAGE BRIDGE OVER THE ILLINOIS RIVER

F.A. ROUTE 49 SEC. (15B-1) -P

PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O.
CHECKED W.D.L.
DRAWN P.M.
CHECKED W.D.L.

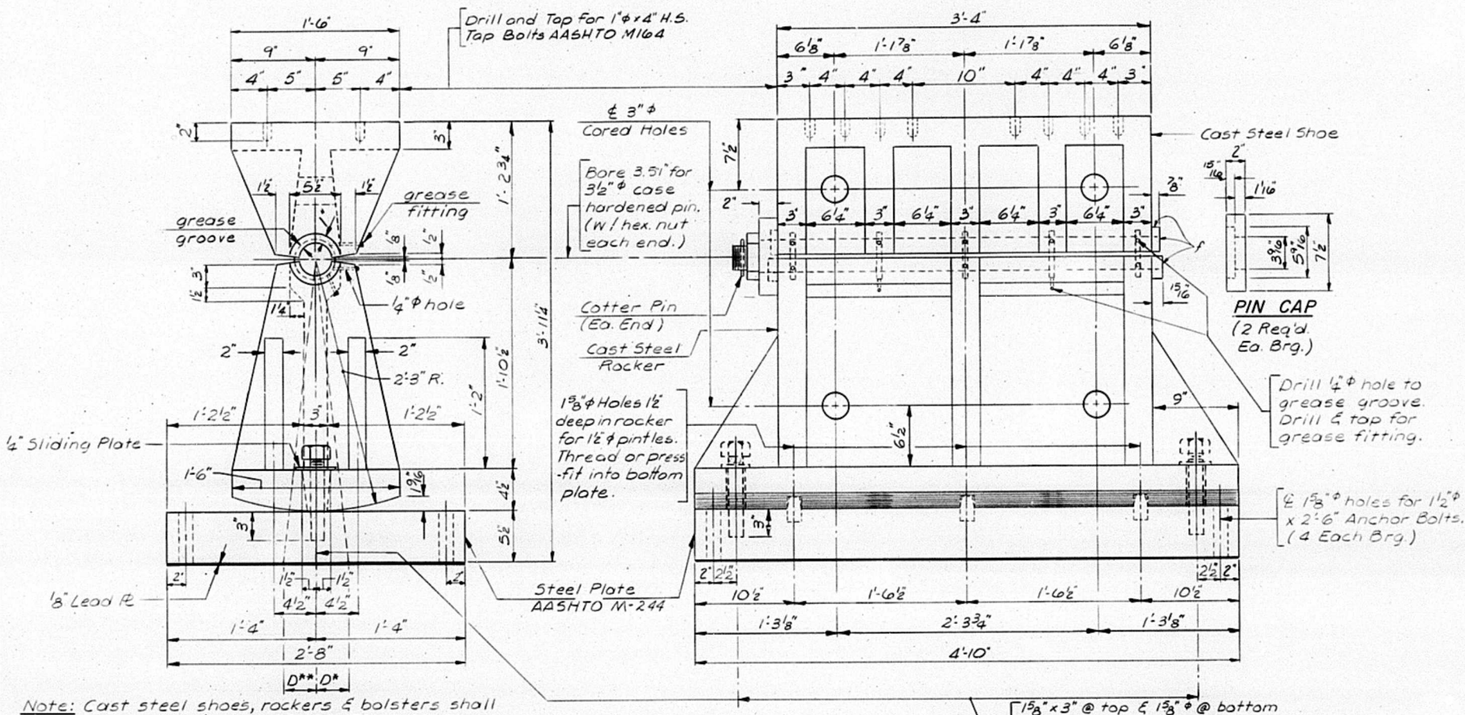
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA. 49	(15B-1) -P	Peoria & Tazewell	96	15
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

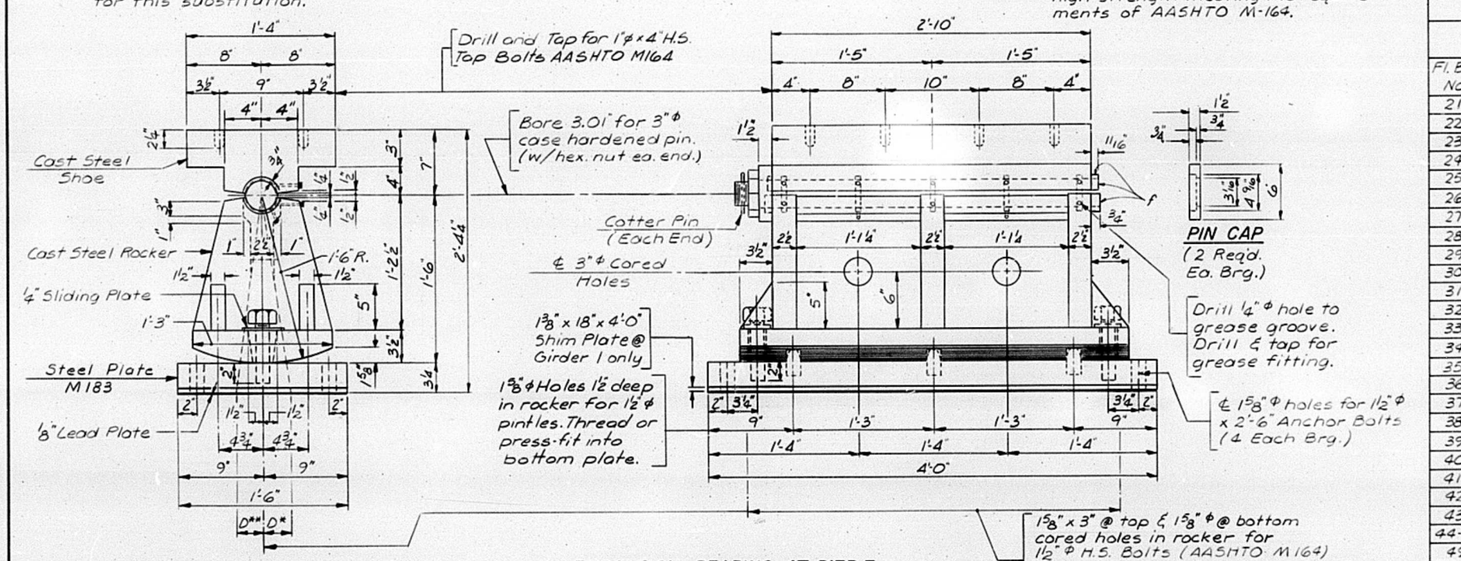
Sheet 13 of 93



EXPANSION BEARING AT PIER 6

Note: Cast steel shoes, rockers & bolsters shall meet requirements of AASHTO M192 Class 90 unless noted otherwise. Structural steel weldments of M222 or M223 may be substituted for the castings, subject to approval by the Engineer prior to fabrication. No extra compensation will be allowed for this substitution.

Note: Hold down bolts, Piers 6 & 7, shall be high strength meeting the requirements of AASHTO M-164.



EXPANSION BEARING AT PIER 7

Note: See Sheet 12 of 93 for notes pertaining to bearings.

FLOOR BEAM MOMENT TABLE

Fl. Bm. No.	I 0.5pt. Fl. Bm. (in.⁴)	D ◆ P(k)	D ◆ W(k/ft)	0.5 point - Floor Beam M_D (ft.k)	M_L (ft.k)	Imp. (ft.k)	M_TOTAL (ft.k)	fs (ksi)
21	53,360	10.4	.23	701	1,500	450	2,532	19.3
22	85,193	30.0	.31	1,783	1,916	575	4,274	21.5
23	81,067	25.2	.31	1,469	1,846	554	3,869	20.0
24	89,217	25.8	.32	1,449	1,777	533	3,759	18.4
25	91,683	25.5	.32	1,380	1,708	512	3,600	17.4
26	71,835	25.2	.27	1,291	1,652	496	3,439	21.0
27	72,080	24.3	.27	1,178	1,568	471	3,217	19.6
28	71,613	28.4	.27	1,416	1,499	450	3,365	20.6
29	71,170	27.7	.27	1,281	1,430	429	3,140	19.2
30	58,445	26.6	.26	1,130	1,360	408	2,898	19.8
31	58,032	26.2	.26	1,060	1,316	395	2,771	19.0
32	57,875	25.6	.26	984	1,273	382	2,639	18.2
33	57,464	25.6	.26	930	1,230	369	2,529	17.5
34	46,609	25.4	.22	831	1,146	344	2,327	19.6
35	46,075	30.5	.22	931	1,122	337	2,390	20.3
36	45,946	29.1	.22	849	1,099	330	2,278	19.4
37	45,609	27.7	.22	772	1,056	317	2,145	18.3
38	35,087	26.3	.21	697	1,012	304	2,013	19.9
39	34,800	25.7	.21	646	971	291	1,908	19.0
40	34,514	25.1	.21	597	930	279	1,806	18.0
41	25,515	24.7	.20	532	869	261	1,662	19.6
42	20,450	31.1	.19	616	848	254	1,718	22.9
43	20,450	29.0	.19	556	807	242	1,605	21.4
44-48	19,459	26.9	.19	515	766	230	1,511	20.7
49	19,459	30.5	.19	580	766	230	1,576	21.6
50	26,854	10.6	.20	223	579	174	976	11.2

◆ Note:
P designates concentrated load at each stringer.
W designates uniform load due to weight of floor beam.

FLOOR BEAM SHEAR & REACTION TABLE

Fl. Bm. No.	At Girder 1: V_D or R_D (k)	V_L or R_L (k)	Imp. (k)	V or R_TOTAL (k)	At Girder 2: V_D or R_D (k)	V_L or R_L (k)	Imp. (k)	V or R_TOTAL (k)
21	37.9	102.2	30.7	170.8	39.3	102.2	30.7	172.2
22	99.6	133.6	40.1	273.3	100.0	133.6	40.1	273.7
23	86.5	132.2	39.7	258.4	83.9	132.2	39.7	255.8
24	90.1	130.6	39.2	259.9	84.1	130.6	39.2	253.9
25	90.6	129.0	38.7	258.3	81.4	129.0	38.7	249.1
26	89.8	127.4	38.2	255.4	77.1	127.4	38.2	242.7
27	75.2	116.0	34.8	226.0	72.0	116.0	34.8	222.8
28	76.4	114.9	34.5	225.8	80.6	114.9	34.5	230.0
29	75.6	113.7	34.1	223.4	76.5	113.7	34.1	224.3
30	74.6	112.6	33.8	221.0	72.2	112.6	33.8	218.6
31	75.3	111.2	33.4	219.9	69.5	111.2	33.4	214.1
32	76.0	109.9	33.0	218.9	66.8	109.9	33.0	209.7
33	76.7	108.5	32.6	217.8	64.1	108.5	32.6	205.2
34	62.8	106.9	32.1	201.8	59.8	106.9	32.1	198.8
35	64.0	105.3	31.6	200.9	68.2	105.3	31.6	205.1
36	62.8	109.6	32.9	205.3	63.6	109.6	32.9	206.1
37	61.5	108.4	32.5	202.4	59.0	108.4	32.5	199.9
38	61.0	107.3	32.2	200.5	55.2	107.3	32.2	194.7
39	60.8	106.1	31.8	198.7	51.8	106.1	31.8	189.7
40	60.6	104.7	31.4	196.7	48.3	104.7	31.4	184.4
41	47.9	103.2	31.0	182.1	44.4	103.2	31.0	178.6
42	48.3	101.8	30.5	180.6	52.1	101.8	30.5	184.4
43	46.6	100.0	30.0	176.6	47.2	100.0	30.0	177.2
44-48	43.8	99.7	29.9	173.4	43.8	99.7	29.9	173.4
49	49.2	99.7	29.9	178.8	49.2	99.7	29.9	178.8
50	19.5	75.5	22.6	117.6	19.5	75.5	22.6	117.6

GIRDER MOMENT TABLE

	0.4 point Span 6	Pier 5	0.5 point Span 7	Pier 6	0.6 point Span 8
I (in.⁴)	821,778	2,491,658	427,008	2,103,568	557,271
D (k/ft.)	6.46	6.26	4.97	4.85	4.26
M_D (ft.k)	17,291	38,290	7,704	29,688	10,548
M_L (ft.k)	7,349	10,064	4,954	9,743	5,739
Imp (ft.k)	1,102	1,510	743	1,461	861
M_TOTAL (ft.k)	25,742	49,864	12,401	40,892	17,148
fs (ksi)	21.8	24.2 A	21.4	23.3 B	21.0

A - Includes .5 ksi additional stress due to haunch.
B - Includes .4 ksi additional stress due to haunch.

GIRDER REACTION TABLE

	℄ E. Brg Pier 4	℄ Brg. Pier 5	℄ Brg. Pier 6	℄ W. Brg. Pier 7
R_D (K)	435.0	1,467.0	1,152.6	282.2
R_L (K)	174.6	372.8	345.7	142.4
Imp. (K)	26.2	55.9	51.8	21.4
R_TOTAL (K)	635.8	1,895.7	1,550.1	446.0

STRINGER MOMENT TABLE

	0.4 point End Spans	0.5 point All Int. Spans	1st. Int. Floor Beam	All Other Int. Floor Beams
I (in.⁴)	1,350	1,350	1,350	1,350
D (k/ft.)	1.15	1.15	1.15	1.15
M_D (ft.k)	50	22	68	55
M_L (ft.k)	126	95	113	106
Imp. (ft.k)	38	29	34	32
M_TOTAL (ft.k)	214	146	215	193
fs (ksi)	22.5	15.4	22.6	20.3

STRINGER SHEAR & REACTION TABLE

	End Floor Beam: V_R	R	First Interior Floor Beam: V_L	V_R	R	All Other Floor Beams: V_L	V_R	R
R_D (k)	10.7	10.7	16.5	14.3	30.8	13.6	13.6	27.2
R_L (k)	34.5	34.5	39.7	37.1	45.3	37.3	37.3	42.2
Imp. (k)	10.4	10.4	11.9	11.1	13.6	11.2	11.2	12.7
R_TOTAL (k)	55.6	55.6	68.1	62.5	89.7	62.1	62.1	82.1

V_R - denotes shear to right of support.
V_L - denotes shear to left of support.
R - denotes reaction.

BEARINGS, MOMENTS & REACTIONS
SPANS 6, 7 & 8

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O.
CHECKED W.D.L.
DRAWN P.M.
CHECKED W.D.L.

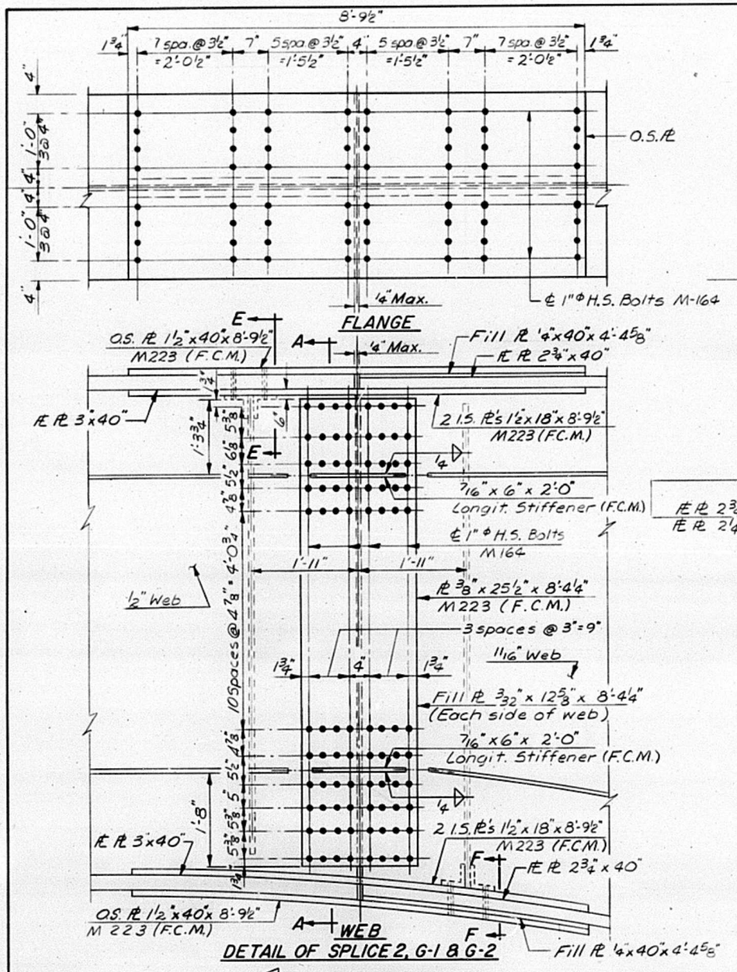
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

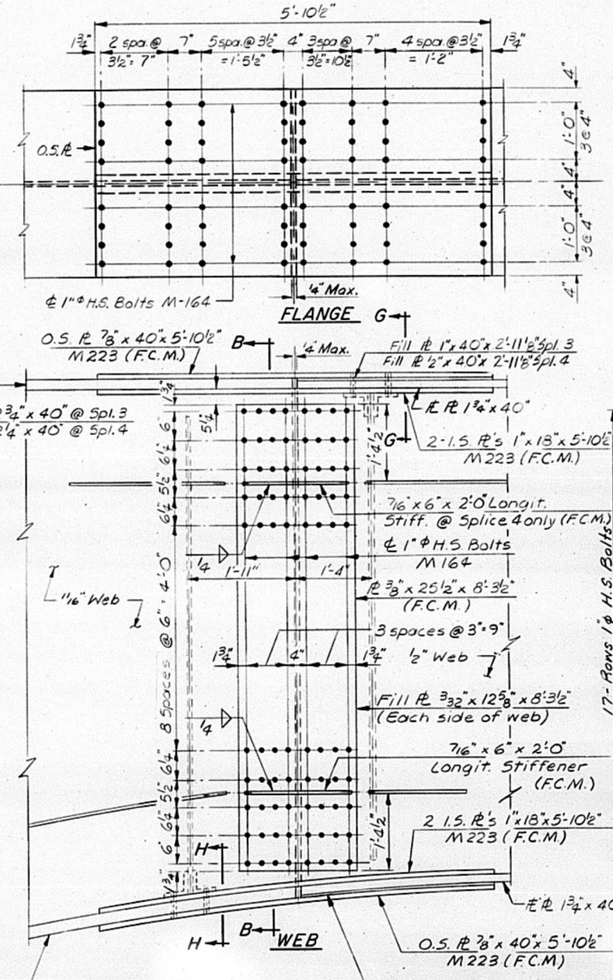
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA-49	(15B-1) -P	PEORIA & TAZEWELL	96	16
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

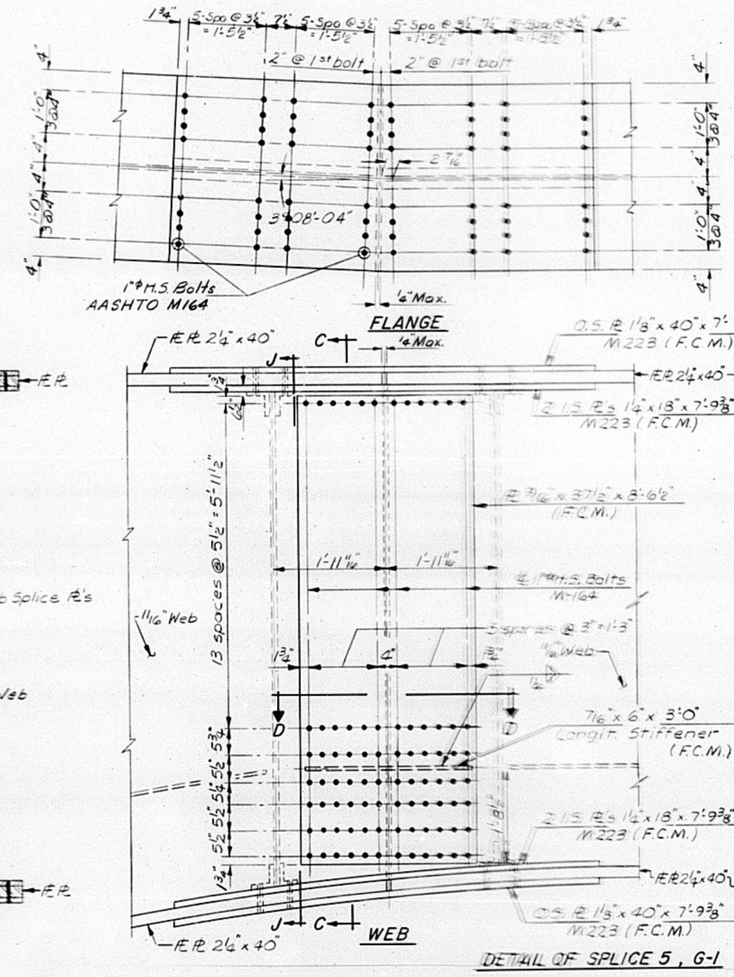
Sheet 14 of 93



DETAIL OF SPLICE 2, G-1 & G-2

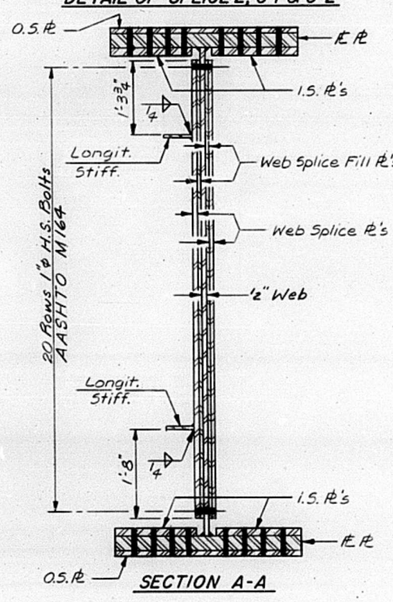


DETAIL OF SPLICES 3 & 4, G-1 & G-2

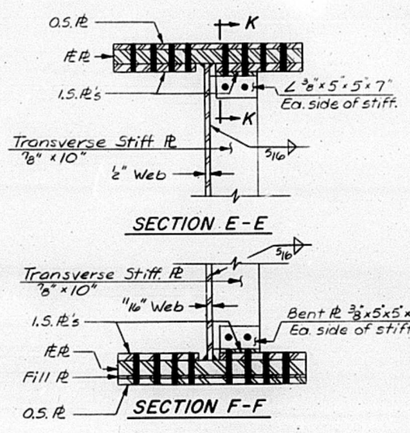


DETAIL OF SPLICE 5, G-1

Note: Flange Splice plate lengths given along ℄ Girder.

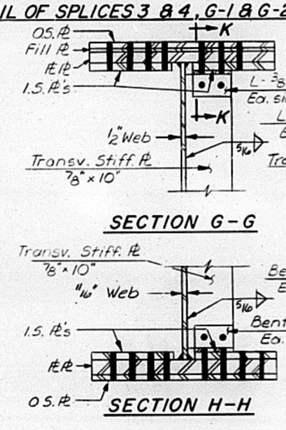


SECTION A-A



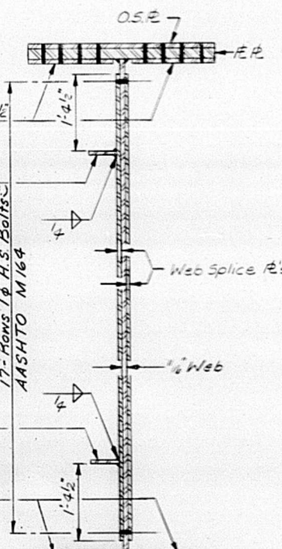
SECTION E-E

SECTION F-F

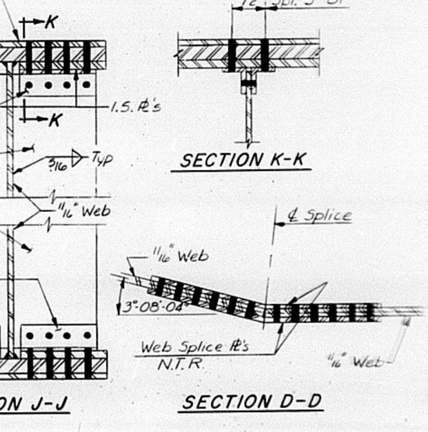


SECTION G-G

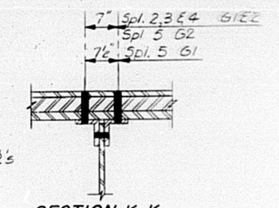
SECTION H-H



SECTION B-B

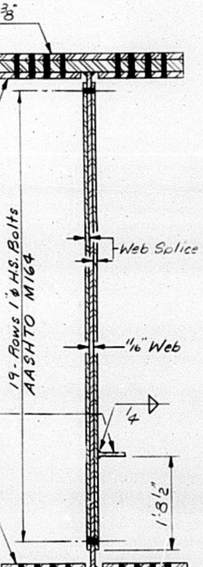


SECTION J-J



SECTION K-K

SECTION D-D



SECTION C-C

Notes:

All splice plate, transverse & longitudinal stiffener structural steel shown on this sheet shall be AASHTO M-183 unless otherwise noted.

See girder sheets for girder steel.

See Sheet 15 of 93 for Detail of Splice 5, G-2.

All flange splice plates, web splice plates & longitudinal stiffener plates shown on this sheet shall be (F.C.M.) Fracture Critical Members.

SPLICE DETAILS 2,3,4 & 5 GIRDER 1
AND SPLICE DETAILS 2,3 & 4 GIRDER 2

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED S.C.O.
DRAWN B.J.D.
CHECKED W.D.L.

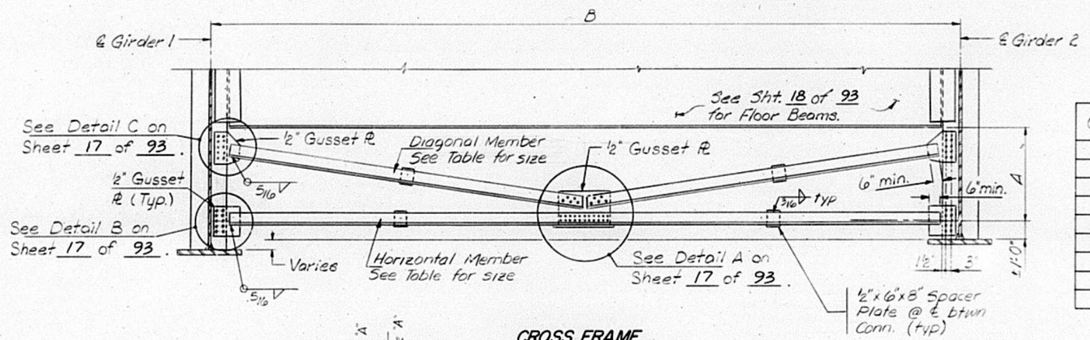
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) -P	PEORIA & TAZEWELL	96	17
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 15 of 93

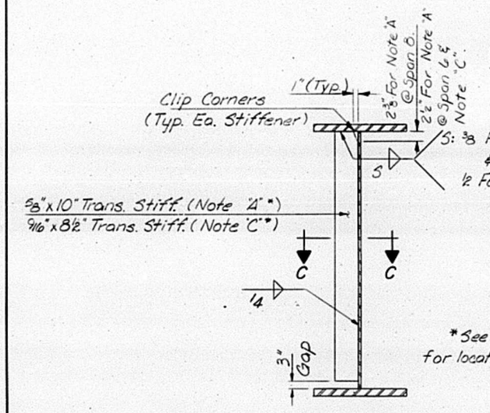


CROSS FRAME
(CF-29,30,31,40-49,& 50)
(1 EACH)

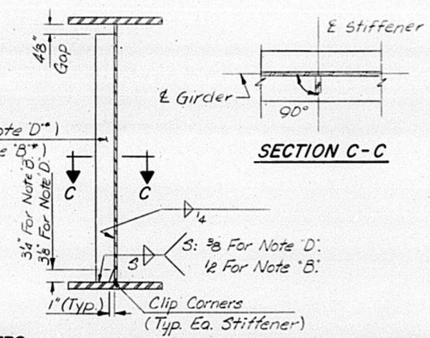
CROSS-FRAME DIMENSIONS

C.F. NO.	DIM. "A"	DIM. "B"	SIZE - 2 ANGLES *	
			DIAGONAL	HORIZONTAL
29	3'-9"	54'-4"	8"x6"x½"	8"x6"x½"
30	8'-0"	53'-0½"	8"x6"x½"	8"x6"x½"
31	4'-3"	51'-9⅛"	8"x6"x½"	8"x6"x½"
40	5'-2"	40'-1⅛"	6"x6"x⅜"	6"x4"x⅜"
41	9'-5"	38'-9¾"	8"x6"x½"	8"x6"x½"
42	6'-0"	37'-6¼"	6"x6"x⅜"	6"x4"x⅜"
43	3'-9"	36'-2¾"	6"x6"x⅜"	6"x4"x⅜"
44-49	3'-0"	36'-0"	6"x6"x⅜"	6"x4"x⅜"
50	4'-2"	36'-0"	6"x6"x⅜"	6"x4"x⅜"

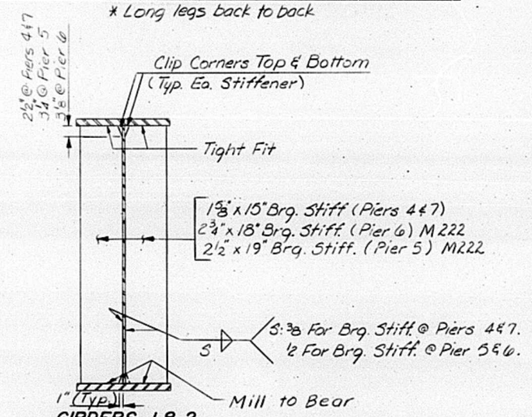
* Long legs back to back



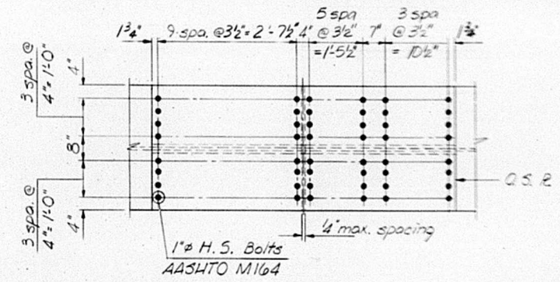
GIRDERS 1 & 2
TRANSVERSE STIFFENERS



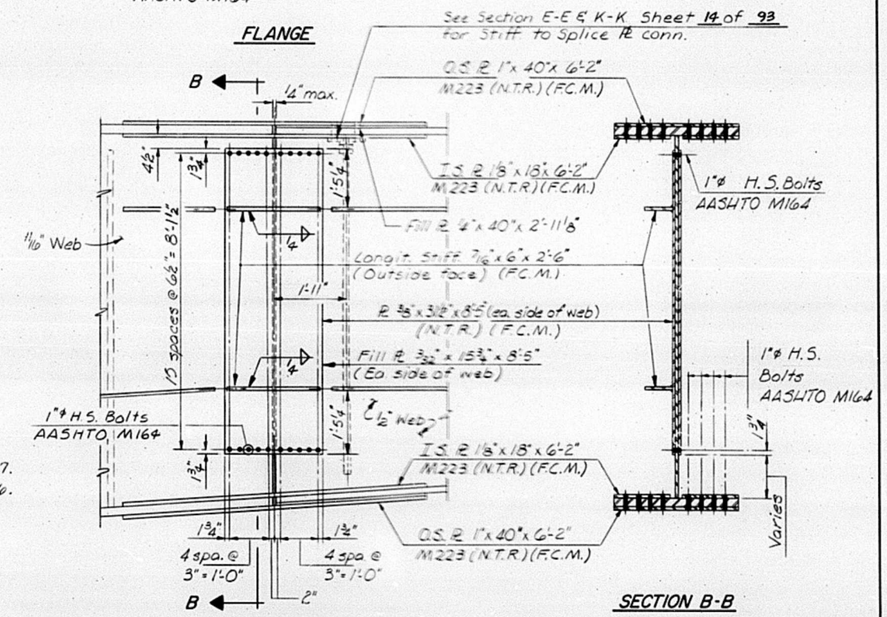
SECTION C-C



GIRDERS 1 & 2
BEARING STIFFENERS



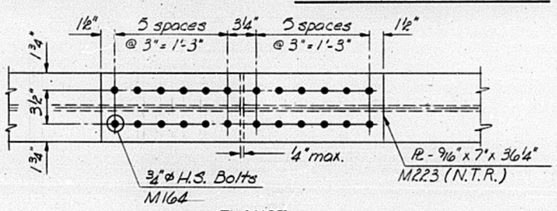
FLANGE



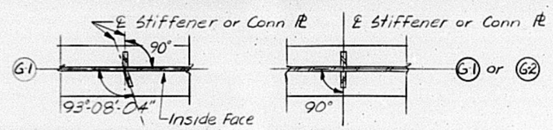
WEB

SECTION B-B

DETAIL OF SPLICE 5, G-2



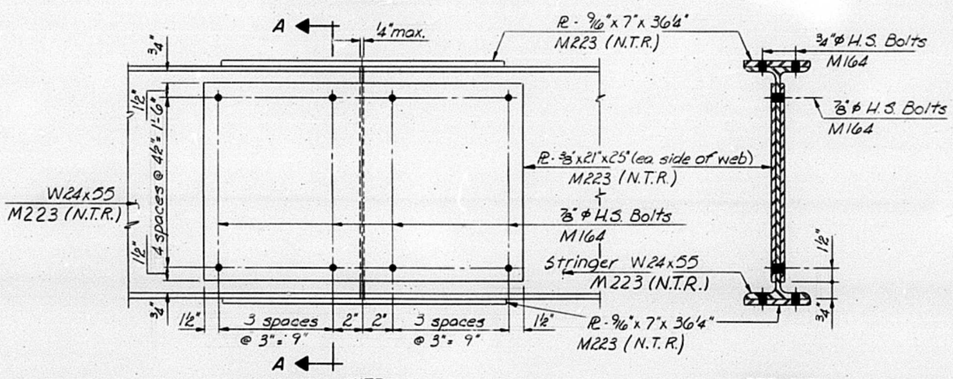
FLANGE



Typical Girder 1
Pier 4 thru Splice #4

Typical Girder 1
Splice #4 to Pier 7
Typical Girder 2-all

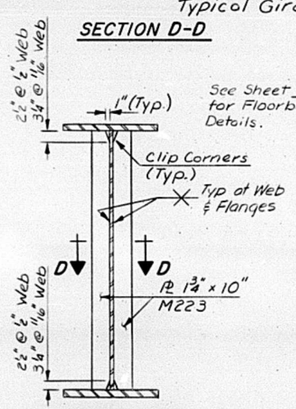
SECTION D-D



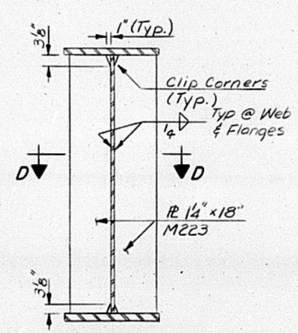
WEB

SEC. A-A

STRINGER SPLICE DETAIL



GIRDERS 1 & 2
FLOOR BEAM CONNECTION ℞s



GIRDER 1
TRANSVERSE STIFFENERS
FB-43 to FB-44

Notes

N.T.R. denotes material that shall conform to the Supplemental Requirements for Notch Toughness.

All Steel shall be AASHTO M183 unless otherwise noted.

STRUCTURAL STEEL DETAILS
SPANS 6, 7 & 8

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED S.C.O.
DRAWN R.J.F.
CHECKED W.D.L.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

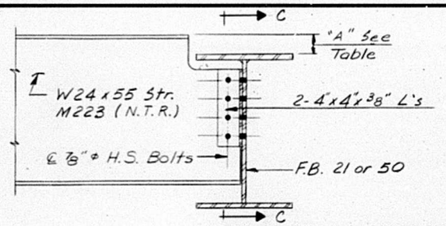
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA. 49	(15B-1) -P	PEORIA & TAZEWELL	96	18
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 16 of 93

Note: N.T.R. denotes material that shall conform to the Supplemental Requirements for Notch Toughness.

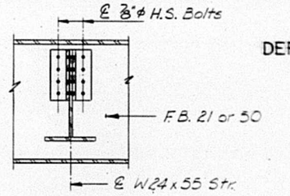
All steel shall be A.A.S.H.T.O. M183 unless otherwise noted.

All bolts shall be A.A.S.H.T.O. H.S. M 164

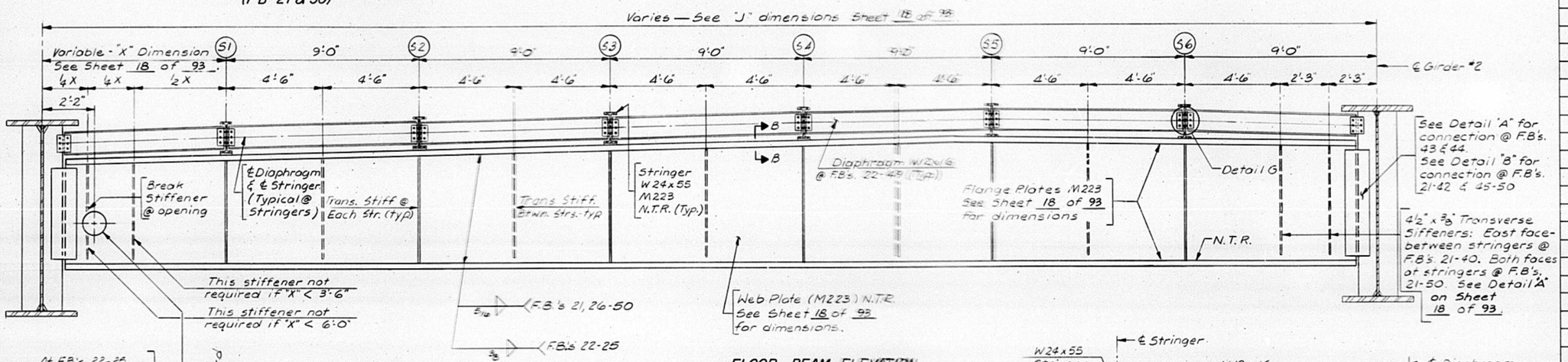


STRINGER FLOOR BEAM CONN.
(FB 21 & 50)

F.B. No.	STR. No.	"A" Dim.
21	1	4 3/8"
21	2	3"
21	3	3"
21	4	4 1/8"
21	5	5 3/8"
21	6	6 1/2"
50	4	4 3/8"
50	5	3 3/8"
50	6	5 1/4"

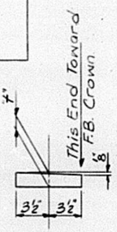


SECTION C-C



FLOOR BEAM ELEVATION
Looking East

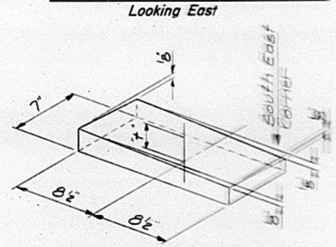
At F.B.'s 22-25, 27 & 28, 1'-2" ϕ opening for 12" ϕ steel drainage pipe. See Sheet 18 of 93 for complete details.



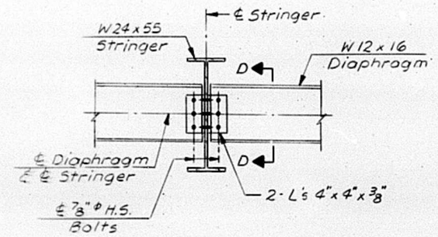
DETAIL C

Location	y
F.B. 22 Str. 1 & 2	1/4"
F.B. 22 Str. 3 F.B. 23 Str. 1 & 2	3/16"
F.B. 22 Str. 4 F.B. 23 Str. 3 & 4	1/8"
F.B. 22 Str. 5	0

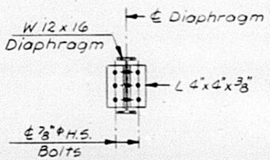
DETAIL D



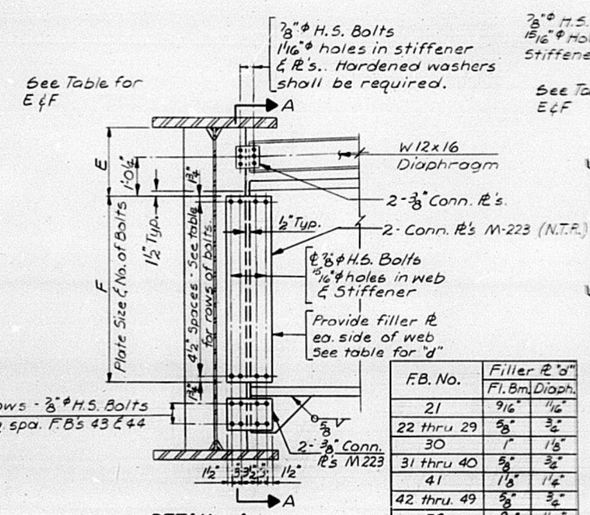
DETAIL E



DETAIL G

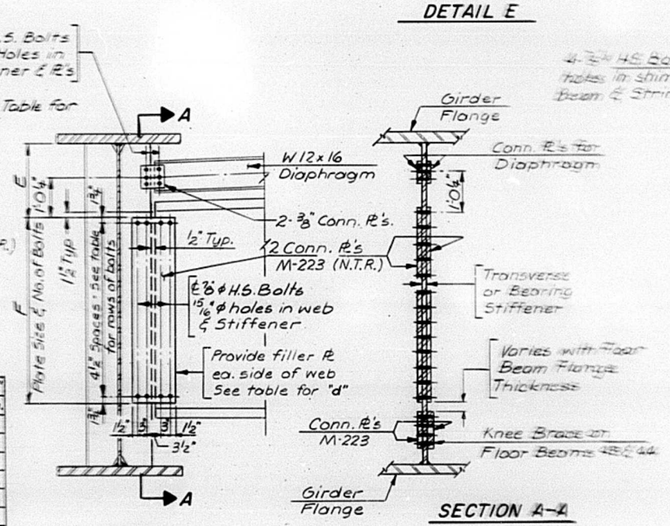


SECTION D-D



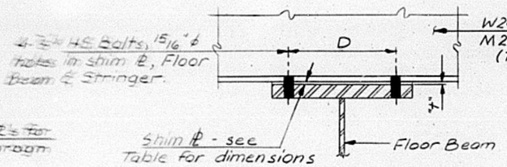
DETAIL A

F.B. No.	Filler PL "d" Fl. Bm.	Filler PL "d" Diaph.
21	9/16"	11/16"
22 thru 29	5/8"	3/4"
30	1"	1 1/8"
31 thru 40	5/8"	3/4"
41	1 1/8"	1 1/4"
42 thru 49	5/8"	3/4"
50	9/16"	11/16"

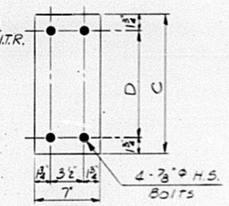


DETAIL B

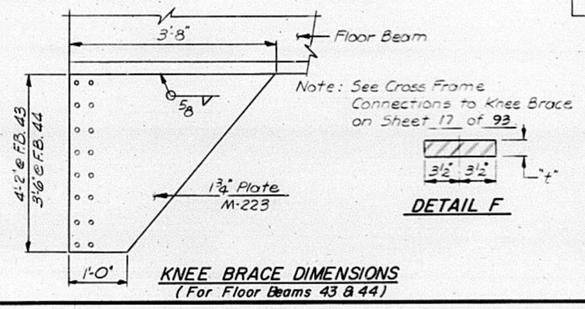
SECTION A-A



SECTION B-B
STRINGER FLOOR BEAM CONN.
(FB 22 thru 49)



PLAN
Shim Plate



DETAIL F

KNEE BRACE DIMENSIONS
(For Floor Beams 43 & 44)

FLOOR BEAM CONNECTIONS

Floor Beam No.	E Gir. #1	E Gir. #2	F Plate Size & No. of Bolts Girder 1 & 2
21	0'-5 3/8"	0'-6 1/2"	3/8" x 12 1/2" x 4'-5" 12 rows x 4 = 48
22	1'-11"	1'-9 7/8"	3/8" x 12 1/2" x 4'-9 1/2" 13 rows x 4 = 52
23	1'-11"	1'-9 7/8"	
24	2'-1 1/4"	1'-9 3/8"	
25	2'-1"	1'-9 1/2"	
26	1'-11 5/8"	1'-9 1/4"	
27	1'-11 3/4"	1'-9 3/8"	
28	1'-10"	1'-9 1/4"	
29	1'-10 1/8"	1'-9 1/4"	
30	1'-10 1/8"	1'-9 1/4"	3/8" x 12 1/2" x 4'-5" 12 rows x 4 = 48
31	1'-10 3/8"	1'-9 1/4"	
32	1'-10 1/2"	1'-9 1/4"	
33	1'-10 5/8"	1'-9 1/4"	
34	1'-10 1/2"	1'-9"	
35	1'-10 1/2"	1'-9"	
36	1'-10 1/2"	1'-9"	
37	1'-10 5/8"	1'-9"	
38	1'-10 3/4"	1'-9	3/8" x 12 1/2" x 3'-8" 10 rows x 4 = 40
39	1'-10 3/4"	1'-9"	
40	1'-10 7/8"	1'-9"	
41	1'-10 3/4"	1'-9"	3/8" x 12 1/2" x 2'-11" 8 rows x 4 = 32
42	1'-8 1/8"	1'-8 1/2"	
43	1'-8 3/8"	1'-8 1/2"	
44	1'-8 7/8"	1'-8 1/2"	
45	1'-9"	1'-8 1/2"	
46	1'-9 1/4"	1'-8 1/2"	
47	1'-9 3/8"	1'-8 1/2"	
48	1'-9 5/8"	1'-8 1/2"	
49	1'-9 3/4"	1'-8 1/2"	
50	0'-6 1/2"	0'-5 1/2"	

*Stringers 1,2,3, see detail E
Stringer 4 see detail C

SHIM PLATE DIMENSIONS

Floor Beam No.	DET.	"t" Str. 1	Str. 2	Str. 3	Str. 4	Str. 5	Str. 6	C	D
21,50			Not Appl.						
22	D	1/4"	1 3/8"	1/4"	1/4"	1/4"	—	1'-5"	1'-1 1/2"
23	D	1/4"	1 5/8"	1/2"	5/8"	—	—	1'-5"	1'-1 1/2"
24	*	1 7/8"	2 1/4"	1 5/8"	1/4"	—	—	1'-5"	1'-1 1/2"
25	C	1 3/8"	1 1/2"	1/4"	1/4"	—	—	1'-5"	1'-1 1/2"
26	C	1/4"	1/2"	1/2"	1/4"	—	—	1'-3"	0'-11 1/2"
27	C	1/4"	1/4"	1/4"	1/4"	—	—	1'-3"	0'-11 1/2"
28-33	C	—	1/4"	1/4"	1/4"	—	—	1'-3"	0'-11 1/2"
34	C	—	1/4"	1/4"	1/4"	—	—	1'-2"	0'-10 1/2"
35-41	C	—	—	1/4"	1/4"	—	—	1'-2"	0'-10 1/2"
42-49	F	—	—	—	—	3/4"	3/4"	1'-2"	0'-10 1/2"

STRUCTURAL STEEL DETAILS
SPANS 6,7,8

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC.(15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O
CHECKED W.D.L.
DRAWN P.M.
CHECKED W.D.L.

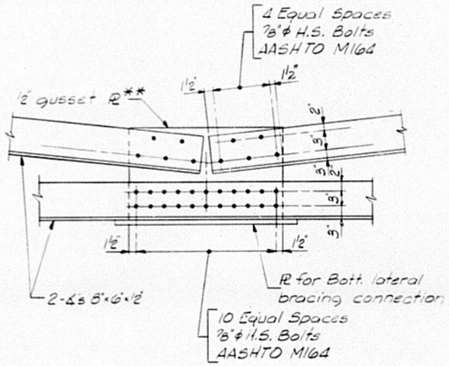
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

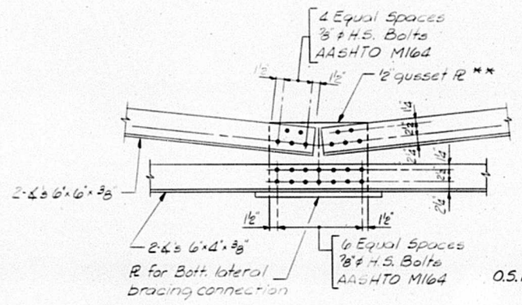
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA. 49	(15B-1) -P	Peoria & Tazewell	96	19
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

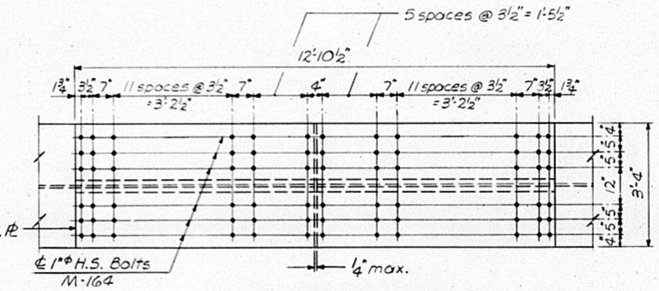
Sheet 17 of 93



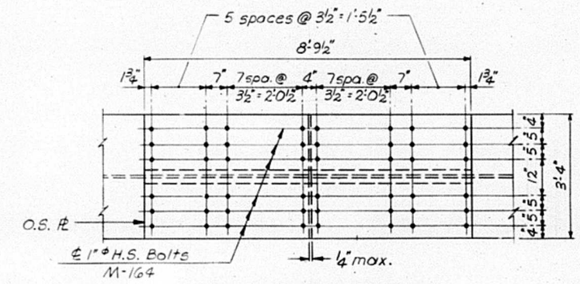
CROSS FRAMES 29 THRU 31 & 41



CROSS FRAMES 40, 42 THRU 50

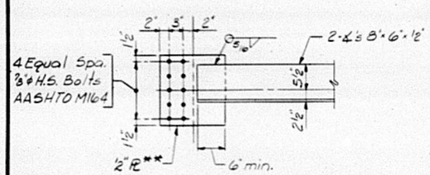


TOP & BOTTOM FLANGES



TOP & BOTTOM FLANGES

DETAIL A



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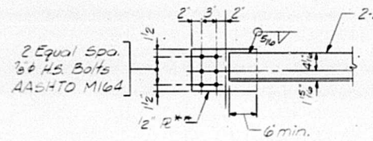

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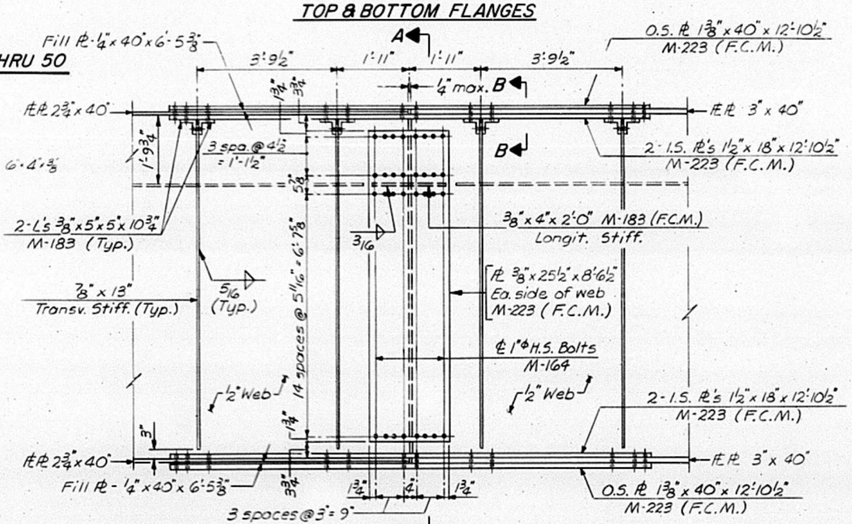
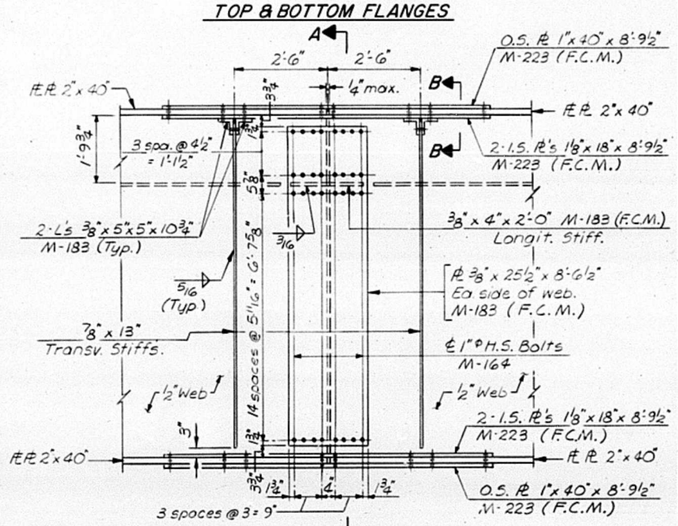


WEB

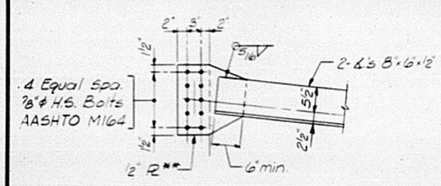
DETAIL OF SPLICE 1, G1 & G2



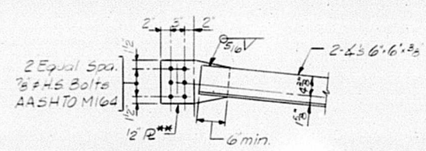
WEB

DETAIL OF SPLICE 6, G1 & G2

DETAIL B



CROSS FRAMES 29 THRU 31 & 41



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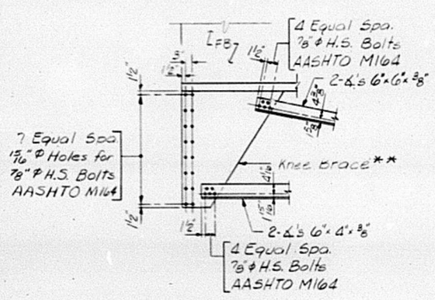
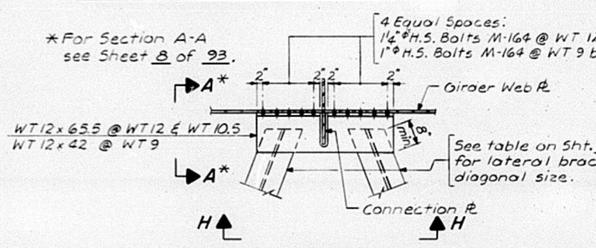
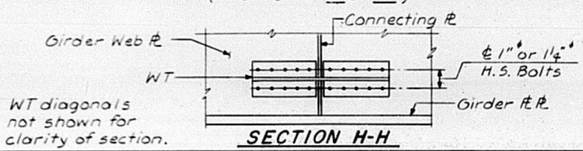


CROSS FRAMES 43 & 44

DETAIL C

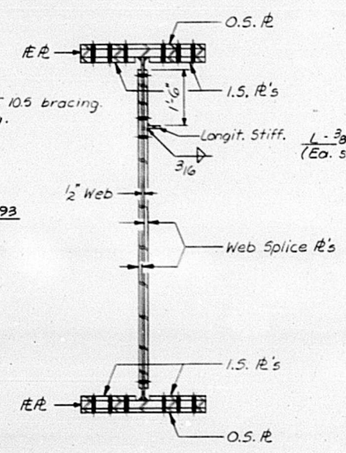


DETAIL G
(From Sheet 8 of 93)

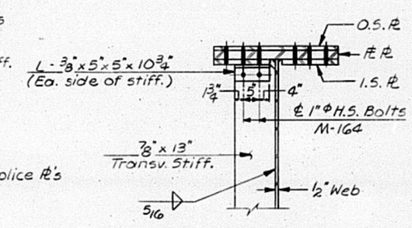


SECTION H-H

Note: WT diagonals not shown for clarity of section.



SECTION A-A



SECTION B-B

Note: All splice plate and stiffener steel shown on this sheet shall be AASHTO M-183 unless otherwise noted. See girder sheets for girder steel.
** 1 1/16" ϕ holes in gusset plates and knee brace (at angle conn.'s only). Hardened washers req'd.

STRUCTURAL STEEL DETAILS
SPANS 6, 7 & 8

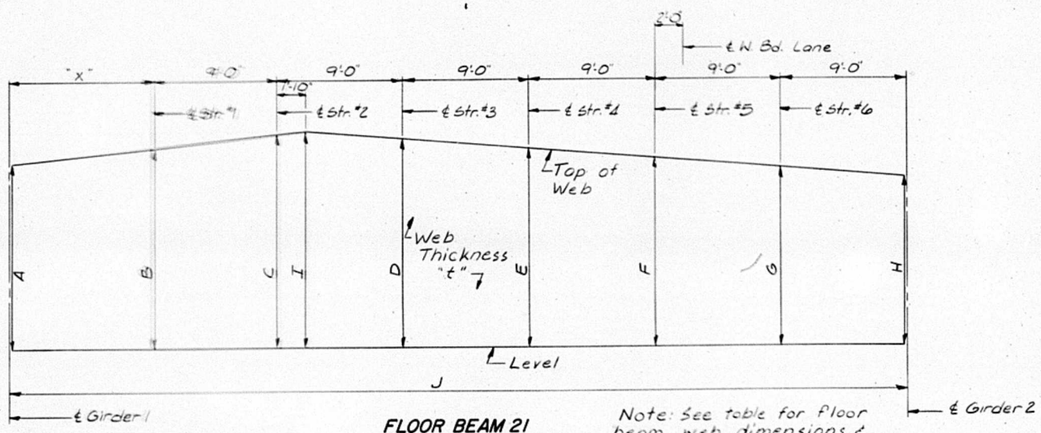
McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.	HANSON ENGINEERS INCORPORATED	FILE NO. 74001
CHECKED S.C.D.		
DRAWN P.M.E. D.A.N.	SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS	DATE
CHECKED W.D.L.		

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

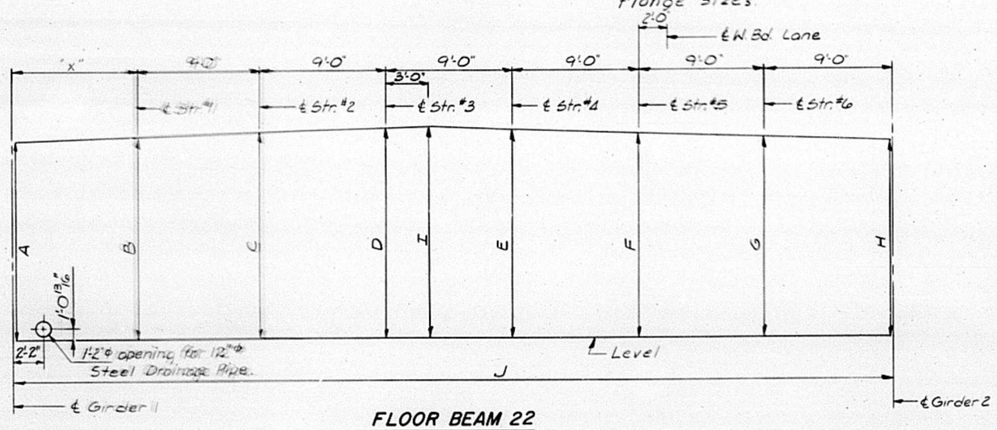
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) -P	PEORIA & TAZEWELL	96	20
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 18 of 93

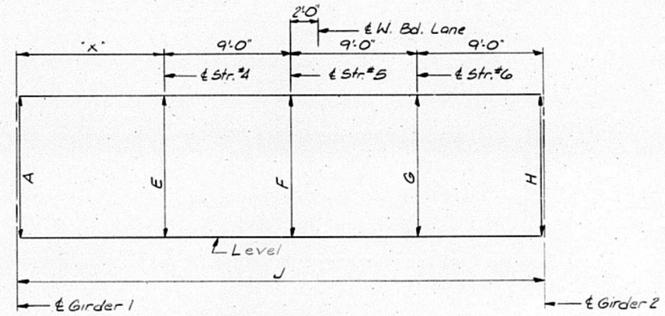


FLOOR BEAM 21

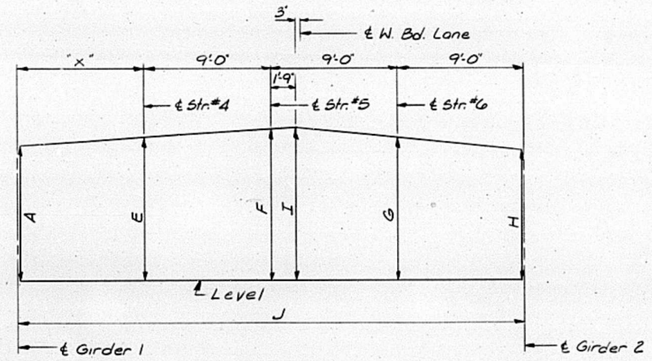
Note: See table for floor beam web dimensions & flange sizes.



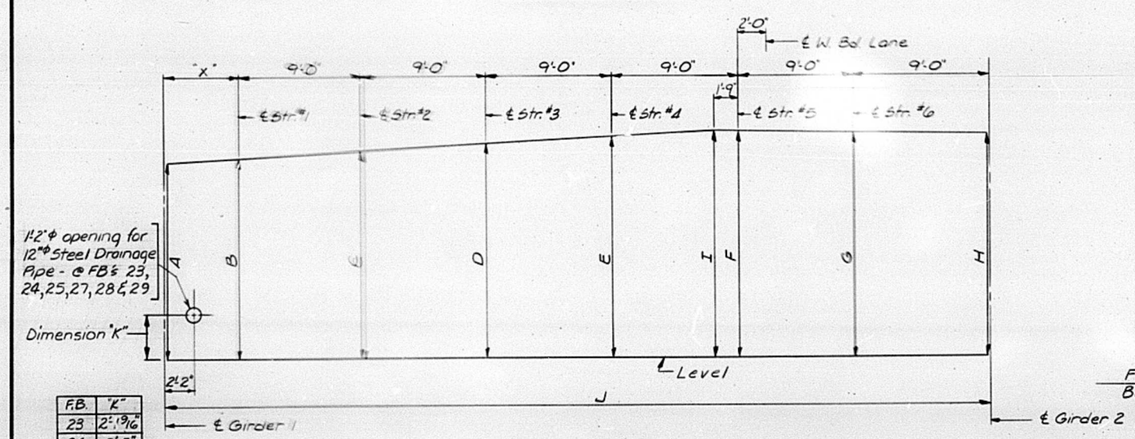
FLOOR BEAM 22



FLOOR BEAM 42-49

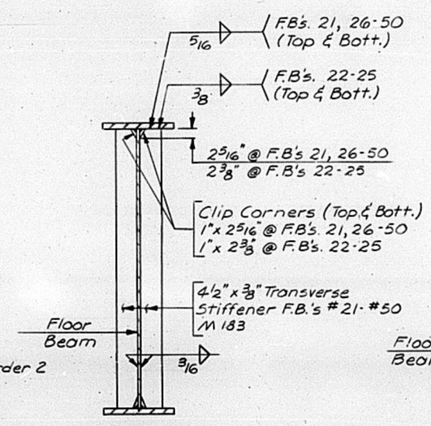


FLOOR BEAM 50

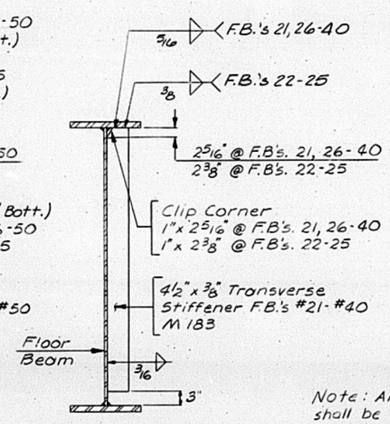


F.B.	"K"
23	2'-1 9/16"
24	3'-5"
25	4'-5 1/8"
27	4'-2 5/8"
28	3'-1 9/16"
29	2'-1 3/8"

FLOOR BEAM 23-41



AT STRINGERS



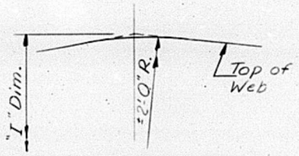
BETWEEN STRINGERS

DETAIL A
FLOOR BEAM
TRANSVERSE STIFFENERS

Note: All Steel this sheet shall be AASHTO M 223 unless otherwise shown.

FLOOR BEAM WEB DIMENSIONS
CAMBERED FOR CROWN AND DEAD LOAD DEFLECTIONS

Floor Beam No.	A	B	C	D	E	F	G	H	I	J	"t"	"X"
21	59 1/2"	64 1/8"	68 3/8"	66 3/4"	63 5/8"	60 3/8"	57 1/4"	54 1/4"	69 1/4"	64'-4 1/8"	1/2"	10'-4 3/8"
22	63 3/4"	65 1/8"	66 3/8"	67 3/4"	67 1/8"	65 3/4"	64 1/4"	62 3/4"	68 1/8"	63'-2 1/8"	1/2"	9'-2 1/8"
23	62 3/4"	63 5/8"	64 5/8"	65 3/4"	66 3/4"	67 1/4"	65 7/8"	64 3/8"	67 5/8"	61'-11"	1/2"	7'-11"
24	62 3/4"	64 1/4"	66 1/8"	68 1/8"	70 1/8"	71 1/2"	70 3/8"	69 1/4"	71 3/4"	60'-7 1/8"	1/2"	6'-7 1/8"
25	62 7/8"	64 1/8"	66 3/8"	68 5/8"	71"	72 5/8"	71 1/2"	70 3/8"	72 3/4"	59'-4 3/8"	1/2"	5'-4 3/8"
26	62 7/8"	63 3/4"	66"	68 5/8"	70 1/2"	72 1/8"	71"	70"	72 3/8"	58'-1 5/8"	1/2"	4'-1 5/8"
27	62 7/8"	63 1/2"	65 7/8"	68 1/8"	70 1/2"	72 1/4"	71 1/8"	70"	72 3/8"	56'-10 1/2"	1/2"	2'-10 1/2"
28	62 7/8"	—	65 1/2"	67 3/4"	70 1/8"	71 3/4"	70 5/8"	69 1/2"	71 7/8"	55'-7 1/2"	1/2"	10'-7 1/2"
29	62 7/8"	—	65 1/8"	67 1/2"	69 3/4"	71 3/8"	70 3/8"	69 1/4"	71 5/8"	54'-4"	1/2"	9'-4"
30	57"	—	58 7/8"	61 1/8"	63 1/2"	65 1/8"	64"	63"	65 3/8"	53'-0 1/2"	1/2"	8'-0 1/2"
31	56 7/8"	—	58 1/2"	60 7/8"	63 1/8"	64 3/8"	63 3/4"	62 5/8"	65	51'-9 5/8"	1/2"	6'-9 5/8"
32	56 7/8"	—	58 1/8"	60 1/2"	62 7/8"	64 1/2"	63 3/8"	62 5/8"	64 3/4"	50'-5 5/8"	1/2"	5'-5 5/8"
33	56 3/4"	—	57 7/8"	60 1/8"	62 1/2"	64 1/8"	63 1/8"	62 1/8"	64 3/8"	49'-2 1/8"	1/2"	4'-2 1/8"
34	56 3/4"	—	57 1/2"	59 7/8"	62 1/4"	63 7/8"	62 7/8"	61 7/8"	64 1/8"	47'-10 1/2"	1/2"	2'-10 1/2"
35	56 3/4"	—	—	59 1/2"	61 3/4"	63 1/2"	62 3/8"	61 3/8"	63 5/8"	46'-6 7/8"	1/2"	10'-6 7/8"
36	56 5/8"	—	—	59 1/8"	61 1/2"	63 1/8"	62 1/8"	61"	63 1/8"	45'-3 1/8"	1/2"	9'-3 1/8"
37	56 3/4"	—	—	58 3/4"	61 1/8"	62 3/4"	61 3/4"	60 3/4"	63"	43'-11 3/4"	1/2"	7'-11 3/4"
38	49 3/4"	—	—	51 1/2"	53 7/8"	55 1/2"	54 1/2"	53 1/8"	55 3/4"	42'-8 1/8"	1/2"	6'-8 1/8"
39	49 1/8"	—	—	51 1/8"	53 1/2"	55 1/8"	54 1/8"	53 1/8"	55 3/4"	41'-4 3/8"	1/2"	5'-4 3/8"
40	49 1/8"	—	—	50 7/8"	53 1/8"	54 7/8"	53 7/8"	52 7/8"	55"	40'-1 7/8"	1/2"	4'-1 7/8"
41	43"	—	—	43 1/2"	45 7/8"	47 5/8"	46 1/2"	45 5/8"	47 3/4"	38'-9 3/4"	1/2"	2'-9 3/4"
42	43"	—	—	—	43"	43"	43"	43"	—	37'-6 1/4"	1/2"	10'-6 1/4"
43	43"	—	—	—	43"	43"	43"	43"	—	36'-2 3/4"	1/2"	9'-2 3/4"
44 - 49	42"	—	—	—	42"	42"	42"	42"	—	36'-0"	1/2"	9'-0"
50	43 5/8"	—	—	—	46 1/8"	48 1/8"	46 1/8"	42 3/8"	49 3/8"	36'-0"	1/2"	9'-0"



OPTIONAL WEB CONFIGURATION AT CROWN

FLOOR BEAM FLANGE SIZES

Floor Beam No.	Flange & Size
21	15" x 1 1/4" — Top & Bott.
22 - 25	17" x 1 3/8" — Top & Bott.
26 - 33	18" x 1 1/2" — Top & Bott.
34 - 50	14" x 1 1/4" — Top & Bott.

FLOOR BEAMS — SPANS 6, 7, 8

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O.
CHECKED W.D.L.
DRAWN P.M.
CHECKED W.D.L.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

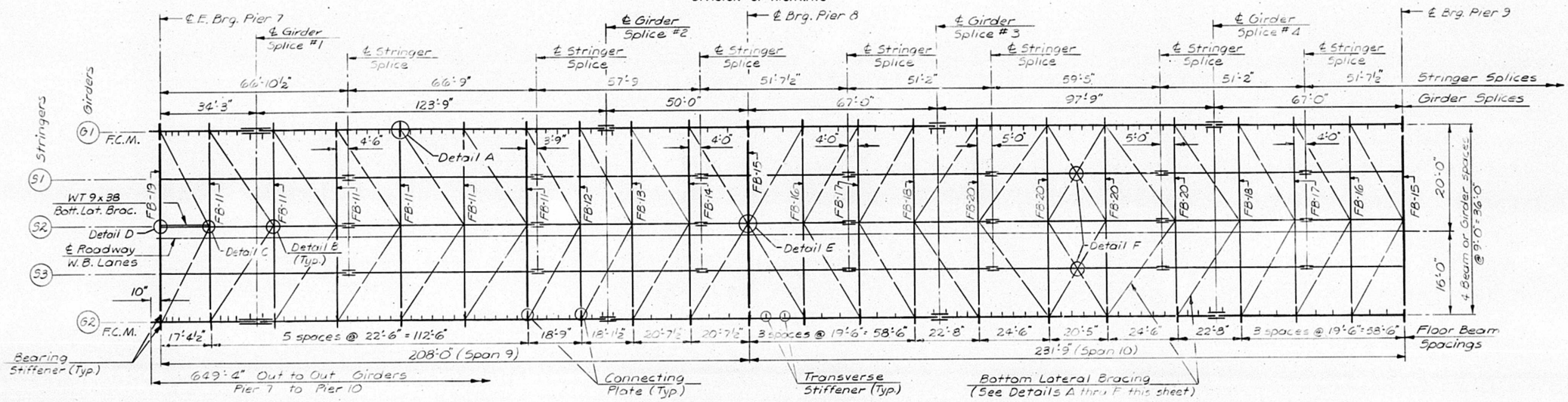
FILE NO. 74001
DATE

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) -P	Peoria & Tazewell	96	21
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

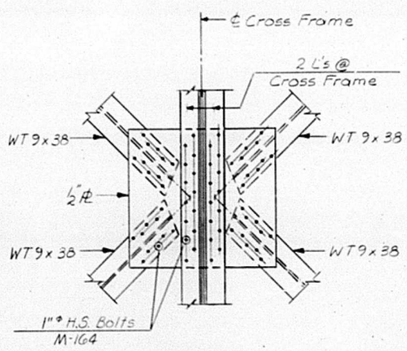
Sheet 19 of 93

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

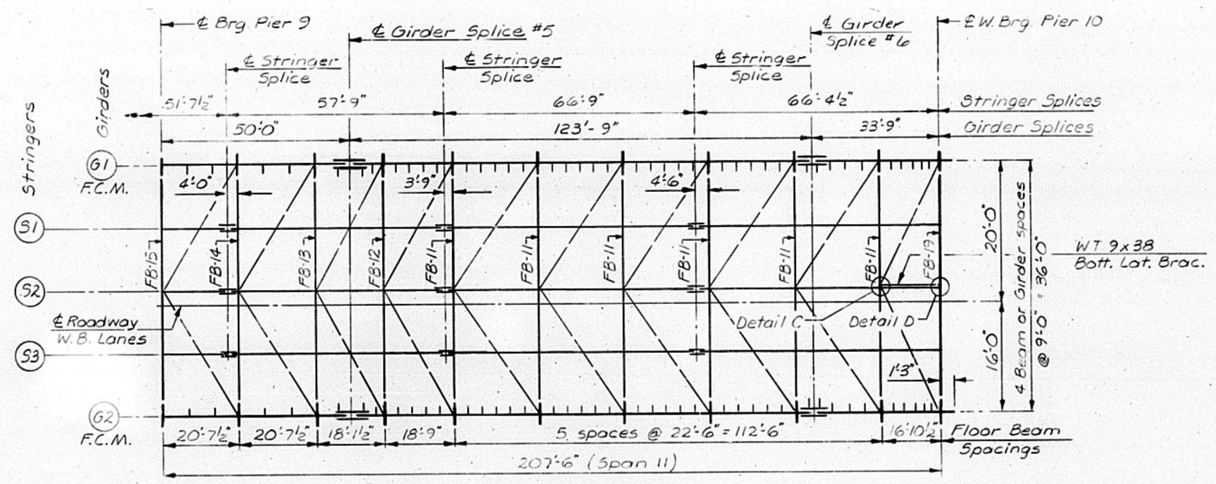
Note: Floor beam designation shown below also indicates cross frames. See sheet 23 of 93 for details.



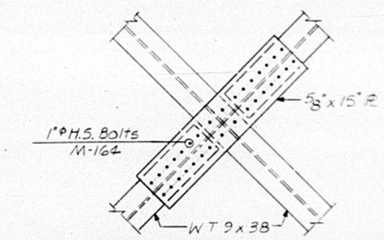
FRAMING PLAN



DETAIL E



FRAMING PLAN



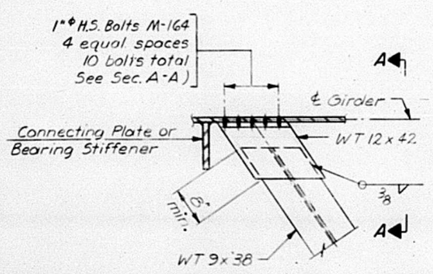
DETAIL F

Notes:

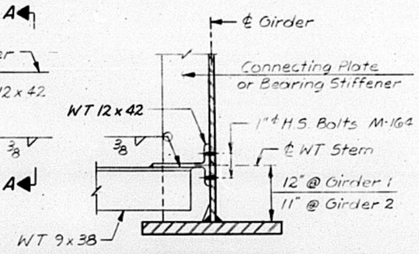
Structural steel for bottom lateral bracing shall meet the requirements for AASHTO M-183 unless otherwise noted.

All dimensions shown are measured horizontally.

F.C.M. denotes Fracture Critical Member. See note on sheet 20 of 93.

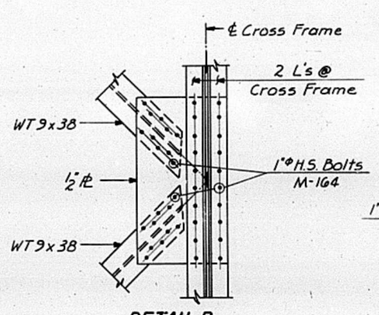


DETAIL A

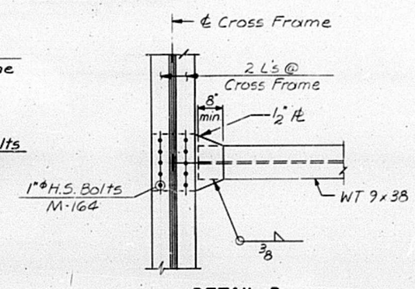


SECTION A-A

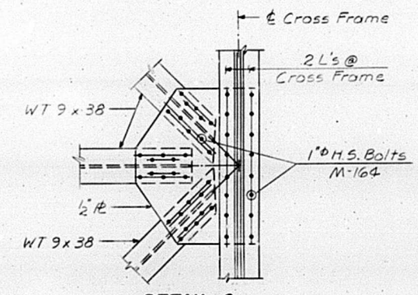
BOTTOM LATERAL BRACING DETAILS



DETAIL B



DETAIL D



DETAIL C

STRUCTURAL STEEL PLAN
SPANS 9, 10 & 11

MC CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O.
CHECKED W.D.L.
DRAWN D.A.N.
CHECKED C.R.N.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001

Note: All transverse stiffeners gapped at top are 11/16" x 10¼" & all transverse stiffeners gapped at bottom are ½" x 7½" unless otherwise shown.

Note: All girder tension flanges, webs, longitudinal stiffeners in tension, flange splice plates and web splice plates for Spans 9, 10 & 11 shall meet the requirements for Fracture Critical Members.

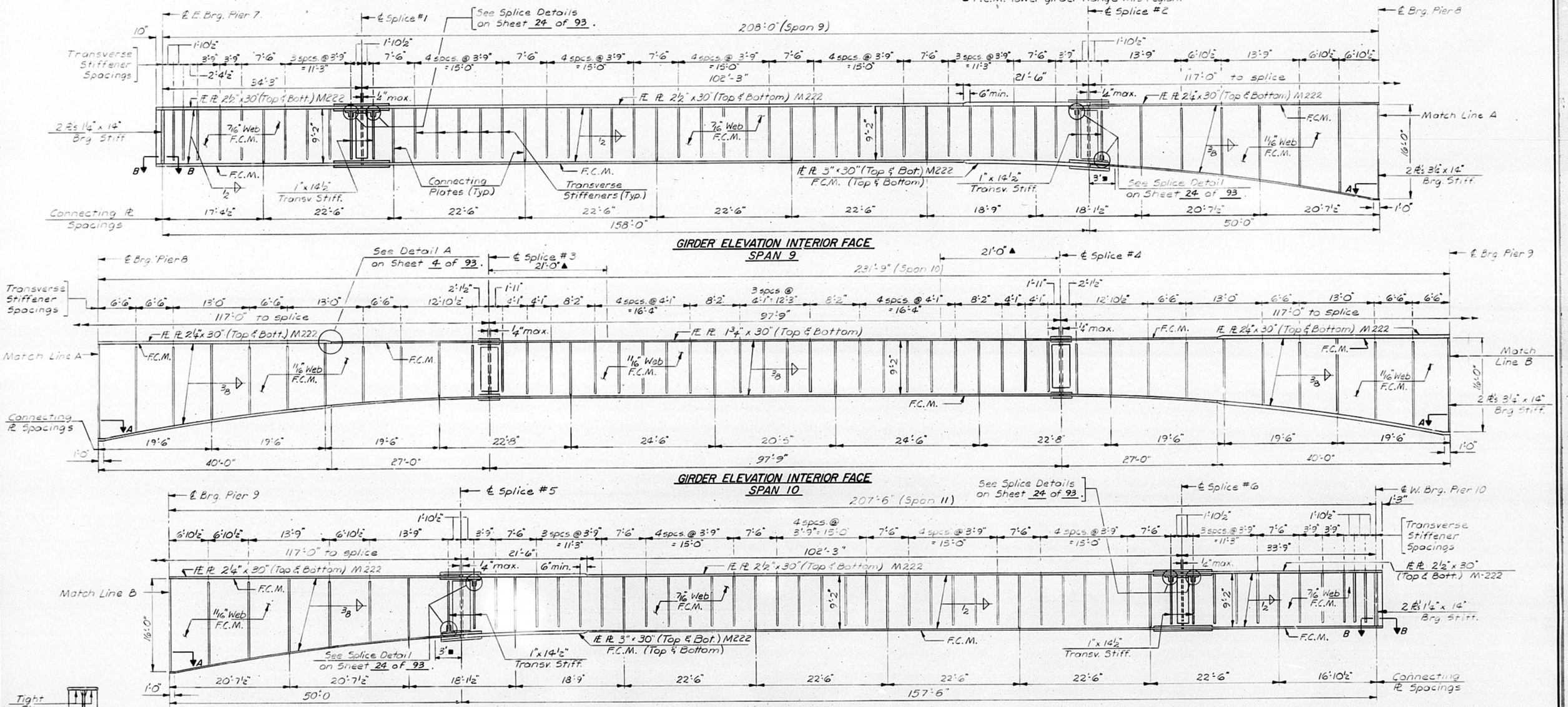
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Note: All dimensions shown on this sheet are measured horizontally & along ℄ girder.

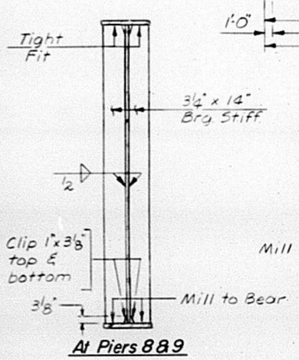
Note: ▲ F.C.M. upper girder flange this region.
■ F.C.M. lower girder flange this region.

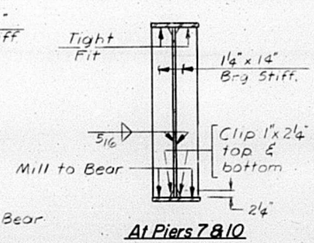
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA 49	(15B-1) -P	Peoria & Tazewell	96	22
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 20 of 93



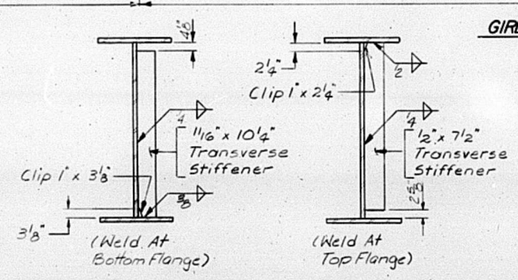
Note: All structural steel shall conform to AASHTO M 183 unless otherwise noted.



