

# LOADING AND BRACING (TL & LTL) ON FLATBED TRAILER OF BLU-113A/B BOMBS PACKED IN CNU-554/E 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	BASIC	MICHAEL SARDONE	<b>DO NOT SCALE</b>			
		REV.		WEBSITE: <a href="http://www.dac.army.mil">HTTP://WWW.DAC.ARMY.MIL</a>			
	TECHNICIAN	BASIC		<b>JUNE 1999</b>			
		REV.					
	DRAFTSMAN	BASIC					
		REV.					
APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND  	TRANSPORTATION ENGINEERING DIVISION						
	VALIDATION ENGINEERING DIVISION	TESTED		CLASS	DIVISION	DRAWING	FILE
	LOGISTICS ENGINEERING OFFICE			19	48	8628	SP11J34
DEFENSE AMMUNITION CENTER							

**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 SPECIFIED IN THIS DRAWING ARE APPLICABLE TO LOADS OF BLU-113A/B BOMBS IN CNU-554/E CONTAINERS. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CONTAINER WITH BOMB INSTALLED. SEE PAGE 3 FOR DETAIL OF THE CONTAINER.
- C. THE LOADS AS SHOWN HEREIN ARE BASED ON 48'-0" LONG BY 8'-0" WIDE FLATBED TRAILERS. TRAILERS OF OTHER LENGTHS AND WIDTHS MAY BE USED. TRAILERS MUST HAVE WOOD OR WOOD AND METAL FLOORS. TRAILERS HAVING ALL-METAL FLOORS CAN NOT 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.
- D. SELECTION OF A VEHICLE FOR THE TRANSPORT OF THE DESIGNATED ITEM IS THE RESPONSIBILITY OF THE ORIGINATING CARRIER AND THE SHIPPER. ONLY VEHICLES IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPLICABLE REGULATORY DOCUMENTS WILL BE SELECTED FOR USE.
- E. 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.
- F. NOTICE: A SHIPMENT WILL BE POSITIONED ON A TRAILER CONSISTENT WITH STATE WEIGHT LAWS.
- G. 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.

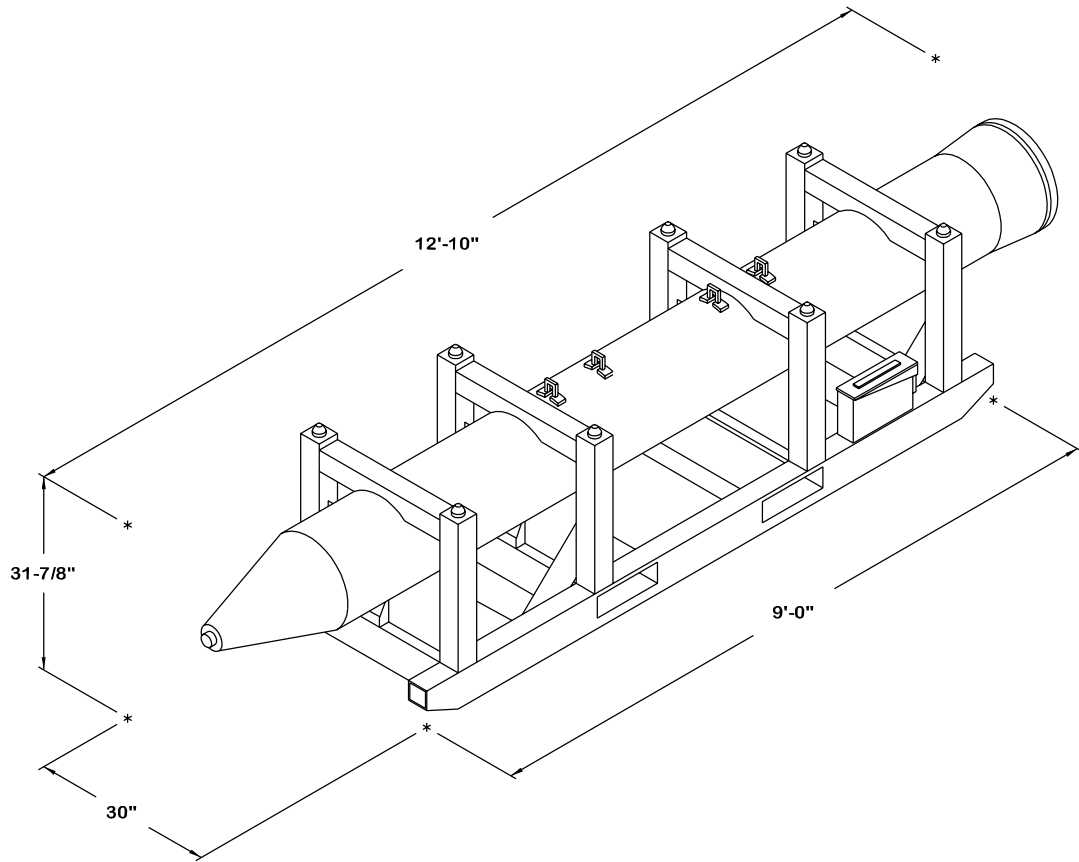
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**MATERIAL SPECIFICATIONS**

- LUMBER - - - - - : SEE TM 743-200-1 (DUNNAGE LUMBER) AND VOLUNTARY PRODUCT STANDARD PS 20.
- NAILS - - - - - : ASTM F1667; COMMON STEEL NAIL (NLCMS OR NLCMMS).
- 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.
- STAKE POCKET PROTECTOR - - - - : COMMERCIAL GRADE.
- ANTI-CHAFING MATERIAL - - - - - : MIL-B-121 (OR EQUAL); NEUTRAL BARRIER MATERIAL.
- CHAIN - - - - - : NATIONAL ASSOCIATION OF CHAIN MANUFACTURER'S WELDED CHAIN SPECIFICATION ADOPTED NOVEMBER 1975.
- LOAD BINDER - - - - - : FED SPEC GGG-B-325.

