

APPROVED BY  
BUREAU OF EXPLOSIVES

*D. m. HEALY*

DATE 3-19-97

# JAVELIN

## LOADING AND BRACING<sup>⊕</sup> IN MILVAN CONTAINERS<sup>⊕</sup> OF GUIDED MISSILES PACKED ONE PER CYLINDRICAL METAL CONTAINER

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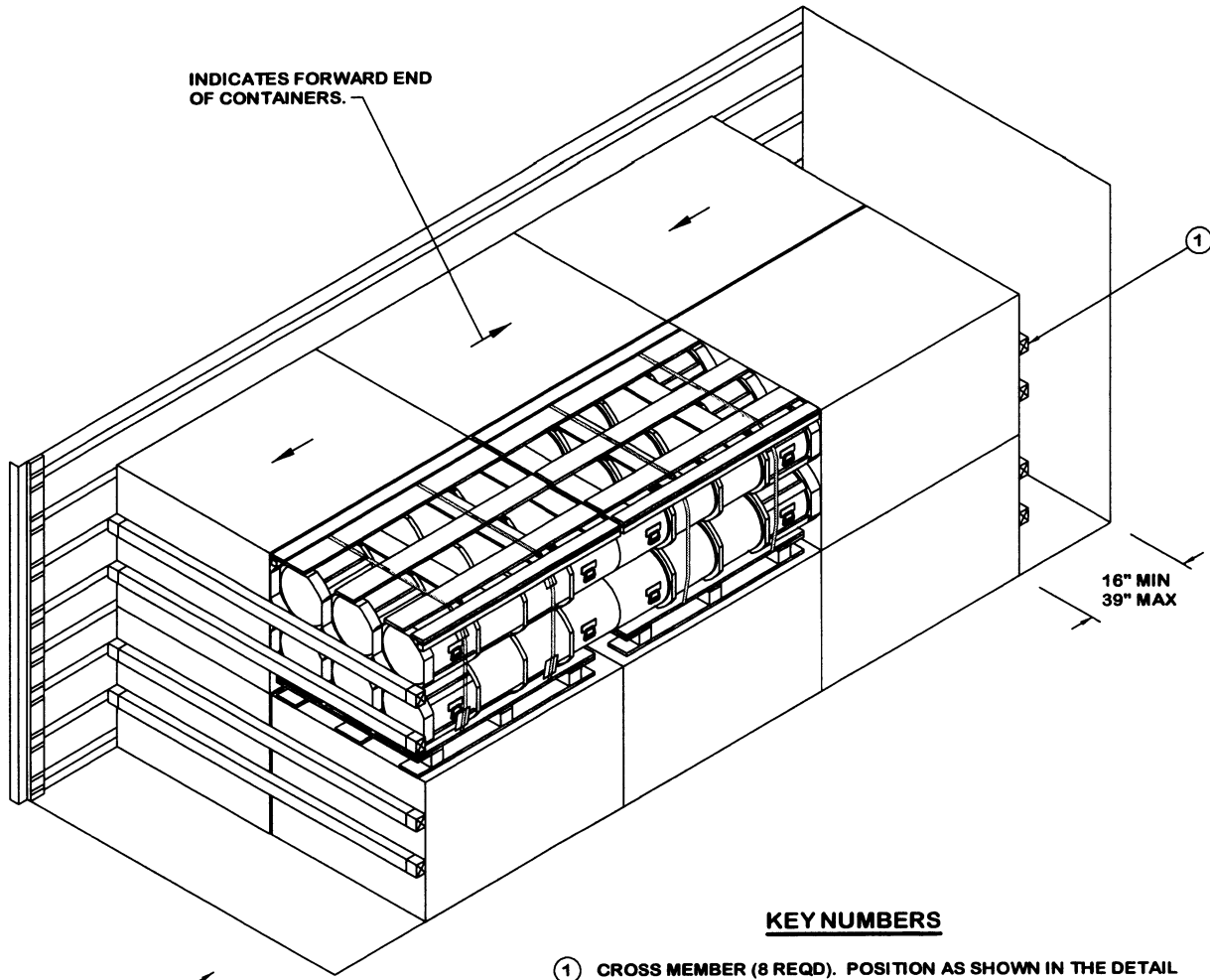
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⊕ **LOADING AND BRACING SPECIFICATIONS SET FORTH WITHIN THIS DRAWING ARE APPLICABLE TO LOADS THAT ARE TO BE SHIPPED BY TRAILER/CONTAINER-ON-FLATCAR (T/COFC) RAIL CARRIER SERVICE. THESE SPECIFICATIONS MAY ALSO BE USED FOR LOADS THAT ARE TO BE MOVED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

⊕ **ONLY MILVAN CONTAINERS WHICH HAVE BEEN MODIFIED TO INCLUDE A MECHANICAL LOAD-BRACING SYSTEM THAT SATISFIES THE REQUIREMENTS OF THE BUREAU OF EXPLOSIVES PAMPHLET 6C WILL BE USED FOR THE MOVEMENT OF AMMUNITION BY T/COFC SERVICE. CAUTION: OTHER REQUIREMENTS OF PAMPHLET 6C ALSO APPLY.**

