

APPROVED BY
BUREAU OF EXPLOSIVES

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DATE 9/9/94

LOADING AND BRACING WITH WOODEN DUNNAGE IN SIDE OPENING ISO CONTAINERS OF M117 (750 POUND) BOMBS, COMPLETE ROUND

- 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.

U.S. ARMY MATERIEL COMMAND DRAWING

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CLASS	DIVISION	DRAWING	FILE
19	48	8571	SP15M7

DO NOT SCALE

PROJECT SP 273-93

GENERAL NOTES

(GENERAL NOTES CONTINUED)

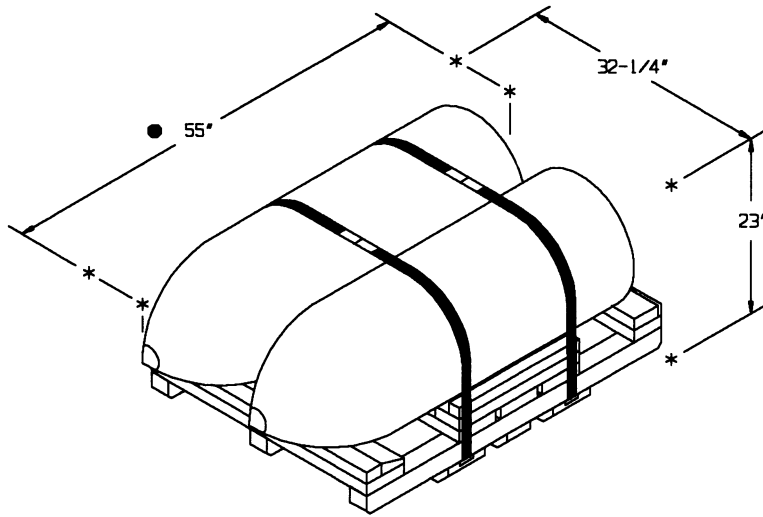
- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE SPECIFIED OUTLOADING PROCEDURES ARE APPLICABLE TO LOADS OF M117 (750 POUND) BOMBS, COMPLETE ROUND. SEE PAGE 3 FOR DETAILS OF THE ITEMS TO BE SHIPPED. CAUTION: REGARDLESS OF THE QUANTITY OF CONTAINERS 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 INTERMODAL CONTAINER WITH INSIDE DIMENSIONS OF 19'-4" LONG BY 89" WIDE BY 88" HIGH. THE LOAD IS DESIGNED FOR TRAILER/CONTAINER-ON-FLAT-CAR (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 CONTAINERS, THEY ARE TO BE POSITIONED SO AS TO ACHIEVE A TIGHT LOAD (TIGHT AGAINST THE DUNNAGE ASSEMBLIES). ALTHOUGH A TOTAL OF 1-1/2" OF UNBLOCKED SPACE ACROSS THE WIDTH OF A LOAD BAY IS PERMITTED, LATERAL VOIDS WITHIN THE LOAD ARE TO BE HELD TO A MINIMUM.
- E. 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" BY 5-1/2" WIDE.
- F. 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.
- G. IN SOME CONTAINERS THERE IS A SLOT AT THE CORNERS OF THE ENDWALLS. PIECES OF DUNNAGE MATERIAL MUST BE LAMINATED TO THE BUFFER PIECES ON THE END BLOCKING ASSEMBLIES 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". THIS PIECE IS NOT REQUIRED WHEN THE CORNER PORTIONS OF THE CONTAINER ENDWALLS ARE SMOOTH AND FLAT.
- 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 SIDE DOORS, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.

- K. REQUIREMENTS CITED WITHIN THE BUREAU OF EXPLOSIVES PAMPHLET 6C APPLY WHEN THE SHIPMENT MOVES BY TRAILER/CONTAINER-ON-FLAT-CAR (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.
- L. 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.
- M. 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 0.454KG.
- N. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF ONE SEAL WITH TWO PAIR OF NOTCHES WILL BE USED TO SEAL THE JOINT WHEN A NOTCH-TYPE SEALER IS BEING USED. A MINIMUM OF TWO SEALS, BUTTED TOGETHER WITH TWO PAIR OF CRIMPS PER SEAL WILL BE USED TO SEAL THE JOINT WHEN A CRIMP-TYPE SEALER IS BEING USED. REFER TO THE "STRAP JOINT A" AND "STRAP JOINT B" DETAILS ON PAGE 9.

