

THAAD

LOADING AND TIEDOWN ON M1000 AND M870A3 TACTICAL FLATBED TRAILER* OF TERMINAL HIGH ALTI- TITUDE AREA DEFENSE (THAAD) MISSILE PACKED IN MISSILE ROUND (MR) CONTAINER ON MISSILE ROUND PALLET – TRANSPORTABLE (MRP-T)

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DISTRIBUTION STATEMENT A:

APPROVED FOR PUBLIC RELEASE
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***CAUTION:** THE OUTLOADING PROCEDURES SHOWN HEREIN ARE ONLY APPLICABLE
TO HIGHWAY MOVEMENTS, NOT TRAILER-ON-FLATCAR(TOFC) MOVEMENTS.

U.S. ARMY MATERIEL COMMAND DRAWING

<p style="text-align: center;">APPROVED, U.S. ARMY AVIATION AND MISSILE COMMAND</p> <p>DEGURSE.DANA.M ARLENE.13993885 00</p> <p style="font-size: small;">Digitally signed by DEGURSE.DANA.MARLENE.139 9388500 Date: 2022.09.15 14:01:09 -05'00'</p>	<p>CAUTION: VERIFY PRIOR TO USE AT https://www.dau.edu/cop/ammo/Pages/Default.aspx THAT THIS IS THE MOST CURRENT VERSION OF THIS DOCUMENT. THIS IS PAGE 1 OF 10.</p>			
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<p style="text-align: center;">APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND</p> <p>BRAILSFORD.KEIT H.ANTHONY.10286 55661</p> <p style="font-size: small;">Digitally signed by BRAILSFORD.KEITH.ANTHONY. 1028655661 Date: 2022.09.16 14:37:52 -05'00'</p> <p style="text-align: center;">DEFENSE AMMUNITION CENTER</p>	REVISION NO. 2		AUGUST 2022	
	SEE THE REVISION LISTING ON PAGE 2			
	CLASS	DIVISION	DRAWING	FILE
	19	48	8250	GM17TH2

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 THAAD MISSILE PACKED IN MISSILE ROUND (MR) CONTAINER, PACKED ON MISSILE ROUND PALLET – TRANSPORTABLE (MRP-T). SUBSEQUENT REFERENCE TO CONTAINER MEANS THE CONTAINER WITH MISSILE ITEMS. SEE PAGE 3 AND TB 9-1427-610-50-1 SECTION VIII FOR DETAILS OF THE MRP-T AND THE HANDLING AND TRANSPORTATION PROCEDURES.
- C. THE LOAD AS SHOWN HEREIN IS BASED ON A 51'-10" LONG BY 12'-0" WIDE M1000 TACTICAL TRAILER, WITH DECK LENGTH OF 34'-9" AND WIDTH OF 10'-0", AND A 45'-3" LONG BY 8'-6" WIDE M870A3 TACTICAL TRAILER, WITH DECK LENGTH OF 33'-5". OTHER VARIATIONS OF THE M1000 AND M870A3 TRAILERS MAY BE USED, PROVIDED THE TRAILERS ARE CONFIGURED IN A WAY THAT WILL ACCOMMODATE THE MRP-T AND THE CHAIN TIEDOWN REQUIREMENTS. **CAUTION:** MRP-T CAN ONLY BE LOADED ON THE M870A3 TRAILER, OTHER M870 TRAILER VARIANTS ARE NOT APPROVED FOR USE.
- D. THE APPROVED METHODS SHOWN HEREIN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING AND TIEDOWN OF THE DESIGNATED ITEM. **NOTICE:** A SHIPMENT WILL BE POSITIONED ON A TRAILER CONSISTENT WITH STATE WEIGHT LAWS.
- E. 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.
- 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. 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.
- H. THESE PROCEDURES CAN ALSO BE UTILIZED FOR THE SHIPMENT OF THE CONTAINERS WHEN THEY ARE LOADED WITH AN ITEM WHICH IS IDENTIFIED DIFFERENTLY BY NOMENCLATURE THAN THE ITEM IDENTIFIED IN THE DRAWING TITLE, OR WHEN THEY ARE EMPTY.

(CONTINUED AT RIGHT)

(GENERAL NOTES CONTINUED)

- J. THE TRANSPORTING VEHICLE OPERATOR SHOULD BE INSTRUCTED TO PERIODICALLY INSPECT THE CHAINS AND LOAD BINDERS DURING TRANSIT AND TIGHTEN IF NECESSARY.
- 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 DETAILS ON PAGE 10 FOR GUIDANCE.
- L. 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.
- M. 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.

MATERIAL SPECIFICATIONS

- LUMBER** - - - - - : SEE TM 743-200-1 (DUNNAGE LUMBER) AND VOLUNTARY PRODUCT STANDARD PS 20.
- CHAIN, M1000** - - - - : 4010-01-361-8378, 1/2", 7 FT LONG; OR 4010-01-371-5772, 1/2", 11 FT LONG; OR 4010-01-385-5974, 1/2", 19 FT LONG.
- CHAIN, M870A3** - - - - : 4010-00-443-4845, 3/8", 14.5 FT LONG.
- LOAD BINDER, M1000** - - - - : 3990-01-626-8740, 1/2".
- LOAD BINDER, M870A3** - - - - : 3990-01-213-1746, 3/8".
- TIEDOWN SHACKLE** - - - - : 4030-01-605-7652, 1-1/8" DIA, 12 TON; OR 4030-01-398-6693, 1-3/8" DIA, 13-1/2 TON; SEE FED SPEC RR-C-271.
- STRAPPING, STEEL** - - - - : ASTM D3953; FLAT STRAPPING, TYPE 1, HEAVY DUTY, FINISH A, B (GRADE 2), OR C.
- SEAL, STRAP** - - - - : ASTM D3953; CLASS H, FINISH A, B (GRADE 2), OR C, DOUBLE NOTCH TYPE, STYLE I, II, OR IV.
- WIRE, CARBON STEEL** - - - - : ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, 0.0800" DIA, GRADE 1006 OR BETTER.

