

# LOADING AND BRACING<sup>⊕</sup> IN END OPENING ISO CONTAINERS OF GBU-53 SMALL DIAMETER BOMB II PACKED ONE PER CNU-714 CON- TAINER

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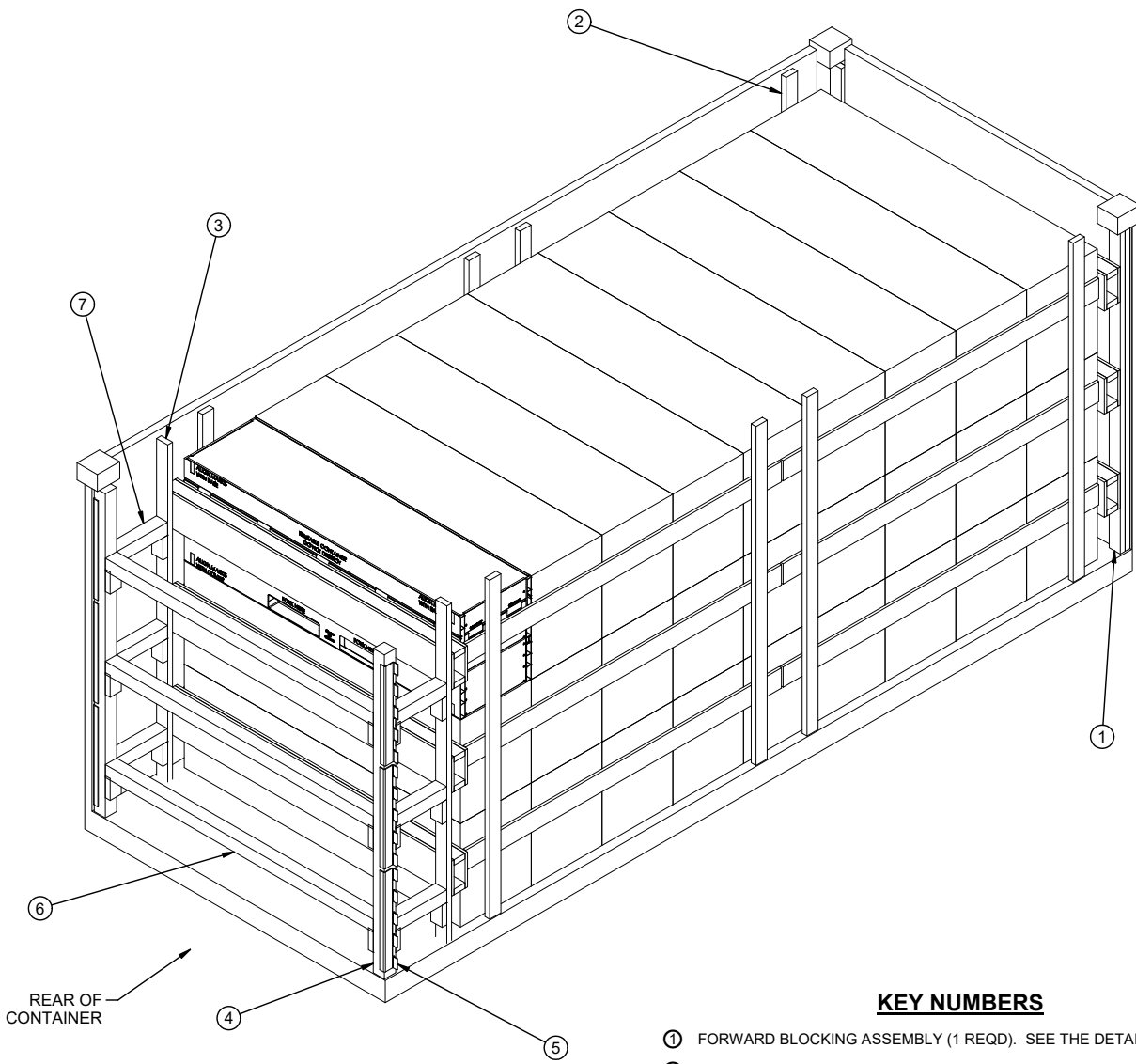
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⊕ THE PROCEDURES SHOWN HEREIN ARE APPLICABLE TO LOADS THAT ARE TO  
BE SHIPPED BY TRAILER/CONTAINER-ON-FLATCAR (T/COFC) RAIL, MOTOR, OR  
WATER CARRIERS.

