

LOADING AND BRACING[⊕] IN SIDE OPENING ISO CONTAINERS OF THE MODULAR PACK MINE SYSTEM (MOPMS), M131, AND PRACTICE, M136, PALLETIZED

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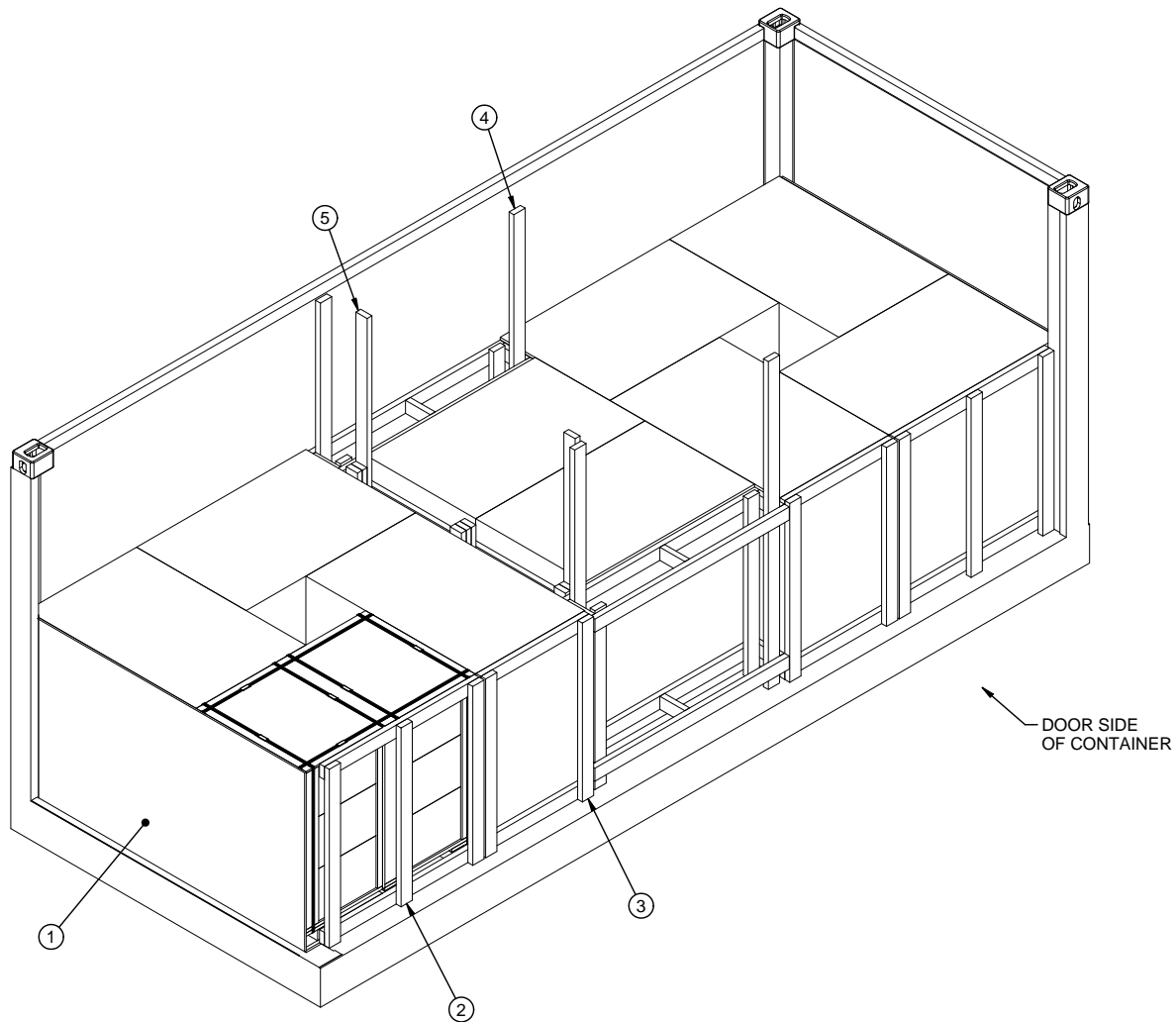
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⊕ THE PROCEDURES SHOWN HEREIN ARE APPLICABLE TO LOADS THAT ARE TO
BE SHIPPED BY TRAILER/CONTAINER-ON-FLATCAR (T/COFC) RAIL, MOTOR, OR
WATER CARRIERS.

U.S. ARMY MATERIEL COMMAND DRAWING

<p>APPROVED, U.S. ARMY JOINT MUNITIONS COMMAND</p> <p>RUS.ALLEN.J .1230354282</p> <small>Digitally signed by RUS.ALLEN.J.1230354282 DN: cn=US, ou=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=RUS.ALLEN.J.1230354282 Date: 2016.01.05 14:53:02 -06'00'</small>		<p>CAUTION: VERIFY PRIOR TO USE AT HTTPS://MHP.REDSTONE.ARMY.MIL THAT THIS IS THE MOST CURRENT VERSION OF THIS DOCUMENT. THIS IS PAGE 1 OF 10.</p>			
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DESIGN ENGINEER		BASIC	LAURA FIEFFER		REVISION NO. 1
		REV.	SPENCER HOVEY		
<p>APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND</p> <p>SHIMP.UPTON .R.1231257183</p> <small>Digitally signed by SHIMP.UPTON.R.1231257183 DN: cn=US, ou=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=SHIMP.UPTON.R.1231257183 Date: 2016.01.08 13:28:31 -06'00'</small>		ENGINEERING DIVISION	<p>FIEFFER.LAUR A.A.1230375727</p> <small>Digitally signed by FIEFFER.LAURA.A.1230375727 DN: cn=US, ou=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=FIEFFER.LAURA.A.1230375727 Date: 2015.10.20 07:24:24 -05'00'</small>		FEBRUARY 2016
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		TEST REPORT	NA		CLASS
U.S. ARMY DEFENSE AMMUNITION CENTER		EXPLOSIVE SAFETY DIRECTORATE	<p>TIRONE.JOSEPH.A NDREW.102668374 9</p> <small>Digitally signed by TIRONE.JOSEPH.ANDREW.1026683749 DN: cn=US, ou=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=TIRONE.JOSEPH.ANDREW.1026683749 Date: 2015.12.03 17:50:48 -05'00'</small>	DIVISION	DRAWING
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ISOMETRIC VIEW

