

APPROVED BY
BUREAU OF EXPLOSIVES

DATE

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5/13/94

LOADING AND BRACING WITH WOODEN DUNNAGE ON FLATRACK 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

(GENERAL NOTES CONTINUED)

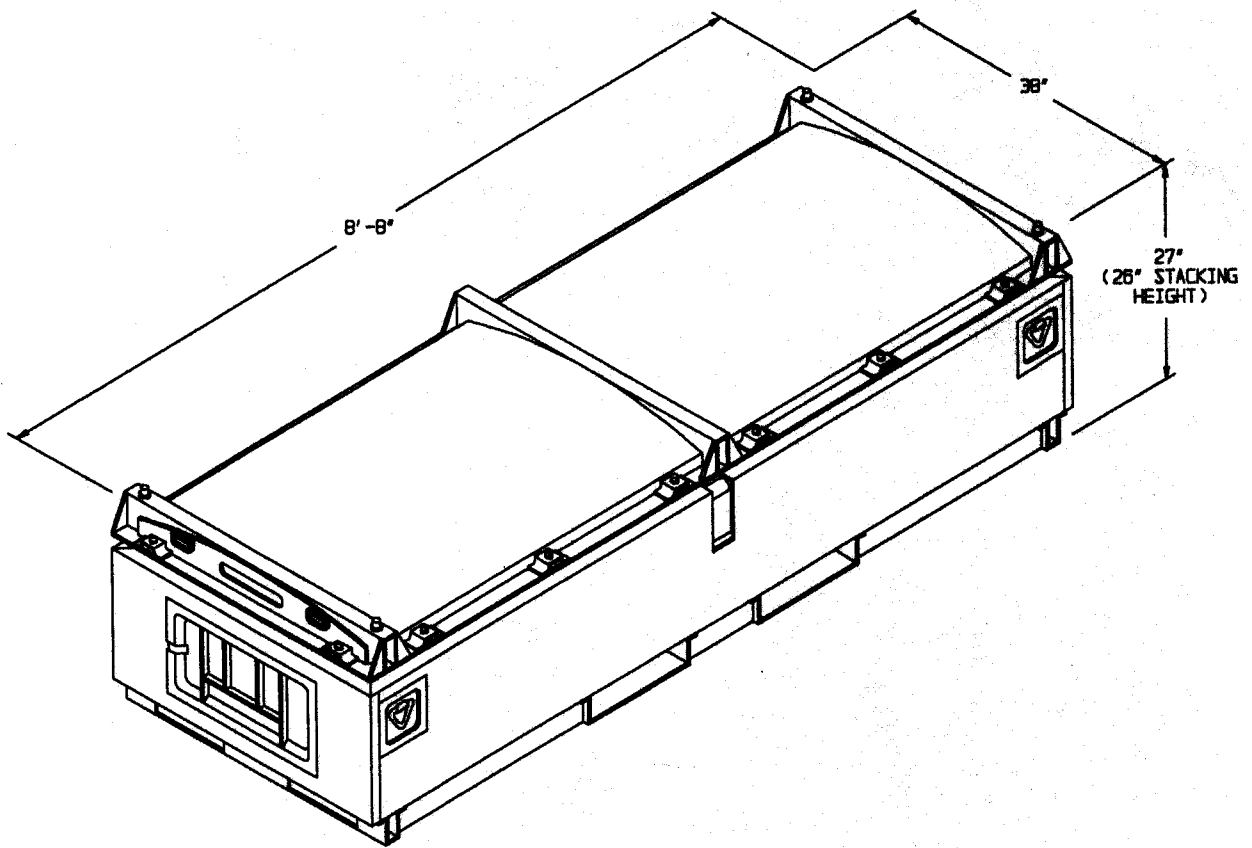
- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. ALL LOADS SHIPPED BY THE PROCEDURES DEPICTED IN THIS DRAWING MUST BE IN ACCORDANCE WITH THE REQUIREMENTS SET FORTH IN TITLE 49, THE UNITED STATES CODE OF FEDERAL REGULATIONS; AR 55-355/AFM 75-2; DOD 4500.32-R; DOD 5100.76-M; DOD 6055.9-STD; AS WELL AS ANY AND ALL OTHER APPLICABLE SERVICE REGULATIONS.
- B. THE SPECIFIED OUTLOADING PROCEDURES ARE APPLICABLE TO LOADS OF MK20 (ROCKEYE II) OR CBU-59/B (APAM) BOMBS PACKED IN CNU-238/E CONTAINERS. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CNU-238/E CONTAINER WITH BOMBS INSTALLED. SEE PAGE 3 FOR DETAILS OF THE CONTAINER. CAUTION: REGARDLESS OF THE QUANTITY OF CONTAINERS TO BE SHIPPED, THE "MAXIMUM GROSS WEIGHT" OF THE FLATRACK ISO CONTAINER MUST NOT BE EXCEEDED.
- D. THE LOAD AS SHOWN IS BASED ON A 20'-0" LONG BY 8'-0" WIDE FLATRACK ISO CONTAINER WITH FULL HEIGHT ENDWALLS, AND INSIDE DIMENSIONS OF 19'-4" LONG BY 7'-2" WIDE. THE LOAD AS SHOWN CAN BE SHIPPED BY ANY FORM OF SURFACE TRANSPORTATION. NOTICE: OTHER CONTAINERS OF THE SAME DESIGN CONFIGURATION CAN ALSO BE USED.
