

APPROVED BY
BUREAU OF EXPLOSIVES

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DATE 8/6/96

LOADING AND BRACING WITH WOODEN DUNNAGE IN SIDE OPENING ISO CONTAINERS OF BLU-113A/B BOMBS PACKED IN CNU-554/E CONTAINERS

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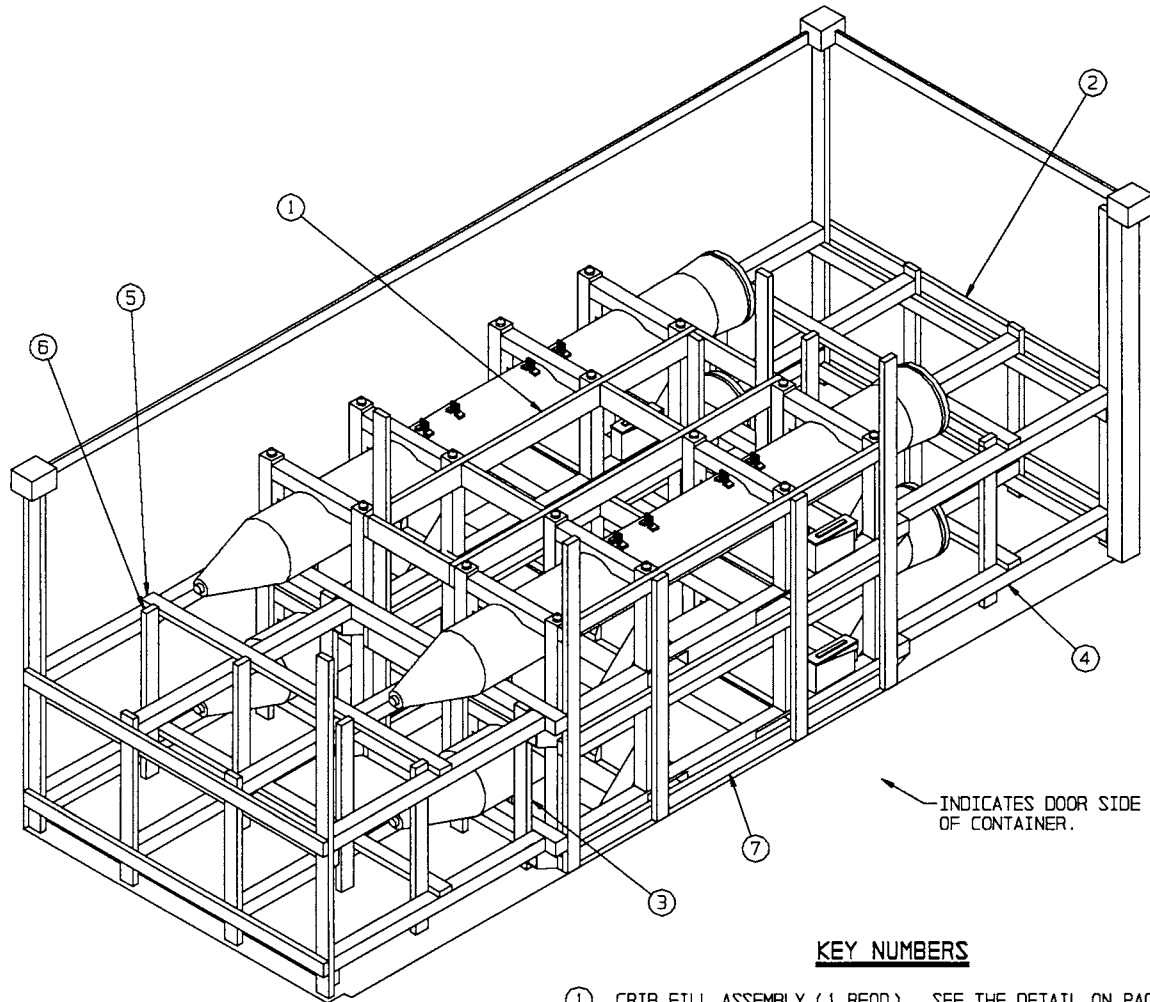
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- LOADING AND BRACING SPECIFICATIONS SET FORTH WITHIN THIS DRAWING ARE APPLICABLE TO LOADS THAT ARE TO BE SHIPPED BY TRAILER/CONTAINER-ON-FLATCAR (T/COFC) RAIL CARRIER SERVICE. THESE SPECIFICATIONS MAY ALSO BE USED FOR LOADS THAT ARE TO BE MOVED BY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

