

MIL-P-15011J
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MILITARY SPECIFICATION

PALLETS, MATERIAL HANDLING, WOOD POST CONSTRUCTION, 4-WAY ENTRY

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the design, materials, and fabrication of material handling pallets for general storage and air cargo handling.

1.2 Classification. Pallets shall be wood, post type construction, 4-way entry, and one of the following styles, sizes, types and classes (see 6.2):

- Style 1 - General storage (see Figure 1)
- Style 1A - General storage (see Figure 1A)
- Style 1B - General storage or cargo (see Figure 1B)
- Style 2 - Air cargo, lightweight (see Figure 2)

- Size A - 40"L x 48"W (1016 mm X 1219 mm) (See Figures 1 and 2)
- Size B - 35"L x 45½"W (889 mm X 1156 mm) (See figure 1A)
- Size C - 42"L x 53"W (1067 mm X 1346 mm) (see Figure 1B)

- Type I - Assembled (Style 1, 1A, 1B and Style 2)
- Type II - Unassembled (Style 1, 1A, and 1B only)

- Class 1 - Seasoned lumber (see ¶3.2.1.2)
- Class 2 - Unseasoned lumber (unspecified moisture content)

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specification, standards, and handbooks. The following specifications, standards, and handbooks form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

Beneficial comments (recommendations, additions, deletion) and any pertinent data which may be of use in improving this document should be addressed to: Fitting Out and Supply Support Assistance Center, Z-133/5, Norfolk, VA 23512-5000 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FSC 3990

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SPECIFICATIONS

FEDERAL

FF-N-105 -Nails, Wire Brads, Staples
QQ-S-781 -Steel Strapping, Flat

MILITARY

MIL-B-117 -Bag, Sleeve and Tubing, Interior Packaging

STANDARDS

MILITARY

MIL-STD-105 -Sampling Procedures and Tables for Inspection by
Attributes.
MIL-STD-129 -Marking for Shipment and Storage
MIL-STD-731 -Quality of Wood Members for Containers and Pallets

(Copies of specifications and standards required by contractors in connection with specific procurement functions should be obtained from the activity or as directed by the contracting officer).

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this specification to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date of the solicitation.

NATIONAL BUREAU OF STANDARDS

American Softwood Lumber Standards

(Application for copies should be addressed to Office of Engineering Standard Services, National Bureau of Standards, Washington, D.C. 20234).

2.2 Other publication. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitations for bids should apply.

AMERICAN NATIONAL STANDARD

Structural Glued Laminated Timber, ANSI/AITC A190.1

(Application for copies should be addressed to American Institute of Timber Construction, 333 W. Hampden Ave; Englewood, CL 80110)

ASTM STANDARD

Standard Test Methods for Moisture Content of wood, D-2016.

(Nongovernment standards and other publications are normally available from the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other information services).

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2.3. Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Standard product. Type I pallets shall be completely assembled and ready for use when presented for Government acceptance. Components for type II pallets shall be sized and finished as specified herein and furnished with sufficient hardware to permit field assembly.

3.1.1 First article inspection. Unless otherwise specified (see 6.2), the supplier shall furnish a pallet (or pallets) as specified in the contract or purchase order to prove, before production is commenced, that his production methods and design detail will produce pallets, within the time frame specified, that comply with the requirements of this specification. The sample shall be constructed in the same facilities to be used for the manufacture of the production item. Examination and tests shall be those specified in Section 4. Any changes or deviations from the sample during production shall be subject to the approval of the contracting officer or his authorized representative. Approval of the sample shall not relieve the supplier of his obligation to furnish pallets conforming to this specification.

3.2 Materials. Materials shall be as specified herein.

3.2.1 Wood. Wood shall be of any of the species or combination thereof, within the group specified from MIL-STD-731 or ANSI/AITG A190.1. Unless otherwise specified (see 6.2), Style 1, Style 1A and style 1B pallets shall be constructed of woods from Group IV of MIL-STD-731 or Table 1 of ANSI/AITC A190.1. Style 2 pallets shall be constructed of woods from Groups I, II and III of MIL-STD-731 unless otherwise specified (see 6.2).

3.2.1.1 Quality of wood. Wood quality shall comply with the minimum requirements of MIL-STD-731 or ANSI/AITC A190.1. Wood shall be free of decay which can be detected visually or by abnormal brashness when picked with a sharp instrument. Lumber shall be free from insects, beetles, powder post beetle deterioration, and any other infestation at time of delivery, that may result in subsequent pallet destruction. To ensure that the pallet is completely free of the oak wilt fungus, all hardwood and softwood component parts shall be absolutely free from bark.

3.2.1.2 Moisture content. At the time of fabrication at the manufacturer's plant, the average moisture content of wood components for class 1 pallets shall conform to detailed requirements specified by MIL-STD-731 or ANSI/AITC A190.1 if laminated lumber is used. Moisture content for wood components for class 2 pallets is unrestricted. When water-borne salt treatment is used (Womanized or equivalent) moisture measurement shall comply with the requirements of paragraph 4.5.2.1.1 herein.

3.2.1.3 Preservative treatment. When specified, (see 6.2), pallets or finished wood parts thereof shall be completely immersed for a minimum of one

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minute in a solution of one of the following wood preservatives which shall be registered with the U.S. Environmental Protection Agency for the use intended:

- a. Copper naphthenate reduced with water down to 2% copper as metal (see 6.7), or
- b. Zinc naphthenate reduced with water down to 3% zinc as metal (see 6.6), or
- c. Copper-8-quinolinolate reduced with water down to 1.8% copper-8-quinolinolate as solution (see 6.3).

Alternatively, pallets or the finished wood parts thereof shall be completely flooded for a minimum of one minute with one of the preservatives as to inundate all interior and exterior surfaces (when finished wood parts are dipped). Care shall be exercised to assure complete coverage of all surfaces of the board. After the dip treatment, the pallets shall be air dried (or dried for an appropriate time in a kiln or oven) for a period of 24 hours minimum in a well ventilated area allowing full air circulation around all surfaces of the wood. The pallets must be dried prior to shipment. See paragraph 3.4.1 for identification of preservative treated pallets.