(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.
- STRAPPING, STEEL - - : ASTM D3953; FLAT STRAPPING, TYPE I, HEAVY DUTY, FINISH A, B, (GRADE 2), OR C.
- SEAL, STRAP - - - - : ASTM D3953; CLASS H, FINISH A, B (GRADE 2), OR C, DOUBLE NOTCH TYPE, STYLE I, II, OR IV.

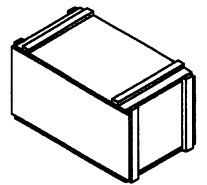
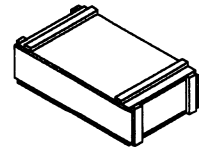
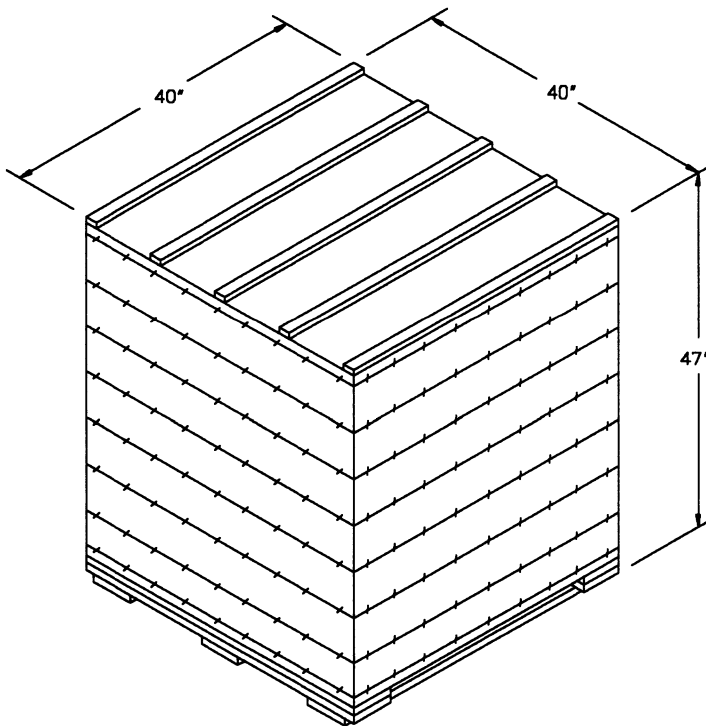


750 POUND, M117

FOR DETAILS OF THE PALLET UNIT
SEE AIR FORCE TPO 1325-926-1868.

GROSS WEIGHT - 1,540 TO 1,575 LBS (APPROX)

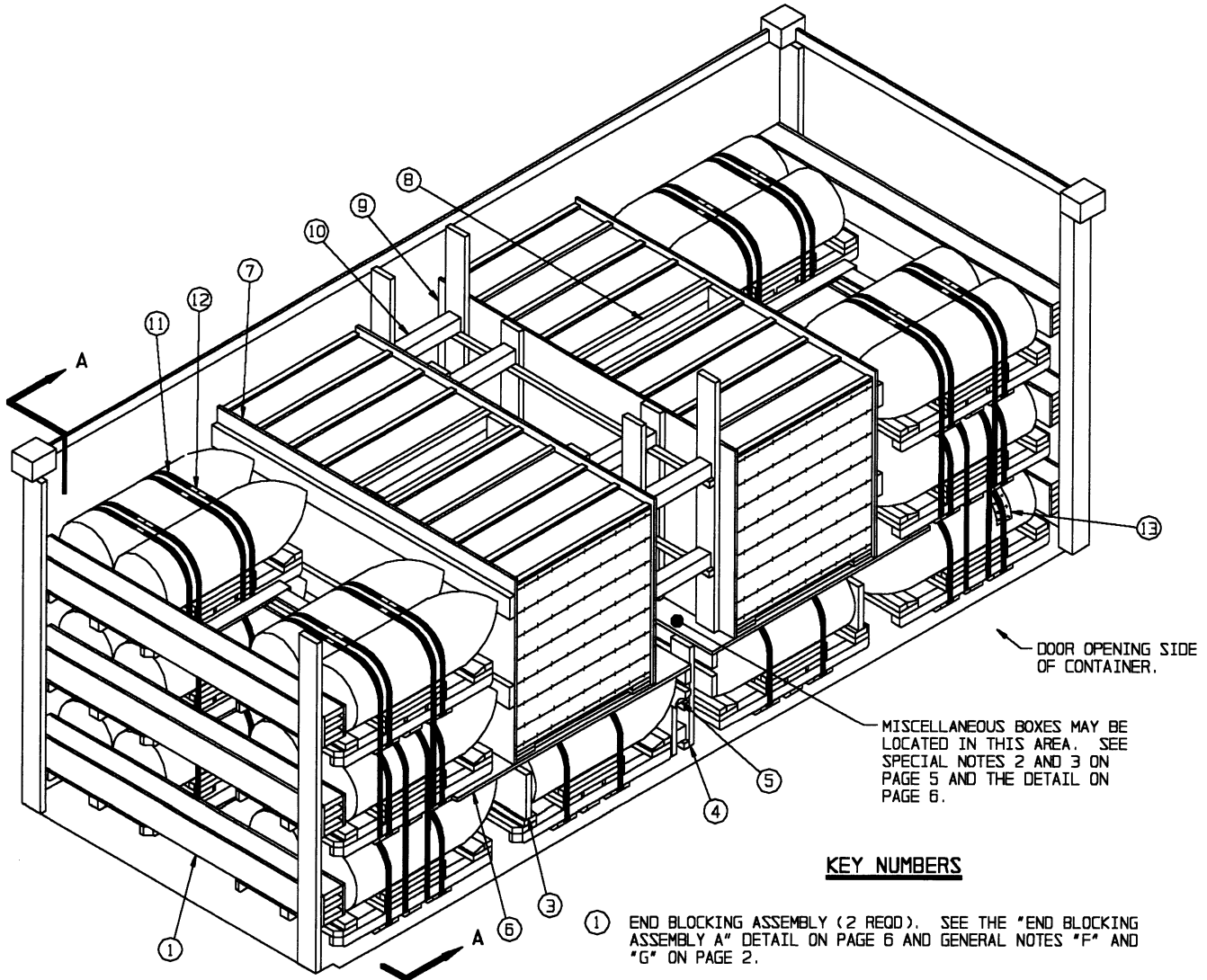
- UNIT LENGTH FOR BOMBS EQUIPPED WITH CONICAL NOSE PLUGS IS 55". UNIT LENGTH FOR BOMBS EQUIPPED WITH FLAT TYPE NOSE PLUGS IS 52-1/4".



