LOGAN COUNTY

BRIDGE

INSPECTION REPORT

1969

PREPARED

FOR

THE HONORABLE BOARD OF COUNTY COMMISSIONERS

Don Downing

Harvey C. Terrill *John Inskeep*

AND

Chester R. Kurtz P.E.

LOGAN COUNTY ENGINEER

BY

R. F. Mc GUCKIN & ASSOC. INC.

CIVIL ENGINEER

COLUMBUS, OHIO

R. F. McGuckin & Associates
Consulting Civil Engineers
Box 5553
Columbus, Ohio 43221

BRIDGE NO.

LOG - 21 - 1.01

OVER THE

GREATER MIAMI RIVER

This through Whipple Truss was built in 1882 on stone abutments by the Massilon Bridge Co. The structure is placed squarly across the stream, with gently sloping banks.

Except where the truss has been hit, (U_5L_5), it is in very good condition, the only structual deficiency occurring in the hip vertical (~~67%~~ 56% legal). The floor, which has been replaced, is in fair condition, however, the curb has rotted away and should be removed to permit drainage.

The floor system is the only serious weakness (~~44%~~ 41% legal) because of light stringers. When the deck is replaced, the stringers should be replaced with larger and heavier beams.

It is therefore recommended:

1. The bridge be posted for one-lane traffic and 55% reduction of legal loads. 60%
2. The curbing be removed to permit drainage.
3. Consideration should be given to using welded metal deck to reduce vibration.

Respectfully submitted,

RFM:hb

R. F. McGUCKIN & ASSOCIATES

R. F. McGuckin, PE

R. F. McGuckin & Associates
Consulting Civil Engineers
Box 5553
Columbus, Ohio 43221

BRIDGE NO

LOG - 21 - 1.01

The following items were observed and are here noted as a matter of record:

1. Approach guard rail 25 ft. on north 37.5 feet on south.
2. Approach pavement higher than bridge.
3. Lellow guard in first bay - intermittant.
4. Hip vertical welded above eye.
5. U_5L_5 North - has been damaged by collision and rewelded. Approximately One (1) inch excentricity in load.
6. U_3L_5 North - has had turnbuckle welded.
7. L_0U_1 has been brushed - cover plate bent.
8. Stone abutment walls in excellent condition.
9. Floor leaks.
10. West end finish leaks badly.
11. Second and Third stringers from south have been replaced.
12. Substantial vibration under load.

BRIDGE NO: LOG 21-101 SPAN (c. to c.) 140'-0"
COUNTY LOGAN ROADWAY 16'-0"
TYPE WHIPPLE TYPE FLOOR WOOD
DATE BUILT 1882 WEARING SURF. BIT

ANALYSIS OF BRIDGES FOR POSTING

CALCULATED BY R.L. PHILLIPS DATE 8-6-69
CHECKED R.B. 6/26/74
R. F. McGUCKIN & ASSOCIATES

BEAM OR GIRDER (LONGITUDINAL) Span 14'-0" Spacing 1'-8" Dead Load per lin. ft. of Beam 60 #/'

Size of Beam	Section Modulus	Percent Available	Section Modulus Available	Moment Resist. Foot Kips	D.L.M. 1000 # p.l.f.	D.L.M. per Beam	Mom.Res. Available L.L.+I	L.L.M. per Traffic Lane	Equivalent Number Beams	L.L.M. per Beam	Impact	L.L.M. plus Impact	Percent S-15-46 Loading	Percent Legal Load	Percent Total and Axle Loads Reduced	S- -46
6I12.5	7.3	90%	6.57	11.50	24.5	1.47	10.03	84.0	5.40	15.56	30%	20.23	49.6%	40.9%	59.1%	S-6.1-46
				7.67		1.97	6.2					20.23				7.59 HS-4.6-44

FLOOR BEAMS Ctr. to Ctr. Supports 17'-3" Dead Load per lin. ft. of Beam 556 #/'

Size or Section of Beam	Section Modulus	Percent Available	Section Modulus Available	Moment Resist. Foot Kips	D.L.M. 1000 # p.l.f.	D.L.M. per Beam	Mom.Res. Available L.L.+I	Reaction due to Traffic Lane Load	L.L.M. per Beam	Impact	L.L.M. plus Impact	Percent S-15-46 Loading	Percent Legal Load	Percent Total and Axle Loads Reduced		
	112.26	90%	101.03	176.81	37.2	20.67	156.14	24	74	30%	96.2	162.3	97.4	2.6%		
									71	21.3	92.3	169.2	101.5	0		

TRUSSES Span (ctrs. end bearings) 140'-0" Panel Length 14'-0" Dead Load per lin. ft. (One Tr.) ____ D.L.Pan. 6600

Member	Section	Percent Section Available	Unit Stress Used	Total Stress Available	Mom.Res. or Total Stress	D.L. Stress or Mom.	Stress or Mom. for L.L.+I	Stress or L.L.M. for one Traf.Lane	Percent to One Truss	Stress or L.L.M. to One Truss	Impact	Stress or L.L.M. plus Impact	Percent S-15-46 Loading	Percent Legal Load	Percent Total and Axle Loads Reduced	
L_0L_2	4.12	95%	21000	82.19	—	19.8	62.4	40.3	71%	28.6	18.9%	34.0	183	181	—	
L_2L_3	5.68		"	113.32	—	28.6	84.7	62.4		44.3		52.7	161	159	—	
L_4L_5	10.63		"	211.9	—	50.6	161.3	100.2		71.2		89.6	191	189	—	
L_0U_1	12.69		15153	182.7	—	35.6	147.1	75.6		51.5		61.3	240	238	—	
U_1U_2	"		16783	202.8	—	41.8	160.5	87.9		62.4		74.2	216	214	—	
U_4U_5	"		"	"	—	55.0	147.3	112.0		79.5		94.5	156	154	—	
U_1L_1	1.75		21000	34.9	—	6.6	28.3	33.1		23.5	30%	30.6	92.6	76A 55.6	24% 43.9	S-13.9-46
U_2L_2	4.78		12750	57.9	—	6.6	51.3	26.3		18.7	18.9%	22.2	231	229	—	
L_2L_4	8.50		21000	169.6	—	41.8	127.8	87.9		62.4	"	74.2	172	170	—	

Unit Stresses (Tension) For Posting
Structures Built Since 1930 – 27000 # p.s.i.
Structures Built 1900–1930 – 24000 # p.s.i.
Structures Built Before 1900 – 21000 # p.s.i.

$\tan_1\theta$ .667 $\sec_1\theta$ 1.20

$\tan_2\theta$ 1.333 $\sec_2\theta$ 1.667

ANALYSIS OF BRIDGE NO. LOG 21-1.01 Cont'd. BRIDGE FOR POSTING

Calculated by RLP Checked by

R. F. Mc Guckin & Associates
CONSULTING ENGINEERS

TRUSSES Span. c-c bgs. 140'-0" Panel length 14'-0" Dead load one truss/lin. ft. _____ Per panel 6600

Member	Section	% & Section available	Unit stress used	Total stress Available	Mom. Res. or total stress	D. L. Stress or mom.	Mom. Resist available for L. L. + Imp	Stress or LLM for 1 traffic lane	% to one truss	Stress or LLM to 1 truss	Impact	L.L.M. + Impact	% S-15-46 loading	% LEGAL LOAD	% total & axle loads reduced	S- -46
U_3L_3	3.90	95%	11900	44,090	—	3.3	40.8	19.3	71%	13.7	18.9%	16.3	250	248	—	
U_4L_4	"			44,090	—	0	44.1	16.0		11.4		13.5	326	323	—	
* U_5L_5	"			44,090	—	+3.6	47.7	9.9		7.1		8.4	569	563	—	
U_1L_2	3.12		21000	62.2	—	15.8	46.4	46.2		32.8		39.0	116	115	—	
U_1L_3	3.44			68.6	—	16.5	51.1	51.0		36.2		43.0	121	120	—	
U_2L_4	2.50			49.9	—	11.0	38.9	43.9		31.2		37.1	105	104	—	
U_3L_5	1.62			32.3	—	5.50	26.8	32.2		22.9		27.2	98.6	97.6	2.4%	
U_4L_6	1.27			25.3	—	0	25.3	26.7		19.0		22.5	112	111	—	
U_5L_7	.77			15.4	—	+6.1	21.5	16.6		11.8		14.0	153	151	—	

Unit Stresses (tension) for Posting.

Structures built since 1930	27000 lb. p.s.i.
Structures built 1900 thru 1930	24000 lb. p.s.i.
Structures built before 1900	21000 lb. p.s.i.

Tan θ _____ Sec. θ _____

BRIDGE INSPECTION REPORT

CONDITION CODE: GOOD = 1, FAIR = 2, POOR = 3, CRITICAL = 4

Log. 21-1.01

BRIDGE NUMBER: EXISTING PLEAS. 21 - 1.01 (Twp. ROAD : SLM-L/R) REVISED ____ ____ (ROUTE SLM-L/R)

HWY. SYSTEM: C FED. AID SYSTEM: _ YEAR BUILT: 1882

DIV. __ BR. TYPE STT O/A LGTH. 140' NO. OF SPANS: 1 OVER OR UNDER: SOC GREAT MIAMI RIVER

SUPERSTRUCTURE:

		TYPE	COND.
1.	DECK SLAB: REINF. CONC.=1, TIMBER STRIP=2, TIMBER PLANK=3, FILLED STL. GRID=4, OPEN STL. GRID=5, CORRUGATED STL.=6, BUCKLE PL.=7, CHECKER PL.=8, JACK ARCH=9, OTHER=0	2	3
2.	WEARING SURFACE: CONC.=C, BITUMINOUS=B, OTHER=0	B	3
3.	CURBS & MEDIAN: CONC.=C, STL.=S, TIMBER=T, OTHER=0	T	4
4.	WALKWAYS: SEE DECK SLAB FOR TYPE CODE	—	
5.	RAILINGS: CONC.=C, STL.=S, TIMBER=T, CONC. & ALUMINUM=A, OTHER=0 — GUARD RAIL - 27" HIGH	S	2
6.	JOISTS: STL.=S, TIMBER=T	S	2
7.	FLOORBEAMS: STL.=S, CONC.=C, TIMBER=T	S	1
8.	FLOORBEAM CONNECTIONS: ROD=R, PLATE=P, ANGLE=A	R	1
9.	LONGITUDINAL BEAMS or GIRDERS: STL.=S, CONC.=C, PRESTRESSED CONC.=P, TIMBER=T	—	
10.	TRUSS ALIGNMENT: STL.=S, TIMBER=T	S	1
11.	HIP VERTICALS:		1
12.	END POSTS: STL.=S, TIMBER=T	S	1
13.	TOP CHORDS: STL.=S, TIMBER=T	S	1
14.	BOTTOM CHORDS: STL.=S, TIMBER=T	S	1
15.	WEB MEMBERS-VERTICAL: STL.=S, TIMBER=T — TYPE 3, COND. 3		
16.	DIAGONAL:	S	1
17.	PORTALS: STL.=S, TIMBER=T — TYPE S, COND. 1		
18.	SWAYBRACING: STL.=S, TIMBER=T	S	1
19.	LATERAL BRACING: STL.=S, TIMBER=T — TYPE S, COND. 1		
20.	CROSS FRAMES or DIAPHRAGMS: STL.=S, TIMBER=T, CONC.=C		
21.	DECK EXPANSION DEVICES: STL.=S, OTHER=0		
22.	BEARINGS: ROCKERS=R, BOLSTERS=B, ROLLERS=N, PLATES=P, ELASTOMERIC=E, OTHER=0 — TYPE N, COND. 3	P	1
23.	DRAINAGE SYSTEM: THRU CURBS=T, SCUPPERS=S, SCUPPERS WITH DOWNSPOUTS=D, OTHER=0 — OPEN SIDE	O	1
24.	ARCHES: CONC=C, STL=S, MASONRY=M, TIMBER=T		
25.	MOVABLE BRIDGE MACHINERY: BASCULE=B, VERTICAL LIFT=V, SWING=S		
26.	SUSPENSION BRIDGE CABLE or CHAIN BENTS:		
27.	SUSPENSION BRIDGE TOWERS: STL=S, MASONRY=M		
28.	SUSPENSION SYSTEMS-MAIN: CABLE=C, EYEBAR=E		
29.	SUSPENDER:		
30.	PAINT: SHOW YEAR LAST PAINTED IN LEFT & CENTER BLOCKS — Est. 19 68 1		
31.	RESPONSE TO LIVE LOAD: EXCESSIVE DEFL. & VIB.=E, SATISFACTORY=S		S

SUBSTRUCTURE:

		TYPE	COND.
40.	ABUTMENTS: WALL=W, SPILL-THRU=S, GRAVITY=G	G	1
41.	BACKWALLS: CONC.=C, MASONRY=M, OTHER=0 — O 2		
42.	WINGWALLS: CONC.=C, MASONRY=M, OTHER=0	M	1
43.	BRIDGE SEATS – ABUTMENT: CONC.=C, MASONRY=M, TIMBER=T, STL=S — M 1		
44.	PIER: TYPE COND.	—	
45.	PIERS: COLUMN=C, WALL=W, T-TYPE=T, CAPPED PILE=P, OTHER=0		
46.	SUSPENSION BRIDGE ANCHORAGES: CONC=C, MASONRY=M		
47.	PILING: STL.=S, TIMBER=T, CAST-IN-PLACE=C, PRECAST CONC.=P		

GENERAL:

50.	STREAM CHANNEL — WATERWAY (SHOW IN LEFT BLOCK: UNRESTRICTED=U, RESTRICTED=R)	SCOUR (SHOW IN TYPE BLOCK: SCOURED=Y, NOT SCOURED=N)	ALIGNMENT (SHOW IN CONDITION BLOCK)	U N 1
51.	BANK PROTECTION: SHOW IN TYPE BLOCK: ADDITIONAL PROTECTION NEEDED=Y, NO=N			N 1
52.	CULVERTS: BOX=B, ARCH=A, SLAB TOP=S, PIPE=P			
53.	APPROACH GUARDRAIL: DEEP BEAM=D, CABLE=C, WOVEN=W, OTHER=0 — TYPE C D, COND. 3 1			
54.	APPROACH EMBANKMENT: SHOW IN TYPE BLOCK: SETTLED=Y, NOT SETTLED=N			N 1
55.	APPROACH PAVEMENT: CONC.=C, BITUMINOUS=B, OTHER=0 — B 1			
56.	APPROACH ALIGNMENT & GRADE:			1
57.	APPROACH SLABS: SHOW IN TYPE BLOCK: SETTLED=S, NOT SETTLED=N			
58.	SUMMARY: SATISFACTORY=1, NEEDS HOUSEKEEPING MAINT.=2, MINOR REPAIR=3, MAJOR REPAIR=4			2

USE REVERSE SIDE FOR ADDITIONAL DETAILS.

70. INSPECTED BY: [signature] SIGNED — RFM INITIALS — 8/2/69 DATE

REVIEWED BY: R. Gene Guckin & Assoc. Inc. Consulting Civil Engineers — __ INITIALS — __/__/__ DATE

BRIDGE INSPECTION RECORD

Code: good (G), fair (F), poor (P), critical (C)

Bridge Number Log. 21-101

Twp. Pleasant Highway System C Federal Aid System

Year Built 1882 Over or Under 500 Bridge Type STT

Loading S-6.1-46 No. of Spans 1 Overall Length 139.75'

Month		8									
Day		2									
Year	68	69	70	71	72	73	74	75	76	77	78
SUPERSTRUCTURE											
1. Deck Slab		P									
2. Wearing Surface		P									
3. Curbs		C									
4. Walkways											
5. Railings		F									
6. Joists		F									
7. Floorbeams		G									
8. Floorbeam Connections		G									
9. Long Beams or Girders											
10. Trusses: Alignment		G									
11. Hip Verticals		G									
12. End Posts		G									
13. Top Chords		G									
14. Bottom Chords		G									
15. Web Members-Vertical		P									
16. Web Members-Diagonal		G									
17. Portals		G									
18. Sway Bracing		G									
19. Lateral Bracing		G									
20. Crossframes or Diaphragms											
21. Deck Expansion Devices											
22. Bearings Rollers		P									
Plates		G									
23. Drainage System		G									
24. Arches											
25. Moveable Bridge Machinery											
26. Susp. Br. C or Ch. Bts.											
27. Susp. Bridge Towers											
28. Susp. System--Main											
29. Susp. System--Suspender											
30. Paint		G									
31. Response to Live Load		G									
SUBSTRUCTURE											
40. Abutments		G									
41. Backwalls		F									
42. Wingwalls		G									
43. Bridge Seats--Abutments		G									
44. Bridge Seats--Piers											
45. Piers											
46. Susp. Bridge Anchorage											
47. Piling											
GENERAL											
50. Stream Channel		G									
51. Bank Protection		G									
52. Approach Slabs											
53. Approach Guardrail		P									
54. Approach Embankment		G									
55. Approach Pavement		G									
56. Alignment & Grade		G									
60. Culverts											
70. Inspected By		RM									

R. F. McGUCKIN & ASSOCIATES

STEEL TRUSS BRIDGES

DATE August 2, 1969

TYPE OF BRIDGE	NO. OF SPANS	FABRICATOR	DATE BUILT
THRU WHIPPLE	1	Massillon Bridge	1882

APPROX. SAFE LOAD CAPACITY - OF TRUSS 55% Legal S-13.9-46 OF FLOOR SYSTEM 49% Legal S-6.1-4(

CLEAR SPAN	LENGTH OUT TO OUT OF FLOOR	WIDTH BETWEEN CURBS OR FELLOE GUARDS	WIDTH OUT TO OUT OF TRUSSES	WIDTH OF SIDEWALKS	HEIGHT OF FLOOR ABOVE BRIDGE SEAT	CLEARANCE DIMENSIONS MAX. HEIGHT	WIDTH	MIN. HEIGHT	HEIGHT OF FLOOR ABOVE BOTTOM CHORD	EXPANSION PROVI ROLL- ERS	ROLA- ERS	SL IN
137.33'	139.75'	15.0'	18.57'	None	1.06'	18.5'	15.97'	15.0'	.044'	X		

TYPE AND SIZE OF RAILING OR HUB GUARD: Guard Rail

TYPE AND SIZE OF CURB OR FELLOE GUARD: Curb 3 x 6 Timber

DESCRIPTION OF FLOOR DRAINAGE: Over side

ALIGNMENT AND SKEW OF STRUCTURE: Square

APPROACH SLABS: None

LENGTH: -

STREAM: Great Miami River

HEIGHT FROM GRADE TO STREAM BED: 16.67'

HEIGHT FROM GRADE TO HIGH WATER: Est. 5.0'

CHANNEL CHARACTERISTICS - APPROX. WIDTH BETWEEN BANKS: 160.0'

CHANNEL DEPTH: 2.0'

NATURE OF BOTTOM: Silty

CONDITION OF BANKS: Grassy Slope Tree Lined

ALIGNMENT OF STREAM ABOVE AND BELOW STRUCTURE: Straight

SKEW OF NORMAL FLOW: 5° R.F.

