

APPROVED BY
BUREAU OF EXPLOSIVES

D M Hardy

DATE 6/29/95

TOW

LOADING AND BRACING WITH WOODEN
DUNNAGE IN SIDE OPENING ISO
CONTAINERS OF GUIDED MISSILES
PACKED ONE PER CNU-553/E
CYLINDRICAL METAL CONTAINER

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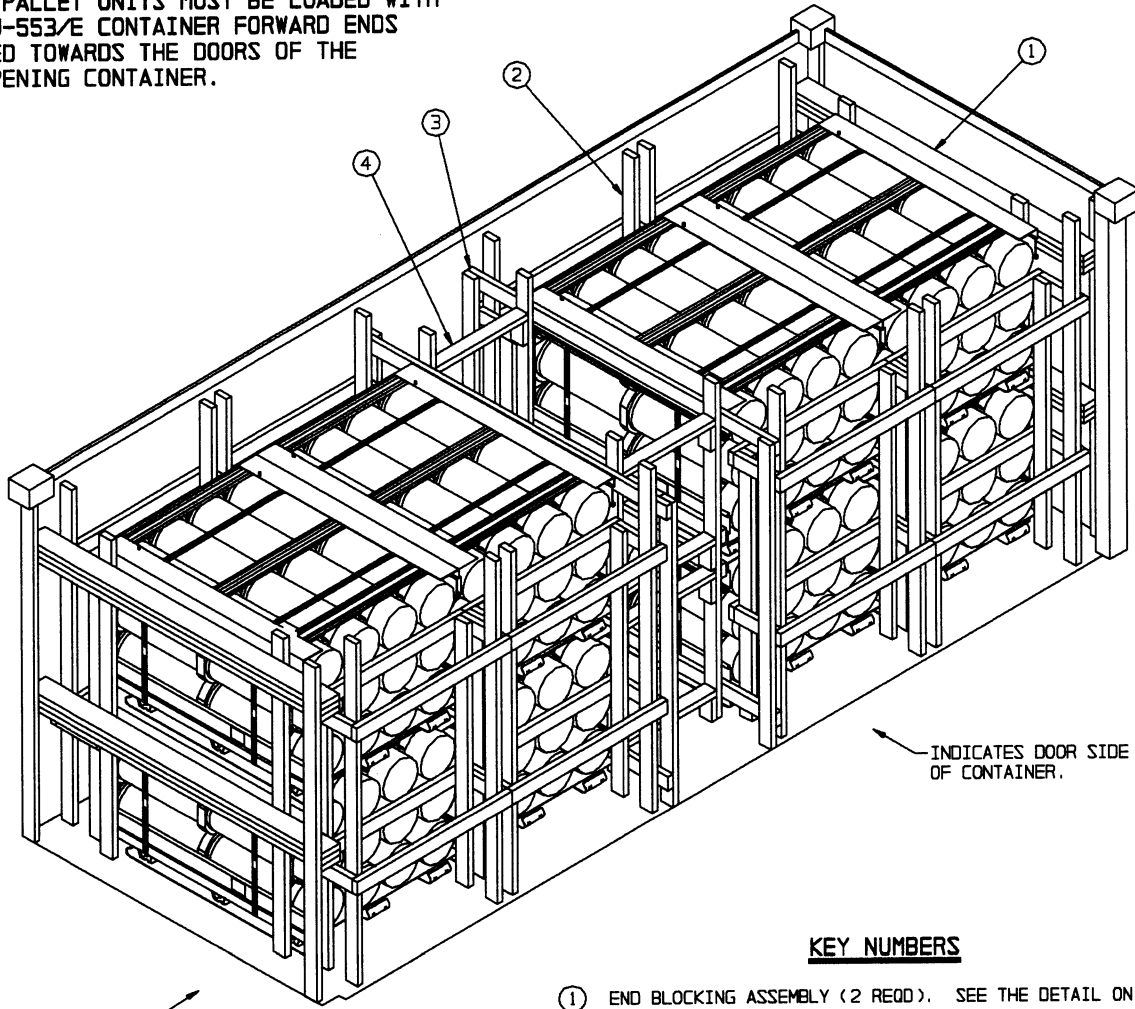
- LOADING AND BRACING SPECIFICATIONS SET FORTH WITHIN THIS DRAWING ARE APPLICABLE TO LOADS THAT ARE TO BE SHIPPED BY TRAILER/CONTAINER-ON-FLATCAR (T/COFC) RAIL CARRIER SERVICE. THESE SPECIFICATIONS MAY ALSO BE USED FOR LOADS THAT ARE TO BE MOVED BY MOTOR OR WATER CARRIERS.

