

LOADING AND BRACING[⊕] IN END OPENING ISO CONTAINERS OF BOMB, 2,000 LB, MK84 ON MK79 PALLET

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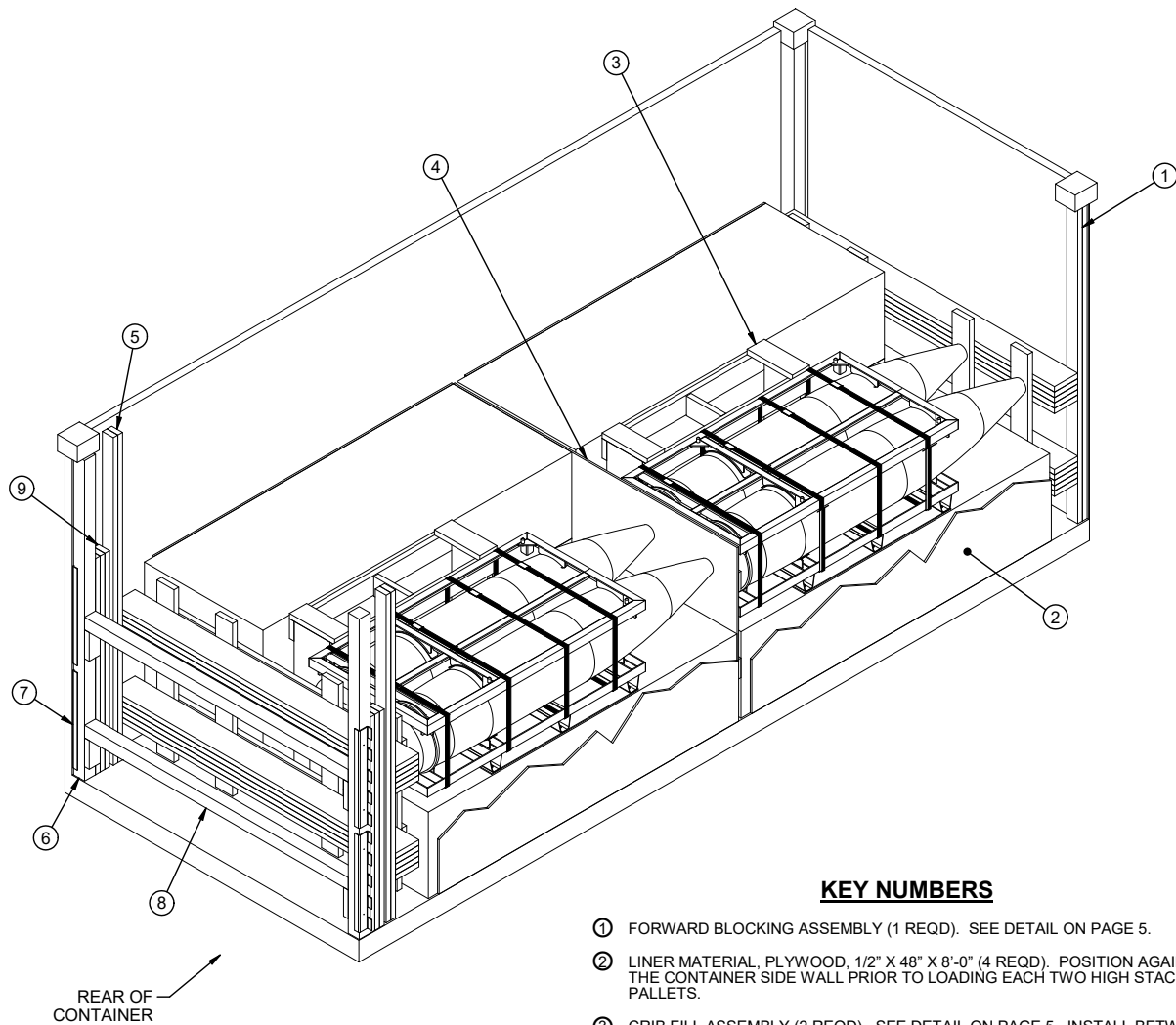
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® THE PROCEDURES SHOWN HEREIN ARE APPLICABLE TO LOADS THAT ARE TO
BE SHIPPED BY TRAILER/CONTAINER-ON-FLATCAR (T/COFC) RAIL, MOTOR, OR
WATER CARRIERS.

