

APPROVED BY
 HAZARDOUS MATERIALS SYSTEMS
 (BOE) ASSOCIATION OF AMERICAN
 RAILROADS
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LOADING AND BRACING¹ ON COMMERCIAL FLATRACK CONTAINERS OF AIM-9L GUIDED MISSILES IN CNU-310/E SHIPPING AND STORAGE CONTAINERS

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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 (TCOFC) 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" ON PAGE 2.

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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. 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 AIM-9L GUIDED MISSILE IN A CNU-310/E CONTAINER. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CNU-310/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 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. PORTIONS OF ONE OF THE FLATRACK ENDWALLS DEPICTED WITHIN THIS DRAWING HAVE NOT BEEN SHOWN IN THE LOAD VIEW FOR CLARITY PURPOSES.
- F. WHEN LOADING THE CNU-310/E CONTAINERS, THEY ARE TO BE POSITIONED TIGHTLY AGAINST THE END BLOCKING ASSEMBLY AND THE ADJACENT STACK OF CONTAINERS. 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 LATERAL VOIDS CAN BE ELIMINATED FROM A LOAD BY INCREASING THE LENGTH OF THE FLOOR LINE BLOCKING AND/OR SHIFTING THE BLOCKING TO ACHIEVE A TIGHT FIT AGAINST THE CONTAINERS. EXCESSIVE LONGITUDINAL VOIDS CAN BE ELIMINATED BY EITHER INCREASING THE LENGTH OF THE STRUTS AND HOLD-DOWN CLEATS IN THE END BLOCKING ASSEMBLY OR BY WEDGING IN AN ADDITIONAL PIECE OF APPROPRIATE THICKNESS LUMBER BETWEEN THE HEADER PIECE OF THE END BLOCKING ASSEMBLY AND THE FLATRACK ENDWALL. NAIL THROUGH THE HEADER PIECE AND INTO THE ADDITIONAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 8".
- G. WHEN INSTALLING THE END BLOCKING ASSEMBLIES, THE ASSEMBLIES MUST BE POSITIONED SO AS TO BE SUPPORTED AND IN LINE WITH THE STRONG POINTS AT THE BASE OF THE FLATRACK ENDWALLS. **NOTE:** SOME FLATRACK ENDWALLS WILL REQUIRE FILL PIECES TO BE INSTALLED ON THE HEADER OF THE END BLOCKING ASSEMBLY TO PROVIDE A UNIFORM LOAD BEARING SURFACE. NAIL THESE FILL PIECES TO THE HEADER PIECE W/1 APPROPRIATELY SIZED NAIL EVERY EIGHT INCHES.
- H. 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" BY 5-1/2" WIDE.
- J. 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.
- 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. 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.

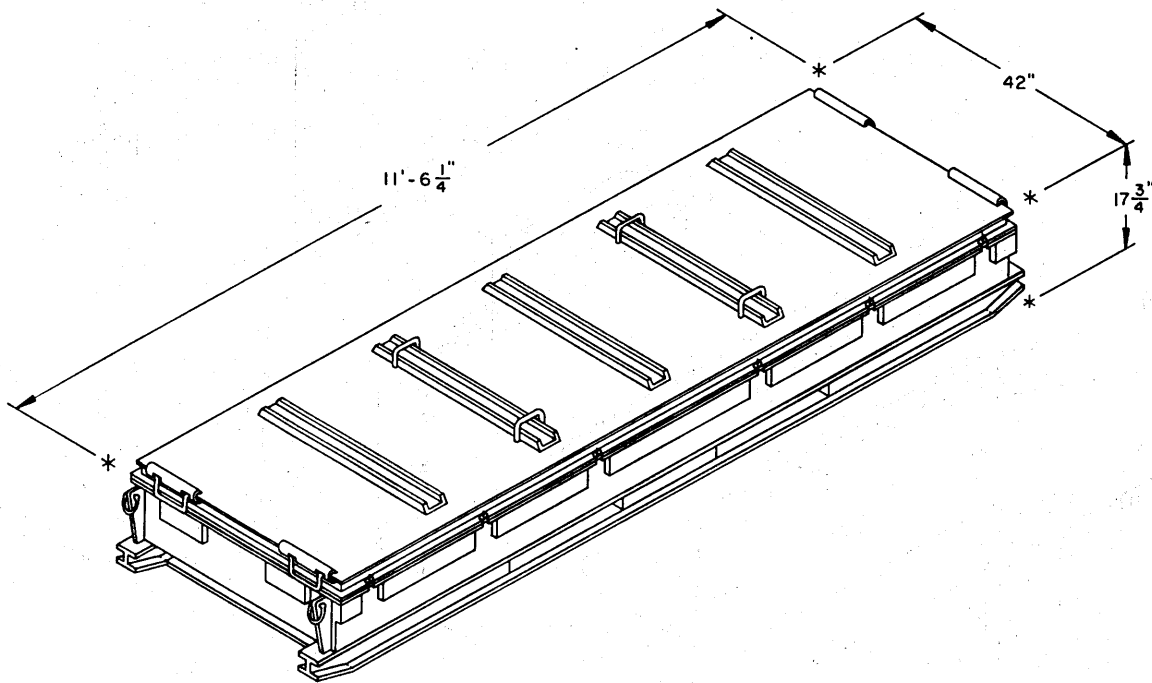
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MATERIAL SPECIFICATIONS

