

APPROVED BY
BUREAU OF EXPLOSIVES

John Long

DATE 9/15/97

LOADING AND BRACING* IN END OPENING ISO CONTAINERS OF PROPELLING CHARGES PACKED IN CYLINDRICAL METAL CONTAINERS

M13 SERIES CONTAINERS

INDEX

<u>ITEM</u>	<u>PAGE(S)</u>
GENERAL NOTES AND MATERIAL SPECIFICATIONS - - - - -	2
PALLET UNIT DETAILS - - - - -	3
12-UNIT LOAD (FLAT DUNNAGE - BASIC HEIGHT) - - - - -	4-5
14-UNIT LOAD (FLAT DUNNAGE - DECREASED HEIGHT) - - - - -	6-7
12-UNIT LOAD (ROUTED DUNNAGE - BASIC HEIGHT) - - - - -	8-9
14-UNIT LOAD (ROUTED DUNNAGE - DECREASED HEIGHT) - - - - -	10-11
DETAILS - - - - -	12-16

- LOADING AND BRACING SPECIFICATIONS SET FORTH WITHIN THIS DRAWING ARE APPLICABLE TO LOADS THAT ARE TO BE SHIPPED BY TRAILER/CONTAINER-ON-FLATCAR (T/COFC) RAIL CARRIER SERVICE. THESE SPECIFICATIONS MAY ALSO BE USED FOR LOADS THAT ARE TO BE MOVED BY MOTOR OR WATER CARRIERS.

U.S. ARMY MATERIEL COMMAND DRAWING

APPROVED, U.S. ARMY INDUSTRIAL OPERATIONS COMMAND <i>Michael Sardone</i>	ENGINEER	BASIC	MICHAEL SARDONE	DO NOT SCALE			
		REV.		WEBSITE: HTTP://WWW.DAC.ARMY.MIL			
	TECHNICIAN	BASIC		JULY 1997			
	REV.						
	DRAFTSMAN	BASIC					
		REV.					
APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND <i>William F. Ernst</i> DEFENSE AMMUNITION CENTER	TRANSPORTATION ENGINEERING DIVISION		<i>W.P. Friedrichs</i>				
	VALIDATION ENGINEERING DIVISION		<i>William H. K... TESTED</i>	CLASS	DIVISION	DRAWING	FILE
	LOGISTICS ENGINEERING OFFICE		<i>William F. Ernst</i>	19	48	4154/2	15PM1002

GENERAL NOTES

(GENERAL NOTES CONTINUED)

- 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 PROPELLING CHARGES PACKED IN M13 SERIES METAL CONTAINERS. SUBSEQUENT REFERENCE TO PALLET UNIT HEREIN MEANS THE PALLET UNIT WITH AMMUNITION ITEMS. SEE PAGE 3 AND AMC DRAWING 19-48-4042A/2-20PM1001 FOR DETAILS OF THE PALLET UNIT. CAUTION: REGARDLESS OF THE QUANTITY OF PALLET UNITS 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 HORIZONTAL PIECES ON THE CENTER FILL ASSEMBLIES. NAIL EACH ADDITIONAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE THICKNESS AND/OR QUANTITY OF THE VERTICAL OR HORIZONTAL PIECES IN THE CENTER FILL ASSEMBLIES MAY BE ADJUSTED AS REQUIRED TO FACILITATE VARIANCE IN THE SIZE OF THE PALLET UNIT.
- E. 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.
- F. 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.
- 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. PORTIONS OF THE CONTAINER DEPICTED WITHIN THIS DRAWING, SUCH AS THE SIDEWALL, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.

(CONTINUED AT RIGHT)

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.

M. REQUIREMENTS CITED WITHIN THE BUREAU OF EXPLOSIVES PAMPHLET 6C 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 25.4 MM AND ONE POUND EQUALS 0.454 KG.

P. THE QUANTITY OF PALLET UNITS SHOWN IN THE LOADS MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SEE THE FILLER ASSEMBLY ON PAGE 9.

- 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 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 UNITS TO BE SHIPPED.

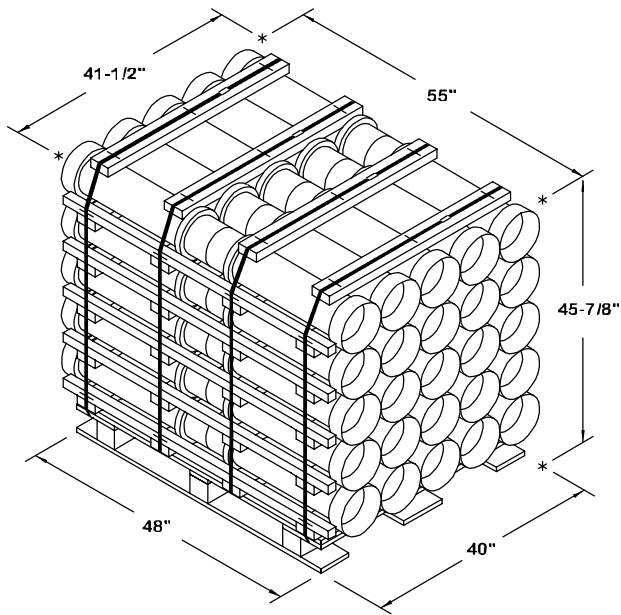
MATERIAL SPECIFICATIONS

LUMBER - - - - - -: SEE TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC MM-L-751.

NAILS - - - - - -: FED SPEC FF-N-105; COMMON.

PLYWOOD - - - - - -: COMMERCIAL ITEM DESCRIPTION A-A-55057, TYPE A, CONSTRUCTION AND 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.

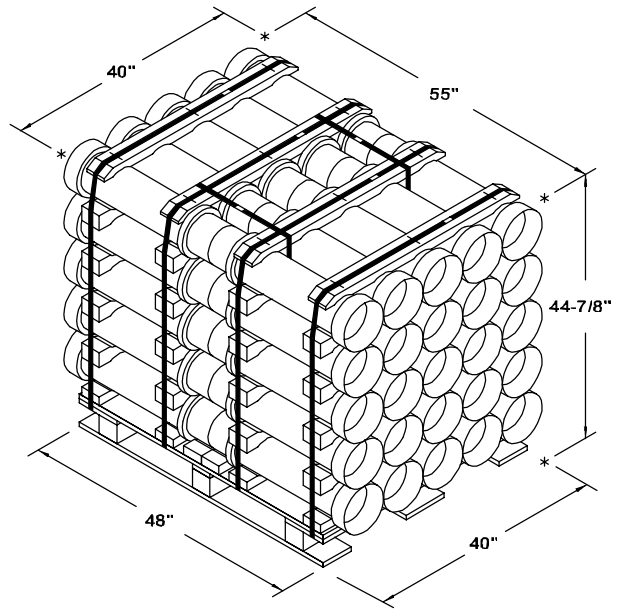
STEEL, STRUCTURAL -: ASTM A501, STEEL STRUCTURAL TUBING; AND ASTM A570, STEEL, STRIP, HOT-ROLLED, GRADE 36 (MINIMUM).



FLAT DUNNAGE PALLET (BASIC HEIGHT)

CONTAINER ----- 50 EACH @ 30.5 LBS (APPROX)
 CUBE ----- 60.6 CUBIC FEET (APPROX)
 GROSS WEIGHT ----- 1,747 LBS (APPROX)

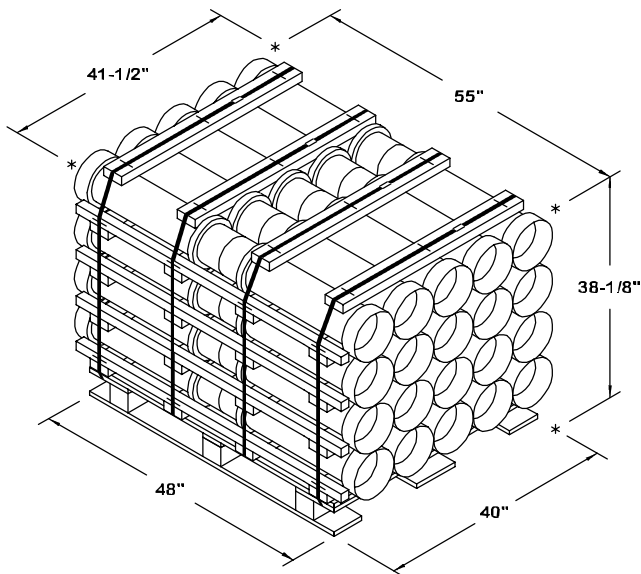
REFER TO PAGES 4 AND 5 FOR OUTLOADING PROCEDURES.



ROUTED DUNNAGE PALLET (BASIC HEIGHT)

CONTAINER ----- 50 EACH @ 30.5 LBS (APPROX)
 CUBE ----- 57.1 CUBIC FEET (APPROX)
 GROSS WEIGHT ----- 1,761 LBS (APPROX)

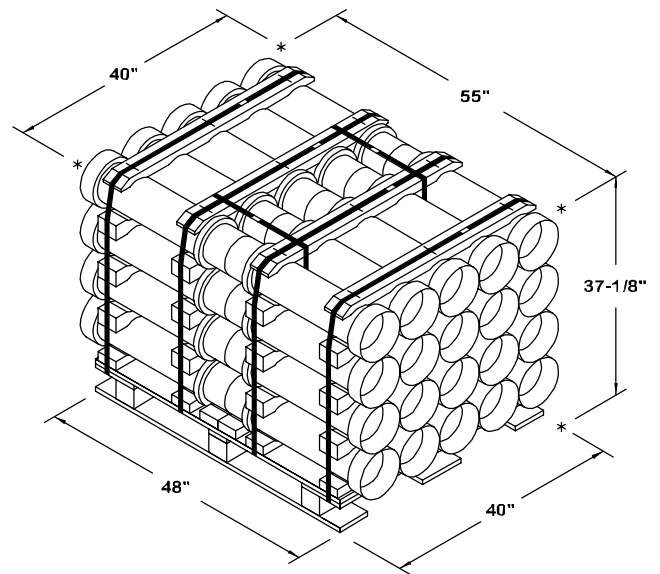
REFER TO PAGES 8 AND 9 FOR OUTLOADING PROCEDURES.



FLAT DUNNAGE PALLET (DECREASED HEIGHT)

CONTAINER ----- 40 EACH @ 30.5 LBS (APPROX)
 CUBE ----- 50.4 CUBIC FEET (APPROX)
 GROSS WEIGHT ----- 1,421 LBS (APPROX)

REFER TO PAGES 6 AND 7 FOR OUTLOADING PROCEDURES.

