

APPROVED BY
 MECH DIV AAR, THEIR LETTER
 DATED 30 Sep 93 FILE LR-11.0.137
 SIGNED [Signature]
 DATE 6 Jan 94
 MTMCTEA, FT EUSTIS, VA.

HAWK

LOADING AND BRACING ON FLAT CAR OF FME SHOP 21

THIS OUTLOADING PROCEDURAL DRAWING INCLUDES PROCEDURES FOR GENERAL SERVICE FLAT CARS (FM) AND FOR CUSHIONED FLAT CARS (FMS) EQUIPPED WITH SPECIAL CHAIN TIEDOWN DEVICES OF VARIOUS DESIGN AND MANUFACTURE.

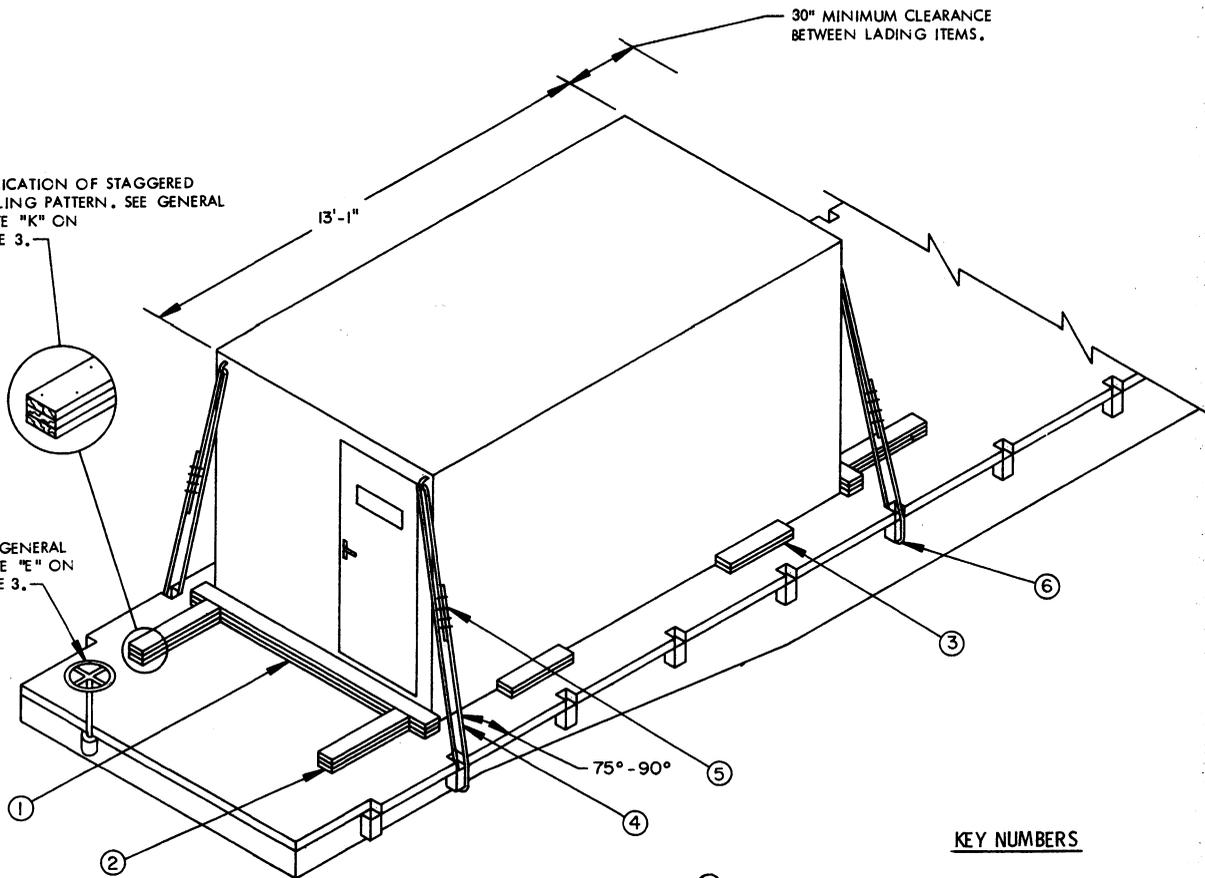
DO NOT SCALE

REVISIONS				DRAWN BY <i>SW</i>	PT <i>pt</i>	PROJ ENG <i>RSH/WRF</i>	ABSMI - LC/MS-OP <i>REG</i>
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PROJECT GSE 741-88

APPLICATION OF STAGGERED NAILING PATTERN. SEE GENERAL NOTE "K" ON PAGE 3.

