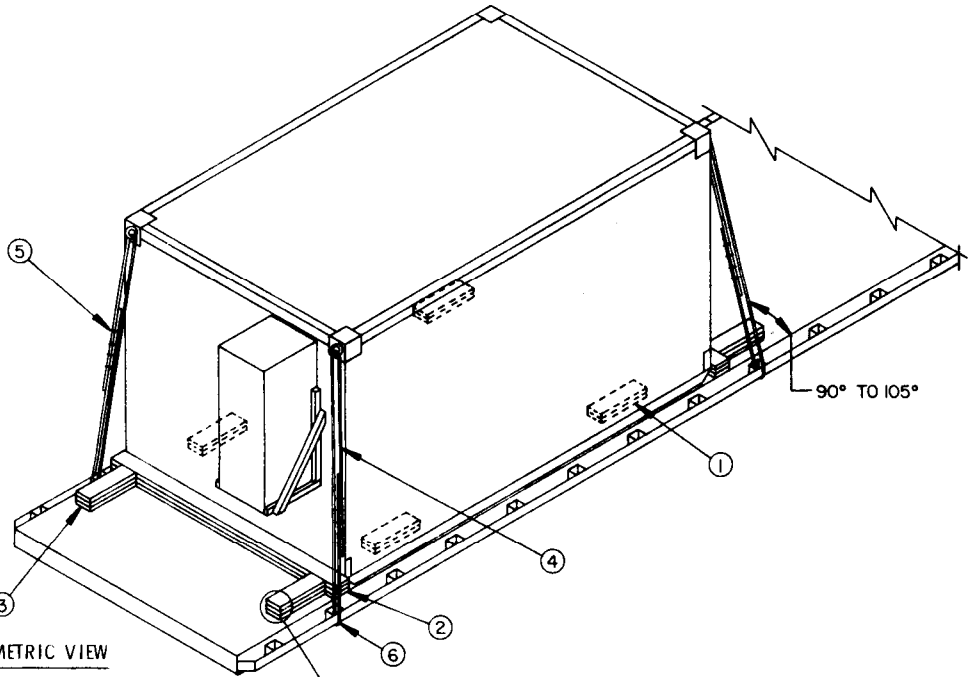


TOW

LOADING AND BRACING ON FLAT BED OR "LOW-BOY" TRAILER OF IMPROVED CONTACT SUPPORT SET

REVISIONS				DESIGNED BY <i>SW/ds</i>	FIELD ENG <i>RSF/WRF</i>	ANALYST/STDP <i>DAE/RLH</i>
				<i>ANN</i>	LOG ENGINE OFFICE <i>WRF/Ann</i>	
APPROVED, U.S. ARMY MISSILE COMMAND						
<i>Gm [Signature]</i>						
APPROVED BY CHIEF OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND (AMC)						
<i>John L. Byrd</i> U.S. ARMY DEFENSE ACQUISITION CENTER AND SCHOOL						
U.S. ARMY AMC DRAWING						
JANUARY 1985						
				CLASS	DIVISION	DRAWING
				19	48	7611
						FILE GSE 11 TO 3

DO NOT SCALE

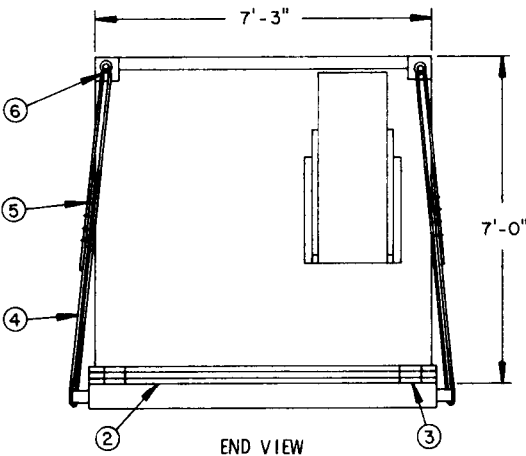


ISOMETRIC VIEW

APPLICATION OF STAGGERED NAILING PATTERN. SEE GENERAL NOTE "L" ON FIG. 3.

