

APPROVED BY
BUREAU OF EXPLOSIVES

Jan / July

DATE 5/3/09

LOADING AND BRACING* IN SIDE OPENING ISO CONTAINERS OF STANDARD MISSILE, RIM-66, PACKED 1 PER MK372 SHIPPING AND STORAGE CONTAINER

INDEX

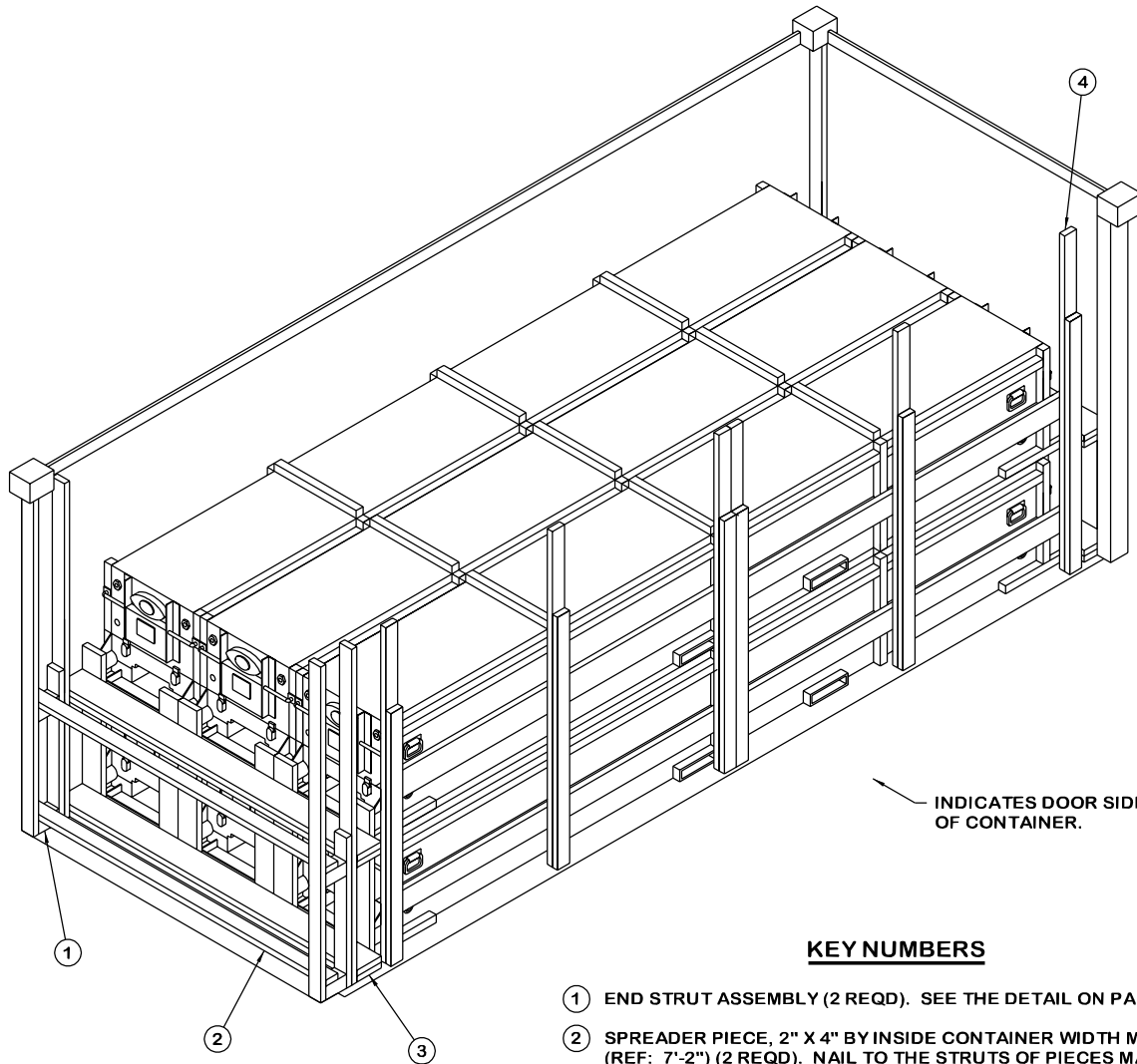
ITEM	PAGE(S)
6-UNIT LOAD - - - - -	2
GENERAL NOTES AND MATERIAL SPECIFICATIONS - - - - -	3
CONTAINER DETAILS - - - - -	4
DETAILS - - - - -	4-6
LESS-THAN-FULL-LOAD DETAILS - - - - -	6

