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 HAZARDOUS MATERIALS SYSTEMS  
 (BOE) ASSOCIATION OF AMERICAN  
 RAILROADS  
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 DATE 8/22/88

# LOADING AND BRACING<sup>1</sup> ON COMMERCIAL FLATRACK CONTAINERS OF 30MM AMMUNITION PACKED IN CNU-332/E SHIPPING AND STORAGE CONTAINER

INDEX

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

1 LOADING AND BRACING SPECIFICATIONS SET FORTH WITHIN THIS DRAWING ARE APPLICABLE TO LOADS THAT ARE TO 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 "O" ON PAGE 2.

**DO NOT SCALE**

REVISIONS				DRAFTSMAN	PROJ ENG
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## 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. 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 5700.76-M; DOD 6055.9-STD; AS WELL AS ANY AND ALL OTHER APPLICABLE SERVICE REGULATIONS.
- C. THE SPECIFIED OUTLOADING PROCEDURES ARE APPLICABLE FOR 30MM AMMUNITION PACKED IN CNU-332/E CONTAINERS. THE SHIPPING AND STORAGE CONFIGURATION FOR THE CONTAINERS CONSISTS OF TWO CONTAINERS UNITIZED INTO ONE TWIN-PACK UNIT. SUBSEQUENT REFERENCE TO CONTAINER OR TWIN-PACK, HEREIN MEANS THE CNU-332/E CONTAINER, WITH 30MM AMMUNITION INSTALLED. SEE PAGE 3 FOR DETAIL 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 BE EXCEEDED.
- 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 ON TO 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 END WALLS, 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-322/E CONTAINERS, THEY ARE TO BE POSITIONED SO AS TO ACHIEVE A TIGHT LOAD BETWEEN THE NAILED BLOCKING 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 REMOVED FROM A LOAD BY INCREASING THE WIDTH OF THE FILL PIECE IN THE CENTER OF THE FLATRACK LOAD.
- H. WHEN STEEL STRAPPING IS SEALED AT 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 6 FOR GUIDANCE.
- J. 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.

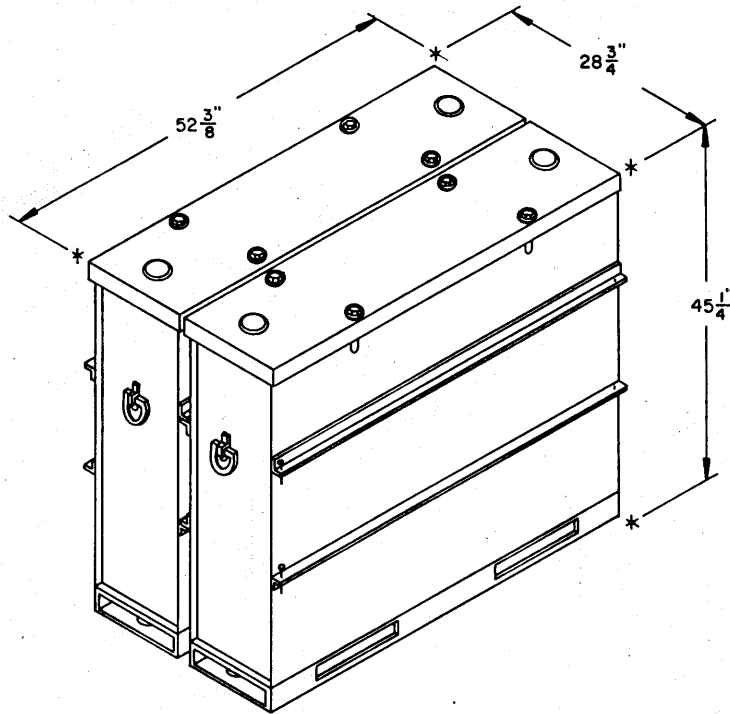
( CONTINUED AT RIGHT )

