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DATE 5/13/94

# LOADING AND BRACING IN END OPENING ISO CONTAINERS OF MK20 AND MODS (ROCKEYE II) AND CBU-78/B (GATOR) PACKED IN THE MK18 MOD 0 CRADLE

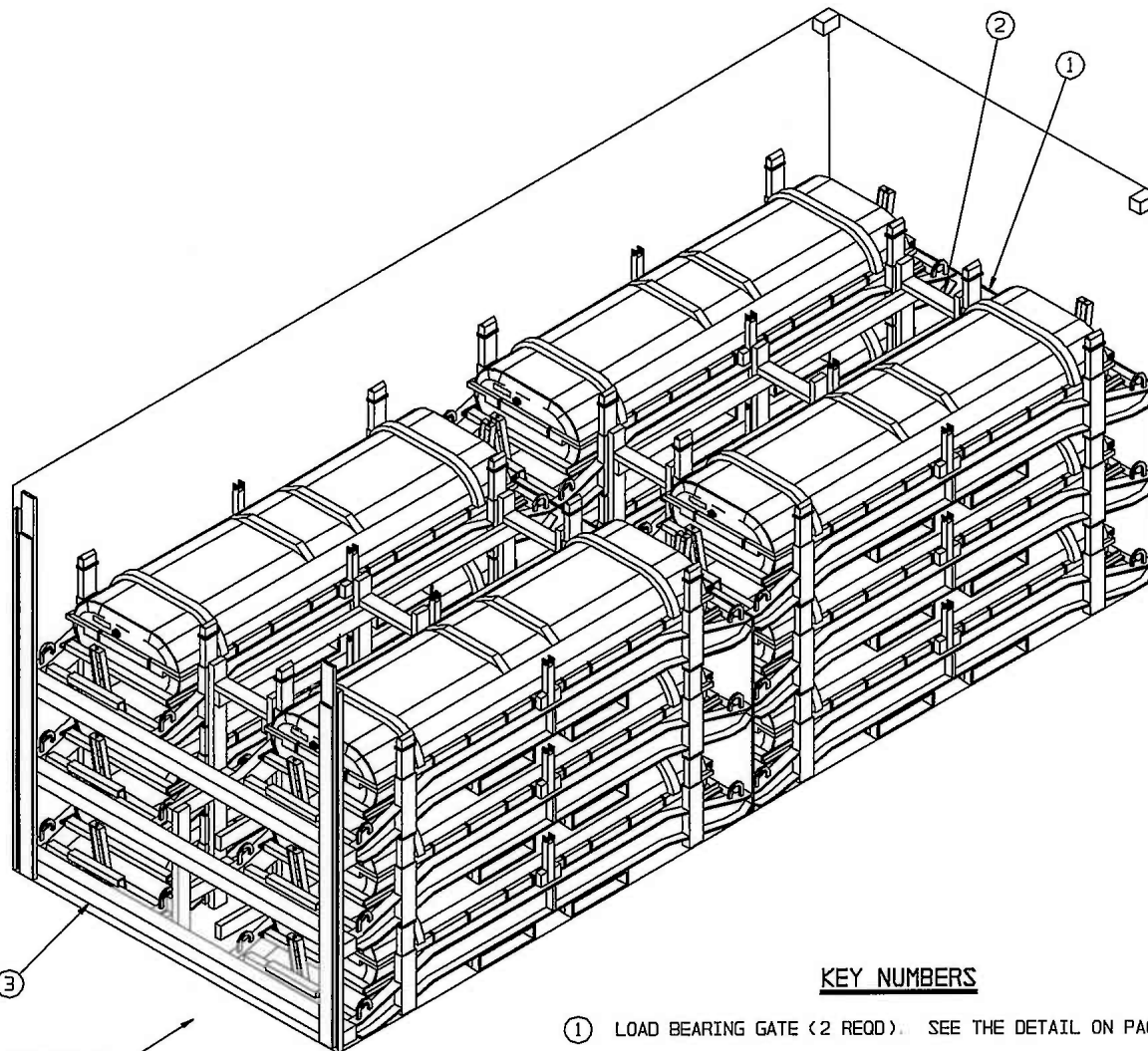
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- LOADING AND BRACING SPECIFICATIONS SET FORTH WITHIN THIS DRAWING ARE APPLICABLE TO LOADS THAT ARE TO BE SHIPPED BY TRAILER/CONTAINER-ON-FLATCAR (T/COFC) RAIL CARRIER SERVICE. THESE SPECIFICATIONS MAY ALSO BE USED FOR LOADS THAT ARE TO BE MOVED BY MOTOR OR WATER CARRIERS.

