

APPROVED BY  
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*D. A. Lane*

DATE 4/22/01


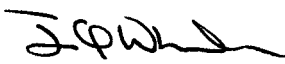
# LOADING AND BRACING<sup>●</sup> IN SIDE OPENING ISO CONTAINERS OF 2,000 POUND GUIDED BOMB UNITS (GBU-24/MK84), COMPLETE ROUND

## INDEX

ITEM	PAGE(S)
TYPICAL LOADING PROCEDURES - - - - -	2
GENERAL NOTES AND MATERIAL SPECIFICATIONS - - - - -	3
PALLET UNIT AND CONTAINER DETAILS - - - - -	4-5
DETAILS - - - - -	5-8

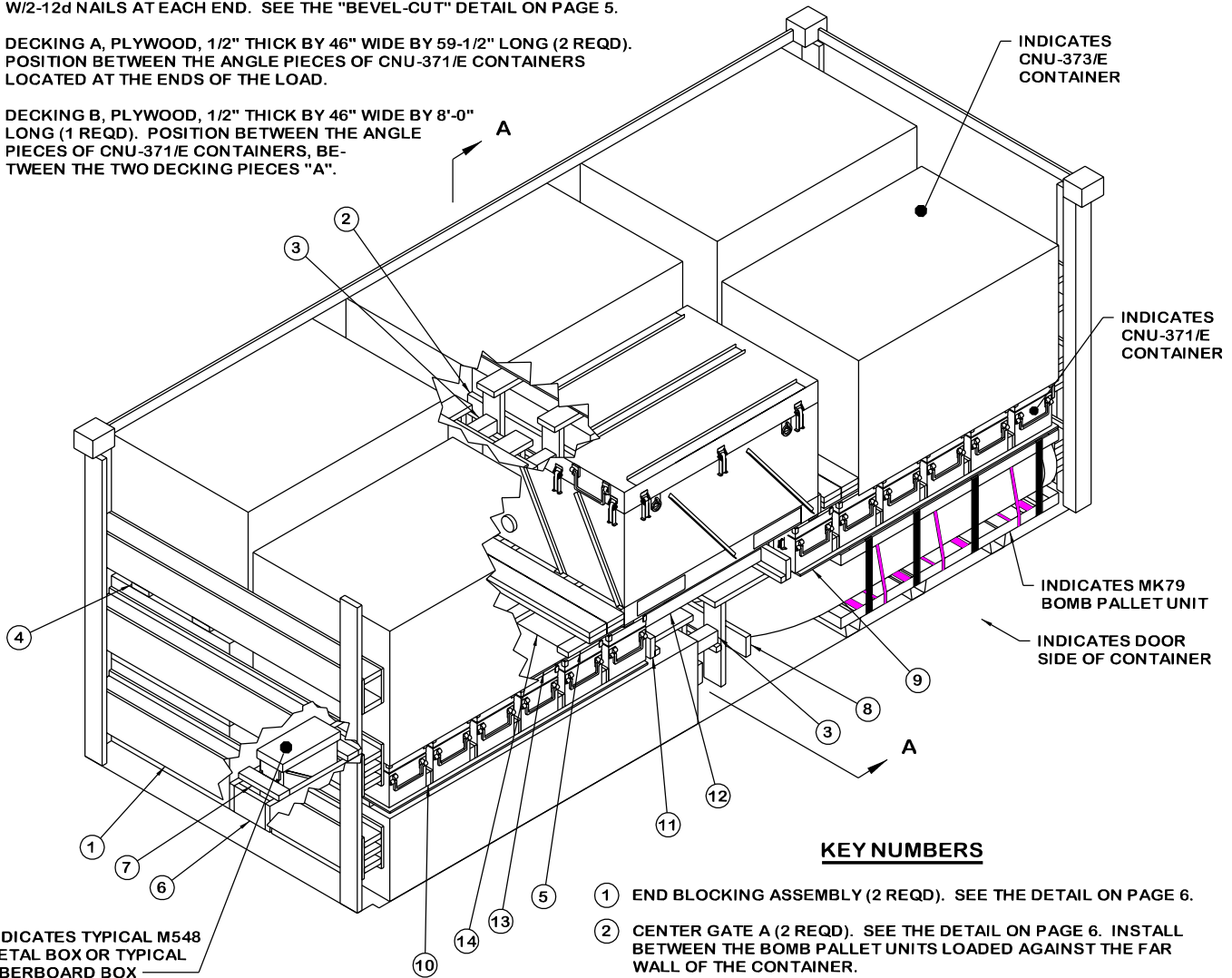
● LOADING AND BRACING SPECIFICATIONS SET FORTH WITHIN THIS DRAWING ARE APPLICABLE TO LOADS THAT ARE TO BE SHIPPED BY TRAILER/CONTAINER-ON-FLATCAR (T/COFC) RAIL CARRIER SERVICE. THESE SPECIFICATIONS MAY ALSO BE USED FOR LOADS THAT ARE TO BE MOVED BY MOTOR OR WATER CARRIERS.

