

# LOADING AND BRACING\* IN MILVAN CONTAINERS<sup>⊗</sup> OF ADG-769 ADAPTER GROUPS, PACKED IN CNU-439 SHIPPING AND STORAGE CONTAINERS

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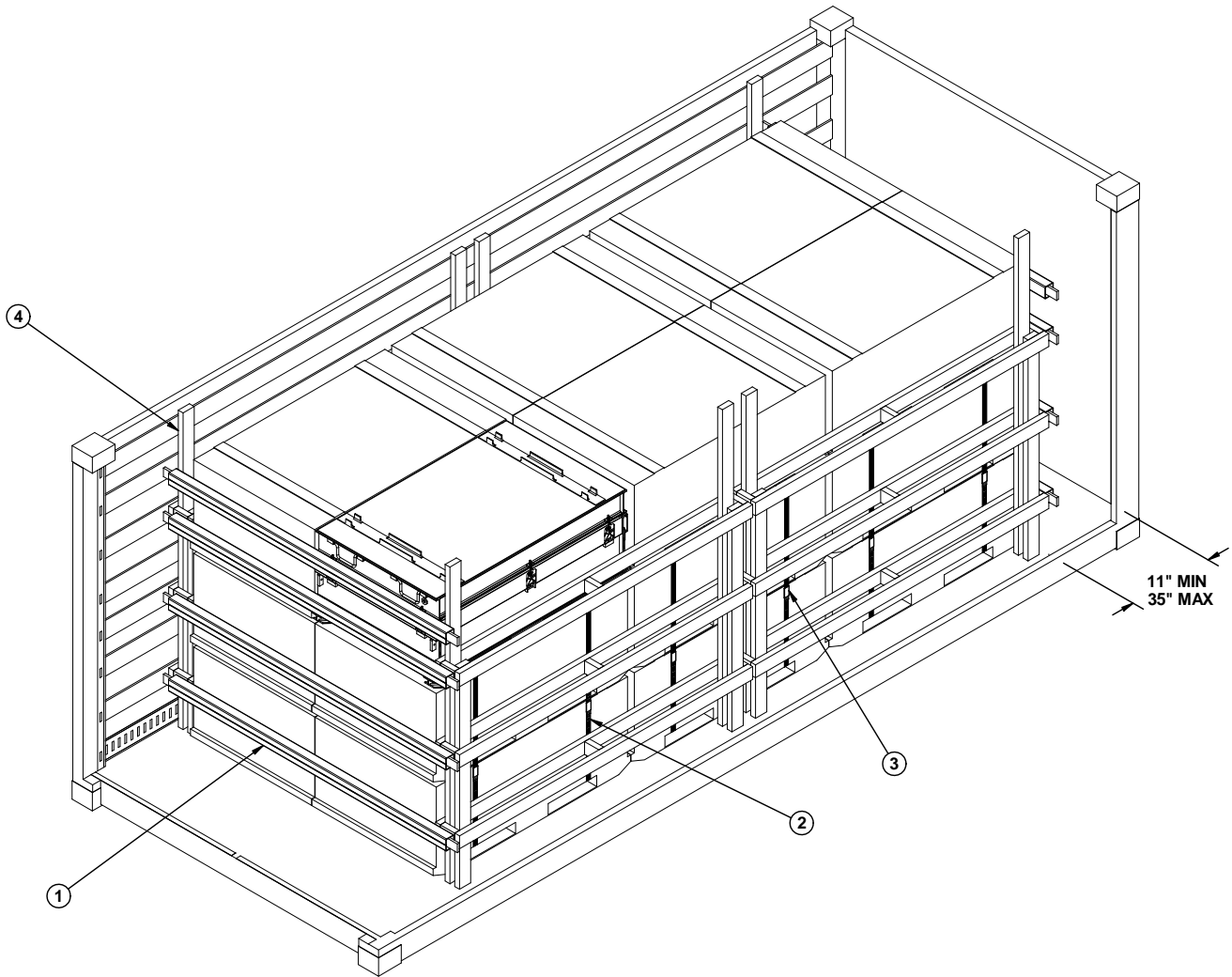
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⊗ ONLY MILVAN CONTAINERS WHICH HAVE BEEN MODIFIED TO INCLUDE A MECHANICAL LOAD-BRACING SYSTEM AS SPECIFIED WITHIN MIL-C-52661 WILL BE USED FOR THE MOVEMENT OF AMMUNITION BY T/COFC SERVICE.

