

INCH-POUND

MIL-P-236J
 6 May 1992
 SUPERSEDING
 MIL-P-236H
 18 December 1985

MILITARY SPECIFICATION
 PIPE, CULVERT, NESTABLE

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

1. SCOPE

1.1 Scope. This specification covers flanged and notched galvanized steel, and aluminum alloy nestable culvert pipe in diameters of 8-inches through 84-inches.

1.2 Classification. Nestable culvert pipe shall be of the following types, classes, and sizes as specified (see 6.2):

Type I - Flanged (see figure 1)
 Type II - Notched (see figure 2)

Class 1 - Zinc-coated (galvanized) steel
 Class 2 - Aluminum alloy

Diameter sizes:

8-inch	36-inch	66-inch
12-inch	42-inch	72-inch
18-inch	48-inch	84-inch
24-inch	54-inch	
30-inch	60-inch	

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: USA Belvoir Research, Development, and Engineering Center, ATTN: STRBE-TSE, Fort Belvoir, VA 22060-5606 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A
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 distribution is unlimited.

FSC 4710

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2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

FEDERAL

- FF-B-575 - Bolts, Hexagon and Square.
- FF-N-105 - Nails, Brads, Staples, and Spikes: Wire, Cut and Wrought.
- FF-N-836 - Nut: Square, Hexagon, Cap, Slotted, Castle, Knurled, Welding and Single Ball Seat.
- FF-W-92 - Washer, Metal, Flat (Plain).
- PPP-B-621 - Boxes, Wood, Nailed and Lock-Corner.

MILITARY

- MIL-P-116 - Preservation, Methods of.
- MIL-T-704 - Treatment and Painting of Materiel.
- MIL-T-22361 - Thread Compound, Antiseize, Zinc Dust Petrolatum.

STANDARDS

FEDERAL

- FED-STD-595 - Colors Used in Government Procurements.

MILITARY

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-129 - Marking for Shipment and Storage.
- MIL-STD-130 - Identification Marking of US Military Property.
- MIL-STD-731 - Quality of Wood Members for Containers and Pallets.
- MIL-STD-889 - Dissimilar Metals.

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- MIL-STD-1186 - Cushioning, Anchoring, Bracing, Blocking and Waterproofing; with Appropriate Test Methods.
- MIL-STD-2073-1 - DoD Materiel Procedures for Development and Application of Packaging Requirements.

(Unless otherwise indicated, copies of federal and military specifications and standards are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Non-Government 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 are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

- M 197 - Aluminum Alloy Sheet for Corrugated Aluminum Pipe.
- M 218 - Steel Sheet, Zinc-Coated (Galvanized) for Corrugated Steel Pipe.
- M 243 - Field Applied Coating of Corrugated Metal Structural Plate for Pipe, Pipe Arches, and Arches.

(Application for copies should be addressed to the AASHTO, 444 N. Capitol Street, N.W., Suite 225, Washington, D.C. 20001.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- A 444 - Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process for Storm Sewer and Drainage Pipe.
- A 744 - Specification for Aluminum - Alloy Sheet for Corrugated Aluminum Pipe.
- B 209 - Aluminum-Alloy Sheet and Plate.
- D 3951 - Standard Practice for Commercial Packaging.
- D 3953 - Standard Specification for Strapping, Flat Steel and Seals.
- D 4675 - Selection and Use of Flat Strapping Materials.

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

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NATIONAL MOTOR FREIGHT TRAFFIC ASSOCIATION INC. AGENT (NMFTA)

National Motor Freight Classification Rules.

(Application for copies should be addressed to the American Trucking Association, Inc., ATTN: Traffic Order Section, 2200 Mill Road, Alexandria, VA 22314.)

UNIFORM CLASSIFICATION COMMITTEE AGENT (UCCA)

Uniform Freight Classification Rules.

(Application for copies should be addressed to Uniform Classification Committee, ATTN: Tariff Publishing Officer, Room 1106, 222 S. Riverside Plaza, Chicago, IL 60606.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

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

3. REQUIREMENTS

3.1 Description. The nestable culvert pipe sections shall be curved corrugated sheet metal, and when assembled, the sections shall form a circular pipe. One full section is equal to two half sections which shall make a full round culvert pipe.

3.2 Material. Material shall be as specified herein. Materials not as specified shall be selected by the contractor and shall be subject to all provisions of this specification.

3.2.1 Class 1, galvanized steel. Class 1 corrugated nestable pipe shall be manufactured from zinc-coated steel sheets conforming to ASTM A 444, gauge as shown in table I.

3.2.2 Class 2, aluminum alloy. Class 2 corrugated nestable culvert type shall be manufactured from aluminum alloy sheets conforming to ASTM B 209, Alclad 3004-H34 alloy, gauge as shown in table I.

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TABLE I. Diameter and gauge.

Class 1		Class 2	
Nominal Pipe Diameter (inches)	Gauge (thickness equivalent inches)	Nominal Pipe Diameter (inches)	Gauge (thickness equivalent inches)
8 thru 24	16 (.064)	8 thru 24	16 (.060)
30 thru 36	14 (.079)	30 thru 36	14 (.075)
42 thru 54	12 (.109)	42 thru 54	12 (.105)
60 thru 72	10 (.138)	60 and 66	10 (.135)
84	8 (.168)	72 and 84	8 (.164)

3.2.3 Material deterioration prevention and control. The pipe shall be fabricated from compatible materials, inherently corrosion resistant or treated to provide protection against the various forms of corrosion and deterioration that may be encountered in any of the applicable operation and storage environment to which the pipe may be exposed.

3.2.4 Dissimilar metals. Dissimilar metals shall not be used in intimate contact with each other unless protected against galvanic corrosion. Dissimilar metals and methods of protection are defined and detailed in MIL-STD-889.

3.2.5 Identification of materials and finishes. The contractor shall identify the specific material, material finish, or treatment for use with component and subcomponent, and shall make information available upon request to the contracting officer or designated representative.

3.3 Recovered materials. For the purpose of this requirement, recovered materials are those materials which have been collected from solid waste and reprocessed to become a source of raw materials, as distinguished from virgin raw materials. The components, pieces and parts incorporated in the pipe may be newly fabricated from recovered materials to the maximum extent practicable, provided the pipe produced meets all other requirements of this specification. Used, rebuilt or remanufactured components, pieces and parts shall not be incorporated in the pipe.

3.4 Identification marking. The pipe shall be identified and marked in accordance with MIL-STD-130, method optional, and shall include the PIN number (see 1.2 and 6.4).

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3.5 Type I pipe, flanged. Type I pipe culvert shall have continuous flanges along longitudinal direction on both sides of the half section. Slotted holes shall be provided when required for ease in joining the two half sections of pipe.

3.5.1 Bolts and nuts. Bolts and nuts shall be furnished for longitudinal joining and, when required (see 6.2), for circumferential joining. Quantities of bolts and nuts shall be sufficient to fasten the two half sections and the adjacent sections. Bolts shall conform to FF-B-575, type I or type II. Nuts shall conform to FF-N-836, type I, or type II, style optional. Bolts shall be long enough to have at least three threads showing above the nut. Unless otherwise specified (see 6.2), bolts and nuts shall be 300 series stainless steel with the use of antiseize compound conforming to MIL-T-22361, on the threads, zinc-nickel.

