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DATE

# LOADING AND BRACING<sup>•</sup> IN MILVAN CONTAINERS<sup>⊕</sup> OF BLU-109/B (2,000 POUND) BOMBS IN CNU-417/E CONTAINERS

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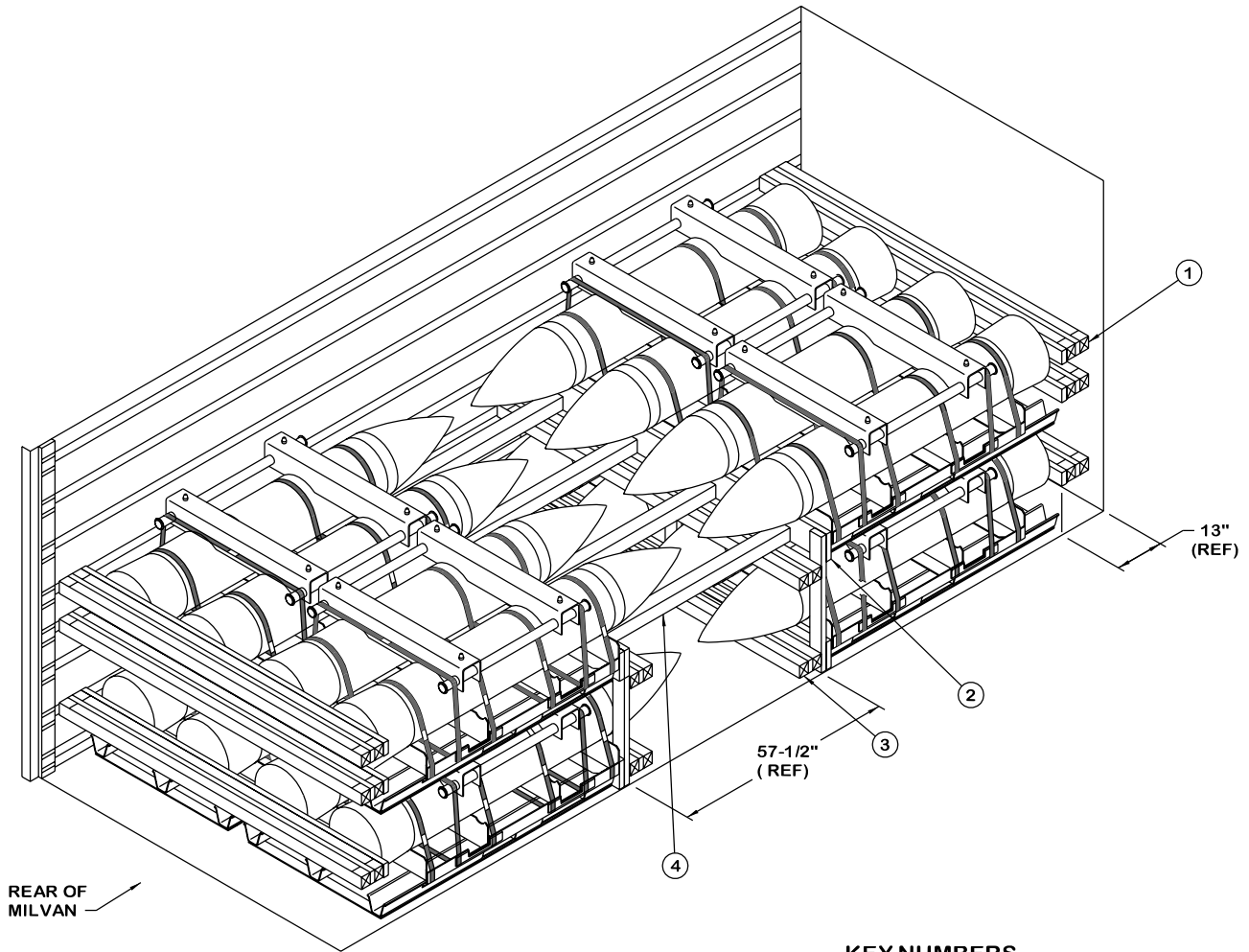
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• **LOADING AND BRACING SPECIFICATIONS SET FORTH WITHIN THIS DRAWING ARE APPLICABLE TO LOADS THAT ARE TO BE SHIPPED BY TRAILER/CONTAINER-ON-FLATCAR (T/COFC) RAIL CARRIER SERVICE. THESE SPECIFICATIONS MAY ALSO BE USED FOR LOADS THAT ARE TO BE MOVED BY MOTOR OR WATER CARRIERS.**