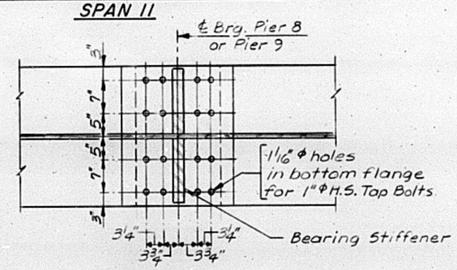


BEARING STIFFENERS

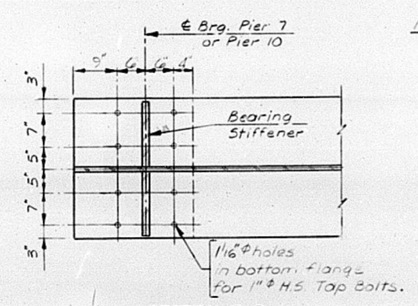
Note: See Sheet 22 of 93 for details of connecting plate.



TRANSVERSE STIFFENERS



SECTION A-A



SECTION B-B

STRUCTURAL STEEL GIRDERS
SPANS 9, 10 & 11

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O.
CHECKED W.D.L.
DRAWN D.A.N.
CHECKED C.R.N.

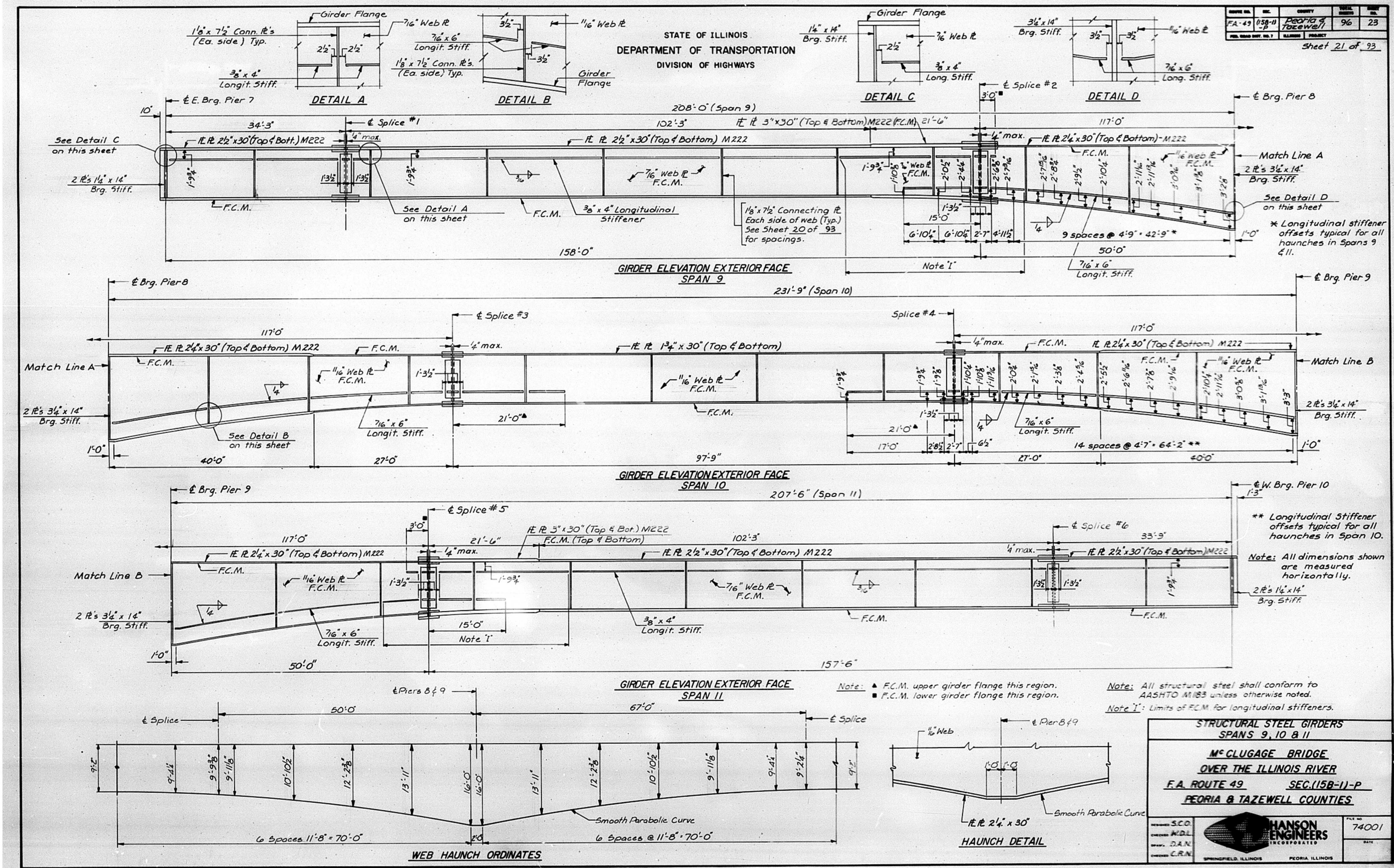
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-11)-P	Peoria & Tazewell	96	23
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 21 of 93

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS



Note: ▲ F.C.M. upper girder flange this region.
■ F.C.M. lower girder flange this region.

Note: All structural steel shall conform to AASHTO M183 unless otherwise noted.

Note "I": Limits of F.C.M. for longitudinal stiffeners.

STRUCTURAL STEEL GIRDERS
SPANS 9, 10 & 11

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-11)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O.
CHECKED W.D.L.
DRAWN D.A.N.
CHECKED C.R.N.

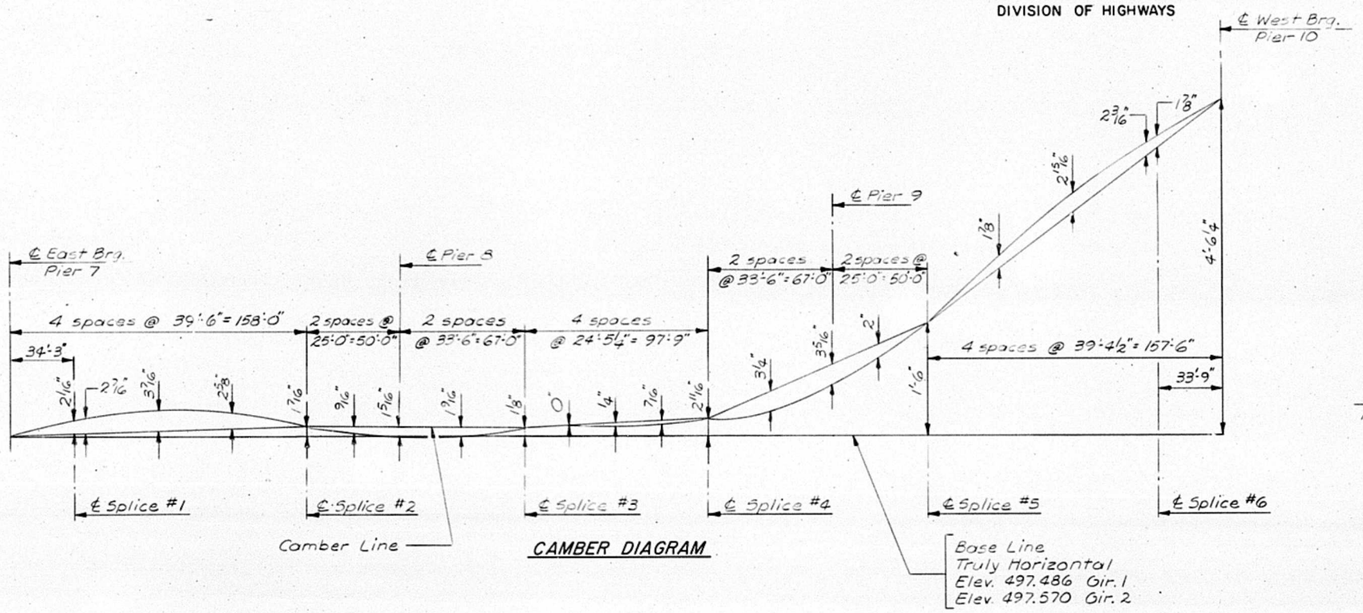
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

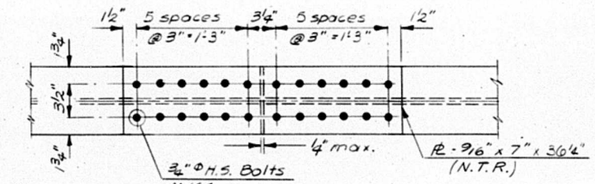
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.-49	(15B-1)-P	PEORIA & TAZEWELL	96	24
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

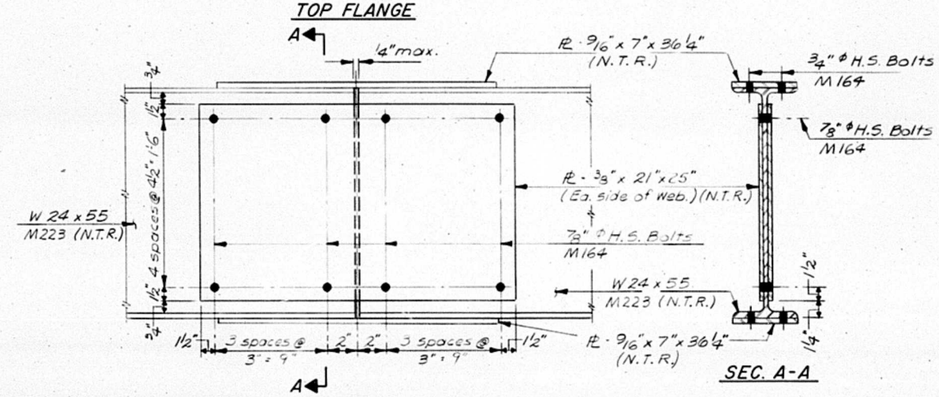
Sheet 22 of 93



CAMBER DIAGRAM

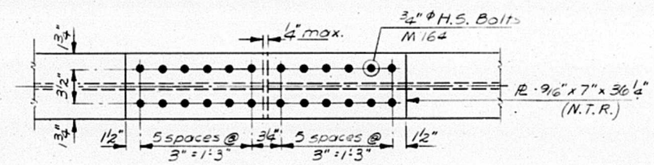


TOP FLANGE



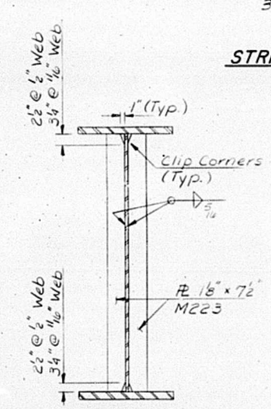
WEB

SEC. A-A



BOTTOM FLANGE

STRINGER SPLICE DETAIL



GIRDERS 1 & 2
FLOOR BEAM CONNECTION PLS

FLOOR BEAM MOMENT TABLE

	I (in.⁴)	P (k) ◆	W (k/ft) ◆	0.5 point Me (ft k)	M4 (ft k)	Imp (ft k)	Mtot (ft k)	fs (ksi)
End F.B.	19,459	11.2	0.21	235	579	174	988	13.6
Typ. Int. F.B.	19,459	28.2	0.21	543	704	211	1,458	20.0
1st. Int. F.B.	19,459	32.0	0.21	611	758	227	1,596	21.9

Note ◆ — P designates concentrated load at each stringer. W designates uniform load due to weight of floor beam.

TOP OF WEB ELEVATIONS

Location	Girder 1	Girder 2
Pier 7, E.Brg.	497.486	497.570
Splice #1	497.684	497.768
Splice #2	497.606	497.690
Pier 8, Brg.	497.486	497.570
Splice #3	497.580	497.664
Splice #4	497.710	497.794
Pier 9, Brg.	498.165	498.249
Splice #5	498.986	499.070
Splice #6	501.509	501.593
Pier 10, W. Brg.	502.007	502.091

Elevations include camber for dead load deflections and are for fabrication only.

STRINGER SHEAR & REACTION TABLE

	End Floor Beam VR	End Floor Beam R	First Interior Floor Beam VL	First Interior Floor Beam VR	First Interior Floor Beam R	All Other Floor Beams VL	All Other Floor Beams VR	All Other Floor Beams R
R P (k)	9.4	9.4	16.1	16.3	32.5	20.3	20.3	39.0
R 4 (k)	29.7	29.7	32.6	36.3	40.7	39.4	39.4	44.5
Imp (k)	8.9	8.9	9.8	10.9	12.2	11.8	11.8	13.4
RTOTAL (k)	48.0	48.0	58.5	63.5	85.4	71.5	71.5	96.9

VR - denotes shear to right of support.
VL - denotes shear to left of support.
R - denotes reaction.

GIRDER REACTION TABLE

	℄ E. Brg. Pier 7 & ℄ W. Brg. Pier 10	℄ Brg. Pier 8 & ℄ Pier 9
R P (k)	321.5	1,037.7
R 4 (k)	135.5	315.7
Imp. (k)	20.3	45.8
RTOTAL (k)	477.3	1,399.2

STRINGER MOMENT TABLE

	0.4 point End Spans	0.5 point Int. Spans	1st. Int. Floor Beam	Other Int. Floor Beams
I (in.⁴)	1350	1350	1350	1350
P (k/ft)	1.47	1.47	1.47	1.47
M P (ft k)	30	35	59	70
M 4 (ft k)	95	111	94	110
Imp (ft k)	28	33	28	33
MTOT (ft k)	153	179	181	213
fs (ksi)	16.1	18.8	19.1	22.4

FLOOR BEAM REACTION TABLE

	End FL. Bm.	1st. Int. Fl. Bm.	Typ. Int. Fl. Bm.
R P (k)	20.5	51.8	46.2
R 4 (k)	68.3	89.7	83.4
RI (k)	20.5	26.9	25.0
RTOT (k)	109.3	168.4	154.6

GIRDER MOMENT TABLE

	0.4 Point Spans 9 & 11	Pier 8 or 9	0.5 Point Span 10
I (in⁴)	523,213	1,679,052	404,094
P (k/ft)	4.18	4.18	4.18
MP (ft k)	12,221	23,904	4,312
M4 (ft k)	5,543	8,375	4,116
Imp (ft k)	832	1,214	576
MTOTAL (ft k)	18,596	33,493	9,004
fs (ksi)	24.5	23.5	15.2

NOTE: Reaction & Moment Tables are based on a Dead Load of 25 #/sq. ft. for Class I surfacing and 94 #/sq. ft. of concrete slab plus the weight of the structural steel.

Notes:
The designation N.T.R. signifies main load carrying members that are subject to the Supplemental Requirements for Notch Toughness.

Splice Plate Material shall conform to AASHTO M223

STRUCTURAL STEEL DETAILS
SPANS 9, 10 & 11

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED C.R.N.
DRAWN D.A.N.
CHECKED S.C.O.

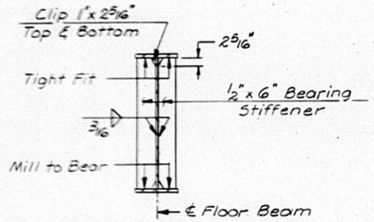
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

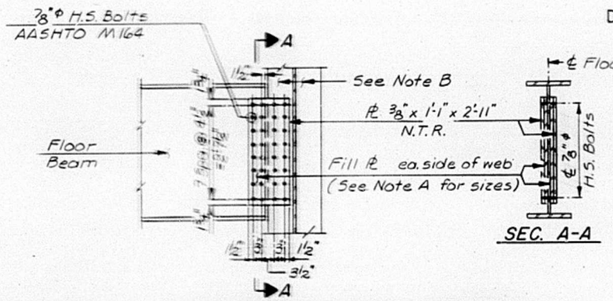
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.-49	(15B-1) -P	Peoria & Tazewell	96	25
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 23 of 93



INTERIOR FLOOR BEAM BEARING STIFFENER

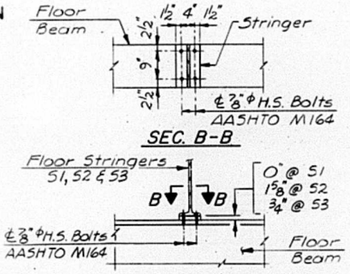


SEC. A-A

Note A:
2 - 3/8"x 16"x 24" Fill PL's @ F.B.-19
2 - 3/8"x 6"x 24" Fill PL's @ F.B.-15
2 - 5/16"x 6"x 24" Fill PL's @ F.B's. 11, 12, 13, 14, 16, 17, 18 & 20.

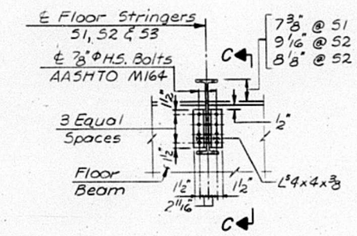
Note B:
1 1/4"x 14" Brg. Stiff @ F.B.-19
3/4"x 14" Brg. Stiff @ F.B.-15
1 1/8"x 7 1/2" Conn. PL @ F.B's. 11, 12, 13, 14, 16, 17, 18 & 20.

FLOOR BEAM TO GIRDER CONNECTION

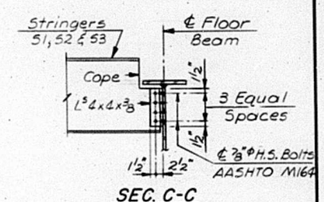


SEC. B-B

DETAIL D
(AT INTERIOR FLOOR BEAM)

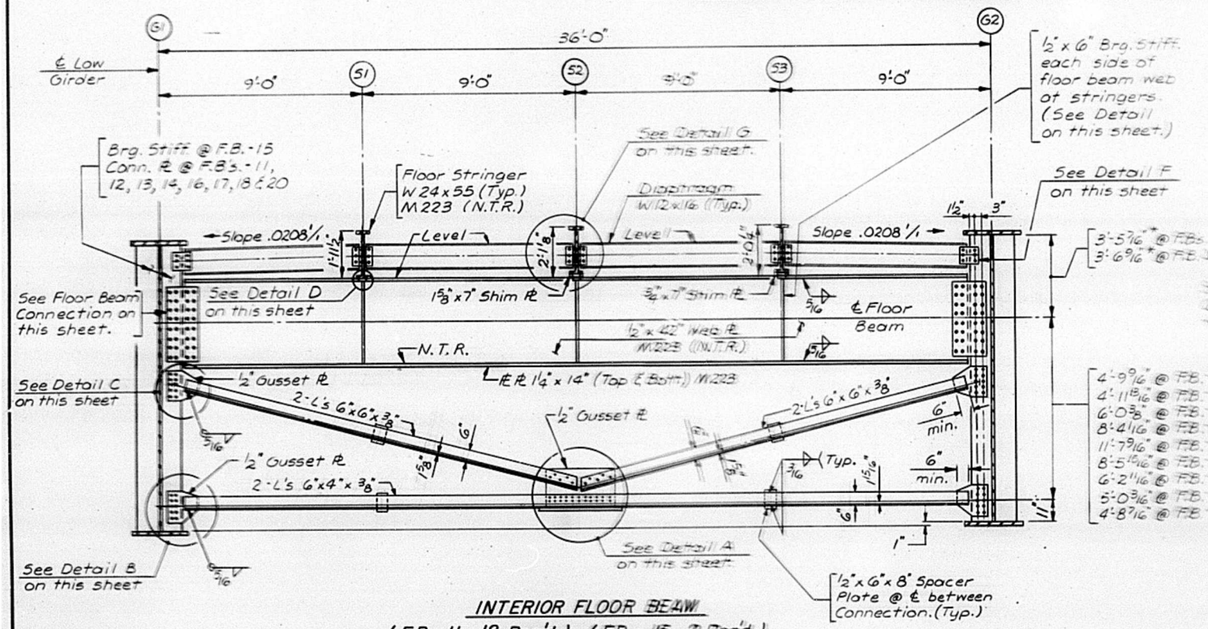


DETAIL E
(AT END FLOOR BEAM)



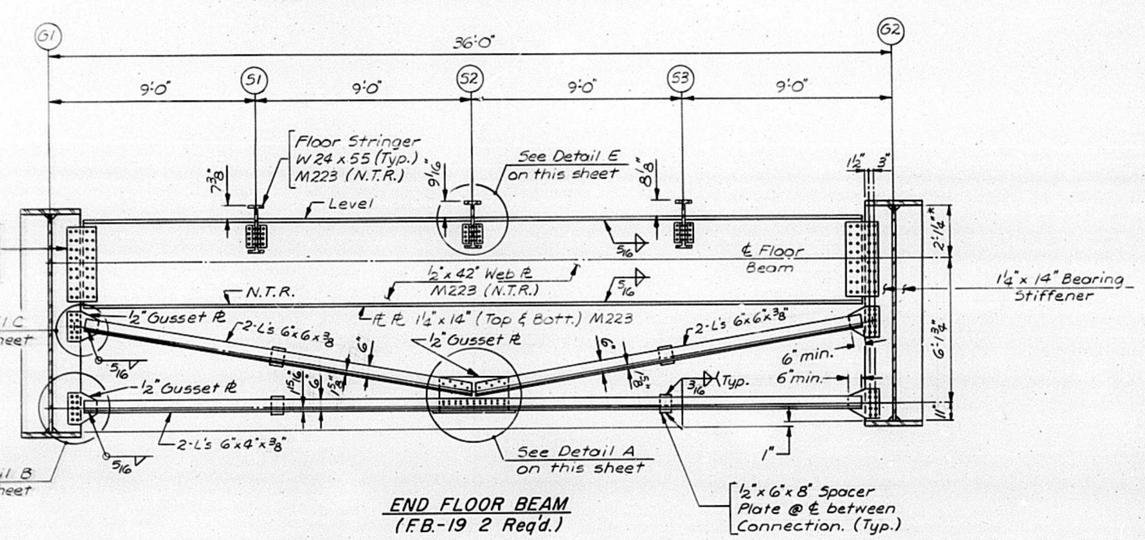
SEC. C-C

STRINGER TO FLOOR BEAM CONNECTIONS

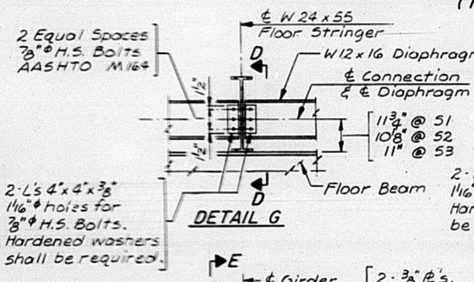


INTERIOR FLOOR BEAM

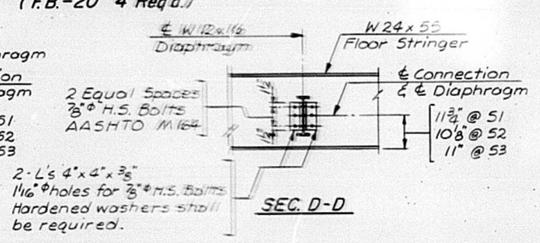
(F.B.-11 12 Req'd.) (F.B.-15 2 Req'd.)
(F.B.-12 2 Req'd.) (F.B.-16 2 Req'd.)
(F.B.-13 2 Req'd.) (F.B.-17 2 Req'd.)
(F.B.-14 2 Req'd.) (F.B.-18 2 Req'd.)
(F.B.-20 4 Req'd.)



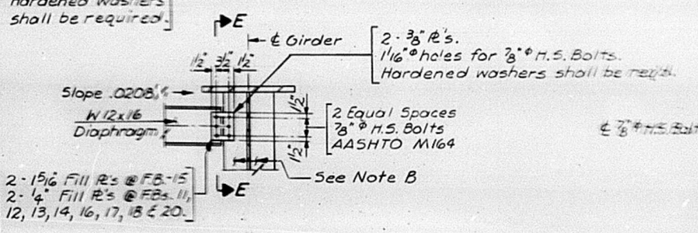
END FLOOR BEAM
(F.B.-19 2 Req'd.)



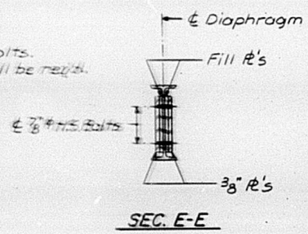
DETAIL G



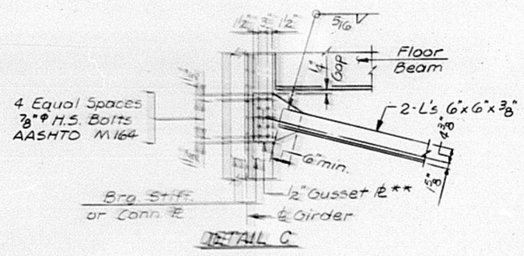
SEC. D-D



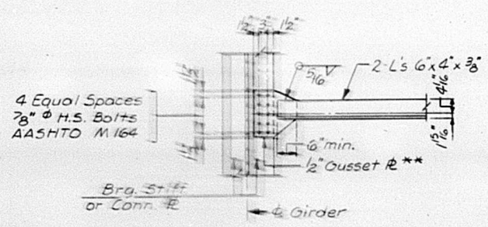
DETAIL F



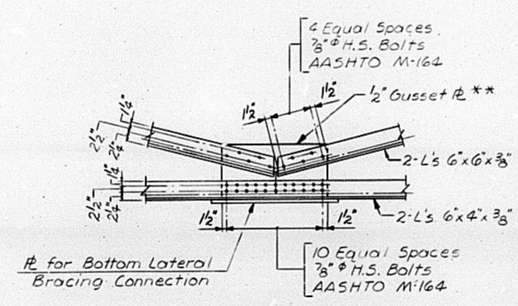
SEC. E-E



DETAIL C



DETAIL B



DETAIL A

Notes:

N.T.R. denotes material that shall conform to the Supplemental Requirements for Notch Toughness.

Structural steel for cross frames shall meet the requirements of AASHTO M183 unless otherwise noted.

* = 1" less for girder 1.

** = 11/16"Φ holes in gusset plate for 7/8"Φ H.S. Bolts. Hardened washers shall be required.

FLOOR BEAM DETAILS
SPANS 9, 10 & 11

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.Q.
CHECKED W.D.L.
DRAWN D.A.N.
CHECKED C.R.N.

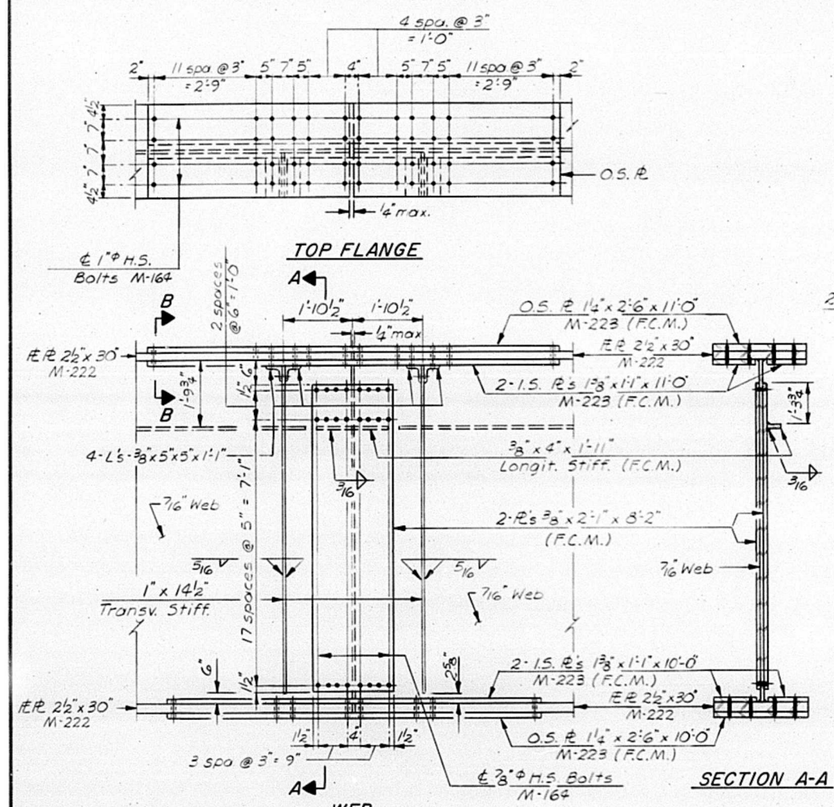
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

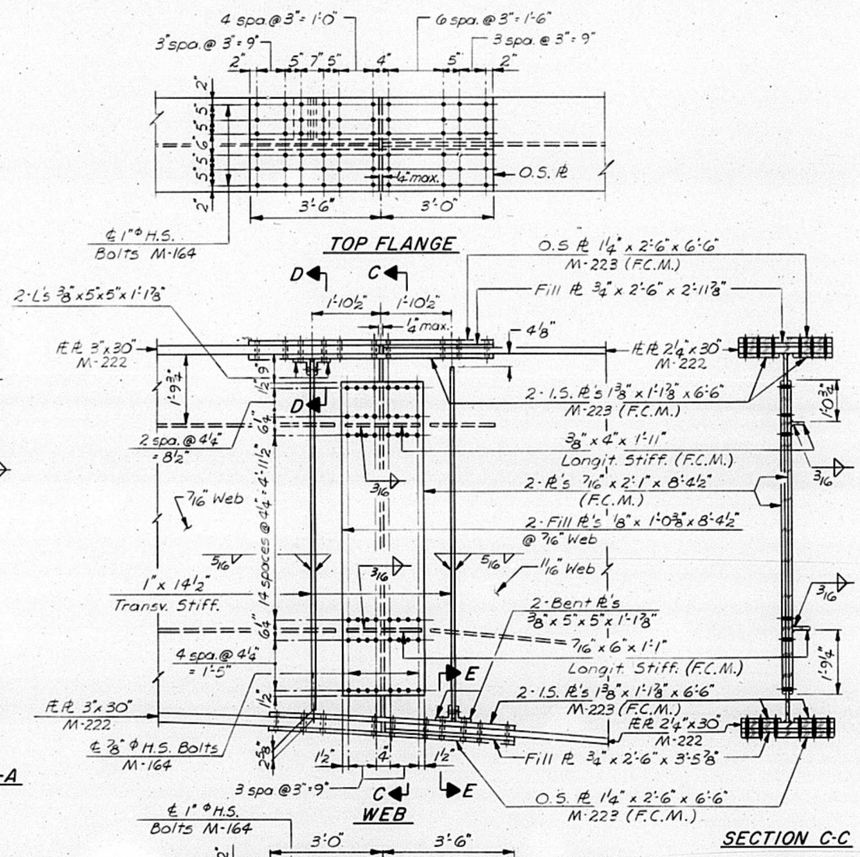
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA-49	(15B-1) -P	Peoria & Tazewell	96	26
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

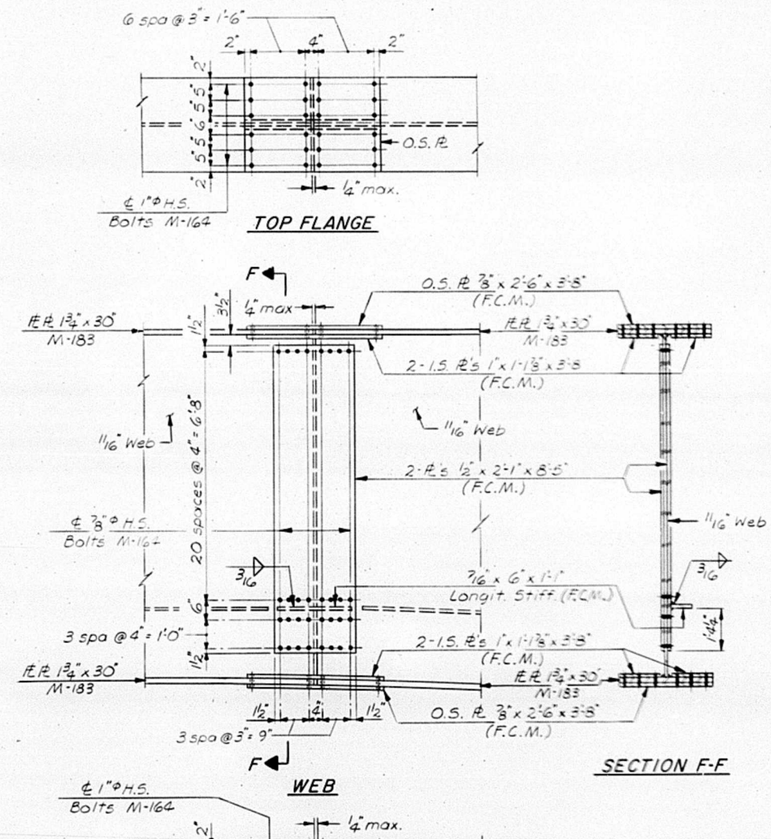
Sheet 24 of 93



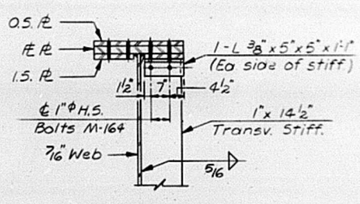
DETAIL OF SPLICES 1 & 6

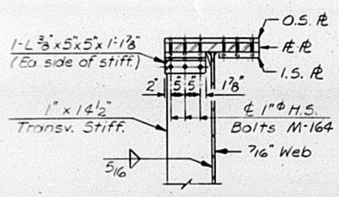


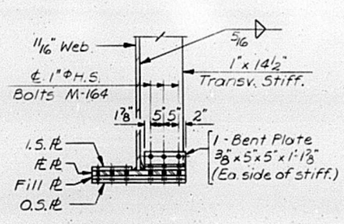
DETAIL OF SPLICES 2 & 5



DETAIL OF SPLICES 3 & 4







Notes

Structural steel shall meet the requirements of AASHTO M-183 unless otherwise noted.

Flange splice plates, web splice plates and longitudinal stiffeners attached to web splice plates shall meet the requirements of Fracture Critical Members. (F.C.M.)

GIRDER SPLICE DETAILS
SPANS 9, 10 & 11

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O.
CHECKED C.R.N.
DRAWN D.A.N.
CHECKED S.C.O.

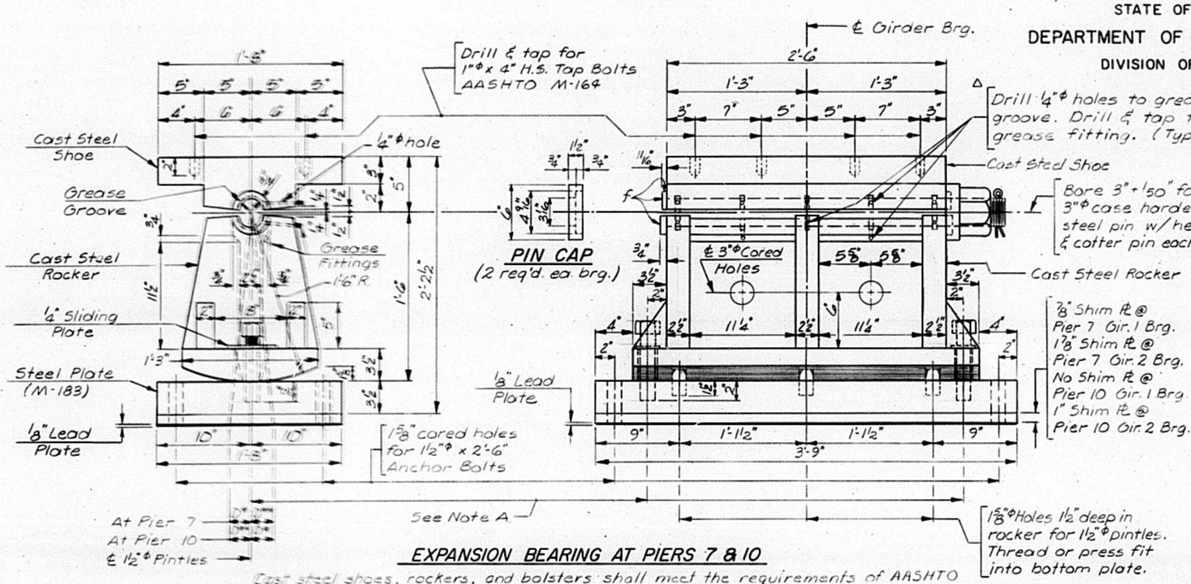
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

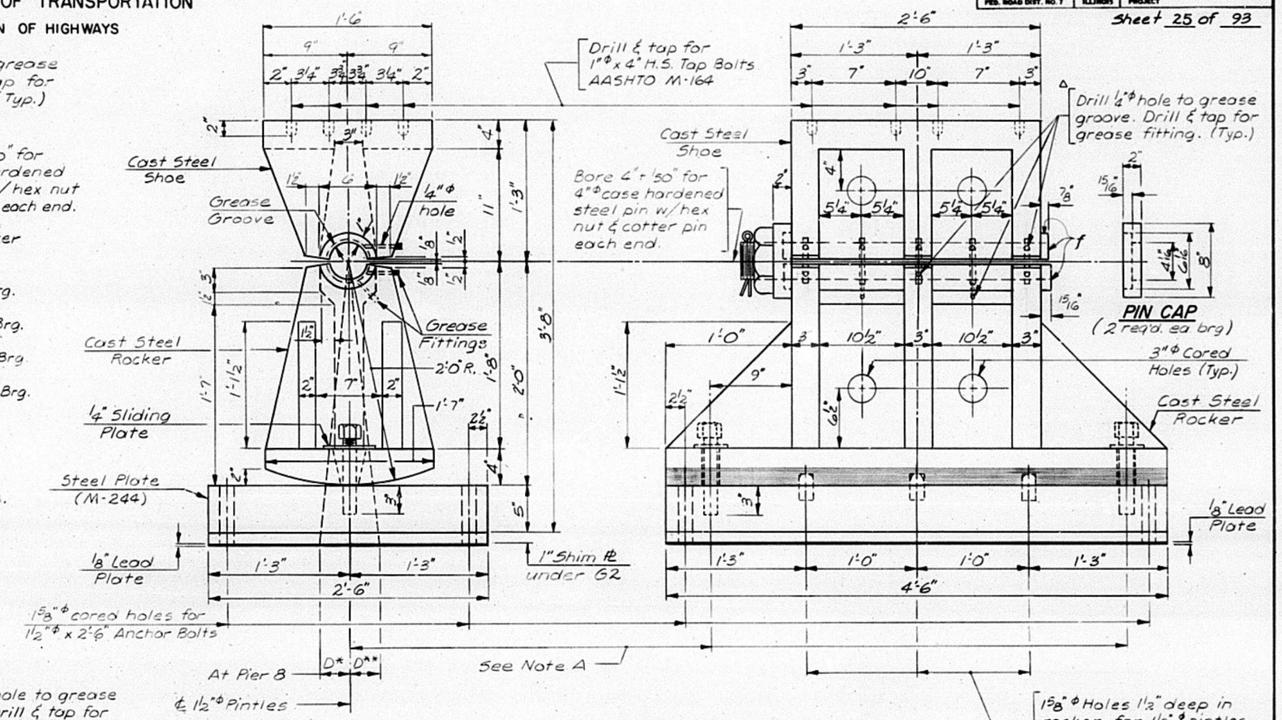
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) -P	PEORIA & TAZEWELL	96	27
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 25 of 93



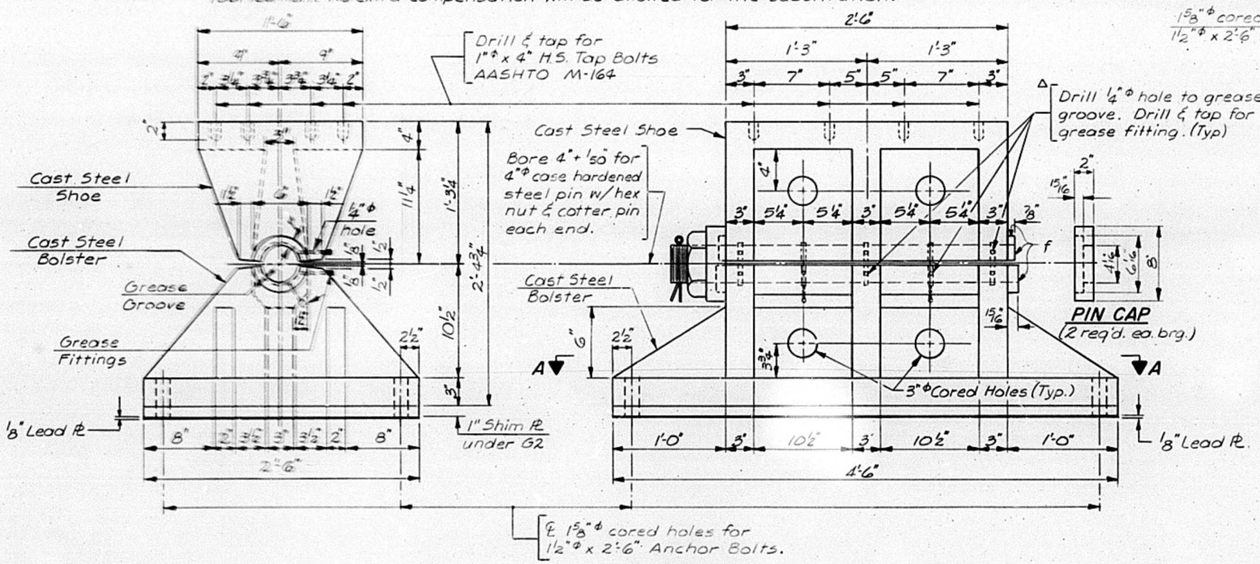
EXPANSION BEARING AT PIERS 7 & 10

Cast steel shoes, rockers, and bolsters shall meet the requirements of AASHTO M192 Class 90. Structural steel weldments meeting the requirements of AASHTO M222 or M223 may be substituted for the castings, subject to approval by the Engineer prior to fabrication. No extra compensation will be allowed for the substitution.



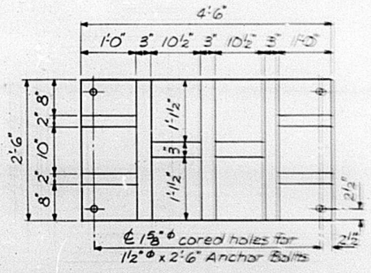
EXPANSION BEARING AT PIER 8

Cast steel shoes, rockers and bolsters shall meet the requirements of AASHTO M-192 Class 90 unless otherwise noted. Structural steel weldments meeting the requirements of AASHTO M-222 or M-223 may be substituted for the castings, subject to approval by the Engineer prior to fabrication. No extra compensation will be allowed for the substitution.

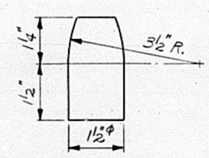


FIXED BEARING AT PIER 9

Cast steel shoes, rockers, and bolsters shall meet the requirements of AASHTO M192 Class 90. Structural steel weldments meeting the requirements of AASHTO M-222 or M-223 may be substituted for the castings, subject to approval by the Engineer prior to fabrication. No extra compensation will be allowed for the substitution.

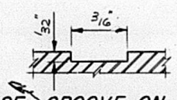


SECTION A-A



PINTLE DETAIL

Steel for pintles shall meet the requirements of AASHTO M-223



GREASE GROOVE ON SADDLE

Note: Grease bearing assembly with molybdenum grease before installation.

Note A: 1 5/8" x 3 1/2" Cored holes in Rocker for 1 1/2"Φ H.S. Bolts (AASHTO M-164) Threaded holes in bottom plate for 1 1/2"Φ H.S. Bolts (AASHTO M-164)

NOTES FOR SETTING OF ANCHOR BOLTS AT EXPANSION BEARINGS

a.) D* (Side of bearing away from fixed bearing.)
D* = 1/8" per each 100' of expansion for every 15° fall below the normal temperature of 50°F.

D** (Side of bearing toward fixed bearing.)
D** = 1/8" per each 100' of expansion for every 15° rise above the normal temperature of 50°F.

b.) After girders have been erected and dimensions D* & D** determined, holes shall be drilled & anchor bolts shall be grouted in place. All fixed anchor bolts may be built into the masonry.

BEARING DETAILS
SPANS 9, 10, & 11

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED D.L.B.
CHECKED J.E.H.
DRAWN P.M.
CHECKED C.R.N.

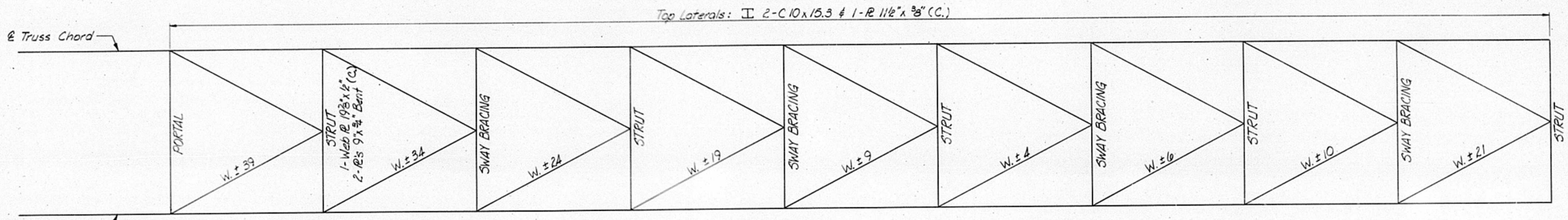
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

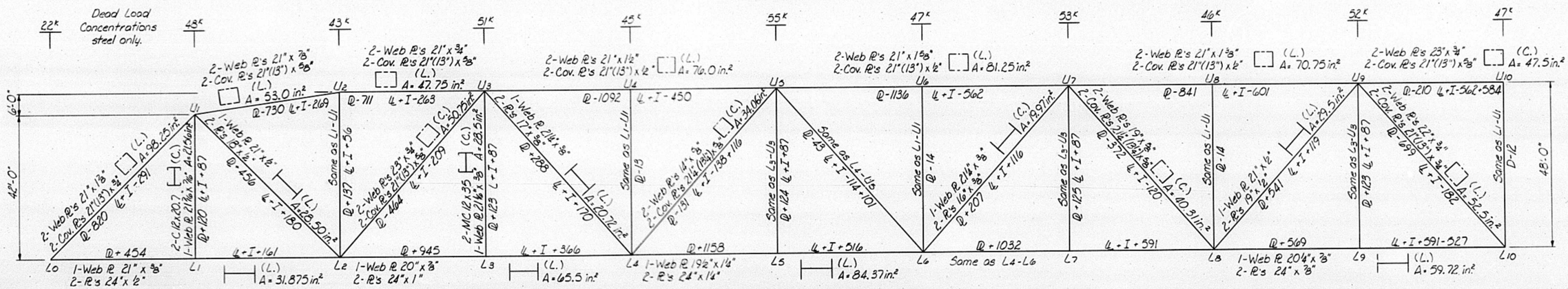
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.-49	(15B-1) -P	PEORIA & TAZEWELL	96	28
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 26 of 93



All Struts: W21x83 (C.) except as noted.

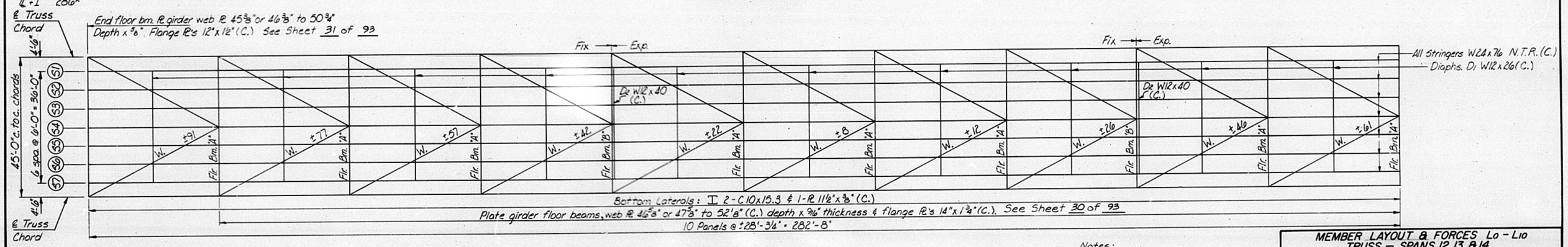
TOP LATERALS



Reaction:
D 744k
L+I 286k
Wind 226k

Note: Areas of Tension Members are gross areas.

TRUSS ELEVATION



BOTTOM FRAMING PLAN L0 TO L10

Notes:

Dead load, live load and wind forces are given in kips.

Steel on this sheet noted (C.) shall be Carbon M-183.

Steel on this sheet noted (L.) shall be Low-alloy M-223

For truss members to be designated "N.T.R." see truss detail sheets 33 thru 40 of 93.

MEMBER LAYOUT & FORCES L0 - L10
TRUSS — SPANS 12, 13, & 14

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED R.N.C.
CHECKED W.O.L.
DRAWN R.U.F.
CHECKED R.N.C.

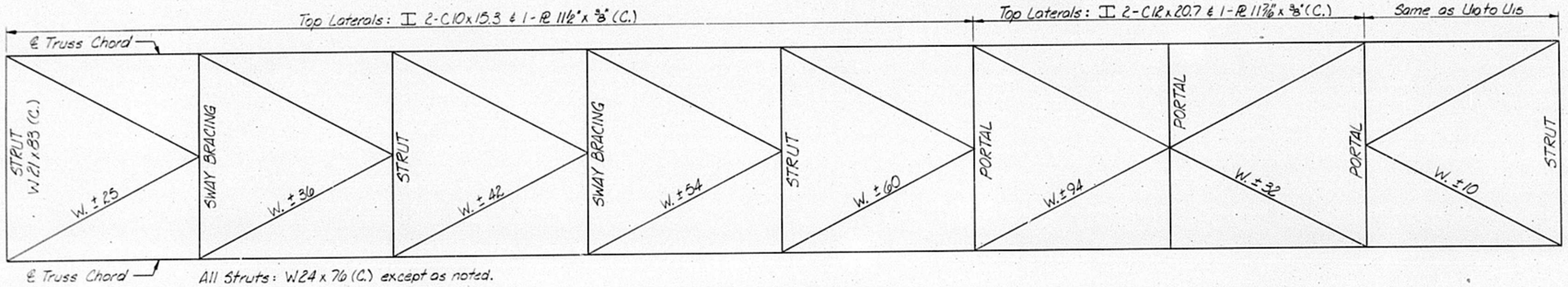
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

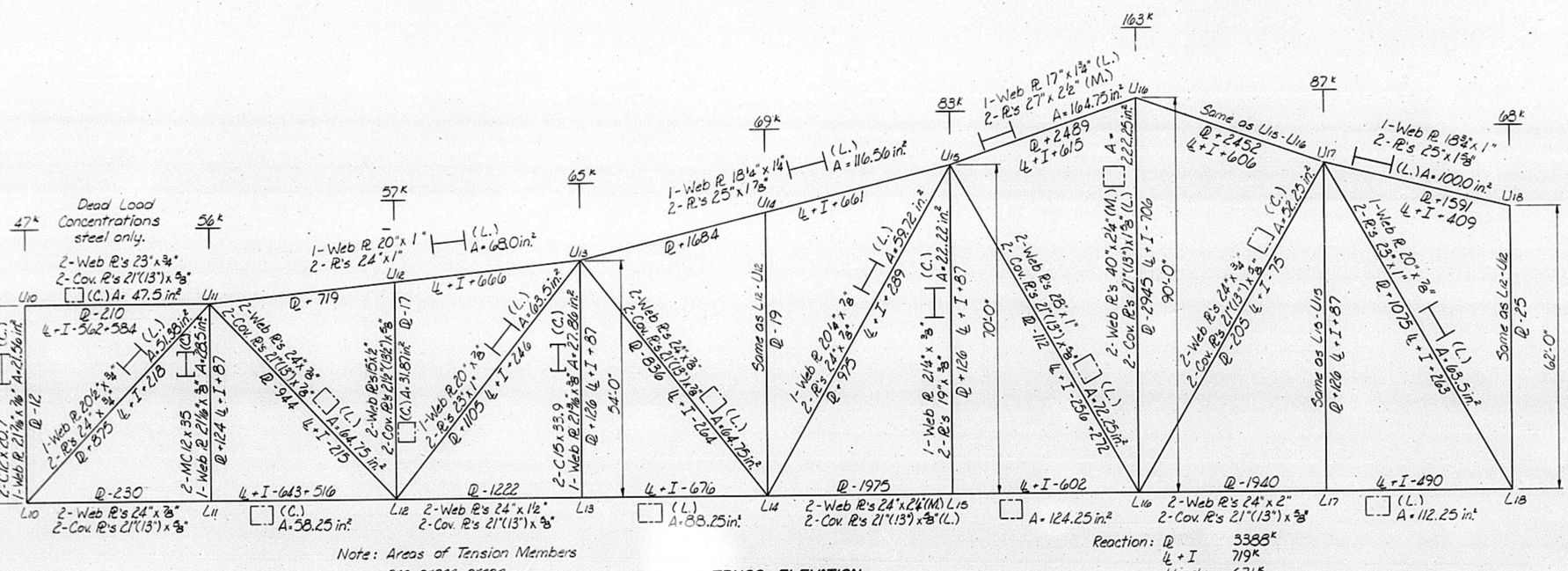
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA.49	(15B-1)-P	PEORIA & TAZEWELL	96	29
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

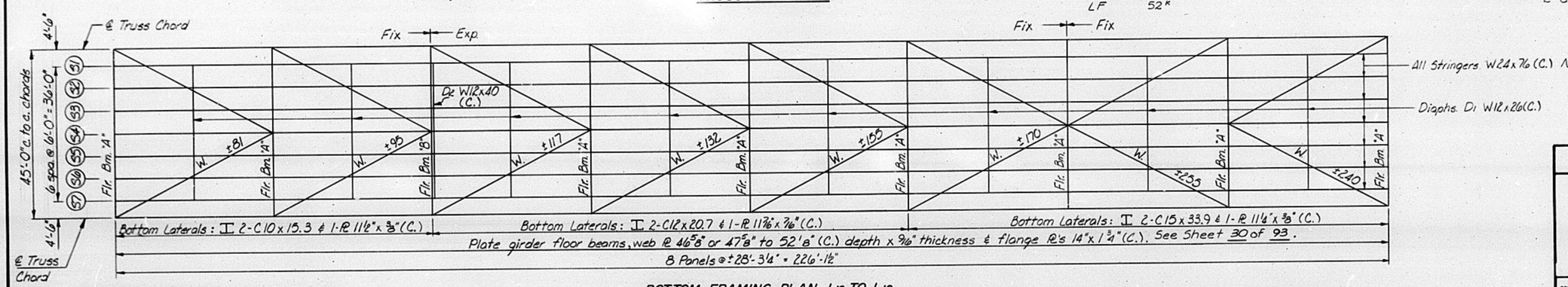
Sheet 27 of 93



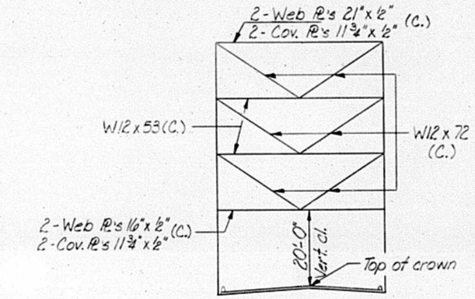
TOP LATERALS



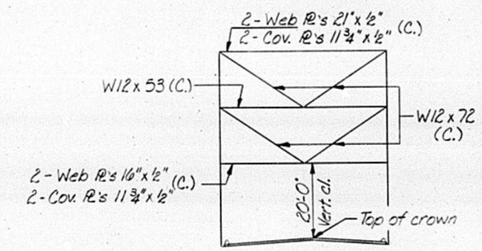
TRUSS ELEVATION



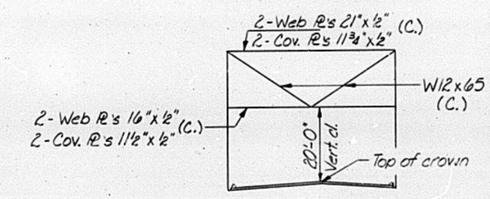
BOTTOM FRAMING PLAN L10 TO L18



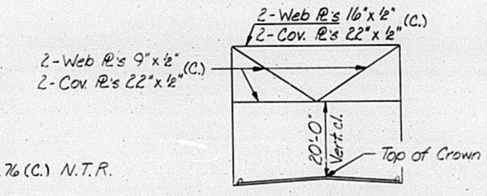
PORTAL L16-U16



PORTAL L16-U15 & L16-U17



PORTAL L20-U21 & L21-U22



PORTAL L0-U1

For truss members to be designated "N.T.R." see truss detail sheets 33 thru 40 of 93.

Dead Load, live load and wind forces are given in kips.

Steel shown on this sheet noted (C.) shall be Carbon M183.
Steel noted (L.) shall be Low-alloy M 223.
Steel noted (M.) shall be Low-alloy M 222.

MEMBER LAYOUT & FORCES L10-L18
TRUSS — SPANS 12, 13, & 14

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED R.W.C.
CHECKED W.D.L.
DRAWN R.J.F.
CHECKED R.W.C.

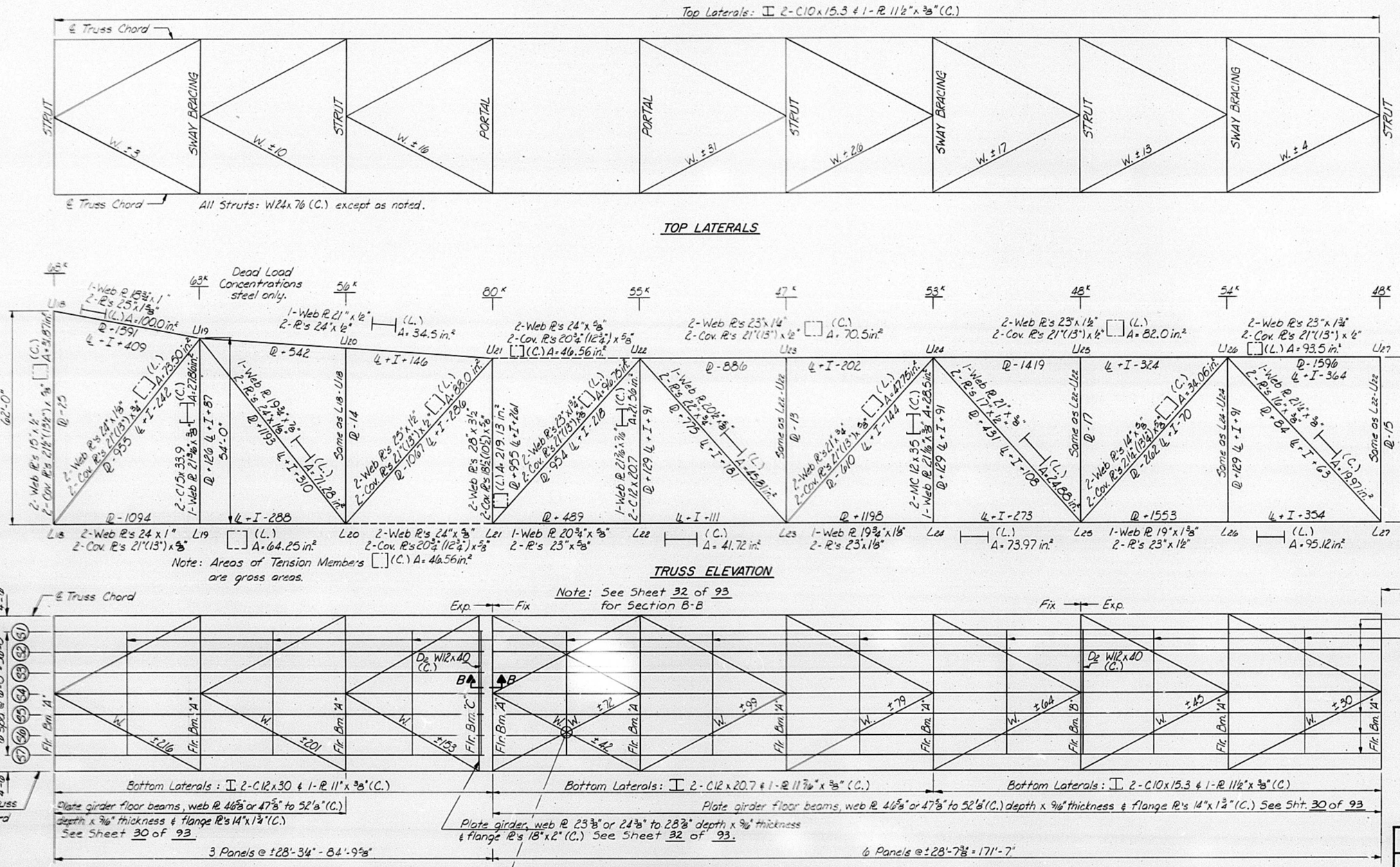
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

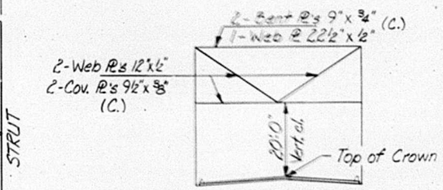
FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

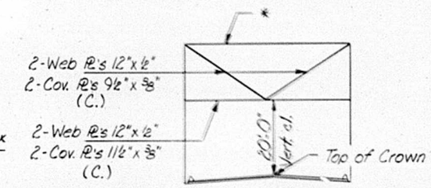
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA 49	(15B-1)-P	PEORIA & TAZEWELL	96	30
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 28 of 93





SWAY BRACING U13 & U19



SWAY BRACING U3, U5, U7, U9, U11, U24 & U26

* W12x33 @ U3, U5, U7 & U9
W24x76 @ U24 & U26
2-PL's 9"x ¾" Bent } @ U11
Web PL 22½"x½"

MEMBER LAYOUT & FORCES L18-L27
TRUSS — SPANS 12, 13, & 14

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC.(15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED R.W.C.
CHECKED W.D.L.
DRAWN R.J.F.
CHECKED W.D.L.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

For truss members to be designated "N.T.R." see truss detail sheets 33 thru 40 of 93.

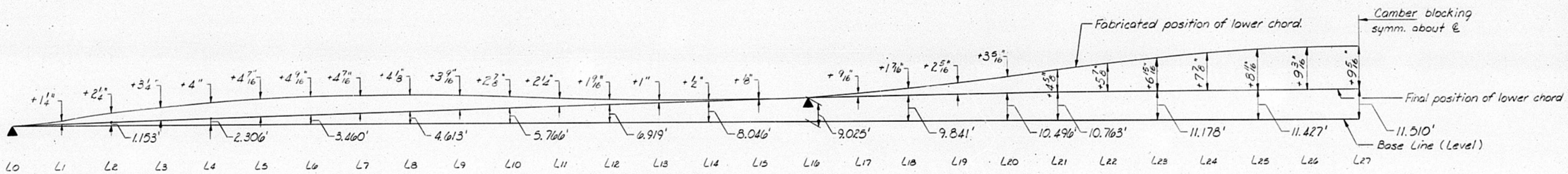
Dead Load, live load and wind forces are given in kips.

Note:
Steel shown on this sheet noted (C.) shall be Carbon M183
Steel noted (L.) shall be Low-alloy M223

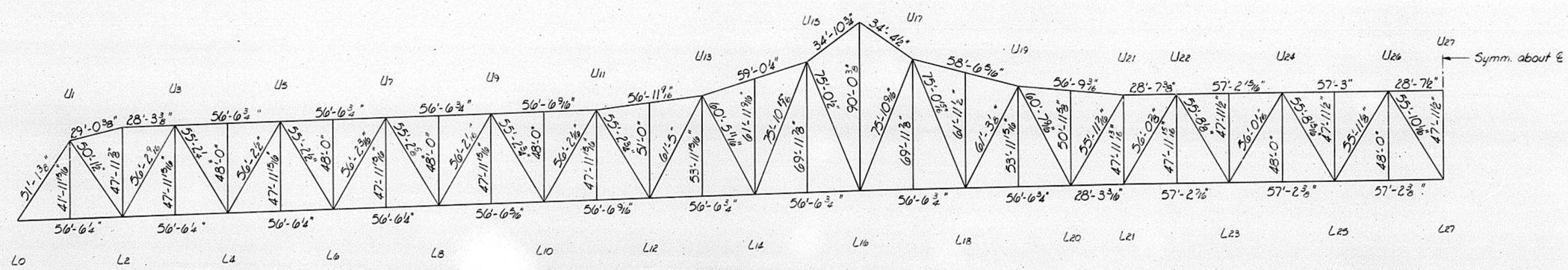
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) -P	PEORIA & TAZEWELL	96	31
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 29 of 93



CAMBER BLOCKING ORDINATES
& BOTTOM CHORD OFFSETS



FABRICATED LENGTHS

TRUSS LAYOUT
SPANS 12, 13, & 14

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED R.W.C.
CHECKED W.D.L.
DRAWN R.J.F.
CHECKED R.W.C.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

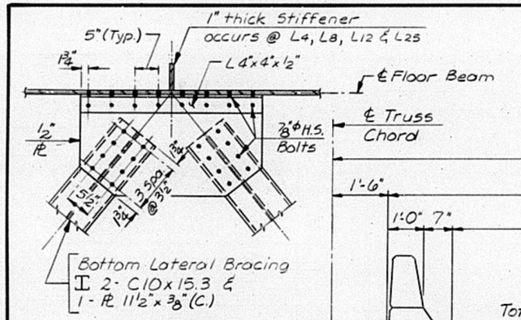
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA 49	(15B-1) -P	PEORIA & TAZEWELL	96	32
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 30 of 93

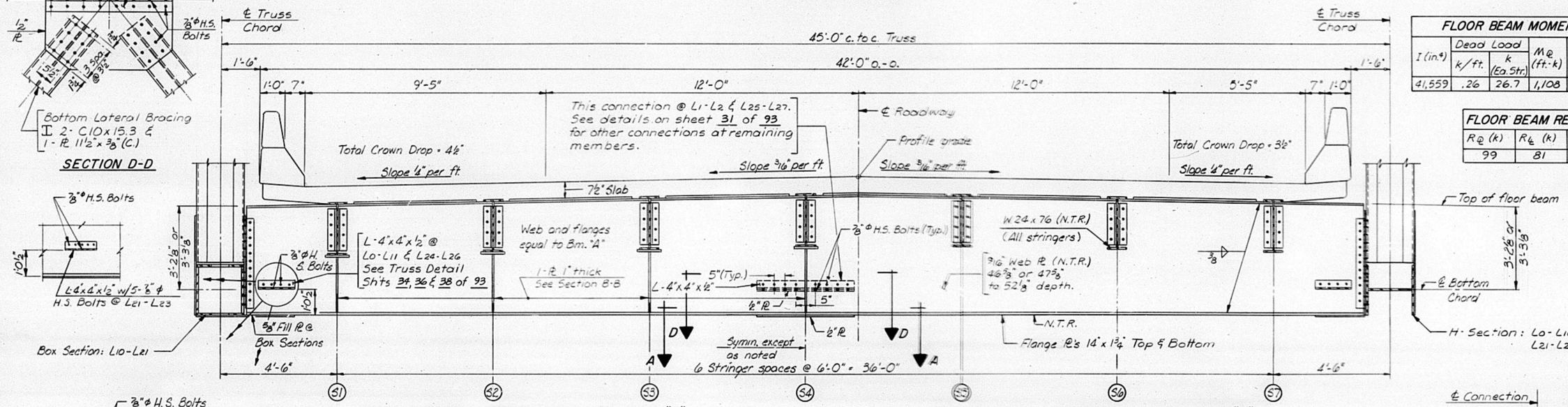
N.T.R. denotes main load carrying members that are subject to the Supplemental Requirements for Notch Toughness.

FLOOR BEAM MOMENT TABLE AT .5 PT.							
I (in.⁴)	Dead Load k/ft.	Dead Load k (Ea. Str.)	$M_{@}$ (ft.-k)	$M_{℄}$ (ft.-k)	Imp (ft.-k)	M_T (ft.-k)	fs (ksi)
41,559	.26	26.7	1,108	932	280	2,320	18.5

FLOOR BEAM REACTION TABLE			
$R_{@}$ (k)	$R_{℄}$ (k)	Imp (k)	R_{TOTAL}
99	81	24.3	204.3



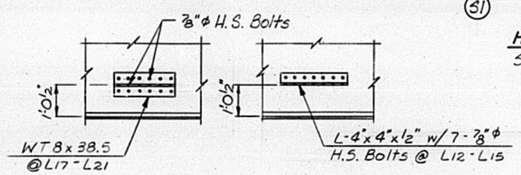
SECTION D-D

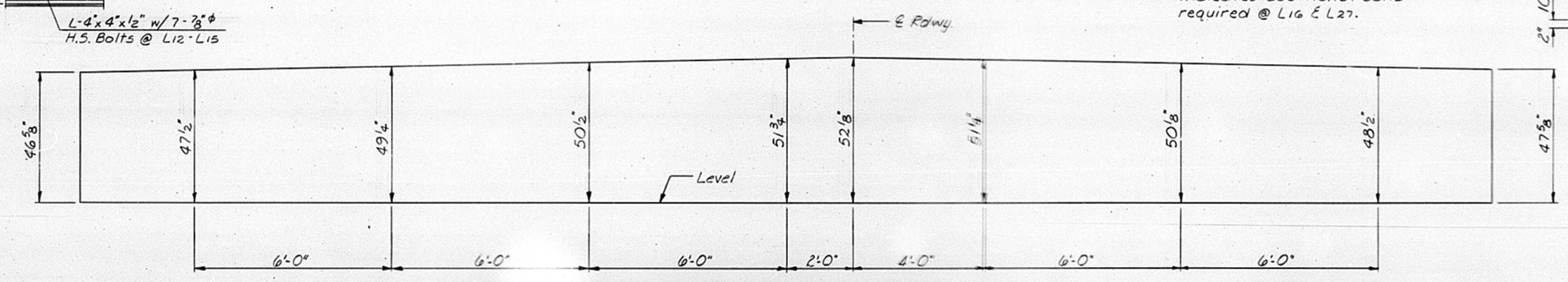


HALF ELEVATION INTERMEDIATE FLOOR BEAM "B"
Showing expansion side @ L4, L8, L12, L25, L4', L8', L12' & L25'. Opposite side equal to Flr. Bm. "A"

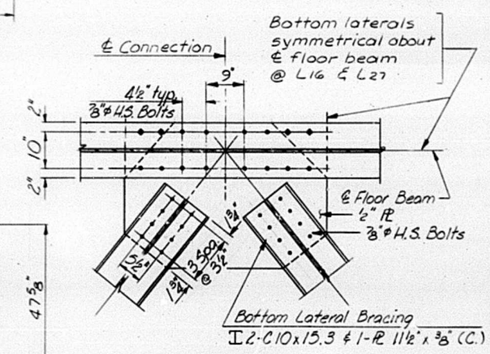
HALF ELEVATION INTERMEDIATE FLOOR BEAM "A"
(Stringer conn. one side only at L21)

◆ - Indicates additional bolts required @ L16 & L27.



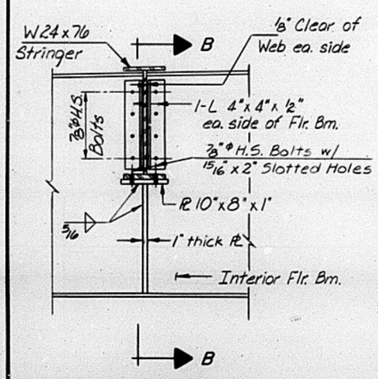


WEB PLATE OFFSETS CAMBERED FOR CROWN & DEAD LOAD DEFLECTIONS

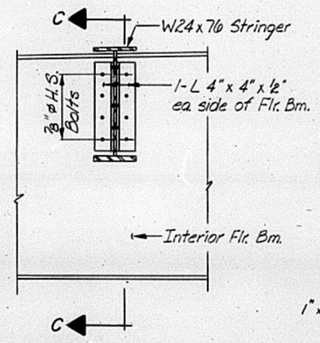


SECTION A-A

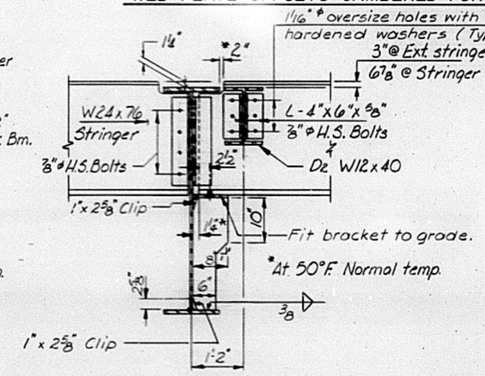
Note: All steel shown on this sheet shall be carbon steel M183 except as noted. Steel noted (L.) shall be Low-alloy M223.



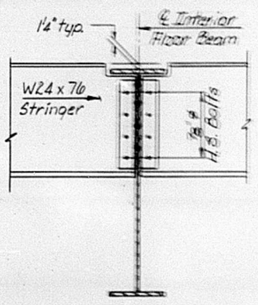
STRINGER CONNECTION AT FLOOR BEAM "B"



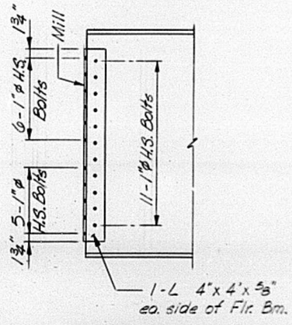
STRINGER CONNECTION AT FLOOR BEAM "A"



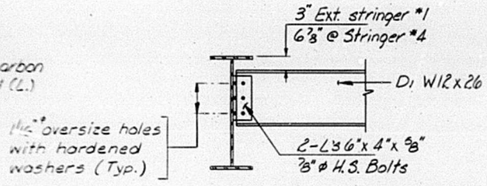
SECTION B-B



SECTION C-C



INTERMEDIATE FLOOR BEAM CONNECTION



DIAPHRAGM D1

INTERIOR FLOOR BEAMS A & B
TRUSS — SPANS 12, 13, & 14

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED R.W.C.
CHECKED W.D.L.
DRAWN R.J.F.
CHECKED R.W.C.

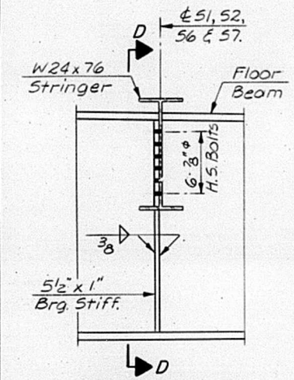
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

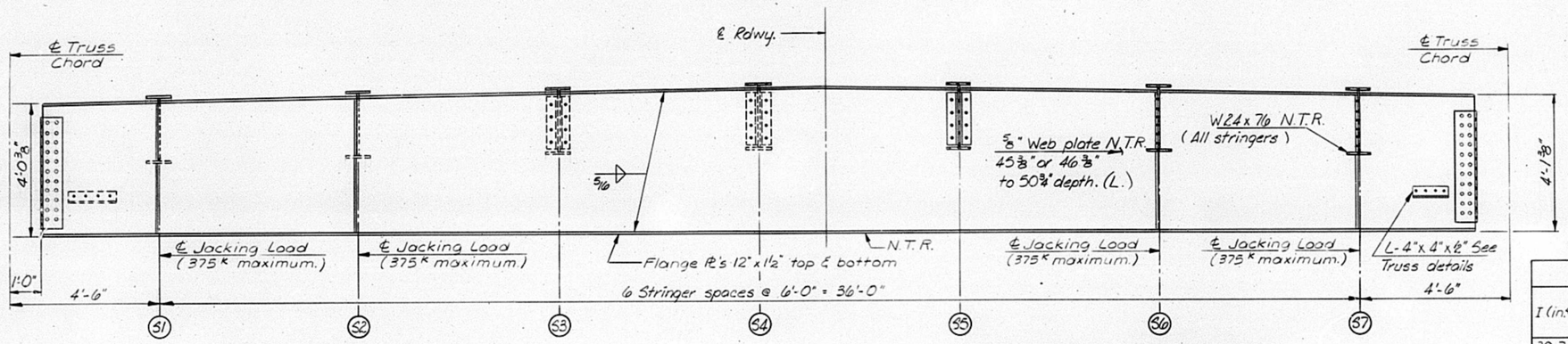
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA:49	(15B-1)-P	PEORIA & TAZEWELL	96	33
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 31 of 93



END FLOOR BEAM STRINGER CONNECTION
(At Location of Jacking Load)

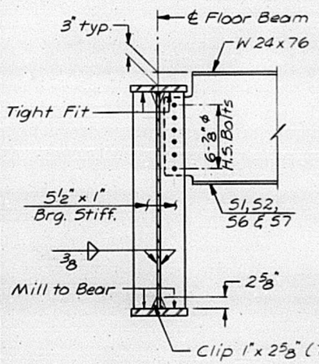


HALF ELEVATION – END FLOOR BEAM
Showing approach span side.

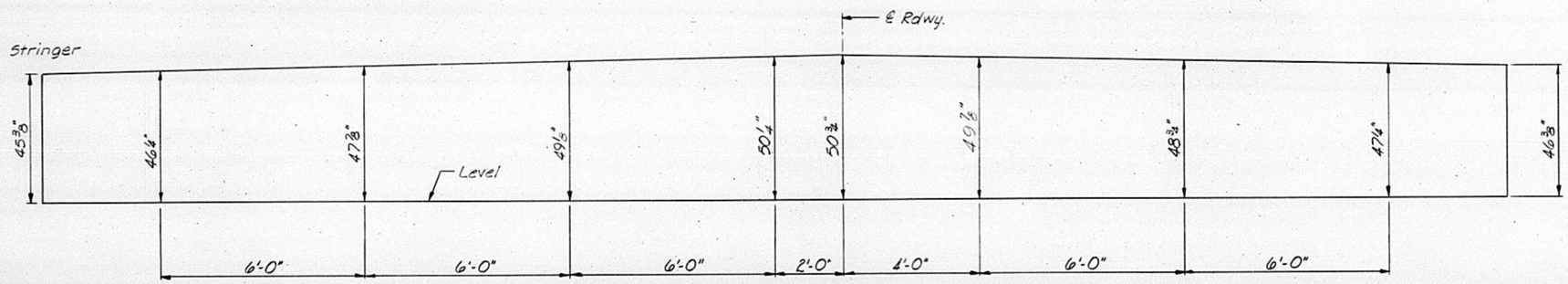
HALF ELEVATION – END FLOOR BEAM
Showing truss span side.

FLOOR BEAM REACTION TABLE			
$R_{\mathbb{C}}$ (k)	$R_{\mathbb{L}}$ (k)	Imp (k)	R_{TOTAL}
51	73	22	146

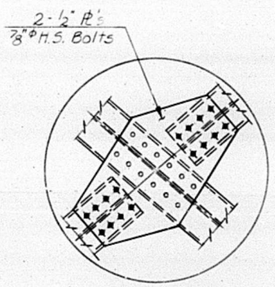
FLOOR BEAM MOMENT TABLE AT .5 PT.								
I (in.⁴)	Dead Load k/ft.	Dead Load k (Ea. Str.)	$M_{\mathbb{C}}$ (ft.-k)	$M_{\mathbb{L}}$ (ft.-k)	Imp (ft.-k)	M_T (ft.-k)	f_s (ksi)
30,711	.22	13.4	585	864	259	1,708	17.8



SECTION D-D



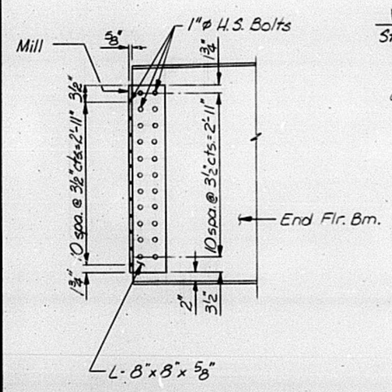
WEB PLATE OFFSETS CAMBERED FOR CROWN & DEAD LOAD DEFLECTIONS



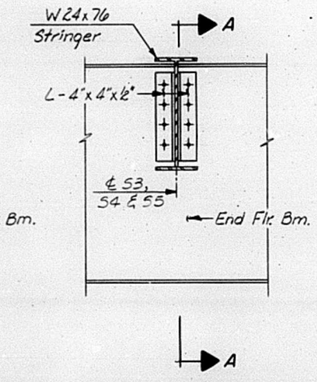
DETAIL "D"
(From Sheet 28 of 93.)

Note: All steel shown on this sheet shall be Carbon M183 except as noted. Steel noted (L.) shall be Low-alloy M223

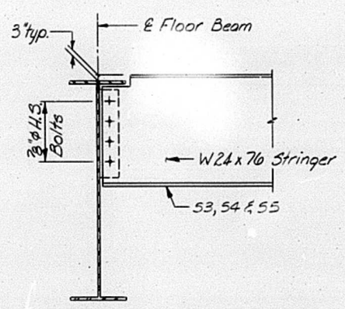
N.T.R. denotes main load carrying members that are subject to the Supplemental Requirements for Notch Toughness.



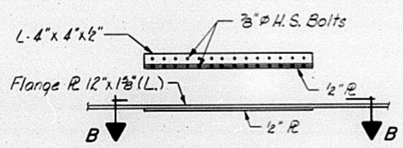
END FLOOR BEAM CONNECTION DETAIL



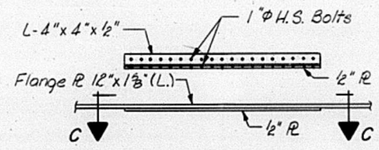
END FLOOR BEAM STRINGER CONNECTION



SECTION A-A

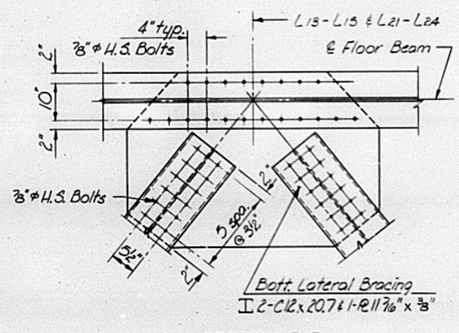


DETAIL I

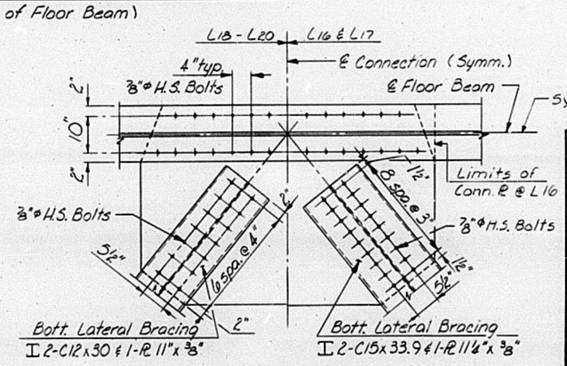


DETAIL II

BOTTOM LATERAL BRACING CONNECTION DETAILS
(At center of Floor Beam)



SECTION B-B



SECTION C-C

END FLOOR BEAM
TRUSS – SPANS 12, 13, & 14

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED R.W.C.
CHECKED W.D.L.
DRAWN R.J.F.
CHECKED R.W.C.

