

APPROVED BY
 MECH DIV AAR, THEIR LETTER
 DATED 14 DEC 73 FILE 16-11.0.13
 SIGNED Frank L. Rose
 DATE 17 DEC 1973
 TEA, MTMTS, FT EUSTIS, VA.

AADCP

LOADING AND BRACING ON FLAT CAR OF SHELTER, AN/TSQ-73 (MISSILE MINDER)

INDEX

<u>ITEM</u>	<u>PAGE(S)</u>
GENERAL NOTES, AND MATERIAL SPECIFICATIONS -----	3
SHELTER, AN/TSQ-73 (UNCRATED-MOUNTED ON SKID BASE)-----	2,3
SHELTER, AN/TSQ-73 (CRATED)-----	4,5
DETAILS -----	6

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.

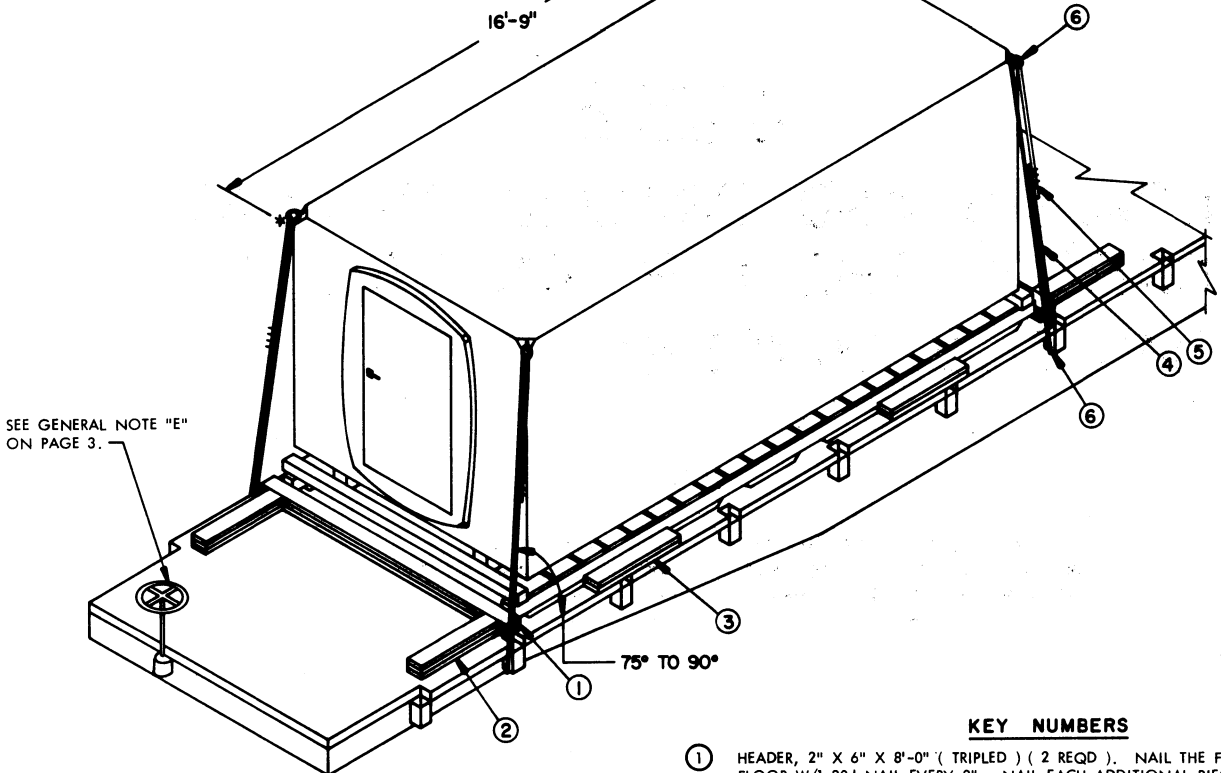
REVISIONS				DRAFTSMAN	PROJ ENG	AMCPM-TDS-RA-E
				<i>CBK</i>	<i>GE/UM</i>	<i>Gilligan</i>
				CHECKER	DDG ENGRG OFFICE	AMCPM-EP
				<i>JDS</i>	<i>John Boyd</i>	<i>Steve Reed</i>
				APPROVED		
				<i>Wesley E. Gilleland</i>		
				U. S. ARMY MISSILE COMMAND		
				APPROVED BY ORDER OF COMMANDING GENERAL		
				U. S. ARMY MATERIEL COMMAND		
				<i>W. E. Gilleland</i>		
				USAMC AMMO CENTER		
				U.S. ARMY MATERIEL COMMAND		
				JANUARY 1974		
				CLASS	DIVISION	DRAWING
				19	48	7805
						FILE
						GSE 5AD4

DO NOT SCALE

NOTE ●:

A STANDARD THIMBLE SPECIFIED CAN BE SECURED TO A CABLE WITH A 1/2" CLIP. HOWEVER, IF DESIRED, OR IF THE 1/2" THIMBLE BEING USED IS OF A TYPE WHICH CANNOT BE SECURED TO A CABLE WITH A 1/2" CLIP, A 5/8" CLIP MAY BE USED.

