

APPROVED BY
BUREAU OF EXPLOSIVES

02/10/96

DATE 11/10/96

LOADING AND BRACING[•] IN MILVAN CONTAINERS[⊕] OF 2,000-POUND BOMB, MK84 AND MODS, UNITIZED 2 BOMBS PER METAL PALLET, MK79 MOD 0

INDEX

ITEM	PAGE(S)
GENERAL NOTES, AND MATERIAL SPECIFICATIONS - - - - -	2
PALLET UNIT DETAIL - - - - -	3
TYPICAL LOADING PROCEDURES - - - - -	4,5
DETAILS - - - - -	6,7
TYPICAL PROCEDURES FOR OMITTED UNIT - - - - -	8

- 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.

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U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL	DECEMBER 1996		
	CLASS	DIVISION	DRAWING
	19	48	4280
			FILE
			15PB1006

DO NOT SCALE

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 OUTLOADING PROCEDURES SPECIFIED HEREIN ARE APPLICABLE TO THE 2,000 POUND BOMB, MK84 AND MOOS, UNITIZED 2 BOMBS PER METAL PALLET, MK79 MOD O. SUBSEQUENT REFERENCE TO PALLET UNIT HEREIN MEANS THE PALLET UNIT WITH 2,000 LB BOMBS INSTALLED. SEE PAGE 3 FOR DETAILS OF THE PALLET UNIT. 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 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.
- E. DUNNAGE LUMBER SPECIFIED IS OF A NOMINAL SIZE. FOR EXAMPLE, 2" X 4" MATERIAL IS ACTUALLY 1-1/2" 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 25.4 MM AND ONE POUND EQUALS 0.454 KG.

(CONTINUED AT RIGHT)

MATERIAL SPECIFICATIONS

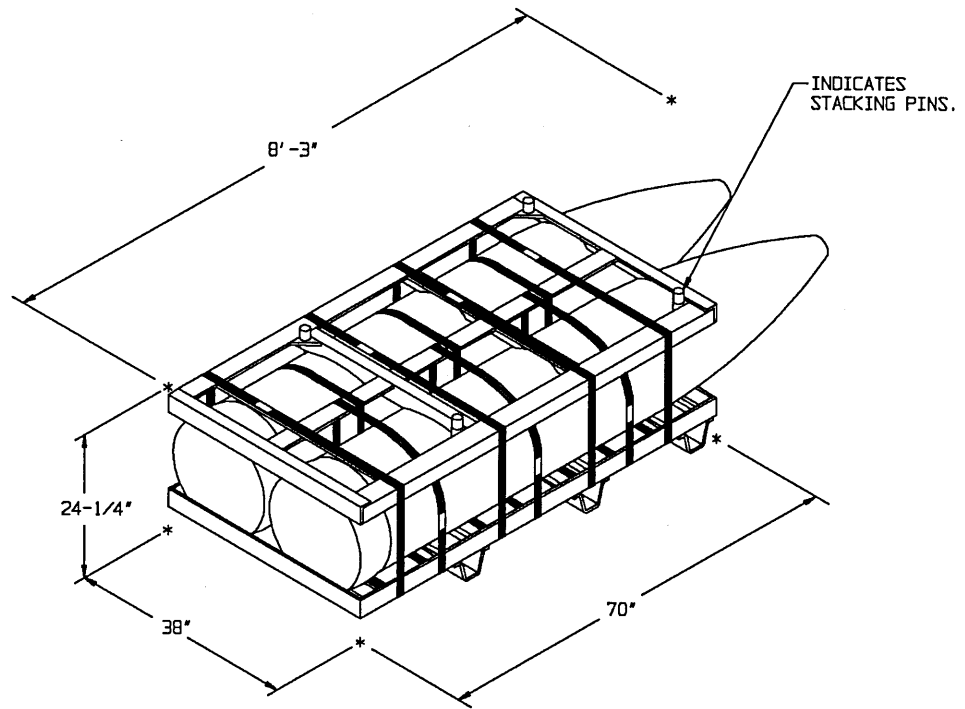
- LUMBER - - - - - : SEE TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC MM-L-751.
- NAILS - - - - - : FED SPEC FF-N-105; COMMON.
- PLYWOOD - - - - - : COMMERCIAL ITEM DESCRIPTION A-A-55057, TYPE A, CONSTRUCTION AND INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D. IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER INTERIOR OR AN EXTERIOR GRADE MAY BE SUBSTITUTED.
- WIRE, CARBON STEEL - : ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, .0800" DIA, GRADE 1006 OR BETTER.

