

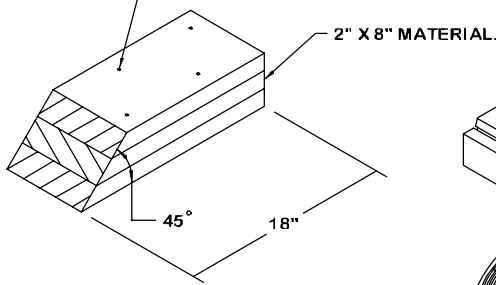
# SENTINEL

## LOADING AND BRACING ON FLATBED OR LOW-BOY TRAILER OF ANTENNA TRANSCEIVER GROUP (ATG), AN/MPQ-64, MOUNTED ON A HIGH MOBILITY TRAILER

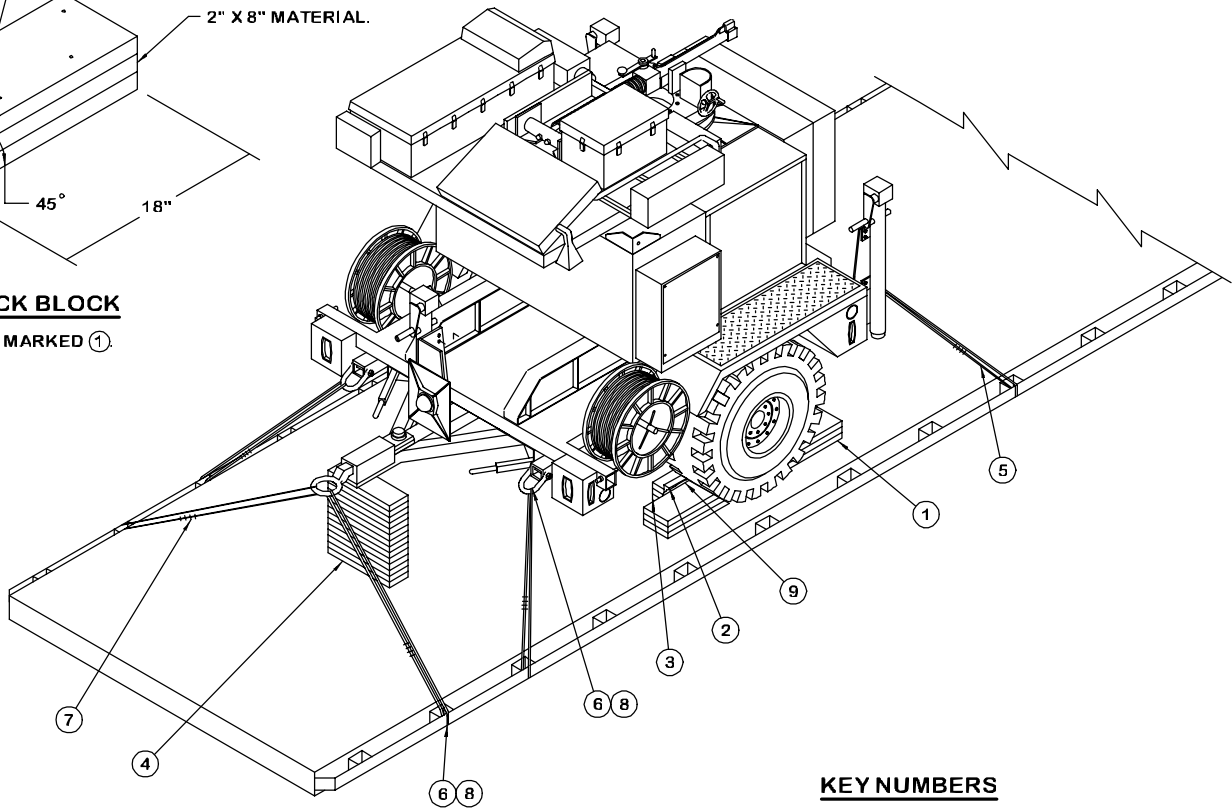
### U.S. ARMY MATERIEL COMMAND DRAWING

APPROVED, U.S. ARMY AVIATION AND MISSILE COMMAND  	ENGINEER	BASIC	MICHAEL SARDONE	DO NOT SCALE				
		REV.		WEBSITE: <a href="http://www.dac.army.mil">HTTP://WWW.DAC.ARMY.MIL</a>				
	TECHNICIAN	BASIC		SEPTEMBER 1998				
	REV.							
	DRAFTSMAN	BASIC						
		REV.						
APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND  U.S. ARMY DEFENSE AMMUNITION CENTER	TRANSPORTATION ENGINEERING DIVISION		<i>W. R. Jurek</i>					
	VALIDATION ENGINEERING DIVISION		<i>James H. Kuhn</i>	TESTED	CLASS	DIVISION	DRAWING	FILE
	LOGISTICS ENGINEERING OFFICE		<i>William F. Ernst</i>		19	48	7615	GSE11SN1

DRIVE ALL NAILS PERPENDICULAR TO FLOOR IN A STAGGERED PATTERN AS SHOWN.



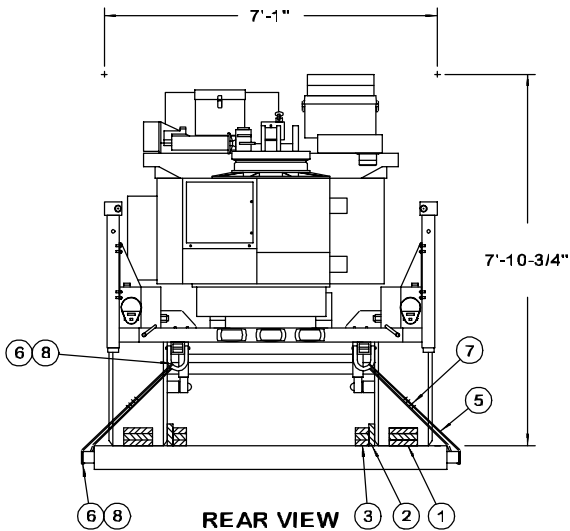
**CHOCK BLOCK**  
PIECE MARKED ①



**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① CHOCK BLOCK (4 REQD). SEE THE DETAIL ABOVE. LOCATE BEVELED END OF BLOCK AGAINST WHEEL. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-10d NAILS. NAIL EACH ADDITIONAL PIECE W/4-20d NAILS. SEE GENERAL NOTE "C" ON PAGE 3.
- ② RUBBING STRIP, 2" X 6" X 36" (2 REQD). POSITION ON EDGE AND NAIL TO A LOWER PIECE MARKED ③ W/5-10d NAILS.
