

PROJECT GROUP NO. NT-003 036 A
ENGR. REPORT NO. 2. 2020254

1 JULY 1952

Collapsible Aluminum Household Effects Shipping Container

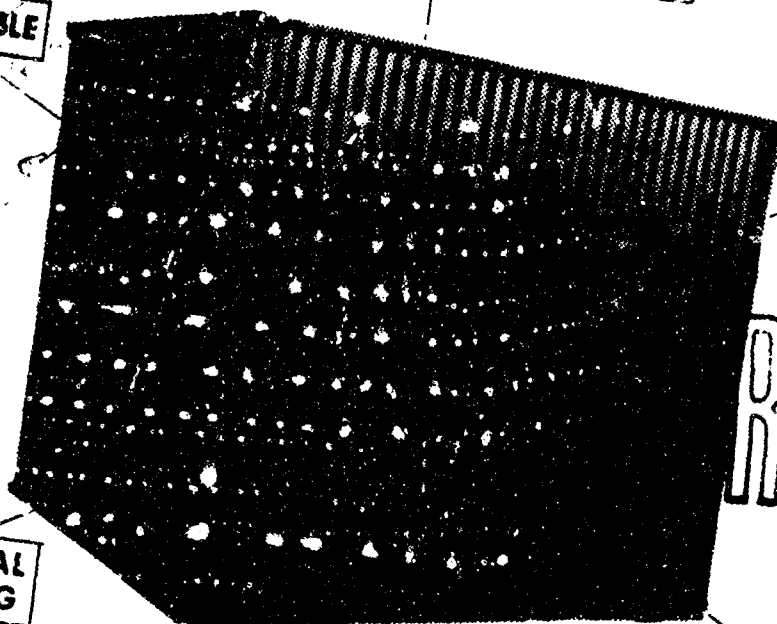
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AD 647969

PROTECTION AGAINST DAMAGE

COLLAPSIBLE

LIGHTWEIGHT



ELIMINATE INDIVIDUAL
PACKING & MARKING

PILFER RESISTANT

REDUCE PACKING
& HANDLING COST

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SUPPLY ENGINEERING DIVISION
U.S. Naval Supply Research & Development Facility
Bayonne, New Jersey

RESEARCH AND DEVELOPMENT DIVISION
BUREAU OF SUPPLIES AND ACCOUNTS
WASHINGTON, D.C.

TECHNICAL REPORT REVIEW

"EVALUATION OF AN EXPERIMENTAL COLLAPSIBLE
ALUMINUM HOUSEHOLD EFFECTS CONTAINER"

Engineering Report #2.2020254
29 December 1950
under
Project No. NTOC3016

APPROVAL:

Report Approved 12 March 1951

SECURITY

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/s/ J. H. TAYLOR, Jr.
Commander, (SC), USN
Director, Research and Development Division
By direction of the Chief of Bureau

Supply Engineering Division
U. S. Naval Supply Research and Development Facility
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Bayonne, New Jersey

PROJECT GROUP - NT-003-016
PROJECT REPORT - 2.2020254

EVALUATION OF AN EXPERIMENTAL COLLAPSIBLE
ALUMINUM HOUSEHOLD EFFECTS CONTAINER

AUTHORIZATION:

ChBuSanda ltr to OIC, USNSHDP, BayNJ, file S-82
(HER:el)S-3C-3(10), dtd 26 July 1950

PURPOSE:

To evaluate the performance of a Collapsible Aluminum Household Container manufactured by Northwest Consolidators, 402 Loman Building, Seattle 4, Washington, and determine its acceptability for Navy use.

CONCLUSION:

1. The aluminum household container is structurally sound.
2. The load capacity may be safely increased from the rated 1800 lbs. (7.5 lbs. per cu.ft.) to 3700 lbs. (15 lbs. per cu.ft.)
3. The sling hooks (lifting lugs) are inadequate and should not be used for handling purposes.

4. Prolonged exposure to weather or salt spray should be avoided.
5. The roof design precludes tiering of containers.

INTRODUCTION

The Bureau of Supplies and Accounts procured an experimental lot of thirty (30) Collapsible Aluminum Household Effects Containers, which were distributed as follows:

24 Containers to Naval Supply Center, Oakland, California

5 Containers to Naval Supply Depot, Seattle, Washington

1 Container to U.S. Naval Supply Research and Development
Facility, Bayonne, New Jersey

The experimental container was subjected to a series of accelerated laboratory and field tests, designed to simulate all possible hazards that the container may encounter during warehousing, stevedoring, and transportation operations. The conclusions and recommendations in this report are based on the results of these tests.

Field activities have been requested to submit operational usage data on each container in actual use. When sufficient data is accumulated, it will be evaluated and incorporated in a final report.

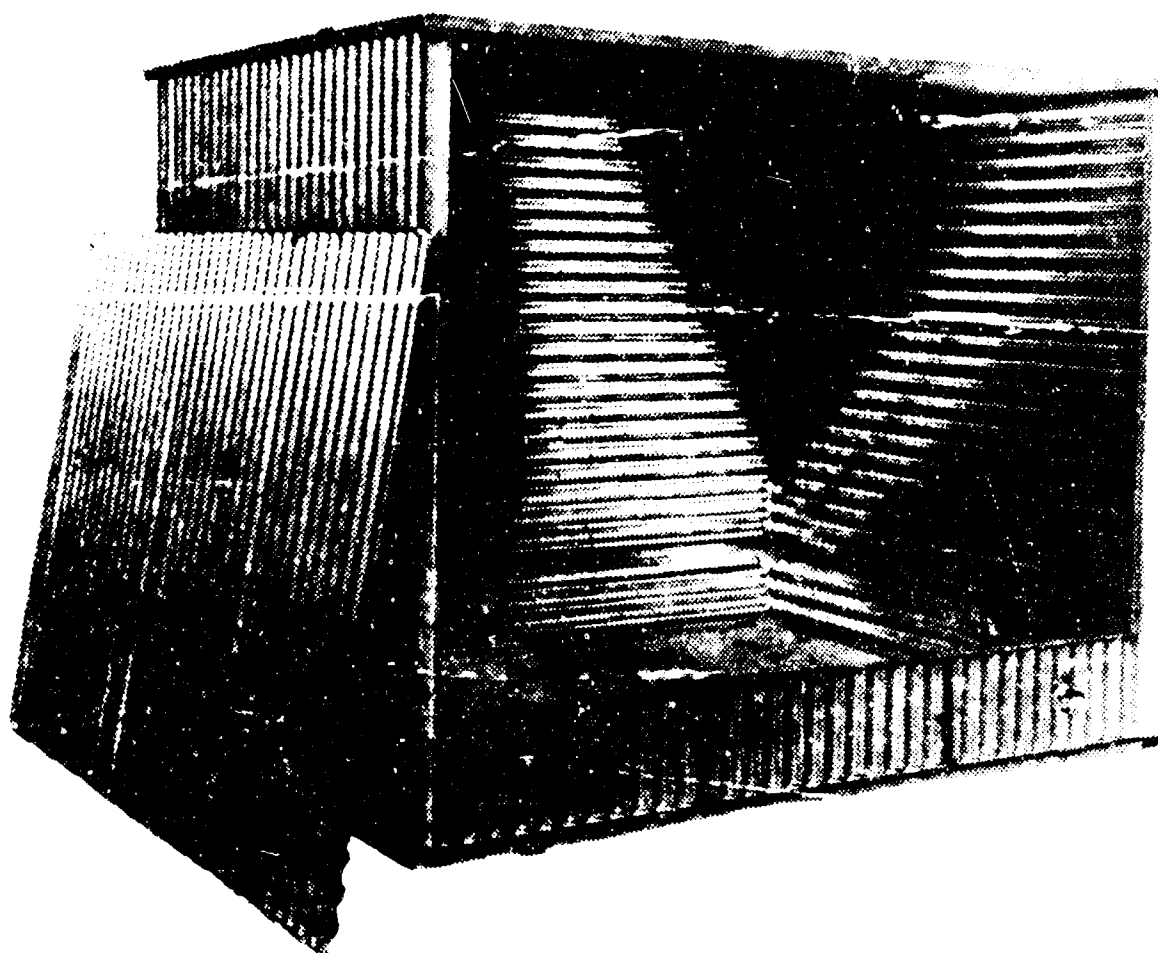


Photo Neg. No. USNSRDF 535-5

ASSEMBLED UNIT

Overall Dimensions - 96-1/2" x 71" x 78" high

Shipping Cube - 310 Cubic Feet

Clear Inside Dimensions - 91" x 66" x 71-1/4" high

Cargo Cube - 243 Cubic feet

Tare Weight - 535 lbs.

Skid Height - 4"

Assembly Time - 1.5 Man hours

Disassembly Time - 1.1 Man hours

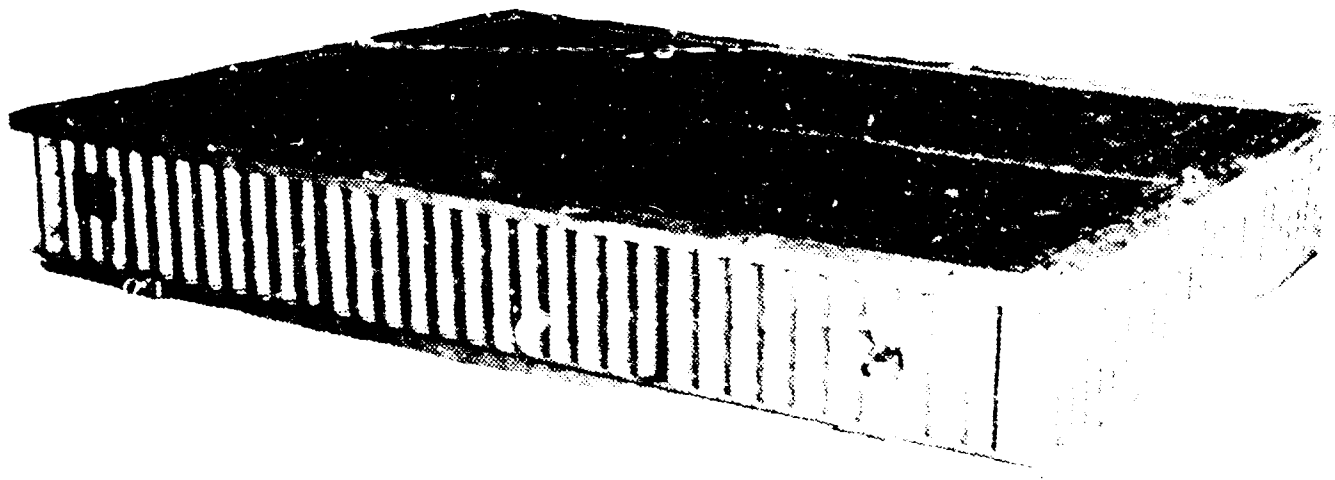


Photo Neg. No. USNSRDF 522-1

KNOCKDOWN UNIT

Overall Dimensions - $96\frac{1}{2}'' \times 71'' \times 17\frac{1}{2}''$

Shipping Cube - 69.5 Cubic feet

Tare Weight - 535 lbs.

CONSTRUCTION - Drawing No. CC12-2, D.C. Taylor, 402 Leman Building,
Seattle, Washington

The basic construction of the container consists of corrugated aluminum sheet with the corrugations .87" deep and with a pitch of 2.67". The unit is assembled with $\frac{3}{8}''$ - 16 N.C. steel nuts and bolts.

Floor Section - Double aluminum corrugated sheets riveted perpendicular to each other, lower sheet - .064" thick, upper sheet - .032" thick. Loose 3/8" plywood sheet is placed within to act as flooring.

Side Sections - Double aluminum corrugated sheets, .032" thick, riveted perpendicular to each other.

Roof Section - 3/16" aluminum plate riveted to .032" corrugated aluminum sheet.

