

ATACMS

LOADING AND BRACING[⊕] IN SIDE OPENING ISO CONTAINERS OF ROCKET MOTOR, M124, PACKED ONE PER SHIPPING CRATE

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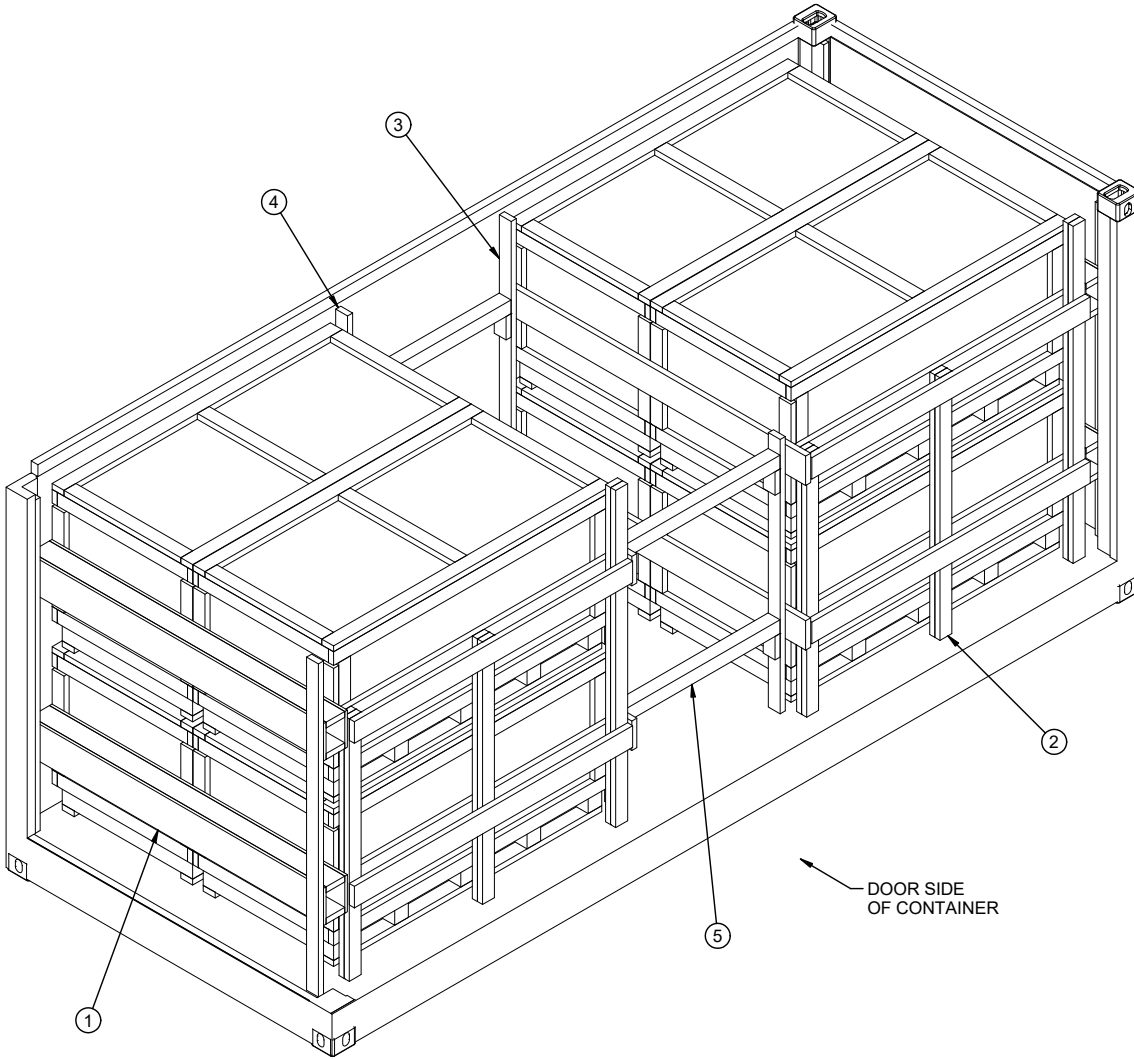
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® THE PROCEDURES SHOWN HEREIN ARE APPLICABLE TO LOADS THAT ARE TO
BE SHIPPED BY TRAILER/CONTAINER-ON-FLATCAR (T/COFC) RAIL, MOTOR, OR
WATER CARRIERS.