- LUMBER** -----: SEE TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC MM-L-751.
- NAILS** -----: FED SPEC FF-N-105; COMMON.
- STRAPPING, STEEL** ----: FED SPEC QQ-5-781; CLASS I, TYPE I OR IV, HEAVY DUTY, FINISH A, B (GRADE 2), OR C.
- SEAL, STRAP** -----: FED SPEC QQ-5-781; TYPE D, STYLE I, II, OR IV, CLASS H, FINISH A, B (GRADE 2), OR C.
- STAPLE** -----: FED SPEC FF-N-105; TYPE III, STYLE 3 (OR COMMERCIAL GRADE).
- ANTI-CHAFING MATERIAL** -----: MIL-B-121; NEUTRAL BARRIER MATERIAL(OR EQUAL).

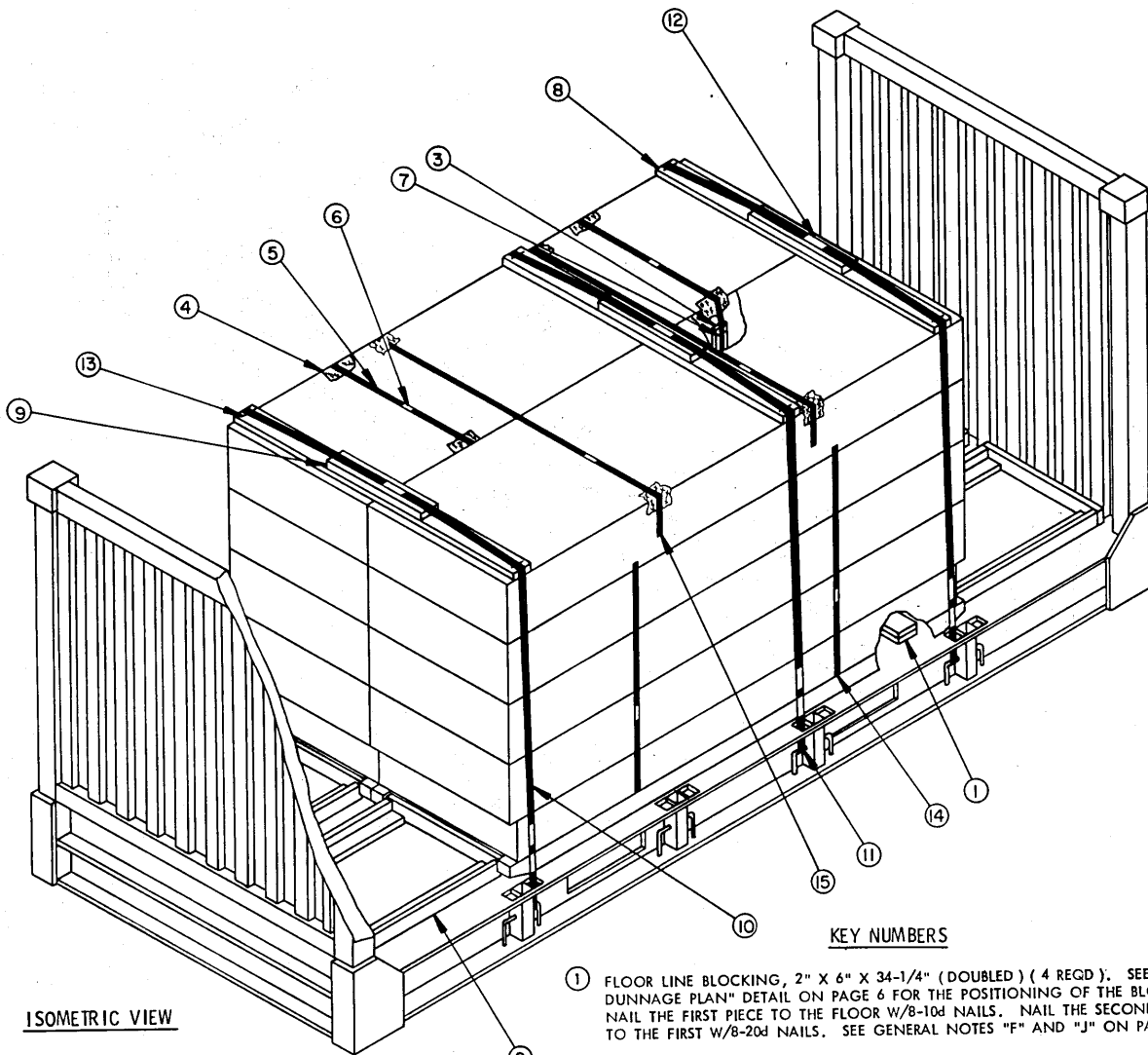
(GENERAL NOTES CONTINUED)