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.

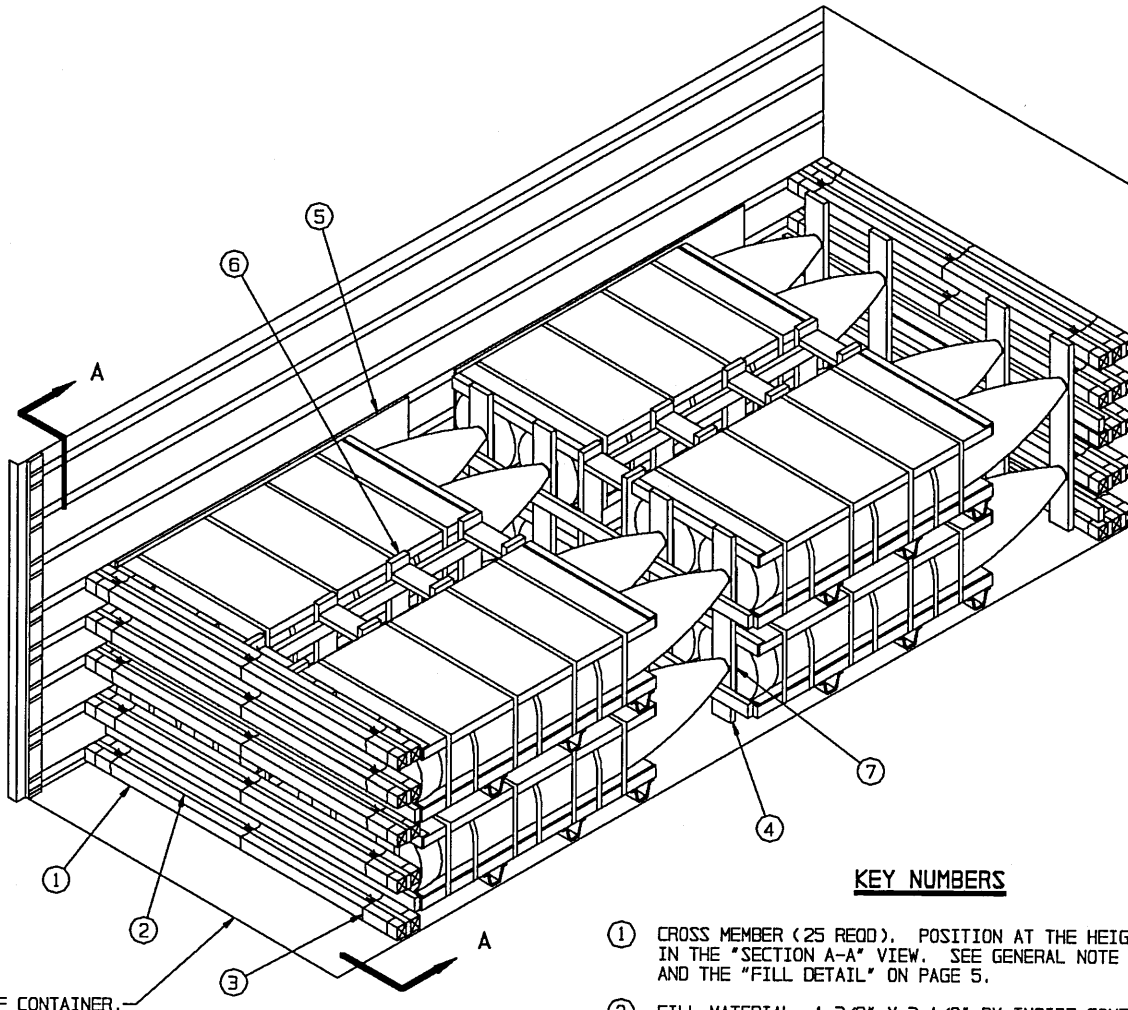
L. SPECIAL T/COFC NOTES:

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 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. TWENTYFOOT AND 40-FOOT UNITS CAN BE LOADED ON THE SAME CAR.
- M. 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 INCREASING THE LENGTH OF THE STRUTS IN THE CRIB FILL ASSEMBLIES, AS NECESSARY, TO FACILITATE VARIANCE IN CONTAINER SIZE.
- N. 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.
- O. THE QUANTITY OF PALLET UNITS SHOWN IN THE LOAD ON PAGE 4 MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SEE THE "TYPICAL PROCEDURES FOR OMITTED UNIT" DETAIL ON PAGE 8.
1. IF A LOAD IS REDUCED BY ONLY A SMALL AMOUNT (ONE OR TWO LADING UNITS), LADING UNITS NORMALLY MAY BE ELIMINATED FROM THE REAR 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.



PALLET UNIT

BOMB - - - - 2 EACH @ 1,930 LBS (APPROX)
 CUBE - - - - 52.8 CU. FT. (APPROX)
 GROSS WEIGHT - 4,133 LBS (APPROX)

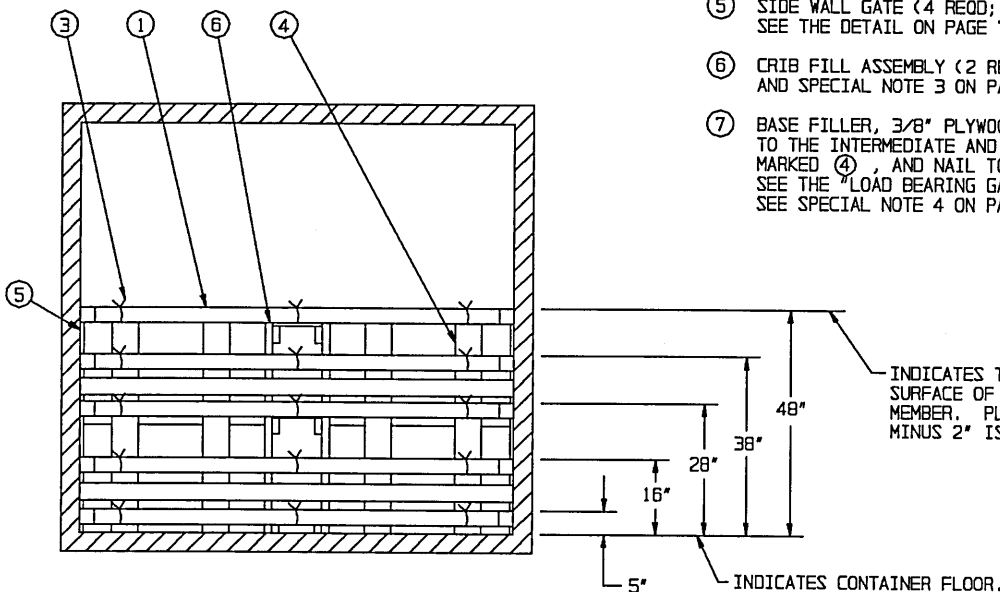


REAR OF CONTAINER.

