



# Reliance Universal Inc.

CONCRETE SEWER AND CULVERT PIPE ... MANHOLES  
PRESTRESSED BRIDGE BEAMS ... CRIBBING  
UTILITY CONDUIT ... VAULTS

Concrete Products Division	
COLUMBUS, O.	614 221-2355
DELAWARE, O.	614 363-1376
PITTSBURGH, PA	412 561-0770
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KNOXVILLE, TENN.	615 681-1191
JACKSONVILLE, TENN.	615 526-1139
BRISTOL, TENN.	615 766-6129
CHARLOTTE, N. CAR.	704 375-9391
COLUMBIA, S. CAR.	803 253-9017

11-28-75

Chet

BR 21-1.01 79g

length = 141'  
width = 16'0"

Plus ✓  
For 2'x6" Stringers =  
6 Lines of 10W = 25  
@ 2'9" c/c.

For 3"x9" Stringers =  $\frac{79g}{2}$   
5 Lines of 10W = 29  
@ 3'6" c/c

Check Prices —

2255 sq. ft.

Jim Slater To Quote: 12/19/75

69 ft's  
38" ft's

# STEEL WAREHOUSE DIVISION

COLUMBUS PIPE and EQUIPMENT CO.

773 Markison Ave.

Columbus, Ohio 43207

CALL 614-444-7871

COLLECT

1976

## STEEL WAREHOUSE

Beams  
Angles  
Channels  
Sheets  
Plates  
Floor Plates  
Rounds  
Flats  
Rails  
Tested Pipe  
Structural Pipe  
Tee Bars  
Half Ovals  
Cold Rolled Steel

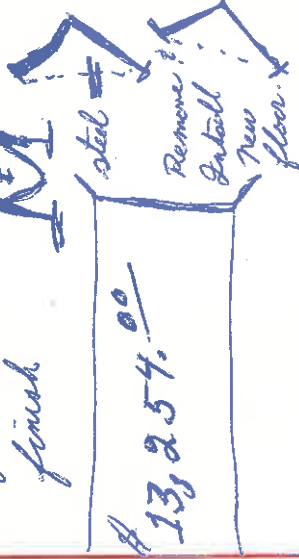
**BUILDING PRODUCTS DEPT.**  
Visqueen Film  
Armweld Steel  
Frames and Doors  
Sargent Hardware  
Nails  
Louvers  
Joist Anchors,  
Hangers, Bridging  
Expanded Metal  
and Grating  
Roof Deck  
Concrete Block  
Reinforcing  
Steel Wire  
Reinforcing Mesh  
Reinforcing Bars  
Steel Columns  
Culvert Pipe  
Fiberglass  
Fairbanks Trucks  
Casters

**PLUMBING SUPPLIES DEPT.**  
Eljer Fixtures  
Pipe Fittings & Valves  
Pumps-Sump & Water  
Water Heaters  
Boilers (Radiation)  
Plastic Pipe & Fittings  
Fairbank Valves

List of things to do.

21,150 \* @ 36¢ = furnish

Shop coat slingers  
fill prime  
finish



Two Bills \$ 17,619.00  
for steel =

for labor = \$ 5,640.00  
egg, etc

# LOGAN COUNTY

BRIDGE

INSPECTION REPORT

---

1969

PREPARED

FOR

THE HONORABLE BOARD OF COUNTY COMMISSIONERS

*Don Downing*

*Harvey E. Terwill John Stricko*

AND

*Erester J. Fluty, Jr.*

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 Massillon Bridge Co. The structure is placed squarely across the stream, with gently sloping banks.

Except where the truss has been hit, (UGLY), it is in very good condition, the only structural deficiency occurring in the hip vertical (67% 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% legal) because of tight 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.
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. J. 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. Left guard in first bay - intermittent.
4. Hip vertical welded above eye.
5. U<sub>5L5</sub> North - has been damaged by collision and rewelded. Approximately One (1) inch eccentricity in load.
6. U<sub>3L5</sub> North - has had turnbuckle welded.
7. L<sub>OU1</sub> 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: 105 21-101 SPAN (c. to c.) 140'-0"  
 COUNTY LOGAN ROADWAY 16'-0"  
 TYPE WHIPPLE TYPE FLOOR WOOD WEARING SURF. BIT  
 DATE BUILT 1882

ANALYSIS OF BRIDGES FOR POSTING

CALCULATED BY DATE  
 R. F. PHILLIPS 8-6-69  
 CHECKED

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.+1	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
612x5	7.3	90%	6.57	11.50	24.5	1.47	10.03	84.0	0.40	15.56	30%	20.23	49.6%	40.9%	59.1%
				7.67			19.7	6.2				20.73			45

FLOOR BEAMS Ctr. to Ctr. Supports 17'-3" Dead Load per lin. ft. of Beam 55.6%

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.+1	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	156.19	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	K Stress Available	Mom. Res. or Total Stress	D.L. Stress or Mom.	Stress or Mom. for L.L.+1	Stress or L.L.M. for one Traffic Lane	Percent to One Truss	Stress or L.L.M. to One Truss	Impact	Stress plus Impact	Percent S-15-46 Loading	Percent Legal Load	Percent Total and Axle Loads Reduced
L <sub>2</sub> L <sub>3</sub>	4.12	95%	21000	82.19	19.8	62.4	40.3	71%	28.6	18.9%	34.0	183	181	—	
L <sub>2</sub> L <sub>4</sub>	5.68	"	"	113.32	28.6	84.7	62.4	44.3	52.7	161	159	—	—		
L <sub>4</sub> L <sub>5</sub>	10.63	"	"	211.9	50.6	161.3	100.2	71.2	84.6	191	189	—	—		
L <sub>0</sub> L <sub>1</sub>	12.69	"	15153	182.7	35.6	147.1	75.6	51.5	61.3	240	238	—	—		
U <sub>1</sub> U <sub>2</sub>	"	"	16783	202.3	41.8	160.5	87.9	62.4	74.2	216	214	—	—		
U <sub>2</sub> U <sub>3</sub>	"	"	"	"	55.0	147.3	112.0	79.5	94.5	156	154	—	—		
U <sub>1</sub> L <sub>1</sub>	1.75	"	21000	34.9	6.6	28.3	33.1	23.5	30.6	92.6	92.6	—	—		
U <sub>2</sub> L <sub>2</sub>	4.78	"	12750	57.9	6.6	51.3	26.3	18.7	18.9%	22.2	231	229	—		
L <sub>3</sub> L <sub>4</sub>	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. 0.667 sec. 0.120  
 Tan. 0.1333 sec. 0.1667

BRIDGE NO. 21-101 Cont'd. BRIDGE FOR POSTING  
 ANALYSIS OF  
 Calculated by *R.L.P.*  
 Checked by *R.L.P.*  
*J. F. Mc Guerin & Associates*  
 CONSULTING ENGINEERS

TRUSSES Span, c-c bgs. 140'-0" Panel length 44'-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 + Imp. available for L. L.	Stress or LLM for 1 traffic lane	% to one truss	Stress or LLM to 1 truss	Impact + L.L.M.	% S-15-46 loading	% LEGAL LOAD	% total & axle loads reduced S-46
U3L3	3.90	95%	11900	44090	—	3.3	40.8	19.3	71%	13.7	18.9%	250	248	—
U4L4	"	"	↑	44090	—	0	44.1	16.0	↑	11.4	13.5	326	323	—
U5L5*	"	"	↑	44090	—	+3.6	47.7	9.9	↑	7.1	8.4	569	563	—
U4L2	3.12	↑	21000	62.2	—	15.8	46.4	46.2	↑	32.8	39.0	116	115	—
U4L3	3.44	↑	68.6	68.6	—	16.5	51.1	51.0	↑	36.2	43.0	121	120	—
U4L4	2.50	↑	49.9	49.9	—	11.0	38.9	43.9	↑	31.2	37.1	105	104	—
U4L5	1.62	↑	32.3	32.3	—	550	26.8	32.2	↑	22.9	27.2	98.6	97.6	2.4%
U4L6	1.27	↑	25.3	25.3	—	0	25.3	26.7	↑	19.0	22.5	112	111	—
U5L7	1.77	↑	15.4	15.4	—	+6.1	21.5	16.6	↑	11.8	14.0	153	151	—

Unit Stresses (tension) for Posting.  
 Structures built since 1930  
 Structures built 1900 thru 1930  
 Structures built before 1900

27000 lb. p.s.i.  
 24000 lb. p.s.i.  
 21000 lb. p.s.i.

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

EXISTING REVISED

106.21-1.01 Pres. 21-1.01

BRIDGE NUMBER: Pres. 21-1.01

DIV. STT BR. TYPE STT O/A LGTH. 140 NO. OF SPANS: 1

HWY. SYSTEM: 5 FED. AID SYSTEM: 1 YEAR BUILT: 1882

**SUPERSTRUCTURE:**

REMARKS: GUARD RAIL - 27" HIGH

NO.	DESCRIPTION	TYPE COND.	TYPE COND.	TYPE COND.	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				3 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				5 2
6.	JOISTS: STL.=S, TIMBER=T				5 2
7.	FLOORBEAMS: STL.=S, CONC.=C, TIMBER=T				5 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	S 3	16. DIAGONAL:		S 1
17.	PORTALS: STL.=S, TIMBER=T	S 1	18. SWAYBRACING: STL.=S, TIMBER=T		S 1
19.	LATERAL BRACING: STL.=S, TIMBER=T	S 1	20. CROSS FRAMES or DIAPHRAGMS: STL.=S, TIMBER=T, CONC.=C		
21.	DECK EXPANSION DEVICES: STL.=S, OTHER=O				
22.	BEARINGS: ROCKERS=R, BOLSTERS=B, ROLLERS=N, PLATES=P, ELASTOMERIC=E, OTHER=O				N 3 P 1
23.	DRAINAGE SYSTEM: THRU CURBS=T SCUPPERS=S, SCUPPERS WITH DOWNSPOUTS=D, OTHER=O				Open Side 0 1
24.	ARCHES: STL.=S, MASONRY=M, TIMBER=T				
26.	SUSPENSION BRIDGE CABLE or CHAIN BENTS:				
28.	SUSPENSION SYSTEMS-MAIN: CABLE=C, EYEBAR=E				
30.	PAINT: SHOW YEAR LAST PAINTED IN LEFT & CENTER BLOCKS SUBSTRUCTURE: WALL=W, SPILL.L=THRU=S, GRAVITY=G	Est. 19 68	31. RESPONSE TO LIVE LOAD: EXCESSIVE DEF.L=V, VIB.=E, SATISFACTORY=S		S
41.	BACKWALLS: CONC.=C, MASONRY=M, OTHER=O	0 2	42. WINGWALLS: CONC.=C, MASONRY=M, OTHER=O		M 1
43.	BRIDGE SEATS - ABUTMENT: CONC.=C, MASONRY=M, TIMBER=T, STL.=S	M 1	44. PIER:		-
45.	PIERS: COLUMN=C, WALL=W, T-TYPE=T, CAPPED PILE=P, OTHER=O				
46.	SUSPENSION BRIDGE ANCHORAGES: CONC.=C, MASONRY=M		47. PILING: STL.=S, TIMBER=T, CAST-IN-PLACE=C, PRECAST CONC.=P		
50.	GENERAL WATERWAY STREAM CHANNEL - SHOW IN LEFT BLOCK UNRESTRICTED=U, RESTRICTED=R				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, MOVEN=W, OTHER=O	C 3 D 1	54. APPROACH EMBANKMENT: SHOW IN TYPE BLOCK: SETTLED=Y, NOT SETTLED=N		N 1
55.	APPROACH PAVEMENT: CONC.=C, BITUMINOUS=B, OTHER=O	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

70. [Signature]  
SIGNED

[Signature] INITIALS  
8/2/69 DATE

USE REVERSE SIDE FOR ADDITIONAL DETAILS.  
[Signature] INITIALS  
[Signature] DATE