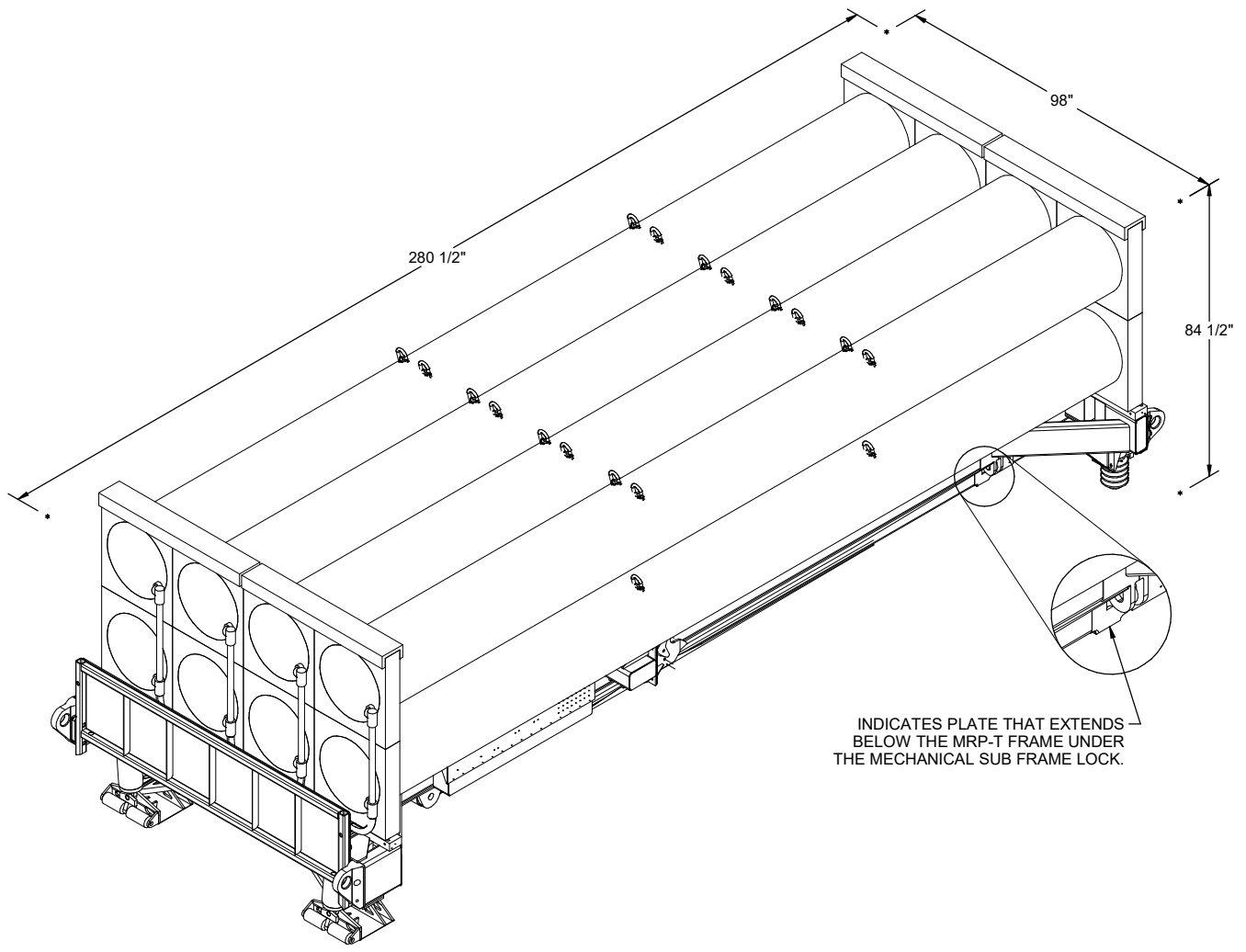
REVISIONS

REVISION NO. 1, DATED JUNE 2018, CONSISTS OF:

1. ADDING LOADING AND TIEDOWN PROCEDURES FOR MRP-T ON M870A3 FLATBED TRAILER.
2. UPDATING CHAIN TIEDOWNS FOR M1000 AND M870A3 TRAILER LOADS.
3. ADDING GHOST SHORING TO M1000 TRAILER LOAD.
4. ADDING DETAILS FOR BLOCKING ASSEMBLY, REAR DECK SHORING, AND LOADING RAMP.

REVISION NO. 2, DATED AUGUST 2022, CONSISTS OF:

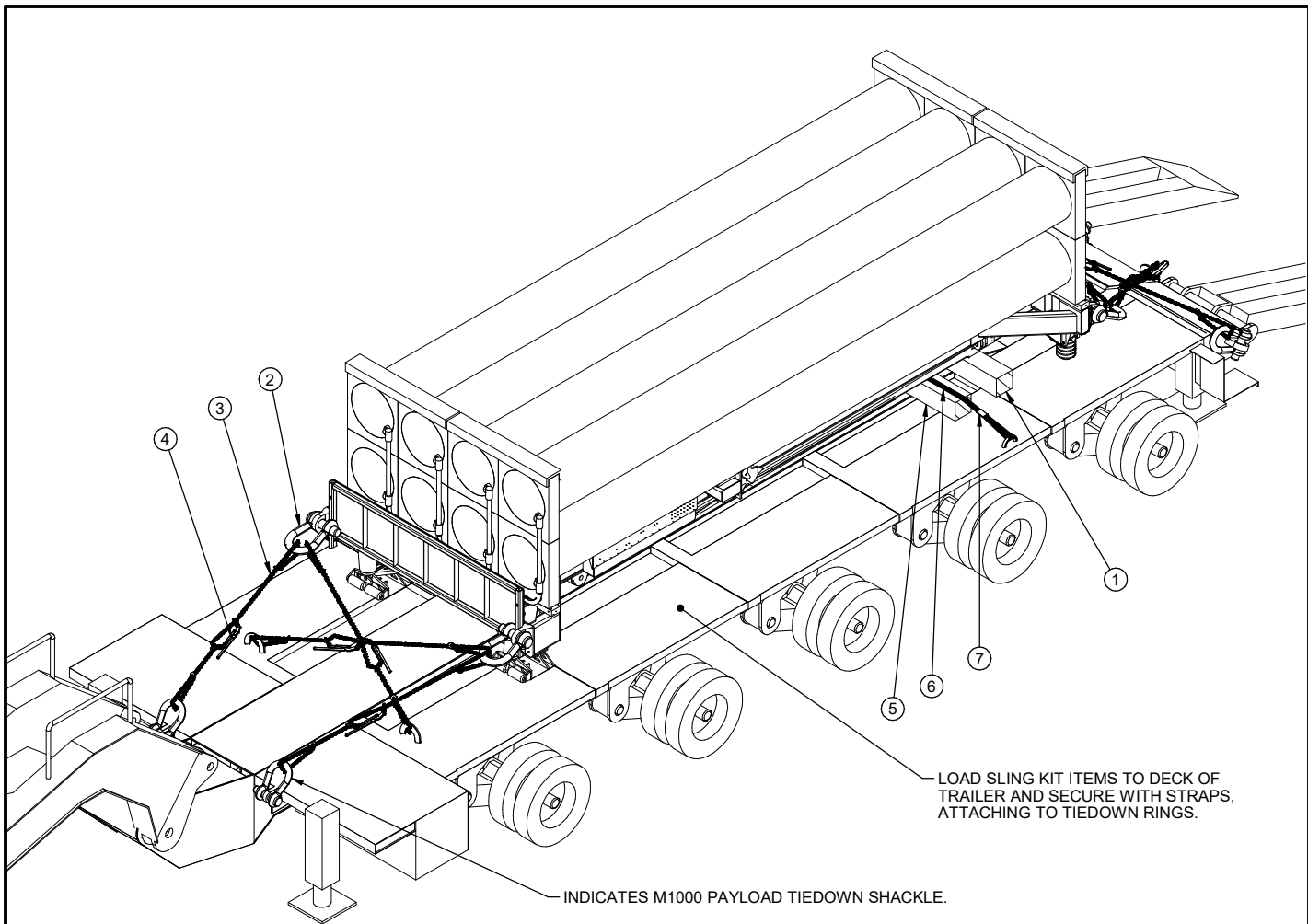
- ADDING "DISTRIBUTION STATEMENT A" TO COVER PAGE.



INDICATES AFT
END OF CONTAINERS

MRP-T LOADED DETAIL

GROSS WEIGHT - - - - - 27,783 LBS (APPROX)
 CUBE - - - - - 1,337 CU FT (APPROX)



