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BUREAU OF EXPLOSIVES

O. L. Long

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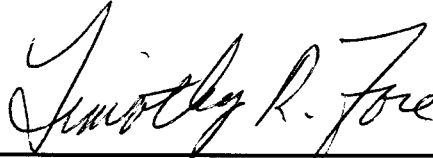

LOADING AND BRACING* IN SIDE OPENING ISO CONTAINERS OF 40MM CARTRIDGES PACKED IN PA120 METAL BOXES, UNITIZED ON A 45-1/2" X 35" METAL PALLET

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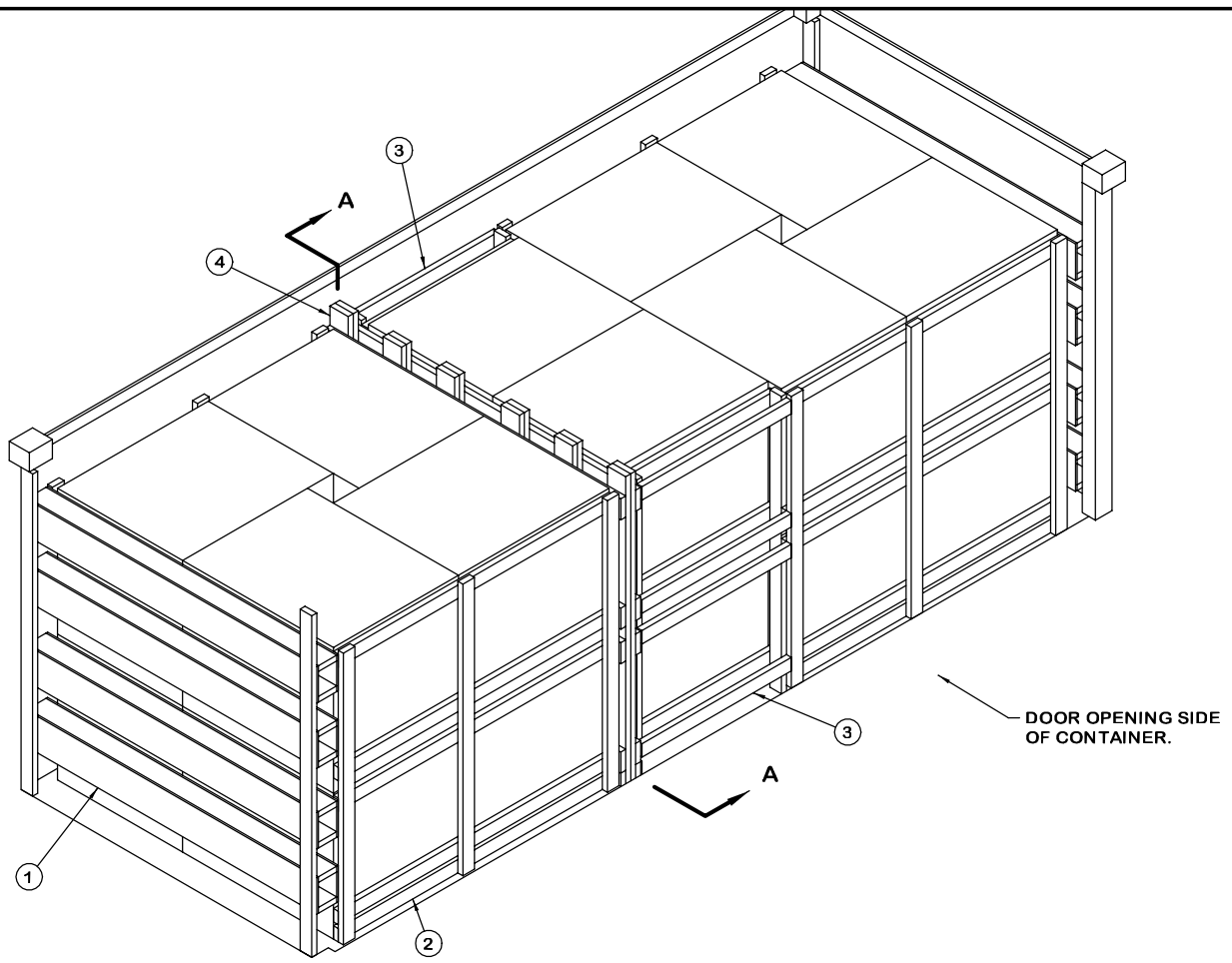
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- * LOADING AND BRACING SPECIFICATIONS SET FORTH WITHIN THIS DRAWING ARE APPLICABLE TO LOADS THAT ARE TO BE SHIPPED BY TRAILER/CONTAINER-ON-FLATCAR (T/COFC) RAIL CARRIER SERVICE. THESE SPECIFICATIONS MAY ALSO BE USED FOR LOADS THAT ARE TO BE MOVED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

