

DATE 4-12-05

LOADING AND BRACING* IN END OPENING ISO CONTAINERS OF JOINT DIRECT ATTACK MUNITION (JDAM), PACKED 2 PER CNU-589/E SHIPPING AND STORAGE CONTAINER

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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
FIELD SUPPORT 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 8.

DO NOT SCALE

FEBRUARY 2005

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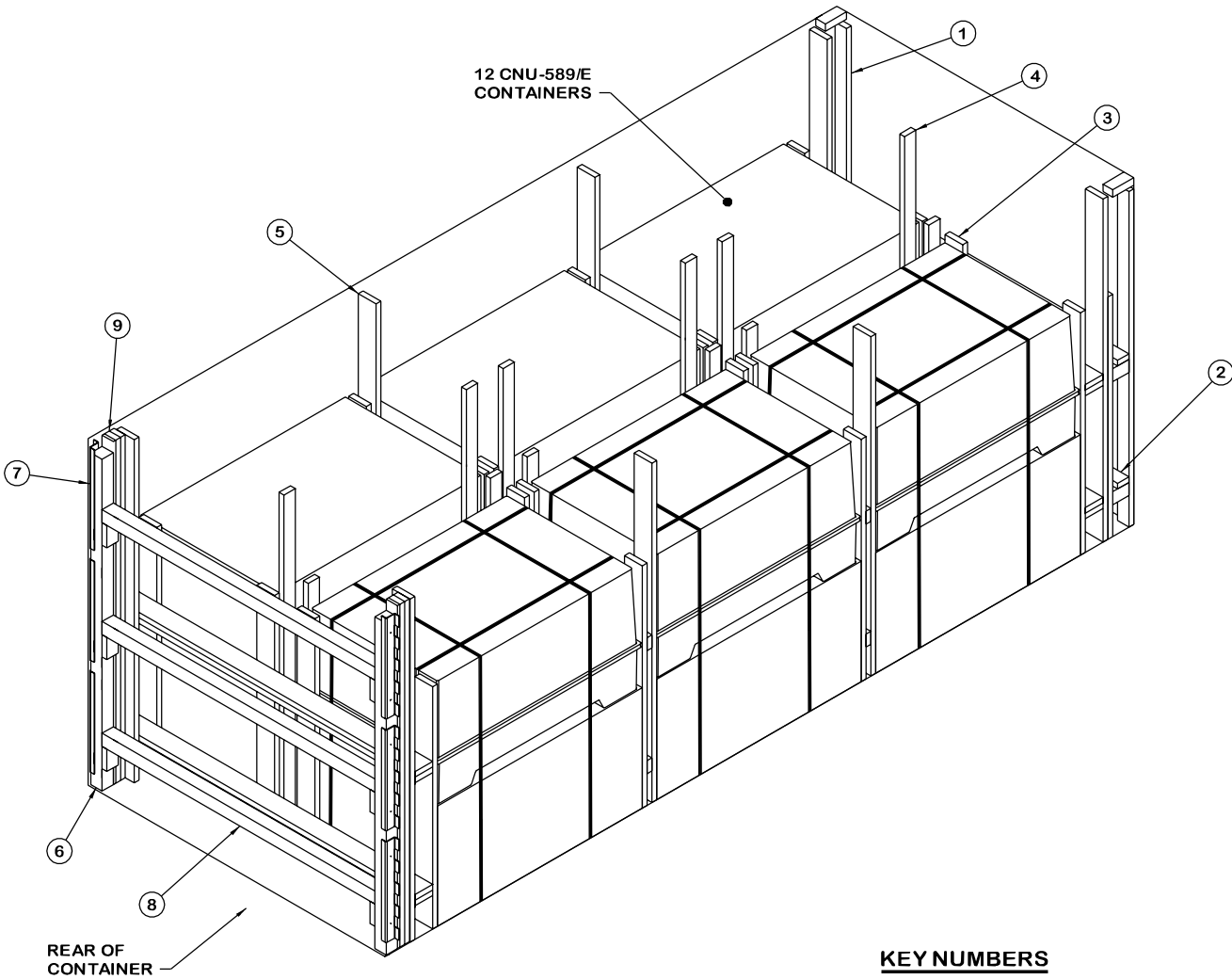
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CLASS	DIVISION	DRAWING	FILE
19	48	8788	SP15K10