SKEW OF FLOOD FLOW: 5° R.F.

SUPERSTRUCTURE

STD. DRAWING NO.

TYPE OF TRUSSES	LENGTH OF SPANS - C. TO C.	NO. PANELS	LENGTH OF PANELS
THRU WHIPPEE	140.0'	10	14.0'

FLOOR BEAMS AND CONNECTIONS

TYPE	NUMBER	SPACING	SECTION		SIZE-SHAPE-NET SECTION		NO. & SIZE RIVETS FLOOR BEAM TO CONN.	NO. & SIZE RIVETS CONN. TO TRU
INTERMEDIATE FLOOR BEAMS	9	14.0'	24" Girder	HANGERS	1 1/6" U-Bolt	RIVETED CONNECTIONS	-	-
END FLOOR BEAMS				HANGERS		RIVETED CONNECTIONS		

FLOOR JOISTS

KIND	NO. LINES	SIZE	WIDTH OF FLANGE	THICKNESS OF WEB	SPACING
I BEAMS	8	6" I @ 13#	3 1/2"	0.255"	1.66'
CHANNELS	2	6" C @ 8.2#	1 7/8"	0.230"	1.66'
WOOD		SIZE, TREATMENT, SPECIES			

DO JOISTS REST ON TOP OF FLOOR BEAMS? Yes HOW FRAMED TO FLOOR BEAMS: Bolted

ARE SHELF ANGLES USED? No END JOISTS - LENGTH: 13.25' SUPPORTS: 3 x 1 Plate on 6 x 1 3/8[

FLOOR

REINFORCED CONCRETE SLAB — INCHES THICK — CONCRETE — INCHES THICK ON CORRUGATED ARCHES OR BUCKLE PLATE

WEARING SURFACE TYPE: Bit. Conc. THICKNESS: 1" PLANK SIZE, TREATMENT, SPECIES: No

STRIP SIZE, TREATMENTS, SPECIES: 2 x 4 Creosoted HOW FASTENED TO JOISTS: Bolted Clips

SUB-STRUCTURE

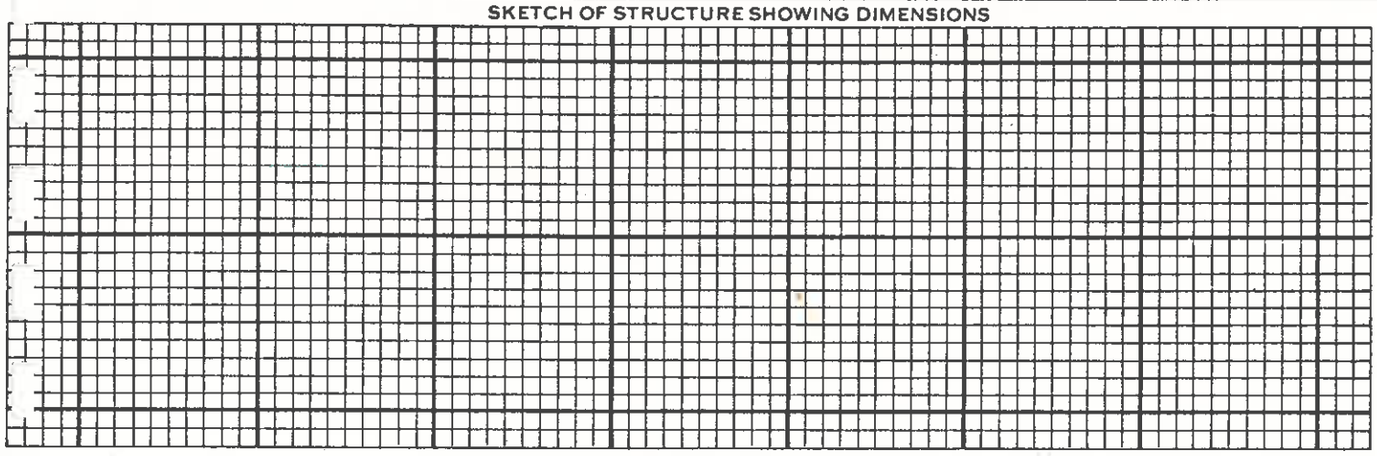
STD. DRAWING NO.

ABUTMENTS AND PIERS	MATERIAL	TYPE	HEIGHT FOOTER TO BRIDGE SEAT	WIDTH OF BRIDGE SEAT	LENGTH OF BRIDGE SEAT	FOUNDATIONS (PILING)	WINGS (LENGTHS, ANGLES ETC.)
REAR	Masonry	Gravity	Est. 16'	18.66'	2.66'	Prob. Timber Crib	11'x3'x45°
FORWARD							
PIER	"	"	"	"	"	"	All 4-Corners
PIER							

BRIDGE NO.	TOWNSHIP	ROAD NO.	SYSTEM	SECTION	STRENGTH				ROADWAY			CLEARANCE			TYPE				
					H10 -	H12	H15	H20	15-18	18-22	23+	12-	12-14	14+ OPEN	A	B	G	S	T
Log.21-1.01	PLEASANT	21	C																

Log.21-1.0	LOGAN	21			H10-	H12	H15	H20	16-18	19-22	23 +	12-	13-14	14 +	OPEN	A	B	G	S	T
BRIDGE NO.	COUNTY	ROUTE NO.	S.H. NO.	SECTION	STRENGTH				ROADWAY			CLEARANCE				TYPE				

SKETCH OF STRUCTURE SHOWING DIMENSIONS



SECTION OF TRUSS MEMBERS

D POSTS 2 @ 10" I @ 15.3# with 15" x 1/4" Plate

TOP CHORDS Same as end post

BOTTOM CHORDS L_0L_2 2-3 x 11/16" , L_2L_3, 2-3 1/2 x 13/16 , L_3L_4 2-4 1/4 x 1 , L_4L_5 2-5 x 1 1/6

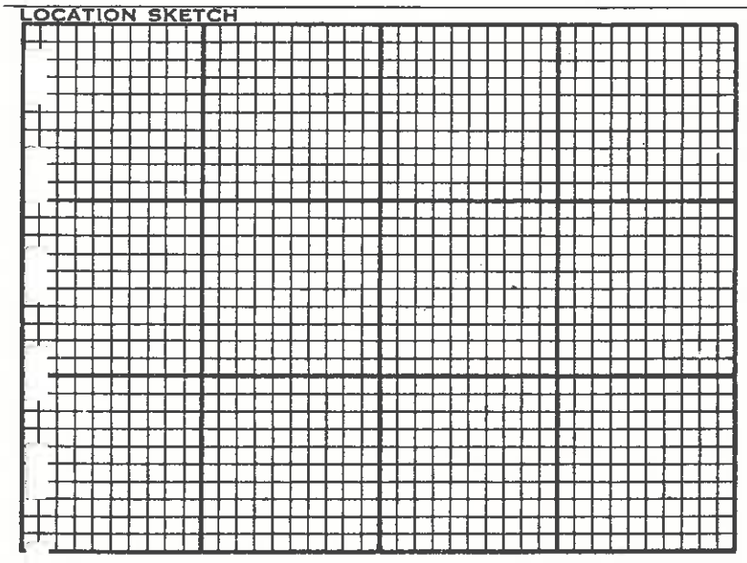
TERMEDIATE POSTS U_2L_2 2-6" [@8.2# ATT Others 2-5" [@6.7#

AGONALS U_1L_2 2-2 1/2 x 5/8 , U_1L_3 2-2 1/2 x 11/16 , U_2L_4 2-2 1/2 x 1/2 , U_2L_5 2-1 5/8 x 1/2 ,

HIP VERTICALS 2 - 1 3/4 x 1/2 U_5L_7 1-7/8" , U_4L_6 1-1 1/8

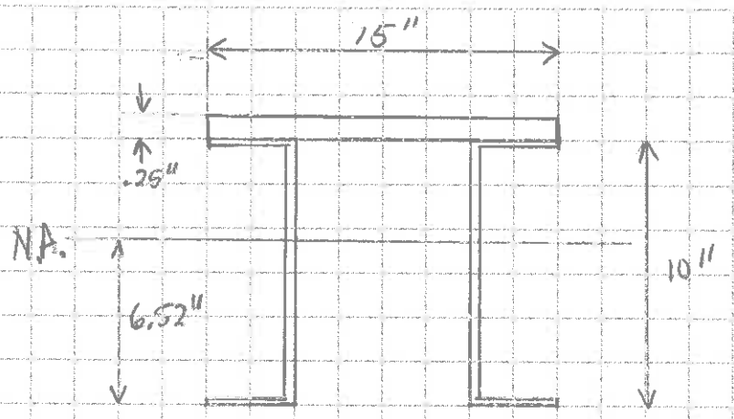
S 2 3/4" Lower 2" Upper

LOCATION SKETCH



REMARKS:- Painted 1967

R.B.
6/26/74



$A_E = 4.96 in^2 \quad I_E = 66.9 in^4$

$$\bar{y} = \frac{10.125(3.75) + 5(2)(4.96)}{3.75 + 2(4.96)} = \frac{82.57}{12.67} = 6.52"$$

$$I_E = 2(66.9) + 2(4.96)(1.52)^2 = 157.41$$

$$J_{P_i} = \frac{15(.25)^3}{12} + 3.75(3.605)^2 = 48.75$$

$$I_T = 203.16$$

$$R = \sqrt{I/A} = \sqrt{\frac{203.16}{12.67}} = \sqrt{16.035}$$

$$\therefore \quad R = 4.0$$

ELECTRONIC BRIDGE CARD REPORT

SFN: 4631838 | ROAD NO.: C0021 | ROAD NAME: CR 21

TOWNSHIP: PLE | LOGPT.: 01.00 | YEAR BUILT: 1900 | REHAB: 1997

BRIDGE TYPE: 344 STEEL/TRUSS/THRU | RAILING: 7 STEEL GUARDRAIL ON STEEL,CONC,TIMBER POST

FEAT. INTERS.: MIAMI RIVER | WEAR. SURF.: 6 BITUMINOUS (ASPH CONC) INCL CHIP & SEAL

NO. OF SPANS: MAIN/APPR 344 / 000 | CLEAR SPAN:

LENGTH: 000143' | DECK WIDTH: 016.0'

DEGREE OF SKEW: 00 | STEEL TYPE:

NO. OF BEAMS OR GIRDERS:		SIZE:		SPACING:	
NO. OF FLOOR BEAMS:		SIZE:		SPACING:	
NO. OF FLOOR BEAMS:		SIZE:		SPACING:	

DRAINAGE AREA (AC): #Error

Please Note: If field indicates "#Error", then field is coded UUU.

LAST LOCAL UPDATE: 04 / 24 / 2006

% OF LEGAL 075

REAR ABUTMENT:	1 1	STONE / GRAVITY
FORWARD ABUTMENT:	1 1	STONE / GRAVITY
PIER MATERIAL/TYPE:	N N	NONE / NONE

SUFFICIENCY RATING: 47.3%

PAINT CONDITION: 2 | Q YEAR: | Q CFS: | FUNCTIONAL CLASS:

OVERALL CONDITION: 4P | 09 Rur Local

FILE COPY

Ery

RESOLUTION NO. 156-06

The Board of Logan County Commissioners met in regular open session on this date of April 4, 2006 with the full Board present.

Mr. John Bayliss moved that the following Resolution be Adopted:

RE: REDUCTION IN THE LOAD LIMIT ON BRIDGE 21-1.00 OVER THE GREAT MIAMI RIVER IN PLEASANT TOWNSHIP

WHEREAS, as a result of the annual bridge inspections, it has been determined that the design limits of the steel truss on Bridge 21-1.00 in Pleasant Township warrants the reduction of the maximum weight of vehicle and load, and

WHEREAS, Scott C. Coleman, Logan County Engineer, recommends that the maximum weight of vehicle and load crossing Bridge 21-1.00 in Pleasant Township be reduced by 25% (75% legal) in accordance with Section 5577.071 of the Ohio Revised Code,

THEREFORE BE IT RESOLVED by the Logan County Commissioners to authorize the Logan County Engineer to reduce the load limit by 25% (75% legal) on Bridge 21-1.00 in Pleasant Township.

Mr. David Knight seconded the motion.

Roll Call resulted as follows:

Mr. John Bayliss, President — yes

Mr. Jack Reser, Vice President — yes

Mr. David Knight, Member — aye

I, Kacy D. Kirby, Clerk/Administrator, hereby certify this to be a true copy of the proceedings as taken from the minutes of the meeting of the Logan County Commissioners on this date of April 4, 2006.

Kacy D. Kirby, Clerk/Administrator

RECEIVED
APR 13 2006

Contact:
Scott C. Coleman, P.E., P.S.
Logan County Engineer

1991 County Road 13
P.O. Box 427
Bellefontaine, OH 43311
Phone 937-592-2791
Fax 937-599-2658

Logan County Engineer's Office

Bridge Load Reduction

For Immediate Release: March 30, 2006

Pleasant Township Bridge 21-1.00 to receive Load Restriction

The Logan County Engineer's Office announces that due to our annual bridge inspections, Bridge 21-1.00, located between CR 24 and CR 77, will be reduced to 75% of the legal loading for all vehicles.

The reduction is due to the design limits of the steel truss superstructure.

All Road Construction Updates are posted on our web site at: www.co.logan.oh.us/engineer

OFFICE OF THE
LOGAN COUNTY ENGINEER
P.O. Box 427
1991 Rd. 13
Bellefontaine, Ohio 43311

SCOTT C. COLEMAN, P.E., P.S.
Engineer

Telephone: (937) 592-2791
Fax: (937) 599-2658
www.co.logan.oh.us

FILE COPY

March 30, 2006

The Honorable Board of
Logan County Commissioners
117 E. Columbus Ave., Suite 100
Bellefontaine, OH 43311

RE: Reduction in the Load Limit on Bridge 21-1.00, over the Great Miami River

Dear Commissioners:

As a result of our annual bridge inspections, it has been determined that the design limits of the steel truss on the above mentioned bridge warrants the reduction of the maximum weight of vehicle and load, and I recommend the following:

Bridge	Recommended load limits
Bridge 21-1.00, Pleasant Township	25% reduction (75% legal)

Therefore, in accordance with Section 5577.071 of the Ohio Revised Code, I am requesting that your honorable board adopt a resolution reducing the maximum weight of vehicle and load on the above mentioned bridge.

Sincerely,

Scott C. Coleman P.E., P.S.
Logan County Engineer

Eng.

RESOLUTION NO. 77-76

The County Commissioners met in regular open session on this date of March 5, 1976 with the full Board present.

Mr. G. Parker Kennedy moved that the following Resolution be adopted:

RE: Logan County Bridge 21-1.01

WHEREAS the above mentioned structure located on C.R. #21 about three miles north of DeGraff over the Great Miami River, is currently posted at 60% reduction in legal loads and the wood floor is in critical condition and in need of total replacement, and

WHEREAS the Logan County Engineer proposes to replace the stringers and flooring on this structure with new 10 inch steel stringers and structural plate bridge flooring at an estimated cost of $15,300.00, and

WHEREAS in accordance with Section 5543.11 O.R.C., the Logan County Engineer hereby notifies that the project will require the closing to thru traffic of C.R. #21 from C.R. #77 to C.R. #24 for a period of 3 weeks, and provides a detour as follows:

Commencing at the intersection of C.R. #21 and C.R. #77; thence with C.R. #77 westerly1.05 miles to T.R. #35; thence with T.R. #35 southerly 1.05 miles to S.R. #47; thence with S.R. #47 easterly 1.7 miles to C.R. #24; thence with C.R. #24 northerly .4 mile to C.R. #21 and there terminate. A total distance of 4.2 miles.

THEREFORE BE IT RESOLVED by the Logan County Commissioners to authorize the Logan County Engineer to proceed with the above mentioned project by "Force Account".

Mr. Warren W. Smith seconded the motion.

Roll Call resulted as follows:

Donald E. Corwin — Yes
Mr. Donald E. Corwin, Chairman

G. Parker Kennedy — Yes
Mr. G. Parker Kennedy, V. Chr.

Warren W. Smith — Yes
Mr. Warren W. Smith, Member

I, Anna C. Furrow, Clerk hereby certify this to be a true copy of the proceedings as taken from the minutes of the meeting of the Logan County Commissioners on this date of March 5, 1976.

Anna C. Furrow
Anna C. Furrow, Clerk

Material Br 21-1.01

6 Lines of 10WF25 191' each

14 - 61' Beams will make this.

2 - 61' + 19' = 191'

Primed delivered to bridge site.

21,350# Total

Decking 2x6 7ga. Painted.