- E. WHEN LOADING THE CNU-238/E CONTAINERS, THEY ARE TO BE POSITIONED SO AS TO ACHIEVE A TIGHT LOAD BETWEEN THE END BLOCKING ASSEMBLY AND THE LADING. ALTHOUGH A TOTAL OF ONE INCH OF UNBLOCKED SPACE ACROSS THE WIDTH OF A LOAD IS PERMITTED, LONGITUDINAL VOIDS WITHIN THE LOAD ARE TO BE HELD TO A MINIMUM, NOT EXCEEDING ONE-HALF INCH (1/2"). EXCESSIVE SLACK CAN BE ELIMINATED FROM A LOAD BY LAMINATING ADDITIONAL PIECES OF APPROPRIATE THICKNESS TO THE HORIZONTAL PIECES ON THE CENTER GATE. NAIL EACH ADDITIONAL PIECE TO THE HORIZONTAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE THICKNESS AND QUANTITY OF THE VERTICAL PIECES IN THE CENTER GATE MAY BE ADJUSTED AS REQUIRED TO FACILITATE VARIANCE IN THE LENGTH OF THE CONTAINER.
- 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. PORTIONS OF ONE OF THE FLATRACK ENDWALLS DEPICTED WITHIN THIS DRAWING HAVE NOT BEEN SHOWN IN THE LOAD VIEW FOR CLARITY PURPOSES.
- J. WHEN INSTALLING END BLOCKING ASSEMBLIES, THE ASSEMBLIES MUST BE POSITIONED SO AS TO BE SUPPORTED AND IN LINE WITH THE STRONG POINTS OF THE FLATRACK ENDWALLS. SEE SPECIAL NOTE 1 ON PAGE 5.
- K. WHEN STEEL STRAPPING IS SEALED IN AN END-OVER-END LAP JOINT, A MINIMUM OF ONE SEAL WITH TWO PAIR OF NOTCHES WILL BE USED TO SEAL THE JOINT WHEN A NOTCH-TYPE SEALER IS BEING USED. A MINIMUM OF TWO SEALS, BUTTED TOGETHER WITH TWO PAIR OF CRIMPS PER SEAL, WILL BE USED TO SEAL THE JOINT WHEN A CRIMP-TYPE SEALER IS BEING USED. REFER TO THE "STRAP JOINT A" AND "STRAP JOINT B" DETAILS ON PAGE 7 FOR GUIDANCE.
- L. 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.