## ( GENERAL NOTES CONTINUED )

- K. 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.
- L. THE FLATRACK SHOWN ON PAGE 4 IS A FULL HEIGHT (8'-0") FLATRACK. THERE ARE ALSO ONE-HALF HEIGHT (48") AND TWO-THIRDS HEIGHT (57") FLATRACKS. IF THE HEIGHT OF THE LOAD PERMITS AND IF THESE OTHER HEIGHT FLATRACKS ARE AVAILABLE, THEY MAY BE USED. AS IN THE CASE OF THE LOAD ON PAGE 4, THE CONTAINERS WILL FIT ON A ONE-HALF OR TWO-THIRDS HEIGHT FLATRACK.
- M. THE OUTLOADING PROCEDURES SPECIFIED HEREIN CAN ALSO BE UTILIZED FOR THE SHIPMENT OF THE DEPICTED CNU-332/E CONTAINERS WHEN THEY ARE LOADED WITH AN ITEM WHICH IS IDENTIFIED DIFFERENTLY BY NOMENCLATURE THAN THE ITEM DESIGNATED WITHIN THE DRAWING TITLE, PROVIDED THE GROSS WEIGHT OF THE CONTAINER DOES NOT EXCEED 2,350 POUNDS.
- N. 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.
- O. DURING INTRASTATE AND/OR INTERSTATE MOVES BY MOTOR CARRIER, A PROPER CHASSIS/MODIFIED FLAT BED TRAILER MUST BE USED TO PRECLUDE VIOLATION OF ONE OR MORE "WEIGHT LAWS" APPLICABLE TO THE STATE OR STATES INVOLVED.
- 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.

## 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 1, TYPE I OR II, 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.
ANTI-CHAFING MATERIAL -----	: NEUTRAL BARRIER MATERIAL; MIL-B-121 ( OR EQUAL ).

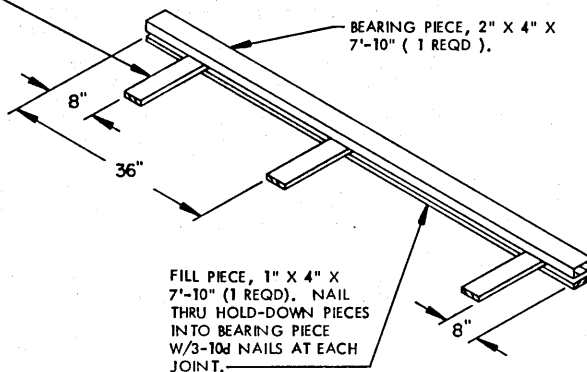


**TWIN - PACK UNIT ( CNU-332/E CONTAINER )**

**TWIN-PACK UNIT DATA:**

NUMBER OF CONTAINERS -----	TWO
GROSS WEIGHT -----	2,350 LBS ( APPROX )
CUBE -----	39.24 CUBIC FEET ( APPROX )

HOLD-DOWN PIECE, 1" X 4" X 16"  
(3 REQD). NAIL TO BEARING PIECE  
W/3-6d NAILS.

