


APPROVED BY
BUREAU OF EXPLOSIVES



DATE 1-18-2008


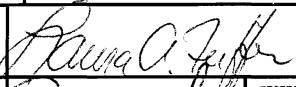


LOADING AND BRACING* IN SIDE OPENING ISO CONTAINERS OF 2.75 INCH HYDRA ROCKETS PACKED IN PA150 CYLINDRICAL METAL CON- TAINERS ON 4-WAY ENTRY WOODEN PALLETS WITH METAL TOP LIFT

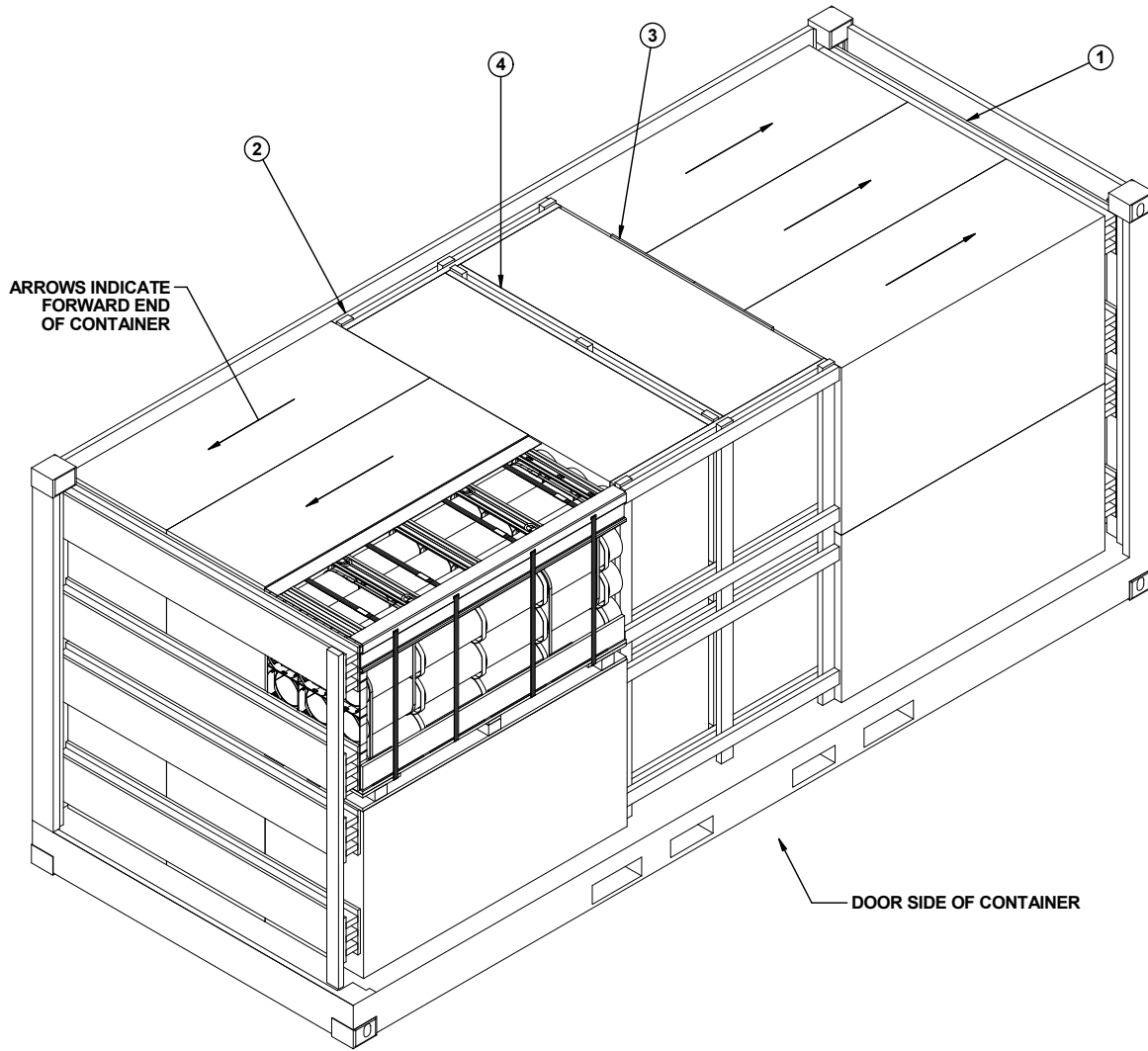
INDEX

<u>ITEM</u>	<u>PAGE(S)</u>
TYPICAL LOADING PROCEDURE - - - - -	2
GENERAL NOTES AND MATERIAL SPECIFICATIONS - - - - -	3
PALLET UNIT DETAILS - - - - -	4
DETAILS - - - - -	5-7
LESS-THAN-FULL-LOAD PROCEDURE - - - - -	8

*THE PROCEDURES SHOWN HEREIN ARE APPLICABLE TO LOADS THAT ARE TO BE SHIPPED BY CONTAINER-ON-FLATCAR (COFC) RAIL, MOTOR, OR WATER CARRIERS.

