

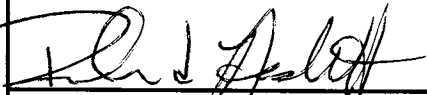
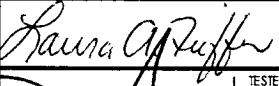


# LOADING AND BRACING (TL & LTL) ON FLATBED TRAILERS OF BLU-109 OR BLU-116 BOMBS ON MHU-212 PALLETS

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- PROCEDURES SHOWN HEREIN ARE ONLY APPLICABLE FOR HIGHWAY MOVEMENTS, NOT FOR TRAILER ON FLATCAR MOVEMENTS.

## U.S. ARMY MATERIEL COMMAND DRAWING

|  |  |   |  |                       |          |
|--|--|---|--|-----------------------|----------|
| APPROVED, U.S. ARMY<br>JOINT MUNITIONS COMMAND   |  | <b>CAUTION: VERIFY PRIOR TO USE AT WWW.DAC.ARMY.MIL THAT THIS IS<br/>THE MOST CURRENT VERSION OF THIS DOCUMENT. THIS IS PAGE 1 OF 18.</b> |  |                       |          |
|   |  | <b>DO NOT SCALE</b>   |  | <b>SEPTEMBER 2003</b> |          |
|  |  | ENGINEER OR<br>TECHNICIAN   | BASIC<br>REV.  | PATRICK DOUGHERTY     |          |
| APPROVED BY ORDER OF COMMANDING GENERAL,<br>U.S. ARMY MATERIEL COMMAND   |  | TRANSPORTATION<br>ENGINEERING<br>DIVISION   |  |                       |          |
| <br>U.S. ARMY DEFENSE AMMUNITION CENTER |  | VALIDATION<br>ENGINEERING<br>DIVISION   | TESTED   | CLASS                 | DIVISION |
|  |  | ENGINEERING<br>DIRECTORATE  |  | 19                    | 48       |
|  |  |   |  | DRAWING               | FILE     |
|  |  |   |  | 8771                  | SP11PB3  |

**GENERAL NOTES**

**(GENERAL NOTES CONTINUED)**

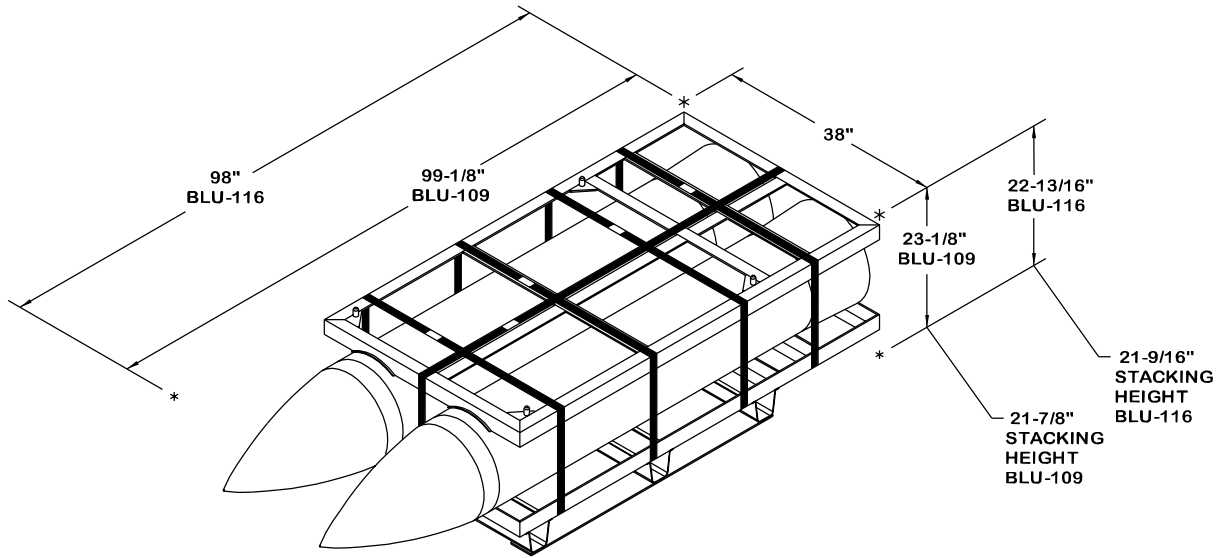
- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1, AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE OUTLOADING PROCEDURES SPECIFIED IN THIS DRAWING ARE APPLICABLE TO LOADS OF BLU-109 OR BLU-116 BOMBS ON MHU-212 METAL PALLETS. SUBSEQUENT REFERENCE TO PALLET UNIT MEANS THE PALLET WITH BOMBS. SEE NAVSEASYS COM DRAWING 6214303 AND PAGE 3 FOR DETAILS OF THE PALLET UNITS.
- C. THE LOADS AS SHOWN HEREIN ARE BASED ON 48'-0" LONG BY 8'-6" WIDE, 45'-0" LONG BY 8'-0" WIDE, AND 40'-0" LONG BY 8'-0" WIDE FLATBED TRAILERS. TRAILERS OF OTHER LENGTH AND WIDTHS MAY BE USED. TRAILERS MUST HAVE WOOD OR WOOD AND METAL FLOORS. TRAILERS HAVING ALL-METAL FLOORS CANNOT BE USED. CAUTION: IF THE TRAILER FLOOR IS EQUIPPED WITH EXPOSED METAL DECKING ABOVE THE BOGIE ASSEMBLY, OR ELSEWHERE, FIELD MEASUREMENTS SHOULD BE MADE TO ENSURE THAT THE METAL DECKING DOES NOT INTERFERE WITH THE PROPER POSITIONING AND NAILING OF THE DUNNAGE AS SPECIFIED BY THE PROCEDURES SHOWN HEREIN.
- D. SELECTION OF A VEHICLE FOR THE TRANSPORT OF THE DESIGNATED ITEM IS THE RESPONSIBILITY OF THE ORIGINATING CARRIER AND THE SHIPPER. ONLY VEHICLES IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPLICABLE REGULATORY DOCUMENTS WILL BE SELECTED FOR USE.
- E. GROSS WEIGHT AND AXLE DISTRIBUTION OF WEIGHT FOR A LOAD WILL BE THE RESPONSIBILITY OF THE CARRIER. THE CARRIER WILL ADVISE THE SHIPPER OF APPLICABLE LOADING REQUIREMENTS, AND THE SHIPPER WILL LOAD ACCORDINGLY.
- F. NOTICE: A SHIPMENT WILL BE POSITIONED ON A TRAILER CONSISTENT WITH STATE WEIGHT LAWS.
- G. OTHER TYPES OF LADING ITEMS MAY BE LOADED ON A TRAILER 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 HEREIN.

- H. CAUTION: REGARDLESS OF THE TYPE OF TRAILER INVOLVED, ONLY THOSE TRAILERS HAVING TIEDOWN ANCHORING FACILITIES WHICH PROVIDE HOLDING STRENGTH EQUAL TO OR GREATER THAN THE STRENGTH OF THE HOLD-DOWN STRAPS OR CHAINS AND WHICH ALIGN NEAR THE INDICATED LOCATIONS FOR THE HOLD-DOWN STRAPS OR CHAINS SHOULD BE USED. IF THE TRAILER ANCHOR DEVICES ARE NOT PROPERLY POSITIONED TO RECEIVE STRAPPING OR CHAINS, AS SHOWN, OR IF THE ANCHOR DEVICES ARE NOT EQUAL TO OR GREATER THAN THE STRENGTH OF THE TIEDOWN STRAPS OR CHAINS, STEEL STRAPS MAY BE APPLIED TO FORM A COMPLETE LOOP WHICH ENCOMPASSES BOTH THE LADING AND THE TRAILER FRAME AND/OR BED. CAUTION: AVOID TRAILER WHEELS, FIFTH WHEEL PLATE CONTROLS AND OTHER APPURTENANCES. USE EDGE PROTECTORS OR PADS ON ALL SHARP EDGES. NEITHER CHAINS NOR WEB STRAPS WILL BE APPLIED TO FORM A COMPLETE LOOP WHICH ENCOMPASSES BOTH THE LADING AND THE TRAILER FRAME AND/OR BED.
- J. 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 FLOOR OF THE TRANSPORTING VEHICLE, 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 THE PIECE ONTO OR RIGHT BESIDE A NAIL IN A LOWER PIECE.
- K. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF ONE SEAL WITH TWO PAIR OF NOTCHES WILL BE USED TO SEAL THE JOINT WHEN A NOTCH-TYPE SEALER IS BEING USED. A MINIMUM OF TWO SEALS, BUTTED TOGETHER WITH TWO PAIR OF CRIMPS PER SEAL WILL BE USED TO SEAL THE JOINT WHEN A CRIMP-TYPE SEALER IS BEING USED. REFER TO THE "STRAP JOINT A" AND "STRAP JOINT B" DETAILS ON PAGE 16 FOR GUIDANCE.
- L. THE TRANSPORTING VEHICLE OPERATOR SHOULD BE INSTRUCTED TO PERIODICALLY INSPECT THE TIEDOWN CHAINS AND LOAD BINDERS DURING TRANSIT AND TIGHTEN IF NECESSARY.
- M. THE NUMBER OF LADING UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE TRAILER TO BE LOADED OR THE QUANTITY TO BE SHIPPED. THE APPROVED METHODS SHOWN HEREIN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING AND STAYING OF THE DESIGNATED ITEM.
- N. DUNNAGE LUMBER SPECIFIED IS OF NOMINAL SIZE. FOR EXAMPLE, 1" X 4" MATERIAL IS ACTUALLY 3/4" THICK BY 3-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE.
- O. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES, AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM, AND ONE POUND EQUALS 0.454 KG.

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**MATERIAL SPECIFICATIONS**

- LUMBER - - - - - : SEE TM 743-200-1 (DUNNAGE LUMBER) AND VOLUNTARY PRODUCT STANDARD PS 20.
- NAILS - - - - - : ASTM F1667; COMMON STEEL NAIL (NLCMS OR NLCMMS).
- STRAP, WEB, COMMERCIAL - - - - - : WEB SLING AND TIEDOWN ASSOCIATION RECOMMENDED STANDARD SPECIFICATION FOR SYNTHETIC WEB TIEDOWNS, REVISED 1998.
- STRAPPING, STEEL - - : ASTM D3953; FLAT STRAPPING, TYPE 1, HEAVY DUTY, FINISH A, B (GRADE 2), OR C.
- SEAL, STRAP - - - - - : ASTM D3953; CLASS H, FINISH A, B (GRADE 2), OR C, DOUBLE NOTCH TYPE, STYLE I, II, OR IV.
- WIRE, CARBON STEEL - - : ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, 0.0800" DIA, GRADE 1006 OR BETTER.
- STAPLE, STRAP - - - - : COMMERCIAL GRADE.
- STAKE POCKET PROTECTOR - - - - - : COMMERCIAL GRADE.
- CHAIN - - - - - : NATIONAL ASSOCIATION OF CHAIN MANUFACTURER'S WELDED CHAIN SPECIFICATION ADOPTED NOVEMBER 1999.
- LOAD BINDER - - - - - : FED SPEC GGG-B-325.

