


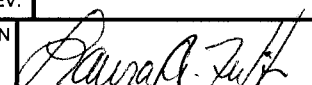
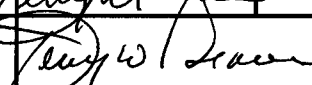
LOADING AND BRACING[⊕] IN SIDE OPENING ISO CONTAINERS OF FIN ASSEMBLY, BSU-33, ON METAL PALLET

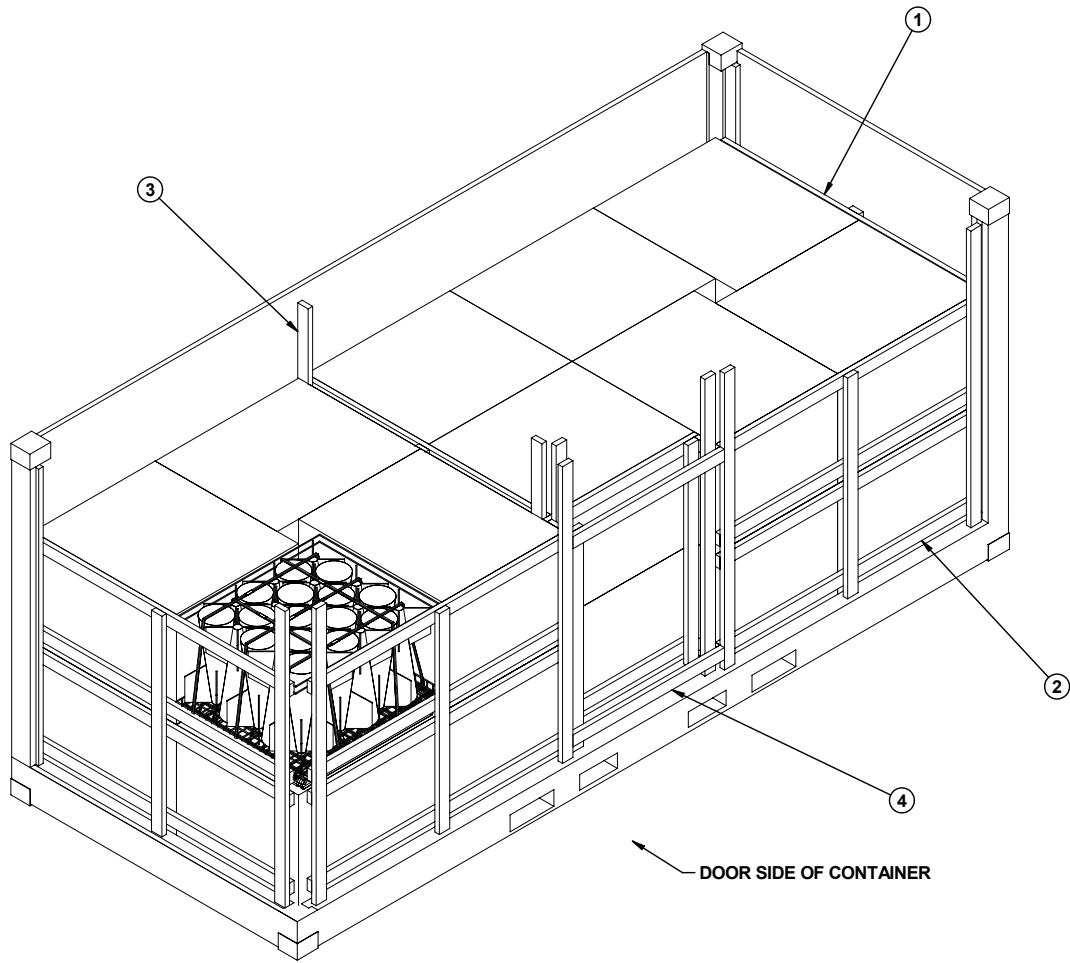
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⊕THE PROCEDURES SHOWN HEREIN ARE APPLICABLE TO LOADS THAT ARE TO BE SHIPPED BY CONTAINER-ON-FLATCAR (COFC) RAIL, MOTOR, OR WATER CARRIERS.