⊕ **ONLY TYPE II OR TYPE IV MILVAN CONTAINERS WHICH HAVE BEEN MODIFIED TO INCLUDE A MECHANICAL LOAD-BRACING SYSTEM THAT MEETS THE REQUIREMENTS OF MIL-C-52661 WILL BE USED FOR THE MOVEMENT OF AMMUNITION BY T/COFC SERVICE.**

## U.S. ARMY MATERIEL COMMAND DRAWING

APPROVED, U.S. ARMY JOINT MUNITIONS COMMAND		<b>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.</b>							
<i>Patrick Dougherty</i>		DO NOT SCALE			JUNE 2007				
		ENGINEER OR TECHNICIAN	BASIC REV.	PATRICK DOUGHERTY					
APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND		TRANSPORTATION ENGINEERING DIVISION	<i>Aurora C. Zeff</i>						
<i>Charles P. Stross</i>		VALIDATION ENGINEERING DIVISION	<i>Therese B. H.</i> TESTED			CLASS	DIVISION	DRAWING	FILE
		ENGINEERING DIRECTORATE	<i>Therese B. H.</i>			19	48	8611	SP15PB5
U.S. ARMY DEFENSE AMMUNITION CENTER		PROJECT <u>SP 309-95</u>							



**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① CROSS MEMBER (DOUBLED, WITH EXTERNAL FILL PIECE) (6 REQD). POSITION AS SHOWN IN THE DETAIL ABOVE, AT THE 16", 38", AND 48" HEIGHTS AT THE FRONT AND REAR OF THE LOAD. SEE THE "FILL DETAIL" ON PAGE 4 AND GENERAL NOTE "N" ON PAGE 3.
- ② CENTER GATE (2 REQD). SEE THE DETAIL ON PAGE.
- ③ CROSS MEMBER (DOUBLED) (4 REQD). POSITION AS SHOWN IN THE DETAIL ABOVE, AT THE 5", AND 28" HEIGHTS AT THE CENTER OF THE LOAD. SEE THE "FILL DETAIL" ON PAGE 4.
- ④ STRUT, 4' X 4" X 60-1/2" (4 REQD). POSITION STRUTS ON TOP OF CROSSBEAMS AND TOENAIL TO CENTER GATES W/2-12d NAILS AT EACH END.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	94	62
2" X 8"	31	41
4" X 4"	21	27
NAILS	NO. REQD	POUNDS
10d (3")	54	1
12d (3-1/4")	16	1/4
WIRE, .0800" DIA	45' REQD	0.75 LBS
CROSS MEMBER		20 REQD

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
CNU-417	8	34,760 LBS
DUNNAGE		262 LBS
CONTAINER		5,700 LBS
TOTAL WEIGHT		40,722 LBS (APPROX)

**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. SPECIAL T/COFC NOTES:**

1. CAUTION: LOADED CONTAINERS MUST BE ON CHASSIS EQUIPPED WITH TWO BOGIE ASSEMBLIES WHEN BEING MOVED IN TOFC SERVICE, REGARDLESS OF THE LOAD WEIGHT WITHIN THE CONTAINER.
2. LOAD LIMITS OF T/COFC RAIL CARS 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.
3. CHASSIS/CONTAINERS COUPLED INTO A 40-FOOT TRAILER CONFIGURATION MUST BE PLACED AT THE B-END OF A TOFC RAILCAR. THE REAR END OF THE 40-FOOT UNIT WILL OVERHANG THE END OF THE CAR IF IT IS PLACED AT THE A-END. TWENTY-FOOT AND 40-FOOT UNITS CAN BE LOADED ON THE SAME CAR.