Framing - All framing members are made of aluminum extrusions and have the following shapes:

Floor Framing - 1-1/4" x 2" x 1-1/4" x 3/16" Z Section

Corn. Posts - 1-1/4" x 2" x 1-1/4" x 3/16" Z Section

Roof Framing - 1" x 1-1/4" x 1/8" angle

Side Panel Framing - 1-1/4" x 1-1/4" x 1/8" angle

Skids - Two 4" x 2.66" structural aluminum I beams with 10" x 2-1/2" openings for fork trucks.

Sling Hooks - Four 1" eye bolts, 3/8" shank, bolted to floor frame members.

METHOD OF TEST

1. Determination of Characteristics

a. Weight and Cube

The container was weighed and all pertinent dimension taken to ascertain the shipping and cargo cube of the container when fully assembled, as well as the shipping cube when the container is knockdown.

b. Time required for Assembly and Disassembly

The container was assembled and disassembled by two men using 9/16" box wrenches. The assembly time included the unbolting of the roof from the lower side panels and complete erection of the unit. Similarly, the disassembly time included the complete dismantling of the unit, placing the upper side panels into the lower section, and bolting the roof on the lower side panels.

2. Weather Resistance Test

To simulate a heavy rain, the container was subjected to a water spray from a 1-1/2" fire hose equipped with a fog nozzle. The spray was directed at the test unit from various directions and angles for a period of thirty minutes. At the conclusion of the test, a side panel was removed and the interior of the unit was examined for evidence of water entry.

3. Load Test

The container was loaded to its rated capacity of 1800 lbs. with a well balanced load so that shifting was held to a minimum. The deflection in the floor section was then determined.

4. Handling Test

a. The loaded container was lifted with a 6000 lb. fork truck and transported approximately 50 feet. Ease of entry of forks into openings in skids was noted.

b. Two wire slings were placed under the floor of the container adjacent to the skids. The loaded unit was then lifted by a crane. Resistance of the bottom edges of the container to crushing was noted.

c. The container was placed on 6" wood rollers. The test unit was moved approximately 50 ft. on these rollers. Particular attention was paid to the deflection of the skids at the fork truck openings.

5. Edge Drop Test

One skid of the test unit was placed on a 6" x 8" timber approximately 8 feet long. The other side of the container was lifted by fork truck and a 4" x 4" x 18" block was placed vertically under one corner. The container was examined in this position and any undue deflection or wracking noted. The 4" x 4" x 18" block was then pulled out from under the unit

allowing the container to strike the pavement with a fall of 18". This operation was repeated by placing the block under each of the four corners successively, and then repeated again using a 4" x 4" x 24" block. At the conclusion of the test the floor was examined for further deflection.

6. Stevedoring Test

a. This test was designed to determine the suitability of the container for stevedoring operations. It was exposed to simulated conditions which might be encountered due to faulty cargo handling equipment, improper operation by personnel, or unavoidable circumstances when being loaded on or unloaded from cargo ships. The test was divided into three parts.

(1) Shub Test - The loaded container was lifted approximately 25 ft. above the ground by a crane equipped with wire slings. The brake of the crane was released and the container lowered at full speed until it reached a point approximately 5 feet above ground. At that time, the brake was applied suddenly and the load brought to a quick halt. This test was repeated twice.

(2) Drop Test - The loaded container was lifted by a crane equipped with slings to a point 18 " above the ground. The brake of the crane was released and the test unit dropped freely with the skids

striking the concrete pavement squarely. This operation was repeated a second time with the container falling freely from a point 24" above the ground.

(3) Swing Test - To simulate a container striking the ship's side during hoisting and loading operation, the test unit was held by a crane approximately one foot above the ground next to a substantially solid wall. The container was pulled away from the wall a distance of approximately 10 feet with a cable attached to a fork truck and equipped with a quick release mechanism. The release mechanism was activated and the container was allowed to strike the wall squarely on a side panel. The operation was repeated and the container so held that it struck the wall squarely at a corner.

At the conclusion of these tests, the container was examined for floor deflection and other damage. It was dismantled to determine ease of disassembly.

A 125% overload was added, making a total load of 4000 lbs. in the test unit, and tests No. 3 through 6 inclusive were repeated. At the conclusion of the second series of tests, the container was re-examined and again disassembled and assembled.

SUMMARY OF TEST RESULTS

1. Assembly and Disassembly

Initial assembly of the Collapsible Aluminum Household Effects Container disclosed that five bolt holes did not line up. These holes

were enlarged in order that the container could be fully assembled. Bolting the upper and lower side panels together was awkward and time consuming due to the small clearance around the bolt heads. These bolts are located between the aluminum corrugations and it is necessary to use 9/16" box wrenches to effectively turn them. Even then, the bolts can only be turned less than 90 degrees at one time.

2. Weather Resistance

The weather resistance test disclosed that a small amount of water seeped in between the horizontal angles connecting the upper and lower side panels. This condition is undesirable if the loaded container is to be exposed to the elements for any practical length of time.

3. Load Test

There was no appreciable deflection in the floor of the container when it was loaded, as rated, with 1800 lbs. When the load was increased to 4000 lbs., the maximum deflection in the floor was approximately 1/4". This deflection is not excessive and the aluminum corrugations were not stressed beyond their elastic limit.

4. Handling

The lifting lugs, or sling hooks for this container consist of four 1" eye bolts with 3/8" shanks bolted to the floor framing sections. They

could not be tested since one was torn off the container during transit from the west coast and another so weakened that it snapped when a slight force was applied to it. In lieu of the lifting lugs, two wire slings were placed under the container, parallel and adjacent to the skids, and the unit was then lifted by a crane. In addition to being lifted by a crane, the Handling Test indicated the loaded unit can be readily handled by a fork truck or moved a short distance as into the wings of a ship by wooden rollers.

5. Edge Drop and Stevedoring

The container when loaded either with 1800 lbs. or 4000 lbs. withstood the Edge Drop Test and Stevedoring Tests in an excellent manner. The unit was slightly damaged during these tests. The damage consisted of minor deformation of corrugations, bending of roof corner, etc., and did not impair the further utilization of the container.

At the conclusion of the tests the container was disassembled, unloaded, inspected, and reassembled again without too much difficulty. Only one bolt could not be replaced.

CONCLUSIONS AND RECOMMENDATIONS

The tests to which the container was subjected indicate that it is structurally sound. The manufacturer's rated load of 1800 lbs. equals

approximately 7.5 lbs. per cubic foot. This is a low capacity rating. Since the container is structurally sound and successfully withstood the tests with a 4000 lb. load, it is recommended that the rated capacity of this container be increased to 15 lbs. per cubic foot or 3700 lbs.

The eye bolt "sling hooks" are inadequate for lifting the container with a crane and should not be used for that purpose. Instead two wire slings should be placed under the container parallel and adjacent to the skids when the unit is to be lifted with a crane. The present sling hooks might be used to secure the unit to the deck of a truck, railway car or ship.

No means are provided in the interior of the container to fasten household articles to the floor or sides. It is recommended that either bars be welded to the interior corrugations of the side panels or some other means be provided to secure household articles within the container. This will require that one side panel be designated and so stenciled that it be the last panel bolted to the loaded container and the first panel unbolted when the container is to be unloaded.

If it is anticipated that the containers will be exposed to the elements for appreciable lengths of time, it is recommended that a thin gasket be secured to the lower framing angle of the upper side panels. This will provide a tight horizontal joint between side panels, and eliminate water from entering along that joint. If, however, the

anticipated usage of the container is such that it will seldom be exposed to the elements, the weather resistance, as presently constructed, is sufficient.

The roof design of the container is such that it precludes tiering of the containers, one on another, or placing of heavy loads on the roof.

*Addendum to Evaluation of an Experimental
Collapsible Aluminum Household Effects Container*



SUPPLY ENGINEERING DIVISION
U.S. Naval Supply Research & Development Facility
Naval Supply Depot Bayonne, N.J.

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RESEARCH AND DEVELOPMENT DIVISION
BUREAU OF SUPPLIES AND ACCOUNTS
WASHINGTON, D.C.

TECHNICAL REPORT REVIEW

"ADDENDUM TO EVALUATION OF AN EXPERIMENTAL COLLAPSIBLE
ALUMINUM HOUSEHOLD EFFECTS CONTAINER"

PROJECT GROUP - NTO03-016(a)
AUTHORIZATION - SE52-15
PROJECT REPORT - 2.2020251

APPROVAL: Report Approved 1 April 1952

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/s/ J.H. TAYLOR, JR.
Commander, (SC) USN
Director, Research and Development Division
By direction of the Chief of Bureau

SUPPLY ENGINEERING DIVISION
U. S. NAVAL SUPPLY RESEARCH & DEVELOPMENT FACILITY
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Bayonne, N. J.

PROJECT GROUP - NT003-016(a)
AUTHORIZATION - SE52-15
PROJECT REPORT - 2.2020254

ADDENDUM TO EVALUATION OF AN EXPERIMENTAL
COLLAPSIBLE ALUMINUM HOUSEHOLD EFFECTS CONTAINER

AUTHORIZATION: ChBuSanda ltr to OinC, USNSRDF, Bay, N. J.,
File OW-3 All/3 dtd 23 July 1951

PURPOSE: Summation and evaluation of field reports and
recommendations, to determine modifications for
maximum utility of the container in the trans-
portation of household effects.

CONCLUSION: Minor modification and reinforcement using
similar materials will permit conformance to
recommendations received in field service
reports.

SUMMATION OF FIELD REPORTS

1. Twenty-nine containers were distributed about October 1950 to the Naval Supply Center, Oakland, and the Naval Supply Depot, Seattle, to be used in normal transportation of household effects by common carrier. The using facilities were furnished forms and requested to supply data for field service evaluation and compilation by NSRDF.
2. Fifty-nine separate reports have been received to date covering twenty-seven of the containers, two have yet to be heard from, while the thirtieth is on hand in the laboratory, to be held for further development work.
3. Seventeen separate suggestions have been tabulated with frequency of mention as shown in Table A:

<u>TABLE A</u>	<u>Number of Recommendations</u>
Additional support required on bottom for protection against the forks.	5
A metal or plywood plaque to be provided for stenciling or attaching shipping identification and codes.	4
Stronger bolting or fastening on the opening side. In some cases the threads stripped under load.	4
Provide interior fittings to permit strapping and bracing of a part load. These could be straps, bars, strap eyes or eye bolts.	2
Provide additional bracing for the top to support a load.	2

TABLE A

Number of
Recommendations

Furnish a third skid in the center for additional protection of the bottom against damage by fork trucks.	2
Top panel should be furnished in heavier gauge to resist cutting by sharp top loads.	2
Provide leveling blocks under flooring to prevent springing, so that bolting will be easy.	2
Use standard thread so that the bolts are easily replaceable from stock bins.	1
Place recessed handles in panels to eliminate handling hazard in assembly and disassembly.	1
The bottom portion of the front panel should be a permanent part of the base to prevent misalignment.	1
"Bolting" on front panel should be reversed so that vibration will not loosen the bolts and drop them out.	1
Use standard nuts and bolts through drilled holes instead of bolts in tapped holes.	1
Develop a larger size container capable of carrying 3 or 4 rooms, this container was called a 1½ to 2 room size.	1
Attach bolts by a short length of chain.	1
Furnish a small container for excess bolts when not in use.	1
Place a pad eye on each corner of the top so that wire straps may be run through while loading and unloading on shipboard.	1

4. Twenty-five of the reports characterized the containers as either satisfactory, good or excellent. Twenty-five of the reports made no special comment, only filling in the blanks furnished.