KEY NUMBERS

- ① SIDE BLOCKING, 2" X 6" X 18" (DOUBLED) (4 REQD). PREPOSITION SO AS TO CONTACT THE ITEM SKIDS AND NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-12d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTE "L" ON PAGE 3.
- ② HEADER, 2" X 6" BY TRAILER WIDTH (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/1-12d NAIL EVERY 8". NAIL EACH ADDITIONAL PIECE W/1-20d NAIL EVERY 8".
- ③ BACK-UP CLEAT, 2" X 6" X 18" (TRIPLED) (4 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-12d NAILS. NAIL EACH ADDITIONAL PIECE W/5-20d NAILS.
- ④ STEEL WIRE ROPE, 3/8" DIA, 6.56 TONS (4 REQD). INSTALL CABLE TO APPROXIMATE THE ANGLE SHOWN AND TO FORM A COMPLETE LOOP FROM AN ANCHORING FACILITY ON THE TRAILER THRU A LADING TIEDOWN DEVICE AND BACK TO THE TRAILER ANCHORING FACILITY. NOTE: CABLE OF A LARGER SIZE MAY BE USED. SEE GENERAL NOTES "F", "H", AND "J" AND THE "SPECIAL PROVISIONS" ON PAGE 3.
- ⑤ CLIP, WIRE ROPE, SIZE 3/8" (24 REQD). USE FOUR (4) PER CABLE JOINT AND ONE (1) PER THIMBLE. SEE GENERAL NOTE "F" ON PAGE 3 AND KEY NUMBER ⑥ BELOW.
- ⑥ THIMBLE, STANDARD, SIZE 3/8" (8 REQD). USE ONE (1) PER TRAILER ANCHORING FACILITY AND ONE (1) PER LADING TIEDOWN DEVICE. SECURE TO WIRE ROPE MARKED ④ W/1 CLIP PER THIMBLE. NOTE: 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

SPECIAL PROVISIONS (FOR UNCRATED SHELTERS):

- LADING MAY BE SECURED BY CARRIER-OWNED CHAINS AND LOAD BINDERS IN LIEU OF SPECIFIED WIRE ROPE CABLE DUNNAGE MATERIALS, PROVIDING THE FOLLOWING CONDITIONS ARE MET:
1. ONLY CHAINS AND LOAD BINDERS OF GOOD QUALITY SHOULD BE USED. CAUTION: EXTREME CARE MUST BE USED IN TENSIONING CHAINS TO PREVENT DAMAGE TO THE LADING OR DEFORMATION OF THE LADING TIEDOWN FACILITIES.
 2. ONE (1) LINE OF 3/8" CHAIN, OR ONE (1) LINE OF 1/4" CHAIN, MAY BE SUBSTITUTED FOR EACH WIRE ROPE CABLE MARKED ④. CHAINS SHALL BE INSTALLED AT THE SAME LOCATIONS SHOWN FOR WIRE ROPE CABLES AND IN THE SAME MANNER AS DIRECTED IN GENERAL NOTE "J".
 3. IF DESIRED, CHAINS OF A LARGER SIZE THAN SPECIFIED ABOVE MAY BE USED.
 4. BEFORE AND DURING INSTALLATION, THE CHAINS AND LOAD BINDERS SHALL BE INSPECTED FOR BENT HOOKS, STRETCH, GOUGES, BENT LINKS, WEAR AND ANY OTHER NOTICEABLE DEFECTS. ANY DEFICIENCY SHALL BE CAUSE FOR REJECTION OF A CHAIN OR LOAD BINDER.
 5. CHAINS MUST NOT BE TWISTED DURING INSTALLATION.
 6. THE TENSIONING DEVICE OF EACH LOAD BINDER MUST BE SAFETY-WIRE TIED TO PREVENT ACCIDENTAL OPENING OR LOOSENING IN TRANSIT.
 7. ANTI-CHAFING MATERIAL MUST BE PLACED AND SECURED BETWEEN CHAINS AND 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 AR 740-1.
- B. THE LOAD AS SHOWN IS BASED ON A FLAT BED OR "LOW BOY" TRAILER 8'-0" WIDE WITH A WOOD OR A WOOD AND METAL FLOOR. 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 A TRAILER. THE NUMBER OF UNITS TO BE DEPENDENT ON THE SIZE OF THE TRAILER USED OR THE QUANTITIES OF UNITS TO BE SHIPPED, 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 RETENSION PROPERTIES EQUAL TO OR BETTER THAN SPECIFIED DUNNAGE LUMBER AND A SUFFICIENT NUMBER OF TIEDOWN FACILITIES OF A STRENGTH EQUAL TO OR BETTER THAN SPECIFIED LADING TIEDOWN ASSEMBLIES.
- D. SHIPMENT GROSS WEIGHT, AXLE DISTRIBUTION OF LADING WEIGHT AND OVERALL DIMENSIONS MUST MEET STATE LAW REQUIREMENTS.
- E. LADING DATA:
SUPPORT SET (UNCRATED)
DIMENSIONS ----- 13'-9" LONG BY 7'-3" WIDE BY 7'-0" HIGH.
GROSS WEIGHT ---- 3,920 POUNDS (APPROX).