\*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

<b>APPROVED, U.S. ARMY JOINT MUNITIONS COMMAND</b>  <b>RUS.ALLEN</b> J.123035428 2 <small>Digitally signed by RUS. ALLEN.J.1230354282 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=RUS. ALLEN.J.1230354282 Date: 2009.04.17 12:15:42 -05'00'</small>		<b>CAUTION: VERIFY PRIOR TO USE AT WWW.DAC.ARMY.MIL THAT THIS IS THE MOST CURRENT VERSION OF THIS DOCUMENT. THIS IS PAGE 1 OF 6.</b>							
		<b>DO NOT SCALE</b>		<b>MARCH 2009</b>					
		ENGINEER OR TECHNICIAN	BASIC REV.	<b>QUYEN TRAN</b>					
<b>APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND</b>  <b>CARNEY. GARY. BURTON.10387 08038</b> U.S. ARMY DEFENSE AMMUNITION CENTER <small>Digitally signed by CARNEY. GARY.BURTON.1038708038 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=CARNEY.GARY. BURTON.1038708038 Date: 2009.04.27 13:52:07 -05'00'</small>		TRANSPORTATION ENGINEERING DIVISION	<b>FIEFFER.LAURA. A.1230375727</b> <small>Digitally signed by FIEFFER.LAURA. A.1230375727 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, ou=FIEFFER.LAURA.A.1230375727 Date: 2009.03.02 08:26:15 -08'00'</small>		TESTED	CLASS	DIVISION	DRAWING	FILE
		VALIDATION ENGINEERING DIVISION	<b>BARICKMAN. PHILIP. W.1230202202</b> <small>Digitally signed by BARICKMAN. PHILIP.W.1230202202 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, ou=BARICKMAN.PHILIP. W.1230202202 Date: 2009.03.02 15:23:42 -08'00'</small>			<b>19</b>	<b>48</b>	<b>8683</b>	<b>SP15J106</b>
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**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① CROSS MEMBER (8 REQD). POSITION AS SHOWN IN THE DETAIL ABOVE AT THE 16", 38", 60", AND 72" HEIGHTS. SEE THE "FILL DETAIL" ON PAGE 5.
- ② UNITIZING STRAP, 1-1/4" X .035" OR .031" X 16'-0" LONG STEEL STRAPPING (12 REQD). INSTALL THROUGH FORK POCKETS AS FAR APART AS POSSIBLE.
- ③ SEAL FOR 1-1/4" STEEL STRAPPING (12 REQD, 1 PER STRAP). DOUBLE NOTCH EACH SEAL.
- ④ SIDE FILL ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 5.

**BILL OF MATERIAL**

LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	295	197
NAI LS	NO. REQD	POUNDS
10d (3")	240	4
STEEL STRAPPING, 1-1/4" - 192' REQD - 27-1/2 LBS		
SEAL FOR 1-1/4" STRAPPING - 12 REQD - - - 1/2 LB		
CROSS MEMBER - - - - - 8 REQD		

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
CNU-439	18	11, 142 LBS
DUNNAGE		425 LBS
CONTAINER		5, 700 LBS
<b>TOTAL WEI GHT</b>		<b>17, 267 LBS (APPROX)</b>