U.S. ARMY MATERIEL COMMAND DRAWING

<p>APPROVED, U.S. ARMY JOINT MUNITIONS COMMAND</p>	<p>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 8.</p>							
<p>APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND</p>  <p>Gary B. Carney U.S. ARMY DEFENSE AMMUNITION CENTER</p>	DO NOT SCALE			SEPTEMBER 2007				
	ENGINEER OR TECHNICIAN	BASIC REV.	ADIN FELICIANO					
	TRANSPORTATION ENGINEERING DIVISION							
VALIDATION ENGINEERING DIVISION	TESTED			CLASS	DIVISION	DRAWING	FILE	
ENGINEERING DIRECTORATE			19	48	4334/60	15PM1025		



ISOMETRIC VIEW

KEY NUMBERS

- ① END BLOCKING ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 5.
- ② SIDE FILL ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 6.
- ③ SEPARATOR ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 7.
- ④ CENTER FILL ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 6.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" x 4"	319	213
NAILS	NO. REQD	POUNDS
6d (2")	528	3
10d (3")	228	4
PLYWOOD, 1/2" - -	29.0 SQ FT REQD - -	39.9 LBS
PLYWOOD, 3/4" - -	111.2 SQ FT REQD - -	229.3 LBS

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT - - - - -	16 - - - - -	35,376 LBS
DUNNAGE - - - - -	- - - - -	702 LBS
CONTAINER - - - - -	- - - - -	6,050 LBS
TOTAL WEIGHT - - - - -		42,128 LBS (APPROX)

GENERAL NOTES

- 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 2.75 INCH ROCKETS, PACKED IN PA150 CONTAINERS, PALLETIZED. SUBSEQUENT REFERENCE TO PALLET UNIT HEREIN MEANS THE PALLET UNIT WITH AMMUNITION ITEMS. SEE PAGE 4 AND AMC DRAWING 19-48-4326/60-20PM1012 FOR DETAILS OF THE PALLET UNIT. **CAUTION:** REGARDLESS OF THE QUANTITY OF PALLET UNITS 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, WITH 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 PALLET UNITS, 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 SIDE FILL ASSEMBLIES. NAIL EACH ADDITIONAL PIECE W/ APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE THICKNESS OF THE PIECES IN THE SIDE FILL ASSEMBLIES MAY BE ADJUSTED AS REQUIRED TO FACILITATE VARIANCE IN THE SIZE OF THE PALLET UNIT.
- 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. IN SOME CONTAINERS THERE IS A SLOT AT THE CORNERS OF THE ENDWALL. 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 FORWARD WALL 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 FORWARD LONGITUDINAL BLOCKING.
- H. 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.
- J. **CAUTION:** DO NOT NAIL DUNNAGE MATERIAL TO THE CONTAINER WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.
- K. PORTIONS OF THE CONTAINER DEPICTED WITHIN THIS DRAWING, SUCH AS THE SIDEWALL, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.

L. 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.

- 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.

