LOADING AND BRACING* IN END OPENING ISO CONTAINERS OF CHARGE, DEMOLITION, LINEAR, HE, M59 AND INERT, M69 PACKED IN METAL CONTAINERS

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
JOINT MUNITIONS COMMAND

WARD.GINA.M.1369379808 Digitally signed by WARD.GINA.M.1369379808 Date: 2020.11.19 11:21:23 -06'00'

APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND

SMITH.THERESA.ANN.1009147639 Digitally signed by SMITH.THERESA.ANN.1009147639 Date: 2020.11.23 09:07:47 -06'00'

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DO NOT SCALE

MARCH 2006

DESIGN ENGINEER	BASIC	MELVIN SIX	
	REV.	RICHARD GARSIDE	REVISION NO. 1 — OCTOBER 2020
ENGINEERING DIVISON		FIEFFER.LAURA.A.1230375727 Digitally signed by FIEFFER.LAURA.A.1230375727 Date: 2020.10.28 08:05:29 -05'00'	SEE THE REVISION LISTING ON PAGE 3
TEST ENGINEER		FELICIANO.ADIN.1259200373 Digitally signed by FELICIANO.ADIN.1259200373 Date: 2020.11.12 12:04:01 -06'00'	
TEST REPORT	NA		
EXPLOSIVE SAFETY DIRECTORATE		FAIRHURST.ROBERT.JOHN.1015766880 Digitally signed by FAIRHURST.ROBERT.JOHN.1015766880 Date: 2020.11.18 09:48:11 -06'00'	

CLASS	DIVISION	DRAWING	FILE
19	48	4328	15J1009

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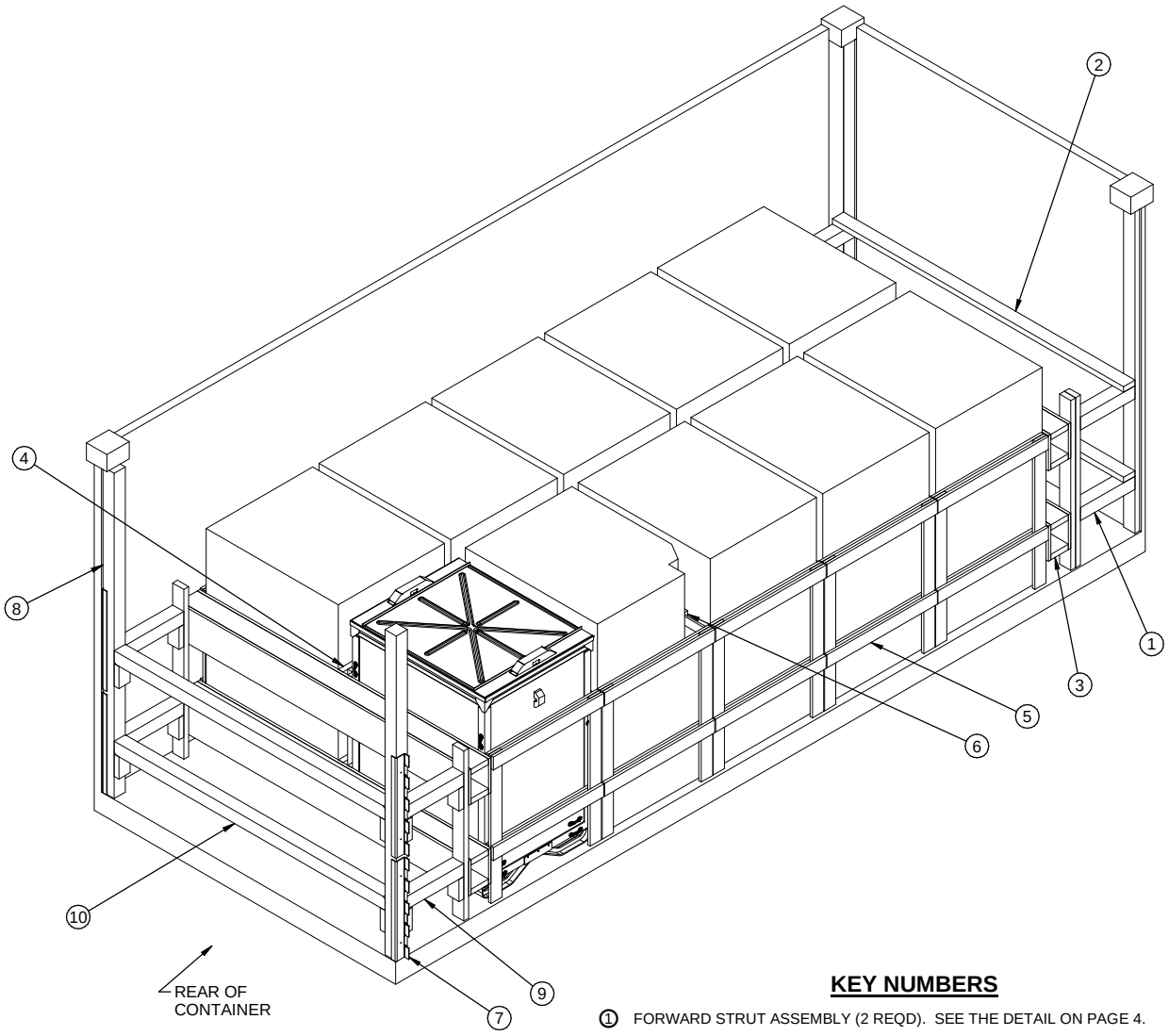

