

LOADING AND BRACING[⊕] IN SIDE OPENING ISO CONTAINERS OF SMALL DIAMETER BOMB SINGLE WEAPON PACKED ONE PER CNU- 659 CONTAINER, PALLETIZED

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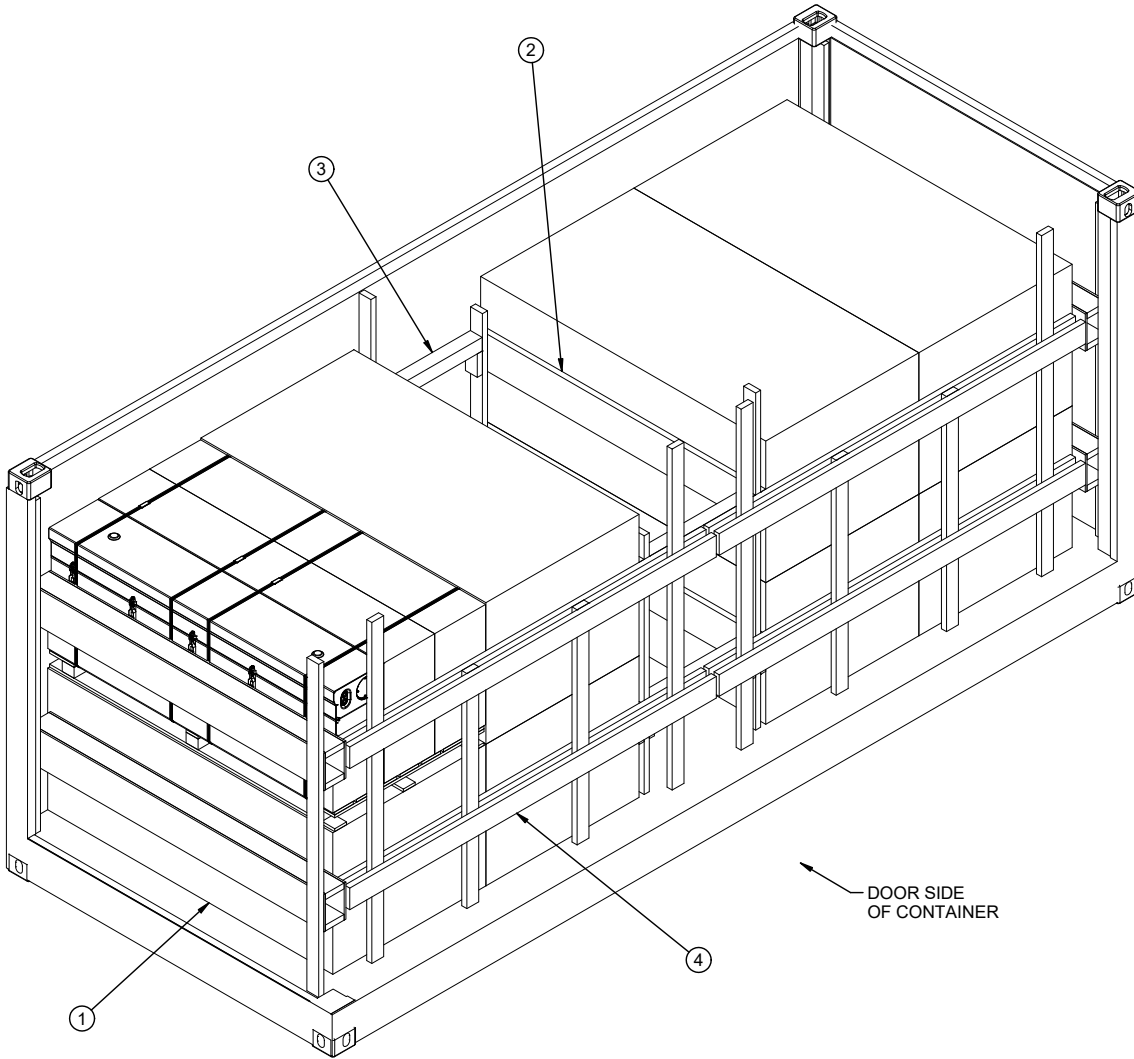
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⊕ THE PROCEDURES SHOWN HEREIN ARE APPLICABLE TO LOADS THAT ARE TO
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WATER CARRIERS.

