

APPROVED BY U.S. COAST GUARD (CG) <i>D.A. Rikman</i> DATE <i>16 March 1975</i>	APPROVED BY BUREAU OF EXPLOSIVES <i>A. G. Grassmuck</i> SUPERVISOR, MILITARY & INTERMODAL SERVICES DATE <i>12/5/75</i>
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# LOADING AND BRACING<sup>⊕</sup> IN MILVAN CONTAINERS<sup>⊕</sup> OF PALLETIZED UNITS OF 152MM CARTRIDGE PACKED IN THE PA64 SERIES CYLINDRICAL METAL CONTAINER (20-CONTAINER PALLET UNIT)

⊙ LOADING AND BRACING SPECIFICATIONS SET FORTH WITHIN THIS DRAWING ARE APPLICABLE TO LOADS THAT ARE TO BE SHIPPED BY TRAILER/CONTAINER-ON-FLAT-CAR (T/COFC) RAIL CARRIER SERVICE. THESE SPECIFICATIONS MAY ALSO BE USED FOR LOADS THAT ARE TO BE MOVED BY MOTOR OR WATER OR AIR CARRIERS. SEE THE "SPECIAL T/COFC NOTES" BELOW.

⊕ 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.

### MAXIMUM LOAD WEIGHT CRITERIA:

THE ITEMIZED LOAD WEIGHTS ARE CONTROLLED BY EQUIPMENT CAPABILITY FACTORS. ALSO, THESE LISTED LOAD WEIGHTS IDENTIFY THE MAXIMUM COMBINED WEIGHT OF AMMUNITION LADING UNITS AND DUNNAGE THAT CAN BE PLACED INTO ONE (1) MILVAN CONTAINER WITHOUT VIOLATING ONE OR MORE OF THE "CAPABILITY FACTORS". SEE NOTES 1 AND 2.

- 39,100 LBS IN 20-FT CONTAINERS (W/O CHASSIS) ABOARD CONTAINERSHIP.
- 39,100 LBS IN CONTAINER ON 20-FT CHASSIS WITH DOUBLE BOGIE. SEE NOTE 3.
- 25,300 LBS IN CONTAINER ON 20-FT CHASSIS WITH SINGLE BOGIE. SEE NOTE 4.
- 21,300 LBS IN EACH CONTAINER ON 40-FT CHASSIS (COUPLED WITH DOUBLE BOGIE). SEE NOTE 3.
- 19,300 LBS IN 20-FT CONTAINER (W/O CHASSIS) ABOARD FIXED-WING AIRCRAFT.
- 39,100 LBS IN 20-FT CONTAINER (W/O CHASSIS) FOR ROTARY-WING AIRCRAFT. SEE NOTE 5.

NOTE 1: DUNNAGE INCLUDES MATERIALS, OTHER THAN COMPONENTS OF THE MECHANICAL LOAD-BRACING SYSTEM, USED TO BLOCK AND BRACE A LOAD.

NOTE 2: ALTHOUGH THE HEAVIEST MAXIMUM LOAD IS DELINEATED ON PAGES 2 AND 3, PROVISIONS ARE INCLUDED WITHIN THIS DRAWING SO THAT THE BASIC LOAD CAN BE ADJUSTED TO SATISFY A LESSER QUANTITY OF LADING UNITS. ADDITIONAL INSTRUCTIONS ARE UNDER THE "REDUCED-LOAD PROVISIONS" SECTION ON PAGE 2.

NOTE 3: 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 MILVAN SYSTEM.

NOTE 4: BY SPECIAL AUTHORITY, IT MAY BE POSSIBLE TO MOVE HEAVIER LOADS ON SINGLE BOGIE CHASSIS WITHIN AN INSTALLATION.

