

LOADING AND BRACING[⊕] IN SIDE OPENING ISO CONTAINERS OF HARPOON MISSILES, RGM-84, PACKED IN MK694 MOD 0 CONTAINERS

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⊕ THE PROCEDURES SHOWN HEREIN ARE APPLICABLE TO LOADS THAT ARE TO
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WATER CARRIERS.

U.S. ARMY MATERIEL COMMAND DRAWING

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RUS.ALLEN.J .1230354282 Digitally signed by RUS.ALLEN.J.1230354282 Date: 2019.04.04 15:45:16 -05'00'	DO NOT SCALE		JUNE 2006		
	DESIGN ENGINEER	BASIC REV.	RICHARD GARSIDE RICHARD GARSIDE		
APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND	ENGINEERING DIVISION	FIEFFER.LAUR A.A.1230375727 Digitally signed by FIEFFER.LAURA.A.1230375727 Date: 2019.03.29 08:53:48 -05'00'	REVISION NO. 1	APRIL 2019	
THOMAS.CARL.AN THONY.110462137 2 Digitally signed by THOMAS.CARL.ANTHONY.1104 621372 Date: 2019.04.05 07:38:35 -05'00'	TEST ENGINEER	FELICIANO.AD IN.1259200373 Digitally signed by FELICIANO.ADIN.1259200373 Date: 2019.03.28 13:42:51 -05'00'	SEE THE REVISION LISTING ON PAGE 2		
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	EXPLOSIVE SAFETY DIRECTORATE	FAIRHURST.ROBE RT.JOHN.10157688 80 Digitally signed by FAIRHURST.ROBERT.JOHN.101 5766880 Date: 2019.04.01 09:35:07 -05'00'	19	48	8755
U.S. ARMY DEFENSE AMMUNITION CENTER					

GENERAL NOTES

(GENERAL NOTES CONTINUED)

- 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 HARPOON MISSILE (RGM-84) PACKED IN MK694 MOD 0 CONTAINER. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS CONTAINER WITH AMMUNITION ITEMS. SEE NAVY SEA SYSTEMS COMMAND DRAWING DL5167322 AND PAGE 4 FOR DETAILS OF THE CONTAINER. **CAUTION:** REGARDLESS OF THE QUANTITY OF CONTAINERS TO BE SHIPPED, THE "MAXIMUM GROSS WEIGHT" OF THE SIDE OPENING ISO CONTAINER MUST NOT BE EXCEEDED.
- C. THE LOAD AS SHOWN IS BASED ON A 6,050 POUND 20' LONG BY 8' WIDE BY 8'-6" HIGH SIDE OPENING ISO CONTAINER WITH INSIDE DIMENSIONS OF 19'-4" LONG BY 89" WIDE BY 88" HIGH AND A MAXIMUM GROSS WEIGHT OF 52,910 POUNDS. THE LOAD IS DESIGNED FOR TRAILER/CONTAINER-ON-FLATCAR (T/COFC) SHIPMENT. HOWEVER, THE LOADS 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 CONTAINERS, 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 HORIZONTAL PIECES ON THE CENTER BLOCKING ASSEMBLIES. NAIL EACH ADDITIONAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE THICKNESS AND/OR QUANTITY OF THE VERTICAL OR HORIZONTAL PIECES IN THE CENTER BLOCKING ASSEMBLIES MAY BE ADJUSTED AS REQUIRED TO FACILITATE VARIANCE IN THE SIZE OF THE CONTAINERS. THE LOADS MUST BE AS TIGHT AS POSSIBLE LONGITUDINALLY, BUT THE VOID MUST NOT EXCEED 3/4" OVERALL. EXCESSIVE SLACK CAN BE ELIMINATED BY ADDING ADDITIONAL FILL MATERIAL TO THE BUFFER PIECES OF THE END BLOCKING ASSEMBLIES. NAIL EACH ADDITIONAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12".
- 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, ON TO, OR RIGHT BESIDE A NAIL IN A LOWER PIECE.
- G. IN SOME ISO CONTAINERS THERE IS A SLOT AT THE CORNERS OF THE END-WALLS. PIECES OF DUNNAGE MATERIAL MUST BE LAMINATED TO THE BUFFER PIECES ON THE END BLOCKING ASSEMBLY TO PROVIDE A FLAT SURFACE FOR THE BUFFER PIECES. A PIECE OF 2" X 4", 2" X 3" OR A SPECIAL WIDTH PIECE CUT-TO-FIT CAN BE USED. THIS FILL PIECE WILL BE NAILED WITH ONE APPROPRIATELY SIZED NAIL EVERY 12". NOTE THAT SOME CONTAINERS ARE EQUIPPED WITH "TIE-BARS" IN THE CORNER SLOT, WHICH PRECLUDE THE USE OF A FULL HEIGHT FILL PIECE. WHEN "TIE-BARS" ARE PRESENT, THE FILL PIECE MUST BE INSTALLED IN SEGMENTS DESIGNED TO FIT BETWEEN THE "TIE-BARS" VERTICALLY. THE FILL PIECE(S) IS NOT REQUIRED WHEN THE CORNER PORTIONS OF THE CONTAINER ENDWALLS ARE SMOOTH AND FLAT. DO NOT ALLOW ANY DUNNAGE ASSEMBLY TO CONTACT THE CONTAINER ENDWALLS. ONLY THE CORNER POSTS OF THE CONTAINER SHOULD BE USED FOR ENDWALL LONGITUDINAL BLOCKING.
- H. WHETHER AN ISO CONTAINER IS FULL OR IS 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.
- J. **CAUTION:** DO NOT NAIL DUNNAGE MATERIAL TO THE ISO CONTAINER WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.
- K. PORTIONS OF THE ISO CONTAINER DEPICTED WITHIN THIS DRAWING, SUCH AS THE SIDEWALL, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.
- L. THE MAXIMUM LOAD WEIGHTS ARE CONTROLLED BY EQUIPMENT CAPABILITY FACTORS. ALTHOUGH THE HEAVIEST MAXIMUM LOAD IS DELINEATED IN THE LOAD VIEW, PROVISIONS ARE INCLUDED WITHIN THIS DRAWING SO THAT THE BASIC LOAD CAN BE ADJUSTED TO SATISFY A LESSER QUANTITY OF LADING UNITS. DEPENDING ON TRANSPORTATION ROUTING, IT MAY BE NECESSARY TO REDUCE THE LOAD WEIGHT TO SATISFY "WEIGHT LAWS" OF CERTAIN STATES. ALSO, IT MAY BE NECESSARY TO REDUCE THE LOAD WEIGHT TO SATISFY OTHER WEIGHT RESTRICTIONS IMPOSED ON THE INTERMODAL CONTAINER SYSTEM.
- M. REQUIREMENTS CITED WITHIN THE ASSOCIATION OF AMERICAN RAILROADS (AAR) INTERMODAL LOADING GUIDE 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 TOFC 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.

