LOADING AND BRACING⊕ IN SIDE OPENING ISO CONTAINERS OF 500 POUND GUIDED BOMB UNITS (GBU-38), COMPLETE ROUND

INDEX

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

U.S. ARMY MATERIEL COMMAND DRAWING

APPROVED, U.S. ARMY
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JUNE 2024

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CLASS	DIVISION	DRAWING	FILE
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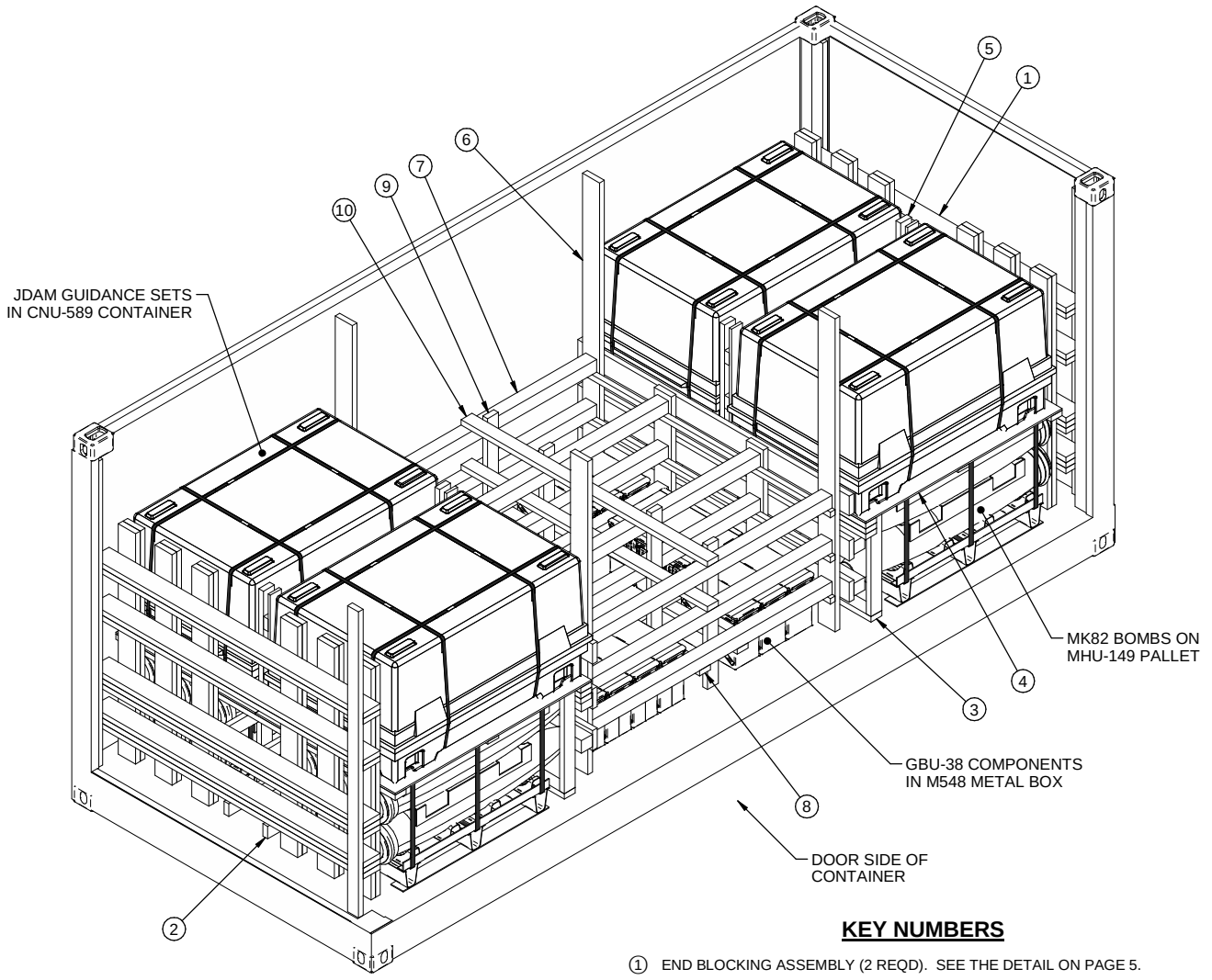
PROJECT SP 592-23



ISOMETRIC VIEW

KEY NUMBERS

① END BLOCKING ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 5.

② LOWER CRIB FILL ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 7.

③ DECKING SUPPORT ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 7. POSITION AT NOSE END OF MK82 BOMB PALLET UNITS. NAIL TO LOWER CRIB FILL ASSEMBLY AS INSTRUCTED ON PAGE 7.