U.S. ARMY MATERIEL COMMAND DRAWING

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ISOMETRIC VIEW

KEY NUMBERS

- ① FORWARD BLOCKING ASSEMBLY (1 REQD). SEE DETAIL ON PAGE 5.
- ② LINER MATERIAL, PLYWOOD, 1/2" X 48" X 8'-0" (4 REQD). POSITION AGAINST THE CONTAINER SIDE WALL PRIOR TO LOADING EACH TWO HIGH STACK OF PALLETS.
- ③ CRIB FILL ASSEMBLY (2 REQD). SEE DETAIL ON PAGE 5. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNIT STACKS. ONE STACK OF PALLET UNITS SHALL BE LOADED FIRST. THE CRIB FILL ASSEMBLY SHALL THEN BE POSITIONED WITH THE HOLD DOWN CLEATS LOCATED BETWEEN THE BASE SKIDS OF THE STACK.
- ④ SEPARATOR GATE (1 REQD). SEE DETAIL ON PAGE 4. PLACE GATE WITH THE BEARING PIECES AGAINST THE BASE OF THE BOMBS.
- ⑤ REAR BLOCKING ASSEMBLY (1 REQD). SEE DETAIL ON PAGE 6.
- ⑥ DOOR POST VERTICAL, (2 REQD). SEE DETAIL ON PAGE 7, AND "DETAIL A" ON PAGE 7, AND GENERAL NOTE "P" ON PAGE 3.
- ⑦ UNIVERSAL LOAD RETAINER (4 REQD, 2 PER SIDE). NAIL THROUGH THE HOLES INTO THE DOOR POST VERTICAL W/2-10d NAILS. SEE DEPARTMENT OF ARMY DRAWING DA-116, "DETAIL A" ON PAGE 7, AND GENERAL NOTE "P" ON PAGE 3.
- ⑧ DOOR SPANNER, 4" X 4" MATERIAL 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 7.
- ⑨ FILL MATERIAL, 4" WIDE BY 60" LONG MATERIAL (AS REQD). NAIL THE FIRST PIECE TO THE REAR BLOCKING ASSEMBLY W/6 NAILS OF A SUITABLE SIZE (10d FOR 2" THICK MATERIAL). NAIL EACH ADDITIONAL PIECE TO THE PREVIOUS PIECE IN A SIMILAR MANNER. **NOTE:** MULTIPLE PIECES MAY BE LAMINATED TOGETHER FIRST AND THEN TOENAILED TO THE REAR BLOCKING ASSEMBLY.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" x 6"	28	14
2" x 4"	105	70
2" x 6"	95	95
2" x 8"	152	203
2" x 12"	16	32
4" x 4"	29	38
NAILS	NO. REQD	POUNDS
6d (2")	40	1/4
10d (3")	468	7-1/4
12d(3-1/4")	8	1/4
PLYWOOD, 1/2" - 158.33 SQ FT REQD - - 217.71 LBS		
UNIVERSAL LOAD RETAINER - - 4 REQD - - 26.00 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT - - - - -	8 - - - - -	33,064 LBS
DUNNAGE - - - - -	- - - - -	1,155 LBS
CONTAINER - - - - -	- - - - -	4,700 LBS
TOTAL WEIGHT - - - - -		38,919 LBS (APPROX)

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 MK84 2,000 LB BOMBS ON MK79 METAL PALLETS. SUBSEQUENT REFERENCE TO PALLET UNIT HEREIN MEANS THE PALLET UNIT WITH THE BOMBS. SEE PAGE 4 AND NAVAL SEA SYSTEMS COMMAND DRAWING 6214081 FOR DETAILS OF THE PALLET UNIT. **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 PALLET 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 BEARING PIECES ON THE CRIB FILL ASSEMBLIES. NAIL EACH ADDITIONAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE WIDTH OF THE VERTICAL PIECES IN THE CRIB FILL ASSEMBLIES 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 INSTALLING ADDITIONAL 4" WIDE BY 60" LONG FILL MATERIAL, AS DETAILED ON PAGE 2.
- 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. PORTIONS OF THE CONTAINER DEPICTED WITHIN THIS DRAWING, SUCH AS THE SIDEWALL, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.
- G. IN SOME 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 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 FORWARD WALL, 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. **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.

(CONTINUED AT RIGHT)

(GENERAL NOTES CONTINUED)

