LOADING AND BRACING® IN END OPENING ISO CONTAINERS OF 40 LB BLOCK DEMOLITION CRATERING CHARGE PACKED IN M18 CYLINDRICAL METAL CONTAINERS ON WOODEN PALLETS

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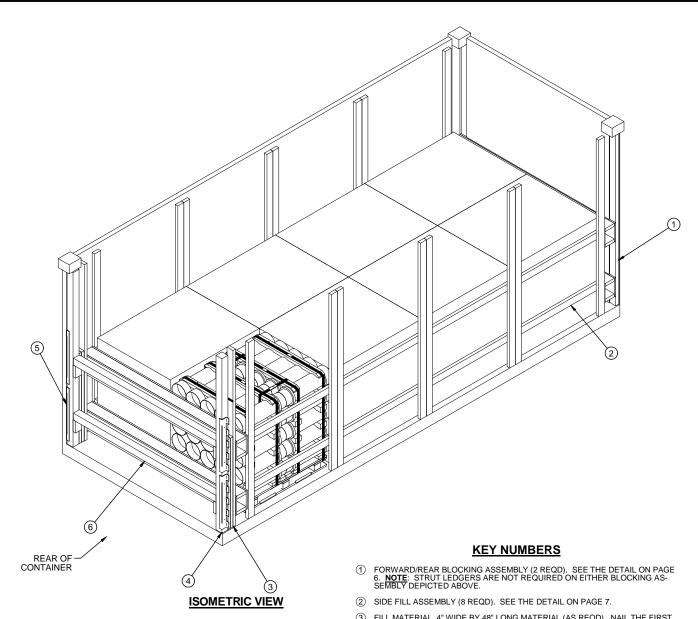
DISTRIBUTION STATEMENT A:

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 CAUTION: VERIFY PRIOR TO USE AT HTTPS://MHP.REDSTONE.ARMY.MIL THAT THIS IS JOINT MUNITIONS COMMAND THE MOST CURRENT VERSION OF THIS DOCUMENT. THIS IS PAGE 1 OF 10. RUS.ALLEN.J Digitally signed by RUS.ALLEN.J 1230034282 DN: C=US, 0=US. Government, ou=Dob, ou=PKI, ou=USA, on=DkS.ALLEN.J 1230034282 Date: 2016.11.08 13:14:02-06:00' DO NOT SCALE OCTOBER 1991 BASIC LAURA FIEFFER DESIGN ENGINEER **MADELINE BANKS** RF\/ **REVISION NO. 1 JANUARY 2017** APPROVED BY ORDER OF COMMANDING FIFFFFR I AUR **ENGINEERING** GENERAL, U.S ARMY MATERIEL COMMAND SEE THE REVISION LISTING ON PAGE 5 DIVISON A.A.1230375727 CLASS DIVISION DRAWING FII F TEST ENGINEER FELICIANO.AD Digitally signed by FELICIANO.ADIN.1259200373 SHIMP.UPTON SHIME/DEPONR.1231257183 DN: c=US, o=US, Government, ou=DoD, o=US, TEST IN.1259200373 ou=PKI, ou=USA, on=FELICIANO.ADIN.1259200373 Date: 2016.10.31 11:14:38-05:00* REPORT 4215/12 15PM1013 **EXPLOSIVE** TIRONE JOSEPH 19 48 SAFETY ANDREW.1026683 ou=PKI, ou=USA, cn=TIRONE.JOSEPH.ANDREW.1026 Date: 2016.10.31 13:13:25 -05'00' DIRECTORATE U.S. ARMY DEFENSE AMMUNITION CENTER



BILL OF MATERIAL			
LUMBER	LINEAR FEET	BOARD FEET	
1" X 4" 2" X 4" 2" X 6" 4" X 4"	35 241 61 29	12 161 61 39	
NAI LS	NO. REQD	POUNDS	
6d (2") 10d (3") 12d (3-1/4")	232 128 8	1-1/2 2 1/4	
PLYWOOD. 3/4" 48.03 SO FT REOD 99.06 LBS			