- M. REQUIREMENTS CITED WITHIN THE BUREAU OF EXPLOSIVES PAMPHLET 6C APPLY WHEN THE SHIPMENT MOVES BY TRAILER/CONTAINER-ON-FLATCAR (T/COFC).
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.
- N. 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.
- 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. THE OUTLOADING PROCEDURES SPECIFIED HEREIN CAN ALSO BE UTILIZED FOR THE SHIPMENT OF THE DEPICTED CNU-310/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 2,000 POUNDS.
- Q. 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.



CNU-310E CONTAINER DETAIL

CONTAINER ----- 1 EA @ 610 LBS (APPROX)
CUBE ----- 59.6 CUBIC FEET (APPROX)
GROSS WEIGHT ----- 1,380 LBS (APPROX)



ISOMETRIC VIEW

KEY NUMBERS

- (KEY NUMBERS CONTINUED)
- 12 SEAL FOR 2" STRAPPING (15 REQD, 5 PER STRAP). FASTEN EACH HOLD-DOWN STRAP, PIECE MARKED 10, AT THREE LOCATIONS WITH ONE SEAL CRIMPED WITH TWO PAIR OF NOTCHES AT EACH LOCATION. FASTEN EACH STRAPPING PAD, PIECE MARKED 11, WITH ONE SEAL CRIMPED WITH ONE PAIR OF NOTCHES. SEE GENERAL NOTE "K" ON PAGE 2.
 - 13 STAPLE, 2-1/8" CROWN WIDTH X 1" LEG LENGTH (6 REQD). FASTEN HOLD-DOWN STRAP, PIECE MARKED 10, TO THE STRAPPING BOARD, PIECE MARKED 8, WITH ONE STAPLE NEAR EACH END.
 - 14 UNITIZING STRAP, 1-1/4" X .035" OR .031" BY A LENGTH TO SUIT (REF: 19'-0") (2 REQD). POSITION THRU TOP AND BOTTOM CONTAINER FORK TINE OPENINGS SO AS TO ENCIRCLE A CONTAINER STACK AS SHOWN.
 - 15 BUNDLING STRAP, 1-1/4" X .035" OR .031" BY A LENGTH TO SUIT (REF: 17'-6") (2 REQD). POSITION SO AS TO ENCIRCLE LATERALLY ADJACENT TOP LAYER CONTAINERS AND PASS THRU FORK TINE OPENINGS.
 - 1 FLOOR LINE BLOCKING, 2" X 6" X 34-1/4" (DOUBLED) (4 REQD). SEE "FLOOR DUNNAGE PLAN" DETAIL ON PAGE 6 FOR THE POSITIONING OF THE BLOCKING. NAIL THE FIRST PIECE TO THE FLOOR W/8-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/8-20d NAILS. SEE GENERAL NOTES "F" AND "J" ON PAGE 2.
 - 2 END BLOCKING ASSEMBLY (4 REQD). SEE THE "END BLOCKING ASSEMBLY" DETAIL ON PAGE 6. INSTALL BETWEEN BOTTOM FRAME MEMBER OF CONTAINER AND BASE OF FLATRACK ENDWALL WITH A TIGHT FIT. NAIL THRU EACH HOLD-DOWN CLEAT INTO THE FLATRACK FLOOR W/8-10d NAILS. SEE GENERAL NOTES "F", "G", AND "J" ON PAGE 2.