(CONTINUED AT RIGHT)

- M. DURING INTRASTATE AND/OR INTERSTATE MOVES BY MOTOR CARRIER, A PROPER CHASSIS OR MODIFIED FLAT BED TRAILER MUST BE USED TO PRECLUDE VIOLATION OF ONE OR MORE "WEIGHT LAWS" APPLICABLE TO THE STATE OR STATES INVOLVED.
- N. THE 2" STRAPPING USED FOR LOAD SECUREMENT, I.E., HOLD-DOWN STRAPS, WILL ONLY BE FASTENED TO THE FLATRACK CONTAINER BY UTILIZING TIEDOWN PROVISIONS LOCATED ON THE TOP OR ALONG THE SIDE OF THE FLATRACK BOTTOM SIDE RAILS. CAUTION: THE LOAD SECUREMENT STRAPS WILL NOT BE POSITIONED AROUND THE UNDERSIDE OR THROUGH THE FORKLIFT POCKETS OF THE FLATRACK CONTAINER. ADDITIONALLY, THE FLATRACK TIEDOWN PROVISIONS MUST BE AT LEAST AS STRONG AS THE 2" LOAD SECUREMENT STRAPPING BEING USED; AND BE OF A SUFFICIENT WIDTH TO RECEIVE THE 2" STRAPPING AND BE OF A DESIGN WHICH WILL PROVIDE A BEARING SURFACE ACROSS THE FULL WIDTH OF THE 2" STRAPPING SO THAT THE STRAPPING WILL NOT BE DEFORMED, ESPECIALLY AT ITS EDGES, WHEN PROPERLY TENSIONED.
- O. THE OUTLOADING PROCEDURES SPECIFIED HEREIN CAN ALSO BE UTILIZED FOR THE SHIPMENT OF CNU-238/E CONTAINERS WHEN THEY ARE LOADED WITH AN ITEM WHICH IS IDENTIFIED DIFFERENTLY BY NOMENCLATURE THAN THE ITEMS DESIGNATED WITHIN THE DRAWING TITLE.
- P. REFER TO ASSOCIATION OF AMERICAN RAILROADS MANUAL "GENERAL RULES GOVERNING THE LOADING OF COMMODITIES ON OPEN TOP CARS" FOR APPLICABLE LOADING RULES AS FOLLOWS: PREFACE, 1A, 2, 5, 10, AND 15. NOTE THAT ALL STRAPPING USED FOR LOAD SECUREMENT, I.E., HOLD-DOWN STRAPS, MUST BE MARKED AS SPECIFIED IN LOADING RULE 15.
- Q. ANTI-CHAFING MATERIAL MAY BE INSTALLED AT POINTS OF CONTACT BETWEEN CONTAINERS AND BETWEEN CONTAINERS AND STEEL STRAPPING, IF DESIRED, TO PREVENT CHAFING DAMAGE TO CONTAINER PAINT AND MARKINGS.
- R. CNU-238/E CONTAINERS THAT ARE UNITIZED AS SPECIFIED WITHIN WR-54/268 OR WR-54/270 (NAVY) MAY BE LOADED IN A UNITIZED CONFIGURATION, PROVIDING THE MATERIALS HANDLING EQUIPMENT (MHE) BEING USED FOR HANDLING OF THE CONTAINERS IS OF SUFFICIENT CAPACITY. NOTE: THE CONTAINERS DO NOT NEED TO BE UNITIZED PRIOR TO LOADING.
- S. 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.