## U.S. ARMY MATERIEL COMMAND DRAWING

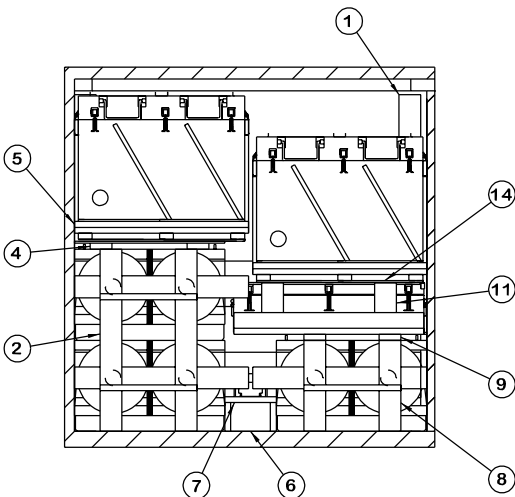
APPROVED, U.S. ARMY OPERATIONS SUPPORT COMMAND  	ENGINEER	BASIC	LAURA A. FIEFFER	DO NOT SCALE			
		REV.		WEBSITE: <a href="http://www.dac.army.mil">HTTP://WWW.DAC.ARMY.MIL</a>			
	TECHNICIAN	BASIC		MARCH 2001			
		REV.					
	DRAFTSMAN	BASIC					
		REV.					
APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND  	TRANSPORTATION ENGINEERING DIVISION		<i>G. L. Willis</i>				
	VALIDATION ENGINEERING DIVISION		<i>Gregory W. Lane</i>	CLASS	DIVISION	DRAWING	FILE
	ENGINEERING DIRECTORATE		<i>William R. French</i>	19	48	8719	SP15M13
U.S. ARMY DEFENSE AMMUNITION CENTER							

(KEY NUMBERS CONTINUED)

- ⑫ STRUT, 4" X 4" BY CUT TO FIT (REF: 42") (2 REQD). TOENAIL TO THE CENTER GATES "C" W/2-12d NAILS AT EACH END. SEE THE "BEVEL-CUT" DETAIL ON PAGE 5.
- ⑬ DECKING A, PLYWOOD, 1/2" THICK BY 46" WIDE BY 59-1/2" LONG (2 REQD). POSITION BETWEEN THE ANGLE PIECES OF CNU-371/E CONTAINERS LOCATED AT THE ENDS OF THE LOAD.
- ⑭ DECKING B, PLYWOOD, 1/2" THICK BY 46" WIDE BY 8'-0" LONG (1 REQD). POSITION BETWEEN THE ANGLE PIECES OF CNU-371/E CONTAINERS, BETWEEN THE TWO DECKING PIECES "A".



**ISOMETRIC VIEW**



**SECTION A-A**

NOTE: STRUTS AND CENTER CNU-373/E CONTAINERS HAVE BEEN OMITTED FOR CLARITY PURPOSES.

**KEY NUMBERS**

- ① END BLOCKING ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 6.
- ② CENTER GATE A (2 REQD). SEE THE DETAIL ON PAGE 6. INSTALL BETWEEN THE BOMB PALLET UNITS LOADED AGAINST THE FAR WALL OF THE CONTAINER.
- ③ STRUT, 4" X 4" BY CUT TO FIT (REF: 11") (6 REQD, FOUR BETWEEN CENTER GATES "A" AND TWO BETWEEN CENTER GATES "B"). TOENAIL TO THE CENTER GATES W/2-12d NAILS AT EACH END. SEE THE "BEVEL-CUT" DETAIL ON PAGE 5.
- ④ DECKING ASSEMBLY A (2 REQD). SEE THE DETAIL ON PAGE 8. POSITION ON TOP OF THE BOMB PALLET UNITS LOADED AGAINST THE FAR WALL OF THE CONTAINER, WITH THE RISER PIECES ALIGNED WITH THE VERTICAL PIECES OF CENTER GATE "A".
- ⑤ SEPARATOR ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 7. FABRICATE BETWEEN THE CNU-373/E CONTAINERS.
- ⑥ ANTI-SWAY BRACE (2 REQD). SEE THE DETAIL ON PAGE 8. INSTALL LATERALLY BETWEEN THE BOMB PALLET UNITS.
- ⑦ STOP PIECE, 2" X 4" BY LENGTH TO SUIT (AS REQD). INSTALL TO RESTRAIN THE MISCELLANEOUS BOXES WITHIN THE ANTI-SWAY BRACES. SEE THE "SECUREMENT OF MISCELLANEOUS BOXES" DETAIL ON PAGE 5.
- ⑧ CENTER GATE B (2 REQD). SEE THE DETAIL ON PAGE 7. INSTALL BETWEEN THE BOMB PALLET UNITS LOADED ON THE DOOR SIDE OF THE CONTAINER.
- ⑨ DECKING ASSEMBLY B (2 REQD). SEE THE DETAIL ON PAGE 8. POSITION ON TOP OF THE BOMB PALLET UNITS LOADED ON THE DOOR SIDE OF THE CONTAINER, WITH THE RISER PIECES ALIGNED WITH THE VERTICAL PIECES OF CENTER GATE "B".
- ⑩ SEPARATOR PIECE, 1" AND 2" X 4" X 48" (10 EACH REQD). LAMINATE THE 1" PIECE TO THE 2" PIECE W/5-6d NAILS. INSTALL BETWEEN THE CNU-371/E CONTAINERS.
- ⑪ CENTER GATE C (2 REQD). SEE THE DETAIL ON PAGE 7. INSTALL BETWEEN THE CNU-371/E CONTAINERS.

(GENERAL NOTES CONTINUED)

GENERAL NOTES

- J. 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.
- 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.
- 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. 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.
- O. ANTI-CHAFING MATERIAL, CONSISTING OF NEUTRAL BARRIER MATERIAL, PLYWOOD, OR HARDBOARD, MAY BE INSTALLED AT POINTS OF CONTACT BETWEEN THE LADING AND THE SIDE OPENING CONTAINER TO PREVENT CHAFING DAMAGE TO CONTAINER PAINT AND MARKINGS.

