APPROVED BY
BUREAU OF EXPLOSIVES

DATE ///0/04

JAVELIN

LOADING AND BRACING IN END OPENING ISO CONTAINERS OF GUIDED MISSILES PACKED ONE PER PLASTIC CONTAINER

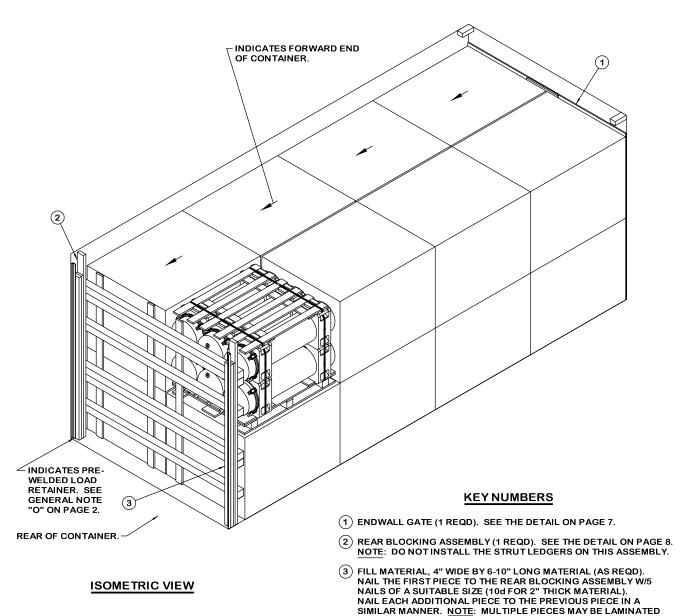
<u>INDEX</u>

<u>ITEM</u>	PAGE(S)
16-UNIT LOAD IN AN ISO CONTAINER EQUIPPED WITH PRE-WELDED LOAD RETAINERS	
GENERAL NOTES AND MATERIAL SPECIFICATIONS	
12-UNIT LOAD	4
PALLET UNIT DETAIL	
EIGHT-UNIT LOAD	6
DETAILS	7-10

U.S. ARMY MATERIEL COMMAND DRAWING

	APPROVED, U.S. ARMY AVIATION AND MISSILE COMMAND	CAUTION: VERIFY PRIOR TO USE AT WWW.DAC.ARMY.MIL THAT THIS IS THE MOST CURRENT VERSION OF THIS DOCUMENT. THIS IS PAGE 1 OF 10.					
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	PROVED BY ORDER OF COMMANDING GENERAL,	TRANSPORTATION	4.0.0.00			<u></u>	
	U.S. ARMY MATERIEL COMMAND	ENGINEERING DIVISION	J. T. Willis				
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	U.S. ARMY DEFENSE AMMUNITION CENTER	DIRECTORATE	S. o. Willis				

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.



BILL OF MATERIAL			
LUMBER	LINEAR FEET	BOARD FEET	
1" × 4" 2" × 4" 4" × 4"	19 60 31	7 40 41	
NAILS	NO. REQD	POUNDS	
6d (2") 10d (3")	34 74	1/4 1-1/4	
PLYWOOD, 1/2" 53.67 SQ FT REQD 73.79 LBS			

LOAD AS SHOWN

TOGETHER FIRST AND THEN TOENAILED TO THE REAR BLOCKING

ASSEMBLY. SEE "DETAIL A" ON PAGE 10.