- * 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 FIELD SUPPORT COMMAND		CAUTION: VERIFY PRIOR TO USE AT WWW.DAC.ARMY.MIL THAT THIS IS THE MOST CURRENT VERSION OF THIS DOCUMENT. THIS IS PAGE 1 OF 6.			
<i>[Signature]</i>		DO NOT SCALE		OCTOBER 2003	
		ENGINEER OR TECHNICIAN	BASIC REV.	MELVIN SIX	
APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND		TRANSPORTATION ENGINEERING DIVISION	<i>[Signature]</i>	TESTED	
U.S. ARMY DEFENSE AMMUNITION CENTER		VALIDATION ENGINEERING DIVISION	<i>[Signature]</i>	CLASS	DIVISION
		ENGINEERING DIRECTORATE	<i>[Signature]</i>	19	48
				DRAWING	FILE
				8801	SP15J148

PROJECT SP 500-03



ISOMETRIC VIEW

INDICATES DOOR SIDE OF CONTAINER.

KEY NUMBERS

- ① END STRUT ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 4.
- ② SPREADER PIECE, 2" X 4" BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-2") (2 REQD). NAIL TO THE STRUTS OF PIECES MARKED ① W/2-10d NAILS AT EACH END.
- ③ END BLOCKING ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 5. NAIL THROUGH THE BUFFER PIECES INTO THE VERTICAL PIECE OF PIECES MARKED ① W/3-10d NAILS.
- ④ SIDE BLOCKING ASSEMBLY (2 REQD). SEE DETAIL ON PAGE 5. PLACE BOTH SIDE BLOCKING ASSEMBLIES ON THE DOOR SIDE OF THE CONTAINER AS SHOWN.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	25	9
2" X 4"	134	89
2" X 6"	72	72
2" X 8"	58	78
4" X 4"	2	3
NAILS	NO. REQD	POUNDS
6d (2")	30	1/4
10d (3")	230	3-3/4

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
MK372 CONTAINER	6	13,500 LBS
DUNNAGE		502 LBS
ISO CONTAINER		6,050 LBS
TOTAL WEIGHT		20,052 LBS (APPROX)

- J. 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.
- K. MAXIMUM LOAD WEIGHT CRITERIA:
 THE MAXIMUM LOAD WEIGHTS ARE CONTROLLED BY EQUIPMENT CAPABILITY FACTORS. ALTHOUGH THE HEAVIEST MAXIMUM LOADS ARE DELINEATED IN THE LOAD VIEWS, PROVISIONS ARE INCLUDED WITHIN THIS DRAWING SO THAT THE BASIC LOADS 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.
- L. 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 ST THAT THE TRUCK UNDER ONE END OF THE CAR CARRIES MORE THAN ONE-HALF OF THE LOAD LIMIT FOR THAT CAR.
- M. 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.
- N. WHETHER A 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.
- O. THE QUANTITY OF CONTAINERS SHOWN IN THE LOAD ON PAGE 2 MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SEE THE "LESS-THAN-FULL-LOAD" DETAIL ON PAGE 6.
- P. ANTI-CHAFING MATERIAL MAY BE INSTALLED AT POINTS OF CONTACT BETWEEN THE MK372 CONTAINERS AND BETWEEN THE MK372 CONTAINERS AND THE SIDE OPENING CONTAINER, IF DESIRED, TO PREVENT CHAFING DAMAGE TO CONTAINER MARKINGS.
- R. WHEN STEEL STRAPPING IS SEALED AT 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.