- 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 2,000 LB GBU-24 (MK84) BOMBS, INCLUDING ASSOCIATED COMPONENTS. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CONTAINERS WITH THE GBU-24 COMPONENTS. SEE PAGES 4 AND 5 FOR DETAILS OF THE COMPONENTS. 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 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 ANTI-SWAY BRACES. NAIL EACH ADDITIONAL PIECE TO THE LONGITUDINAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE LENGTH OF THE LATERAL PIECES 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 LAMINATED TO THE BUFFER PIECES ON THE END BLOCKING 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 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. PORTIONS OF THE CONTAINER DEPICTED WITHIN THIS DRAWING, SUCH AS THE SIDE DOORS, HAVE NOT BEEN SHOWN IN THE LOAD VIEW FOR CLARITY PURPOSES.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
MK84 BOMB PALLET UNIT -	6 - - - - -	24,462 LBS
CNU-371/E CONTAINER		
WITH WGU-39/B - - - -	12 - - - - -	1,692 LBS
CNU-373/E CONTAINER		
WITH BSU-84A/B - - - -	6 - - - - -	6,252 LBS
FW73 BOX - - - - -	3 - - - - -	15 LBS
G119 BOX - - - - -	2 - - - - -	78 LBS
DUNNAGE - - - - -		1,335 LBS
CONTAINER - - - - -		6,050 LBS
TOTAL WEIGHT - - - - -		39,884 LBS (APPROX)

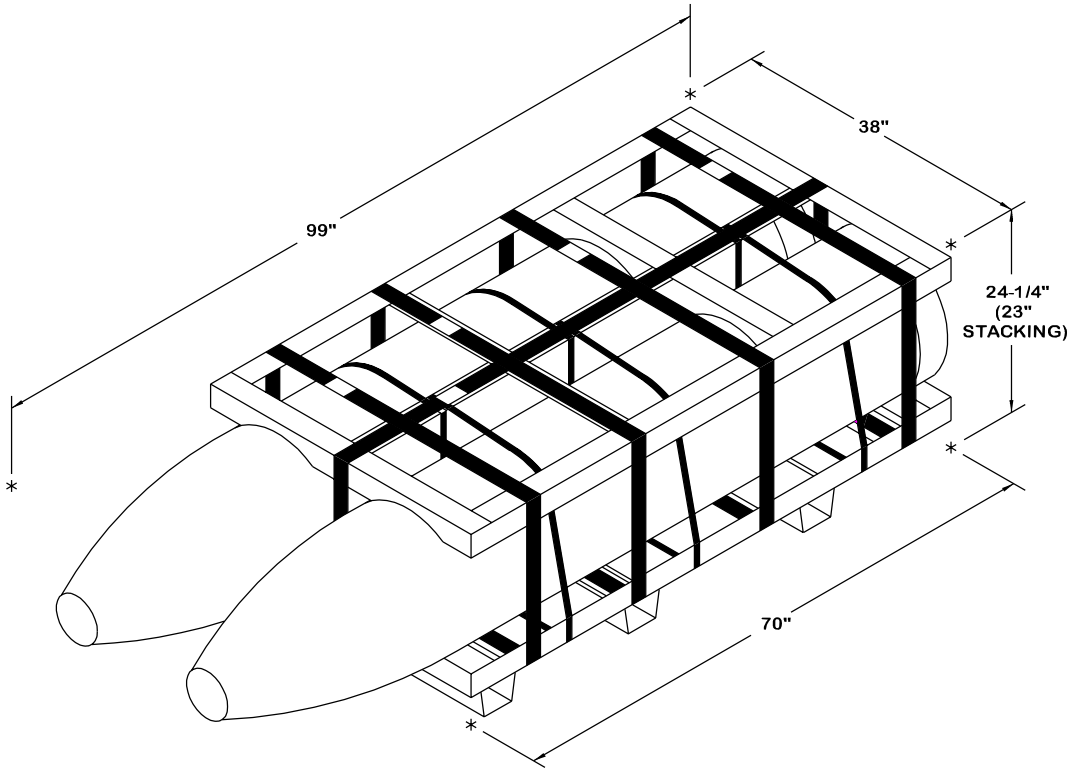
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BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	40	14
2" X 2"	21	7
2" X 4"	71	47
2" X 6"	329	329
2" X 8"	39	52
4" X 4"	13	17
NAILS	NO. REQD	POUNDS
6d (2")	470	3
10d (3")	266	4-1/4
12d (3-1/4")	32	3/4
PLYWOOD, 1/2" - 174.68 SQ FT REQD - - - -		240.19 LBS
PLYWOOD, 3/4" - 77.64 SQ FT REQD - - - -		160.13 LBS