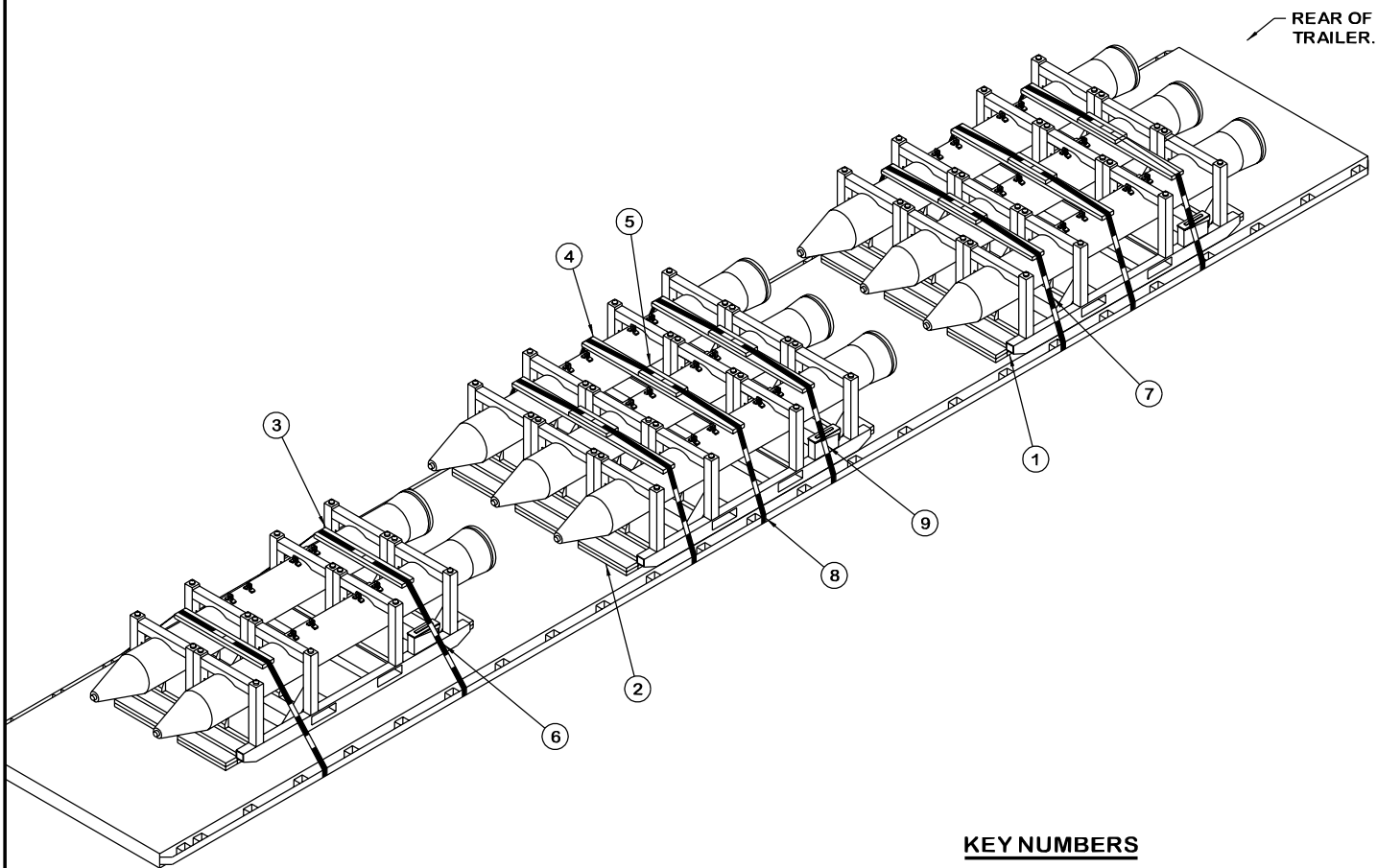
**(GENERAL NOTES CONTINUED)**

- H. 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.
- J. A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES. ALSO, 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 THE PIECE ONTO OR RIGHT BESIDE A NAIL IN A LOWER PIECE.
- K. 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 "STRAP JOINT A" AND "STRAP JOINT B" DETAILS ON PAGE 11 FOR GUIDANCE.
- L. THE TRANSPORTING VEHICLE OPERATOR SHOULD BE INSTRUCTED TO PERIODICALLY INSPECT THE TIEDOWN CHAINS AND LOAD BINDERS DURING TRANSIT AND TIGHTEN IF NECESSARY.
- M. THE NUMBER OF LADING UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE TRAILER TO BE LOADED OR THE QUANTITY TO BE SHIPPED. THE APPROVED METHODS SHOWN HEREIN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING AND STAYING OF THE DESIGNATED ITEM.
- N. 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.
- 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 0.454 KG.
- P. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTION WHICH IS IMMEDIATELY ADJACENT TO A DEPICTED OUTLOADING METHOD.



