LOADING AND BRACING⊕ IN SIDE OPENING ISO CONTAINERS OF MK82 (500 POUND) BOMBS ON MHU-149 METAL PALLETS, USING SHOCK-GARD RESTRAINT MATERIAL

INDEX

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SEPTEMBER 2022

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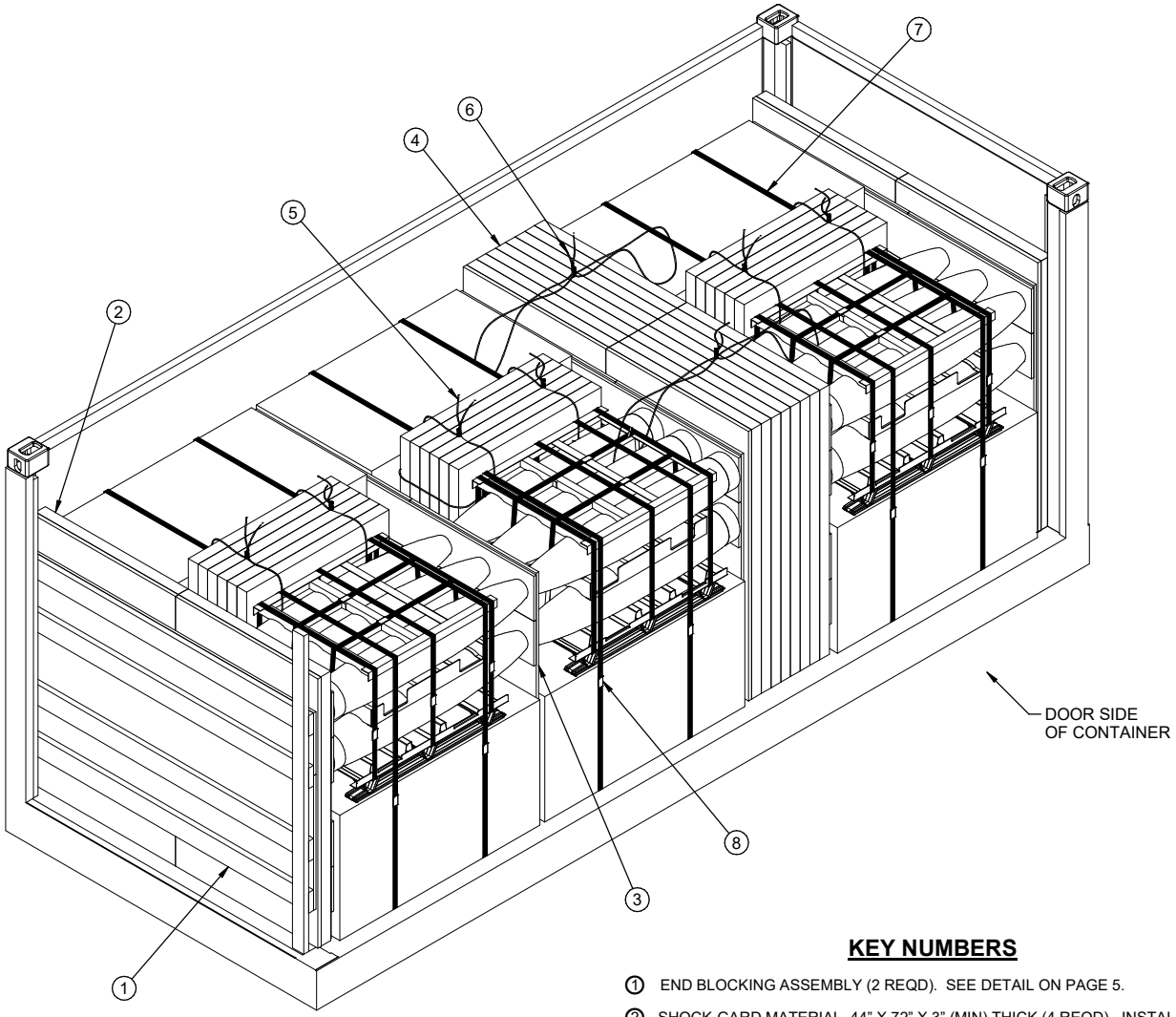

ISOMETRIC VIEW

KEY NUMBERS

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

② SHOCK-GARD MATERIAL, 44" X 72" X 3" (MIN) THICK (4 REQD). INSTALL VERTICALLY BETWEEN THE SEPARATOR GATE AND END BLOCKING ASSEMBLY.