### U.S. ARMY MATERIEL COMMAND DRAWING

APPROVED, U.S. ARMY AVIATION AND MISSILE COMMAND  <i>John E. Wheeler</i>	ENGINEER	BASIC	Laura Fieffer	DO NOT SCALE			
		REV.		WEBSITE: <a href="http://www.dac.army.mil">HTTP://WWW.DAC.ARMY.MIL</a>			
	TECHNICIAN	BASIC		APRIL 1997			
		REV.					
	DRAFTSMAN	BASIC					
		REV.					
APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND  <i>William J Ernst</i>  DEFENSE AMMUNITION CENTER	TRANSPORTATION ENGINEERING DIVISION		<i>William Ernst</i>				
	VALIDATION ENGINEERING DIVISION		<i>William Ernst</i> TESTED	CLASS	DIVISION	DRAWING	FILE
	LOGISTICS ENGINEERING OFFICE		<i>William Ernst</i>	19	48	5987	GM15JV1



**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① CROSS MEMBER (8 REQD). POSITION AS SHOWN IN THE DETAIL ABOVE, AT THE 16", 28", 48" AND 60" HEIGHTS. SEE THE "FILL DETAIL" ON PAGE 5.

**LOAD AS SHOWN**

<u>ITEM</u>	<u>QUANTITY</u>	<u>WEIGHT (APPROX)</u>
PALLET UNIT .....	12 .....	6,588 LBS
DUNNAGE .....	.....	0 LBS
CONTAINER .....	.....	5,700 LBS
<b>TOTAL WEIGHT .....</b>		<b>12,288 LBS (APPROX)</b>

<b>BILL OF MATERIAL</b>	
CROSS MEMBER .....	8 REQD

(GENERAL NOTES CONTINUED)

- H. 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.
- J. 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.
- K. 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 25.4 MM AND ONE POUND EQUALS 0.454 KG.
- L. TO MAKE LOADING EASIER, TO HELP ACHIEVE A TIGHT LOAD ACROSS A CONTAINER, AND TO PREVENT UNACCEPTABLE DAMAGE TO LADING UNITS WHEN LOADING A MILVAN, A SLIP-SHEET CAN BE USED EFFECTIVELY AS A "SHOE HORN" TYPE DEVICE. THE SLIP-SHEET WILL PROVIDE A SMOOTH SURFACE THAT WILL PREVENT UNIT STRAPS AND/OR CONTAINERS FROM INTERLOCKING OR CATCHING ON OTHER PROJECTIONS WHEN LATERALLY ADJACENT LADING UNITS ARE BEING LOADED. A SLIP-SHEET WILL BE USED AFTER ONE-HALF OF A STACK IS LOADED WITH ONE OF ITS SIDES IN TIGHT CONTACT AT ONE SIDE OF THE MILVAN. THE SLIP-SHEET IS TO BE PLACED AGAINST THE OTHER SIDE OF THE HALF-STACK BEFORE THE LAST HALF OF THE STACK IS LOADED. AFTER A STACK IS COMPLETED, THE SLIP-SHEET IS TO BE REMOVED FOR SUBSEQUENT USE WITH THE NEXT STACK. A SLIP-SHEET OF SUITABLE SIZE CAN BE MADE FROM A SHEET OF 1/8" TEMPERED HARDBOARD (MASONITE) OR FROM A SHEET OF ANY OTHER MATERIAL THAT WILL SATISFY THE REQUIREMENTS.
- M. 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.
- N. 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 RAIL CAR. 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.
- O. 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 BY LAMINATING ADDITIONAL PIECES OF APPROPRIATE THICKNESS TO THE LONGITUDINAL PIECES ON THE CRIB FILL ASSEMBLIES, OR BY INSERTING PLYWOOD OR HARDBOARD FILLER BETWEEN PALLET UNITS. NAIL EACH ADDITIONAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE LENGTH OF THE LATERAL PIECES IN THE CRIB FILL ASSEMBLIES MAY BE ADJUSTED, AS NECESSARY, TO FACILITATE VARIANCE IN THE PALLET UNIT SIZE.
- P. 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.
- Q. THE QUANTITY OF CONTAINERS SHOWN IN THE LOADS ON PAGES 2 AND 4 MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SEE THE "LESS-THAN-FULL LOAD" DETAILS ON PAGE 8.

