MLRS

LOADING AND BRACING ⌖ (CL & LCL) IN EUROPEAN BOXCAR OF MULTIPLE LAUNCH ROCKET SYSTEM ROCKET POD/CONTAINERS (RP/C)

INDEX

⌖ DELINEATED LOADING AND BRACING PROCEDURES COMPLY WITH THE REGOLAMENTO INTERNAZIONALE VEICOLI (RIV): REGULATIONS GOVERNING THE RECIPROCAL USE OF WAGONS IN INTERNATIONAL TRAFFIC.

U.S. ARMY MATERIEL COMMAND DRAWING

APPROVED, U.S. ARMY AVIATION AND MISSILE COMMAND

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SEE THE REVISION LISTING ON PAGE 2

CLASS	DIVISION	DRAWING	FILE
19	48	5517	GM5RS2

PROJECT GM 722-79

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 SHOWN HEREIN ARE APPLICABLE TO EUROPEAN BOXCARS WHICH CONFORM TO THE RIV REQUIREMENTS.

C. THE OUTLOADING PROCEDURES CONTAINED HEREIN ARE APPLICABLE TO THE MULTIPLE LAUNCH ROCKET SYSTEM (MLRS) ROCKET/POD CONTAINER (RP/C). SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE RP/C WITH ROCKET COMPONENTS.

D. FOR DETAILS OF THE RP/C, SEE DRAWING NO. 13027900.

CONTAINER DIMENSIONS - - 13'-10" (4,216MM) LONG BY 41-1/2" (1,054MM) WIDE BY 33" (838MM) HIGH.
GROSS WEIGHT - - - - - - 5,078 POUNDS (2,305 KG) (APPROX)

E. THE ROCKET IS AN EXPLOSIVE ITEM. THE OUTLOADING PROCEDURES SPECIFIED HEREIN CAN ALSO BE UTILIZED FOR THE SHIPMENT OF THE CONTAINERS WHEN THEY ARE LOADED WITH AN ITEM WHICH IS IDENTIFIED DIFFERENTLY BY NOMENCLATURE THAN THE ITEM DESIGNATED WITHIN THE DRAWING TITLE.

F. THE SELECTION OF RAILCARS FOR THE TRANSPORT OF THE DESIGNATED ITEM IS THE RESPONSIBILITY OF THE ORIGINATING CARRIER AND THE SHIPPER. ONLY CARS WHICH HAVE "SOUND" FLOORS AND ARE IN OTHERWISE PROPER CONDITION, IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPLICABLE REGULATORY DOCUMENT, WILL BE SELECTED.

G. A LIST OF RAILCARS THAT MAY BE USED FOR SHIPMENTS OF THE DEPICTED LOADS IS SHOWN IN A CHART ON THIS PAGE. OTHER TYPES OF CLOSED BOXCARS CAN BE USED PROVIDING THESE OTHER CARS ARE PROPERLY EQUIPPED FOR THE APPLICATION OF THE PRESCRIBED LOAD-SECURING BLOCKING IN ACCORDANCE WITH THE SPECIFIED PROCEDURES. MINOR DEVIATIONS FROM THE LOCATIONS SHOWN IN THE LOAD VIEWS FOR INSTALLING BLOCKING COMPONENTS IN A CAR ARE PERMITTED. HOWEVER, THE INTENT OF THE SPECIFIED BLOCKING PROCEDURES MUST BE ACHIEVED.

H. THE NUMBER OF CONTAINERS MAY BE ADJUSTED TO FIT THE SIZE OF THE BOXCAR BEING LOADED OR THE QUANTITY TO BE SHIPPED; HOWEVER, THE APPROVED METHODS CONTAINED HEREIN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING, AND STAYING OF THE CONTAINERS. NOTICE: A SHIPMENT WILL BE POSITIONED IN THE RAILCAR IN COMPLIANCE WITH WEIGHT DISTRIBUTION REQUIREMENTS.

J. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN A CAR WHICH IS 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.

K. STEEL STRAPPING DEPICTED IN THIS DRAWING HAS BEEN SPECIFIED AS 1-1/4" (32MM) X .035" (.889MM). HOWEVER, .031" (.787MM) THICK STRAPPING MAY BE USED IN LIEU OF .035" THICK STRAP.

L. NOTICE: 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 LAMINATING DUNNAGE. 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 INTO OR RIGHT BESIDE A NAIL IN A LOWER PIECE.

(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.

STAPLE, STRAP - - -: COMMERCIAL GRADE.

WIRE, CARBON STEEL -: ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, .0800" DIA, GRADE 1006 OR BETTER.

(GENERAL NOTES CONTINUED)

M. NAILS USED FOR FLOOR LINE BLOCKING WILL HAVE A MINIMUM DIAMETER OF 5MM. NAIL SIZES WILL BE SELECTED TO PROVIDE A MINIMUM OF 40MM PENETRATION INTO THE CAR FLOOR. HOWEVER, THE LENGTH OF THE NAIL WILL BE SUCH THAT THE NAIL DOES NOT COMPLETELY PENETRATE THE CAR FLOOR. SEE THE "NAIL CHART" AND THE "SPECIAL NAILING GUIDANCE" BELOW. NAILS WHICH ARE OF OTHER SIZES, OR WHICH HAVE A NOMENCLATURE DIFFERENT THAN THAT USED HEREIN, MAY ALSO BE USED PROVIDING THEY MEET THE MINIMUM REQUIREMENTS STIPULATED WITHIN THIS DOCUMENT.

N. NAILS USED FOR FABRICATING DUNNAGE ASSEMBLIES SHALL BE OF THE MAXIMUM PRACTICAL LENGTH WHICH WILL PREVENT THE NAIL POINT FROM COMPLETELY PENETRATING THE DUNNAGE ASSEMBLY. THE NAIL POINT IS TO BE CONCEALED WITHIN THE DUNNAGE ASSEMBLY TO PREVENT POSSIBLE DAMAGE TO THE LADING.

O. 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 USED. REFER TO THE "STRAP JOINT A" AND "STRAP JOINT B" DETAILS ON PAGE 14.

P. THE PROCEDURES DEPICTED WITHIN THIS DRAWING ARE BASED ON THE USE OF DIMENSIONAL SIZED LUMBER. IN MOST CASES, THE METRIC EQUIVALENT IS GIVEN IN PARENTHESIS FOLLOWING THE DIMENSION. HOWEVER, WHERE THE METRIC EQUIVALENT IS NOT SHOWN, IT MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS 0.454 KG.

Q. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS. ATTENTION IS ALSO DIRECTED TO THE "SPECIAL HANDLING GUIDANCE" ON PAGE 3 AND TO THE "PREPARATION OF ROCKET POD/CONTAINER FOR SHIPMENT" DETAILS ON PAGE 4.

* NAIL CHART

SIZE	LENGTH	DIAMETER
10d	3" (76MM)	0.148" (3.77MM)
12d	3-1/4" (83MM)	0.148" (3.77MM)
16d	3-1/2" (89MM)	0.1620" (4.11MM)
20d	4" (102MM)	0.1920" (4.88MM)
30d *	4-1/2" (114MM)	0.2070" (5.26MM)
40d *	5" (127MM)	0.2253" (5.72MM)
50d *	5-1/2" (140MM)	0.2437" (6.19MM)
60d *	6" (152MM)	0.2626" (6.67MM)

*NAILS WHICH HAVE ADEQUATE DIAMETER FOR NAILING FLOOR LINE BLOCKING. THE LENGTH OF THE NAIL MUST MEET THE REQUIREMENTS OF GENERAL NOTE "M".

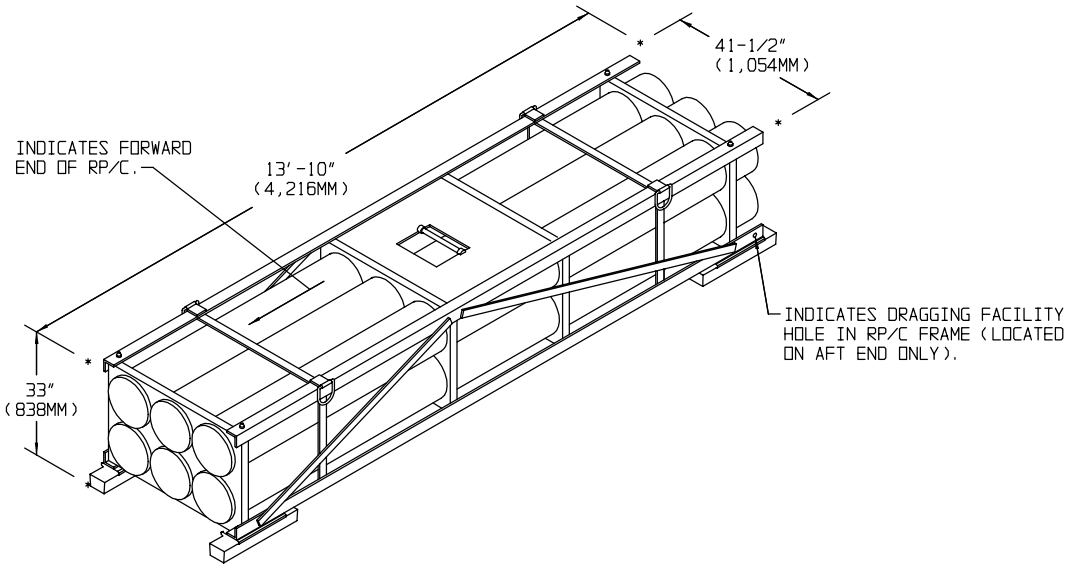
LIST OF RAILCARS THAT MAY BE USED FOR SHIPMENTS

TYPE OF RAILCAR	LENGTH OF RAILCAR	NO. OF ITEMS	MAXIMUM TOTAL WEIGHT (APPROX) OF ITEMS
TBIS 869/870	41'-9" (12,744MM)	8	40,624 LBS (18,443 KG)
TBIS 871	41'-9" (12,744MM)	8	40,624 LBS (18,443 KG)

REVISION

REVISION NO.1 DATED MAY 1997 CONSISTS OF:

1. ADDING THE MLRS POD STABILZING FRAME.
2. UPDATING "LAUNCH POD/CONTAINER" TO "ROCKET POD/CONTAINER".



ROCKET POD/CONTAINER

SPECIAL HANDLING GUIDANCE

1. CONTAINER PREPARATION PRIOR TO STACKING FOR OUTLOADING.

   A. EVERY CONTAINER TO BE SHIPPED IN THE TOP LAYER MUST FIRST BE PREPARED BY STRAPPING TWO STRAPPING BOARDS AND A SPACER ASSEMBLY TO IT AS DEPICTED IN FIGURE 1 ON PAGE 4.