U.S. ARMY MATERIEL COMMAND DRAWING

APPROVED, U.S. ARMY INDUSTRIAL OPERATIONS COMMAND 	ENGINEER	BASIC		DO NOT SCALE			
		REV.		WEBSITE: HTTP://WWW.DAC.ARMY.MIL			
	TECHNICIAN	BASIC	RICHARD HAYNES	AUGUST 1998			
		REV.					
	DRAFTSMAN	BASIC					
		REV.					
APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND 	TRANSPORTATION ENGINEERING DIVISION		<i>W. R. Francis</i>				
	VALIDATION ENGINEERING DIVISION		<i>James H. Kuhn</i> TESTED	CLASS	DIVISION	DRAWING	FILE
	LOGISTICS ENGINEERING OFFICE		<i>William F. Ernest</i>	19	48	4271/ 21	15PM1015

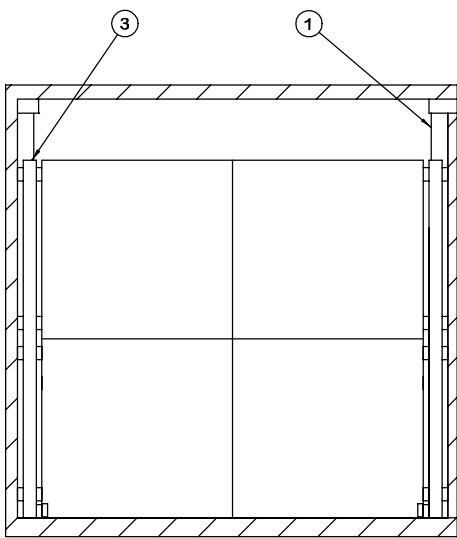
PROJECT CA 286/21-92



ISOMETRIC VIEW

KEY NUMBERS

- ① END BLOCKING ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 4. SEE GENERAL NOTES "F" AND "G" ON PAGE 3.
- ② SIDE BLOCKING ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 5.
- ③ SIDE FILL (2 REQD). SEE THE DETAIL ON PAGE 5. POSITION SO AS TO BE ADJACENT TO THE PALLET UNITS IN THE CENTER PORTION OF THE CONTAINER.
- ④ CENTER GATE (2 REQD). SEE THE DETAIL ON PAGE 6. WIRE TIE TO A PALLET UNIT IN TWO PLACES WITH 24" LONG PIECES OF WIRE.



SECTION A-A

(GENERAL NOTES CONTINUED)