MATERIAL SPECIFICATIONS

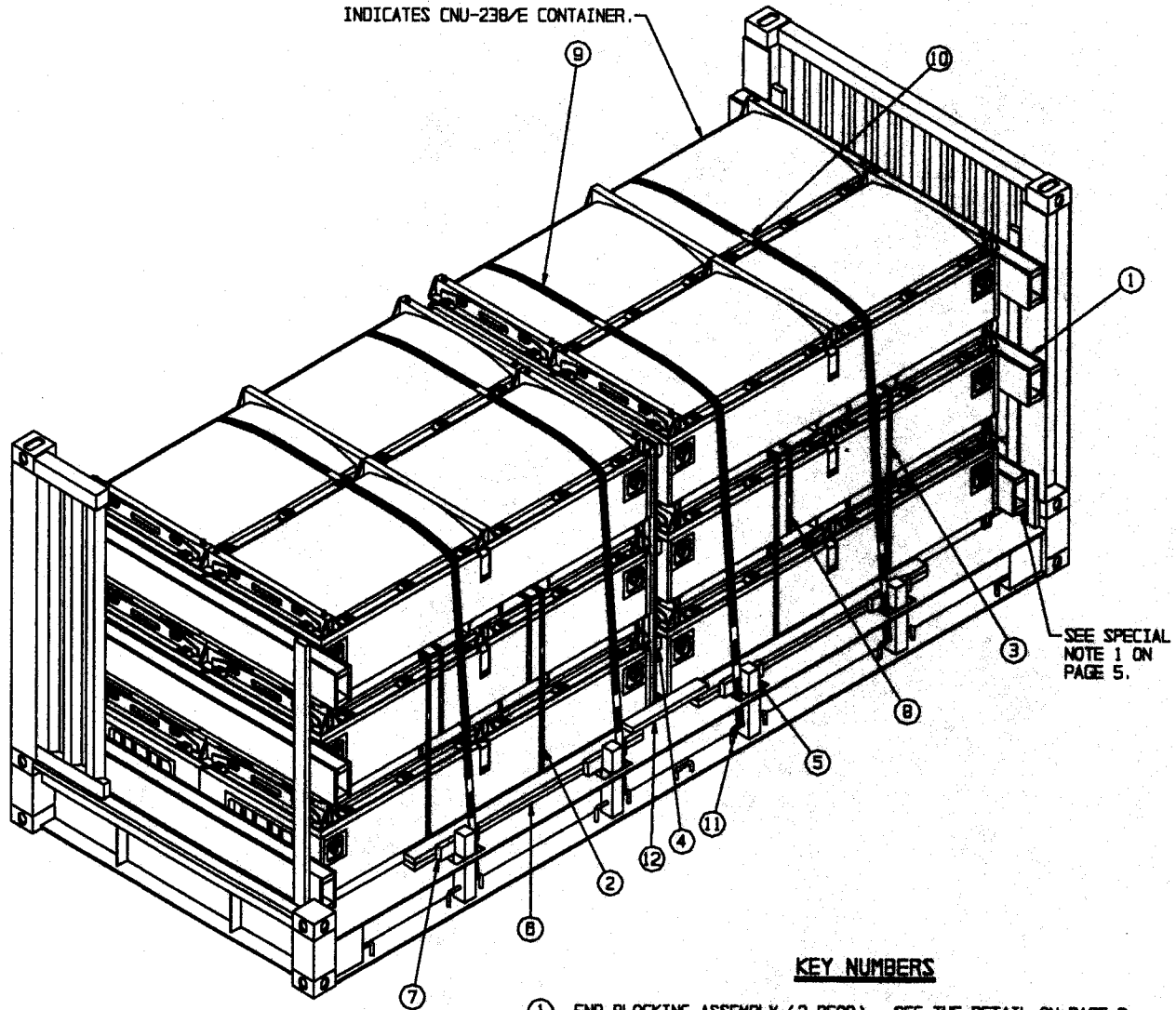
- LUMBER - - - - - : SEE TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC M4-L-751.
- NAILS - - - - - : FED SPEC FF-N-105; COMMON.
- PLYWOOD - - - - - : COMMERCIAL ITEM DESCRIPTION A-A-55057, TYPE A, CONSTRUCTION AND INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-0. IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER INTERIOR OR AN EXTERIOR GRADE MAY BE SUBSTITUTED.
- 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.
- ANTI-CHAFING MATERIAL - - - - - : MIL-B-121 (OR EQUAL); NEUTRAL BARRIER MATERIAL.



CNU-238/E CONTAINER

CONTAINER WEIGHT, MK20 - - - - 1,657-1,687 LBS (APPROX)
CONTAINER WEIGHT, CBU-58/B - - 2,157 LBS (APPROX)
CUBE - - - - - 61.8 CU FT

INDICATES CNU-238/E CONTAINER.



ISOMETRIC VIEW

(KEY NUMBERS CONTINUED)

- ⑩ SEAL FOR 2" STRAPPING (20 REQD). FASTEN PIECE MARKED ⑨ WITH ONE SEAL AT EACH LOCATION CRIMPED WITH TWO PAIR OF NOTCHES. FASTEN PIECE MARKED ⑪ WITH ONE SEAL CRIMPED WITH ONE PAIR OF NOTCHES. SEE THE "TIEDOWN DETAIL" ON PAGE 7.
- ⑪ PAD, STRAPPING, 2" X .044" OR .050" X 18" (8 REQD). PRE-POSITION THE PAD BETWEEN THE HOLD-DOWN STRAP, PIECE MARKED ⑨, AND THE FLATRACK TIEDOWN PROVISIONS. FASTEN WITH ONE SEAL CRIMPED WITH ONE PAIR OF NOTCHES. SEE THE "TIEDOWN DETAIL" ON PAGE 7.
- ⑫ STOP PIECE, 2" X 4" X 24" (2 REQD). NAIL TO THE SIDE BLOCKING PIECES W/3-10d NAILS AT EACH END.