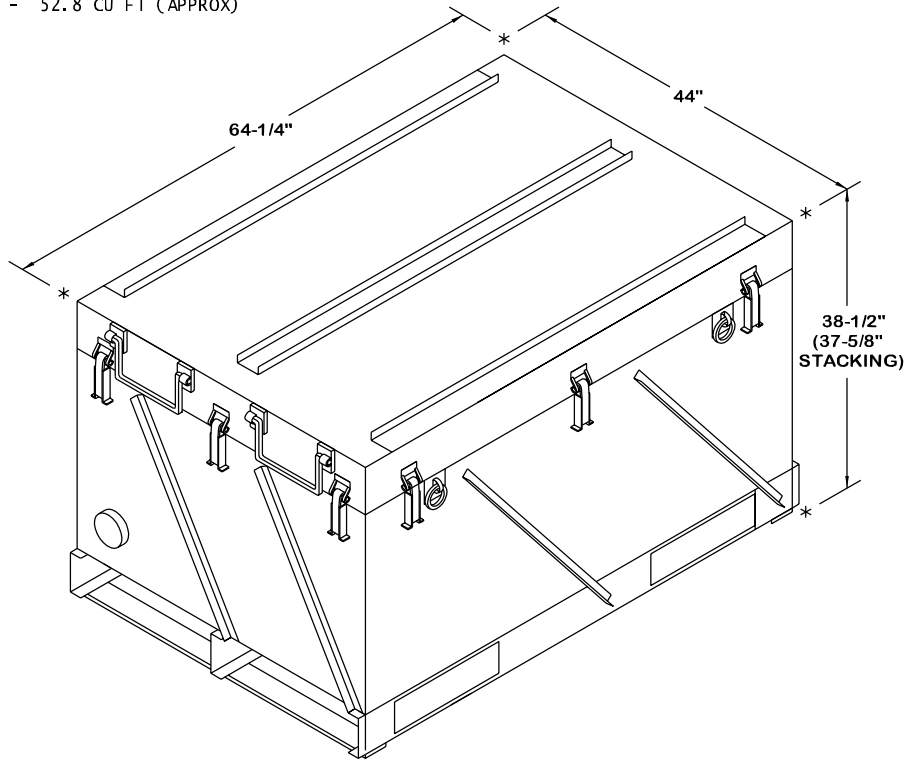
MATERIAL SPECIFICATIONS

- LUMBER - - - - - : SEE TM 743-200-1 (DUNNAGE LUMBER) AND VOLUNTARY PRODUCT STANDARD PS 20.
- NAILS - - - - - : ASTM F1667; COMMON STEEL NAIL (NLCS OR NLCSMS).
- 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.
- ANTI-CHAFING MATERIAL - - - - - : MIL-B-121 (OR EQUAL); NEUTRAL BARRIER MATERIAL.
- HARDBOARD - - - - - : ANSI/AHA A135.4, CLASS 1.



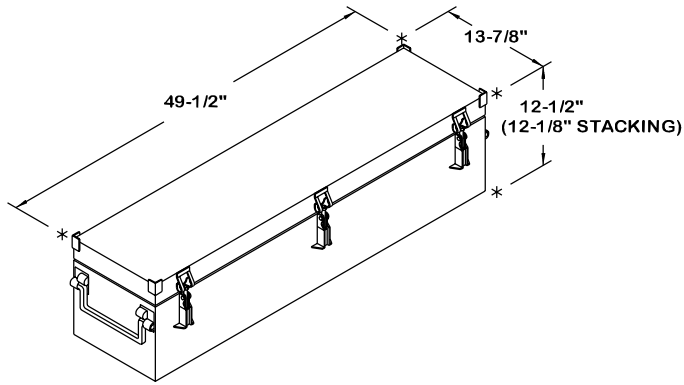
**MK84 (F275) BOMBS ON MK79 PALLETS**

GROSS WEIGHT - - - - - 4,077 LBS (APPROX)  
 CUBE - - - - - 52.8 CU FT (APPROX)



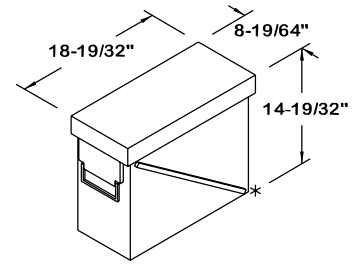
**BSU-84A/B (EA27) IN CNU-373/E CONTAINER**

GROSS WEIGHT - - - - - 1,042 LBS (APPROX)  
 CUBE - - - - - 61.8 CUBIC FEET (APPROX)



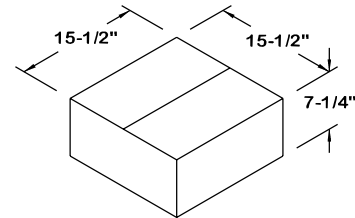
**WGU-39/B (EA37) IN CNU-371/E CONTAINER**

GROSS WEIGHT - - - - - 141 LBS (APPROX)  
 CUBE - - - - - 5.0 CUBIC FEET (APPROX)



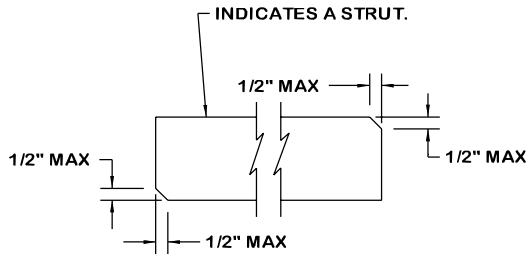
**FMU-139A/B (G119) IN M548 METAL BOX**

GROSS WEIGHT - - - - - 39 LBS (APPROX)  
 CUBE - - - - - 1.3 CUBIC FEET (APPROX)



