

APPROVED BY U.S. COAST GUARD <i>M.D. Mowitz</i> DATE <u>6/1/88</u>	APPROVED BY HAZARDOUS MATERIALS SYSTEMS (BOE) ASSOCIATION OF AMERICAN RAILROADS <i>J. A. Alshuman</i> DATE <u>4/22/88</u>
---	--

LOADING AND BRACING ¹ ON COMMERCIAL FLATRACK CONTAINERS OF MK-20 ROCKEYE DISPENSER AND BOMB IN CNU-319/E SHIPPING AND STORAGE CONTAINER

INDEX

<u>ITEM</u>	<u>PAGE (S)</u>
GENERAL NOTES, AND MATERIAL SPECIFICATIONS -----	2
TYPICAL CONTAINER DETAILS -----	3
TYPICAL FULL LOAD PROCEDURES -----	4-5
GENERAL DETAILS -----	6-8

① LOADING AND BRACING SPECIFICATIONS SET FORTH WITHIN THIS DRAWING ARE APPLICABLE TO LOADS THAT ARE TO BE SHIPPED BY TRAILER/CONTAINER-ON-FLAT-CAR (T/COFC) RAIL CARRIER SERVICE. THESE SPECIFICATIONS MAY ALSO BE USED FOR LOADS THAT ARE TO BE MOVED BY MOTOR OR WATER CARRIERS. SEE GENERAL NOTE "L".

REVISIONS				DRAFTSMAN	PROJ ENG
				<i>Dier</i> / dh	<i>WRE</i> / WRE
				CHECKER	LOG ENGRS OFFICE
					<i>W.F. Ernst</i>
				APPROVED, U.S. ARMY ARMAMENT, MUNITIONS AND CHEMICAL COMMAND	
				<i>S.D. Byrd TMB-S</i>	
				APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND (AMC)	
				<i>William F. Ernst</i>	
				U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL	
				U.S. ARMY AMC DRAWING	
				JUNE 1988	
				CLASS	DIVISION
				DRAWING	FILE
				19	48
				7075	SP 15J1