U.S. ARMY MATERIEL COMMAND DRAWING

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 10.					
		DO NOT SCALE			AUGUST 2006		
		ENGINEER OR TECHNICIAN	BASIC REV.	ADIN FELICIANO			
APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND		TRANSPORTATION ENGINEERING DIVISION					
		VALIDATION ENGINEERING DIVISION	TESTED			CLASS	DIVISION
		ENGINEERING DIRECTORATE				19	48
U.S. ARMY DEFENSE AMMUNITION CENTER							



ISOMETRIC VIEW

KEY NUMBERS

- ① END GATE (2 REQD). SEE THE DETAIL ON PAGE 7.
- ② SIDE FILL ASSEMBLY A (2 REQD). SEE THE DETAIL ON PAGE 7.
- ③ CENTER GATE A (1 REQD). SEE DETAIL ON PAGE 7.
- ④ SIDE FILL ASSEMBLY (1 REQD). SEE DETAIL ON PAGE 9.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	258	172
NAILS	NO. REQD	POUNDS
10d (3")	152	2-1/2

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT - - - - -	20 - - - - -	16,720 LBS
DUNNAGE - - - - -	- - - - -	347 LBS
CONTAINER - - - - -	- - - - -	6,050 LBS
TOTAL WEIGHT - - - - -		23,117 LBS (APPROX)

GENERAL NOTES

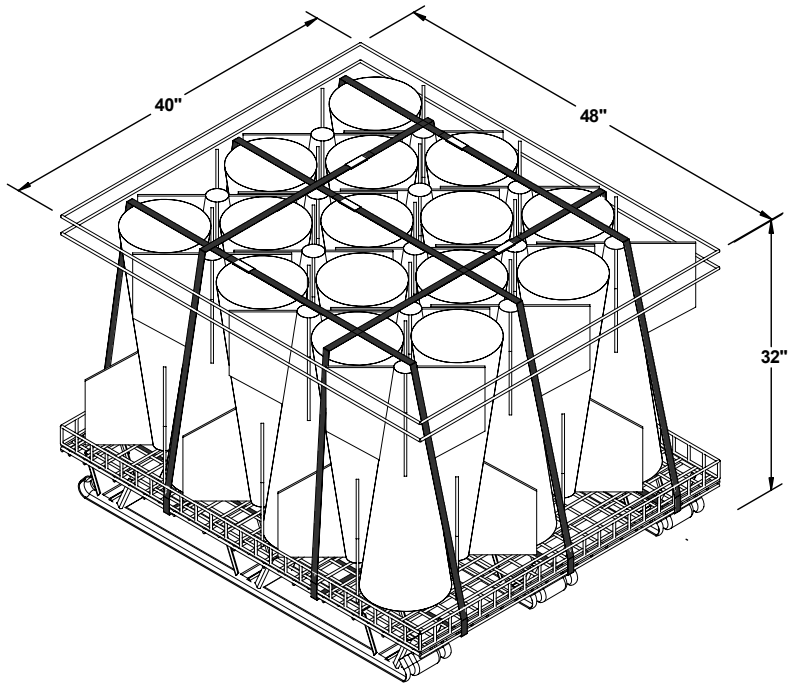
(GENERAL NOTES CONTINUED)