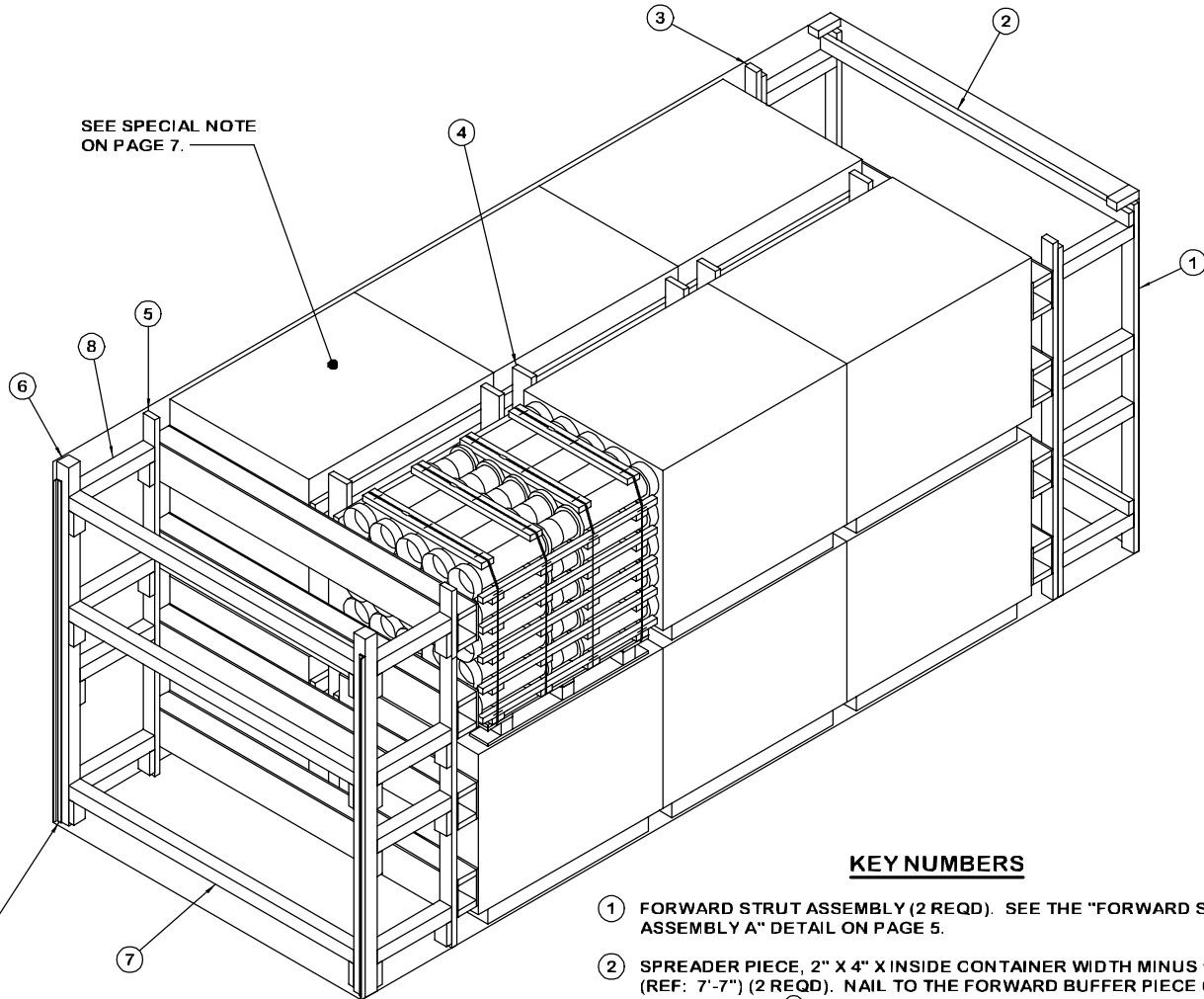


ROUTED DUNNAGE PALLET (DECREASED HEIGHT)

CONTAINER ----- 40 EACH @ 30.5 LBS (APPROX)
 CUBE ----- 47.3 CUBIC FEET (APPROX)
 GROSS WEIGHT ----- 1,432 LBS (APPROX)

REFER TO PAGES 10 AND 11 FOR OUTLOADING PROCEDURES.

SEE SPECIAL NOTE
ON PAGE 7.



INDICATES WELDED LOAD
RETAINER. SEE SPECIAL
NOTE AND DETAILS ON
PAGE 15.

KEY NUMBERS

- ① FORWARD STRUT ASSEMBLY (2 REQD). SEE THE "FORWARD STRUT ASSEMBLY A" DETAIL ON PAGE 5.
- ② SPREADER PIECE, 2" X 4" X INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-7") (2 REQD). NAIL TO THE FORWARD BUFFER PIECE OF PIECE MARKED ① W/2-10d NAILS AT EACH END.
- ③ FORWARD BLOCKING ASSEMBLY (1 REQD). SEE THE "FORWARD BLOCKING ASSEMBLY A" DETAIL ON PAGE 12. NAIL TO EACH FORWARD STRUT ASSEMBLY, PIECE MARKED ①, W/5-10d NAILS.
- ④ CENTER FILL ASSEMBLY (3 REQD). SEE THE "CENTER FILL ASSEMBLY A" DETAIL ON PAGE 5.
- ⑤ REAR BLOCKING ASSEMBLY (1 REQD). SEE THE "REAR BLOCKING ASSEMBLY A" DETAIL ON PAGE 12.
- ⑥ DOOR POST VERTICAL (2 REQD). SEE THE "DOOR POST VERTICAL A" DETAIL ON PAGE 14 AND THE DETAILS AND SPECIAL NOTE ON PAGE 15.
- ⑦ DOOR SPANNER, 4" X 4" MATERIAL, CUT TO A LENGTH THAT WILL PROVIDE FOR A DRIVE FIT (REF: 7'-1-3/8") (3 REQD). TOENAIL TO THE 4" X 4" DOOR POST VERTICAL PIECES W/2-12d NAILS AT EACH END. SEE THE "BEVEL-CUT" DETAIL ON PAGE 14. AFTER INSTALLING THE BOTTOM AND TOP DOOR SPANNERS, THE STRUTS, PIECES MARKED ⑧, ARE TO BE INSTALLED.
- ⑧ STRUT, 4" X 4" BY CUT-TO-FIT (8 REQD). TOENAIL TO THE "REAR BLOCKING ASSEMBLY" AND THE "DOOR POST VERTICAL" W/2-12d NAILS AT EACH END. SEE THE "BEVEL-CUT" DETAIL ON PAGE 14.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	214	143
2" X 6"	168	168
4" X 4"	67	90
NAILS	NO. REQD	POUNDS
6d (2")	352	2-1/4
10d (3")	244	3-3/4
12d (3-1/4")	44	3/4
PLYWOOD, 1/2"	96.06 SQ FT	132-1/4 LBS

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	12	20,964 LBS
DUNNAGE		941 LBS
CONTAINER		4,700 LBS
TOTAL WEIGHT		26,605 LBS (APPROX)

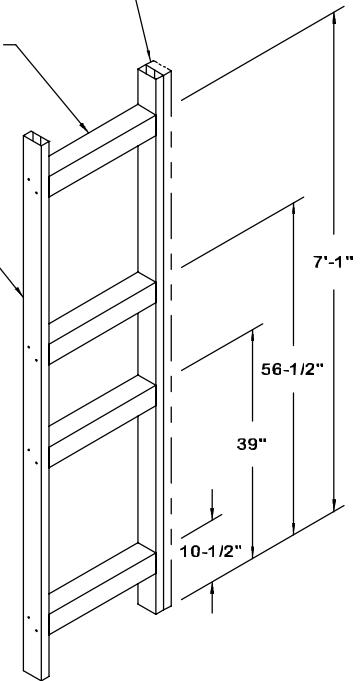
RECOMMENDED SEQUENTIAL LOADING PROCEDURES

1. PREFABRICATE TWO FORWARD STRUT ASSEMBLIES A, ONE FORWARD BLOCKING ASSEMBLY A, THREE CENTER FILL ASSEMBLIES A, ONE REAR BLOCKING ASSEMBLY A, AND TWO DOOR POST VERTICALS A.
2. INSTALL THE TWO FORWARD STRUT ASSEMBLIES A.
3. INSTALL THE SPREADER PIECES.
4. INSTALL THE FORWARD BLOCKING ASSEMBLY A.
5. LOAD FOUR CONTAINERS AND INSTALL ONE CENTER FILL ASSEMBLY A.
6. REPEAT STEP 5 TWICE.
7. INSTALL THE REAR BLOCKING ASSEMBLY.
8. INSTALL THE TWO DOOR POST VERTICALS A, AND, AS APPROPRIATE, NAIL TO THE DOOR POST VERTICAL RETAINERS.
9. INSTALL THE TWO DOOR SPANNER PIECES (ONE AT THE LOWEST POSITION AND ONE AT THE UPPERMOST POSITION).
10. INSTALL THE STRUTS BETWEEN THE REAR BLOCKING ASSEMBLY AND THE DOOR POST VERTICALS AND INSTALL THE REMAINING DOOR SPANNER PIECE.

SEE GENERAL NOTE "G" ON PAGE 2.

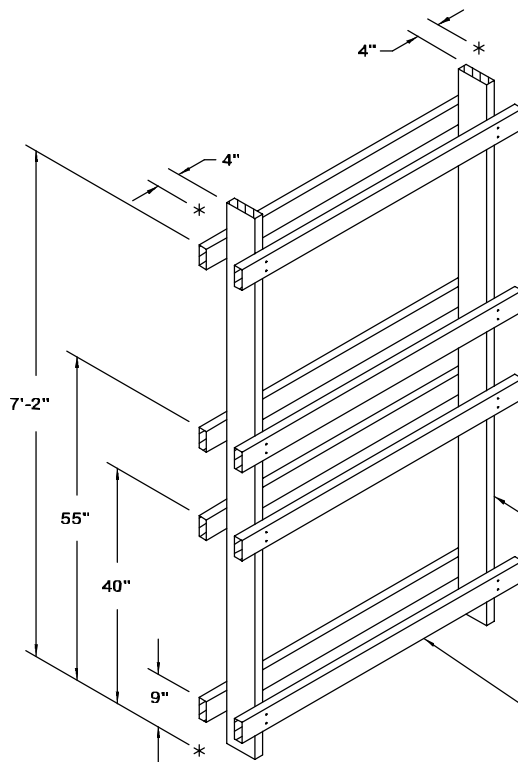
STRUT, 4" X 4" X 21" (4 REQD).

