

APPROVED BY
 MECH DIV AAR, THEIR LETTER
 DATED 14 DEC 73 FILE 45-11.6-17
 SIGNED Frank L. Tanc
 DATE 17 DEC 1973
 TEA, MTMTS, FT EUSTIS, VA.

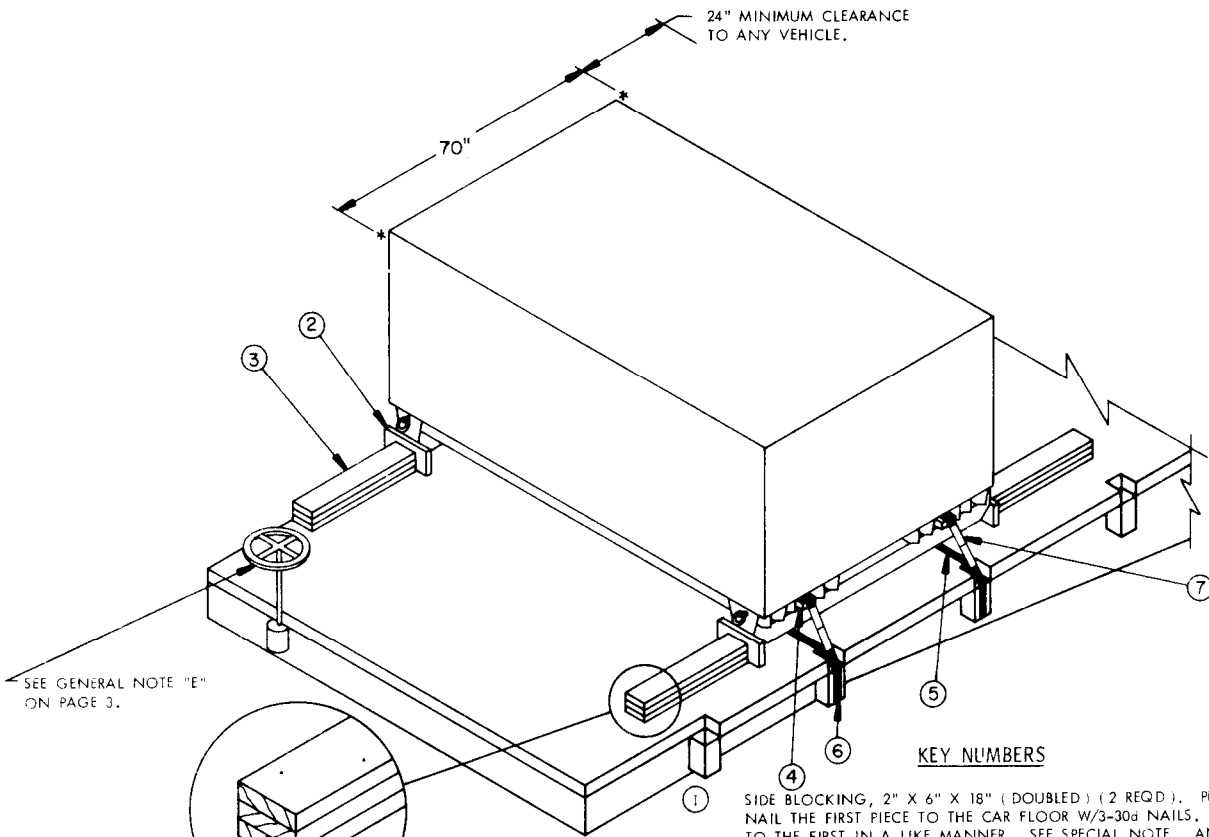
LANCE

LOADING AND BRACING ON FLAT CAR OF PALLETIZED PROPELLANT DRAINING KIT

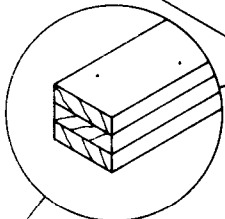
THIS OUTLOADING PROCEDURAL DRAWING INCLUDES PROCEDURES FOR GENERAL SERVICE FLAT CARS (FM) AND FOR CUSHIONED FLAT CARS (FMS) EQUIPPED WITH SPECIAL CHAIN TIE-DOWN DEVICES OF VARIOUS DESIGN AND MANUFACTURE.

