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# LOADING AND BRACING ON COMMERCIAL FLATRACK CONTAINERS OF BLU-107/B (DURANDAL) WEAPONS IN CNU-381/E SHIPPING AND STORAGE CONTAINERS

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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 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 "K" ON PAGE 2.

**DO NOT SCALE**

REVISIONS				DRAFTSMAN <i>ap</i>	PROJ ENG <i>LAF/WRF</i>
				CHECKER <i>WRF</i>	LOG ENGRG OFFICE <i>WRF</i>
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## 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 BLU-107/B (DURANDAL) WEAPON IN A CNU-381/E CONTAINER. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CNU-381/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 INCLUDING LADING AND DUNNAGE MUST NOT BE EXCEEDED.
- D. 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 19'-5" LONG BY 7'-10" 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-381/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 BEARING PIECE ON THE END BLOCKING ASSEMBLY AT ONE END OF THE LOAD. NAIL EACH ADDITIONAL PIECE TO THE BEARING PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE THICKNESS AND QUANTITY OF THE BEARING PIECES ON THE END BLOCKING ASSEMBLIES 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 6" MATERIAL IS ACTUALLY 3/4" THICK BY 5-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" 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 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.
- K. 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.
- L. 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.
- 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

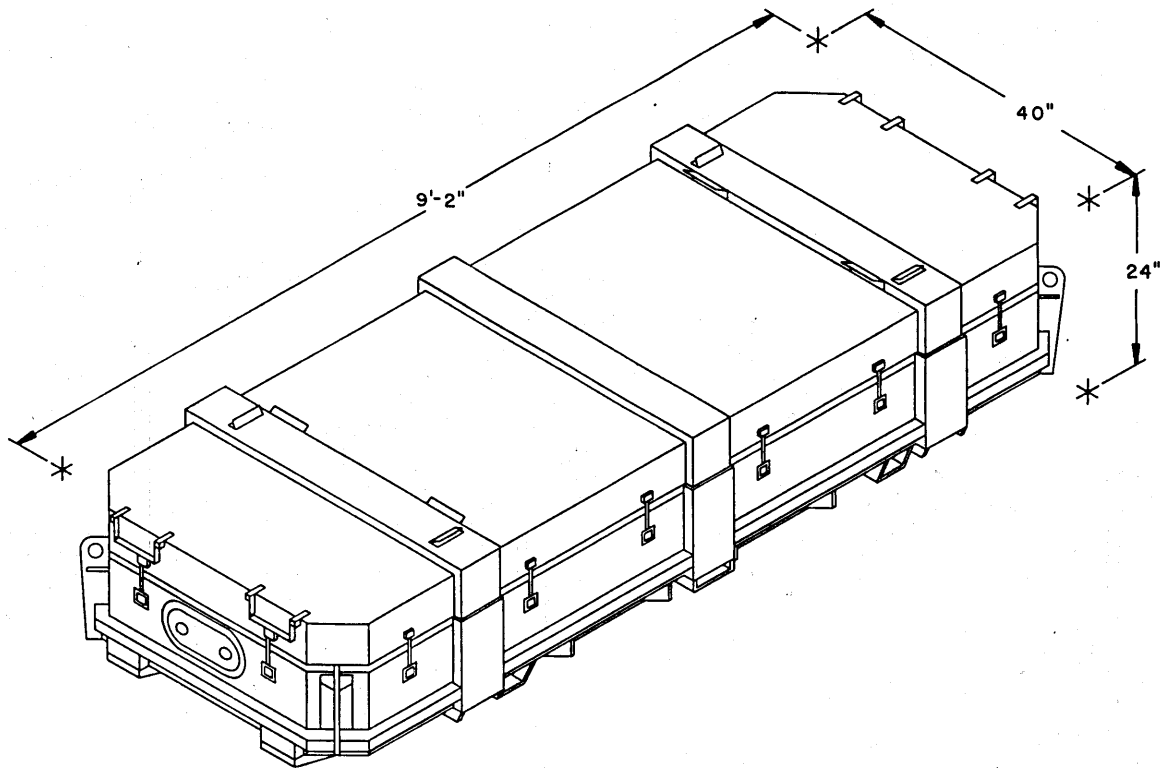
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## MATERIAL SPECIFICATIONS