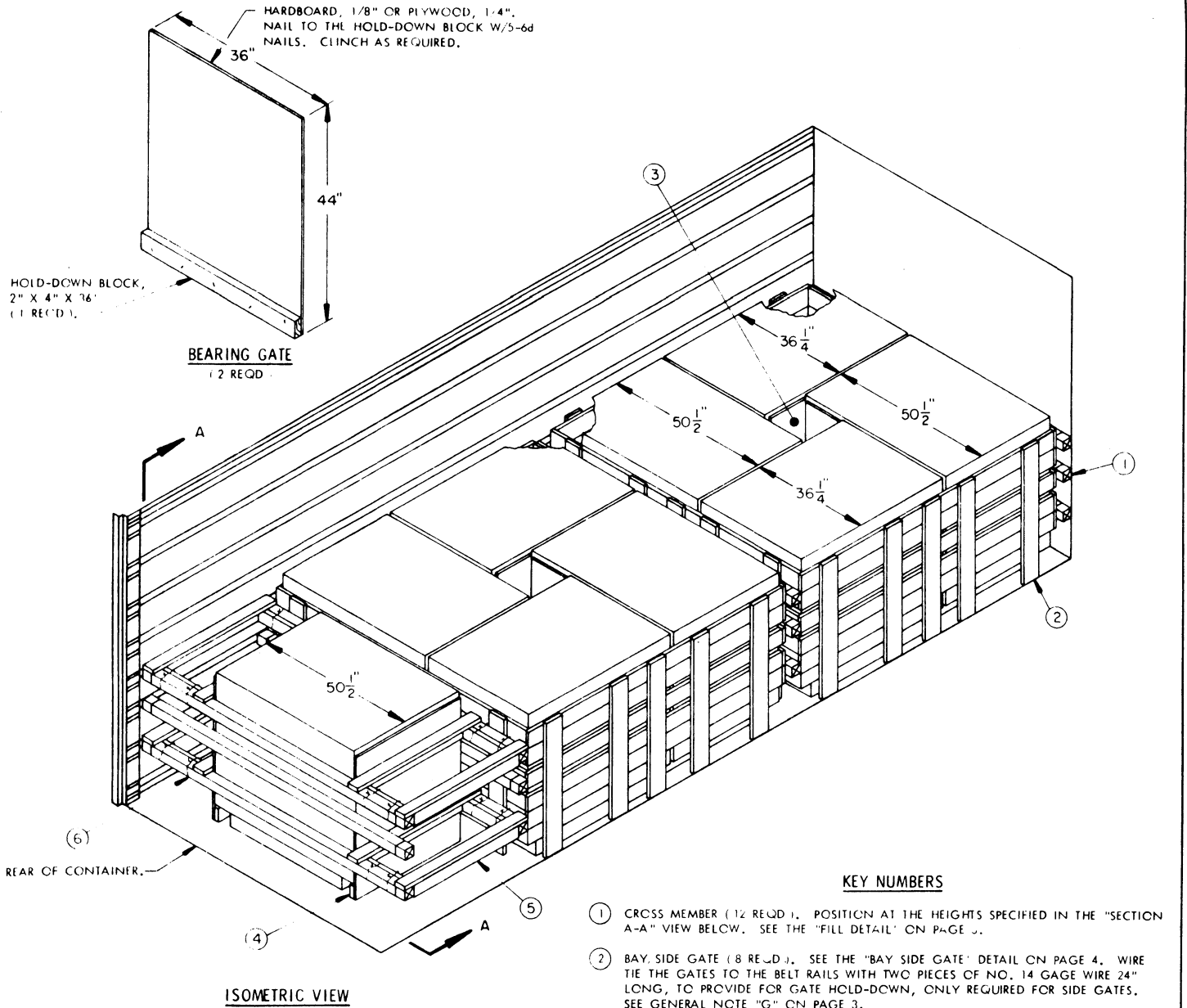
NOTE 5: IT WILL BE NECESSARY TO REDUCE WEIGHT OF SOME LOADS TO BE MOVED BY ROTARY-WING AIRCRAFT, DEPENDING ON "LIFT" CAPABILITY OF THE SCHEDULED AIRCRAFT.

**DO NOT SCALE**

### SPECIAL T/COFC NOTES:

- A. CAUTION: LOADED CONTAINERS MUST BE ON CHASSIS EQUIPPED WITH TWO BOGIE ASSEMBLIES WHEN BEING MOVED IN TOFC SERVICE, REGARDLESS OF LOAD WEIGHT WITHIN THE CONTAINER.
- B. 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.
- C. 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 OVER-HANG 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.