SUPPORT SET (CRATED)
DIMENSIONS ----- 15'-0" LONG BY 8'-0" WIDE BY 7'-8" HIGH.
GROSS WEIGHT ---- 5,945 POUNDS (APPROX).
- F. REFER TO ORD DRAWING 19-48-C-ORDJU-588, "WIRE ROPE AND ANNEALED WIRE APPLICATION METHODS FOR SECURING LADING ON RAIL AND 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.
- G. SEE THE SPECIAL PROVISIONS AT THE LEFT AND ON PAGE 5 FOR SPECIFICATIONS WHICH MUST BE APPLIED IF CHAINS AND LOAD BINDERS ARE USED FOR SECURING SHELTERS.
- H. TENSIONING OF STEEL WIRE ROPE CAN BE ACCOMPLISHED BY EMPLOYING TWO (2) CABLE "GRIPPERS" AND AN APPLICABLY SIZED "COME-A-LONG" TYPE MECHANICAL HOIST.
- J. CAUTION: IT IS RECOMMENDED THAT CABLE TIEDOWNS BE INSTALLED TO APPROXIMATE ANGLE SHOWN; HOWEVER, IF PLACEMENT OF TRANSPORTER TIE-DOWN FACILITIES PREVENTS THIS, CARE MUST BE EXERCISED TO ENSURE THAT CABLE TIEDOWNS ON THE SAME SIDE OF LADING ARE INSTALLED SO THEIR RETENTION FORCES ACT IN OPPOSITE LONGITUDINAL DIRECTIONS.
- K. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE.
- L. 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.
- M. CONVERSION TO METRIC EQUIVALENTS: THE DIMENSIONS WITHIN THIS DRAWING 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 POUNDS EQUALS 0.454KG.
- N. WHEN ANY STRAP IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) PAIR OF CRIMPS PER SEAL MUST BE USED TO SEAL THE JOINT.
- O. 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 OR CRATE 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 6.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 6"	75	75
NAILS	NO. REQD	POUNDS
12d (3-1/4")	84	1-1/2
20d (4")	84	3
ROPE, STEEL WIRE, 3/8" DIA ----- 70' REQD ----- 18 LBS		
CLIP, 3/8" ----- 24 REQD ----- 8 LBS		
THIMBLE, STANDARD, 3/8" ----- 8 REQD ----- 2 LBS		