- 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 FIN ASSEMBLY, BSU-33 IN ADU-426 METAL PALLET ADAPTERS ON METAL PALLETS. SUBSEQUENT REFERENCE TO PALLET UNIT HEREIN MEANS THE PALLET UNIT WITH AMMUNITION ITEMS. SEE PAGE 4 AND NAVY DRAWING 6214035 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'-5-1/4" LONG BY 89-3/4" WIDE BY 88" HIGH, WITH A MAXIMUM GROSS WEIGHT OF 52,910 POUNDS. OLDER/OTHER CONTAINERS MAY HAVE DIFFERENT INSIDE MEASUREMENTS, VERIFY INSIDE CONTAINER DIMENSIONS PRIOR TO FABRICATING DUNNAGE. 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 OR CRIB FILL ASSEMBLIES. NAIL EACH ADDITIONAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE THICKNESS, QUANTITY, AND/OR LENGTH OF THE VERTICAL OR HORIZONTAL PIECES IN THE SIDE FILL, OR CRIB 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 OR TO THE VERTICAL PIECES ON THE END GATE 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 AND TOP PALLET ADAPTERS, 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.
- 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 PAGES 5 AND 6.
1. IF A LOAD IS REDUCED BY ONLY A SMALL AMOUNT (ONE OR TWO LADING UNITS), LADING UNITS NORMALLY MAY BE ELIMINATED FROM THE CENTER OF THE LOAD.
2. IF A LOAD IS REDUCED BY A LARGE AMOUNT (MORE THAN TWO LADING UNITS), LADING UNITS SHOULD BE ELIMINATED AS REQUIRED AND THE VOID IN THE LONGITUDINAL CENTER OF THE CONTAINER SHIFTED FORE OR AFT, AS NECESSARY, TO ACHIEVE A SYMMETRICAL WEIGHT DISTRIBUTION. THE DEPICTED PROCEDURES WILL BE FOLLOWED AS CLOSELY AS POSSIBLE, MAKING ONLY THOSE ADJUSTMENTS TO THE DUNNAGE WHICH ARE REQUIRED TO ACCOMMODATE THE NUMBER OF UNITS TO BE SHIPPED.
- Q. ANTI-CHAFING MATERIAL MAY BE INSTALLED AT POINTS OF CONTACT BETWEEN PALLET UNITS, BETWEEN PALLET UNITS AND THE SIDE OPENING CONTAINER IF DESIRED, TO PREVENT CHAFING DAMAGE TO CONTAINER PAINT AND MARKINGS.
- R. RECOMMENDED SEQUENTIAL LOADING PROCEDURES FOR THE LOAD ON PAGE 4:
1. PREFABRICATE TWO END GATES, TWO SIDE FILL ASSEMBLIES "A", ONE SIDE FILL ASSEMBLY "B", AND ONE CENTER GATE.
2. INSTALL ONE END GATE.
3. LOAD EIGHT PALLET UNITS.
4. INSTALL ONE SIDE FILL ASSEMBLY "A".
5. INSTALL THE SECOND END GATE.
6. REPEAT STEPS 3 AND 4.
7. LOAD FOUR PALLET UNITS.
8. INSTALL THE CENTER GATE.
9. INSTALL THE SIDE FILL ASSEMBLY "B".