M. 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.

N. METAL-TO-METAL CONTACT WITH THE NOSE OR BASE OF THE BOMBS WILL BE AVOIDED. POSITION THE CROSSMEMBERS SO THAT THE EXTERNAL WOOD FILL MATERIAL IS IN CONTACT WITH THE BASE OF THE BOMB.

O. ANTI-CHAFING MATERIAL MAY BE INSTALLED AT POINTS OF CONTACT BETWEEN THE CNU-417 CONTAINERS AND MILVAN, OR BETWEEN CNU-417 CONTAINERS, IF DESIRED, TO PREVENT CHAFING DAMAGE TO CONTAINER PAINT AND MARKINGS.

P. 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 5.

1. IF A LOAD IS REDUCED BY ONLY A SMALL AMOUNT (ONE, TWO OR THREE LADING UNITS), LADING UNITS NORMALLY MAY BE ELIMINATED FROM THE TOP OF THE LOAD.
2. IF A LOAD IS REDUCED BY A LARGE AMOUNT (MORE THAN THREE 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.

**Q. RECOMMENDED SEQUENTIAL LOADING PROCEDURES:**

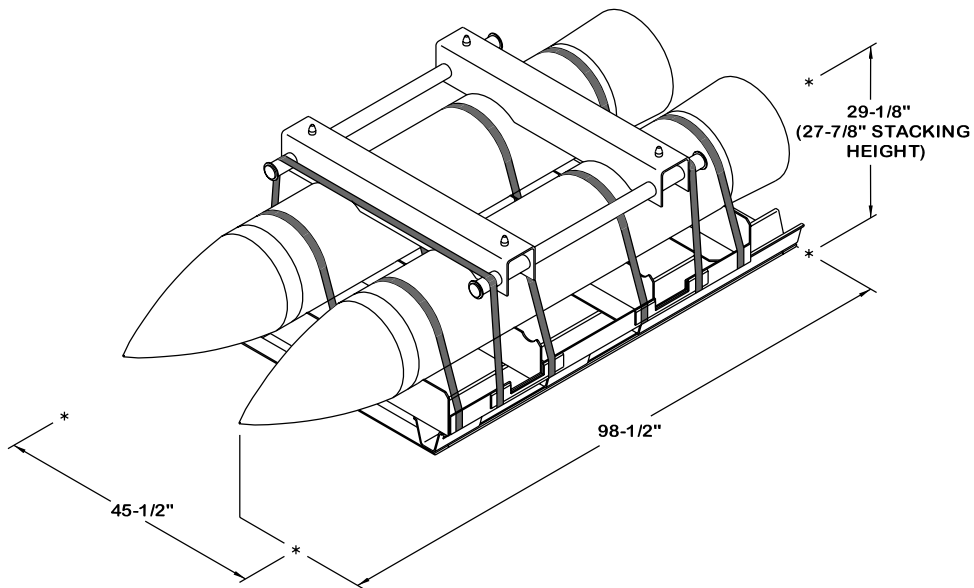
1. PREFABRICATE THE CENTER GATES.
2. INSTALL DOUBLED CROSSMEMBERS AT THE 16", 38", AND 48" HEIGHTS WITH EXTERNAL FILL MATERIAL TOWARDS THE REAR OF MILVAN.
3. LOAD FOUR CNU-417/E CONTAINERS.
4. INSTALL A CENTER GATE AGAINST THE FOUR CNU-417/E CONTAINERS.
5. INSTALL DOUBLED CROSSMEMBERS AT THE 5" AND 28" HEIGHTS. POSITION THE CROSSMEMBERS TIGHT AGAINST THE CENTER GATE.
6. INSTALL DOUBLED CROSSMEMBERS AT THE 5" AND 28" HEIGHTS.
7. INSTALL A CENTER GATE AGAINST THE CROSSMEMBERS.
8. INSTALL THE STRUTS.
9. LOAD FOUR CNU-417/E CONTAINERS.
10. INSTALL DOUBLED CROSSMEMBERS AT THE 16", 38", AND 48" HEIGHTS WITH EXTERNAL FILL MATERIAL TOWARDS BOMB BODIES.

