LOADING AND BRACING⊕ IN SIDE OPENING ISO CONTAINERS OF SIDEARM (AGM-122) MISSILES PACKED IN CNU-434 CONTAINERS

INDEX

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⊕ THE PROCEDURES SHOWN HEREIN ARE APPLICABLE TO LOADS THAT ARE TO BE SHIPPED BY CONTAINER-ON-FLATCAR (COFC) RAIL, MOTOR, OR WATER CARRIERS.

U.S. ARMY MATERIEL COMMAND DRAWING

APPROVED, U.S. ARMY JOINT MUNITIONS COMMAND

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MARCH 2018

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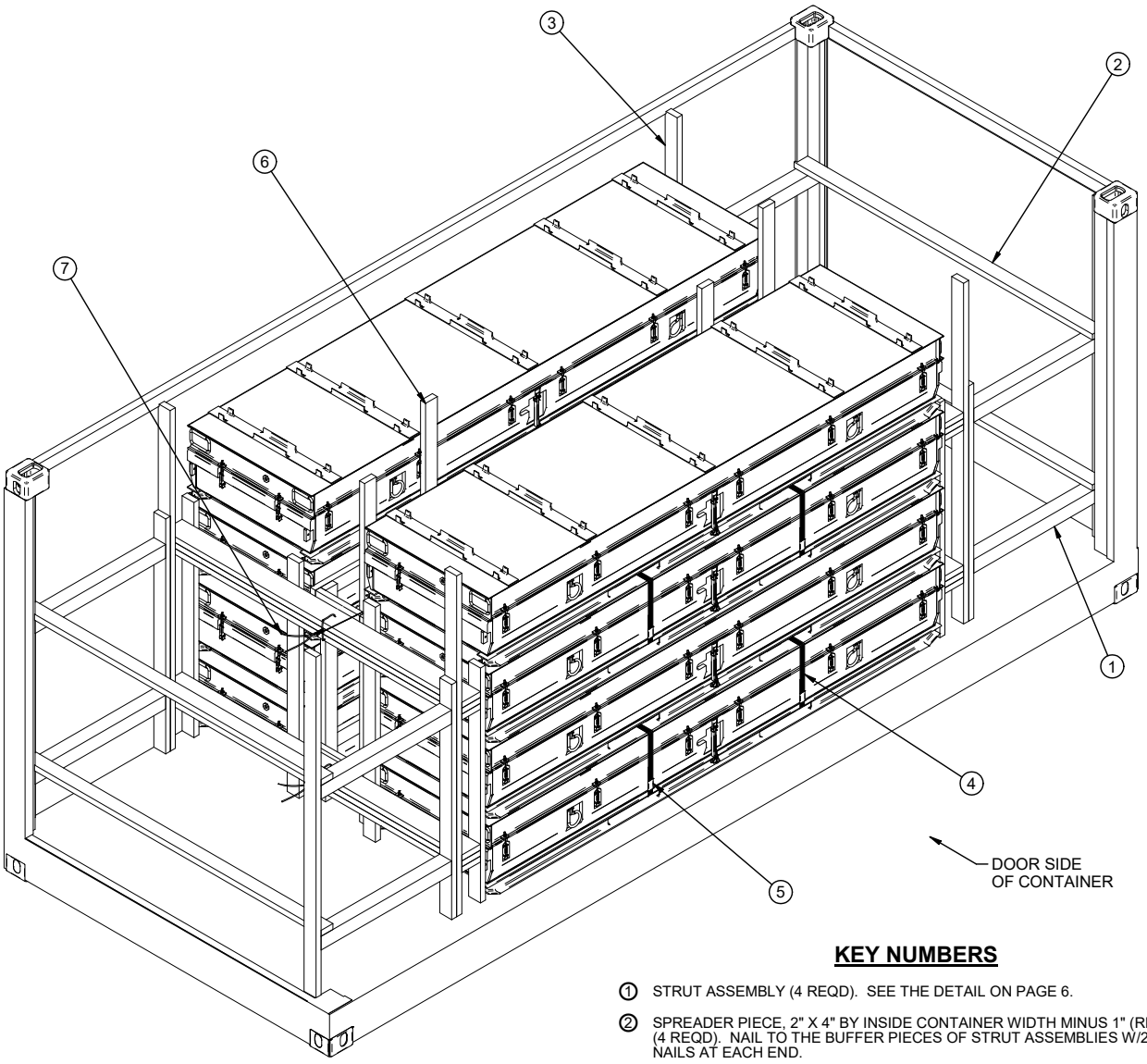
CLASS	DIVISION	DRAWING	FILE
19	48	8711	SP15J119

PROJECT SP 410-00



ISOMETRIC VIEW

KEY NUMBERS

① STRUT ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 6.

② SPREADER PIECE, 2" X 4" BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-7") (4 REQD). NAIL TO THE BUFFER PIECES OF STRUT ASSEMBLIES W/2-10d NAILS AT EACH END.

③ END BLOCKING ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 6. NAIL THROUGH THE VERTICAL PIECES OF THE STRUT ASSEMBLY INTO THE BUFFER PIECES W/5-10d NAILS.

