MLRS

LOADING AND BRACING (TL & LTL) IN VAN TRAILERS⌖ OF MULTIPLE LAUNCH ROCKET SYSTEM ROCKET POD/ CONTAINERS (R/PC)

INDEX

⌖ THIS DOCUMENT INCLUDES OUTLOADING PROCEDURES FOR CONVENTIONAL TYPE TRAILERS AND FOR TRAILERS EQUIPPED WITH MECHANICAL BRACING DEVICES AS APPROVED BY THE BUREAU OF EXPLOSIVES, ASSOCIATION OF AMERICAN RAILROADS. CAUTION: THE PROCEDURES SHOWN HEREIN, FOR BOTH TYPES OF TRAILERS, ARE ONLY APPLICABLE FOR HIGHWAY MOVEMENTS; NOT FOR TRAILER-ON-FLAT-CAR MOVEMENTS.

U.S. ARMY MATERIEL COMMAND DRAWING

APPROVED, U.S. ARMY MISSILE COMMAND

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REVISION NO. 1 — AUGUST 1996

SEE THE REVISION LISTING ON PAGE 3

DO NOT SCALE

PROJECT GM 719-79

GENERAL NOTES

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 THE MULTIPLE LAUNCH ROCKET SYSTEM (MLRS) COMPLETE ROUND WHEN PACKED IN THE ROCKET POD/CONTAINER (RP/C). SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE RP/C WITH ROCKET COMPONENTS.

C. FOR DETAILS OF THE RP/C, SEE U.S. ARMY MISSILE COMMAND DRAWING NO. 13027900 AND THE DETAIL ON PAGE 3.

D. THE OUTLOADING PROCEDURES DELINEATED HEREIN CAN ALSO BE UTILIZED FOR THE SHIPMENT OF THE DEPICTED MLRS CONTAINERS WHEN THEY ARE LOADED WITH AN ITEM WHICH IS IDENTIFIED DIFFERENTLY BY NOMENCLATURE THAN THE ITEM DESIGNATED WITHIN THE DRAWING TITLE.

E. THE GROSS WEIGHT AND AXLE DISTRIBUTION OF WEIGHT FOR A LOAD WILL BE THE RESPONSIBILITY OF THE CARRIER. THE CARRIER WILL ADVISE THE SHIPPER OF THE APPLICABLE LOADING REQUIREMENTS, AND THE SHIPPER WILL LOAD ACCORDINGLY. THE TOTAL WEIGHT OF THE LADING, OF THE DUNNAGE, OF THE TRACTOR, AND OF THE SEMITRAILER CARRYING THE LADING MUST NOT EXCEED THE MAXIMUM GROSS WEIGHT ALLOWED FOR THE STATE OR STATES THRU WHICH THE LOAD IS TO BE TRANSPORTED BY MOTOR CARRIER. LIKEWISE, THE GROSS WEIGHT ON A SINGLE OR TANDEM AXLE MUST NOT EXCEED THE MAXIMUM ALLOWABLE WEIGHT. IF THERE IS ANY DOUBT AS TO WHETHER THE TOTAL GROSS WEIGHT OR AXLE WEIGHT EXCEEDS THE MAXIMUM ALLOWED, WEIGHT SHOULD BE VERIFIED BY ACTUALLY WEIGHING THE LOADED VEHICLE.

F. NOTICE: A SHIPMENT WILL BE POSITIONED IN THE TRAILER CONSISTENT WITH STATE WEIGHT LAWS. THE NUMBER OF LADING UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE TRAILER TO BE LOADED OR THE QUANTITY TO BE SHIPPED. COMBINATIONS OF THE OUTLOADING PROCEDURES SPECIFIED MAY BE USED, HOWEVER, THE APPROVED METHODS SHOWN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING, AND STAYING OF THE DESIGNATED ITEMS.

G. THE "LOAD AS SHOWN" FOR THE FULL LOADS DEPICTED HEREIN IS BASED ON AN APPROXIMATE LADING WEIGHT OF 42,000 POUNDS. THE SPECIFIED BLOCKING AND BRACING FOR THE FULL LOADS IS ADEQUATE FOR THE RETENTION OF LOADS, UP TO 43,000 POUNDS.

H. OTHER TYPES OF LADING ITEMS MAY BE LOADED INTO TRAILERS WHICH ARE PARTIALLY LOADED WITH THE DESIGNATED ITEMS, 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.

J. THE LOADS AS SHOWN HEREIN ARE FOR VAN TRAILERS WHICH ARE 89" TO 98" WIDE (INSIDE DIMENSION) AND OF VARIOUS LENGTHS, UP TO AND INCLUDING 48'-0" LONG. THEY ARE LIMITED TO HIGHWAY MOVEMENTS ONLY. THE DEPICTED LOADS ARE BASED ON TRAILERS OF THE CONVENTIONAL TYPE OR ARE BASED ON TRAILERS WHICH ARE EQUIPPED WITH SELF-CONTAINED MECHANICAL BRACING DEVICES (CROSS MEMBERS AND WALL MEMBERS) AND APPLY TO TRAILERS HAVING WOOD, WOOD AND METAL, OR ALL METAL FLOORS.

(CONTINUED AT RIGHT)

MATERIAL SPECIFICATIONS

LUMBER - - - - - - - - :	SEE TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC MM-L-751.
NAILS - - - - - - - - :	FED SPEC FF-N-105; COMMON.
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, .0800" DIA, GRADE 1006 OR BETTER.
STAPLE - - - - - - - - :	FED SPEC FF-N-105; 1-17/32" CROWN WIDTH X 3/4" LEG LENGTH FOR 1-1/4" STRAPPING, TYPE III, STYLE 3.
ANTI-CHAFING MATERIAL - - - - - - :	MIL-B-121 (OR EQUAL); NEUTRAL BARRIER MATERIAL.

(GENERAL NOTES CONTINUED)

K. THE OUTLOADING PROCEDURES DELINEATED ON PAGES 10 THRU 12, ARE FOR TRAILERS EQUIPPED WITH VARIOUS TYPES OF SELF-CONTAINED MECHANICAL DEVICES, AND ARE LIMITED TO HIGHWAY MOVEMENT ONLY. THE HEIGHT REQUIREMENTS SPECIFIED WITHIN THIS DRAWING FOR THE INSTALLATION OF CROSS MEMBERS ARE IDENTICAL TO THOSE RECOMMENDED BY THE BUREAU OF EXPLOSIVES PAMPHLET 6C. CAUTION: TRAILERS EQUIPPED WITH WALL MEMBERS WHICH DO NOT MEET THE LOCATION REQUIREMENTS MUST NOT BE USED.

1. VOIDS LENGTHWISE WITHIN THE LOAD MUST BE HELD TO A MINIMUM. CROSS MEMBERS MUST BE PLACED AGAINST THE LADING AS TIGHTLY AS THE HOLE SPACING IN THE CROSS MEMBER ATTACHMENT FACILITY PERMITS. EACH CROSS MEMBER WILL BE INSTALLED WITH THE ENDS ATTACHED AS NEARLY AS POSSIBLE IN "MATED" POSITIONS (AT EQUAL HEIGHTS AND EQUAL DISTANCES FROM THE END OF THE TRAILER).

2. CROSS MEMBERS IN EMPTY TRAILERS AND THOSE NOT USED IN LOADED TRAILERS MUST BE SECURED FOR SHIPMENT. COMPONENTS ASSIGNED TO EACH TRAILER MUST REMAIN THEREWITH EVEN THOUGH UNUSED DURING SOME SHIPMENTS.

3. ONE CROSS MEMBER WILL BE REQUIRED FOR EACH 10,000 LBS OF LADING, AND SHOULD NOT BE RELIED UPON TO RETAIN A GREATER WEIGHT. CROSS MEMBERS WILL NOT BE DOUBLED; THAT IS, TWO CROSS MEMBERS AT THE SAME HEIGHT LOCATION WILL NOT BE PLACED SIDE BY SIDE.

L. SELECTION OF A VEHICLE TO BE USED TO TRANSPORT THE DESIGNATED ITEM MUST COMPLY WITH AR 55-355, CHAPTER 29, FOR EXPLOSIVES AND OTHER DANGEROUS ARTICLES, IN FULL.

N. FOR TRAILERS NOT EQUIPPED WITH REAR CORNER POSTS, THE REAR BLOCKING MUST EXTEND TO CONTACT THE REAR DOORS WHEN CLOSED.

O. 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 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE.

P. NOTICE: A STAGGERED NAILING PATTERN WILL BE USED WHENEVER 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. 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.