U.S. ARMY MATERIEL COMMAND DRAWING			
APPROVED, U.S. ARMY ARMAMENT, MUNITIONS AND CHEMICAL COMMAND	DRAFTSMAN	TECHNICIAN	ENGINEER
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U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL			
JANUARY 1994			
CLASS	DIVISION	DRAWING	FILE
19	48	8544	SP15J40

DO NOT SCALE



REAR OF CONTAINER.

ISOMETRIC VIEW

KEY NUMBERS

- ① LOAD BEARING GATE (2 REOD). SEE THE DETAIL ON PAGE 4.
- ② CENTER FILL ASSEMBLY (2 REOD). SEE THE DETAIL ON PAGE 5.
- ③ REAR BLOCKING ASSEMBLY (1 REOD). SEE THE DETAIL ON PAGE 5 AND "DETAIL A" AND "DETAIL B" ON PAGE 6.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	16	6
2" X 4"	198	132
4" X 4"	23	31
NAILS	NO. REOD	POUNDS
6d (2")	28	1/4
10d (3")	164	2-3/4
PLYWOOD, 1/2" - - - 64.75 SQ FT REOD - - - 89.03 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
MK18 CRADLE	12	17,460 LBS
DUNNAGE		431 LBS
CONTAINER		4,700 LBS
<b>TOTAL WEIGHT</b>		<b>22,591 LBS (APPROX)</b>