ISOMETRIC VIEW

KEY NUMBERS

① FORWARD STRUT ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 4.

② SPREADER PIECE, 2" X 4" BY CONTAINER WIDTH MINUS 1" (REF: 7'-7") (2 REQD). NAIL TO THE FORWARD STRUT ASSEMBLIES AS SHOWN W/2-10d NAILS AT EACH END.

③ FORWARD/REAR BLOCKING ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 5. NAIL BUFFER PIECES OF "FORWARD BLOCKING ASSEMBLY" TO VERTICAL PIECES OF "FORWARD STRUT ASSEMBLY" W/4-10d NAILS.

④ CRIB FILL ASSEMBLY (5 REQD). SEE THE DETAIL ON PAGE 5.

⑤ SIDE FILL ASSEMBLY (10 REQD). SEE THE DETAIL ON PAGE 7.

⑥ LOAD BEARING GATE (4 REQD). SEE THE DETAIL ON PAGE 6.

⑦ UNIVERSAL LOAD RETAINER (4 REQD, 2 PER SIDE). NAIL THROUGH THE HOLES INTO THE DOOR POST VERTICAL W/2-10d NAILS. SEE "DETAIL A" ON PAGE 7, DEPARTMENT OF ARMY DRAWING DA-116, AND GENERAL NOTE "Q" ON PAGE 3.

⑧ DOOR POST VERTICAL (2 REQD). SEE THE DETAIL ON PAGE 4 AND "DETAIL A" ON PAGE 7.

⑨ STRUT, 4" X 4" BY CUT-TO-FIT (REF: 18") (4 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.

⑩ DOOR SPANNER, 4" X 4" BY CUT TO A LENGTH THAT WILL PROVIDE A DRIVE FIT (REF: 7'-1 1/4") (2 REQD). TOENAIL 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 4"	182	61
2" X 4"	201	134
2" X 6"	61	61
4" X 4"	41	54
NAILS	**NO. REQD**	**POUNDS**
6d (2")	336	2
10d (3")	192	3
12d (3 1/4")	40	3/4

PLYWOOD, 1/2" - - - 79.75 SQ FT REQD - - - - 109.66 LBS
PLYWOOD, 3/4" - - - 48.03 SQ FT REQD - - - - 99.06 LBS
UNIVERSAL LOAD RETAINER - - - 4 REQD - - - - - - 26 LBS

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINERS	10	25,000 LBS
DUNNAGE		833 LBS
ISO CONTAINER		4,700 LBS
TOTAL WEIGHT		30,533 LBS

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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 OUTLOADING PROCEDURES SPECIFIED IN THIS DRAWING ARE APPLICABLE TO LOADS OF LINEAR DEMOLITION CHARGES, HE M59, AND INERT M69 (MICLIC), IN METAL SHIPPING AND STORAGE CONTAINERS. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CONTAINER WITH MICLIC ITEMS INSTALLED. SEE PAGE 4 AND NAVAL SEA SYSTEMS COMMAND DRAWING 6120618 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 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 CRIB FILL ASSEMBLIES. NAIL EACH ADDITIONAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE THICKNESS OR QUANTITIES OF THE DUNNAGE PIECES IN THE SIDE FILL OR CRIB FILL ASSEMBLIES MAY BE ADJUSTED AS REQUIRED TO FACILITATE VARIANCE IN THE SIZE OF THE CONTAINERS. 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 AT THE AFT END OF THE LOADS.

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, ON TO, 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 ISO 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 STRUT 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 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.

H. WHETHER AN ISO 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 ISO CONTAINER WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.

K. PORTIONS OF THE ISO CONTAINER DEPICTED WITHIN THIS DRAWING, SUCH AS THE SIDE WALLS AND ROOF, 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. 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. 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 8.

