# LOADING AND BRACING\* IN MILVAN **CONTAINERS® OF MODULAR PACK** MINE SYSTEM (MOPMS), M131, AND PRACTICE, M136, PALLETIZED

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

\*ONLY MILVAN CONTAINERS WHICH HAVE BEEN MODIFIED TO INCLUDE A MECHANICAL LOAD BRACING SYSTEM THAT SATIS-FIES THE REQUIREMENTS OF THE BUREAU OF EXPLOSIVES PAMPHLET 6C WILL BE USED FOR THE MOVEMENT OF AMMUNI-TION BY T/COFC SERVICE.

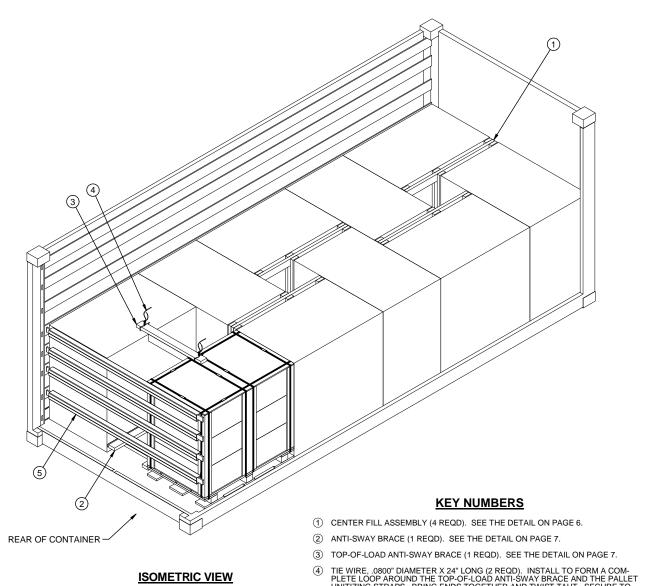
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DIRECTORATE



- TIE WIRE, 0800" DIAMETER X 24" LONG (2 REQD). INSTALL TO FORM A COMPLETE LOOP AROUND THE TOP-OF-LOAD ANTI-SWAY BRACE AND THE PALLET UNITIZING STRAPS. BRING ENDS TOGETHER AND TWIST TAUT. SECURE TO THE TOP-OF-LOAD ANTI-SWAY BRACE WITH A PARTIALLY DRIVEN 10d NAIL BENT OVER THE WIRE OR WITH A STRAP STAPLE.
- $\mbox{\Large (3)}$  CROSS MEMBER (4 REQD). POSITION AS SHOWN IN THE DETAIL ABOVE, AT THE 16", 28", 38" AND 48" HEIGHTS. SEE THE "FILL DETAIL" ON PAGE 6.

BILL OF MATERIAL				
LUMBER	LINEAR FEET	BOARD FEET		
2" X 2"	12	4		
2" X 4"	134	90		
4" X 4"	2	3		
NAI LS	NO. REQD	POUNDS		
10d (3")	114	4		
WIRE, .0800" DIA CROSS MEMBER	4′ RE	QD NI L 4 REQD		

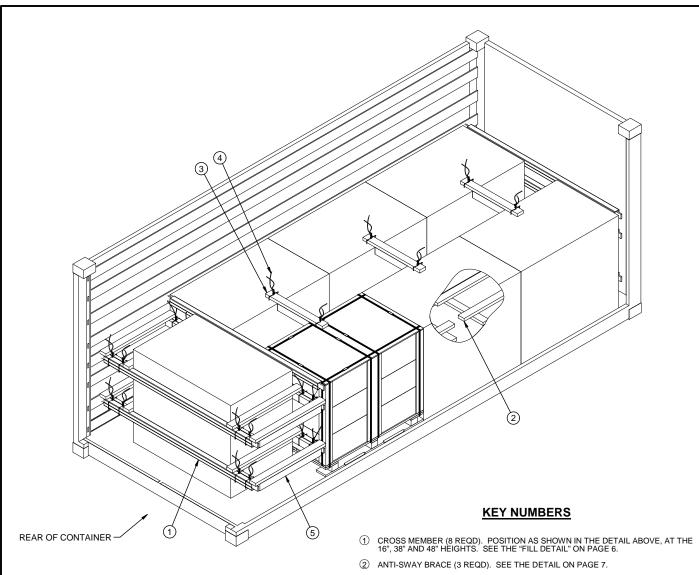
## LOAD AS SHOWN\*

<u>I TEM</u>	QUANTI TY	WEIGHT (APPROX)
DUNNAGE	10	198 LBS
	TOTAL WEIGHT	16,898 LBS (APPROX)

<sup>\*</sup>THIS LOAD IS ONLY APPLICABLE TO PALLET UNIT "A".