TYPICAL COMPONENT BOXES
VARIOUS SIZES AND WEIGHTS.

FIN ASSEMBLY, MAU-91

FOR DETAILS OF THE WIREBOUND BOX
SEE AIR FORCE TO 11A6-10-7.



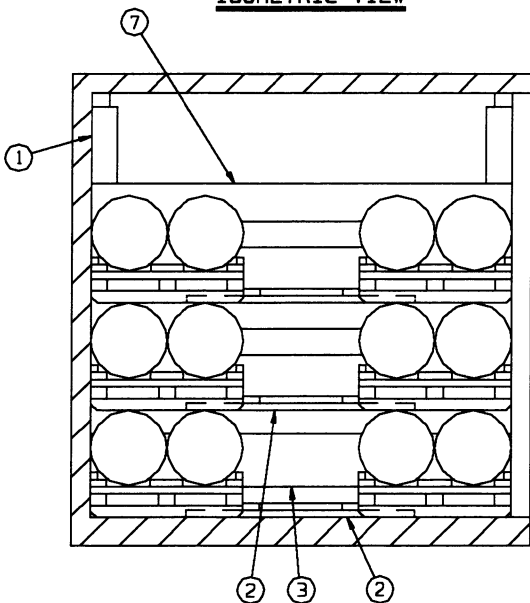
DOOR OPENING SIDE OF CONTAINER.

MISCELLANEOUS BOXES MAY BE LOCATED IN THIS AREA. SEE SPECIAL NOTES 2 AND 3 ON PAGE 5 AND THE DETAIL ON PAGE 6.

