

---

## PARTS (SELECTED QUANTITIES) ON A PALLET

---

### **1.0 SCOPE**

This standard provides the preservation/protection and packaging of large, heavy or difficult to handle objects, forgings, castings, rings, large rolls of paper, large cylindrical objects, etc., and when specified, permits consolidation of items on a pallet.

### **2.0 REFERENCE**

2.1 Lockheed Packaging Standard LPS 40-001

### **3.0 REQUIREMENTS**

#### **3.1 GENERAL**

- 3.1.1 Methods for the preservation, protection and palletizing of items shall be in conformance with the requirements described herein. Requirements for a specific preservation method shall be noted on the procurement document. (See Paragraph 3.2.1)
- 3.1.2 Item(s) shall be clean and free of foreign matter. Preserve/protect the material in accordance with the requirements specified in Table 1 . The preservation/protection method to be used is a part of the Lockheed Packaging Standard (LPS) callout on the procurement document.
- 3.1.3 Item(s) shall be uniformly loaded and adequately secured to the pallet by bolting methods or with strapping tensioned equally to a degree, to prevent lateral movement of the item(s) during handling and shipment. (See Figure 1 through 8 for examples.)

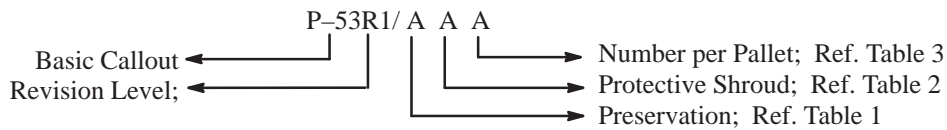
**CAUTION:** AVOID OVER TENSIONING OF STRAPS WHICH COULD CAUSE PERMANENT DEFORMATION/DAMAGE TO THE ITEM(S).
- 3.1.4 Tie-down strap size is determined by the total number of straps to be used, divided into the packaged weight of the item(s) which gives the weight that each strap must bear. This weight is compared with strap capacities listed in Table 4 . The strapping which has the same or next higher capacity must be used.

**NOTE:** Use of steel strapping (size/thickness) other than those in Table 4 may be used, providing that the strapping used for the application meets the manufacturer's recommended safe operating standards.
- 3.1.5 Items may be nested within each other to reduce package cube, providing that no degradation to the items results from such action.
- 3.1.6 Items with critical surface/finishes may be consolidated (tiered) on pallets providing that spacers/separators fabricated from wood, particle board, corrugated fiberboard, plastics, etc., are used to prevent metal-to-metal contact and to permit uniform stacking (see Figure 3 and 4).
- 3.1.7 Large heavy items (rings, forgings, castings, etc.) which may be stackable, but may not be safely handled or removed without the assistance of mechanical equipment (fork lift, overhead hoist, etc.), must be separated between each other with spacers of sufficient height to permit the entry of fork lifting equipment for inspection/unloading without requiring physical rehandling (see Figure 4).
- 3.1.8 Edge protectors or battens must be used at the edges (Figure 1) of loads to prevent damage by the straps or to prevent displacement of straps.
- 3.1.9 Protective shrouds, covers or caps, when specified, shall provide protection against weather, moisture, dust, etc., (see Table 2 ) and be adequately secured to withstand handling/shipment.
- 3.1.10 Except for "A"-frame type pallets (Figure 6), items loaded on pallet(s) shall not extend beyond the pallet deck.
- 3.1.11 Pallets shall be of a standard size or be commensurate with the size of the item(s). Pallet/skid design, lumber and construction quality shall meet or exceed specifications contained herein. Loads supported on pallet(s) shall not exceed the weight and stress limits provided by the design material.

- 3.1.12 Type and style of pallet(s) shall be selected on a basis of minimum fabrication cost, consideration of the anticipated hazards (i.e., rehandling, stacking, transport mode, etc.), to which the shipment may be exposed, and minimum weight/cube to assure the lowest freight rate to destination.
- 3.1.13 Lumber used to fabricate pallets shall meet construction grade for wood groups II, III or IV of MIL-STD-731. Pallet construction shall be of good workmanship, quality, provision for forklift handling and free from any design defects and/or any other defects which may affect its serviceability during handling/shipment.
- 3.1.14 Unless otherwise specified, maximum load (gross weight) per individual pallet shall not exceed 3000 pounds.
- 3.1.15 Unless otherwise specified, maximum overall height of loaded pallet(s) shall not exceed limits imposed by carrier regulations. Wherever possible and practical, items should be disassembled to a degree which would reduce package cube to comply with carrier restrictions and facilitate handling.
- 3.1.16 When authorized on the procurement document one-way (nonreusable) type pallets (i.e., corrugated fiberboard, minimum quality wood pallets) may be utilized for shipment of items, providing that adequate forklift entry provisions are provided for handling purposes.
- 3.1.17 All items and materials placed on pallets shall be above the top deck height. Additionally, materials that protrude past the edge of the pallet shall not hang beneath the top deck height of pallet.