**CNU-554/E CONTAINER**

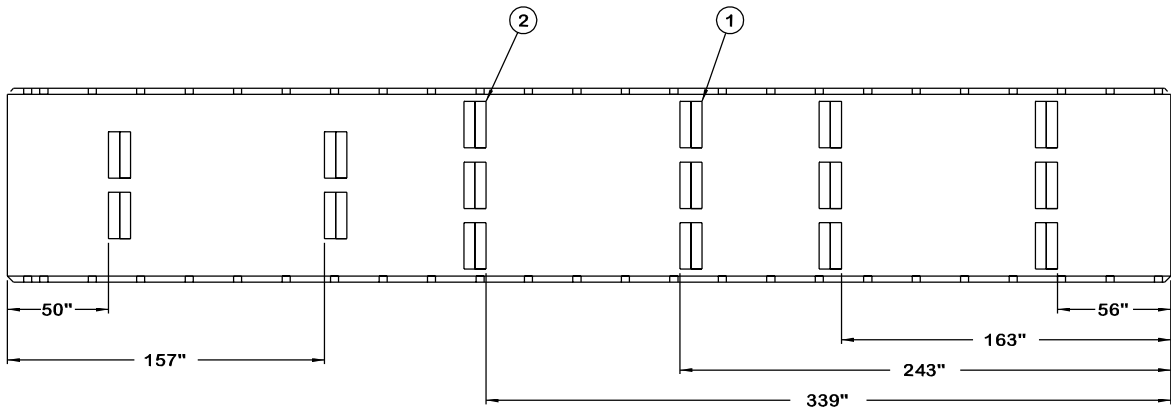
GROSS WEIGHT ----- 5,255 LBS (APPROX)  
 CUBE ----- 85.2 CU. FT. (APPROX)



**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① HEADER, 2" X 6" X 23" (TRIPLED) (16 REQD). NAIL THE FIRST PIECE TO THE FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST AND THE THIRD PIECE TO THE SECOND W/5-20d NAILS. SEE THE "PRE-POSITIONED DUNNAGE PLAN VIEW" DETAIL ON PAGE 5.
- ② BACK-UP CLEAT, 2" X 6" X 23" (DOUBLED) (16 REQD). NAIL THE FIRST PIECE TO THE FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/5-20d NAILS. SEE THE "PRE-POSITIONED DUNNAGE PLAN VIEW" DETAIL ON PAGE 5.
- ③ STRAPPING BOARD, 2" X 6" X 42" (2 REQD). POSITION AS SHOWN.
- ④ STRAPPING BOARD, 2" X 6" X 72" (6 REQD). POSITION AS SHOWN.
- ⑤ PURCHASE BOARD, 2" X 6" X 18" (6 REQD). NAIL TO THE STRAPPING BOARDS, PIECES MARKED ④, W/3-10d NAILS.
- ⑥ HOLD-DOWN STRAP, 2" X .050" OR .044" X 19'-6" LONG STEEL STRAPPING (2 REQD). INSTALL EACH STRAP FROM TWO 9'-9" LONG PIECES. POSITION OVER THE TOP OF THE LOAD AS SHOWN. FASTEN TO PIECE MARKED ③ W/2 STAPLES.
- ⑦ HOLD-DOWN STRAP, 2" X .050" OR .044" X 20'-6" LONG STEEL STRAPPING (6 REQD). INSTALL EACH STRAP FROM TWO 10'-3" LONG PIECES. POSITION OVER THE TOP OF THE LOAD AS SHOWN. FASTEN TO PIECE MARKED ④ W/2 STAPLES.
- ⑧ PAD, 2" X .050" OR .044" X 18" LONG STEEL STRAPPING (16 REQD). POSITION UNDER STAKE POCKET OR RUB RAIL AND SEAL TO HOLD-DOWN STRAP. SEE "DETAIL A" ON PAGE 11. ALT: STAKE POCKET PROTECTOR (32 REQD). USE 2 UNDER EACH STAKE POCKET OR RUB RAIL WITH A HOLD-DOWN STRAP. SEE "DETAIL B" ON PAGE 11.
- ⑨ SEAL FOR 2" STEEL STRAPPING (48 REQD, 6 PER STRAP). DOUBLE CRIMP EACH SEAL, EXCEPT THOSE USED TO SECURE THE PADS, PIECE MARKED ⑧. SEE THE "END-OVER-END LAP JOINT DETAILS" ON PAGE 11.