- 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 BLU-109/B (2,000 POUND) BOMBS ON CNU-417/E CONTAINER. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CONTAINER WITH THE BOMBS. SEE PAGE 4 AND U.S. AIR FORCE DRAWING 8463212 FOR DETAILS OF THE CONTAINER. CAUTION: REGARDLESS OF THE QUANTITY OF UNITS TO BE SHIPPED, THE "MAXIMUM GROSS WEIGHT" OF THE MILVAN MUST NOT BE EXCEEDED.
- C. THE LOADS AS SHOWN ARE BASED ON A 20' LONG BY 8' WIDE BY 8' HIGH MILVAN CONTAINER WITH INSIDE DIMENSIONS OF 19'-4" LONG BY 92" WIDE BY 87" HIGH. THE LOADS ARE DESIGNED FOR TRAILER/CONTAINER-ON-FLATCAR (T/COFC) SHIPMENT.
- D. THE SPECIFIED OUTLOADING PROCEDURES ARE FOR CONTAINERS EQUIPPED WITH SELF-CONTAINED MECHANICAL BRACING DEVICES AS DESCRIBED IN MIL-C-52661. CROSS MEMBER ATTACHMENT FACILITIES WITHIN THESE CONTAINERS MUST PROVIDE FOR THE INSTALLATION OF LOAD BLOCKING CROSS MEMBERS AT THE HEIGHTS SPECIFIED. VOIDS LENGTHWISE WITHIN THE LOAD MUST BE HELD TO A MINIMUM. CROSS MEMBERS MUST BE PLACED AGAINST THE LADING AS TIGHTLY AS THE HOLE SPACING IN THE CROSS MEMBER ATTACHMENT FACILITY PERMITS. SEE THE "FILL DETAIL" ON PAGE 4 FOR ADDITIONAL GUIDANCE. EACH CROSS MEMBER WILL BE INSTALLED WITH THE ENDS ATTACHED AS NEARLY AS POSSIBLE IN "MATED" POSITIONS (AT EQUAL HEIGHTS, AND AT EQUAL DISTANCES FROM THE END OF THE CONTAINER). CROSS MEMBERS IN EMPTY CONTAINERS AND THOSE NOT USED IN LOADED CONTAINERS MUST BE FASTENED INTO BELT RAILS FOR SHIPMENT. COMPONENTS ASSIGNED TO EACH CONTAINER MUST REMAIN THEREWITH EVEN THOUGH UNUSED DURING SOME SHIPMENTS. THE LOAD BLOCKING COMPONENT DESIGNATED AS "CROSS MEMBER" HEREIN IS IDENTIFIED AS "BEAM ASSEMBLY" WITHIN TM 55-8115-200-23&P, DATED DECEMBER 1979. THE BEAM ASSEMBLY IS FURTHER IDENTIFIED AS NSN 8115-00-165-6623.
- E. DUNNAGE LUMBER SPECIFIED IS OF A 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. CAUTION: DO NOT NAIL DUNNAGE MATERIAL TO THE MILVAN WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.
- G. 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.
- H. PORTIONS OF THE MILVAN DEPICTED WITHIN THIS DRAWING, SUCH AS ONE OF THE SIDEWALLS, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.
- 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.