U.S. ARMY MATERIEL COMMAND DRAWING

APPROVED, U.S. ARMY JOINT MUNITIONS COMMAND		CAUTION: VERIFY PRIOR TO USE AT HTTPS://MHP.REDSTONE.ARMY.MIL THAT THIS IS THE MOST CURRENT VERSION OF THIS DOCUMENT. THIS IS PAGE 1 OF 8.			
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EXPLOSIVE SAFETY DIRECTORATE	THOMAS.CARL.AN THONY.1104621372 <small>Digitally signed by THOMAS.CARL.ANTHONY.11046 21372 Date: 2018.04.09 07:52:14 -05'00'</small>	CLASS	DIVISION	DRAWING	FILE
U.S. ARMY DEFENSE AMMUNITION CENTER		19	48	8830	SP15PM9



ISOMETRIC VIEW

KEY NUMBERS

- ① END BLOCKING ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 6.
- ② CENTER GATE ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 6.
- ③ STRUT, 4" X 4" BY CUT-TO-FIT (REF: 31-1/4") (4 REQD). INSTALL AS SHOWN AND TOENAIL EACH END TO THE CENTER GATE ASSEMBLY W/2-10d NAILS. SEE THE "BEVEL-CUT" DETAIL ON PAGE 5.
- ④ SIDE FILL ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 7.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	107	71
2" X 6"	130	130
2" X 10"	28	47
4" X 4"	11	14
NAI LS	NO. REQD	POUNDS
6d (2")	176	1
10d (3")	168	2-3/4
12d (3-1/4")	16	1/4
PLYWOOD, 1/2" - - 45.92 SQ FT REQD - - 63.14 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	8	19,912 LBS
DUNNAGE		591 LBS
CONTAINER		6,050 LBS
TOTAL WEIGHT		26,553 LBS (APPROX)

