

LOADING AND BRACING[⊕] IN SIDE OPENING ISO CONTAINERS OF LONG RANGE ANTI-SHIP MISSILE (LRASM) PACKED IN CNU-745 CONTAINERS

INDEX

ITEM	PAGE(S)
TYPICAL LOAD PROCEDURES	2
GENERAL NOTES AND MATERIAL SPECIFICATIONS	3
CNU-745 CONTAINER DETAIL	4
DETAILS	5-6
TWO CNU-745 CONTAINER LOAD	7
LESS-THAN-FULL-LOAD PROCEDURES	8

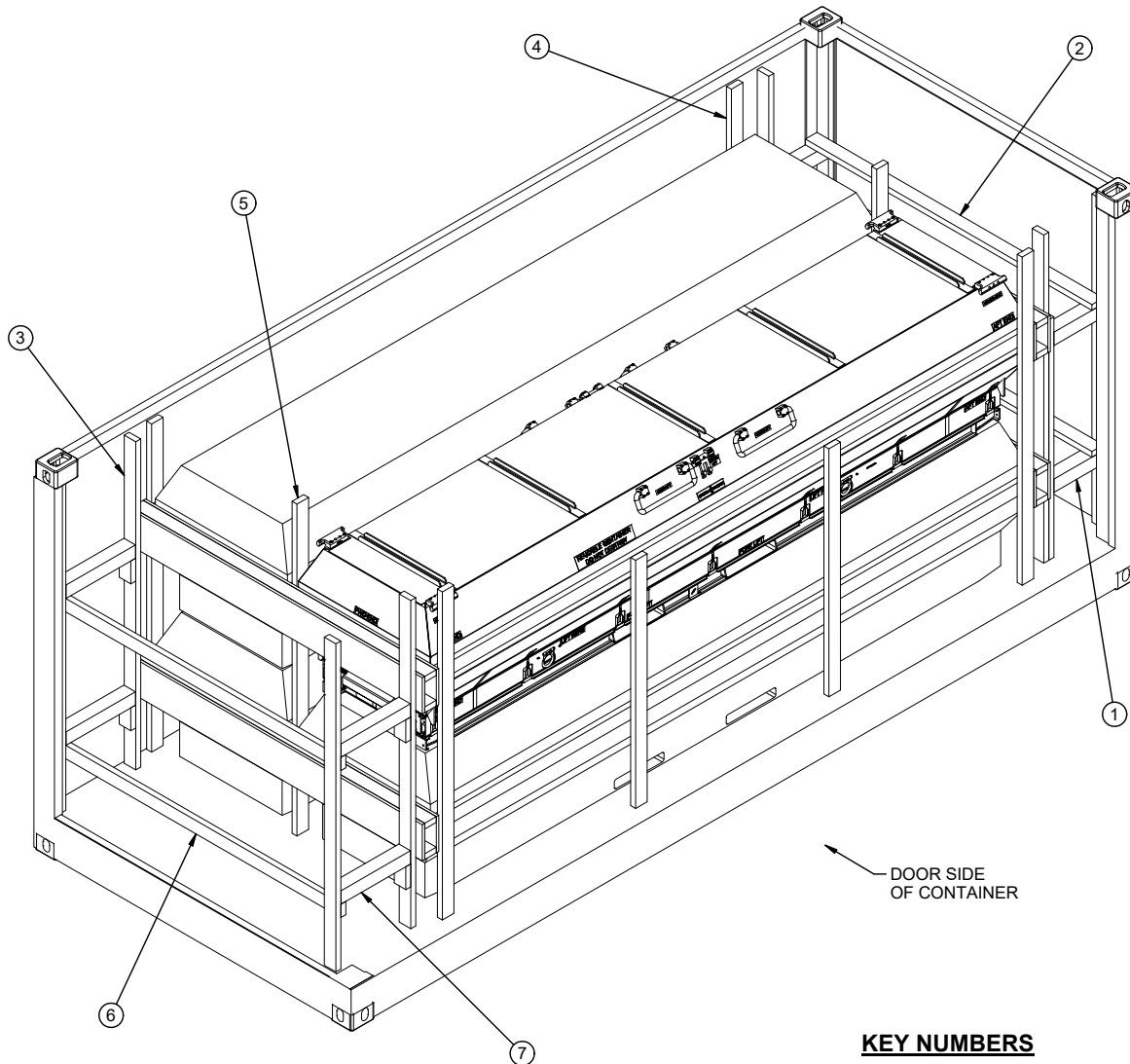
DISTRIBUTION STATEMENT A:

APPROVED FOR PUBLIC RELEASE
DISTRIBUTION IS UNLIMITED.