④ STACK UNITIZING STRAP, 1-1/4" X .035" OR .031" OR .029" X 24" LONG STEEL STRAPPING (8 REQD, 2 PER 2 CNU-434 CONTAINERS). INSTALL THROUGH FORKLIFT OPENINGS OF FIRST AND SECOND LAYER CONTAINERS, AS FAR APART AS ALLOWABLE. REPEAT WITH THIRD AND FOURTH LAYER CONTAINERS.

⑤ SEAL FOR 1-1/4" UNITIZING STRAP (8 REQD, 1 PER STRAP). CRIMP ONE SEAL WITH TWO PAIR OF NOTCHES OR CRIMP TWO SEALS WITH TWO PAIR OF CRIMPS EACH. SEE "STRAP JOINT A" AND "STRAP JOINT B" DETAILS ON PAGE 7.

⑥ CENTER FILL ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 7.

⑦ TIE WIRE, .0800" DIA BY 24" LONG (4 REQD, 2 PER FILL ASSEMBLY). INSTALL TO FORM A COMPLETE LOOP AROUND THE FILL ASSEMBLY AND AN ADJACENT LADING UNIT OR STABILIZING DUNNAGE. BRING ENDS TOGETHER AND TWIST TAUT. SECURE TO THE CENTER FILL ASSEMBLY WITH A PARTIALLY DRIVEN 10d NAIL BENT OVER THE WIRE OR WITH A STRAP STAPLE.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2″ X 4″	227	151
2″ X 6″	176	176
4″ X 4″	26	35
NAILS	**NO. REQD**	**POUNDS**
10d (3″)	200	3-1/4
12d(3-1/4″)	32	3/4

STEEL STRAPPING, 1-1/4″ - 83′ REQD - - 11.86 LBS
SEAL FOR 1-1/4″ STRAPPING - 8 REQD - - 0.18 LBS
WIRE, .0800″ DIAMETER - - 12′ REQD - - 0.20 LBS

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CNU-434 CONTAINER	8	11,096 LBS
DUNNAGE		739 LBS
CONTAINER		6,050 LBS
TOTAL WEIGHT		17,885 LBS (APPROX)

PROJECT SP 410-00

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. THE SPECIFIED OUTLOADING PROCEDURES ARE APPLICABLE TO LOADS OF SIDEARM MISSILES PACKED IN CNU-434 CONTAINERS. SUBSEQUENT REFERENCE TO CONTAINER OR CONTAINER UNIT HEREIN MEANS THE CNU-434 CONTAINER WITH AMMUNITION ITEMS. SEE PAGE 5 AND NAVAL AIR SYSTEMS COMMAND DRAWING NUMBER 1596AS206 FOR DETAILS OF THE CONTAINER. **CAUTION:** REGARDLESS OF THE QUANTITY OF CONTAINERS TO BE SHIPPED, THE "MAXIMUM GROSS WEIGHT" OF THE SIDE OPENING ISO CONTAINER MUST NOT BE EXCEEDED.

C. THE LOAD AS SHOWN IS BASED ON A 6,050 POUND 20' LONG BY 8' WIDE BY 8'-6" HIGH SIDE OPENING ISO CONTAINER WITH INSIDE DIMENSIONS OF 19'-6-1/4" LONG BY 90" WIDE BY 89" HIGH, WITH A MAXIMUM GROSS WEIGHT OF 52,910 POUNDS. OLDER/OTHER CONTAINERS MAY HAVE DIFFERENT INSIDE MEASUREMENTS, VERIFY INSIDE CONTAINER DIMENSIONS PRIOR TO FABRICATING DUNNAGE. THE LOAD IS DESIGNED FOR TRAILER/CONTAINER-ON-FLATCAR (T/COFC) SHIPMENT, HOWEVER, THE LOAD AS DESIGNED CAN ALSO BE MOVED BY OTHER SURFACE MODES OF TRANSPORT. **NOTICE:** OTHER CONTAINERS OF THE SAME DESIGN CONFIGURATION CAN BE USED.

D. WHEN LOADING CONTAINERS, THEY ARE TO BE POSITIONED SO AS TO ACHIEVE A TIGHT LOAD (TIGHT AGAINST THE DUNNAGE ASSEMBLIES). THE UNBLOCKED SPACE ACROSS THE WIDTH OF A LOAD BAY IS NOT TO EXCEED 1-1/2". EXCESSIVE SLACK CAN BE ELIMINATED FROM A LOAD BY LAMINATING ADDITIONAL PIECES OF APPROPRIATE THICKNESS TO THE LONGITUDINAL PIECES ON THE CENTER OR SIDE FILL ASSEMBLIES. NAIL EACH ADDITIONAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". THE LOADS MUST BE AS TIGHT AS POSSIBLE LONGITUDINALLY, BUT THE VOID MUST NOT EXCEED 3/4" OVERALL. EXCESSIVE SLACK CAN BE ELIMINATED EITHER BY INCREASING THE LENGTH OF THE STRUTS IN THE TWO STRUT ASSEMBLIES ON ONE END OF THE LOAD, OR BY INSTALLING 4" WIDE BY 66" LONG FILL MATERIAL. FILL MATERIAL MAY BE INSTALLED BETWEEN THE STRUT ASSEMBLY VERTICAL PIECES AND THE END BLOCKING ASSEMBLY BUFFER PIECES, TOENAIL EACH PIECE W/5 APPROPRIATELY SIZED NAILS (10d FOR 2" MATERIAL).