   B. EVERY CONTAINER TO BE SHIPPED IN THE BOTTOM LAYER MUST FIRST BE PREPARED BY STRAPPING A RISER ASSEMBLY AND A SPACER ASSEMBLY TO IT AS DEPICTED IN FIGURE 2 ON PAGE 4.

   C. TO AID IN THE INSTALLATION OF THE SPACER ASSEMBLY TO THE CONTAINER, THE CONTAINER SHOULD BE SUPPORTED BY TWO 4" X 4" (102MM X 102MM) PIECES POSITIONED LATERALLY UNDER THE SKIDS SLIGHTLY OUTWARD FROM THE MAIN CONTAINER FRAME ENDS.

2. CONTAINER STACKING FOR OUTLOADING PURPOSES AND CONTAINER OR CONTAINER STACK HANDLING.

   NOTES: (1) MATERIALS HANDLING EQUIPMENT (MHE) IS INTENDED TO MEAN EQUIPMENT, SUCH AS FORKLIFT TRUCKS, CRANES, HAND TRUCKS, DOLLIES, ROLLER ASSEMBLIES, SLINGS, AND SPREADER BARS, THAT CAN BE USED TO HANDLE THE DEPICTED CONTAINERS.

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

   A. IF AVAILABLE MHE DOES NOT HAVE AN ALLOWABLE CAPACITY GREAT ENOUGH TO CARRY A STACK OF TWO CONTAINERS (APPROXIMATELY 10,200 POUNDS) (4,631 KG) IN ONE LIFT, THEN THE CONTAINERS MUST BE HANDLED INDIVIDUALLY. ONLY APPROVED AND APPROPRIATELY SIZED MHE WILL BE USED FOR THE HANDLING OF THE DEPICTED CONTAINERS.

   B. IF THE CONTAINERS ARE BEING HANDLED INDIVIDUALLY, A BOTTOM LAYER CONTAINER MUST BE PLACED IN THE CAR IN ITS FINAL SHIPPING LOCATION. A TOP LAYER CONTAINER IS THEN BROUGHT IN AND POSITIONED DIRECTLY ON TOP OF THE BOTTOM LAYER CONTAINER. THE UPPER CONTAINER SHOULD BE PLACED AS CLOSELY AS POSSIBLE IN VERTICAL ALIGNMENT WITH THE LOWER CONTAINER. THE TWO CONTAINERS SHALL THEN BE UNITIZED USING TWO 1-1/4" X .035" OR .031" (32MM X .889MM OR .787MM) STEEL STRAPS PLACED AS SHOWN FOR THE DUNNAGE STRAP IN FIGURE 2 ON PAGE 4.

(CONTINUED AT LEFT)

(SPECIAL HANDLING GUIDANCE CONTINUED)

C. IF A CONTAINER STACK IS BEING HANDLED AND POSITIONED INTO THE CAR AT ONE TIME, THE STACK MUST BE UNITIZED AS DESCRIBED IN 2.B AT THE RIGHT PRIOR TO ITS MOVEMENT.

D. WHEN A CONTAINER STACK IS BEING UNITIZED, CARE MUST BE EXERCISED WHEN TIGHTENING THE STRAPS TO ENSURE THAT THE ALUMINUM FRAME MEMBERS OF THE CONTAINERS ARE NOT "PULLED IN" OR DEFORMED.

E. IF HANDLING PRIOR TO LOADING OPERATIONS IS ACCOMPLISHED WITH A FORKLIFT TRUCK, THE TINES OF THE FORKLIFT ARE INSERTED INTO THE MLRS POD STABILIZING FRAME SHOWN IN THE DETAILS ON PAGE 14. THE FORKLIFT CARRIAGE IS TO BE CENTERED ON THE CENTER OF BALANCE MARK ON THE MLRS POD. NOTE: 1/4-INCH SAFETY CHAINS ARE NOT SHOWN BUT WILL BE WELDED TO THE STABILIZING FRAME AT THE MOST DIRECT LOCATION FOR ATTACHMENT TO THE FORKLIFT CARRIAGE BY SECURE HOOKING.

F. THE DUNNAGE ASSEMBLIES AT THE ENDS OF THE BOXCAR MUST BE POSITIONED PRIOR TO THE LOADING OF THE CONTAINERS IN THE BOXCAR.

G. ONCE THE FIRST STACK OF CONTAINERS IS IN POSITION, THE SECOND STACK CAN BE POSITIONED SUBSEQUENT TO THE INSTALLATION OF THE ANTI-CHAFING ASSEMBLY. LOADING AND POSITIONING OF THE SECOND STACK WILL BE ACCOMPLISHED UTILIZING THE METHOD PREVIOUSLY DESCRIBED FOR THE FIRST STACK.

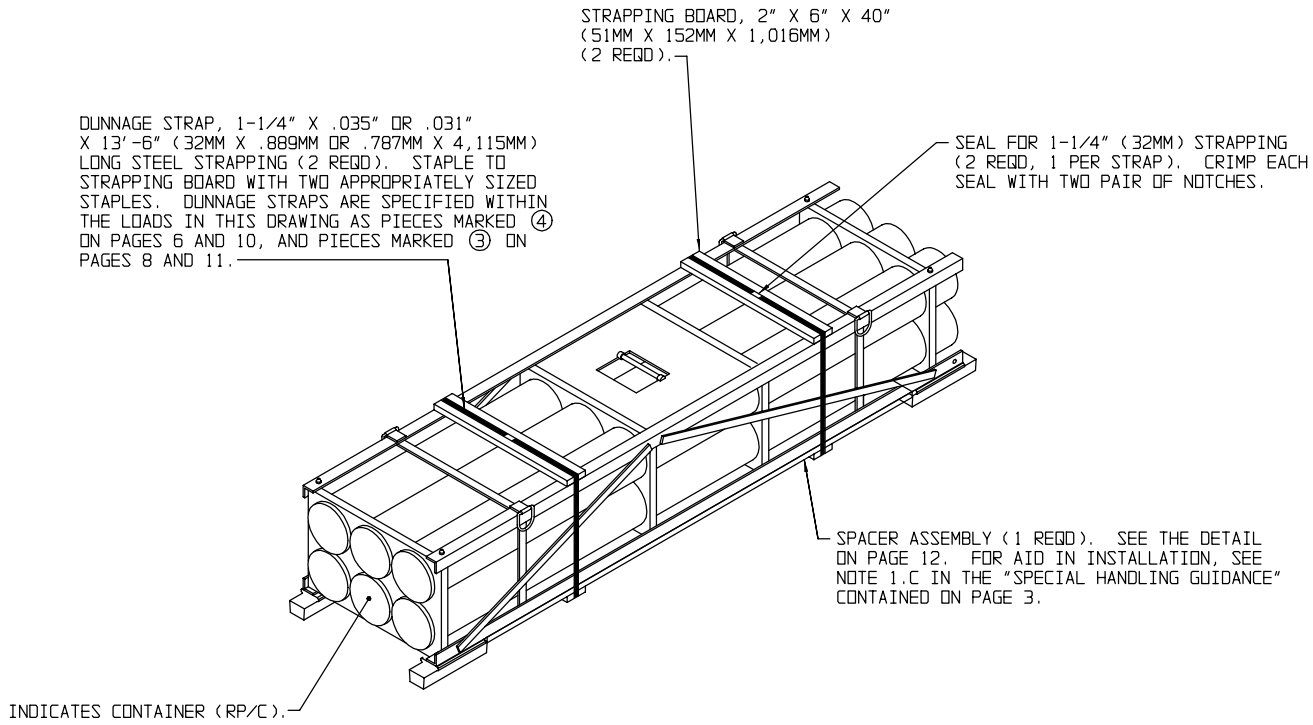


FIGURE 1

THIS VIEW DEPICTS AN UPPER LAYER CONTAINER WITH REQUIRED DUNNAGE/DUNNAGE ASSEMBLIES ATTACHED. THE DUNNAGE/ DUNNAGE ASSEMBLIES MUST BE ASSEMBLED TO THE CONTAINER PRIOR TO LOADING INTO THE BOXCAR.