U.S. ARMY MATERIEL COMMAND DRAWING			
APPROVED, U.S. ARMY MISSILE COMMAND <i>Gregory W. Pope</i>	DRAFTSMAN	TECHNICIAN	ENGINEER L. FIEFFER
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APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND <i>William J. Ernst</i>	JUNE 1994		
U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL	CLASS	DIVISION	DRAWING
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DO NOT SCALE

PROJECT GM 877-93

NOTE: PALLET UNITS MUST BE LOADED WITH THE CNU-553/E CONTAINER FORWARD ENDS DIRECTED TOWARDS THE DOORS OF THE SIDE OPENING CONTAINER.



REAR OF CONTAINER. →

→ INDICATES DOOR SIDE OF CONTAINER.

ISOMETRIC VIEW

KEY NUMBERS

- ① END BLOCKING ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 5.
- ② CRIB FILL ASSEMBLY (8 REQD). SEE THE DETAIL ON PAGE 6.
- ③ CENTER GATE (2 REQD). SEE THE DETAIL ON PAGE 7.
- ④ STRUT, 2" X 4" BY CUT-TO-FIT (REF: 27") (8 REQD). TOENAIL TO THE CENTER GATE $\frac{1}{2}$ -10d NAILS AT EACH END.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	544	363
2" X 6"	86	86
NAILS	NO. REQD	POUNDS
10d (3")	504	8

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	8	12,336 LBS
DUNNAGE		906 LBS
CONTAINER		6,050 LBS
TOTAL WEIGHT		19,292 LBS (APPROX)

K. TO MAKE LOADING EASIER, TO HELP ACHIEVE A TIGHT LOAD ACROSS A CONTAINER, AND TO PREVENT UNACCEPTABLE DAMAGE TO LADING UNITS WHEN LOADING A SIDE OPENING CONTAINER, 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 AND/OR CONTAINERS FROM INTERLOCKING OR CATCHING ON OTHER PROJECTIONS WHEN LONGITUDINALLY ADJACENT LADING UNITS ARE BEING LOADED. A SLIP-SHEET WILL BE USED AFTER ONE PALLET UNIT STACK IS LOADED WITH ONE OF ITS SIDES IN TIGHT CONTACT AT ONE END OF THE SIDE OPENING CONTAINER. THE SLIP-SHEET IS TO BE PLACED AGAINST THE OTHER SIDE OF THE STACK BEFORE THE NEXT PALLET UNIT STACK IS LOADED. AFTER THE SECOND PALLET UNIT STACK IS LOADED, THE SLIP-SHEET IS TO BE REMOVED FOR SUBSEQUENT USE WITH THE REMAINING PALLET UNIT STACKS. 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.

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. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN SIDE OPENING CONTAINERS WHICH ARE PARTIALLY LOADED WITH THE DESIGNATED ITEM, PROVIDING THAT THE TOTAL LOAD IS COMPATIBLE, EXISTING DIRECTIVES ARE NOT VIOLATED, AND THE OTHER LADING ITEMS ARE BLOCKED AND BRACED TO EQUAL THE BLOCKING AND BRACING CRITERIA SPECIFIED.

Q. 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" DETAILS ON PAGE 8. WHEN A CONTAINER IS TO BE 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.

R. THESE PROCEDURES CAN ALSO BE UTILIZED FOR THE SHIPMENT OF THE CNU-553/E CONTAINERS WHEN THEY ARE LOADED WITH AN ITEM OTHER THAN THE SPECIFIED GUIDED MISSILE, OR WHEN THEY ARE EMPTY.

S. ANTI-CHAFING MATERIAL MAY BE INSTALLED AT POINTS OF CONTACT BETWEEN PALLET UNITS, AND BETWEEN PALLET UNITS AND THE CONTAINER, IF DESIRED, TO PREVENT CHAFING DAMAGE TO PAINT AND MARKINGS.

A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 (CHAPTER 5).