BRIDGE INSPECTION RECORD

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

Bridge Number: Log. 21-101

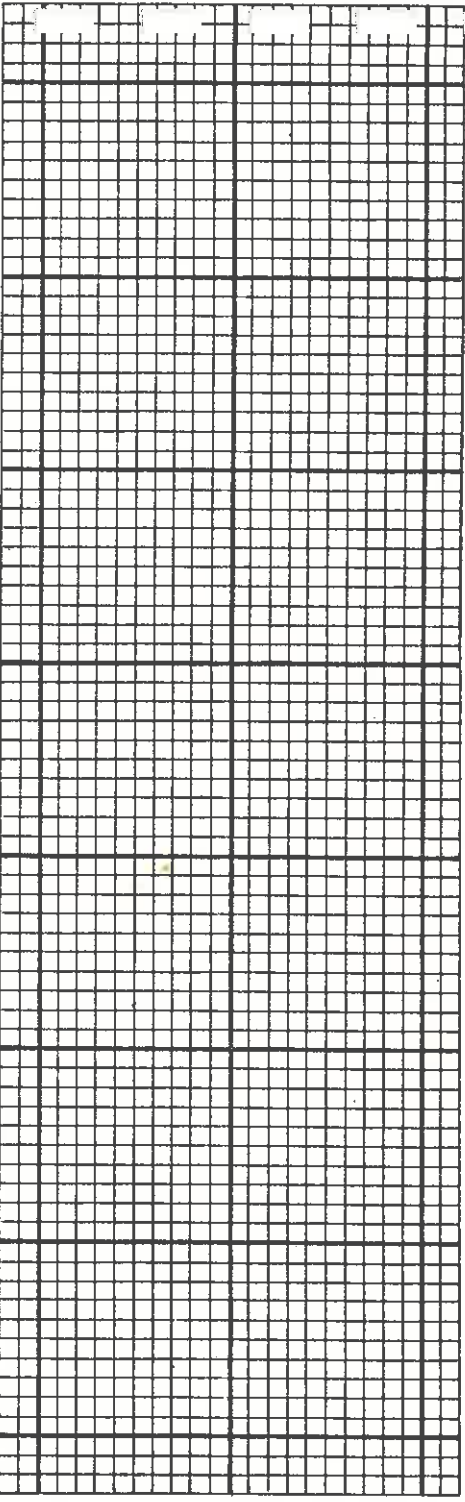
Twp. Pleasant Highway System C Federal Aid System STT  
 Year Built 1882 Over or Under 500 Bridge Type \_\_\_\_\_  
 Loading S-6.1-46 No. of Spans 1 Overall Length 139.75'

	Month																	
Day																		
Year																		
SUPERSTRUCTURE			68	69	70	71	72	73	74	75	76	77	78					
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				P														
				<i>Rollers</i>														
				<i>Plates</i>														
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				G														
40. Abutments				G														
41. Backwalls				G														
42. Wingwalls				F														
43. Bridge Seats-Abutments				G														
44. Bridge Seats-Piers				G														
45. Piers																		
46. Susp. Bridge Anchorage																		
47. Piling																		
GENERAL																		
50. Stream Channel				G														
51. Bank Protection																		
52. Approach Slabs				G														
53. Approach Guardrail																		
54. Approach Embankment				P														
55. Approach Pavement				G														
56. Alignment & Grade				G														
60. Culverts				G														
70. Inspected By				RM														



Log. 21-1.0      LOGAN      21      ROUTE NO.      S.H. NO.      SECTION       M-HIS       HIS M-HIS      ROADWAY       12-13-14+ OPEN       CLEARANCE      TYPE

SKETCH OF STRUCTURE SHOWING DIMENSIONS



SECTION OF TRUSS MEMBERS

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

TOP CHORDS    Same as end post

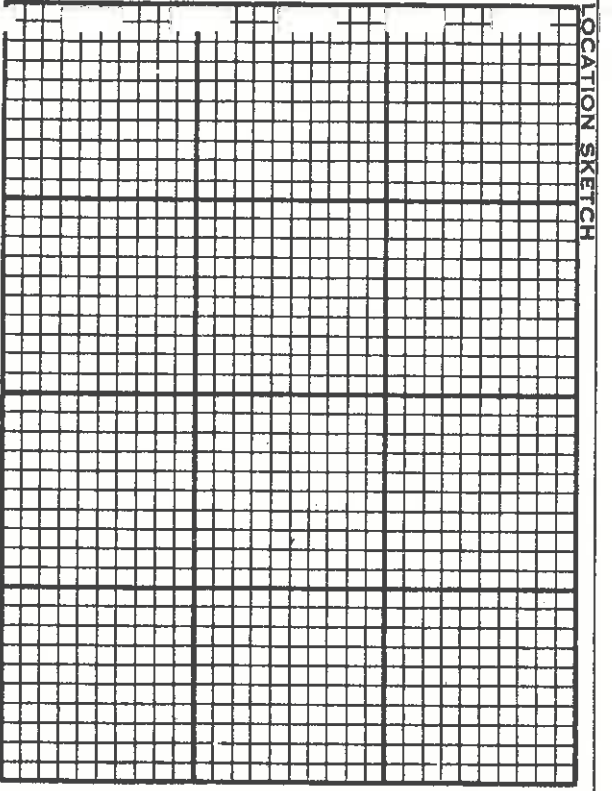
BOTTOM CHORDS    L<sub>2</sub>L<sub>2</sub> 2-3 x 11/16" , L<sub>2</sub>L<sub>3</sub>, 2-3 1/2 x 13/16 , L<sub>3</sub>L<sub>4</sub> 2-4 1/4 x 1 , L<sub>4</sub>L<sub>5</sub> 2-5 x 1 1/6

INTERMEDIATE POSTS    U<sub>1</sub>L<sub>2</sub> 2-6" @ 8.2# ALL Others 2-5" @ 6.7#

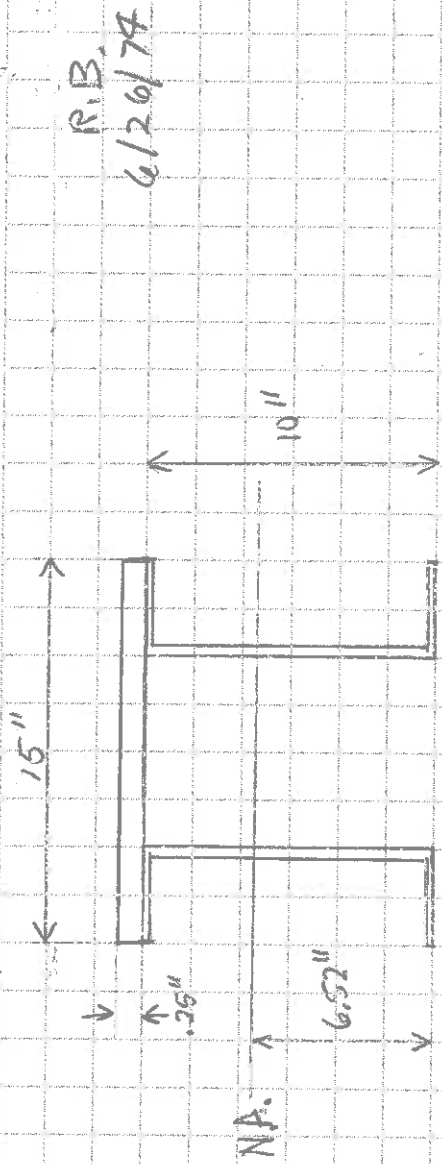
LAGOMAS U<sub>1</sub>L<sub>2</sub> 2-2 1/2 x 5/8 , U<sub>1</sub>L<sub>3</sub> 2-2 1/2 x 11/16 , U<sub>2</sub>L<sub>4</sub> 2-2 1/2 x 1/2 , U<sub>2</sub>L<sub>5</sub> 2-1 5/8 x 1/2 , U<sub>5</sub>L<sub>7</sub> 1-7/8" , U<sub>4</sub>L<sub>6</sub> 1-1 1/8

HIP VERTICALS    2 - 1 3/4 x 1/2

IS    2 3/4" Lower 2" Upper



REMARKS: Painted 1967



$$A_F = 4.96 \text{ in}^2 \quad I_F = 66.9 \text{ in}^4$$

$$\bar{y} = \frac{10.125(3.75) + 5(2)(9.96)}{3.75 + 2(9.96)} = \frac{82.57}{12.67} = 6.52$$

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

$$I_A = \frac{15(0.25)^3}{12} + 3.75(3.605)^2 = 48.75$$

$$I_T = 203.16$$

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

$$\therefore \underline{R = 4.0}$$

# 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: DECK WIDTH: 016.0'  
LENGTH: 000143 STEEL TYPE:  
DEGREE OF SKEW: 00

NO. OF BEAMS OR GIRDERS: SPACING: DRAINAGE AREA (AC): #Error  
NO. OF FLOOR BEAMS: SPACING: Please Note: If field indicates "#Error",  
NO. OF FLOOR BEAMS: SPACING: then field is coded UUU.

LAST LOCAL UPDATE:  
04 / 24 / 2006  
% OF LEGAL 075

SUFFICIENCY RATING: 47.3%

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

PAINT CONDITION: 2 Q YEAR: Q CFS: FUNCTIONAL CLASS: 09 Rur Local  
OVERALL CONDITION: 4P

*Eny*  
**FILE COPY**

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**

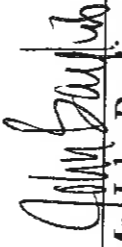



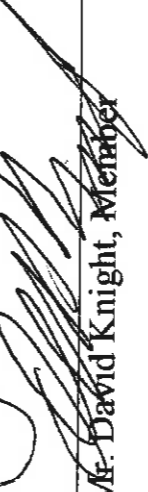

WHEREAS, as a result of the annual bridge inspections, it has been determined that the design limits of the steel truss on Bridge 21-1.00 in Pleasant Township warrants the reduction of the maximum weight of vehicle and load, and

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.

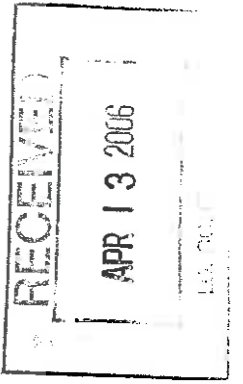
Mr. David Knight seconded the motion.

Roll Call resulted as follows:

	
Mr. John Bayliss, President	
	
Mr. Jack Reser, Vice President	
	
Mr. David Knight, Member	

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



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

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

**Logan County  
Engineer's Office**

# Bridge Load Reduction **FILE COPY**

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](http://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



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 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.

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

Ed Parker Kennedy      yes  
Mr. G. Parker Kennedy, V. Chr.

Warren W. Smith      yes  
Mr. Warren W. Smith, Member

I, Anna C. Farrow, 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. Farrow  
Anna C. Farrow, Clerk

Material Br 21-1.0.1

6 lines of 100x25 19' each  
14 - 6' Beams will make this.

$$2 - 6' + 19' = 19'$$

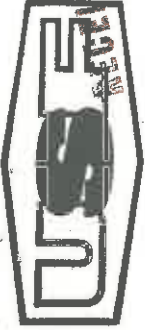
Primed delivered to bridge site.

21,350# Total

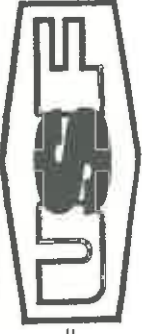
Decking 2x6 7ga. Painted.

see quote

ordered  
3/17/76



# QUOTATION



No. 12216

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:

- |    |   | <u>Painted</u> | <u>Galv.</u> |
|----|---|----------------|--------------|
| 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 Dams 3x144 @ _____                                   |                | \$5.25 PC.   |