E. 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.

F. IN SOME CONTAINERS THERE IS A SLOT AT THE CORNERS OF THE ENDWALL. PIECES OF DUNNAGE MATERIAL MUST BE LAMINATED TO THE BUFFER PIECES ON THE STRUT ASSEMBLIES TO PROVIDE A FLAT SURFACE FOR THE BUFFER PIECES. A PIECE OF 2" X 4", 2" X 3" OR A SPECIAL WIDTH PIECE CUT-TO-FIT CAN BE USED. THIS FILL PIECE WILL BE NAILED WITH ONE APPROPRIATELY SIZED NAIL EVERY 12". NOTE THAT SOME CONTAINERS ARE EQUIPPED WITH "TIE-BARS" IN THE CORNER SLOT, WHICH PRECLUDE THE USE OF A FULL HEIGHT FILL PIECE. WHEN "TIE-BARS" ARE PRESENT, THE FILL PIECE MUST BE INSTALLED IN SEGMENTS DESIGNED TO FIT BETWEEN THE "TIE-BARS" VERTICALLY. THE FILL PIECE(S) IS NOT REQUIRED WHEN THE CORNER PORTIONS OF THE CONTAINER FORWARD WALL ARE SMOOTH AND FLAT. DO NOT ALLOW ANY DUNNAGE ASSEMBLY TO CONTACT THE CONTAINER ENDWALLS, ONLY THE CORNER POSTS OF THE CONTAINER SHOULD BE USED FOR FORWARD LONGITUDINAL BLOCKING.

G. WHETHER A CONTAINER IS FULL OR IS LOADED WITH A REDUCED QUANTITY OF LADING UNITS, THE LENGTHWISE CENTER OF GRAVITY OF THE LOAD MUST BE WITHIN 12", IN EITHER DIRECTION, OF THE MID-POINT OF THE CONTAINER.

H. **CAUTION:** DO NOT NAIL DUNNAGE MATERIAL TO THE CONTAINER WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.

J. PORTIONS OF THE CONTAINER DEPICTED WITHIN THIS DRAWING, SUCH AS THE SIDEWALL, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.

K. **MAXIMUM LOAD WEIGHT CRITERIA:**

THE MAXIMUM LOAD WEIGHTS ARE CONTROLLED BY EQUIPMENT CAPABILITY FACTORS. ALTHOUGH THE HEAVIEST MAXIMUM LOADS ARE DELINEATED IN THE LOAD VIEWS, PROVISIONS ARE INCLUDED WITHIN THIS DRAWING SO THAT THE BASIC LOADS CAN BE ADJUSTED TO SATISFY A LESSER QUANTITY OF LADING UNITS. DEPENDING ON TRANSPORTATION ROUTING, IT MAY BE NECESSARY TO REDUCE THE LOAD WEIGHT TO SATISFY "WEIGHT LAWS" OF CERTAIN STATES. ALSO, IT MAY BE NECESSARY TO REDUCE THE LOAD WEIGHT TO SATISFY OTHER WEIGHT RESTRICTIONS IMPOSED ON THE INTERMODAL CONTAINER SYSTEM.

(CONTINUED AT RIGHT)

L. REQUIREMENTS CITED WITHIN THE ASSOCIATION OF AMERICAN RAILROADS (AAR) INTERMODAL LOADING GUIDE 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.

M. DURING INTRASTATE AND/OR INTERSTATE MOVES BY MOTOR CARRIER, A PROPER CHASSIS OR MODIFIED FLATBED TRAILER MUST BE USED TO PRECLUDE VIOLATION OF ONE OR MORE "WEIGHT LAWS" APPLICABLE TO THE STATE OR STATES INVOLVED.

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 0.454 KG.

