

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

LOADING OF S-280()/G SIZED SHELTERS INTO CONTAINER ANSI/ISO TYPE 1AA

Headquarters, Department of the Army, Washington, D.C.
3 March 1978

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	Paragraph	Page
Purpose.....	1	1
Description.....	2	1
Roadway Loading and Unloading.....	3	1
Alternate Roadway Unloading Method.....	4	2
Dock Loading and Unloading.....	5	2
Alternate Dock Unloading.....	6	4

1. Purpose. This technical bulletin provides installation and removal instructions for S-280 sized shelters, facilities, and shelter assemblies used with shipping container ANSI/ISO Type 1AA.

2. Description. a. Loading and unloading shelters from containers on trailers requires equipment as designated or prepared as shown in figures 1 through 10.

b. Every shelter has a nameplate that locates its center of gravity. The forklift tines must straddle the center of gravity to achieve stability whenever the shelter is lifted.

c. Each end of the shelter floor contains a structural extrusion. Only these extrusions shall carry the forces when lifted or supported by the forklift tines, the thrust of the ram, and the bearing load of the chocks.

CAUTION

The shelter shall NOT be lifted or transported from the ends in a manner in which the forklift tines bear against the bottom skin surface of the floor.

NOTE

The container shall not be less than 2 inches higher or 1 1/2 inches wider than the overall shelter height or width.

3. Roadway Loading and Unloading. Roadway loading and unloading requires an area that is large enough for the tractor-trailer and two forklifts (fig. 3) to maneuver. It is best if the area (roadway) is flat, level, and hard surfaced. A wide road or two intersecting ones will usually provide sufficient area.

a. Loading

(1) Measure the skid width (fig. 1) of each shelter that is to be placed in the container. Use the smallest skid width value obtained. Prepare the header (fig. 6) and guide rails (blocking) in the container as shown in figure 2. The "D" values are to be equal.

(2) Spot the tractor-trailer in-line.

(3) Place the shelter on a set of blocks (fig. 10). To do this, tip the forklift mast slightly forward, place the tips of the tines about 3 inches under an

end extrusion lift, insert a block under each corner, and lower. Repeat for the other end.

(4) Place a spacer (fig. 4) across the base of the tines on each forklift. From the side, place the first forklift tines fully under the skid runners observing the center of gravity conditions. Pick up the shelter and position it behind the container (fig. 11). The skids shall just clear the container floor and the shelter sides shall be equally spaced from the container walls.

(5) Back up the tractor-trailer so the container envelops the shelter (fig. 12).

(6) Position the second forklift at the end and place its tines under the shelter but over the first forklift tines. With the forklift mast tipped slightly forward move forward until the spacer on the base of the tines is bottomed out between the mast and the extrusion.

(7) The second forklift accepts the shelter load at the extrusion so the first forklift can be removed.

(8) The second forklift makes any height corrections necessary, (fig. 13) and then pushes the shelter into the container as far as it can.

(9) The second forklift transfers its shelter load completely to the container and backs away.

(10) Remove the spacer from the tines of one forklift so it can slip on the ram weldment (fig. 8). The ram cross member is held against the extrusion. The 18-foot long timber is engaged in the sockets and the shelter pushed down into the container. The sleeve and the 12-foot timber are added and the shelter is pushed against the header (fig. 14).

(11) Remove the ram and replace the spacer on the tines.

(12) Nail at least two chocks (fig. 6) to the floor up against the extrusion.

(13) In the same manner, the middle and end shelter are placed in the container.

(14) The last set of chocks may have to be nailed to the guide rails because the container may have a steel sill. It maybe necessary to tailor the chocks to fit. A header may be used instead of chocks. See figure 15 for a typically loaded container.

b. Unloading.

(1) Remove the end shelter blocking.

(2) Place the tines of the first forklift under the shelter as far as possible as it sets in the container.

(3) Place the hooks of the chain (fig. 9) into the shelter towing eyes. Attach the other end of the chain to a forklift so the chain will exert an equal force to each towing eye with a minimum of slack.

(4) Tip the mast slightly forward and raise it until the tines contact the extrusion and begins to lift the shelter.

(5) Back up the forklift and pull the shelter from the container to a point where the shelter remains about a foot or two into the container.

(6) Position the second forklift at the side, observing the center of gravity, and place its tines fully under the shelter skid runners.

(7) The side forklift accepts the shelter load and raises it so the shelter skids are just off the container floor,

(8) Drive the tractor-trailer straight away to remove the shelter from the container.

(9) Unchain the end forklift and back it away.

(10) The second forklift lowers the shelter and moves it away.

(11) Finally, place the shelter on a set of blocks thus freeing the forklift and completing the removal.

(12) The blocks may be removed by the method of paragraph 3a(3) or the shelter may remain on them if enough sets are available.

NOTE

Do not remove the guide rails because they are needed to remove the middle and last shelters.

c. Unloading the Middle and Last Shelters.

(1) Remove the chocks in turn.

(2) Attach the chain to the shelter towing eyes and the forklift and pull the shelter to the container doorway. The shelter can stick out of the container about one foot.

(3) Continue starting with paragraph 3b(2).

d. Material Removal. The guide rails and header are to be removed if the container is no longer going to be used to transport shelters and is going to be returned to its owner.

4. Alternate Roadway Unloading Method. a. Proceed to the point where the shelter is supported by the container and forklift (para 3b(1) through (5)).

b. Position the second forklift at the side so that its tines are symmetrical about a line 72 inches from the container end.

c. Place the second forklift tines fully under and contacting the skid runners where it can accept some of the load. Tip the mast backwards slightly if necessary.

d. Back up the end forklift thereby pulling the shelter out of the container, sliding it over the side forklift tines until it drops onto the tines.

e. At this point continue, starting with paragraph 3b(9).

5. Dock Loading and Unloading. It is assumed that the dock is of sufficient size for loading and unloading the shelters. The minimum width required for one method is estimated at 36 feet (3 feet for the ramp, 12 feet for the shelter, 20 feet for the forklift and tines, and 1 foot for the forklift to

maneuver in). Other loading methods require less width. If the dock is slightly higher than the container floor, then wood can be put under the trailer wheels to achieve flushness. If this cannot be done or is impractical because the dock is too high, then the dock method cannot be used. Where the dock has an adjustable ramp, care must be exercised that the resulting angles do not cause the shelter roof to hit the container doorway lintel or ceiling.

a. Flush Loading. The blocking in the container is prepared as previously described. (See fig. 2.) In the case where the dock and container floor are flush a shelter can be lined up and slid in by being pushed by the forklift (tines underneath, mast tipped forward). Once a shelter is in, continue starting with paragraph 3 a(10).

b. Over the Edge Loading. This method can be used when the container floor is 4 inches to 18 inches above the dock.

(1) Place the shelter on a set of blocks.

(2) Spot the container on the tractor-trailer in-line perpendicular to the dock and about three feet from it.

(3) Pick the shelter up from the side with the tines on the runners and observing center of gravity.

(4) Move the forklift so it is parallel to the dock edge and close enough to it so the shelter overhangs it by about two feet and is opposite the container.

