APPROVED BY **BUREAU OF EXPLOSIVES**

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4 June 2008

HELLFIRE

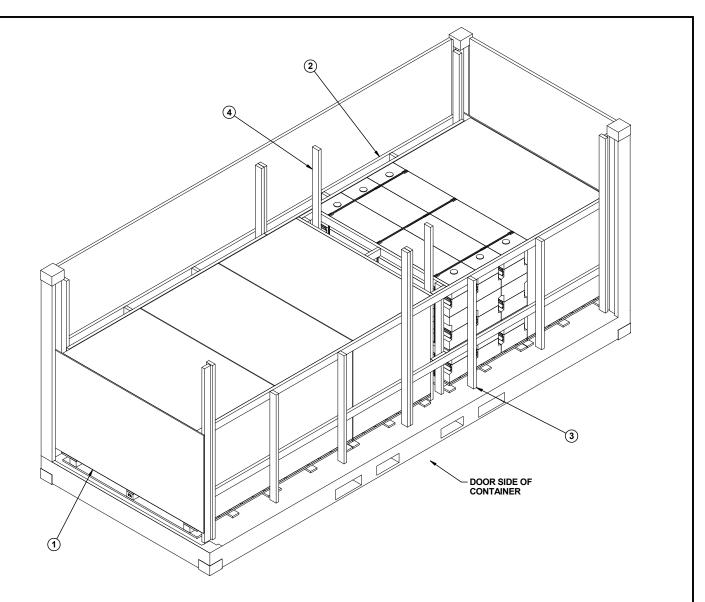
LOADING AND BRACING* IN SIDE **OPENING ISO CONTAINERS OF** HELLFIRE GUIDED MISSILE, PACKED IN METAL CONTAINERS, PALLETIZED AND UNPALLETIZED

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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 CAUTION: VERIFY PRIOR TO USE AT WWW.DAC.ARMY.MIL THAT THIS IS AVIATION ANDMISSILE COMMAND THE MOST CURRENT VERSION OF THIS DOCUMENT. THIS IS PAGE 1 OF 6. Digitally signed by SCHMITT. SCHMITT. ELIZABETH.1016576081 DN: cn=SCHMITT. ELIZABETH. ELIZABETH.1016576081, c=US, o=U.S. Government, DO NOT SCALE **APRIL 2008** 1016576081 ou=DoD, PKI, USA Date: 2008.10.30 14:53:21 **ENGINEER** BASIC **ADIN FELICIANO** -05'00' TECHNICIAN RFV/ TRANSPORTATION FIEFFER.LAURA Delay logod by FIEFFER.LAURA A. 123075727 A. 1230375727 A. 1230375727 Delay 2008.03.29 14.22.41-05007 APPROVED BY ORDER OF COMMANDING **ENGINEERING** GENERAL, U.S ARMY MATERIEL COMMAND DIVISON CARNEY. GARY. Digitally signed by CARNEY. GARY.BURTON.1038708038 DIVISION DRAWING FILE CLASS TESTED VALIDATION BURTON.10387 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, **ENGINEERING** JERRY. W.1230949952 C=US, 0=U.S. Government, ou=DoD, P USA Research 1 have reviewed this document Date: 2008.04.03 14:49:57-0500 DIVISON cn=CARNEY GARY 08038 8229 19 48 GM15HF3 NORTUNEN. LARRY. Digitally signed by NORTUNEN. R. 1230549628 DN: 0019N/RIT INFN I APDV 0 **ENGINEERING** DIRECTORATE R.1230549628 U.S. ARMY DEFENSE AMMUNITION CENTER



KEY NUMBERS

- ① END BLOCKING ASSEMBLY A (2 REQD). SEE THE DETAIL ON PAGE 7.
- ② SIDE FILL ASSEMBLY A (2 REQD). SEE THE DETAIL ON PAGE 9.
- $\ensuremath{\mathfrak{J}}$ SIDE FILL ASSEMBLY B (2 REQD). SEE THE DETAIL ON PAGE 11.
- $\textcircled{4} \;\;$ CENTER FILL ASSEMBLY A (1 REQD). SEE THE DETAIL ON PAGE 6.

BILL OF MATERIAL				
LUMBER LINEAR FEET BOARD FEET				
2" x 4"	286	191		
NAILS	NO. REQD	POUNDS		
6d (2")	20	1/4		
10d (3")	136	2-1/4		
PLYWOOD. 1/2" 57.33 SO FT REOD 78.83 LBS				

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (A	PPROX)
DUNNAGE	5	8,745 LE 462 LE 6,050 LE	S
Т	OTAL WEIGHT	15.257 LE	S (APPROX)