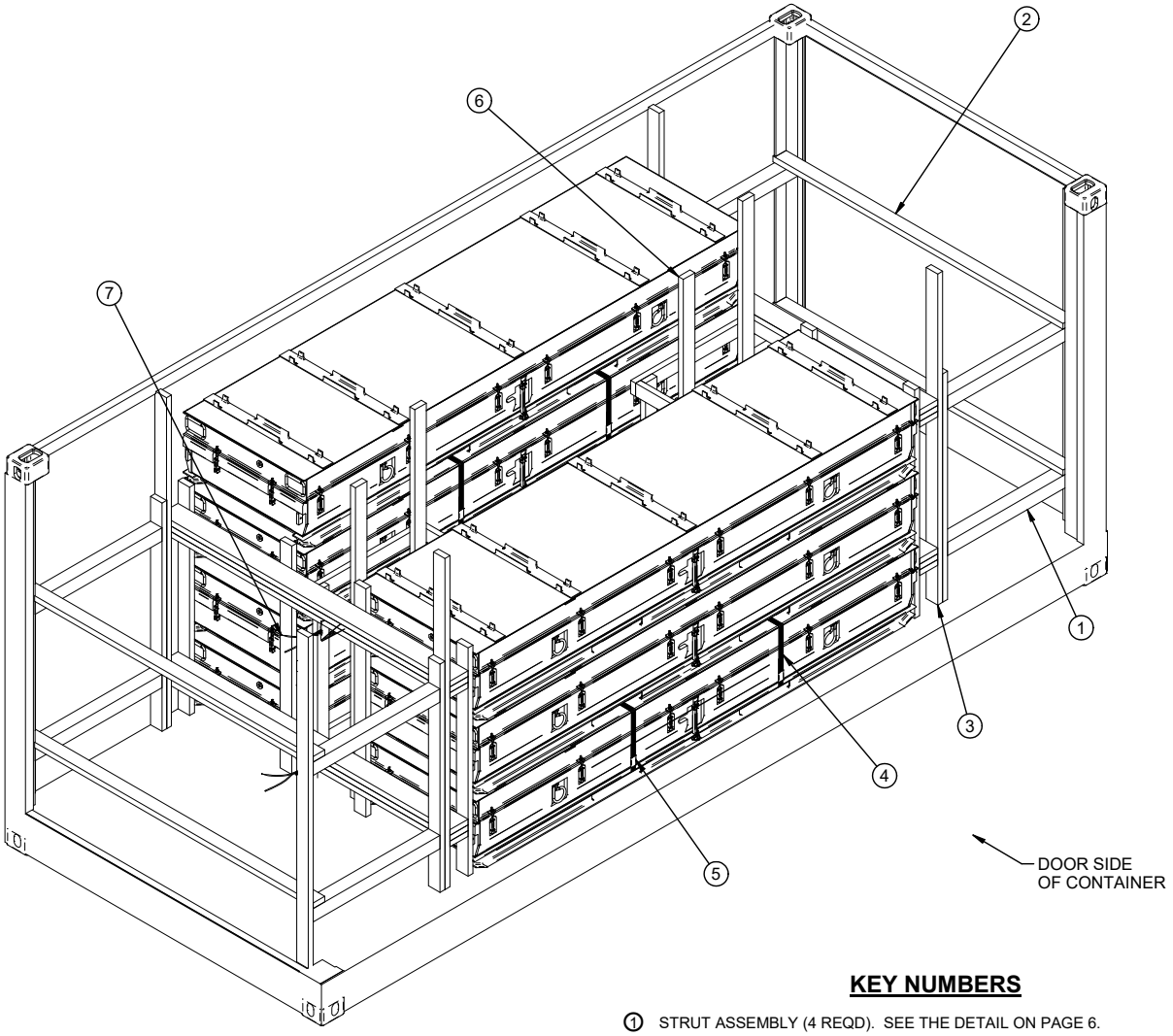
O. THE QUANTITY OF CONTAINERS SHOWN IN THE LOAD ON PAGE 2 MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SEE THE “REDUCED LADING LOAD PROCEDURE” ON PAGE 4, OR THE “LESS-THAN-FULL LOAD PROCEDURE” ON PAGE 8.

P. 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.

Q. ANTI-CHAFING MATERIAL MAY BE INSTALLED AT POINTS OF CONTACT BETWEEN CONTAINERS, BETWEEN CONTAINERS AND THE SIDE OPENING CONTAINER, AND BETWEEN CONTAINERS AND STEEL STRAPPING, IF DESIRED, TO PREVENT CHAFING DAMAGE TO CONTAINER PAINT AND MARKINGS.

MATERIAL SPECIFICATIONS

LUMBER - - - - - - - -:	SEE TM 743-200-1 (DUNNAGE LUMBER) AND VOLUNTARY PRODUCT STANDARD PS 20.
NAILS - - - - - - - -:	ASTM F1667; COMMON STEEL NAIL NLCMS OR NLCMMS).
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.
WIRE, CARBON STEEL -:	ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, 0.0800" DIA, GRADE 1006 OR BETTER.
STAPLE - - - - - - -:	ASTM F1667; STFCS-189 OR STFCS-207,15/16" OR 1" CROWN WIDTH X 3/4" LEG LENGTH FOR 3/4" STRAPPING, OR STFCS-224, 1-17/32" CROWN WIDTH X 3/4" LEG LENGTH FOR 1-1/4" STRAPPING.
ANTI-CHAFING MATERIAL - - - - - -:	MIL-PRF-121 (OR EQUAL); NEUTRAL BARRIER MATERIAL.



ISOMETRIC VIEW

KEY NUMBERS

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② SPREADER PIECE, 2" X 4" BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-7") (4 REQD). NAIL TO THE BUFFER PIECES OF STRUT ASSEMBLIES W/2-10d NAILS AT EACH END.

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⑤ SEAL FOR 1-1/4" UNITIZING STRAP (6 REQD, 1 PER STRAP). CRIMP ONE SEAL WITH TWO PAIR OF NOTCHES OR CRIMP TWO SEALS WITH TWO PAIR OF CRIMPS EACH. SEE "STRAP JOINT A" AND "STRAP JOINT B" DETAILS ON PAGE 7.

⑥ CENTER FILL ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 7.