See quote

ordered

3/17/76

No. 12216

QUOTATION

RECEIVED
DEC 29 1975
LOGAN COUNTY ENGINEER

UNITED STEEL FABRICATORS, DIV.
ALLEN ELECTRIC & EQUIPMENT COMPANY
Wooster, Ohio 44691

Telephone: Area Code 216
262-6010

TO Logan County Engineering Department — Date December 22 1975

ADDRESS P. O. Box 427, Bellefontaine, Oh. 43311 — Your Inquiry No.

ATTENTION Mr. Chester Kurtz, Co. Engr. — Your Inquiry Date

PROJECT Deck Replacement - Bridge No. 21-1.01 — Bids Due

Pleasant Township - Logan County, Ohio

This QUOTATION is firm for 30 days from above date and is for U. S. F. PRODUCTS of the specific designs and materials described below.

USF STRUCTURAL PLATE BRIDGE FLOORING with 2 x 6 CORRUGATIONS FABRICATED FOR WELD DOWN METHOD:

		Painted	Galv.
1.	2256 SF 7 Gage 2x6 Corrugated Plates @	$3.25 SF	$4.25 SF
2.	32 LF 7 Gage Zee Type End Finish Plates (2 Pls. - 11" wide x 16' lg.) @	$3.00 LF	$4.00 LF
3.	24 Pcs 10 Gage Loose End Dames 3x144 @	$5.25 PC.	

ALTERNATE - USF STRUCTURAL PLATE BRIDGE FLOORING with 3x9 CORRUGATIONS FABRICATED FOR WELD DOWN METHOD:

		Painted	Galv.
1A.	2256 SF 7 Gage 3x9 Corrugated Plates @	$3.40 SF	$4.40 SF
2A.	32 LF 7 Gage Zee Type End Finish Plates (2 Pls. - 10" wide x 16" lg.) @	$3.00 LF	$4.00 LF
3A.	24 Pcs. 7 Gage Loose End Dams 4x144 @	$9.50 Pc.	

Specifications Crown - USF Standard Design & Logan County Project Plans

Shipment Within (60) Days

F.O.B. PLANT, WOOSTER, OHIO via truck

FREIGHT ☐ PREPAID & CHARGE ☒ PREPAID ☐ COLLECT

TERMS: Net 30 Days

This is a quotation only. The conditions printed on the reverse side are specifically made a part of this proposal. When signed by the addressee, it shall constitute an offer to purchase in the exact terms of the proposal, including the conditions. When received and approved by our home office, it shall constitute a firm contract.

ACCEPTED _____ Date _____ Firm Name

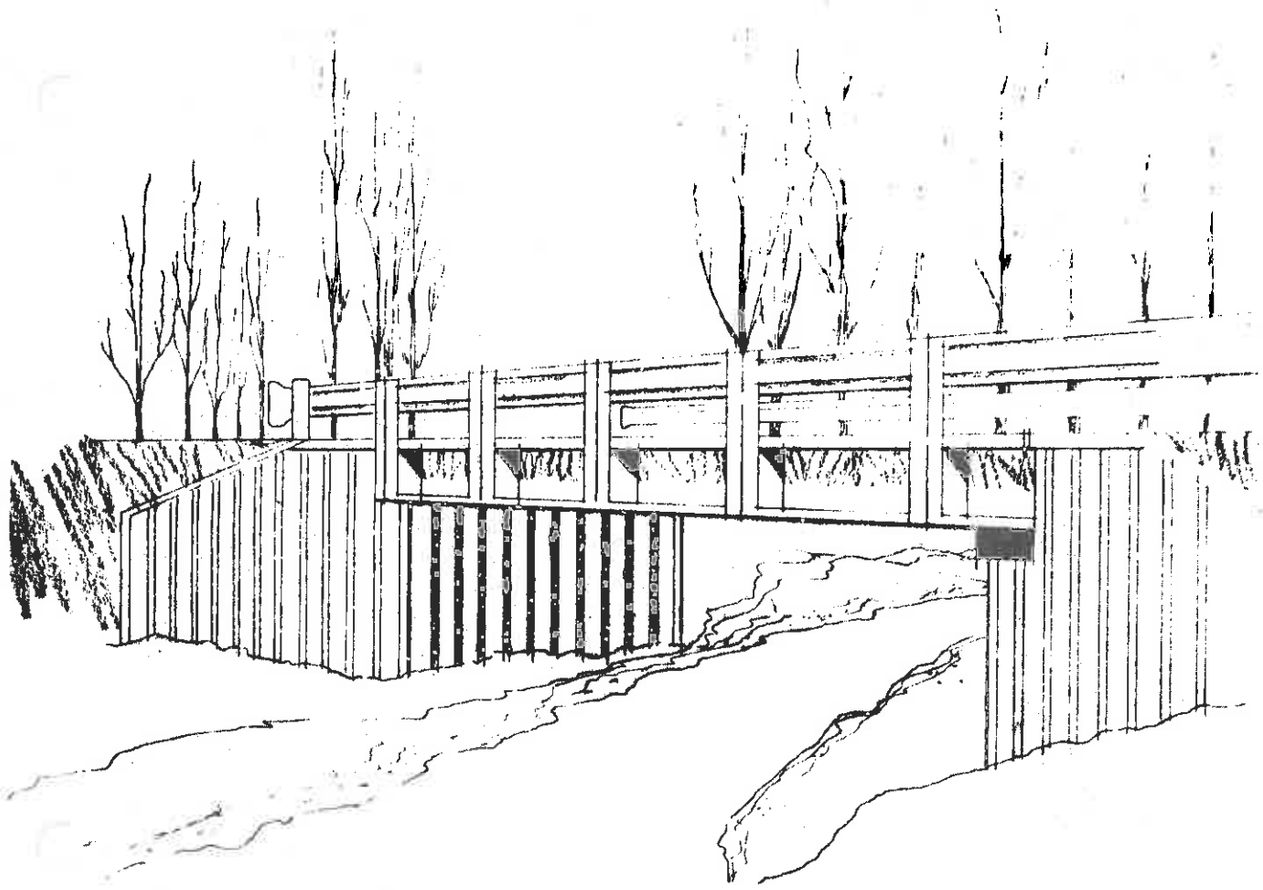
BY _____ Title

cc: Robt. L. Porter, Inc.

UNITED STEEL FABRICATORS, DIV.

BY J. P. Slater

J. P. SLATER



USF country!

Whether your highway contract calls for a country "scenic route" or a superhighway, you should make your construction site "USF Country"!

USF has a full line of time-tested products . . . structural plate bridge flooring, sheet piling, guard rail, and sectional plate pipe structures. And all USF highway products are designed with this in mind; you want lower material costs, greater ease of installation and a wider margin of safety.

Where's your next highway project? That's "USF Country"!

STRUCTURAL PLATE BRIDGE FLOORING

SHEET PILING

GUARD RAIL

SECTIONAL PLATE

SALES OFFICE

UNITED STEEL FABRICATORS DIVISION

1330 North Main Street, Orrville, Ohio 44667

Jim Slater – Phone: 216/682-8010

OHIO REPRESENTATIVES

Gomer Jenkins, Minerva, Ohio – 216/868-4705

Robert L. Porter, Toledo, Ohio – 419/472-4219

The Crown Divisions of THE ALLEN GROUP INC.

1330 North Main Street, Orrville, Ohio 44667

THE CROWN DIVISIONS
OF THE ALLEN GROUP INC.

EXECUTIVE OFFICES
1330 NORTH MAIN STREET
ORRVILLE, OHIO 44667
AREA CODE (216) 682-8010

November 7, 1975

S A L E S B U L L E T I N

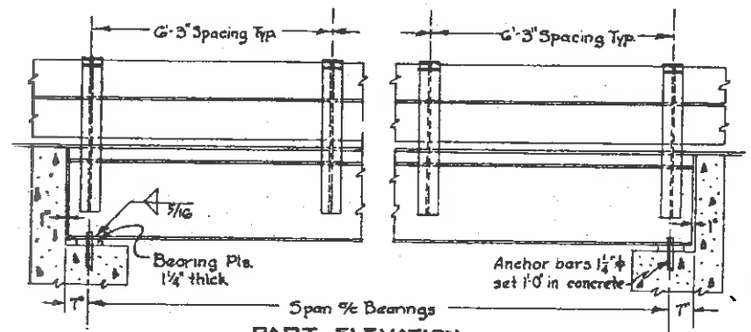
To: All USF-Crown Distributors

From: Jim Slater, Product Manager
Highway Products Department

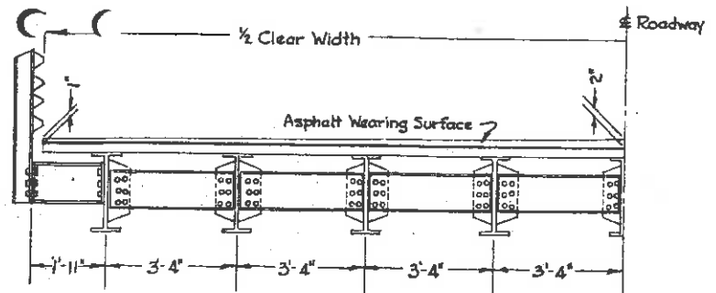
Subject: Change of Address
Highway Products Dept. Sales Office

Effective November 10, 1975 our Sales Office will be located at the Crown Fabricator's Plant at Wooster, Ohio. Please direct all inquiries to the following address:

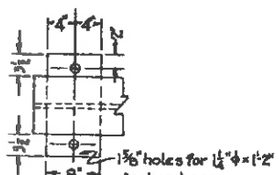
The Crown Divisions
Highway Products Department
High & Gasche Streets
Wooster, Ohio 44691
Ph. No. 216-262-6010



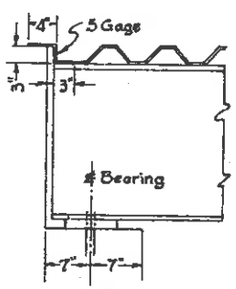
PART ELEVATION



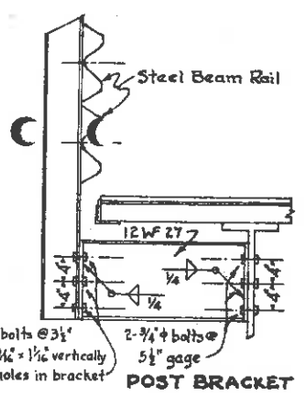
TYPICAL HALF SECTION



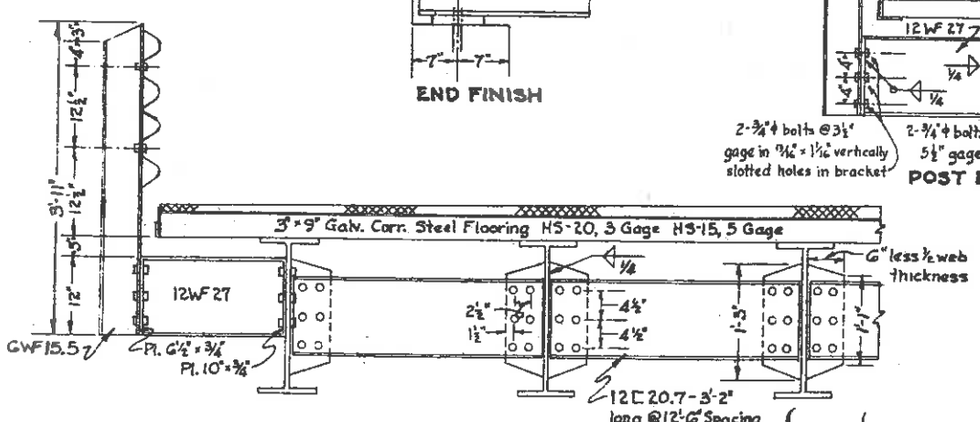
BEARING PLATE



END FINISH



POST BRACKET



PART SECTION

NOTES

THESE DRAWINGS are intended as guides to the designer in the preparation of plans for the individual bridge and as construction drawings to show details not set forth on the plans.

DIAPHRAMS AND RAIL BRACKETS shall be fastened with ¾" hot-dipped galvanized machine bolts using lock washers. All holes 13/16" diameter unless otherwise shown.

STRUCTURAL STEEL shall meet the requirements of ASTM A-36 and shall be galvanized after fabrication in accordance with ASTM-123.

GALVANIZED CORRUGATED STEEL FLOORING shall have a minimum Section Modulus of 0.284 cu. in. per inch for 5 gage and 0.320 cu in per inch for 3 gage, and a minimum Tensile Strength of 58,000 psi. a minimum Yield Strength of 40,000 psi. The flooring shall be furnished with bolt-on end dams and clips for fastening to the beams.

GALVANIZED STEEL BEAM BRIDGE

LOADING HS-20-44 & HS-15-44

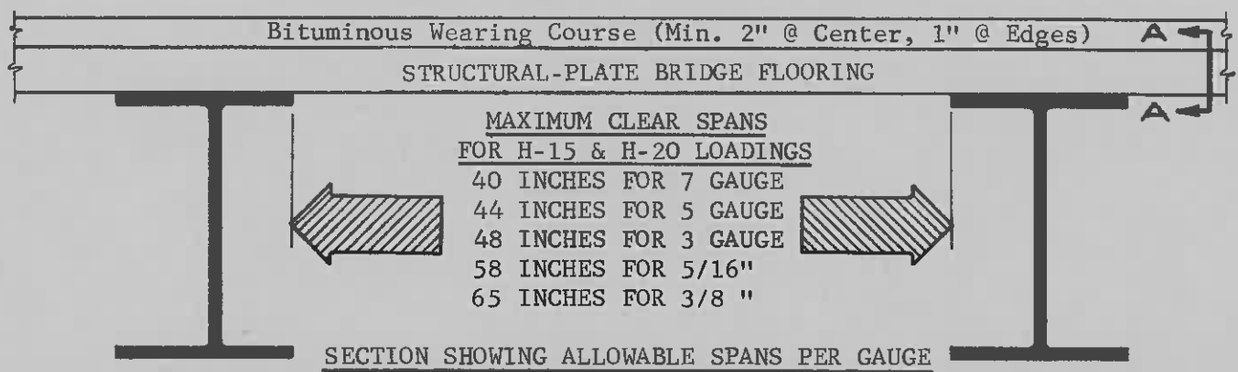
DATE	DESIGN		DWG. NO.
1968	WMC		CSF-1

BEAM REQUIREMENTS				
SPAN c/c BEARING	HS-20-44		HS-15-44	
	REQ'D.SECT.MOD.	BEAM SIZE	REQ'D.SECT.MOD.	BEAM SIZE
20'-0"	47.8	16WF36	45.0	16WF36
22'-6"	54.6	16WF36	51.4	16WF36
25'-0"	63.7	16WF40	60.0	16WF40
27'-6"	75.9	16WF50	71.4	16WF45
30'-0"	88.1	18WF50	83.1	18WF50
32'-6"	101.4	18WF60	95.3	18WF55
35'-0"	113.2	21WF62	108.5	21WF62
37'-6"	130.4	21WF68	121.9	21WF62
40'-0"	145.9	21WF73	137.4	21WF68
42'-6"	161.7	24WF76	152.5	24WF76
45'-0"	178.5	24WF84	167.5	24WF76
47'-6"	193.3	24WF84	182.8	24WF84
50'-0"	210.8	24WF94	199.6	24WF94
52'-6"	226.6	27WF94	224.6	27WF94
55'-0"	242.4	27WF94	230.2	27WF94
57'-6"	256.8	27WF102	247.7	27WF102
60'-0"	279.7	30WF108	263.6	27WF102
62'-6"	297.0	30WF108	281.6	30WF108
65'-0"	316.6	30WF116	298.1	30WF108
67'-6"	337.3	30WF124	317.6	30WF116
70'-0"	357.8	30WF130	337.6	30WF124

ROADWAY REQUIREMENTS			
CLEAR WIDTH	SPACING	NO. BEAMS	LGT. BRACKET
24'-0"	6@ 3'-4"	7	2'- 3"
26'-0"	7@ 3'-4"	8	1'- 7"
28'-0"	8@ 3'-4"	9	0"-11"
30'-0"	8@ 3'-4"	9	1'-11"
32'-0"	9@ 3'-4"	10	1'- 3"

For assistance in design of your structures call or write to:

USF STRUCTURAL-PLATE BRIDGE FLOORING W/3x9 CORRUGATIONS



SECTION SHOWING ALLOWABLE SPANS PER GAUGE

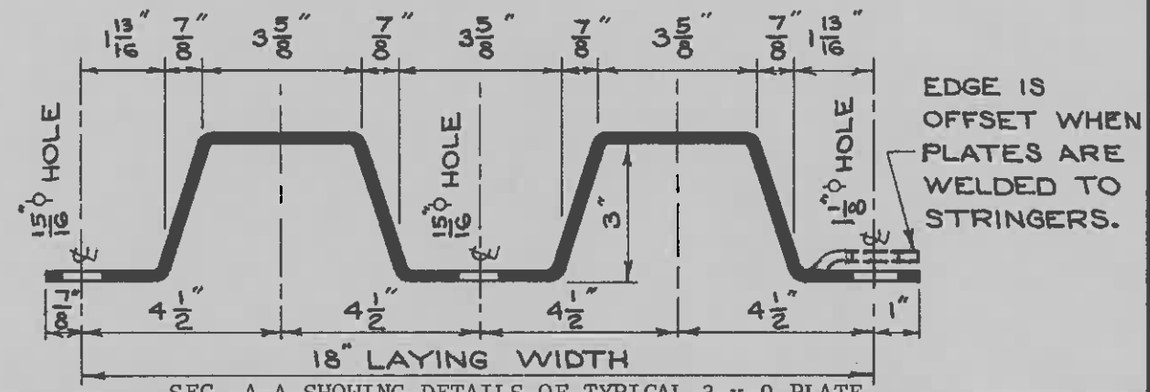
PLATES FURNISHED: GALVANIZED AFTER FABRICATION ASTM A-123 OR WITH PRIME COAT OF BAKED-ON LEAD CHROMATE

PLATES OVER 12' IN LENGTH MAY BE SPLICED BY WELDING 2 OR MORE PLATES TOGETHER END TO END AS FOLLOWS:

(1) All splices not occurring over stringers shall be continuous butt welds on both sides.