GENERAL NOTES

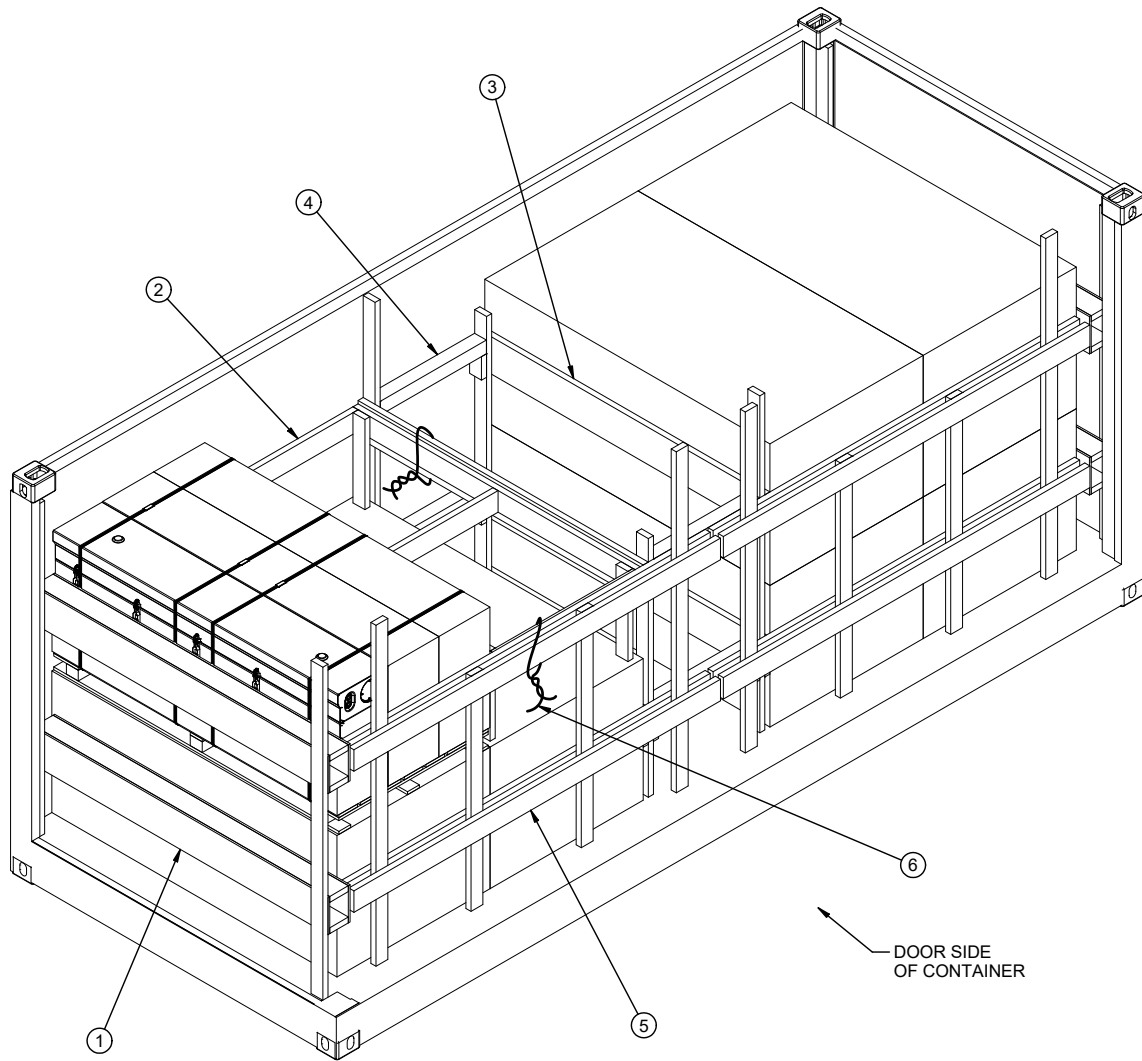
(GENERAL NOTES CONTINUED)