PAGE 2

SEALED PALLET UNIT LOAD

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 HELLFIRE GUIDED MISSILES, PACKED IN METAL CONTAINERS, PALLETIZED AND UNPALLETIZED. SUBSEQUENT REFERENCE TO PALLET UNIT HEREIN MEANS THE PALLET UNIT WITH AMMUNITION ITEMS. SEE PAGE 4 AND AMC DRAWING 19-48-5250-GM20HF1 FOR DETAILS OF THE PALLET UNIT. SEE PAGE 5 AND APN DRAWINGS 13012182 (UNSEALED), 13155079 (SEALED) AND 13349586 (STRETCHED) FOR DETAILS OF THE CONTAINERS. CAUTION: REGARDLESS OF THE QUANTITY OF CONTAINERS TO BE SHIPPED, THE "MAXIMUM GROSS WEIGHT" OF THE SIDE OPENING ISO CONTAINER MUST NOT BE
- 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'-4" LONG BY 89" WIDE BY 88" HIGH, WITH A MAXIMUM GROSS WEIGHT OF 52,910 POUNDS. 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 PALLET UNITS OR 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 OR QUANTITY OF PIECES IN THE SIDE FILL ASSEMBLIES MAY BE ADJUSTED AS REQUIRED TO FACILITATE VARIANCE IN THE SIZE OF THE PALLET UNIT OR CONTAINER.
- E. 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.
- F. 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.
- G. 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 END BLOCKING ASSEMBLY "B" 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.
- H. 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
- J. <u>CAUTION</u>: DO NOT NAIL DUNNAGE MATERIAL TO THE CONTAINER WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.
- K. PORTIONS OF THE CONTAINER DEPICTED WITHIN THIS DRAWING, SUCH AS THE SIDEWALL, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.
- L. 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.

- M. 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 FOL-LOW:
 - A LOADED CONTAINER MUST BE ON A CHASSIS EQUIPPED WITH TWO BO-GIE 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)

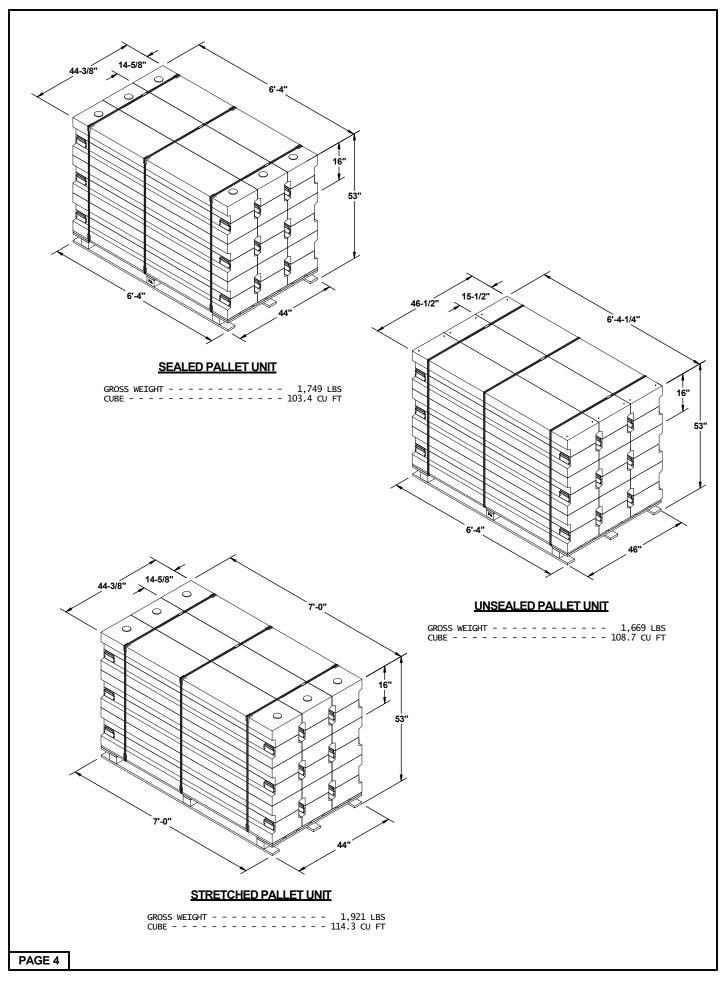
(GENERAL NOTES CONTINUED)