KEY NUMBERS

- ① END BLOCKING ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 6. INSTALL WITH THE VERTICAL PIECES INSET INTO THE FLATRACK ENDWALL. SEE SPECIAL NOTE 1 ON PAGE 5.
- ② UNITIZING STRAP, 1-1/4" X .035" OR .031" BY A LENGTH TO SUIT (REF: 17'-0") (8 REQD). INSTALL TO UNITIZE ONE STACK OF THREE CONTAINERS.
- ③ SEAL FOR 1-1/4" STRAPPING (12 REQD, 1 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES.
- ④ CENTER GATE (1 REQD). SEE THE DETAIL ON PAGE 6.
- ⑤ STAKE, 4" X 4" X 18" (8 REQD). INSTALL THE STAKE INTO THE FLATRACK STAKE POCKETS WITH A TIGHT (SNUG) FIT. NOTE: REFERENCE DIMENSIONS FOR A TIGHT FITTING STAKE ARE 3-1/4" (ACTUAL) X 3-1/4" (ACTUAL). NAIL 1-20d NAIL THRU THE HOLE PROVIDED IN THE FACE OF THE FLATRACK STAKE POCKET AND INTO THE STAKE. BEND THE PROTRUDING HEAD OF THE NAIL OVER AGAINST THE STAKE POCKET.
- ⑥ SIDE BLOCKING, 2" X 4" X 72" (DOUBLED) (4 REQD). LAMINATE THE FIRST PIECE TO THE SECOND PIECE W/7-10d NAILS. INSTALL AS DEPICTED, AGAINST THE CNU-238/E CONTAINERS AND CENTERED BETWEEN THE TWO STAKES.
- ⑦ FILL PIECE, 1" OR 2" X 4" X 12" (AS REQD). POSITION BETWEEN THE STAKE AND THE SIDE BLOCKING AND NAIL TO THE SIDE BLOCKING WITH 3 APPROPRIATELY SIZED NAILS (6d FOR 1" MATERIAL, 10d FOR 2" MATERIAL). TOENAIL TO THE STAKE W/2-12d NAILS.
- ⑧ BUNDLING STRAP, 1-1/4" X .035" OR .031" BY A LENGTH TO SUIT (REF: 18'-0") (4 REQD). INSTALL TO ENCIRCLE THE UPPER TWO LAYERS OF CONTAINERS.
- ⑨ HOLD-DOWN STRAP, 2" X .044" OR .050" BY A LENGTH TO SUIT (REF: 25'-0") (4 REQD). INSTALL EACH STRAP FROM TWO 12'-6" LONG PIECES.