(5) Move the container back until it is a few inches away from the shelter (fig. 16).

(6) Position the shelter accurately with respect to the container. The skids (fig. 11) are just to clear to the container floor.

(7) Back the container up to the dock enveloping the shelter.

(8) Lower the shelter onto the container floor and wood on the dock maintaining the shelter level.

(9) Reposition the forklift at the shelter end having its tines underneath and the mast tipped slightly forward.

(10) Pick the shelter up off the blocks at the extrusion and push it into the container as far as it will go.

(11) Continue starting with paragraph 30(10).

c. Ramp Loading. This method is suitable when the container floor is 1/2 inch to 6 inches above the dock.

(1) Place the ramp (fig. 7) so it rests on the dock and the lip of the container.

(2) Blocking under the ramp maybe provided if doubts exist as to the ramp's strength.

(3) Position the shelter at the bottom of the ramp such that its walls are equally spaced from

the container inside walls (fig. 17).

(4) Tip the forklift mast slightly forward and place the tines underneath the shelter and push it up the ramp.

(5) Once the shelter has entered the container, raise the tines to keep the shelter level so it can be pushed in until the forklift wheels contact the ramp. Remove the forklift leaving the shelter in the container.

(6) Continue starting with paragraph 3a(10).

d. Flush Unloading. Generally it is best to have the container on the tractor-trailer in-line and backed up to the dock. Remove the blocking in turn as required. When the dock and the container floor are flush attach the chain between the shelter and forklift and slide the shelter directly out of the container. Once on the dock the shelter can be put onto a set of blocks and be relocated.

e. Over the Edge Unloading. This method is suitable when the container floor is 4 inches to 18 inches above the dock.

(1) Remove the blocking at the end.

(2) Attach the chain to the shelter and forklift (See para 3b (3)).

(3) Tip the mast slightly forward and lift the shelter slightly at the extrusion.

(4) Pull the shelter from the container except for a foot or two.

(5) Lower the forklift end onto wood such as to maintain the shelter level.

(6) Remove the chains.

(7) Position the forklift at the shelter side, observing the center of gravity, and lift the shelter off the wood and the container.

(8) Move the tractor-trailer squarely away from the dock.

(9) The shelter, free from the container, can now be relocated as required.

(10) In the same manner remove the other two shelters after pulling each to the doorway.

f. Down the Ramp Unloading. Use the ramp to remove shelters when the container floor is 1/2 inch to 6 inches above the dock.

(1) Back the tractor-trailer squarely up against the dock.

(2) Remove the blocking from the end.

(3) Place the ramp on the container's lip and dock.

(4) Wood blocking is required under the ramp.

(5) Tip the mast slightly forward. Place the tines under the shelter and having the forklift wheels contact the ramp.

(6) Chain the forklift to the shelter.

(7) Pull the shelter from the container and down the ramp lowering the tines to keep the shelter level.

(8) Invariably the ramp will be pulled off the container's lip and fall onto the blocking underneath. Continued pulling will eventually cause the skids to reach the dock and be clear of the ramp.

(9) If it is necessary to pick the shelter up to relocate it, place it on blocks (para 3a(3)). Transport from the side with the skid runners on the tines.

(10) Replace the ramp and its blocking.

(11) Remove the blocking (chocks) from the next shelter.

(12) Pull the shelter to the doorway.

(13) Proceed as before.

6. Alternate Dock Unloading. a. When the container floor is 4 inches to 6 inches above the dock use this method.

(1) Chain the forklift to the shelter as previously described (para 3b(3)).

(2) Tip the mast slightly forward and raise the tines.

(3) Pull the shelter out of the container except for about a foot.

(4) Place a timber under the skids, spanning all three of them, and of just the right height to be level with the container floor. The timber is placed about 4 feet from the dock edge and parallel to it.

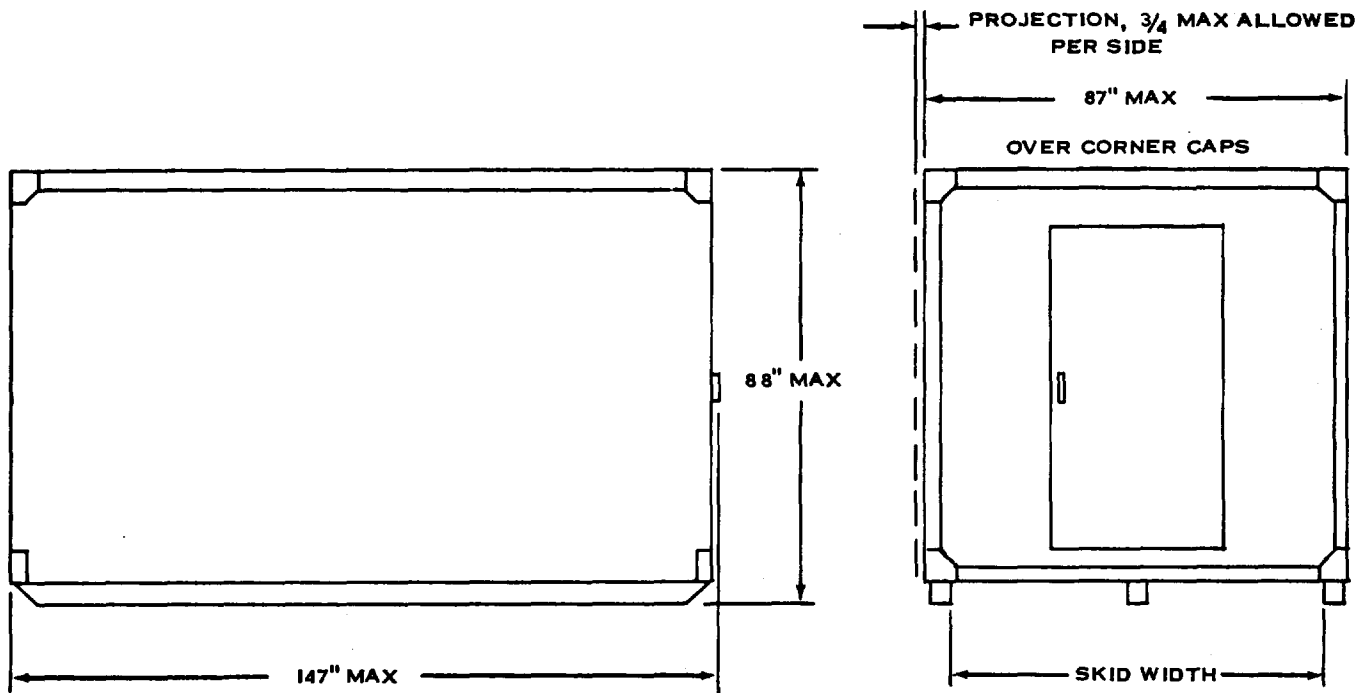
(5) Pull the shelter slowly out of the container until it drops off the container end and onto the timber and clears the dock edge by about a foot.

(6) Lower the forklift end onto suitable blocks.

(7) Unchain the forklift.

(8) The forklift is now free so it can pick up the shelter from the side and relocate it.

b. The other shelters can be removed in the same manner but will have to be pulled to the doorway.