ISOMETRIC VIEW

KEY NUMBERS

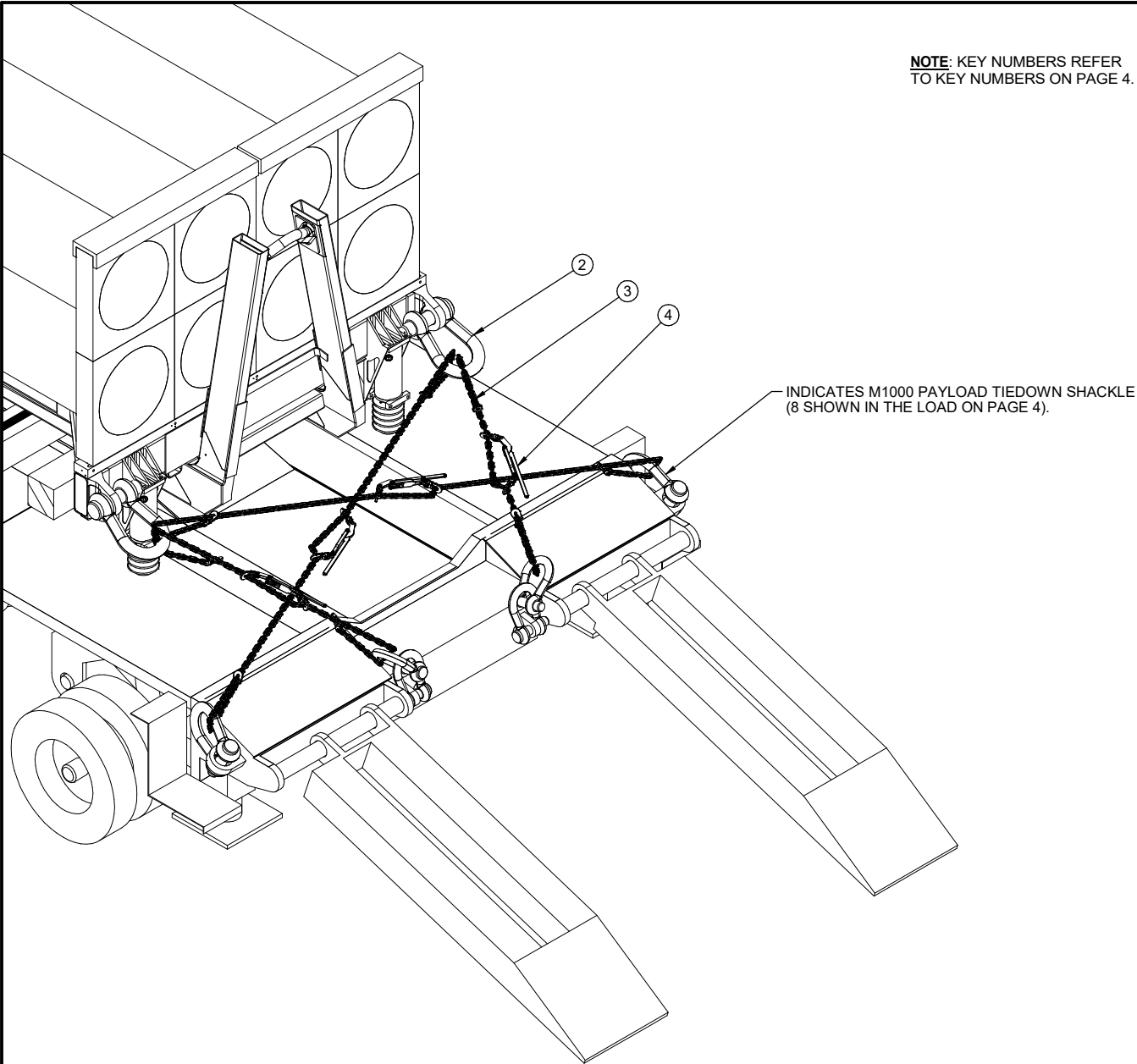
- ① BLOCKING, 8" X 8" X 6'-0" (1 REQD). POSITION UNDER THE FRAME CENTERED ON THE PLATE THAT EXTENDS BELOW THE MRP-T FRAME UNDER THE MECHANICAL SUBFRAME LOCK AS THE MRP-T IS PLACED ON TRAILER.
- ② MRP-T TIEDOWN SHACKLE (4 REQD). INSTALL THE MRP-T SLING KIT SHACKLE TO THE MRP-T TIEDOWN POINT. SEE TB 9-1427-610-50-1 FOR FURTHER DETAILS.
- ③ CHAIN, M1000, 1/2" BY A LENGTH TO SUIT (REF: 12'-0") (8 REQD). POSITION AS SHOWN ABOVE AND ON PAGE 5, FASTENING GRABHOOKS TO MRP-T SHACKLES AND M1000 TRAILER TIEDOWN FITTING OR SHACKLE. SEE THE "SPECIAL PROVISIONS FOR CHAIN TIEDOWN" ON PAGE 10.
- ④ LOAD BINDER, M1000, 1/2" (8 REQD, 1 PER CHAIN). WIRE TIE HANDLE TO PREVENT OPENING DURING TRANSPORT. SEE THE "SPECIAL PROVISIONS FOR CHAIN TIEDOWN" ON PAGE 10.
- ⑤ GHOST SHORING, 8" X 8" X 6'-0" (1 REQD). PLACE APPROXIMATELY 12" FROM PREVIOUSLY INSTALLED BLOCKING, ADJUSTING POSITION AS NECESSARY TO ACCOMMODATE STRAP.
- ⑥ STRAP, 2" X .035" OR .031" X 12'-0" LONG STEEL STRAPPING (1 REQD). INSTALL OVER GHOST SHORING AND UNDER MRP-T FRAME. FASTEN TO CLOSEST TIEDOWN FITTING WITH ONE SEAL ON EACH SIDE OF TRAILER. STRAP MAY BE COMPOSED OF TWO OR MORE PIECES, WITH EACH ADDITIONAL JOINT SEALED WITH ONE SEAL SECURED WITH TWO PAIR OF NOTCHES.
- ⑦ SEAL FOR 2" STEEL STRAPPING (2 REQD). SECURE EACH SEAL WITH TWO PAIR OF NOTCHES. SEE THE END-OVER-END LAP JOINT DETAILS ON PAGE 10.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
8" X 8"	12	64
CHAIN, M1000, 1/2"	8 REQD	169 LBS
LOAD BINDER, M1000, 1/2"	8 REQD	48 LBS
SHACKLE, MRP-T SLING KIT	4 REQD	80 LBS
STEEL STRAPPING, 2"	12' REQD	4 LBS
SEAL FOR 2" STRAPPING	2 REQD	NIL
WIRE, .0800" DIA	AS REQD	NIL