The pallet manufacturer shall provide a copy of the appropriate EPA approved preservative label(s) with each shipment. The label(s) shall provide the EPA registration numbers(s) and any precautionary instructions for use or handling of the treated wood products. (See 5.3)

3.2.1.3.1 Presence Copper Napthenate or Copper-8-Quinolinolate) Preservative. When treated with Copper naphthenate or Copper-8-quinolinolate the pallet shall show evidence of discoloration when tested as specified in 4.5.2.2.1.

3.2.1.3.2 Presence of Zinc Naphthenate Preservative. When treated with zinc naphthenate the pallet shall show evidence of discoloration when treated as specified in 4.5.2.2.2.

3.2.2 Fastners.

3.2.2.1 Style 1, 1A and 1B pallets. Nails shall be made of hardened steel, mechanically deformed (drive screw) type conforming to FF-N-105, type II, style 18 except that the nail point may be diamond [not longer than 5/32 inch (4 mm), or chisel provided the width does not exceed the wire diameter. Nails shall be helically threaded with a minimum of 4 flutes. Length and size of nails shall be as specified in Table I (See 6.2.1).

3.2.2.2 Style 2 pallets. The 2 inch (51 mm) and 2 1/2 inch (63 mm) nails shall be made of hardened steel, mechanically deformed (drive screw) type conforming to FF-N-105, type II, style 18. These nails shall be helically threaded with a minimum of 4 flutes. Size and use of nails shall be as specified in Table II. The 1 inch (25 mm) nails, when used, shall be of steel wire, cement coated, smooth shank, flat head, diamond point conforming to FF-N-105, type II, Style

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4, or chisel point conforming to the same specification. Staples, when used, shall be 3/16 inch (5 mm) crown width conforming to FF-N-105, type III, style 3. Length of staples shall be as specified in Table II. Staples shall pass through the boards and clinch. Length and size of roils shall be as specified in Table II (See 6.2.1).

3.3 Design and construction. Design and construction of pallets shall be as specified herein and in accordance with Figures 1, 1A, 1B and 2 as applicable. Assembly of type I pallets shall be in accordance with 3.3.3.1. Dimensions adopted by softwood lumber standard (see 6.4) are acceptable for pallets constructed from wood groups I and II of MIL-STD-731 with exception that post plus stringer board height of 3 3/4 inches (95 mm) minimum shall be maintained to provide entry for materials handling equipment.

3.3.1 Tolerances. Except as otherwise indicated herein, and on the applicable figure, tolerances shall be as specified in Figures 1, 1A, 1B and 2. Minimum allowable thickness of softwood lumber from groups I and II shall be restricted to the dimensional limitations of MIL-STD-731 for one inch (25 mm) nominal lumber in lieu of tolerances specified in Figures 1, 1A and 1B.

3.3.2 Details of components.

3.3.2.1 Deckboards. Deckboards shall be surfaced on the outside faces of the pallet. All deckboards shall be surfaced to a uniform thickness and end deckboards at top and bottom of pallet shall be free of wane on their outer edges. Pre-drilling of deckboards of assembled pallets is at the option of the supplier. Pre-drilling, when used, shall be accomplished with a 5/32 inch (4 mm) diameter drill. Deckboards of type II pallets shall be pre-drilled in accordance with above. Strap slots extending the length of the board shall be provided in the top deckboards as shown in figures 1, 1A and 1B.

3.3.2.2 Stringer boards. Stringer boards directly beneath the top deckboards shall be surfaced on one side to a uniform thickness.

3.3.2.3 Posts. Posts shall be finished or smooth sawn on both top and bottom to a uniform height. Outer faces of all outside posts shall be finished. Ends of posts shall be cut square with sides.

3.3.2.4 Fasteners. Fasteners used to assemble pallets shall be specified in

3.3.3 Fabrication of pallets.

3.3.3.1 Assembly. Pallets shall be assembled with fasteners specified in 3.2.2, and the requirements of Table I or II as applicable. Nails shall be driven in a staggered pattern. Staples shall be driven in two rows. splits caused by nailing shall be supported by additional fasteners. Fasteners shall be positioned not less than 3/4 inch (19 mm) from the end and one inch (25 mm) from the side edge of deckboards. The remaining fasteners shall be uniformly spaced between them. All fasteners bent in driving shall be removed or broken off below the surface and replaced. The heads of fasteners shall be driven down beneath the surface of the board.

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TABLE I. Pallet Assembly Construction Requirements, Style 1, 1A and 1B.

1. Assemble pallet in accordance with Figures 1, 1A or 1B as applicable.
2. For group III, IV and laminated woods fasten each top deckboard to stringer boards with 1 5/8 inch (41 mm) 11 gauge drive screw nail. For group I and II woods, 1½ inch (38 mm) 11 gauge drive-screw nails shall be used. For top deck boards 3 5/8 inch (92 mm) 3 1/2 inch (89 mm) for wood groups I and II] to 4 7/8 inches (124 mm), 5 to 6 7/8 inches (127 mm to 175 mm), and 7 to 8½ inches (178 mm to 216 mm) wide; 2, 3, and 4 nails, respectively shall be used at each joint.
3. Fasten top deckboard and stringer boards assembly to post with 3 1/4 inch (83 mm) 10 guage drive-screw nails. Use 3 nails for 3 5/8 inch (92 mm) and 5 5/8 inch (143 mm) posts; and 4 nails for 7 5/8 inch (194 mm) posts.
4. Fasten each bottom deckboard to posts with 2 1/4 inch (57 mm) 11 gauge drive-screw nails. Use 3 nails for 3 5/8 inch (92 mm) and 5 5/8 inch (143 mm) posts; and 4 nails for 7 5/8 inch (194 mm) posts.