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			DATE NOVEMBER 1975	
			AMC AMMO CEN DWG NO	
			<b>D-SARAC-4388</b>	



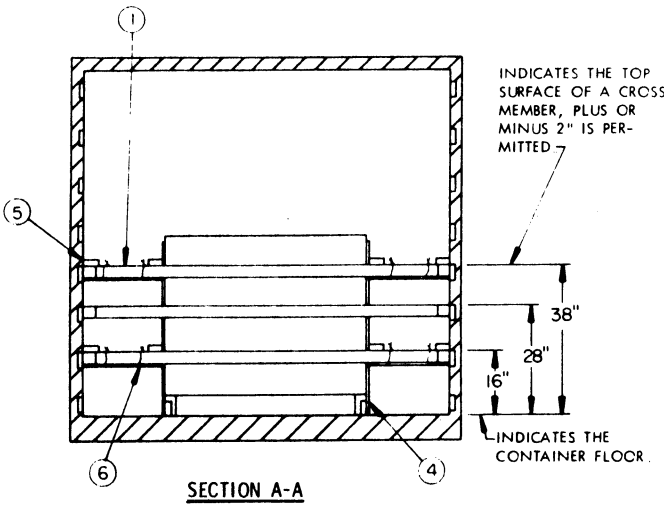
**KEY NUMBERS**

- ① CROSS MEMBER (12 REQ'D). POSITION AT THE HEIGHTS SPECIFIED IN THE "SECTION A-A" VIEW BELOW. SEE THE "FILL DETAIL" ON PAGE 5.
- ② BAY SIDE GATE (8 REQ'D). SEE THE "BAY SIDE GATE" DETAIL ON PAGE 4. WIRE TIE THE GATES TO THE BELT RAILS WITH TWO PIECES OF NO. 14 GAGE WIRE 24" LONG, TO PROVIDE FOR GATE HOLD-DOWN, ONLY REQUIRED FOR SIDE GATES. SEE GENERAL NOTE "G" ON PAGE 3.
- ③ SEPARATOR GATE (8 REQ'D). SEE THE "SEPARATOR GATE" DETAIL ON PAGE 3.
- ④ BEARING GATE (2 REQ'D). SEE THE "BEARING GATE" DETAIL ABOVE.
- ⑤ SPACER ASSEMBLY (4 REQ'D). SEE THE "SPACER ASSEMBLY" DETAIL ON PAGE 4 AND GENERAL NOTE "H" ON PAGE 3.
- ⑥ TIE WIRE, NO. 14 GAGE WIRE 18" LONG (16 REQ'D). INSTALL TO FORM A COMPLETE LOOP AROUND THE SPACER ASSEMBLY AND THE CROSS MEMBER, BRING THE ENDS TOGETHER AND TWIST TIGHT. SECURE TO THE SPACER ASSEMBLY WITH A PARTIALLY DRIVEN 10d NAIL BENT OVER THE WIRE, OR WITH A STRAP STAPLE.

**REDUCED-LOAD PROVISIONS**

WHEN A CONTAINER IS TO BE LOADED WITH A REDUCED QUANTITY OF LADING UNITS, THE LENGTHWISE CENTER OF GRAVITY OF A LOAD MUST BE WITHIN 12", IN EITHER DIRECTION, OF THE MIDPOINT IN A MILVAN, AND THE FOLLOWING CRITERIA WILL APPLY:

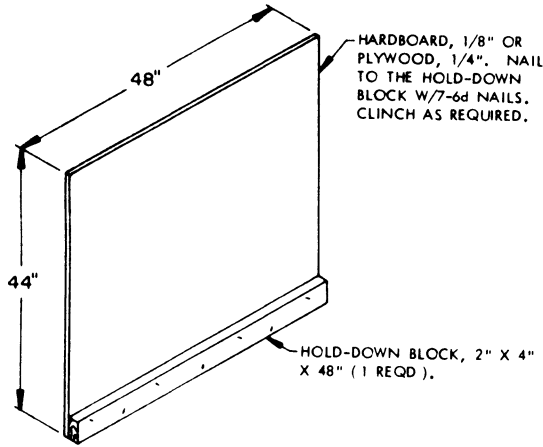
- A. IF A LOAD IS REDUCED BY ONLY A SMALL AMOUNT, LADING UNITS NORMALLY MAY BE ELIMINATED FROM THE REAR OF THE LOAD. FOR EXAMPLE IF ONLY 6 UNITS ARE TO BE LOADED, THE METHOD SPECIFIED BY THE "ALTERNATIVE LOADING PATTERN" SHOWN ON PAGE 4 MUST BE APPLIED.
- B. IF A LOAD IS REDUCED BY A LARGE AMOUNT, LADING UNITS SHOULD BE ELIMINATED FROM LOCATIONS WITHIN THE LOAD OR LADING UNITS SHOULD BE ELIMINATED AS REQUIRED AND THE TOTAL LOAD SHIFTED AS NECESSARY FORE OR AFT, 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.
- C. COMBINATIONS OF THE VARIOUS DEPICTED LOADING PATTERNS MAY BE USED TO SATISFY THE NUMBER OF UNITS TO BE SHIPPED. HOWEVER, EACH LOAD BAY WILL BE INDEPENDENTLY BLOCKED AS A SEPARATE LOAD BAY IN ACCORDANCE WITH THE DEPICTED PROCEDURES FOR THAT SPECIFIC LOADING PATTERN.



PALLET UNITS AND DUNNAGE IN FRONT OF THE REAR LOAD BAY HAVE NOT BEEN SHOWN IN THE "SECTION A-A" VIEW FOR CLARITY PURPOSES.

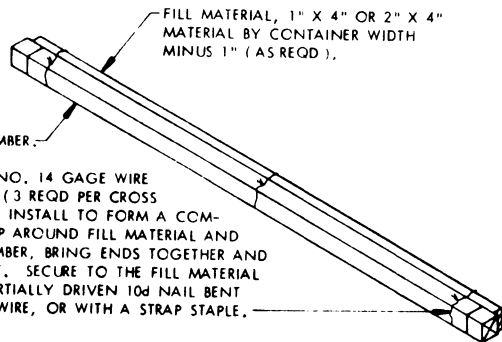
**GENERAL NOTES**

- 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 A LOAD OF 20-CONTAINER PALLET UNITS OF 152MM CARTRIDGE PACKED IN THE PA64 SERIES CYLINDRICAL METAL CONTAINER. SUBSEQUENT REFERENCE TO PALLET UNIT MEANS THE PALLETIZED UNIT WITH AMMUNITION ITEMS. SEE PAGE 4 OF THIS DRAWING AND US ARMY MATERIEL COMMAND DRAWING NO. 19-48-4136-20PM1000 FOR DETAIL OF THE PALLETIZED UNIT. CAUTION: REGARDLESS OF THE QUANTITY OF UNITS TO BE SHIPPED, THE "MAXIMUM GROSS WEIGHT" OF 44,800 POUNDS MUST NOT BE EXCEEDED.
- C. THE LOAD AS SHOWN IS 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 LOAD IS DESIGNED FOR TRAILER/CONTAINER-ON-FLAT-CAR (T/COFC) SHIPMENT.
- D. 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 HEIGHT DIMENSIONS SPECIFIED WITHIN THIS DRAWING FOR THE INSTALLATION OF CROSS MEMBERS CONFORM WITH BUREAU OF EXPLOSIVES PAMPHLET 6C, WITH THE EXCEPTION THAT TWO (2) ADDITIONAL BELT RAILS HAVE BEEN SHOWN, ONE AT 72" AND ONE AT 83" HEIGHT 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 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. SEE THE "FILL DETAIL" AT LEFT 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 55-8115-200-24, DATED SEPTEMBER 1972. THE BEAM ASSEMBLY IS FURTHER IDENTIFIED AS NSN 8115-00-165-6623 ( FSN 8115-165-6623 ).
- E. DUNNAGE LUMBER SPECIFIED IS OF A NOMINAL SIZE. FOR EXAMPLE, 1" X 6" MATERIAL IS ACTUALLY 3/4" THICK BY 5-1/2" OR 5-5/8" WIDE AND 2" X 4" MATERIAL IS ACTUALLY 1-1/2" THICK BY 3-1/2" WIDE OR 1-5/8" THICK BY 3-5/8" WIDE.
- F. CAUTION: DO NOT NAIL DUNNAGE MATERIAL TO THE CONTAINER WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.
- G. ALTHOUGH A TOTAL OF 1-1/2" ( ONE AND ONE-HALF INCH ) OF UNBLOCKED SPACE ACROSS THE WIDTH OF A LOAD BAY IS PERMITTED, LATERAL VOIDS WITHIN THE LOAD ARE TO BE HELD TO A MINIMUM. EXCESSIVE SLACK CAN BE ELIMINATED FROM A LOAD BAY BY LAMINATING ADDITIONAL BEARING PIECES OF APPROPRIATE THICKNESS TO THE BEARING PIECES OF THE SIDE GATES. NAIL EACH ADDITIONAL PIECE TO A BEARING PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12".
- H. THE SPACER ASSEMBLY AS DETAILED ON PAGE 4 NEED NOT BE FABRICATED FOR A DRIVE FIT. THE ASSEMBLY SHOULD BE FABRICATED SO THAT IT CAN BE EASILY INSTALLED. HOWEVER, IT MUST FIT TIGHT ENOUGH SO AS TO NOT ALLOW MORE THAN ONE-HALF INCH ( 1/2" ) VOID ACROSS THE WIDTH OF A BRACED LOAD.
- J. A STAGGERED NAILING PATTERN WILL BE USED WHEREVER 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.
- K. PORTIONS OF THE CONTAINER DEPICTED WITHIN THIS DRAWING, SUCH AS ONE OF THE SIDEWALLS, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.



