

CHAPTER 4

INSPECTION OF ISO CONTAINERS (MILVANS)

NOTES

INTRODUCTION

With the growth of the containerization industry, the Department of Defense recognizes the need of transporting ammunition and components and general cargo by using intermodal freight cargo containers. To ensure safe transport of hazardous cargo, the condition of the containers must be inspected in the uniform manner to ensure their serviceability. The prescribed standards that must be adhered to, terms, and criteria prescribed for containers are listed here in this handout, and in MIL-HDBK 138A.

Containers used for shipment of explosives and dangerous materials are referred to by numerous terms such as CONEX, MILVAN, or Intermodal Dry Cargo Container, and ISO Containers. These containers are made of three basic materials. One type is aluminum or steel construction, and another is fiberglass reinforced plywood. You can refer to MIL-HDBK 138A for detailed drawings on the basic construction of the different types of containers.

Some containers are called mechanical containers. The term mechanical simply means that metal mechanical dunnage is supplied with the container in order to secure the cargo inside to prevent shifting and possible damage to the cargo during shipment and handling. These same containers are also made to be adapted to a semi-trailer frame for transporting from one place to another. For short distances in and around the port, special heavy duty container lifts can be used. Remember, prior to containers being loaded on to a trailer, the trailer and truck must be inspected using DD Form 626. All vehicles transporting explosives must meet the same prerequisites. After containers have been inspected and certified to meet the requirements to carry explosives and dangerous articles, each container must have a "MILVAN Certificate for Class 1", (see Figure 4-5) signed and affixed to the MILVAN.

- Figure 4-1 Door Assembly Inspection Points
- Figure 4-2 Primary Structural Components Inspection Points
- Figure 4-3 End-Opening Container Inspection Checklist
- Figure 4-4 Open-Top Container Inspection Checklist
- Figure 4-5 Side-Opening Container Inspection Checklist
- Figure 4-6 Flat Rack Container Inspection Checklist
- Figure 4-7 Serviceability Certificate for Class 1

1. DEFINITIONS:

- a. Structural Member: Top and bottom side rails, top and bottom end rails, door sills and headers, corner posts, corner fittings, and floor crossmembers.
- b. Inspector: An individual who, because of training and/or experience gained while inspecting containers, trucks, trailers, or railcars, is considered by his commander/supervisor to be qualified to inspect containers using the criteria contained herein.

2. The following criteria will be used to inspect ISO containers for movement of hazardous cargo. Each criteria will be through a visual inspection, and except where tolerances are provided, acceptance of the container will be based on the judgment of the inspector.

- a. Welds joining structural members must be intact and not cracked. Fasteners (i. e., rivets or bolts) at juncture of structural members must be unbroken. Juncture of structural members and side or end wall panels shall not contain either broken welds or loose/missing fasteners that are separated by less than 48 inches in any direction from other loose/missing fasteners.
- b. Doors shall operate freely, with hinge welds/fasteners intact, gaskets serviceable, and lock mechanism/anti-rack hardware functioning properly.
- c. Container will not be out of alignment to preclude safe use of top lifting frames or that may cause jamming of container in ship cells.
- d. No structural member shall be broken, cut, or cracked; torn, twisted, bent, or bowed floor crossmembers are not a cause for rejection provided welds are not broken and in the judgment of the inspector, the structural integrity of the container floor has not been reduced beyond safe limits. Further, corner blocks/fittings must not be distorted, cracked, or contain broken or gouged apertures that would prevent engagement or safe use of tie down or lifting devices.
- e. Container floors shall not contain torn, broken, cracked, or splintered boards that will impair either the structural strength or water tight integrity of the container or that will be hazardous to either the cargo or operating personnel.
- f. No part of the container shall protrude past the plane of the corner blocks.
- g. Corrosive failure of any structural member, such as when the structural member could be punctured by striking the area lightly with a welders hammer, will be cause to reject the container. Corrosion of the structural member other than superficial surface rust should be checked by the inspector to ensure that the structural integrity of the member is not adversely affected.

h. Splice/Patches:

- (1) No more than two splices are allowed on each bottom or top side rail.
- (2) No more than one splice is allowed on top or bottom end rail or door header.
- (3) No splices are allowed on door sills or corner posts. (Except MILVAN where one splice not interfering with door seals or locking devices is acceptable.
- (4) No lapped splices, either welded, bolted, or riveted, are acceptable. (Except MILVAN where welded lap splices extending 12 inches on either side of damaged area are acceptable). Only butt welded inset splices are acceptable on commercial containers.
- (5) No corrugated skin patches shall be of unlike corrugation.
- (6) No patches affixed to container skin by pop rivets are acceptable.
- (7) No more than one splice shall exist in any floor board, and no more than three splices are allowed in any container floor.

I. No condition shall exist that adversely degrades weather tight integrity of the container.

- j. Each container must bear, in addition to a manufacturer's data plate, a CSC Safety Approval Plate or a decal or other certification showing that the container was built to, and meets, the requirements of the International Convention for Safe Containers.
- k. Crushed, cut, broken, or bent horizontal and vertical rails or distorted/gouged rail slots of the MILVAN container will cause the restraint system to be rejected. Such condition alone will not preclude the MILVAN from being acceptable when other approved systems of restraint (i.e., that in commercial containers) are to be employed.