U.S. ARMY MATERIEL COMMAND DRAWING

<p style="text-align: center;">APPROVED, U.S. ARMY AVIATION AND MISSILE COMMAND</p> <p>O'CONNOR.DOUG LAS.LEO.11405822 51</p> <p style="font-size: small;">Digitally signed by O'CONNOR.DOUGLAS.LEO.114 0582251 Date: 2021.05.04 13:31:58 -05'00'</p>	<p>CAUTION: VERIFY PRIOR TO USE AT https://www.dau.edu/cop/ammo/pages/default.aspx THAT THIS IS THE MOST CURRENT VERSION OF THIS DOCUMENT. THIS IS PAGE 1 OF 8.</p>					
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<p style="text-align: center;">APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND</p> <p>BRAILSFORD.KEITH H.ANTHONY.10286 55661</p> <p style="font-size: small;">Digitally signed by BRAILSFORD.KEITH.ANTHONY. 1028655661 Date: 2021.05.04 14:43:06 -05'00'</p> <p style="text-align: center;">U.S. ARMY DEFENSE AMMUNITION CENTER</p>	ENGINEERING DIVISION	FIEFFER.LAUR A.A.1230375727				
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	EXPLOSIVE SAFETY DIRECTORATE	FAIRHURST.ROBE RT.JOHN.10157688 80	DIVISION	DRAWING	FILE	
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ISOMETRIC VIEW

KEY NUMBERS

- ① END BLOCKING ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 6.
- ② CRIB FILL ASSEMBLY A (2 REQD). SEE THE DETAIL ON PAGE 8.
- ③ CENTER GATE RIGHT (1 REQD). SEE THE DETAIL ON PAGE 7.
- ④ CENTER GATE LEFT (1 REQD). SEE THE DETAIL ON PAGE 7.
- ⑤ STRUT, 4" X 4" BY CUT-TO-FIT (REF: 46-3/4") (4 REQD). INSTALL AS SHOWN AND TOENAIL EACH END TO THE CENTER GATE W/2-12d NAILS. SEE THE "BEVEL-CUT" DETAIL ON PAGE 5.

BI LL OF MATERIAL

LUMBER	LI NEAR FEET	BOARD FEET
2" X 4"	132	88
2" X 6"	113	113
2" X 8"	30	40
4" X 4"	16	21
NAI LS	NO. REQD	POUNDS
6d (2")	176	1
10d (3")	192	3
12d (3-1/4")	16	1/4
PLYWOOD, 3/4" - - 45.92 SQ FT REQD - - 94.70 LBS		

LOAD AS SHOWN

ITEM	QUANTI TY	WEI GHT (APPROX)
SHI PPI NG CRATE	8	20,688 LBS
DUNNAGE		623 LBS
CONTAI NER		6,050 LBS
TOTAL WEI GHT		27,361 LBS (APPROX)