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

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

Specifications Crown - USF Standard Design & Logan County Project Plans

Shipment Within (60) Days  PREPAID & CHARGE  PREPAID

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

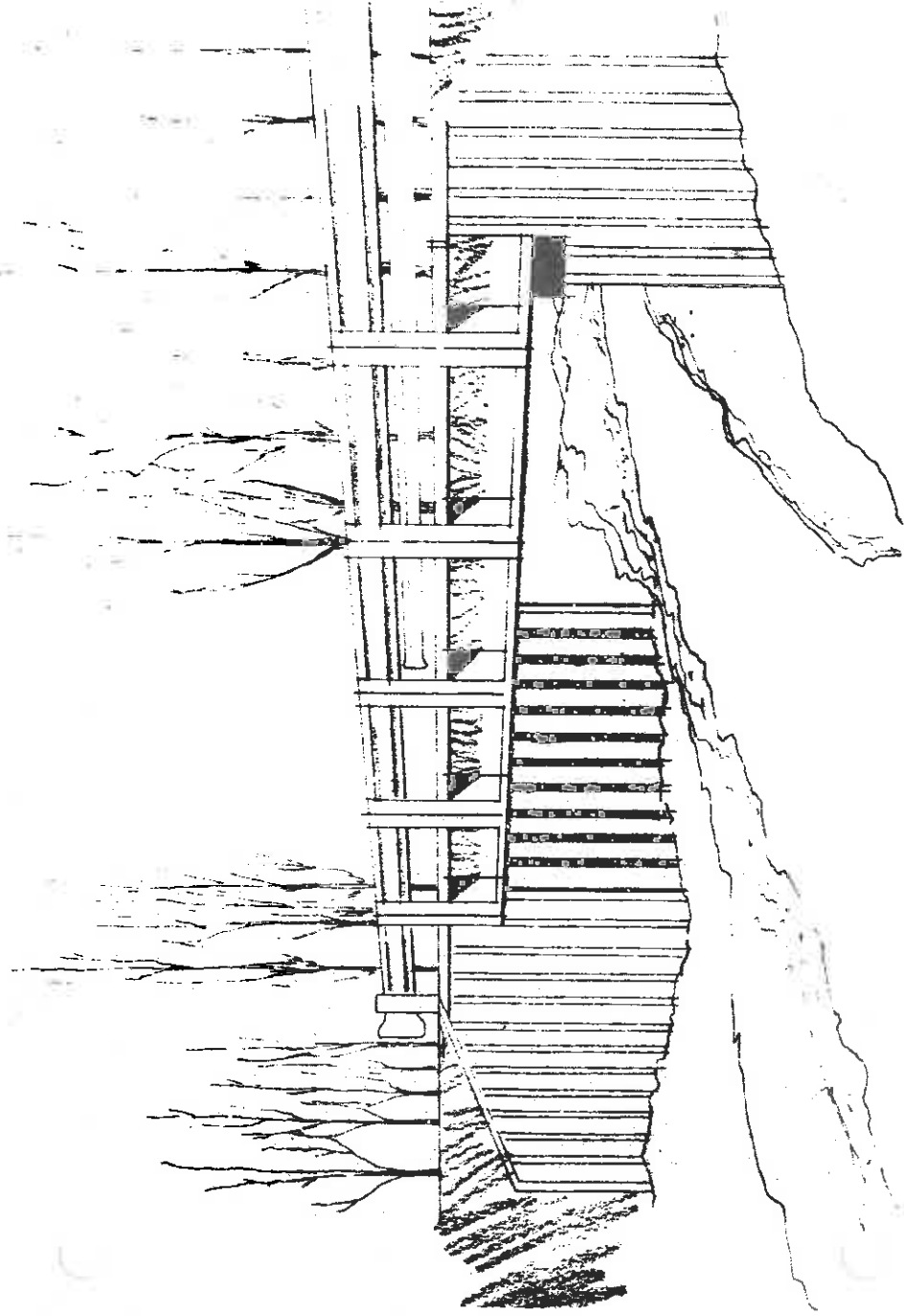
Firm Name

BY \_\_\_\_\_

cc: Robt. L. Porter, Inc.

UNITED STEEL FABRICATORS, DIV.

BY J. P. SLATER



# USF country!

Whether your highway contract calls for a country "scenic route" or a super-highway, 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

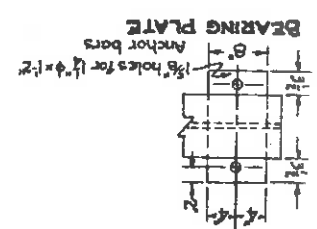
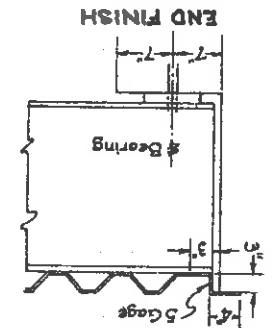
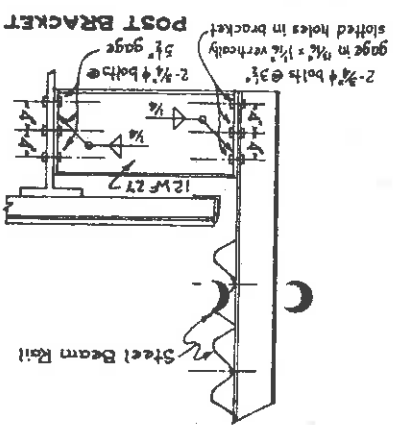
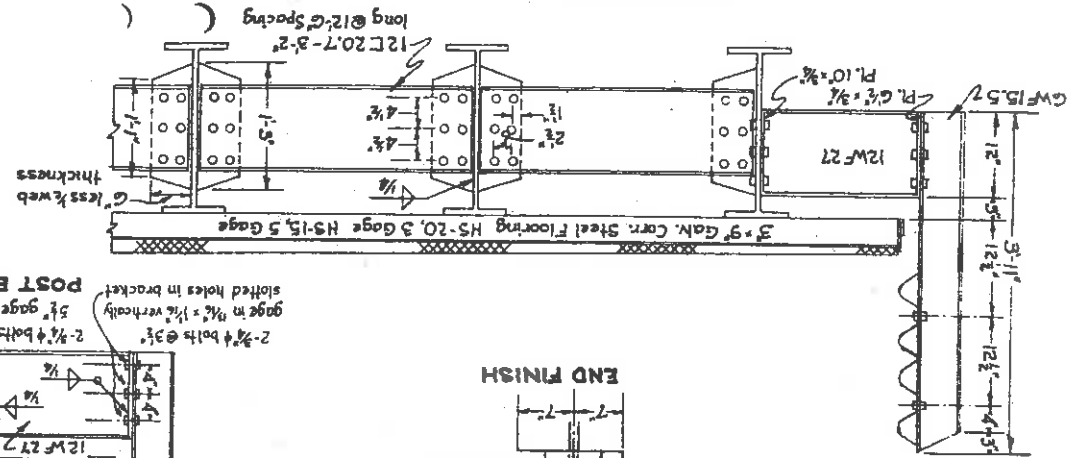
Subject: Change of Address  
Highway Products Dept. Sales Office

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:

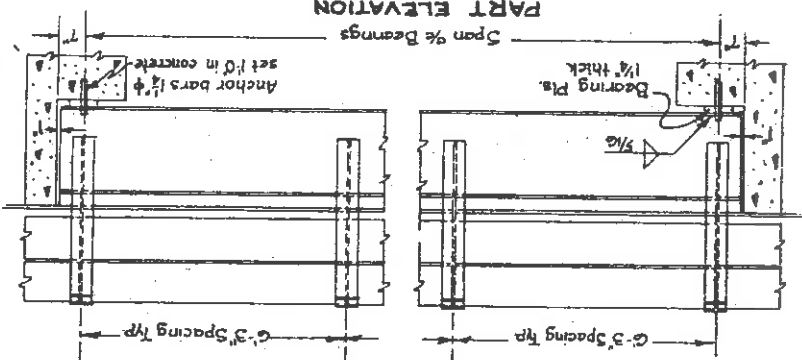
The Crown Divisions  
Highway Products Department  
High & Gasche Streets  
Wooster, Ohio 44691  
Ph. No. 216-262-6010

DATE	DESIGN	DATE	DESIGN
1958	M-C	1958	M-C
Dwg. No.		Dwg. No.	
LOADING HS-20-44 & HS-15-44		LOADING HS-20-44 & HS-15-44	
<b>GALVANIZED STEEL BEAM BRIDGE</b>			
<b>CST-1</b>			

**PART SECTION**



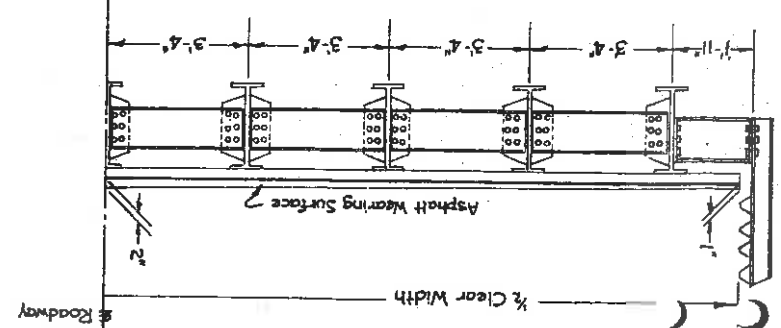
**PART ELEVATION**



**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. DIAPHRAGMS AND RAIL BRACKETS shall be fastened with 1/2 inch hot-dipped galvanized machine bolts using lock washers. All holes 1/16 inch diameter unless otherwise shown. STRUCTURAL STEEL shall meet the requirements of ASTM A-56 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. The flooring shall be furnished with bolt on end dams and clips for fastening to the beams.

**TYPICAL HALF SECTION**



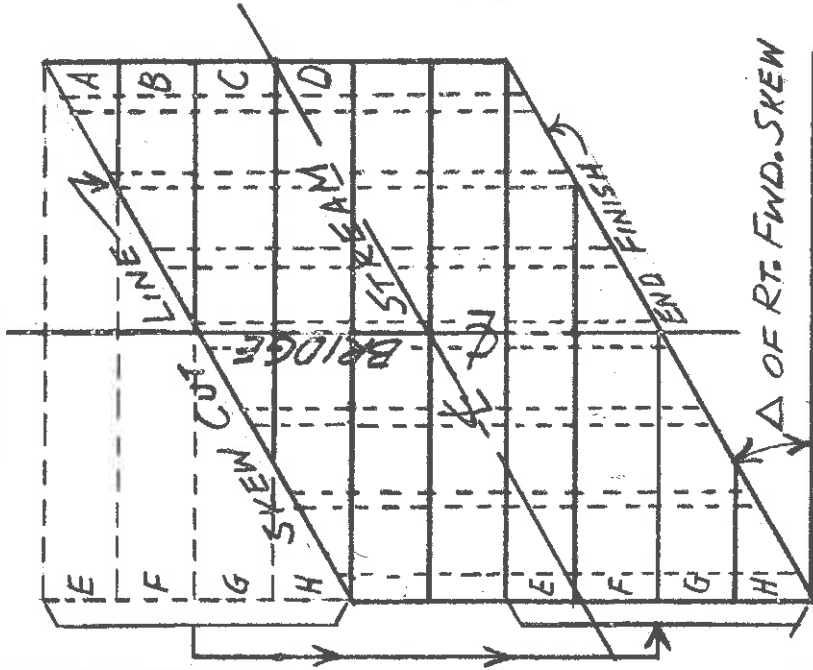
BEAM REQUIREMENTS					
% BEARING SPAN	HS-20-44			HS-15-44	
	REQ'D. SECT. MOD.	BEAM SIZE	REQ'D. SECT. MOD.	BEAM SIZE	BEAM SIZE
20'-0"	47.8	16WF36	45.0	16WF36	16WF36
22'-6"	54.6	16WF36	51.4	16WF36	16WF36
25'-0"	63.7	16WF40	60.0	16WF40	16WF40
27'-6"	75.9	16WF50	71.4	16WF45	16WF45
30'-0"	88.1	18WF50	83.1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

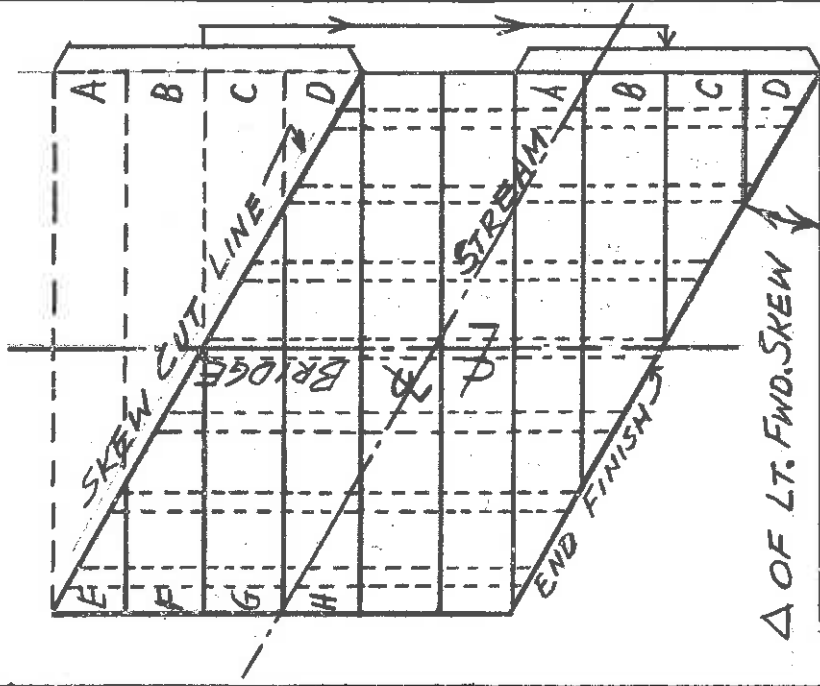
For assistance in design of your structures call or write to:



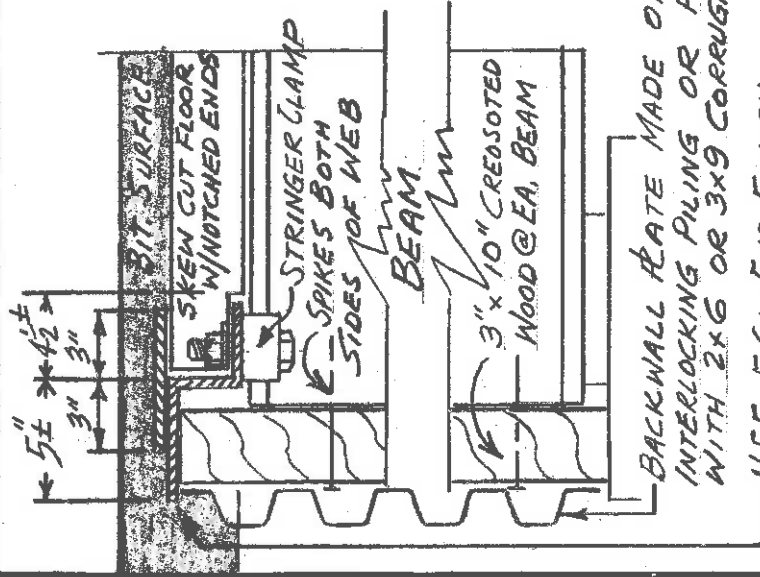




PLAN OF BRIDGE RT. FWD. SKWEN



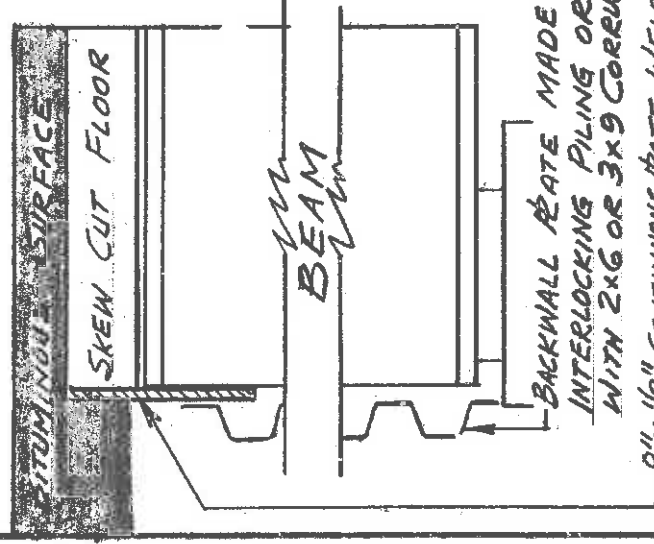
PLAN OF BRIDGE LT. FWD. SKWEN



BACKWALL HEATE MADE OF INTERLOCKING PILING OR FLOORG WITH 2x6 OR 3x9 CORRUGATIONS

USF 5GA. END FINISH

END FINISH DETAIL  
FOR SKWEN CUT HEATES W/NOTCHED ENDS



BACKWALL HEATE MADE OF INTERLOCKING PILING OR FLOORG WITH 2x6 OR 3x9 CORRUGATIONS.

8" x 1/2" CONTINUOUS HEATE WELDED TO BEAMS AND FLOOR PLATES

DETAIL WELDED ON END FINISH  
FOR SKWEN OR SQUARE BRIDGES

UNITED STEEL FABRICATORS DIV.

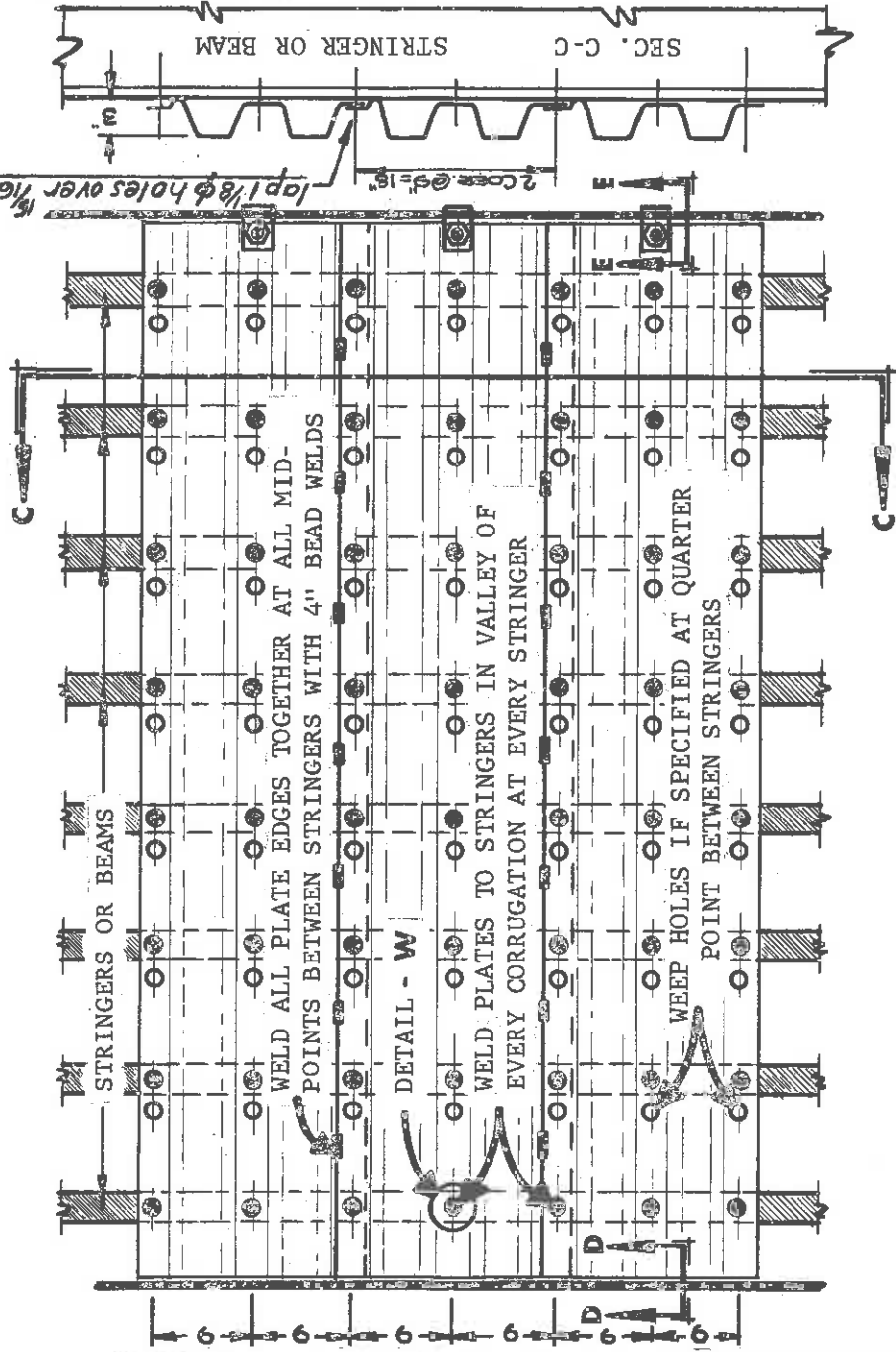
Allen Electric and Equipment Co.

WOOSTER, OHIO 44691

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



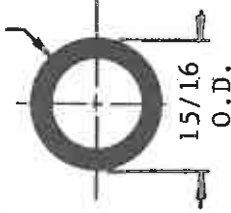
ERECTION OF U.S.F. 3 x 9 BRIDGE FLOORING BY WELD METHOD



TYPICAL PLAN FOR WELDING U.S.F. 3 x 9 FLOORING TO STRINGERS

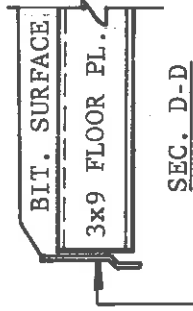
SEE DWG. NO. D12-04(1) FOR FLOOR PLATE DETAILS

3/16 x 3 FILLET WELD



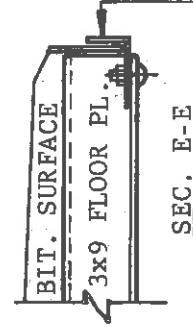
DETAIL - W

15/16 Weld Hole  
Shop Punched or  
Burned in Field



WELD-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



BOLT-ON END DAMS

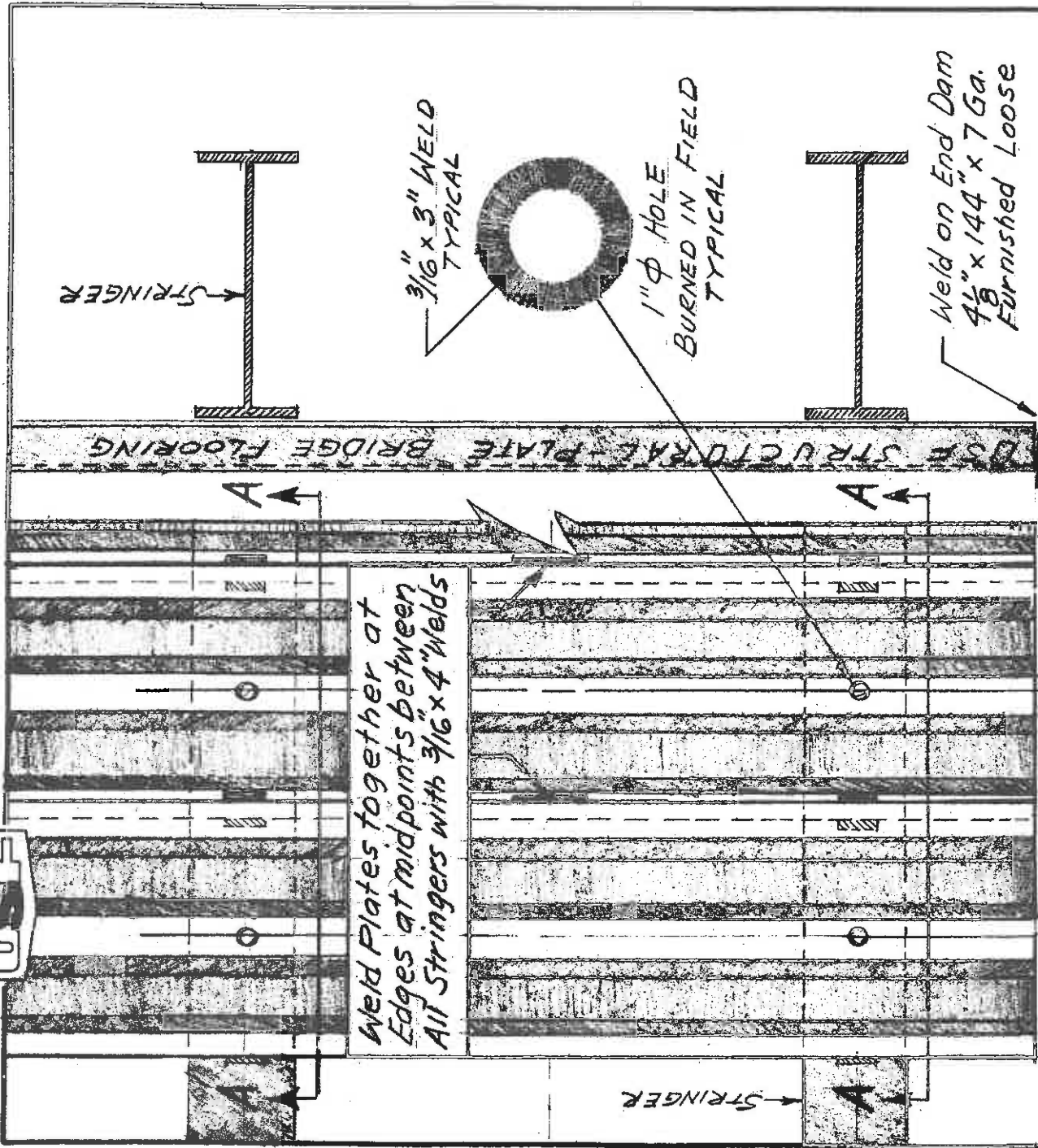
Typical Assembly:

- (1) 2" x 2" x 1/4" on 18" Ctrs.
  - (1) 5/8 x 1 1/4 Oval Neck Bolt
  - (1) 5/8 Heavy Duty Nut
- Necessary Plate 3 1/2 x 144 x 7 Ga.