**3.2 UNIT PACKAGING**

- 3.2.1 Unit packaging shall be in accordance with the designated requirements selected from Table 1 , Table 2 , Table 3 , as invoked by the Lockheed Packaging Standard (LPS) callout on the procurement document. The LPS suffix letter contained in each table specifies the type of preservation, protection and packing to apply to the item(s). The suffix letters follow the basic callout (P-53R1) identifies the applicable preservation (Table 1 ), type of shroud/cover (Table 2 ), quantity per pallet (Table 3 ), in that order.



- 3.2.2 Item(s) shall be uniformly loaded and secured to a pallet in accordance with the provisions of this standard.
- 3.2.3 “A”-frame pallets (Figure 6) shall be used to permit transport of overwidth items (exceeding 8-ft width) in conformance with carrier regulations.

**NOTE:** Depicted “A”-frame is shown for illustrative purposes only. Style and bracing may vary providing that other requirements of this standard are met.

**3.3 INTERMEDIATE PACKAGING**

Not applicable.

**3.4 PACKING**

- 3.4.1 Pallet(s) as packed, shall protect each item during handling/shipping and shall meet the minimum requirements of this standard and common carriers, for acceptance for safe transportation at the lowest rate to the point of delivery.
- 3.4.2 Enclose or attach a copy of the packing slip to the palletized load.

**3.5 MARKING**

- 3.5.1 Unit Package Marking – Label or mark each pallet load to show at least part number per contracting document, quantity of items (when containing multiples) LMSC contracting document number, supplier identity and destination. Additional markings may be specified in the LMSC detail specification or drawing.

3.5.2 Intermediate Marking

Not applicable.

3.5.3 Shipping Container Marking – Same as Paragraph 3.5.1 (shipping container is the unit package).

<b>Table 1</b>	
<b>LPS Suffix</b>	<b>Preservation/Protection Requirements</b>
A	Item(s) shall be interleaved with a suitable noncorrosive paper, e.g., MIL-P-17667, Type I.
B	Item(s) shall be preserved with an oil conforming to MIL-L-3150, or equivalent, and interleaved with a noncorrosive paper.
C	Item(s) shall be thoroughly cleaned and preserved per LPS Suffix B (Table 1 ) but interleaving is not required.
D	Item(s) shall be individually wrapped with a noncorrosive paper.
E	Item(s) shall be thoroughly cleaned and preserved with an oil conforming to LAC 34-4285.
F	Item(s) shall be protected by the applicable process as specified in the procurement document, drawing/specification.
G	Item(s) shall be oiled per LPS Suffix B (Table 1 ) and individually wrapped with a noncorrosive paper.
H	Item(s) shall be cleaned/preserved in accordance with the LMSC requirements specified in the procurement document.
I	Items(s) shall be individually wrapped with a suitable non-contaminating paper, e.g., MIL-P-17667, Type I.
J	No oiling, coating or interleaving requirement.

<b>Table 2</b>	
<b>LPS Suffix</b>	<b>Protective Shroud, Cover, Cap, etc.</b>
A	Enclose entire pallet load with polyethylene sheet, minimum .004-inch thick
B	Completely shroud the item(s) with an opaque water-proof material of adequate thickness and toughness to withstand handling/shipment.
C	Apply a corrugated fiber/wood cap (cover) over the top of the palletized item(s) in accordance with Figure 5.
D	Apply a wood cap (cover) over the top of the item(s) in accordance with Figure 5.
E	Unitize load with stretch film so that multiple small items can be secured on a pallet.
F	No specific shroud or cover requirement.

<b>Table 3</b>	
<b>LPS Suffix</b>	<b>Number of Items per Pallet</b>
A	The number of items shall not exceed one (1) per pallet.
B	The number of items shall be limited to the maximum allowable dimensional weight/carrier restrictions contained in this standard.
C	The number of items shall be at suppliers' option providing that all applicable requirements of this standard are met and that maximum allowable consolidation of items per pallet is utilized.
D	The number of items shall not exceed three (3) items per pallet.
E	The number of items shall be as specified in the procurement document or LMSC specification.