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

U.S. ARMY MATERIEL COMMAND DRAWING

APPROVED, U.S. ARMY JOINT MUNITIONS COMMAND RUS.ALLEN.J .1230354282 <small>Digitally signed by RUS.ALLEN.J.1230354282 Date: 2019.01.22 12:28:37 -06'00'</small>		CAUTION: VERIFY PRIOR TO USE AT https://www.dau.mil/cop/ammo/Pages/Default.aspx THAT THIS IS THE MOST CURRENT VERSION OF THIS DOCUMENT. THIS IS PAGE 1 OF 8.			
		DO NOT SCALE		NOVEMBER 2018	
		DESIGN ENGINEER	BASIC	QUYEN TRAN	
			REV.		
APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND THOMAS.CARL.AN THONY.110462137 2 <small>Digitally signed by THOMAS.CARL.ANTHONY.1104 621372 Date: 2019.01.25 12:43:37 -06'00'</small>		ENGINEERING DIVISON	FIEFFER.LAUR A.A.1230375727 <small>Digitally signed by FIEFFER.LAURA.A.1230375727 Date: 2018.11.01 14:39:29 -05'00'</small>	CLASS	DIVISION
		TEST ENGINEER	FELICIANO.AD IN.1259200373 <small>Digitally signed by FELICIANO.ADIN.1259200373 Date: 2018.11.06 12:36:41 -06'00'</small>	DRAWING	FILE
		TEST REPORT	NA	19	48
U.S. ARMY DEFENSE AMMUNITION CENTER		EXPLOSIVE SAFETY DIRECTORATE	THOMAS.CARL.ANT HONY.1104621372 <small>Digitally signed by THOMAS.CARL.ANTHONY.11046 21372 Date: 2018.12.06 11:42:25 -06'00'</small>	8888	SP15J180



ISOMETRIC VIEW

KEY NUMBERS

- ① STRUT ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 5.
- ② SPREADER PIECE, 2" X 4" BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-2-3/4") (2 REQD). NAIL TO THE STRUTS OF THE STRUT ASSEMBLY W/2-10d NAILS AT EACH END.
- ③ END BLOCKING ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 5. NAIL THROUGH THE BUFFER PIECES INTO THE VERTICAL PIECE OF THE STRUT ASSEMBLIES W/5-10d NAILS. **NOTE:** STRUT LEDGERS ARE ONLY REQUIRED ON THE LEFT END BLOCKING ASSEMBLY. DO NOT INSTALL STRUT LEDGERS ON THE RIGHT END BLOCKING ASSEMBLY.
- ④ SIDE FILL ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 6.
- ⑤ CENTER FILL ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 6.
- ⑥ END GATE (1 REQD). SEE THE DETAIL ON PAGE 5.
- ⑦ STRUT, 4" X 4" BY CUT-TO-FIT (REF: 21") (4 REQD). TOENAIL TO THE VERTICAL PIECES OF THE LEFT END BLOCKING ASSEMBLY AND OF THE END GATE W/2-12d NAILS AT EACH END. SEE THE "BEVEL-CUT" DETAIL ON PAGE 4.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	60	20
2" X 4"	293	195
4" X 4"	12	16
NAI LS	NO. REQD	POUNDS
6d (2")	224	1-1/2
10d (3")	104	1-3/4
12d (3-1/4")	16	1/4
PLYWOOD, 1/2"	46.84 SQ FT REQD	96.61 LBS

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CNU-745 CONTAINER	4	16,000 LBS
DUNNAGE		562 LBS
CONTAINER		6,050 LBS
TOTAL WEIGHT		22,612 LBS (APPROX)