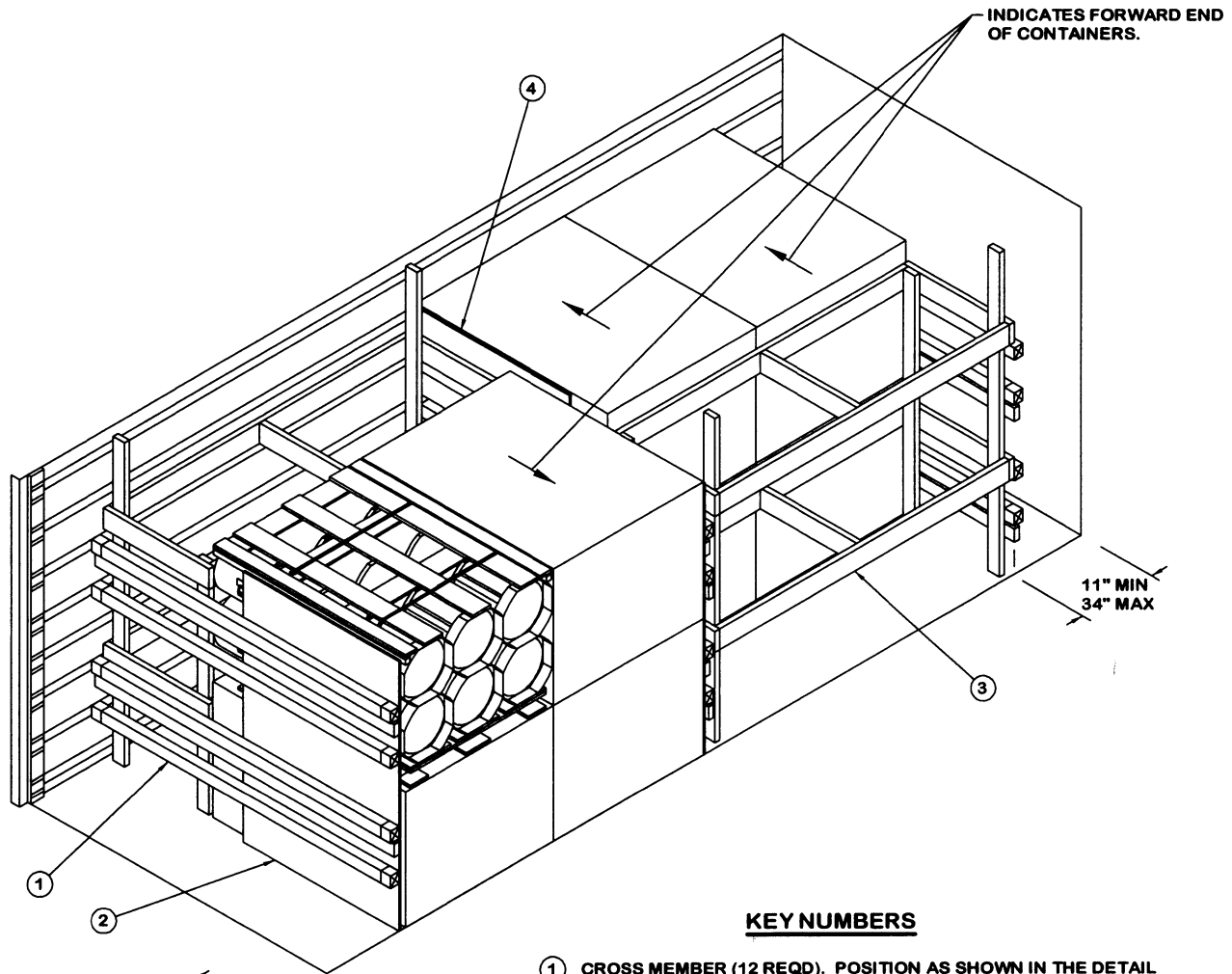
GENERAL NOTES

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE OUTLOADING PROCEDURES SPECIFIED HEREIN ARE APPLICABLE TO LOADS OF JAVELIN MISSILES PACKED ONE PER CYLINDRICAL METAL CONTAINER. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CONTAINER WITH MISSILE COMPONENTS. CAUTION: REGARDLESS OF THE QUANTITY OF UNITS TO BE SHIPPED, THE "MAXIMUM GROSS WEIGHT" OF THE MILVAN MUST NOT BE EXCEEDED.
- C. FOR DETAIL OF THE PALLET UNIT, SEE U.S. ARMY MATERIEL COMMAND DRAWING NO. 19-48-5266-GM20JV1 AND PAGE 5.  
  
PALLET DIMENSIONS ---- 45-3/4" LONG X 59-1/4" WIDE  
X 36-1/4" HIGH (APPROX)  
GROSS WEIGHT ----- 549 POUNDS (APPROX)  
CUBE ----- 56.9 CUBIC FEET (APPROX)
- D. 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.
- E. THE SPECIFIED OUTLOADING PROCEDURES ARE FOR CONTAINERS EQUIPPED WITH SELF-CONTAINED MECHANICAL BRACING DEVICES AS DESCRIBED WITHIN BUREAU OF EXPLOSIVES PAMPHLET 6C. CROSS MEMBER ATTACHMENT FACILITIES WITHIN THESE CONTAINERS MUST PROVIDE FOR THE INSTALLATION OF LOAD BLOCKING CROSS MEMBERS AT THE HEIGHTS SPECIFIED. THE WEIGHT DIMENSIONS SPECIFIED WITHIN THIS DRAWING FOR THE INSTALLATION OF CROSS MEMBERS CONFORM WITH THE BUREAU OF EXPLOSIVES PAMPHLET 6C, WITH THE EXCEPTION THAT TWO ADDITIONAL BELT RAILS HAVE BEEN SHOWN: ONE AT 72" AND ONE AT 83" HIGH FROM THE CONTAINER FLOOR. 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. EACH CROSS MEMBER WILL BE INSTALLED WITH THE ENDS ATTACHED AS NEARLY AS POSSIBLE IN "MATED" POSITIONS (AT EQUAL HEIGHT 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. SEE THE "FILL DETAIL" ON PAGE 5 FOR THE DUNNAGING METHOD REQUIRED TO ELIMINATE AN EXCESSIVE LENGTHWISE VOID WITHIN A LOAD. 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.
- F. 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.
- G. **CAUTION:** DO NOT NAIL DUNNAGE MATERIAL TO THE MILVAN WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.