PLYWOOD, 3/4" - - 48.03 SQ FT REQD - - 99.06 LBS UNIVERSAL LOAD RETAINER - - 4 REQD - - 26.00 LBS

- 3 FILL MATERIAL, 4" WIDE BY 48" LONG MATERIAL (AS REQD). NAIL THE FIRST PIECE TO THE REAR BLOCKING ASSEMBLY W/4 NAILS OF A SUITABLE SIZE (10d FOR 2" THICK MATERIAL). NAIL EACH ADDITIONAL PIECE TO THE PREVIOUS PIECE IN A SIMILAR MANNER. **NOTE**: MULTIPLE PIECES MAY BE LAMINATED TOGETHER FIRST AND THEN TOENAILED TO THE REAR BLOCKING ASSEMBLY. SEE "DETAIL A" ON PAGE 8.
- 4 DOOR POST VERTICAL (2 REQD). SEE THE DETAIL ON PAGE 6, "DETAIL A" ON PAGE 8, AND GENERAL NOTE "Q" ON PAGE 3.
- (5) UNIVERSAL LOAD RETAINER (4 REQD, 2 PER SIDE). NAIL THROUGH THE HOLES INTO THE DOOR POST VERTICAL W/2-10d NAILS. SEE DEPARTMENT OF ARMY DRAWING DA-116, "DETAIL A" ON PAGE 8, AND GENERAL NOTE "Q" ON PAGE 3.
- (6) DOOR SPANNER, 4" X 4" MATERIAL CUT TO A LENGTH THAT WILL PROVIDE A DRIVE FIT (REF: 7'-1-1/4") (2 REQD). TOENAIL TO THE DOOR POST VERTICAL W/2-12d NAILS AT EACH END. SEE THE "BEVEL-CUT" DETAIL ON PAGE 9.

LOAD AS SHOWN*

<u>I TEM</u>	<u>QUANTI TY</u>	<u>WEIGHT</u> (APPROX)
	8	
CONTAINER -		4, 700 LBS
	TOTAL WEIGHT	33, 435 LBS (APPROX)

* $\underline{\text{MOTE}}$: The Load depicted on this page is based on pallet unit "A".

TYPICAL LOADING PROCEDURE FOR PALLET UNITS A OR C

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 PALLETIZED DEMOLITION CRATERING CHARGES PACKED IN M18 SERIES METAL CONTAINERS. SUBSEQUENT REFERENCE TO PALLET UNIT HEREIN MEANS THE PALLET UNIT WITH AMMUNITION ITEMS. SEE PAGE 5 AND AMC DRAWING 19-48-4079/11-20PM1002 FOR DETAILS OF THE PALLET UNITS. CAUTION: REGARDLESS OF THE QUANTITY OF CONTAINERS TO BE SHIPPED, THE "MAXIMUM GROSS WEIGHT" OF THE END OPENING ISO CONTAINER MUST NOT BE EXCEEDED.
- C. THE LOAD AS SHOWN IS BASED ON A 4,700 POUND 20' LONG BY 8' WIDE BY 8'-6' HIGH END OPENING ISO CONTAINER WITH INSIDE DIMENSIONS OF 19'-4" LONG BY 92" WIDE BY 93" HIGH, WITH A MAXIMUM GROSS WEIGHT OF 52,910 POUNDS. OLDER/OTHER CONTAINERS MAY HAVE A TOTAL INSIDE HEIGHT OF 95", BUT A CLEAR HEIGHT UNDER THE ROOF BOWS OF 93", VERIFY INSIDE CONTAINER HEIGHT 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 PALLET UNITS, 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 OR VERTICAL PIECES ON THE SIDE FILL ASSEMBLIES OR CENTER 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 OR CENTER FILL ASSEMBLIES MAY BE ADJUSTED AS REQUIRED TO FACILITATE VARIANCE IN THE SIZE OF THE PALLET UNIT. THE LOADS MUST BE AS TIGHT AS POSSIBLE LONGITUDINALLY, BUT THE VOID MUST NOT EXCEED 3/4" OVERALL. EXCESSIVE SLOCK CAN BE ELIMINATED BY INSTALLING 4" WIDE BY 56" LONG FILL MATERIAL. FILL MATERIAL MAY BE INSTALLED BETWEEN THE DOOR POST VERTICAL PIECES AND THE END BLOCKING ASSEBMBLY 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. PORTIONS OF THE CONTAINER DEPICTED WITHIN THIS DRAWING, SUCH AS THE SIDEWALL, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.
- G. IN SOME CONTAINERS THERE IS A SLOT AT THE CORNERS OF THE FORWARD WALL. PIECES OF DUNNAGE MATERIAL MUST BE LAMINATED TO THE BUFFER PIECES ON THE FORWARD BLOCKING ASSEMBLY OR FORWARD 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 FORWARD WALL, 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. 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 DRAWNING 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)