1. IF A LOAD IS REDUCED BY ONLY A SMALL AMOUNT (ONE CONTAINER), THE CONTAINER NORMALLY MAY BE ELIMINATED FROM THE CENTER OF THE LOAD.

2. IF A LOAD IS REDUCED BY A LARGE AMOUNT (MORE THAN ONE CONTAINER), THE CONTAINER SHOULD BE ELIMINATED AS REQUIRED AND THE TOTAL LOAD SHIFTED FORE OR AFT, AS NECESSARY, TO ACHIEVE A SYMMETRICAL WEIGHT DISTRIBUTION. THE DEPICTED PROCEDURES WILL BE FOLLOWED AS CLOSELY AS POSSIBLE, MAKING ONLY THOSE ADJUSTMENTS TO THE DUNNAGE WHICH ARE REQUIRED TO ACCOMMODATE THE NUMBER OF CONTAINERS TO BE SHIPPED.

Q. FOUR UNIVERSAL LOAD RETAINERS, AS DEPICTED IN THE LOADS ON PAGES 2 AND 8, ARE REQUIRED WHEN LOADING THE MICLIC CONTAINERS. 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 ISO CONTAINER, AND FOR OTHER METHODS OF REAR-OF-LOAD RESTRAINT.

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.
STEEL, STRUCTURAL -:	ASTM A36; 36,000 PSI MINIMUM YIELD OR BETTER.

REVISION

REVISION NO. 1, DATED OCTOBER 2020, CONSISTS OF:

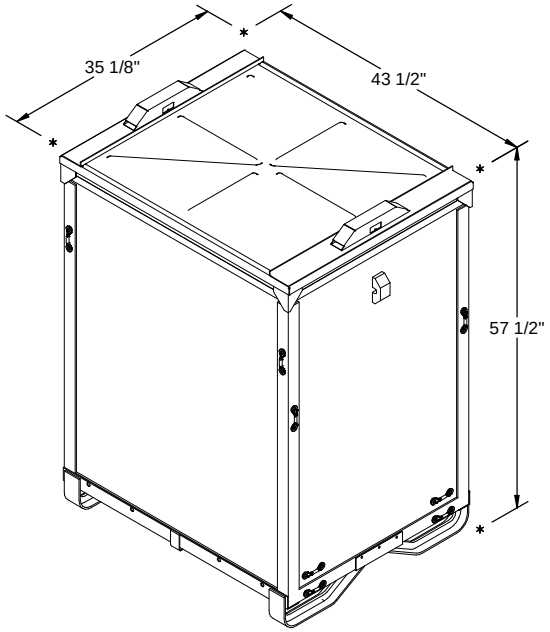
1. UPDATING LOAD BEARING GATES TO ELIMINATE CONTAINER INTERFERENCE.

2. UPDATING SIDE FILL ASSEMBLY, CRIB FILL ASSEMBLY, FORWARD STRUT ASSEMBLY, AND REAR STRUTS TO TIGHTEN LOAD.

3. UPDATING OMITTED CONTAINER ASSEMBLY.

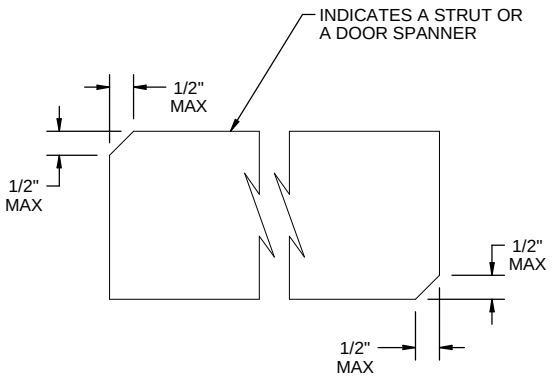
4. UPDATING GENERAL NOTES ABOVE.

5. UPDATING BILL OF MATERIAL AND LOAD AS SHOWN ON PAGE 2.



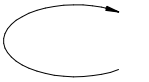
CONTAINER DETAIL

	M59 HE CHARGE	M69 INERT CHARGE
GROSS WEIGHT	2,500 LBS	2,390 LBS
CUBE	51 CU FT (APPROX)	

