

# OFFICE MEMORANDUM

R-287



MICHIGAN  
STATE HIGHWAY DEPARTMENT  
JOHN C. MACKIE, COMMISSIONER

April 18, 1958

To: W. W. McLoughlin  
Testing and Research Engineer

From: E. A. Finney

Subject: Rigidity Tests on Union Steel Products Co.  
Dowel Bar Joint Assembly (Type L). Report No. 287  
which supplements Report No. 200, 237, 259 and 276.  
Research Project 39 R-1(3).

The Union Steel Products Company has made certain modifications in their dowel bar joint assembly. As a result the new assembly (Sample No. 58 MR-44) was submitted to the Research Laboratory for testing and evaluation.

Vertical and lateral rigidity tests were conducted in accordance with the procedure used previously on other dowel bar joint assemblies and described completely in Report No. 200. The test results indicate that this assembly is 3.8 times as stiff vertically and 2.5 times as stiff laterally as the Bethlehem assembly which has been considered as a standard of acceptability.

Figure 1, shows a dimensional cross-section, while Figure 2 shows a detailed and an overall view of the subject assembly. Figure 3 illustrates the vertical and horizontal load-deflection relationships for the Union Steel Products Company (Type L) contraction joint assembly compared to the Bethlehem (Type C) contraction joint assembly.

On the sample submitted for testing two improvements were suggested to Mr. Bill Federhart of Union Steel Products Company. These suggested improvements were as follows:

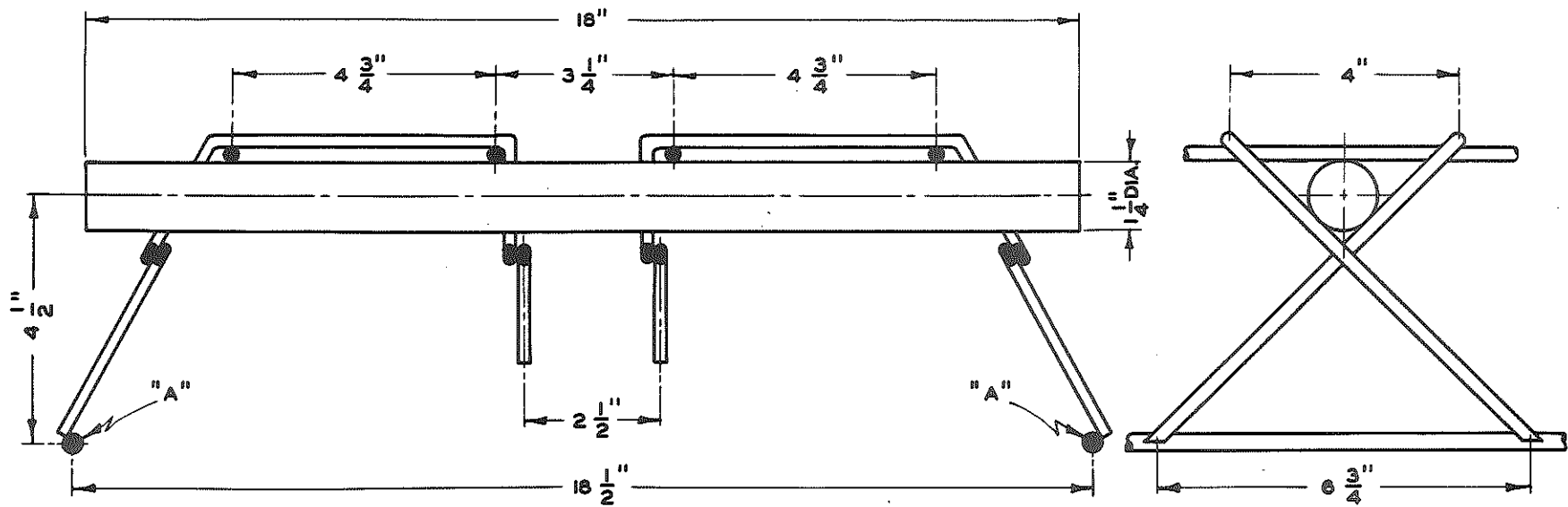
1. The end wires should be extended beyond the last dowel a minimum of  $4\frac{1}{2}$  inches. Their print called for a  $3\frac{1}{2}$  inch extension. This suggestion was made in order to provide more or less automatic lateral positioning of the assembly in the pavement lane.
2. The assembly as received had no provision for the proper positioning of the base plate beneath a contraction joint assembly. After discussing this with Mr. Federhart, he said this would be remedied by the use of three guide wires to position the base plates. These guide bars would be placed on the assembly in the field.