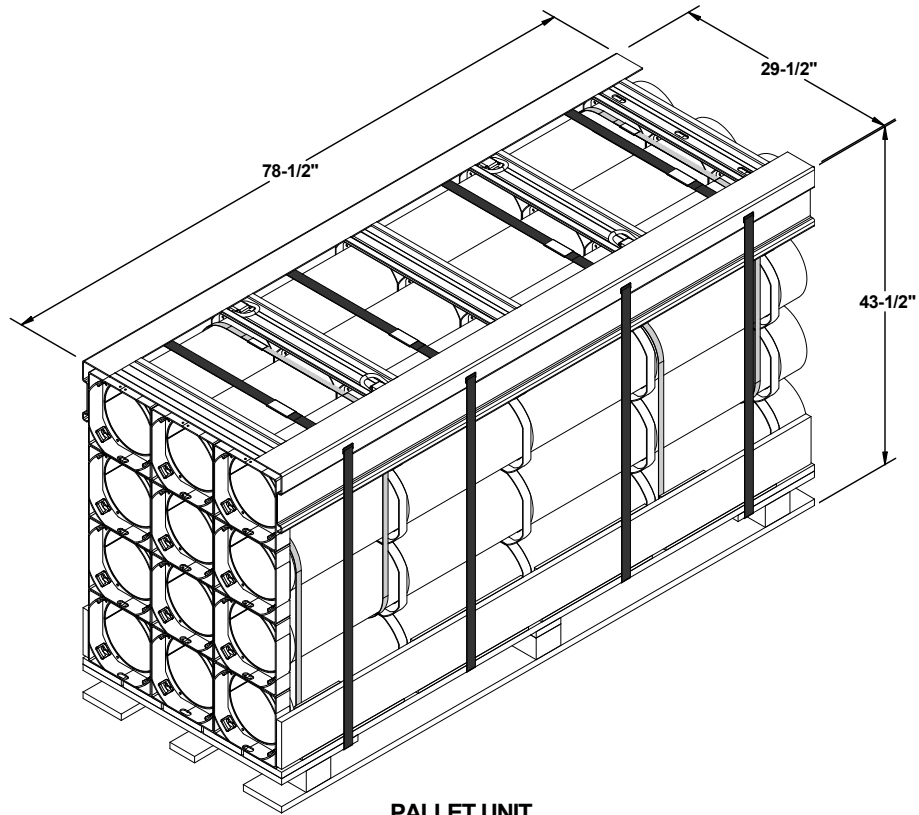
(CONTINUED AT RIGHT)

(GENERAL NOTES CONTINUED)

- 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 PALLET UNITS SHOWN IN THE LOAD ON PAGE 2 MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SEE THE "LESS-THAN-FULL PROCEDURE" ON PAGE 8.
- Q. ANTI-CHAFING MATERIAL MAY BE INSTALLED AT POINTS OF CONTACT BETWEEN CONTAINERS AND THE SIDE OPENING CONTAINER, IF DESIRED, TO PREVENT CHAFING DAMAGE TO CONTAINER PAINT AND MARKINGS.
- R. LOAD-BLOCKING STRUTS WHICH ARE 48" OR LONGER MUST BE STIFFENED BY THE APPLICATION OF HORIZONTAL AND VERTICAL STRUT BRACING AS SHOWN ON PAGE 8. BRACING IS NOT REQUIRED IF THE STRUTS FOR THE LOAD BEING SHIPPED ARE SHORTER THAN 48". THE LENGTH OF THE LOAD-BLOCKING STRUTS SHOULD BE KEPT AS SHORT AS POSSIBLE (APPROX 18" MINIMUM), BUT IN THE EVENT IT IS NECESSARY TO USE STRUTS WHICH ARE 8'-0" OR MORE IN LENGTH, IT WILL BE NECESSARY TO APPLY AN ADDITIONAL SET OF HORIZONTAL AND VERTICAL STRUT BRACING PIECES. STRUT BRACING SHOULD BE APPLIED SO AS TO PROVIDE NEARLY EQUAL SPACES BETWEEN THE BRACING PIECES AND THE CENTER GATES AND/OR BETWEEN ADJACENT STRUT BRACING PIECES. NOTE THAT HORIZONTAL STRUT BRACING PIECES FOR THE UPPER LEVEL OF STRUTS FOR ALL BUT THE UPPERMOST TIER OF A LOAD MAY BE DIFFICULT TO APPLY TO THE TOP SURFACES OF THE STRUT AS DEPICTED. STRUT BRACING WILL BE EQUALLY EFFECTIVE IF APPLIED TO THE UNDER SIDE OF THOSE STRUTS.
- S. RECOMMENDED SEQUENTIAL LOADING PROCEDURES FOR THE LOAD ON PAGE 2:
1. PREFABRICATE TWO END BLOCKING ASSEMBLIES, ONE CENTER FILL ASSEMBLY, ONE SEPARATOR ASSEMBLY AND TWO SIDE FILL ASSEMBLIES.
 2. INSTALL THE END BLOCKING ASSEMBLIES.
 3. LOAD TWELVE PALLET UNITS.
 4. INSTALL ONE SIDE FILL ASSEMBLY.
 5. INSTALL ONE SEPARATOR ASSEMBLY.
 6. INSTALL FOUR PALLET UNITS.
 7. INSTALL ONE CENTER FILL ASSEMBLY.
 8. INSTALL ONE SIDE FILL ASSEMBLY.

