

APPROVED BY
 BUREAU OF EXPLOSIVES
E. P. Reiner
 SUPERVISOR, MILITARY & INTERMODAL SERVICES
 DATE *8/27/82*

PATRIOT

LOADING AND BRACING ON FLAT CAR OF THE COMPLETE ROUND IN MISSILE CANISTER (SHIPPING, STORAGE AND LAUNCH CONTAINER), W/O OVERPACK AND W/OVERPACK

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U.S. ARMY DARCOM DRAWING						
AUGUST 1982						
CLASS	DIVISION	DRAWING	FILE			
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DO NOT SCALE

GENERAL NOTES

(GENERAL NOTES CONTINUED)

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1, AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE LOADS AS SHOWN HEREIN ARE BASED ON FLAT CARS OF VARIOUS LENGTHS AND WIDTHS WITH STAKE POCKETS SPACED 42" ON CENTER. SEE THE "SPECIAL NOTES" SECTIONS ADJACENT TO AN OUTLOADING METHOD FOR SPECIFIC GUIDANCE.
- C. THE OUTLOADING PROCEDURES SPECIFIED HEREIN ARE APPLICABLE TO THE PATRIOT COMPLETE ROUND, WHEN PACKED IN THE MISSILE CANISTER (SHIPPING, STORAGE AND LAUNCH CONTAINER), W/O OVERPACK AND W/OVERPACK.
- D. FOR DETAIL OF THE MISSILE CANISTER, SEE DRAWING NUMBER 11450000, AND THE "CANISTER DETAIL" ON PAGE 3.

CANISTER DIMENSIONS-----234" LONG X 42-3/8" WIDE X 38-3/4" HIGH.
GROSS WEIGHT-----3,750 LBS (APPROX).

FOR DETAILS OF THE OVERPACK (FOR CANISTER) SEE DRAWING NUMBER D-SARAC-4500, AND THE "OVERPACK UNIT DETAIL" ON PAGE 3.

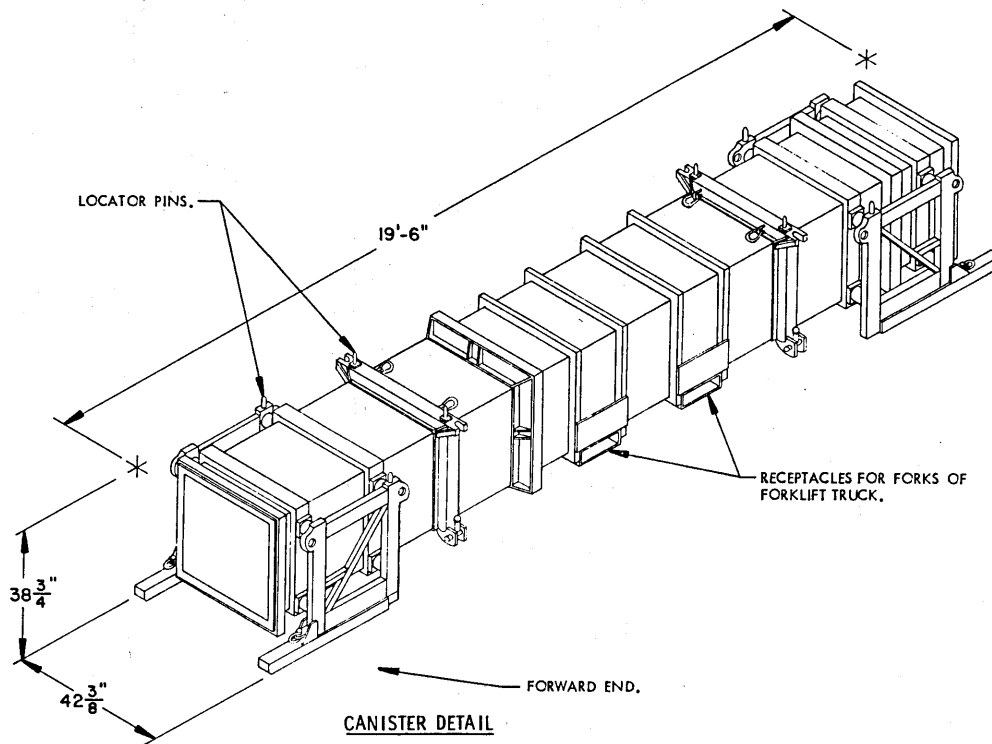
OVERPACK UNIT DIMENSIONS ---248" LONG X 47-1/4" WIDE X 49-3/4" HIGH.
GROSS WEIGHT (W/CANISTER) ---5,268 LBS (APPROX).
- E. THIS ITEM IS A DOT CLASS "A" EXPLOSIVE. THESE PROCEDURES CAN ALSO BE UTILIZED FOR THE SHIPMENT OF THE CANISTERS WHEN THEY ARE LOADED WITH AN ITEM WHICH IS IDENTIFIED DIFFERENTLY BY NOMENCLATURE THAN THE ITEM DESIGNATED WITHIN THE DRAWING TITLE, OR WHEN THEY ARE EMPTY.
- F. THE SELECTION OF RAILCARS FOR THE TRANSPORT OF THE DESIGNATED ITEMS WILL BE IN ACCORDANCE WITH HAZARDOUS MATERIALS REGULATIONS OF DOT AND AR 55-355, CHAPTER 213, FOR EXPLOSIVES AND OTHER DANGEROUS ARTICLES, IN FULL.
- G. IF THE RAILCAR BEING USED IS NOT EQUIPPED WITH PLACARD BOARDS ON BOTH ENDS AND BOTH SIDES, 16" X 24" BOARDS MUST BE PROVIDED AS REQUIRED. CAUTION: BOARDS AND BOARD MOUNTING BRACKETS MUST NOT BE NAILED TO THE LADING.
- H. 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 13 FOR APPLICATION-OF-DUNNAGE METHODS WHICH PERMIT THE USE OF SOME CARS THAT HAVE EXPOSED STEEL COMPONENTS. IF THE CAR TO BE USED HAS SUCH EXPOSED STEEL COMPONENTS, THE CAR MAY NECESSARILY HAVE TO BE LONGER THAN THE ONE SPECIFIED FOR THE APPLICABLE LOAD.
- J. NOTICE: A SHIPMENT WILL BE POSITIONED ON THE RAIL CAR IN COMPLIANCE WITH THE WEIGHT DISTRIBUTION REQUIREMENTS OF THE AAR. THE APPROVED METHODS FOR THE LOADS SPECIFIED MUST BE FOLLOWED. THE NUMBER OF UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE CAR TO BE LOADED OR THE QUANTITY TO BE SHIPPED. FOR A LOAD QUANTITY OTHER THAN SPECIFIED, THE APPROVED METHODS FOR BLOCKING, BRACING, AND STAYING MUST BE FOLLOWED AS CLOSELY AS POSSIBLE.
- K. IF THE CAPACITY OF THE MATERIALS HANDLING EQUIPMENT PERMITS, IT IS RECOMMENDED THAT CANISTERS AND/OR OVERPACK UNITS BE UNITIZED PRIOR TO PLACEMENT ABOARD THE FLAT CAR. SEE THE "UNITIZATION AND HANDLING PROCEDURES" ON PAGES 4 AND 5.
- L. CAUTION: STAKE POCKETS ON FLAT CARS WILL BE USED FOR ANCHORING HOLD-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.

- M. BASED ON FLAT CARS WITH STAKE POCKETS SPACED 42" APART, CANISTERS MUST BE POSITIONED AS SHOWN TO FACILITATE PROPER APPLICATION OF 2" TIE-DOWN STRAPPING; HOWEVER, IF CARS ARE AVAILABLE WITH STAKE POCKETS SPACED OTHER THAN 42" APART OR IF ADEQUATE TIE-DOWN DEVICES ARE PROVIDED BETWEEN STAKE POCKETS, CANISTERS SHOULD BE POSITIONED ON THE CAR TO MOST EFFICIENTLY UTILIZE TIE-DOWN ATTACHMENT POINTS.
- N. OTHER TYPES OF LADING ITEMS MAY BE LOADED ON A CAR WHICH IS PARTIALLY LOADED WITH THE DESIGNATED ITEM, PROVIDING THE TOTAL LOAD IS COMPATIBLE, EXISTING DIRECTIVES ARE NOT VIOLATED, AND THE OTHER LADING ITEMS ARE BLOCKED AND BRACED TO EQUAL THE BLOCKING AND BRACING CRITERIA SPECIFIED.
- O. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT, OR AS SHOWN IN "DETAIL A" OR "DETAIL B" ON PAGE 13, A MINIMUM OF TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) PAIR OF CRIMPS PER SEAL MUST BE USED TO SEAL THE JOINT. CAUTION: EXERCISE CARE DURING TENSIONING TO PREVENT DAMAGE TO THE CANISTERS OR OVERPACK UNITS.
- P. 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 AND 4" X 4" MATERIAL IS ACTUALLY 3-1/2" WIDE BY 3-1/2" THICK.
- Q. A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES. ALSO, A STAGGERED NAILING PATTERN WILL BE USED WHEN DUNNAGE IS NAILED TO THE CAR FLOOR, 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 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.
- R. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "UNITIZATION AND HANDLING PROCEDURES" ON PAGES 4 AND 5 AND TO THE "SPECIAL NOTES" SECTION WHICH IS IMMEDIATELY ADJACENT TO A DEPICTED OUTLOADING METHOD.