- ③ SIDE BLOCKING, 2" X 4" X 36" (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-10d NAILS. NAIL EACH ADDITIONAL PIECE IN A LIKE MANNER. NOTE THAT WHEN LOADING ON A TRAILER WHICH IS 8'-6" WIDE, THE RUBBING STRIP AND SIDE BLOCKING, PIECES MARKED ② AND ③, MAY BE PLACED ON THE OUTSIDE OF THE WHEEL.
- ④ SUPPORT PIECE, 2" X 6" X 18" (14 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/6-20d NAILS. NAIL EACH ADDITIONAL PIECE IN A LIKE MANNER. SEE GENERAL NOTE "K" ON PAGE 3.
- ⑤ STEEL WIRE ROPE, 3/8" DIA, 6.56 TONS (6 REQD). INSTALL CABLE TO APPROXIMATE ANGLE SHOWN AND TO FORM A COMPLETE LOOP FROM ANCHORING FACILITY ON TRAILER THROUGH TIE-DOWN DEVICE OR LUNETTE ON LADING AND BACK TO TRAILER ANCHORING FACILITY. SEE GENERAL NOTES "F", "H", AND "J" ON PAGE 3 AND THE "CABLE JOINT" DETAIL ON PAGE 4. NOTE: CABLE OF A LARGER SIZE MAY BE USED. SEE THE "SPECIAL PROVISIONS FOR CHAIN TIEDOWN" ON PAGE 4.
- ⑥ THIMBLE, STANDARD, SIZE 3/8" (12 REQD). USE WITH PIECE MARKED ⑤. ONE PER EACH ANCHORING FACILITY ON THE TRAILER AND ONE PER EACH LADING TIE-DOWN DEVICE. SECURE TO CABLE WITH PIECE MARKED ⑧. NOTE THAT AN "OPEN PATTERN" THIMBLE IS RECOMMENDED.
- ⑦ CLIP, WIRE ROPE, SIZE 3/8" (24 REQD). USE FOUR PER CABLE JOINT. SEE THE "CABLE JOINT" DETAIL ON PAGE 4.
- ⑧ CLIP, WIRE ROPE, SIZE 1/2" (12 REQD). USE TO SECURE THIMBLE, PIECE MARKED ⑥, TO THE WIRE ROPE. ALT: .0800" DIA WIRE MAY BE USED IN LIEU OF A CLIP FOR SECUREMENT OF THE THIMBLE TO THE TIE-DOWN CABLE.
- ⑨ WATERPROOF PAPER OR BURLAP OF A SUFFICIENT SIZE TO POSITION UNDER AND EXTEND 2" ABOVE PIECE MARKED ②.