B. THE OUTLOADING PROCEDURES SPECIFIED HEREIN ARE APPLICABLE TO THE TOW GUIDED MISSILE PACKED ONE PER CNU-553/E CYLINDRICAL METAL CONTAINER. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CONTAINER WITH MISSILE COMPONENTS. CAUTION: REGARDLESS OF THE QUANTITY OF UNITS TO BE SHIPPED, THE "MAXIMUM GROSS WEIGHT" OF THE SIDE OPENING ISO CONTAINER MUST NOT BE EXCEEDED.

C. FOR DETAIL OF THE PALLET UNIT, SEE U.S. ARMY MATERIEL COMMAND DRAWING NO. 19-48-5268-GM2DT02 AND PAGE 3.

PALLET DIMENSIONS - - - - 45-1/2" LONG X 58-15/16" WIDE
 X 38-7/16" HIGH (APPROX)
 GROSS WEIGHT - - - - - 1,542 POUNDS (APPROX)
 CUBE - - - - - 59.7 CUBIC FEET (APPROX)

D. THE LOADS AS SHOWN ARE BASED ON 6,050 POUND 20' LONG BY 8' WIDE BY 8'-6" HIGH SIDE OPENING ISO CONTAINER WITH INSIDE DIMENSIONS OF 19'-4" LONG BY 89" WIDE BY 88" HIGH AND A MAXIMUM GROSS WEIGHT OF 52,910 POUNDS. THE LOAD IS DESIGNED FOR TRAILER/CONTAINER-ON-FLATCAR (T/COFC) SHIPMENT, HOWEVER, THE LOAD AS DESIGNED CAN ALSO BE MOVED BY MOTOR OR WATER CARRIERS. NOTICE: OTHER CONTAINERS OF THE SAME DESIGN CONFIGURATION CAN ALSO BE USED.

E. WHEN LOADING CONTAINERS, 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 LONGITUDINAL PIECES ON THE CRIB FILL ASSEMBLIES. NAIL EACH ADDITIONAL PIECE TO THE LONGITUDINAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE LENGTH OF THE LATERAL PIECES IN THE CRIB FILL ASSEMBLY MAY BE ADJUSTED, AS NECESSARY, TO FACILITATE VARIANCE IN THE PALLET UNIT 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 CONTAINER WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.

J. PORTIONS OF THE CONTAINER DEPICTED WITHIN THIS DRAWING, SUCH AS THE SIDE DOORS, HAVE NOT BEEN SHOWN IN THE LOAD VIEW FOR CLARITY PURPOSES.

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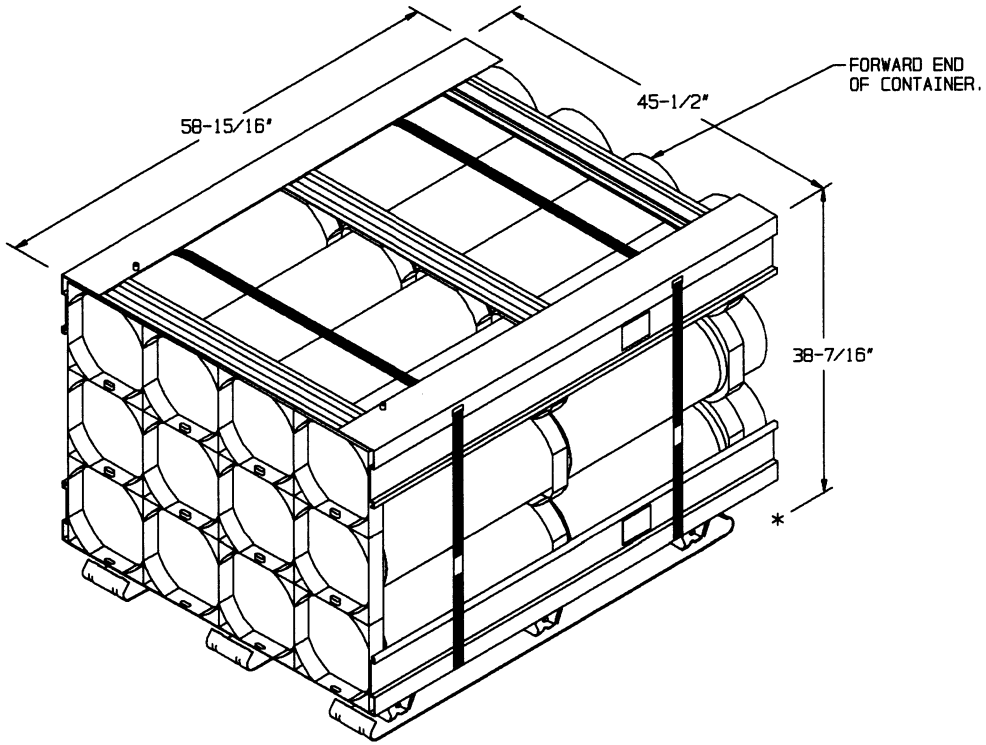
MATERIAL SPECIFICATIONS