U.S. ARMY MATERIEL COMMAND DRAWING			
APPROVED, U.S. ARMY INDUSTRIAL OPERATIONS COMMAND <i>Daniel E. Stachnick</i>	DRAFTSMAN	TECHNICIAN	ENGINEER L. FIEFFER
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APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND <i>William F. Ernst</i>	JULY 1996		
U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL	CLASS	DIVISION	DRAWING
	19	48	8630
			FILE SP15J78

DO NOT SCALE

PROJECT SP 329-96



ISOMETRIC VIEW

KEY NUMBERS

- ① CRIB FILL ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 5.
- ② END BLOCKING GATE (2 REQD). SEE THE DETAIL ON PAGE 5.
- ③ LOAD BEARING GATE (2 REQD). SEE THE DETAIL ON PAGE 6.
- ④ STRUT, 4" X 4" BY CUT TO FIT (REF: 61-1/2") (16 REQD). TOENAIL TO PIECES MARKED ② AND ③ W/2-12d NAILS AT EACH END. SEE THE "BEVEL-CUT" DETAIL ON PAGE 4.
- ⑤ HORIZONTAL STRUT BRACING, 2" X 4" X 7'-3" (4 REQD). NAIL TO THE STRUTS, PIECE MARKED ④, W/2-10d NAILS AT EACH JOINT.
- ⑥ VERTICAL STRUT BRACING, 2" X 4" X 42" (8 REQD). NAIL TO THE STRUTS, PIECE MARKED ④, W/2-10d NAILS AT EACH JOINT.
- ⑦ SIDE FILL ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 6.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	257	172
2" X 6"	71	71
4" X 4"	112	150
NAILS	NO. REQD	POUNDS
10d (3")	292	4-1/2
12d (3-1/4")	64	1-1/4

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CNU-554/E	4	21,020 LBS
DUNNAGE		792 LBS
CONTAINER		6,050 LBS
TOTAL WEIGHT		27,862 LBS (APPROX)

