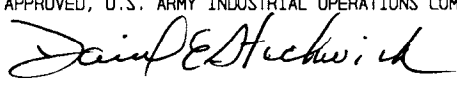

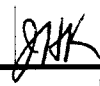




LOADING AND BRACING ON FLATBED TRAILERS • OF HARM (AGM-88) MISSILES PACKED IN CNU-355/E CONTAINERS

INDEX

<u>ITEM</u>	<u>PAGE(S)</u>
GENERAL NOTES AND MATERIAL SPECIFICATIONS - - - - -	2
CONTAINER DETAIL - - - - -	3
16-UNIT LOAD ON A 40'-0" LONG BY 8'-0" WIDE FLATBED TRAILER (STEEL STRAP TIEDOWN METHOD) - - - - -	4,5
16-UNIT LOAD ON A 40'-0" LONG BY 8'-0" WIDE FLATBED TRAILER (CHAIN TIEDOWN METHOD) - - - - -	6,7
16-UNIT LOAD ON A 40'-0" LONG BY 8'-0" WIDE FLATBED TRAILER (WEB STRAP TIEDOWN METHOD) - - - - -	8,9
TYPICAL LTL (1-UNIT LOAD) - - - - -	10
DETAILS - - - - -	11
PROVISIONS FOR THE USE OF FIREHOSE - - - - -	12

• CAUTION: THE OUTLOADING PROCEDURES SHOWN HEREIN ARE ONLY APPLICABLE TO HIGHWAY MOVEMENTS, NOT TRAILER-ON-FLATCAR (TOFC) MOVEMENTS.

U.S. ARMY MATERIEL COMMAND DRAWING			
APPROVED, U.S. ARMY INDUSTRIAL OPERATIONS COMMAND 	DRAFTSMAN	TECHNICIAN	ENGINEER
		R. HAYNES	M. SARDONE
APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND 	VALIDATION ENGINEERING DIVISION	TRANSPORTATION ENGINEERING DIVISION	LOGISTICS ENGINEERING OFFICE
			
DECEMBER 1986			
REVISION NO. 2	OCTOBER 1996	CLASS	DIVISION
		DRAWING	FILE
SEE THE REVISION LISTING ON PAGE 2		19	48
		7078	SP11J1

DO NOT SCALE

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 OUTLOADING PROCEDURES SPECIFIED IN THIS DRAWING ARE APPLICABLE TO LOADS OF HARM (AGM-88) MISSILES PACKED IN CNU-355/E CONTAINERS. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CONTAINER WITH MISSILES INSTALLED. SEE PAGE 3 FOR DETAIL OF THE CONTAINER.
- C. THE LOADS AS SHOWN HEREIN ARE BASED ON 40'-0" LONG BY 8'-0" WIDE, FLATBED TRAILERS. TRAILERS OF OTHER WIDTHS AND LONGER TRAILERS MAY 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.
- D. 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.
- 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.

- 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.

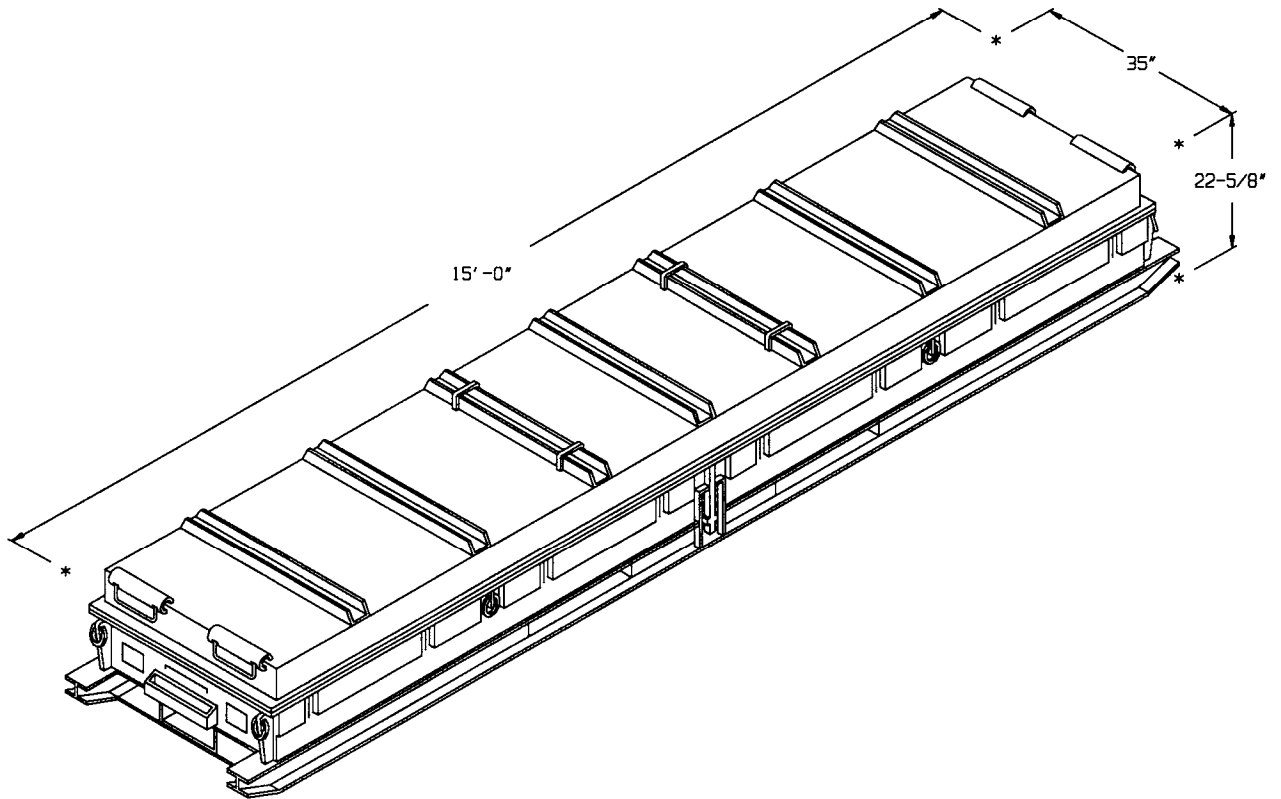
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MATERIAL SPECIFICATIONS