GENERAL NOTES

- 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. THE QUANTITY OF PALLET UNITS SHOWN IN THE LOAD ON PAGE 2 MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SEE THE "FILLER ASSEMBLY" ON PAGE 4. WHEN A CONTAINER IS TO BE 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.
 - 1. IF A LOAD IS REDUCED BY ONLY A SMALL AMOUNT (ONE OR TWO LADING UNITS), LADING UNITS NORMALLY MAY BE ELIMINATED FROM THE CENTER 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.
- O. RECOMMENDED SEQUENTIAL LOADING PROCEDURES:
 - 1. PREFABRICATE TWO END BLOCKING ASSEMBLIES, FOUR SIDE BLOCKING ASSEMBLIES, TWO SIDE FILL ASSEMBLIES, AND TWO CENTER GATES.
 - 2. INSTALL ONE END BLOCKING ASSEMBLY AND ONE SIDE BLOCKING ASSEMBLY.
 - 3. LOAD EIGHT PALLET UNITS IN A CHIMNEY PATTERN.
 - 4. REPEAT STEPS 2 AND 3 AT THE OPPOSITE END OF THE CONTAINER.
 - 5. INSTALL ONE SIDE FILL ASSEMBLY AND LOAD FOUR PALLET UNITS IN THE CENTER PORTION OF THE CONTAINER.
 - 6. INSTALL THE TWO CENTER GATES, THE REMAINING TWO SIDE BLOCKING ASSEMBLIES, AND THE SIDE FILL ASSEMBLY.

- 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 40MM CARTRIDGES PACKED IN PA 120 SERIES METAL CONTAINERS. SUBSEQUENT REFERENCE TO PALLET UNIT HEREIN MEANS THE PALLET UNIT WITH AMMUNITION ITEMS. SEE PAGE 4 AND AMC DRAWING 19-48-4232/21-20PM1007 FOR DETAILS OF THE PALLET UNIT. 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 ISO CONTAINER WITH INSIDE DIMENSIONS OF 19'-4" LONG BY 89" WIDE BY 88" HIGH. 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 PALLET UNITS, 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. EXCESSIVE SLACK CAN BE ELIMINATED FROM A LOAD BY LAMINATING ADDITIONAL PIECES OF APPROPRIATE THICKNESS TO THE VERTICAL PIECES ON THE SIDE FILL ASSEMBLIES. NAIL EACH ADDITIONAL PIECE W/1-APPLICABLY SIZED NAIL EVERY 12".
- E. DUNNAGE LUMBER SPECIFIED IS OF 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. 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, SUCH AS SOME ALL STEEL CONTAINERS, THERE IS A SLOT AT THE CORNERS OF THE ENDWALLS. A PIECE OF DUNNAGE MATERIAL MUST BE LAMINATED TO THE BUFFER PIECES OF THE END BLOCKING ASSEMBLIES TO PROVIDE A FLAT SURFACE FOR THE 2" X 4" 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 ENDWALL OF THE CONTAINER IS 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 ASSOCIATION OF AMERICAN RAILROADS IN TERMINAL 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.

MATERIAL SPECIFICATIONS

LUMBER -----: SEE TM 743-200-1 (DUNNAGE LUMBER) AND VOLUNTARY PRODUCTS STANDARD PS 20.

NAILS -----: ASTM F 1667; COMMON STEEL NAILS (NLCMS OR NLCMMS).

WIRE, CARBON STEEL : ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, .0800" DIA, GRADE 1006 OR BETTER.

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.