APPROVED BY ORDER OF COMMANDING GENERAL,
U.S. ARMY MATERIEL COMMAND



U.S. ARMY DEFENSE AMMUNITION CENTER



ISOMETRIC VIEW

KEY NUMBERS

- ① STRUT ASSEMBLY (2 REQD). SEE DETAIL ON PAGE 4. AFTER THE END BLOCKING ASSEMBLY IS INSTALLED, NAIL THROUGH THE BUFFER PIECE OF THE END BLOCKING ASSEMBLY INTO THE VERTICAL PIECE OF THE STRUT ASSEMBLY W/4-10d NAILS.
- ② SPREADER PIECE, 2" X 4" BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-7") (2 REQD). NAIL TO THE STRUTS ON THE STRUT ASSEMBLY W/2-10d NAILS AT EACH END.
- ③ END BLOCKING ASSEMBLY (2 REQD). SEE DETAIL ON PAGE 4.
- ④ CRIB FILL ASSEMBLY (3 REQD). SEE DETAIL ON PAGE 5. POSITION BETWEEN ADJACENT 2-HIGH STACKS OF CNU-589/E CONTAINERS AS SHOWN.
- ⑤ SEPARATOR GATE (2 REQD). SEE DETAIL ON PAGE 5. POSITION BETWEEN ROWS OF CNU-589/E CONTAINERS AS SHOWN.
- ⑥ DOOR POST VERTICAL (2 REQD). SEE DETAIL ON PAGE 5 AND "DETAIL A" ON PAGE 6.
- ⑦ UNIVERSAL LOAD RETAINER (6 REQD, 3 PER SIDE). NAIL THROUGH THE HOLES INTO THE DOOR POST VERTICAL W/2-10d NAILS. SEE DEPARTMENT OF ARMY DRAWING DA-116, "DETAIL A" ON PAGE 6, AND DAC DRAWING ACV00682.
- ⑧ DOOR SPANNER, 4" X 4" MATERIAL CUT TO A LENGTH THAT WILL PROVIDE A DRIVE FIT (REF: 7'-1-3/8") (3 REQD). TOENAIL TO THE DOOR POST VERTICAL W/2-12d NAILS AT EACH END. SEE "BEVEL CUT" DETAIL ON PAGE 5.
- ⑨ FILL MATERIAL 4" WIDE BY 6'-10" LONG MATERIAL (AS REQD). NAIL THE FIRST PIECE TO THE REAR BLOCKING ASSEMBLY W/6 NAILS OF APPROPRIATE SIZE (10d FOR 2" THICK MATERIAL). NAIL EACH ADDITIONAL PIECE TO THE PREVIOUS PIECE IN A SIMILAR MANNER. NOTE: MULTIPLE PIECES MAY BE LAMINATED TOGETHER FIRST AND THEN TOENAILED TO THE END BLOCKING ASSEMBLY.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	290	193
2" X 6"	231	231
4" X 4"	55	73
NAILS	NO. REQD	POUNDS
10d (3")	390	6
12d (3-1/4")	12	1/4
UNIVERSAL LOAD RETAINER	--- 6 REQD ---	39 LBS

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CNU-589/E CONTAINER	-- 12	7,428 LBS
DUNNAGE	-----	1,039 LBS
CONTAINER	-----	4,700 LBS
TOTAL WEIGHT		13,167 LBS (APPROX)

N. 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.

O. 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.

P. THE QUANTITY OF CONTAINERS SHOWN IN THE LOAD ON PAGE 2 MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SEE THE DETAIL ON PAGE 7 AND GENERAL NOTE "H".