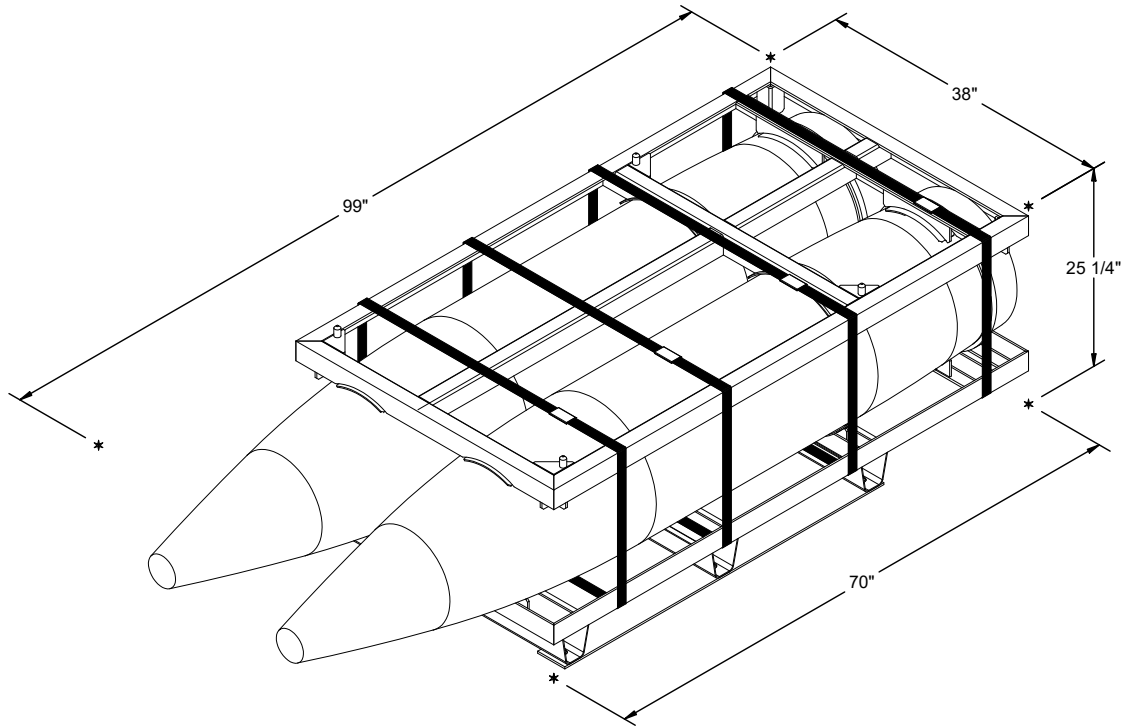
- N. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS 0.454 KG.
- O. THE QUANTITY OF PALLET UNITS SHOWN IN THE LOAD ON PAGE 2 MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SEE THE FILLER ASSEMBLY AND THE "LESS-THAN-FULL LOAD PROCEDURE" ON PAGE 8.
- P. FOUR UNIVERSAL LOAD RETAINERS, AS DEPICTED IN THE LOADS ON PAGES 2 AND 8, ARE REQUIRED WHEN LOADING A TWO HIGH LOAD, AND TWO ARE REQUIRED WHEN LOADING A ONE HIGH LOAD. 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 CONTAINER, AND FOR OTHER METHODS OF REAR-OF-LOAD RESTRAINT.
- Q. 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.
- R. RECOMMENDED SEQUENTIAL LOADING PROCEDURES:
 1. PREFABRICATE ONE FORWARD AND ONE REAR BLOCKING ASSEMBLY, TWO CRIB FILL ASSEMBLIES, ONE SEPARATOR GATE, AND TWO DOOR POST VERTICALS WITH UNIVERSAL LOAD RETAINERS ATTACHED.
 2. INSTALL THE FORWARD BLOCKING ASSEMBLY.
 3. POSITION THE LINER MATERIAL AGAINST THE SIDE OF THE CONTAINER.
 4. LOAD A STACK OF TWO PALLET UNITS TIGHT AGAINST THE FORWARD BLOCKING ASSEMBLY AND LINER MATERIAL.
 5. INSTALL ONE CRIB FILL ASSEMBLY.
 6. REPEAT STEPS 3 AND 4.
 7. INSTALL THE SEPARATOR GATE.
 8. REPEAT STEP 3.
 9. LOAD A STACK OF TWO PALLET UNITS TIGHT AGAINST THE SEPARATOR GATE AND THE LINER MATERIAL.
 10. REPEAT STEPS 3, 5 AND 9.
 11. INSTALL THE REAR BLOCKING ASSEMBLY.
 12. INSTALL THE TWO DOOR POST VERTICAL ASSEMBLIES (ONE RIGHT HAND AND ONE LEFT HAND).
 13. INSTALL THE TWO DOOR SPANNER PIECES.
 14. INSTALL THE SOLID FILL MATERIAL.

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.
- WIRE, CARBON STEEL** - : ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, 0.0800" DIA, GRADE 1006 OR BETTER.