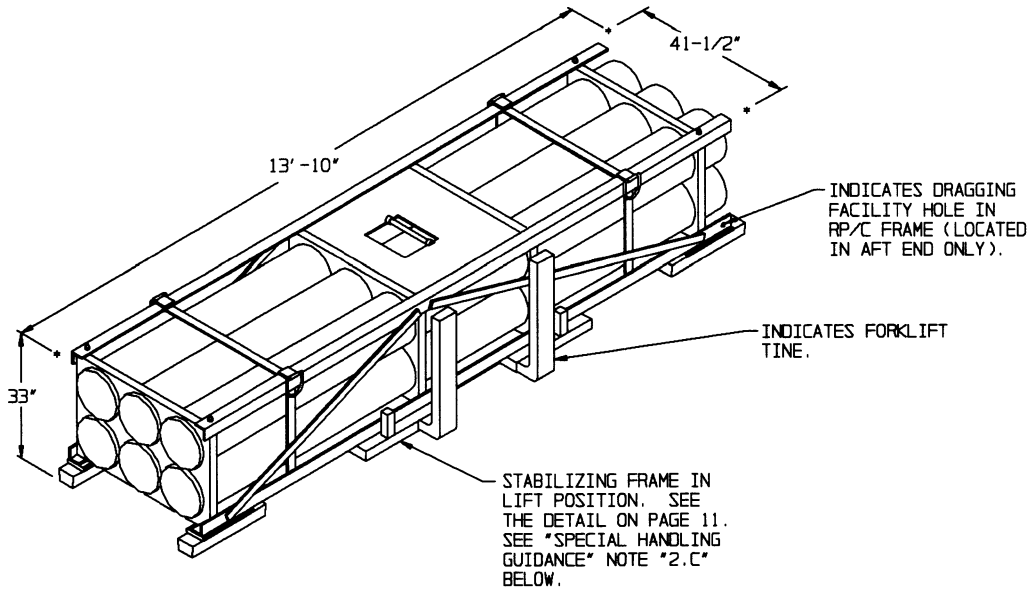
Q. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF ONE SEAL WITH TWO PAIR OF NOTCHES WILL BE USED TO SEAL THE JOINT WHEN A NOTCH-TYPE SEALER IS BEING USED. A MINIMUM OF TWO SEALS, BUTTED TOGETHER WITH TWO PAIR OF CRIMPS PER SEAL WILL BE USED TO SEAL THE JOINT WHEN A CRIMP-TYPE SEALER IS BEING USED.

R. POWER DRIVEN STAPLES MAY BE USED AS ALTERNATIVE FASTENERS FOR NAILS WHEN CONSTRUCTING DUNNAGE ASSEMBLIES WHICH ARE TO BE USED IN THE DELINEATED TRAILER LOADS SHOWN THROUGHOUT THIS DRAWING. THE STAPLES TO BE USED MUST BE EQUAL IN LENGTH TO THE SPECIFIED NAIL SIZE AND MUST BE SUBSTITUTED ON A ONE STAPLE FOR ONE NAIL BASIS. STAPLES WHICH ARE 2-1/2" OR LESS IN LENGTH SHOULD BE IN ACCORDANCE WITH FEDERAL SPECIFICATION FF-N-105 AS NEARLY AS PRACTICABLE. STAPLES WHICH ARE LONGER THAN 2-1/2" WILL BE A COMMERCIAL GRADE, OF A QUALITY EQUIVALENT TO THOSE MANUFACTURED BY SENCO PRODUCTS INCORPORATED. NOTE: STAPLES WILL NOT BE SUBSTITUTED FOR NAILS IN ANY LOAD RESTRAINING FLOOR DUNNAGE APPLICATION.

S. CAUTION: WHEN POWER OR PNEUMATIC NAILERS ARE BEING USED IN THE APPLICATION OF NAILED FLOORLINE BLOCKING OR BRACING, CONTAINERS BEING LOADED INTO THE CONVEYANCE MUST BE POSITIONED TO ALLOW A CLEAR PATH OF EXIT FOR THE OPERATOR AT ALL TIMES, SHOULD AN EMERGENCY EXIT BECOME NECESSARY.

T. 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 25.4 MM AND ONE POUND EQUALS 0.454 KG.

U. ALL LOADS ARE SHOWN WITH ALL THE CONTAINERS FACING IN THE SAME DIRECTION, THAT IS THE FORWARD END OF THE CONTAINER TOWARDS THE FORWARD END OF THE TRAILER.



RP/C STACKING AND HANDLING GUIDANCE

1. POD STACKING FOR OUTLOADING PURPOSES.

   A. THE UPPER POD SHOULD BE PLACED AS CLOSELY AS POSSIBLE IN VERTICAL ALIGNMENT WITH THE LOWER POD.

   B. WHEN STACKING THESE PODS, CARE MUST BE EXERCISED TO ENSURE THAT THE INTERLOCKING HOLES IN THE BOTTOM OF THE POD SKIDS ALIGN CORRECTLY WITH THE INTERLOCKING PINS ON THE TOP OF THE POD FRAME. THIS WILL PRECLUDE DAMAGE TO THE SKIDS AND ENSURE PROPER FUNCTIONING OF THE POD INTERLOCKS.

2. POD OR POD STACK HANDLING.

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

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

   A. ONLY APPROVED AND APPROPRIATELY SIZED MHE WILL BE USED FOR HANDLING THE DEPICTED PODS.

   B. IF HANDLING FROM THE SIDE IS ACCOMPLISHED WITH A FORKLIFT TRUCK, THE TINES OF THE FORKLIFT ARE TO BE INSERTED INTO THE MLRS POD STABILIZING FRAME SHOWN IN THE DETAIL ON PAGE 11. THE FORKLIFT CARRIAGE IS TO BE CENTERED ON THE CENTER OF GRAVITY OF THE MLRS RP/C. NOTE: 1/4" SAFETY CHAINS ARE NOT SHOWN BUT WILL BE WELDED TO THE STABILIZING FRAME FOR SECUREMENT TO THE FORKLIFT CARRIAGE.

   C. WHEN THE PODS ARE BEING INSERTED INTO THE VAN TRAILER BY PUSHING WITH A FORKLIFT TRUCK, A 4" X 4" BUFFER BOARD MUST BE POSITIONED BETWEEN THE HEELS OF THE FORKLIFT TRUCK TINES AND THE POD FRAME.

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REVISION

REVISION NO 1, DATED AUGUST 1996 CONSISTS OF:

1. ADDING MLRS POD STABILIZER DETAIL AND PROCEDURES.

ROCKET POD/CONTAINER

GROSS WEIGHT - - 5,078 POUNDS (APPROX)

(RP/C STACKING AND PROCEDURAL GUIDANCE CONTINUED)

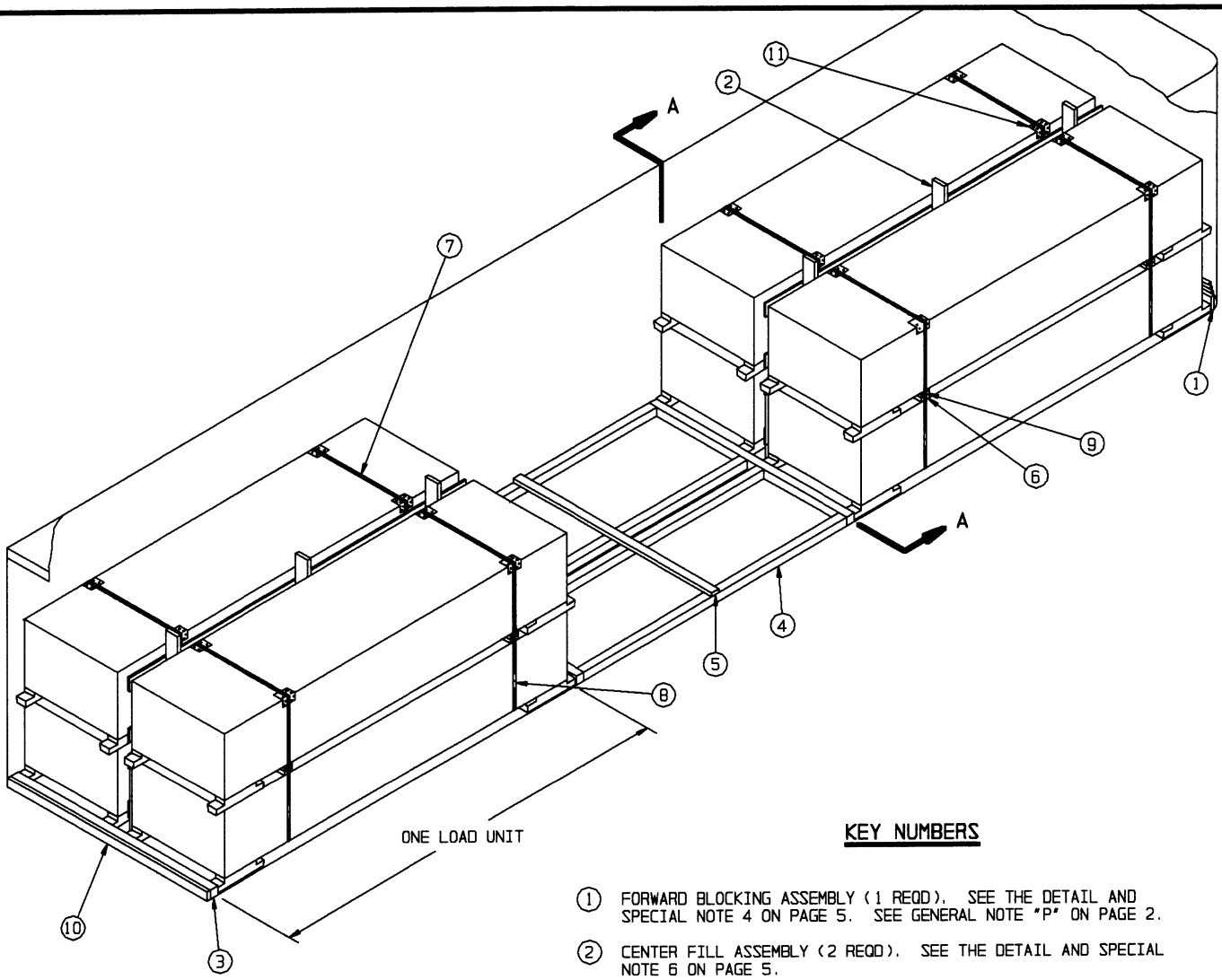
   D. WHEN REMOVING A POD OR POD STACK FROM A VAN TRAILER BY ATTACHING CHAINS TO THE FRAME AND DRAGGING THE POD OR POD STACK PARTIALLY OUT OF THE VAN TRAILER, CARE MUST BE TAKEN TO ENSURE THAT THE PULL ANGLE OF EACH OF THE TWO CHAIN LEGS IS 60° OR GREATER. IF THE CHAIN IS ATTACHED SO THAT THE ANGLE IS LESS THAN 60° , STRUCTURAL FAILURE OR THE RP/C FRAME COULD OCCUR. SEE THE "RP/C TOW ANGLE" DETAIL ON PAGE 11 CHAINS WILL BE ATTACHED ONLY TO BOTTOM-LAYER RP/C UNITS, AND SHACKLES WILL BE USED TO ATTACH THE DRAG CHAINS TO THE DRAGGING FACILITY HOLES. A FORKLIFT TRUCK IS TO BE USED FOR DRAGGING THE UNITS SO THAT THE TINES OF THE TRUCK CAN BE INSERTED A SHORT DISTANCE UNDER THE AFT END OF THE BOTTOM RP/C AND THE AFT END OF THE RP/C UNIT LIFTED ENOUGH TO JUST CLEAR THE TRAILER FLOOR BEFORE ACTUAL DRAGGING IS BEGUN. CAUTION: FORKLIFT TRUCK TINES MUST ONLY BEAR ON THE BOTTOM SURFACE OF A BULKHEAD BRACE ASSEMBLY AT THE AFT END OF THE BOTTOM RP/C UNIT DURING A DRAGGING OPERATION. NOTICE: WIRE ROPE CABLE CAN BE SUBSTITUTED FOR THE CHAIN SPECIFIED HEREIN.

