LOADING AND BRACING WITH WOODEN
DUNNAGE IN END OPENING ISO
CONTAINERS OF AIR INFLATABLE
RETARDER, BSU-49/B PACKED IN THE
CNU-335/E OR CNU-335A/E CONTAINER,
AND BSU-50/B PACKED IN THE
CNU-336/E OR CNU-336A/E CONTAINER

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● LOADING AND BRACING SPECIFICATIONS SET FORTH WITHIN THIS DRAWING ARE APPLICABLE TO LOADS THAT ARE TO BE SHIPPED BY TRAILER/CONTAINER-ON-FLATCAR (T/COFC) RAIL CARRIER SERVICE. THESE SPECIFICATIONS MAY ALSO BE USED FOR LOADS THAT ARE TO BE MOVED BY MOTOR OR WATER CARRIERS.

U.S. ARMY MATERI	EL (	OMM	AND DE	RAWING	
APPROVED, U.S. ARMY ARMAMENT, MUNITIONS AND	ORAFT	SHAN	TECHNICIAN	ENGINEER	
CHEMICAL COMMAND				L. FIEFFER	
APPROVED BY ORDER OF COMMANDING GENERAL, U.S.	VALIDA ENGINE CIVIS	RING	TRANSPORTATION ENGINEERING DIVISION	LOGISTICS ENGINEERING OFFICE	
APRIY HATERIEL COMMAND	ķ	WK.	W. Durin	& WFEINT	
William F Ernst	ı	N	OVEMBER 1	993	
U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL	CLASS DIVISIO		DRAWING	FILE	
	19	48	8538	3EL2192	

DO NOT SCALE

#### GENERAL NOTES

- THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TH 743-200-1 (CHAPTER 5).
- THE SPECIFIED OUTLOADING PROCEDURES ARE APPLICABLE TO LOADS OF AIR INFLATABLE RETARDER, BSU-48/8 PACKED IN THE CMU-335/E OR CMU-335A/E CONTAINER OR BSU-50/8 PACKED IN THE CMU-335/E CONTAINER OR CMU-335A/E CONTAINER.

  SUBSCOULT REFERENCE TO CONTAINER HEREIN MEANS THE CONTAINER WITH AIR INFLATABLE RETARDER. SEE PAGE 3 FOR DETAILS OF THE CONTAINERS. CAUTION: REGARDLESS OF THE OUANTITY OF CONTAINERS TO BE SHIPPED, THE "MAXIMUM GROSS WEIGHT" OF THE END OPENING ISD CONTAINER MUST NOT BE
- THE LOAD AS SHOWN IS BASED ON A 4,700 POUND 20' LONG BY 8' WIDE BY 8'-8" HIGH END OPENING ISO CONTAINER WITH INSIDE DIMENSIONS OF 18'-4" LONG BY 92" WIDE BY 95" (93" CLEAR HEIGHT) AND A MAXIMUM GROSS VEIGHT 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.
- WHEN LOADING CONTAINERS, THEY ARE TO BE POSITIONED SO AS TO ACHIEVE A TIGHT LOAD (TIGHT AGAINST THE DUNNAGE ASSEMBLIES). ALTHOUGH A TOTAL OF L-1/2" OF UNBLOCKED SPACE ACROSS THE WIDTH OF A LOAD BAY IS PERMITTED, LATERAL VOIDS WITHIN THE LOAD ARE TO BE HELD TO A MINIMUM. EXCESSIVE SLACK CAN BE ELIMINATED FROM A LOAD BY LAMINATING ADDITIONAL PIECES OF APPROPRIATE THICKNESS TO THE LONGITUDINAL PIECES ON THE CENTER FILL ASSEMBLIES OR THE HORIZONTAL PIECES ON THE SIDE FILL ASSEMBLIES. NAIL EACH ADDITIONAL PIECE W/I APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE LENGTH OF THE LATERAL PIECES IN THE CENTER FILL ASSEMBLIES OR THE THICKNESS AND/OR QUANTITY THE VERTICAL OR HORIZONTAL PIECES IN THE SIZE FALL ASSEMBLIES MAY BE ADJUSTED AS REQUIRED TO FACILITATE VARIANCE IN THE CONTAINER SIZE.
- 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 B" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE.
- 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 CRIVEN THROUGH ONTO OR RIGHT BESIDE A NAIL IN A LOWER PIECE.