④ DECKING ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 6. POSITION ON TOP OF MK82 BOMB PALLET UNITS, AFTER LOWER CRIB FILL ASSEMBLIES AND DECKING SUPPORT ASSEMBLIES ARE INSTALLED.

⑤ UPPER CRIB FILL ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 7.

⑥ CENTER GATE (2 REQD). SEE THE DETAIL ON PAGE 6.

⑦ STRUT, 4" X 4" BY CUT-TO-FIT (REF: 6'-5-3/4") (12 REQD). TOENAIL TO THE CENTER GATES W/2-12d NAILS AT EACH END. SEE THE "BEVEL-CUT" DETAIL ON PAGE 8.

⑧ RESTRAINT PIECE, 2" X 4" X 27" OR 33" (AS REQD). POSITION AGAINST M548 METAL BOXES AND NAIL TO THE STRUTS W/2-10d NAILS AT EACH END. SEE THE DETAIL ON PAGE 8.

⑨ VERTICAL STRUT BRACING, 2" X 4" X 40" (4 REQD). POSITION CENTERED ON STRUTS. NAIL TO EACH STRUT W/2-10d NAILS AT EACH JOINT.

⑩ HORIZONTAL STRUT BRACING, 2" X 4" X 6'-7" (2 REQD). POSITION ACROSS THE TOP TWO LAYERS OF STRUTS. NAIL TO EACH STRUT W/2-10d NAILS AT EACH JOINT.

BILL OF MATERIAL		
LUMBER	**LINEAR FEET**	**BOARD FEET**
1″ X 4″	26	9
2″ X 2″	41	14
2″ X 4″	264	176
2″ X 6″	359	359
4″ X 4″	116	155
NAILS	**NO. REQD**	**POUNDS**
6d (2″)	82	1/2
10d (3″)	776	12
12d (3-1/4″)	80	1-1/3
PLYWOOD, 1/2″ - - 78.31 SQ FT REQD - 107.68 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CNU-589 CONTAINER	4	2,436 LBS
MHU-149 PALLET UNIT	4	12,800 LBS
M548 CONTAINER	20	1,040 LBS
DUNNAGE		1,544 LBS
CONTAINER		6,050 LBS
TOTAL WEIGHT		23,870 LBS

PROJECT SP 592-23

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 500 LB GBU-38 BOMBS AND ASSOCIATED COMPONENTS IN A SIDE OPENING CONTAINER. SUBSEQUENT REFERENCE TO PALLET UNITS OR CONTAINERS HEREIN MEANS PALLET UNITS OR CONTAINERS WITH GBU-38 COMPONENTS. SEE PAGE 4 FOR DETAILS OF THE COMPONENTS. **CAUTION:** REGARDLESS OF THE QUANTITY OF PALLET UNITS OR CONTAINERS TO BE SHIPPED, THE "MAXIMUM GROSS WEIGHT" OF THE SIDE OPENING ISO CONTAINER MUST NOT BE EXCEEDED.

C. THE LOAD AS SHOWN IS BASED ON A 6,050 POUND 20' LONG BY 8' WIDE BY 8'-6" HIGH SIDE OPENING ISO CONTAINER WITH INSIDE DIMENSIONS OF 19'-6-1/4" LONG BY 90" WIDE BY 89" HIGH, WITH A MAXIMUM GROSS WEIGHT OF 52,910 POUNDS. OLDER/OTHER CONTAINERS MAY HAVE DIFFERENT INSIDE MEASUREMENTS, VERIFY INSIDE CONTAINER DIMENSIONS 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 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 VERTICAL PIECES ON THE CRIB FILL ASSEMBLIES. NAIL EACH ADDITIONAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE THICKNESS, LENGTH AND/OR QUANTITY OF THE DUNNAGE LUMBER USED MAY BE ADJUSTED AS REQUIRED TO FACILITATE VARIANCE IN THE SIZE OF THE CONTAINER. THE LOADS MUST BE AS TIGHT AS POSSIBLE LONGITUDINALLY, BUT THE VOID MUST NOT EXCEED 3/4" OVERALL. EXCESSIVE SLACK CAN BE ELIMINATED BY INCREASING THE LENGTH OF THE STRUTS.

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. 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.

G. IN SOME CONTAINERS THERE IS A SLOT AT THE CORNERS OF THE ENDWALL. PIECES OF DUNNAGE MATERIAL MUST BE LAMINATED TO THE VERTICAL PIECES ON THE END BLOCKING ASSEMBLY TO PROVIDE A FLAT SURFACE FOR THIS ASSEMBLY. 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 ENDWALLS, 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.