## U.S. ARMY MATERIEL COMMAND DRAWING

APPROVED, U.S. ARMY JOINT MUNITIONS COMMAND  RUS.ALLEN.J.1230354282 <small>Digitally signed by RUS.ALLEN.J.1230354282 Date: 2018.07.26 13:49:39 -05'00'</small>		<b>CAUTION: VERIFY PRIOR TO USE AT <a href="https://mhp.redstone.army.mil">HTTPS://MHP.REDSTONE.ARMY.MIL</a> THAT THIS IS THE MOST CURRENT VERSION OF THIS DOCUMENT. THIS IS PAGE 1 OF 8.</b>			
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		DESIGN ENGINEER	BASIC REV.	QUYEN TRAN	
APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND  SHIMP.UPTON.R.1231257183 <small>Digitally signed by SHIMP.UPTON.R.1231257183 Date: 2018.07.27 08:44:20 -05'00'</small>		ENGINEERING DIVISON	FIEFFER.LAUR A.A.1230375727 <small>Digitally signed by FIEFFER LAURA A.1230375727 Date: 2018.06.26 07:46:04 -05'00'</small>		
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				19	48
				8884	SP15J177



**KEY NUMBERS**

- ① FORWARD BLOCKING ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 5.
- ② SIDE FILL ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 5.
- ③ REAR BLOCKING ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 6.
- ④ DOOR POST VERTICAL (2 REQD). SEE THE DETAIL AND "DETAIL A" ON PAGE 7, AND GENERAL NOTE "P" ON PAGE 3.
- ⑤ 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 7, 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'-0") (3 REQD). TOENAIL TO THE DOOR POST VERTICAL W/2-12d NAILS AT EACH END. SEE THE "BEVEL-CUT" DETAIL ON PAGE 4.
- ⑦ STRUT, 4" X 4" BY CUT-TO-FIT (REF: 16", 18" FOR THE LOAD ON PAGE 8) (6 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 4.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	99	50
2" X 4"	206	138
4" X 4"	44	59
NAILS	NO. REQD	POUNDS
6d (2")	360	2-1/4
10d (3")	112	1-3/4
12d(3-1/4")	36	3/4
PLYWOOD, 3/4" - - 72.04 SQ FT REQD - - 148.59 LBS		
UNIVERSAL LOAD RETAINER - - 6 REQD - - 39.00 LBS		

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
CNU-714 CONTAINER - - 27 - - - - -		14,040 LBS
DUNNAGE - - - - -		687 LBS
CONTAINER - - - - -		4,700 LBS
TOTAL WEIGHT - - - - -		19,427 LBS (APPROX)

## GENERAL NOTES

- 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 GBU-53 SMALL DIAMETER BOMB II PACKED ONE PER CNU-714 CONTAINER. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CONTAINER WITH AMMUNITION ITEMS. SEE PAGE 4 AND RAYTHEON DRAWING 2239994 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 CNU-714 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 HORIZONTAL PIECES ON THE SIDE FILL ASSEMBLIES. NAIL EACH ADDITIONAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE THICKNESS OF THE HORIZONTAL OR VERTICAL PIECES IN THE SIDE FILL ASSEMBLIES MAY BE ADJUSTED AS REQUIRED TO ACHIEVE A TIGHT LOAD. THE LOADS MUST BE AS TIGHT AS POSSIBLE LONGITUDINALLY, BUT THE VOID MUST NOT EXCEED 3/4" OVERALL.
- 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 BESIDE A NAIL IN A LOWER PIECE.
- F. 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 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 FORWARD WALL, 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.