LUMBER -----:	SEE TM 742-200-1, DUNNAGE LUMBER; FED SPEC MM-L-751.
NAILS -----:	COMMON; FED SPEC FF-N-105.
STRAPPING, STEEL -----:	CLASS 1, TYPE I OR IV, HEAVY DUTY, FINISH A, B (GRADE 2) OR C; FED SPEC QQ-5-781.
STRAP SEAL -----:	TYPE D, STYLE I, II OR IV, CLASS H, FINISH A, B (GRADE 2) OR C; FED SPEC QQ-5-781.
STRAP STAPLE -----:	COMMERCIAL GRADE.
ANTI-CHAFING MATERIAL--:	NEUTRAL BARRIER MATERIAL; MIL-B-121 (OR EQUAL).

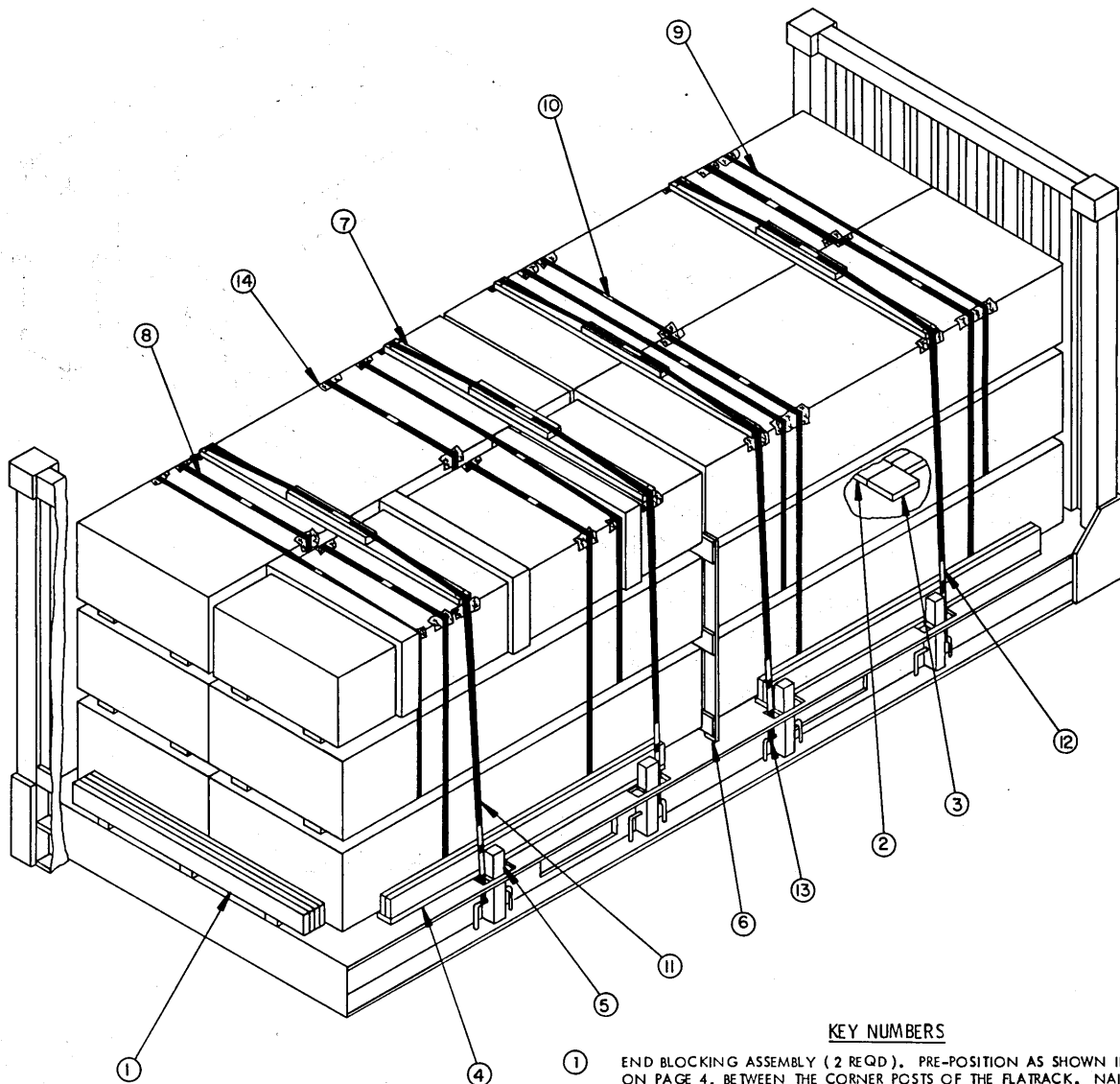
BE POSITIONED AROUND THE UNDERSIDE OR THROUGH THE FORKLIFT POCKETS OF THE FLATRACK CONTAINER. ADDITIONALLY, THE FLATRACK TIEDOWN PROVISIONS MUST BE AT LEAST AS STRONG AS THE 2" LOAD SECUREMENT STRAPPING BEING USED, AND BE OF A SUFFICIENT WIDTH TO RECEIVE THE 2" STRAPPING AND BE OF A DESIGN WHICH WILL 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.