③ SEPARATOR GATE (5 REQD). SEE THE DETAIL ON PAGE 5. NAIL THE END SEPARATOR GATES TO THE SHOCK-GARD MATERIAL W/4-10d NAILS EACH TO PREVENT VERTICAL MOVEMENT OF THE MATERIAL.

④ SHOCK-GARD MATERIAL, 44" X 72" X 1/2", 1" OR 3" THICK (5 LOCATIONS, AS REQD). INSTALL BETWEEN SEPARATOR GATES AND BETWEEN PALLET UNITS. SEE GENERAL NOTE "D" ON PAGE 3.

⑤ TIE WIRE, 0.0800 DIA, 6' LONG (6 REQD). INSTALL THE WIRE TO FORM A COMPLETE LOOP OVER THE TOP AND AROUND THE SIDE OF THE SHOCK-GARD MATERIAL FILLING THE GAP BETWEEN PALLET UNITS. LOOP WIRE THROUGH THE BANDING OR FRAMES OF THE PALLET UNITS AND TWIST TAUT.

⑥ TIE WIRE, 0.0800 DIA, 6' LONG (2 REQD). INSTALL THE WIRE TO FORM A COMPLETE LOOP THROUGH THE BANDING OR FRAME OF THE PALLET UNIT, OVER THE TOP OF THE SHOCK-GARD MATERIAL FILLING THE CENTER GAP, TO THE BANDING OR FRAME OF THE PALLET UNIT ON THE OTHER SIDE OF THE SHOCK-GARD MATERIAL FILLING THE CENTER GAP AND TWIST TAUT.

⑦ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 18'-6" LONG STEEL STRAPPING (12 REQD). INSTALL SO AS TO ENCIRCLE TWO PALLET UNITS AS SHOWN.

⑧ SEAL FOR 1-1/4" STEEL STRAPPING (12 REQD, 1 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	86	58
NAILS	**NO. REQD**	**POUNDS**
6d (2")	304	2
10d (3")	56	1

SHOCK-GARD 1" - - - 132 SQ FT REQD - - - 28.5 LBS
SHOCK-GARD 3" - - - 836 SQ FT REQD - - - 484.5 LBS
PLYWOOD, 3/4" - - 408.1 SQ FT REQD - - - 841.7 LBS
STEEL STRAPPING, 1-1/4"- 222' REQD - - - 31.71 LBS
SEAL FOR 1-1/4" STRAPPING - 12 REQD - - - 0.55 LBS
WIRE, .0800" DIA - - - - 48 FT REQD - - - 1 LB

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	12	36,420 LBS
DUNNAGE		1,506 LBS
CONTAINER		6,050 LBS
	TOTAL WEIGHT	43,976 LBS (APPROX)

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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 MK82 (500 POUND) BOMBS ON MHU-149 METAL PALLETS. SUBSEQUENT REFERENCE TO PALLET UNIT HEREIN MEANS MHU-149 METAL PALLET WITH MK82 BOMBS INSTALLED. SEE SPI F00-294-4152 AND PAGE 4 FOR DETAILS OF THE PALLET UNIT. **CAUTION:** REGARDLESS OF THE QUANTITY OF PALLET UNITS 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 A 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 PALLET UNITS, THEY ARE TO BE POSITIONED SO AS TO ACHIEVE A TIGHT LOAD (TIGHT AGAINST THE DUNNAGE ASSEMBLIES OR SHOCK-GARD). 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 ADDING ADDITIONAL LAYERS OF SHOCK-GARD BETWEEN THE PALLET UNITS. THE LOADS MUST BE AS TIGHT AS POSSIBLE LONGITUDINALLY, BUT THE VOID MUST NOT EXCEED 3/4" OVERALL. EXCESSIVE SLACK CAN BE ELIMINATED BY ADDING ADDITIONAL LAYERS OF SHOCK-GARD BETWEEN THE SEPARATOR GATES.