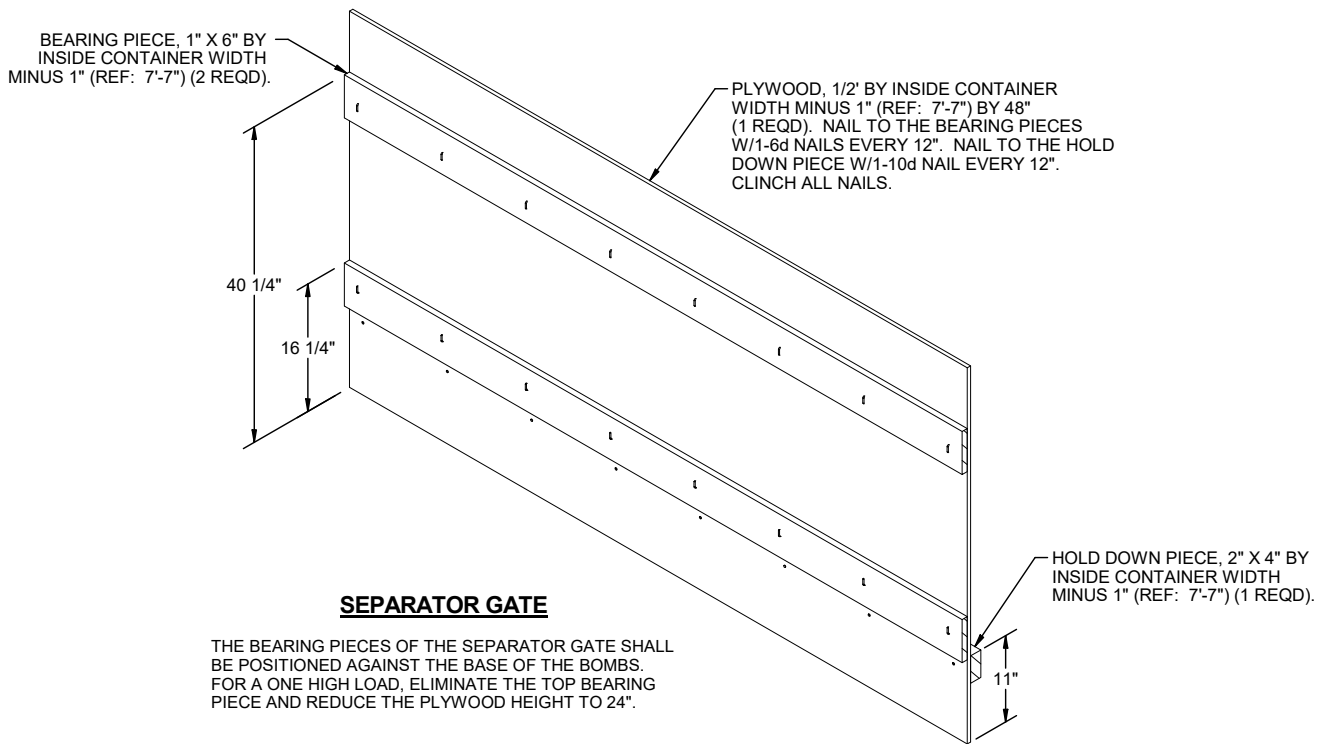
REVISIONS

- REVISION NO. 1, DATED FEBRUARY 2015, CONSISTS OF:
REDESIGNING OMITTED UNIT ASSEMBLY.
- REVISION NO. 2, DATED NOVEMBER 2023, CONSISTS OF:
UPDATING OMITTED UNIT ASSEMBLY.



PALLET UNIT DATA

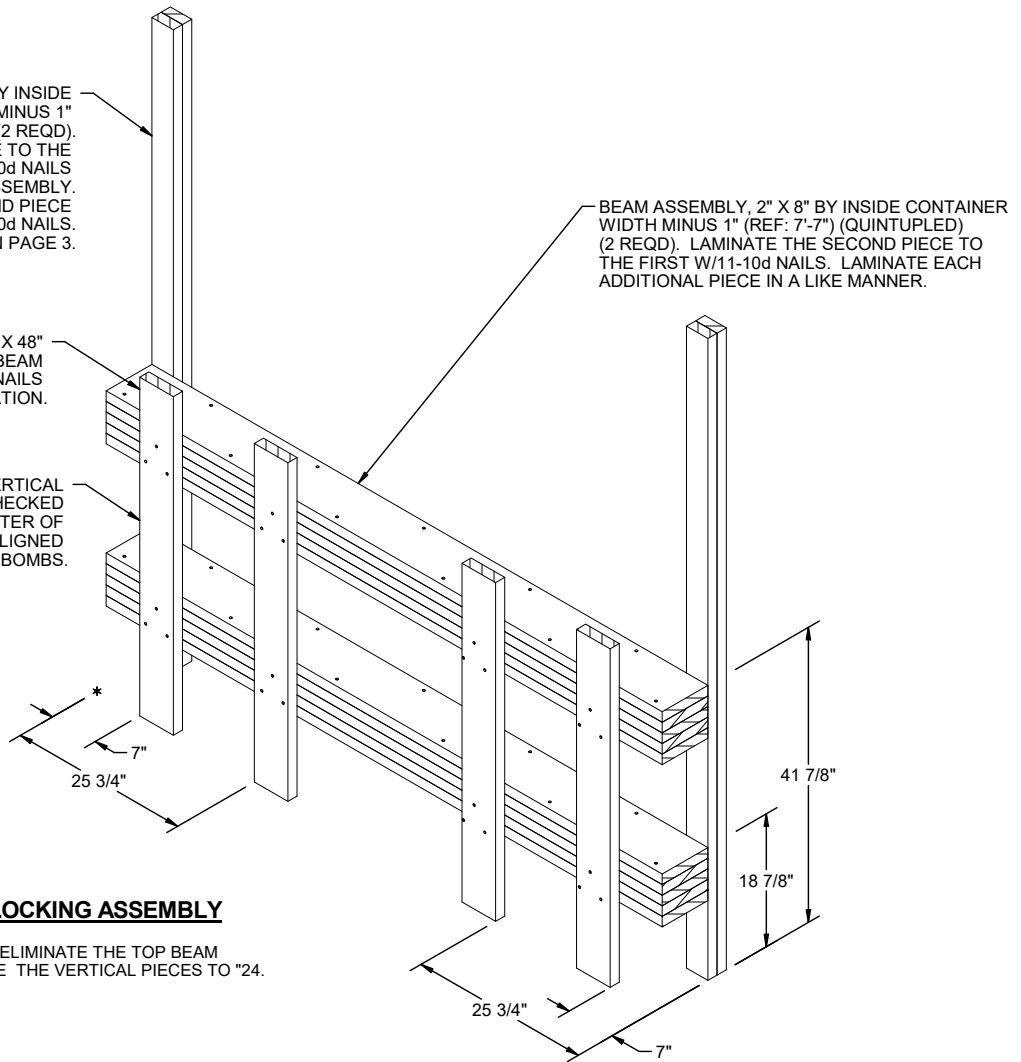
GROSS WEIGHT - - - - - 4,133 LBS (APPROX)
 CUBE - - - - - 52.8 CU FT (APPROX)