(CONTINUED AT RIGHT)

- N. 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.
- O. 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.
- P. THE QUANTITY OF CONTAINERS SHOWN IN THE LOAD ON PAGE 3 MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SEE THE DETAILS ON PAGES 6 AND 7.
- Q. WHEN STEEL STRAPPING IS SEALED IN AN END-OVER-END LAP JOINT, A MINIMUM OF ONE SEAL WITH TWO PAIR OF NOTCHES WILL BE USED TO SEAL THE JOINT WHEN A NOTCH-TYPE SEALER IS BEING USED. A MINIMUM OF TWO SEALS, BUTTED TOGETHER WITH TWO PAIR OF CRIMPS PER SEAL, WILL BE USED TO SEAL THE JOINT WHEN A CRIMP-TYPE SEALER IS BEING USED. REFER TO THE "STRAP JOINT A" AND "STRAP JOINT B" DETAILS ON PAGE 6 FOR GUIDANCE.
- R. ANTI-CHAFING MATERIAL MAY BE INSTALLED AT POINTS OF CONTACT BETWEEN CONTAINERS, BETWEEN CONTAINERS AND THE END OPENING CONTAINER, AND BETWEEN CONTAINERS AND STEEL STRAPPING, IF DESIRED, TO PREVENT CHAFING DAMAGE TO CONTAINER PAINT AND MARKINGS.
- S. RECOMMENDED SEQUENTIAL LOADING PROCEDURES:
1. PREFABRICATE TWO END BLOCKING ASSEMBLIES AND TWO CENTER BLOCKING ASSEMBLIES.
 2. INSTALL THE END BLOCKING ASSEMBLIES.
 3. LOAD TWO DOUBLE-STACKED AND STRAPPED CONTAINERS TIGHT AGAINST BACK WALL.
 4. INSTALL TWO CENTER BLOCKING ASSEMBLIES TIGHT AGAINST THE DOUBLE-STACKED CONTAINERS.
 5. LOAD LAST TWO DOUBLE-STACKED AND STRAPPED CONTAINERS TIGHT AGAINST THE CENTER BLOCKING ASSEMBLIES.