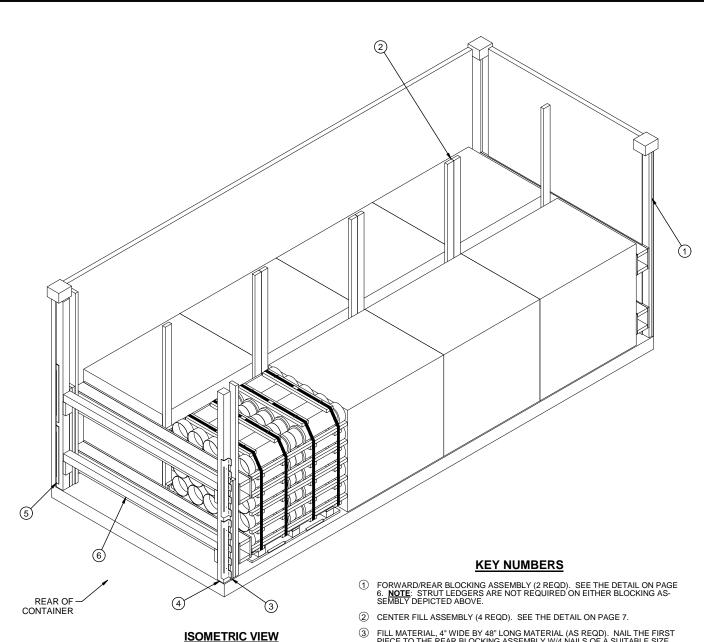
(GENERAL NOTES CONTINUED)

- 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 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.
- M. DURING INTRASTATE AND/OR INTERSTATE MOVES BY MOTOR CARRIER, A PROPER CHASSIS OR MODIFIED FLATBED TRAILER MUST BE USED TO PRE-CLUDE 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 PALLET UNITS SHOWN IN THE LOADS ON PAGES 2 OR 4
 MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SEE THE "LESS-THANFILL LOAD PROCEDURE" ON PAGE 10.
 - IF A LOAD IS REDUCED BY ONLY A SMALL AMOUNT (ONE LADING UNIT), LADING UNITS NORMALLY MAY BE ELIMINATED FROM THE CENTER OF THE I OAD
 - 2. IF A LOAD IS REDUCED BY A LARGE AMOUNT (MORE THAN ONE LADING UNIT), LADING UNITS SHOULD BE ELIMINATED AS REQUIRED AND THE TOTAL LOAD SHIFTED FORE OR AFT, AS NECESSARY, TO ACHIEVE A SYMMETRICAL WEIGHT DISTRIBUTION. THE DEPICTED PROCEDURES WILL BE FOLLOWED AS CLOSELY AS POSSIBLE, MAKING ONLY THOSE ADJUSTMENTS TO THE DUNNAGE WHICH ARE REQUIRED TO ACCOMMODATE THE NUMBER OF UNITS TO BE SHIPPED.
- 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. LOAD-BLOCKING STRUTS WHICH ARE 48" OR LONGER MUST BE STIFFENED BY THE APPLICATION OF HORIZONTAL AND VERTICAL STRUT BRACING AS SHOWN IN THE "TYPICAL STRUT BRACING" DETAIL ON PAGE 73 OF DRAW-ING AMC 19-48-4153-15PA1002. BRACING IS NOT REQUIRED IF THE STRUTS FOR THE LOAD BEING SHIPPED ARE SHORTER THAN 48". THE LENGTH OF THE LOAD-BLOCKING STRUTS SHOULD BE KEPT AS SHORT AS POSSIBLE (APPROX 18" MINIMUM), BUT IN THE EVENT IT IS NECESSARY TO USE STRUTS WHICH ARE 8'-0" OR MORE IN LENGTH, IT WILL BE NECESSARY TO APPLY AN ADDITIONAL SET OF HORIZONTAL AND VERTICAL STRUT BRACING PIECES. STRUT BRACING SHOULD BE APPLIED SO AS TO PROVIDE NEARLY EQUAL SPACES BETWEEN THE BRACING PIECES AND THE CENTER GATES AND/OR BETWEEN ADJACENT STRUT BRACING PIECES. NOTE THAT HORIZONTAL STRUT BRACING PIECES FOR THE UPPER LEVEL OF STRUTS FOR ALL BUT THE UPPERMOST TIER OF A LOAD MAY BE DIFFICULT TO APPLY TO THE TOP SURFACES OF THE STRUT AS DEPICTED. STRUT BRACING WILL BE EQUALLY EFFECTIVE IF APPLIED TO THE UNDER SIDE OF THOSE STRUTS.