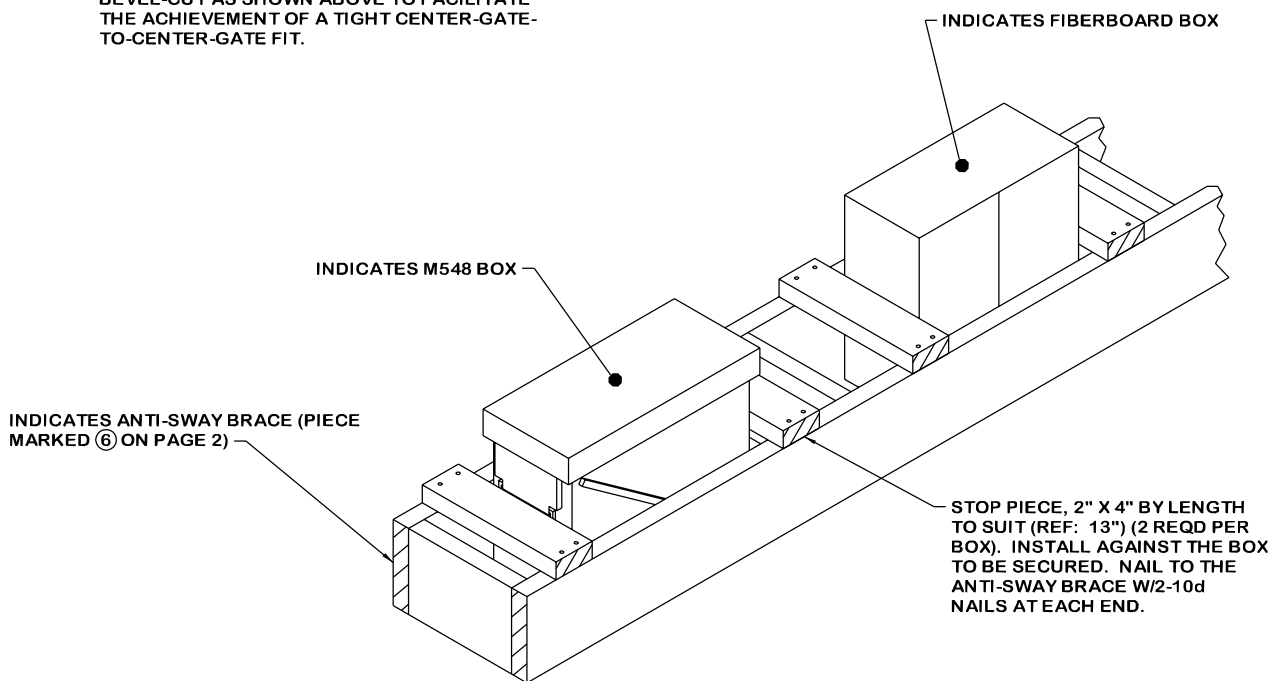
**SWIVEL AND LOOP ASSEMBLY (FY73) IN FIBERBOARD BOX**

GROSS WEIGHT - - - - - 5 LBS (APPROX)  
 CUBE - - - - - 1.0 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 CENTER-GATE-TO-CENTER-GATE FIT.



**SECUREMENT OF MISCELLANEOUS BOXES**

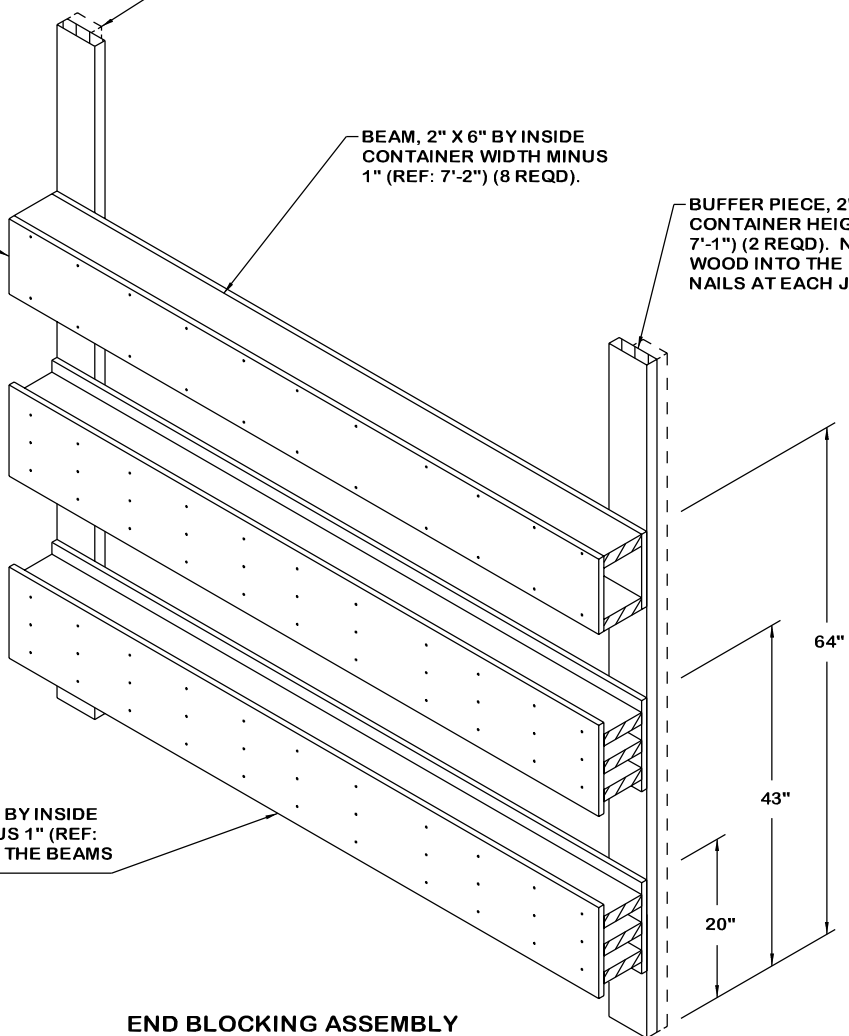
SEE GENERAL NOTE "G" ON PAGE 3.