(CONTINUED AT RIGHT)

### MATERIAL SPECIFICATIONS

LUMBER - - - - - - SEE TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC MM-L-751.

MAILS ----: FED SPEC FF-N-105; COMMON.

PLYWOOD ----: COMMERCIAL ITEM DESCRIPTION
A-A-55057, TYPE A, CONSTRUCTION AND
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.

- - LEET , DAIPPLANT TALE .- - LEET , DAIPPLANT , DAIPPLANT , DAIPPLANT , PAINT , FINISH A, B (GRADE 2), OR

SEAL, STRAP - - - -: ATRIANTED HTZA : - - - PARTZ H, FINISH A, B (GRADE 2), OR C, DOUBLE NOTCH TYPE, STYLE I. II. OR IV.

ASTM ABS3; ANNEALED AT FINISH, BLACK OXIDE FINISH, .0900° DIA, GRADE 1008 WIRE, CARBON STEEL -: OR BETTER.

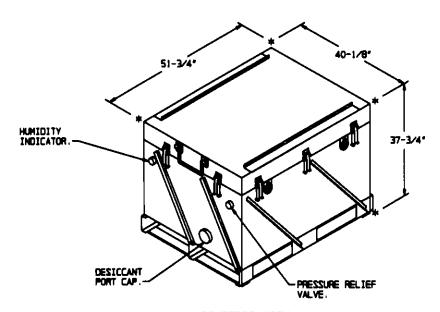
STAPLE, STRAP - - -: COMMERCIAL GRADE.

STEEL, STRUCTURAL -: ASTM ASO1, STEEL STRUCTURAL TUBING; AND ASTM AS70, STEEL, STRIP, HOT-ROLLED, GRADE 36 (MINIMUM).

ANTI-CHAFING MATERIAL - - - - -: MIL-8-121 (OR EQUAL); NEUTRAL BARRIER MATERIAL.

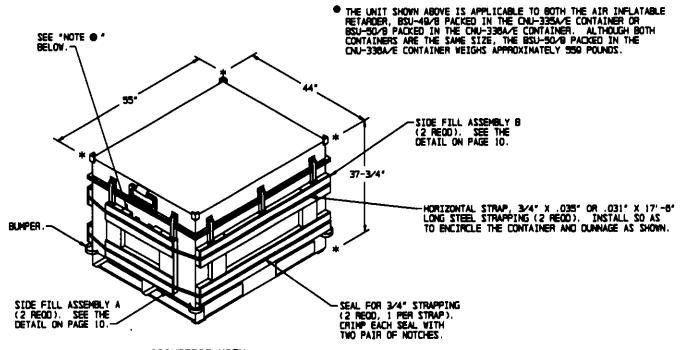
(GENERAL NOTES CONTINUED)