In order to illustrate the way the Union Steel Products Company has modified the sample to incorporate the two previous suggestions a revised blue-print is attached. This assembly as modified appears satisfactory, for the changes which were made would not affect the rigidity of the assembly.

E. A. Finney *E.A.F.*  
E. A. Finney, Director  
Research Laboratory

RAF:MSO:la  
cc: C. B. Laird  
C. A. Weber  
C. H. Cash  
E. J. Rathfoot  
Encl.

"A" = "0" GA. (.3085 DIA.). ALL OTHER WIRE TO BE "3" GA. (.243 DIA.).



UNION STEEL PRODUCTS COMPANY CONTRACTION JOINT ASSEMBLY

SAMPLE 58 MR-44

FIGURE 1

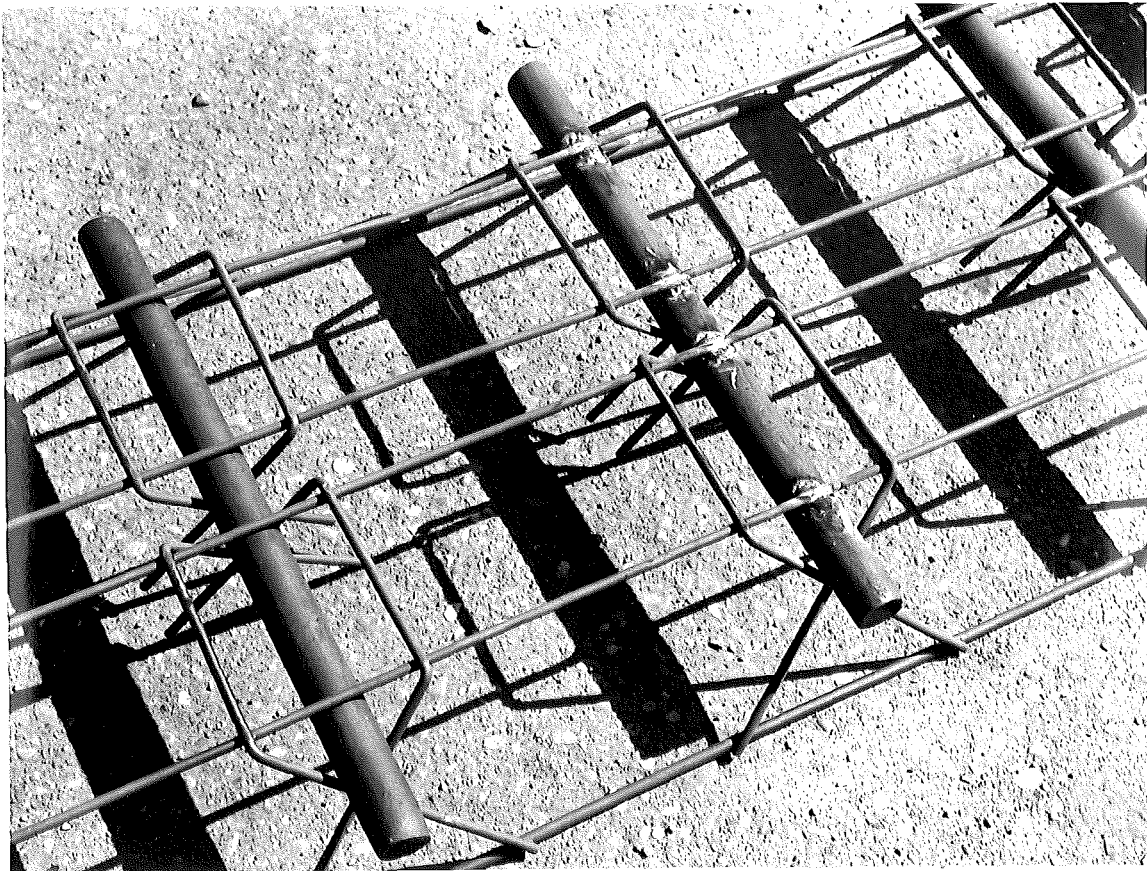
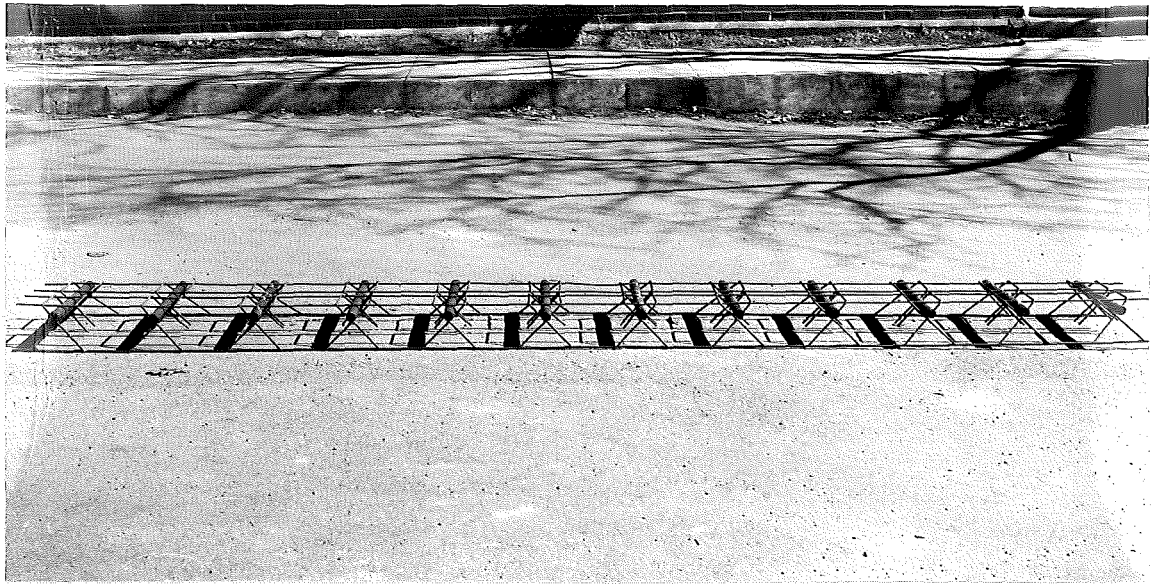