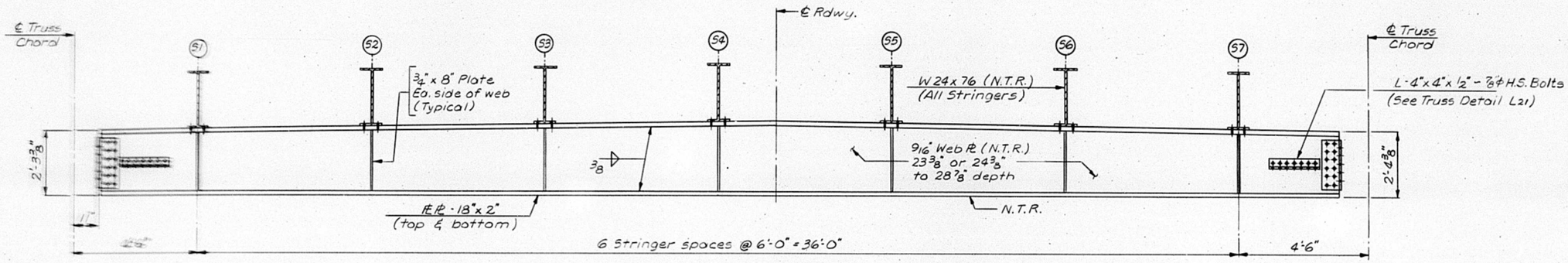
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

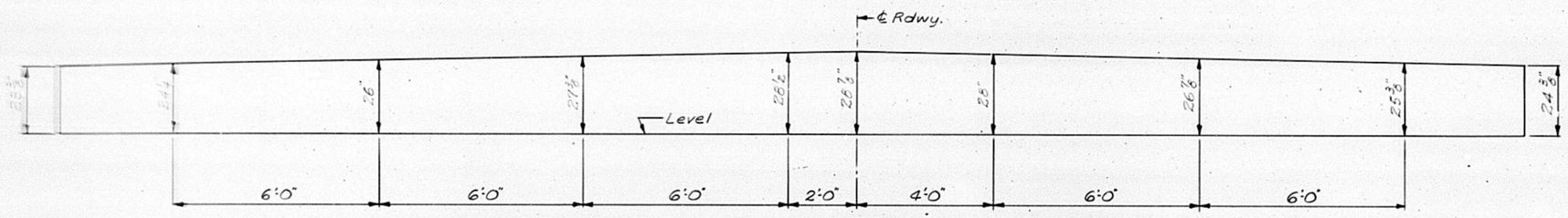
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.-49	(15B-1) -P	PEORIA & TAZEWELL	96	34
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

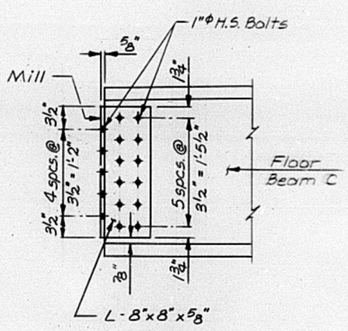
Sheet 32 of 93



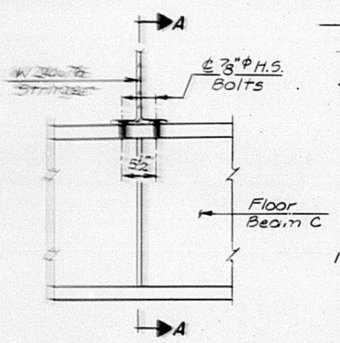
ELEVATION – FLOOR BEAM C



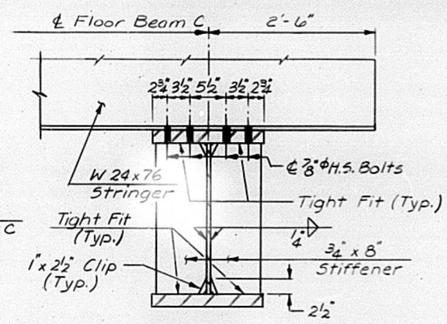
WEB PLATE OFFSETS CAMBERED FOR CROWN & DEAD LOAD DEFLECTIONS



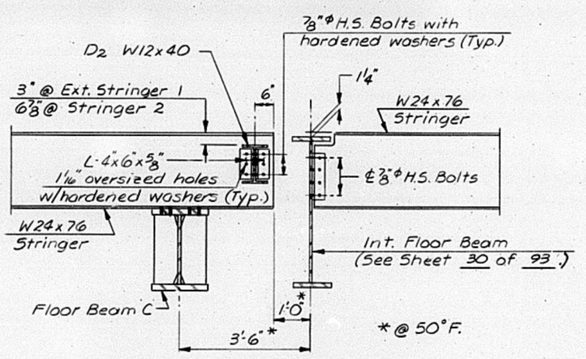
FLOOR BEAM C CONNECTION DETAIL



FLOOR BEAM C STRINGER CONNECTION



SECTION A-A



SECTION B-B
(From Sheet 28 of 93.)

Notes:

All steel shown on this sheet shall be Carbon M183

N.T.R. denotes main load carrying members that are subject to the Supplemental Requirements for Notch Toughness.

FLOOR BEAM C
TRUSS - SPANS 12, 13 & 14

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED R.W.C.
CHECKED W.D.L.
DRAWN D.A.N.
CHECKED R.W.C.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

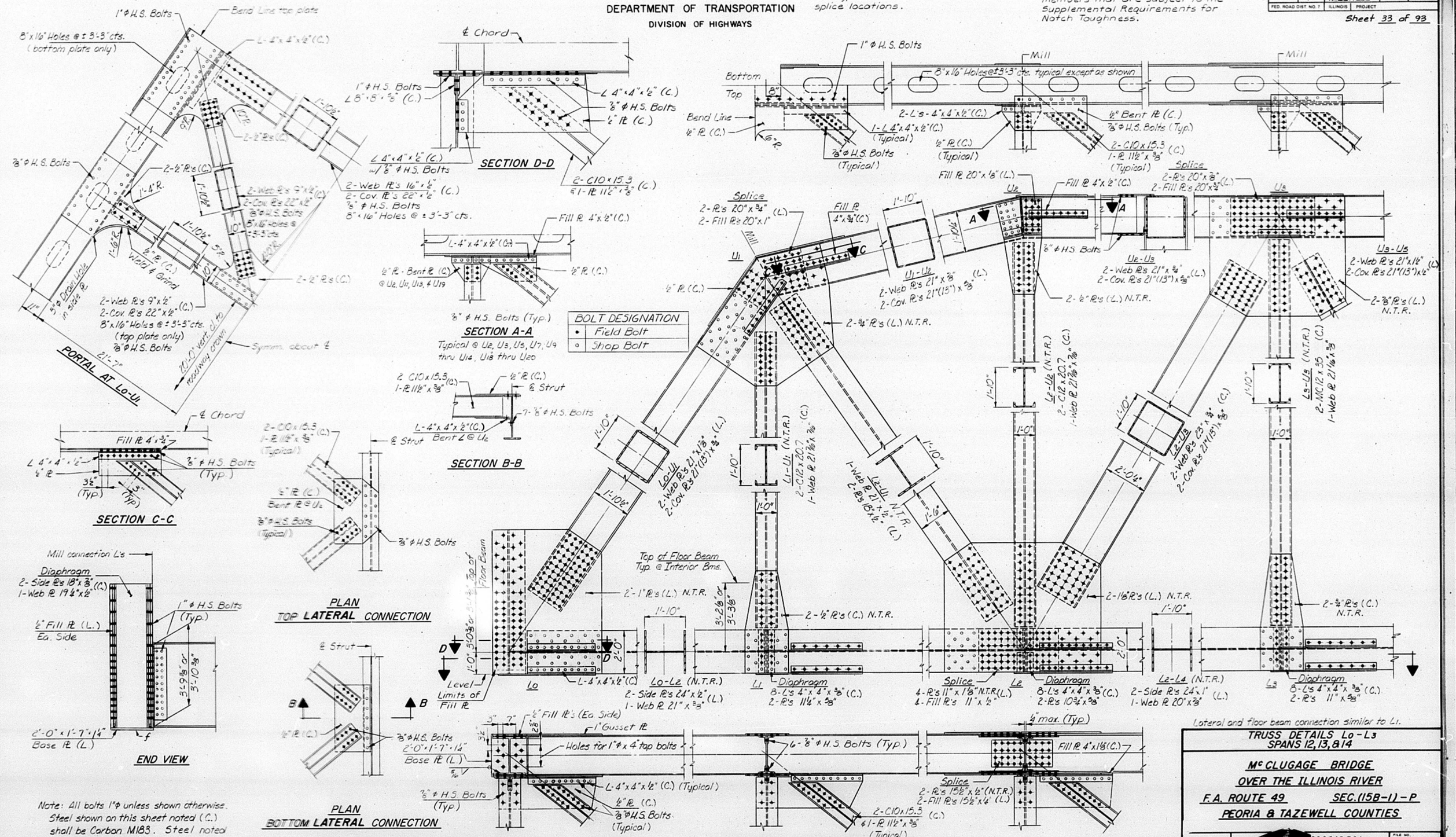
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

See Detail "C" on sheet 43 of 93 for typical detail of Handhole at splice locations.

N.T.R. denotes main load carrying members that are subject to the Supplemental Requirements for Notch Toughness.

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA-49	(158-1)-P	PEORIA & TAZEWELL	96	35
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 33 of 93



Note: All bolts 1"φ unless shown otherwise. Steel shown on this sheet noted (C.) shall be Carbon M183. Steel noted (L.) shall be Low-alloy M223.

TOP LATERALS TO ℄ STRUT
Typical @ U2, U4, U6, U8, U10, U12, U14, U18, U23, & U25

TRUSS DETAILS Lo - L3
SPANS 12, 13, & 14

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (158-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED R.W.C.
CHECKED W.D.L.
DR'WN R.J.E.
CHECKED R.W.C.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

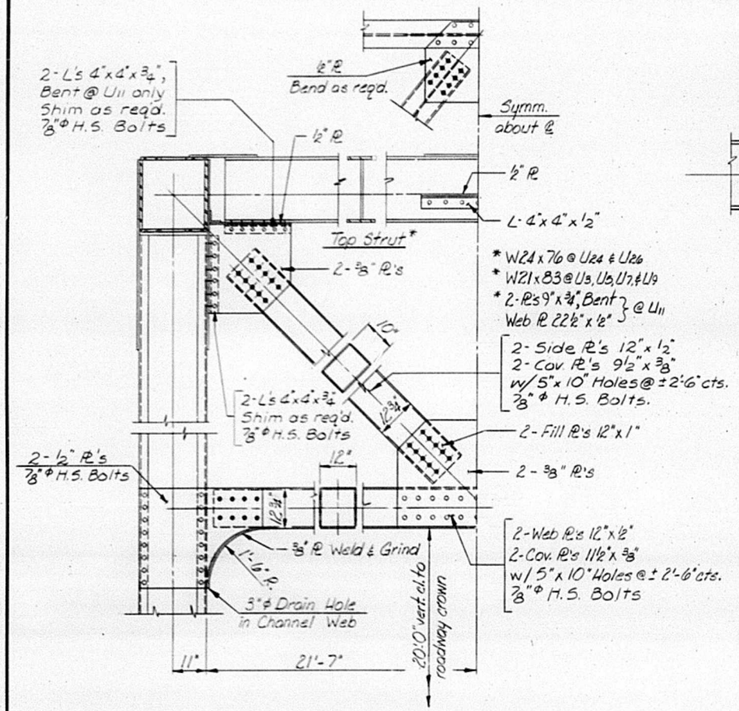
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

See Detail "C" on sheet 43 of 93 for typical detail of Handhole at splice locations.

N.T.R. denotes main load carrying members that are subject to the Supplemental Requirements for Notch Toughness.

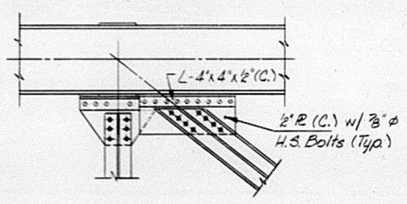
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA:49	(15B-1) -P	PEORIA & TAZEWELL	96	36
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 34 of 93



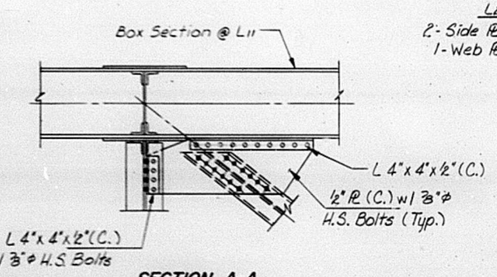
SWAY BRACE AT U3, U5, U7, U9, U11, U24, & U26

All steel shown in sway brace shall be Carbon M183; 7/8"φ H.S. Bolts. For details of strut at U11, see sheet 36 of 93.



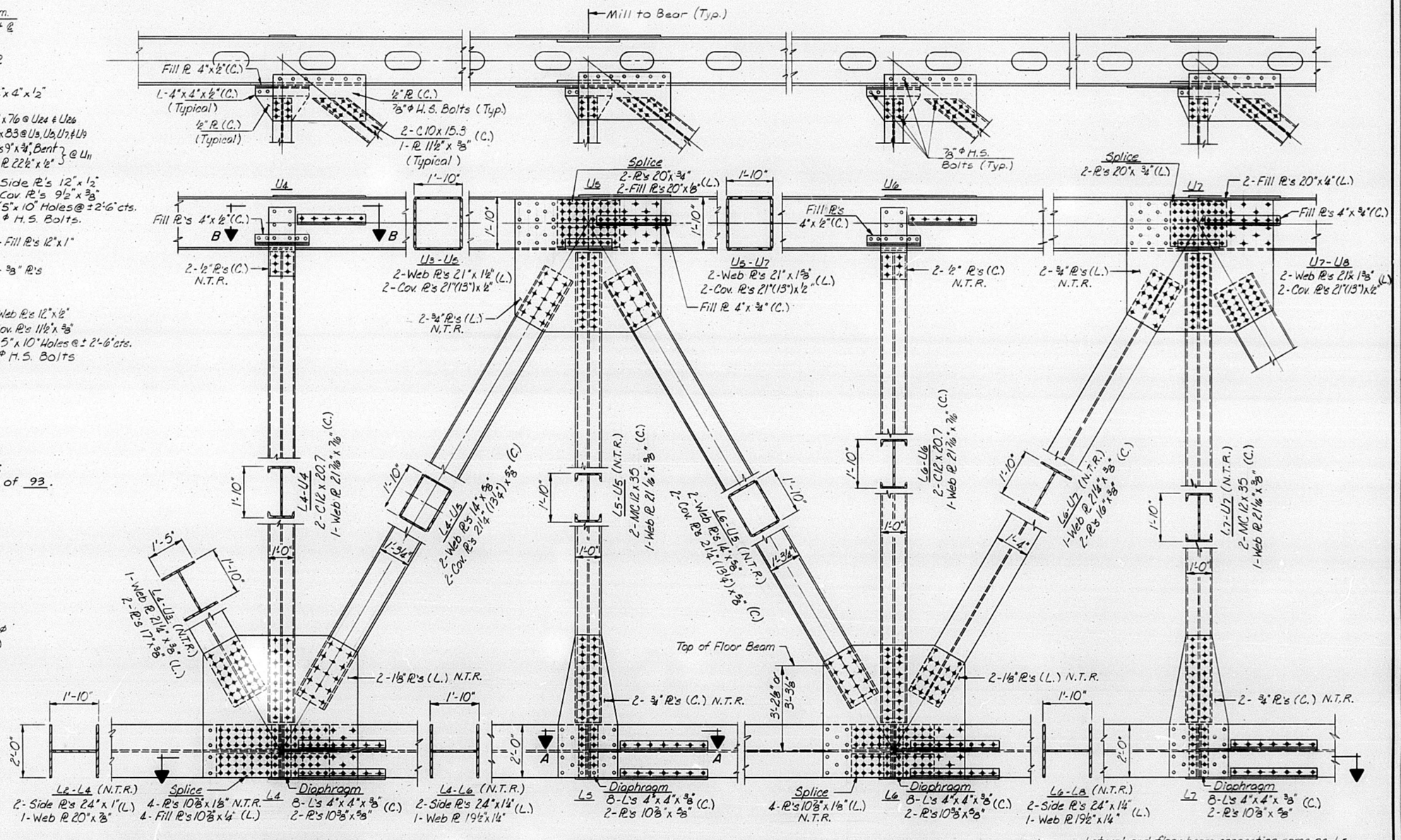
SECTION B-B

Typical @ U4, U6, U8, U23, & U25

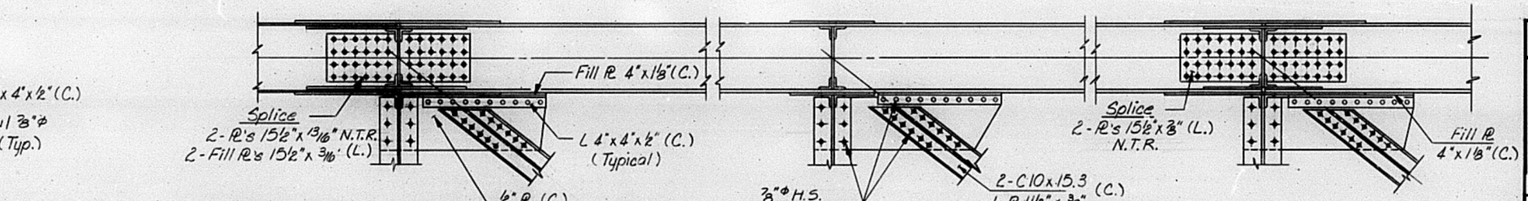


SECTION A-A

Typical @ L1 thru L10
Similar @ L11



Lateral and floor beam connection same as L6.



Note: All bolts 1"φ unless shown otherwise. Steel shown on this sheet noted (C.) shall be Carbon M183. Steel noted (L.) shall be Low-alloy M223.

TRUSS DETAILS L4 - L7
SPANS 12, 13, & 14

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED R.W.C.
CHECKED W.D.L.
DRAWN R.J.F.
CHECKED R.W.C.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

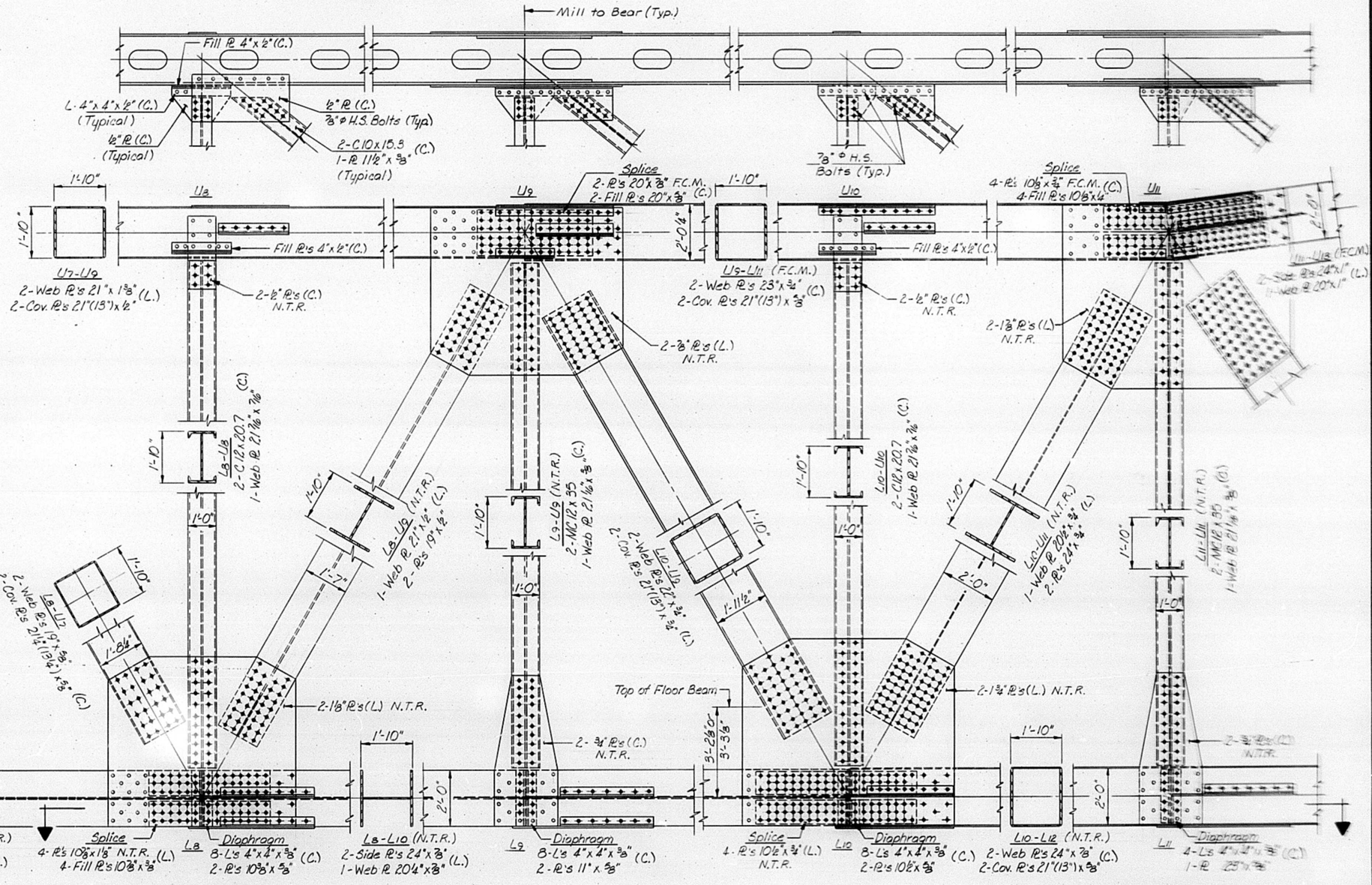
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

See Detail "C" on sheet 43 of 93 for typical detail of Handhole at splice locations.

N.T.R. denotes main load carrying members that are subject to the Supplemental Requirements for Notch Toughness.

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA-49	(15B-1) -P	PEORIA & TAZEWELL	96	37
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 35 of 93



Lateral and floor beam connection similar to L9 & L15.

Note: Tension chord & tension splices @ the interior piers & hanger for suspended span shall meet the requirements for Fracture Critical Members (F.C.M.)

Note: All bolts 1"φ unless shown otherwise. Steel shown on this sheet noted (C.) shall be Carbon M183. Steel noted (L.) shall be Low-alloy M223.

TRUSS DETAILS L8-L11
SPANS 12, 13, & 14

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED R.W.C.
CHECKED N.D.L.
DRAWN R.J.F.
CHECKED R.W.C.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

74001

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

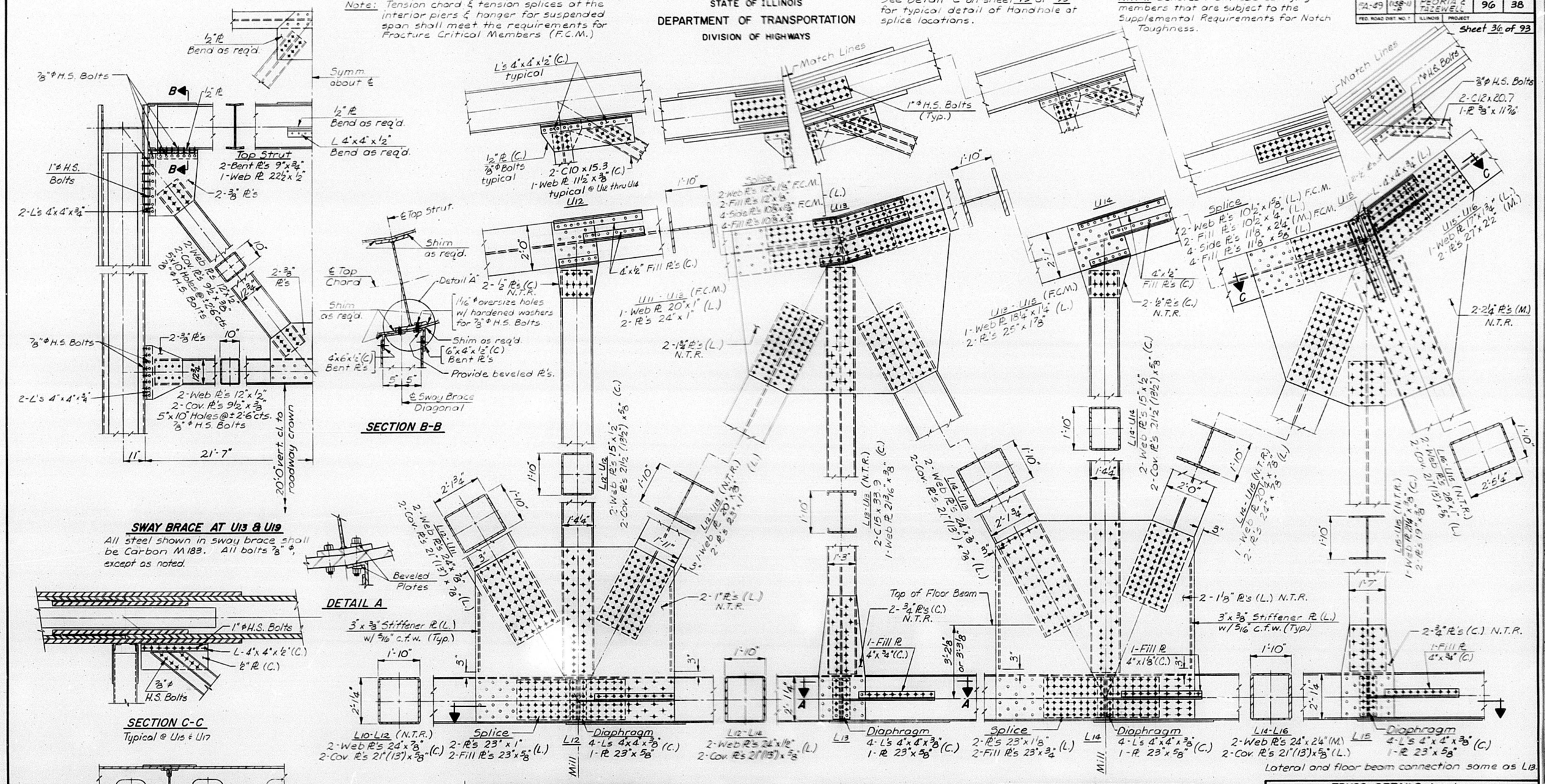
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA-49	(15B-1)-F	PEORIA & TAZEWELL	96	38
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 36 of 93

Note: Tension chord & tension splices at the interior piers & hanger for suspended span shall meet the requirements for Fracture Critical Members (F.C.M.)

See Detail "C" on sheet 43 of 93 for typical detail of Handhole at splice locations.

N.T.R. denotes main load carrying members that are subject to the Supplemental Requirements for Notch Toughness.



Note: All bolts 1"Φ unless shown otherwise. Steel shown on this sheet noted (C.) shall be Carbon M 183; Steel noted (L.) shall be Low-alloy M 223; Steel noted (M.) shall be Low-alloy M 222.

TRUSS DETAILS L12-L15
SPANS 12, 13, & 14

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-F
PEORIA & TAZEWELL COUNTIES

DESIGNED R.W.C.
CHECKED W.D.L.
DRAWN D.A.N.
CHECKED R.W.C.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

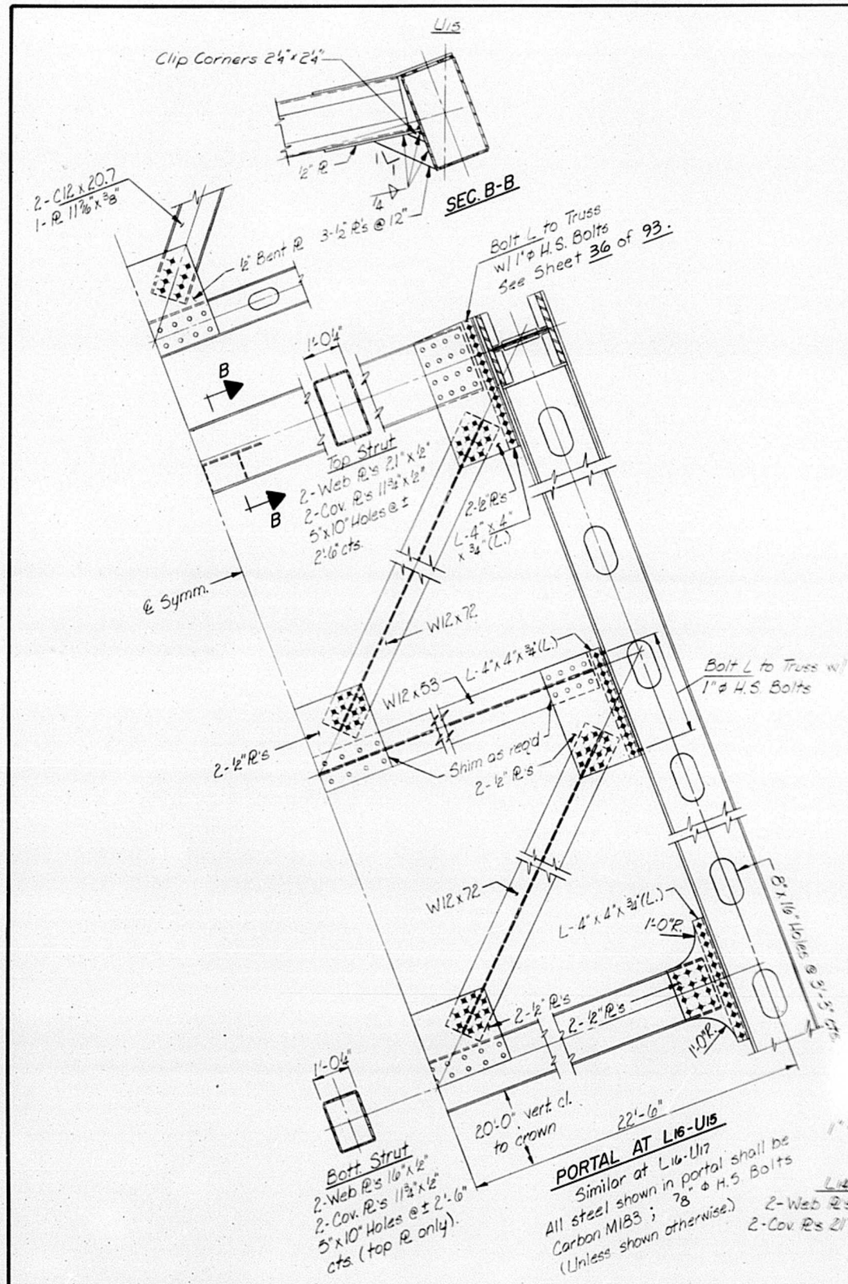
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-11)-P	PEORIA & TAZEWELL	96	39
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

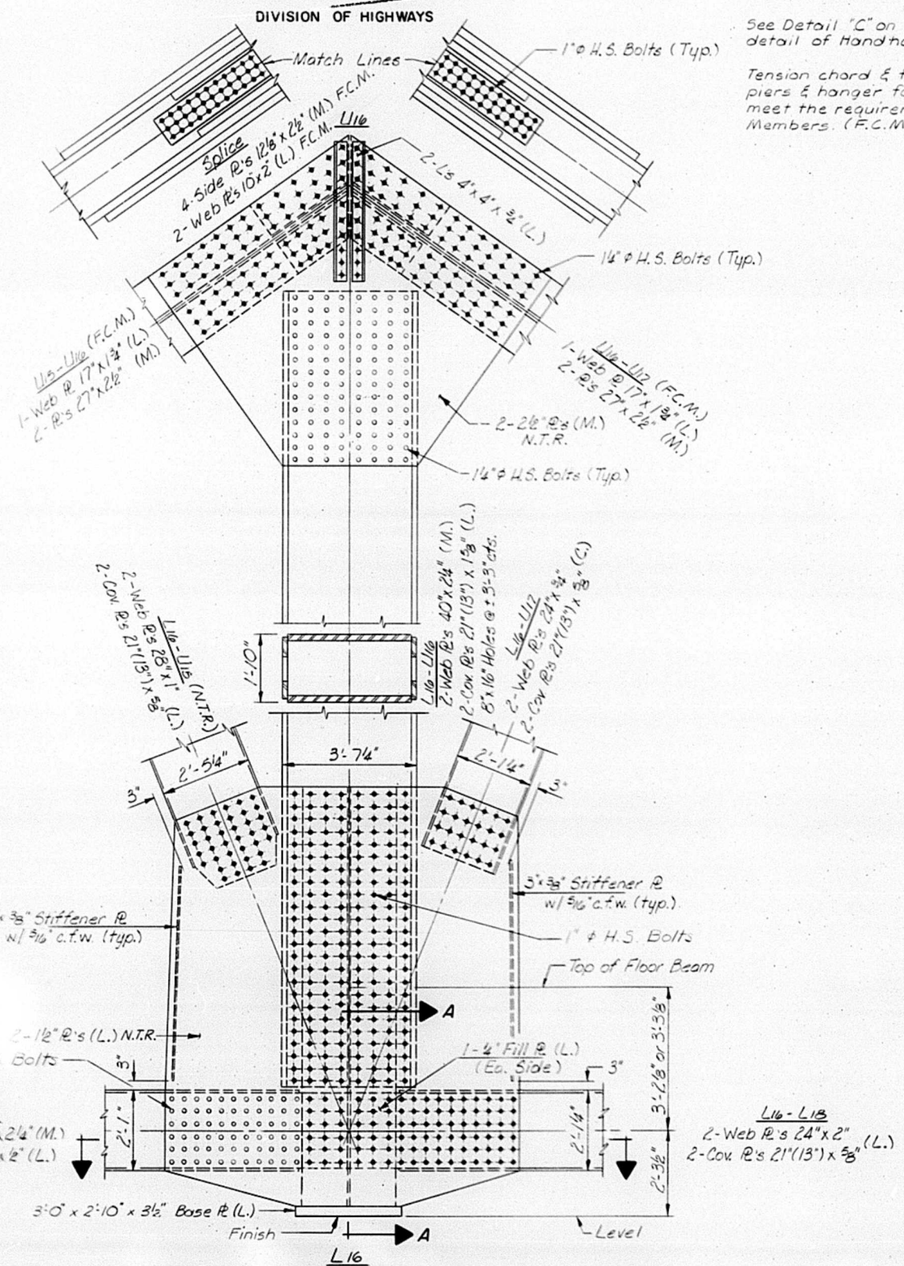
Sheet 37 of 93

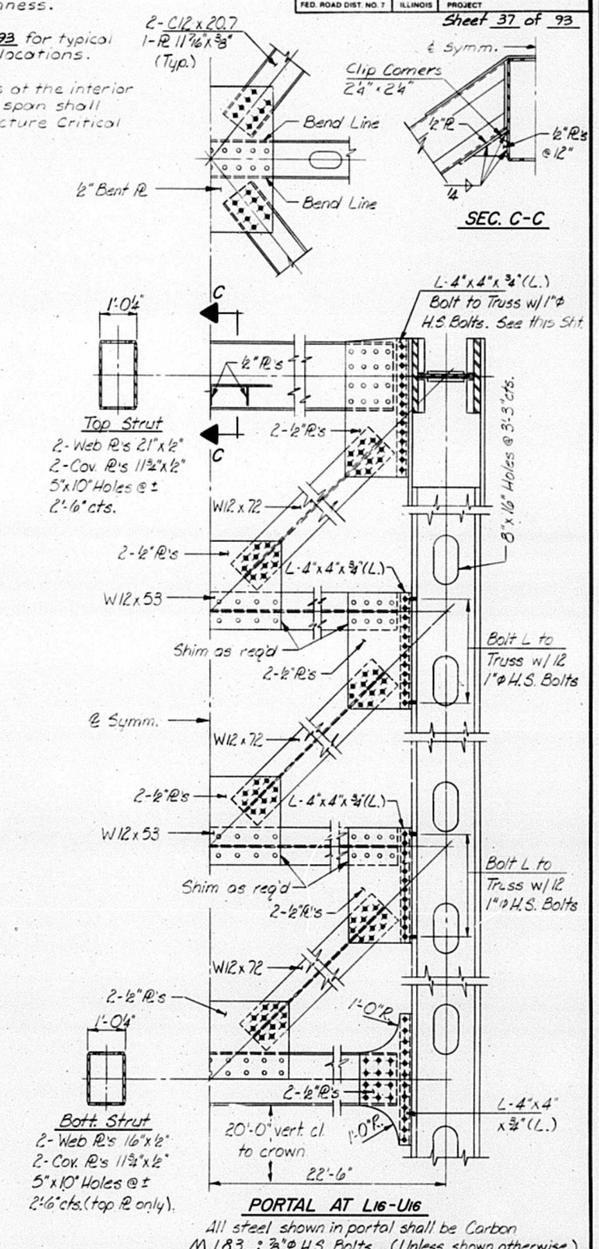
N.T.R. denotes main load carrying members that shall conform to the Supplemental Requirements for Notch Toughness.

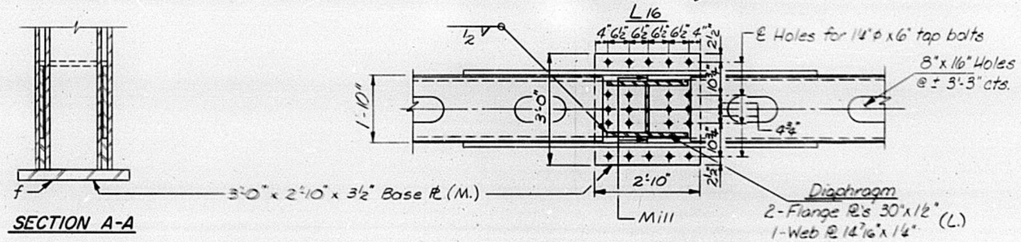
See Detail "C" on sheet 43 of 93 for typical detail of Handhole at splice locations.

Tension chord & tension splices at the interior piers & hanger for suspended span shall meet the requirements for Fracture Critical Members. (F.C.M.)









Note: All bolts 1"φ unless shown otherwise. Steel shown on this sheet noted (C.) shall be Carbon M183; Steel noted (L.) shall be Low-alloy M223; Steel noted (M.) shall be Low-alloy M222.

TRUSS DETAILS L16
SPANS 12, 13, & 14

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED R.W.C.
CHECKED W.D.L.
DRAWN R.U.F.
CHECKED R.W.C.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.-49	(15B-1)-P	PEORIA & TAZEWELL	96	40
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

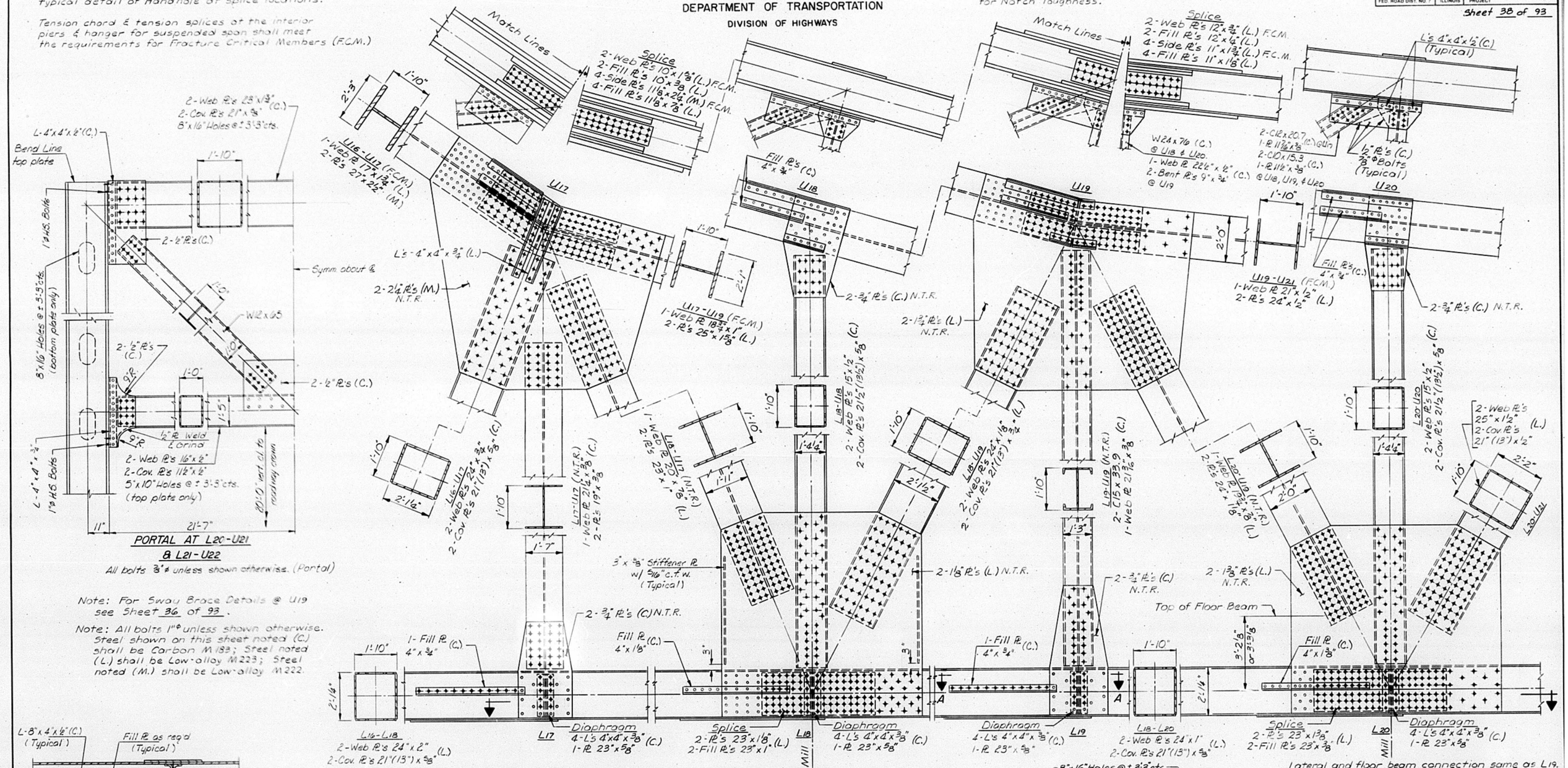
Sheet 38 of 93

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

See Detail "C" on sheet 43 of 93 for typical detail of Handhole at splice locations.

Tension chord & tension splices at the interior piers & hanger for suspended span shall meet the requirements for Fracture Critical Members (F.C.M.)

N.T.R. denotes main load carrying members that are subject to the Supplemental Requirements for Notch Toughness.



Note: For Sway Brace Details @ U19 see Sheet 36 of 93.

Note: All bolts 1"ϕ unless shown otherwise. Steel shown on this sheet noted (C.) shall be Carbon M183; Steel noted (L.) shall be Low-alloy M223; Steel noted (M.) shall be Low-alloy M222.

TRUSS DETAILS L17-L20
SPANS 12, 13, & 14

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED R.W.C.
CHECKED W.D.L.
DRAWN D.A.N.
CHECKED R.W.C.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) -P	PEORIA & TAZEWELL	96	41
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 39 of 93

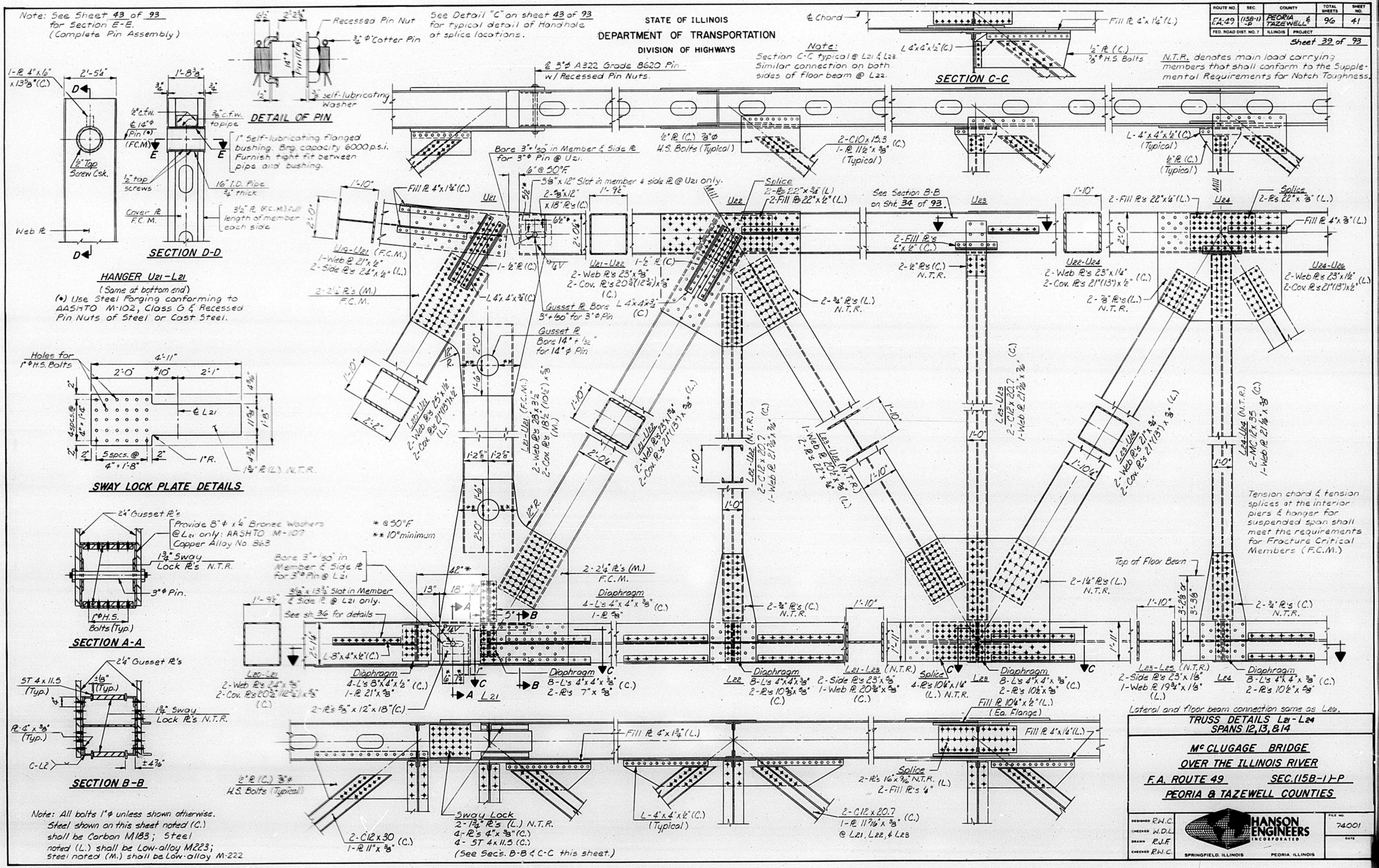
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Note: See Sheet 43 of 93 for Section E-E. (Complete Pin Assembly)

See Detail "C" on sheet 43 of 93 for typical detail of Handhole at splice locations.

Note: Section C-C typical @ L21 & L23. Similar connection on both sides of floor beam @ L22.

N.T.R. denotes main load carrying members that shall conform to the Supplemental Requirements for Notch Toughness.



TRUSS DETAILS L21 - L24
SPANS 12, 13, & 14

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED R.W.C.
CHECKED W.D.L.
DRAWN R.J.F.
CHECKED R.W.C.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

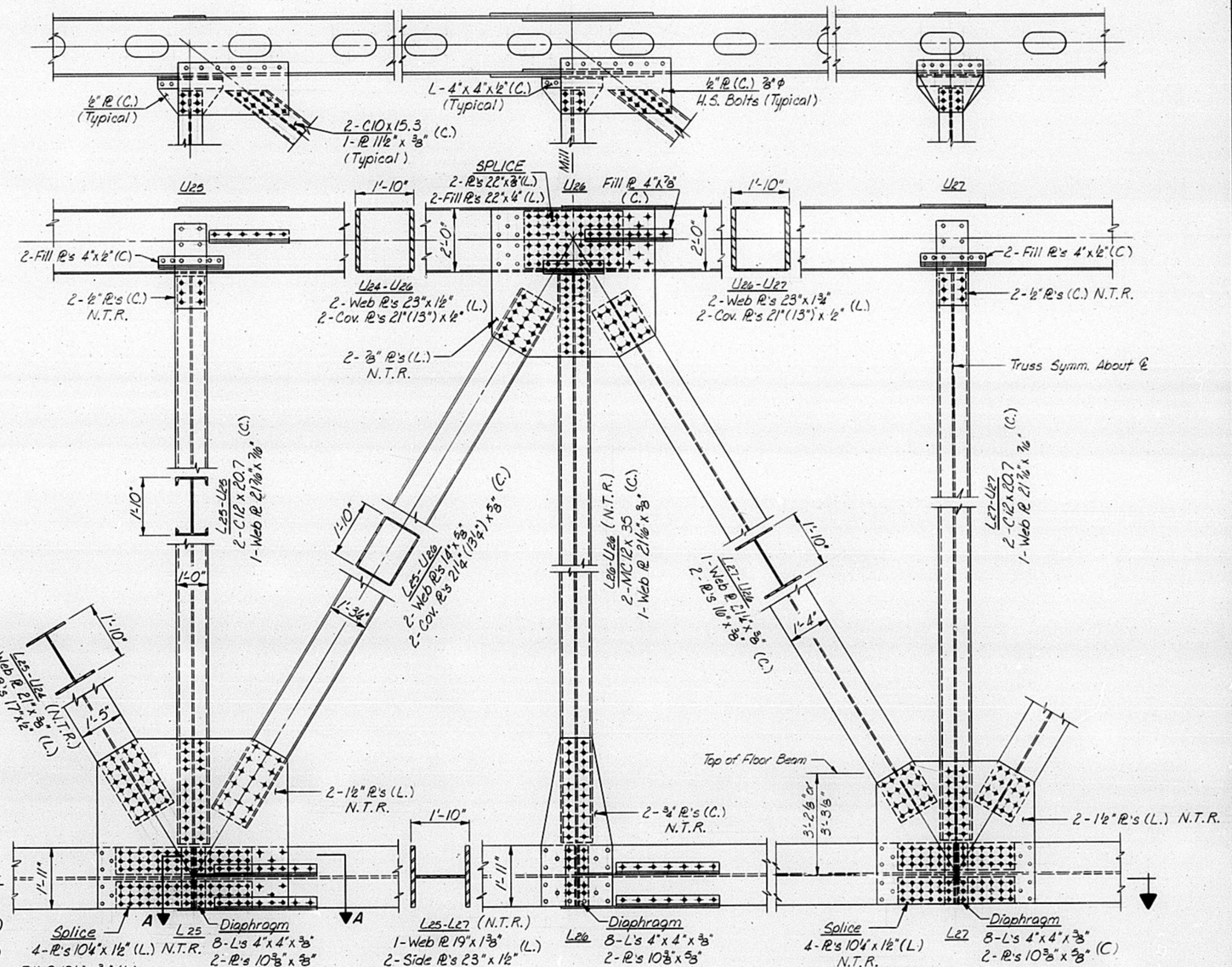
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

See Detail "C" on sheet 43 of 93 for typical detail of Handhole at splice locations.

N.T.R. denotes main load carrying members that are subject to the Supplemental Requirements for Notch Toughness.

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA-49	(15B-1) -P	PEORIA & TAZEWELL	96	42
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 40 of 93



Note: All bolts 1" Φ unless shown otherwise. Steel shown on this sheet noted (C.) shall be Carbon M183; Steel noted (L.) shall be Low-alloy M223

TRUSS DETAILS L25-L27
SPANS 12, 13, & 14

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC.(15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED R.W.C.
CHECKED W.D.L.
DRAWN R.L.F.
CHECKED R.W.C.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

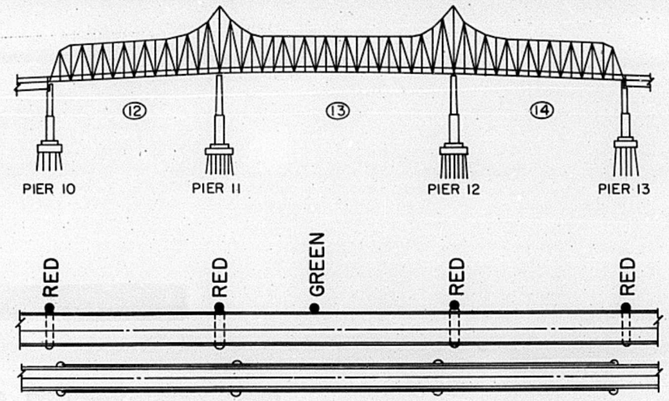
FILE NO. 74001
DATE

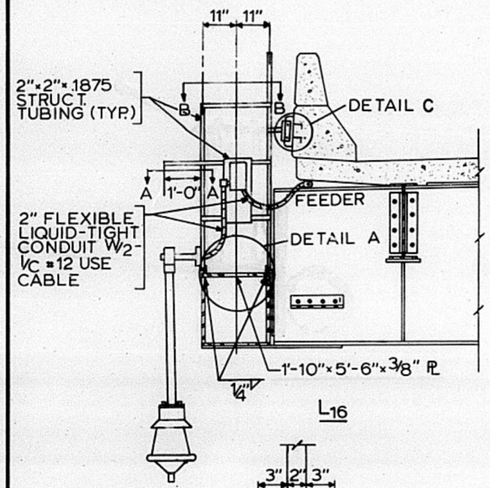
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) -P	PEORIA & TAZEWELL	96	43
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

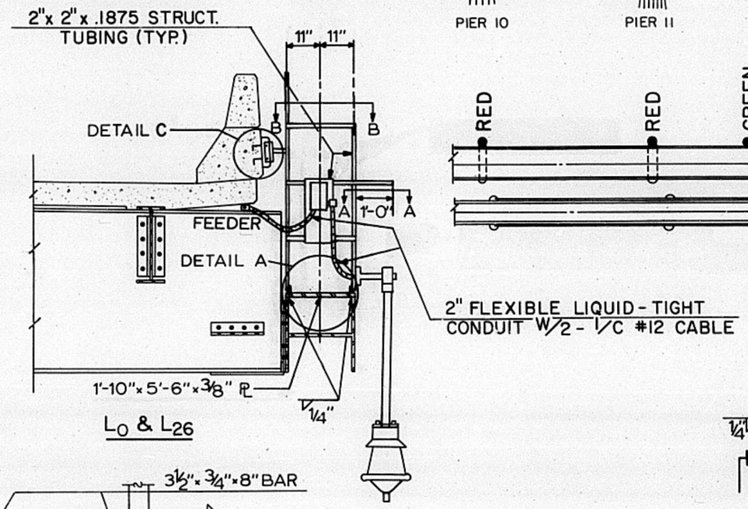
SHEET 41 OF 93

NOTE: PERMANENT NAVIGATIONAL LIGHTS WILL BE FURNISHED AND ERECTED BY THE DECKING CONTRACTOR. THE SAFETY CAGE WILL BE FURNISHED BY THIS CONTRACT AND STORED AT THE LOCATION DESIGNATED BY THE ENGINEER. IT IS TO BE ERECTED BY THE DECKING CONTRACTOR.

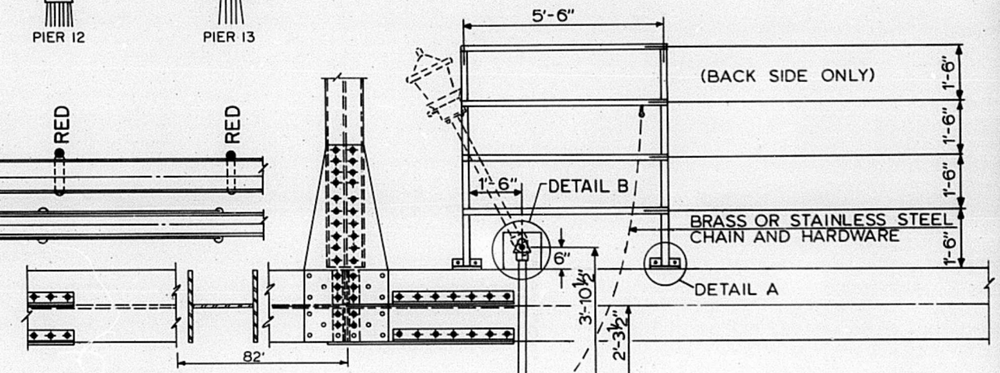




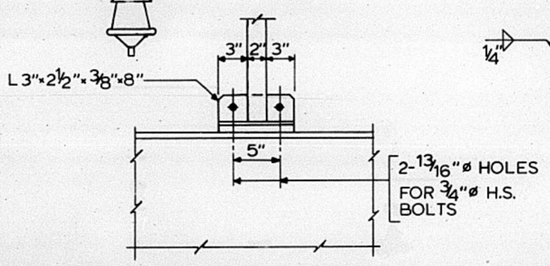
L16

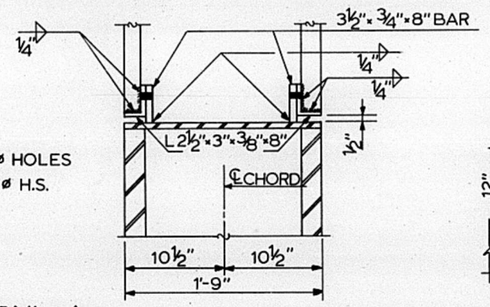


L0 & L26

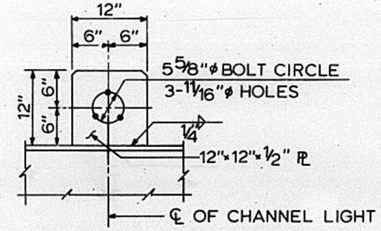


L26
ONE EACH

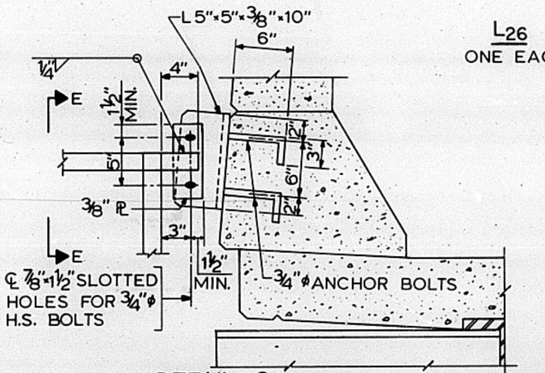




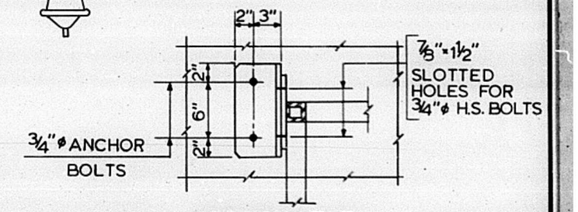
DETAIL A



DETAIL B



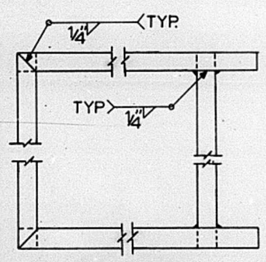
DETAIL C



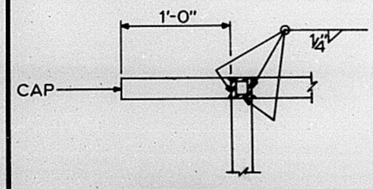
SECTION E-E

NOTES:
HOLLOW STRUCTURAL STEEL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION A501 "HOT FORMED WELDED AND SEAMLESS CARBON STEEL STRUCTURAL TUBING".
BOLTING MATERIALS, BOLTS, CAP SCREWS, AND NUTS SHALL CONFORM TO THE REQUIREMENT OF ASTM DESIGNATION A307.

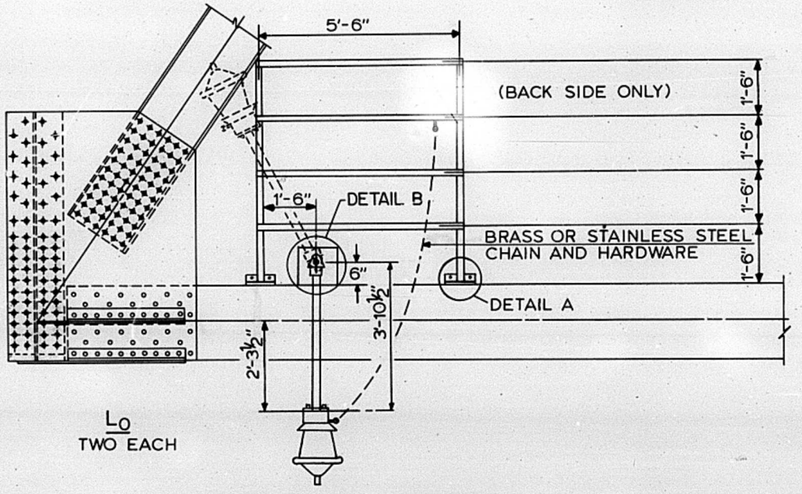
BILL OF MATERIAL		
ITEM	UNIT	NO.
FURN. & ERECTING NAVIGATIONAL LIGHTS	EACH	5



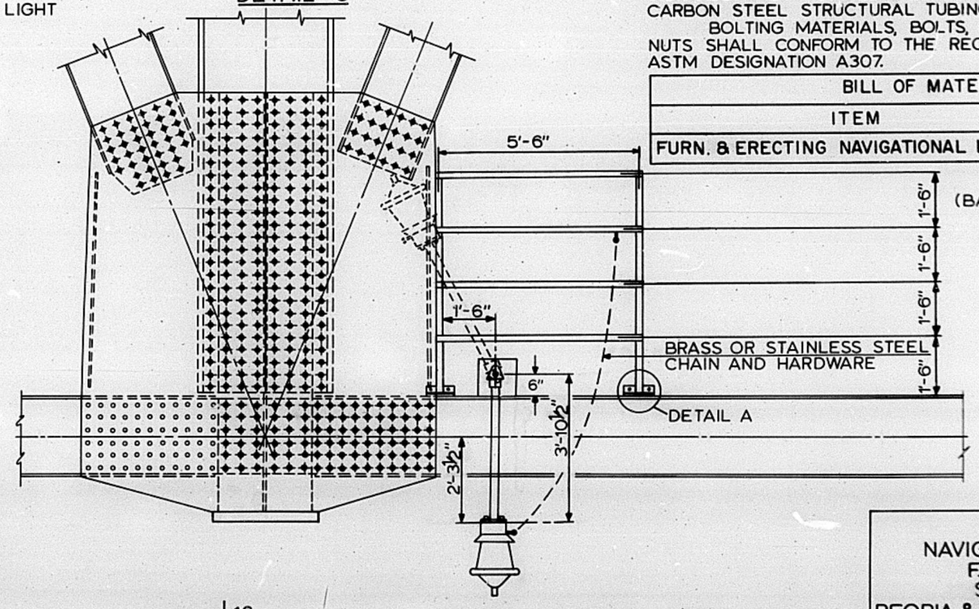
VIEW B-B
(SHOWING WELD DETAILS)



SECTION A-A
(SHOWING WELD DETAILS)



L0
TWO EACH



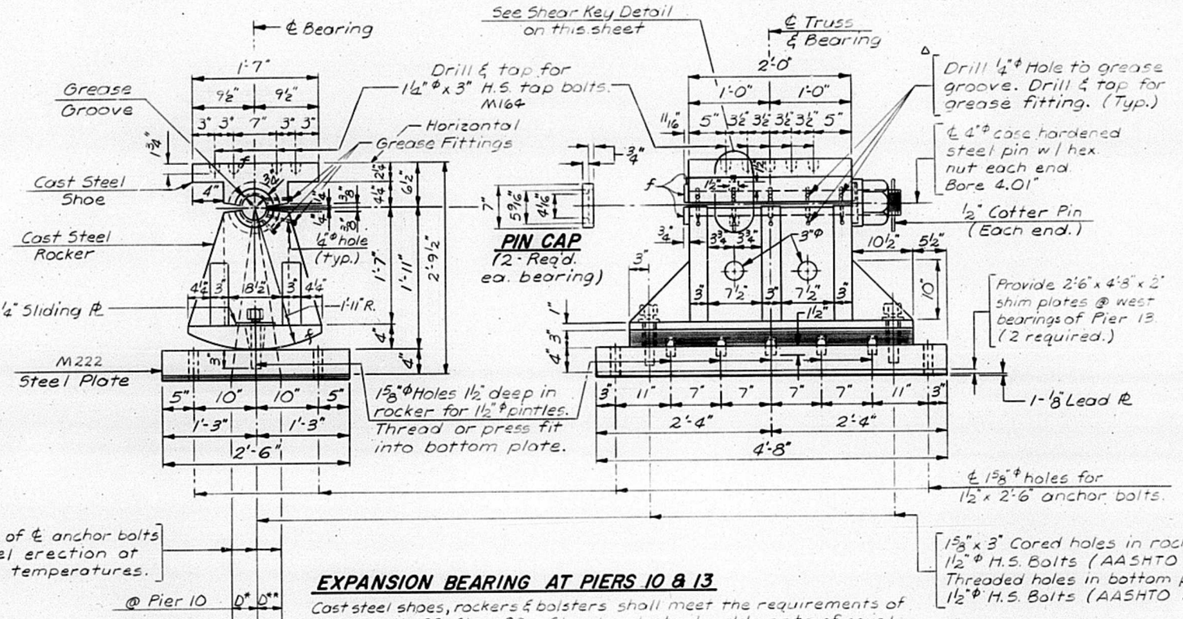
L16
TWO EACH

DETAIL
NAVIGATIONAL LIGHTS
F.A. ROUTE 49
SECTION (15B-1)-P
PEORIA & TAZEWELL COUNTIES
11-2-79

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

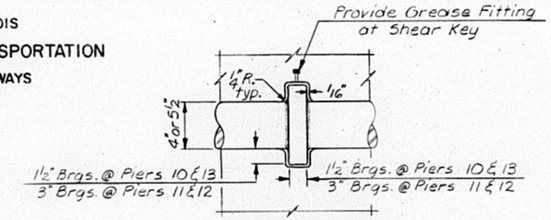
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.-49	(15B-1) -P	PEORIA & TAZEWELL	96	44
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 42 of 93

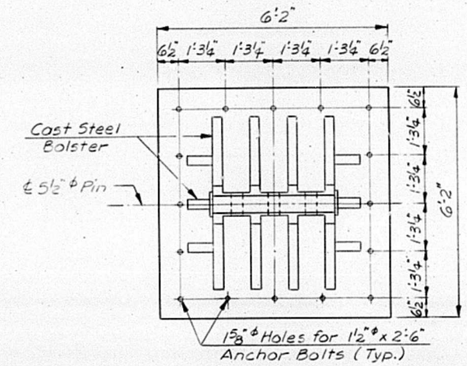


EXPANSION BEARING AT PIERS 10 & 13

Cast steel shoes, rockers & bolsters shall meet the requirements of AASHTO M-192 Class 90. Structural steel weldments of equal sections & strength may be substituted for the castings subject to approval by the Engineer prior to fabrication but at no additional compensation.

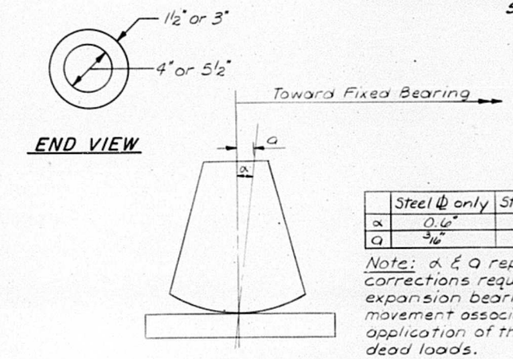


SHEAR KEY DETAIL



PLAN OF BOLSTER & STEEL PLATE AT FIXED BEARING AT PIERS 11 & 12

(Showing anchor bolt hole locations)



	Steel Φ only	Steel + Conc. Φ
α	0.6"	1.5"
Q	3/16"	3/8"

Note: α & Q represent corrections required on expansion bearing due to movement associated with application of the above dead loads.

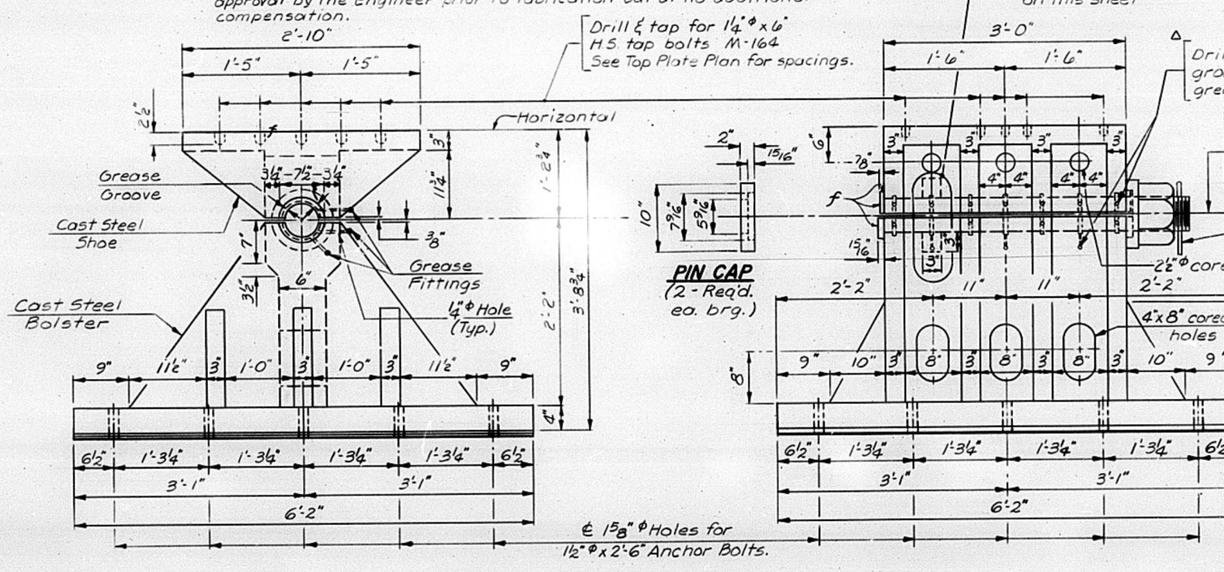
ROCKER SETTING DIAGRAM

NOTES FOR SETTING OF ANCHOR BOLTS AT EXPANSION BEARINGS

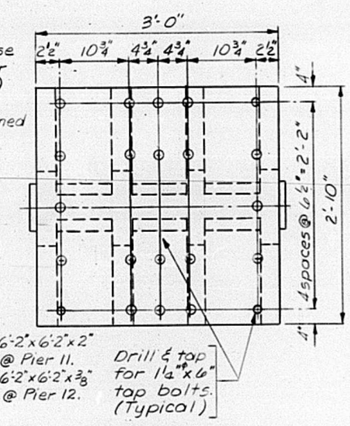
a) D* (Side of bearing away from fixed bearing.) D* = ⅛" per each 100' of expansion for every 15° fall below the normal temperature of 50°F.

b) D** (Side of bearing toward fixed bearing.) D** = ⅛" per each 100' of expansion for every 15° rise above the normal temperature of 50°F.

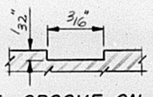
c) After girders have been erected and dimensions D* & D** determined, holes shall be drilled & anchor bolts shall be grouted in place. All fixed anchor bolts may be built into the masonry.



FIXED BEARING AT PIERS 11 & 12

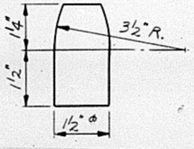


TOP PLATE PLAN



GREASE GROOVE ON SADDLE

△ Note: Grease bearing assembly with molybdenum grease before installation.



PINTLE DETAIL

Notes:

Cast steel shoes, rockers and bolsters shall meet the requirements of AASHTO M-192 Class 120 unless otherwise noted.

The surface finish of parts in contact shall meet the following ANSI Surface Roughness Requirements. (As defined in ANSI B46.1, Part I.):
a) Top surface of top shoe = ANSI 500
b) Bottom of rocker and Top of masonry plate = ANSI 250
c) Cylindrical surface of pins, all surfaces in contact with cylindrical surface of pins. Pintel, pintel socket in rocker = ANSI 125

TRUSS BEARING DETAILS
SPANS 12, 13 & 14

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED R.W.C.
CHECKED CRN
DRAWN D.A.N.
CHECKED R.W.C.

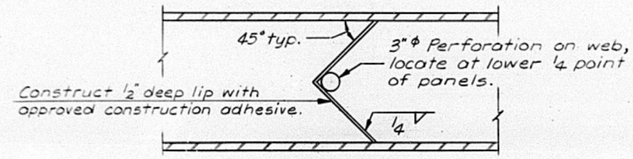
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

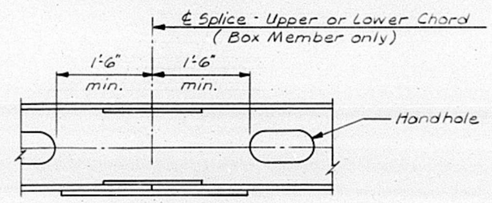
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.49	(15B-1) -P	PEORIA & TAZEWELL	96	45
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 43 of 93



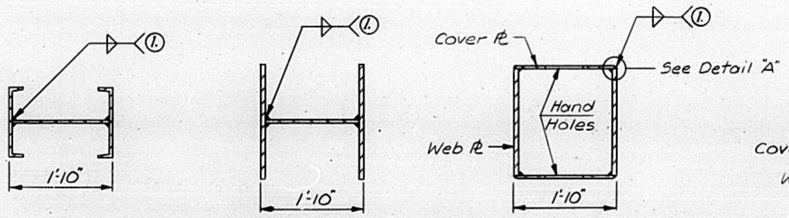
DRAIN DETAIL

Typical @ Chord Members U11-U21, L0-L10 & L21-L27

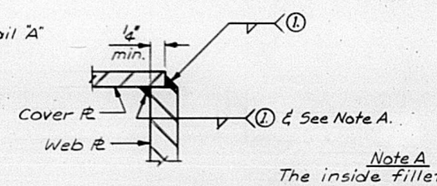


DETAIL C

(Typical detail for all upper or lower chord box member splices.)

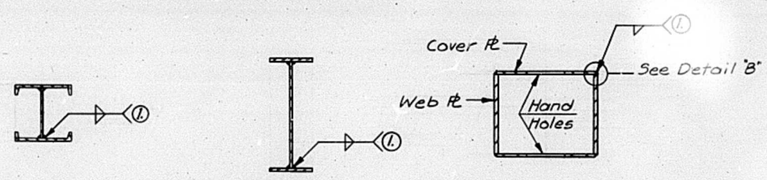


TOP CHORDS, BOTTOM CHORDS, DIAGONALS & VERTICAL TRUSS MEMBERS

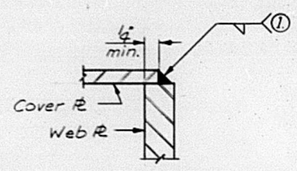


DETAIL "A"

Note A
The inside fillet weld shall be the same size as the outside weld and extend from the end of the member to 1'-0" beyond the edge of the gusset plate.



LATERALS, STRUTS, SWAY & PORTALS

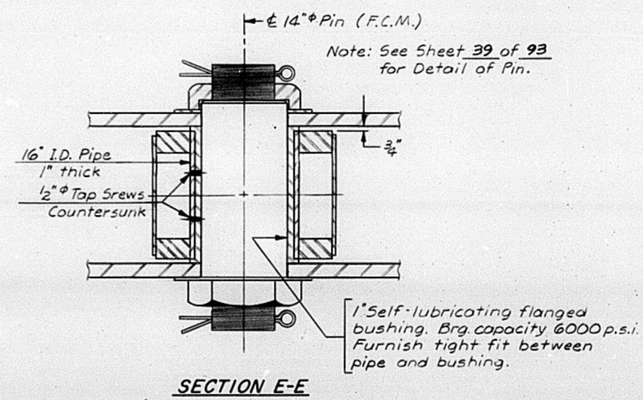


DETAIL "B"

① FILLET WELD SIZES OF MAIN TRUSS MEMBERS

Material Thickness of Thicker Part Joined (in.)	Size of Fillet Weld (in.)
To ¾ incl.	¼
Over ¾ to 1½	5/16
Over 1½ to 2¼	⅜
Over 2¼	½

WELDING DETAILS



SECTION E-E

(From Sheet 39 of 93.)
Hanger U21-L21

16" I.D. pipe shall meet the requirements of ANSI / ASTM A-501 for round structural steel tubing.

14" ϕ pin shall meet the requirements for Fracture Critical Members (F.C.M.) and shall be made of steel forging conforming to AASHTO M-102, Class G.

STRUCTURAL STEEL DETAILS
TRUSS - SPANS 12, 13 & 14

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED R.W.C.
CHECKED C.R.N.
DRAWN D.A.N.
CHECKED R.W.C.

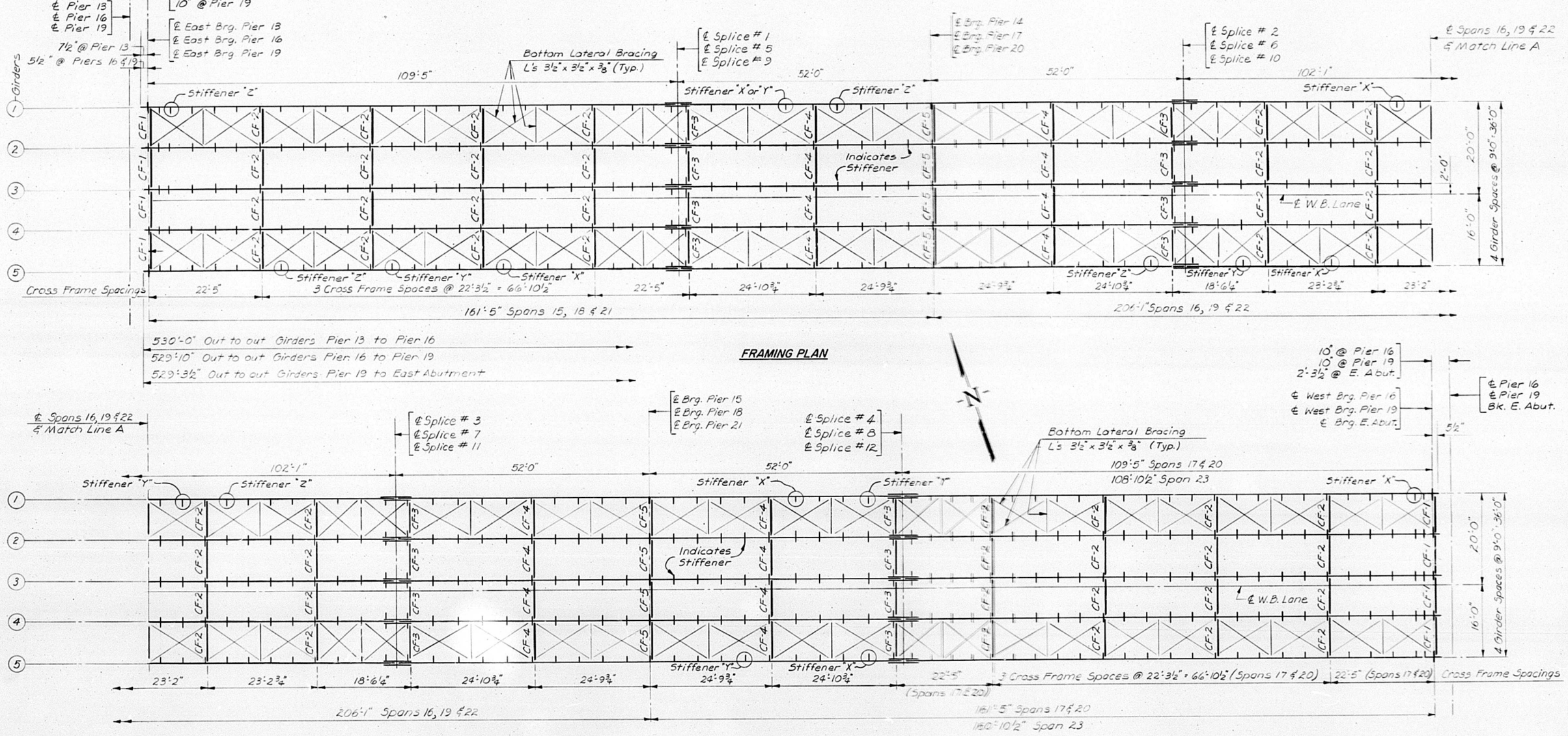
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

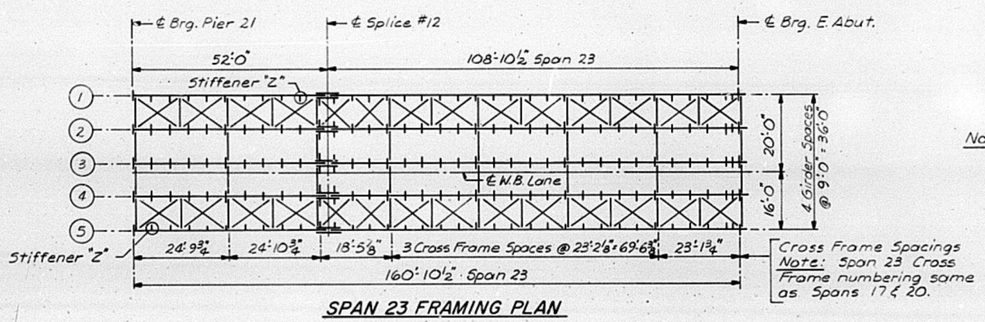
FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA. 49	(15B-1) -P	Peoria & Tazewell	96	46
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 44 of 93





SPAN 23 FRAMING PLAN

FRAMING PLAN

Note: All dimensions shown are measured horizontally.

Note: See Sheet 93 of 93 for details of scupper attachment to selected stiffeners marked "X", "Y" or "Z"
Stiffener "X" in Spans 15-16-17.
Stiffener "Y" in Spans 18-19-20.
Stiffener "Z" in Spans 21-22-23.