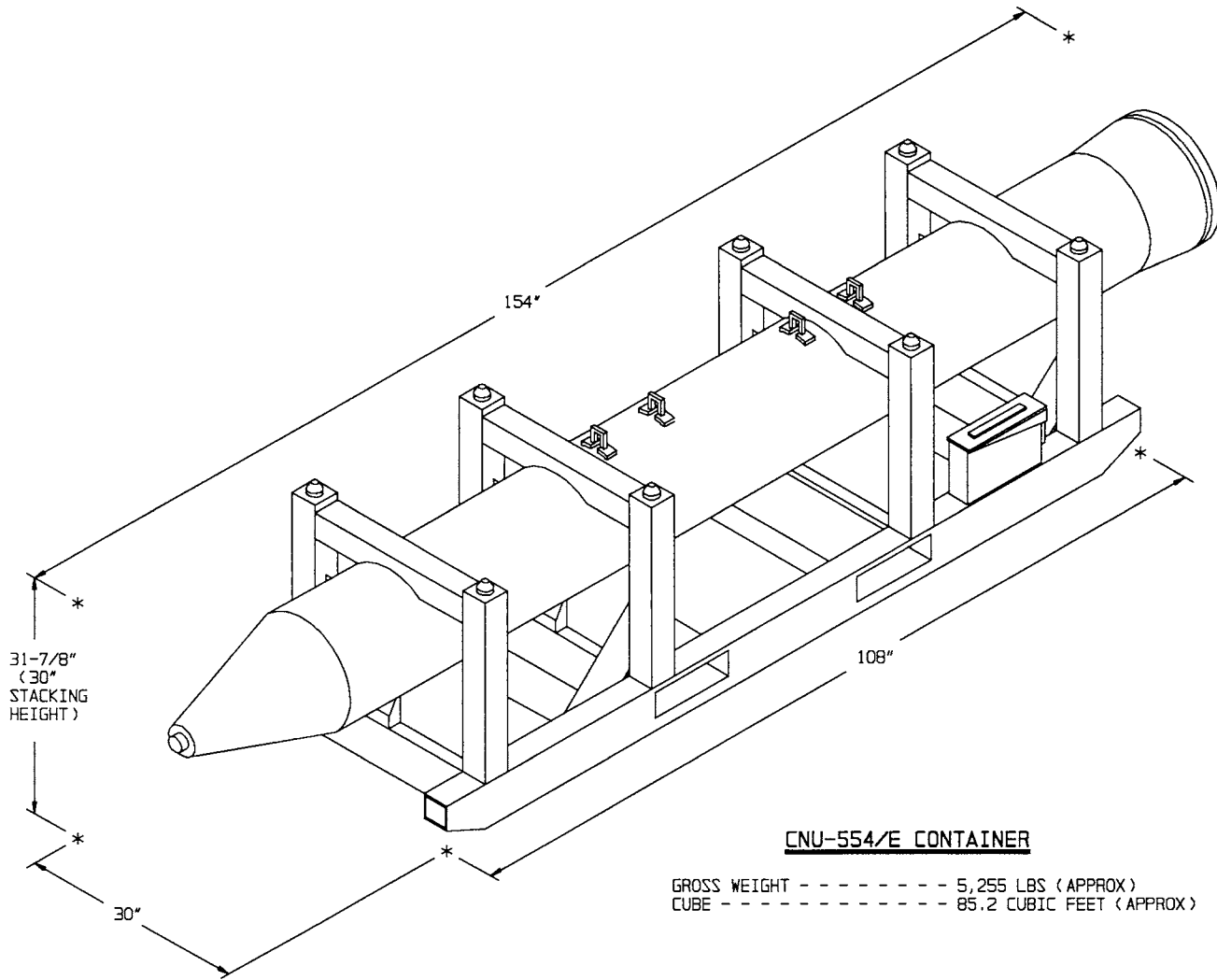
- J. PORTIONS OF THE CONTAINER DEPICTED WITHIN THIS DRAWING, SUCH AS THE SIDE DOORS, HAVE NOT BEEN SHOWN IN THE LOAD VIEW FOR CLARITY PURPOSES.
- K. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4 MM AND ONE POUND EQUALS 0.454 KG.
- L. 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.
- M. REQUIREMENTS CITED WITHIN THE BUREAU OF EXPLOSIVES PAMPHLET 6C 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.
- N. 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.
- O. 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.
- P. THE QUANTITY OF CONTAINERS SHOWN IN THE LOAD ON PAGE 2 MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SEE THE "LESS-THAN-FULL-LOAD" PROCEDURE ON PAGE 7.
- Q. ANTI-CHAFING MATERIAL MAY BE INSTALLED AT POINTS OF CONTACT BETWEEN CONTAINERS AND THE SIDE OPENING CONTAINER, AND BETWEEN CONTAINERS AND STEEL STRAPPING, IF DESIRED, TO PREVENT CHAFING DAMAGE TO CONTAINER PAINT AND MARKINGS.
- R. RECOMMENDED SEQUENTIAL LOADING PROCEDURES:
 - 1. PREFABRICATE ONE CRIB FILL ASSEMBLY, TWO END BLOCKING GATES, TWO LOAD BEARING GATES, AND ONE SIDE FILL ASSEMBLY.
 - 2. LOAD TWO CONTAINERS AGAINST THE FAR WALL, CENTERING THE CNU-554/E CONTAINER BASE LONGITUDINALLY ON THE LENGTH OF THE SIDE OPENING CONTAINER.
 - 3. INSTALL THE CRIB FILL ASSEMBLY.
 - 4. LOAD TWO CONTAINERS.
 - 5. INSTALL ONE END BLOCKING ASSEMBLY AND ONE LOAD BEARING GATE.
 - 6. INSTALL EIGHT STRUTS, FOUR VERTICAL STRUT BRACES, AND TWO HORIZONTAL STRUT BRACES.
 - 7. REPEAT STEPS 5 AND 6.