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

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

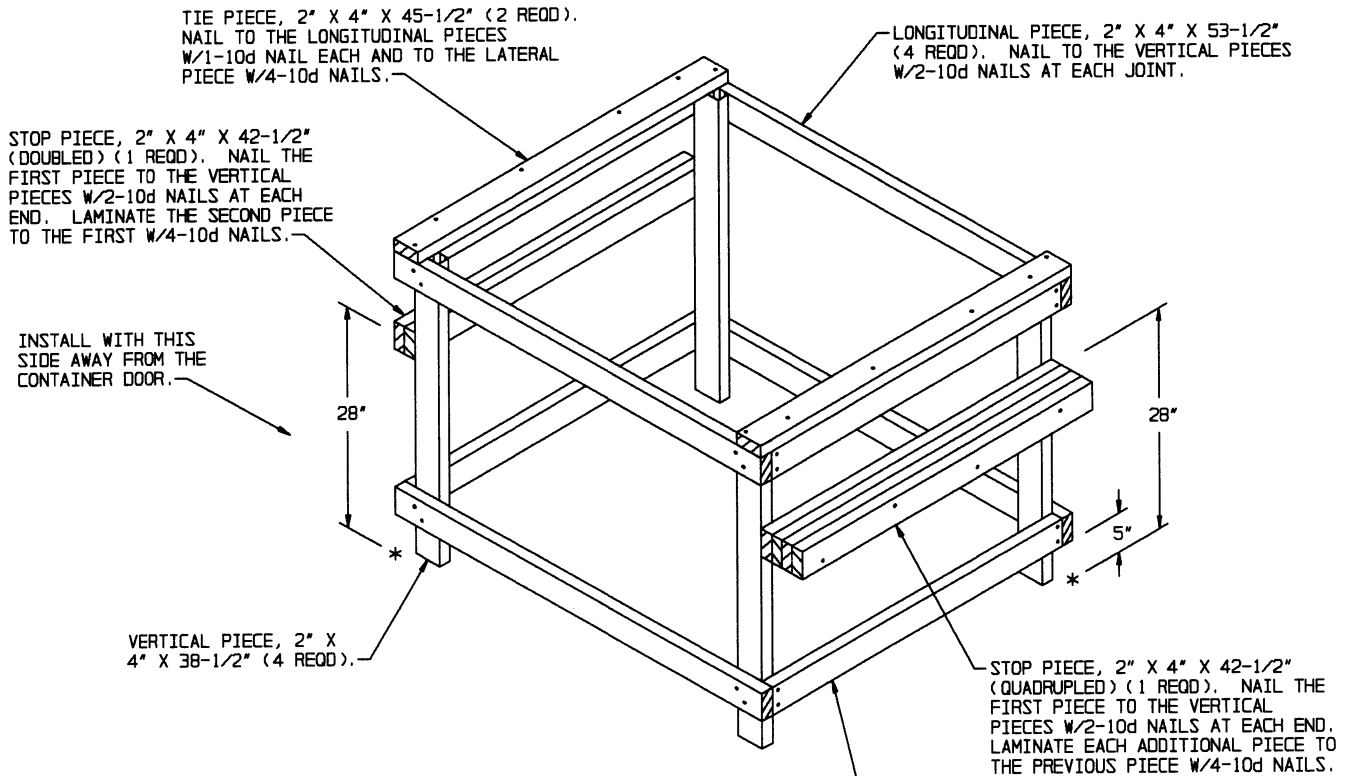
PLYWOOD - - - - - : COMMERCIAL ITEM DESCRIPTION A-A-55057, TYPE A, CONSTRUCTION AND INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D. IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER INTERIOR OR AN EXTERIOR GRADE MAY BE SUBSTITUTED.