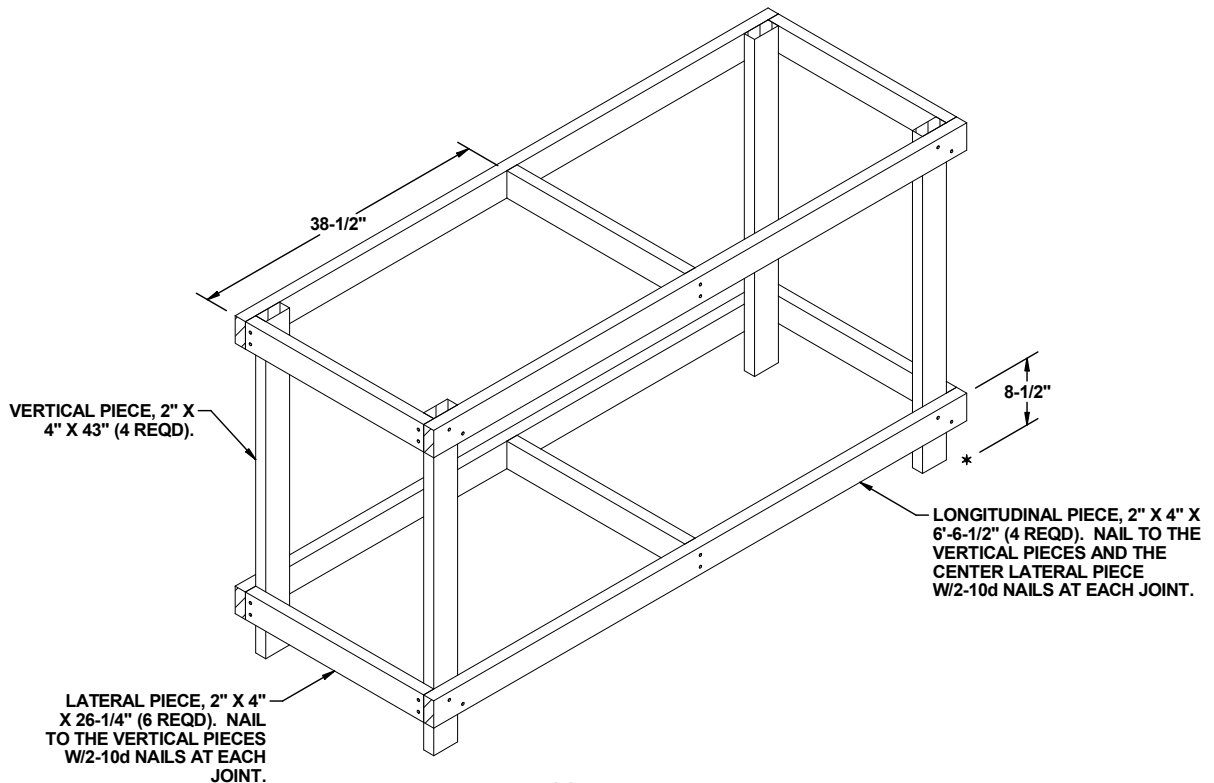
MATERIAL SPECIFICATIONS

- LUMBER** - - - - - : SEE TM 743-200-1 (DUNNAGE LUMBER) AND VOLUNTARY PRODUCT STANDARD PS 20.
- NAILS** - - - - - : ASTM F1667; COMMON STEEL NAIL NLCMS OR NLCMMS).
- PLYWOOD** - - - - - : 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.
- WIRE, CARBON STEEL** - - : ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, 0.0800" DIA, GRADE 1006 OR BETTER.
- ANTI-CHAFING MATERIAL** - - - - - : MIL-PRF-121 (OR EQUAL); NEUTRAL BARRIER MATERIAL.