 - 8. INSTALL 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 OUTLOADING PROCEDURES SPECIFIED IN THIS DRAWING ARE APPLICABLE TO LOADS OF BLU-113A/B BOMBS PACKED IN CNU-554/E CONTAINERS. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CONTAINER WITH BOMB. SEE PAGE 4 FOR DETAILS OF THE CONTAINER. CAUTION: REGARDLESS OF THE QUANTITY OF UNITS TO BE SHIPPED, THE "MAXIMUM GROSS WEIGHT" OF THE SIDE OPENING ISO CONTAINER MUST NOT BE EXCEEDED.
- C. THE LOADS AS SHOWN ARE BASED ON 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 AND A MAXIMUM GROSS WEIGHT OF 52,910 POUNDS. THE LOAD IS DESIGNED FOR TRAILER/CONTAINER-ON-FLATCAR (T/COFC) SHIPMENT, HOWEVER, THE LOAD AS DESIGNED CAN ALSO BE MOVED BY MOTOR OR WATER CARRIERS. NOTICE: OTHER CONTAINERS OF THE SAME DESIGN CONFIGURATION CAN ALSO BE USED.
- D. WHEN LOADING THE BOMBS, 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 SIDE FILL ASSEMBLY. NAIL EACH ADDITIONAL PIECE TO THE VERTICAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE THICKNESS AND QUANTITY OF THE DUNNAGE LUMBER USED MAY BE ADJUSTED AS REQUIRED TO FACILITATE VARIANCE IN THE SIZE OF THE CONTAINER.
- E. DUNNAGE LUMBER SPECIFIED IS OF NOMINAL SIZE. FOR EXAMPLE, 1" X 6" MATERIAL IS ACTUALLY 3/4" THICK BY 5-1/2" 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 ENDWALLS. PIECES OF DUNNAGE MATERIAL MUST BE NAILED TO THE HORIZONTAL PIECES ON THE END BLOCKING GATE TO PROVIDE A FLAT SURFACE FOR THE GATE. 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 TO EACH HORIZONTAL PIECE WITH TWO APPROPRIATELY SIZED NAILS. NOTE THAT SOME CONTAINERS ARE EQUIPPED WITH "TIE-BARS" IN THE CORNER SLOT, WHICH PRECLUDE THE USE OF A SOLID 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 ENDWALLS 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 LONGITUDINAL BLOCKING.
- H. CAUTION: DO NOT NAIL DUNNAGE MATERIAL TO THE CONTAINER WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.