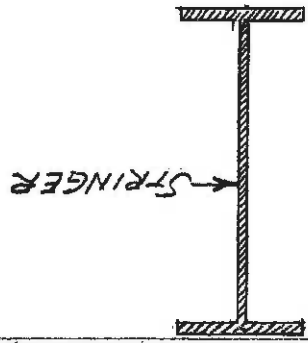
TYPICAL DETAILS

**UNITED STEEL FABRICATORS DIV.**

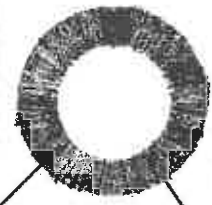
Allen Electric & Equipment Co.  
WOOSTER, OHIO 44691



Weld Plates together at Edges at midpoints between All Stringers with  $\frac{3}{16}$ " x 4" Welds



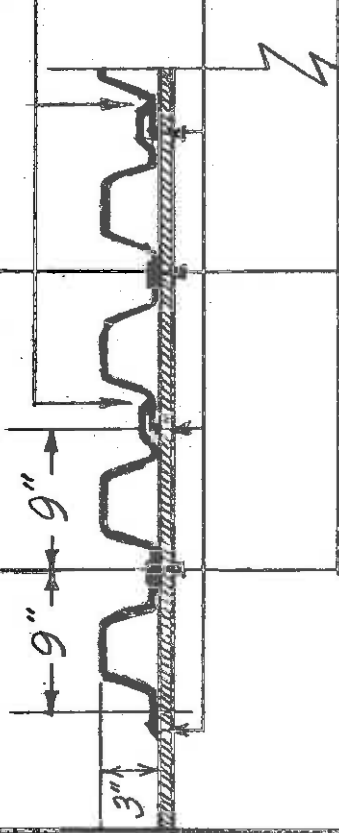
$\frac{3}{16}$ " x 3" WELD TYPICAL



1"  $\phi$  HOLE BURNED IN FIELD TYPICAL



Weld on End Dam  $4\frac{1}{8}$ " x 144" x 7 Ga. Furnished Loose



SECS. A-A

Weld Overlap Edge of every Plate to Underlap Plate at every Stringer with  $\frac{3}{16}$ " x 3" Welds.  
 Weld Underlap Edge of every Plate to every Stringer with  $\frac{3}{16}$ " x 3" Welds.  
 Weld Centers of every Plate to every Stringer with  $\frac{3}{16}$ " x 3" Welds.

**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)

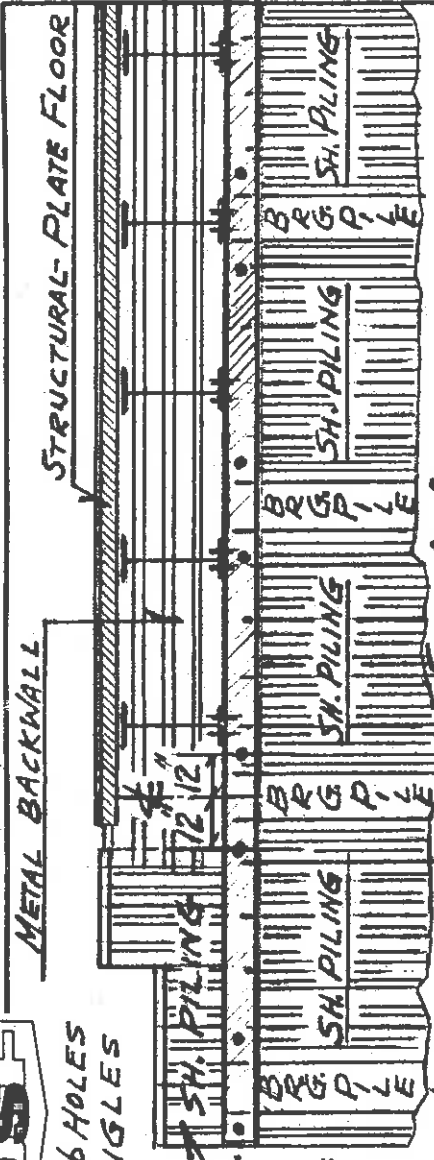


PROVIDE  $\frac{7}{8}$ "  $\phi$  HOLES  
IN CAP ANGLES  
TO MATCH  
SHIM BARS

IF AVAILABLE  
OLD ABUT.  
STONE CAN  
BE USED  
HERE TO  
RETAIN BERM.

SPCG. 46" 60" 74"  
IDEAL FOR SH. PILING

SEC. A-A



A

GALV. BACKWALL  
10 GA. OR  
HEAVIER

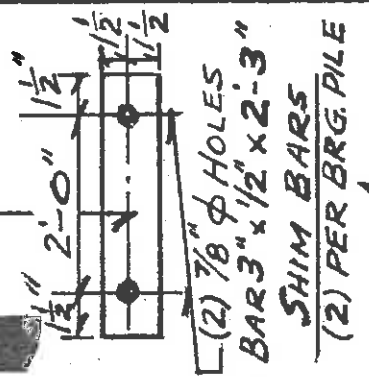
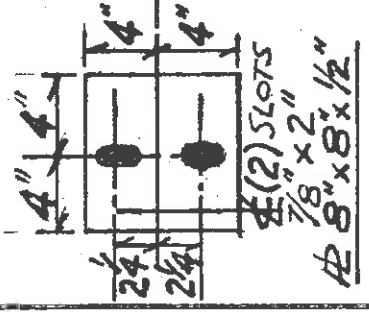
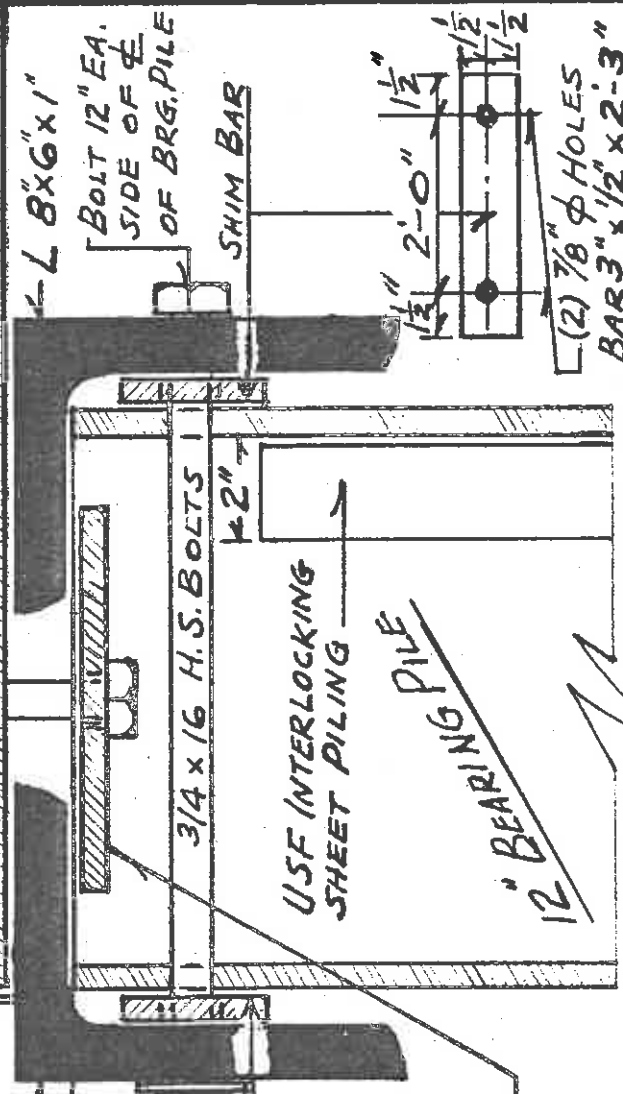
STRINGER  
6"

$\phi$  BEARING PILE ABUTMENT  
 $\phi$   $\frac{3}{4}$ " x  $3\frac{1}{2}$ " H.S. BOLTS  
 $\phi$   $\frac{15}{16}$ "  $\phi$  HOLES IN BEAM FLANGE

L 8" x 6" x 1"

1 1/2"

SHIM BAR



A

DETAILS

LOW COST FAST ERECTION ALL STEEL BRIDGE ABUTMENT

G. 2-70

UNITED STEEL FABRICATORS DIV.

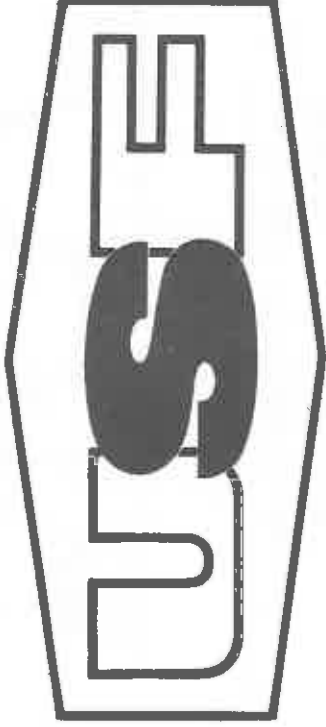
Allen Electric and Equipment Co.

WOOSTER, OHIO 44691

# UNITED STEEL FABRICATORS, DIVISION

ALLEN ELECTRIC AND EQUIPMENT COMPANY  
HIGHWAY PRODUCTS DEPARTMENT

WOOSTER, OHIO, 44691 - TEL. 216 - 262 - 6010



INTERLOCKING OR FLANGED

## SHEET STEEL PILING

VERSATILE



ECONOMICAL



LIGHTWEIGHT

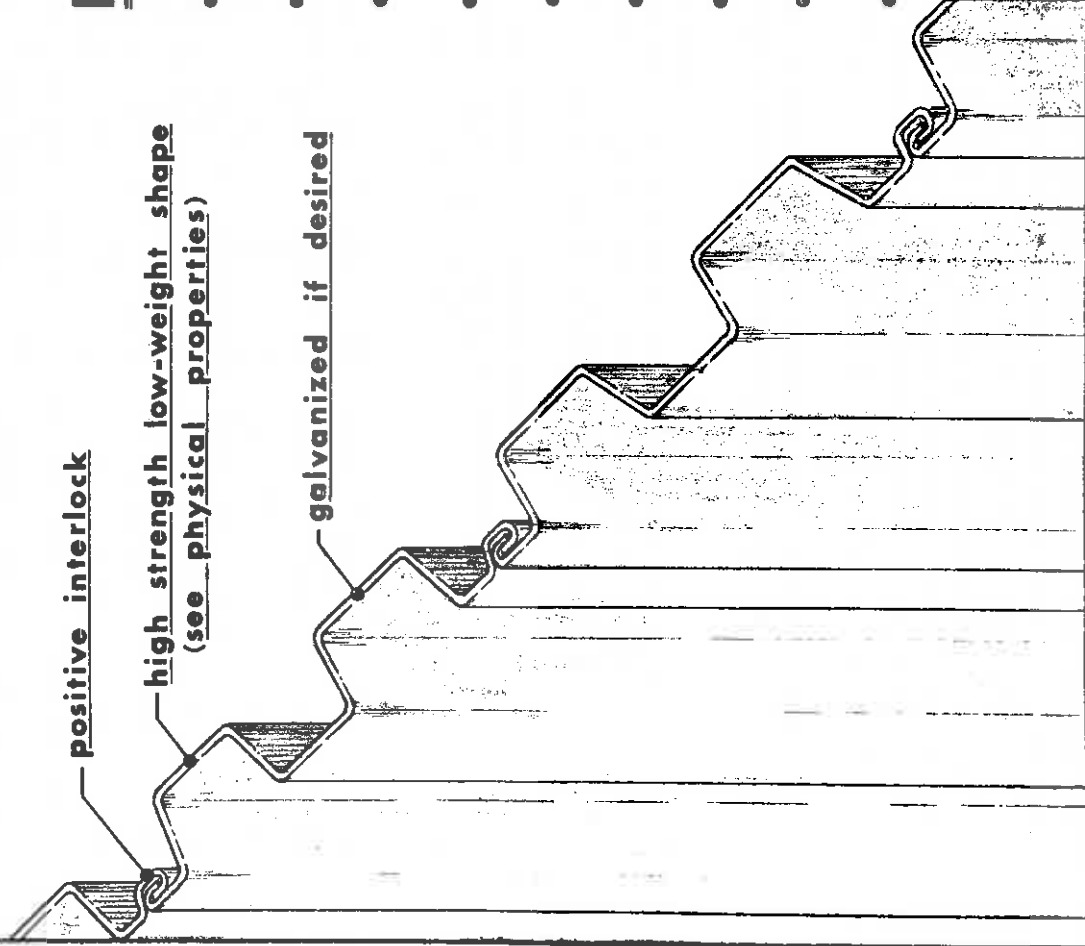
positive interlock

high strength low-weight shape  
(see physical properties)