3.5.2 Washers. Washers to be furnished in accordance with FF-W-92, type optional, grade 1, class A, galvanized for class 1 pipe, or grade 1, class C for class 2 pipe shall be furnished.

3.6 Type II pipe, notched. Type II nestable culvert pipe shall be notched such that the top and bottom sections are identical and one end of the top sections slips into the groove of the bottom section and vice versa.

3.6.1 Fasteners. Fastening devices (eye bolts, hooks, and stitches) for fastening the notched culvert pipe shall be 300 series stainless steel with the use of antiseize compound conforming to MIL-T-22361 on the threads, zinc-nickel.

3.7 Dimensions and tolerances. Unless otherwise specified (see 6.2), the following dimensions and tolerances shall be applicable.

Depth of corrugation:	0.475-inch - 0.525-inch
Pitch of corrugation:	2.25-inch - 3.00-inch
Tolerance on diameter:	±0.5-inch (dia. up to 36-inch)
	±1.0-inch (dia. 42 thru 84-inch)
Tolerance on gauge thickness:	0.007-inch
Tolerance on sheet length:	±0.50-inch
Depth of flange:	2.00-inch - 2.50-inch
End to center of holes:	1.00-inch - 1.25-inch
End to center of first hole:	0.75-inch - 2.50-inch

3.8 Treatment and painting. When specified (see 6.2), the fabricated culvert pipe sections shall be coated on both sides with a bituminous coating to a minimum thickness of 0.050-inch in accordance with AASHTO M 243. If specified for the IPDS (Inland

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Petroleum Distribution System), (see 6.2), the corrugated pipe sections shall be treated and painted in accordance with MIL-T-704, type A. Top coat color shall be close to color no. 30277 of FED-STD-595.

3.9 Workmanship. All culvert pipe shall be free of any ragged or diagonally sheared edges, bruised, or broken zinc-coating, burrs or sharp edges.

4. QUALITY 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 (examinations and tests) 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 specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 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 ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this 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 Component and material inspection. The contractor is responsible for ensuring that components and materials are manufactured, examined, and tested in accordance with referenced specifications and standards, as applicable.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. Quality conformance inspection (see 4.3).
- b. Inspection of packaging (see 4.5).

4.3 Quality conformance inspection.

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4.3.1 Sampling. Sampling for examination shall be in accordance with MIL-STD-105, using tables I and IIa. A lot shall be accepted when 0 defects are found and rejected when 1 or more defects are found.

4.3.2 Examination. Samples selected in accordance with 4.3.1 shall be examined as specified in 4.4.1.

4.4 Inspection procedures.

4.4.1 Examination. The culvert pipe sections shall be examined as specified for the following defects:

101. Type, class, and size not as specified (see 1.2).
102. Materials are not as specified (see 3.2).
103. Gauge thickness not as specified (see table I).
104. Materials not resistant to or treated to be made resistant to corrosion or deterioration (see 3.2.3).
105. Dissimilar metals as defined in MIL-STD-889 are not effectively insulated (see 3.2.4).
106. Contractor does not have documentation available for identification of material, material finishes or treatments (see 3.2.5).
107. Used, rebuilt, or remanufactured components, pieces or parts incorporated in the pipe (see 3.3).
108. Identification marking missing or illegible (see 3.4).
109. Bolts, nuts, washers, and fasteners missing or not as specified (see 3.5 and 3.6).
110. Improperly formed holes or tolerances not as specified (see 3.7).
111. Treatment and painting not as specified (see 3.8).
112. Workmanship not as specified (see 3.9).

4.5 Inspection of packaging.

4.5.1 Quality conformance inspection of pack.

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

4.5.1.2 Sampling. Sampling for examination shall be in accordance with MIL-STD-105, using tables I and IIa. A lot shall be accepted when 0 defects are found and rejected when 1 or more defects are found.

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5. PACKAGING

5.1 Preservation. Preservation shall be level A or level C in accordance with MIL-STD-2073-1 as specified (see 6.2).

5.1.1 Level A.

5.1.1.1 Unprotected surfaces. Unprotected exterior metal surfaces of items such as assembly bolts, nuts, washers, and tools, requiring the application of a contact preservative in accordance with MIL-P-116, shall be coated with type P-1 preservative. The preservative shall conform to the applicable specification listed in and shall be applied in accordance with MIL-P-116.

5.1.1.2 Technical publications. Technical publications shall be preserved in accordance with MIL-P-116, method IC-1 or IC-3.

5.1.1.3 Accessory containers. The assembly fastenings, tool and technical publications, as specified in 5.1.1.2, shall be consolidated together in a close-fitting box conforming to PPP-B-621, class 2, style 4. The boxes shall be of the length, width, and depth to fit the requirement, as shown in figure 3 and 4. Blocking, bracing, and cushioning of the contents within the box shall be in accordance with MIL-STD-1186. Box closure shall be in accordance with appendix to the box specification. Strapping shall be in accordance with ASTM D 3953, type 1 or 2, zinc-coated, size as applicable and ASTM D 4675.

5.1.2 Level C. The culvert pipe assembly fastenings, tools and technical publications shall be preserved in a manner to afford protection against deterioration and damage during shipment from the contractor to the initial destination.

5.2 Packing. Packing shall be level A or C as specified (see 6.2).

5.2.1 Level A.

5.2.1.1 Bundling. Pipe, in units of 40 linear feet, with accessories, and preserved as specified in 5.1, shall be bundled as shown in figures 3 and 4 and as specified herein, with the bundles classified as follows:

Group A bundles: 8-, 12-, or 18-inch diameter pipe.
Group B bundles: 24-, 30-, 36-, or 42-inch diameter pipe.
Group C bundles: 48-, 54-, 60-, 66-, 72-, or 84-inch diameter pipe.

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5.2.1.1.1 Corner protectors, lifting plates, and strapping. Corner protectors and lifting plates shall be formed from sheet steel, not less than 0.1046-inch nominal thickness. The lifting plates shall be slotted as shown in figures 3 and 4 to permit passage of the straps through the plates, and shall be bent around the top and bottom edges of the bundles as shown in figures 3 and 4. Strapping shall conform to ASTM D 3953, type 1 or 2, zinc-coated, size as specified herein, and ASTM D 4675.

5.2.1.1.2 Packing requirements for type I culvert pipes.

5.2.1.1.2.1 Group A bundles. Units of 40 linear feet of pipe of like diameter and the required boxed accessories shall be bundled with five sections of pipe per bundle. Bundles of like diameter pipe, of 12-inch or 18-inch size, shall be grouped in quantities of eight for palletizing. One of the eight bundles shall contain the boxed accessories, placed lengthwise in the bundle, and located between the second and third sections of pipe as shown in figure 3. Each bundle shall be secured with one flat-steel strap, size 3/4-inch by 0.023-inch, applied lengthwise of the bundle, located at the center of the arch, and drawn sufficiently tight to remain in place on the bundle, as shown in figure 3. The steel strap securing the bundle containing the box of accessories shall be stapled to the ends of the box. The bundles shall be additionally secured with zinc-coated carbon steel wire ties not less than 0.1055-inch nominal diameter, inserted through the bolt holes in all flanges at each of the four corners of the bundle. The wire shall be drawn sufficiently tight to hold the flanges as close together as possible and the tie shall be completed with the ends of the wire on the top flange twisted and bent down against the flanges so that no wire tie is left projecting over the edge.

