


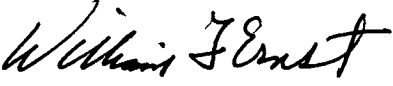

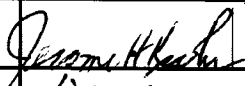
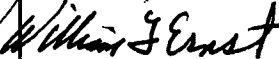
# LOADING AND BRACING (TL & LTL) ON FLATBED TRAILERS\* OF CBU-87/B AND CBU-89/B MUNITIONS PACKED IN CNU-411/E METAL CONTAINERS

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● CAUTION: THE OUTLOADING PROCEDURES SHOWN HEREIN ARE ONLY APPLICABLE TO HIGHWAY MOVEMENTS; NOT TRAILER-ON-FLAT CAR MOVEMENTS.

## U.S. ARMY MATERIEL COMMAND DRAWING

APPROVED, U.S. ARMY INDUSTRIAL OPERATIONS COMMAND  	ENGINEER REV.	BASIC REV.	MICHAEL SARDONE RALPH ARNOLD	DO NOT SCALE WEBSITE: <a href="http://www.dac.army.mil">HTTP://WWW.DAC.ARMY.MIL</a> <b>NOVEMBER 1986</b>			
APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND   DEFENSE AMMUNITION CENTER	DRAFTSMAN REV.	BASIC REV.	PHYLLIS BELLICH	REVISION NO. 4	JUNE 1997		
	TRANSPORTATION ENGINEERING DIVISION			SEE THE REVISION LISTING ON PAGE 2			
	VALIDATION ENGINEERING DIVISION	LOGISTICS ENGINEERING OFFICE	TESTED  	CLASS 19	DIVISION 48	DRAWING 7077	FILE SP11M7

## 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 OUTLOADING PROCEDURES CONTAINED HEREIN ARE APPLICABLE TO CBU-87/B AND CBU-89/B MUNITIONS PACKED IN CNU-411/E METAL CONTAINERS. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CNU-411/E CONTAINER WITH CONTENTS.
- C. FOR DETAILS OF THE CNU-411/E CONTAINER, SEE AIR FORCE DRAWING NO. 8394441 AND DETAIL ON PAGE 3.
- CONTAINER DIMENSIONS ----- 8'-4" LONG X 38-3/4" WIDE X 25-5/8" HIGH  
GROSS WEIGHT W/CBU-87/B MUNITIONS - 2,370 POUNDS (APPROX)  
GROSS WEIGHT W/CBU-89/B MUNITIONS - 1,930 POUNDS (APPROX)  
TARE WEIGHT ----- 470 POUNDS (APPROX)
- D. THE LOADS AS SHOWN HEREIN ARE BASED ON 8'-0" WIDE BY 40'-0" LONG, 8'-0" WIDE BY 45'-0" LONG, AND 8'-0" WIDE BY 48'-0" LONG FLATBED TRAILERS. TRAILERS OF OTHER LENGTHS CAN BE USED. TRAILERS MUST HAVE WOOD OR WOOD AND METAL FLOORS; TRAILERS HAVING ALL-METAL FLOORS CANNOT BE USED. CAUTION: IF THE TRAILER FLOOR IS EQUIPPED WITH EXPOSED METAL DECKING ABOVE THE BOGIE ASSEMBLY, OR ELSEWHERE, FIELD MEASUREMENTS SHOULD BE MADE TO ENSURE THAT THE METAL DECKING DOES NOT INTERFERE WITH THE PROPER POSITIONING AND NAILING OF THE DUNNAGE AS SPECIFIED BY THE PROCEDURES SHOWN HEREIN.
- E. SELECTION OF A VEHICLE USED TO TRANSPORT THE DESIGNATED ITEM MUST COMPLY WITH AR 55-355, CHAPTER 29, FOR EXPLOSIVES AND OTHER DANGEROUS ARTICLES, IN FULL.
- F. GROSS WEIGHT AND AXLE DISTRIBUTION OF WEIGHT FOR A LOAD WILL BE THE RESPONSIBILITY OF THE CARRIER. THE CARRIER WILL ADVISE THE SHIPPER OF APPLICABLE LOADING REQUIREMENTS, AND THE SHIPPER WILL LOAD ACCORDINGLY.
- G. NOTICE: A SHIPMENT WILL BE POSITIONED ON A TRAILER CONSISTENT WITH STATE WEIGHT LAWS.
- H. OTHER TYPES OF LADING ITEMS MAY BE LOADED ON A TRAILER WHICH IS PARTIALLY LOADED WITH THE DESIGNATED ITEM, PROVIDING THE TOTAL LOAD IS COMPATIBLE, EXISTING DIRECTIVES ARE NOT VIOLATED, AND THE OTHER LADING ITEMS ARE BLOCKED AND BRACED TO EQUAL THE BLOCKING AND BRACING CRITERIA SPECIFIED HEREIN.

(CONTINUED AT RIGHT)

## MATERIAL SPECIFICATIONS

- LUMBER -----: SEE TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC MM-L-751.
- NAILS -----: FED SPEC FF-N-105; COMMON.
- STRAP, WEB -----: WEB SLING AND TIEDOWN ASSOCIATION RECOMMENDED STANDARD SPECIFICATION FOR SYNTHETIC WEB TIEDOWNS, FIRST PUBLISHED IN 1991.
- 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.
- STAPLE, STRAP -----: COMMERCIAL GRADE.
- CHAIN -----: NATIONAL ASSOCIATION OF CHAIN MANUFACTURER'S WELDED CHAIN SPECIFICATION ADOPTED NOVEMBER 1975.
- LOAD BINDER -----: FED SPEC GGG-B-325.

## (GENERAL NOTES CONTINUED)

- J. CAUTION: REGARDLESS OF THE TYPE OF TRAILER INVOLVED, ONLY THOSE TRAILERS HAVING TIEDOWN ANCHORING FACILITIES WHICH PROVIDE HOLDING STRENGTH EQUAL TO OR GREATER THAN THE STRENGTH OF THE HOLD-DOWN STRAPS OR CHAINS AND WHICH ALIGN NEAR THE INDICATED LOCATIONS FOR THE HOLD-DOWN STRAPS OR CHAINS SHOULD BE USED. IF THE TRAILER ANCHOR DEVICES ARE NOT PROPERLY POSITIONED TO RECEIVE STRAPPING OR CHAINS, AS SHOWN, OR IF THE ANCHOR DEVICES ARE NOT EQUAL TO OR GREATER THAN THE STRENGTH OF THE TIEDOWN STRAPS OR CHAINS, STEEL STRAPS MAY BE APPLIED TO FORM A COMPLETE LOOP WHICH ENCOMPASSES BOTH THE LADING AND THE TRAILER FRAME AND/OR BED. CAUTION: AVOID TRAILER WHEELS, FIFTH WHEEL PLATE CONTROLS AND OTHER APPURTENANCES. USE EDGE PROTECTORS OR PADS ON ALL SHARP EDGES. NEITHER CHAINS NOR WEB STRAPS WILL BE APPLIED TO FORM A COMPLETE LOOP WHICH ENCOMPASSES BOTH THE LADING AND THE TRAILER FRAME AND/OR BED.
- K. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE AND 1" X 4" MATERIAL IS ACTUALLY 3/4" THICK BY 3-1/2" WIDE.
- L. A STAGGERED NAILING PATTERN WILL BE USED WHEN DUNNAGE IS NAILED TO THE FLOOR OF THE TRANSPORTING VEHICLE, OR WHEN LAMINATING DUNNAGE. THE NAILING PATTERN WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL DOES NOT PENETRATE INTO OR NEAR A CRACK BETWEEN FLOOR BOARDS. 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.
- M. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF ONE SEAL WITH TWO PAIR OF NOTCHES WILL BE USED TO SEAL THE JOINT WHEN A NOTCH-TYPE SEALER IS BEING USED. A MINIMUM OF TWO SEALS, BUTTED TOGETHER, WITH TWO PAIR OF CRIMPS PER SEAL WILL BE USED TO SEAL THE JOINT WHEN A CRIMP-TYPE SEALER IS BEING USED. REFER TO THE "END-OVER-END LAP JOINT DETAILS" ON PAGE 13.
- N. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTION WHICH IS IMMEDIATELY ADJACENT TO A DEPICTED OUTLOADING METHOD.
- O. 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 0.454KG.
- P. IF CHAINS AND LOAD BINDERS ARE BEING USED IN LIEU OF STEEL STRAPPING, THE "SPECIAL PROVISIONS FOR CHAIN TIEDOWN" ON PAGE 9 MUST BE APPLIED TO ENSURE ADEQUATE SECUREMENT OF THE LOAD PRIOR TO SHIPMENT. ALSO SEE THE "SPECIAL NOTES" ON PAGE 9.
- Q. THE TRANSPORTING VEHICLE OPERATOR SHOULD BE INSTRUCTED TO PERIODICALLY INSPECT THE TIEDOWN CHAINS AND LOAD BINDERS DURING TRANSIT AND TIGHTEN IF NECESSARY.
- R. IF WEB STRAPS ARE BEING USED IN LIEU OF STEEL STRAPPING, THE "SPECIAL PROVISIONS FOR WEB STRAP TIEDOWN" ON PAGE 11 MUST BE APPLIED TO ENSURE ADEQUATE SECUREMENT OF THE LOAD PRIOR TO SHIPMENT. ALSO SEE THE SPECIAL NOTES ON PAGE 11.

## REVISIONS

REVISION NO. 1, DATED APRIL 1987, CONSISTS OF:

ADDING ALTERNATE OUTLOADING PROCEDURES UTILIZING CHAINS AND LOAD BINDERS FOR TIEDOWN OF CONTAINER LOAD.

REVISION NO. 2, DATED JANUARY 1988, CONSISTS OF:

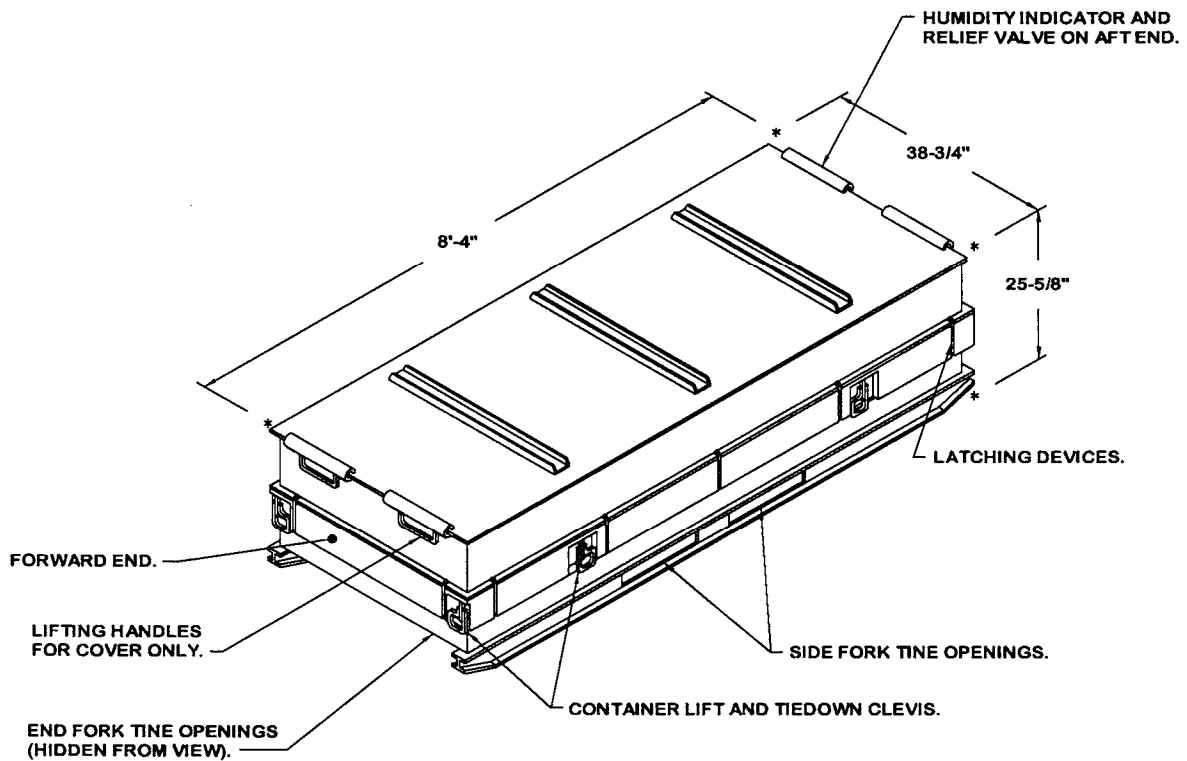
CHANGING ANTI-CHAFING ASSEMBLY DETAIL, AND REDUCING QUANTITY OF STEEL TIEDOWN STRAPS AND STRAPPING BOARDS.