GENERAL NOTES

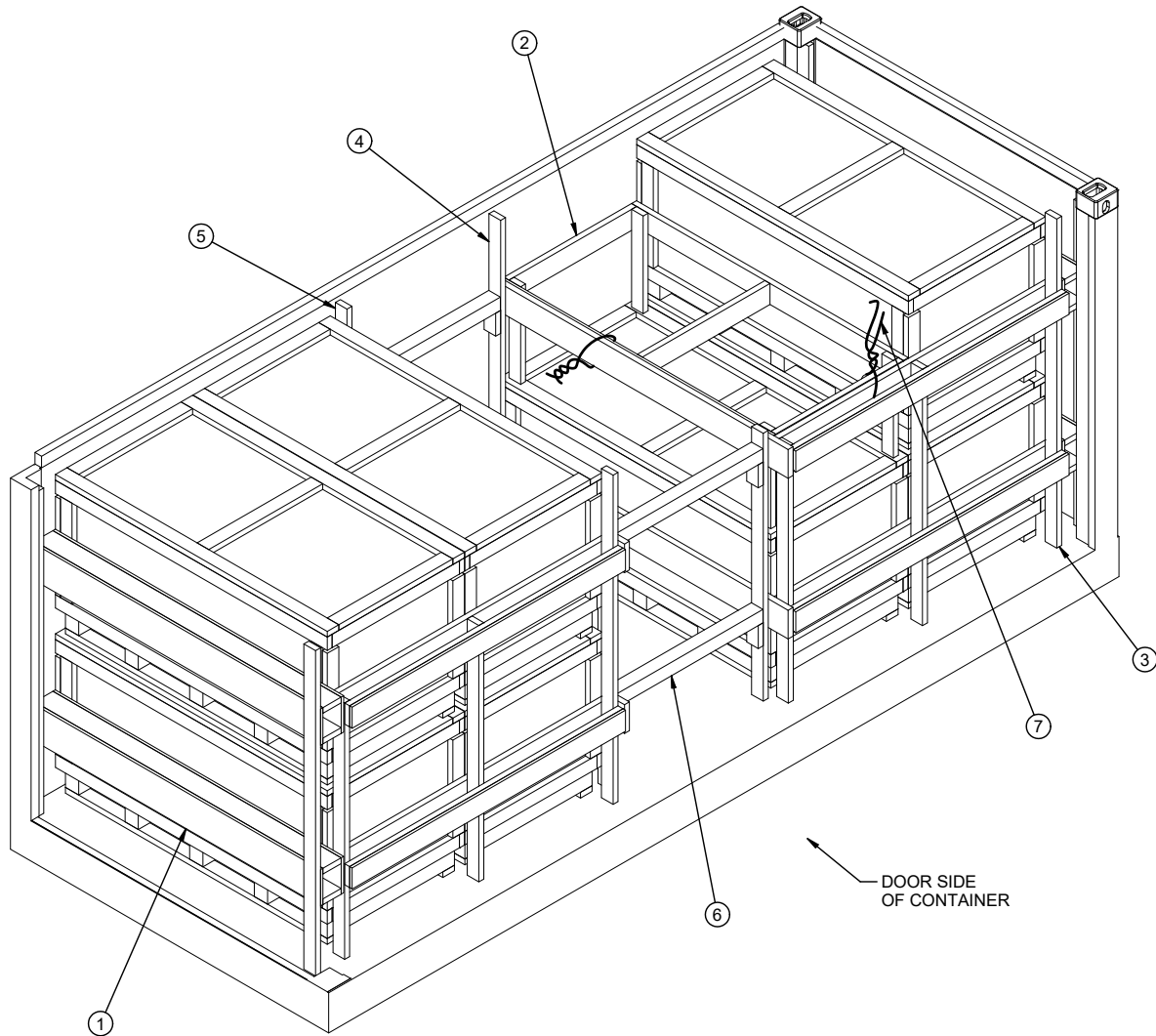
(GENERAL NOTES CONTINUED)

- 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 ATACMS M124 SOLID ROCKET MOTOR PACKED ONE PER SHIPPING CRATE. SUBSEQUENT REFERENCE TO CRATE HEREIN MEANS THE CRATE WITH AMMUNITION ITEMS. SEE PAGE 5 AND ATLANTIC RESEARCH CORPORATION DRAWING CA0267005 FOR DETAILS OF THE CRATE. **CAUTION:** REGARDLESS OF THE QUANTITY OF CRATES 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 ISO CONTAINER WITH INSIDE DIMENSIONS OF 19'-5-1/4" LONG BY 89-3/4" WIDE BY 88" HIGH, WITH A MAXIMUM GROSS WEIGHT OF 52,910 POUNDS. OLDER/OTHER CONTAINERS MAY HAVE DIFFERENT INSIDE MEASUREMENTS, VERIFY INSIDE CONTAINER DIMENSIONS PRIOR TO FABRICATING DUNNAGE. THE LOAD IS DESIGNED FOR TRAILER/CONTAINER-ON-FLATCAR (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 CRATES, 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 FROM A LOAD BY LAMINATING ADDITIONAL PIECES OF APPROPRIATE THICKNESS TO THE HORIZONTAL PIECES ON THE CRIB FILL ASSEMBLIES. NAIL EACH ADDITIONAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". THE LOADS MUST BE AS TIGHT AS POSSIBLE LONGITUDINALLY, BUT THE VOID MUST NOT EXCEED 3/4" OVERALL. EXCESSIVE SLACK CAN BE ELIMINATED BY INCREASING THE LENGTH OF STRUTS.
- E. 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 BE-SIDE A NAIL IN A LOWER PIECE.
- F. IN SOME CONTAINERS THERE IS A SLOT AT THE CORNERS OF THE ENDWALL. PIECES OF DUNNAGE MATERIAL MUST BE LAMINATED TO THE BUFFER PIECES ON THE END BLOCKING ASSEMBLY 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". NOTE THAT SOME CONTAINERS ARE EQUIPPED WITH "TIE-BARS" IN THE CORNER SLOT, WHICH PRECLUDE THE USE OF A FULL HEIGHT FILL PIECE. WHEN "TIE-BARS" ARE PRESENT, THE FILL PIECE MUST BE INSTALLED IN SEGMENTS DESIGNED TO FIT BETWEEN THE "TIE-BARS" VERTICALLY. THE FILL PIECE(S) IS NOT REQUIRED WHEN THE CORNER PORTIONS OF THE CONTAINER FORWARD WALL ARE SMOOTH AND FLAT. DO NOT ALLOW ANY DUNNAGE ASSEMBLY TO CONTACT THE CONTAINER ENDWALLS, ONLY THE CORNER POSTS OF THE CONTAINER SHOULD BE USED FOR FORWARD LONGITUDINAL BLOCKING.
- G. 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.
- 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 SIDEWALL, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.
- 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. REQUIREMENTS CITED WITHIN THE ASSOCIATION OF AMERICAN RAILROADS (AAR) INTERMODAL LOADING GUIDE APPLY WHEN THE SHIPMENT MOVES BY TRAILER/CONTAINER-ON-FLATCAR (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.