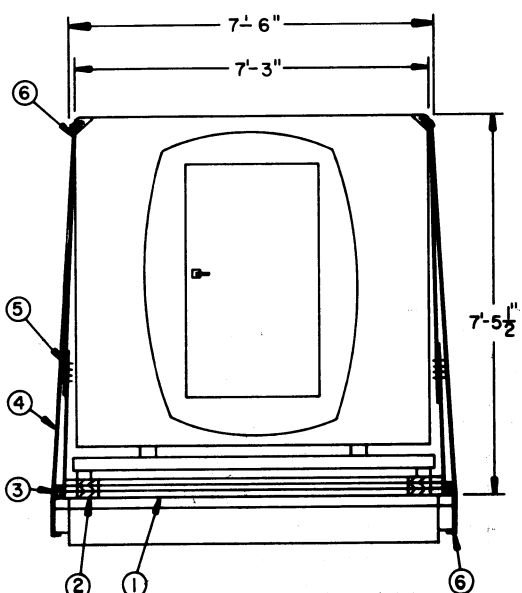
24" MINIMUM CLEARANCE TO ANY VEHICLE.



ISOMETRIC VIEW

KEY NUMBERS

- ① HEADER, 2" X 6" X 8'-0" (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/1-30d NAIL EVERY 8". NAIL EACH ADDITIONAL PIECE W/1-60d NAIL EVERY 8". SEE GENERAL NOTE "M" ON PAGE 3.
- ② BACK-UP CLEAT, 2" X 6" X 30" (TRIPLED) (4 REQD). POSITION 3" FROM THE END OF PIECE MARKED ① AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-30d NAILS. NAIL EACH ADDITIONAL PIECE W/5-60d NAILS.
- ③ SIDE BLOCKING, 2" X 6" X 30" (DOUBLED) (4 REQD). CENTER ON THE CRATE SKIDS AS SHOWN AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-30d NAILS. NAIL THE SECOND PIECE TO THE FIRST PIECE IN A LIKE MANNER.
- ④ STEEL WIRE ROPE, 1/2" DIAMETER, 11.5 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 TIE DOWN DEVICE AND BACK TO THE STAKE POCKET. SEE GENERAL NOTES "D", "J", AND "K" ON PAGE 3.
- ⑤ CLIP, SIZE 1/2" (24 REQD). FOUR (4) PER CABLE AND ONE (1) PER THIMBLE. SEE GENERAL NOTE "D" ON PAGE 3.
- ⑥ THIMBLE, STANDARD, 1/2" SIZE (8 REQD). ONE (1) PER STAKE POCKET AND ONE (1) PER LADING TIE DOWN DEVICE. SECURE TO WIRE ROPE PIECE MARKED ④ W/1-CLIP PER THIMBLE. SEE GENERAL NOTE "D" ON PAGE 3 AND "NOTE ●" ABOVE.



END VIEW

CAR BRAKE WHEEL OMITTED FOR CLARITY PURPOSES.

SPECIAL PROVISIONS:

AN UNCRATED SHELTER 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'-5" WIDE BETWEEN THE OUTER CHANNELS FOR THE SECUREMENT OF PIECES MARKED ① THRU ③.
2. ONE (1) MOVABLE ANCHOR WITH CHAIN ASSEMBLY TIE DOWN DEVICE MUST BE SUBSTITUTED FOR EACH WIRE ROPE CABLE TIE DOWN MARKED ④. CHAINS WILL BE ATTACHED TO THE LADING AT THE SAME LOCATIONS SHOWN FOR THE WIRE ROPE. 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.