E. THIS DRAWING DEPICTS A 12-PALLET UNIT MAXIMUM CONFIGURATION, WITH A LADING WEIGHT OF 43,976 POUNDS. DUE TO RESTRICTIONS ENACTED BY THE SURFACE DEPLOYMENT AND DISTRIBUTION COMMAND AND THE JOINT MUNITIONS COMMAND, ANY ISO CONTAINER DESTINED TO BE MOVED OVER CONUS HIGHWAYS CAN NOT EXCEED 40,000 POUNDS GROSS WEIGHT. IN ORDER TO COMPLY WITH THIS RESTRICTION, TWO PALLET UNITS MUST BE ELIMINATED FROM THE 12-PALLET UNIT MAXIMUM LOAD. THIS WILL RESULT IN A 10-PALLET UNIT LOAD WITH A GROSS WEIGHT OF 37,906 POUNDS. SEE THE "LESS-THAN-FULL" LOAD PROCEDURES ON PAGE 6 FOR DETAILS.

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 END-WALL. PIECES OF DUNNAGE MATERIAL MUST BE LAMINATED TO THE BUFFER PIECES ON THE END 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 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.

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.

(CONTINUED AT RIGHT)

(GENERAL NOTES CONTINUED)

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. THE QUANTITY OF PALLET UNITS SHOWN IN THE LOAD ON PAGE 2 MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SEE THE "LESS-THAN-FULL LOAD PROCEDURE" ON PAGE 6.

P. WHEN STEEL STRAPPING IS SEALED IN AN END-OVER-END LAP JOINT, A MINIMUM OF ONE SEAL WITH TWO PAIR OF NOTCHES WILL BE USED TO SEAL THE JOINT WHEN A NOTCH-TYPE SEALER IS BEING USED. A MINIMUM OF TWO SEALS, BUTTED TOGETHER WITH TWO PAIR OF CRIMPS PER SEAL, WILL BE USED TO SEAL THE JOINT WHEN A CRIMP-TYPE SEALER IS BEING USED. REFER TO THE "END-OVER-END STAP JOINTS FOR DETAILS ON PAGE 4 FOR GUIDANCE.

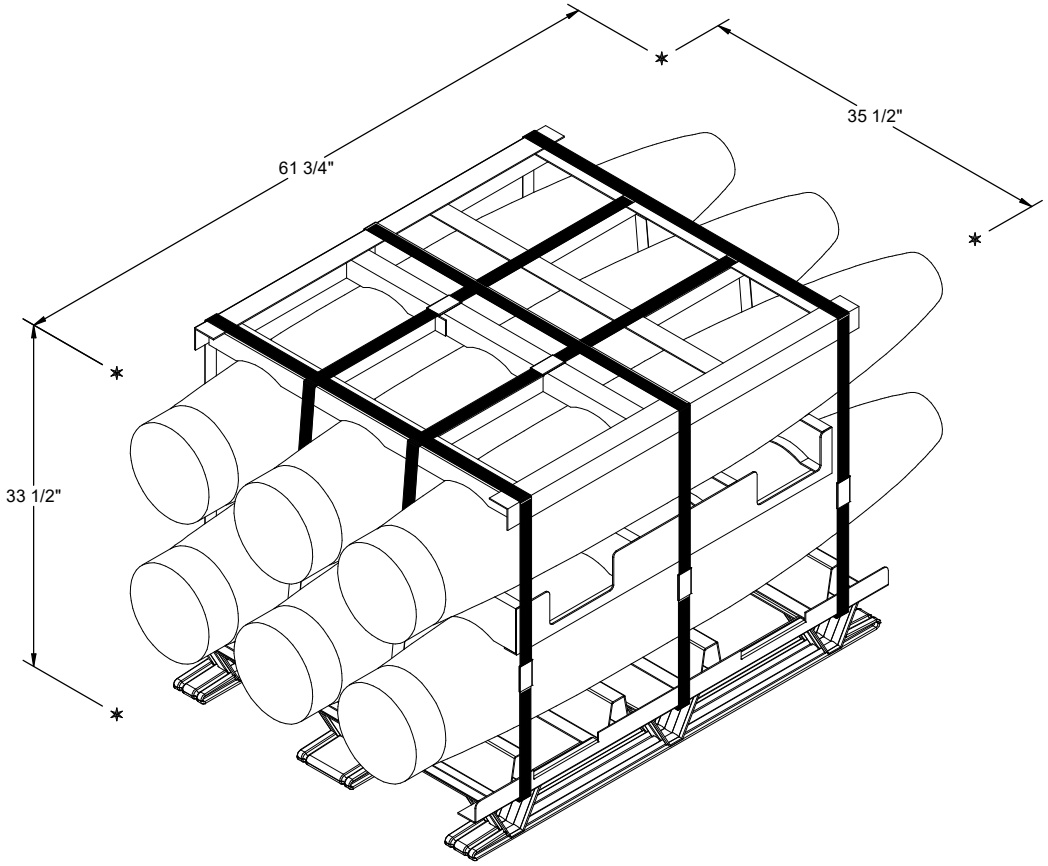
Q. ANTI-CHAFING MATERIAL MAY BE INSTALLED AT POINTS OF CONTACT BETWEEN PALLET UNITS AND THE SIDE OPENING CONTAINER, AND BETWEEN PALLET UNITS AND STEEL STRAPPING, IF DESIRED, TO PREVENT CHAFING DAMAGE TO PALLET UNIT PAINT AND MARKINGS.