MATERIAL SPECIFICATIONS

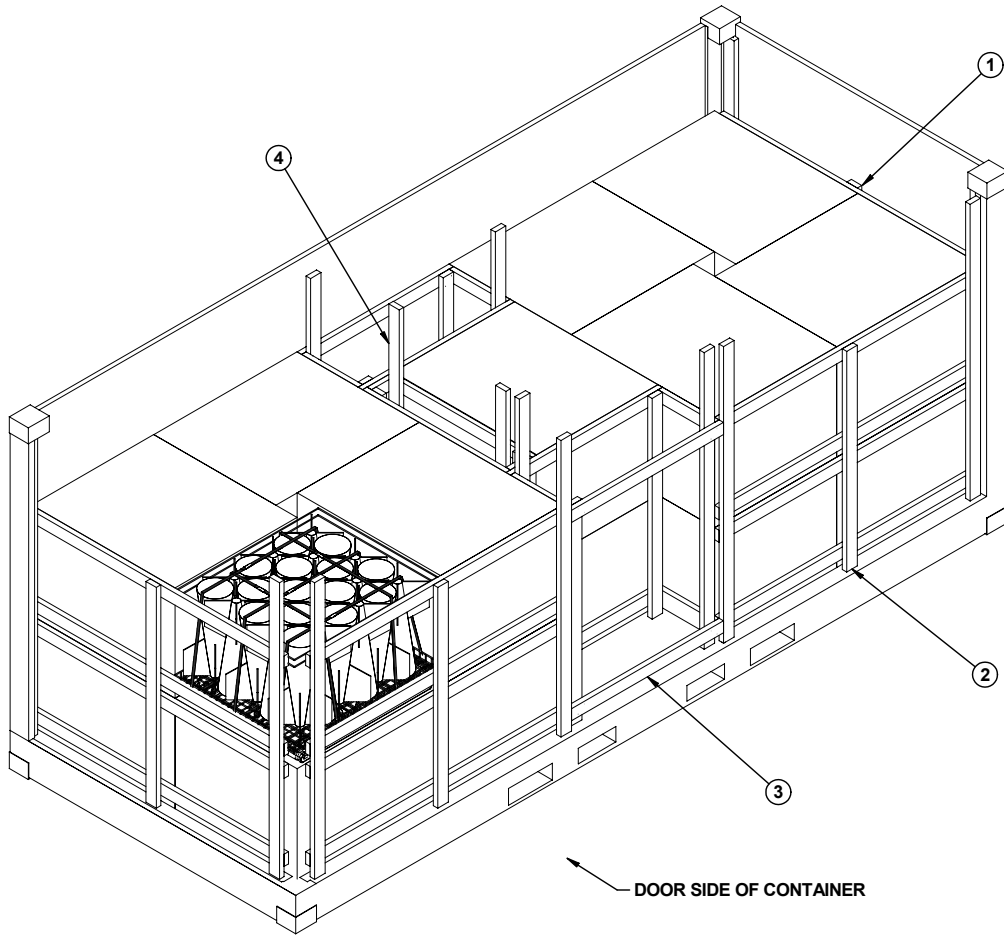
- LUMBER - - - - - : SEE TM 743-200-1 (DUNNAGE LUMBER) AND VOLUNTARY PRODUCT STANDARD PS 20.
- NAILS - - - - - : ASTM F1667; COMMON STEEL NAIL NLCMS OR NLCMMS).
- PLYWOOD - - - - - : COMMERCIAL ITEM DESCRIPTION A-A-55057, INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D. IF SPECIFIED GRADE 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.

(CONTINUED AT RIGHT)