## GENERAL NOTES

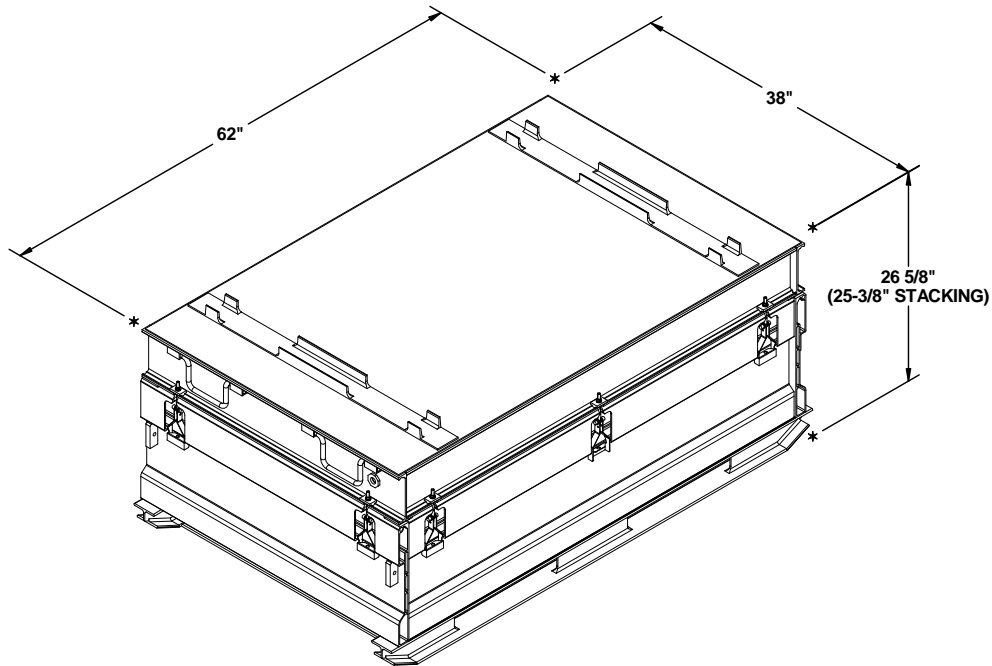
(GENERAL NOTES CONTINUED)