Q. RECOMMENDED SEQUENTIAL LOADING PROCEDURES:

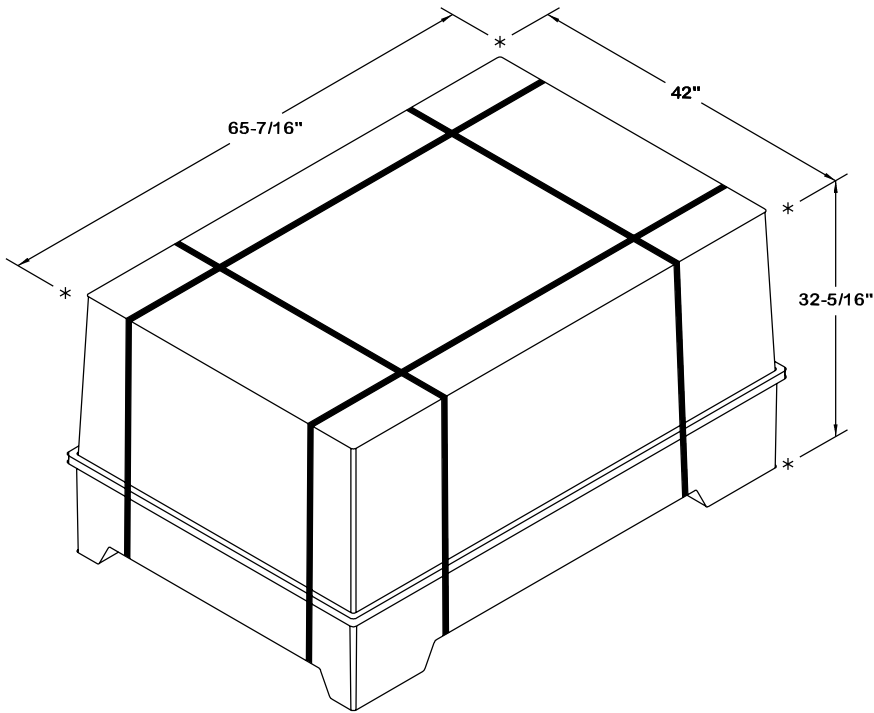
- 1. PREFABRICATE TWO STRUT ASSEMBLIES, TWO END BLOCKING ASSEMBLIES, THREE CRIB FILL ASSEMBLIES, AND TWO DOOR POST VERTICALS.
- 2. INSTALL THE TWO STRUT ASSEMBLIES, THE TWO SPREADER PIECES, AND ONE END BLOCKING ASSEMBLY.
- 3. LOAD TWO STACKS OF 2-HIGH CNU-589/E CONTAINERS.
- 4. INSTALL ONE CRIB FILL ASSEMBLY.
- 5. INSTALL ONE SEPARATOR GATE.
- 6. REPEAT STEPS 3, 4, AND 5.
- 7. REPEAT STEPS 3 AND 4.
- 8. INSTALL THE REMAINING END BLOCKING ASSEMBLY, THE TWO DOOR POST VERTICAL ASSEMBLIES WITH UNIVERSAL LOAD RETAINERS, AND THE SOLID FILL MATERIAL.
- 9. INSTALL THE THREE DOOR SPANNER PIECES.

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).
- STEEL, STRUCTURAL - - - - - : ASTM A36; 36,000PSI MINIMUM YIELD OR BETTER.
- WIRE, CARBON STEEL - - - - - : ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, 0.0800" DIA, GRADE 1006 OR BETTER.

- 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 JOINT DIRECT ATTACK MUNITION (JDAM) GUIDANCE KITS PACKED IN CNU-589/E CONTAINERS. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CONTAINER WITH AMMUNITION ITEMS. SEE PLASTICS RESEARCH CORPORATION DRAWING 103060-101 AND PAGE 4 FOR DETAILS OF THE CONTAINER. 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 CONTAINERS, 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 VERTICAL "B" PIECES ON THE CRIB FILL ASSEMBLIES. NAIL EACH ADDITIONAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12".
- 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 STRUT 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 FORWARD WALL, ONLY THE CORNER POSTS OF THE CONTAINER SHOULD BE USED FOR FORWARD LONGITUDINAL BLOCKING.
- H. 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.
- J. CAUTION: DO NOT NAIL DUNNAGE MATERIAL TO THE CONTAINER WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.
- K. PORTIONS OF THE CONTAINER DEPICTED WITHIN THIS DRAWING, SUCH AS THE SIDEWALL, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.
- L. SIX UNIVERSAL LOAD RETAINERS ARE DEPICTED IN THE LOAD ON PAGE 2. SIX UNIVERSAL LOAD RETAINERS ARE REQUIRED WHEN LOADING THE CNU-589/E CONTAINERS MORE THAN ONE LAYER HIGH. WHEN LOADING SIX OR LESS CONTAINERS (ONE LAYER HIGH) FOUR UNIVERSAL LOAD RETAINERS ARE REQUIRED. REFER TO DAC DRAWING ACV00682 FOR DETAILS OF THE UNIVERSAL LOAD RETAINER CONSTRUCTION, AND DEPARTMENT OF THE ARMY DRAWING DA-116 FOR DETAILS FOR INSTALLATION TO THE DOOR POST VERTICAL, PLACEMENT INTO THE CONTAINER, AND FOR OTHER METHODS OF REAR OF LOAD RESTRAINT.
- 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 0.454 KG.