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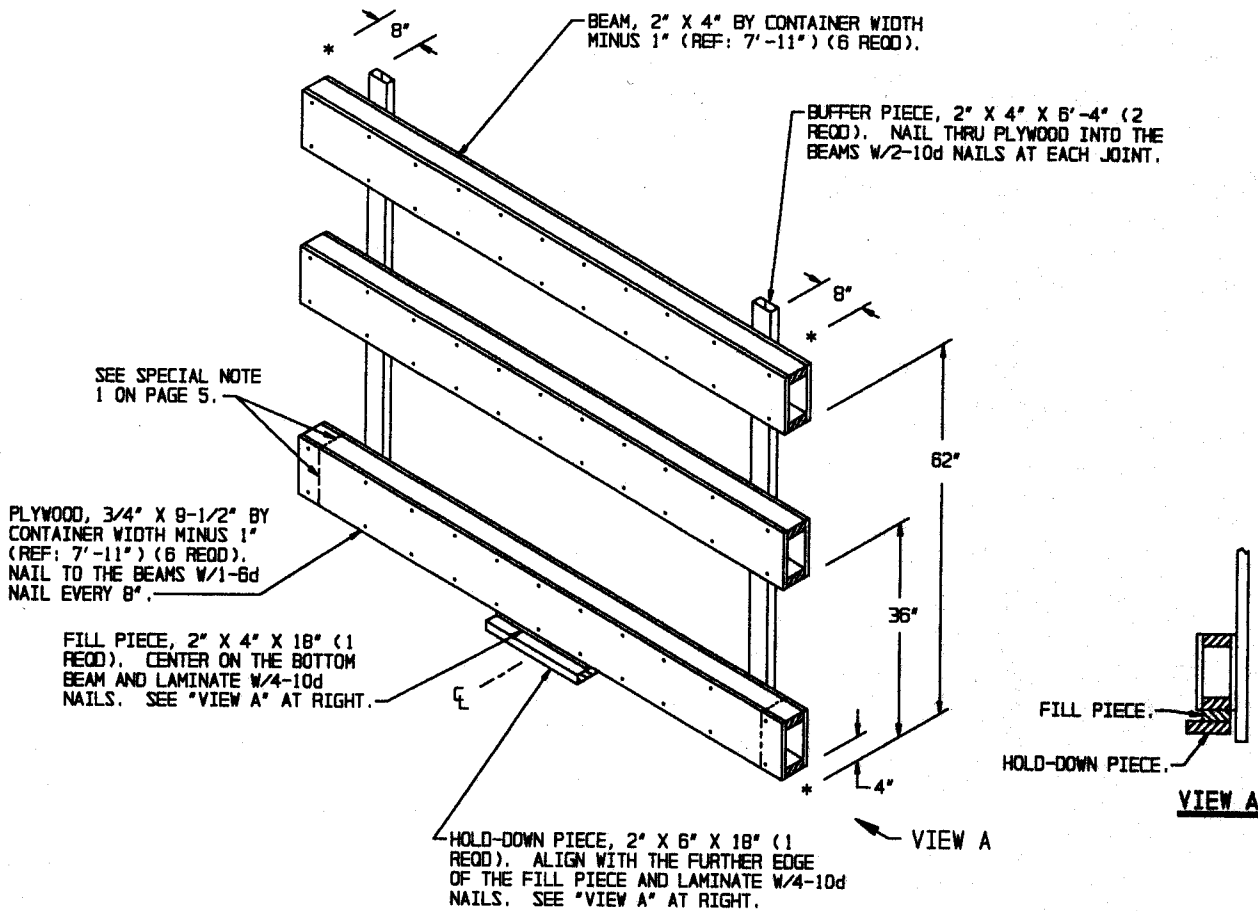
SPECIAL NOTES:

1. THE LENGTH OF THE BOTTOM BOX BEAM ASSEMBLY IN THE END BLOCKING ASSEMBLY MUST BE DECREASED IN ORDER TO AVOID CONTACT WITH THE FLATRACK HINGE. THE BOX BEAM ASSEMBLIES, HOWEVER, MUST STILL BEAR AGAINST THE FLATRACK STRONG POINTS.
2. THE LOAD AS SHOWN MAY BE REDUCED BY ONE OR TWO LAYERS, IF DESIRED, FOR A SHIPMENT OF 12 OR 6 CONTAINERS.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	12	4
1" X 6"	6	3
2" X 3"	12	6
2" X 4"	232	155
2" X 6"	9	9
4" X 4"	12	16
NAILS	NO. REOD	POUNDS
6d (2")	282	1-3/4
10d (3")	177	2-3/4
12d (3-1/4")	16	1/2
20d (4")	8	1/2
PLYWOOD, 3/4" - - - -	75.21 SQ FT REOD -	155.13 LBS
STEEL STRAPPING, 1-1/4" - - -	208' REOD - - -	30 LBS
SEAL FOR 1-1/4" STRAPPING - - -	12 REOD - - -	3/4 LB
STEEL STRAPPING, 2" - - - -	112' REOD - - -	38 LBS
SEAL FOR 2" STRAPPING - - - -	20 REOD - - -	4 LBS