 - 3 ANTI-CHAFING BOARD, 1" X 4" X 6-2" (2 REQD). POSITION AN ANTI-CHAFING BOARD APPROXIMATELY 30" FROM EACH END OF ONE CONTAINER STACK AS SHOWN ABOVE.
 - 4 ANTI-CHAFING, NEUTRAL BARRIER MATERIAL (AS REQD). POSITION UNDER THE STRAPS, PIECES MARKED 5, AND 13 AT POINTS OF CONTACT WITH EDGES OF THE CONTAINERS, EXCEPT AT FORK TINE OPENINGS.
 - 5 UNITIZING STRAP, 1-1/4" X .035" OR .031" BY A LENGTH TO SUIT (REF: 22'-0") (2 REQD). POSITION EACH STRAP OVER AN ANTI-CHAFING BOARD, PIECE MARKED 3, AND AROUND ONE CONTAINER STACK AS SHOWN ABOVE.
 - 6 SEAL FOR 1-1/4" STRAPPING (6 REQD, 1 PER STRAP). FASTEN EACH STRAP MARKED 5, 14, OR 15, WITH ONE SEAL, CRIMPED WITH TWO PAIR OF NOTCHES. SEE GENERAL NOTE "K" ON PAGE 2.
 - 7 STAPLE, 1-17/32" CROWN WIDTH X 3/4" LEG LENGTH (4 REQD). FASTEN EACH UNITIZING STRAP, PIECE MARKED 5, TO THE ANTI-CHAFING BOARD, PIECE MARKED 3, WITH ONE STAPLE NEAR THE TOP AND ONE STAPLE NEAR THE BOTTOM.
 - 8 STRAPPING BOARD, 2" X 6" X 83" (3 REQD). POSITION THE STRAPPING BOARDS VERTICALLY IN LINE WITH THE FLATRACK TIEDOWN POINTS AND ON THE FLAT SURFACE OF THE CONTAINER LIDS. CAUTION: DO NOT POSITION THE STRAPPING BOARDS ON TOP OF CONTAINER LID REINFORCING RIBS.
 - 9 PURCHASE BOARD, 2" X 6" X 28" (3 REQD). CENTER ON THE STRAPPING BOARD, PIECE MARKED 8, AND NAIL W/4-10d NAILS. SEE GENERAL NOTE "J" ON PAGE 2.
 - 10 HOLD-DOWN STRAP, 2" X .050" BY A LENGTH TO SUIT (REF: 26'-0") (3 REQD). INSTALL EACH STRAP FROM TWO 13'-0" LONG PIECES FASTENED TO THE TIEDOWN POINTS AS SHOWN. SEE GENERAL NOTE "O" ON PAGE 2.
 - 11 PAD, STRAPPING, 2" X .050" X 18" (6 REQD). PRE-POSITION THE PAD BETWEEN THE HOLD-DOWN STRAP, PIECE MARKED 10, AND THE FLATRACK TIEDOWN PROVISION AND SECURE WITH ONE SEAL CRIMPED WITH ONE PAIR OF NOTCHES. SEE THE "TIEDOWN DETAIL" ON PAGE 7.

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SPECIAL NOTE:

THE LOAD AS SHOWN ON PAGE 4 MAY BE REDUCED BY AN EVEN NUMBER OF CONTAINERS SUCH AS TWO FROM THE TOP LAYER OR FOUR FROM THE TOP TWO LAYERS OF THE LOAD. FOR EACH REDUCED LAYER OF THE LOAD, THE ANTI-CHAFING BOARDS, PIECE MARKED (3), ARE TO BE SHORTENED AN INCREMENT OF 15-1/2" AND THE STRAPS, PIECES MARKED (5), (10), AND (15) ARE TO BE SHORTENED AN INCREMENT OF 31". THE PROCEDURES AS DEPICTED WITHIN THIS DRAWING ARE NOT APPLICABLE FOR THE SHIPMENT OF AN ODD NUMBER OF CONTAINERS.