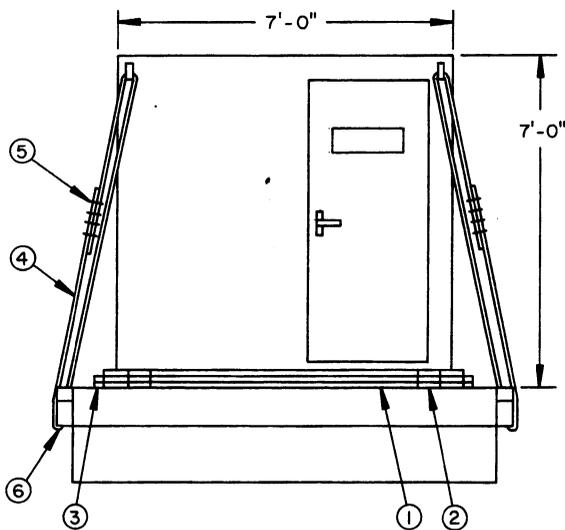
SEE GENERAL NOTE "E" ON PAGE 3.



ISOMETRIC VIEW

KEY NUMBERS

- ① HEADER, 2" X 6" X 7'-6" (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/1-20d NAIL EVERY 5". NAIL EACH ADDITIONAL PIECE W/1-50d NAIL EVERY 5". SEE GENERAL NOTE "K" ON PAGE 3.
- ② BACK-UP CLEAT, 2" X 6" X 30" (TRIPLED) (4 REQD). POSITION 6" FROM THE END OF PIECE MARKED ① AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/8-20d NAILS. NAIL EACH ADDITIONAL PIECE WITH W/8-50d NAILS.
- ③ SIDE BLOCKING, 2" X 6" X 24" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/6-20d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ④ STEEL WIRE ROPE, 3/8" DIAMETER, 6.56 TONS (4 REQD). INSTALL CABLE TO APPROXIMATE THE ANGLE SHOWN AND TO FORM A COMPLETE LOOP FROM STAKE POCKET ON THE CAR THROUGH THE LADING TIEDOWN DEVICE AND BACK TO THE STAKE POCKET. SEE GENERAL NOTES "D", "G", AND "H" ON PAGE 3. LARGER SIZE CABLE MAY BE USED IF AVAILABLE, WHEN SPECIFIED CABLE IS NOT AVAILABLE.
- ⑤ CLIP, SIZE 3/8" (24 REQD). FOUR (4) PER CABLE AND ONE (1) PER THIMBLE. SEE GENERAL NOTE "D" ON PAGE 3 AND KEY NUMBER ⑥ GUIDANCE BELOW.
- ⑥ THIMBLE, STANDARD, SIZE 3/8" (8 REQD). ONE (1) PER STAKE POCKET AND ONE (1) PER LADING TIEDOWN DEVICE. SECURE TO WIRE ROPE PIECE MARKED ④ W/1-CLIP PER THIMBLE. A STANDARD THIMBLE AS SPECIFIED CAN BE SECURED TO A CABLE WITH A 3/8" CLIP, HOWEVER, IF DESIRED, OR IF THE 3/8" THIMBLE BEING USED IS OF A TYPE WHICH CANNOT BE SECURED TO A CABLE WITH A 3/8" CLIP, A 1/2" CLIP MAY BE USED. NOTE THAT AN "OPEN PATTERN" THIMBLE IS RECOMMENDED. ALT: NO. 14 GAGE WIRE MAY BE USED IN LIEU OF A 3/8" CLIP FOR SECUREMENT OF THE THIMBLE TO THE TIEDOWN CABLE.