PAGE 2

TYPICAL LOADING PROCEDURE (PALLET UNIT A)



**ISOMETRIC VIEW** 

- ③ TOP-OF-LOAD ANTI-SWAY BRACE (3 REQD). SEE THE DETAIL ON PAGE 7.
- TIE WIRE, .0800" DIAMETER X 24" LONG (14 REQD). INSTALL TO FORM A COMPLETE LOOP AROUND THE TOP-OF-LOAD ANTI-SWAY BRACE AND THE PALLET UNITIZING STRAPS OR A COMPLETE LOOP AROUND THE CROSS MEMBER AND THE SPACCE ASSEMBLY. BRING ENDS TOGETHER AND TWIST TAUT. SECURE TO THE TOP-OF-LOAD ANTI-SWAY BRACE WITH A PARTIALLY DRIVEN 100 NAIL BENT OVER THE WIRE OR WITH A STRAP STAPLE.
- 5 SPACER ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 7.

BILL OF MATERIAL			
LUMBER	LINEAR FEET	BOARD FEET	
2" X 4"	174	116	
4" X 4"	5	6	
NAI LS	NO. REQD	POUNDS	
10d (3")	144	2 1/4	
WIRE, .0800" DIA CROSS MEMBER	28' R	EQD 1 LB 8 REOD	

## LOAD AS SHOWN\*

<u>I TEM</u>	<u>QUANTI TY</u>	<u>WEI GHT</u> (APPROX)
	7	
		5, 700 LBS
	TOTAL WEIGHT	13,438 LBS (APPROX)

\*THIS LOAD IS APPLICABLE TO EITHER PALLET UNIT, SEE GENERAL NOTE "N" ON PAGE 4.

## **TYPICAL LOADING PROCEDURE (PALLET UNIT B)**

## **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 MODULAR PACK MINE SYSTEM (MOPMS) PALLET UNITS. SUBSEQUENT REFERENCE TO PALLET UNIT HEREIN MEANS THE PALLET UNIT WITH AMMUNITION ITEMS. SEE PAGE 5 AND ARDEC DRAWING 9349988 FOR DETAILS OF THE PALLET UNIT. CAUTION: REGARDLESS OF THE QUANTITY OF PALLET 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 MILC-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" ON PAGE 6 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". EXCESSIVE SLACK CAN BE ELIMINATED BY LAMINATING ADDITIONAL PIECES OF APPROPRIATE THICKNESS TO THE VERTICAL PIECES ON THE CENTER FILL ASSEMBLIES. NAIL EACH ADDITIONAL PIECE TO THE VERTICAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE THICKNESS AND/OR QUANTITY OF THE VERTICAL OR HORIZONTAL PIECES MAY BE ADJUSTED, AS NECESSARY, TO FACILITATE VARIANCE IN THE PALLET UNIT.
- 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. <u>CAUTION</u>: 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.

(CONTINUED AT RIGHT)

### (GENERAL NOTES CONTINUED)

- 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:
  - 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.
  - 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.
- 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 "SHOEHORN" TYPE DEVICE. THE SLIP-SHEET WILL PROVIDE A SMOOTH SURFACE THAT WILL PREVENT UNIT STRAPS 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 CONTAINERS SHOWN IN THE LOADS ON PAGES 2 AND 3 MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SEE THE "LESS-THAN-FULL LOAD PROCEDURE" ON PAGE 8 AND 9 RESPECTIVELY.
- P. 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.

## REVISION

REVISION NO. 1, DATED MAY 2015, CONSISTS OF

ADDING A LOADING PROCEDURE FOR ADDITIONAL PALLET UNIT CONFIGURATION

## **MATERIAL SPECIFICATIONS**

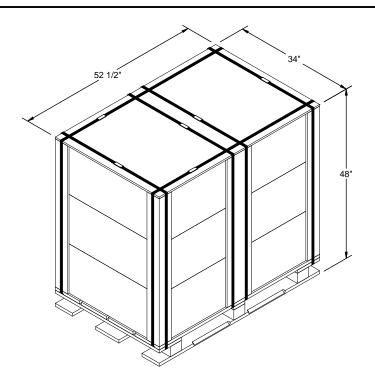
<u>LUMBER - - - - - - - - : SEE TM 743-200-1 (DUNNAGE LUMBER) AND VOLUNTARY PRODUCT STANDARD PS 20.</u>

NAILS - - - - - - : ASTM F1667; COMMON STEEL NAIL (NLCMS OR

NAILS - - - - - - : ASTM F1667; COMMON STEEL NAIL (NLCMS OR NLCMMS).