- 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 SLOCKING ASSEMBLY 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". THIS PIECE IS NOT REQUIRED WHEN THE CORNER PORTIONS OF THE CONTAINER FORWARD WALL ARE SMOOTH AND FLAT.
- CAUTION: DO NOT NAIL OUNNAGE MATERIAL TO THE CONTAINER WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.
- PORTIONS OF THE CONTAINER DEPICTED WITHIN THIS DRAWING, SUCH AS THE SIDEWALL, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.
- REQUIREMENTS CITED WITHIN THE BUREAU OF EXPLOSIVES PAMPHLET BC APPLY WHEN THE SHIPMENT MOVES BY TRAILER/CONTAINER-ON-FLATCAR (T/COFC). SPECIAL T/COFC NOTES
  - 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.
- L. 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 "VEIGHT LAWS" APPLICABLE TO THE STATE OR STATES TNYOUVED.
- M. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES AND WEIGHTS ARE EXPRESSED IN POLINDS. WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCHEQUALS 25.4MM AND ONE POUND EQUALS 0.454 KG.
- N. THE QUANTITY OF CONTAINERS SHOWN IN THE LOADS ON PAGE 4 AND PAGE 6 MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SE THE "LESS-THAN-FULL-LOAD" PROCEDURE ON PAGE B. WHEN A CONTAINER IS TO BE 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.
  - IF A LOAD IS REDUCED BY ONLY A SMALL AMOUNT (ONE OR TWO LADING UNITS), LADING UNITS NORMALLY MAY BE ELIMINATED FROM THE CENTER OF THE LOAD.
  - 2. IF A LOAD IS REDUCED BY A LARGE AMOUNT (MORE THAN TWO LADING UNITS), 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.
- O. ANTI-CHAFING MATERIAL MAY BE INSTALLED AT POINTS OF CONTACT BETVEEN CONTAINERS, BETVEEN CONTAINERS AND THE ENO OPENING CONTAINER, AND BETVEEN CONTAINERS AND STEEL STRAPPING, IF DESIRED, TO PREVENT DHAFING DAMAGE TO CONTAINER PAINT AND MARKINGS.



#### ISOMETRIC VIEW

AIR INFLATABLE RETARDER, BSU-49/8 (CNU-335A/E CNTR) - - 1,038 LBS (APPROX)



# ISOMETRIC VIEW

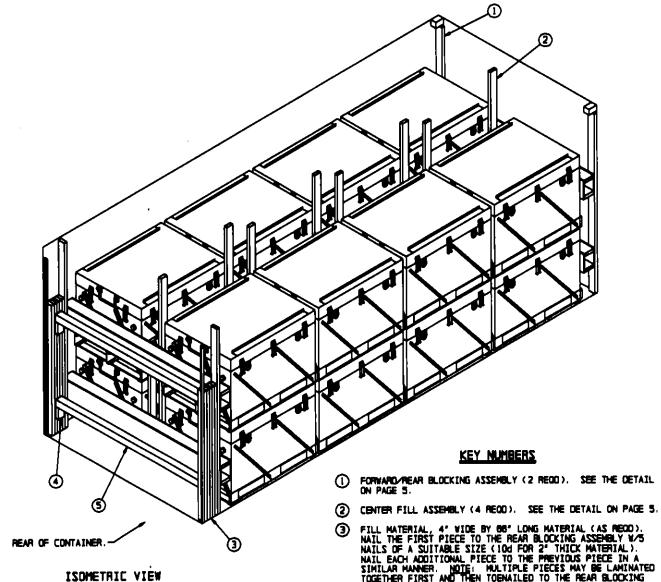
AIR INFLATABLE RETARDER, BSU-49/8 (CNU-335/E CNTR) - - 1,038 LBS (APPROX) DUNNAGE - - - - 82 LBS

TOTAL WEIGHT - - - - 1,120 LBS (APPROX)

- THE UNIT SHOWN ABOVE IS APPLICABLE TO BOTH THE AIR INFLATABLE RETARDER, BSU-40/8 PACKED IN THE CNU-335/E CONTAINER OR BSU-50/8 PACKED IN THE CNU-338/E CONTAINER. ALTHOUGH BOTH CONTAINERS ARE THE SAME SIZE, THE BSU-50/8 PACKED IN THE CNU-338/E CONTAINER WEIGHS APPROXIMATELY 841 POUNDS.
- NOTE: THE INTERMEDIATE FILLER PIECE OF THE "SIDE FILL ASSEMBLY A" MAY BE NOTCHED OR PARTIALLY OMITTED AS NECESSARY TO PROVIDE ACCESS TO THE MUMIDITY INDICATOR AND PRESSURE RELIEF VALVE. SEE "DETAIL A" ON PAGE 10.

