

MIL-B-12233E
31 December 1986
SUPERSEDING
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MILITARY SPECIFICATION

BAGS, SAND: BURLAP AND COTTON

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

1. SCOPE

1.1 Scope. This document covers burlap and cotton sand bags.

1.2 Classification. Sand bags shall be of the following classes as specified (see 6.2):

- Class A - Jute or kenaf burlap
- Class B - Cotton osnaburg
- Class C - Cotton canvas duck
- Class D - Reclaimed cotton canvas (duck)

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Documents. The following documents form a part of this document 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, deletions) and any pertinent data which may be of use in improving this document should be addressed to: U.S. Army Natick Research, Development, and Engineering Center, Natick, MA 01760-5014 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 8105

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SPECIFICATIONS

FEDERAL

- L-P-378 - Plastic Sheet and Strip, Thin Gauge Polyolefin.
- T-R-571 - Rope; Cotton.
- T-T-616 - Treatment; Mildew-Resistant, for Rope and Cord.
- V-T-276 - Thread, Cotton.
- V-T-285 - Thread, Polyester.
- V-T-295 - Thread, Nylon.
- FF-N-105 - Nails, Wire, Brads, and Staples.
- NN-P-71 - Pallets, Material Handling, Wood, Stringer Construction 2-Way and 4-Way (Partial).
- QQ-S-781 - Steel, Strapping, Flat.
- RR-S-366 - Sieve, Standard for Testing Purposes.
- CCC-C-419 - Cloth, Duck, Cotton, Unbleached, Plied-Yarns Army and Numbered.
- CCC-C-429 - Cloth, Osnaburg, Cotton.
- CCC-C-467 - Cloth, Burlap, Jute (or Kenaf).
- MMM-A-250 - Adhesive, Water-Resistant (for Sealing Fiberboard Boxes).
- MMM-A-260 - Adhesive, Water-Resistant (for Sealing Waterproofed Paper).
- PPP-B-601 - Boxes, Wood, Cleated-Plywood.
- PPP-B-636 - Boxes, Shipping, Fiberboard.
- PPP-B-640 - Boxes, Fiberboard, Corrugated, Triple-Wall.
- PPP-B-1055 - Barrier Material, Waterproof, Flexible.
- PPP-F-320 - Fiberboard; Corrugated and Solid Sheet Stock (Container Grade), and Cut Shapes.

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- MIL-T-3530 - Thread and Twine; Mildew-Resistant or Water Repellent Treated.
- MIL-F-46032 - Fungus-Resistant Treatment for Sandbags; Copper Processes.

STANDARDS

FEDERAL

- FED-STD-595 - Colors.
- FED-STD-751 - Stitches, Seams, and Stitchings.

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- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-129 - Marking for Shipment and Storage.

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(Copies of documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Other publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted shall be those listed in the issues of the DODISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS shall be the issues of the nongovernment documents which are current on the date of the solicitation.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D 3951 - Standard Practice for Commercial Packaging

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

(Technical society and technical association documents are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document shall take precedence. Nothing in this document, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Materials and components. Materials (see 6.3) and components shall be as specified herein.

3.1.1 Cloth, burlap or jute (kenaf). The jute or kenaf burlap for class A bags shall conform to class 3 of CCC-C-467.

3.1.2 Cloth osnaburg cotton. The osnaburg cotton cloth for class B bags shall conform to class 2, 6.8 ounces per square yard of CCC-C-429. Equivalent cotton osnaburg cloth containing not more than 7 percent rayon may be used.

3.1.3 Cloth, duck, cotton. Cloth cotton duck for class C bags shall conform to type III, 14.80 ounces per square yard of CCC-C-419. For class D bags, serviceable reclaimed cotton canvas (duck) salvaged from unservicable equipment shall conform to any type duck of CCC-C-419 weighing 18 ounces or more per square yard.