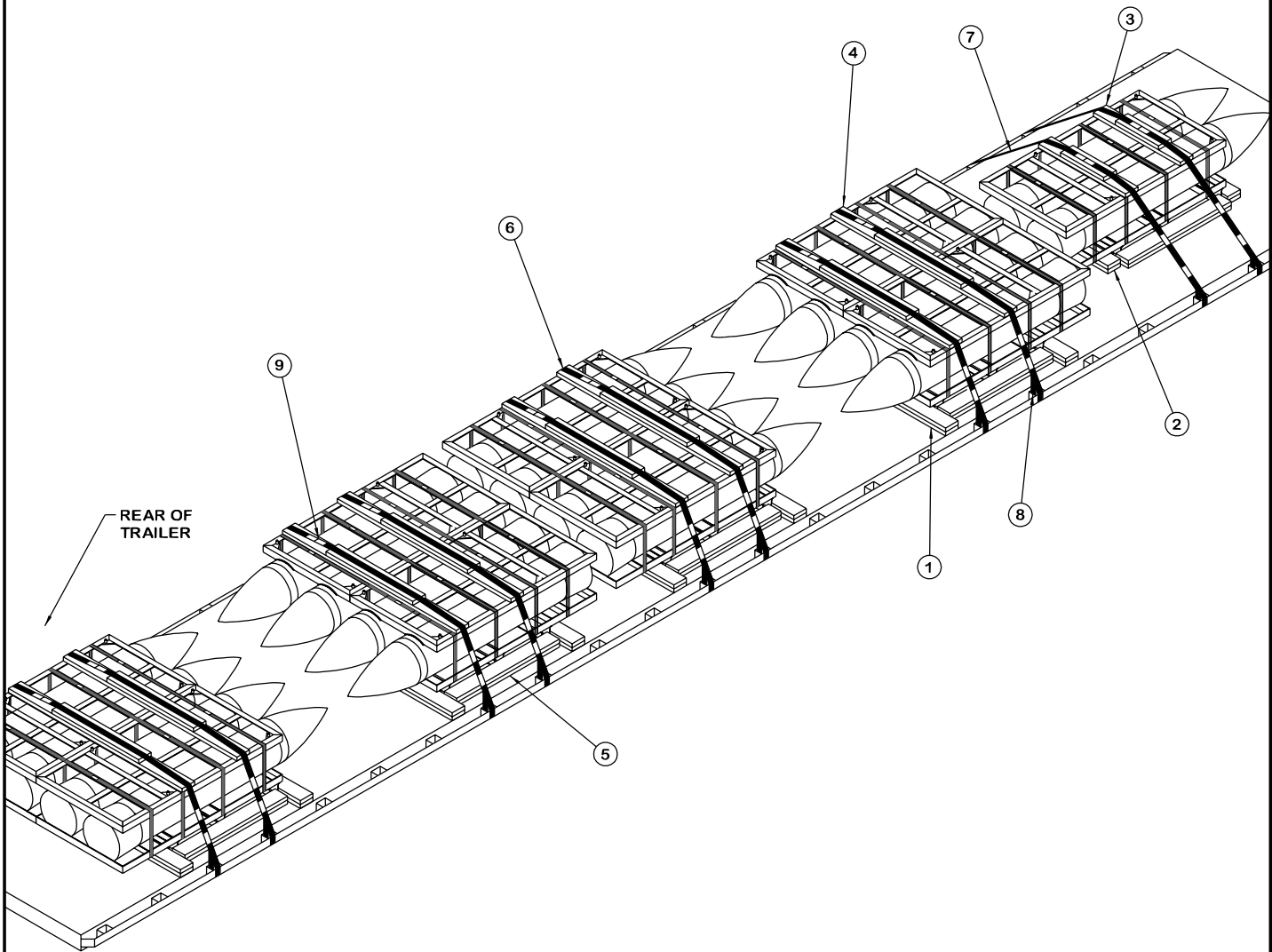


**BLU-109 BOMBS ON MHU-212/E PALLET**

GROSS WEIGHT - - - - - 4,323 LBS (APPROX)  
 CUBE - - - - - 47.7 CU FT (APPROX)

**BLU-116 BOMBS ON MHU-212A/E PALLET**

GROSS WEIGHT - - - - - 4,168 LBS (APPROX)  
 CUBE - - - - - 46.5 CU FT (APPROX)



**ISOMETRIC VIEW**

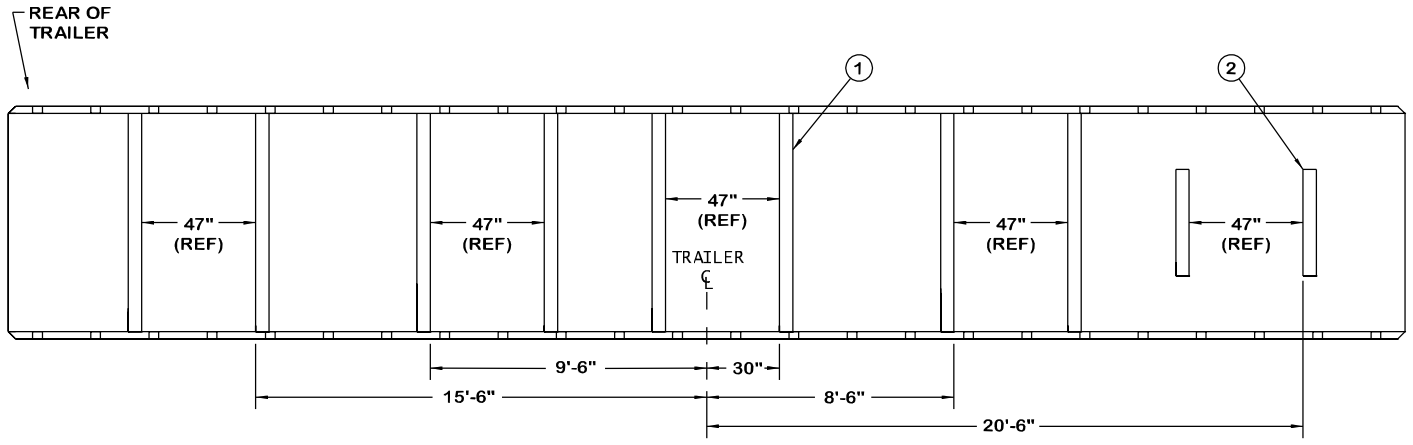
(KEY NUMBERS CONTINUED)

- ⑦ HOLD DOWN STRAP, 2" X .050" OR .044" X 19'-0" LONG STEEL STRAPPING (2 REQD). INSTALL EACH STRAP FROM TWO 9'-6" LONG PIECES. SEE SPECIAL NOTE 4 ON PAGE 5.
- ⑧ PAD, 2" X .050" OR .044" X 18" LONG STEEL STRAPPING (20 REQD). POSITION BETWEEN THE HOLD DOWN STRAP AND THE TRAILER SIDE RAIL OR STAKE POCKET AND SEAL TO THE HOLD DOWN STRAP. SEE "DETAIL A" ON PAGE 16. ALTERNATE: STAKE POCKET PROTECTOR (40 REQD). USE TWO UNDER EACH STAKE POCKET OR RUB RAIL WITH A HOLD DOWN STRAP. SEE "DETAIL B" ON PAGE 16.
- ⑨ SEAL FOR 2" STEEL STRAPPING (60 REQD, 6 PER STRAP). DOUBLE NOTCH EACH SEAL EXCEPT THOSE USED TO SECURE THE PADS. SEE THE "END OVER END LAP JOINT DETAIL" ON PAGE 16.

**KEY NUMBERS**

- ① LONG HEADER, 2" X 6" BY DECK WITH MINUS 1" (REF: 7'-11") (DOUBLED) (8 REQD). PRE-POSITION AS SHOWN BY THE "PRE-POSITIONED DUNNAGE PLAN VIEW A" ON PAGE 5. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/5-20d NAILS. SEE SPECIAL NOTES 2 AND 3 ON PAGE 5.
- ② SHORT HEADER, 2" X 6" X 44" (DOUBLED) (2 REQD). PRE-POSITION AS SHOWN BY THE "PRE-POSITIONED DUNNAGE PLAN VIEW A" ON PAGE 5. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/3-20d NAILS.
- ③ STRAPPING BOARD ASSEMBLY A (2 REQD). SEE DETAIL ON PAGE 15. POSITION ON TOP OF THE SINGLE PALLET UNIT TO ALIGN WITH THE HOLD DOWN STRAPS. LOCATE AND DRILL HOLES TO INSTALL OVER PALLET UNIT STACKING PINS AS NECESSARY.
- ④ STRAPPING BOARD ASSEMBLY B (8 REQD). SEE DETAIL ON PAGE 15. POSITION ON TOP OF THE DOUBLED PALLET UNITS TO ALIGN WITH THE HOLD DOWN STRAPS. LOCATE AND DRILL HOLES TO INSTALL OVER PALLET UNIT STACKING PINS AS NECESSARY.
- ⑤ SIDE BLOCKING, 2" X 6" X 45" (DOUBLED) (10 REQD). POSITION ON BOTH SIDES OF THE SINGLE PALLET UNIT AT THE FRONT OF THE TRAILER AND ON BOTH SIDES OF THE ADJACENT PALLET UNITS. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A SIMILAR MANNER.
- ⑥ HOLD DOWN STRAP, 2" X .050" OR .044" X 20'-0" LONG STEEL STRAPPING (8 REQD). INSTALL EACH STRAP FROM TWO 10'-0" LONG PIECES. SEE SPECIAL NOTE 4 ON PAGE 5.

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**PRE-POSITIONED DUNNAGE PLAN VIEW A**