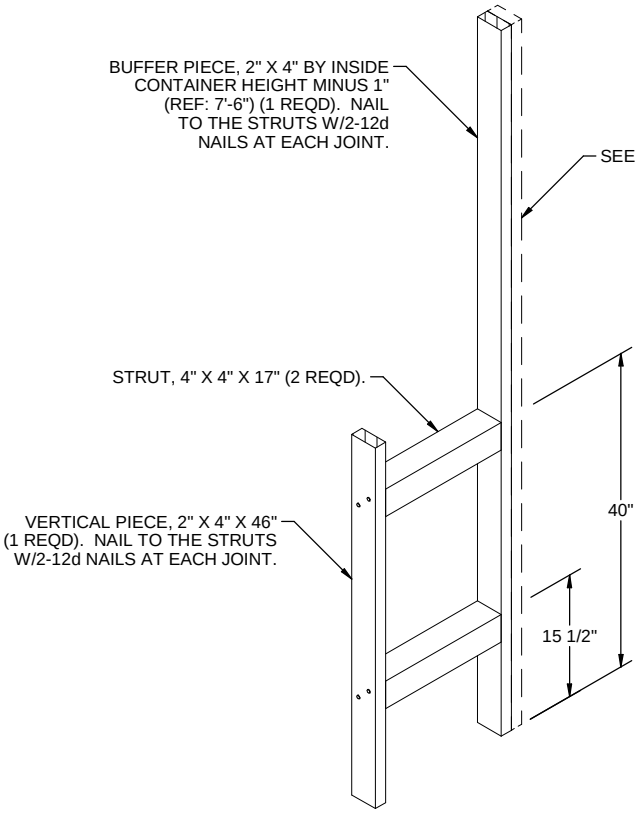


BEVEL CUT

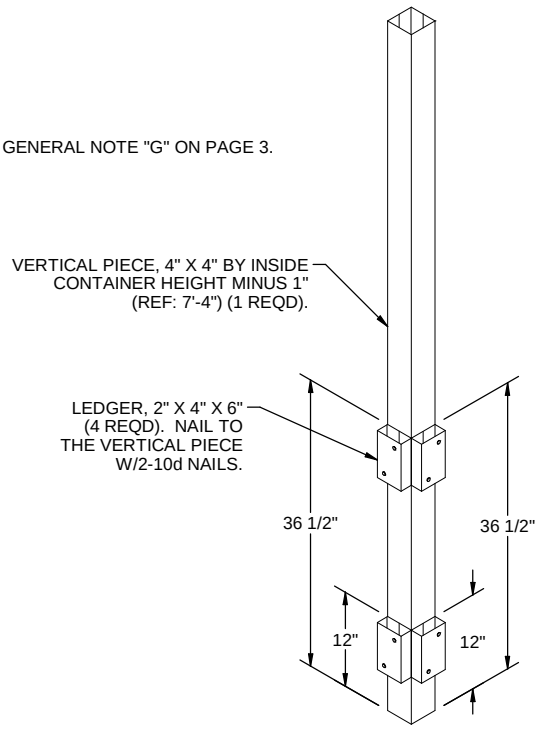
IF DESIRED, EACH END OF A STRUT OR DOOR SPANNER MAY BE BEVEL-CUT AS SHOWN ABOVE TO FACILITATE INSTALLING THE STRUTS WITH A "DRIVE" FIT.



ROTATED 90° FROM THE ISOMETRIC VIEW SHOWN ON PAGE 2.