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE OUTLOADING PROCEDURES SPECIFIED IN THIS DRAWING ARE APPLICABLE TO LOADS OF STANDARD MISSILES (RIM-66) PACKED IN MK372 CONTAINERS. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CONTAINER WITH MISSILE. SEE NAVAL SEA SYSTEMS COMMAND DRAWING OR-68/21B AND PAGE 4 FOR DETAILS OF THE CONTAINER. CAUTION: REGARDLESS OF THE QUANTITY OF UNITS TO BE SHIPPED, THE "MAXIMUM GROSS WEIGHT" OF THE SIDE OPENING ISO CONTAINER MUST NOT BE EXCEEDED.
- C. THE LOADS AS SHOWN ARE 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 LOAD AS DESIGNED CAN ALSO BE MOVED BY MOTOR OR WATER CARRIERS. NOTICE: OTHER CONTAINERS OF THE SAME DESIGN CONFIGURATION CAN ALSO BE USED.
- D. WHEN LOADING THE 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 SIDE FILL ASSEMBLY. NAIL EACH ADDITIONAL PIECE TO THE VERTICAL PIECES W/1 APPROPRIATELY SIZED NAIL EVERY 12".
- E. DUNNAGE LUMBER SPECIFIED IS OF NOMINAL SIZE. FOR EXAMPLE, 1" X 6" MATERIAL IS ACTUALLY 3/4" THICK BY 5-1/2" 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. IN SOME ISO CONTAINERS THERE IS A SLOT AT THE CORNERS OF THE ENDWALLS. PIECES OF DUNNAGE MATERIAL MUST BE LAMINATED TO THE BUFFER PIECES ON THE END STRUT OR BLOCKING ASSEMBLIES 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 LONGITUDINAL BLOCKING.
- H. CAUTION: DO NOT NAIL DUNNAGE MATERIAL TO THE CONTAINER WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE. PORTIONS OF THE CONTAINER DEPICTED WITHIN THIS DRAWING, SUCH AS THE SIDE DOORS, HAVE NOT BEEN SHOWN IN THE LOAD VIEW FOR CLARITY PURPOSES.

(CONTINUED AT LEFT)