STRUCTURAL STEEL PLAN
SPANS 15 THRU 23

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED D.L.B.
CHECKED S.E.N.
DRAWN DAN
CHECKED C.E.N.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

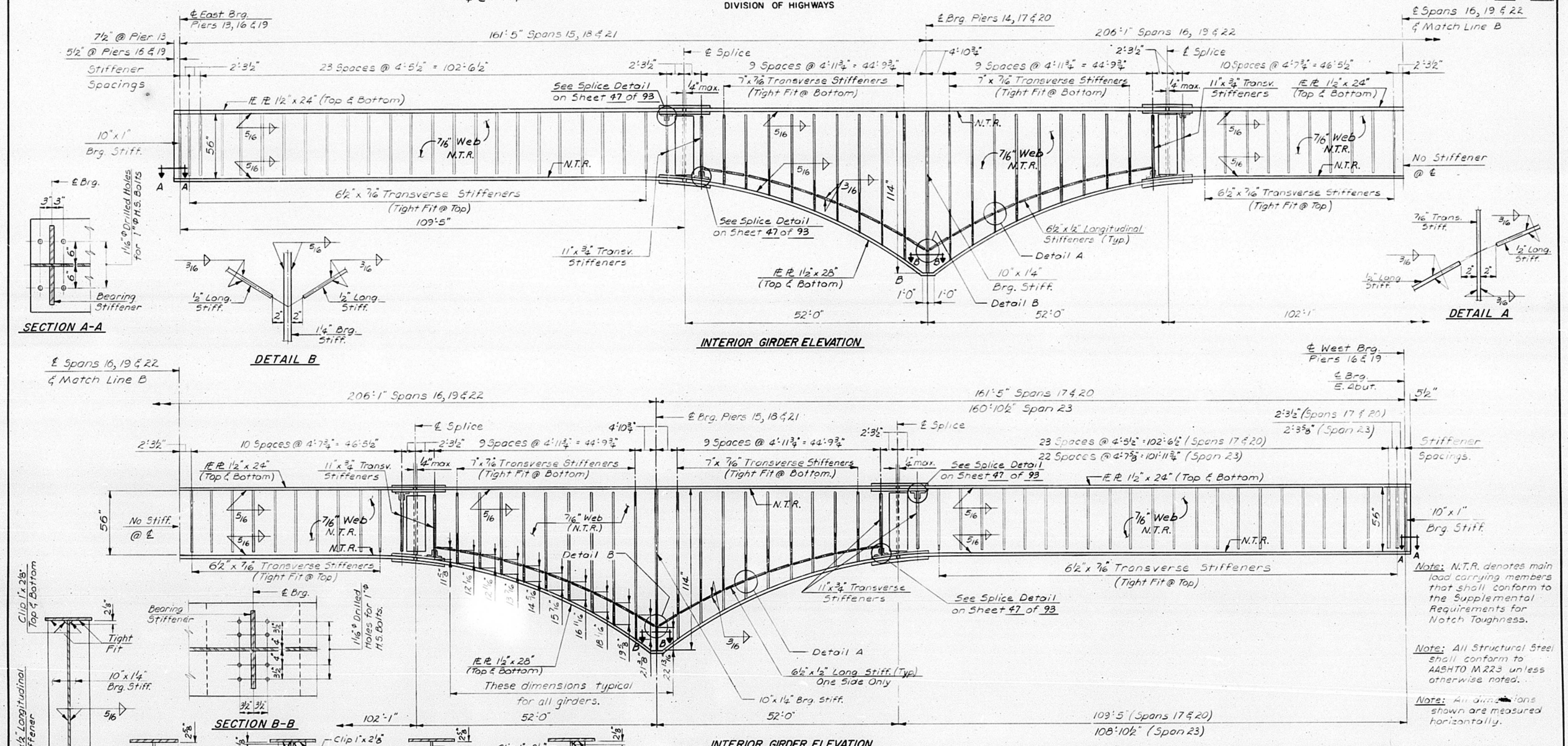
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA 49	(15B-1)-P	Peoria & Tazewell	96	47
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 45 of 93

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Note A: 1/4 @ 7" x 7/16" stiff. @ cross frames.
3/16 @ 7" x 7/16" stiff. w/o cross frames.
1/4 @ 11" x 3/4" stiff.

Note B: 1/4 @ 6 1/2" x 7/16" stiff. @ cross frames.
3/16 @ 6 1/2" x 7/16" stiff. w/o cross frames.
1/4 @ 11" x 3/4" stiff.



Note: N.T.R. denotes main load carrying members that shall conform to the Supplemental Requirements for Notch Toughness.

Note: All Structural Steel shall conform to AASHTO M 223 unless otherwise noted.

Note: All dimensions shown are measured horizontally.

STRUCTURAL STEEL GIRDERS
SPANS 15 THRU 23

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC.(15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED DLB
CHECKED JEH
DRAWN DAN
CHECKED CRN

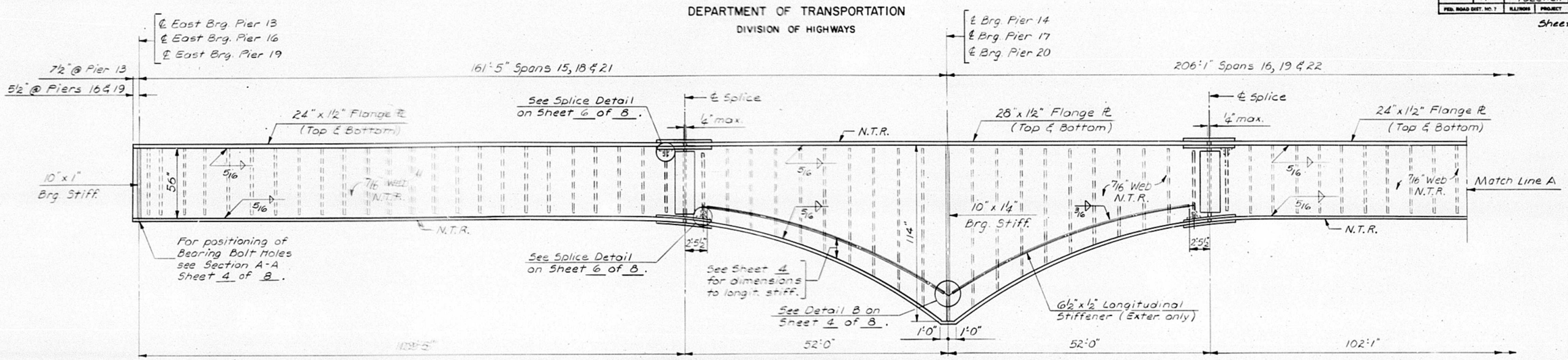
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

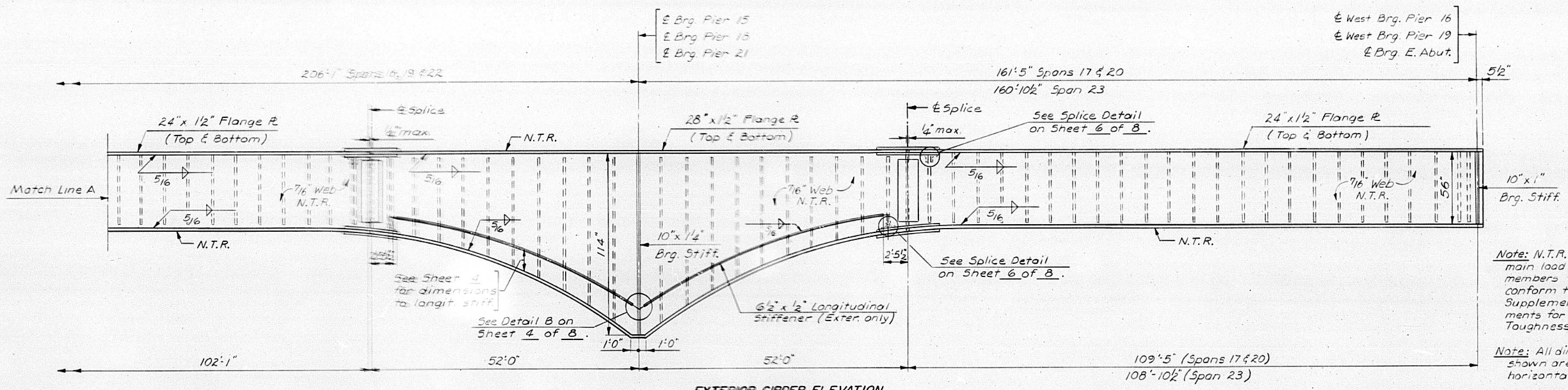
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA 49	(15B-1)-P	Peoria & Tazewell	96	48
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 46 of 93



EXTERIOR GIRDER ELEVATION

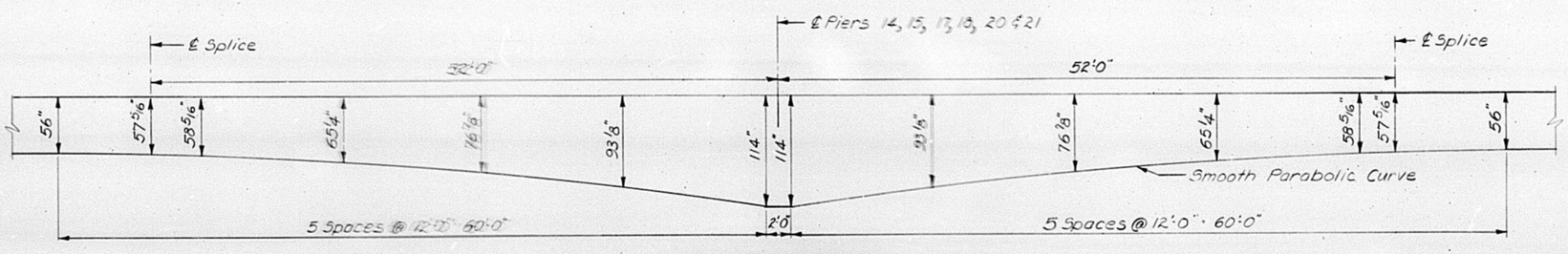


EXTERIOR GIRDER ELEVATION

Note: N.T.R. denotes main load carrying members that shall conform to the Supplemental Requirements for Notch Toughness.

Note: All dimensions shown are measured horizontally.

Note: All Structural Steel shall conform to AASHTO M 223 unless otherwise noted.



WEB HAUNCH ORDINATES

STRUCTURAL STEEL GIRDERS
SPANS 15 THRU 23

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED DLB
CHECKED JEH
DRAWN DAN
CHECKED CRN

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
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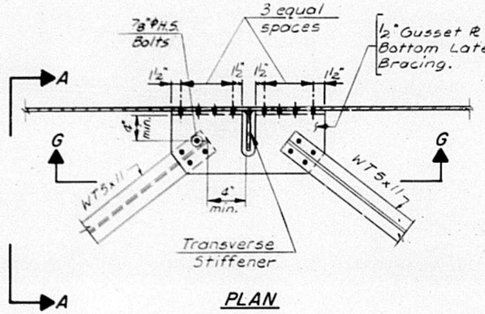
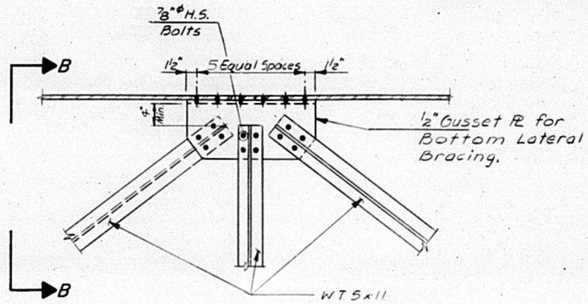
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1)-P	Peoria & Tazewell	96	49
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

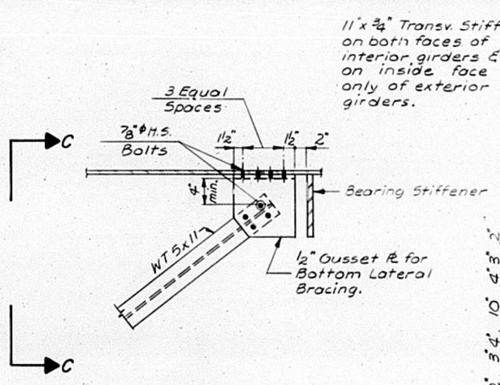
Sheet 47 of 93



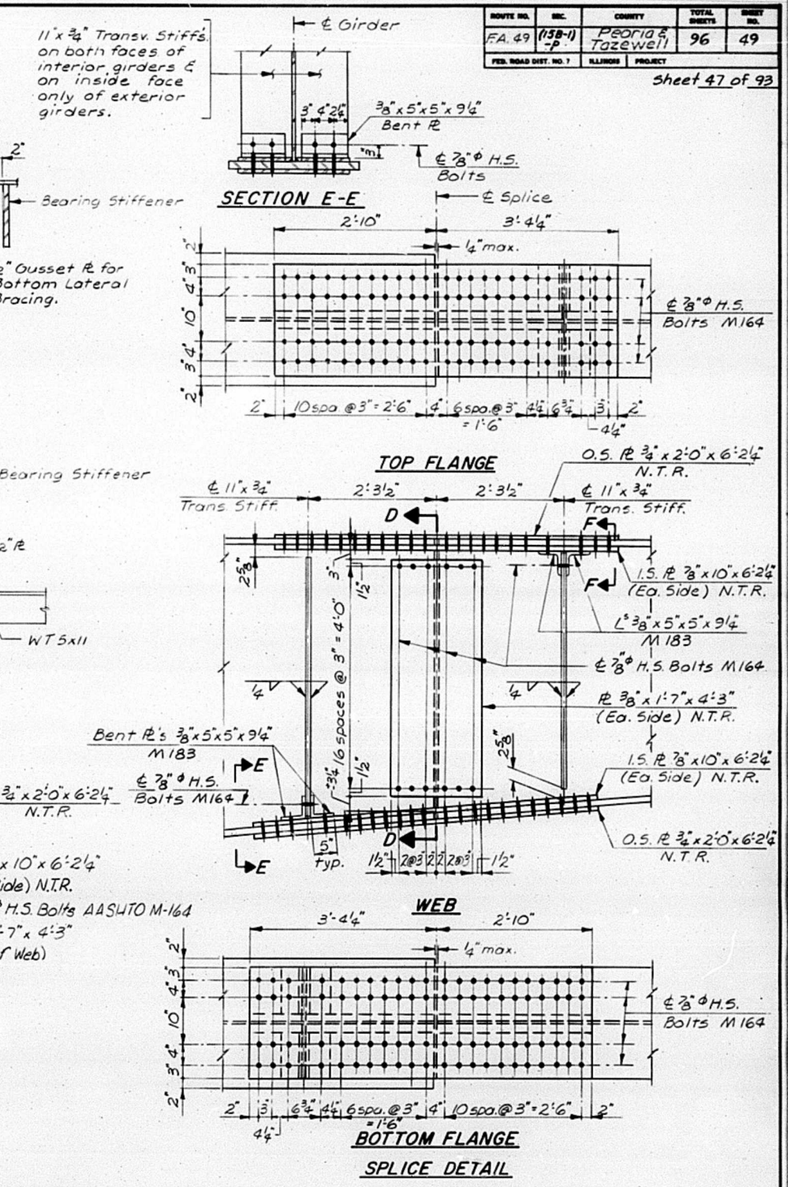
PLAN

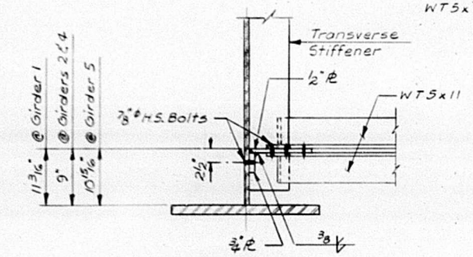


PLAN

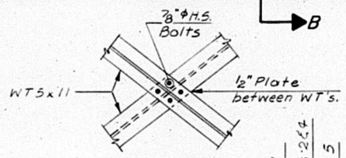


PLAN

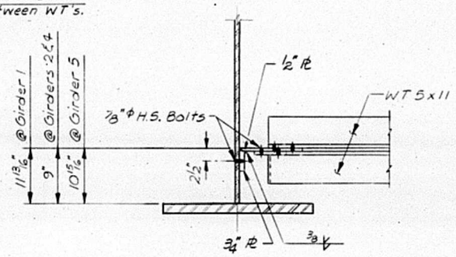




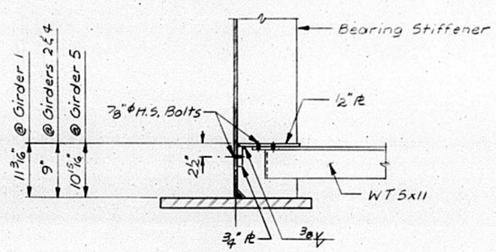
SECTION A-A
(At Transverse Stiffener)



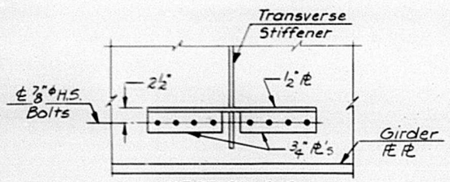
PLAN AT INTERSECTION



SECTION B-B
(At Girder Between Cross Frames)

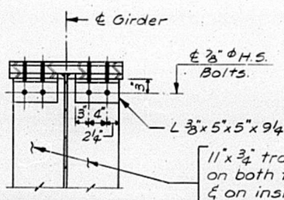


SECTION C-C
(At Bearing Stiffener)



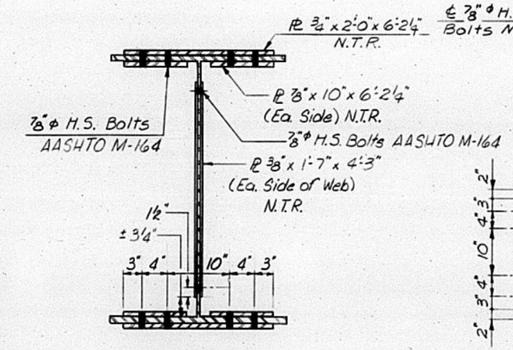
SECTION G-G

Note: WT 5x11 not shown for clarity of section.



SECTION F-F

BOTTOM LATERAL BRACING DETAILS



SECTION D-D
(Thru the Splice)

INTERIOR GIRDER MOMENT TABLE	0.4 Point Spans 15, 17, 18, 20, 21 & 23	Piers 14, 15, 17 18, 20 & 21	0.5 Point Spans 16, 19 & 22
I (in.⁴)	65,915	334,160	65,915
DL (K/ft)	1.66	1.66	1.66
M DL (1K)	2,517	6,752	2,055
M LL (1K)	1,800	3,113	1,775
Imp (1K)	315	504	268
M TOTAL (1K)	4,632	10,369	4,098
fs (K/in²)	24.9	21.8	22.0

TOP OF WEB ELEVATIONS *	Girder 1	Girder 2	Girder 3	Girder 4	Girder 5
℄ Brg. Pier #13	502.133	502.315	502.456	502.378	502.216
℄ Splice #1	500.051	500.233	500.374	500.296	500.134
℄ Brg. Pier #14	498.840	499.022	499.163	499.085	498.923
℄ Splice #2	497.897	498.079	498.220	498.142	497.980
℄ Splice #3	495.815	495.997	496.138	496.060	495.898
℄ Brg. Pier #15	494.636	494.818	494.959	494.881	494.719
℄ Splice #4	493.732	493.914	494.055	493.977	493.815
℄ W. Brg. Pier #16	491.343	491.525	491.666	491.588	491.426
℄ E. Brg. Pier #16	491.309	491.491	491.632	491.554	491.392
℄ Splice #5	489.227	489.409	489.550	489.472	489.310
℄ Brg. Pier #17	488.016	488.198	488.339	488.261	488.099
℄ Splice #6	487.073	487.255	487.396	487.318	487.156
℄ Splice #7	484.991	485.173	485.314	485.236	485.074
℄ Brg. Pier #18	483.812	483.994	484.135	484.057	483.895
℄ Splice #8	482.908	483.090	483.231	483.153	482.991
℄ W. Brg. Pier #19	480.519	480.701	480.842	480.764	480.602
℄ E. Brg. Pier #19	480.485	480.667	480.808	480.730	480.568
℄ Splice #9	478.414	478.596	478.737	478.659	478.497
℄ Brg. Pier #20	477.192	477.374	477.515	477.437	477.275
℄ Splice #10	476.260	476.442	476.583	476.505	476.343
℄ Splice #11	474.178	474.360	474.501	474.423	474.261
℄ Brg. Pier #21	472.988	473.170	473.311	473.233	473.071
℄ Splice #12	472.095	472.277	472.418	472.340	472.178
℄ Brg. E. Abut.	469.706	469.888	470.029	469.951	469.789

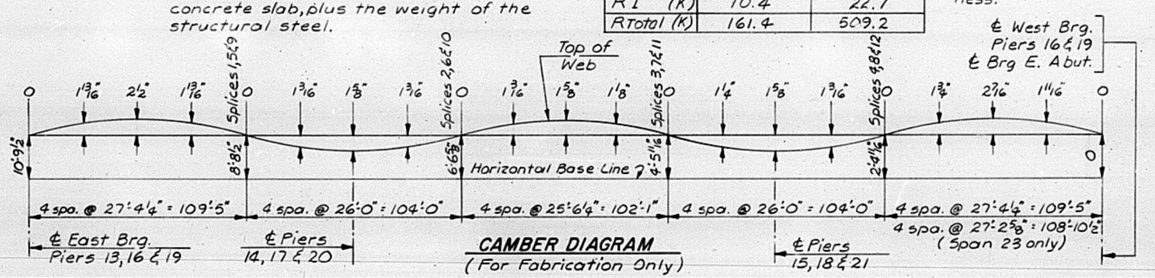
* Elevations include camber for dead load deflections and are for fabrication only.

Note: Reaction & Moment tables are based on a Dead Load of 25 #/sq. ft. of future wearing surface & 94 #/sq. ft. of concrete slab, plus the weight of the structural steel.

INTERIOR GIRDER REACTION TABLE	End Pier	Int. Pier
R DL (K)	91.7	346.6
R LL (K)	59.3	139.9
R I (K)	10.4	22.7
R Total (K)	161.4	509.2

N.T.R. denotes material that shall conform to the Supplemental Requirements for Notch Toughness.

Steel Specifications this sheet:
Splice Plates — AASHTO M 223
Lateral Bracing — AASHTO M183
Bolts — AASHTO M-164



CAMBER DIAGRAM
(For Fabrication Only)

STRUCTURAL STEEL DETAILS
SPANS 15 THRU 23

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED D.L.B.
CHECKED C.R.N.
DRAWN D.A.N.
CHECKED C.R.N.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

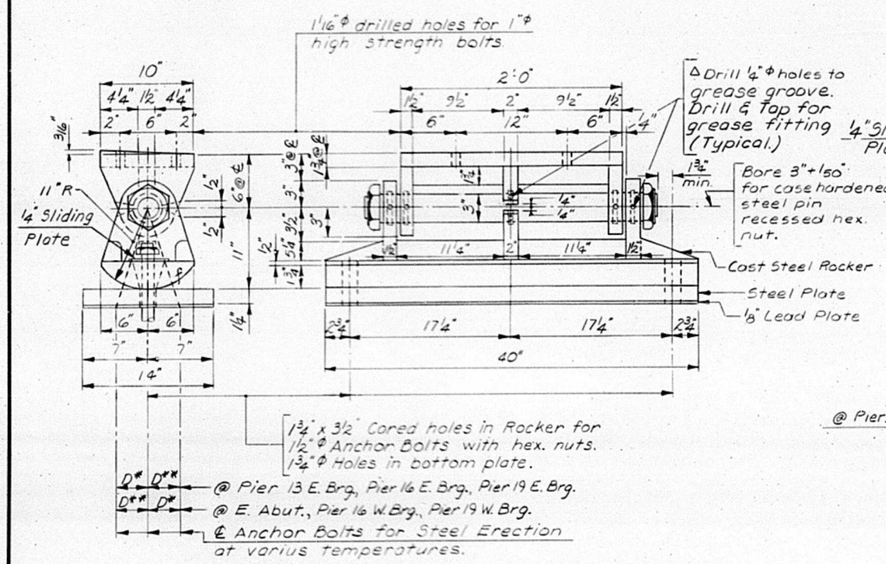
FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

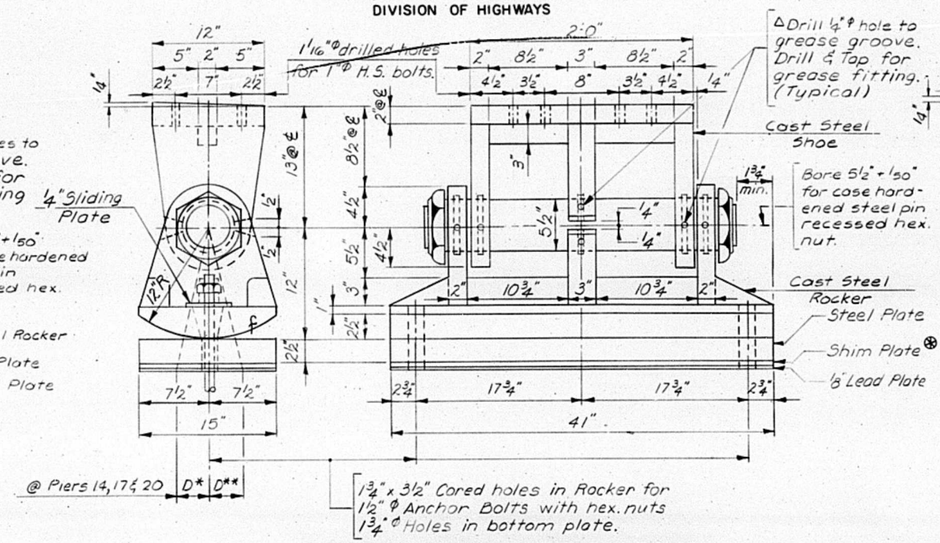
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1)-P	Peoria & Tazewell	96	50
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 48 of 93

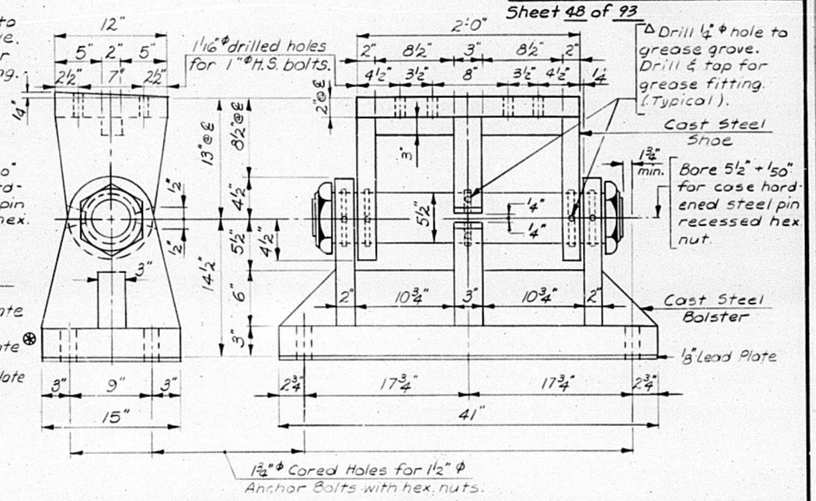
Note: Structural steel weldments of M-223 Gr. 50 or M-222 may be substituted for the castings subject to approval by the Engineer prior to fabrication. No additional compensation will be allowed.



EXPANSION BEARING AT PIERS 13, 16, 19, & EAST ABUTMENT



EXPANSION BEARING AT PIERS 14, 17 & 20



FIXED BEARING AT PIERS 15, 18 & 21

⊕ NOTES ON SHIM PLATES FOR BEARINGS:

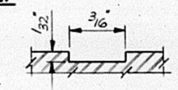
Provide 14" x 40" x 3/8" Shim Plates @ Girders 1 thru 5 for the West Bearings of Pier 16. (5 Req'd)

Provide 14" x 40" x 3/8" Shim Plates @ Girders 1 thru 5 for the West Bearings of Pier 19. (5 Req'd.)

Provide 15" x 41" x 2 1/2" Shim Plates @ Girders 1 thru 5 for Piers 14 & 20. (10 Req'd.)

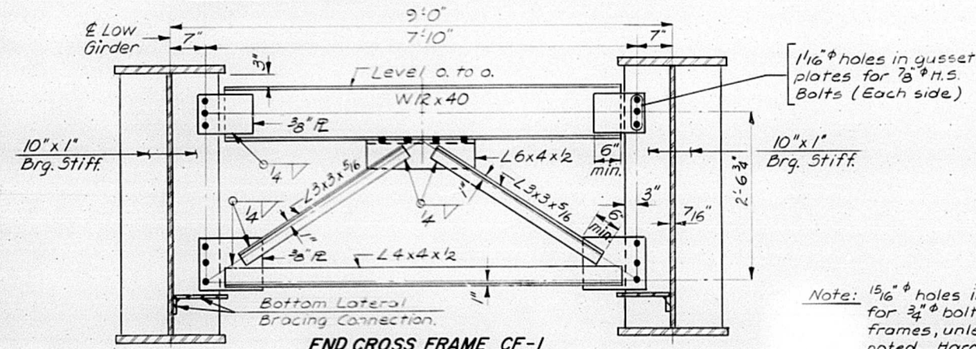
Provide 15" x 41" x 1 3/8" & 15" x 41" x 1" Shim Plates (total of 2 3/8") @ Girders 1 thru 5 for Pier 15. (5 Req'd.)

Provide 15" x 41" x 1 3/8" & 15" x 41" x 1" Shim Plates (total of 2 3/8") @ Girders 1 thru 5 for Pier 17. (5 Req'd)



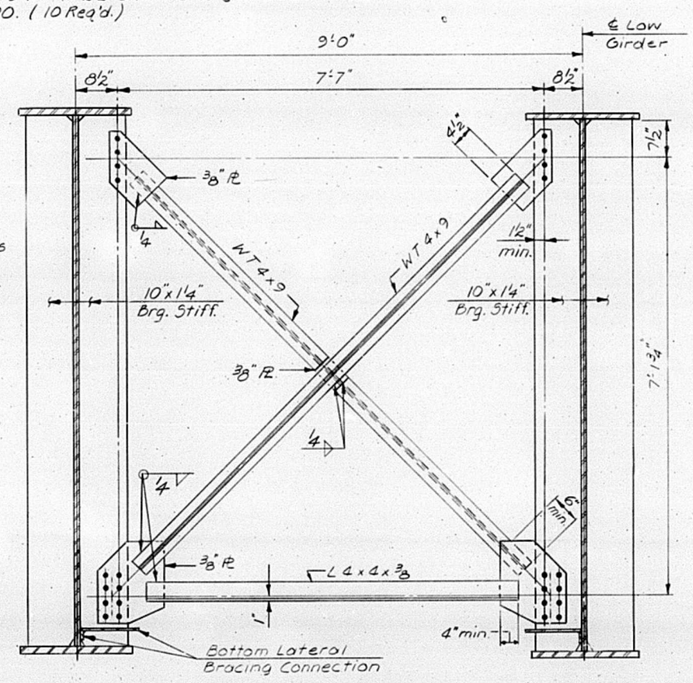
GREASE GROOVE ON SADDLE

△ Note: Grease bearing assembly with molybdenum grease before installation.



END CROSS FRAME CF-1
(24 Req'd)

Note: 15/16" Φ holes in gusset plates for 3/4" Φ bolts at all cross frames, unless otherwise noted. Hardened washers shall be required over holes in gusset plates.



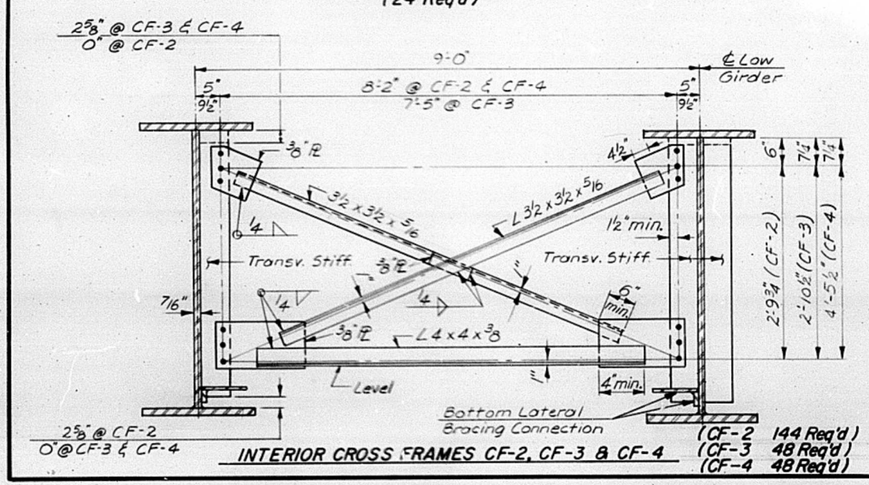
INTERIOR CROSS FRAME CF-5
(24 Req'd)

NOTES FOR SETTING OF ANCHOR BOLTS AT EXPANSION BEARINGS

a) D* (Side of Bearing away from fixed Bearing.) D* = 1/8" per each 100' of expansion for every 15° fall below the Normal Temperature of 50 °F.

D** (Side of Bearing toward fixed Bearing.) D** = 1/8" per each 100' of expansion for every 15° rise above the Normal Temperature of 50 °F.

b) After Girders have been erected and dimensions D* & D** determined, holes shall be drilled & anchor bolts shall be grouted in place. All fixed anchor bolts may be built into the masonry.



INTERIOR CROSS FRAMES CF-2, CF-3 & CF-4

(CF-2 144 Req'd)
(CF-3 48 Req'd)
(CF-4 48 Req'd)

Steel Specifications this sheet:

Bearing Plate Material - AASHTO M222 or M223
Cross Frames - AASHTO M183
Cross Frame Bolts - AASHTO M164
Cast Steel Bearings - AASHTO M192 Class 120

BEARINGS & CROSS FRAMES
SPANS 15 THRU 23

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED D.L.B.
CHECKED C.R.N.
DRAWN D.A.N.
CHECKED C.R.N.

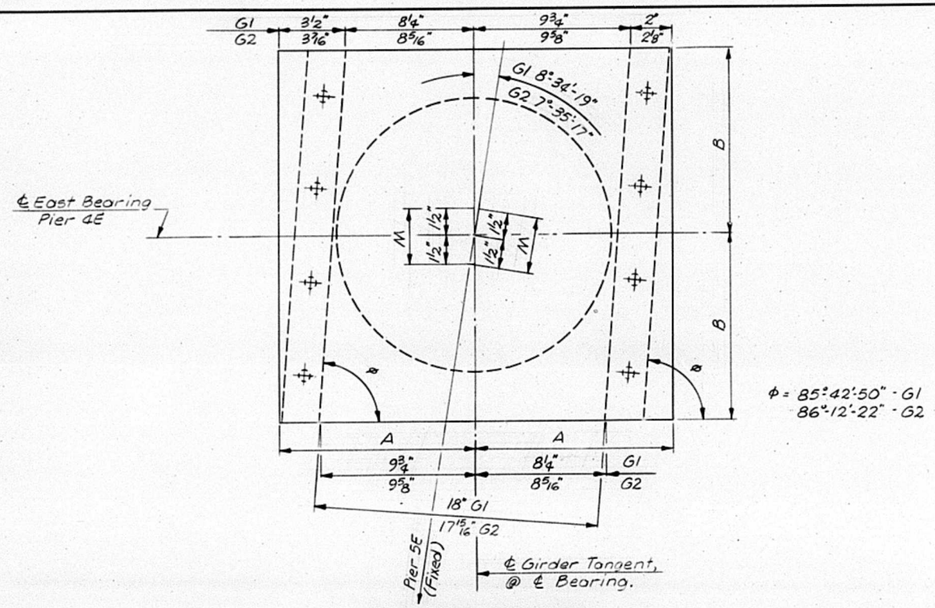
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

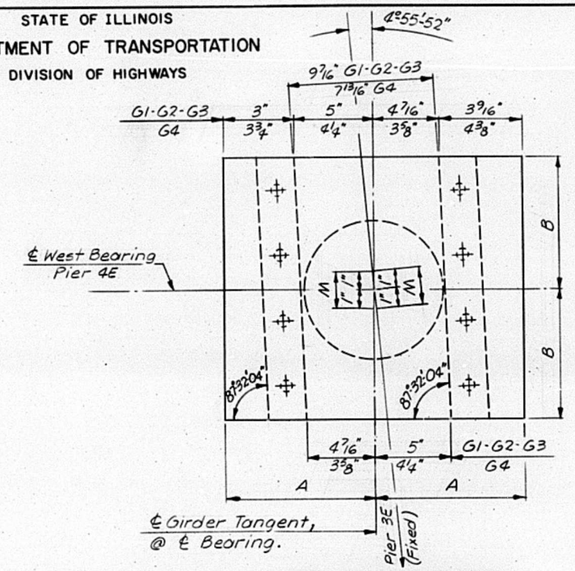
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA. 49	(15B-1) I-P	Peoria & Tazewell	96	51
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 49 of 93



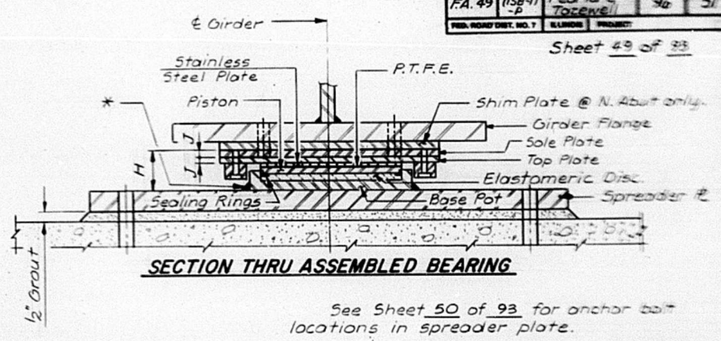
PLAN VIEW TOP PLATE AT PIER 4E EAST BEARINGS

GUIDED EXPANSION FLOATING BEARING TABLE OF DIMENSIONS AT PIER 4E E. BRGS.																
Capacity (Tons)	Location Support	Location Girder	Sole Pl. Bevel	Dimensions A	B	H	J	L	M	I.D.	Spreader Pl. t"	w"	ℓ"	Top Bolts** A_1	B_1
300	E. Brg.	1	⅜"	11¾"	10"	5¼"	1"	8¾"	3"	14¾"	4½"	17½"	44"	9½"	7½"
300	Pier 4E	2	⅜"	11¾"	10"	5¼"	1"	8¾"	3"	14¾"	4½"	17½"	44"	9½"	7½"



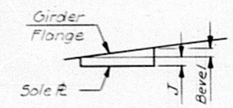
PLAN VIEW TOP PLATE AT PIER 4E WEST BEARINGS

GUIDED EXPANSION FLOATING BEARING TABLE OF DIMENSIONS AT PIER 4E W. BRGS.																
Capacity (Tons)	Location Support	Location Girder	Sole Pl. Bevel	Dimensions A	B	H	J	L	M	I.D.	Spreader Pl. t"	w"	ℓ"	Top Bolts** A_1	B_1
75	W. Brg.	1,2 & 3	⅝"	8"	7"	3¹⁄₁₆"	⅝"	4⁹⁄₁₆"	2"	7⅜"	2½"	10"	26"	6¼"	5¼"
50	Pier 4E	4	⅝"	8"	7"	3"	⅝"	3¾"	2"	6"	2½"	10"	26"	6¼"	5¼"

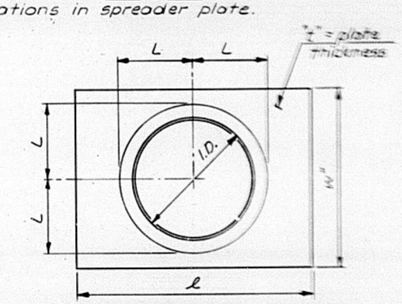


SECTION THRU ASSEMBLED BEARING

See Sheet 50 of 93 for anchor bolt locations in spreader plate.



SIDE VIEW OF SOLE PLATE



BASE POT & SPREADER PLATE

To be used at:
North Abutment Girders 1-2-3-4
South Abutment Girders 1-2-3-4
Pier 4E - West Brg. Girders 1-2-3-4
Pier 4E - East Brg. Girders 1-2.

NOTES:

Bearing manufacturer to provide temporary tie downs to resist uplift (10% of Vertical Capacity) during construction. To be removed after steel has been erected.

* Bearing manufacturer may attach the base pot to the spreader plate with high tensile socket screws of correct size, countersunk and extending a minimum of one diameter into the spreader plate or he may fillet weld the base pot to the spreader plate.

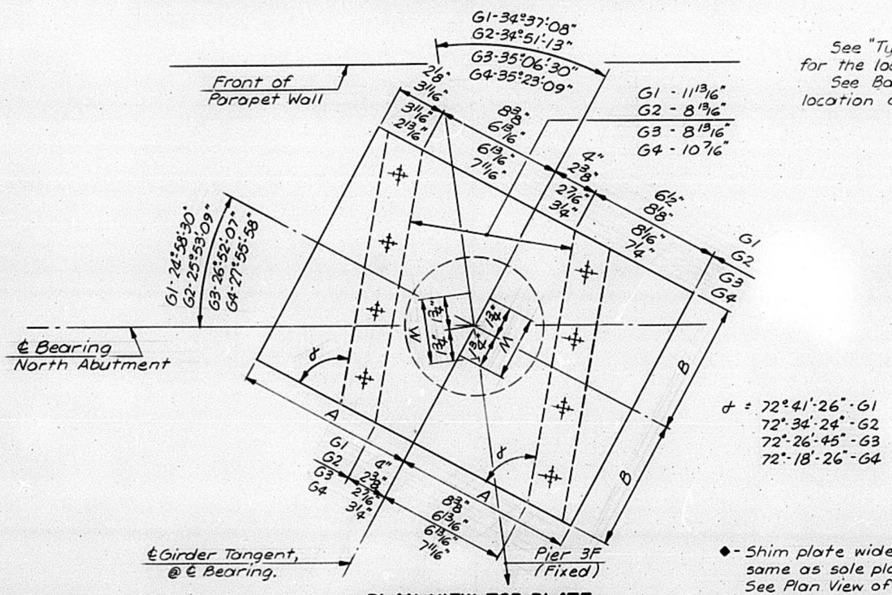
** Top bolt hole locations on sole plate. See Sheet 50 of 93 for details.

M = Total Movement.

The bearing manufacturer shall submit shop drawings to the Engineer for approval before proceeding with the fabrication of the bearings.

Bearings shall be placed on a ½" thick bed of epoxy quartz sand grout and carefully levelled. No load shall be placed on the bearing until the grout has set and developed a minimum of 80% strength.

On the Guided Expansion Floating Bearings provide guide bars and fasteners capable of resisting 35% of vertical capacity at the No. & So. Abut. & 10% of vertical capacity at all other locations.



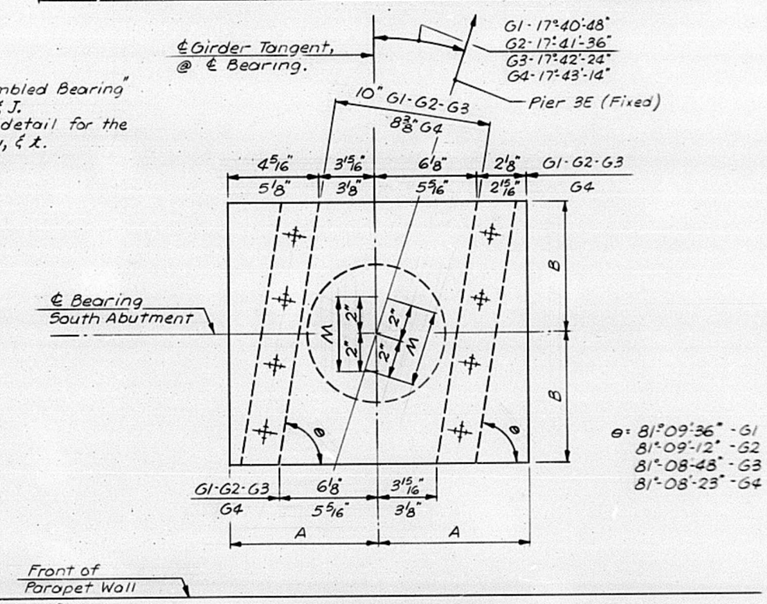
See "Typical Section thru Assembled Bearing" for the location of dimensions H & J.
See Base Pot & Spreader Plate detail for the location of dimensions L, I.D., ℓ, w, & t.

α = 72°41'-26" - G1
72°34'-24" - G2
72°26'-45" - G3
72°18'-26" - G4

◆ - Shim plate wide & length same as sole plate dimensions. See Plan View of Top Plate at North Abutment.

PLAN VIEW TOP PLATE AT NORTH ABUTMENT

GUIDED EXPANSION FLOATING BEARING TABLE OF DIMENSIONS AT N. ABUT.																			
Capacity (Tons)	Location Support	Location Girder	Sole Pl. Bevel	Dimensions A	B	H	J	L	M	I.D.	Spreader Pl. t"	w"	ℓ"	Top Bolts** A_1	B_1	Shim Pl. t"	w"	ℓ"
100	N. Abut.	1	11⁄16"	10½"	7"	3¾"	¾"	5¼"	3½"	8⁹⁄₁₆"	3½"	11"	33½"	3½"	3¼"	¼"	◆	◆
50	N. Abut.	2	11⁄16"	10½"	7"	3"	⅝"	3¾"	3½"	6"	2¼"	10"	33½"	3½"	3¼"	1⅝"	◆	◆
50	N. Abut.	3	11⁄16"	10½"	7"	3"	⅝"	3¾"	3½"	6"	2¼"	10"	33½"	3½"	3¼"	1½"	◆	◆
75	N. Abut.	4	11⁄16"	10½"	7"	3¹⁄₁₆"	⅝"	4⁹⁄₁₆"	3½"	7⅜"	3"	10"	33½"	3½"	3¼"	¾"	◆	◆



θ = 81°09'-36" - G1
81°09'-12" - G2
81°08'-48" - G3
81°08'-23" - G4

PLAN VIEW TOP PLATE AT SOUTH ABUTMENT

GUIDED EXPANSION FLOATING BEARING TABLE OF DIMENSIONS AT S. ABUT.																
Capacity (Tons)	Location Support	Location Girder	Sole Pl. Bevel	Dimensions A	B	H	J	L	M	I.D.	Spreader Pl. t"	w"	ℓ"	Top Bolts** A_1	B_1
75	South	1,2 & 3	7⁄16"	8¼"	7"	3¹⁄₁₆"	⅝"	4⁹⁄₁₆"	4"	7⅜"	2¾"	10"	26"	6¼"	5¼"
50	Abut.	4	7⁄16"	8¼"	7"	3"	⅝"	3¾"	4"	6"	2¾"	10"	26"	6¼"	5¼"

FLOATING BEARINGS

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 **SEC. (15B-1)I-P**
PEORIA & TAZEWELL COUNTIES

DESIGNED C.R.N.
CHECKED S.C.O.
DRAWN D.A.N.
CHECKED S.C.O.

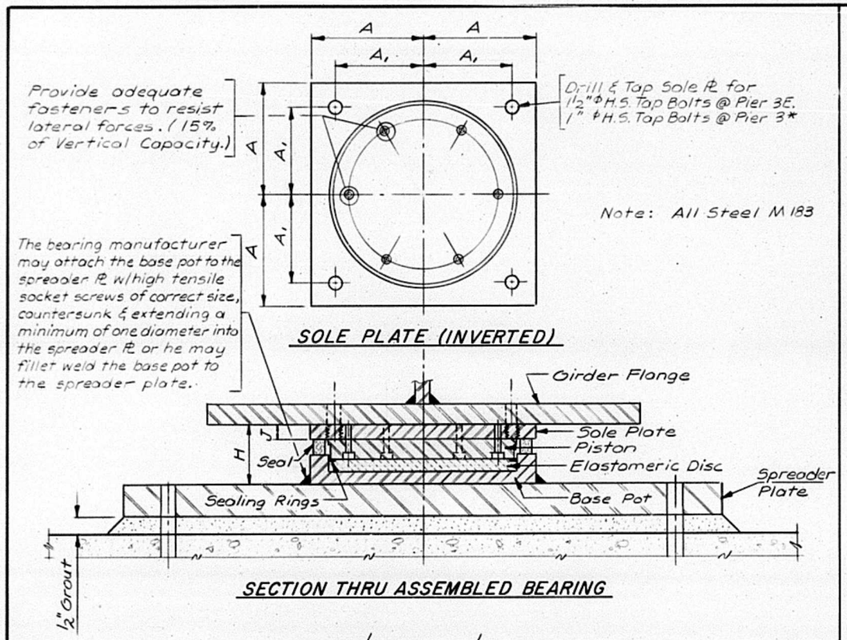
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

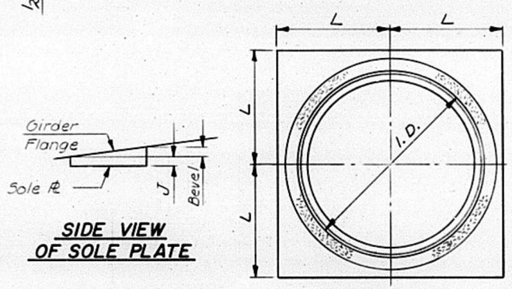
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) -P	Peoria & Tazewell	96	52
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 50 of 93



SOLE PLATE (INVERTED)

SECTION THRU ASSEMBLED BEARING

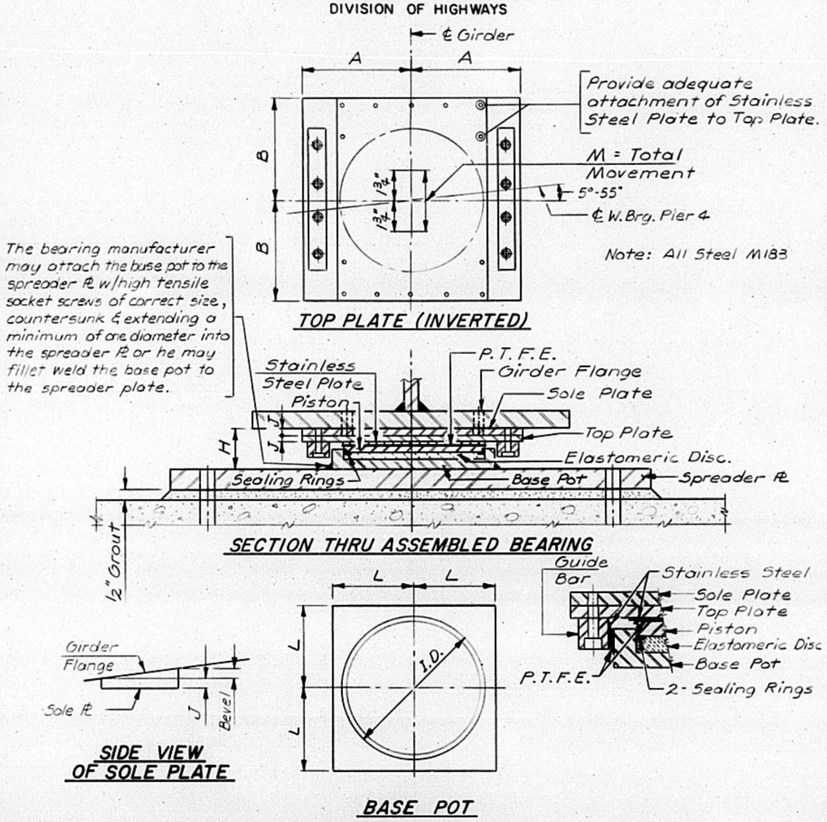


SIDE VIEW OF SOLE PLATE

BASE POT

FIXED FLOATING BEARING TABLE OF DIMENSIONS												
Capacity (Tons)	Location		Sole Pl.	Dimensions					Spreader Pl.			**
	Support	Girder	Bevel	A	H	J	L	ID	t"	w"	ℓ"	A_1
100	Pier 3*	1	1/4"	5 1/4"	3"	7/8"	5 1/4"	8 9/16"	2 3/4"	15 1/4"	27 1/2"	3 1/2"
150	Pier 3*	4	1/8"	6 5/16"	3 7/16"	1"	6 5/16"	10 7/16"	2 3/4"	15 1/4"	27 1/2"	4 1/2"
200	Pier 3E	1,3 & 4	5/16"	7 1/4"	3 1/2"	1"	7 1/4"	12 1/16"	3"	16"	32 1/2"	5 1/2"
225	Pier 3E	2	5/16"	7 5/8"	3 3/4"	1"	7 5/8"	12 13/16"	3"	16"	32 1/2"	5 3/4"
	Pier 3*	2 & 3	3/16"						2 3/4"	15 1/4"	27 1/2"	

FIXED FLOATING BEARING



TOP PLATE (INVERTED)

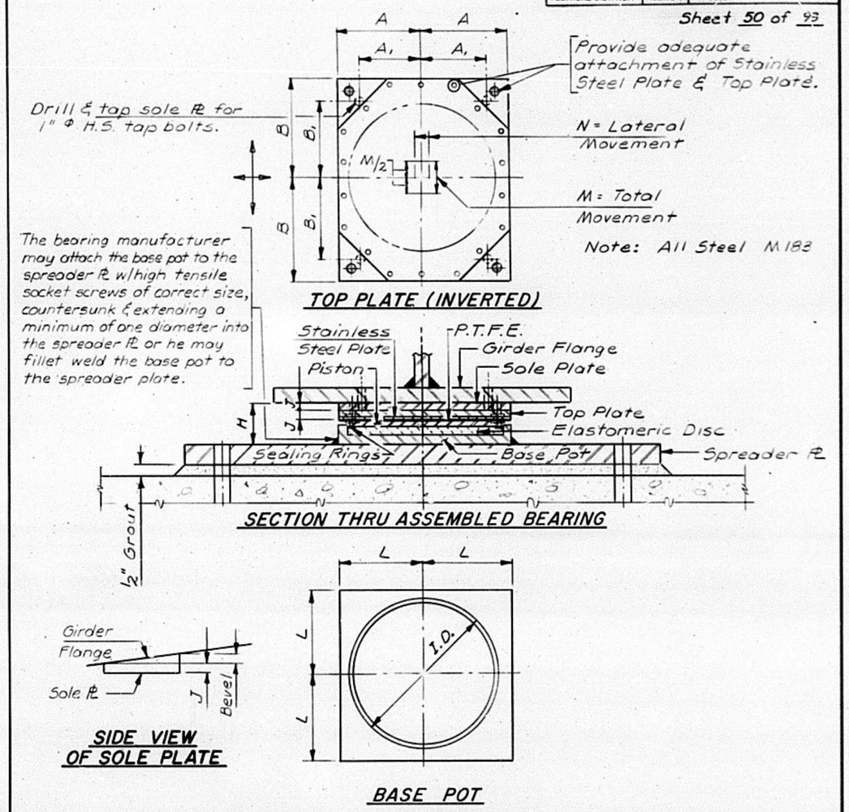
SECTION THRU ASSEMBLED BEARING

SIDE VIEW OF SOLE PLATE

BASE POT

GUIDED EXPANSION FLOATING BEARING TABLE OF DIMENSIONS														
Capacity (Tons)	Location		Sole Pl.	Dimensions							Spreader Pl.			**	
	Support	Girder	Bevel	A	B	H	J	L	M	I.D.	t"	w"	ℓ"	A_1	B_1
50	Pier 4*	1,2,3 & 4	3/16"	5 7/16"	5 3/4"	3"	5 3/8"	3 3/4"	3 1/2"	6"	2 1/2"	7 1/2"	23 1/2"	3 1/2"	3 1/4"

GUIDED EXPANSION FLOATING BEARING



TOP PLATE (INVERTED)

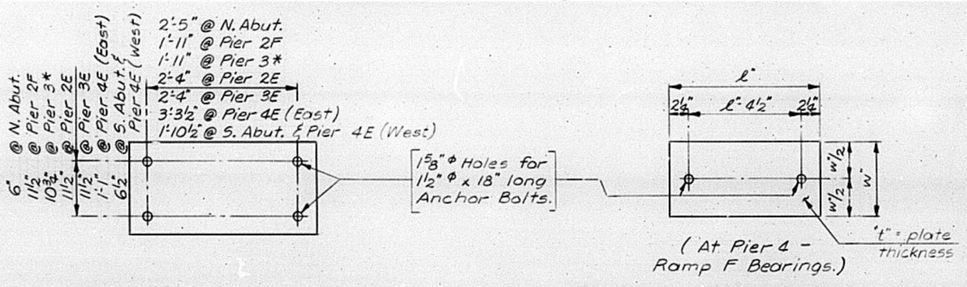
SECTION THRU ASSEMBLED BEARING

SIDE VIEW OF SOLE PLATE

BASE POT

NON-GUIDED EXPANSION FLOATING BEARING TABLE OF DIMENSIONS															
Capacity (Tons)	Location		Sole Pl.	Dimensions								Spreader Pl.		**	
	Support	Girder	Bevel	A	B	H	J	L	M	N	I.D.	t"	w"	ℓ"	A_1	B_1
175	Pier 2E	1	1/8"	7 5/8"	7 5/8"	4 3/16"	3/4"	6 3/4"	2"	2"	11 1/4"	3"	16"	32 1/2"	5 3/4"	5 3/4"
	Pier 2F	1	5/16													
200	Pier 2E	3 & 4	1/8"	8"	8"	4 7/16"	7/8"	7 1/4"	2"	2"	12 1/16"	3"	16"	32 1/2"	6 1/4"	6 1/2"
	Pier 2F	2 & 4	3/8"													
225	Pier 2E	2	1/8"	8 3/8"	8 3/8"	4 5/8"	7/8"	7 5/8"	2"	2"	12 13/16"	3"	16"	32 1/2"	6 1/2"	6 1/2"
	Pier 2F	3	3/8"													

NON-GUIDED EXPANSION FLOATING BEARING



(At Pier 4 - Ramp F Bearings.)

SPREADER PLATE DETAILS

Notes

Bearing manufacturer to provide temporary tie downs to resist uplift (10% of Vertical Capacity) during construction. To be removed after steel has been erected.

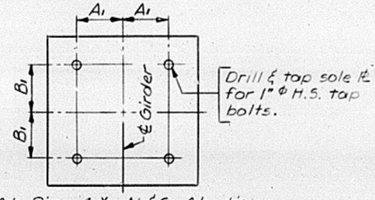
** Tap bolt hole locations on sole plate.

The bearing manufacturer shall submit shop drawings to the Engineer for approval before proceeding with the fabrication of the bearings.

Bearings shall be placed on a 1/2" thick bed of epoxy quartz sand grout and carefully levelled. No load shall be placed on the bearing until the grout has set and developed a minimum of 80% strength.

* Applies only to Ramp F Bearings.

On the Guided Expansion Floating Bearings provide guide bars and fasteners capable of resisting 35% of vertical capacity at the No. 4 & 5a Abut. & 10% of vertical capacity at all other locations.



(At Pier 4 *, N. & S. Abut's, & East & West Brgs. Pier 4E.)

TAP BOLT HOLE LOCATIONS IN SOLE PLATE AT GUIDED EXPANSION FLOATING BEARING

FLOATING BEARINGS

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED CRN
CHECKED S.C.O.
DRAWN D.A.N.
CHECKED S.C.O.

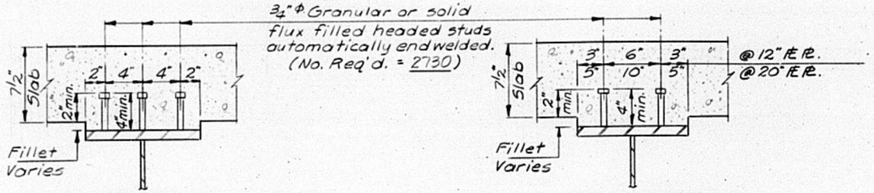
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

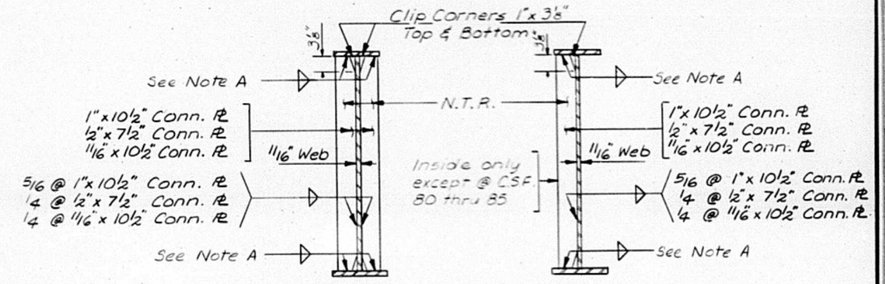
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) -P	PEORIA & TAZEWELL	96	53
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 51 of 93



SHEAR STUDS
PIER 4 to SPLICE 1
SPLICE 2 to SPLICE 3
SPLICE 4 to N. ABUT.

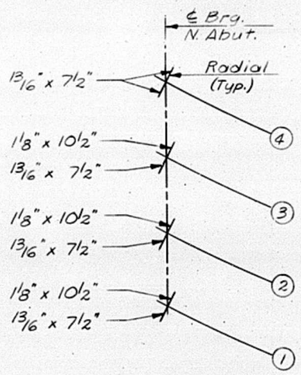
SHEAR STUDS
SPLICE 1 to SPLICE 2
SPLICE 3 to SPLICE 4



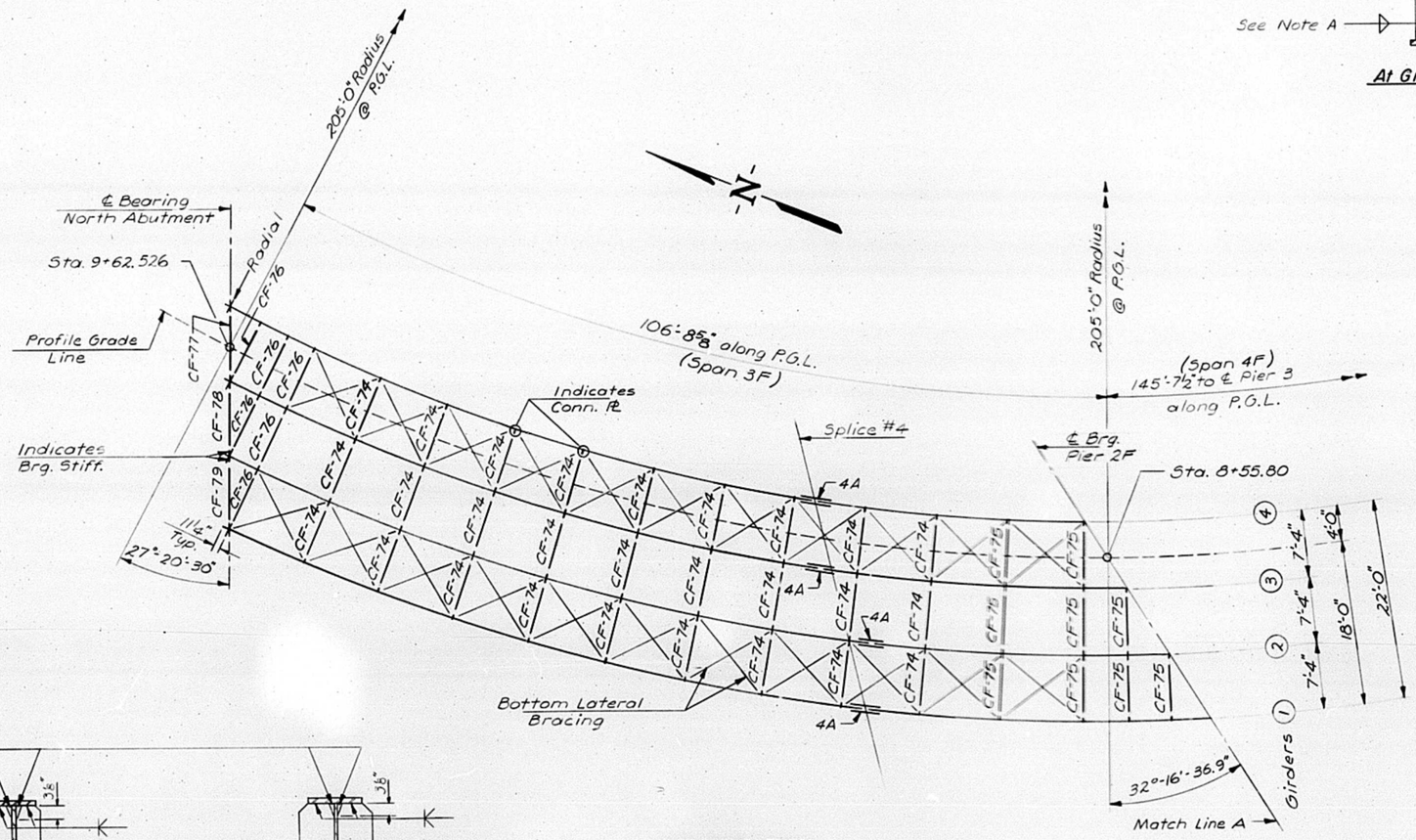
At Girders 2 & 3 **At Girders 1 & 4**

CONNECTING PLATES
For locations of Conn. Pl.'s see Ramp F - Girder Details.
All Conn. Pls - M183 Steel

Note A:
9/16 @ 1" Conn. Pl.
5/16 @ ½" Conn. Pl.
3/8 @ 11/16" Conn. Pl.

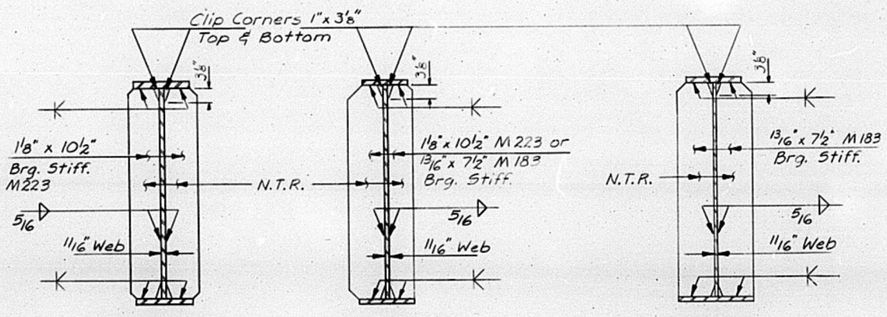


BEARING STIFFENERS AT NORTH ABUTMENT



FRAMING PLAN
(Span 3F)

Note: All dimensions shown are measured horizontally.



At Piers 2F & 3 **At N. Abut.** **At Pier 4**

BEARING STIFFENERS
For locations of Brg. Stiff's. see Ramp F - Girder Details.

STRUCTURAL STEEL FRAMING PLAN
RAMP F - SPAN 3F

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 **SEC. (15B-1)-P**
PEORIA & TAZEWELL COUNTIES

DESIGNED N.D.L.
CHECKED C.R.N.
DRAWN D.A.N.
CHECKED C.R.N.

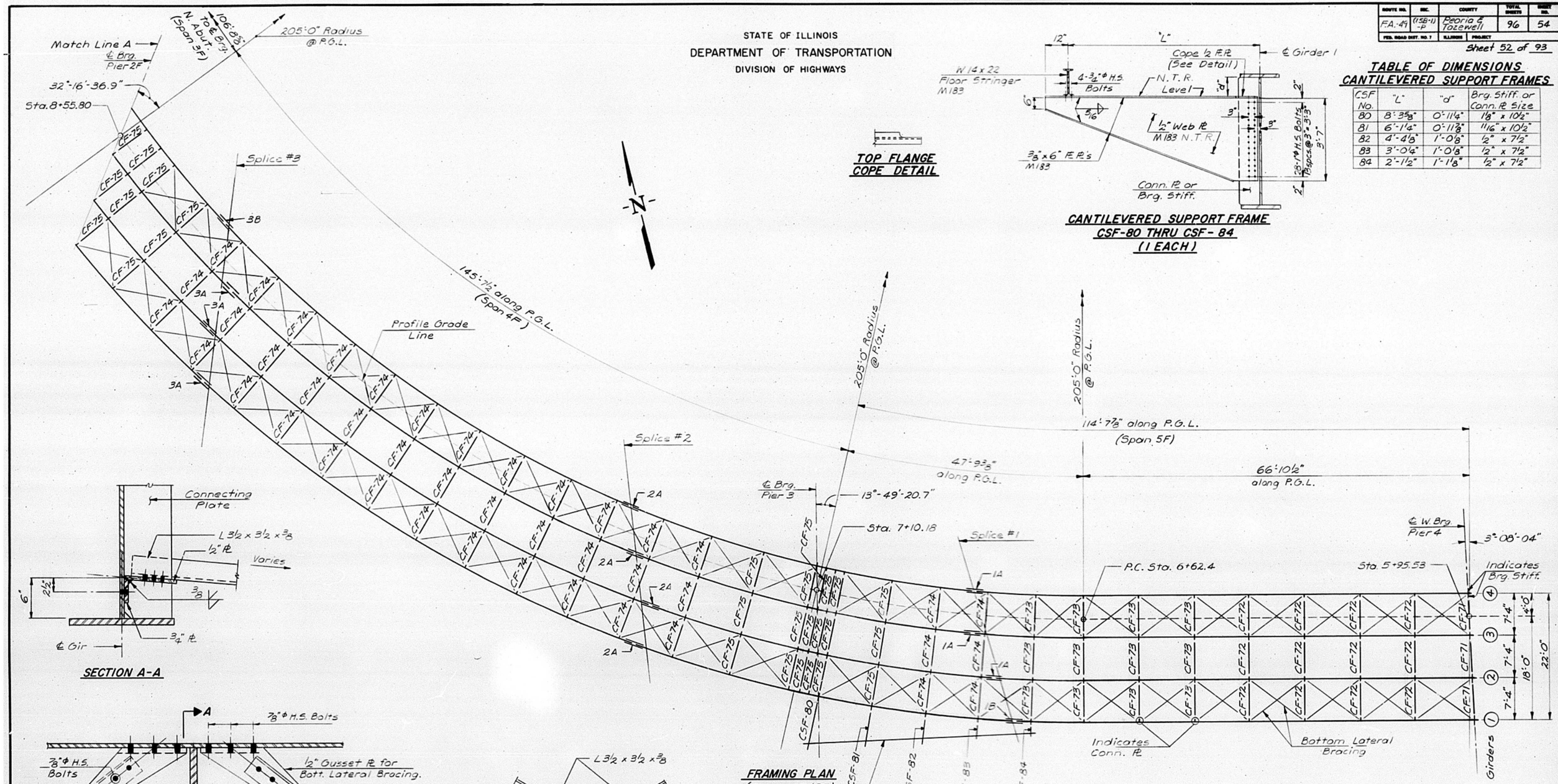
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.-49	(15B-1)-P	Peoria & Tazewell	96	54
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 52 of 93



FRAMING PLAN
(Spans 4F & 5F)

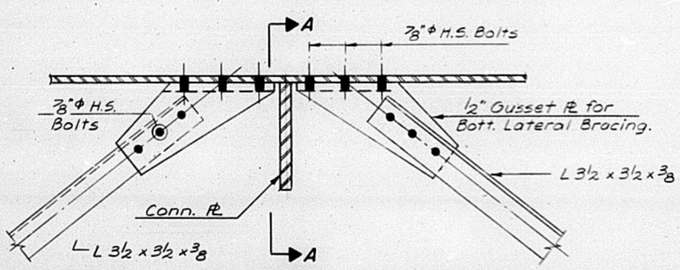
CANTILEVERED SUPPORT FRAME
CSF-80 THRU CSF-84
(1 EACH)

TOP FLANGE COPE DETAIL

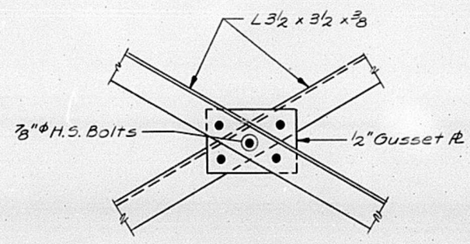
TABLE OF DIMENSIONS CANTILEVERED SUPPORT FRAMES

CSF No.	"L"	"d"	Brg. Stiff. or Conn. PL Size
80	8'-3⅝"	0'-11¼"	1⅛" x 10½"
81	6'-1¼"	0'-11⅞"	11/16" x 10½"
82	4'-4⅛"	1'-0⅛"	½" x 7½"
83	3'-0¼"	1'-0⅛"	½" x 7½"
84	2'-1½"	1'-1⅛"	½" x 7½"

SECTION A-A



PLAN



AT INTERSECTION

Lateral Bracing Angles & Conn. Mat'l. shall be AASHTO M183 Steel

BOTTOM LATERAL BRACING DETAILS

Note: All dimensions shown are measured horizontally.

STRUCTURAL STEEL FRAMING PLAN
RAMP F - SPANS 4F & 5F

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED C.R.N.
DRAWN D.A.N.
CHECKED C.R.N.

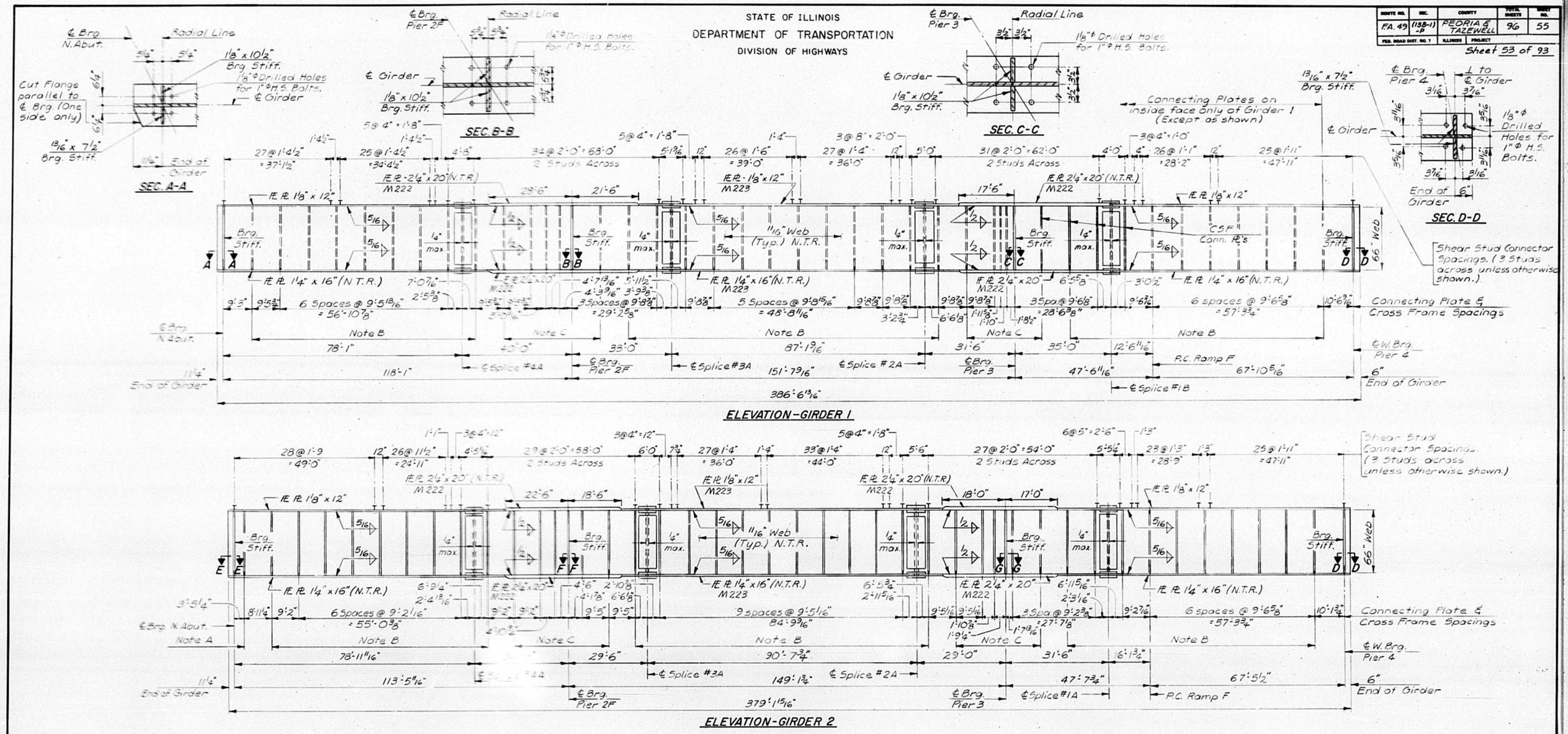
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

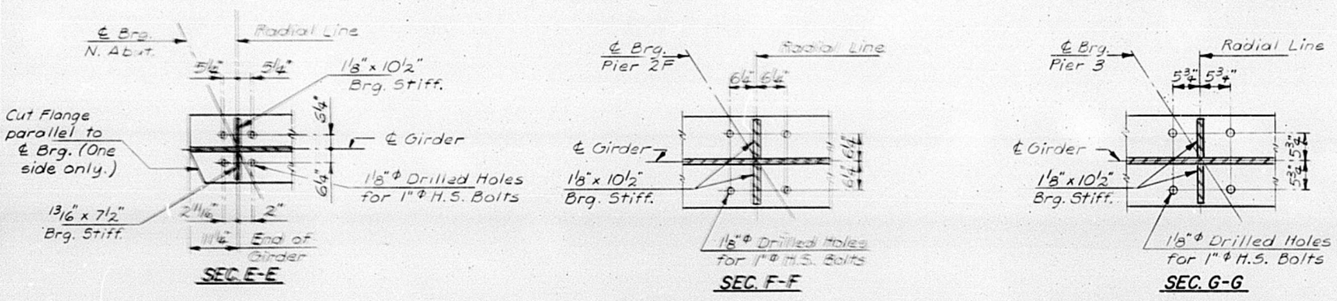
FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1)-P	PEORIA & TAZEWELL	96	55
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 53 of 93





Notes

All dimensions are measured along ℄ Girder.

N.T.R. refers to the Supplemental Requirements for Notch Toughness.

Note A: 1" x 10½" Connecting Plates.

Note B: ½" x 7½" Connecting Plates.

Note C: 11⁄16" x 10½" Connecting Plates.

Steel Specifications this sheet shall be AASHTO M183 Steel unless otherwise noted.

All dimensions shown are measured horizontally.

RAMP F - GIRDER DETAILS

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED C.R.N.
DRAWN D.A.N.
CHECKED C.R.N.

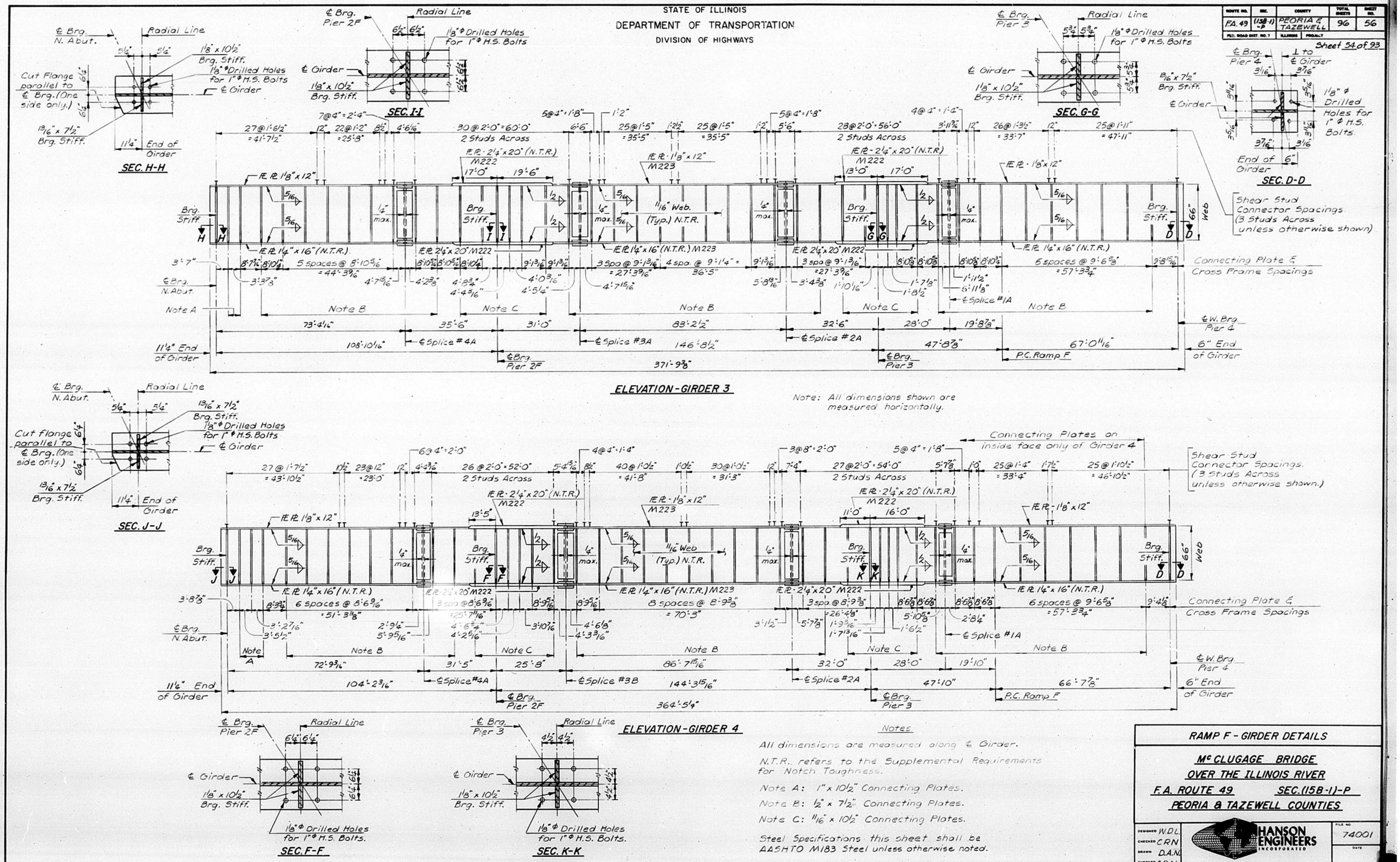
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1)-P	PEORIA & TAZEWELL	96	56
FED. ROAD DIST. NO. 7	ILLINOIS	PROJ.		

Sheet 54 of 93



Notes

All dimensions are measured along ℄ Girder.

N.T.R. refers to the Supplemental Requirements for Notch Toughness.

Note A: 1" x 10½" Connecting Plates.

Note B: ½" x 7½" Connecting Plates.

Note C: 11/16" x 10½" Connecting Plates.

Steel Specifications this sheet shall be AASHTO M183 Steel unless otherwise noted.