BUFFER PIECE, 2" X 4" X 7'-6" (2 REQD). NAIL TO THE STRUTS W/2-10d NAILS AT EACH JOINT.



FORWARD STRUT ASSEMBLY A

FOR A ONE-HIGH LOAD, ELIMINATE THE TOP TWO STRUTS AND SHORTEN ONE VERTICAL PIECE TO 45".

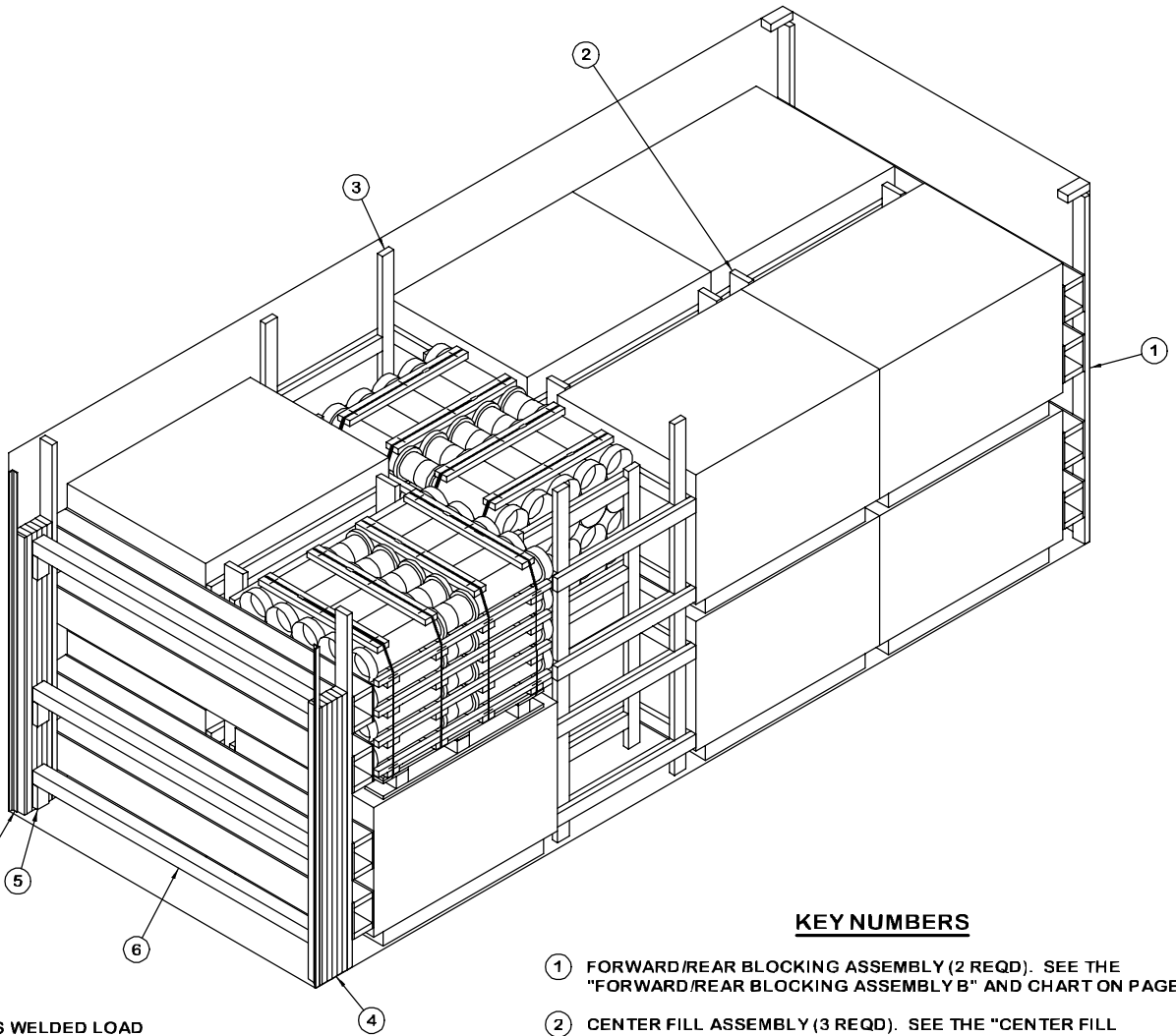


VERTICAL PIECE, 2" X 6" X 7'-8" (2 REQD).

BEARING PIECE, 2" X 4" X 55" (8 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.

CENTER FILL ASSEMBLY A

FOR A ONE-HIGH LOAD, ELIMINATE THE TOP FOUR BEARING PIECES AND SHORTEN THE VERTICAL PIECES TO 45".



INDICATES WELDED LOAD RETAINER. SEE SPECIAL NOTE AND DETAILS ON PAGE 15 AND "DOOR POST VERTICAL C" DETAIL ON PAGE 14.

KEY NUMBERS

- ① FORWARD/REAR BLOCKING ASSEMBLY (2 REQD). SEE THE "FORWARD/REAR BLOCKING ASSEMBLY B" AND CHART ON PAGE 13.
- ② CENTER FILL ASSEMBLY (3 REQD). SEE THE "CENTER FILL ASSEMBLY B" DETAIL ON PAGE 7.
- ③ CRIB FILL ASSEMBLY (2 REQD). SEE THE "CRIB FILL ASSEMBLY A" ON PAGE 7.
- ④ FILL MATERIAL, 4" WIDE BY 72" LONG MATERIAL (AS REQD). NAIL THE FIRST PIECE TO THE REAR BLOCKING ASSEMBLY W/6-10d NAILS OF A SUITABLE SIZE (10d FOR 2" MATERIAL). LAMINATE EACH ADDITIONAL PIECE TO THE PREVIOUS PIECE IN A SIMILAR MANNER. NOTE: MULTIPLE PIECES MAY BE LAMINATED TOGETHER AND THEN TOENAILED TO THE REAR BLOCKING ASSEMBLY W/6-10d NAILS.
- ⑤ STRUT LEDGER, 2" X 4" X 6" (6 REQD - OPTIONAL). INSTALL IF DESIRED TO AID IN THE INSTALLATION OF SPANNER PIECES. NAIL TO THE FILL MATERIAL W/2-10d NAILS.
- ⑥ DOOR SPANNER, 4" X 4" MATERIAL, CUT TO A LENGTH THAT WILL PROVIDE FOR A DRIVE FIT (REF: 7'-1-3/8") (3 REQD). TOENAIL TO THE FILL MATERIAL W/2-12d NAILS AT EACH END. SEE THE "BEVEL-CUT" DETAIL ON PAGE 14. NOTE THAT THESE PIECES ARE NOT REQUIRED IF THE SPACE BETWEEN THE REAR BLOCKING ASSEMBLY AND THE LOAD RETAINER IS NOT GREATER THAN 6".

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	12	4
2" X 4"	378	252
2" X 6"	160	160
4" X 4"	22	30
NAILS	NO. REQD	POUNDS
6d (2")	364	2-1/4
10d (3")	456	7
12d (3-1/4")	12	1/4
PLYWOOD, 1/2"	96.06 SQ FT	132-1/4 LBS

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	14	19,894 LBS
DUNNAGE		1,034 LBS
CONTAINER		4,700 LBS

TOTAL WEIGHT - - - - - 25,628 LBS (APPROX)

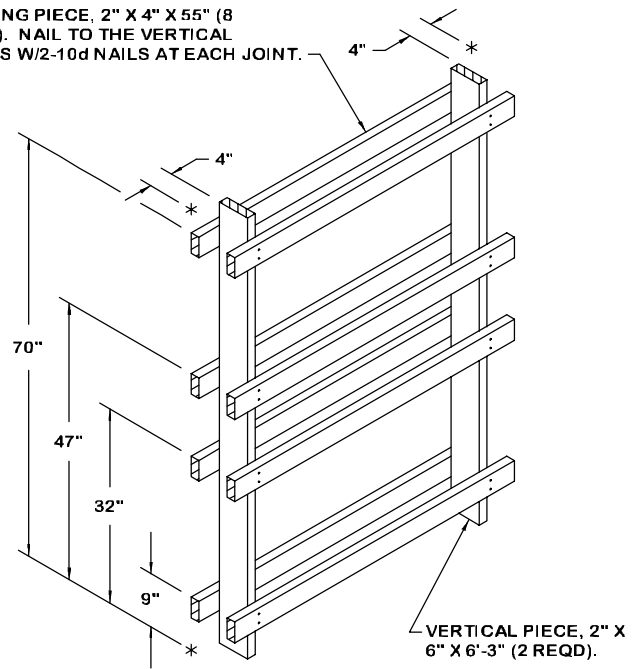
RECOMMENDED SEQUENTIAL LOADING PROCEDURES

1. PREFABRICATE TWO FORWARD/REAR BLOCKING ASSEMBLIES B, THREE CENTER FILL ASSEMBLIES B, AND TWO CRIB FILL ASSEMBLIES A.
2. INSTALL THE FORWARD BLOCKING ASSEMBLY.
3. LOAD FOUR PALLET UNITS AND ONE CENTER FILL ASSEMBLY B.
4. REPEAT STEP 3.
5. LOAD TWO PALLET UNITS AND TWO CRIB FILL ASSEMBLIES A.
6. REPEAT STEP 3.
7. INSTALL THE REAR BLOCKING ASSEMBLY.
8. INSTALL THE FILL MATERIAL BETWEEN THE REAR BLOCKING ASSEMBLY AND THE LOAD RETAINERS.
9. INSTALL THE SIX STRUT LEDGERS AND THREE SPANNER PIECES.