BILL OF MATERIAL										
LUMBER	LINEAR FEET	BOARO FEET								
2" X 6"	31	31								
NAILS	NO. REOD	ZONUOS								
6d (2°)	88	3/4								

STEEL STRAPPING, 3/4" -- 35.00' RE00 -- 2-1/2 LBS SEAL FOR 3/4" STRAPPING --- 2 RE00 -- -- NIL PLYWOOD, 1/2" --- 11.77 SQ FT RE00 -- 15.19 LBS



NYOHZ ZA DADJ

ITEM		g	<u>UANT</u>	ITY		WEIG	HT (AP	(APPROX)		
CNU-335A/E OUNNAGE CONTAINER					 	- 5	25 raz			
	TOTAL	AEIGHT			 	- 21,9	00 LBS	(APPROX)		

#### **LOAD AS SHOWN**

ITEM						<u>Q</u>	JAN	T	T	!					WEIGHT	(APPROX)
CNU-336A/E DUNNAGE - CONTAINER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	592	LB2

TOTAL WEIGHT - - - - - - 14,235 LBS (APPROX)

- FILL MATERIAL, 4" WIDE BY 88" LONG MATERIAL (AS REDD).

  NAIL THE FIRST PIECE TO THE REAR BLOCKING ASSEMBLY W/5

  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 8E LAMINATED

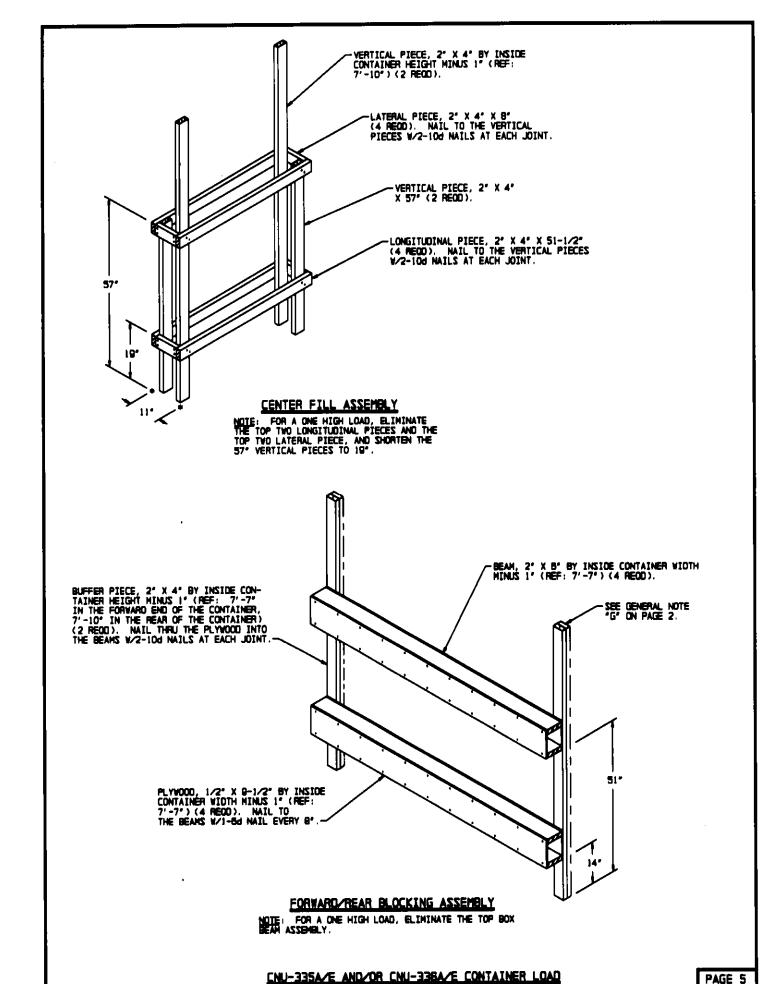
  TOGETHER FIRST AND THEN TOENAILED TO THE REAR BLOCKING

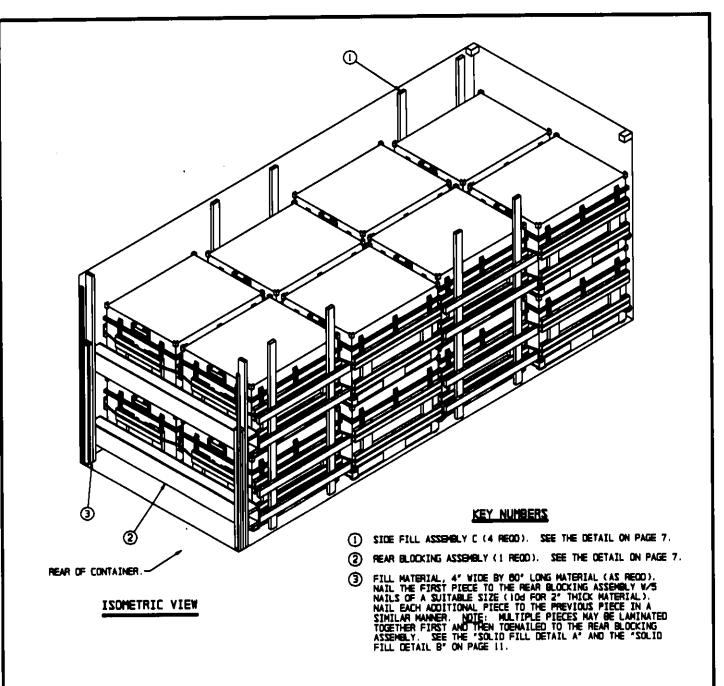
  ASSEMBLY. SEE THE "SOLID FILL DETAIL A" AND THE "SOLID

  FILL DETAIL B" ON PAGE 11.
- (4) STRUT LEDGER, 2" X 4" X 8" (4 SHOWN OPTIONAL). INSTALL IF DESIRED TO AID IN THE INSTALLATION OF SPANNER PIECES. NAIL TO THE FILL MATERIAL W/2-10d NAILS. INSTALL