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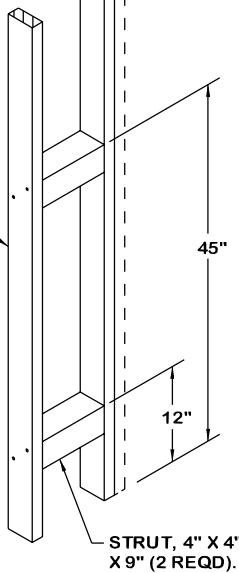
CNU-589/E CONTAINER

GROSS WEIGHT - - - - - 619 LBS (APPROX)
 CUBE - - - - - 51.4 CUBIC FEET (APPROX)

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

INDICATES FILL PIECE, SEE GENERAL NOTE "G" ON PAGE 3.

VERTICAL PIECE, 2" X 4" X 65" (1 REQD). NAIL TO THE STRUTS W/2-10d NAILS AT EACH JOINT.



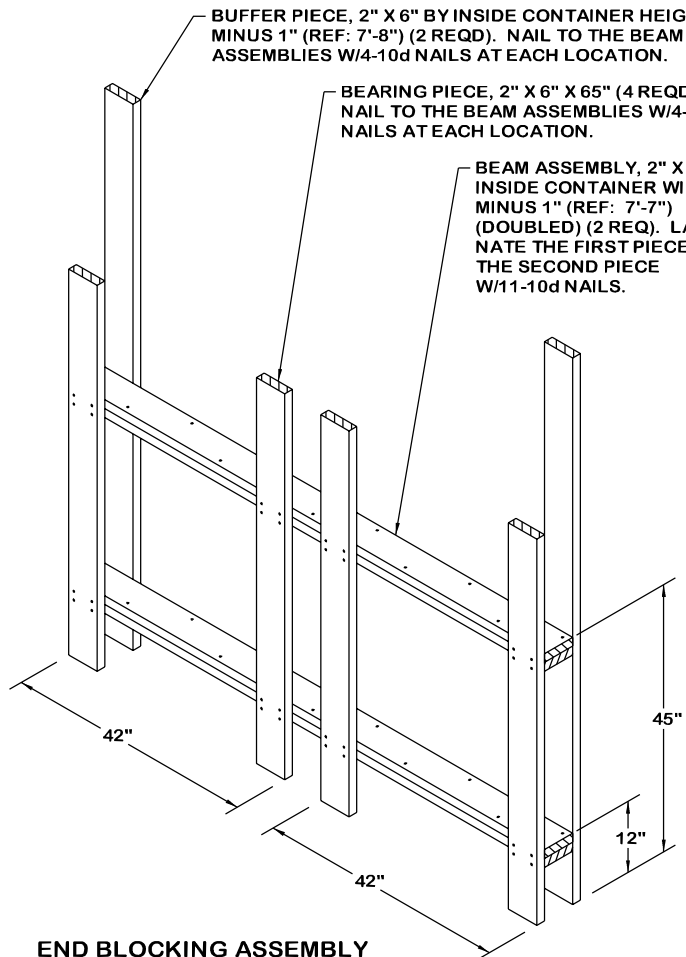
STRUT, 4" X 4" X 9" (2 REQD).