ISOMETRIC VIEW

KEY NUMBERS

- ① CROSS MEMBER (25 REQD). POSITION AT THE HEIGHTS SPECIFIED IN THE "SECTION A-A" VIEW. SEE GENERAL NOTE "D" ON PAGE 2, AND THE "FILL DETAIL" ON PAGE 5.
- ② FILL MATERIAL, 1-3/8" X 3-1/2" BY INSIDE CONTAINER WIDTH MINUS 1" (15 REQD). SEE THE "FILL MATERIAL INSTALLATION DETAIL" ON PAGE 6.
- ③ TIE WIRE, NO. 14 GAGE WIRE BY LENGTH TO SUIT (REF: 24" AND 36") (15 EACH LENGTH REQD). SEE THE "FILL MATERIAL INSTALLATION DETAIL" ON PAGE 6 AND SPECIAL NOTE 2 ON PAGE 5.
- ④ LOAD BEARING GATE (3 REQD). SEE THE DETAIL ON PAGE 6.
- ⑤ SIDE WALL GATE (4 REQD; 2 RIGHT HAND AND 2 LEFT HAND). SEE THE DETAIL ON PAGE 7.
- ⑥ CRIB FILL ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 7 AND SPECIAL NOTE 3 ON PAGE 5.
- ⑦ BASE FILLER, 3/8" PLYWOOD, 5-1/2" X 10" (16 REQD). NAIL TO THE INTERMEDIATE AND REAR LOAD BEARING GATES, PIECES MARKED ④, AND NAIL TO THE VERTICAL PIECE W/3-6d NAILS. SEE THE "LOAD BEARING GATE" DETAIL ON PAGE 6 FOR GUIDANCE. SEE SPECIAL NOTE 4 ON PAGE 5.

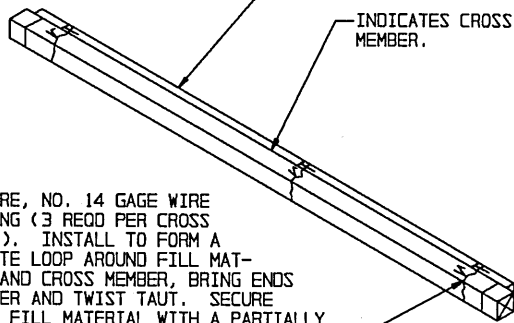


INDICATES THE TOP SURFACE OF A CROSS MEMBER. PLUS ZERO OR MINUS 2" IS PERMITTED.

INDICATES CONTAINER FLOOR.

SECTION A-A

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



INDICATES CROSS
MEMBER.

TIE WIRE, NO. 14 GAGE WIRE
18" LONG (3 REOD PER CROSS
MEMBER). INSTALL TO FORM A
COMPLETE LOOP AROUND FILL MAT-
ERIAL 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

SPECIAL NOTES:

1. THE LOAD AS SHOWN ON PAGE 4 DEPICTS AN 8 PALLET UNIT LOAD OF 2,000 POUND, MKB4, BOMBS IN A MILVAN CONTAINER.
2. TIE WIRES, SHOWN AS PIECES MARKED ③, SHALL BE USE TO SECURE THE FILL MATERIAL TO THE CROSS MEMBERS. THE 36" LONG PIECES SHALL BE USED WITH THE TRIPLED CROSS MEMBERS AT THE FORWARD END OF THE CONTAINER AND THE 24" LONG PIECES SHALL BE USED WITH THE DOUBLED CROSS MEMBERS AT THE REAR OF THE CONTAINER.
3. THE LENGTH OF THE STRUTS ON THE CRIB FILL ASSEMBLY, PIECE MARKED ⑥, MAY BE ADJUSTED IN LENGTH AS NECESSARY TO ENSURE THAT NO MORE THAN 1-1/2" VOID ACROSS THE WIDTH OF THE LOAD EXISTS.
4. THE LOCATION OF THE BASE FILLER PIECES, PIECE MARKED ⑦, SHOULD BE "FIELD CHECKED" TO ENSURE THAT THEY BEAR AGAINST THE BASE OF THE BOMB AND NOT AGAINST THE METAL PALLET FRAME.
5. CAUTION: EXTREME CARE MUST BE USED IN HANDLING OF THE BOMB PALLET UNITS, DUE TO THE LOADING METHOD DEPICTED ON PAGE 4. THESE PALLET UNITS ARE NOT NORMALLY END HANDLED, SINCE THE PALLET'S ARE OF A TWO-WAY ENTRY TYPE, WITH THE LENGTH OF THE PALLET UNIT BEING GREATER THAN THE WIDTH OF THE MILVAN, PALLET UNITS CAN ONLY BE LOADED AS SHOWN. NOTE THAT FORKLIFT TRUCK TINES WILL HAVE TO BE PLACED UNDER THE PALLET SKIDS DURING LOADING AND UNLOADING OPERATIONS.