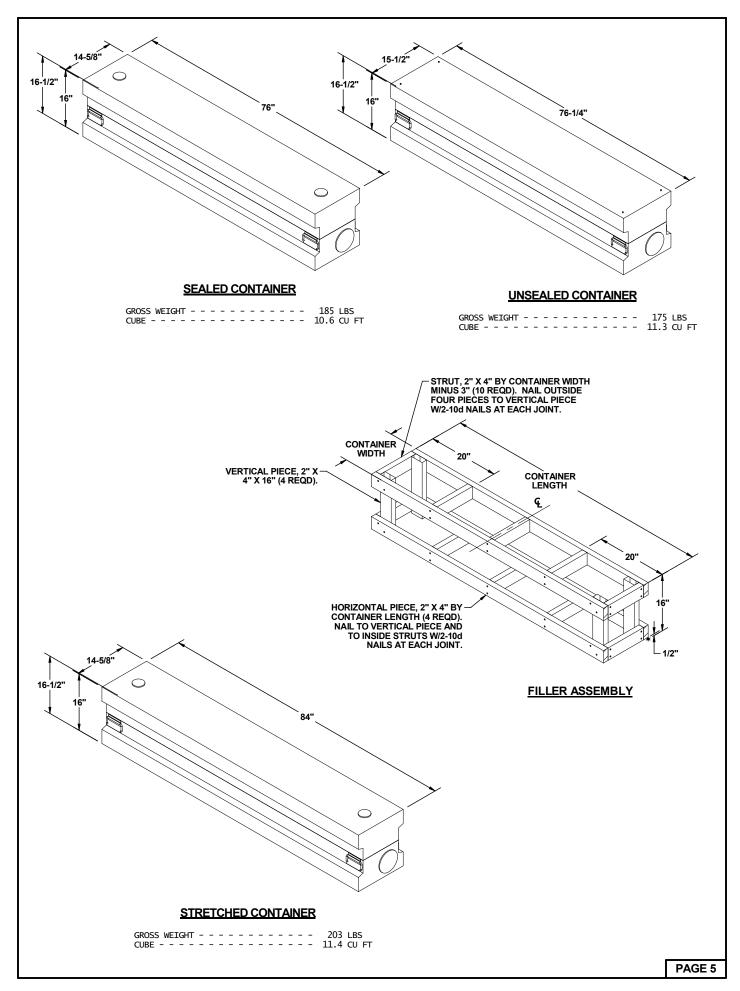
- N. DURING INTRASTATE AND/OR INTERSTATE MOVES BY MOTOR CARRIER, A PROPER CHASSIS OR MODIFIED FLATBED TRAILER MUST BE USED TO PRECLUDE VIOLATION OF ONE OR MORE "WEIGHT LAWS" APPLICABLE TO THE STATE OR STATES INVOLVED.
- O. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCU-MENT ARE EXPRESSED IN INCHES AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COM-PUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS 0.454 KG.
- P. THE QUANTITY OF CONTAINERS OR PALLET UNITS SHOWN IN THE LOADS HEREIN MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SEE THE "FILLER ASSEMBLY" DETAIL ON PAGE 5.
- Q. ANTI-CHAFING MATERIAL MAY BE INSTALLED AT POINTS OF CONTACT BETWEEN PALLET UNITS, BETWEEN UNPALLETIZED CONTAINERS, BE-TWEEN UNPALLETIZED CONTAINERS AND THE SIDE OPENING CONTAINER OR BETWEEN PALLET UNITS AND THE SIDE OPENING CONTAINER, IF DE-SIRED, TO PREVENT CHAFING DAMAGE TO CONTAINER PAINT AND MARK-