KEY NUMBERS

- ① END BLOCKING ASSEMBLY (2 REQD). SEE THE "END BLOCKING ASSEMBLY A" DETAIL ON PAGE 6 AND GENERAL NOTES "F" AND "G" ON PAGE 2.
- ② ANTI-SWAY BRACE (8 REQD). SEE THE DETAIL ON PAGE 8 AND SPECIAL NOTE 4 ON PAGE 5.
- ③ BUFFER PIECE, 2" X 12" BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-4") (2 REQD). POSITION ON EDGE ON THE AFT END STOP PIECE OF THE BOMB PALLET AS SHOWN.
- ④ CENTER GATE (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 5. SEE GENERAL NOTE "D" ON PAGE 2.
- ⑤ STRUT, 4" X 4" BY CUT TO FIT (REF: 17") (8 REQD). POSITION SO AS TO BE BETWEEN THE CENTER GATES, PIECES MARKED ④. TOENAIL TO THE CENTER GATES W/2-16d NAILS AT EACH END.
- ⑥ DECKING, PLYWOOD, 1/2" THICK BY 44" WIDE BY LENGTH TO SUIT (4 REQD). POSITION ON TOP OF THE BOMB PALLET UNITS AND CENTER GATES AS SHOWN.
- ⑦ SEPARATOR GATE (2 REQD). SEE THE DETAIL ON PAGE 7. POSITION WITH THE HORIZONTAL PIECES AGAINST THE BOMBS.
- ⑧ CRIB FILL (2 REQD). SEE THE DETAIL ON PAGE 9. POSITION BETWEEN THE BOXES CONTAINING THE BOMB FINS.
- ⑨ CENTER GATE (2 REQD). SEE THE "CENTER GATE B" DETAIL ON PAGE 7.
- ⑩ STRUT, 4" X 4" BY CUT TO FIT (REF: 3B-1/2") (8 REQD). POSITION SO AS TO BE BETWEEN THE CENTER GATES, PIECES MARKED ⑨. TOENAIL TO THE CENTER GATES W/2-16d NAILS AT EACH END.

ISOMETRIC VIEW



SECTION A-A

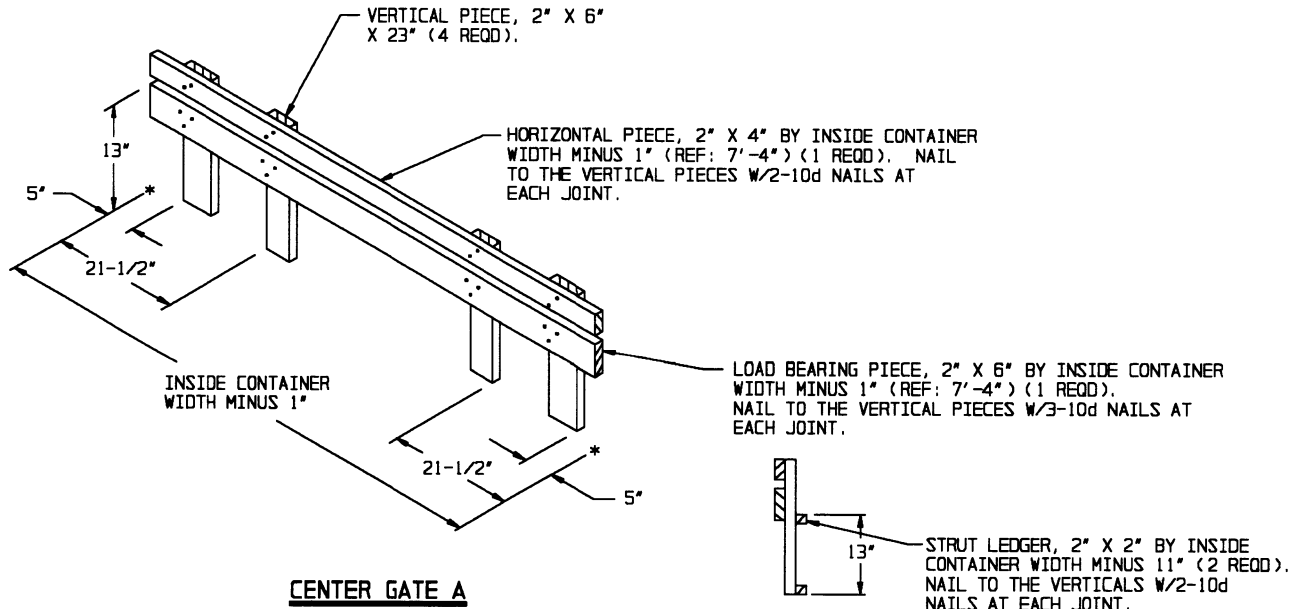
(CONTINUED ON PAGE 5)

(KEY NUMBERS CONTINUED FROM PAGE 4)

- ⑪ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 14'-0" LONG STEEL STRAPPING (16 REOD). INSTALL SO AS TO ENCIRCLE THE LOWER TWO PALLET UNITS AND/OR TOP TWO PALLET UNITS WITH TWO STRAPS EACH AS SHOWN.
- ⑫ SEAL FOR 1-1/4" STEEL STRAPPING (16 REOD, 1 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES. SEE GENERAL NOTE "N" ON PAGE 2.
- ⑬ ANTI-CHAFING MATERIAL (AS REOD). POSITION UNDER ALL STEEL STRAPPING AT POINTS OF CONTACT WITH THE BOMB BODIES.