⑦ TIE WIRE, .0800" DIA BY 24" LONG (4 REQD, 2 PER FILL ASSEMBLY). INSTALL TO FORM A COMPLETE LOOP AROUND THE FILL ASSEMBLY AND AN ADJACENT LADING UNIT OR STABILIZING DUNNAGE. BRING ENDS TOGETHER AND TWIST TAUT. SECURE TO THE CENTER FILL ASSEMBLY WITH A PARTIALLY DRIVEN 10d NAIL BENT OVER THE WIRE OR WITH A STRAP STAPLE.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2″ X 4″	227	152
2″ X 6″	176	176
4″ X 4″	26	34
NAILS	**NO. REQD**	**POUNDS**
10d (3″)	200	3-1/4
12d(3-1/4″)	32	3/4

STEEL STRAPPING, 1-1/4″ - 63′ REQD - - 8.89 LBS
SEAL FOR 1-1/4″ STRAPPING - 6 REQD - - 0.14 LBS
WIRE, .0800″ DIAMETER - - 12′ REQD - - 0.20 LBS

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CNU-434 CONTAINER	7	9,709 LBS
DUNNAGE		735 LBS
CONTAINER		6,050 LBS
TOTAL WEIGHT		16,495 LBS (APPROX)

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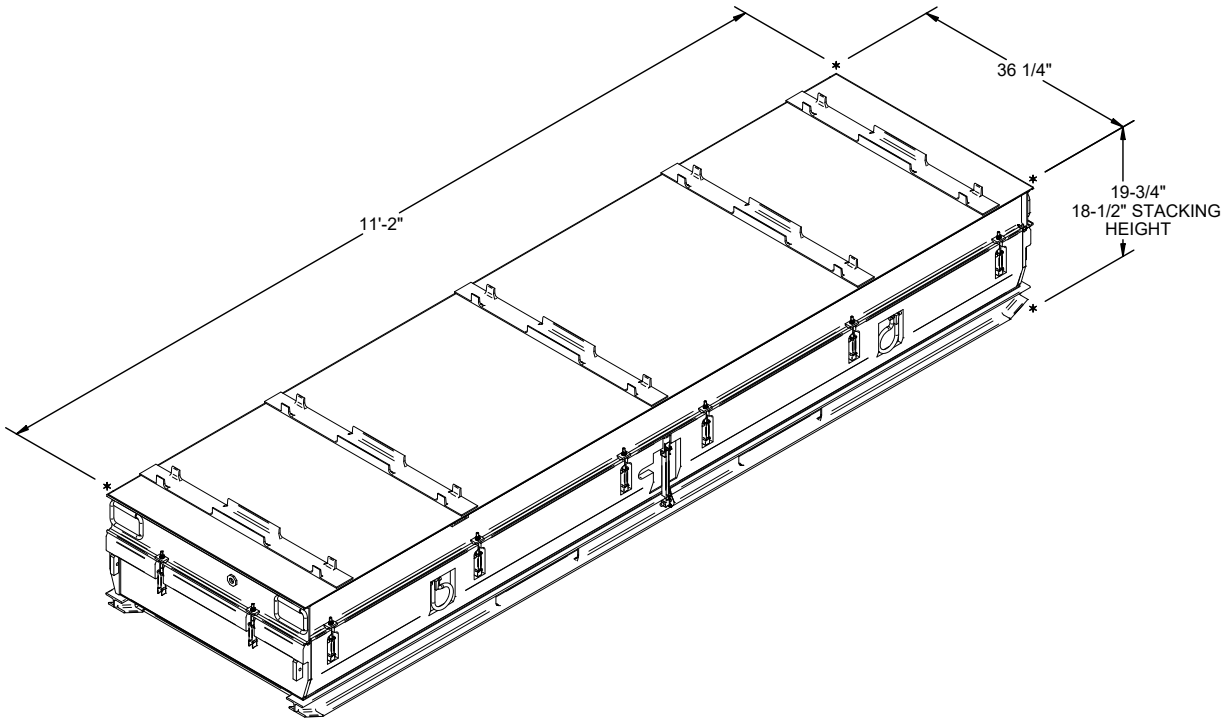


CONTAINER DATA

GROSS WEIGHT - - - - - - - - - - - - - 1,387 LBS
CUBE - - - - - - - - - - - - - - - - - 52.0 CU FT

UNITIZATION AND HANDLING GUIDANCE

1. STACKING CONTAINERS FOR UNITIZING:

   A. AN UPPER CONTAINER SHOULD BE PLACED AS CLOSE AS POSSIBLE IN VERTICAL ALIGNMENT WITH THE NEXT LOWER CONTAINER.

   B. POSITION THE AFT END OF AN UPPER CONTAINER ABOVE THE AFT END OF THE NEXT LOWER CONTAINER.

   C. THE CONTAINER SKIDS OF AN UPPER CONTAINER SHOULD BE FULLY SEATED AGAINST THE SKID LOCATOR PIECES ON THE COVER OF THE NEXT LOWER CONTAINER.