- 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 PALLETIZED SMALL DIAMETER BOMB SINGLE WEAPONS PACKED ONE GBU-39/B BOMB PER CNU-659 CONTAINER. SUBSEQUENT REFERENCE TO PALLET UNIT HEREIN MEANS THE PALLET UNIT WITH AMMUNITION ITEMS. SEE PAGE 5 AND AMC DRAWING 19-48-8826-SP20J1, AND BOEING DRAWING 70P993152-1001 FOR DETAILS OF THE PALLET UNIT AND CONTAINER. **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 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 SIDE FILL ASSEMBLIES MAY BE ADJUSTED AS REQUIRED TO FACILITATE VARIANCE IN THE SIZE OF THE PALLET UNIT. THE LOADS MUST BE AS TIGHT AS POSSIBLE LONGITUDINALLY, BUT THE VOID MUST NOT EXCEED 3/4" OVERALL. EXCESSIVE SLACK CAN BE ELIMINATED BY INCREASE THE LENGTH OF STRUTS.
- E. 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.
- F. 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.
- G. 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.
- H. **CAUTION:** DO NOT NAIL DUNNAGE MATERIAL TO THE CONTAINER WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.
- J. PORTIONS OF THE CONTAINER DEPICTED WITHIN THIS DRAWING, SUCH AS THE SIDEWALL, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.
- 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 SO 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. 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.
- O. THE QUANTITY OF PALLET UNITS SHOWN IN THE LOAD ON PAGE 2 MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SEE THE "SEVEN PALLET UNIT LOAD" ON PAGE 4.
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 TOTAL LOAD 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.
- P. STRUTS WHICH ARE 48" OR LONGER MUST BE STIFFENED BY THE APPLICATION OF HORIZONTAL AND VERTICAL STRUT BRACING AS SHOWN IN THE "TYPICAL STRUT BRACING" DETAIL ON PAGE 73 OF DRAWING AMC 19-48-4153-15PA1002. BRACING IS NOT REQUIRED IF THE STRUTS FOR THE LOAD BEING SHIPPED ARE SHORTER THAN 48". THE LENGTH OF THE 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.
- Q. 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.
- R. ANTI-CHAFING MATERIAL MAY BE INSTALLED AT POINTS OF CONTACT BETWEEN PALLET UNITS OR BETWEEN PALLET UNITS AND THE SIDE OPENING CONTAINER, IF DESIRED, TO PREVENT CHAFING DAMAGE TO CONTAINER PAINT AND MARKINGS.
- S. RECOMMENDED SEQUENTIAL LOADING PROCEDURES FOR THE LOAD ON PAGE 2:
1. PREFABRICATE TWO END BLOCKING ASSEMBLIES, TWO CENTER GATE ASSEMBLIES, AND TWO SIDE FILL ASSEMBLIES.
2. INSTALL TWO END BLOCKING ASSEMBLIES.
3. LOAD EIGHT PALLET UNITS.
4. INSTALL TWO CENTER GATE ASSEMBLIES.
5. MEASURE AND INSTALL FOUR CUT-TO-FIT STRUTS.
6. INSTALL TWO SIDE FILL ASSEMBLIES.

(CONTINUED AT RIGHT)

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 NLCMMS).
<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>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.