REVISIONS				DRAFTSMAN <i>D.H.C./J.B.</i>	PROJ. ENG. <i>TOC/J.W.</i>	AMSRM-LCSM <i>Tom</i>
				CHECKER <i>JDS</i>	LOC ENGRG OFFICER <i>[Signature]</i>	AMSMI-01 <i>M.B.</i>
				APPROVED		
				<i>Wesley P. Gillebride</i>		
				U. S. ARMY MISSILE COMMAND		
				APPROVED BY ORDER OF COMMANDING GENERAL		
				U. S. ARMY MATERIEL COMMAND		
				<i>A. H. Elmer</i>		
				USAMC AMMO CENTER		
				U.S. ARMY MATERIEL COMMAND		
				JANUARY 1974		
				CLASS	DIVISION	DRAWING
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DO NOT SCALE



SEE GENERAL NOTE "E" ON PAGE 3.

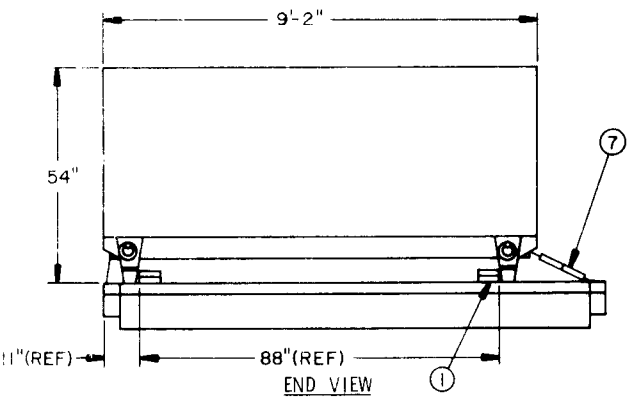


APPLICATION OF STAGGERED NAILING PATTERN. SEE GENERAL NOTE "M" ON PAGE 3.

ISOMETRIC VIEW

KEY NUMBERS

- ① SIDE BLOCKING, 2" X 6" X 18" (DOUBLED) (2 REQD). PRE-POSITION AS SHOWN. NAIL THE FIRST PIECE TO THE CAR FLOOR W/3-30d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE AND GENERAL NOTE "M" ON PAGE 3.
- ② SKID BEARING PIECE, 2" X 6" X 12" (4 REQD). POSITION ON EDGE AND NAIL TO LOWER PIECE MARKED ③ W/2-12d NAILS.
- ③ BACK-UP CLEAT, 2" X 6" X 30" (TRIPLED) (4 REQD). ALIGN WITH PALLET SKID AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-30d NAILS. NAIL EACH ADDITIONAL PIECE W/5-60d NAILS.
- ④ STRAPPING BOARD, 2" X 4" BY LENGTH TO SUIT (REF: 8'-8") (2 REQD).
- ⑤ HOLD-DOWN STRAP, 2" X .050" X 34'-0" LONG STEEL STRAPPING (2 REQD). INSTALL IN ONE PIECE. SEE SPECIAL NOTES 2, 4, AND 5 ON PAGE 3.
- ⑥ PAD, 2" X .050" X 24" LONG STEEL STRAPPING (4 REQD). POSITION UNDER AND SEAL TO A PIECE MARKED ⑤. SEE "DETAIL A" AND "DETAIL B" ON PAGE 6. ALT: STAKE POCKET PROTECTOR (8 REQD). USE TWO (2) UNDER EACH TIE DOWN FACILITY WITH A PIECE MARKED ⑤. SEE "DETAIL C" ON PAGE 6.
- ⑦ SEAL FOR 2" STRAPPING (8 REQD, 4 PER STRAP). SEE GENERAL NOTE "G" ON PAGE 3.