KEY NUMBERS

- ① ENDWALL GATE (2 REQD). SEE THE DETAIL ON PAGE 9.
- ② SIDE FILL ASSEMBLY A (2 REQD). SEE THE DETAIL ON PAGE 6.
- ③ SIDE FILL ASSEMBLY B (2 REQD). SEE THE DETAIL ON PAGE 6.
- ④ SIDE FILL ASSEMBLY C (2 REQD). SEE THE DETAIL ON PAGE 7.
- ⑤ CENTER FILL ASSEMBLY A (1 REQD). SEE THE DETAIL ON PAGE 8.

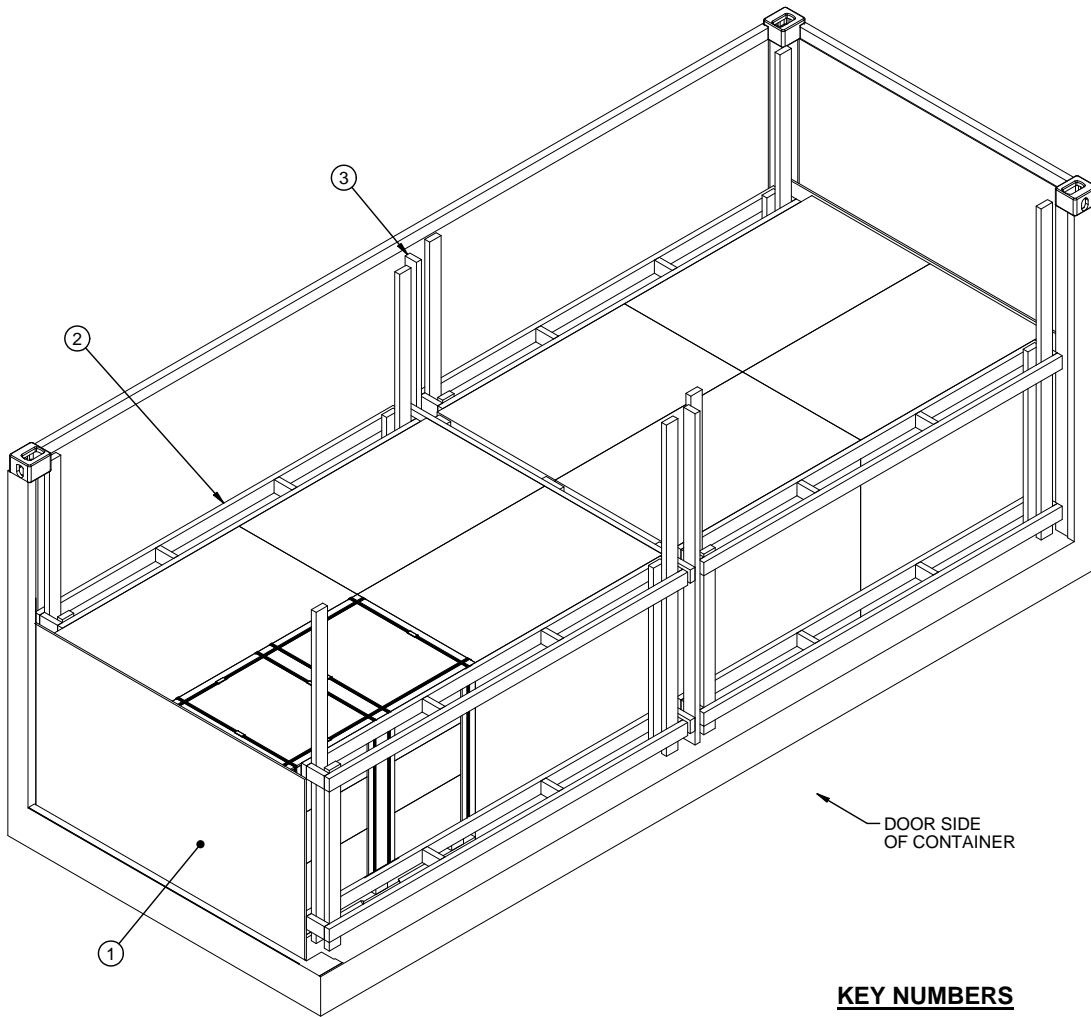
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 2"	12	4
2" X 4"	237	158
NAI LS	NO. REQD	POUNDS
6d (2")	8	1/4 LB
10d (3")	196	3 LBS
PLYWOOD, 1/2" - - 57.33 SQ FT REQD - - 78.83 LBS		

LOAD AS SHOWN*

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT - - - - -	10 - - - - -	11,300 LBS
DUNNAGE - - - - -	- - - - -	406 LBS
CONTAINER - - - - -	- - - - -	6,050 LBS
TOTAL WEIGHT - - - - -		17,756 LBS (APPROX)

*THIS LOAD IS ONLY APPLICABLE TO PALLET UNIT "A".