SPECIAL NOTES:

- 1. THE LOAD AS SHOWN ON PAGE 4 DEPICTS A COMPLETE ROUND LOAD OF 750 POUND M117 BOMBS, INCLUDING 16 PALLETS OF BOMBS, 4 WIREBOUND CRATES WITH MAU-91 FINS, AND NUMEROUS BOXES CONTAINING MISCELLANEOUS ITEMS SUCH AS FUZES, ADAPTORS, AND COUPLERS.
- 2. WHEN INSTALLING THE DUNNAGE THAT APPLIES TO THE MISCELLANEOUS BOXES, ADJUSTMENTS TO THE QUANTITY AND SIZE OF MATERIAL MAY BE ADJUSTED AS NECESSARY.
- 3. MISCELLANEOUS BOXES MAY ALSO BE PLACED IN OTHER VOID AREAS WITHIN THE LOAD, SUCH AS BETWEEN THE CENTER GATES "A" OR BETWEEN LATERALLY ADJACENT LOAD UNITS OF BOMB PALLETS.
- 4. FLOOR LINE ANTI-SWAY BRACES SHOULD BE PLACED INTO POSITION PRIOR TO LOADING THE SECOND STACK WITHIN A LOAD UNIT, WHEREAS IT WILL BE EASIER TO PARTIALLY FABRICATE THE SECOND AND THIRD LAYER ANTI-SWAY BRACES AND INSTALL THEM AFTER THE SECOND STACK HAS BEEN LOADED.



END VIEW

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	53	18
2" X 2"	39	13
2" X 4"	163	109
2" X 6"	236	236
2" X 12"	15	30
4" X 4"	25	33
NAILS	NO. REOD	POUNDS
6d (2")	88	1/2
8d (2-1/2")	308	3
10d (3")	216	3
16d (3-1/2")	48	1
STEEL STRAPPING, 1-1/4"	224' REOD	32 LBS
SEAL FOR 1-1/4" STRAPPING	16 REOD	1 LB
PLYWOOD, 1/2"	60 SQ FT REOD	124 LBS
PLYWOOD, 3/4"	88 SQ FT REOD	121 LBS
ANTI-CHAFING MATERIAL	AS REOD	NIL

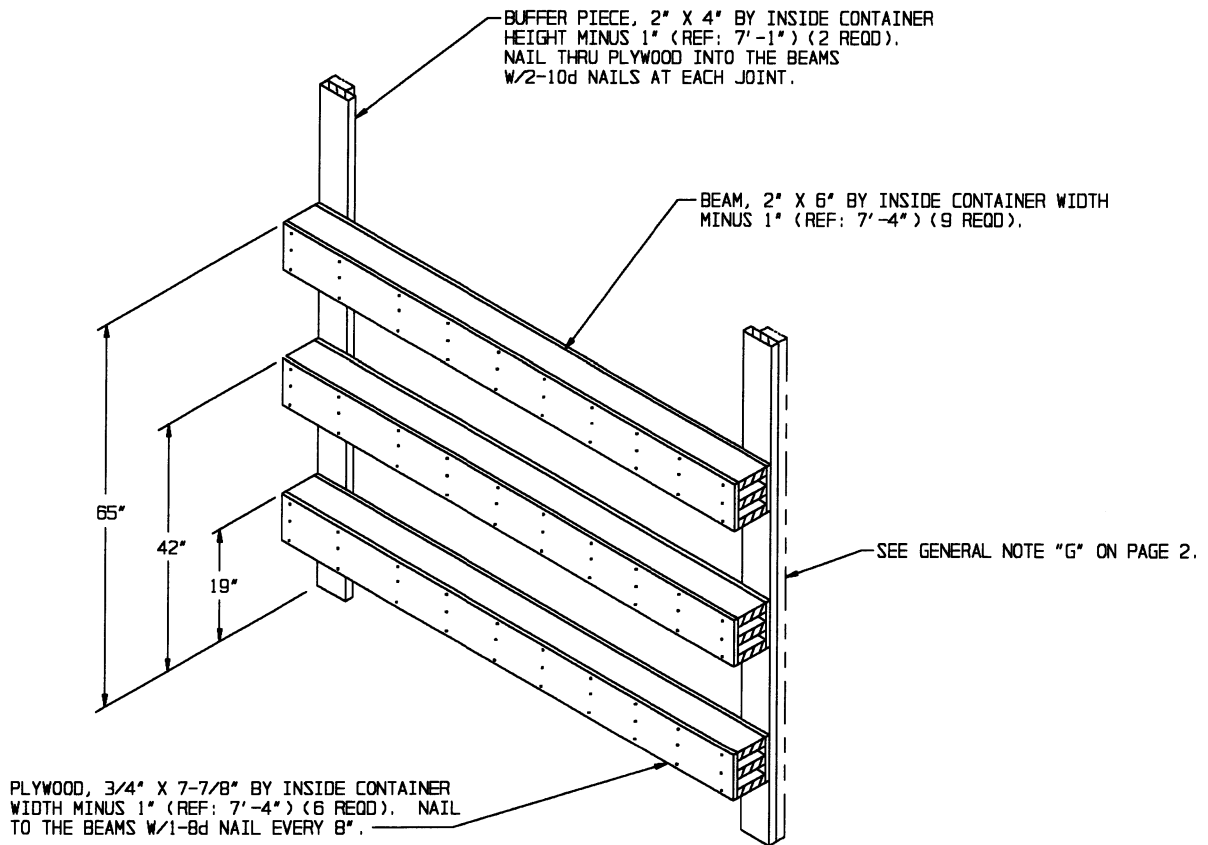
TYPICAL ITEMS AS DEPICTED WITHIN THIS DRAWING		
DDIC	NOMENCLATURE	QUANTITY
F114	M117 BOMB, 750 LB	32
F672	MAU-91 FIN	16
F835	M904 FUZE	2 *
G119	FUZE FMU 139	6 *
F372	ADAPTOR T45E7	2 *
M212	FUZE M-9	1 *
OY42	STRAP	1 *