R. 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.

S. 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

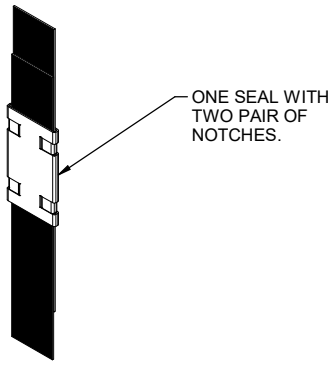
MATERIAL SPECIFICATIONS

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.
SHOCK-GUARD	SHOCK-GARD 1/2"X44"X72":5WJQ, 1/2" X 44" X 72" SHOCK-GARD 1"X44"X72":5WJQ7, 1" X 44" X 72" SHOCK-GARD 3"X44"X72":5WJQ7, 3" X 44" X 72"
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-PRF-121 (OR EQUAL); NEUTRAL BARRIER MATERIAL.
WIRE, CARBON STEEL	ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, 0.0800" DIA, GRADE 1006 OR BETTER.



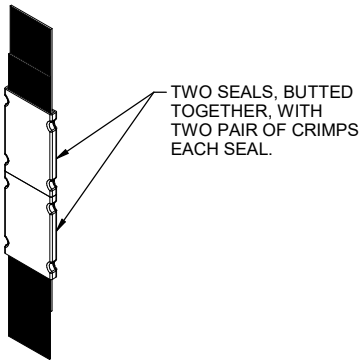
MK82 BOMBS ON MHU-149 PALLET

GROSS WEIGHT - - - - - - - - - - 3,035 LBS (APPROX)
CUBE - - - - - - - - - - - - - 42.5 CU FT (APPROX)



STRAP JOINT A

METHOD OF SECURING A
STRAP JOINT WHEN USING
A NOTCH-TYPE SEALER.



STRAP JOINT B

METHOD OF SECURING A
STRAP JOINT WHEN USING
A CRIMP-TYPE SEALER.