<b>Table 4 (REF PARAGRAPH 3.1.4)</b>			
Maximum Safe Working Capacities – Steel Strapping (Ref QQ-S-781, Type I)			
Nominal Width/Thickness Size (inch)	Load Capacity per Strap (pound)	Material Cold Rolled Standard	Material Hot Rolled/Cold Rolled High Tension (pound)
3/8 x .015	112	X	
3/8 x .020	150	X	
3/8 x .023	150	X	
1/2 x .015	150	X	
1/2 x .020	200	X	
5/8 x .020	250	X	
5/8 x .023	300	X	
3/4 x .023	350	X	
3/4 x .025			575 (CR)
3/4 x .028	450		575 (HR)
3/4 x .031			725 (CR)
3/4 x .035	725		725 (HR)
1-1/4 x .031			900 (CR)
1-1/4 x .035			900 (HR)
1-1/4 x .044			1275 (CR)
1-1/4 x .050			1275 (HR)
1-1/4 x .065			1700 (HR)
2 x .044			2000 (CR)
2 x .050			2000 (HR)
2 x .065			2625 (HR)

#### **4.0 QUALITY ASSURANCE**

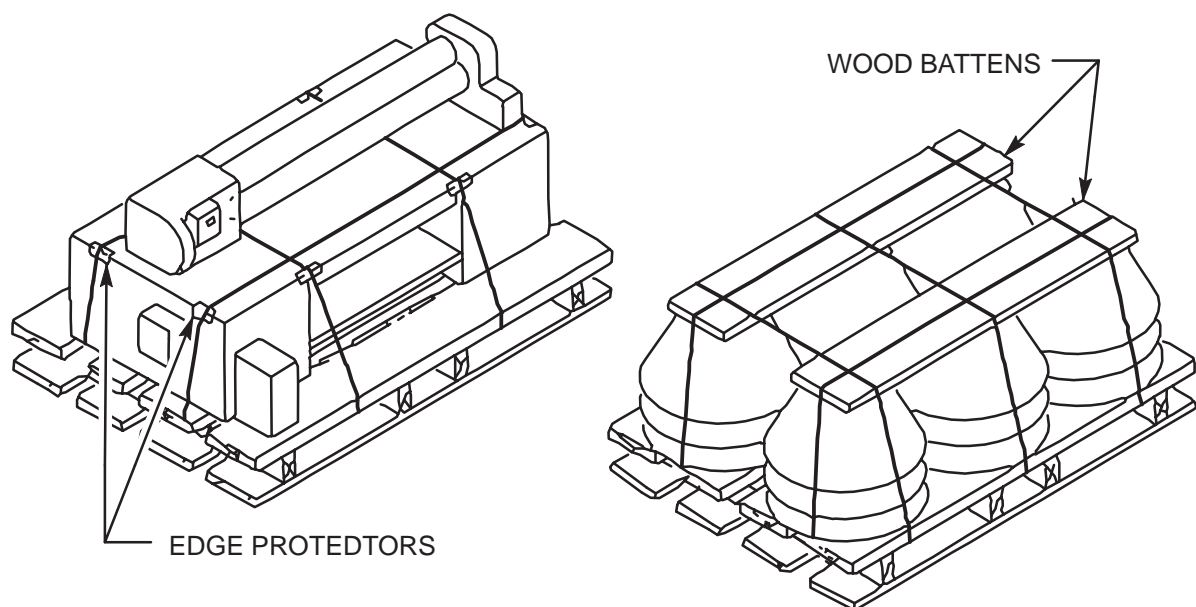
4.1 Packaging shall be accomplished in such a manner as to prevent physical damage to, or degradation of, the packaged items during delivery to the using activity. It shall be the prerogative of LMSC to return damaged items, at supplier expense, when such damage is attributable to improper or inadequate protection.

#### **5.0 NOTES**

5.1 The following information is intended as a guide or aid to suppliers in meeting the requirements of this specification.