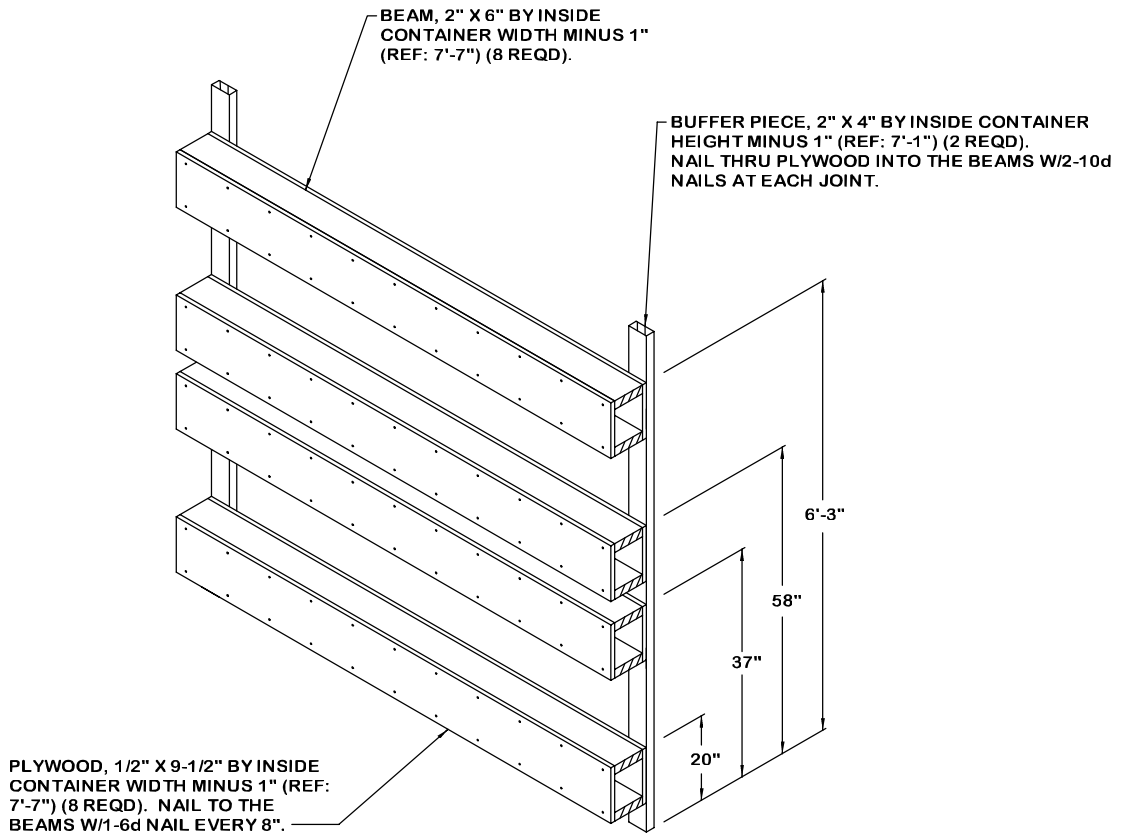
(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" x 4"	343	229
2" x 6"	261	261
NAILS	NO. REQD	POUNDS
6d (2")	352	2
10d (3")	484	7-1/2
PLYWOOD, 1/2"	96 SQ FT REQD	132 LBS
WIRE, 0.0800" DIA	4' REQD	NIL

LOAD AS SHOWN

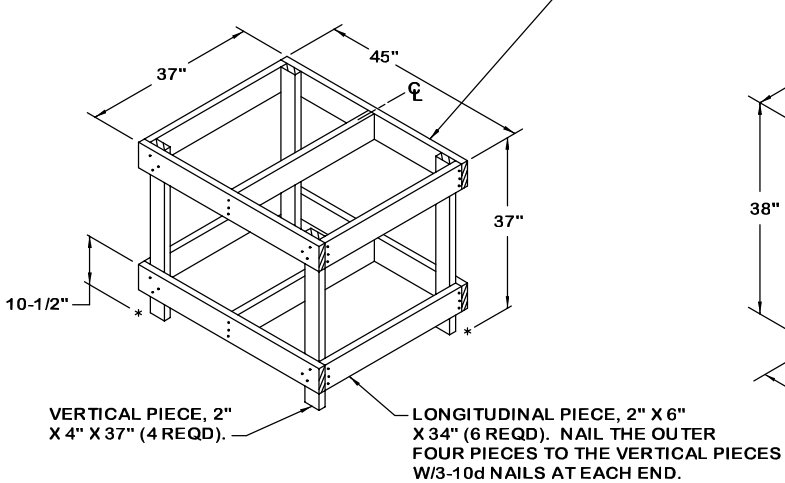
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	20	44,000 LBS
DUNNAGE		1,122 LBS
CONTAINER		6,050 LBS

TOTAL WEIGHT ----- 51,172 LBS (APPROX)