3.1.4 Thread.

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3.1.4.1 Cotton. The thread shall conform to type IIIB of V-T-276 for class C or D bags. Thread sizes shall be ticket No. 10, 5 ply for needle and ticket No. 10, 3 ply for looper. Black polypropylene thread, 1050 denier size, 140 filament may be substituted for class A and B bags.

3.1.4.2 Polyester. Alternatively, polyester thread conforming to type I or II, class 1, sub-class A of V-T-285 may be used for class C or D bags. The thread size shall be F for needle and E for looper.

3.1.4.3 Nylon. The nylon thread shall conform to type II or III, size F for needle and E for looper, color black of V-T-295 for class A and B bags. This thread may also be used as an alternate for class C and D bags.

3.1.5 Tie string. The tie string for class C and D bags shall conform to class 2, 1/8 inch diameter rope of T-R-571 with the ends, water-insoluble resin-dipped or tied to prevent ravelling. For class A and B bags, the tie strings (rope) shall be 3 ply jute twine with a minimum breaking strength of 60 pounds. All tie strings shall be not less than 24 inches in length.

3.2 Construction.

3.2.1 Bag, sand. Bags shall be made of one piece of cloth. Cloth shall be cut to produce a bag with two sewed sides, or one sewed side and a sewed bottom. Seams shall be on the outside and tie strings shall be on the inside. The bag will be inverted inside out prior to filling by user.

3.2.2 Stitches, seams and stitching. All stitching shall conform to FED-STD-751. Seams shall be tightly, strongly, and uniformly sewn. The stitching shall be straight, uniform, even, and continuous throughout the length of the seams with the ends of the stitching secured and terminating in a chain extending from 1 to 3 inches beyond the ends of the seams.

3.2.2.1 Type 401 stitching. Types of stitching shall be as shown in table I, using no less than 3-1/2 stitches per inch with thread as specified in 3.1.4.

TABLE I. Stitches and seams

Class (bag)	Raw edges	Selvages
A	401-SSd-1 or 401-SSn-1 (cut edges) or 401-SSn-1	401-SSa-1 or 401-SSd-1
B	401-SSa-1 or 401-SSd-1	401-SSa-1 or 401-SSd-1
C	401-SSa-2 or 401-SSc-2	401-SSa-2 or 401-SSc-2
D	401-SSa-2 or 401-SSc-2	401-SSa-2 or 401-SSc-2

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3.2.3 Seam repair. Defects in seams shall be repaired by initiating a new seam beginning in a lockstitch chain which catches the fabric of the bag edge 3 inches before the defect, crosses the original stitching of the seam, continues parallel to the stitching inside the seam, then recrosses the original stitching, and ends in a lockstitch chain off the bag edge not less than 3 inches beyond the defect. The lockstitch chain shall be from 1 to 3 inches in length.

3.2.4 Tie string fastening. The tie string shall be securely fastened to the sandbag by catching the approximate center of the string in the stitches of a sewn side seam, $3 + 1/2$ inches from the top of the bag. The tie string shall be placed on the inside of the bag.

3.2.5 Additional tie strings. A minimum of 20 extra loose tie strings shall be furnished with each 100 bags.

3.2.6 Drop resistance. When subjected to the drop test specified in 4.3.1, the bag shall not spill or expose the contents, nor show any break in the fabric or thread.

3.2.7 Mildew-resistance and color. Rope, twine, cotton thread, and fabric used in the fabrication of bags shall be mildew-resistant treated as specified in 3.2.7.1, 3.2.7.2, and 3.2.7.3. The color of the mildew-resistant treated materials shall approximate any of the following colors of FED-STD-595: 30045 through 30108, 30117 through 30166, 30219, 34052, and 34079 through 34128. The mildew-resistant treatment and coloration or dye shall thoroughly impregnate the material and shall not weaken the bags or cause the bags to stiffen or stick together.

3.2.7.1 Mildew-resistant-treatment for rope. Rope shall be mildew resistant treated in accordance with T-T-616.

3.2.7.2 Mildew-resistant treatment for twine and thread. Jute twine and cotton thread shall be mildew-resistant treated in accordance with type I, class 1 of MIL-T-3530 except that not less than 0.4 percent copper as metal from the inhibitor shall be used. Polypropylene thread need not be treated.