3. INSTALLATION OF 1-1/4" X .035" STACK UNITIZING STEEL STRAPPING. NOTE: STACK UNITIZING STRAPS MUST NOT BE APPLIED UNTIL THE SUPPORT ASSEMBLIES ARE IN POSITION.

   A. EACH OF THE TWO UNITIZING STRAPS SHOULD BE POSITIONED AROUND THE CONTAINERS AS SHOWN, NEAR THE POD STRONG POINTS (I.E., THE LATERAL FRAME MEMBERS/BULKHEAD). PLACE STRAPPING SO THAT IT LAYS FLAT AND STRAIGHT WITH THE CONTOUR OF THE PODS; I.E., VERTICAL ALONG THE SIDES AND STRAIGHT ACROSS THE TOP AND BOTTOM OF THE STACK.

   B. PLACE ANTI-CHAFING NEUTRAL BARRIER MATERIAL UNDER THE STRAPPING AT ALL POINTS OF CONTACT WITH THE POD AND SECURE TO PREVENT DISLODGMENT DURING AND AFTER STRAP APPLICATION. STRIPS OF ANTI-CHAFING MATERIAL MAY BE TAPED OR STRING-TIED TO THE POD OR STRAPPING, OR IT CAN BE FORMED INTO STRAP ENCIRCLING TUBES BY WINDING THE MATERIAL AROUND THE STRAPPING TO FORM A SELF-HOLDING UNIT.

   C. STRAPPING WILL BE FIRMLY TENSIONED, AND EACH END-OVER-END LAP JOINT WILL BE SEALED WITH TWO STRAP SEALS AS SHOWN. CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE GENERAL NOTE "Q" ON PAGE 2. THE LAP JOINTS WILL BE MADE ALONG THE SIDE OF THE STACK SO THAT THE SEALS WILL NOT BE IN CONTACT WITH THE PODS. DURING STRAP TENSIONING, CARE SHOULD BE EXERCISED TO INSURE THAT THE PODS ARE NOT DAMAGED. EXCESS STRAPPING (STRAP ENDS) SHOULD BE CUT OR BROKEN OFF NEAR THE JOINT SEALS.



KEY NUMBERS

(1) FORWARD BLOCKING ASSEMBLY (1 REQD). SEE THE DETAIL AND SPECIAL NOTE 4 ON PAGE 5. SEE GENERAL NOTE "P" ON PAGE 2.

(2) CENTER FILL ASSEMBLY (2 REQD). SEE THE DETAIL AND SPECIAL NOTE 6 ON PAGE 5.

(3) HEADER, 4" X 4" BY INSIDE TRAILER WIDTH MINUS 1/2" (3 REQD).

(4) STRUT, 4" X 4" BY CUT TO FIT (4 REQD). ALIGN WITH THE CONTAINER SKIDS AND TOENAIL TO THE HEADERS, PIECES MARKED (3), W/2-16d NAILS AT EACH END.

(5) STRUT BRACE, 2" X 4" BY INSIDE TRAILER WIDTH MINUS 1/2" (1 REQD). NAIL TO THE STRUTS, PIECES MARKED (4), W/3-10d NAILS AT EACH JOINT.

(6) SUPPORT, 2" X 4" X 41" (DOUBLED) AND 1" X 4" X 41" (8 REQD). NAIL THE SECOND 2" X 4" PIECE TO THE FIRST W/4-10d NAILS. LAMINATE THE 1" X 4" PIECE W/4-6d NAILS. SEE SPECIAL NOTE 7 ON PAGE 5 AND GENERAL NOTE "P" ON PAGE 2.

(7) STACK UNITIZING STRAP, 1-1/4" X .035" OR .031" X 20'-0" LONG STEEL STRAPPING (8 REQD). STAPLE STRAP TO SUPPORT PIECE MARKED (6), W/1-STAPLE AT EACH LOCATION. SEE THE "STACKING AND HANDLING GUIDANCE" ON PAGE 3.

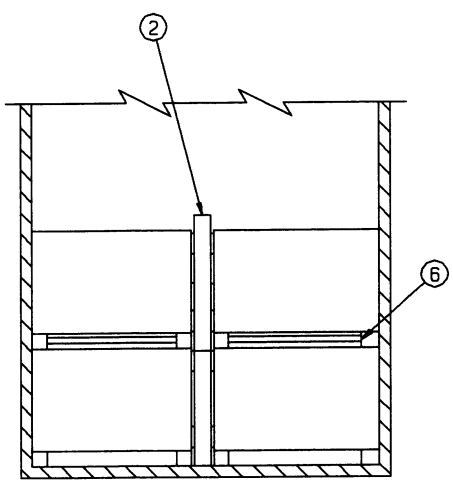
(8) SEAL FOR 1-1/4" STEEL STRAPPING (16 REQD, 2 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE GENERAL NOTE "Q" ON PAGE 2.

(9) STAPLE, 1-17/32 X 3/4" LEG LENGTH (16 REQD).

(10) SOLID FILL, 4" WIDE MATERIAL BY THICKNESS REQUIRED TO CONTACT THE TRAILER DOORS WHEN CLOSED. NAIL TO THE REAR HEADER, PIECE MARKED (3), W/1-10d NAIL EVERY 8"

(11) ANTI-CHAFING NEUTRAL BARRIER MATERIAL (AS REQD). POSITION UNDER ALL STRAPS AT POINTS OF CONTACT WITH THE CONTAINERS.

ISOMETRIC VIEW



SECTION A-A

8-CONTAINER LOAD IN A 40'-0" LONG CONVENTIONAL VAN TRAILER

PROJECT GM 719-79

SPECIAL NOTES:

1. THE LOAD VIEWS AND "LOAD AS SHOWN" SECTION ON PAGES 4 AND 5 ARE FOR A LOAD OF 8 CONTAINERS IN A 40'-0" LONG BY 7'-6" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER.

2. A WIDER OR NARROWER TRAILER THAN THAT SHOWN ON PAGE 4 MAY BE USED FOR SHIPPING THE DEPICTED LOAD BY ADJUSTING THE NUMBER AND THICKNESS OF THE VERTICAL AND HORIZONTAL PIECES OF THE "CENTER FILL ASSEMBLIES" AS NECESSARY.

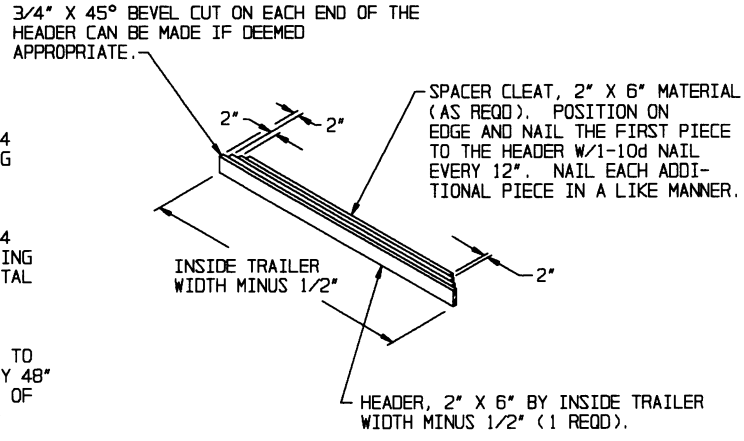
3. IF THE TRAILER BEING OUTLOADED IS EQUIPPED WITH REAR CORNER POSTS, THE REAR HEADER, PIECE MARKED ③ , IS TO BE POSITIONED AGAINST THE CORNER POSTS AND 4" WIDE BY 48" LONG MATERIAL IS TO BE LAMINATED TO THE REAR SURFACE OF THE HEADER, AS REQUIRED TO FILL THE VOID BETWEEN THE HEADER AND THE REAR DOORS WHEN THEY ARE CLOSED.