DO NOT SCALE

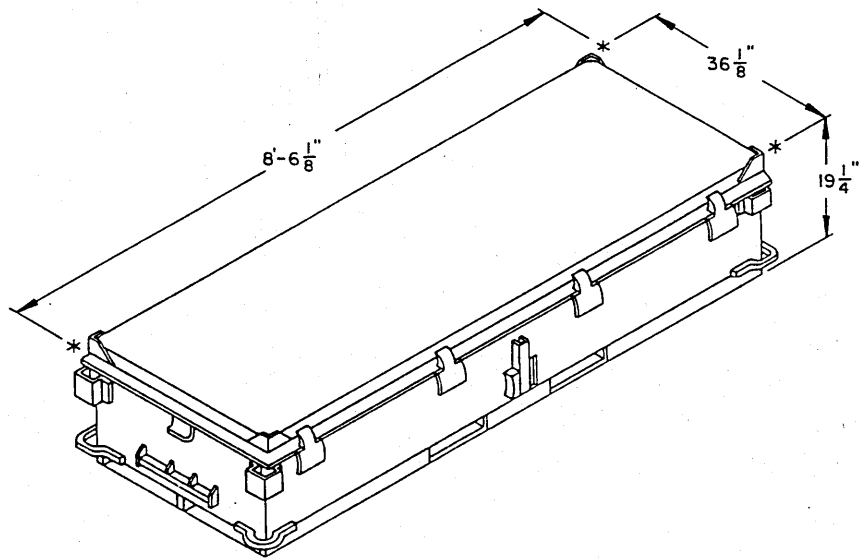
GENERAL NOTES

(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.
- C. THE SPECIFIED OUTLOADING PROCEDURES ARE APPLICABLE TO THE MK-20, ROCKEYE DISPENSER AND BOMB IN THE CNU-319/E CONTAINER. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CNU-319/E CONTAINER WITH MISSILES 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 INCLUDING LADING AND DUNNAGE MUST NOT EXCEED 44,800 POUNDS.
- D. A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE, WHEN NAILS ARE DRIVEN INTO THE 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.
- E. THE LOAD AS SHOWN IS BASED ON A 20'-0" LONG BY 8'-0" WIDE COMMERCIAL FLATRACK CONTAINER WITH FULL HEIGHT ENDWALLS, AND INSIDE DIMENSIONS OF 18'-8" LONG BY 7'-10" WIDE. THE LOAD AS SHOWN CAN BE SHIPPED BY ANY FORM OF SURFACE TRANSPORTATION. **NOTICE:** OTHER FLATRACK CONTAINERS OF THE SAME DESIGN CONFIGURATION CAN ALSO BE USED.
- F. DUNNAGE LUMBER SPECIFIED IS OF A NOMINAL SIZE. FOR EXAMPLE, 1" X 6" MATERIAL IS ACTUALLY 3/4" THICK BY 5-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE.
- G. WHEN LOADING THE CNU-319/E CONTAINERS, THEY ARE TO BE POSITIONED SO AS TO ACHIEVE A TIGHT LOAD BETWEEN THE LOAD BEARING GATES AND THE LADING. ALTHOUGH A TOTAL OF ONE INCH (1") OF UNBLOCKED SPACE ACROSS THE WIDTH OF THE 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 DUNNAGE TO THE LOAD BEARING GATE (S). NAIL EACH ADDITIONAL PIECE OF DUNNAGE TO THE LOAD BEARING GATE ASSEMBLY W/1 APPROPRIATELY SIZED NAIL EVERY EIGHT INCHES (8").
- H. PORTIONS OF THE FLATRACK ENDWALLS DEPICTED WITHIN THIS DRAWING HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.
- J. WHEN INSTALLING THE LOAD BEARING GATES, THE GATE ASSEMBLY MUST BE POSITIONED SO AS TO BE SUPPORTED AND IN LINE WITH THE STRONG POINTS OF THE FLATRACK ENDWALLS. **NOTE:** SOME FLATRACK ENDWALLS WILL REQUIRE FILL PIECES TO BE INSTALLED ON THE LOAD BEARING GATE TO PROVIDE A UNIFORM LOAD BEARING SURFACE. NAIL THESE FILL PIECES TO THE LOAD BEARING GATE W/1 APPROPRIATELY SIZED NAIL EVERY SIX INCHES (6").
- K. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF ONE (1) SEAL WITH TWO (2) PAIR OF NOTCHES WILL BE USED TO SEAL THE JOINT WHEN A NOTCH-TYPE SEALER IS BEING USED. A MINIMUM OF TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) 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 6 FOR GUIDANCE.
- L. 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.
- M. 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; 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.