48'-0" LONG TRAILER

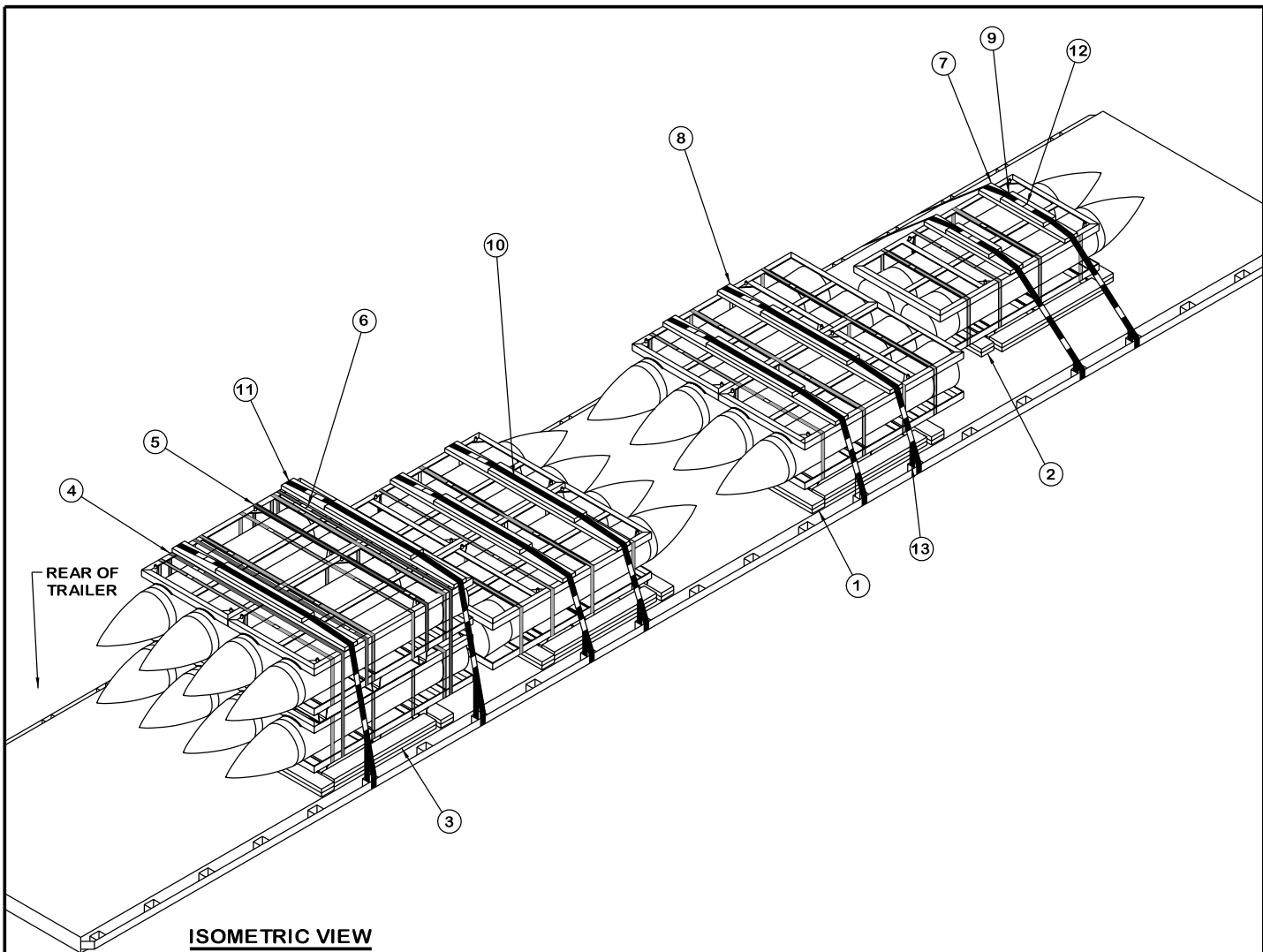
**SPECIAL NOTES:**

1. A 9-UNIT LOAD IS SHOWN ON A 48'-0" LONG BY 8'-6" WIDE FLATBED TRAILER. OTHER LENGTH AND WIDTH TRAILERS MAY BE USED.
2. THE HEADER LOCATIONS ARE DESIGNED TO POSITION THE HOLD DOWN STRAPS OVER THE TOP FRAME OF THE PALLET UNITS, IN ALIGNMENT WITH THE STAKE POCKETS. THE HEADER LOCATIONS MAY BE ADJUSTED AS NECESSARY TO ACCOMPLISH THIS.
3. THE POSITION OF THE LOAD IS BASED UPON THE ASSUMPTION OF A 48'-0" LONG TRAILER HAVING STAKE POCKETS SPACED 24" ON CENTER AND WITH THE FIRST STAKE POCKET LOCATED AT 12" FROM THE FRONT. STAKE POCKETS NUMBERS 3, 4, 7, 8, 12, 13, 16, 17, 21, AND 22, AS COUNTED FROM THE FRONT OF THE TRAILER SHOULD BE USED FOR THE ATTACHMENT OF THE HOLD DOWN STRAPS. THE LOAD MAY BE ADJUSTED TO ACCOMMODATE DIFFERENCES IN THE LOCATION OR SPACING OF THE STAKE POCKETS.
4. IF CHAINS AND LOAD BINDERS ARE TO BE USED FOR LOAD SECUREMENT IN LIEU OF THE STEEL STRAPPING, REFER TO THE PROCEDURES ON PAGES 10 AND 11 FOR GUIDANCE. IF WEB STRAPS ARE TO BE USED FOR LOAD SECUREMENT, REFER TO THE PROCEDURES ON PAGES 12 AND 13 FOR GUIDANCE.
5. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. THE LOAD CAN BE REDUCED BY MULTIPLES OF TWO PALLET UNITS BY OMITTING ONE OR MORE TWO WIDE LOAD PALLET UNITS. THE LOAD CAN BE REDUCED BY ONE PALLET UNIT BY OMITTING THE PALLET UNIT AT THE FRONT OF THE LOAD.
6. THE LOCATION OF THE HEADERS IS DESIGNED TO PROVIDE LONGITUDINAL RESTRAINT OF THE PALLET UNITS. THE 47" REFERENCED DIMENSION IS BASED UPON THE SPACING OF THE PALLET UNIT SKIDS. VERIFY SKID SPACING PRIOR TO NAILING THE HEADERS IN POSITION. ADJUST SPACING AS REQUIRED.
7. THIS LOAD CAN NOT BE INCREASED TO 10 PALLET UNITS WITHOUT EXCEEDING THE AXLE WEIGHT LIMITATIONS.

| BILL OF MATERIAL          |                     |            |
|---------------------------|---------------------|------------|
| LUMBER                    | LINEAR FEET         | BOARD FEET |
| 2" x 6"                   | 304                 | 304        |
| NAILS                     | NO. REQD            | POUNDS     |
| 10d (3")                  | 176                 | 2-3/4      |
| 20d (4")                  | 46                  | 1-1/2      |
| STEEL STRAPPING, 2" - -   | 228' REQD - - - - - | 76 LBS     |
| SEAL FOR 2" STRAPPING - - | 60 REQD - - - - -   | 12 LBS     |

**LOAD AS SHOWN**

| ITEM                   | QUANTITY    | WEIGHT (APPROX)     |
|------------------------|-------------|---------------------|
| PALLET UNIT - - - - -  | 9 - - - - - | 38,907 LBS          |
| DUNNAGE - - - - -      | - - - - -   | 700 LBS             |
| TOTAL WEIGHT - - - - - |             | 39,607 LBS (APPROX) |



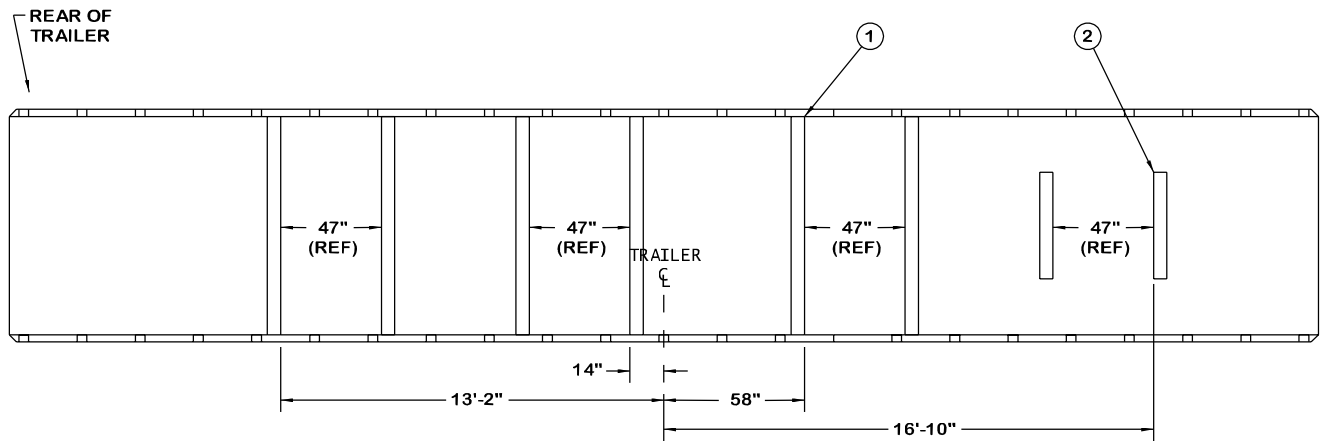
**ISOMETRIC VIEW**

**KEY NUMBERS**

**(KEY NUMBERS CONTINUED)**

- ⑧ STRAPPING BOARD ASSEMBLY B (6 REQD). SEE DETAIL ON PAGE 15. POSITION ON TOP OF THE DOUBLED PALLET UNITS TO ALIGN WITH THE HOLD DOWN STRAPS. LOCATE AND DRILL HOLES TO INSTALL OVER PALLET UNIT STACKING PINS AS NECESSARY.
- ⑨ HOLD DOWN STRAP, 2" X .050" OR .044" X 19'-0" LONG STEEL STRAPPING (2 REQD). INSTALL EACH STRAP FROM TWO 9'-6" LONG PIECES. SEE SPECIAL NOTE 3 ON PAGE 7.
- ⑩ HOLD DOWN STRAP, 2" X .050" OR .044" X 20'-0" LONG STEEL STRAPPING (4 REQD). INSTALL EACH STRAP FROM TWO 10'-0" LONG PIECES. SEE SPECIAL NOTE 3 ON PAGE 7.
- ⑪ HOLD DOWN STRAP, 2" X .050" OR .044" X 23'-0" LONG STEEL STRAPPING (2 REQD). INSTALL EACH STRAP FROM TWO 11'-6" LONG PIECES. SEE SPECIAL NOTE 3 ON PAGE 7.
- ⑫ SEAL FOR 2" STEEL STRAPPING (48 REQD, 6 PER STRAP). DOUBLE NOTCH EACH SEAL EXCEPT THOSE USED TO SECURE THE PADS. SEE THE "END OVER END LAP JOINT DETAIL" ON PAGE 16.
- ⑬ PAD, 2" X .050" OR .044" X 18" LONG STEEL STRAPPING (16 REQD). POSITION BETWEEN THE HOLD DOWN STRAP AND THE TRAILER SIDE RAIL OR STAKE POCKET AND SEAL TO THE HOLD DOWN STRAP. SEE "DETAIL A" ON PAGE 16. ALTERNATE: STAKE POCKET PROTECTOR (32 REQD). USE TWO UNDER EACH STAKE POCKET OR RUB RAIL WITH A HOLD DOWN STRAP. SEE "DETAIL B" ON PAGE 16.
- ① LONG HEADER, 2" X 6" X BY DECK WIDTH MINUS 1" (REF: 7'-5") (DOUBLED) (6 REQD). PRE-POSITION AS SHOWN BY THE "PRE-POSITIONED DUNNAGE PLAN VIEW B" ON PAGE 7. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/5-20d NAILS. SEE SPECIAL NOTES 2, 3, AND 4 ON PAGE 7.
- ② SHORT HEADER, 2" X 6" X 44" (DOUBLED) (2 REQD). PRE-POSITION AS SHOWN BY THE "PRE-POSITIONED DUNNAGE PLAN VIEW B" ON PAGE 7. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/3-20d NAILS.
- ③ SIDE BLOCKING, 2" X 6" X 45" (DOUBLED) (8 REQD). POSITION ON BOTH SIDES OF THE SINGLE PALLET UNIT AT THE FRONT OF THE TRAILER AND ON BOTH SIDES OF THE ADJACENT PALLET UNITS. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A SIMILAR MANNER.
- ④ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 14'-8" LONG STEEL STRAPPING (4 REQD). INSTALL TO ENCIRCLE THE TOP AND BOTTOM PALLET UNITS IN A TWO-HIGH STACK.
- ⑤ BUNDLING STRAP, 1-1/4" X .035" OR .031" X 17'-4" LONG STEEL STRAPPING (2 REQD). INSTALL TO ENCIRCLE THE PALLET UNITS IN THE SECOND LAYER.
- ⑥ SEAL FOR 1-1/4" STEEL STRAPPING (12 REQD, 2 PER STRAP). DOUBLE NOTCH EACH SEAL. SEE THE "END OVER END LAP JOINT DETAIL" ON PAGE 16.
- ⑦ STRAPPING BOARD ASSEMBLY A (2 REQD). SEE DETAIL ON PAGE 15. POSITION ON TOP OF THE SINGLE PALLET UNIT TO ALIGN WITH THE HOLD DOWN STRAPS. LOCATE AND DRILL HOLES TO INSTALL OVER PALLET UNIT STACKING PINS AS NECESSARY.

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**PRE-POSITIONED DUNNAGE PLAN VIEW B**

45'-0" LONG TRAILER

(SPECIAL NOTES CONTINUED)

- 7. IF DESIRED, 10 PALLET UNITS CAN BE SHIPPED. FOR 10 PALLET UNITS ON A 45'-0" LONG "WESTERN" TYPE TRAILER, ADD THE ADDITIONAL PALLET UNIT ADJACENT THE SINGLE PALLET UNIT AT THE FRONT OF THE LOAD AND CENTER. THE LENGTH OF ALL HEADERS SHALL BE DECK WIDTH MINUS 1" (REF: 7'-5"). FOR 10 PALLET UNITS ON A TRAILER OTHER THAN A "WESTERN" TYPE, THE LOAD AS SHOWN ON PAGE 6 SHALL BE MOVED 12" TOWARDS THE FRONT OF THE TRAILER. THE ADDITIONAL PALLET UNIT SHALL BE PLACED AT THE FRONT OF THE LOAD AS NOTED ABOVE. THE DIMENSIONS LISTED IN "PLAN VIEW B" ABOVE FOR LOCATING THE HEADERS, SHALL BE CHANGED TO 70" AND 18'-0" FORWARD OF CENTERLINE AND CHANGE TO 2" AND 12'-2" AFT OF CENTERLINE RESPECTIVELY. STAKE POCKET NUMBERS 4, 5, 7, 9, 13, 14, 16, AND 18 SHALL BE USED FOR SECUREMENT OF THE HOLD DOWN STRAPS.