GENERAL NOTES

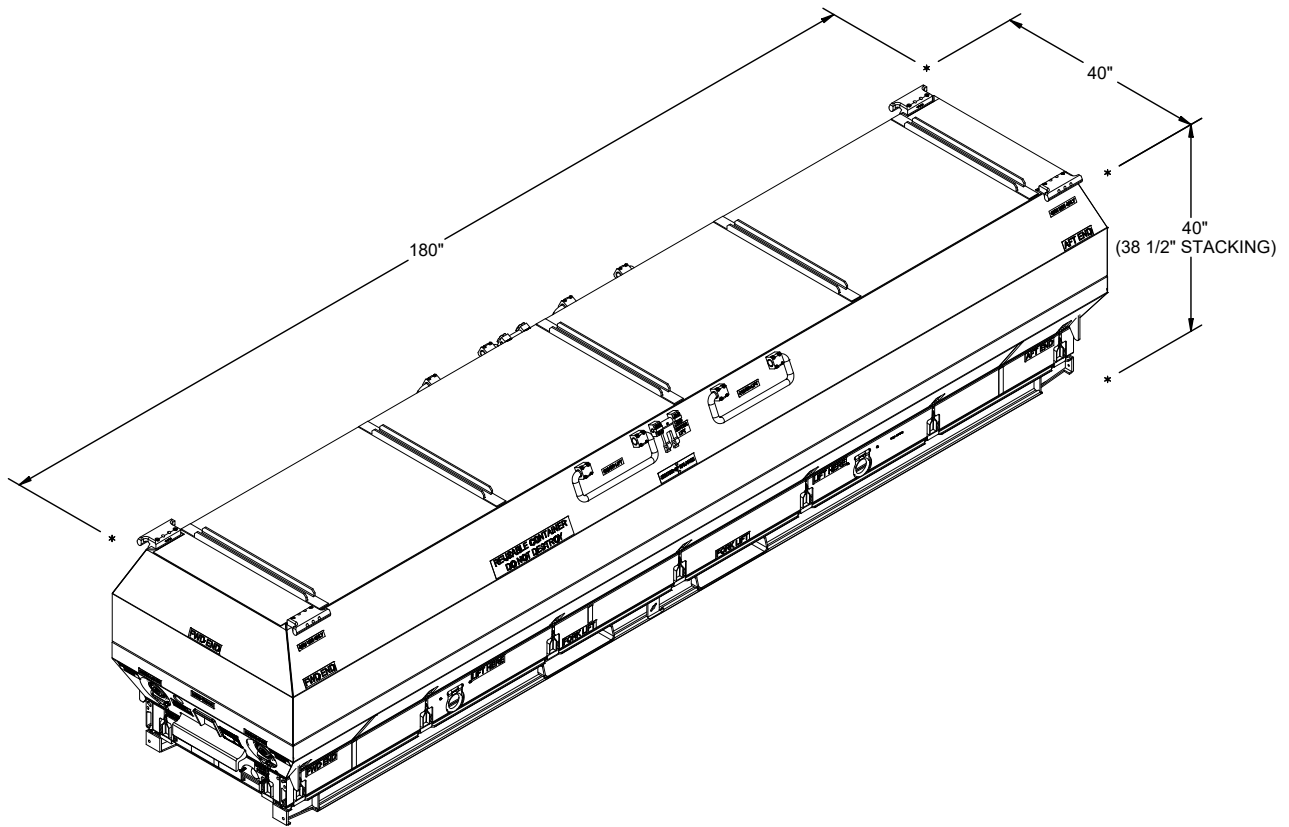
(GENERAL NOTES CONTINUED)

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE SPECIFIED OUTLOADING PROCEDURES ARE APPLICABLE TO LOADS OF LONG RANGE ANTI-SHIP MISSILE (LRASM) PACKED IN CNU-745 CONTAINER. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CONTAINER WITH AMMUNITION ITEMS. SEE PAGE 4 AND LOCKHEED MARTIN DRAWING 797223490 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'-5-1/4" LONG BY 89-3/4" WIDE BY 88" 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 HORIZONTAL PIECES ON THE SIDE FILL ASSEMBLIES. NAIL EACH ADDITIONAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE THICKNESS AND/OR QUANTITY OF THE VERTICAL OR HORIZONTAL PIECES IN THE SIDE FILL ASSEMBLIES MAY BE ADJUSTED AS REQUIRED TO FACILITATE VARIANCE IN THE SIZE OF THE CONTAINER. THE LOADS MUST BE AS TIGHT AS POSSIBLE LONGITUDINALLY, BUT THE VOID MUST NOT EXCEED 3/4" OVERALL. EXCESSIVE SLACK CAN BE ELIMINATED BY INCREASE THE LENGTH OF STRUTS.
- 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 BE-SIDE 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 PIECE ON THE STRUT ASSEMBLY OR TO THE VERTICAL PIECES ON THE END GATE 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.
- 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 "TWO CNU-745 CONTAINER LOAD" AND THE "LESS-THAN-FULL-LOAD" PROCEDURES ON PAGE 7 AND 8, RESPECTIVELY.
- 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. RECOMMENDED SEQUENTIAL LOADING PROCEDURES FOR THE LOAD ON PAGE 2:
1. PREFABRICATE TWO STRUT ASSEMBLIES, TWO END BLOCKING ASSEMBLIES (ONE LEFT AND ONE RIGHT), TWO SIDE FILL ASSEMBLIES, ONE CENTER FILL ASSEMBLY, AND ONE END GATE.
2. INSTALL TWO STRUT ASSEMBLIES AND TWO SPREADER PIECES.
3. INSTALL THE RIGHT END BLOCKING ASSEMBLY.
4. INSTALL ONE SIDE FILL ASSEMBLY.
5. LOAD TWO CNU-745 CONTAINERS.
6. INSTALL THE CENTER FILL ASSEMBLY.
7. LOAD TWO CNU-745 CONTAINERS.
8. INSTALL THE LEFT END BLOCKING ASSEMBLY.
9. INSTALL THE END GATE.
10. MEASURE AND INSTALL FOUR CUT-TO-FIT STRUTS.
11. INSTALL REMAINING SIDE FILL ASSEMBLY.