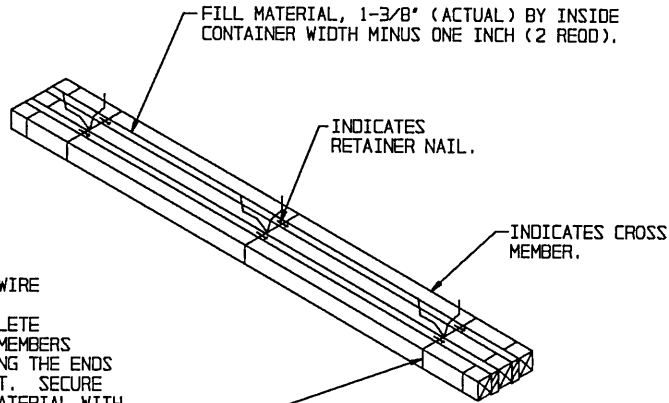
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 3"	8	4
2" X 4"	236	157
2" X 6"	136	136
NAILS	NO. REOD	POUNDS
6d (2")	72	1/2
10d (3")	429	6-1/2
WIRE, NO. 14 GAGE	150' REOD	3 LBS
PLYWOOD, 3/8"	120.78 SQ FT REOD	124.50 LBS
CROSS MEMBER		25 REOD

LOAD AS SHOWN

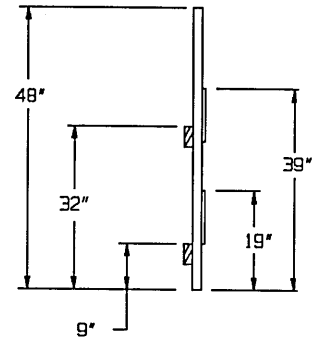
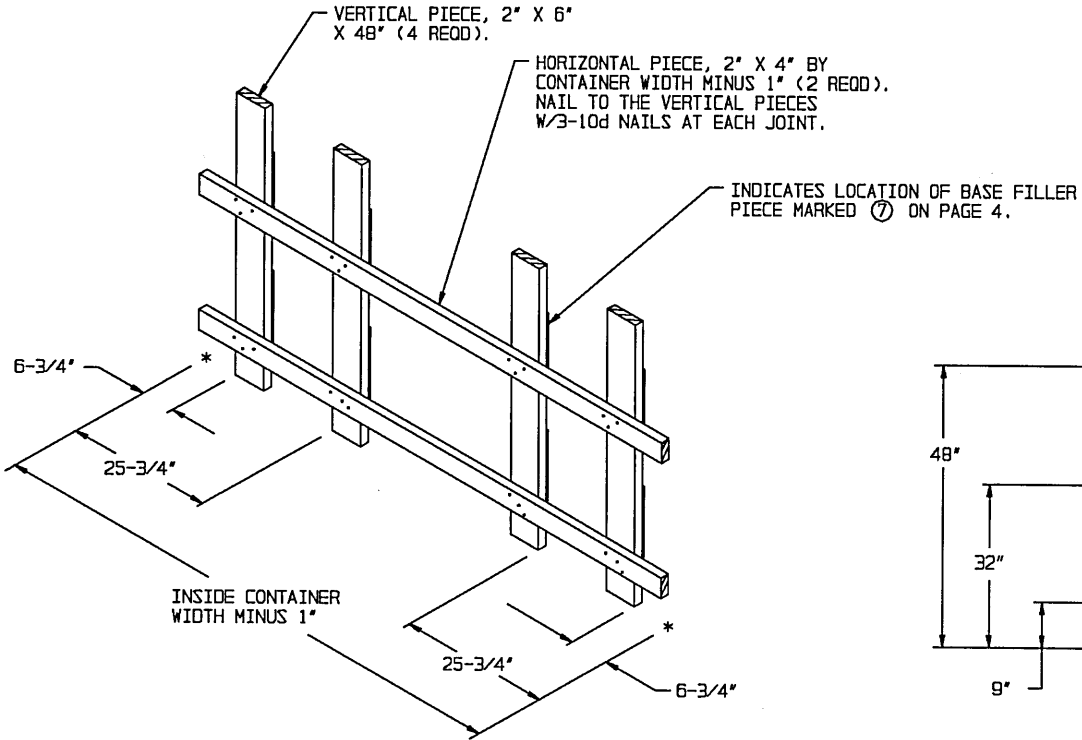
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	8	33,064 LBS
DUNNAGE		729 LBS
CONTAINER		5,700 LBS
TOTAL WEIGHT		39,493 LBS (APPROX)