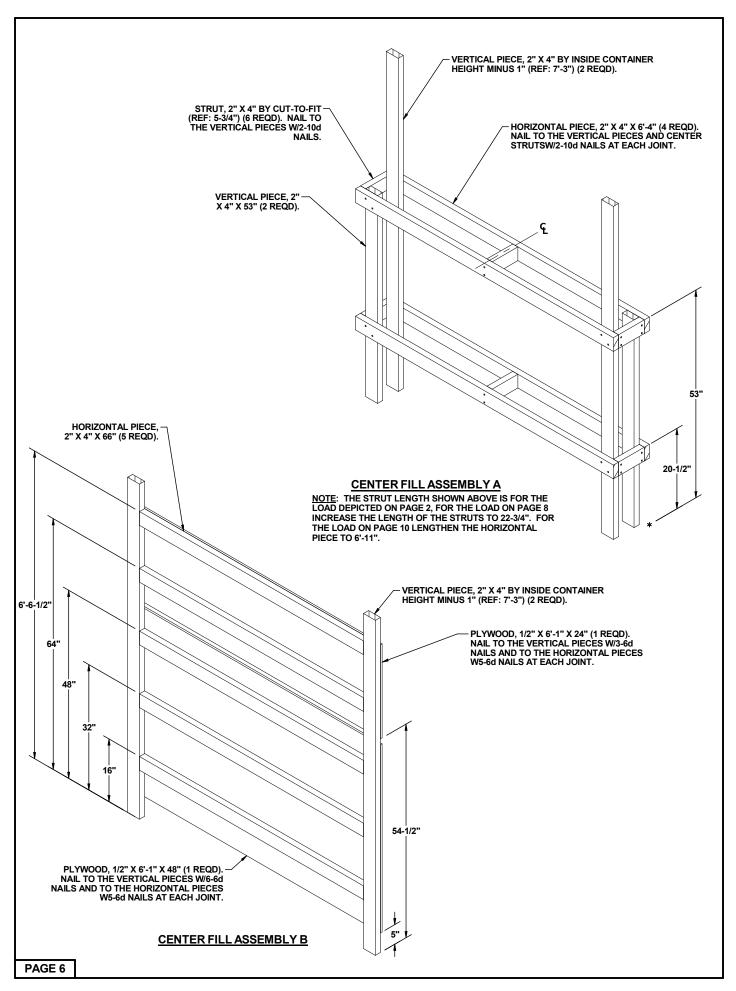
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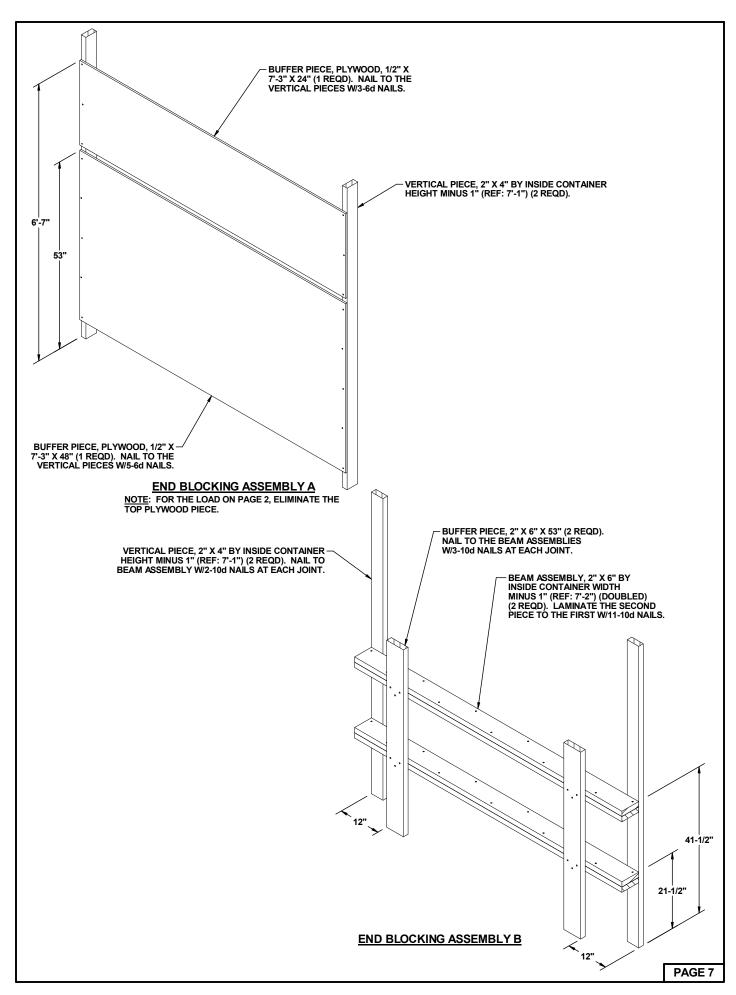
<u>LUMBER</u> :	SEE TM 743-200-1 (DUNNAGE LUMBER) AND VOLUNTARY PRODUCT STANDARD PS 20.
<u>NAILS</u> :	ASTM F1667; COMMON STEEL NAIL NLCMS OR NLCMMS).
<u>PLYWOOD</u> :	COMMERCIAL ITEM DESCRIPTION A-A-55057, INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D. IF SPECIFIED GRADE IS NOT AVAILABLE, 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.
ANTI-CHAFING MATERIAL:	MIL-PRF-121 (OR EQUAL); NEUTRAL BARRIER MATERIAL.