BUFFER PIECE, 2" X 4" BY INSIDE CONTAINER HEIGHT MINUS 1" (REF: 7'-8") (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE BEAM ASSEMBLIES W/3-10d NAILS AT EACH BEAM ASSEMBLY. LAMINATE THE SECOND PIECE TO THE FIRST W/5-10d NAILS. SEE GENERAL NOTE "G" ON PAGE 3.

VERTICAL PIECE, 2" X 6" X 48" (4 REQD). NAIL TO THE BEAM ASSEMBLIES W/3-10d NAILS AT EACH LOCATION.

DIMENSIONS FOR THE VERTICAL PIECES SHOULD BE FIELD CHECKED TO INSURE THAT THE CENTER OF THE VERTICAL PIECES ARE ALIGNED WITH THE CENTER OF THE BOMBS.



FORWARD BLOCKING ASSEMBLY

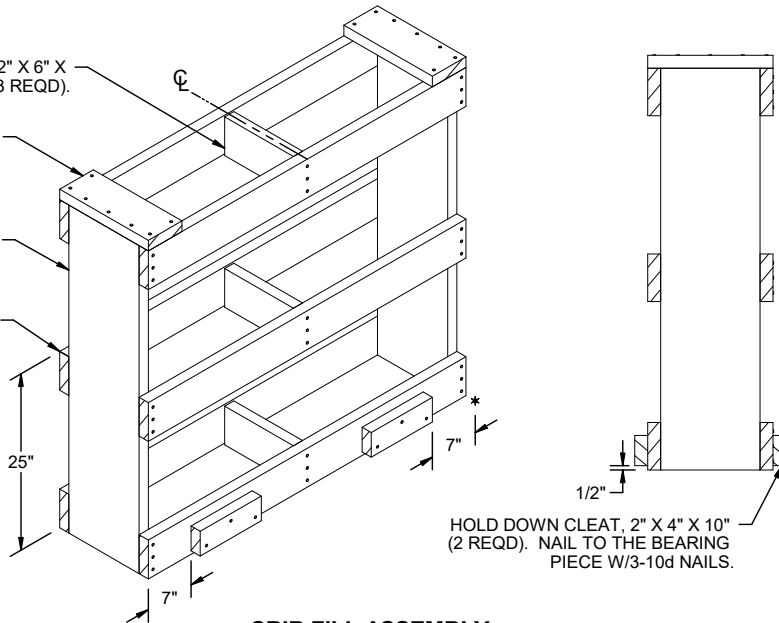
FOR A ONE HIGH LOAD, ELIMINATE THE TOP BEAM ASSEMBLY AND REDUCE THE VERTICAL PIECES TO "24".

SUPPORT PIECE, 2" X 6" X 11-1/4" (3 REQD).

TIE PIECE, 2" X 6" X 14-1/2" (2 REQD). NAIL TO THE BEARING PIECES W/2-10d NAILS AT EACH END AND TO THE VERTICAL PIECE W/3-10d NAILS.

VERTICAL PIECE, 2" X 12" X 46-1/2" (2 REQD).

BEARING PIECE, 2" X 6" X 52" (6 REQD). NAIL TO THE VERTICAL PIECES AND SUPPORT PIECE W/3-10d NAILS AT EACH JOINT.