END VIEW

GENERAL NOTES

SPECIAL PROVISIONS:

THIS SHOP SET MAY BE SECURED ON A CUSHIONED FMS TYPE FLAT CAR WITH CHAIN TIEDOWN ASSEMBLIES IN LIEU OF USING THE DEPICTED GENERAL SERVICE FM TYPE CAR AND THE SPECIFIED TIEDOWN MATERIALS, PROVIDING THE FOLLOWING CONDITIONS ARE MET:

1. THE CAR MUST HAVE A NAILABLE FLOOR AREA AT LEAST 9'-3" WIDE BETWEEN THE OUTER CHANNELS FOR THE SECUREMENT OF PIECES MARKED ①, ②, AND ③.
2. ONE (1) MOVABLE ANCHOR WITH CHAIN ASSEMBLY TIEDOWN DEVICE MUST BE SUBSTITUTED FOR EACH WIRE ROPE CABLE TIE DOWN MARKED ④ ON PAGE 2. CHAINS WILL BE ATTACHED TO THE LADING AT THE SAME LOCATIONS SHOWN FOR THE WIRE ROPE. NOTE THAT IF THE LADING TIEDOWN DEVICE IS NOT LARGE ENOUGH TO PERMIT PASSAGE OF THE HOOK ON THE CHAIN ASSEMBLY, A 5/8" (OR LARGER) SHACKLE MAY BE USED FOR ATTACHMENT OF THE CHAIN. ANCHOR DEVICES WILL BE LOCATED SO AS TO POSITION THE CHAINS WITHIN THE ANGULAR TOLERANCES SPECIFIED ON THE LOAD VIEW.
3. BEFORE AND DURING INSTALLATION, THE ANCHOR DEVICES SHALL BE INSPECTED FOR BENT HOOKS, STRETCH, GOUGES, BENT LINKS, AND WEAR IN THE CHAINS, AND FOR DAMAGED LOAD BINDERS OR WINCHES, OR ANY OTHER NOTICEABLE DEFECTS. ANY DEFICIENCY SHALL BE CAUSE FOR NOT USING AN ANCHOR AND CHAIN ASSEMBLY.
4. CHAINS MUST NOT BE TWISTED DURING INSTALLATION. CHAINS ARE TO BE STRUCK WITH A HAMMER OR BAR AFTER TIGHTENING TO ELIMINATE ANY POSSIBLE MISALIGNMENT OF LINKS. FURTHER TIGHTENING MAY BE REQUIRED TO TAKE UP ANY SLACK THAT DEVELOPS DUE TO LINK ALIGNMENT.
5. TURNBUCKLES OR OTHER TENSIONING DEVICES NOT EQUIPPED WITH SELF-LOCKING DEVICES MUST BE WIRED OR PINNED TO PREVENT THEM FROM TURNING OR LOOSENING DURING TRANSIT.
6. OPEN HOOKS MUST BE SECURED WITH A WIRE AS REQUIRED TO PREVENT THE HOOK FROM BECOMING DISENGAGED FROM THE CHAIN LINK TO WHICH IT IS ATTACHED.

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1.
- B. THE LOAD AS SHOWN IS BASED ON A FLAT CAR 9'-6" WIDE (PLATFORM); WIDER CARS CAN BE USED. ONLY ONE UNIT OF LADING IS SHOWN; HOWEVER, MULTIPLES OF UNITS, AS SHOWN OR DISSIMILAR IN NATURE, MAY BE LOADED ON A CAR. THE NUMBER OF UNITS TO BE LOADED ON A CAR WILL BE DEPENDENT ON THE SIZE OF THE CAR USED OR THE QUANTITIES OF UNITS TO BE SHIPPED WITH THE VIEW OF FULL UTILIZATION OF CARRIER EQUIPMENT.

NOTICE TO TRANSPORTATION OFFICER:

IN LIEU OF REQUISITIONING A GENERAL SERVICE FM *FLAT CAR AS DEPICTED HEREIN, EVERY EFFORT SHOULD BE MADE TO ACQUIRE AN FMS *TYPE CAR. THIS IS A CUSHIONED CAR EQUIPPED WITH SPECIAL TIEDOWN CHANNELS AND MOVABLE ANCHOR AND CHAIN ASSEMBLY TIEDOWN DEVICES **, SUCH AS IS USED FOR TRANSPORTING AGRICULTURAL MACHINERY AND HEAVY, EARTH MOVING EQUIPMENT. SEE "SPECIAL PROVISIONS" ON THIS PAGE FOR GUIDANCE.

* ASSOCIATION OF AMERICAN RAILROADS (AAR) MECHANICAL DESIGNATION FOR CAR TYPE. REFERENCE IS MADE TO THE "OFFICIAL RAILWAY EQUIPMENT REGISTER".