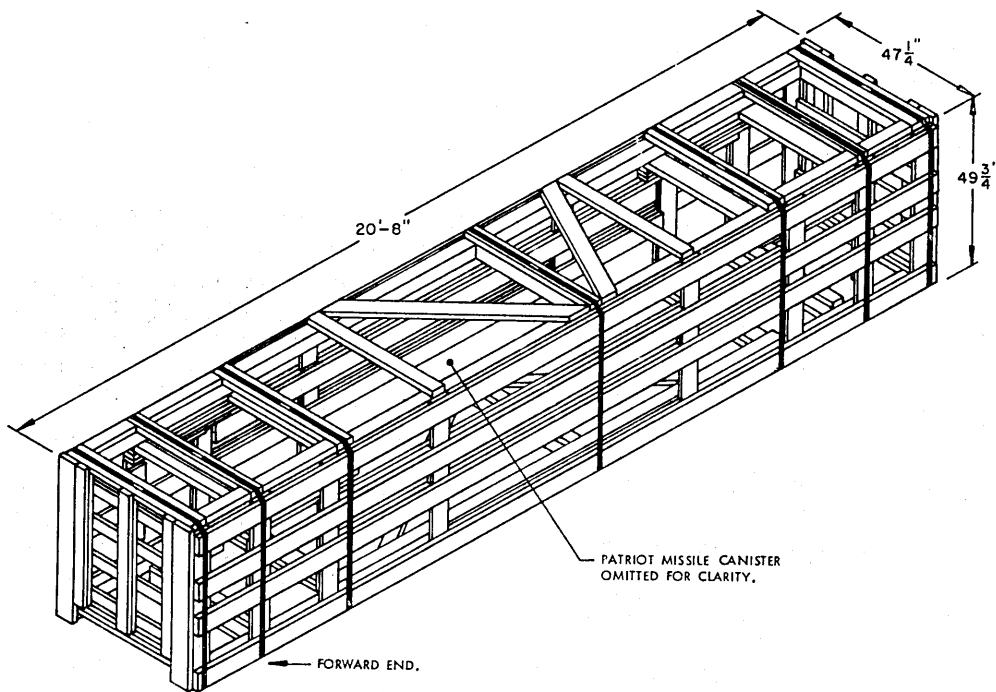
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MATERIAL SPECIFICATIONS

- LUMBER-----: SEE TM 743-200-1, DUNNAGE LUMBER; FED SPEC MM-L-751.
- NAILS-----: COMMON, FED SPEC FF-N-105.
- STRAPPING, STEEL-----: CLASS 1, TYPE I OR IV, HEAVY DUTY, FINISH A OR B (GRADE 2), OR C; FED SPEC QQ-5-781.
- STRAP SEALS -----: TYPE D, STYLE I, II, OR IV, CLASS H, FED SPEC QQ-5-781.
- STRAP STAPLE, STAKE POCKET PROTECTOR-----: COMMERCIAL GRADE.
- ANTI-CHAFING MATERIAL-----: NEUTRAL BARRIER MATERIAL MIL-B-121 (OR EQUAL).
- STEEL, BAR, FLAT-----: COLD DRAWN, LOW CARBON, 1018, PER ASTM A108.

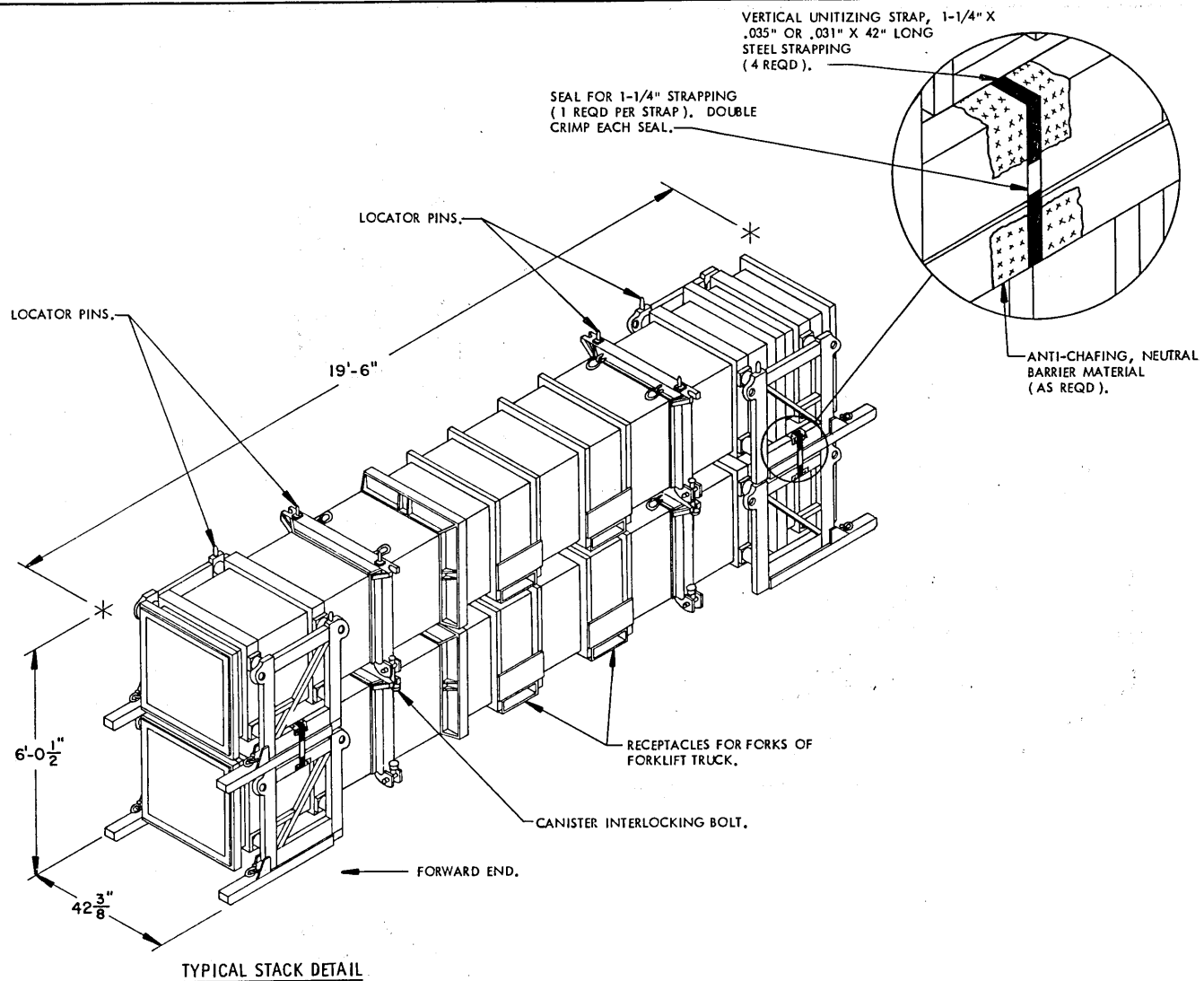


GROSS WEIGHT-----3,750 LBS (APPROX)



GROSS WEIGHT OF CANISTER WITH OVERPACK-----5,268 LBS (APPROX).

CANISTER AND OVERPACK UNIT DETAILS



TYPICAL STACK DETAIL

UNITIZATION AND HANDLING PROCEDURAL GUIDANCE

(UNITIZATION AND HANDLING PROCEDURAL GUIDANCE CONTINUED)

1. STACKING CANISTERS FOR UNITIZING.
 - A. THE SKIDS OF THE UPPER CANISTER MUST BE FULLY SEATED UPON THE LOCATOR PINS OF THE LOWER CANISTER.
 - B. POSITION THE FORWARD END OF THE UPPER CANISTER ABOVE THE FORWARD END OF THE LOWER CANISTER.
 - C. CANISTER INTERLOCKING BOLTS MUST BE TIGHTENED AS SECURELY AS POSSIBLE WITH A NORMAL SIZE HAND TOOL WRENCH (REF 60 FOOT POUNDS).
2. INSTALLATION OF 1-1/4" UNITIZING STRAP.
 - A. EACH OF THE FOUR UNITIZING STRAPS SHOULD BE POSITIONED AROUND THE SHOCK ISOLATION FRAMES AS SHOWN. PLACE STRAPPING SO THAT IT LAYS FLAT AND STRAIGHT.
 - B. PLACE ANTI-CHAFING NEUTRAL BARRIER MATERIAL UNDER THE STRAPPING WHEREVER THE STRAPPING CONTACTS SHARP EDGES AND SECURE TO PREVENT DISLODGEEMENT DURING AND AFTER STRAP APPLICATION.
 - C. STRAPPING WILL BE FIRMLY TENSIONED, AND EACH END-OVER-END LAP JOINT WILL BE SEALED WITH ONE DOUBLE CRIMPED SEAL AS SHOWN. DURING STRAP TENSIONING, CARE SHOULD BE EXERCISED TO ENSURE THAT THE CANISTERS ARE NOT DAMAGED. EXCESS STRAPPING (STRAP ENDS) SHOULD BE CUT OFF OR BROKEN OFF NEAR THE JOINT SEAL.