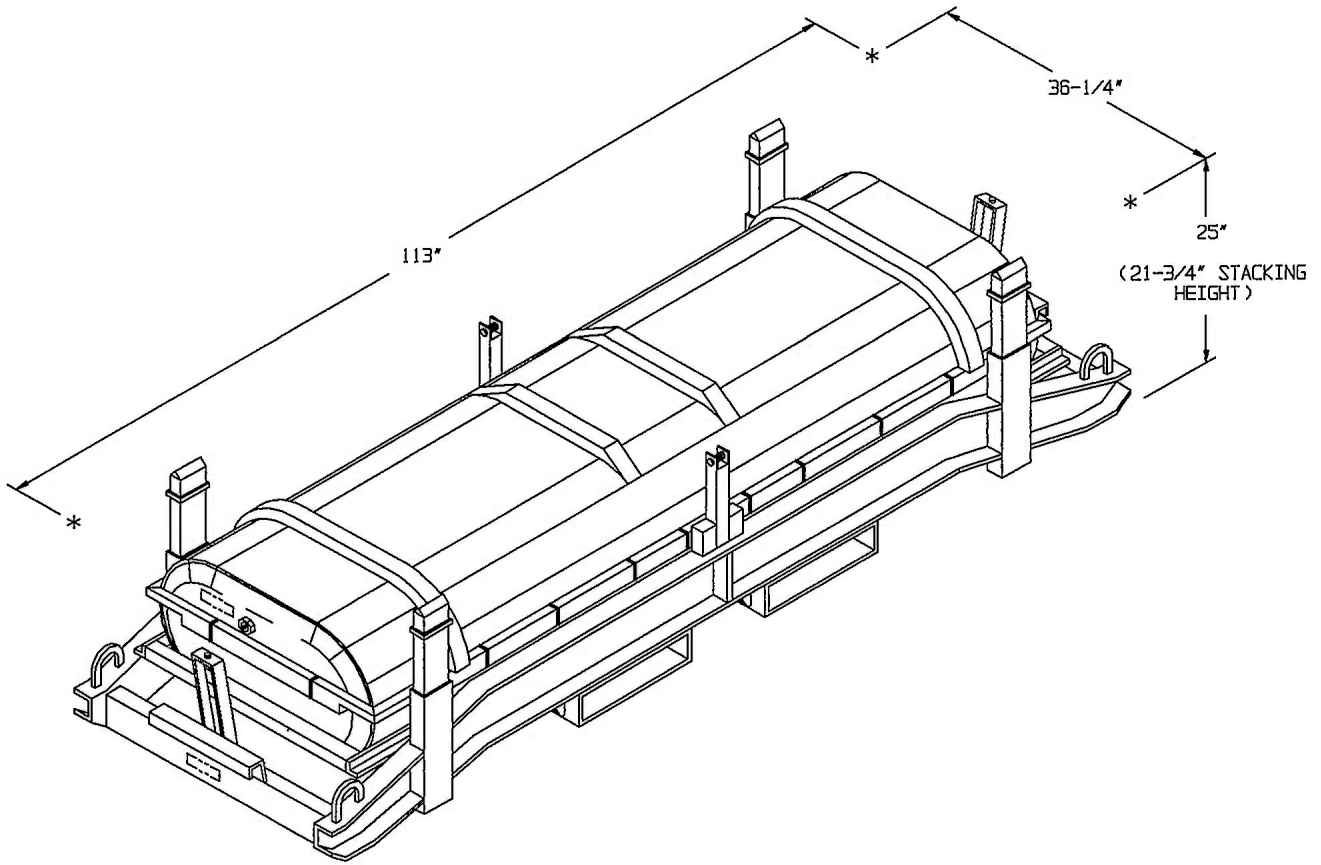
- J. REQUIREMENTS CITED WITHIN THE BUREAU OF EXPLOSIVES PAMPHLET 6C APPLY WHEN THE SHIPMENT MOVES BY TRAILER/CONTAINER-ON-FLATCAR (T/COFC). SPECIAL T/COFC NOTES FOLLOW.
  - 1. A LOADED CONTAINER MUST BE ON A CHASSIS EQUIPPED WITH TWO BOGIE ASSEMBLIES WHEN BEING MOVED IN TOPC SERVICE.
  - 2. THE LOAD LIMIT OF A T/COFC RAILCAR MUST NOT BE EXCEEDED, NOR WILL A CAR BE LOADED SO THAT THE TRUCK UNDER ONE END OF THE CAR CARRIES MORE THAN ONE-HALF OF THE LOAD LIMIT FOR THAT CAR.
- K. DURING INTRASTATE AND/OR INTERSTATE MOVES BY MOTOR CARRIER, A PROPER CHASSIS OR MODIFIED FLATBED TRAILER MUST BE USED TO PRECLUDE VIOLATION OF ONE OR MORE "WEIGHT LAWS" APPLICABLE TO THE STATE OR STATES INVOLVED.
- L. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS 0.454 KG.
- M. THE QUANTITY OF CRADLES SHOWN IN THE LOAD ON PAGE 2 MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SEE THE "LESS-THAN-FULL-LOAD" DETAIL ON PAGE 7. WHEN A CONTAINER IS TO BE LOADED WITH A REDUCED QUANTITY OF LADING UNITS, THE LENGTHWISE CENTER OF GRAVITY OF THE LOAD MUST BE WITHIN 12", IN EITHER DIRECTION, OF THE MID-POINT OF THE CONTAINER.
- N. ANTI-CHAFING MATERIAL MAY BE INSTALLED AT POINTS OF CONTACT BETWEEN CRADLES AND THE END OPENING CONTAINER, AND BETWEEN CRADLES AND STEEL STRAPPING, IF DESIRED, TO PREVENT CHAFING DAMAGE TO CRADLE PAINT AND MARKINGS.
- O. RECOMMENDED SEQUENTIAL LOADING PROCEDURES:
  - 1. PREFABRICATE TWO LOAD BEARING GATES AND TWO CENTER FILL ASSEMBLIES.
  - 2. INSTALL ONE LOAD BEARING GATE.
  - 3. LOAD SIX CRADLES.
  - 4. INSTALL ONE CENTER FILL ASSEMBLY.
  - 5. REPEAT STEPS 2 THRU 4.
  - 6. FABRICATE THE REAR BLOCKING ASSEMBLY IN PLACE.