END VIEW
PIECES MARKED ② AND ③ HAVE BEEN OMITTED FOR CLARITY PURPOSES.

SPECIAL NOTES:

1. PRE-POSITION SIDE BLOCKING CENTERED BETWEEN STAKE POCKETS SO AS TO NOT INTERFERE WITH HOLD-DOWN STRAPPING. SEE REFERENCE DIMENSIONS SHOWN ON END VIEW ON PAGE 2.
2. PRE-POSITION HOLD-DOWN STRAPPING ACROSS THE FLOOR OF THE CAR IN ALIGNMENT WITH THE STAKE POCKETS.
3. AFTER SIDE BLOCKING AND HOLD-DOWN STRAPPING ARE IN PLACE, CENTER THE CONTAINER SKIDS ON SIDE BLOCKING SO THAT THE FORK LIFT OPENINGS ALIGN WITH THE STAKE POCKETS OF THE FLAT CAR. **NOTE:** ONE END OF THE CONTAINER MUST BE POSITIONED IN LINE WITH A CAR SIDE AS SHOWN IN THE END VIEW ON PAGE 2.
4. TO ELIMINATE BREAKING, THE STRAPPING BOARD MUST BE CUT TO FIT SO IT DOES NOT EXTEND BEYOND THE BOTTOM EDGE OF THE FORK LIFT OPENINGS. HOLD-DOWN STRAPPING IS THREADED THROUGH THE STAKE POCKET ON ONE SIDE OF THE CAR, ACROSS THE FLOOR OF THE CAR AND DOWN THROUGH THE STAKE POCKET ON THE OPPOSITE SIDE OF THE CAR, UP AND THROUGH THE FORK LIFT OPENING ON THE CONTAINER, OVER THE STRAPPING BOARD, TO THE OPPOSITE SIDE OF THE CAR WHERE IT WILL BE TENSIONED AND SEALED. **NOTE:** THE PADS, SHOWN IN "DETAIL A" AND "DETAIL B" ON PAGE 6, MUST BE POSITIONED WITH THE SEAL IN PLACE AND CRIMPED PRIOR TO TENSIONING THE HOLD-DOWN STRAPPING.
5. TWO SEALS ARE RECOMMENDED AS INDICATED IN DETAIL B, VIEW B, ON PAGE 6; HOWEVER, IF AVAILABLE SPACE PROHIBITS INSTALLATION OF TWO SEALS, ONE SEAL MAY BE INSTALLED WITH THREE (3) PAIR OF CRIMPS.

GENERAL NOTES

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AMCR 740-13.
- B. THE LOAD AS SHOWN ON PAGES 2 AND 3 IS BASED ON A FLAT CAR 10'-6" WIDE (PLATFORM) AND THE LOAD AS SHOWN ON PAGES 4 AND 5 IS BASED ON A FLAT CAR 9'-2" WIDE (PLATFORM) OR WIDER. ONLY ONE UNIT OF LADING IS SHOWN IN EACH LOAD VIEW; 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:

FOR THE SHIPMENT OF A DRAINING KIT, IN LIEU OF REQUISITIONING A GENERAL SERVICE FM* TYPE FLAT CAR AS DEPICTED HEREIN, EVERY EFFORT SHOULD BE MADE TO ACQUIRE AN FMS* TYPE CUSHIONED FLAT CAR EQUIPPED WITH SPECIAL TIE DOWN CHANNELS AND MOVABLE ANCHOR AND CHAIN ASSEMBLY TIE DOWN DEVICES**, SUCH AS IS USED FOR TRANSPORTING AGRICULTURAL MACHINERY AND HEAVY, EARTH MOVING EQUIPMENT. SEE "SPECIAL PROVISIONS" ON PAGE 5 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 6 IN PUBLICATION OF AAR TITLED "GENERAL RULES GOVERNING THE LOADING OF COMMODITIES ON OPEN TOP CARS".