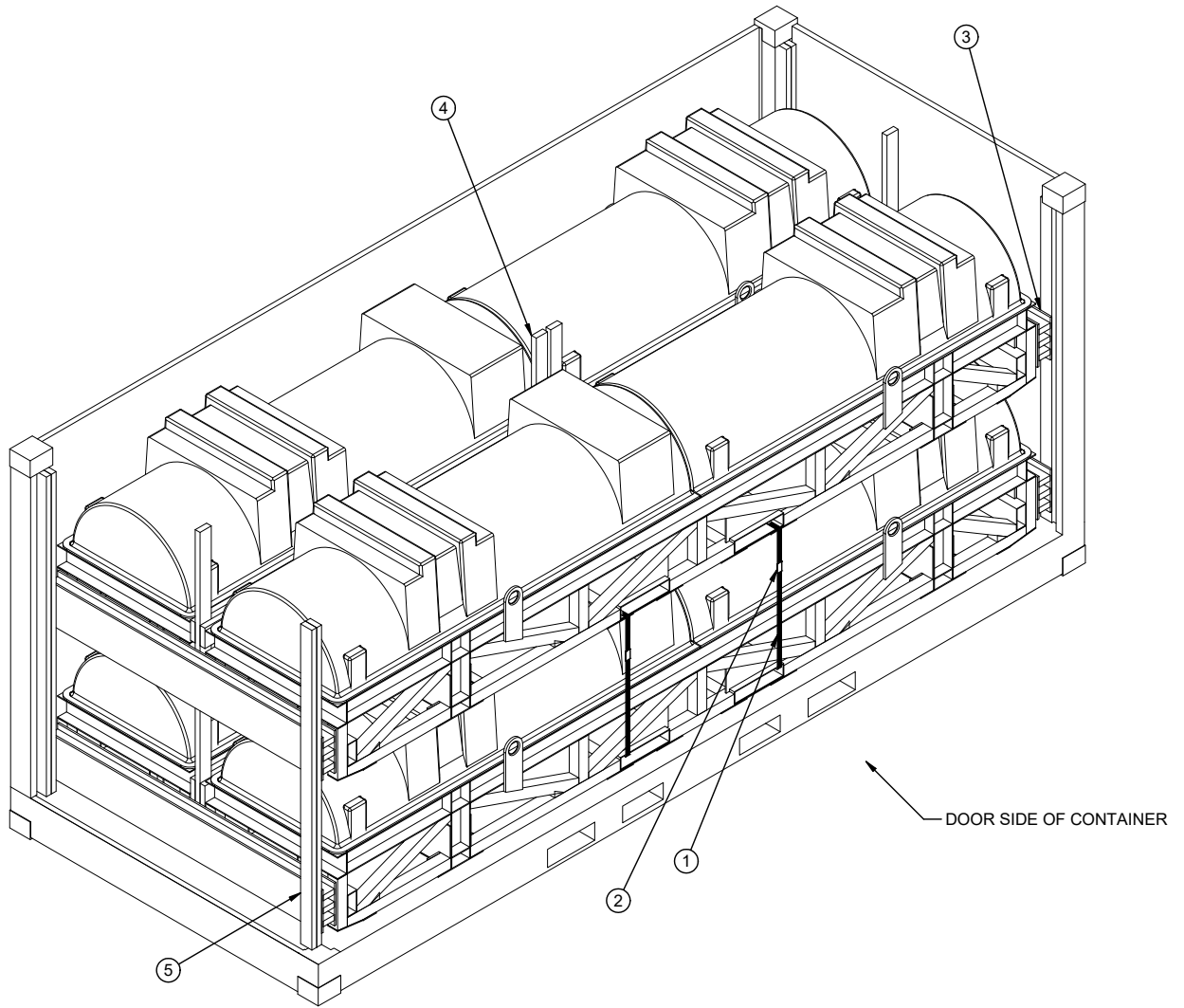
MATERIAL SPECIFICATIONS

<u>LUMBER</u>	- - - - -	SEE TM 743-200-1 (DUNNAGE LUMBER) AND VOLUNTARY PRODUCT STANDARD PS 20.
<u>NAILS</u>	- - - - -	ASTM F1667; COMMON STEEL NAIL NLCMS OR NLCMS).
<u>PLYWOOD</u>	- - - - -	COMMERCIAL ITEM DESCRIPTION A-A-55057, 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.
<u>STRAPPING, STEEL</u>	- - -	ASTM D3953; FLAT STRAPPING, TYPE 1, HEAVY DUTY, FINISH A, B (GRADE 2), OR C.
<u>SEAL, STRAP</u>	- - -	ASTM D3953; CLASS H, FINISH A, B (GRADE 2), OR C, DOUBLE NOTCH TYPE, STYLE I, II, OR IV.
<u>WIRE, CARBON STEEL</u>	- - -	ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, 0.0800" DIA, GRADE 1006 OR BETTER.
<u>ANTI-CHAFING MATERIAL</u>	- - - - -	MIL-PRF-121 (OR EQUAL); NEUTRAL BARRIER MATERIAL.

REVISION

REVISION NO. 1, DATED MARCH 2019, CONSISTS OF:

1. UPDATED SIGNATURE BLOCK ON TITLE PAGE.
2. UPDATED GENERAL NOTES ON PAGE 2.
3. UPDATED KEY NUMBERS AND BILL OF MATERIAL ON PAGE 3.



KEY NUMBERS

- ① UNITIZING STRAP, 1-1/4" X .031" OR .035" X 14'-0" (4 REQD). INSTALL STRAPPING THROUGH THE FORK POCKETS OF THE TOP AND BOTTOM CONTAINERS AS FAR APART AS POSSIBLE.
- ② SEAL FOR 1-1/4" STRAPPING (4 REQD, 1 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES.
- ③ END BLOCKING ASSEMBLY (2 REQD). SEE DETAIL ON PAGE 5.
- ④ CENTER BLOCKING ASSEMBLY (2 REQD). SEE DETAIL ON PAGE 4.
- ⑤ FILL MATERIAL, 1" X 4" OR 2" X 4" X 50 1/2" (AS REQD). NAIL THE FIRST PIECE TO THE END BLOCKING ASSEMBLY W/1 NAIL OF A SUITABLE SIZE EVERY 12" (6d FOR 1" THICK AND 10d FOR 2" THICK MATERIAL). NAIL EACH ADDITIONAL PIECE TO THE PREVIOUS PIECE IN A SIMILAR MANNER. NOTE: MULTIPLE PIECES MAY BE LAMINATED TOGETHER FIRST AND THEN TOENAILED TO THE END BLOCKING ASSEMBLY.