4.3 Door Assembly. See Figure 4-1.

4.3.1 Door Panel. Corrugated or flat sheet steel, plymetal (metal faced wood) material, aluminum sheet and post assembly, or FRP panel that forms either a portion or all of a door.

4.3.2 J-Bar. The portion of the exterior edge of the corner post structure in a doorway frame that encircles and supports the door hinges.

4.3.3 Hinge. Hardware comprised of a blade permanently joined to the door and a lug integral to the corner post structure. A series of hinges enables the door to rotate open or closed.

4.3.4 Hinge Pin. Hinge component that attaches the two components of the hinge and provides a line of rotation. A hinge pin may be surrounded with a bushing to reduce friction and resist corrosion.

4.3.5 Hinge Pin Weld. The weld affixed on the head of the hinge pin to prevent pilferage by removing the hinge pin and door without breaking the custom seal. This is a TIR (see paragraph 4.5.6) requirement.

4.3.6 Locking Bar. Vertical rod of the door assembly with cam locks fitted at each end. When rotated, it engages (locks) the cams into the cam retainers on the doorway frame.

4.3.7 Locking Bar Mounting Bracket. One of the brackets that holds the locking bars in place on the door assembly.

4.3.8 Cam. Fitting on each end of a locking bar that has offset protrusions. Through lever type action, it engages (locks) into a cam retainer to secure the door to the doorway frame.

4.3.9 Cam Retainer. Female component (retainer) located on the sill and header of the rear end frame or top and bottom side rails of a side opening container. It engages and retains the cam of a locking bar.

4.3.10 Door Locking Handle. Handle attached to the door locking bar that rotates the bar (rod) when opening or closing (locking) the container door.

4.3.11 Door Locking Handle Retainer. Pivoting hardware to hold the locking handle in the closed position and provide a means to place a lock and/or security seal on the door(s).

4.3.12 Anti-rack Hardware. Hardware attached to the doors and doorway frame to provide resistance against transverse twisting (racking) of the container. It consists of locking bars, locking bar mounting brackets, cams, cam retainers, locking handles, handle retainers and other support brackets.

4.3.13 Customs Catch. Rod or plate permanently affixed near middle of door to preclude one door opening without opening the other door. Customs catch is only required if door design does not provide a metal overlap as defined by the TIR convention (see paragraph 4.5.6).

4.3.14 Door Seal (Gasket). Flexible plastic, rubber or synthetic rubber attached to the door edges with a retaining strip and fasteners to provide a water proof seal between doors and between the doors and the door frame.

4.3.15 Rain Gutter. The structure attached to the door header on some containers to divert water away from the doorway frame.