- 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 ADG-769 OR ADG-770 ADAPTER GROUPS PACKED IN CNU-439 CONTAINERS. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS CONTAINER WITH AMMUNITION ITEMS. SEE PAGE 4 AND AIR FORCE DRAWING 8644260 FOR DETAILS OF THE CONTAINER. **CAUTION:** REGARDLESS OF THE QUANTITY OF UNITS TO BE SHIPPED, THE "MAXIMUM GROSS WEIGHT" OF THE MILVAN CONTAINER MUST NOT BE EXCEEDED.
- C. THE LOADS AS SHOWN ARE BASED ON A 20' LONG BY 8' WIDE BY 8' HIGH MILVAN CONTAINER WITH INSIDE DIMENSIONS OF 19'-4" LONG BY 92" WIDE BY 87" HIGH. THE LOADS ARE DESIGNED FOR TRAILER/CONTAINER-ON-FLATCAR (T/COFC) SHIPMENT.
- D. THE SPECIFIED OUTLOADING PROCEDURES ARE FOR CONTAINERS EQUIPPED WITH SELF-CONTAINED MECHANICAL BRACING DEVICES AS DESCRIBED IN MIL-C-52661. CROSS MEMBER ATTACHMENT FACILITIES WITHIN THESE CONTAINERS MUST PROVIDE FOR THE INSTALLATION OF LOAD BLOCKING CROSS MEMBERS AT THE HEIGHTS SPECIFIED. VOIDS LENGTHWISE WITHIN THE LOAD MUST BE HELD TO A MINIMUM. CROSS MEMBERS MUST BE PLACED AGAINST THE LADING AS TIGHTLY AS THE HOLE SPACING IN THE CROSS MEMBER ATTACHMENT FACILITY PERMITS. SEE THE "FILL DETAIL" ON PAGE 5 FOR ADDITIONAL GUIDANCE. EACH CROSS MEMBER WILL BE INSTALLED WITH THE ENDS ATTACHED AS NEARLY AS POSSIBLE IN "MATED" POSITIONS (AT EQUAL HEIGHTS, AND AT EQUAL DISTANCES FROM THE END OF THE CONTAINER). CROSS MEMBERS IN EMPTY CONTAINERS AND THOSE NOT USED IN LOADED CONTAINERS MUST BE FASTENED INTO BELT RAILS FOR SHIPMENT. COMPONENTS ASSIGNED TO EACH CONTAINER MUST REMAIN THEREWITH EVEN THOUGH UNUSED DURING SOME SHIPMENTS. THE LOAD BLOCKING COMPONENT DESIGNATED AS "CROSS MEMBER" HEREIN IS IDENTIFIED AS "BEAM ASSEMBLY" WITHIN TM 55-8115-200-23&P, DATED DECEMBER 1979. THE BEAM ASSEMBLY IS FURTHER IDENTIFIED AS NSN 8115-00-165-6623.
- E. WHEN LOADING CONTAINERS, THEY ARE TO BE POSITIONED SO AS TO ACHIEVE A TIGHT LOAD (TIGHT AGAINST THE DUNNAGE ASSEMBLIES). THE UNLOCKED SPACE ACROSS THE WIDTH OF A LOAD BAY IS NOT TO EXCEED 1-1/2". THE LENGTH OF THE STRUTS IN THE SIDE FILL ASSEMBLY MAY BE ADJUSTED, AS NECESSARY, TO FACILITATE VARIANCE IN THE CONTAINER SIZE.
- F. 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.
- G. 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.
- H. **CAUTION:** DO NOT NAIL DUNNAGE MATERIAL TO THE MILVAN WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.
- J. PORTIONS OF THE MILVAN DEPICTED WITHIN THIS DRAWING, SUCH AS ONE OF THE SIDEWALLS, 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:
- CAUTION:** LOADED CONTAINERS MUST BE ON CHASSIS EQUIPPED WITH TWO BOGIE ASSEMBLIES WHEN BEING MOVED IN TOFC SERVICE, REGARDLESS OF THE LOAD WEIGHT WITHIN THE CONTAINER.
  - LOAD LIMITS OF T/COFC RAIL CARS 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.
  - CHASSIS/CONTAINERS COUPLED INTO A 40-FOOT TRAILER CONFIGURATION MUST BE PLACED AT THE B-END OF A TOFC RAILCAR. THE REAR END OF THE 40-FOOT UNIT WILL OVERHANG THE END OF THE CAR IF IT IS PLACED AT THE A-END. TWENTY-FOOT AND 40-FOOT UNITS CAN BE LOADED ON THE SAME CAR.

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



**CNU-439 CONTAINER**

GROSS WEIGHT - - - - - 619 LBS (APPROX)  
 CUBE - - - - - 36.3 CU FT (APPROX)

**UNITIZATION AND HANDLING GUIDANCE**

(UNITIZATION AND HANDLING GUIDANCE CONTINUED)

**1. STACKING CONTAINERS FOR LOADING:**

- A. AN UPPER CONTAINER SHOULD BE PLACED AS CLOSE AS POSSIBLE IN VERTICAL ALIGNMENT WITH THE NEXT LOWER CONTAINER.
- B. POSITION THE FORWARD END OF AN UPPER CONTAINER ABOVE THE FORWARD 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.

