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LOADING AND BRACING* IN MILVAN CONTAINERS⊗ OF BLU-109 BOMBS ON MHU-212 METAL PALLETS

INDEX

⊗ONLY MILVAN CONTAINERS WHICH HAVE BEEN MODIFIED TO INCLUDE A MECHANICAL LOAD-BRACING SYSTEM AS SPECIFIED WITHIN MIL-C-52661 WILL BE USED FOR THE MOVEMENT OF AMMUNITION BY T/COFC SERVICE.

*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

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JOINT MUNITIONS COMMAND

RUS.ALLEN.J.1230354282

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CAUTION: VERIFY PRIOR TO USE AT WWW.DAC.ARMY.MIL THAT THIS IS THE MOST CURRENT VERSION OF THIS DOCUMENT. THIS IS PAGE 1 OF 8.

DO NOT SCALE

NOVEMBER 2010

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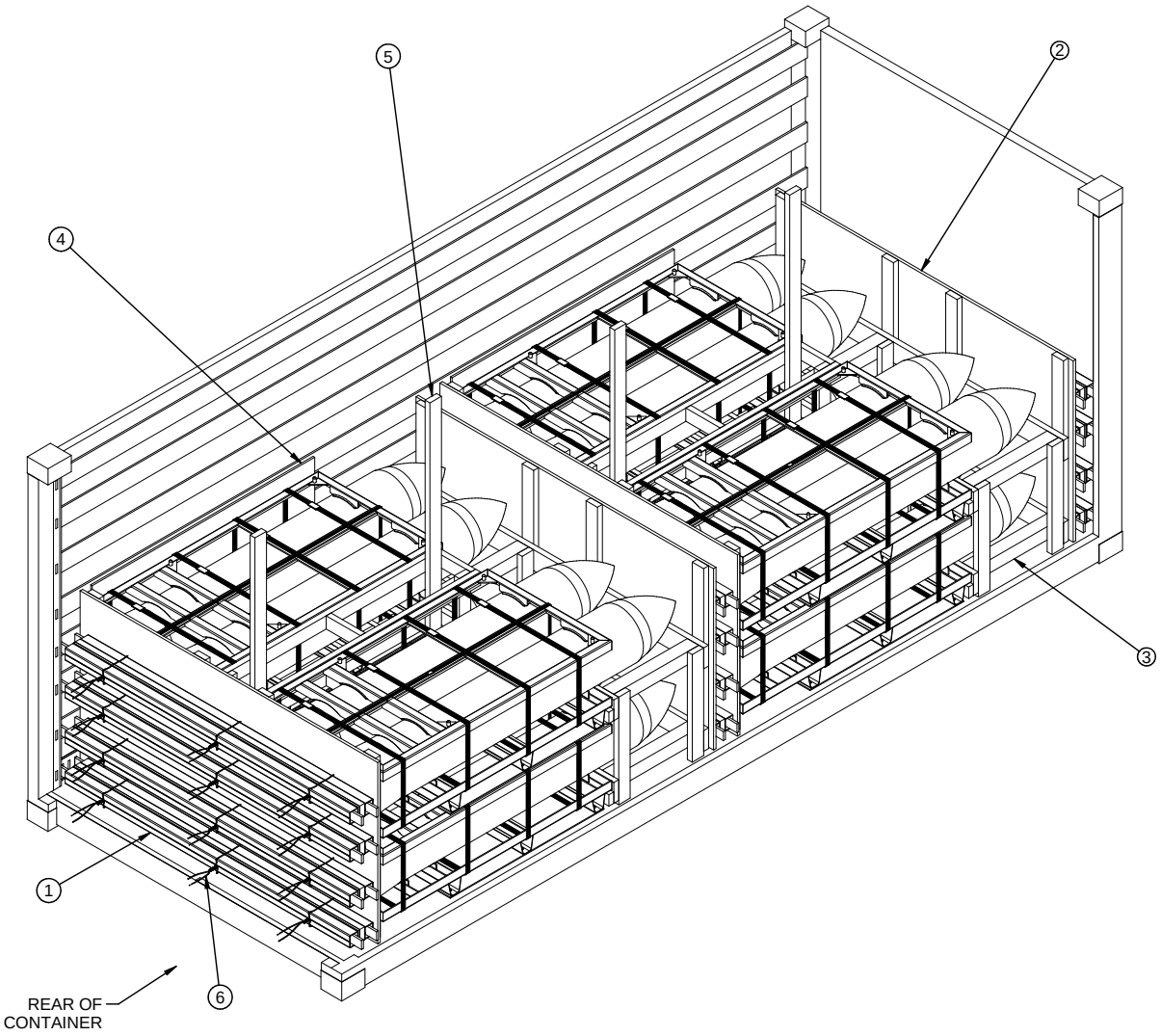
U.S. ARMY DEFENSE AMMUNITION CENTER

CLASS	DIVISION	DRAWING	FILE
19	48	8768	SP15PB14

PROJECT SP 467-02



ISOMETRIC VIEW

TWO RIGHT HAND SIDE WALL GATES HAVE BEEN OMITTED FOR CLARITY PURPOSES.

KEY NUMBERS

① CROSS MEMBER (DOUBLED) (12 REQD). POSITION AS SHOWN IN THE DETAIL ABOVE AT THE 5", 16", 28", AND 38" HEIGHTS. SEE THE "FILL DETAIL" ON PAGE 7.