5.2.1.1.2.2 Group B bundles. Units of 40 linear feet of pipe of like diameter and the required boxed accessories shall be bundled with ten sections of pipe per bundle. Bundles of like diameter pipe of 24-inch, 30-inch, or 36-inch size shall be grouped in quantities of four for palletizing. Unless otherwise specified (see 6.2), one of four bundles shall contain the boxed accessories placed lengthwise in the bundle and located between the fifth and sixth sections of pipe, as shown in figure 3. Each bundle shall be secured with one flat-steel strap and wire ties as specified for group A bundles in 5.2.1.1.2.1. When specified (see 6.2), the boxed accessories shall be placed lengthwise within the curvature of any of the bundles of ten sections. In addition to securing to the pipe section with strapping, a minimum of four staples, securing the strap to the accessory box, shall be used.

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5.2.1.1.2.3 Group C bundles. Units of 40 linear feet of pipe of like diameter and the required boxed accessories shall be bundled with forty sections of pipe per bundle. The required boxed accessories shall be placed lengthwise in the bundle and located between the twentieth and twenty-first sections of pipe as shown in figure 3. The bundle shall be secured with six flat-steel straps, size 1-1/4-inch by 0.035 applied lengthwise of the bundle, with corner protectors and lifting plates as specified in 5.2.1.1.1. The straps shall be drawn sufficiently tight to remain in place on the bundle, as shown in figure 3. A flat-steel strap, size 3/4-inch by 0.023-inch, shall be applied around and stapled to the sides and ends of the accessory box, passing outside the 1-1/4-inch straps securing the bundle.

5.2.1.1.3 Packing requirements for type II culvert pipe.

5.2.1.1.3.1 Group A bundles. Units of 40 linear feet of pipe of like diameter and the required accessories shall be bundled in two bundles. Each bundle shall contain twenty sections of pipe. One of the two bundles shall contain the boxed accessories placed lengthwise in the bundle located between the tenth and eleventh sections of pipe as shown in figure 4. Each bundle shall be secured with flat-steel straps, size 1-1/4-inch by 0.023-inch. The bundle containing the box shall be secured with six straps applied lengthwise of the bundle and drawn sufficiently tight to remain in place on the bundle as shown in figure 4. The securing straps at the top of the arch shall be stapled to the ends of the box. The second bundle shall be secured with two straps applied lengthwise of the bundle and drawn sufficiently tight to remain in place on the bundle as shown in figure 4.

5.2.1.1.3.2 Group B bundles. Units of 40 linear feet of pipe of like diameter and the required boxed accessories shall be bundled in two bundles. Each bundle shall contain twenty sections of pipe per bundle. One of the two bundles shall contain the boxed accessories placed lengthwise in the bundle and located between the tenth and eleventh sections of pipe as shown in figure 4. Each bundle shall be secured with flat-steel straps, size 1-1/4-inch by 0.035-inch. The bundle containing the box shall be secured with six straps applied lengthwise of the bundle and drawn sufficiently tight to remain in place on the bundle as shown in figure 4. A 3/4-inch by 0.023-inch flat strap shall be applied around and stapled to the sides and ends of the box, passing outside the 1-1/4-inch straps securing the bundle. The second bundle shall be secured with three straps applied lengthwise of the bundle and drawn sufficiently tight to remain in place on the bundle as shown in figure 4.

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5.2.1.1.3.3 Group C bundles. Units of 40 linear feet of pipe of like diameter and the required boxed accessories shall be bundled in two bundles. Each bundle shall contain twenty sections of pipe per bundle. One of the two bundles shall contain the boxed accessories placed lengthwise in the bundle and located between the tenth and eleventh sections of pipe as shown in figure 4. Each bundle shall be secured with flat-steel straps, size 2-inch by 0.050-inch with corner protectors and lifting plates as specified in 5.2.1.1.1. The bundle containing the box shall be secured with six straps applied lengthwise of the bundle and drawn sufficiently tight to remain in place on the bundle as shown in figure 4. A 3/4-inch by 0.023-inch flat-steel strap shall be applied around and stapled to the sides and ends of the box, passing outside the 2-inch straps securing the bundles. The second bundle shall be secured with three straps applied lengthwise of the bundle and drawn sufficiently tight to remain in place on the bundle as shown in figure 4.

5.2.1.2 Palletizing. Bundles of type I pipe of like diameter of 12-, 18-, 24-, 30-, or 36-inch size, with accessories shall be palletized as shown in figures 5 and 6, 7 or 8 as applicable. When specified, (see 6.2), bundles of other diameters and bundles of type II pipe may be palletized using these figures as a guide to attain optimum utilization of pallet space. Pipe sizes specified herein are the sizes most frequently used by the military agencies. Palletizing for other sizes should be specified at the time of procurement.

5.2.2 Level C. The culvert pipe, assembly fastenings, tools and technical publications shall be packed to assure carrier acceptance and safe delivery to destination at lowest ratings in compliance with Uniform Freight Classification Rules or National Motor Freight Classification Rules and to conform with ASTM D3951. Pipe may be bundled, crated, or palletized, accessory items shall be protected against deterioration and loss by consolidating the items in suitable containers.

5.3 Marking. In addition to any special marking specified in the contract or purchase order, marking shall be in accordance with MIL-STD-129.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The culvert pipe is intended for use in the construction of field-assembled metal culverts.

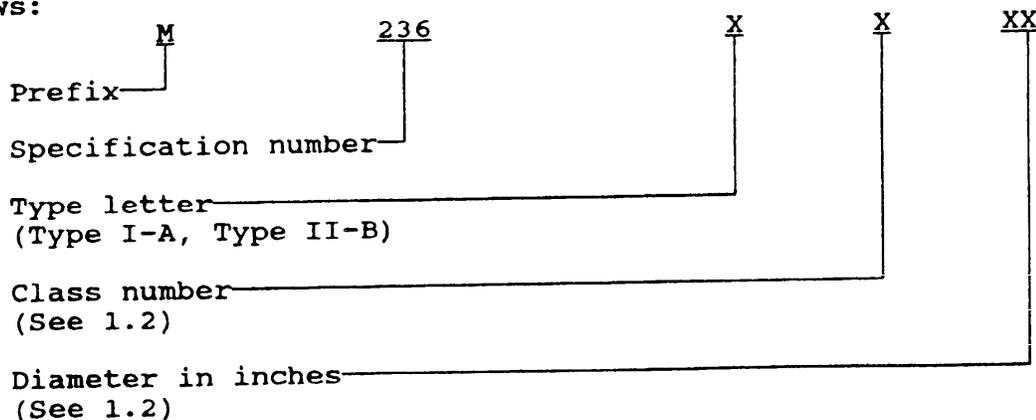
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6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of the specification.
- b. Type, class, and size of culvert pipe required (see 1.2).
- c. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2).
- d. When bolts and nuts are required for circumferential joining of pipe (see 3.5.1).
- e. When dimension and tolerances are other than as specified (see 3.5).
- f. When bolts and nuts are other than stainless steel (see 3.5.1).
- g. When bituminous coating or IPDS coating is required (see 3.8).
- h. Level of preservation and packing required (see 5.1 and 5.2).
- i. Number of bundles that contain accessories (see 5.2.1.1.2.2).
- j. When boxed accessories shall be lengthwise (see 5.2.1.1.2.2).
- k. Number of other diameters and bundles of type II pipe (see 5.2.1.2).