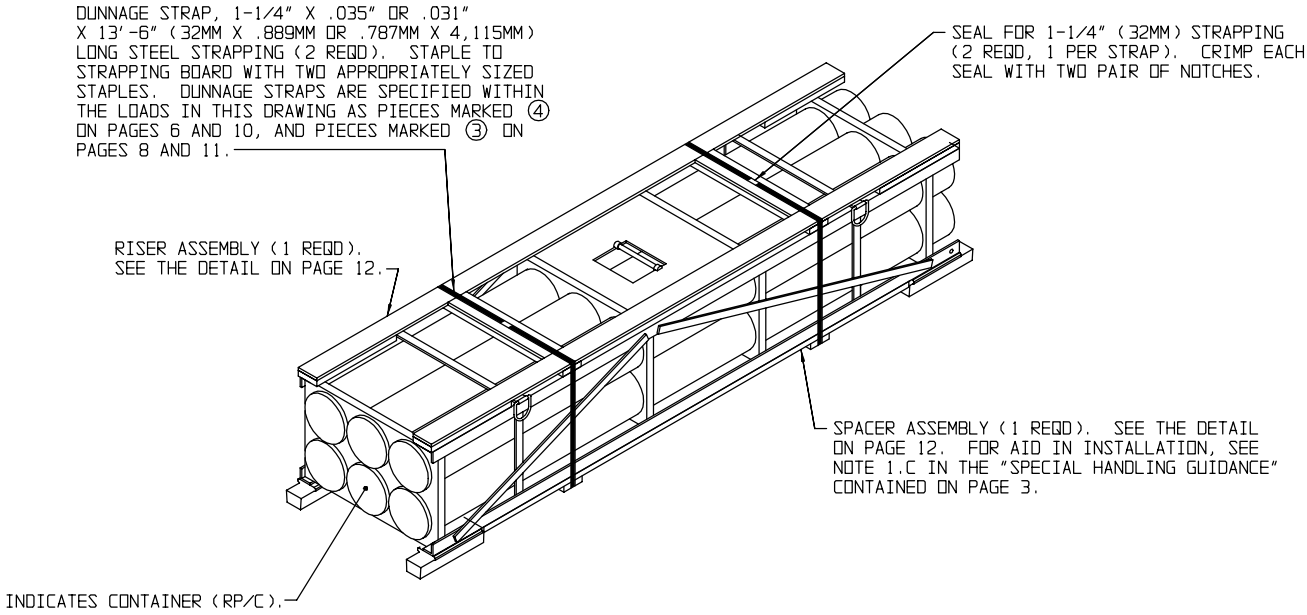
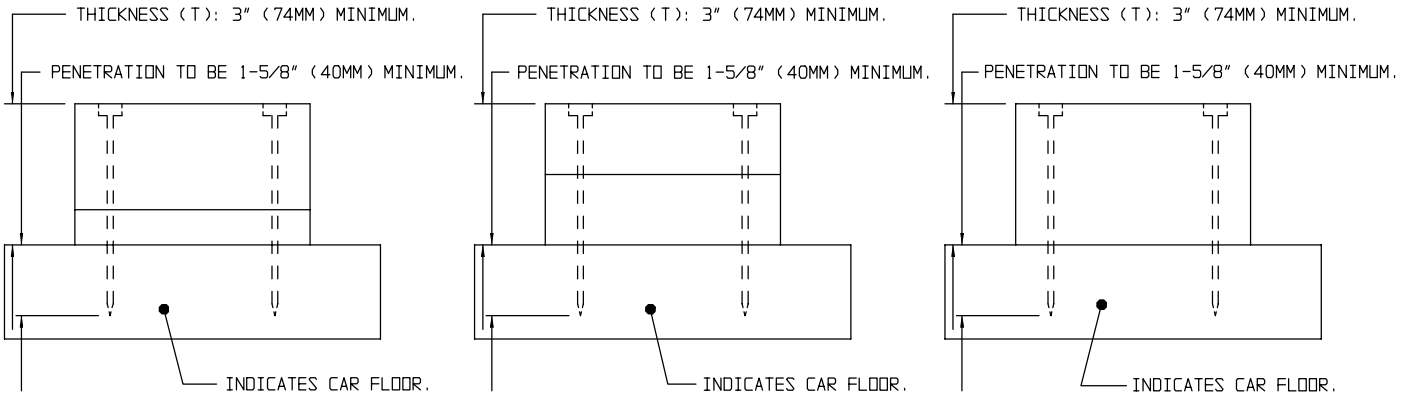


FIGURE 2

THIS VIEW DEPICTS A LOWER LAYER CONTAINER WITH REQUIRED DUNNAGE ASSEMBLIES ATTACHED. THE DUNNAGE ASSEMBLIES MUST BE ASSEMBLED TO THE CONTAINER PRIOR TO LOADING INTO THE BOXCAR.



MIXED THICKNESS OF LUMBER SHOWN
DETAIL A

DOUBLED 2" X 6" LUMBER SHOWN
DETAIL B

4" X 6" LUMBER SHOWN
DETAIL C

TYPICAL NAILING OF FLOOR LINE BLOCKING TO CAR FLOOR

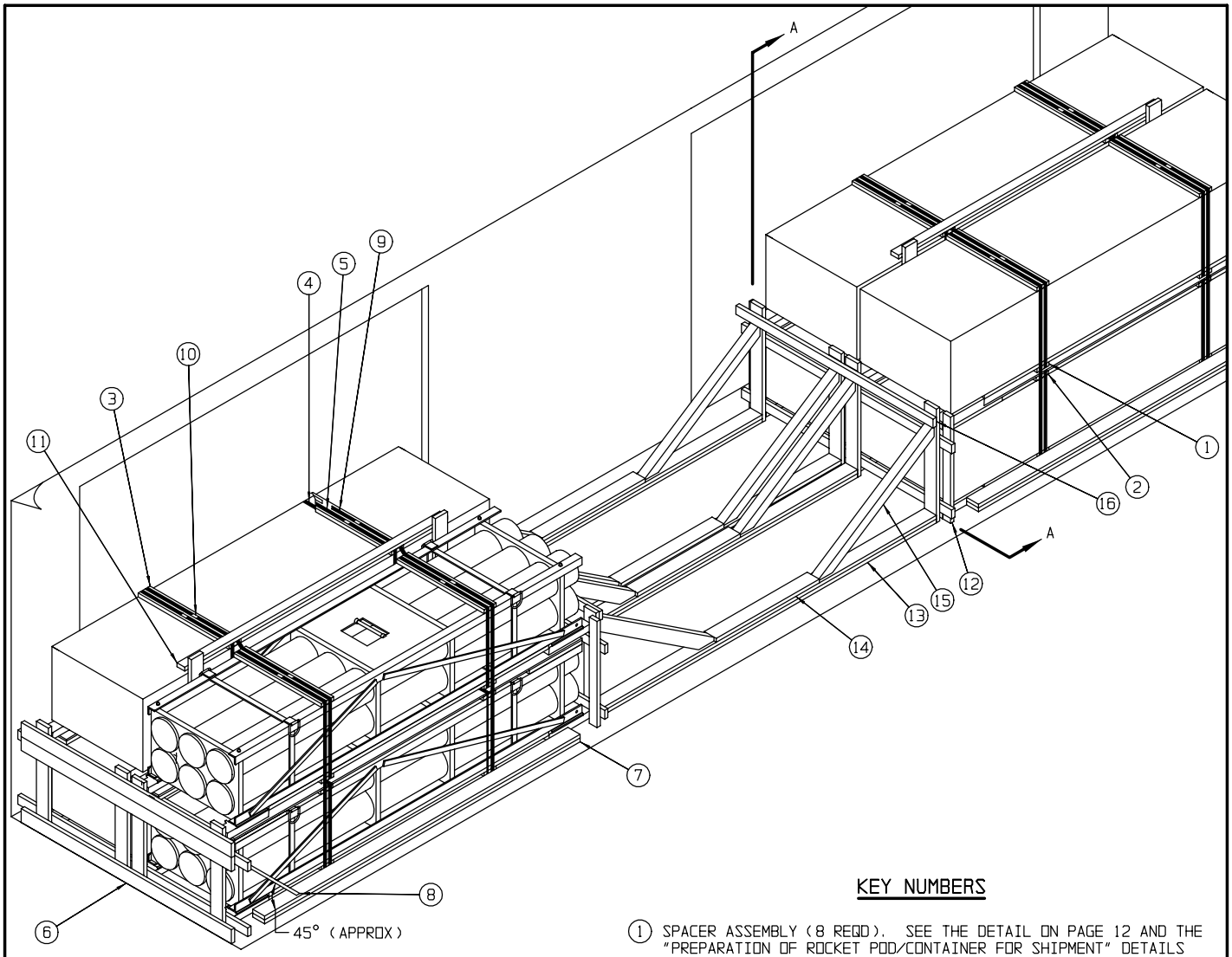
(FOR ADDITIONAL GUIDANCE, SEE "NAIL CHART" ON PAGE 2)

SPECIAL NOTES:

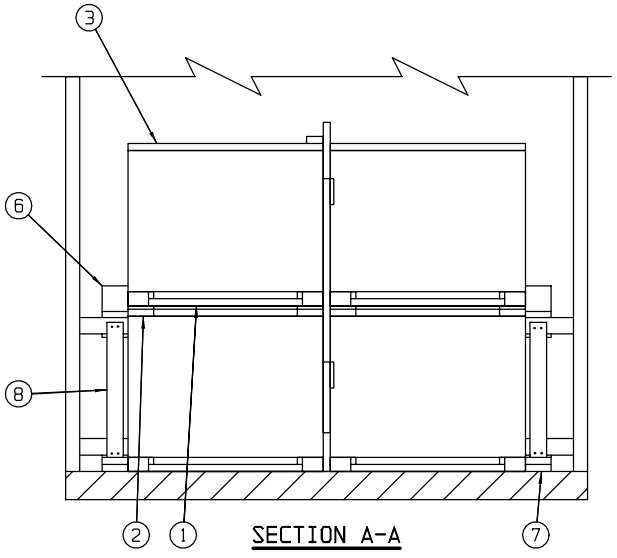
1. THE DETAILS ON THIS PAGE DEPICT POSSIBLE VARIATIONS THAT MAY RESULT FROM USING AVAILABLE LUMBER FOR FLOOR LINE BLOCKING. KEY NUMBERS THROUGHOUT THIS DOCUMENT SPECIFY DOUBLED PIECES OF LUMBER WHICH ARE 2" X 6" IN SIZE FOR SIDE BLOCKING, AS TYPICALLY SHOWN IN DETAIL B ABOVE. IT IS PERMISSIBLE TO USE 4" X 6" LUMBER, OR MIXED THICKNESSES OF LUMBER, AS TYPICALLY SHOWN IN DETAILS A AND C, IN LIEU OF THE SPECIFIED DOUBLED 2" X 6" LUMBER. THE INTENT OF THE SPECIFIED BLOCKING PROCEDURES MUST BE OBTAINED.

2. THE NUMBER OF NAILS USED TO SECURE EACH PIECE OF BLOCKING WILL BE AS SPECIFIED IN THE KEY NUMBERS FOR EACH SPECIFIC PROCEDURE. THE LENGTH OF THE NAILS SELECTED WILL BE ADEQUATE TO NAIL THROUGH THE BLOCKING AND ACHIEVE THE PENETRATION OF THE CAR FLOOR AS SPECIFIED. WHEN NAILING FLOOR LINE BLOCKING TO THE CAR FLOOR, AS DEPICTED IN DETAILS A, B, AND C, THE FOLLOWING APPLIES:

NAILING GUIDANCE CHART					
THICKNESS (T) OF BLOCKING				SIZE OF NAIL	
MINIMUM		MAXIMUM			
3"	(74MM)	3"	(74MM)	30d (4-1/2")	(114MM)
3"	(74MM)	3-3/8"	(87MM)	40d (5")	(127MM)
3-3/8"	(87MM)	4"	(100MM)	50d (5-1/2")	(140MM)
4"	(100MM)	4-3/8"	(112MM)	60d (6")	(152MM)



ISOMETRIC VIEW



SECTION A-A

KEY NUMBERS

(1) SPACER ASSEMBLY (8 REQD). SEE THE DETAIL ON PAGE 12 AND THE "PREPARATION OF ROCKET POD/CONTAINER FOR SHIPMENT" DETAILS ON PAGE 4. SEE GENERAL NOTE "N" ON PAGE 2.