② LOAD BEARING GATE (4 REQD). SEE THE DETAIL ON PAGE 5.

③ SUPPORT ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 6.

④ SIDE WALL GATE (4 REQD; 2 RIGHT HAND AND 2 LEFT HAND). SEE THE DETAIL ON PAGE 6.

⑤ CENTER FILL ASSEMBLY (2 REQD). SEE THE DETAL ON PAGE 5.

⑥ TIE WIRE, 0.0800" DIAMETER WIRE BY 18" LONG (36 REQD, 3 PER DOUBLED CROSSMEMBER). SEE THE "FILL DETAIL" ON PAGE 7.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1″ X 4″	16	6
2″ X 4″	289	193
2″ X 6″	61	61
4″ X 4″	35	47
NAILS	**NO. REQD**	**POUNDS**
6d (2″)	64	1/2
10d (3″)	400	6-1/4

PLYWOOD, 1/2″ - 64.00 SQ FT REQD - - 88.00 LBS
PLYWOOD, 3/4″ - 122.00 SQ FT REQD - - 251.63 LBS
WIRE, .0800″ DIA - - - 54′ REQD - - - - 1 LBS
CROSS MEMBER - - - - - - - - - - - - - - - 24 REQD

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	8	34,584 LBS
DUNNAGE		960 LBS
CONTAINER		5,700 LBS
	TOTAL WEIGHT	41,244 LBS (APPROX)

PROJECT SP 467-02

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 BLU-109 BOMBS ON MHU-212 METAL PALLETS. SUBSEQUENT REFERENCE TO PALLET UNIT HEREIN MEANS THE PALLET UNIT WITH BOMB ITEMS. SEE PAGE 4 FOR DETAILS OF THE PALLET UNIT. **CAUTION:** REGARDLESS OF THE QUANTITY OF UNITS TO BE SHIPPED, THE "MAXIMUM GROSS WEIGHT" OF THE MILVAN CONTAINER MUST NOT BE EXCEEDED.

C. THE LOADS AS SHOWN ARE BASED ON A 20' LONG BY 8' WIDE BY 8' HIGH MILVAN CONTAINER WITH INSIDE DIMENSIONS OF 19'-4" LONG BY 92" WIDE BY 87" HIGH. THE LOADS ARE DESIGNED FOR TRAILER/CONTAINER-ON-FLATCAR (T/COFC) SHIPMENT.

D. THE SPECIFIED OUTLOADING PROCEDURES ARE FOR CONTAINERS EQUIPPED WITH SELF-CONTAINED MECHANICAL BRACING DEVICES AS DESCRIBED IN MIL-C-52661. CROSS MEMBER ATTACHMENT FACILITIES WITHIN THESE CONTAINERS MUST PROVIDE FOR THE INSTALLATION OF LOAD BLOCKING CROSS MEMBERS AT THE HEIGHTS SPECIFIED. VOIDS LENGTHWISE WITHIN THE LOAD MUST BE HELD TO A MINIMUM. CROSS MEMBERS MUST BE PLACED AGAINST THE LADING AS TIGHTLY AS THE HOLE SPACING IN THE CROSS MEMBER ATTACHMENT FACILITY PERMITS. SEE THE "FILL DETAIL" ONE PAGE 7 FOR ADDITIONAL GUIDANCE. EACH CROSS MEMBER WILL BE INSTALLED WITH THE ENDS ATTACHED AS NEARLY AS POSSIBLE IN "MATED" POSITIONS (AT EQUAL HEIGHTS, AND AT EQUAL DISTANCES FROM THE END OF THE CONTAINER). CROSS MEMBERS IN EMPTY CONTAINERS AND THOSE NOT USED IN LOADED CONTAINERS MUST BE FASTENED INTO BELT RAILS FOR SHIPMENT. COMPONENTS ASSIGNED TO EACH CONTAINER MUST REMAIN THEREWITH EVEN THOUGH UNUSED DURING SOME SHIPMENTS. THE LOAD BLOCKING COMPONENT DESIGNATED AS "CROSS MEMBER" HEREIN IS IDENTIFIED AS "BEAM ASSEMBLY" WITHIN TM 55-8115-200-23&P, DATED DECEMBER 1979. THE BEAM ASSEMBLY IS FURTHER IDENTIFIED AS NSN 8115-00-165-6623.

E. 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". THE LENGTH OF THE LATERAL PIECES IN THE SIDE FILL ASSEMBLY MAY BE ADJUSTED, AS NECESSARY, TO FACILITATE VARIANCE IN THE CONTAINER SIZE.

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. 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.

H. **CAUTION:** DO NOT NAIL DUNNAGE MATERIAL TO THE MILVAN WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.

J. PORTIONS OF THE MILVAN DEPICTED WITHIN THIS DRAWING, SUCH AS ONE OF THE SIDEWALLS, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.

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. **CAUTION:** LOADED CONTAINERS MUST BE ON CHASSIS EQUIPPED WITH TWO BOGIE ASSEMBLIES WHEN BEING MOVED IN TOFC SERVICE, REGARDLESS OF THE LOAD WEIGHT WITHIN THE CONTAINER.

2. LOAD LIMITS OF T/COFC RAIL CARS 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.

3. CHASSIS/CONTAINERS COUPLED INTO A 40-FOOT TRAILER CONFIGURATION MUST BE PLACED AT THE B-END OF A TOFC RAILCAR. THE REAR END OF THE 40-FOOT UNIT WILL OVERHANG THE END OF THE CAR IF IT IS PLACED AT THE A-END. TWENTY-FOOT AND 40-FOOT UNITS CAN BE LOADED ON THE SAME CAR.