C. LADING DATA:

ITEM DIMENSIONS ----- 9'-2" LONG X 5'-10" WIDE X 4'-6" HIGH.
ITEM GROSS WEIGHT----- 2,660 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 TIE DOWN 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 THE "TYPICAL END BLOCKING FOR CARS WITH EXPOSED STEEL BOLSTERS" DETAIL ON PAGE 6 FOR APPLICATION OF DUNNAGE METHODS WHICH PERMIT THE USE OF SOME CARS THAT HAVE EXPOSED STEEL COMPONENTS.
- G. WHEN ANY STRAP IS SEALED AT AN END-OVER-END LAP JOINT, AS SHOWN IN "DETAIL B" ON PAGE 6, A MINIMUM OF TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) PAIR OF CRIMPS PER SEAL MUST BE USED. FOR EXCEPTION SEE SPECIAL NOTE 5 ON THIS PAGE.
- H. **CAUTION:** STAKE POCKETS WILL BE USED FOR ANCHORING TIE DOWN STRAPPING WHENEVER POSSIBLE. DO NOT USE SWIVEL RING TYPE ANCHOR DEVICES. IF OTHER TYPES ARE USED, THEY MUST BE OF SUFFICIENT WIDTH TO RECEIVE 2" STRAPPING, AND ALSO BE OF A DESIGN WHICH WILL PROVIDE A BEARING SURFACE ACROSS THE FULL WIDTH OF THE STRAPPING THAT WILL NOT DEFORM A STRAP, ESPECIALLY AT THE EDGES WHEN IT IS TENSIONED.
- J. TO ACHIEVE PROPER CABLE TENSION, EMPLOY TWO (2) CABLE "GRIPPERS" AND AN APPLICABLY SIZED "COME-A-LONG" TYPE MECHANICAL HOIST.
- K. **CAUTION:** IT IS RECOMMENDED THAT CABLE BE INSTALLED AS 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 ARE INSTALLED SO THEIR RETENTION FORCES ACT IN OPPOSITE LONGITUDINAL DIRECTIONS--CONTACT OF THE CABLE WITH THE EDGE OF THE LADING IS PROHIBITED.
- L. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 2" X 4" MATERIAL IS ACTUALLY 1-1/2" THICK BY 3-1/2" WIDE OR 1-5/8" THICK BY 3-5/8" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE OR 1-5/8" THICK BY 5-5/8" WIDE.
- M. **NOTICE:** A STAGGERED NAILING PATTERN WILL BE USED WHEN DUNNAGE IS NAILED TO THE FLOOR OF THE TRANSPORTING VEHICLE, OR WHEN LAMINATING DUNNAGE. 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.