ITEM	QUANTITY	WEIGHT (APPROX)
DUNNAGE	16	²⁴⁹ LBS
TOTAL	, ETCUT	16 060 + 86 (48880)

TOTAL WEIGHT - - - - - - 16,069 LBS (APPROX)

PAGE 2

16-UNIT LOAD IN AN ISO CONTAINER EQUIPPED WITH PRE-WELDED LOAD RETAINERS

(GENERAL NOTES CONTINUED)

- H. <u>CAUTION</u>: 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:
 - A LOADED CONTAINER MUST BE ON A CHASSIS EQUIPPED WITH TWO BOGIE ASSEMBLIES WHEN BEING MOVED IN TOFC SERVICE.
 - 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
- M. 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.
- N. 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 0.454 KG.
- O. CAUTION: THE LOAD ON PAGE 2 CAN ONLY BE CONSTRUCTED USING AN ISO CONTAINER EQUIPPED WITH PRE-WELDED LOAD RETAINERS. THIS LOAD CANNOT BE CONSTRUCTED USING EITHER UNIVERSAL LOAD RETAINERS OR DOOR POST VERTICAL RETAINERS. ANY OF THE THREE AFT END RESTRAINT METHODS DEPICTED IN DEPARTMENT OF THE ARMY DRAWING DA-116 MAY BE USED FOR THE LOADS DEPICTED ON PAGES 4 AND 6.
- P. SIX UNIVERSAL LOAD RETAINERS ARE DEPICTED IN THE LOADS ON PAGES 4 AND 6. FOUR UNIVERSAL LOAD RETAINERS ARE REQUIRED WHEN LOADING ONE LAYER OF PALLET UNITS. REFER TO DAC DRAWING ACV00682 AND DEPARTMENT OF THE ARMY DRAWING DA-116 FOR DETAILS OF THE UNIVERSAL LOAD RETAINER CONSTRUCTION, INSTALLATION TO THE DOOR POST VERTICAL, PLACEMENT INTO THE CONTAINER, AND FOR OTHER METHODS OF REAR-OF-LOAD RESTRAINT.
- Q. 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.
- R. THE QUANTITY OF PALLET UNITS SHOWN IN THE LOADS ON PAGES 2, 4 OR 6 MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SEE THE FILLER ASSEMBLY ON PAGE 4.
 - IF A LOAD IS REDUCED BY ONLY A SMALL AMOUNT (LESS THAN FOUR LADING UNITS FOR THE LOADS ON PAGES 2 AND 4, AND LESS THAN TWO LADING UNITS FOR THE LOAD ON PAGE 6), LADING UNITS NORMALLY MAY BE ELIMINATED FROM THE CENTER OF THE LOAD.
 - 2. IF A LOAD IS REDUCED BY A LARGE AMOUNT (MORE THAN THREE LADING UNITS FOR THE LOADS ON PAGES 2 AND 4, AND MORE THAN ONE LADING UNIT FOR THE LOAD ON PAGE 6), 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.

GENERAL NOTES

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCOR-DANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE SPECIFIED OUTLOADING PROCEDURES ARE APPLICABLE TO LOADS JAVELIN MISSILES PACKED IN PLASTIC CONTAINERS. SUBSEQUENT REFERENCE TO PALLET UNIT HEREIN MEANS THE PALLET UNIT WITH MISSILE ITEMS. SEE PAGE 4 AND AMC DRAWING 19-48-5270-GM20JV2 FOR DETAILS OF THE PALLET UNIT. THE PROCEDURES SHOWN HEREIN MAY ALSO BE USED TO SHIP JAVELIM MISSILES PACKED IN PLASTIC CONTAINERS PALLETIZED ON NATO PALLETS IAW AMC DRAWING 19-48-5275-GM20JV3. CAUTION: REGARDLESS OF THE QUANTITY OF CONTAINERS TO BE SHIPPED, THE "MAXIMUM GROSS WEIGHT" OF THE END OPENING ISO CONTAINER MUST NOT BE EXCEEDED.
- C. THE LOAD AS SHOWN IS BASED ON A 4,700 POUND 20' LONG BY 8' WIDE BY 8'-6" HIGH END OPENING ISO CONTAINER WITH INSIDE DIMENSIONS OF 19'-4" LONG BY 92" WIDE BY 93" HIGH, WITH A MAXIMUM GROSS WEIGHT OF 52,910 POUNDS. OLDER/OTHER CONTAINERS MAY HAVE A TOTAL INSIDE HEIGHT OF 95", BUT A CLEAR HEIGHT UNDER THE ROOF BOWS OF 93", VERIFY INSIDE CONTAINER HEIGHT 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 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 FROM A LOAD BY LAMINATING ADDITIONAL PIECES OF APPROPRIATE THICKNESS TO THE LONGITUDINAL PIECES ON THE SIDE FILL ASSEMBLIES. NAIL EACH ADDITIONAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE LENGTH OF THE LATERAL PIECES IN THE SIDE FILL ASSEMBLIES MAY BE ADJUSTED AS REQUIRED TO FACILITATE VARIANCE IN THE SIZE OF THE PALLET UNIT.
- 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" 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 THERE IS A SLOT AT THE CORNERS OF THE FORWARD WALL. PIECES OF DUNNAGE MATERIAL MUST BE LAMINATED TO THE BUFFER PIECES ON THE FORWARD STRUT 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". 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 FORWARD WALL, ONLY THE CORNER POSTS OF THE CONTAINER SHOULD BE USED FOR FORWARD LONGITUDINAL BLOCKING