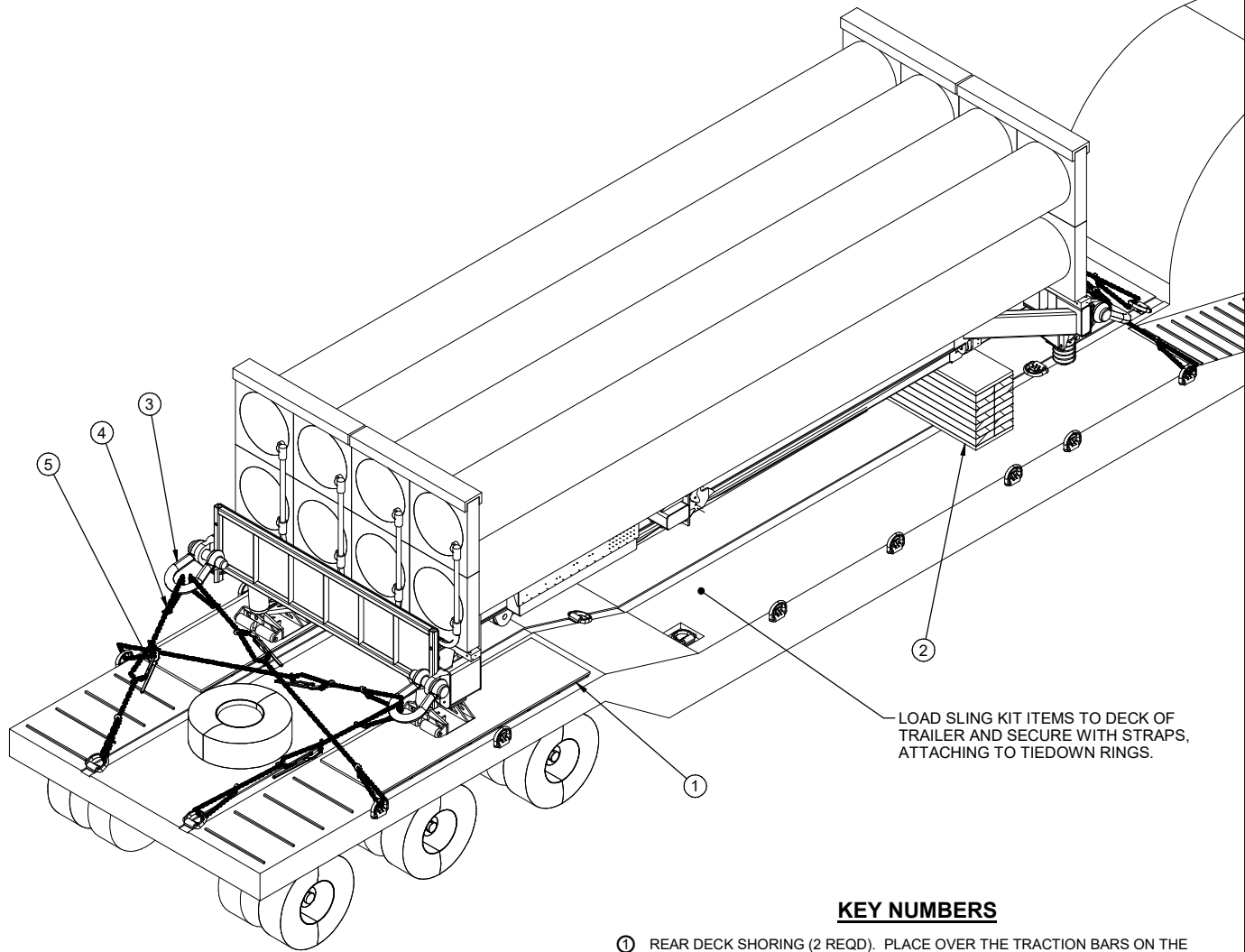
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
MRP-T LOADED	1	27,783 LBS
SLING KIT		1,200 LBS
DUNNAGE		429 LBS
TOTAL WEIGHT		29,412 LBS (APPROX)

NOTE: KEY NUMBERS REFER TO KEY NUMBERS ON PAGE 4.



CHAIN POSITIONING FOR MRP-T ON M1000 TACTICAL TRAILER (REAR)



ISOMETRIC VIEW

KEY NUMBERS

- ① REAR DECK SHORING (2 REQD). PLACE OVER THE TRACTION BARS ON THE REAR DECK. SEE "REAR DECK SHORING" DETAILS ON PAGE 8.
- ② BLOCKING ASSEMBLY (1 REQD). POSITION UNDER THE FRAME CENTERED ON THE PLATE THAT EXTENDS BELOW THE MRP-T FRAME UNDER THE MECHANICAL SUBFRAME LOCK AS THE MRP-T IS PLACED ON TRAILER. SEE "BLOCKING ASSEMBLY" DETAILS ON PAGE 8.
- ③ MRP-T TIEDOWN SHACKLE (4 REQD). INSTALL THE MRP-T SLING KIT SHACKLE TO THE MRP-T TIEDOWN POINT. SEE TB 9-1427-610-50-1 FOR FURTHER DETAILS.
- ④ CHAIN, M870A3, 3/8" BY A LENGTH TO SUIT (REF: 12'-0") (8 REQD). POSITION AS SHOWN ABOVE AND ON PAGE 9, FASTENING GRABHOOKS TO MRP-T SHACKLE AND M870A3 TRAILER SHACKLE. SEE THE "SPECIAL PROVISIONS FOR CHAIN TIEDOWN" ON PAGE 10.
- ⑤ LOAD BINDER, M870A3, 3/8" (8 REQD, 1 PER CHAIN). WIRE TIE HANDLE TO PREVENT OPENING DURING TRANSPORT. SEE THE "SPECIAL PROVISIONS FOR CHAIN TIEDOWN" ON PAGE 10.