REVISION NO. 3, DATED FEBRUARY 1993, CONSISTS OF:

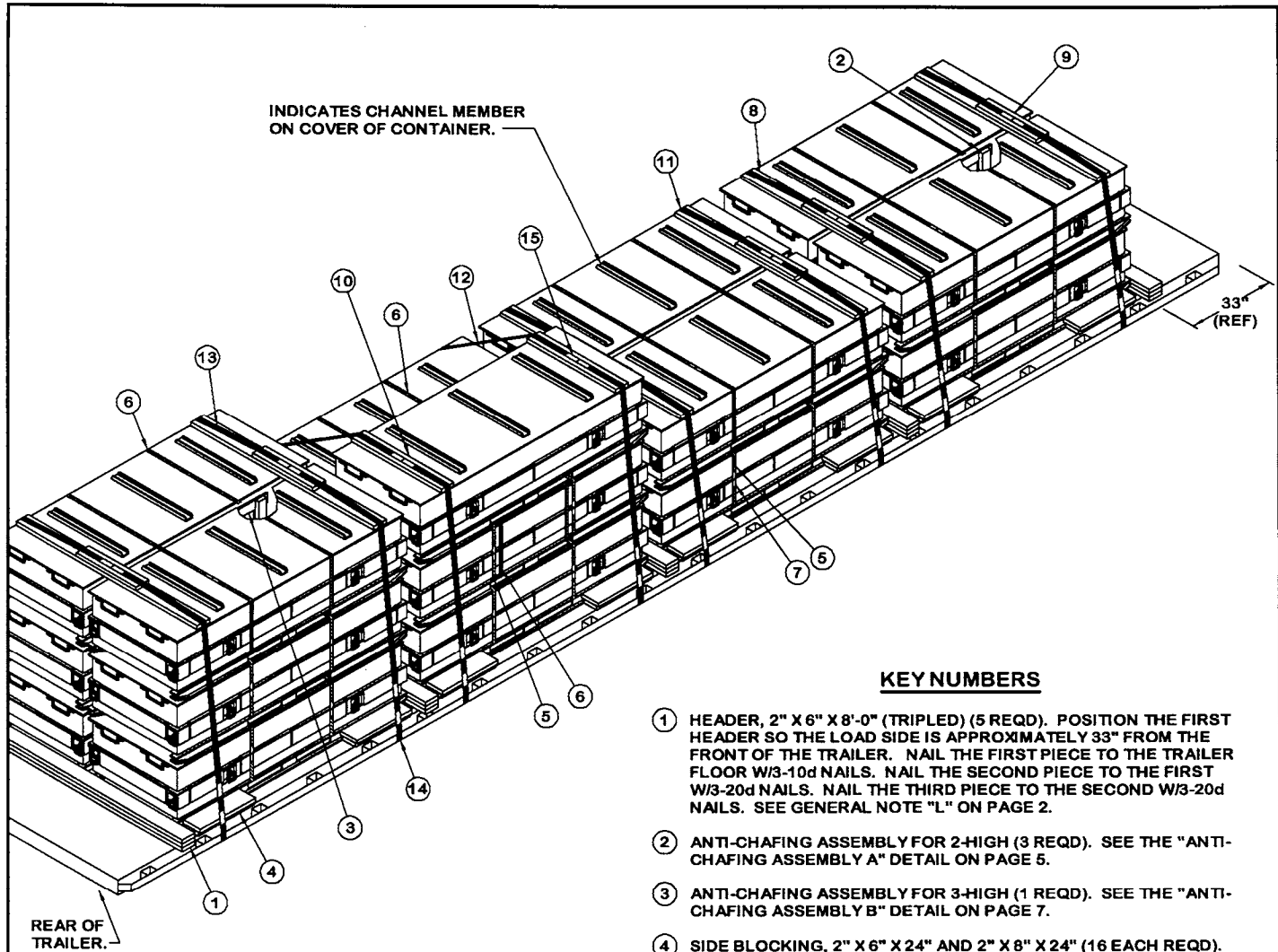
1. ADDING PROCEDURES FOR 45'-0" LONG TRAILERS.
2. REMOVING BACK-UP CLEATS.
3. UPDATING MATERIAL SPECIFICATIONS.

REVISION NO. 4, DATED JUNE 1997, CONSISTS OF:

1. ADDING PROCEDURES FOR THE USE OF WEB STRAPS.
2. INCLUDING PROVISIONS FOR THE USE OF FIRE HOSE.
3. UPDATING DRAWING FORMAT.



**CNU-411/E CONTAINER**  
 (STACKING HEIGHT - 24-13/32")



INDICATES CHANNEL MEMBER ON COVER OF CONTAINER.

33"  
(REF)

REAR OF TRAILER.

### ISOMETRIC VIEW

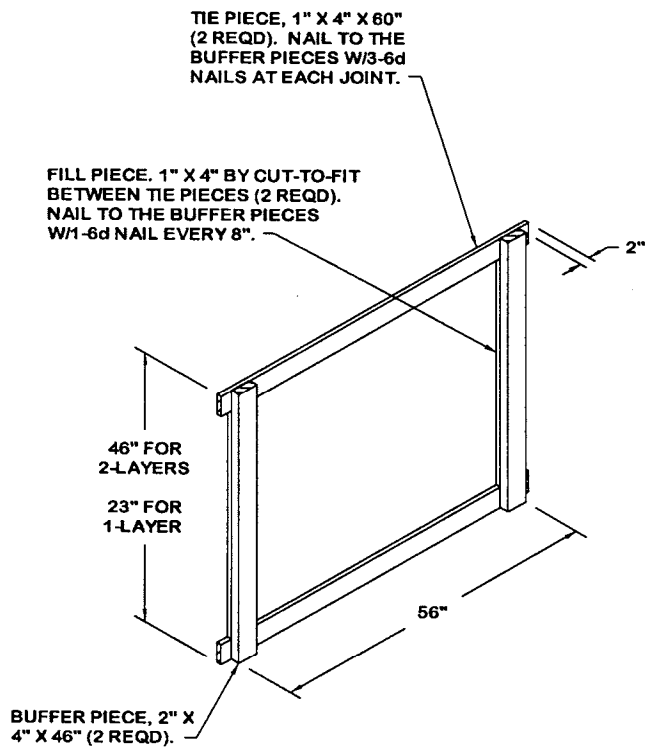
#### (KEY NUMBERS CONTINUED)

- ⑫ HOLD-DOWN STRAP, 2" X .050" OR .044" X 27'-0" LONG STEEL STRAPPING (2 REQD). INSTALL EACH STRAP FROM TWO 13'-6" LONG PIECES. STAPLE TO STRAPPING BOARD, PIECE MARKED ⑩, W/2 STAPLES.
- ⑬ HOLD-DOWN STRAP, 2" X .050" OR .044" X 28'-6" LONG STEEL STRAPPING (2 REQD). INSTALL EACH STRAP FROM TWO 14'-3" LONG PIECES. STAPLE TO STRAPPING BOARD, PIECE MARKED ⑧, W/2 STAPLES.
- ⑭ PAD, 2" X .050" OR .044" X 18" LONG STEEL STRAPPING (16 REQD). POSITION UNDER ANCHORING FACILITY AND SEAL TO HOLD-DOWN STRAP, PIECES MARKED ⑪, ⑫ AND/OR ⑬. ALT: STAKE POCKET PROTECTOR (32 REQD). USE TWO UNDER EACH ANCHORING FACILITY WITH A HOLD-DOWN STRAP. SEE THE "HOLD-DOWN STRAP ANCHORING DETAILS" ON PAGE 13.
- ⑮ SEAL FOR 2" STEEL STRAPPING (48 REQD, 6 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS, EXCEPT THOSE USED TO SECURE THE PADS, PIECE MARKED ⑭. SEE THE "HOLD-DOWN STRAP ANCHORING DETAILS" AND THE "END-OVER-END LAP JOINT DETAILS" ON PAGE 13.

### KEY NUMBERS

- ① HEADER, 2" X 6" X 8'-0" (TRIPLED) (5 REQD). POSITION THE FIRST HEADER SO THE LOAD SIDE IS APPROXIMATELY 33" FROM THE FRONT OF THE TRAILER. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/3-20d NAILS. NAIL THE THIRD PIECE TO THE SECOND W/3-20d NAILS. SEE GENERAL NOTE "L" ON PAGE 2.
- ② ANTI-CHAFING ASSEMBLY FOR 2-HIGH (3 REQD). SEE THE "ANTI-CHAFING ASSEMBLY A" DETAIL ON PAGE 5.
- ③ ANTI-CHAFING ASSEMBLY FOR 3-HIGH (1 REQD). SEE THE "ANTI-CHAFING ASSEMBLY B" DETAIL ON PAGE 7.
- ④ SIDE BLOCKING, 2" X 6" X 24" AND 2" X 8" X 24" (16 EACH REQD). POSITION THE 2" X 6" PIECE AGAINST THE BOTTOM FLANGE OF THE CONTAINER SKID AND NAIL TO THE TRAILER FLOOR W/6-10d NAILS. POSITION THE 2" X 8" PIECE ON TOP OF THE 2" X 6" PIECE AND AGAINST THE WEB OF THE CONTAINER SKID. NAIL TO THE 2" X 6" W/6-10d NAILS. SEE THE "SIDE BLOCKING DETAIL" ON PAGE 14.
- ⑤ STACK UNITIZING STRAP, 1-1/4" X .035" OR .031" X 11'-6" LONG STEEL STRAPPING (22 REQD, 2 PER 2-HIGH STACK AND 4 PER 3-HIGH STACK). INSTALL THRU FORK TINE OPENINGS OF A FIRST LAYER CONTAINER AND A SECOND LAYER CONTAINER, OR THRU FORK TINE OPENINGS OF A SECOND LAYER CONTAINER AND A THIRD LAYER CONTAINER. STRAPS SHOULD BE POSITIONED AS FAR APART AS THE FORK TINE OPENINGS PERMIT. SEE SPECIAL NOTE 2 ON PAGE 5.
- ⑥ BUNDLING STRAP, 1-1/4" X .035" OR .031" X 18'-6" LONG STEEL STRAPPING (8 REQD). INSTALL TO ENIRCLE, THRU FORK TINE OPENINGS, THE TWO LATERALLY ADJACENT CONTAINERS IN THE TOP 2-WIDE LAYER, AS SHOWN. STRAPS SHOULD BE POSITIONED AS FAR APART AS THE FORK TINE OPENINGS PERMIT.
- ⑦ SEAL FOR 1-1/4" STRAPPING (60 REQD, 2 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE GENERAL NOTE "M" ON PAGE 2 AND THE "END-OVER-END LAP JOINT DETAILS" ON PAGE 13.
- ⑧ STRAPPING BOARD, 2' X 6" X 6'-7" (6 REQD). DO NOT PLACE STRAPPING BOARD ON TOP OF A CHANNEL MEMBER ON THE CONTAINER COVER.
- ⑨ PURCHASE BOARD, 2" X 6" X 26" (6 REQD). CENTER ON THE STRAPPING BOARD, PIECE MARKED ⑧, AND NAIL W/4-10d NAILS.
- ⑩ STRAPPING BOARD, 2" X 6" X 39" (2 REQD).
- ⑪ HOLD-DOWN STRAP, 2" X .050" OR .044" X 24'-0" LONG STEEL STRAPPING (4 REQD). INSTALL EACH STRAP FROM TWO 12'-0" LONG PIECES. STAPLE TO STRAPPING BOARD, PIECE MARKED ⑧, W/2 STAPLES. SEE GENERAL NOTE "M" ON PAGE 2.