(CONTINUED AT LEFT)

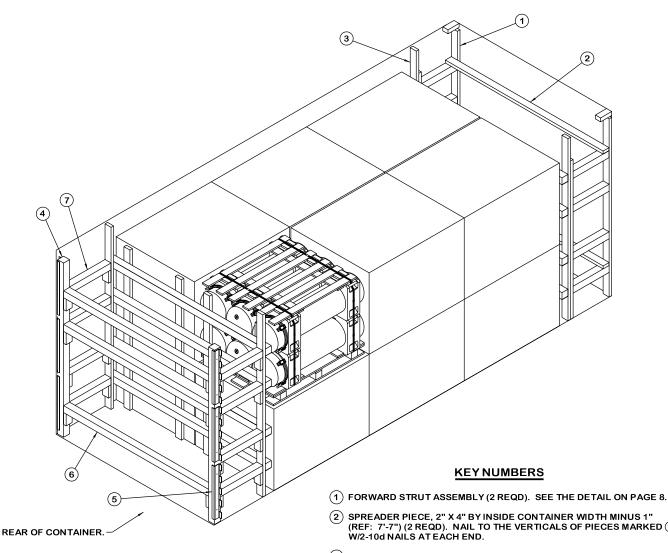
MATERIAL SPECIFICATIONS

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

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

STEEL,
STRUCTURAL - - - -: ASTM A36; 36,000 PSI MINIMUM YIELD OR
BETTER.



ISOMETRIC VIEW

BILL OF MATERIAL			
LUMBER	LINEAR FEET	BOARD FEET	
2" x 4" 4" x 4"	82 97	55 129	
NAILS	NO. REQD	POUNDS	
10d (3") 12d (3-1/4")	122 76	2 1-1/4	
UNIVERSAL LOAD RETAINER 6 REOD 39 LBS			