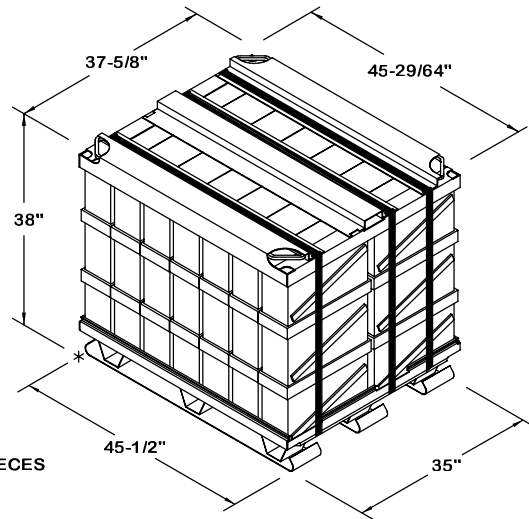
END BLOCKING ASSEMBLY

LATERAL PIECE, 2" X 6" X 45" (4 REQD). NAIL TO THE VERTICAL PIECES AND TO THE CENTER LONGITUDINAL PIECE W/3-10d NAILS AT EACH JOINT.



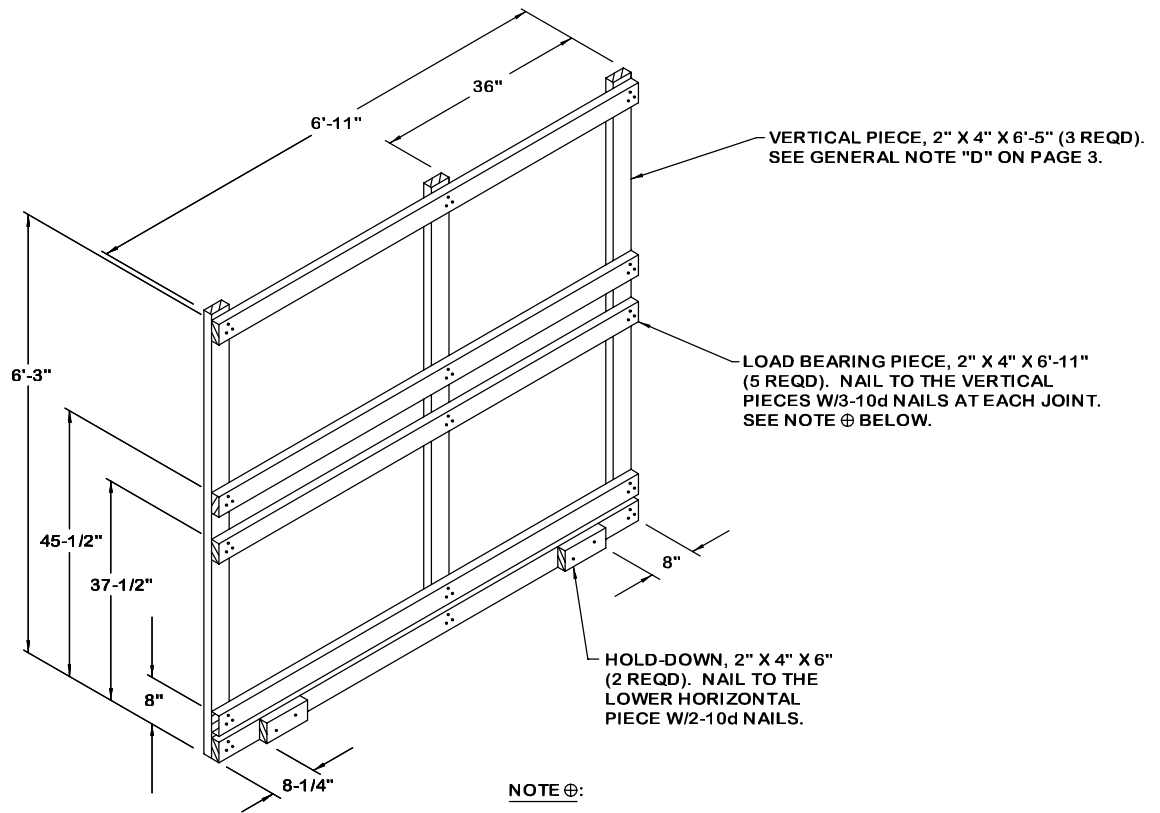
FILLER ASSEMBLY

THE ASSEMBLY DEPICTED ABOVE IS FOR USE IN PLACE OR AN OMITTED PALLET UNIT. FILLER ASSEMBLIES MUST BE WIRE TIED TO ADJACENT PALLET UNITS TO PREVENT UNDUE MOVEMENT. NO MORE THAN FIVE FILLER ASSEMBLIES