

APPROVED BY  
BUREAU OF EXPLOSIVES

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# LOADING AND BRACING WITH WOODEN DUNNAGE IN SIDE OPENING ISO CONTAINERS OF CBU-MK20 AND MODS (ROCKEYE II) AND CBU-59/B (APAM) PACKED IN THE CNU-238/E SHIPPING AND STORAGE 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			
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DO NOT SCALE

## 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 CBU-MK20 AND MODS (ROCKEYE II) AND CBU-59/B (APAM) IN THE CNU-238/E SHIPPING AND STORAGE CONTAINER. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CNU-238/E CONTAINER WITH CONTENTS. SEE PAGE 3 FOR DETAILS OF THE CONTAINER. CAUTION: REGARDLESS OF THE QUANTITY OF CONTAINERS 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 INTERMODAL COMMERCIAL CONTAINER WITH INSIDE DIMENSIONS OF 19'-4" LONG BY 89" WIDE BY 88" HIGH. THE LOAD IS DESIGNED FOR TRAILER/CONTAINER-ON-FLAT-CAR (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 CONTAINERS, THEY ARE TO BE POSITIONED SO AS TO ACHIEVE A TIGHT LOAD (TIGHT AGAINST THE DUNNAGE ASSEMBLIES). ALTHOUGH A TOTAL OF 1-1/2" OF UNBLOCKED SPACE ACROSS THE WIDTH OF A LOAD BAY IS PERMITTED, LATERAL VOIDS WITHIN THE LOAD ARE TO BE HELD TO A MINIMUM. EXCESSIVE SLACK CAN BE ELIMINATED FROM A LOAD BY LAMINATING ADDITIONAL PIECES OF APPROPRIATE THICKNESS TO THE BEARING PIECES ON THE SIDE FILL ASSEMBLY. NAIL EACH ADDITIONAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE THICKNESS OF THE VERTICAL AND BEARING PIECES IN THE SIDE FILL ASSEMBLY MAY BE ADJUSTED AS REQUIRED TO FACILITATE VARIANCE IN THE CONTAINER SIZE.
- 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 ENDWALLS. PIECES OF DUNNAGE MATERIAL MUST BE LAMINATED TO THE BUFFER PIECES ON THE END BLOCKING ASSEMBLIES 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". THIS PIECE IS NOT REQUIRED WHEN THE CORNER PORTIONS OF THE CONTAINER ENDWALLS ARE SMOOTH AND FLAT.
- 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 VIEWS FOR CLARITY PURPOSES.