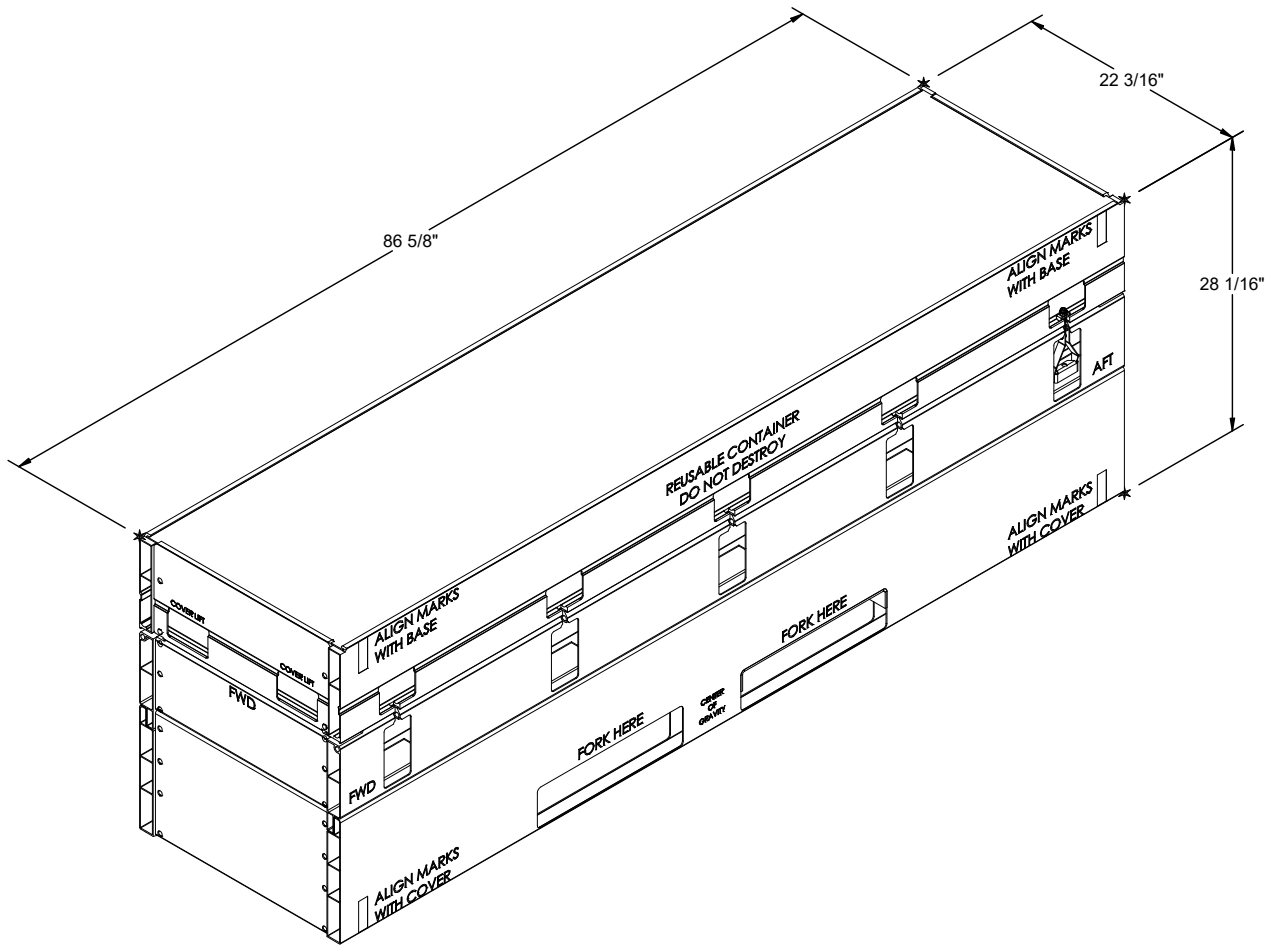
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## (GENERAL NOTES CONTINUED)

- 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. THE QUANTITY OF CNU-714 CONTAINERS SHOWN IN THE LOAD ON PAGE 2 MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SEE THE FILLER ASSEMBLY AND THE "LESS-THAN-FULL LOAD PROCEDURE" ON PAGE 8.
- P. SIX UNIVERSAL LOAD RETAINERS, AS DEPICTED IN THE LOADS ON PAGES 2 AND 8, ARE REQUIRED WHEN LOADING A THREE HIGH LOAD, AND FOUR ARE REQUIRED WHEN LOADING A TWO AND/OR ONE HIGH LOAD. REFER TO DAC DRAWING ACV00682 FOR DETAILS OF THE UNIVERSAL LOAD RETAINER CONSTRUCTION, AND TO 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.
- Q. 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.
- R. ANTI-CHAFING MATERIAL MAY BE INSTALLED AT POINTS OF CONTACT BETWEEN CONTAINERS, IF DESIRED, TO PREVENT CHAFING DAMAGE TO CONTAINER PAINT AND MARKINGS.
- S. RECOMMENDED SEQUENTIAL LOADING PROCEDURES:
1. PREFABRICATE FORWARD BLOCKING ASSEMBLY, REAR BLOCKING ASSEMBLY, FOUR SIDE FILL ASSEMBLIES, AND TWO DOOR POST VERTICALS WITH UNIVERSAL LOAD RETAINERS.
  2. INSTALL THE FORWARD BLOCKING ASSEMBLY.
  3. LOAD FIRST ROW OF CONTAINERS (3 CNU CONTAINERS).
  4. INSTALL TWO SIDE FILL ASSEMBLIES (ONE ON EACH SIDE).
  5. LOAD FOUR MORE ROWS OF CONTAINERS (12 CNU CONTAINERS).
  6. INSTALL TWO SIDE FILL ASSEMBLIES (ONE ON EACH SIDE).
  7. LOAD 12 CNU CONTAINERS.
  8. INSTALL THE REAR BLOCKING ASSEMBLY.
  9. INSTALL TWO DOOR POST VERTICALS WITH UNIVERSAL LOAD RETAINERS.
  10. INSTALL THE UPPERMOST AND LOWERMOST DOOR SPANNER PIECES.
  11. INSTALL SIX REAR STRUTS.
  12. INSTALL THE REMAINING DOOR SPANNER PIECE