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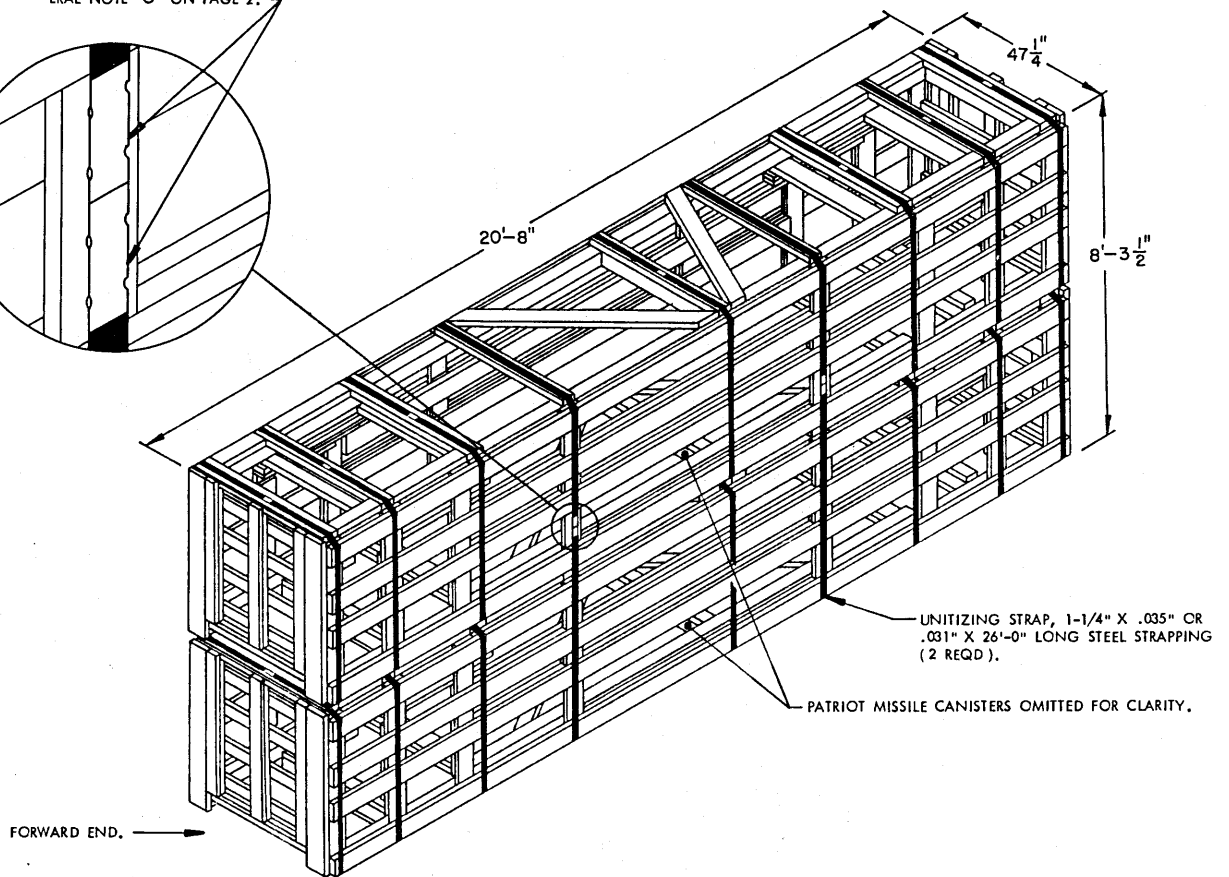
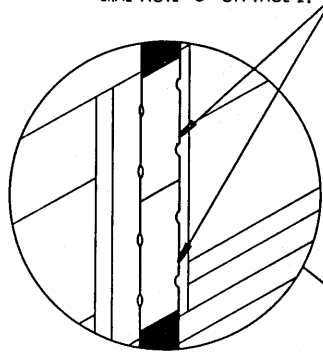
3. CANISTER OR CANISTER STACK HANDLING.

NOTES: (1) APPROVED MATERIALS HANDLING EQUIPMENT (MHE) IS SPECIFIED IN OTHER DOCUMENTS. MHE IS INTENDED TO MEAN EQUIPMENT SUCH AS FORKLIFT TRUCKS, CRANES, HAND TRUCKS, DOLLIES, ROLLER ASSEMBLIES, SLINGS AND SPREADER BARS.

(2) PRECAUTIONARY HANDLING TECHNIQUES NORMALLY EMPLOYED OR AS SPECIFIED FOR THE TYPE OF COMMODITY INVOLVED WILL BE OBSERVED.

 - A. ONLY APPROVED AND APPROPRIATELY SIZED MATERIALS HANDLING EQUIPMENT WILL BE USED FOR HANDLING THE DEPICTED CANISTERS.
 - B. IF HANDLING IS ACCOMPLISHED WITH A FORKLIFT TRUCK, THE CANISTERS SHOULD BE HANDLED FROM A SIDE POSITION AS MUCH AS POSSIBLE. CARE MUST BE EXERCISED WHEN INSERTING FORKS UNDER A CANISTER, TO PREVENT DAMAGE TO THE CANISTER BY THE FORK TINES OR THE FORKLIFT PACKAGE GUARD. FOR VERY SHORT "INCHING" SPEED MOVEMENTS, SUCH AS WILL BE EXPERIENCED DURING FLAT CAR LOADING, A TWO-HIGH CANISTER STACK MAY BE HANDLED BY INSERTING THE FORKS OF A FORKLIFT TRUCK INTO THE FORK RECEPTACLES OF THE UPPER CANISTER.
 - C. SLINGING OF A CANISTER OR A CANISTER STACK WILL BE ACCOMPLISHED IN ACCORDANCE WITH APPROVED PROCEDURES.

SEAL FOR 1-1/4" STEEL STRAPPING
(2 REQD PER STRAP JOINT). DOUBLE
CRIMP EACH SEAL AS SHOWN. SEE GEN-
ERAL NOTE "O" ON PAGE 2.



TYPICAL STACK DETAIL

UNITIZATION AND HANDLING PROCEDURAL GUIDANCE

1. STACKING UNITS FOR UNITIZING.
 - A. THE UPPER UNIT SHOULD BE PLACED AS CLOSELY AS POSSIBLE IN VERTICAL ALIGNMENT WITH THE LOWER UNIT.
 - B. POSITION THE FORWARD END OF THE UPPER UNIT ABOVE THE FORWARD END OF THE LOWER UNIT.
2. INSTALLATION OF 1-1/4" UNITIZING STRAP.
 - A. EACH OF THE TWO UNITIZING STRAPS SHOULD BE POSITIONED AROUND THE UNITS AS SHOWN. PLACE STRAPPING SO THAT IT LAYS FLAT AND STRAIGHT, I.E. VERTICAL ALONG THE SIDES AND STRAIGHT ACROSS THE TOP AND BOTTOM OF THE STACK.
 - B. STRAPPING WILL BE FIRMLY TENSIONED, AND EACH END-OVER-END LAP JOINT WILL BE SEALED WITH TWO DOUBLE CRIMPED STRAP SEALS AS SHOWN. SEE GENERAL NOTE "O" ON PAGE 2. THE LAP JOINTS WILL BE MADE ALONG THE SIDE OF THE STACK. DURING STRAP TENSIONING, CARE SHOULD BE EXERCISED TO ENSURE THAT THE UNITS ARE NOT DAMAGED. EXCESS STRAPPING (STRAP ENDS) SHOULD BE CUT OFF OR BROKEN OFF NEAR THE JOINT SEALS.

3. UNIT OR UNIT STACK HANDLING:

NOTES: (1) APPROVED MATERIALS HANDLING EQUIPMENT (MHE) IS SPECIFIED IN OTHER DOCUMENTS. MHE IS INTENDED TO MEAN EQUIPMENT SUCH AS FORKLIFT TRUCKS, CRANES, HAND TRUCKS, DOLLIES, ROLLER ASSEMBLIES, SLINGS AND SPREADER BARS.

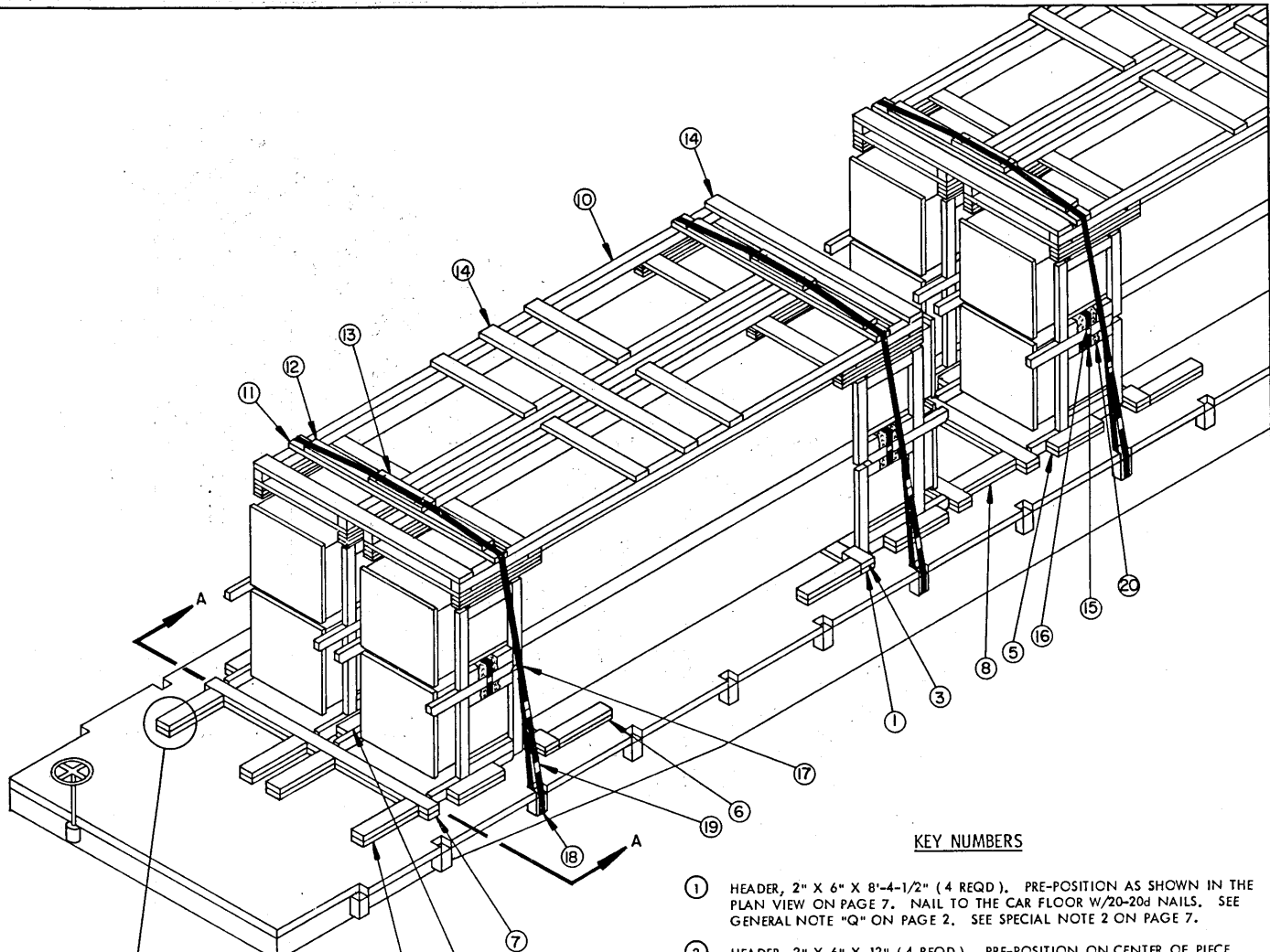
(2) PRECAUTIONARY HANDLING TECHNIQUES NORMALLY EMPLOYED OR AS SPECIFIED FOR THE TYPE OF COMMODITY INVOLVED WILL BE OBSERVED.