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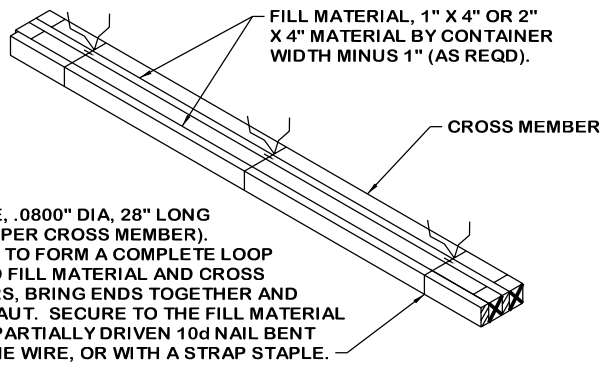
**MATERIAL SPECIFICATIONS**

- LUMBER - - - - - : SEE TM 743-200-1 (DUNNAGE LUMBER) AND VOLUNTARY PRODUCT STANDARD PS 20.
- NAILS - - - - - : ASTM F1667; COMMON STEEL NAIL (NLCMS OR NLCMMS).
- WIRE, CARBON STEEL - - : ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, .0800" DIA, GRADE 1006 OR BETTER.
- ANTI-CHAFING MATERIAL - - - - - : MIL-PRF-121 (OR EQUAL); NEUTRAL BARRIER MATERIAL.