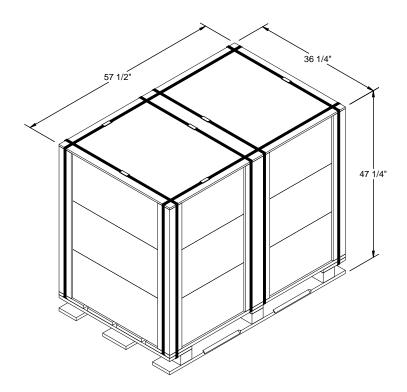
STAPLE, STRAP - - - -: COMMERCIAL GRADE

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



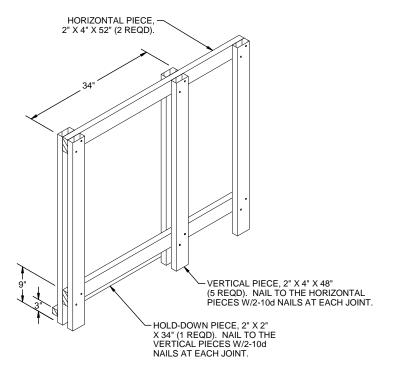
## PALLET UNIT A

UNIT WEIGHT (M131) - - - - - - - 1,100 LBS (APPROX) UNIT WEIGHT (M136) - - - - - - - 1,130 LBS (APPROX) CUBE - - - - - - - - - - - - - 49.6 CU FT (APPROX)



## PALLET UNIT B

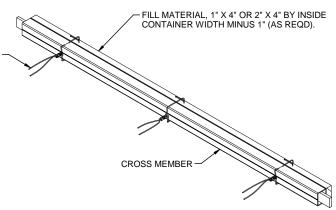
UNIT WEIGHT (M131) - - - - - - - - 1,100 LBS (APPROX) UNIT WEIGHT (M136) - - - - - - - 1,070 LBS (APPROX) CUBE - - - - - - - - - - - - - - 57.0 CU FT (APPROX)



## **CENTER FILL ASSEMBLY**

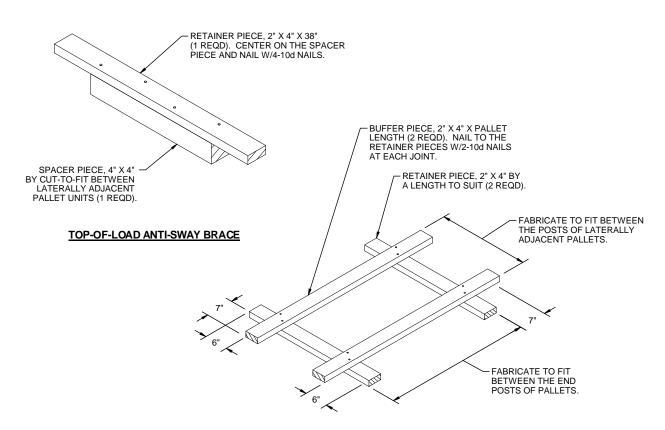
ORIENT THE CENTER FILL ASSEMBLY SUCH THAT THE VERTICAL PIECES LINE UP WITH THE EDGES OF THE PALLET UNITS AND THE HOLD-DOWN PIECES ARE INSET INTO THE PALLET 34" DIMENSION, AS SHOWN IN THE LOAD ON PAGE 2.

TIE WIRE, 0.0800" DIA WIRE 18" LONG (3 REQD PER CROSSMEMBER). INSTALL TO FORM A COMPLETE LOOP AROUND FILL MATERIAL AND CROSS MEMBER, BRING ENDS TOGETHER AND TWIST TAUT. SECURE TO FILL MATERIAL WITH A PARTIALLY DRIVEN 10d NAIL BENT OVER THE WIRE, OR WITH A STRAP STAPLE.