- A. ONLY APPROVED AND APPROPRIATELY SIZED MATERIALS HANDLING EQUIPMENT WILL BE USED FOR HANDLING THE DEPICTED UNITS.

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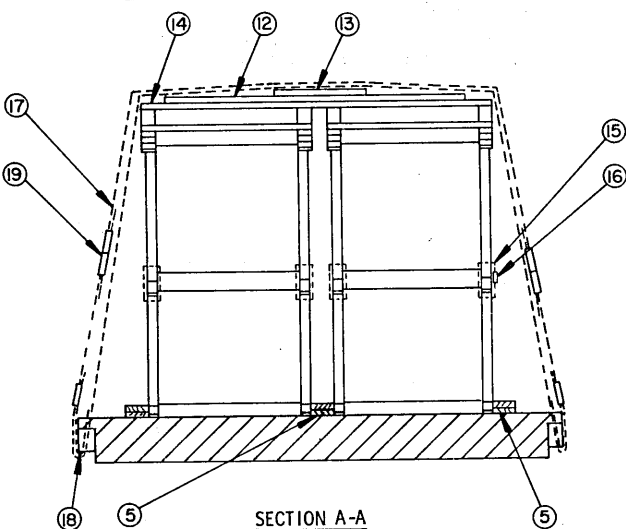
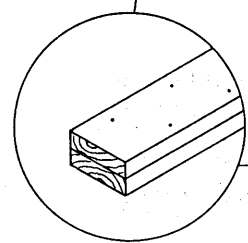
(UNITIZATION AND HANDLING PROCEDURAL GUIDANCE CONTINUED)

- B. IF HANDLING IS ACCOMPLISHED WITH A FORKLIFT TRUCK, THE UNITS SHOULD BE HANDLED FROM A SIDE POSITION AS MUCH AS POSSIBLE. CARE MUST BE EXERCISED WHEN INSERTING FORKS UNDER A UNIT, TO PREVENT DAMAGE TO THE OVERPACK BY THE FORK TINES OR THE FORKLIFT PACKAGE GUARD. FOR VERY SHORT "INCHING" SPEED MOVEMENTS, SUCH AS WILL BE EXPERIENCED DURING FLAT CAR LOADING, A TWO-HIGH UNIT STACK MAY BE HANDLED BY INSERTING THE FORKS OF A FORKLIFT TRUCK INTO THE FORK RECEPTACLES OF THE UPPER MISSILE CANISTER.
- C. SLINGING OF A UNIT OR A UNIT STACK WILL BE ACCOMPLISHED IN ACCORDANCE WITH APPROVED PROCEDURES.



ISOMETRIC VIEW

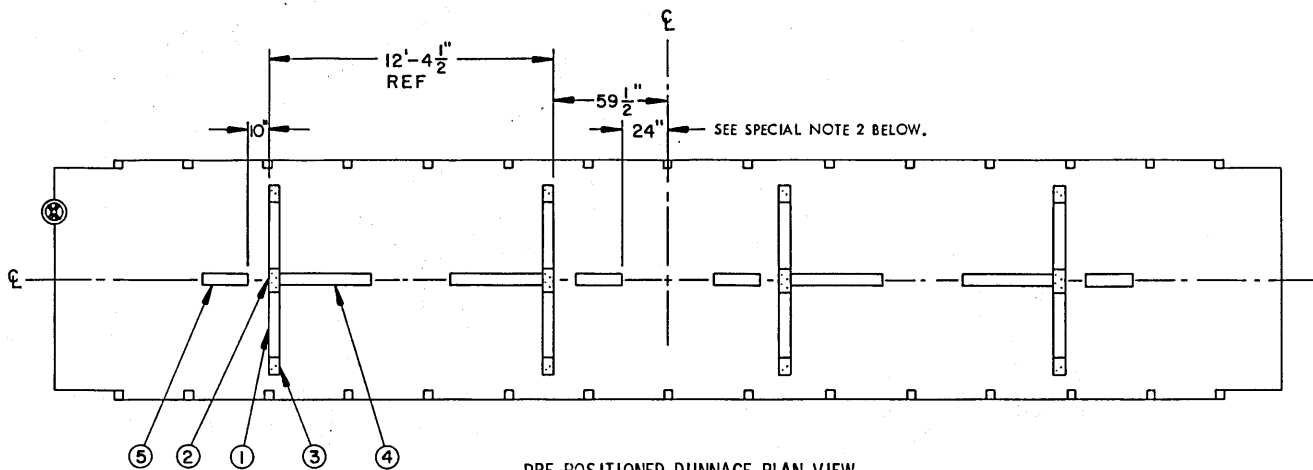
APPLICATION OF STAGGERED NAILING PATTERN. SEE GENERAL NOTE "Q" ON PAGE 2.



KEY NUMBERS

- ① HEADER, 2" X 6" X 8'-4-1/2" (4 REQD). PRE-POSITION AS SHOWN IN THE PLAN VIEW ON PAGE 7. NAIL TO THE CAR FLOOR W/20-20d NAILS. SEE GENERAL NOTE "Q" ON PAGE 2. SEE SPECIAL NOTE 2 ON PAGE 7.
- ② HEADER, 2" X 6" X 12" (4 REQD). PRE-POSITION ON CENTER OF PIECE MARKED ① AND NAIL W/3-50d NAILS.
- ③ HEADER, 2" X 6" X 9" (8 REQD). POSITION ON THE END OF PIECE MARKED ① AND NAIL W/2-50d NAILS.
- ④ BACK-UP CLEAT, 2" X 6" X 48" (DOUBLED) (4 REQD). PRE-POSITION ON THE CENTER LINE OF THE CAR FLOOR AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/12-20d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/12-50d NAILS.
- ⑤ SIDE BLOCKING, 2" X 6" X 24" (DOUBLED) (12 REQD). PRE-POSITION 4 PIECES AS SHOWN IN THE PLAN VIEW ON PAGE 7. PLACE THE OTHER 8 PIECES AGAINST THE CANISTER SKIDS AS SHOWN. NAIL THE FIRST PIECE TO THE CAR FLOOR W/6-20d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/6-30d NAILS.
- ⑥ BACK-UP CLEAT, 2" X 6" X 24" (DOUBLED) (8 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/6-20d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/6-50d NAILS.
- ⑦ HEADER, 2" X 6" X 8'-2" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/20-20d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/20-50d NAILS.
- ⑧ BACK-UP CLEAT, 2" X 6" BY A LENGTH TO SUIT (24" MIN) (DOUBLED) (4 REQD). ALIGN WITH CONTAINER SKIDS AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/6-20d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/6-50d NAILS.
- ⑨ BACK-UP CLEAT, 2" X 6" X 24" (DOUBLED) (8 REQD). ALIGN WITH CONTAINER SKID AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/6-20d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/6-50d NAILS.
- ⑩ HOLD-DOWN ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 12. POSITION AS SHOWN SO AS TO REST ON THE SHOCK ISOLATION FRAMES.
- ⑪ STRAPPING BOARD, 2" X 6" X 7'-7-1/2" (4 REQD). LOCATE ONE NEAR EACH END OF TWO LATERALLY ADJACENT HOLD-DOWN ASSEMBLIES AND SO AS TO ALIGN WITH EACH CAR STAKE POCKET TO WHICH HOLD-DOWN STRAPPING IS TO BE ATTACHED. NAIL TO PIECES MARKED ⑩ W/3-12d NAILS AT EACH JOINT. SEE SPECIAL NOTE 3 ON PAGE 7.

(CONTINUED ON PAGE 7)



PRE-POSITIONED DUNNAGE PLAN VIEW

(KEY NUMBERS CONTINUED FROM PAGE 6)

- ⑫ PURCHASE BOARD, 2" X 6" X 6'-6" (4 REQD). CENTER ON THE LENGTH OF AND NAIL TO PIECE MARKED ⑪ W/13-10d NAILS.
- ⑬ PURCHASE BOARD, 2" X 6" X 24" (4 REQD). CENTER ON THE LENGTH OF AND NAIL TO PIECE MARKED ⑫ W/4-10d NAILS.
- ⑭ TIE BOARD, 2" X 6" X 7'-7-1/2" (6 REQD). LOCATE AT OR NEAR THE ENDS AND CENTER OF PIECES MARKED ⑩ AND NAIL TO ⑩ W/3-12d NAILS AT EACH JOINT.
- ⑮ VERTICAL UNITIZING STRAP, 1-1/4" X .035" OR .031" X 42" LONG STEEL STRAPPING (16 REQD). INSTALL STRAPS AROUND THE SHOCK ISOLATION FRAMES AS SHOWN. SEE THE "UNITIZATION AND HANDLING PROCEDURES (W/O OVERPACK)" ON PAGE 4.
- ⑯ SEAL FOR 1-1/4" STEEL STRAPPING (16 REQD, 1 PER STRAP) DOUBLE CRIMP EACH SEAL.
- ⑰ HOLD-DOWN STRAP, 2" X .050" X 52'-0" LONG STEEL STRAPPING (4 REQD). INSTALL EACH STRAP FROM TWO (2) PIECES, ONE 18'-0" LONG AND ONE 34'-0" LONG. STAPLE TO PIECE MARKED ⑬ W/2 STAPLES. SEE THE "STRAP THREADING DETAIL" ON PAGE 14. SEE GENERAL NOTE "O" ON PAGE 2 AND SPECIAL NOTE 3 AT THE RIGHT.
- ⑱ PAD, 2" X .050" X 48" LONG STEEL STRAPPING (8 REQD). POSITION UNDER STAKE POCKET AND SEAL TO A HOLD-DOWN STRAP MARKED ⑰ . SEE "DETAIL C" ON PAGE 14. ALT: STAKE POCKET PROTECTOR (16 REQD). USE TWO (2) UNDER EACH STAKE POCKET WITH A HOLD-DOWN STRAP. SEE "DETAIL D" ON PAGE 14.
- ⑲ SEAL FOR 2" STEEL STRAPPING (24 REQD, 6 PER STRAP). DOUBLE CRIMP EACH SEAL, EXCEPT THOSE USED TO SECURE THE PADS, PIECES MARKED ⑱ . SEE GENERAL NOTE "O" ON PAGE 2.
- ⑳ ANTI-CHAFING MATERIAL, NEUTRAL BARRIER MATERIAL (AS REQD). POSITION UNDER ALL STRAPS AT POINTS OF CONTACT WITH THE CANISTERS.