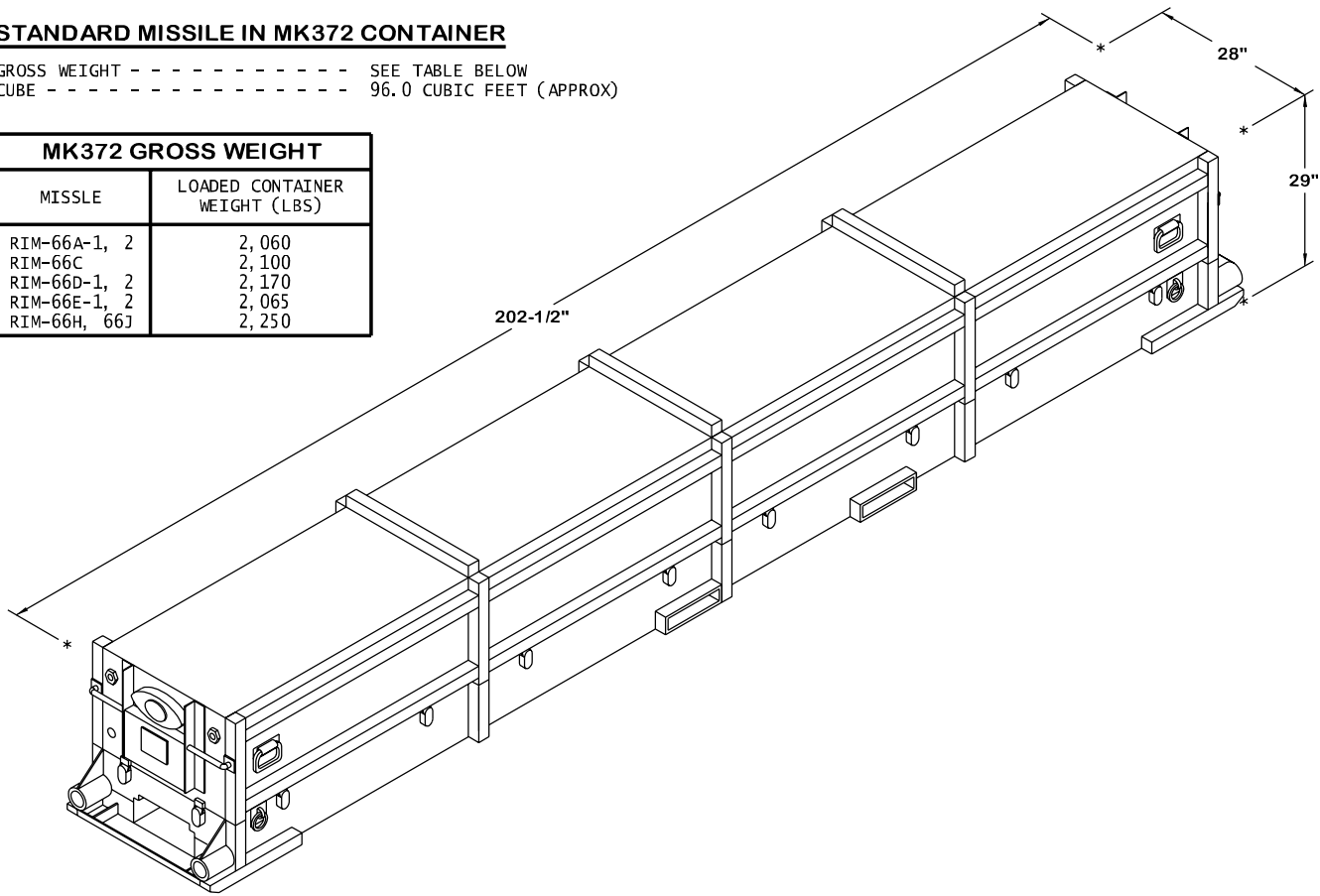
MATERIAL SPECIFICATIONS

- LUMBER - - - - - -: SEE TM 743-200-1 (DUNNAGE LUMBER) AND VOLUNTARY PRODUCT STANDARD PS 20.
- NAILS - - - - - -: ASTM F1667; COMMON STEEL NAIL (NLCMS OR NLCMMS).
- 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.

STANDARD MISSILE IN MK372 CONTAINER

GROSS WEIGHT - - - - - SEE TABLE BELOW
 CUBE - - - - - 96.0 CUBIC FEET (APPROX)

MK372 GROSS WEIGHT	
MISSILE	LOADED CONTAINER WEIGHT (LBS)
RIM-66A-1, 2	2,060
RIM-66C	2,100
RIM-66D-1, 2	2,170
RIM-66E-1, 2	2,065
RIM-66H, 66J	2,250



CONTAINER STACKING AND HANDLING GUIDANCE

1. CONTAINER STACKING FOR OUTLOADING PURPOSES.

- A. AN UPPER CONTAINER SHOULD BE PLACED AS CLOSELY AS POSSIBLE IN VERTICAL ALIGNMENT WITH THE NEXT LOWER CONTAINER.
- B. POSITION THE AFT END OF AN UPPER CONTAINER ABOVE THE AFT END OF THE NEXT LOWER CONTAINER.
- C. THE UPPER CONTAINER NESTING FEATURES AND BEARING SURFACES SHOULD BE PROPERLY ALIGNED WITH THE NEXT LOWER CONTAINER.