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



FILL MATERIAL INSTALLATION

SEE GENERAL NOTE "D" ON PAGE 2.

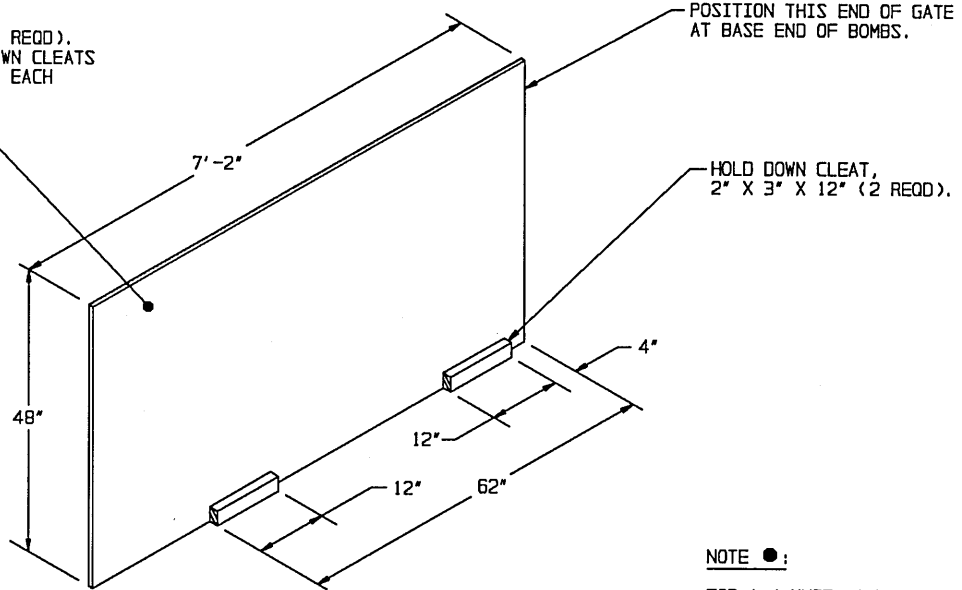


END VIEW

LOAD BEARING GATE

DETAILS

3/8" PLYWOOD (1 REQD).
NAIL TO HOLD-DOWN CLEATS
W/3-6d NAILS AT EACH
LOCATION.