(CONTINUED AT LEFT)

MATERIAL SPECIFICATIONS

- LUMBER: SEE TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC MM-L-751.
- NAILS: FED SPEC FF-N-105; COMMON.
- PLYWOOD: COMMERCIAL ITEM DESCRIPTION A-A-55057, INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D. IF SPECIFIED BETTER INTERIOR OR AN EXTERIOR GRADE MAY BE SUBSTITUTED.
- WIRE, CARBON STEEL: ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, .0800" DIA, GRADE 1006 OR BETTER.



REAR OF CONTAINER.

**ISOMETRIC VIEW**

**KEY NUMBERS**

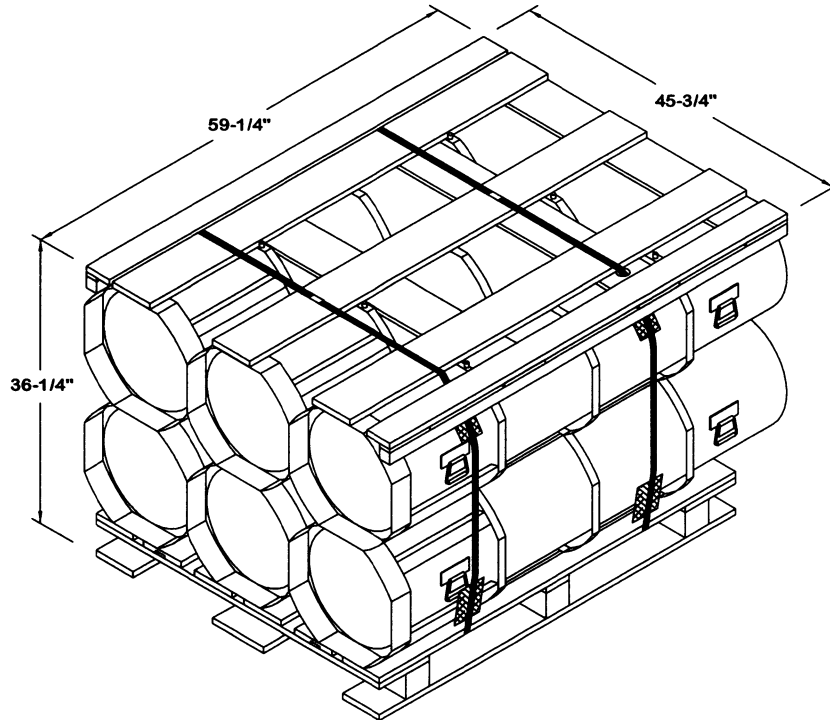
- ① CROSS MEMBER (12 REQD). POSITION AS SHOWN IN THE DETAIL ABOVE, AT THE 16", 28", 48" AND 60" HEIGHTS. SEE THE "FILL DETAIL" ON PAGE 5.
- ② RIGHT HAND GATE (2 REQD). SEE THE DETAIL ON PAGE 7.
- ③ CRIB FILL ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 6.
- ④ LEFT HAND GATE (2 REQD). SEE THE DETAIL ON PAGE 7.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	112	75
2" X 6"	92	92
NAILS	NO. REQD	POUNDS
6d (2")	48	1/2
10d (3")	120	2
PLYWOOD, 1/2" ----- 96.00 SQ FT REQD -----		132.00 LBS
CROSS MEMBER -----		12 REQD

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT -----	8 -----	4,392 LBS
DUNNAGE -----		469 LBS
CONTAINER -----		5,700 LBS

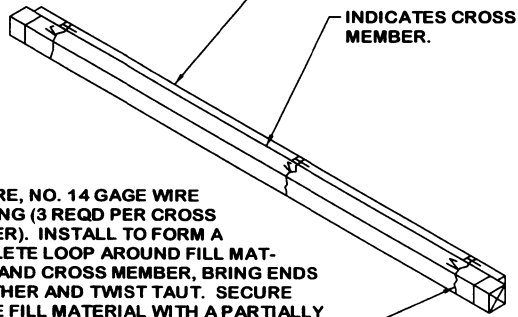
TOTAL WEIGHT ----- 10,561 LBS (APPROX)



**PALLET UNIT DETAIL**

GROSS WEIGHT ----- 549 LBS (APPROX)  
 CUBE ----- 56.9 CUBIC FEET (APPROX)