END-OVER-END LAP JOINT DETAILS

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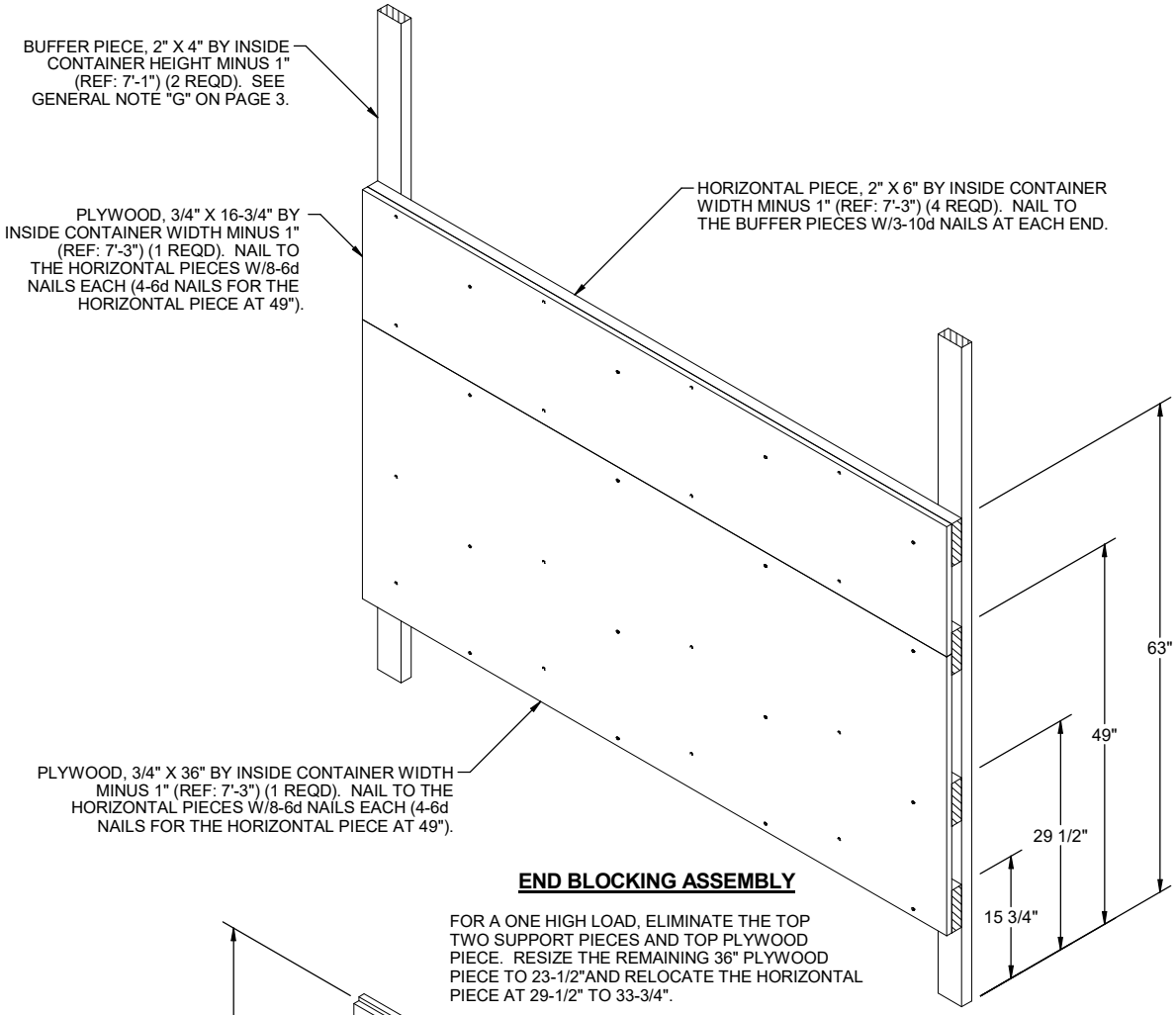
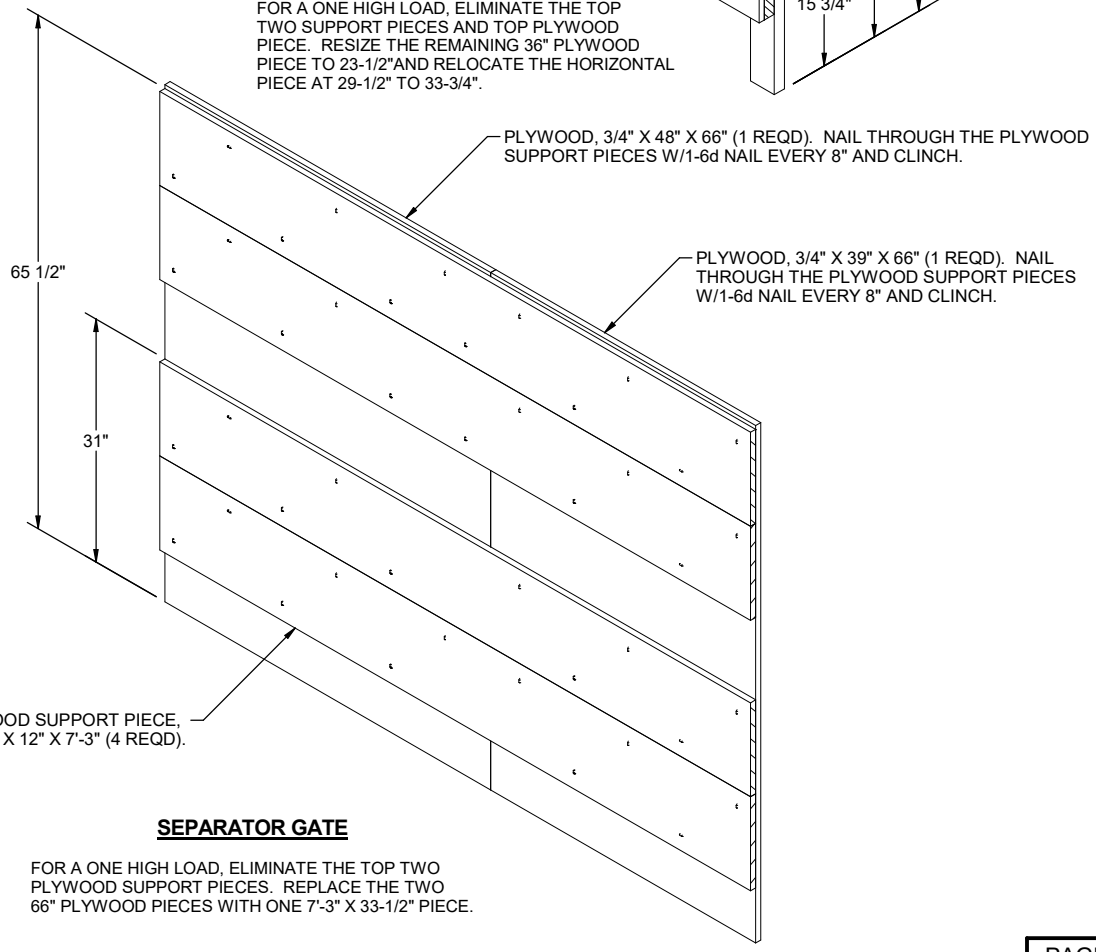