(2) Shop splices over stringers same as (1) except portion of weld bearing on stringer shall be ground smooth.

(3) Field splices over stringers shall be continuous butt welds on top side only.



SEC. A-A SHOWING DETAILS OF TYPICAL 3 x 9 PLATE

PHYSICAL PROPERTIES					WGT	ASPHALT	TOTAL
GAUGE	WIDTH	S.IN^3/IN	S.'IN^3*	M. IN#	LBS/SF	LBS/SF	DEAD LOAD
7 (.1793")	18"	.217	4.34	95,480	11.0	34	45.0
5 (.2092")	18"	.251	5.02	110,440	12.8	34	46.8
3 (.2391")	18"	.281	5.62	123,640	14.6	34	48.6
5/16(.3125")	18"	.350	7.00	154,000	19.1	34	53.1
3/8 (.3750")	18"	.403	8.06	177,320	23.0	34	57.0

Steel Spec. Minimum Tensile 55,000 P.S.I. Minimum Yield 40,000 P.S.I.

* Based on 20" Wheel Spread

TO DESIGN OR ERECT FLOORS FOR:

ATTACHMENT TO STRINGERS BY COMMON WELD METHOD - SEE DWG. NO. D12-04(2)

ATTACHMENT TO STRINGERS BY STUD WELD METHOD - SEE DWG. NO. D12-04(3)

ATTACHMENT TO STRINGERS BY CLAMP METHOD - SEE DWG. NO. D12-04(4)

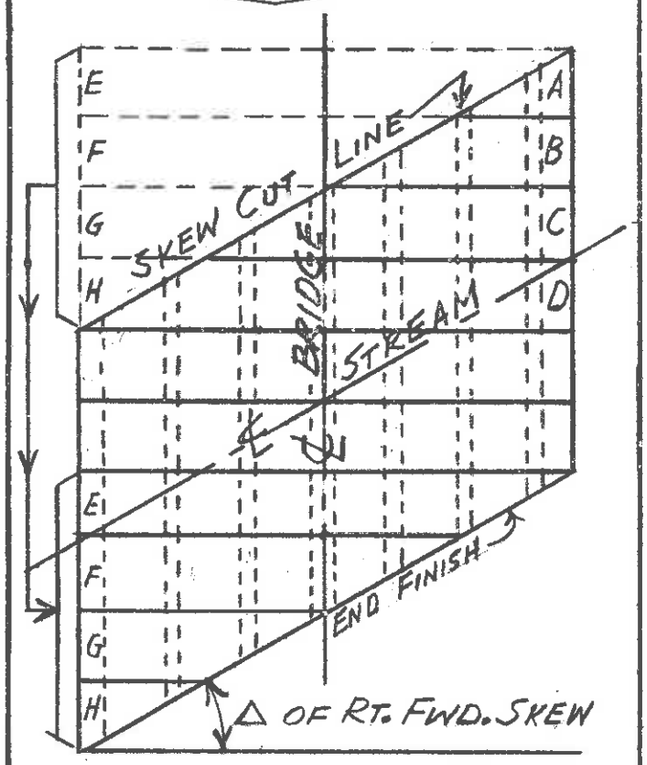
1-70

UNITED STEEL FABRICATORS DIV.

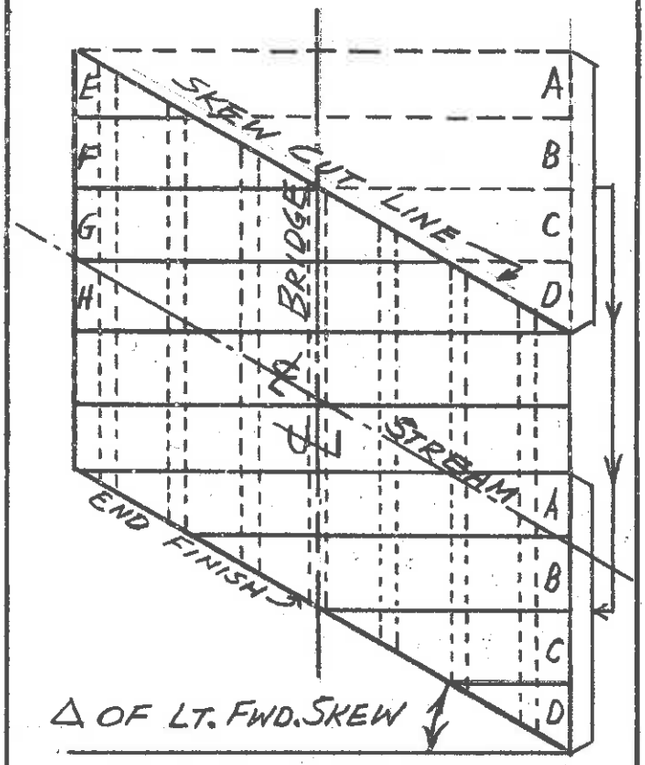
Allen Electric and Equipment Co.

WOOSTER, OHIO 44691

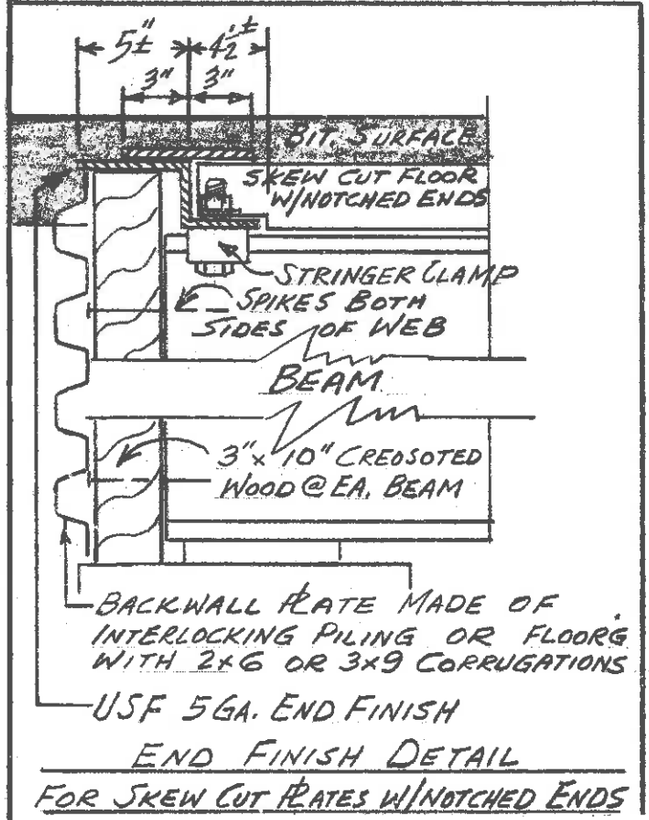
DWG. NO. D12-04(1)



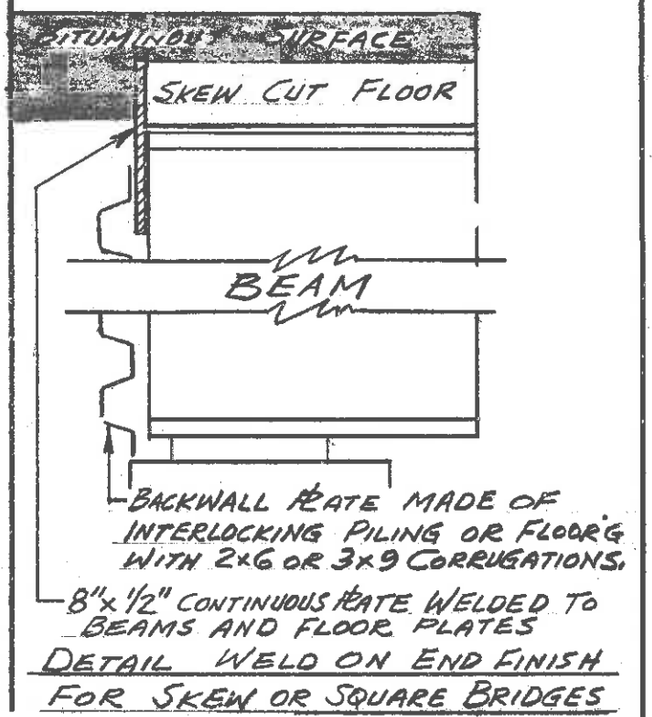
PLAN OF BRIDGE RT. FWD. SKEW



PLAN OF BRIDGE LT. FWD SKEW



END FINISH DETAIL
FOR SKEW CUT PLATES W/NOTCHED ENDS

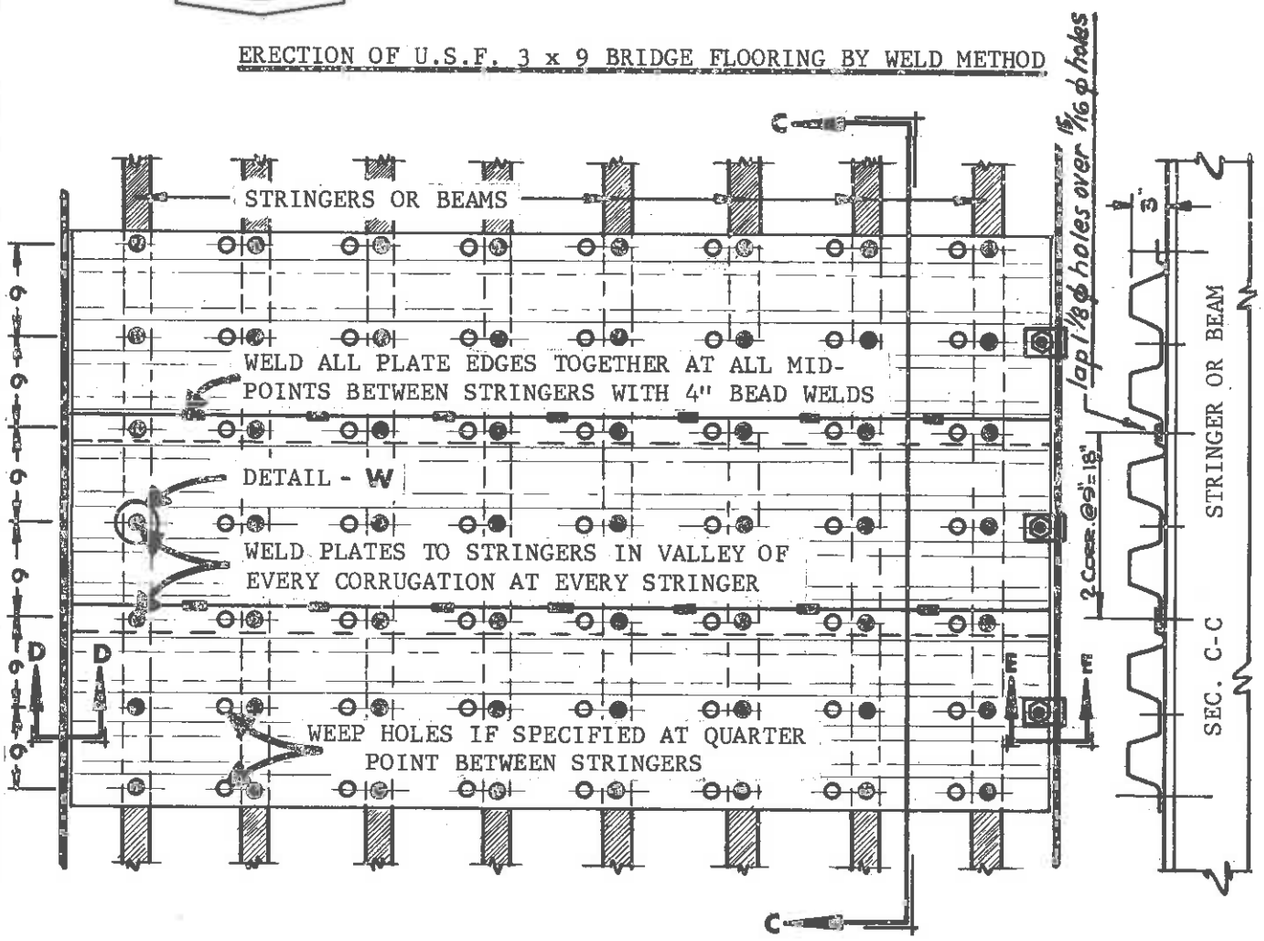


DETAIL WELD ON END FINISH
FOR SKEW OR SQUARE BRIDGES

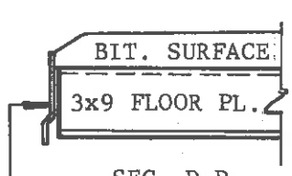
UNITED STEEL FABRICATORS DIV.
Allen Electric and Equipment Co.
WOOSTER, OHIO 44691

Dwg. No. D 12-04 (1A)

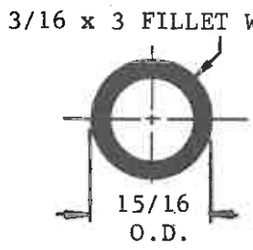
ERECTION OF U.S.F. 3 x 9 BRIDGE FLOORING BY WELD METHOD

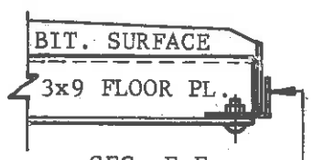


TYPICAL PLAN FOR WELDING U.S.F. 3 x 9 FLOORING TO STRINGERS
SEE DWG. NO. D12-04(1) FOR FLOOR PLATE DETAILS



SEC. D-D





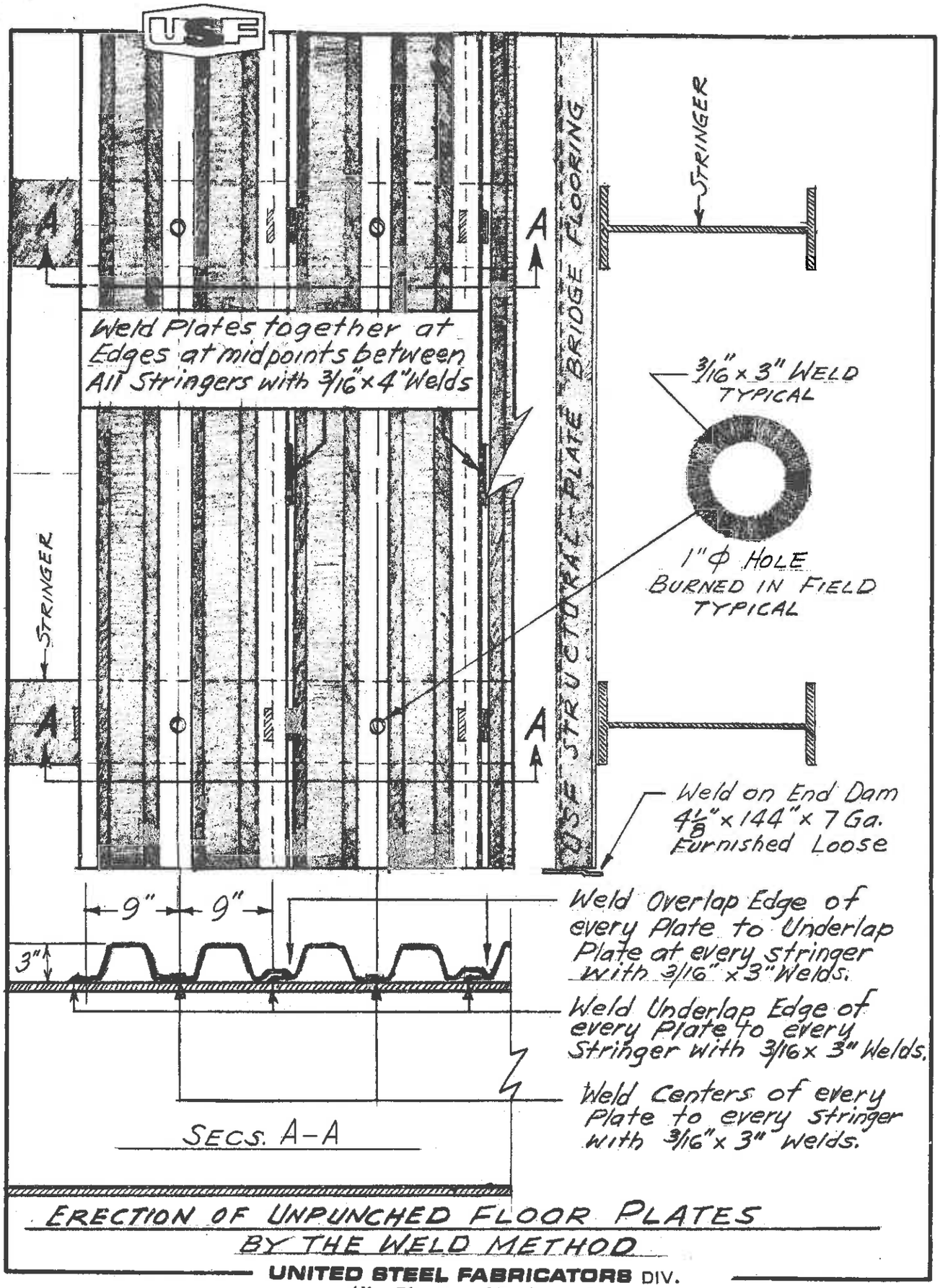
SEC. E-E

WELD-ON END DAMS	DETAIL - W	BOLT-ON END DAMS
4 1/8" x 18" x 7 Ga. Plate Shop Welded to Floor Plate or 4 1/8" x 144" x 7 Ga. Plates Furnished Loose for Field Erection	15/16 Weld Hole Shop Punched or Burned in Field	Typical Assembly: (1) L 2" x 2" x ¼" on 18" Ctrs. (1) 5/8 x 1¼ Oval Neck Bolt (1) 5/8 Heavy Duty Nut Necessary Plate 3½ x 144 x 7 Ga.