PALLET UNIT DATA

GROSS WEIGHT	-----	836 LBS
CUBE	-----	36.4 CU FT



ISOMETRIC VIEW

KEY NUMBERS

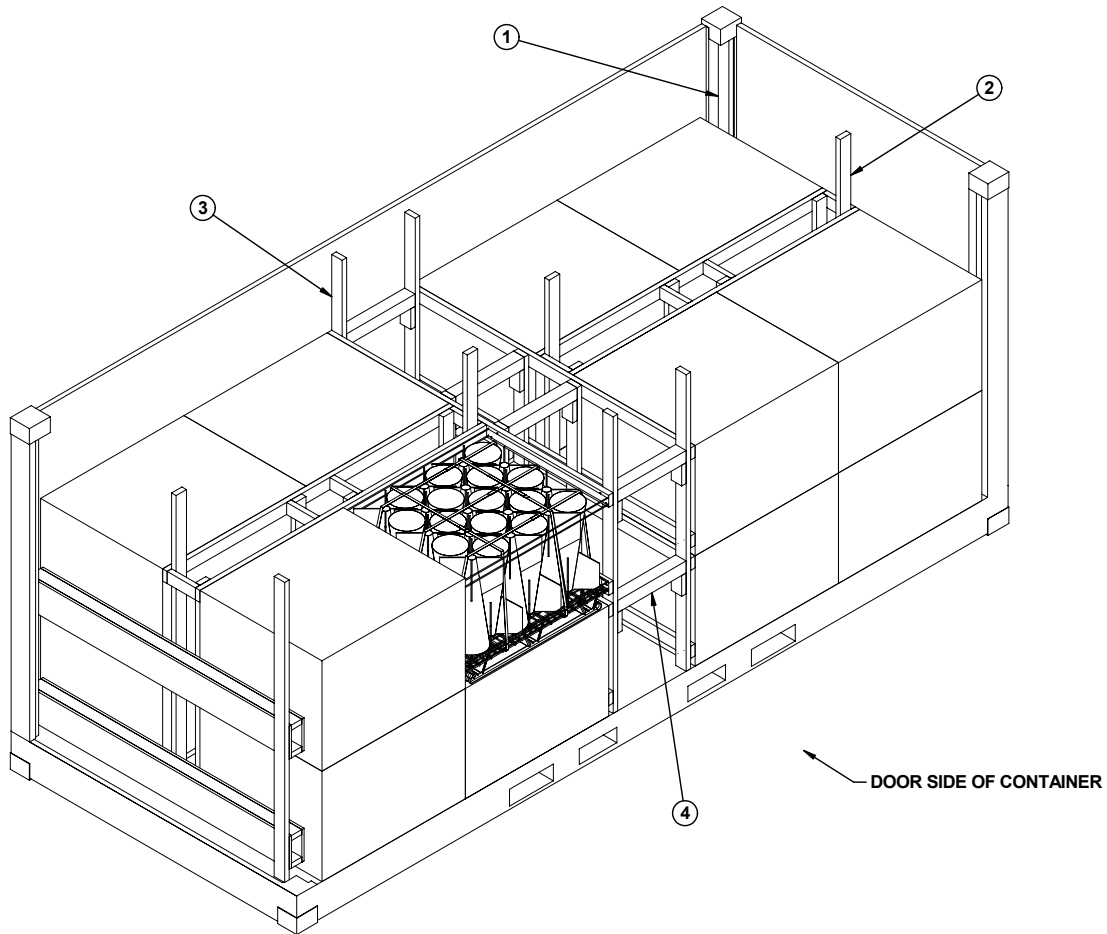
- ① END GATE (2 REQD). SEE THE DETAIL ON PAGE 7.
- ② SIDE FILL ASSEMBLY A (2 REQD). SEE THE DETAIL ON PAGE 7.
- ③ SIDE FILL ASSEMBLY B (2 REQD). SEE DETAIL ON PAGE 9.
- ④ CENTER FILL ASSEMBLY (1 REQD). SEE DETAIL ON PAGE 8.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" x 4"	320	214
NAILS	NO. REQD	POUNDS
10d (3")	224	3-1/2

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT - - - - -	18 - - - - -	15,048 LBS
DUNNAGE - - - - -	- - - - -	431 LBS
CONTAINER - - - - -	- - - - -	6,050 LBS
TOTAL WEIGHT - - - - -		21,529 LBS (APPROX)

18 UNIT LOAD



ISOMETRIC VIEW

KEY NUMBERS

- ① END BLOCKING ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 9.
- ② CRIB FILL ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 8.
- ③ CENTER GATE B (2 REQD). SEE DETAIL ON PAGE 7.
- ④ STRUT, 4" X 4" BY CUT-TO-FIT (REF: 24") (8 REQD). TOENAIL TO THE VERTICAL PIECES OF THE CENTER GATES W/2-12d NAILS AT EACH END. SEE "BEVEL-CUT" DETAIL ON PAGE 10.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	697	465
4" X 4"	16	21
NAILS	NO. REQD	POUNDS
6d (2")	176	1
10d (3")	472	7-1/2
12d (3-1/4")	32	3/4
PLYWOOD, 3/4" - 46.11 SQFT REQD		91.11 LBS

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT - - - - -	16 - - - - -	13,376 LBS
DUNNAGE - - - - -	- - - - -	1,085 LBS
CONTAINER - - - - -	- - - - -	6,050 LBS
TOTAL WEIGHT - - - - -		20,511 LBS (APPROX)

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

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

VERTICAL PIECE, 2" X 4"
X 64" (1 REQD).

38-1/2"
32"
6-1/2"

39"

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

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

VERTICAL PIECE, 2" X 4"
X 64" (2 REQD).