- N. THE OUTLOADING PROCEDURES SPECIFIED HEREIN CAN ALSO BE UTILIZED FOR THE SHIPMENT OF THE DEPICTED CNU-381/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 2,100 POUNDS.
- O. 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.
- P. 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.



GNU-381/E CONTAINER DETAIL

CUBE ----- 61.1 CUBIC FEET (APPROX )  
GROSS WEIGHT ----- 2,050 POUNDS (APPROX )



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**KEY NUMBERS**

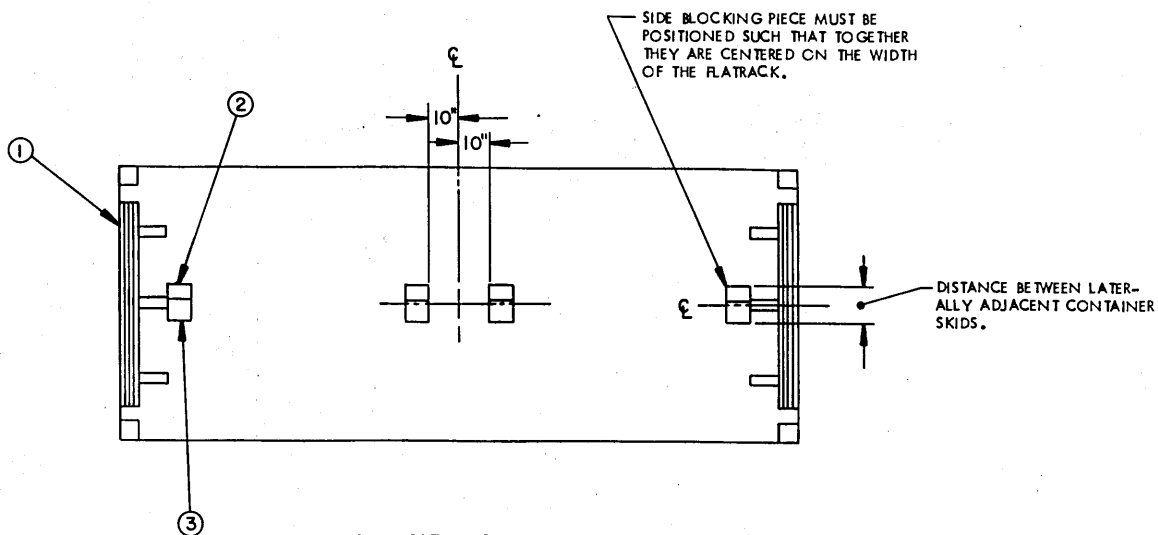
⑫ SEAL FOR 2" STRAPPING (20 REQD). FASTEN PIECE MARKED ⑪ WITH ONE SEAL CRIMPED WITH TWO PAIR OF NOTCHES. FASTEN PIECE MARKED ⑬ WITH ONE SEAL CRIMPED WITH ONE PAIR OF NOTCHES. SEE THE "TIEDOWN DETAIL" ON PAGE 7 AND GENERAL NOTES "J" AND "M" ON PAGE 2.