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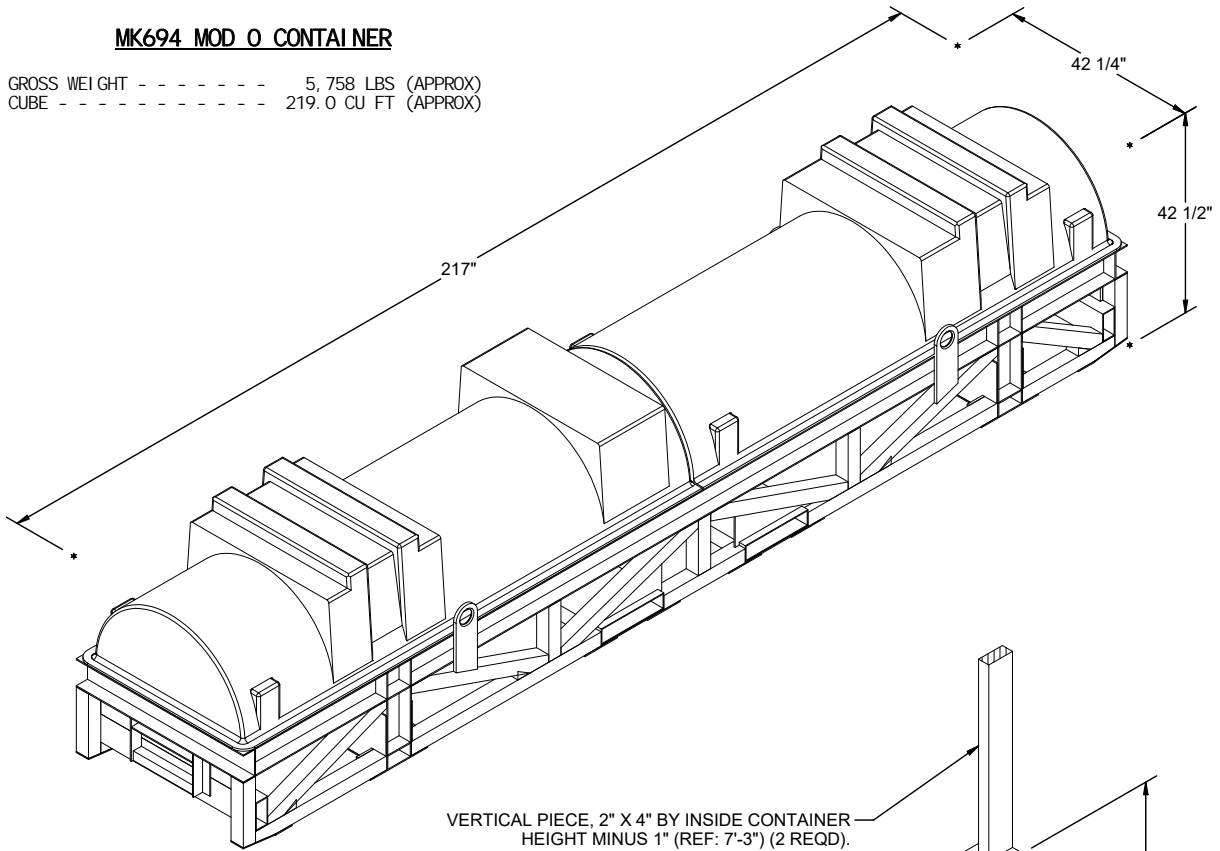
LUMBER	LI NEAR FEET	BOARD FEET
2" X 4"	168	112
2" X 6"	72	72
NAI LS	NO. REQD	POUNDS
6d (2")	264	1-1/2
10d (3")	112	1-3/4
PLYWOOD, 1/2" - - - - -	55 SQ FT REQD - - - - -	75.6 LBS
STEEL STRAPPING, 1-1/4" - - - - -	56' REQD - - - - -	8.0 LBS
SEAL FOR 1-1/4" STRAPPING - - - - -	4 REQD - - - - -	0.18 LBS

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
MK694 - - - - -	4 - - - - -	23,032 LBS
DUNNAGE - - - - -	- - - - -	455 LBS
CONTAINER - - - - -	- - - - -	6,050 LBS
TOTAL WEIGHT - - - - -		29,537 LBS