- LUMBER - - - - - : SEE TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC MM-L-751.
- NAILS - - - - - : FED SPEC FF-N-105; COMMON.
- STRAP - - - - - : WEB 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.
- STAKE POCKET PROTECTOR - - : COMMERCIAL GRADE.
- CHAIN - - - - - : NATIONAL ASSOCIATION OF CHAIN MANUFACTURER'S WELDED CHAIN SPECIFICATION ADOPTED NOVEMBER 1975.
- LOAD BINDER - - - - : FED SPEC GGG-B-325.
- ANTI-CHAFING MATERIAL - - - - - : MIL-B-121 (OR EQUAL); NEUTRAL BARRIER MATERIAL.

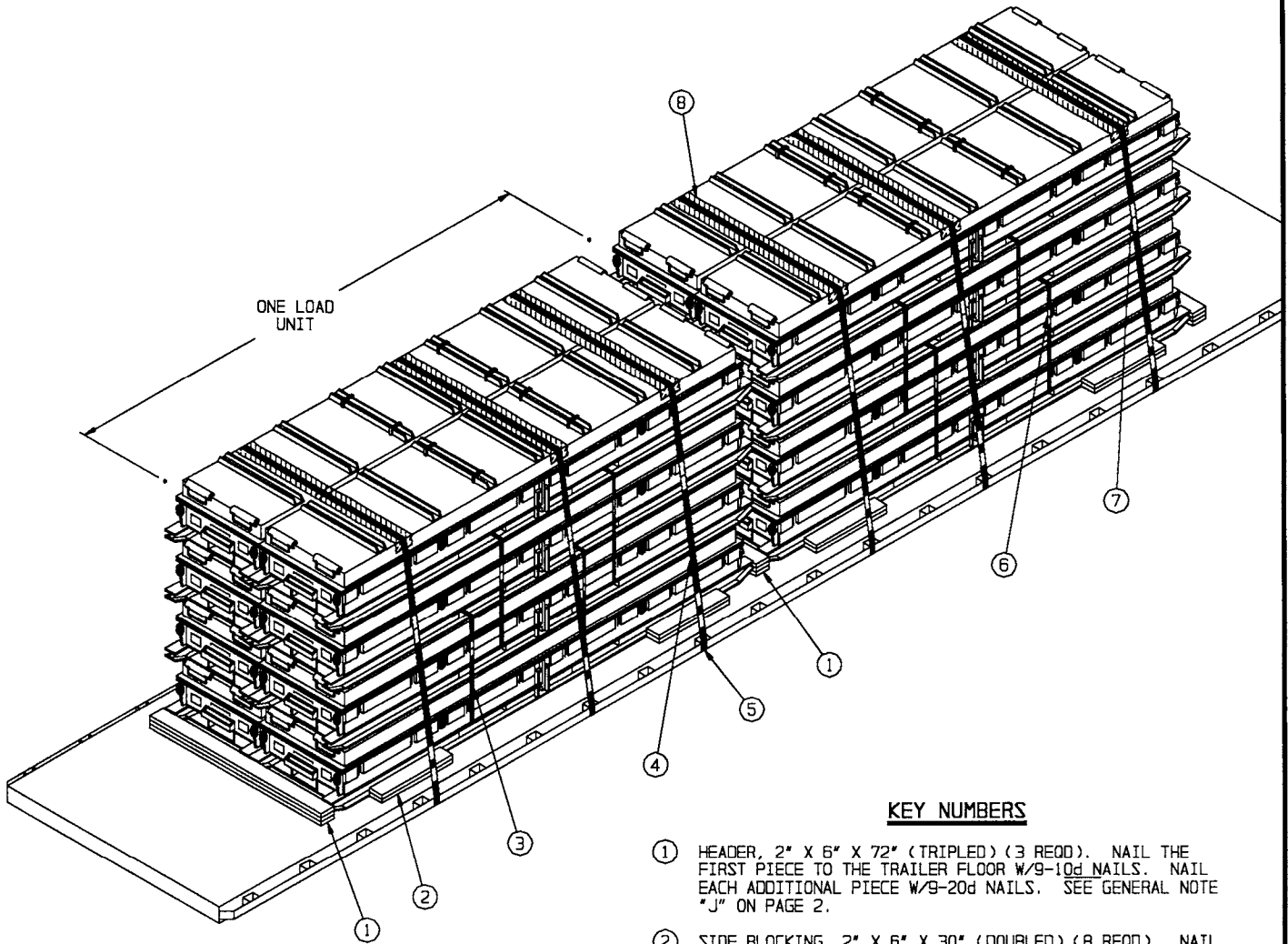
REVISIONS

- REVISION NO. 1, DATED FEBRUARY 1988, CONSISTS OF:
 - 1. REMOVING ANTI-CHAFING MATERIAL REQUIREMENTS WHERE STRAPPING PASSES THROUGH CONTAINER FORKLIFT POCKETS.
- REVISION NO. 2, DATED OCTOBER 1996, CONSISTS OF:
 - 1. ADDING A THIRD STEEL STRAP TO STACK OF EIGHT CONTAINERS IN STEEL STRAP TIEDOWN METHOD.
 - 2. REMOVING BACK-UP CLEATS FROM LOAD DRAWINGS.
 - 3. INCLUDING CHAIN TIEDOWN METHOD DRAWING.
 - 4. ADDING WEB STRAP TIEDOWN METHOD.
 - 5. UPDATING GENERAL NOTES AND DRAWING FORMAT.