TYPICAL DETAILS

UNITED STEEL FABRICATORS DIV.
Allen Electric & Equipment Co.
WOOSTER, OHIO 44691

DWG. NO. D 12-04(2



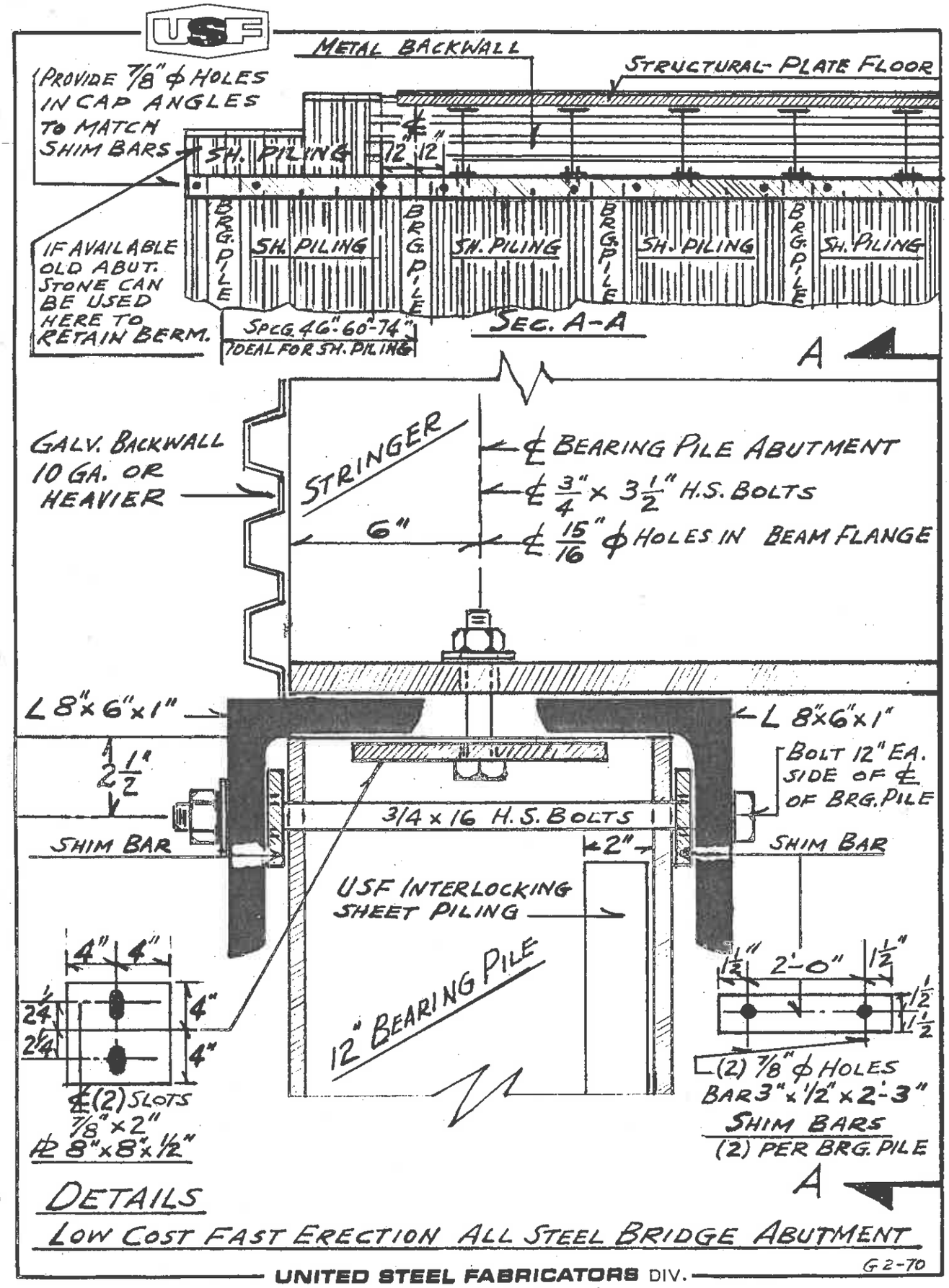
ERECTION OF UNPUNCHED FLOOR PLATES BY THE WELD METHOD

UNITED STEEL FABRICATORS DIV.

Allen Electric and Equipment Co.

WOOSTER, OHIO 44691

Dwg. No. D 12-04 (2A)



DETAILS

LOW COST FAST ERECTION ALL STEEL BRIDGE ABUTMENT

G 2-70

UNITED STEEL FABRICATORS DIV.

Allen Electric and Equipment Co.

WOOSTER, OHIO 44691

UNITED STEEL FABRICATORS, DIVISION

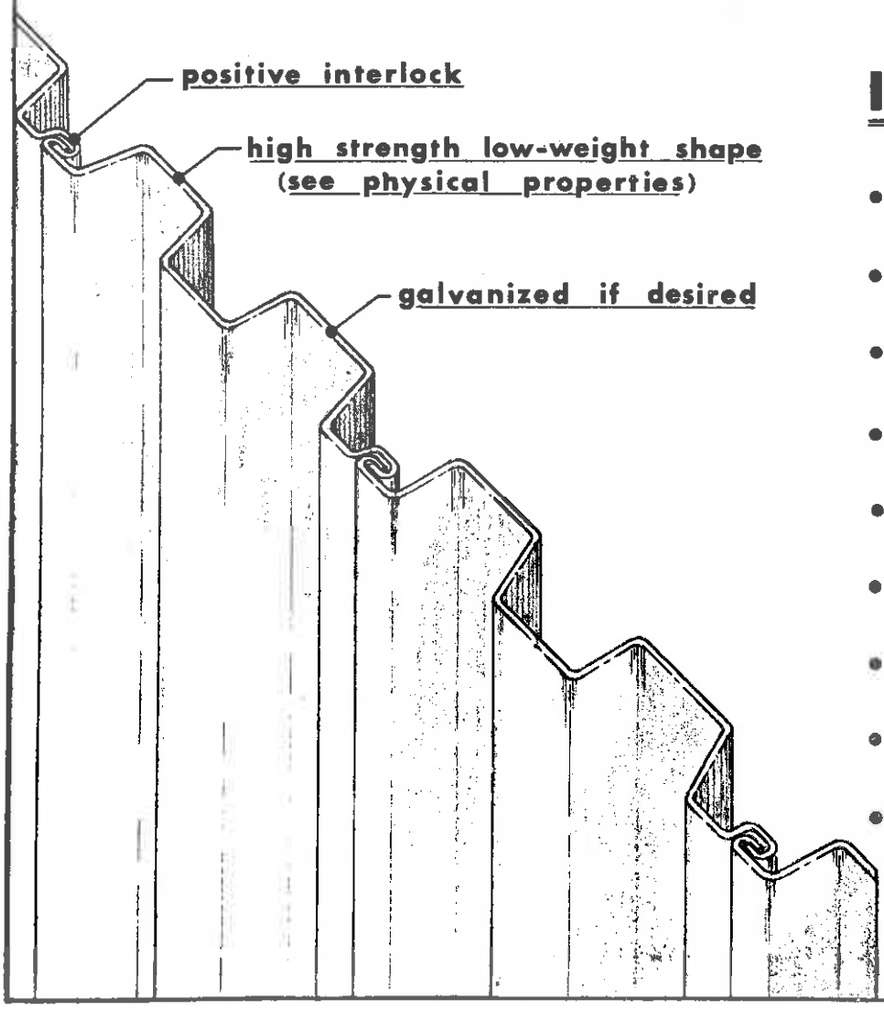
ALLEN ELECTRIC AND EQUIPMENT COMPANY
HIGHWAY PRODUCTS DEPARTMENT
WOOSTER, OHIO, 44691 - TEL. 216 - 262 - 6010

USF

INTERLOCKING OR FLANGED

SHEET STEEL PILING

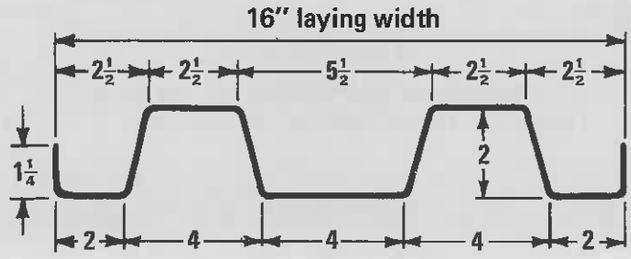
VERSATILE ••• ECONOMICAL ••• LIGHTWEIGHT



IDEAL FOR:

- BRIDGE ABUTMENTS
- CULVERT HEADWALLS
- COFFER DAMS
- DAM CORE WALLS
- FOOTER FORMS
- MARINAS
- RETAINING WALLS
- TRENCHES
- WATER CONTROL

FLANGE TYPE



PHYSICAL PROPERTIES					
Ga.	Thick's In Inches	FLANGED 16" WIDE			
		Weights - Lbs.		Sec. Mod. (In.)	
		Lin. Ft.	Sq. Ft.	Per Pile	Per L.F.
12	.1046	8.4	6.3	1.19	0.89
10	.1345	10.8	8.1	1.53	1.15
9*	.1495	12.0	9.0	1.70	1.27
8	.1644	13.2	9.9	1.87	1.40
7	.1793	14.4	10.8	2.03	1.52
5*	.2092	16.8	12.6	2.37	1.78

*Available on Special Order only.

SPECIFICATIONS

Steel: ASTM A570, Grade A, Made in USA.
Galvanizing: ASTM A123 or A93, 2½ oz. coating class.
Paint: USF Standard Lead Chromate Baked-On.

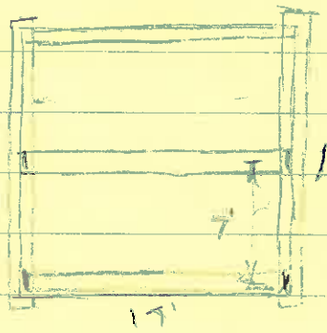
ECONOMICAL DESIGN

The shape of USF Sheet Piling reflects an efficient use of steel as shown by the high section moduli in the table above. When you buy USF Piling you get more for your money.

MISCELLANEOUS

Driving Heads are available. For details of Standard Tees, Crosses, and Corners see P 4.

BR 214.01
11/26/75



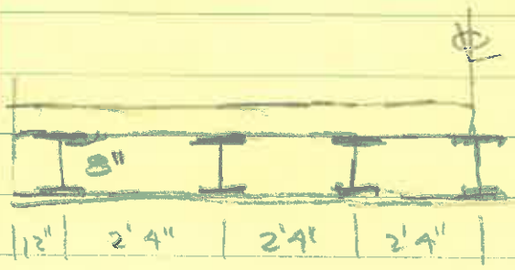
Weight 13# / sq. ft
+ 2" concrete = 25
D.L. = 38# / sq. ft.
D.L./L. Stringer = 285#
Total D.L./ft. = 311#

Try 16 WF 26 Section Mod. 38.1 Avail Mom = 85.23
Moment D.L. = 7.62
Mom. Avail. for L.L. = 78.11
L.L.M./Traf. Lane = 84
Eq. No. Bms = 1.6
L.L.M/Beam = 52.6
Impact = 30%
L.L.M. + I.M. = 68.25
>15 % Legal = 1.144
Percent Legal = 82.5 x 1.144 = 94.4%
USE 14 WF 30

∴ Concrete filled Steel Grid
1. Reduce dead load slightly.
2. Need: #2140.00 steel beams
21500.00 steel grid @ 9.50/sq'
410.00 3/8" Re Bar
900.00 Concrete
24950.00
Say #25 000.00 Material
3. Could Maintain existing elevation by cutting down ends

BR 21- 1.01
11/26/75

WOOD FLOOR



Try 8WF 17 S = 19.1 @ 2'4" 7 Lines

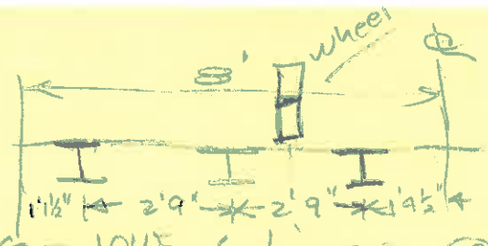
Mom Avail = 31.73
D.L. = 50 × 1/3 × 2.33 + 17 = 55.9 #/ft
+1" Asplalt = 29.17
Say 85 #/ft

Du L. Mom = 2.08 ft-kips
Mom Avail for L.L. = 29.65
L.L./lane = 81
Eq. No. Bms = 3.86
L.L.M = 21.76
L.L.M+I = 28.29
% SIS = 1.048
% Legal = 86.5% Legal

~~8WF 20~~ S = 17.0
D.L. = 89 #/ft
D.L. Mom = 2.15
Mom. Avail = 38.25
Mom Avail for L.L. = 36.10
% SIS = 127.6%
% Legal = 105 %

OK
USE 7 Lines 8WF=20
@ 2'4"

-OVER-



7 Gg 2×6 - 10LF 6 Lines @ 2'9" = 13'9"

TRY 10LF 21 S = 21.5

D.L. = 38.8 × 2.75 + 21.5 = 128.2 #

D.L.M = 14' 128.2/8 = 3.14

Mom Avail = 98.4

Mom Avail for LL = 95.24

L.L.M = 84/2.54 = 33.07

L.L.M + I = 42.99

% S15 = 105

% Legal = 87%

Try 10LF 25 S = 26.4

D.L. = 132.1

D.L.M. = 14' × 132.1/8 = 3.24

Mom. Avail. = 26.4 × 27/12 = 59.9

Mom Avail for LL = 51.66

% S15 = 120.2%

% Legal = 99.2% GOOD ENOUGH

COST

Metal Decking @ $7.00/M' = $15800.00

STRINGERS @ 17¢/lb 3600.00

19400.00

SHEET STEEL say $20,000 material

300

BR 21-1.01
12/29/25

2×6 CORRUGATIONS
6 Lines 10WE25 × 140' = 21000#
@17¢ = $3570.00

Flooring Painted
3.25 × 2256 = 7332
3.00 32 = 96
5.25 24 = 126
$7554.00

TOTAL = $11,124.00

3×9 CORRUGATIONS
5 Lines 10WE29 × 140 = 20300#
@17¢ = $3451.00

3.40 × 2256 = 7670.40
96.00
228.00
$7994.40

TOTAL = $11,445.40

Existing D.L./Panel
= 14 × 16 × (150/6 + 50/3) + 14 × 10 × 12.5
= 11,083#

Proposed 3×9 D.L. = 45 × 14 × 16 + 5 × 14 × 29
12,110# ∴ 9% increase

Proposed 2×6 D.L. 38.3 × 14 × 16 + 6 × 14 × 25
10,791# – reduction

February 19, 1976

The Honorable Board of
Logan County Commissioners
Court House
Bellefontaine, Ohio 43311

COPY

Gentlemen:

Re: Logan County Bridge 21-1.01

The above referenced structure is located on C.R.#21 about 3 miles north of DeGraff over the Great Miami River. The existing structure is a 140 foot long Whipple Truss built in 1882. The floor of this structure is 2 x 4 wood strips clamped to 6 inch stringers. The current 60% posted reduction in legal loads is due to the weakness of these stringers. The wood floor is in critical condition and in need of total replacement.

We propose to replace the stringers and flooring on this structure with new 10 inch steel stringers and structural plate bridge flooring. This will complete the program of upgrading this structure and will eliminate the need for a reduction in legal loads.

The estimated cost of this project is as follows:

Labor		$2,200.00
Equipment		1,100.00
Retirement		176.00
Workmen's Compensation		88.00
Material		11,500.00
Engineering		236.00
Total Estimated Cost	=	$15,300.00

In accordance with Section 5543.11 O.R.C., you are hereby notified that this project will require the closing to thru traffic of C.R. #21 from C.R. #77 to C.R. #24 for a period of 3 weeks.

A detour will be provided as follows: Commencing at the intersection of C.R. #21 and C.R. #77; thence with C.R. #77 westerly 1.05 miles to T.R. #35; thence with T.R. #35 southerly 1.05 miles to S.R. #47; thence with S.R. #47 easterly 1.7 miles to C.R. #24; thence with C.R. #24 northerly .4 mile to C.R. #21 and there terminate. A total distance of 4.2 miles.

Standard barricades, route markings and warning signs will be placed in accordance with the "Ohio Manual of Uniform Traffic Control Devices for Streets and Highways."

We are requesting authorization to proceed with this project on "Force Account."