5. Some selected comments:

1. On container #3, NAS, Pensacola, considered the aluminum containers more satisfactory than plywood which are frequently received from overseas in poor condition, i.e., the bottom pulled out and exposing the contents. Out of every fifty plywood containers received at Pensacola, approximately one is reusable.
2. On container #5, N. Y. Naval Shipyard, Brooklyn, estimates most shipments of household effects within continental United States are by moving van. Therefore these containers were recommended for overseas shipments and consigned only to naval activities for use in return shipments.
3. On container #24, NAS, Norfolk advises the top was damaged, i.e., one foot long cut apparently made by a sharp instrument. There may have been an attempt at pilferage on this box car shipment, however, as nothing was reported missing, the second skin or inside corrugation may have saved the contents.
4. In no case was there any report of damage to the contents that could be assigned to the container construction.
6. The following modifications are applied to the design of the container to accommodate the most advantageous modifications recommended, and with a view toward using similar materials:
 1. An .062 aluminum sheet between the I beam skins and against the bottom corrugation for protection against fork truck forks.

2. A .064 aluminum plaque 18" x 24" placed on one long panel to permit marking with shipping identification and codes.
3. Bolt specifications changed to 7/16" - 14 NC for increased strength, and one hole per fastening elongated to allow for inaccuracies in drilling.
4. Two vertical aluminum straps, 1" x 1/8", per side, from top to bottom to permit tie-down of the load.
5. An additional corrugation added to the roof, below and at right angles to the present corrugation.
6. Top panel flat sheet increased to .064" aluminum.
7. Two rope handles per panel recessed within corrugations to permit safe handling of panels.
8. An open top .032" aluminum box 3 1/2" x 3 1/2" x 3 1/2" placed in one corner to hold excess bolts (and nuts) when disassembled.
7. The modification of this container for overseas transportation would require, as a minimum, attention to redesign and strengthening the unit for tiering or loading on top, and provision for lifting, such as sling hooks or eyes, or some type of lifting lug. At present, NSRDF has a sub-project NTC03-016(a) to develop a similar container suitable for overseas use.
8. The containers were intended for movements within the continental United States. However, nine of the containers did manage to move by sea transportation. These were:

#6	from Norfolk to Puerto Rico
#10	from Oakland to Pearl Harbor

#11, 16, 17 from Oakland to Fray 564
 #15, 28 from San Diego to Norfolk (via LST)
 #20 from Norfolk to Guantanamo Bay and return
 #29 from Norfolk to Guantanamo Bay

9. (a) Appended is a shipment history by container number, date, destination, weight and carrier.

(b) The revised drawing is appended.

10. Discussion

The .064" sheet under the bottom between the skids was considered necessary for protection against scuffing. Several pictures were furnished by using facilities showing gouging and scuffing from forks. It was noted in the laboratory test container that fifteen rivets in the bottom had failed around the corners. This occurred because the I beam skids were cut $1\frac{1}{4}$ inches too short on each end, and therefore did not support the Z beam frame around the bottom. This was a deviation from the drawing, which called for the skids to be brought out right to the edge of the container and therefore supporting the Z beam and the entire panel load.

The marking plaque should also assist in indicating the front for loading and unloading.

Bolting size was increased from $3/8"$ - 16 NC to $7/16"$ - 14 NC to accommodate requests for stronger bolting. Some reports stated that threads stripped under load when closing container. Evidently the mating surfaces were drawn together and one or two

turns taken by hand on the bolts, and upon releasing the load the threads stripped. This condition was probably aggravated by the fact that the bolting was not as originally specified, 3/8" - 24 NF being furnished instead of 3/8" - 16 NC, in which case each individual bolt thread was weaker.

The heavier roof sheet and the extra roof corrugation were considered desirable for increased durability, should the carrier attempt to use the cube above the container.

After the initial assembly by Oakland and Seattle, we have no further reports on assembly and disassembly, and conclude the containers were not shipped collapsed.

Appendix: (a) Shipment History
(b) Revised drawing

CONTAINER NUMBER	SHIPPED	FROM	TO	RECEIVED	WEIGHT		CARRIER
					GROSS	NET	
2	4 Jan 51 13 Jun 51	NSD Seattle N Gun Pac WashDC	N Gun Pac WashDC NAS Pensacola	18 Jan 51 24 Jun 51	2731 2300	2201 1770	50 ft DD Box Car Mec Box Car
3	4 Jan 51 13 Jun 51 19 Nov 51	NSD Seattle N Gun Pac WashDC NAS Pensacola	N Gun Pac WashDC NAS Pensacola NSD San Diego	18 Jan 51 22 Jun 51	2740 2685 2155	2210 2155 1680	50 ft DD Box Car Mec Box Car Box Car
4		NSD Seattle	Charleston N.D. S. Car.	14 Mar 51	2220	1690	Truck-Enclosed Van
5	30 Jan 51 26 Mar 51	NSD Seattle NIN Shpyd Bklyn	N. Shpyd Bklyn NSD Clearfield Ogden Utah	26 Feb 51	1830 2460	1300 1930	Natl Crldg Corp-Box Car Frt Car
		NSD Clearfield Ogden U. NIN Shpyd Bklyn	NIN Shpyd Bklyn NSD San Diego	5 Jun 51	2460	1930	Box Car
	4 Sept 51				2385	1855	Box Car
6	4 May 51 10 Jul 51 1 Oct 51	NSD Seattle NSD San Pedro NSC Norfolk Va	NSD Los Angeles NSC Norfolk Va NS San Juan PR	15 May 51 4 Sept 51 19 Oct 51	2424 2507 2280	1894 1977 1750	40 ft SD Box Car 50 ft DD Box Car USS Potecourt
7	21 Jun 51 NO REPORT 15 Sept 51		NSD Upton Ill NSD San Diego Cal		2150 1960	1620 1430	Box Car Box Car
8	NO REPORT						
9	6 Mar 51	OIC FTB NSC Ukld	NIN Shpyd Bklyn	26 Mar 51	1968	1438	Box Car 40' 6"
10	21 Jun 51 NO REPORT 10 Jul 51		NSD Upton Ill NSD Gr Lakes Ill Oakland for Pearl Harbor		2655 2500	2025 1960	Box Car RR Car

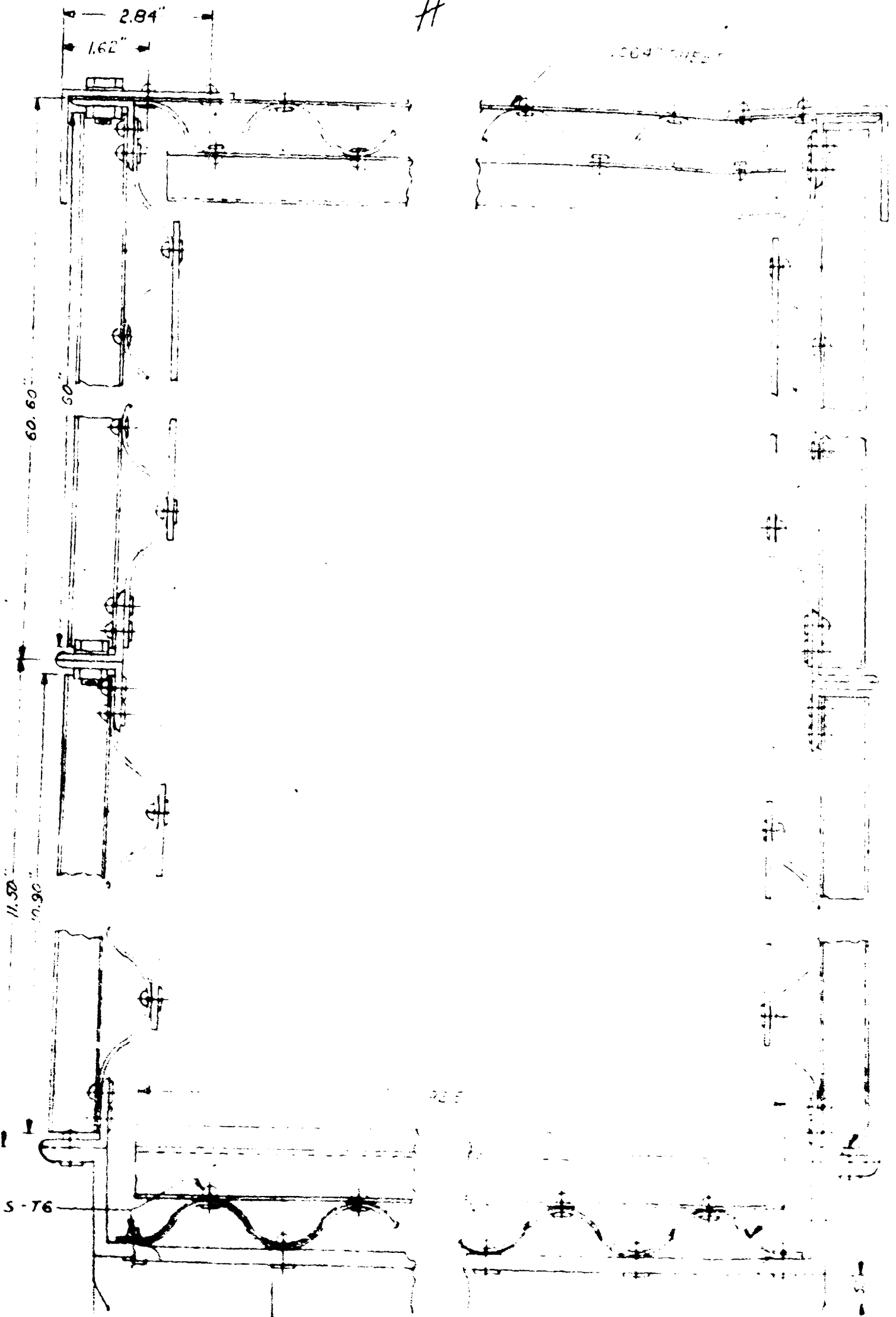
CONTAINER NUMBER	SHIPPED	FROM	TO	WEIGHT		CARRIER
				GROSS	NET	
11	Nov 51	FTB Oakland	Pray 564 via SS Hawaiian Builder	3225	2695	SS Hawaiian Builder
12	21 Jun 51 NO REPORT		Upton Ill	1990	1460	Box Car
	22 Sept 51	NSD Gr Lakes	NSD San Diego	2210	1680	RR Car
13	19 Jun 51	FTB NSC Oakland	NSD San Diego	2110	1580	Box Car
14	21 Jun 51		Upton Ill	2340	1810	Box Car
15	17 Apr 51 7 Jun 51	FTB NSC Oakland NSD San Diego	NSD San Diego FTO NSC Norfolk Va	2385 1940	1855 1410	Box Car 50' 6" LST 1079
16	21 Jun 51 NO REPORT		Upton Ill	2525	1995	Box Car
	10 Jul 51	NSD Gr Lakes Ill	CIC FTB NSC Oakld for Pearl Harbor	2400	1870	RR Car
	NO REPORT					
	31 Oct 51	NSC Oakland Cal	Pray 564 via USNS Gen Aultman	1760	1230	USNS Gen Aultman
17	31 Oct 51	FTB NSC Oakland	Pray 564 via USNS Gen Aultman	2185	1655	USNS Gen Aultman
18	16 Jul 51	FTD NSC Oakland	NSD San Diego	1620	1090	Motor Truck
19	NO REPORT					
20	3 Jul 51 22 Aug 51 Sept-Oct	FTD NSC Oakland N Gun Fac WashDC NSC Norfolk	N Gun Fac WashDC 12 Jul 51 USN Acad Annapolis NSD Guantanamo Bay Sept-Oct Cuba	1980 1980	1450 1450	Box Car Truck
	9 Nov 51	Guantanamo Bay Cuba	NSC Norfolk			USS Corduba