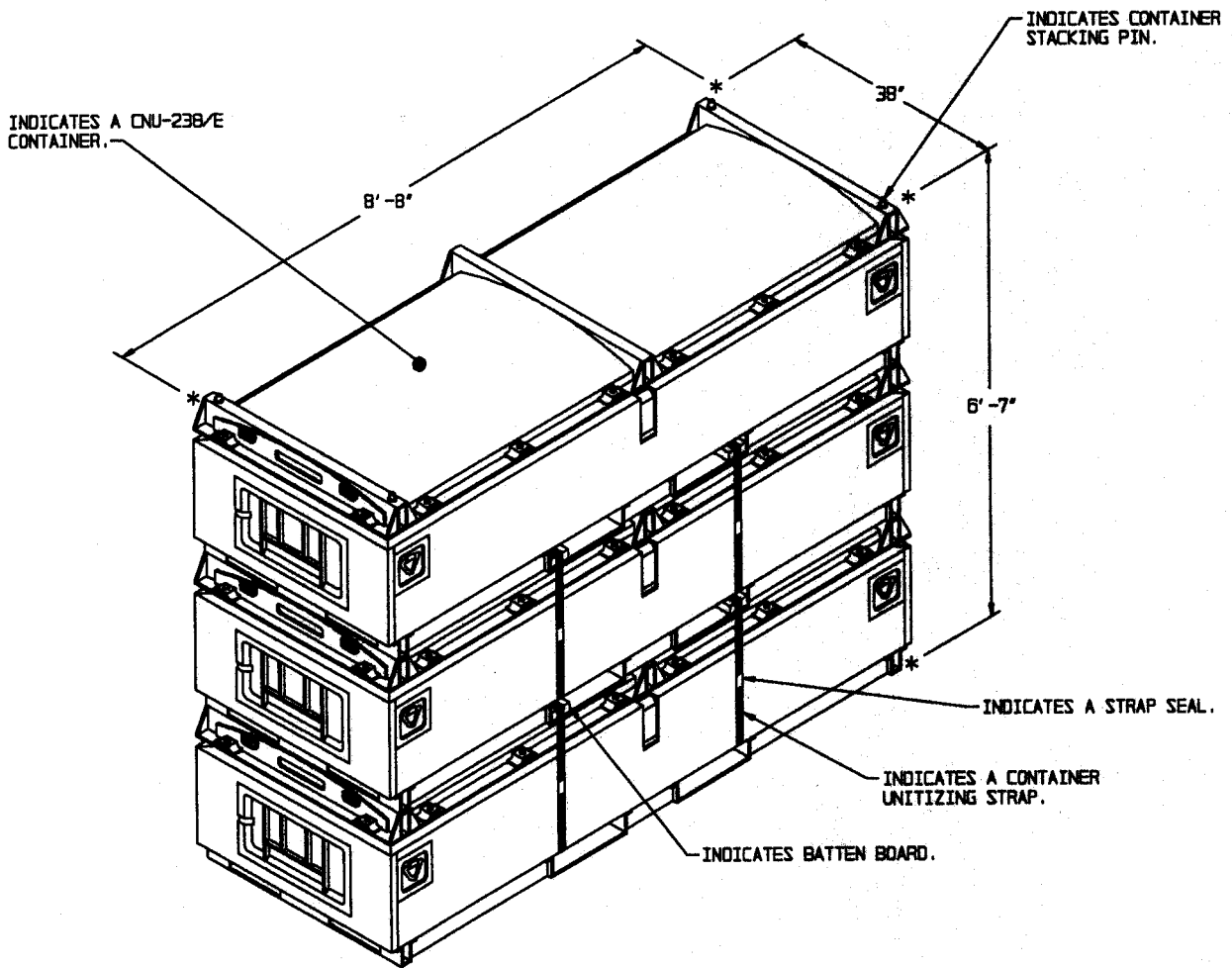
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## MATERIAL SPECIFICATIONS

- LUMBER - - - - - : SEE TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC MM-L-751.
- NAILS - - - - - : FED SPEC FF-N-105; COMMON.
- 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.