FORWARD STRUT ASSEMBLY



DOOR POST VERTICAL

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

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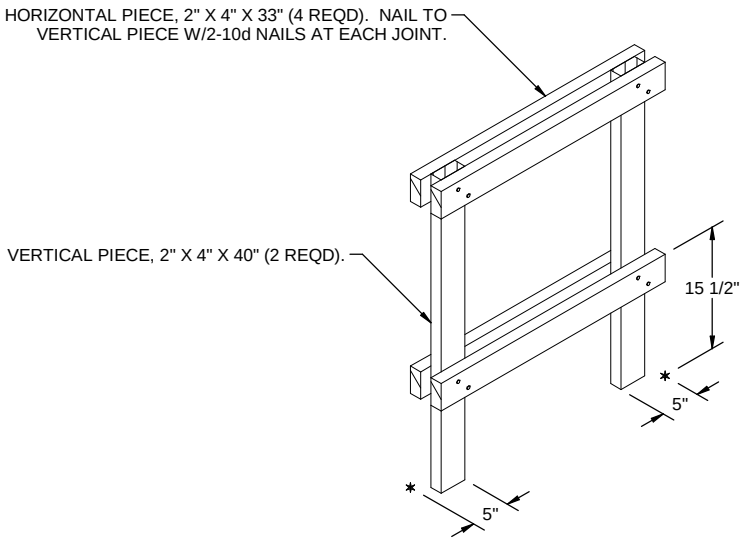
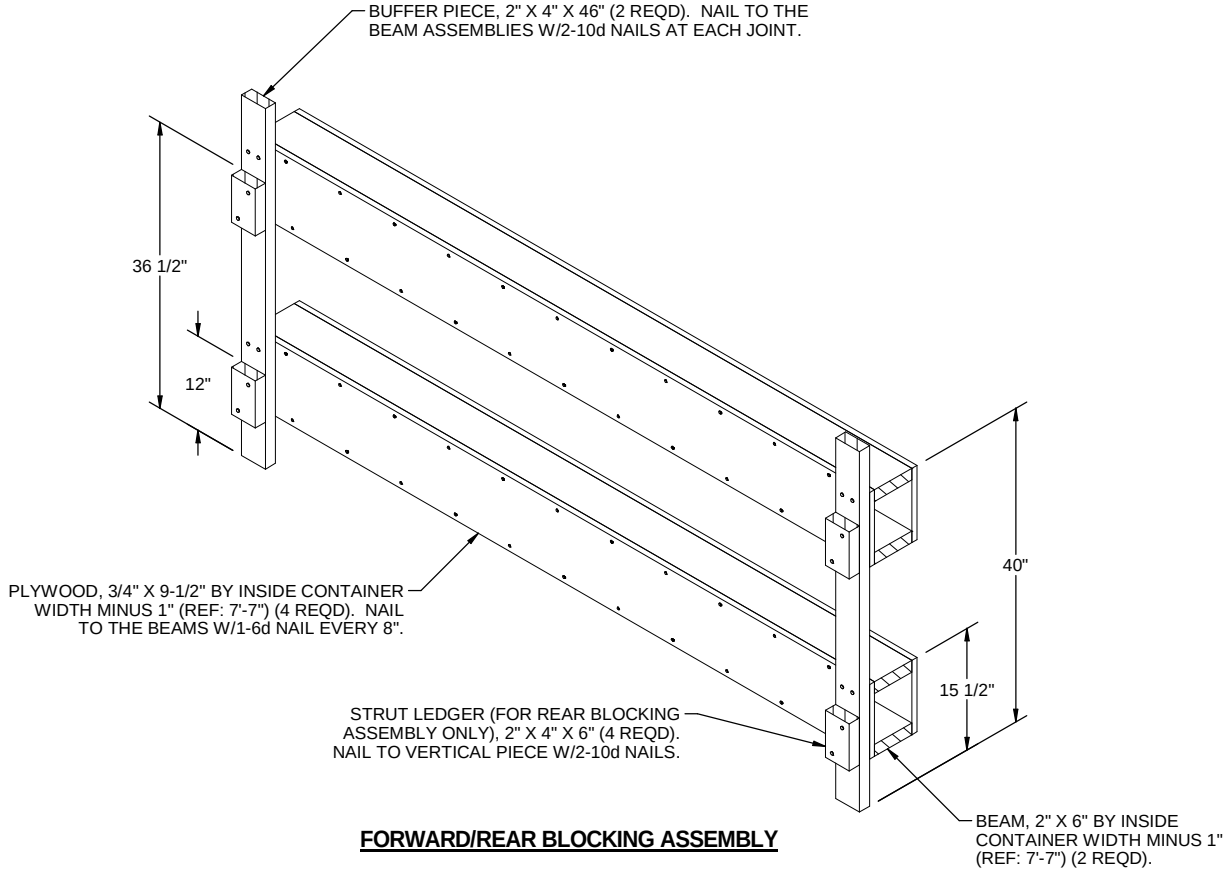