Figure 2  
Overall and close up view.

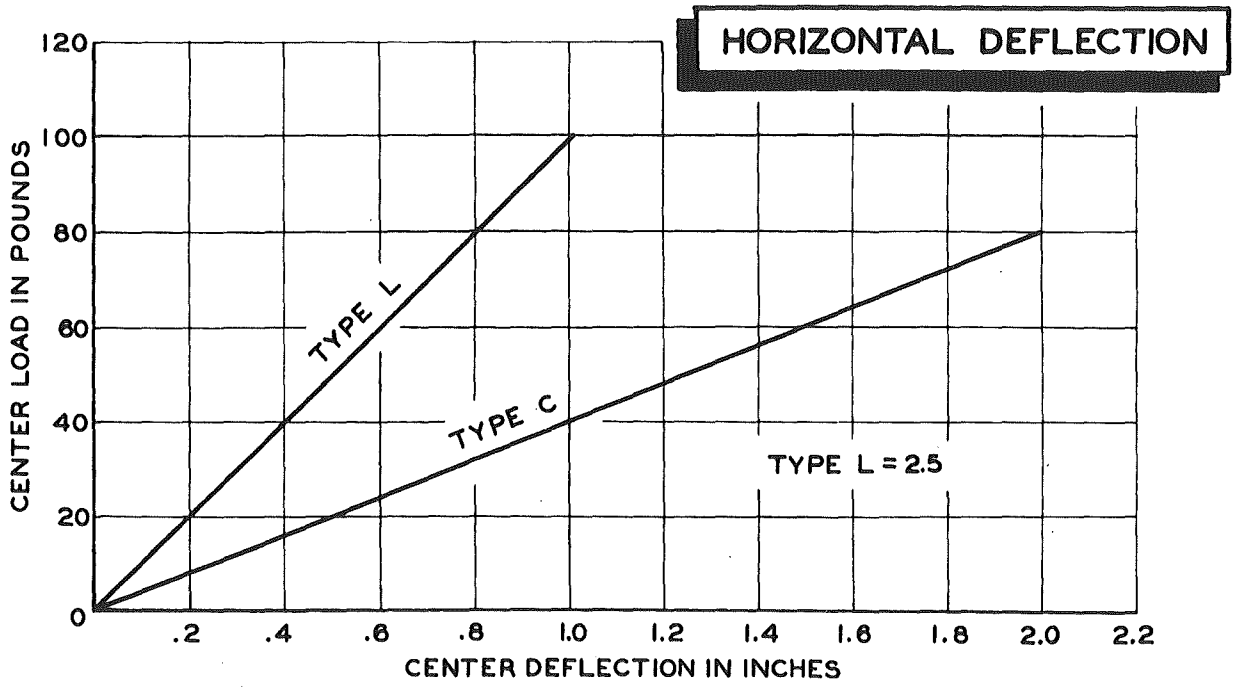
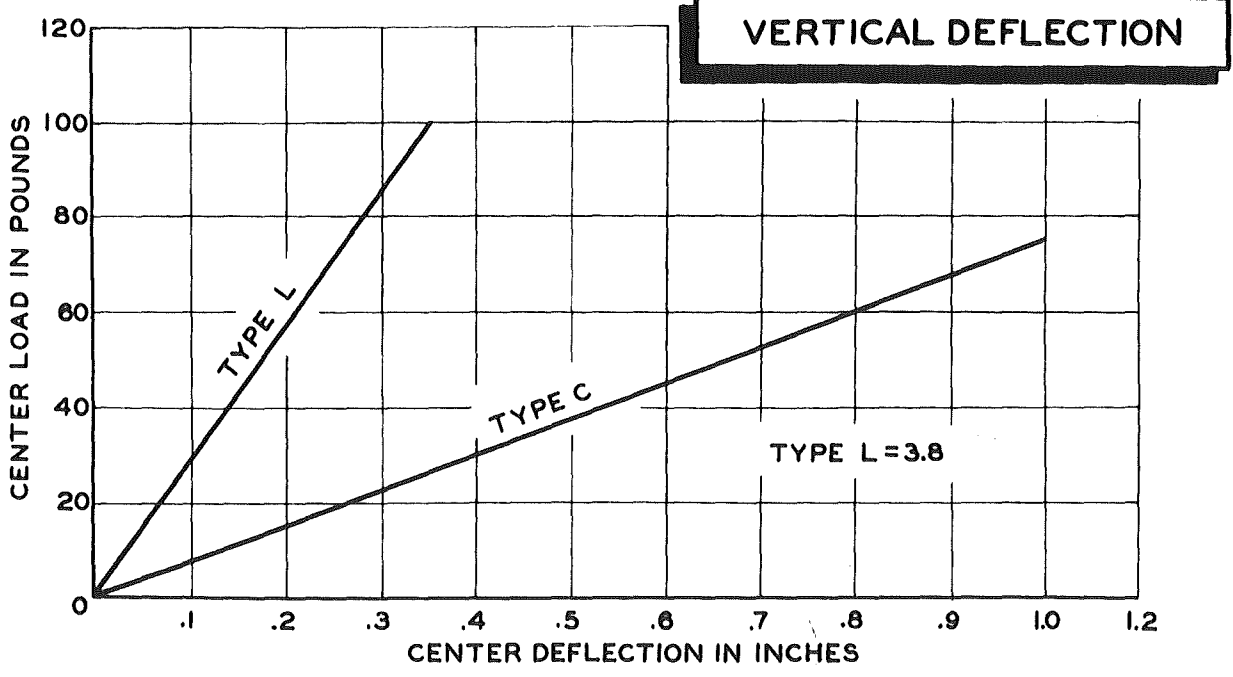