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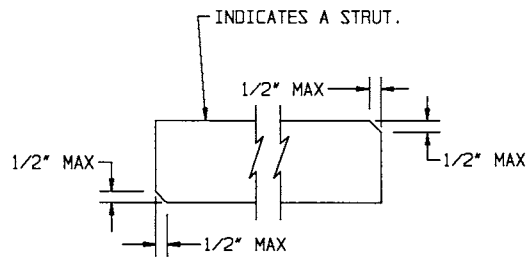
MATERIAL SPECIFICATIONS

- LUMBER - - - - - : SEE TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC MM-L-751.
- NAILS - - - - - : FED SPEC FF-N-105; COMMON.
- STRAPPING, STEEL - - : ASTM D3953; FLAT STRAPPING, TYPE 1, HEAVY DUTY, FINISH A, B (GRADE 2), OR C.
- SEAL, STRAP - - - - : ASTM D3953; CLASS H, FINISH A, B (GRADE 2), OR C, DOUBLE NOTCH TYPE, STYLE I, II, OR IV.
- ANTI-CHAFING MATERIAL - - - - - : MIL-B-121 (OR EQUAL); NEUTRAL BARRIER MATERIAL.



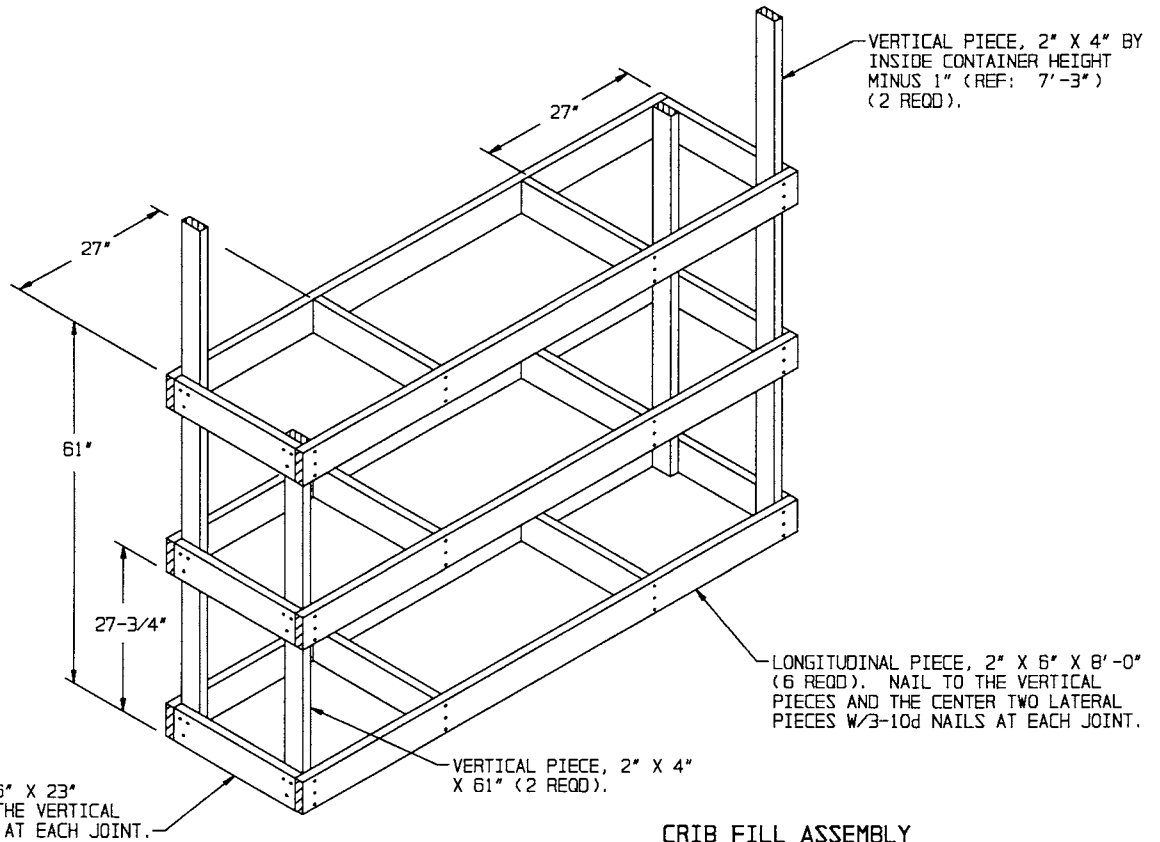
CNU-554/E CONTAINER

GROSS WEIGHT - - - - - 5,255 LBS (APPROX)
 CUBE - - - - - 85.2 CUBIC FEET (APPROX)



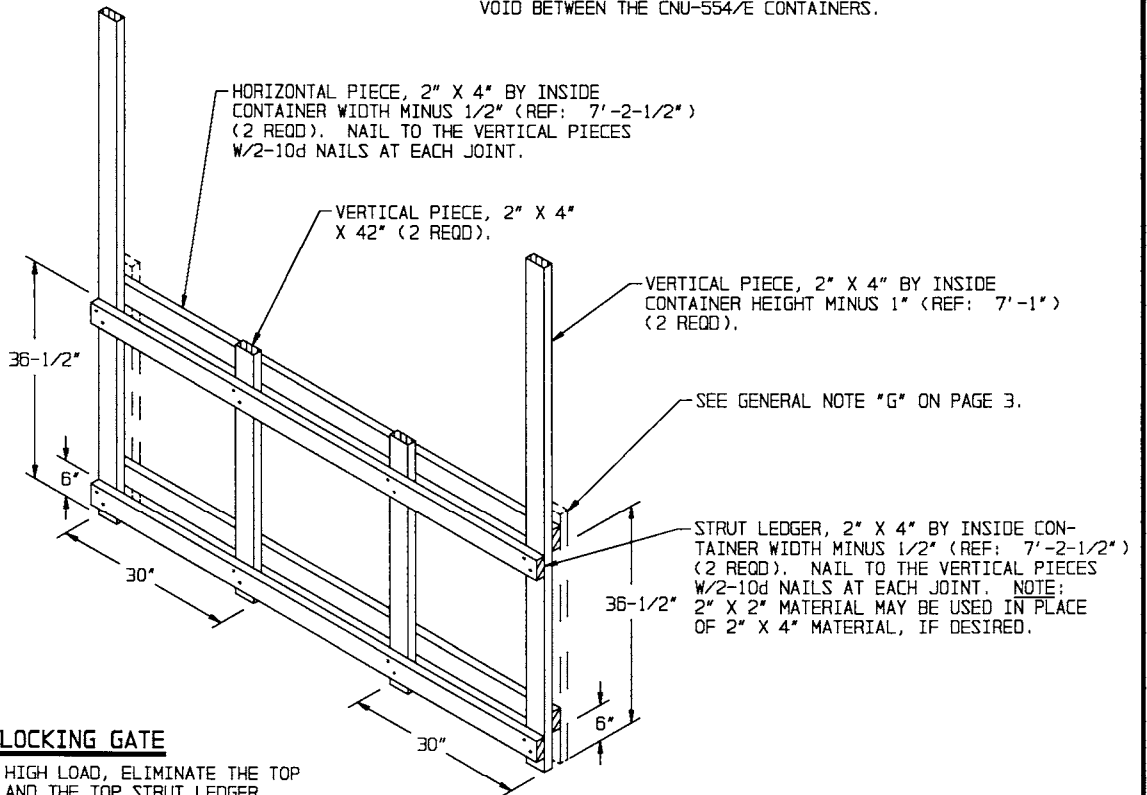
BEVEL-CUT

IF DESIRED, EACH END OF A STRUT MAY BE BEVEL-CUT AS SHOWN ABOVE TO FACILITATE THE ACHIEVEMENT OF A TIGHT LONGITUDINAL FIT.