STRUT ASSEMBLY

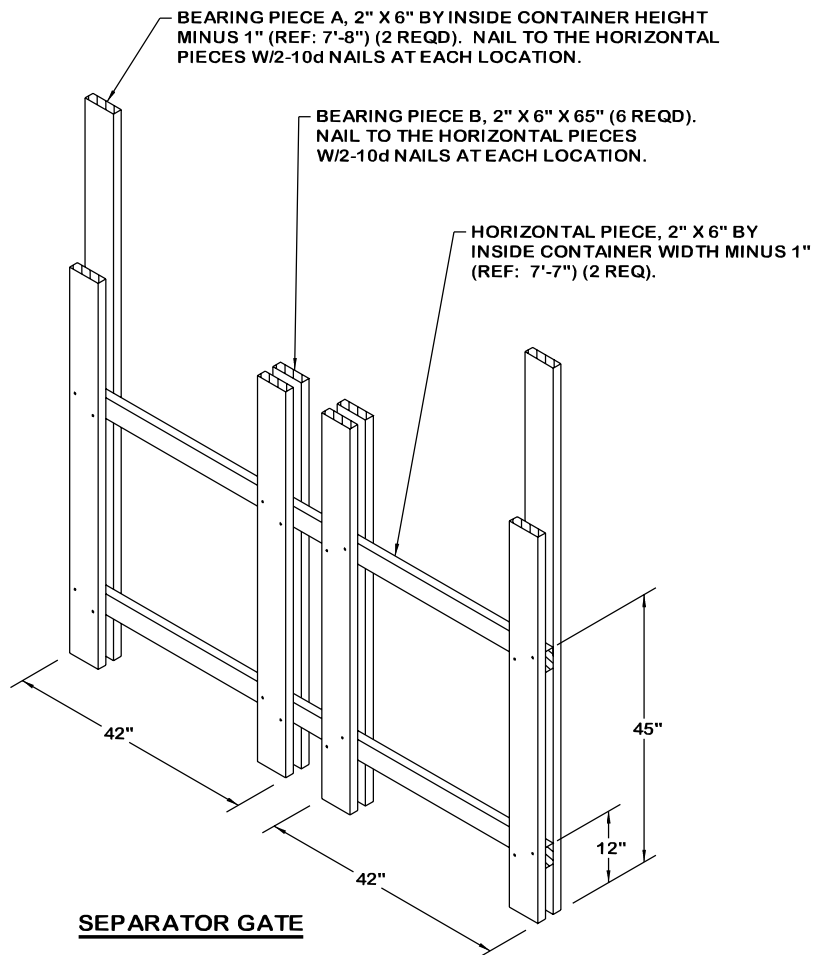
BUFFER PIECE, 2" X 6" BY INSIDE CONTAINER HEIGHT MINUS 1" (REF: 7'-8") (2 REQD). NAIL TO THE BEAM ASSEMBLIES W/4-10d NAILS AT EACH LOCATION.

BEARING PIECE, 2" X 6" X 65" (4 REQD). NAIL TO THE BEAM ASSEMBLIES W/4-10d NAILS AT EACH LOCATION.

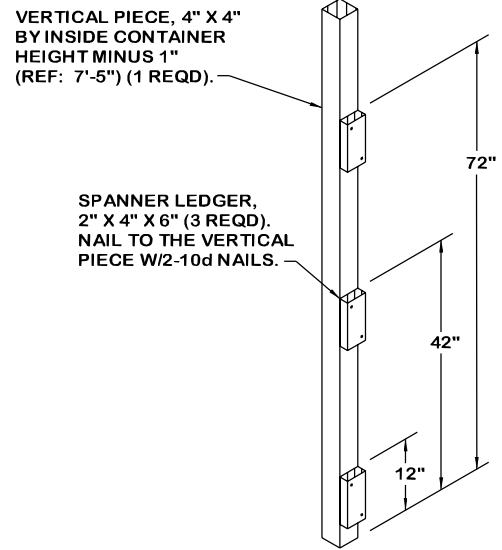
BEAM ASSEMBLY, 2" X 6" BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-7") (DOUBLED) (2 REQD). LAMINATE THE FIRST PIECE TO THE SECOND PIECE W/11-10d NAILS.