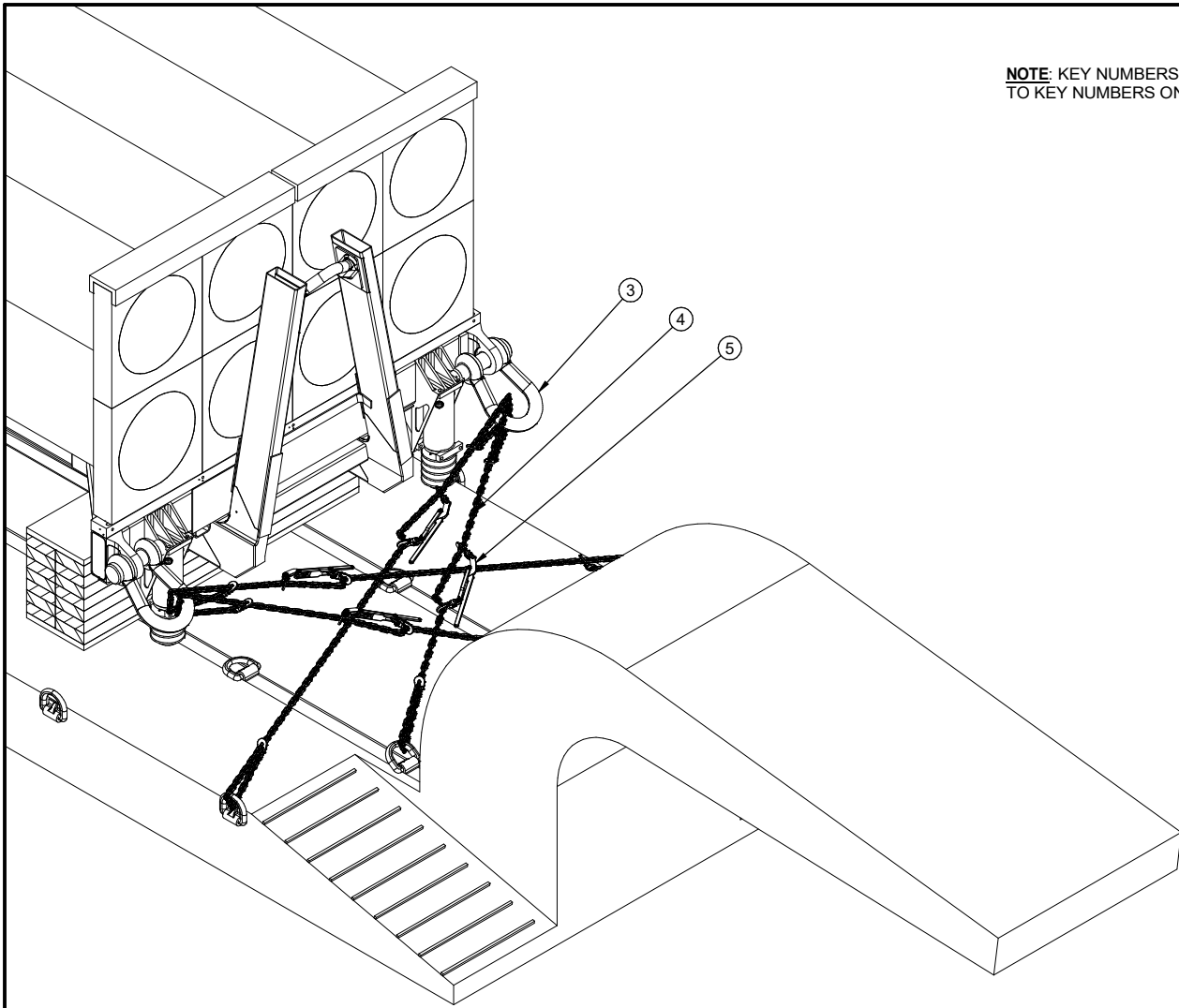
BILL OF MATERIAL

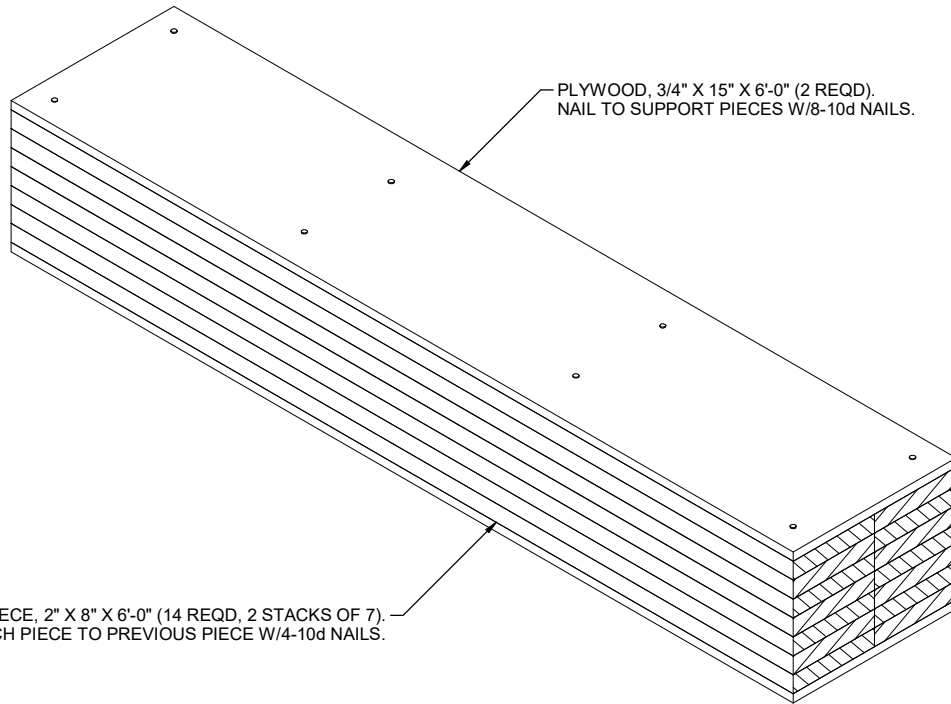
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	72	48
2" X 8"	84	112
NAILS	NO. REQD	POUNDS
6d (2")	92	1/2
10d (3")	210	3-1/4
PLYWOOD, 1/2"-	39.2 SQ FT REQD	54 LBS
PLYWOOD, 3/4"-	43.7 SQ FT REQD	90 LBS
CHAIN, M870A3, 3/8"-	8 REQD	169 LBS
LOAD BINDER, M870A3, 3/8"-	8 REQD	48 LBS
SHACKLE, MRP-T SLING KIT	4 REQD	80 LBS
WIRE, .0800" DIA	AS REQD	NIL