CRIB FILL ASSEMBLY



FORWARD/REAR BLOCKING ASSEMBLY

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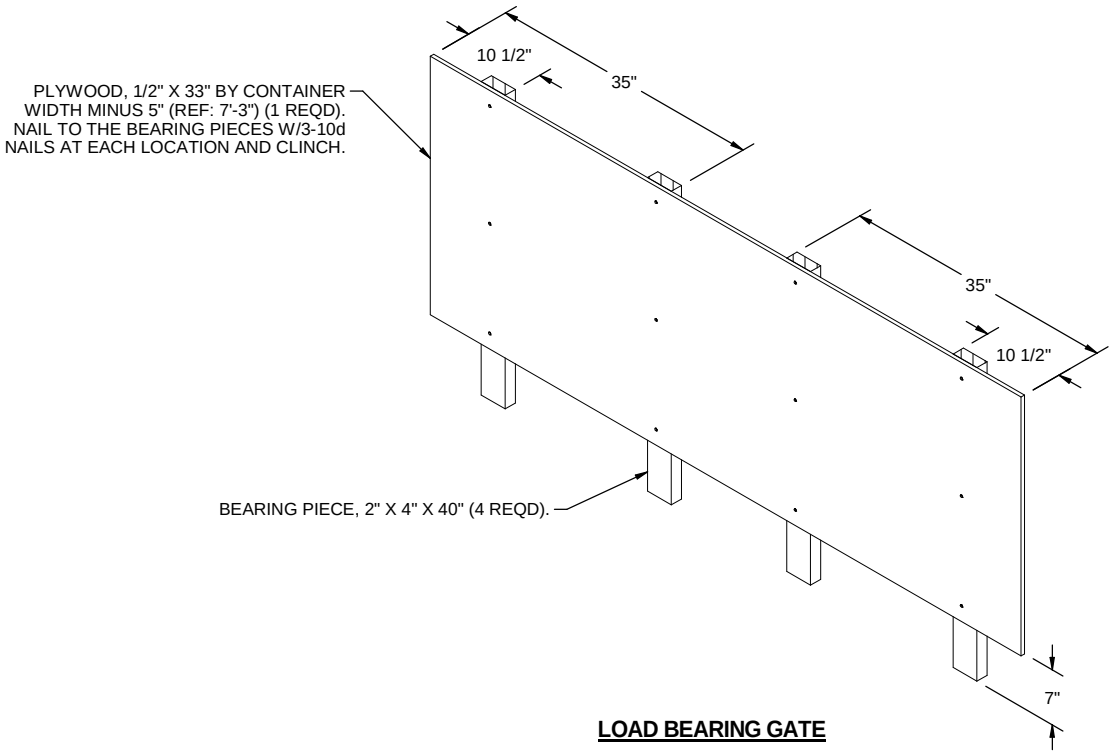
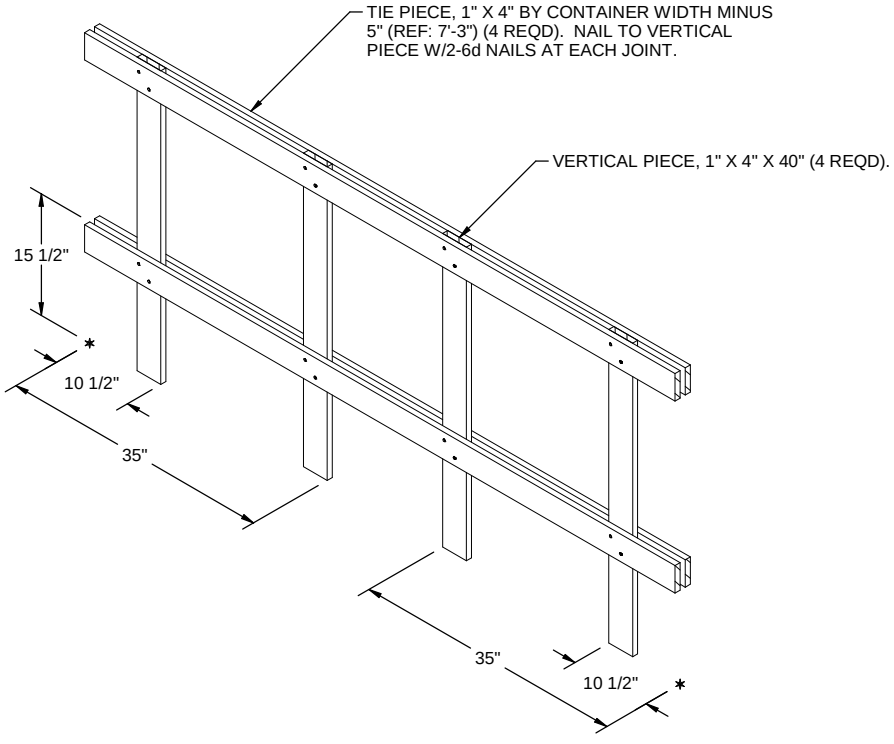