ISOMETRIC VIEW

KEY NUMBERS

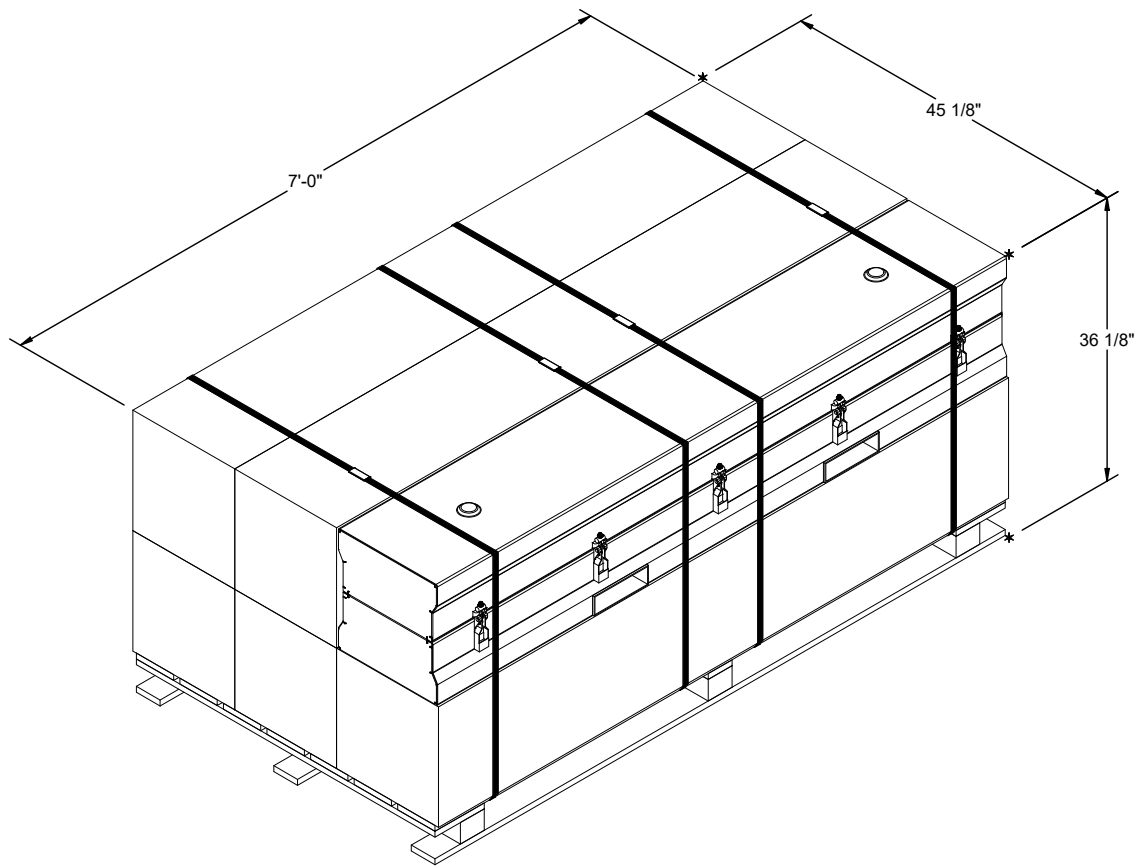
- ① END BLOCKING ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 6.
- ② FILLER ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 7.
- ③ CENTER GATE ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 6.
- ④ STRUT, 4" X 4" BY CUT-TO-FIT (REF: 31-1/4") (4 REQD). INSTALL AS SHOWN AND TOENAIL EACH END TO THE CENTER GATE ASSEMBLY W/2-12d NAILS. SEE THE "BEVEL-CUT" DETAIL ON PAGE 5.
- ⑤ SIDE FILL ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 7.
- ⑥ TIE WIRE, .0800 BY 24" LONG (2 REQD). INSTALL TO FORM A COMPLETE LOOP AROUND THE FILLER ASSEMBLY AND A SIDE FILL ASSEMBLY OR THE CENTER GATE ASSEMBLY. BRING ENDS TOGETHER AND TWIST TAUT.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	114	76
2" X 6"	155	155
2" X 10"	28	47
4" X 4"	11	14
NAI LS	NO. REQD	POUNDS
6d (2")	176	1
10d (3")	198	3
12d (3-1/4")	16	1/4
PLYWOOD, 1/2" - -	45.92 SQ FT REQD - -	63.14 LBS
WI RE, .0800" DIA - - - - -	4' REQD - -	0.07 LBS

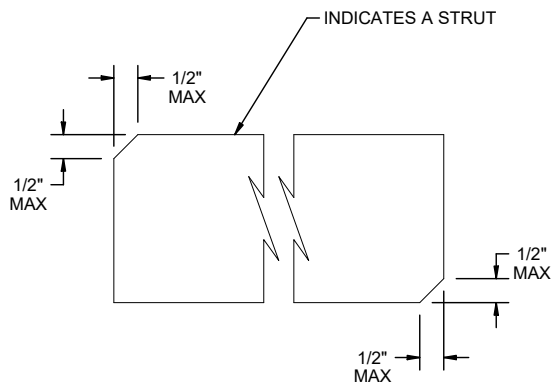
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNI T - - - - -	7 - - - - -	17,423 LBS
DUNNAGE - - - - -	- - - - -	651 LBS
CONTAI NER - - - - -	- - - - -	6,050 LBS
TOTAL WEIGHT - - - - -		24,124 LBS (APPROX)



PALLET UNIT DATA

GROSS WEIGHT - - - - - 2,489 LBS (APPROX)
 CUBE - - - - - 79.2 CU FT (APPROX)



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.

REVISION

REVISION NO. 1, DATED MARCH 2018, CONSISTS OF:
 INCREASING PALLET UNIT WEIGHT AND CORRECTING
 FILE NUMBER.

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

BEAM, 2" X 6" BY INSIDE CONTAINER WIDTH MINUS 1" (REF 7'-3") (4 REQD).

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

SEE GENERAL NOTE "F" ON PAGE 3.