4. IF THE TRAILER BEING OUTLOADED IS EQUIPPED WITH A SQUARE FRONT OR AN INSTALLED BULKHEAD, A HEADER, PIECE MARKED ③ , WILL BE USED AT THE FRONT OF THE LOAD IN LIEU OF THE FORWARD BLOCKING ASSEMBLY, PIECE MARKED ① .

5. A STRUT BRACE, PIECE MARKED ⑤ , IS REQUIRED IF THE LENGTH OF THE STRUTS, PIECES MARKED ④ , IS 7'-0" OR GREATER. ADDITIONALLY, USE ONE STRUT BRACE FOR EVERY 7'-0" OF STRUT LENGTH.

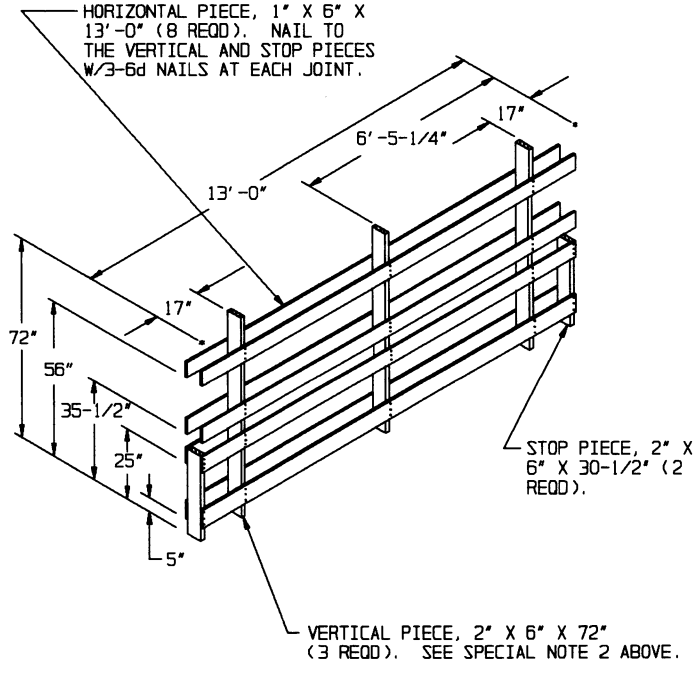
6. THE "CENTER FILL ASSEMBLY" DEPICTED BELOW MAY BE USED WHEN SHIPPING A ONE-CONTAINER HIGH LOAD BY ELIMINATING THE TOP TWO PAIRS OF HORIZONTAL PIECES AND BY CUTTING THE VERTICAL PIECES 36" LONG IN LIEU OF 72" LONG AS SHOWN.

7. ALL STRAPS AND SUPPORTS MUST BE INSTALLED NEAR THE STRONG POINTS OR VERTICALLY REINFORCED AREAS OF THE CONTAINERS AS SHOWN IN THE LOAD VIEWS ON PAGE 4.



FORWARD BLOCKING ASSEMBLY

THE FORWARD BLOCKING ASSEMBLY DEPICTED ABOVE IS FOR USE AT THE FORWARD END OF A TRAILER HAVING ROUNDED CORNERS WITH AN INSIDE RADIUS OF 7" OR LESS. ADDITIONAL LAMINATIONS MUST BE ADDED TO COMPENSATE FOR CORNERS HAVING LARGER RADII.

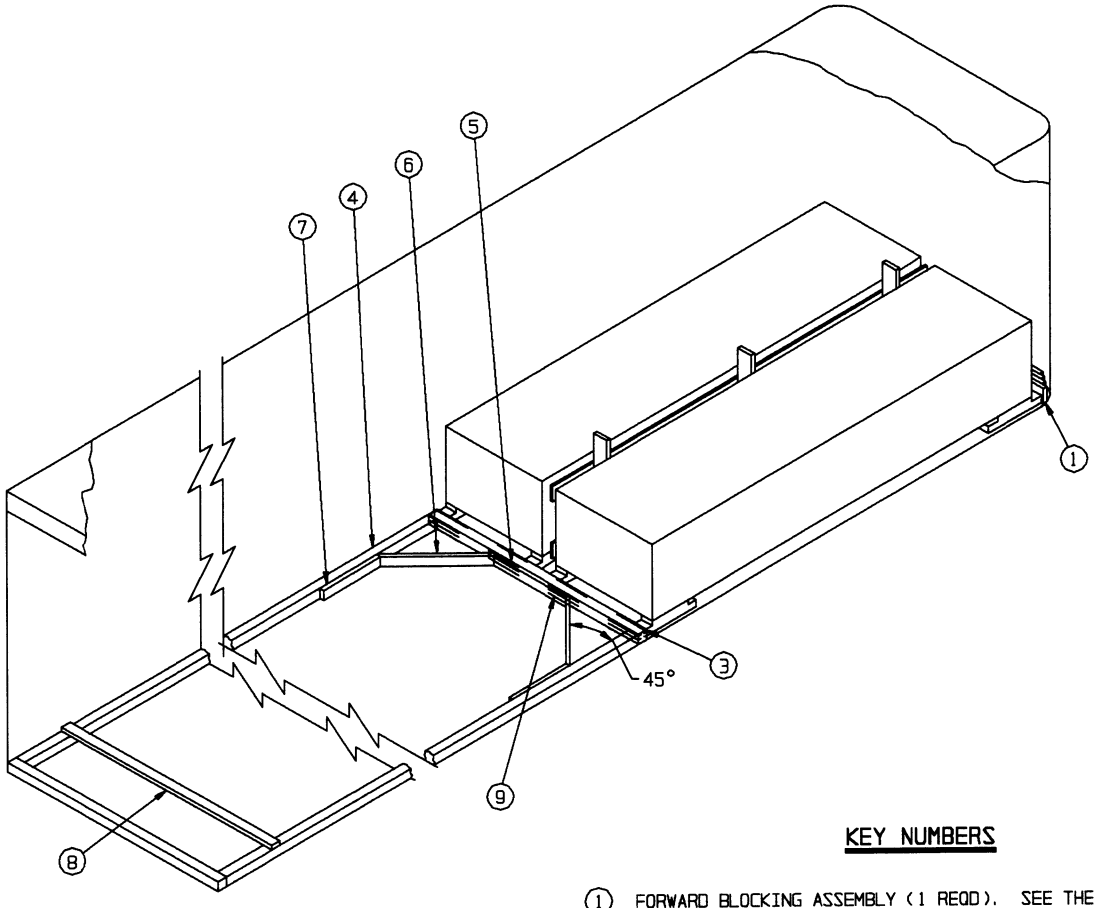


CENTER FILL ASSEMBLY

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	27	9
1" X 6"	208	104
2" X 4"	15	10
2" X 6"	148	148
4" X 4"	64	85
NAILS	NO. REQD	POUNDS
6d (2")	224	1-1/2
10d (3")	80	1-1/4
16d (3-1/2")	16	1/2
STEEL STRAPPING, 1-1/4" - 160' REQD - - - -		23 LBS
SEAL FOR 1-1/4" STRAPPING - 16 REQD - - - - -		1 LB
STAPLE, 1-17/32" X 3/4" - - 16 REQD - - - - -		NIL
ANTI-CHAFING MATERIAL - - - AS REQD - - - - -		NIL

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
MLRS RP/C - - - - - -	8 - - - - - -	40,624 LBS
DUNNAGE - - - - - - - - - - - - - - -		740 LBS
TOTAL WEIGHT - - - - - - - -		41,364 LBS (APPROX)



ISOMETRIC VIEW

SPECIAL NOTES:

1. THE TYPICAL LTL ABOVE DEPICTS A 2-CONTAINER LOAD IN A 7'-6" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER.
2. THE "K-BRACE" BLOCKING, SHOWN AS PIECES ④ THROUGH ⑧, IS ADEQUATE FOR RETAINING A MAXIMUM LTL LOAD OF 24,000 POUNDS OR FOUR CONTAINERS.
3. A WIDER OR NARROWER TRAILER THAN SHOWN ABOVE MAY BE USED FOR SHIPPING THE DEPICTED LOAD BY ADJUSTING THE NUMBER AND THICKNESS OF THE VERTICAL AND HORIZONTAL PIECES OF THE CENTER FILL ASSEMBLY AS NECESSARY.
4. THE REAR HEADER, PIECE MARKED ⑨ , IS FOR USE IN A TRAILER WHICH HAS A NAILABLE FLOOR AND SHOULD BE USED, IF POSSIBLE, IN LIEU OF PIECES MARKED ③ THROUGH ⑧, WHICH APPLY TO TRAILERS HAVING NON-NAILABLE FLOORS.
5. IF THE TRAILER BEING LOADED IS EQUIPPED WITH A SQUARE FRONT OR AN INSTALLED BULKHEAD, A HEADER, PIECE MARKED ③ , WILL BE USED AT THE FRONT OF THE LOAD IN LIEU OF THE FORWARD BLOCKING ASSEMBLY, PIECE MARKED ① .
6. DEPENDING ON THE NUMBER OF CONTAINERS BEING LOADED, EACH OF THE SIDE STRUTS, PIECES MARKED ④ , MAY BE FORMED FROM MORE THAN ONE PIECE OF MATERIAL. TO DO THIS, THE SIDE STRUTS MUST BE SPLICED. SPLICING CAN BE ACCOMPLISHED BY CENTERING A 2" X 4" X 24" PIECE ON THE JOINT OF THE SIDE STRUTS AND NAILING IT TO THE SIDE STRUTS W/4-10d NAILS AT EACH END.
7. ALL LTL LOADS, REGARDLESS OF THEIR SIZE, USING K-BRACE TYPE BLOCKING REQUIRE ONE STRUT BRACE POSITIONED NEAR THE REAR OF THE TRAILER AND NAILED TO THE SIDE STRUTS. IF THE SIDE STRUTS, PIECES MARKED ④ , ARE LONGER THAN 7'-0", AN ADDITIONAL STRUT BRACE, PIECE MARKED ④ , MUST BE APPLIED FOR EVERY 7'-0" OF SIDE STRUT LENGTH.

KEY NUMBERS

① FORWARD BLOCKING ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 5, GENERAL NOTE "P" ON PAGE 2 AND SPECIAL NOTE 5 AT LEFT.

② CENTER FILL ASSEMBLY (1 REQD). SEE THE DETAIL AND SPECIAL NOTE 6 ON PAGE 5.

③ HEADER, 4" X 4" BY INSIDE TRAILER WIDTH MINUS 1/2" (2 REQD).

④ SIDE STRUT, 4" X 4" BY CUT TO FIT (2 REQD). POSITION ALONG TRAILER WALLS AND TOENAIL TO HEADERS, PIECES MARKED ③ , W/2-16d NAILS AT EACH END. SEE SPECIAL NOTE 6 AT LEFT.

⑤ CENTER CLEAT, 2" X 4" X 30" (1 REQD). NAIL TO THE HEADER, PIECE MARKED ③ , W/7-10d NAILS.

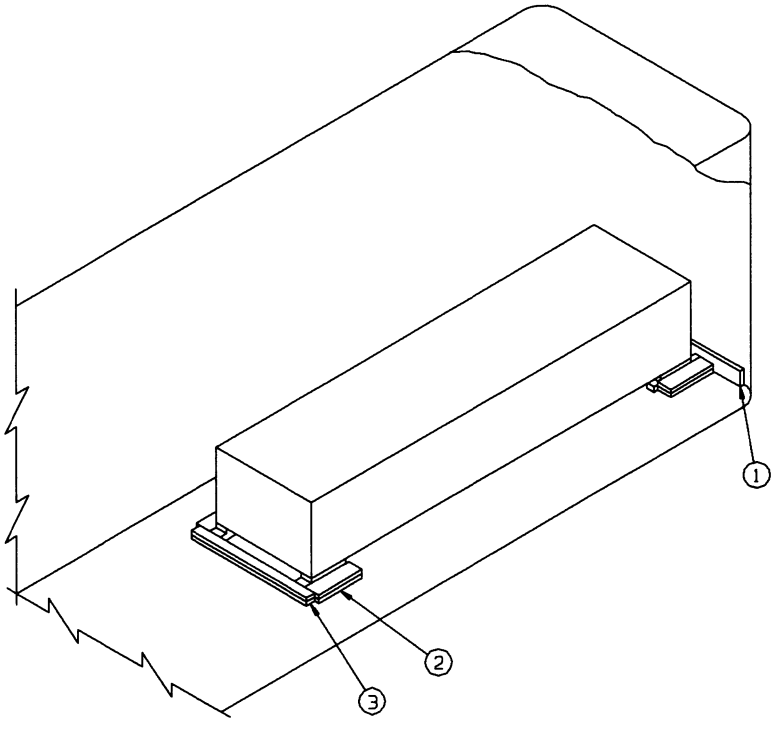
⑥ DIAGONAL BRACE, 2" X 4" BY CUT TO FIT (2 REQD). DOUBLE BEVEL EACH END WITH 45° CUTS. INSTALL AT 45° ANGLE AS SHOWN AND TOENAIL TO HEADER, PIECE MARKED ③ , AND SIDE STRUT, PIECE MARKED ④ , W/2-16d NAILS AT EACH END.

⑦ SIDE CLEAT, 2" X 4" X 24" (2 REQD). POSITION AGAINST DIAGONAL BRACE, PIECE MARKED ⑥ , AND NAIL TO THE SIDE STRUT, PIECE MARKED ④ , W/6-12d NAILS.

⑧ STRUT BRACING, 2" X 4" BY INSIDE TRAILER WIDTH MINUS 1/2" (MINIMUM OF 1 REQD). INSTALL ONE STRUT BRACE NEAR THE REAR END OF THE SIDE STRUTS, PIECES MARKED ④ , AS SHOWN. NAIL TO THE SIDE STRUTS W/3-12d NAILS AT EACH END. SEE SPECIAL NOTE 7 AT LEFT.

⑨ REAR HEADER, 2" X 4" BY INSIDE TRAILER WIDTH MINUS 1/2" (DOUBLED) (1 REQD). POSITION AGAINST SKIDS OF INSTALLED CONTAINERS AND NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/6-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 4 AT LEFT.

TYPICAL LTL IN A CONVENTIONAL VAN TRAILER (2-CONTAINER LOAD)



ISOMETRIC VIEW

KEY NUMBERS

① FORWARD HEADER, 2" X 6" X 6'-0" (1 REQD). POSITION ON EDGE AS SHOWN.

② SIDE BLOCKING, 2" X 6" X 12" (DOUBLED) (4 REQD). POSITION AGAINST THE CONTAINER SKIDS AND NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/4-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTE "P" ON PAGE 2.

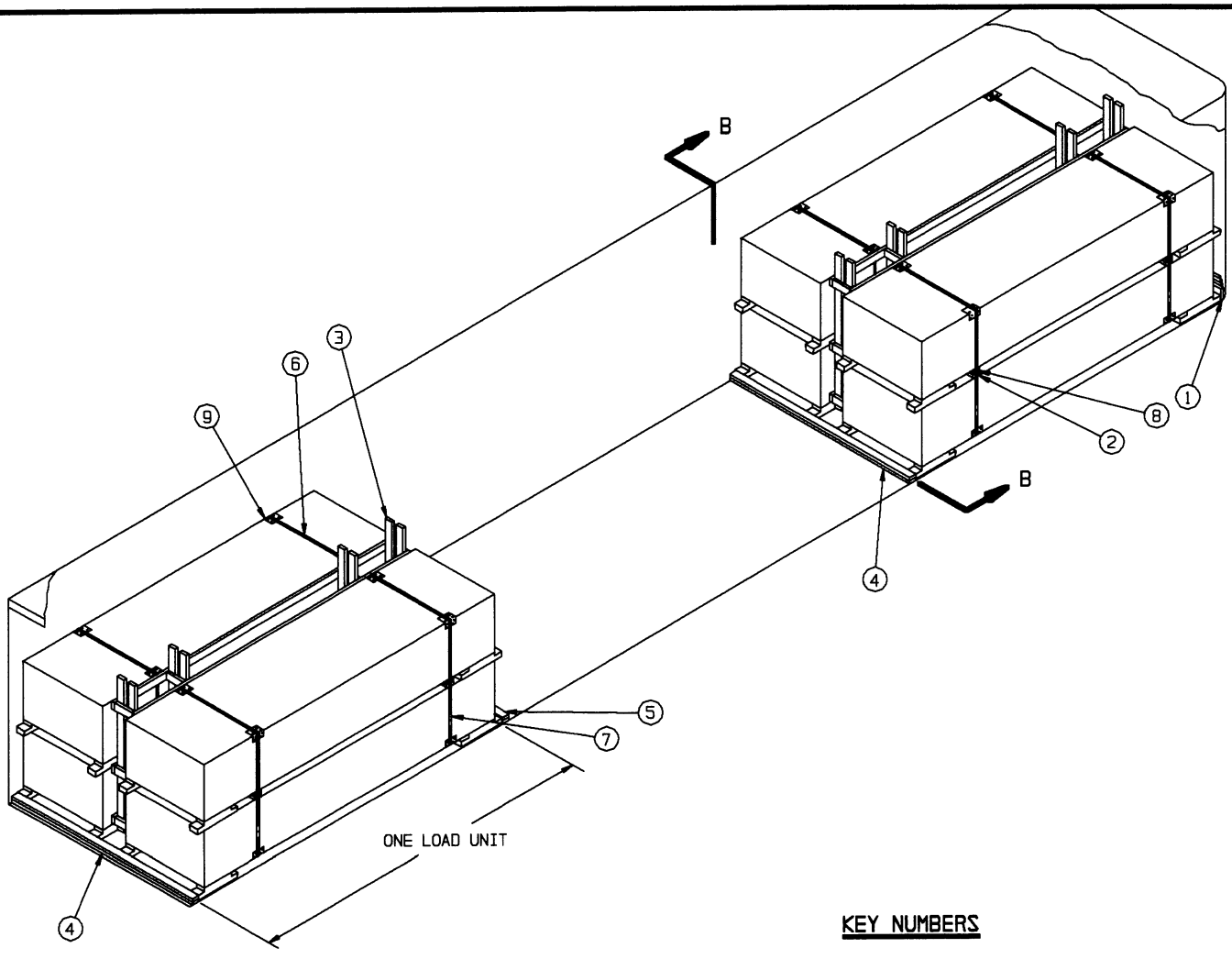
③ REAR HEADER, 2" X 4" X 48" (DOUBLED) (1 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/6-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.