(CONTINUED AT RIGHT)

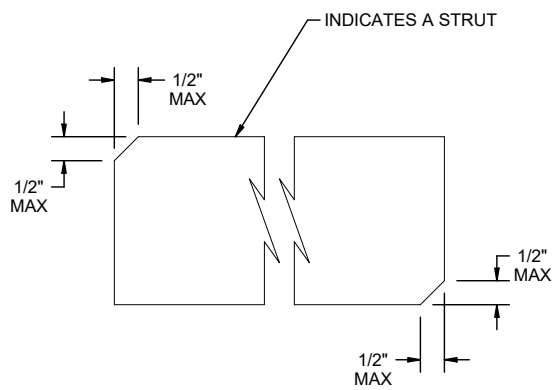
MATERIAL SPECIFICATIONS

- LUMBER - - - - - : SEE TM 743-200-1 (DUNNAGE LUMBER) AND VOLUNTARY PRODUCT STANDARD PS 20.
- NAILS - - - - - : ASTM F1667; COMMON STEEL NAIL NLCMS OR NLCMMS).
- PLYWOOD - - - - - : COMMERCIAL ITEM DESCRIPTION A-A-55057, INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D. IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER INTERIOR OR AN EXTERIOR GRADE MAY BE SUBSTITUTED.
- WIRE, CARBON STEEL - - : ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, 0.0800" DIA, GRADE 1006 OR BETTER.



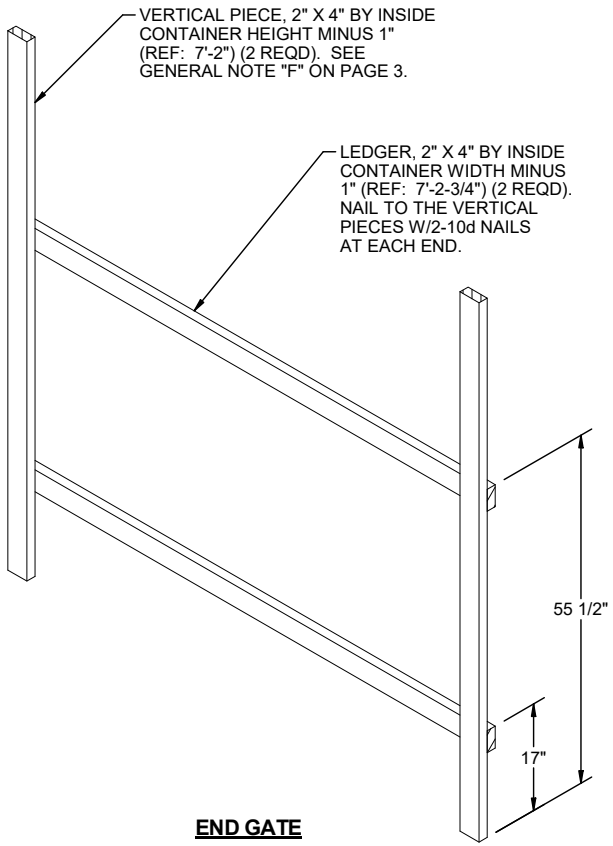
CNU-745 CONTAINER

GROSS WEIGHT - - - - - 4,000 LBS (APPROX)
 CUBE - - - - - 166.7 CU FT (APPROX)



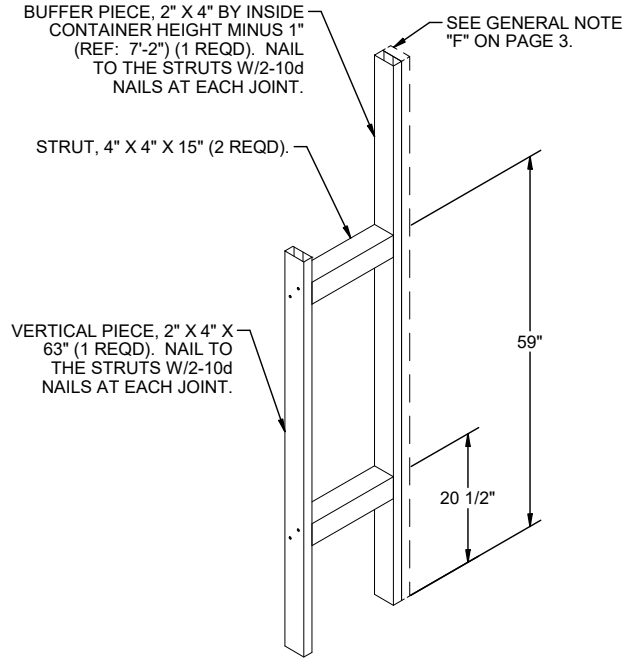
BEVEL CUT

IF DESIRED, EACH END OF A STRUT MAY BE BEVEL-CUT AS SHOWN ABOVE TO FACILITATE INSTALLING THE STRUTS WITH A "DRIVE" FIT.