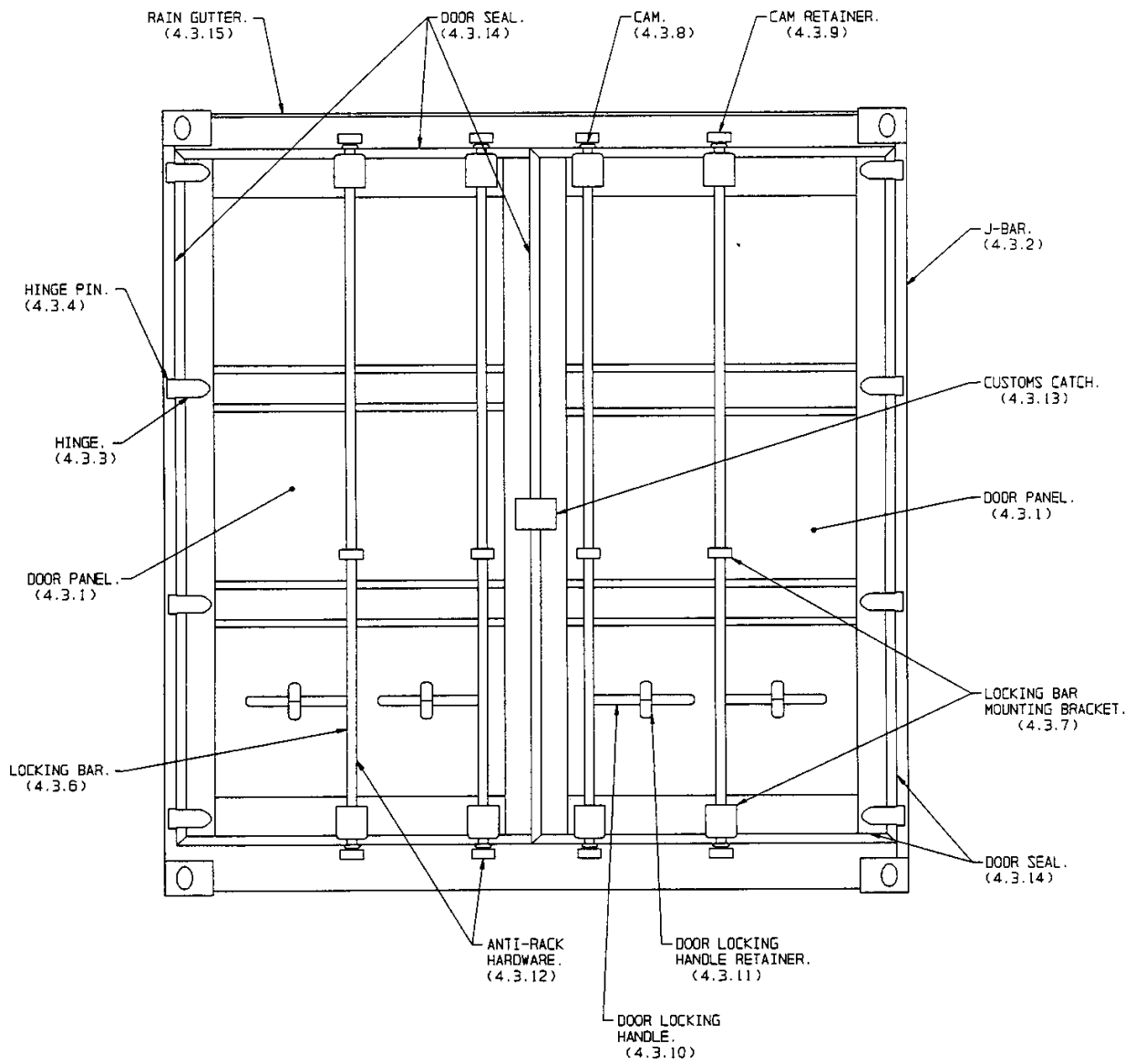


Figure 4-1. Door Assembly

4. CONTAINER TERMINOLOGY

4.1 Primary Structural Components. See Figure 4-2.

4.1.1 Corner Fitting. Internationally standard fitting (casting) located at the eight corners of the container structure to provide means of handling, stacking and securing containers. Specifications are defined in ISO 1161.

4.1.2 Corner Post. Vertical structural member located at the four corners of the container and to which the corner fittings are joined.

4.1.3 Door Header. Lateral structural member situated over the door opening and joined to the corner fittings in the rear end frame.

4.1.4 Door Sill. Lateral structural member at the bottom of the door opening and joined to the corner fittings in the rear end frame.

4.1.5 Rear End Frame. The structural assembly at the rear (door end) of the container consisting of the door sill and header joined at the rear corner fittings to the rear corner posts to form the door **opening**.

4.1.6 Top End Rail. Lateral structural member situated at the top edge of the front end (opposite the door end) of the container and joined to the corner fittings.

4.1.7 Bottom End Rail. Lateral structural member situated at the bottom edge of the front end (opposite the door end) of the container and joined to the corner fittings.

4.1.8 Front End Frame. The structural assembly at the front end (opposite the door end) of the container consisting of top and bottom end rails joined at the front corner fittings to the front corner posts.

4.1.9 Top Side Rail. Longitudinal structural member situated at the top edge of each side of the container and joined to the corner fittings of the end frames.

4.1.10 Bottom Side Rail. Longitudinal structural member situated at the bottom edge of each side of the container and joined to the corner fittings to form a part of the understructure.

4.1.11 Cross Member. Lateral structural member attached to the bottom side rails that supports the flooring.

4.1.12 Understructure. An assembly consisting of bottom side and end rails, door sill (when applicable), cross members and forklift pockets.

4.1.13 Forklift Pocket. Reinforced tunnel (installed in pairs) situated transversely across the understructure and providing openings in the bottom side rails at ISO prescribed positions to enable either empty capacity or empty and loaded capacity container handling by forklift equipment.

4.1.14 Forklift Pocket Strap. The plate welded to the bottom of each forklift pocket opening.

4.1.15 Gooseneck Tunnel. Recess in the front portion of the understructure to accommodate transport by a gooseneck chassis. This feature is more common in forty foot and longer containers.