- S DOOR SPANNER, 4" X 4" MATERIAL, CUT TO A LENGTH THAT WILL PROVIDE FOR A DRIVE FIT (REF: 7'-1-3/8") (2 REDD). TOENAIL TO THE FILL MATERIAL PIECES W/2-12d NAILS AT EACH END. SEE THE "BEVEL-CUT" DETAIL ON PAGE 8. NOTE THAT THESE PIECES AND THE STRUT LEDGERS ARE NOT REQUIRED IF THE SPACE BETWEEN THE REAR BLOCKING ASSEMBLY AND THE LOAD RETAINER IS LESS THAN 6".

BILL OF MATERIAL											
LUMBER LINEAR FEET BOARD FEET											
2" X 4" 2" X 6" 4" X 4"	288 61 15	179 61 20									
NA ILS	NO. RECCO	ZONUOP									
Bd (2") 10d (3") 12d (3-1/4")	176 218 8	1-1/4 3-1/2 1/4									
PLYW000, 1/2" 48.03 SQ FT REOD 88.04 LBS											

CNU-335A/E AND/OR CNU-336A/E CONTAINER LOAD





BILL OF MATERIAL												
LUMBER LINEAR FEET SOARD FEET												
2° X 4° 2° X 6°	171 31	114 31										
ZJIAN	NO. REOD	POUNDS										
6d (2°) 10d (3°)	100	3/4 1-3/4										
PLYW000, 1/2" 24.02 S0 FT RE00 33.03 LBS												

# NYOHZ ZA DAOJ

ITEM			<u>a</u>	JAN	(T)	ידו	<u>'</u>					WEIGHT	(APPROX)				
CNU-335/E DUNNAGE - CONTAINER	-	-	_	-	-	-	-	-	-	-	-	-	-	-	326	LB2	
	TO:	TAL	. 1	Æ	(G)	łΤ	-	-	-	-	-	-	-	-	22,946	L <b>8</b> S	(APPROX)