ANTI-CHAFING MATERIAL - - - - - : MIL-B-121 (OR EQUAL); NEUTRAL BARRIER MATERIAL.



PALLET UNIT DATA

GROSS WEIGHT ----- 1,542 LBS (APPROX)
 CUBE ----- 59.7 CUBIC FEET (APPROX)

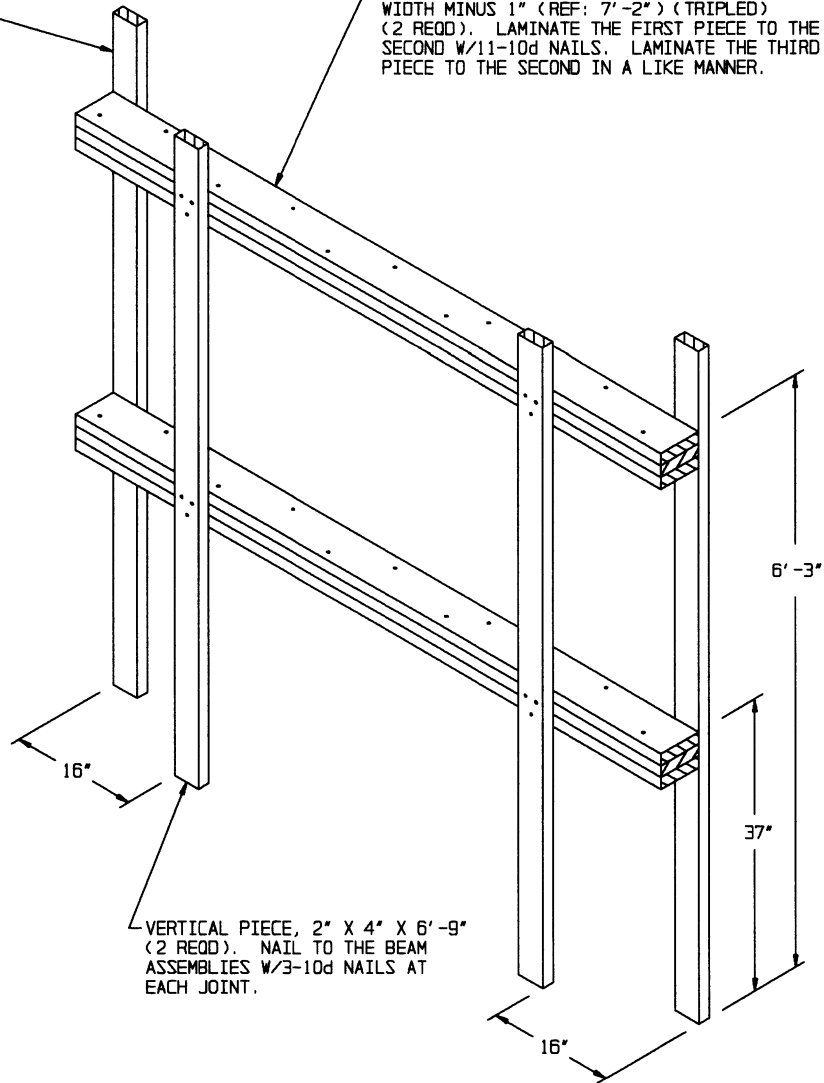


FILLER ASSEMBLY

THE ASSEMBLY DEPICTED ABOVE IS FOR USE IN PLACE OF AN OMITTED PALLET UNIT. FILLER ASSEMBLIES MUST BE WIRE TIED TO ADJACENT DUNNAGE ASSEMBLIES TO PREVENT UNDUQ MOVEMENT. NO MORE THAN TWO FILLER ASSEMBLY MAY BE USED IN THE LOAD DEPICTED ON PAGE 2.