EL40W001

Figure 1. Shelter

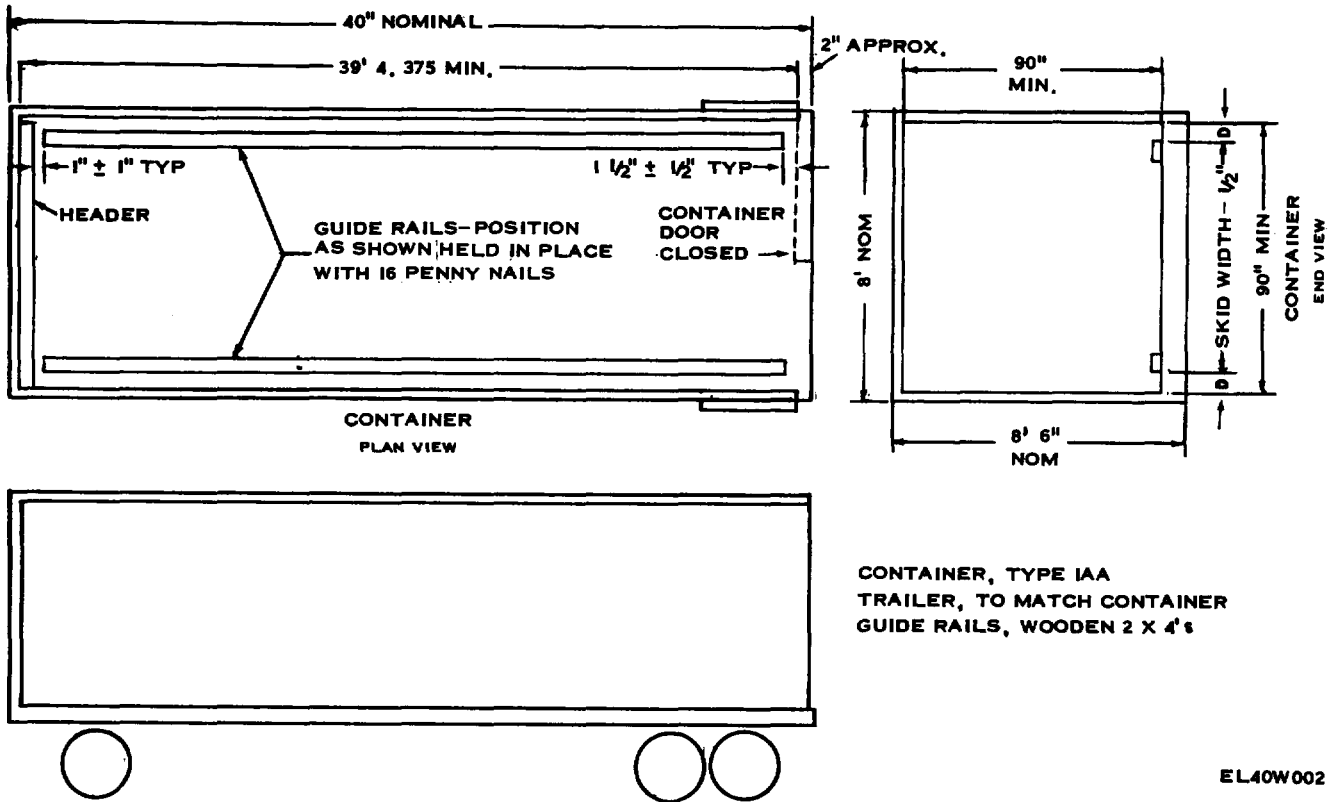


Figure 2. Container on trailer.

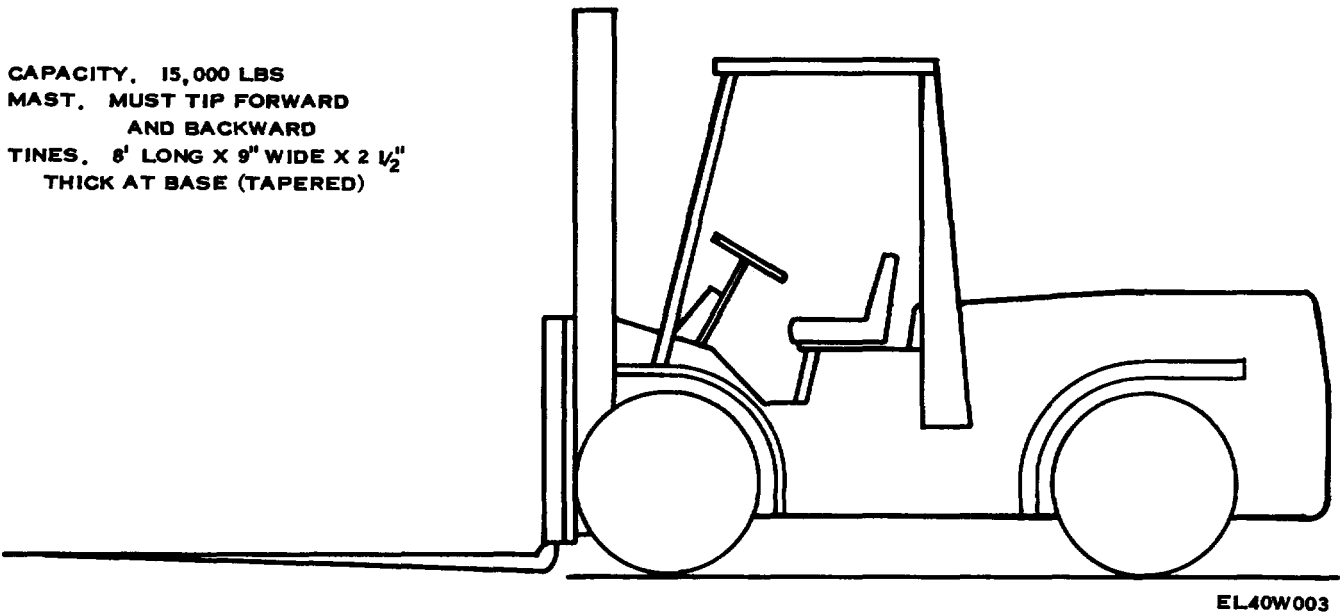
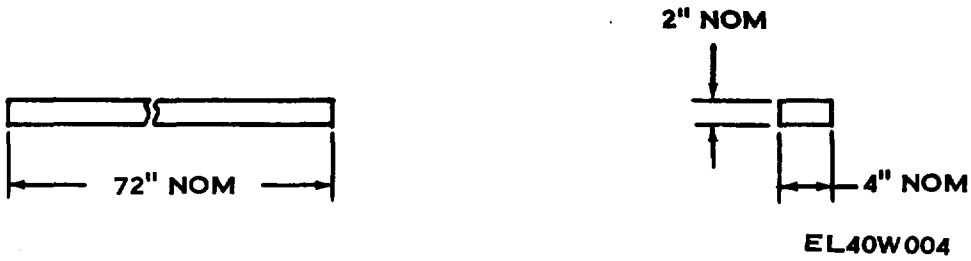
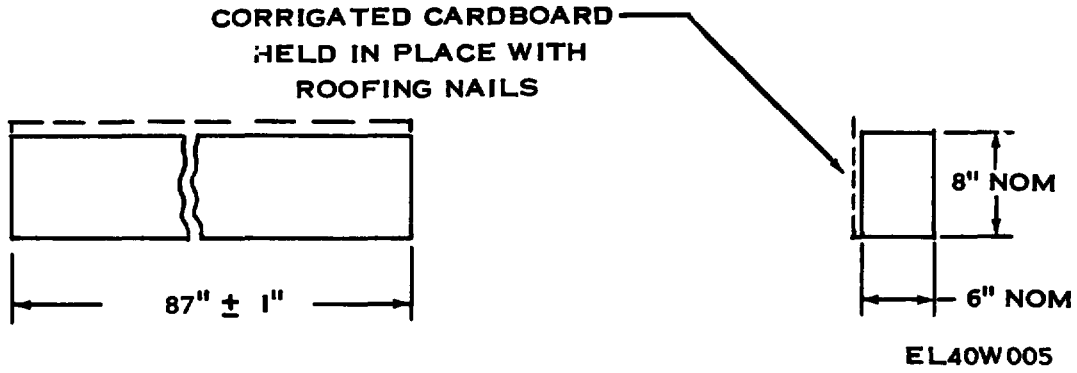