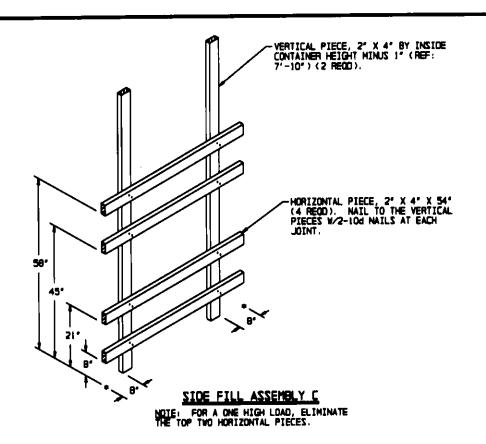
# NWOHZ ZA GAGL

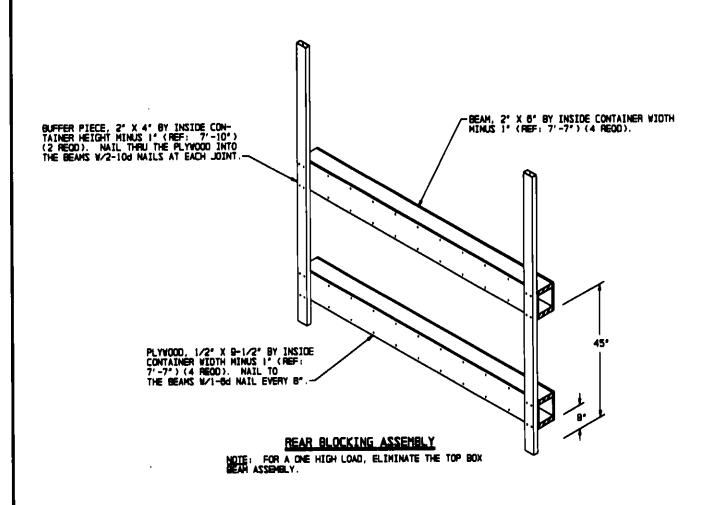
ITEM	QUANTITY WEI	(GHT (APPROX)
OLINNAGE -	18 10,	326 LBS

TOTAL WEIGHT - - - - - - 15,282 LBS (APPROX)

CNU-335/E AND/OR CNU-338/E CONTAINER LOAD

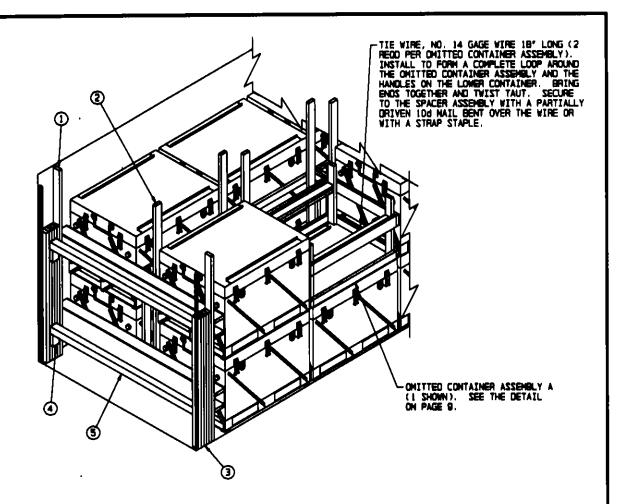
PAGE 6





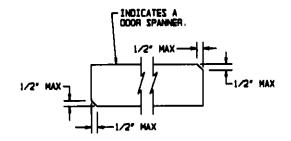
CAU-335/E AND/OR CNU-336/E CONTAINER LOAD

PAGE 7



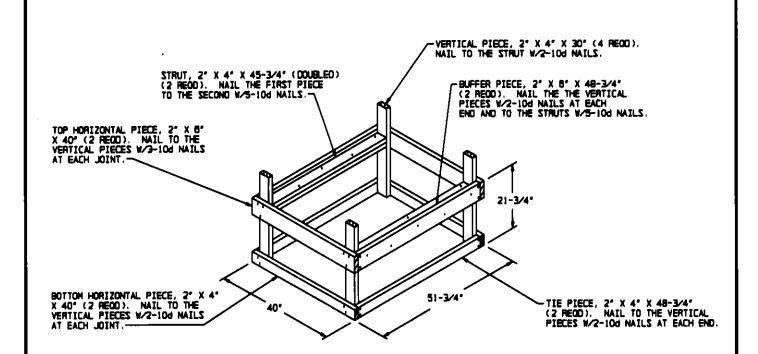
# LESS-THAN-FULL-LOAD PROCEDURE

THE DETAIL ABOVE DEPICTS A BLOCKING METHOD TO BE USED IN A LESS-THAN-FULL CONTAINER LOAD (LESS THAN 18 UNITS). KEY NUMBERS REFER TO KEY NUMBERS ON PAGE 4. THE CNU-335A/E AND/OR THE CNU-335A/E IS SHOWN AS TYPICAL, BUT THE PROCEDURES MAY ALSO BE APPLIED TO THE CONTAINERS AND LOAD DEPICTED ON PAGE 8. SEE GENERAL NOTE "N" ON PAGE 2.