ISOMETRIC VIEW

KEY NUMBERS

- ① ENDWALL GATE (2 REQD). SEE THE DETAIL ON PAGE 9.
- ② SIDE FILL ASSEMBLY D (4 REQD). SEE THE DETAIL ON PAGE 7.
- ③ CENTER FILL ASSEMBLY B (1 REQD). SEE THE DETAIL ON PAGE 8.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 2"	5	2
2" X 4"	289	193
2" X 6"	4	4
NAILS	NO. REQD	POUNDS
6d (2")	8	1/4 LB
10d (3")	212	3-1/2 LB
PLYWOOD, 1/2" - - 57.33 SQ FT REQD - - 78.83 LBS		

LOAD AS SHOWN*

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT - - - - -	8 - - - - -	9,040 LBS
DUNNAGE - - - - -	- - - - -	479 LBS
CONTAINER - - - - -	- - - - -	6,050 LBS
TOTAL WEIGHT - - - - -		15,569 LBS (APPROX)

*THIS LOAD IS APPLICABLE TO EITHER PALLET UNIT. PALLET UNIT "B" IS DEPICTED ABOVE.

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 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 TRAILER/CONTAINER-ON-FLATCAR (T/COFC) SHIPMENT; HOWEVER, THE LOAD AS DESIGNED CAN ALSO BE MOVED BY OTHER SURFACE MODES OF TRANSPORT. **NO-TICE:** 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 HORIZONTAL PIECES OR LONGITUDINAL PIECES ON THE SIDE FILL ASSEMBLIES. NAIL EACH ADDITIONAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE THICKNESS, AND/OR QUANTITY OF THE VERTICAL PIECES IN THE SIDE FILL ASSEMBLIES OR THE LENGTH OF THE LATERAL AND SUPPORT PIECES IN THE SIDE FILL ASSEMBLIES MAY BE ADJUSTED AS REQUIRED TO FACILITATE VARIANCE IN THE SIZE OF THE PALLET UNIT. THE LOADS MUST BE AS TIGHT AS POSSIBLE LONGITUDINALLY, BUT THE VOID MUST NOT EXCEED 3/4" OVERALL. EXCESSIVE SLACK CAN BE ELIMINATED EITHER BY LAMINATING ADDITIONAL FILL PIECES TO THE CENTER FILL ASSEMBLY "A" OR ADDITIONAL VERTICAL PIECES TO THE CENTER FILL ASSEMBLY "B".
- 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. 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.
- G. **CAUTION:** DO NOT NAIL DUNNAGE MATERIAL TO THE CONTAINER WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.
- H. PORTIONS OF THE CONTAINER DEPICTED WITHIN THIS DRAWING, SUCH AS THE SIDEWALL, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.
- J. **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.
- K. 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.
- L. 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)

- M. 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.
- N. THE QUANTITY OF PALLET UNITS SHOWN IN THE LOAD ON PAGES 2 AND 3 MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SEE THE "LESS-THAN-FULL-LOAD PROCEDURE" ON PAGE 10.
1. IF A LOAD IS REDUCED BY ONLY A SMALL AMOUNT (ONE OR TWO LADING UNITS), LADING UNITS NORMALLY MAY BE ELIMINATED FROM THE CENTER OF THE LOAD.
 2. IF A LOAD IS REDUCED BY A LARGE AMOUNT (MORE THAN TWO LADING UNITS), LADING UNITS SHOULD BE ELIMINATED AS REQUIRED AND THE VOID IN THE LONGITUDINAL CENTER OF THE CONTAINER 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 UNITS TO BE SHIPPED.
- O. 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.
- P. LOAD-BLOCKING STRUTS WHICH ARE 48" OR LONGER MUST BE STIFFENED BY THE APPLICATION OF HORIZONTAL AND VERTICAL STRUT BRACING AS DEPICTED ON PAGE 10. BRACING IS NOT REQUIRED IF THE STRUTS FOR THE LOAD BEING SHIPPED ARE SHORTER THAN 48". THE LENGTH OF THE LOAD-BLOCKING STRUTS SHOULD BE KEPT AS SHORT AS POSSIBLE (APPROX 18" MINIMUM), BUT IN THE EVENT IT IS NECESSARY TO USE STRUTS WHICH ARE 8'-0" OR MORE IN LENGTH, IT WILL BE NECESSARY TO APPLY AN ADDITIONAL SET OF HORIZONTAL AND VERTICAL STRUT BRACING PIECES. STRUT BRACING SHOULD BE APPLIED SO AS TO PROVIDE NEARLY EQUAL SPACES BETWEEN THE BRACING PIECES AND THE CENTER GATES AND/OR BETWEEN ADJACENT STRUT BRACING PIECES.

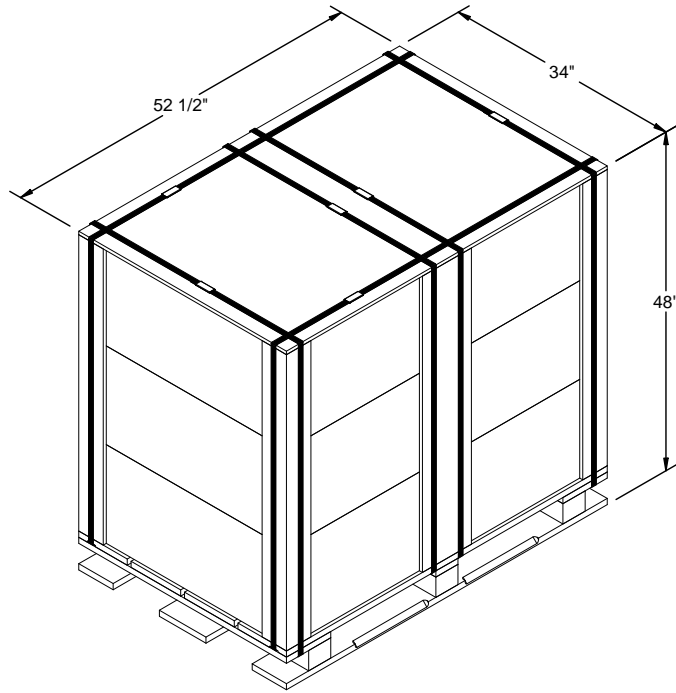
REVISION

REVISION NO. 1, DATED FEBRUARY 2016, CONSISTS OF:

1. ADDING LOADING PROCEDURES FOR AN ADDITIONAL PALLET UNIT.
2. UPDATING OUTLOADING PROCEDURES.

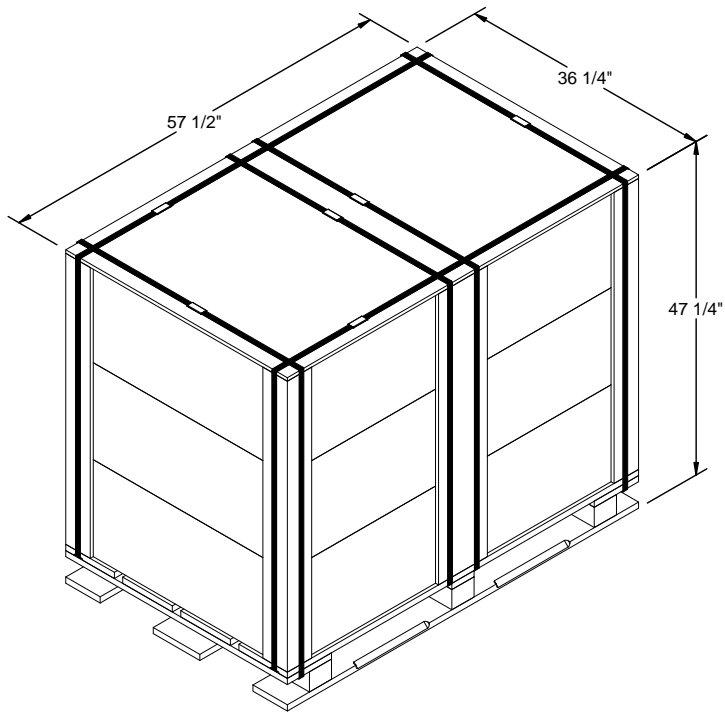
MATERIAL SPECIFICATIONS

LUMBER	- - - - -	SEE TM 743-200-1 (DUNNAGE LUMBER) AND VOLUNTARY PRODUCT STANDARD PS 20.
NAILS	- - - - -	ASTM F1667; COMMON STEEL NAIL NLCMS OR NLCMS).
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.
STAPLE, STRAP	- - - - -	COMMERCIAL GRADE
WIRE, CARBON STEEL	- - - - -	ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, 0.0800" DIA, GRADE 1006 OR BETTER.



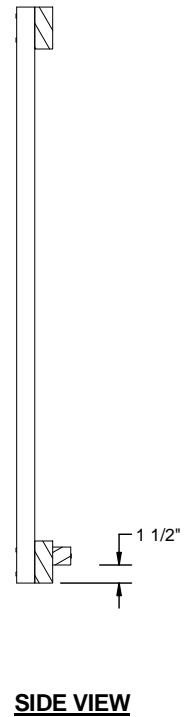
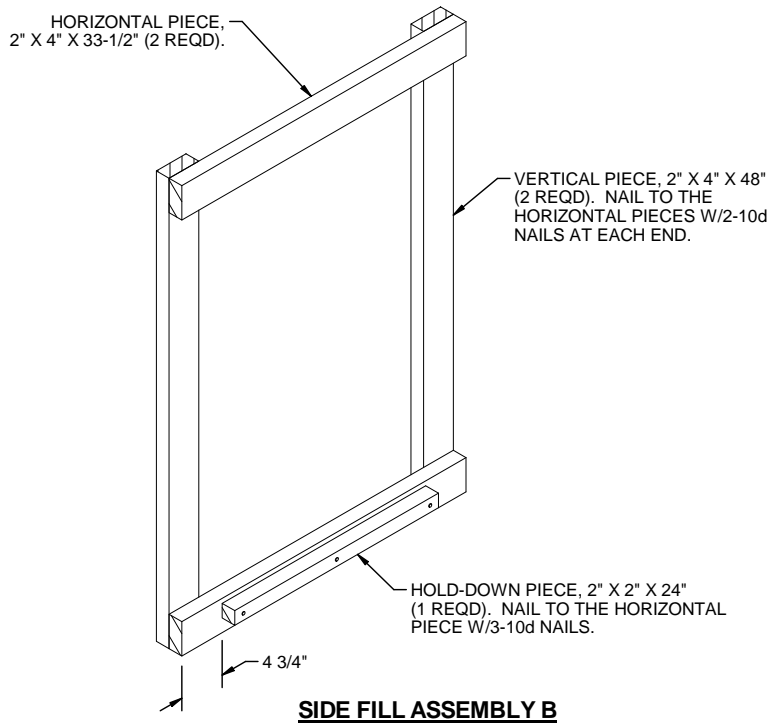
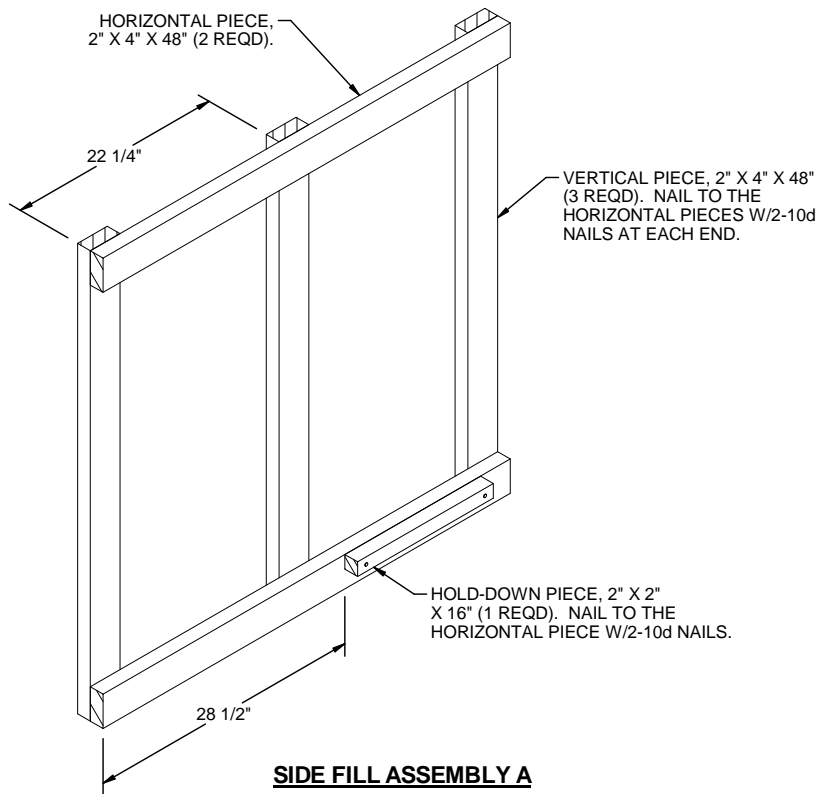
PALLET UNIT A