6.3 Provisioning. When required, the contracting officer should include provisioning requirements for repair parts and maintenance tools as necessary (such as the combination draw and pinch bar), and instructions on shipment of culvert pipes. When required, additional bolts, nuts, and other fasteners should be included in the contract.

6.4 Part or Identifying Number (PIN). The PIN to be used for culvert pipes acquired to this specification are created as follows:



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Example of PIN number: M236-A1-24 for a 24-inch, type A, zinc-coated (galvanized) steel pipe conforming to MIL-P-236.

6.5 Subject term (key word listing).

Corrugated culvert pipe
Corrugated pipe
Sewer pipe

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

Custodians:

Army - ME
Navy - YD
Air Force - 99

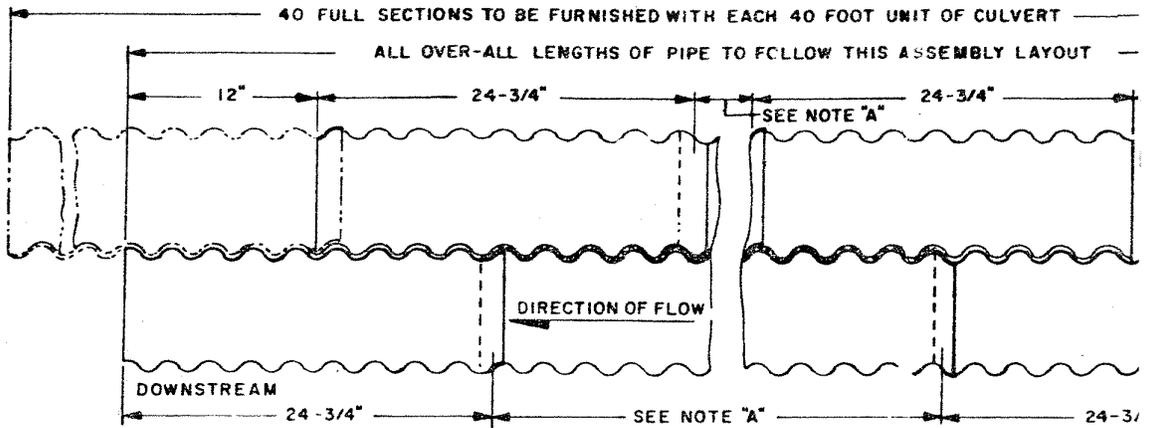
Preparing activity

Army - ME

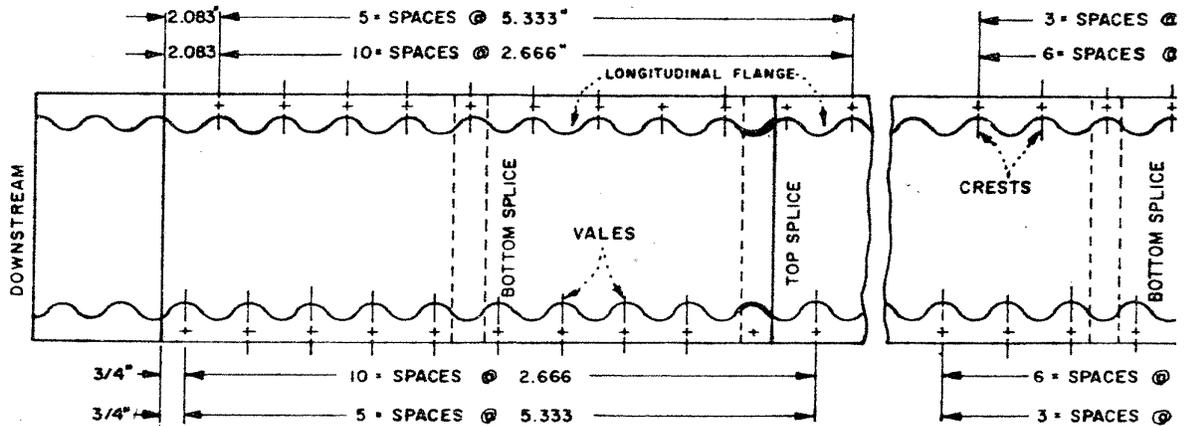
Project 4710-0041

Review activities:

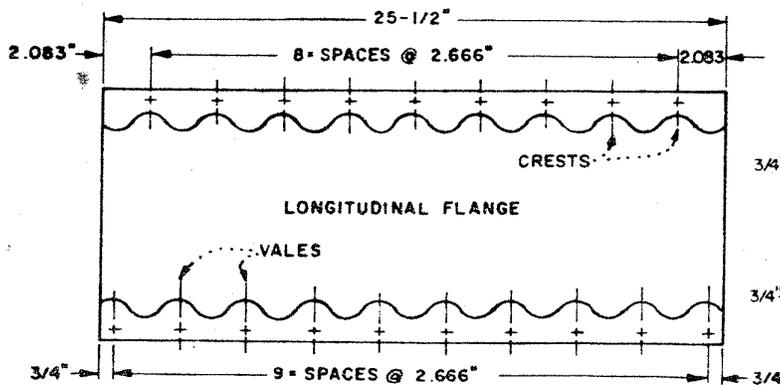
Army - CE
Navy - MC
Air Force - 82
DLA - CS



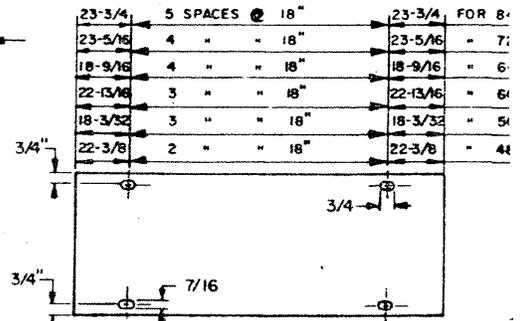
SIDE ELEVATION OF ASSEMBLED OVER-ALL LENGTH OF PIPE
 NOTE "A" - ALL INTERMEDIATE SECTIONS ARE 24" C TO C.



PLAN OF ASSEMBLED OVER-ALL LENGTH OF PIPE
 METHOD OF BOLTING FLANGES

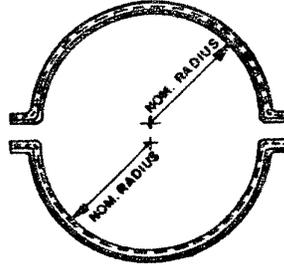
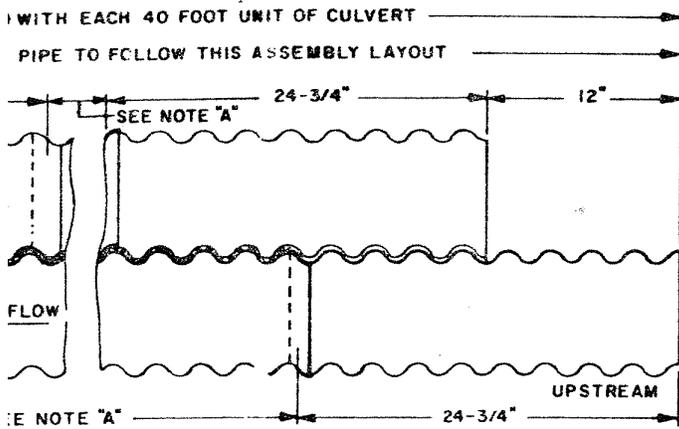