- (2) SPREADER PIECE, 2" X 4" BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-7") (2 REQD). NAIL TO THE VERTICALS OF PIECES MARKED (1)
- (3) FORWARD/REAR BLOCKING ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 8. NAIL THROUGH THE BUFFER PIECES INTO THE VERTICAL PIECE OF PIECES MARKED (1) W/5-10d NAILS. NOTE: STRUT LEDGERS ARE ONLY REQUIRED ON THE REAR BLOCKING ASSEMBLY. DO NOT INSTALL STRUT LEDGERS ON THE FORWARD BLOCKING ASSEMBLY.
- (4) DOOR POST VERTICAL (2 REQD). SEE THE DETAIL ON PAGE 7 AND "DETAIL B" ON PAGE 10.
- (5) UNIVERSAL LOAD RETAINER (6 REQD, 3 PER SIDE). NAIL THROUGH THE HOLES INTO THE DOOR POST VERTICAL W/2-10d NAILS. SEE DE-PARTMENT OF ARMY DRAWING DA-116, DAC DRAWING ACV00682, "DETAIL B" ON PAGE 10, AND GENERAL NOTE "P" ON PAGE 3.
- (6) DOOR SPANNER, 4" X 4" MATERIAL CUT TO A LENGTH THAT WILL PROVIDE A DRIVE FIT (REF: 7'-1-1/4") (3 REQD). TOENAIL TO THE DOOR POST VERTICAL W/2-12d NAILS AT EACH END. SEE THE "BEVEL-CUT" DETAIL ON PAGE 7.
- (7) STRUT, 4" X 4" BY CUT-TO-FIT (REF: 24-1/4") (8 REQD). TOENAIL TO THE BUFFER PIECES OF THE REAR BLOCKING ASSEMBLY AND TO THE DOOR POST VERTICAL W/2-12d NAILS AT EACH END. SEE THE "BEVEL-CUT" DETAIL ON PAGE 7.

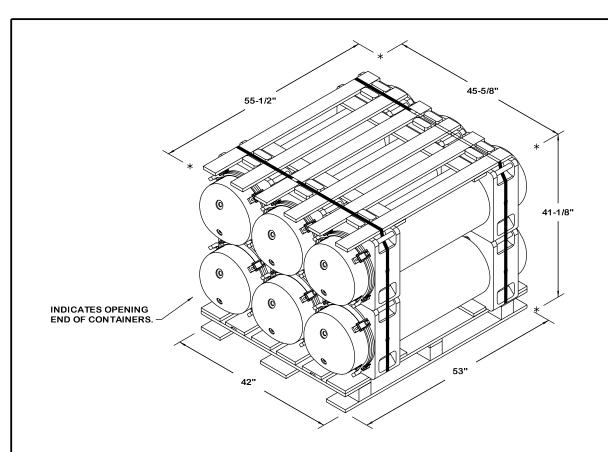
LOAD AS SHOWN

ITEM	QUANTITY	$\underline{\text{WEIGHT}}$ (APPROX)
DUNNAGE	12	409 LBS

TOTAL WEIGHT - - - - - - 13,449 LBS (APPROX)

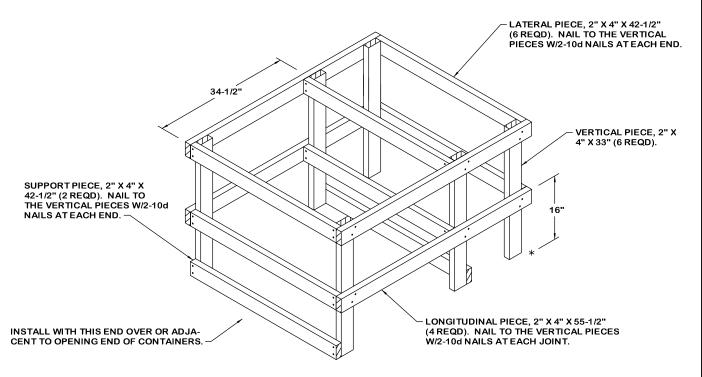
PAGE 4

12-UNIT LOAD



PALLET UNIT

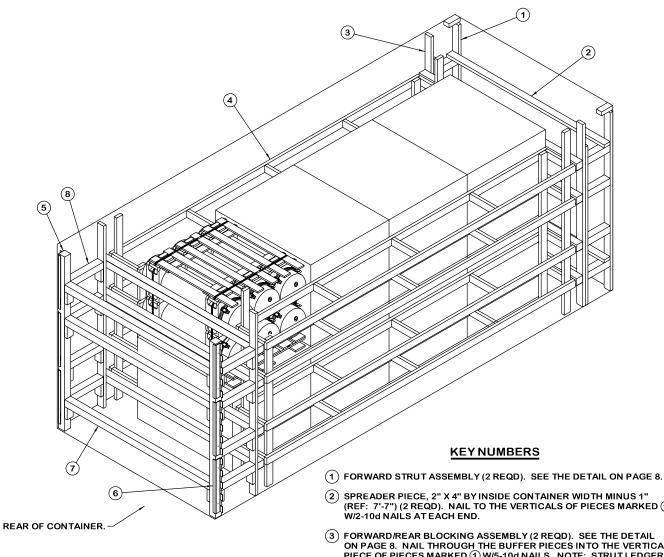
SEE GENERAL NOTE "B" ON PAGE 3.