UNI T WEI GHT (M131) - - - - -	1, 100 LBS (APPROX)
UNI T WEI GHT (M136) - - - - -	1, 130 LBS (APPROX)
CUBE - - - - -	49. 6 CU FEET (APPROX)



PALLET UNIT B

UNI T WEI GHT (M131) - - - - -	1, 100 LBS (APPROX)
UNI T WEI GHT (M136) - - - - -	1, 130 LBS (APPROX)
CUBE - - - - -	57. 0 CU FEET (APPROX)



VERTICAL PIECE, 2" X 4" BY INSIDE CONTAINER HEIGHT MINUS 1" (REF: 7'-4") (2 REQD).

29 3/8"

7 1/4"

SUPPORT PIECE, 2" X 4" X 7-3/4" (2 REQD).

LATERAL PIECE, 2" X 4" X 7-3/4" (4 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH END.

LONGITUDINAL PIECE, 2" X 4" X 60-1/4" (4 REQD). NAIL TO VERTICAL AND SUPPORT PIECES W/2-10d NAILS AT EACH JOINT.

VERTICAL PIECE, 2" X 4" X 47-1/4" (2 REQD).

SIDE FILL ASSEMBLY C

LONGITUDINAL PIECE, 2" X 4" X 9'-2" (4 REQD). NAIL TO VERTICAL AND SUPPORT PIECES W/2-10d NAILS AT EACH JOINT.

VERTICAL PIECE, 2" X 4" BY INSIDE CONTAINER HEIGHT MINUS 1" (REF: 7'-4") (2 REQD).

7 1/4"

SUPPORT PIECE, 2" X 4" X 5-1/2" (4 REQD).

LATERAL PIECE, 2" X 4" X 5-1/2" (4 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH END.