PALLET UNIT

GROSS WEIGHT ----- 2,211 LBS
 CUBE ----- 58.3 CU FT

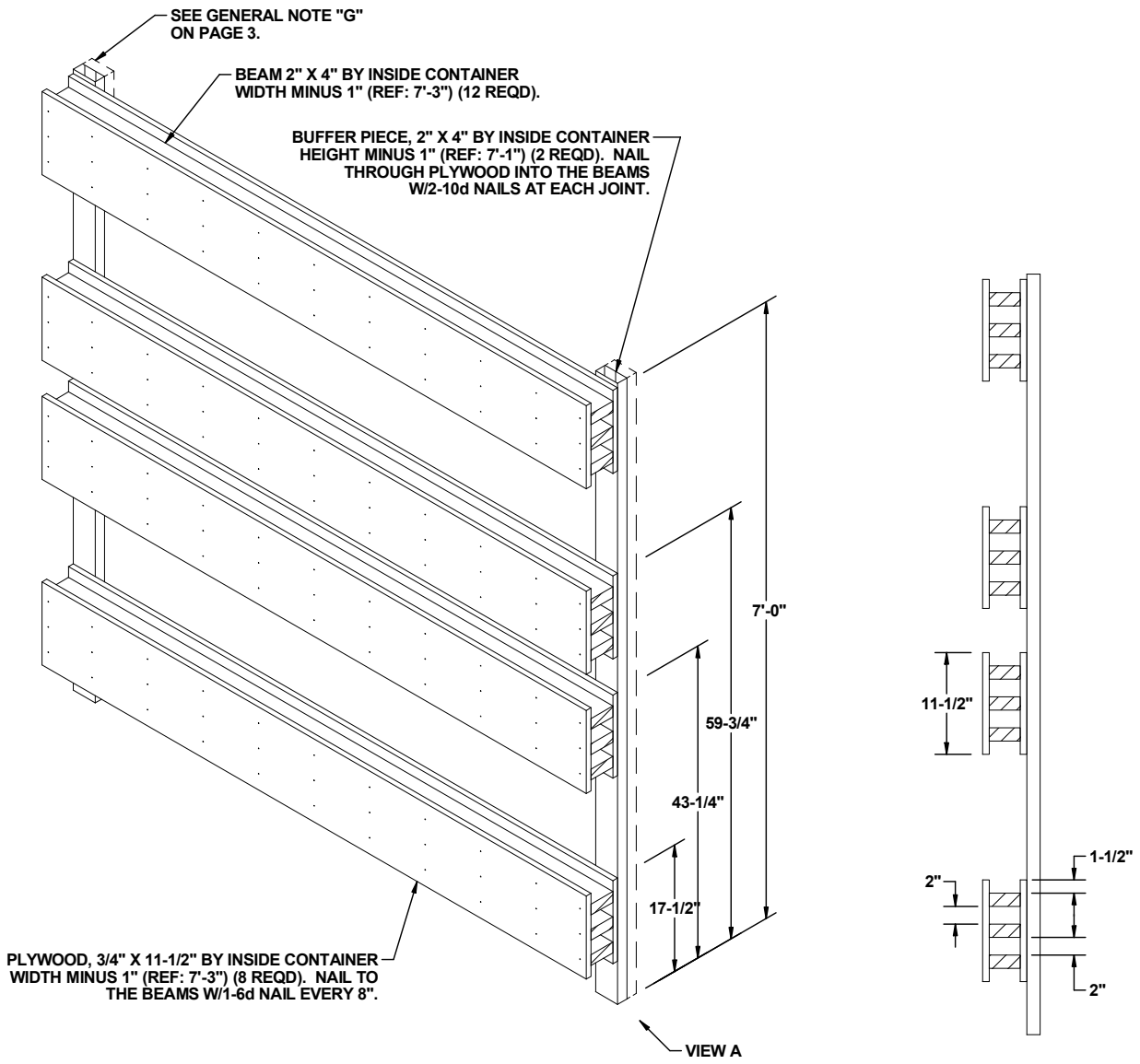


VERTICAL PIECE, 2" X 4" X 43" (4 REQD).

LONGITUDINAL PIECE, 2" X 4" X 6'-6-1/2" (4 REQD). NAIL TO THE VERTICAL PIECES AND THE CENTER LATERAL PIECE W/2-10d NAILS AT EACH JOINT.

LATERAL PIECE, 2" X 4" X 26-1/4" (6 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.

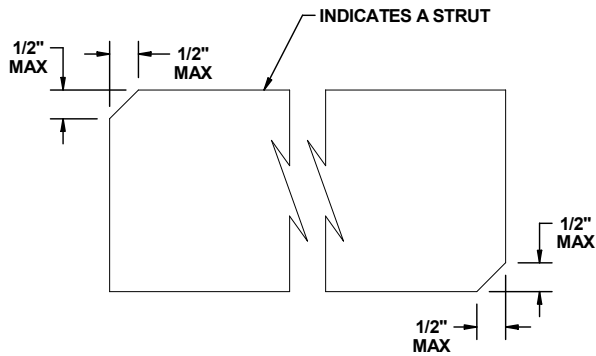
**FILLER ASSEMBLY
 FOR MINUS ONE PALLET UNIT**



PLYWOOD, 3/4" X 11-1/2" BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-3") (8 REQD). NAIL TO THE BEAMS W/1-6d NAIL EVERY 8".