**REAR VIEW**

(GENERAL NOTES CONTINUED)

- L. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE UNLESS OTHERWISE DIMENSIONED. FOR EXAMPLE, 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE AND 2" X 8" MATERIAL IS ACTUALLY 1-1/2" THICK BY 7-1/4" 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.
- N. IF THE LADING ITEM IS TO BE LOADED ONTO OR OFF OF THE TRANSPORTING TRAILER BY OVERHEAD SLINGING, CARE MUST BE EXERCISED SO THAT THE ITEM IS NOT DAMAGED DURING THE HANDLING OPERATION BY THE USE OF IMPROPER EQUIPMENT. ONE RECOMMENDED PROCEDURE IS DELINEATED IN THE "ATTACHMENT OF HANDLING SLING TO SENTINEL ATG TRAILER" DETAIL ON PAGE 5.

MATERIAL SPECIFICATIONS

- LUMBER - - - - - : VOLUNTARY PRODUCT STANDARD PS 20; DOUGLAS FIR OR COMPARABLE LUMBER WITH STRAIGHT GRAIN AND FREE FROM MATERIAL DEFECTS.
- NAILS - - - - - : ASTM F1667; COMMON STEEL NAIL (NLCMS OR NLCMS).
- WIRE, CARBON STEEL - : ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, .0800" DIA, GRADE 1006 OR BETTER.
- ANTI-CHAFING MATERIAL - - - - - : MTL-B-121 (OR EQUAL); NEUTRAL BARRIER MATERIAL.
- ROPE - - - - - : FED SPEC RR-W-410; IMPROVED PLOW STEEL WIRE, PREFORMED, REGULAR LAY, 6 X 19, FLEXIBLE IWRC, MACWHYTE WIRE ROPE CO. (OR EQUAL).
- CLIP - - - - - : FED SPEC FF-C-450; TYPE I, CLASS 1, "U" BOLT, CROSBY, HEAVY DUTY (OR EQUAL).
- THIMBLE - - - - - : FED SPEC FF-T-276; TYPE II.
- CHAIN - - - - - : NATIONAL ASSOCIATION OF CHAIN MANUFACTURER'S WELDED CHAIN SPECIFICATION ADOPTED NOVEMBER 1975.
- LOAD BINDER - - - - : FED SPEC GGG-B-325.
- PAPER - - - - - : COMMERCIAL ITEM DESCRIPTION A-A-203.