**CENTER GATE A / END GATE / SIDE FILL
ASSEMBLY A**

**NOTE: INCREASE THE LENGTH OF THE HORIZONTAL
PIECES BY 5-1/2" FROM WHAT IS SHOWN WHEN BUILDING
THE END OR SIDE GATES.**

38-1/2"
32"
6-1/2"

36-1/2"

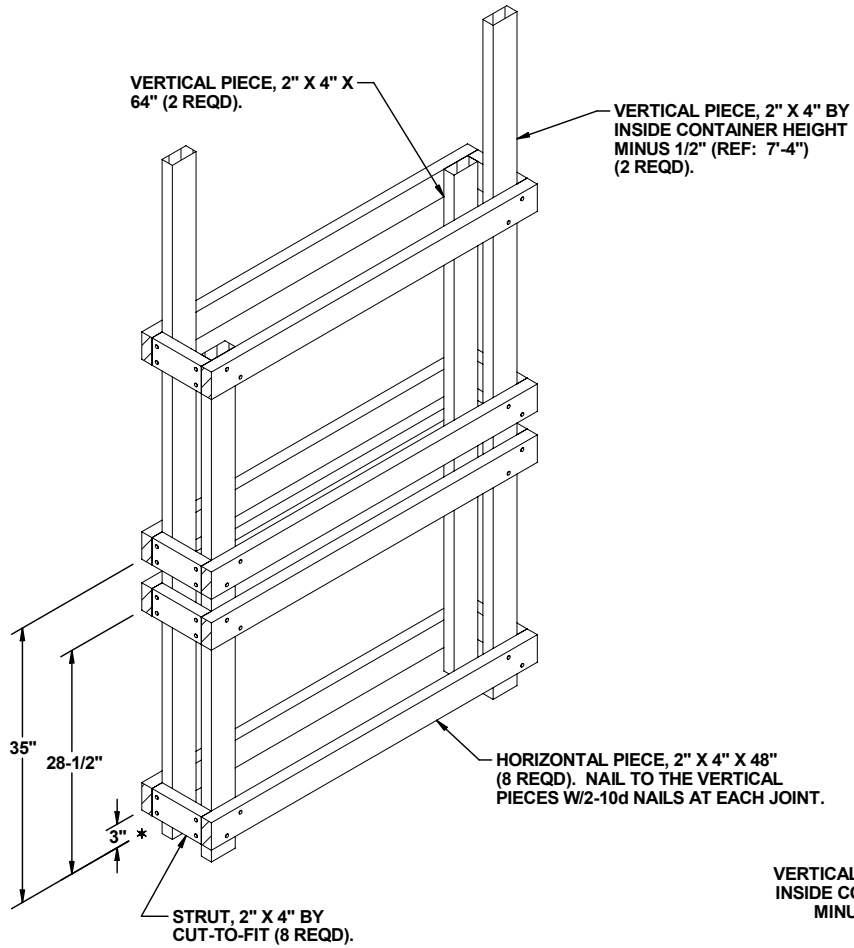
54-1/2"

STRUT LEDGER, 2" X 4" X 6"
(8 REQD). NAIL TO THE
VERTICAL PIECES W/2-10d
NAILS.