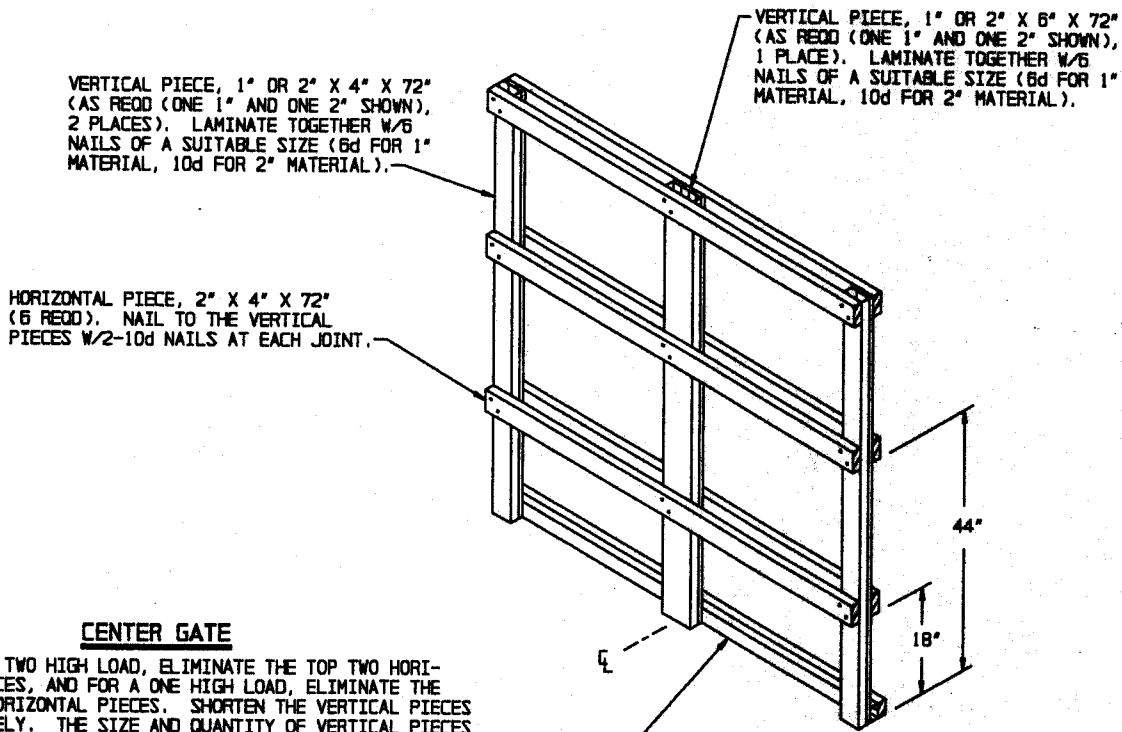
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CNU-23B/E - - - - -	12 - - - - -	25,884 LBS
DUNNAGE - - - - -	- - - - -	520 LBS
FLATRACK - - - - -	- - - - -	5,700 LBS
TOTAL WEIGHT - - - - -		32,204 LBS (APPROX)



END BLOCKING ASSEMBLY

NOTE: FOR TWO HIGH LOAD, ELIMINATE THE TOP BOX BEAM ASSEMBLY, AND FOR A ONE HIGH LOAD, ELIMINATE THE TOP TWO BOX BEAM ASSEMBLIES. SHORTEN THE BUFFER PIECES APPROPRIATELY.



CENTER GATE

NOTE: FOR TWO HIGH LOAD, ELIMINATE THE TOP TWO HORIZONTAL PIECES, AND FOR A ONE HIGH LOAD, ELIMINATE THE TOP FOUR HORIZONTAL PIECES. SHORTEN THE VERTICAL PIECES APPROPRIATELY. THE SIZE AND QUANTITY OF VERTICAL PIECES IS DEPENDENT ON THE VOID AT THE CENTER OF THE LOAD.