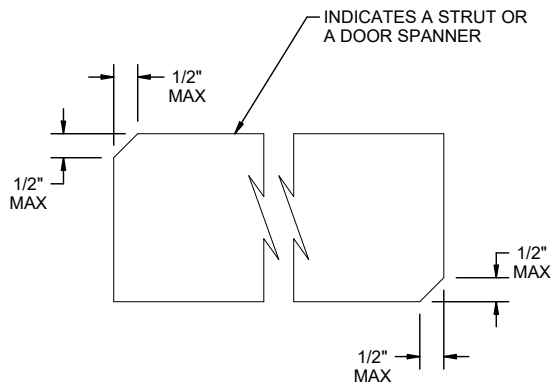
## MATERIAL SPECIFICATIONS

<u>LUMBER</u>	- - - - -	SEE TM 743-200-1 (DUNNAGE LUMBER) AND VOLUNTARY PRODUCT STANDARD PS 20.
<u>NAILS</u>	- - - - -	ASTM F1667; COMMON STEEL NAIL (NLCMS OR NLCMMS).
<u>PLYWOOD</u>	- - - - -	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.
<u>STEEL STRUCTURAL</u>	- - - - -	ASTM A36; 36,000 PSI MINIMUM YIELD OR BETTER.
<u>WIRE, CARBON STEEL</u>	- - - - -	ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, 0.0800" DIA, GRADE 1006 OR BETTER.
<u>ANTI-CHAFING MATERIAL</u>	- - - - -	MIL-PRF-121 (OR EQUAL); NEUTRAL BARRIER MATERIAL.