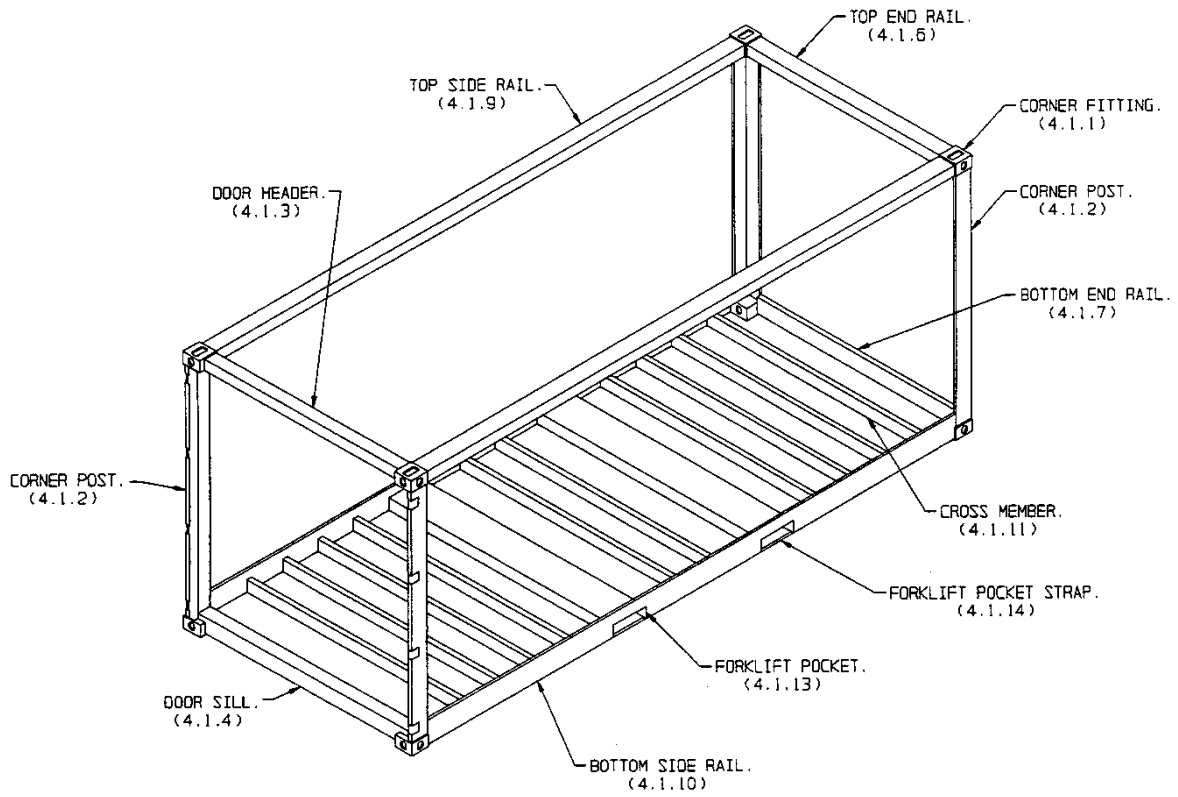


Figure 4-2. Primary Structural Components

END-OPENING CONTAINER INSPECTION CHECKLIST

DATE OF INSPECTION _____ ISO SERIAL NUMBER _____

INSPECTION LOCATION _____ CSC RE - INSPECTION DATE _____

COMPONENT OR ITEM _____ ACCEPT REJECT REMARKS (DEFICIENCIES)

1. MARKINGS & DATA PLATE

ISO MARKINGS			
CSC SAFETY APPROVAL			
MANUFACTURER'S DATA			
TIR, TCT & UIC APPROVALS *			

2. OVERALL CONFIGURATION

DIMENSIONS			
DISTORTION			
PROTRUSIONS			

3. DOOR END (REAR)

CORNER FITTINGS (4 each)			
CORNER POSTS (2 each)			
DOOR HEADER			
DOOR SILL			
DOOR PANELS			
HINGES			
HINGE PIN WELDS *			
LOCKING BARS			
LOCKING BAR MOUNTING BRACKETS			
CAMS			
CAM RETAINERS			
LOCKING HANDLES			
LOCKING HANDLE RETAINERS			
CUSTOMS CATCH *			
DOOR SEALS (GASKETS)			
RAIN GUTTER *			
J - BARS *			

4. CURB SIDE EXTERIOR

TOP SIDE RAIL			
BOTTOM SIDE RAIL			
FORKLIFT POCKETS *			
WALL PANELS			
WALL POSTS *			

5. FRONT END EXTERIOR

CORNER FITTINGS (4 each)			
CORNER POSTS (2 each)			
TOP END RAIL			
BOTTOM END RAIL			
WALL PANELS			
WALL POSTS *			

6. ROAD SIDE EXTERIOR

TOP SIDE RAIL			
BOTTOM SIDE RAIL			
FORKLIFT POCKETS *			
WALL PANELS			
WALL POSTS *			

7. ROOF EXTERIOR

CORNER FITTINGS APERTURES			
TOP SIDE RAILS			
TOP END RAIL			
DOOR HEADER			
ROOF PANELS			
REINFORCEMENT PLATES *			

8. UNDERSTRUCTURE

CORNER FITTING APERTURES			
CROSS MEMBERS			
FORKLIFT TUNNELS *			
SIDE RAILS			
END RAIL			
DOOR SILL			

9. INTERIOR

FLOORING			
FLOOR FASTENERS			
THRESHOLD PLATE *			
ROOF PANELS			
ROOF BOWS *			
WALL PANELS			
LINING *			
MECHANICAL RESTRAINT SYSTEM *			
LOAD BEARING SURFACES *			

NOTE: AN ITEM WITH AN ASTERISK (*) MAY OR MAY NOT BE RELEVANT. MARK "NA" IN THE REMARKS COLUMN FOR ITEMS WHICH ARE NOT APPLICABLE.