CNU-355/E CONTAINER

GROSS WEIGHT - - - - - 2,360 POUNDS (APPROX)
 CUBE - - - - - 82.5 CUBIC FEET (APPROX)



ISOMETRIC VIEW

KEY NUMBERS

- ① HEADER, 2" X 6" X 72" (TRIPLED) (3 REOD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/9-10d NAILS. NAIL EACH ADDITIONAL PIECE W/9-20d NAILS. SEE GENERAL NOTE "J" ON PAGE 2.
- ② SIDE BLOCKING, 2" X 6" X 30" (DOUBLED) (8 REOD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/8-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ③ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 20'-0" LONG STEEL STRAPPING (16 REOD). INSTALL SO AS TO ENCIRCLE THREE CONTAINERS AS SHOWN. SEE GENERAL NOTE "K" ON PAGE 2.
- ④ HOLD-DOWN STRAP. 2" X .050" OR .044" X 26'-0" LONG STEEL STRAPPING (6 REOD). INSTALL EACH STRAP FROM 2 PIECES, ONE 8'-0" LONG AND ONE 18'-0" LONG.
- ⑤ PAD, 2" X .050" OR .044" X 18" LONG STEEL STRAPPING (12 REOD). POSITION UNDER STAKE POCKET OR RUB RAIL AND SEAL TO HOLD-DOWN STRAP MARKED ④. SEE "DETAIL A" ON PAGE 11. ALT: STAKE POCKET PROTECTOR (24 REOD). USE 2 UNDER EACH STAKE POCKET OR RUB RAIL WITH A HOLD-DOWN STRAP. SEE "DETAIL B" ON PAGE 11.
- ⑥ SEAL FOR 1-1/4" STEEL STRAPPING (32 REOD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL.
- ⑦ SEAL FOR 2" STEEL STRAPPING (36 REOD, 6 PER STRAP). DOUBLE CRIMP EACH SEAL, EXCEPT FOR THOSE TO SECURE THE PADS, PIECES MARKED ⑤.
- ⑧ ANTI-CHAFING NEUTRAL BARRIER MATERIAL (AS REOD). PLACE UNDER STRAPPING AT ALL POINTS OF CONTACT WITH THE CONTAINER, EXCEPT WHERE THE UNITIZING STRAP, PIECE MARKED ③, PASSES THROUGH CONTAINER FORKLIFT POCKETS.

SPECIAL NOTES:

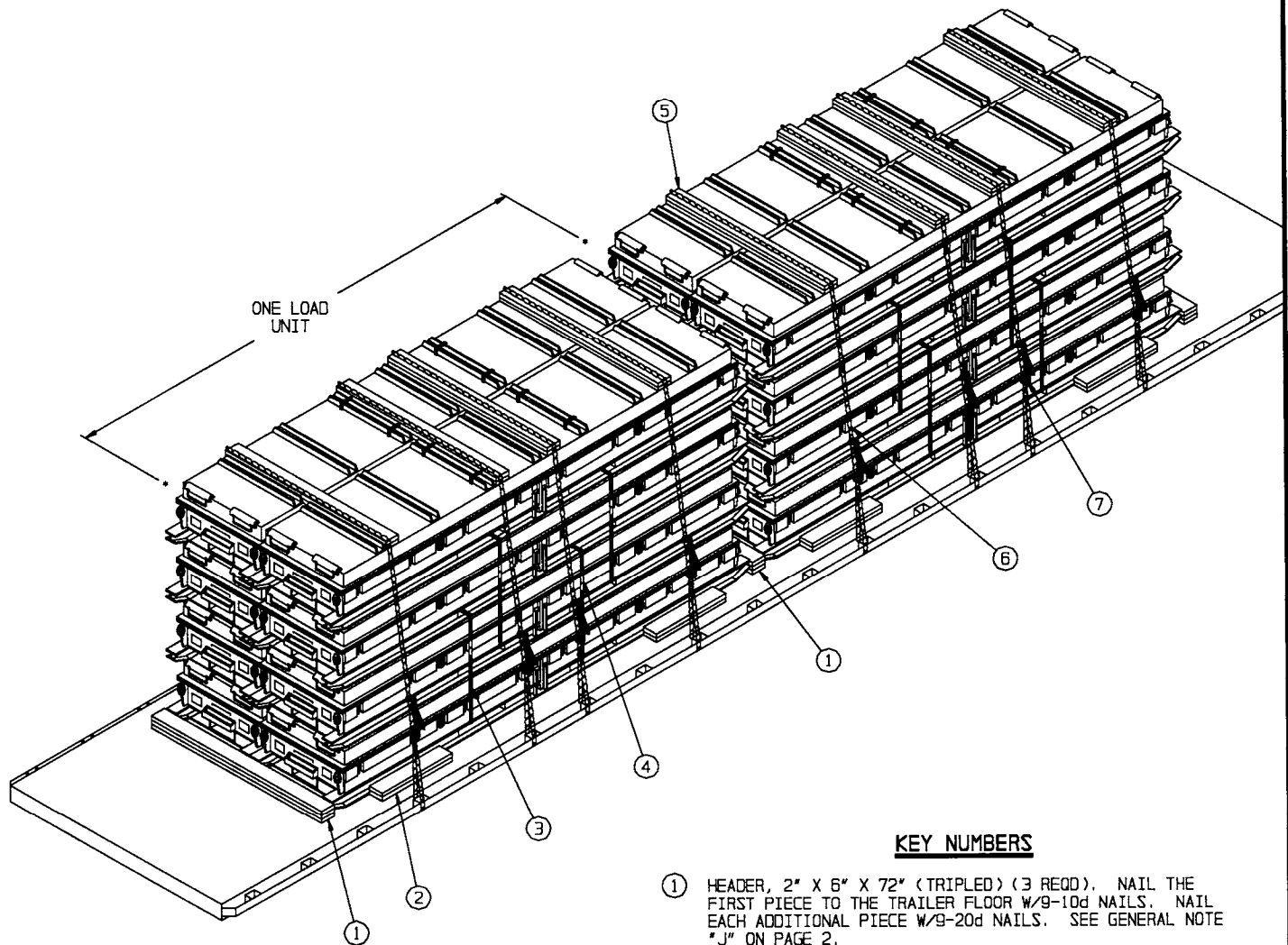
1. A 16-UNIT LOAD IS SHOWN ON A 40'-0" LONG BY 8'-0" WIDE FLATBED TRAILER. THE AVAILABLE NAILING SURFACE OF THE TRAILER BED MUST MEASURE AT LEAST 35'-8" LONG. LONGER TRAILERS BUT NOT SHORTER TRAILERS MAY BE USED. TRAILERS OF OTHER WIDTHS MAY ALSO BE USED.
2. INSTALLATION OF 1-1/4" X .035" OR .031" STEEL STRAPPING:
 - A. POSITION STRAPS SO AS TO ENCIRCLE THE CONTAINERS UTILIZING THE FORKLIFT RECEPTACLES AS SHOWN AND SO THAT THE STRAPPING LAYS FLAT AND STRAIGHT WITH THE BODY SURFACES OF THE CONTAINERS; I.E., VERTICAL ALONG THE SIDES AND FLAT ACROSS THE TOP AND BOTTOM OF THE STACK.
 - B. THE STRAPPING WILL BE FIRMLY TENSIONED. EACH END-OVER-END LAP JOINT WILL BE SEALED WITH TWO SEALS (BUTTED TOGETHER) WITH TWO PAIR OF CRIMPS PER SEAL AS SHOWN IN THE "END-OVER-END LAP JOINT" DETAIL ON PAGE 11. THE LAP JOINT WILL BE MADE ALONG THE SIDE OF THE STACK. EXCESS STRAPPING (STRAP ENDS) SHOULD BE SHOULD BE CUT OFF OR BROKEN OFF NEAR THE JOINT SEALS.
3. IF CAPACITY OF MATERIALS HANDLING EQUIPMENT (MHE) IS ADEQUATE, IT IS RECOMMENDED THAT EACH STACK OF FOUR CONTAINERS BE UNITIZED PRIOR TO LOADING ON THE FLATBED TRAILER. IF THIS IS NOT POSSIBLE, THEN THE UNITIZING STRAPS MUST BE POSITIONED AS LOADING PROGRESSES.
4. PLACE ANTI-CHAFING NEUTRAL BARRIER MATERIAL UNDER THE HOLD-DOWN STRAPPING AT ALL POINTS OF CONTACT WITH THE CONTAINER AND SECURE TO PREVENT DISLODGEEMENT 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. ANTI-CHAFING MATERIAL IS NOT REQUIRED UNDER UNITIZING STRAPS WHICH PASS THROUGH CONTAINER FORKLIFT POCKETS.
5. IF CHAINS AND LOAD BINDERS ARE TO BE USED FOR LOAD SECUREMENT, REFER TO THE PROCEURES ON PAGES 6 AND 7 FOR GUIDANCE.
6. IF WEB STRAP TIEDOWNS ARE TO BE USED FOR LOAD SECUREMENT, REFER TO THE PROCEURES ON PAGES 8 AND 9 FOR GUIDANCE.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 6"	94	94
NAILS	NO. REOD	POUNDS
10d (3")	155	2-1/2
20d (4")	54	2
STEEL STRAPPING, 1-1/4" --	320' REOD --	45-3/4 LBS
STEEL STRAPPING, 2" --	174' REOD --	58 LBS
SEAL FOR 1-1/4" STRAPPING --	32 REOD --	1-1/4 LBS
SEAL FOR 2" STRAPPING --	36 REOD --	7-1/4 LBS
ANTI-CHAFING MATERIAL --	AS REOD --	NIL

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER	16	37,760 LBS
DUNNAGE		305 LBS
TOTAL WEIGHT		38,065 LBS (APPROX)



ISOMETRIC VIEW

KEY NUMBERS

- ① HEADER, 2" X 6" X 72" (TRIPLED) (3 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/9-10d NAILS. NAIL EACH ADDITIONAL PIECE W/9-20d NAILS. SEE GENERAL NOTE "J" ON PAGE 2.
- ② SIDE BLOCKING, 2" X 6" X 30" (DOUBLED) (8 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/8-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ③ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 20'-0" LONG STEEL STRAPPING (16 REQD). INSTALL SO AS TO ENCIRCLE THREE CONTAINERS AS SHOWN. SEE GENERAL NOTE "K" ON PAGE 2.
- ④ SEAL FOR 1-1/4" STEEL STRAPPING (32 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL.
- ⑤ CHAIN BOARD 2" X 6" X 68" (DOUBLED) (8 REQD). LAMINATE W/6-10d NAILS.
- ⑥ CHAIN, BINDING, 5/16", GRADE 70 BY A LENGTH TO SUIT (8 REQD). POSITION AS SHOWN. ATTACH TO A TRAILER STAKE POCKET. DO NOT ATTACH TO A RUB RAIL. 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 Ⓞ, TO THE CHAIN BOARD, PIECE MARKED ⑤, W/1-20d NAIL AT EACH END BY DRIVING EACH NAIL INTO THE CHAIN BOARD THRU AN OPENING IN A CHAIN LINK AND BENDING IT OVER THE LINK.