SPECIAL NOTES:

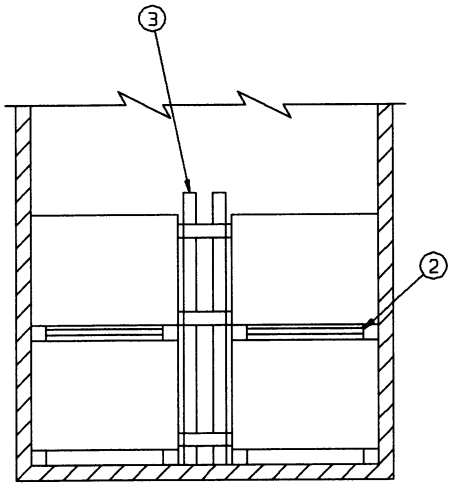
1. THE TYPICAL LTL ABOVE DEPICTS A 1-CONTAINER LOAD IN A 7'-6" WIDE (INSIDE DIMENSION) CONVENTIONAL TYPE VAN TRAILER HAVING A NAILABLE FLOOR. WIDER OR NARROWER TRAILERS THAN THAT SHOWN CAN BE USED FOR SHIPPING THE DEPICTED LOAD.

2. THE REAR HEADER, PIECE MARKED ③ , IS ADEQUATE FOR RETAINING A MAXIMUM LTL LOAD OF TWO CONTAINERS.

TYPICAL LTL IN A CONVENTIONAL VAN TRAILER (1-CONTAINER LOAD)



ISOMETRIC VIEW



SECTION B-B

KEY NUMBERS

(1) FORWARD BLOCKING ASSEMBLY (1 REQD). SEE THE DETAIL AND SPECIAL NOTE 4 ON PAGE 5. SEE GENERAL NOTE "P" ON PAGE 2.

(2) SUPPORT, 2" X 4" X 41" (DOUBLED) AND 1" X 4" X 41" (8 REQD). NAIL THE SECOND 2" X 4" PIECE TO THE FIRST W/4-10d NAILS. LAMINATE THE 1" X 4" PIECE W/4-6d NAILS. SEE SPECIAL NOTE 5 ON PAGE 9.

(3) CRIB FILL (2 REQD). SEE THE DETAIL ON PAGE 9.

(4) REAR HEADER, 2" X 4" BY TRAILER WIDTH MINUS 1/2" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/9-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.

(5) FORWARD HEADER, 2" X 6" BY TRAILER WIDTH MINUS 1/2" (DOUBLED) (1 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/5-20d NAILS.

(6) STACK UNITIZING STRAP, 1-1/4" X .035" OR .031" X 20'-0" LONG STEEL STRAPPING (8 REQD). STAPLE STRAP TO SUPPORT PIECE MARKED (2), W/1-STAPLE AT EACH LOCATION. SEE THE "STACKING AND HANDLING GUIDANCE" ON PAGE 3.

(7) SEAL FOR 1-1/4" STRAPPING (16 REQD, 2 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE GENERAL NOTE "Q" ON PAGE 2.

(8) STAPLE, 1-17/32" X 3/4" LEG LENGTH (16 REQD).

(9) ANTI-CHAFING NEUTRAL BARRIER MATERIAL (AS REQD). POSITION UNDER ALL STRAPS AT POINTS OF CONTACT WITH THE CONTAINERS.

8-CONTAINER LOAD IN A 48'-0" LONG TRAILER

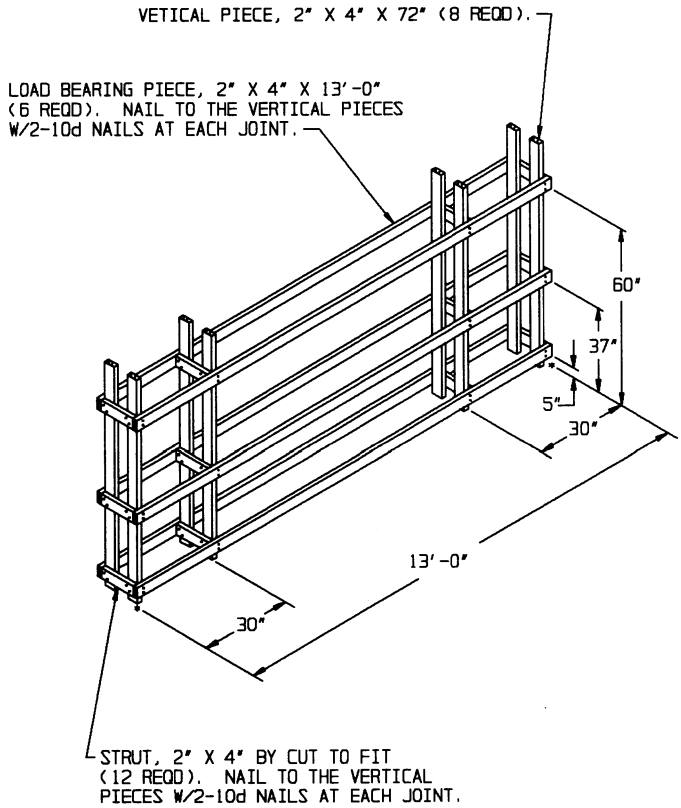
SPECIAL NOTES:

1. THE LOAD VIEW AND "LOAD AS SHOWN" SECTION ON PAGES 8 AND 9 ARE FOR A LOAD OF 8 CONTAINERS IN A 48'-0" LONG BY 8'-2" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER.

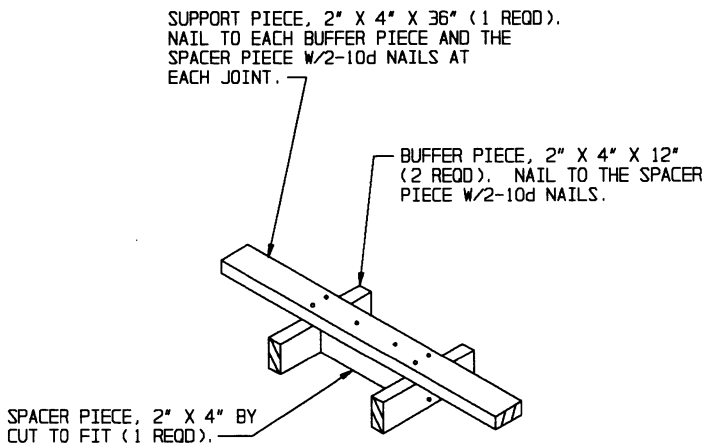
2. A WIDER OR NARROWER TRAILER THAN SHOWN ON PAGE 8 MAY BE USED FOR SHIPPING THE DEPICTED LOAD BY ADJUSTING THE WIDTH OF THE CRIB FILL, PIECE MARKED ③ , AS NECESSARY.

3. IF THE TRAILER BEING OUTLOADED IS EQUIPPED WITH A SQUARE FRONT OR AN INSTALLED BULKHEAD, A FORWARD HEADER, PIECE MARKED ⑤ , WILL BE USED AT THE FRONT OF THE LOAD IN LIEU OF THE FORWARD BLOCKING ASSEMBLY, PIECE MARKED ① .

4. IN LIEU OF THE CRIB FILL ASSEMBLY AS SHOWN IN THE ISOMETRIC VIEW ON PAGE 8, THE FOLLOWING PROCEDURES WILL BE USED. NAILED FLOORLINE BLOCKING, CONSISTING OF TWO DOUBLED 2" X 6" X 18" PIECES , W/5-10d NAILS PER LAYER, WILL BE POSITIONED SO AS TO BEAR AGAINST THE SKIDS ALONG THE LONGITUDINAL CENTERLINE OF THE TRAILER. A TOP-OF-LOAD ANTI-SWAY BRACE, SHOWN BELOW WILL BE POSITIONED BETWEEN THE SECOND LAYER CONTAINERS AND WIRE-TIED TO THE CONTAINERS W/14-GAGE WIRE. FOR THE TWO LOAD UNITS, A TOTAL OF 8 DOUBLED SIDE BLOCKING PIECES AND 4 TOP-OF-LOAD ANTI-SWAY BRACES WILL BE REQUIRED.