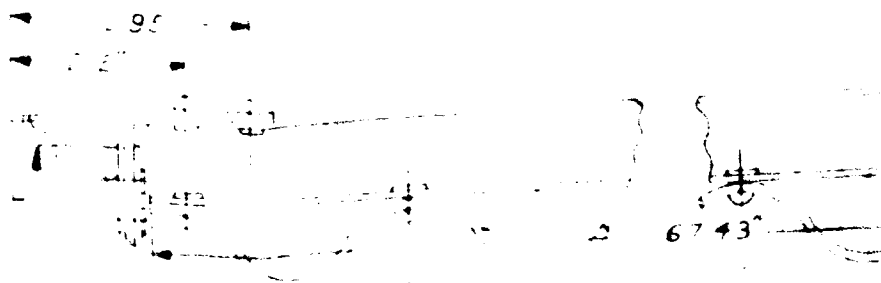
CONTAINER NUMBER	SHIPPED	FROM	TO	WEIGHT		CARRIER
				GROSS	NET	
21	14 Jul 51	FTD NSC Oakland	Phil N Shpyd Phil	2725	2195	Box Car
22	2 Jun 51	FTD NSC Oakland	N Sub Base Contr	2270	1740	Box Car
23	14 Jul 51	FTD NSC Oakland	Phil N Shpyd Phil	1810	1280	Box Car
24		FTB NSC Oakland	NSC Norfolk	2592	2062	Box Car 50' 6"
25	14 Jul 51	FTD NSC Oakland	Phil N Shpyd Phil	1640	1110	Box Car
26	26 Apr 51 NO REPORT NO REPORT 8 Nov 51	FTB NSC Oakland NAS Millington Tenn NSD Seattle Wash	NAS Millington Tenn NAS Seattle Wash N Gun Pac WashDC	1656	1156	Box Car 40' 6"
27	3 Jul 51 22 Aug 51	FTD NSC Oakland N Gun Pac WashDC	N Gun Pac WashDC USN Acad Annapolis	2435	1905	RR Car
28	17 Apr 51 7 Jun 51	FTB NSC Oakland NSD San Diego Cal	NSD San Diego FTO NSC Norfolk	2110 2110	1580 1580	Box Car Trucks
29	3 Jul 51 22 Aug 51	FTD NSC Oakland N Gun Pac WashDC NSC Norfolk	N Gun Pac WashDC USN Acad Annapolis Quantanamo Bay Cuba Sept-Oct	2210 2225	1680 1695	Box Car 50' 5" LST 1079
30	22 Jan 51	FTB NSC Oakland	NAD McAlester Okla	1780	1250	40' DD Box Car

SHIPMENT BY SEA TRANSPORTATION - TABULATION

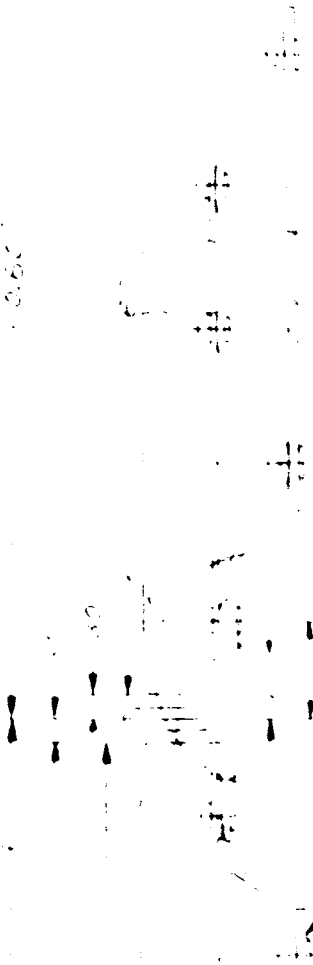
<u>CONTAINER NUMBER</u>	<u>SHIPPED</u>	<u>FROM</u>	<u>TO</u>	<u>WEIGHT</u>		<u>CARGO PER</u>
				<u>GROSS</u>	<u>NET</u>	
6	1 Oct 51	NSC Norfolk	San Juan PR	2230	1750	USS Boutecourt
10	10 Jul 51	NSD Or Lakes Ill	Pearl Harbor	2210	1680	-
11	Nov 51	FTB Oakland	Pray 564	3225	2695	SS Hawaiian Builder
15 (with 28)	7 Jun 51	NSD San Diego	Norfolk	1940	1410	LST 1079
16	31 Oct 51	NSC Oakland	Pray 564	1760	1230	USNS Gen Aultman
17	31 Oct 51	NSC Oakland	Pray 564	2185	1655	USNS Gen Aultman
20	Sept-Oct	NSC Norfolk	NSD Guantanamo Bay Cuba			
20	9 Nov 51	NSD Guantanamo Bay Cuba	NSC Norfolk			USS Corduba
28 (with 15)	7 Jun 51	NSD San Diego	Norfolk	2225	1695	LST 1079
29	Sept-Oct	NSC Norfolk	NSD Guantanamo Bay Cuba			

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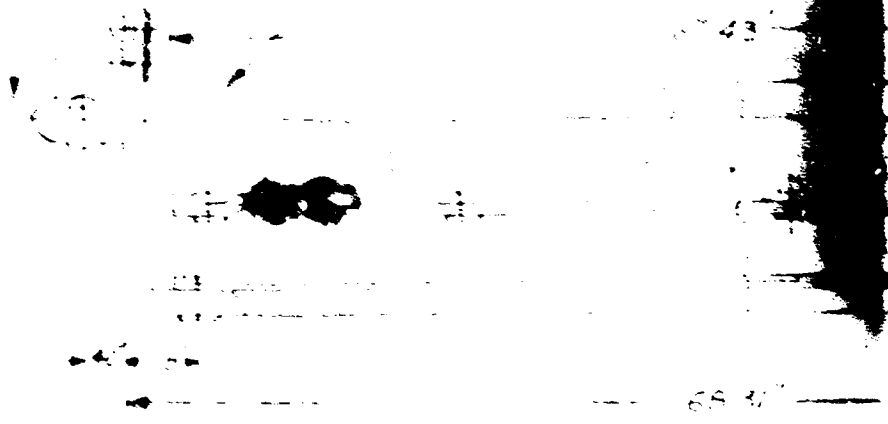


1/2" x 1/2" TE DOWN STAIRS
ON EACH SIDE PLACED 18"
FROM EACH CORNER

FOR SPARE BOLTS
3/4" x 3 1/2" x 3/4"
1032 PL. H. V.
W. ONE CORNER ONLY

1/2" x 1/2" x 1/2"

TWO 1032 SHEETS
14 1/2" x 14 1/2"



C

APR 21 1942
U.S. AIR FORCE

11-1

TO: THE DIRECTOR, AIR FORCE
FROM: THE CHIEF, AIR FORCE
SUBJECT: [Illegible]

[Illegible text in right margin]

U.S. AIR FORCE
PER

THE FOLLOWING INFORMATION
IS FOR THE RECORD OF THE
AIR FORCE

[Illegible text in center]

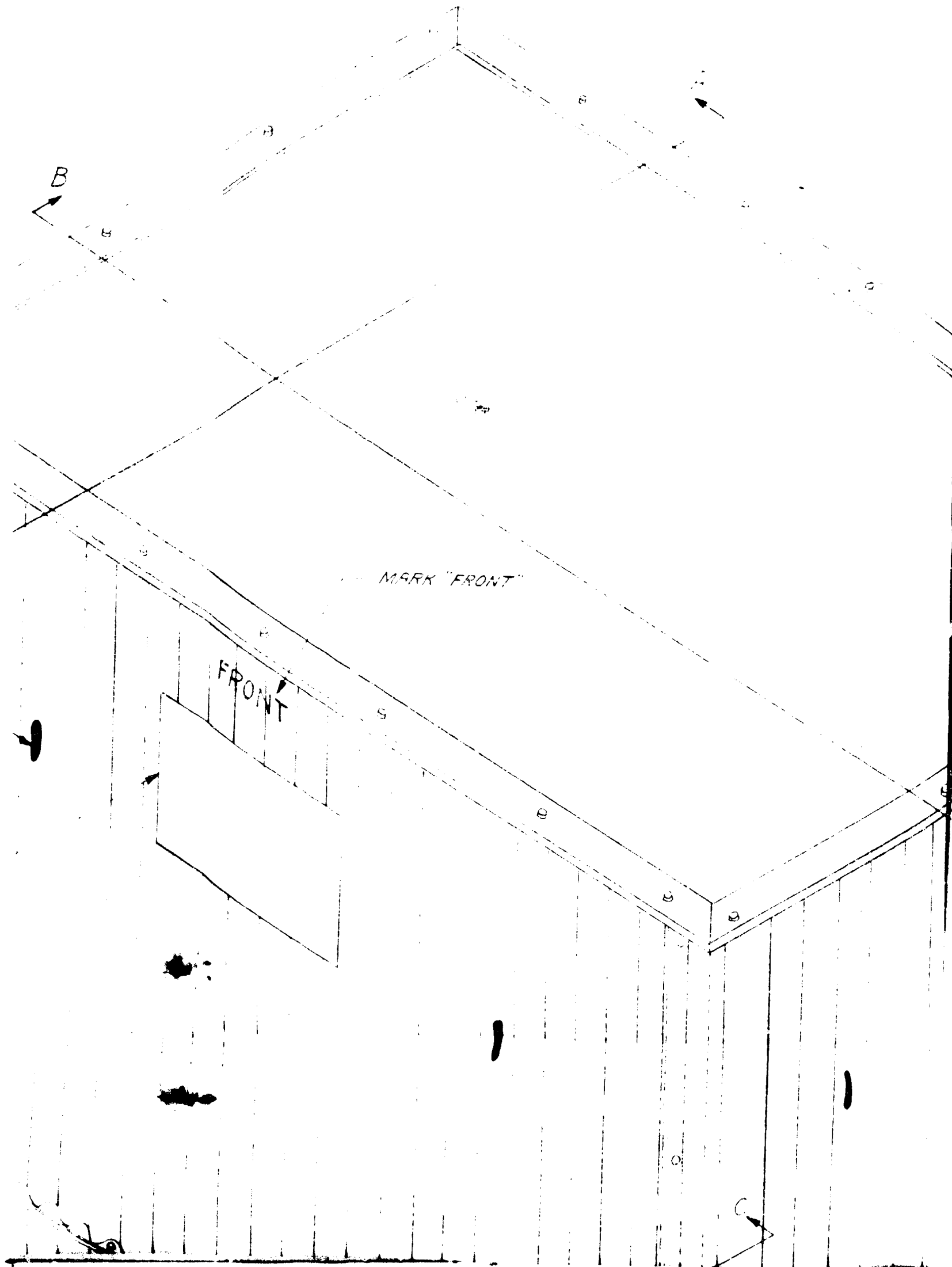
[Illegible text in bottom right]