SPECIAL NOTE:

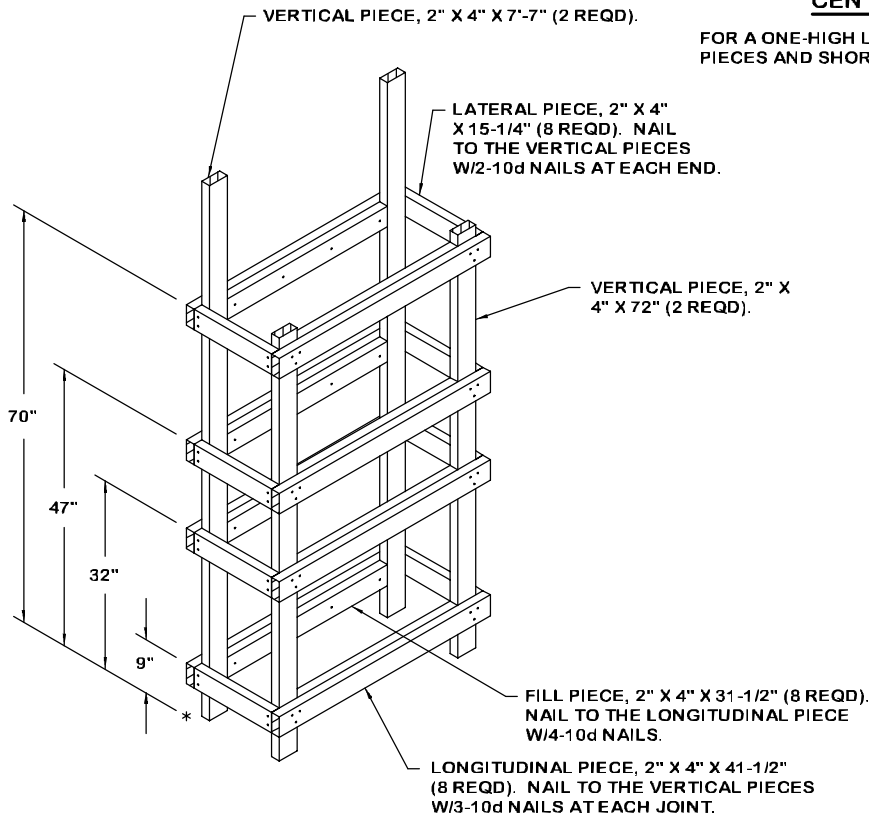
THE PROCEDURES DEPICTED ON PAGE 6 MAY ALSO BE USED FOR THE LOAD DEPICTED ON PAGE 4, PROVIDED THE CONTAINER DOOR HEIGHT IS SUCH TO ALLOW PROPER POSITIONING OF THE REARMOST UPPER LAYER PALLET UNITS.

BEARING PIECE, 2" X 4" X 55" (8 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.



CENTER FILL ASSEMBLY B

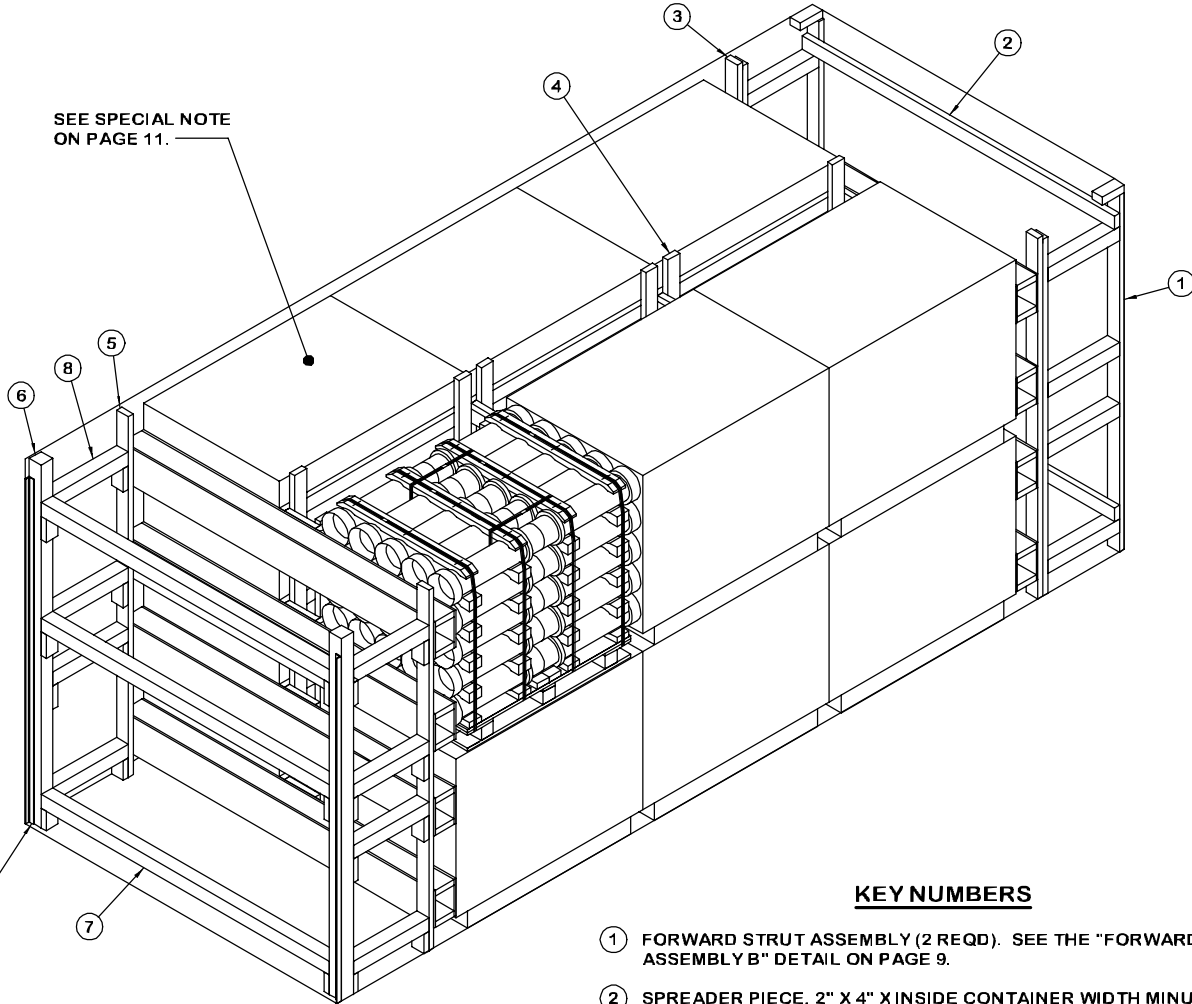
FOR A ONE-HIGH LOAD, ELIMINATE THE TOP FOUR VERTICAL PIECES AND SHORTEN THE VERTICAL PIECES TO 50".



CRIB FILL ASSEMBLY A

FOR A ONE-HIGH LOAD, ELIMINATE THE TOP FOUR LATERAL PIECES, THE TOP FOUR LONGITUDINAL PIECES, AND THE TOP FOUR FILL PIECES. ADJUST THE SHORTER VERTICAL PIECES ACCORDINGLY.

SEE SPECIAL NOTE
ON PAGE 11.



INDICATES WELDED LOAD
RETAINER. SEE SPECIAL
NOTE AND DETAILS ON
PAGE 15.

KEY NUMBERS

- ① FORWARD STRUT ASSEMBLY (2 REQD). SEE THE "FORWARD STRUT ASSEMBLY B" DETAIL ON PAGE 9.
- ② SPREADER PIECE, 2" X 4" X INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-7") (2 REQD). NAIL TO THE FORWARD BUFFER PIECE OF PIECE MARKED ① W/2-10d NAILS AT EACH END.
- ③ FORWARD BLOCKING ASSEMBLY (1 REQD). SEE THE "FORWARD BLOCKING ASSEMBLY A" DETAIL AND NOTE ON PAGE 12. NAIL TO EACH FORWARD STRUT ASSEMBLY, PIECE MARKED ①, W/5-10d NAILS.
- ④ CENTER FILL ASSEMBLY (3 REQD). SEE THE "CENTER FILL ASSEMBLY C" DETAIL ON PAGE 9.
- ⑤ REAR BLOCKING ASSEMBLY (1 REQD). SEE THE "REAR BLOCKING ASSEMBLY A" DETAIL AND NOTE ON PAGE 12.
- ⑥ DOOR POST VERTICAL (2 REQD). SEE THE "DOOR POST VERTICAL B" DETAIL ON PAGE 14 AND THE DETAILS AND SPECIAL NOTE ON PAGE 15.
- ⑦ DOOR SPANNER, 4" X 4" MATERIAL, CUT TO A LENGTH THAT WILL PROVIDE FOR A DRIVE FIT (REF: 7'-1-3/8") (3 REQD). TOENAIL TO THE 4" X 4" DOOR POST VERTICAL PIECES W/2-12d NAILS AT EACH END. SEE THE "BEVEL-CUT" DETAIL ON PAGE 14. AFTER INSTALLING THE BOTTOM AND TOP DOOR SPANNERS, THE STRUTS, PIECES MARKED ⑧, ARE TO BE INSTALLED.
- ⑧ STRUT, 4" X 4" BY CUT-TO-FIT (8 REQD). TOENAIL TO THE "REAR BLOCKING ASSEMBLY" AND THE "DOOR POST VERTICAL" W/2-12d NAILS AT EACH END. SEE THE "BEVEL-CUT" DETAIL ON PAGE 14.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	319	213
2" X 6"	122	122
4" X 4"	67	90
NAILS	NO. REQD	POUNDS
6d (2")	352	2-1/4
10d (3")	388	6
12d (3-1/4")	44	3/4
PLYWOOD, 1/2"	96.06 SQ FT	132-1/4 LBS

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	12	21,132 LBS
DUNNAGE		992 LBS
CONTAINER		4,700 LBS

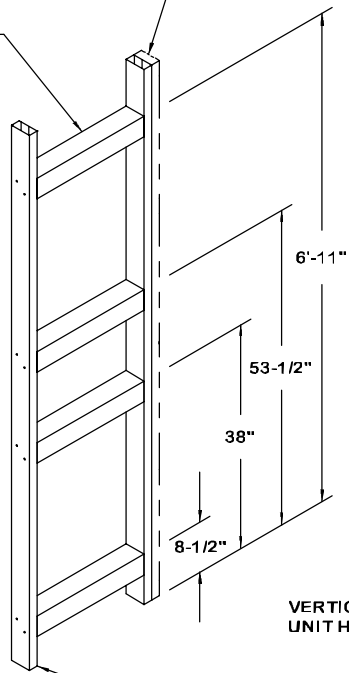
TOTAL WEIGHT - - - - - 26,824 LBS (APPROX)

RECOMMENDED SEQUENTIAL LOADING PROCEDURES

1. PREFABRICATE TWO FORWARD STRUT ASSEMBLIES B, ONE FORWARD BLOCKING ASSEMBLY A, THREE CENTER FILL ASSEMBLIES C, ONE REAR BLOCKING ASSEMBLY A, AND TWO DOOR POST VERTICALS B.
2. INSTALL THE TWO FORWARD STRUT ASSEMBLIES B.
3. INSTALL THE SPREADER PIECES.
4. INSTALL THE FORWARD BLOCKING ASSEMBLY A.
5. LOAD FOUR CONTAINERS AND INSTALL ONE CENTER FILL ASSEMBLY C.
6. REPEAT STEP 5 TWICE.
7. INSTALL THE REAR BLOCKING ASSEMBLY.
8. INSTALL THE TWO DOOR POST VERTICALS B, AND, AS APPROPRIATE, NAIL TO THE DOOR POST VERTICAL RETAINERS.
9. INSTALL THE TWO DOOR SPANNER PIECES (ONE AT THE LOWEST POSITION AND ONE AT THE UPPERMOST POSITION).
10. INSTALL THE STRUTS BETWEEN THE REAR BLOCKING ASSEMBLY AND THE DOOR POST VERTICALS AND INSTALL THE REMAINING DOOR SPANNER PIECE.