* INDICATES NUMBER OF BOXES.

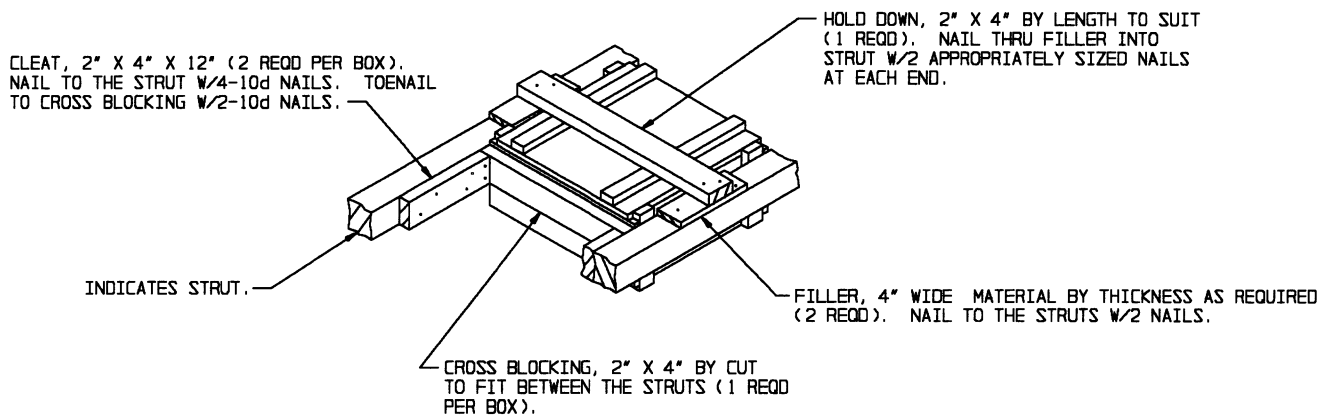
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
BOMB PALLET UNIT	16	24,640 LBS
MAU-91 FIN	4	615 LBS
MISCELLANEOUS BOXES	AS REOD	400 LBS
DUNNAGE		1,164 LBS
CONTAINER		6,050 LBS

TOTAL WEIGHT - - - - - 32,869 LBS (APPROX)



END BLOCKING ASSEMBLY



SECUREMENT OF MISCELLANEOUS BOXES

VERTICAL PIECE, 2" X 6" X 65" (2 REQD).

VERTICAL PIECE, 2" X 6" X 48" (2 REQD).

LOAD BEARING PIECE, PLYWOOD, 3/4" THICK BY 48" WIDE BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-4") (1 REQD). NAIL TO THE VERTICAL PIECES W/6-8d NAILS AT EACH LOCATION.

STRUT LEDGER, 2" X 2" X LENGTH TO SUIT (2 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.