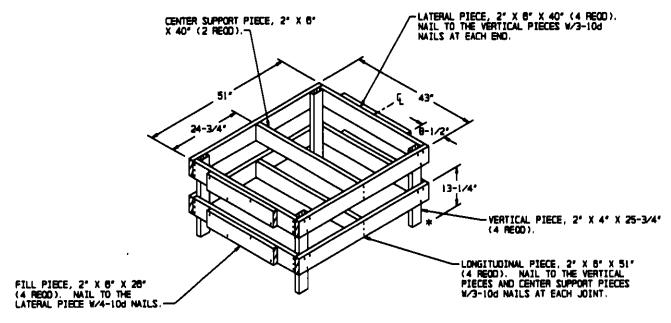
# BEVEL-CUT

IF DESIRED, EACH END OF A GOOR SPANNER PIECE MAY BE SEVEL-CUT AS SHOWN ABOVE TO FACILITATE THE ACHIEVEMENT OF A TIGHT FILL-TO-FILL FIT.



#### OMITTED CONTAINER ASSEMBLY A

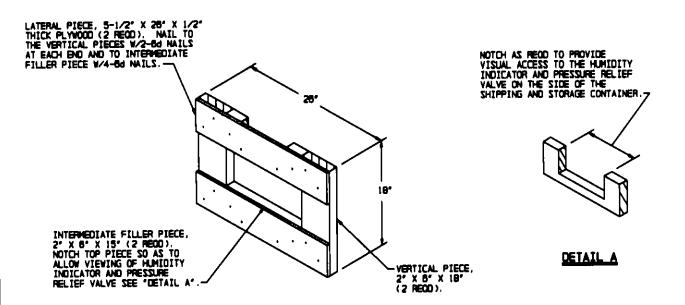
THIS ASSEMBLY IS TO BE USED FOR THE LOAD SHOWN ON PAGE 4 WHEN OMITTING CONTAINER UNITS. SEE THE "LESS-THAN-FULL-LOAD" PROCEDURES DEPICTED ON PAGE B.



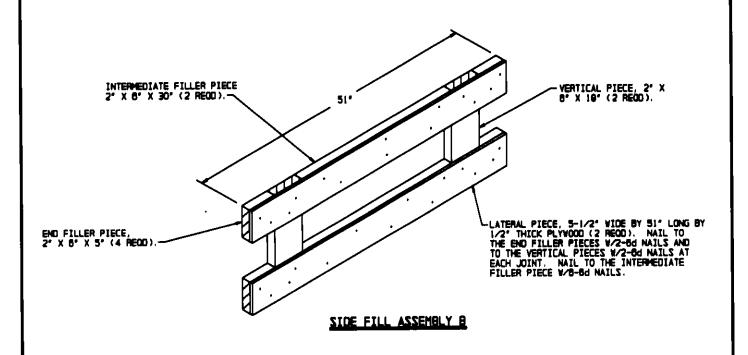
# OMITTED CONTAINER ASSEMBLY B

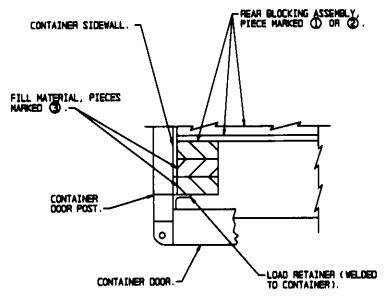
THIS ASSEMBLY IS TO BE USED FOR THE LOAD SHOWN ON PAGE 6 WHEN OMITTING CONTAINER UNITS. SEE THE "LESS-THAN-FULL-LOAD" PROCEDURES DEPICTED ON PAGE 8.