**SEPARATOR GATE**

( 8 REQD )



**FILL DETAIL**

THIS DETAIL DEPICTS METHOD OF POSITIONING FILL MATERIAL BETWEEN CROSS MEMBER AND LADING, WHEN THE VOID BETWEEN THE TWO IS GREATER THAN ONE INCH ( 1" ) FOR LONGITUDINAL BRACING.

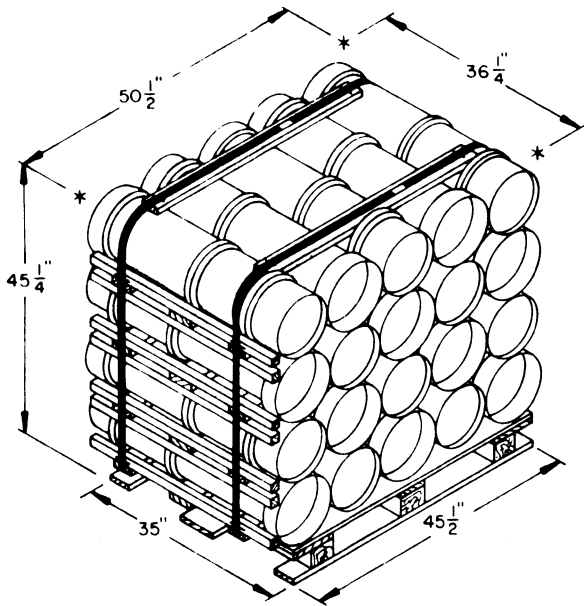
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	438	219
2" X 4"	91	60
NAILS	NO. REQD	POUNDS
6d ( 2" )	666	4
10d ( 3" )	64	1
WIRE NO. 14 GAGE -----	40' REQD -----	1 LB
HARDBOARD, 1/8" -----	129 SQ FT REQD -----	43 LBS
CROSS MEMBER -----		12 REQD

**MATERIAL SPECIFICATIONS**

- LUMBER** ----- : SEE TM 743-200-1, DUNNAGE LUMBER; FED SPEC MM-L-751.
- NAILS** ----- : COMMON, CEMENT COATED OR CHEMICALLY ETCHED; FED SPEC FF-N-105. ALT: ANNULAR-RING TYPE NAIL OF THE SAME SIZE.
- WIRE** ----- : FED SPEC QQ-W-461.
- STAPLE, STRAP** ---- : TYPE III, STYLE 3, 3/4" X 1-3/8"; FED SPEC FF-N-105.
- HARDBOARD** ----- : TYPE I ( STANDARD ); FED SPEC LLL-B-810.
- PLYWOOD** ----- : GROUP B OR C, GRADE C-D ( EXTERIOR ); FED SPEC NN-P-530. IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER EXTERIOR GRADE MAY BE SUBSTITUTED.