(CONTINUED AT RIGHT)

M. TO MAKE LOADING EASIER, TO HELP ACHIEVE A TIGHT LOAD ACROSS A CONTAINER, AND TO PREVENT UNACCEPTABLE DAMAGE TO LADING UNITS WHEN LOADING A MILVAN, A SLIP-SHEET CAN BE USED EFFECTIVELY AS A "SHOE-HORN" TYPE DEVICE. THE SLIP-SHEET WILL PROVIDE A SMOOTH SURFACE THAT WILL PREVENT UNIT STRAPS AND CONTAINERS FROM INTERLOCKING OR CATCHING ON OTHER PROJECTIONS WHEN LATERALLY ADJACENT LADING UNITS ARE BEING LOADED. A SLIP-SHEET WILL BE USED AFTER ONE-HALF OF A STACK IS LOADED WITH ONE OF ITS SIDES IN TIGHT CONTACT AT ONE SIDE OF THE MILVAN. THE SLIP-SHEET IS TO BE PLACED AGAINST THE OTHER SIDE OF THE HALF-STACK BEFORE THE LAST HALF OF THE STACK IS LOADED. AFTER A STACK IS COMPLETED, THE SLIP-SHEET IS TO BE REMOVED FOR SUBSEQUENT USE WITH THE NEXT STACK. A SLIP-SHEET OF SUITABLE SIZE CAN BE MADE FROM A SHEET OF 1/8" TEMPERED HARDBOARD (MASONITE) OR FROM A SHEET OF ANY OTHER MATERIAL THAT WILL SATISFY THE REQUIREMENTS.

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.

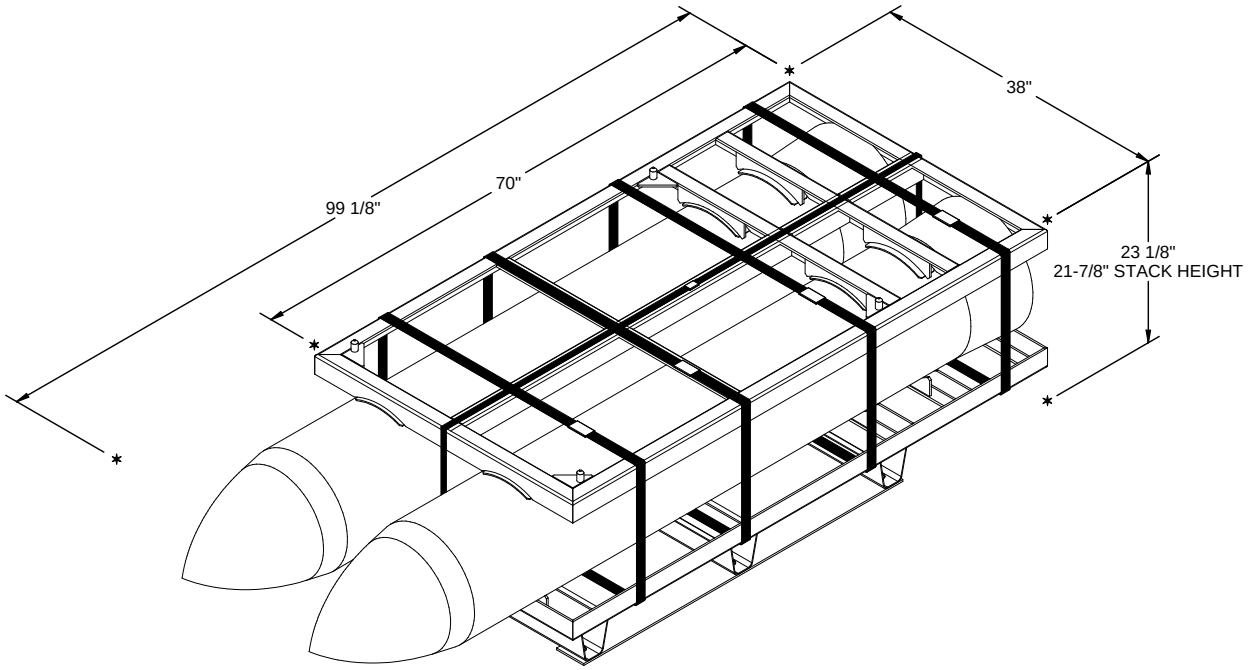
O. THE QUANTITY OF PALLET UNITS SHOWN IN THE LOAD ON PAGE 2 MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SEE THE "LESS-THAN- FULL LOAD PROCEDURE" AND FILLER ASSEMBLY DETAIL ON PAGE 8.

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 “STRAP JOINT A” AND “STRAP JOINT B” DETAILS ON PAGE 7 FOR GUIDANCE.

Q. 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.
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 D853; ANNEALED AT FINISH, BLACK OXIDE FINISH, 0.0800" DIA, GRADE 1006 OR BETTER.