2. UNITIZING PROCEDURE USING 1-1/4" BANDING STRAPS.

   A. STACK TWO CONTAINERS AS SHOWN. BE SURE TO ALIGN THE STACKING FEATURES.

   B. FEED UNITIZING STRAP THROUGH FORK POCKETS OF BOTH CONTAINERS. (2 PLACES)

   C. TENSION AND SECURE EACH STRAP WITH ONE DOUBLE-NOTCHED SEAL.

(CONTINUED AT RIGHT)

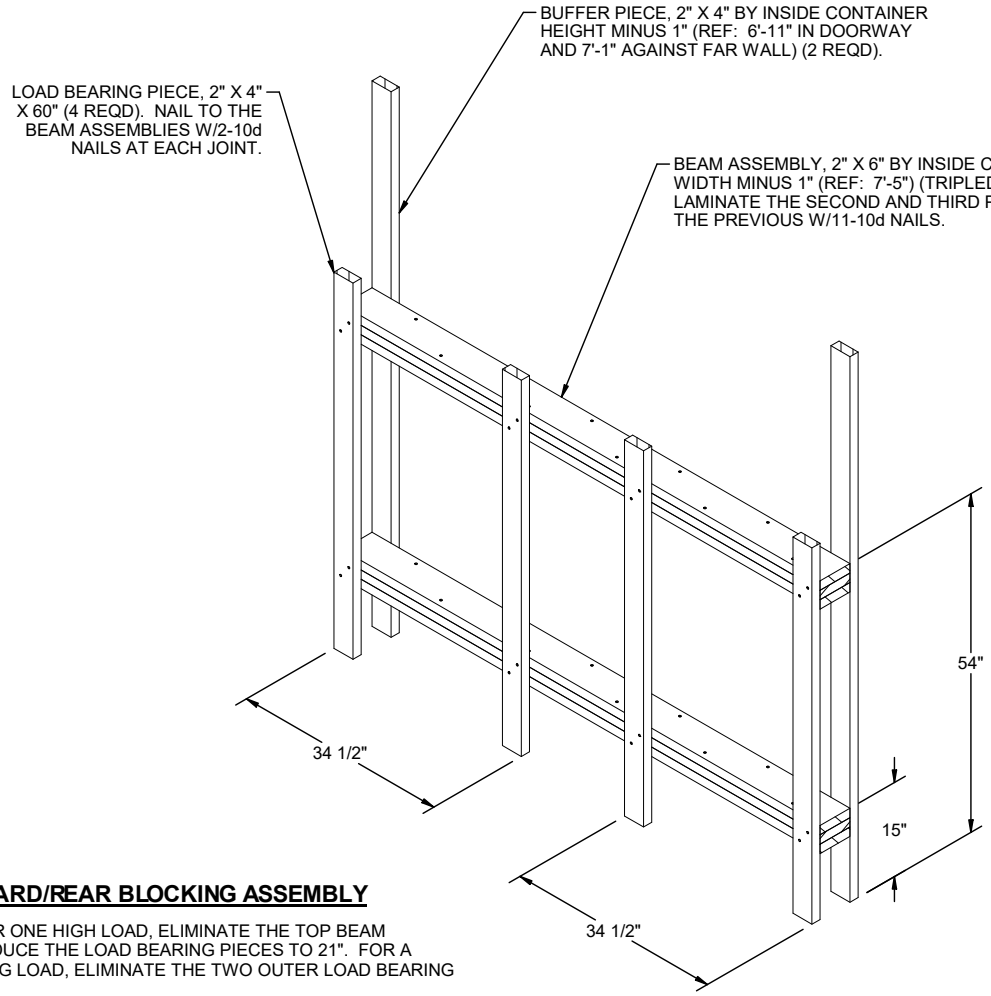
(UNITIZATION AND HANDLING GUIDANCE CONTINUED)

3. CONTAINER OR CONTAINER STACK HANDLING:

   A. ONLY APPROVED AND APPROPRIATELY SIZED MATERIAL HANDLING EQUIPMENT WILL BE USED FOR HANDLING THE DEPICTED CONTAINERS. APPROVED MATERIAL HANDLING EQUIPMENT (FORKLIFT TRUCKS, CRANES, HAND TRUCKS, DOLLIES, ROLLER ASSEMBLIES, SLINGS, SPREADER BARS, ETC.) IS SPECIFIED ELSEWHERE.

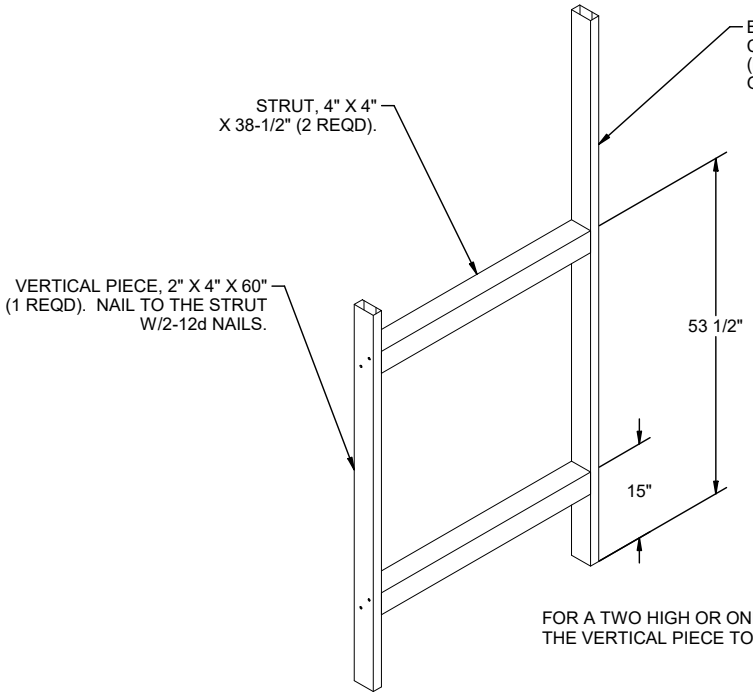
   B. PRECAUTIONARY HANDLING TECHNIQUES NORMALLY EMPLOYED OR AS SPECIFIED FOR THE TYPE OF COMMODITY INVOLVED WILL BE OBSERVED.