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

BEAM, 2" X 6" BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-2") (8 REQD).

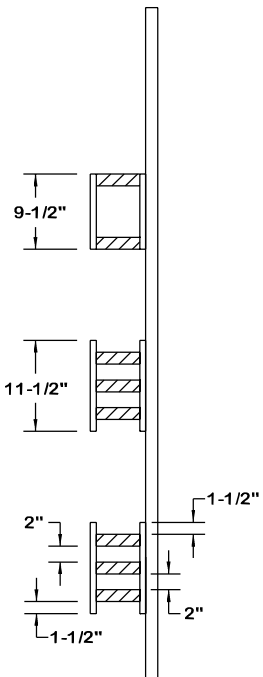
BUFFER PIECE, 2" X 6" BY INSIDE CONTAINER HEIGHT MINUS 1" (REF: 7'-1") (2 REQD). NAIL THRU PLYWOOD INTO THE BEAMS W/2-10d NAILS AT EACH JOINT.

PLYWOOD, 1/2" X 11-1/2" BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-2") (4 REQD). NAIL TO THE BEAMS W/1-6d NAIL EVERY 8".



**END BLOCKING ASSEMBLY**

VIEW A

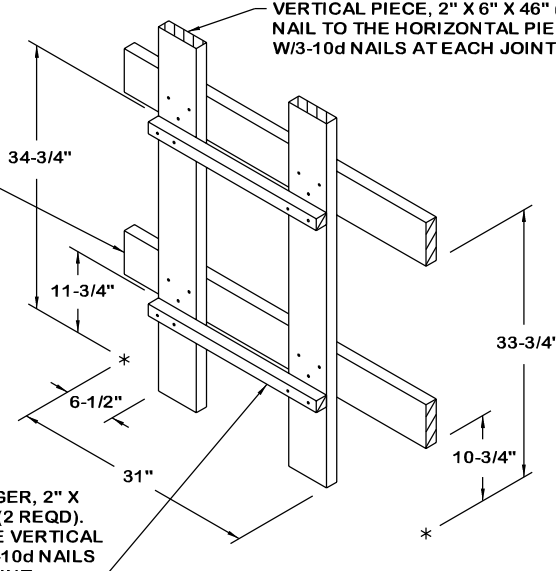


VIEW A

HORIZONTAL PIECE, 2" X 6" X 44" (2 REQD).

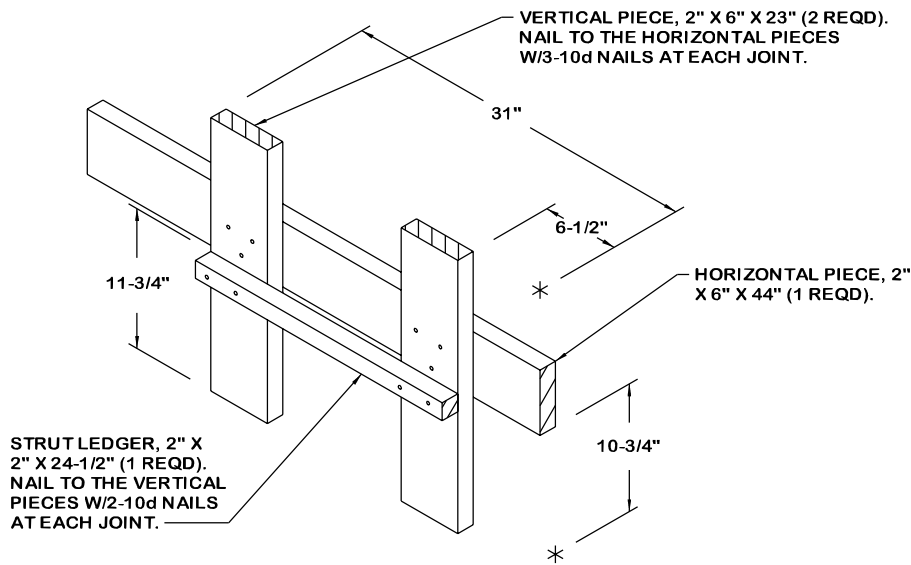
VERTICAL PIECE, 2" X 6" X 46" (2 REQD). NAIL TO THE HORIZONTAL PIECES W/3-10d NAILS AT EACH JOINT.

STRUT LEDGER, 2" X 2" X 24-1/2" (2 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.