(CONTINUED AT RIGHT)

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).
- PLYWOOD - - - - - -: COMMERCIAL ITEM DESCRIPTION A-A-55057, 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, 0.0800" DIA, GRADE 1006 OR BETTER.



ISOMETRIC VIEW

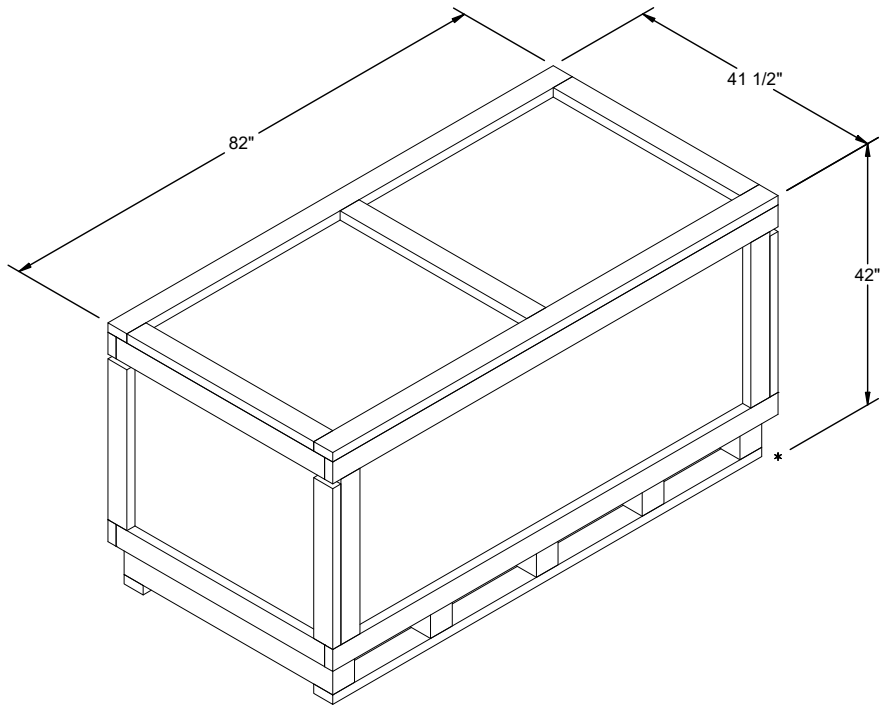
KEY NUMBERS

- ① END BLOCKING ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 6.
- ② FILLER ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 6.
- ③ CRIB FILL ASSEMBLY B (2 REQD). SEE THE DETAIL ON PAGE 8.
- ④ CENTER GATE RIGHT (1 REQD). SEE THE DETAIL ON PAGE 7.
- ⑤ CENTER GATE LEFT (1 REQD). SEE THE DETAIL ON PAGE 7.
- ⑥ STRUT, 4" X 4" BY CUT-TO-FIT (REF: 44-3/4") (4 REQD). INSTALL AS SHOWN AND TOENAIL EACH END TO THE CENTER GATE W/12d NAILS. SEE THE "BEVEL-CUT" DETAIL ON PAGE 5.
- ⑦ TIE WIRE, .0800 BY 24" LONG (2 REQD). INSTALL TO FORM A COMPLETE LOOP AROUND THE FILLER ASSEMBLY AND A CRIB FILL ASSEMBLY OR THE CENTER GATE. BRING ENDS TOGETHER AND TWIST TAUT.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	28	14
2" X 4"	104	69
2" X 6"	136	136
2" X 8"	30	40
4" X 4"	15	20
NAI LS	NO. REQD	POUNDS
6d (2")	208	1-1/4
10d (3")	182	3
12d (3-1/4")	16	1/4
PLYWOOD, 3/4" - - 45.92 SQ FT REQD - - 94.70 LBS		
WI RE, .0800" DIA - - - - 4' REQD - - 0.10 LBS		