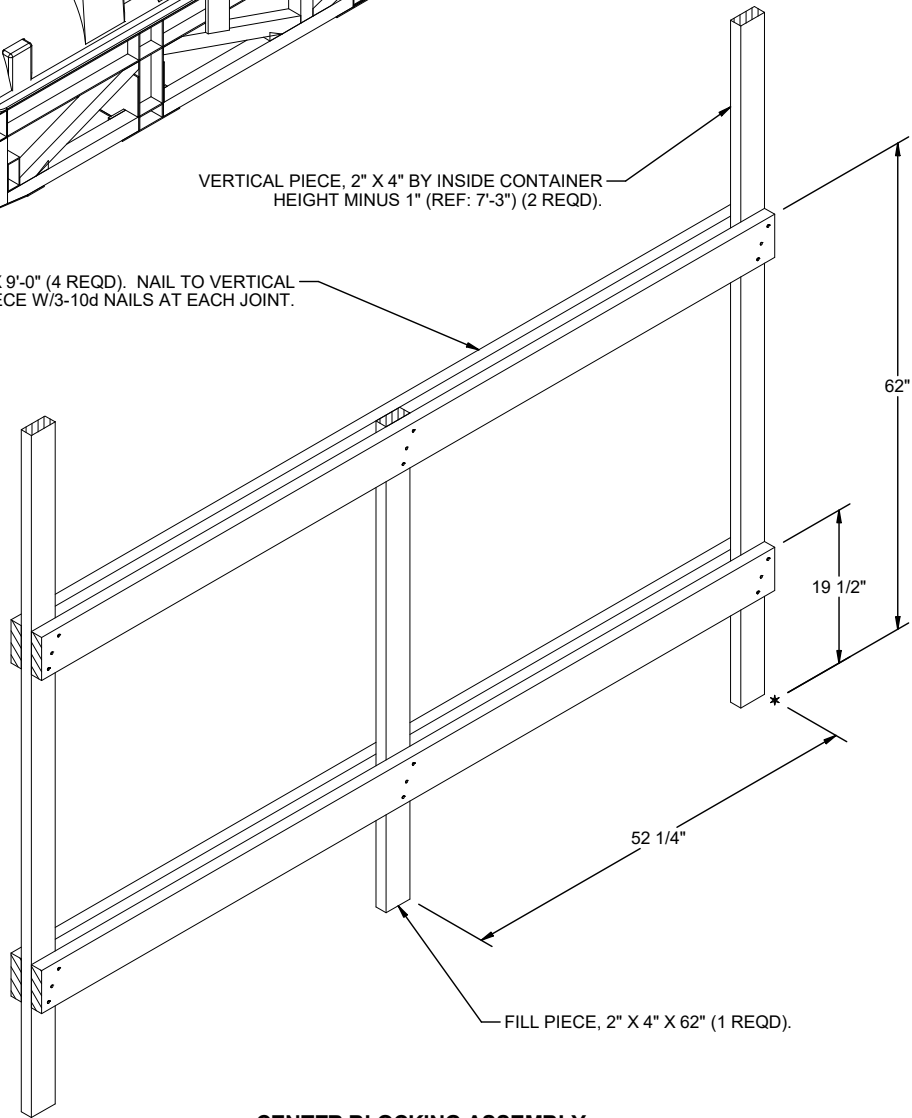
MK694 MOD O CONTAINER

GROSS WEIGHT - - - - - 5,758 LBS (APPROX)
CUBE - - - - - 219.0 CU FT (APPROX)



VERTICAL PIECE, 2" X 4" BY INSIDE CONTAINER HEIGHT MINUS 1" (REF: 7'-3") (2 REQD).