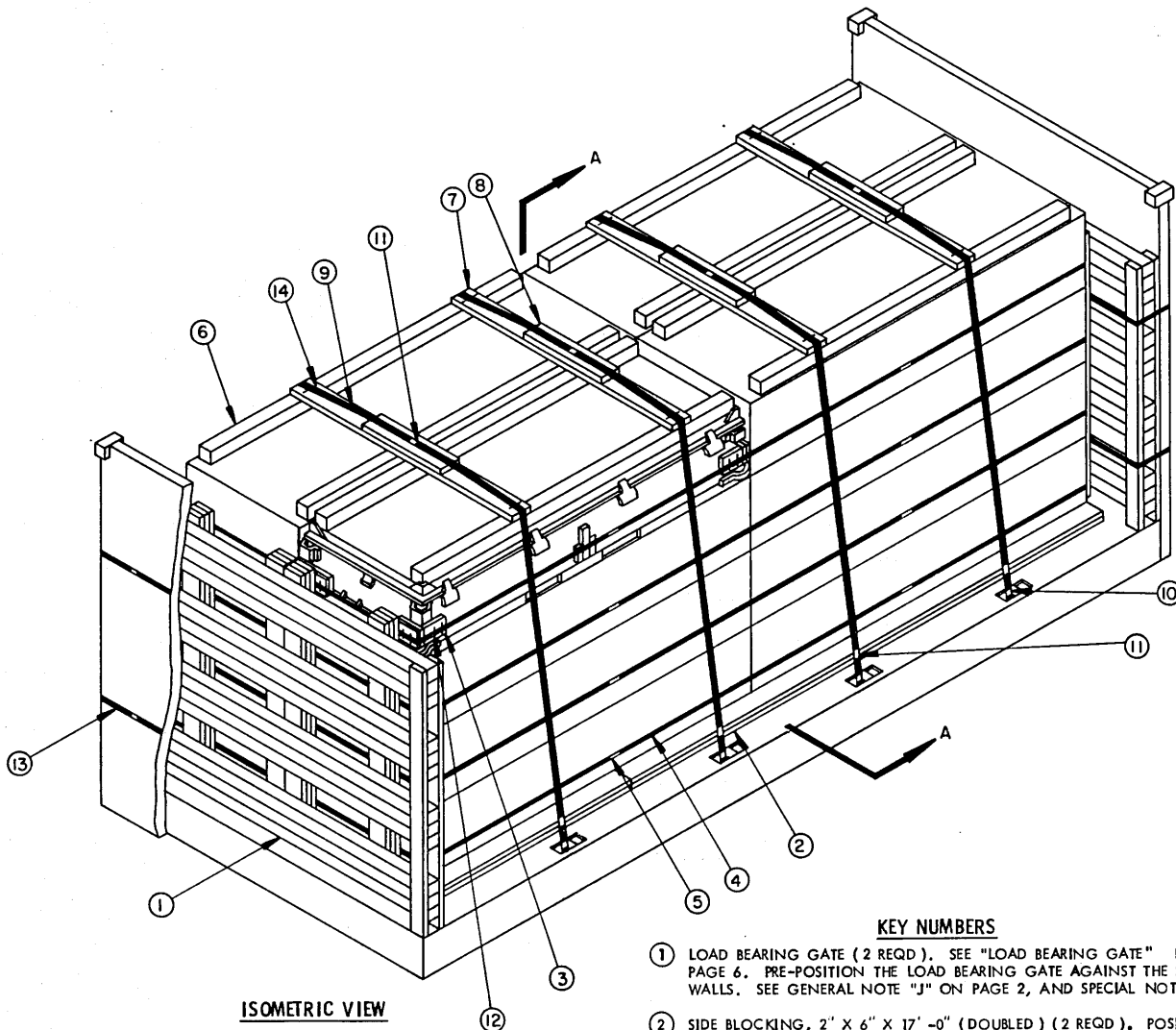
MATERIAL SPECIFICATIONS

- LUMBER** -----: SEE TM 743-200-1, DUNNAGE LUMBER. FED SPEC MM-L-751.
- NAILS** -----: COMMON, FED SPEC FF-N-105.
- STRAPPING, STEEL**---: CLASS I, TYPE I OR IV, HEAVY DUTY, FINISH A, B (GRADE 2), OR C, FED SPEC QQ-S-781.
- STRAP SEAL** -----: TYPE D, STYLE I, II, OR III, CLASS H, FINISH A, B (GRADE 2), OR C, FED SPEC QQ-S-781.
- STRAP STAPLE** -----: COMMERCIAL GRADE.



CNU-319E CONTAINER DETAIL

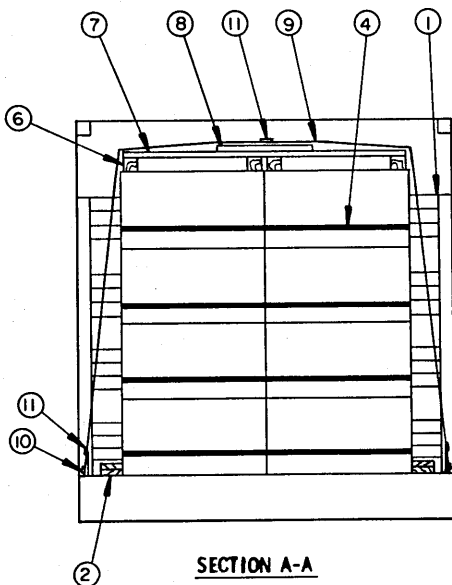
CONTAINER ----- 1 EA @ 475 LBS (APPROX)
 CUBE ----- 41.1 CUBIC FEET (APPROX)
 GROSS WEIGHT ----- 1,475 LBS (APPROX)



ISOMETRIC VIEW

(KEY NUMBERS CONTINUED)

- 13 GATE STRAP, 3/4" X .031" OR .035" BY A LENGTH TO SUIT (REF: 24'-0") (4 REQD). POSITION AROUND THE FLATRACK ENDWALL AND PIECE MARKED ① AS SHOWN ABOVE.
- 14 STAPLE, 2-1/8" X 1" LEG LENGTH (8 REQD). FASTEN PIECE MARKED ⑨ TO PIECE MARKED ⑦ WITH TWO STAPLES AS SHOWN ABOVE.