SEE GENERAL NOTE "G" ON PAGE 2.

STRUT, 4" X 4" X 21" (4 REQD).



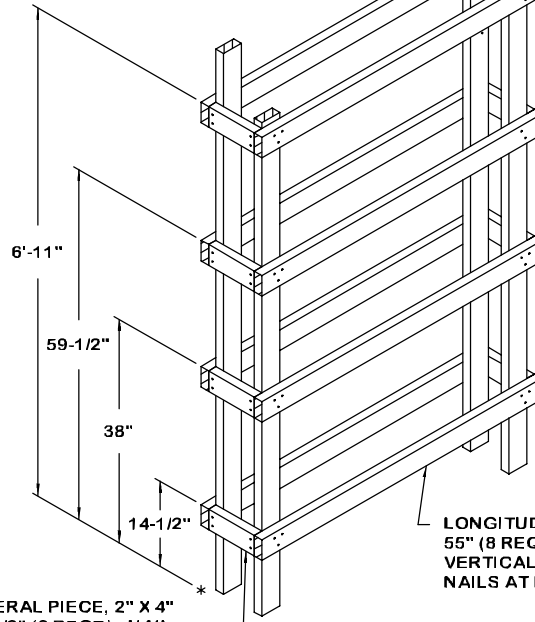
BUFFER PIECE, 2" X 4" X 7'-6" (2 REQD). NAIL TO THE STRUTS W/2-10d NAILS AT EACH JOINT.

FORWARD STRUT ASSEMBLY B

FOR A ONE-HIGH LOAD, ELIMINATE THE TOP TWO STRUTS AND SHORTEN ONE VERTICAL PIECE TO 45".

VERTICAL PIECE, 2" X 4" BY INSIDE CONTAINER HEIGHT MINUS 1" (REF: 7'-8") (2 REQD).

VERTICAL PIECE, 2" X 4" X 7'-0" (2 REQD).



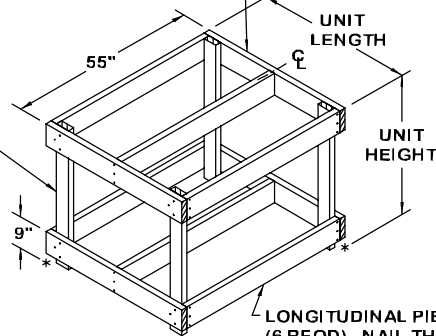
LATERAL PIECE, 2" X 4" X 8-1/2" (8 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH END.

LONGITUDINAL PIECE, 2" X 4" X 55" (8 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.

CENTER FILL ASSEMBLY C

FOR A ONE-HIGH ASSEMBLY, ELIMINATE THE TOP FOUR LATERAL PIECES AND THE TOP FOUR LONGITUDINAL PIECES. SHORTEN THE SMALLER VERTICAL PIECES TO 42".

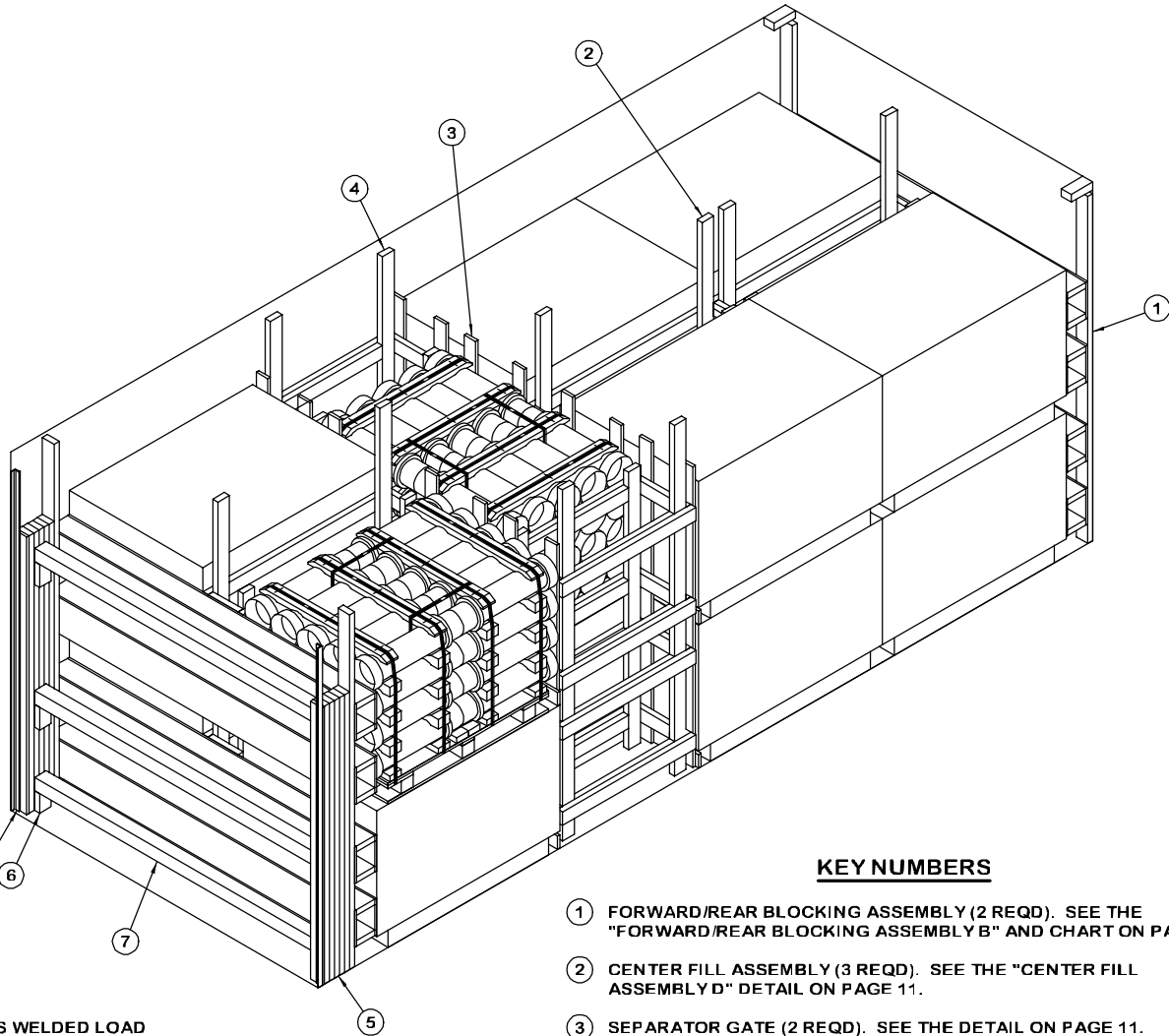
LATERAL PIECE, 2" X 6" X UNIT LENGTH (4 REQD). NAIL TO THE VERTICAL PIECES AND TO THE CENTER LONGITUDINAL PIECE W/3-10d NAILS AT EACH JOINT.



LONGITUDINAL PIECE, 2" X 6" X 52" (6 REQD). NAIL THE OUTER FOUR PIECES TO THE VERTICAL PIECES W/3-10d NAILS AT EACH END.

FILLER ASSEMBLY

THE ASSEMBLY DEPICTED ABOVE IS FOR USE IN PLACE OF AN OMITTED PALLET UNIT. NO MORE THAN FOUR FILLER ASSEMBLIES MAY BE USED PER LOAD. DO NOT INSTALL A FILLER ASSEMBLY IMMEDIATELY ADJACENT TO ANOTHER FILLER ASSEMBLY.



INDICATES WELDED LOAD RETAINER. SEE SPECIAL NOTE AND DETAILS ON PAGE 15 AND "DOOR POST VERTICAL C" DETAIL ON PAGE 14.

KEY NUMBERS

- ① FORWARD/REAR BLOCKING ASSEMBLY (2 REQD). SEE THE "FORWARD/REAR BLOCKING ASSEMBLY B" AND CHART ON PAGE 13.
- ② CENTER FILL ASSEMBLY (3 REQD). SEE THE "CENTER FILL ASSEMBLY D" DETAIL ON PAGE 11.
- ③ SEPARATOR GATE (2 REQD). SEE THE DETAIL ON PAGE 11. POSITION WITH THE HORIZONTAL PIECES TOWARDS THE LENGTH OF THE PALLETS.
- ④ CRIB FILL ASSEMBLY (2 REQD). SEE THE "CRIB FILL ASSEMBLY B" DETAIL ON PAGE 11.
- ⑤ FILL MATERIAL, 4" WIDE BY 72" LONG MATERIAL (AS REQD). NAIL THE FIRST PIECE TO THE REAR BLOCKING ASSEMBLY W/6-10d NAILS OF A SUITABLE SIZE (10d FOR 2" MATERIAL). LAMINATE EACH ADDITIONAL PIECE TO THE PREVIOUS PIECE IN A SIMILAR MANNER. **NOTE:** MULTIPLE PIECES MAY BE LAMINATED TOGETHER AND THEN TOENAILED TO THE REAR BLOCKING ASSEMBLY W/6-10d NAILS.
- ⑥ STRUT LEDGER, 2" X 4" X 5" OR 6" (6 REQD - OPTIONAL). INSTALL IF DESIRED TO AID IN THE INSTALLATION OF SPANNER PIECES. NAIL TO THE FILL MATERIAL W/2-10d NAILS.
- ⑦ DOOR SPANNER, 4" X 4" MATERIAL, CUT TO A LENGTH THAT WILL PROVIDE FOR A DRIVE FIT (REF: 7'-1-3/8") (3 REQD). TOENAIL TO THE FILL MATERIAL W/2-12d NAILS AT EACH END. SEE THE "BEVEL-CUT" DETAIL ON PAGE 14. **NOTE THAT THESE PIECES ARE NOT REQUIRED IF THE SPACE BETWEEN THE REAR BLOCKING ASSEMBLY AND THE LOAD RETAINER IS NOT GREATER THAN 6".**