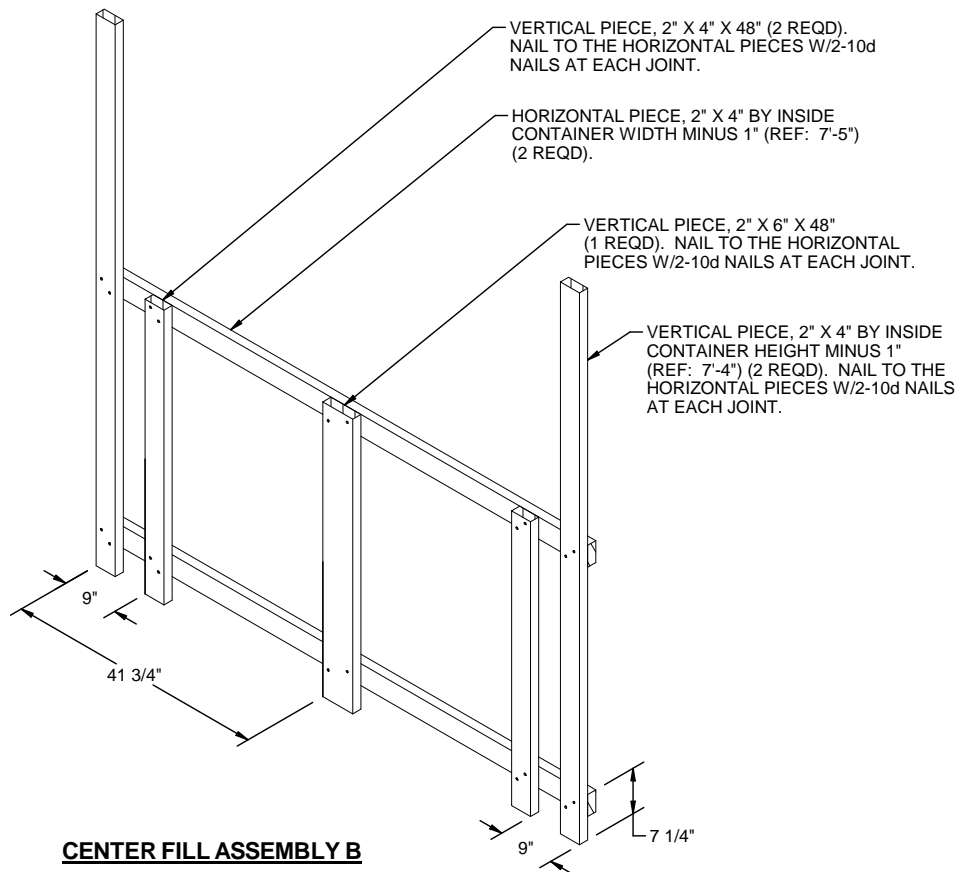
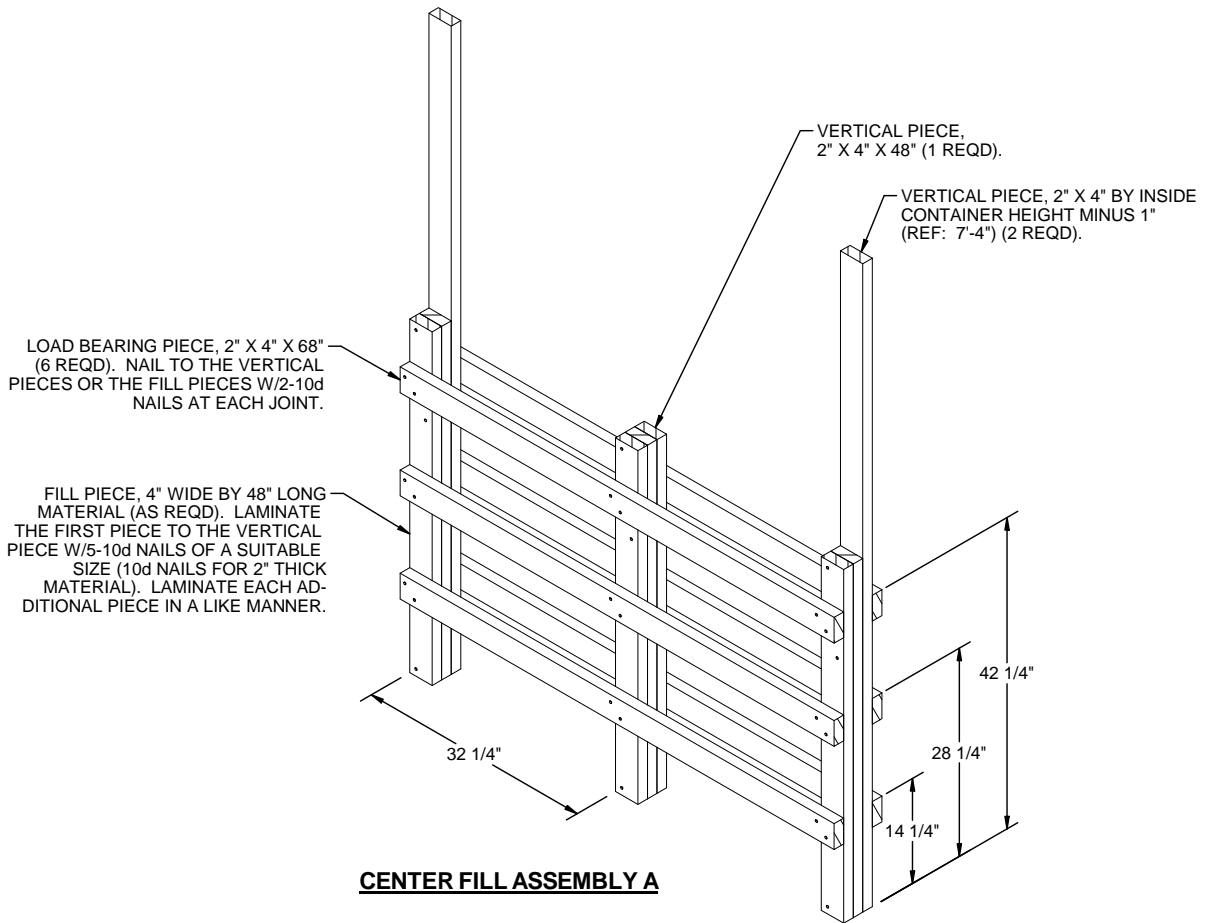
27-1/2" (PALLET UNIT "A")
31" (PALLET UNIT "B")