CRIB FILL ASSEMBLY

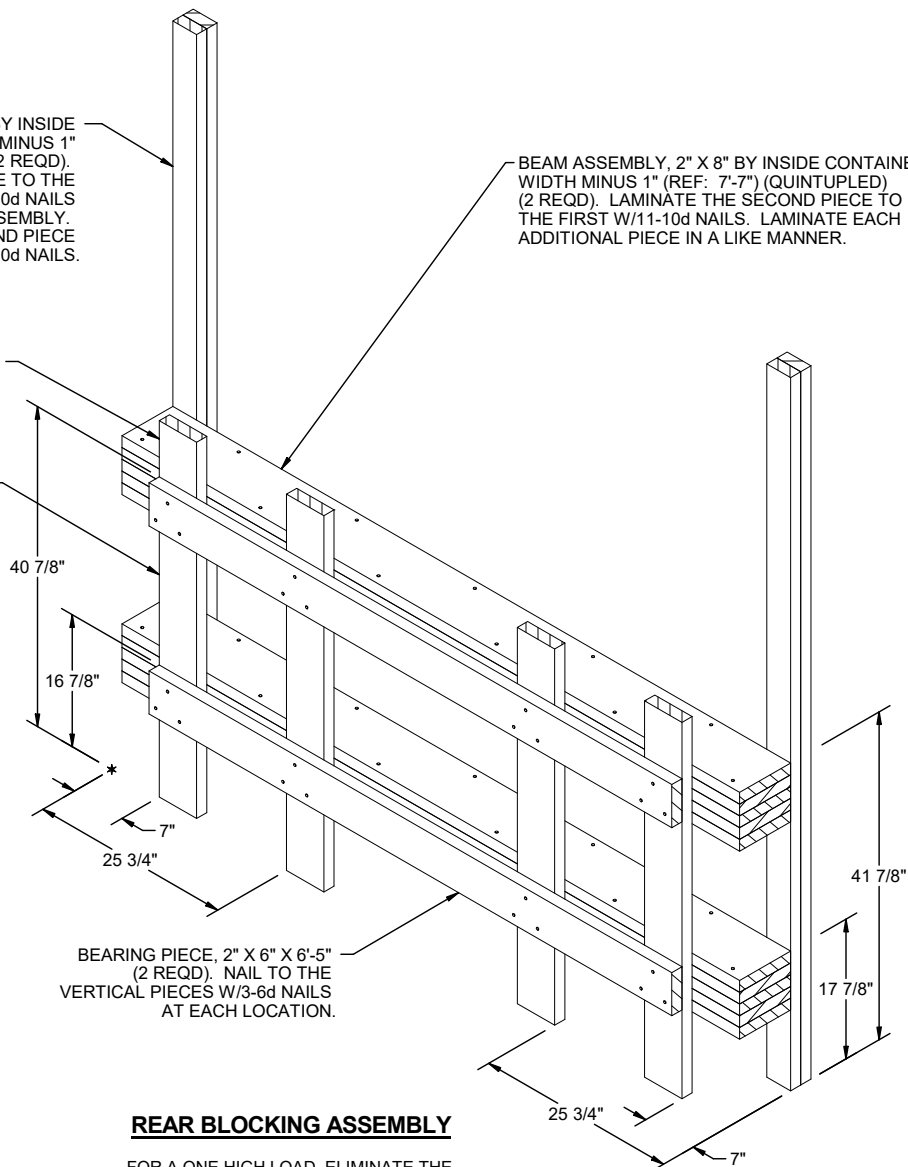
FOR A ONE HIGH LOAD, ELIMINATE THE TWO CENTER BEARING PIECES AND THE CENTER SUPPORT PIECE AND REDUCE THE VERTICAL PIECES TO 24".

BUFFER PIECE, 2" X 4" BY INSIDE
CONTAINER HEIGHT MINUS 1"
(REF: 7'-8") (DOUBLED) (2 REQD).
NAIL THE FIRST PIECE TO THE
BEAM ASSEMBLIES W/3-10d NAILS
AT EACH BEAM ASSEMBLY.
LAMINATE THE SECOND PIECE
TO THE FIRST W/5-10d NAILS.

BEAM ASSEMBLY, 2" X 8" BY INSIDE CONTAINER
WIDTH MINUS 1" (REF: 7'-7") (QUINTUPLED)
(2 REQD). LAMINATE THE SECOND PIECE TO
THE FIRST W/11-10d NAILS. LAMINATE EACH
ADDITIONAL PIECE IN A LIKE MANNER.

VERTICAL PIECE, 2" X 6" X 48"
(4 REQD). NAIL TO THE BEAM
ASSEMBLIES W/3-10d NAILS
AT EACH LOCATION.

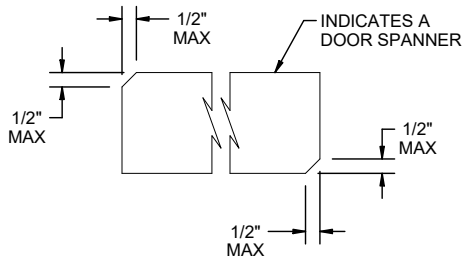
DIMENSIONS FOR THE VERTICAL
PIECES SHOULD BE FIELD CHECKED
TO INSURE THAT THE CENTER OF
THE VERTICAL PIECES ARE ALIGNED
WITH THE CENTER OF THE BOMBS.