(2) RISER ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 12 AND THE "PREPARATION OF ROCKET POD/CONTAINER FOR SHIPMENT" DETAILS ON PAGE 4.

(3) STRAPPING BOARD, 2" X 6" X 40" (51MM X 152MM X 1,016MM) (8 REQD).

(4) DUNNAGE STRAP, 1-1/4" X .035" OR .031" (32MM X .889MM OR .787MM) BY 13'-6" (4,115MM) LONG STEEL STRAPPING (16 REQD). STAPLE TO STRAPPING BOARD, PIECE MARKED (3), OR RISER ASSEMBLY, PIECE MARKED (2), W/2 STAPLES. SEE THE "PREPARATION OF ROCKET POD/CONTAINER FOR SHIPMENT" DETAILS ON PAGE 4. SPECIAL HANDLING GUIDANCE ON PAGE 3.

(5) UNITIZING STRAP, 1-1/4" X .035" OR .031" (32MM X .889MM OR .787MM) BY 19'-0" (5,791MM) LONG STEEL STRAPPING (8 REQD). INSTALL TO ENCIRCLE A STACK OF CONTAINERS.

(6) ENDWALL BULKHEAD (2 REQD). SEE THE DETAIL ON PAGE 13. POSITION WITH THE HORIZONTAL PIECES AGAINST THE CAR ENDWALL.

(7) SIDE BLOCKING, 2" X 6" X 12'-0" (51MM X 152MM X 3,658MM) (DOUBLED) (4 REQD). LOCATE SO AS TO BE CENTERED ALONG THE LENGTH OF THE CONTAINER. PLACE ONE PIECE DIRECTLY ON TOP OF ANOTHER AND NAIL THRU BOTH PIECES AND INTO THE CAR FLOOR W/20 NAILS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.

(8) DIAGONAL BRACE, 2" X 4" X 37" (51MM X 102MM X 940MM) (4 REQD). BEVEL EACH END AND TOENAIL TO THE SIDE BLOCKING, PIECE MARKED (7), AND TO THE ENDWALL BULKHEAD, PIECE MARKED (6), W/2 NAILS AT EACH END.

(9) BUNDLING STRAP, 1-1/4" X .035" OR .031" (32MM X .889MM OR .787MM) BY 21'-0" (6,401MM) LONG STEEL STRAPPING (4 REQD). INSTALL TO ENCIRCLE TOP LAYER CONTAINERS.

(CONTINUED ON PAGE 7)

8-RP/C LOAD

PROJECT GM 722-79

(KEY NUMBERS CONTINUED FROM PAGE 6)

⑩ SEAL FOR 1-1/4" (32MM) STRAPPING (28 REQD, 1 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES. SEE GENERAL NOTE "D" ON PAGE 2.

⑪ ANTI-CHAFING ASSEMBLY "A" (2 REQD). SEE THE DETAIL ON PAGE 12. INSTALL PRIOR TO FINAL POSITIONING OF SECOND STACK IN EACH LOAD BAY. WIRE TIE TO FIRST STACK AT FOUR LOCATIONS WITH 18" (457MM) LENGTHS OF NO. 14 (1.63MM) GAGE WIRE.

⑫ CENTER GATE (2 REQD). SEE THE DETAIL ON PAGE 13. POSITION WITH THE HOLD-DOWN PIECES AGAINST THE CONTAINERS.

⑬ STRUT, 2" X 6" (51MM X 152MM) BY CUT-TO-FIT, (REF: 13'-8") (4,166MM) (DOUBLED) (4 REQD). PLACE ONE PIECE DIRECTLY ON TOP OF ANOTHER AND NAIL THRU BOTH PIECES AND INTO THE CAR FLOOR W/12 NAILS. TOENAIL TO THE CENTER GATES, PIECES MARKED ⑫, W/2 NAILS AT EACH END.

⑭ BACK-UP CLEAT, 2" X 6" (51MM X 152MM) BY CUT-TO-FIT (REF: 47") (1,194MM) (4 REQD). CENTER ON THE LENGTH OF AND NAIL TO A STRUT, PIECE MARKED ⑬, W/8 NAILS. SEE SPECIAL NOTE 2 AT RIGHT.

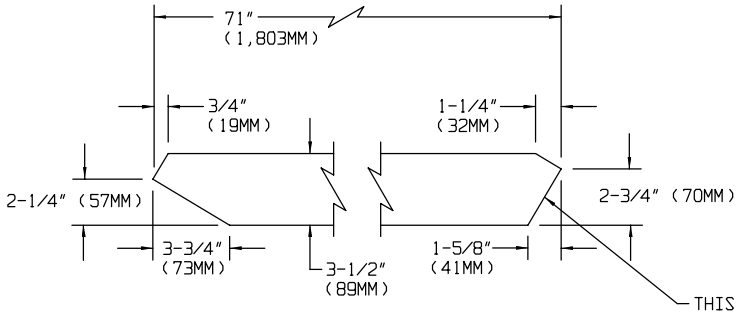
⑮ KNEE BRACE, 4" X 4" X 65-1/2" (102MM X 102MM X 1,664MM) (8 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS. INSTALL SO THE TOP END ALIGNS WITH A CONTAINER SKID. TOENAIL TO A CENTER GATE, PIECE MARKED ⑫, AND TO A BACK-UP CLEAT, PIECE MARKED ⑭, W/2 NAILS AT EACH END.

⑯ HOLD-DOWN CLEAT, 2" X 4" X 7'-6" (51MM X 102MM X 2,286MM) (2 REQD). NAIL TO A CENTER GATE, PIECE MARKED ⑫, W/3 NAILS AT EACH JOINT.

SPECIAL NOTES:

1. A 41'-9" (12,744MM) LONG BY 8'-9" (2,670MM) WIDE EUROPEAN BOXCAR EQUIPPED WITH 14'-3" (4,343MM) SLIDING WALL OPENINGS IS SHOWN.

2. THE LENGTH OF THE STRUTS, PIECES MARKED ⑬, AND THE BACK-UP CLEATS, PIECES MARKED ⑭, SHOWN AS 13'-8" (4,166MM) AND 47" (1,19MM), RESPECTIVELY, ARE BASED ON AN INSIDE CAR LENGTH OF 41'-9" (12,744MM). IF A LONGER CAR IS TO BE LOADED, THE LENGTHS OF PIECES MARKED ⑬ AND ⑭ WILL NEED TO BE INCREASED BY THE DIFFERENCE IN THE LENGTH OF THE CARS. LIKEWISE, IF A SHORTER CAR IS FURNISHED FOR LOADING, THE LENGTHS OF PIECES MARKED ⑬ AND ⑭ WILL NEED TO BE REDUCED BY THE DIFFERENCE IN CAR LENGTHS.



KNEE BRACE

SEE SPECIAL NOTE 2 ABOVE.

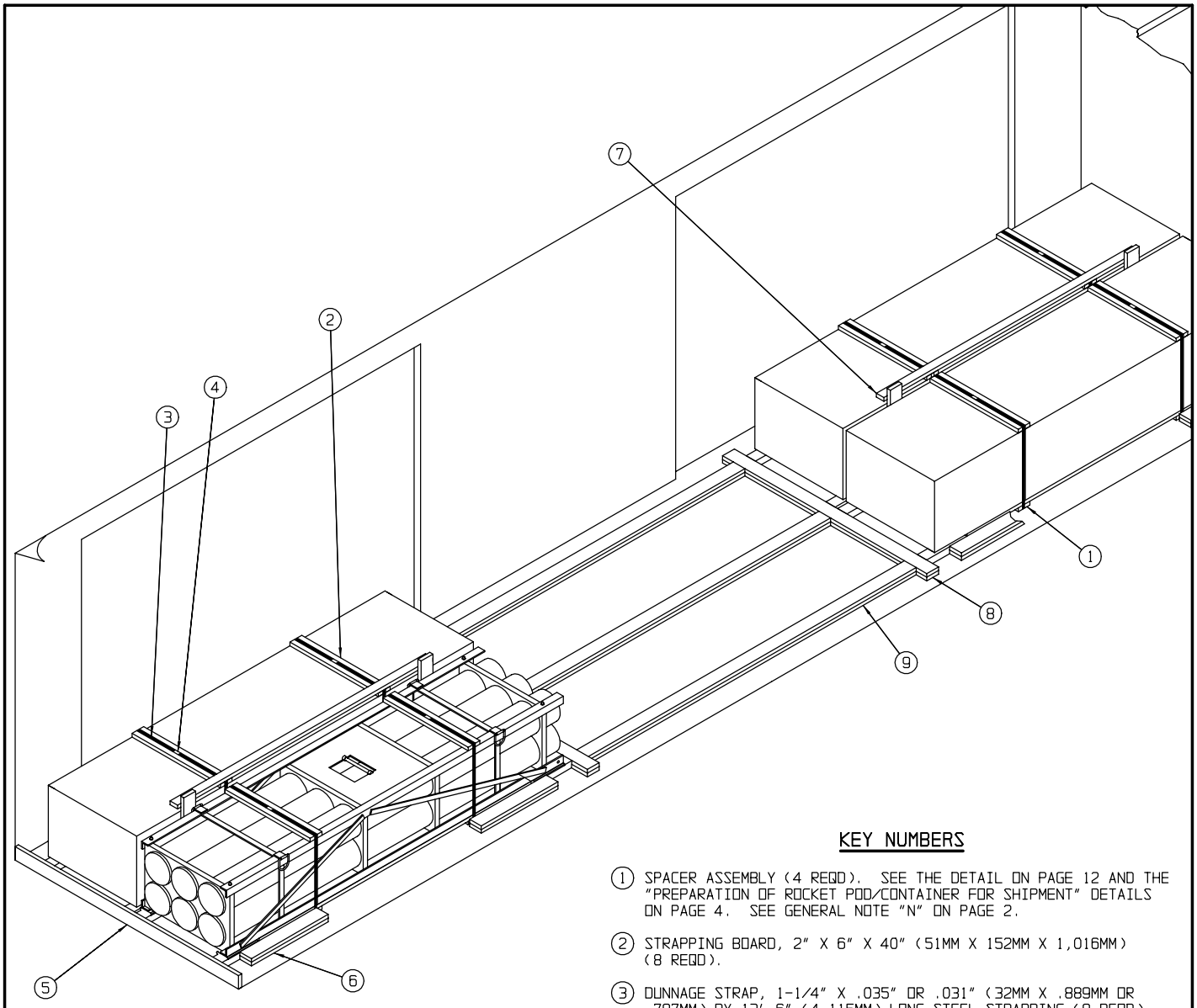
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6" (25MM X 152MM)	173' (52,730MM)	87
2" X 4" (51MM X 102MM)	129' (39,319MM)	86
2" X 6" (51MM X 152MM)	646' (196,901MM)	646
4" X 4" (102MM X 102MM)	44' (13,411MM)	59
NAILS	NO. REQD	POUNDS
SIZE AS REQD	748	22
STEEL STRAPPING, 1-1/4" - - - - 452' REQD - - - - - 65 LBS SEAL FOR 1-1/4" STRAPPING - - - 28 REQD - - - - - 1 LB WIRE, NO. 14 GAGE - - - - - - - - 12' REQD - - - - - NIL STRAP STAPLE - - - - - - - - - - 32 REQD - - - - - 1/2 LB		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER - -- - - - - -	8 - - - - - -	40,624 LBS (18,443 KG)
DUNNAGE - - - - - - - - - - - - - - - -		1,845 LBS (838 KG)
TOTAL WEIGHT - - - - - - - -		42,469 LBS (19,281 KG)