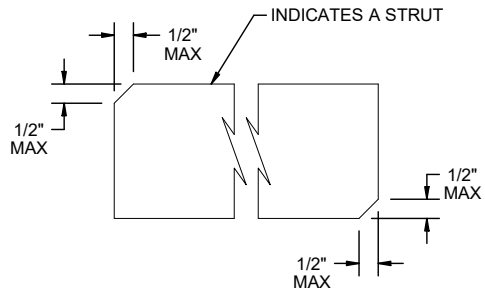
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
SHI PPI NG CRATE	7	18,102 LBS
DUNNAGE		658 LBS
CONTAI NER		6,050 LBS
TOTAL WEIGHT		24,810 LBS (APPROX)



SHIPPING CRATE DATA

GROSS WEIGHT - - - - - 2,586 LBS (APPROX)
 CUBE - - - - - 82.7 CU FT (APPROX)



BEVEL CUT

IF DESIRED, EACH END OF A STRUT MAY BE BEVEL-CUT AS SHOWN ABOVE TO FACILITATE INSTALLING THE STRUTS WITH A "DRIVE" FIT.

BUFFER PIECE, 2" X 4" BY INSIDE CONTAINER HEIGHT MINUS 1" (REF 7'-1") (2 REQD). NAIL THRU PLYWOOD INTO THE BEAMS W/2-10d NAILS AT EACH JOINT.

BEAM, 2" X 6" BY INSIDE CONTIANER WIDTH MINUS 1" (REF 7'-3") (4 REQD).

PLYWOOD, 3/4" X 9-1/2" BY INSIDE CONTAINER WIDTH MINUS 1" (REF 7'-3") (4 REQD). NAIL TO THE BEAMS W/1-6d NAIL EVERY 8"

SEE GENERAL NOTE "F" ON PAGE 3.

69"

27"

END BLOCKING ASSEMBLY

THE DETAIL ABOVE DEPICTS A END BLOCKING ASSEMBLY TO BE USED WITH A TWO HIGH LOAD. FOR A ONE HIGH LOAD, ELIMNATE THE TOP BOX BEAM ASSEMBLY.

VERTICAL PIECE, 2" X 4" X 25-1/2" (4 REQD).

LONGITUDINAL PIECE, 2" X 6" X 6'-10" (2 REQD). NAIL TO THE VERTICAL PIECES AND TO THE CENTER LATERAL PIECE W/3-10d NAILS AT EACH JOINT.