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE SPECIFIED OUTLOADING PROCEDURES ARE APPLICABLE TO LOADS OF MK20 AND MODS (ROCKEYE II) AND CBU-78/B (GATOR) WHEN PACKED IN THE MK18 MOD 0 CRADLE. SUBSEQUENT REFERENCE TO CRADLE HEREIN MEANS THE MK18 MOD 0 CRADLE WITH CONTENTS. SEE PAGE 4 FOR DETAIL OF THE CRADLE. **CAUTION:** REGARDLESS OF THE QUANTITY OF CRADLES TO BE SHIPPED, THE "MAXIMUM GROSS WEIGHT" OF THE END OPENING ISO CONTAINER MUST NOT BE EXCEEDED.
- C. THE LOAD AS SHOWN IS BASED ON A 4,700 POUND 20' LONG BY 8' WIDE BY 8'-6" HIGH END OPENING ISO CONTAINER WITH INSIDE DIMENSIONS OF 19'-4" LONG BY 92" WIDE BY 95" (93" CLEAR HEIGHT) AND A MAXIMUM GROSS WEIGHT OF 52,910 POUNDS. THE LOAD IS DESIGNED FOR TRAILER/CONTAINER-ON-FLATCAR (T/COFC) SHIPMENT, HOWEVER, THE LOAD AS DESIGNED CAN ALSO BE MOVED BY OTHER SURFACE MODES OF TRANSPORT. **NOTICE:** OTHER CONTAINERS OF THE SAME DESIGN CONFIGURATION CAN BE USED.
- D. WHEN LOADING CRADLES, THEY ARE TO BE POSITIONED SO AS TO ACHIEVE A TIGHT LOAD (TIGHT AGAINST THE DUNNAGE ASSEMBLIES). THE UNBLOCKED SPACE ACROSS THE WIDTH OF A LOAD BAY IS NOT TO EXCEED 1-1/2". EXCESSIVE SLACK CAN BE ELIMINATED FROM A LOAD BY LAMINATING ADDITIONAL PIECES OF APPROPRIATE THICKNESS TO THE VERTICAL PIECES ON THE CENTER FILL ASSEMBLIES. NAIL EACH ADDITIONAL PIECE TO THE VERTICAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE LENGTH OF THE STRUTS IN THE CENTER FILL ASSEMBLIES MAY BE ADJUSTED, AS NECESSARY, TO FACILITATE VARIANCE IN THE CRADLE SIZE.
- E. DUNNAGE LUMBER SPECIFIED IS OF NOMINAL SIZE. FOR EXAMPLE, 1" X 4" MATERIAL IS ACTUALLY 3/4" THICK BY 3-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE.
- F. A STAGGERED NAILING PATTERN WILL BE USED WHENEVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES OR WHEN LAMINATING DUNNAGE. ADDITIONALLY, THE NAILING PATTERN FOR AN UPPER PIECE OF LAMINATED DUNNAGE WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL FOR THAT PIECE WILL NOT BE DRIVEN THROUGH ONTO OR RIGHT BESIDE A NAIL IN A LOWER PIECE.
- G. **CAUTION:** DO NOT NAIL DUNNAGE MATERIAL TO THE CONTAINER WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.
- H. PORTIONS OF THE CONTAINER DEPICTED WITHIN THIS DRAWING, SUCH AS THE SIDEWALL, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.