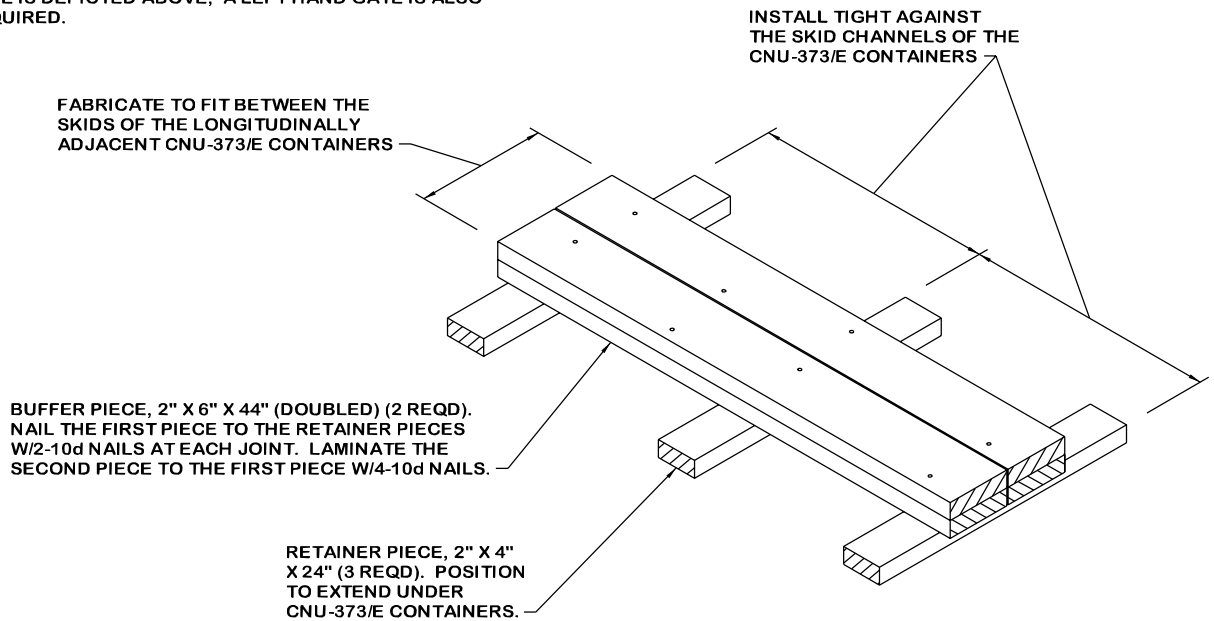
**CENTER GATE A**

NOTE: THE VERTICAL PIECES MUST BE IN ALIGNMENT WITH THE NOSE ENDS OF THE BOMBS. A RIGHT HAND GATE IS DEPICTED ABOVE, A LEFT HAND GATE IS ALSO REQUIRED.



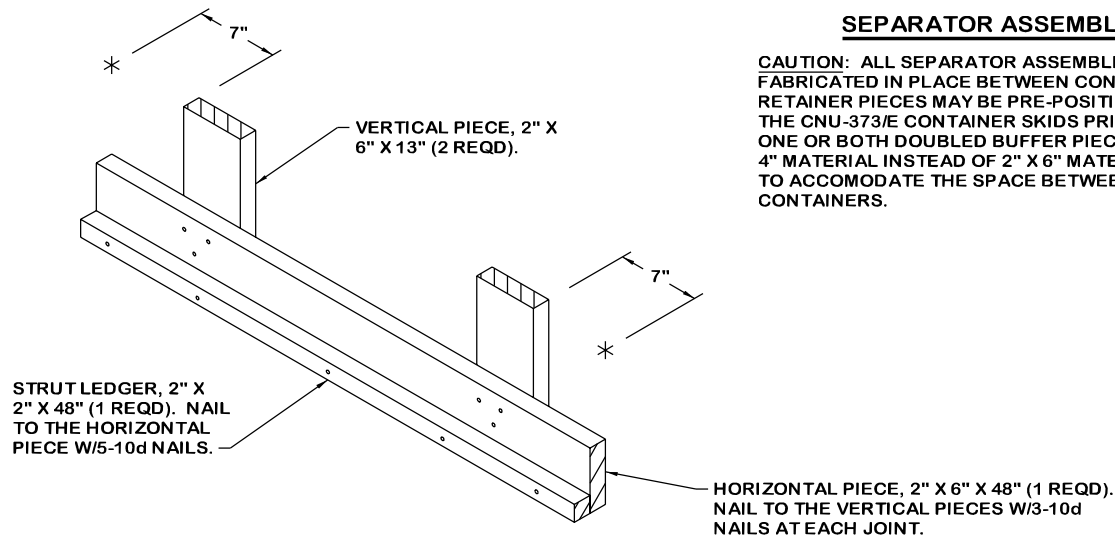
**CENTER GATE B**

NOTE: THE VERTICAL PIECES MUST BE IN ALIGNMENT WITH THE NOSE ENDS OF THE BOMBS. A RIGHT HAND GATE IS DEPICTED ABOVE, A LEFT HAND GATE IS ALSO REQUIRED.