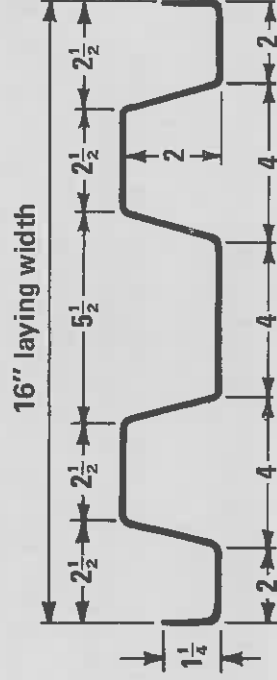
galvanized if desired

### 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

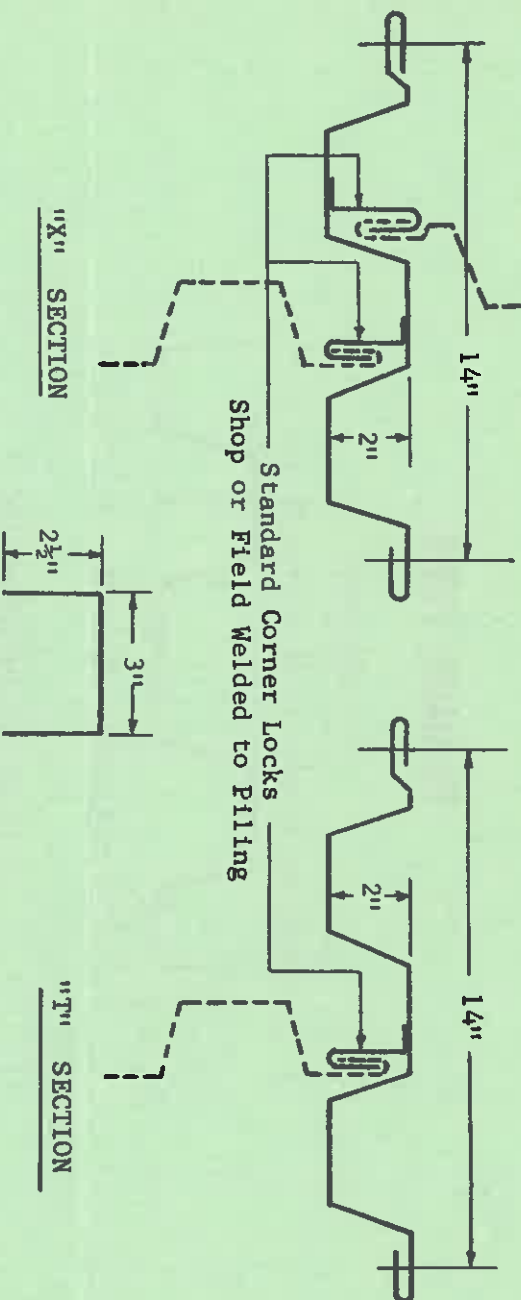
The shape of USF Sheet Piling reflects an efficient use of steel as shown by the high section moduli in the table above. When you buy USF Piling you get more for your money.

### MISCELLANEOUS

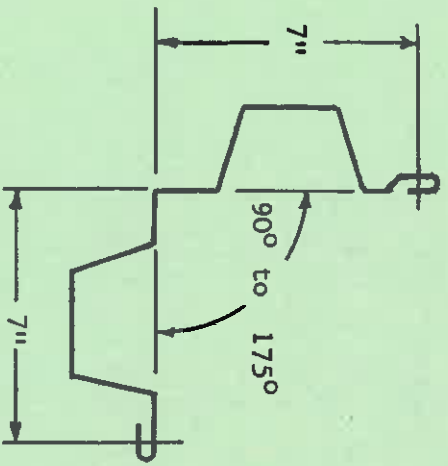
Driving Heads are available. For details of Standard Tees, Crosses, and Corners see P 4.



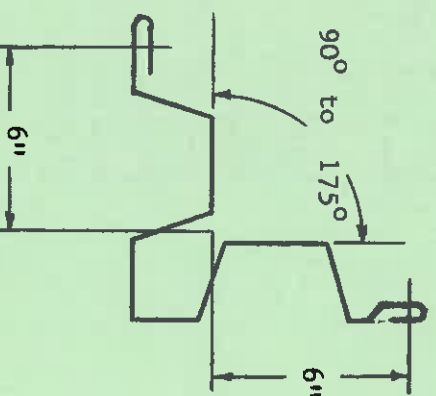
STANDARD ACCESSORIES FOR  
INTERLOCKING SHEET PILING



CHANNEL CAP  
(Use for a neat top finish)



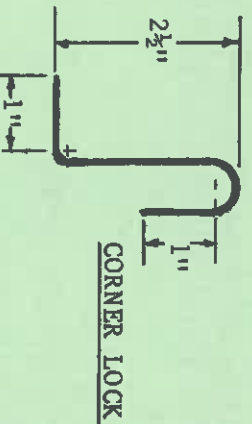
TYPE "A" CORNER



TYPE "B" CORNER



TYPICAL 90° CORNERS MADE WITH U.S.F. CORNER LOCKS

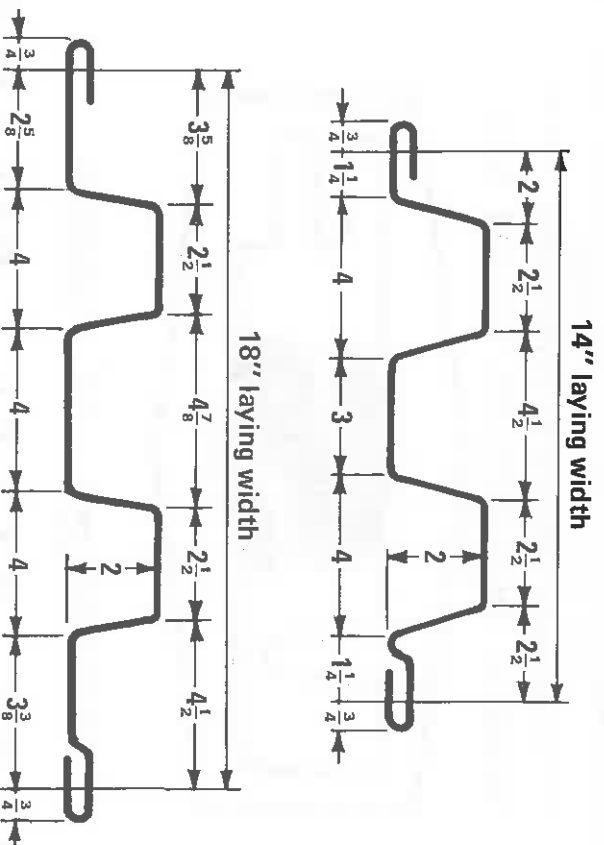


CORNER LOCK



**UNITED STEEL FABRICATORS** DIV  
ALLEN ELECTRIC AND EQUIPMENT COMPANY  
**HIGHWAY PRODUCTS DEPARTMENT**  
Wooster, Ohio Ph. 216-262-6010

# INTERLOCKING TYPE



## PHYSICAL PROPERTIES

Ga.	Thick's In Inches	14" WIDE				*18" WIDE			
		Weights - Lbs.		Sec. Mod. (In. <sup>3</sup> )		Weights - Lbs.		Sec. Mod. (In.)	
		Lin. Ft.	Sq. Ft.	Per Pile	Per L.F.	Lin. Ft.	Sq. Ft.	Per Pile	Per L.F.
12	.1046	8.4	7.20	1.19	1.02	9.7	6.44	1.29	0.86
10	.1345	10.8	9.25	1.53	1.31	12.4	8.28	1.64	1.09
9*	.1495	12.0	10.28	1.70	1.46	13.8	9.20	1.81	1.21
8	.1644	13.2	11.30	1.87	1.61	15.2	10.12	1.97	1.31
7	.1793	14.4	12.35	2.04	1.75	16.6	11.04	2.14	1.43
5*	.2092	16.8	14.40	2.38	2.04	19.3	12.88	2.47	1.65

\* 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. The interlock design insures that the joints will not come apart when the piling is driven. When you buy USF Piling you get more for your money.

### MISCELLANEOUS

USF Interlocking Sheet Piling can be angled approximately 7½° at each joint. Driving Heads are available. For details of Standard Tees, Crosses, and Corners see P 4.

### MONEY SAVING TIP TO HIGHWAY DEPTS.

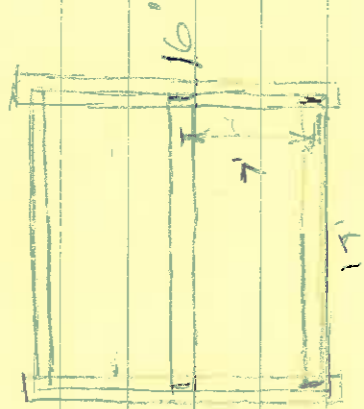
We suggest that it will pay you to join the rapidly increasing number of progressive highway departments who are building bridge abutments and wingwalls of bearing piles and galvanized sheet piling. Subject to numerous ingenious variations these money saving departments drive bearing piles to carry the loads and then drive galvanized sheet piling between or behind the bearing piles to hold the embankments. The departments using this plan get the entire job done in less time than they could excavate and form conventional substructures. They save money and their work crews are enthusiastic about this practical method which relieves them of the drudgery of digging, pumping and working in the mud and water.



BR 211-01

11/26/75

1-9



Weight  $10^{\#}$  / sq. ft  
 + 2" concrete = 25  
 D.L. =  $38^{\#}$  / sq. ft.  
 D.L. / L. Stringer = 285 #  
 Total D.L. / A. = 311 #

Try 16 WF 26 Section Mod. 38.1 Avail Mom = 85.73

Moment D.L. = 7.62

Mom. Avail. for L.L. = 78.11

L.L.M. / Tral. Lane = 84

Eg. No. Bars = 1.6

L.L.M. / Beam = 52.6

Impact = 30%

L.L.M. / In = 68.25

215 % Legal = 1.144

Percent Legal =  $82.5 \times 1.144 = 94.7\%$

USE 14 WF 30

Concrete Filled Steel Guid

1. Reduce dead load slightly.

2. Needs: 2140<sup>00</sup> steel beams

21500<sup>00</sup> steel erid. @ 9.50/ft

410<sup>00</sup> 3/8" Re Bar

100<sup>00</sup> Concrete

24450<sup>00</sup>

say 25000<sup>00</sup>

Material

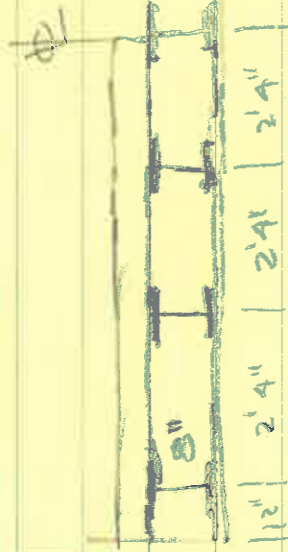
3. Could Maintain existing elevation

by cutting down ends

BR 21-1.01

11/26/75

WOOD FLOOR

Try BUF 17  $S = 19.1$  @ 2'4" 7 Lines

$$\text{Mom Avail} = 31.73$$

$$D.L. = 50 \times \frac{1}{9} \times 2.33 + 17 = 55.8 \# / \text{ft}$$

$$+ 1" \text{ Asphalt} = 29.17$$

$$\text{Say } 85 \# / \text{ft}$$

$$D.L. \text{ Mom} = 2.08 \text{ ft-kips}$$

$$\text{Mom Avail for L.L.} = 29.65$$

$$L.L. / \text{lane} = 84$$

$$\text{Eq. No. Buff} = 3.86$$

$$L.L.M = 21.76$$

$$L.L.M + I = 28.29$$

$$\% S15 = 1.048$$

$$\% \text{ Legal} = 86.5\% \text{ Legal.}$$

$$\boxed{\text{BUF } 20} \quad S = 17.0$$

$$D.L. = 83 \# / \text{ft}$$

$$D.L. \text{ Mom} = 2.15$$

$$\text{Mom. Avail} = 38.25$$

$$\text{Mom Avail for L.L.} = 36.10$$

$$\% S15 = 127.6\%$$

$$\% \text{ Legal} = 105\% \quad \text{OK}$$

$$\text{Case } 7 \text{ Lines } \boxed{\text{BUF } 20}$$

$$\text{@ } 2'4"$$

-OVER-

## COST WOOD FLOOR

$$(\text{steel}) 141 \times 20 \times 7 \times .17 = 3355.00$$

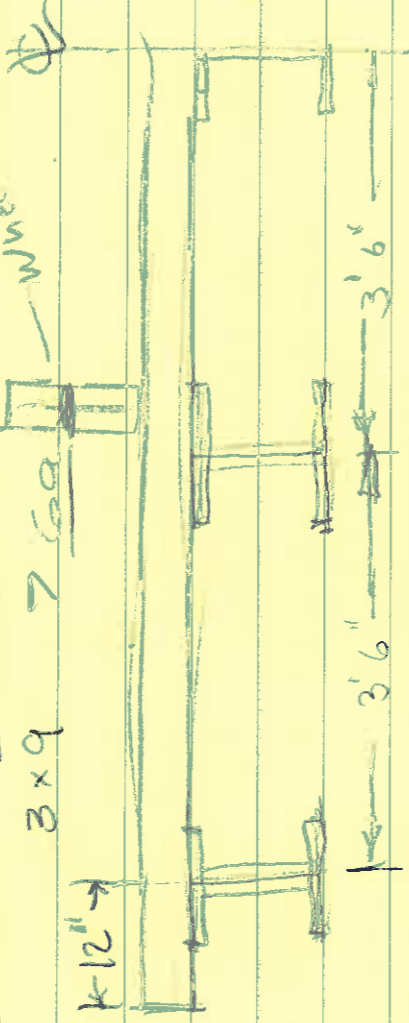
$$(\text{wood}) 141 \times 16 \times 4 \times .28 = 2527.00$$