## (GENERAL NOTES CONTINUED)

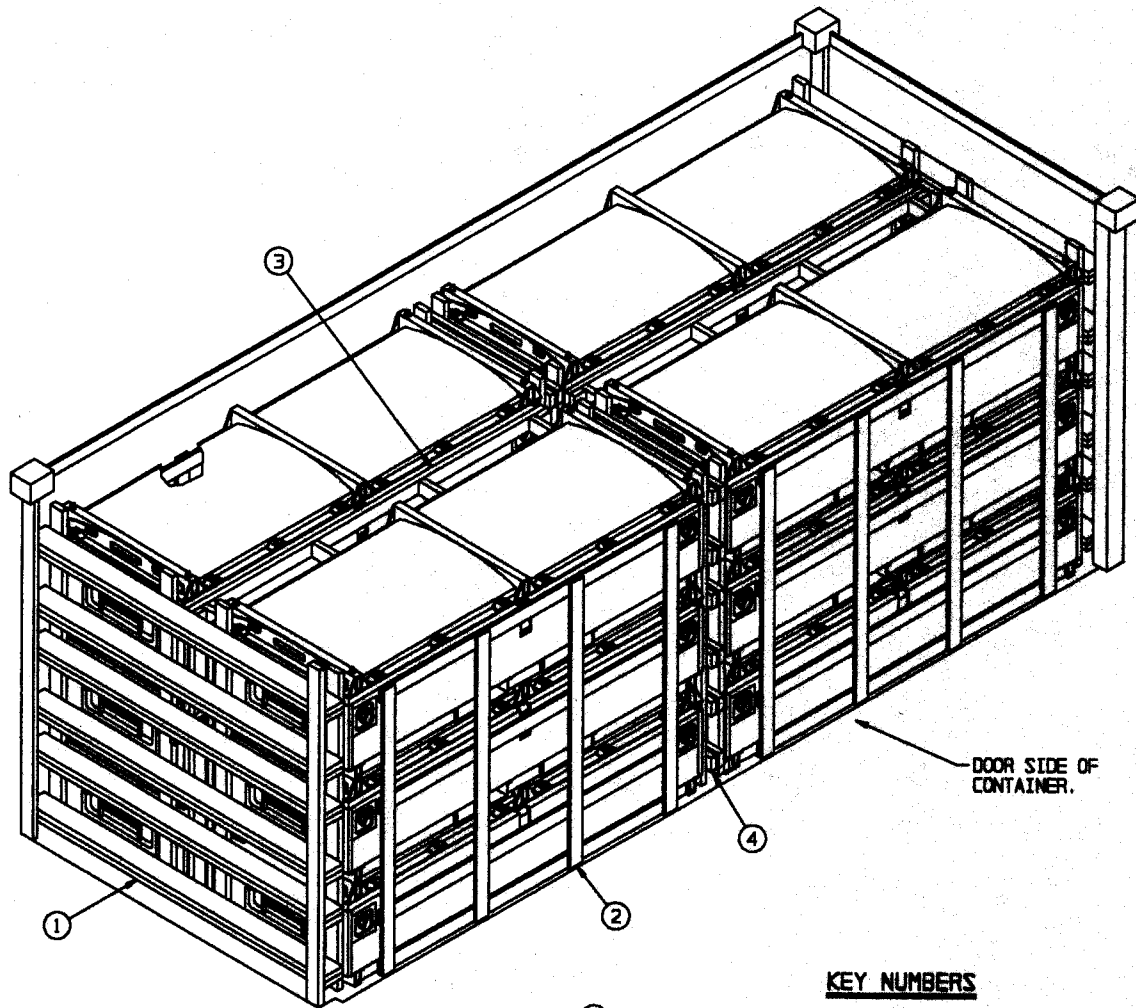
- K. REQUIREMENTS CITED WITHIN THE BUREAU OF EXPLOSIVES PAMPHLET 6C APPLY WHEN THE SHIPMENT MOVES BY TRAILER/CONTAINER-ON-FLAT-CAR (T/COFC). SPECIAL T/COFC NOTES FOLLOW:
1. A LOADED CONTAINER MUST BE ON A CHASSIS EQUIPPED WITH TWO BOGIE ASSEMBLIES WHEN BEING MOVED IN TOFC SERVICE.
  2. THE LOAD LIMIT 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.
- 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 0.454KG.
- N. THE QUANTITY OF CONTAINERS SHOWN IN THE LOAD ON PAGE 4 MAY BE REDUCED FOR SHIPMENT, IF DESIRED. 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. ALSO, THE SIDE FILL ASSEMBLY AND SPACER ASSEMBLY WHICH IS CONTACTING THE REDUCED CONTAINER STACK MAY BE REDUCED IN HEIGHT, IF DESIRED.



**CONTAINER STACK**  
(SEE SPECIAL NOTES BELOW)

**SPECIAL NOTES:**

1. A STACK OF CONTAINERS, CONSISTING OF THREE (3) CNU-238/E CONTAINERS, WILL BE UNITIZED AS SPECIFIED WITHIN NAVAL SEA SYSTEMS COMMAND DRAWING WR 54/270 PRIOR TO SHIPMENT WITHIN A SIDE OPENING ISO CONTAINER.
2. IF THE MATERIALS HANDLING EQUIPMENT (MHE) TO BE USED FOR THE HANDLING OF THE CNU-238/E CONTAINERS DOES NOT HAVE A CAPACITY GREAT ENOUGH TO HANDLE A STACK OF THREE CONTAINERS, THE CONTAINERS MAY BE HANDLED INDIVIDUALLY. THE CONTAINER STACK, HOWEVER, MUST BE UNITIZED AS SPECIFIED IN WR 54/270 PRIOR TO ITS FINAL POSITIONING WITHIN THE SIDE OPENING ISO CONTAINER.



ISOMETRIC VIEW

KEY NUMBERS

- ① END BLOCKING ASSEMBLY (2 REOD). SEE THE DETAIL ON PAGE 6.
- ② SIDE FILL ASSEMBLY (4 REOD). SEE THE DETAIL ON PAGE 6.
- ③ SPACER ASSEMBLY (2 REOD). SEE THE DETAIL ON PAGE 7.
- ④ CENTER FILL ASSEMBLY (2 REOD). SEE THE DETAIL ON PAGE 7 AND THE SPECIAL NOTE ON PAGE 5.