SPECIAL NOTES:

1. A 16-UNIT LOAD IS SHOWN ON A 40'-0" LONG BY 8'-0" WIDE FLATBED TRAILER. THE AVAILABLE NAILING SURFACE OF THE TRAILER BED MUST MEASURE AT LEAST 35'-8" LONG. LONGER TRAILERS BUT NOT SHORTER TRAILERS MAY BE USED. TRAILERS OF OTHER WIDTHS MAY ALSO BE USED.
2. INSTALLATION OF 1-1/4" X .035" OR .031" STEEL STRAPPING:
 - A. POSITION STRAPS SO AS TO ENCIRCLE THE CONTAINERS UTILIZING THE FORKLIFT RECEPTACLES AS SHOWN AND SO THAT THE STRAPPING LAYS FLAT AND STRAIGHT WITH THE BODY SURFACES OF THE CONTAINERS; I.E., VERTICAL ALONG THE SIDES AND FLAT ACROSS THE TOP AND BOTTOM OF THE STACK.
 - B. THE STRAPPING WILL BE FIRMLY TENSIONED. EACH END-OVER-END LAP JOINT WILL BE SEALED WITH TWO SEALS (BUTTED TOGETHER) WITH TWO PAIR OF CRIMPS PER SEAL AS SHOWN IN THE "END-OVER-END LAP JOINT" DETAIL ON PAGE 11. THE LAP JOINT WILL BE MADE ALONG THE SIDE OF THE STACK. EXCESS STRAPPING (STRAP ENDS) SHOULD BE SHOULD BE CUT OFF OR BROKEN OFF NEAR THE JOINT SEALS.
3. IF CAPACITY OF MATERIALS HANDLING EQUIPMENT (MHE) IS ADEQUATE, IT IS RECOMMENDED THAT EACH STACK OF FOUR CONTAINERS BE UNITIZED PRIOR TO LOADING ON THE FLATBED TRAILER. IF THIS IS NOT POSSIBLE, THEN THE UNITIZING STRAPS MUST BE POSITIONED AS LOADING PROGRESSES.
4. IF STEEL STRAPPING IS TO BE USED FOR LOAD SECUREMENT REFER TO THE PROCEDURES ON PAGES 4 AND 5 FOR GUIDANCE.
5. IF WEB STRAP TIEDOWNS ARE TO BE USED FOR LOAD SECUREMENT, REFER TO THE PROCEDURES ON PAGES 8 AND 9 FOR GUIDANCE.

SPECIAL PROVISIONS FOR CHAIN TIEDOWN

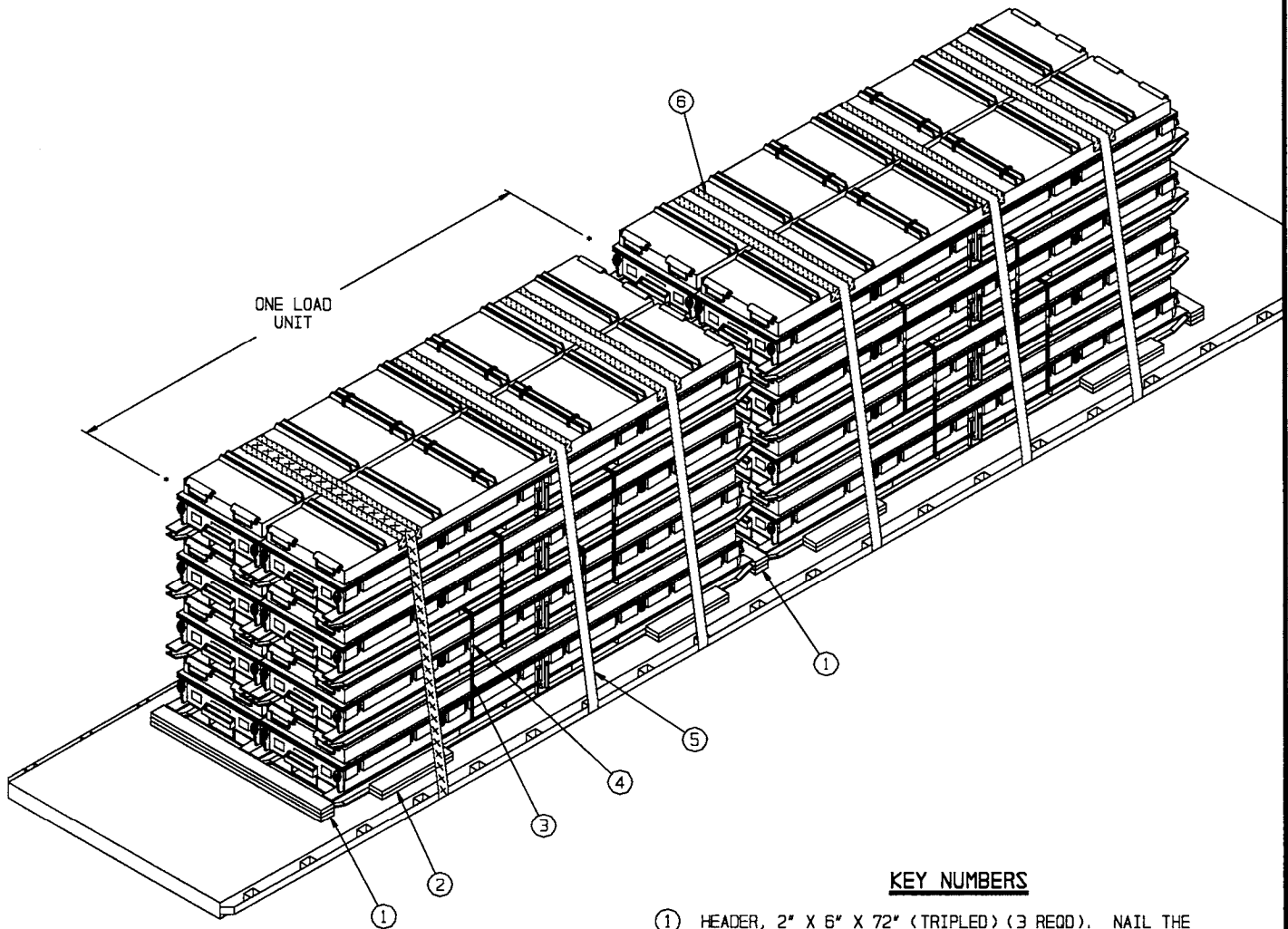
LADING MAY BE SECURED TO THE FLATBED TRAILER BY CARRIER-OWNED CHAINS AND LOAD BINDERS IN LIEU OF SPECIFIED STRAPPING, PROVIDED THE FOLLOWING CONDITIONS ARE MET AND THE PROCEDURES CONTAINED ON PAGES 6 AND 7 ARE FOLLOWED.