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**ANTI-CHAFING ASSEMBLY A**

**SPECIAL NOTES:**

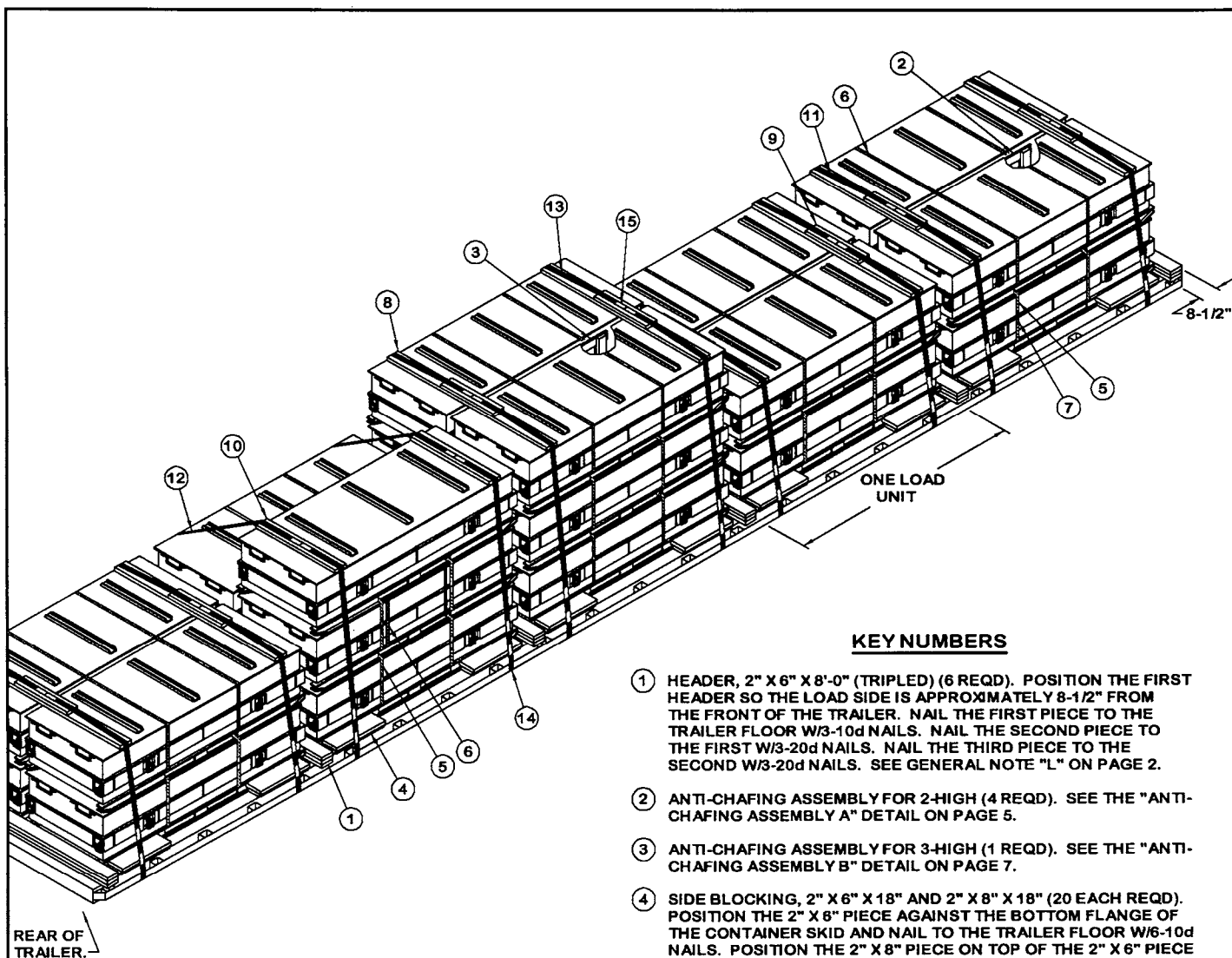
1. A 19-CONTAINER LOAD OF CBU-87/B MUNITIONS IS SHOWN ON A 40'-0" LONG BY 8'-0" WIDE FLATBED TRAILER. TRAILERS OF OTHER LENGTHS MAY BE USED. IF A 45'-0" OR LONGER TRAILER IS TO BE LOADED, REFER TO THE PROCEDURES SHOWN ON PAGE 6 FOR GUIDANCE. NOTE THAT THE 33" REFERENCE DIMENSION AT THE FRONT OF THE LOAD IS ONLY APPLICABLE FOR THE DEPICTED 40'-0" LONG TRAILER.
2. IF DESIRED, AND IF THE CAPACITY OF THE FORKLIFT TRUCK PERMITS, TWO OR THREE CONTAINERS MAY BE STACKED AND UNITIZED WITH STEEL STRAPS, AS SPECIFIED BY KEY NUMBER ⑤, PRIOR TO PLACEMENT ON THE TRAILER.
3. THE DEPICTED 19-UNIT LOAD SHOULD BE TRANSPORTABLE ON AN AVERAGE WEIGHT TRAILER HAVING THE TANDEM AXLES LOCATED IN THE "WESTERN" POSITION (AT THE EXTREME REAR OF THE TRAILER) AND BEING PULLED BY AN AVERAGE WEIGHT TRACTOR WITHOUT EXCEEDING THE WEIGHT LIMIT ON ANY AXLES. THE WEIGHT OF THE LADING ON EACH SET OF TANDEM AXLES SHOULD BE VERIFIED BY ACTUALLY WEIGHING THE LOADED VEHICLE. IF NECESSARY, THE PLACEMENT OF THE UNITS IN THE TOP LAYER CAN BE ADJUSTED, OR ONE OR MORE UNITS CAN BE OMITTED FROM THE DEPICTED LOAD, TO PROVIDE FOR PROPER AXLE LOADING. IF THE LOAD IS TO BE REDUCED BY ONE CONTAINER, OMIT THE ODD UNIT FROM THE TOP LAYER. IF THE LOAD IS TO BE REDUCED BY TWO CONTAINERS, LATERALLY ADJACENT CONTAINERS SHOULD BE OMITTED FROM THE TOP LAYER.
4. THE DEPICTED PROCEDURES MAY BE USED FOR SHIPMENT OF A 19-UNIT LOAD OF CBU-89/B MUNITIONS. ADDITIONAL UNITS MAY BE ADDED TO THE DEPICTED LOAD IF DESIRED. DO NOT LOAD MORE THAN THREE CONTAINERS HIGH.
5. IF CHAINS AND LOAD BINDERS ARE TO BE USED IN LIEU OF THE 2" STRAPPING FOR LOAD SECUREMENT, REFER TO THE PROCEDURES ON PAGES 8 AND 9 FOR GUIDANCE.
6. IF WEB STRAPS ARE TO BE USED IN LIEU OF THE 2" STEEL STRAPPING FOR LOAD SECUREMENT, REFER TO THE PROCEDURES ON PAGES 10 AND 11 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	75	25
2" X 4"	35	24
2" X 6"	211	211
2" X 8"	32	43
NAILS	NO. REQD	POUNDS
6d (2")	100	3/4
10d (3")	231	3-3/4
20d (4")	30	1-1/4
1-1/4" STEEL STRAPPING ---- 401' REQD ----- 57-1/2 LBS		
2" STEEL STRAPPING ----- 231' REQD ----- 77 LBS		
SEAL FOR 1-1/4" STRAPPING ---- 60 REQD ----- 2-3/4 LBS		
SEAL FOR 2" STRAPPING ----- 48 REQD ----- 9-3/4 LBS		
STAPLE FOR 2" STRAPPING ---- 16 REQD ----- NIL		

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER (W/CBU-87/B)	19	45,030 LBS
DUNNAGE		759 LBS

TOTAL WEIGHT ----- 45,789 LBS (APPROX)



**ISOMETRIC VIEW**

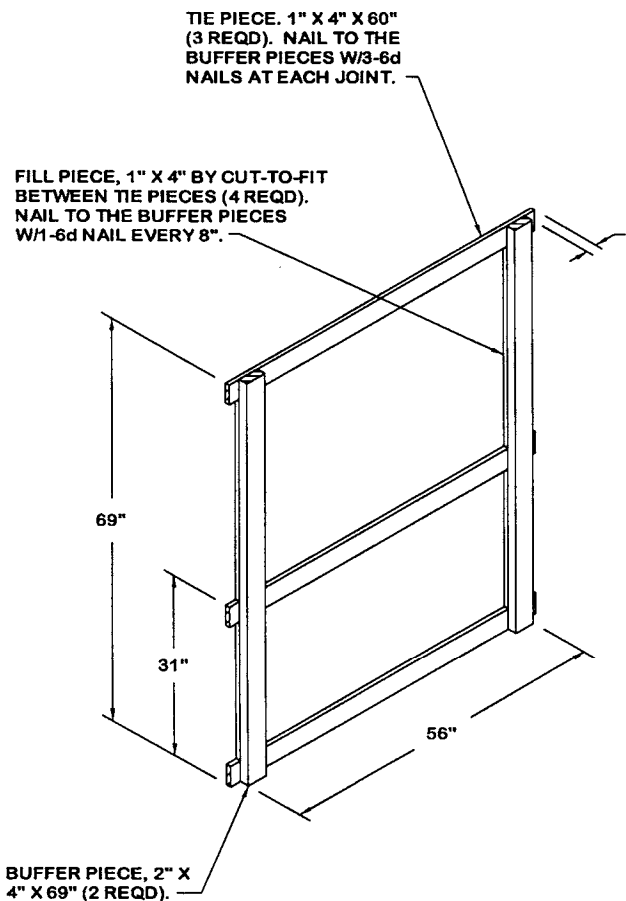
**(KEY NUMBERS CONTINUED)**

- ⑫ HOLD-DOWN STRAP, 2" X .050" OR .044" X 27'-0" LONG STEEL STRAPPING (2 REQD). INSTALL EACH STRAP FROM TWO 13'-6" LONG PIECES. STAPLE TO STRAPPING BOARD, PIECE MARKED ⑩, W/2 STAPLES.
- ⑬ HOLD-DOWN STRAP, 2" X .050" OR .044" X 28'-6" LONG STEEL STRAPPING (2 REQD). INSTALL EACH STRAP FROM TWO 14'-3" LONG PIECES. STAPLE TO STRAPPING BOARD, PIECE MARKED ⑧, W/2 STAPLES.
- ⑭ PAD, 2" X .050" OR .044" X 18" LONG STEEL STRAPPING (20 REQD). POSITION UNDER ANCHORING FACILITY AND SEAL TO HOLD-DOWN STRAP, PIECES MARKED ⑪, ⑫ AND/OR ⑬. ALT: STAKE POCKET PROTECTOR (32 REQD). USE TWO UNDER EACH ANCHORING FACILITY WITH A HOLD-DOWN STRAP. SEE THE "HOLD-DOWN STRAP ANCHORING DETAILS" ON PAGE 13.
- ⑮ SEAL FOR 2" STEEL STRAPPING (60 REQD, 6 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS, EXCEPT THOSE USED TO SECURE THE PADS, PIECE MARKED ⑭. SEE THE "HOLD-DOWN STRAP ANCHORING DETAILS" AND THE "END-OVER-END LAP JOINT DETAILS" ON PAGE 13.