Respectfully submitted,

Chester R. Kurtz

Chester R. Kurtz, P.E.
Logan County Engineer

CRK/MWB/ed

COST WOOD FLOOR

(Steel) 141 × 20 × 7 × .17 = #3355.00

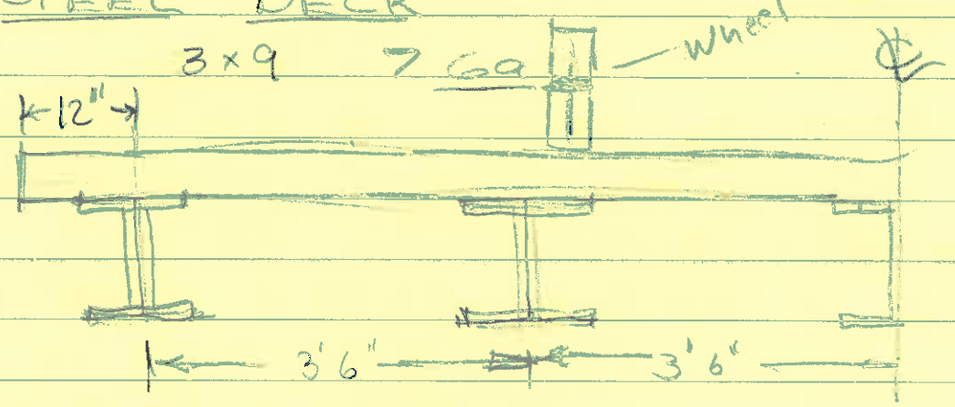
(WOOD) 141 × 16 × 4 × .28 = 2527.00

Nails - Clips & Bolts = 500.00

6382.00

Wood Deck say #6500.00 Material

STEEL DECK



Eq. No. Bm = 2.0

D.L. = 45.1 × 3.5 + 25 = 183#

D.L. M = 14².183/8 = 4.5

L.L. M = 84/2 = 42.0

L.L. M = 1.3 × 42 = 54.6

10WF25 S = 26.4

Mom. Avail. = 59.4

Mom Avail. for L.L. = 54.9

S.F. = 101%

% Legal = 83 %

10WF29 S = 30.8

D.L. M = 4.58

Mom Avail. = 69.3

" " L.L. = 64.7

S.F. = 118%

% Legal = 97.7% OK

5 Lines 10WF29

FOR (0%) REDUCTION 8/1/74 RIB

HIP VERTICALS

Existing MEMBER = 2 - $1\frac{3}{4}'' \times \frac{1}{2}''$

STRESS FOR 0% REDUCTION

$$F = \frac{100}{82.5}(30.6) + 6.6_{D.L.S.} = 43.7K$$

AVAILABLE STRESS

$.95 \times 2 \times 1.75 \times .5 \times 19 ksi = 31.6K$

NEEDED STRESS

$43.7K - 31.6K = 12.1K$

$\frac{12.1K}{27 ksi} = .45 in^2$ call it $.5 in^2$

(f = 27ksi FOR NEW STEEL)

$.5/2 = .25 in^2$ per existing bars

∴ COULD USE

.5 x .25

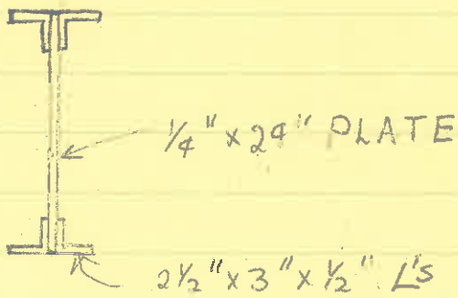
2 — $\frac{1}{2} \times \frac{1}{2}$ in bars @ .85 #/ft
2 - $1 \times \frac{1}{4}$ in bars @ .85 #/ft
2 - 9/16" diameter ϕ @ .895 #/ft

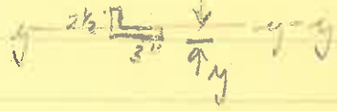
BRIDGE 21-1.01

$M_{DSO} = \frac{100}{82}(20.23) + 1.5 = 26.17$ ft k

$26.17 = \frac{S \times 27}{12}$ $\quad S = 26.17 \times \frac{12}{27} = 11.63$ in^3 at f = 27 ksi

A 6WF20 WOULD GIVE 0% REDUCTION ($S = 13.4$ in^3)





3 x 2 1/2 x 1/2" $\quad$ 8.5 #/ft $\quad$ $A = 2.5$ in^2 $\quad$ $I_{yy} = 1.3$ in^4 $\quad$ $\bar{y} = .75$ in $\quad$ $S_{yy} = .74$ in^3

$I_{PL} = \frac{bh^3}{12} = \frac{.25(24)^3}{12} = 288$ in^4

$\bar{y} = 12"$

$I_{L's} = 4(1.3) + 4(2.5 - .313)(11.25)^2 = 1112.37$ (5.2)

$I_T = 1400.37$

$S = \frac{I_T}{\bar{y}} = \frac{1400.37}{12} = 116.7$

THEY USE 112.26 (OK)

111.39

111.2

$\tan\theta_1 = L/H = 19/21 = .667$ $\quad P = 10$

$\sec\theta_1 = 25.29/21 = 1.202$

$\tan\theta_2 = \frac{28}{21} = 1.333$

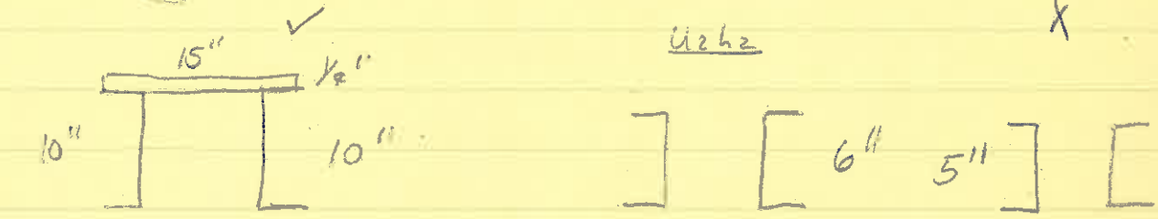
$\sec\theta_2 = \frac{35}{21} = 1.667$

D.L. = 6.6 K/PANEL.

91.58 37.78 60.06 106.26 9.62 91.58 15.77 9.29 115.5 10.63 5.08 5.08 1.39

1.1667

$h_0 u_1$, $u_1 u_2$, $u_4 u_5$, $u_2 h_2$, $u_3 h_3$, $u_4 h_4$, $u_5 h_5$



$A_{10} = 9.96 \qquad I = 66.9$

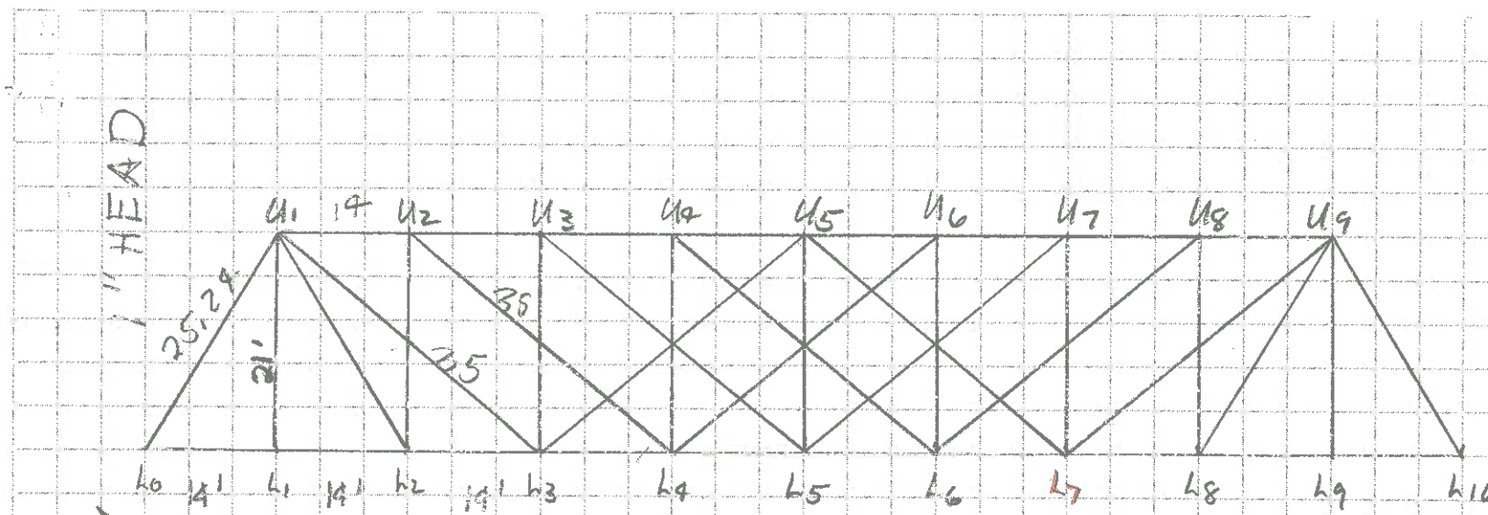
$$\bar{y} = \frac{10.125(3.75) + 5(2)(9.96)}{3.75 + 2(9.96)} = \frac{82.58}{12.67} = 6.52''$$

$$I_{10} = 2(66.9) + 2(9.96)(1.52)^2 = 154.91$$

$$I_{PL} = \frac{15(.25)^3}{12} + 3.75(3.605)^2 = 98.75$$

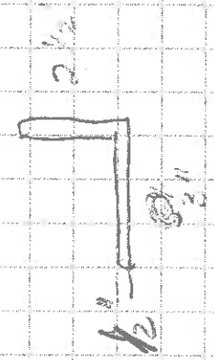
$$I_T = 203.16$$

$$R = \sqrt{\frac{I}{A}} = \sqrt{\frac{203.16}{12.67}} = \sqrt{16.035} = 4.0$$



1 HEAD

RIVETS ~5/8"



(4.5).7(6.6)

$\frac{14}{21}(4.5)(6.6)$ 29.7

19.8

784
400
1184

900

25.24
35.0

441
196
637

784
441
1225.

400
196
596

29.4

21-1.01

OHIO DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BRIDGE INVENTORY & APPRAISAL CODE SHEET

CHECKED BY _____ DATE _____

C.A. Bruce DATE 5/29/79

PROCESSING KEY	
STRUCTURE FILE NO.	TRANS. CODE
4631838	C

CARD NO.	(1) ODOT DISTRICT	(2) CITY OR TOWN	(3) INVENTORY ROUTE: ON/UNDER	SYSTEM	ROUTE NUMBER	DIRECT. SUFFIX	DESIGNATION	PREF. ROUTE	(4) FEATURE(S) INTERSECTED	(5) INV.RTE. BRIDGE NO.: COUNTY	UNIT NUMBER: STRAIGHT LINE MILEAGE	SPECIAL DESIGNATION	(6) SECTION I. D. NUMBER	INV
1			1	4	C0021		1							00

CARD NO.	(13) DEFENSE: SECTION NUMBER	MILEPOINT BEGIN SECTION	SECTION LENGTH	(14) TOT.MIN HORIZONTAL CLEAR.: NON-CARD. OPENING	CARDINAL OPENING	(15) PRACTICAL MAXIMUM VERTICAL CLEAR.: FT.	IN.	(16)	(17) INTERSECTED ROUTE: ON/UNDER	SYSTEM	ROUTE NUMBER	DIRECT. SUFFIX	DESIGNATION	PREF. ROUTE	(18) FEATURE(S) INTERSECTED
2				00	160	18	11								

CARD NO.	(20) INTERSECTED ROUTE A.D.T. (TENS)	(21) A.D.T. YEAR	(22) FED. AID SYSTEM	(23) ADMIN. JURISD.	(24) FUNCTIONAL CLASS	(25) DEFENSE: SECTION NUMBER	MILEPOINT BEGIN SECTION	SECTION LENGTH	(26) TOT MIN HORIZONTAL CLEAR.: NON-CARD. OPENING	CARDINAL OPENING	(27) PRACTICAL MAXIMUM VERTICAL CLEAR.: FT.	IN.	(28)	(29) BY-PASS LENGTH	(30) COORDINATES: LATITUDE DEGREES	MINUTES	LONGITUDE DEGREES	MINUTES	(31) PHYS. VULNER.	(32) TOLL	ORIG. CONS.
3														04						3	00

CARD NO.	(38) APPROACH ROADWAY WIDTH	(39) MEDIAN TYPE	(40) FLARED	(41) BRIDGE ROADWAY WIDTH (CB/CB)	(42) DECK WIDTH (OUT/OUT)	(43) RAIL TYPE	(44) DECK DRAIN.	(45) SIDEWALKS: LEFT	RIGHT	(46) FLOOR SLAB	(47) WEARING SURFACE: TYPE	THICKNESS (INCH)	(48) STRUCTURE TYPE: MAIN SPANS NUMBER	MAIN SPANS TYPE CODE	APPR. SPANS NUMBER	APPR. SPANS TYPE CODE	(49) TOTAL NO. SPANS	(50) MAXIMUM SPAN LENGTH	(51) OVERALL STRUCTURE LENGTH	(52) TYPE SERVICE	(53) BRIDGE DESCRIPTION
4	020	000	0	0160	0160	7				6	2	04	001	3440	0	0		0140	00143		/

CARD NO.	(58) SUBSTRUCTURE: ABUTMENTS REAR MAT'L	TYPE	FWD. MAT'L	TYPE	PIERS PREDOMINATE NUMBER UNITS	MAT'L	TYPE	OTHER NUMBER UNITS	MAT'L	TYPE	OTHER NUMBER UNITS	MAT'L	TYPE	(59) PILING	(60) MIN. VERT. UNDERCLEAR. (MAIN LANES) NON-CARD. OPENING FT.	IN.	CARDINAL OPENING FT.	IN.	(61) MIN. LATERAL UNDERCLEAR. TO EDGE OF LANE NON-CARD. DIRECT. LEFT	RIGHT	CARDINAL DIRECT. LEFT	RIGHT	(62) NAVIGATION CONTROLLED	VERT. CLEAR.	HORIZ. CLEAR.	(63) OHIO ORIGINAL CONSTR. PROJ. NO.	(64) MICROFILM REEL NO.
5																											

ION ER	MILEPOINT BEGIN SECTION	SECTION LENGTH	CLEAR. NON-CARD. OPENING	CLEAR. CARDINAL OPENING	MINIMUM VERTICAL CLEAR. FT.	MINIMUM VERTICAL CLEAR. IN.		ON/UND	SYSTE	ROUTE NUMBER	DIRECT.	DESIGNAT	PREF. RO	(18) FEATURE(S) INTERSECTED	COUNT	STRAIGHT LINE MILEAGE	SPECIAL DESIGNATIO
	19	22	25	28	30	32		36	37	38	43	44	45	46	71	74	79 80

(20) SECTED JTE .-T. NS)	(21) A.D.T. YEAR	(22) FED. AID SYSTEM	(23) ADMIN. JURISD.	(24) FUNCTIONAL CLASS	(25) DEFENSE SECTION NUMBER	MILEPOINT BEGIN SECTION	SECTION LENGTH	(26) TOT MIN HORIZONTAL CLEAR. NON-CARD. OPENING	CARDINAL OPENING	(27) PRACTICAL MAXIMUM VERTICAL CLEAR. FT.	IN.	(28)	(29) BY-PASS LENGTH	(30) COORDINATES LATITUDE DEGREES	MINUTES	LONGITUDE DEGREES	MINUTES	(31) PHYS. VULNER.	(32) TOLL	(33) YEAR BUILT ORIG. CONS.	MAJOR RECON.	(34) NO. LANES ON STRUCT.	UNDER STRUCT.	(35) HORIZ. CURVE DEG.	MIN.	(36) SKEW	(37) DESIGN LOADING
	16	18	20	22	24	29	33	36	39	42	44	46	50	52	54	57	60	63	64	65	67	69	71	73	75	77	79 80

(39) MEDIAN TYPE	(40) FLARED	(41) BRIDGE ROADWAY WIDTH (CB/CB)	(42) DECK WIDTH (OUT/OUT)	(43) RAIL. TYPE	(44) DECK DRAIN.	(45) SIDEWALKS LEFT	RIGHT	(46) FLOOR SLAB	(47) WEARING SURFACE TYPE	THICKNESS (INCH)	(48) STRUCTURE TYPE MAIN SPANS NUMBER	TYPE CODE	APPR. SPANS NUMBER	TYPE CODE	(49) TOTAL NO. SPANS	(50) MAXIMUM SPAN LENGTH	(51) OVERALL STRUCTURE LENGTH	(52) TYPE SERVICE	(53) BRIDGE DESCRIPTION	(54) MINIMUM VERTICAL CLEAR. ON BRIDGE FT.	IN.	(55)	(56)	(57) BEARING TYPE
13	16	17	21	25	26	27	30	33	34	35	37	40	43	46	49	52	56	62	64	66	68	70	75	80

(58) SUBSTRUCTURE ITS O.	PIERS PREDOMINATE TYPE	NUMBER UNITS	MAT'L	OTHER TYPE	NUMBER UNITS	MAT'L	OTHER TYPE	NUMBER UNITS	MAT'L	TYPE	(59) PILING	(60) MIN. VERT. UNDERCLEAR. (MAIN LANES) NON-CARD. OPENING FT.	IN.	CARDINAL OPENING FT.	IN.	(61) MIN. LATERAL UNDERCLEAR. TO EDGE OF LANE NON-CARD. DIRECT. LEFT	RIGHT	CARDINAL DIRECT. LEFT	RIGHT	(62) NAVIGATION CONTROLLED	VERT. CLEAR.	HORIZ. CLEAR.	(63) OHIO ORIGINAL CONSTR. PROJ. NO.	(64) MICROFILM REEL NO.	(65) ORIGINAL CONSTRUCTION FEDERAL AID PROJECT NUMBER
13	14	16	17	18	20	21	22	24	25	26	27	29	31	33	35	38	41	44	47	48	51	55	61	67 80

(68) LOAD RATING INVENTORY RATING	OHIO % OF LEGAL	RATING YEAR	(67) INSP. RESP.	(68) MAINT. RESP.	(69) APPRAISAL DECK GEOM.	UNDERCLEAR.	SAFE LOAD CAP.	WATERWAY ADEQ.	APPR. ALIGN.	REMAIN. LIFE	(70) PROPOSED IMPROVEMENTS YEAR NEEDED	TYPE SERVICE	TYPE WORK	LENGTH OF IMPROVEMENT	IMPR. DES. LOAD	PROPOSED ROAD WIDTH	NUMBER LANES	DESIGN A.D.T. (TENS)	YEAR A.D.T.	ADJ. RDWY. YEAR	TYPE	(71) COST OF IMPROVEMENTS TOTAL COST ($1000'S)	YEAR OF COSTS	BREAKDOWN ($1000'S) PRELIM. ENG.	DEMO-LITION	SUB-STRUCTURE	SUPER-STRUCTURE	(72) PRIORITY
13	16	18	21	22	23	24	25	26	27	28	29	31	32	35	40	42	46	48	54	56	56	59	64	66	69	72	76	80