8-RP/C LOAD

PROJECT GM 722-79



ISOMETRIC VIEW

KEY NUMBERS

(1) SPACER ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 12 AND THE "PREPARATION OF ROCKET POD/CONTAINER FOR SHIPMENT" DETAILS ON PAGE 4. SEE GENERAL NOTE "N" ON PAGE 2.

(2) STRAPPING BOARD, 2" X 6" X 40" (51MM X 152MM X 1,016MM) (8 REQD).

(3) DUNNAGE STRAP, 1-1/4" X .035" OR .031" (32MM X .889MM OR .787MM) BY 13'-6" (4,115MM) LONG STEEL STRAPPING (8 REQD). STAPLE TO STRAPPING BOARD, PIECE MARKED (2), W/2 STAPLES. SEE THE "PREPARATION OF ROCKET POD/CONTAINER FOR SHIPMENT" DETAILS ON PAGE 4.

(4) SEAL FOR 1-1/4" (32MM) STRAPPING (8 REQD, 1 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES. SEE GENERAL NOTE "D" ON PAGE 2.

(5) ENDWALL BULKHEAD, 2" X 6" (51MM X 152MM) BY CAR WIDTH MINUS 1/2" (13MM) (2 REQD). NAIL TO THE CAR ENDWALL W/6 NAILS. SEE SPECIAL NOTE 2 ON PAGE 9.

(6) SIDE BLOCKING, 2" X 6" X 36" (51MM X 152MM X 914MM) (DOUBLED) (8 REQD). LOCATE SO AS TO BE CENTERED ALONG THE LENGTH OF THE CONTAINER SKIDS. PLACE ONE PIECE DIRECTLY ON TOP OF ANOTHER AND NAIL THRU BOTH PIECES AND INTO THE CAR FLOOR W/9 NAILS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.

(7) ANTI-CHAFING ASSEMBLY "B" (2 REQD). SEE THE DETAIL ON PAGE 9. INSTALL PRIOR TO FINAL POSITIONING OF THE SECOND CONTAINER IN EACH LOAD BAY. WIRE TIE TO FIRST CONTAINER AT TWO LOCATIONS WITH 18" (457MM) LENGTHS OF NO. 14 (1.63MM) GAGE WIRE.

(8) HEADER, 2" X 6" X 8'-0" (51MM X 152MM X 2,438MM) (DOUBLED) (2 REQD). LOCATE SO AS TO BE CENTERED ON THE CONTAINER SKIDS. PLACE ONE PIECE DIRECTLY ON TOP OF ANOTHER AND NAIL THRU BOTH PIECES AND INTO THE CAR FLOOR W/12 NAILS. SEE GENERAL NOTE "M" ON PAGE 2.

(9) BACK-UP CLEAT, 2" X 6" (51MM X 152MM) BY CUT-TO-FIT (REF: 12'-11") (3,937MM) (DOUBLED) (3 REQD). POSITION AS SHOWN. PLACE ONE PIECE DIRECTLY ON TOP OF ANOTHER AND NAIL THRU BOTH PIECES AND INTO THE CAR FLOOR W/12 NAILS.

(KEY NUMBERS CONTINUED FROM PAGE 10)

(11) ANTI-CHAFING ASSEMBLY "A" (1 REQD). SEE THE DETAIL ON PAGE 12. INSTALL PRIOR TO FINAL POSITIONING OF SECOND STACK IN THE LOAD BAY. WIRE TIE TO FIRST STACK AT FOUR LOCATIONS WITH 18" (457MM) LENGTHS OF NO. 14 (1.63MM) GAGE WIRE.

(12) ANTI-CHAFING ASSEMBLY "B" (1 REQD). SEE THE DETAIL ON THIS PAGE. INSTALL PRIOR TO FINAL POSITIONING OF SECOND STACK IN THE LOAD BAY. WIRE TIE TO FIRST STACK AT FOUR LOCATIONS WITH 18" (457MM) LENGTHS OF NO. 14 (1.63MM) GAGE WIRE.

(13) CENTER GATE (2 REQD). SEE THE DETAIL ON PAGE 13. POSITION WITH THE HOLD-DOWN PIECES AGAINST THE CONTAINERS.

(14) STRUT, 2" X 6" (51MM X 152MM) BY CUT-TO-FIT (REF: 13'-8") (4,166MM) (DOUBLED) (4 REQD). PLACE ONE PIECE DIRECTLY ON TOP OF ANOTHER AND NAIL THRU BOTH PIECES AND INTO THE CAR FLOOR W/12 NAILS. TOENAIL TO THE CENTER GATES, PIECES MARKED (13), W/2 NAILS AT EACH END.

(15) BACK-UP CLEAT, 2" X 6" (51 MM X 152 MM) BY CUT-TO-FIT (REF: 47") (1,194MM) (4 REQD). CENTER ON THE LENGTH OF AND NAIL TO A STRUT, PIECE MARKED (14), W/8 NAILS. SEE SPECIAL NOTE 2 ON PAGE 10.

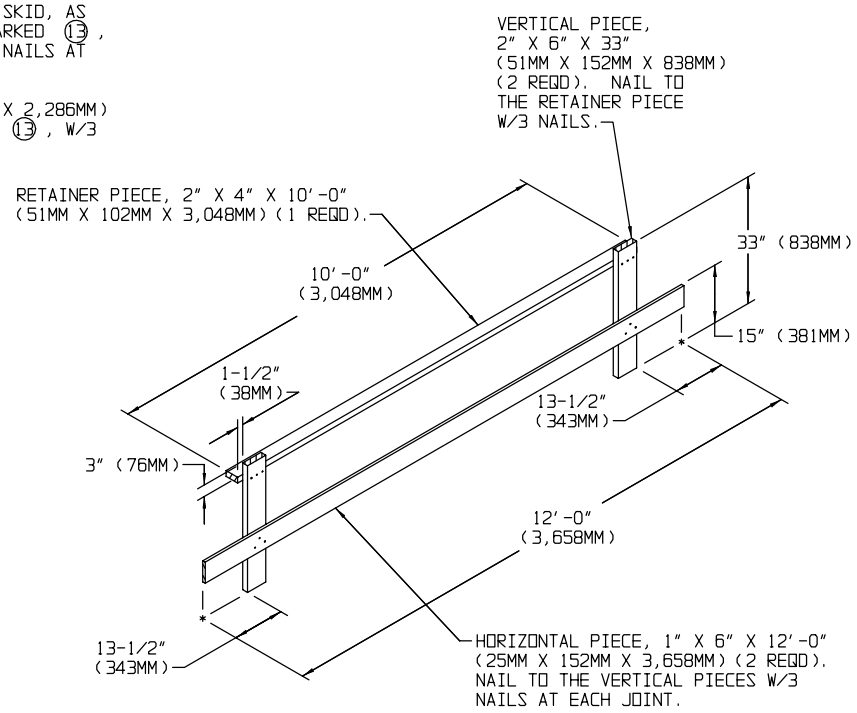
(16) KNEE BRACE, 4" X 4" X 65-1/2" (102MM X 102MM X 1,664MM) (8 REQD). SEE THE DETAIL ON PAGE 7 FOR BEVEL CUTS. INSTALL SO THE TOP END ALIGNS WITH A CONTAINER SKID, AS APPLICABLE. TOENAIL TO A CENTER GATE, PIECE MARKED (13), AND TO A BACK-UP CLEAT, PIECE MARKED (15), W/2 NAILS AT EACH END.

(17) HOLD-DOWN CLEAT, 2" X 4" X 7'-6" (51MM X 102MM X 2,286MM) (2 REQD). NAIL TO A CENTER GATE, PIECE MARKED (13), W/3 NAILS AT EACH JOINT.

SPECIAL NOTES:

1. A 4-CONTAINER LOAD IS SHOWN IN A 41'-9" (12,744MM) LONG BY 8'-9" (2,670MM) WIDE EUROPEAN BOXCAR EQUIPPED WITH 14'-3" (4,343MM) SLIDING WALL OPENINGS. BOXCARS OF OTHER DIMENSIONS AND BOXCARS HAVING WIDER WALL OPENINGS MAY BE USED.

2. IF THE BOXCAR BEING USED IS NOT EQUIPPED WITH A NAILABLE ENDWALL, OMIT THE ENDWALL BULKHEADS, PIECES MARKED (5), AND SUBSTITUTE HEADERS SHOWN AS PIECE MARKED (8).