SECTION A-A

KEY NUMBERS

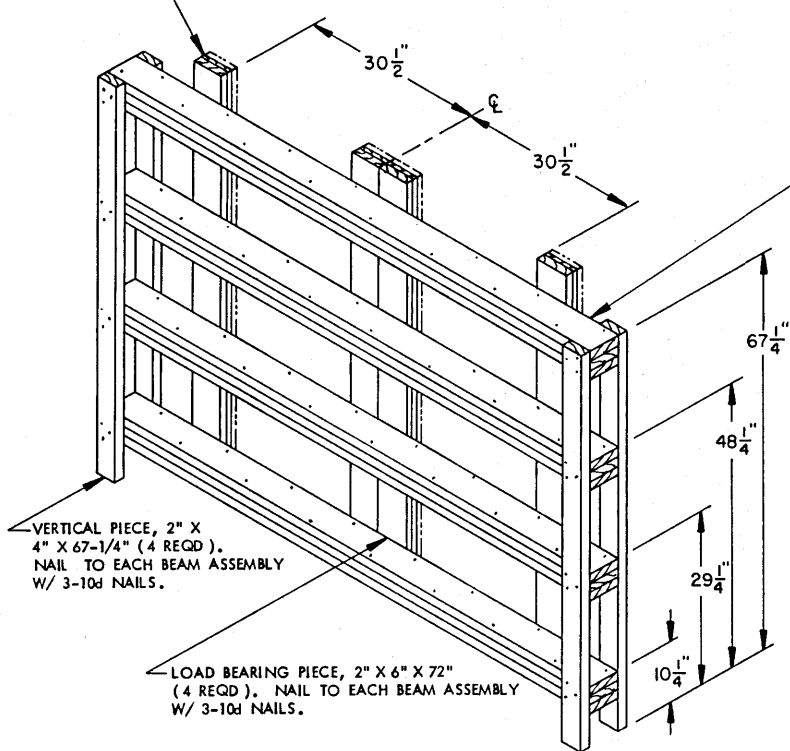
- ① LOAD BEARING GATE (2 REQD). SEE "LOAD BEARING GATE" DETAIL ON PAGE 6. PRE-POSITION THE LOAD BEARING GATE AGAINST THE FLAT RACK END WALLS. SEE GENERAL NOTE "J" ON PAGE 2, AND SPECIAL NOTE 4 ON PAGE 5.
- ② SIDE BLOCKING, 2" X 6" X 17'-0" (DOUBLED) (2 REQD). POSITION THE FIRST PIECE AGAINST THE CONTAINERS SIDEWALL AND NAIL W/1-10d NAIL EVERY SIX INCHES (6"). POSITION THE SECOND PIECE ON TOP OF THE FIRST AND NAIL IN A LIKE MANNER. SEE SPECIAL NOTE 1 ON PAGE 5.
- ③ CORNER FILL ASSEMBLY (64 REQD). SEE "CORNER FILL ASSEMBLY" DETAIL ON PAGE 7. SEE SPECIAL NOTE ON PAGE 7.
- ④ BUNDLING STRAP, 3/4" X .035" OR .031" BY A LENGTH TO SUIT (REF: 22'-0") (16 REQD).
- ⑤ SEAL, 3/4" (20 REQD). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES.
- ⑥ SUPPORT PIECE, 4" X 4" BY A LENGTH TO SUIT (REF: 8'-4") (8 REQD). POSITION ON TOP AND TIGHTLY AGAINST THE CONTAINER INTERLOCKS. SEE SPECIAL NOTE 2 ON PAGE 5.
- ⑦ STRAPPING BOARD, 2" X 6" X 68" (4 REQD). POSITION THE STRAPPING BOARD ON TOP OF THE SUPPORT PIECES AS SHOWN ABOVE AND NAIL W/3-12d NAILS AT EACH JOINT. SEE GENERAL NOTE "M" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 5.
- ⑧ PURCHASE BOARD, 2" X 6" X 24" (4 REQD). CENTER THE PURCHASE BOARD ON THE STRAPPING BOARD, PIECE MARKED ⑦, AND NAIL W/4-10d NAILS. SEE GENERAL NOTE "D" ON PAGE 2.
- ⑨ HOLD-DOWN STRAP, 2" X .050" BY A LENGTH TO SUIT (REF: 22'-0") (4 REQD). SEE GENERAL NOTES "M" AND "O" ON PAGE 2, SPECIAL NOTE 3 ON PAGE 5, AND THE "TIEDOWN DETAIL" ON PAGE 8.
- ⑩ PAD, STRAPPING, 2" X .050" X 18" (8 REQD). PRE-POSITION THE PAD BETWEEN THE STRAPPING, PIECE MARKED ⑨, AND THE FLAT-RACK TIEDOWN PROVISION, AND SECURE WITH ONE SEAL CRIMPED WITH ONE PAIR OF NOTCHES.
- ⑪ SEAL, 2" (20 REQD). FASTEN PIECE MARKED ⑩ WITH ONE SEAL CRIMPED WITH ONE PAIR OF NOTCHES. FASTEN PIECE MARKED ⑨ WITH ONE SEAL CRIMPED WITH TWO PAIR OF NOTCHES. SEE GENERAL NOTE "K" ON PAGE 2.
- ⑫ STAPLE, 15/16" X 3/4" LEG LENGTH (256 REQD). FASTEN PIECE MARKED ③ TO PIECE MARKED ④ WITH FOUR (4) STAPLES PER CORNER FILL ASSEMBLY. SEE "CORNER FILL ASSEMBLY" DETAIL ON PAGE 7 FOR STAPLE PLACEMENT.