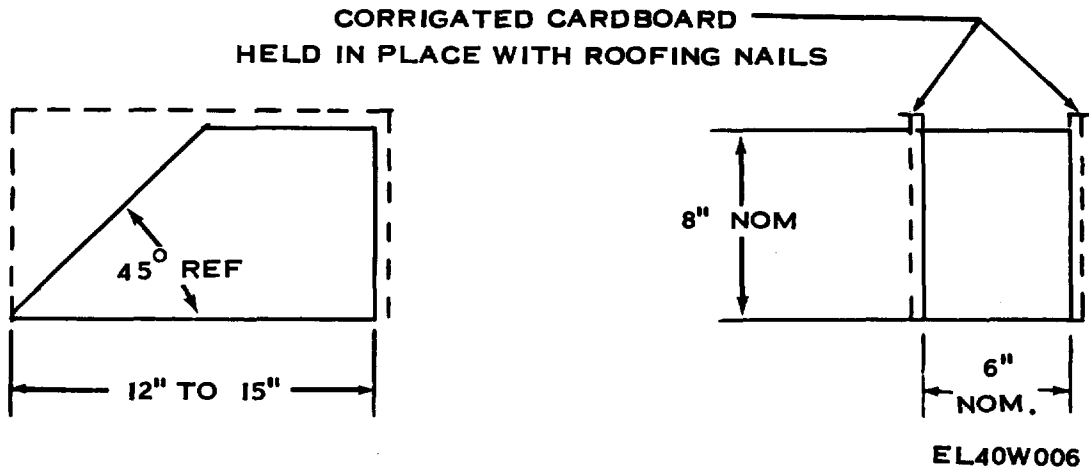
Figure 3. Forklift



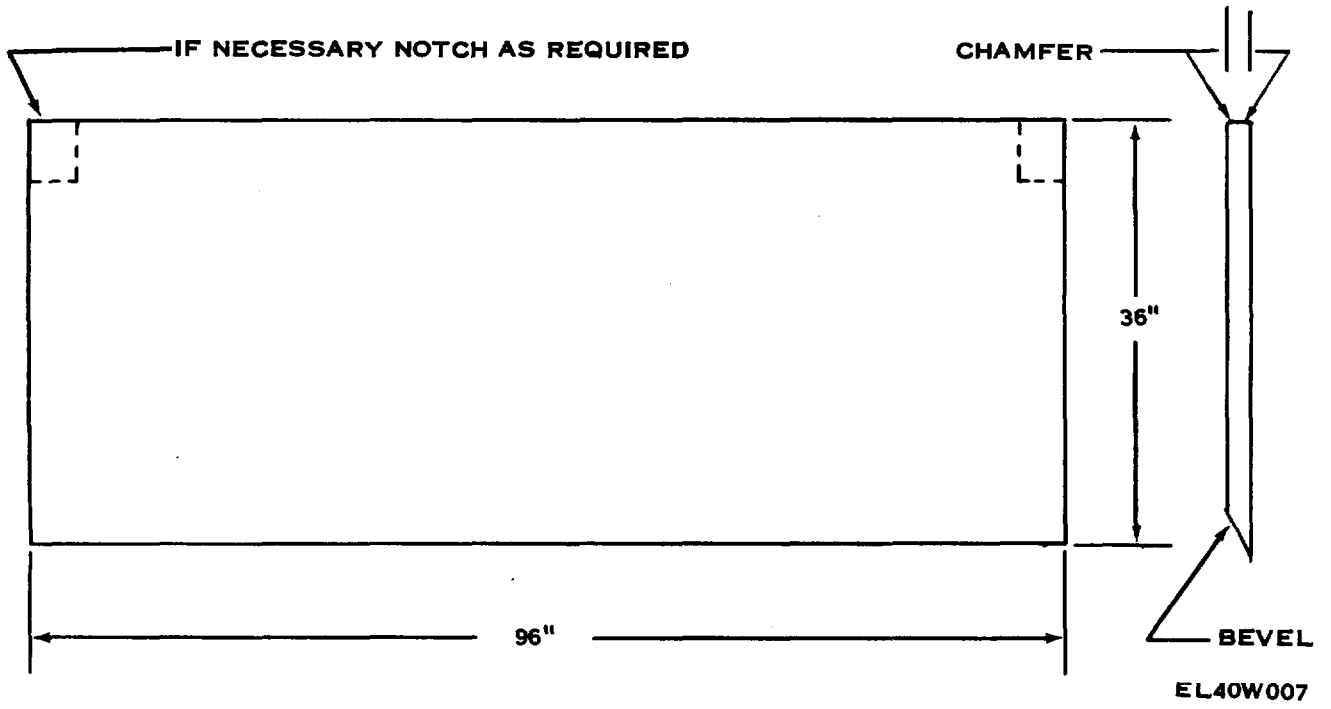
MATERIAL: WOOD
Figure 4. Spacer.