2. CONTAINER OR CONTAINER STACK HANDLING.

NOTES: (1) MATERIALS HANDLING EQUIPMENT (MHE) IS INTENDED TO MEAN EQUIPMENT, SUCH AS FORKLIFT TRUCKS, CRANES, HAND TRUCKS, DOLLIES, ROLLER ASSEMBLIES, SLINGS, AND SPREADER BARS, THAT CAN BE USED TO HANDLE THE DEPICTED ASSEMBLIES.

(2) PRECAUTIONARY HANDLING TECHNIQUES NORMALLY EMPLOYED OR AS SPECIFIED FOR THE TYPE OF COMMODITY INVOLVED WILL BE OBSERVED.

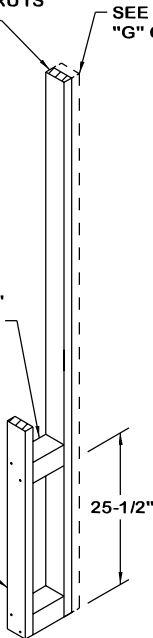
- A. ONLY APPROVED AND APPROPRIATELY SIZED MHE WILL BE USED FOR HANDLING THE DEPICTED CONTAINERS.
- B. IF HANDLING IS ACCOMPLISHED WITH A FORKLIFT TRUCK, THE CONTAINERS SHOULD BE HANDLED FROM A SIDE POSITION AS MUCH AS POSSIBLE. CARE MUST BE EXERCISED WHEN INSERTING FORKS UNDER A CONTAINER, TO PREVENT DAMAGE TO THE CONTAINER BY THE FORK TINES OR THE FORKLIFT PACKAGE GUARD.

BUFFER PIECE, 2" X 4" BY INSIDE CONTAINER HEIGHT MINUS 1" (REF: 7'-4") (1 REQD). NAIL TO THE STRUTS W/2-12d NAILS AT EACH JOINT.

SEE GENERAL NOTE "G" ON PAGE 3.

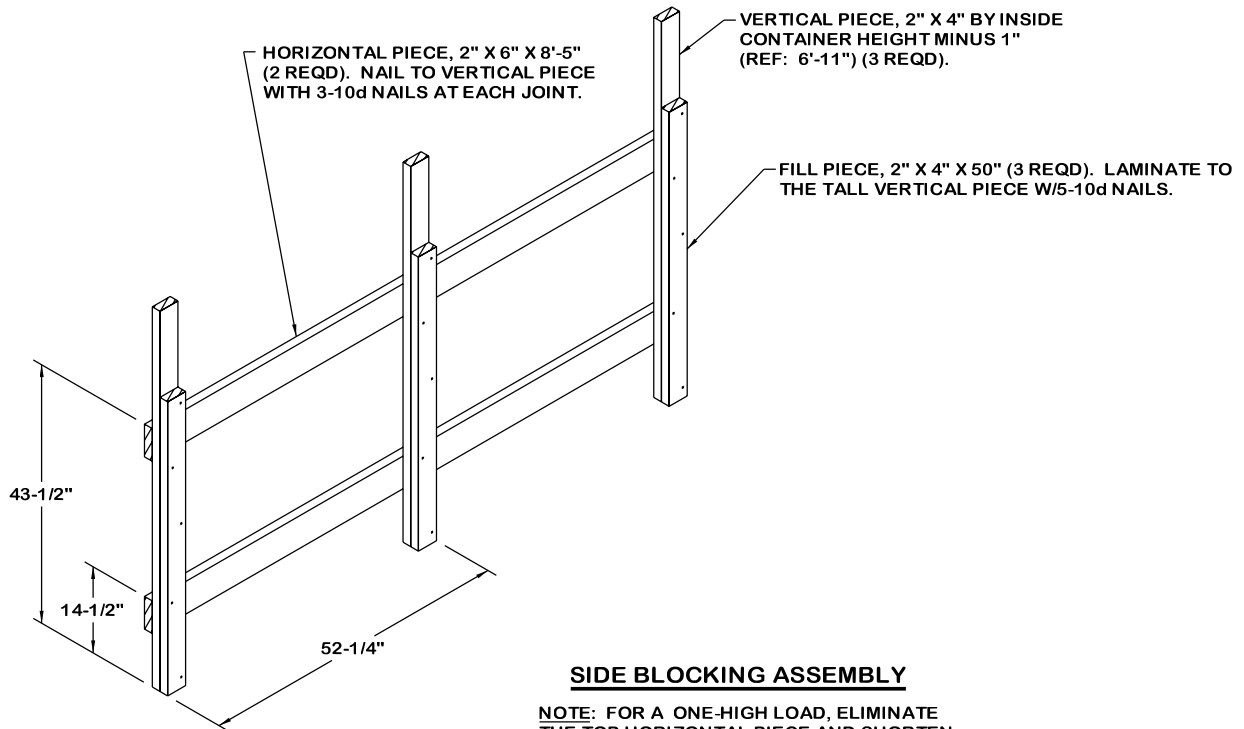
STRUT, 4" X 4" X 6" (2 REQD).