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT ( APPROX )
PALLET UNIT -----	9 -----	16,749 LBS
DUNNAGE -----		607 LBS
CONTAINER -----		5,700 LBS
TOTAL GROSS WEIGHT -----		23,056 LBS



**PALLET UNIT**

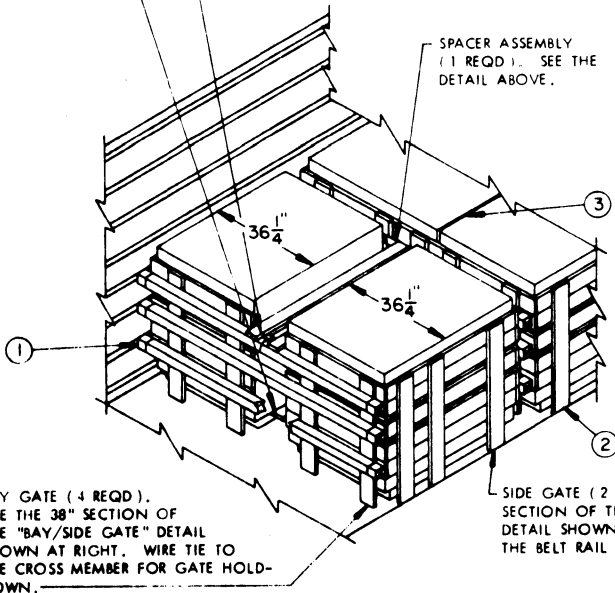
UNIT WEIGHT ----- 1,861 POUNDS (APPROX).  
 CUBE ----- 47.9 CUBIC FEET.

**NOTE (D)**

POSITION THE TOP OF THE HOLD-DOWN BLOCK TO CLEAR THE BOTTOM OF THE 28" HIGH CROSS MEMBER (24" FROM THE BOTTOM OF THE GATE). WHEN TWO GATES ARE USED BACK TO BACK, AS IN THE CENTRAL SECTION OF THE LOAD, ONE HOLD-DOWN BLOCK MUST BE LOCATED 12" FROM THE BOTTOM OF THE GATE, TO CLEAR THE HOLD-DOWN BLOCK OF THE ADJACENT GATE.

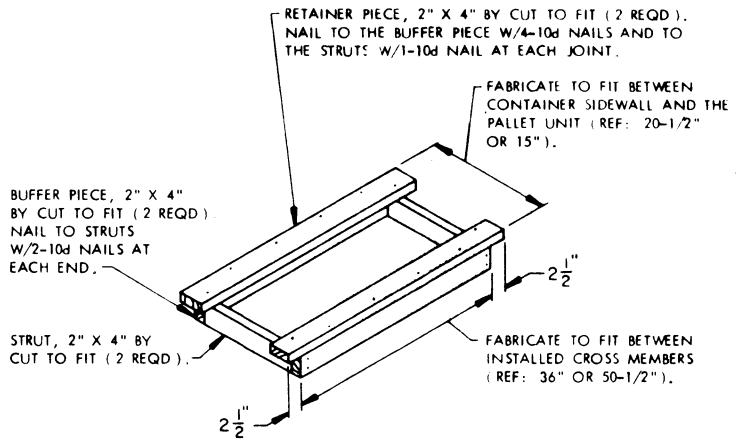
TIE WIRE, NO. 14 GAGE WIRE 18" LONG (2 REQD.). INSTALL TO FORM A COMPLETE LOOP AROUND THE SPACER ASSEMBLY AND THE CROSS MEMBER. BRING THE ENDS TOGETHER AND TWIST TAUT.

ANTI-SWAY BRACE (1 REQD.). SEE DETAIL AT RIGHT.



**ALTERNATIVE LOADING PATTERN**

THE BAY/SIDE GATES FOR THE ALTERNATIVE LOADING PATTERN ARE FABRICATED BY USING THE BAY/SIDE GATE DETAIL ABOVE. THE 38" AND 50" GATE LENGTH WILL BE USED IN CONJUNCTION WITH THE OTHER DIMENSIONS SHOWN, EXCEPT THE 7'-5-1/2" DIMENSION.