END BLOCKING ASSEMBLY

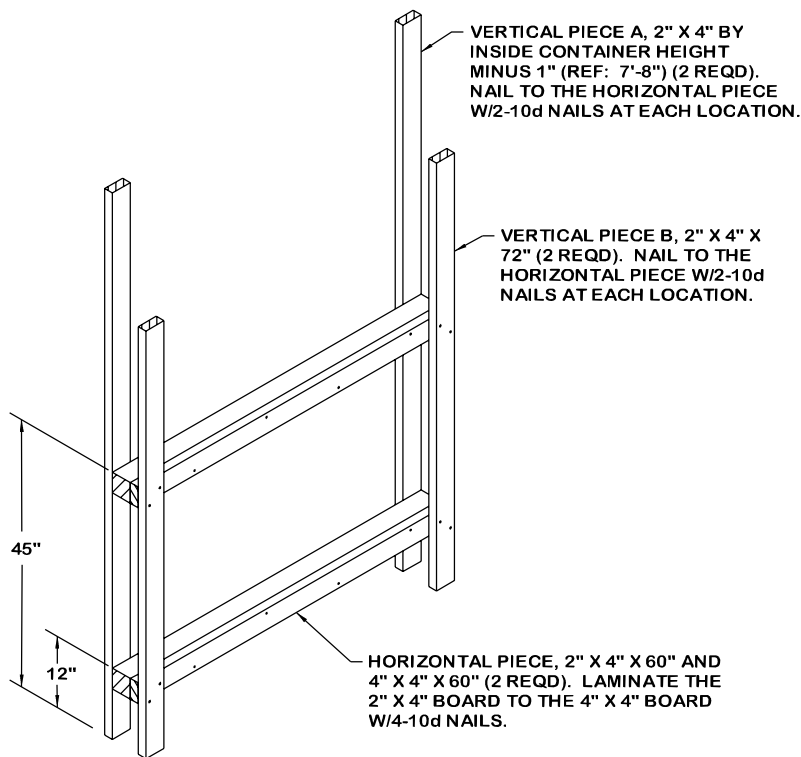


SEPARATOR GATE

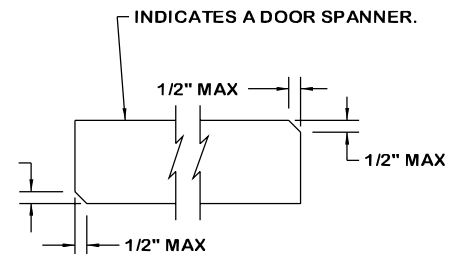


DOOR POST VERTICAL

NOTE: FOR A ONE HIGH LOAD, ELIMINATE THE TOP SPANNER LEDGER.