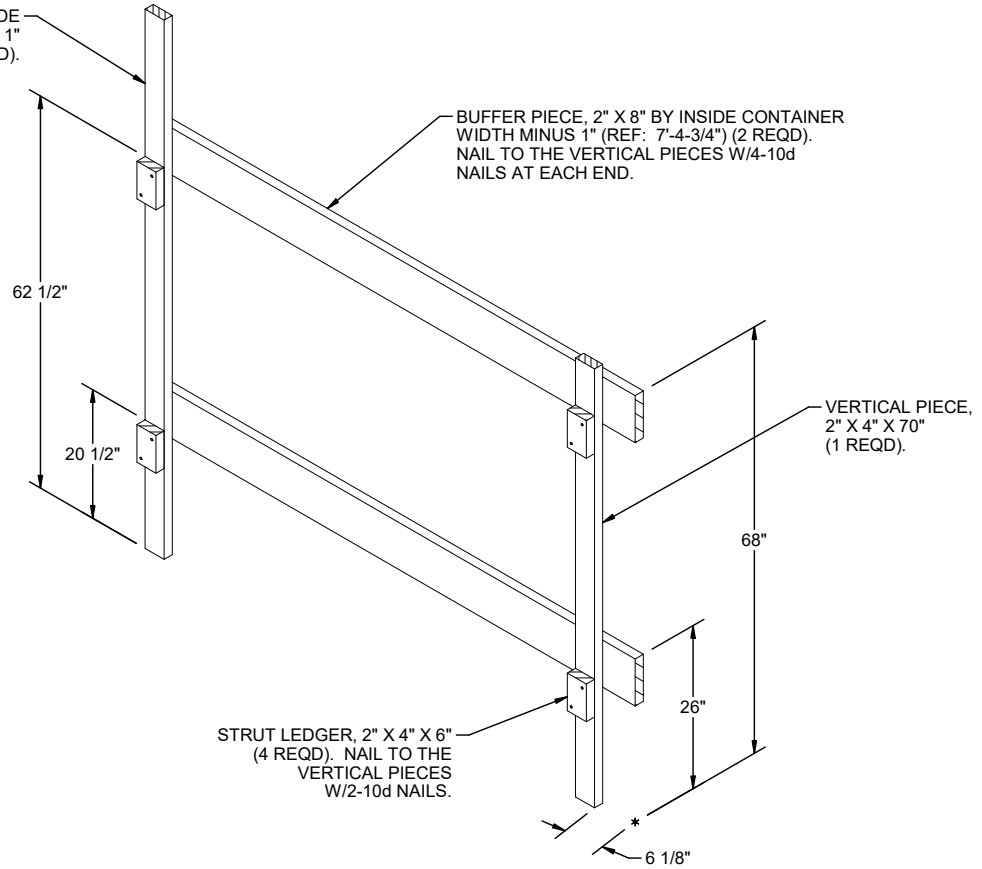
LATERAL PIECE, 2" X 6" X 38-1/2" (3 REQD). NAIL THE OUTER LATERAL PIECES TO THE VERTICAL PIECES W/3-10d NAILS AT EACH END.

40 1/4"

FILLER ASSEMBLY

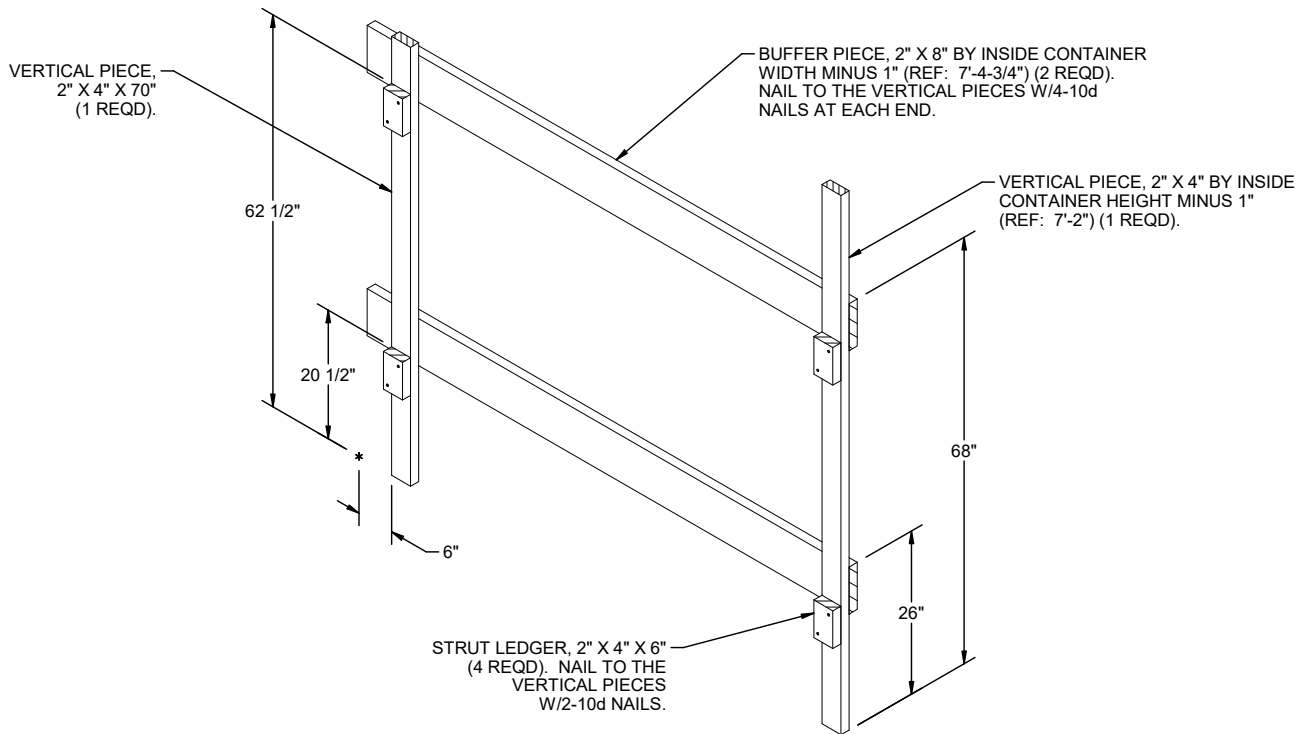
FOR MINUS ONE CRATE.