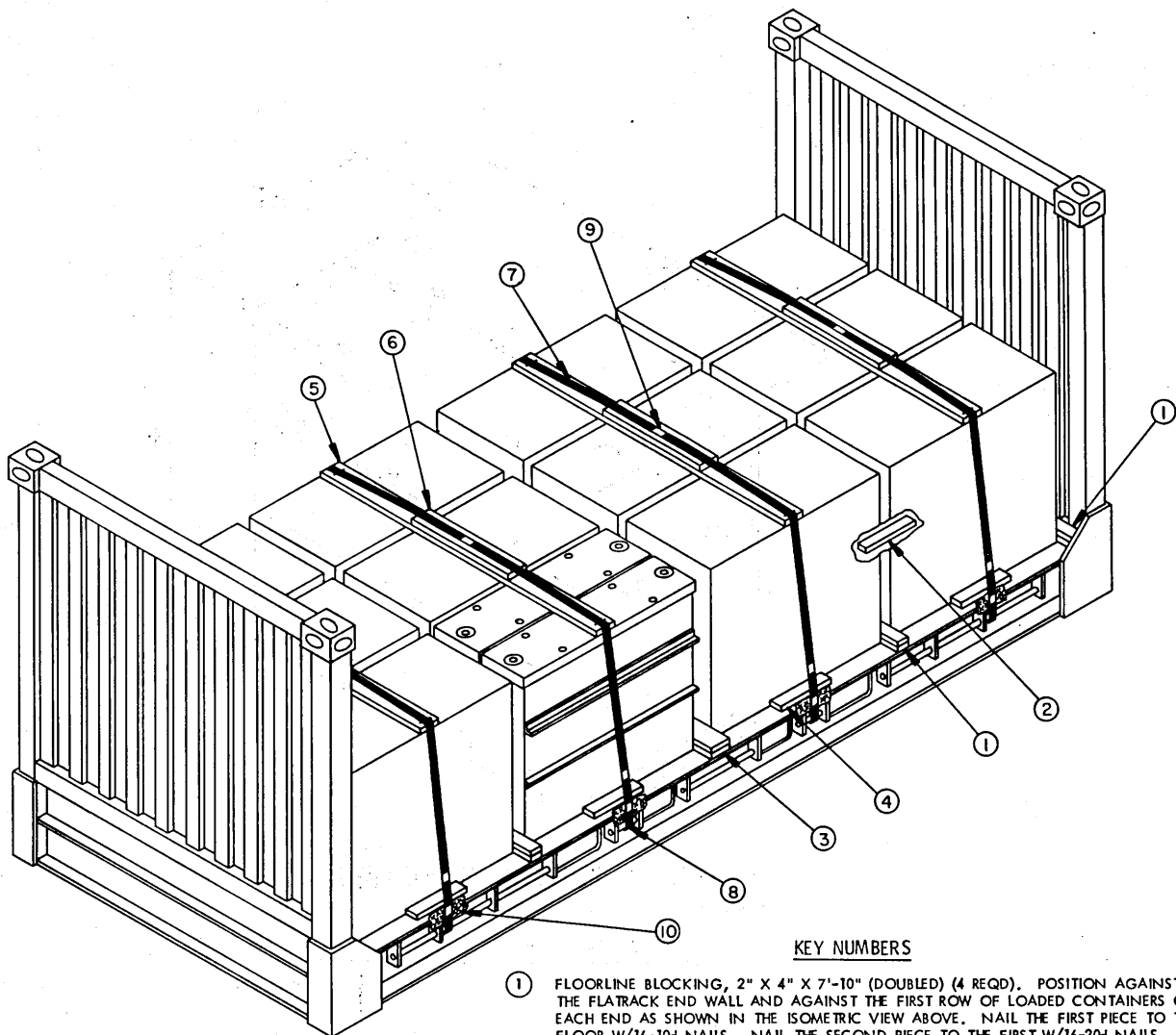


**ALTERNATIVE FLOORLINE BLOCKING**

SEE SPECIAL NOTE ABOVE.

**SPECIAL NOTE:**

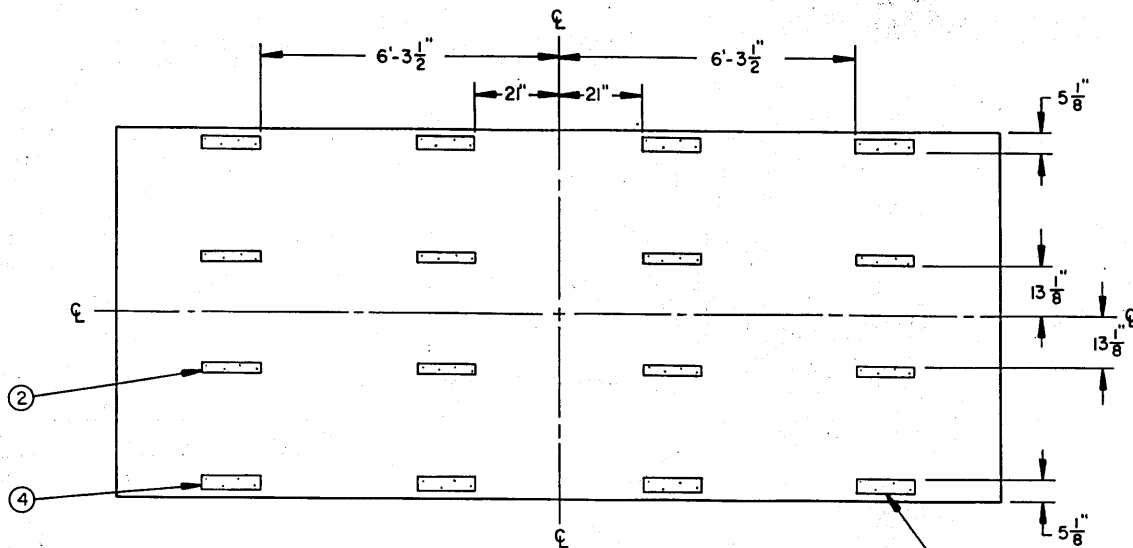
THE ALTERNATIVE FLOORLINE BLOCKING IS INTENDED FOR USE ON FLATRACKS WHICH DO NOT HAVE A NAILABLE FLOOR EXTENDING THE FULL FLATRACK LENGTH. THE ALTERNATIVE FLOORLINE BLOCKING WILL BE SUBSTITUTED FOR THE TWO FLOORLINE BLOCKING ASSEMBLIES THAT ARE POSITIONED AGAINST THE END WALLS OF THE FLATRACK. THE ALTERNATIVE FLOORLINE BLOCKING WILL ONLY BE USED WHEN IT IS IMPOSSIBLE TO NAIL THE OUTERMOST TWO FLOORLINE BLOCKING ASSEMBLIES IN PLACE.