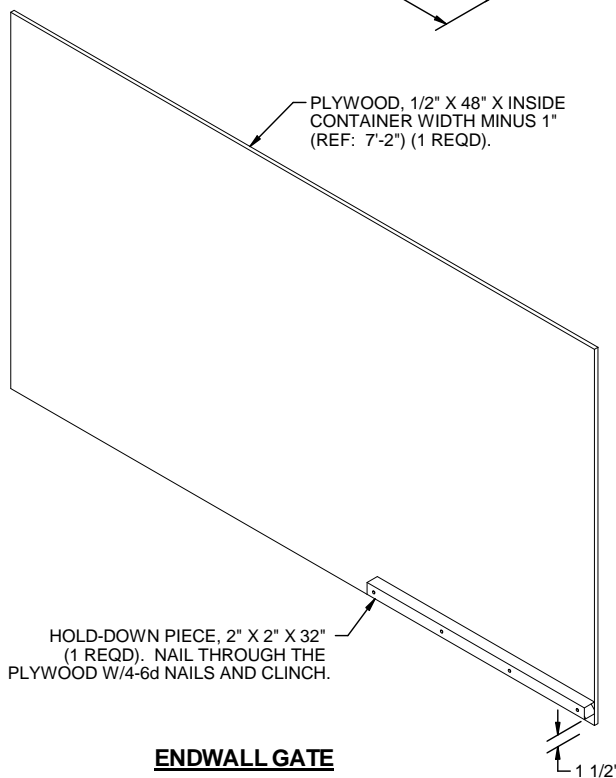
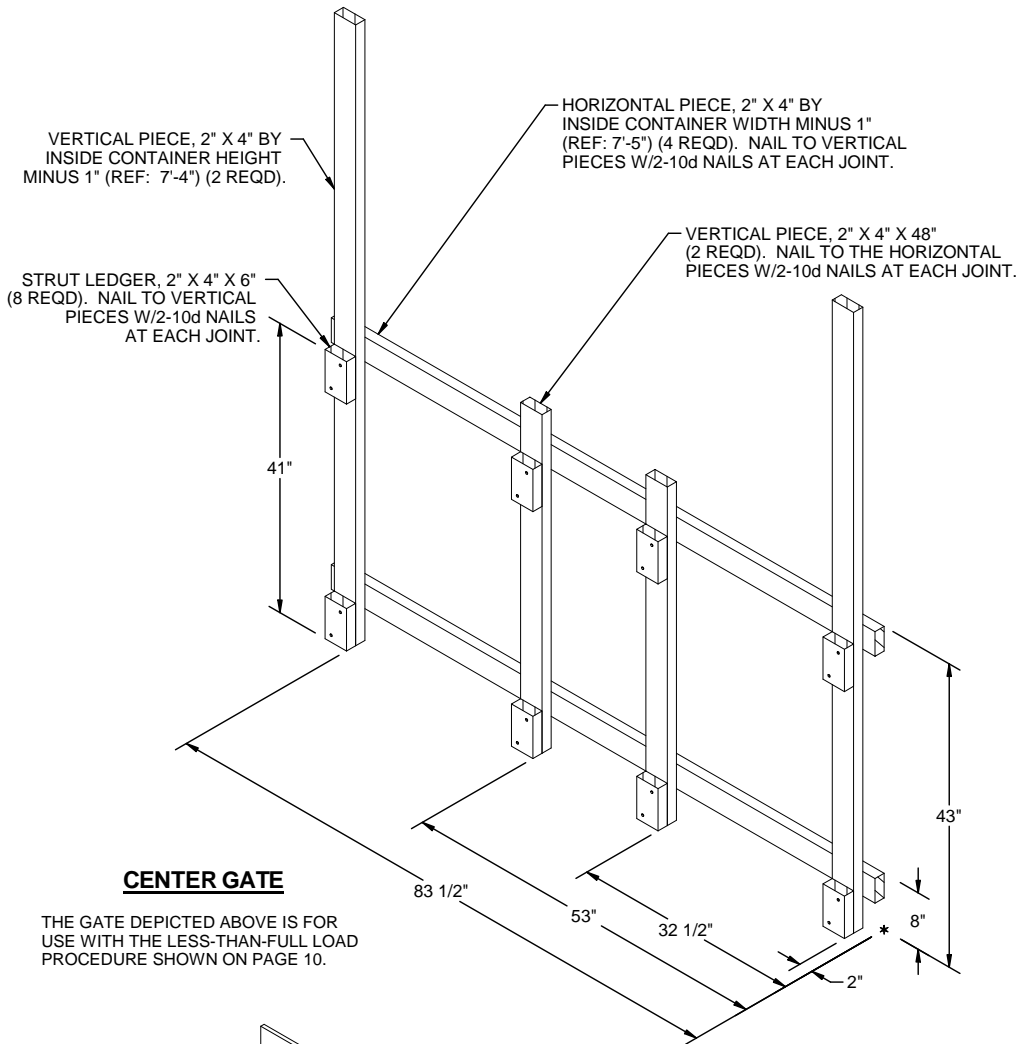
68-1/2" (PALLET UNIT "A")
6'-1" (PALLET UNIT "B")

VERTICAL PIECE, 2" X 4" X 48" (2 REQD).

SIDE FILL ASSEMBLY D

THE ASSEMBLY DEPICTED ABOVE IS FOR USE WITH PALLET UNIT "B". WHEN CONSTRUCTED FOR USE WITH PALLET UNIT "A", INCREASE THE LENGTH OF THE SUPPORT AND LATERAL PIECES TO 7'-3/4", AND REDUCE THE LENGTH OF THE LONGITUDINAL PIECES TO 8'-5".