LOAD BEARING GATE



ALTERNATE LOAD BEARING GATE

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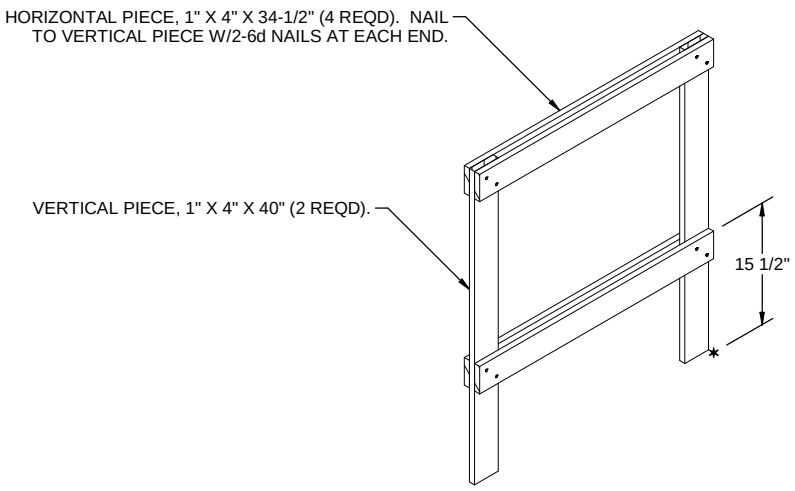
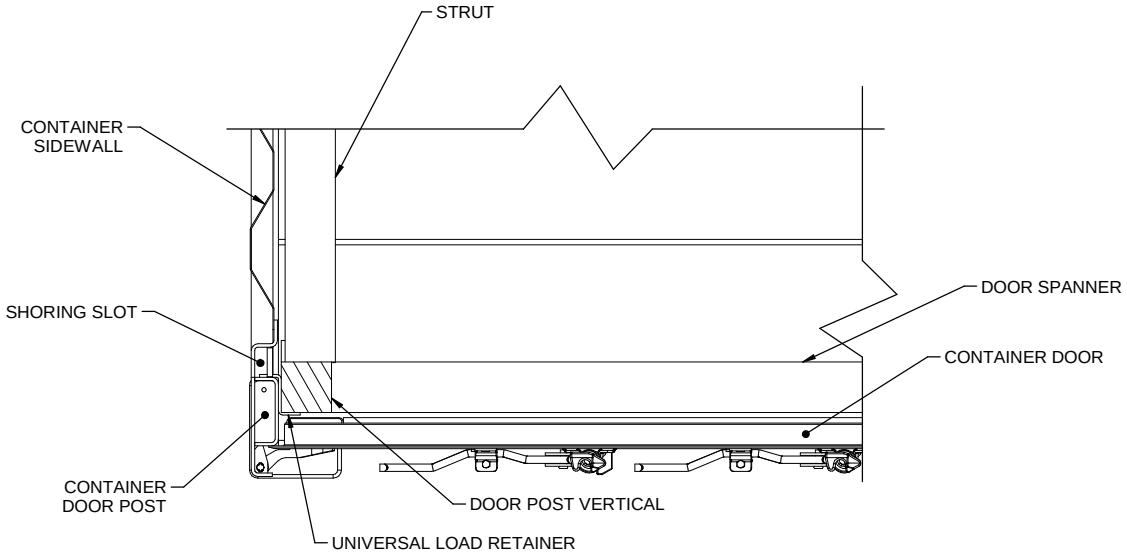
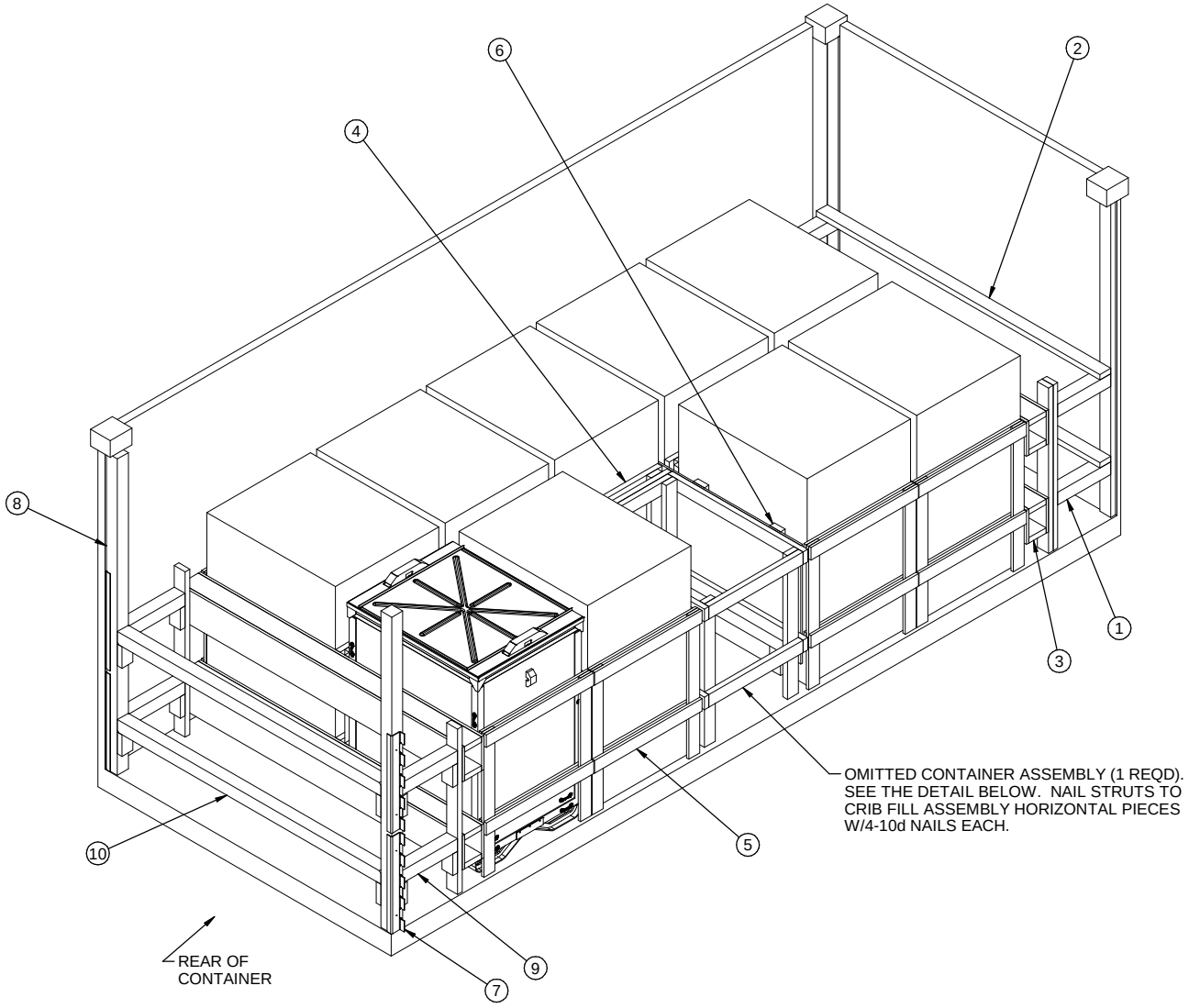