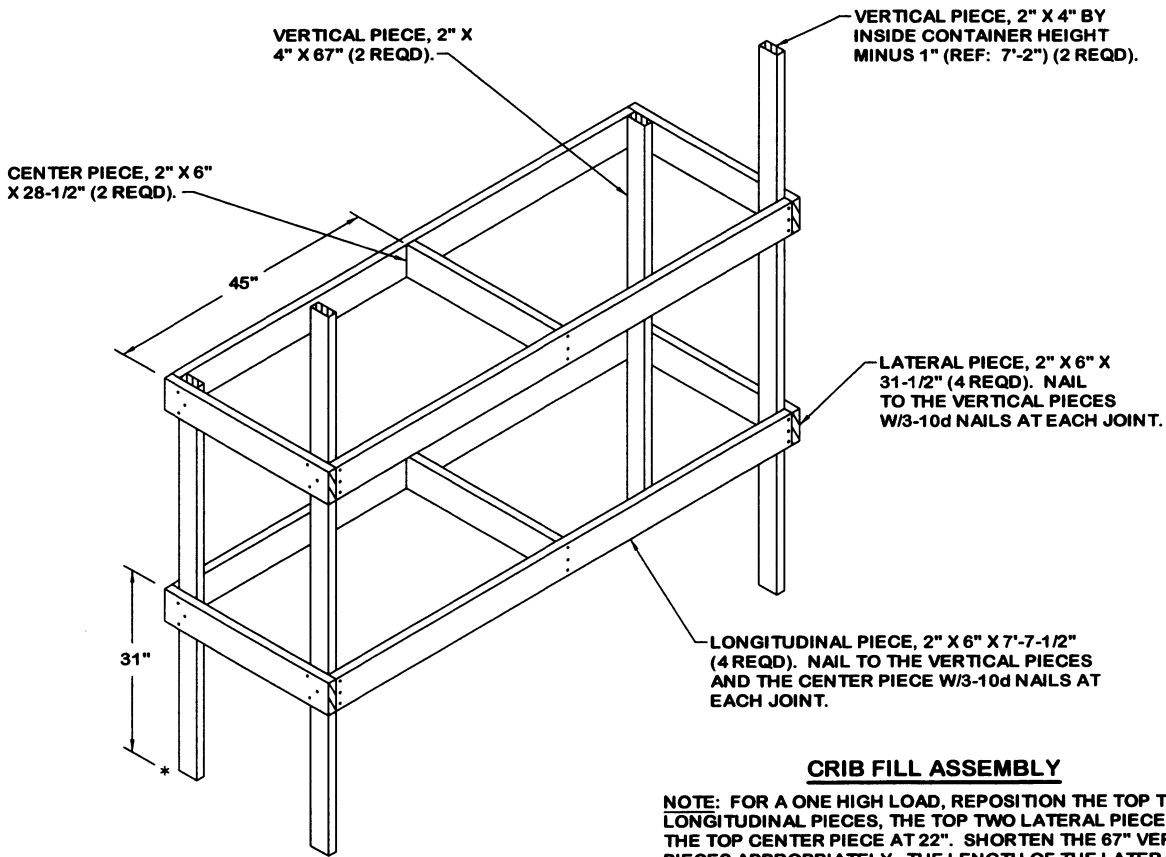
FILL MATERIAL, 1" X 4" OR 2" X 4" MATERIAL BY CONTAINER WIDTH MINUS 1" (AS REQD).



INDICATES CROSS MEMBER.

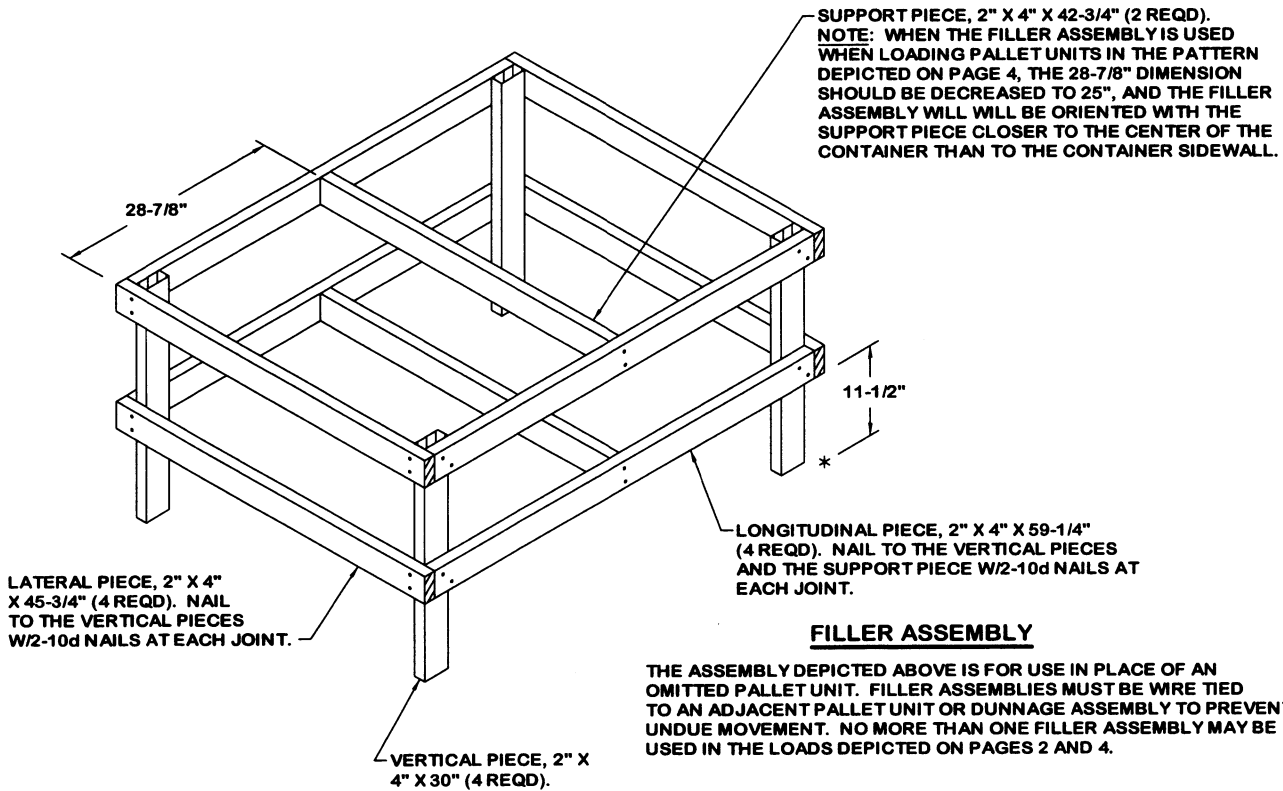
TIE WIRE, NO. 14 GAGE WIRE 18" LONG (3 REQD PER CROSS MEMBER). INSTALL TO FORM A COMPLETE LOOP AROUND FILL MATERIAL AND CROSS MEMBER, BRING ENDS TOGETHER AND TWIST TAUT. SECURE TO THE FILL MATERIAL WITH A PARTIALLY DRIVEN 10d NAIL BENT OVER THE WIRE, OR WITH A STRAP STAPLE.