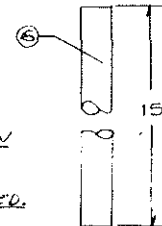
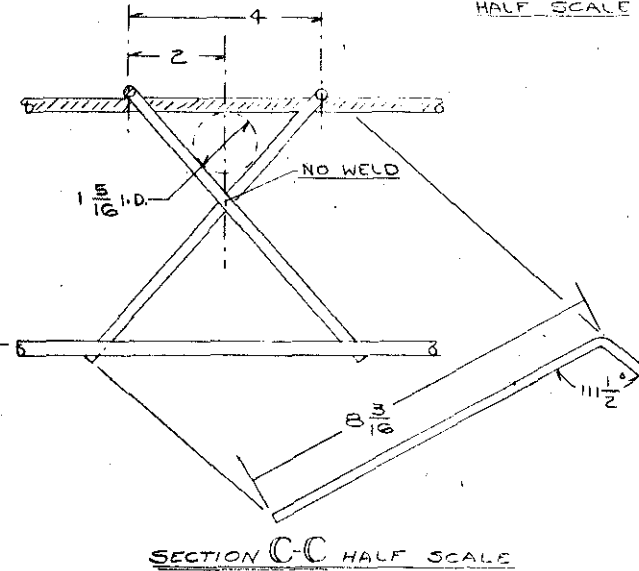