**RECOMMENDED SEQUENTIAL LOADING PROCEDURES**

1. PRE-FABRICATE TWO END BLOCKING ASSEMBLIES, FOUR SIDE FILL ASSEMBLIES, TWO SPACER ASSEMBLIES AND TWO CENTER FILL ASSEMBLIES.
2. INSTALL ONE END BLOCKING ASSEMBLY, ONE SIDE FILL ASSEMBLY AND LOAD ONE STACK OF THREE CONTAINERS.
3. REPEAT STEP 2.
4. INSTALL ONE CENTER FILL ASSEMBLY.
5. INSTALL ONE SPACER ASSEMBLY AND LOAD ONE STACK OF THREE CONTAINERS.
6. REPEAT STEP 5.
7. INSTALL ONE CENTER FILL ASSEMBLY.
8. INSTALL THE TWO REMAINING SIDE FILL ASSEMBLIES.

**SPECIAL NOTE:**

THE "CENTER FILL ASSEMBLY", PIECE MARKED ④, IS BASED ON A VOID OF 7" BETWEEN LONGITUDINALLY ADJACENT CONTAINERS. IF THE VOID IS LESS THAN 7", THE THICKNESS OF THE FILL MATERIAL MAY NEED TO BE ADJUSTED. A FIELD CHECK OF THE VOID BETWEEN LONGITUDINALLY ADJACENT CONTAINERS SHOULD BE MADE PRIOR TO ASSEMBLING THE CENTER FILL.

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
CBU-MK20	12	20,332 LBS
DUNNAGE		1,071 LBS
CONTAINER		6,050 LBS
<b>TOTAL WEIGHT</b>		<b>27,453 LBS (APPROX)</b>

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	255	85
2" X 4"	381	254
2" X 6"	191	191
NAILS	NO. REQD	POUNDS
6d (2")	152	1
10d (3")	644	10

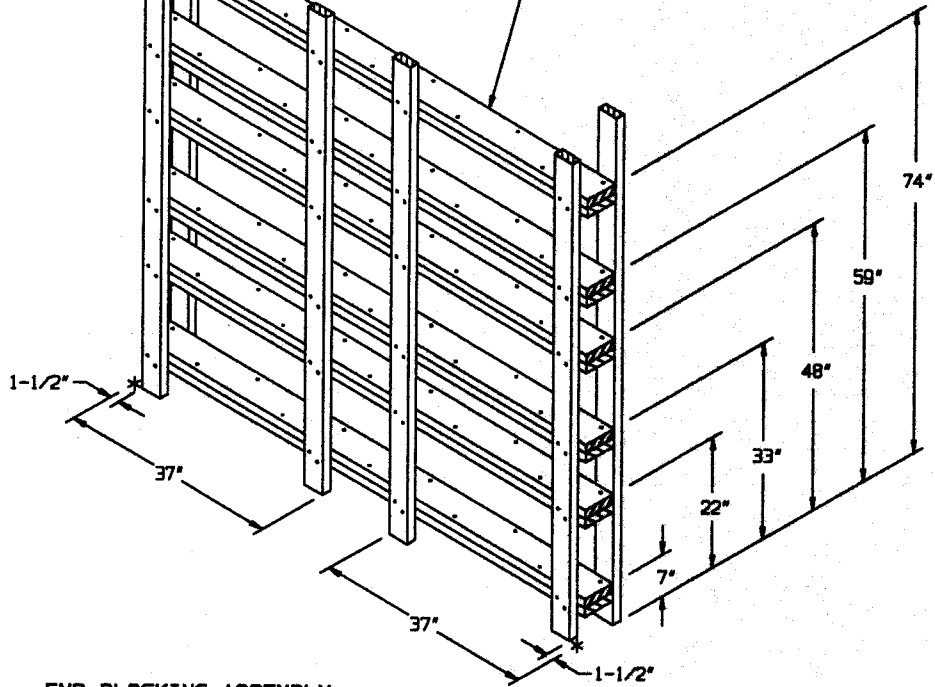
**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
CBU-SB/B	12	25,972 LBS
DUNNAGE		1,071 LBS
CONTAINER		6,050 LBS
<b>TOTAL WEIGHT</b>		<b>33,093 LBS (APPROX)</b>

BEARING PIECE, 2" X 4" X 6'-8"  
(4 REOD). NAIL TO THE BEAM  
ASSEMBLIES W/2-10d NAILS AT  
EACH JOINT.