(CONTINUED AT LEFT)

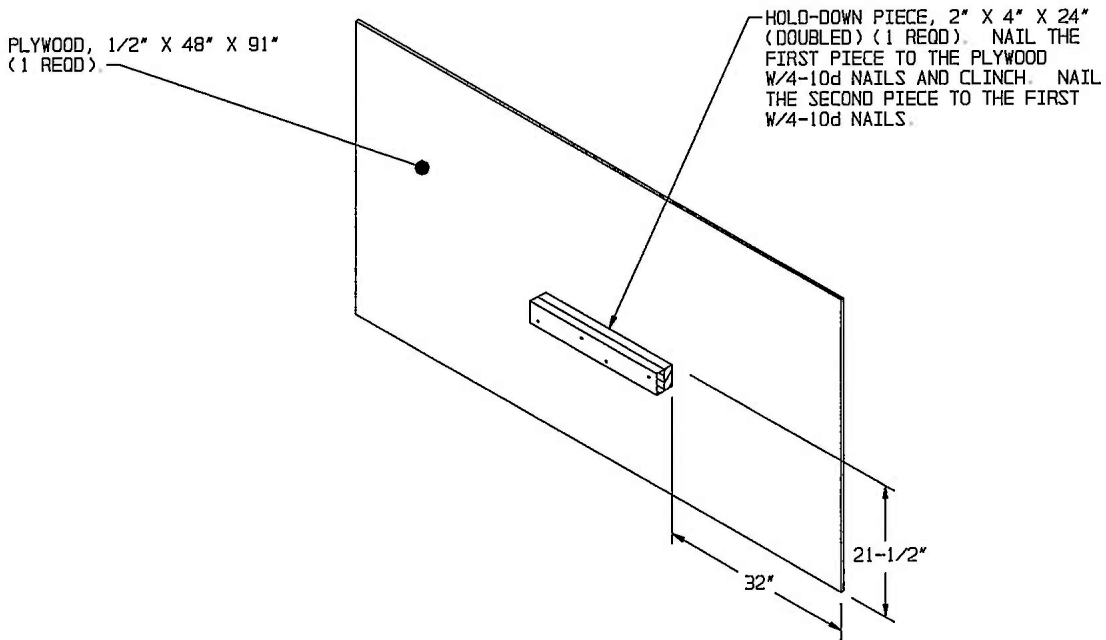
MATERIAL SPECIFICATIONS

- LUMBER - - - - - : SEE TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC MM-L-751.
- NAILS - - - - - : FED SPEC FF-N-105; COMMON.
- PLYWOOD - - - - - : COMMERCIAL ITEM DESCRIPTION A-A-55057, TYPE A, CONSTRUCTION AND INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D. IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER INTERIOR OR AN EXTERIOR GRADE MAY BE SUBSTITUTED.
- STRAPPING, STEEL - - - : ASTM D3953; FLAT STRAPPING, TYPE 1, HEAVY DUTY, FINISH A, B (GRADE 2), OR C.
- SEAL, STRAP - - - - - : ASTM D3953; CLASS H, FINISH A, B (GRADE 2), OR C, DOUBLE NOTCH TYPE, STYLE I, II, OR IV.
- ANTI-CHAFING MATERIAL - - - - - : MIL-B-121 (OR EQUAL); NEUTRAL BARRIER MATERIAL.



**MK18 MOD 0 CRADLE**

GROSS WEIGHT ----- 1,455 LBS (APPROX)  
 CUBE ----- 59.3 CUBIC FEET (APPROX)



**LOAD BEARING GATE**

HORIZONTAL PIECE, 2" X 4" X 7'-2"  
(2 REQD). NAIL TO THE VERTICAL  
PIECES W/2-10d NAILS AT EACH JOINT.  
SEE "VIEW A" AT RIGHT FOR POSI-  
TIONING DIMENSIONS.