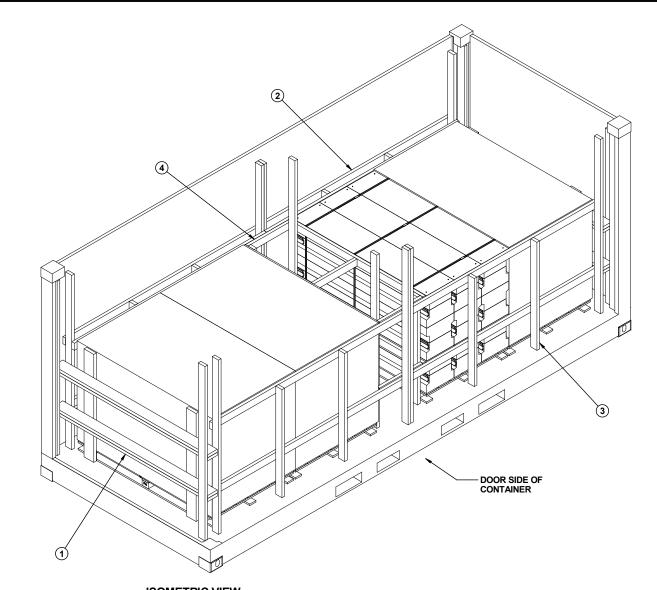
PAGE 3











KEY NUMBERS

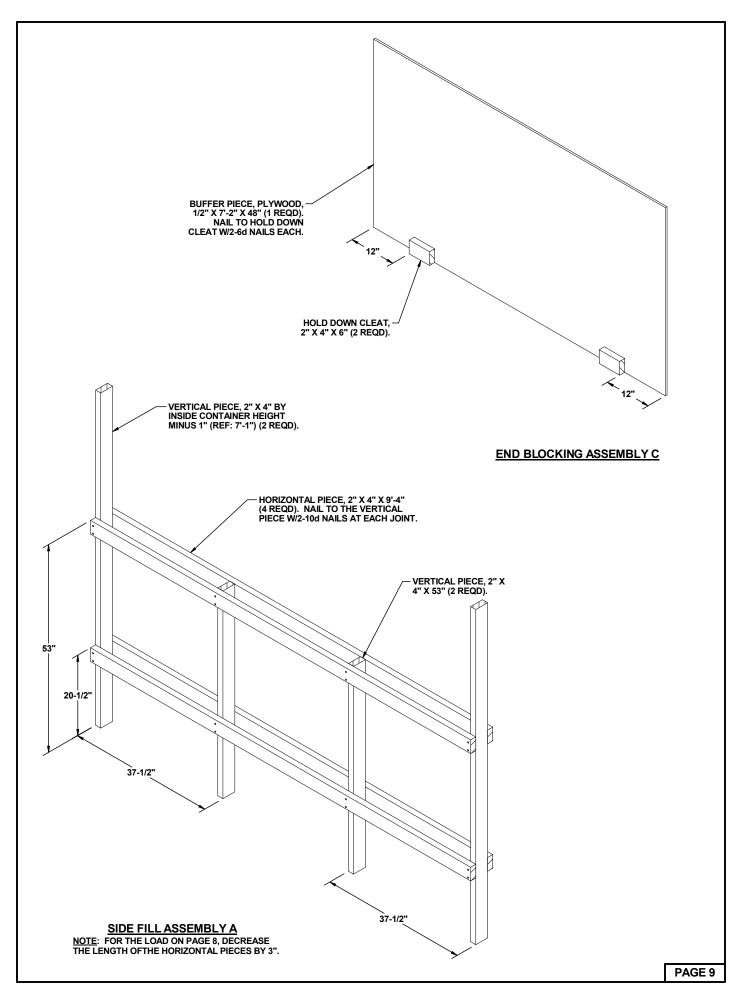
- ① END BLOCKING ASSEMBLY B (2 REQD). SEE THE DETAIL ON PAGE 7.
- ② SIDE FILL ASSEMBLY A (2 REQD). SEE THE DETAIL ON PAGE 9.
- ③ SIDE FILL ASSEMBLY B (2 REQD). SEE THE DETAIL ON PAGE 11.
- $\textcircled{4} \;\;$ CENTER FILL ASSEMBLY A (1 REQD). SEE THE DETAIL ON PAGE 6.

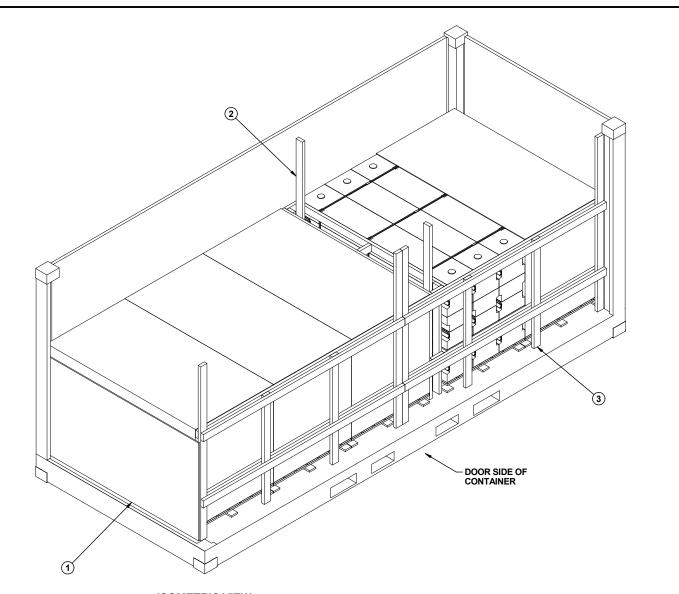
BILL OF MATERIAL				
LUMBER LINEAR FEET BOARD FEET				
2" x 4" 266 178 2" x 6" 76 76				
NAILS NO. REQD POUNDS		POUNDS		
10d (3") 220 3-1/2				

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
DUNNAGE -	T 4	6,676 LBS 511 LBS 6,050 LBS
	TOTAL WEIGHT	13.237 LBS (APPROX)

PAGE 8 UNSEALED PALLET UNIT LOAD





KEY NUMBERS

- $\ensuremath{\textcircled{\scriptsize 1}}$ END BLOCKING ASSEMBLY C (2 REQD). SEE THE DETAIL ON PAGE 9.
- ② CENTER FILL ASSEMBLY A (1 REQD). SEE THE DETAIL ON PAGE 6.
- $\ensuremath{\mathfrak{J}}$ SIDE FILL ASSEMBLY C (2 REQD). SEE THE DETAIL ON PAGE 11.