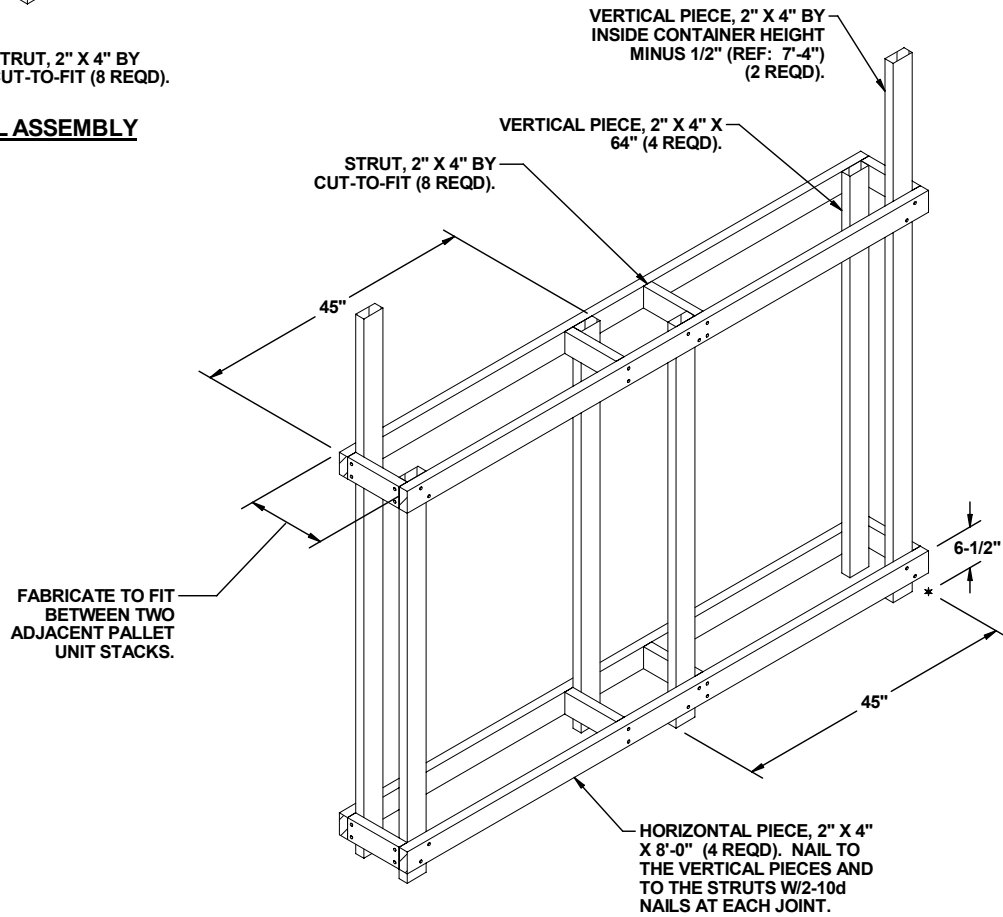
22-1/2"

36-1/2"

CENTER GATE ASSEMBLY B



CENTER FILL ASSEMBLY



CRIB FILL ASSEMBLY

SEE GENERAL NOTE
"G" ON PAGE 3.

BUFFER PIECE, 2" X 4"
BY INSIDE CONTAINER
HEIGHT MINUS 1"
(REF: 7'-1") (2 REQD).
NAIL THROUGH
PLYWOOD INTO
BEAMS W/2-10d NAILS
AT EACH JOINT.

BEAM, 2" X 4" BY
INSIDE CONTAINER
WIDTH MINUS 1"
(REF: 7'-2") (4 REQD).

PLYWOOD, 9-1/2" X 3/4"
BY INSIDE CONTAINER
WIDTH MINUS 1" (REF:
7'-2") (4 REQD). NAIL
TO THE BEAMS W/1-6d
NAIL EVERY 8".

35"
3"

END BLOCKING ASSEMBLY

STRUT, 2" X 4" BY
CUT-TO-FIT (4 REQD).
NAIL TO THE VERTICAL
PIECES W/2-10d NAILS
AT EACH END.

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

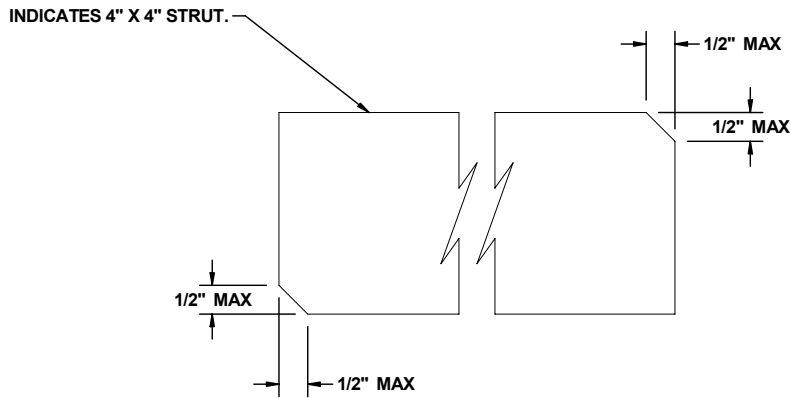
VERTICAL PIECE, 2" X 4"
X 64" (2 REQD).