**FILL DETAIL**



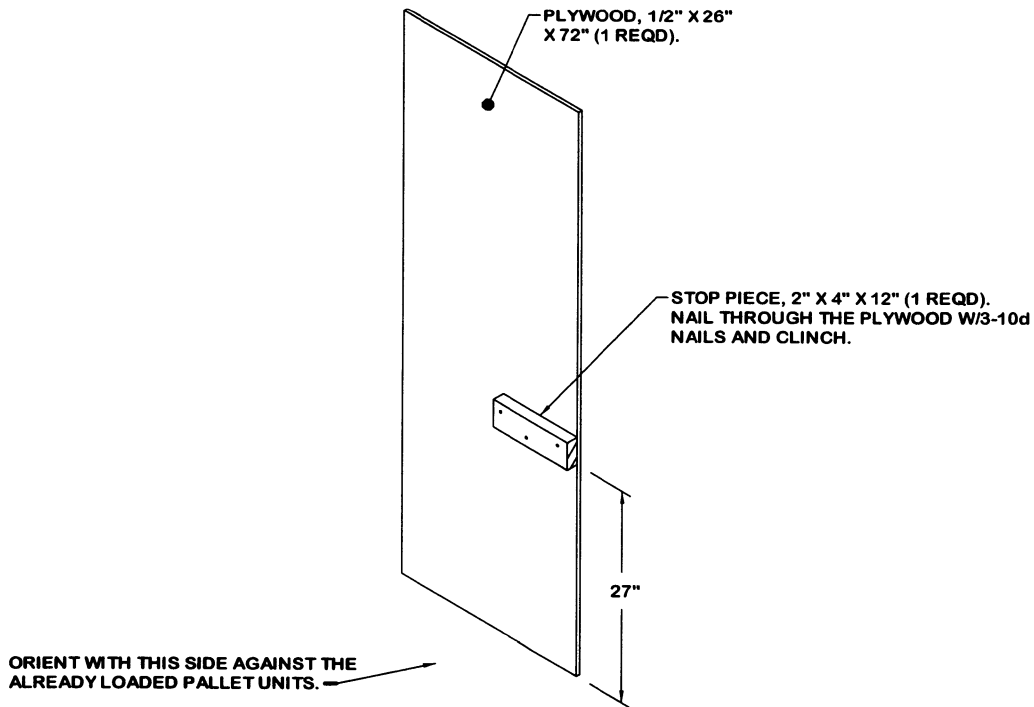
**CRIB FILL ASSEMBLY**

**NOTE: FOR A ONE HIGH LOAD, REPOSITION THE TOP TWO LONGITUDINAL PIECES, THE TOP TWO LATERAL PIECES, AND THE TOP CENTER PIECE AT 22". SHORTEN THE 67" VERTICAL PIECES APPROPRIATELY. THE LENGTH OF THE LATERAL PIECES IS DEPENDENT ON THE VOID BETWEEN THE PALLET UNIT AND THE CONTAINER SIDEWALL. THE LENGTH OF THE LONGITUDINAL PIECES MUST BE FIELD CHECKED TO ENSURE A TIGHT LONGITUDINAL FIT.**