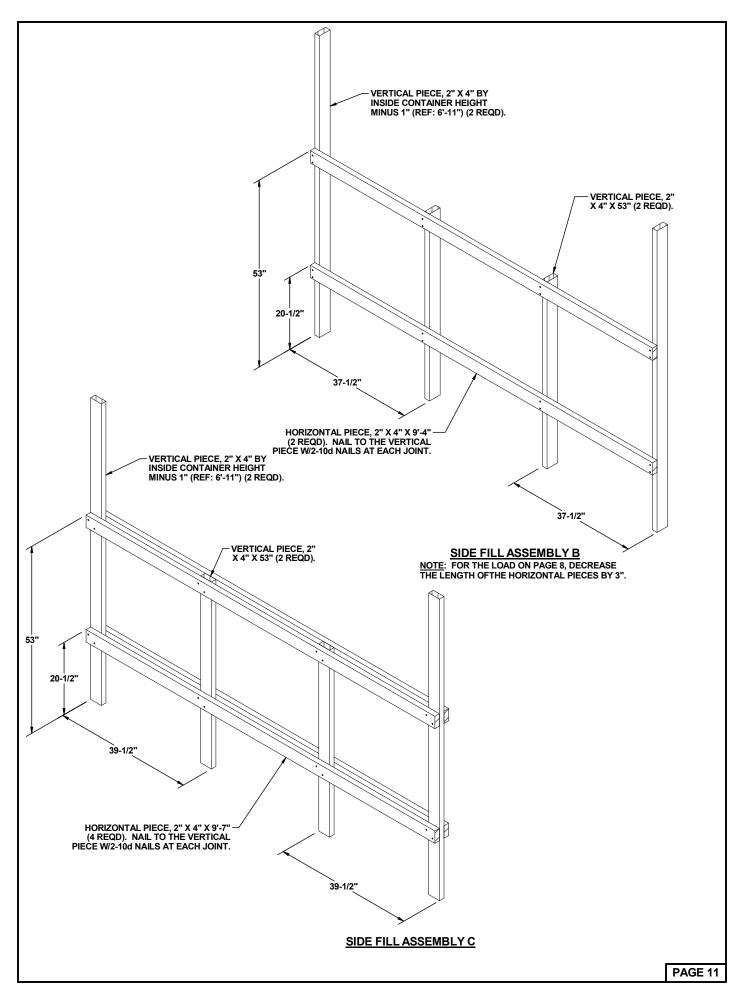
BILL OF MATERIAL				
LUMBER LINEAR FEET BOARD FEET				
2" X 4"	142	95		
NAILS	NO. REQD	POUNDS		
10d (3")	80	1-1/4		
PLYWOOD, 1/2" 57.33 SQ FT REQD 78.83 LBS				

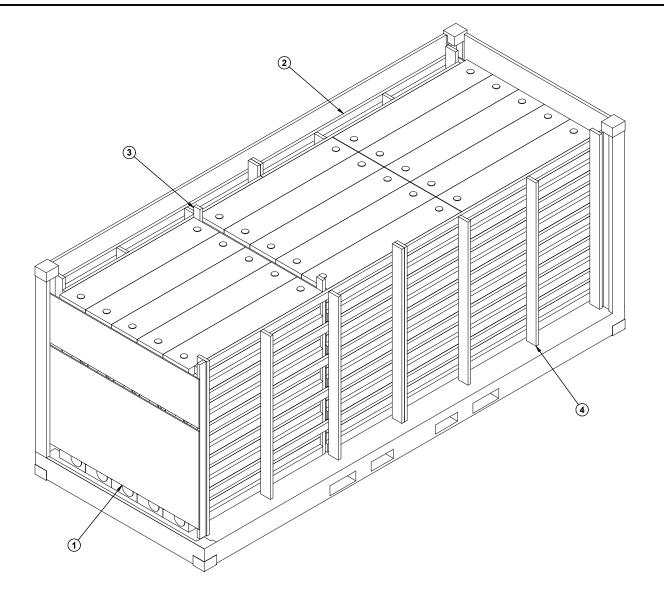
LOAD AS SHOWN

<u>ITEM</u>	QUANTITY	WEIGHT (A	PPROX)
DUNNAGE	5	9,605 LE 269 LE 6,050 LE	S
то	TAL WEIGHT	15.924 LB	S (APPROX)

PAGE 10

STRETCHED PALLET UNIT LOAD





KEY NUMBERS

- ① END BLOCKING ASSEMBLY A (2 REQD). SEE THE DETAIL ON PAGE 7.
- ② SIDE FILL ASSEMBLY D (2 REQD). SEE THE DETAIL ON PAGE 13.
- ③ CENTER FILL ASSEMBLY B (1 REQD). SEE THE DETAIL ON PAGE 6.
- (4) SIDE FILL ASSEMBLY E (2 REQD). SEE THE DETAIL ON PAGE 13.