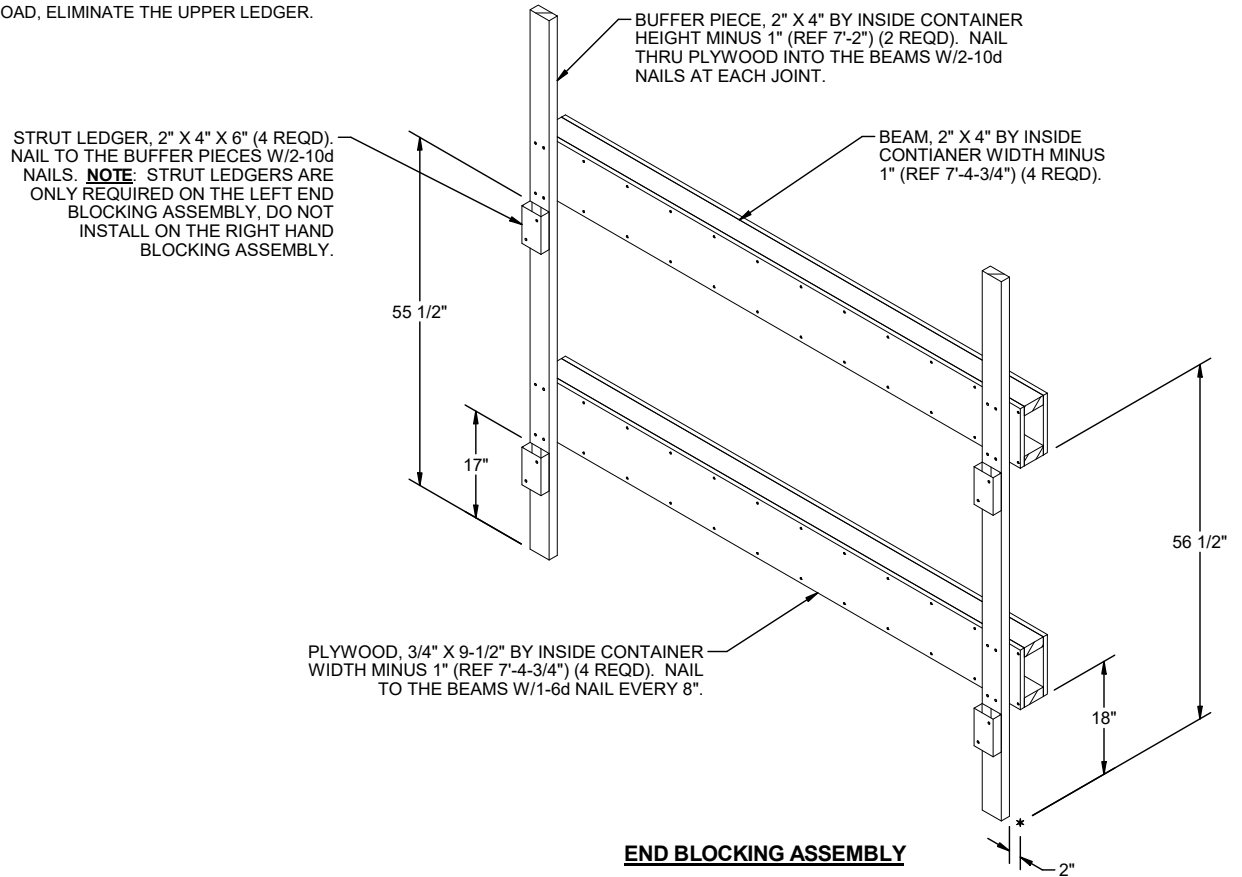
END GATE

THE DETAIL ABOVE DEPICTS AN END GATE TO BE USED WITH A TWO HIGH LOAD. FOR A ONE HIGH LOAD, ELIMINATE THE UPPER LEDGER.



STRUT ASSEMBLY

THE DETAIL ABOVE DEPICTS A STRUT ASSEMBLY TO BE USED WITH A TWO HIGH LOAD. FOR A ONE HIGH LOAD, ELIMINATE THE TOP STRUT AND SHORTEN THE VERTICAL PIECE TO 24\".