⑬ PAD, STRAPPING, 2" X .050" X 18" (8 REQD). PRE-POSITION THE PAD BETWEEN THE HOLD-DOWN STRAP, PIECE MARKED ⑪, AND THE FLATRACK TIEDOWN POINTS. FASTEN WITH ONE SEAL CRIMPED WITH ONE PAIR OF NOTCHES. SEE THE "TIEDOWN DETAIL" ON PAGE 7 AND GENERAL NOTE "M" ON PAGE 2.

⑭ ANTI-CHAFING MATERIAL (AS REQD). POSITION UNDER STRAPS AT ALL POINTS OF CONTACT WITH THE CONTAINERS.

- ① END BLOCKING ASSEMBLY (2 REQD). PRE-POSITION AS SHOWN IN THE PLAN VIEW ON PAGE 4, BETWEEN THE CORNER POSTS OF THE FLATRACK. NAIL THE HOLD-DOWN CLEATS TO THE FLATRACK FLOOR W/4-10d NAILS EACH. SEE THE "END BLOCKING ASSEMBLY" DETAIL ON PAGE 6 AND THE "PRE-POSITIONED DUNNAGE" DETAIL ON PAGE 5. SEE GENERAL NOTES "E" AND "G" ON PAGE 2.
- ② SIDE BLOCKING, 2" X 6" X 8" (4 REQD). PRE-POSITION AS SHOWN IN THE PLAN VIEW ON PAGE 5. NAIL TO THE FLATRACK FLOOR W/5-20d NAILS.
- ③ SIDE BLOCKING, 2" X 8" (RIPPED-TO-FIT REF: 7-1/4" X 8" (4 REQD). PRE-POSITION AS SHOWN IN THE PLAN VIEW ON PAGE 5. NAIL TO THE FLATRACK FLOOR W/5-20d NAILS.
- ④ SIDE BLOCKING ASSEMBLY (4 REQD). SEE THE "SIDE BLOCKING ASSEMBLY" DETAIL ON PAGE 6 AND GENERAL NOTE "G" ON PAGE 2.
- ⑤ STAKE, 4" X 4" (CUT FOR A SNUG FIT) X 18" (8 REQD). INSTALL THE STAKES IN THE FLATRACK STAKE POCKETS WITH A SNUG FIT. SECURE TO FLATRACK CONTAINER W/1-20d NAIL DRIVEN THRU THE CONTAINER STAKE POCKET HOLE PARTIALLY INTO THE STAKE. BEND OVER REMAINING PART OF NAIL AS APPROPRIATE TO NAIL TO THE SIDE BLOCKING ASSEMBLY, PIECE MARKED ④, W/2-12d NAILS.
- ⑥ ANTI-CHAFING ASSEMBLY (1 REQD). SEE THE "ANTI-CHAFING ASSEMBLY" DETAIL ON PAGE 6. THE ANTI-CHAFING ASSEMBLY MAY BE WIRE TIED TO THE CNU-381/E CONTAINERS IF DESIRED TO FACILITATE LOADING.
- ⑦ STRAPPING BOARD ASSEMBLY (4 REQD). SEE THE "STRAPPING BOARD ASSEMBLY" DETAIL ON PAGE 7 AND SPECIAL NOTE 2 ON PAGE 5.
- ⑧ UNITIZING STRAP, 1-1/4" X .035" OR .031" BY A LENGTH-TO-SUIT (REF: 18'-0") (8 REQD). INSTALL TO UNITIZE ONE STACK OF THREE CONTAINERS.
- ⑨ BUNDLING STRAP, 1-1/4" X .035" OR .031" BY A LENGTH-TO-SUIT (REF: 21'-0") (4 REQD). INSTALL TO ENCIRCLE THE CONTAINERS IN THE UPPER TWO LAYERS.
- ⑩ SEAL FOR 1-1/4" STRAPPING, (12 REQD, 1 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES. SEE GENERAL NOTE "J" ON PAGE 2.
- ⑪ HOLD-DOWN STRAP, 2" X .050" BY A LENGTH-TO-SUIT (REF: 24'-0") (4 REQD). INSTALL EACH STRAP FROM TWO 12'-0" LONG PIECES. STAPLE TO THE STRAPPING BOARD ASSEMBLY, PIECE MARKED ⑦, WITH TWO STAPLES. SEE GENERAL NOTE "M" ON PAGE 2.