ISOMETRIC VIEW

KEY NUMBERS

- ① FLOORLINE BLOCKING, 2" X 4" X 7'-10" (DOUBLED) (4 REQD). POSITION AGAINST THE FLATRACK END WALL AND AGAINST THE FIRST ROW OF LOADED CONTAINERS ON EACH END AS SHOWN IN THE ISOMETRIC VIEW ABOVE. NAIL THE FIRST PIECE TO THE FLOOR W/16-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/16-20d NAILS. SEE GENERAL NOTE "D" ON PAGE 2 AND "ALTERNATIVE FLOORLINE BLOCKING" DETAIL ON PAGE 3.
- ② CENTER BLOCKING, 2" X 3" X 15" (8 REQD). POSITION AS SHOWN ON THE "CENTER AND SIDE BLOCKING PLAN VIEW" ON PAGE 5. NAIL TO THE FLOOR W/3-10d NAILS.
- ③ FILL PIECE, 2" MATERIAL BY A WIDTH TO FIT (REF: 6" ACTUAL) X 7'-10" (DOUBLED) (1 REQD). POSITION BETWEEN THE CONTAINERS IN THE CENTER OF THE FLATRACK TO FILL THE EXCESS SPACE. LAMINATE THE FIRST PIECE TO THE SECOND W/16-10d NAILS. NAIL TO THE FLOOR W/16-20d NAILS. SEE GENERAL NOTE "D" ON PAGE 2.
- ④ SIDE BLOCKING, 2" X 4" X 15" (8 REQD). POSITION AS ON THE "CENTER AND SIDE BLOCKING PLAN VIEW" ON PAGE 5. NAIL TO THE FLOOR W/3-10d NAILS.
- ⑤ STRAPPING BOARD, 2" X 6" X 7'-2" (4 REQD). POSITION THE STRAPPING BOARDS AS SHOWN ABOVE. SEE SPECIAL NOTE 1 ON PAGE 5.
- ⑥ PURCHASE BOARD, 2" X 6" X 30" (4 REQD). CENTER ON THE STRAPPING BOARD, PIECE MARKED ⑤, AND NAIL W/4-10d NAILS. SEE GENERAL NOTE "D" ON PAGE 2.
- ⑦ HOLD-DOWN STRAP, 2" X .050" BY A LENGTH TO SUIT (REF: 18'-0") (4 REQD). INSTALL EACH STRAP FROM TWO 9'-0" LONG PIECES. STAPLE TO STRAPPING BOARDS WITH TWO STAPLES EACH. SEE GENERAL NOTE "P" ON PAGE 2.
- ⑧ PAD, STRAPPING, 2" X .050" X 18" (8 REQD). PRE-POSITION THE PAD BETWEEN THE HOLD-DOWN STRAP, PIECE MARKED ⑦, AND THE FLATRACK TIEDOWN PROVISION AND SECURE WITH ONE SEAL CRIMPED WITH ONE PAIR OF NOTCHES. SEE TIEDOWN DETAIL ON PAGE 6.
- ⑨ SEAL, 2" (20 REQD, 5 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES EXCEPT FOR SEALS USED TO SECURE STRAPPING PADS. SEE GENERAL NOTES "H" AND "K" ON PAGE 2.
- ⑩ ANTI-CHAFING MATERIAL (AS REQD). POSITION UNDER STRAPS AT ALL POINTS OF CONTACT WITH THE FLATRACK.