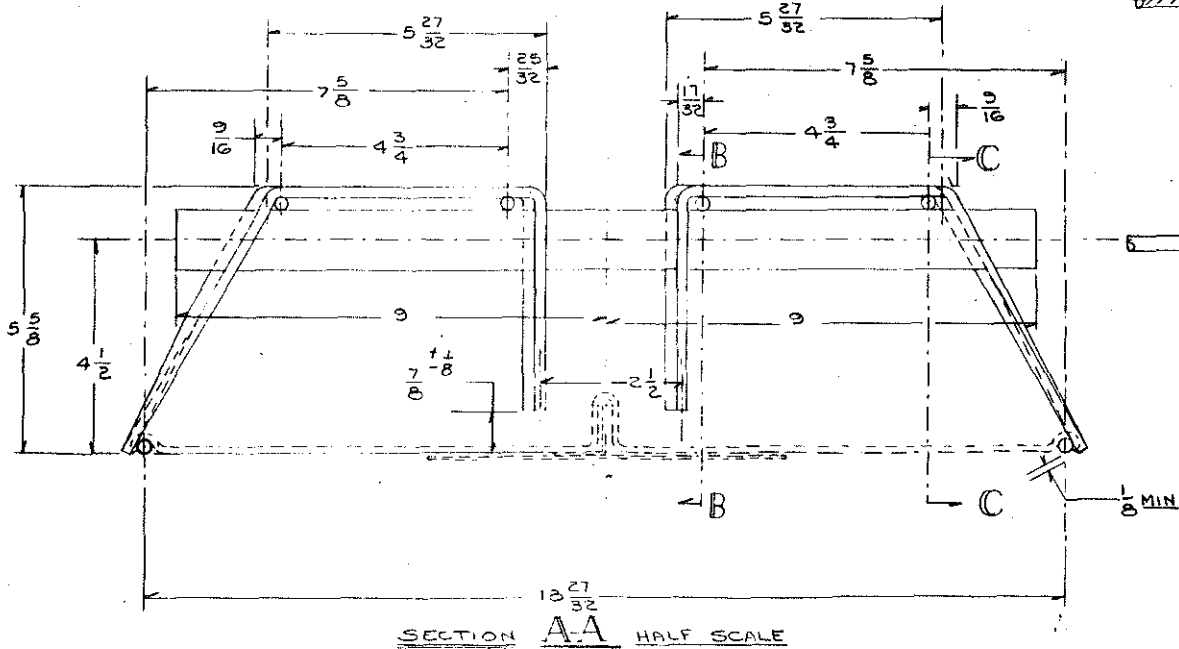
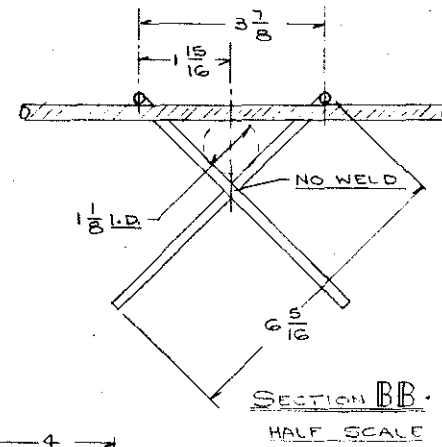
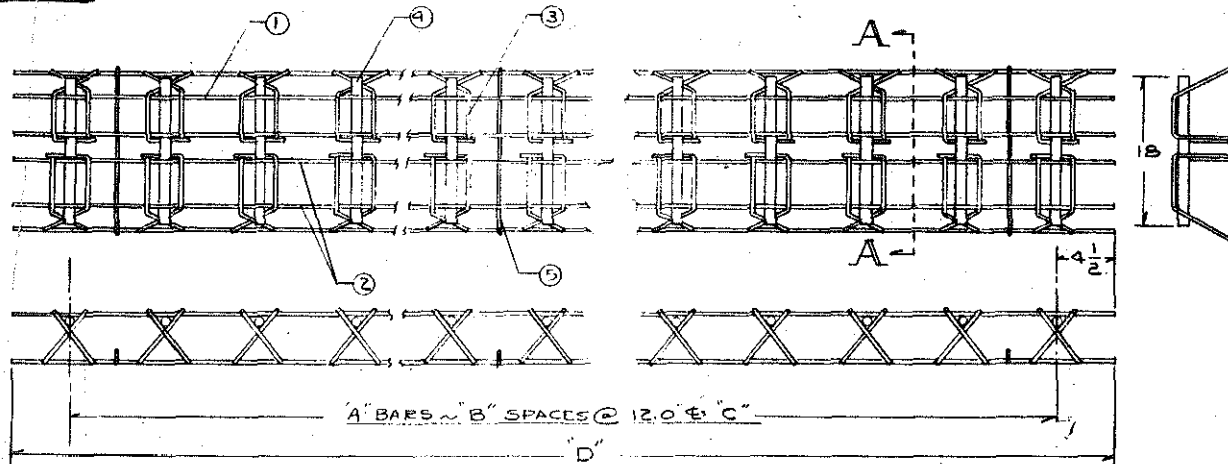