(CONTINUED AT LEFT)

SPECIAL NOTES:

1. FOR FLAT RACKS WHERE THE SIDE BLOCKING CANNOT BE NAILED TO THE FLOOR, A DOUBLED 2" X 6" CAN BE USED. SEE "ALTERNATIVE SIDE BLOCKING PROCEDURES" ON PAGE 8.
2. THE SUPPORT PIECES MUST BE TIGHT AGAINST THE CONTAINER EDGE INTERLOCKS, BOTH IN THE LATERAL AND LONGITUDINAL DIRECTIONS TO MINIMIZE THE MOVEMENT OF THE CONTAINERS DURING SHIPMENT.
3. POSITION THE STRAPPING BOARDS, PIECES MARKED ⑦, AND THE HOLD-DOWN STRAPS, PIECES MARKED ⑧ SO AS TO BE VERTICALLY IN LINE WITH THE FLAT RACK TIEDOWN POINTS AND PERPENDICULAR TO THE FLAT RACK FLOOR, WHEN VIEWED FROM THE SIDE OF THE FLAT RACK. **NOTE:** THE POSITION OF THE STRAPPING BOARDS MUST BE WITHIN 24" FROM EACH END OF THE SUPPORT PIECE, PIECE MARKED ⑥.
4. DEPENDING ON THE AVAILABILITY OF MATERIALS, AND ECONOMIC CONSIDERATIONS, THE "ALTERNATIVE LOAD BEARING GATE" MAY BE SUBSTITUTED FOR LOAD BEARING GATE, PIECE MARKED ①, SHOWN IN THE LOAD ON PAGE 4.

FILL PIECE, 1" X 6" X 72" (4 REQD).
 NAIL TO THE LOAD BEARING PIECE W/1-8d NAIL EVERY EIGHT INCHES (8"). **NOTE:** ADD ADDITIONAL 1" X 6" AND OR 2" X 6" FILL PIECES AS REQUIRED TO FILL THE VOID BETWEEN THE LOAD BEARING GATE AND THE CONTAINERS. NAIL EACH ADDITIONAL PIECE WITH ONE (1) APPROPRIATELY SIZED NAIL EVERY EIGHT INCHES (8"). SEE GENERAL NOTES "D" AND "G" ON PAGE 2.



BEAM ASSEMBLY, 2" X 6" BY END WALL WIDTH MINUS 1/2" (REF: 7'-9-1/2") (TRIPLED) (4 REQD). NAIL THE FIRST PIECE TO THE SECOND W/1-10d NAIL EVERY SIX INCHES (6"). LAMINATE THE THIRD PIECE TO THE SECOND IN A LIKE MANNER. SEE GENERAL NOTE "D" ON PAGE 2.

VERTICAL PIECE, 2" X 4" X 67-1/4" (4 REQD).
 NAIL TO EACH BEAM ASSEMBLY W/ 3-10d NAILS.

LOAD BEARING PIECE, 2" X 6" X 72" (4 REQD). NAIL TO EACH BEAM ASSEMBLY W/ 3-10d NAILS.