**CENTER AND SIDE BLOCKING PLAN VIEW**

( KEY NUMBERS ABOVE REFER TO KEY NUMBERS ON PAGE 4 ).

SEE SPECIAL NOTE 2 BELOW.

**SPECIAL NOTES:**

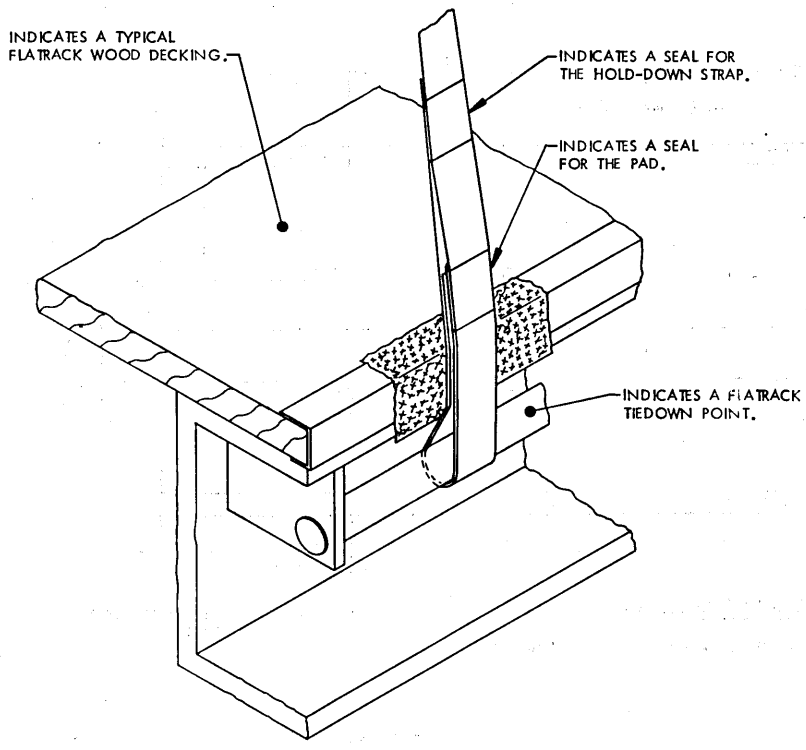
1. THE STRAPPING BOARDS ARE TO BE POSITIONED ON THE FLAT SURFACE, AND AS CLOSE TO THE CENTER OF THE CONTAINER LIDS AS POSSIBLE. THE STRAPPING MUST BE POSITIONED SO AS TO BE AS CLOSE AS POSSIBLE TO BE IN VERTICAL ALIGNMENT WITH THE FLATRACK TIEDOWN POINTS. SEE GENERAL NOTE "K" ON PAGE 2.
2. IF THE FLATRACK BEING USED DOES NOT HAVE AVAILABLE FLOORING COMPLETELY ACROSS THE WIDTH OF THE CAR, THEN AN ALTERNATIVE SIDE BLOCKING MUST BE USED AS SHOWN ON PAGE 6.