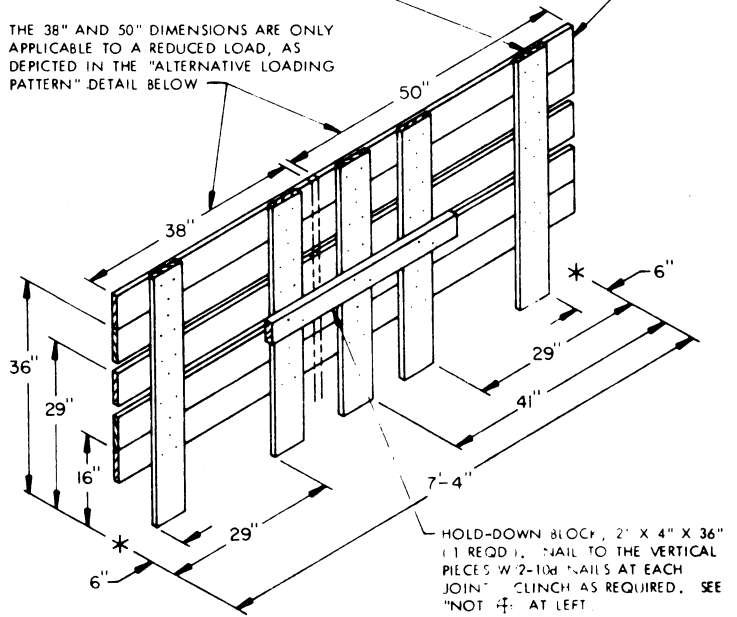


**SPACER ASSEMBLY**

SEE GENERAL NOTE "H" ON PAGE 3.

RETAINER PIECE, 2" X 4" BY CUT TO FIT (2 REQD.). NAIL TO THE BUFFER PIECE W/4-10d NAILS AND TO THE STRUTS W/1-10d NAIL AT EACH JOINT.  
 BUFFER PIECE, 2" X 4" BY CUT TO FIT (2 REQD.) NAIL TO STRUTS W/2-10d NAILS AT EACH END.  
 STRUT, 2" X 4" BY CUT TO FIT (2 REQD.).  
 FABRICATE TO FIT BETWEEN CONTAINER SIDEWALL AND THE PALLET UNIT (REF: 20-1/2" OR 15").  
 FABRICATE TO FIT BETWEEN INSTALLED CROSS MEMBERS (REF: 36" OR 50-1/2").  
 BEARING PIECE, 1" X 6" X 7'-4" (5 REQD.).  
 VERTICAL PIECE, 1" X 6" X 42" (5 REQD.). NAIL TO THE BEARING PIECES W/3-6d NAILS AT EACH JOINT. CLINCH AS REQUIRED.

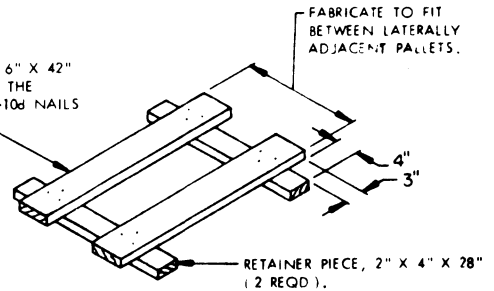
THE 38" AND 50" DIMENSIONS ARE ONLY APPLICABLE TO A REDUCED LOAD, AS DEPICTED IN THE "ALTERNATIVE LOADING PATTERN" DETAIL BELOW



**BAY/SIDE GATE**

(8 REQD., 4 WITH HOLD-DOWN BLOCKS AND 4 WITHOUT HOLD-DOWN BLOCKS).

BEARING PIECE, 2" X 6" X 42" (2 REQD.). NAIL TO THE RETAINER PIECES W/3-10d NAILS AT EACH JOINT.



**ANTI-SWAY BRACE**

THIS ASSEMBLY MUST BE FABRICATED IN PLACE BETWEEN THE PALLETS.