52"

16"

END BLOCKING ASSEMBLY

THE DETAIL ABOVE DEPICTS A END BLOCKING ASSEMBLY TO BE USED WITH A TWO HIGH LOAD. FOR A ONE HIGH LOAD ELIMINATE THE TOP BOX BEAM ASSEMBLY.

VERTICAL PIECE, 2" X 4" X 66" (1 REQD).

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

BUFFER PIECE, 2" X 10" X 7'-0" (2 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH END.

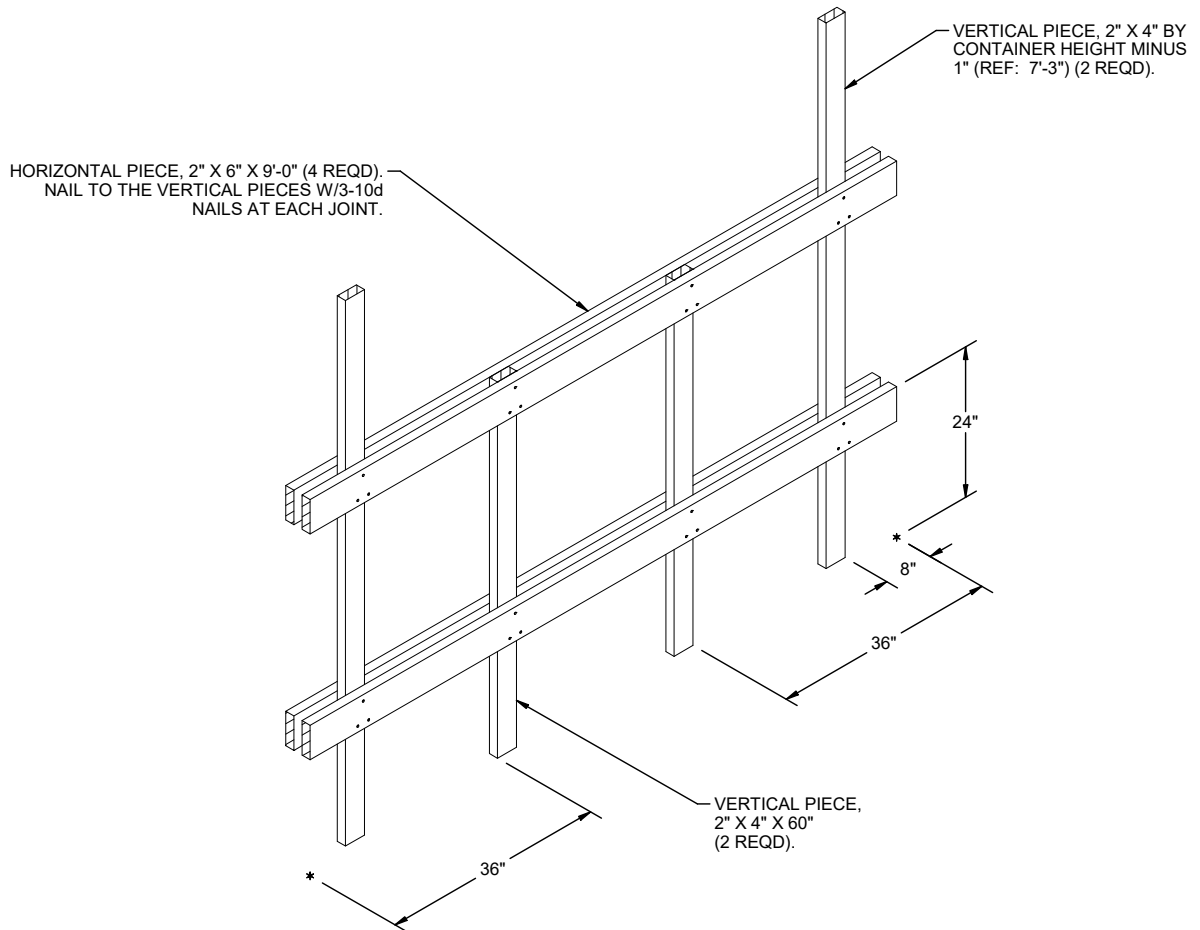
VERTICAL PIECE, 2" X 4" BY INSIDE CONTAINER HEIGHT MINUS 1" (REF: 7'-2") (1 REQD).