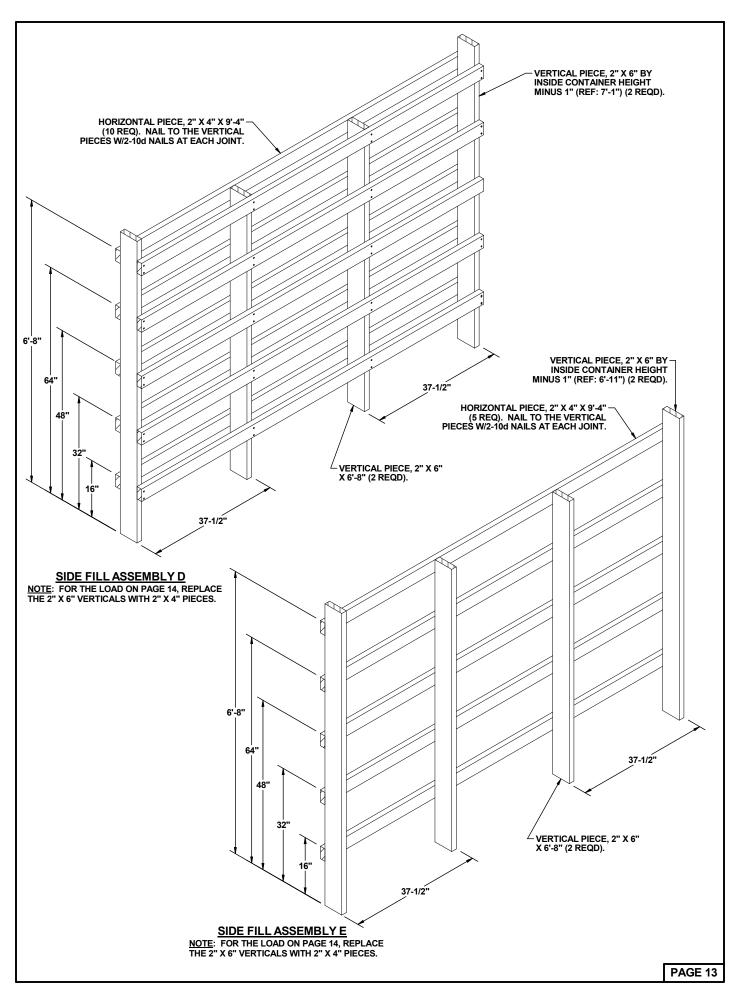
BILL OF MATERIAL				
LUMBER LINEAR FEET BOARD FEET				
2" X 4"	351	234		
2" X 6"	111	111		
NAILS	NO. REQD	POUNDS		
6d (2")	73	1/2		
10d (3") 240 3-3/4				
PLYWOOD, 1/2" 130.5 SQ FT REQD 179.5 LBS				

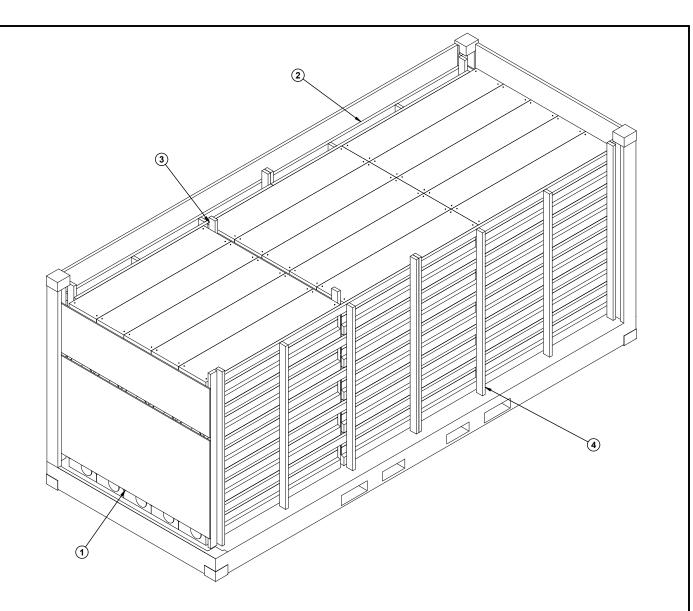
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<u>ITEM</u>	QUANTITY	WEIGHT	(APP	ROX)
DUNNAGE	75	13,875 872 6,050	LBS	
ТС	OTAL WEIGHT	20.797	LBS	(APPROX)

PAGE 12

UNPALLETIZED SEALED CONTAINER LOAD





KEY NUMBERS

- ① END BLOCKING ASSEMBLY A (2 REQD). SEE THE DETAIL ON PAGE 7.
- ② SIDE FILL ASSEMBLY D (2 REQD). SEE THE DETAIL ON PAGE 13.
- ③ CENTER FILL ASSEMBLY B (1 REQD). SEE THE DETAIL ON PAGE 6.
- (4) SIDE FILL ASSEMBLY E (2 REQD). SEE THE DETAIL ON PAGE 13.