BLU-109 ON MHU-212 PALLET

GROSS WEIGHT - - - - - - - - - 4,323 LBS (APPROX)
CUBE - - - - - - - - - - - - 47.7 CU FT (APPROX)

UNITIZATION AND HANDLING GUIDANCE

1. STACKING PALLET UNITS FOR UNITIZING:

   A. AN UPPER PALLET UNIT SHOULD BE PLACED AS CLOSE AS POSSIBLE IN VERTICAL ALIGNMENT WITH THE LOWER PALLET UNIT.

   B. POSITION THE AFT END OF AN UPPER PALLET UNIT ABOVE THE AFT END OF THE LOWER PALLET UNIT.

   C. THE PALLET UNIT SKIDS OF AN UPPER PALLET UNIT SHOULD BE FULLY SEATED AGAINST THE SKID LOCATOR PIECES ON THE COVER OF THE LOWER PALLET UNIT.

2. UNITIZING PROCEDURE USING 1-1/4" STEEL STRAPING, SEE ALSO GENERAL NOTE "P" ON PAGE 3:

   A. STACK TWO PALLET UNITS. BE SURE TO ALIGN THE STACKING FEATURES.

   B. FEED UNITIZING STRAP, 1-1/4" X .035" OR .031" X 14'-8" LONG STEEL STRAPPING (2 REQD PER STACK), THROUGH THE OUTER PALLET POSTS OF THE LOWER PALLET UNIT.

   C. BRING THE STRAP ENDS TOGETHER OVER THE TOP FRAME OF THE TOP PALLET UNIT.

   D. TENSION AND SECURE EACH STRAP WITH ONE DOUBLE-NOTCHED SEAL (2 REQD PER STACK).

(CONTINUED AT RIGHT)

(UNITIZATION AND HANDLING GUIDANCE CONTINUED)

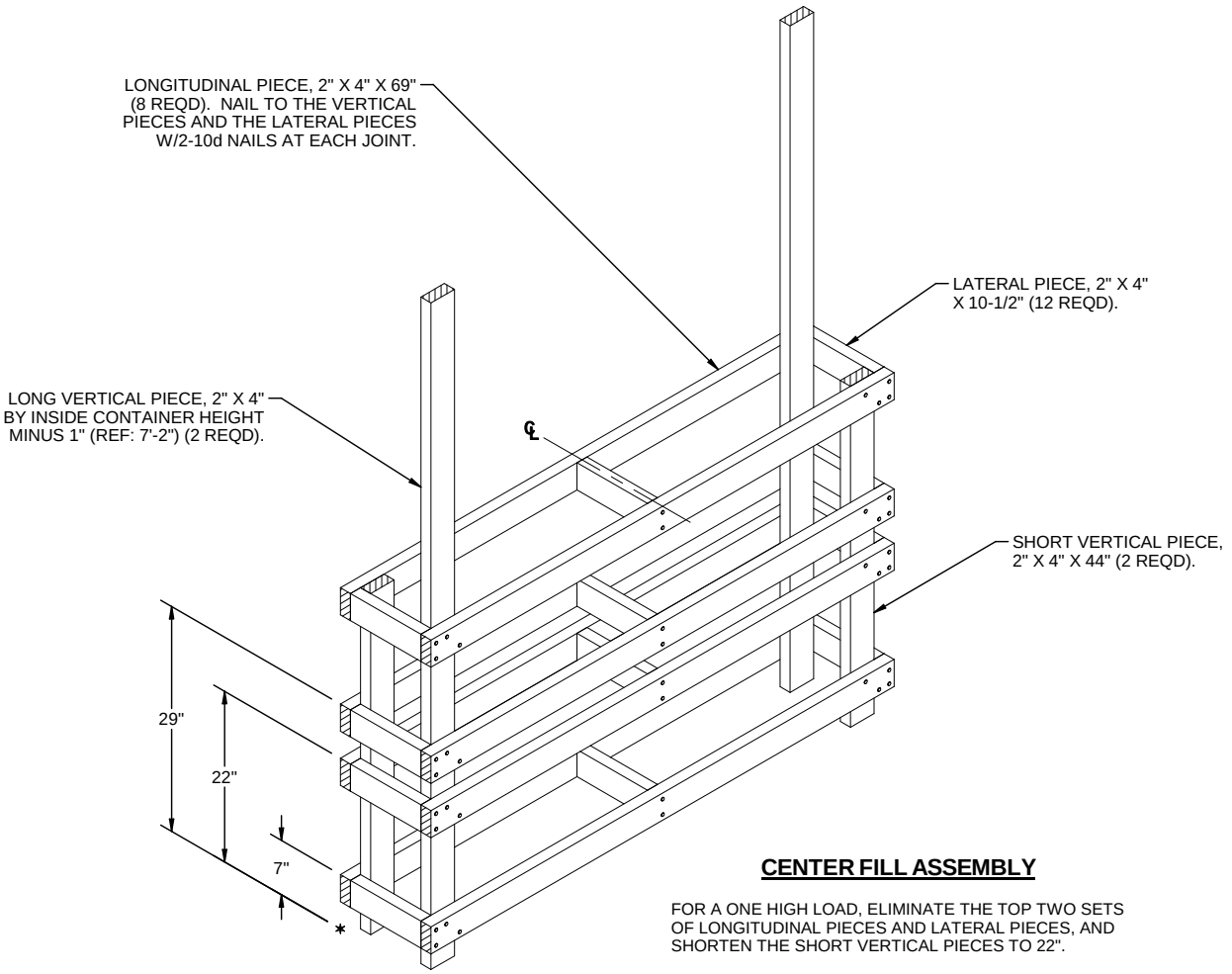
3. PALLET UNIT OR PALLET UNIT STACK HANDLING:

   A. ONLY APPROVED AND APPROPRIATELY SIZED MATERIAL HANDLING EQUIPMENT WILL BE USED FOR HANDLING THE DEPICTED PALLET UNITS. APPROVED MATERIAL HANDLING EQUIPMENT (FORKLIFT TRUCKS, CRANES, HAND TRUCKS, DOLLIES, ROLLER ASSEMBLIES, SLINGS, SPREADER BARS, ETC.) IS SPECIFIED ELSEWHERE.