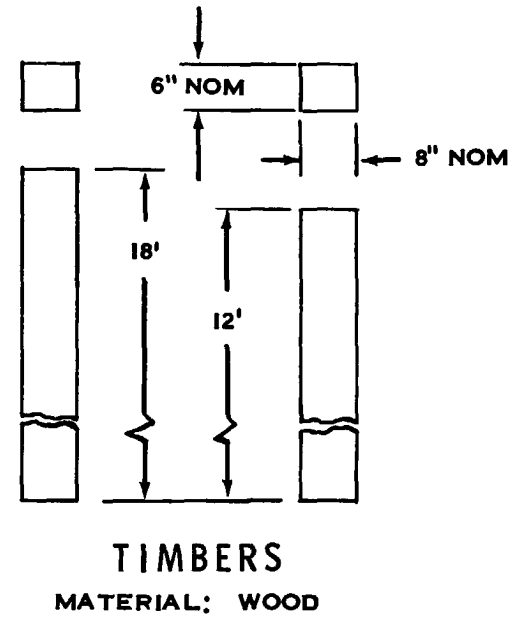
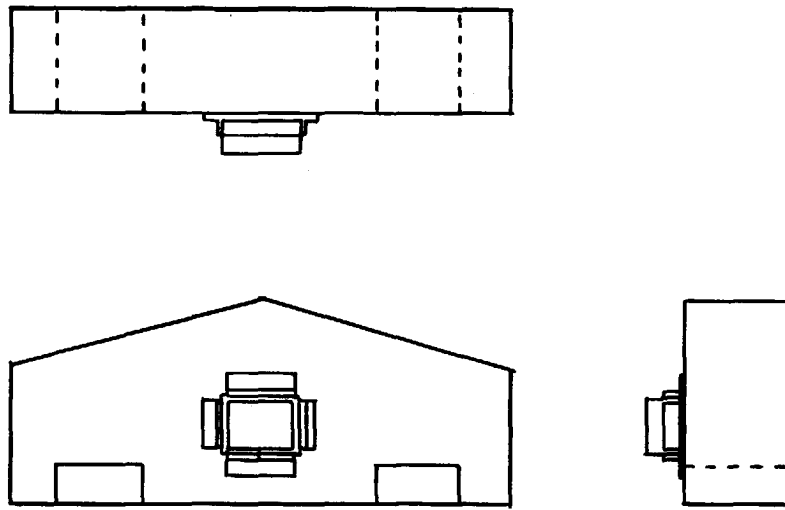
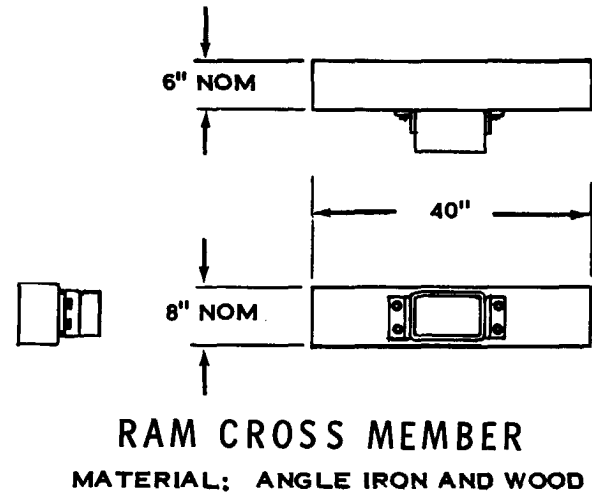
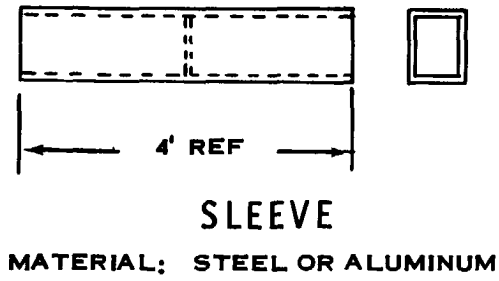
MATERIAL; WOOD
Figure 5. Header



MATERIAL: WOOD
Figure 6. Chock



MATERIAL: STEEL
Figure 7. Ramp



EL40W008

Figure 8. Ram configuration.

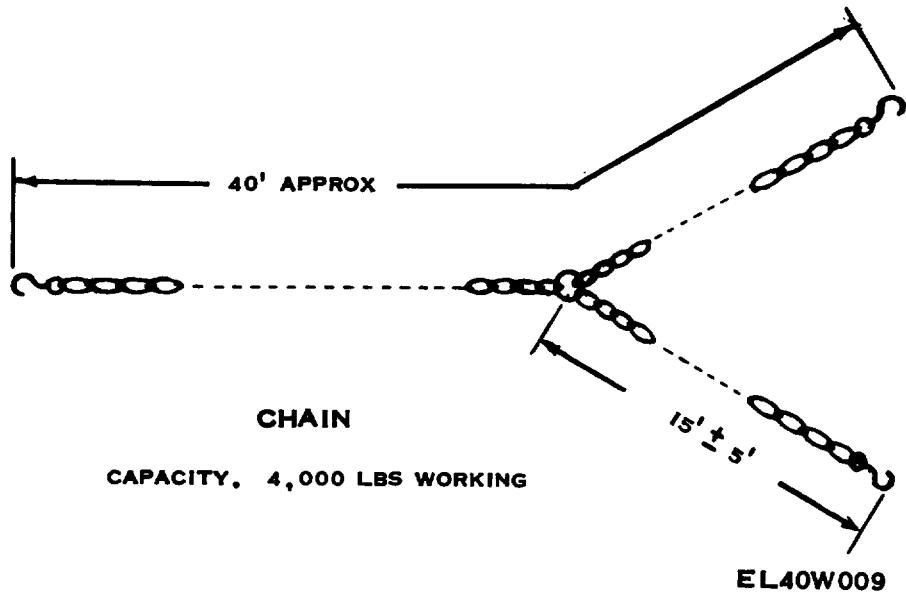
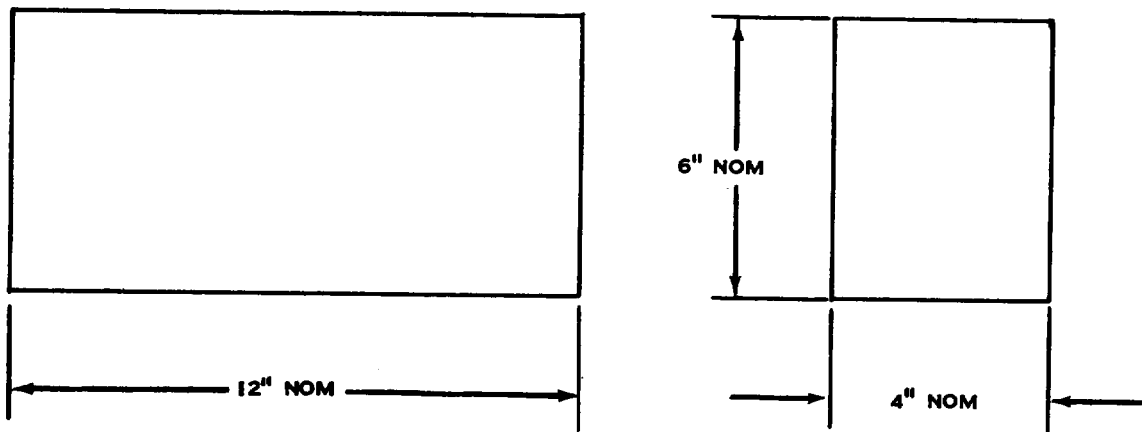
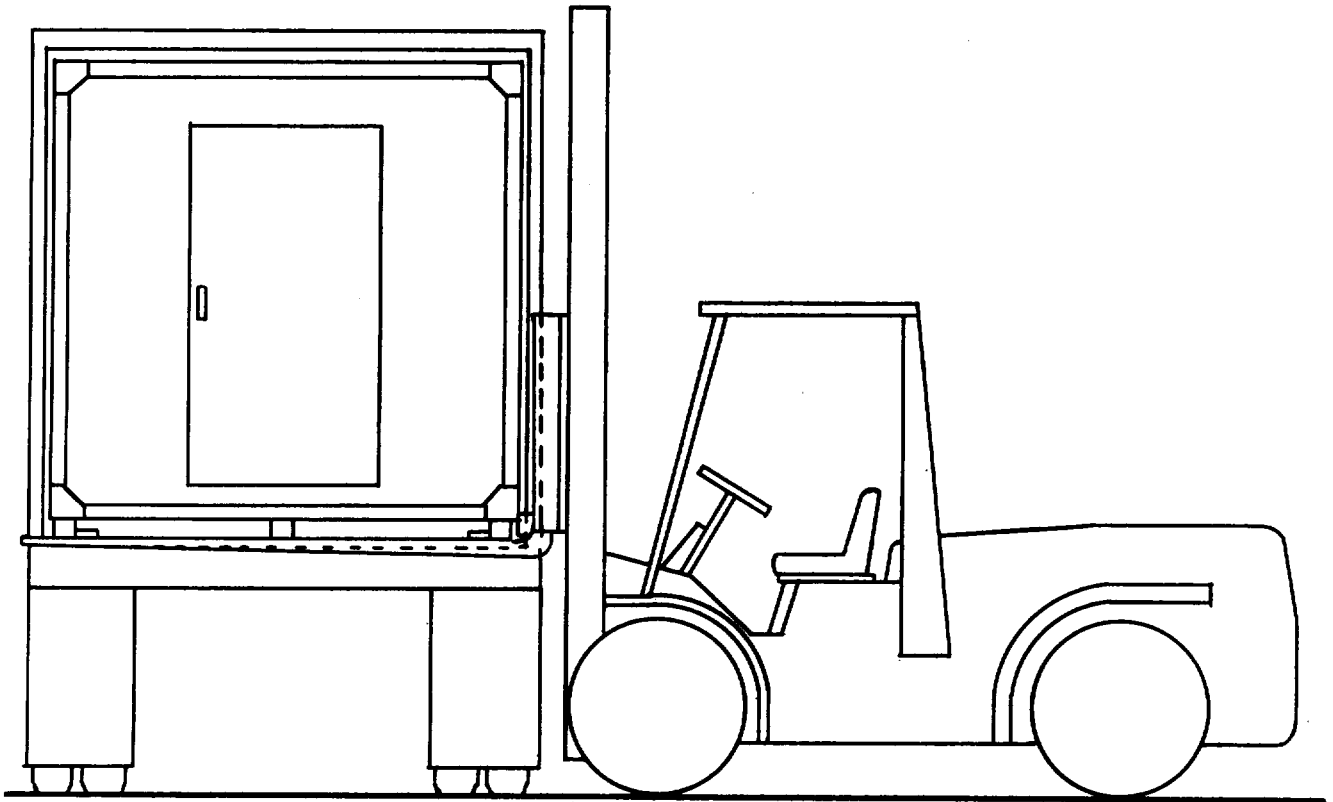