SPECIAL NOTES:

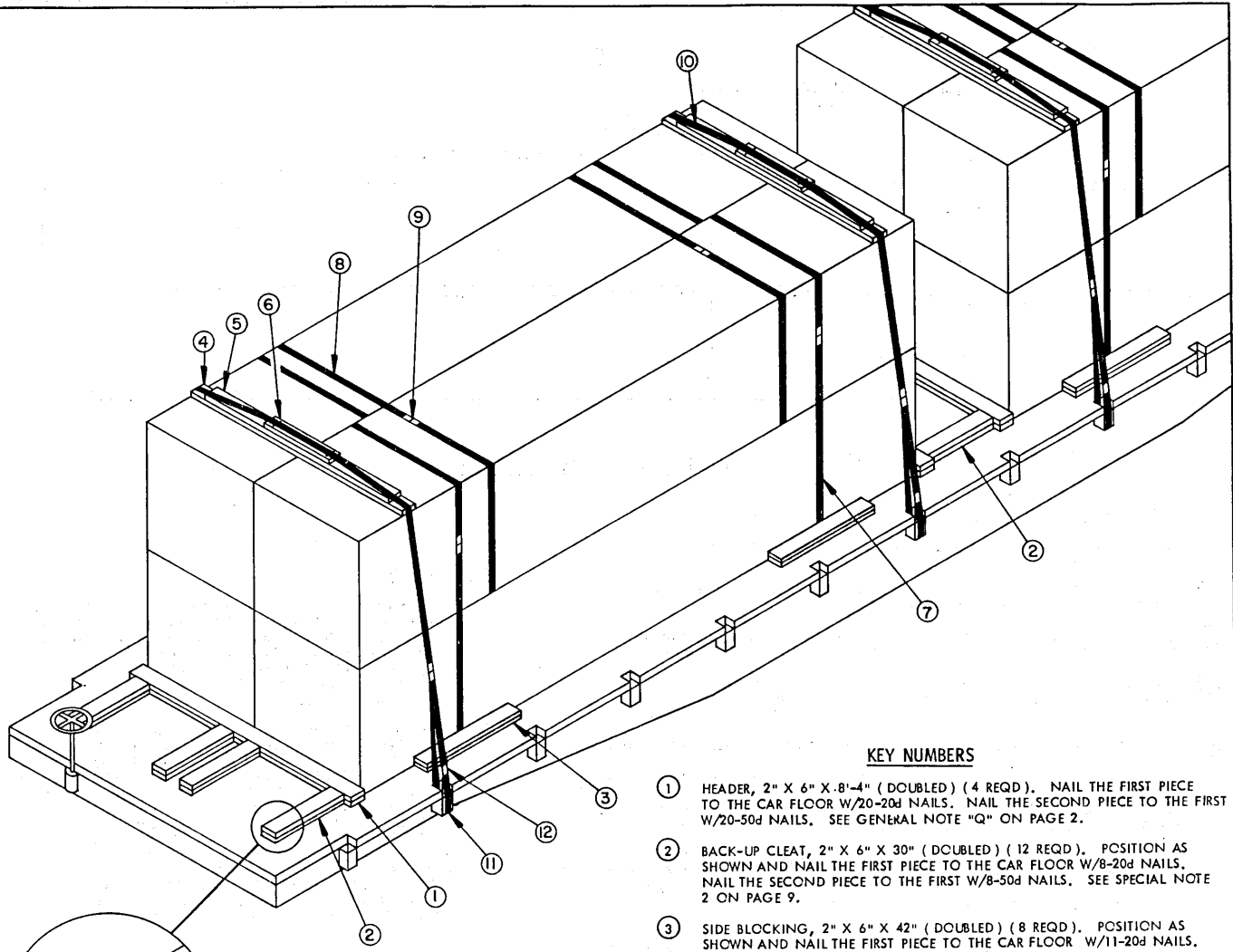
1. AN 8-UNIT LOAD IS SHOWN ON A 53'-6" LONG BY 10'-6" WIDE (PLATFORM) FLAT CAR WITH FIFTEEN STAKE POCKETS SPACED 42" ON CENTER. NARROWER CARS, OTHER LENGTH CARS, AND CARS HAVING STAKE POCKETS SPACED OTHER THAN 42" CAN BE USED. NOTE THAT CARS LONGER THAN 50'-6" SHOULD NOT BE ORDERED FOR SHIPMENT OF AN 8-UNIT LOAD. SEE SPECIAL NOTE 2 FOR ADDITIONAL GUIDANCE.
2. A 50'-0" LONG CAR HAVING FOURTEEN STAKE POCKETS SPACED 42" ON CENTER CAN BE USED FOR SHIPPING THE DEPICTED LOAD. THE LOCATION FOR THE HEADERS, PIECES MARKED ①, WILL BE APPROXIMATELY 64" FROM THE CENTER LINE. A 48'-0" LONG CAR HAVING FOURTEEN POCKETS SPACED 39" ON CENTER CAN BE USED. PIECES MARKED ① WILL THEN BE LOCATED APPROXIMATELY 55" FROM THE CAR CENTER. A 50'-0" CAR HAVING SIXTEEN POCKETS SPACED 36" ON CENTER CAN ALSO BE USED. PIECES MARKED ① FOR THE LOAD WILL BE APPROXIMATELY 63-1/2" FROM CENTER. A 48'-0" LONG CAR WITH POCKETS 45" ON CENTER OR A 50'-0" CAR WITH POCKETS 48" ON CENTER CAN BE USED. PIECES MARKED ① WILL THEN BE LOCATED APPROXIMATELY 54" AND 63-1/2", RESPECTIVELY, FROM THE CENTER LINE OF THE CAR. SEE SPECIAL NOTE 3
3. THE HOLD-DOWN STRAPS, PIECES MARKED ⑰, SHOULD EXTEND OVER THE LOAD AT A POINT DIRECTLY ABOVE THE SHOCK ISOLATION FRAMES. IF THIS IS NOT POSSIBLE, THE HOLD-DOWN STRAPS MUST BE CENTERED BETWEEN THESE FRAMES. FOR GUIDANCE, STRAPS WILL BE ATTACHED TO STAKE POCKETS SO THERE ARE FIVE (5) SPACES (A SPACE BEING FROM ONE POCKET TO THE NEXT), BETWEEN THEM FOR POCKET SPACINGS OF 32" TO 37", FOUR (4) SPACES FOR POCKETS 38" TO 47", AND THREE (3) SPACES FOR STAKE POCKETS OVER 48" ON CENTER.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	26	9
2" X 4"	178	119
2" X 6"	475	475
4" X 4"	136	182
NAILS	NO. REQD	POUNDS
6d (2")	128	1
10d (3")	68	1-1/4
12d (3-1/4")	824	13-3/4
20d (4")	464	16-3/4
30d (4-1/2")	72	3-3/4
50d (5-1/2")	276	21-1/4
STEEL STRAPPING, 1-1/4" X .035" OR .031" --- 56' REQD ----- 8 LBS		
STEEL STRAPPING, 2" X .050" ----- 224' REQD ----- 75 LBS		
SEAL FOR 1-1/4" STRAPPING ----- 16 REQD ----- 3/4 LBS		
SEAL FOR 2" STRAPPING ----- 24 REQD ----- 5 LBS		
STEEL, FLAT, 1/4" X 3-1/2" ----- 10' REQD ----- 30 LBS		
STAPLE FOR 2" STRAPPING ----- 8 REQD ----- NIL		
ANTI-CHAFING MATERIAL ----- AS REQD ----- NIL		

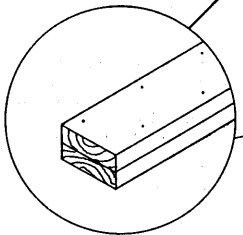
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
MISSILE CANISTER	8	30,000 LBS
DUNNAGE		1,748 LBS
TOTAL WEIGHT		31,748 LBS (APPROX)

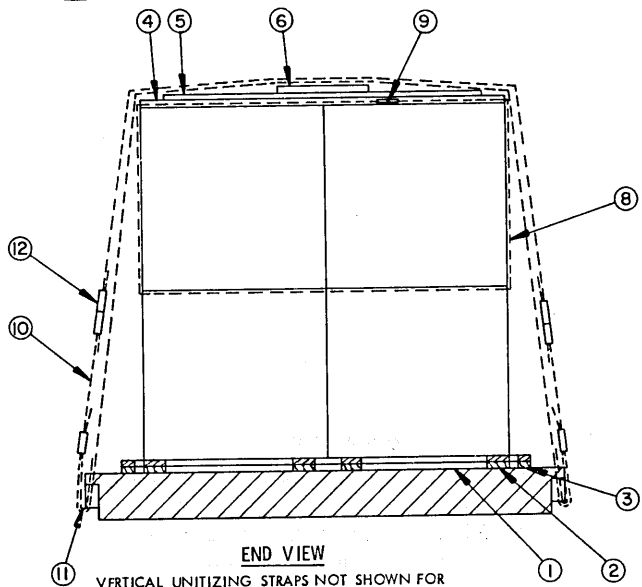
8-UNIT LOAD (W/O OVERPACK) ON A 53'-6" LONG BY 10'-6" WIDE FLAT CAR



ISOMETRIC VIEW



APPLICATION OF STAGGERED NAILING PATTERN. SEE GENERAL NOTE "Q" ON PAGE 2.