MATERIAL SPECIFICATIONS

LUMBER :	SEE TM 743-200-1 (DUNNAGE LUMBER) AND VOL- UNTARY PRODUCT STANDARD PS 20.
NAILS:	ASTM F1667; COMMON STEEL NAIL (NLCMS OR NLCMMS).
STAPLE :	ASTM F1667; STFCS-224, 1-17/32" CROWN WIDTH X 3/4" LEG LENGTH FOR 1-1/4" STRAP-PING.
STEEL STRUCTURAL:	ASTM A36; 36,000 PSI MINIMUM YIELD OR BET-

<u>WIRE, CARBON STEEL</u> -: ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, 0.0800" DIA, GRADE 1006 OR BETTER.



BILL OF MATERIAL			
LUMBER	LINEAR FEET	BOARD FEET	
2" X 4"	144	96	
2" X 6"	61	61	
4" X 4"	29	39	
NAI LS	NO. REQD	POUNDS	
6d (2")	176	1-1/4	
10d (3")	96	1-1/2	
12d (3-1/4")	8	1/4	
PLYWOOD, 3/4" 48.03 SQ FT REQD 99.06 LBS			

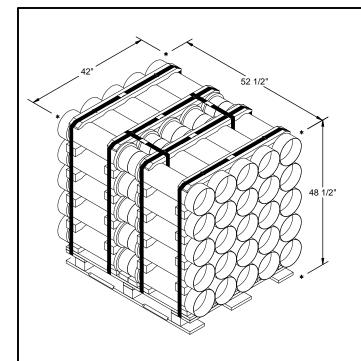
UNI VERSAL LOAD RETAINER - - 4 REQD - - 26.00 LBS

- (3) FILL MATERIAL, 4" WIDE BY 48" LONG MATERIAL (AS REQD). NAIL THE FIRST PIECE TO THE REAR BLOCKING ASSEMBLY W/4 NAILS OF A SUITABLE SIZE (10d FOR 2" THICK MATERIAL). NAIL EACH ADDITIONAL PIECE TO THE PREVIOUS PIECE IN A SIMILAR MANNER. **NOTE**: MULTIPLE PIECES MAY BE LAMINATED TOGETHER FIRST AND THEN **TOE**NAILED TO THE REAR BLOCKING ASSEMBLY. SEE "DETAIL A" ON PAGE 8.
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LOAD AS SHOWN

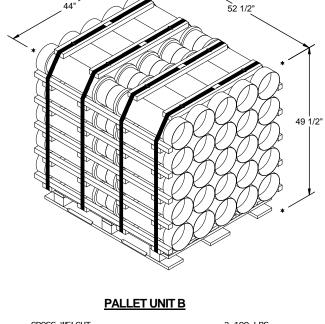
<u>I TEM</u>	QUANTI TY	WEIGHT (APPROX)
DUNNAGE	8	518 LBS
	TOTAL WEIGHT	30, 658 LBS (APPROX)