GENERAL NOTES

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1.
- B. THE LOAD AS SHOWN IS BASED ON A FLATBED OR "LOW-BOY" TRAILER 8'-0" WIDE WITH A WOOD OR A WOOD AND METAL FLOOR. WIDER TRAILERS MAY BE USED. TRAILERS WITH ALL METAL FLOORS WILL NOT BE USED. ONLY ONE UNIT OF LADING IS SHOWN; HOWEVER, MULTIPLES OF UNITS AS SHOWN OR DISSIMILAR IN NATURE MAY BE LOADED ON THE TRAILER, WITH THE VIEW OF FULL UTILIZATION OF CARRIER EQUIPMENT.
- C. ONLY TRAILERS CAPABLE OF SAFELY TRANSPORTING THE LADING TO DESTINATION WITHOUT DAMAGE WILL BE SELECTED. TRAILERS SELECTED MUST HAVE "SOUND" FLOORS WHICH PROVIDE NAIL RETENTION PROPERTIES EQUAL TO OR BETTER THAN THE SPECIFIED DUNNAGE LUMBER, AND A SUFFICIENT NUMBER OF TIE-DOWN FACILITIES OF A STRENGTH EQUAL TO OR BETTER THAN SPECIFIED LADING TIE-DOWN ASSEMBLIES.
- D. SHIPMENT GROSS WEIGHT, AXLE DISTRIBUTION OF THE LADING WEIGHT AND OVERALL DIMENSIONS MUST MEET STATE LAW REQUIREMENTS.
- E. LADING DATA:

ITEM DIMENSIONS -- 11'-0" LONG BY 7'-1" WIDE BY 7'-10-3/4" HIGH  
ITEM GROSS WEIGHT - 3,740 POUNDS (APPROX)

- F. REFER TO MTMCTEA REFERENCE 96-55-20, "TIEDOWN HANDBOOK FOR TRUCK MOVEMENTS", FOR PROPER TIEDOWN APPLICATION. ALSO, WHEN APPLYING WIRE ROPE (CABLE) CLIP (CLAMP) NUTS, THE FOLLOWING IS TO BE ACCOMPLISHED. AFTER THE NUTS HAVE BEEN INITIALLY TIGHTENED TO THE DESIRED TORQUE, THE "U" SIDE OF EACH CLIP MUST BE STRUCK SEVERAL TIMES WITH A HAMMER TO ENSURE PROPER SEATING INTO THE DEAD END LINE. FINAL TORQUE WILL BE ACQUIRED BY REPEATEDLY AND ALTERNATELY TIGHTENING EACH CLIP NUT UNTIL THE DESIRED TORQUE IS ACHIEVED. CAUTION: DURING WIRE ROPE INSTALLATION, AVOID CONTACT WITH ALL ELECTRICAL WIRING, VEHICLE CONTROLS AND OTHER APPURTENANCES. METAL FILLERS OR COMPARABLE CUSHIONING MATERIAL MUST BE USED BETWEEN TIEDOWN CABLES AND ALL SHARP EDGES.
- G. SEE THE "SPECIAL PROVISIONS FOR CHAIN TIEDOWN" ON PAGE 4 FOR SPECIFICATIONS WHICH MUST BE APPLIED IF CHAINS AND LOAD BINDERS ARE TO BE USED.
- H. CABLES WILL BE TENSIONED SUFFICIENTLY TO CAUSE SLIGHT VEHICLE BODY DEPRESSION. TENSIONING CAN BE ACCOMPLISHED BY EMPLOYING TWO CABLE GRIPPERS AND AN APPLICABLY SIZED COME-A-LONG TYPE MECHANICAL HOIST.
- J. CAUTION: IT IS RECOMMENDED THAT STEEL WIRE ROPE TIEDOWNS BE INSTALLED TO APPROXIMATE THE ANGLE SHOWN; HOWEVER, IF PLACEMENT OF TRANSPORTER TIEDOWN FACILITIES PREVENTS THIS, CARE MUST BE EXERCISED TO ENSURE THAT TIEDOWNS ON THE SAME SIDE OF THE LADING ARE INSTALLED SO THEIR RETENTION FORCES ACT IN OPPOSITE LONGITUDINAL DIRECTIONS.
- K. NOTICE: A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN NAILS ARE DRIVEN INTO 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 THE 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.