SIDE FILL ASSEMBLY



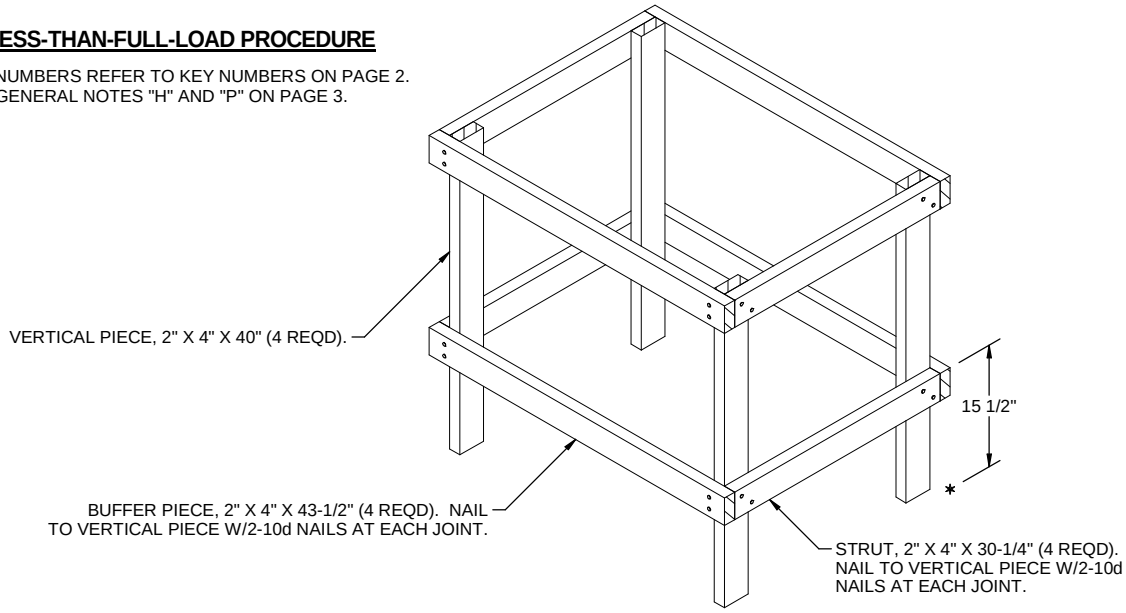
DETAIL A

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



LESS-THAN-FULL-LOAD PROCEDURE

KEY NUMBERS REFER TO KEY NUMBERS ON PAGE 2.
SEE GENERAL NOTES "H" AND "P" ON PAGE 3.



OMITTED CONTAINER ASSEMBLY

(FOR MINUS ONE UNIT)

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