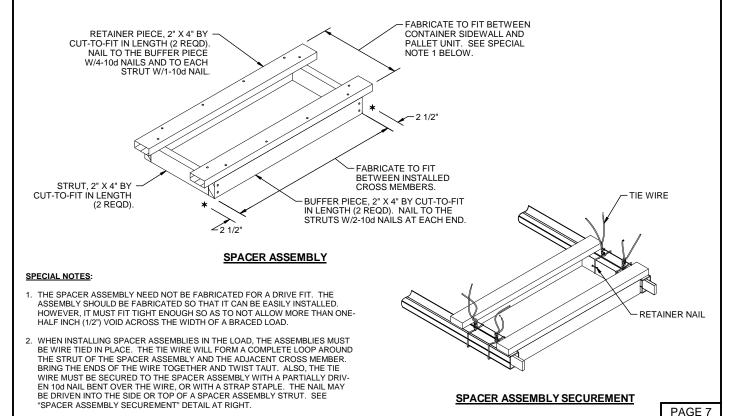
## **FILL DETAIL**

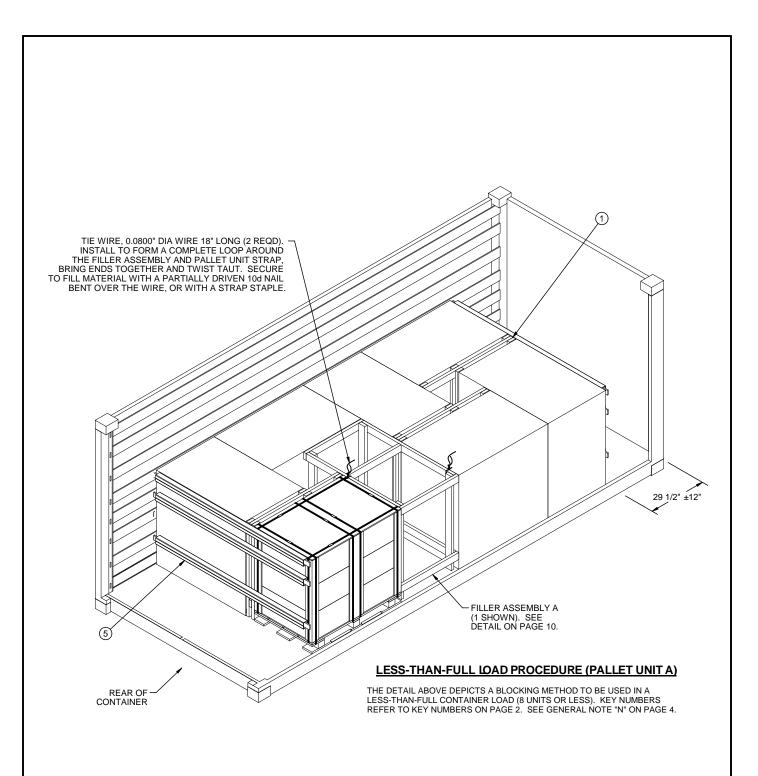
THIS DETAIL DEPICTS THE METHOD OF POSITIONING FILL MATERIAL BETWEEN CROSS MEMBER AND LADING WHEN THE VOID BETWEEN THE TWO IS GREATER THAN 1°.