**KEY NUMBERS**

- ① HEADER, 2" X 6" X 8'-0" (TRIPLED) (6 REQD). POSITION THE FIRST HEADER SO THE LOAD SIDE IS APPROXIMATELY 8-1/2" FROM THE FRONT OF THE TRAILER. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/3-20d NAILS. NAIL THE THIRD PIECE TO THE SECOND W/3-20d NAILS. SEE GENERAL NOTE "L" ON PAGE 2.
- ② ANTI-CHAFING ASSEMBLY FOR 2-HIGH (4 REQD). SEE THE "ANTI-CHAFING ASSEMBLY A" DETAIL ON PAGE 5.
- ③ ANTI-CHAFING ASSEMBLY FOR 3-HIGH (1 REQD). SEE THE "ANTI-CHAFING ASSEMBLY B" DETAIL ON PAGE 7.
- ④ SIDE BLOCKING, 2" X 6" X 18" AND 2" X 8" X 18" (20 EACH REQD). POSITION THE 2" X 6" PIECE AGAINST THE BOTTOM FLANGE OF THE CONTAINER SKID AND NAIL TO THE TRAILER FLOOR W/8-10d NAILS. POSITION THE 2" X 8" PIECE ON TOP OF THE 2" X 6" PIECE AND AGAINST THE WEB OF THE CONTAINER SKID. NAIL TO THE 2" X 6" W/8-10d NAILS. SEE THE "SIDE BLOCKING DETAIL" ON PAGE 14.
- ⑤ STACK UNITIZING STRAP, 1-1/4" X .035" OR .031" X 11'-6" LONG STEEL STRAPPING (26 REQD, 2 PER 2-HIGH STACK, AND 4 PER 3-HIGH STACK). INSTALL THRU FORK TINE OPENINGS OF A FIRST LAYER AND A SECOND LAYER CONTAINER, OR THRU FORK TINE OPENINGS OF A SECOND LAYER CONTAINER AND A THIRD LAYER CONTAINER. STRAPS SHOULD BE POSITIONED AS FAR APART AS THE FORK TINE OPENINGS PERMIT. SEE SPECIAL NOTE 2 ON PAGE 7.
- ⑥ BUNDLING STRAP, 1-1/4" X .035" OR .031" X 18'-6" LONG STEEL STRAPPING (10 REQD). INSTALL TO ENCIRCLE, THRU FORK TINE OPENINGS, THE TWO LATERALLY ADJACENT CONTAINERS IN THE TOP 2-WIDE LAYER, AS SHOWN. STRAPS SHOULD BE POSITIONED AS FAR APART AS THE FORK TINE OPENINGS PERMIT.
- ⑦ SEAL FOR 1-1/4" STRAPPING (72 REQD, 2 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE GENERAL NOTE "M" ON PAGE 2 AND THE "END-OVER-END LAP JOINT DETAILS" ON PAGE 13.
- ⑧ STRAPPING BOARD, 2" X 6" X 6'-7" (8 REQD). DO NOT PLACE STRAPPING BOARD ON TOP OF A CHANNEL MEMBER ON THE CONTAINER COVER.
- ⑨ PURCHASE BOARD, 2" X 6" X 26" (8 REQD). CENTER ON THE STRAPPING BOARD, PIECE MARKED ⑧, AND NAIL W/4-10d NAILS.
- ⑩ STRAPPING BOARD, 2" X 6" X 39" (2 REQD).
- ⑪ HOLD-DOWN STRAP, 2" X .050" OR .044" X 24'-0" LONG STEEL STRAPPING (6 REQD). INSTALL EACH STRAP FROM TWO 12'-0" LONG PIECES. STAPLE TO STRAPPING BOARD, PIECE MARKED ⑧, W/2 STAPLES. SEE GENERAL NOTE "M" ON PAGE 2.

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**ANTI-CHAFING ASSEMBLY B**

FOR USE IN A FULL 3-LAYER LOAD UNIT.

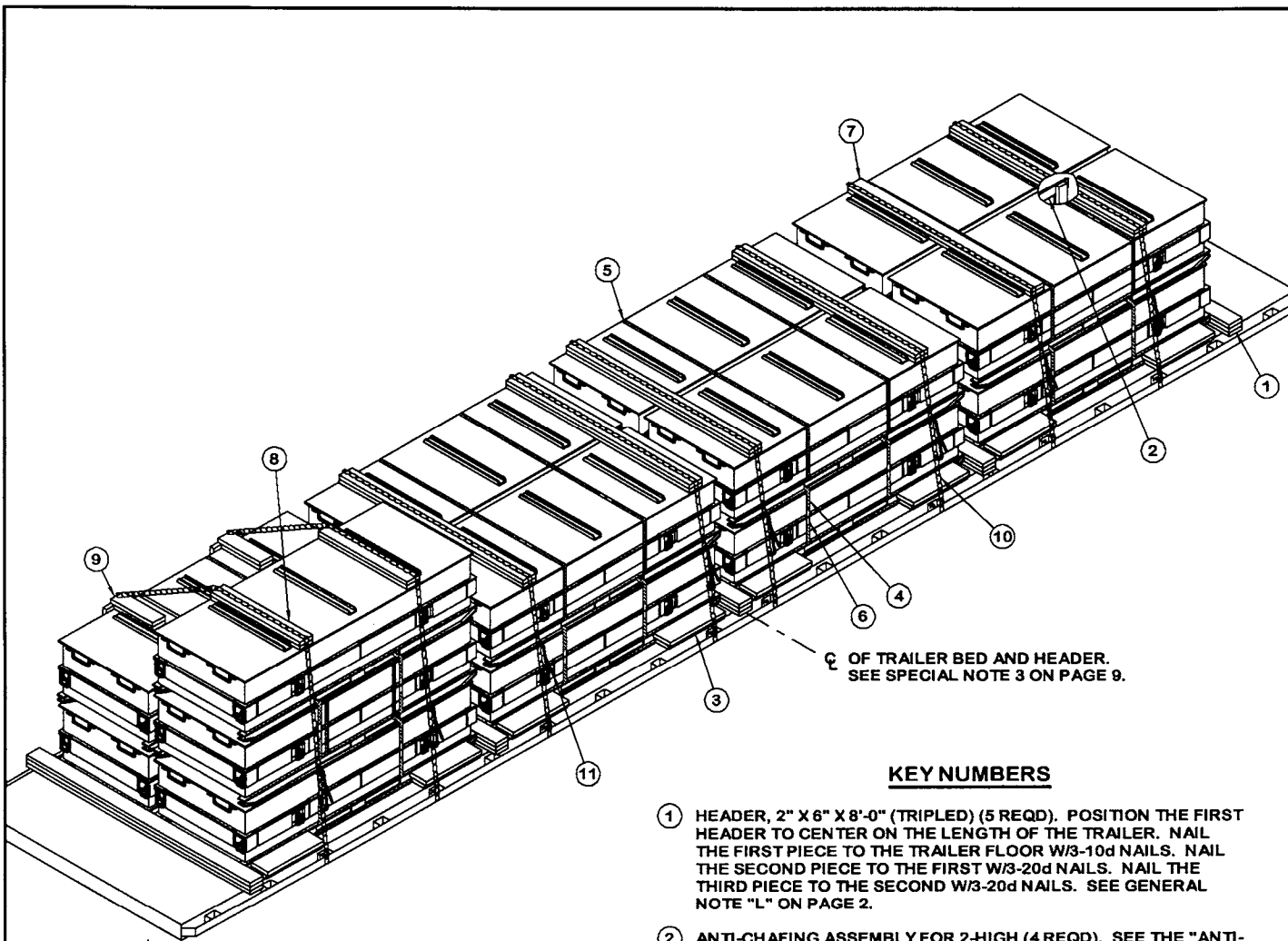
**SPECIAL NOTES:**

1. A 23-CONTAINER LOAD OF CBU-89/B MUNITIONS IS SHOWN ON A 45'-0" LONG BY 8'-0" WIDE FLATBED TRAILER. TRAILERS OF OTHER LENGTHS MAY BE USED, HOWEVER, A SHORTER TRAILER CANNOT BE USED FOR THE SHIPMENT OF FIVE LOAD UNITS.
2. IF DESIRED, AND IF THE CAPACITY OF THE FORKLIFT TRUCK PERMITS, TWO OR THREE CONTAINERS MAY BE STACKED AND UNITIZED WITH STEEL STRAPS, AS SPECIFIED BY KEY NUMBER ⑤, PRIOR TO PLACEMENT ON THE TRAILER.
3. THE DEPICTED 23-UNIT LOAD SHOULD BE TRANSPORTABLE ON AN AVERAGE WEIGHT TRAILER HAVING THE TANDEM AXLES LOCATED IN THE "WESTERN" POSITION (AT APPROXIMATELY 73" FROM THE EXTREME REAR OF THE TRAILER) AND BEING PULLED BY AN AVERAGE WEIGHT TRACTOR WITHOUT EXCEEDING THE WEIGHT LIMIT ON ANY AXLES. THE WEIGHT OF THE LADING ON EACH SET OF TANDEM AXLES SHOULD BE VERIFIED BY ACTUALLY WEIGHING THE LOADED VEHICLE. IF NECESSARY, THE PLACEMENT OF THE UNITS IN THE TOP LAYER CAN BE ADJUSTED, OR ONE OR MORE UNITS CAN BE OMITTED FROM THE DEPICTED LOAD, TO PROVIDE FOR PROPER AXLE LOADING. IF THE LOAD IS TO BE REDUCED BY ONE CONTAINER, OMIT THE ODD UNIT FROM THE TOP LAYER. IF THE LOAD IS TO BE REDUCED BY TWO CONTAINERS, LATERALLY ADJACENT CONTAINERS SHOULD BE OMITTED FROM THE TOP LAYER.
4. THE DEPICTED PROCEDURES FOR A 45 FOOT LONG TRAILER MAY BE USED FOR SHIPMENT OF A 19-UNIT LOAD OF CBU-87/B MUNITIONS. IT IS RECOMMENDED THAT ONE CONTAINER BE OMITTED FROM A FULL 2-LAYER LOAD, WITH THE UNIT BEING OMITTED FROM EITHER THE SECOND OR THIRD LOAD UNIT FROM THE FRONT OF THE TRAILER. DEPENDING UPON THE WEIGHT OF THE EQUIPMENT FURNISHED BY THE CARRIER, IT MAY BE POSSIBLE TO SHIP A FULL 2-LAYER LOAD OF TWENTY CONTAINERS WITH CBU-87/B MUNITIONS.
5. IF CHAINS AND LOAD BINDERS ARE TO BE USED IN LIEU OF THE 2" STEEL STRAPPING FOR LOAD SECUREMENT, REFER TO THE PROCEDURES ON PAGES 8 AND 9 FOR GUIDANCE.
6. IF WEB STRAPS ARE TO BE USED IN LIEU TO THE 2" STEEL STRAPPING FOR LOAD SECUREMENT, REFER TO THE PROCEDURES ON PAGES 10 AND 11 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	91	31
2" X 4"	43	29
2" X 6"	251	251
2" X 8"	30	40
NAILS	NO. REQD	POUNDS
6d (2")	122	3/4
10d (3")	290	4-1/2
20d (4")	36	1-1/2
1-1/4" STEEL STRAPPING	484' REQD	69-1/4 LBS
2" STEEL STRAPPING	285' REQD	95 LBS
SEAL FOR 1-1/4" STRAPPING	72 REQD	3-1/4 LBS
SEAL FOR 2" STRAPPING	60 REQD	12 LBS
STAPLE FOR 2" STRAPPING	20 REQD	NIL

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER (W/CBU-89/B)	23	44,390 LBS
DUNNAGE		888 LBS
<b>TOTAL WEIGHT</b>		<b>45,278 LBS (APPROX)</b>



REAR OF TRAILER.