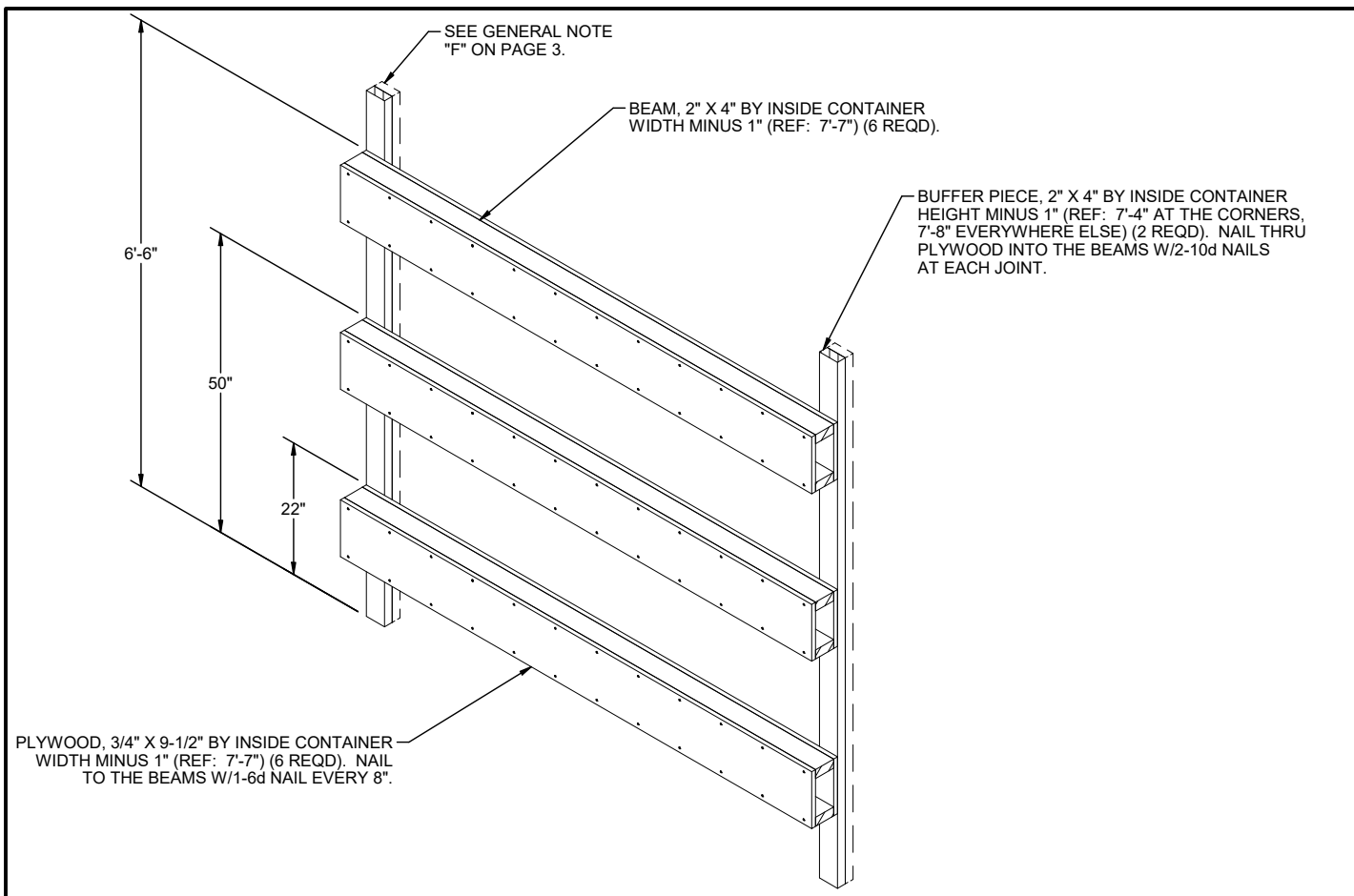
**CNU-714 CONTAINER**

GROSS WEIGHT - - - - - 520 LBS  
 CUBE - - - - - 31.2 CU FT



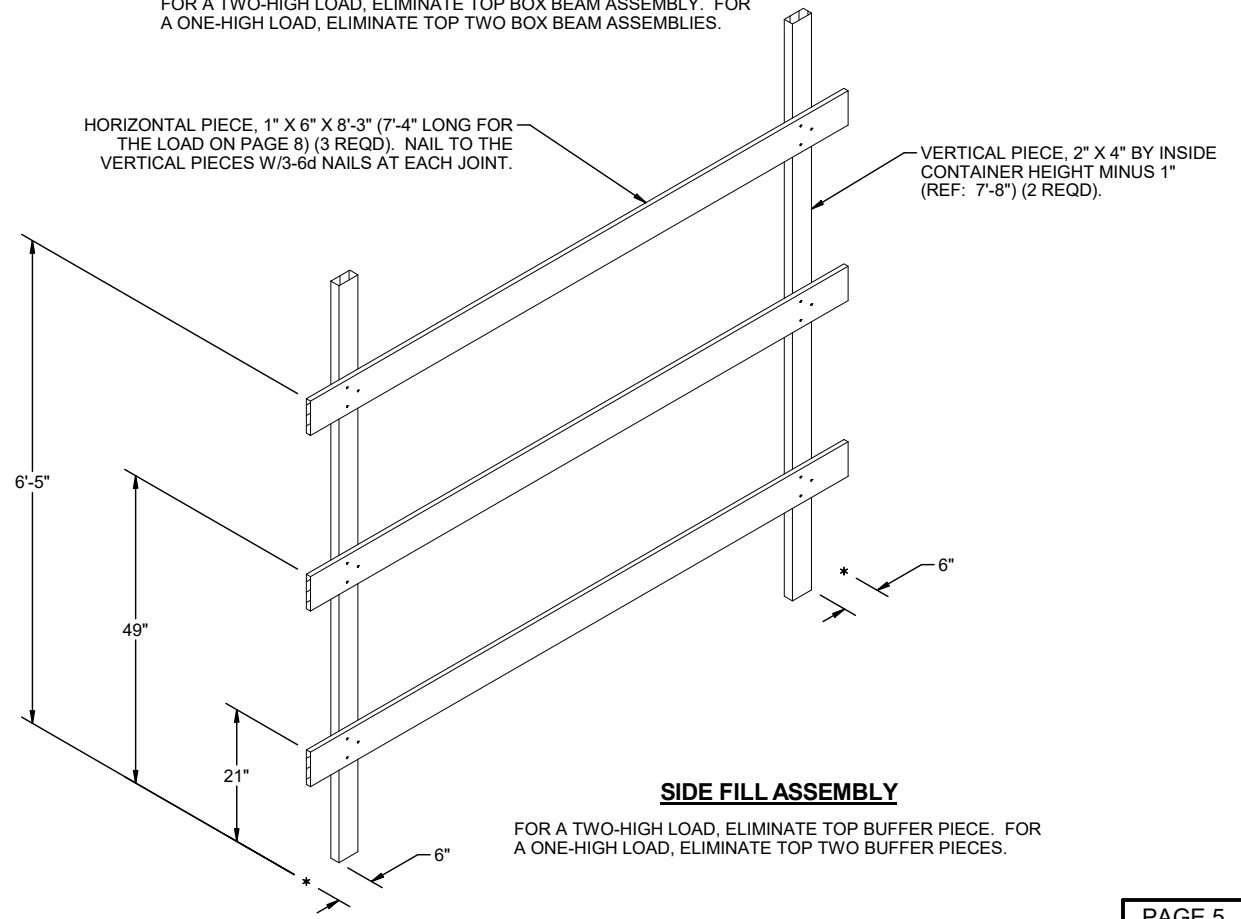
**BEVEL CUT**

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



**FORWARD BLOCKING ASSEMBLY**

FOR A TWO-HIGH LOAD, ELIMINATE TOP BOX BEAM ASSEMBLY. FOR A ONE-HIGH LOAD, ELIMINATE TOP TWO BOX BEAM ASSEMBLIES.



**SIDE FILL ASSEMBLY**

FOR A TWO-HIGH LOAD, ELIMINATE TOP BUFFER PIECE. FOR A ONE-HIGH LOAD, ELIMINATE TOP TWO BUFFER PIECES.

STRUT LEDGER, 2" X 4" X 6"  
(6 REQD). NAIL TO THE  
BUFFER PIECES W/2-10d  
NAILS EACH.

BUFFER PIECE, 2" X 4" BY INSIDE CONTAINER  
HEIGHT MINUS 1" (REF: 7'-8") (2 REQD). NAIL  