ALTERNATIVE LOAD BEARING GATE

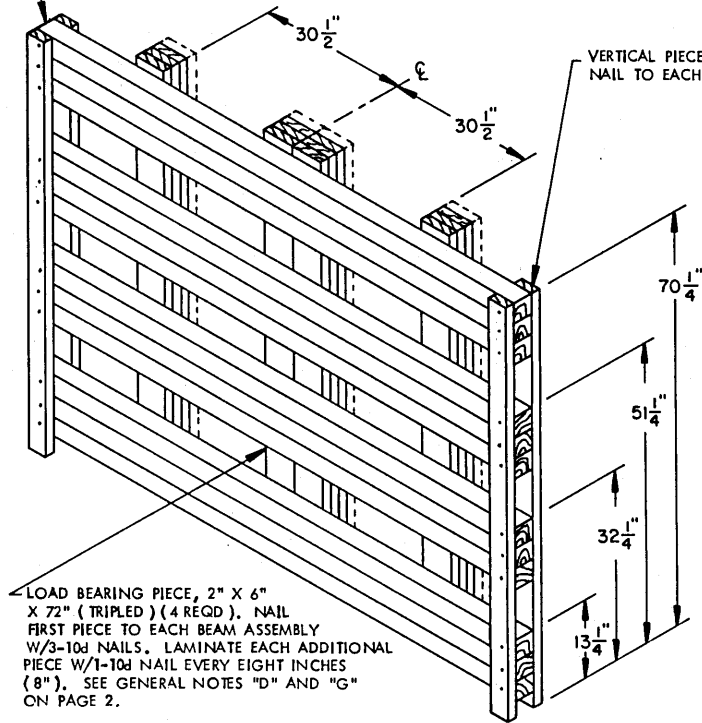
SEE GENERAL NOTE "J" ON PAGE 2 AND SPECIAL NOTE 4 ABOVE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 8"	55	37
2" X 4"	47	32
2" X 6"	243	243
2" X 8"	83	111
4" X 4"	255	340
NAILS	NO. REQD	POUNDS
8d (2-1/2")	320	3-1/2
10d (3")	536	8-1/4
12d (3-1/4")	48	1
STEEL STRAPPING, 3/4" X .035" OR .031" ---	448' REQD	32 LBS
SEAL FOR 3/4" STRAPPING	20 REQD	1 LB
STEEL STRAPPING, 2" X .050" ---	88' REQD	30 LBS
SEAL FOR 2" STRAPPING	20' REQD	5 LBS
EDGE PROTECTORS, 2" STRAPPING	12' REQD	3 LBS
STAPLES FOR 3/4" STRAPPING	256 REQD	2 LBS
STAPLES FOR 2" STRAPPING	8 REQD	NIL

LOAD AS SHOWN

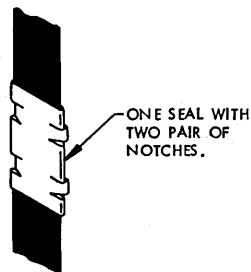
ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINERS	16 @ 1,475 LBS	23,600 LBS
DUNNAGE		1,612 LBS
FLAT RACK		5,732 LBS
TOTAL WEIGHT		30,944 LBS

BEAM ASSEMBLY, 4" X 4" BY END WALL WIDTH MINUS 1/2" (REF: 7'-9-1/2") (TRIPLED) (4 REQD).



LOAD BEARING GATE

SEE GENERAL NOTE "J" ON PAGE 2.



STRAP JOINT A

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

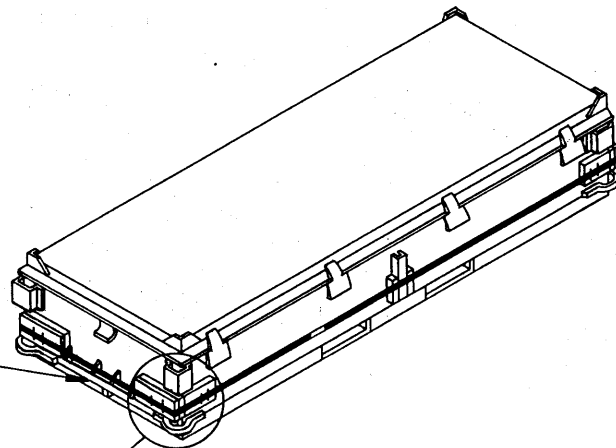


STRAP JOINT B

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

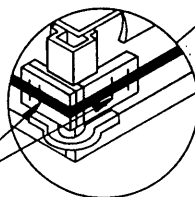
STRAP/JOINT DETAIL

INDICATES A LATERAL SUPPORT PIECE.