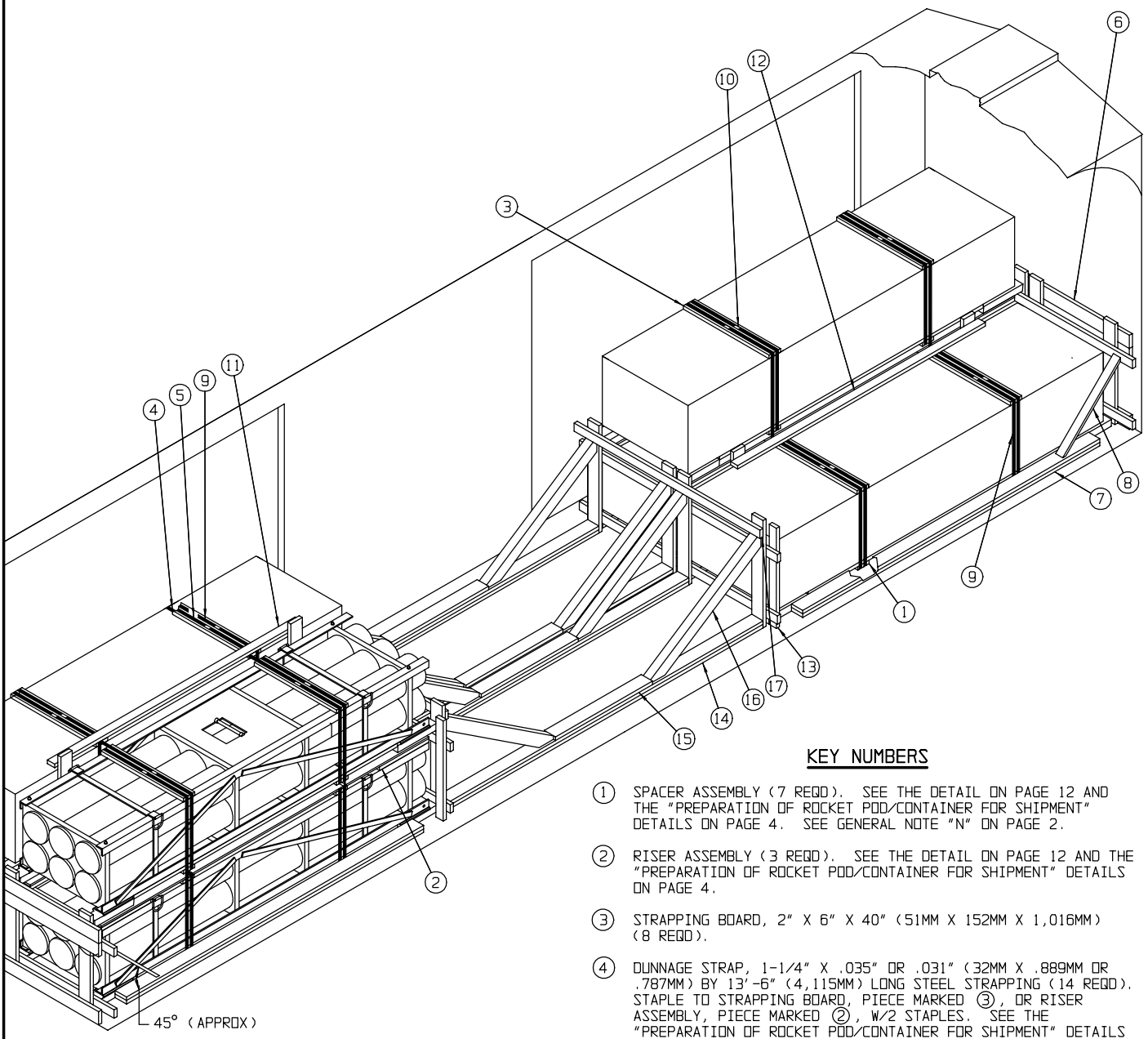


ANTI-CHAFING ASSEMBLY B

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6" (25MM X 152MM)	24 (7,315MM)	12
2" X 4" (5MM X 102MM)	20 (6,096MM)	14
2" X 6" (51MM X 152MM)	374 (113,995MM)	374
NAILS	NO. REQD	POUNDS
SIZE AS REQD	224	12-1/2
STEEL STRAPPING, 1-1/4" - - - 108' REQD - - - - 15-1/2 LBS SEAL FOR 1-1/4" STRAPPING - - - 8 REQD - - - - - 1/2 LB WIRE, NO. 14 GAGE - - - - - - - 6' REQD - - - - - - - NIL STRAP STAPLE - - - - - - - - - 16 REQD - - - - - - - NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER - -- - - - - -	4 - - - - - -	20,312 LBS (9,222 KG)
DUNNAGE - - - - - - - - - - - - - - - -		829 LBS (376 KG)
TOTAL WEIGHT - - - - - - - -		21,141 LBS (9,588 KG)



ISOMETRIC VIEW

KEY NUMBERS

(1) SPACER ASSEMBLY (7 REQD). SEE THE DETAIL ON PAGE 12 AND THE "PREPARATION OF ROCKET POD/CONTAINER FOR SHIPMENT" DETAILS ON PAGE 4. SEE GENERAL NOTE "N" ON PAGE 2.

(2) RISER ASSEMBLY (3 REQD). SEE THE DETAIL ON PAGE 12 AND THE "PREPARATION OF ROCKET POD/CONTAINER FOR SHIPMENT" DETAILS ON PAGE 4.

(3) STRAPPING BOARD, 2" X 6" X 40" (51MM X 152MM X 1,016MM) (8 REQD).

(4) DUNNAGE STRAP, 1-1/4" X .035" OR .031" (32MM X .889MM OR .787MM) BY 13'-6" (4,115MM) LONG STEEL STRAPPING (14 REQD). STAPLE TO STRAPPING BOARD, PIECE MARKED (3), OR RISER ASSEMBLY, PIECE MARKED (2), W/2 STAPLES. SEE THE "PREPARATION OF ROCKET POD/CONTAINER FOR SHIPMENT" DETAILS ON PAGE 4.

(5) UNITIZING STRAP, 1-1/4" X .035" OR .031" (32MM X .889MM OR .787MM) BY 19'-0" (5,791MM) LONG STEEL STRAPPING (6 REQD). SEE THE "PREPARATION OF ROCKET POD/CONTAINER FOR SHIPMENT" DETAILS ON PAGE 4.

(6) ENDWALL BULKHEAD (2 REQD). SEE THE DETAIL ON PAGE 13. POSITION WITH THE HORIZONTAL PIECES AGAINST THE CAR ENDWALL.

(7) SIDE BLOCKING, 2" X 6" X 12'-0" (51MM X 152MM X 3,658MM) (DOUBLED) (4 REQD). LOCATE SO AS TO BE CENTERED ALONG THE LENGTH OF THE CONTAINER. PLACE ONE PIECE DIRECTLY ON TOP OF ANOTHER AND NAIL THRU BOTH PIECES AND INTO THE CAR FLOOR W/20 NAILS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.

(8) DIAGONAL BRACE, 2" X 4" X 46" (51MM X 102MM X 1,168MM) (4 REQD). BEVEL EACH END AND TOENAIL TO THE SIDE BLOCKING, PIECE MARKED (7), AND TO THE ENDWALL BULKHEAD, PIECE MARKED (6), W/2 NAILS AT EACH END.

(9) BUNDLING STRAP, 1-1/4" X .035" OR .031" (32MM X .889MM OR .787MM) BY 21'-0" (6,401MM) LONG STEEL STRAPPING (4 REQD). SEE SPECIAL NOTE 3.

(10) SEAL FOR 1-1/4" (32MM) STRAPPING (24 REQD, 1 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES. SEE GENERAL NOTE "O" ON PAGE 2.

(CONTINUED ON PAGE 9)

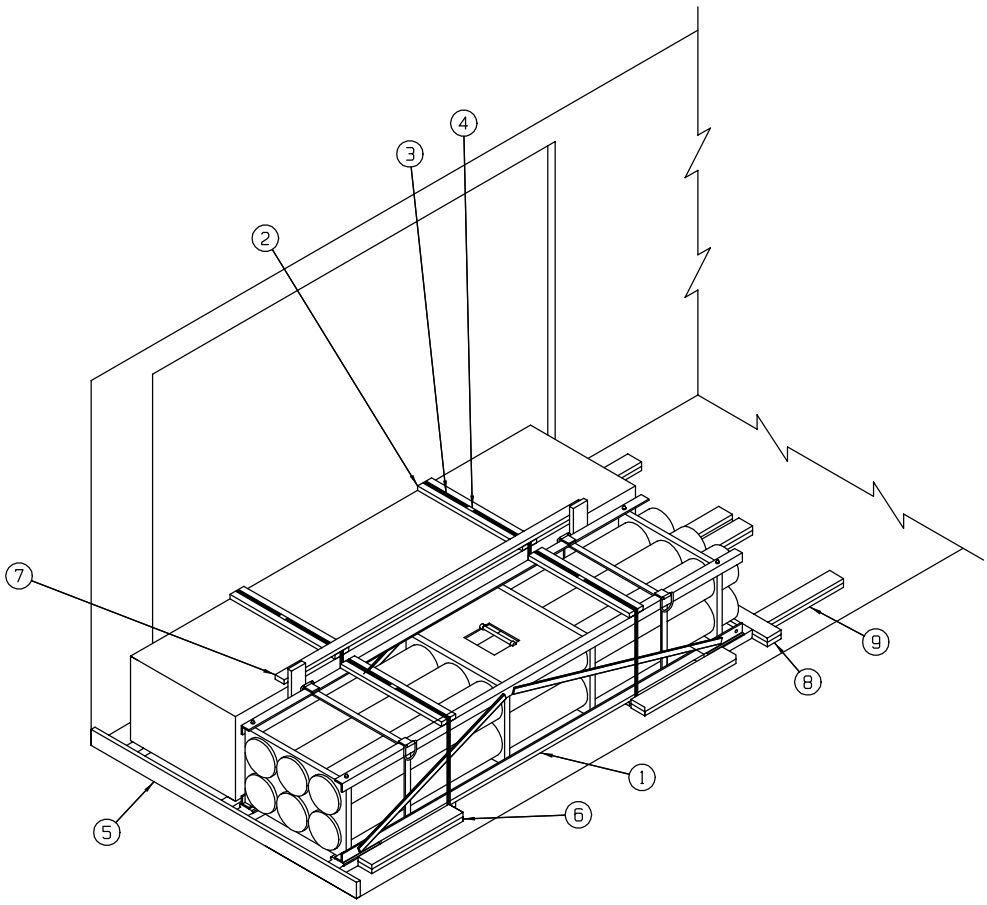
SPECIAL NOTES:

1. A PARTIAL VIEW OF A LOAD IN AN 41'-9" (12,744MM) LONG BY 8'-9" (2,670MM) WIDE BOXCAR HAVING ONE CONTAINER OMITTED FROM THE TOP LAYER IS SHOWN. BOXCARS OF OTHER LENGTHS AND WIDTHS MAY BE USED.