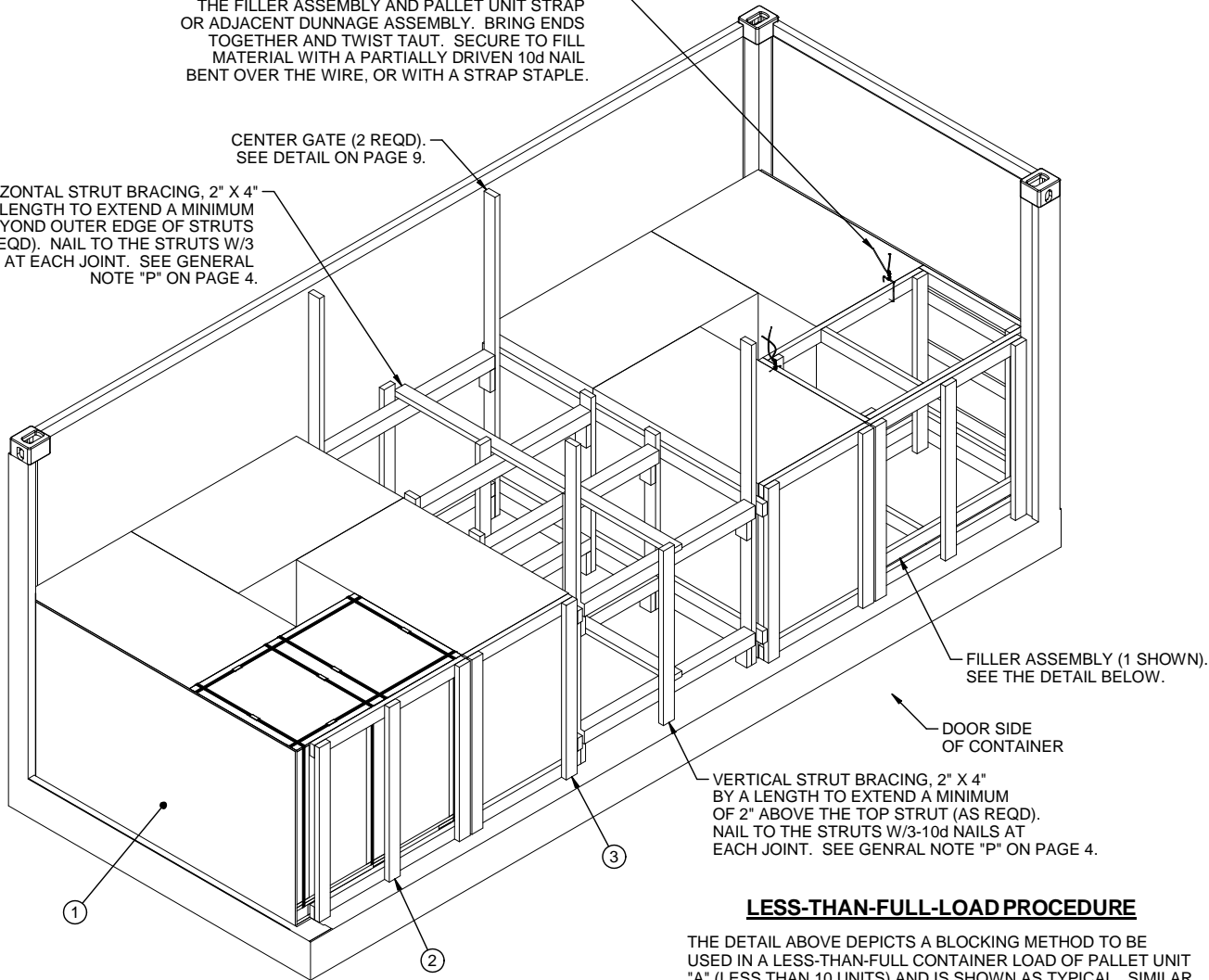


ENDWALL GATE TO BE INSTALLED WITH THE HOLD-DOWN PIECE UNDER THE SHORT SIDE OF THE PALLET UNIT.

TIE WIRE, 0.0800" DIA WIRE 18" LONG (2 REQD). INSTALL TO FORM A COMPLETE LOOP AROUND THE FILLER ASSEMBLY AND PALLET UNIT STRAP OR ADJACENT DUNNAGE ASSEMBLY. 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.

CENTER GATE (2 REQD). SEE DETAIL ON PAGE 9.

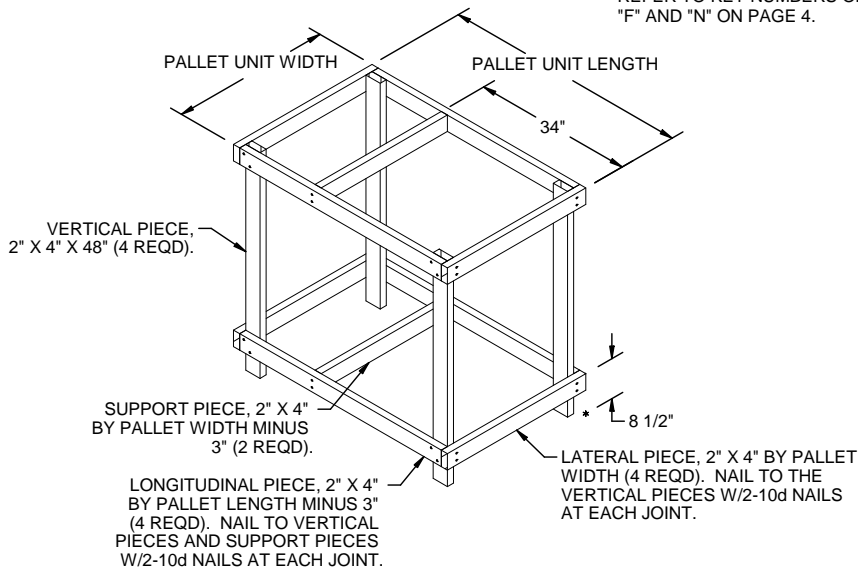
HORIZONTAL STRUT BRACING, 2" X 4" BY A LENGTH TO EXTEND A MINIMUM OF 2" BEYOND OUTER EDGE OF STRUTS (AS REQD). NAIL TO THE STRUTS W/3 NAILS AT EACH JOINT. SEE GENERAL NOTE "P" ON PAGE 4.



VERTICAL STRUT BRACING, 2" X 4" BY A LENGTH TO EXTEND A MINIMUM OF 2" ABOVE THE TOP STRUT (AS REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT. SEE GENERAL NOTE "P" ON PAGE 4.

LESS-THAN-FULL-LOAD PROCEDURE

THE DETAIL ABOVE DEPICTS A BLOCKING METHOD TO BE USED IN A LESS-THAN-FULL CONTAINER LOAD OF PALLET UNIT "A" (LESS THAN 10 UNITS) AND IS SHOWN AS TYPICAL. SIMILAR REDUCTIONS MAY BE MADE TO THE LOAD ON PAGE 3 FOR EITHER PALLET UNIT "A" OR PALLET UNIT "B". KEY NUMBERS REFER TO KEY NUMBERS ON PAGE 2. SEE GENERAL NOTES "F" AND "N" ON PAGE 4.



FILLER ASSEMBLY

FOR MINUS ONE PALLET UNIT. NO MORE THAN ONE FILLER ASSEMBLY MAY BE USED PER ONE-HIGH LOAD. DO NOT INSTALL FILLER ASSEMBLY IMMEDIATELY ADJACENT TO CENTER FILL ASSEMBLY.