   C. IF HANDLING IS ACCOMPLISHED WITH A FORKLIFT TRUCK, THE CONTAINERS SHOULD BE HANDLED FROM A SIDE POSITION AS MUCH AS POSSIBLE. CARE MUST BE EXERCISED WHEN INSERTING FORKS UNDER A CONTAINER, TO PREVENT DAMAGE TO THE CONTAINER BY THE FORK TINES OR THE FORKLIFT PACKAGE GUARD. IF ONE CONTAINER IS HANDLED BY SLINGING, THE SLING MAY BE ATTACHED TO THE LIFTING POINTS ON THE CONTAINER. DO NOT HANDLE STACKED CONTAINERS WITH A SLING.



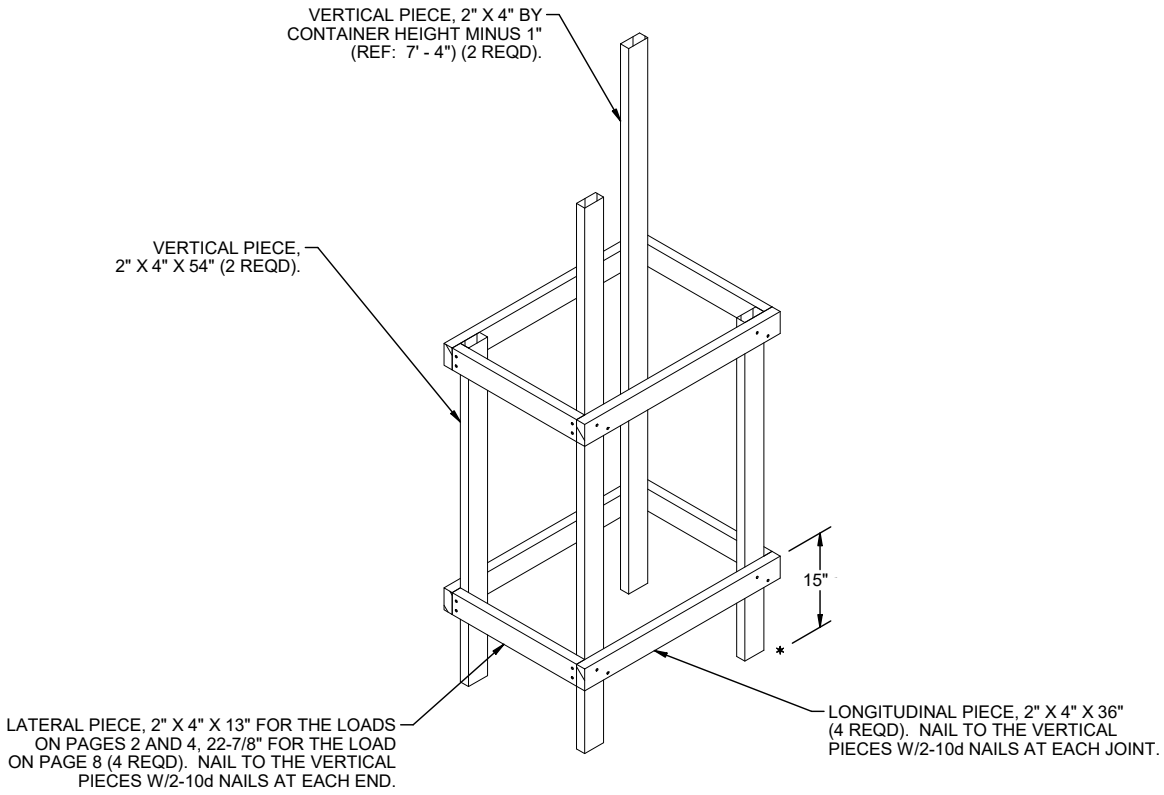
FORWARD/REAR BLOCKING ASSEMBLY

FOR A TWO HIGH OR ONE HIGH LOAD, ELIMINATE THE TOP BEAM ASSEMBLY AND REDUCE THE LOAD BEARING PIECES TO 21". FOR A SINGLE-WIDE LADING LOAD, ELIMINATE THE TWO OUTER LOAD BEARING PIECES.



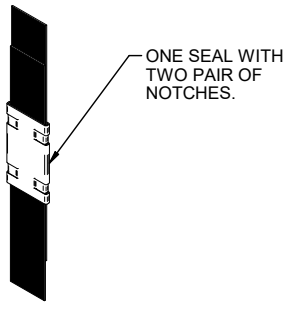
STRUT ASSEMBLY

FOR A TWO HIGH OR ONE HIGH LOAD, ELIMINATE THE UPPER STRUT AND SHORTEN THE VERTICAL PIECE TO 21".