** A TYPICAL CAR OF THIS TYPE IS SHOWN BY FIGURE 88-B OF SECTION IN PUBLICATION AAR TITLED "GENERAL RULES GOVERNING THE LOADING OF COMMODITIES ON OPEN TOP CARS AND TRAILERS". CHAINS MUST PROOF TEST AT LEAST 18,000 POUNDS.

C. LADING DATA:

FME SHOP 21 ----- 13'-1" LONG BY 7'-0" WIDE BY 7'-0" HIGH.
GROSS WEIGHT ----- 5,440 POUNDS (APPROX).

- D. REFER TO ORD DWG 19-48-C-ORDJU-588, "WIRE ROPE AND ANNEALED WIRE APPLICATION METHODS FOR SECURING LADING ON RAIL & MOTOR CARRIER EQUIP", FOR PROPER TIEDOWN APPLICATION, EXCEPT THAT THE NUTS ON 3/8" CABLE CLIPS WILL BE TIGHTENED TO A TORQUE OF 35 TO 40 FOOT POUNDS.
- E. REFER TO ASSOCIATION OF AMERICAN RAILROADS MANUAL, "GENERAL RULES GOVERNING THE LOADING OF COMMODITIES ON OPEN TOP CARS" FOR APPLICABLE LOADING RULES; PREFACE 1-A, 2, 3, 4, 5, 9, 14, AND 15.
- F. ONLY CARS WITH "SOUND" FLOORS WILL BE USED. CARS WITH STEEL FLOOR ENDS AND/OR EXPOSED STEEL BOLSTERS WHICH INTERFERE WITH PROPER POSITIONING OR NAILING OF THE DUNNAGE WILL NOT BE USED. SEE "END BLOCKING FOR CARS WITH EXPOSED STEEL BOLSTERS" DETAIL ON PAGE 4, FOR APPLICATION OF DUNNAGE METHODS WHICH PERMIT THE USE OF SOME CARS THAT HAVE EXPOSED STEEL COMPONENTS.
- G. TO ACHIEVE PROPER CABLE TENSION, EMPLOY TWO (2) CABLE "GRIPPERS" AND AN APPLICABLE SIZED "COME-A-LONG" TYPE MECHANICAL HOIST.
- H. **CAUTION:** IT IS RECOMMENDED THAT CABLE BE INSTALLED TO THE APPROXIMATE ANGLE SHOWN, HOWEVER, IF PLACEMENT OF THE CAR STAKE POCKETS PREVENTS THIS, CARE MUST BE EXERCISED TO ENSURE THAT THE CABLES ON THE SAME SIDE OF THE LADING BE INSTALLED SO THEIR RETENTION FORCES ACT IN OPPOSITE LONGITUDINAL DIRECTIONS—CONTACT OF THE CABLE WITH THE EDGE OF THE LADING IS PROHIBITED.
- J. 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.
- K. **NOTICE:** A STAGGERED NAILING PATTERN WILL BE USED WHEN NAILING DUNNAGE TO THE FLOOR OF THE TRANSPORTING VEHICLE, OR WHEN LAMINATING DUNNAGE. ALSO, 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.
- L. **CONVERSION TO METRIC EQUIVALENTS:** DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENT MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS 0.454KG.
- M. IF THE LADING ITEM IS TO BE LOADED ONTO OR OFF OF THE TRANSPORTING CAR BY OVERHEAD SLINGING, CARE MUST BE EXERCISED SO THAT THIS ITEM IS NOT DAMAGED DURING THE HANDLING OPERATION BY THE USE OF IMPROPER EQUIPMENT. ONE RECOMMENDED PROCEDURE IS DELINEATED IN THE "SLINGING PROVISIONS" DETAIL ON PAGE 5.