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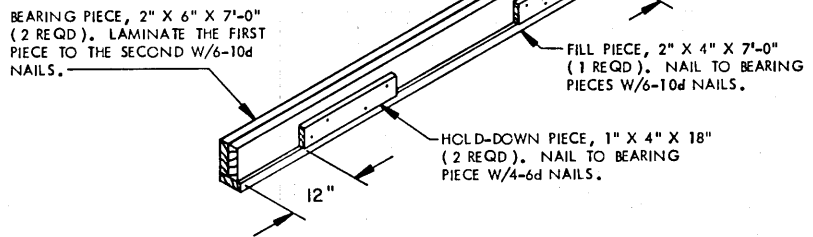
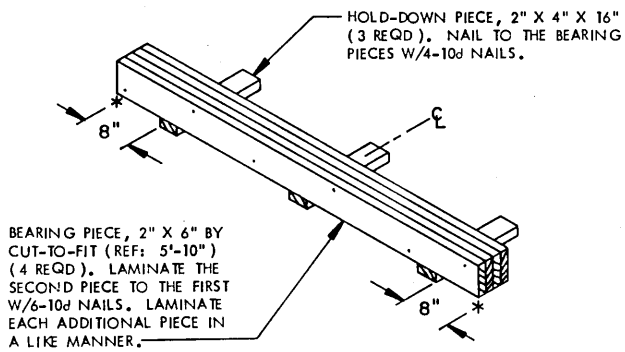
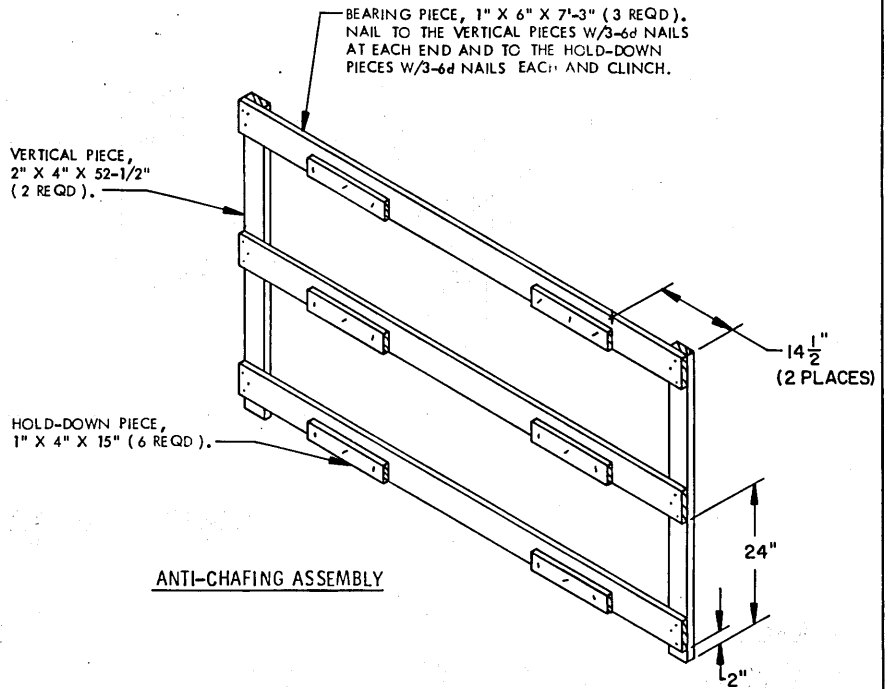
**PRE-POSITIONED DUNNAGE PLAN VIEW**  
( KEY NUMBERS REFER TO KEY NUMBERS ON PAGE 4.)