   B. PRECAUTIONARY HANDLING TECHNIQUES NORMALLY EMPLOYED OR AS SPECIFIED FOR THE TYPE OF COMMODITY INVOLVED WILL BE OBSERVED.

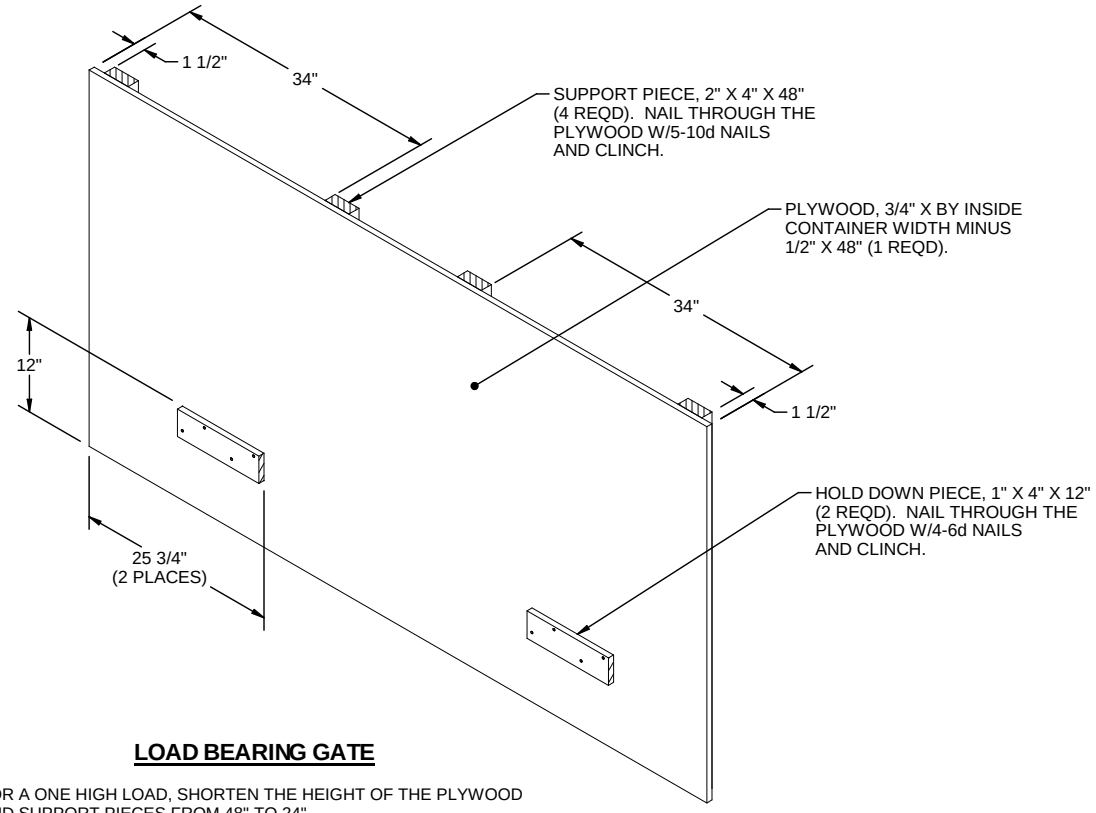
   C. IF HANDLING IS ACCOMPLISHED WITH A FORKLIFT TRUCK, THE PALLET UNITS SHOULD BE HANDLED FROM A SIDE POSITION AS MUCH AS POSSIBLE. CARE MUST BE EXERCISED WHEN INSERTING FORKS UNDER A PALLET UNIT, TO PREVENT DAMAGE TO THE PALLET UNIT BY THE FORK TINES OR THE FORKLIFT PACKAGE GUARD. IF ONE PALLET UNIT IS HANDLED BY SLINGING, THE SLING MAY BE ATTACHED TO THE LIFTING POINTS ON THE PALLET UNIT. DO NOT HANDLE STACKED PALLET UNITS WITH A SLING.

   D. WHEN UNLOADING A PALLET UNIT OR PALLET UNIT STACK FROM THE MILVAN, THE FORKLIFT TINES WILL BE INSERTED UNDER THE LOWER PALLET UNIT, THE FORKLIFT WILL THEN ELEVEATE THE END SLIGHTLY ABOVE THE FLOOR, AND BEGIN DRAGGING THE PALLET UNIT OR STACK FROM THE CONTAINER AFTER ATTACHING A CHAIN OR WEB STRAP FROM A LOWER PALLET UNIT LIFT POINT AROUND THE FORKLIFT MAST TO A LIFT POINT OF THE OPPOSITE SIDE OF THE PALLET UNIT.