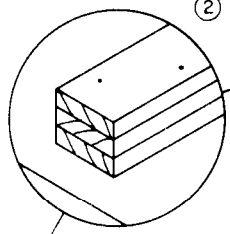
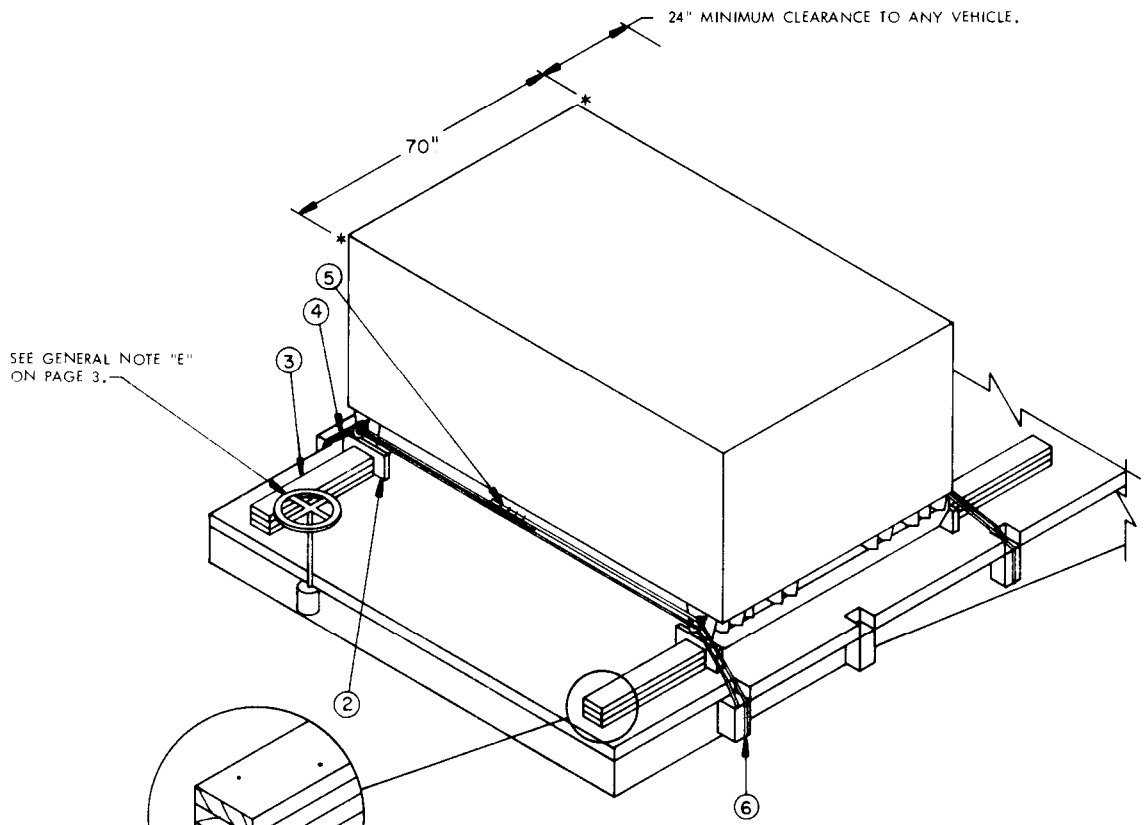
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	19	13
2" X 6"	40	40
NAILS	NO. REQD	POUNDS
12d (3-1/4")	8	NIL
30d (4-1/2")	32	1-3/4
60d (6")	40	4
STEEL STRAPPING, 2" X .050"	76' REQD	26 LBS
SEALS FOR 2" STRAPPING	8 REQD	1-1/2 LBS

MATERIAL SPECIFICATIONS

- LUMBER** ----- : DOUGLAS FIR OR COMPARABLE LUMBER WITH STRAIGHT GRAIN AND FREE OF MATERIAL DEFECTS. REF: FED SPEC MM-L-751.
- NAILS** ----- : COMMON, CEMENT COATED OR CHEMICALLY ETCHED.
REF: FED SPEC FF-N-105.
ALT: ANNULAR-RING TYPE NAIL OF SAME SIZE.
- 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 I, CLASS 1.
- STRAPPING, STEEL** ---- : TYPE I, CLASS A, B, OR C. REF: FED SPEC QQ-S-781.
- STRAP SEAL;
STAKE POCKET
PROTECTOR** ----- : COMMERCIAL GRADE.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
DRAINING KIT	1	2,660 LBS
DUNNAGE		166 LBS
TOTAL WEIGHT		2,826 LBS

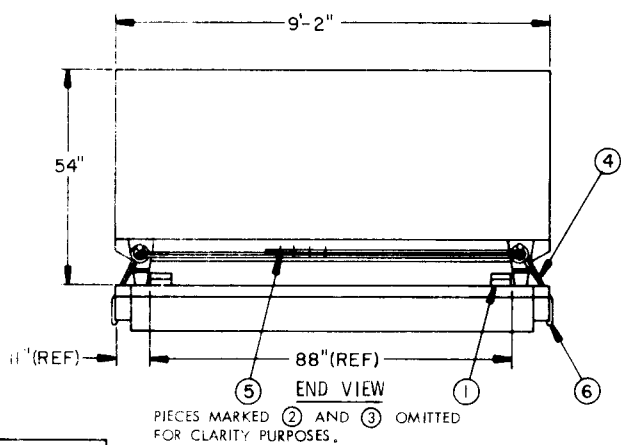


APPLICATION OF STAGGERED NAILING PATTERN. SEE GENERAL NOTE "M" ON PAGE 3.