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	147	49
2" X 4"	473	316
2" X 6"	122	122
4" X 4"	22	30
NAILS	NO. REQD	POUNDS
6d (2")	428	2-1/2
10d (3")	600	9-1/4
12d (3-1/4")	12	1/4
PLYWOOD, 1/2"	96.06 SQ FT	132-1/4 LBS

LOAD AS SHOWN

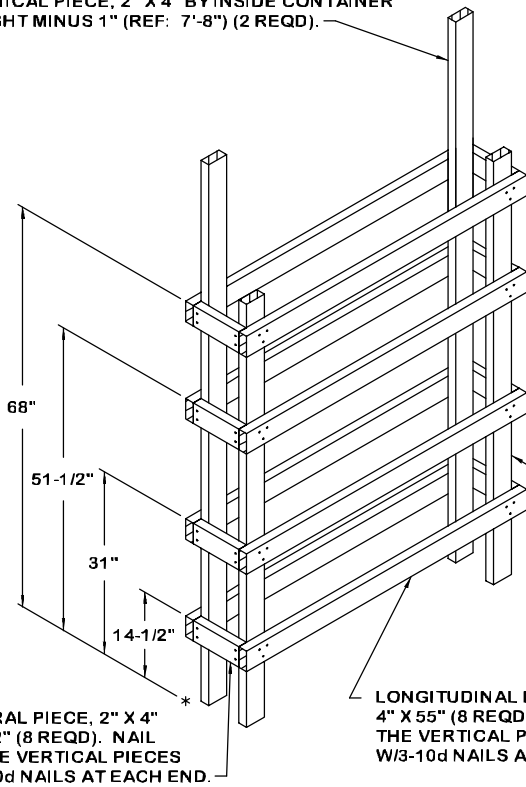
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	14	20,048 LBS
DUNNAGE		1,179 LBS
CONTAINER		4,700 LBS

TOTAL WEIGHT - - - - - 25,927 LBS (APPROX)

RECOMMENDED SEQUENTIAL LOADING PROCEDURES

1. PREFABRICATE TWO FORWARD/REAR BLOCKING ASSEMBLIES B, THREE CENTER FILL ASSEMBLIES D, TWO SEPARATOR GATES, AND TWO CRIB FILL ASSEMBLIES B.
2. INSTALL THE FORWARD BLOCKING ASSEMBLY.
3. LOAD FOUR PALLET UNITS AND ONE CENTER FILL ASSEMBLY D.
4. REPEAT STEP 3.
5. INSTALL ONE SEPARATOR GATE.
6. LOAD TWO PALLET UNITS AND TWO CRIB FILL ASSEMBLIES B.
7. REPEAT STEP 5.
8. REPEAT STEP 3.
9. INSTALL THE REAR BLOCKING ASSEMBLY.
10. INSTALL THE FILL MATERIAL BETWEEN THE REAR BLOCKING ASSEMBLY AND THE LOAD RETAINERS.
11. INSTALL THE SIX STRUT LEDGERS AND THREE SPANNER PIECES.

VERTICAL PIECE, 2" X 4" BY INSIDE CONTAINER HEIGHT MINUS 1" (REF: 7'-8") (2 REQD).



CENTER FILL ASSEMBLY D

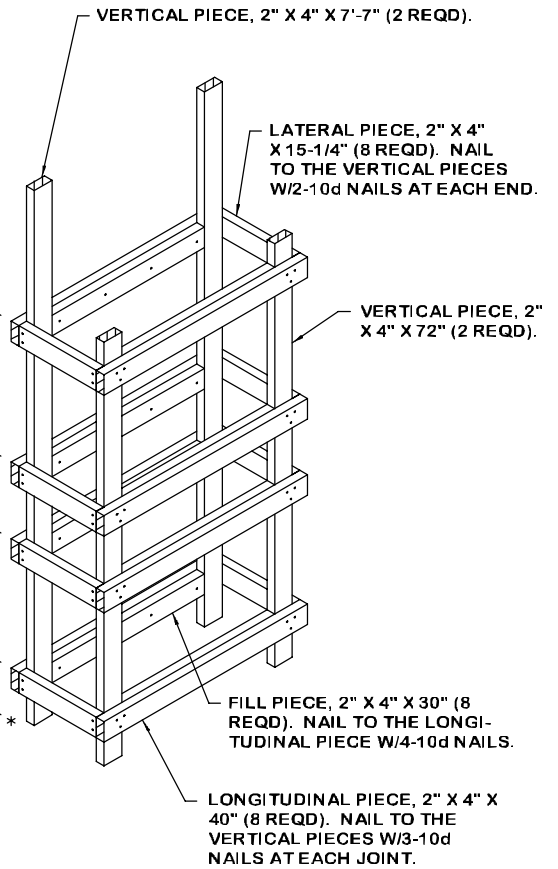
FOR A ONE-HIGH ASSEMBLY, ELIMINATE THE TOP FOUR LATERAL PIECES AND THE TOP FOUR LONGITUDINAL PIECES. SHORTEN THE SMALLER VERTICAL PIECES TO 42".

SPECIAL NOTE:

THE PROCEDURES DEPICTED ON PAGE 10 MAY ALSO BE USED FOR THE LOAD DEPICTED ON PAGE 8, PROVIDED THE CONTAINER DOOR HEIGHT IS SUCH TO ALLOW PROPER POSITIONING OF THE REARMOST UPPER LAYER PALLET UNITS.

VERTICAL PIECE, 1" X 4" X 6'-6" (7 REQD).

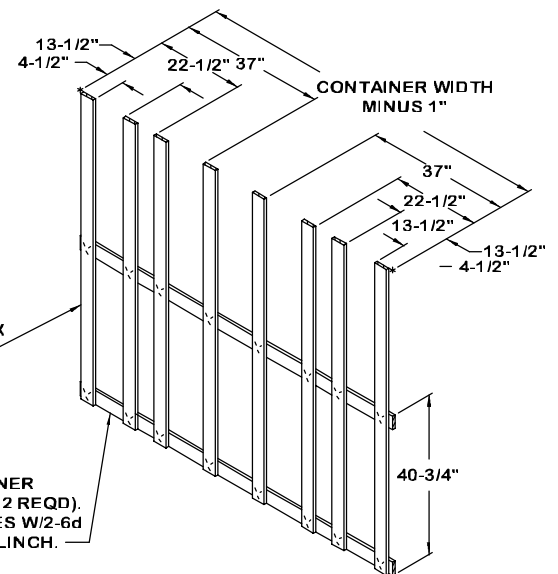
TIE PIECE, 1" X 4" BY CONTAINER WIDTH MINUS 1" (REF: 7'-7") (2 REQD). NAIL TO THE VERTICAL PIECES W/2-6d NAILS AT EACH JOINT AND CLINCH.



CRIB FILL ASSEMBLY B

FOR A ONE-HIGH LOAD, ELIMINATE THE TOP FOUR LATERAL PIECES, THE TOP FOUR LONGITUDINAL PIECES, AND THE TOP FOUR FILL PIECES. ADJUST THE SHORTER VERTICAL PIECES ACCORDINGLY.

VERTICAL PIECE, 2" X 4" X 72" (2 REQD).

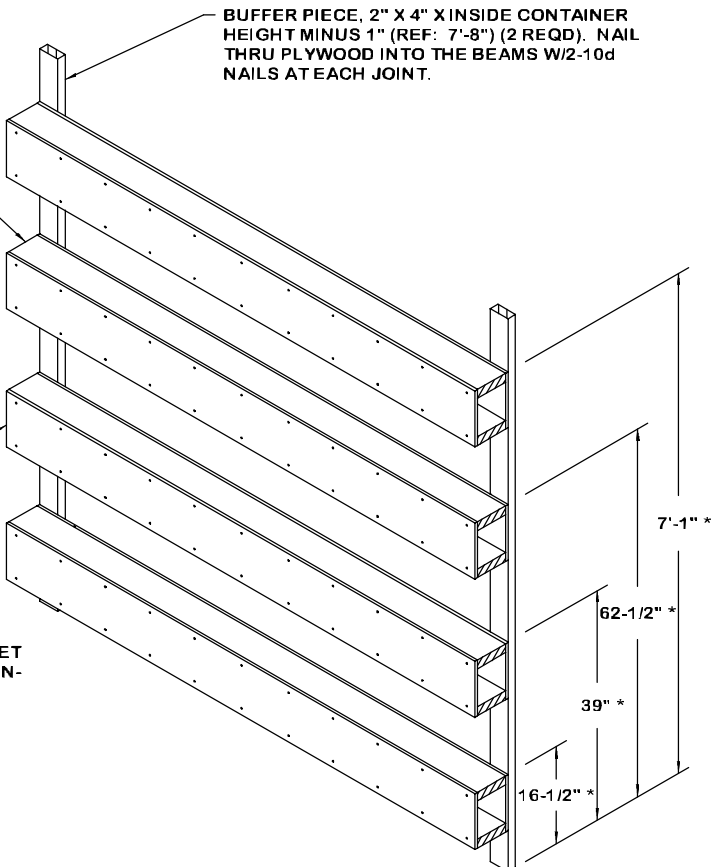


SEPARATOR GATE

BEAM, 2" X 6" BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-7") (8 REQD).

PLYWOOD, 1/2" X 9-1/2" BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-7") (8 REQD). NAIL TO THE BEAMS W/1-6d NAIL EVERY 8".

BUFFER PIECE, 2" X 4" X INSIDE CONTAINER HEIGHT MINUS 1" (REF: 7'-8") (2 REQD). NAIL THRU PLYWOOD INTO THE BEAMS W/2-10d NAILS AT EACH JOINT.