$$\text{Nails - clips + Bolts} = 500.00$$

$$= 6382.00$$

Wood Deck say \$6500.00 Material

## STEEL DECK



$$\text{Eq. No. Bm} = 2.0$$

$$D_{\text{allow}} = 15.1 \times 3.5 + 25 = 183 \#$$

$$D_{\text{allow}} M = 14^3 \cdot 183 / 8 = 4.5$$

$$D_{\text{allow}} M = 84 / 2 = 42.0$$

$$LL_{\text{allow}} = 1.3 \times 42 = 54.6$$

$$10WF25 \quad S = 26.4$$

$$\text{Mom Avail.} = 59.4$$

$$\text{Mom Avail. for } LL_1 = 54.9$$

$$S_{15} = 101.7$$

$$\% \text{ Legal} = 83 \%$$

$$10WF29 \quad S = 30.8$$

$$D_{\text{allow}} M = 4.58$$

$$\text{Mom Avail.} = 69.3$$

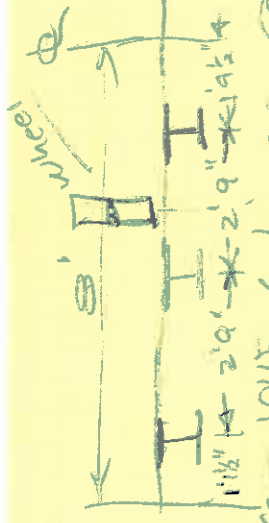
$$" \quad " \quad D_{\text{allow}} = 64.7$$

$$S_{15} = 118 \%$$

$$\% \text{ Legal} = 97.7\% \quad \text{OK}$$

$$5 \text{ Lines } 10WF29 -$$

± ± ± ± ±



7 ga 2 x 6 - 10WF 21 @ 2'9" = 13'9"

TRY 10WF 21 S = 21.5

D.L. =  $38.8 \times 2.75 + 21.5 = 128.2 \#$

A.L.M =  $14^2 \times 128 / 8 = 3.14$

Mom Avail = 18.4

Mom Avail for LL = 45.24

L.L.M =  $39 / 2.59 = 33.07$

L.L.M + I = 42.99

% S15 = 105

% Legal = 87%

Try 10WF 25 S = 26.9

D.L. = 132.1

D.L.M. =  $14^2 \times 132.1 / 8 = 3.24$

Mom Avail. =  $26.9 \times 27 / 12 = 59.9$

Mom Avail for LL = 51.66

% S15 = 120.2%

% Legal = 99.2% GOOD ENOUGH

COST

Metal Decking @ \$7.00/ft<sup>2</sup>

= \$15,800.00

STAINERS @ 17¢/lb

3600.00

19400.00

\$20,000 Material

BR 21-101

12/29/75

2x6 CORRUGATIONS

$$6 \text{ Lines } 10WF 25 \times 140' = 21,000^{\#}$$

$$@ 171^{\#} = \$35,700$$

Flooring Painted

$$3.25 \times 2256 = 7332$$

$$3.00 \quad 32 = 96$$

$$5.25 \quad 24 = 126$$

$$\# 7554.00$$

$$\text{TOTAL} = \$11,124.00$$

3x9 CORRUGATIONS

$$5 \text{ Lines } 10WF 29 \times 140 = 20,300^{\#}$$

$$@ 171^{\#} = \$3451.00$$

$$3.40 \times 2256 = 7670.40$$

$$96.00$$

$$228.00$$

$$\# 7994.40$$

$$\text{TOTAL} = \$11,373.70$$

$$\# 11,745.40$$

Existing D.L. / Panel

$$= 14 \times 16 \times (150/6 + 50/3) + 14 \times 10 \times 13.5$$

$$= 11,083^{\#}$$

$$\text{Proposed D.L.} = 45 \times 14 \times 16 + 5 \times 14 \times 29$$

$$12,110^{\#} \quad \text{or } 9\% \text{ increase}$$

Proposed D.L.

$$38.8 \times 14 \times 16 + 6 \times 14 \times 25$$

$$10,791^{\#} - \text{reduction}$$

February 19, 1976

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

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.

COPY

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, P.E.  
Logan County Engineer

CRK/MWB/ed

COPY

## FOR(0%) REDUCTION

8/1/74

R1B

### HIP VERTICALS

Existing MEMBER = 2 - 1<sup>3</sup>/<sub>4</sub> x 1/2"  $\square$

### STRESS FOR 0% REDUCTION

$$F = \frac{100}{82.5} (30.6) + 6.6 = 43.7K$$

D.L.S.

### AVAILABLE STRESS

$$.95 \times 2 \times 1.75 \times 1.5 \times 19Ksi = 31.6K$$

### NEEDED STRESS

$$43.7K - 31.6K = 12.1K$$

$$\frac{12.1K}{27Ksi} = .45in^2 \quad \text{call it } \underline{.5in^2}$$

(F=27Ksi; FOR NEW STEEL)

$$\frac{.5}{2} = \underline{.25in^2} \quad \text{per existing bars}$$

### ∴ COULD USE

- 2 - 1/2 x 1/2 in bars @ .85 #/ft
- 2 - 1 x 1/4 in bars @ .85 #/ft
- 2 - 9/16" diameter  $\phi$  @ .845 #/ft



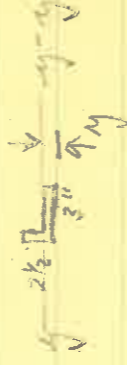
BRIDGE 21-1:01

$$M_{0.5} = \frac{100}{8.2} (20.23) + 1.5 = 26.17 \text{ ft-k}$$

$$26.17 = \frac{S \times 18.21}{12} \quad S = 26.17 \times \frac{12}{18.21} = 11.63 \text{ in}^3$$

at  $f = 27 \text{ ksi}$

A 6WF20 WOULD GIVE 0% REDUCTION  
( $S = 13.9 \text{ in}^3$ )



$$3 \times 2\frac{1}{2} \times \frac{1}{2}''$$

$$8.5 \text{ #/ft}$$

$$I_{yy} = 1.3 \text{ in}^4$$

$$A = 2.5 \text{ in}^2$$

$$y = .75 \text{ in}$$

$$S_{yy} = .79 \text{ in}^3$$

$$I_{pl} = \frac{bh^3}{12} = \frac{.25(2.9)^3}{12} = 288 \text{ in}^4$$

$$x = 12''$$

$$I_{Ls} = 4(1.3) + 4(2.5^2)(.313) (11.25)^2 = 1112.37$$

$$I_T = 1900.37$$

$$S = \frac{I_T}{x} = \frac{1900.37}{12} = 116.7$$

THEY USE 112.26 (OK)

$$2.28$$

$$111.34$$

$$116.7$$

T

$$\begin{aligned} \tan \theta_1 &= \frac{19}{21} = .667 & P=10 \\ \sec \theta_1 &= \frac{25.29}{21} = 1.202 \end{aligned}$$

$$\begin{aligned} \tan \theta_2 &= \frac{28}{21} = 1.333 \\ \sec \theta_2 &= \frac{35}{21} = 1.667 \end{aligned}$$

\*

D.L. = 60.6 K/PANEL.

91.58

60.06

106.26

91.58

15.71

115.5

10.63

5.08

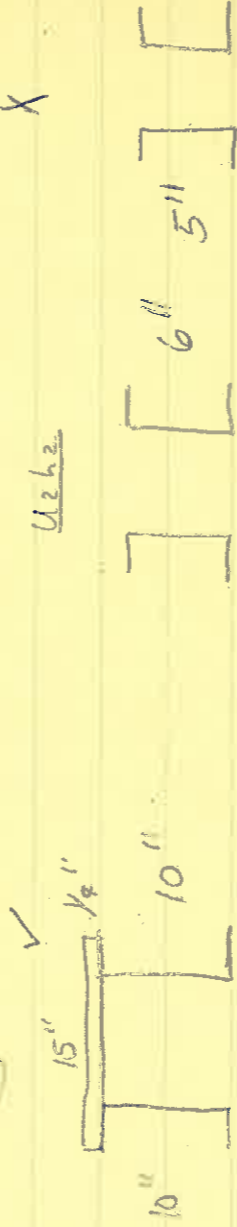
5.08

1.39

9.27

$U_1, U_2, U_3, U_4, U_5, U_6, U_7, U_8, U_9, U_{10}, U_{11}, U_{12}, U_{13}, U_{14}, U_{15}, U_{16}, U_{17}, U_{18}, U_{19}, U_{20}, U_{21}, U_{22}, U_{23}, U_{24}, U_{25}, U_{26}, U_{27}, U_{28}, U_{29}, U_{30}, U_{31}, U_{32}, U_{33}, U_{34}, U_{35}, U_{36}, U_{37}, U_{38}, U_{39}, U_{40}, U_{41}, U_{42}, U_{43}, U_{44}, U_{45}, U_{46}, U_{47}, U_{48}, U_{49}, U_{50}, U_{51}, U_{52}, U_{53}, U_{54}, U_{55}, U_{56}, U_{57}, U_{58}, U_{59}, U_{60}$

1.1667



$$A = 9.96 \quad I = 66.9$$

$$\bar{y} = \frac{10.125(3.75) + 5(2)(9.96)}{3.75 + 2(9.96)} = \frac{37.97 + 99.6}{133.8} = \frac{137.57}{133.8} = 1.02$$

$$I_{10} = 2(66.9) + 2(9.96)(1.52)^2 = 159.91$$

$$I_{pt} = \frac{15(125)^3}{12} + 3.75(3.605)^2 = 98.75$$

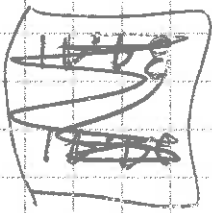
$$I_T = 203.16$$

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

1225  
 150  
 782

637  
 961  
 941

35.0  
 25.24

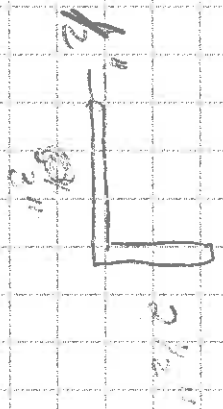


1184  
 596  
 196  
 990

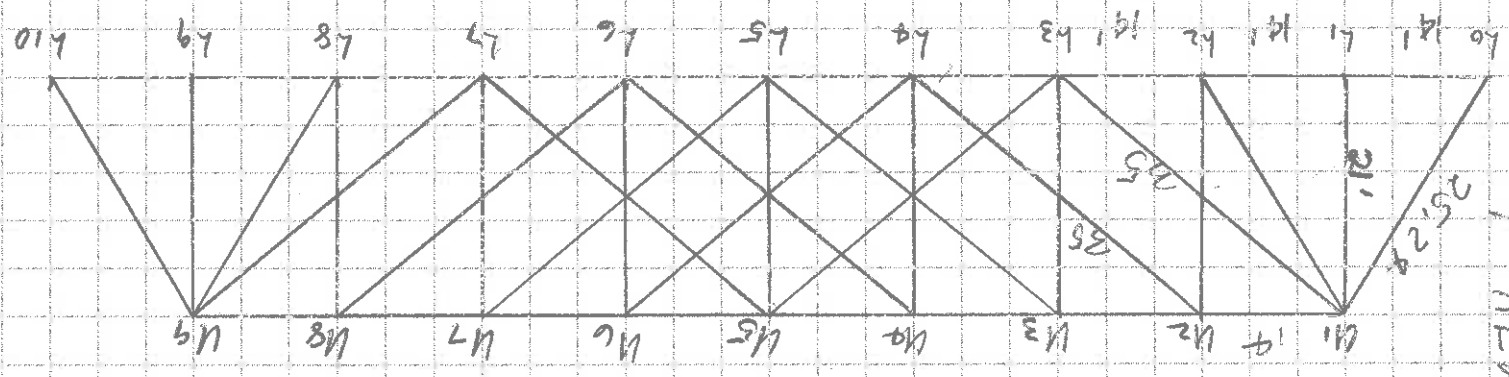
900  
 1184

189  
 900  
 789

19.8  
 $\frac{21}{14} (9.5)(6.6)$   
 29.7  
 $(4.5) \cdot 7 (6.6)$



RIVETS ~ 5/8"  
 1" HEAD



1184

$$\underline{u_0, u_1} \quad R = 4$$

$$y_R = \frac{25.24}{4} \times 12 = 75.72$$

$$F = 1.1667 \times 13088.8 = \underline{15,27}$$

15153

1298,7

2012,08

78

$\sqrt{6036,9}$

$$\underline{78 \times R} = 12 \times 25.24$$

$$3.88 = R$$

$$\underline{u_1, u_2}$$

$$R = 4$$

$$y_R = \frac{14}{4} \times 12 = 42$$

14912

$$\underline{u_2, u_3}$$

$$R = 2.34$$

$$\frac{21}{2.34} \times 12 = 107.269$$

$$F = 11162$$

$$R = 1.95$$

$$\frac{21}{1.95} \times 12 = 129.23$$

.899

BRIDGE INVENTORY & APPRAISAL CODE SHEET

21-1.01

PROCESSING KEY	
STRUCTURE FILE NO.	TRANS. CODE
4631.838C	

CHECKED BY P.A. Bruce DATE 5/29/79

JUN 18 1979

CARD NO.	(1) DISTRICT	(2) CITY OR TOWN	(3) INVENTORY ROUTE						(4) FEATURE(S) INTERSECTED			(5) INV. RTE. BRIDGE NO.	(6) COUNTY	(7) SECTION I. D. NUMBER	(8) INVENTORY ROUTE A.D.T. (TENS)	(9) A.D.T. YEAR	(10) FED-AID SYSTEM	(11) ADMIN. JURISD.	(12) FUNCTIONAL CLASS					
			ON/UNDER SYSTEM	ROUTE NUMBER	DIRECT SUFFIX	DESIGNATION	PREF. ROUTE	UNIT NUMBER	STRAIGHT LINE MILEAGE	SPECIAL DESIGNATION														
1	10	12	16	17	18	19	20	21	22	23	24	25	26	61	54	59	61	65	71	73	75	77	79	80