Figure 9. Chain.



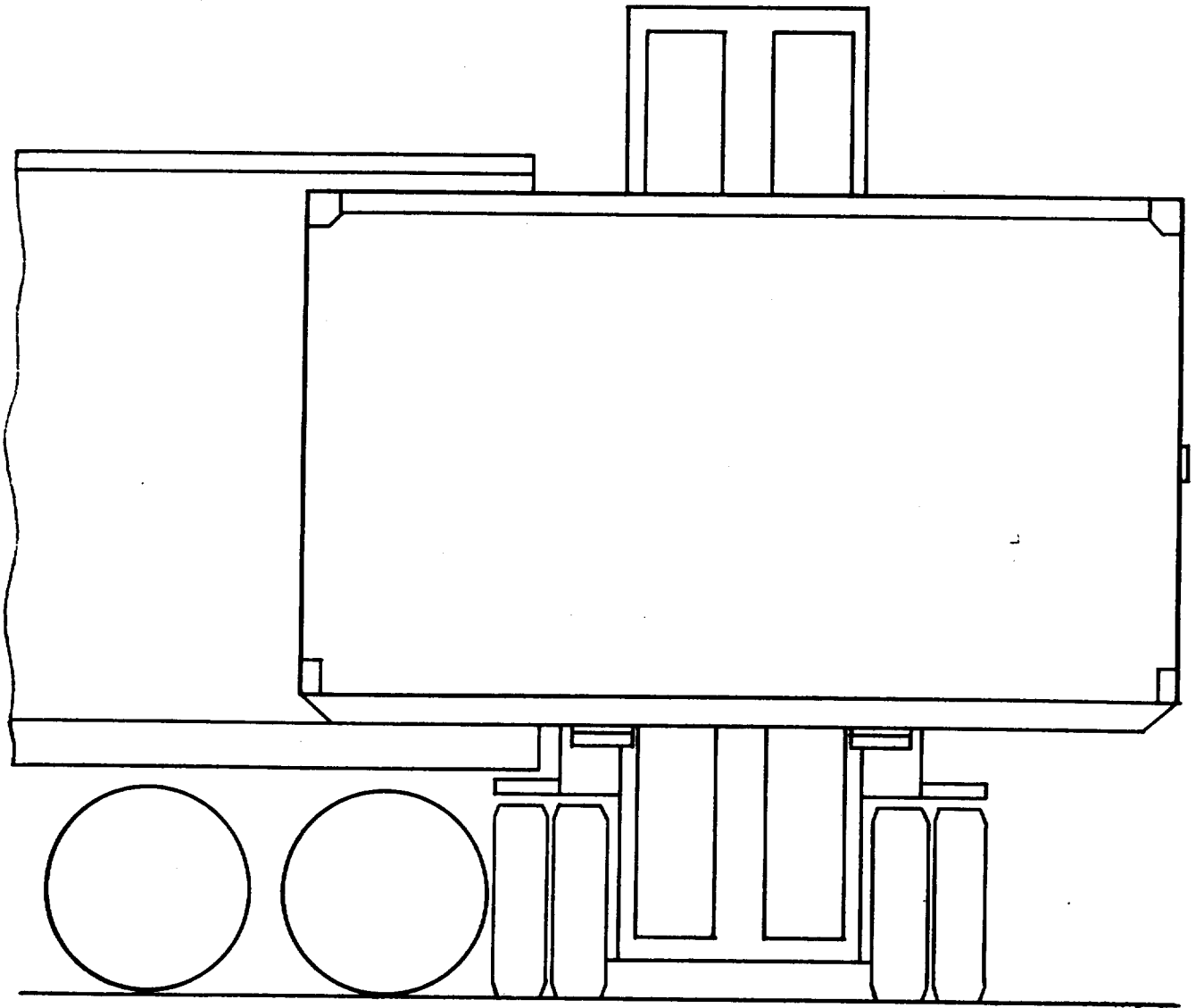
MATERIAL: WOOD
FOUR BLOCKS TO A SET
Figure 10. Block.