FIGURE 3

13587C



MODEL NO.	"A" NO. DOWEL BARS	"B" SPACES	"C" & DIM.	"D" LONGIT BARS	"E" NO. TRANS FORMED BARS	
M-9-10-U	10	9	108	117	40	KNOCKED DOWN ASSEMBLED
M-9-10-A	10	9	108	117	40	KNOCKED DOWN ASSEMBLED
M-9-11-U	11	10	120	129	44	KNOCKED DOWN ASSEMBLED
M-9-11-A	11	10	120	129	44	KNOCKED DOWN ASSEMBLED
M-9-12-U	12	11	132	141	48	KNOCKED DOWN ASSEMBLED
M-9-12-A	12	11	132	141	48	KNOCKED DOWN ASSEMBLED

**NOTE:**  
 WELD BARS AT INTERSECTION  
 UNLESS OTHERWISE SPEC.  
 DOWEL BARS FURNISHED BY  
 CUSTOMER AND NOT WELDED.

**STAKE - FULL SCALE**  
 This print is the property of the Union Steel Products Co., subject to return on demand and is loaned with the understanding that it is not to be used, directly or indirectly in any way detrimental to the interest of the U. S. P. Co.

REV.	RECORD	DATE	ISSUE
ORIGINAL		4-17-58	1
	REVISED & RE-DRAWN FROM 13587A	4-17-58	2

13587C

NO.	QTY.	DESCRIPTION
6		01.306 STAKES
5	3	57469B 10(.135) GUIDE BAR
4		1/8 DIA. DOWELS
3		3(243) TRANS. BARS
2	4	3(243) LONGIT. BARS
1	2	01.306 LONGIT. BARS

MATERIAL: LOW CARBON STEEL WIRE, INDUSTRIAL QUALITY

FINISH: No Finish

CUSTOMER: U.S.P. Co.  
 MICH. HWY. DEPT.  
 TRANS. DOWEL BAR INSTALLATION FOR 9" PAVEMENT

UNION STEEL PRODUCTS CO., WIRE PRODUCTS DIVISION ALBION, MICHIGAN

APR 17 1958

ALL ANGLES 90° UNLESS SPECIFIED. REMOVE ALL BURRS AND SHARP PROJECTIONS.	THIS PRINT FOR DEPT.	SCALE	DRAWN BY	DATE DRAWN	SHEET
LIMITS UNLESS SPECIFIED - ANGLES ± 1° FRACTIONS ± 1/16 DECIMALS ± .005	NONE	None	Romey	4-17-58	13587 C

REV.	RECORD	DATE	WORK
	ORIGINAL	12-13-57	1
8			
7			
6			
5			
4			
3			
2			
1			

MATERIAL: LOW CARBON STEEL WIRE INDUSTRIAL QUALITY

FINISH: NO FINISH

MODEL: \_\_\_\_\_ PART NO.: \_\_\_\_\_

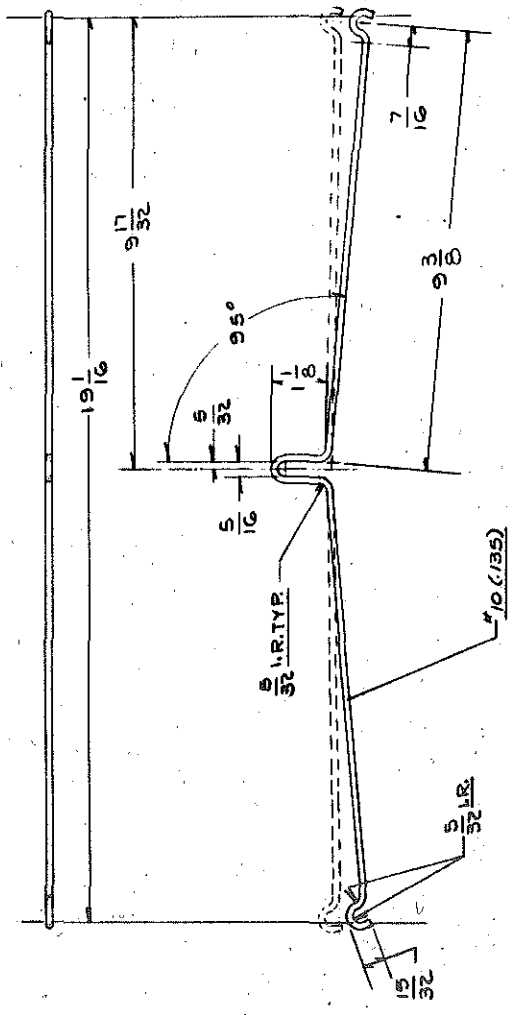
CUSTOMER: U.S.P.C.  
MEN-HYD. DEPT.

USE FOR: \_\_\_\_\_

UNION STEEL PRODUCTS CO.  
STEEL PRODUCTS DIVISION  
ALBION, MICHIGAN

WORK NO.: \_\_\_\_\_ SHEET: \_\_\_\_\_ OF \_\_\_\_\_

57469



This print is the property of the Union Steel Products Co., subject to return on demand and is loaned with the understanding that it is not to be used, directly or indirectly in any way detrimental to the interest of the U. S. P. Co.

APR 17 1958

ALL ANGLES 90° UNLESS SPECIFIED.	THIS PRINT FOR DEPT.
REMOVE ALL BURRS AND SHARP PROJECTIONS.	SCALE: _____
ANGLES UNLESS SPECIFIED: ANGLES ± 1°	DRAWN BY: _____
FRACTIONS ± 1/32 DECIMALS ± .005	DATE: 12-13-57