 TABLE II. Pallet Assembly Construction Requirements, Style 2

1. Assemble pallet in accordance with Figure 2.
 2. Fasten each top deckboard to stringer boards with one inch (25 mm) staples or with one inch (25 mm) cement coated nails clinched. Use 4 staples or 3 nails for 3 1/2 through 4 5/8 inch (89 mm through 118 mm) wide deckboards and 6 staples or 4 nails for larger boards,
 3. Fasten top deck board and stringer board assembly to posts with three 2 1/2 inch (63 mm) 10 gauge drive-screw nails per posts.
 4. Fasten bottom deckboards to posts with three 2 inch (51 mm) 11 gauge drive-screw nails per posts.
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3.3.4 Positioning of components. Assembled pallets shall form a rectangle. All intermediate deckboards shall be parallel to the edges. Stringer boards and post shall not protrude on any side. All posts shall have the grain of the wood parallel to the length of the stringer boards and shall be positioned as shown on the applicable drawing.

3.4 Identification. When specified (see 6.2), type I pallets shall be branded or stenciled with the information shown in Figures 1, 1A, 1B, or 2, as applicable (see 6.5). If above identification is not required, unit packs of type I pallets (see Figure 3) and unit packs of type II pallets (see Figure 4) shall be identified as indicated in 5.3 and shall further include the stock number and contract number in letters 1/4 inch (6 mm) high (minimum).

3.4.1 Identification of preservative treated pallets (see 3.2.1.3). The letters "PA" shall be annotated on all pallets subjected to the Copper-8-quinolinolate preservative treatment. The letter "PB" shall be annotated on all pallets subjected to the zinc naphthenate preservative treatment. The letters "PC" shall be annotated on all pallets subjected to the copper naphthenate preservative treatment. The marking shall be on the outside of the center posts in letters one-inch minimum in height.

3.5 Workmanship. Assembled pallets shall be clean and properly assembled. Surfaces shall be smooth and free of splinters or damage. In addition, unassembled pallets shall be free of defects which may affect field assembly.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure that supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of section 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material."

4.2 Classification of inspection. Inspection shall be classified as follows:

- (a) First article inspection (see 4.3)
- (b) Quality conformance inspection (see 4.4)
- (c) Inspection of preparation for delivery (see 4.6)

4.3 First article inspection.

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4.3.1 Examination. The sample(s) shall be examined as specified in 4.5.1. presence of one or more defects shall be cause for rejection. A sample shall consist of either an assembled pallet or set of components necessary to assemble one (1) pallet.

4.3.2 Tests. Each sample shall be tested as specified in 4.5.2. Failure of any test shall be cause for rejection.

4.4 Quality conformance inspection.

4.4.1 Sampling. Sampling for examination and moisture content test (4.5.2.1) shall be in accordance with MIL-STD-105. A lot shall consist of all pallets, of one style, size type and class offered for acceptance at one time. A sample shall be either one (1) assembled pallet or the necessary components for assembling one (1) pallet. (See section 4.5.2.2. for sampling for presence of preservation.)

4.4.2 Examination. Samples selected in accordance with 4.4.1 shall be examined as specified in 4.5.1. Inspection shall be level II and the acceptable quality level (AQL) shall be 6.5 defects per hundred units for total defects and 2.5 defects per hundred units for major defects.

4.4.3 Tests. Samples selected in accordance with 4.4.1 shall be tested as specified in 4.5.2.1. Inspection level shall be S-2 with an AQL of 4.0 defects per hundred units. When preservation is required, presence of such will be tested according to section 4.5.2.2.

4.5 Inspection procedure.

4.5.1 Examination. Pallets, assembled or unassembled shall be examined, as applicable, for defects classified as follows:

MAJOR DEFECTS

101. Brittleheart (applicable to eucalyptus robusta species only).
102. Fasteners not correct type or pattern.
103. Incorrect species of wood or wood group.
104. Decay or evidence of insect infestation.
105. Not chamfered.
106. No preservative (if specified).
107. Incorrect marking information.
108. Any allowable defect or combination of defects occurring in a position that impairs strength of the pallet.
109. Strap slots missing (when required).
110. All wood components not absolutely free from bark.
111. Incorrect pallet or board dimensions.

MINOR DEFECTS

201. Defects or imperfections that interfere with the prescribed assembly.
202. Through checks, splits and shakes exceeding in length the width of the piece.
203. Wane (use class 2 of MIL-STD-731 for allowable defects).

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- 204. Warp.
- 205. Knots (use class 2 of MIL-STD-731 for allowable defects.
- 206. Cross grain (use class 2 of MIL-STD-731 for allowable defects.
- 207. Boards not surfaced where required.
- 208. Incorrectly applied or incorrect preservative.
- 209. Marking missing, illegible, or incorrect.
- 210. Protruding stringer boards or posts.
- 211. Intermediary deckboards not parallel to edge.

4.5.2 Test.

4.5.2.1 Moisture content. Moisture content for class 1 pallet components shall be accomplished using any method of ASTM-D-2016. Three determinations shall be made on each deckboard and stringer board, two near the ends and one at the center. The average shall represent the moisture content of the component. Failure to meet unit or average requirements shall cause rejection (see 3.2.1.2).

4.5.2.1.1 Moisture content of salt treated lumber. When salt treated lumber is used the moisture content shall be measured as specified in the oven-drying method of ASTM-D-2016. The test for verification of compliance with maximum water content requirements shall be accomplished on each batch of lumber treated. The test samples shall accompany the batch of lumber through each stage of treatment and drying. Samples shall be the same lumber species and exposed to the same processes as the batch they represent. Test data shall be detailed on data sheets (one for each batch) giving weights and test results in detail. Each sheet shall be certified by properly authorized treatment staff personnel to be true and accurate and shall be approved by the DCASMA inspector.

4.5.2.2 Presence of preservative.

A sample of 15 pallets shall be selected at random from each lot for this test. Four members (two cover assemblies and two base assemblies) of the pallets selected, shall be subjected to the test specified below. If one or more members fail to meet the applicable requirement (see 3.2.1.3.1), additional members from the pallet shall be tested. The pallet will be considered acceptable when a total of four individual members (two cover assemblies and two base assemblies) meet the applicable requirements. Failure of any pallet to comply with the requirements shall be cause for rejection of the lot.

4.5.2.2.1. Method of Test for Presence of Copper naphthenate or Copper-8-quinolinolate preservative.

Materials and Equipment. The materials and equipment required are as follows.