PAGE 9



# SIDE FILL ASSEMBLY A



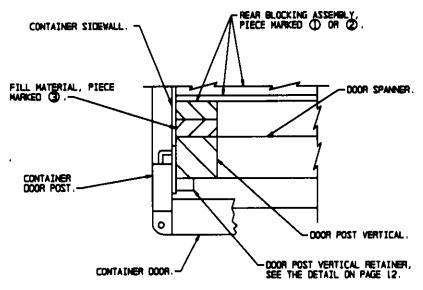


### DETAIL A

A PARTIAL PLAN VIEW OF THE LEFT REAR PORTION OF THE CONTAINER (AS DEPICTED ON PAGE 6) IS SHOWN DEPICTING THE PROPER POSITION OF THE FILL MATERIAL AND ADJACENT DUNNAGE PIECES.

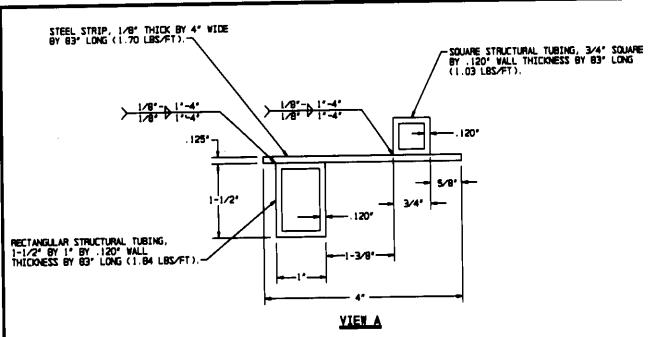
#### SPECIAL NOTE:

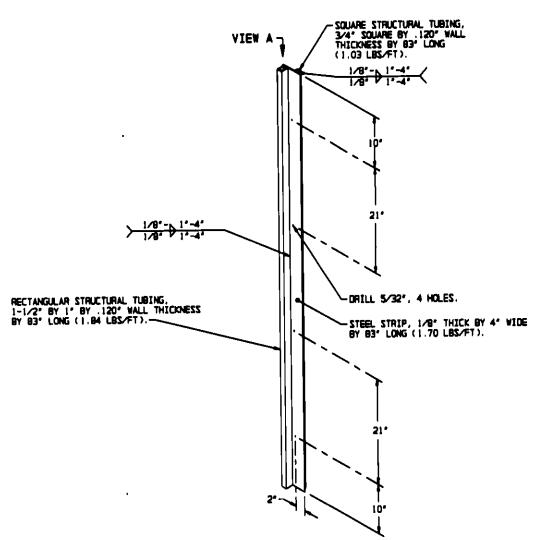
WHEN ISO CONTAINERS ARE NOT EQUIPPED WITH PRE-WELDED LOAD RETAINERS, AS DEPICTED IN "DETAIL A" ABOVE, DOOR POST VERTICALS, DOOR POST VERTICAL RETAINERS AND DOOR SPANNERS WILL BE REQUIRED FOR THE LOADS DEPICTED ON PAGE 4 AND PAGE 8. SEE VARIOUS LOADS WITHIN AMC DRAWING 18-48-4153-15PA1002 FOR EXAMPLES. SEE PAGE 12 FOR DETAILS OF THE METAL DOOR POST VERTICAL RETAINER.



# DETAIL B

A PARTIAL PLAN VIEW OF THE LEFT REAR PORTION OF THE CONTAINER (AS DEPICTED ON PAGE 8) IS SHOWN DEPICTING THE PROPER POSITION OF THE DOOR POST VERTIICAL REATINER AND ADJACENT DUNNAGE PIECES.





# DOOR POST VERTICAL RETAINER

NDIE: THE ABOVE ASSEMBLY HAS BEEN SHOWN ROTATED 90° FROM THE ORIENTATION IN HHICH IT IS INSTALLED IN THE LEFT REAR CORNER OF THE CONTAINER. THE ASSEMBLY HAS BEEN ROTATED FOR HOLE LOCATION CLARITY.