(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	18	12
2" X 6"	27	27
2" X 8"	17	23
NAILS	NO. REQD	POUNDS
10d (3")	50	1
12d (3-1/4")	10	1/4
20d (4")	100	3-3/4
ROPE, STEEL WIRE, 3/8" - - - - 60' REQD - - - - 15 LBS		
CLIP, 3/8" - - - - - - - - - - 24 REQD - - 7-1/2 LBS		
CLIP, 1/2" - - - - - - - - - - 12 REQD - - 5-1/4 LBS		
THIMBLE, STANDARD, 3/8" - - - 12 REQD - - 2-1/4 LBS		
WATERPROOF PAPER OR BURLAP - - AS REQD - - - - - NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
ATG TRAILER	1	3,740 LBS
DUNNAGE	-	159 LBS
TOTAL WEIGHT		3,899 LBS (APPROX)

## SPECIAL PROVISIONS FOR CHAIN TIEDOWN

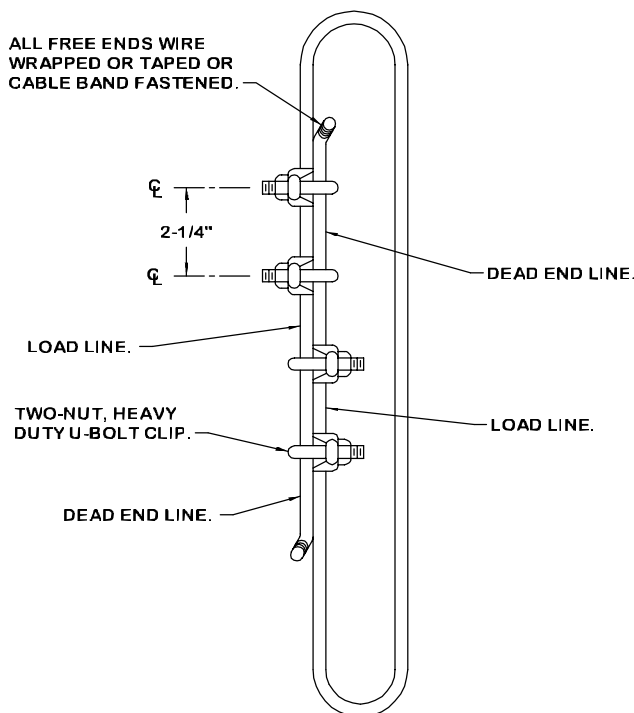
LADING MAY BE SECURED TO THE FLATBED OR "LOW-BOY" TRAILER BY CARRIER-OWNED CHAINS AND LOAD BINDERS IN LIEU OF THE SPECIFIED WIRE ROPE CABLE TIEDOWNS, PROVIDING THE FOLLOWING CONDITIONS ARE MET:

- 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.
- NAILED FLOORLINE DUNNAGE, AS SPECIFIED IN THE BASIC LOAD ON PAGE 2, WILL BE USED FOR LATERAL AND LONGITUDINAL RESTRAINT.
- 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. SEE "CHART 1" AT RIGHT FOR COMMON CHAIN GRADE MARKINGS.
- 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 OR TIEDOWN PROVISIONS.
- ANTI-CHAFING MATERIAL MUST BE PLACED AND SECURED BETWEEN CHAINS AND LADING AT ALL POINTS OF CONTACT, EXCEPT AT DEFINITIVE TIE-DOWN POINTS.
- CHAIN SIZES, GRADES, AND QUANTITIES APPROVED FOR USE IN LIEU OF WIRE ROPE CABLE ARE CONTAINED WITHIN "CHART 2" AT RIGHT.
- WHENEVER POSSIBLE, CHAINS SHALL BE INSTALLED USING THE SAME TIEDOWN FACILITY ON THE LADING AND THE SAME STAKE POCKET OF THE TRAILER AS SHOWN FOR THE WIRE ROPE CABLES. THE CHAINS WILL ONLY BE ATTACHED TO THE FLATBED TRAILER BY MEANS OF PASSING THE CHAINS THROUGH THE STAKE POCKETS; I.E. CHAINS WILL NOT BE ATTACHED TO THE TRAILER RUB RAILS. CHAINS AND LOAD BINDERS SHOULD BE POSITIONED VERTICALLY SO THAT THEY APPEAR AS NEAR PERPENDICULAR AS POSSIBLE TO THE TRAILER BED WHEN VIEWED FROM THE SIDE OF THE TRAILER.
- CHAIN AND FITTINGS OF A HIGHER GRADE (SAME SIZES) OR A LARGER SIZE (SAME GRADE) AS CONTAINED IN THE CHARTS AT RIGHT MAY BE SUBSTITUTED FOR THOSE SPECIFIED IN THE CHARTS.
- THE GRABHOOKS ON THE ENDS OF THE CHAIN MAY BE OF THE FOLLOWING TYPES WITH GRADE MARKINGS AS INDICATED.
  - 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.
  - 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.
- 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.
- LOAD BINDERS SHALL BE COMPATIBLE WITH THE SIZE OF THE CHAIN BEING USED AND HAVE A MINIMUM BREAKING STRENGTH OF 16,200 POUNDS (WORKING LOAD LIMIT OF 5,400 POUNDS). OVER-CENTER 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.
- THE TRANSPORTING VEHICLE OPERATOR SHOULD BE INSTRUCTED TO PERIODICALLY INSPECT THE TIEDOWN CHAINS AND LOAD BINDERS DURING TRANSIT AND RE-TIGHTEN, IF NECESSARY, TO ENDURE LOAD INTEGRITY.