- a. Reagent (copper indicator). Dissolve 0.5 grams chrome azurol "S" concentrate (see 6.8) and 5.0 grams sodium acetate in 80 ml of distilled water and then dilute further to 500 ml total with distilled water.
- b. Sprayer. A common hand pump (fly/flit gun) sprayer type applicator shall be used.

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Test Procedure. Spray reagent solution evenly over surface of dried wood. A deep blue color reveals the presence of copper (from the preservative).

4.5.2.2.2 Method of Test for Presence of Zinc Naphthenate Preservative.

Materials and equipment. The materials and equipment required are as follows:

a. Reagents (Stock solutions)

- (1) 1 gram of potassium ferricyanide dissolved in 100 ml of distilled water.
- (2) 1 gram of potassium iodide dissolved in 100 ml of distilled water.
- (3) Starch indicator solution. Make a paste of 1 gram of soluble starch in about 5 ml of distilled water, add 100 ml of distilled water and boil for 1 minute with constant stirring. Cool. Note: This solution is subject to biodegradation and therefore should not be used longer than 3 days before a new batch is prepared.

b. Sprayer: A DeVilbiss No. 30 atomizer or equivalent.

Test procedure: Mix 10 ml each of the three stock solutions and pour into the atomizer (sprayer). Spray mixture evenly over surface of dried wood. The solution will cause the treated wood to turn a deep blue instantly while the untreated part will retain its original color.

4.6 Inspection of preparation for delivery.

4.6.1 Quality conformance inspection of pack.

4.6.1.1 Unit of product. For the purpose of inspection, a completed pack prepared for shipment shall be considered a unit of product.

4.6.1.2 Sampling. Sampling for examination shall be in accordance with MIL-STD-105.

4.6.1.3 Examination. Samples selected in accordance with 4.6.1.2 shall be examined for the following defects. Inspection level shall be S-2 with an AQL of 4.0 defects per hundred units.

110. Improper stacking
111. Improper strapping
112. Improper or poor marking
113. Contents per shipping unit is not correct

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5. PACKAGING

5.1 Preservation. Not applicable.

5.2 Packing. The pallet shall be packed level A, B, or C as specified (see

6.2). Shipments shall be made in carload or truckload lots when possible. For truckload lots, the maximum number of pallets in a unit pack shall be as shown in Figure 3. The actual quantity of pallets in each unit pack shall be marked

on each pack in accordance with MIL-STD-129. Nails shall be shipped in the required quantities with type II pallets. As allowance against loss or damage, a 10 percent increase in the number of nails shall be provided. These nails will be packaged in bags in accordance with MIL-B-117 and placed in the voids between the post of "made up pallet No.4" (see step IV of Figure 4). These bags shall be stapled in place in a manner to prevent opening in transit and shippage. As specified by step VI, Figure 4, two bags with copies of Figure 5 shall also accompany each shipment.

5.2.1 Type I assembled pallets. Type I assembled pallets shall be packed in accordance with Figure 3. Steel strapping shall be 1 1/4" X .035" (32 mm X .9 mm) conforming to Class 1, Type I, of QQ-S-781.

5.2.2 Type II unassembled pallets. Type II unassembled pallets shall be packed in accordance with Figure 4. Steel strapping shall be 1 1/4" X .035" (32 mm x .9 mm) conforming to Class 1, Type I, of QQ-S-781.

5.3 Marking. In addition to any marking required, marking for shipment shall be in accordance with MIL-STD-129.

The pallet manufacturer will ensure that each shipment of pallets treated with preservative is clearly labeled. This label will identify the potential hazards associated with handling the product and the appropriate personal protective equipment (gloves, clothing, respirator, etc.) to be used.

6. NOTES .

6.1 Intended use. The pallets described herein are for use in general materials handling operations in the military storage and distribution system both CONUS and OCONUS, wherever full 4-way entry is required by conventional mobile materials handling equipment. Pallets may be loaded wherever materials enter the supply system for storage purposes and may be shipped loaded from storage. pallets may be used for long term storage in both covered and uncovered areas.

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6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number, and date of this specification
- b. Style, size, type, and class of pallet required (see 1.2).
- c. When first article sample is not required (see 3.1.1).
- d. When preservative is required (see 3.2.1.3).
- e. Level of packing required (see 5.2).
- f. When pallets shall be constructed of woods other than specified (see 3.2.1).
- g. When marking is required (see 3.4).

6.2.1 Fastener complement. The following breakdown of the required fastener complement is provided for information purposes in ordering. Nominal length and diameter of metric sized nails may be used provided they meet all requirements of this specification and equal or exceed the characteristics of the inch units.

6.2.1.1 Style 1. 1A and 1B pallet fastener complement.

- (a) Nails 3 1/4 inches (83 mm) long - 30 nails per pallet required, approximate weight data: 73 nails per pounds (161 nails per kilogram), 42 pounds (18.6 kg) per 100 pallets.
- (b) Nails 2 1/4 inches (57 mm) long - 30 nails per pallet required, approximate weight data: 131 nails per pound (289 nails per kg), 23 pounds (10.4 kg) per 100 pallets.
- (c) Nails 1 5/8 inches (41 mm) long - 60 nails per pallet required, approximate weight data: 170 nails per pound (375 nails per kg), 36 pounds (16 kg) per 100 pallets.

6.2.1.2 Style 2 pallet fastener complement.

- (a) Nails 2 1/2 inches (63 mm) long - 27 nails per pallet required, approximate weight data: 95 nails per pound (210 nails per kg), 29 pounds (13 kg) per 100 pallets.
- (b) Nails 2 inches (51 mm) long - 27 nails per pallet required, approximate weight data: 147 nails per pound (324 nails per kg), 19 pounds (8.3 kg) per 100 pallets.
- (c) Staples. 144 required per pallet. 14,400 required per 100 pallets.
- (d) Nails one inch (25 mm) long - 96 nails per pallet required, approximate weight data: 1,252 nails per pound (2763 nails per kg), 8 pounds (3.5 kg) per 100 pallets.

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6.3 Copper-8-quinolinolate preservative, may be obtained from the Chapman Chemical Company, P.O. BOX 9158, Memphis, TN 38019 or from equivalent facility.