(CONTINUED AT RIGHT)

(GENERAL NOTES CONTINUED)

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 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.

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.

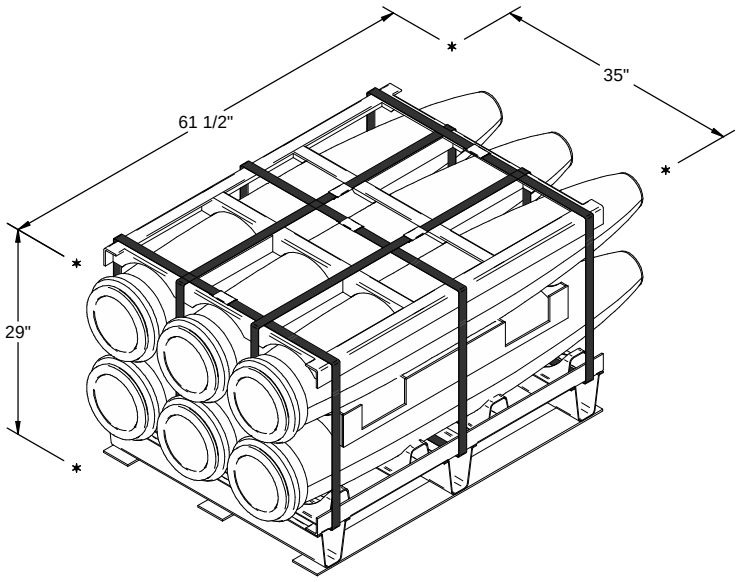
O. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS 0.454 KG.

P. LOAD-BLOCKING STRUTS WHICH ARE 48" OR LONGER MUST BE STIFFENED BY THE APPLICATION OF HORIZONTAL AND VERTICAL STRUT BRACING AS SHOWN IN THE LOAD ON PAGE 2. BRACING IS NOT REQUIRED IF THE STRUTS FOR THE LOAD BEING SHIPPED ARE SHORTER THAN 48". THE LENGTH OF THE LOAD-BLOCKING STRUTS SHOULD BE KEPT AS SHORT AS POSSIBLE (APPROX 18" MINIMUM), BUT IN THE EVENT IT IS NECESSARY TO USE STRUTS WHICH ARE 8'-0" OR MORE IN LENGTH, IT WILL BE NECESSARY TO APPLY AN ADDITIONAL SET OF HORIZONTAL AND VERTICAL STRUT BRACING PIECES. STRUT BRACING SHOULD BE APPLIED SO AS TO PROVIDE NEARLY EQUAL SPACES BETWEEN THE BRACING PIECES AND THE CENTER GATES AND/OR BETWEEN ADJACENT STRUT BRACING PIECES. NOTE THAT HORIZONTAL STRUT BRACING PIECES FOR THE UPPER LEVEL OF STRUTS FOR ALL BUT THE UPPERMOST TIER OF A LOAD MAY BE DIFFICULT TO APPLY TO THE TOP SURFACES OF THE STRUT AS DEPICTED. STRUT BRACING WILL BE EQUALLY EFFECTIVE IF APPLIED TO THE UNDER SIDE OF THOSE STRUTS.

Q. ANTI-CHAFING MATERIAL MAY BE INSTALLED AT POINTS OF CONTACT BETWEEN PALLET UNITS OR CONTAINERS, AND BETWEEN PALLET UNITS OR CONTAINERS AND THE SIDE OPENING CONTAINER, IF DESIRED, TO PREVENT CHAFING DAMAGE TO CONTAINER PAINT AND MARKINGS.