THRU PLYWOOD INTO THE BEAMS W/2-10d  
NAILS AT EACH JOINT.

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

67 1/2"

39 1/2"

11 1/2"

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

6'-6"

50"

22"

**REAR BLOCKING ASSEMBLY**

FOR A TWO-HIGH LOAD, ELIMINATE TOP BOX BEAM ASSEMBLY AND TOP TWO STRUT LEDGERS. FOR A ONE-HIGH LOAD, ELIMINATE TOP TWO BOX BEAM ASSEMBLIES AND TOP FOUR STRUT LEDGERS.

SEE GENERAL NOTE  
"F" ON PAGE 3.

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

VERTICAL PIECE, 2" X 4" X 6'-5" (1 REQD).  
NAIL TO THE STRUTS W/2-10d NAILS  
AT EACH JOINT.

71"

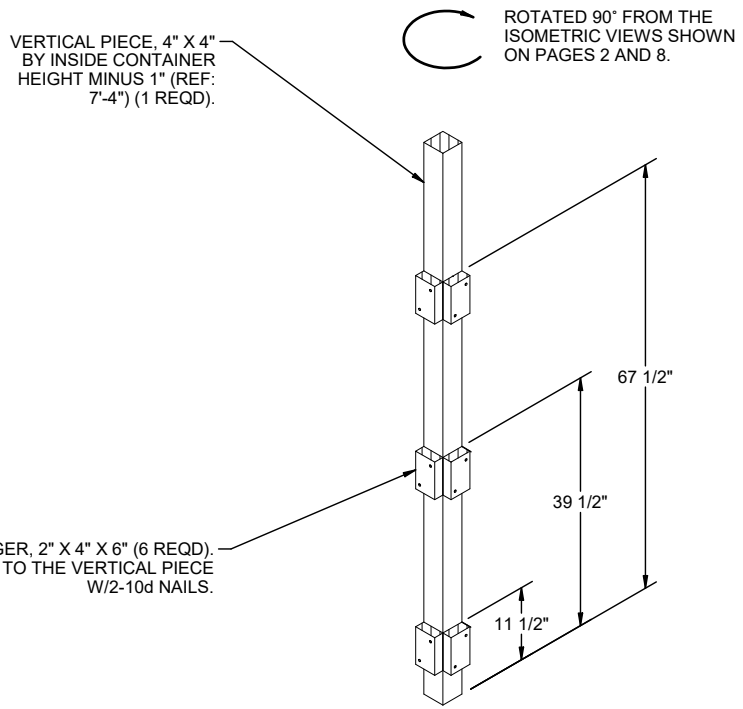
43"

15"

STRUT, 4" X 4" X 17" (3 REQD).