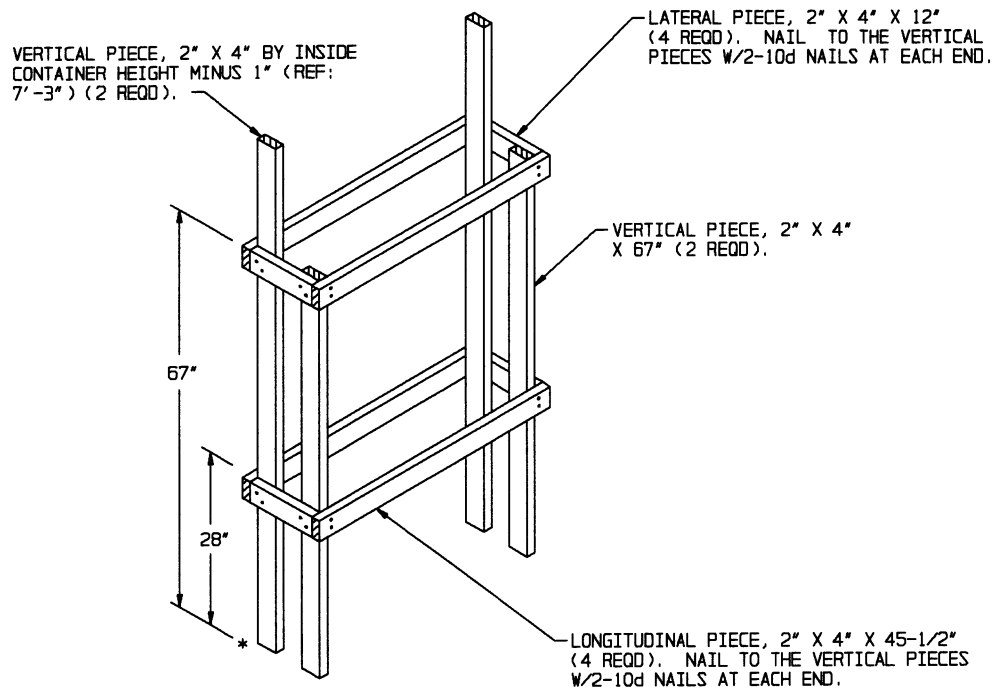
BUFFER PIECE, 2" X 4" BY INSIDE
CONTAINER HEIGHT MINUS 1" (REF:
7'-1") (2 REQD). NAIL TO THE BEAM
ASSEMBLIES W/3-10d NAILS AT
EACH JOINT.