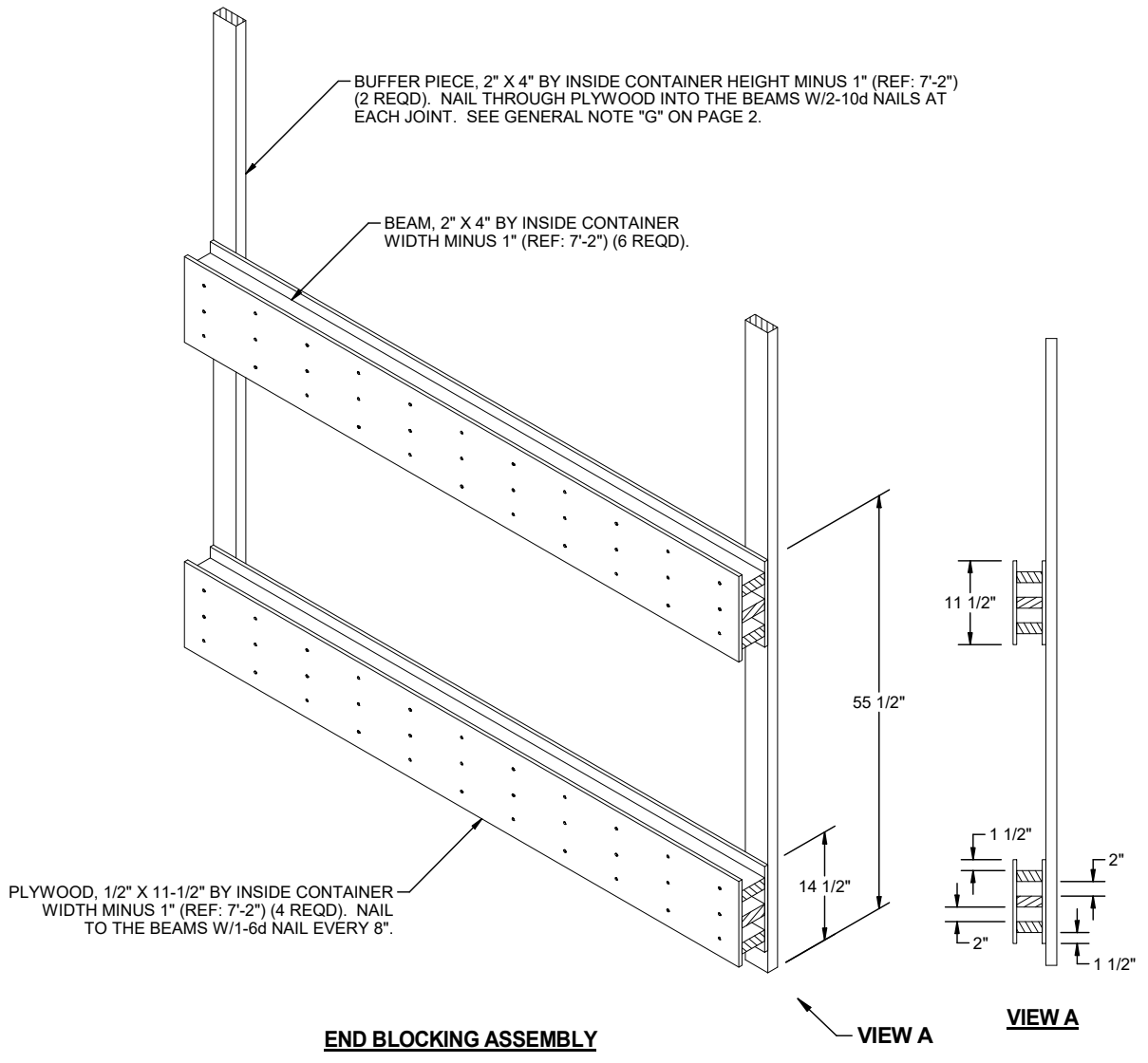
HORIZONTAL PIECE, 2" X 6" X 9'-0" (4 REQD). NAIL TO VERTICAL PIECES AND FILL PIECE W/3-10d NAILS AT EACH JOINT.



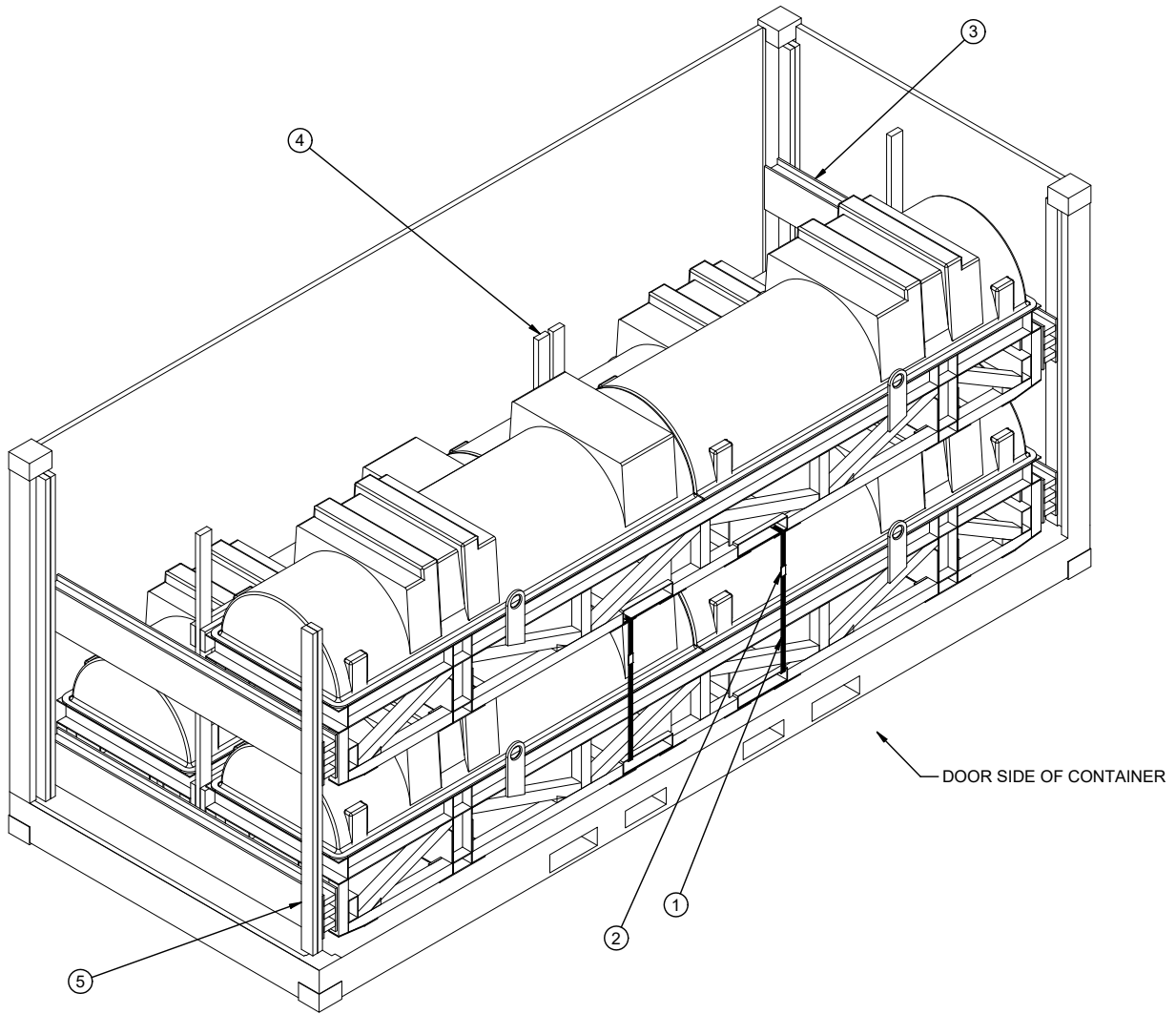
FILL PIECE, 2" X 4" X 62" (1 REQD).