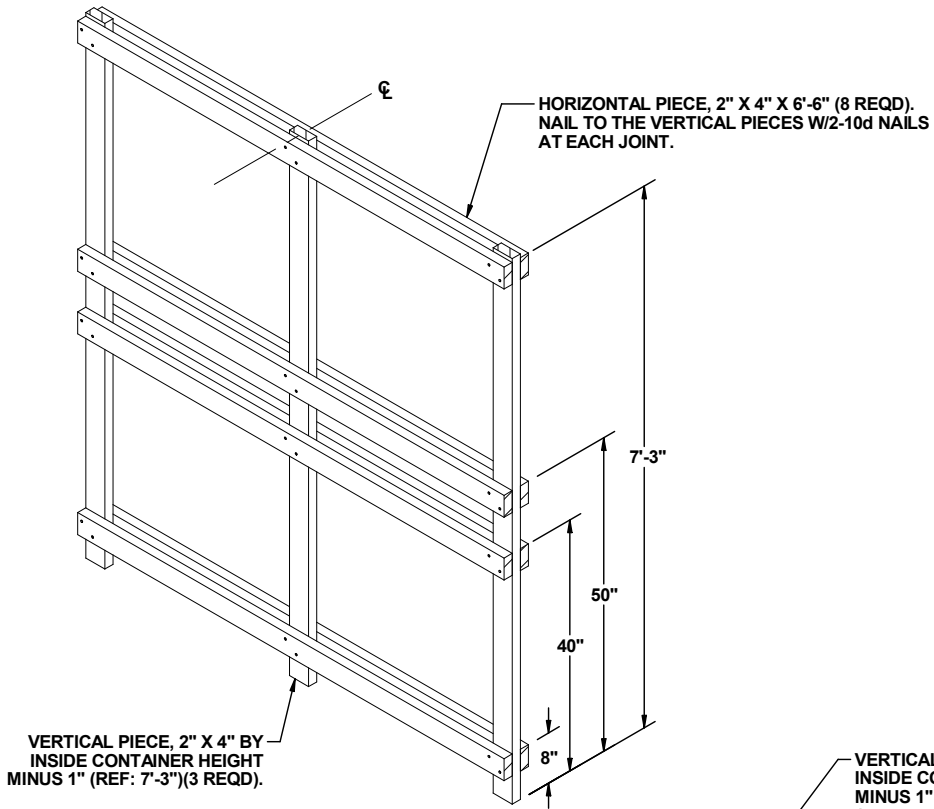
END BLOCKING ASSEMBLY

NOTE: FOR A ONE-HIGH LOAD, ELIMINATE THE TOP TWO BEAM ASSEMBLIES.