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.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 6"	185	185
NAILS	NO. REQD	POUNDS
10d (3")	203	3-1/4"
20d (4")	70	2-1/2"
STEEL STRAPPING, 1-1/4"	320' REQD	45-3/4 LBS
SEAL FOR 1-1/4" STRAPPING	32 REQD	1-1/4 LBS
CHAIN, BINDING, 5/16"	172' REQD	207 LBS
LOAD BINDER	8 REQD	48 LBS

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER	16	37,760 LBS
DUNNAGE		678 LBS
TOTAL WEIGHT		38,438 LBS (APPROX)



ISOMETRIC VIEW

KEY NUMBERS

- ① HEADER, 2" X 6" X 72" (TRIPLED) (3 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/9-10d NAILS. NAIL EACH ADDITIONAL PIECE W/9-20d NAILS. SEE GENERAL NOTE "J" ON PAGE 2.
- ② SIDE BLOCKING, 2" X 6" X 30" (DOUBLED) (8 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/8-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ③ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 20'-0" LONG STEEL STRAPPING (16 REQD). INSTALL SO AS TO ENCIRCLE THREE CONTAINERS AS SHOWN. SEE GENERAL NOTE "K" ON PAGE 2.
- ④ SEAL FOR 1-1/4" STEEL STRAPPING (32 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL.
- ⑤ WEB STRAP ASSEMBLY (6 REQD, 3 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.
- ⑥ ANTI-CHAFING, NEUTRAL BARRIER MATERIAL (AS REQD). PLACE UNDER WEB STRAPPING AT ALL POINTS OF CONTACT WITH THE CONTAINER.

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"	94	94
NAILS	NO. REQD	POUNDS
12d (3")	155	2-1/2
20d (3-1/2")	54	2
STEEL STRAPPING, 1-1/4"	-- 320' REQD	-- 45-3/4 LBS
SEAL FOR 1-1/4" STRAPPING	-- 32 REQD	-- 1-1/4 LBS
WEB STRAP ASSEMBLIES	-----	6 REQD
ANTI-CHAFING MATERIAL	-----	NIL

SPECIAL NOTES:

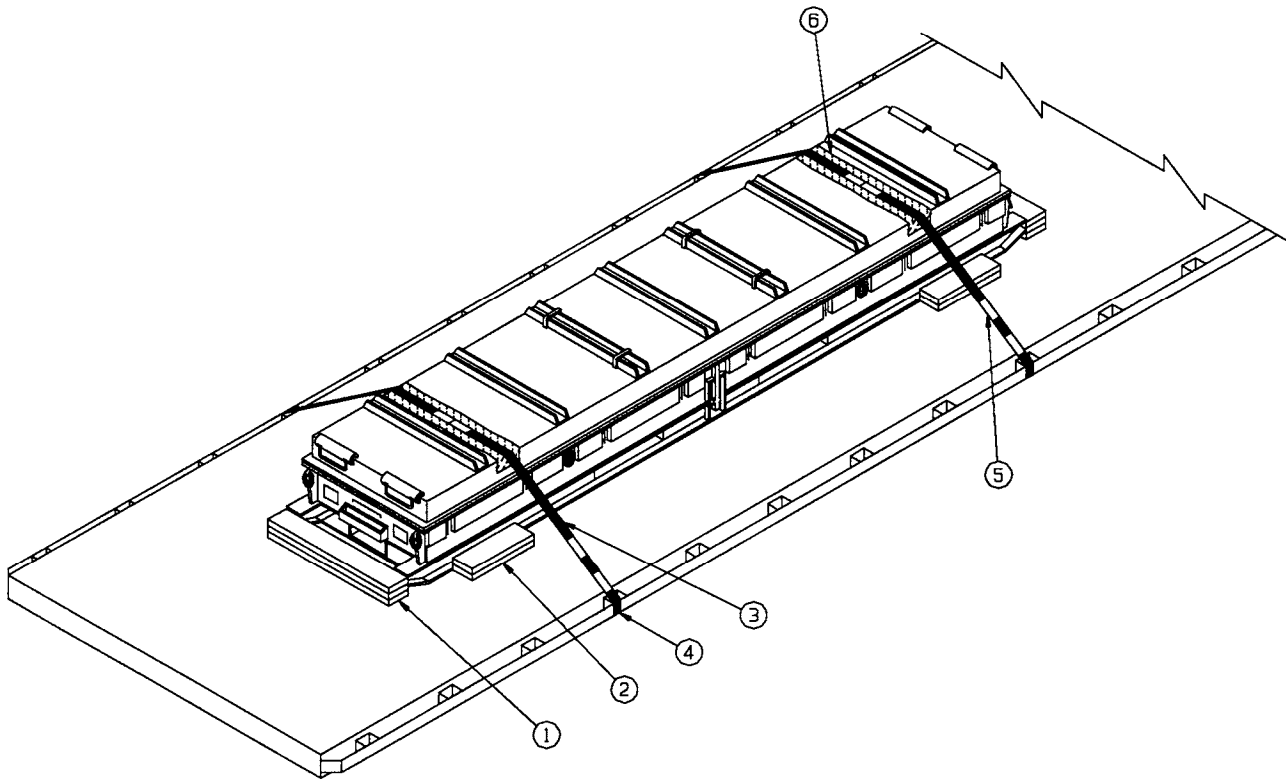
1. A 16-UNIT LOAD IS SHOWN ON A 40'-0" LONG BY 8'-0" WIDE FLATBED TRAILER. THE AVAILABLE NAILING SURFACE OF THE TRAILER BED MUST MEASURE AT LEAST 35'-8" LONG. LONGER TRAILERS BUT NOT SHORTER TRAILERS MAY BE USED. TRAILERS OF OTHER WIDTHS MAY ALSO BE USED.
2. INSTALLATION OF 1-1/4" X .035" OR .031" STEEL STRAPPING:
 - A. POSITION STRAPS SO AS TO ENCIRCLE THE CONTAINERS UTILIZING THE FORKLIFT RECEPTACLES AS SHOWN AND SO THAT THE STRAPPING LAYS FLAT AND STRAIGHT WITH THE BODY SURFACES OF THE CONTAINERS; I.E., VERTICAL ALONG THE SIDES AND FLAT ACROSS THE TOP AND BOTTOM OF THE STACK.
 - B. THE STRAPPING WILL BE FIRMLY TENSIONED. EACH END-OVER-END LAP JOINT WILL BE SEALED WITH TWO SEALS (BUTTED TOGETHER) WITH TWO PAIR OF CRIMPS PER SEAL AS SHOWN IN THE "END-OVER-END LAP JOINT" DETAIL ON PAGE 11. THE LAP JOINT WILL BE MADE ALONG THE SIDE OF THE STACK. EXCESS STRAPPING (STRAP ENDS) SHOULD BE SHOULD BE CUT OFF OR BROKEN OFF NEAR THE JOINT SEALS.
3. IF CAPACITY OF MATERIALS HANDLING EQUIPMENT (MHE) IS ADEQUATE, IT IS RECOMMENDED THAT EACH STACK OF FOUR CONTAINERS BE UNITIZED PRIOR TO LOADING ON THE FLATBED TRAILER. IF THIS IS NOT POSSIBLE, THEN THE UNITIZING STRAPS MUST BE POSITIONED AS LOADING PROGRESSES.
4. PLACE ANTI-CHAFING NEUTRAL BARRIER MATERIAL UNDER THE WEB STRAPPING AT ALL POINTS OF CONTACT WITH THE CONTAINER AND SECURE TO PREVENT DISLODGEEMENT 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. ANTI-CHAFING MATERIAL IS NOT REQUIRED UNDER UNITIZING STRAPS WHICH PASS THROUGH CONTAINER FORKLIFT POCKETS.
5. IF STEEL STRAPPING IS TO BE USED FOR LOAD SECUREMENT, REFER TO THE PROCEUDRES ON PAGES 4 AND 5 FOR GUIDANCE.
6. IF CHAINS AND LOAD BINDERS ARE TO BE USED FOR LOAD SECUREMENT, REFER TO THE PROCEDURES ON PAGES 6 AND 7 FOR GUIDANCE.

(SPECIAL PROVISIONS FOR WEB STRAP TIE DOWN 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	----- 16	----- 37,760 LBS
DUNNAGE	-----	----- 240 LBS
TOTAL WEIGHT		----- 38,000 LBS (APPROX)