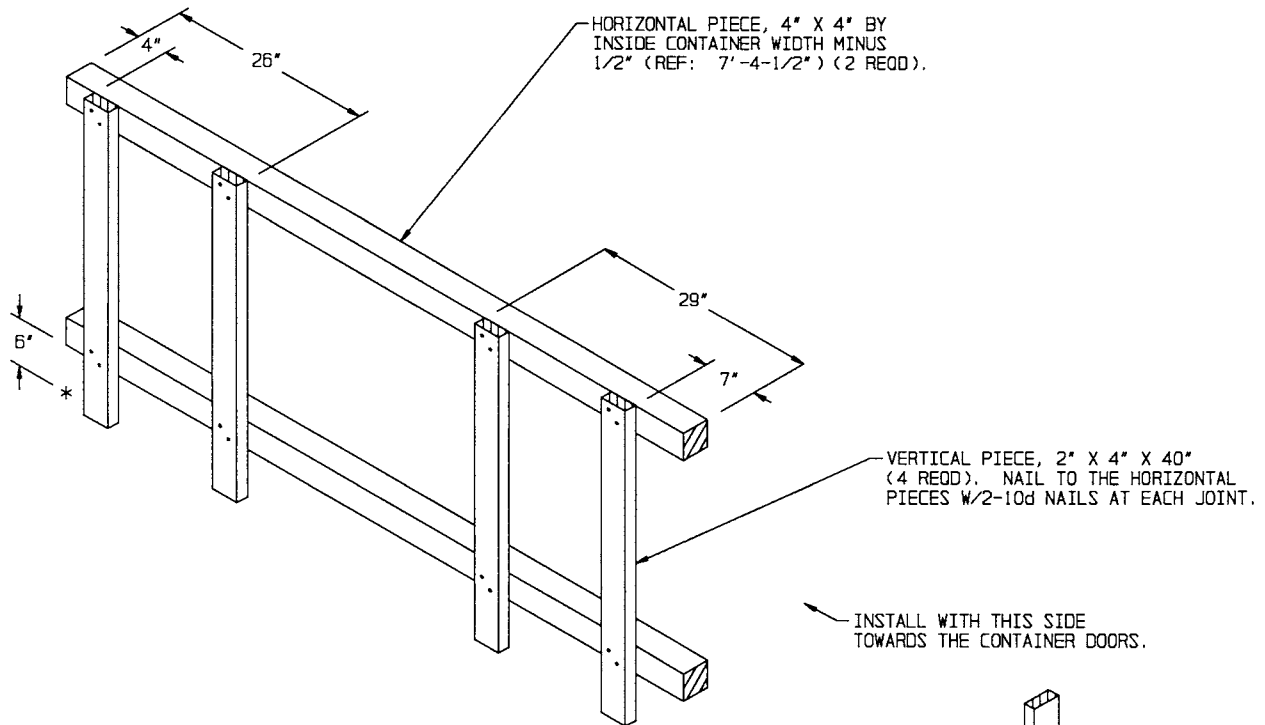
CRIB FILL ASSEMBLY

NOTE: FOR A ONE HIGH LOAD, ELIMINATE THE TOP TWO LONGITUDINAL PIECES, AND THE TOP FOUR LATERAL PIECES, AND REPOSITION THE MIDDLE TWO LONGITUDINAL PIECES AND THE MIDDLE FOUR LATERAL PIECES AT 25", INSTEAD OF 27-3/4". SHORTEN THE 61" VERTICAL PIECES APPROPRIATELY. THE LENGTH OF THE LATERAL PIECES IS DEPENDENT ON THE VOID BETWEEN THE CNU-554/E CONTAINERS.