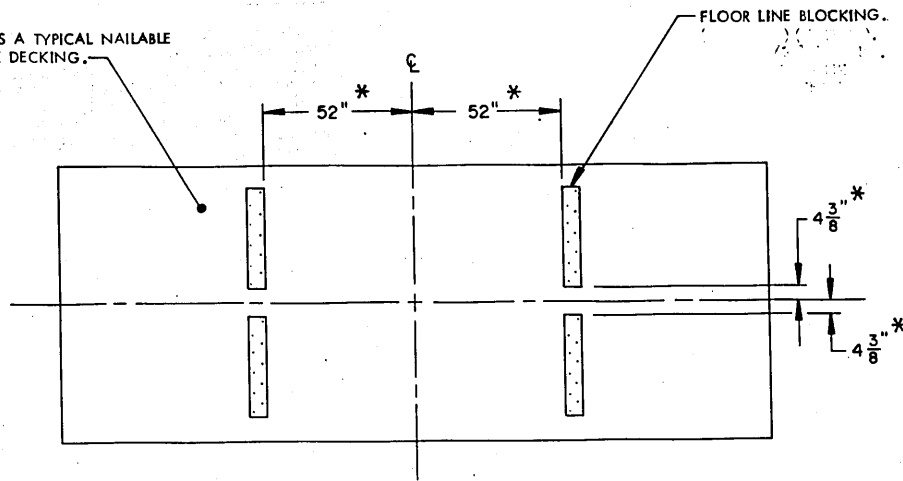
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	12	4
2" X 4"	108	72
2" X 6"	51	51
NAILS	NO. REQD	POUNDS
10d (3")	204	3-1/4
20d (4")	32	1-1/4
STEEL STRAPPING, 1-1/4" X .035" OR .031"	117 REQD	17 LBS
SEAL FOR 1-1/4" STRAPPING	6 REQD	NIL
STEEL STRAPPING, 2" X .050"	87" REQD	29 LBS
SEAL FOR 2" STRAPPING	15 REQD	3 LBS
STAPLES, 2-1/8" X 1"	6 REQD	NIL
STAPLES, 1-17/32" X 3/4"	4 REQD	NIL
ANTI-CHAFING, NEUTRAL BARRIER MATERIAL	AS REQD	NIL

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER	10 @ 1,380 LBS	13,800 LBS
DUNNAGE		302 LBS
FLATRACK		5,732 LBS
TOTAL WEIGHT		19,834 LBS

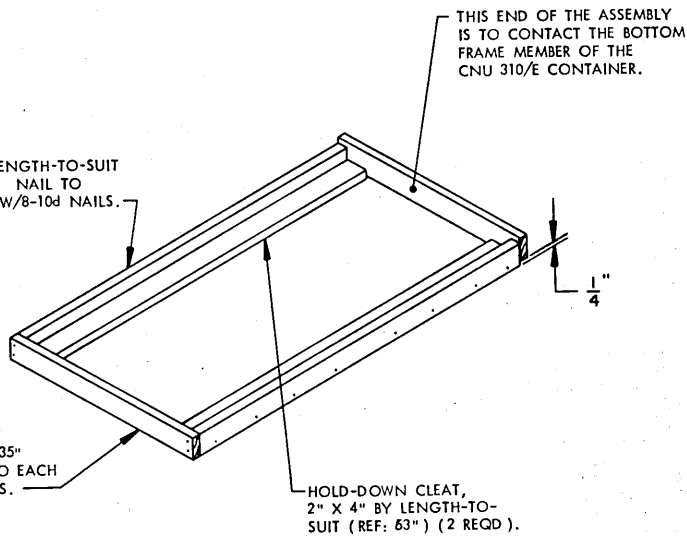
INDICATES A TYPICAL NAILABLE
FLATRACK DECKING.



FLOOR DUNNAGE PLAN DETAIL.

* SPECIAL NOTE: THE FLOOR LINE BLOCKING MAY BE SHIFTED LONGITUDINALLY TO AVOID CONTAINER OBSTRUCTIONS AND LATERALLY TO ACHIEVE A TIGHT FIT BETWEEN CONTAINER STACKS. SEE GENERAL NOTE "F" ON PAGE 2.