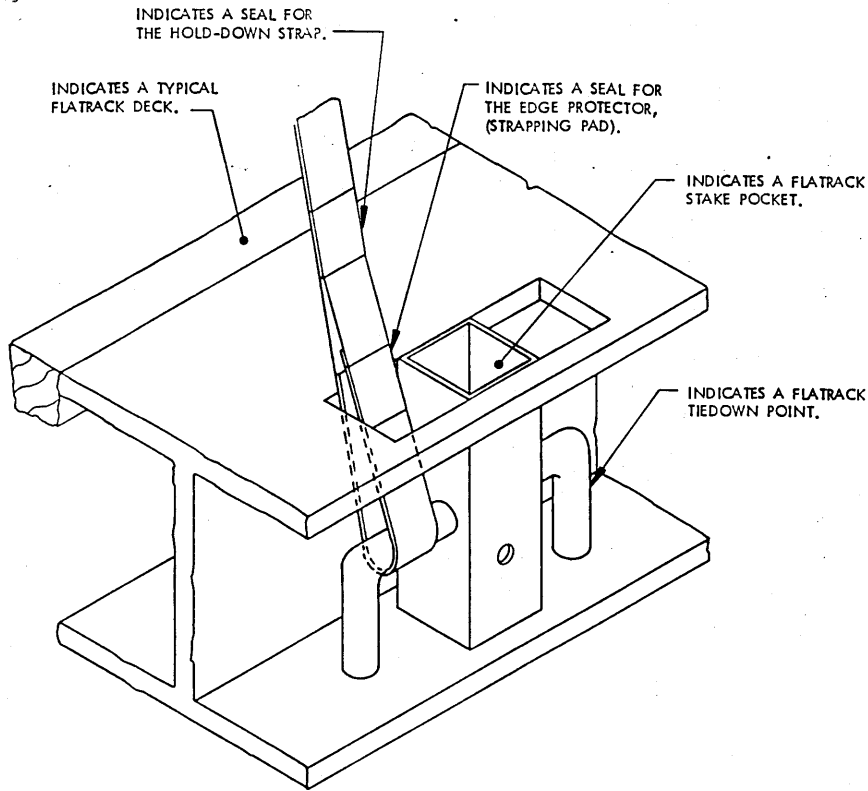
**SPECIAL NOTES:**

1. THE LOAD AS SHOWN ON PAGE 4 MAY BE REDUCED BY ONE OR TWO LAYERS FOR A SHIPMENT OF 8 OR 4 CNU-381/E CONTAINERS, WITH LOAD WEIGHTS OF 16,400 POUNDS AND 8,200 POUNDS, RESPECTIVELY. THE ANTI-CHAFING ASSEMBLY MUST BE MODIFIED AS FOLLOWS. FOR A TWO-HIGH LOAD, REDUCE THE VERTICAL PIECE LENGTH TO 29-1/2", AND ELIMINATE THE UPPERMOST BEARING PIECE AND THE TWO TOP HOLD-DOWN PIECES. FOR A ONE-HIGH LOAD, REDUCE THE VERTICAL PIECE LENGTH TO 22", AND ELIMINATE THE UPPERMOST BEARING PIECE AND THE FOUR UPPER HOLD-DOWN PIECES.
2. POSITION THE STRAPPING BOARD ASSEMBLIES, PIECES MARKED (7), AND THE HOLD-DOWN STRAPS, PIECES MARKED (1), SO AS TO BE VERTICALLY IN LINE WITH THE FLATRACK TIEDOWN POINTS AND PERPENDICULAR TO THE FLATRACK FLOOR WHEN VIEWED FROM THE SIDE OF THE FLATRACK.