GENERAL NOTES

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AMCR 740-13.
- B. THE LOAD AS SHOWN ON PAGE 2 IS BASED ON FLAT CARS 8'-6" WIDE (PLAT-FORM) AND THE LOAD AS SHOWN ON PAGE 4 IS BASED ON FLAT CARS 9'-2" WIDE (PLATFORM). WIDER CARS CAN BE USED. 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 SHIPMENT OF AN UNCRATED SHELTER, IN LIEU OF REQUISITIONING A GENERAL SERVICE FM* FLAT CAR AS DEPICTED HEREIN, EVERY EFFORT SHOULD BE MADE TO ACQUIRE AN FMS* TYPE FLAT CAR. THIS IS A CUSHIONED 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 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 88-8 OF SECTION 6 IN PUBLICATION OF AAR TITLED "GENERAL RULES GOVERNING THE LOADING OF COMMODITIES ON OPEN TOP CARS".

- C. LADING DATA (UNCRATED - MOUNTED ON SKID BASE):

DIMENSIONS----16'-9" LONG BY 7'-6" WIDE BY 7'-5-1/2" HIGH.
GROSS WEIGHT -9,090 POUNDS (APPROX).

- C. LADING DATA (CRATED):

DIMENSIONS----16'-10-1/2" LONG BY 8'-0" WIDE BY 7'-7-1/4" HIGH.
GROSS WEIGHT -10,150 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 1/2" CABLE CLIPS WILL BE TIGHTENED TO A TORQUE OF 85 TO 95 FOOT POUNDS.
- E. REFER TO ASSOCIATION OF AMERICAN RAILROADS MANUAL, "GENERAL RULES GOVERNING 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, OR AS SHOWN IN DETAILS "A" AND "B" ON PAGE 6, A MINIMUM OF TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) PAIR OF CRIMPS PER SEAL MUST BE USED.
- 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 TO APPROXIMATE THE 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 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.
- 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.

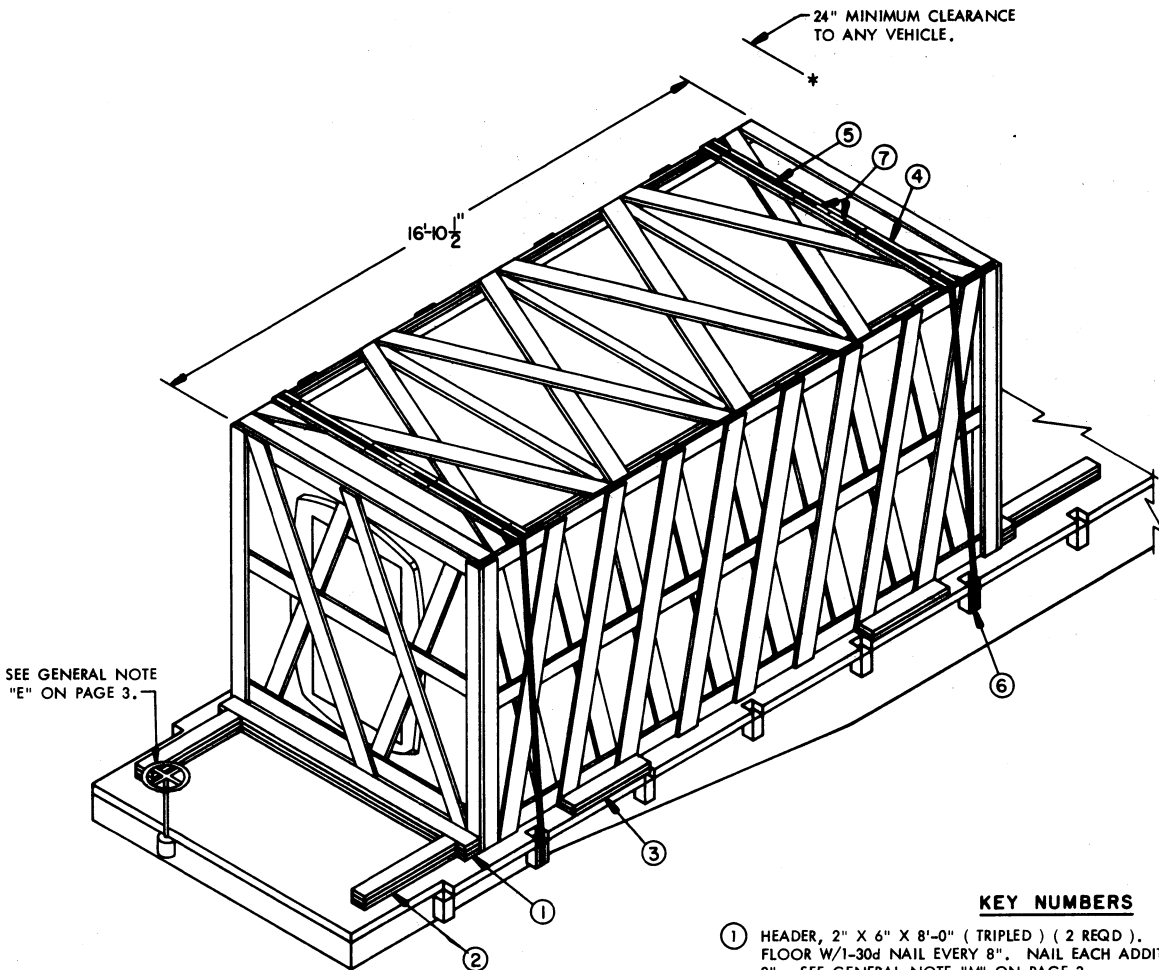
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 6"	98	98
NAILS	NO. REQD	POUNDS
30d (4-1/2")	84	4-1/4
60d (6")	88	9
ROPE, STEEL WIRE, 1/2" DIA. ----- 68' REQD ----- 30 LBS		
CLIP, 1/2" ----- 24 REQD ----- 1-1/2 LBS		
THIMBLE, STANDARD, 1/2"----- 8 REQD ----- 2 LBS		