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

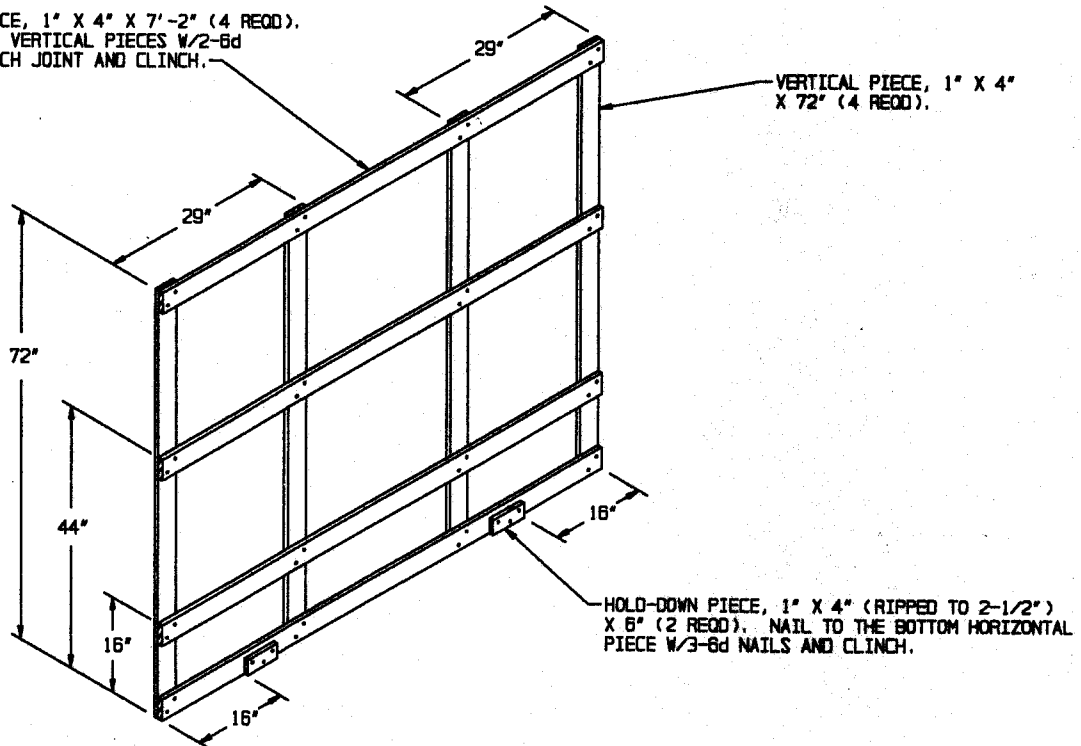
BEAM ASSEMBLY, 2" X 8" BY INSIDE CONTAINER WIDTH  
MINUS 1" (REF: 7'-2") (DOUBLED) (8 REOD). LAMI-  
NATE THE SECOND PIECE TO THE FIRST PIECE W/11-10d  
NAILS.



**END BLOCKING ASSEMBLY**

BEARING PIECE, 1" X 4" X 7'-2" (4 REOD).  
NAIL TO THE VERTICAL PIECES W/2-6d  
NAILS AT EACH JOINT AND CLINCH.

VERTICAL PIECE, 1" X 4"  
X 72" (4 REOD).