VERTICAL PIECE, 2" X 4" X 35" (1 REQD). NAIL TO THE STRUTS W/2-12d NAILS AT EACH JOINT.



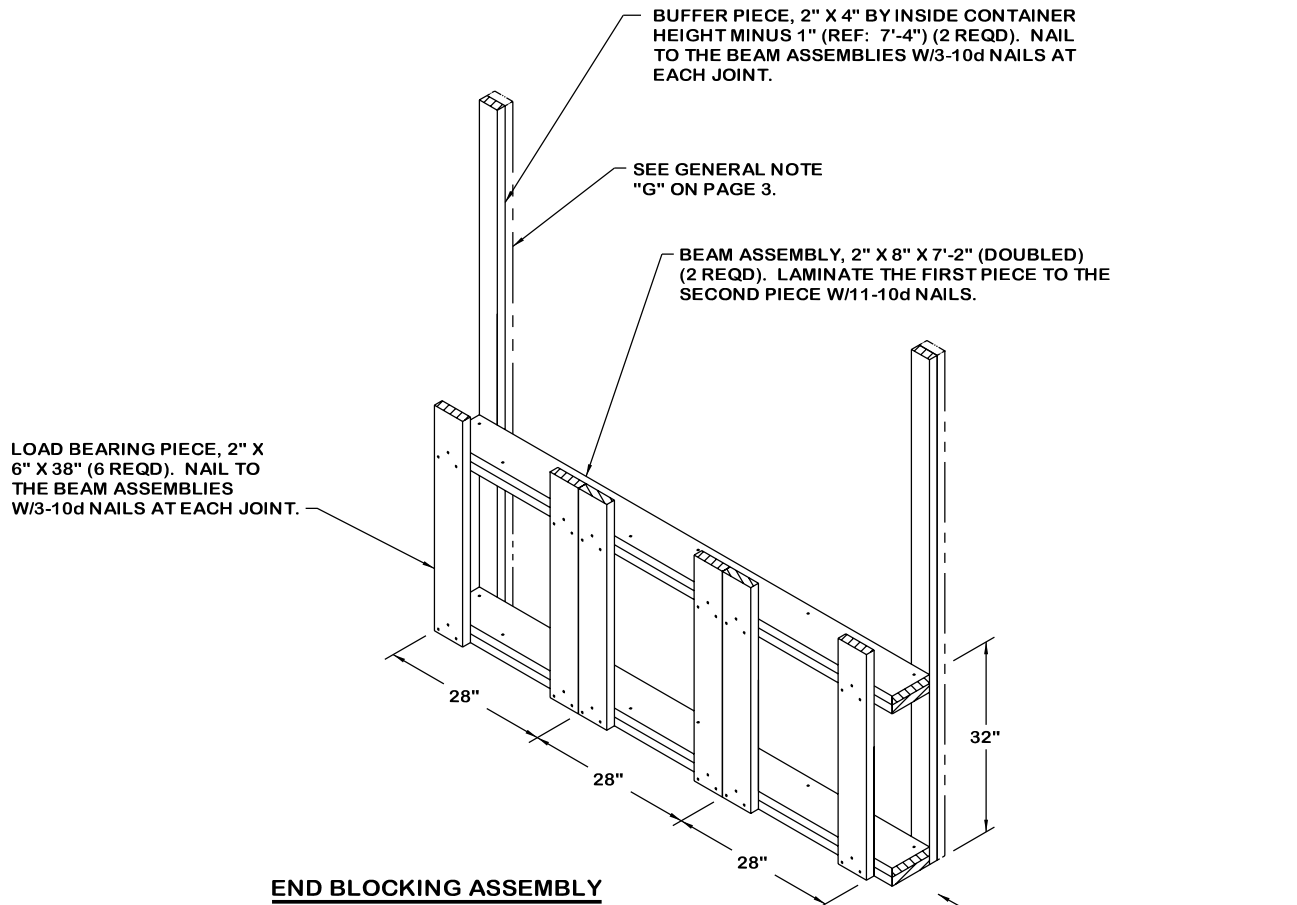
END STRUT ASSEMBLY

NOTE: FOR A ONE HIGH LOAD, LOWER THE TOP STRUT TO SIT ON BOTTOM STRUT AND SHORTEN THE VERTICAL PIECE APPROPRIATELY. THE LENGTH OF THE STRUTS IS DEPENDENT ON THE VOID AT THE END OF THE LOAD. LONGITUDINAL SLACK MUST BE KEPT TO A MINIMUM (LESS THAN 3/4").



SIDE BLOCKING ASSEMBLY

NOTE: FOR A ONE-HIGH LOAD, ELIMINATE
THE TOP HORIZONTAL PIECE AND SHORTEN
THE FILL PIECES TO 19".