D

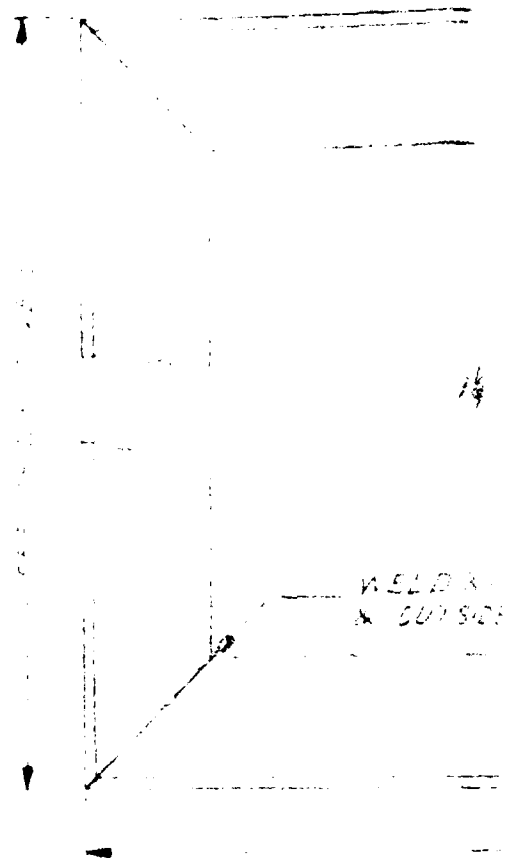
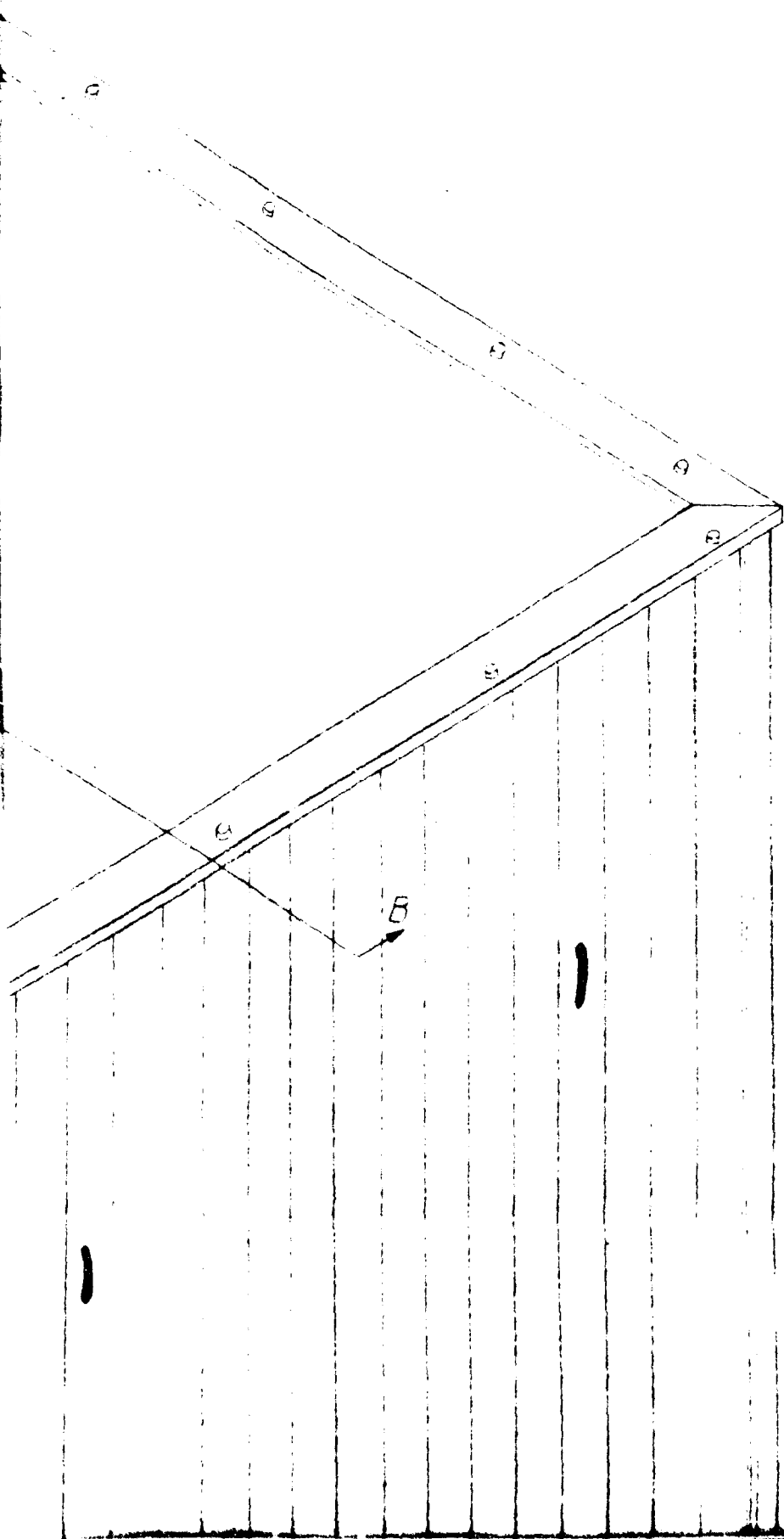
RECEIVED 40.
1957

2 PUFF HAWKS
PER SIDE

RECEIVED 40.
1957



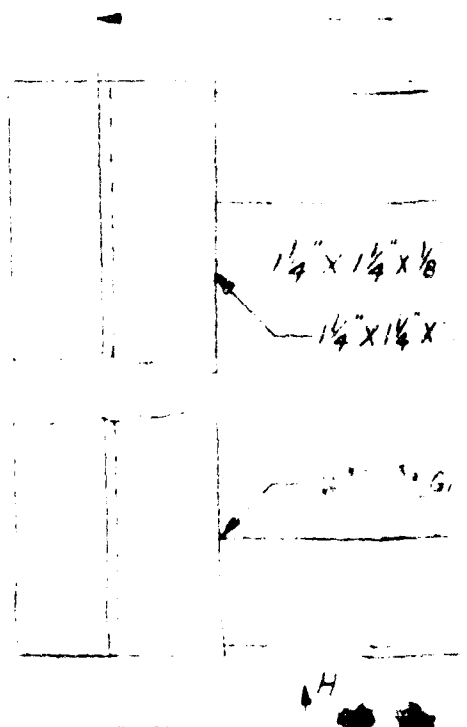
P



1/4

WELD X
OUTSIDE

S/L
(U)

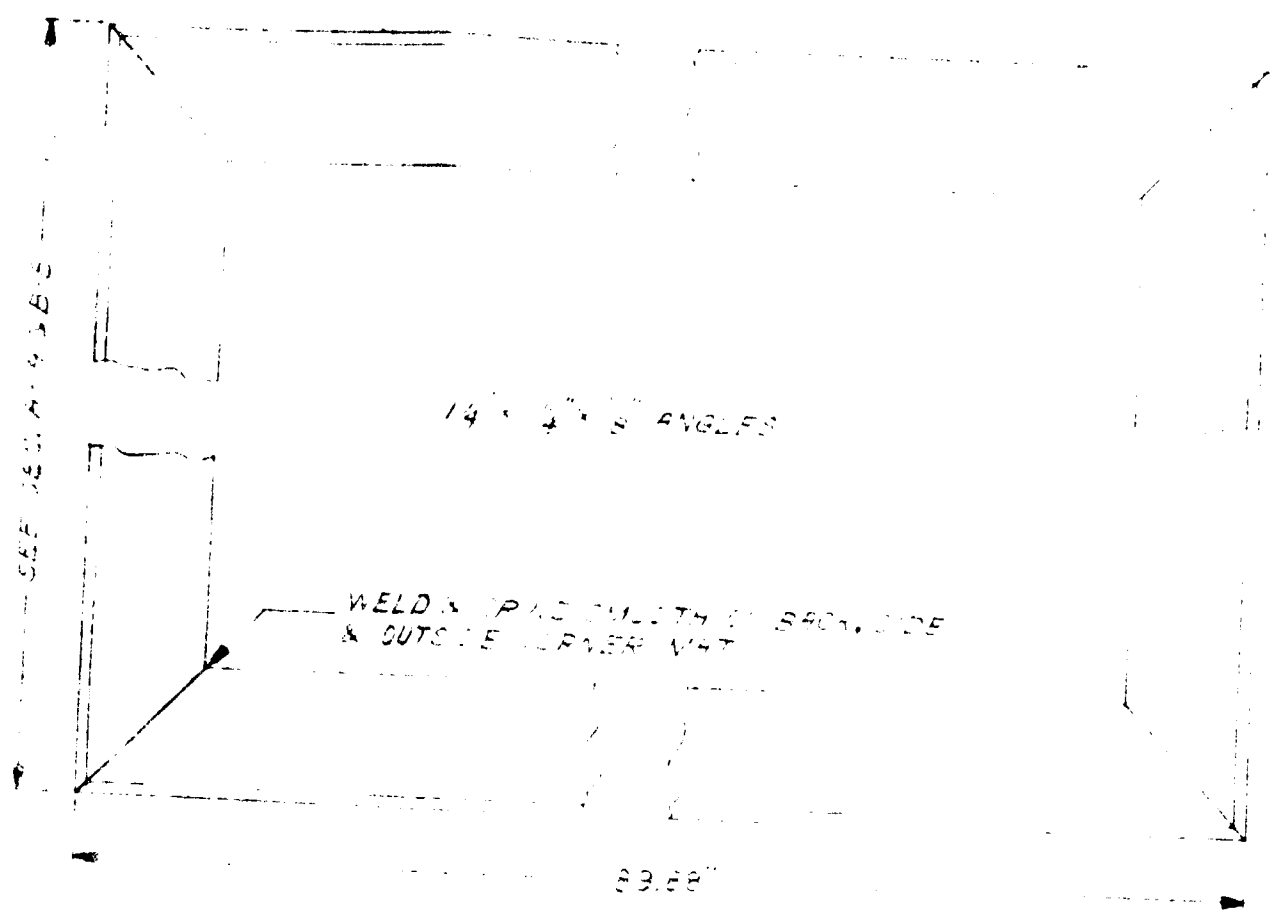


1/4" x 1/4" x 1/8"

1/4" x 1/4" x 1/8"

END
(U)

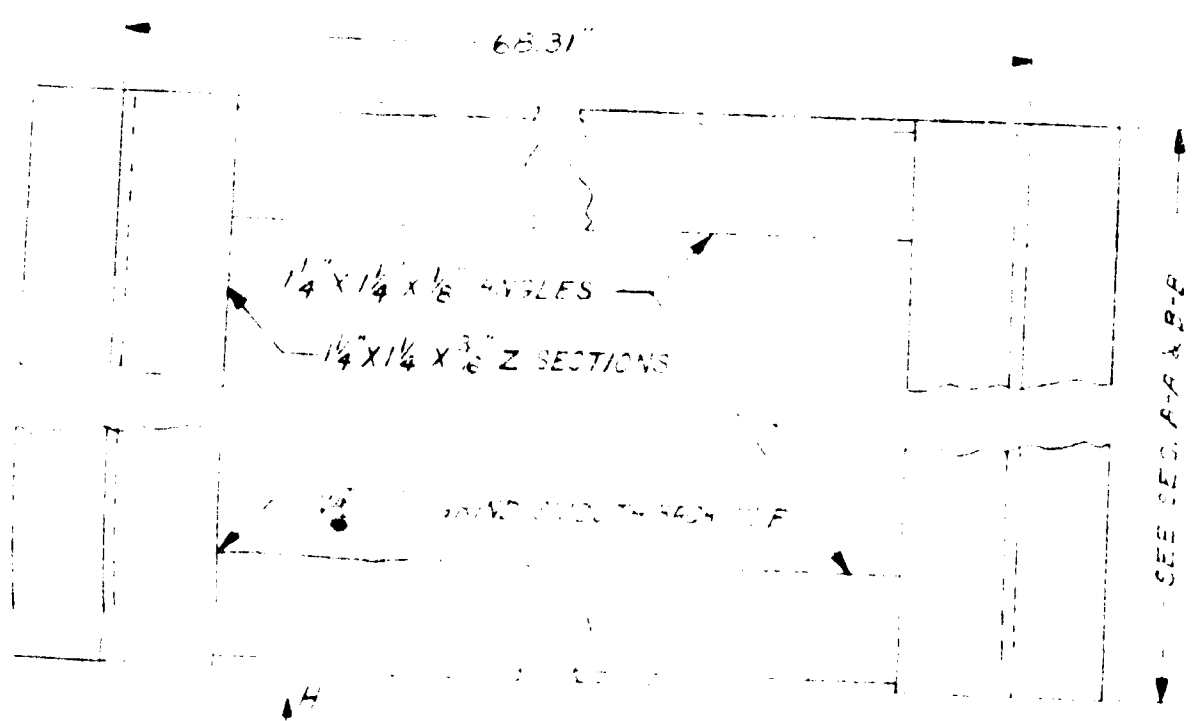
G.