RAMP F - GIRDER DETAILS

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED C.R.N.
DRAWN D.A.N.
CHECKED C.R.N.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1)-P	PEORIA & TAZEWELL	96	57
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 55 of 93

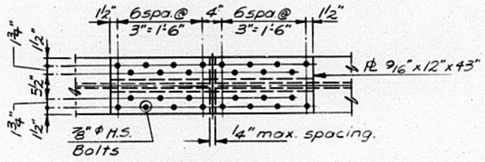
GIRDER I MOMENT TABLE

	0.4 Span 3F or Span 5F		Pier 2F or 3F	0.5 Span 4F	
I_s (in.^{4})	53,684		121,316	53,684	
I_c N=30 (in.^{4})	77,988		——	77,988	
I_c N=10 (in.^{4})	106,923		——	106,923	
	T. Fl	B. Fl.		T. Fl.	B. Fl.
S_s (in.^{3})	1,455	1,706	3,442	1,455	1,706
S_c N=30 (in.^{3})	2,657	1,999	——	2,657	1,999
S_c N=10 (in.^{3})	5,245	2,228	——	5,424	2,228
℄ (K/ft.)	1.06		1.27	1.06	
M ℄ (ft.K)	964	964	2,576	1,103	1,103
f_s ℄ (KSI)	7.95	6.78	8.98	9.10	7.76
f_w ℄ (KSI)	1.48	0.75	1.13	1.85	0.95
S ℄ (K/ft.)	0.20		0.20	0.20	
M S ℄ (ft.K)	204	204	490	257	257
f_s S ℄ (KSI)	0.92	1.22	1.71	1.16	1.54
f_w S ℄ (KSI)	0	0.25	0.20	0	0.31
M ℄ (ft.K)	906	906	1,240	1,072	1,072
M IMP (ft.K)	226	226	310	269	269
M TOTAL (ft.K)	1,132	1,132	1,550	1,341	1,341
f_s ℄ (KSI)	2.59	6.10	5.40	3.07	7.22
f_w ℄ (KSI)	0	0.92	0.61	0	0.99
f_s TOTAL (KSI)	11.46	14.1	16.09	13.33	16.52
$f_s + w$ TOTAL (KSI)	12.94	16.02	18.03	15.18	18.77
F_B allowable (KSI)	14.0	20.0	18.20	18.10	25.9
$F_B + F_W$ allow. (KSI)	20.0	20.0	26.50	25.9	25.9

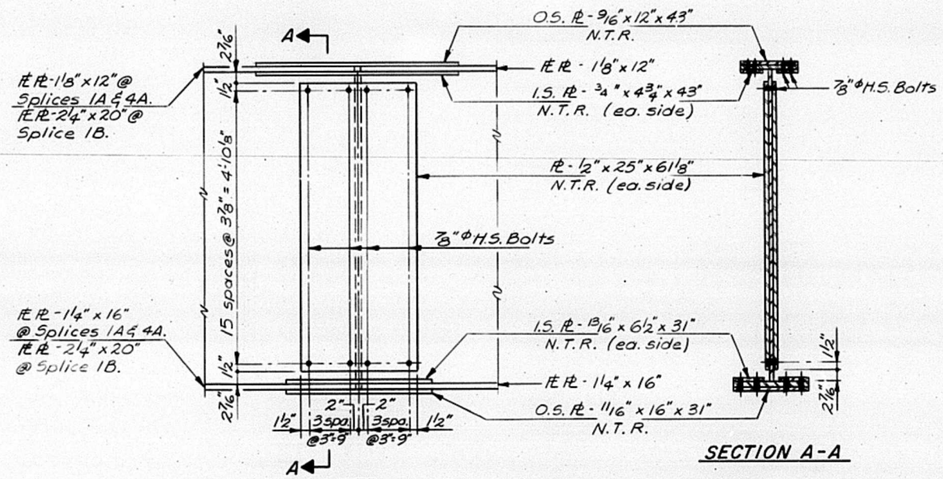
3 Span (Composite in Positive Moment Areas only.)
I_s & S_s are the moment of inertia and section modulus of the steel section.
I_c & S_c are the moment of inertia and section modulus of the composite section used in computing f_s, N=30 for Superimposed ℄ and N=10 for ℄.
f_w is Normal Stress due to Lateral Flange Bending.

Note: Girder I has largest Moments and is used for Table.

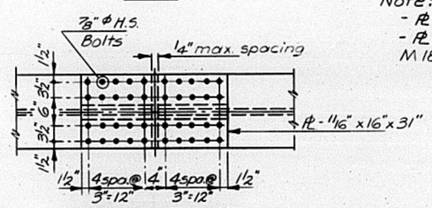
F_B is allowable stress due to bending alone.
$F_B + F_W$ is allowable stress due to bending and nonuniform torsion (lateral flange bending).



TOP FLANGE



SECTION A-A



BOTTOM FLANGE

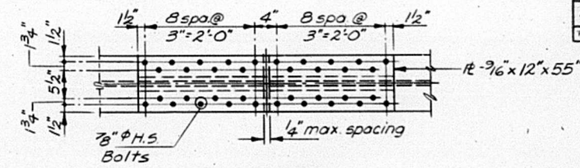
DETAIL OF SPLICE 1A, 1B & 4A

All Splice PL's = AASHTO M183 Steel.

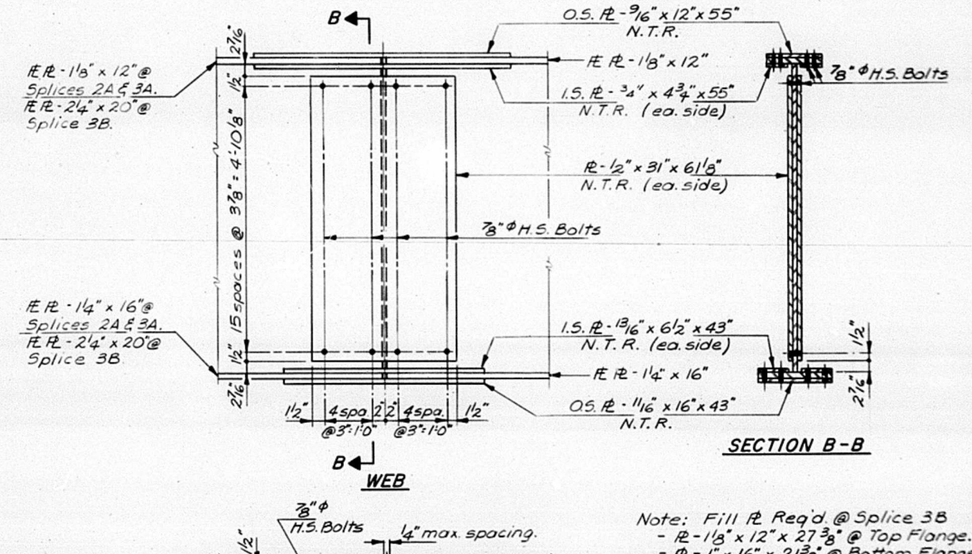
Note: Fill PL Req'd. @ Splice 1B
- PL-1⅛" x 12" x 21⅜" @ Top Flange.
- PL-1" x 16" x 15⅜" @ Bott. Flange.
M183

Note: The designation N.T.R. signifies main load carrying members that are subject to the Supplemental Requirements for Notch Toughness.

Type A Splice - No fill plates required.
Type B Splice - Flange fill plates required.

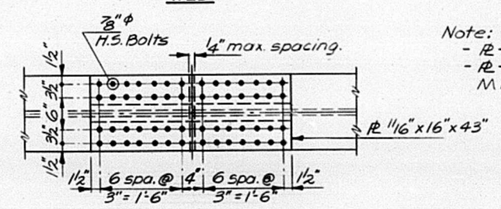


TOP FLANGE



SECTION B-B

WEB



BOTTOM FLANGE

DETAIL OF SPLICE 2A, 3A & 3B

Flange Splice PL's = AASHTO M223 Steel
All other Splice PL's = AASHTO M183 Steel

Note: Fill PL Req'd. @ Splice 3B
- PL-1⅛" x 12" x 27⅜" @ Top Flange.
- PL-1" x 16" x 21⅜" @ Bottom Flange.
M183 Steel.

REACTION TABLE

	N. Abut. Girders				Pier 2F Girders				Pier 3F Girders				Pier 4 (Ramp F Girders only.)			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
R ℄ (k)	75.3	20.4	15.9	47.2	119.2	178.1	204.4	169.6	64.5	225.5	220.1	156.5	40.1	41.3	43.0	45.5
R S ℄ (k)	14.5	5.1	3.7	8.6	26.1	29.9	33.6	31.5	12.9	42.9	40.8	25.9	7.9	8.3	8.5	9.2
R ℄ (K)	65.3	23.5	21.8	35.3	138.5	122.2	122.4	142.2	65.1	114.5	109.5	75.6	32.7	31.5	30.1	27.8
R IMP (k)	19.6	7.0	6.5	10.6	41.6	36.6	36.7	42.7	19.5	34.4	32.8	22.7	9.8	9.4	9.0	8.4
R TOTAL (k)	174.7	56.0	47.9	101.7	325.4	366.8	397.1	386.0	162.0	417.3	403.2	280.7	90.5	90.5	90.6	90.9

Reaction and Moment tables are based on a Dead Load of 25 #/sq.ft. of future Cl. I Surfacing & 94#/sq.ft. of concrete slab in addition to the weight of the structural steel.

RAMP F
SPLICES, MOMENT & REACTION TABLES

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED WDL
CHECKED CRN
DRAWN D.A.N.
CHECKED C.R.N

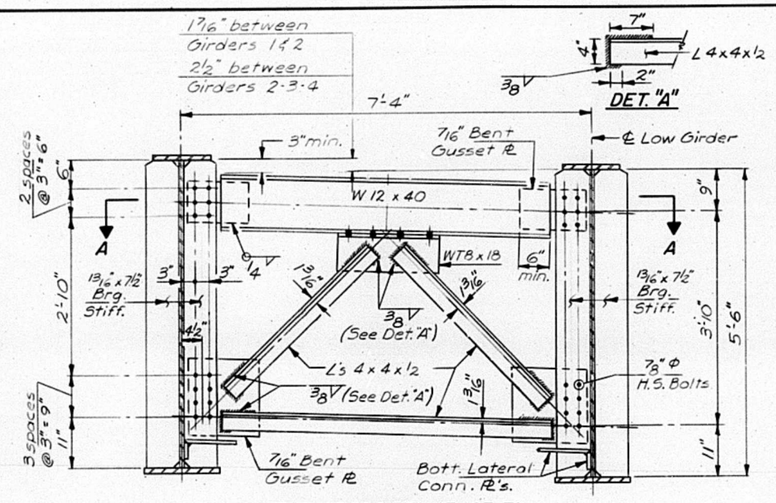
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

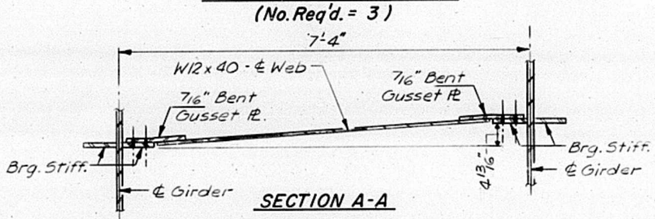
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA-4	(15B-1)-P	PEORIA & TAZEWELL	96	58
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 56 of 93

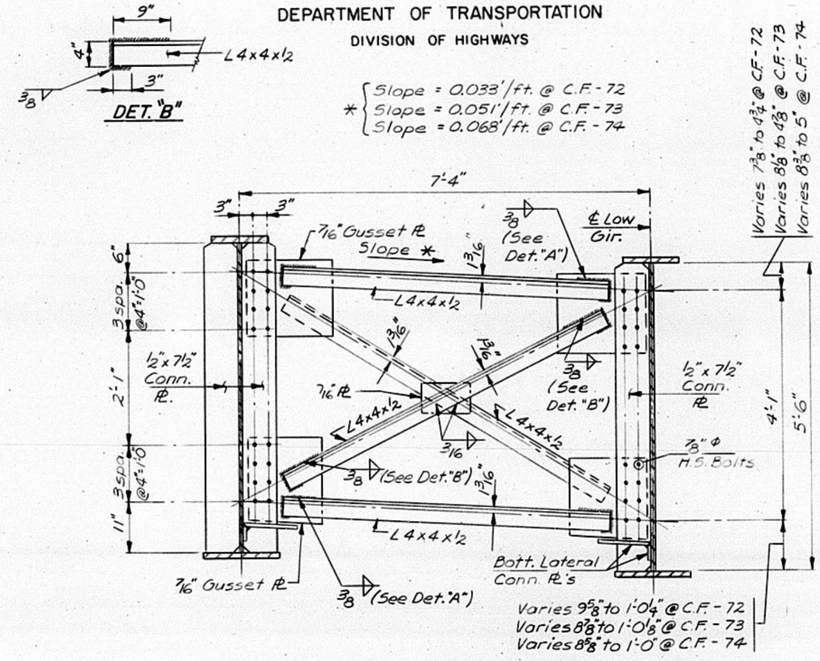


END CROSS FRAME CF-71
(No. Req'd. = 3)



SECTION A-A

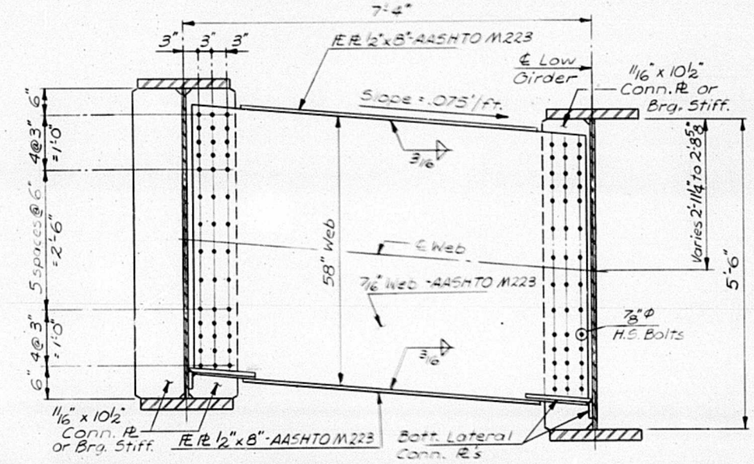
Note: 1" Φ Holes in Brg. Stiff's. for 7/8" Φ Bolts.
1 1/16" Φ Holes in Gusset Pl's for 7/8" Φ Bolts.
Hardened washers shall be required over holes in gusset Pl's.



* Slope = 0.033'/ft. @ C.F. - 72
Slope = 0.051'/ft. @ C.F. - 73
Slope = 0.068'/ft. @ C.F. - 74

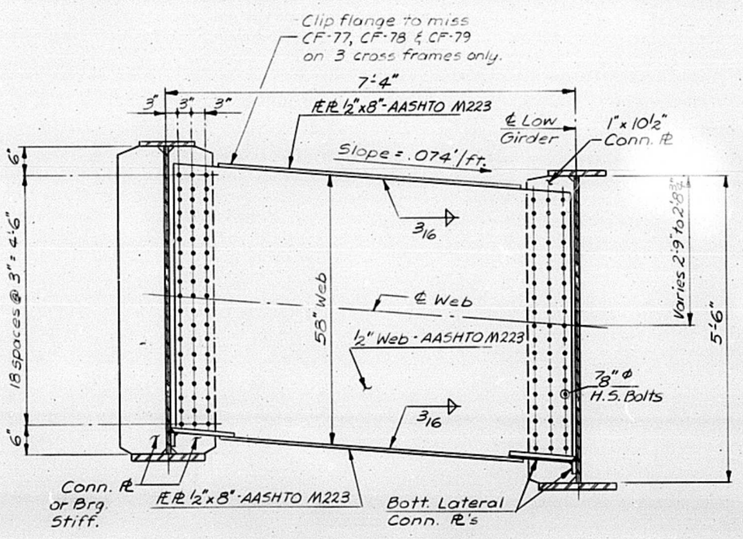
INTERIOR CROSS FRAMES CF-72, CF-73 & CF-74
(No. CF-72 Req'd. = 12)
(No. CF-73 Req'd. = 12)
(No. CF-74 Req'd. = 69)

Note: 1" Φ Holes in Conn. Pl's for 7/8" Φ Bolts.
1 1/16" Φ Holes in Gusset Pl's for 7/8" Φ Bolts.
Hardened washers shall be required over holes in gusset Pl's.



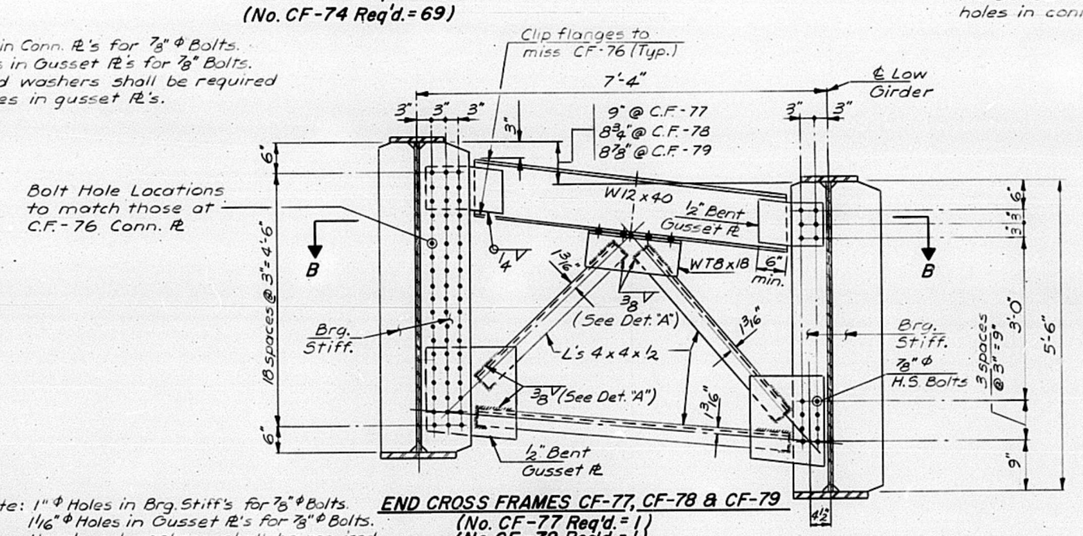
INTERIOR CROSS FRAME CF-75
(No. Req'd. = 36)

Note: 1" Φ Holes in Pl. Gir. Web for 7/8" Φ Bolts.
1 1/16" Φ Holes in Conn. Pl's for 7/8" Φ Bolts.
Hardened washers shall be required over holes in conn. Pl's.



INTERIOR CROSS FRAME CF-76
(No. Req'd. = 6)

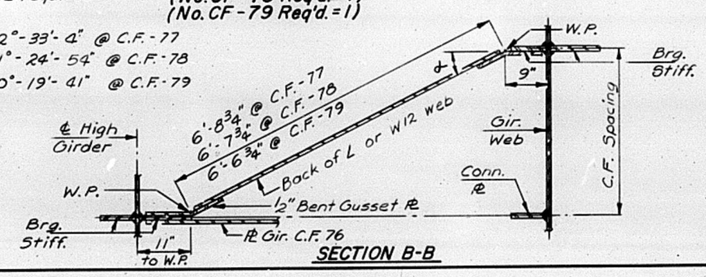
Note: 1" Φ Holes in Pl. Gir. Web for 7/8" Φ Bolts.
1 1/16" Φ Holes in Conn. Pl's for 7/8" Φ Bolts.
Hardened washers shall be required over holes in conn. Pl's.



Note: 1" Φ Holes in Brg. Stiff's for 7/8" Φ Bolts.
1 1/16" Φ Holes in Gusset Pl's for 7/8" Φ Bolts.
Hardened washers shall be required over holes in gusset Pl's.

END CROSS FRAMES CF-77, CF-78 & CF-79
(No. CF-77 Req'd. = 1)
(No. CF-78 Req'd. = 1)
(No. CF-79 Req'd. = 1)

α = 32°-33'-4" @ C.F. - 77
α = 31°-24'-54" @ C.F. - 78
α = 30°-19'-41" @ C.F. - 79



SECTION B-B

Note: All Cross Frame material shown on this sheet shall conform to the Supplemental Requirements for Notch Toughness.

Note: All dimensions shown are measured horizontally.

Note: See sheets 51 & 52 of 93 for location of Bottom Lateral Bracing & the connection details.

Superelevation:
Attain Sta. 5+74.4 (.02'/ft.) to Sta. 7+06.40 (.08'/ft.)
Fill Sta. 7+06.40 to Sta. 9+47.51 (.08'/ft.)
Remove Sta. 9+47.51 (.08'/ft.) to Sta. 10+79.51 (.02'/ft.)

Steel Specifications this sheet:
Cross Frames - AASHTO M183
Bolts - AASHTO M164
(Unless otherwise noted)

RAMP F - CROSS FRAMES

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

WDL
CRN
D.A.N.
C.R.N.

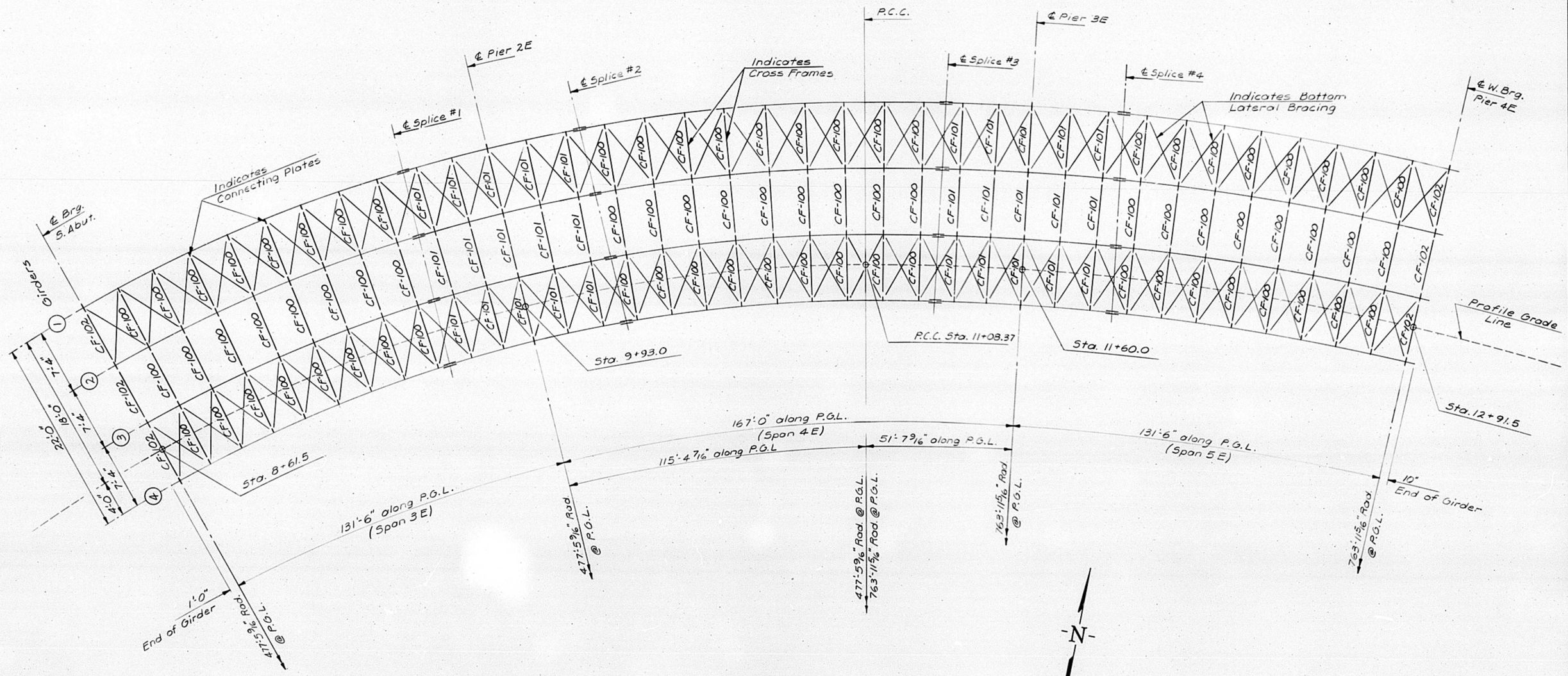
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1)-P	PEORIA & TAZEWELL	96	59
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 57 of 93



FRAMING PLAN

Note: All dimensions shown are measured horizontally.

RAMP E - SPANS 3E, 4E & 5E
STRUCTURAL STEEL-FRAMING PLAN

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC.(15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED S.C.O.
DRAWN D.A.N.
CHECKED R.W.C.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

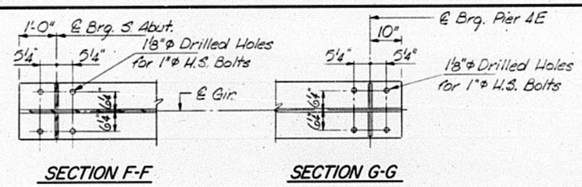
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) -E	PEORIA & TAZEWELL	96	60
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

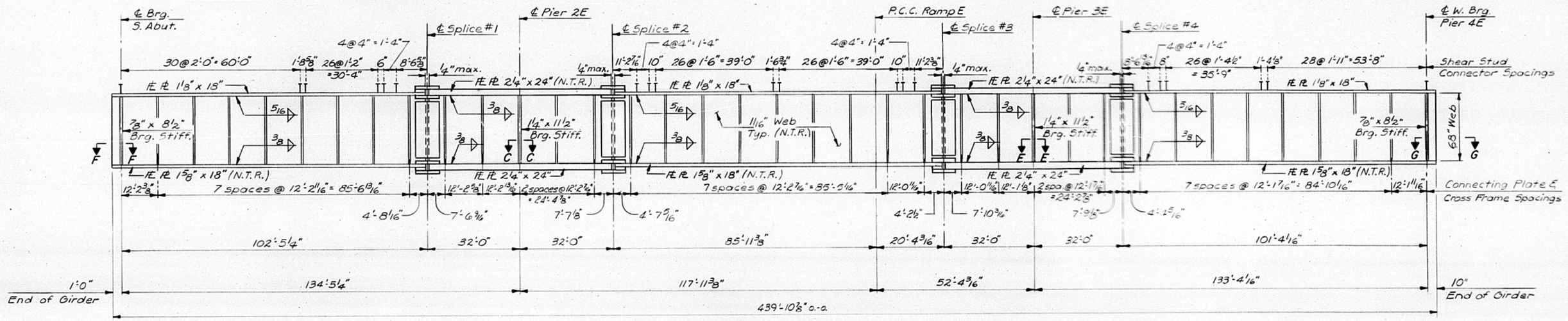
Sheet 58 of 93

Note:
Steel Specifications this sheet
(Unless otherwise noted)

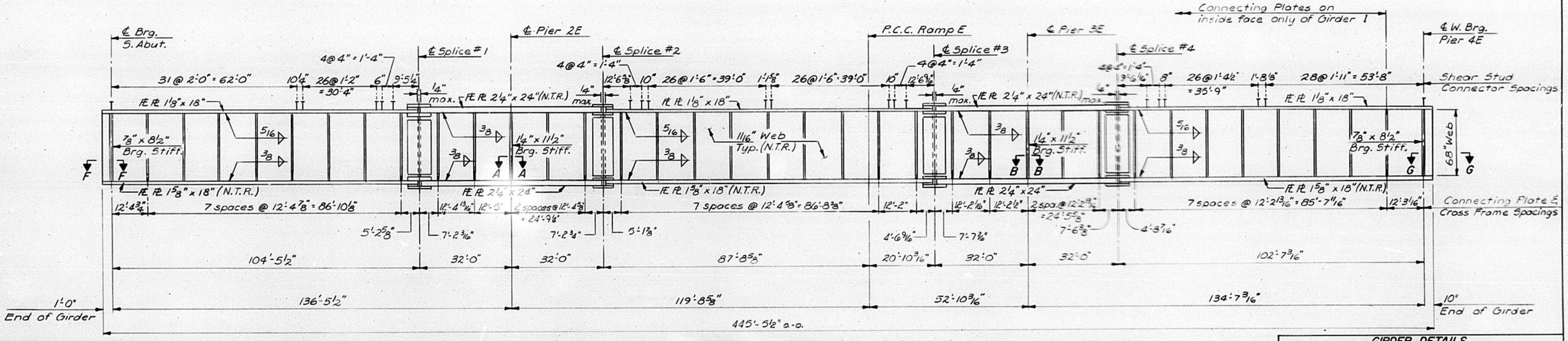
Flanges	1⅛" x 18"	AASHTO	M223
	1⅜" x 18"	AASHTO	M223
	2¼" x 24"	AASHTO	M222
Web	11/16" x 68"	AASHTO	M183
Bearing Stiffners —		AASHTO	M223

Note: All dimensions shown are measured horizontally & along ℄ Girder.

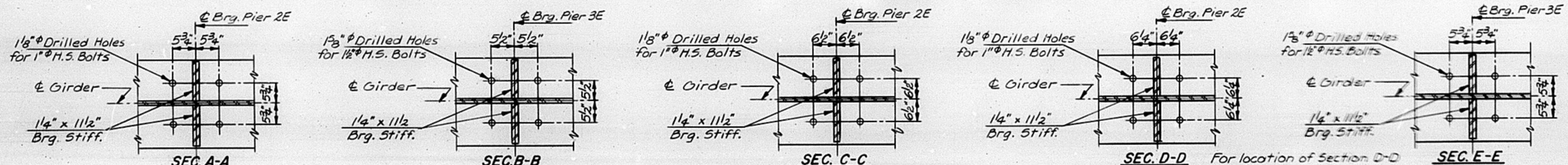




ELEVATION-GIRDER 2



ELEVATION-GIRDER 1



For location of Section D-D see Sheet 59 of 93

GIRDER DETAILS
RAMP E - SPANS 3E, 4E & 5E

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC.(15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED S.C.O.
DRAWN D.A.N.
CHECKED R.W.C.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS — PEORIA, ILLINOIS

FILE NO. 74001
DATE

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) -P	PEORIA & TAZEWELL	96	61
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

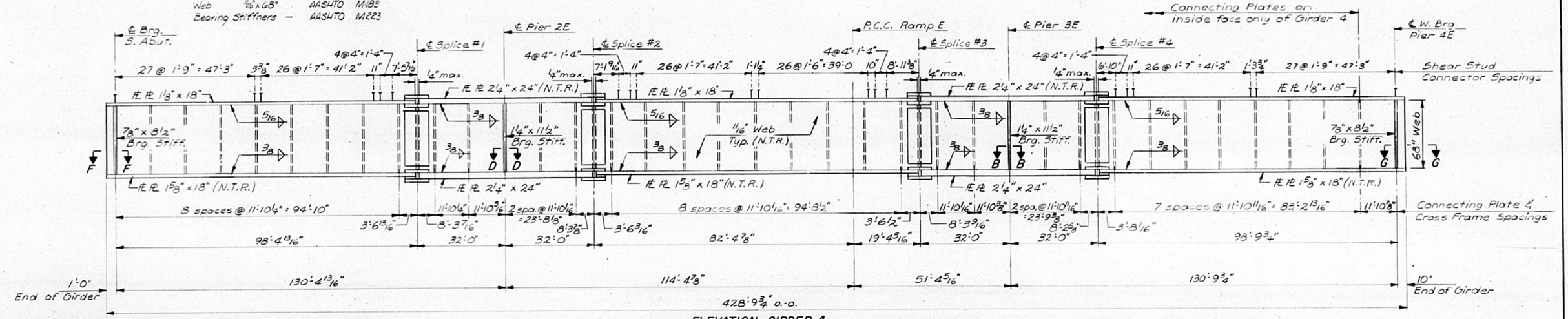
Sheet 59 of 93

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

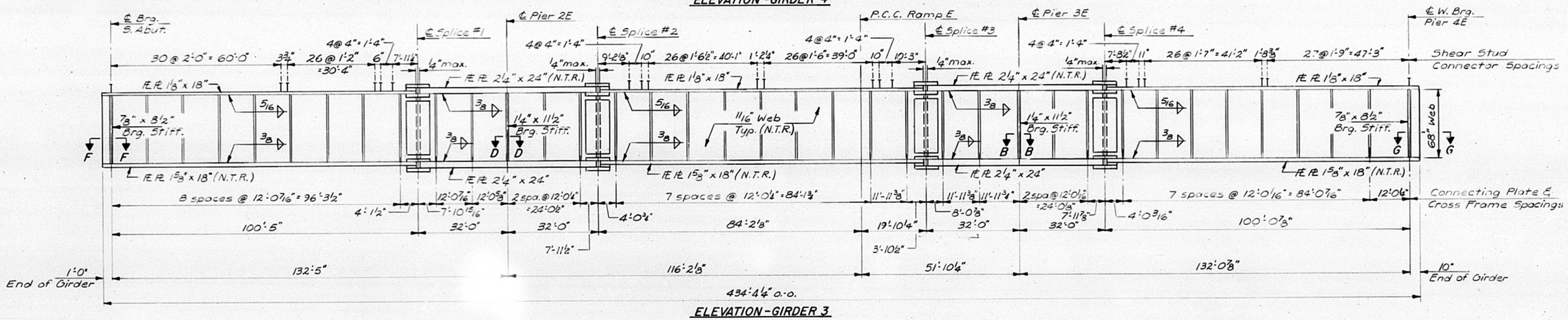
Note:
Steel Specifications this sheet.
(Unless otherwise noted.)

Flanges	1⅛" x 18"	AASHTO	M223
	1⅝" x 18"	AASHTO	M223
	2¼" x 24"	AASHTO	M222
Web	7/16" x 68"	AASHTO	M183
Bearing Stiffners –		AASHTO	M223

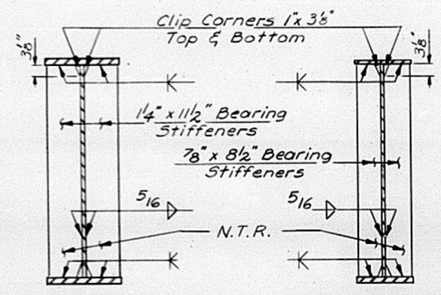
Note: For Sections B-B, D-D, F-F & G-G see Sheet 58 of 93.



ELEVATION - GIRDER 4

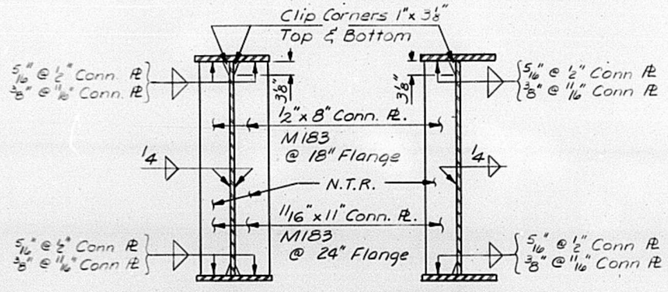


ELEVATION - GIRDER 3



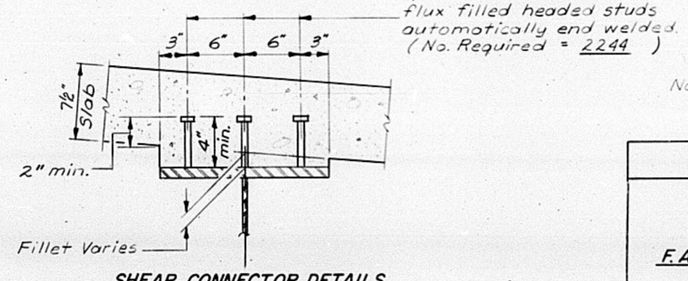
At Piers 2E & 3E — At Pier 4E & S. Abut.

BEARING STIFFENERS



At Girders 2 & 3 — At Girders 1 & 4

CONNECTING PLATES



SHEAR CONNECTOR DETAILS

Note: All dimensions shown are measured horizontally & along ℄ Girder.

GIRDER DETAILS
RAMP E - SPANS 3E, 4E & 5E

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED S.C.O.
DRAWN D.A.N.
CHECKED R.W.C.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) -P	PEORIA & TAZEWELL	96	62
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

GIRDER I MOMENT TABLE

		0.4 Span 3E or Span 5E		Pier 2E or 3E	0.5 Span 4E	
I_s	(in.⁴)	76,608		151,306	76,608	
I_c N=30	(in.⁴)	104,961		—	104,961	
I_c N=10	(in.⁴)	141,358		—	141,358	
		T. Fl.	B. Fl.		T. Fl.	B. Fl.
S_s	(in.³)	1,993	2,370	4,174	1,993	2,370
S_c N=30	(in.³)	3,318	2,683	—	3,318	2,683
S_c N=10	(in.³)	6,169	2,955	—	6,169	2,955
DL	(k/ft.)	1.20		1.40	1.20	
M_{DL}	(ft.k)	1,632		3,936	1,032	
$f_{s\,DL}$	(ksi)	9.82	8.26	11.32	6.21	5.22
$f_{w\,DL}$	(ksi)	2.16	1.50	1.28	1.37	0.95
S_{DL}	(k/ft.)	0.55		0.55	0.55	
M_{SDL}	(ft.k)	861		1,575	787	
$f_{s\,SDL}$	(ksi)	3.11	3.85	4.53	2.85	3.52
f_{wSDL}	(ksi)	0	0.78	0.50	0	0.72
M_{LL}	(ft.k)	1,251		1,292	1,337	
M_{IMP}	(ft.k)	313		323	334	
M_{TOTAL}	(ft.k)	1,564		1,615	1,671	
$f_{s\,LL}$	(ksi)	3.04	6.35	4.64	3.25	6.78
$f_{w\,LL}$	(ksi)	0	1.46	0.51	0	1.55
$f_{s+w\,TOTAL}$	(ksi)	18.13	22.20	22.78	13.68	18.74
				B. Fl.		
F_B allowable	(ksi)	23.5		22.2	23.5	
$F_B + F_w$ allow	(ksi)	26.8	26.8	26.1	26.8	26.8
VR	(k)	70		—	67	

3 Span (Composite in Positive Moment Areas Only.)

I_s & S_s are the moment of inertia and section modulus of the steel section.

I_c & S_c are the moment of inertia and section modulus of the composite section used in computing f_s, N=30 for superimposed DL and N=10 for LL.

f_w is Normal stress due to Lateral Flange Bending.

VR is the maximum LL + Impact Shear Range in the span used to determine shear connector spacing.

F_B allowable is the maximum allowable normal stress, tension or compression, in the extreme fibers of the member.

$F_B + F_w$ allowable is the maximum total stress allowed due to both normal bending and lateral flange bending stresses.

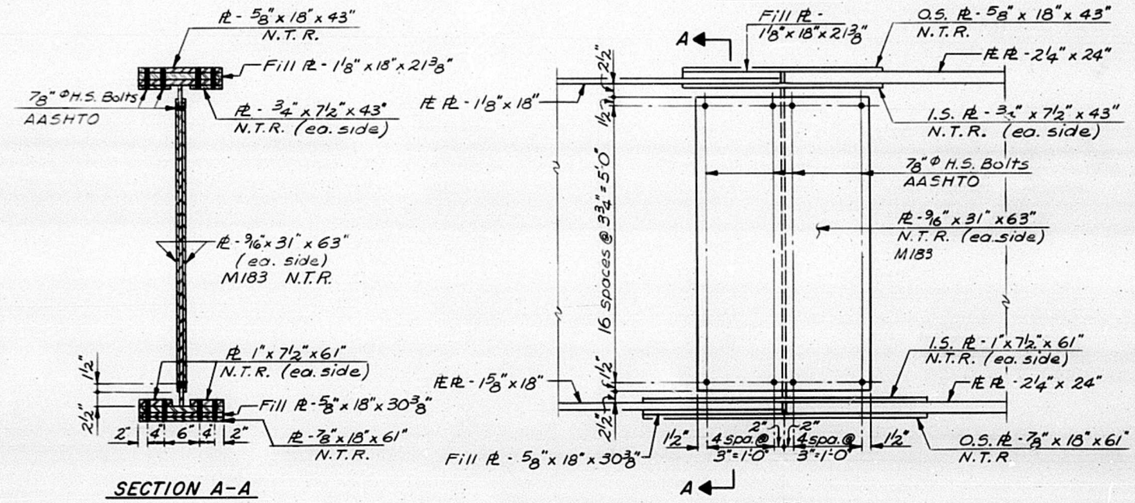
REACTION TABLE

	5. Abut. Girders				Pier 2E Girders				Pier 3E Girders				Pier 4E Girders *			
	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1
R DL (K)	40.0	50.3	58.4	68.5	243.2	222.9	241.7	191.5	232.4	219.7	233.1	205.6	45.7	51.9	56.9	63.2
R SDL (K)	18.8	24.8	28.2	34.7	90.6	90.6	102.8	88.2	91.1	91.3	100.2	92.3	21.9	25.0	26.9	30.3
R LL (K)	25.4	31.5	36.2	44.3	68.3	70.9	80.4	71.5	68.1	71.4	79.6	75.2	27.4	32.4	35.6	41.2
R IMP (K)	6.4	7.9	9.1	11.1	17.1	17.7	20.1	17.9	17.0	17.9	19.9	18.8	6.8	8.1	8.9	10.3
R TOTAL (K)	90.6	114.5	131.9	158.6	419.2	402.1	445.0	368.9	408.6	400.3	432.8	391.9	101.8	117.4	128.3	145.0

* Reactions are for West Brgs. only at Pier 4E.

Reaction and Moment tables are based on a Dead Load of 42.5 #/sq.ft of Cl. I surfacing & 94 #/sq.ft. of concrete slab in addition to the weight of the structural steel.

Note: The designation N.T.R. signifies main load carrying members that are subject to the Supplemental Requirements for Notch Toughness.



Steel Specifications this sheet:
Splice PL's. - AASHTO M 223
Bolts - AASHTO M 164
Unless otherwise noted.

STRUCTURAL STEEL DETAILS
RAMP E - SPANS 3E, 4E & 5E

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED S.C.O.
DRAWN D.A.N.
CHECKED R.W.C.

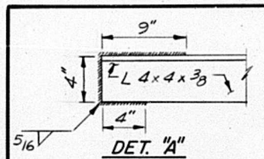
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

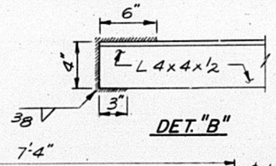
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) -P	PEORIA & TAZEWELL	96	63
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 61 of 93

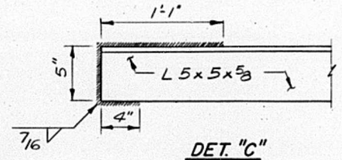
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS



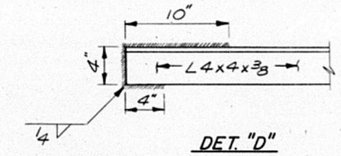
DET. "A"



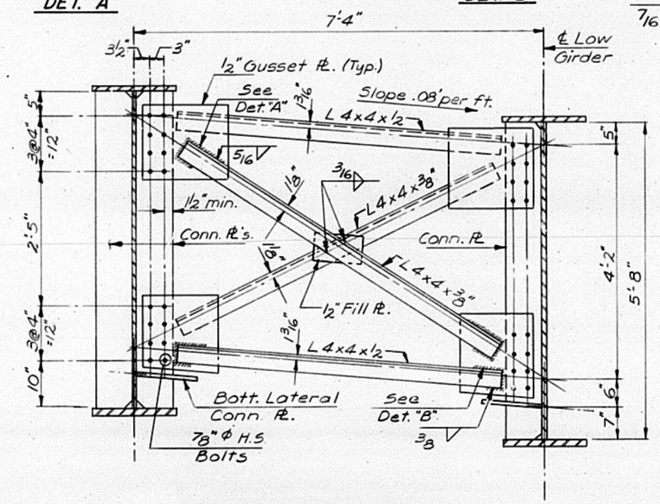
DET. "B"



DET. "C"

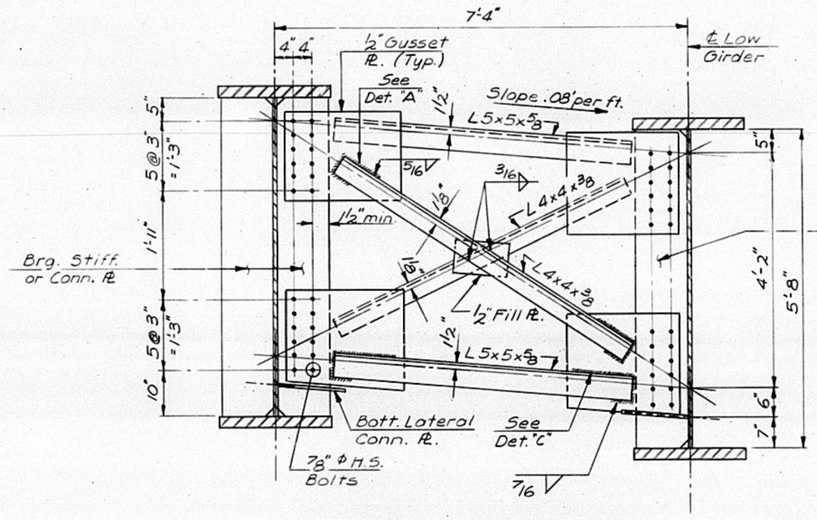


DET. "D"



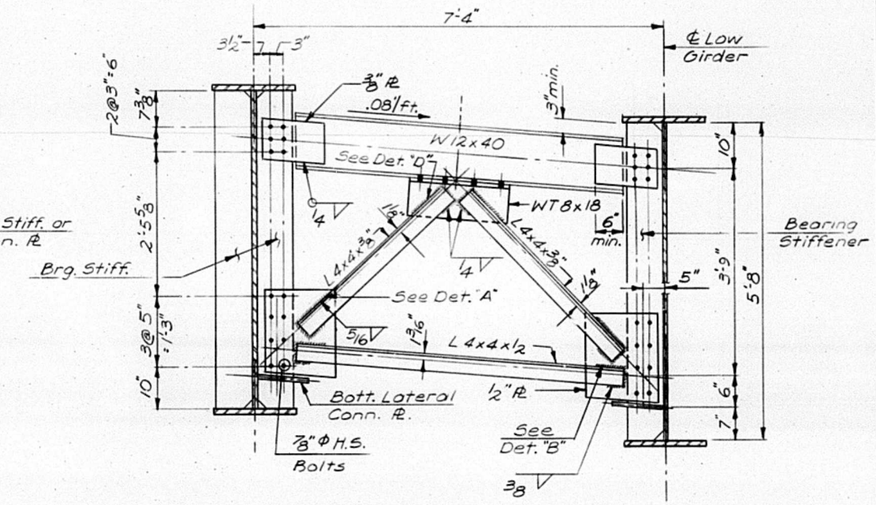
INTERIOR CROSS FRAME CF-100
(No. Req'd. = 75)

Note: 1 1/16" Φ holes in gusset Pl's for 7/8" Φ bolts. Hardened washers shall be required over holes in gusset Pl's.
Bottom Lateral Connection Pl required as shown on Steel Framing Plan.



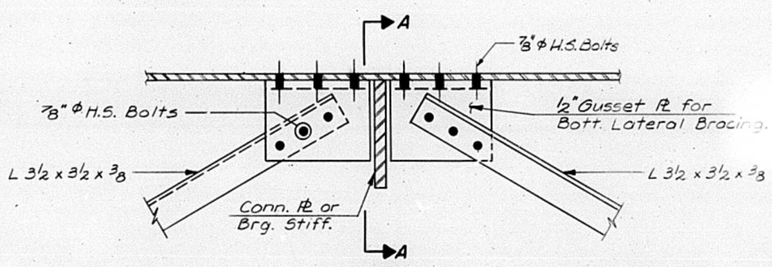
INTERIOR CROSS FRAME CF-101
(No. Req'd. = 30)

Note: 1 1/16" Φ holes in gusset Pl's for 7/8" Φ bolts. Hardened washers shall be required over holes in gusset Pl's.
Bottom Lateral Connection Pl required as shown on Steel Framing Plan.

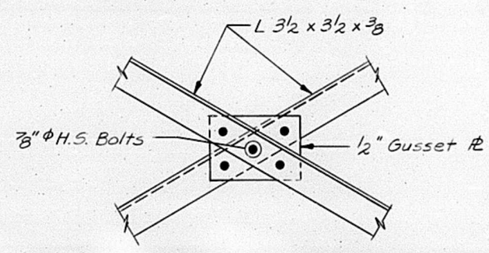


END CROSS FRAME CF-102
(No. Req'd. = 6)

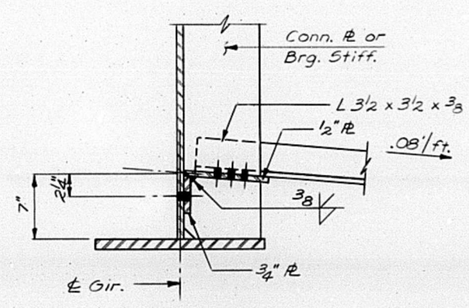
Note: 1 1/16" Φ holes in gusset Pl's for 7/8" Φ bolts. Hardened washers shall be required over holes in gusset Pl's.
Bottom Lateral Connection Pl required as shown on Steel Framing Plan.



PLAN



AT INTERSECTION



SECTION A-A

Steel Specifications this sheet:

Cross Frames -	AASHTO M-183
Bottom Lateral Bracing -	AASHTO M-183
Bolts -	AASHTO M-164

Note: All cross frame material shown on this sheet shall conform to the Supplemental Requirements for Notch Toughness.

BOTTOM LATERAL BRACING DETAILS

CROSS FRAMES & BOTT. LATERAL BRACING
RAMP E - SPANS 3E, 4E & 5E

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED S.C.O.
DRAWN D.A.N.
CHECKED R.W.C.

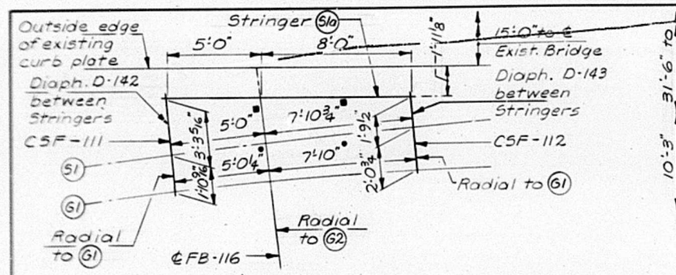
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

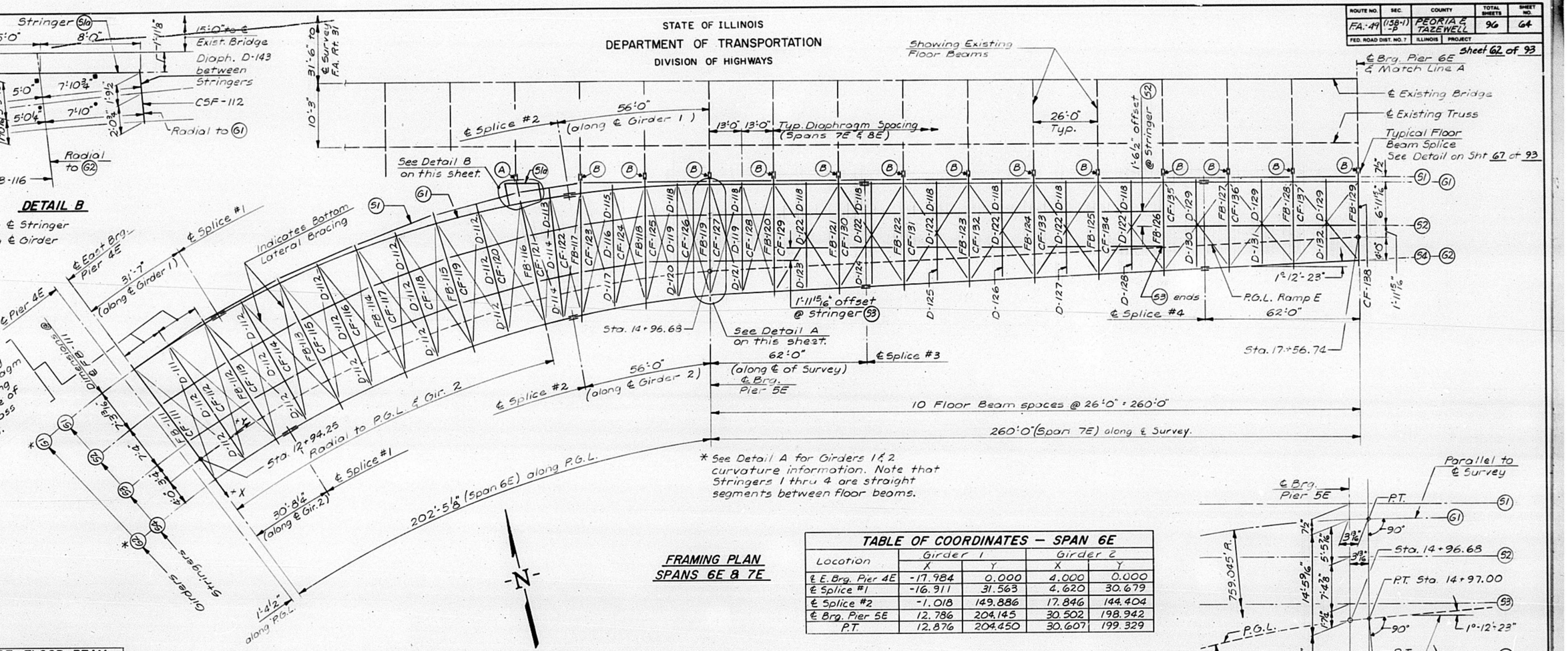
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA:-49	(15B-1) -P	PEORIA & TAZEWELL	96	64
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 62 of 93



DETAIL B

• = measured along ℄ Stringer
• = measured along ℄ Girder

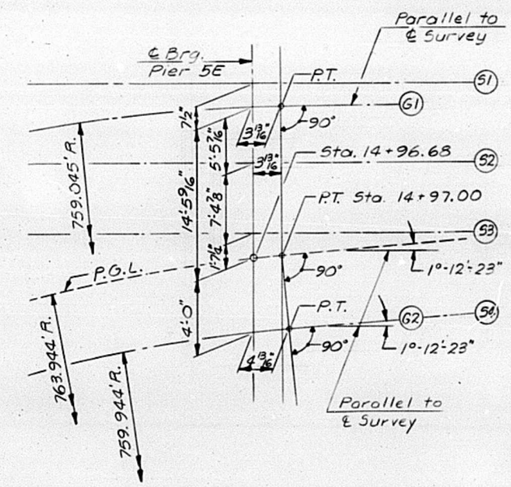


* See Detail A for Girders 1 & 2 curvature information. Note that Stringers 1 thru 4 are straight segments between floor beams.

FRAMING PLAN SPANS 6E & 7E

TABLE OF COORDINATES — SPAN 6E

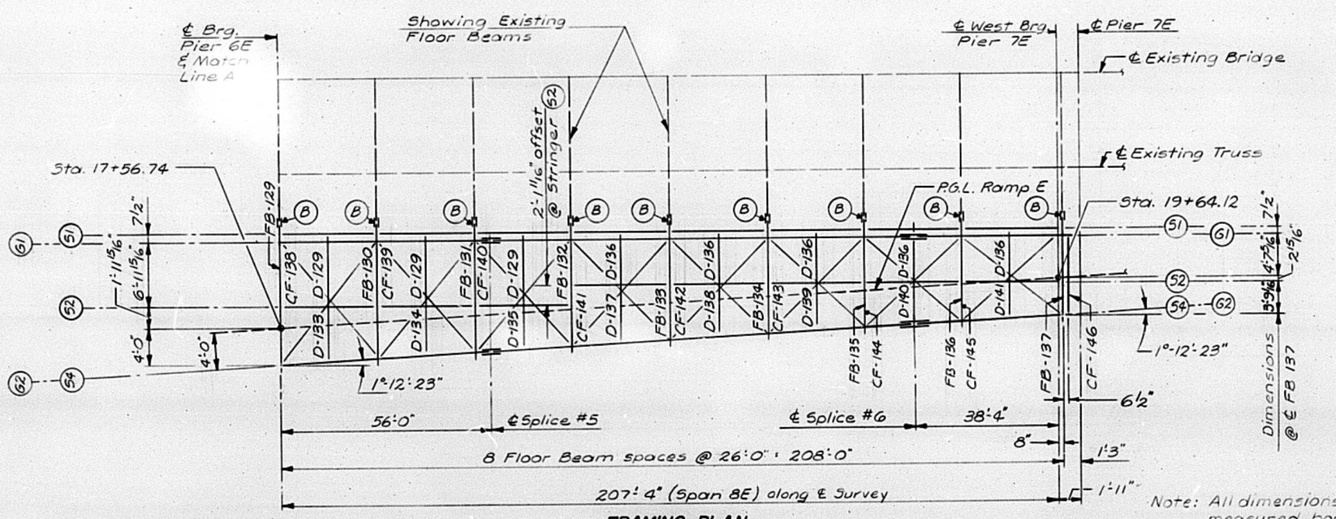
Location	Girder 1 X	Girder 1 Y	Girder 2 X	Girder 2 Y
℄ E. Brg. Pier 4E	-17.984	0.000	4.000	0.000
℄ Splice #1	-16.911	31.563	4.620	30.679
℄ Splice #2	-1.018	149.886	17.846	144.404
℄ Brg. Pier 5E	12.786	204.145	30.502	198.942
P.T.	12.876	204.450	30.607	199.329



DETAIL A

TABLE OF FLOOR BEAM & CROSS FRAME SPACINGS (SPAN 6E ONLY)

		along ℄ Girder 1	along ℄ Girder 2
Floor Beams	111 to 112	25'-0 1/2"	24'-4 11/16"
	112 to 113	26'-2"	25'-5 3/8"
	113 to 114	26'-2"	25'-5 1/2"
	114 to 115	26'-2"	25'-5 5/8"
	115 to 116	26'-2"	25'-5 13/16"
	116 to 117	25'-4 1/4"	22'-11 7/8"
	117 to 118	26'-0 7/16"	26'-0 7/8"
	118 to 119	26'-0 1/16"	26'-0 1/4"
Cross Frames	111 to 112	12'-6 1/4"	12'-2"
	112 to 113	12'-6 1/4"	12'-2 1/16"
	113 to 114	13'-1"	12'-8 11/16"
	114 to 115	13'-1"	12'-8 11/16"
	115 to 116	13'-1"	12'-8 3/4"
	116 to 117	13'-1"	12'-8 3/4"
	117 to 118	13'-1"	12'-8 13/16"
	118 to 119	13'-1"	12'-8 13/16"
	119 to 120	13'-1"	12'-8 7/8"
	120 to 121	13'-1"	12'-8 15/16"
	121 to 122	12'-8 1/8"	11'-5 15/16"
	122 to 123	12'-8 1/8"	11'-5 15/16"
	123 to 124	13'-0 1/4"	13'-0 7/16"
	124 to 125	13'-0 3/16"	13'-0 7/16"
	125 to 126	13'-0 1/16"	13'-0 1/8"
	126 to 127	13'-0"	13'-0 1/8"



FRAMING PLAN SPAN 8E

STRUCTURAL STEEL FRAMING PLAN
RAMP E - SPANS 6E, 7E & 8E

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED W.E.B.
DRAWN D.A.N.
CHECKED S.C.O.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

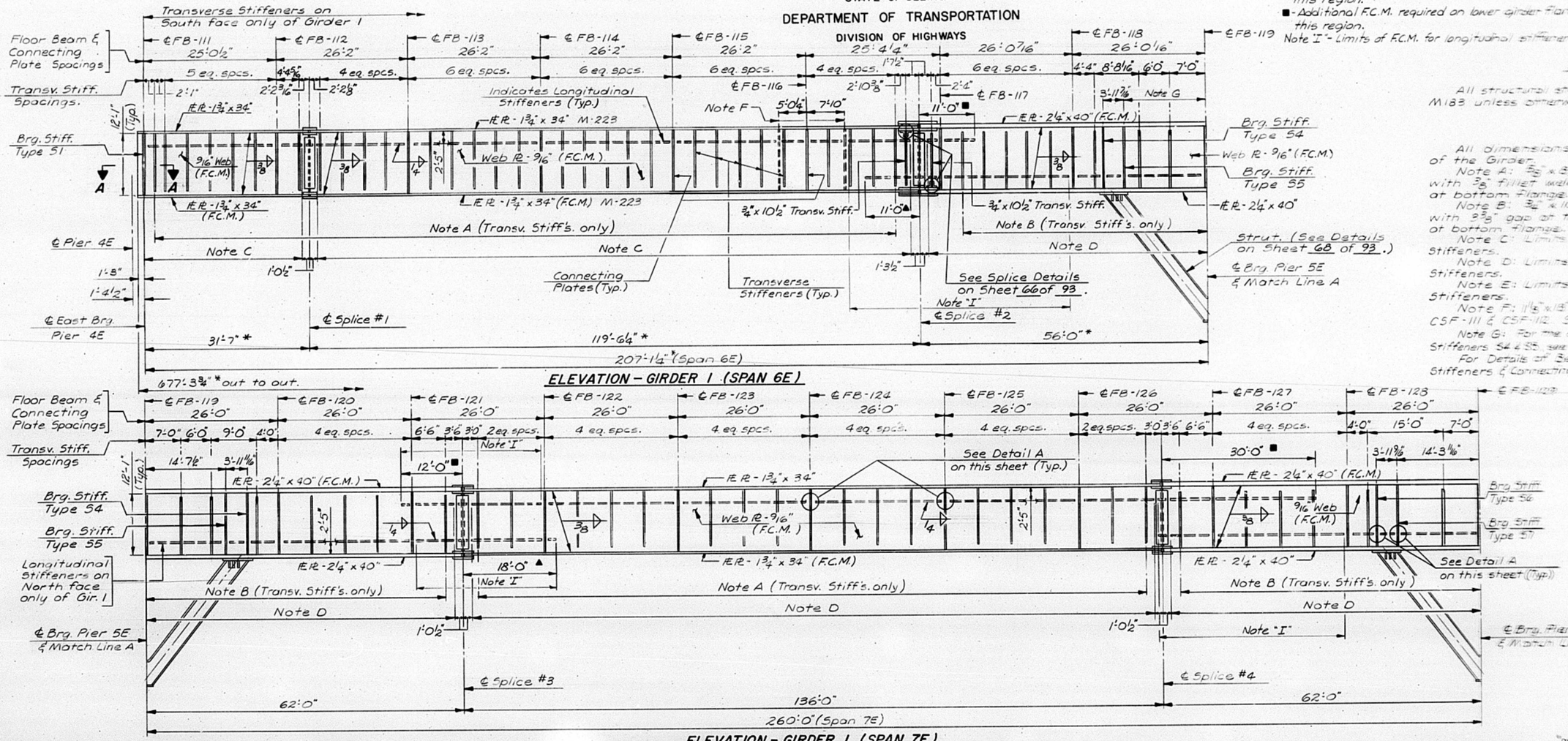
FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1)-P	PEORIA & TAZEWELL	96	65
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

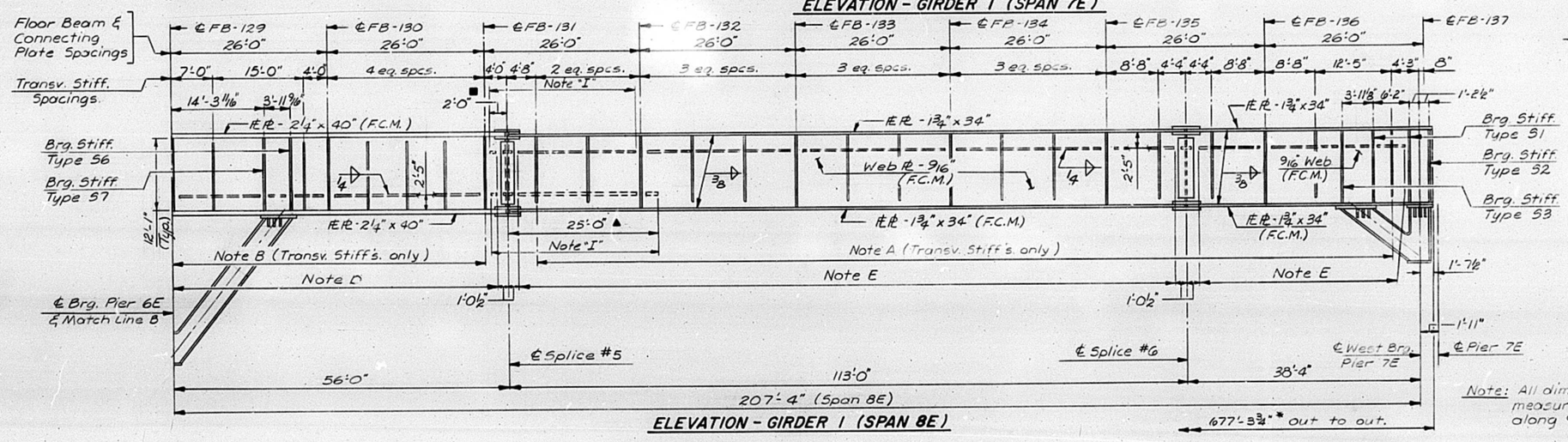
Sheet 63 of 93

▲-Additional F.C.M. required on upper girder flange this region.
■-Additional F.C.M. required on lower girder flange this region.
Note "I"- Limits of F.C.M. for longitudinal stiffeners.



ELEVATION – GIRDER 1 (SPAN 6E)

ELEVATION – GIRDER 1 (SPAN 7E)



ELEVATION – GIRDER 1 (SPAN 8E)

Notes:

All structural steel shall conform to AASHTO M183 unless otherwise noted.

All dimensions are measured along ℄ of the Girder.

Note A: ⅜" x 8½" Transverse Stiffeners with ⅜" fillet weld at top flange & 3⅜" gap at bottom flange.

Note B: ⅜" x 10" Transverse Stiffeners with 2⅜" gap at top flange & ⅜" fillet weld at bottom flange.

Note C: Limits of ⅜" x 4" Longitudinal Stiffeners.

Note D: Limits of ⅜" x 5" Longitudinal Stiffeners.

Note E: Limits of 7/16" x 6" Longitudinal Stiffeners.

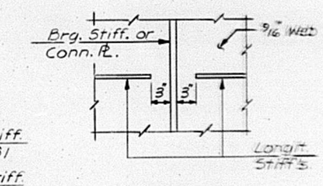
Note F: 11/16" x 18" Connecting Plates for CSF-111 & CSF-112. See Details on Sheet 70 of 93.

Note G: For the exact location of Bearing Stiffeners S4 & S5, see Det. shown on sheet 65 of 93.

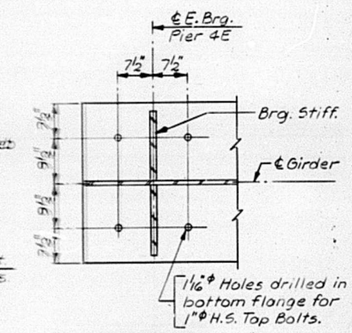
For Details of Bearing Stiffeners, Transverse Stiffeners & Connecting PL's see Sheet 66 of 93.

* See Structural Steel Framing Plan, sh. 62 of 93 for span 6E girder 1 radius of curvature.

Girder flanges as shown, webs, longitudinal stiffeners as shown, flange splice plates, web splice plates, strut flanges, webs and end plates shall meet the requirements for Fracture Critical Members (F.C.M.).



DETAIL A



SECTION A-A

Note: All dimensions shown are measured horizontally & along ℄ of girder.

GIRDER 1 DETAILS
RAWP E - SPANS 6E, 7E & 8E

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED M.D.L.
CHECKED S.D.C.
DRAWN D.A.W.
CHECKED S.D.C.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

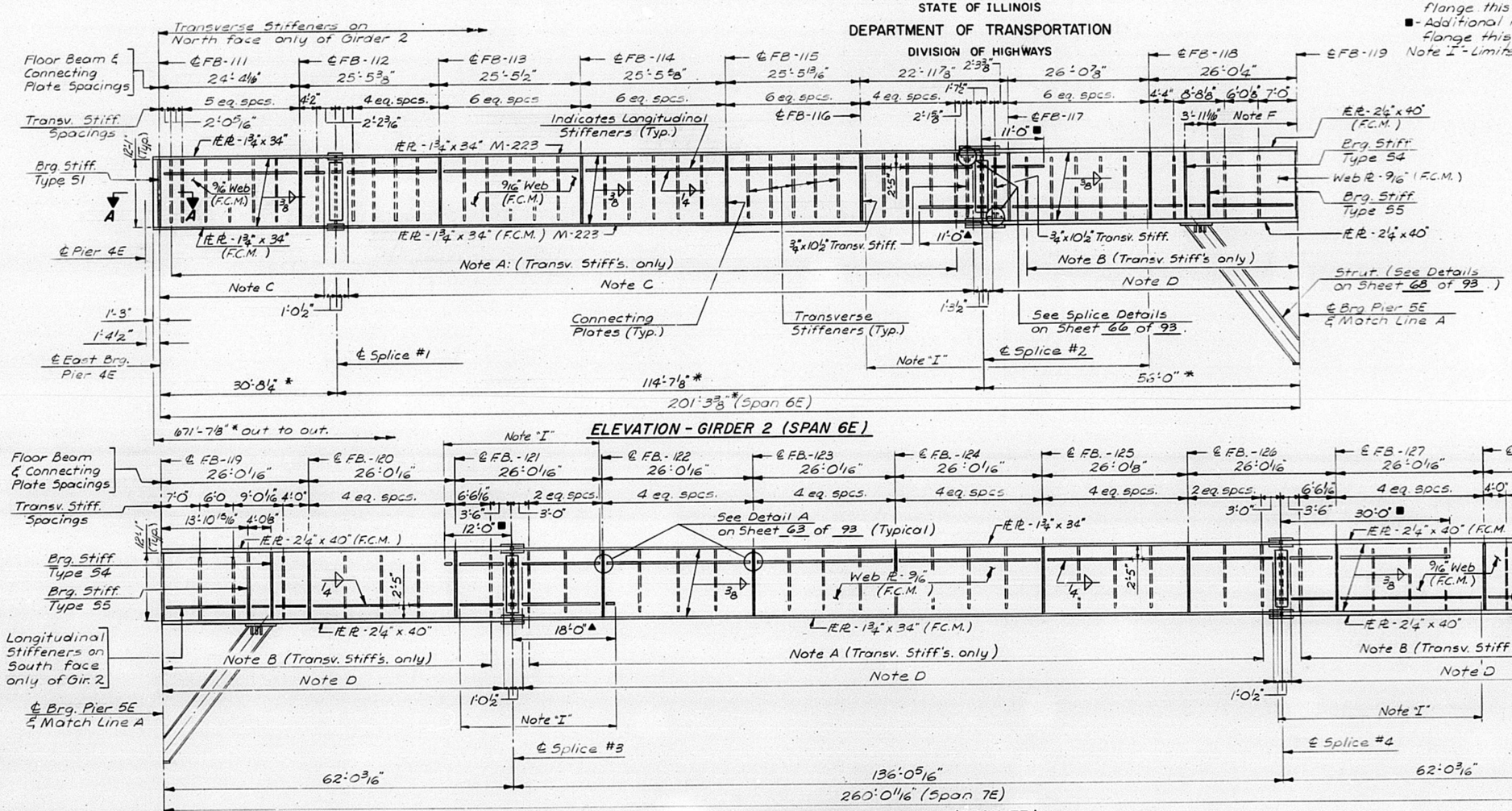
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1)-P	PEORIA & TAZEWELL	96	66
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 64 of 93

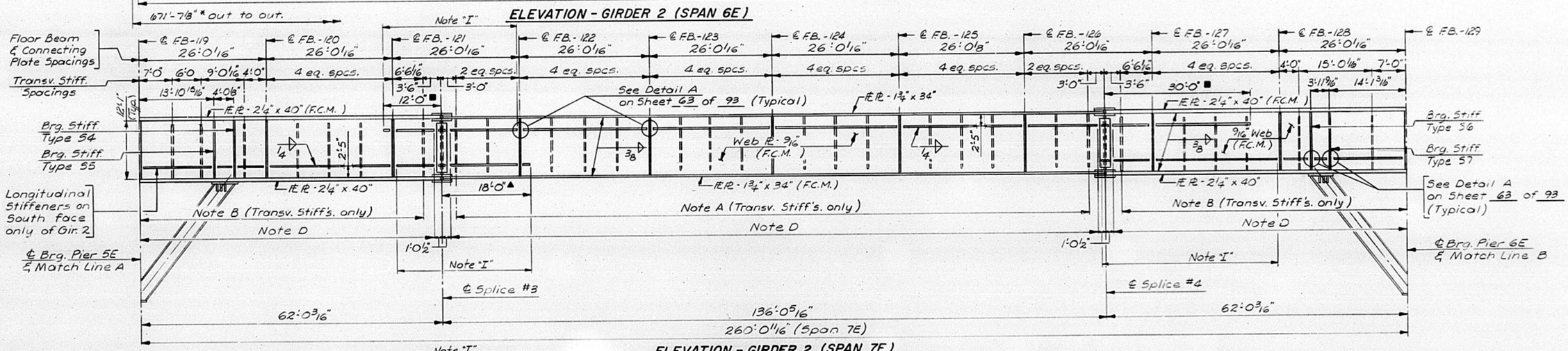
▲ - Additional F.C.M. required on upper girder flange this region.
■ - Additional F.C.M. required on lower girder flange this region.
Note I - Limits of F.C.M. for longitudinal stiffeners.

Notes:
All structural steel shall conform to AASHTO M-183 unless otherwise noted.

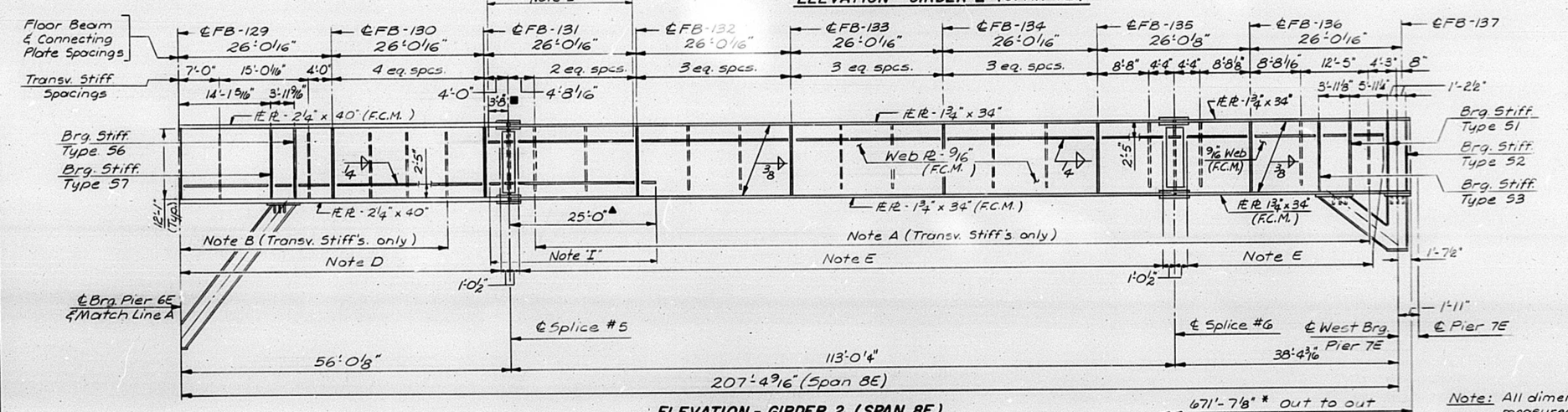
All dimensions are measured along ℄ of the Girder
Note A: 5/8" x 8 1/2" Transverse Stiffeners with 3/8" fillet weld at top flange & 3 3/8" gap at bottom flange.
Note B: 3/4" x 10" Transverse Stiffeners with 3 3/8" gap at top flange & 3/8" fillet weld at bottom flange.
Note C: Limits of 3/8" x 4" Longitudinal Stiffeners.
Note D: Limits of 3/8" x 5" Longitudinal Stiffeners.
Note E: Limits of 7/16" x 6" Longitudinal Stiffeners.
Note F: For the exact location of Bearing Stiffeners S4 & S5, see Det shown on sheet 65 of 93.
For Details of Bearing Stiffeners, Transverse Stiffeners and Connecting Plates see Sheet 66 of 93.
* See Structural Steel Framing Plan, sh. 62 of 93, for span 6E girder 2 radius of curvature.
For Section A-A see Sheet 63 of 93.



ELEVATION - GIRDER 2 (SPAN 6E)



ELEVATION - GIRDER 2 (SPAN 7E)



ELEVATION - GIRDER 2 (SPAN 8E)

Note: Girder flanges as shown, webs, longitudinal stiffeners as shown, flange splice plates, web splice plates, strut flanges, webs and end plates shall meet the requirements for Fracture Critical Members (F.C.M.).

Note: All dimensions shown are measured horizontally & along ℄ of girder.

GIRDER 2 DETAILS
RAMP E - SPANS 6E, 7E & 8E

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED S.C.O.
DRAWN D.A.N.
CHECKED S.C.O.

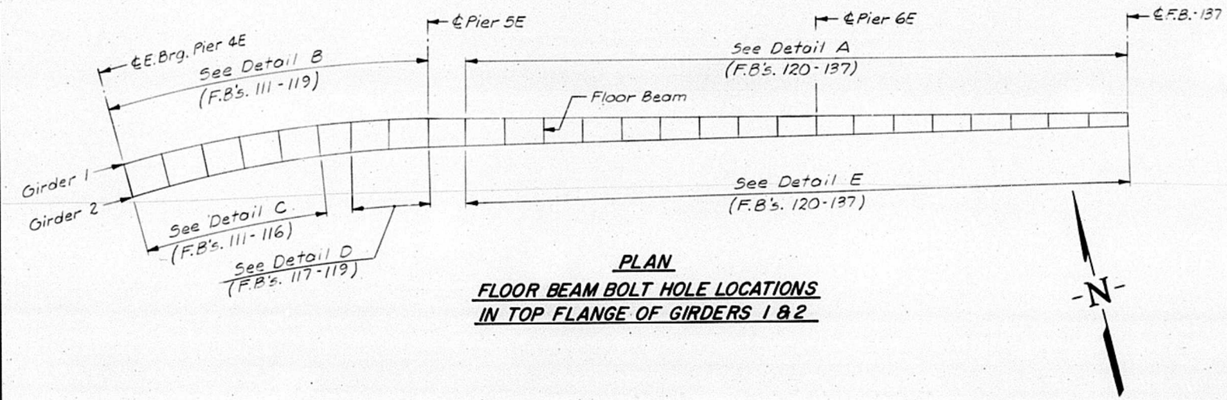
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

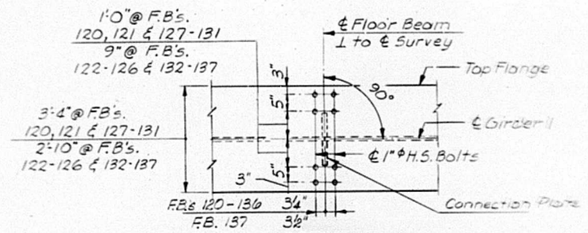
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) -P	PEORIA & TAZEWELL	96	67
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

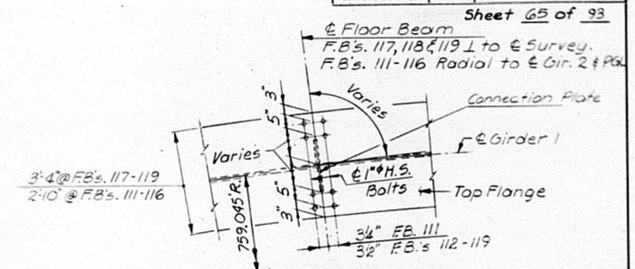
Sheet 65 of 93



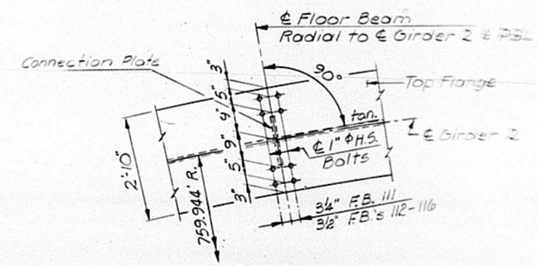
PLAN
FLOOR BEAM BOLT HOLE LOCATIONS IN TOP FLANGE OF GIRDERS 1 & 2



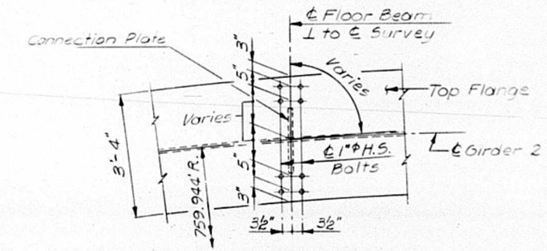
DETAIL A
(F.B's. 120 - 137 @ Girder 1)



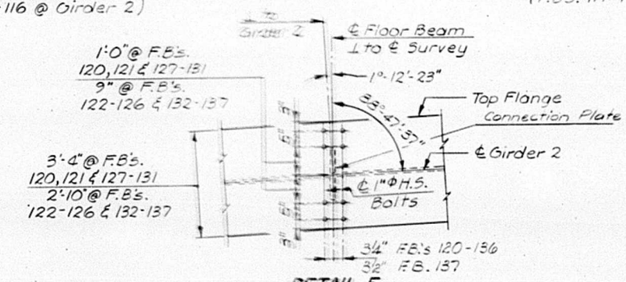
DETAIL B
(F.B's. 111 - 119 @ Girder 1)



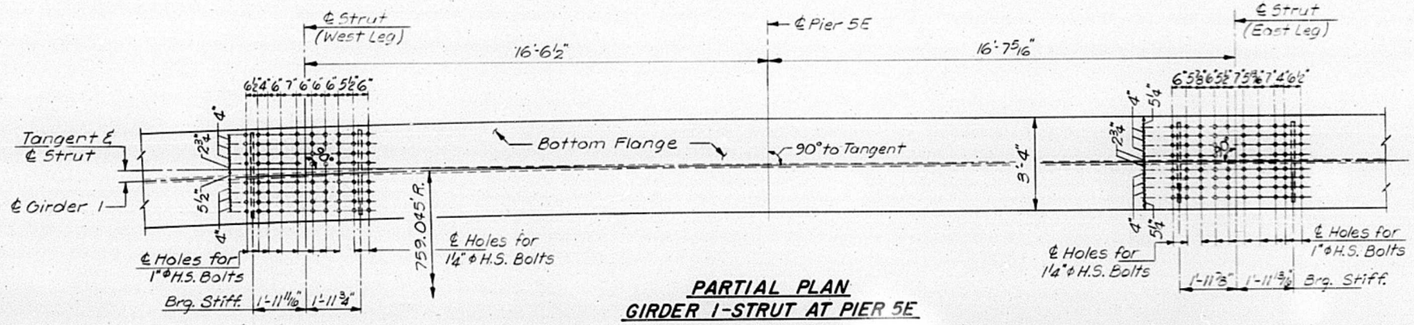
DETAIL C
(F.B's. 111 - 116 @ Girder 2)



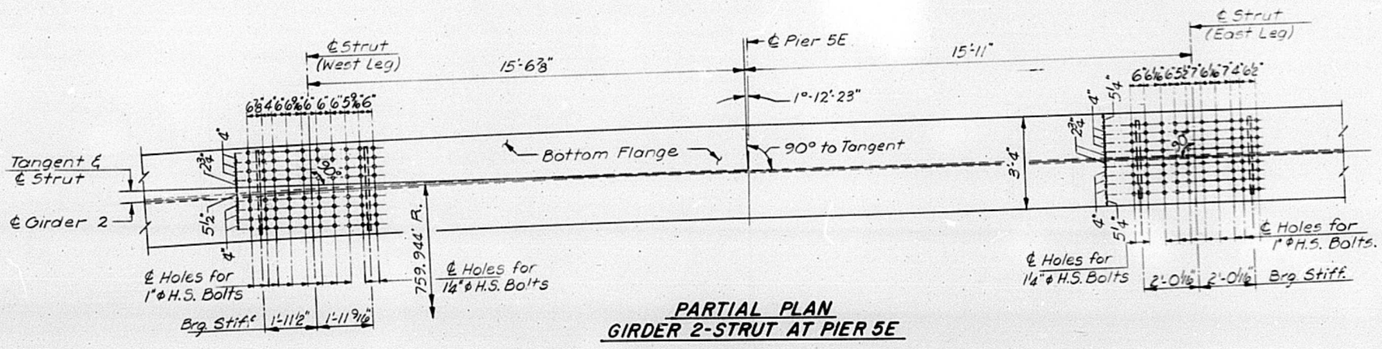
DETAIL D
(F.B's. 117 - 119 @ Girder 2)



DETAIL E
(F.B's. 120 - 137 @ Girder 2)



PARTIAL PLAN
GIRDER 1-STRUT AT PIER 5E



PARTIAL PLAN
GIRDER 2-STRUT AT PIER 5E

STRUT BOLT HOLE LOCATIONS IN BOTTOM FLANGE OF GIRDERS 1 & 2

Note: See Strut Details, Sheet 82 of 93, for Bolt Hole Locations for Struts @ Piers 6E & 7E, Girders 1 & 2.