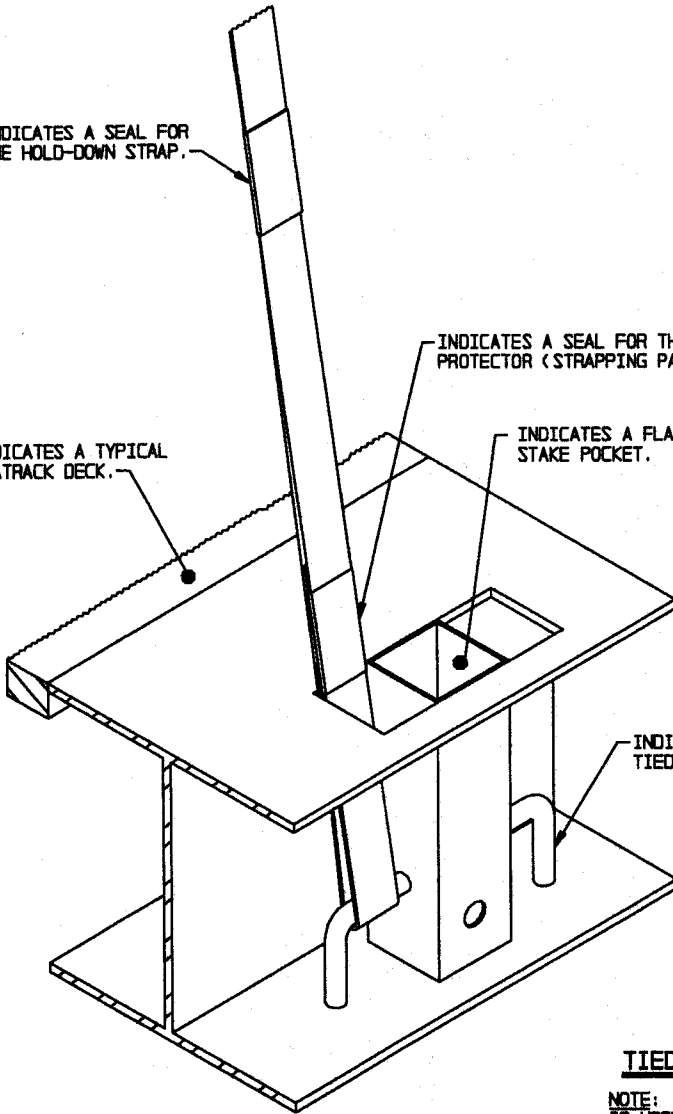
INDICATES A SEAL FOR THE HOLD-DOWN STRAP.

INDICATES A TYPICAL FLATRACK DECK.

INDICATES A SEAL FOR THE EDGE PROTECTOR (STRAPPING PAD).

INDICATES A FLATRACK STAKE POCKET.

INDICATES A FLATRACK TIEDOWN POINT.



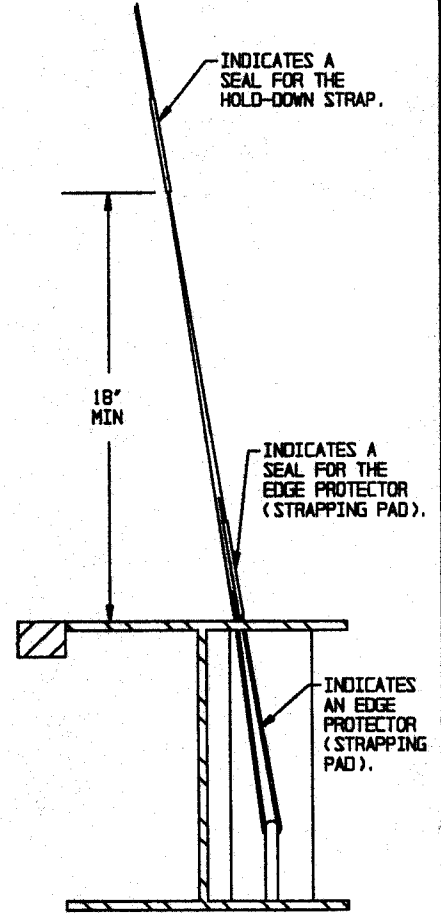
PARTIAL ISOMETRIC SECTION VIEW

INDICATES A SEAL FOR THE HOLD-DOWN STRAP.

18" MIN

INDICATES A SEAL FOR THE EDGE PROTECTOR (STRAPPING PAD).

INDICATES AN EDGE PROTECTOR (STRAPPING PAD).



PARTIAL SIDE VIEW

TIEDOWN DETAIL

NOTE: THIS PROCEDURE IS USED FOR TIEDOWN OF THE LOAD USING FLATRACK SIDE RAIL TIEDOWN POINTS. SEE GENERAL NOTE "N" ON PAGE 2.



STRAP JOINT A

METHOD OF SECURING A STRAP JOINT WHEN USING A NOTCH-TYPE SEALER.



STRAP JOINT B

METHOD OF SECURING A STRAP JOINT WHEN USING A CRIMP-TYPE SEALER.

STRAP/SEAL DETAIL

DETAILS