END VIEW

VERTICAL UNITIZING STRAPS NOT SHOWN FOR CLARITY.

KEY NUMBERS

- ① HEADER, 2" X 6" X 8'-4" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/20-20d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/20-50d NAILS. SEE GENERAL NOTE "Q" ON PAGE 2.
- ② BACK-UP CLEAT, 2" X 6" X 30" (DOUBLED) (12 REQD). POSITION AS SHOWN AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/8-20d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/8-50d NAILS. SEE SPECIAL NOTE 2 ON PAGE 9.
- ③ SIDE BLOCKING, 2" X 6" X 42" (DOUBLED) (8 REQD). POSITION AS SHOWN AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/11-20d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/11-30d NAILS.
- ④ STRAPPING BOARD, 2" X 6" X 7'-6" (4 REQD).
- ⑤ PURCHASE BOARD, 2" X 6" X 6'-10" (4 REQD). CENTER ON THE LENGTH OF AND NAIL TO PIECE MARKED ④ W/13-10d NAILS.
- ⑥ PURCHASE BOARD, 2" X 6" X 24" (4 REQD). CENTER ON THE LENGTH OF AND NAIL TO PIECE MARKED ⑤ W/4-10d NAILS.
- ⑦ VERTICAL UNITIZING STRAP, 1-1/4" X .035" OR .031" X 26'-0" LONG STEEL STRAPPING (8 REQD). SEE THE "UNITIZATION AND HANDLING PROCEDURES (W/OVERPACK)" ON PAGE 5.
- ⑧ BUNDLING STRAP, 1-1/4" X .035" OR .031" X 26'-0" LONG STEEL STRAPPING (4 REQD). INSTALL TO ENIRCLE THE LATERALLY ADJACENT UNITS IN THE TOP LAYER, AS SHOWN.
- ⑨ SEAL FOR 1-1/4" STEEL STRAPPING (24 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "O" ON PAGE 2.
- ⑩ HOLD-DOWN STRAP, 2" X .050" X 66'-0" LONG STEEL STRAPPING (4 REQD). INSTALL EACH STRAP FROM TWO PIECES, ONE 18'-0" LONG AND ONE 48'-0" LONG. SEE THE "STRAP THREADING DETAIL" ON PAGE 14. STAPLE TO THE PURCHASE BOARD, PIECE MARKED ⑥, W/2 STAPLES. SEE GENERAL NOTE "O" ON PAGE 2.
- ⑪ PAD, 2" X .050" X 24" LONG STEEL STRAPPING (8 REQD). POSITION UNDER STAKE POCKET AND SEAL TO HOLD-DOWN STRAP MARKED ⑩. SEE "DETAIL C" ON PAGE 14. ALT: STAKE POCKET PROTECTOR (16 REQD). USE TWO (2) UNDER EACH STAKE POCKET WITH A HOLD-DOWN STRAP. SEE "DETAIL D" ON PAGE 14.
- ⑫ SEAL FOR 2" STEEL STRAPPING (32 REQD, 8 PER STRAP). DOUBLE CRIMP EACH SEAL, EXCEPT THOSE USED TO SECURE THE PADS, PIECES MARKED ⑪.

8-UNIT LOAD (W/OVERPACK) ON A 53'-6" LONG BY 10'-6" WIDE FLAT CAR

SPECIAL NOTES:

1. AN 8-UNIT LOAD IS SHOWN ON A 53'-6" LONG BY 10'-6" WIDE (PLATFORM) FLAT CAR WITH STAKE POCKETS SPACED 42" ON CENTER. CARS SHORTER THAN 52'-0" CANNOT BE USED FOR SHIPMENT OF THE DEPICTED LOAD. LONGER CARS, NARROWER CARS (9'-2" MIN), AND CARS HAVING STAKE POCKETS SPACED OTHER THAN 42" MAY BE USED.
2. THE BACK-UP CLEATS, PIECES MARKED ② , WHICH ARE LOCATED BETWEEN THE LOAD UNITS MAY BE INCREASED IN LENGTH AS NECESSARY TO PROVIDE FOR PROPER LOCATION OF THE HOLD-DOWN STRAPS, PIECES MARKED ⑩ , NEAR THE ENDS OF THE OVERPACK UNITS AS SHOWN. HOWEVER, THOSE PIECES MUST NOT BE SHORTENED; 30" IS THE MINIMUM LENGTH ALLOWABLE.

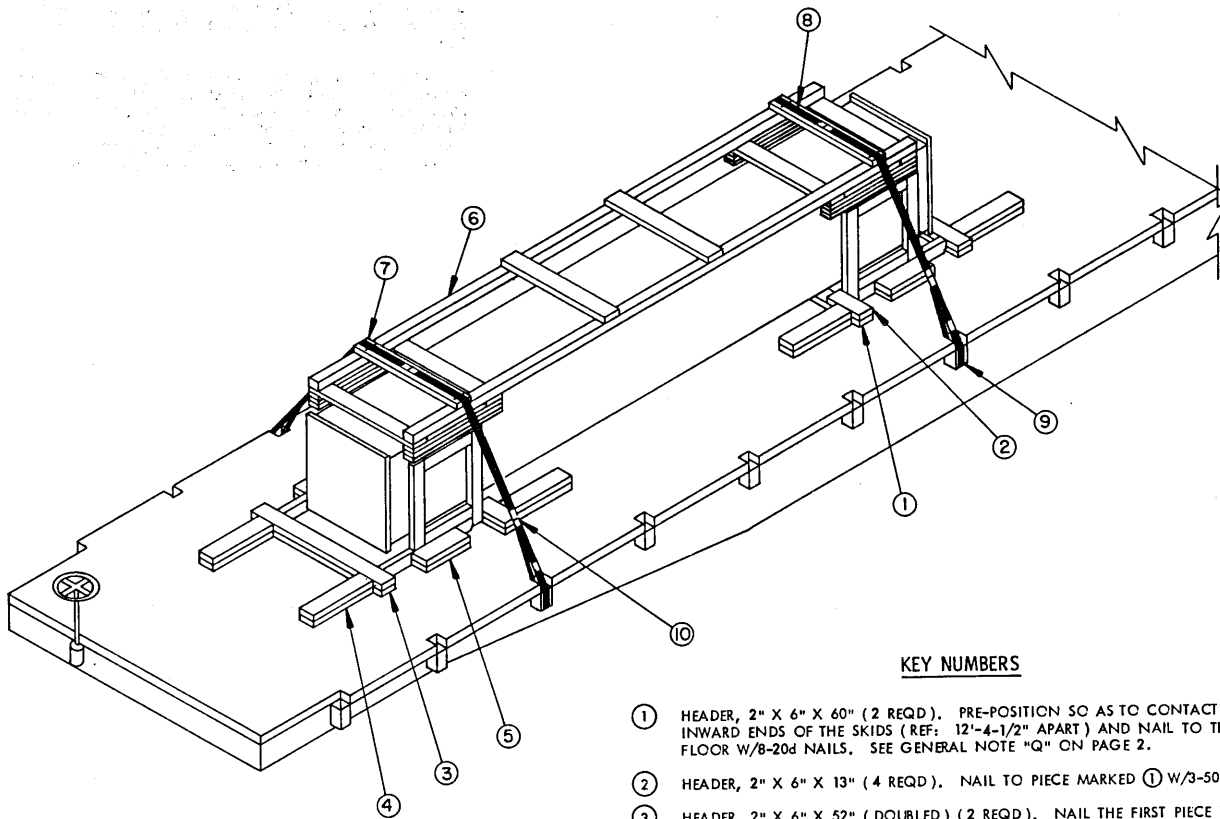
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 6"	248	248
NAILS	NO. REQD	POUNDS
10d (3")	68	1-1/4
20d (4")	264	9-1/2
30d (4-1/2")	88	4-1/2
50d (5-1/2")	176	13-3/4
STEEL STRAPPING, 1-1/4" X .035" OR .031" --312' REQD---45 LBS		
STEEL STRAPPING, 2" X .050"-----176' REQD--- 59 LBS		
SEAL FOR 1-1/4" STRAPPING -----24 REQD-----1 LB		
SEAL FOR 2" STRAPPING-----32 REQD-----7 LBS		
STAPLE FOR 2" STRAPPING----- 8 REQD----- NIL		

LOAD AS SHOWN

<u>ITEM</u>	<u>QUANTITY</u>	<u>WEIGHT (APPROX)</u>
MISSILE CANISTER		
W/OVERPACK-----8-----		42,144 LBS
DUNNAGE-----		637 LBS
TOTAL WEIGHT-----		42,781 LBS