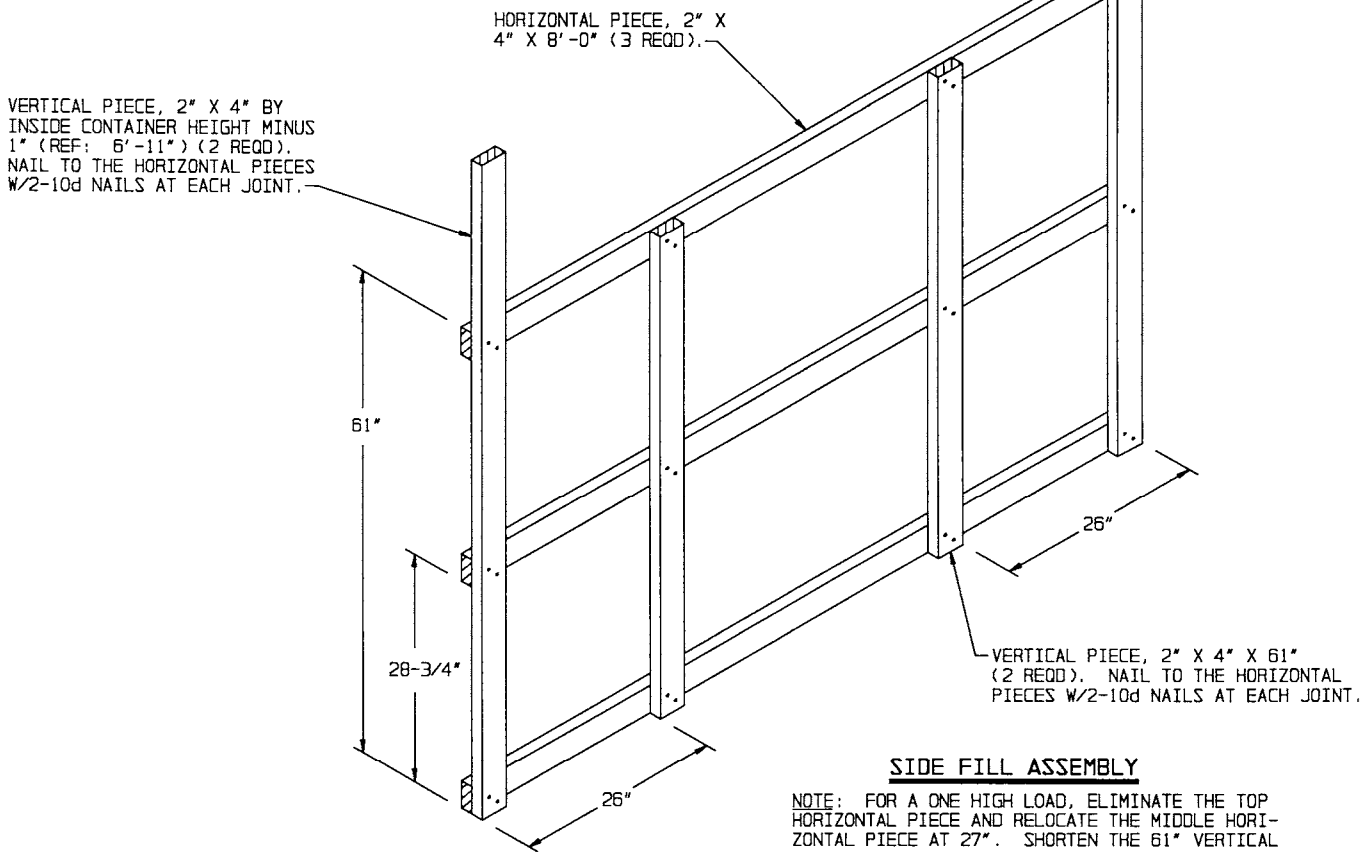
END BLOCKING GATE

NOTE: FOR A ONE HIGH LOAD, ELIMINATE THE TOP HORIZONTAL PIECE AND THE TOP STRUT LEDGER. SHORTEN THE 42" VERTICAL PIECES TO 12".