CRIB FILL ASSEMBLY



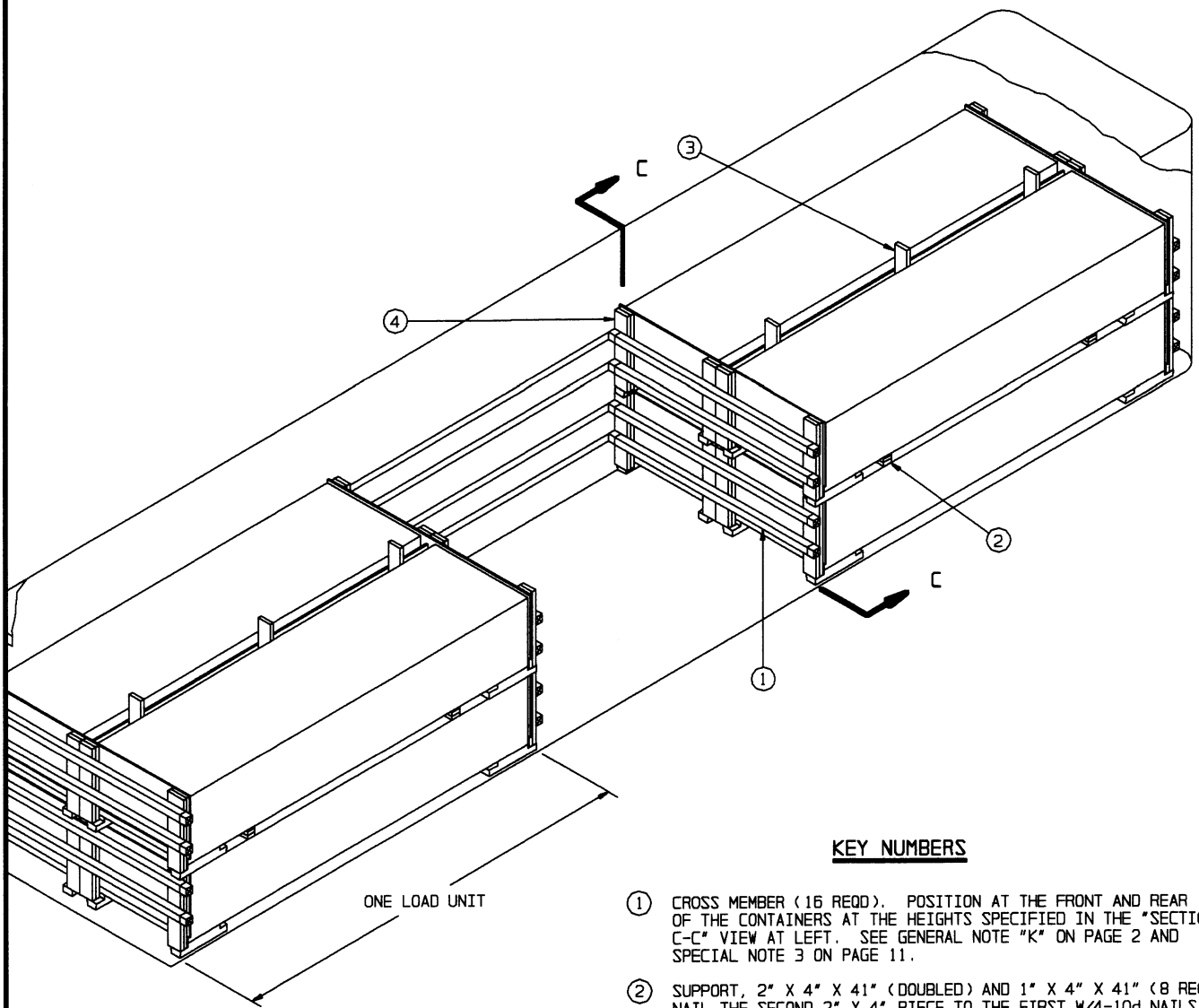
TOP-OF-LOAD ANTI-SWAY BRACE

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4" 2" X 4"	27 332	9 221
NAILS	NO. REQD	POUNDS
6d (2") 10d (3")	48 144	1/4 2-1/4
ANTI-CHAFING MATERIAL - - AS REQD - - - - - - - -		NIL
CROSS MEMBER - - - - - - - - - - - - - - - - - -		16 REQD

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
MLRS RP/C	8	40,624 LBS
DUNNAGE		463 LBS
TOTAL WEIGHT - - - - - - - -		41,087 LBS (APPROX)

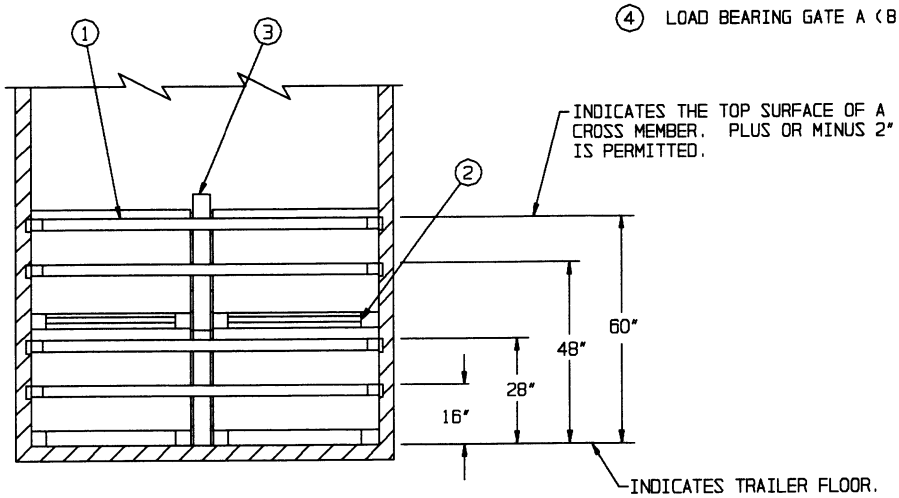
8-CONTAINER LOAD IN A 48'-0" LONG TRAILER



ISOMETRIC VIEW

KEY NUMBERS

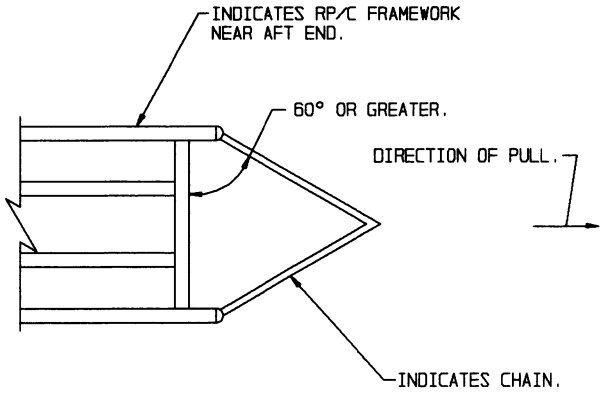
1. CROSS MEMBER (16 REQD). POSITION AT THE FRONT AND REAR OF THE CONTAINERS AT THE HEIGHTS SPECIFIED IN THE "SECTION C-C" VIEW AT LEFT. SEE GENERAL NOTE "K" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 11.
2. SUPPORT, 2" X 4" X 41" (DOUBLED) AND 1" X 4" X 41" (8 REQD). NAIL THE SECOND 2" X 4" PIECE TO THE FIRST W/4-10d NAILS. LAMINATE THE 1" X 4" PIECE W/4-6d NAILS. SEE SPECIAL NOTE 7 ON PAGE 5 AND GENERAL NOTE "P" ON PAGE 2.
3. CENTER FILL ASSEMBLY (2 REQD). SEE THE DETAIL AND SPECIAL NOTE 6 ON PAGE 5.
4. LOAD BEARING GATE A (8 REQD). SEE THE DETAIL ON PAGE 11.



SECTION C-C

THE LOAD BEARING GATES, PIECES MARKED ④ HAVE NOT BEEN SHOWN FOR CLARITY PURPOSES.

8-CONTAINER LOAD IN A 40'-0" LONG TRAILER EQUIPPED WITH MECHANICAL BRACING DEVICES

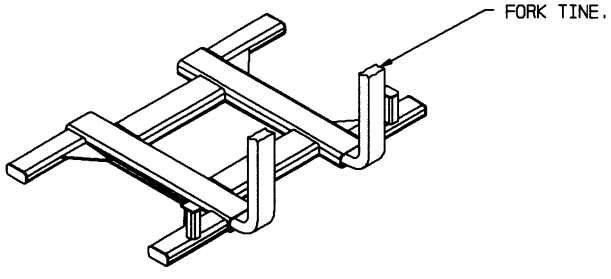


RP/C TOW ANGLE

(PARTIAL PLAN VIEW)

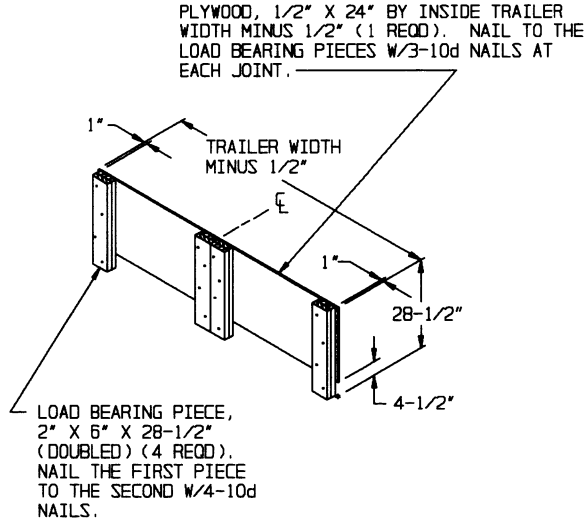
SPECIAL NOTES:

1. THE LOAD VIEWS AND "LOAD AS SHOWN" SECTION ON PAGES 10 AND 11 ARE FOR A LOAD OF 8 CONTAINERS IN A 40'-0" LONG BY 7'-6" WIDE (INSIDE DIMENSION) TRAILER WHICH IS EQUIPPED WITH A MECHANICAL LOAD BRACING SYSTEM.
2. A WIDER OR NARROWER TRAILER THAN THAT SHOWN ON PAGE 10 MAY BE USED FOR SHIPPING THE DEPICTED LOAD BY ADJUSTING THE NUMBER AND THICKNESS OF THE VERTICAL AND HORIZONTAL PIECES OF THE "CENTER FILL ASSEMBLIES" AS NECESSARY.
3. THE CROSS MEMBERS LOCATED AT THE FORWARD AND REAR END OF THE LOAD MUST BE POSITIONED SO THAT WHEN THE CONTAINER CONTACTS THEM, THE CONTAINER SKIDS DO NOT COME IN CONTACT WITH THE FRONT WALL OF THE TRAILER OR THE TRAILER DOORS.