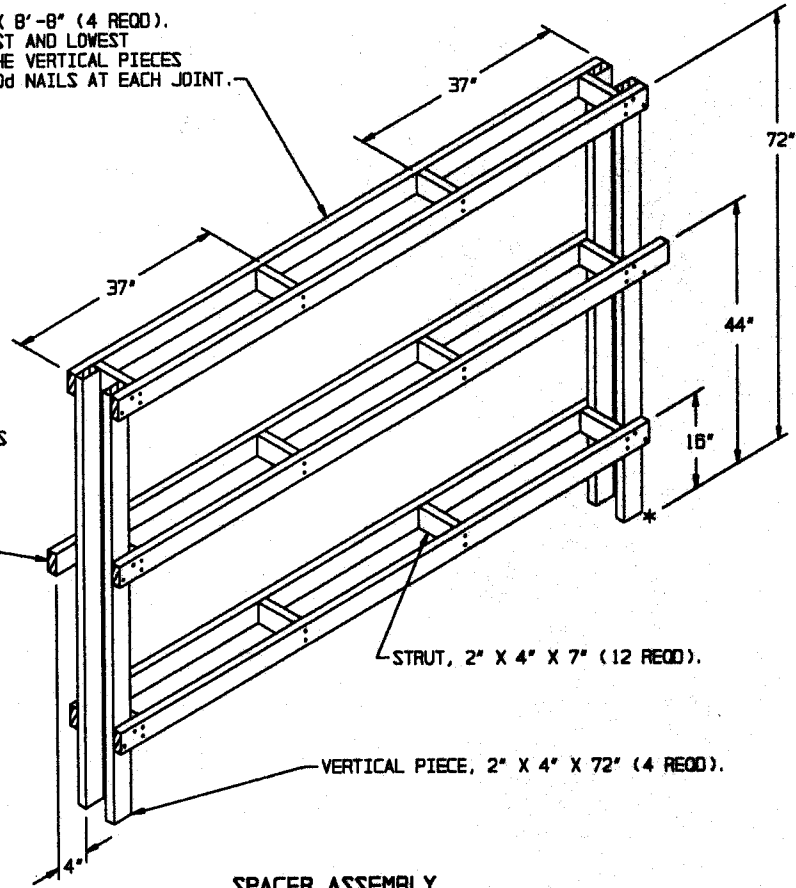


HOLD-DOWN PIECE, 1" X 4" (RIPPED TO 2-1/2"  
X 6" (2 REOD). NAIL TO THE BOTTOM HORIZONTAL  
PIECE W/3-6d NAILS AND CLINCH.

**SIDE FILL ASSEMBLY**

BEARING PIECE, 2" X 4" X 8'-8" (4 REQD).  
 POSITION AT THE UPPERMOST AND LOWEST  
 POSITIONS AND NAIL TO THE VERTICAL PIECES  
 AND TO THE STRUTS W/2-10d NAILS AT EACH JOINT.

HOLD-DOWN PIECE, 2" X 4" X 9'-0"  
 (2 REQD). POSITION SO AS TO  
 EXTEND 4" PAST THE VERTICAL PIECES  
 AT OPPOSITE ENDS OF THE ASSEMBLY  
 AS SHOWN. NAIL TO THE VERTICAL  
 PIECES AND STRUTS W/2-10d NAILS  
 AT EACH JOINT.



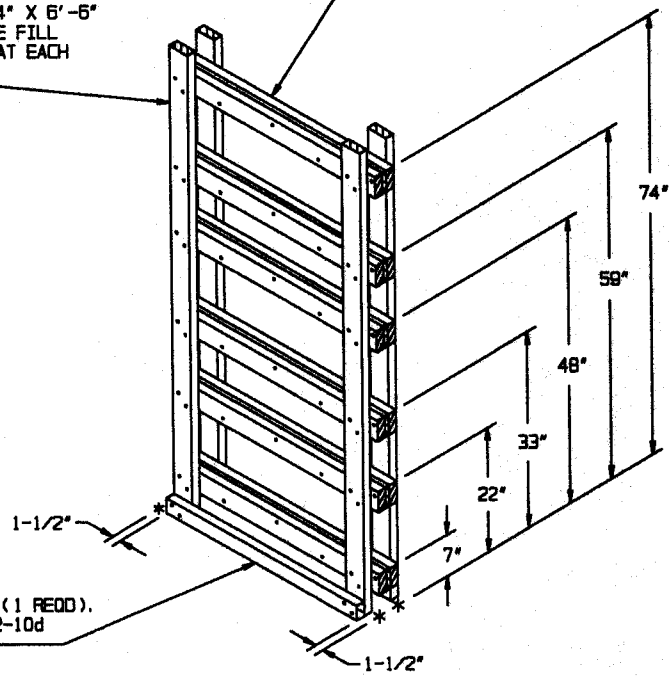
STRUT, 2" X 4" X 7" (12 REQD).

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

SPACER ASSEMBLY

FILL MATERIAL, 2" X 4" X 40" (2 REQD) AND  
 1" X 4" X 40" (1 REQD). POSITION THE  
 1" X 4" PIECE BETWEEN THE 2" X 4" PIECES  
 AND LAMINATE W/5-10d NAILS ON EACH SIDE.

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



HOLD-DOWN PIECE, 2" X 3" X 37" (1 REQD).  
 NAIL TO THE VERTICAL PIECES W/2-10d  
 NAILS AT EACH END.

CENTER FILL ASSEMBLY

DETAILS