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



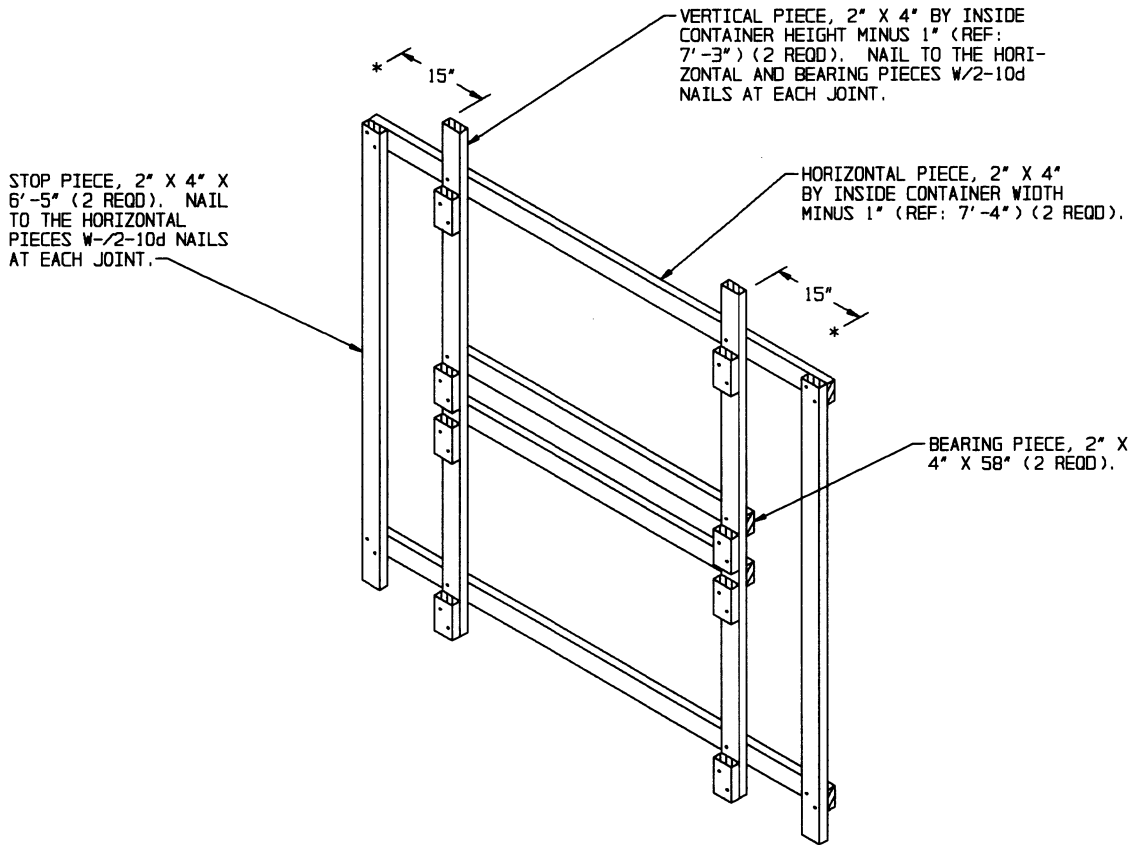
END BLOCKING ASSEMBLY

NOTE: FOR A ONE HIGH LOAD, ELIMINATE THE TOP BEAM
ASSEMBLY. SHORTEN THE VERTICAL PIECES APPROPRIATELY.



CRIB FILL ASSEMBLY

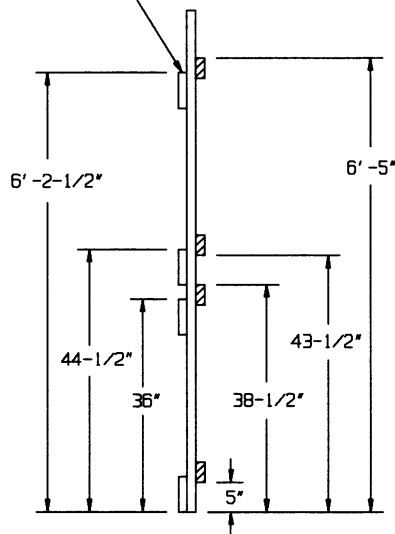
NOTE: FOR A ONE HIGH LOAD, REPOSITION THE TOP TWO LONGITUDINAL PIECES AND THE TOP TWO LATERAL PIECES AT 38", AND REPOSITION THE LOWER TWO LONGITUDINAL PIECES AND THE LOWER TWO LATERAL PIECES AT 18". SHORTEN THE 67" VERTICAL PIECES APPROPRIATELY. THE LENGTH OF THE LATERAL PIECES IS DEPENDENT ON THE VOID BETWEEN THE PALLET UNIT AND THE CONTAINER SIDEWALL OR DOORS.



CENTER GATE

NOTE: FOR A ONE HIGH LOAD, ELIMINATE THE BEARING PIECES AND THE FOUR TOP STRUT LEDGERS, AND REPOSITION THE TOP HORIZONTAL PIECE AT 38-1/2". SHORTEN THE VERTICAL AND STOP PIECES TO 38-1/2". SEE THE "END VIEW" BELOW FOR DUNNAGE LOCATIONS.