SPECIAL NOTES:

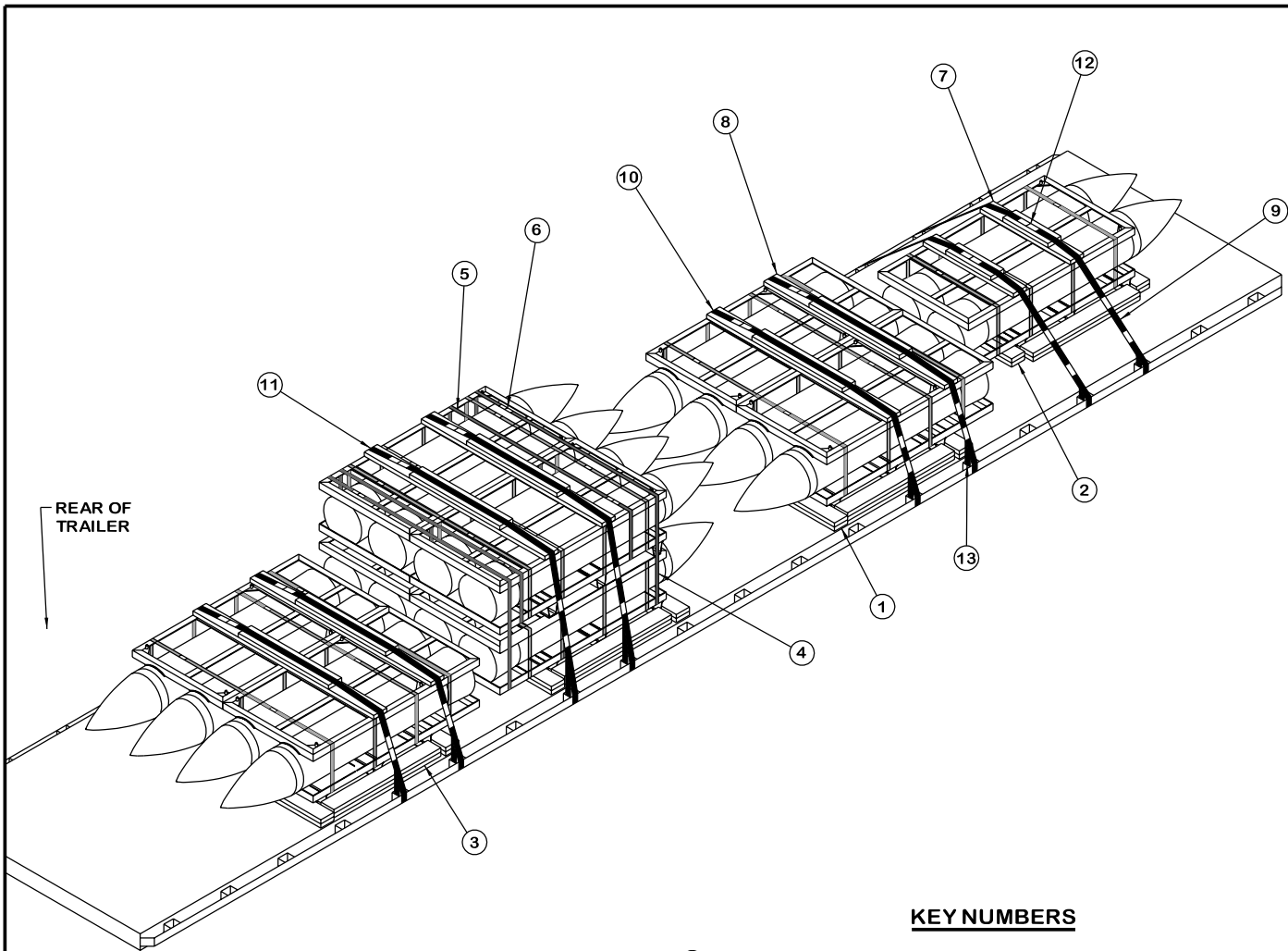
- 1. A 9-UNIT LOAD IS SHOWN ON A 45'-0" LONG BY 8'-0" WIDE "WESTERN" TYPE FLATBED TRAILER. OTHER LENGTH AND WIDTH TRAILERS MAY BE USED. SEE SPECIAL NOTE 7 AT LEFT.
- 2. THE HEADER LOCATIONS ARE DESIGNED TO LOCATE THE HOLD DOWN STRAPS OVER THE TOP FRAME OF THE PALLET UNITS, IN ALIGNMENT WITH THE STAKE POCKETS. THE LOCATIONS OF THE HEADERS MAY BE ADJUSTED AS NECESSARY TO ACCOMPLISH THIS.
- 3. THE POSITION OF THE LOAD IS BASED UPON THE ASSUMPTION OF A 45'-0" LONG TRAILER HAVING STAKE POCKETS SPACED 24" ON CENTER AND WITH THE FIRST STAKE POCKET LOCATED AT 6" FROM THE FRONT. STAKE POCKETS NUMBERS 4, 5, 8, 9, 13, 14, 16, AND 18, AS COUNTED FROM THE FRONT OF THE TRAILER SHOULD BE USED FOR THE ATTACHMENT OF THE HOLD DOWN STRAPS. THE LOAD MAY BE ADJUSTED TO ACCOMMODATE DIFFERENCES IN THE LOCATION OR SPACING OF THE STAKE POCKETS.
- 4. THE HEADER LOCATIONS ARE DESIGNED TO PROVIDE LONGITUDINAL RESTRAINT OF THE PALLET UNITS. THE 47" REFERENCED DIMENSION IS BASED UPON THE SPACING OF THE PALLET UNIT SKIDS. VERIFY SKID SPACING PRIOR TO NAILING THE BASE END HEADERS IN POSITION. ADJUST SPACING AS REQUIRED.
- 5. IF CHAINS AND LOAD BINDERS ARE TO BE USED FOR LOAD SECUREMENT IN LIEU OF THE STEEL STRAPPING, REFER TO THE PROCEDURES ON PAGES 10 AND 11 FOR GUIDANCE. IF WEB STRAPS ARE TO BE USED FOR LOAD SECUREMENT, REFER TO THE PROCEDURES ON PAGES 12 AND 13 FOR GUIDANCE.
- 6. THE DEPICTED LOAD, OR A LOAD ON OTHER THAN A "WESTERN" TYPE TRAILER, CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. THE LOAD CAN BE REDUCED BY MULTIPLES OF TWO PALLET UNITS BY OMITTING THE TWO PALLET UNITS FROM THE TOP LAYER. THE LOAD CAN BE REDUCED BY ONE PALLET UNIT BY OMITTING THE PALLET UNIT AT THE FRONT OF THE LOAD.

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LOAD AS SHOWN

| ITEM         | QUANTITY | WEIGHT (APPROX)     |
|--------------|----------|---------------------|
| PALLET UNIT  | 9        | 38,907 LBS          |
| DUNNAGE      |          | 550 LBS             |
| TOTAL WEIGHT |          | 39,457 LBS (APPROX) |

| BILL OF MATERIAL              |             |                |
|-------------------------------|-------------|----------------|
| LUMBER                        | LINEAR FEET | BOARD FEET     |
| 2" x 6"                       | 230         | 230            |
| NAILS                         | NO. REQD    | POUNDS         |
| 10d (3")                      | 172         | 2-3/4          |
| 20d (4")                      | 36          | 1-1/4          |
| STEEL STRAPPING, 1-1/4" - -   | 94' REQD    | - - - - 13 LBS |
| SEAL FOR 1-1/4" STRAPPING - - | 12 REQD     | - - - - NIL    |
| STEEL STRAPPING, 2" - - - -   | 188' REQD   | - - - - 63 LBS |
| SEAL FOR 2" STRAPPING - - -   | 48 REQD     | - - - - 10 LBS |



**ISOMETRIC VIEW**

**(KEY NUMBERS CONTINUED)**

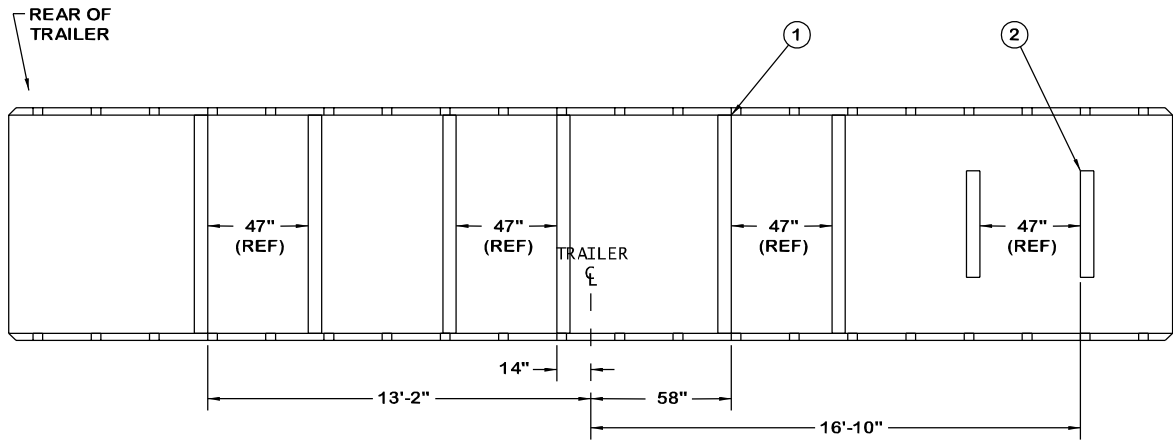
- ⑨ HOLD DOWN STRAP, 2" X .050" OR .044" X 19'-0" LONG STEEL STRAPPING (2 REQD). INSTALL EACH STRAP FROM TWO 9'-6" LONG PIECES. SEE SPECIAL NOTE 4 ON PAGE 9.
- ⑩ HOLD DOWN STRAP, 2" X .050" OR .044" X 20'-0" LONG STEEL STRAPPING (4 REQD). INSTALL EACH STRAP FROM TWO 10'-0" LONG PIECES. SEE SPECIAL NOTE 4 ON PAGE 9.
- ⑪ HOLD DOWN STRAP, 2" X .050" OR .044" X 23'-0" LONG STEEL STRAPPING (2 REQD). INSTALL EACH STRAP FROM TWO 11'-6" LONG PIECES. SEE SPECIAL NOTE 4 ON PAGE 9.
- ⑫ SEAL FOR 2" STEEL STRAPPING (48 REQD, 6 PER STRAP). DOUBLE NOTCH EACH SEAL EXCEPT THOSE USED TO SECURE THE PADS. SEE THE "END OVER END LAP JOINT DETAIL" ON PAGE 16.
- ⑬ PAD, 2" X .050" OR .044" X 18" LONG STEEL STRAPPING (16 REQD). POSITION BETWEEN THE HOLD DOWN STRAP AND THE TRAILER SIDE RAIL OR STAKE POCKET AND SEAL TO THE HOLD DOWN STRAP. SEE "DETAIL A" ON PAGE 16. ALTERNATE: STAKE POCKET PROTECTOR (32 REQD). USE TWO UNDER EACH STAKE POCKET OR RUB RAIL WITH A HOLD DOWN STRAP. SEE "DETAIL B" ON PAGE 16.

**KEY NUMBERS**

- ① LONG HEADER, 2" X 6" X BY DECK WIDTH MINUS 1" (REF: 7'-5") (DOUBLED) (6 REQD). PRE-POSITION AS SHOWN BY THE "PRE-POSITIONED DUNNAGE PLAN VIEW C" ON PAGE 9. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/5-20d NAILS. SEE SPECIAL NOTES 2, 3, AND 4 ON PAGE 9.
- ② SHORT HEADER, 2" X 6" X 44" (DOUBLED) (2 REQD). PRE-POSITION AS SHOWN BY THE "PRE-POSITIONED DUNNAGE PLAN VIEW C" ON PAGE 9. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/3-20d NAILS. SEE SPECIAL NOTE 4 ON PAGE 9.
- ③ SIDE BLOCKING, 2" X 6" X 45" (DOUBLED) (8 REQD). POSITION ON BOTH SIDES OF THE SINGLE PALLET UNIT AT THE FRONT OF THE TRAILER AND ON BOTH SIDES OF THE ADJACENT PALLET UNITS. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A SIMILAR MANNER.
- ④ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 14'-8" LONG STEEL STRAPPING (4 REQD). INSTALL TO ENCIRCLE THE TOP AND BOTTOM PALLET UNITS IN A TWO-HIGH STACK.
- ⑤ BUNDLING STRAP, 1-1/4" X .035" OR .031" X 17'-4" LONG STEEL STRAPPING (2 REQD). INSTALL TO ENCIRCLE THE PALLET UNITS IN THE SECOND LAYER.
- ⑥ SEAL FOR 1-1/4" STEEL STRAPPING (12 REQD, 2 PER STRAP). DOUBLE NOTCH EACH SEAL. SEE THE "END OVER END LAP JOINT DETAIL" ON PAGE 16.
- ⑦ STRAPPING BOARD ASSEMBLY A (2 REQD). SEE DETAIL ON PAGE 15. POSITION ON TOP OF THE SINGLE PALLET UNIT TO ALIGN WITH THE HOLD DOWN STRAPS. LOCATE AND DRILL HOLES TO INSTALL OVER PALLET UNIT STACKING PINS AS NECESSARY.
- ⑧ STRAPPING BOARD ASSEMBLY B (6 REQD). SEE DETAIL ON PAGE 15. POSITION ON TOP OF THE DOUBLED PALLET UNITS TO ALIGN WITH THE HOLD DOWN STRAPS. LOCATE AND DRILL HOLES TO INSTALL OVER PALLET UNIT STACKING PINS AS NECESSARY.

(CONTINUED AT LEFT)





**PRE-POSITIONED DUNNAGE PLAN VIEW C**

40'-0" LONG TRAILER

(SPECIAL NOTES CONTINUED)

7. IF DESIRED, 10 PALLET UNITS CAN BE SHIPPED. FOR 10 PALLET UNITS ON A 40'-0" LONG "WESTERN" TYPE TRAILER, ADD THE ADDITIONAL PALLET UNIT ADJACENT TO THE SINGLE PALLET UNIT AT THE FRONT OF THE LOAD AND CENTER. THE LENGTH OF ALL HEADERS SHALL BE THE DECK WIDTH MINUS 1" (REF: 7'-5"). THE LENGTH OF THE HOLD DOWN STRAPS AT THE FRONT OF THE LOAD SHALL BE INCREASED TO 20'-0". FOR 10 PALLET UNITS ON A TRAILER OTHER THAN A "WESTERN" TYPE, THE CHANGES TO THE LOAD AS NOTED ABOVE APPLY.