MATERIAL SPECIFICATIONS

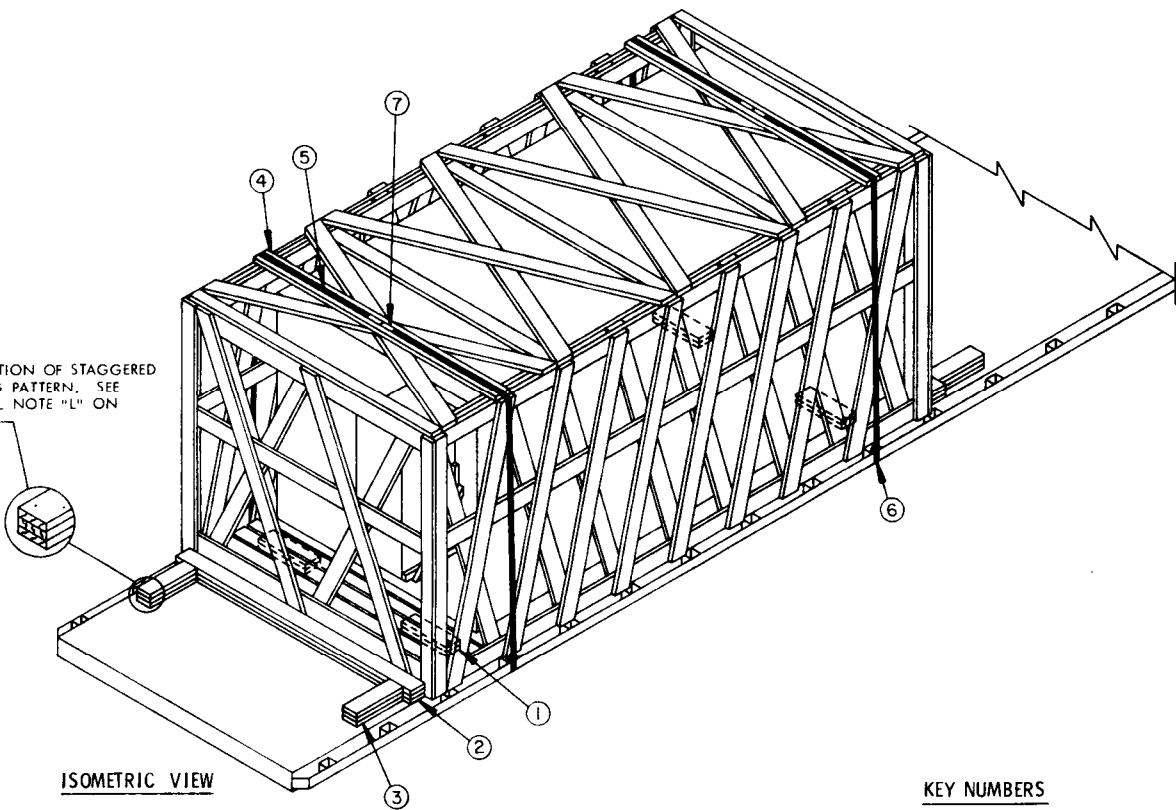
- LUMBER**----- : DOUGLAS FIR OR COMPARABLE LUMBER WITH STRAIGHT GRAIN AND FREE OF MATERIAL DEFECTS. REF: FED SPEC MM-L-751.
- NAILS** ----- : COMMON, FED SPEC FF-N-105.
- ROPE** ----- : STEEL WIRE, PLAIN, PREFORMED, REGULAR LAY, 6.56 TONS, 6 X 19, FLEXIBLE IWRC, MACWHYTE WIRE, ROPE CO (OR EQUAL). REF: FED SPEC RR-W-410.
- CLIPS** ----- : "U" BOLT, CROSBY, HEAVY DUTY (OR EQUAL). REF: FED SPEC FF-C-450, TYPE I, CLASS 1.
- THIMBLE STANDARD** -- : TYPE II, FED SPEC FF-T-276.
- STRAPPING, STEEL** ---- : CLASS I, TYPE I OR IV, HEAVY DUTY, FINISH A, B (GRADE 2), OR C; FED SPEC QQ-5-781.
- STRAP SEAL** ----- : TYPE D, STYLE I, II, OR IV, CLASS H, FED SPEC QQ-5-781.
- STRAP STAPLE, STAKE POCKET PROJECTOR** -- : COMMERCIAL GRADE.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
IMPROVED CONTACT SUPPORT SET (UNCRATED)	-----1-----	3,920 LBS
DUNNAGE	-----	183 LBS