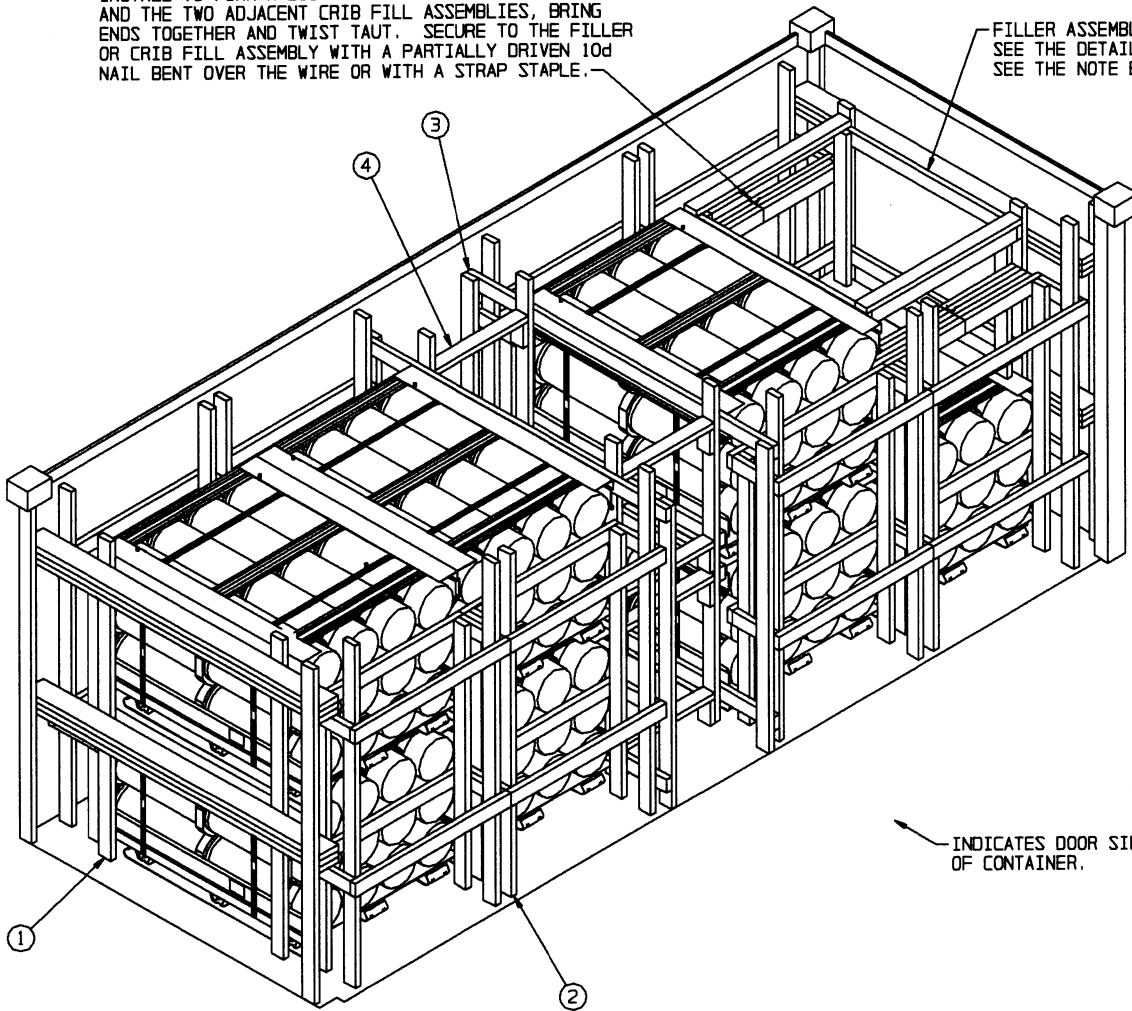
STRUT LEDGER, 2" X 4" X 6" (8 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS EACH. THE STRUT LEDGER LOCATED AT 44-1/2" CAN ONLY BE PRE-NAILED ON ONE CENTER GATE.



END VIEW

TIE WIRE, NO. 14 GAGE WIRE 18" LONG (2 REQD).
 INSTALL TO FORM A LOOP AROUND THE FILLER ASSEMBLY
 AND THE TWO ADJACENT CRIB FILL ASSEMBLIES, BRING
 ENDS TOGETHER AND TWIST TAUT. SECURE TO THE FILLER
 OR CRIB FILL ASSEMBLY WITH A PARTIALLY DRIVEN 10d
 NAIL BENT OVER THE WIRE OR WITH A STRAP STAPLE.

FILLER ASSEMBLY (1 REQD).
 SEE THE DETAIL ON PAGE 4.
 SEE THE NOTE BELOW.



ISOMETRIC VIEW

LESS-THAN-FULL-LOAD PROCEDURE

KEY NUMBERS REFER TO KEY NUMBERS ON PAGE 2. DO NOT INSTALL
 FILLER ASSEMBLIES ADJACENT TO CENTER GATES (PIECE MARKED ③).
 CAUTION: THE LATERAL PIECES OF THE FILLER ASSEMBLY MUST BE
 IN LINE WITH THE VERTICAL PIECES OF THE END BLOCKING ASSEMBLY.
 THE QUANTITY AND SIZE OF THE STOP PIECES IN THE FILLER ASSEMBLY
 MAY BE VARIED AS REQUIRED TO ENSURE PROPER ALIGNMENT.