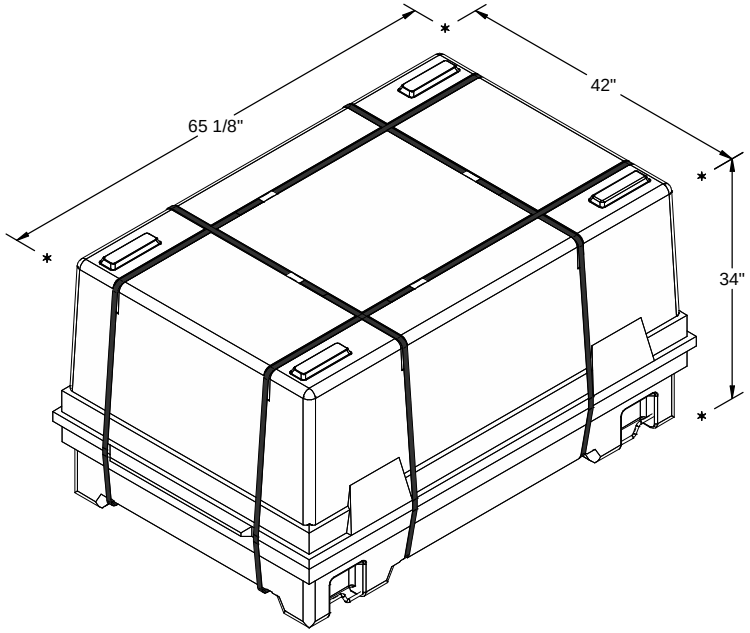
MATERIAL SPECIFICATIONS

LUMBER	SEE TM 743-200-1 (DUNNAGE LUMBER) AND VOLUNTARY PRODUCT STANDARD PS 20.
NAILS	ASTM F1667; COMMON STEEL NAIL NLCMS OR NLCMMS).
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-PRF-121 (OR EQUAL); NEUTRAL BARRIER MATERIAL.



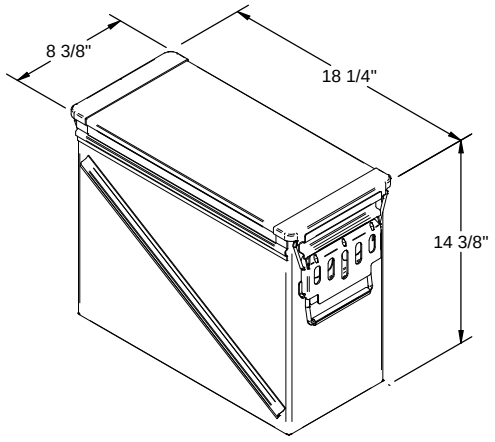
MK82 BOMBS ON MHU-149 PALLET

GROSS WEIGHT - - - - - - - - - 3,200 LBS (APPROX)
CUBE - - - - - - - - - - - - - 36.1 CU FT (APPROX)



KMU-572 IN CNU-589 CONTAINER

WITH 6 EACH GUIDANCE SETS
GROSS WEIGHT - - - - - - - - - - - - - 609 LBS (APPROX)
CUBE - - - - - - - - - - - - - - - - - 53.8 CU FT (APPROX)