STRUT, 2" X 4" X 15-1/2" (9 REQD).  
NAIL TO THE HORIZONTAL PIECES  
W/2-10d NAILS AT EACH END.

VERTICAL PIECE, 2" X 4"  
X 60" (6 REQD).

STOP PIECE, 2" X 4" X  
32" (1 REQD). NAIL TO  
THE HORIZONTAL PIECES  
W/2-10d NAILS AT EACH  
JOINT. SEE THE "NOTE"  
BELOW.

HORIZONTAL PIECE, 2" X 4" X 9'-4"  
(4 REQD). NAIL TO THE VERTICAL  
PIECES W/2-10d NAILS AT EACH JOINT.  
SEE "VIEW A" AT RIGHT FOR POSITIONING  
DIMENSIONS.

VIEW A

VIEW A

**CENTER FILL ASSEMBLY**

NOTE: FOR TWO HIGH LOAD, ELIMINATE THE TOP TWO  
HORIZONTAL PIECES AND THE TOP THREE STRUTS, AND  
FOR A ONE HIGH LOAD, ELIMINATE THE TOP FOUR HORI-  
ZONTAL PIECES AND THE TOP SIX STRUTS. SHORTEN  
THE VERTICAL AND STOP PIECES APPROPRIATELY. THE  
STOP PIECE IS ONLY REQUIRED ON THE REARMOST CENTER  
FILL ASSEMBLY. INSTALL THE REARMOST CENTER FILL  
ASSEMBLY SUCH THAT THE STOP PIECE IS AT THE REAR  
OF THE CONTAINER.

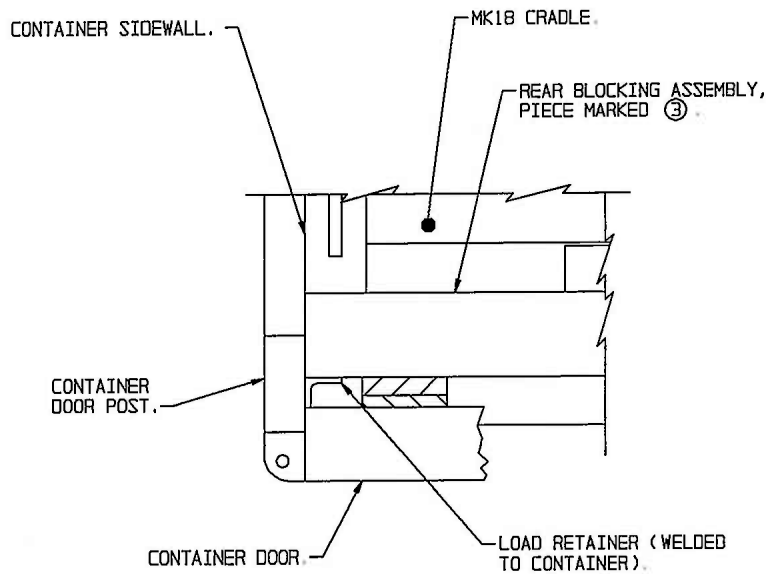
FILL PIECE, PLYWOOD, 1/2" X 3-1/2"  
X 7'-0" (2 REQD). LAMINATE TO THE  
VERTICAL PIECE W/8-6d NAILS.

HORIZONTAL PIECE, 4" X 4" BY INSIDE  
CONTAINER WIDTH MINUS 1" (REF: 7'-7")  
(3 REQD).

VERTICAL PIECE, 1" X 4" BY INSIDE  
CONTAINER HEIGHT MINUS 1" (REF:  
7'-10") (2 REQD). NAIL TO THE  
HORIZONTAL PIECES W/2-6d NAILS  
AT EACH JOINT.