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



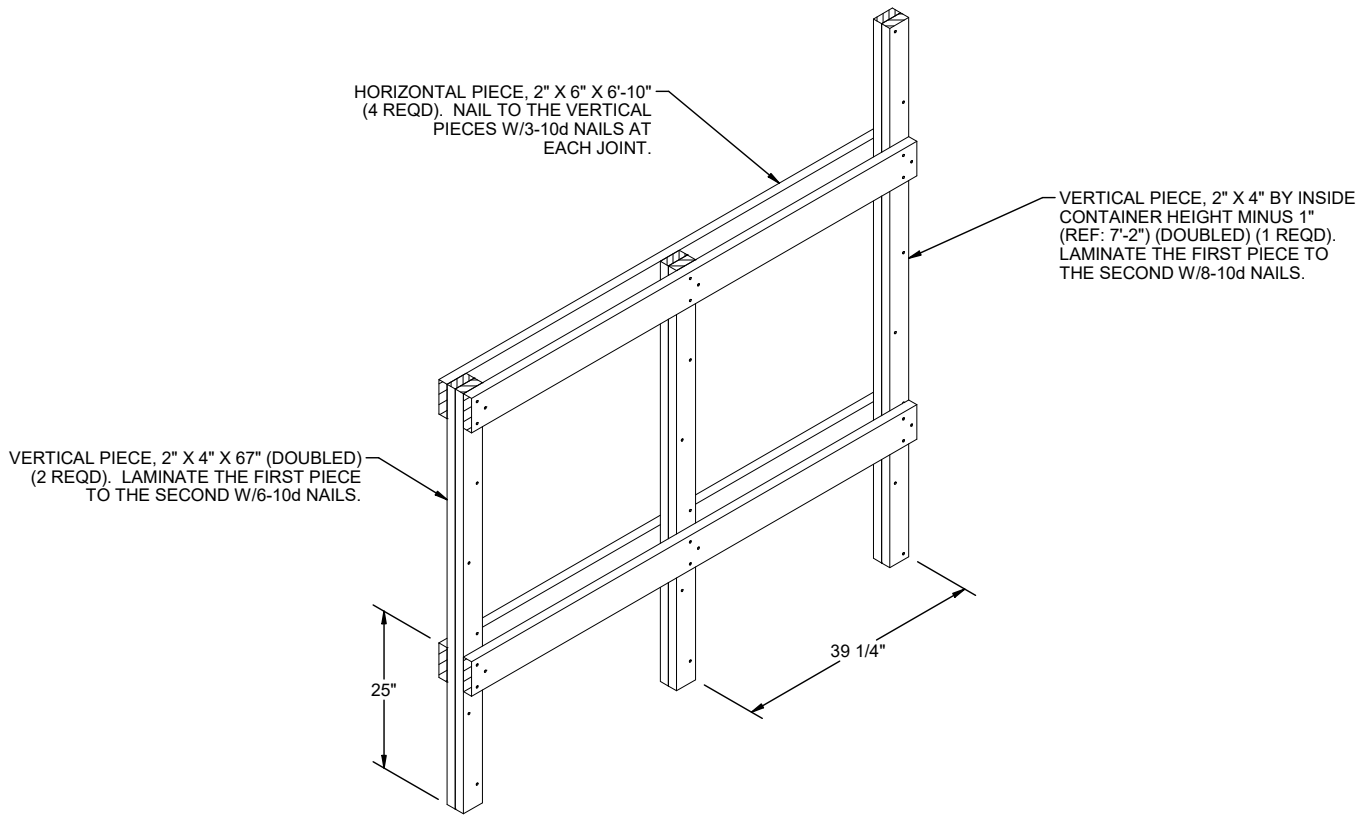
CENTER GATE RIGHT

THE DETAIL ABOVE DEPICTS A CENTER GATE TO BE USED ON THE RIGHT SIDE WITH A TWO HIGH LOAD. FOR A ONE HIGH LOAD, ELIMINATE THE UPPER BUFFER PIECE AND THE TOP TWO STRUT LEDGERS, AND SHORTEN THE 70" VERTICAL PIECE TO 28".