**PRE-POSITIONED DUNNAGE PLAN VIEW**

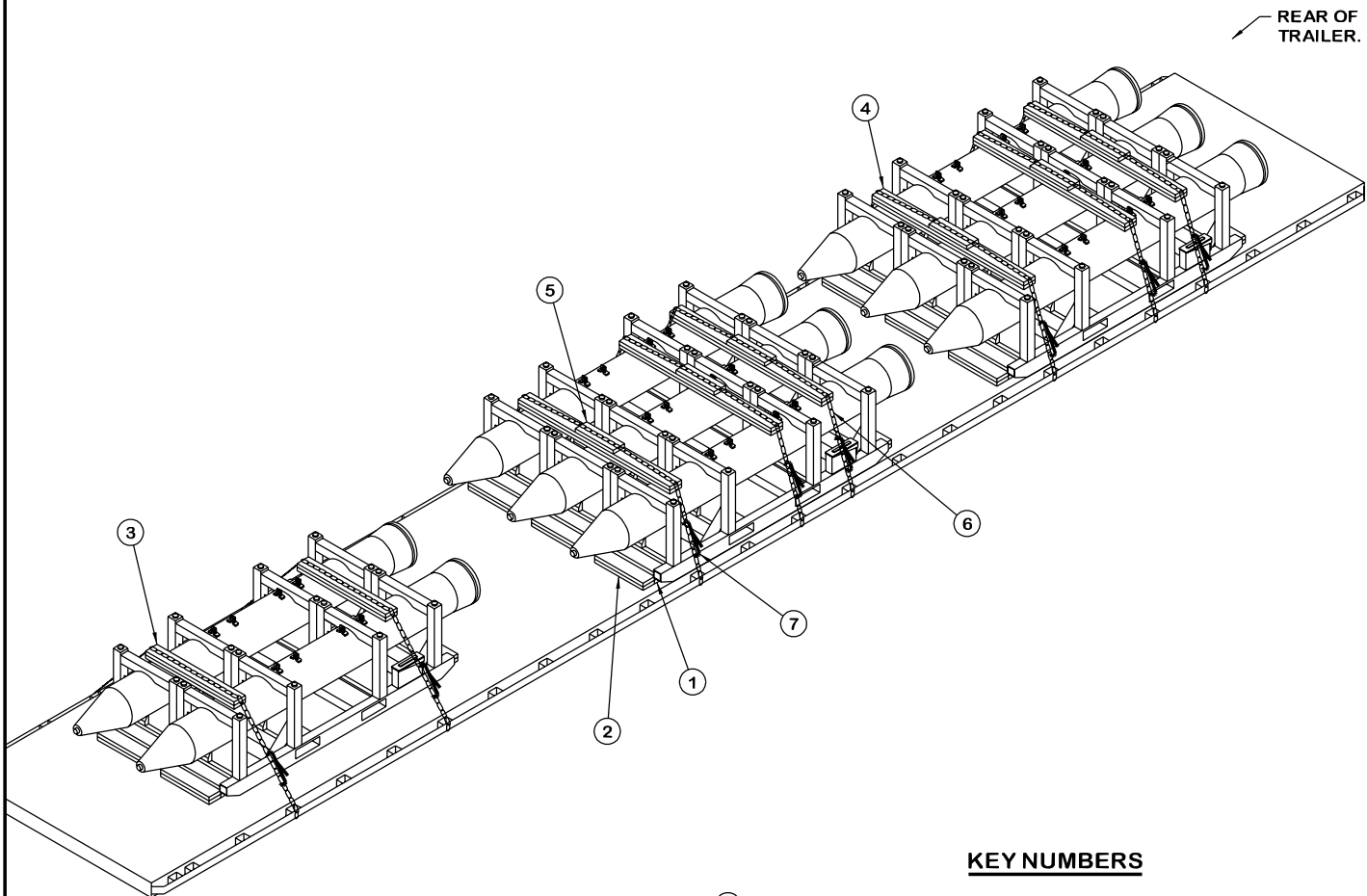
**SPECIAL NOTES:**

1. AN EIGHT UNIT LOAD ON A 48'-0" LONG BY 8'-0" WIDE FLATBED TRAILER IS SHOWN. SHORTER AND WIDER TRAILERS CAN BE USED. SEE GENERAL NOTES "E" AND "F" ON PAGE 2.
2. IF CHAINS AND LOAD BINDERS ARE USED FOR LOAD SECUREMENT IN LIEU OF THE DEPICTED STEEL STRAPPING, REFER TO THE LOAD ON PAGES 6 AND 7 FOR GUIDANCE.
3. IF WEB STRAP TIEDOWNS ARE USED FOR LOAD SECUREMENT IN LIEU OF THE DEPICTED STEEL STRAPPING, REFER TO THE LOAD ON PAGES 8 AND 9 FOR GUIDANCE.
4. IF DESIRED, THE "STRAPPING/CHAIN BOARD ASSEMBLY" DEPICTED ON PAGE 12 MAY BE USED IN LIEU OF THE STRAPPING BOARDS AND THE PURCHASE BOARDS, PIECES MARKED ③, ④, AND ⑤.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 6"	206	206
NAILS	NO. REQD	POUNDS
10d (3")	98	1-1/2
20d (4")	120	4-1-2
2" STEEL STRAPPING - -	186' REQD - - - - -	62 LBS
SEAL FOR 2" STRAPPING - -	48 REQD - - - - -	9-3/4 LBS
STAPLE FOR 2" STRAPPING -	16 REQD - - - - -	1/4 LB

**LOAD AS SHOWN**

<u>ITEM</u>	<u>QUANTITY</u>	<u>WEIGHT (APPROX)</u>
CONTAINER - - - - -	8 - - - - -	42,040 LBS
DUNNAGE - - - - -	- - - - -	490 LBS
TOTAL WEIGHT - - - - -		42,530 LBS (APPROX)



**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① HEADER, 2" X 6" X 23" (TRIPLED) (16 REQD). NAIL THE FIRST PIECE TO THE FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST AND THE THIRD PIECE TO THE SECOND W/5-20d NAILS. SEE THE "PRE-POSITIONED DUNNAGE PLAN VIEW" DETAIL ON PAGE 5.
- ② BACK-UP CLEAT, 2" X 6" X 23" (DOUBLED) (16 REQD). NAIL THE FIRST PIECE TO THE FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/5-20d NAILS. SEE THE "PRE-POSITIONED DUNNAGE PLAN VIEW" DETAIL ON PAGE 5.
- ③ CHAIN BOARD, 2" X 6" X 42" (DOUBLED) (2 REQD). LAMINATE W/1-10d NAIL EVERY 8".
- ④ CHAIN BOARD, 2" X 6" X 72" (DOUBLED) (6 REQD). LAMINATE W/1-10d NAIL EVERY 8".
- ⑤ PURCHASE BOARD, 2" X 6" X 18" (6 REQD). NAIL TO THE CHAIN BOARDS, PIECES MARKED ④, W/3-10d NAILS.
- ⑥ 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 7.
- ⑦ LOAD BINDER, 5/16", OVER-CENTER TYPE (8 REQD, 1 PER CHAIN). WIRE TIE HANDLE TO PREVENT OPENING DURING TRANSPORT. FASTEN THE TENSIONED CHAIN, PIECE MARKED ⑥, TO THE CHAIN BOARD, PIECES MARKED ③ AND ④, W/1-20d NAIL AT EACH END, BENDING OVER TO FORM A LOOP AROUND THE CHAIN LINK. SEE THE "SPECIAL PROVISIONS FOR CHAIN TIEDOWN" ON PAGE 7.