SPECIAL NOTES:

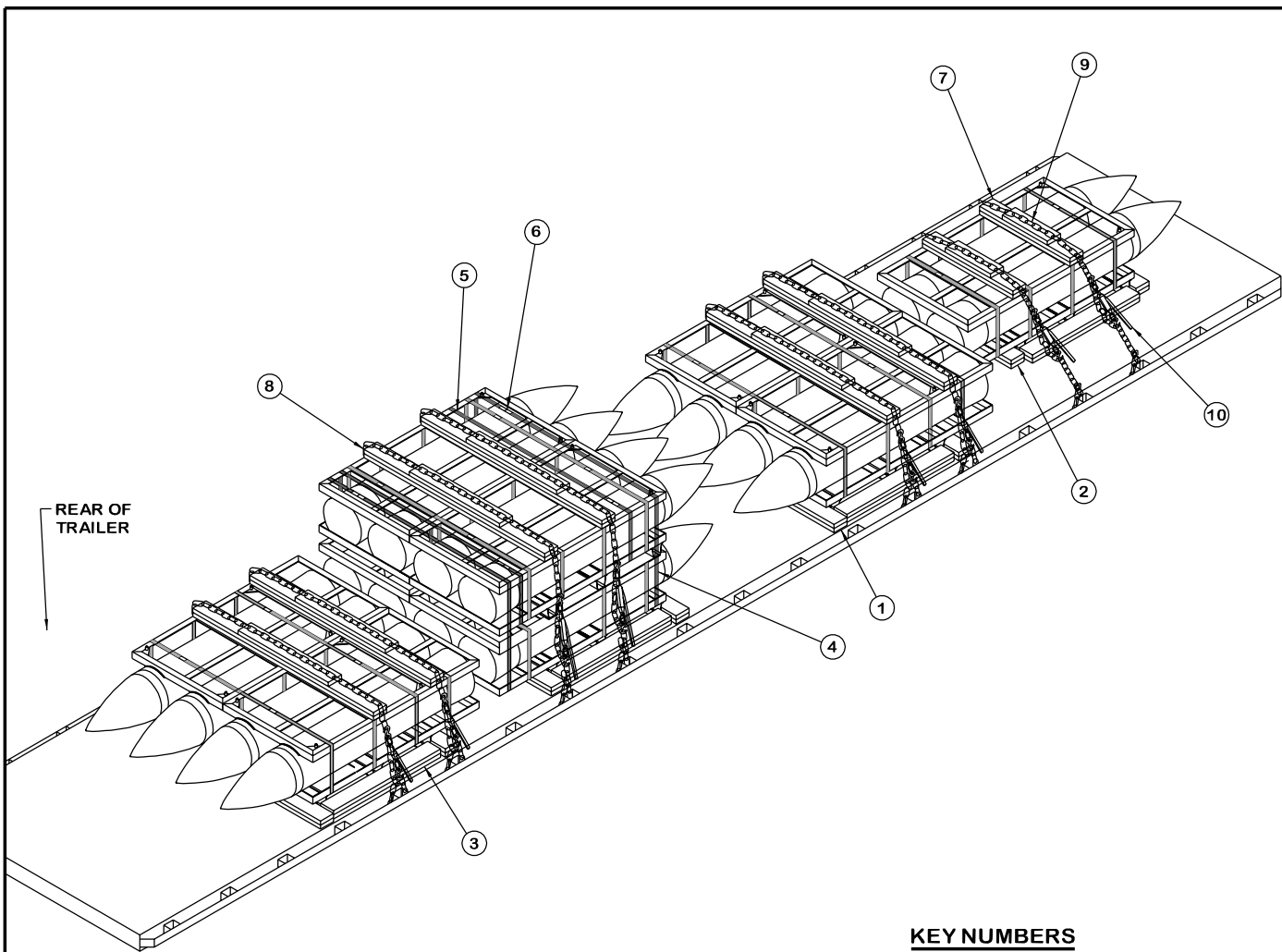
1. A 9-UNIT LOAD IS SHOWN ON A 40'-0" LONG BY 8'-0" WIDE "WESTERN" TYPE FLATBED TRAILER. OTHER LENGTH AND WIDTH TRAILERS MAY BE USED. SEE SPECIAL NOTE 7 AT LEFT.
2. THE HEADER LOCATIONS ARE DESIGNED TO LOCATE THE HOLD DOWN STRAPS OVER THE TOP FRAME OF THE PALLET UNITS, IN ALIGNMENT WITH THE STAKE POCKETS. THE HEADER LOCATIONS MAY BE ADJUSTED AS NECESSARY TO ACCOMPLISH THIS.
3. THE POSITION OF THE LOAD IS BASED UPON THE ASSUMPTION OF A 40'-0" LONG TRAILER HAVING STAKE POCKETS SPACED 24" ON CENTER AND WITH THE FIRST STAKE POCKET LOCATED AT 12" FROM THE FRONT. STAKE POCKETS NUMBERS 3, 4, 6, 7, 12, 13, 15, AND 16, AS COUNTED FROM THE FRONT OF THE TRAILER SHOULD BE USED FOR THE ATTACHMENT OF THE HOLD DOWN STRAPS. THE LOAD MAY BE ADJUSTED TO ACCOMMODATE DIFFERENCES IN THE LOCATION OR SPACING OF THE STAKE POCKETS.
4. THE HEADER LOCATIONS ARE DESIGNED TO PROVIDE LONGITUDINAL RESTRAINT OF THE PALLET UNITS. THE 47" REFERENCED DIMENSION IS BASED UPON THE SPACING OF THE PALLET UNIT SKIDS. VERIFY SKID SPACING PRIOR TO NAILING THE BASE END HEADERS IN POSITION. ADJUST SPACING AS REQUIRED.
5. IF CHAINS AND LOAD BINDERS ARE TO BE USED FOR LOAD SECUREMENT IN LIEU OF THE STEEL STRAPPING, REFER TO THE PROCEDURES ON PAGES 10 AND 11 FOR GUIDANCE. IF WEB STRAPS ARE TO BE USED FOR LOAD SECUREMENT, REFER TO THE PROCEDURES ON PAGES 12 AND 13 FOR GUIDANCE.
6. THE DEPICTED LOAD, OR A LOAD ON OTHER THAN A "WESTERN" TYPE TRAILER, CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. THE LOAD CAN BE REDUCED BY MULTIPLES OF TWO PALLET UNITS BY OMITTING THE TWO PALLET UNITS FROM THE TOP LAYER. THE LOAD CAN BE REDUCED BY ONE PALLET UNIT BY OMITTING THE PALLET UNIT AT THE FRONT OF THE LOAD.

(CONTINUED AT LEFT)

| BILL OF MATERIAL              |                   |            |
|-------------------------------|-------------------|------------|
| LUMBER                        | LINEAR FEET       | BOARD FEET |
| 2" x 6"                       | 230               | 230        |
| NAILS                         | NO. REQD          | POUNDS     |
| 10d (3")                      | 172               | 2-3/4      |
| 20d (4")                      | 36                | 1-1/4      |
| STEEL STRAPPING, 1-1/4" - -   | 94' REQD - - - -  | 13 LBS     |
| SEAL FOR 1-1/4" STRAPPING - - | 12 REQD - - - -   | NIL        |
| STEEL STRAPPING, 2" - - - -   | 188' REQD - - - - | 63 LBS     |
| SEAL FOR 2" STRAPPING - - - - | 48 REQD - - - -   | 10 LBS     |

**LOAD AS SHOWN**

| ITEM                   | QUANTITY    | WEIGHT (APPROX)     |
|------------------------|-------------|---------------------|
| PALLET UNIT - - - - -  | 9 - - - - - | 38,907 LBS          |
| DUNNAGE - - - - -      | - - - - -   | 550 LBS             |
| TOTAL WEIGHT - - - - - |             | 39,457 LBS (APPROX) |



**ISOMETRIC VIEW**

**(KEY NUMBERS CONTINUED)**

- ⑨ CHAIN, BINDING, 5/16", GRADE 70, BY A LENGTH TO SUIT (REF: 17'-6") (8 REQD). POSITION AS SHOWN. ATTACH TO A STAKE POCKET. DO NOT ATTACH TO A RUB RAIL. SEE GENERAL NOTE "L" ON PAGE 2 AND THE "SPECIAL PROVISIONS FOR CHAIN TIEDOWN" ON PAGE 11.
- ⑩ LOAD BINDER, 5/16", OVER-CENTER TYPE (8 REQD, 1 PER CHAIN). WIRE TIE HANDLE TO PREVENT OPENING DURING TRANSPORT. FASTEN THE TENSIONED CHAIN TO A LATERAL PIECE OF A CHAIN BOARD ASSEMBLY. FASTEN TO THE CHAIN BOARD ASSEMBLY W/4-20d NAILS. DRIVE EACH NAIL INTO THE LATERAL PIECE OR PURCHASE BOARD OF THE CHAIN BOARD ASSEMBLY THRU AN OPENING IN A CHAIN LINK AND BEND IT OVER THE LINK.

**KEY NUMBERS**

- ① LONG HEADER, 2" X 6" X BY DECK WIDTH MINUS 1" (REF: 7'-5") (DOUBLED) (6 REQD). PRE-POSITION AS SHOWN BY THE "PRE-POSITIONED DUNNAGE PLAN VIEW C" ON PAGE 9. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/5-20d NAILS. SEE SPECIAL NOTES 2, 3, AND 4 ON PAGE 11.
- ② SHORT HEADER, 2" X 6" X 44" (DOUBLED) (2 REQD). PRE-POSITION AS SHOWN BY THE "PRE-POSITIONED DUNNAGE PLAN VIEW C" ON PAGE 9. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/3-20d NAILS.
- ③ SIDE BLOCKING, 2" X 6" X 45" (DOUBLED) (8 REQD). POSITION ON BOTH SIDES OF THE SINGLE PALLET UNIT AT THE FRONT OF THE TRAILER AND ON BOTH SIDES OF THE ADJACENT PALLET UNITS. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A SIMILAR MANNER.
- ④ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 14'-8" LONG STEEL STRAPPING (4 REQD). INSTALL TO ENCIRCLE THE TOP AND BOTTOM PALLET UNITS IN A TWO-HIGH STACK.
- ⑤ BUNDLING STRAP, 1-1/4" X .035" OR .031" X 17'-4" LONG STEEL STRAPPING (2 REQD). INSTALL TO ENCIRCLE THE PALLET UNITS IN THE SECOND LAYER.
- ⑥ SEAL FOR 1-1/4" STEEL STRAPPING (12 REQD, 2 PER STRAP). DOUBLE NOTCH EACH SEAL. SEE THE "END OVER END LAP JOINT DETAIL" ON PAGE 16.
- ⑦ CHAIN BOARD ASSEMBLY A (2 REQD). SEE DETAIL ON PAGE 15. POSITION ON TOP OF THE SINGLE PALLET UNIT TO ALIGN WITH THE HOLD DOWN STRAPS. LOCATE AND DRILL HOLES TO INSTALL OVER PALLET UNIT STACKING PINS AS NECESSARY.
- ⑧ CHAIN BOARD ASSEMBLY B (6 REQD). SEE DETAIL ON PAGE 15. POSITION ON TOP OF THE DOUBLED PALLET UNITS TO ALIGN WITH THE HOLD DOWN STRAPS. LOCATE AND DRILL HOLES TO INSTALL OVER PALLET UNIT STACKING PINS AS NECESSARY.

(CONTINUED AT LEFT)

**SPECIAL PROVISIONS FOR CHAIN TIEDOWN**

LADING MAY BE SECURED TO THE FLATBED TRAILER BY CARRIER-OWNED CHAINS AND LOAD BINDERS IN LIEU OF SPECIFIED STRAPPING, PROVIDED THE FOLLOWING CONDITIONS ARE MET AND THE PROCEDURES CONTAINED ON PAGES 8 AND 9 ARE FOLLOWED.