14" X 4" X 3/8" ANGLES

WELD 1/4" PLATE FULL THICK ON EACH SIDE
& OUTSIDE CORNER W/4"

FRAME
SIDE PANELS
(UPPER & LOWER)



14" X 14" X 1/8" ANGLES

14" X 14" X 3/8" Z SECTIONS

WELD 1/4" PLATE FULL THICK ON EACH SIDE

SEE SEC. A-A & B-B

END FRAME C-FRAME
(UPPER & LOWER)

H

NOTES

MATERIAL: ALL CORRUGATION .032" INDUSTRIAL ALCLAD
 .87 DEEP
 EXTRUSIONS -

$1\frac{1}{4}$ " X $1\frac{1}{4}$ " X $\frac{1}{8}$ " ANGLE 61S-T6
 1 " X $3\frac{1}{4}$ " X $\frac{1}{8}$ " ANGLE 63S-T5
 $1\frac{1}{4}$ " X $2\frac{1}{4}$ " X $1\frac{1}{4}$ " X $\frac{3}{16}$ " Z 61S-T6
 4 " X 266 I BEAM 61S-T6

PLATE - $\frac{3}{16}$ " 52S-H32

STAIN - .032" & .064" 52S-H32

STAIN - 1 " X $\frac{1}{8}$ " 52S-H32

ALL NUTS & BOLTS $\frac{1}{4}$ " X 14 N.C. STEEL - CAD. PLATE

ALTERNATE BOLT & PERMANENT THREADED FITTING

ALL WASHERS - FLAT $\frac{7}{16}$ " X $\frac{1}{16}$ " 2S-H18

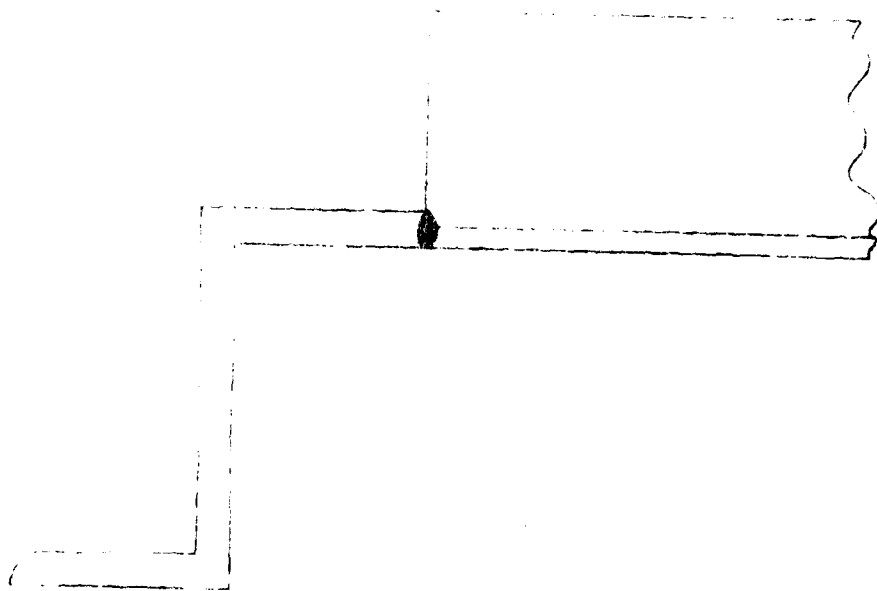
RIVETS: SIDE & END PANELS - CORR. TO CORR. RIVET EVERY
 THIRD PITCH IN BOTH DIRECTIONS.

TOP - EVERY OTHER PITCH & STAGGER BETWEEN ROWS.

BOTTOM - EVERY THIRD PITCH END-WISE & EVERY
 OTHER PITCH LENGTH-WISE.

SIDE & END PANELS CORR. TO ANGLES - EVERY
 OTHER PITCH

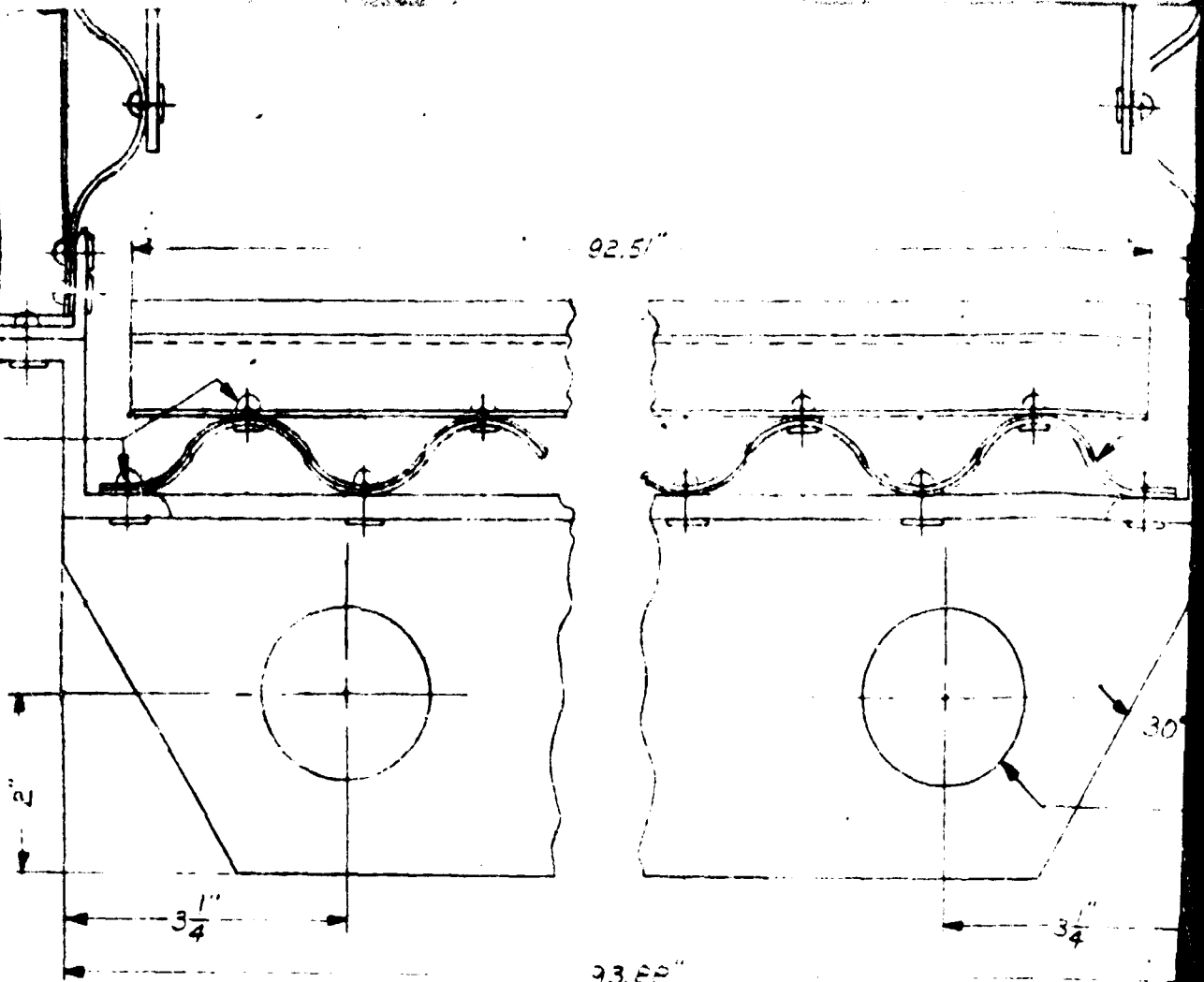
I BEAM & PLATE TO CORR. - EVERY OTHER PITCH
 STAGGER ACROSS & OF BEAM.



H-H

$\frac{5}{32}$ " R.H. 53S-T6

92.51"

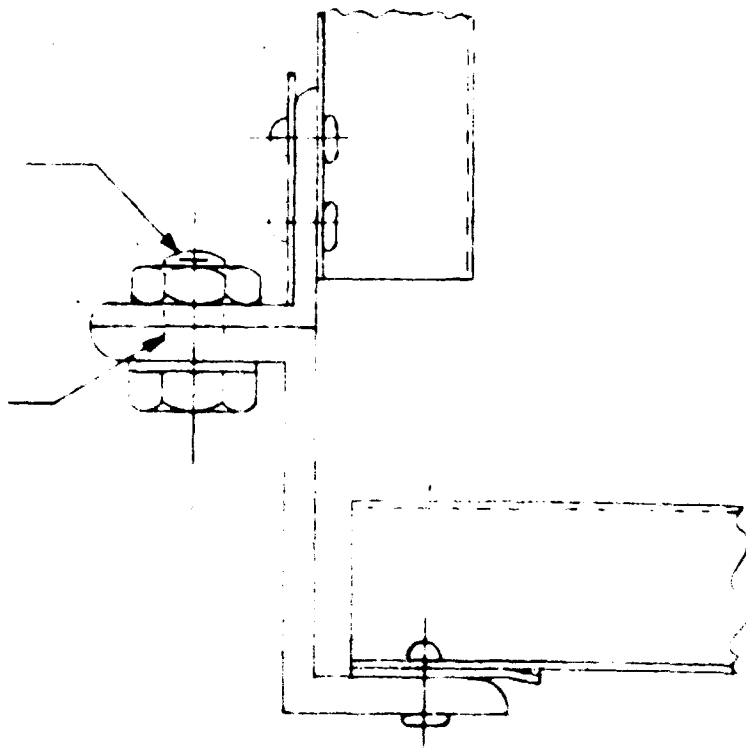


93.88"

B-B

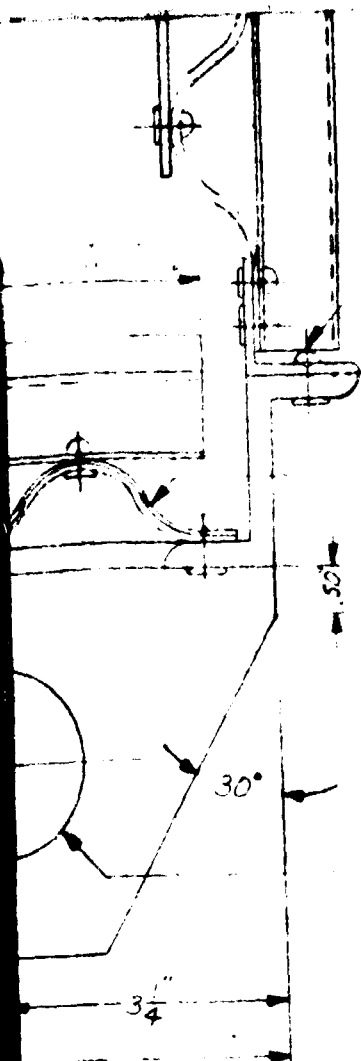
BOTTOM PANEL BOLTED
THIS END ONLY -
OPPOSITE END RIVETED

ONE RUN OF DRILLED
BOLT HOLES ELONGATED,
ON ONE SIDE OF ALL
BOLTED JOINTS



C-C & D-D

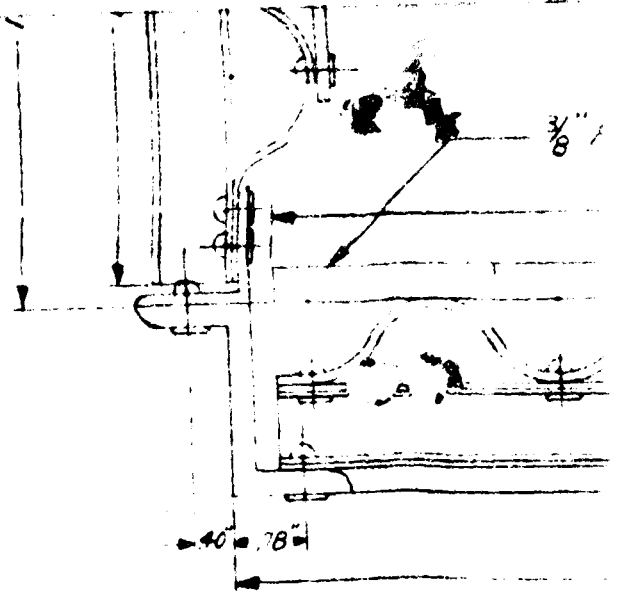
I



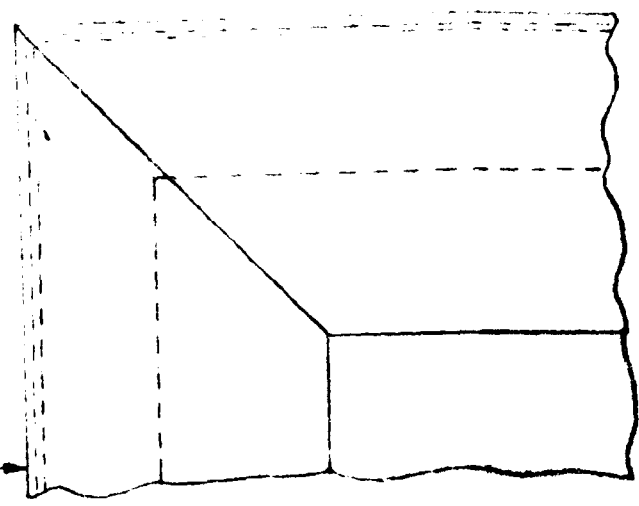
3/16" R.H. 53S-T 61

TWO .032" SHEETS
OR ONE .064"