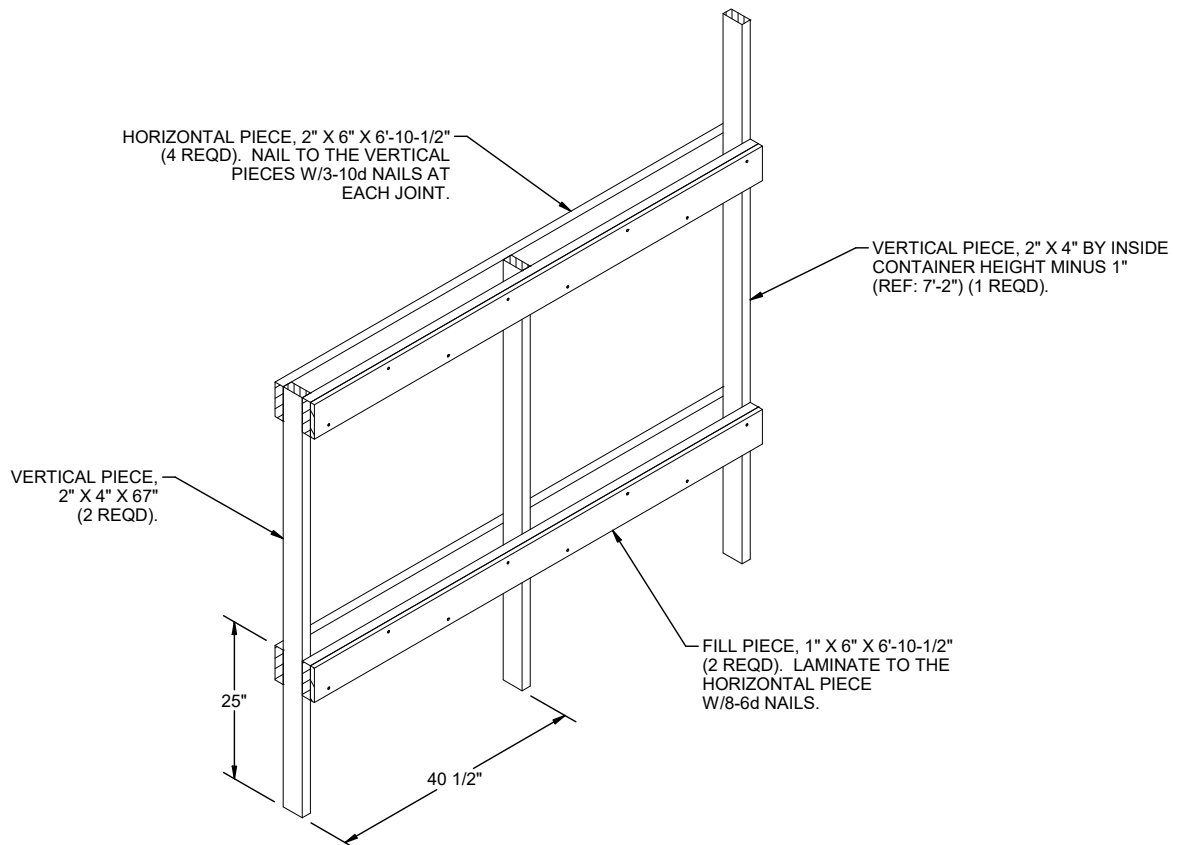
CENTER GATE LEFT

THE DETAIL ABOVE DEPICTS A CENTER GATE TO BE USED ON THE LEFT SIDE WITH A TWO HIGH LOAD. FOR A ONE HIGH LOAD, ELIMINATE THE UPPER BUFFER PIECE AND THE TOP TWO STRUT LEDGERS, AND SHORTEN THE 70" VERTICAL PIECE TO 28".



CRIB FILL ASSEMBLY A

FOR A ONE-HIGH LOAD, ELIMINATE THE TOP SET OF HORIZONTAL PIECES,
AND SHORTEN THE 67" VERTICAL PIECES TO 25".



CRIB FILL ASSEMBLY B

FOR A ONE-HIGH LOAD, ELIMINATE THE TOP SET OF HORIZONTAL PIECES
AND FILL PIECE, AND SHORTEN THE 67" VERTICAL PIECES TO 25".