**SPECIAL NOTES:**

1. AN EIGHT UNIT LOAD ON A 48'-0" LONG BY 8'-0" WIDE FLATBED TRAILER IS SHOWN. SHORTER AND WIDER TRAILERS CAN BE USED. SEE GENERAL NOTES "E" AND "F" ON PAGE 2.
2. **NOTE:** THE CHAINS MUST BE ATTACHED TO THE TRAILER STAKE POCKETS AND VERTICALLY IN LINE WITH THE CHAIN BOARDS. THE CHAIN BOARDS CAN BE SHIFTED, BUT MUST NOT BE POSITIONED CLOSER THAN 6" FROM THE CONTAINER ENDS TO PROVIDE FOR VERTICAL ALIGNMENT. IT MAY BE NECESSARY IN SOME LOADS TO SHIFT THE CONTAINERS WITH DUNNAGE TO ADHERE WITH THIS LOADING REQUIREMENT. SEE GENERAL NOTES "E" AND "F" ON PAGE 2.
3. IF STEEL STRAPPING IS USED FOR LOAD SECUREMENT IN LIEU OF THE DEPICTED CHAINS AND LOAD BINDERS, REFER TO THE LOAD ON PAGES 4 AND 5 FOR GUIDANCE.
4. IF WEB STRAP TIEDOWNS ARE USED FOR LOAD SECUREMENT IN LIEU OF THE DEPICTED CHAINS AND LOAD BINDERS, REFER TO THE LOAD ON PAGES 8 AND 9 FOR GUIDANCE.
5. IF DESIRED, THE "STRAPPING/CHAIN BOARD ASSEMBLY" DEPICTED ON PAGE 12 MAY BE USED IN LIEU OF THE CHAIN BOARDS AND THE PURCHASE BOARDS, PIECES MARKED ③, ④, AND ⑤.

**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.

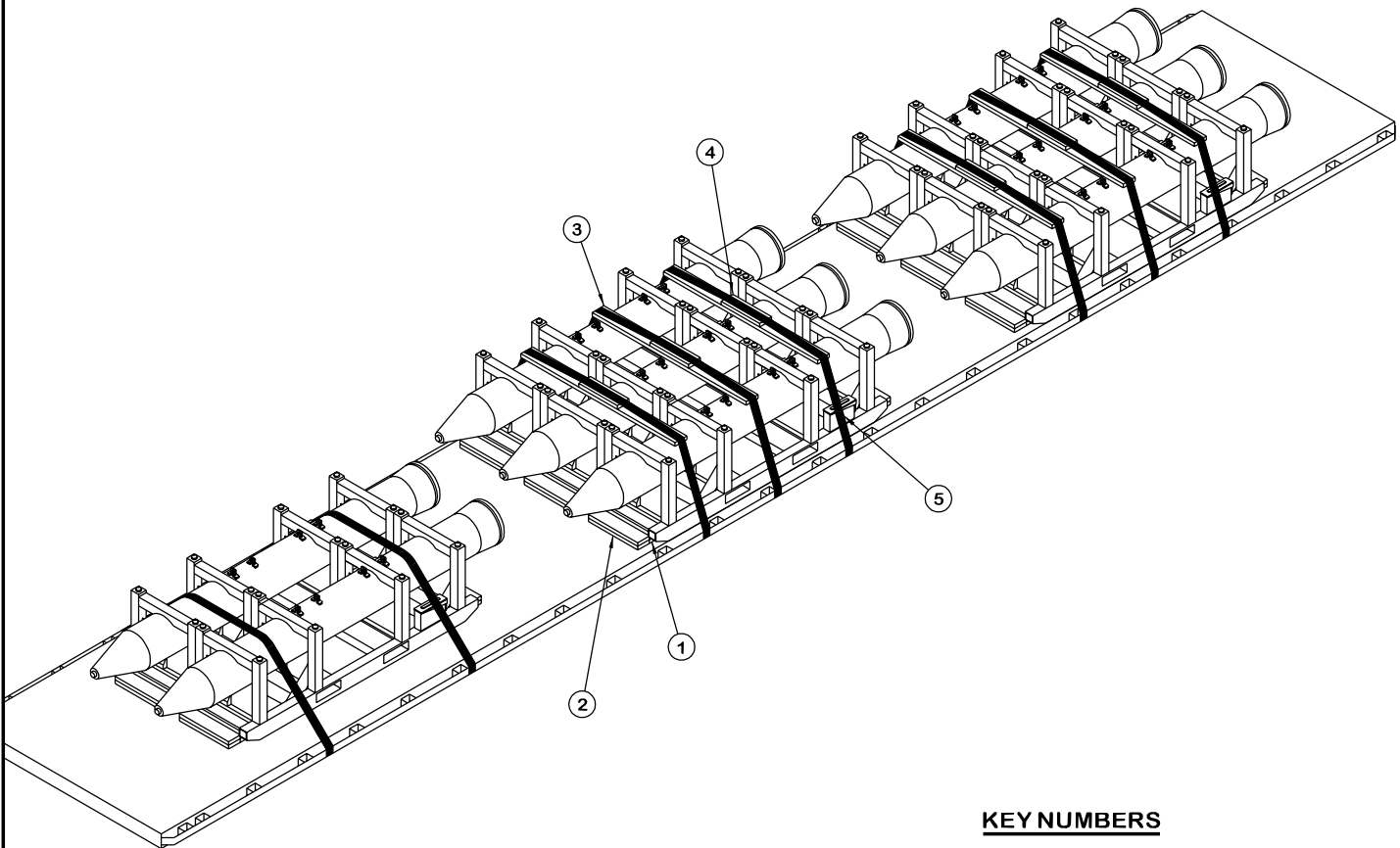
1. ONLY CHAINS AND LOAD BINDERS OF GOOD QUALITY WILL BE USED. ALL CHAINS AND LOAD BINDERS SHALL CONFORM TO THE NATIONAL ASSOCIATION OF CHAIN MANUFACTURER'S WELDED CHAIN SPECIFICATION ADOPTED NOVEMBER 1975.
2. ALL CHAINS SHALL BE MARKED AS PRESCRIBED BY THE NATIONAL ASSOCIATION OF CHAIN MANUFACTURER'S 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.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 6"	249	249
NAILS	NO. REQD	POUNDS
10d (3")	162	2-1/2
20d (4")	136	5
CHAIN, BINDING, 5/16" - 164' REQD - - - - - 197 LBS		
BINDER, LOAD - - - - - 8 REQD - - - - - 48 LBS		