EL40W010



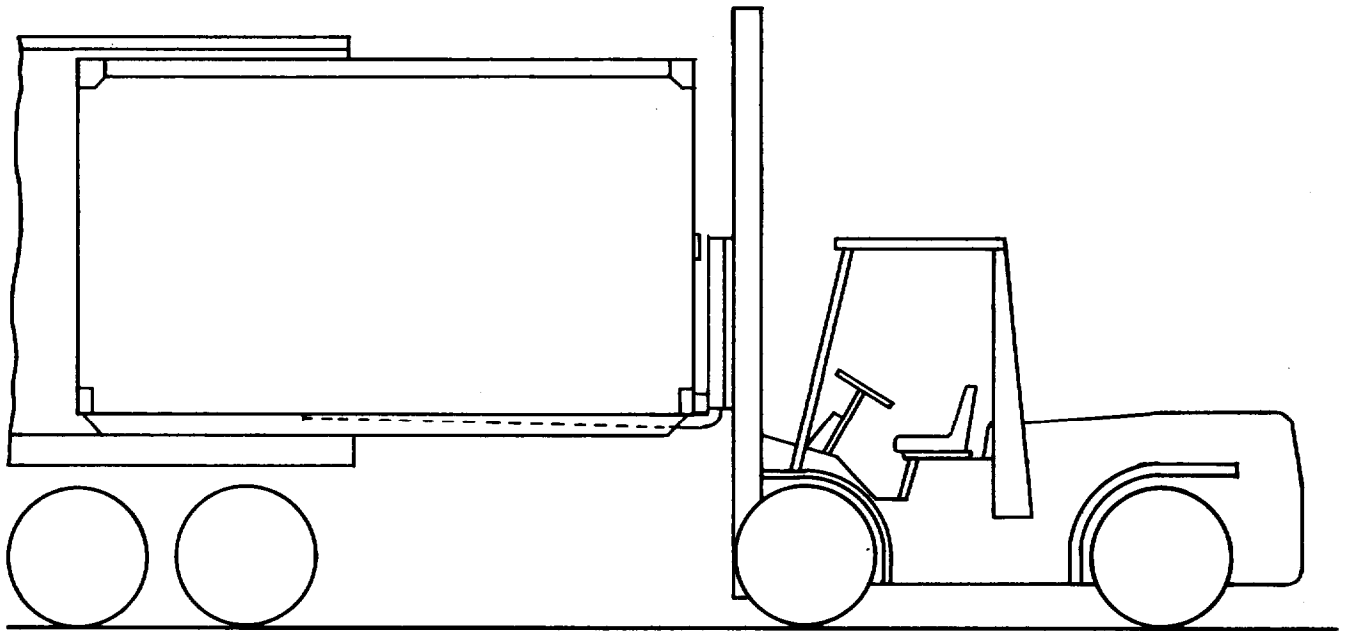
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Figure 11. Forklift positioning shelter.



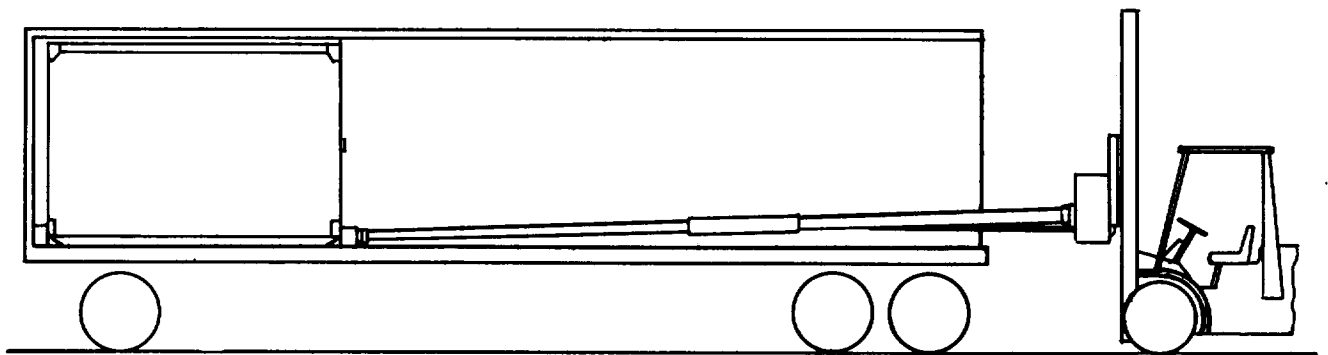
EL40W012

Figure 12. Container enveloping shelter.



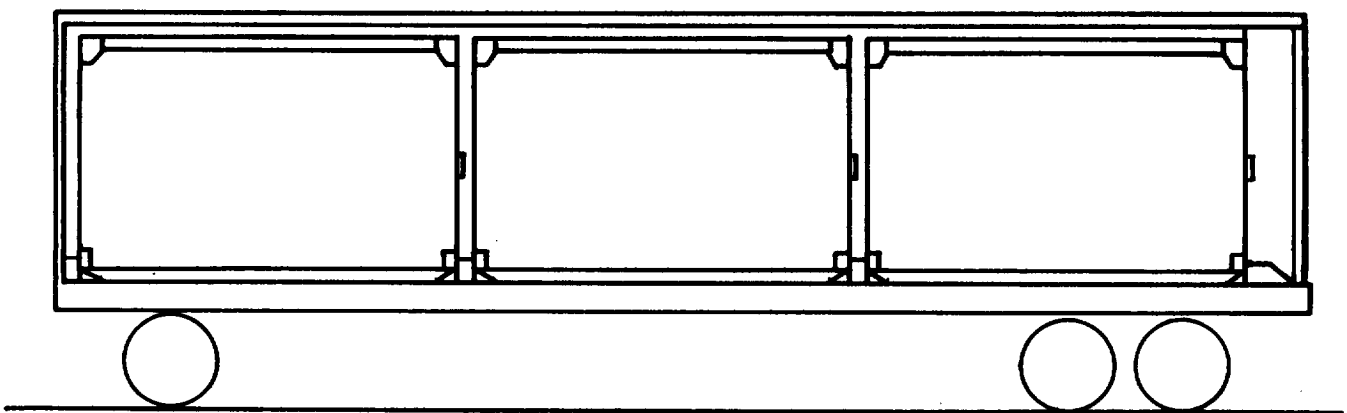
EL40W013

Figure 13. Forklift pushing shelter into container.