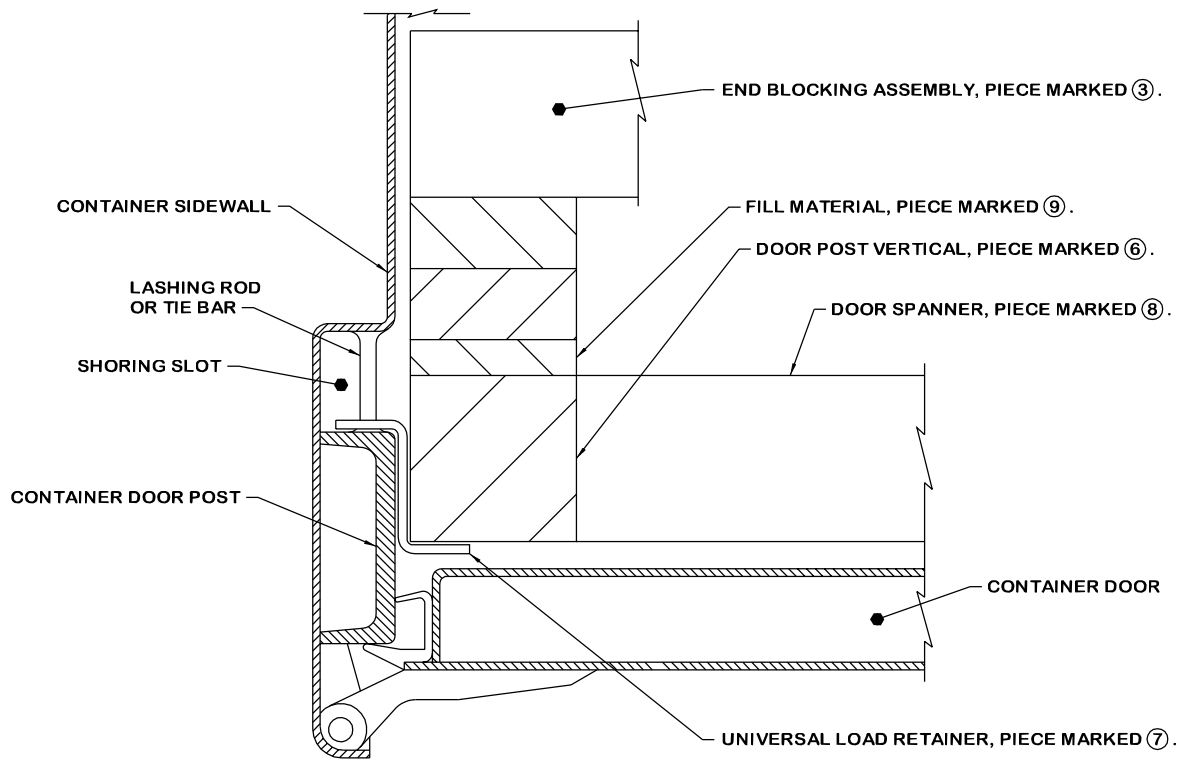


CRIB FILL ASSEMBLY



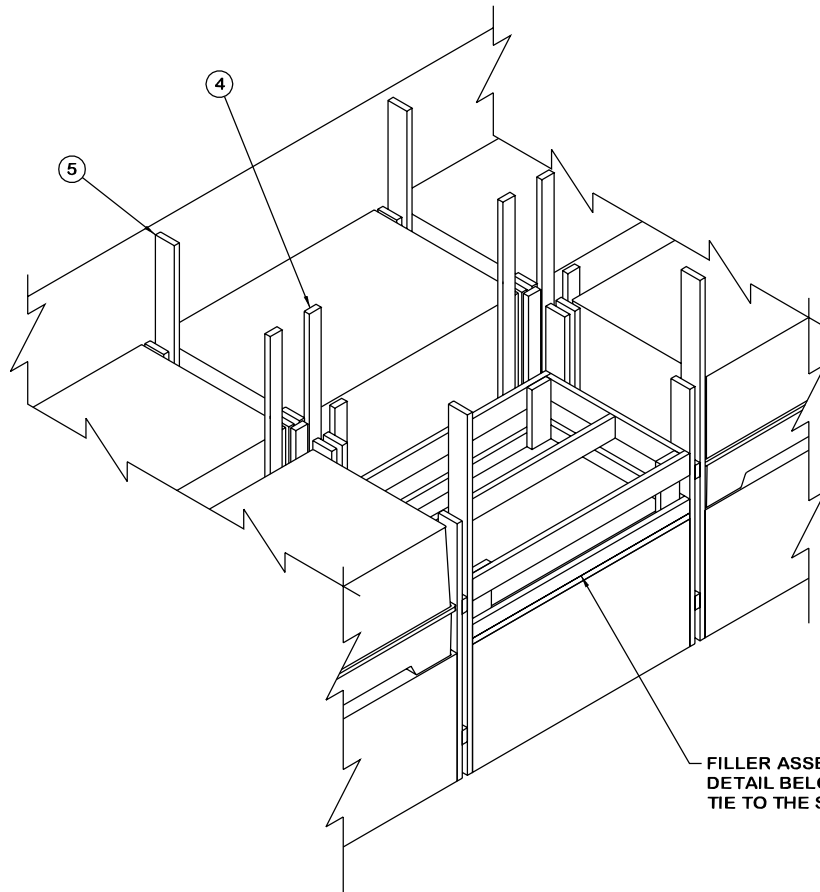
BEVEL-CUT

IF DESIRED, EACH END OF A DOOR SPANNER MAY BE BEVEL-CUT AS SHOWN ABOVE TO FACILITATE THE ACHIEVEMENT OF A TIGHT FIT BETWEEN THE DOOR POST VERTICALS AND THE DOOR SPANNERS.