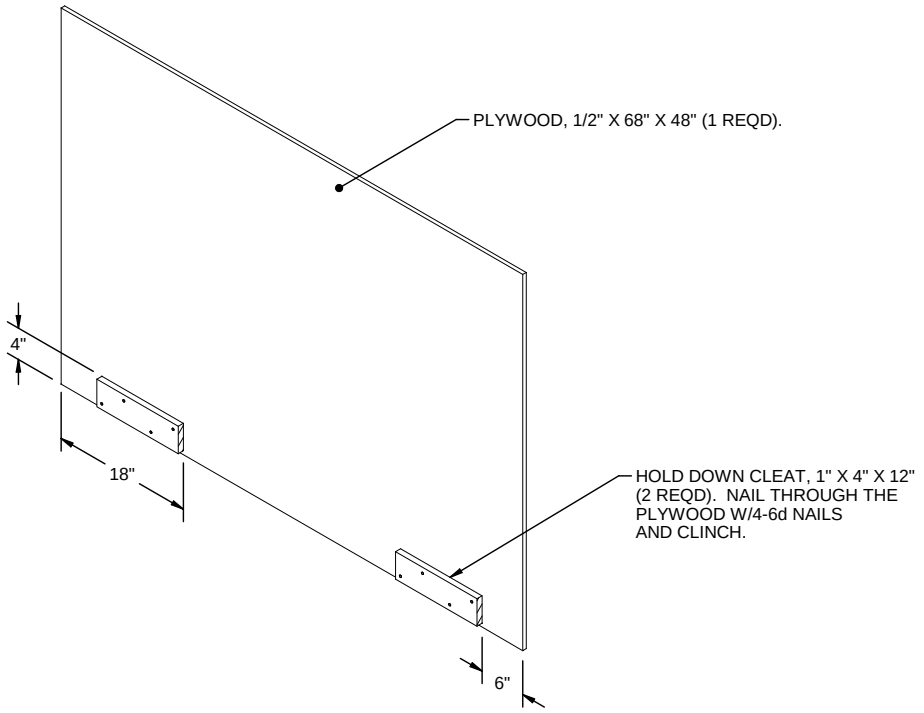
CENTER FILL ASSEMBLY

FOR A ONE HIGH LOAD, ELIMINATE THE TOP TWO SETS OF LONGITUDINAL PIECES AND LATERAL PIECES, AND SHORTEN THE SHORT VERTICAL PIECES TO 22".