S:

OFFICIAL USE ONLY

O.A.CODE _____

REVIEWED BY _____

DATE _____

DATA RECORDER (STAMP) V76

DEC 02 1981

DATE _____

IBER	BEGIN SECTION	SECTION LENGTH	VERTICAL CLEAR. NON-CARD. OPENING	VERTICAL CLEAR. CARDINAL OPENING	VERTICAL CLEAR. FT.	VERTICAL CLEAR. IN.	BN/UN	SYST	ROUTE NUMBER	DIRECT.	DESIGNA	PREF. R	(18) FEATURE(S) INTERSECTED	COUN	STRAIGHT LINE MILEAGE	SPECIAL DESIGNATIO
	15	19	22	25	29	30	32	36	37	38	43	44	45	46	71	74	79 80

(20) RSECTED OUTE D.T. ENS)	(21) A.D.T. YEAR	(22) FED. AID SYSTEM	(23) ADMIN. JURISD.	(24) FUNCTIONAL CLASS	(25) DEFENSE SECTION NUMBER	MILEPOINT BEGIN SECTION	SECTION LENGTH	(26) TOT MIN HORIZONTAL CLEAR. NON-CARD. OPENING	TOT MIN HORIZONTAL CLEAR. CARDINAL OPENING	(27) PRACTICAL MAXIMUM VERTICAL CLEAR. FT.	PRACTICAL MAXIMUM VERTICAL CLEAR. IN.	(28)	(29) BY-PASS LENGTH	(30) COORDINATES LATITUDE DEGREES	LATITUDE MINUTES	LONGITUDE DEGREES	LONGITUDE MINUTES	31 PHYS. VULNER.	32 TOLL	(33) YEAR BUILT ORIG. CONS.	YEAR BUILT MAJOR RECON.	(34) NO. LANES ON STRUCT.	NO. LANES UNDER STRUCT.	(35) HORIZ. CURVE DEG.	HORIZ. CURVE MIN.	(36) SKEW	(37) DESIGN LOADING
	16	18	20	22	24	29	33	36	39	42	44	46	50	52	54	57	60	63	64	65	67	69	71	73	76	77	79 80

)	(39) MEDIAN TYPE	40 FLARED	(41) BRIDGE ROADWAY WIDTH (CB/CB)	(42) DECK WIDTH (OUT/OUT)	43 RAIL. TYPE	44 DECK DRAIN.	(45) SIDEWALKS LEFT	SIDEWALKS RIGHT	46 FLOOR SLAB	(47) WEARING SURFACE TYPE	WEARING SURFACE THICKNESS (INCH)	(48) STRUCTURE TYPE MAIN SPANS NUMBER	MAIN SPANS TYPE CODE	APPR. SPANS NUMBER	APPR. SPANS TYPE CODE	(49) TOTAL NO. SPANS	(50) MAXIMUM SPAN LENGTH	(51) OVERALL STRUCTURE LENGTH	(52) TYPE SERVICE	(53) BRIDGE DESCRIPTION	(54) MINIMUM VERTICAL CLEAR. ON BRIDGE FT.	MINIMUM VERTICAL CLEAR. ON BRIDGE IN.	(55)	(56)	57 BEARING TYPE
	13	16	17	21	25	26	27	30	33	34	35	37	40	43	46	49	52	56	62	64	66	68	70	75	80

(58) SUBSTRUCTURE ENTS WO.	PIERS PREDOMINATE TYPE	PREDOMINATE NUMBER UNITS	PREDOMINATE MAT'L	PREDOMINATE TYPE	OTHER NUMBER UNITS	OTHER MAT'L	OTHER TYPE	OTHER NUMBER UNITS	OTHER MAT'L	OTHER TYPE	59 PILING	(60) MIN. VERT. UNDERCLEAR. (MAIN LANES) NON-CARD. OPENING FT.	NON-CARD. OPENING IN.	CARDINAL OPENING FT.	CARDINAL OPENING IN.	(61) MIN. LATERAL UNDERCLEAR. TO EDGE OF LANE NON-CARD. DIRECT. LEFT	NON-CARD. DIRECT. RIGHT	CARDINAL DIRECT. LEFT	CARDINAL DIRECT. RIGHT	(62) NAVIGATION CONTROLLED	VERT. CLEAR.	HORIZ. CLEAR.	(63) OHIO ORIGINAL CONSTR. PROJ. NO.	(64) MICROFILM REEL NO.	(65) ORIGINAL CONSTRUCTION FEDERAL AID PROJECT NUMBER
12	13	14	18	17	18	20	21	22	24	25	26	27	29	31	33	35	38	41	44	47	48	51	55	61	67 80

(66) LOAD RATING INVENTORY RATING	OHIO % OF LEGAL	RATING YEAR	67 INSP. RESP.	68 MAINT. RESP.	(69) APPRAISAL DECK GEOM.	UNDERCLEAR.	SAFE LOAD CAP.	WATERWAY ADEQ.	APPR. ALIGN.	REMAIN. LIFE	(70) PROPOSED IMPROVEMENTS YEAR NEEDED	TYPE SERVICE	TYPE WORK	LENGTH OF IMPROVEMENT	IMPR. DES. LOAD	PROPOSED ROAD WIDTH	NUMBER LANES	DESIGN A.D.T. (TENS)	YEAR A.D.T.	ADJ. RDWY. YEAR	ADJ. RDWY. TYPE	(71) COST OF IMPROVEMENTS TOTAL COST ($1000'S)	YEAR OF COSTS	BREAKDOWN ($1000'S) PRELIM. ENG.	DEMO-LITION	SUB-STRUCTURE	SUPER-STRUCTURE	72 PRIORITY
13	16	18	21	22	23	24	25	26	27	28	29	31	32	35	40	42	46	48	54	56	58	58	64	66	69	72	76	80
					4	W	5	8	8	1																	

KS:

OFFICIAL USE ONLY

O.A.CODE _____

REVIEWED BY _____

DATE _____

DATA RECORDER (STAMP)

NOV 03 19

DATE _____

BER	BEGIN SECTION	SECTION LENGTH	VERTICAL CLEAR. NON-CARD. OPENING	VERTICAL CLEAR. CARDINAL OPENING	VERTICAL CLEAR. FT.	VERTICAL CLEAR. IN.		ON/UN	SYST	ROUTE NUMBER	DIRECT.	DESIGN	PREF.	(26) FEATURE(S) INTERSECTED	COUN	STRAIGHT LINE MILEAGE	SPECIAL DESIGNATI
	15	19	22	25	28	30	32	36	37	38	43	44	45	46	71	74	79 80

(20) RSECTED UTE D.T. ENS)	(21) A.D.T. YEAR	(22) FED. AID SYSTEM	(23) ADMIN. JURISD.	(24) FUNCTIONAL CLASS	(25) DEFENSE SECTION NUMBER	MILEPOINT BEGIN SECTION	SECTION LENGTH	(26) TOT MIN HORIZONTAL CLEAR. NON-CARD. OPENING	CARDINAL OPENING	(27) PRACTICAL MAXIMUM VERTICAL CLEAR. FT.	IN.	(28)	(29) BY-PASS LENGTH	(30) COORDINATES LATITUDE DEGREES	MINUTES	LONGITUDE DEGREES	MINUTES	31 PHYS. VULNER.	32 TOLL	(33) YEAR BUILT ORIG. CONS.	MAJOR RECON.	(34) NO. LANES ON STRUCT.	UNDER STRUCT.	(35) HORIZ. CURVE DEG.	MIN.	(36) SKEW	(37) DESIGN LOADING
	16	18	20	22	24	29	33	36	38	42	44	46	50	52	54	57	60	63	64	65	67	69	71	73	75	77	79 80

(39) MEDIAN TYPE	40 FLARED	(41) BRIDGE ROADWAY WIDTH (CB/CB)	(42) DECK WIDTH (OUT/OUT)	43 RAIL. TYPE	44 DECK DRAIN.	(45) SIDEWALKS LEFT	RIGHT	46 FLOOR SLAB	(47) WEARING SURFACE TYPE	THICKNESS (INCH)	(48) STRUCTURE TYPE MAIN SPANS NUMBER	TYPE CODE	APPR. SPANS NUMBER	TYPE CODE	(49) TOTAL NO. SPANS	(50) MAXIMUM SPAN LENGTH	(51) OVERALL STRUCTURE LENGTH	(52) TYPE SERVICE	(53) BRIDGE DESCRIPTION	(54) MINIMUM VERTICAL CLEAR. ON BRIDGE FT.	IN.	(55)	(56)	57 BEARING TYPE
13	16	17	21	25	26	27	30	33	34	35	37	40	43	46	49	52	56	62	64	66	68	70	75	80

(58) SUBSTRUCTURE NTS WD. PIERS PREDOMINATE TYPE	NUMBER UNITS	MAT'L	OTHER TYPE	NUMBER UNITS	MAT'L	OTHER TYPE	NUMBER UNITS	MAT'L	TYPE	59 PILING	(60) MIN. VERT. UNDERCLEAR. (MAIN LANES) NON-CARD. OPENING FT.	IN.	CARDINAL OPENING FT.	IN.	(61) MIN. LATERAL UNDERCLEAR. TO EDGE OF LANE NON-CARD. DIRECT. LEFT	RIGHT	CARDINAL DIRECT. LEFT	RIGHT	(62) NAVIGATION CONTROLLED	VERT. CLEAR.	HORIZ. CLEAR.	(63) OHIO ORIGINAL CONSTR. PROJ. NO.	(64) MICROFILM REEL NO.	(65) ORIGINAL CONSTRUCTION FEDERAL AID PROJECT NUMBER
12 13	14	16	17	19	20	21	22	24	25	26	27	29	31	33	35	38	41	44	47	48	51	55	61	67 80

(66) LOAD RATING INVENTORY RATING	OHIO % OF LEGAL	RATING YEAR	67 INSP. RESP.	68 MAINT. RESP.	(69) APPRAISAL DECK GEOM.	UNDERCLEAR.	SAFE LOAD CAP.	WATERWAY ADEQ.	APPR. ALIGN.	REMAIN. LIFE	(70) PROPOSED IMPROVEMENTS YEAR NEEDED	TYPE SERVICE	TYPE WORK	LENGTH OF IMPROVEMENT	IMPR. DES. LOAD	PROPOSED ROAD WIDTH	NUMBER LANES	DESIGN A.D.T. (TENS)	YEAR A.D.T.	ADJ. ROWY. YEAR	TYPE	(71) COST OF IMPROVEMENTS TOTAL COST ($1000'S)	YEAR OF COSTS	BREAKDOWN ($1000'S) PRELIM. ENG.	DEMO-LITION	SUB-STRUCTURE	SUPER-STRUCTURE	72 PRIORITY
13	16	18	21	22	23	24	25	26	27	28	29	31	32	35	40	42	46	48	54	56	58	59	64	66	69	72	76	80
9.2.7	100	7.6																									

KS:

OFFICIAL USE ONLY

O.A.CODE _____

REVIEWED BY _____

DATE _____

DATA RECORDER (STAMP)

P-56

OCT 2 × 1977

DATE _____

	BEGIN SECTION	SECTION LENGTH	NON-CARD. OPENING	CARDINAL OPENING	VERTICAL CLEAR. FT.	VERTICAL CLEAR. IN.		ON/UN	SYST	ROUTE NUMBER	DIRECT.	DESIGN	PREF.		COUN	STRAIGHT LINE MILEAGE	SPECIAL DESIGNAT.
	15	19	22	25	28	30	32	36	37	38	43	44	45	46	73	74	79 80

	(21) A.D.T. YEAR	(22) FED. AID SYSTEM	(23) ADMIN. JURISD.	(24) FUNCTIONAL CLASS	(25) DEFENSE SECTION NUMBER	MILEPOINT BEGIN SECTION	SECTION LENGTH	(26) TOT MIN HORIZONTAL CLEAR. NON-CARD. OPENING	CARDINAL OPENING	(27) PRACTICAL MAXIMUM VERTICAL CLEAR. FT.	IN.	(28)	(29) BY-PASS LENGTH	(30) COORDINATES LATITUDE DEGREES	MINUTES	LONGITUDE DEGREES	MINUTES	(31) PHYS. VULNER.	(32) TOLL	(33) YEAR BUILT ORIG. CONS.	MAJOR RECON.	(34) NO. LANES ON STRUCT.	UNDER STRUCT.	(35) HORIZ. CURVE DEG.	MIN.	(36) SKEW	(37) DESIGN LOADING
	16	18	20	22	24	29	33	36	39	42	44	46	50	52	54	57	60	63	64	65	67	69	71	73	75	77	79 80
																				00	7,6						

	(39) MEDIAN TYPE	40 FLARED	(41) BRIDGE ROADWAY WIDTH (CB/CB)	(42) DECK WIDTH (OUT/OUT)	43 RAIL. TYPE	44 DECK DRAIN.	(45) SIDEWALKS LEFT	RIGHT	46 FLOOR SLAB	(47) WEARING SURFACE TYPE	THICKNESS (INCH)	(48) STRUCTURE TYPE MAIN SPANS NUMBER	TYPE CODE	APPR. SPANS NUMBER	TYPE CODE	(49) TOTAL NO. SPANS	(50) MAXIMUM SPAN LENGTH	(51) OVERALL STRUCTURE LENGTH	(52) TYPE SERVICE	(53) BRIDGE DESCRIPTION	(54) MINIMUM VERTICAL CLEAR. ON BRIDGE FT.	IN.	(55)	(56)	57 BEARING TYPE
	13	16	17	21	25	26	27	30	33	34	35	37	40	43	46	49	52	56	62	64	66	68	70	75	80

(58) SUBSTRUCTURE 'S	PIERS PREDOMINATE TYPE	NUMBER UNITS	MAT'L	OTHER TYPE	NUMBER UNITS	MAT'L	OTHER TYPE	NUMBER UNITS	MAT'L	TYPE	59 PILING	(60) MIN. VERT. UNDERCLEAR. (MAIN LANES) NON-CARD. OPENING FT.	IN.	CARDINAL OPENING FT.	IN.	(61) MIN. LATERAL UNDERCLEAR. TO EDGE OF LANE NON-CARD. DIRECT. LEFT	RIGHT	CARDINAL DIRECT. LEFT	RIGHT	(62) NAVIGATION CONTROLLED	VERT. CLEAR.	HORIZ. CLEAR.	(63) OHIO ORIGINAL CONSTR. PROJ. NO.	(64) MICROFILM REEL NO.	(65) ORIGINAL CONSTRUCTION FEDERAL AID PROJECT NUMBER
	13 14	16	17	18	20	21	22	24	25	26	27	29	31	33	35	38	41	44	47	48	51	55	61	67 80	

) LOAD RATING INVENTORY RATING	OHIO % OF LEGAL	RATING YEAR	67 INSP. RESP.	68 MAINT. RESP.	(69) APPRAISAL DECK GEOM.	UNDERCLEAR.	SAFE LOAD CAP.	WATERWAY ADEQ.	APPR. ALIGN.	REMAIN. LIFE	(70) PROPOSED IMPROVEMENTS YEAR NEEDED	TYPE SERVICE	TYPE WORK	LENGTH OF IMPROVEMENT	IMPR. DES. LOAD	PROPOSED ROAD WIDTH	NUMBER LANES	DESIGN A.D.T. (TENS)	YEAR A.D.T.	ADJ. ROWY. YEAR	TYPE	(71) COST OF IMPROVEMENTS TOTAL COST ($1000'S)	YEAR OF COSTS	BREAKDOWN ($1000'S) PRELIM. ENG.	DEMO-LITION	SUB-STRUCTURE	SUPER-STRUCTURE	72 PRIORITY
	13 16	18	21	22	23	24	25	26	27	28	29	31	32	35	40	42	46	48	54	56	58	59	64	66	69	72	76	80
~~767~~ 727	1,00	76			4	N	5	8	8	1																		

OFFICIAL USE ONLY

O.A.CODE _____

REVIEWED BY _____

DATE _____

DATA RECORDER (STAMP)

FEB 23 1978

FEB 23 1977

DATE

BER	BEGIN SECTION	SECTION LENGTH	VERTICAL CLEAR. NON-CARD. OPENING	VERTICAL CLEAR. CARDINAL OPENING	VERTICAL CLEAR. FT.	VERTICAL CLEAR. IN.	ON/UN	SYST	NUMBER	DIRECT.	DESIGN	PREF.	COUN	STRAIGHT LINE MILEAGE	SPECIAL DESIGNATI
	15	19	22	25	28	30	32	36	37	38	43	44	45	71	74	78 80
			0 0 0	1 5 0	1 8	0 6										

(20) SECTED UTE ..T. NS)	(21) A.D.T. YEAR	(22) FED. AID SYSTEM	(23) ADMIN. JURISD.	(24) FUNCTIONAL CLASS	(25) DEFENSE SECTION NUMBER	MILEPOINT BEGIN SECTION	SECTION LENGTH	(26) TOT MIN HORIZONTAL CLEAR. NON-CARD. OPENING	(26) TOT MIN HORIZONTAL CLEAR. CARDINAL OPENING	(27) PRACTICAL MAXIMUM VERTICAL CLEAR. FT.	(27) PRACTICAL MAXIMUM VERTICAL CLEAR. IN.	(28)	(29) BY-PASS LENGTH	(30) COORDINATES LATITUDE DEGREES	(30) COORDINATES LATITUDE MINUTES	(30) COORDINATES LONGITUDE DEGREES	(30) COORDINATES LONGITUDE MINUTES	31 PHYS. VULNER.	32 TOLL	(33) YEAR BUILT ORIG. CONS.	(33) YEAR BUILT MAJOR RECON.	(34) NO. LANES ON STRUCT.	(34) NO. LANES UNDER STRUCT.	(35) HORIZ. CURVE DEG.	(35) HORIZ. CURVE MIN.	(36) SKEW	(37) DESIGN LOADING
	16	18	20	22	24	29	33	36	38	42	44	46	50	52	54	57	60	63	64	65	67	68	71	73	75	77	78 80
													0 4						3	0 0	0 0	0 1	0 0			0 0	1 0