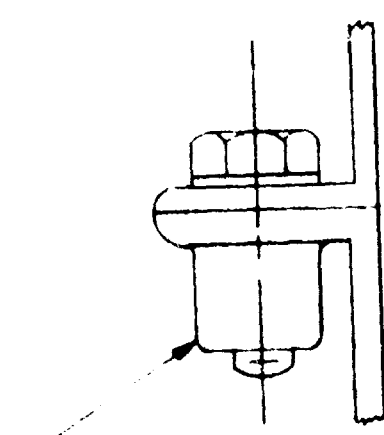
2" DIA. SHACKLE HOLE



TOP PANEL
ONLY



1" X 3 1/4" X 1/8"
ANGLES



NUT PLATE SELF LOCKING

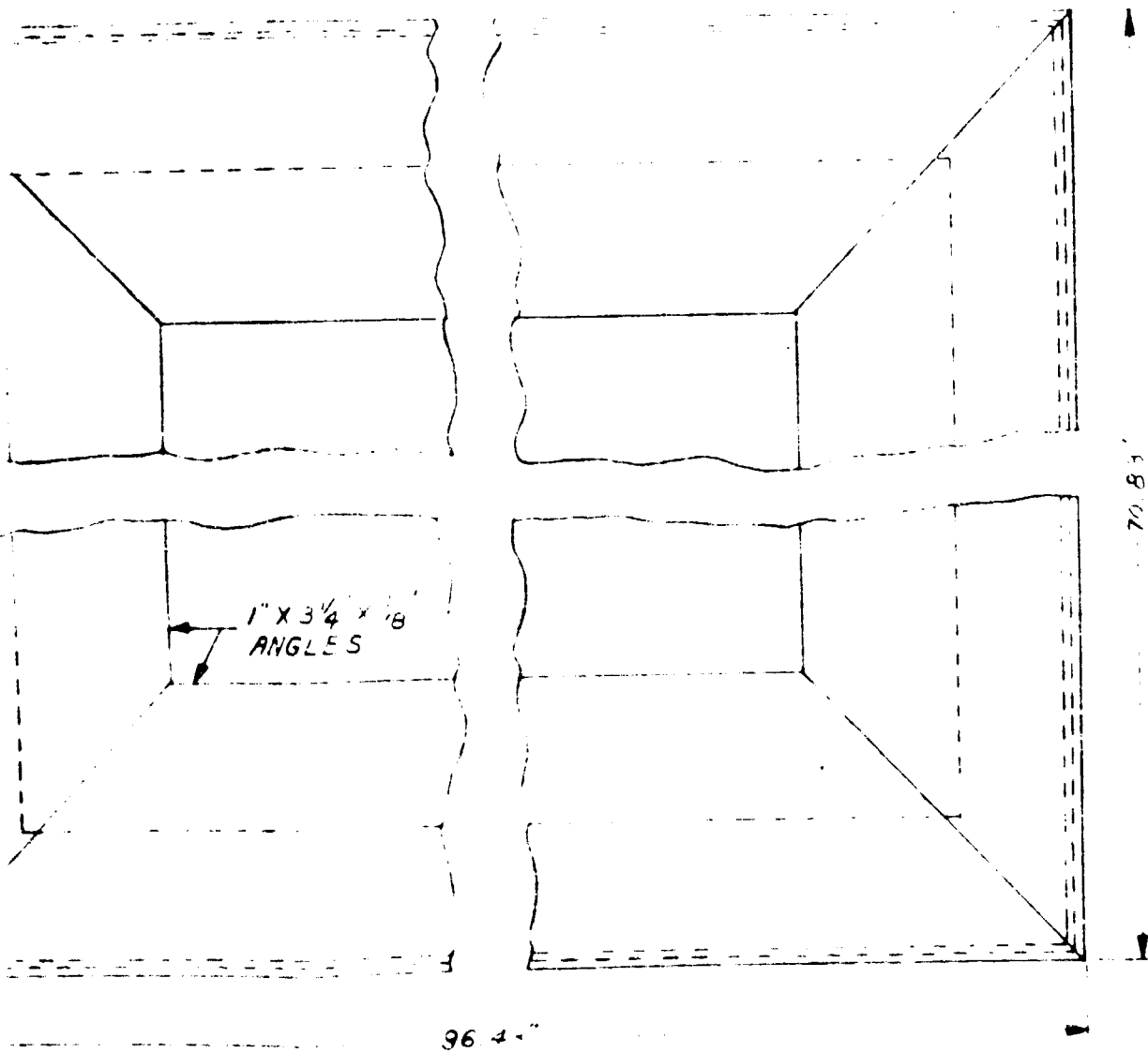
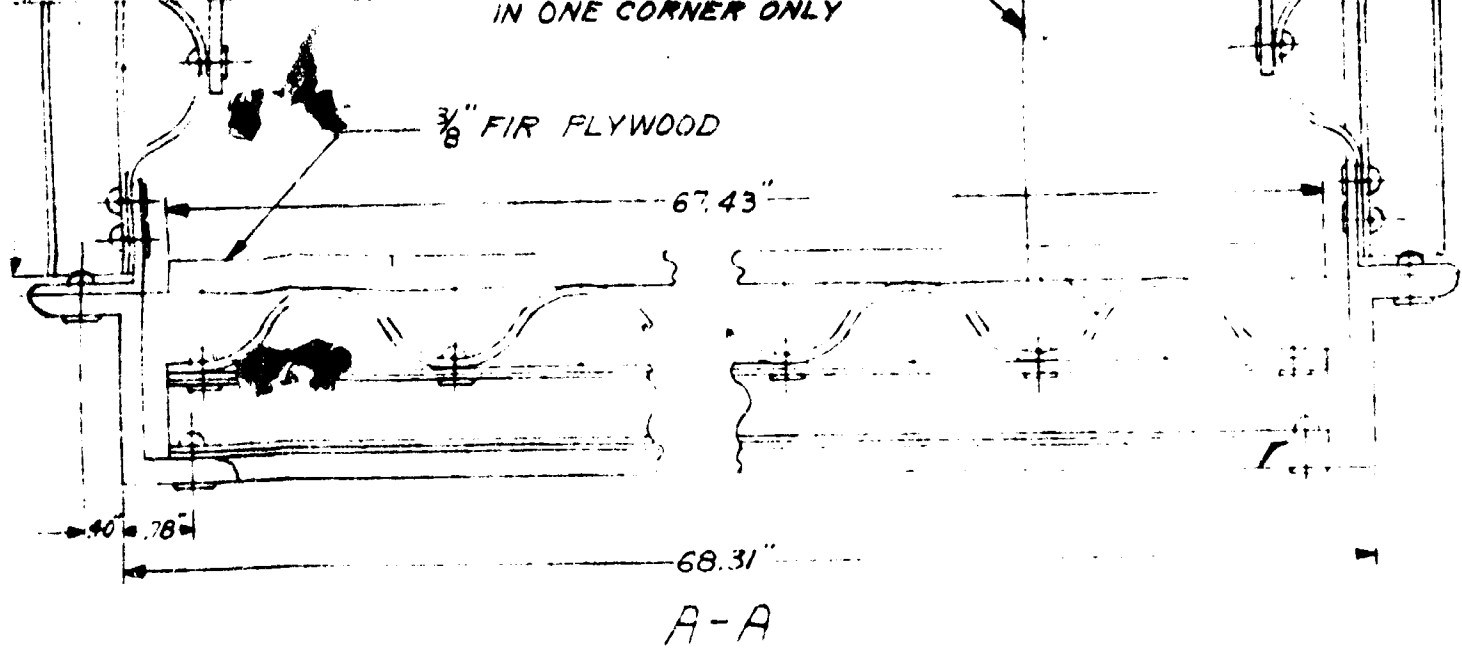
ALTERNATE FASTENING