FABRICATE TO FIT
BETWEEN PALLET
UNIT AND CONTAINER
DOOR.

6-1/2"
*

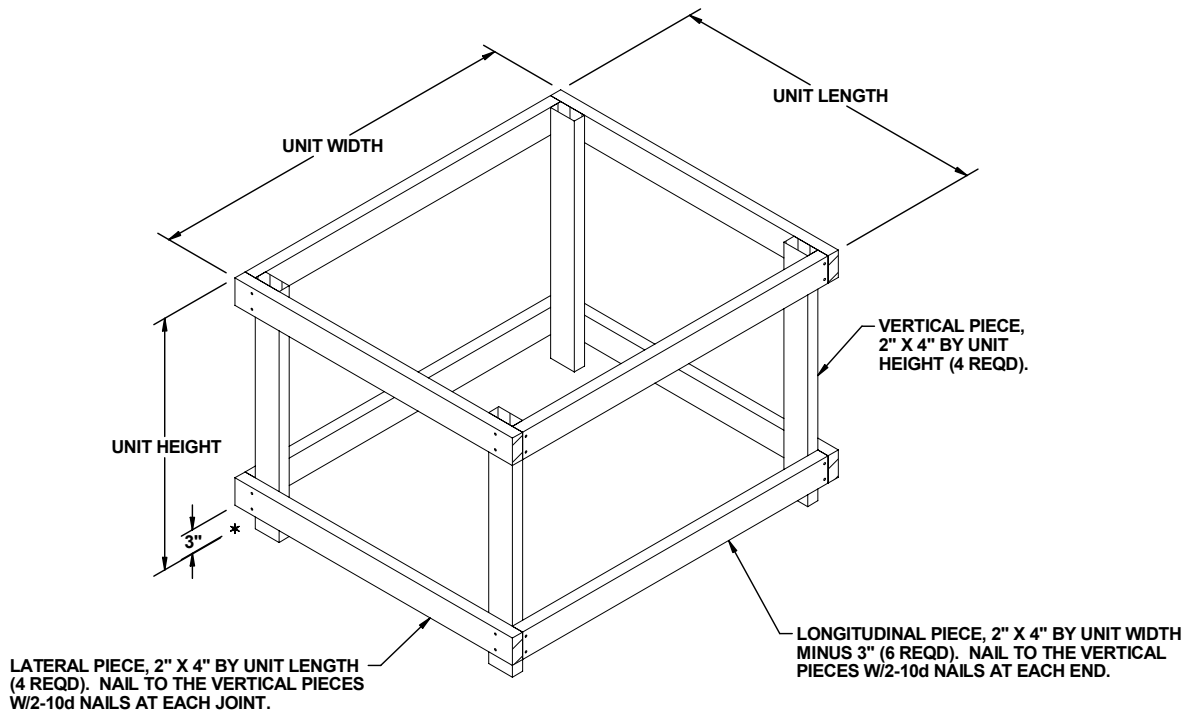
HORIZONTAL PIECE, 2" X 4"
X 51" (4 REQD). NAIL TO
THE VERTICAL PIECES
W/2-10d NAILS AT EACH
JOINT.

SIDE FILL ASSEMBLY B



BEVEL-CUT

IF DESIRED, EACH END OF A STRUT MAY BE BEVEL-CUT AS SHOWN ABOVE TO FACILITATE THE ACHIEVEMENT OF A TIGHT FIT BETWEEN THE CENTER GATES.



OMITTED UNIT ASSEMBLY

THIS ASSEMBLY IS FOR USE IN PLACE OF AN OMITTED PALLET UNIT. NO MORE THAN THREE OMITTED UNIT ASSEMBLIES MAY BE USED PER TWO-HIGH LOAD, AND NO MORE THAN ONE OMITTED UNIT ASSEMBLY MAY BE USED PER ONE-HIGH LOAD. DO NOT INSTALL IMMEDIATELY ADJACENT TO ANOTHER OMITTED UNIT ASSEMBLY. WIRE TIE TO ADJACENT PALLET UNIT(S) IN TWO PLACES.