ACCEPTED _____ REJECTED _____ NEW CSC RE - INSPECTION DATE _____

INSPECTOR: _____ (PRINT NAME)

_____ (SIGNATURE)

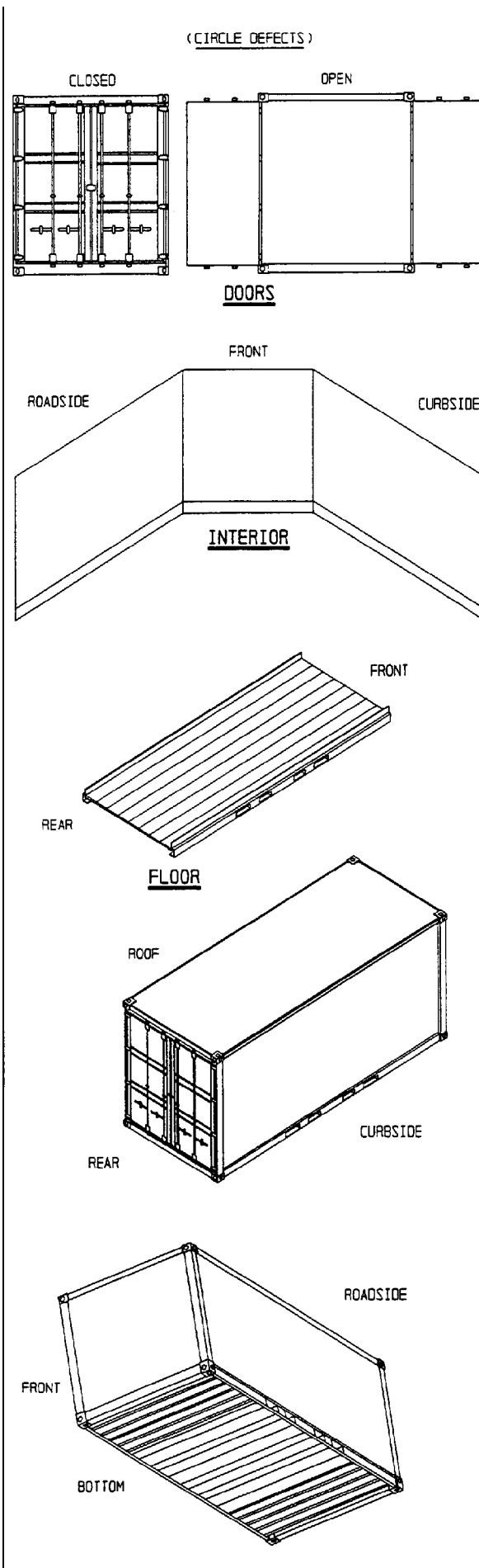


Figure 4-3. END - OPENING CONTAINER INSPECTION CHECKLIST

OPEN TOP CONTAINER INSPECTION CHECKLIST

DATE OF INSPECTION _____ ISO SERIAL NUMBER _____
 INSPECTION LOCATION _____ CSC RE - INSPECTION DATE _____
 COMPONENT OR ITEM _____ ACCEPT REJECT REMARKS (DEFICIENCIES)

1. MARKINGS & DATA PLATE

ISO MARKINGS			
CSC SAFETY APPROVAL			
MANUFACTURER'S DATA			
TIR, TCT & UIC APPROVALS *			

2. OVERALL CONFIGURATION

DIMENSIONS			
DISTORTION			
PROTRUSIONS			

3. DOOR END (REAR)

CORNER FITTINGS (4 each)			
CORNER POSTS (2 each)			
HEADER AND HEADER PINS *			
DOOR SILL			
DOOR PANELS			
HINGES			
HINGE PIN WELDS *			
LOCKING BOLTS *			
SAFETY CHAINS *			
LOCKING BARS *			
LOCKING BAR MOUNTING BRACKETS*			
CAMS *			
CAM RETAINERS *			
LOCKING HANDLES			
LOCKING HANDLE RETAINERS			
DOOR SEALS (GASKETS)			
J - BARS *			

4. CURB SIDE EXTERIOR

TOP SIDE RAIL			
BOTTOM SIDE RAIL			
FORKLIFT POCKETS *			
WALL PANELS			

5. FRONT END EXTERIOR

CORNER FITTINGS (4 each)			
CORNER POSTS (2 each)			
TOP END RAIL			
BOTTOM END RAIL			
WALL PANELS			

6. ROAD SIDE EXTERIOR

TOP SIDE RAIL			
BOTTOM SIDE RAIL			
FORKLIFT POCKETS *			
WALL PANELS			

7. ROOF EXTERIOR

CORNER FITTINGS APERTURES			
ROOF BOWS			
TARP			
WELDED LOOPS			
TIR CABLE			
RAIN GUTTER *			

8. UNDERSTRUCTURE

CORNER FITTING APERTURES			
CROSS MEMBERS			
FORKLIFT TUNNELS *			
FLOOR WELDS *			
SIDE RAILS			
END RAIL			
DOOR SILL			

9. INTERIOR

FLOORING (WOOD OR METAL)			
FLOOR FASTENERS OR WELDS			
DOOR RAMP SURFACE *			
THRESHOLD PLATE *			
WALL PANELS			
LINING *			
MECHANICAL RESTRAINT SYSTEM *			
LOAD BEARING SURFACES *			

NOTE: AN ITEM WITH AN ASTERISK (*) MAY OR MAY NOT BE RELEVANT.
 MARK "NA" IN THE REMARKS COLUMN FOR ITEMS WHICH ARE NOT APPLICABLE.