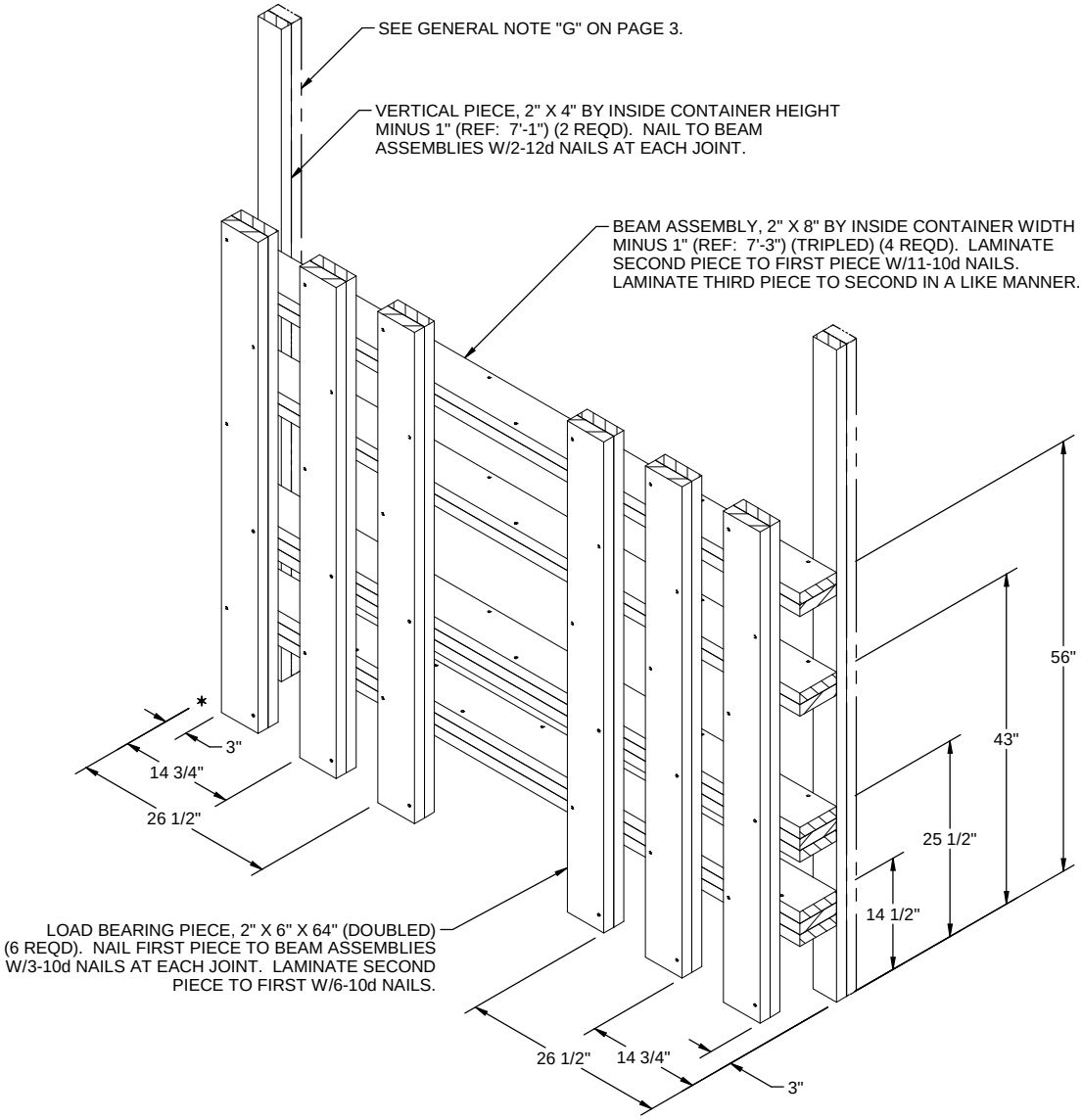


M548 METAL BOX

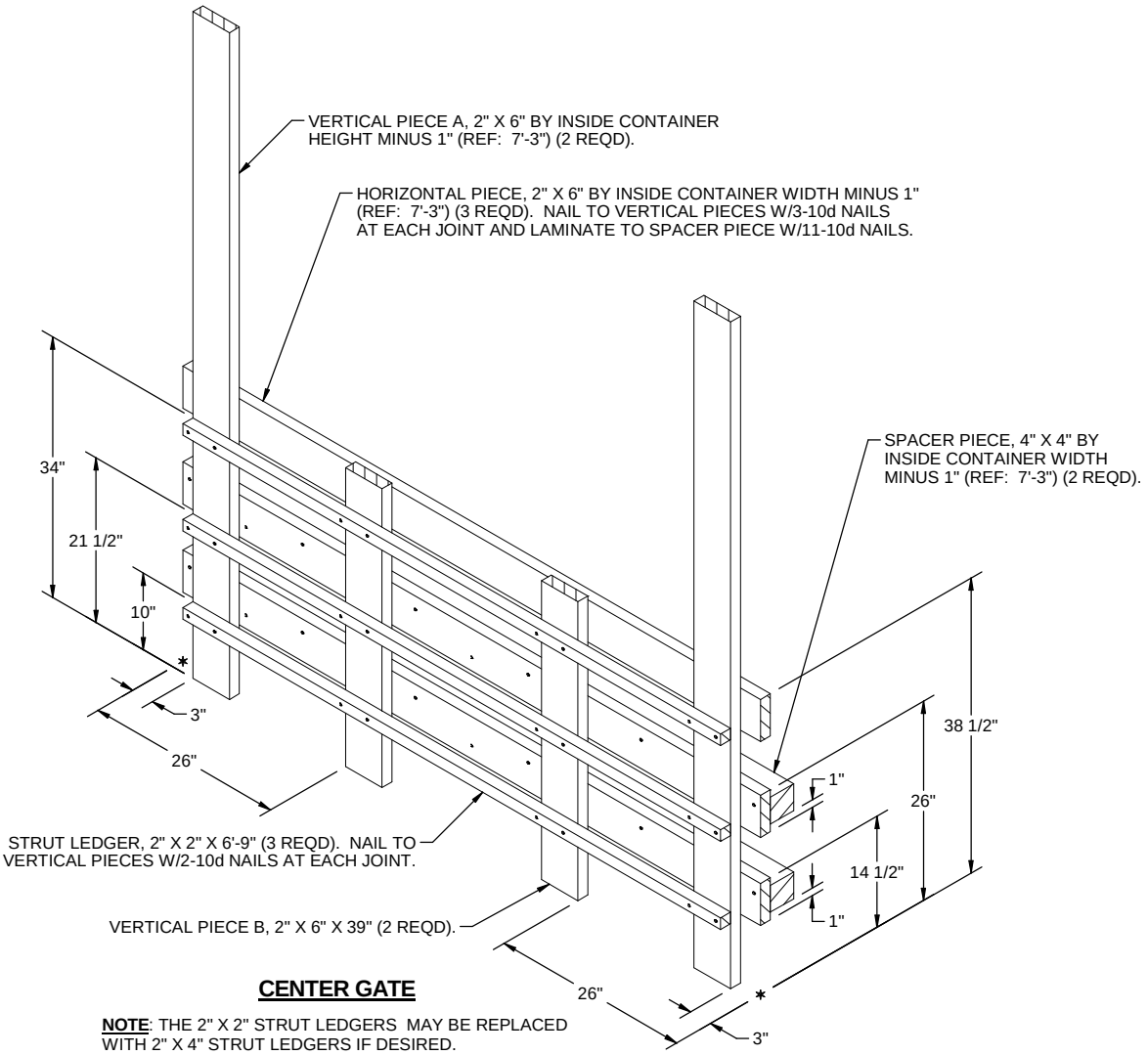
GROSS WEIGHT - - - - - - - - - - - - - - - - 52 LBS (MAX)
CUBE - - - - - - - - - - - - - - - - - - - 1.27 CU FT (APPROX)