GIRDERS 1 & 2 FLANGE DETAILS
RAMP E - SPANS 6E, 7E & 8E

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O.
CHECKED W.D.L.
DRAWN D.A.N.
CHECKED W.D.L.

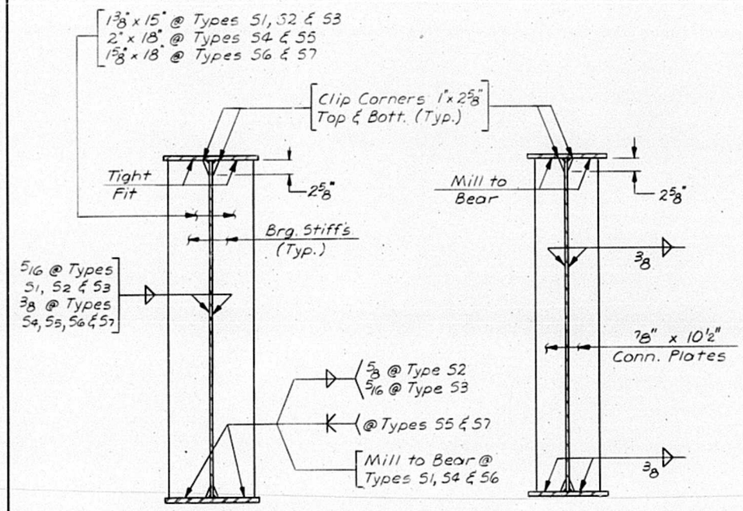
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

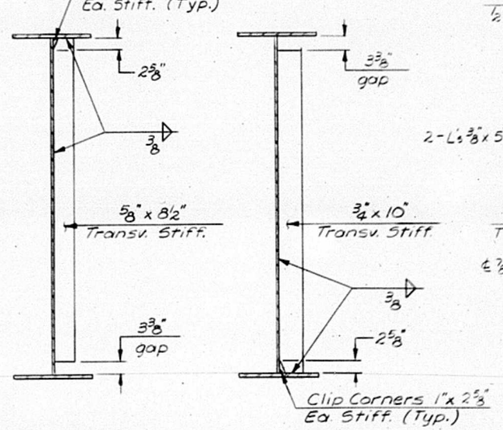
FILE NO. 74001
DATE

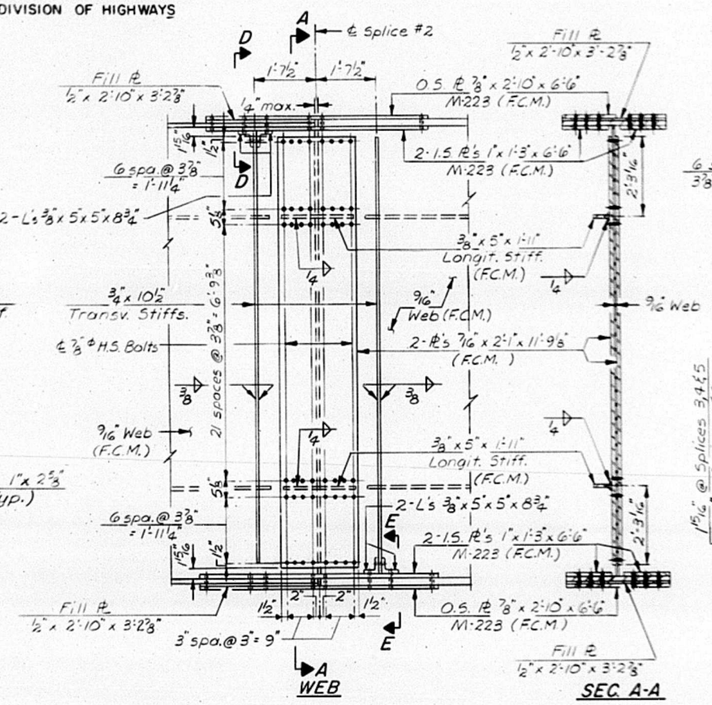
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

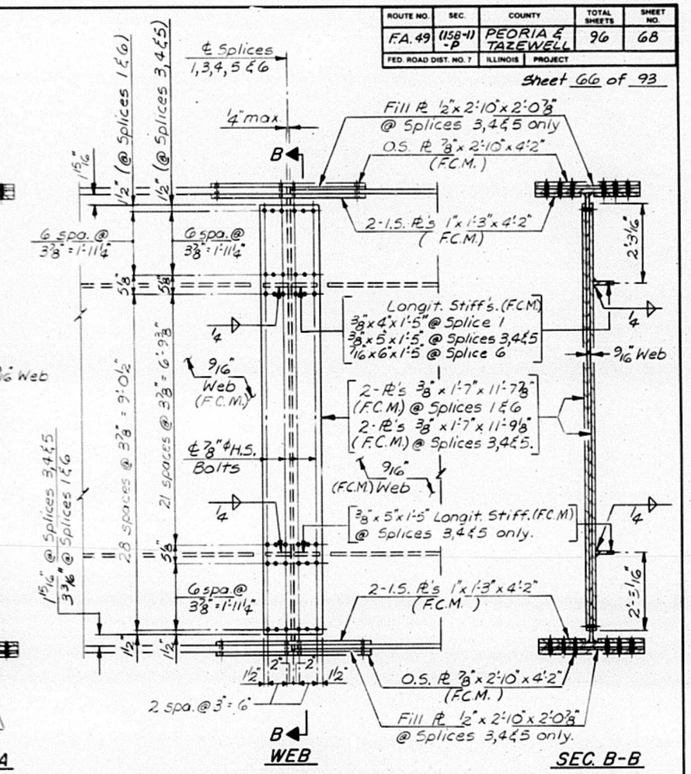
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) -P	PEORIA & TAZEWELL	96	68
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 66 of 93









* * TYPES S1-S7

BEARING STIFFENERS

**: For Locations of Bearing Stiffener Types S1-S7 See Girder Detail Sheets 63 & 64.

CONNECTING PLATES

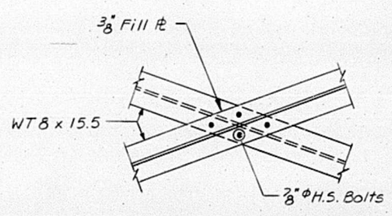
For locations of Conn. Plates see Girder Detail Sheets 63 & 64.

* NOTE A

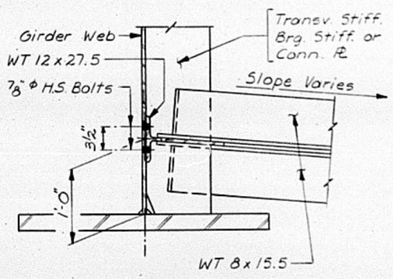
* NOTE B

TRANSVERSE STIFFENERS

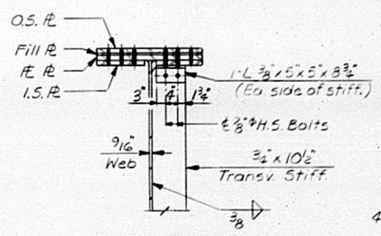
*: For Note A & Note B See Girder Detail Sheets 63 & 64.



AT INTERSECTION

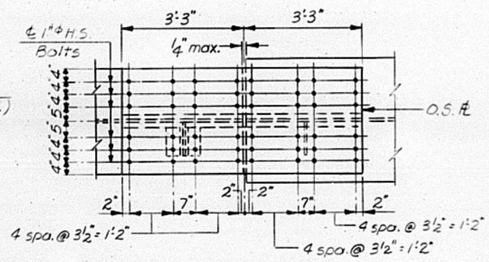


SECTION C-C



SECTION D-D

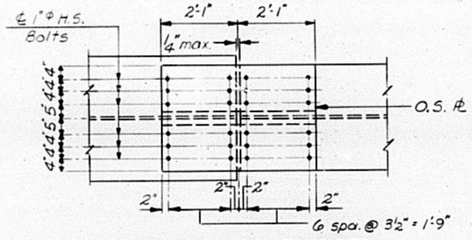
(Section E-E is reverse of Section D-D)



TOP FLANGE

(Bottom Flange is reverse of Top Flange)

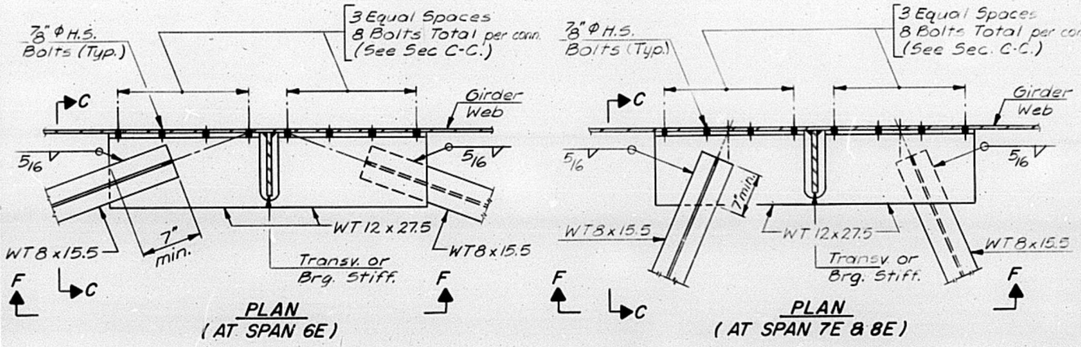
DETAIL OF SPLICE 2



TOP & BOTTOM FLANGES

Note: For location of Connections A, B & C see Sheet 68 of 93.

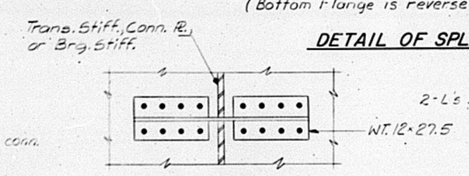
DETAIL OF SPLICES 1,3,4,5 & 6



PLAN (AT SPAN 6E)

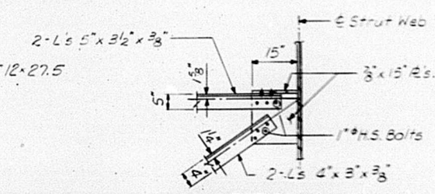
PLAN (AT SPAN 7E & 8E)

BOTTOM LATERAL BRACING DETAILS

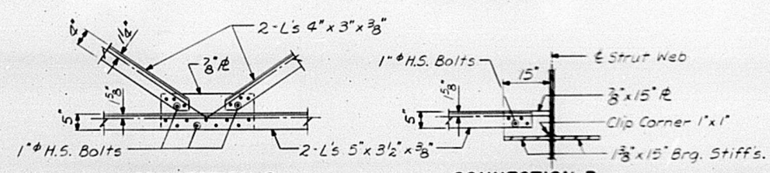


VIEW F-F

(For purposes of clarity WT's 8 x 15.5 are not shown.)



CONNECTION A



CONNECTION C

CONNECTION B

HORIZONTAL BRACING DETAILS FOR STRUTS AT PIERS 5E & 6E

Notes:

All Structural Steel shall meet the requirements for AASHTO M-183 unless otherwise noted.

All High Strength Bolts shall meet the requirements for AASHTO M-164

Flange splice plates, web splice plates, and longitudinal stiffeners as shown shall meet the requirements for Fracture Critical Members (F.C.M.)

STRUCTURAL STEEL DETAILS
RAMP E - SPANS 6E, 7E & 8E

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED S.C.Q.
DRAWN D.A.N.
CHECKED S.C.Q.

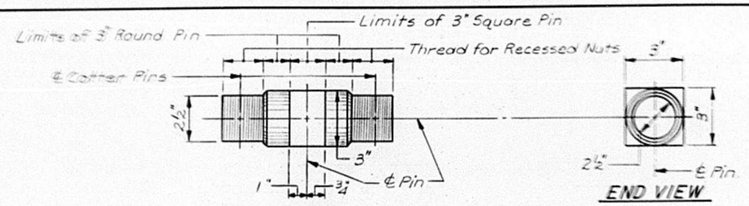
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

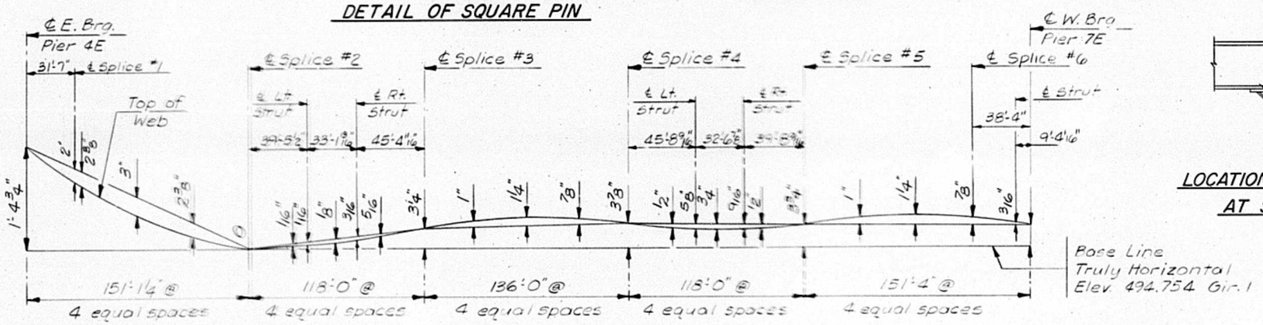
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) P	PEORIA & TAZEWELL	96	69
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 67 of 93

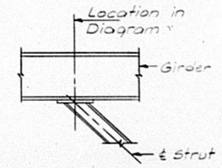


DETAIL OF SQUARE PIN

END VIEW



CAMBER DIAGRAM - GIRDER 1



LOCATION SKETCH AT STRUT

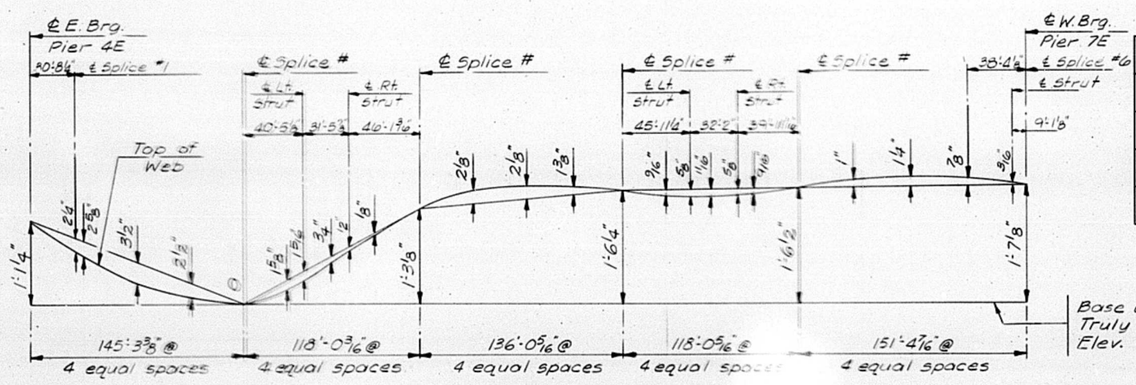
GIRDER MOMENT TABLE							
	.4 Span	Pier 5E		.5 Span	Pier 6E		.6 Span
	6E	@ Lt Strut	@ Rt Strut	7E	@ Lt Strut	@ Rt Strut	8E
I (in⁴)	783,618	1,118,696	1,118,696	783,618	1,118,696	1,118,696	783,618
D (K/1)	Varies	Varies	Varies	Varies	Varies	Varies	Varies
M@ (1K)	15,549	13,390	15,437	4,504	8,448	8,226	6,915
M℄ (1K)	5,869	4,012	4,569	3,037	2,982	3,128	2,789
Imp (1K)	880	602	685	456	447	469	418
M TOT (1K)	22,298	18,004	20,692	7,997	11,877	11,823	10,123
f_s (ksi)	25.4	* 15.2	* 17.5	9.1	* 10.00	* 10.0	11.5
f_w (ksi)	1.40	0.60	.70	N.A.	N.A.	N.A.	N.A.
$f_s + w$ TOT (ksi)	26.8	* 15.80	* 18.2	9.1	* 10.00	* 10.0	11.5

* At Tension Flange
f_w is normal stress due to lateral flange bending.
f_s is primary and secondary stress combined.
N.A. — not applicable.

GIRDER REACTION TABLE				
	Pier 4E	Pier 5E	Pier 6E	Pier 7E
R@ (K)	381.5	991.2	678.1	195.0
R℄ (K)	152.3	278.1	203.4	74.3
Imp (K)	22.8	41.7	30.5	11.1
Total (K)	556.6	1311.0	912.0	280.4

TOP OF WEB ELEVATIONS**		
	Girder 1	Girder 2
℄ E. Brg. Pier 4E	496.148	494.384
℄ Splice #1	495.691	493.963
℄ Splice #2	494.754	493.280
℄ Lt Dia. Strut 5E	494.782	493.602
℄ Rt. Dia. Strut 5E	494.905	494.006
℄ Splice #3	495.025	494.540
℄ Splice #4	495.077	494.801
℄ Lt. Dia. Strut 6E	495.021	494.757
℄ Rt. Dia. Strut 6E	495.023	494.762
℄ Splice #5	495.067	494.822
℄ Splice #6	495.129	494.934
℄ Dia. Strut 7E	495.072	494.886
℄ Vertical Strut 7E	495.056	494.874

** Elevations include camber for dead load deflections and are for fabrication only.



CAMBER DIAGRAM - GIRDER 2

STRUT LOAD TABLE												
Girder 1 & 2	A (in²)	I (in⁴)	S (in³)	P@ (K)	P℄ (K)	P IMP (K)	M@ (K')	M℄ (K')	M IMP (K')	V@ (K)	V℄ (K)	V IMP (K)
Pier 5E Diagonals	183.5	89,281	2,014	655	155	27	T 1071 B 336	312 123	55 22	43	12	2
Pier 6E Diagonals	183.5	89,281	2,014	442	120	21	T 588 B 148	217 85	38 15	25	8	2
Pier 7E Diagonals	53.5	8,715	581	9	2.2	0.4	T 134 B 47	44 12	8 2	7	1.7	.3
Pier 7E Vertical	53.5	8,715	581	180	49	9	T 46 B 47	8 12	.2 2	1.5	.4	.1

Notes:

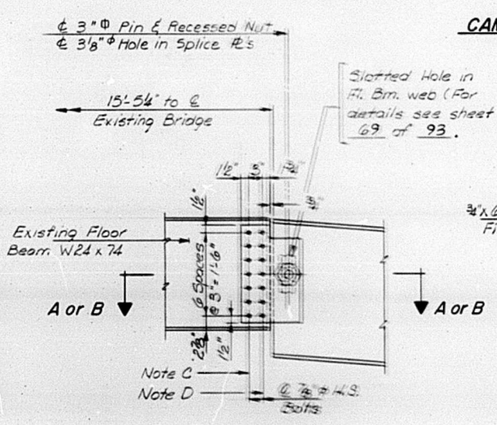
All structural steel shall meet the requirements of A.A.S.H.T.O. M183 unless otherwise noted.

All high strength bolts shall meet the requirements of A.A.S.H.T.O. M164

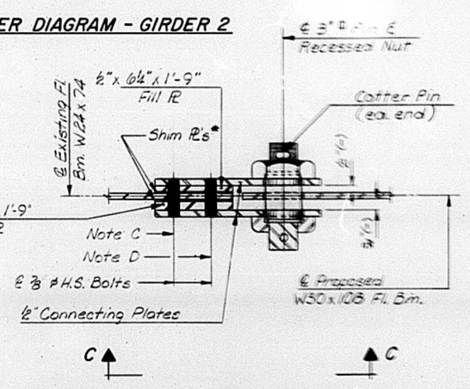
3" ϕ Pins shall meet the requirements of A.A.S.H.T.O. M169

Note C: ℄ field drilled holes for ⅞" ϕ high strength bolts.

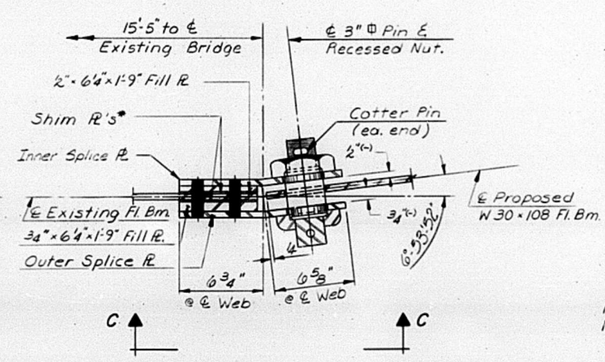
Note D: ℄ of existing ⅞" ϕ rivet holes after removal of 6" stanchion rail post.



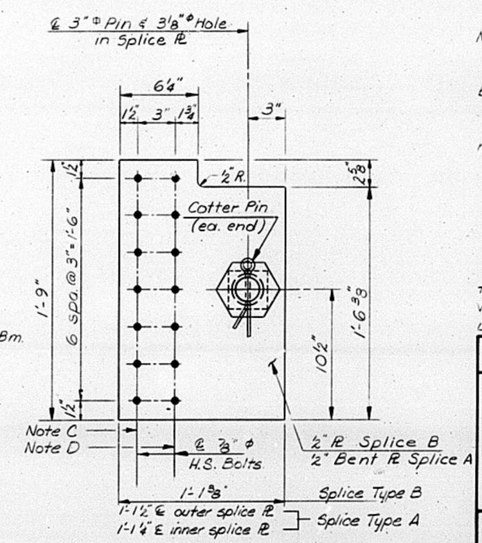
ELEVATION



SECTION A-A - TYPE B



SECTION B-B - TYPE A



VIEW C-C

FLOOR BEAM SPLICE TYPES A&B

* 2-⅛" x 6¼" x 1'-9" shim pl's to be provided at each floor beam connection. Shim plates to be used only when the ℄ of the existing floor beams do not line up with the ℄ of the proposed floor beams.

STRUCTURAL STEEL DETAILS
RAMP E - SPANS 6E, 7E & 8E

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED S.C.O.
DRAWN D.A.N.
CHECKED S.C.O.

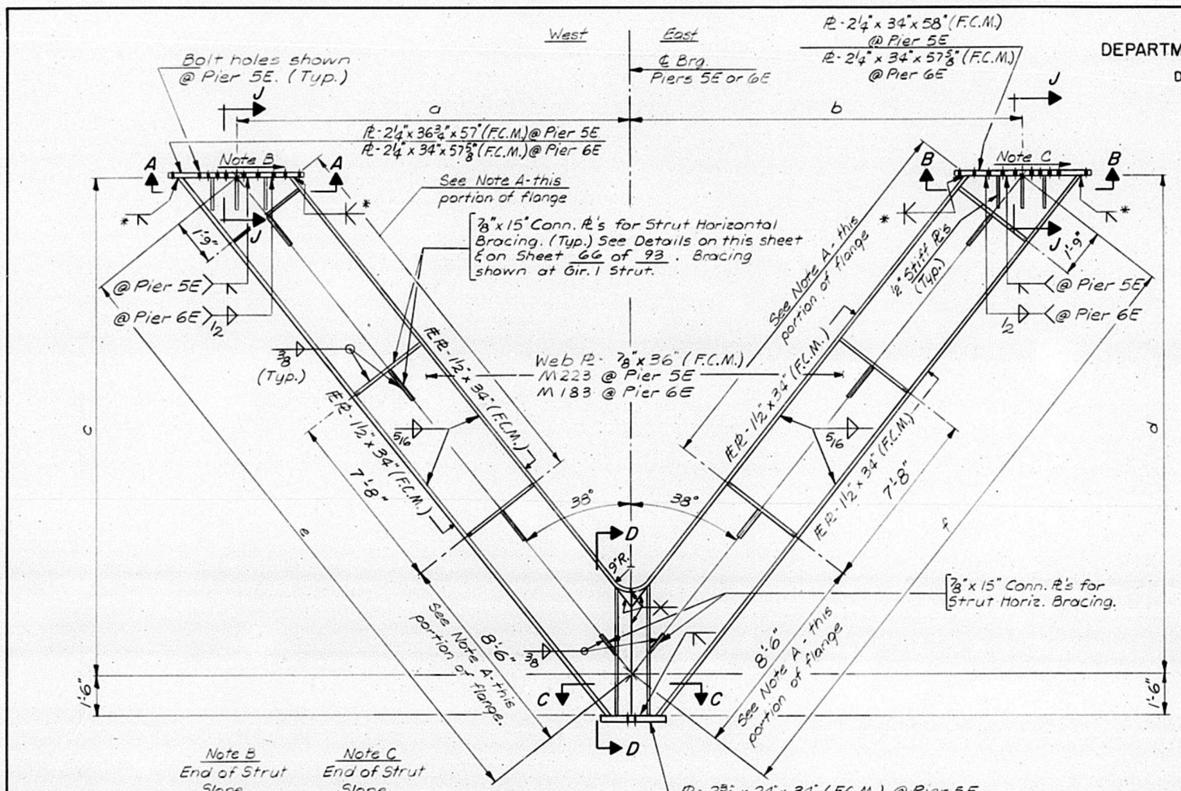
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) -P	PEORIA & TAZEWELL	96	70
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 68 of 93



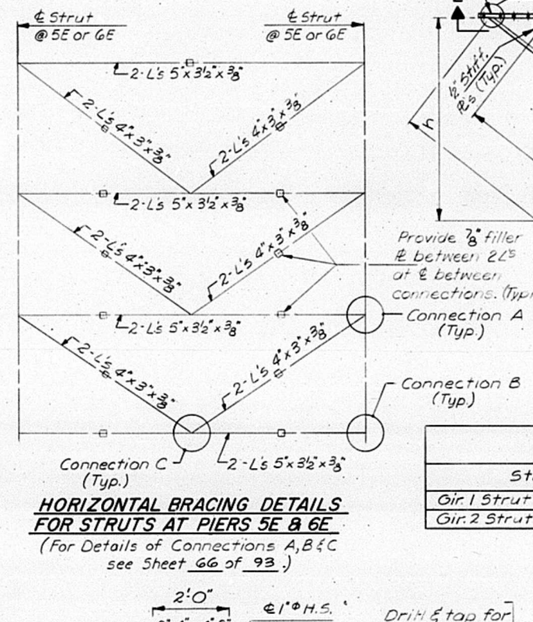
STRUT AT PIERS 5E & 6E
GIRDERS 1 & 2

	Note B End of Strut Slope	Note C End of Strut Slope
Gir. 1 Strut @ Pier 5E	+.00350%	+.00200%
Gir. 1 Strut @ Pier 6E	Level	Level
Gir. 2 Strut @ Pier 5E	+.01460%	+.01327%
Gir. 2 Strut @ Pier 6E	Level	Level

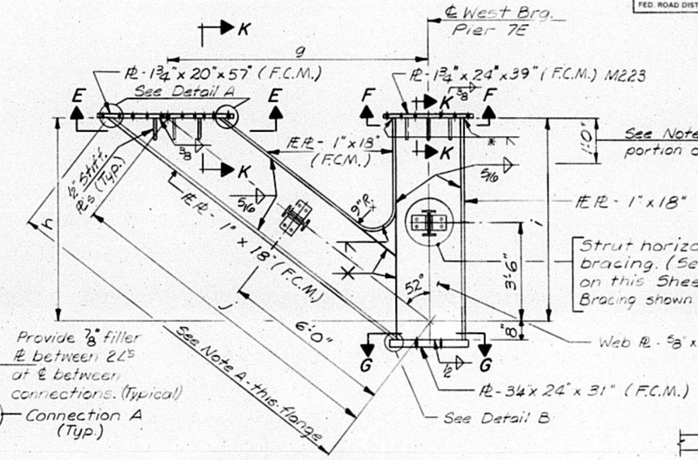
Note: Positive slope indicates rise from west to east.

TABLE OF DIMENSIONS (STRUT AT PIERS 5E & 6E)

Strut	a	b	c	d	e	f
Gir. 1 Strut @ Pier 5E	16'-6½"	16'-7 5/16"	21'-2 1/16"	21'-3⅛"	26'-10⅜"	26'-11¾"
Gir. 1 Strut @ Pier 6E	16'-3 7/16"	16'-3 7/16"	20'-10 9/16"	20'-10 9/16"	26'-5½"	26'-5½"
Gir. 2 Strut @ Pier 5E	15'-6⅞"	15'-11"	19'-11 9/16"	20'-4 1/16"	25'-3 9/16"	25'-10¼"
Gir. 2 Strut @ Pier 6E	16'-0 15/16"	16'-1 1/16"	20'-7"	20'-7⅛"	26'-1⅜"	26'-1 9/16"



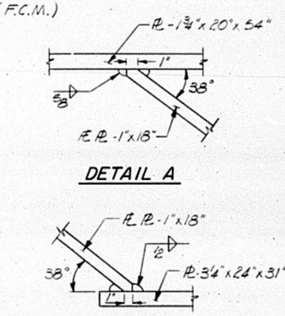
HORIZONTAL BRACING DETAILS FOR STRUTS AT PIERS 5E & 6E
(For Details of Connections A, B & C see Sheet 66 of 93.)



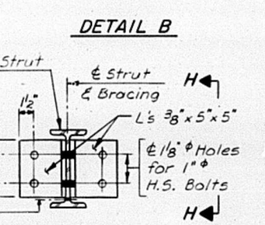
STRUT AT PIER 7E
GIRDERS 1 & 2

TABLE OF DIMENSIONS (STRUT AT PIER 7E)

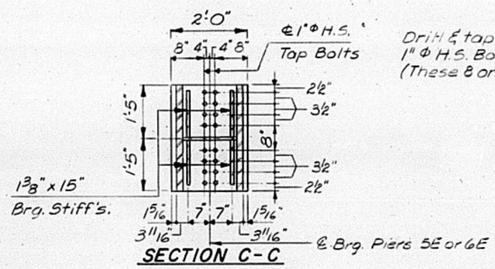
Strut	g	h	i	j
Gir. 1 Strut @ Pier 7E	9'-4 1/16"	7'-3 9/16"	7'-3 9/16"	11'-10 3/16"
Gir. 2 Strut @ Pier 7E	9'-1⅛"	7'-1 3/16"	7'-1 3/16"	11'-6½"



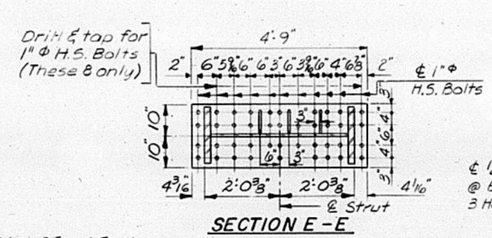
DETAIL A



DETAIL B

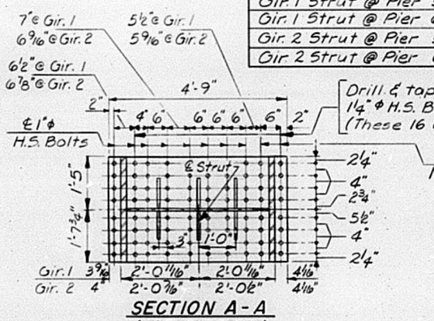


SECTION C-C

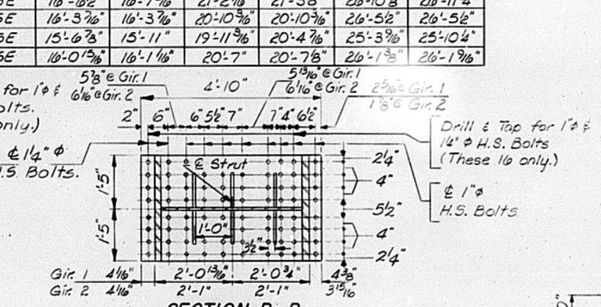


SECTION E-E

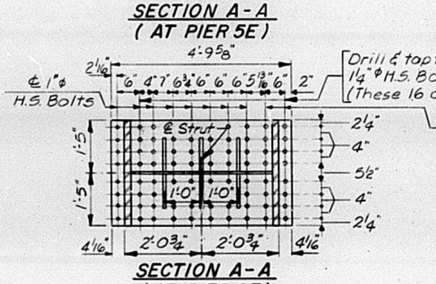
ELEVATION



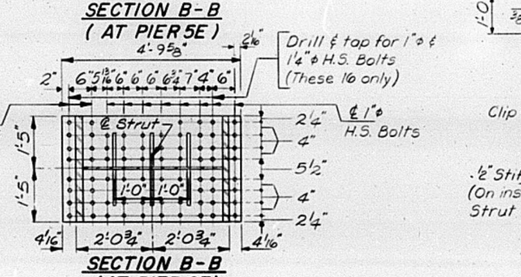
SECTION A-A
(AT PIER 5E)



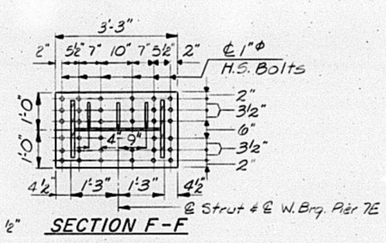
SECTION B-B
(AT PIER 5E)



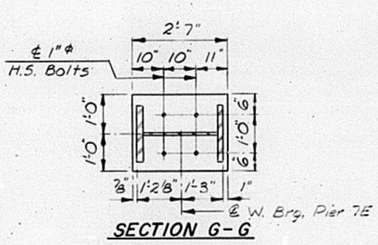
SECTION A-A
(AT PIER 6E)



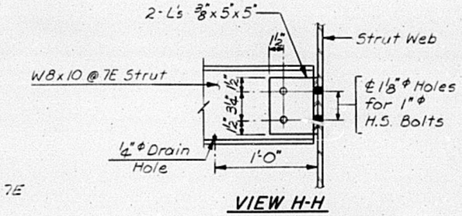
SECTION B-B
(AT PIER 6E)



SECTION F-F

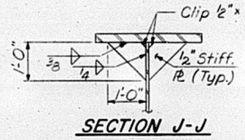


SECTION G-G

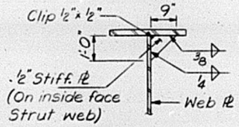


VIEW H-H

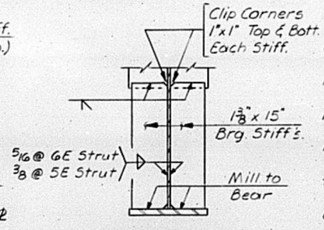
HORIZONTAL BRACING DETAILS FOR STRUTS AT PIER 7E



SECTION J-J



SECTION K-K



SECTION D-D
BEARING STIFFENERS

Notes:

All Structural Steel shall conform to A.A.S.H.T.O. M183 unless otherwise noted.

All High Strength Bolts shall conform to A.A.S.H.T.O. M164.

Strut flanges, webs & end Pl's shall meet the requirements for Fracture Critical Members (F.C.M.)

All strut to girder connections shall have the bolt heads at the top of the connection.

* Fillet and groove welds between end plates and flanges shall be radiographically tested.

Note A: Flange to web fillet welds in tension areas of struts shall be electromagnetically tested.

STRUT DETAILS - GIRDERS 1 & 2
RAMP E - SPANS 6E, 7E & 8E

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED S.C.O.
DRAWN D.A.N.
CHECKED S.C.O.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

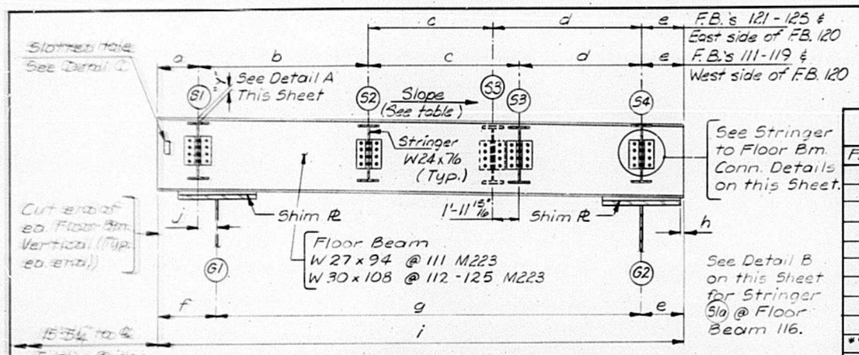
FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

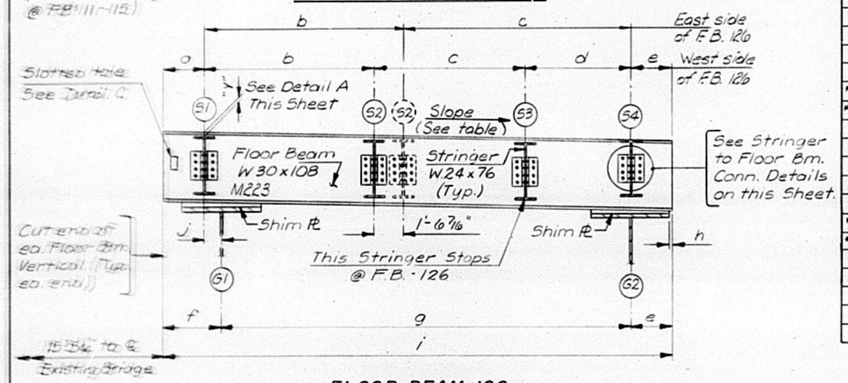
** W.- West side of floor beam
*** E.- East side of floor beam

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) -P	PEORIA & TAZEWELL	96	71
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

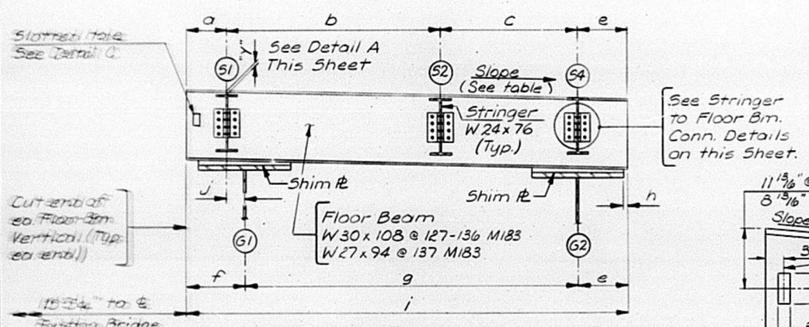
Sheet 69 of 93



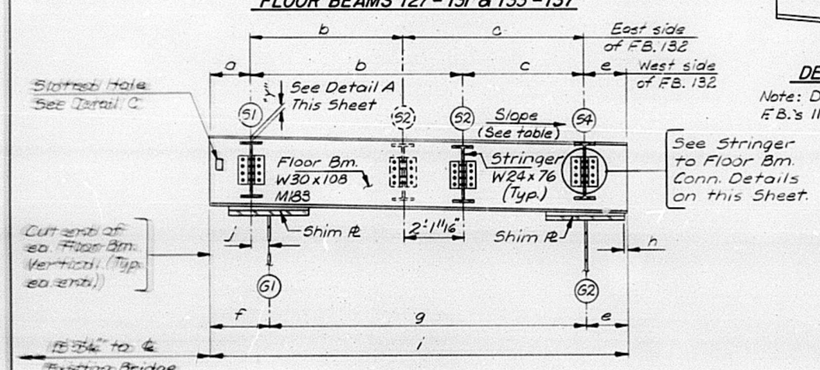
FLOOR BEAMS 111 - 125



FLOOR BEAM 126



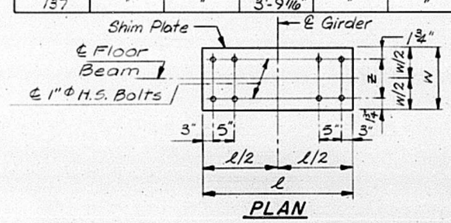
FLOOR BEAMS 127 - 131 & 133 - 137



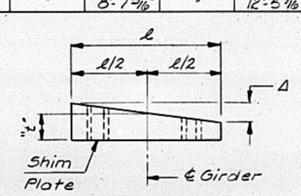
FLOOR BEAM 132

TABLE OF DIMENSIONS
FLOOR BEAMS 111 - 137

F.B. No.	a	b	c	d	e	f	g	h	i	j	Slope ft/ft.
111	1'-8 13/16"	7'-4"	7'-4"	7'-4"	1'-9"	1'-9"	21'-11 13/16"	4"	25'-5 13/16"	3/16"	.08
112	"	"	"	"	"	2'-1 11/16"	21'-7¾"	"	25'-5 13/16"	4¼"	"
113	"	"	"	"	"	2'-5 11/16"	21'-3⅛"	"	25'-5 13/16"	8⅞"	"
114	"	"	"	"	"	2'-10⅜"	20'-10 9/16"	"	25'-5 13/16"	1'-1 13/16"	"
115	"	"	"	"	"	3'-3 13/16"	20'-5"	"	25'-5 13/16"	1'-7"	"
116	4'-1"	"	"	"	"	6'-1½"	19'-11½"	"	27'-10"	2'-0½"	.0711
117	1'-5¾"	7'-9"	7'-1½"	7'-1½"	"	3'-10 15/16"	19'-6 13/16"	1"	25'-2¾"	2'-5 3/16"	.0758
118	"	6'-1"	7'-4⅞"	6'-7 5/16"	"	2'-6¾"	19'-0 3/16"	"	23'-3 15/16"	1'-1"	.0713
119	"	"	"	5'-7¼"	"	2'-1¼"	18'-5⅝"	"	22'-3⅞"	7½"	.0578
** 120W.	"	"	"	5'-0 11/16"	"	"	17'-11"	"	21'-9¼"	"	.0432
*** 120E.	"	"	5'-4 15/16"	7'-0⅜"	"	"	17'-11"	"	21'-9¼"	"	.0432
121	"	"	"	6'-6 1/16"	"	"	17'-4 7/16"	"	21'-2 11/16"	"	.0314
122	"	"	"	5'-11½"	"	"	16'-9⅜"	4"	20'-8⅛"	"	.0235
123	"	"	"	5'-4 13/16"	"	"	16'-3 5/16"	"	20'-1 9/16"	"	.0198
124	"	"	"	4'-10⅜"	"	"	15'-8¾"	"	19'-7"	"	.0197
125	"	"	"	4'-3¾"	"	"	15'-2 3/16"	"	19'-0 7/16"	"	.0198
** 126W.	"	"	"	3'-9 3/16"	"	"	14'-7 9/16"	"	18'-5 13/16"	"	.0199
*** 126E.	"	7'-7 7/16"	7'-7 11/16"	N.A.	"	"	14'-7 9/16"	"	18'-5 13/16"	"	.0199
127	"	"	7'-1 11/16"	"	"	"	14'-1"	1"	17'-11¼"	"	.0200
128	"	"	6'-6½"	"	"	"	13'-6 7/16"	"	17'-4 11/16"	"	.0201
129	"	"	5'-11 13/16"	"	"	"	12'-11⅞"	"	16'-10⅛"	"	.0202
130	"	"	5'-5⅜"	"	"	"	12'-5 5/16"	"	16'-3 9/16"	"	.0203
131	"	"	4'-10 13/16"	"	"	"	11'-10¾"	"	15'-9"	"	.0205
** 132W.	"	"	4'-4¼"	"	"	"	11'-4 3/16"	4"	15'-2 7/16"	"	.0207
*** 132E.	"	5'-5¾"	6'-5 15/16"	"	"	"	11'-4 3/16"	"	15'-2 7/16"	"	.0207
133	"	"	5'-11⅜"	"	"	"	10'-9⅜"	"	14'-7⅞"	"	.0208
134	"	"	5'-4 13/16"	"	"	"	10'-3 1/16"	"	14'-1 5/16"	"	.0210
135	"	"	4'-10¼"	"	"	"	9'-8 7/16"	"	13'-6 11/16"	"	.0213
136	"	"	4'-3 11/16"	"	"	"	9'-1⅞"	"	13'-0⅛"	"	.0215
137	"	"	3'-9 11/16"	"	"	"	8'-7 5/16"	"	12'-5 9/16"	"	.0217

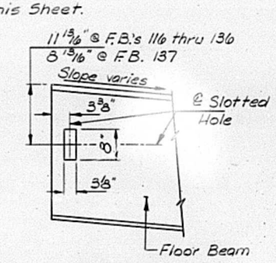


PLAN



ELEVATION

SHIM PLATE DETAILS

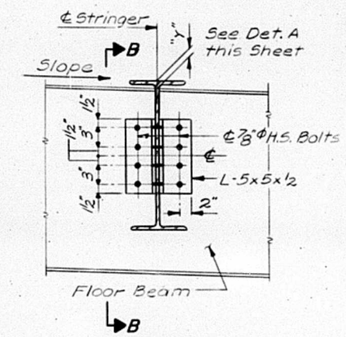


DETAIL C

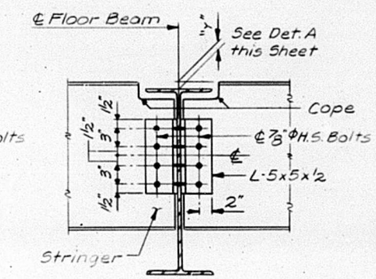
Note: Does not apply at F.B.'s 111 thru 115.

TABLE OF DIMENSIONS
SHIM PLATES

Shim Pl @ F.B. No.	ℓ	w	z	Δ	"t"
111	2'-10"	10"	6½"	2¾"	1¾"
112	"	10½"	7"	"	"
113	"	"	"	"	"
114	"	"	"	"	"
115	"	"	"	"	"
116	"	"	"	2 7/16"	"
117	3'-4"	"	"	3"	"
118	"	"	"	2⅞"	"
119	"	"	"	2 5/16"	1⅜"
120	"	"	"	1¾"	1⅛"
121	"	"	"	1¼"	⅞"
122	2'-10"	"	"	13/16"	⅝"
123	"	"	"	11/16"	"
124	"	"	"	"	"
125	"	"	"	"	"
126	"	"	"	"	"
127	3'-4"	"	"	13/16"	"
128	"	"	"	"	"
129	"	"	"	"	"
130	"	"	"	"	"
131	"	"	"	"	"
132	2'-10"	"	"	11/16"	"
133	"	"	"	"	"
134	"	"	"	"	"
135	"	"	"	¾"	"
136	"	"	"	"	"
137	"	10"	6½"	"	"

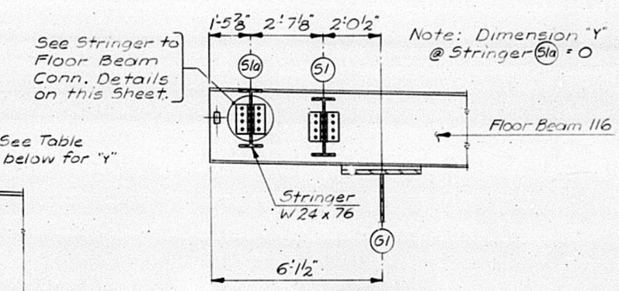


ELEVATION

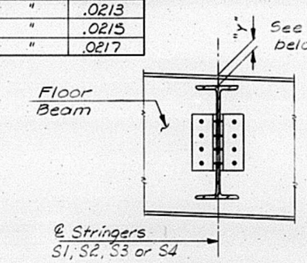


SECTION B-B

STRINGER - FLOOR BEAM CONNECTION DETAILS



DETAIL B



DETAIL A
(DIMENSION "Y")

*Note:
Positive (+) "Y" indicates Stringer above Floor Beam.
Negative (-) "Y" indicates Stringer below Floor Beam.

TABLE OF DIMENSIONS
(DIMENSION "Y")*

F.B. No.	S1	S2	S3	S4
111	+ 3"	+ 3"	+ 3"	+ 3"
112	0	0	0	0
113	"	"	"	"
114	"	"	"	"
115	"	"	"	"
116	+ 2⅜"	+ 1⅝"	+ ¾"	"
117	- ¼"	+ ⅜"	+ ¼"	"
118	- 1¼"	- ⅞"	- ⅜"	"
119	- 1"	- ¾"	- ¼"	"
120 W&E	- ⅝"	- ⅜"	"	"
121	"	"	"	"
122	"	"	"	"
123	"	"	"	"
124	"	"	"	"
125	"	"	"	"
126 W&E	"	"	" ◆	"
127	"	- ¼"	N.A.	"
128	"	"	"	"
129	"	"	"	"
130	"	"	"	"
131	"	"	"	"
132 W&E	"	"	"	"
133	"	"	"	"
134	"	"	"	"
135	"	"	"	"
136	"	"	"	"
137	+ 2⅜"	+ 2¾"	"	+ 3"

◆ West side only. N.A. - not applicable.

Notes:

All Structural Steel shall meet the requirements of AASHTO M-183 unless otherwise noted.

All High Strength Bolts shall meet the requirements of AASHTO M-164

All Stringers and Floor Beams shall meet the requirements for Notch Toughness.

FLOOR BEAM DETAILS
RAMP E - SPANS 6E, 7E & 8E

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC.(15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.Q.
CHECKED W.D.L.
DRAWN D.A.N.
CHECKED S.C.Q.

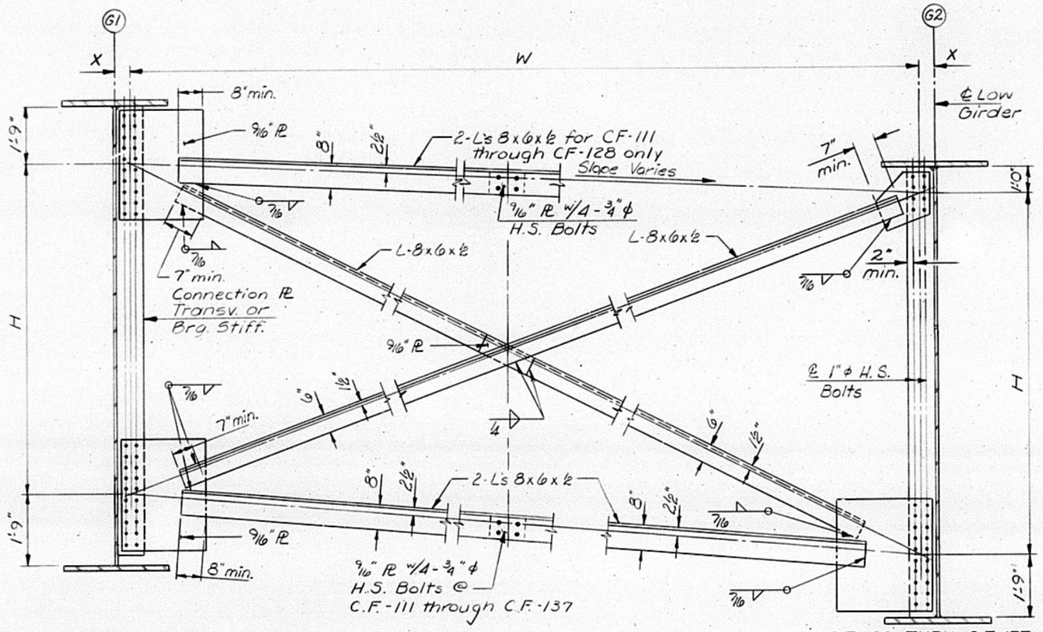
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) -P	PEORIA & TAZEWELL	96	72
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 70 of 93

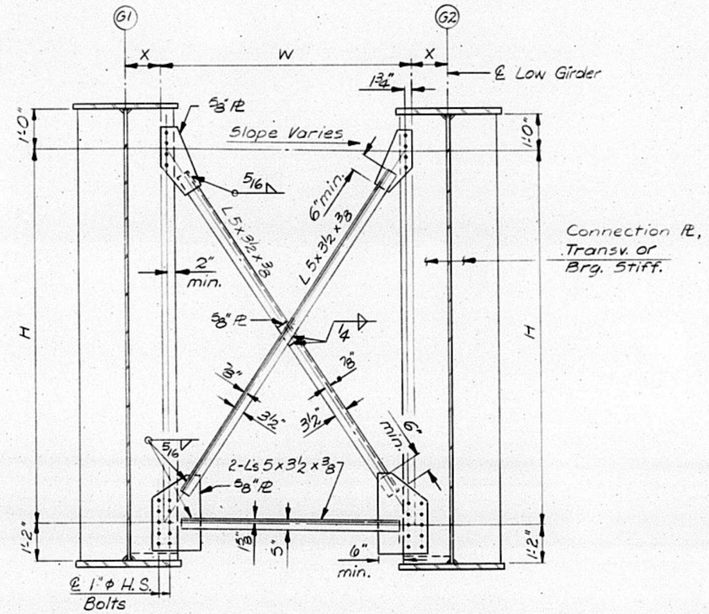


C.F.-111 THRU C.F.-128

CROSS FRAMES C.F.-111 THRU C.F.-137
(TYPE 1)

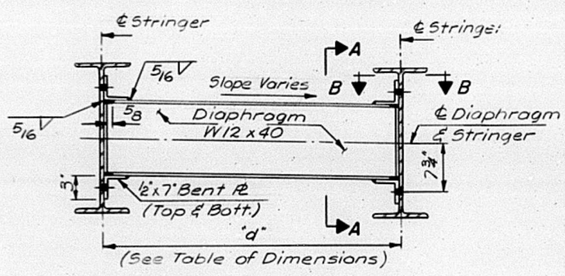
C.F.-129 THRU C.F.-137

Note: See Girder Flange Details, Sheet 65, for orientation of cross frame connection plates.



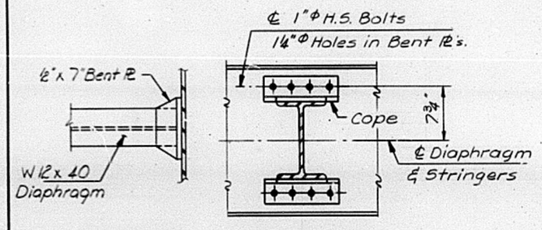
CROSS FRAMES C.F.-138 THRU C.F.-146
(TYPE 2)

TABLE OF DIMENSIONS CROSS FRAMES			
	Cross Frame No.	Dimensions W	H	X
Type 1	C.F.-111	20'-0 13/16"	8'-7"	11½"
	C.F.-112	20'-11¾"	"	5"
	C.F.-113	20'-9¾"	"	"
	C.F.-114	20'-7 7/16"	"	"
	C.F.-115	20'-5⅛"	"	"
	C.F.-116	20'-2 11/16"	"	"
	C.F.-117	20'-0 3/16"	"	"
	C.F.-118	19'-9⅝"	"	"
	C.F.-119	19'-7"	"	"
	C.F.-120	19'-4¼"	"	"
	C.F.-121	19'-1½"	"	"
	C.F.-122	18'-10 5/16"	"	"
	C.F.-123	18'-5 13/16"	"	6½"
	C.F.-124	18'-2½"	"	"
	C.F.-125	17'-11 13/16"	"	"
	C.F.-126	17'-7⅞"	"	"
	C.F.-127	17'-4 9/16"	"	"
	C.F.-128	17'-1 5/16"	"	"
	C.F.-129	16'-10"	9'-4"	"
	C.F.-130	16'-3 7/16"	"	"
	C.F.-131	15'-11⅞"	"	5"
	C.F.-132	15'-5 5/16"	"	"
	C.F.-133	14'-10¾"	"	"
	C.F.-134	14'-4 3/16"	"	"
	C.F.-135	13'-9 9/16"	"	"
	C.F.-136	13'-0"	"	6½"
	C.F.-137	12'-5 7/16"	"	6½"
Type 2	C.F.-138	11'-10⅜"	9'-11"	6½"
	C.F.-139	11'-4 5/16"	"	"
	C.F.-140	10'-9¾"	"	"
	C.F.-141	10'-6 3/16"	"	5"
	C.F.-142	9'-11⅝"	"	"
	C.F.-143	9'-5 1/16"	"	"
	C.F.-144	8'-10 7/16"	"	"
	C.F.-145	8'-3⅜"	"	"
	C.F.-146	6'-8 9/16"	"	11½"

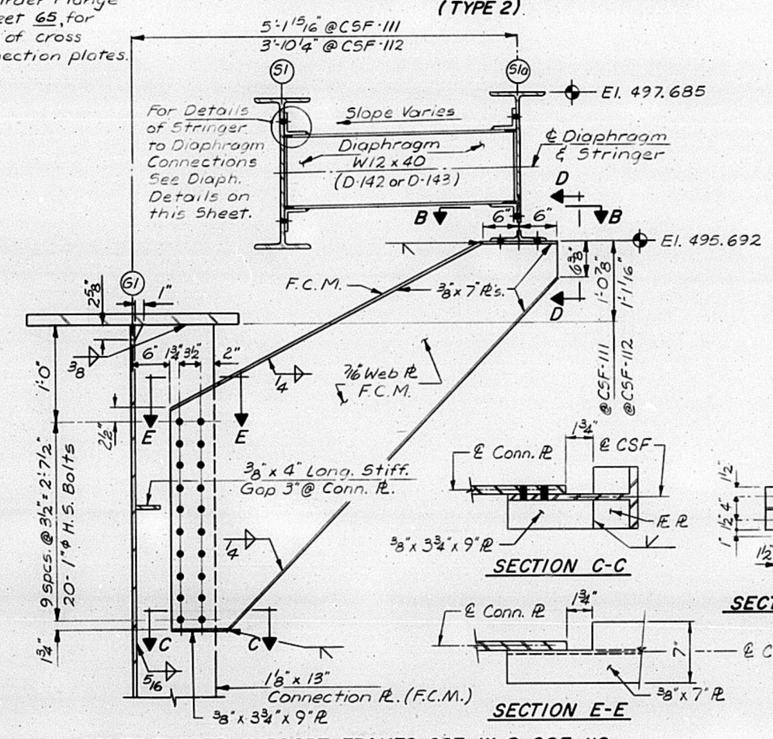


DIAPHRAGMS D-111 THRU D-143

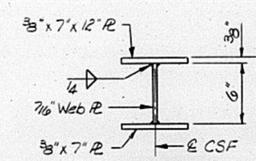
TABLE OF DIMENSIONS DIAPHRAGMS	
Diaphragm No.	Dimension "d"
D-111	7'-3 15/16"
D-112	7'-4"
D-113	7'-6 5/16"
D-114	7'-2⅝"
D-115	6'-11"
D-116	7'-3 9/16"
D-117	6'-10 7/16"
D-118	6'-1"
D-119	7'-4⅞"
D-120	6'-1 5/16"
D-121	5'-3 15/16"
D-122	5'-4 15/16"
D-123	6'-9 5/16"
D-124	6'-2¾"
D-125	5'-8 3/16"
D-126	5'-1⅜"
D-127	4'-7 1/16"
D-128	4'-0½"
D-129	7'-7 7/16"
D-130	7'-4⅜"
D-131	6'-9 13/16"
D-132	6'-3¼"
D-133	5'-8⅝"
D-134	5'-2 1/16"
D-135	4'-7½"
D-136	5'-5¾"
D-137	6'-2 11/16"
D-138	5'-8 1/16"
D-139	5'-1½"
D-140	4'-6 15/16"
D-141	4'-0⅜"
D-142	3'-3 5/16"
D-143	1'-9½"



SECTION B-B SECTION A-A

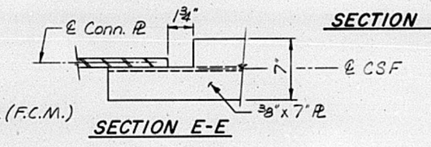


CANTILEVERED SUPPORT FRAMES CSF-111 & CSF-112



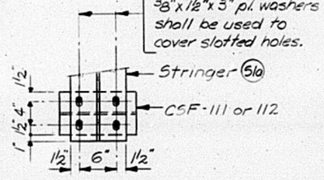
VIEW D-D

SECTION C-C



SECTION E-E

1 5/16" ϕ holes in CSF 1½" slotted holes in Stringer for ⅞" ϕ H.S. Bolts ⅜"x1½"x3" pl. washers shall be used to cover slotted holes.



SECTION B-B

NOTES:

F.C.M. denotes material that shall conform to the Supplemental Requirements for Fracture Critical Members

1 9/16" ϕ holes in gusset Pl's for 1" ϕ high strength bolts.

Hardened washers shall be required over holes in cross frame gusset Pl's and Diaphragm bent Pl's.

All Structural Steel shall meet the requirements of AASHTO M-183 unless otherwise noted.

All High Strength Bolts shall meet the requirements of AASHTO M-164

STRUCTURAL STEEL DETAILS
RAMP E - SPANS 6E, 7E & 8E

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED S.C.O.
DRAWN D.A.N.
CHECKED S.C.O.

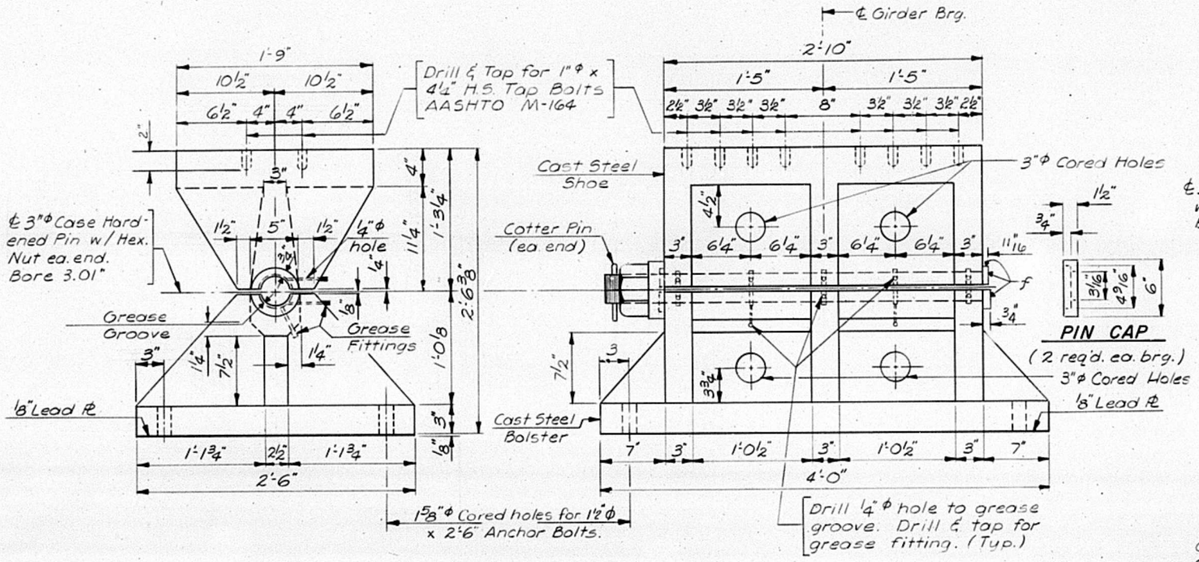
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

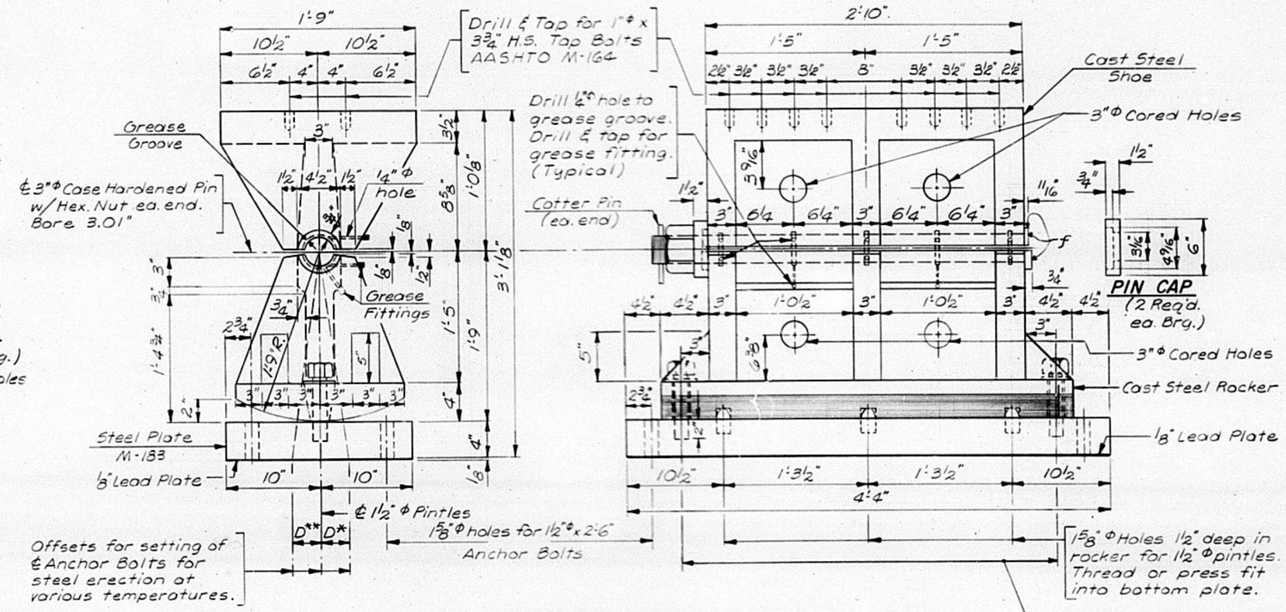
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1)-P	PEORIA & TAZEWELL	96	73
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 71 of 93



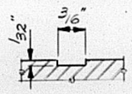
FIXED BEARING AT PIER 5E

Cast steel shoe & bolster shall meet the requirements of AASHTO M-192 Class 90. Structural steel weldments of equal sections meeting the requirements of AASHTO M-222 or M-223 may be substituted for the castings, subject to approval by the Engineer prior to fabrication. No extra compensation will be allowed for the substitution.



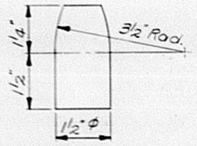
EXPANSION BEARING AT PIER 6E

Cast steel shoe & rocker shall meet the requirements of AASHTO M-192 Class 90. Structural steel weldments of equal sections meeting the requirements of AASHTO M-222 or M-223 may be substituted for the castings, subject to approval by the Engineer prior to fabrication. No extra compensation will be allowed for the substitution.



GREASE GROOVE ON SADDLE

Grease bearing assembly with molybdenum grease before installation.



PINTLE DETAIL

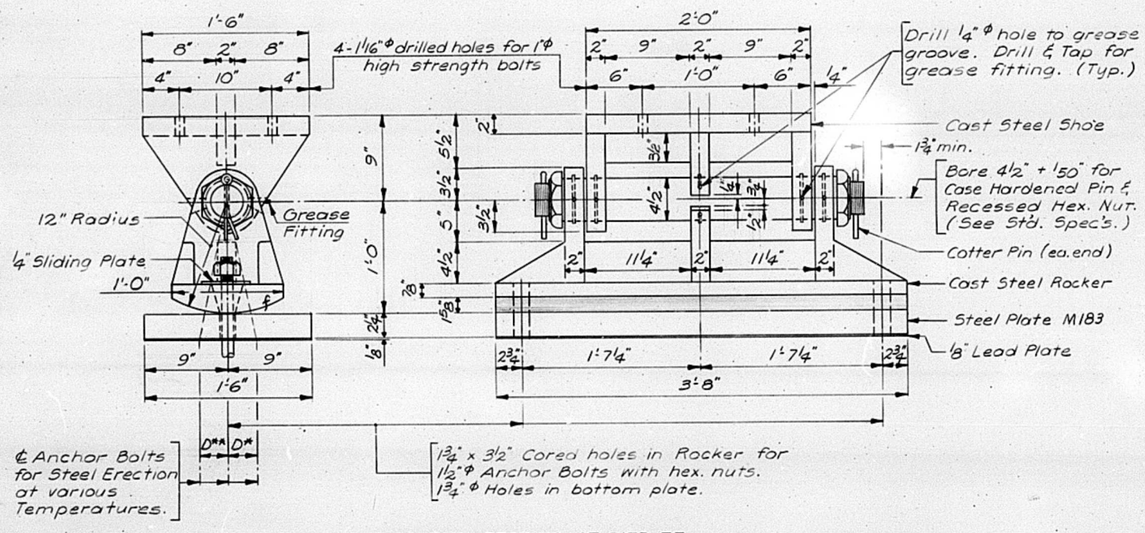
Steel for pintles shall meet the requirements of AASHTO M-223.

NOTES FOR SETTING OF ANCHOR BOLTS AT EXPANSION BEARINGS

A.) D* (Side of Bearing away from Fixed Bearing. D* = ⅛" per each 100' of expansion for every 15° fall below the Normal Temperature of 50°F.

D** (Side of Bearing toward Fixed Bearing. D** = ⅛" per each 100' of expansion for every 15° rise above the Normal Temperature of 50°F.

B.) After Girders have been erected and dimensions D* & D** determined, holes shall be drilled & anchor bolts shall be grouted in place. All fixed anchor bolts may be built into the masonry.



EXPANSION BEARING AT PIER 7E

Cast steel shoe & rocker shall meet the requirements of AASHTO M-192 Class 90. Structural steel weldments of equal sections meeting the requirements of AASHTO M-222 or M-223 may be substituted for the castings, subject to approval by the Engineer prior to fabrication. No extra compensation will be allowed for the substitution.

For details of Bearing Assembly @ ℄ East Bearing of Pier 4E see sheet 49 of 93.

BEARING DETAILS
RAMP E - SPANS 6E, 7E & 8E

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED S.C.O.
DRAWN D.A.N.
CHECKED S.C.O.

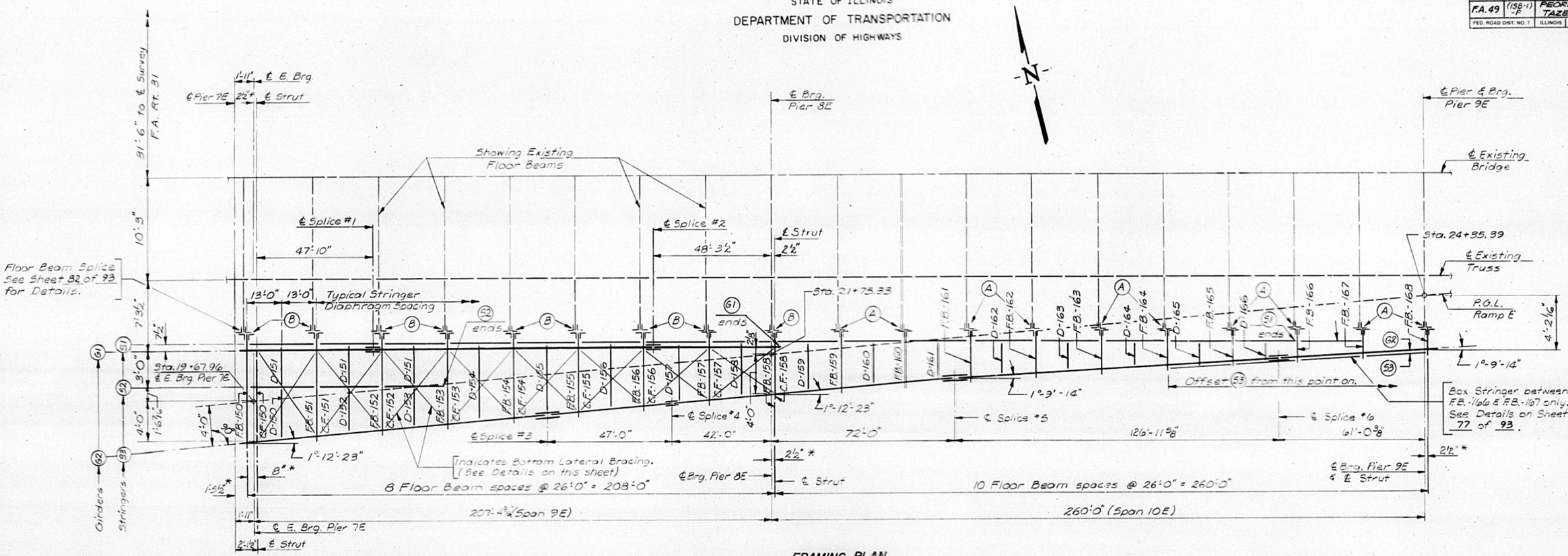
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

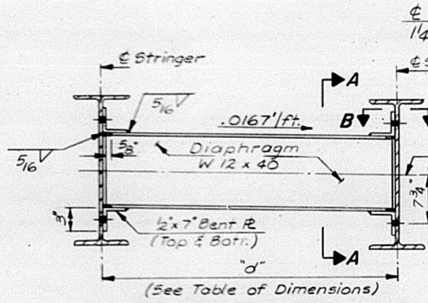
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1)-P	PEORIA & TAZEWELL	96	74
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

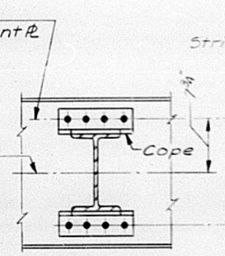
Sheet 72 of 93



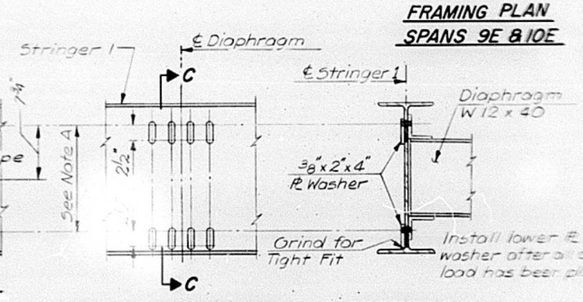
FRAMING PLAN
SPANS 9E & 10E



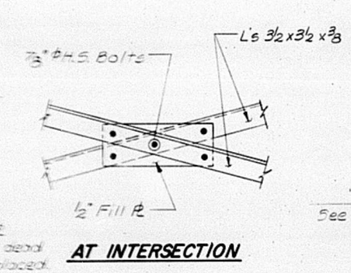
DIAPHRAGMS D-150 THRU D-166



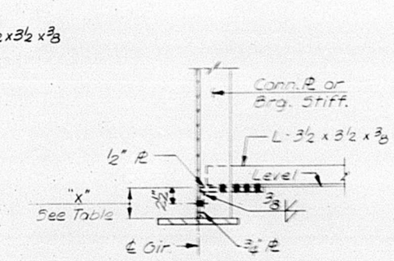
SECTION A-A



DETAIL AT STRINGER 1 SECTION C-C



AT INTERSECTION



SECTION D-D

NOTES

* ℄ all Ramp E floor beams (spans 9E & 10E) will initially be offset 2½" East of ℄ of existing floor beams. After all dead load has been placed, offset will range from 0" to ⅛" East of existing floor beams.

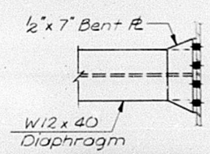
All structural steel shall conform to AASHTO M183 unless otherwise noted.

All dimensions are measured horizontally and parallel or perpendicular to the centerline of survey unless otherwise shown.

TABLE OF DIMENSIONS
DIAPHRAGMS D-150 - D-166

Diaphragm No.	Dimension "d"
D-150	5'-3 7/16"
D-151	3'-7½"
D-152	4'-8⅞"
D-153	4'-2 5/16"
D-154	7'-3¼"
D-155	6'-8⅜"
D-156	6'-2 1/16"
D-157	5'-7½"
D-158	5'-0 15/16"
D-159	4'-6⅜"
D-160	3'-11 13/16"
D-161	3'-5¼"
D-162	2'-10⅞"
D-163	2'-4 9/16"
D-164	1'-10 9/16"
D-165	1'-10 7/16"
D-166	1'-4 3/16"

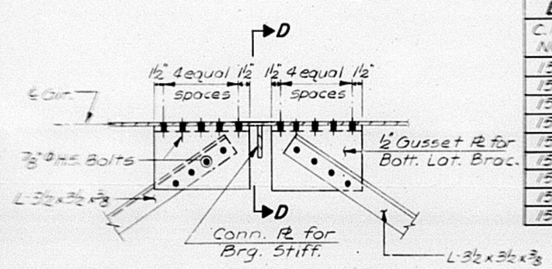
Note: Hardened washers shall be required over 1¼" Φ holes in Bent Plates.



SECTION B-B

NOTE A

℄ 1" Φ H.S. Bolts after all dead load is in place. Use 2½" slotted hole in all stringer 1 connections. Note that for the installation of diaphragms, the ℄ of the 1" Φ H.S. bolts will be near the bottom of the slots. All 1" Φ H.S. bolts used in the stringer 1 connection should have self-locking nuts. The nuts should be installed onto the bolts but not tightened, so that the stringer may be free to move as additional dead load deflects the girder-stringer system. The nuts should have the self-locking device in use during construction to prevent them from backing off of the bolt. After all dead load has been placed, the nuts on the stringer 1 connections should then be tightened by the deck contractor.



PLAN

BOTTOM LATERAL BRACING DETAILS

TABLE OF "X" DIMENSIONS

C.F. No.	Gir. 1	Gir. 2
150	5"	6½"
151	5"	6⅜"
152	5"	6¼"
153	5"	6⅛"
154	5"	6"
155	5"	5 15/16"
156	5"	5 13/16"
157	5"	5 11/16"
158	5"	5 9/16"

STRUCTURAL STEEL PLAN
RAMP E - SPANS 9E & 10E

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC.(15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O.
CHECKED C.R.N.
DRAWN D.A.N.
CHECKED S.C.O.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

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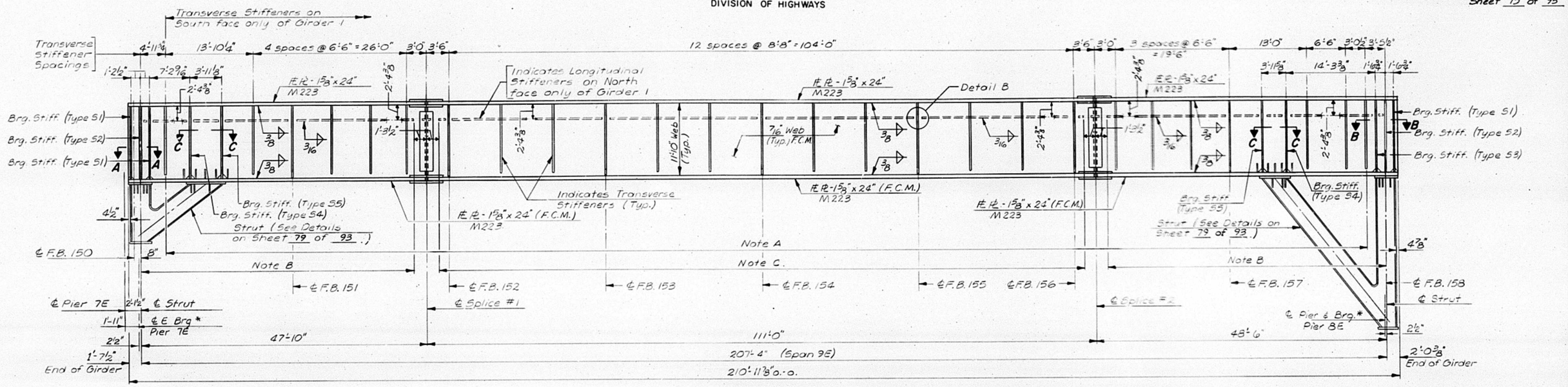
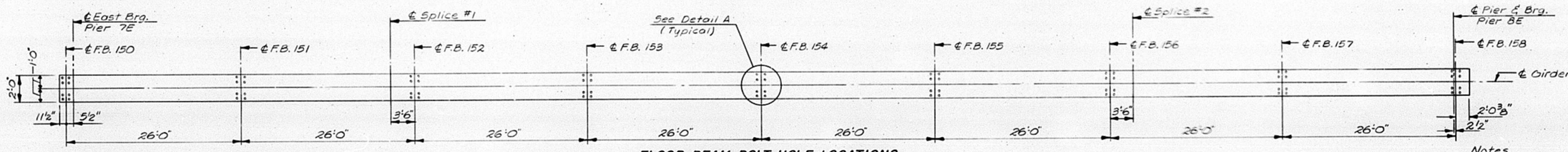
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA.-49	(158-11-P)	PEORIA & TAZEWELL	96	75
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 73 of 93



ELEVATION - GIRDER 1

* Work with Rocker Setting Diagram Sheet 84 of 93.



FLOOR BEAM BOLT HOLE LOCATIONS IN TOP FLANGE OF GIRDER 1

Notes

Girder tension flange, web, splice plates and all strut flanges, webs and end plates shall meet the requirements for Fracture Critical Members (F.C.M.).

All structural steel shall conform to AASHTO M183 unless otherwise noted.

All dimensions are measured along ℄ of the Girder.

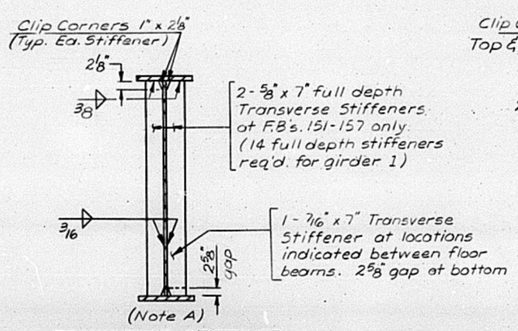
Note A: 7⁄16" x 7" Transverse Stiffeners with ⅜" fillet weld at top flange & 2⅝" gap at bottom flange.

Note B: Limits of ⅜" x 4" Longitudinal Stiffeners.

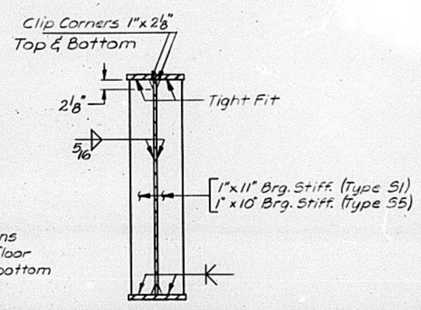
Note C: Limits of ⅜" x 5" Longitudinal Stiffeners.

For Sections A-A thru C-C see sheet 78 of 93.

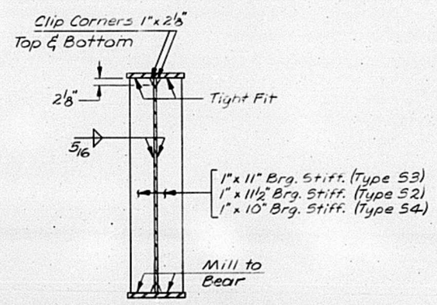
All dimensions shown are measured horizontally and along ℄ girder.