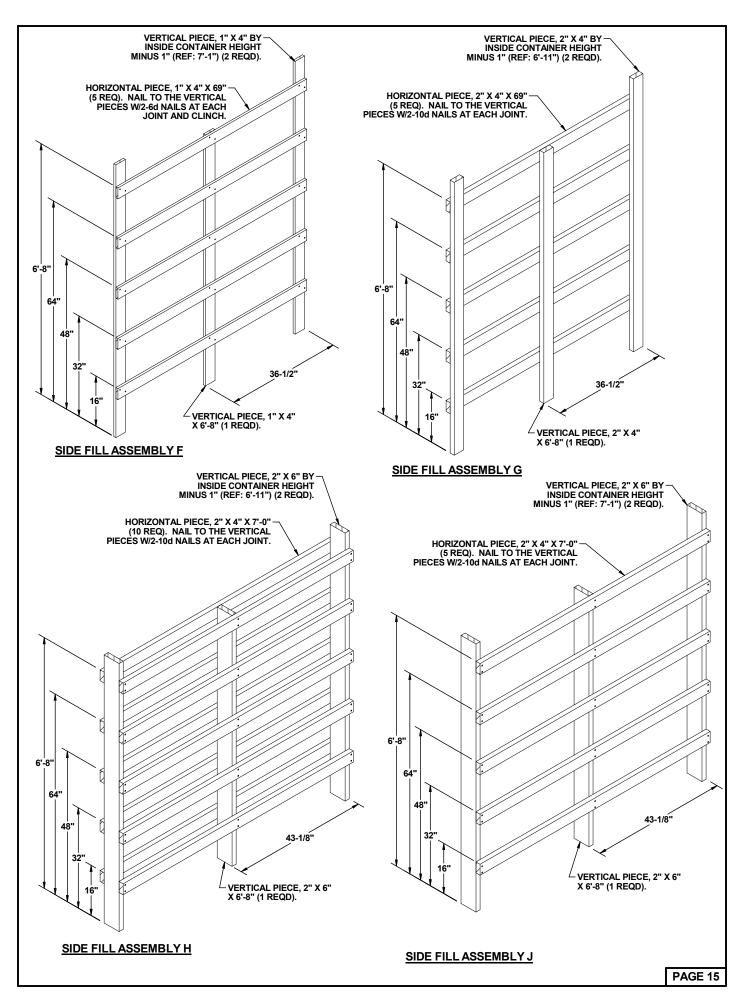
BILL OF MATERIAL				
LUMBER LINEAR FEET BOARD FEE				
2" x 4"	460	307		
NAILS	NO. REQD	POUNDS		
6d (2")	73	1/2		
10d (3")	240	3-3/4		
PLYWOOD, 1/2" 130.5 SQ FT REQD 179.5 LBS				

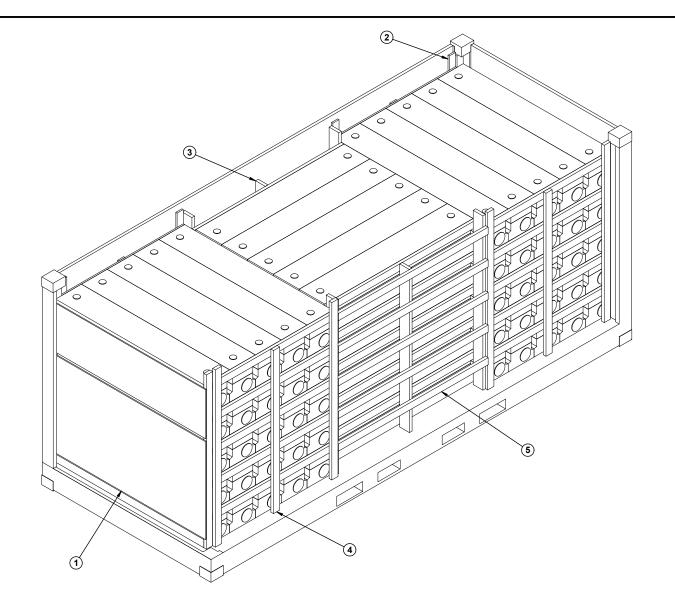
LOAD AS SHOWN

<u>ITEM</u>	QUANTITY	WEIGHT (AP	PROX)
DUNNAGE	75	13,125 LBS 796 LBS 6,050 LBS	
т	OTAL WEIGHT	19.971 LBS	(APPROX)

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UNPALLETIZED UNSEALED CONTAINER LOAD





KEY NUMBERS

- ① END BLOCKING ASSEMBLY A (2 REQD). SEE THE DETAIL ON PAGE 7.
- $\ensuremath{ \mbox{\Large (2)}}$ SIDE FILL ASSEMBLY F (2 REQD). SEE THE DETAIL ON PAGE 15.
- ③ SIDE FILL ASSEMBLY J (1 REQD). SEE THE DETAIL ON PAGE 15.
- $\textcircled{4} \quad \text{SIDE FILL ASSEMBLY G (2 REQD)}. \ \ \text{SEE THE DETAIL ON PAGE 15}.$
- $\ensuremath{\mathfrak{S}}$ SIDE FILL ASSEMBLY H (2 REQD). SEE THE DETAIL ON PAGE 15.

BILL OF MATERIAL			
LUMBER	LINEAR FEET	BOARD FEET	
1" x 4"	100	34	
2" X 4"	235	157	
2" x 6"	21	21	
NAILS	NO. REQD	POUNDS	
6d (2")	92	1/2	
10d (3")	150	2-1/2	
PLYWOOD, 1/2" 87 SQ FT REQD 119.6 LBS			

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
DUNNAGE ·	75	15,225 LBS 544 LBS 6,050 LBS
TOTAL WEIGHT		21.819 LBS (APPROX)

PAGE 16

UNPALLETIZED STRETCHED CONTAINER LOAD