**ISOMETRIC VIEW**

CL OF TRAILER BED AND HEADER.  
SEE SPECIAL NOTE 3 ON PAGE 9.

**KEY NUMBERS**

- ① HEADER, 2" X 6" X 8'-0" (TRIPLED) (5 REQD). POSITION THE FIRST HEADER TO CENTER ON THE LENGTH OF THE TRAILER. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/3-20d NAILS. NAIL THE THIRD PIECE TO THE SECOND W/3-20d NAILS. SEE GENERAL NOTE "L" ON PAGE 2.
- ② ANTI-CHAFING ASSEMBLY FOR 2-HIGH (4 REQD). SEE THE "ANTI-CHAFING ASSEMBLY A" DETAIL ON PAGE 5.
- ③ SIDE BLOCKING, 2" X 6" X 24" AND 2" X 8" X 24" (16 EACH REQD). POSITION THE 2" X 6" PIECE AGAINST THE BOTTOM FLANGE OF THE CONTAINER SKID AND NAIL TO THE TRAILER FLOOR W/6-10d NAILS. POSITION THE 2" X 8" PIECE ON TOP OF THE 2" X 6" PIECE AND AGAINST THE WEB OF THE CONTAINER SKID. NAIL TO THE 2" X 6" W/6-10d NAILS. SEE THE "SIDE BLOCKING DETAIL" ON PAGE 14.
- ④ STACK UNITIZING STRAP, 1-1/4" X .035" OR .031" X 11'-6" LONG STEEL STRAPPING (18 REQD, 2 PER 2-HIGH STACK AND 4 PER 3-HIGH STACK). INSTALL THRU FORK TINE OPENINGS OF A FIRST LAYER CONTAINER AND A SECOND LAYER CONTAINER, OR THRU FORK TINE OPENINGS OF A SECOND LAYER CONTAINER AND A THIRD LAYER CONTAINER. STRAPS SHOULD BE POSITIONED AS FAR APART AS THE FORK TINE OPENINGS PERMIT. SEE SPECIAL NOTE 5 ON PAGE 9.
- ⑤ BUNDLING STRAP, 1-1/4" X .035" OR .031" X 18'-6" LONG STEEL STRAPPING (8 REQD). INSTALL TO ENCIRCLE, THRU FORK TINE OPENINGS, TWO LATERALLY ADJACENT CONTAINERS IN THE TOP 2-WIDE LAYER, AS SHOWN. STRAPS SHOULD BE POSITIONED AS FAR APART AS THE FORK TINE OPENINGS PERMIT.
- ⑥ SEAL FOR 1-1/4" STRAPPING (52 REQD, 2 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE GENERAL NOTE "N" ON PAGE 2, AND THE "END-OVER-END LAP JOINT DETAILS" ON PAGE 13.
- ⑦ CHAIN BOARD, 2" X 6" X 6'-7" (DOUBLED) (6 REQD). LAMINATE W/1-10d NAIL EVERY 8". DO NOT PLACE ON TOP OF A CHANNEL MEMBER ON THE CONTAINER COVER.
- ⑧ CHAIN BOARD, 2" X 6" X 38" (DOUBLED) (2 REQD). LAMINATE W/5-10d NAILS.
- ⑨ CHAIN BOARD ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 14.

**(KEY NUMBERS CONTINUED)**

- ⑩ CHAIN, BINDING, 5/16" GRADE 70 BY A LENGTH TO SUIT (8 REQD). POSITION AS SHOWN ABOVE, FASTENING THE CHAIN GRABHOOKS TO THE TRAILER STAKE POCKETS. SEE THE "SPECIAL PROVISIONS FOR CHAIN TIEDOWN" ON PAGE 9.
- ⑪ LOAD BINDER, 5/16", OVERCENTER TYPE (8 REQD, 1 PER CHAIN). WIRE TIE HANDLE TO PREVENT OPENING DURING TRANSPORT. FASTEN THE TENSIONED CHAIN, PIECE MARKED ⑩, TO THE CHAIN BOARDS, PIECES MARKED ⑦ AND ⑧, W/1-20d NAIL AT EACH END, BENDING OVER TO FORM A LOOP AROUND THE CHAIN LINK. FASTEN THE TENSIONED CHAIN TO A CHAIN BOARD ASSEMBLY, PIECE MARKED ⑨, W/1-16d NAIL BENT OVER TO FORM A LOOP AROUND THE CHAIN LINK.

(CONTINUED AT LEFT)



**SPECIAL PROVISIONS FOR CHAIN TIEDOWN**

LADING MAY BE SECURED TO THE FLATBED TRAILER BY CARRIER-OWNED CHAINS AND LOAD BINDERS IN LIEU OF SPECIFIED STRAPPING, PROVIDED THE FOLLOWING CONDITIONS ARE MET AND THE PROCEDURES CONTAINED ON PAGES 8 AND 9 ARE FOLLOWED.

1. ONLY CHAINS AND LOAD BINDERS OF GOOD QUALITY WILL BE USED. ALL CHAINS AND LOAD BINDERS SHALL CONFORM TO THE NATIONAL ASSOCIATION OF CHAIN MANUFACTURER'S WELDED CHAIN SPECIFICATION ADOPTED NOVEMBER 1975.
2. ALL CHAINS SHALL BE MARKED AS PRESCRIBED BY THE NATIONAL ASSOCIATION OF CHAIN MANUFACTURER'S WELDED CHAIN SPECIFICATION ADOPTED NOVEMBER 1975. AT LEAST ONE LINK IN EVERY 36 LINKS SHALL CARRY THE MANUFACTURER'S PERMANENT AND DISTINCTIVE MARK IDENTIFYING THE GRADE OF CHAIN. CHAINS NOT MARKED IN THIS MANNER SHALL NOT BE USED. IN ADDITION TO THE GRADE MARKING, THE CHAIN MAY ALSO CARRY LETTER MARKINGS OR SYMBOLS IDENTIFYING THE CHAIN MANUFACTURER. THE PRESENCE OF THE MANUFACTURER'S IDENTIFICATION MARKING IS NOT MANDATORY.
3. BEFORE AND DURING INSTALLATION, THE CHAINS AND LOAD BINDERS SHALL BE INSPECTED FOR BENT HOOKS, STRETCH, GOUGES, BENT LINKS, WEAR, OR ANY OTHER NOTICEABLE DEFECTS. ANY DEFICIENCY SHALL BE CAUSE FOR REJECTION OF A CHAIN OR LOAD BINDER. CHAINS MUST NOT BE TWISTED DURING INSTALLATION. CAUTION: EXTREME CARE MUST BE EXERCISED WHEN TENSIONING CHAINS TO PREVENT DAMAGE OR PERMANENT DEFORMATION TO THE LADING.
4. CHAIN SIZES AND GRADES APPROVED FOR USE WITH FLATBED TRAILER LOADS ARE AS FOLLOWS:
  - A. 3/8", GRADE 43 HIGH TEST CHAIN
  - B. 5/16", GRADE 70 BINDING CHAIN
  - C. 3/8", GRADE 70 BINDING CHAIN
  - D. 5/16", GRADE 80 ALLOY STEEL CHAIN
  - E. 3/8", GRADE 80 ALLOY STEEL CHAIN
5. THE GRABHOOKS ON THE ENDS OF THE CHAIN MAY BE OF THE FOLLOWING TYPES WITH GRADE MARKINGS AS INDICATED.
  - A. CLEVIS GRABHOOKS, 3/8" SIZE, DO NOT REQUIRE GRADE MARKING. ALLOY GRABHOOKS, 5/16" SIZE, SHALL CARRY THE MANUFACTURER'S GRADE MARK OF 7, 70, OR 700. THE HOOKS SHALL BE USED ON THE APPROPRIATE SIZE CHAIN.
  - B. CLOSED EYE GRABHOOKS, 3/8" AND 5/16" SIZE, MAY BE USED ON THE APPROPRIATE SIZE CHAIN IF THEY ARE A PART OF A CHAIN ASSEMBLY WHICH WAS PROVIDED BY A CHAIN MANUFACTURER, AND THE CHAIN ASSEMBLY CARRIES THE CORRECT GRADE IDENTIFICATION MARKING AS PREVIOUSLY STATED. CLOSED EYE GRABHOOKS THAT FORM A PART OF THE CHAIN ASSEMBLY ARE EXEMPT FROM GRADE MARKINGS.
6. CONNECTING LINKS USED FOR CHAIN REPAIR MUST BE CORRECTLY MARKED AND BE EQUAL TO OR GREATER IN STRENGTH THAN THE CHAIN THEY ARE REPAIRING. CHAINS WITH UNMARKED CONNECTING LINKS SHALL NOT BE USED.
7. CHAIN AND FITTING OF A HIGHER GRADE MAY BE SUBSTITUTED FOR THE GRADES SPECIFIED IN NOTE 4 ABOVE.
8. LOAD BINDERS SHALL BE 5/16" TO 3/8" SIZE AND HAVE A MINIMUM BREAKING STRENGTH OF 16,200 POUNDS (WORKING LOAD LIMIT OF 5,400 POUNDS). OVERCENTER TYPE LOAD BINDERS SHALL BE SAFETY WIRED TO PREVENT ACCIDENTAL OPENING DURING TRANSPORT. LOAD BINDER SIZE SHALL BE COMPATIBLE WITH THE SIZE OF THE CHAIN BEING USED.