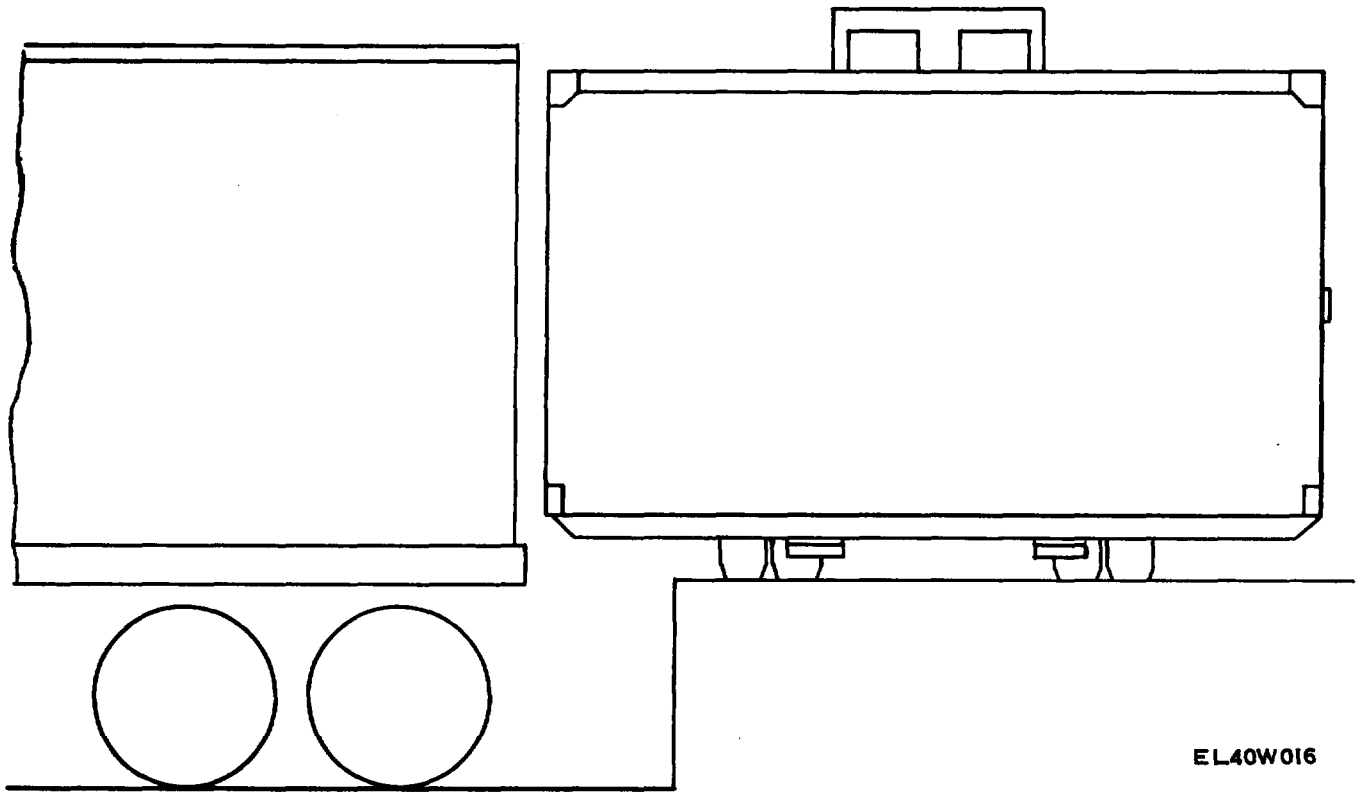
EL40W014

Figure 14. Shelter positioned by ram.



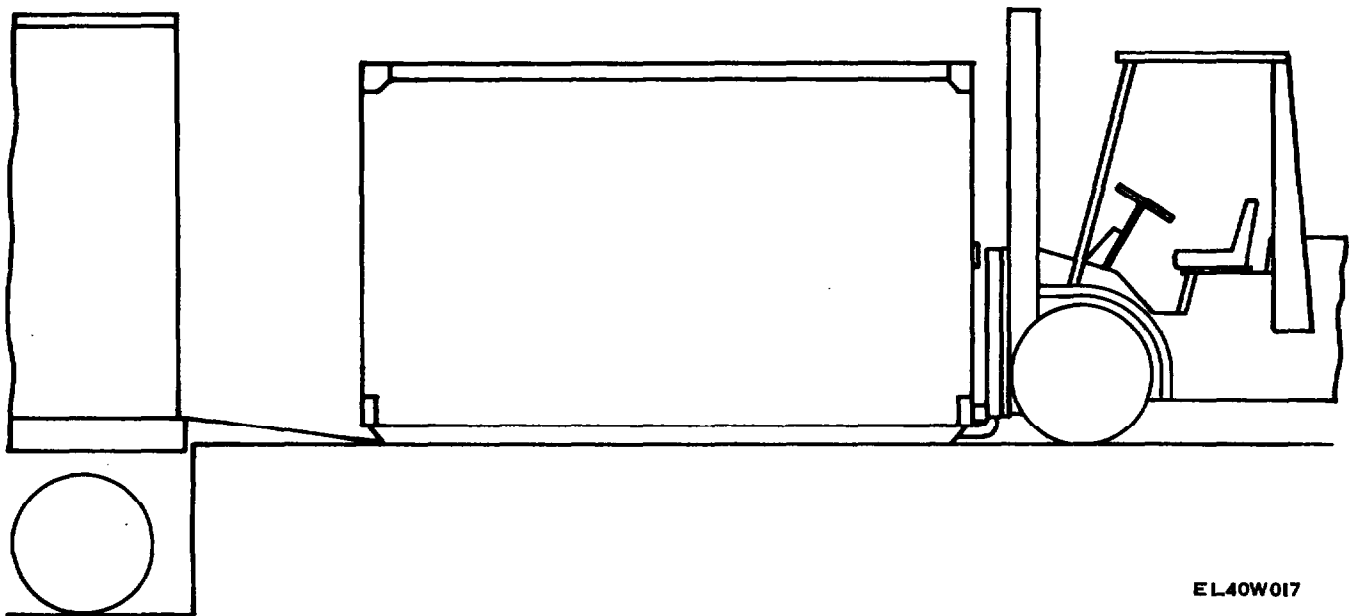
EL40W015

Figure 15. Blocking of shelter in container.



EL40W016

Figure 16. Dock loading over the edge.



EL40W017

Figure 17. Loading up the ramp.

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Fort Carson (6)	6-525	57
Ft Richardson (ECOM Off) (2)	6-526	
HISA (Ft Monmouth) (88)	6-555	
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USAICS (3)	6-576	
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USAFAS (2)	6-615	
USAARMS (2)	6-616	
USAIS (2)	6-617	
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AD(1) except	11-15	
SAAD (80)	11-16	
LBAD (14)	11-17	
TOAD (14)	11-35	
SHAD (8)	11-37	
USA Dep (1)	11-39	
Sig Sec USA Dep (1)	11-85	
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ARNG & USAR: None.

For explanation of abbreviations used, see AR 310-50.

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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
 1 decimeter = 10 centimeters = 3.94 inches
 1 meter = 10 decimeters = 39.37 inches
 1 dekameter = 10 meters = 32.8 feet
 1 hectometer = 10 dekameters = 328.08 feet
 1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
 1 decigram = 10 centigrams = 1.54 grains
 1 gram = 10 decigrams = .035 ounce
 1 dekagram = 10 grams = .35 ounce
 1 hectogram = 10 dekagrams = 3.52 ounces
 1 kilogram = 10 hectograms = 2.2 pounds
 1 quintal = 100 kilograms = 220.46 pounds
 1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
 1 deciliter = 10 centiliters = 3.38 fl. ounces
 1 liter = 10 deciliters = 33.81 fl. ounces
 1 dekaliter = 10 liters = 2.64 gallons
 1 hectoliter = 10 dekaliters = 26.42 gallons
 1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	To	Multiply by	To change	To	Multiply by
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

°F Fahrenheit temperature 5/9 (after subtracting 32) Celsius temperature °C

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