96.4

PLAN VII

J

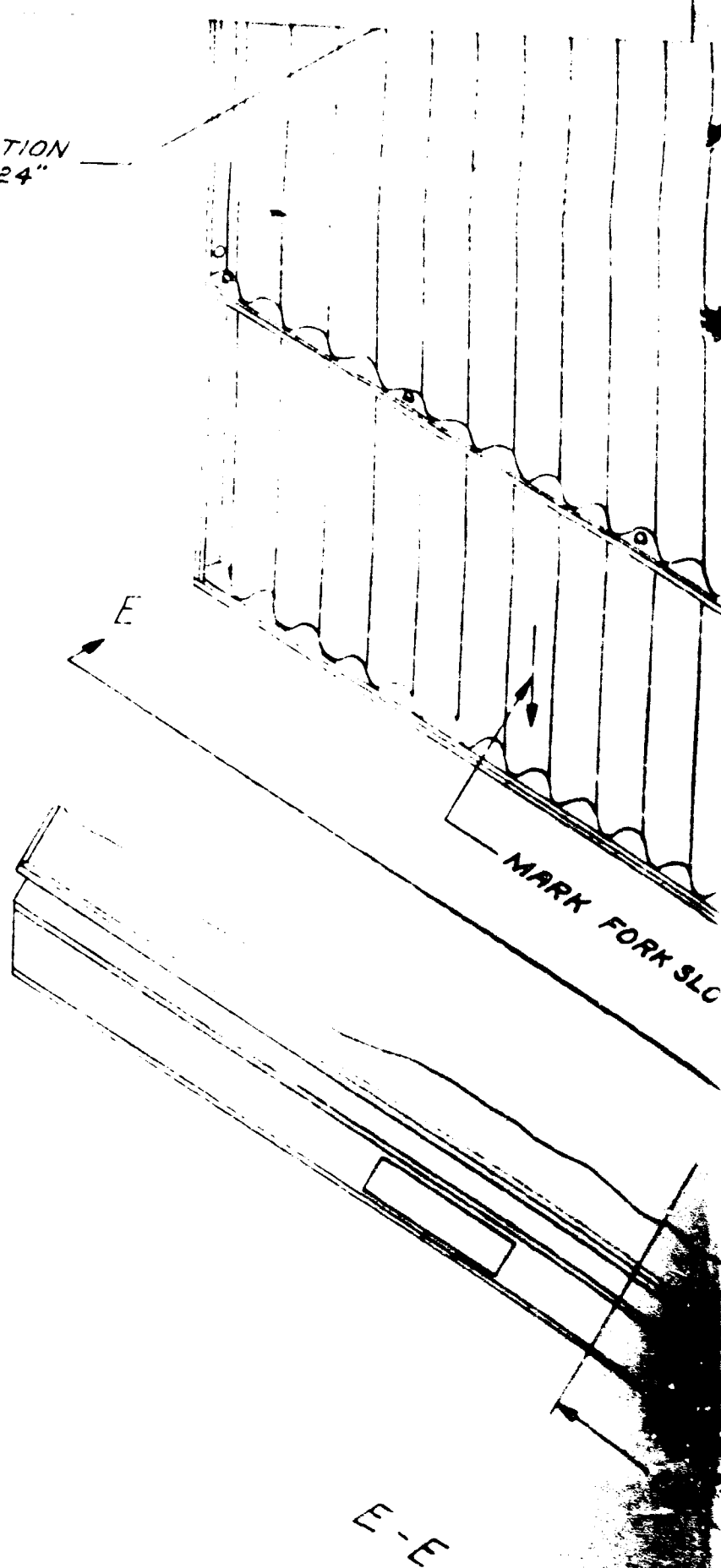
IN ONE CORNER ONLY



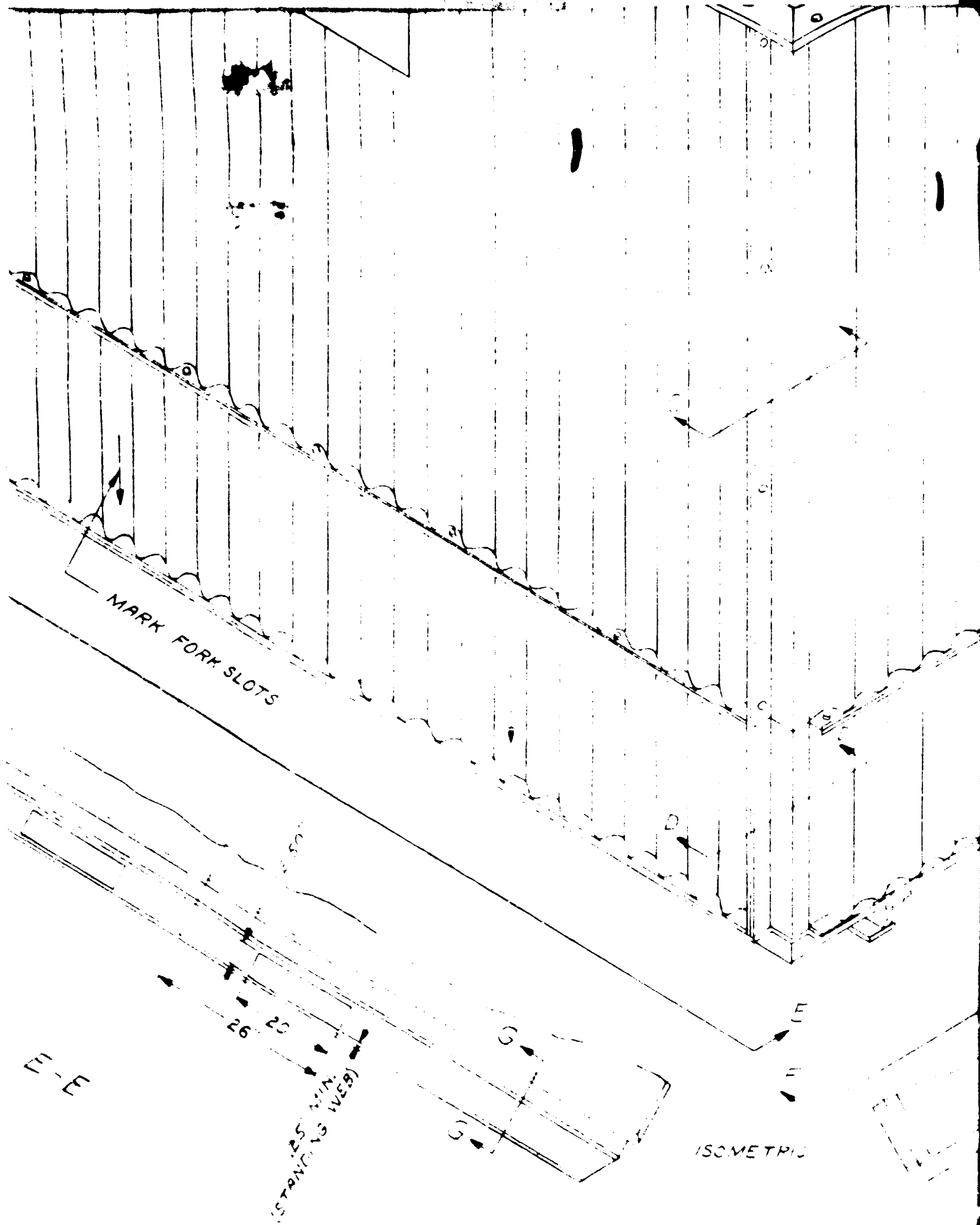
PLAN VIEW

K

ALUMINUM IDENTIFICATION
PLAQUE .064" X 18" X 24"



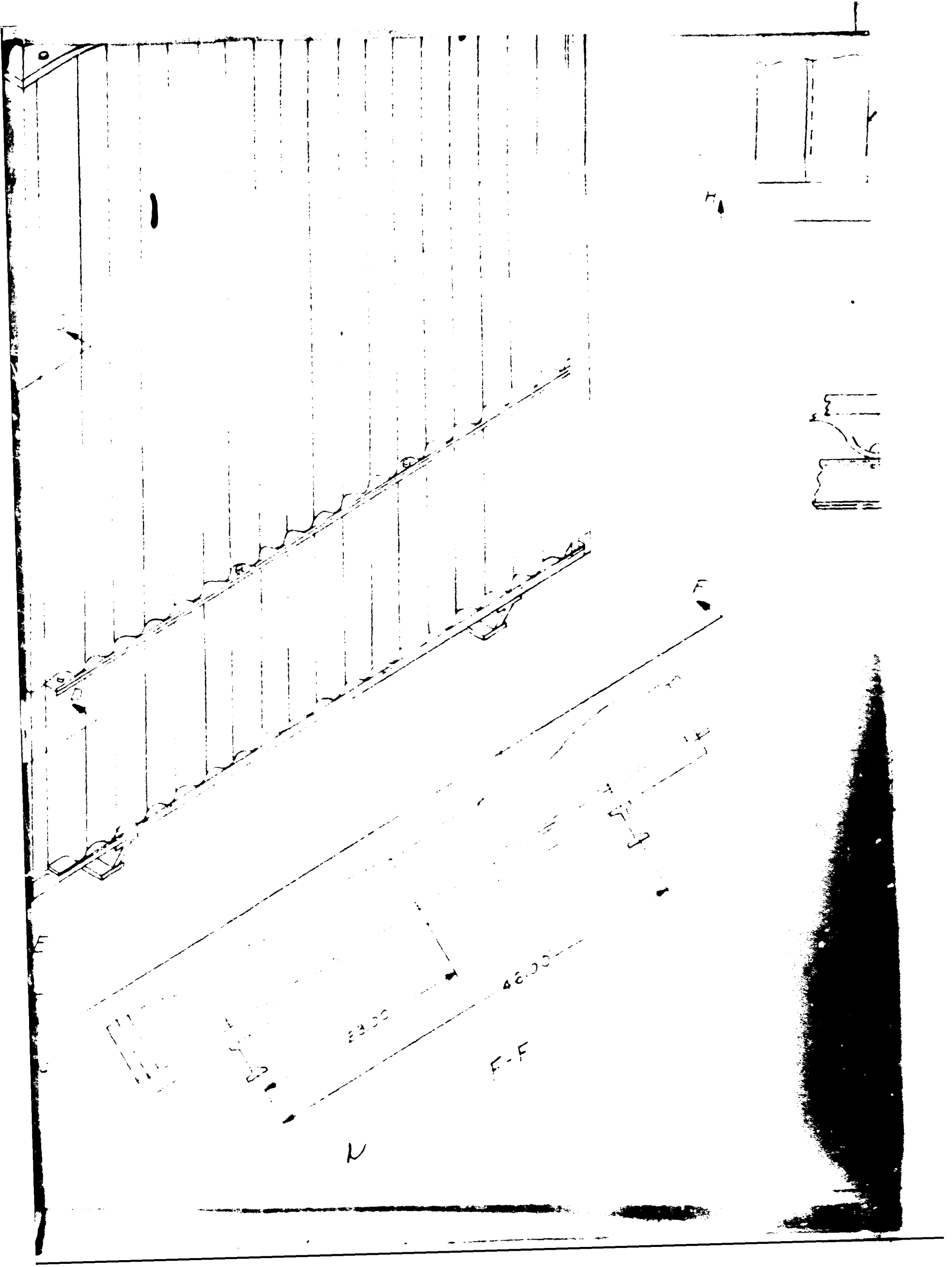
L

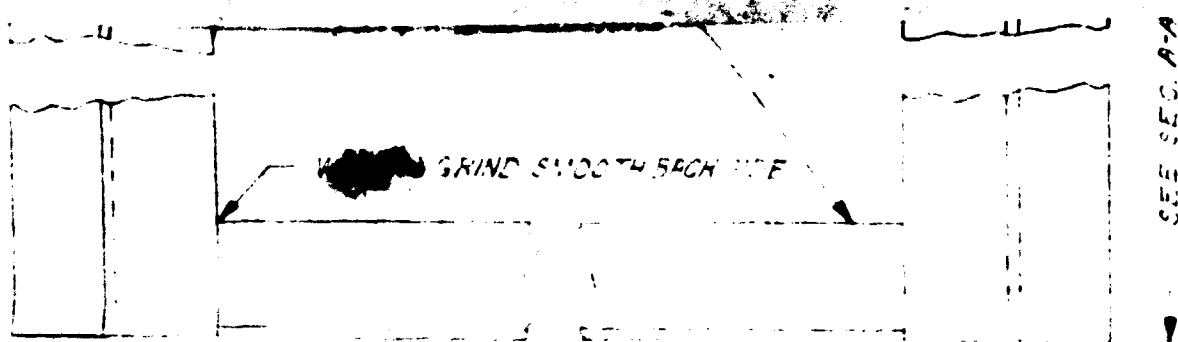


MARK FORK SLOTS

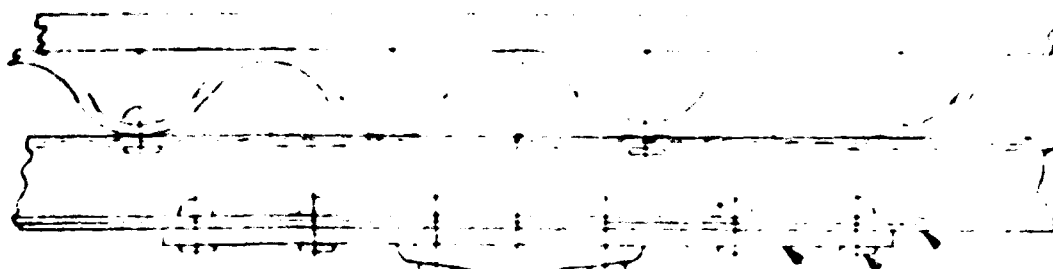
25 26
(STANDING WEB)

ISOMETRIC





END PANELS - FRAME
(UPPER & LOWER)



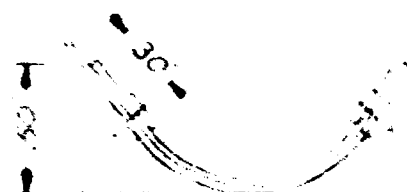
1024 X 33 X 72 ALUM. I.B.M.
SCUFF PLATE BETWEEN
BEARING PLATES
3/6" DIA. R.H. RIVET
535-T61

4 STRUCTURAL I
BEAMS 61S-T6

.189" PLATE
52 S-H 32

2.25"
3.62"
4.0"

G-G



TYPE SCUFF

DETAIL 1

H-H

ALUMINUM BOTTOM
BETWEEN FORM

S
T

REV. DATE

REMARKS

DEPARTMENT OF THE NAVY
BUREAU OF SUPPLIES AND ACCOUNTS

COLLAPSIBLE
CONTAINER

U.S. NAVAL SUPPLY RESEARCH AND DEVELOPMENT FACILITY
SUPPLY ENGINEERING DIVISION
BAYONNE, N.J.

DRAWN BY: *T.L.R.*

APPROVED:

CHECKED BY:

DATE

P

DWG. NO. - SED-SK-335