DETAIL A

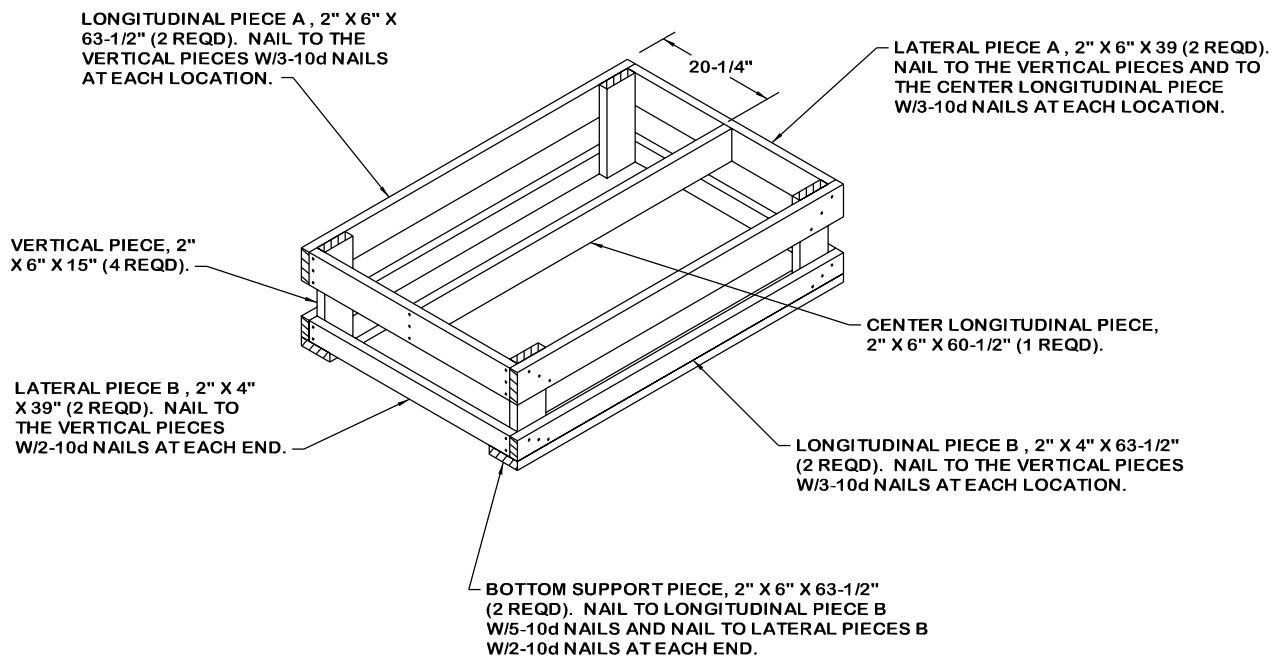
A PARTIAL PLAN VIEW OF THE LEFT REAR PORTION OF THE CONTAINER IS SHOWN DEPICTING THE PROPER POSITION OF THE UNIVERSAL LOAD RETAINER AND ADJACENT DUNNAGE PIECES. SEE DEPARTMENT OF ARMY DRAWING DA-116 FOR ADDITIONAL DETAILS AND PROCEDURES FOR OTHER TYPES OF RETAINERS THAT MAY BE USED FOR REAR-OF-LOAD RESTRAINT.



FILLER ASSEMBLY, (1 SHOWN) SEE
DETAIL BELOW. TOENAIL OR WIRE
TIE TO THE SEPARATOR GATES.

LESS-THAN-FULL-LOAD PROCEDURE

THE DETAIL ABOVE DEPICTS A BLOCKING METHOD TO BE USED IN
A LESS-THAN-FULL CONTAINER LOAD (LESS THAN 12 UNITS). KEY
NUMBERS REFER TO KEY NUMBERS ON PAGE 2. SEE GENERAL
NOTE "H" ON PAGE 3.



FILLER ASSEMBLY