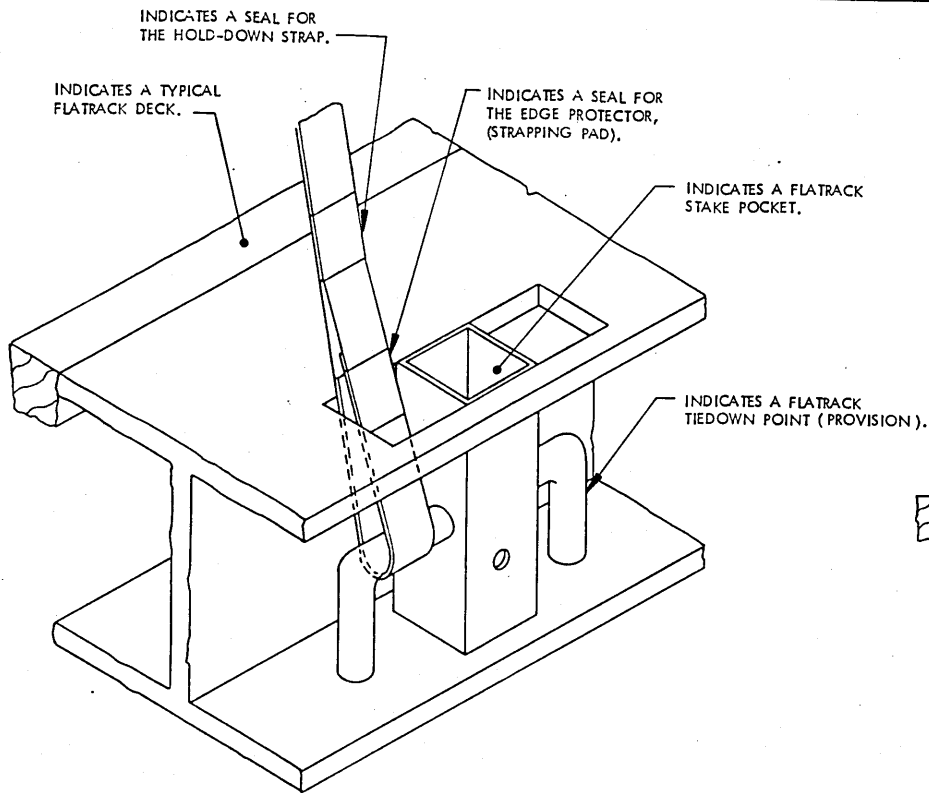
STRUT, 2" X 4" BY LENGTH-TO-SUIT
(REF: 63") (2 REQD). NAIL TO
HOLD-DOWN CLEAT W/8-10d NAILS.



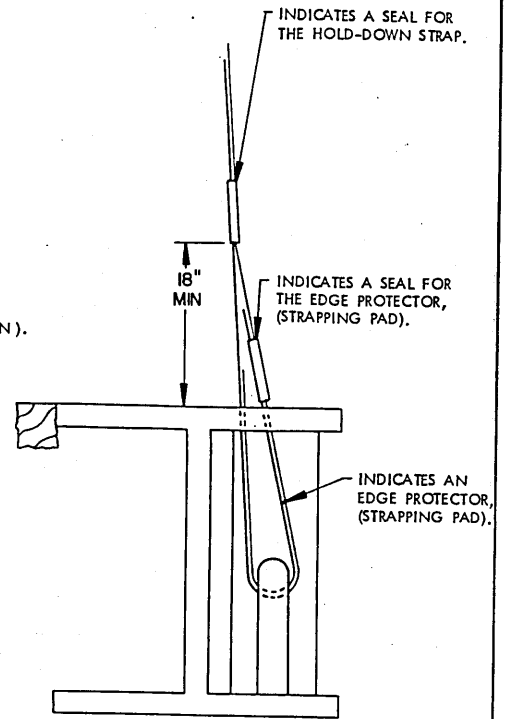
HEADER, 2" X 4" X 35"
(2 REQD). NAIL TO EACH
STRUT W/2-10d NAILS.

HOLD-DOWN CLEAT,
2" X 4" BY LENGTH-TO-
SUIT (REF: 63") (2 REQD).

END BLOCKING ASSEMBLY



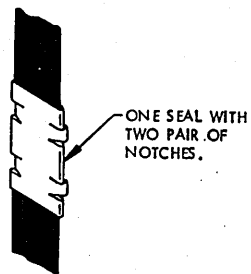
ISOMETRIC VIEW



SIDE VIEW

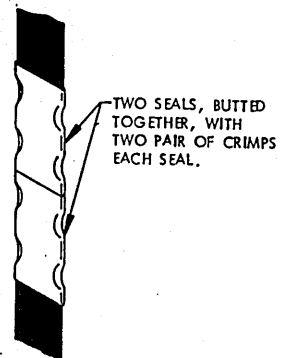
TIEDOWN DETAIL

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