3.2.7.3 Mildew-resistant treatment for fabric. Fabric shall be mildew-resistant treated in accordance with type II, of MIL-F-46032.

3.2.8 Dimensions. Finished bags shall have an overall interior length of $26 - 1/2$ inches, plus $2 - 1/2$ inches or minus 3 inches, and an overall interior width of 14 inches, plus or minus $1 - 1/2$ inches. The finished bags shall be uniform in shape and size.

3.2.9 Class A bags. The top of the class A bags (see 3.1.1) shall have either a selvage edge or a hem. The hem shall be on the outside of the finished bag. A $1/4$ inch lap of material beyond the stitching of the hem shall be

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provided. When cloth with cut edges is used to form the sides or bottom, the lap of the seam shall be not less than 3/8 inch.

3.2.10 Class B bags. The top of the class B bags (see 3.1.2) shall have either a selvage edge or a hem. When cloth with raw edges is used to form the sides or bottom, the seams shall be uniform throughout their entire length so that not less than 1/2 inch of fabric shall extend beyond the stitching. Cloth shall be cut squarely across the weave to prevent excessive raveling of raw edges.

3.2.11 Classes C and D bags. The tops of both class C and D bags (see 3.1.3) shall have either a selvage edge or a hem. When raw edges are used to form the sides or bottom of the bag, both plies of material shall extend not less than 1/2 inch beyond the stitching. Cloth shall be cut squarely across the weave to prevent excessive raveling of raw edges.

3.3 Workmanship. Bags shall be free of holes, tears, punctures, and other defects which may affect serviceability. Bags shall be both dry and flexible, and shall be uniform in appearance. Individual bags shall be uniform in color. Seams shall be straight and even.

4. QUALITY OF ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use 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 document where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this document shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the document 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.

4.1.2 Responsibility for dimensional requirements. Unless otherwise specified in the contract or purchase order, the contractor is responsible for assuring that all specified dimensions have been met. When dimensions cannot be examined on the end item, inspection shall be made at any point, or at all points in the manufacturing process necessary to assure compliance with all dimensional requirements.

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4.2 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with MIL-STD-105.

4.2.1 Component and material inspection. In accordance with 4.1, components and materials shall be inspected in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified, or qualified in this document or applicable purchase document.

4.2.2 End item visual examination. The end item shall be examined for defects listed in table II. The lot size shall be expressed in units of bags. The sample unit shall be one finished bag with tie string attached. The inspection level shall be I and the acceptable quality level (AQL), expressed in terms of defects per hundred unit, shall be 1.0 for major defects and 2.5 for total (major and minor combined) defects.

TABLE II. End item visual defects

Examine	Defect	Classification	
		Major	Minor
Fabric	Not as specified.	X	
	Color not as specified.	X	
Tie strings	Not as specified or not securely fastened in specified location.	X	
Stitching, seam and stitch type	Not as specified.	X	
	Not uniform and complete over entire area of seams.		X
Construction and workmanship	Bag not one piece construction	X	
	Hole, tear, or puncture in bag.	X	
	Stitching not ending in a chain extending 1 to 3 inches beyond seam end.		X
	Hem not located as specified.		X
	Seams of hem not on outside.		X
	Materials lap at hem incorrect.		X
	Shape and size not uniform.		X
	Bag stiff or sticky.		X
	Dirty, damp, or inflexible.		X
	Bag not uniform in color.		X

4.2.3 End item dimensional examination. The end item shall be examined for dimensions specified in 3.2.8. Any dimension not within specified tolerance shall be classified as a defect. The lot size shall be expressed in units of bags. The sample unit shall be one finished bag. The inspection level shall

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be S-2 and the AQL, expressed in terms of defects per hundred units, shall be 2.5.

4.2.4 End item testing. The end item shall be drop tested as specified in 4.3.1 for conformance to the requirements in 3.2.6. The lot size shall be expressed in units of bags. The sample unit shall be one finished bag. The inspection level shall be S-2 and the AQL, expressed in terms of defects per hundred units, shall be 2.5.