CHART 1				
APPROVED CHAIN FOR EQUIPMENT TIEDOWN				
CHAIN TYPE	GRADE	SIZE	BREAKING STRENGTH	COMMON MARKINGS
HIGH TEST	43	1/4"	7,750 LBS	H: 4: 43: 430: OR HT
HIGH TEST	43	5/16"	11,600 LBS	H: 4: 43: 430: OR HT
HIGH TEST	43	3/8"	16,200 LBS	H: 4: 43: 430: OR HT
BINDING	70	1/4"	12,600 LBS	7: 70: OR 700
BINDING	70	5/16"	18,800 LBS	7: 70: OR 700
BINDING	70	3/8"	26,400 LBS	7: 70: OR 700
ALLOY STEEL	80	7/32"	8,700 LBS	8: 80: OR 800
ALLOY STEEL	80	9/32"	14,400 LBS	8: 80: OR 800
ALLOY STEEL	80	5/16"	17,800 LBS	8: 80: OR 800
ALLOY STEEL	80	3/8"	25,600 LBS	8: 80: OR 800

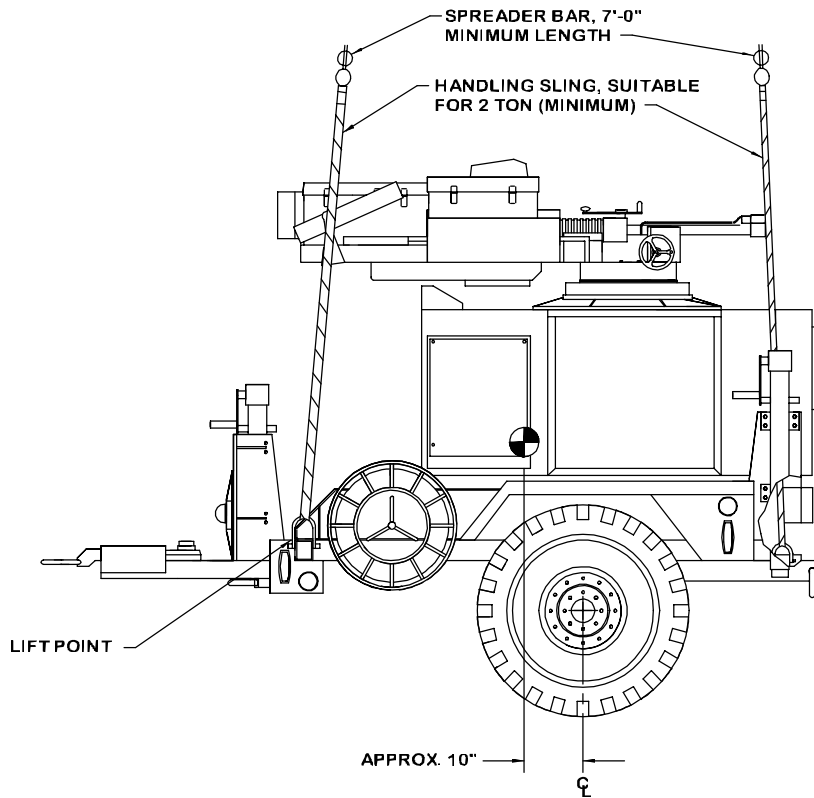
CHART 2				
CHAIN QUANTITIES FOR EQUIPMENT TIEDOWN				
CHAIN TYPE	GRADE	SIZE	EACH SIDE	TOTAL
HIGH TEST	43	1/4"	2	4
HIGH TEST	43	5/16"	2	4
HIGH TEST	43	3/8"	2	4
BINDING	70	1/4"	2	4
BINDING	70	5/16"	2	4
BINDING	70	3/8"	2	4
ALLOY STEEL	80	7/32"	2	4
ALLOY STEEL	80	9/32"	2	4
ALLOY STEEL	80	5/16"	2	4
ALLOY STEEL	80	3/8"	2	4