BILL OF MATERIAL

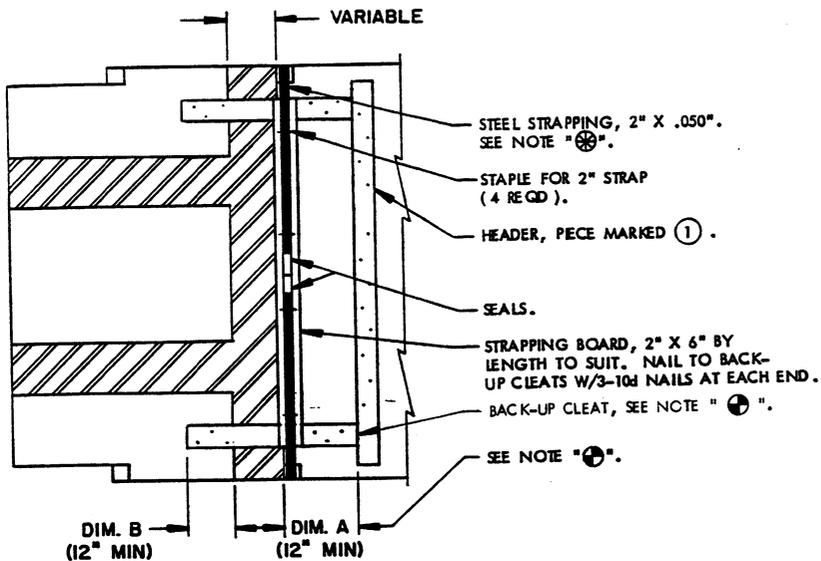
LUMBER	LINEAR FEET	BOARD FEET
2" X 6"	91	91
NAILS	NO. REQD	POUNDS
20d (4")	116	4-1/4
50d (5-1/2")	136	10-1/2
ROPE, STEEL WIRE, 3/8" ----- 80' REQD ----- 20 LBS		
CLIP, 3/8" ----- 24 REQD ----- 7-1/2 LBS		
CLIP, 1/2" (ALT. FOR 3/8") (8 REQD) ----- 2 LBS		
THIMBLES, STANDARD 3/8" ----- 8 REQD ----- 1-1/2 LBS		

MATERIAL SPECIFICATIONS

- LUMBER** ----- : DOUGLAS FIR OR COMPARABLE LUMBER WITH STRAIGHT GRAIN AND FREE OF MATERIAL DEFECTS. REF: FED SPEC MM-L-751.
- NAILS** ----- : COMMON. REF: FED SPEC FF-N-105.
- ROPE** ----- : STEEL WIRE, PLAIN, PREFORMED, REGULAR LAY, 6.56 TONS, 6" X 19" FLEXIBLE IWRC, MACWHYTE WIRE ROPE CO (OR EQUAL). REF: FED SPEC RR-W-410.
- CLIPS** ----- : "U" BOLT, CROSBY, HEAVY DUTY (OR EQUAL). REF: FED SPEC FF-C-450, TYPE 1, CLASS 1.
- THIMBLE** ----- : TYPE II, FED SPEC FF-T-276.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
FME SHOP 21	1	5,440 LBS
DUNNAGE		226 LBS
TOTAL WEIGHT		5,666 LBS (APPROX)



TYPICAL END BLOCKING FOR CARS WITH EXPOSED STEEL BOLSTERS (TOP VIEW)

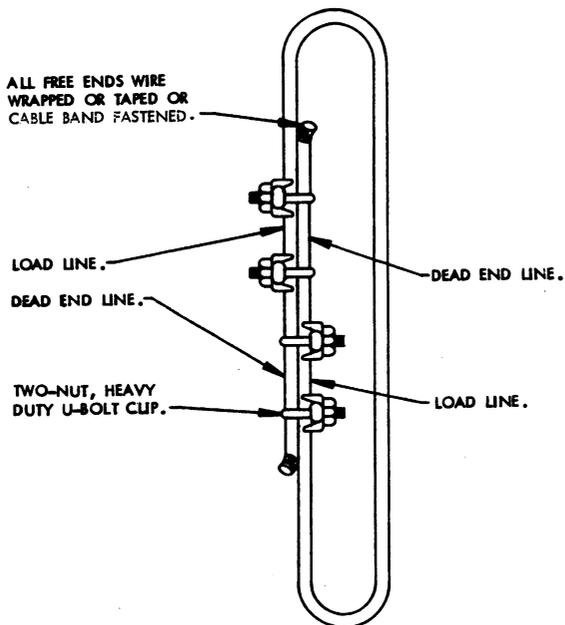
SEE GENERAL NOTE "F" ON PAGE 3.

NOTE ④:

THE OPTIONAL STRAP HOLD DOWN FOR END BLOCKING IS FOR CARS WITH OR WITHOUT EXPOSED STEEL BOLSTERS.