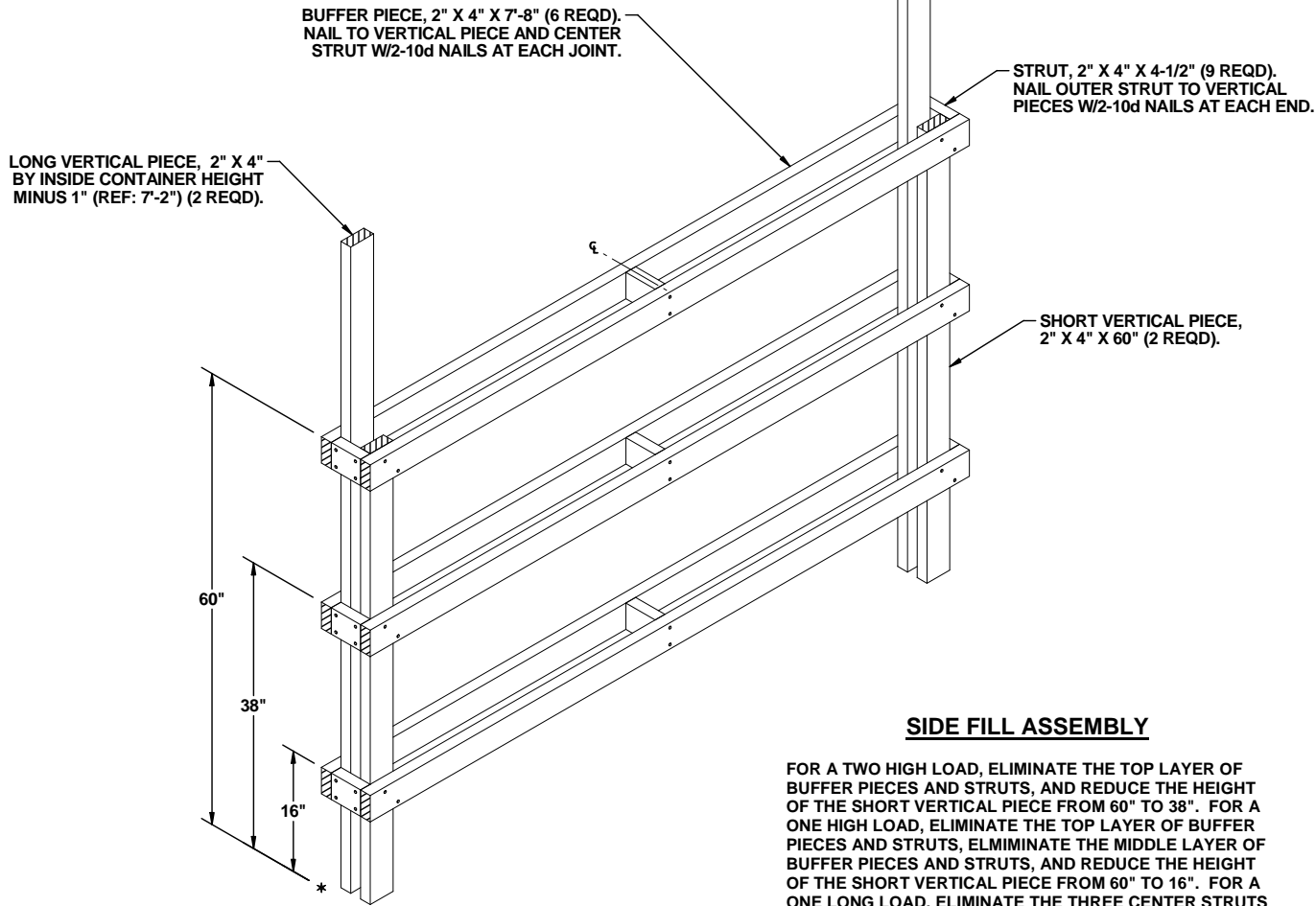
**2. INSTALLATION OF UNITIZING STRAPS:**