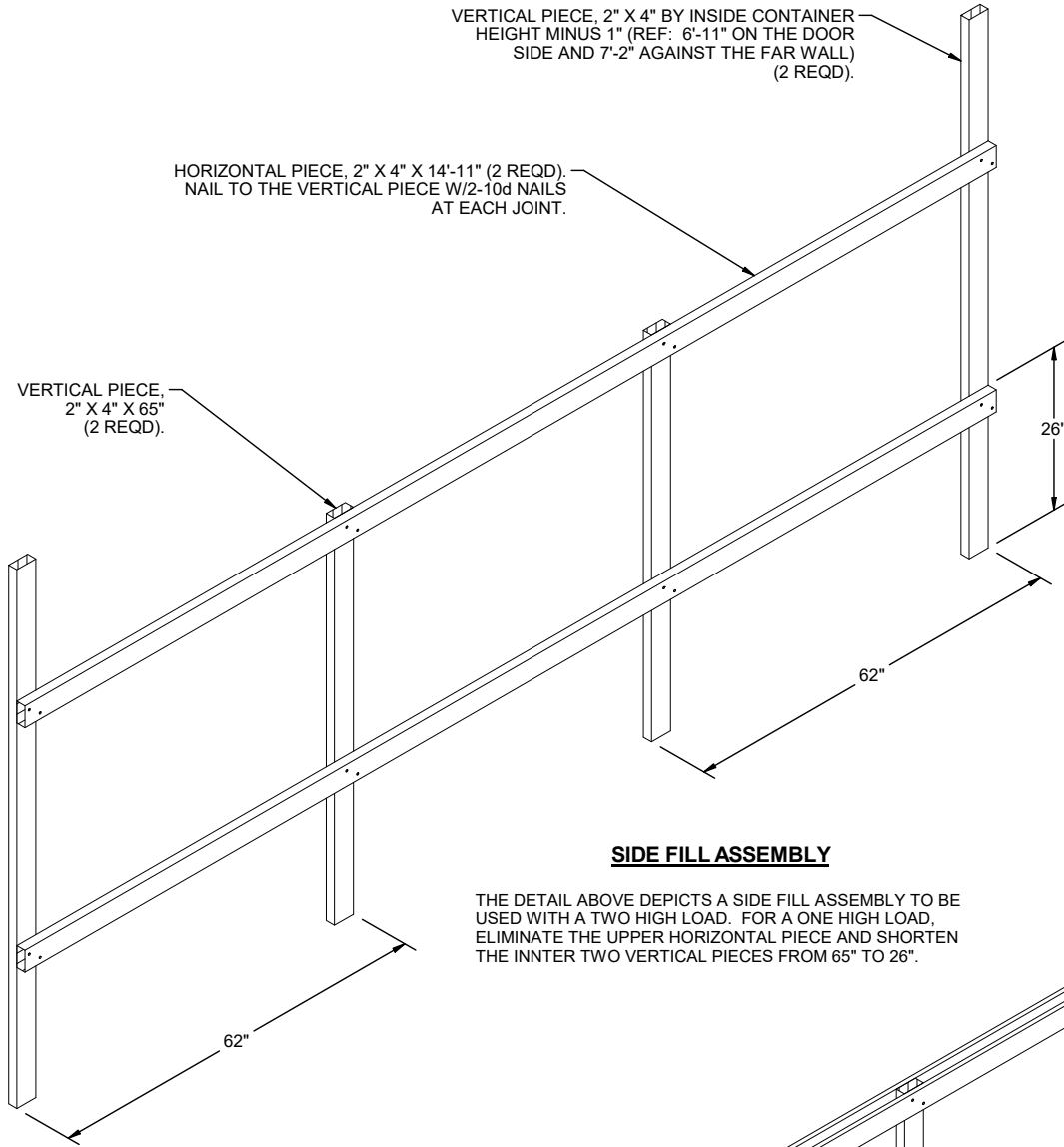
END BLOCKING ASSEMBLY

THE LEFT END BLOCKING ASSEMBLY IS SHOWN ABOVE. THE RIGHT END BLOCKING ASSEMBLY WILL HAVE THE VERTICAL PIECE ON THE OPPOSITE END SHIFTED 2\" AND WILL NOT HAVE STRUT LEDGERS. FOR A ONE HIGH LOAD, ELIMINATE THE TOP BOX BEAM ASSEMBLY AND TWO TOP STRUT LEDGERS (WHERE APPLICABLE).

VERTICAL PIECE, 2" X 4" BY INSIDE CONTAINER
HEIGHT MINUS 1" (REF: 6'-11" ON THE DOOR
SIDE AND 7'-2" AGAINST THE FAR WALL)
(2 REQD).

HORIZONTAL PIECE, 2" X 4" X 14'-11" (2 REQD).
NAIL TO THE VERTICAL PIECE W/2-10d NAILS
AT EACH JOINT.

VERTICAL PIECE,
2" X 4" X 65"
(2 REQD).



SIDE FILL ASSEMBLY

THE DETAIL ABOVE DEPICTS A SIDE FILL ASSEMBLY TO BE
USED WITH A TWO HIGH LOAD. FOR A ONE HIGH LOAD,
ELIMINATE THE UPPER HORIZONTAL PIECE AND SHORTEN
THE INNER TWO VERTICAL PIECES FROM 65" TO 26".