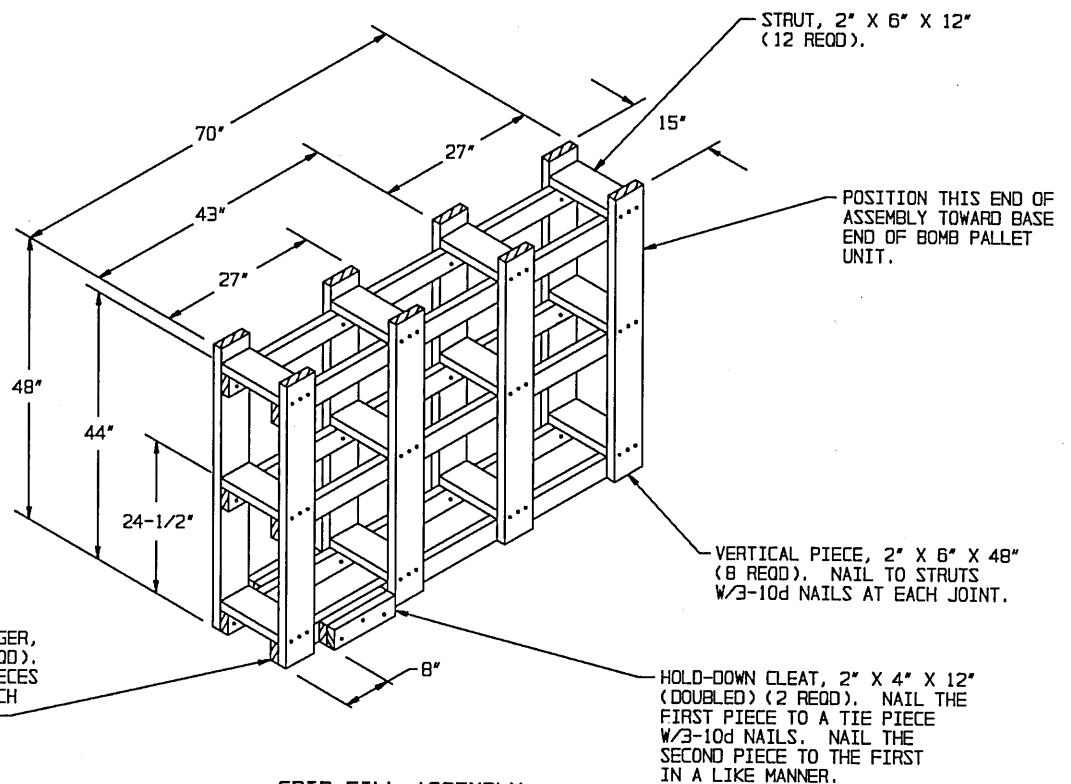


NOTE ●:

FOR A 4-UNIT, 1-LAYER LOAD,
REDUCE THE HEIGHT OF THE GATE TO 24".

SIDE WALL GATE

(A RIGHT HAND GATE IS SHOWN. NOTE THAT 2 RIGHT HAND
AND 2 LEFT HAND GATES ARE REQUIRED FOR THE LOAD
SHOWN ON PAGE 4). SEE NOTE ● AT RIGHT.



TIE PIECE/STRUT LEDGER,
2" X 4" X 70" (6 REQD).
NAIL TO VERTICAL PIECES
W/3-10d NAILS AT EACH
JOINT.

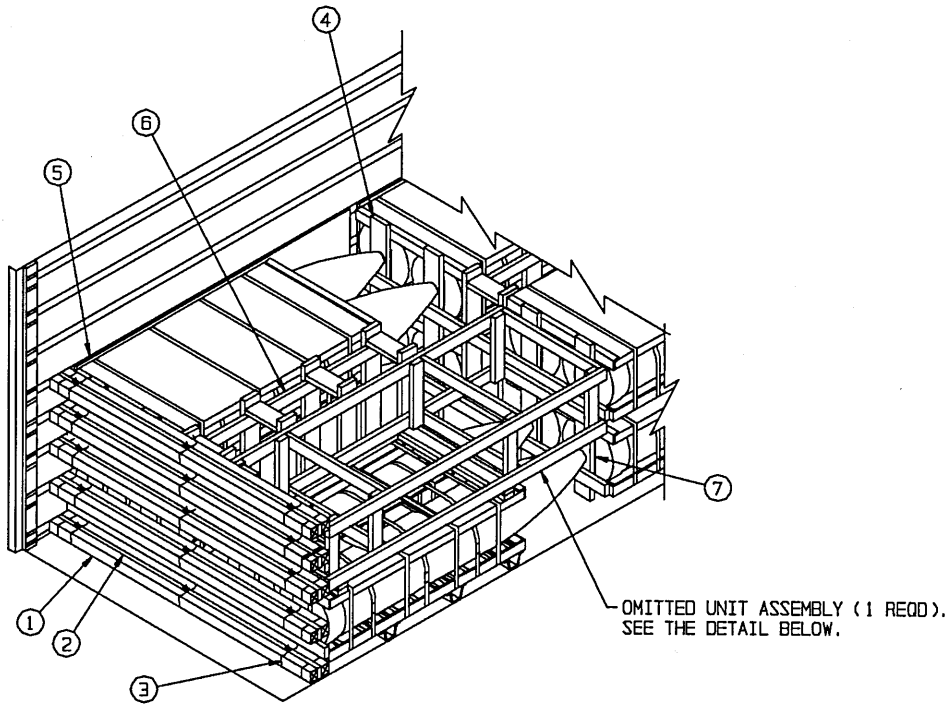
NOTE ▲:

FOR A 4-UNIT, 1-LAYER LOAD,
OMIT TWO TIE PIECES/STRUT
LEDGERS AND FOUR STRUTS.
REDUCE THE VERTICAL PIECES
TO 24". REDUCE THE 24-1/2"
HEIGHT FOR THE SECOND LAYER
STRUTS TO 21-1/2".

CRIB FILL ASSEMBLY

SEE NOTE ▲ AT LEFT.

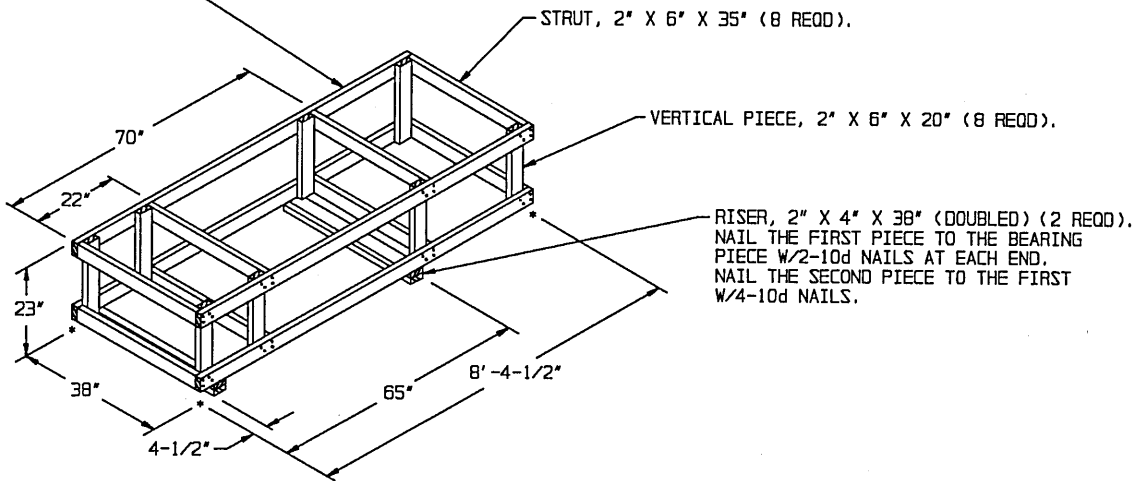
DETAILS



PARTIAL ISOMETRIC VIEW

THE DETAIL ABOVE DEPICTS A BLOCKING METHOD TO BE USED IN A "REDUCED-LOAD" CONTAINER LOAD (LESS THAN EIGHT UNITS). KEY NUMBERS REFER TO KEY NUMBERS ON PAGE 4. WHEN SHIPPING A SEVEN UNIT LOAD AS SHOWN ABOVE, THE CROSS MEMBERS AT THE FORWARD END OF THE CONTAINER SHALL BE POSITIONED APPROXIMATELY 7" FROM THE FRONT WALL OF THE CONTAINER.

BEARING PIECE, 2" X 6" X 8'-4-1/2"
(4 REOD). NAIL TO THE VERTICAL PIECES
AND THE STRUTS W/3-10d NAILS
AT EACH JOINT.



OMITTED UNIT ASSEMBLY