FILLER ASSEMBLY

THE ASSEMBLY DEPICTED ABOVE IS FOR USE IN PLACE OF AN OMITTED PALLET UNIT. FILLER ASSEMBLIES MUST BE WIRE TIED TO ADJACENT PALLET UNITS OR DUNNAGE ASSEMBLIES TO PREVENT UNDUE MOVEMENT. NO MORE THAN THREE FILLER ASSEMBLIES MAY BE USED IN THE LOADS DEPICTED ON PAGES 2 AND 4, AND NO MORE THAN ONE FILLER ASSEMBLY MAY BE USED IN THE LOAD DEPICTED ON PAGE 6.

PAGE 5



ISOMETRIC VIEW

BILL OF MATERIAL			
LUMBER	LINEAR FEET	BOARD FEET	
2" x 4" 4" x 4"	462 54	308 72	
NAILS	NO. REQD	POUNDS	
10d (3") 12d (3-1/4")	346 76	5-1/2 1-1/4	
UNIVERSAL LOAD RETAINER 6 REOD 39 LBS			

- (REF: 7'-7") (2 REQD). NAIL TO THE VERTICALS OF PIECES MARKED (1)
- ON PAGE 8. NAIL THROUGH THE BUFFER PIECES INTO THE VERTICAL PIECE OF PIECES MARKED (1) W/5-10d NAILS. NOTE: STRUT LEDGERS ARE ONLY REQUIRED ON THE REAR BLOCKING ASSEMBLY. DO NOT INSTALL STRUT LEDGERS ON THE FORWARD BLOCKING ASSEMBLY.
- (4) SIDE FILL ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 9.
- (5) DOOR POST VERTICAL (2 REQD). SEE THE DETAIL ON PAGE 7 AND "DETAIL B" ON PAGE 10.
- (6) UNIVERSAL LOAD RETAINER (6 REQD, 3 PER SIDE). NAIL THROUGH THE HOLES INTO THE DOOR POST VERTICAL W/2-10d NAILS. SEE DE-PARTMENT OF ARMY DRAWING DA-116, DAC DRAWING ACV00682, "DETAIL B" ON PAGE 10, AND GENERAL NOTE "P" ON PAGE 3.
- (7) DOOR SPANNER, 4" X 4" MATERIAL CUT TO A LENGTH THAT WILL PROVIDE A DRIVE FIT (REF: 7'-1-1/4") (3 REQD). TOENAIL TO THE DOOR POST VERTICAL W/2-12d NAILS AT EACH END. SEE THE "BEVEL-CUT" DETAIL ON PAGE 7.
- (8) STRUT, 4" X 4" BY CUT-TO-FIT (REF: 19-1/4") (8 REQD). TOENAIL TO THE BUFFER PIECES OF THE REAR BLOCKING ASSEMBLY AND TO THE DOOR POST VERTICAL W/2-12d NAILS AT EACH END. SEE THE "BEVEL-CUT" DETAIL ON PAGE 7.