CENTER BLOCKING ASSEMBLY

NOTE: FOR A ONE-HIGH LOAD, ELIMINATE THE TOP TWO HORIZONTAL PIECES AND MAKE THE FILL PIECE 19-1/2" LONG.

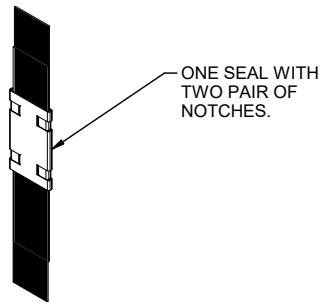


NOTE: FOR A ONE-HIGH LOAD, ELIMINATE THE TOP BOX BEAM ASSEMBLY.



LESS-THAN-FULL-LOAD PROCEDURE

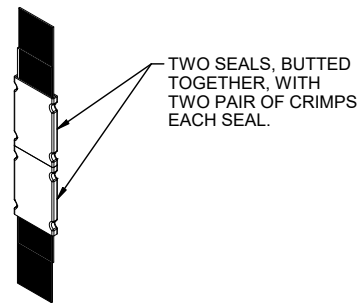
KEY NUMBERS REFER TO KEY NUMBERS ON PAGE 3.



ONE SEAL WITH TWO PAIR OF NOTCHES.

STRAP JOINT A

METHOD OF SECURING A STRAP JOINT WHEN USING A NOTCH-TYPE SEALER.