PLAN OF PIPE SECTION
 FLANGE PUNCH LAYOUT FOR ALL DIAMETERS

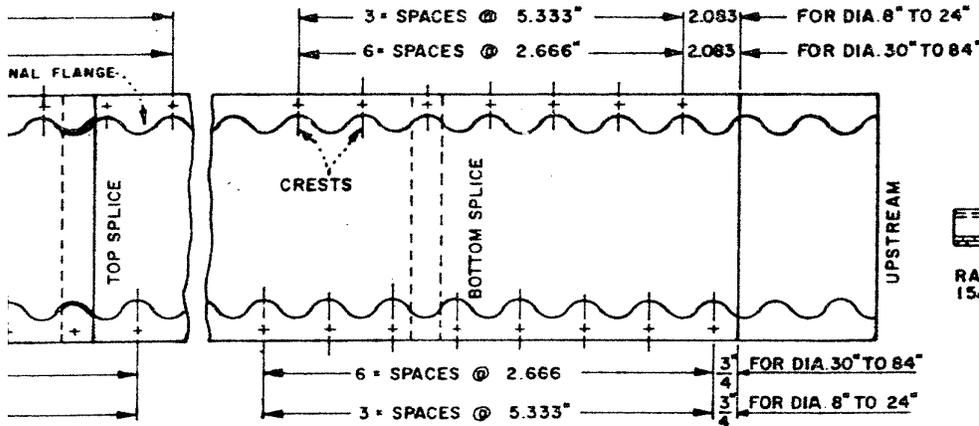


PLAN OF CORRUGATED SHEETS
 SHOWING LOCATION OF SLOTTED HOLES
 FOR CIRCUMFERENTIAL JOINTING

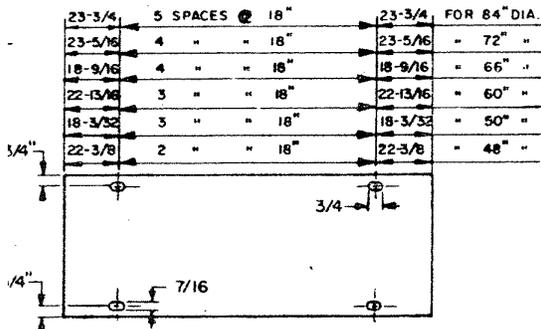
FIGURE I. Type I culvert, pipe,



ASSEMBLED OVER-ALL LENGTH OF PIPE
DIAPHRAGM SECTIONS ARE 24" C TO C.



ASSEMBLED OVER-ALL LENGTH OF PIPE
BOLTING FLANGES



PLAN OF CORRUGATED SHEETS
SHOWING LOCATION OF SLOTTED JOINTS
FOR CIRCUMFERENTIAL JOINTING

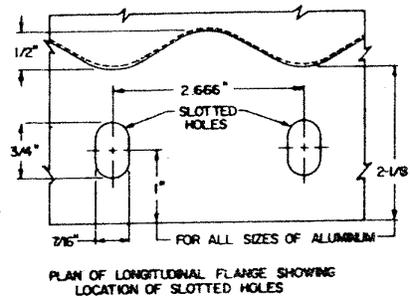
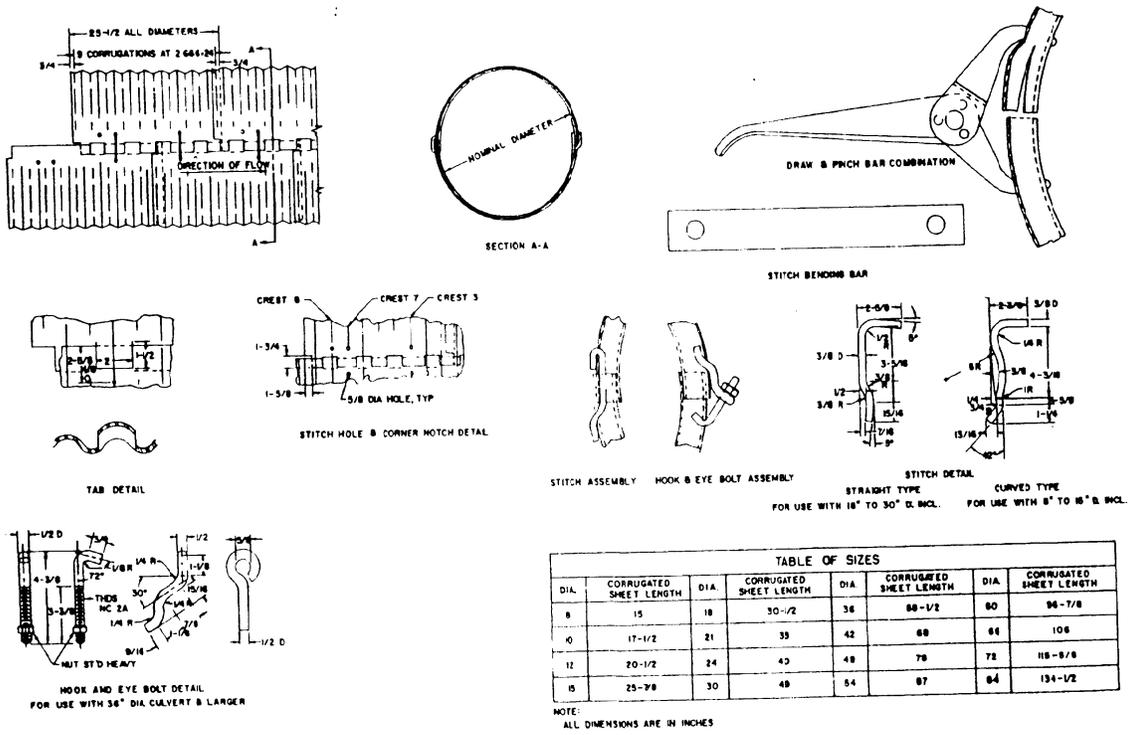


TABLE OF SIZES							
DIA	CORRUGATED SHEET LENGTH	DIA	CORRUGATED SHEET LENGTH	DIA	CORRUGATED SHEET LENGTH	DIA	CORRUGATED SHEET LENGTH
8"	17-9/16"	18"	33-1/4"	36"	61-3/4"	60"	99-5/8"
10"	20-11/16"	21"	38"	42"	71-3/16"	66"	109-1/8"
12"	23-13/16"	24"	42-3/4"	48"	80-3/4"	72"	118-5/8"
15"	28-9/16"	30"	52-3/16"	54"	90-3/16"	84"	137-1/2"