(39) MEDIAN TYPE	40 FLARED	(41) BRIDGE ROADWAY WIDTH (CB/CB)	(42) DECK WIDTH (OUT/OUT)	43 RAIL. TYPE	44 DECK DRAIN.	(45) SIDEWALKS LEFT	(45) SIDEWALKS RIGHT	46 FLOOR SLAB	(47) WEARING SURFACE TYPE	(47) WEARING SURFACE THICKNESS (INCH)	(48) STRUCTURE TYPE MAIN SPANS NUMBER	(48) STRUCTURE TYPE MAIN SPANS TYPE CODE	(48) STRUCTURE TYPE APPR. SPANS NUMBER	(48) STRUCTURE TYPE APPR. SPANS TYPE CODE	(49) TOTAL NO. SPANS	(50) MAXIMUM SPAN LENGTH	(51) OVERALL STRUCTURE LENGTH	(52) TYPE SERVICE	(53) BRIDGE DESCRIPTION	(54) MINIMUM VERTICAL CLEAR. ON BRIDGE FT.	(54) MINIMUM VERTICAL CLEAR. ON BRIDGE IN.	(55)	(56)	57 BEARING TYPE
13	16	17	21	25	26	27	30	33	34	35	37	40	43	46	49	52	56	62	64	66	68	70	75	80
0 0 0	0	0 1 5 0	0 1 6 0	6	1	0 0 0	0 0 0	2	2	0 1	0 0 1	3 4 1	0 0 0	0 0 0	0 0 1	0 1 3 7	0 0 0 1 4 0	1 5		1 5	0 0			5

(58) SUBSTRUCTURE MATERIALS	59 PILING	(60) MIN. VERT. UNDERCLEAR. (MAIN LANES) NON-CARD. OPENING	(60) MIN. VERT. UNDERCLEAR. (MAIN LANES) CARDINAL OPENING	(61) MIN. LATERAL UNDERCLEAR. TO EDGE OF LANE NON-CARD. DIRECT. LEFT	(61) MIN. LATERAL UNDERCLEAR. TO EDGE OF LANE NON-CARD. DIRECT. RIGHT	(61) MIN. LATERAL UNDERCLEAR. TO EDGE OF LANE CARDINAL DIRECT. LEFT	(61) MIN. LATERAL UNDERCLEAR. TO EDGE OF LANE CARDINAL DIRECT. RIGHT	(62) NAVIGATION CONTROLLED	(62) NAVIGATION VERT. CLEAR.	(62) NAVIGATION HORIZ. CLEAR.	(63) OHIO ORIGINAL CONSTR. PROJ. NO.	(64) MICROFILM REEL NO.	(65) ORIGINAL CONSTRUCTION FEDERAL AID PROJECT NUMBER
13	26	27	31	35	38	41	44	47	48	51	55	61	67 80
1 0 0 0 0 0 0 0 0	4	0 0	0 0	0 0	0 0	9 9 9	9 9 9	9 9 9	9 9 9	0	0 0 0	0 0 0 0	

LOAD RATING INVENTORY RATING	LOAD RATING OHIO % OF LEGAL	67 INSP. RESP.	68 MAINT. RESP.	(69) APPRAISAL DECK GEOM.	UNDERCLEAR.	SAFE LOAD CAP.	WATERWAY ADEQ.	APPR. ALIGN	REMAIN. LIFE	(70) PROPOSED IMPROVEMENTS YEAR NEEDED	TYPE SERVICE	TYPE WORK	LENGTH OF IMPROVEMENT	IMPR. DES. LOAD	PROPOSED ROAD WIDTH	NUMBER LANES	DESIGN A.D.T. (TENS)	YEAR A.D.T.	ADJ. RDWY. YEAR	ADJ. RDWY. TYPE	(71) COST OF IMPROVEMENTS TOTAL COST ($1000'S)	YEAR OF COSTS	BREAKDOWN ($1000'S) PRELIM. ENG.	BREAKDOWN ($1000'S) DEMOLITION	BREAKDOWN ($1000'S) SUB-STRUCTURE	BREAKDOWN ($1000'S) SUPER-STRUCTURE	72 PRIORITY	73
13	18	19	20	21	22	23	24	25	26	27	28	30	31	34	39	41	45	47	53	55	57	58	63	65	69	71	75	78	80
9 1 2	0 4 5	3	3		4	N	2	8	8	1	8 3	0	0 0 0	0 0 0 0 0	0 0	0 0 0 0	0 0	0 0 0 0 0 0	0 0	0 0	0	0 0 0 0 0	0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0	

DATA RECORDER (STAMP)

V4

NOV 06 1973

DATE

Logan County Engineer's Office

Memo

To: Bridge Files

From: Stephanie Ann Goff, Assistant Engineer

Date: 11/10/98

Re: Change in Bridge Numbers

In 1998, the Logan County Engineer's Office had Mastermind Systems re-run the control point information for all of Logan County.

Therefore, all of the log points for the bridges have changed. In each file, a BR-87 was filled out showing the change in log points and this memo was attached to show the reason for the changes.

ENGLISH UNITS

OHIO DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
BRIDGE INVENTORY & APPRAISAL CODE SHEET

DATE STAMP ____ CODED BY ____ DATE ____

Old # 01.01

STRUCTURE FILE NO.	TRAN. CODE
1	8
4631813	C

CARD	MPO CODE	CITY OR TOWN (FIPS)	ON/UNDER	SYSTEM	ROUTE NUMBER	DIRECT. SUFFIX	DESIGNATION	PREF. ROUTE	4 FEATURE(S) INTERSECTED	COUNTY	UNIT NUMBER: STRAIGHT LINE MILEAGE	SPECIAL DESIGNATION	6 INVENTORY ROUTE A.D.T.
9	10	12	17	18	19	24	25	26	27	52	55	60	62
A					C0021						0100		

CARD	NHS	MACRO COR	FUNCTIONAL CLASS	17 INVENTORY: TOT. MIN. HORIZONTAL CLEAR: NON-CARD. OPENING	TOT. MIN. HORIZONTAL CLEAR: CARDINAL OPENING	18 INV. PRACTICAL MAXIMUM VERTICAL CLEARANCE: FT.	IN.	DEFENSE	20	21	22 INTERSECTED ROUTE: ON/UNDER	SYSTEM	ROUTE NUMBER	DIRECT. SUFFIX	DESIGNATION	PREF. ROUTE	23 FEATURE(S) INTERSECTED	24 INT. RT COUNTY	UN ST MI
9	10	11	12	14	17	20		24	25	27	28	29	30	35	36	37	38	63	66
B																			

CARD	27 INTERSECTED ROUTE TRUCK TRAFFIC	NHS	MACRO COR	FUNCTIONAL CLASS	31 INTERSECTED TOT. MIN. HORIZONTAL CLEAR: NON-CARD. OPENING	CARDINAL OPENING	32 DIR. TRAF	33 NETWORK	34 PARALLEL	35	36 DEFENSE	37 INT. PRACTICAL MAXIMUM VERTICAL CLEARANCE: FT.	IN.	38 BY-PASS LENGTH	39 COORDINATES: LATITUDE: DEGREES	MINUTES	SECONDS	LONGITUDE: DEGREES	MINUTES	SECONDS	40 TOLL	41 YEAR BUILT	42 YEAR MAJOR REHAB.	43 NO. LANES: ON STRUCT.	UNDER STRUCT.	44 HORI CURV DEG.
9	10	15	16	17	19	22	25	26	27	28	29	30		34	36	38	40	44	46	48	52	53	57	61	63	65
C																										

CARD	49 APPROACH ROADWAY WIDTH	50 BRIDGE ROADWAY WIDTH (CB/CB)	51 DECK WIDTH (OUT/OUT)	52 MEDIAN TYPE	53 MED. OP./CL.	54 SIDEWALKS: LEFT	RIGHT	55 CURBS SIDEWALKS: LEFT: MATER.	TYPE	RIGHT: MATER.	TYPE	56 FLARED	57 COMPOSITE	58 RAIL TYPE	59 DECK DRAIN	60 DECK TYPE	61 EXT. DECK PROT.	INT. DECK PROT.	62 WEARING SURFACE: TYPE	THICKNESS (INCHES)	63 STRUCTURE TYPE: MAIN SPANS: NUMBER	TYPE CODE	APPR. SPANS: NUMBER	TYPE CODE	64	65 MAXIMUM SPAN LENGTH	66 OVERA STRUCT LENGT
9	10	13	17	21	24	25	28	31	32	33	34	35	36	37	38	39	40	41	42	43	45	48	51	54	57	60	64
D																											

CARD	70 SUBSTRUCTURE: ABUTMENTS: REAR MATL.	TYPE	FWD. MATL.	TYPE	PIERS: PREDOMINATE NUMBER	UNITS	MATL.	TYPE	OTHER NUMBER	UNITS	MATL.	TYPE	OTHER NUMBER	UNITS	MATL.	TYPE	71 FOUNDATION: ABUT. REAR	FORWARD	PIERS PREDOM.	OTHER	OTHER	72 AVG. LENGTH ABUT FOUND.	73 AVG. LENGTH PIER FOUND.	74 SCOUR CR.	75 CHAN. PROT.	76	77 MIN. VERT. UNDERCLEAR. (MAIN LANES): NON-CARD. OPENING FT.	IN.	CARDINAL OPENING FT.	IN.	78 MIN. LATERAL UNDERCLEAR. TO EDGE OF LANE: NON-CARD. DIRECT LEFT	RIGHT	CARDINAL DIRECT LEFT	RIGHT	79 MINIMUM VERTICAL CLEAR ON BRIDGE FT.	IN.	80 MINIMUM CLEAR TO EDGE NON-CARDINAL LEFT	RIGHT
9	10	11	12	13	14	16	17	18	20	21	22	24	25	26	27	28	29	30	31	33	35	36	37	38		42		46	49	52	55	58		62	65
E																																						

CARD	83 LOAD RATING	84	85	86	87	88	89	90	PROPOSED IMPROVEMENTS	91	92	93
F												

21-1.01 Pleasant Twp.

Logan County Bridge Offers Window To The Past

By David A. Simmons, Ohio Historical Society

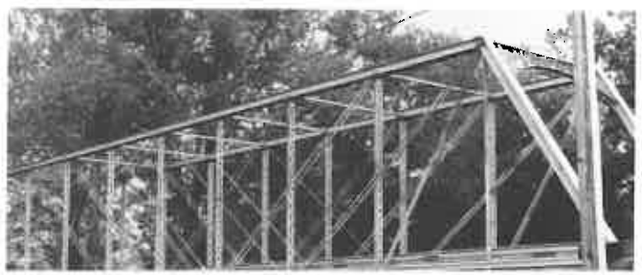
The Great Miami River Bridge, located near Logansville in Logan County, is significant as an exceptionally well-preserved representative of 19th-century American metal bridge engineering and as a prime example of the products of an important Ohio bridge firm, the Massillon Bridge Company.

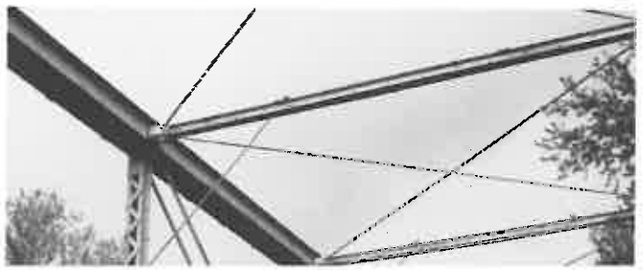
One of the major bridge building operations in Ohio during the late 19th century, the Massillon Bridge Company was first established in 1869 by Joseph Davenport, a Massillon, Ohio, inventor. During the 1870's, the company came to the attention of Andrew J. Sprague, a Toledo bridge builder and general contractor, who was then working as a traveling salesman for the famous Smith Bridge Company. In 1881, Massillon Bridge reorganized with Sprague as president, although he continued to maintain his Toledo address. Sprague had experience as the superintendent of bridges for a northwestern Ohio railroad, and in 1874 he jointly patented a variation on the combination wood and iron Howe truss commonly used for railroad bridges. Beginning in the early 1880's, the firm operated from both cities, with the Toledo shop focusing on wooden structures and the Massillon works fabricating iron bridges. Incorporated in 1887, the firm continued to erect bridges throughout the Midwest until Sprague's death in 1905 when it reconstituted as the Toledo-Massillon Bridge Company.

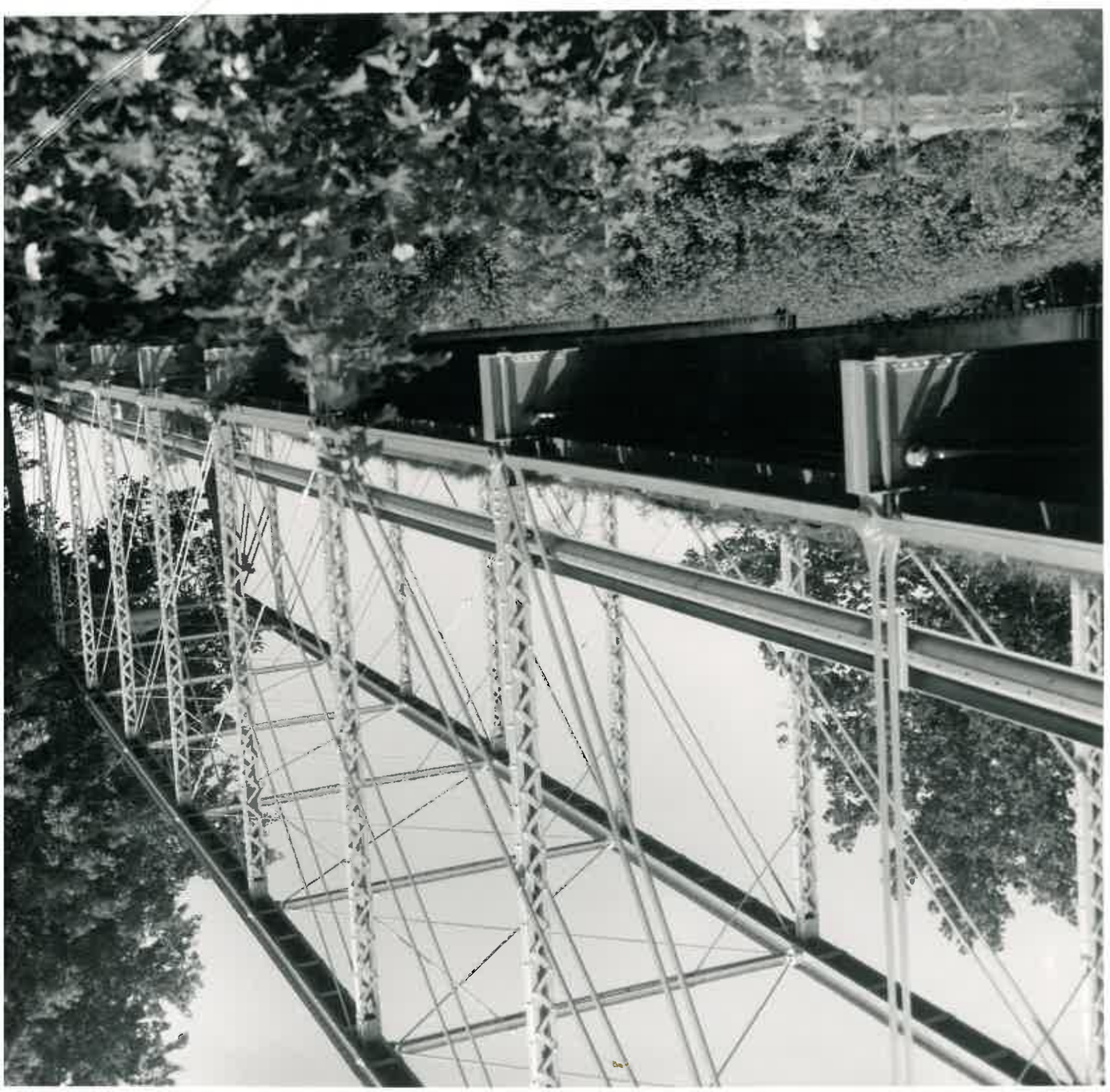
The Great Miami River Bridge, built in 1882, exemplifies the double-intersection Pratt through truss, also known as a Whipple truss, that was generally used for long-span structures during this period. Along with the single-intersection Pratt, it was among the standard and most widely accepted designs for American metal bridges in the second half of the 19th century. Now they have become rare, especially those as well preserved as this example. The bridge closely follows the proportioning of trusswork advocated by C. Charles Shaler, one of the nation's most widely respected civil engineers, who developed a formula for designing truss bridges in the years just after the Civil War. In light of his recommendation that the sectional area of tension members be proportioned according to dead and live load stresses, the long diagonal bars on the Great Miami bridge get thinner towards the center of the truss while just the reverse is true of the lower chord eyebars. Detailing on the bridge is representative of Massillon Bridge structures. The use of rod-type latticework for the portal bracing on through trusses is typical, as is the distinctive D-shaped connector between the top chord and upper cross bracing.

The decorative portal bracing and distinctive nameplate of the Great Miami River Bridge near Logansville are typical of the structures completed in the late 19th century by the Massillon Bridge Company of Massillon, Ohio.

All told, the bridge is among an ever-decreasing number of Ohio bridges whose truss design and detailing reflect important trends in the state's engineering heritage.■








4631838 12 3 97