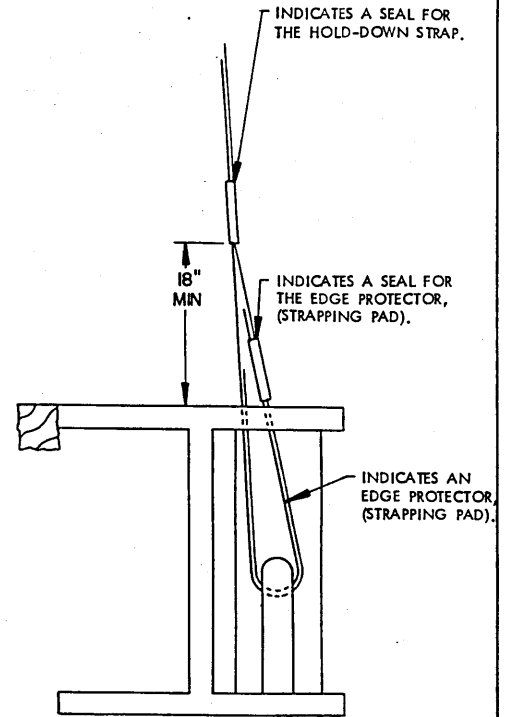
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	20	7
1" X 6"	22	11
2" X 4"	78	52
2" X 6"	106	106
2" X 8"	3	4
4" X 4"	12	16
NAILS	NO. REQD	POUNDS
6d (2")	68	1/2
10d (3")	152	2-1/2
12d (3-1/4")	24	1/2
20d (4")	48	1-3/4
STEEL STRAPPING, 1-1/4" X .035"	228' REQD	33 LBS
STEEL STRAPPING, 2" X .050"	108' REQD	36 LBS
SEAL FOR 1-1/4" STRAPPING	12 REQD	1 LB
SEAL FOR 2" STRAPPING	20 REQD	4 LBS
ANTI-CHAFING MATERIAL	AS REQD	NIL
STAPLE, 2-1/8" X 1"	8 REQD	NIL

LOAD AS SHOWN		
ITEM	QUANTITY	WEIGHT ( APPROX )
CNU-381/E CONTAINER	12	24,600 LBS
DUNNAGE		472 LBS
FLATRACK CONTAINER		5,732 LBS
TOTAL WEIGHT		30,804 LBS





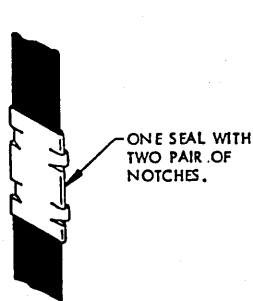
ISOMETRIC VIEW



SIDE VIEW

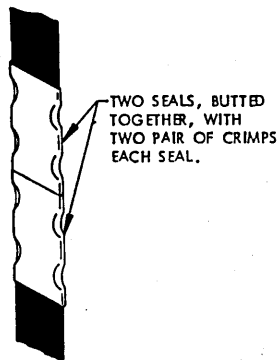
TIEDOWN DETAIL

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



STRAP JOINT A

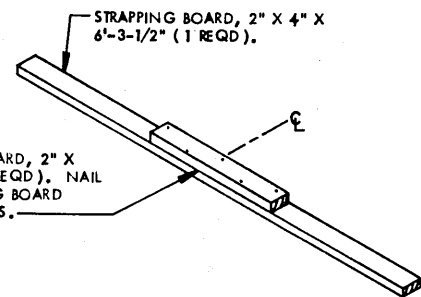
METHOD OF SECURING A STRAP JOINT WHEN USING A NOTCH-TYPE SEALER.



STRAP JOINT B

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

STRAP/SEAL DETAIL



STRAPPING BOARD ASSEMBLY

DETAILS