4.2.5 Packaging examination. The fully packaged end items shall be examined for the defects listed in table III. The lot size shall be expressed in units of shipping containers. The sample unit shall be one shipping container fully packaged. The inspection level shall be S-2 and the AQL, expressed in terms of defects per hundred units, shall be 2.5.

TABLE III. Packaging defects

Examine	Defect
Marking	Omitted; incorrect; illegible; of improper size, location, sequence, or method of application.
Materials	Any component missing, damaged, or not as specified. Polyethylene sheet not placed over pallet under first course of bundles or not covering outside edges of bottom course for class A and B bags. Fiberboard bottom protectors not in position for palletized class A and B bags. Fiberboard edge protectors (under strapping) missing or incomplete for palletized class A and B bags. Palletized load not constructed of compact and uniform bundles and the bundles not uniformly stacked on the pallet for class A and B bags. Plastic bag not in place for palletized load of class A and B bags. (Level A packing only) Fiberboard pad not placed between top of palletized load and bag shroud for class A and B sandbags. Fiberboard cover not sealed with adhesive as required as figure 2.
Contents	Number per container not as specified. Not boxed or wrapped as specified.

4.3 Methods of inspection.4.3.1 Drop test.

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4.3.1.1 Apparatus and sand. The drop tester used must (a) fully support the bag before the drop, (b) permit accurate pre-positioning of the bag to assure a true fall and impact at the exact place and in the direction desired, (c) permit accurate control of the drop height, (d) have a spring-loaded arm or lever to permit an absolutely free, unobstructed fall, and (e) provide an impact surface of solid concrete, or steel of sufficient mass to absorb all shock without deflection. The sand used shall be clean, dry Ottawa sand (pass through a No. 20 sieve and be retained on a No. 30 sieve). Sieves shall conform to RR-S-366.

4.3.1.2 Procedure. Fill the bag with 44 pounds of sand. Firmly knot the tie string about the choke and distribute the sand evenly throughout the bag. If necessary, tighten the tie string and redistribute the contents after each drop. The test shall consist of two drops of the bag from the height specified in 4.3.1.3 or 4.3.1.4. The first drop shall be on either the front or back face. The second drop shall be on a side seam.

4.3.1.3 Class A, B, and C bags. Class A, B, and C bags shall be dropped from a height of 4 feet onto faces and sides.

4.3.1.4 Class D bags. Class D bags shall be dropped from a height of 4 feet onto the faces, sides, and bottoms.

4.3.1.5 Failure. Exposure of contents, spillage of contents, or any break in the fabric or thread after any drop shall constitute failure of this test.

5. PACKAGING

5.1 Preservation. Preservation shall be level A or Commercial as specified (see 6.2).

5.1.1 Level A.

5.1.1.1 Class A and B bags. Bags of like description with individual tie strings placed inside each bag or folded to lay inside the package, shall be squarely stacked flatwise in quantities of 100 with the additional 20 (maximum) tie strings placed in the top bag. In unit packaging the class A bags, two packs of approximately five bags (4-6) each shall be folded lengthwise and placed in the center of each unit pack, from bottom to top, placement of the folded bags shall be between the 19th and 25th bag and the 69th and 75th bag. Including the two unit packs of five bags folded lengthwise, each unit pack shall contain 100 bags. Each stack shall be closely compressed to form a flat bundle and secured while under compression with a girthwise tie located at the center of the bundle. Ties shall be jute twine having a minimum breaking strength of 260 pounds or black polypropylene twine having a minimum breaking strength of 100 pounds, and shall be tied with a square knot. Length and width of the package shall be equal to the outside measurements of the flat bag with a tolerance of plus 1-1/2 inches in length and plus 1-1/2 inches in width.