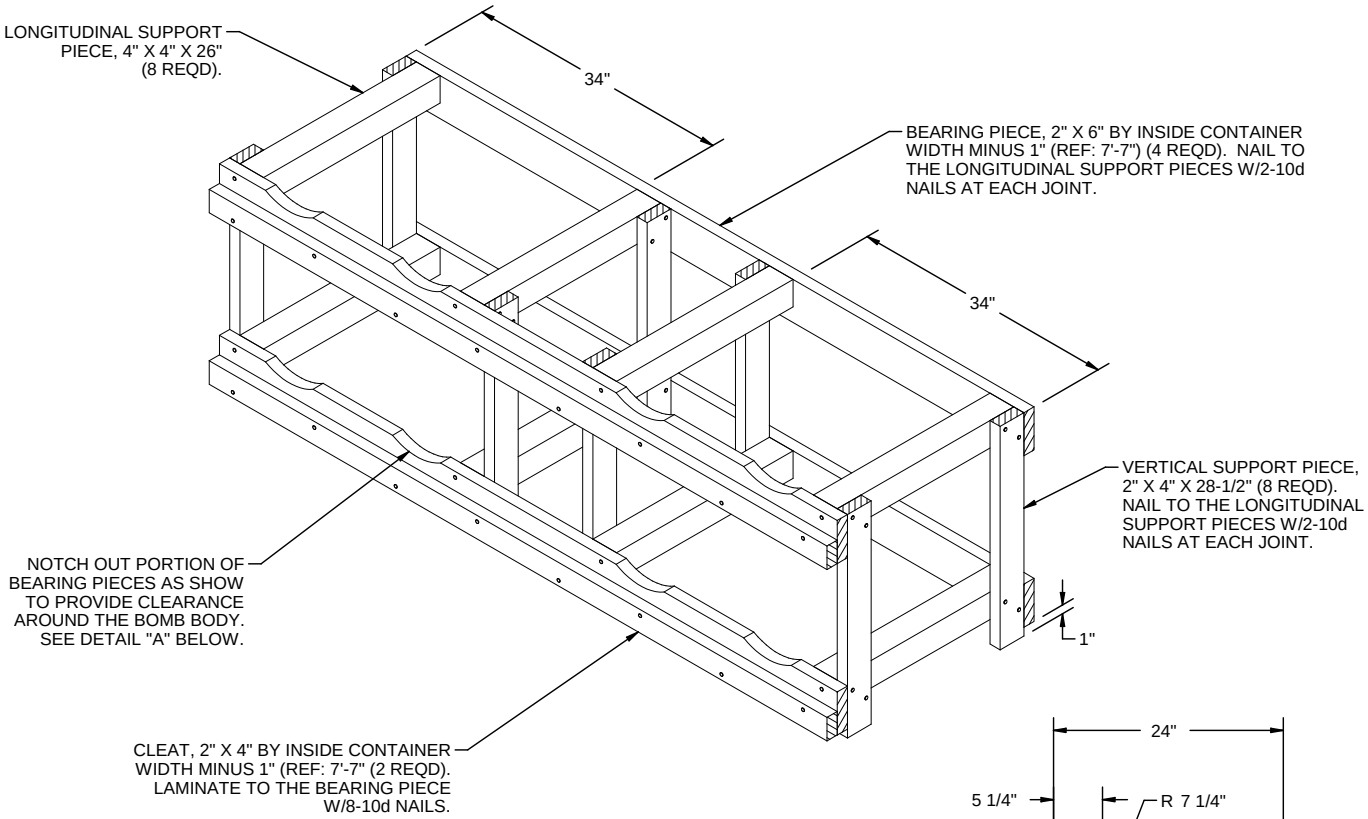
LOAD BEARING GATE

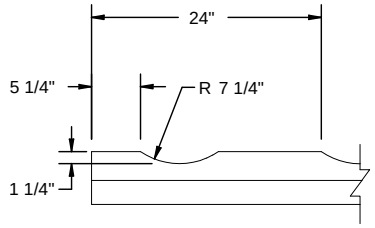
FOR A ONE HIGH LOAD, SHORTEN THE HEIGHT OF THE PLYWOOD AND SUPPORT PIECES FROM 48" TO 24".



SIDE WALL GATE

FOR ONE HIGH LOAD, SHORTEN THE HEIGHT OF THE PLYWOOD FROM 48" TO 24".



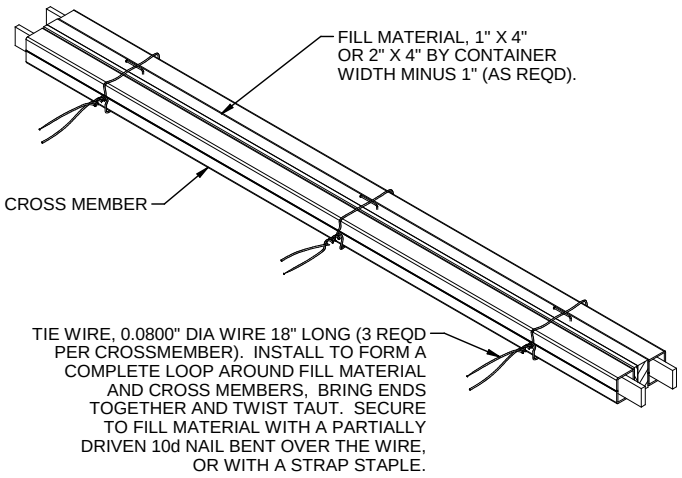


SUPPORT ASSEMBLY

FOR ONE HIGH LOAD, ELIMINATE THE TOP SET OF LONGITUDINAL SUPPORT PIECES, CLEATS, AND BEARING PIECES; SHORTEN THE VERTICAL SUPPORT PIECES FROM 28-1/2" TO 6-5/8".

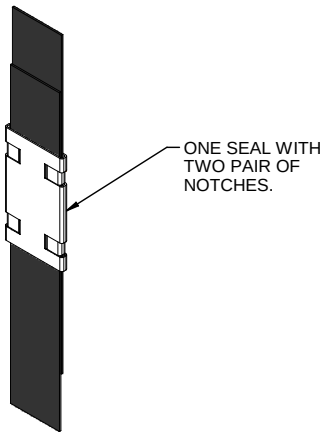
DETAIL A

PROJECT SP 467-02



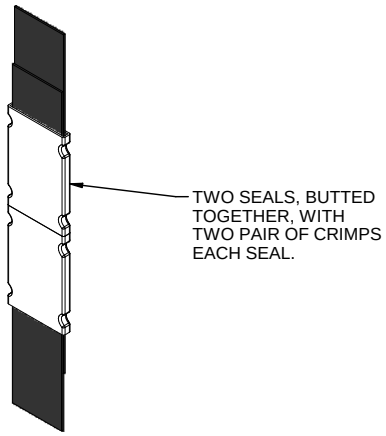
FILL DETAIL

THIS DETAIL DEPICTS THE METHOD OF POSITIONING FILL MATERIAL BETWEEN CROSS MEMBERS WHEN DOUBLED CROSSMEMBERS ARE REQUIRED.