6.4 Softwood lumber standard. Product Standard 20-70 "American Softwood Lumber Standard", under the auspices of the Department of Commerce, changed the widths and thicknesses of softwood lumber. The changes did not effect hardwood lumber.

6.5 Pallet marking. Option to mark individual type I pallets with' "U.S." is provided for cases where marking is required when pallets are designated for the Mutual Assistance Program. Also, provision to mark manufacturer's identification is included in 3.4 when it may be needed on individual pallets.

6.6 Zinc Napthenate, for the 3 percent zinc as metal solution, may be obtained from the Mooney Chemicals Inc., 2301 Scranton Road, Cleveland, Ohio 44113-9988 or equivalent facility.

6.7 Copper Napthenate, for the 2% copper as metal solution, may be obtained from the Mooney Chemicals, Inc., 2301 Scranton Road, Cleveland, Ohio 44113-9988 or equivalent facility.

6.8 Chrome azurol "S" may be obtained from Eastman Chemical Co., Rochester, New York or equivalent facility.

CUSTODIANS:

Army-ME
Navy - SA
Air Force - 99

PREPARING ACTIVITY:

Navy - SA

PROJECT-3990-0184

REVIEW ACTIVITIES:

Army - AL, SM, EA, MD, AR
Navy - SA, OS
Air Force - 43, 69, 84
DLA - GS

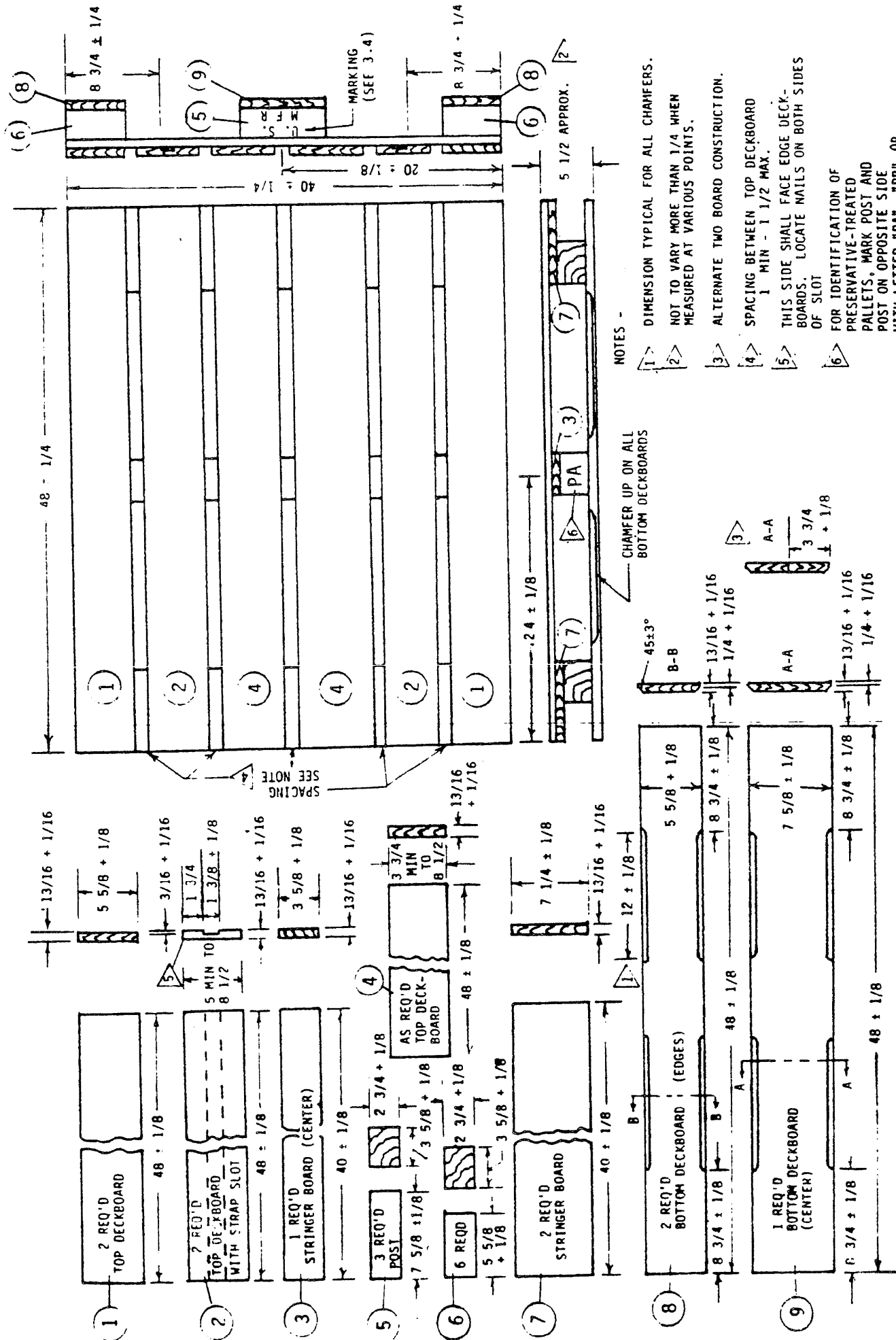
USER ACTIVITIES:

Army -
Navy - SA, YD, SH
Air Force -

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TABLE III. ENGLISH TO METRIC CONVERSION USE FOR FIG. 1, 1A,

<u>INCHES</u>	<u>MM</u>	<u>INCHES</u>	<u>MM</u>
1/16	2	7	178
1/8	3	7 1/4	184
5/32	4	7 5/8	194
3/16	5		
1/4	6	8	203
3/4	19	8 1/8	206
13/16	21	8 1/2	216
		8 3/4	222
1	25		
1 1/4	32	10 1/2	267
1 3/8	35		
1 1/2	38	11 1/4	286
1 5/8	41		
1 3/4	44	12	305
2	51	17 1/2	444
2 1/4	57		
2 1/2	63	20	508
2 3/4	70		
3	76	21	533
3 1/4	83		
3 1/2	89	22 3/4	578
3 5/8	92		
3 3/4	95	24	610
4 5/8	118		
5	127	26 1/2	673
5 1/2	140		
5 5/8	143	35	889
6 7/8	175	40	1016
		42	1067
		45 1/2	1156
		48	1219
		53	1346