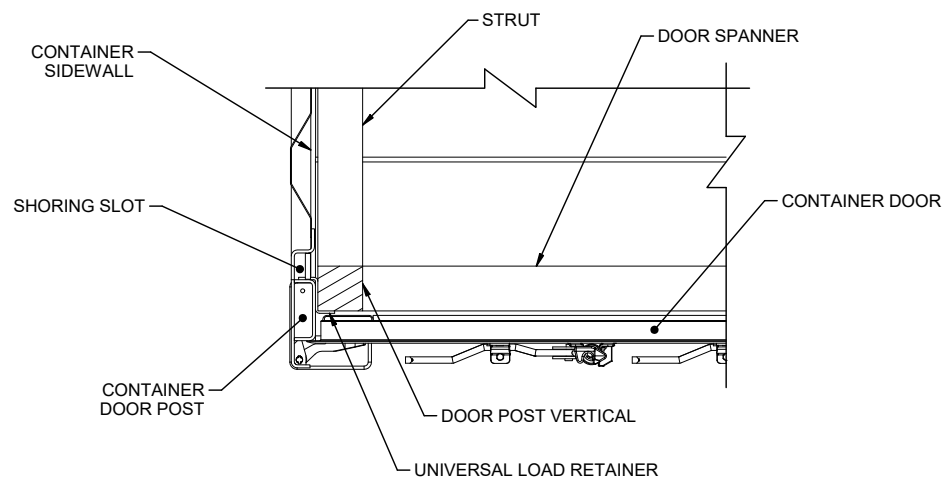
**FORWARD STRUT ASSEMBLY**

FOR A TWO-HIGH LOAD, ELIMINATE TOP STRUT, AND SHORTEN THE VERTICAL PIECE FROM 6'-5" TO 49". FOR A ONE-HIGH LOAD, ELIMINATE TOP TWO STRUTS, AND SHORTEN THE VERTICAL PIECE FROM 6'-5" TO 21".