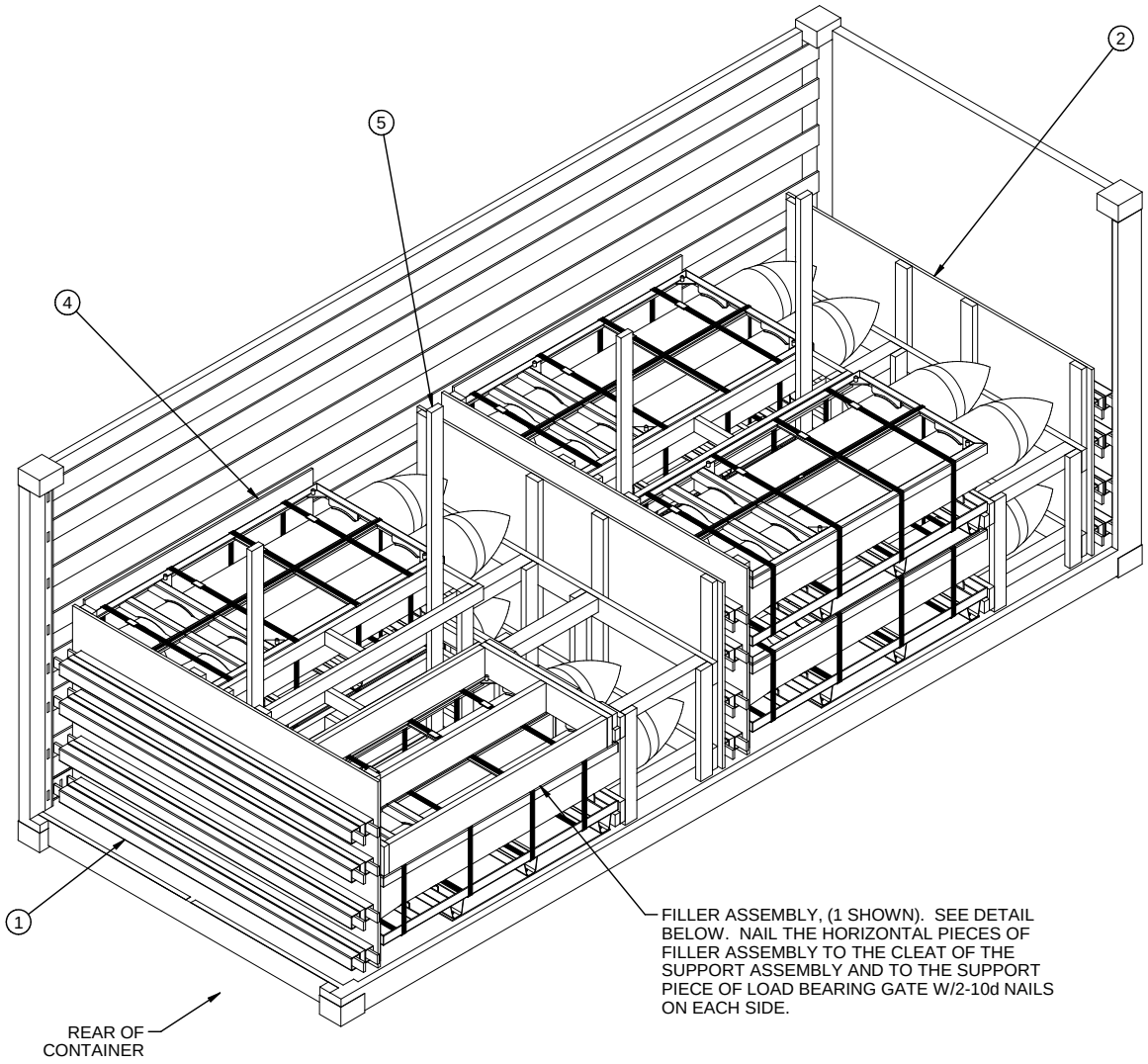
STRAP JOINT A

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



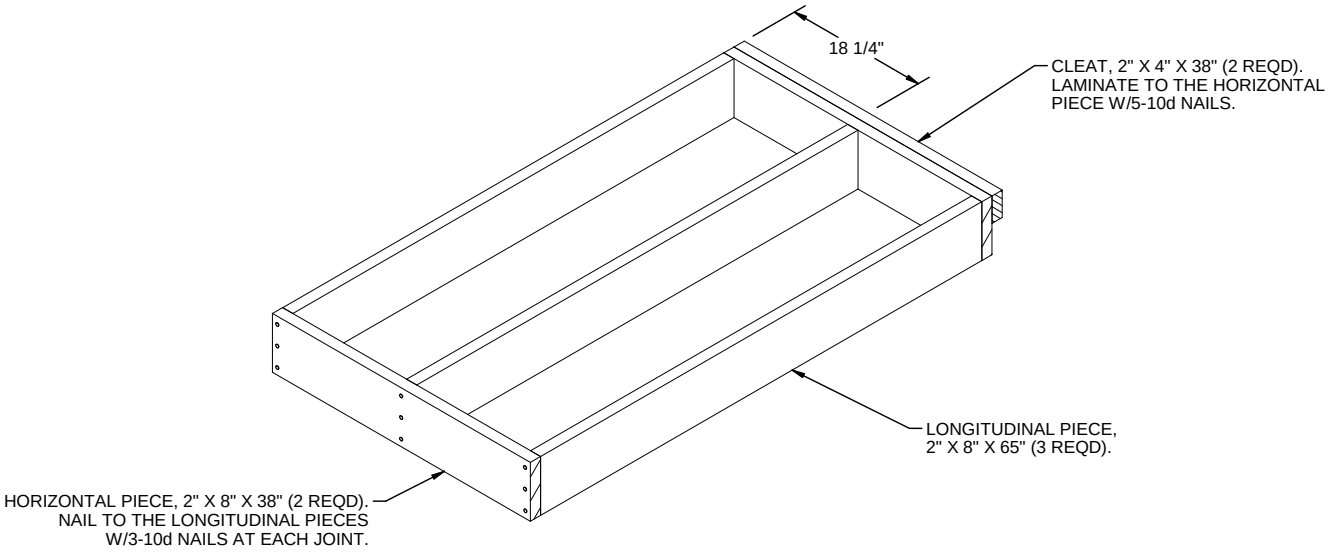
STRAP JOINT B

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



LESS-THAN-FULL-LOAD PROCEDURE

KEY NUMBERS REFER TO KEY NUMBERS ON PAGE 2. INSTALL FILLER ASSEMBLY TO FIT WITHIN LOWER CONTAINER STACKING LUGS. TWO RIGHT HAND SIDE WALL GATES HAVE BEEN OMITTED FOR CLARITY PURPOSES.



FILLER ASSEMBLY

INSTALL THE SIDE WITH THE CLEAT AGAINST THE SUPPORT ASSEMBLY.