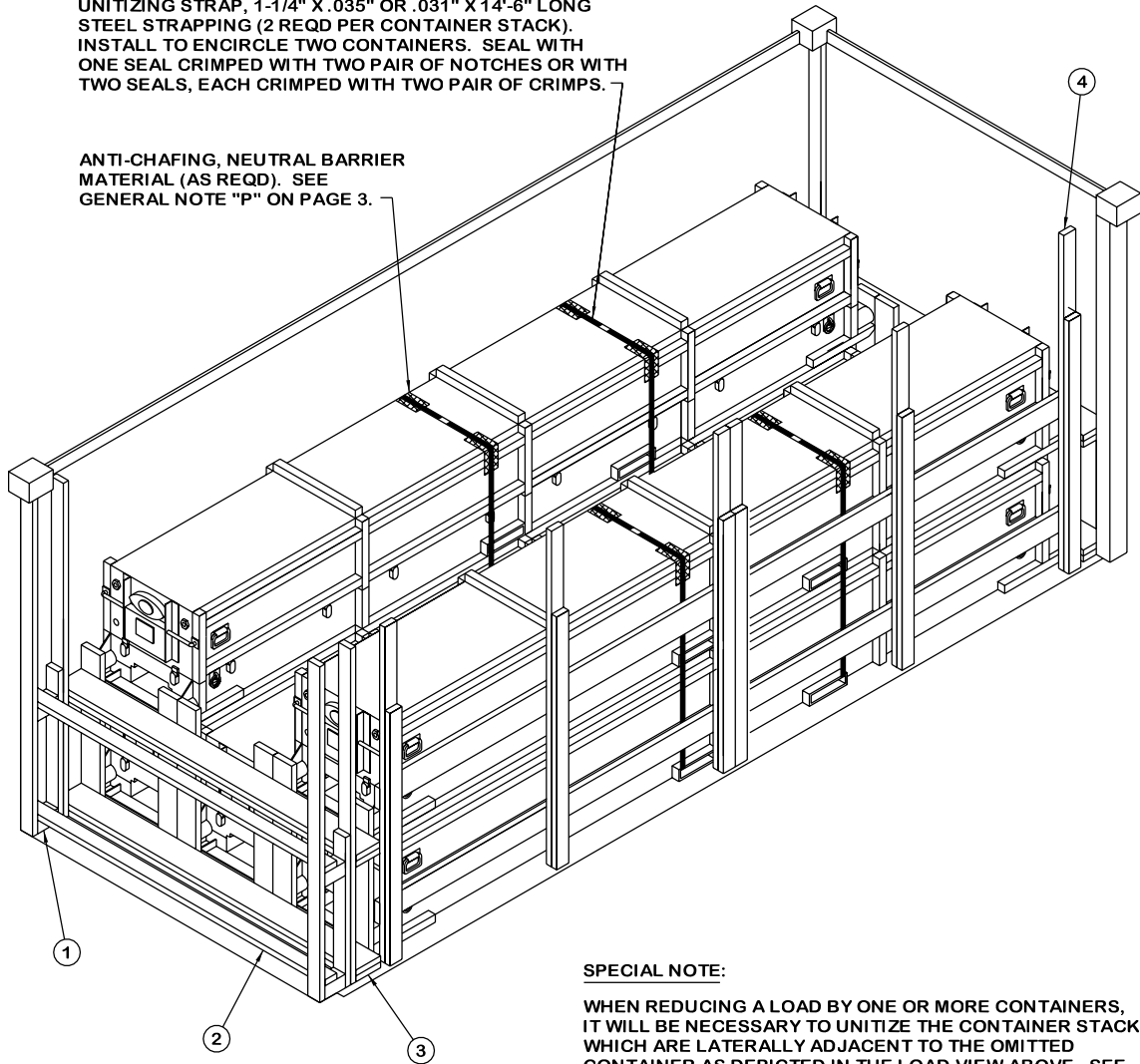
END BLOCKING ASSEMBLY

NOTE: FOR A ONE-HIGH LOAD, ELIMINATE THE TOP
BEAM ASSEMBLY AND SHORTEN LOAD BEARING PIECE
TO 6". THE ASSEMBLY DEPICTE ABOVE IS A RIGHT-HAND
ASSEMBLY. A LEFT-HAND ASSEMBLY IS ALSO REQUIRED.

INSTALL WITH THIS SIDE
TOWARDS CONTAINER DOORS.

UNITIZING STRAP, 1-1/4" X .035" OR .031" X 14'-6" LONG
 STEEL STRAPPING (2 REQD PER CONTAINER STACK).
 INSTALL TO ENCIRCLE TWO CONTAINERS. SEAL WITH
 ONE SEAL CRIMPED WITH TWO PAIR OF NOTCHES OR WITH
 TWO SEALS, EACH CRIMPED WITH TWO PAIR OF CRIMPS.

ANTI-CHAFING, NEUTRAL BARRIER
 MATERIAL (AS REQD). SEE
 GENERAL NOTE "P" ON PAGE 3.



SPECIAL NOTE:

WHEN REDUCING A LOAD BY ONE OR MORE CONTAINERS,
 IT WILL BE NECESSARY TO UNITIZE THE CONTAINER STACKS
 WHICH ARE LATERALLY ADJACENT TO THE OMITTED
 CONTAINER AS DEPICTED IN THE LOAD VIEW ABOVE. SEE
 GENERAL NOTE "N" ON PAGE 3.

LESS-THAN-FULL-LOAD PROCEDURE

KEY NUMBERS REFER TO KEY NUMBERS ON PAGE 2.



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