NOTE: A CHAIN IS NORMALLY MARKED WITH ONLY ONE TYPE OF STRENGTH MARKING; I.E., A CHAIN MAY BE MARKED 70 OR MAY BE MARKED 700 OR MAY BE MARKED 700. THE CHAIN NEED NOT AND MOST LIKELY WILL NOT HAVE A COMBINATION OF STRENGTH MARKINGS.



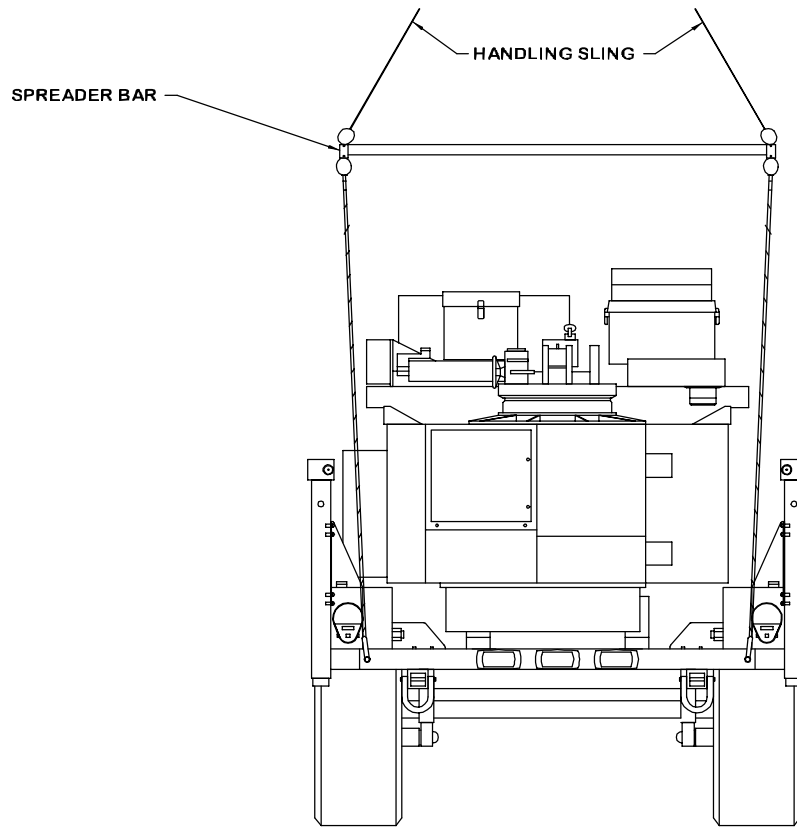
### CABLE JOINT

PROPER TIGHTENING OF THE WIRE ROPE CLIP NUTS CAN BE ACCOMPLISHED BY UTILIZING A PROPER SIZED TORQUE WRENCH. AFTER THE NUTS HAVE BEEN INITIALLY TIGHTENED, THE "U" OF EACH CLIP MUST BE STRUCK SEVERAL TIMES WITH A HAMMER TO INSURE PROPER SEATING INTO THE DEAD END LINE. FINAL TORQUE WILL BE ACQUIRED BY REPEATEDLY AND ALTERNATELY TIGHTENING EACH CLIP NUT. SEE PIECES MARKED ⑦ AND ⑧ ON PAGE 2.



**ELEVATION VIEW**

FOR DIMENSION AND WEIGHT, SEE GENERAL NOTE "E" ON PAGE 3.



**REAR VIEW**