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5.1.1.2 Class C and D bags. Bags of like description shall be unit packed together in quantities of 25 bags, with five additional tie strings, in a close-fitting box conforming to W5c, style optional of PPP-B-636 or wrapped with paper conforming to class B-1 or B-2 of PPP-B-1055. All folds, seams, and laps of the wrap shall be sealed with adhesive conforming to MMM-A-260.

5.1.2 Commercial. Bags of like description shall be preserved in accordance with ASTM D 3951.

5.2 Packing. Packing shall be level A, B, or Commercial, as specified.

5.2.1 Level A packing.

5.2.1.1 Class A and B bags. Bags of like description preserved as specified in 5.1, shall be bundled together to form a flat pack of 200 bags by placing one unit pack atop the other. Each bundle shall be tightly compressed with a minimum total pressure of 1,000 pounds on the entire area of the bag (2.5 psi). While under pressure, each bundle shall be strapped with two girthwise and one lengthwise straps conforming to type I, class B, 3/8 inch by 0.015 inch of QQ-S-781. Girthwise straps shall be applied approximately 5 inches from each end of the bundle. The lengthwise strap shall be centered on the bundle. Length and width of the bundle shall be equal to the outside measurements of the flat bag within a tolerance of plus 1-1/2 inches in length and plus 1-1/2 inches in width. Bundles prepared as described above shall be palletized and covered in accordance with figures 1 and 2.

5.2.1.2 Class C and D bags. Bags of like description, preserved as specified in 5.1, shall be unit packed together in close-fitting boxes conforming to overseas type, style optional of PPP-B-601. The net load in each box shall not exceed 1,000 pounds. Boxes shall be strapped in accordance with the appendix to the box specification. Strapping shall be zinc coated.

5.2.2 Level B packing.

5.2.2.1 Class A and B bags. Bags bundled as described in 5.2.1.1 shall be palletized as shown in figures 1 and 2 except that the plastic bag shall not be required.

5.2.2.2 Class C and D bags. Bags of like description preserved as specified in 5.1.1.2 shall be unit packed together in close-fitting boxes conforming to class 2, grade A, style E of PPP-B-640. Closure and strapping shall be in accordance with the appendix to the box specification. Strapping shall be zinc coated.

5.2.3 Commercial packing. Bags preserved as specified in 5.1, shall be packed in accordance with ASTM D 3951.

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5.3 Marking. In addition to any special marking required by the contract or purchase order, unit packs, shipping containers, and palletized unit loads shall be marked in accordance with MIL-STD-129 or ASTM D 3951, as applicable.

6. NOTES

6.1 Intended use. Class A, B, and D bags are intended for use in the construction of field fortifications. Class C bags are intended for use in stabilizing the 4.2-inch chemical mortar base.

6.2 Ordering data. Acquisition documents should specify the following:

- a. Title, number, and date of this document.
- b. Class of bag required (see 1.2).
- c. Selection of applicable preservation and packing (see 5.1 and 5.2).

6.3 Recycled material. It is encouraged that recycled material be used when practical as long as it meets the requirements of this document (see 3.1).

6.4 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

6.5 Subject term (key word) listing.

Bags, sand
Burlap
Cotton
Reclaimed cotton canvas

Custodians:

Army - GL
Air Force - 69

Preparing activity:

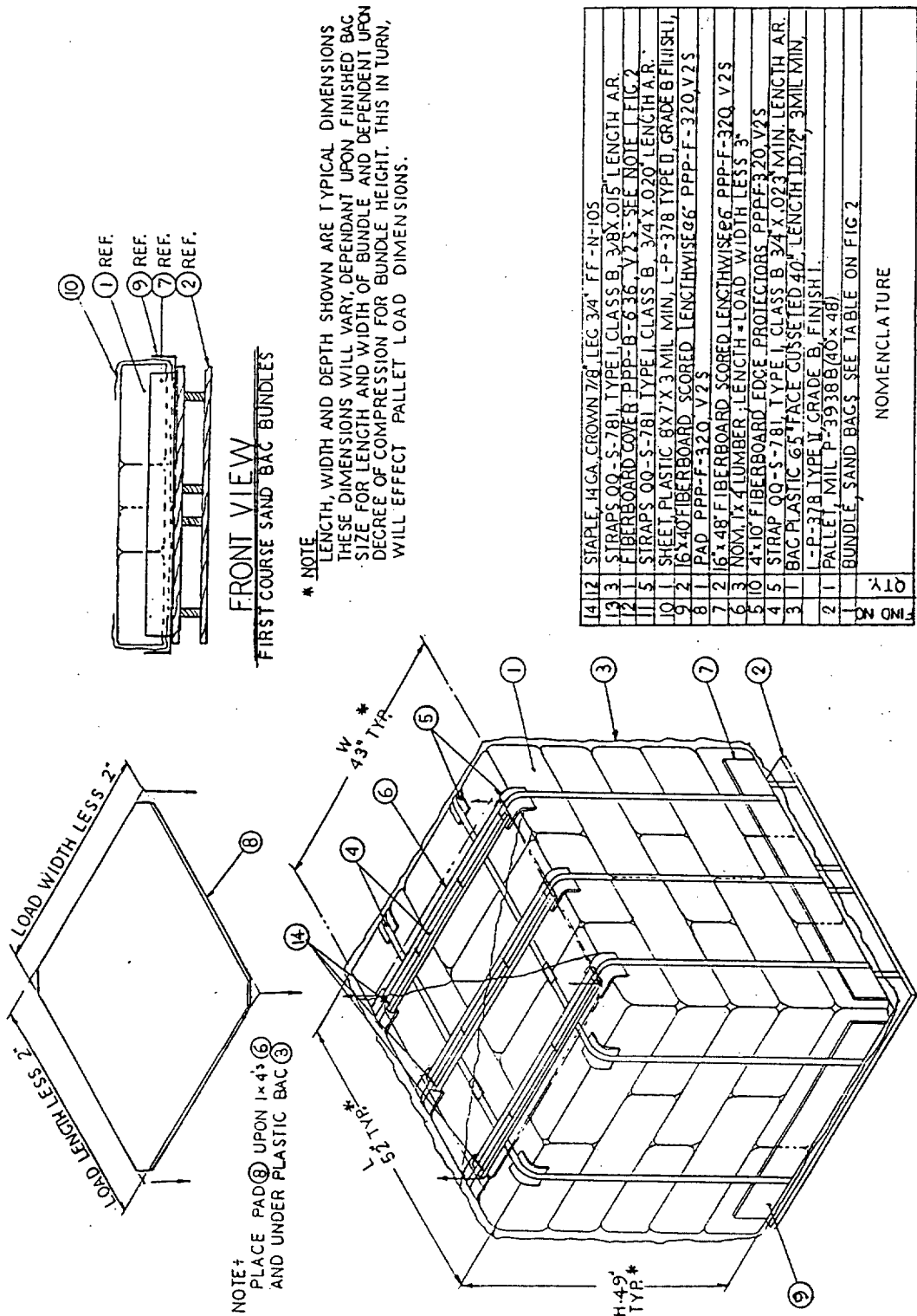
Army - GL

Project No. 8105-0306

Review activity:

Air Force - 84

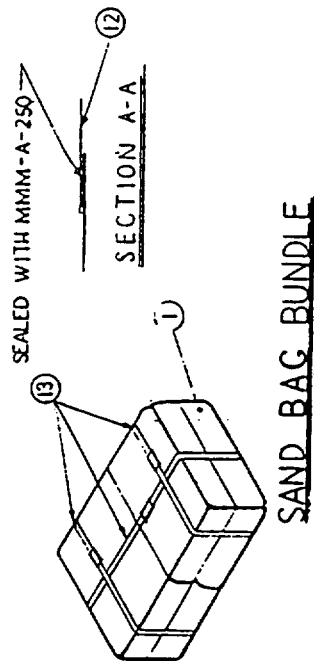
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SAND BAG PALLETIZATION
CLASS A & B SANDBAGS