LOAD AS SHOWN

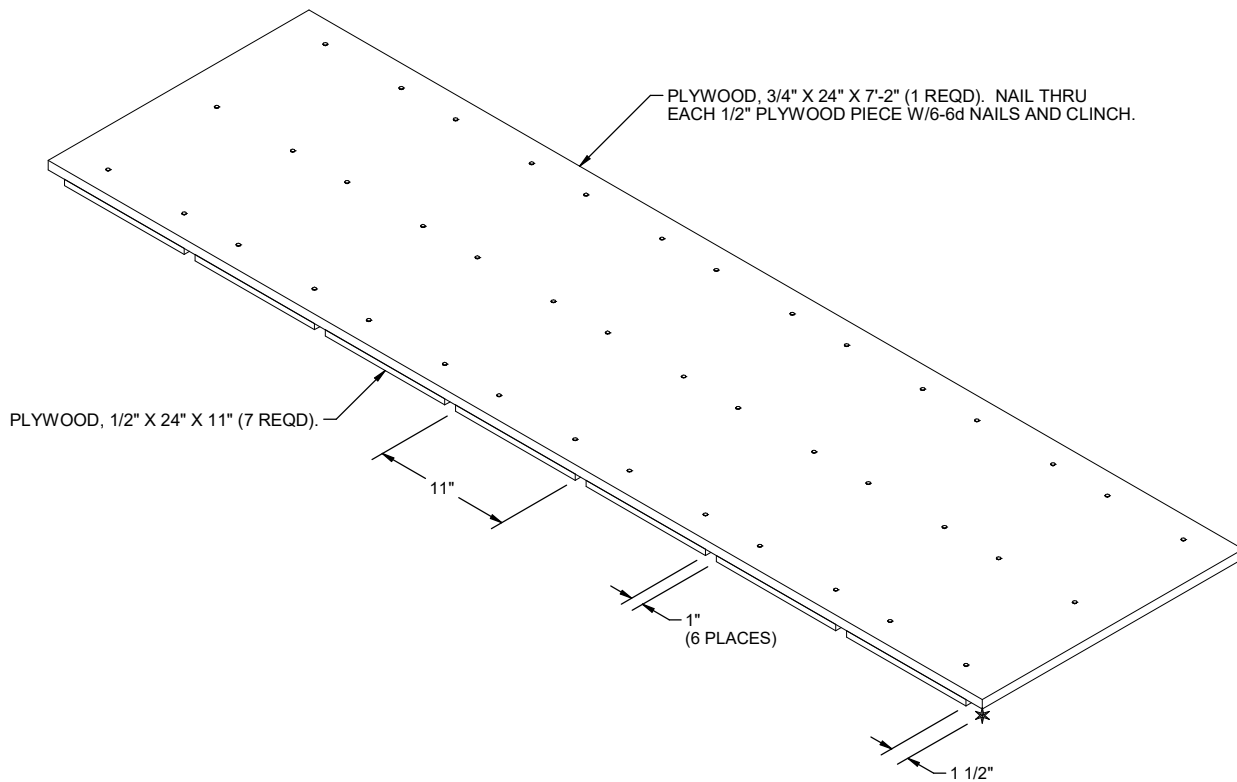
ITEM	QUANTITY	WEIGHT (APPROX)
MRP-T LOADED	1	27,783 LBS
SLING KIT		1,200 LBS
DUNNAGE		764 LBS
TOTAL WEIGHT		29,747 LBS (APPROX)

NOTE: KEY NUMBERS REFER TO KEY NUMBERS ON PAGE 6.