**BILL OF MATERIAL**

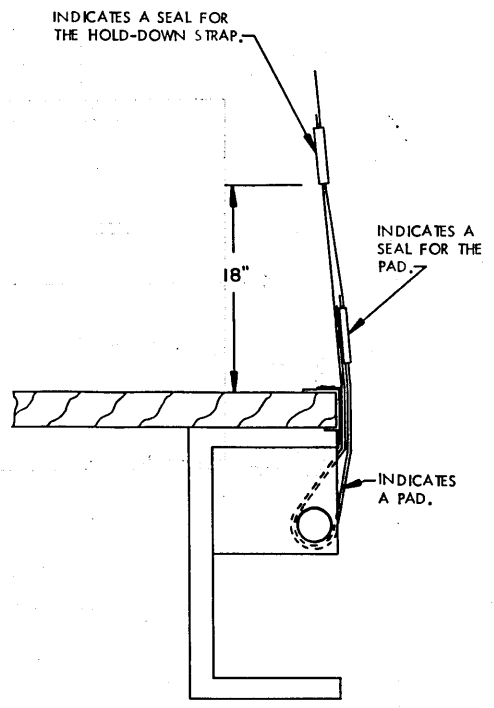
LUMBER	LINEAR FEET	BOARD FEET
2" X 3"	10	5
2" X 4"	73	49
2" X 6"	39	39
2" X 8"	16	22
NAILS	NO. REQD	POUNDS
10d (3")	144	2 1/4
20d (4")	80	3
STEEL STRAPPING, 2" X .035" OR .031" -----	84' REQD -----	28 LBS
SEAL FOR 2" STRAPPING -----	20 REQD -----	4 LBS
STAPLE FOR 2" STRAPPING -----	8 REQD -----	NIL
ANTI-CHAFING MATERIAL -----	AS REQD -----	NIL

**LOAD AS SHOWN**

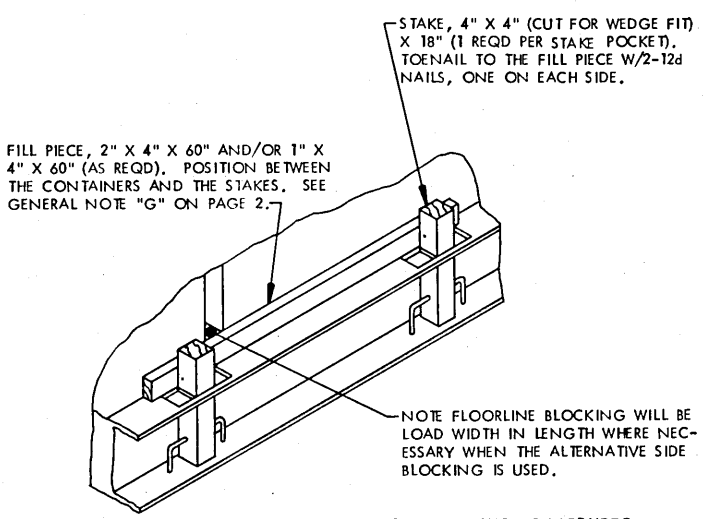
ITEM	QUANTITY	WEIGHT ( APPROX )
TWIN-PACK -----	12 -----	28,250 LBS
( CNU-332/E CONTAINER )		
DUNNAGE -----		268 LBS
FLATRACK -----		5,732 LBS
<b>TOTAL WEIGHT -----</b>		<b>34,250 LBS</b>



**TIEDOWN DETAIL**



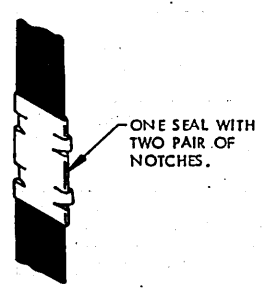
**SIDE VIEW**



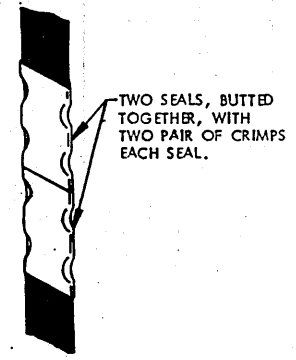
**ALTERNATIVE SIDE BLOCKING PROCEDURES**

**INSTALLATION PROCEDURES:**

- STEP 1: POSITION SIDE FILL ON EDGE AGAINST CONTAINERS AND BETWEEN 2 STAKE POCKETS.
- STEP 2: INSTALL STAKES IN THE FLATRACK CONTAINER STAKE POCKETS WITH A FORCED WEDGE FIT. TOENAIL TO THE SIDE FILL W/1-12d NAIL ON EACH SIDE.
- STEP 3: REPEAT STEPS 1 AND 2 FOR EACH SET OF TWO STAKE POCKETS.



**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.