8-UNIT LOAD (W/OVERPACK) ON A 53'-6" LONG BY 10'-6" WIDE FLAT CAR



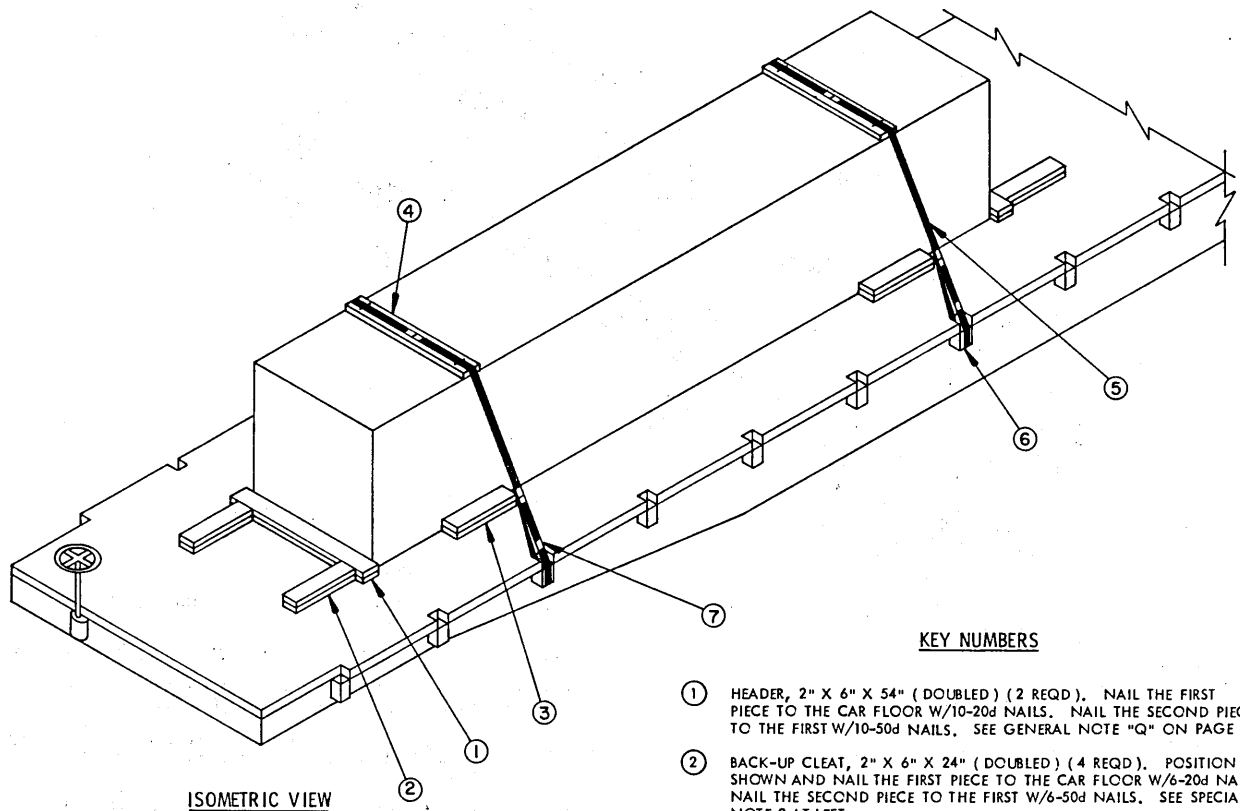
ISOMETRIC VIEW

SPECIAL NOTES:

1. A 1-UNIT LOAD IS SHOWN ON A 9'-2" (PLATFORM) FLAT CAR WITH THE STAKE POCKETS SPACED 42" ON CENTER. A WIDER OR NARROWER CAR MAY BE USED.
2. STRAPPING BOARDS, PIECES MARKED ⑦, MUST BE LOCATED SO AS TO ALIGN WITH LATERALLY ADJACENT STAKE POCKETS AND ALSO SO THAT THEY ARE LOCATED AS NEAR AS POSSIBLE OVER THE CENTER OF THE SHOCK ISOLATION FRAMES. SEE SPECIAL NOTE 3 ON PAGE 7 FOR ADDITIONAL GUIDANCE.
3. TWO (2) BACK-UP CLEATS, SHOWN AS PIECES MARKED ④, ARE ADEQUATE FOR RETAINING A MAXIMUM LCL LOAD OF 9,000 POUNDS. IF TWO CANISTERS ARE TO BE SHIPPED END TO END, A HEADER PIECE MARKED ①, MUST BE INSTALLED BETWEEN THE TWO UNITS. BACK-UP CLEATS OF AN APPLICABLE LENGTH MAY BE USED BETWEEN TWO HEADERS IN ORDER TO SPACE THE CANISTERS TO PROPERLY ALIGN THE HOLD-DOWN STRAPS, PIECES MARKED ⑧, WITH THE CAR STAKE POCKETS.

KEY NUMBERS

- ① HEADER, 2" X 6" X 60" (2 REQD). PRE-POSITION SO AS TO CONTACT THE INWARD ENDS OF THE SKIDS (REF: 12'-4-1/2" APART) AND NAIL TO THE CAR FLOOR W/8-20d NAILS. SEE GENERAL NOTE "Q" ON PAGE 2.
- ② HEADER, 2" X 6" X 13" (4 REQD). NAIL TO PIECE MARKED ① W/3-50d NAILS.
- ③ HEADER, 2" X 6" X 52" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/7-20d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/7-50d NAILS.
- ④ BACK-UP CLEAT, 2" X 6" X 24" (DOUBLED) (8 REQD). POSITION AS SHOWN AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/6-20d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/6-50d NAILS. SEE SPECIAL NOTE 3 AT LEFT.
- ⑤ SIDE BLOCKING, 2" X 6" X 18" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/4-20d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/4-30d NAILS.
- ⑥ HOLD-DOWN ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 12. POSITION AS SHOWN SO AS TO REST ON THE SHOCK INSULATION FRAMES.
- ⑦ STRAPPING BOARD, 2" X 6" X 42-3/4" (2 REQD). LOCATE ONE NEAR EACH END OF PIECE MARKED ④ AND SO AS TO ALIGN WITH EACH CAR STAKE POCKET TO WHICH HOLD-DOWN STRAPPING IS TO BE ATTACHED. NAIL TO PIECE MARKED ④ W/3-12d NAILS AT EACH END. SEE SPECIAL NOTE 2 AT LEFT.
- ⑧ HOLD-DOWN STRAP, 2" X .050" X 23'-0" LONG STEEL STRAPPING (2 REQD). INSTALL EACH STRAP FROM TWO (2) 11'-6" LONG PIECES. STAPLE TO PIECE MARKED ⑦ W/2 STAPLES. SEE GENERAL NOTE "O" ON PAGE 2 AND SPECIAL NOTE 2 AT LEFT.
- ⑨ PAD, 2" X .050" STEEL STRAPPING, 24" LONG (4 REQD). POSITION UNDER A STAKE POCKET AND SEAL TO HOLD-DOWN STRAP MARKED ⑧. SEE "DETAIL A" ON PAGE 13. -ALT: STAKE POCKET PROTECTOR (8 REQD). USE TWO (2) UNDER EACH STAKE POCKET WITH A HOLD-DOWN STRAP. SEE "DETAIL B" ON PAGE 13.
- ⑩ SEAL FOR 2" STEEL STRAPPING (16 REQD, 8 PER STRAP). DOUBLE CRIMP EACH SEAL, EXCEPT THOSE USED TO SECURE THE PADS, PIECES MARKED ⑨. SEE GENERAL NOTE "O" ON PAGE 2.



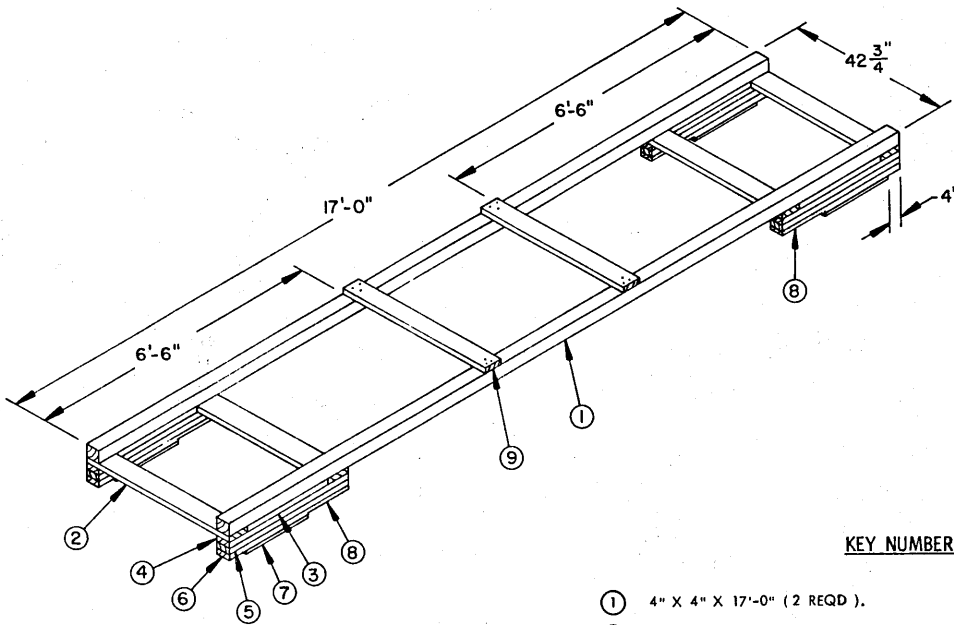
ISOMETRIC VIEW

KEY NUMBERS

- ① HEADER, 2" X 6" X 54" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/10-20d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/10-50d NAILS. SEE GENERAL NOTE "Q" ON PAGE 2.
- ② BACK-UP CLEAT, 2" X 6" X 24" (DOUBLED) (4 REQD). POSITION AS SHOWN AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/6-20d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/6-50d NAILS. SEE SPECIAL NOTE 2 AT LEFT.
- 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 W/6-30d NAILS.
- ④ STRAPPING BOARD, 2" X 6" X 42" (2 REQD).
- ⑤ HOLD-DOWN STRAP, 2" X .050" X 25'-0" LONG STEEL STRAPPING (2 REQD). INSTALL EACH STRAP FROM TWO (2) 12'-6" LONG PIECES. STAPLE TO PIECE MARKED ④ W/2 STAPLES. SEE GENERAL NOTE "O" ON PAGE 2.
- ⑥ PAD, 2" X .050" STEEL STRAPPING 24" LONG (4 REQD). POSITION UNDER A STAKE POCKET AND SEAL TO HOLD-DOWN STRAP MARKED ⑤ . SEE "DETAIL A" ON PAGE 13. ALT: STAKE POCKET PROTECTOR (8 REQD). USE TWO (2) UNDER EACH STAKE POCKET WITH A HOLD-DOWN STRAP. SEE "DETAIL B" ON PAGE 13.
- ⑦ SEAL FOR 2" STEEL STRAPPING (16 REQD, 8 PER STRAP). DOUBLE CRIMP EACH SEAL, EXCEPT THOSE USED TO SECURE THE PADS, PIECES MARKED ⑥ . SEE GENERAL NOTE "O" ON PAGE 2.