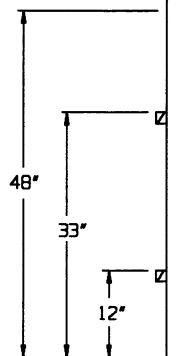
5-1/4"

21-1/2"

INSIDE CONTAINER WIDTH MINUS 1"

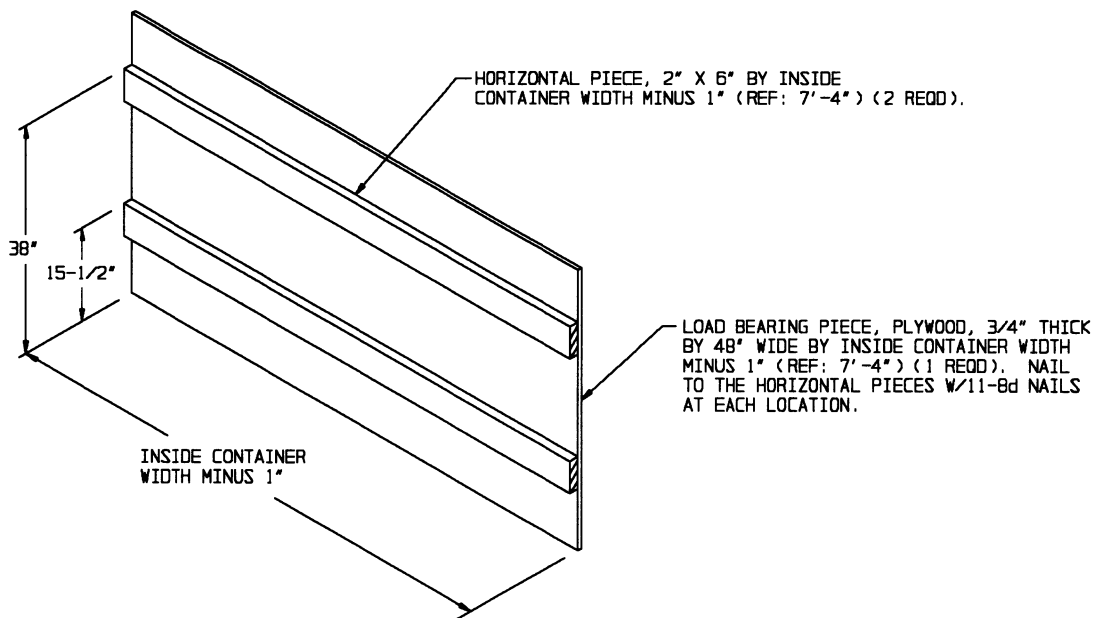
21-1/2"

5-1/4"



END VIEW

CENTER GATE B

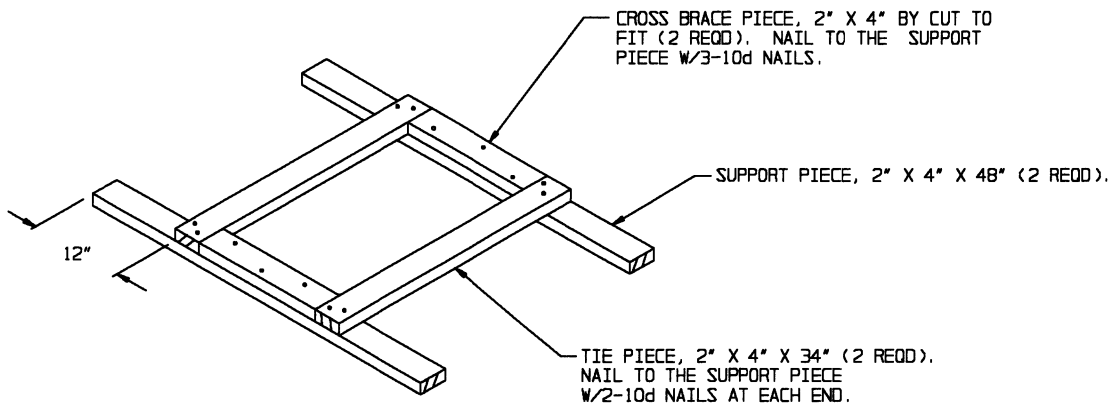


HORIZONTAL PIECE, 2" X 6" BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-4") (2 REQD).

LOAD BEARING PIECE, PLYWOOD, 3/4" THICK BY 48" WIDE BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-4") (1 REQD). NAIL TO THE HORIZONTAL PIECES W/11-8d NAILS AT EACH LOCATION.