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER	8	42,040 LBS
DUNNAGE		751 LBS
TOTAL WEIGHT		42,791 LBS (APPROX)

REAR OF TRAILER.



**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① HEADER, 2" X 6" X 23" (TRIPLED) (16 REQD). NAIL THE FIRST PIECE TO THE FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST AND THE THIRD PIECE TO THE SECOND W/5-20d NAILS. SEE THE "PRE-POSITIONED DUNNAGE PLAN VIEW" DETAIL ON PAGE 5.
- ② BACK-UP CLEAT, 2" X 6" X 23" (DOUBLED) (16 REQD). NAIL THE FIRST PIECE TO THE FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/5-20d NAILS. SEE THE "PRE-POSITIONED DUNNAGE PLAN VIEW" DETAIL ON PAGE 5.
- ③ STRAPPING BOARD, 2" X 6" X 72" (6 REQD). POSITION AS SHOWN.
- ④ PURCHASE BOARD, 2" X 6" X 18" (6 REQD). NAIL TO THE STRAPPING BOARDS, PIECES MARKED ③, W/3-10d NAILS.
- ⑤ WEB STRAP ASSEMBLY (8 REQD, 1 PER CONTAINER IN 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
2" X 6"	206	206
NAILS	NO. REQD	POUNDS
10d (3")	98	1-1/2
20d (4")	120	4-1-2
WEB STRAP ASSEMBLIES	8	8 REQD

**SPECIAL NOTES:**

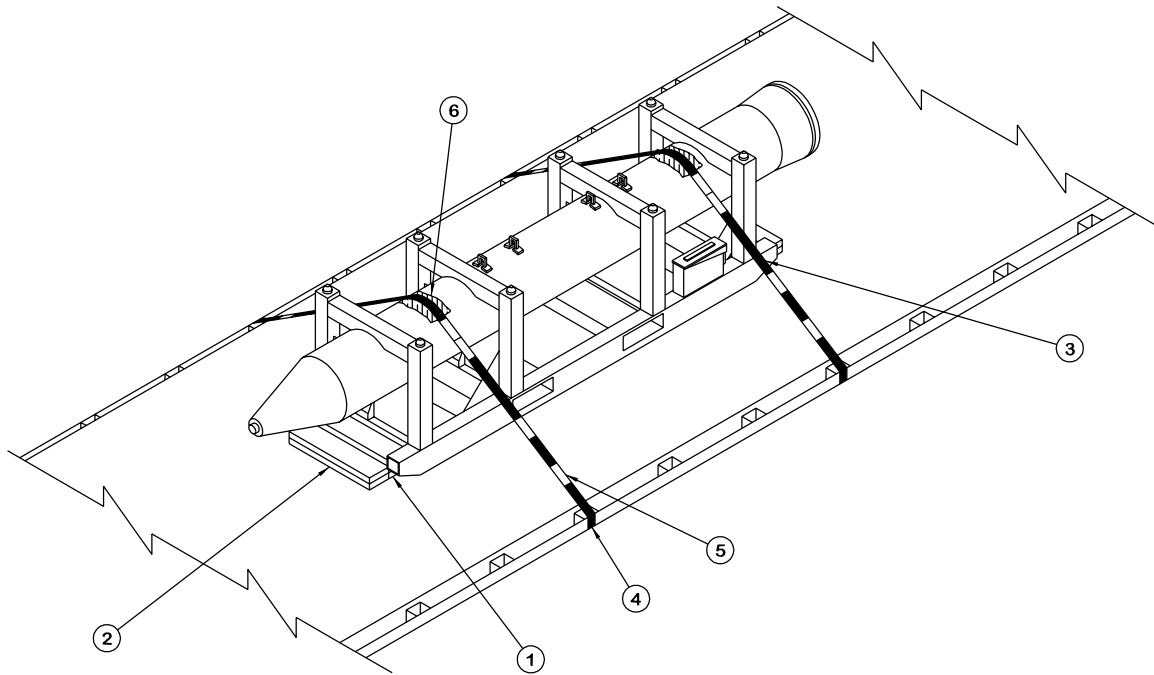
1. AN EIGHT UNIT LOAD ON A 48'-0" LONG BY 8'-0" WIDE FLATBED TRAILER IS SHOWN. SHORTER AND WIDER TRAILERS CAN BE USED. SEE GENERAL NOTES "E" AND "F" ON PAGE 2.
2. IF STEEL STRAPPING IS USED FOR LOAD SECUREMENT IN LIEU OF THE DEPICTED WEB STRAP TIEDOWNS, REFER TO THE LOAD ON PAGES 4 AND 5 FOR GUIDANCE.
3. IF CHAINS AND LOAD BINDERS ARE USED FOR LOAD SECUREMENT IN LIEU OF THE DEPICTED WEB STRAP TIEDOWNS, REFER TO THE LOAD ON PAGES 6 AND 7 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**