CARD NO.	(13) DEFENSE SECTION NUMBER	(14) MILEPOINT BEGIN SECTION	(15) SECTION LENGTH	(16) TOT. MIN HORIZONTAL CLEAR.		(17) INTERSECTED ROUTE ON/UNDER SYSTEM	ROUTE NUMBER	DIRECT SUFFIX	DESIGNATION	PREF. ROUTE	(18) FEATURE(S) INTERSECTED	(19) INTER. RTE. BRIDGE NO.												
				NON-CARD. OPENING	CARDINAL OPENING								FT.	IN.	STRAIGHT LINE MILEAGE	SPECIAL DESIGNATION								
2		15	19	22	25	26	29	30	32	36	37	39	43	44	45	46	71	74	79	80				

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	(26) MILEPOINT BEGIN SECTION	(27) SECTION LENGTH	(28) TOT. MIN HORIZONTAL CLEAR.		(29) PRACTICAL MAXIMUM VERTICAL CLEAR.	(30) COORDINATES	(31) BY-PASS LENGTH	(32) PHYS. VULNER. TOLL	(33) YEAR BUILT	(34) NO. LANES	(35) HORIZ. CURVE	(36) SKEW	(37) DESIGN LOADING											
									NON-CARD. OPENING	CARDINAL OPENING										DEGREES	MINUTES	DEGREES	MINUTES	ORIG. CONS.	MAJOR RECON.	ON STRUCT.	UNDER STRUCT.	DEG.	MIN.	
3		16	18	20	22	24	29	33	36	39	42	44	46	50	52	54	57	60	63	64	65	67	68	69	71	73	75	77	79	80

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		46 FLOOR SLAB TYPE	(47) WEARING SURFACE THICKNESS (INCH)	(48) STRUCTURE TYPE				(49) TOTAL NO. SPANS	(50) MAXIMUM SPAN LENGTH	(51) OVERALL STRUCTURE LENGTH	(52) TYPE SERVICE	(53) BRIDGE DESCRIPTION	(54) MINIMUM VERTICAL CLEAR. ON BRIDGE		(55)	(56)	57 BEARING TYPE					
								LEFT	RIGHT			NUMBER	TYPE CODE	NUMBER	TYPE CODE						FT.	IN.								
4	020	000	0	016	016	7				62	04	001	3	4	0	0	0140	000	143			16	06							

CARD NO.	(58) SUBSTRUCTURE					59 PILING	(60) MIN. VERT. UNDERCLEAR. (MAIN LANES)				(61) MIN. LATERAL UNDERCLEAR. TO EDGE OF LANE				(62) NAVIGATION		(63) OHIO ORIGINAL CONSTR. PROJ. NO.	(64) MICROFILM REEL NO.	(65) ORIGINAL CONSTRUCTION FEDERAL AID PROJECT NUMBER											
	ABUTMENTS		PIERS				NON-CARD. OPENING	CARDINAL OPENING	NON-CARD. UNDERCLEAR.		CARDINAL UNDERCLEAR.		CONTROLLED	VERT. CLEAR.	HORIZ. CLEAR.															
	REAR	FWD.	PREDOMINATE	OTHER	OTHER				FT.	IN.	FT.	IN.																		
5	10	11	12	13	14	16	17	18	20	21	22	24	25	26	27	28	29	31	33	35	38	41	44	47	48	51	55	61	67	80

CARD NO.	(66) LOAD RATING				(69) APPRAISAL					(70) PROPOSED IMPROVEMENTS								(71) COST OF IMPROVEMENTS					72 PRIORITY									
	OPERATING RATING	INVENTORY RATING	OHIO % OF LEGAL	RATING YEAR	INSP. RESP.	MAINT. RESP.	DECK GEOM.	UNDERCLEAR.	SAFE LOAD CAP.	WATERWAY ADEQ.	APPR. ALIGN.	REMAIN. LIFE	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.		TOTAL COST (\$1000'S)	YEAR OF COSTS	PRELIM. ENG.	DEMO-LITION	SUB-STRUCTURE	SUPER-STRUCTURE			
6	9.40	9.26	100	76	3	3	4	N	5	0	5	1																				

REMARKS:

OFFICIAL USE ONLY

O.A. CODE \_\_\_\_\_

REVIEWED BY \_\_\_\_\_

DATE \_\_\_\_\_

RECORDED (STAMP)

JUN 18 1979

DATE \_\_\_\_\_

PROCESSING KEY  
 STRUCTURE  
 FILE NO. 4631838C

BRIDGE INVENTORY & APPRAISAL CODE SHEET

CODED BY *W. H. ...* DATE *2-11-80* CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

1	9	10	12	16	17	18	23	24	25	26	29	30	32	35	36	37	38	42	43	44	45	46	51	54	59	61	65	71	75	77	79	80
	CARD NO.	0001 DISTRICT	CITY OR TOWN	ON/UNDER SYSTEM	ROUTE NUMBER	ROUTE NUMBER	SECTION BEG. LENGTH	SECTION LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	
		(1)	(2)	(3) INVENTORY ROUTE	(4) FEATURE(S) INTERSECTED	(5) INV. RTE. BRIDGE NO.	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	

2	9	10	19	22	25	28	30	32	35	36	37	38	42	43	44	45	46	51	54	59	61	65	71	74	79	80
	CARD NO.	SECTION NUMBER	SECTION BEG. LENGTH	SECTION LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH
		(13) DEFENSE	(14)	(15)	(16)	(17) INTERSECTED ROUTE	(18) FEATURE(S) INTERSECTED	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)

3	9	10	16	18	20	24	29	33	36	39	42	44	46	50	52	54	57	60	63	64	65	67	69	71	73	75	77	79	80	
	CARD NO.	INTERSECTED ROUTE (TENS)	R.D.T. YEAR	FED. AID SYSTEM	ADMIN. JURISD.	FUNCTIONAL CLASS	SECTION NUMBER	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	SECTION BEG. LENGTH	
		(20)	(21)	(22)	(23)	(24)	(25) DEFENSE	(26)	(27)	(28)	(29)	(30) COORDINATES	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)	(41)	(42)	(43)	(44)	(45)	(46)	(47)	(48)

4	9	10	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
	CARD NO.	APPROACH ROADWAY WIDTH	MEDIAN TYPE	FLARED BRIDGE (CB/CB) WIDTH	DECK WIDTH (OUT/OUT)	RAIL. TYPE DECK DRAIN.	LEFT RIGHT	LEFT RIGHT	LEFT RIGHT	LEFT RIGHT	LEFT RIGHT	LEFT RIGHT	LEFT RIGHT	LEFT RIGHT	LEFT RIGHT	LEFT RIGHT	LEFT RIGHT	LEFT RIGHT	LEFT RIGHT	LEFT RIGHT	LEFT RIGHT	LEFT RIGHT	LEFT RIGHT	LEFT RIGHT	LEFT RIGHT	LEFT RIGHT	LEFT RIGHT
		(38)	(39)	(40)	(41)	(42)	(43)	(44)	(45)	(46)	(47)	(48) STRUCTURE TYPE	(49)	(50)	(51)	(52)	(53)	(54)	(55)	(56)	(57)	(58)	(59)	(60)	(61)	(62)	

5	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	31	32	35	36	38	41	44	47	48	51	55	61	67	80
	CARD NO.	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	REAR FWD. PERS	
		(58) SUBSTRUCTURE	(59)	(60) MIN. VERT. UNDERCLEAR.	(61) MIN. LATERAL UNDERCLEAR. TO EDGE OF LANE	(62) NAVIGATION	(63)	(64)	(65)	(66)	(67)	(68)	(69)	(70)	(71) COST OF IMPROVEMENTS	(72)	(73)	(74)	(75)	(76)	(77)	(78)	(79)	(80)	(81)	(82)	(83)	(84)	(85)	(86)	(87)	(88)	(89)	(90)	

6	9	10	13	18	21	22	23	24	25	26	27	28	29	31	32	35	40	42	46	48	54	55	56	58	59	65	69	72	76	80			
	CARD NO.	OPERATING RATING	INVENTORY RATING	OHIO % OF LEGAL RATING	INSP. RESP. YEAR	MAINT. RESP. DECK GEOM.	UNDERCLEAR. SAFE LOAD CAP.	WATERWAY REQ. APPR. ALIGN.	REMAIN. LIFE	YEAR NEEDED	TYPE SERVICE	TYPE WORK	LENGTH OF IMPROVEMENT	IMPR. DES. LOAD	PROPOSED ROAD WIDTH	NUMBER LANES	DESIGN (TENS)	YEAR R.D.T.	YEAR R.D.T.	YEAR R.D.T.	YEAR R.D.T.	YEAR R.D.T.	YEAR R.D.T.	YEAR R.D.T.	YEAR R.D.T.	YEAR R.D.T.	YEAR R.D.T.	YEAR R.D.T.	YEAR R.D.T.	YEAR R.D.T.	YEAR R.D.T.	YEAR R.D.T.	
		(66) LOAD RATING	(67)	(68)	(69) APPRAISAL	(70)	(71) COST OF IMPROVEMENTS	(72)	(73)	(74)	(75)	(76)	(77)	(78)	(79)	(80)	(81)	(82)	(83)	(84)	(85)	(86)	(87)	(88)	(89)	(90)	(91)	(92)	(93)	(94)	(95)	(96)	

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REMARKS:











# Memo

**To:** Bridge Files  
**From:** Stephanie Ann Goff, Assistant Engineer  
**Date:** 11/10/98  
**Re:** Change in Bridge Numbers

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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.



## 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



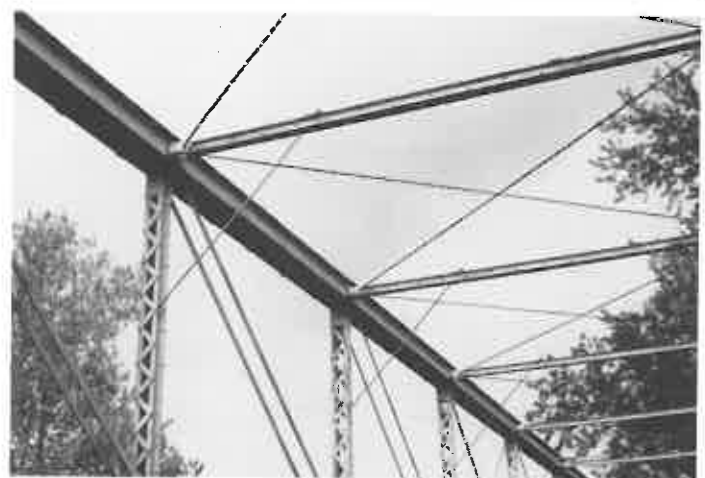
The decorative portal bracing and distinctive nameplate of the Great Miami River Bridge near Logansville are typical of the structures completed in the late 19th century by the Massillon Bridge Company of Massillon, Ohio.

distinctive D-shaped connector between the top chord and upper cross bracing.

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. ■



Tension members on this 140-foot Whipple truss bridge are proportioned according to a formula devised after the Civil War by a prominent civil engineer from St. Louis, C. Charles Shaler. Diagonals increase in section towards the end, while the lower chord eyebars are largest in the center panels.



Especially interesting on this Logan County bridge are the details such as D-shaped connector designed to attach three separate members at a single point on the top chord, a feature used only by this company.