MAY BE USED IN THE LOAD DEPICTED ON PAGE 2. DO NOT INSTALL A FILLER ASSEMBLY IMMEDIATELY ADJACENT TO ANOTHER FILLER ASSEMBLY.



PALLET UNIT

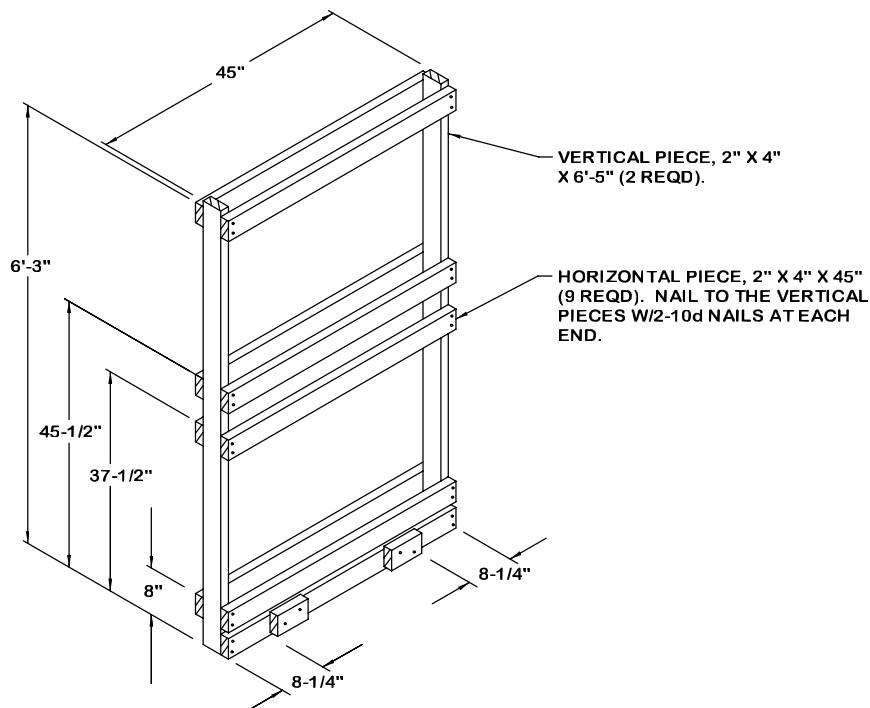
UNIT WEIGHT - - - - - 2,200 LBS (APPROX)
 CUBE - - - - - 37.6 CU FT (APPROX)



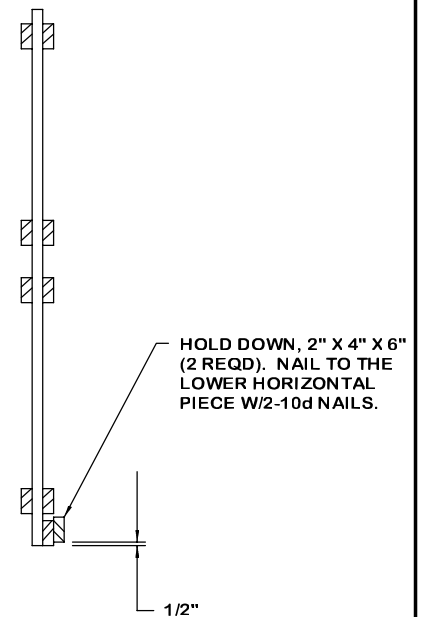
NOTE ⊕:

LOAD BEARING PIECES MAY BE CONSTRUCTED FROM 1" X 4" MATERIAL IF THE INSIDE WITH OF THE CONTAINER IS SUCH THAT 2" X 4" MATERIAL WILL BE TOO THICK.