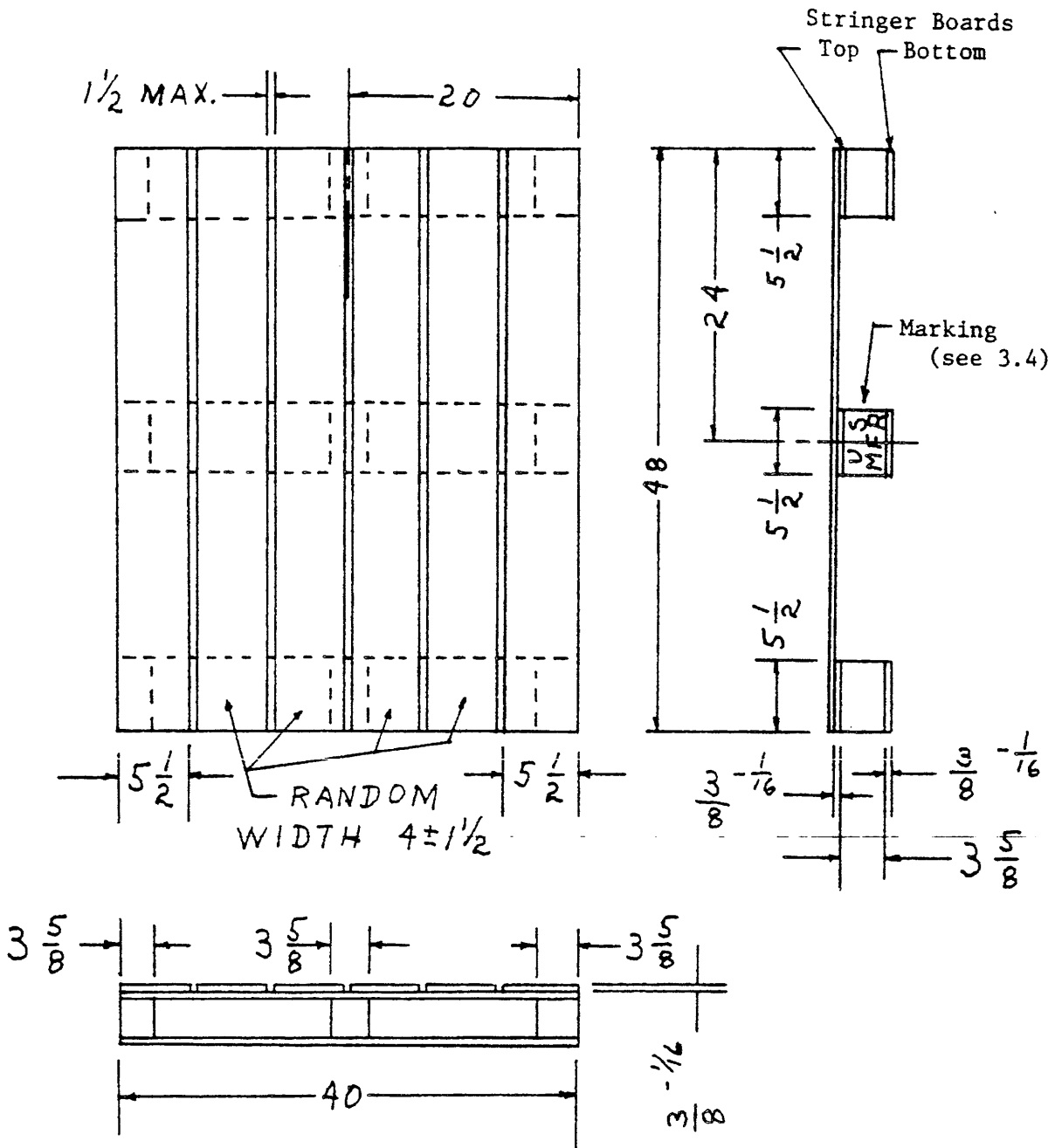


- NOTES -
1. DIMENSION TYPICAL FOR ALL CHAMFERS.
 2. NOT TO VARY MORE THAN 1/4 WHEN MEASURED AT VARIOUS POINTS.
 3. ALTERNATE TWO BOARD CONSTRUCTION.
 4. SPACING BETWEEN TOP DECKBOARD 1 MIN - 1 1/2 MAX.
 5. THIS SIDE SHALL FACE EDGE DECKBOARDS. LOCATE NAILS ON BOTH SIDES OF SLOT.
 6. FOR IDENTIFICATION OF PRESERVATIVE-TREATED PALLETS, MARK POST AND POST ON OPPOSITE SIDE WITH LETTER "PA", "PB" OR "PC" (SEE ¶ 3.4.1)

FIGURE 1 PALLET ASSEMBLY STYLE 1

ON STYLE 1 PALLETS SQUARENESS WILL BE CHECKED BY MEASURING THE TWO DIAGONALS ACROSS THE TOP. DIFFERENCE SHALL NOT EXCEED 3/4.