<u>ITEM</u>	<u>QUANTITY</u>	<u>WEIGHT (APPROX)</u>
CONTAINER	8	42,040 LBS
DUNNAGE		418 LBS
TOTAL WEIGHT		42,458 LBS (APPROX)



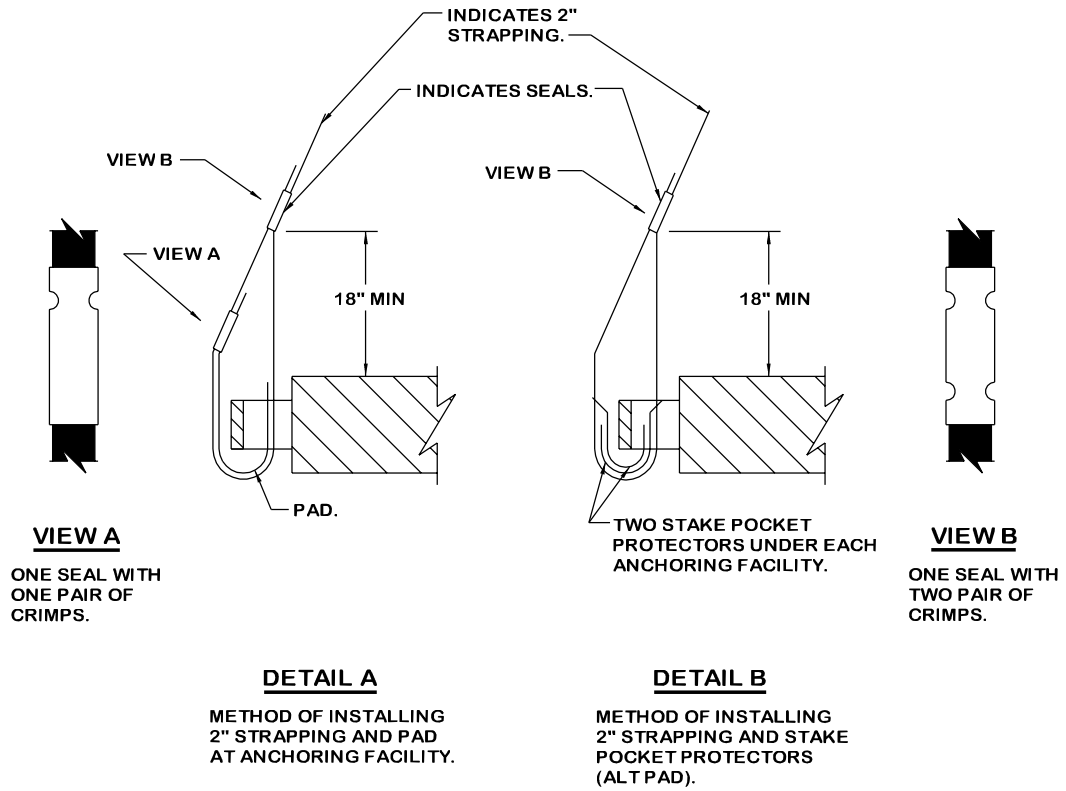
**ISOMETRIC VIEW**

**SPECIAL NOTES:**

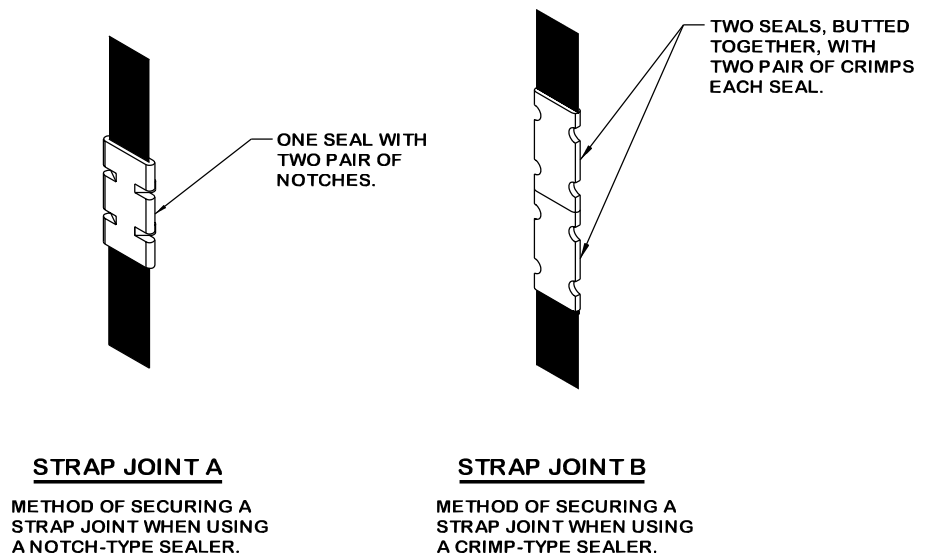
1. A ONE CONTAINER LOAD ON AN 8'-0" WIDE TRAILER IS SHOWN. OTHER ODD NUMBERS OF CONTAINERS CAN BE SHIPPED BY COMBINING THE PROCEDURES ON PAGE 4 AND THIS PAGE. SEE GENERAL NOTES "E" AND "F" ON PAGE 2.
2. REFER TO "SPECIAL PROVISIONS FOR CHAIN TIEDOWN" ON PAGE 7 OR TO "SPECIAL PROVISIONS FOR WEB STRAP TIE-DOWN" ON PAGE 9, EITHER OF WHICH MAY BE USED IN LIEU OF STEEL HOLD-DOWN STRAPPING.
3. PIECES MARKED ① AND ② MUST BE PRE-POSITIONED AND NAILED PRIOR TO LOADING THE CONTAINER ON THE TRAILER.