CNU-319/E CONTAINER WITH CORNER FILL ASSEMBLIES INSTALLED

STAPLES, NOTE: FOUR (4) STAPLES ARE REQUIRED PER CORNER FILL ASSEMBLY.



SPECIAL NOTE:

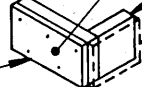
PRIOR TO PLACING A CNU-319/E CONTAINER UPON A FLATRACK FOR SHIPMENT, CORNER FILL ASSEMBLIES, AS DETAILED AND SPECIFIED BELOW, MUST BE INSTALLED ON THE CORNERS OF THE CONTAINER AS SHOWN ABOVE. THE LENGTH OF END PIECE DEPICTED IN THE CORNER FILL ASSEMBLY BELOW, SHOULD BE LONG ENOUGH TO FILL THE VOID BETWEEN THE EDGE OF THE CONTAINER AND THE LATERAL SUPPORT PIECE, PLUS 1-1/2". INCREASE OR DECREASE THE LENGTH OF THE END PIECE AS REQUIRED. CORNER FILL ASSEMBLY INSTALLATION WILL BE ACCOMPLISHED UTILIZING ONE 3/4" X .035" OR .031" STEEL STRAP AND ONE 3/4" SEAL CRIMPED WITH TWO PAIR OF NOTCHES.

END PIECE, 2" X 8" BY A LENGTH TO SUIT (REF: 10-1/4"). NAIL TO THE SIDE PIECE W/3-10d NAILS.

INDICATES CONTAINER ENDS FACING FLATRACK END WALLS.

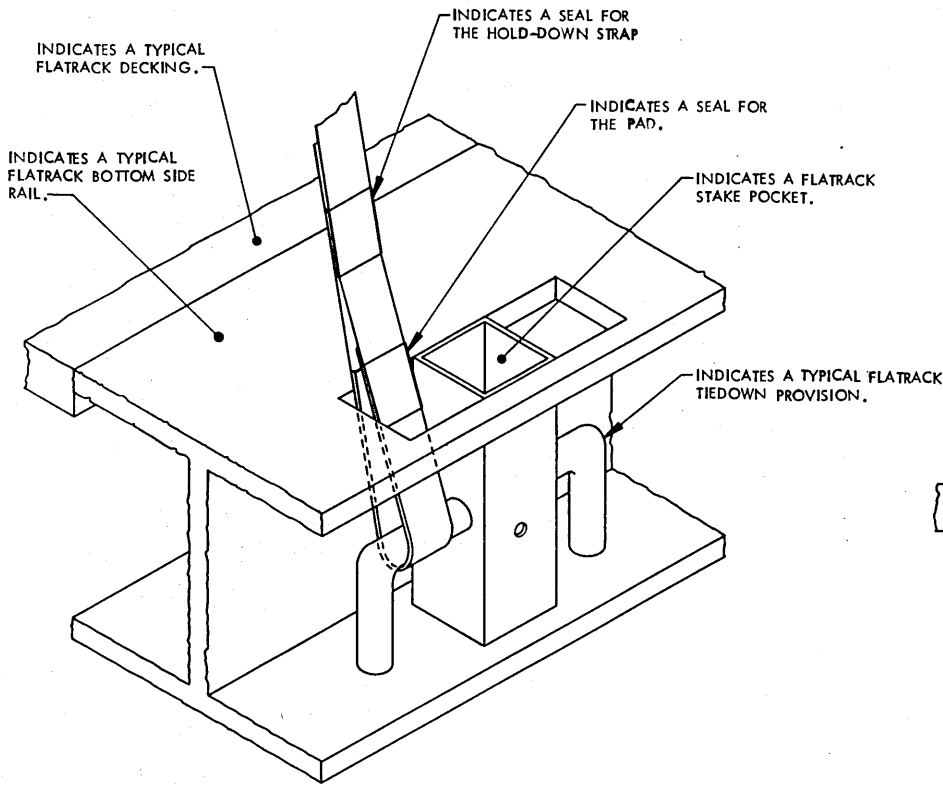
SIDE PIECE, 2" X 8" X 5-1/4".