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 11.5 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 I.
- STRAPPING, STEEL**--- TYPE I, CLASS A, B, OR C. REF: FED SPEC QQ-S-781.
- STRAP SEAL; STRAP STAPLE; STAKE POCKET PROTECTOR**--- COMMERCIAL GRADE.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
SHELTER, UNCRATED, MOUNTED ON SKID		
BASE-----	1	9,090 LBS
DUNNAGE -----		293 LBS
TOTAL WEIGHT -----		9,383 LBS

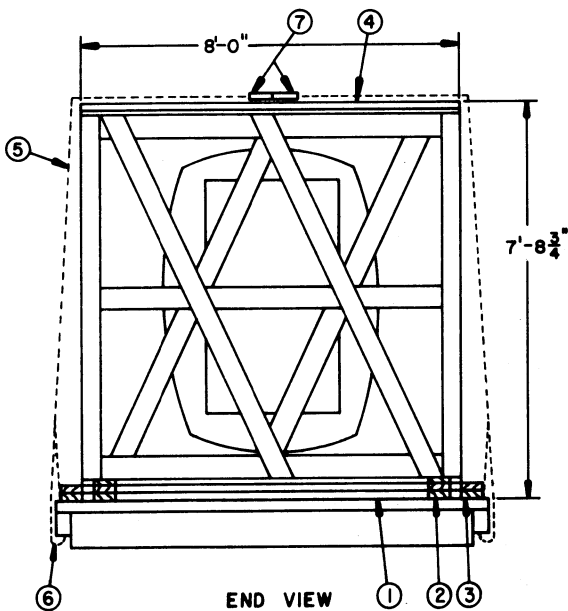


SEE GENERAL NOTE
"E" ON PAGE 3.

ISOMETRIC VIEW

KEY NUMBERS

- ① HEADER, 2" X 6" X 8'-0" (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/1-30d NAIL EVERY 8". NAIL EACH ADDITIONAL PIECE W/1-60d NAIL EVERY 8". SEE GENERAL NOTE "M" ON PAGE 3.
- ② BACK-UP CLEAT, 2" X 6" X 36" (TRIPLED) (4 REQD). POSITION 3" FROM THE END OF PIECE MARKED ① AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/6-30d NAILS. NAIL EACH ADDITIONAL PIECE W/6-60d NAILS.
- ③ SIDE BLOCKING, 2" X 6" X 30" (DOUBLED) (4 REQD). POSITION 30" FROM THE END OF THE CRATE AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-30d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ④ STRAPPING BOARD, 2" X 6" X 8'-0" (2 REQD).
- ⑤ HOLD-DOWN STRAP, 2" X .050" X 32'-0" STEEL STRAPPING (2 REQD). INSTALL EACH STRAP FROM TWO (2) 16'-0" LONG PIECES. SEE GENERAL NOTES "G" AND "H" ON PAGE 3. STAPLE TO THE STRAPPING BOARD, PIECE MARKED ④ W/4-2" STAPLES.
- ⑥ PAD, 2" X .050" STEEL STRAPPING 24" LONG (4 REQD). POSITION UNDER AND SEAL TO PIECE MARKED ⑤. SEE "DETAIL A" ON PAGE 6. ALTERNATIVE: STAKE POCKET PROTECTOR (8 REQD). USE TWO (2) UNDER EACH STAKE POCKET WITH PIECES MARKED ⑤. SEE "DETAIL B" ON PAGE 6.
- ⑦ SEAL FOR 2" STRAPPING (16 REQD, 8 PER STRAP). EXCEPT FOR SEALS USED TO SECURE PIECES MARKED ⑥, DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "G" ON PAGE 3.