1. ONLY CHAINS AND LOAD BINDERS OF GOOD QUALITY WILL BE USED. ALL CHAINS AND LOAD BINDERS SHALL CONFORM TO THE NATIONAL ASSOCIATION OF CHAIN MANUFACTURER'S WELDED CHAIN SPECIFICATION ADOPTED NOVEMBER 1999.
2. ALL CHAINS SHALL BE MARKED AS PRESCRIBED BY THE NATIONAL ASSOCIATION OF CHAIN MANUFACTURER'S WELDED CHAIN SPECIFICATION ADOPTED NOVEMBER 1999. AT LEAST ONE LINK IN EVERY 36 LINKS SHALL CARRY THE MANUFACTURER'S PERMANENT AND DISTINCTIVE MARK IDENTIFYING THE GRADE OF CHAIN. CHAINS NOT MARKED IN THIS MANNER SHALL NOT BE USED. IN ADDITION TO THE GRADE MARKING, THE CHAIN MAY ALSO CARRY LETTER MARKINGS OR SYMBOLS IDENTIFYING THE CHAIN MANUFACTURER. THE PRESENCE OF THE MANUFACTURER'S IDENTIFICATION MARKING IS NOT MANDATORY.
3. BEFORE AND DURING INSTALLATION, THE CHAINS AND LOAD BINDERS SHALL BE INSPECTED FOR BENT HOOKS, STRETCH, GOUGES, BENT LINKS, WEAR, OR ANY OTHER NOTICEABLE DEFECTS. ANY DEFICIENCY SHALL BE CAUSE FOR REJECTION OF A CHAIN OR LOAD BINDER. CHAINS MUST NOT BE TWISTED DURING INSTALLATION. CAUTION: EXTREME CARE MUST BE EXERCISED WHEN TENSIONING CHAINS TO PREVENT DAMAGE OR PERMANENT DEFORMATION TO THE LADING.
4. CHAIN SIZES AND GRADES APPROVED FOR USE WITH FLATBED TRAILER LOADS ARE AS FOLLOWS:
  - A. 3/8", GRADE 43 HIGH TEST CHAIN
  - B. 5/16", GRADE 70 TRANSPORT CHAIN
  - C. 3/8", GRADE 70 TRANSPORT CHAIN
  - D. 5/16", GRADE 80 ALLOY STEEL CHAIN
  - E. 3/8", GRADE 80 ALLOY STEEL CHAIN
5. THE GRABHOOKS ON THE ENDS OF THE CHAIN MAY BE OF THE FOLLOWING TYPES WITH GRADE MARKINGS AS INDICATED.
  - A. CLEVIS GRABHOOKS, 3/8" SIZE, DO NOT REQUIRE GRADE MARKING. ALLOY GRABHOOKS, 5/16" SIZE, SHALL CARRY THE MANUFACTURER'S GRADE MARK OF 7, 70, OR 700. THE HOOKS SHALL BE USED ON THE APPROPRIATE SIZE CHAIN.
  - B. CLOSED EYE GRABHOOKS, 3/8" AND 5/16" SIZE, MAY BE USED ON THE APPROPRIATE SIZE CHAIN IF THEY ARE A PART OF A CHAIN ASSEMBLY WHICH WAS PROVIDED BY A CHAIN MANUFACTURER, AND THE CHAIN ASSEMBLY CARRIES THE CORRECT GRADE IDENTIFICATION MARKING AS PREVIOUSLY STATED. CLOSED EYE GRABHOOKS THAT FORM A PART OF THE CHAIN ASSEMBLY ARE EXEMPT FROM GRADE MARKINGS.
  6. CLOSED EYE GRABHOOKS, 3/8" AND 5/16" SIZE, MAY BE USED ON THE APPROPRIATE SIZE CHAIN IF THEY ARE A PART OF A CHAIN ASSEMBLY WHICH WAS PROVIDED BY A CHAIN MANUFACTURER, AND THE CHAIN ASSEMBLY CARRIES THE CORRECT GRADE IDENTIFICATION MARKING AS PREVIOUSLY STATED. CLOSED EYE GRABHOOKS THAT FORM A PART OF THE CHAIN ASSEMBLY ARE EXEMPT FROM GRADE MARKINGS.
7. CONNECTING LINKS USED FOR CHAIN REPAIR MUST BE CORRECTLY MARKED AND BE EQUAL TO OR GREATER IN STRENGTH THAN THE CHAIN THEY ARE REPAIRING. CHAINS WITH UNMARKED CONNECTING LINKS SHALL NOT BE USED.
8. CHAIN AND FITTING OF A HIGHER GRADE MAY BE SUBSTITUTED FOR THE GRADES SPECIFIED IN NOTE 4 ABOVE.
9. LOAD BINDERS SHALL BE 5/16" TO 3/8" SIZE AND HAVE A MINIMUM BREAKING STRENGTH OF 16,200 POUNDS (WORKING LOAD LIMIT OF 5,400 POUNDS). OVERCENTER TYPE LOAD BINDERS SHALL BE SAFETY WIRED TO PREVENT ACCIDENTAL OPENING DURING TRANSPORT. LOAD BINDER SIZE SHALL BE COMPATIBLE WITH THE SIZE OF THE CHAIN BEING USED.

**SPECIAL NOTES:**

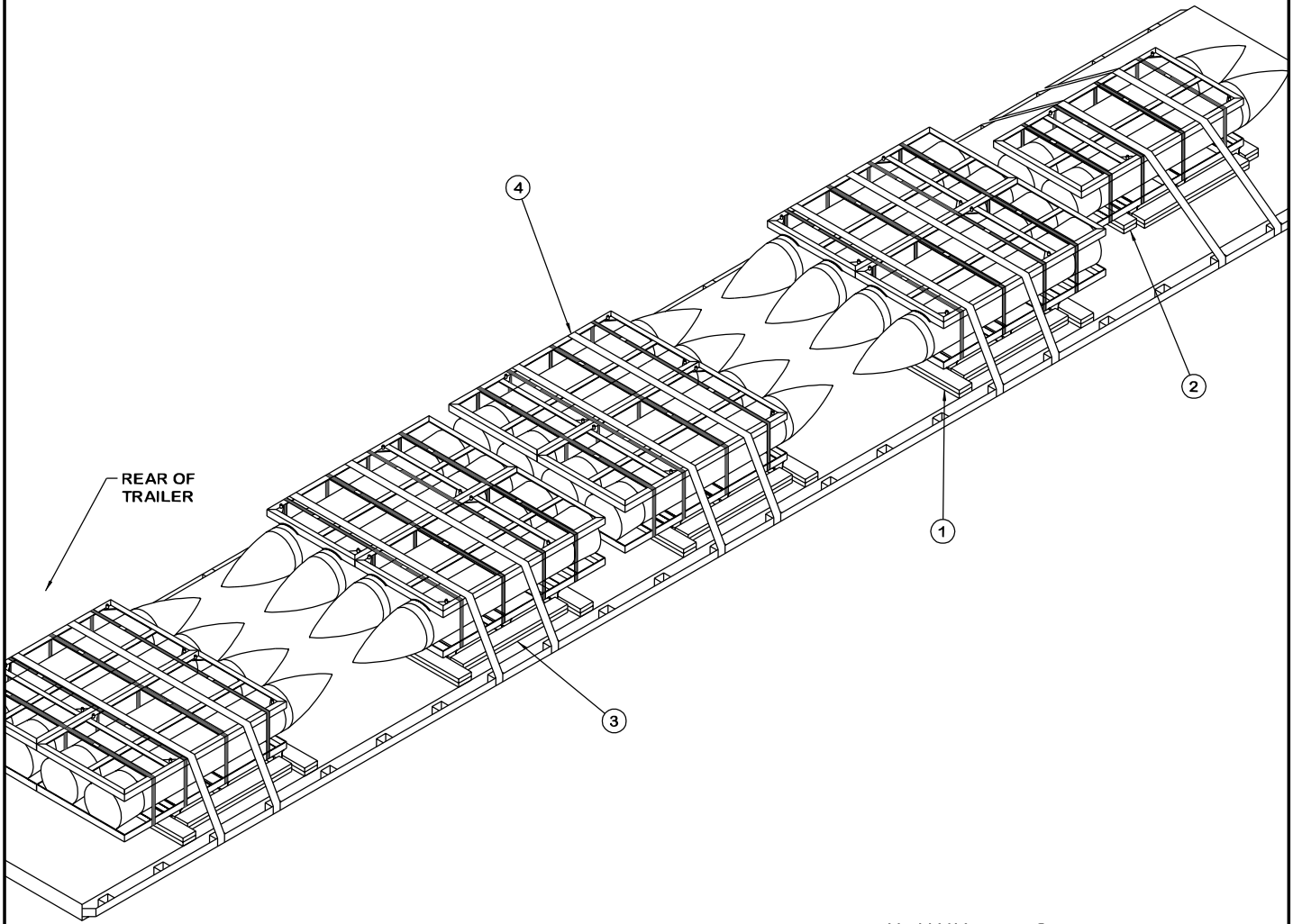
1. A 9-UNIT LOAD IS SHOWN ON A 40'-0" LONG BY 8'-0" WIDE "WESTERN" TYPE FLATBED TRAILER. OTHER LENGTH AND WIDTH TRAILERS MAY BE USED. SEE SPECIAL NOTE 6 BELOW.
2. THE LOCATIONS OF THE NOSE END HEADERS ARE DESIGNED TO LOCATE THE HOLD DOWN STRAPS OVER THE TOP FRAME OF THE PALLET UNITS, IN ALIGNMENT WITH THE STAKE POCKETS OR TRAILER SIDE RAIL. THE LOCATIONS OF THE HEADERS MAY BE ADJUSTED AS NECESSARY TO ACCOMPLISH THIS.
3. THE POSITION OF THE LOAD IS BASED UPON THE ASSUMPTION OF A 40'-0" LONG TRAILER HAVING STAKE POCKETS SPACED 24" ON CENTER AND WITH THE FIRST STAKE POCKET LOCATED AT 12" FROM THE FRONT. STAKE POCKETS NUMBERS 3, 4, 6, 7, 12, 13, 15, AND 16, AS COUNTED FROM THE FRONT OF THE TRAILER SHOULD BE USED FOR THE ATTACHMENT OF THE HOLD DOWN STRAPS. THE LOAD MAY BE ADJUSTED TO ACCOMMODATE DIFFERENCES IN THE LOCATION OR SPACING OF THE STAKE POCKETS.
4. THE LOCATIONS OF THE BASE END HEADERS ARE DESIGNED TO PROVIDE LONGITUDINAL RESTRAINT OF THE PALLET UNITS. THE 47" REFERENCED DIMENSION IS BASED UPON THE SPACING OF THE PALLET UNIT SKIDS. VERIFIED SKID SPACING PRIOR TO NAILING THE BASE END HEADERS IN POSITION. ADJUST SPACING AS REQUIRED.
5. IF STEEL STRAPPING IS TO BE USED FOR LOAD SECUREMENT IN LIEU OF THE CHAINS AND LOAD BINDERS, REFER TO THE PROCEDURES ON PAGES 8 AND 9 FOR GUIDANCE. IF WEB STRAPS ARE TO BE USED FOR LOAD SECUREMENT, REFER TO THE PROCEDURES ON PAGES 12 AND 13 FOR GUIDANCE.
6. THE DEPICTED LOAD, OR A LOAD ON OTHER THAN A "WESTERN" TYPE TRAILER, CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. THE LOAD CAN BE REDUCED BY MULTIPLES OF TWO PALLET UNITS BY OMITTING THE TWO PALLET UNITS FROM THE TOP LAYER. THE LOAD CAN BE REDUCED BY ONE PALLET UNIT BY OMITTING THE PALLET UNIT AT THE FRONT OF THE LOAD.
7. IF DESIRED, 10 PALLET UNITS CAN BE SHIPPED. FOR 10 PALLET UNITS ON A 40'-0" LONG "WESTERN" TYPE TRAILER, ADD THE ADDITIONAL PALLET UNIT ADJACENT TO THE SINGLE PALLET UNIT AT THE FRONT OF THE LOAD AND CENTER. THE LENGTH OF THE HEADERS AT THE FRONT AND REAR OF THE FIRST STACK OF PALLET UNITS SHALL BE THE DECK WIDTH MINUS 1" (REF: 7'-5"). FOR 10 PALLET UNITS ON A TRAILER OTHER THAN A "WESTERN" TYPE, THE CHANGES TO THE LOAD AS NOTED ABOVE APPLY.
8. THE CHAINS WILL ONLY BE ATTACHED TO THE FLATBED TRAILER BY MEANS OF PASSING THE CHAINS THROUGH THE STAKE POCKETS. CAUTION: THE CHAINS WILL NOT BE ATTACHED TO THE TRAILER RUB RAILS.