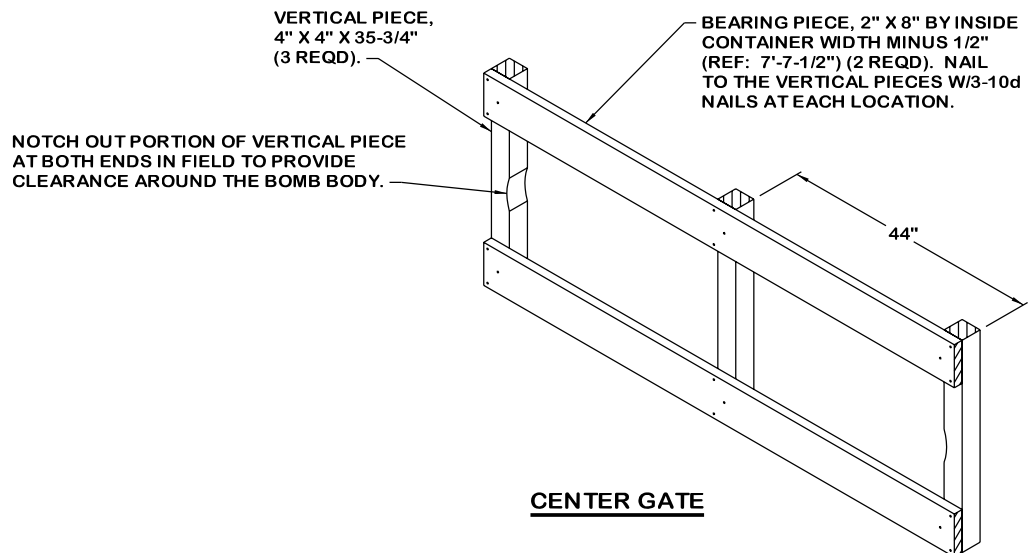


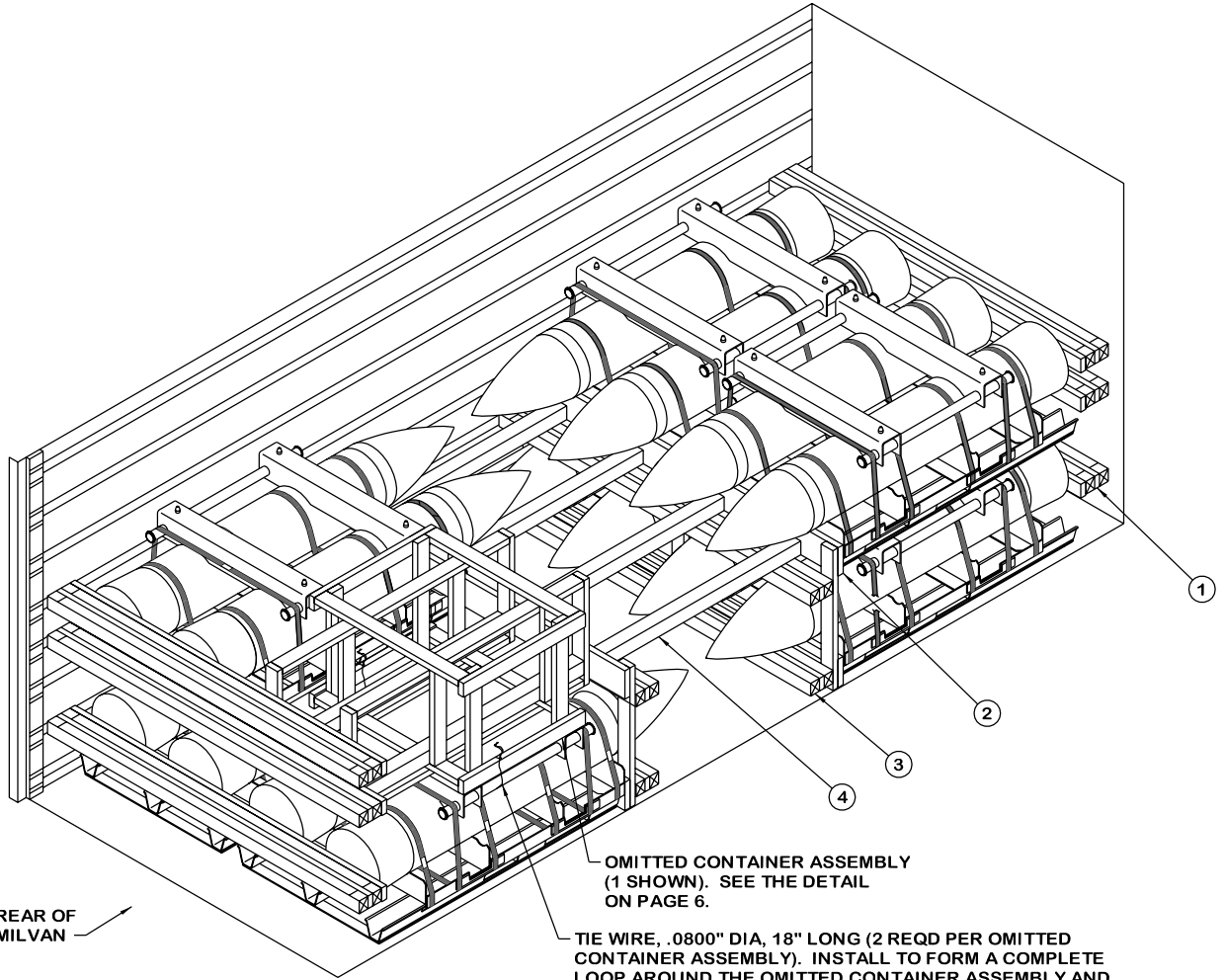
**PALLET UNIT**

GROSS WEIGHT -- 4,345 LBS (APPROX)  
 CUBE - - - - - 74.8 CU FT (APPROX)