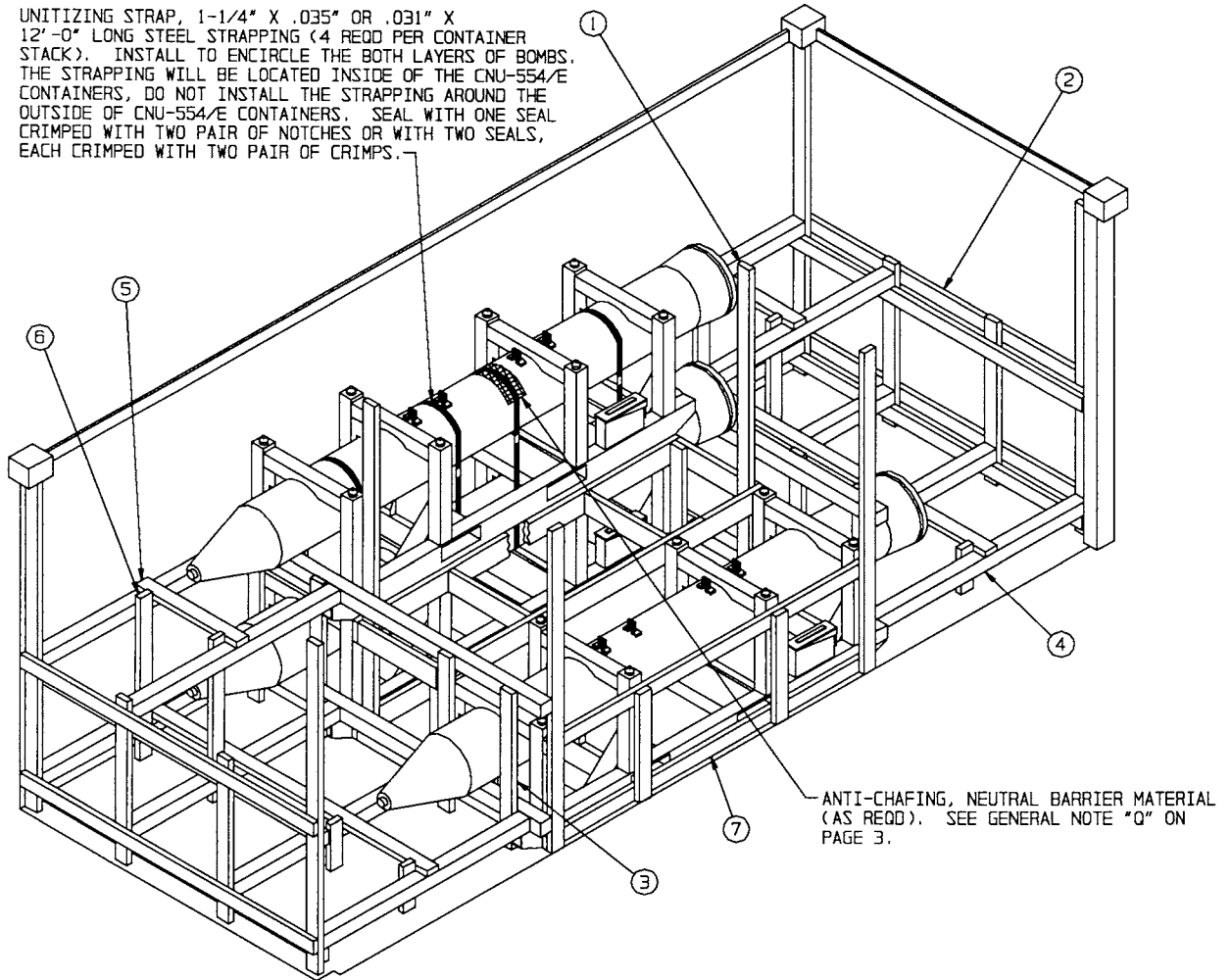


LOAD BEARING GATE

NOTE: FOR A ONE HIGH LOAD, ELIMINATE THE TOP HORIZONTAL PIECE. SHORTEN THE VERTICAL PIECES TO 12". A "RIGHT HAND" GATE IS SHOWN ABOVE. A "LEFT HAND" GATE IS ALSO REQUIRED.



UNITIZING STRAP, 1-1/4" X .035" OR .031" X 12'-0" LONG STEEL STRAPPING (4 REQD PER CONTAINER STACK). INSTALL TO ENCIRCLE THE BOTH LAYERS OF BOMBS. THE STRAPPING WILL BE LOCATED INSIDE OF THE CNU-554/E CONTAINERS, DO NOT INSTALL THE STRAPPING AROUND THE OUTSIDE OF CNU-554/E CONTAINERS. SEAL WITH ONE SEAL CRIMPED WITH TWO PAIR OF NOTCHES OR WITH TWO SEALS, EACH CRIMPED WITH TWO PAIR OF CRIMPS.



ANTI-CHAFING, NEUTRAL BARRIER MATERIAL (AS REQD). SEE GENERAL NOTE "Q" ON PAGE 3.

ISOMETRIC VIEW

SPECIAL NOTE:

WHEN REDUCING A LOAD BY ONE CONTAINER, IT WILL BE NECESSARY TO UNITIZE THE CONTAINER STACK WHICH IS LONGITUDINALLY ADJACENT TO THE OMITTED CONTAINER AS DEPICTED IN THE LOAD VIEW ABOVE. SEE GENERAL NOTE "Q" ON PAGE 3.

LESS-THAN-FULL-LOAD PROCEDURE

KEY NUMBERS REFER TO KEY NUMBERS ON PAGE 2. NOTE THAT THE CRIB AND SIDE FILL ASSEMBLIES HAVE BEEN MODIFIED AS DESCRIBED ON PAGES 5 AND 6. ALSO, FOUR STRUTS HAVE BEEN OMITTED, TWO HORIZONTAL STRUT BRACES HAVE BEEN REDUCED IN LENGTH, AND FOUR VERTICAL STRUT BRACES HAVE BEEN SHORTENED.