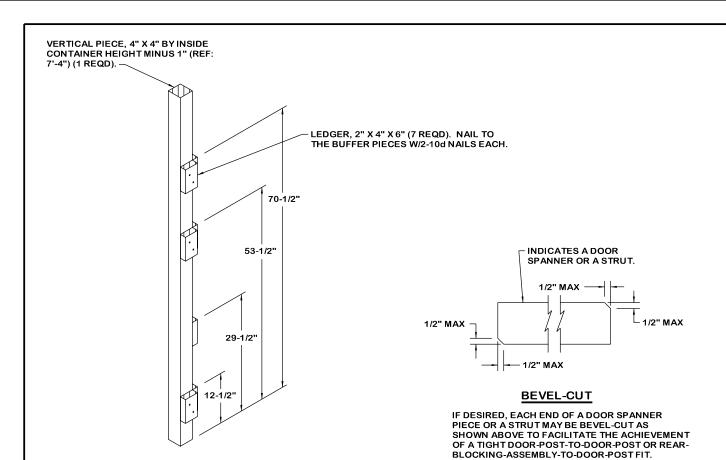
LOAD AS SHOWN

ITEM	QUANTITY	$\underline{\text{WEIGHT}}$ (APPROX)
DUNNAGE	8	805 LBS

TOTAL WEIGHT - - - - - - 11,065 LBS (APPROX)

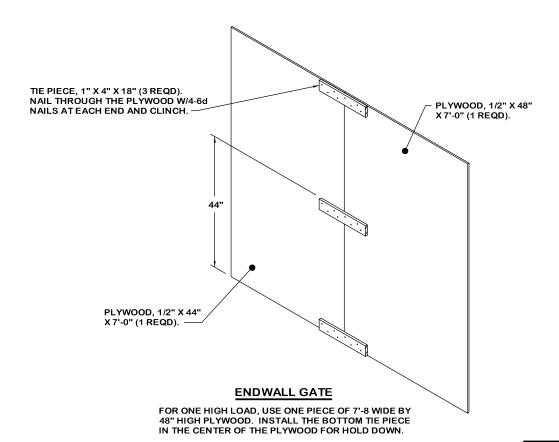
PAGE 6

EIGHT-UNIT LOAD

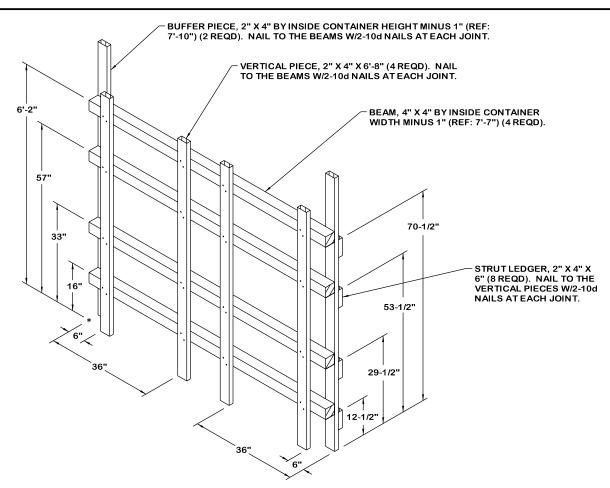


DOOR POST VERTICAL

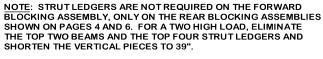
FOR A ONE HIGH LOAD, ELIMINATE THE TOP TWO STRUT LEDGERS AND THE TOP DOOR SPANNER LEDGER. REPOSITION THE DOOR SPANNER LEDGER CURRENTLY AT 53-1/2" TO 29-1/2".



PAGE 7



FORWARD/REAR BLOCKING ASSEMBLY



STRUT, 4" X 4" X 21" FOR THE LOAD
ON PAGE 4 OR 13" FOR THE LOAD
ON PAGE 6 (4 REQD).

VERTICAL PIECE, 2" X 4"
X 6'-8" (1 REQD). NAIL
TO THE STRUTS W/2-12d
NAILS AT EACH JOINT.