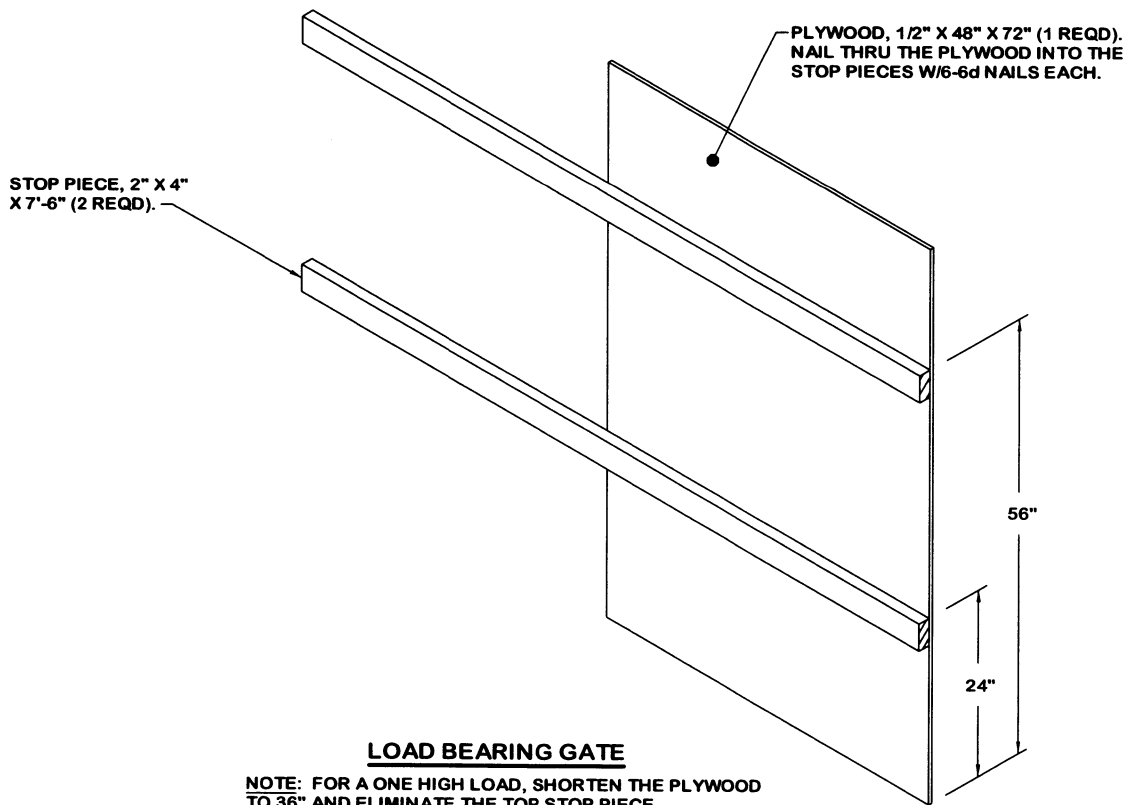
**FILLER ASSEMBLY**

**THE ASSEMBLY DEPICTED ABOVE IS FOR USE IN PLACE OF AN OMITTED PALLET UNIT. FILLER ASSEMBLIES MUST BE WIRE TIED TO AN ADJACENT PALLET UNIT OR DUNNAGE ASSEMBLY TO PREVENT UNDUE MOVEMENT. NO MORE THAN ONE FILLER ASSEMBLY MAY BE USED IN THE LOADS DEPICTED ON PAGES 2 AND 4.**