ISOMETRIC VIEW

KEY NUMBERS

- ① SIDE BLOCKING, 2" X 6" X 18" (DOUBLED) (2 REQD). PRE-POSITION AS SHOWN. NAIL THE FIRST PIECE TO THE CAR FLOOR W/3-30d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE ON PAGE 5 AND GENERAL NOTE "M" ON PAGE 3.
- ② SKID BEARING PIECE, 2" X 6" X 12" (4 REQD). POSITION ON EDGE AND NAIL TO LOWER PIECE MARKED ③ W/2-12d NAILS.
- ③ BACK-UP CLEAT, 2" X 6" X 30" (TRIPLED) (4 REQD). ALIGN WITH PALLET SKID AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-30d NAILS. NAIL EACH ADDITIONAL PIECE W/5-60d NAILS.
- ④ STEEL WIRE ROPE, 3/8" DIAMETER, 6.56 TONS (2 REQD). INSTALL THE CABLE FROM THE STAKE POCKET ON ONE SIDE OF THE CAR THRU THE LADING TIE DOWN DEVICES TO THE STAKE POCKET ON THE OTHER SIDE OF THE CAR AND BACK THRU THE LADING TIE DOWN DEVICES TO FORM A COMPLETE LOOP AS SHOWN. NOTE: CABLE OF A LARGER SIZE MAY BE USED. SEE GENERAL NOTES "D", "E", "J", AND "K". SEE THE "SPECIAL PROVISIONS" ON PAGE 5.
- ⑤ CLIP, SIZE 3/8" (12 REQD). USE FOUR (4) PER CABLE JOINT AND ONE (1) THIMBLE. SEE GENERAL NOTE "D".
- ⑥ THIMBLE, STANDARD, SIZE 3/8" (4 REQD). USE ONE (1) PER STAKE POCKET. SECURE TO PIECE MARKED ④ W/1-CLIP PER THIMBLE. A STANDARD THIMBLE, AS SPECIFIED CAN BE SECURED TO A WIRE ROPE 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.



SPECIAL NOTE:

PRE-POSITION SIDE BLOCKING CENTERED ON A STAKE POCKET. SEE REFERENCE DIMENSIONS SHOWN ON END VIEW ON PAGE 4. CENTER CONTAINER SKIDS ON SIDE BLOCKING SO THAT TIE DOWN POINTS ARE EQUALLY SPACED BETWEEN STAKE POCKETS AS SHOWN IN ISOMETRIC VIEW ON PAGE 4.

SPECIAL PROVISIONS:

A DRAINING KIT MAY BE SECURED ON A CUSHIONED FMS TYPE CAR WITH CHAIN TIE DOWN ASSEMBLIES IN LIEU OF USING THE DEPICTED GENERAL SERVICE FM TYPE CAR AND THE SPECIFIED TIE DOWN MATERIALS, PROVIDING THE FOLLOWING CONDITIONS ARE MET:

1. THE CAR MUST HAVE A NAILABLE FLOOR AREA AT LEAST 8'-6" WIDE BETWEEN THE OUTER CHANNELS FOR THE SECUREMENT OF PIECES MARKED ① AND ③.
2. TWO (2) MOVABLE ANCHORS WITH CHAIN ASSEMBLY TIE DOWN DEVICES MUST BE SUBSTITUTED FOR EACH WIRE ROPE CABLE TIE DOWN MARKED ④. ONE CHAIN WILL BE ATTACHED TO THE LADING AT EACH TIE DOWN POINT (4 REQD). NOTE THAT IF THE LADING TIE DOWN 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 VIEWS.
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 WIRE AS REQUIRED TO PREVENT THE HOOK FROM BECOMING DISENGAGED FROM THE CHAIN LINK TO WHICH IT IS ATTACHED.
7. ANTI-CHAFING MATERIAL MUST BE PLACED AND SECURED BETWEEN THE CHAINS AND THE LADING AT ALL POINTS OF CONTACT, EXCEPT AT DEFINITIVE TIE DOWN POINTS.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 6"	40	40
NAILS	NO. REQD	POUNDS
12d (3-1/4")	8	NIL
30d (4-1/2")	32	1-3/4
60d (6")	40	4
ROPE, STEEL WIRE, 3/8" -----	52' REQD -----	13 LBS
CLIP, 3/8" -----	12 REQD -----	4 LBS
THIMBLE, STANDARD, 3/8" -----	4 REQD -----	3/4 LB
CLIP, 1/2" (ALT FOR 3/8") -----	4 REQD -----	2 LBS

LOAD AS SHOWN

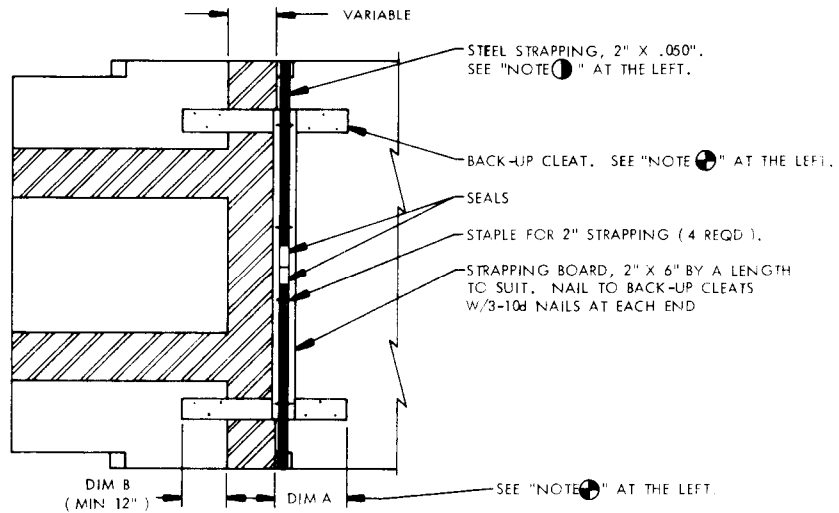
ITEM	QUANTITY	WEIGHT (APPROX)
DRAINING KIT -----	1 -----	2,660 LBS
DUNNAGE -----		126 LBS
TOTAL WEIGHT -----		2,786 LBS

NOTE 1:

WHEN LOADING CARS WHICH HAVE EXPOSED STEEL BOLSTERS, DIMENSION "B" MUST BE AT LEAST 12", AND THE TOTAL OF DIMENSIONS "A" AND "B" MUST BE EQUAL TO OR GREATER THAN THE LENGTH OF A BACK-UP CLEAT (PIECE MARKED ③) TO PROVIDE FOR PROPER NAILING TO THE CAR FLOOR. SEE PIECE MARKED ③ ON PAGE 2 OR 4 FOR PROPER NAILING.

NOTE 2:

THE STRAP HOLD-DOWN FOR END BLOCKING AS SHOWN AT THE RIGHT IS OPTIONAL; IT MAY BE USED FOR CARS WITH EXPOSED STEEL BOLSTERS AS SHOWN, OR IT MAY BE USED FOR CARS WHICH DO NOT HAVE EXPOSED STEEL BOLSTERS.



TYPICAL END BLOCKING FOR CARS WITH EXPOSED STEEL BOLSTERS

SEE GENERAL NOTE "E" ON PAGE 3. THE BLOCKING AS SHOWN IS APPLICABLE FOR THE ITEM HEREIN.