57"

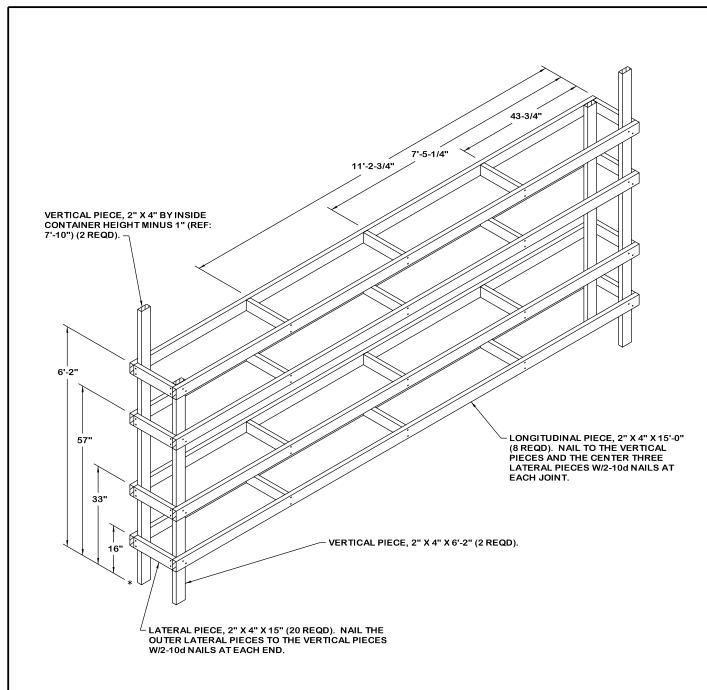
FORWARD STRUT ASSEMBLY

BUFFER PIECE, 2" X 4" BY INSIDE CONTAINER HEIGHT MINUS 1" (REF:

7'-7") (1 REQD). NAIL TO THE STRUTS

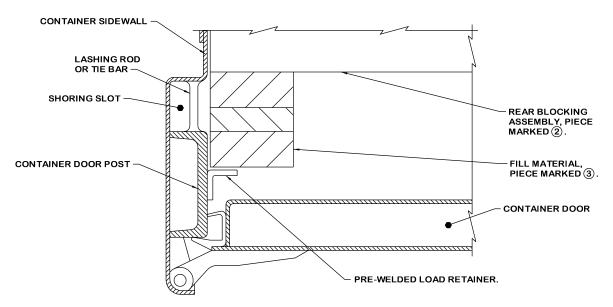
FOR A ONE HIGH LOAD, ELIMINATE THE TOP TWO STRUTS AND SHORTEN THE VERTICAL PIECE TO 39".

PAGE 8



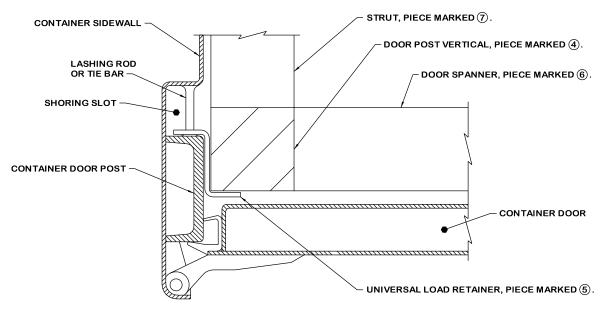
SIDE FILL ASSEMBLY

FOR A ONE HIGH LOAD, ELIMINATE THE TOP TWO LONGITUDINAL PIECES AND THE TOP 10 LATERAL PIECES. SHORTEN THE 6'-2" VERTICAL PIECES TO 33".



DETAIL A

THE VIEW AND KEY NUMBERS ABOVE REFER TO THE LOAD ON PAGE 2. SEE GENERAL NOTE "O" ON PAGE 3.



DETAIL B

THE VIEW ABOVE REFER TO THE LOADS ON PAGES 4 AND 6, AND THE KEY NUMBERS ABOVE REFER TO THE LOAD ON PAGE 4. SEE GENERAL NOTE "O" ON PAGE 3.