I. Type I culvert, pipe, detail.

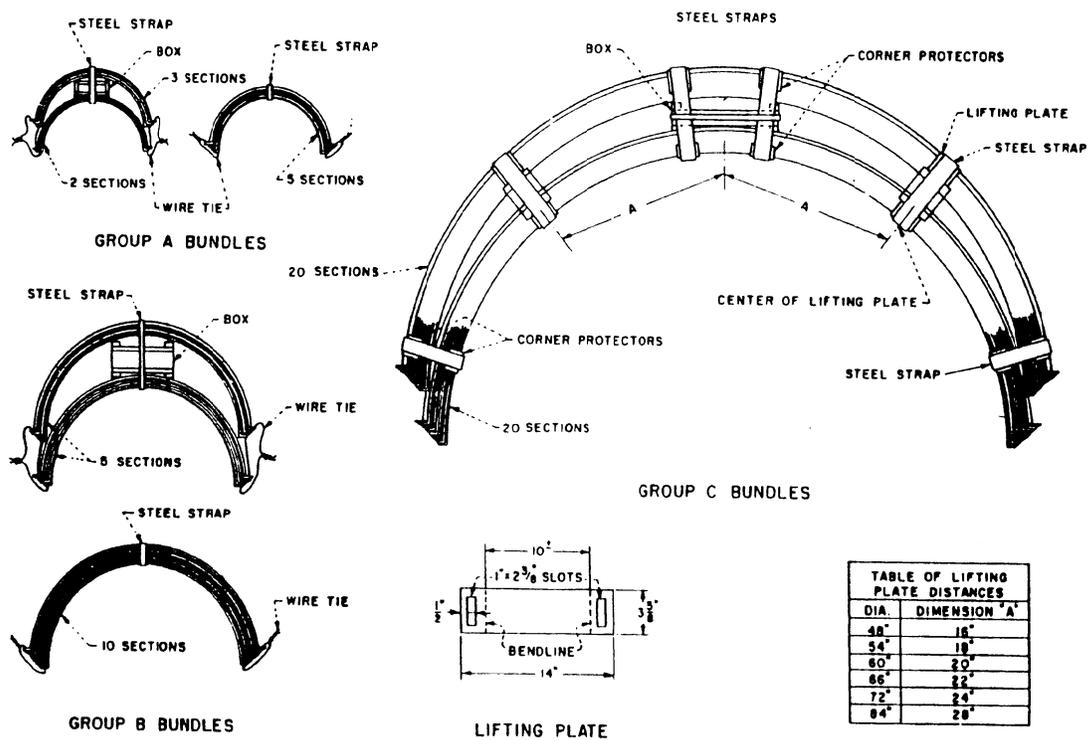
X-1051A



MIL-P-236J

FIGURE 2. Type II culvert, pipe, detail.

X-1560



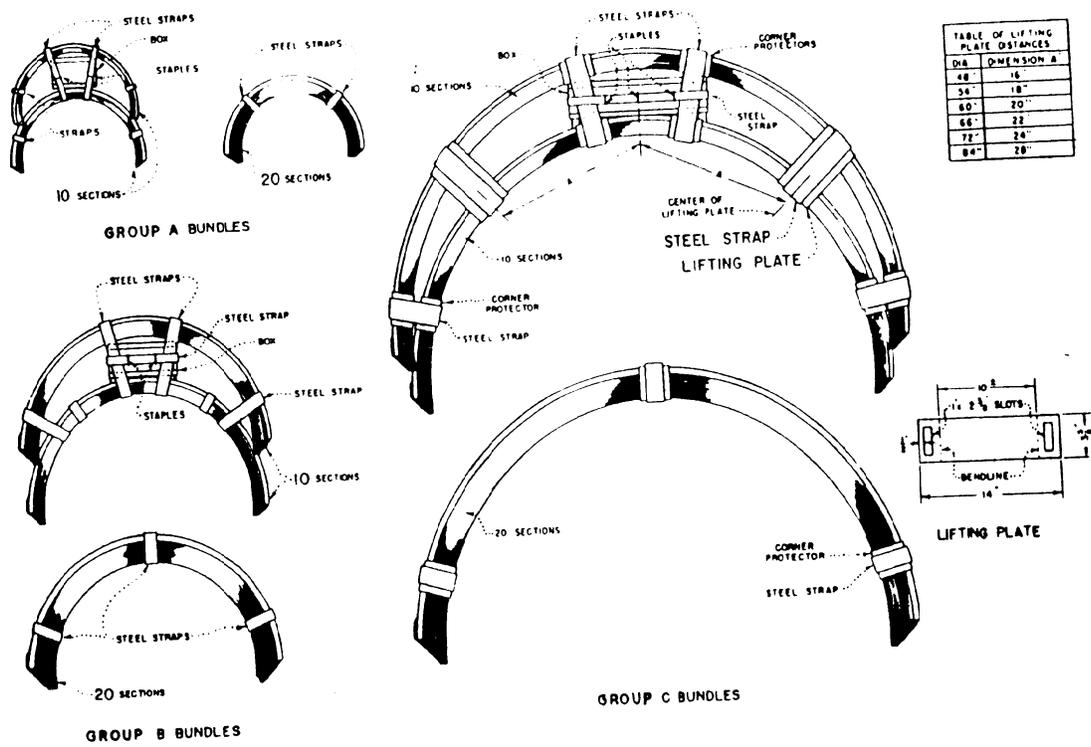
17

MIL-P-236J

FIGURE 3. Type I culvert pipe bundles.

X-1052

18

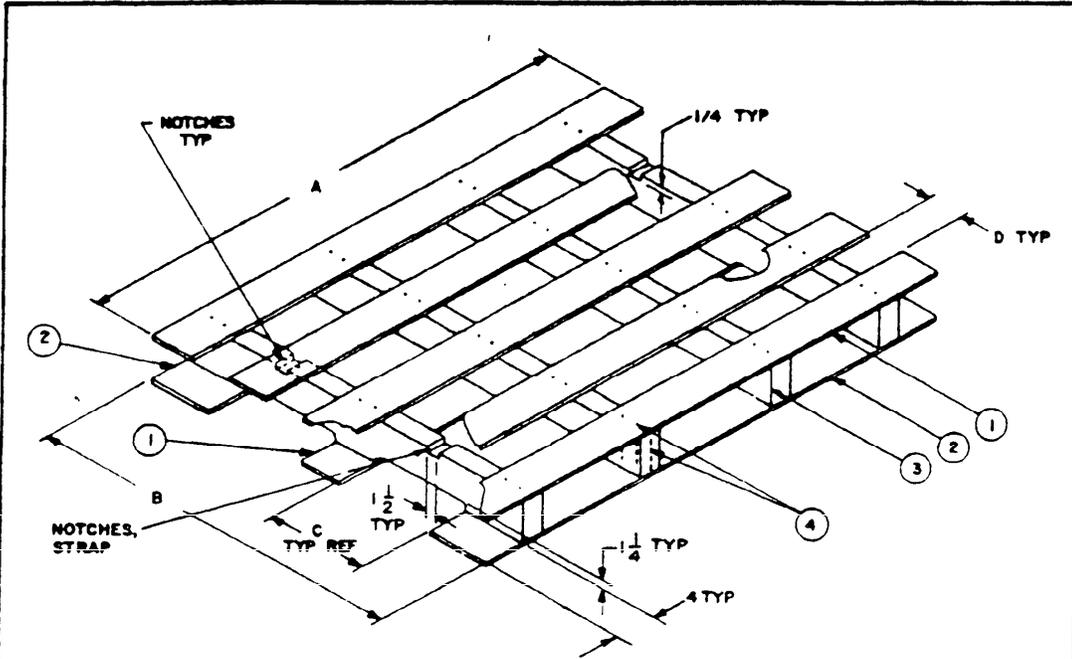


MIL-P-236J

FIGURE 4. Type II culvert pipe bundles.