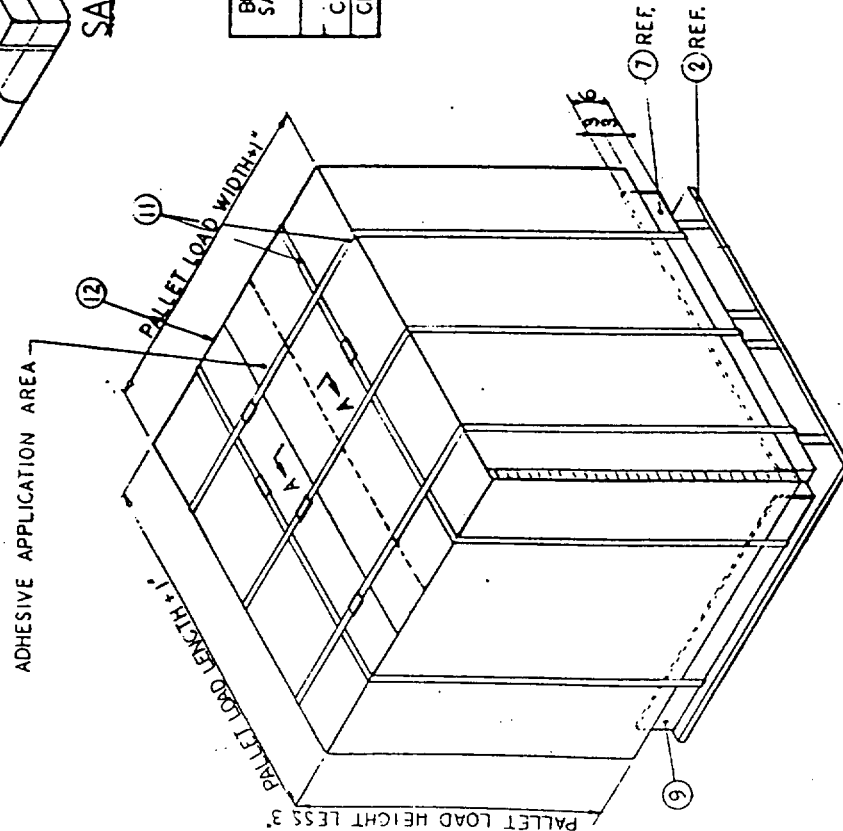
FIG. 1

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BUNDLED SAND BAGS	BUNDLES OF 200 BAGS PER COURSE	COURSES PER PALLET
CLASS A	1	5
CLASS B	1	3

NOTES:
 1- HALF SLOTTED CONTAINER WITHOUT BOTTOM WITH 6" OVERLAP OF LENGTHWISE FLAPS OF TOP, TOP FLAPS TO BE SEALED WITH ADHESIVE CONFORMING TO MMM-A-250 PRIOR TO PLACEMENT OF COVER OVER PALLET LOAD. DIMENSIONS VARY WITH PALLET LOAD DIM. SEE NOTE FIG. 1
 2-FOR FIND NO 11 AND NO 12 SEE FIG. 1



FIBERBOARD COVER
 FOR
 PALLETIZED SAND BAGS, CLASS A & B
 FIG. 2

DX1091

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER MIL-B-12233E		2. DOCUMENT TITLE BAGS, SAND: BURLAP AND COTTON	
3a. NAME OF SUBMITTING ORGANIZATION		4. TYPE OF ORGANIZATION (Mark one)	
b. ADDRESS (Street, City, State, ZIP Code)		<input type="checkbox"/> VENDOR	
		<input type="checkbox"/> USER	
		<input type="checkbox"/> MANUFACTURER	
		<input type="checkbox"/> OTHER (Specify): _____	
5. PROBLEM AREAS			
a. Paragraph Number and Wording:			
b. Recommended Wording:			
c. Reason/Rationale for Recommendation:			
6. REMARKS			
7a. NAME OF SUBMITTER (Last, First, MI) - Optional		b. WORK TELEPHONE NUMBER (Include Area Code) - Optional	
c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional		8. DATE OF SUBMISSION (YYMMDD)	