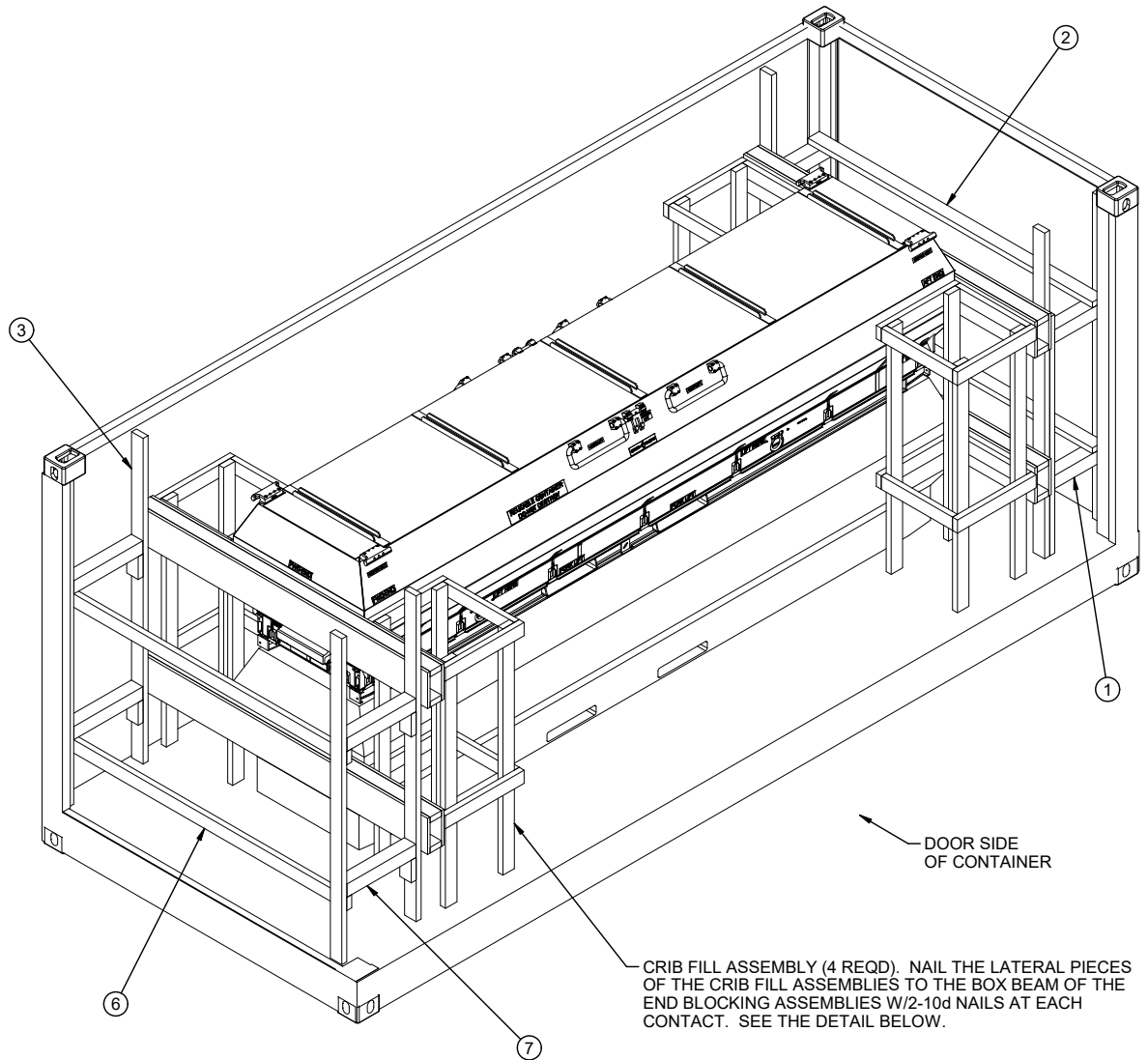
VERTICAL PIECE, 2" X 4"
BY INSIDE CONTAINER
HEIGHT MINUS 1"
(REF: 7'-3")
(2 REQD).

VERTICAL PIECE,
2" X 4" X 65"
(2 REQD).

HORIZONTAL PIECE, 1 X 4" X 14'-11" (4 REQD).
NAIL TO THE VERTICAL PIECE W/2-6d NAILS
AT EACH JOINT.

CENTER FILL ASSEMBLY

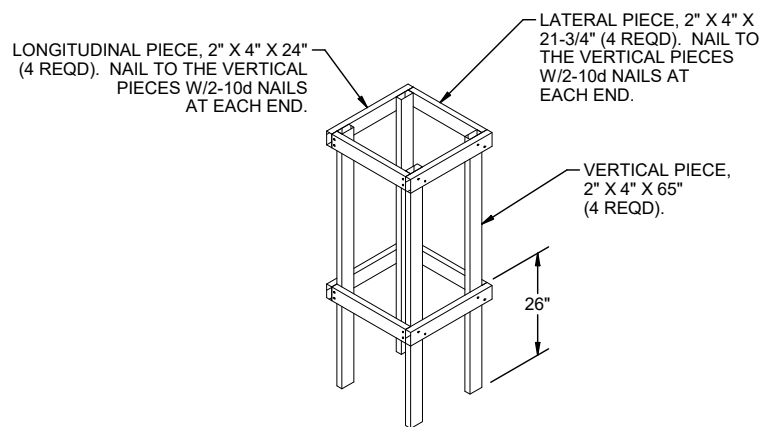
THE DETAIL ABOVE DEPICTS A CENTER FILL ASSEMBLY TO BE USED
WITH A TWO HIGH LOAD. FOR A ONE HIGH LOAD, ELIMINATE THE
UPPER TWO HORIZONTAL PIECES AND SHORTEN THE INNER TWO
VERTICAL PIECES FROM 65" TO 26".