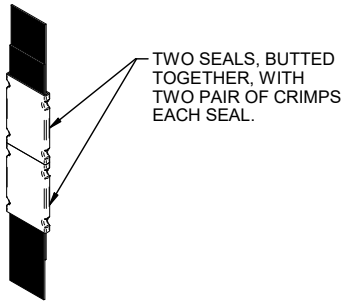
CENTER/SIDE FILL ASSEMBLY

FOR A ONE HIGH OR TWO HIGH LOAD, ELIMINATE THE UPPER TWO HORIZONTAL PIECES AND UPPER TWO LATERAL PIECES AND SHORTEN THE SHORT VERTICAL PIECES TO 15".



STRAP JOINT A

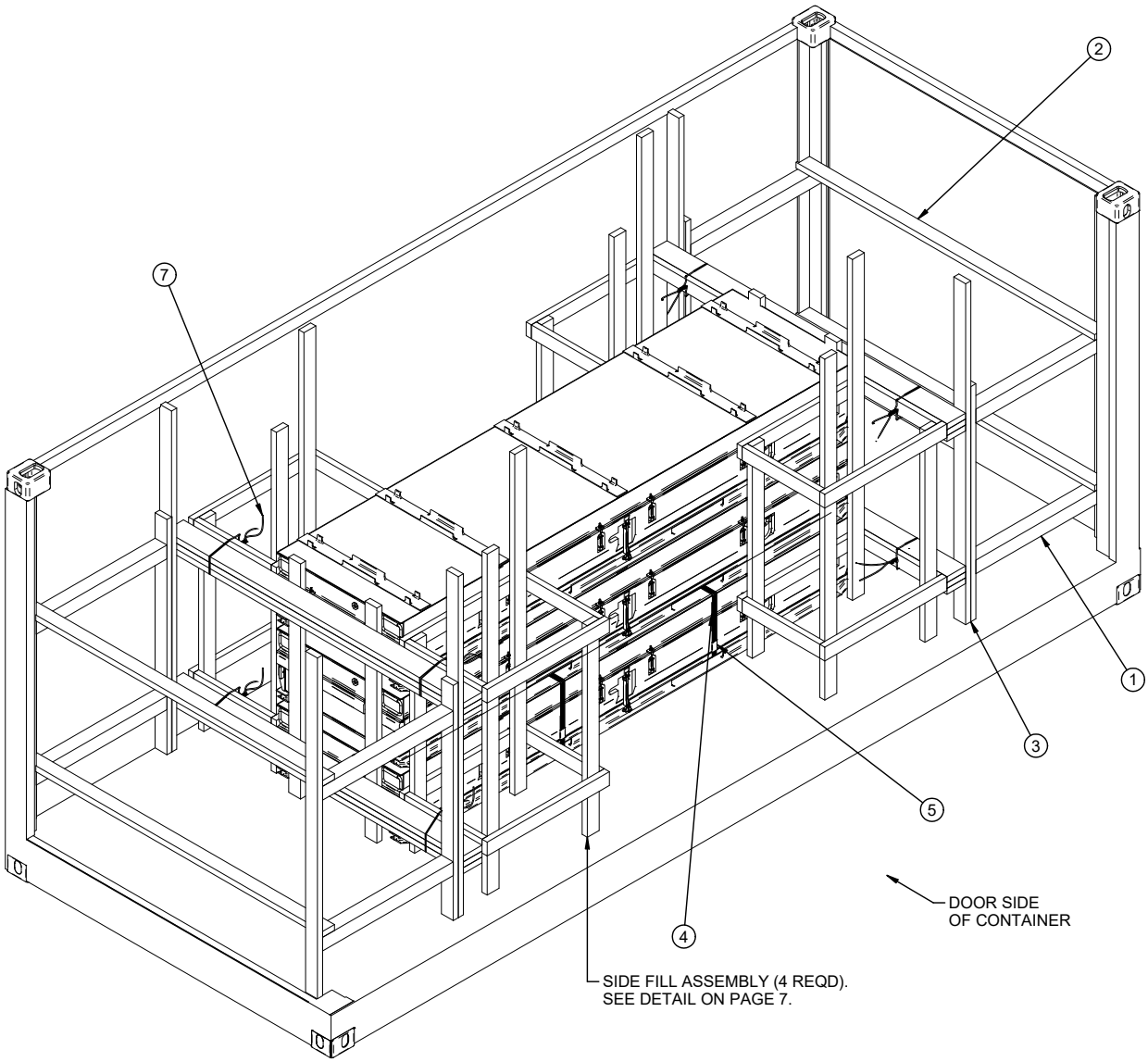
METHOD OF SECURING A STRAP JOINT WHEN USING A NOTCH-TYPE SEALER.



STRAP JOINT B

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

END-OVER-END LAP JOINT DETAILS



ISOMETRIC VIEW

LESS-THAN-FULL-LOADPROCEDURE

THE DETAIL ABOVE DEPICTS A BLOCKING METHOD TO BE USED IN A LESS-THAN-FULL CONTAINER LOAD (LESS THAN 5 UNITS). KEY NUMBERS REFER TO KEY NUMBERS ON PAGE 4. SEE GENERAL NOTES "G" AND "O" ON PAGE 3.