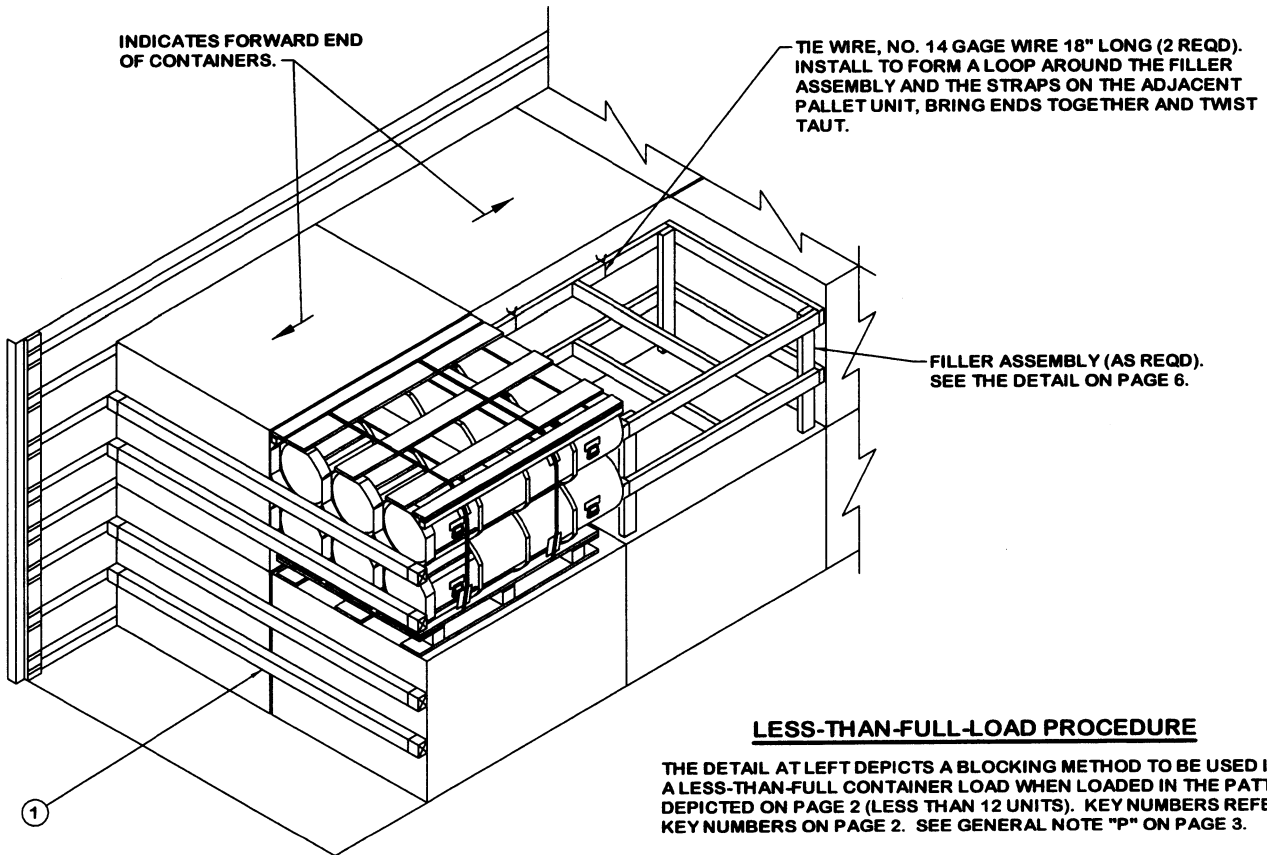
**SEPARATOR GATE**

**NOTE:** FOR A ONE HIGH LOAD, SHORTEN THE PLYWOOD TO 36".



**LOAD BEARING GATE**

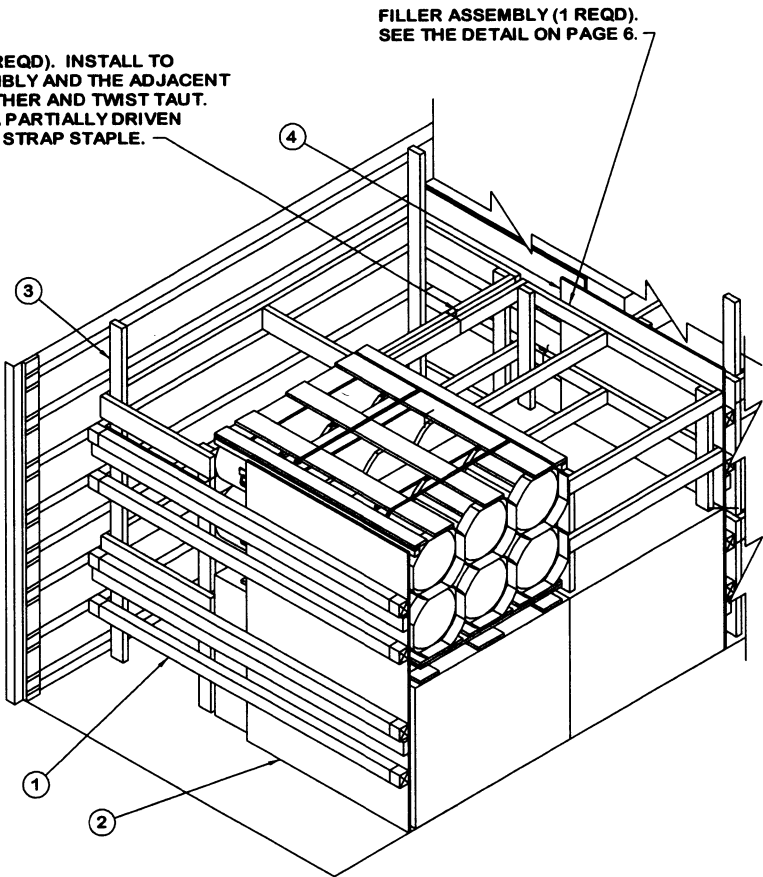
**NOTE:** FOR A ONE HIGH LOAD, SHORTEN THE PLYWOOD TO 36" AND ELIMINATE THE TOP STOP PIECE.



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

THE DETAIL AT LEFT DEPICTS A BLOCKING METHOD TO BE USED IN A LESS-THAN-FULL CONTAINER LOAD WHEN LOADED IN THE PATTERN DEPICTED ON PAGE 2 (LESS THAN 12 UNITS). KEY NUMBERS REFER TO KEY NUMBERS ON PAGE 2. SEE GENERAL NOTE "P" ON PAGE 3.

TIE WIRE, NO. 14 GAGE WIRE 18" LONG (2 REQD). INSTALL TO FORM A LOOP AROUND THE FILLER ASSEMBLY AND THE ADJACENT DUNNAGE ASSEMBLY, BRING ENDS TOGETHER AND TWIST TAUT. SECURE TO THE FILLER ASSEMBLY WITH A PARTIALLY DRIVEN 10d NAIL BENT OVER THE WIRE OR WITH A STRAP STAPLE.



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

THE DETAIL AT RIGHT DEPICTS A BLOCKING METHOD TO BE USED IN A LESS-THAN-FULL CONTAINER LOAD WHEN LOADED IN THE PATTERN DEPICTED ON PAGE 4 (LESS THAN EIGHT UNITS). KEY NUMBERS REFER TO KEY NUMBERS ON PAGE 4. SEE GENERAL NOTE "P" ON PAGE 3.