TYPICAL LOADING PROCEDURE FOR PALLET UNIT B

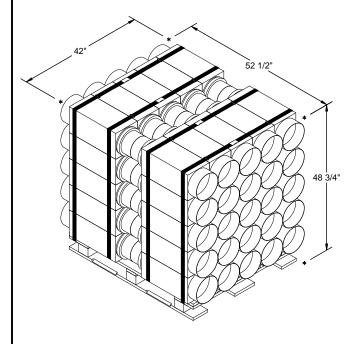


PALLET UNIT A

GROSS WEI GHT - - - - - - - - - - - - 3, 194 LBS CUBE - - - - - - - - - - - 62. 9 CU FT



GROSS WEI GHT - - - - - - - - - - 3, 180 LBS CUBE - - - - - - 65.6 CU FT



PALLET UNIT C

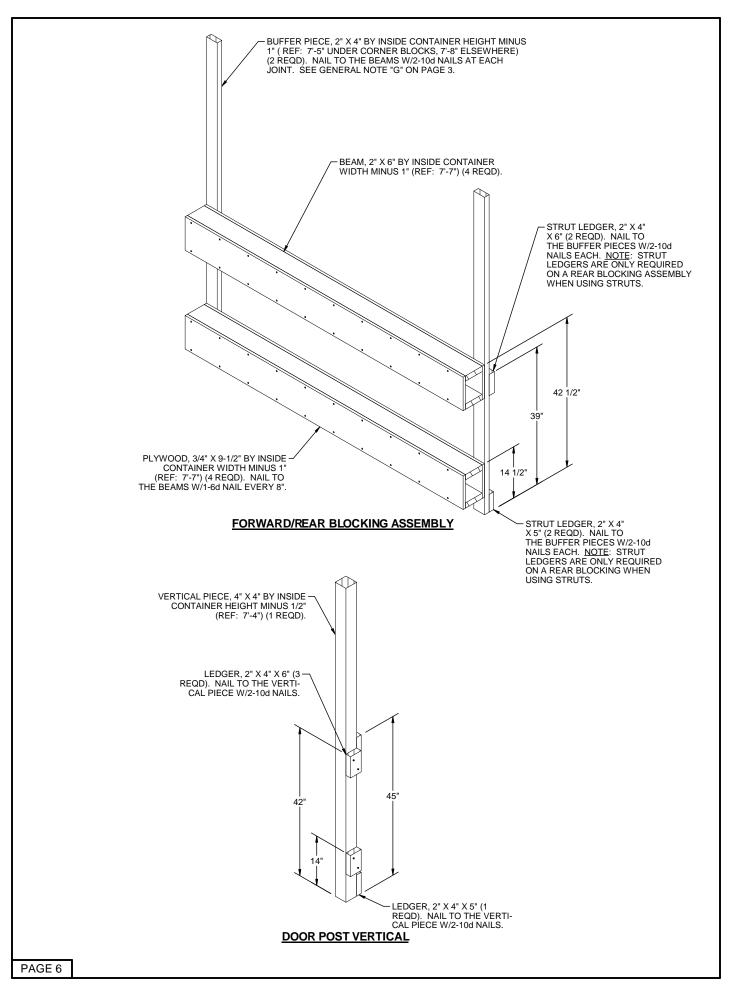
GROSS WEI GHT - - - - - - - - - - - 3, 508 LBS CUBE - - - - - - - 60. 7 CU FT

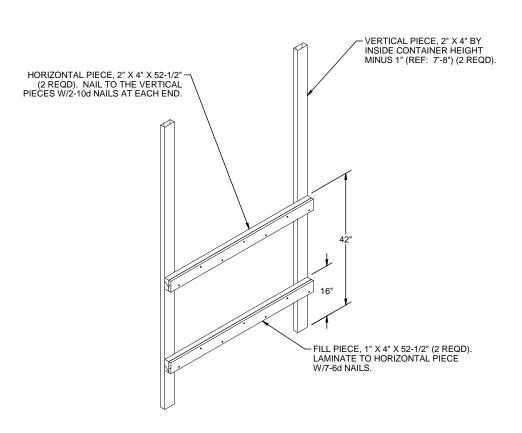
REVISION

REVISION NO. 1, DATED JANUARY 2017, CONSISTS OF:

- UPDATING DRAWING FORMAT
 ADDING AN ALTERNATE LOADING PROCEDURE.
 ADDING LESS-THAN-FULL LOAD PROCEDURE.