BEARING PIECE, 2" X 6" X 6'-5"
(2 REQD). NAIL TO THE
VERTICAL PIECES W/3-6d NAILS
AT EACH LOCATION.

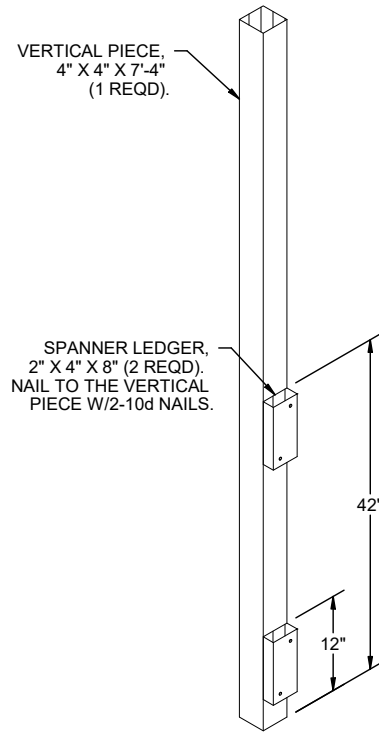
REAR BLOCKING ASSEMBLY

FOR A ONE HIGH LOAD, ELIMINATE THE
TOP BEAM ASSEMBLY, THE TOP
BEARING PIECE AND REDUCE THE
VERTICAL PIECES TO 24".