SPECIAL NOTES:

1. A 1-UNIT LOAD IS SHOWN ON A 9'-2" WIDE (PLATFORM) FLAT CAR WITH THE STAKE POCKETS SPACED 42" ON CENTER. A WIDER OR NARROWER CAR OR A CAR HAVING POCKETS SPACED OTHER THAN 42" MAY BE USED.
2. TWO (2) BACK-UP CLEATS, SHOWN AS PIECES MARKED ② , ARE ADEQUATE FOR RETAINING A MAXIMUM LCL LOAD OF 9,000 POUNDS. IF TWO OVERPACK UNITS ARE TO BE SHIPPED END TO END, POSITION UNITS TOGETHER, WITHOUT A HEADER BETWEEN. INCREASE THE LENGTH OF THE BACK-UP CLEATS TO 30" AND SECURE EACH LAYER WITH EIGHT (8) NAILS OF THE SPECIFIED SIZE.

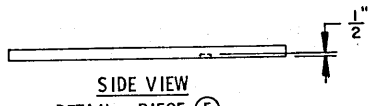
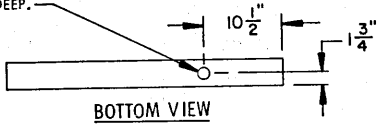


KEY NUMBERS

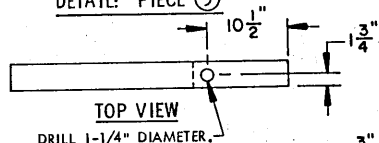
- ① 4" X 4" X 17'-0" (2 REQD).
- ② 2" X 6" X 42-3/4" (4 REQD). NAIL TO PIECE MARKED ① W/3-12d NAILS AT EACH END.
- ③ 2" X 4" X 25" (4 REQD). NAIL TO PIECE MARKED ① W/6-12d NAILS.
- ④ 2" X 4" X 36" (4 REQD). NAIL TO PIECE MARKED ② W/3-12d NAILS AT EACH END AND TO PIECE MARKED ③ W/5-12d NAILS.
- ⑤ 2" X 4" X 36" (4 REQD). DRILL 1-1/4" DIAMETER BY 1/2" DEEP HOLE AS SHOWN BY THE DETAIL AT THE LEFT. NAIL TO PIECE MARKED ④ W/9-12d NAILS.
- ⑥ 2" X 4" X 36" (4 REQD). RABBET ONE END AND DRILL A 1-1/4" DIAMETER HOLE AS SHOWN BY THE DETAIL AT THE LEFT. NAIL TO PIECE MARKED ⑤ W/9-12d NAILS.
- ⑦ 1" X 4" X 19" (4 REQD). NAIL TO PIECE MARKED ⑥ W/8-6d NAILS.
- ⑧ STEEL PLATE, 1/4" X 3-1/2" X 7" (4 REQD). SEE THE DETAIL AT THE LEFT FOR THE LOCATION OF HOLES TO BE DRILLED. NAIL TO PIECE MARKED ⑥ W/4-20d NAILS.
- ⑨ 2" X 6" X 42-3/4" (2 REQD). NAIL TO PIECES MARKED ① W/3-12d NAILS AT EACH END.

HOLD-DOWN ASSEMBLY

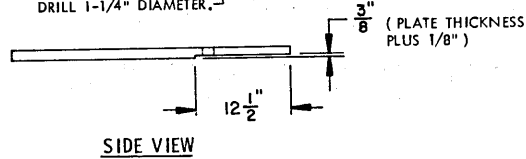
DRILL 1-1/4" DIAMETER BY 1/2" DEEP.



DETAIL: PIECE ⑤



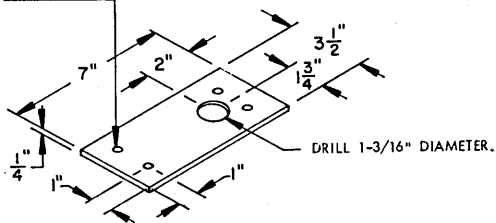
DRILL 1-1/4" DIAMETER.



DETAIL: PIECE ⑥

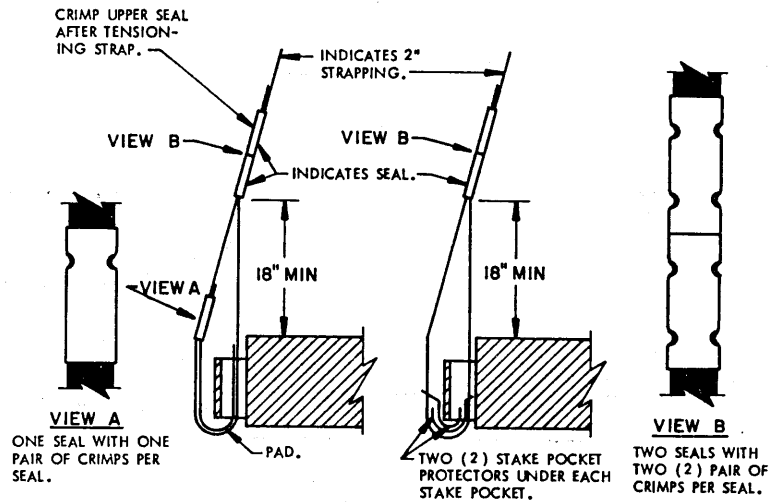
DETAIL: PIECE ⑧

DRILL 7/32" DIAMETER, 4 PLACES.



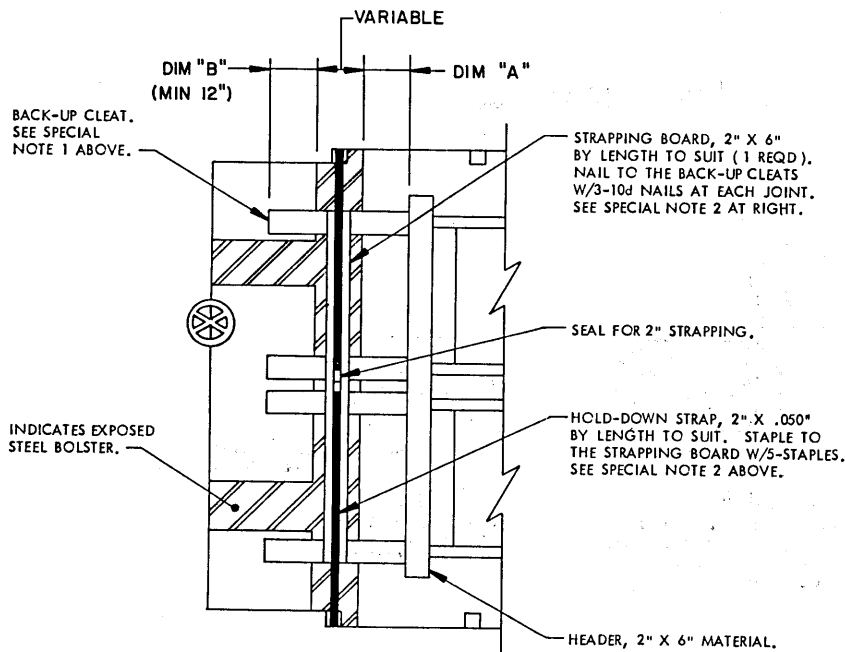
DETAIL: PIECE ⑧

DETAILS



DETAIL A
 METHOD OF INSTALLING 2" STRAPPING AND PAD AT STAKE POCKET FOR ALL LOADS EXCEPT ON THE LOADS ON PAGES 6 AND 8.

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

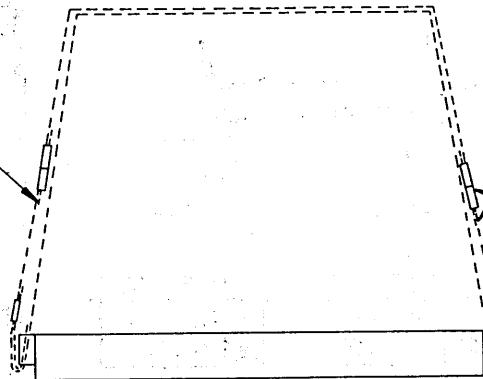


TYPICAL END BLOCKING FOR CARS WITH
EXPOSED STEEL BOLSTERS

SPECIAL NOTES:

1. WHEN LOADING CARS HAVING 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 TO PROVIDE FOR PROPER NAILING TO THE CAR FLOOR. SEE KEY NUMBER ① ON PAGE 6, AND KEY NUMBER ② ON PAGE 8 FOR PROPER NAILING.
2. THE OPTIONAL STRAP HOLD-DOWN FOR END BLOCKING IS FOR CARS WITH OR WITHOUT EXPOSED STEEL BOLSTERS.

LOCATION OF ONE STRAP TENSIONING DEVICE.



LOCATION OF ONE STRAP TENSIONING DEVICE.

INDICATES SEALS.

INDICATES PAD.

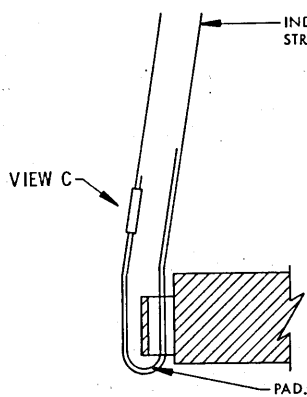
STRAP THREADING DETAIL

IT IS RECOMMENDED THAT TWO (2) TENSIONING DEVICES BE USED SIMULTANEOUSLY, ONE ON EACH SIDE OF THE LOAD AS INDICATED ABOVE, WHEN TENSIONING A HOLD-DOWN STRAP. THE USE OF TWO TENSIONING DEVICES WILL REDUCE BINDING OF THE STRAPPING DURING THE TENSIONING OPERATION.



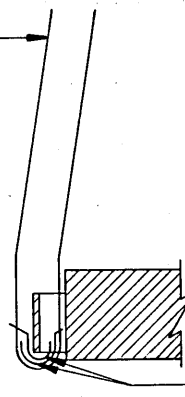
VIEW C

ONE SEAL WITH ONE PAIR OF CRIMPS.



DETAIL C

METHOD OF INSTALLING 2" STRAPPING AND PAD AT STAKE POCKET FOR THE LOADS ON PAGES 6 AND 8.



DETAIL D

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

TWO (2) STAKE POCKET PROTECTORS UNDER EACH STAKE POCKET.

DETAILS