**LOAD AS SHOWN**

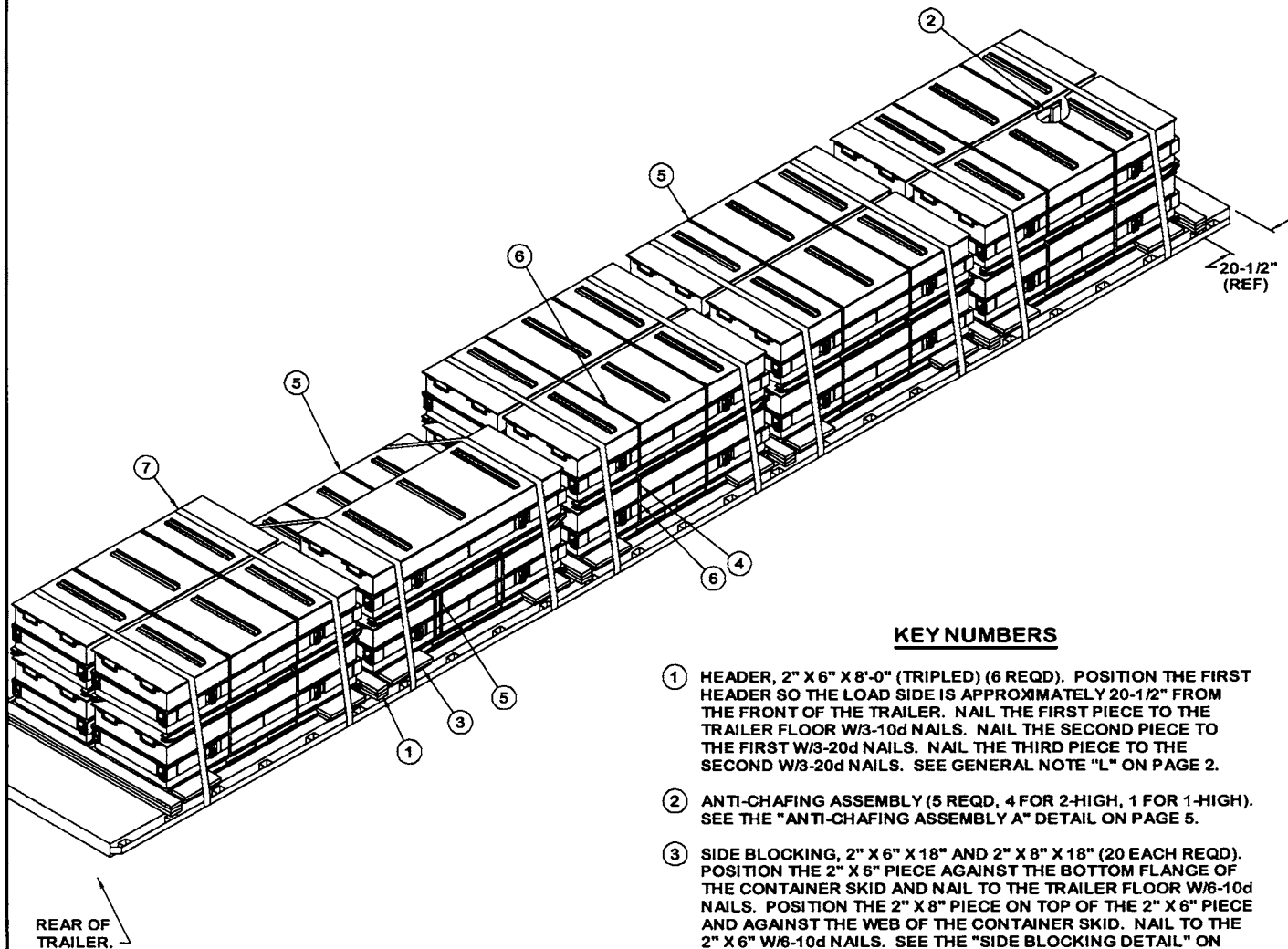
ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER (W/CBU-87/B)	17	40,290 LBS
DUNNAGE		972 LBS
<b>TOTAL WEIGHT</b>		<b>41,262 LBS (APPROX)</b>

**SPECIAL NOTES:**

1. A 17-CONTAINER LOAD IS SHOWN ON A 40'-0" LONG BY 8'-0" WIDE FLATBED TRAILER. TRAILERS OF OTHER LENGTHS MAY BE USED.
2. THE PROCEDURES DEPICTED ON PAGE 8 AND ON THIS PAGE CAN BE USED FOR ANY OF THE LOADS DEPICTED HEREIN. NOTE: THE CHAINS MUST BE ATTACHED TO THE TRAILER STAKE POCKETS; DO NOT ATTACH TO A RUB RAIL. THE CHAIN BOARDS MUST BE POSITIONED SO AS TO PROVIDE FOR VERTICAL ALIGNMENT OF THE CHAINS AS VIEWED FROM THE SIDE OF THE TRAILER. THE CHAIN BOARDS CAN BE SHIFTED LEFT OR RIGHT BUT MUST NOT BE POSITIONED CLOSER THAN 6" FROM THE CONTAINER ENDS TO PROVIDE FOR THE VERTICAL ALIGNMENT. IT MAY BE NECESSARY FOR SOME LOADS TO SHIFT THE CONTAINERS AND DUNNAGE IN ORDER TO COMPLY WITH THIS REQUIREMENT. SEE GENERAL NOTE "Q" ON PAGE 2.
3. WHEN LOADING A FULL OR NEARLY FULL LOAD ON A 40 FOOT LONG TRAILER, POSITION A HEADER, PIECE MARKED (1), ON THE CENTER OF THE LENGTH OF THE TRAILER AND LOAD IN BOTH DIRECTIONS FROM THERE. THIS WILL LOCATE CONTAINERS SO AS TO COMPLY WITH NOTE 2 ABOVE AS PERTAINS TO VERTICAL ALIGNMENT OF CHAINS, CHAIN BOARDS, AND TRAILER STAKE POCKETS.
4. A 17-UNIT LOAD IS SHOWN AS A TYPICAL LOAD USING THE CHAIN TIEDOWN METHODS OF LOAD SECUREMENT. THE PROCEDURES ARE APPLICABLE FOR EITHER THE CBU-87/B OR THE CBU-89/B MUNITIONS PACKED IN CNU-411/E CONTAINERS. THE NUMBER OF UNITS CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED.
5. IF DESIRED, AND IF THE CAPACITY OF THE FORKLIFT TRUCK PERMITS, TWO OR THREE CONTAINERS MAY BE STACKED AND UNITIZED WITH STEEL STRAPS, AS SPECIFIED BY KEY NUMBER (4), PRIOR TO PLACEMENT ON THE TRAILER.
6. IF THE DEPICTED LOAD IS TO BE DECREASED, THE THIRD-LAYER CONTAINER SHOULD BE OMITTED FIRST, WITH ADDITIONAL CONTAINERS BEING OMITTED FROM THE CENTER PORTION OF THE LOAD, AS NECESSARY. IF THE DEPICTED LOAD IS TO BE INCREASED, CONTAINERS CAN BE ADDED TO THE REAR PORTION OF THE LOAD SIMILAR TO THE PLACEMENT SHOWN ON PAGE 4. IF A 45 FOOT TRAILER IS BEING LOADED, THE PROCEDURES ON PAGE 6 MAY BE USED AS GUIDANCE IN CONTAINER PLACEMENT.

**BILL OF MATERIAL**

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	66	22
2" X 4"	33	22
2" X 6"	241	241
2" X 8"	32	43
NAILS	NO. REQD	POUNDS
6d (2")	88	3/4
10d (3")	273	4-1/4
20d (4")	47	1-3/4
1-1/4" STEEL STRAPPING ---- 355' REQD		50-3/4 LBS
SEAL FOR 1-1/4" STRAPPING --- 52 REQD		2-1/2 LBS
CHAIN, BINDING, 5/16" ----- 172' REQD		207 LBS
BINDER, LOAD ----- 8 REQD		48 LBS



REAR OF TRAILER.

**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① HEADER, 2" X 6" X 8'-0" (TRIPLED) (6 REQD). POSITION THE FIRST HEADER SO THE LOAD SIDE IS APPROXIMATELY 20-1/2" FROM THE FRONT OF THE TRAILER. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/3-20d NAILS. NAIL THE THIRD PIECE TO THE SECOND W/3-20d NAILS. SEE GENERAL NOTE "L" ON PAGE 2.
- ② ANTI-CHAFING ASSEMBLY (5 REQD, 4 FOR 2-HIGH, 1 FOR 1-HIGH). SEE THE "ANTI-CHAFING ASSEMBLY A" DETAIL ON PAGE 5.
- ③ SIDE BLOCKING, 2" X 6" X 18" AND 2" X 8" X 18" (20 EACH REQD). POSITION THE 2" X 6" PIECE AGAINST THE BOTTOM FLANGE OF THE CONTAINER SKID AND NAIL TO THE TRAILER FLOOR W/6-10d NAILS. POSITION THE 2" X 8" PIECE ON TOP OF THE 2" X 6" PIECE AND AGAINST THE WEB OF THE CONTAINER SKID. NAIL TO THE 2" X 6" W/6-10d NAILS. SEE THE "SIDE BLOCKING DETAIL" ON PAGE 14.
- ④ STACK UNITIZING STRAP, 1-1/4" X .035" OR .031" X 11'-6" LONG STEEL STRAPPING (18 REQD, 2 PER 2-HIGH STACK). INSTALL THRU FORK TINE OPENINGS OF A FIRST LAYER AND A SECOND LAYER CONTAINER. STRAPS SHOULD BE POSITIONED AS FAR APART AS THE FORK TINE OPENINGS PERMIT. SEE SPECIAL NOTE 2 ON PAGE 11.
- ⑤ BUNDLING STRAP, 1-1/4" X .035" OR .031" X 18'-6" LONG STEEL STRAPPING (10 REQD). INSTALL TO ENIRCLE, THRU FORK TINE OPENINGS, THE TWO LATERALLY ADJACENT CONTAINERS IN THE TOP 2-WIDE LAYER, AS SHOWN. STRAPS SHOULD BE POSITIONED AS FAR APART AS THE FORK TINE OPENINGS PERMIT.
- ⑥ SEAL FOR 1-1/4" STRAPPING (56 REQD, 2 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE GENERAL NOTE "M" ON PAGE 2 AND THE "END-OVER-END LAP JOINT DETAILS" ON PAGE 13.
- ⑦ WEB STRAP ASSEMBLY (8 REQD, 2 PER LOAD UNIT). POSITION TO EXTEND FROM A WINCH ON ONE SIDE OF THE TRAILER, OVER THE CONTAINERS, TO AN ATTACHMENT POINT ON THE OPPOSITE SIDE. SEE THE "SPECIAL PROVISIONS FOR WEB STRAP TIEDOWN" ON PAGE 9.

**SPECIAL PROVISIONS FOR WEB STRAP TIEDOWN**

LADING MAY BE SECURED TO A FLATBED TRAILER BY WEB STRAP ASSEMBLIES IN LIEU OF STEEL STRAPPING OR CHAINS AND LOAD BINDERS, PROVIDED THE FOLLOWING CONDITIONS ARE MET.