ALL DIMENSIONS are in inches. See table 3 for Metric Equivalent

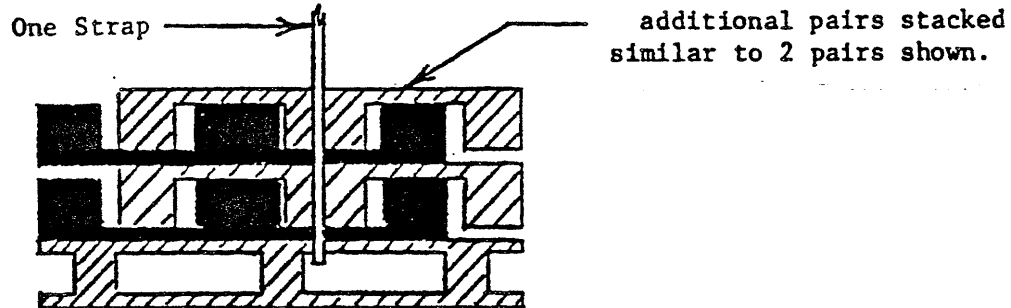


Dimensions in inches

Tolerances: $\pm 1/8$ unless otherwise specified

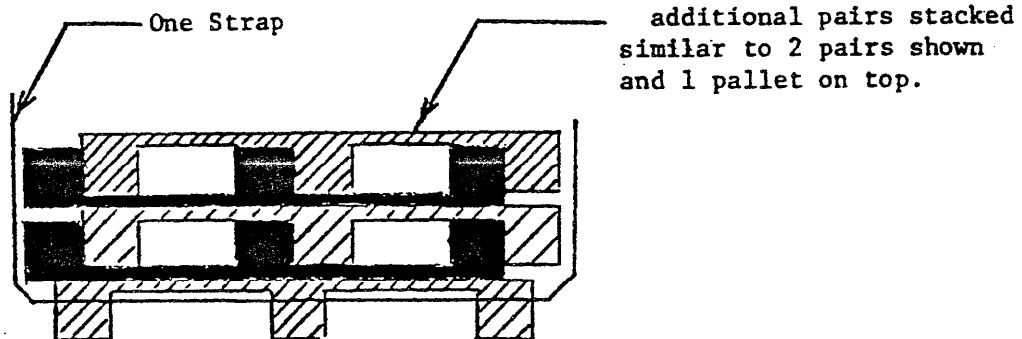
FIGURE 2; PALLET ASSEMBLY, STYLE 2

MIL-P-15011J

STYLE 1 PALLETS

Method of packaging pallets for delivery.
15 pallets per unit pack maximum.

1. Place 1 pallet in normal position.
2. Nest 2 pallets and position pairs as shown.
3. Strap using 1 1/4" (32mm) steel strapping.

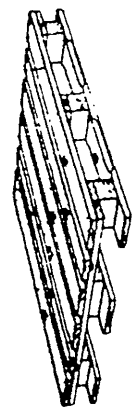
STYLE 2 PALLETS

Method of packaging pallets for delivery.
20 pallets-per unit pack maximum.

1. Place 1 pallet in normal position.
2. Nest 2 pallets and position pairs as shown.
3. Position 1 pallet on top.
4. Strap using 1 1/2" (32mm) steel strapping.

FIGURE 3. Packaging, Assembled Pallets

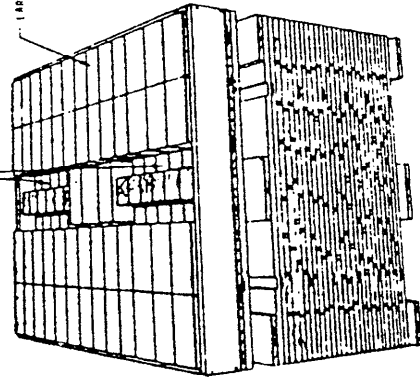
MARKING - EACH UNIT SHALL BE MARKED FOR SHIPMENT AS SPECIFIED IN MIL-STD 128. MARKING SHALL BE PERMANENT AND REPRODUCIBLE. MARKINGS IN THE AREA MOST SUITABLE FOR THE PURPOSE



STEP I

ASSEMBLE PALLET NOS. 4, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 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, 97, 98, 99, 100

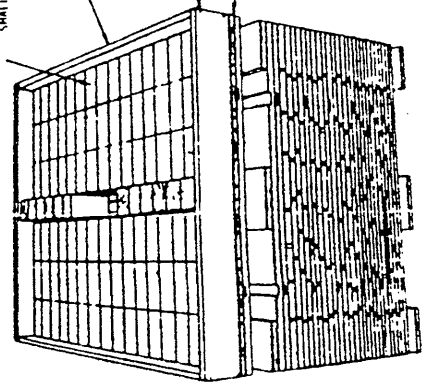
LOCATION FOR BAGS, TYPE 1, CLASS B OR MIL-B BAGS OF TYPE 11 PALLETS



STEP IV

THE LARGED POSTS SHALL BE NEEDED AND PLACED ON THE SMALL POSTS WITHIN THE FRAME AS SHOWN

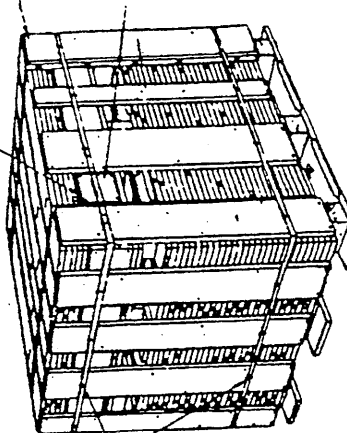
STRINGERS FOR PALLET NOS. 7, 8, 9, 10, 11, 12, 13, 14 AND SURPLUS STRINGERS FOR PALLET NOS. 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 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, 97, 98, 99, 100



STEP III

A FRAME, HAVING OVERSIZING DIMENSIONS OF 40" X 40" X 5 5/8", SHALL BE PLACED ON PALLET NO. 4. THE FRAME SHALL BE CONSTRUCTED OF NOMINAL 1" CUMBER COMPONENTS OF THE FRAME JOINT NOT COMPONENTS OF THE PALLET. THE SMALLER WOOD PILES SHALL BE NEEDED AND PLACED BETWEEN THE FRAME ON THE DECK BOARDS OF PALLET NO. 4 AS SHOWN

FRAME, HAVING OVERSIZING DIMENSIONS OF 40" X 40" X 5 5/8", SHALL BE PLACED ON PALLET NO. 4. THE FRAME SHALL BE CONSTRUCTED OF NOMINAL 1" CUMBER COMPONENTS OF THE FRAME JOINT NOT COMPONENTS OF THE PALLET. THE SMALLER WOOD PILES SHALL BE NEEDED AND PLACED BETWEEN THE FRAME ON THE DECK BOARDS OF PALLET NO. 4 AS SHOWN



STEP VI

PALLET AS MAKE RANDOM WIDTH BOARDS AS NECESSARY TO THE SIDES AND ENDS OF EACH BUNDLE OF 20 PALLET TO KEEP ALL DECK BOARDS IN CONTACT AS SHOWN. RANDOM WIDTH BOARDS SHALL HAVE NOT LESS THAN TWO (2) STRIPS 1/2" IN WIDTH. THESE BOARDS ARE NOT COMPONENTS OF THE PALLET. SPACING BETWEEN BOARDS SHALL NOT EXCEED 3/4"