#### **5.2 MATERIAL SPECIFICATIONS**

<b><u>Commodity</u></b>	<b><u>Military/Commercial Specifications</u></b>
Fiberboard, Corrugated/Solid	PPP-F-320
Film, Plastic	L-P-378
Palletized and Containerized Loads	MIL-STD-147
Paper, Neutral	MIL-P-17667
Quality of Wood Members	MIL-STD-731
Strapping, Steel (Flat/Seals)	QQ-S-781



**Figure 1. Item(s) Secured with Strapping**

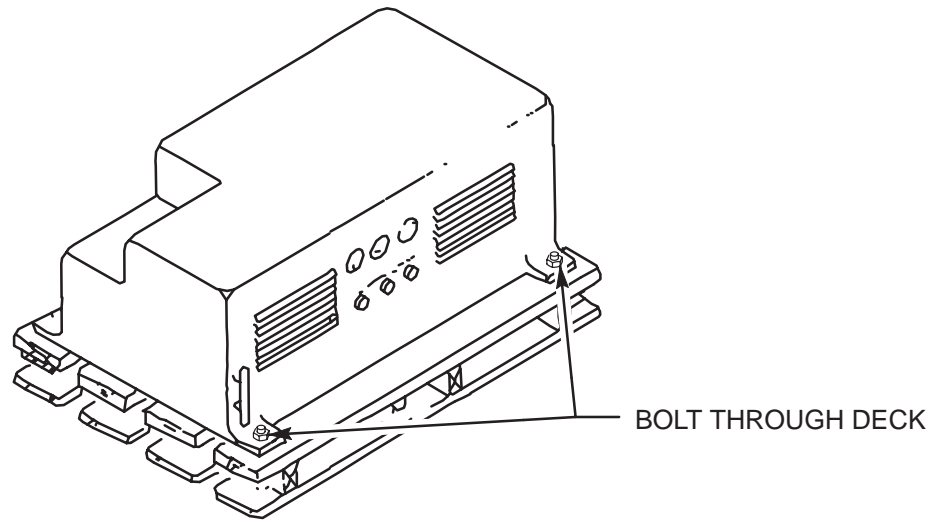


Figure 2. Item Secured with Bolts/Nuts

P10060-001

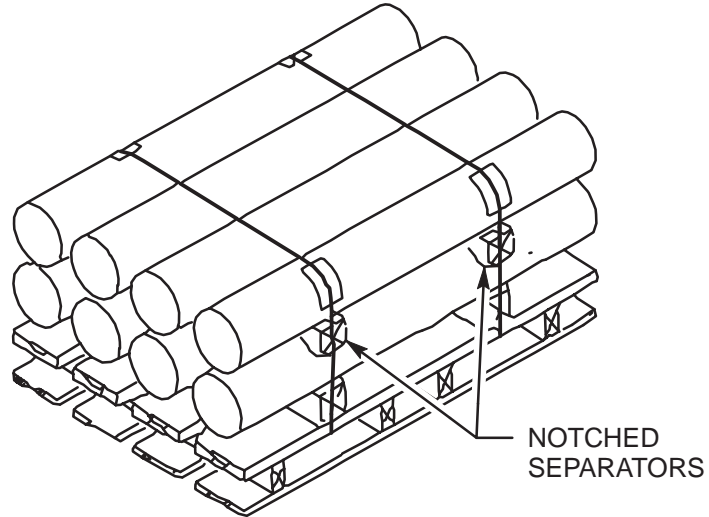


Figure 3. Items Secured to Prevent Rolling

P10061-001

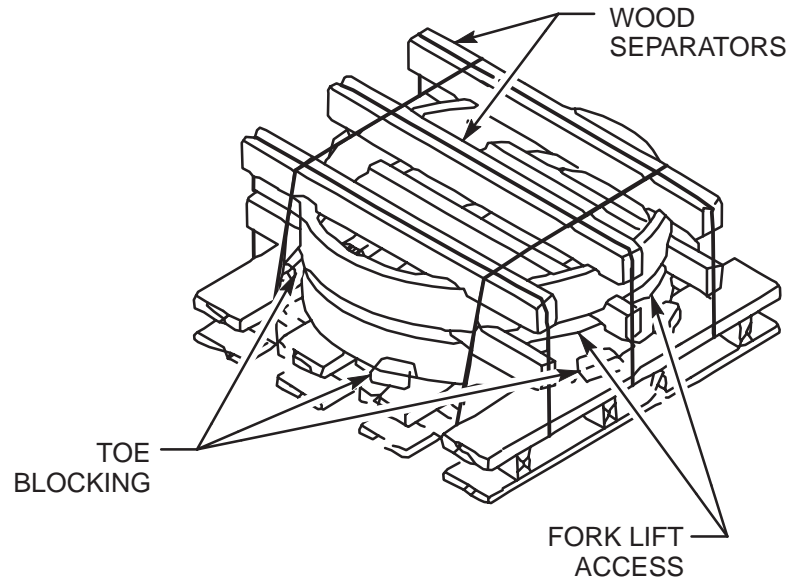


Figure 4. Items Stacked Permitting Forklift Access

P10062-002

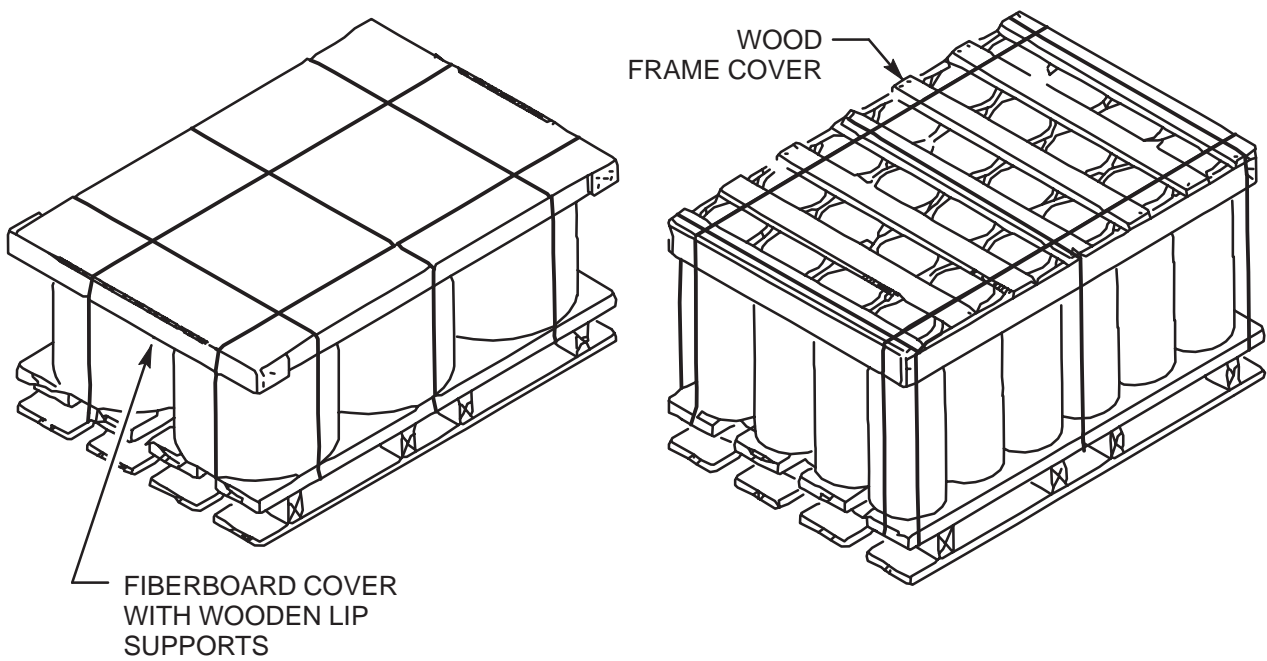