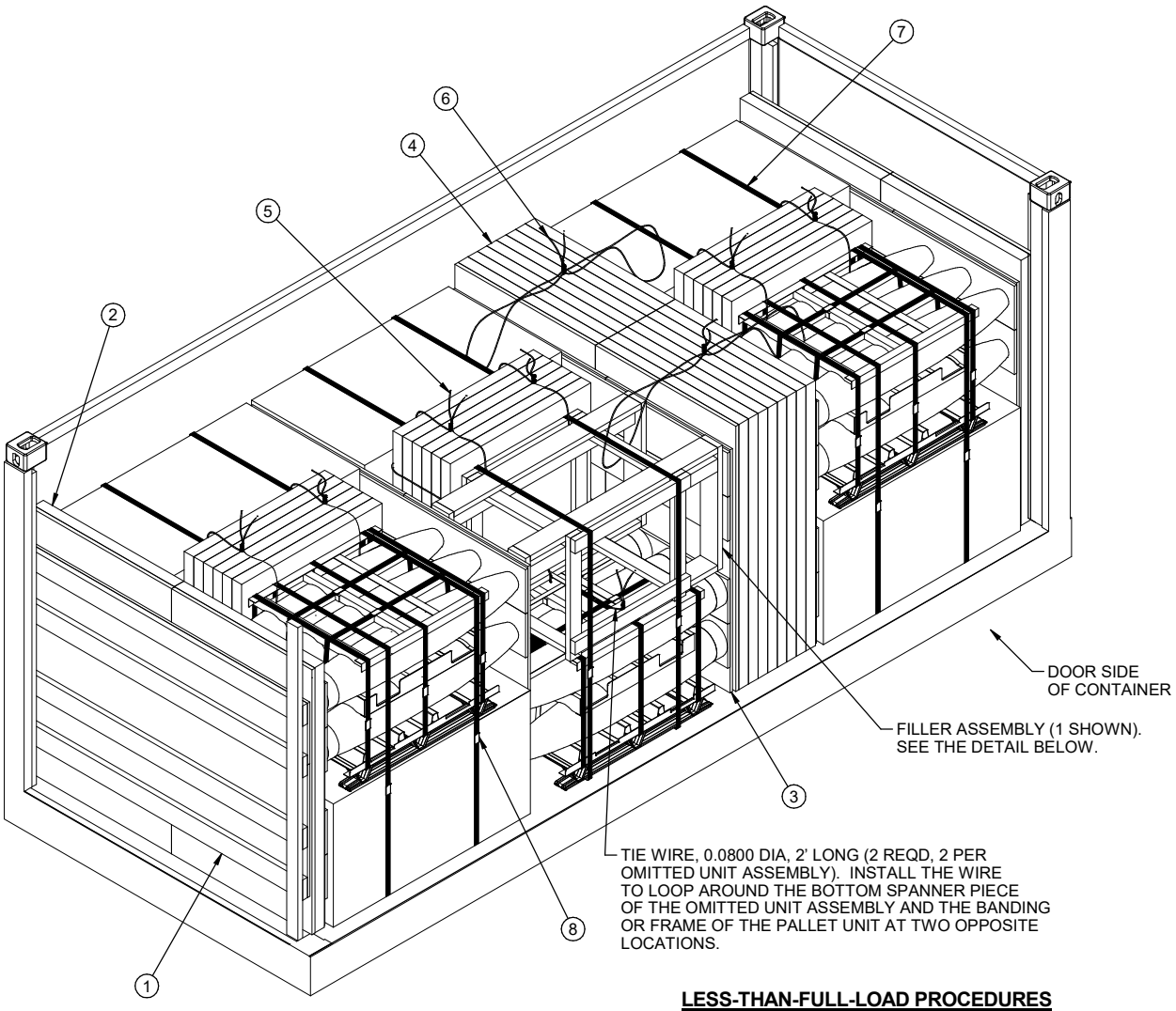
END BLOCKING ASSEMBLY

FOR A ONE HIGH LOAD, ELIMINATE THE TOP TWO SUPPORT PIECES AND TOP PLYWOOD PIECE. RESIZE THE REMAINING 36" PLYWOOD PIECE TO 23-1/2"AND RELOCATE THE HORIZONTAL PIECE AT 29-1/2" TO 33-3/4".



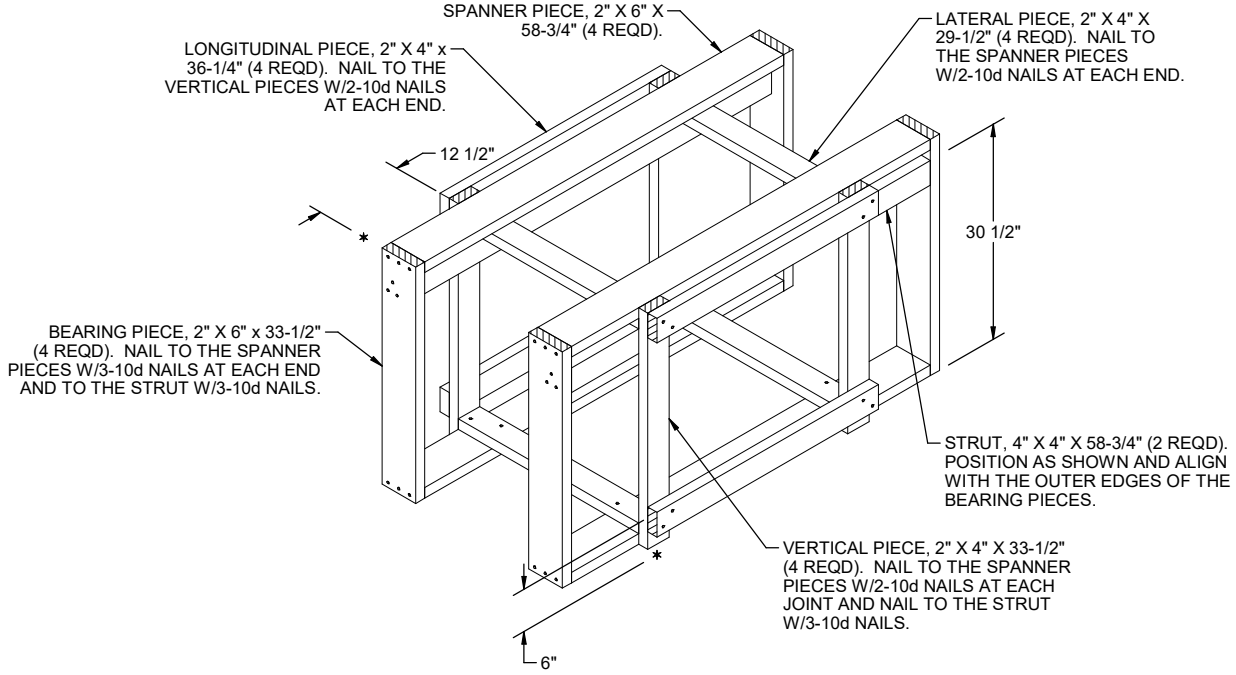
SEPARATOR GATE

FOR A ONE HIGH LOAD, ELIMINATE THE TOP TWO PLYWOOD SUPPORT PIECES. REPLACE THE TWO 66" PLYWOOD PIECES WITH ONE 7'-3" X 33-1/2" PIECE.



LESS-THAN-FULL-LOAD PROCEDURES

KEY NUMBERS REFER TO KEY NUMBER ON PAGE 2.



OMITTED UNIT ASSEMBLY

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