PROJECT SP 592-23

LOAD COMPOSITION CHART						
NSN	DODIC	NOMENCLATURE	TOTAL PER ISO	QUANTITY PER UNIT PACK	CONTAINER QUANTITY	CONTAINER
1325-01-064-0853	E485	BOMB GP 500 LB MK82 MOD 1	24	6	4	MHU-149
1325-01-491-0003	EB52	GUIDANCE SET JDAM KMU-572A/B	24	6	4	CNU-589
1325-01-575-8162	ED51	FMU-152A/B FUZE SYSTEM	24	6	4	M548
1325-01-548-4634	KY70	PROXIMITY SENSOR DSU-33D/B	24	2	12	M548
1325-00-609-2344	FW26	NOSE SUPPORT CUP	24	12	2	M548
1325-00-124-1538	G008	NOSE PLUG	24	12	2	M548

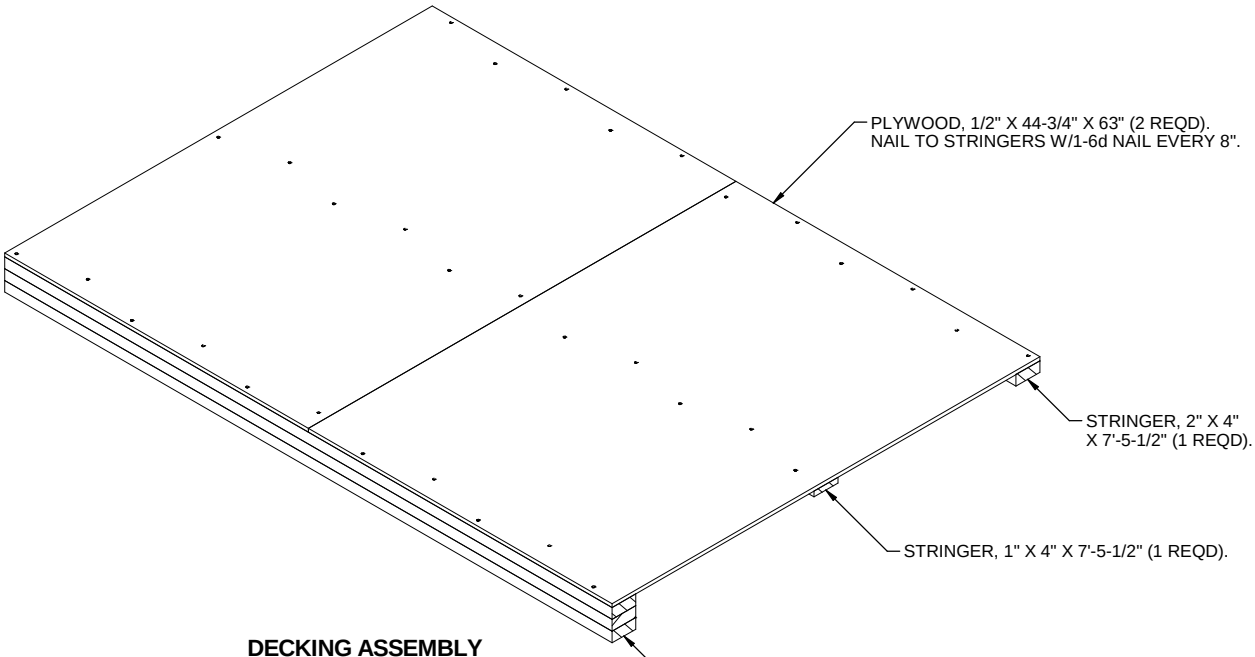


END BLOCKING ASSEMBLY



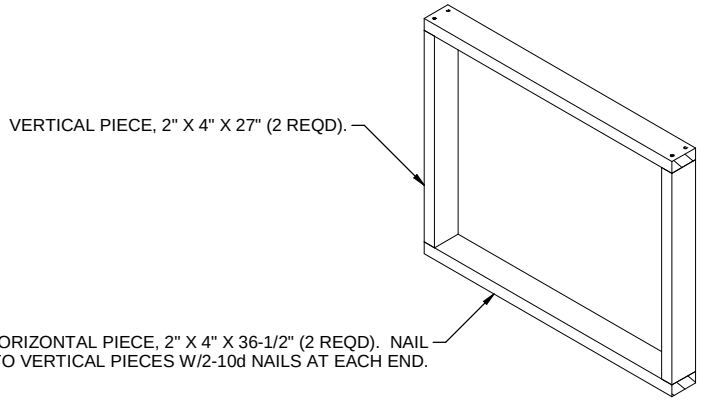
CENTER GATE

NOTE: THE 2" X 2" STRUT LEDGERS MAY BE REPLACED WITH 2" X 4" STRUT LEDGERS IF DESIRED.