INSIDE CONTAINER WIDTH MINUS 1"

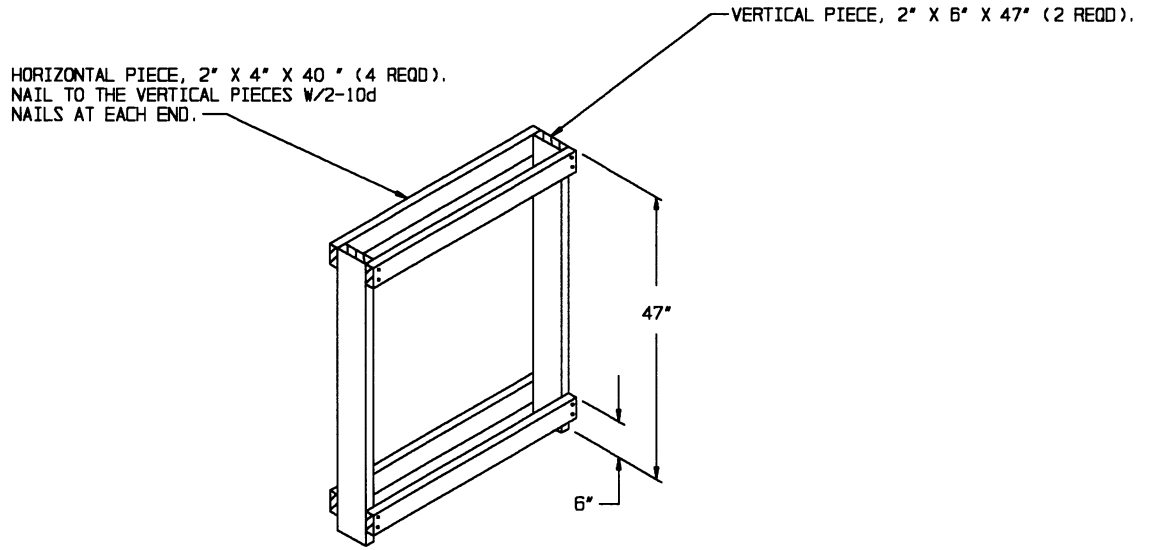
SEPARATOR GATE



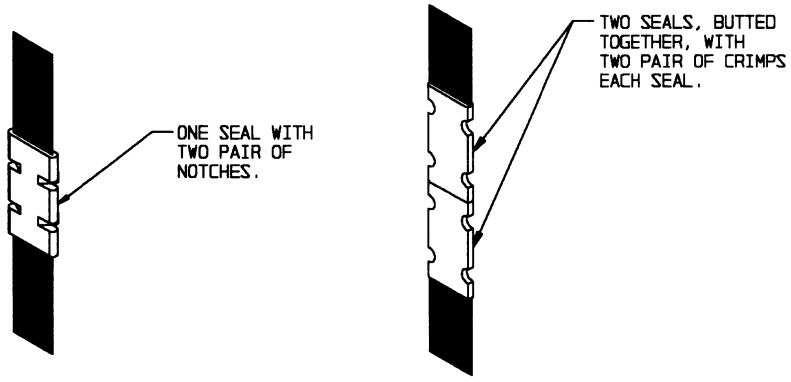
ANTI-SWAY BRACE

SPECIAL NOTE:

PARTIALLY ASSEMBLE THE ANTI-SWAY BRACE BY NAILING ONE TIE PIECE TO THE SUPPORT PIECES. AFTER ONE PALLET UNIT HAS BEEN POSITIONED IN THE LOAD UNIT LAYER IN WHICH THE ANTI-SWAY BRACE IS TO BE USED, INSERT THE LONG ENDS OF THE SUPPORT AND RISER PIECES SO AS TO EXTEND BETWEEN THE OUTER DECK BOARDS OF THE PALLET. SLIDE THE PARTIAL ASSEMBLY IN UNDER THE BOARDS ON THE PALLET UNIT. POSITION THE OTHER PALLET UNIT. PULL THE PARTIAL ASSEMBLY OUT AND INSERT THE SHORT END OF THE SUPPORT AND RISER PIECES UNDER THE LAST PALLET SO THE TIE PIECE BEARS AGAINST THE NOSE AND AFT END STOP PIECES. POSITION THE REMAINING TIE PIECE AGAINST THE FIRST PALLET UNIT AND NAIL IN PLACE. THEN NAIL THE TWO CROSS BRACE PIECES TO THE SUPPORT PIECES AS SHOWN.



CRIB FILL



STRAP JOINT A

METHOD OF SECURING A
STRAP JOINT WHEN USING
A NOTCH-TYPE SEALER.

STRAP JOINT B

METHOD OF SECURING A
STRAP JOINT WHEN USING
A CRIMP-TYPE SEALER.

END-OVER-END LAP JOINT DETAILS