**FILL DETAIL**

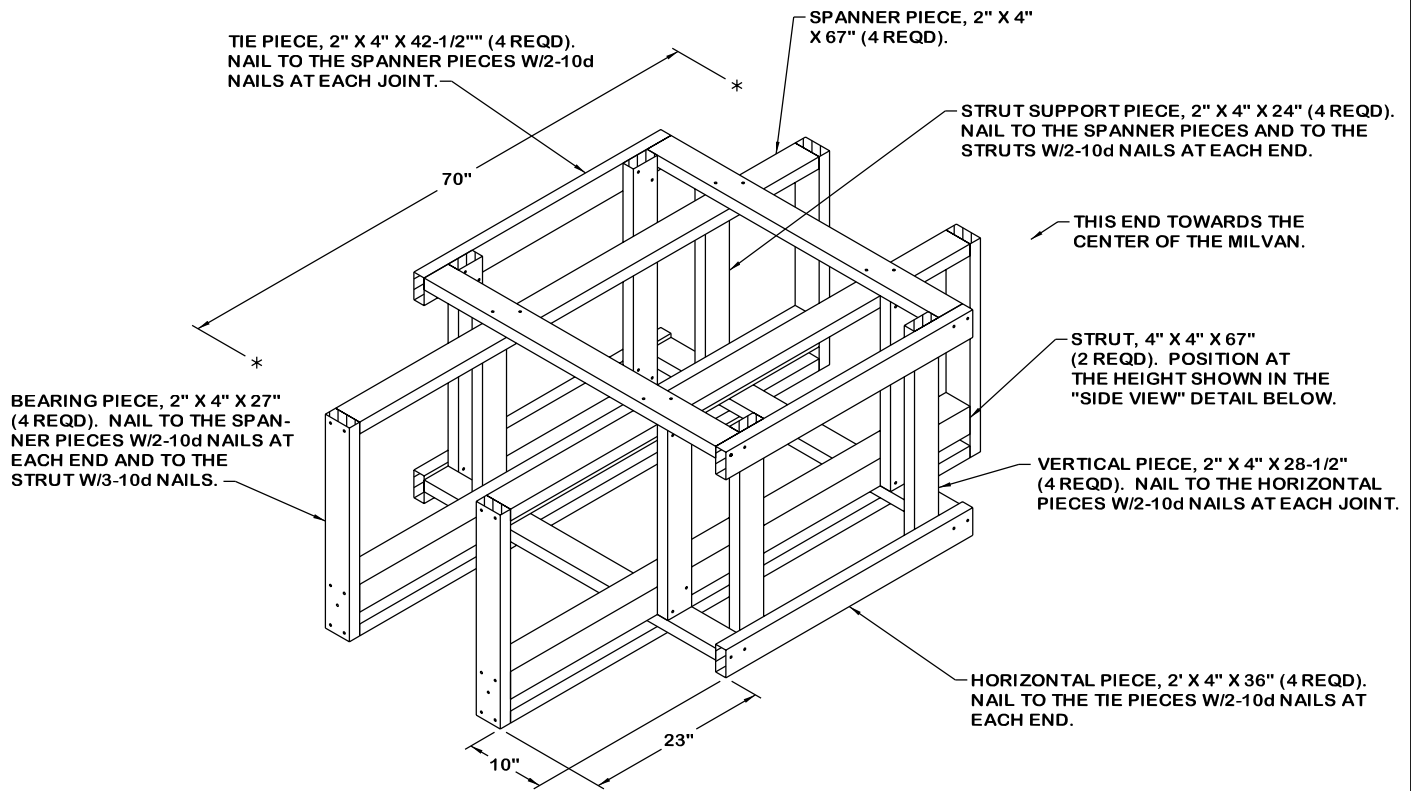




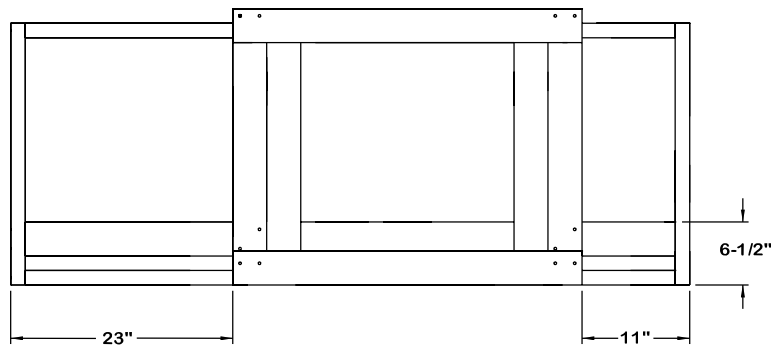
**ISOMETRIC VIEW**

**LESS-THAN-FULL-LOAD PROCEDURE**

KEY NUMBERS REFER TO KEY NUMBERS ON PAGE 2.



**OMITTED CONTAINER ASSEMBLY**



**SIDE VIEW**