END VIEW

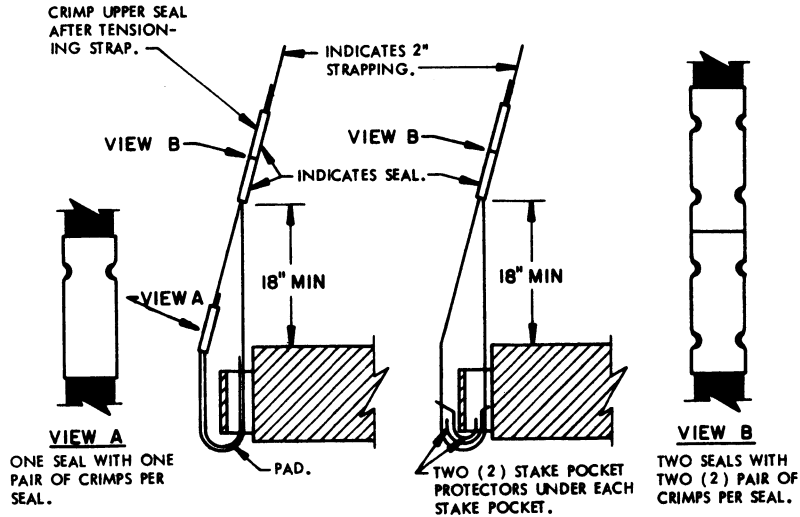
CAR BRAKE WHEEL OMITTED
FOR CLARITY PURPOSES.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 6"	120	120
NAILS	NO. REQD	POUNDS
30d (4-1/2")	88	4-1/2
60d (6")	96	9-3/4
STEEL STRAPPING, 2" X .050" ----- 72' REQD ----- 24 LBS		
SEAL FOR 2" STRAPPING----- 16 REQD ----- 3 LBS		
STAPLES FOR 2" STRAPPING----- 8 REQD ----- NIL		

LOAD AS SHOWN

<u>ITEM</u>	<u>QUANTITY</u>	<u>WEIGHT (APPROX)</u>
SHELTER, CRATED -----1-----		10,150 LBS
<u>DUNNAGE</u> -----		341 LBS
TOTAL WEIGHT -----		10,491 LBS



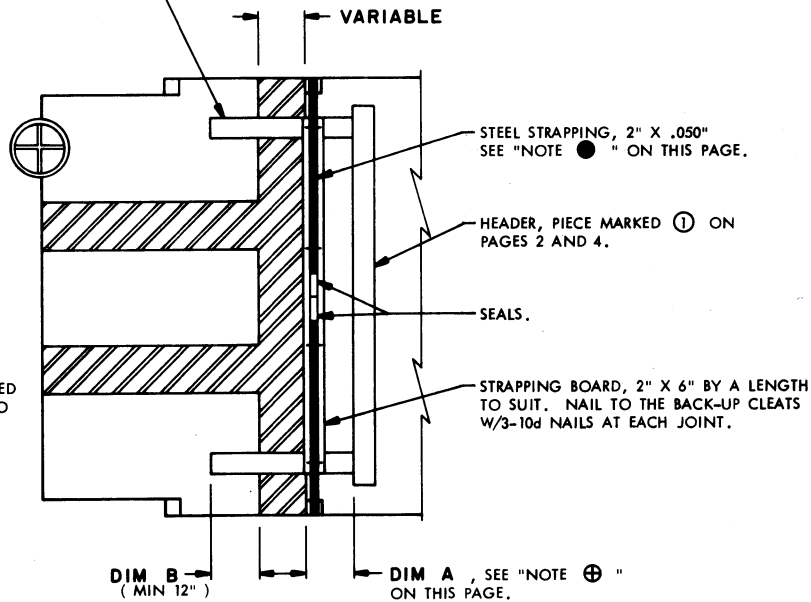
DETAIL A
METHOD OF INSTALLING 2" STRAPPING AND PAD AT STAKE POCKET.

DETAIL B
METHOD OF INSTALLING 2" STRAPPING AND STAKE POCKET PROTECTORS (ALT PAD).

BACK-UP CLEAT, PIECE MARKED ② ON PAGES 2 AND 4, SEE "NOTE ⊕" ON THIS PAGE.

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

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



END BLOCKING FOR CARS WITH EXPOSED STEEL BOLSTERS