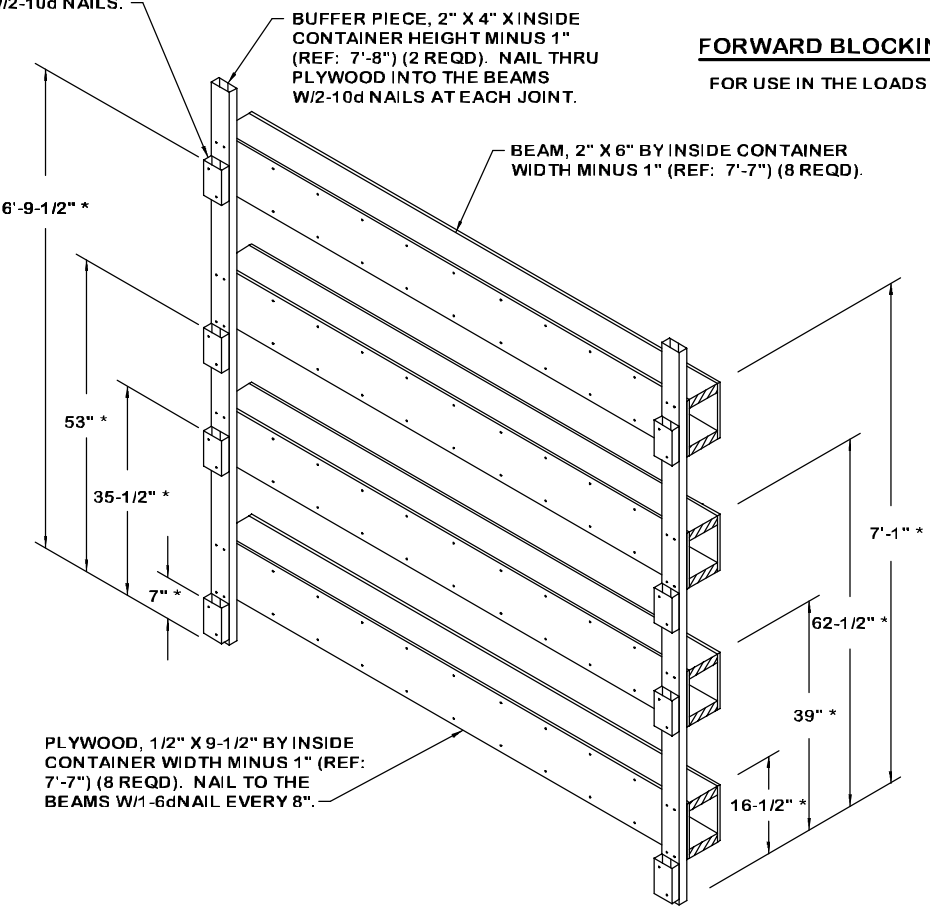
NOTE *: THE DIMENSIONS SHOWN ARE FOR FLAT DUNNAGE PALLET UNITS. FOR ROUTED DUNNAGE PALLET UNITS, THE DIMENSIONS ARE 14-1/2", 38", 59-1/2" AND 6'-11" FOR THE BEAM ASSEMBLIES AND 5", 34-1/2", 50", AND 6'-7-1/2" FOR THE STRUT LEDGERS. THE BOTTOM TWO STRUT LEDGERS, FOR USE WITH ROUTED DUNNAGE PALLET UNITS, WILL BE 5" INSTEAD OF 6" LONG.

STRUT LEDGER, 2" X 4" X 6" (6 REQD). NAIL TO THE BUFFER PIECE W/2-10d NAILS.

BUFFER PIECE, 2" X 4" X INSIDE CONTAINER HEIGHT MINUS 1" (REF: 7'-8") (2 REQD). NAIL THRU PLYWOOD INTO THE BEAMS W/2-10d NAILS AT EACH JOINT.

FORWARD BLOCKING ASSEMBLY A
FOR USE IN THE LOADS ON PAGES 4 AND 8.

BEAM, 2" X 6" BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-7") (8 REQD).



PLYWOOD, 1/2" X 9-1/2" BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-7") (8 REQD). NAIL TO THE BEAMS W/1-6d NAIL EVERY 8".

REAR BLOCKING ASSEMBLY A
FOR USE IN THE LOADS ON PAGES 4 AND 8.

SEE GENERAL NOTE "G" ON PAGE 2.

BEAM, 2" X 6" BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-7") (8 REQD).

BUFFER PIECE, 2" X 4" X INSIDE CONTAINER HEIGHT MINUS 1" (REF: 7'-8") (2 REQD). NAIL THRU PLYWOOD INTO THE BEAMS W/2-10d NAILS AT EACH JOINT.

BLOCKING ASSEMBLY CHART		
DIMENSION	FLAT	ROUTED
A	16-1/2"	14-1/2"
B	32"	31"
C	54-1/2"	51-1/2"
D	70"	68"

PLYWOOD, 1/2" X 9-1/2" BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-7") (8 REQD). NAIL TO THE BEAMS W/1-6d NAIL EVERY 8".

FORWARD/REAR BLOCKING ASSEMBLY B

BUFFER PIECE, 2" X 4" BY INSIDE CONTAINER HEIGHT MINUS 1" (REF: 7'-6" AT FORWARD END, 7'-8" AT REAR END) (2 REQD). NAIL TO THE BEAM ASSEMBLIES W/3-10d NAILS AT EACH JOINT.

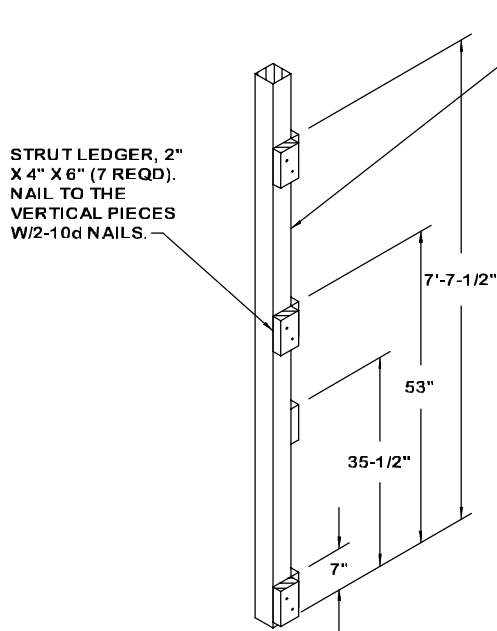
LOAD BEARING PIECE, 2" X 4" BY HEIGHT OF TOP BEAM ASSEMBLY PLUS 6" (4 REQD). NAIL TO THE BEAM ASSEMBLIES W/3-10d NAILS AT EACH JOINT.

BEAM ASSEMBLY, 2" X 6" BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-7") (QUADRUPLED) (4 REQD). LAMINATE THE SECOND PIECE TO THE FIRST PIECE W/11-10d NAILS. LAMINATE EACH ADDITIONAL PIECE IN A LIKE MANNER.

ALTERNATIVE FORWARD/REAR BLOCKING ASSEMBLY

NOTE: THE ALTERNATIVE FORWARD/REAR BLOCKING ASSEMBLY MAY BE USED IN PLACE OF ANY FORWARD/REAR BLOCKING ASSEMBLY IN THE LOADS DEPICTED HEREIN. THE ABOVE DIMENSIONS ARE FOR A BLOCKING ASSEMBLY FOR THE LOAD ON PAGE 4. ADJUST THE DIMENSIONS FOR THE DIFFERENT PALLET UNITS ACCORDINGLY.

DETAILS

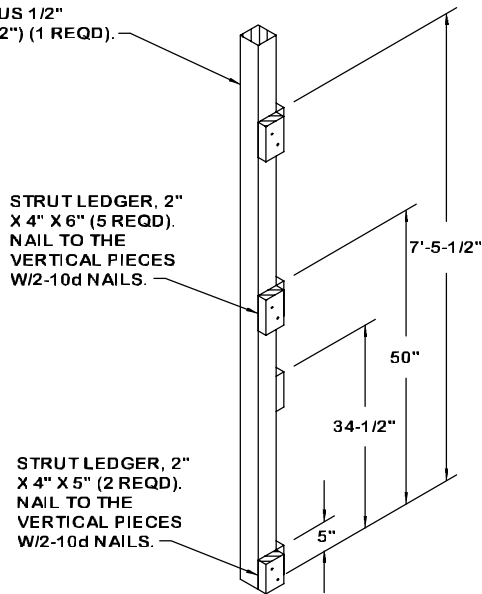


STRUT LEDGER, 2" X 4" X 6" (7 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS.

VERTICAL PIECE, 4" X 4" BY INSIDE CONTAINER HEIGHT MINUS 1/2" (REF: 7'-8-1/2") (1 REQD).

DOOR POST VERTICAL A

IF THE ISO CONTAINER TO BE LOADED IS NOT EQUIPPED WITH PRE-WELDED LOAD RETAINERS, THE DOOR POST VERTICAL MUST BE NAILED TO THE DOOR POST VERTICAL RETAINER. NAIL THROUGH THE HOLES IN THE DOOR POST VERTICAL RETAINER INTO THE DOOR POST VERTICAL W/4-10d NAILS.

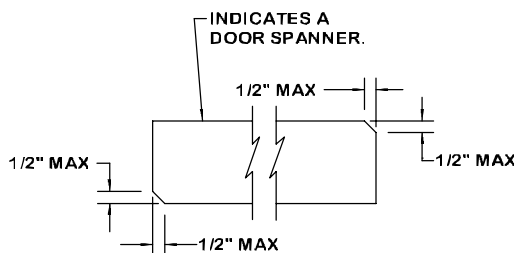


STRUT LEDGER, 2" X 4" X 6" (5 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS.

STRUT LEDGER, 2" X 4" X 5" (2 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS.

DOOR POST VERTICAL B

IF THE ISO CONTAINER TO BE LOADED IS NOT EQUIPPED WITH PRE-WELDED LOAD RETAINERS, THE DOOR POST VERTICAL MUST BE NAILED TO THE DOOR POST VERTICAL RETAINER. NAIL THROUGH THE HOLES IN THE DOOR POST VERTICAL RETAINER INTO THE DOOR POST VERTICAL W/4-10d NAILS.

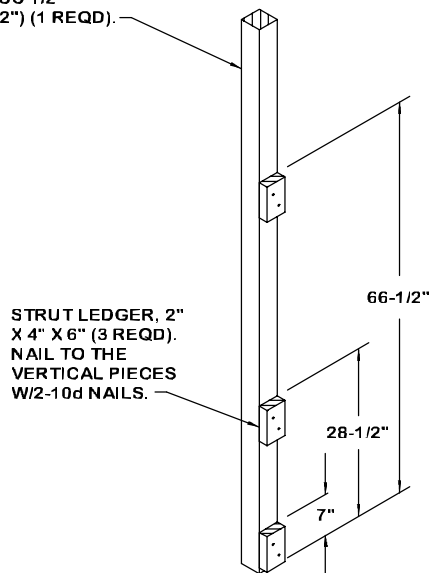


INDICATES A DOOR SPANNER.