TRANSVERSE STIFFENER

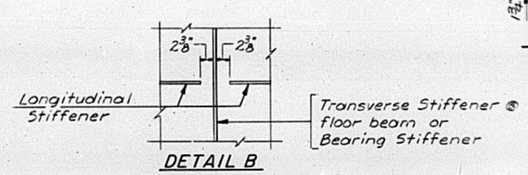


Types S1 & S5

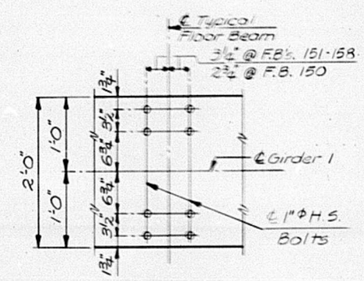


Types S2, S3 & S4

BEARING STIFFENERS



DETAIL B
(View of North Face of Girder 1)



DETAIL A

GIRDER 1 DETAILS
RAMP E - SPAN 9E

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC.(158-1)-P
PEORIA & TAZEWELL COUNTIES

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CHECKED C.R.N.
DRAWN D.A.N.
CHECKED S.C.O.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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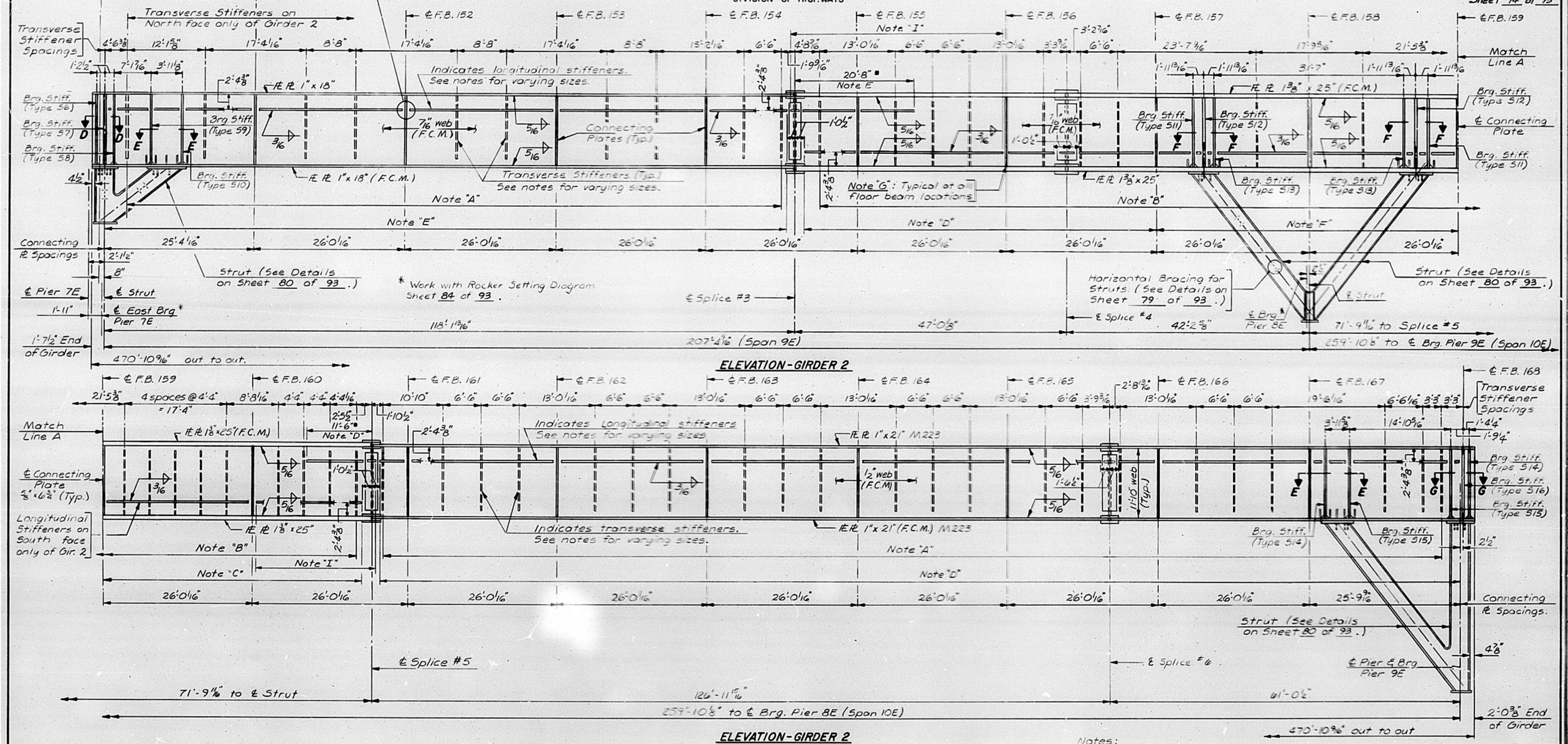
FA-49	(15B-1)-P	PEORIA & TAZEWELL	96	76
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

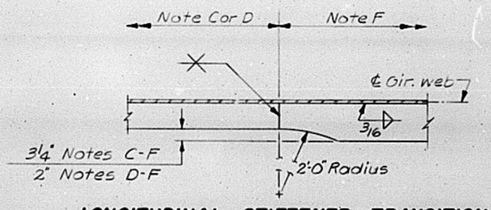
Sheet 74 of 93

Note "I": Limits of F.C.M. for longitudinal stiffeners.
■ - Additional F.C.M. required on lower girder flange this region.



ELEVATION-GIRDER 2

ELEVATION-GIRDER 2



LONGITUDINAL STIFFENER TRANSITION

Note "A": 7/16" x 6 3/4" transverse stiffeners with 5/16 fillet weld at top flange, 3/16 fillet weld along web, & 2 5/8" gap at bottom flange.

Note "B": 7/16" x 6 3/4" transverse stiffeners with 2 5/8" gap at top flange, 5/16 fillet weld at bottom flange, & 3/16 fillet weld along web.

Note "C": 3/8" x 2 3/4" Longitudinal stiffener.

Note "D": 3/8" x 4" Longitudinal stiffener.

Note "E": 3/8" x 5" Longitudinal stiffener.

Note "F": 3/8" x 6" Longitudinal stiffener.

Note "G": 5/16 fillet weld at top & bottom flange, & 1/4" fillet weld along web.

Notes:

All structural steel shall conform to AASHTO M183 unless otherwise noted.

All girder tension flanges, webs, splice plates, longitudinal stiffeners in tension and all strut flanges, webs, and end plates shall meet the requirements for Fracture Critical Members (F.C.M.).

All dimensions shown are measured horizontally and along ℄ Girder.

All bearing stiffener & transverse stiffener sizes & details are shown on Sheet 75 of 93.

For Sections D-D thru G-G see Sheet 78 of 93.

GIRDER 2 DETAILS
RAMP E - SPANS 9E & 10E

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O.
CHECKED R.W.G.
DRAWN D.A.N.
CHECKED S.C.O.

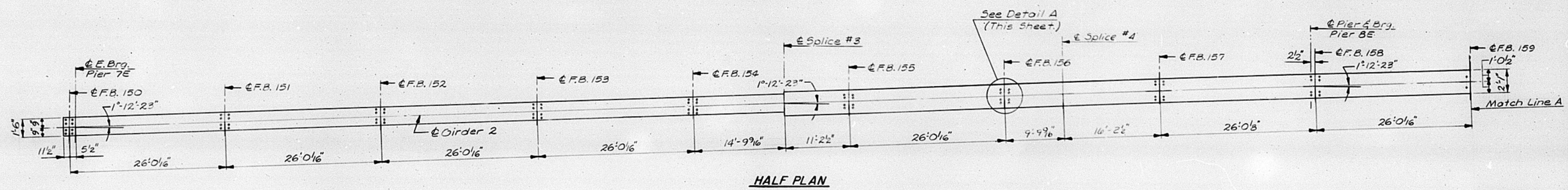
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

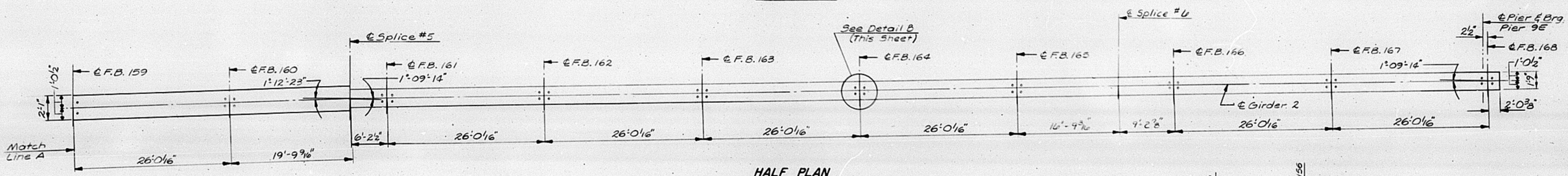
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.-49	(158-1)-P	PEORIA & TAZEWELL	96	77
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 75 of 93

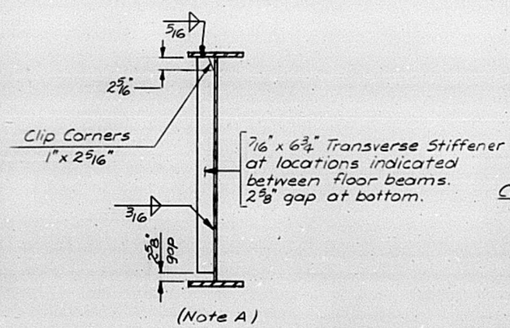


HALF PLAN

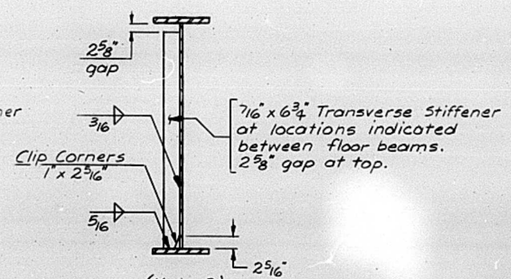


HALF PLAN

FLOOR BEAM BOLT HOLE LOCATIONS IN TOP FLANGE OF GIRDER 2

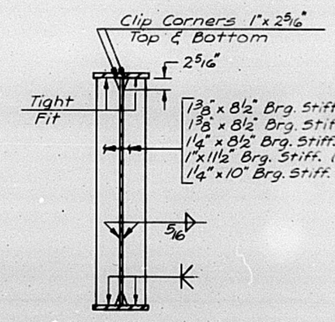


(Note A)

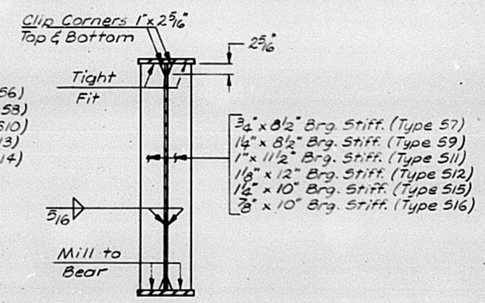


(Note B)

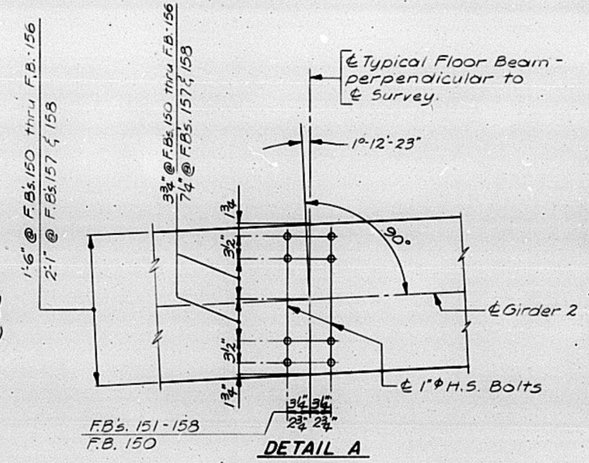
TRANSVERSE STIFFENERS



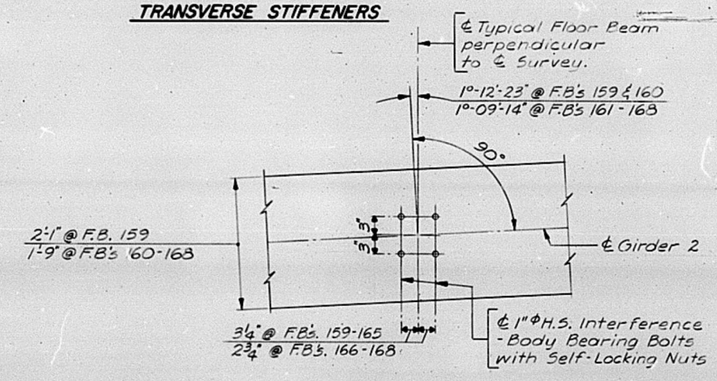
TYPES S6, S8, S10, S13 & S14



TYPES S7, S9, S11, S12, S15 & S16

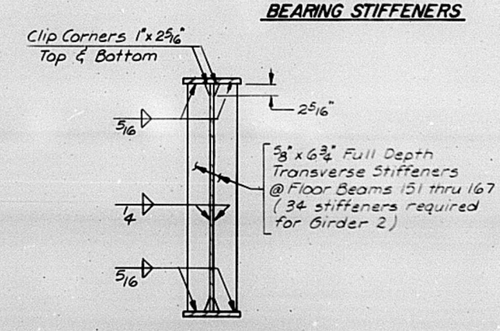


DETAIL A
(@ F.B.'s. 150 thru 158)



DETAIL B
(@ F.B.'s. 159 thru 168)

BEARING STIFFENERS



TRANSVERSE STIFFENER AT FLOOR BEAM

Notes:

Angles shown in Half Plan are measured from a line parallel to ℄ of survey.

See Sheet 74 of 93 for location of transverse stiffeners and of bearing stiffeners.

All dimensions shown are measured horizontally.

GIRDER 2 DETAILS
RAMP E - SPANS 9E & 10E

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC.(158-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O.
CHECKED R.W.C.
DRAWN D.A.N.
CHECKED S.C.O.

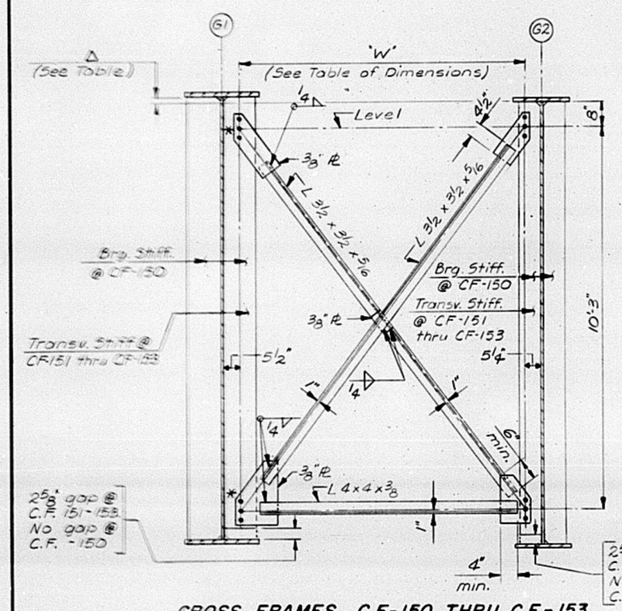
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 7-4001
DATE

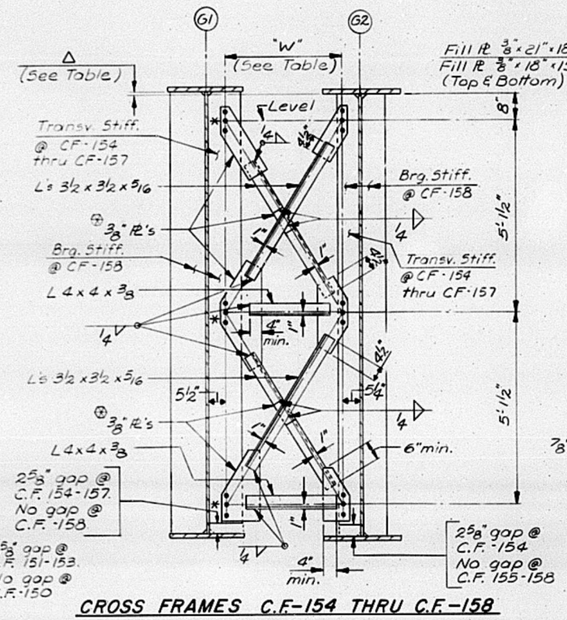
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1)-P	PEORIA & TAZEWELL	96	78
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 76 of 93



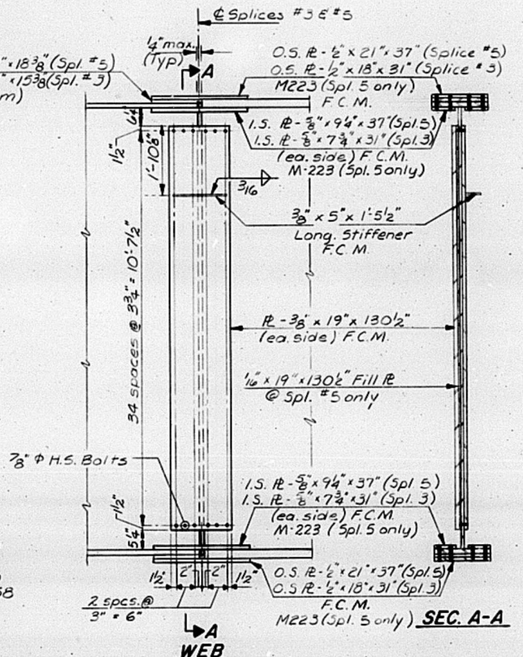
CROSS FRAMES C.F.-150 THRU C.F.-153



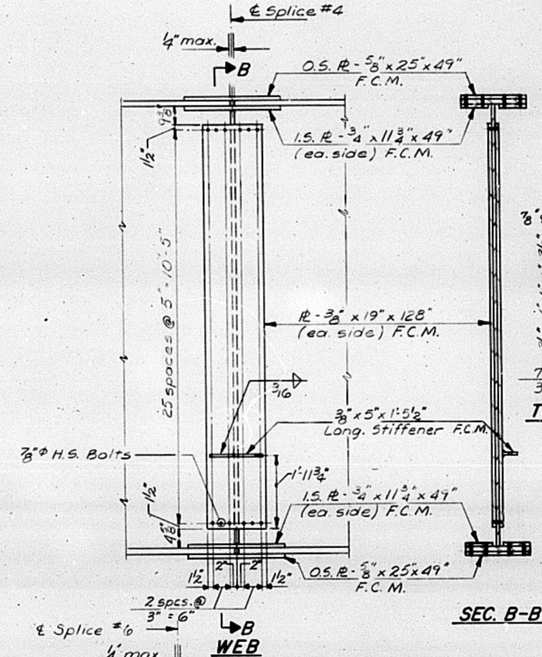
CROSS FRAMES C.F.-154 THRU C.F.-158

Note: 1 1/16" Φ holes in gusset PL's for 7/8" Φ H.S. Bolts.

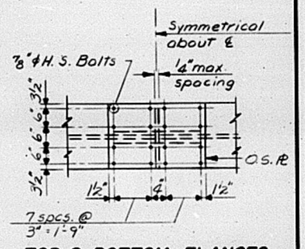
Hardened washers shall be required over holes in gusset PL's.



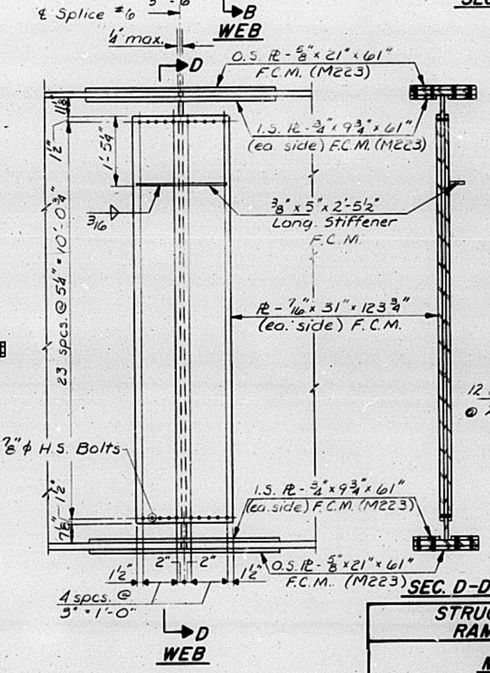
SEC. A-A



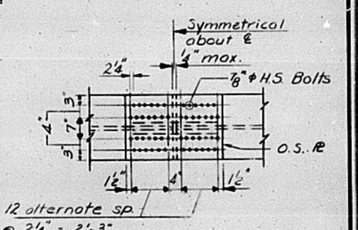
SEC. B-B



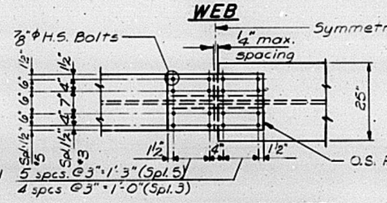
TOP & BOTTOM FLANGES DETAIL OF SPLICE 4



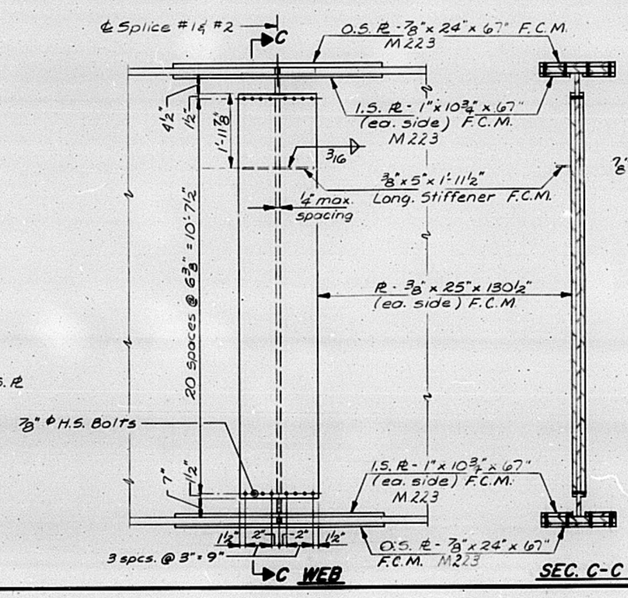
SEC. D-D



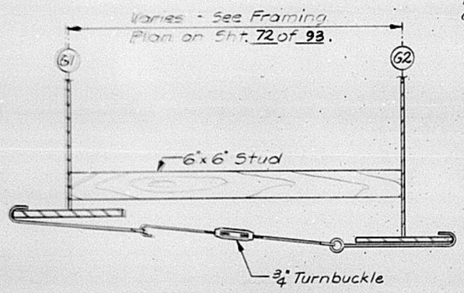
TOP & BOTTOM FLANGES DETAIL OF SPLICE 6



TOP & BOTTOM FLANGES DETAIL OF SPLICES 3 & 5



SEC. C-C



SUGGESTED TEMPORARY GIRDER BRACING DETAIL

TABLE OF DIMENSIONS CROSS FRAMES		
Cross Frame No.	Dimension "W"	Δ
C.F. 150	7'-7 1/4"	1 1/2"
C.F. 151	7'-0 15/16"	1 3/8"
C.F. 152	6'-6 3/8"	1 1/4"
C.F. 153	5'-11 3/16"	1 1/8"
C.F. 154	5'-5 1/4"	1"
C.F. 155	4'-10 11/16"	15/16"
C.F. 156	4'-4 1/16"	13/16"
C.F. 157	3'-9 1/2"	11/16"
C.F. 158	3'-2 15/16"	9/16"

* See note with Suggested Temporary Girder Bracing Detail on this sheet.

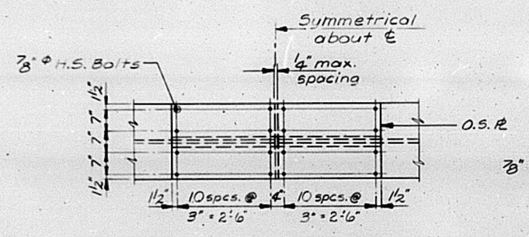
⊛ 3/8" Bent Plate shall be used @ C.F.-158.

Temporary girder bracing shall be used during the construction of Span 9E. As shown in the suggested temporary girder bracing detail, the bottom flange of the girder shall be braced against both inward and outward movements. The temporary bracing shall be installed adjacent to all cross frames at ± 26 ft. intervals and spaced to miss all girder splices and transverse stiffeners. Note that the cross frames shall initially be installed only to girder 2. After all dead load has been placed, the holes in the bearing or transverse stiffeners of girder 1 will match those holes in the gusset plates of the cross frames. The cross frames should then be bolted to girder 1 by the deck contractor. The cost of the temporary girder bracing shall be incidental to the cost of the structural steel.

Steel Specifications This Sheet:

All structural steel shall meet the requirements of AASHTO M-183 unless otherwise noted.

All high strength bolts shall meet the requirements of AASHTO M-164.



TOP & BOTTOM FLANGES DETAIL OF SPLICES 1 & 2

STRUCTURAL STEEL DETAILS
RAMP E - SPANS 9E & 10E

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O.
CHECKED R.W.C.
DRAWN D.A.M.
CHECKED S.C.O.

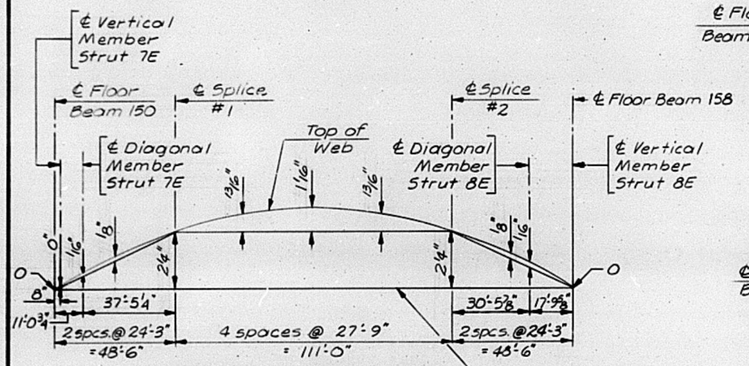
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

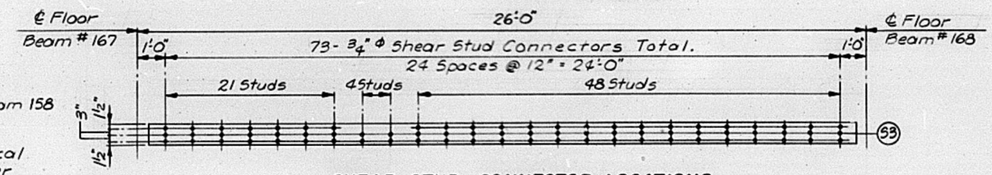
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA 49	(15B-1) -P	PEORIA & TAZEWELL	96	79
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

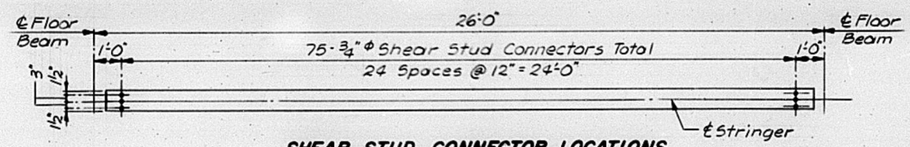
Sheet 77 of 93



CAMBER DIAGRAM - GIRDER 1



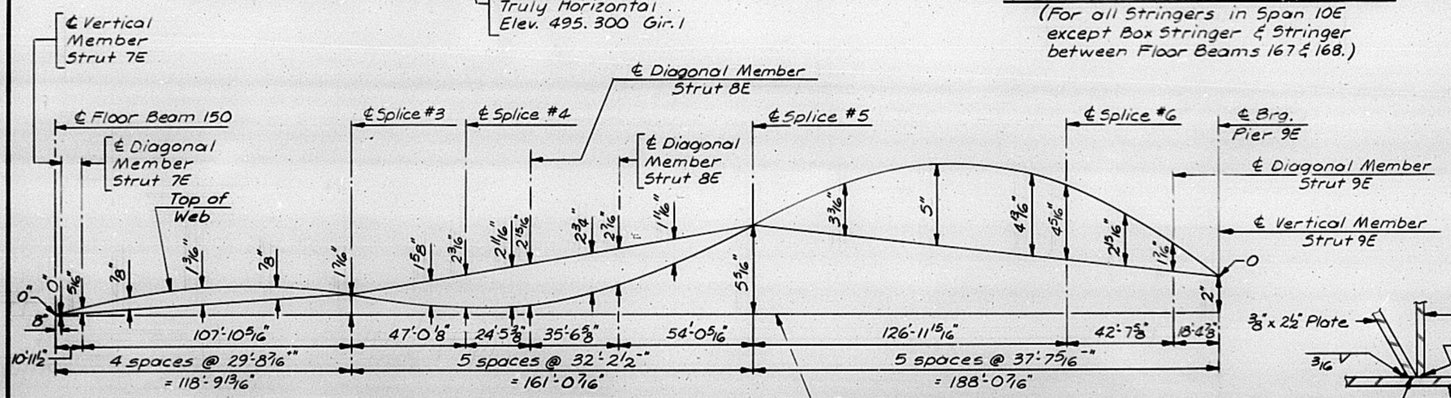
SHEAR STUD CONNECTOR LOCATIONS
(On Stringer S3 between Floor Beams 167 & 168.)



SHEAR STUD CONNECTOR LOCATIONS
(For all Stringers in Span 10E except Box Stringer & Stringer between Floor Beams 167 & 168.)

GIRDER MOMENT TABLE					
	Girder 1	Girder 2			
	Span 9E	Span 9E		Span 10E	
	.5pt.	.375pt.	.91pt.	.07pt.	.6pt.
I (in.⁴)	506,657	288,435	457,715	457,715	319,109
℄* (K/I)	1.845	1.538	1.549	1.643	1.527
M℄ (ik)	9,219	3,123	8,258	7,687	6,783
M↳ (ik)	2,048	1,470	1,337	1,285	1,031
Imp. (ik)	287	206	187	180	145
M_{TOTAL} (ik)	11,554	4,799	9,782	9,152	7,959
f_s (ksi)	19.9	14.4	18.6	17.4	21.5

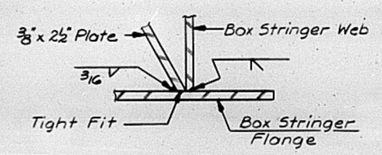
* Due to varying super width, this figure is only an average of varying dead load.



CAMBER DIAGRAM - GIRDER 2

GIRDER 2 REACTION TABLE			
	Pier 7E	Pier 8E	Pier 9E
R℄ (K)	105.9	466.1	145.8
R↳ (K)	41.8	77.7	14.1
Imp. (K)	5.8	10.9	2.0
R_{TOTAL} (K)	153.5	554.7	161.9

GIRDER 1 REACTION TABLE		
	Pier 7E	Pier 8E
R℄ (K)	176.5	189.3
R↳ (K)	49.7	41.6
Imp (K)	6.2	5.8
R_{TOTAL} (K)	226.4	236.7

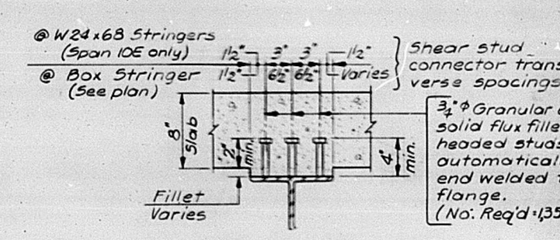


DETAIL F

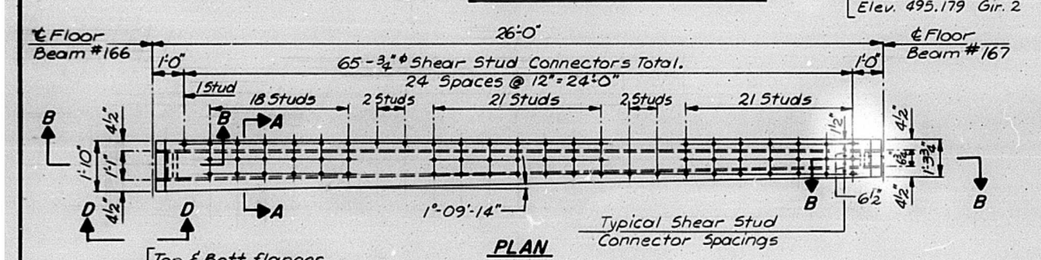
TOP OF WEB ELEVATIONS **		
	Girder 1	Girder 2
℄ Vertical Member Strut 7E	495.300	495.179
℄ Diagonal Member Strut 7E	495.348	495.216
℄ Splice #1	495.488	N.A.
℄ Splice #3	N.A.	495.299
℄ Splice #2	495.488	N.A.
℄ Splice #4	N.A.	495.622
℄ Diagonal Member Strut 8E	495.374	495.197
℄ Vertical Member Strut 8E	495.300	N.A.
℄ Diagonal Member Strut 8E	N.A.	495.310
℄ Splice #5	N.A.	495.622
℄ Splice #6	N.A.	495.795
℄ Diagonal Member Strut 9E	N.A.	495.493
℄ Vertical Member Strut 9E	N.A.	495.346

** Elevations include camber for dead load deflections and are for fabrication only. N.A. denotes not applicable.

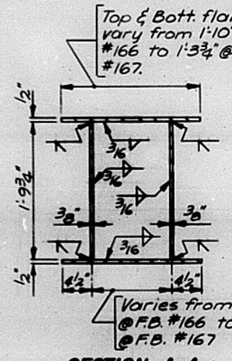
TABLE OF "Y" DIMENSIONS		
Fl. Bm. No.	Str. 1	Str. 3
166	⅞"	1 15/16"
167	–	1¾"
168	–	1½"



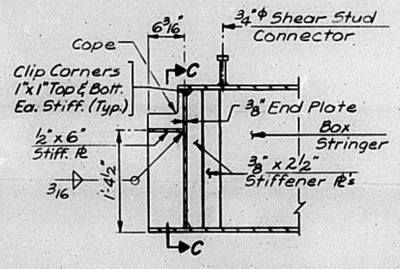
SHEAR STUD CONNECTOR DETAILS



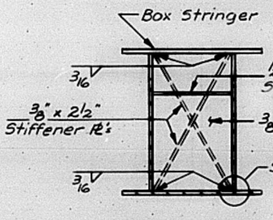
PLAN



SECTION A-A



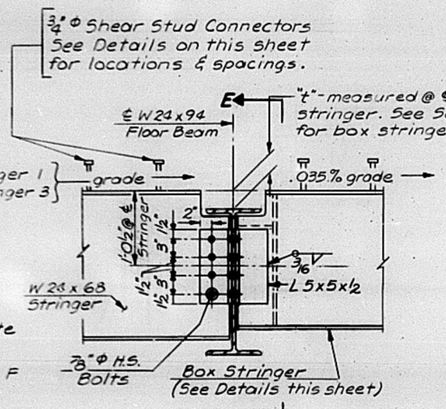
SECTION B-B



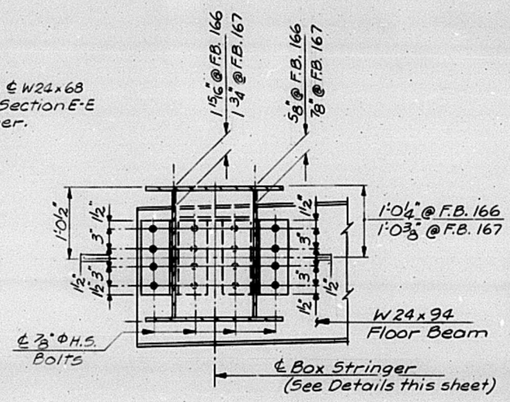
SECTION C-C

Notes:
Structural steel shall meet the requirements of AASHTO M-183.
Box Stringer shall be subject to the Supplemental Requirements for Notch Toughness.

BOX STRINGER DETAILS



VIEW D-D



SECTION E-E

BOX STRINGER CONNECTION DETAILS

STRUCTURAL STEEL DETAILS
RAMP E - SPANS 9E & 10E

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER

F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O.
CHECKED W.O.L.
DRAWN D.A.N.
CHECKED S.C.O.

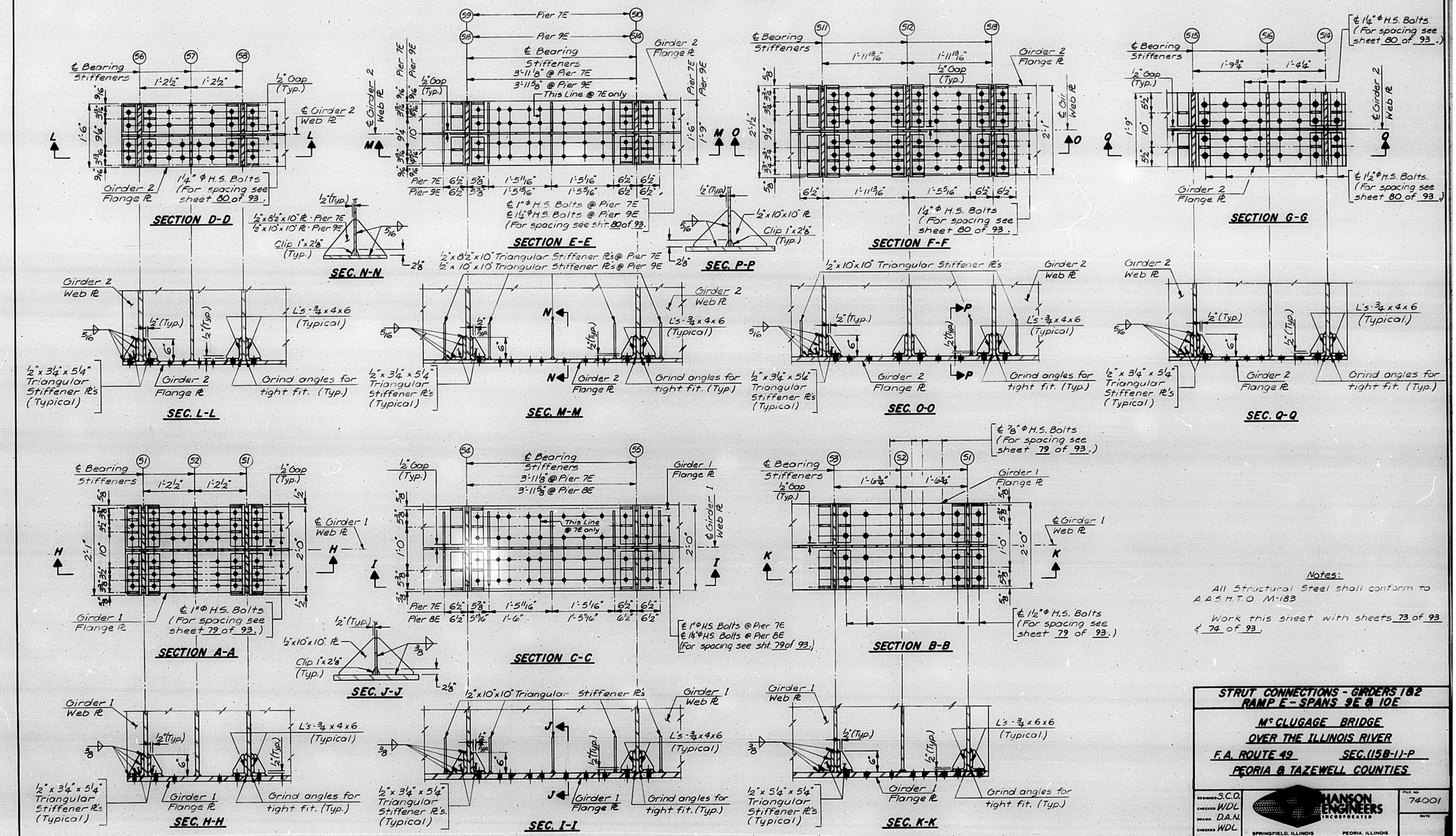
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(158-1)-P	PEORIA & TAZEWELL	96	80
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 78 of 93

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS



Notes:

All Structural Steel shall conform to A.A.S.H.T.O. M-183

Work this sheet with sheets 73 of 93 & 74 of 93.

STRUT CONNECTIONS - GIRDERS 1 & 2
RAMP E - SPANS 9E & 10E

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (158-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O.
CHECKED WDL
DRAWN D.A.N.
CHECKED WDL

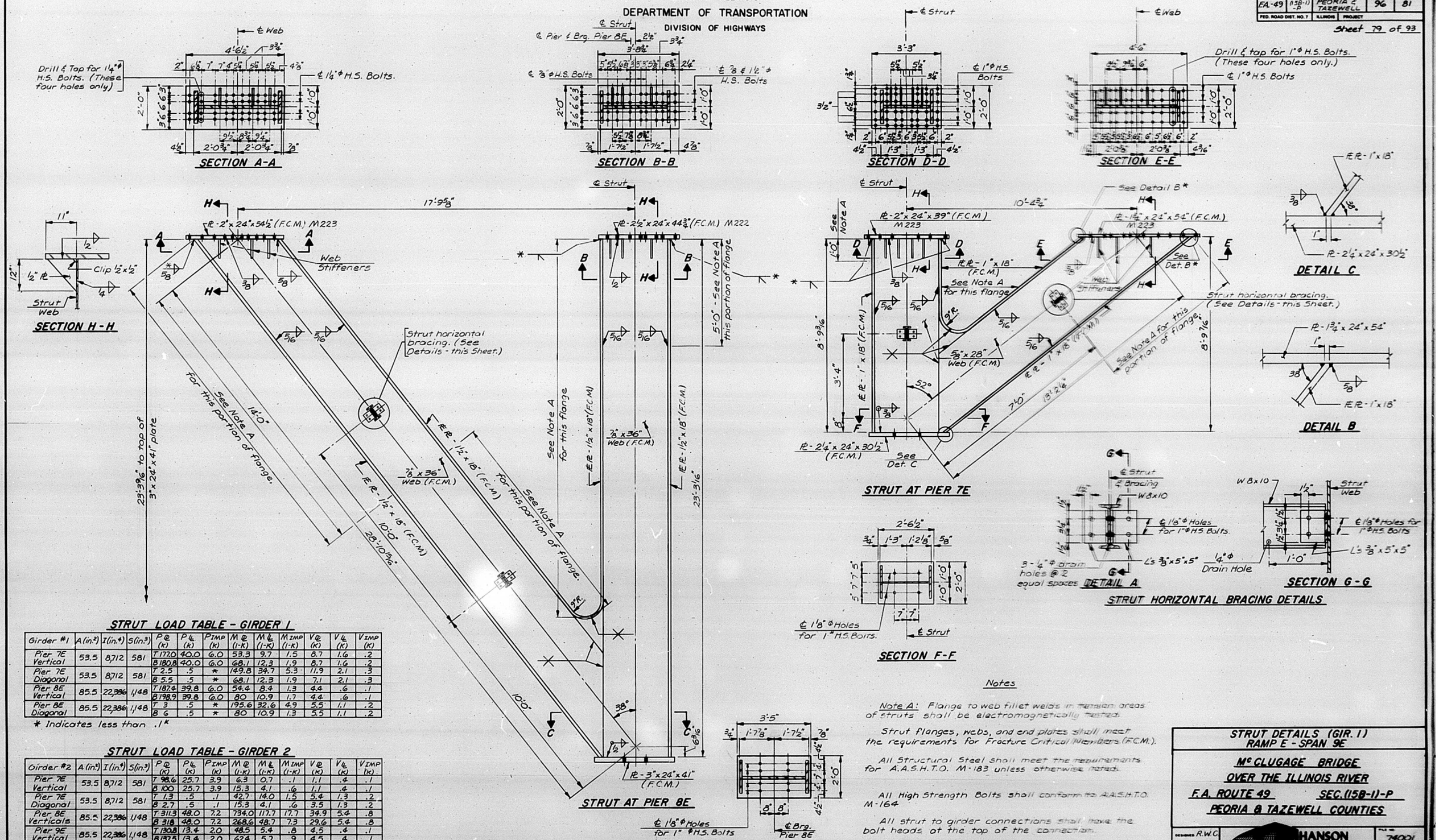
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA-49	(15B-1)-P	PEORIA & TAZEWELL	96	81
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 79 of 93



STRUT LOAD TABLE - GIRDER 1

Girder #1	A (in.²)	I (in.⁴)	S (in.³)	P ℄ (K)	P ⊥ (K)	P IMP (K)	M ℄ (I-K)	M ⊥ (I-K)	M IMP (I-K)	V ℄ (K)	V ⊥ (K)	V IMP (K)
Pier 7E Vertical	53.5	8,712	581	T 177.0	40.0	6.0	53.3	9.7	1.5	8.7	1.6	.2
				B 180.8	40.0	6.0	68.1	12.3	1.9	8.7	1.6	.2
Pier 7E Diagonal	53.5	8,712	581	T 2.5	.5	*	149.8	34.7	5.3	11.9	2.1	.3
				B 5.5	.5	*	68.1	12.3	1.9	7.1	2.1	.3
Pier 8E Vertical	85.5	22,386	1,148	T 187.4	39.8	6.0	54.4	8.4	1.3	4.4	.6	.1
				B 198.9	39.8	6.0	80	10.9	1.7	4.4	.6	.1
Pier 8E Diagonal	85.5	22,386	1,148	T 3	.5	*	195.6	32.6	4.9	5.5	1.1	.2
				B 6	.5	*	80	10.9	1.3	5.5	1.1	.2

* Indicates less than .1 K

STRUT LOAD TABLE - GIRDER 2

Girder #2	A (in.²)	I (in.⁴)	S (in.³)	P ℄ (K)	P ⊥ (K)	P IMP (K)	M ℄ (I-K)	M ⊥ (I-K)	M IMP (I-K)	V ℄ (K)	V ⊥ (K)	V IMP (K)
Pier 7E Vertical	53.5	8,712	581	T 98.6	25.7	3.9	6.3	0.7	.1	1.1	.4	.1
				B 100	25.7	3.9	15.3	4.1	.6	1.1	.4	.1
Pier 7E Diagonal	53.5	8,712	581	T 1.3	.5	.1	42.7	14.0	1.5	5.4	1.3	.2
				B 2.7	.5	.1	15.3	4.1	.6	3.5	1.3	.2
Pier 8E Verticals	85.5	22,386	1,148	T 311.3	48.0	7.2	734.0	117.7	17.7	34.9	5.4	.8
				B 318	48.0	7.2	268.6	48.7	7.3	29.6	5.4	.8
Pier 9E Vertical	85.5	22,386	1,148	T 130.8	13.4	2.0	48.5	5.4	.8	4.5	.4	.1
				B 137.5	13.4	2.0	62.4	5.7	.9	4.5	.4	.1
Pier 9E Diagonal	85.5	22,386	1,148	T 3.0	.2	*	124.5	16.0	2.4	3.4	.7	.1
				B 3.7	.2	*	62.4	5.7	.9	8.6	.7	.1

* Indicates less than .1 K

Notes

Note A: Flange to web fillet welds in tension areas of struts shall be electromagnetically tested.

Strut flanges, webs, and end plates shall meet the requirements for Fracture Critical Members (F.C.M.).

All Structural Steel shall meet the requirements for A.A.S.H.T.O. M-183 unless otherwise noted.

All High Strength Bolts shall conform to A.A.S.H.T.O. M-164

All strut to girder connections shall have the bolt heads at the top of the connection.

* = Fillet and groove welds between end plates and flanges shall be radiographically tested.

STRUT DETAILS (GIR. 1)
RAMP E - SPAN 9E

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED R.W.C.
CHECKED S.C.O.
DRAWN D.A.N.
CHECKED S.C.O.

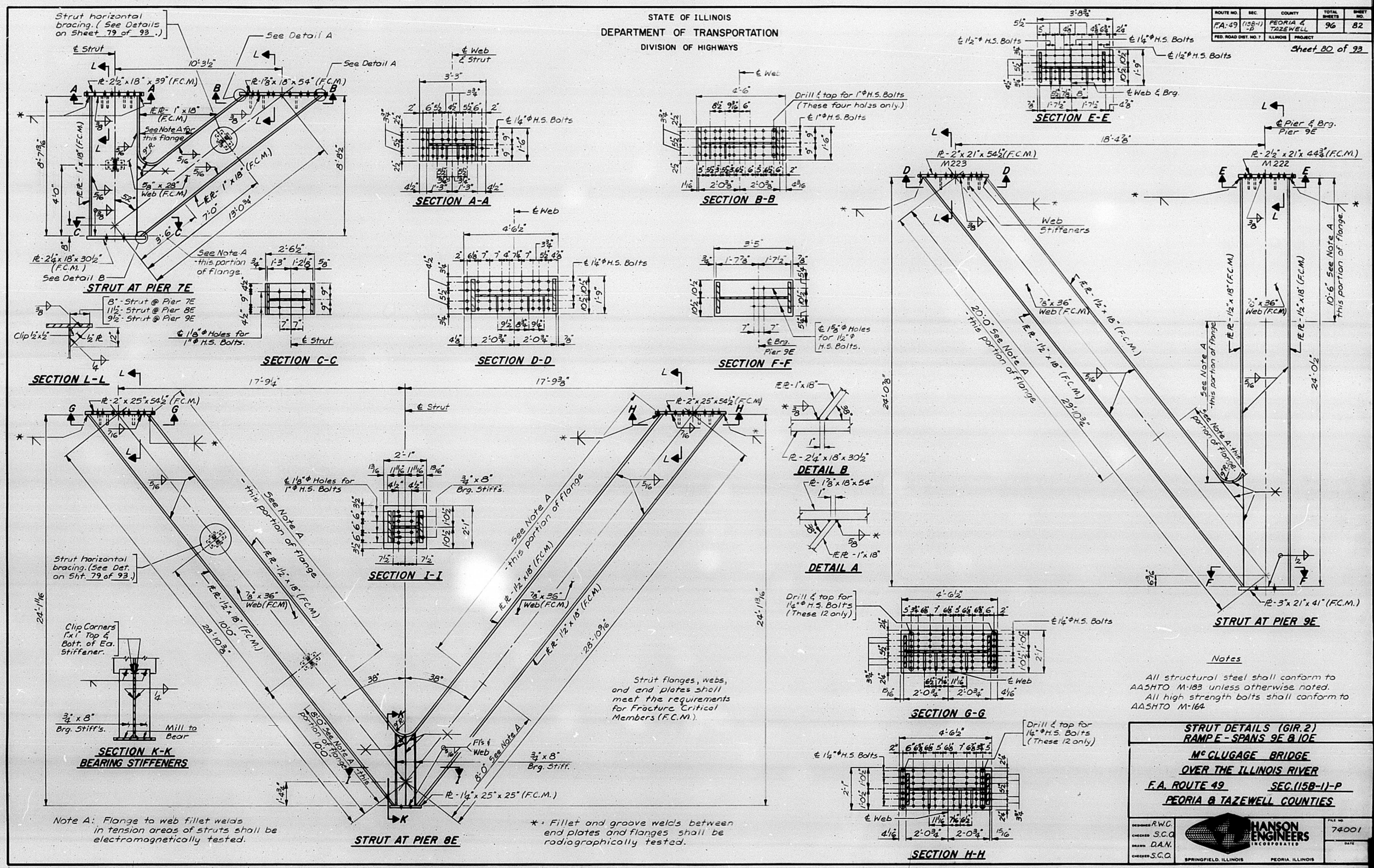
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA:49	(15B-1) -P	PEORIA & TAZEWELL	96	82
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 80 of 93



Note A: Flange to web fillet welds in tension areas of struts shall be electromagnetically tested.

* = Fillet and groove welds between end plates and flanges shall be radiographically tested.

Notes

All structural steel shall conform to AASHTO M-183 unless otherwise noted.
All high strength bolts shall conform to AASHTO M-164

STRUT DETAILS (GIR.2)
RAMP E - SPANS 9E & 10E

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC.(15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED R.W.C.
CHECKED S.C.O.
DRAWN D.A.N.
CHECKED S.C.O.

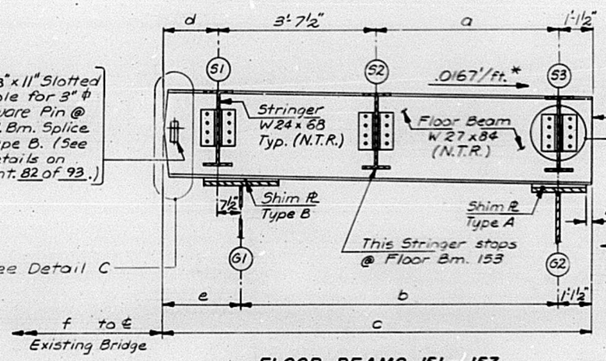
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

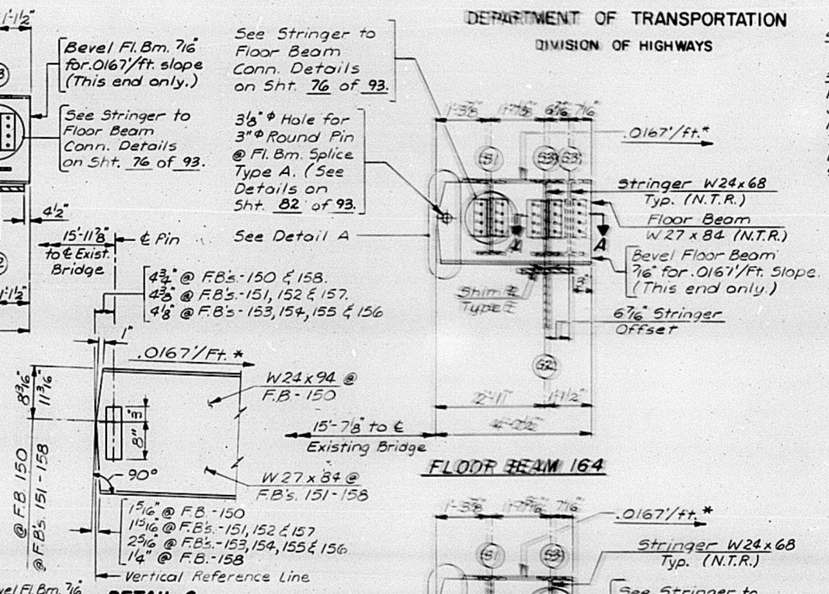
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1)-P	PEORIA & TAZEWELL	96	83
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 81 of 93



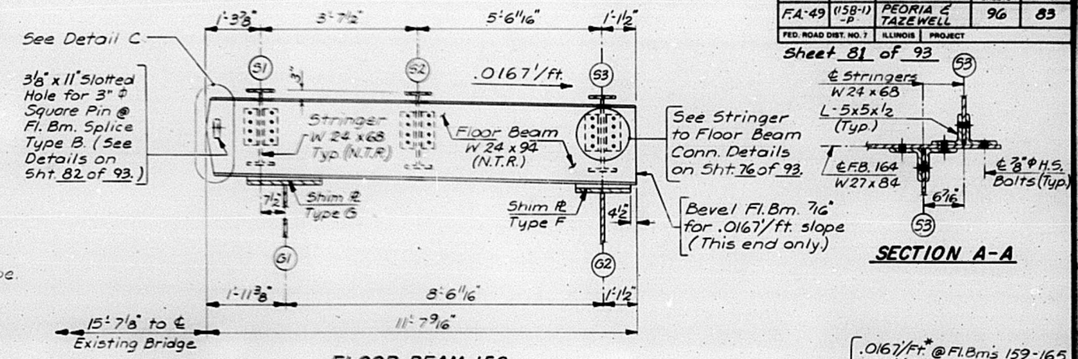
FLOOR BEAMS 151 – 153

TABLE OF DIMENSIONS FLOOR BEAMS 151 – 153						
F.B. No.	a	b	c	d	e	f
151	5'-0⅛"	8'-0⅛"	11'-0⅝"	1'-3½"	1'-11"	15'-7½"
152	4'-5 9/16"	7'-5 9/16"	10'-6 1/16"	1'-3½"	1'-11"	15'-7½"
153	3'-11"	6'-11"	9'-11¼"	1'-3¼"	1'-10¾"	15'-7¾"



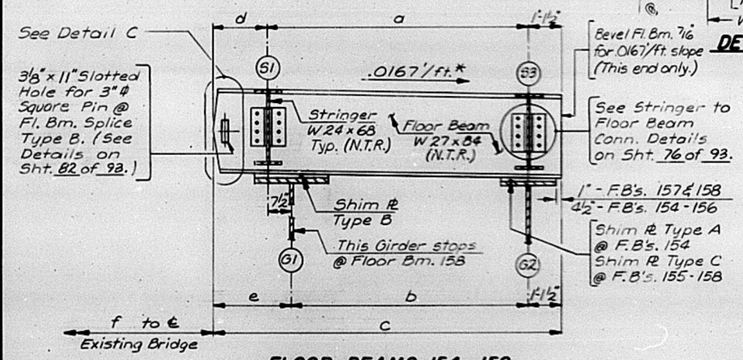
DETAIL C

FLOOR BEAM 164



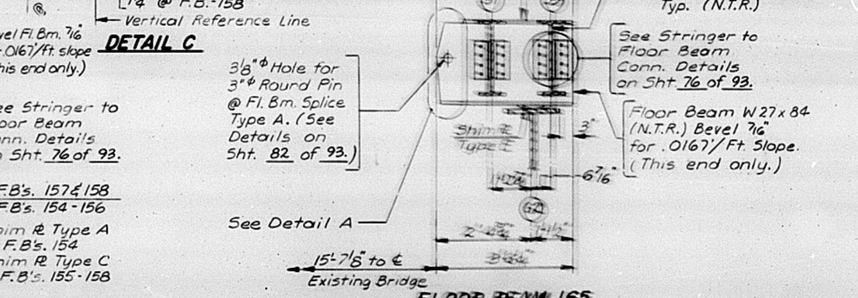
SECTION A-A

FLOOR BEAM 150

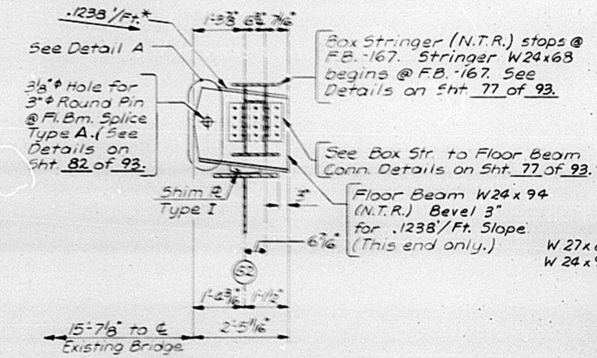


FLOOR BEAMS 154 – 158

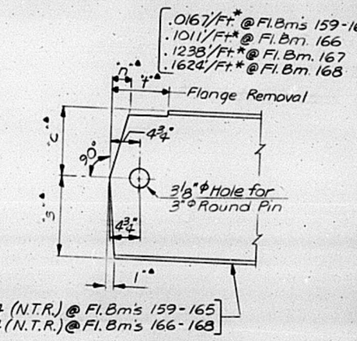
TABLE OF DIMENSIONS FLOOR BEAMS 154 – 158						
F.B. No.	a	b	c	d	e	f
154	6'-11 15/16"	6'-4 7/16"	9'-4 11/16"	1'-3¼"	1'-10¾"	15'-7¾"
155	6'-5⅜"	5'-9⅞"	8'-10⅛"	1'-3¼"	1'-10¾"	15'-7¾"
156	5'-10¾"	5'-3¼"	8'-3½"	1'-3¼"	1'-10¾"	15'-7¾"
157	5'-4 3/16"	4'-8 11/16"	7'-9 3/16"	1'-3½"	1'-11"	15'-7½"
158	4'-9⅝"	4'-2⅛"	7'-3"	1'-3⅜"	1'-11⅜"	15'-7⅛"



FLOOR BEAM 165

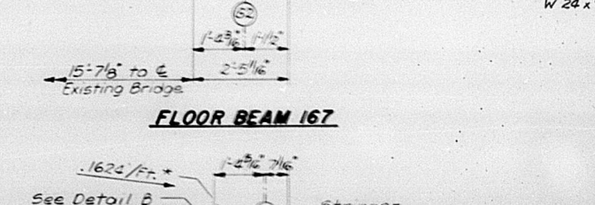


FLOOR BEAM 167



DETAIL A

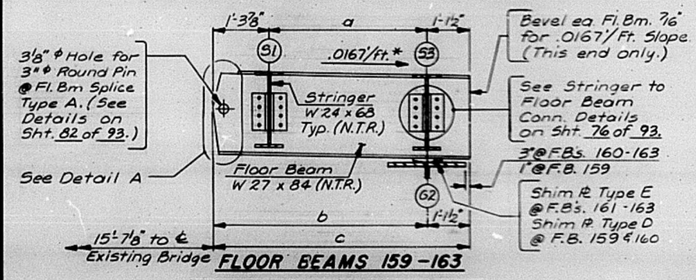
FLOOR BEAM 166



FLOOR BEAM 168

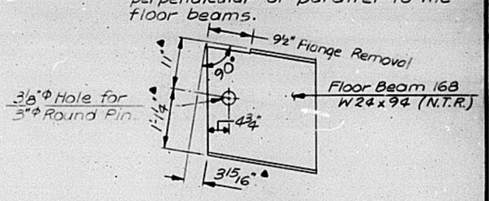
TABLE OF DIMENSIONS FOR DETAILS A & B				
F.B. No.	"n"▲	"t"▲	"s"▲	"c"▲
159	0"	8"	1'-3½"	11 3/16"
160	⅜"	8"	1'-3½"	11 3/16"
161	¾"	8"	1'-3½"	11 3/16"
162	⅞"	8"	1'-3½"	11 3/16"
163	1¼"	8"	1'-3½"	11 3/16"
164	1¾"	8"	1'-3½"	11 3/16"
165	2½"	8"	1'-3½"	11 3/16"
166	1¼"	9½"	1'-1⅞"	11⅛"
167	1¼"	9½"	1'-1 3/16"	11 1/16"
168	**	**	**	**

** = Does not apply (See Detail B)
▲ = Dimensions that are measured perpendicular or parallel to the floor beams.



FLOOR BEAMS 159 – 163

TABLE OF DIMENSIONS FLOOR BEAMS 159 – 163			
F.B. No.	a	b	c
159	4'-3 1/16"	5'-6 5/16"	6'-8 7/16"
160	3'-8½"	5'-0⅝"	6'-1⅞"
161	3'-2"	4'-5⅞"	5'-7⅜"
162	2'-7 11/16"	3'-11 9/16"	5'-1 11/16"
163	2'-1 7/16"	3'-5 5/16"	4'-6 3/16"



DETAIL B

Notes:

N.T.R. denotes main load carrying members that are subject to the Supplemental Requirements for Notch Toughness.

* Final floor beam slope shown. Slope will vary during construction due to girder camber.

All dimensions shown are parallel or perpendicular to a truly horizontal line unless otherwise noted.

The 3" Φ pin and angles 1 & 4 of the floor beam splice detail, sheet 82 of 93, shall be installed to the floor beams before removing from the shop.

Due to the large camber of Girder 2 in Span 10E, floor beams 166 to 168 should be placed after all other floor beams and adjoining stringers have been placed.

See Sheet 76 of 93 for shim plate details.

Structural Steel Specifications: (This Sheet):

Structural Steel: AASHTO M183

High Strength Bolts: AASHTO M164

FLOOR BEAM DETAILS
RAMP E – SPANS 9E & 10E

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER

F.A. ROUTE 49 SEC. (15B-1)-P

PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O.
CHECKED WDL
DRAWN D.A.N.
CHECKED S.C.O.

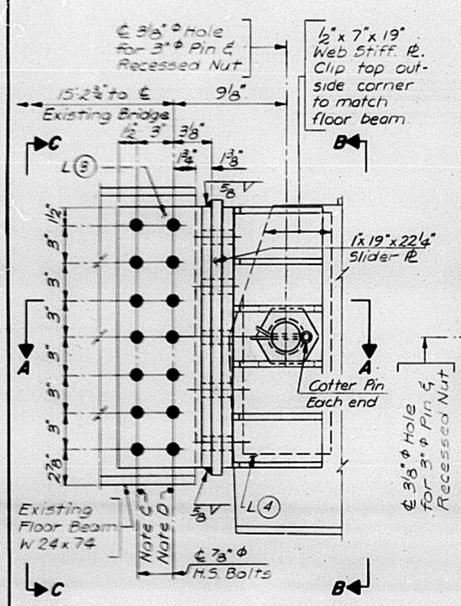
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

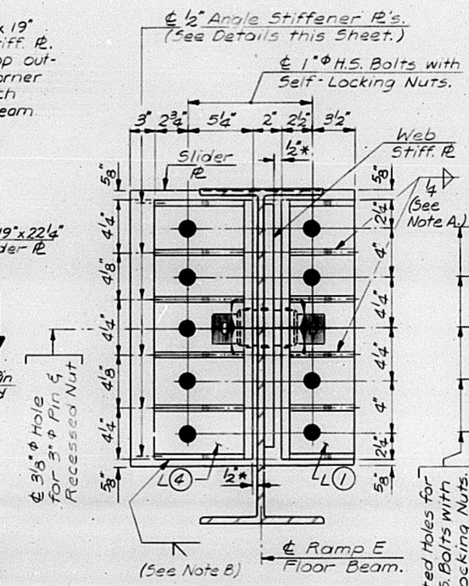
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.-49	(158-1)-P	PEORIA & TAZEWELL	96	84
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

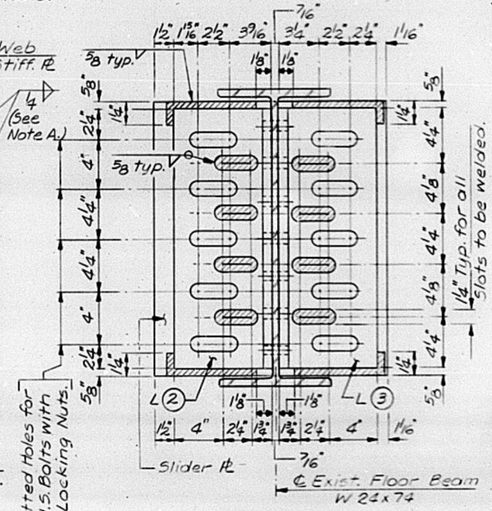
Sheet 82 of 93



ELEVATION
FLOOR BEAM SPLICE TYPE A



SECTION B-B



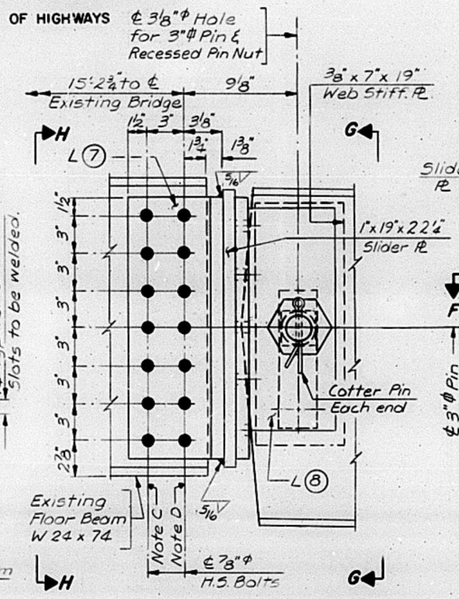
SECTION C-C

Note A: Typical for both legs of all angle interior stiffener plates.

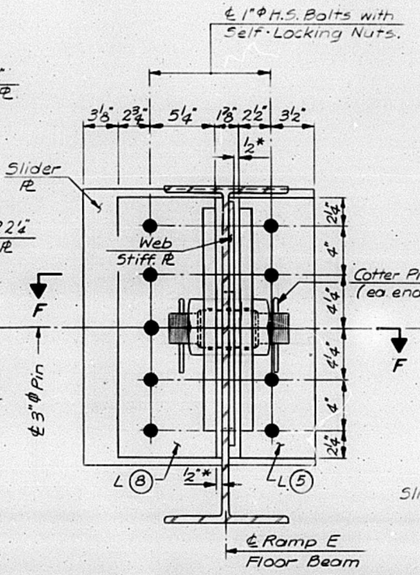
Note B: Typical for both legs of all angle exterior stiffener plates.

Note C: ℄ field drilled holes for ⅞"Φ high strength bolts.

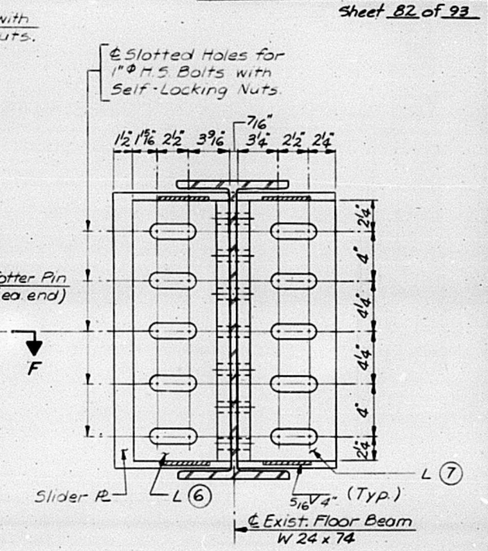
Note D: ℄ of existing ⅞"Φ rivet holes after removal of 6" stanchion rail post.



ELEVATION
FLOOR BEAM SPLICE TYPE B



SECTION G-G



SECTION H-H

Notes:

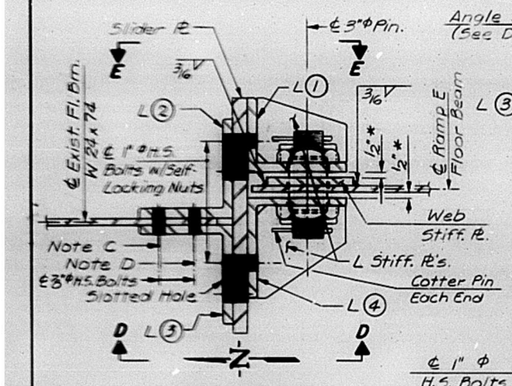
The 3"Φ pin and angles L4 & L5 of floor beam splice type A shall be installed to the floor beams before removing from the shop.

No field welding shall be allowed for floor beam splices.

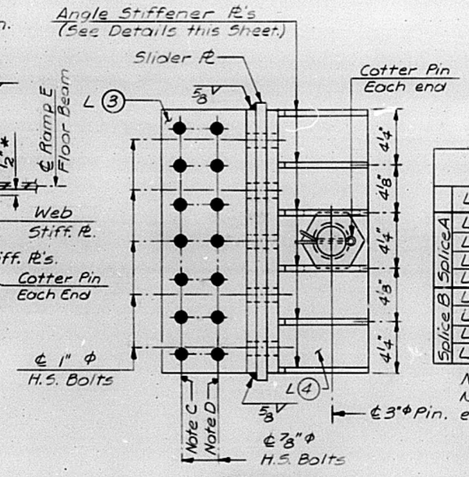
During the construction phase, the 1"Φ H.S. bolts of splice type A and the 1"Φ H.S. bolts of splice type B shall be installed with the locking nut just making contact with the part to be joined. The nuts should then be locked into this position. After all dead load has been placed, i.e. final dead load movement has taken place, the bolts are to be fully tightened and locked into position by the deck contractor.

L2, L3, L6, & L7 are to receive ½"x3"x6" plate washers over the slotted holes for the H.S. bolts. L2 & L6 should have the plate washers installed with the H.S. bolts. L3 & L7 cannot have the plate washers installed until all dead load is in place and final dead load movement has occurred. They should then be installed before final bolt tightening.

* Maintain ½" gap after all dead load has been placed.

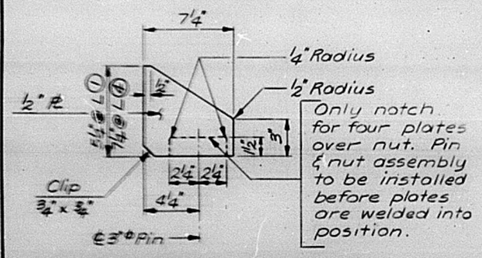


SECTION A-A



VIEW D-D

Note: VIEW E-E reverse of VIEW D-D.



ANGLE STIFFENER PLATE DETAILS

TABLE OF ANGLE SIZES

	L No.	L Size	Cut from L	Steel Spec.
Splice A	L1	8"x6"x¾"	N.A.	M183
	L2	8"x7⅝"x¾"	8"x8"x¾"	M183
	L3	8"x7⅝"x¾"	8"x8"x¾"	M183
	L4	8"x8"x¾"	N.A.	M183
Splice B	L5	8"x6"x1"	N.A.	M183
	L6	8"x7⅝"x1"	8"x8"x1"	M223
	L7	8"x7⅝"x1"	8"x8"x1"	M223
	L8	8"x8"x1"	N.A.	M183

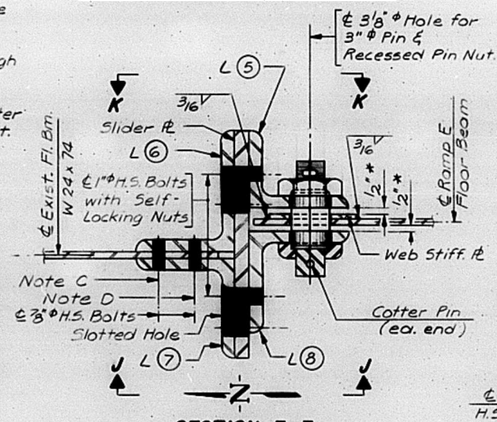
N.A. = Not Applicable
Note Ls 2 3 6 & 7 clipped ⅜" to clear exist. stringer to floor beam conn.

Steel Specifications This Sheet:

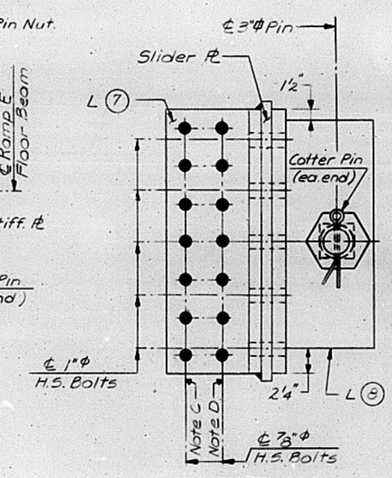
All structural steel shall meet the requirements of AASHTO M183 unless otherwise noted.

All high strength bolts shall meet the requirements of AASHTO M164.

3" Pins shall meet the requirements of AASHTO M169.

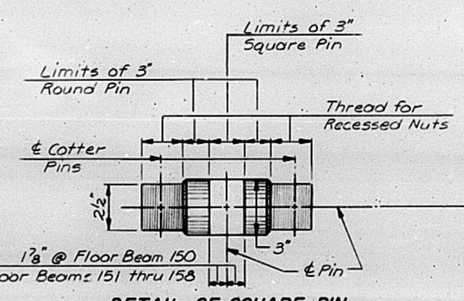


SECTION F-F

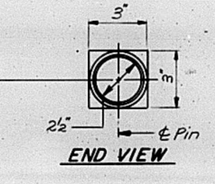


VIEW J-J

Note: VIEW K-K reverse of VIEW J-J.



DETAIL OF SQUARE PIN



END VIEW

FLOOR BEAM SPLICE TYPES A&B
RAMP E - SPANS 9E & 10E

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC.(158-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O.
CHECKED W.D.L.
DRAWN D.A.N.
CHECKED W.D.L.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

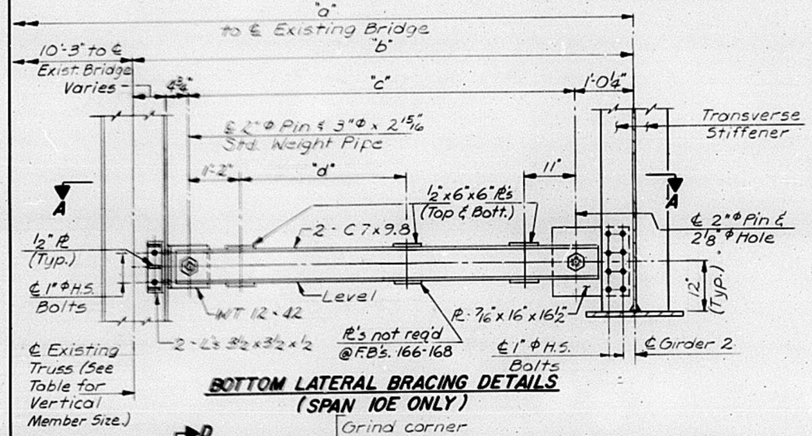
FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) -P	PEORIA & TAZEWELL	96	85
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 83 of 93

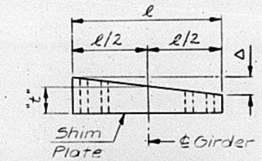
Note: For dimensions "a" thru "d" see Table at right.



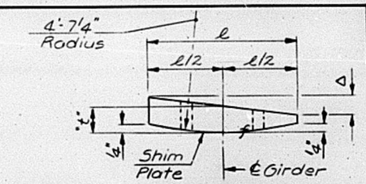
BOTTOM LATERAL BRACING DETAILS
(SPAN 10E ONLY)

TABLE OF DIMENSIONS BOTTOM LATERAL BRACING					
F.B. No.	Dimensions "a"	"b"	"c"	"d"	Existing Vertical
159	21'-2 1/16"	10'-11 1/16"	8'-11¼"	3'-6"	14 WF 43
160	20'-7½"	10'-4½"	8'-4 9/16"	3'-3"	14 WF 61
161	20'-1"	9'-10"	7'-10 3/16"	3'-0"	14 WF 43
162	19'-6 11/16"	9'-3 11/16"	7'-3¾"	2'-9"	14 WF 61
163	19'-0 7/16"	8'-9 7/16"	6'-9⅝"	2'-6"	14 WF 43
164	18'-6⅛"	8'-3⅛"	6'-3 3/16"	2'-3"	14 WF 61
165	17'-11⅞"	7'-8⅞"	5'-9 1/16"	2'-0"	14 WF 43
166	17'-5 9/16"	7'-2 9/16"	5'-2⅝"	N.A.	14 WF 61
167	16'-11 5/16"	6'-8 5/16"	4'-8½"	N.A.	14 WF 43
168	16'-5"	6'-2"	4'-2"	N.A.	14 WF 87

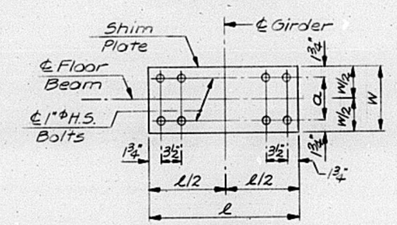
Note A: If back of channels, one side of WT web in contact with channel, & edge of pipe in contact with channel.



ELEVATION 1

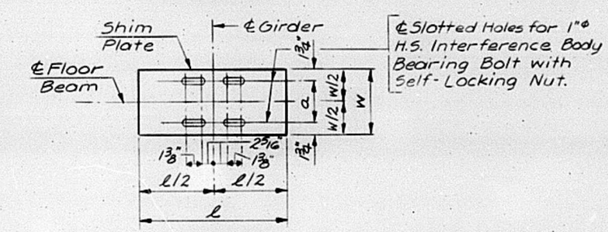


ELEVATION 2



PLAN 1

SHIM PLATE DETAIL 1



PLAN 2

SHIM PLATE DETAIL 2

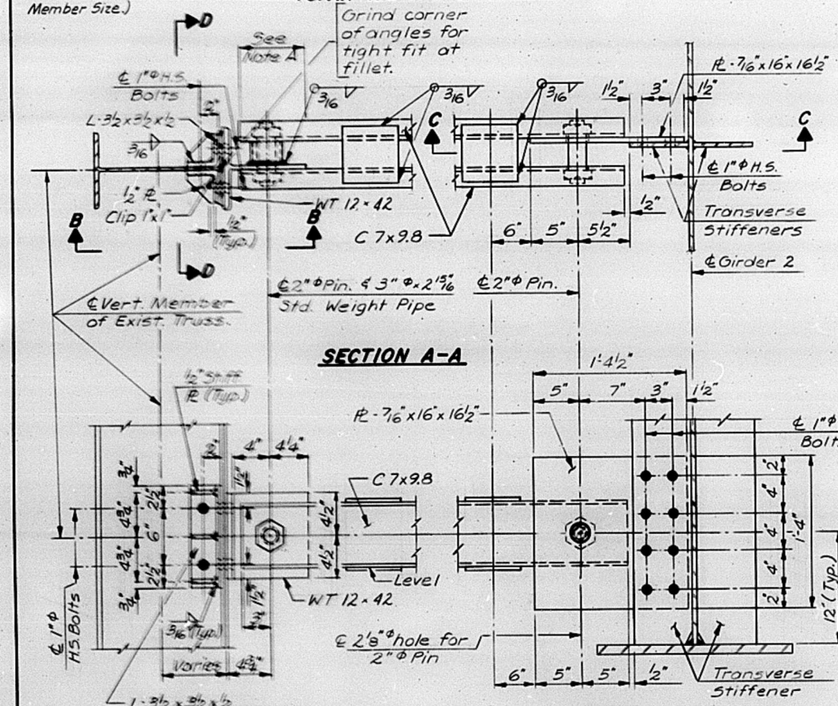
TABLE OF DIMENSIONS SHIM PLATES						
Type	Detail	ℓ	w	a	"t"	Δ
A	1	18"	10"	6½"	13/16"	5/16"
B	1	24"	10"	6½"	7/16"	3/8"
C	1	25"	10"	6½"	7/16"	7/16"
D	2	10½"	10"	6½"	7/16"	3/16"
E	2	10½"	10"	6½"	13/16"	3/16"
F	1	18"	9"	5½"	13/16"	5/16"
G	1	24"	9"	5½"	7/16"	3/8"
H	2	10½"	9"	5½"	1 11/16"	1 1/16"
I	2	10½"	9"	5½"	1 15/16"	1⅜"
J	2	10½"	9"	5½"	2 5/16"	1¾"

Notes:

All structural steel shown on this sheet shall conform to AASHTO M183 unless otherwise noted.

All high strength bolts shown on this sheet shall conform to AASHTO M 164.

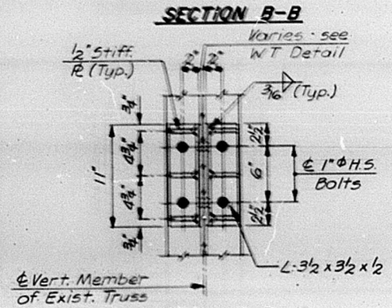
N.T.R. denotes main load carrying members that are subject to the Supplemental Requirements for Notch Toughness.