**REAR BLOCKING ASSEMBLY**

NOTE: FOR TWO HIGH LOAD, ELIMINATE THE TOP HORIZONTAL  
PIECE, AND FOR A ONE HIGH LOAD, ELIMINATE THE TOP TWO  
HORIZONTAL PIECES. THE WIDTH AND QUANTITY OF FILL PIECES  
MUST BE ADEQUATE TO CONTACT THE DOOR WHEN THE HORIZONTAL  
PIECES ARE IN CONTACT WITH THE LOAD RETAINER. SEE "DETAIL  
A" AND "DETAIL B" ON PAGE 6.

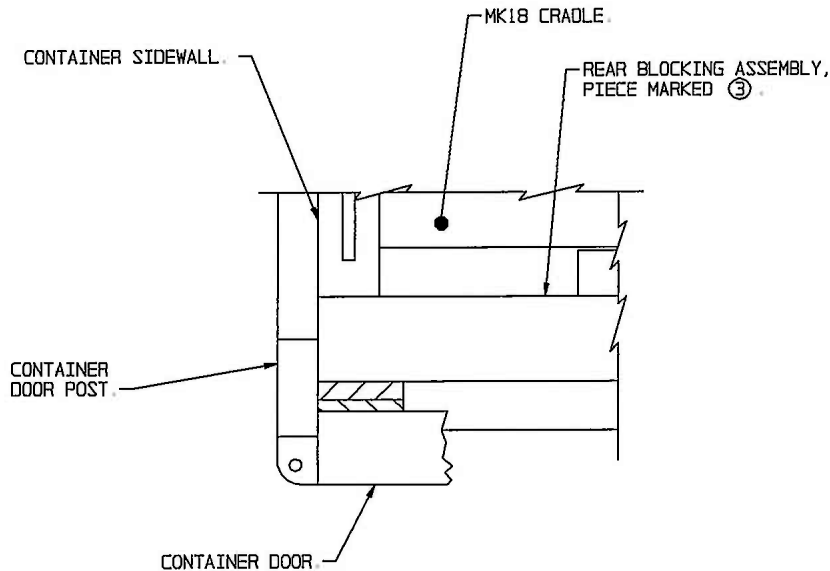


**DETAIL A**

A PARTIAL PLAN VIEW OF THE LEFT REAR PORTION OF THE CONTAINER IS SHOWN DEPICTING THE PROPER POSITION OF THE REAR BLOCKING ASSEMBLY AND ADJACENT CRADLES.