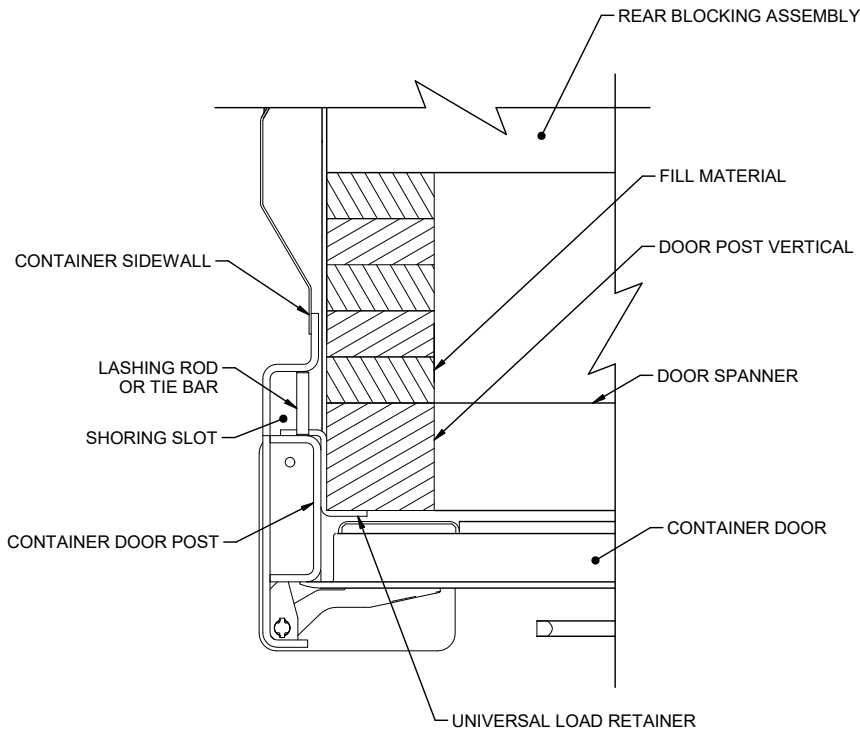
BEVEL CUT

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



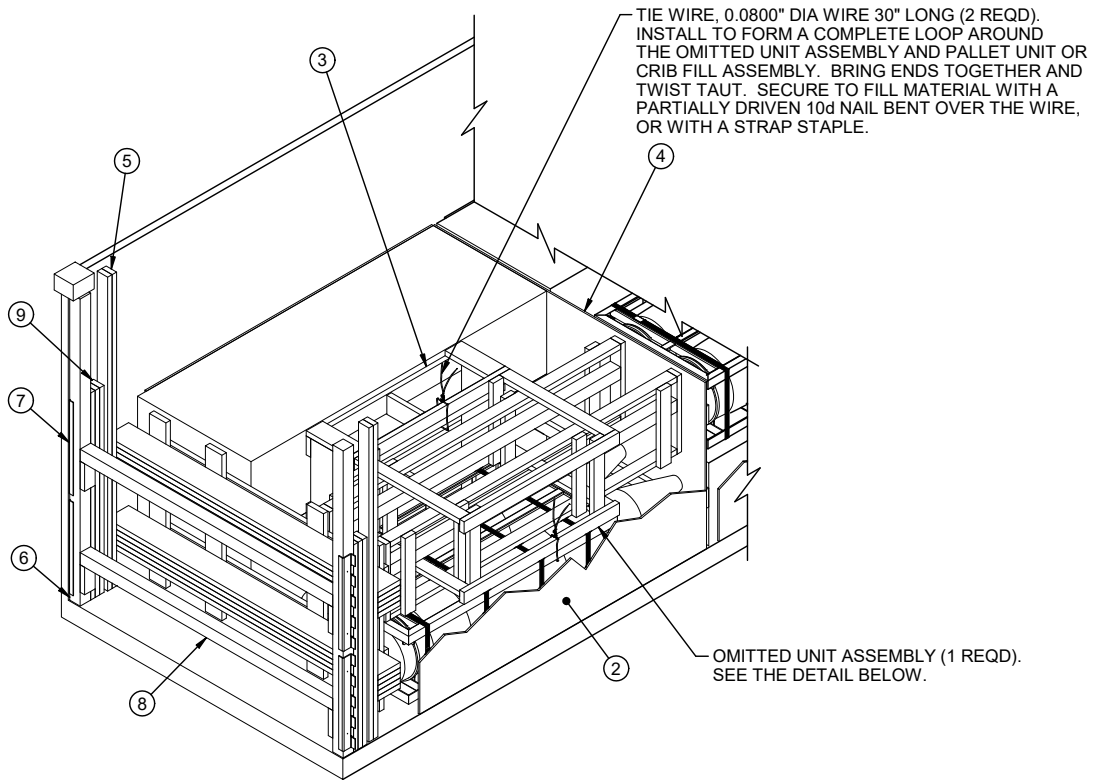
DOOR POST VERTICAL

FOR A ONE HIGH LOAD LOWER THE TOP SPANNER LEDGER TO 40\".



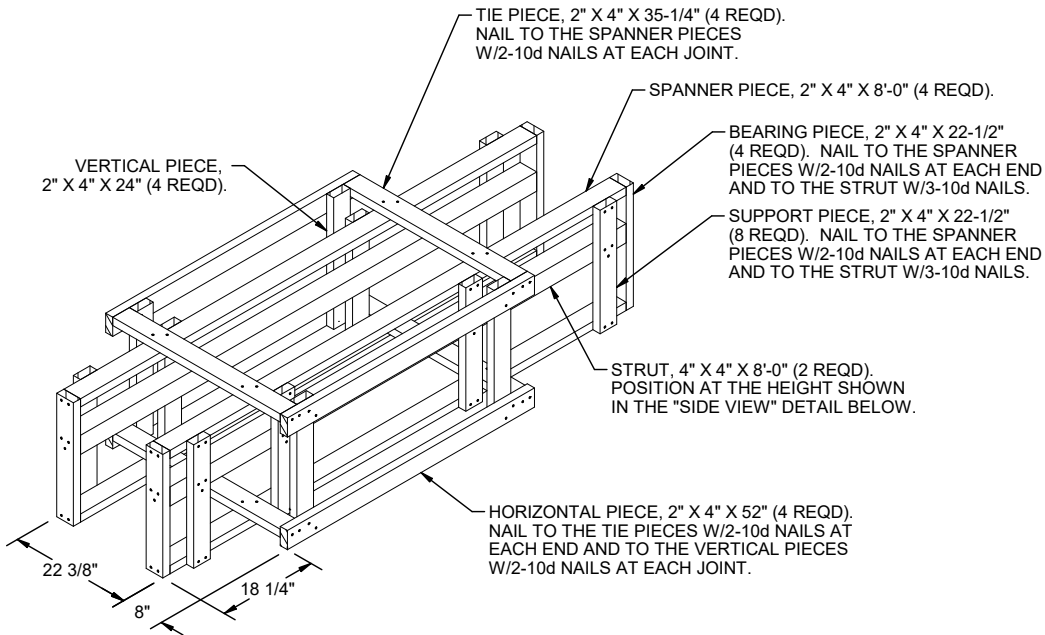
DETAIL A

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.

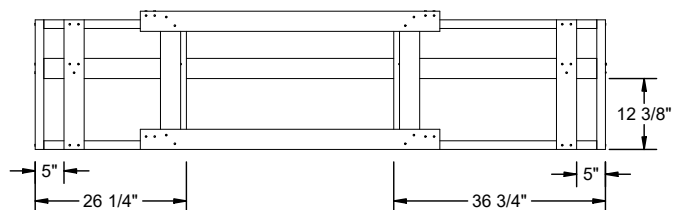


LESS-THAN-FULL LOAD PROCEDURE

THE DETAIL ABOVE DEPICTS A BLOCKING METHOD TO BE USED IN A "REDUCED LOAD" CONTAINER LOAD (LESS THAN EIGHT PALLET UNITS). KEY NUMBERS REFER TO THE KEY NUMBERS SHOWN ON PAGE 2. SEE GENERAL NOTES "H" AND "O" ON PAGE 3.



OMITTED UNIT ASSEMBLY



SIDE VIEW