1. ONLY WEB STRAPS OF GOOD QUALITY WILL BE USED. ALL WEB STRAPS AND ASSOCIATED HARDWARE SHALL CONFORM TO THE WEB SLING & TIEDOWN ASSOCIATION RECOMMENDED STANDARD SPECIFICATION FOR SYNTHETIC WEB TIEDOWNS, FIRST PUBLISHED IN 1991.
2. ALL WEB STRAP TIEDOWN ASSEMBLIES SHALL BE PERMANENTLY LABELED WITHIN 18" OF ONE END TO SHOW:
  - A. NAME OR TRADEMARK OF MANUFACTURER
  - B. WORKING LOAD LIMIT (WLL)
  - C. DATE OF MANUFACTURE (MONTH AND YEAR)
3. WEB STRAP ASSEMBLY MINIMUM BREAKING STRENGTH WILL BE AT LEAST THREE TIMES THE WLL MARKED ON THE STRAP.
4. THE TOTAL MINIMUM BREAKING STRENGTH (MBS) OF THE STRAPS USED TO RESTRAIN AMMUNITION ITEMS WILL BE AT LEAST 1-1/2 TIMES THE TOTAL WEIGHT OF THE ITEMS, WITH A MINIMUM OF TWO STRAPS POSITIONED OVER EACH LOAD UNIT ON A TRAILER. WRITTEN PROOF OF THE MBS OF THE STRAPS SHALL BE PROVIDED BY THE CARRIER TO THE SHIPPING ACTIVITY IF REQUESTED.
5. CARRIERS MUST COMPLY WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS APPLICABLE TO CARGO RESTRAINT USING WEB STRAPS.
6. WHEN USING STRAPS AND WINCHES FOR CARGO RESTRAINT, THE STRAPS WILL BE TENSIONED UNTIL TIGHT WITHOUT CAUSING DAMAGE TO THE CARGO. ONLY WINCH BARS WILL BE USED FOR OPERATING THE STRAP WINCHES.
7. BEFORE AND DURING INSTALLATION, THE WEB STRAP ASSEMBLIES SHALL BE INSPECTED FOR DEFECTS. STRAPS HAVING ANY OF THE FOLLOWING DEFECTS WILL NOT BE USED FOR THE RESTRAINT OF ANY AMMUNITION LOAD, WITH THE EXCEPTION OF ONE WITH FRAYED ENDS. A STRAP HAVING FRAYED ENDS CAN BE USED IF THE FRAYED END IS TRIMMED AND MELTED WITH HEAT OR FLAME UNTIL ALL STRANDS ARE SEIZED.
  - A. STRAP ASSEMBLY HARDWARE: SHALL BE INSPECTED FOR BENT HOOKS, GOUGES, CORROSION, SIGNS OF REPAIR, BENT RATCHETS OR WINCHES, WEAR, OR ANY OTHER NOTICEABLE DEFECTS.
  - B. STRAP WEBBING: SHALL BE INSPECTED FOR KNOTS, EXCESSIVE ABRASIVE WEAR, TEARS, PUNCTURES, CUTS, ACID OR CAUSTIC BURNS, BROKEN STITCHES, FRAYED ENDS, OIL OR GREASE SPOTS EXCEEDING 6 SQUARE INCHES, BLEACHING OF COLOR, INCREASED STIFFNESS, SPLICES, VISIBLE WEAR INDICATOR THREADS, OR ANY OTHER NOTICEABLE DEFECTS.
8. RATCHET HANDLES MUST BE IN THE LOCKED POSITION AND/OR WINCH LOCKING DEVICES MUST BE FULLY SEATED IN THE TEETH OF THE WINCH.
9. IF THE WINCHES BEING USED ARE THE REMOVABLE TYPE HAVING BOLTS FOR ATTACHMENT TO THE TRAILER, CARE MUST BE EXERCISED WHEN ATTACHING THE WINCHES TO THE TRAILER. IF EXCESSIVE FORCE IS EXERTED ON THE BOLT DURING TENSIONING, DEFORMATION OF THE WINCH BRACKET MAY OCCUR, AND SUBSEQUENTLY CAUSE FAILURE OF THE WINCH BRACKET DURING TRANSPORT. WINCHES MUST BE FASTENED TO THE TRAILER WITH A MINIMUM OF TWO BOLTS.

(CONTINUED AT RIGHT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	79	27
2" X 4"	36	24
2" X 6"	174	174
2" X 8"	30	40
NAILS	NO. REQD	POUNDS
6d (2")	106	3/4
10d (3")	258	4
20d (4")	36	1-1/2
1-1/4" STEEL STRAPPING ----- 392' REQD -----		56 LBS
SEAL FOR 1-1/4" STRAPPING ----- 60 REQD -----		2-3/4 LBS
WEB STRAP ASSEMBLIES -----		10 REQD

**SPECIAL NOTES:**

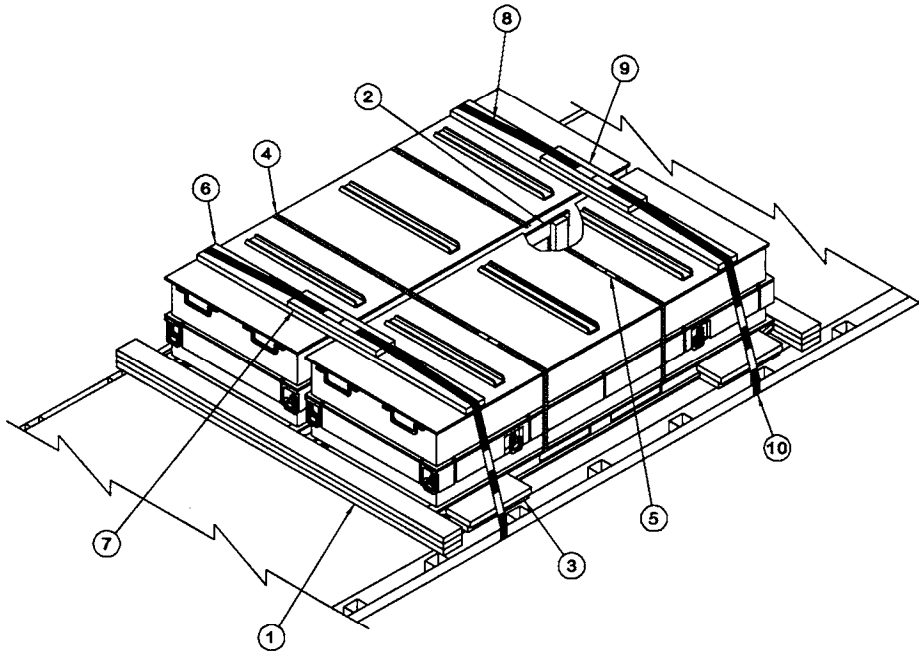
1. A 19-CONTAINER LOAD OF CBU-87/B MUNITIONS IS SHOWN ON A 48'-0" LONG BY 8'-0" WIDE FLATBED TRAILER. TRAILERS OF OTHER LENGTHS MAY BE USED. NOTE THAT THE 20-1/2" REFERENCE DIMENSION AT THE FRONT OF THE LOAD IS ONLY APPLICABLE FOR THE DEPICTED 48'-0" LONG TRAILER.
2. IF DESIRED, AND IF THE CAPACITY OF THE FORKLIFT TRUCK PERMITS, TWO OR THREE CONTAINERS MAY BE STACKED AND UNITIZED WITH STEEL STRAPS, AS SPECIFIED BY KEY NUMBER ⑤, PRIOR TO PLACEMENT ON THE TRAILER.
3. THE DEPICTED 19-UNIT LOAD SHOULD BE TRANSPORTABLE ON AN AVERAGE WEIGHT TRAILER HAVING THE TANDEM AXLES LOCATED IN THE "WESTERN" POSITION (AT APPROXIMATELY 73" FROM THE EXTREME REAR OF THE TRAILER) AND BEING PULLED BY AN AVERAGE WEIGHT TRACTOR WITHOUT EXCEEDING THE WEIGHT LIMIT ON ANY AXLES. THE WEIGHT OF THE LADING ON EACH SET OF TANDEM AXLES SHOULD BE VERIFIED BY ACTUALLY WEIGHING THE LOADED VEHICLE. IF NECESSARY, THE PLACEMENT OF THE UNITS IN THE TOP LAYER CAN BE ADJUSTED, OR ONE OR MORE UNITS CAN BE OMITTED FROM THE DEPICTED LOAD, TO PROVIDE FOR PROPER AXLE LOADING. IF THE LOAD IS TO BE REDUCED BY ONE CONTAINER, OMIT THE ODD UNIT FROM THE FOURTH LOAD UNIT. IF THE LOAD IS TO BE REDUCED BY TWO CONTAINERS, LATERALLY ADJACENT CONTAINERS SHOULD BE OMITTED.
4. THE DEPICTED PROCEDURES FOR A 48 FOOT LONG TRAILER MAY BE USED FOR SHIPMENT OF A 19-UNIT LOAD OF CBU-89/B MUNITIONS. ADDITIONAL UNITS MAY BE ADDED TO THE DEPICTED LOAD IF DESIRED. DO NOT LOAD MORE THAN THREE CONTAINERS HIGH.
5. IF CHAINS AND LOAD BINDERS ARE TO BE USED IN LIEU OF THE 2" STEEL STRAPPING FOR LOAD SECUREMENT, REFER TO THE PROCEDURES ON PAGES 8 AND 9 FOR GUIDANCE.

(SPECIAL PROVISIONS FOR WEB STRAP TIEDOWN CONTINUED)

10. DRIVERS MUST BE INSTRUCTED TO PERIODICALLY CHECK THE TIGHTNESS OF THE WEB STRAP ASSEMBLIES AND RE-TIGHTEN, IF NECESSARY.
11. IF PROVIDED ON OR WITH THE WEB STRAP ASSEMBLIES, SCUFF SLEEVES/WEB PROTECTORS WILL BE USED WHEREVER THE STRAP PASSES OVER A SHARP CORNER OR IRREGULAR SURFACE. IF NOT PROVIDED, ANTI-CHAFING MATERIAL OF A SUITABLE THICKNESS WILL BE USED TO INSURE THAT THE STRAP WEBBING IS NOT DAMAGED DURING TRANSPORT OF THE LOAD.
12. THE HARDWARE FITTING OF THE TIEDOWN ASSEMBLIES MUST BE ATTACHED TO THE TRAILER IN SUCH A MANNER THAT THEY WILL REMAIN IN PLACE IF SLACK DEVELOPS IN THE STRAP DURING TRANSPORT.

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER (W/CBU-87/B)	19	45,030 LBS
DUNNAGE		595 LBS
<b>TOTAL WEIGHT</b>		<b>45,625 LBS (APPROX)</b>