**BILL OF MATERIAL**

| LUMBER                    | LINEAR FEET | BOARD FEET |
|---------------------------|-------------|------------|
| 2" X 6"                   | 275         | 275        |
| NAILS                     | NO. REQD    | POUNDS     |
| 10d (3")                  | 222         | 3-1/2      |
| 20d (4")                  | 64          | 2-1/4      |
| STEEL STRAPPING, 1-1/4"   | 94' REQD    | 13 LBS     |
| SEAL FOR 1-1/4" STRAPPING | 12 REQD     | NIL        |
| CHAIN, BINDING, 5/16"     | 140' REQD   | 168 LBS    |
| LOAD BINDER, 5/16"        | 8 REQD      | 48 LBS     |

**LOAD AS SHOWN**

| ITEM                | QUANTITY | WEIGHT (APPROX)            |
|---------------------|----------|----------------------------|
| PALLET UNIT         | 9        | 38,907 LBS                 |
| DUNNAGE             |          | 735 LBS                    |
| <b>TOTAL WEIGHT</b> |          | <b>39,642 LBS (APPROX)</b> |



REAR OF TRAILER

**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① LONG HEADER, 2" X 6" BY DECK WIDTH MINUS 1" (REF: 7'-11") (DOUBLED) (8 REQD). PRE-POSITION AS SHOWN BY THE "PRE-POSITIONED DUNNAGE PLAN VIEW A" ON PAGE 5. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/5-20d NAILS. SEE SPECIAL NOTES 2 AND 3 ON PAGE 13.
- ② SHORT HEADER, 2" X 6" X 44" (DOUBLED) (2 REQD). PRE-POSITION AS SHOWN BY THE "PRE-POSITIONED DUNNAGE PLAN VIEW A" ON PAGE 5. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/3-20d NAILS.
- ③ SIDE BLOCKING, 2" X 6" X 45" (DOUBLED) (10 REQD). POSITION ON BOTH SIDES OF THE SINGLE PALLET UNIT AT THE FRONT OF THE TRAILER AND ON BOTH SIDES OF THE ADJACENT PALLET UNITS. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A SIMILAR MANNER.
- ④ WEB STRAP ASSEMBLY (10 REQD). POSITION TO EXTEND FROM A WINCH ON ONE SIDE OF THE TRAILER, OVER THE PALLET UNITS, TO AN ATTACHMENT POINT ON THE OPPOSITE SIDE. SEE THE "SPECIAL PROVISIONS FOR WEB STRAP TIEDOWN" ON PAGE 13.

**SPECIAL PROVISIONS FOR WEB STRAP TIEDOWN**

LADING MAY BE SECURED TO A FLATBED TRAILER BY WEB STRAP ASSEMBLIES IN LIEU OF STEEL STRAPPING OR CHAINS AND LOAD BINDERS, PROVIDED THE FOLLOWING CONDITIONS ARE MET.

1. ONLY WEB STRAPS OF GOOD QUALITY WILL BE USED. ALL WEB STRAPS AND ASSOCIATED HARDWARE SHALL CONFORM TO THE WEB SLING & TIEDOWN ASSOCIATION RECOMMENDED STANDARD SPECIFICATION FOR SYNTHETIC WEB TIEDOWNS, FIRST PUBLISHED IN 1991.
2. ALL WEB STRAP TIEDOWN ASSEMBLIES SHALL BE PERMANENTLY LABELED WITHIN 18" OF ONE END TO SHOW:
  - A. NAME OR TRADEMARK OF MANUFACTURER
  - B. WORKING LOAD LIMIT (WLL)
  - C. DATE OF MANUFACTURE (MONTH AND YEAR)
3. WEB STRAP ASSEMBLY MINIMUM BREAKING STRENGTH WILL BE AT LEAST THREE TIMES THE WLL MARKED ON THE STRAP.
4. THE TOTAL MINIMUM BREAKING STRENGTH (MBS) OF THE STRAPS USED TO RESTRAIN AMMUNITION ITEMS WILL BE AT LEAST 1-1/2 TIMES THE TOTAL WEIGHT OF THE ITEMS, WITH A MINIMUM OF TWO STRAPS POSITIONED OVER EACH LOAD UNIT ON A TRAILER. WRITTEN PROOF OF THE MBS OF THE STRAPS SHALL BE PROVIDED BY THE CARRIER TO THE SHIPPING ACTIVITY IF REQUESTED.
5. CARRIERS MUST COMPLY WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS APPLICABLE TO CARGO RESTRAINT USING WEB STRAPS.
6. WHEN USING STRAPS AND WINCHES FOR CARGO RESTRAINT, THE STRAPS WILL BE TENSIONED UNTIL TIGHT WITHOUT CAUSING DAMAGE TO THE CARGO. ONLY WINCH BARS WILL BE USED FOR OPERATING THE STRAP WINCHES.
7. BEFORE AND DURING INSTALLATION, THE WEB STRAP ASSEMBLIES SHALL BE INSPECTED FOR DEFECTS. STRAPS HAVING ANY OF THE FOLLOWING DEFECTS WILL NOT BE USED FOR THE RESTRAINT OF ANY AMMUNITION LOAD, WITH THE EXCEPTION OF ONE WITH FRAYED ENDS. A STRAP HAVING FRAYED ENDS CAN BE USED IF THE FRAYED END IS TRIMMED AND MELTED WITH HEAT OR FLAME UNTIL ALL STRANDS ARE SEIZED.
  - A. STRAP ASSEMBLY HARDWARE: SHALL BE INSPECTED FOR BENT HOOKS, GOUGES, CORROSION, SIGNS OF REPAIR, BENT RATCHETS OR WINCHES, WEAR, OR ANY OTHER NOTICEABLE DEFECTS.
  - B. STRAP WEBBING: SHALL BE INSPECTED FOR KNOTS, EXCESSIVE ABRASIVE WEAR, TEARS, PUNCTURES, CUTS, ACID OR CAUSTIC BURNS, BROKEN STITCHES, FRAYED ENDS, OIL OR GREASE SPOTS EXCEEDING 6 SQUARE INCHES, BLEACHING OF COLOR, INCREASED STIFFNESS, SPLICES, VISIBLE WEAR INDICATOR THREADS, OR ANY OTHER NOTICEABLE DEFECTS.
8. RATCHET HANDLES MUST BE IN THE LOCKED POSITION AND/OR WINCH LOCKING DEVICES MUST BE FULLY SEATED IN THE TEETH OF THE WINCH.
9. IF THE WINCHES BEING USED ARE THE REMOVABLE TYPE HAVING BOLTS FOR ATTACHMENT TO THE TRAILER, CARE MUST BE EXERCISED WHEN ATTACHING THE WINCHES TO THE TRAILER. IF EXCESSIVE FORCE IS EXERTED ON THE BOLT DURING TENSIONING, DEFORMATION OF THE WINCH BRACKET MAY OCCUR, AND SUBSEQUENTLY CAUSE FAILURE OF THE WINCH BRACKET DURING TRANSPORT. MUST BE FASTENED TO THE TRAILER WITH A MINIMUM OF TWO BOLTS.

(SPECIAL PROVISIONS CONTINUED AT RIGHT)

| BILL OF MATERIAL     |             |            |
|----------------------|-------------|------------|
| LUMBER               | LINEAR FEET | BOARD FEET |
| 2" X 6"              | 153         | 153        |
| NAILS                | NO. REQD    | POUNDS     |
| 10d (3")             | 52          | 1          |
| 20d (4")             | 46          | 1-1/2      |
| WEB STRAP ASSEMBLIES |             | 10 REQD    |

**SPECIAL NOTES:**

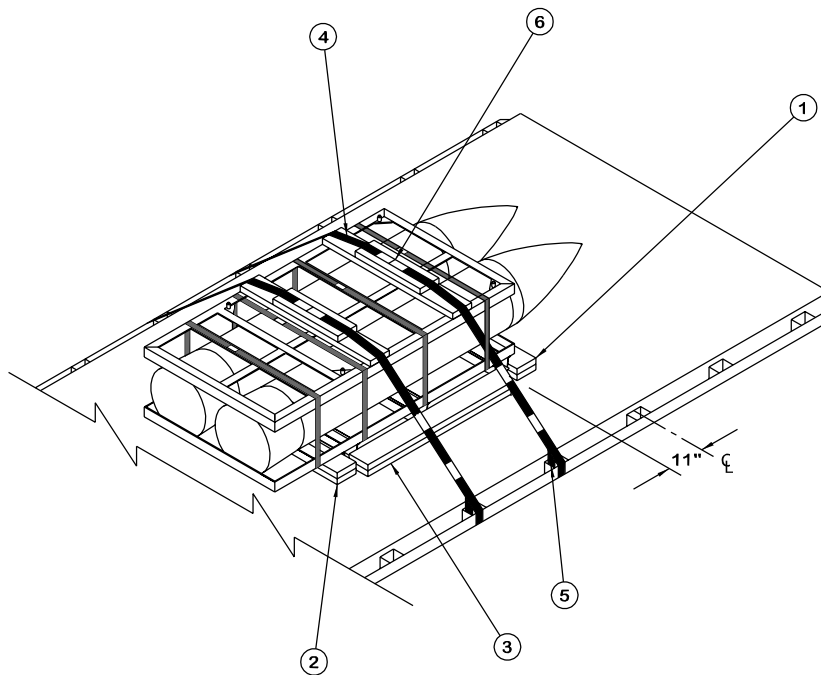
1. A 9-UNIT LOAD IS SHOWN ON A 48'-0" LONG BY 8'-6" WIDE FLATBED TRAILER. OTHER LENGTH AND WIDTH TRAILERS MAY BE USED.
2. THE LOCATIONS OF THE NOSE END HEADERS ARE DESIGNED TO LOCATE THE HOLD DOWN STRAPS OVER THE TOP FRAME OF THE PALLET UNITS, IN ALIGNMENT WITH THE STAKE POCKETS OR TRAILER SIDE RAIL. THE LOCATIONS OF THE HEADERS MAY BE ADJUSTED AS NECESSARY TO ACCOMPLISH THIS.
3. THE LOCATIONS OF THE BASE END HEADERS ARE DESIGNED TO PROVIDE LONGITUDINAL RESTRAINT OF THE PALLET UNITS. THE 47" REFERENCED DIMENSION IS BASED UPON THE SPACING OF THE PALLET UNIT SKIDS. VERIFIED SKID SPACING PRIOR TO NAILING THE BASE END HEADERS IN POSITION. ADJUST SPACING AS REQUIRED.
4. IF STEEL STRAPPING IS TO BE USED FOR LOAD SECUREMENT IN LIEU OF WEB STRAPS, REFER TO THE PROCEDURES ON PAGES 4 AND 5 FOR GUIDANCE. IF CHAINS AND LOAD BINDERS ARE TO BE USED FOR LOAD SECUREMENT, REFER TO THE PROCEDURES ON PAGES 10 AND 11 FOR GUIDANCE.
5. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. THE LOAD CAN BE REDUCED BY MULTIPLES OF TWO PALLET UNITS BY OMITTING ONE OR MORE TWO WIDE LOAD PALLET UNITS. THE LOAD CAN BE REDUCED BY ONE PALLET UNIT BY OMITTING THE PALLET UNIT AT THE FRONT OF THE LOAD.
6. THIS LOAD CAN NOT BE INCREASED TO 10 PALLET UNITS WITHOUT EXCEEDING THE AXLE WEIGHT LIMITATIONS.

**(SPECIAL PROVISIONS FOR WEB STRAP TIEDOWN CONTINUED)**

10. DRIVERS MUST BE INSTRUCTED TO PERIODICALLY CHECK THE TIGHTNESS OF THE WEB STRAP ASSEMBLIES AND RE-TIGHTEN, IF NECESSARY.
11. IF PROVIDED ON OR WITH THE WEB STRAP ASSEMBLIES, SCUFF SLEEVES/WEB PROTECTORS WILL BE USED WHEREVER THE STRAP PASSES OVER A SHARP CORNER OR IRREGULAR SURFACE. IF NOT PROVIDED, ANTI-CHAFING MATERIAL OF A SUITABLE THICKNESS WILL BE USED TO INSURE THAT THE STRAP WEBBING IS NOT DAMAGED DURING TRANSPORT OF THE LOAD.
12. THE HARDWARE FITTING OF THE TIEDOWN ASSEMBLIES MUST BE ATTACHED TO THE TRAILER IN SUCH A MANNER THAT THEY WILL REMAIN IN PLACE IF SLACK DEVELOPS IN THE STRAP DURING TRANSPORT.