**KEY NUMBERS**

- ① HEADER, 2" X 6" X 23" (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO THE FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST AND THE THIRD PIECE TO THE SECOND W/5-20d NAILS.
- ② BACK-UP CLEAT, 2" X 6" X 23" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/5-20d NAILS.
- ③ HOLD-DOWN STRAP, 2" X .050" OR .044" X 19'-6" LONG STEEL STRAPPING (2 REQD). INSTALL EACH STRAP FROM TWO 9'-9" LONG PICES. POSITION OVER THE TOP OF THE LOAD AS SHOWN.
- ④ PAD, 2" X .050" OR .044" X 18" LONG STEEL STRAPPING (4 REQD). POSITION UNDER STAKE POCKET OR RUB RAIL AND SEAL TO HOLD-DOWN STRAP. SEE "DETAIL A" ON PAGE 11. ALT: STAKE POCKET PROTECTOR (8 REQD). USE 2 UNDER EACH STAKE POCKET OR RUB RAIL WITH A HOLD-DOWN STRAP. SEE "DETAIL B" ON PAGE 11.
- ⑤ SEAL FOR 2" STEEL STRAPPING (12 REQD, 6 PER STRAP). DOUBLE CRIMP EACH SEAL, EXCEPT THOSE USED TO SECURE THE PADS, PIECE MARKED ④. SEE THE "END-OVER-END LAP JOINT DETAILS" ON PAGE 11.
- ⑥ ANTI-CHAFING NEUTRAL BARRIER MATERIAL (AS REQD). POSITION UNDER STRAPS AT POINTS OF CONTACT WITH THE CONTAINER.



**HOLD-DOWN STRAP ANCHORING DETAILS**



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

**PROVISIONS FOR THE USE OF FIRE HOSE 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).

(CONTINUED AT RIGHT)

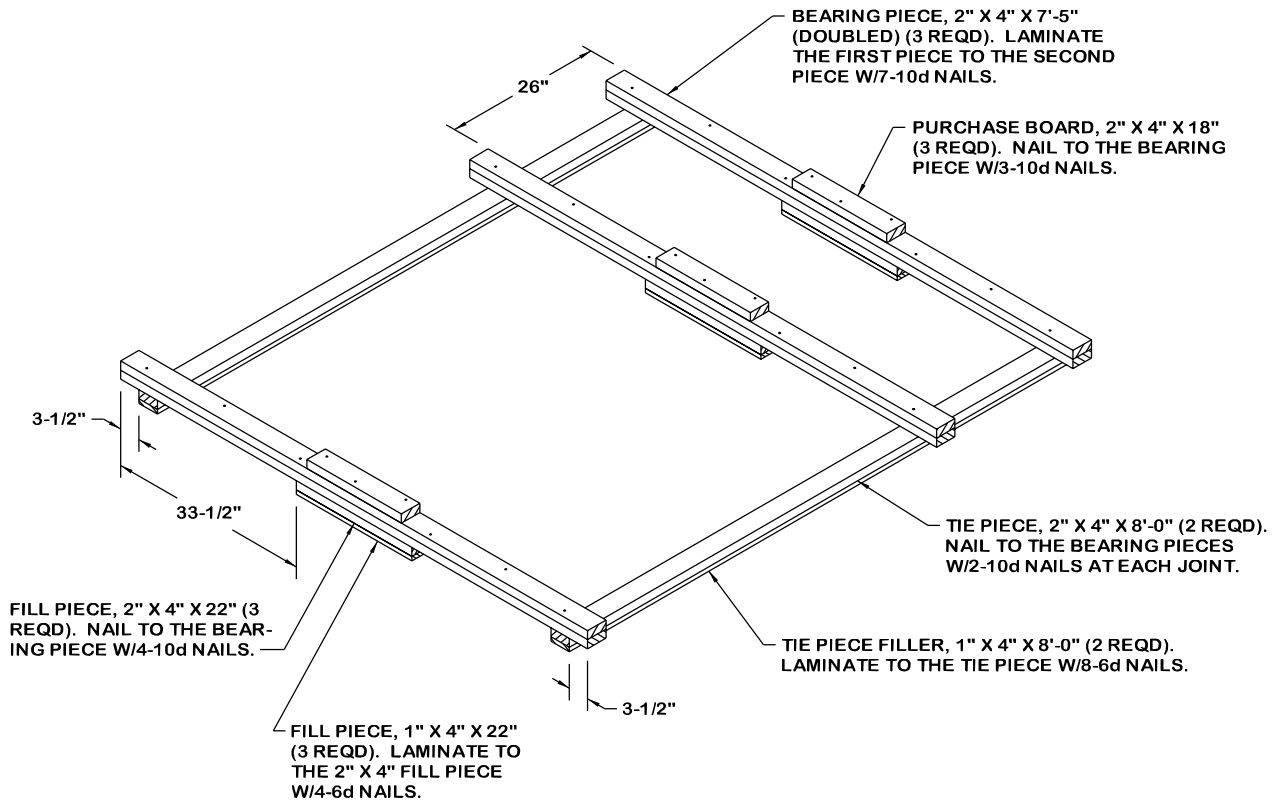
**PROVISIONS FOR THE USE OF FIREHOSE IN LIEU OF CHAIN BOARDS OR STRAPPING BOARDS (CONTINUED)**

**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, 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.



**STRAPPING/CHAIN BOARD ASSEMBLY**