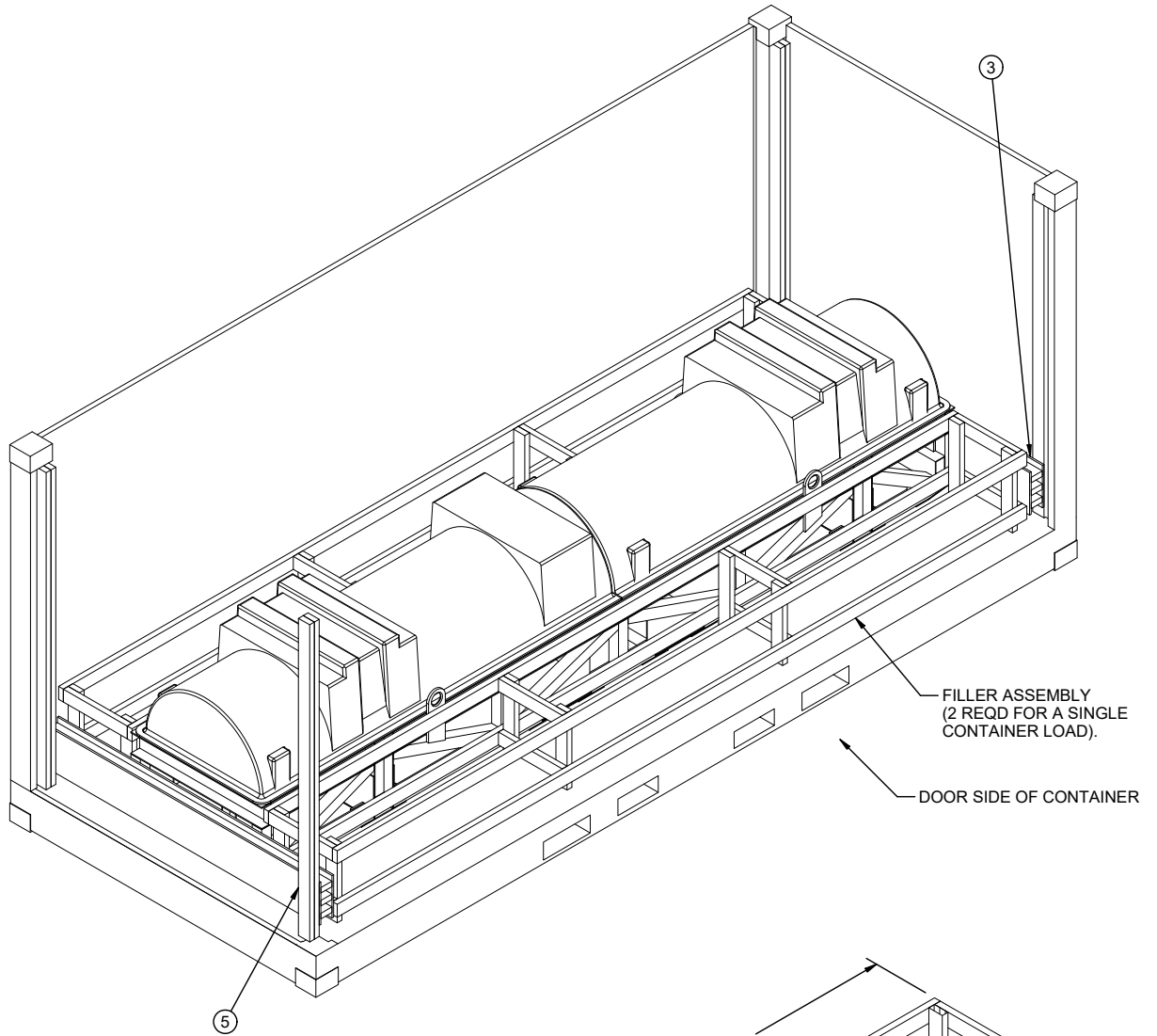


TWO SEALS, BUTTED TOGETHER, WITH TWO PAIR OF CRIMPS EACH SEAL.

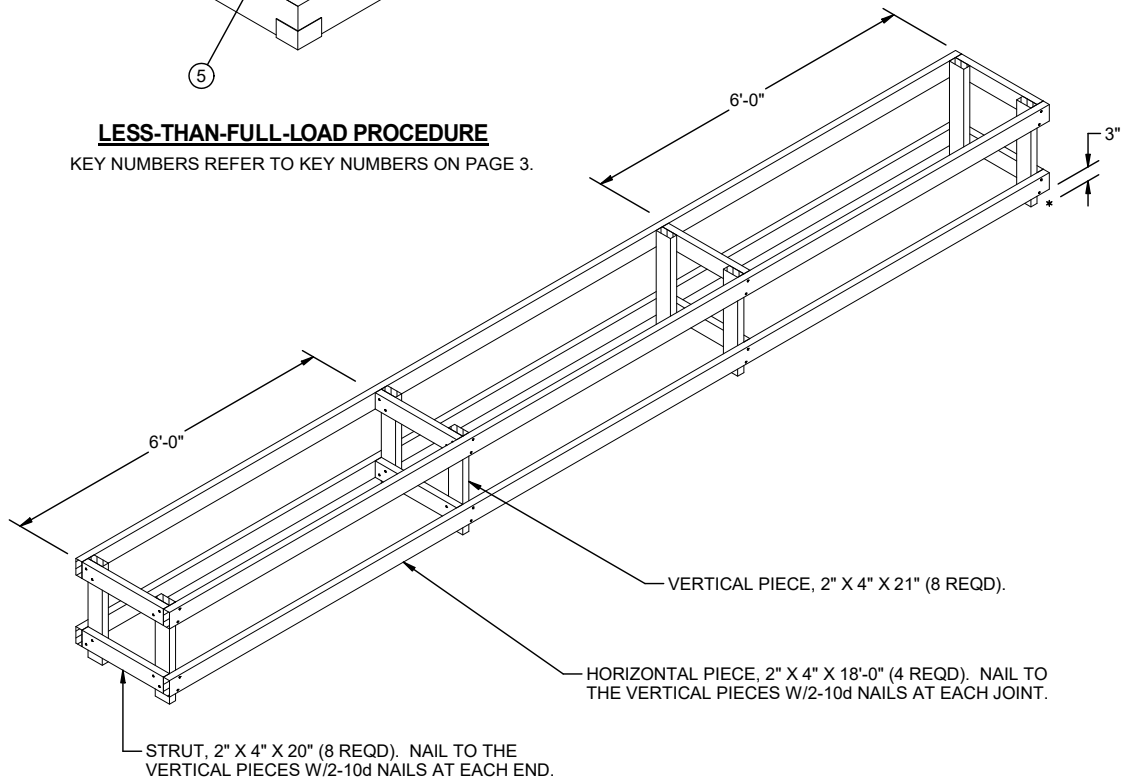
STRAP JOINT B

METHOD OF SECURING A STRAP JOINT WHEN USING A CRIMP-TYPE SEALER.

END-OVER-END LAP JOINT DETAILS



LESS-THAN-FULL-LOAD PROCEDURE
KEY NUMBERS REFER TO KEY NUMBERS ON PAGE 3.



FILLER ASSEMBLY