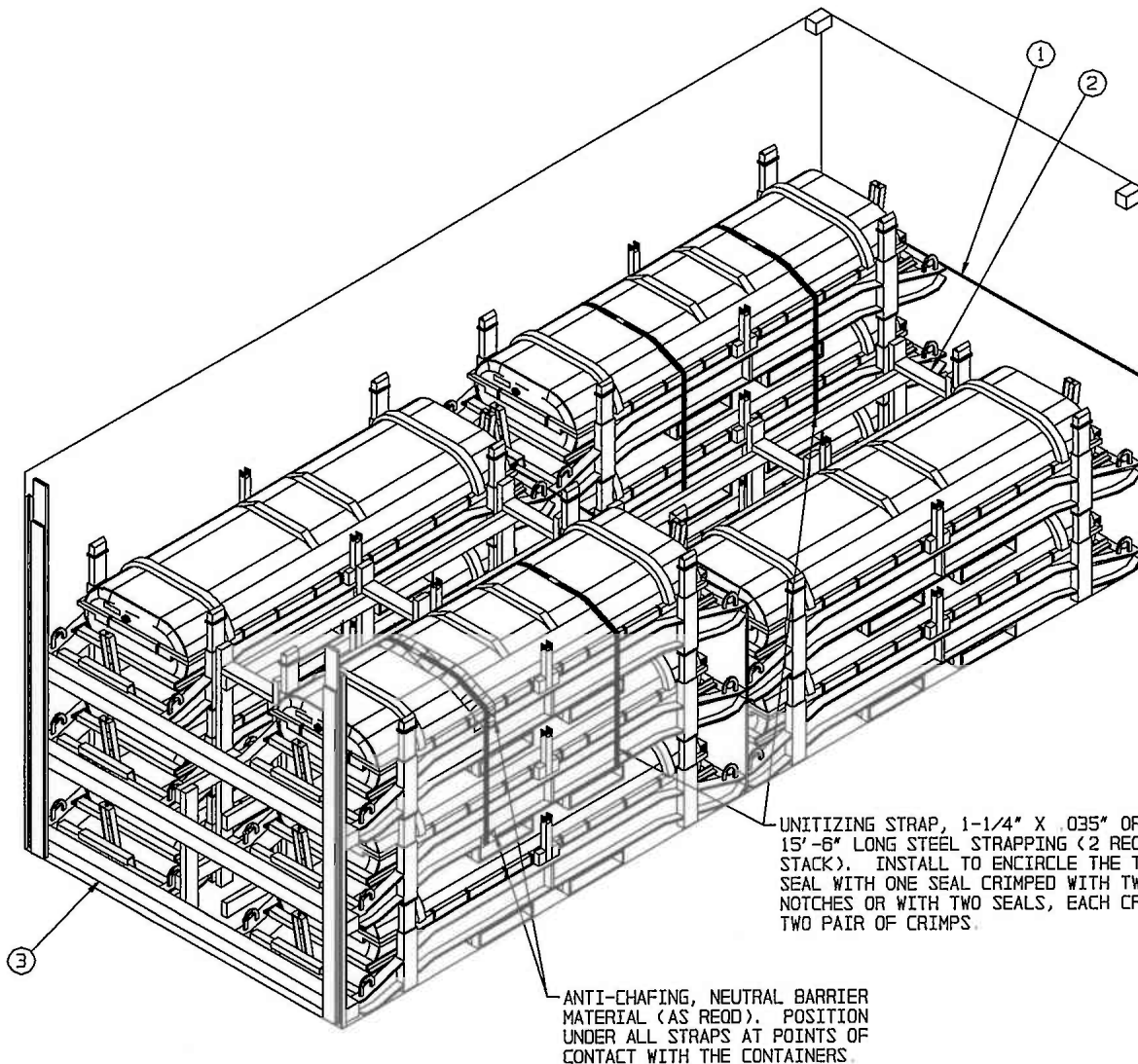
**SPECIAL NOTE:**

WHEN ISO CONTAINERS ARE NOT EQUIPPED WITH PRE-WELDED LOAD RETAINERS, AS DEPICTED IN "DETAIL B" BELOW, THE VERTICAL AND FILL PIECES ON THE REAR BLOCKING ASSEMBLY WILL BE MOVED OUTWARD SO AS TO BE FLUSH WITH THE EDGE OF THE HORIZONTAL PIECES.



**DETAIL B**

A PARTIAL PLAN VIEW OF THE LEFT REAR PORTION OF THE CONTAINER IS SHOWN DEPICTING THE PROPER POSITION OF THE REAR BLOCKING ASSEMBLY AND ADJACENT CRADLES.



ISOMETRIC VIEW

SPECIAL NOTE:

WHEN REDUCING A LOAD BY ONE OR MORE CRADLES, IT WILL BE NECESSARY TO UNITIZE THE CRADLE STACKS WHICH ARE Laterally and Longitudinally Adjacent to the Omitted Cradle as Depicted in the Load View Above. See GENERAL NOTE "M" ON PAGE 3.

LESS-THAN-FULL-LOAD PROCEDURE

KEY NUMBERS REFER TO KEY NUMBERS ON PAGE 2. NOTE THAT ONE CENTER FILL ASSEMBLY HAS BEEN MODIFIED AS DESCRIBED ON PAGE 5.