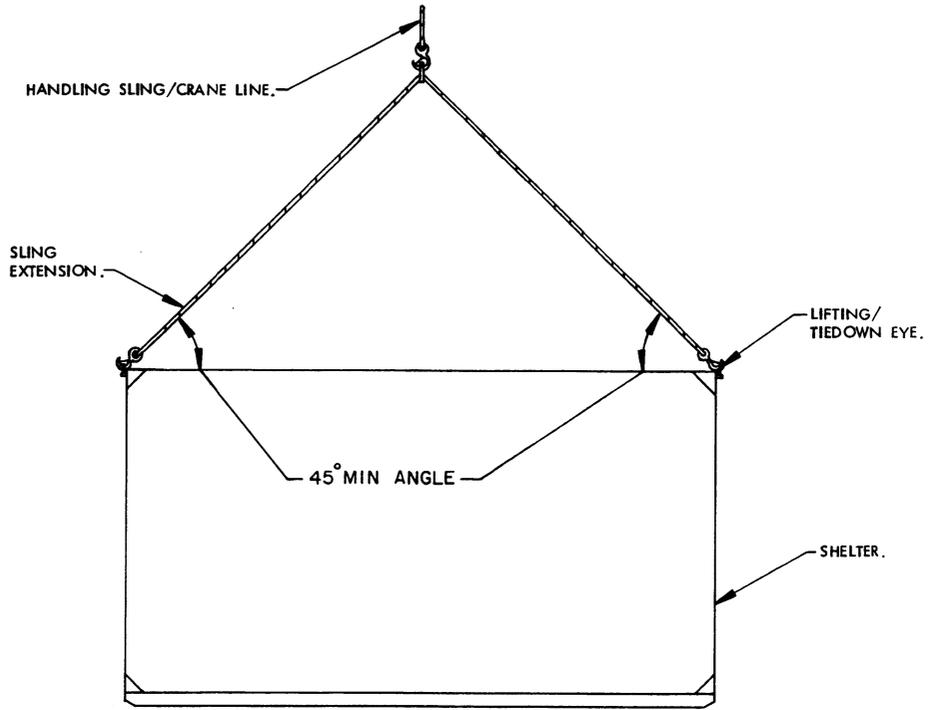
NOTE ⑤:

WHEN LOADING CARS WITH EXPOSED STEEL BOLSTERS, THE TOTAL OF DIMENSION "A" AND DIMENSION "B" (MIN 12") MUST EQUAL THE LENGTH OF THE BACK-UP CLEATS (PIECES MARKED ②) TO PROVIDE FOR PROPER NAILING TO THE CAR FLOOR. SEE PIECE MARKED ② ON PAGE 2 FOR PROPER NAILING.

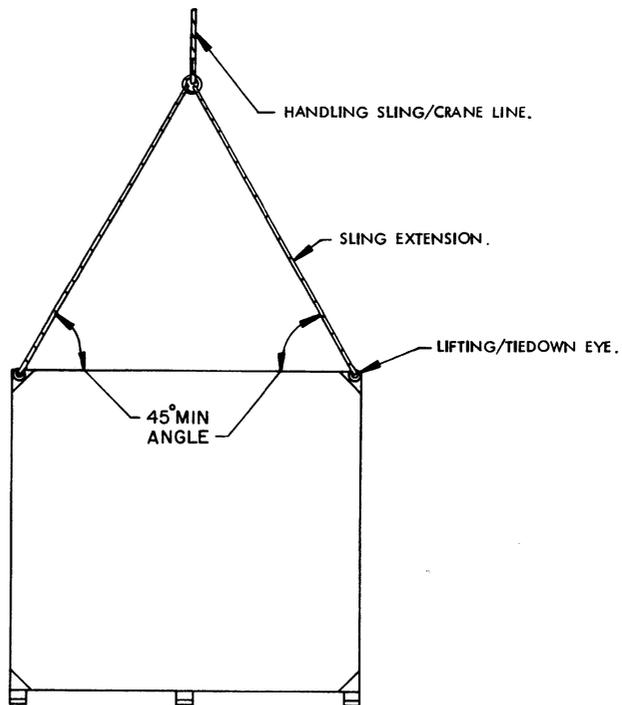


CABLE JOINT

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" SIDE 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.



SIDE ELEVATION VIEW



END VIEW