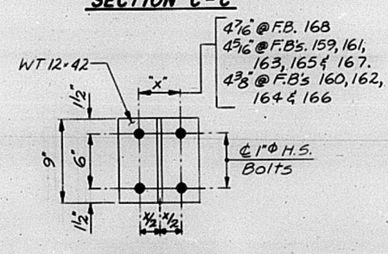
SECTION A-A

SECTION B-B

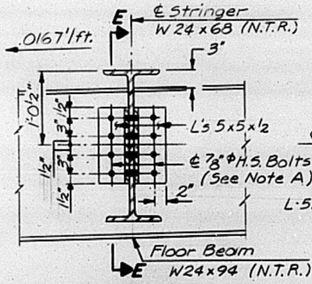
SECTION C-C



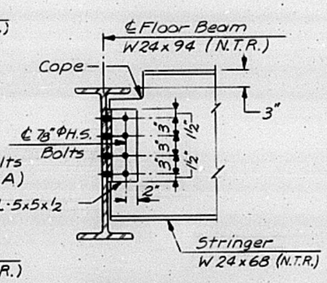
SECTION D-D



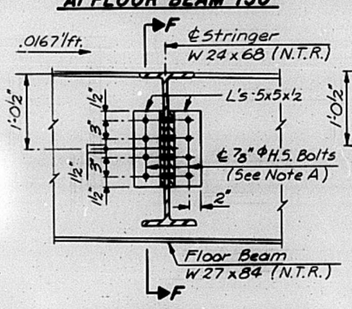
WT DETAIL



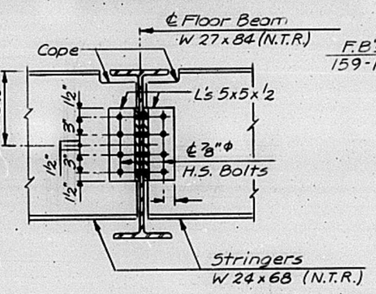
ELEVATION AT FLOOR BEAM 150



SECTION E-E



ELEVATION AT FLOOR BEAMS 151-165

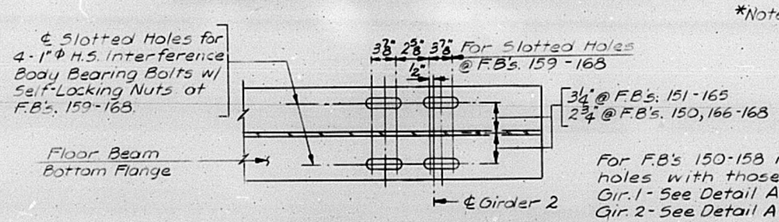


SECTION F-F

Note A: Where required ream holes for H.S. Bolts for Stringer 3 floor beam connections.

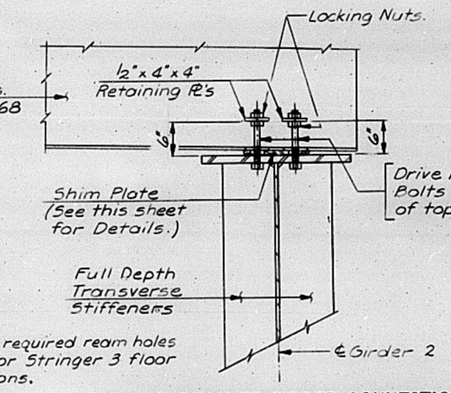
STRINGER TO FLOOR BEAM CONNECTION DETAILS *

*Note: For Stringer to Floor Beam Connection Details at Floor Beams 166, 167 & 168 see Box Stringer Connection Details on Sheet 77 of 93.



For F.B's 150-158 match 8 - 1 1/16"Φ holes with those in girder flange.
Gir. 1 - See Detail A on Sht. 73 of 93.
Gir. 2 - See Detail A on Sht. 75 of 93.

FLOOR BEAM BOLT HOLE LOCATIONS



FLOOR BEAM TO GIRDER CONNECTION
(@ F.B's. 159 thru 168)

STRUCTURAL STEEL DETAILS
RAMP E - SPANS 9E & 10E

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER

F.A. ROUTE 49 SEC. 15B-1 -P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O.
CHECKED W.D.L.
DRAWN D.A.N.
CHECKED W.D.L.

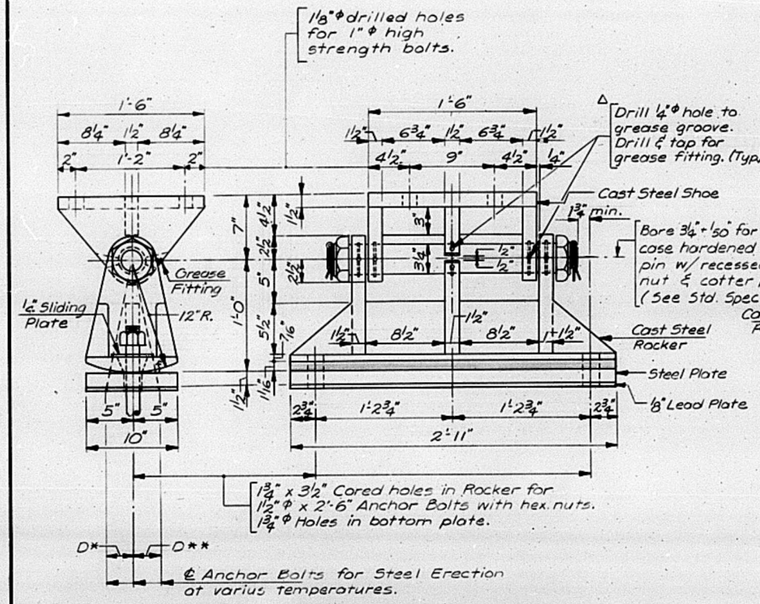
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

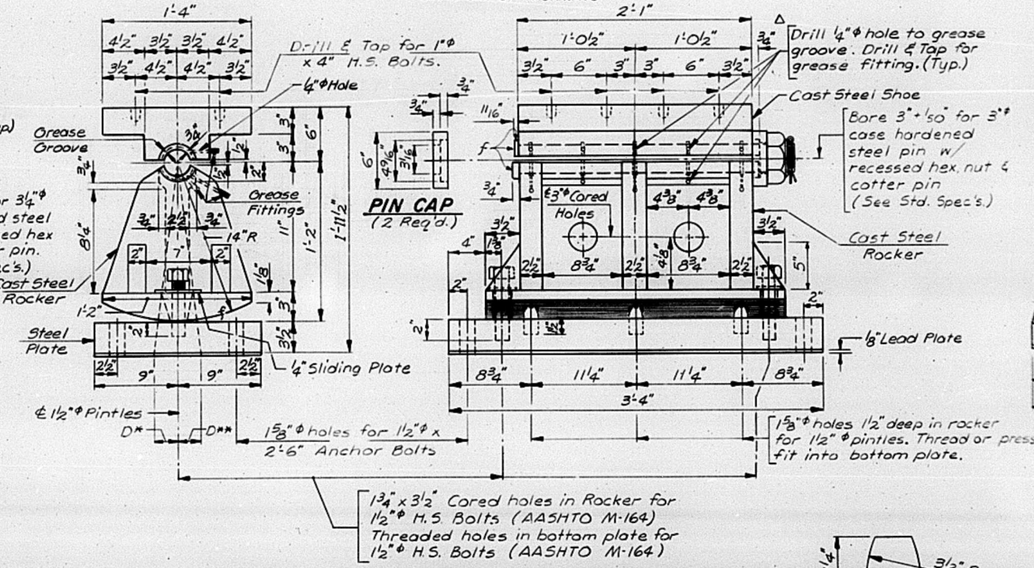
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA.-49	(15B-1)-P	PEORIA & TAZEWELL	96	86
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 84 of 93

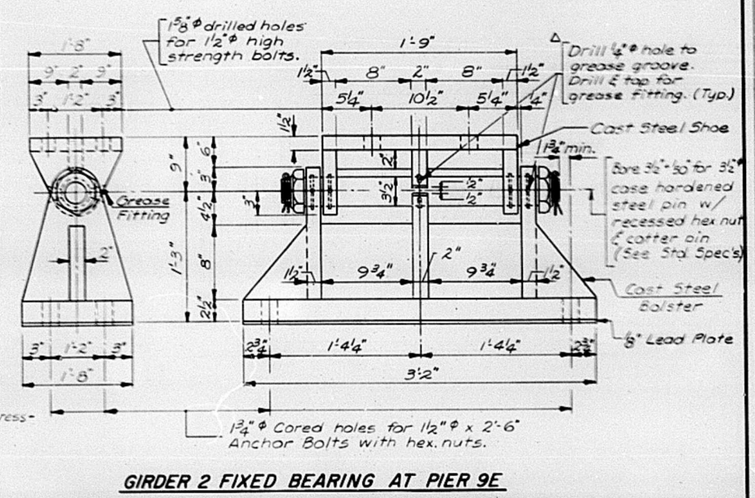


GIRDER 2 EXPANSION BEARING AT PIER 7E

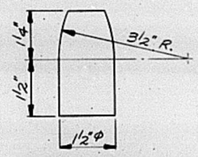


PIN CAP
(2 Req'd.)

GIRDER 2 EXPANSION BEARING AT PIER 8E



GIRDER 2 FIXED BEARING AT PIER 9E



PINTLE DETAIL

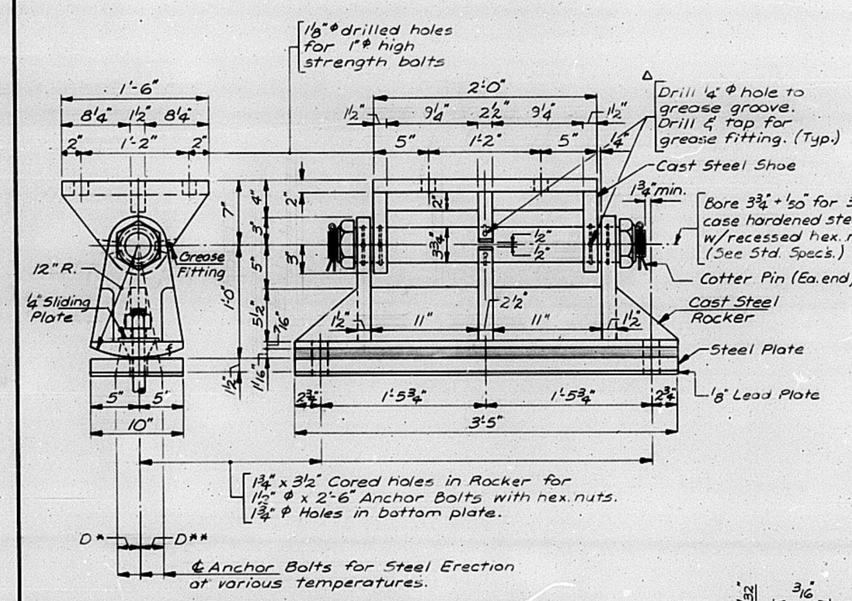
Steel for pintles shall meet the requirements of AASHTO M-223.

NOTES FOR SETTING OF ANCHOR BOLTS AT EXPANSION BEARINGS

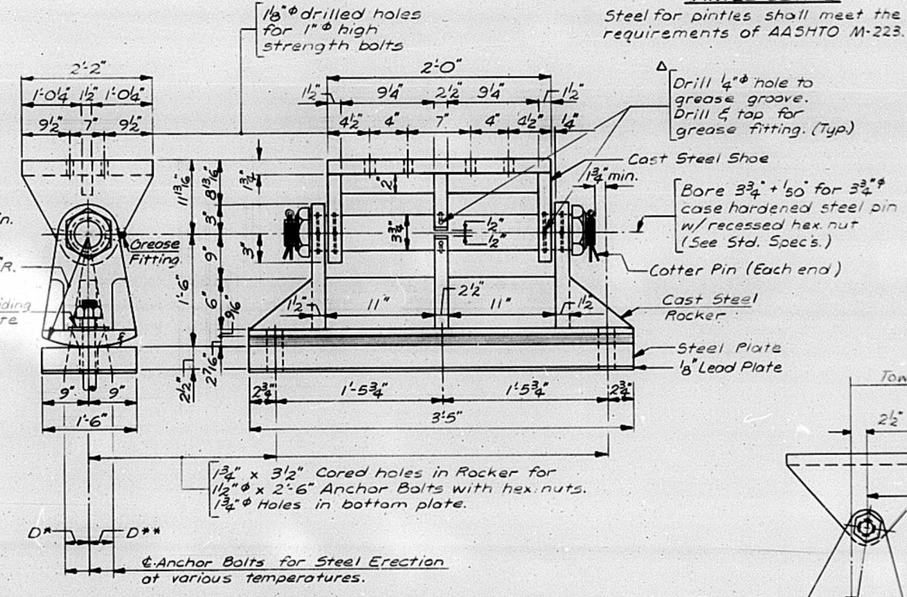
a.) D* (Side of bearing away from fixed bearing.) D* = ⅛" per each 100' of expansion for every 15° fall below the normal temperature of 50° F.

D** (Side of bearing toward fixed bearing.) D** = ⅛" per each 100' of expansion for every 15° rise above the normal temperature of 50° F.

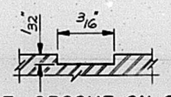
b.) After girders have been erected and dimensions D* & D** determined, holes shall be drilled & anchor bolts shall be grouted in place. All fixed anchor bolts may be built into the masonry.



GIRDER 1 EXPANSION BEARING AT PIER 7E

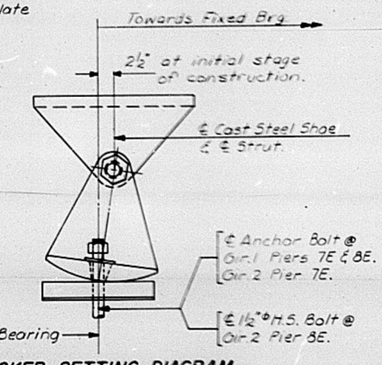


GIRDER 1 EXPANSION BEARING AT PIER 8E



GREASE GROOVE ON SADDLE

△Note: Grease bearing assembly with molybdenum grease before installation.



ROCKER SETTING DIAGRAM

For Bearings @ Piers 7E & 8E Girders 1 & 2 in addition to expansion requirements.

Notes:

Cast steel shoes, rockers, & bolsters shall meet requirements of AASHTO M-192 Class 90 unless otherwise indicated.

Bearing plate material shall meet requirements of AASHTO M-222 or M223 unless otherwise indicated.

Structural steel weldments of equal sections of M222 or M223 may be substituted for the castings subject to approval by the Engineer prior to fabrication but at no additional compensation.

BEARING DETAILS
RAMP E - SPANS 9E & 10E

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER

F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O.
CHECKED R.W.C.
DRAWN D.A.N.
CHECKED S.C.O.

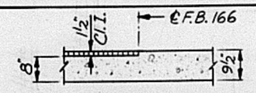
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

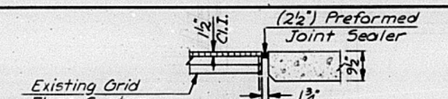
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) -P	Peoria & Tazewell	96	87
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

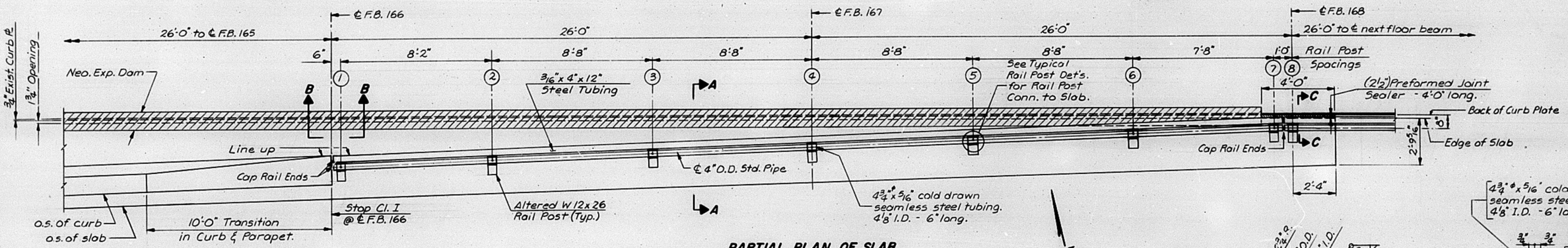
Sheet 85 of 93



SECTION B-B

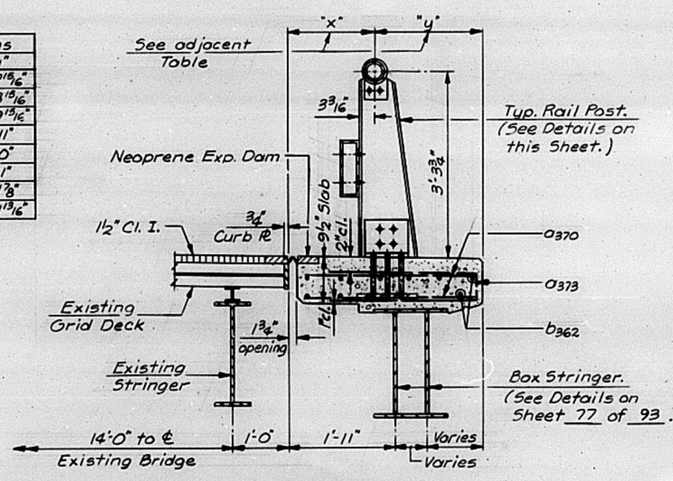


SECTION C-C

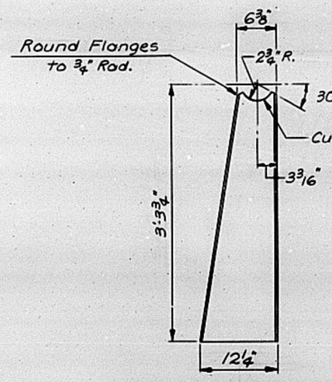


PARTIAL PLAN OF SLAB

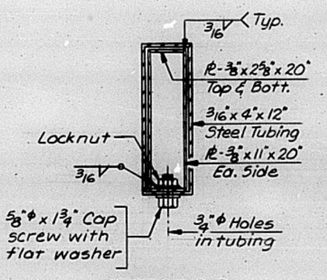
Rail Post No.	Dimensions "x"	Dimensions "y"
1	2'-7⅛"	1'-7 15/16"
2	2'-3 7/16"	1'-8 15/16"
3	1'-11 9/16"	1'-9 15/16"
4	1'-7⅝"	1'-11"
5	1'-3¾"	2'-0"
6	0'-11⅞"	2'-1"
7	0'-8 7/16"	2'-1⅞"
8	0'-8 3/16"	2'-1 3/16"



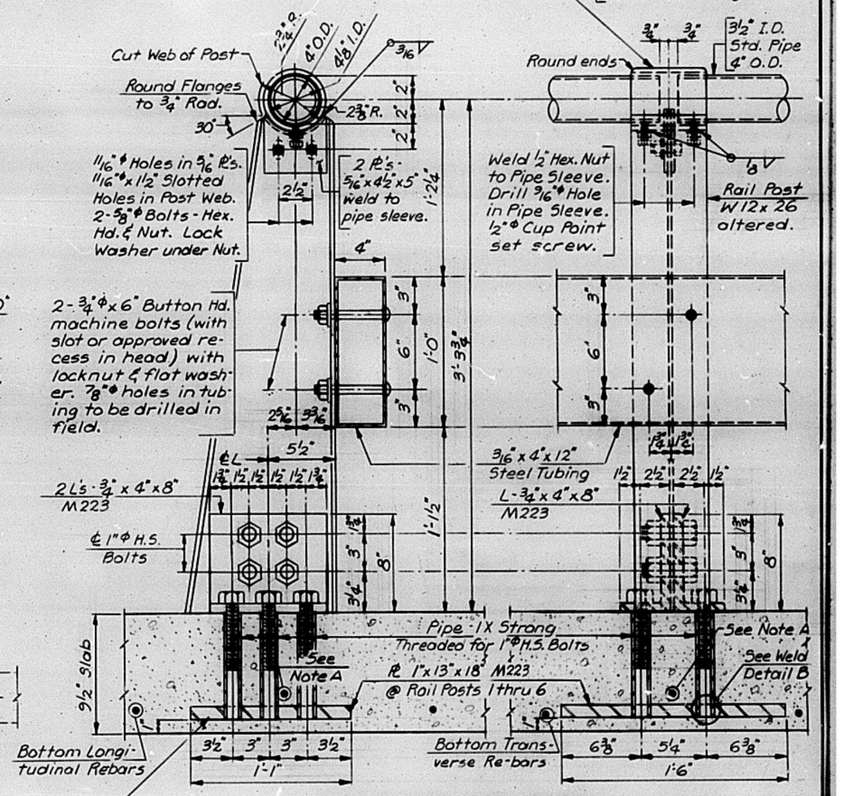
SECTION A-A



RAIL POST DIMENSIONS (ALTERED W12 x 26)

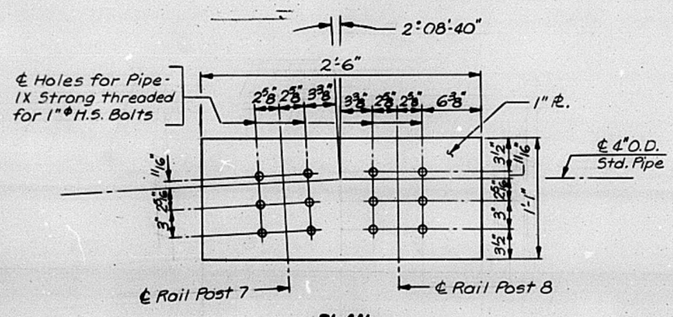


SECTION D-D



TYPICAL RAIL POST DETAILS

1 Single Plate for both Rail Posts 7 & 8. Size = 1" x 13" x 30" M223 (See Det. C this Sht.)



PLAN
DETAIL C
(Single Plate for Rail Posts 7 & 8.)

NOTES

All dimensions shown are measured horizontally.

Note A: Bottom Longitudinal & Transverse Reinforcement Bars that fall in line with 1" x 13" x 18" Plates shall be placed over the plates.

Pipes - 1X Strong shall be plugged during pouring of concrete. Upper end plugs shall be temporary & lower end plugs may be permanent.

Hollow structural steel tubing shall conform to the requirements of A.S.T.M. A-500 Grade B or A-501 Structural Steel Tubing.

All other steel shapes & plates shall conform to the requirements of AASHTO M-183 unless otherwise noted.

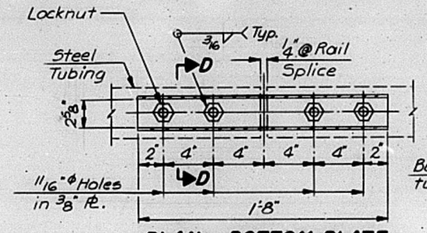
Provide one ⅛" and one ¼" shim plate 6½" x 12", per post, to align rail box section.

Bolts, cap screws, and nuts shall conform to the requirements of ASTM A-307 except for high strength bolts, nuts & washers noted which shall conform to AASHTO M-164

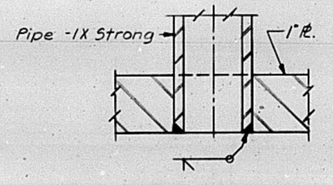
Railing shall be in accordance with Sec. 508 of the Std. Spec., except as noted, & paid for at the contract unit price per Lin. Ft. for Steel Railing.

Railing shall be adjusted to true vertical and horizontal alignment after erection.

Cap all rail ends as noted.



PLAN - BOTTOM PLATE
RAIL SPLICE DETAILS



WELD DETAIL B

STEEL BRIDGE RAIL DETAILS
RAMP E-SPAN 10E

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC.(15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O.
CHECKED C.R.N.
DRAWN D.A.N.
CHECKED C.R.N.

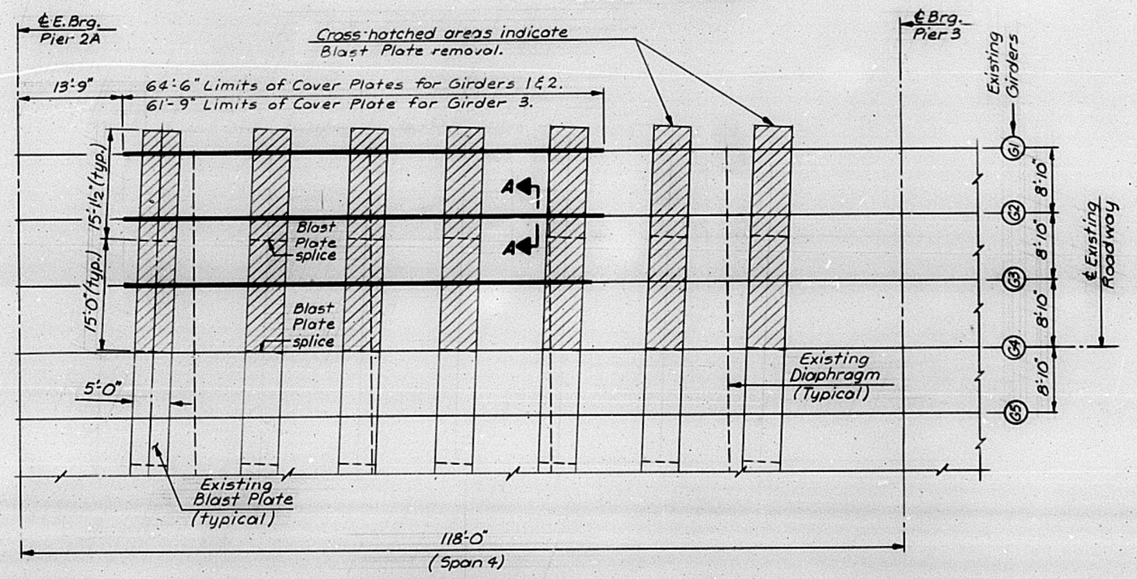
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

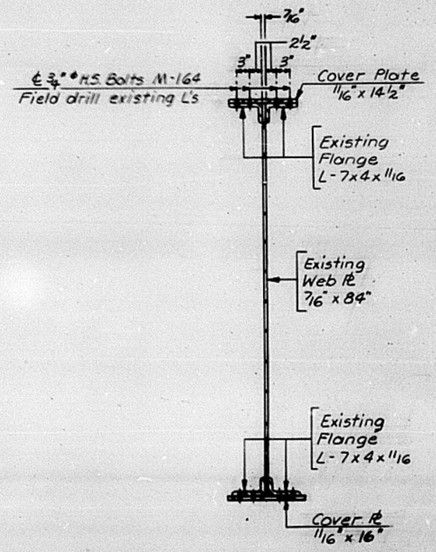
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(158-1) -P	Peoria & Tazewell	96	88
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

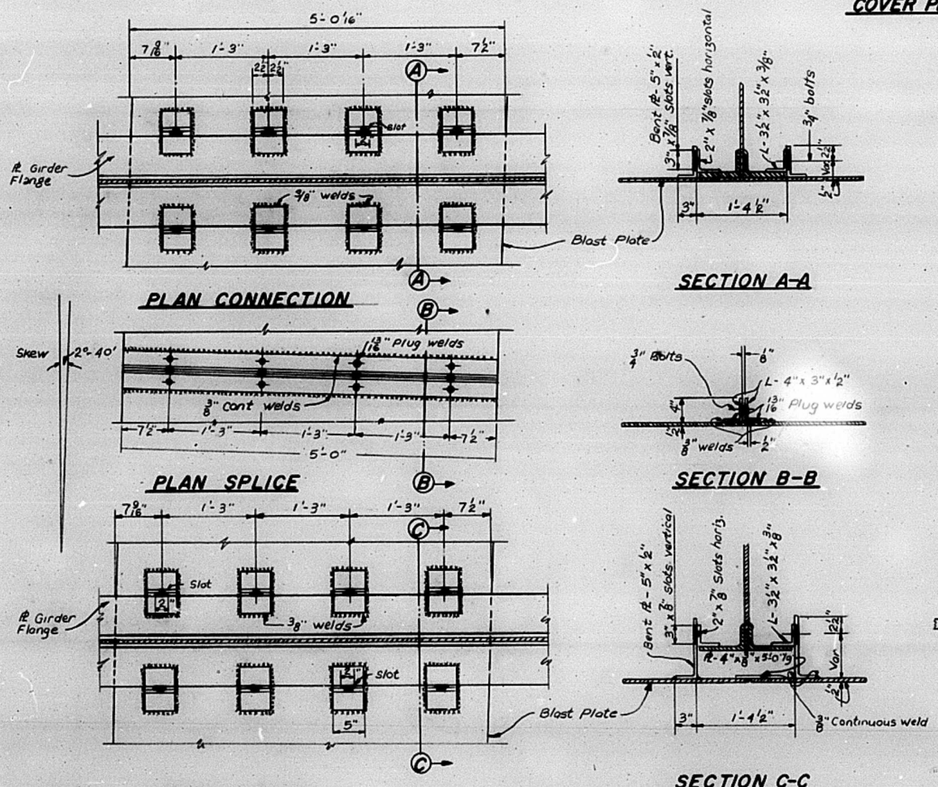
Sheet 86 of 93



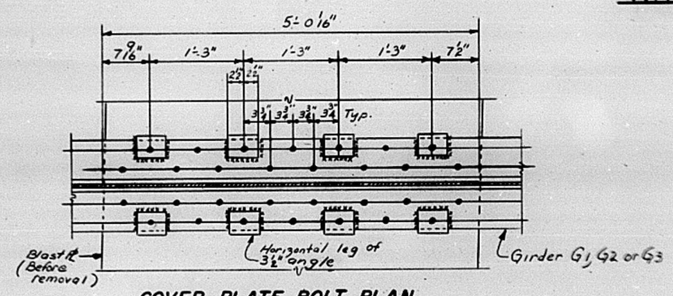
COVER PLATE LAYOUT



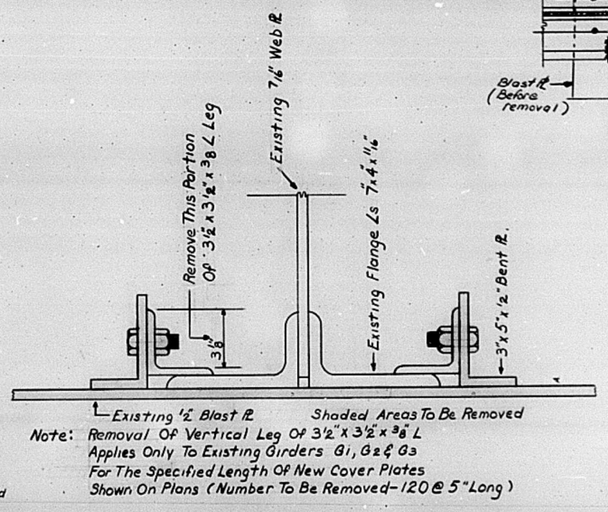
SECTION A-A
TYPICAL - SPAN 4 - GIRDERS 1,2 & 3



BLAST PLATE DETAILS



COVER PLATE BOLT PLAN



Note: Removal Of Vertical Leg Of 3½" x 3½" x 3/8" L Applies Only To Existing Girders G1, G2 & G3 For The Specified Length Of New Cover Plates Shown On Plans (Number To Be Removed - 120 @ 5" Long)

BLAST PLATE CONNECTION REMOVAL

Note: Cover plates shall be made of M183 steel.

STRUCTURAL STEEL DETAILS
EXISTING SPAN 4

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (158-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED S.C.O.
DRAWN D.A.N.
CHECKED S.C.O.

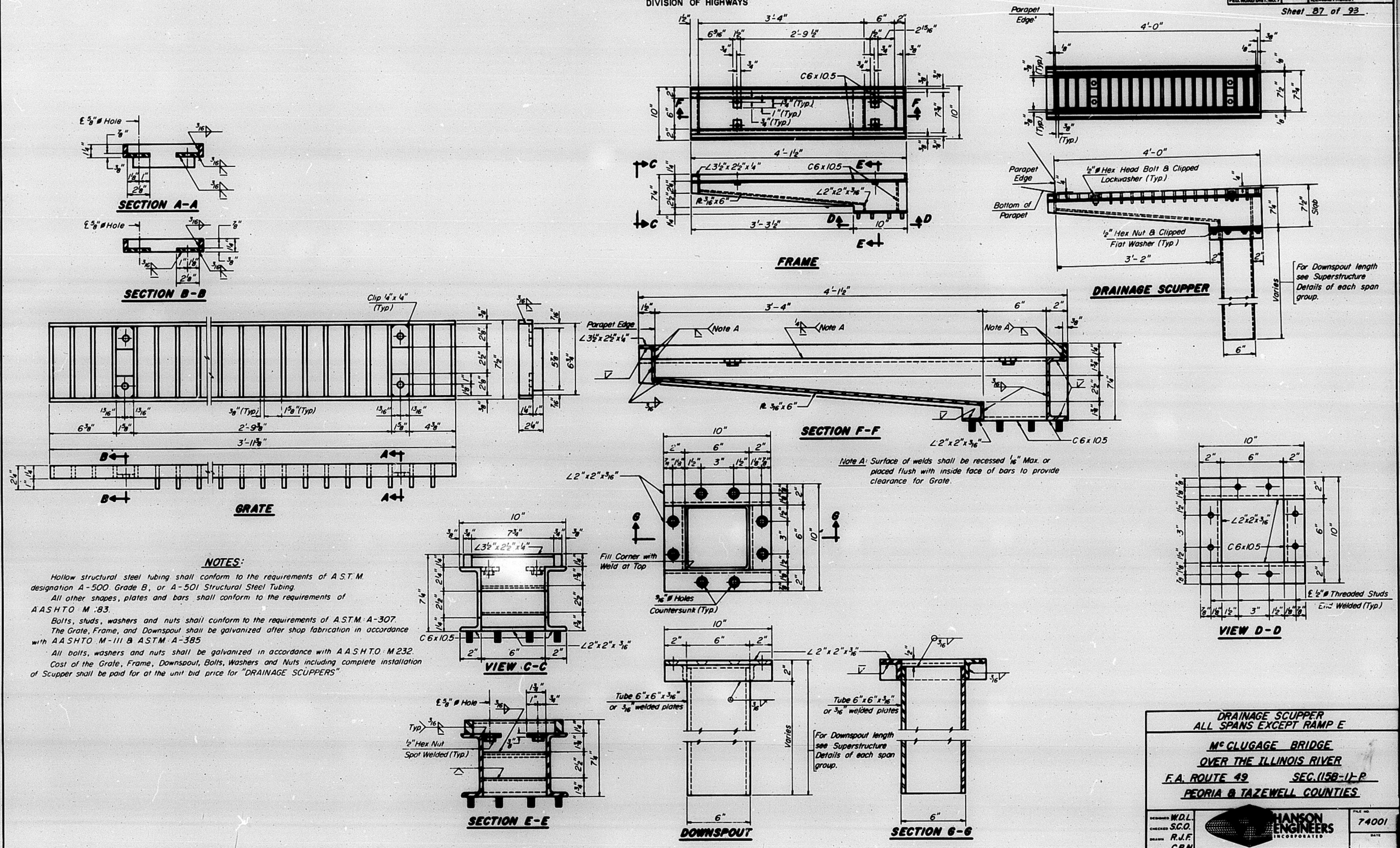
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA-49	(158-1)-P	Peoria & Tazewell	96	89
FED. ROAD DIST. NO. 7		ILLINOIS PROJECT		

Sheet 87 of 93



NOTES:

Hollow structural steel tubing shall conform to the requirements of A.S.T.M. designation A-500 Grade B, or A-501 Structural Steel Tubing.

All other shapes, plates and bars shall conform to the requirements of A.A.S.H.T.O. M-83.

Bolts, studs, washers and nuts shall conform to the requirements of A.S.T.M. A-307.

The Grate, Frame, and Downspout shall be galvanized after shop fabrication in accordance with A.A.S.H.T.O. M-111 & A.S.T.M. A-385

All bolts, washers and nuts shall be galvanized in accordance with A.A.S.H.T.O. M 232.

Cost of the Grate, Frame, Downspout, Bolts, Washers and Nuts including complete installation of Scupper shall be paid for at the unit bid price for "DRAINAGE SCUPPERS".

DRAINAGE SCUPPER
ALL SPANS EXCEPT RAMP E

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (158-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED S.C.O.
DRAWN R.J.F.
CHECKED C.R.N.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

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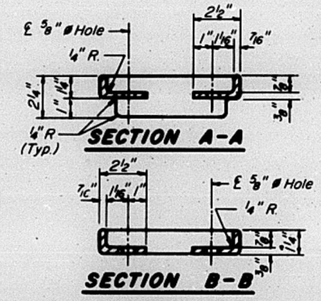
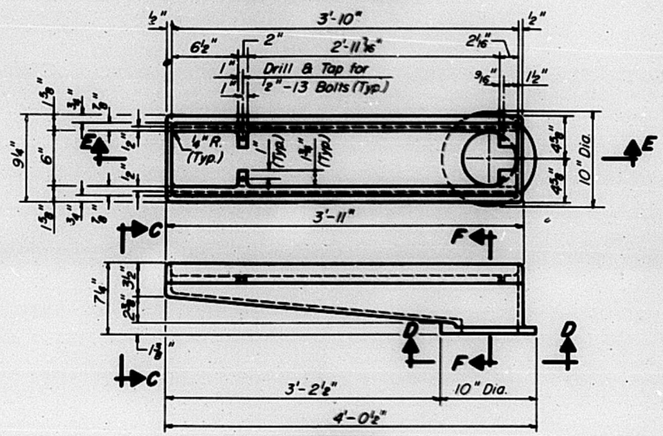
DATE

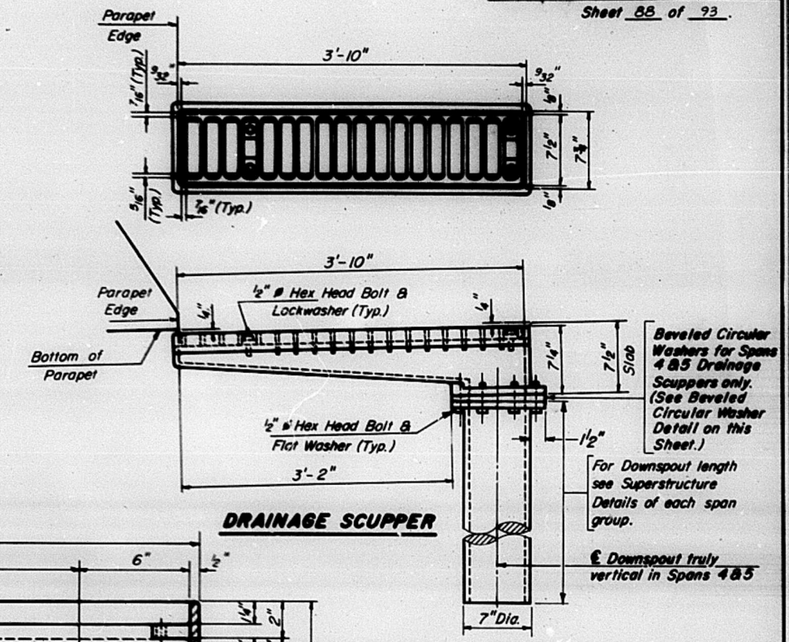
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

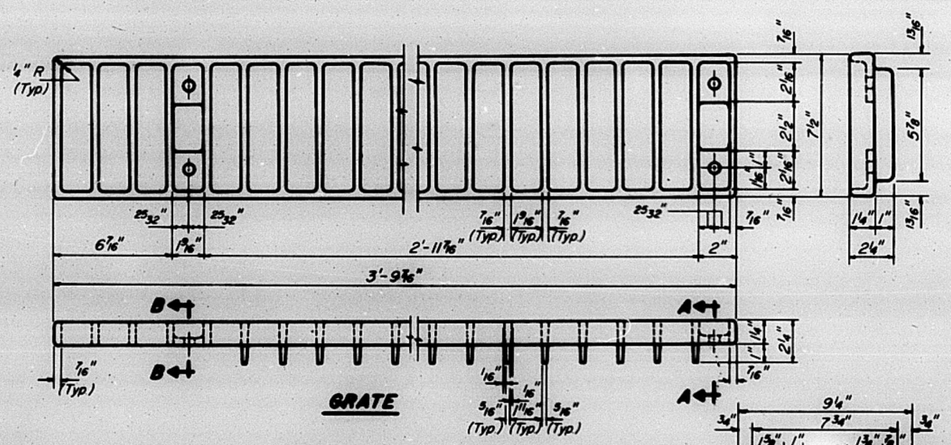
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA:49	(158-1)-P	Peoria & Tazewell	96	90
FED. ROAD DIST. NO. 7		ILLINOIS PROJECT		

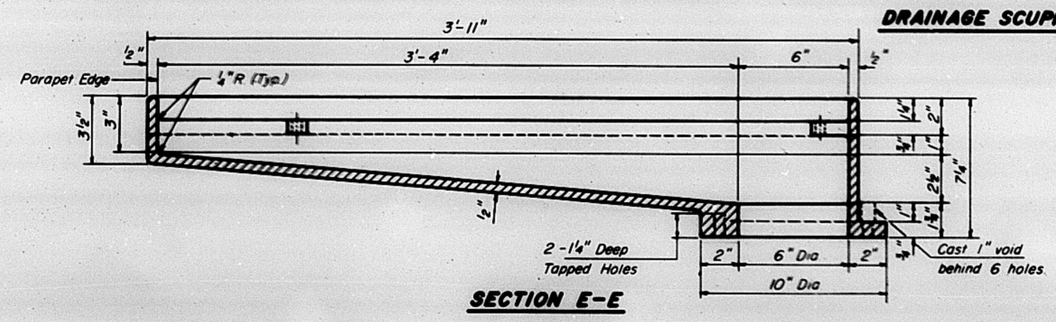
Sheet 88 of 93

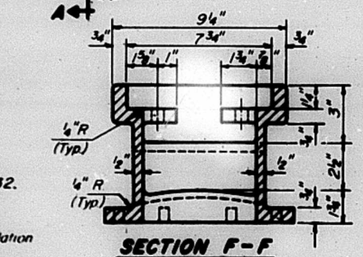


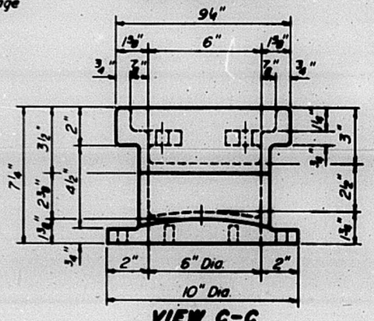


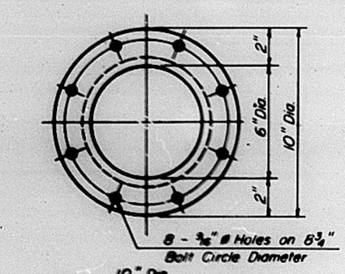


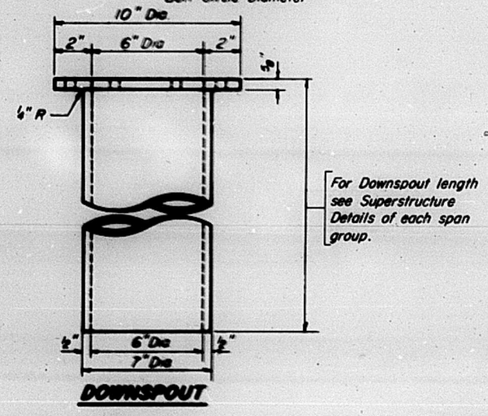


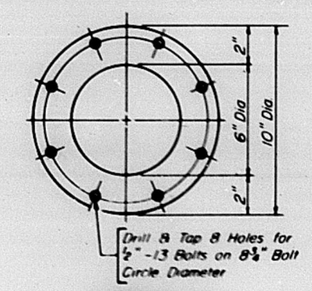


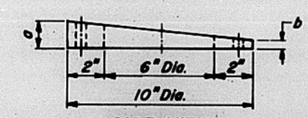












WASHER LOCATION	a	b
* Downspout closest to Pier 2	1 3/8"	3/8"
* Downspout closest to Pier 3	1 1/8"	3/8"
* Downspout closest to Pier 4	3/16"	3/8"

* See Sheet 91 of 93 for exact downspout locations.

BEVELED CIRCULAR WASHER DETAIL

NOTES:

All cast iron parts shall be gray iron conforming to the requirements of AASHTO: M-105, Class 30.

Bolts and washers shall conform to the requirements of A.S.T.M.: A-307.

All bolts and washers shall be galvanized in accordance with A.A.S.H.T.O. M-232.

As an alternate bolts and washers may be stainless steel conforming to the requirements of A.S.T.M. A-193 Type 304.

Cost of the Grate, Frame, Downspout, bolts and washers including complete installation of Scupper shall be paid for at the unit bid price for "DRAINAGE SCUPPERS".

The Contractor may use at his option steel drainage scuppers or cast iron drainage scuppers.

ALTERNATE - CAST IRON DRAINAGE SCUPPER
ALL SPANS EXCEPT RAMP E

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (158-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED S.C.O.
DRAWN R.J.F.
CHECKED C.R.N.

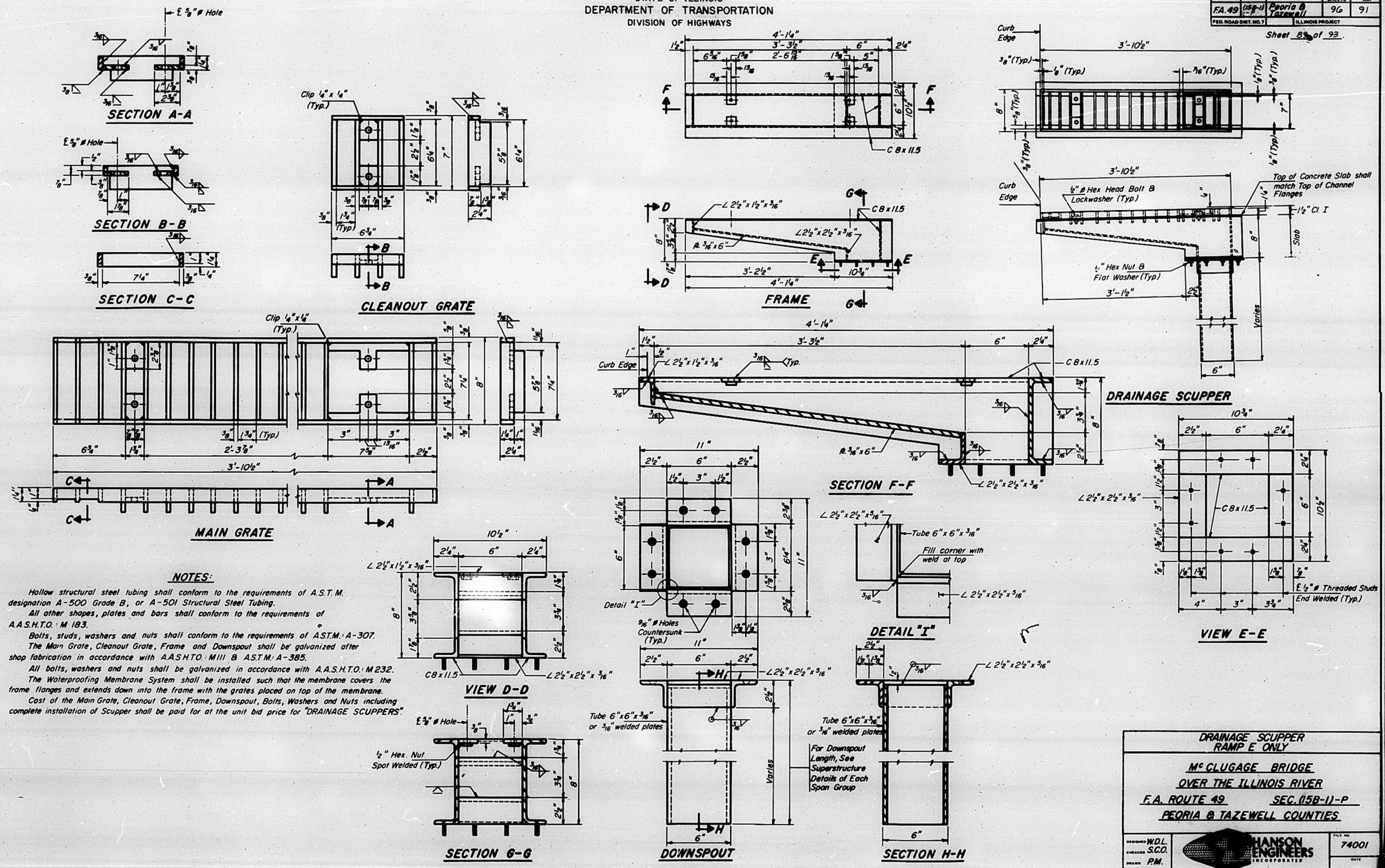
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1)-P	Peoria & Tazewell	96	91
FED. ROAD DIST. NO. 7		ILLINOIS PROJECT		

Sheet 88 of 93



NOTES:

Hollow structural steel tubing shall conform to the requirements of A.S.T.M. designation A-500 Grade B, or A-501 Structural Steel Tubing.

All other shapes, plates and bars shall conform to the requirements of A.A.S.H.T.O. M 183.

Bolts, studs, washers and nuts shall conform to the requirements of A.S.T.M. A-307.

The Main Grate, Cleanout Grate, Frame and Downspout shall be galvanized after shop fabrication in accordance with A.A.S.H.T.O. M111 & A.S.T.M. A-385.

All bolts, washers and nuts shall be galvanized in accordance with A.A.S.H.T.O. M 232.

The Waterproofing Membrane System shall be installed such that the membrane covers the frame flanges and extends down into the frame with the grates placed on top of the membrane.

Cost of the Main Grate, Cleanout Grate, Frame, Downspout, Bolts, Washers and Nuts including complete installation of Scupper shall be paid for at the unit bid price for "DRAINAGE SCUPPERS".

DRAINAGE SCUPPER
RAMP E ONLY

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED S.C.O.
DRAWN P.M.
CHECKED W.D.L.

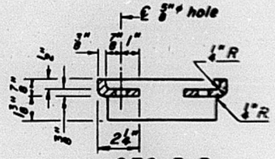
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

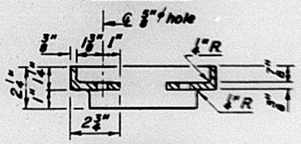
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(158-1) -P	Peoria & Tazewell	96	92
FED. ROAD DIST. NO. 7		ILLINOIS PROJECT		

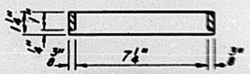
Sheet 90 of 93



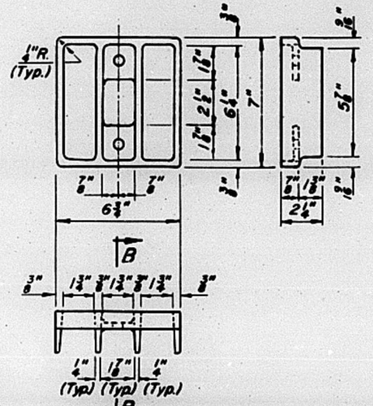
SEC. B-B



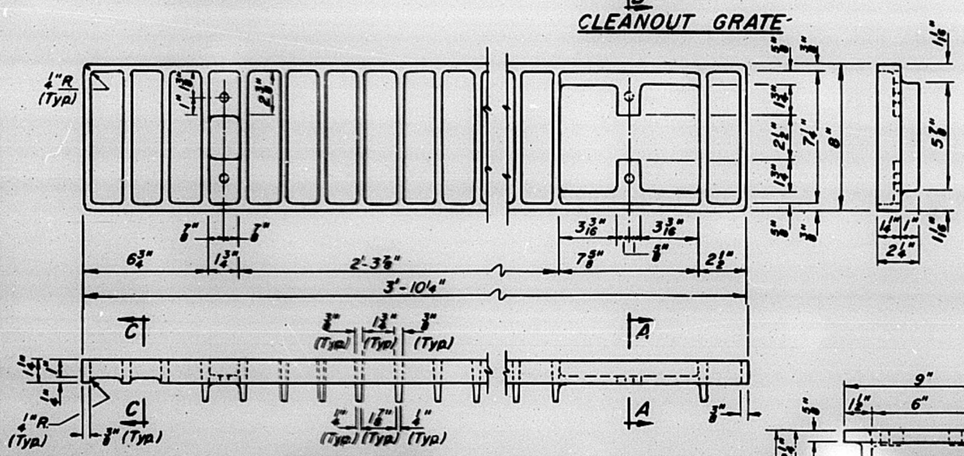
SEC. A-A



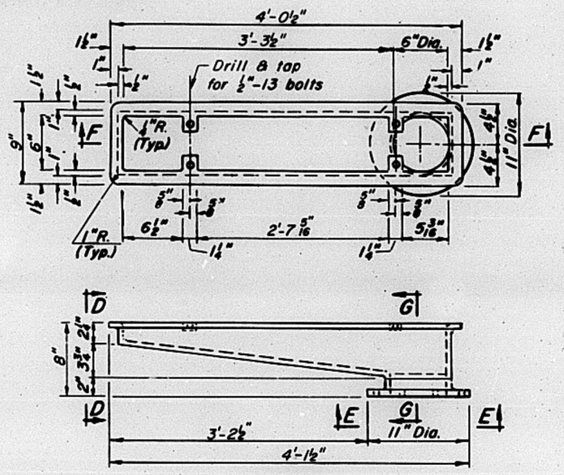
SEC. C-C



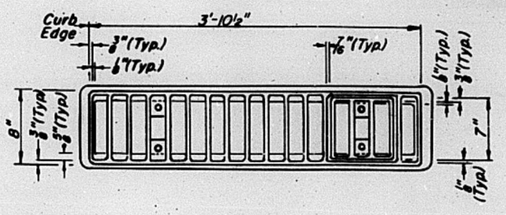
CLEANOUT GRATE

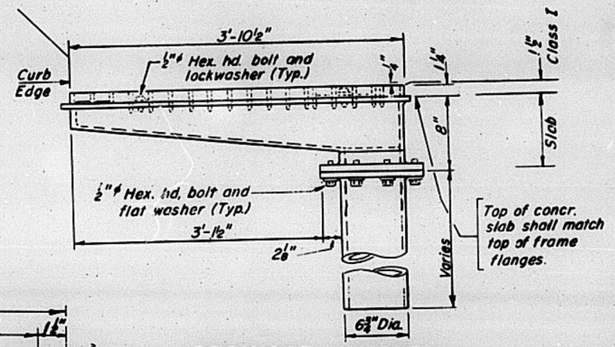


MAIN GRATE

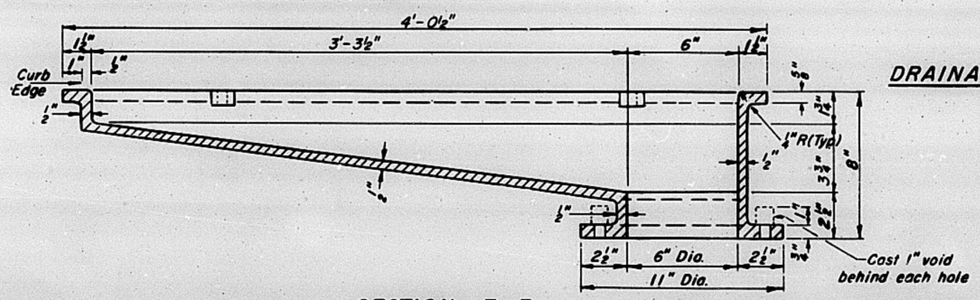


FRAME

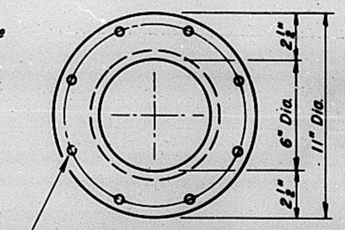




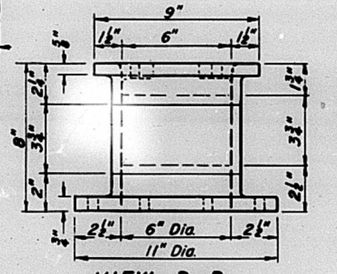
DRAINAGE SCUPPER



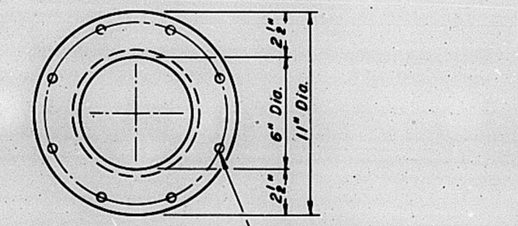
SECTION F-F

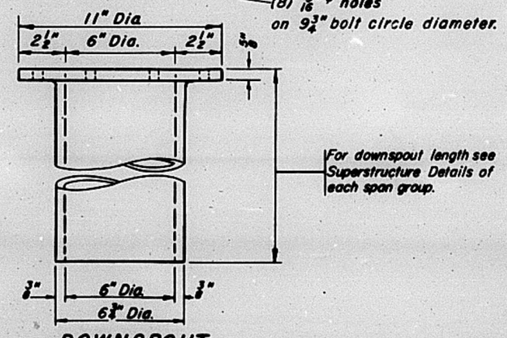


VIEW E-E

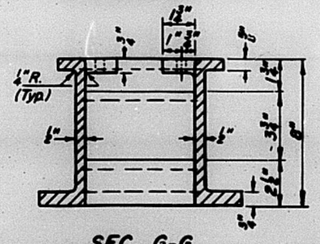


VIEW D-D





DOWNSPOUT



SEC. G-G

NOTES:

All cast iron parts shall be gray iron conforming to the requirements of AASHTO M 105, Class 30.

Bolts, washers and nuts shall conform to the requirements of ASTM A-307.

All bolts, washers and nuts shall be galvanized in accordance with AASHTO M 232.

The waterproofing membrane system shall be installed such that the membrane covers the frame flanges and extends down into the frame with the grates placed on top of the membrane.

Cost of the Main Grate, Cleanout Grate, Frame, Downspout, Bolts, Washers and Nuts including complete installation of Scupper shall be paid for at the unit bid price for "DRAINAGE SCUPPERS".

The Contractor may use at his option steel frames and steel grates or cast frames and cast grates, but will not be allowed to use steel grates with cast frames nor cast grates with steel frames.

ALTERNATE CAST IRON DRAINAGE SCUPPER
RAMP E ONLY

Mc CLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC.(158-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED W.D.L.
CHECKED S.C.Q.
DRAWN P.M.
CHECKED W.D.L.

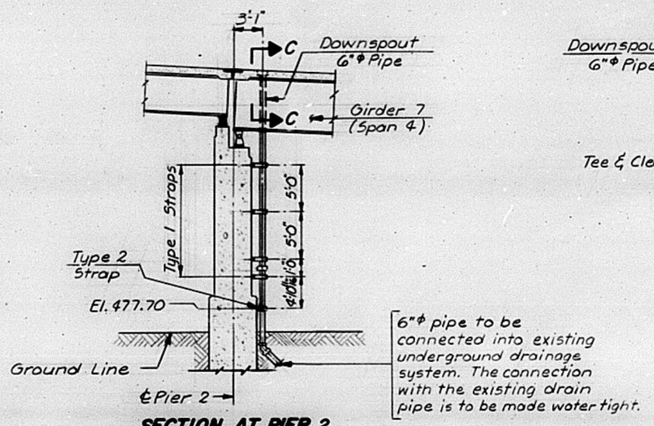
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

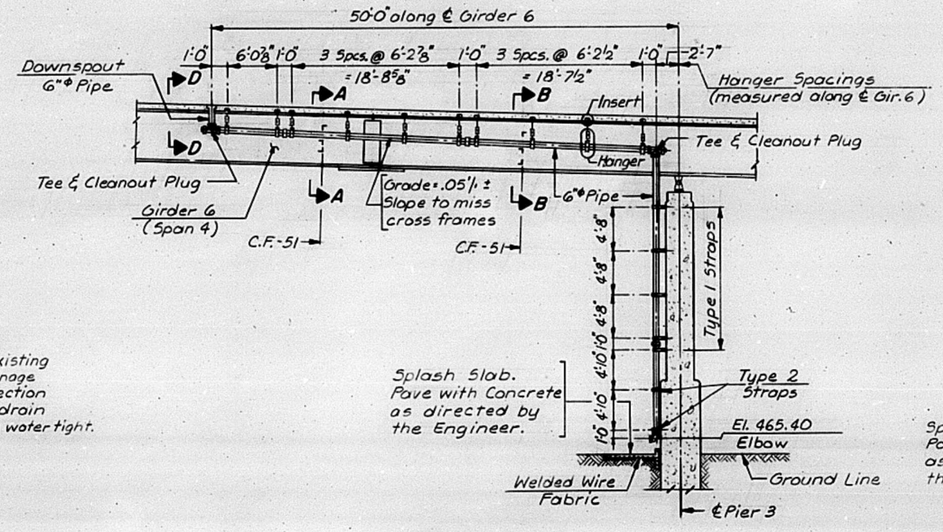
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B-1) P	Peoria & Tazewell	96	93
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

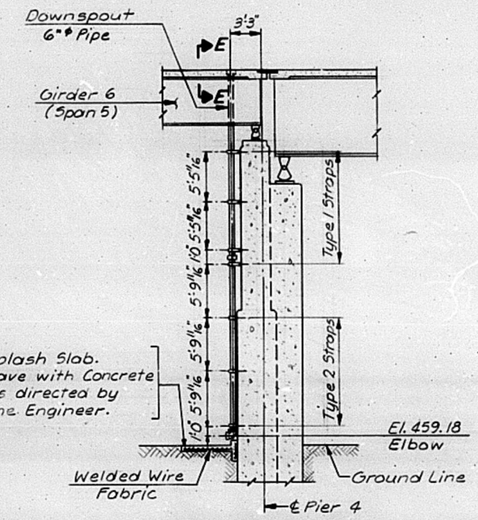
Sheet 91 of 93



SECTION AT PIER 2
DRAINAGE DETAILS



SECTION AT PIER 3
DRAINAGE DETAILS



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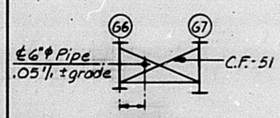
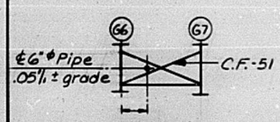
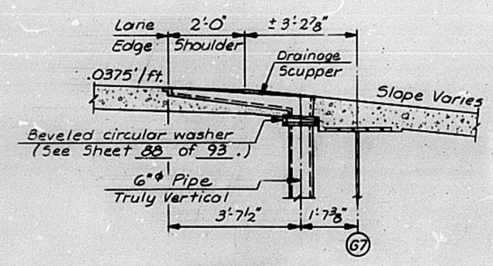
DRAINAGE DETAILS



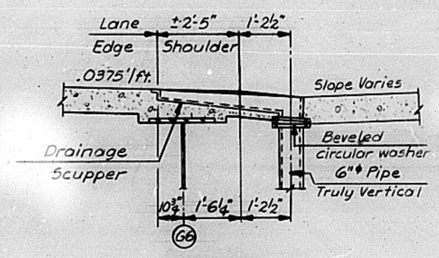
SEC. A-A



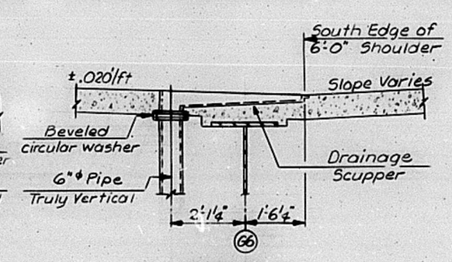
SEC. B-B



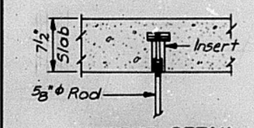
SECTION C-C



SECTION D-D



SECTION E-E



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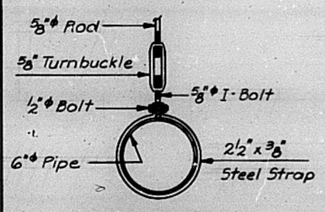
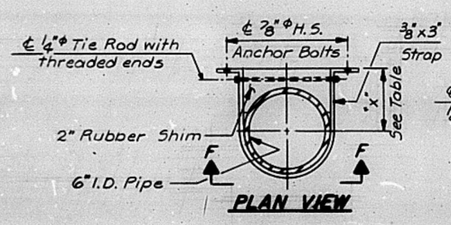
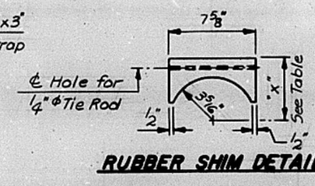


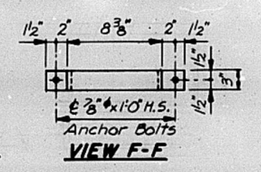
HANGER DETAIL



PLAN VIEW



RUBBER SHIM DETAIL



VIEW F-F

STRAP DETAILS

TABLE FOR DIMENSION "X"	
Strap	"x"
Type 1	1'-1"
Type 2	6"

NOTES

All dimensions shown are measured horizontally.

All structural steel shall meet the requirements of AASHTO M-183 unless otherwise shown.

All High Strength Bolts and Anchor Bolts shall meet the requirements of AASHTO M-164.

Class X Concrete shall be used in paved splash slabs & shall be incidental to the Drainage System.

Welded Wire Fabric shall be 6" x 6" mesh, #4 gage, 58 Lbs. per 100 Sq. Ft., conforming to the requirements of AASHTO M-55.

The Drainage Scuppers are included in Bill of Material for each span group.

Pay item Drainage System, Complete shall include providing and installing 12"φ pipe, 6"φ pipe, saddles, elbows, tees, sleeves, inserts, hangers, straps, cleanouts, and all other necessary items to complete the underdeck drainage.

DRAINAGE SYSTEM
SPANS 4 & 5

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (15B-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED N.D.L.
CHECKED S.C.O.
DRAWN D.A.N.
CHECKED S.C.O.

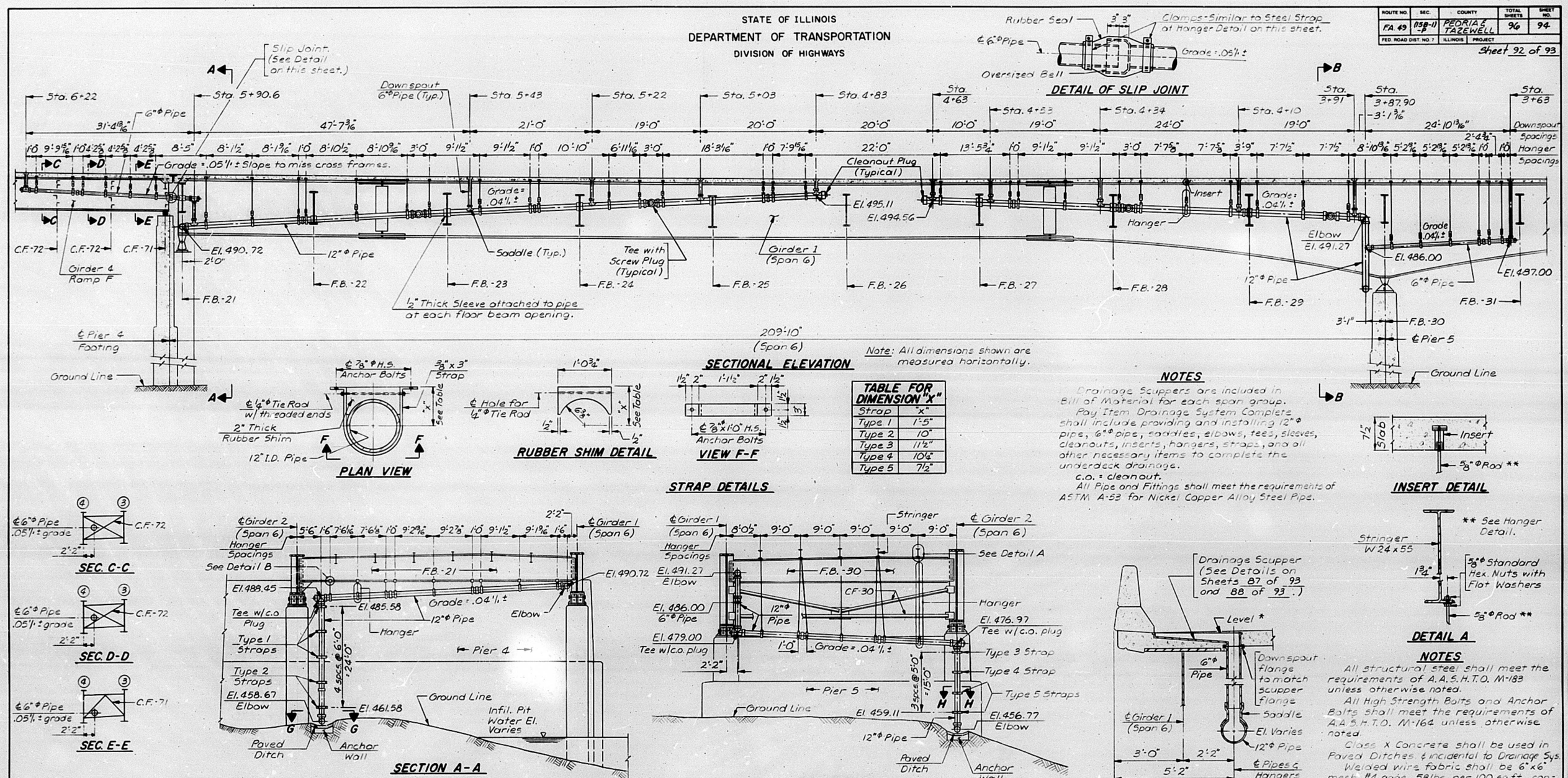
HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS · PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
FA. 49	158-11-P	PEORIA & TAZEWELL	96	94
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

Sheet 92 of 93



DETAIL OF SLIP JOINT

SECTIONAL ELEVATION

Note: All dimensions shown are measured horizontally.

PLAN VIEW

RUBBER SHIM DETAIL

VIEW F-F

STRAP DETAILS

TABLE FOR DIMENSION "X"	
Strap	"x"
Type 1	1'-5"
Type 2	10"
Type 3	11 1/2"
Type 4	10 1/4"
Type 5	7 1/2"

NOTES

Drainage Scuppers are included in Bill of Material for each span group.

Pay Item Drainage System Complete shall include providing and installing 12"Φ pipe, 6"Φ pipe, saddles, elbows, tees, sleeves, cleanouts, inserts, hangers, straps, and all other necessary items to complete the underdeck drainage.

c.o. = cleanout.

All Pipe and Fittings shall meet the requirements of ASTM A-53 for Nickel Copper Alloy Steel Pipe.

INSERT DETAIL

SECTION A-A

SECTION B-B

SECTION THRU CURB

* Applies only to scuppers shown on this sheet.

DETAIL A

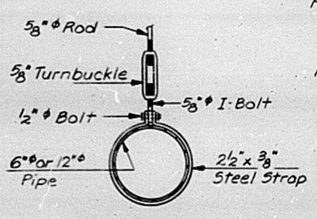
NOTES

All structural steel shall meet the requirements of A.A.S.H.T.O. M-183 unless otherwise noted.

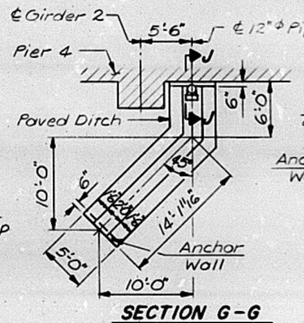
All High Strength Bolts and Anchor Bolts shall meet the requirements of A.A.S.H.T.O. M-164 unless otherwise noted.

Class X Concrete shall be used in Paved Ditches & incidental to Drainage Sys.

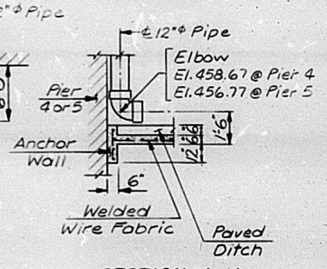
Welded wire fabric shall be 6"x6" mesh, #4 gage, 58lbs. per 100 sq.ft., conforming to the requirements of A.A.S.H.T.O. M-55.



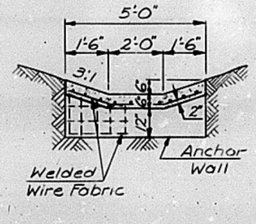
HANGER DETAIL



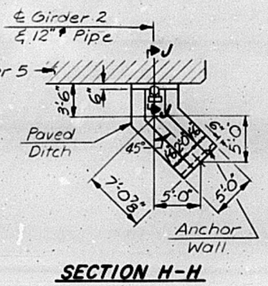
SECTION G-G



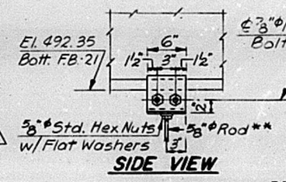
SECTION J-J



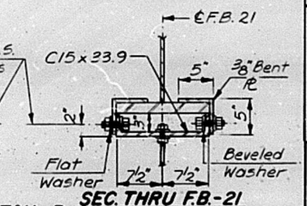
SECTION THRU PAVED DITCH



SECTION H-H



SIDE VIEW



SEC. THRU F.B.-21

DETAIL B

DRAINAGE SYSTEM
SPAN 6

McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 SEC. (158-1)-P
PEORIA & TAZEWELL COUNTIES

DESIGNED S.C.O.
CHECKED W.D.L.
DRAWN D.A.N.
CHECKED W.D.L.

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

FILE NO. 74001
DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

F.A. Rte. 49	Sec. 1158-1-P	County Peoria & Tazewell	Total Sheets 96	Sheet No. 95

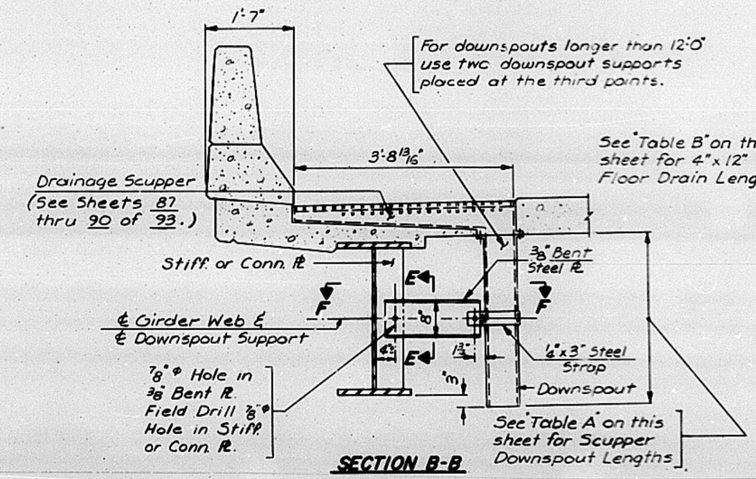
Sheet 93 of 93

"TABLE A"

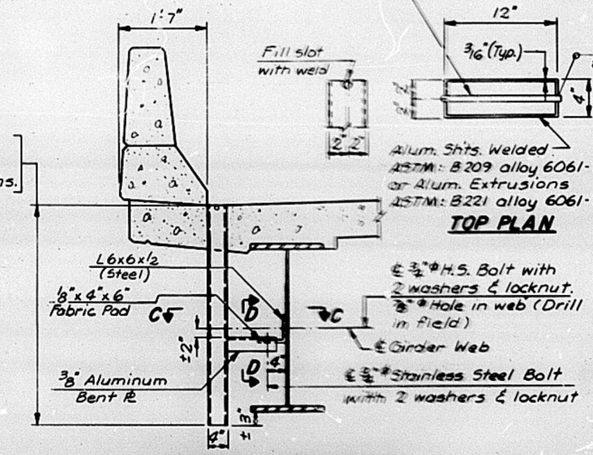
DRAINAGE SCUPPER DOWNPOUTS	
Length	No.
4'-7"	24
5'-8"	12
6'-3"	5
6'-7"	4
7'-1"	2
7'-11"	1
9'-6"	1
10'-0"	7
10'-4"	5
10'-8"	1
11'-9"	2
12'-0"	1
14'-10"	16
15'-6"	33
16'-1"	1

"TABLE B"

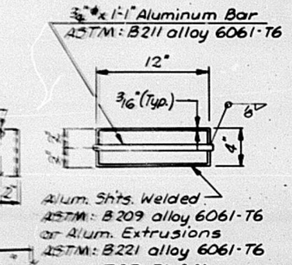
4"x12" FLOOR DRAINS	
Length	No.
10'-7"	52
10'-8"	79
11'-2"	12
11'-5"	16
11'-10"	6
12'-5"	5
12'-6"	8
13'-0"	3
13'-7"	3
13'-11"	3
14'-0"	8
14'-9"	4
14'-10"	4
15'-6"	21
15'-9"	4
15'-10"	4
16'-8"	4
16'-9"	4



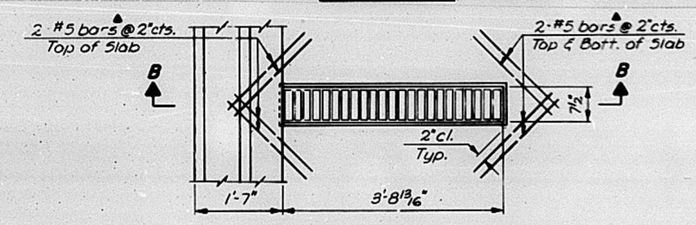
SECTION B-B



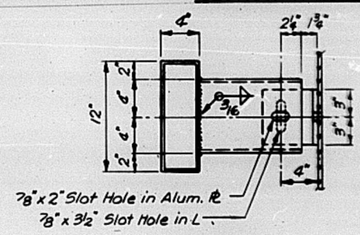
SECTION THRU PARAPET



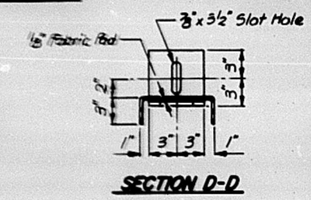
TOP PLAN



PLAN



SECTION C-C

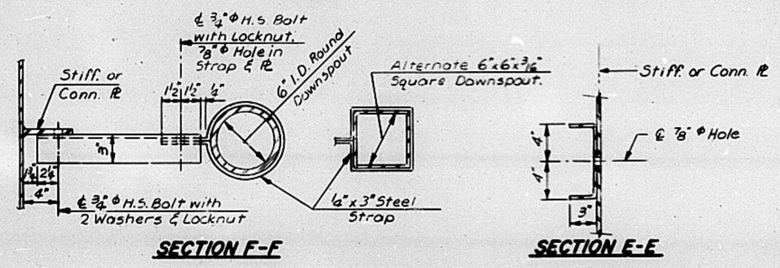


SECTION D-D

4"x12" FLOOR DRAIN DETAILS

Note: The exterior surfaces of the aluminum drain shall be painted the same color as bridge girder.

No. 4"x12" Floor drains required = 240 .



SECTION F-F

SECTION E-E

DRAINAGE SCUPPER DETAILS

FLOOR DRAINS & DOWNSPOUTS

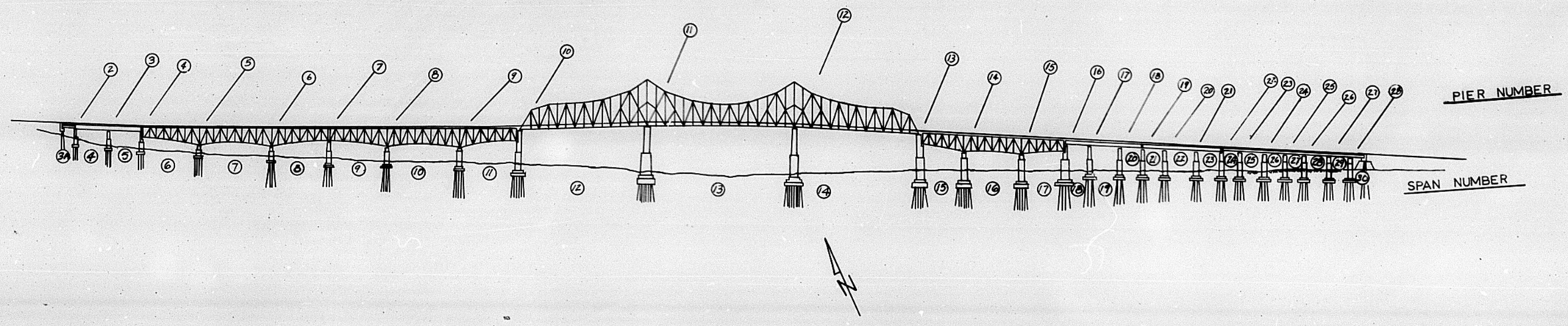
McCLUGAGE BRIDGE
OVER THE ILLINOIS RIVER
F.A. ROUTE 49 **SEC. (15B-1)-P**
PEORIA & TAZEWELL COUNTIES

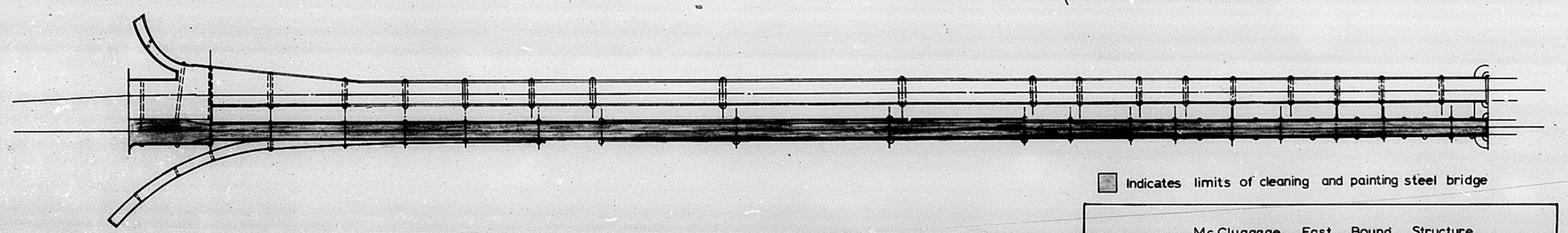
CRN
NDL
DAN
CRN

HANSON ENGINEERS INCORPORATED
SPRINGFIELD, ILLINOIS PEORIA, ILLINOIS

File No. 74001

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 49	(15B)-P	PEORIA TAZEWELL	96	96
FED. ROAD DIV. NO. 7	ILLINOIS	PROJ.		





Indicates limits of cleaning and painting steel bridge

Mc Cluggage East Bound Structure		
SPANS	STRUCTURAL STEEL LBS.	
3A	96,180	
4,5	589,290	
6 to 11	2,620,687	
12,13,14	4,534,030	
15,16,17	909,540	
18 to 30	1,284,975	
TOTAL	10,034,702 LBS. = 5,017 TONS	

PEORIA COUNTY 2786.5 TONS
TAZEWELL COUNTY 2230.5 TONS

TOTAL BILL OF MATERIAL

ITEM	UNIT	TOTAL	PEORIA	TAZEWELL
CLEANING AND PAINTING STEEL BRIDGE	L-SUM	1	0.6	0.4
TRAFFIC CONTROL AND PROTECTION STD 2315	L-SUM	1	1	

GENERAL PLAN
EXISTING
Mc CLUGGAGE BRIDGE
OVER ILLINOIS RIVER
F.A. ROUTE 49 SEC(15B)-P
PEORIA - TAZEWELL COUNTIES