2. THE LENGTH OF THE STRUTS, PIECES MARKED (14), AND THE BACK-UP CLEATS, PIECES MARKED (15), SHOWN AS 13'-8" (4,166MM) AND 47" (1,194MM), RESPECTIVELY, ARE BASED ON AN INSIDE CAR LENGTH OF 41'-9" (12,744MM). IF A LONGER CAR IS TO BE LOADED, THE LENGTHS OF PIECES MARKED (14) AND (15) WILL NEED TO BE INCREASED BY THE DIFFERENCE IN THE LENGTH OF THE CARS. LIKEWISE, IF A SHORTER CAR IS FURNISHED FOR LOADING, THE LENGTHS OF PIECES MARKED (14) AND (15) WILL NEED TO BE REDUCED BY THE DIFFERENCE IN CAR LENGTHS.

3. WHEN ONE CONTAINER IS OMITTED FROM A LOAD BAY, BUNDLING STRAPS ARE STILL TO BE INSTALLED AROUND THE BOTTOM LAYER CONTAINERS.

TYPICAL LCL-ONE RP/C OMITTED FROM THE TOP LAYER



ISOMETRIC VIEW

SPECIAL NOTES:

1. A 2-CONTAINER LOAD IS SHOWN IN AN 8'-9" (2,670MM) WIDE BOXCAR. BOXCARS OF OTHER WIDTHS MAY BE USED.

2. IF THE BOXCAR BEING LOADED IS NOT EQUIPPED WITH A NAILABLE ENDWALL, OMIT THE ENDWALL BULKHEAD, PIECE MARKED ⑤, AND SUBSTITUTE A SECOND HEADER, PIECE MARKED ⑧.

KEY NUMBERS

① SPACER ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 12 AND THE "PREPARATION OF ROCKET POD/CONTAINER FOR SHIPMENT" DETAILS ON PAGE 4. SEE GENERAL NOTE "N" ON PAGE 2.

② STRAPPING BOARD, 2" X 6" X 40" (51MM X 152MM X 1,016MM) (4 REQD).

③ DUNNAGE STRAP, 1-1/4" X .035" OR .031" (32MM X .889MM OR .787MM) BY 13'-6" (4,115MM) LONG STEEL STRAPPING (4 REQD). STAPLE TO STRAPPING BOARD, PIECE MARKED ②, W/2 STAPLES. SEE THE "PREPARATION OF ROCKET POD/CONTAINER FOR SHIPMENT" DETAILS ON PAGE 4.

④ SEAL FOR 1-1/4" (32MM) STRAPPING (4 REQD, 1 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES. SEE GENERAL NOTE "O" ON PAGE 2.

⑤ ENDWALL BULKHEAD, 2" X 6" (51MM X 152MM) BY CAR WIDTH MINUS 1/2" (13MM) (1 REQD). NAIL TO THE CAR ENDWALL W/6 NAILS. SEE SPECIAL NOTE 2 AT LEFT.

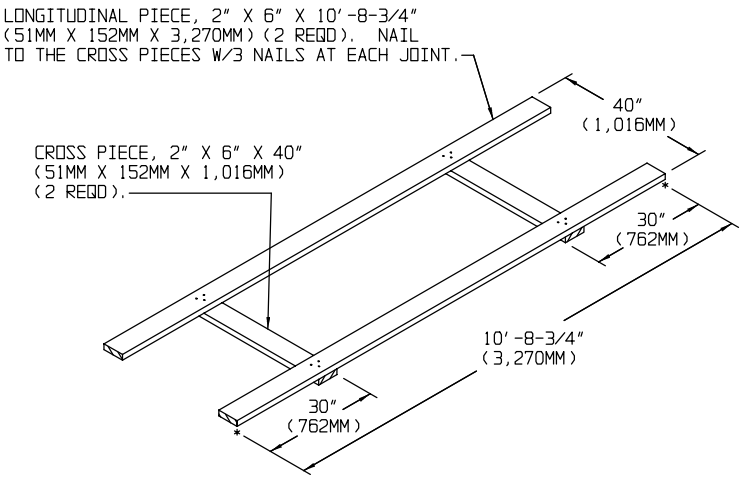
⑥ SIDE BLOCKING, 2" X 6" X 36" (51MM X 152MM X 914MM) (DOUBLED) (4 REQD). LOCATE SO AS TO BE CENTERED ALONG THE LENGTH OF THE CONTAINER SKIDS. PLACE ONE PIECE DIRECTLY ON TOP OF ANOTHER AND NAIL THRU BOTH PIECES AND INTO THE CAR FLOOR W/9 NAILS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.

⑦ ANTI-CHAFING ASSEMBLY "B" (1 REQD). SEE THE DETAIL ON PAGE 9. INSTALL PRIOR TO FINAL POSITIONING OF THE SECOND CONTAINER IN THE LOAD BAY. WIRE TIE TO FIRST CONTAINER AT TWO LOCATIONS WITH 18" (457MM) LENGTHS OF NO. 14 (1.63MM) GAGE WIRE.

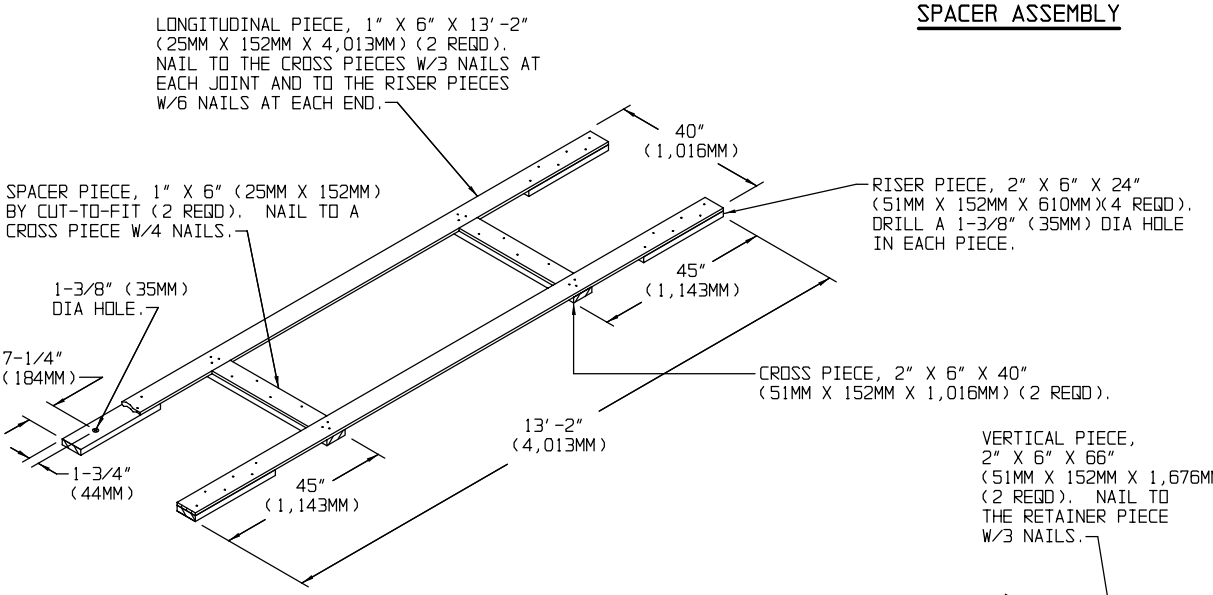
⑧ HEADER, 2" X 6" X 8'-0" (51MM X 152MM X 2,438MM) (DOUBLED) (1 REQD). LOCATE SO AS TO BE CENTERED ON THE CONTAINER SKIDS. PLACE ONE PIECE DIRECTLY ON TOP OF ANOTHER AND NAIL THRU BOTH PIECES AND INTO THE CAR FLOOR W/12 NAILS. SEE GENERAL NOTE "M" ON PAGE 2.

⑨ BACK-UP CLEAT, 2" X 6" X 30" ((51MM X 152MM X 762MM) (DOUBLED) (4 REQD). POSITION AS SHOWN SO THAT A BACK-UP CLEAT IS ALIGNED WITH A CONTAINER SKID. PLACE ONE PIECE DIRECTLY ON TOP OF ANOTHER AND NAIL THRU BOTH PIECES AND INTO THE CAR FLOOR W/5 NAILS.