X-3352 A

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DIMENSIONS ARE INCHES

* ONE BUNDLE PER ROW CONTAINS THE FASTENERS CONTAINER

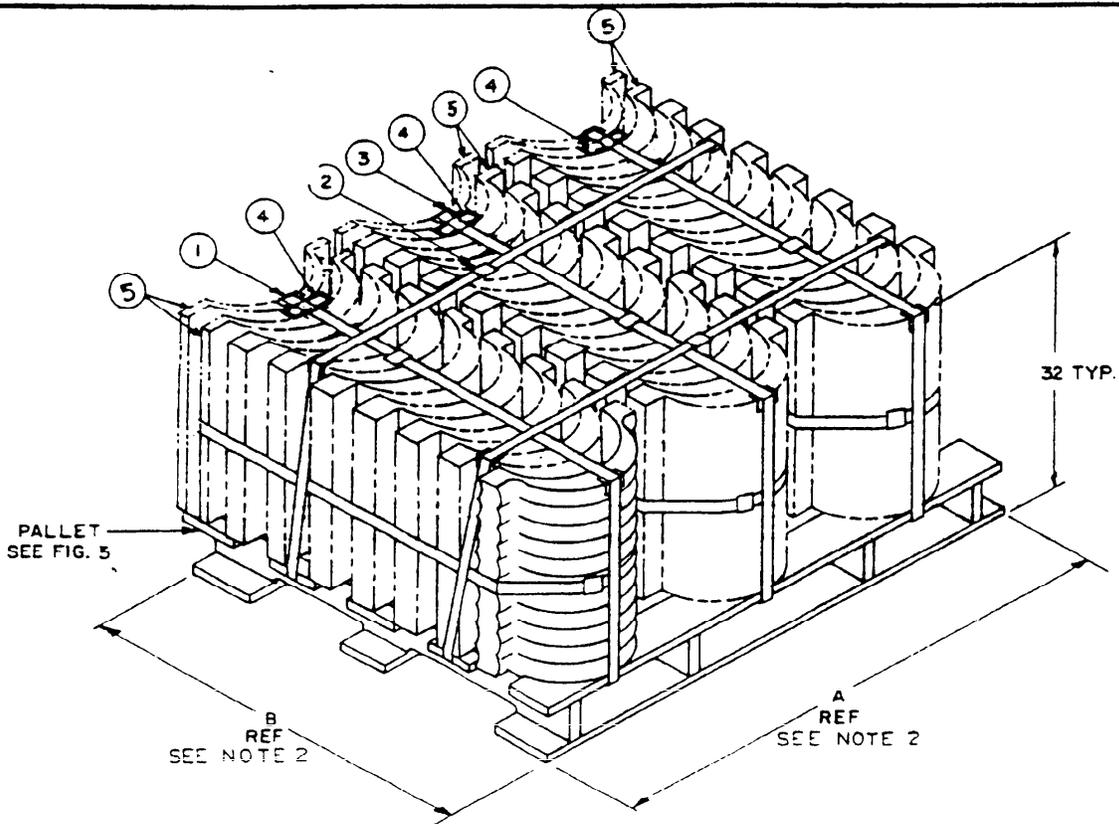
PIPE SIZE	A DIM	B DIM	C DIM	D DIM	PIPE BUNDLES	
					NO. BUNDLES/ROW *	NO. ROWS/PALLET
12	48	36	10	4	8	3
18	48	40	12	5	8	2
24	56	36	11	4 1/2	4	2
30	40	48	12	5	4	1
36	40	48	12	5	4	1

4	TYPE II, STYLE 18	76	NAILS, PALLET, FLAT HD, DIAMOND PT, STL, ZN COATED, 9 GAUGE X 3 LG.	FF-N-108
3	GROUP II, III OR IX, CL 2	4	WOOD, STRUCTURAL, 2 X 4 X 8 LG, CUT-OUT 1 1/4 DP X C LG, EXCEPTIONS: SAME AS ITEM 1	MIL-STD-731
2	GROUP II, III OR IX, CL 2	2	WOOD, STRUCTURAL, 1 X 6 X 4 LG EXCEPTIONS: SAME AS ITEM 1	MIL-STD-731
1	GROUP II, III OR IX, CL 2	6	WOOD, STRUCTURAL, 1 X 4 X 4 LG EXCEPTIONS: HEMLOCK UNACCEPTABLE, DOUGLAS-FIR MUST BE COAST-TYPE	MIL-STD-731
PART NO.	PART OR IDENT NO.	QTY REQD	DESCRIPTION	SPECIFICATION
LIST OF MATERIAL				

FIGURE 5. Pallet construction.

X-793B

MIL-P-236J



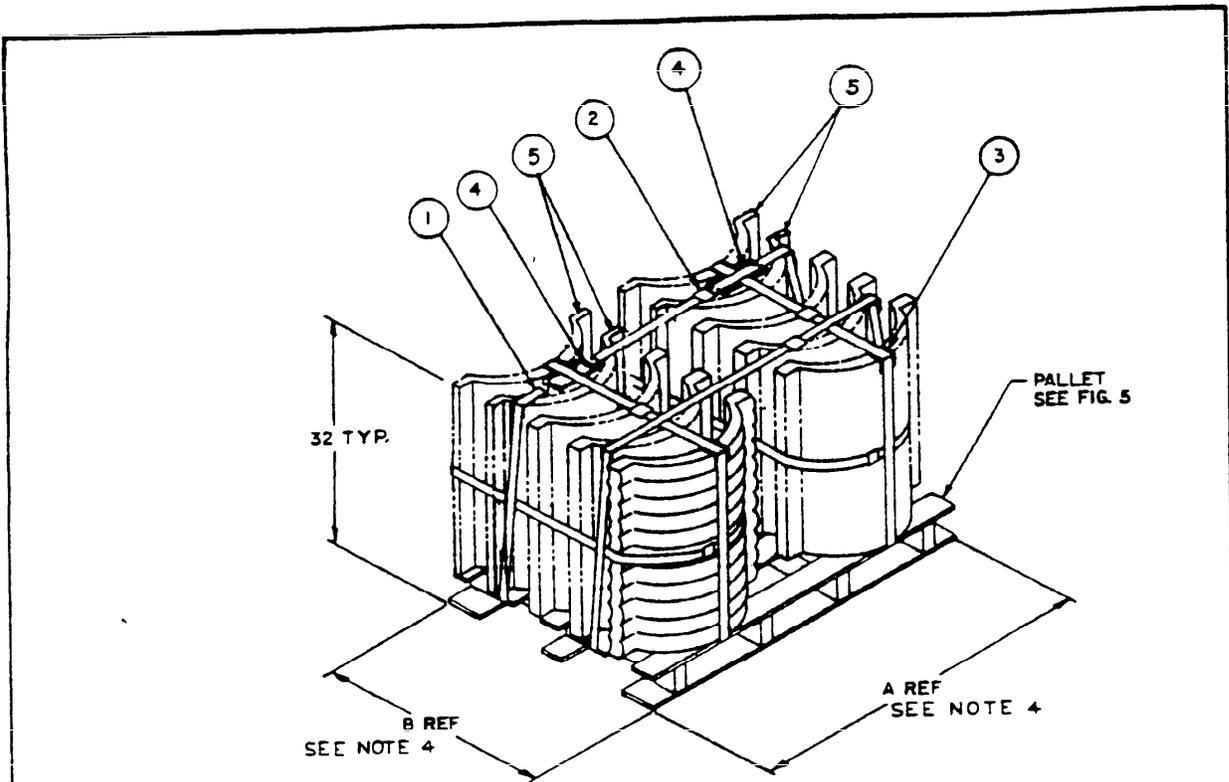
NOTE ÷1-FOR 12" PIPE: 8 BUNDLES OF 5 SECTIONS EACH PER ROW
 2-FOR REFERENCE DIMENSIONS A AND B, SEE FIG. 5