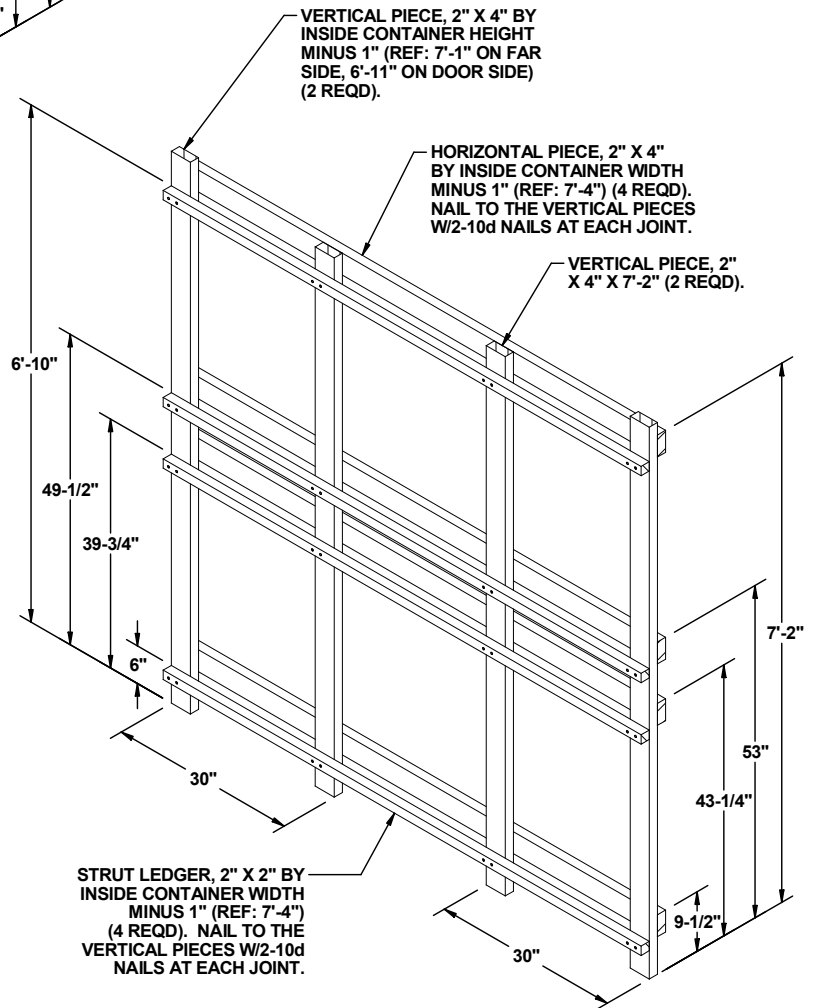
BEVEL CUT

IF DESIRED, EACH END OF A STRUT MAY BE BEVEL-CUT AS SHOWN ABOVE TO FACILITATE INSTALLING THE STRUTS WITH A "DRIVE" FIT.



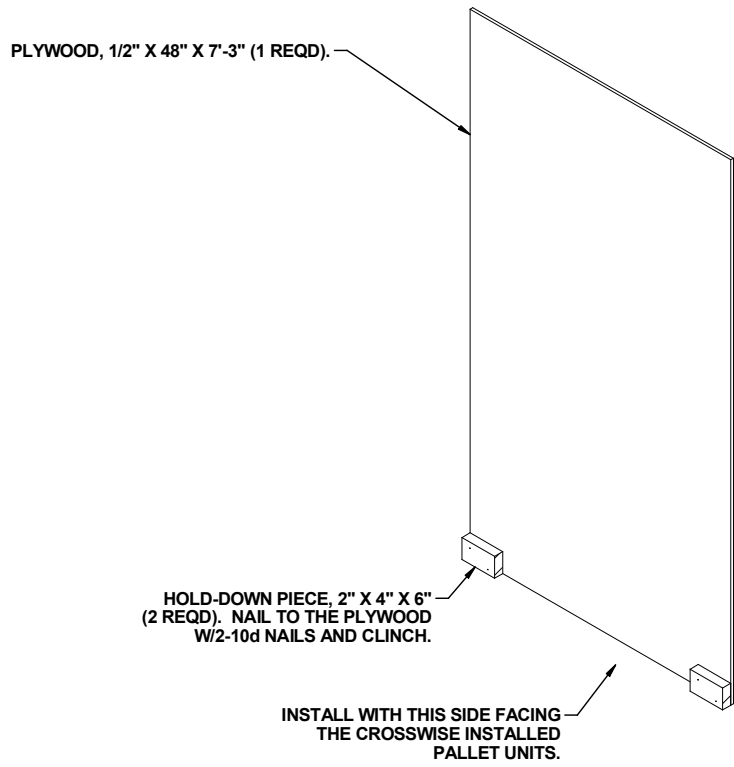
CENTER / SIDE FILL ASSEMBLY

NOTE: THE DEPICTED VIEW IS FOR A CENTER FILL ASSEMBLY. IF A SIDE FILL ASSEMBLY IS TO BE CONSTRUCTED, REDUCE THE LENGTH OF THE HORIZONTAL PIECES TO 63". FOR A ONE HIGH LOAD, ELIMINATE THE TOP FOUR HORIZONTAL PIECES AND REDUCE THE HEIGHT OF THE MIDDLE VERTICAL PIECE TO 44".



CENTER GATE

NOTE: FOR A ONE HIGH LOAD, ELIMINATE THE TOP TWO HORIZONTAL PIECES AND STRUT LEDGERS AND REDUCE THE HEIGHT OF THE TWO INNER VERTICAL PIECES TO 44".