Figure 5. Items Secured (Bonded) with Cover

P10063-002

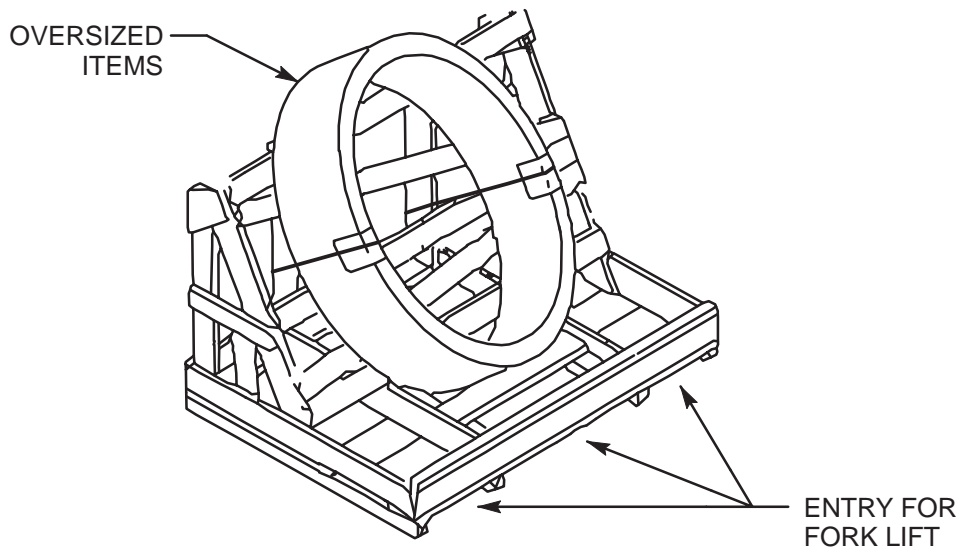


Figure 6. "A"-Frame Pallet for Oversize Shipments

P10064-001

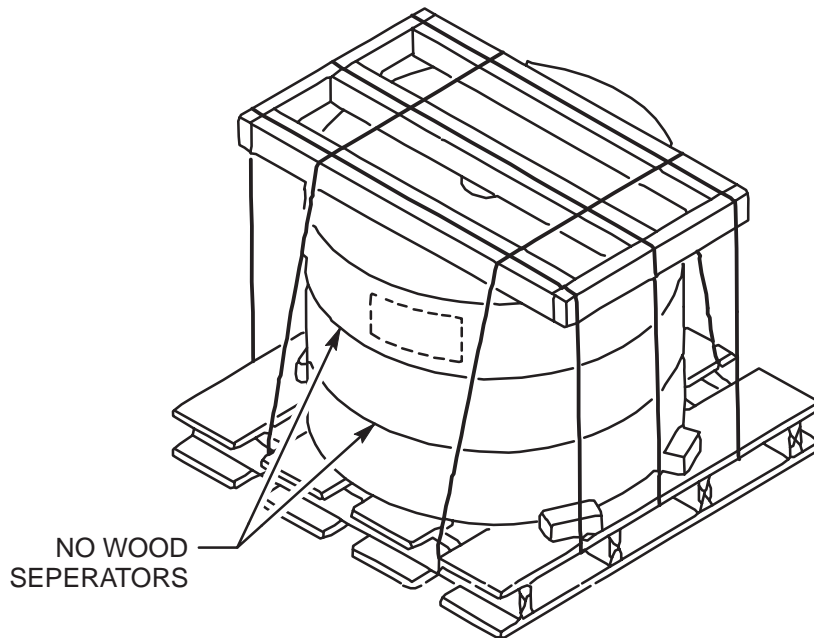


Figure 7. Items Stacked and Secured with Strapping

P10157-001



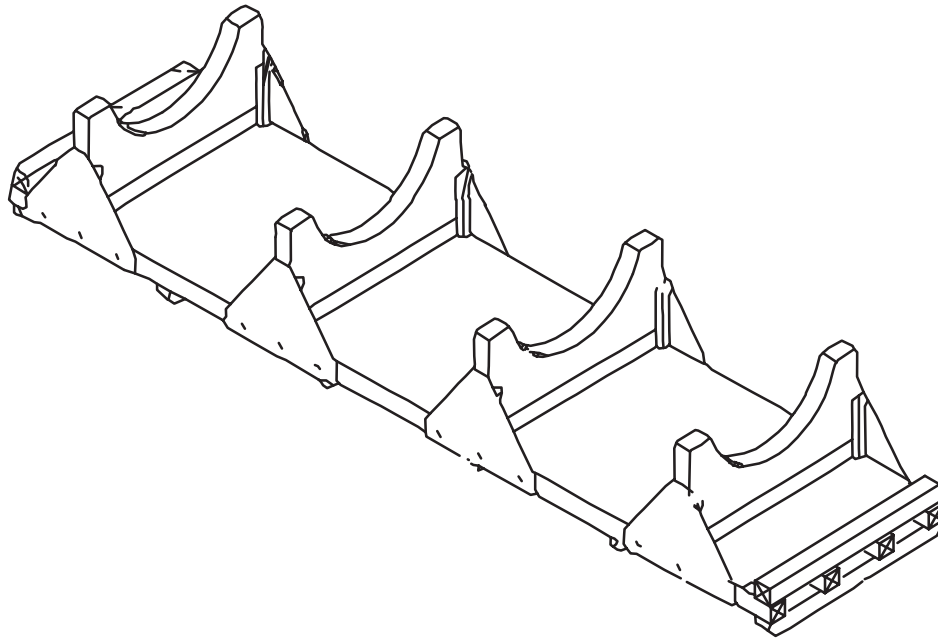


Figure 8. Cradle/Saddle Pallet for Cylindrical Items

P10158-001