5		3	ONE GROUP A BUNDLE PER ROW CONTAINING BOX OF FASTENERS	
4		3	INTERMEDIATE PACKAGE (ASSEMBLY FASTENINGS, ETC.)	
3		10	EDGE PROTECTORS, STEEL	
2		8	SEALS, 1 1/4 NOM SIZE	
1	TYPE I, CL B	LINEAR	STRAPPING, FLAT, NAILESS, STL, ZN COATED, 1 1/4 NOM SIZE X .035 NOM THK	ASTM D 3953
FIND NO.	PART OR IDENT NO.	QTY RECD	DESCRIPTION	SPECIFICATION
LIST OF MATERIAL				

FIGURE 6. Palletized unit load.

X-795D

MIL-P-236J



5		2	HALF BUNDLES, WITH F.ASTENERS CONTAINER BETWEEN (SEE NOTE 3)	
4		2	INTERMEDIATE PACKAGE (ASSEMBLY FASTENINGS, ETC.)	
3		8	EDGE PROTECTORS, STEEL	
2		6	SEALS, 1 1/4 NOM SIZE	
1	TYPE I CL B	LINE AR	STRAPPING, FLAT, NAILESS, STL, ZN COATED, 1 1/4 NOM SIZE X .035 NOM THK	ASTM D 3963
ITEM NO.	PART OR IDENT NO.	QTY REQD	DESCRIPTION	SPECIFICATION
LIST OF MATERIAL				

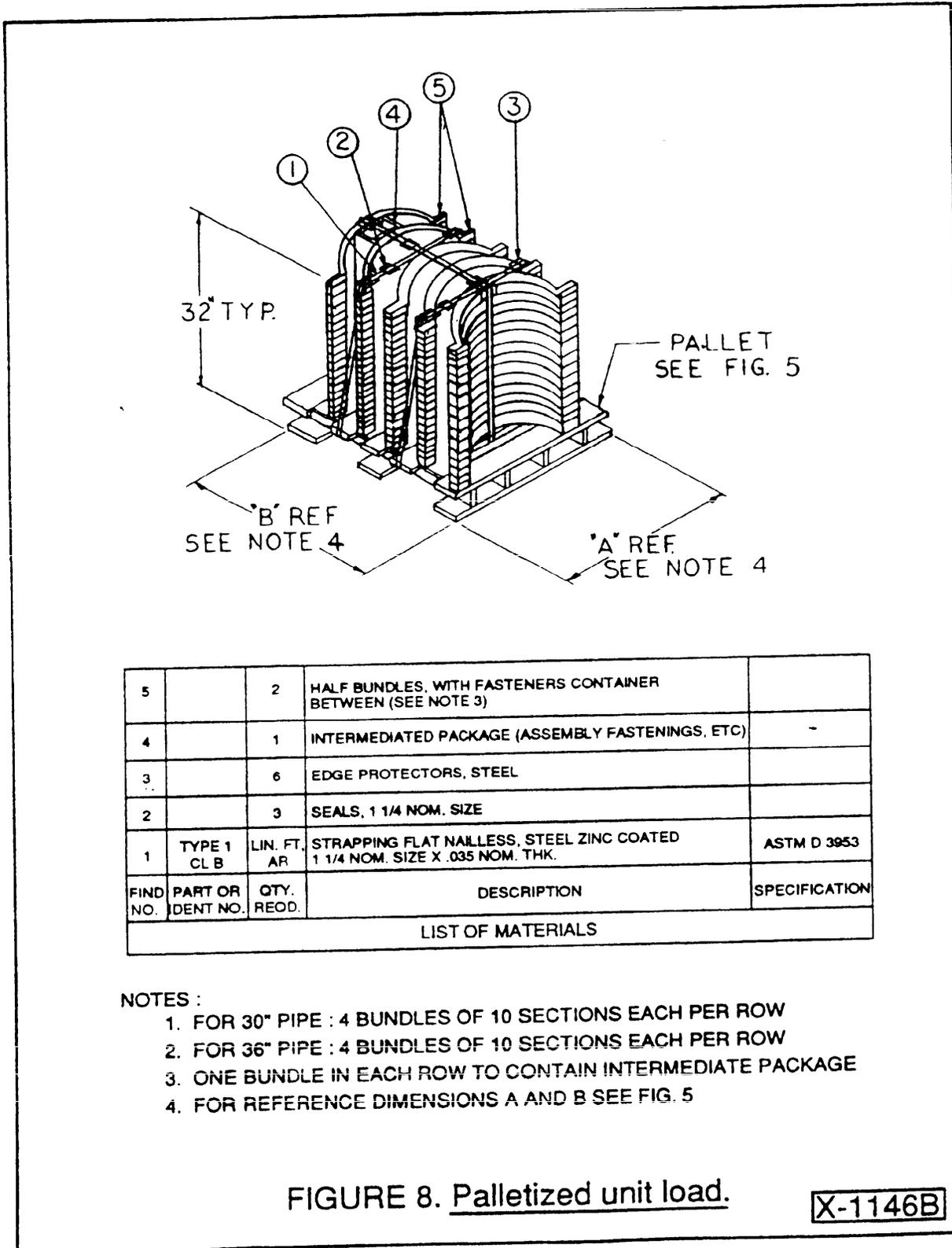
NOTES+

- 1.FOR 24" PIPE : 4 BUNDLES OF 10 SECTIONS EACH PER ROW
- 2.FOR 18" PIPE : 8 BUNDLES OF 5 SECTIONS EACH PER ROW
- 3.ONE BUNDLE IN EACH ROW TO CONTAIN INTERMEDIATE PACKAGE.
- 4.FOR REFERENCE DIMENSIONS A AND B SEE, FIG 5

FIGURE 7. Palletized unit load.

X-794B

MIL-P-236J



5		2	HALF BUNDLES, WITH FASTENERS CONTAINER BETWEEN (SEE NOTE 3)	
4		1	INTERMEDIATED PACKAGE (ASSEMBLY FASTENINGS, ETC)	-
3		6	EDGE PROTECTORS, STEEL	
2		3	SEALS, 1 1/4 NOM. SIZE	
1	TYPE 1 CL B	LIN. FT. AR	STRAPPING FLAT NAILLESS, STEEL ZINC COATED 1 1/4 NOM. SIZE X .035 NOM. THK.	ASTM D 3953
FIND NO.	PART OR IDENT NO.	QTY. REOD.	DESCRIPTION	SPECIFICATION
LIST OF MATERIALS				

NOTES :

1. FOR 30" PIPE : 4 BUNDLES OF 10 SECTIONS EACH PER ROW
2. FOR 36" PIPE : 4 BUNDLES OF 10 SECTIONS EACH PER ROW
3. ONE BUNDLE IN EACH ROW TO CONTAIN INTERMEDIATE PACKAGE
4. FOR REFERENCE DIMENSIONS A AND B SEE FIG. 5

FIGURE 8. Palletized unit load.

X-1146B

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