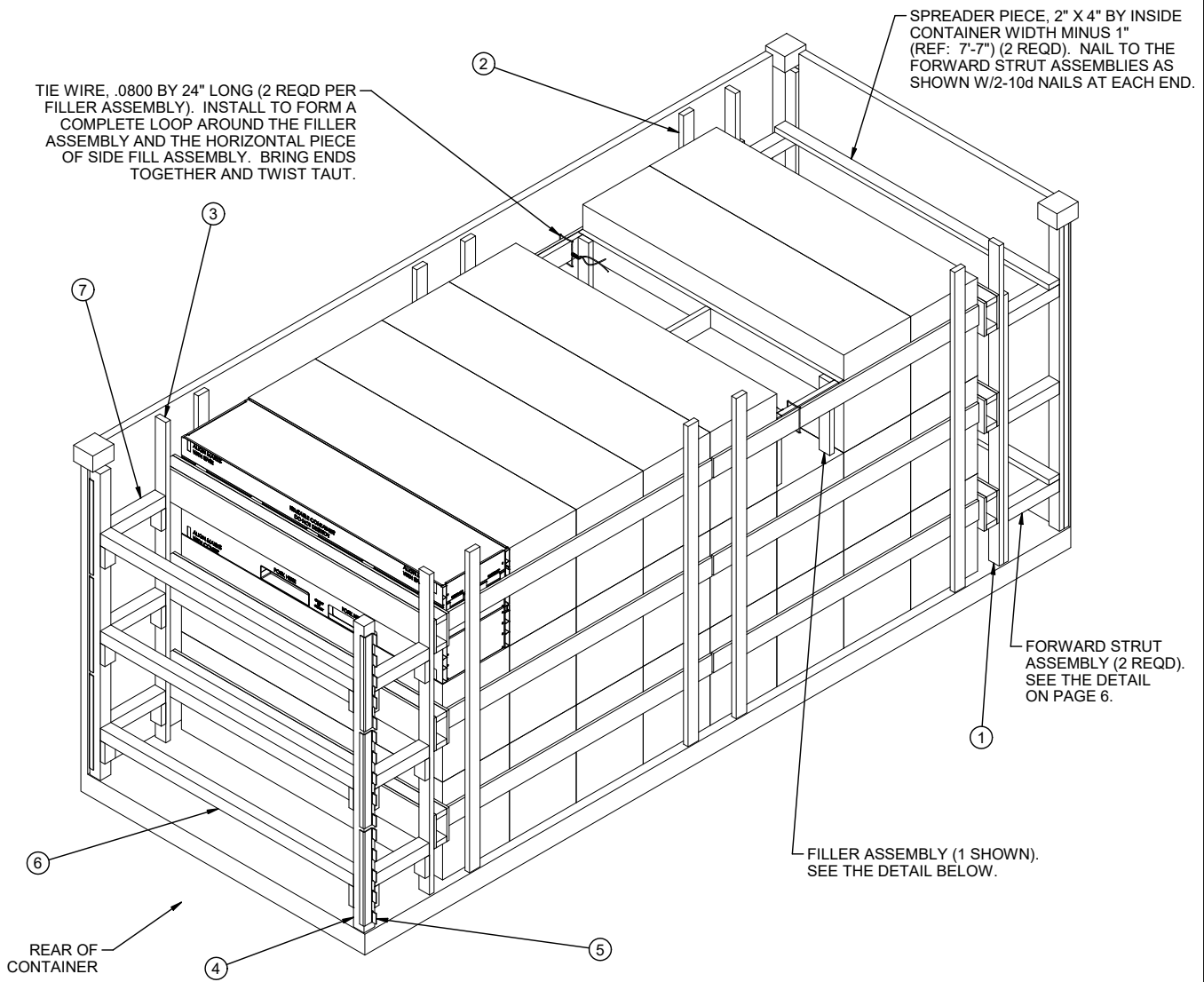
**DOOR POST VERTICAL**

FOR A TWO-HIGH LOAD, ELIMINATE TOP STRUT LEDGER AND TOP DOOR SPANNER LEDGER. FOR A ONE-HIGH LOAD, ELIMINATE TOP TWO STRUT LEDGERS AND TOP DOOR SPANNER LEDGER.



**DETAIL A**

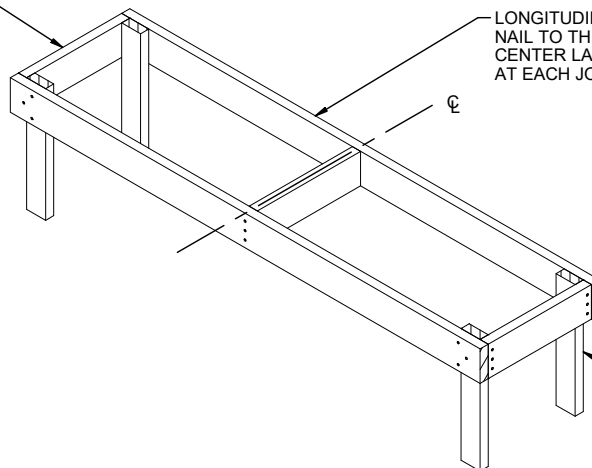
A PARTIAL PLAN VIEW OF THE LEFT REAR PORTION OF THE CONTAINER IS SHOWN DEPICTING THE PROPER POSITION OF THE DOOR POST VERTICAL, UNIVERSAL LOAD RETAINER, AND ADJACENT DUNNAGE PIECES.



**LESS-THAN-FULL-LOADPROCEDURE**

KEY NUMBERS REFER TO KEY NUMBERS ON PAGE 2.  
SEE GENERAL NOTES "G" AND "O" ON PAGE 3.

LATERAL PIECE, 2" X 6" X 19" (3 REQD).  
NAIL THE OUTER LATERAL PIECES TO THE VERTICAL PIECES W/2-10d NAILS AT EACH END.



**FILLER ASSEMBLY**

THE ASSEMBLY DEPICTED ABOVE IS FOR USE IN PLACE OF AN OMITTED CONTAINER. FILLER ASSEMBLIES MUST BE WIRE TIED TO THE HORIZONTAL PIECES OF SIDE FILL ASSEMBLIES TO PREVENT UNDUE MOVEMENT. NO MORE THAN TWO FILLER ASSEMBLIES WILL BE USED IN ANY LOAD.