SEPARATOR ASSEMBLY

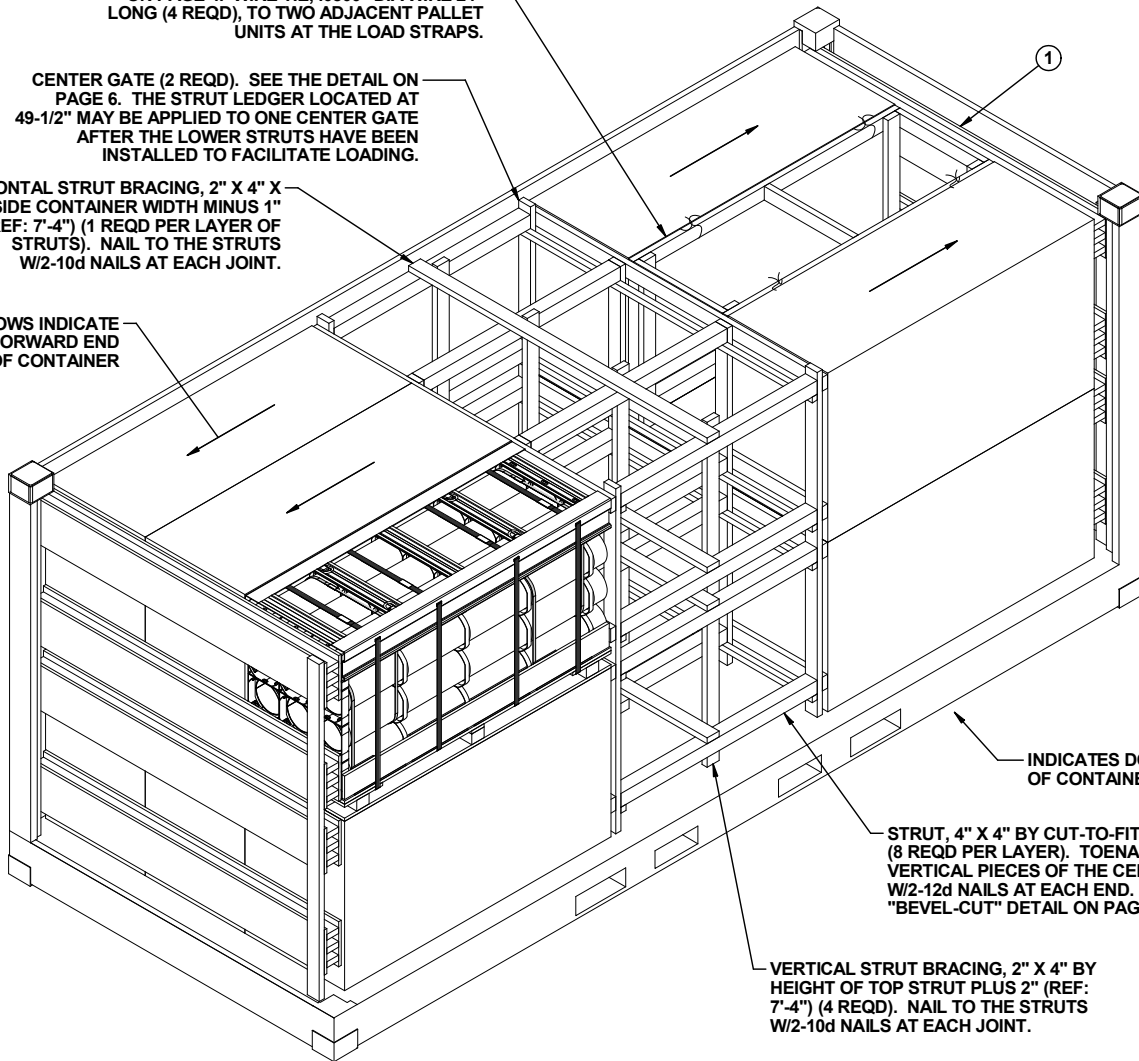
NOTE: FOR ONE-HIGH LOADS, REDUCE THE HEIGHT OF THE PLYWOOD TO 44".

FILLER ASSEMBLY (1 SHOWN). SEE DETAIL ON PAGE 4. WIRE TIE, .0800" DIA WIRE 24" LONG (4 REQD), TO TWO ADJACENT PALLET UNITS AT THE LOAD STRAPS.

CENTER GATE (2 REQD). SEE THE DETAIL ON PAGE 6. THE STRUT LEDGER LOCATED AT 49-1/2" MAY BE APPLIED TO ONE CENTER GATE AFTER THE LOWER STRUTS HAVE BEEN INSTALLED TO FACILITATE LOADING.

HORIZONTAL STRUT BRACING, 2" X 4" X INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-4") (1 REQD PER LAYER OF STRUTS). NAIL TO THE STRUTS W/2-10d NAILS AT EACH JOINT.

ARROWS INDICATE FORWARD END OF CONTAINER



INDICATES DOOR SIDE OF CONTAINER.

STRUT, 4" X 4" BY CUT-TO-FIT (58" SHOWN) (8 REQD PER LAYER). TOENAIL TO THE VERTICAL PIECES OF THE CENTER GATES W/2-12d NAILS AT EACH END. SEE THE "BEVEL-CUT" DETAIL ON PAGE 5.

VERTICAL STRUT BRACING, 2" X 4" BY HEIGHT OF TOP STRUT PLUS 2" (REF: 7'-4") (4 REQD). NAIL TO THE STRUTS W/2-10d NAILS AT EACH JOINT.

LESS THAN FULL LOAD PROCEDURE
KEY NUMBERS REFER TO THE KEY NUMBERS ON PAGE 2.
SEE GENERAL NOTES "H" AND "R" ON PAGE 3.