- A. STRAPS WILL BE POSITIONED SO AS TO ENCIRCLE THE CONTAINERS AND SO THAT THE STRAPPING LAYS FLAT AND STRAIGHT WITH THE BODY SURFACE OF THE CONTAINER; I.E., VERTICAL ALONG THE SIDES AND FLAT ACROSS THE TOP AND BOTTOM OF THE STACK.
- B. PLACE ANTI-CHAFING NEUTRAL BARRIER MATERIAL UNDER THE STRAPPING AT ALL POINTS OF CONTACT WITH THE CONTAINER, IF DESIRED, AND SECURE TO PREVENT DISLODGE MENT DURING AND AFTER STRAP APPLICATION. STRIPS OF ANTI-CHAFING MATERIAL MAY BE TAPED OR STRING-TIED TO THE CONTAINER OR STRAPPING, OR IT CAN BE FORMED INTO STRAP ENCIRCLING TUBES BY WINDING THE MATERIAL AROUND THE STRAPPING TO FORM A SELF-HOLDING UNIT.
- C. STRAPPING WILL BE FIRMLY TENSIONED AND EACH END-OVER-END LAP JOINT WILL BE SEALED AS DELINEATED IN GENERAL NOTE "O" ON PAGE 3. THE LAP JOINTS WILL BE MADE ALONG THE SIDE OF THE STACK AS SHOWN. DURING STRAP TENSIONING, CARE SHOULD BE EXERCISED TO ENSURE THAT THE CONTAINERS ARE NOT DAMAGED. EXCESS STRAPPING (STRAP ENDS) SHOULD BE CUT OFF OR BROKEN OFF NEAR THE JOINT SEALS.

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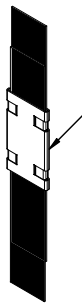
**3. CONTAINER OR CONTAINER STACK HANDLING:**

- 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.
- D. WHEN UNLOADING CONTAINERS, REMOVE THE CROSS MEMBERS. ATTACH A CHAIN FROM THE CONTAINER LIFTING CLEVIS ON ONE SIDE OF THE BOTTOM CONTAINER, AROUND THE FORKLIFT MAST, TO THE CONTAINER LIFTING CLEVIS ON THE OPPOSITE SIDE OF THE BOTTOM CONTAINER. SLIGHTLY ELEVATE AND INSERT THE FORK TINES UNDER THE END OF THE CONTAINER STACK AND SLOWLY DRAG THE CONTAINER STACK REARWARD UNTIL IT CAN BE HANDLED FROM THE SIDE, TAKING CARE NOT TO DAMAGE THE CONTAINERS.



**SIDE FILL ASSEMBLY**

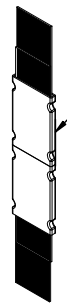
FOR A TWO HIGH LOAD, ELIMINATE THE TOP LAYER OF BUFFER PIECES AND STRUTS, AND REDUCE THE HEIGHT OF THE SHORT VERTICAL PIECE FROM 60" TO 38". FOR A ONE HIGH LOAD, ELIMINATE THE TOP LAYER OF BUFFER PIECES AND STRUTS, ELIMINATE THE MIDDLE LAYER OF BUFFER PIECES AND STRUTS, AND REDUCE THE HEIGHT OF THE SHORT VERTICAL PIECE FROM 60" TO 16". FOR A ONE LONG LOAD, ELIMINATE THE THREE CENTER STRUTS AND REDUCE THE LENGTH OF THE BUFFER PIECES TO 61".



ONE SEAL WITH TWO PAIR OF NOTCHES.

**STRAP JOINT A**

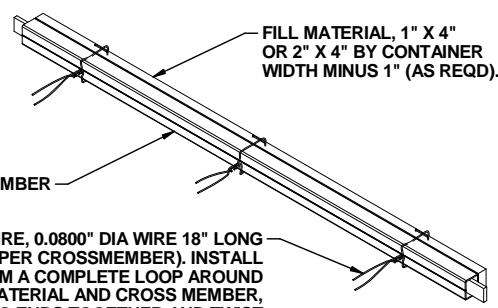
METHOD OF SECURING A STRAP JOINT WHEN USING A NOTCH-TYPE SEALER.



TWO SEALS, BUTTED TOGETHER, WITH TWO PAIR OF CRIMPS EACH SEAL.