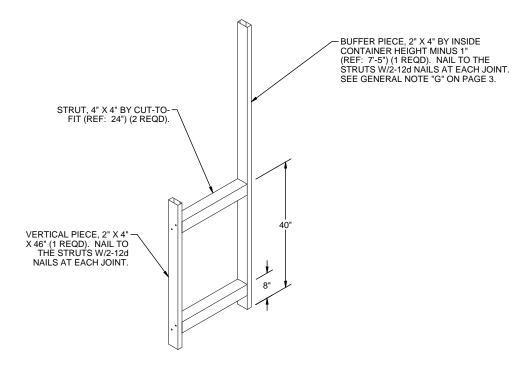
PAGE 5





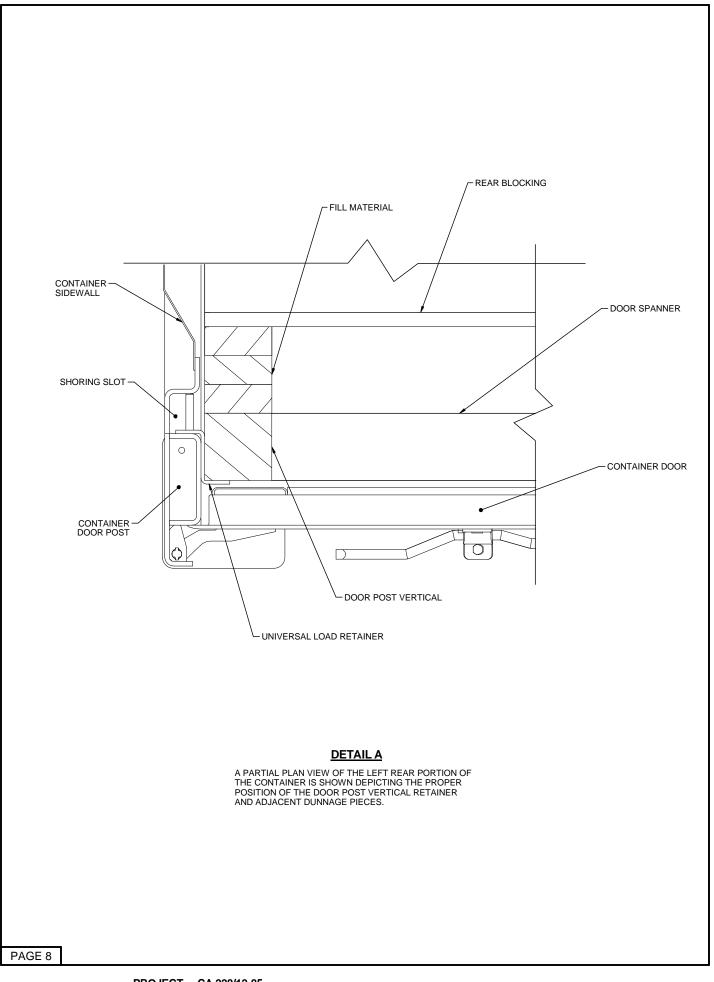
CENTER/SIDE FILL ASSEMBLY

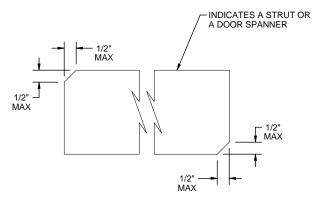
 $\underline{\text{NOTE}}\textsc{:}$ FILL PIECE IS ONLY REQUIRED FOR THE LOAD DEPICTED ON PAGE 4, AND IS NOT REQUIRED FOR THE LOAD ON PAGE 2.



FORWARD STRUT ASSEMBLY

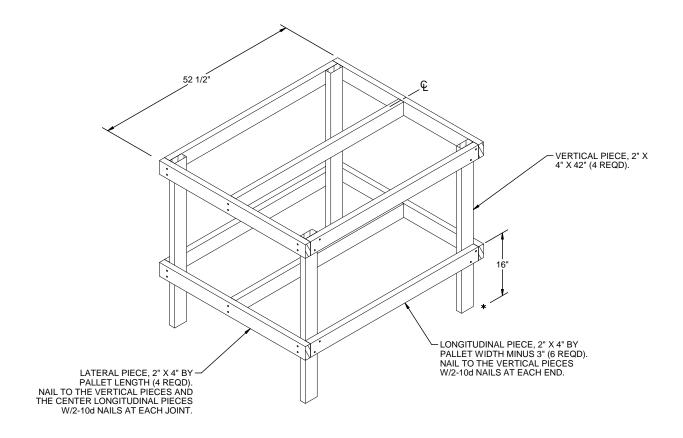
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BEVEL CUT

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



FILLER ASSEMBLY

THE ASSEMBLY DEPICTED ABOVE IS FOR USE IN PLACE OF AN OMITTED PALLET UNIT. FILLER ASSEMBLIES MUST BE WIRE TIED TO AN ADJACENT PALLET UNIT STRAP, OR CENTER OR SIDE FILL ASSEMBLY TO PREVENT UNDUE MOVEMENT. NO MORE THAN ONE FILLER ASSEMBLY WILL BE USED IN ANY LOAD.

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