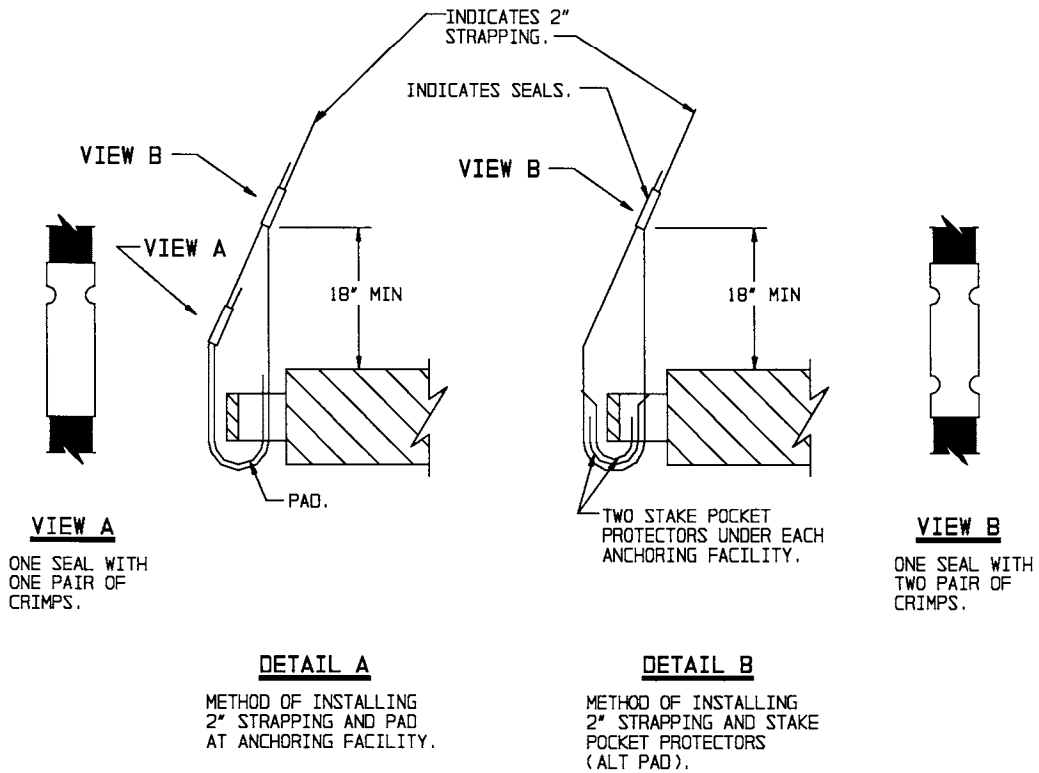
ISOMETRIC VIEW

SPECIAL NOTES:

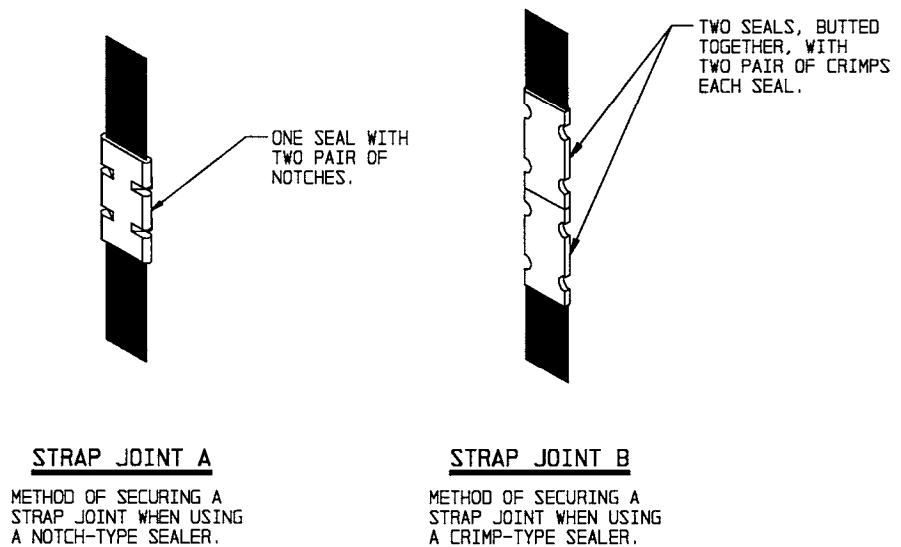
1. THE LTL LOAD ABOVE DEPICTS A 1-CONTAINER LOAD ON AN 8'-0" WIDE FLATBED TRAILER HAVING A NAILABLE FLOOR.
2. REFER TO "SPECIAL PROVISIONS FOR CHAIN TIEDOWN" ON PAGE 7 OR "SPECIAL PROVISIONS FOR WEB STRAP TIEDOWN" WHICH MAY BE USED IN LIEU OF HOLD-DOWN STRAPPING.

KEY NUMBERS

- ① HEADER, 2" X 6" X 35" (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-10d NAILS. NAIL EACH ADDITIONAL PIECE W/5-20d NAILS. SEE GENERAL NOTE "J" ON PAGE 2.
- ② SIDE BLOCKING, 2" X 6" X 18" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/4-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ③ HOLD-DOWN STRAP, 2" X .044" OR .050" X 14'-0" LONG STEEL STRAPPING (2 REQD). INSTALL EACH STRAP FROM TWO 7'-0" LONG PIECES. SEE GENERAL NOTE "K" ON PAGE 2.
- ④ PAD, 2" X .044" OR .050" X 18" LONG STEEL STRAPPING (4 REQD). POSITION UNDER STAKE POCKET OF RUB RAIL AND SEAL TO THE HOLD-DOWN STRAP MARKED ③. SEE "DETAIL A" ON PAGE 11. ALT: STAKE POCKET PROTECTOR (8 REQD). USE TWO 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 FOR THOSE USED TO SECURE THE PADS, PIECES MARKED ④.
- ⑥ ANTI-CHAFING, NEUTRAL BARRIER MATERIAL (AS REQD). PLACE UNDER STRAPPING AT ALL POINTS OF CONTACT WITH 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 WITHIN APPROVED AMC 19-48 SERIES FLATBED TRAILER UNLOADING DRAWINGS, 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.

4. 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.