ACCEPTED _____ REJECTED _____ NEW CSC RE - INSPECTION DATE _____

INSPECTOR: _____ (PRINT NAME)

_____ (SIGNATURE)

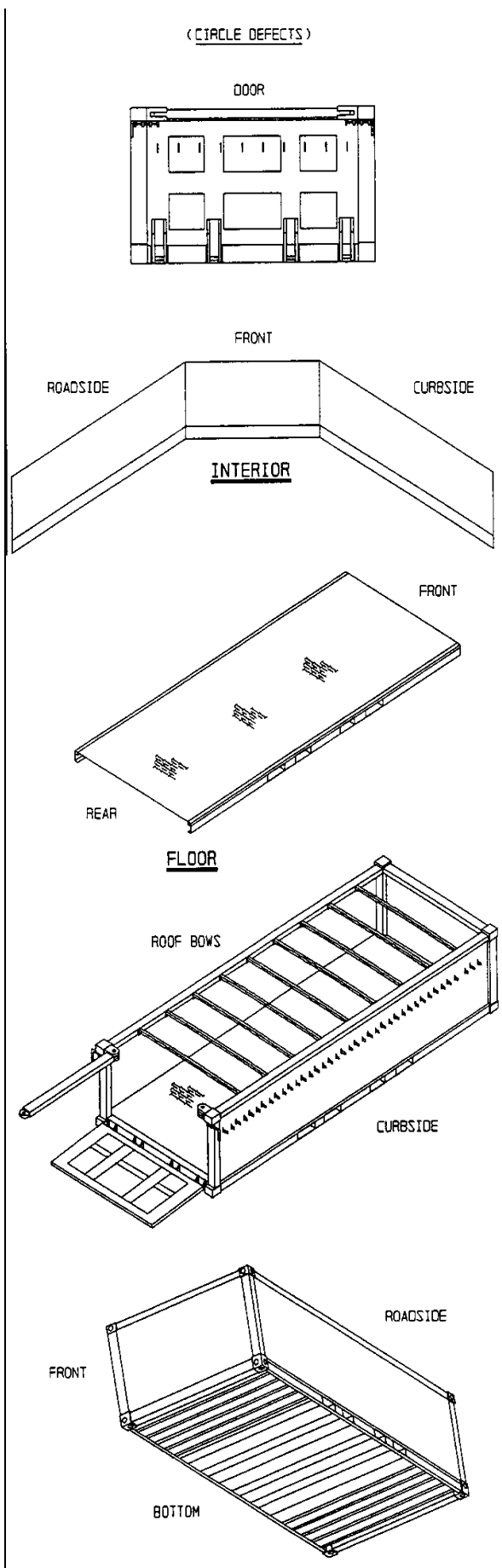


Figure 4-4. OPEN TOP CONTAINER INSPECTION CHECKLIST

SIDE-OPENING CONTAINER INSPECTION CHECKLIST

DATE OF INSPECTION _____ ISO SERIAL NUMBER _____

INSPECTION LOCATION _____ CSC RE - INSPECTION DATE _____

COMPONENT OR ITEM _____ ACCEPT REJECT REMARKS (DEFICIENCIES)

1. MARKINGS & DATA PLATE

ISO MARKINGS			
CSC SAFETY APPROVAL			
MANUFACTURER'S DATA			
TIR, TCT & UIC APPROVALS *			

2. OVERALL CONFIGURATION

DIMENSIONS			
DISTORTION			
PROTRUSIONS			

3. DOOR SIDE

DOOR HEADER (TOP SIDE RAIL)			
DOOR SILL (BOTTOM SIDE RAIL)			
FORKLIFT POCKETS			
DOOR PANELS			
HINGES			
HINGE PIN WELDS *			
LOCKING BARS			
LOCKING BAR MOUNTING BRACKETS			
CAMS			
CAM RETAINERS			
LOCKING HANDLES			
LOCKING HANDLE RETAINERS			
CUSTOMS CATCH *			
DOOR SEALS (GASKETS)			
RAIN GUTTER *			
J - BARS *			

4. RIGHT END EXTERIOR

CORNER FITTINGS (4 each)			
CORNER POSTS (2 each)			
TOP END RAIL			
BOTTOM END RAIL			
WALL PANELS			
WALL POSTS *			

5. BACK SIDE EXTERIOR

TOP SIDE RAIL			
BOTTOM SIDE RAIL			
FORKLIFT POCKETS			
WALL PANELS			
WALL POSTS *			

6. LEFT END EXTERIOR

CORNER FITTINGS (4 each)			
CORNER POSTS (2 each)			
TOP END RAIL			
BOTTOM END RAIL			
WALL PANELS			
WALL POSTS *			

7. ROOF EXTERIOR

CORNER FITTINGS APERTURES			
TOP SIDE RAIL (BACK SIDE)			
TOP SIDE RAIL (DOOR HEADER)			
TOP END RAILS			
ROOF PANELS			
REINFORCEMENT PLATES *			

8. UNDERSTRUCTURE

CORNER FITTING APERTURES			
CROSS MEMBERS			
FORKLIFT TUNNELS *			
BOTTOM SIDE RAILS (BACK SIDE)			
BOTTOM SIDE RAIL (DOOR SILL)			
BOTTOM END RAILS			

9. INTERIOR

FLOORING			
FLOOR FASTENERS			
ROOF PANELS			
ROOF BOWS *			
WALL PANELS			
LINING *			
TIEDOWN PROVISIONS *			
LOAD BEARING SURFACES *			

NOTE: AN ITEM WITH AN ASTERISK (*) MAY OR MAY NOT BE RELEVANT. MARK "NA" IN THE REMARKS COLUMN FOR ITEMS WHICH ARE NOT APPLICABLE.