**STRAP JOINT B**

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

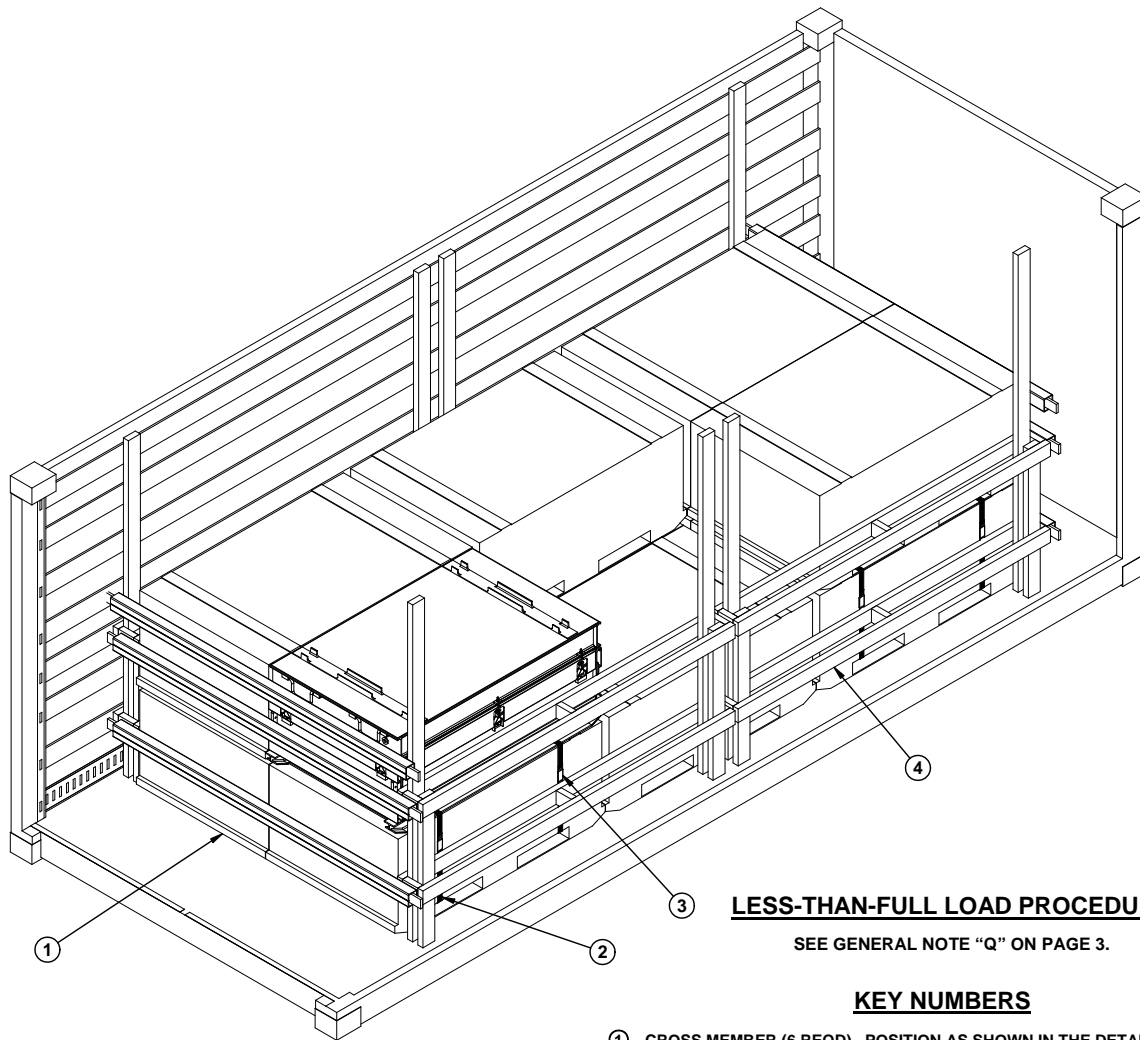


FILL MATERIAL, 1" X 4" OR 2" X 4" BY CONTAINER WIDTH MINUS 1" (AS REQD).  
CROSS MEMBER  
TIE WIRE, 0.0800" DIA WIRE 18" LONG (3 REQD PER CROSSMEMBER). INSTALL TO FORM A COMPLETE LOOP AROUND FILL MATERIAL AND CROSS MEMBER, BRING ENDS TOGETHER AND TWIST TAUT. SECURE TO FILL MATERIAL WITH A PARTIALLY DRIVEN 10d NAIL BENT OVER THE WIRE, OR WITH A STRAP STAPLE.