FILL PIECE, 1" X 8" X 10-1/4". NAIL TO THE END PIECE W/5-8d NAILS. CLINCH AS REQUIRED.

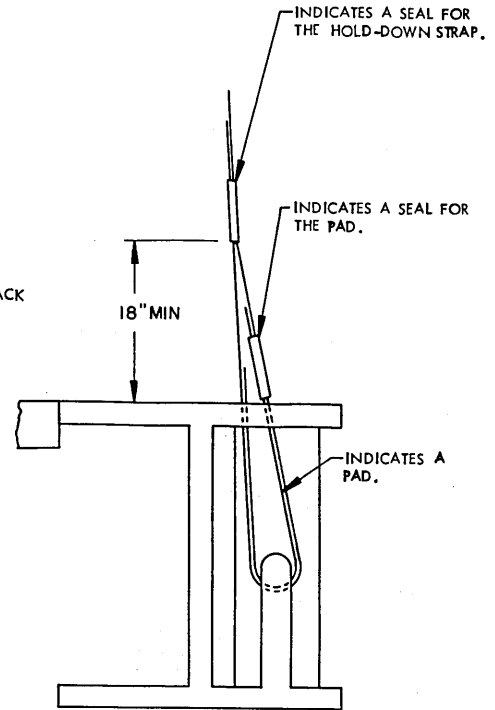


FILL PIECE, 1" X 8" X 6-3/4". NAIL TO THE SIDE PIECE AND END PIECE W/4-8d NAILS. NOTE: THIS PIECE IS ONLY REQUIRED WHEN CONTAINER SIDE WALLS ARE IN CONTACT WITH OTHER CONTAINER SIDEWALLS. CLINCH NAILS AS REQUIRED.

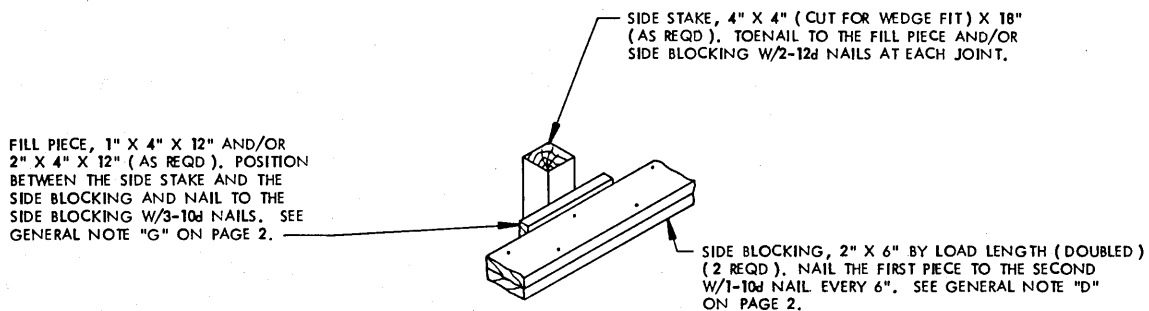
CORNER FILL ASSEMBLY



TIEDOWN DETAIL



SIDE VIEW



ALTERNATIVE SIDE BLOCKING PROCEDURES

INSTALLATION PROCEDURES:

- STEP 1: POSITION THE ASSEMBLED SIDE BLOCKING AGAINST THE CONTAINER SIDE RAILS.
- STEP 2: INSTALL THE SIDE STAKES IN THE FLATRACK CONTAINER STAKE POCKETS WITH A FORCED (WEDGE) FIT. NAIL THE SIDE STAKE TO THE STAKE POCKET W/1-30d NAIL THROUGH THE HOLE PROVIDED IN THE SIDE OF THE STAKE POCKET TO AVOID VERTICAL MOVEMENT OF THE STAKE DURING SHIPMENT.
- STEP 3: POSITION FILL PIECE (S) BETWEEN THE SIDE BLOCKING AND SIDE STAKE SO AS TO ALLOW NO MORE THAN ONE HALF-INCH (1/2") OF LATERAL VOID BETWEEN THE CONTAINERS AND SIDE BLOCKING.
- STEP 4: REPEAT STEPS 1, 2 AND 3 ON THE OPPOSITE SIDE OF THE FLATRACK.