ACCEPTED _____ REJECTED _____ NEW CSC RE - INSPECTION DATE _____

INSPECTOR: _____ (PRINT NAME)

_____ (SIGNATURE)

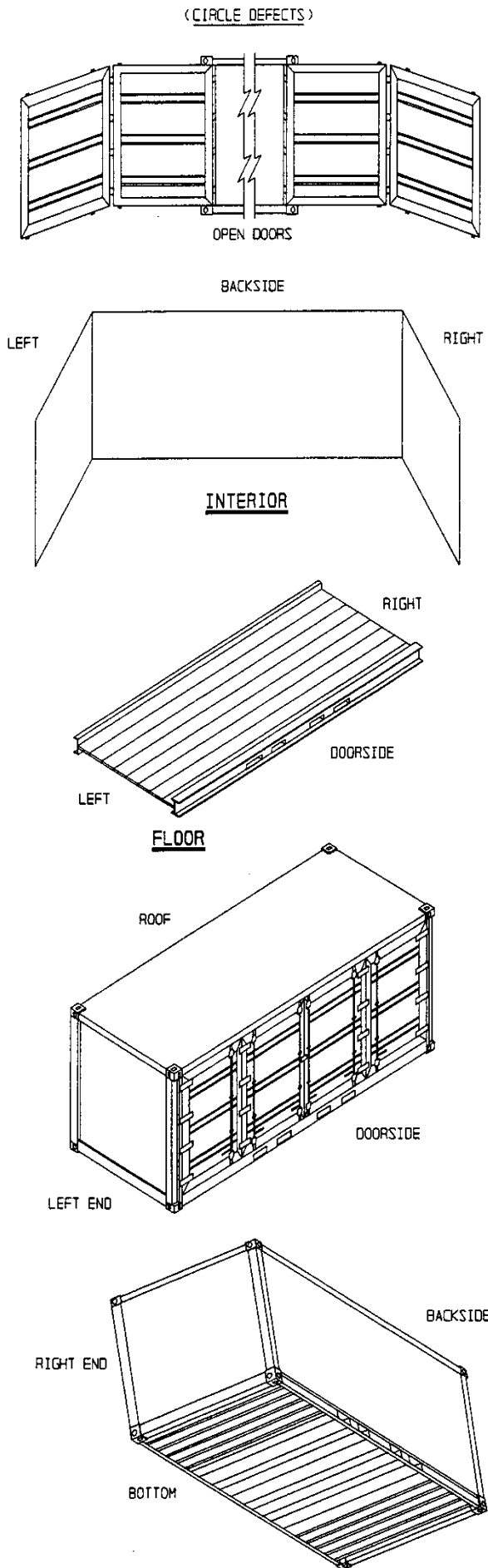


Figure 4-5. SIDE-OPENING CONTAINER INSPECTION CHECKLIST (Page 4-12)

FLATRACK CONTAINER INSPECTION CHECKLIST

DATE OF INSPECTION _____ ISO SERIAL NUMBER _____

INSPECTION LOCATION _____ CSC RE - INSPECTION DATE _____

COMPONENT OR ITEM _____ ACCEPT REJECT REMARKS (DEFICIENCIES)

1. MARKINGS & DATA PLATE

ISO MARKINGS			
CSC SAFETY APPROVAL			
MANUFACTURER'S DATA			
TIR, TCT & UIC APPROVALS *			

2. OVERALL CONFIGURATION

DIMENSIONS			
DISTORTION			
PROTRUSIONS			

3. END A

CORNER FITTINGS (4 each)			
CORNER POSTS (2 each)			
TOP APERTURES			
TOP END RAIL			
BOTTOM END RAIL			
WALL PANELS			
WALL POSTS *			
LOCKING HARDWARE *			

4. SIDE A

SIDE RAIL			
STANCHIONS			
TIEDOWN PROVISIONS			
FORKLIFT POCKETS *			

5. END B

CORNER FITTINGS (4 each)			
CORNER POSTS (2 each)			
TOP APERTURES			
TOP END RAIL			
BOTTOM END RAIL			
WALL PANELS			
WALL POSTS *			
LOCKING HARDWARE *			