TOTAL WEIGHT ----- 4,103 LBS (APPROX)

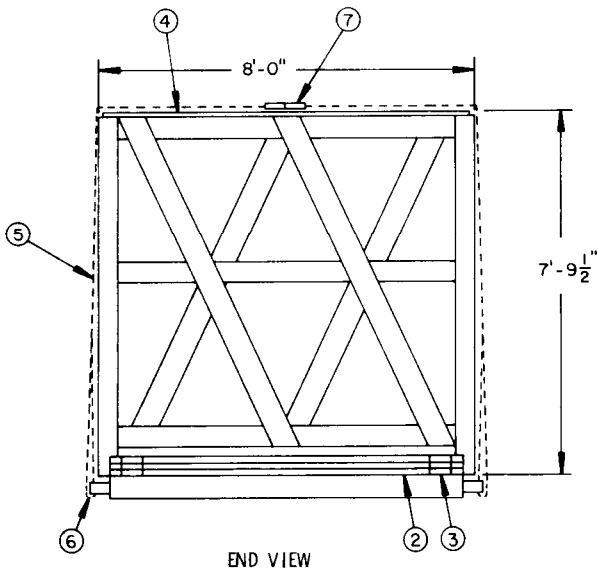
APPLICATION OF STAGGERED
NAILING PATTERN. SEE
GENERAL NOTE "L" ON
PAGE 3.



ISOMETRIC VIEW

KEY NUMBERS

- ① SIDE BLOCKING, 2" X 6" X 18" (DOUBLED) (4 REQD). PRE-POSITION SO AS TO BE AGAINST THE CRATE SKIDS AS SHOWN. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-12d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTE "L" ON PAGE 3.
- ② HEADER, 2" X 6" X TRAILER WIDTH (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/1-12d NAIL EVERY 8". NAIL EACH ADDITIONAL PIECE W/1-20d NAIL EVERY 8".
- ③ BACK-UP CLEAT, 2" X 6" X 18" (TRIPLED) (4 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-12d NAILS. NAIL EACH ADDITIONAL PIECE W/5-20d NAILS.
- ④ STRAPPING BOARD, 2" X 6" X 8'-0" (2 REQD).
- ⑤ HOLD-DOWN STRAP, 2" X .050" X 32'-0" LONG STEEL STRAPPING (2 REQD). INSTALL EACH STRAP FROM TWO (2) 16'-0" LONG PIECES. STAPLE TO PIECE MARKED ④ W/4-2" STAPLES. SEE THE "SPECIAL PROVISIONS" ON PAGE 5.
- ⑥ PAD, 2" X .050" X 18" LONG STEEL STRAPPING (4 REQD). POSITION UNDER AND SEAL TO A PIECE MARKED ⑤. SEE "DETAIL A" ON PAGE 6. ALT: STAKE POCKET PROTECTOR (8 REQD). USE TWO (2) UNDER EACH ANCHORING FACILITY WITH A PIECE MARKED ⑤. SEE "DETAIL B" ON PAGE 6.
- ⑦ SEAL FOR 2" STRAPPING (12 REQD, 6 PER STRAP). SEE GENERAL NOTE "N" ON PAGE 3.