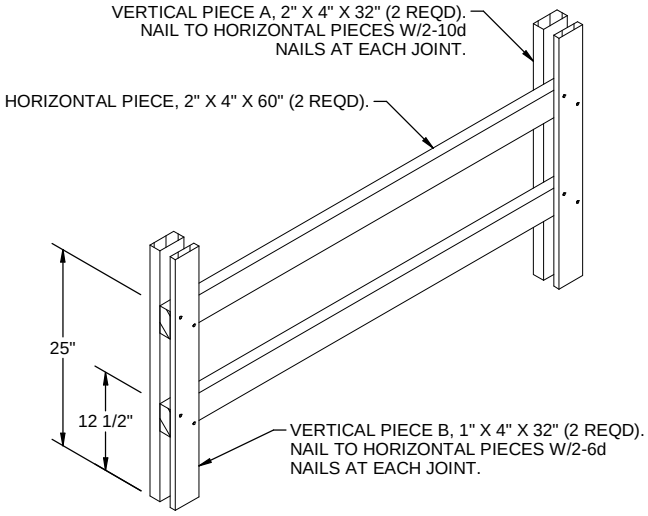
DECKING ASSEMBLY

PROJECT SP 592-23

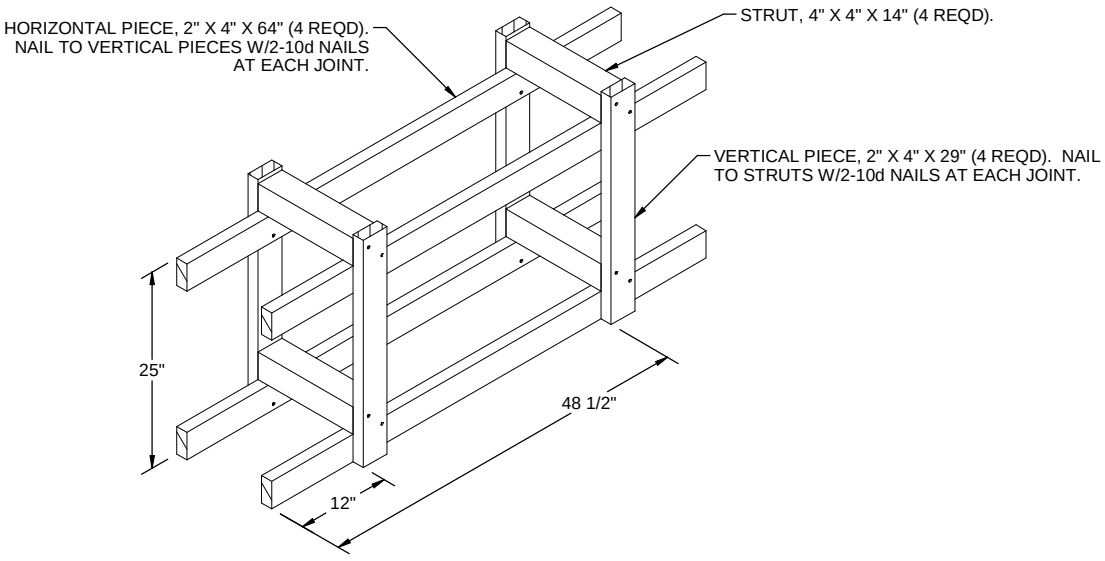


DECKING SUPPORT ASSEMBLY

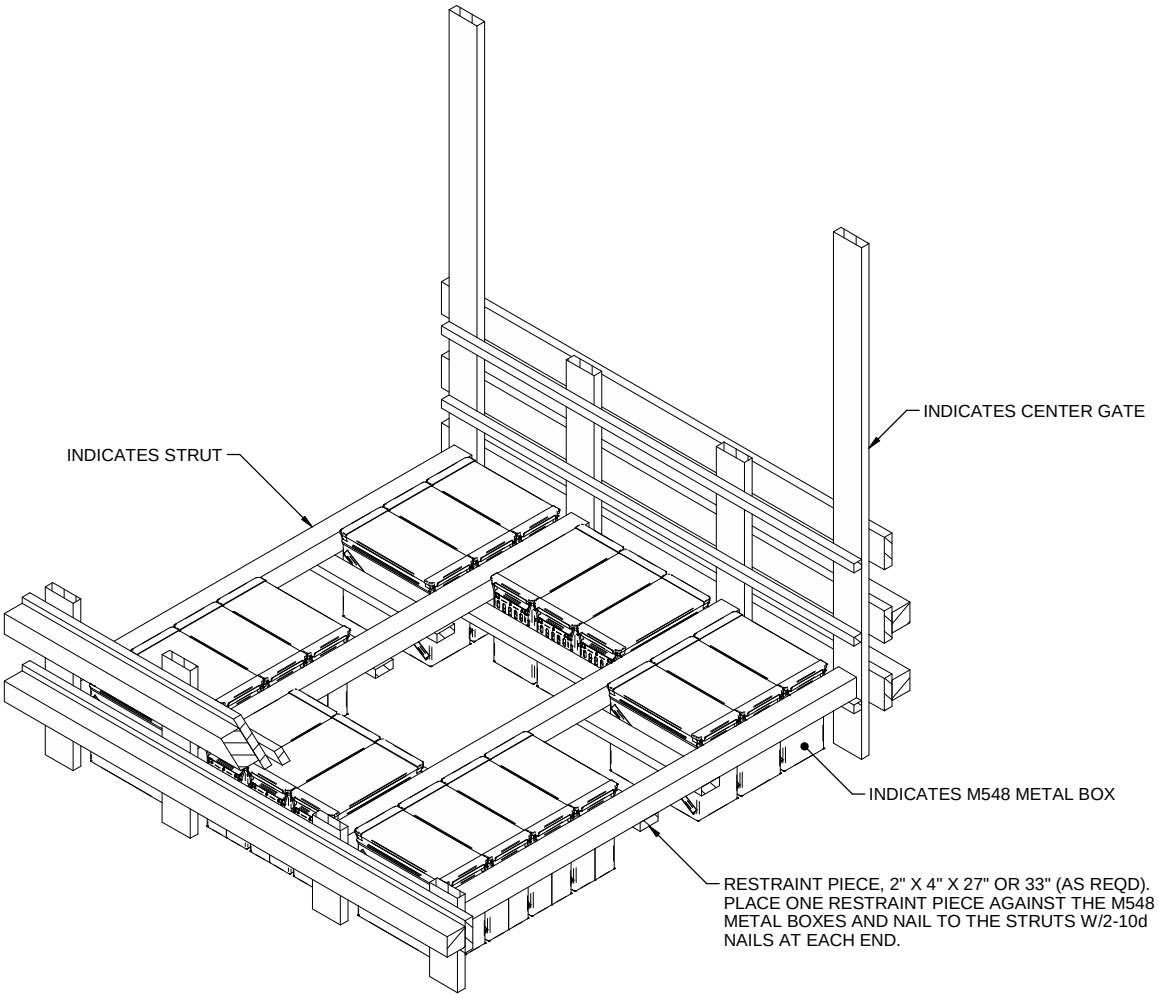
POSITION PRIOR TO INSTALLING CENTER GATE. FOR ADDITIONAL STABILITY AFTER INSTALLATION, NAIL VERTICAL PIECE TO HORIZONTAL PIECES OF LOWER CRIB ASSEMBLY W/2-10d NAILS AT EACH JOINT.



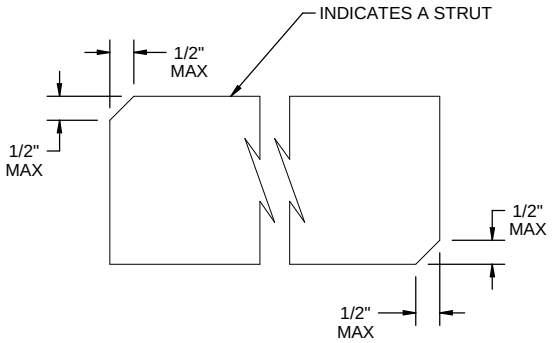
UPPER CRIB FILL ASSEMBLY



LOWER CRIB FILL ASSEMBLY



SECUREMENT OF MISCELLANEOUS BOXES



BEVEL CUT

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