50 1/2"

13 1/2"

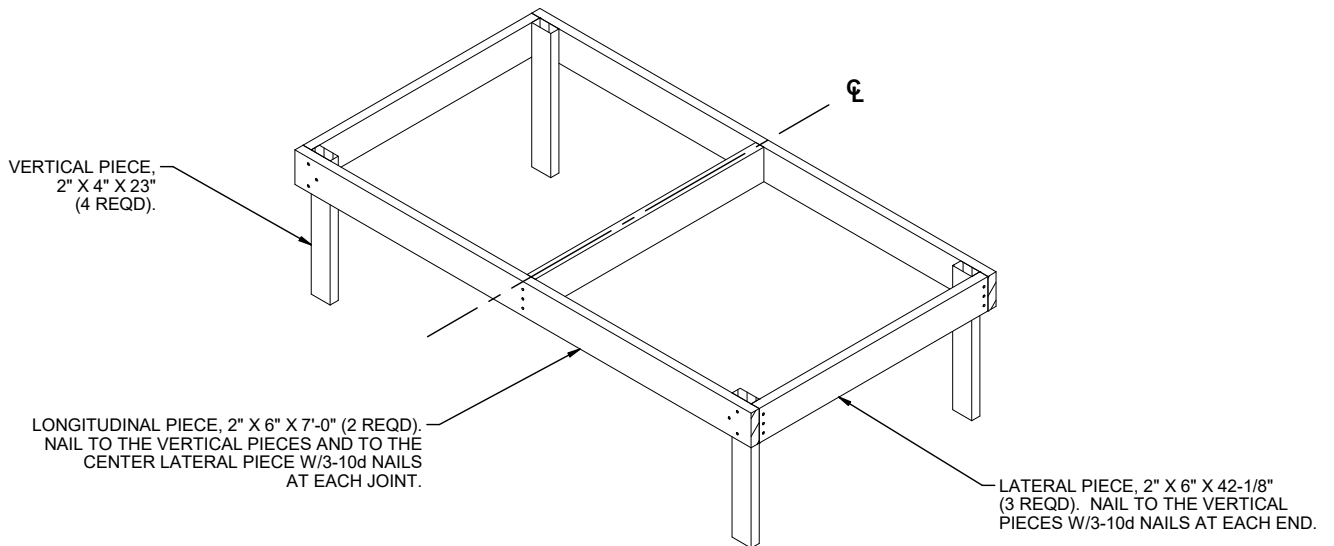
CENTER GATE ASSEMBLY

THE DETAIL ABOVE DEPICTS A CENTER GATE ASSEMBLY TO BE USED WITH A TWO HIGH LOAD. FOR A ONE HIGH LOAD ELIMINATE THE UPPER BUFFER PIECE, THE TOP TWO STRUT LEDGERS, AND SHORTEN THE 66" VERTICAL PIECE TO 29".



SIDE FILL ASSEMBLY

THE DETAIL ABOVE DEPICTS A SIDE FILL ASSEMBLY TO BE USED WITH A TWO HIGH LOAD. FOR A ONE HIGH LOAD ELIMINATE THE TOP TWO HORIZONTAL PIECES AND SHORTEN 60" VERTICAL PIECES TO 24".



FILLER ASSEMBLY

FOR MINUS ONE PALLET UNIT. FOR MINUS TWO PALLET UNITS, REDUCE ONE ROW OF UNITS AND INCREASE THE STRUTS TO SUITABLE LENGTH.