END VIEW

SPECIAL PROVISIONS (FOR CRATED SUPPORT SETS):

LADING MAY BE SECURED BY CARRIER-OWNED CHAINS AND LOAD BINDERS IN LIEU OF SPECIFIED HOLD-DOWN STRAPPING DUNNAGE MATERIALS, PROVIDING THE FOLLOWING CONDITIONS ARE MET:

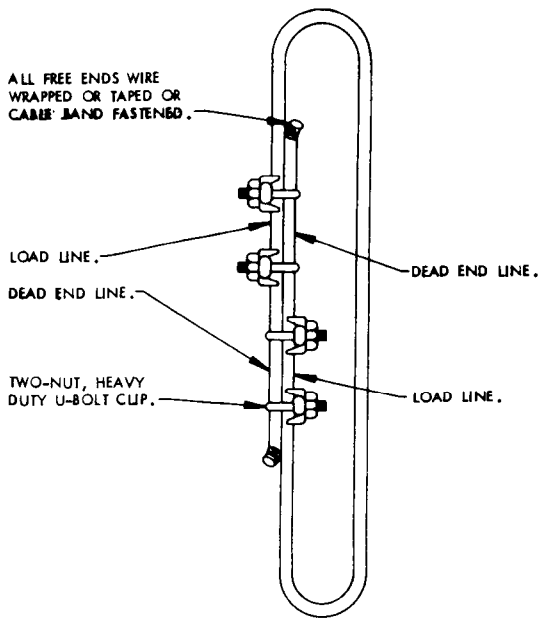
1. ONLY CHAINS AND LOAD BINDERS OF GOOD QUALITY SHOULD BE USED. CAUTION: EXTREME CARE MUST BE USED IN TENSIONING CHAINS TO PREVENT DAMAGE TO SUPPORT SET CRATE.
2. IN LIEU OF EACH HOLD-DOWN STRAP MARKED ⑤, ONE (1) LINE OF 3/8" CHAIN OR ONE (1) LINE OF 1/4" CHAIN CAN BE USED. THE STRAPPING BOARD MARKED ④ MUST BE DOUBLED AND LAMINATED W/1-10d NAIL EVERY 12". EACH CHAIN SHALL BE SECURED TO THE LAMINATED BOARDS W/4-20d NAILS BY PARTIALLY DRIVING EACH NAIL INTO THE BOARD THRU AN OPENING IN THE CHAIN LINK AND BENDING IT OVER THE LINK.
3. IF DESIRED, CHAINS OF A LARGER SIZE THAN SPECIFIED MAY BE USED.
4. BEFORE AND DURING INSTALLATION, THE CHAINS AND LOAD BINDERS SHALL BE INSPECTED FOR BENT HOOKS, STRETCH, GOUGES, BENT LINKS, WEAR AND OTHER NOTICEABLE DEFECTS, ANY DEFICIENCY SHALL BE CAUSE FOR REJECTION OF A CHAIN OR LOAD BINDER.
5. CHAINS MUST NOT BE TWISTED DURING INSTALLATION.
6. THE TENSIONING DEVICE OF EACH LOAD BINDER MUST BE SAFETY-WIRE TIED TO PREVENT ACCIDENTAL OPENING OR LOOSENING IN TRANSIT.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 6"	91	91
NAILS	NO. REQD	POUNDS
12d (3-1/4")	84	1-1/2
20d (4")	84	3
STEEL STRAPPING, 2" X .050" -----	70' REQD -----	24 LBS
SEAL FOR 2" STRAPPING -----	12 REQD -----	3 LBS
STAPLE FOR 2" STRAPPING -----	8 REQD -----	NIL