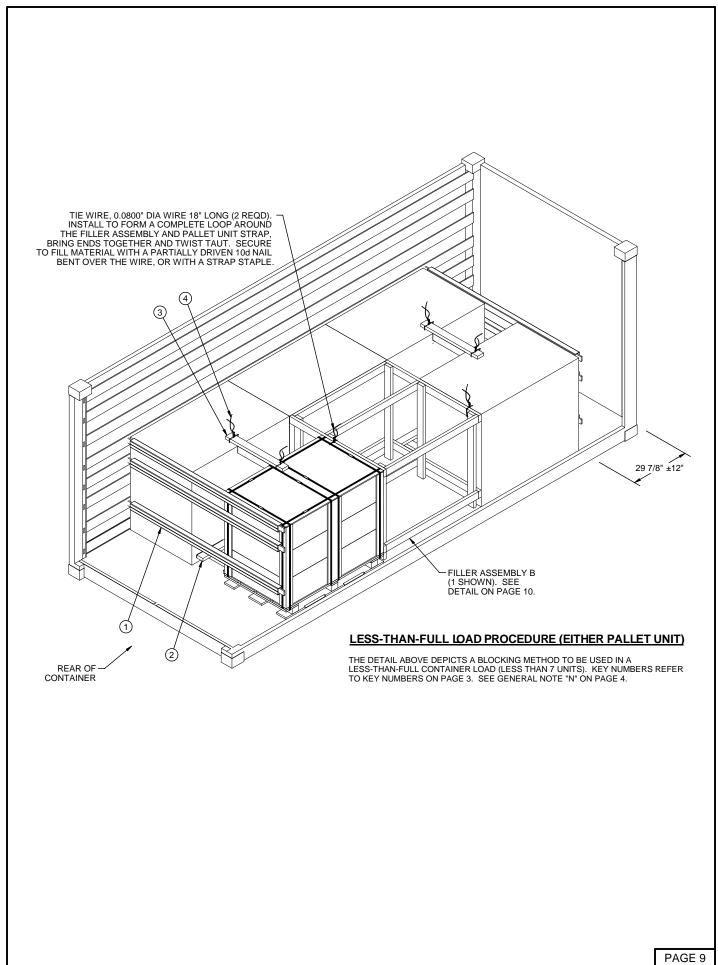


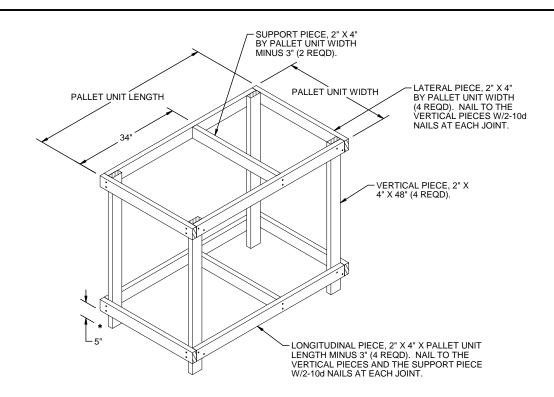
## **ANTI-SWAY BRACE**

IF DESIRED, THE ANTI-SWAY BRACE CAN BE PARTIALLY PRE-ASSEMBLED; ONE BUFFER PIECE CAN BE NAILED TO BOTH RETAINER PIECES. THE LONG ENDS OF THE ASSEMBLY CAN THEN BE INSTALLED INTO THE FORKLIFT OPENINGS OF A LOADED PALLET PRIOR TO POSITIONING THE LATERALLY ADJACENT PALLET UNIT.



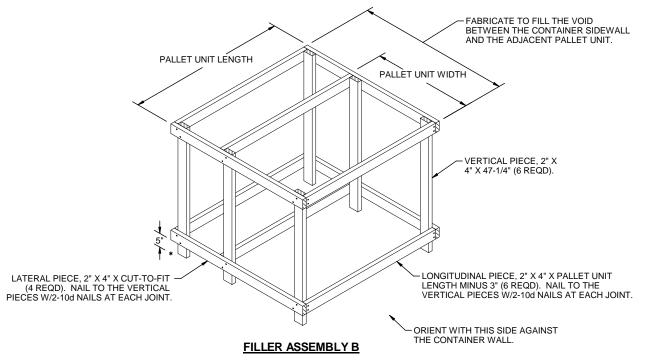






## **FILLER ASSEMBLY A**

THE ASSEMBLY DEPICTED ABOVE IS FOR USE IN PLACE OF AN OMITTED PALLET UNIT WITHIN A CHIMNEYED LOAD BAY. FILLER ASSEMBLIES MUST BE WIRE TIED TO PALLET UNIT STRAPS TO PREVENT UNDUE MOVEMENT. NO MORE THAN ONE FILLER ASSEMBLY WILL BE USED IN ANY LOAD. ORIENT THE FILLER ASSEMBLY SUCH THAT THE SUPPORT PIECE IS IN LINE WITH THE 34" DIMENSION OF THE LATERALLY ADJACENT PALLET LINIT



THE ASSEMBLY DEPICTED ABOVE IS FOR USE IN PLACE OF AN OMITTED PALLET UNIT. THIS ASSEMBLY IS DESIGNED TO REPLACE A PALLET UNIT, ANTI-SWAY BRACE, AND TOP-OF-LOAD ANTI-SWAY BRACE. FILLER ASSEMBLIES MUST BE WIRE TIED TO AN ADJACENT PALLET UNIT STRAP OR CENTER FILL ASSEMBLY TO PREVENT UNDUE MOVEMENT. NO MORE THAN ONE FILLER ASSEMBLY WILL BE USED IN ANY LOAD. DO NOT USE ADJACENT TO CHIMNEYED PALLET UNITS.