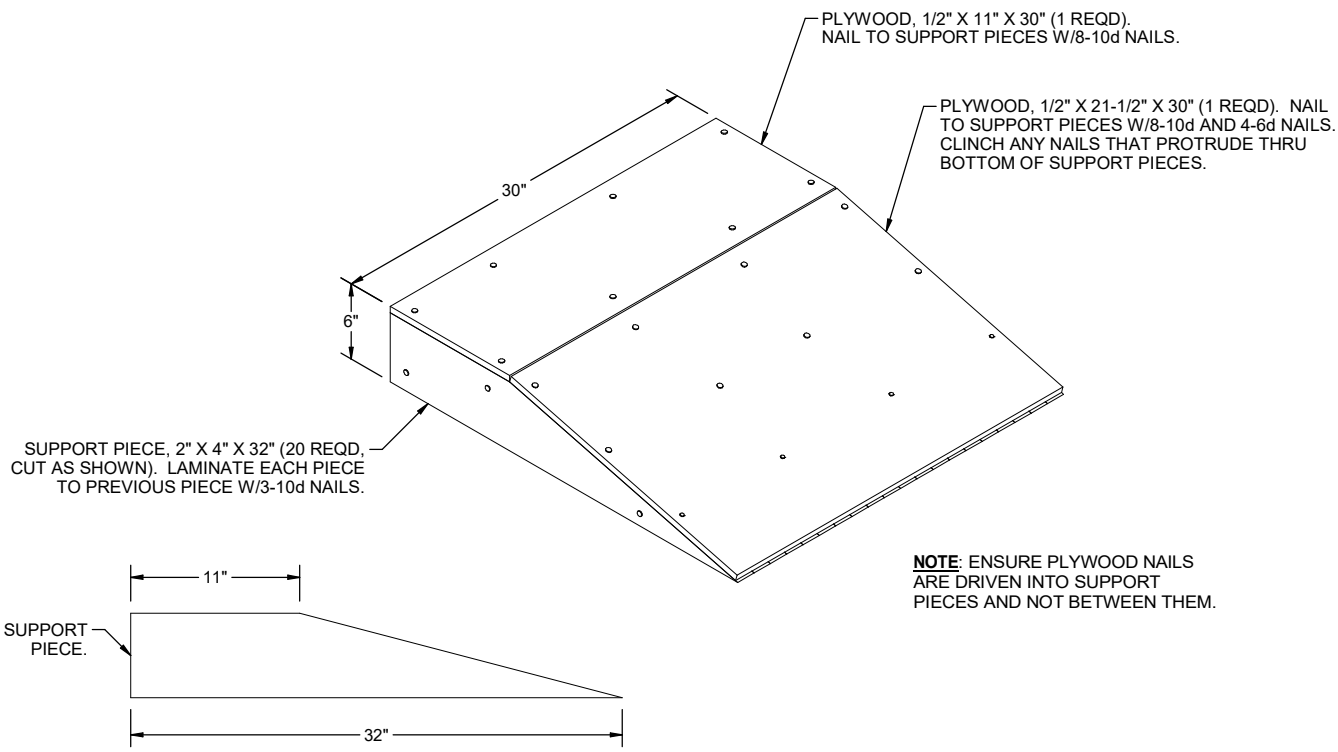




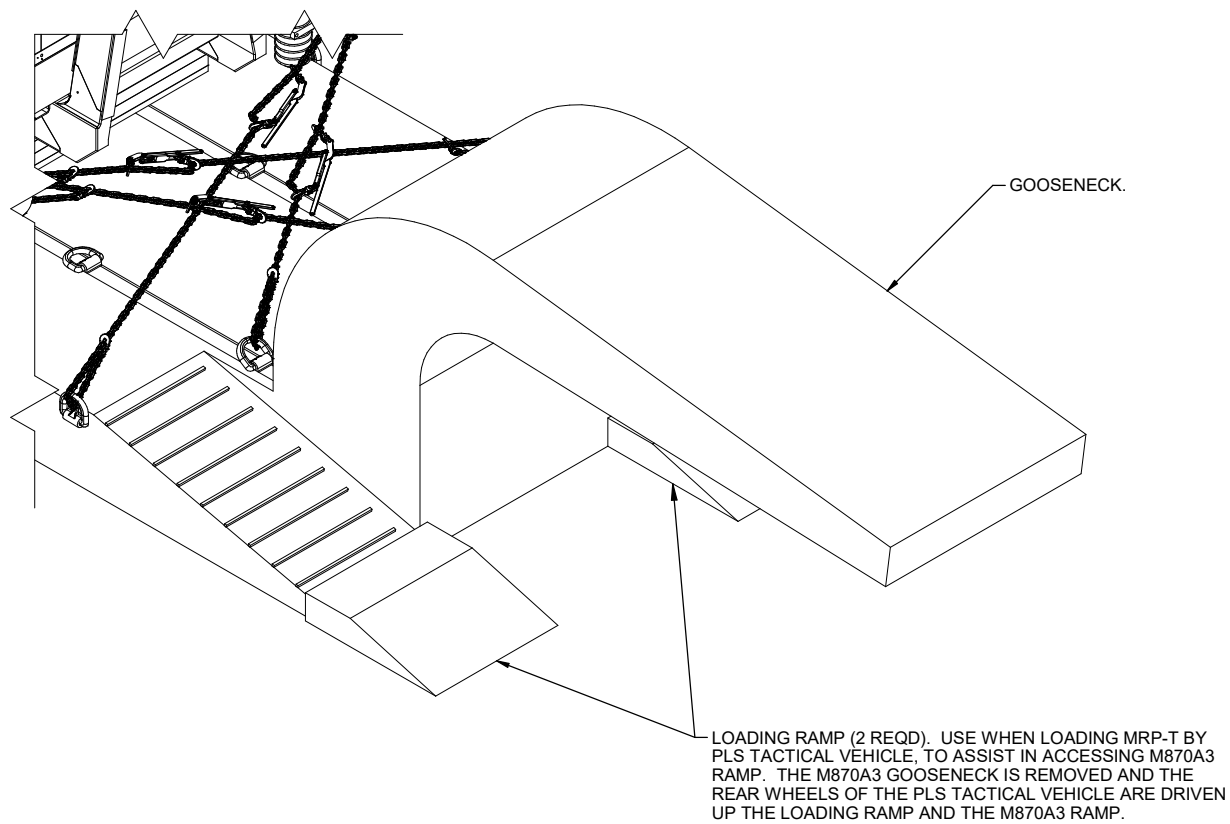
BLOCKING ASSEMBLY



REAR DECK SHORING



LOADING RAMP



SPECIAL PROVISIONS FOR CHAIN TIEDOWN

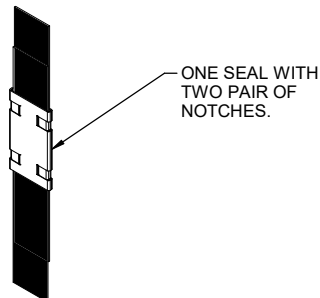
LADING MAY BE SECURED TO THE TRAILER BY CARRIER-OWNED CHAINS AND LOAD BINDERS, PROVIDED THE FOLLOWING CONDITIONS ARE MET AND THE PROCEDURES CONTAINED ON PAGES 4 THRU 7 ARE FOLLOWED.

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 2010.
2. ALL CHAINS SHALL BE MARKED AS PRESCRIBED BY THE NATIONAL ASSOCIATION OF CHAIN MANUFACTURER'S WELDED CHAIN SPECIFICATION ADOPTED NOVEMBER 2010. 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 TRANSPORT CHAIN
 - C. 3/8", GRADE 70 TRANSPORT CHAIN
 - D. 5/16", GRADE 80 ALLOY STEEL CHAIN
 - E. 3/8", GRADE 80 ALLOY STEEL CHAIN
 - F. 1/2", GRADE 80 ALLOY STEEL CHAIN

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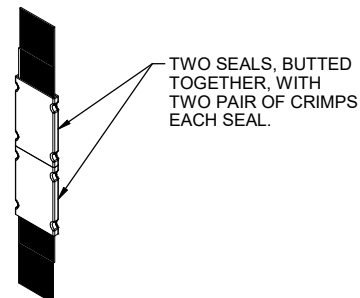
(SPECIAL PROVISIONS FOR CHAIN TIEDOWN CONTINUED)

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", 5/16", AND 1/2" 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 1/2" 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.



STRAP JOINT A

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



STRAP JOINT B

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

END-OVER-END LAP JOINT DETAILS