SIDE BLOCKING ASSEMBLY



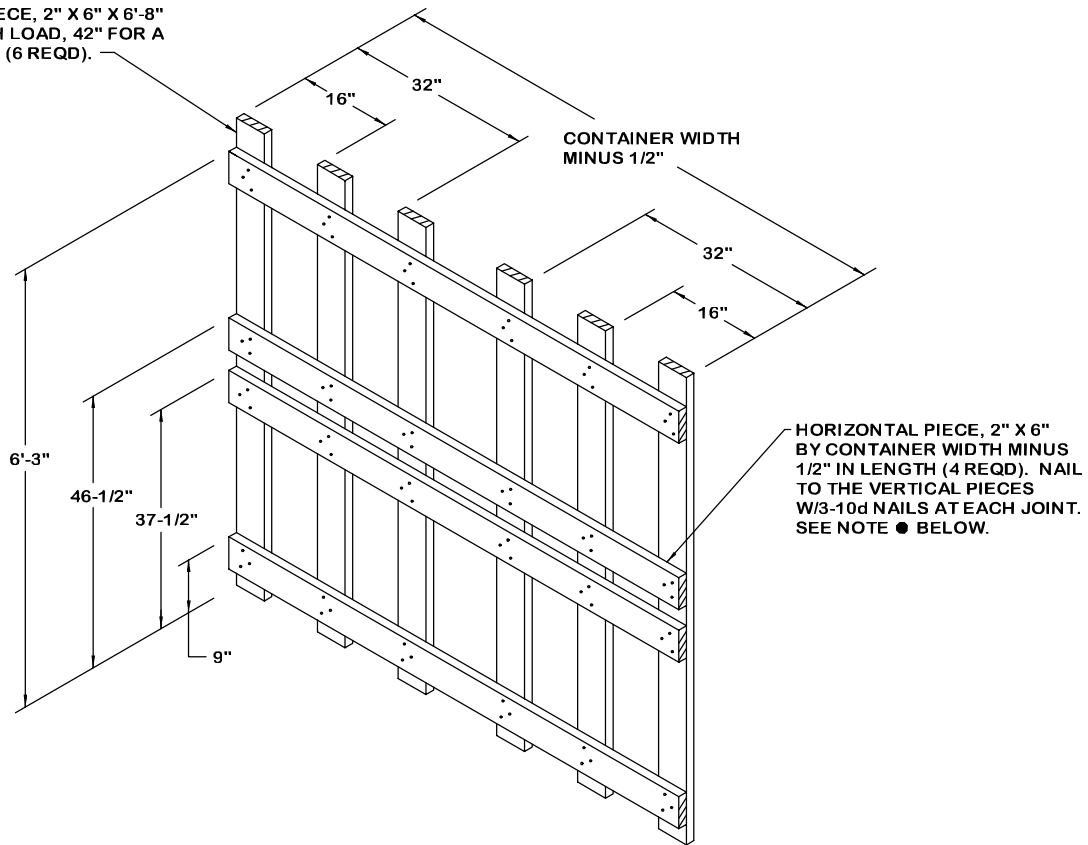
SIDE FILL



END VIEW

DETAILS

VERTICAL PIECE, 2" X 6" X 6'-8"
FOR A 2-HIGH LOAD, 42" FOR A
1-HIGH LOAD (6 REQD).



CENTER GATE

NOTE ●:

HORIZONTAL PIECES MAY BE CONSTRUCTED FROM
1" X 6" MATERIAL IF THE VOID BETWEEN THE PALLET
UNITS IS SUCH THAT 2" X 6" MATERIAL WOULD BE
TOO THICK.