6. SIDE B

SIDE RAIL			
STANCHIONS			
TIEDOWN PROVISIONS			
FORKLIFT POCKETS *			

7. UNDERSTRUCTURE

CORNER FITTINGS APERTURES			
CROSS MEMBERS			
FORKLIFT TUNNELS *			
SIDE RAILS			
END RAILS			

8. CARGO AREA

FLOORING			
FLOOR FASTENERS			
LOAD BEARING SURFACES			
STACKING CONES *			

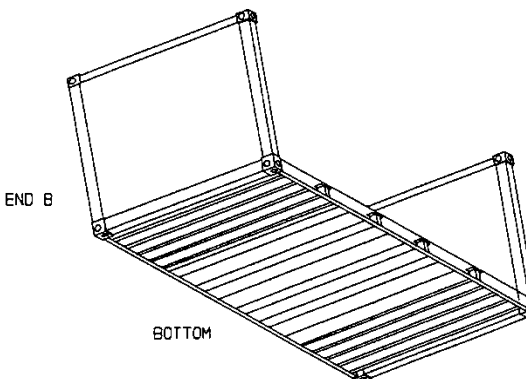
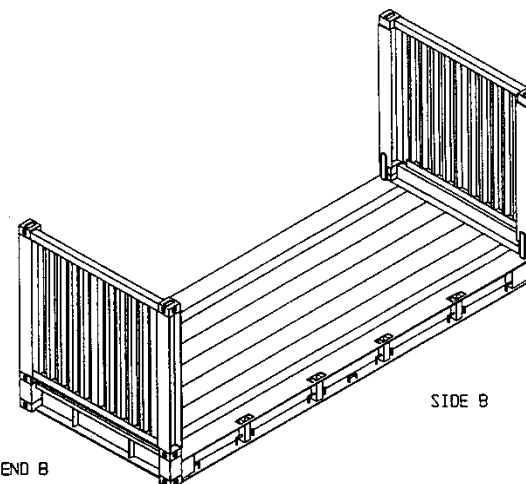
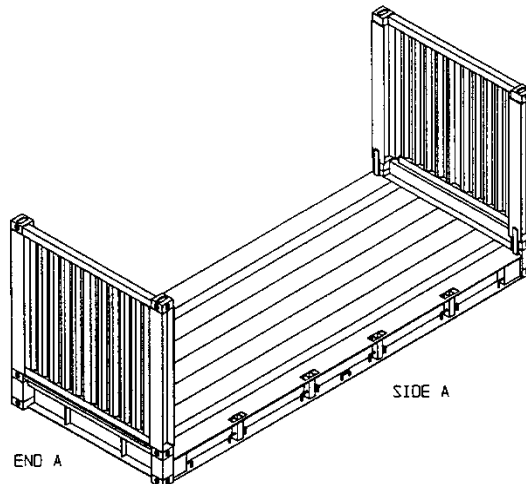
NOTE: AN ITEM WITH AN ASTERISK (*) MAY OR MAY NOT BE RELEVANT. MARK "NA" IN THE REMARKS COLUMN FOR ITEMS WHICH ARE NOT APPLICABLE.

ACCEPTED _____ REJECTED _____ NEW CSC RE - INSPECTION DATE _____

INSPECTOR: _____ (PRINT NAME)

_____ (SIGNATURE)

(CIRCLE DEFECTS)



SERVICEABILITY CERTIFICATE FOR CLASS 1				
SHIPPER (CONSIGNOR):		ISO CODE AND SERIAL NUMBER:		
DESTINATION (CONSIGNEE):		STYLE OF CONTAINER:		
TRANSPORTER:		End-Opening -----		
		Side-Opening -----		
		Open-Top -----		
		Flatrack -----		
DESCRIPTION AND QUANTITY OF CARGO (Including Proper Shipping Name):				
UNO SERIAL NUMBER	UN HAZARD CLASS AND DIVISION	STOWAGE COMPATABILITY GROUP	LADING WEIGHT IN POUNDS	NET EXPLOSIVE WEIGHT IN POUNDS
<p>DECLARATION (Statement of Serviceability) This container has been examined in accordance with the recommendations of the International Maritime Dangerous Goods (IMDG) Code as set forth within Title 49 of the United States Code of Federal Regulations (CFR) part 176.172.</p> <p>This container is considered to be structurally serviceable and is suitable for the transport of cargo identified above. Furthermore:</p> <ul style="list-style-type: none"> - The container has an appropriate CSC approval plate affixed to it. - Before the container was loaded, it was free of any residue of previous cargo and its interior walls and floor were free from protrusions. - Only compatible cargo items were loaded into the container. - Only compatible cargo items were loaded into the container. - Cargo items were adequately packaged and/or unitized prior to loading and the packages and/or unit loads were properly positioned and secured within the container to preclude shifting and/or damage during transit - Capacity of the container was not exceeded and the cargo was loaded so not more than sixty (60) percent of the cargo weight was positioned in less than half the length of the container. - In addition to proper markings on the packages and/or unit loads, appropriate placards were securely affixed to all four exterior surfaces (sides and ends) of the container. 				
INSPECTOR (EXAMINER):			LOCATION: -----	
Signature: -----			DATE: -----	
Printed Name: -----				
Job Title: -----				

Figure 4-5

Figure 4-7. SERVICEABILITY CERTIFICATE FOR CLASS 1