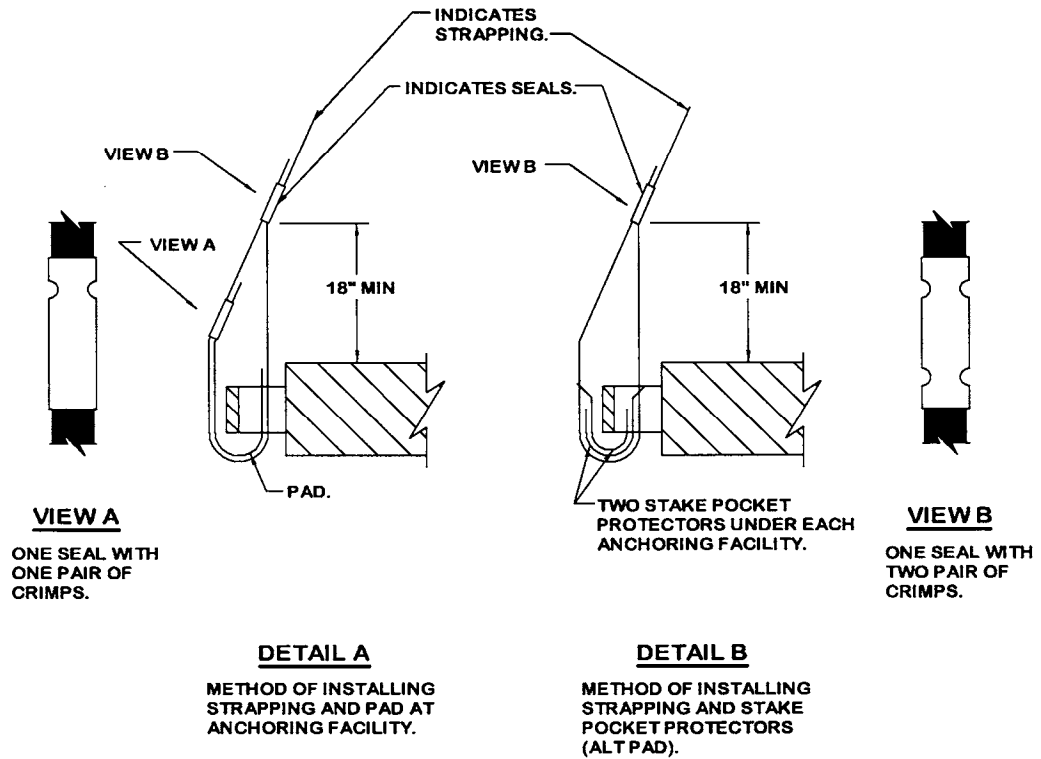
**ISOMETRIC VIEW**

**SPECIAL NOTES:**

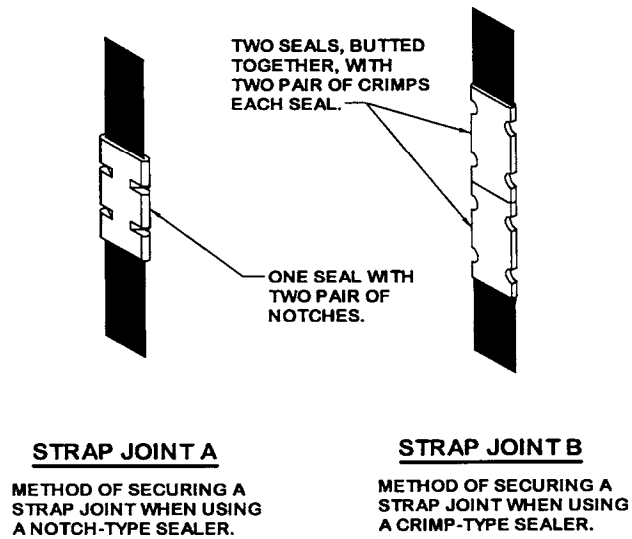
1. A 2-CONTAINER LOAD IS SHOWN ON AN 8'-0" WIDE FLATBED TRAILER. THESE PROCEDURES MAY BE USED IN CONJUNCTION WITH THE PROCEDURES DEPICTED ON PAGES 4 AND 6 AS NECESSARY IN OBTAINING THE QUANTITY TO BE SHIPPED.
2. THE DEPICTED 2-CONTAINER LOAD CAN BE MODIFIED FOR THE SHIPMENT OF A 1-CONTAINER LOAD AS FOLLOWS:
  - A. OMIT PIECES MARKED ②, ④, ⑤ AND ⑦.
  - B. USE PIECES MARKED ③, ⑨ AND ⑩ AS SPECIFIED.
  - C. REDUCE LENGTH OF THE TWO HEADERS, PIECE MARKED ①, TO 45".
  - D. REDUCE LENGTH OF THE TWO STRAPPING BOARDS, PIECE MARKED ⑥, TO 39".
  - E. REDUCE LENGTH OF THE TWO HOLD-DOWN STRAPS, PIECE MARKED ⑧, TO 19'-0".

**KEY NUMBERS**

- ① HEADER, 2" X 6" X 8'-0" (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/3-20d NAILS. NAIL THE THIRD PIECE TO THE SECOND W/3-20d NAILS. SEE GENERAL NOTE "L" ON PAGE 2.
- ② ANTI-CHAFING ASSEMBLY (1 REQD). SEE THE "ANTI-CHAFING ASSEMBLY A" DETAIL ON PAGE 5.
- ③ SIDE BLOCKING, 2" X 6" X 18" AND 2" X 8" X 18" (4 EACH REQD). POSITION THE 2" X 6" PIECE AGAINST THE BOTTOM FLANGE OF THE CONTAINER SKID AND NAIL TO THE TRAILER FLOOR W/5-10d NAILS. POSITION THE 2" X 8" PIECE ON TOP OF THE 2" X 6" PIECE AND AGAINST THE WEB OF THE CONTAINER SKID. NAIL TO THE 2" X 6" W/5-10d NAILS. SEE THE "SIDE BLOCKING DETAIL" ON PAGE 14.
- ④ BUNDLING STRAP, 1-1/4" X .035" OR .031" X 18'-6" LONG STEEL STRAPPING (2 REQD). INSTALL TO ENCIRCLE, THRU FORK TINE OPENINGS, TWO LATERALLY ADJACENT CONTAINERS AS SHOWN. STRAPS SHOULD BE POSITIONED AS FAR APART AS THE FORK TINE OPENINGS PERMIT.
- ⑤ SEAL FOR 1-1/4" STEEL STRAPPING (4 REQD, 2 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE GENERAL NOTE "M" ON PAGE 2 AND THE "END-OVER-END LAP JOINT DETAILS" ON PAGE 13.
- ⑥ STRAPPING BOARD, 2" X 6" X 6'-7" (2 REQD).
- ⑦ PURCHASE BOARD, 2" X 6" X 26" (2 REQD). CENTER ON THE STRAPPING BOARD, PIECE MARKED ⑥, AND NAIL W/4-10d NAILS.
- ⑧ HOLD-DOWN STRAP, 2" X .050" OR .044" X 20'-0" LONG STEEL STRAPPING (2 REQD). INSTALL EACH STRAP FROM TWO 10'-0" LONG PIECES. STAPLE TO STRAPPING BOARD, PIECE MARKED ⑥, W/2 STAPLES. SEE GENERAL NOTE "M" ON PAGE 2.
- ⑨ SEAL FOR 2" STEEL STRAPPING (12 REQD, 6 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS, EXCEPT THOSE USED TO SECURE THE PADS, PIECE MARKED ⑩. SEE THE "HOLD-DOWN STRAP ANCHORING DETAILS" AND "END-OVER-END LAP JOINT DETAILS" ON PAGE 13.
- ⑩ PAD, 2" X .050" OR .044" X 18" LONG STEEL STRAPPING (4 REQD). POSITION UNDER ANCHORING FACILITY AND SEAL TO HOLD-DOWN STRAP, PIECE MARKED ⑧. ALT: STAKE POCKET PROTECTOR (8 REQD). USE TWO UNDER EACH ANCHORING FACILITY WITH A HOLD-DOWN STRAP.



**HOLD-DOWN STRAP ANCHORING DETAILS**



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

## PROVISIONS FOR THE USE OF FIREHOSE IN LIEU OF CHAIN BOARDS OR STRAPPING BOARDS

FIRE HOSE THAT IS NO LONGER SUITABLE FOR USE IN FIRE FIGHTING APPLICATIONS CAN BE SUBSTITUTED FOR THE DOUBLED 2" BY 6" WOODEN CHAIN BOARDS OR SINGLE 2" BY 6" STRAPPING BOARDS, AS SPECIFIED HEREIN, PROVIDED THE FOLLOWING CONDITIONS ARE MET.

### 1. SUBSTITUTION AND APPLICATION GUIDANCE

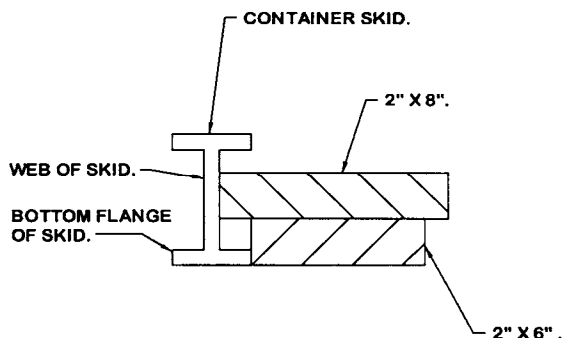
- A. FIRE HOSE MAY BE USED WHEREVER A CHAIN OR STRAPPING BOARD CONTACTS A RIGID SURFACE OF THE LOAD PROVIDED GOUGING, SCRATCHING, CRACKING, BENDING, CRUSHING, OR OTHER VISIBLE DAMAGE DOES NOT OCCUR TO THE LOAD.
- B. ONE OR MORE SEGMENTS OF FIRE HOSE MAY BE USED TO REPLACE EACH CHAIN OR STRAPPING BOARD PROVIDING LOAD PROTECTION DURING TENSIONING OF TIEDOWNS AND LOAD SHIPMENT; I.E., A CHAIN BOARD NEED NOT BE REPLACED BY A SINGLE SEGMENT OF HOSE, MULTIPLE SEGMENTS MAY BE USED INSTEAD, AS LONG AS THEY ARE SECURELY FASTENED TO THE TIEDOWN. REGARDLESS OF THE NUMBER OF SEGMENTS USED, THE HOSE LENGTH WILL BE SUCH THAT IT EXTENDS AT LEAST 6" BEYOND THE EDGE OF THE LOAD.
- C. FIRE HOSE CANNOT BE USED IN PLACE OF A PURCHASE BOARD ON A LOAD CONSISTING OF MORE THAN TWO PALLETS OR CONTAINERS ACROSS THE WIDTH OF THE TRAILER. THE FIRE HOSE CAN BE APPLIED TO THE OUTER STACKS, HOWEVER, A PURCHASE BOARD ASSEMBLY WILL STILL BE REQUIRED TO PROVIDE VERTICAL HOLD-DOWN ON THE CENTER STACK(S).

### 2. ACCEPTABLE FIRE HOSE

- A. FIRE HOSE TO BE USED WILL BE A RUBBER LINED SINGLE OR DOUBLE JACKETED TYPE; I.E., IT MUST HAVE A RUBBER LINING INSIDE A SINGLE OR DOUBLED FABRIC (COTTON, LINEN, ETC.) JACKET.
- B. THE COLLAPSED WIDTH OF THE HOSE MUST BE A MINIMUM OF 2-1/2".
- C. THE HOSE SEGMENTS USED MUST NOT CONTAIN DEFECTS THAT WILL ALLOW DIRECT CONTACT OF THE CHAIN OR LOAD BINDER WITH THE LOAD. THE HOSE THICKNESS MUST ALSO BE OF SUCH A THICKNESS THAT DENTING OR DAMAGE TO THE LOAD DOES NOT OCCUR DURING CHAIN OR STRAP TENSIONING.

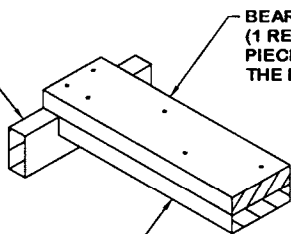
### 3. SECUREMENT TO CHAINS OR STRAPS

- A. THE SEGMENTS OF HOSE USED UNDER EACH CHAIN OR STRAP WILL BE SECURED TO THE CHAIN OR STRAP WITH ONE FASTENER EVERY 12", WITH A MINIMUM OF TWO FASTENERS REQUIRED PER HOSE SEGMENT.
- B. FASTENERS CAN CONSIST OF PLASTIC ELECTRICAL TIES, NO. 14 GAGE WIRE, OR TAPE. REGARDLESS OF THE TYPE OF FASTENING USED, IT MUST PROVIDE A POSITIVE MEANS OF SECUREMENT OF THE HOSE TO THE CHAIN OR STRAP AND MUST NOT DAMAGE THE SURFACE OF THE CONTAINER, PALLET, OR ITEM IT CONTACTS.



SIDE BLOCKING DETAIL

STOP PIECE, 2" X 4" X 12"  
(1 REQD). NAIL TO THE  
FILL PIECE W/2-10d NAILS.



FILL PIECE, 2" X 6"  
X 16-1/2" (1 REQD).

BEARING PIECE, 2" X 6" X 18"  
(1 REQD). NAIL TO THE STOP  
PIECE W/2-10d NAILS AND TO  
THE FILL PIECE W/4-10d NAILS.

### CHAIN BOARD ASSEMBLY

FOR USE IN THE CHAIN TIEDOWN  
METHOD LOAD SHOWN ON PAGE 8.