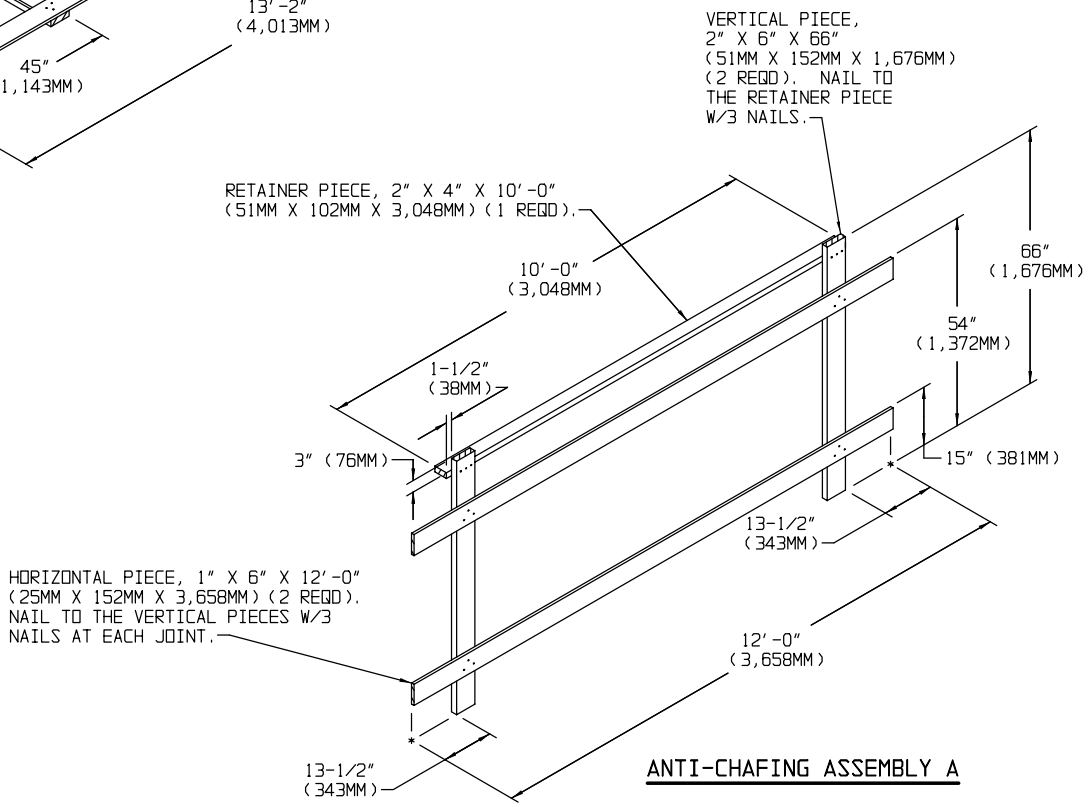
TYPICAL LCL - TWO RP/C LOAD



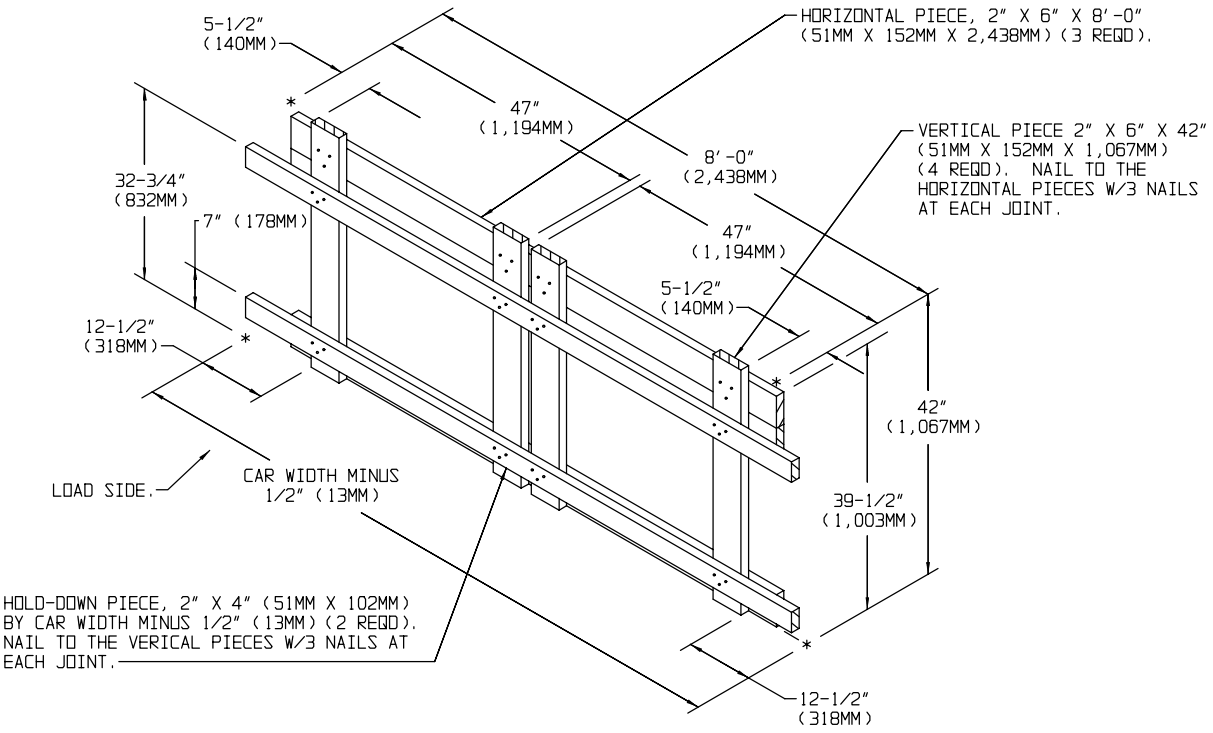
SPACER ASSEMBLY



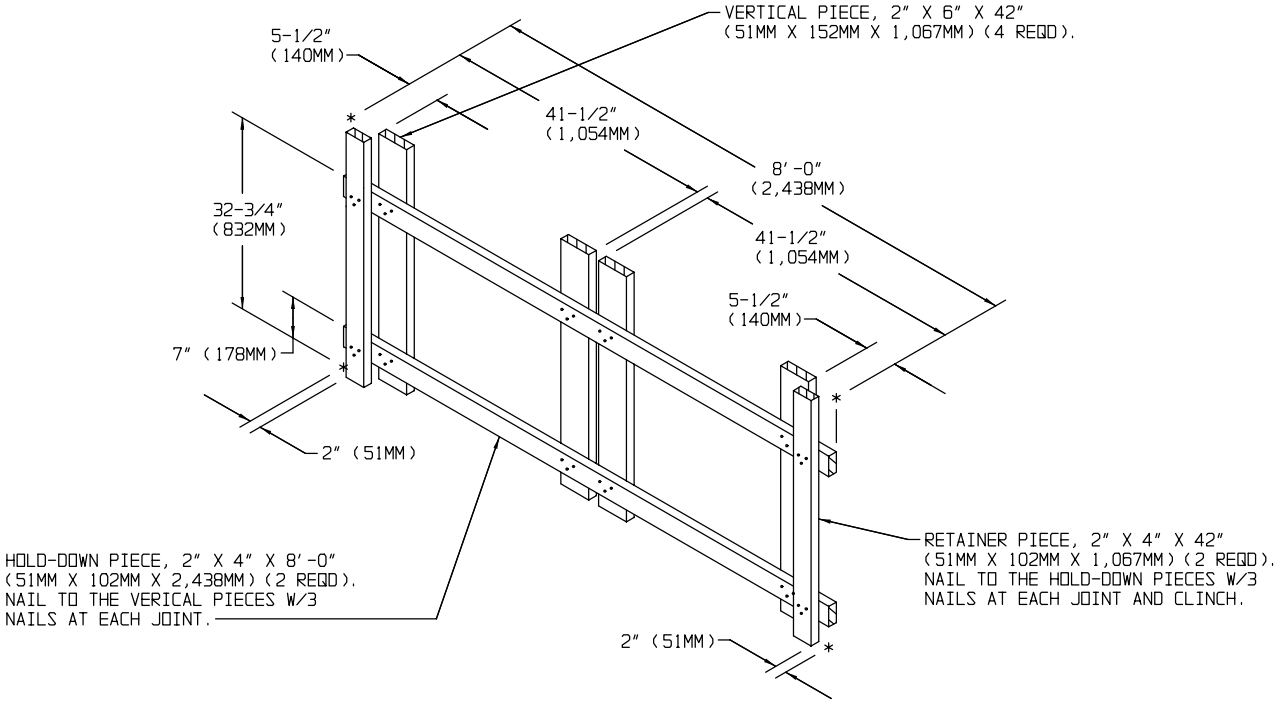
RISER ASSEMBLY



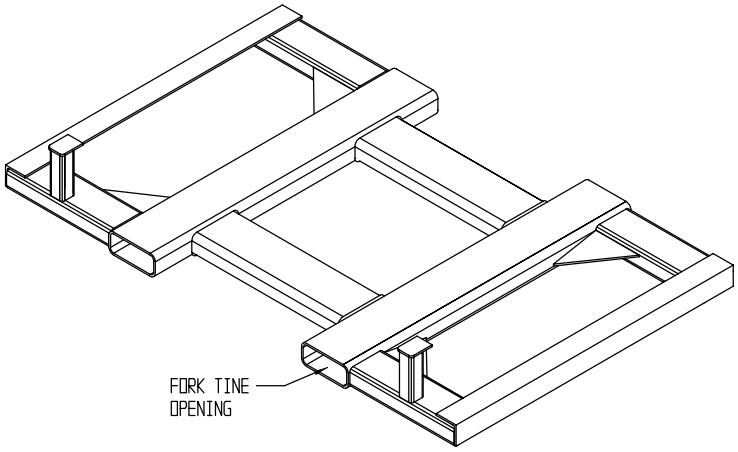
ANTI-CHAFING ASSEMBLY A



ENDWALL BULKHEAD

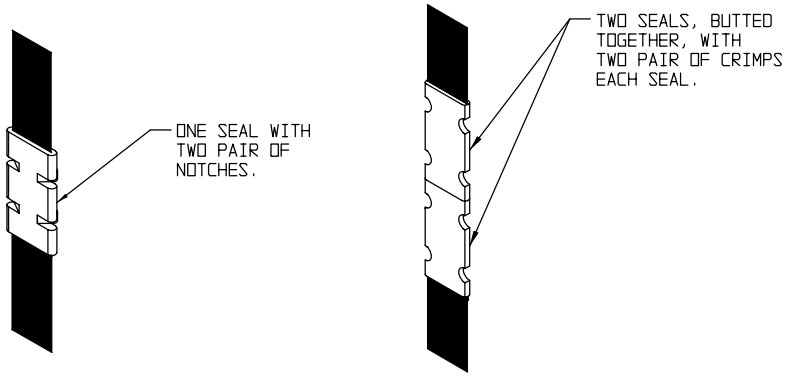


CENTER GATE



MLRS POD STABILIZING FRAME

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



STRAP JOINT A

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

STRAP JOINT B

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

END-OVER-END LAP JOINT DETAILS