ISOMETRIC VIEW

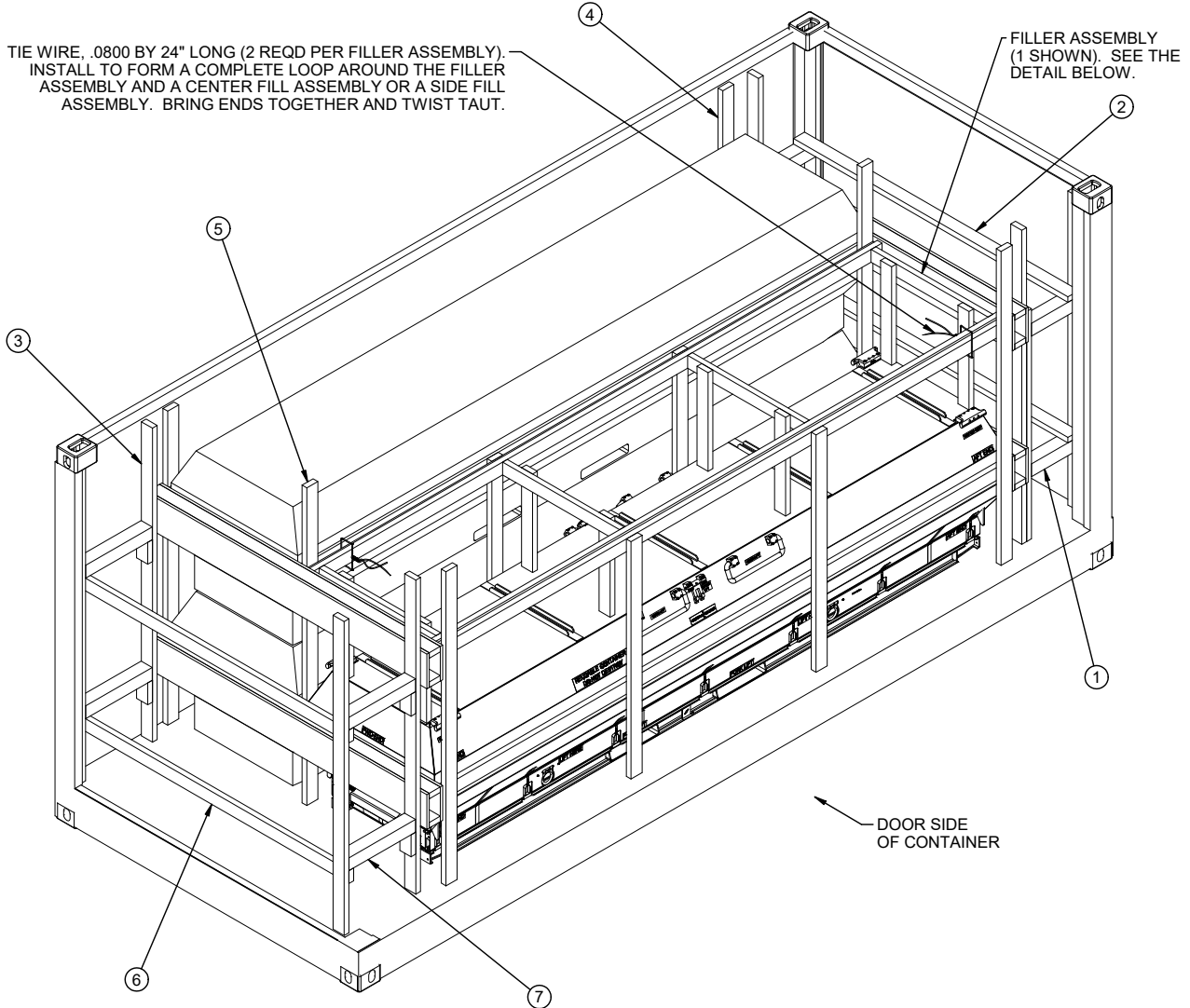
KEY NUMBERS REFER TO KEY NUMBERS ON PAGE 2.
SEE GENERAL NOTES "G" AND "O" ON PAGE 3.

CRIB FILL ASSEMBLY (4 REQD). NAIL THE LATERAL PIECES OF THE CRIB FILL ASSEMBLIES TO THE BOX BEAM OF THE END BLOCKING ASSEMBLIES W/2-10d NAILS AT EACH CONTACT. SEE THE DETAIL BELOW.



CRIB FILL ASSEMBLY

THE DETAIL ABOVE DEPICTS A CRIB FILL ASSEMBLY TO BE USED WITH A TWO CONTAINER LOAD. FOR A ONE CONTAINER LOAD, ELIMINATE THE UPPER TWO LONGITUDINAL AND TWO LATERAL PIECES, AND SHORTEN THE VERTICAL PIECES TO 26".



LESS-THAN-FULL-LOADPROCEDURES

KEY NUMBERS REFER TO KEY NUMBERS ON PAGE 2.
SEE GENERAL NOTES "G" AND "O" ON PAGE 3.