BEVEL-CUT

IF DESIRED, EACH END OF A STRUT OR DOOR SPANNER PIECE MAY BE BEVEL-CUT AS SHOWN ABOVE TO FACILITATE THE ACHIEVEMENT OF A TIGHT REAR-OF-LOAD OR DOOR-POST-TO-DOOR-POST FIT.

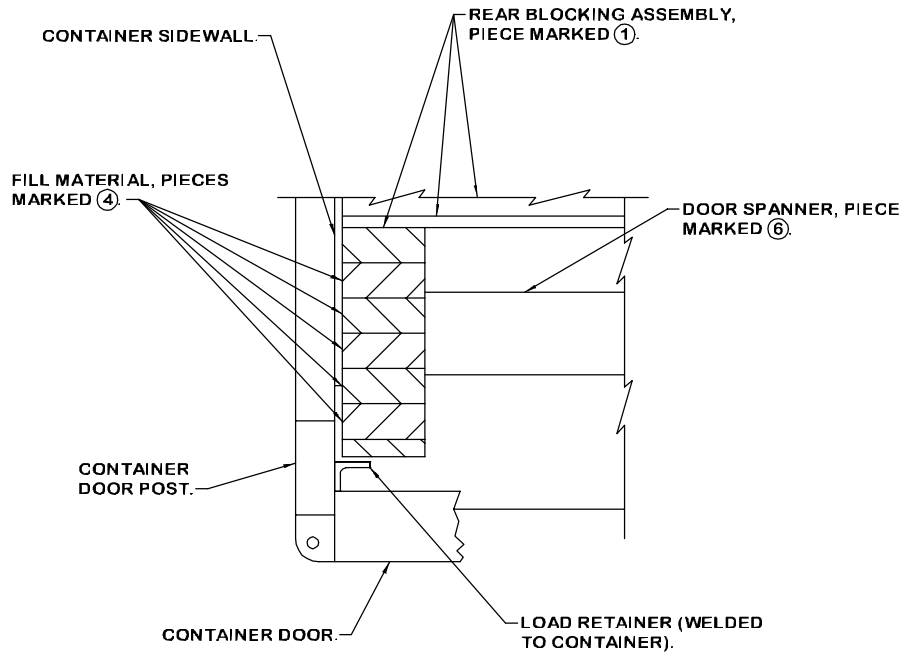
VERTICAL PIECE, 4" X 4" BY INSIDE CONTAINER HEIGHT MINUS 1/2" (REF: 7'-8-1/2") (1 REQD).



STRUT LEDGER, 2" X 4" X 6" (3 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS.

DOOR POST VERTICAL C

IF THE ISO CONTAINER TO BE LOADED IS NOT EQUIPPED WITH PRE-WELDED LOAD RETAINERS, THE DOOR POST VERTICAL MUST BE NAILED TO THE DOOR POST VERTICAL RETAINER. NAIL THROUGH THE HOLES IN THE DOOR POST VERTICAL RETAINER INTO THE DOOR POST VERTICAL W/4-10d NAILS.

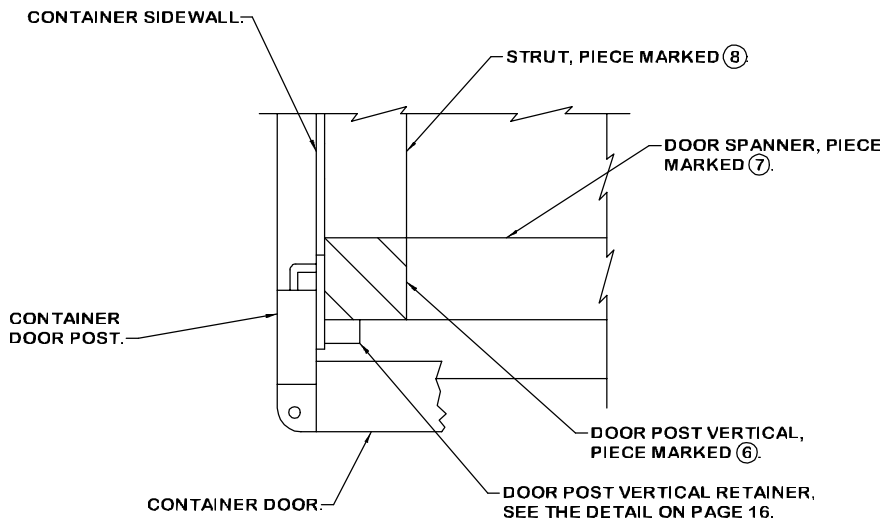


DETAIL A

A PARTIAL PLAN VIEW OF THE LEFT REAR PORTION OF THE CONTAINER IS SHOWN DEPICTING THE PROPER POSITION OF THE FILL MATERIAL AND ADJACENT DUNNAGE PIECES. KEY NUMBERS REFER TO THE KEY NUMBERS ON PAGE 6.

SPECIAL NOTE:

WHEN ISO CONTAINERS ARE NOT EQUIPPED WITH PRE-WELDED LOAD RETAINERS, AS DEPICTED IN "DETAIL A" ABOVE, DOOR POST VERTICAL RETAINERS WILL BE REQUIRED FOR THE LOADS DEPICTED ON PAGES 4, 6, 8, AND 10. SEE VARIOUS LOADS WITHIN AMC DRAWING 19-48-4153-15PA1002 FOR EXAMPLES. SEE PAGE 16 FOR DETAILS OF THE METAL DOOR POST VERTICAL RETAINER.



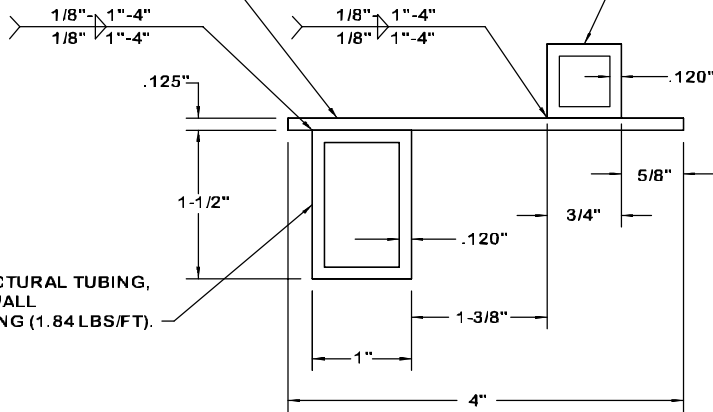
DETAIL B

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. KEY NUMBERS REFER TO THE KEY NUMBERS ON PAGE 4.

DETAILS

STEEL STRIP, 1/8" THICK BY 4" WIDE
BY 83" LONG (1.70 LBS/FT).

SQUARE STRUCTURAL TUBING, 3/4" SQUARE
BY .120" WALL THICKNESS BY 83" LONG
(1.03 LBS/FT). SEE SPECIAL NOTE BELOW.



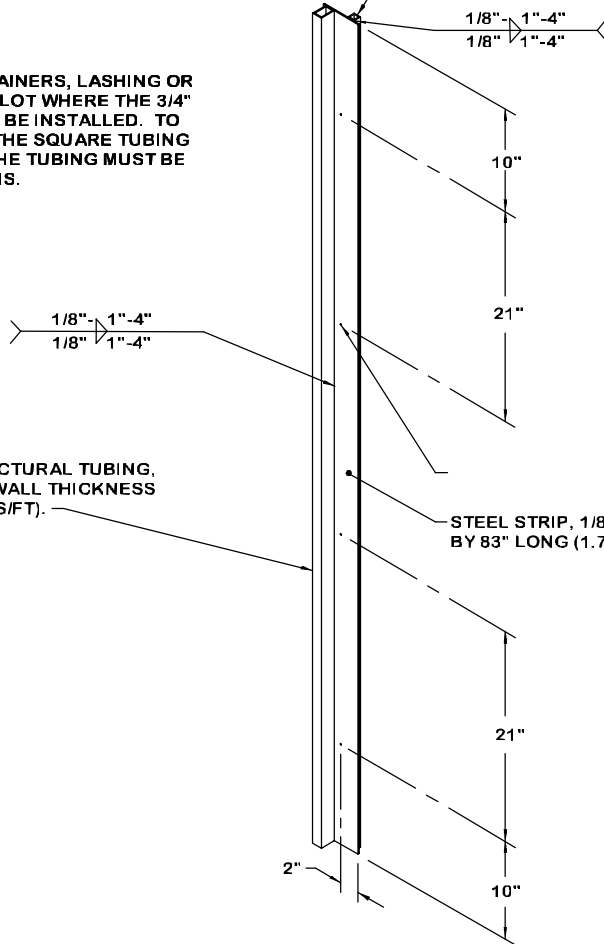
RECTANGULAR STRUCTURAL TUBING,
1-1/2" BY 1" BY .120" WALL
THICKNESS BY 83" LONG (1.84 LBS/FT).

VIEW A

SPECIAL NOTE:

IN MOST CORRUGATED STEEL CONTAINERS, LASHING OR TIE BARS WILL BE PRESENT IN THE SLOT WHERE THE 3/4" SQUARE STRUCTURAL TUBING IS TO BE INSTALLED. TO ENSURE PROPER ENGAGEMENT OF THE SQUARE TUBING AND THE CONTAINER DOOR POST, THE TUBING MUST BE NOTCHED AT THE TIE BAR LOCATIONS.

SQUARE STRUCTURAL TUBING,
3/4" SQUARE BY .120" WALL
THICKNESS BY 83" LONG
(1.03 LBS/FT).



RECTANGULAR STRUCTURAL TUBING,
1-1/2" BY 1" BY .120" WALL
THICKNESS
BY 83" LONG (1.84 LBS/FT).

STEEL STRIP, 1/8" THICK BY 4" WIDE
BY 83" LONG (1.70 LBS/FT).

DOOR POST VERTICAL RETAINER

NOTE: THE ABOVE ASSEMBLY HAS BEEN SHOWN ROTATED 90° FROM THE ORIENTATION IN WHICH IT IS INSTALLED IN THE LEFT REAR CORNER OF THE CONTAINER. THE ASSEMBLY HAS BEEN ROTATED FOR HOLE LOCATION CLARITY.