FIGURE 5 IS TO BE USED IN THE CONSTRUCTION OF THE PALLET AS SHOWN

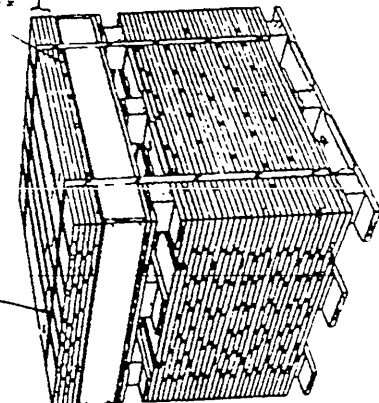
MADE UP PALLET NO. 4

MADE UP PALLET NO. 70

STEP II

PALLETS SHALL BE STACKED IN SERIES OF 3. DECK BOARDS FOR THE FIRST SERIES OF 3 PALLETS, NOS. 19, 18, 17, 16, AND THIS FIRST SERIES ON WOOD PILES SHALL BE PLACED ON THE DECK BOARDS AS SHOWN. DECK BOARDS FOR THE NEXT SERIES OF 3 PALLETS SHALL THEN BE PLACED ON THE STRINGERS. STRINGERS FOR THIS SERIES OF PALLET PLUS SURPLUS STRINGERS FROM THE PREVIOUS SERIES OF PALLET SHALL BE STACKED AS SHOWN. TO THROUGH 5, INCLUSIVE MADE UP PALLET NO. 4 SHALL THEN BE PLACED ON TOP OF THE STRINGERS AS SHOWN

STEEL STRAP, 1 1/4" X .035", CONFORMING TO SPEC. (MIL-STD-178) PARAGRAPH 5.



STEP V

STRINGERS FOR THE REMAINING SERIES OF THREE PALLETS SHALL BE PLACED ON TOP OF THE STRINGERS. EACH STACK OF 20 PALLETS SHALL BE STABILIZED WITH TWO STRAPS AS SHOWN

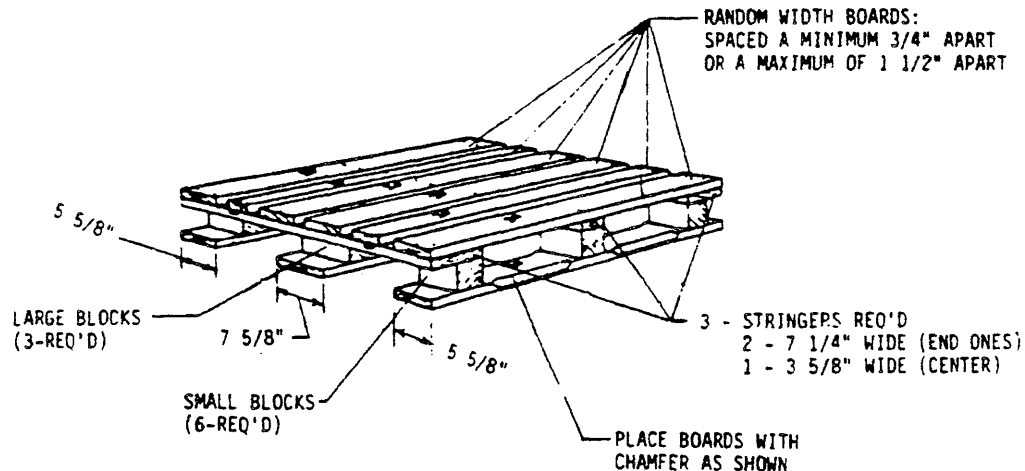
STRINGERS FOR PALLET NOS. 3, 2, 1

DECK BOARDS FOR PALLET NOS. 3, 2, 1

STEEL STRAP, 1 1/4" X .035", CONFORMING TO SPEC. (MIL-STD-178) PARAGRAPH 5.

NOTE: THIS DRAWING IS TO BE USED AS A PACKING GUIDE ONLY

FIGURE 4 TYPE 11 PALLETS, UNASSEMBLED, WOOD, 4-WAY ENTRY, GENERAL STORAGE, METHOD OF PACKING 20 PALLETS FOR DOMESTIC AND OVERSEAS SHIPMENTS



ERECTION INSTRUCTIONS

- STEP 1 - REMOVE THE DUNNAGE AND STRAPS HOLDING THE UNASSEMBLED PALLETS
- STEP 2 - REMOVE THE BOARDS FOR THREE PALLETS. NOS. 1, 2, & 3, AND KEEP ALL LIKE MEMBERS TOGETHER.
- STEP 3- REMOVE PALLET NO. 4 AND THE FRAME CONTAINING ALL THE BLOCKS AT THE SAME TIME. THE BLOCKS ARE NOT MARKED. SIX SMALL AND 3 LARGE BLOCKS ARE REQ'D) FOR EACH PALLET.
- STEP 4 - ASSEMBLE REMAINING PALLET PARTS. THEY ARE STACKED IN SEQUENCE.

NAILING SCHEDULE

WIDTH OF BOARD IN INCHES	NO. OF NAILS AT EACH BEARING POINT
3 5/8 to 4 7/8	2
5 to 6 7/8	3
7 to 8 1/2	4

USE 1 5/8 1 5/8 LONG NAILS WHEN NAILING THROUGH DECKBOARDS INTO STRINGER BOARDS.

USE 3 1/4 INCH LONG NAILS WHEN NAILING TOP DECKBOARDS AND STRINGER BOARD ASSEMBLY INTO POSTS.

USE 2 1/4 INCH LONG NAILS WHEN NAILING BOTTOM DECKBOARDS INTO POSTS.

NOTE : TO BE USED IN CONJUNCTION WITH FIGURE 4, METHOD OF PACKING PALLETS.

FIGURE 5 - ERECTION INSTRUCTIONS FOR TYPE II PALLETS, UNASSEMBLED, WOOD, 4-WAY ENTRY, GENERAL STORAGE