**FILL DETAIL**

THIS DETAIL DEPICTS THE METHOD OF POSITIONING FILL MATERIAL BETWEEN CROSS MEMBER AND LADING, WHEN THE VOID BETWEEN THE TWO IS GREATER THAN 1".

**END-OVER-END LAP JOINT DETAILS**

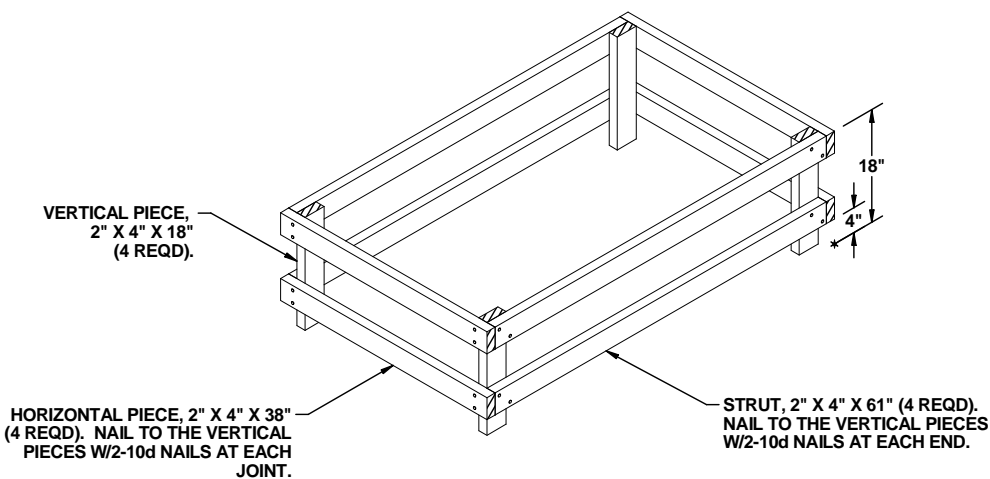


**LESS-THAN-FULL LOAD PROCEDURE**

SEE GENERAL NOTE "Q" ON PAGE 3.

**KEY NUMBERS**

- ① CROSS MEMBER (6 REQD). POSITION AS SHOWN IN THE DETAIL ABOVE AT THE 16", 38", AND 48" HEIGHTS. SEE THE "FILL DETAIL" ON PAGE 5.
- ② UNITIZING STRAP, 1-1/4" X .035" OR .031" X 12'-0" LONG STEEL STRAPPING (10 REQD). INSTALL THROUGH FORK POCKETS AS FAR APART AS POSSIBLE.
- ③ SEAL FOR 1-1/4" STEEL STRAPPING (10 REQD, 1 PER STRAP). DOUBLE NOTCH EACH SEAL.
- ④ SIDE FILL ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 5.



**FILLER ASSEMBLY**

THIS ASSEMBLY IS FOR USE WHEN LOADING AN ODD NUMBER OF CONTAINERS ONE LAYER HIGH. SECURE THE FILLER ASSEMBLY TO THE HANDLES OR LATCHES OF ADJACENT CNU-439 CONTAINER USING TIE WIRE IN AT LEAST TWO PLACES. INSTALL EACH WIRE AROUND THE FILLER ASSEMBLY HORIZONTAL PIECE OR STRUT AND THROUGH THE HANDLE OF THE CNU CONTAINER OR CNU CONTAINER LATCH. PULL WIRE TAUT AND TWIST WIRE WITH A MINIMUM OF TWO COMPLETE TWISTS.