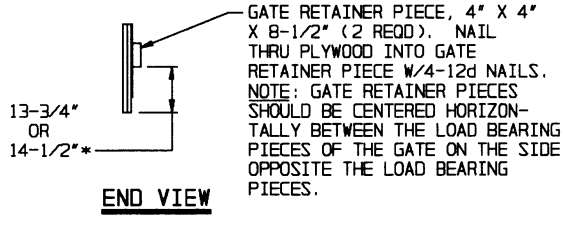


MLRS POD STABILIZING FRAME

REFER TO U.S. ARMY ARMAMENT, MUNITIONS AND CHEMICAL COMMAND, DEFENSE AMMUNITION CENTER AND SCHOOL DRAWING NUMBER AC200000809 TO MANUFACTURE. THE DRAWING CAN BE OBTAINED FROM THE FOLLOWING ADDRESS: U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL, ATTN: SIOAC-DES, SAVANNA, IL 61074-9639, DSN 585-8928, COMM (815) 273-8928.



LOAD BEARING GATE A



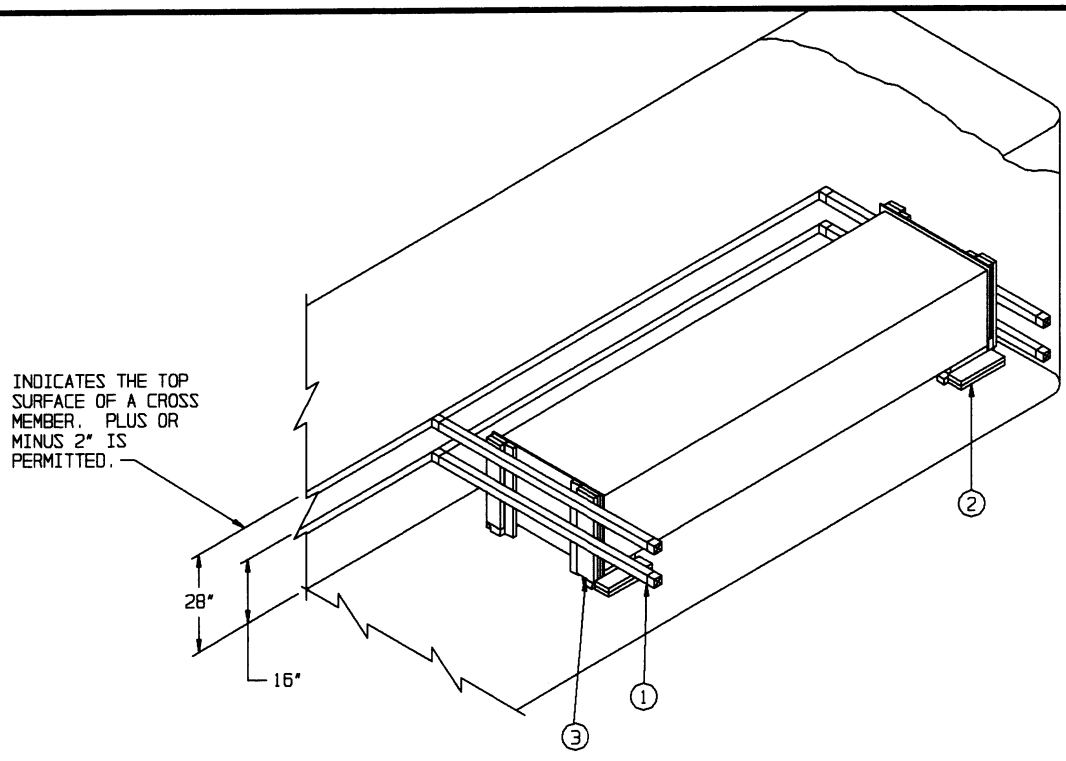
END VIEW

* THE 13-3/4" DIMENSION WILL BE USED IN THE LOWER GATE AND THE 14-1/2" DIMENSION WILL BE USED IN THE UPPER GATE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4" 1" X 6" 2" X 6" 4" X 4"	31 108 464 12	11 54 464 16
NAILS	NO. REQD	POUNDS
6d (2") 10d (3") 12d (3-1/4")	288 224 64	2 3-1/2 1
PLYWOOD, 1/2" - - 120 SQ FT REQD - - - - -		166 LBS
CROSS MEMBER - - - - - - - - - - - - - - - - -		16 REQD

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
MLRS RP/C - - - - - -	8 - - - - - -	40,624 LBS
DUNNAGE - - - - - - - - - - - - - - - -		1,260 LBS
TOTAL WEIGHT - - - - - - - -		41,884 LBS (APPROX)



ISOMETRIC VIEW

SPECIAL NOTES:

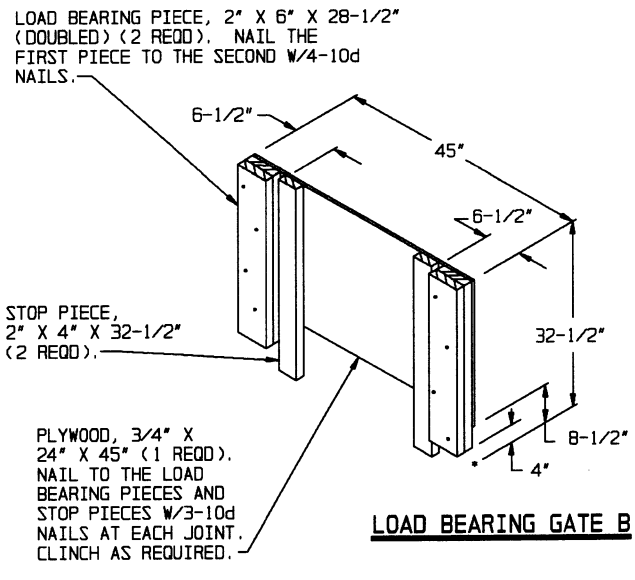
1. THE TYPICAL LTL ABOVE DEPICTS A 1-CONTAINER LOAD IN A 7'-6" WIDE (INSIDE DIMENSION) TRAILER EQUIPPED WITH A MECHANICAL LOAD BRACING SYSTEM AND A NAILABLE FLOOR. A WIDER OR NARROWER TRAILER THAN THAT SHOWN MAY BE USED FOR SHIPPING THE DEPICTED LOAD.
2. THE CROSS MEMBERS LOCATED AT THE FORWARD AND REAR END OF THE LOAD MUST BE POSITIONED SO THAT WHEN THE CONTAINER CONTACTS THEM, THE CONTAINER SKIDS DO NOT COME IN CONTACT WITH THE FRONT WALL OF THE TRAILER OR THE TRAILER DOORS.

KEY NUMBERS

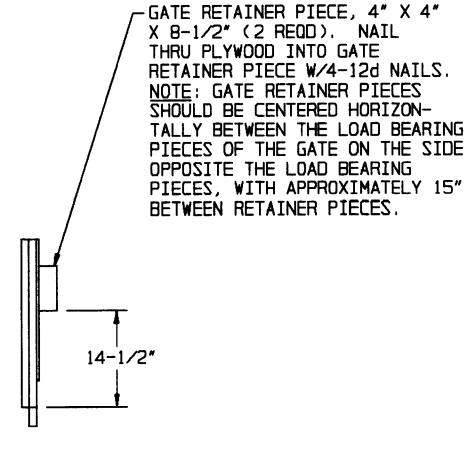
(1) CROSS MEMBER (4 REQD). POSITION AT THE FRONT AND REAR OF THE CONTAINER AT THE HEIGHTS SPECIFIED IN THE "ISOMETRIC VIEW" ABOVE. SEE SPECIAL NOTE 2 AT LEFT AND GENERAL NOTE "K" ON PAGE 2.

(2) SIDE BLOCKING, 2" X 6" X 12" (DOUBLED) (4 REQD). POSITION AGAINST THE CONTAINER SKIDS AND NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTE "P" ON PAGE 2.

(3) LOAD BEARING GATE B (2 REQD). SEE THE DETAIL BELOW.



LOAD BEARING GATE B



END VIEW

TYPICAL LTL IN A TRAILER EQUIPPED WITH MECHANICAL BRACING DEVICES (1-CONTAINER LOAD)