LOAD AS SHOWN

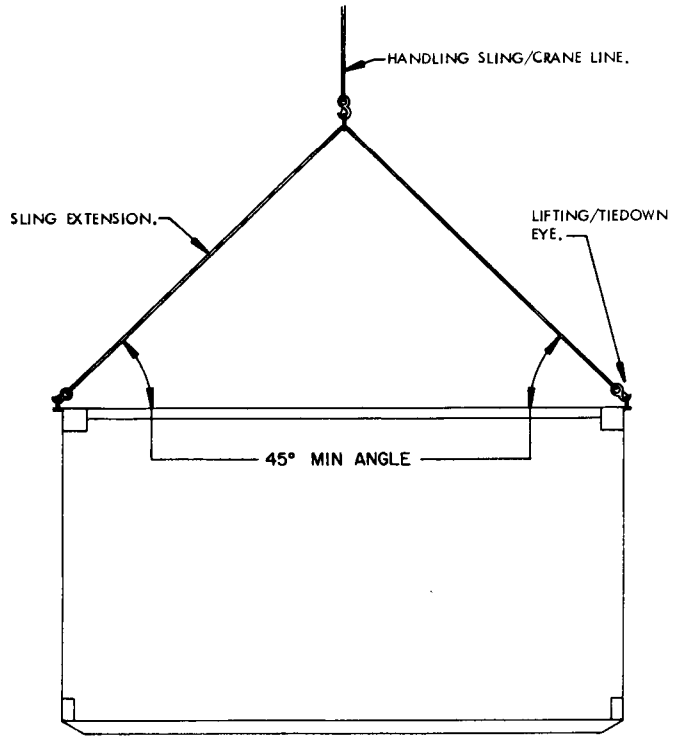
<u>ITEM</u>	<u>QUANTITY</u>	<u>WEIGHT (APPROX)</u>
IMPROVED CONTACT		
SUPPORT SET (CRATED)-----	1-----	5,945 LBS
DUNNAGE-----		214 LBS

TOTAL WEIGHT --- 6,159 LBS (APPROX)

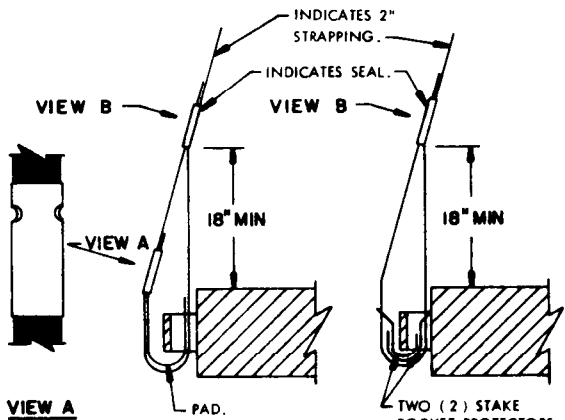


CABLE JOINT

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

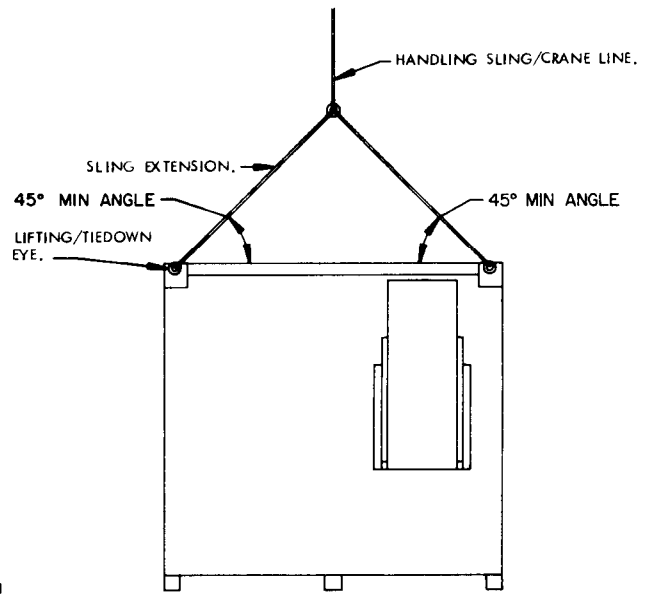


VIEW A
ONE SEAL WITH ONE PAIR OF CRIMPS.

DETAIL A
METHOD OF INSTALLING 2" STRAPPING AND PAD AT ANCHORING FACILITY.

VIEW B
ONE SEAL WITH TWO PAIR OF CRIMPS.

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



END VIEW

SLINGING PROVISIONS