**LOAD AS SHOWN**

| ITEM         | QUANTITY | WEIGHT (APPROX)     |
|--------------|----------|---------------------|
| PALLET UNIT  | 9        | 38,907 LBS          |
| DUNNAGE      |          | 309 LBS             |
| TOTAL WEIGHT |          | 39,216 LBS (APPROX) |



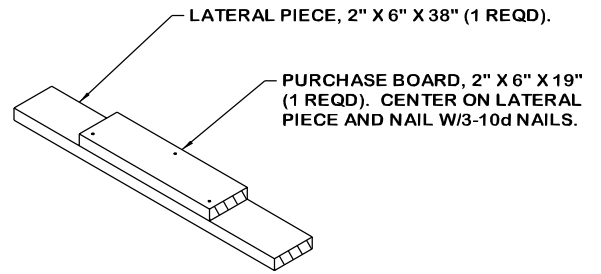
**ISOMETRIC VIEW**

**SPECIAL NOTES:**

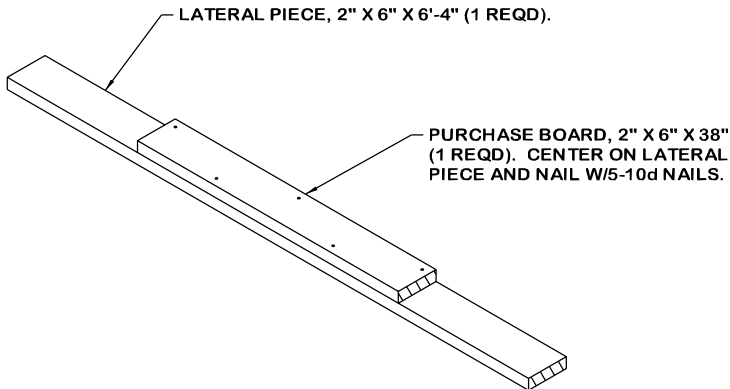
1. A 1-UNIT LOAD IS SHOWN ON A 8'-0" WIDE FLATBED TRAILER. OTHER WIDTH TRAILERS MAY BE USED.
2. THE PALLET UNIT SHOULD BE LOCATED ON THE TRAILER AS DIMENSIONED BY THE "ISOMETRIC VIEW" AND AS SPECIFIED WITHIN KEY NUMBER ①.
3. IF CHAINS AND LOAD BINDERS ARE TO BE USED FOR LOAD SECUREMENT IN LIEU OF THE STEEL STRAPPING, REFER TO THE PROCEDURES ON PAGES 10 AND 11 FOR GUIDANCE. IF WEB STRAPS ARE TO BE USED FOR LOAD SECUREMENT, REFER TO THE PROCEDURES ON PAGES 12 AND 13 FOR GUIDANCE.

**KEY NUMBERS**

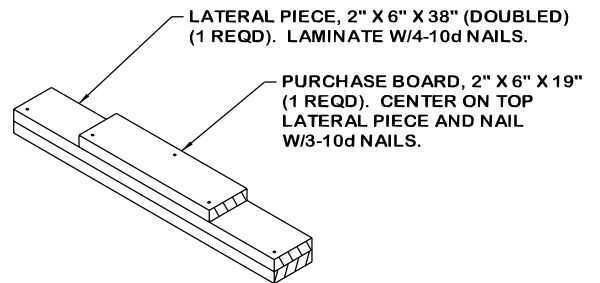
- ① FORWARD HEADER, 2" X 6" X 44" (DOUBLED) (1 REQD). PRE-POSITION AS SHOWN, WITH THE LOAD BEARING EDGE 11" FROM THE CENTER OF A STAKE POCKET. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/3-20d NAILS.
- ② REAR HEADER, 2" X 6" X 44" (DOUBLED) (1 REQD). POSITION SO THAT A 47" SPACE EXIST BETWEEN THE FORWARD AND REAR HEADER. THE 47" SPACING REQUIREMENT IS BASED ON THE DISTANCE BETWEEN THE PALLET UNIT SKIDS, VERIFY SKID SPACING PRIOR TO NAILING THE REAR HEADER. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/3-20d NAILS.
- ③ SIDE BLOCKING, 2" X 6" X 45" (DOUBLED) (2 REQD). POSITION ON BOTH SIDES OF THE PALLET UNIT. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A SIMILAR MANNER.
- ④ HOLD DOWN STRAP, 2" X .050" OR .044" X 19'-0" LONG STEEL STRAPPING (2 REQD). INSTALL EACH STRAP FROM TWO 9'-6" LONG PIECES.
- ⑤ PAD, 2" X .050" OR .044" X 18" LONG STEEL STRAPPING (4 REQD). POSITION BETWEEN THE HOLD DOWN STRAP AND THE TRAILER SIDE RAIL OR STAKE POCKET AND SEAL TO THE HOLD DOWN STRAP. SEE "DETAIL A" ON PAGE 16. ALTERNATE: STAKE POCKET PROTECTOR (40 REQD). USE TWO UNDER EACH STAKE POCKET OR RUB RAIL WITH A HOLD DOWN STRAP. SEE "DETAIL B" ON PAGE 16.
- ⑥ SEAL FOR 2" STEEL STRAPPING (12 REQD, 6 PER STRAP). DOUBLE NOTCH EACH SEAL EXCEPT THOSE USED TO SECURE THE PADS. SEE THE "END OVER END LAP JOINT DETAIL" ON PAGE 16.



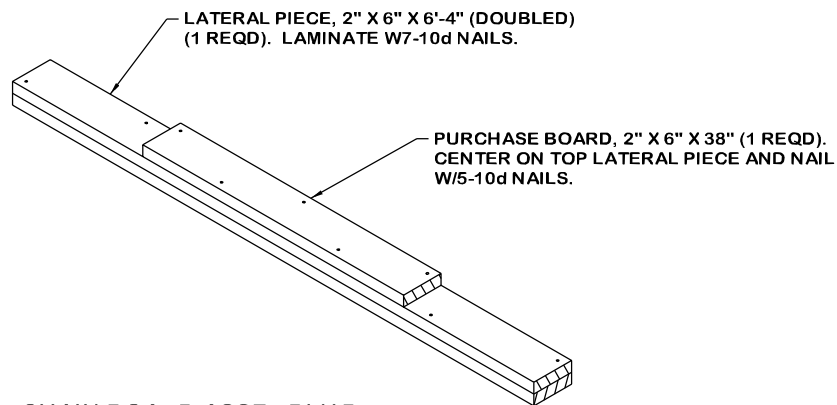
**STRAPPING BOARD ASSEMBLY A**



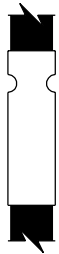
**STRAPPING BOARD ASSEMBLY B**



**CHAIN BOARD ASSEMBLY A**

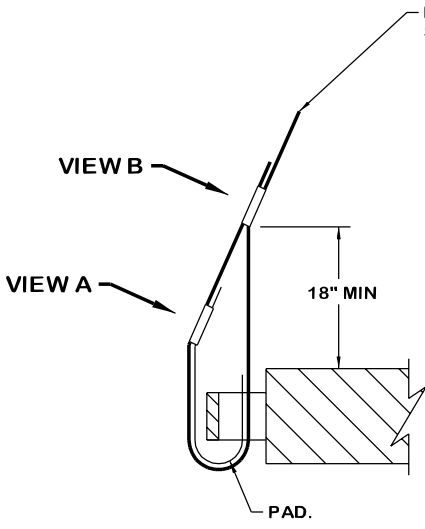


**CHAIN BOARD ASSEMBLY B**



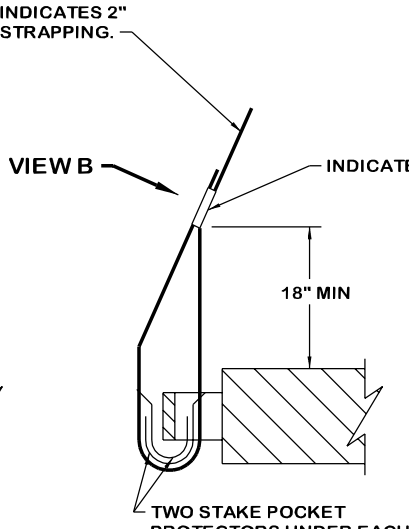
**VIEW A**

ONE SEAL WITH ONE PAIR OF CRIMPS.



**DETAIL A**

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



**DETAIL B**

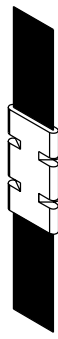
METHOD OF INSTALLING 2" STRAPPING AND STAKE POCKET PROTECTORS (ALT PAD).



**VIEW B**

ONE SEAL WITH TWO PAIR OF CRIMPS.

**HOLD-DOWN STRAP ANCHORING DETAILS**



ONE SEAL WITH TWO PAIR OF NOTCHES.

**STRAP JOINT A**

METHOD OF SECURING A STRAP JOINT WHEN USING A NOTCH-TYPE SEALER.



TWO SEALS, BUTTED TOGETHER, WITH TWO PAIR OF CRIMPS EACH SEAL.

**STRAP JOINT B**

METHOD OF SECURING A STRAP JOINT WHEN USING A CRIMP-TYPE SEALER.

**END-OVER-END LAP JOINT DETAILS**



**PROVISIONS FOR THE USE OF FIRE HOSE IN LIEU  
OF CHAIN BOARDS OR STRAPPING BOARDS**

FIRE HOSE THAT IS NO LONGER SUITABLE FOR USE IN FIRE FIGHTING APPLICATIONS CAN BE SUBSTITUTED FOR THE DOUBLED 2" BY 6" WOODEN CHAIN BOARDS OR SINGLE 2" BY 6" STRAPPING BOARDS, AS SPECIFIED HEREIN, PROVIDED THE FOLLOWING CONDITIONS ARE MET.

**1. SUBSTITUTION AND APPLICATION GUIDANCE**

- A. FIRE HOSE MAY BE USED WHEREVER A CHAIN OR STRAPPING BOARD CONTACTS A RIGID SURFACE OF THE LOAD PROVIDED GOUGING, SCRATCHING, CRACKING, BENDING, CRUSHING, OR OTHER VISIBLE DAMAGE DOES NOT OCCUR TO THE LOAD.
- B. ONE OR MORE SEGMENTS OF FIRE HOSE MAY BE USED TO REPLACE EACH CHAIN OR STRAPPING BOARD PROVIDING LOAD PROTECTION DURING TENSIONING OF TIEDOWNS AND LOAD SHIPMENT; I.E., A CHAIN BOARD NEED NOT BE REPLACED BY A SINGLE SEGMENT OF HOSE, MULTIPLE SEGMENTS MAY BE USED INSTEAD, AS LONG AS THEY ARE SECURELY FASTENED TO THE TIEDOWN. REGARDLESS OF THE NUMBER OF SEGMENTS USED, THE HOSE LENGTH WILL BE SUCH THAT IT EXTENDS AT LEAST 6" BEYOND THE EDGE OF THE LOAD.
- C. FIRE HOSE CANNOT BE USED IN PLACE OF A PURCHASE BOARD ON A LOAD CONSISTING OF MORE THAN TWO PALLETS OR CONTAINERS ACROSS THE WIDTH OF THE TRAILER. THE FIRE HOSE CAN BE APPLIED TO THE OUTER STACKS, HOWEVER, A PURCHASE BOARD ASSEMBLY WILL STILL BE REQUIRED TO PROVIDE VERTICAL HOLD-DOWN ON THE CENTER STACK(S).

**2. ACCEPTABLE FIRE HOSE**

- A. FIRE HOSE TO BE USED WILL BE A RUBBER LINED SINGLE OR DOUBLE JACKETED TYPE; I.E., IT MUST HAVE A RUBBER LINING INSIDE A SINGLE OR DOUBLED FABRIC (COTTON, LINEN, ETC.) JACKET.
- B. THE COLLAPSED WIDTH OF THE HOSE MUST BE A MINIMUM OF 2-1/2".
- C. THE HOSE SEGMENTS USED MUST NOT CONTAIN DEFECTS THAT WILL ALLOW DIRECT CONTACT OF THE CHAIN OR LOAD BINDER WITH THE LOAD. THE HOSE THICKNESS MUST ALSO BE OF SUCH A THICKNESS THAT DENTING OR DAMAGE TO THE LOAD DOES NOT OCCUR DURING CHAIN OR STRAP TENSIONING.

**3. SECUREMENT TO CHAINS OR STRAPS**

- A. THE SEGMENTS OF HOSE USED UNDER EACH CHAIN OR STRAP WILL BE SECURED TO THE CHAIN OR STRAP WITH ONE FASTENER EVERY 12", WITH A MINIMUM OF TWO FASTENERS REQUIRED PER HOSE SEGMENT.
- B. FASTENERS CAN CONSIST OF PLASTIC ELECTRICAL TIES, WIRE, OR TAPE. REGARDLESS OF THE TYPE OF FASTENING USED, IT MUST PROVIDE A POSITIVE MEANS OF SECUREMENT OF THE HOSE TO THE CHAIN OR STRAP AND MUST NOT DAMAGE THE SURFACE OF THE CONTAINER, PALLET, OR ITEM IT CONTACTS.