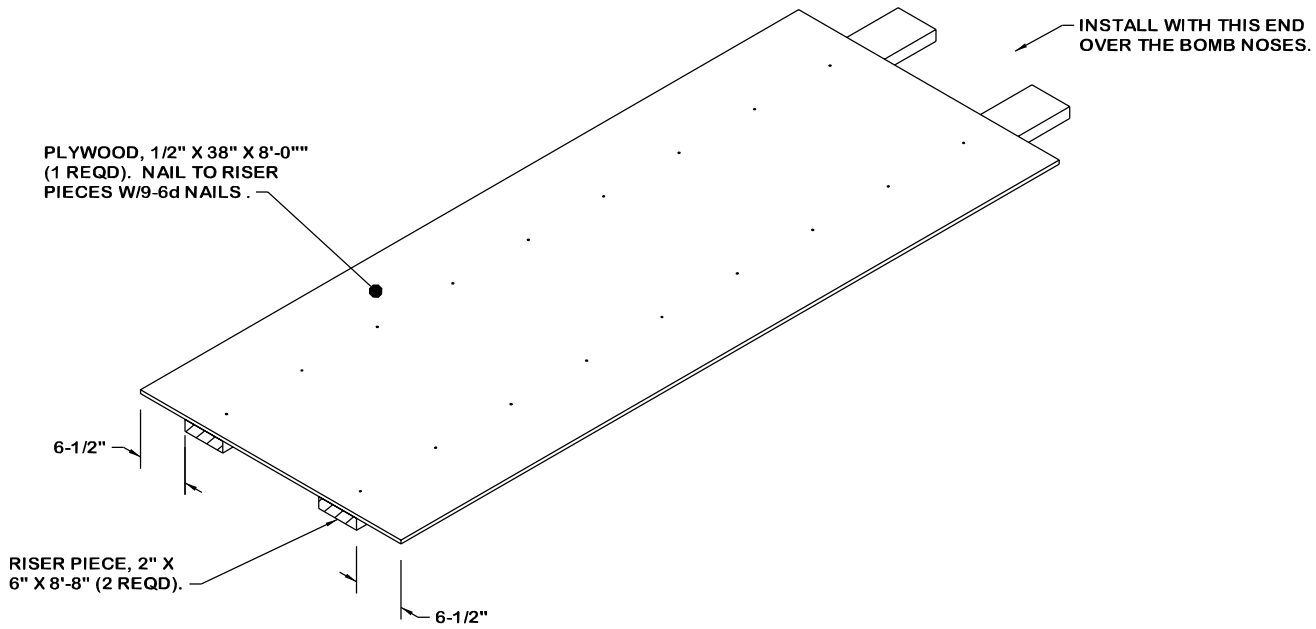


**SEPARATOR ASSEMBLY**

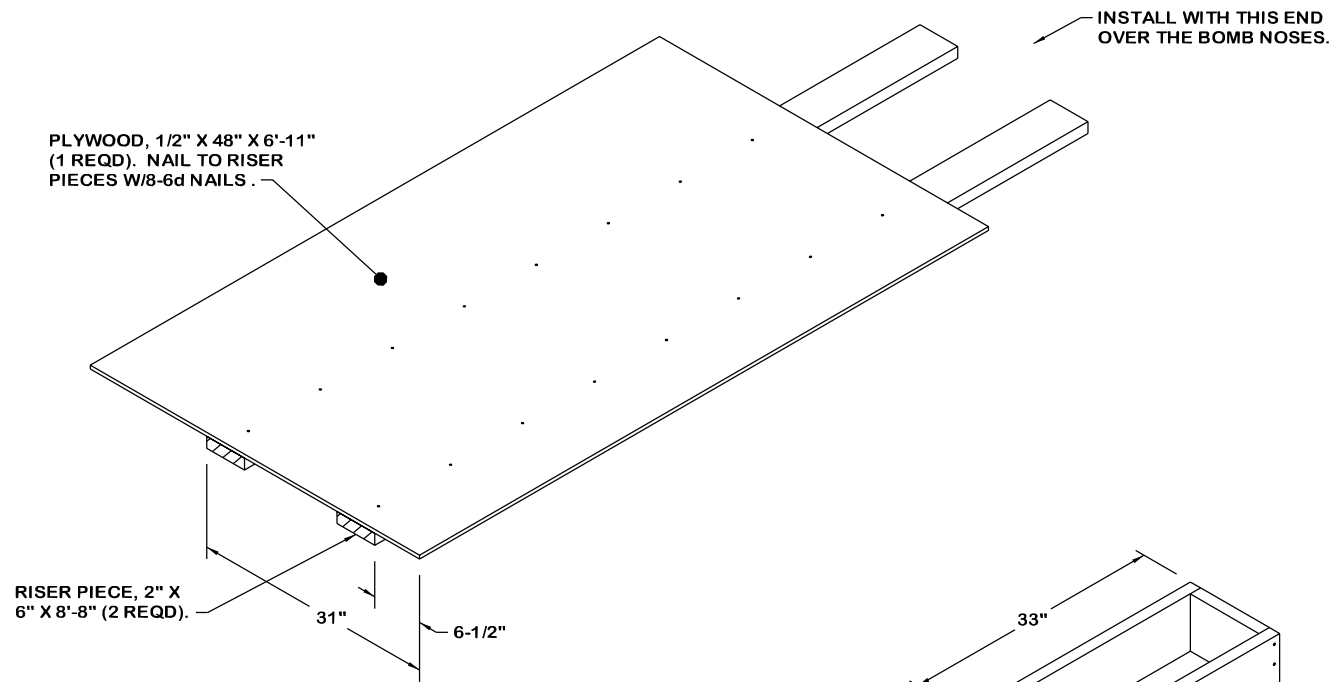
CAUTION: ALL SEPARATOR ASSEMBLIES MUST BE FABRICATED IN PLACE BETWEEN CONTAINERS. THE RETAINER PIECES MAY BE PRE-POSITIONED WITHIN THE CNU-373/E CONTAINER SKIDS PRIOR TO LOADING. ONE OR BOTH DOUBLED BUFFER PIECES MAY BE 2" X 4" MATERIAL INSTEAD OF 2" X 6" MATERIAL, IF NEEDED, TO ACCOMODATE THE SPACE BETWEEN THE CNU-373/E CONTAINERS.



**CENTER GATE C**



**DECKING ASSEMBLY A**



**DECKING ASSEMBLY B**

A LEFT HAND ASSEMBLY IS DEPICTED ABOVE, A RIGHT HAND ASSEMBLY IS ALSO REQUIRED.

