

APPROVED BY
BUREAU OF EXPLOSIVES

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DATE 9/15/97

LOADING AND BRACING (CL & LCL) IN BOXCARS OF 2.75 INCH HYDRA ROCKETS PACKED IN CYLINDRICAL METAL CONTAINERS

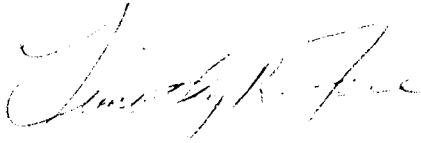

PA151 SERIES CONTAINERS

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- THIS OUTLOADING PROCEDURE DRAWING INCLUDES PROCEDURES FOR CONVENTIONAL TYPE BOXCARS, BOXCARS EQUIPPED WITH MECHANICAL BRACING DEVICES OF VARIOUS DESIGN AND MANUFACTURE, AND CUSHIONED BOXCARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.

U.S. ARMY MATERIEL COMMAND DRAWING

APPROVED, U.S. ARMY INDUSTRIAL OPERATIONS COMMAND 	ENGINEER	BASIC	MICHAEL SARDONE	DO NOT SCALE			
		REV.		WEBSITE: HTTP://WWW.DAC.ARMY.MIL			
	TECHNICIAN	BASIC		JUNE 1997			
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APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND 	TRANSPORTATION ENGINEERING DIVISION		<i>W. R. Truiche</i>				
	VALIDATION ENGINEERING DIVISION		<i>James H. Keck</i>	CLASS	DIVISION	DRAWING	FILE
	LOGISTICS ENGINEERING OFFICE		<i>William F. Ernst</i>	19	48	4242/ 61	5PM1004
DEFENSE AMMUNITION CENTER							

PROJECT CA 254/61-88

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 FOR 2.75" HYDRA ROCKETS PACKED IN THE PA151 CONTAINER AND UNITIZED ON A METAL PALLET. SEE THE PICTORIAL VIEW ON PAGE 5. REFER TO AMC DRAWING 19-48-4231/61-20PM1006 FOR UNITIZATION PROCEDURES FOR THE PA151 SERIES CONTAINERS.
- C. THE OUTLOADING PROCEDURES DEPICTED WITHIN THIS DOCUMENT ARE APPLICABLE FOR SHIPMENTS IN CONVENTIONAL TYPE BOXCARS, FOR SHIPMENTS IN BOXCARS EQUIPPED WITH VARIOUS TYPES OF SELF-CONTAINED MECHANICAL BRACING DEVICES, AND FOR SHIPMENTS IN CUSHIONED BOXCARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.
- D. CAUTION: METAL ROCKET CONTAINERS THAT ARE FLUSH WITH OR OVERHANG THE PALLET END MUST NOT BE ALLOWED TO CONTACT STEEL ENDWALLS OF BOXCARS. THIS TYPE OF UNIT LOAD SHOULD BE SHIPPED IN BOXCARS HAVING WOOD ENDWALLS. IF CARS WITH WOOD ENDWALLS ARE NOT AVAILABLE, AND ALL-STEEL CARS ARE USED, THE ENDWALLS MUST BE LINED WITH DIMENSIONAL LUMBER, PLYWOOD, HARDBOARD, OR SOLID FIBERBOARD. THE LINING SHOULD BE PROVIDED WHEREVER METAL-OF-CONTAINER TO METAL-OF-CAR CONTACT IS POSSIBLE. REFER TO PAGE 42 FOR GUIDANCE.
- E. THE SELECTION OF RAILCARS FOR THE TRANSPORT OF PALLET UNITS OF ROCKETS 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 DOCUMENTS, WILL BE SELECTED.
- F. WHEN SELECTING RAILCARS, EVERY EFFORT SHOULD BE MADE TO OBTAIN BOXCARS THAT DO NOT HAVE BOWED ENDWALLS. CARS HAVING BOWED ENDS CAN BE USED, HOWEVER, IF AN ENDWALL IS BOWED OUTWARD MORE THAN 2" EITHER FROM SIDE TO SIDE OR FROM FLOOR TO ROOF, AN END-OF-CAR BULKHEAD MUST BE INSTALLED TO PROVIDE A "SQUARED OFF" SURFACE FOR THE LOAD AT THE END OF THE CAR. REFER TO PAGE 43 FOR GUIDANCE.
- G. CONVENTIONAL BOXCARS EQUIPPED WITH SLIDING DOORS HAVE BEEN SHOWN, HOWEVER, THE DEPICTED OUTLOADING PROCEDURES ARE ALSO APPLICABLE FOR CONVENTIONAL CARS EQUIPPED WITH PLUG DOORS. CAUTION: DUNNAGE MATERIAL MUST NOT BE NAILED TO ANY PLUG DOOR, WHETHER AUXILIARY OR MAIN. ALSO, AFTER THE PLUG DOORS ON A CAR ARE CLOSED AND READY FOR THE INSTALLATION OF CAR SEALS, A PIECE OF WIRE OF SUITABLE SIZE WILL BE USED IN ADDITION TO AND IN CONJUNCTION WITH EACH CAR SEAL USED TO SEAL THE CAR. THE WIRE WILL BE THREADED THRU THE HOLES IN THE DOOR LATCH ASSEMBLY ONE OR MORE TIMES, AND THE WIRE ENDS WILL BE TWISTED TOGETHER.

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 OR 2, 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.
PLYWOOD	COMMERCIAL ITEM DESCRIPTION A-A-55057, TYPE A, CONSTRUCTION AND INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D. IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER INTERIOR OR AN EXTERIOR GRADE MAY BE SUBSTITUTED.
HARDBOARD	ANSI/AHA A135.4, CLASS 1.
FIBERBOARD	FED SPEC PPP-F-320; TYPE SF (SOLID FIBERBOARD), CLASS DOMESTIC, ALL GRADES.

(GENERAL NOTES CONTINUED)

- H. THE USE OF AN OFFSET LOADING PATTERN WILL FACILITATE LOADING AND UNLOADING OPERATIONS IN THE DOORWAY AREA OF THE CAR. UNLESS PROHIBITED WITHIN THE SPECIAL NOTES, A FULL LOAD SHOULD BE BUILT USING AN OFFSET LOADING PATTERN. FOR INSTANCE, A LOAD CONSISTING OF AN EVEN NUMBER OF LOAD UNITS AND HAVING TWO MORE LOAD UNITS IN ONE END OF THE CAR THAN IN THE OPPOSITE END, OR A LOAD CONSISTING OF AN ODD NUMBER OF LOAD UNITS AND HAVING ONE MORE LOAD UNIT IN ONE END THAN IN THE OTHER IS CONSIDERED TO BE AN OFFSET LOAD.
- J. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN CARS WHICH ARE PARTIALLY LOADED WITH PALLET UNITS OF ROCKETS, 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. MIXED ITEMS TO BE SHIPPED IN CARS EQUIPPED WITH MECHANICAL BRACING DEVICES MUST BE SEPARATELY BLOCKED, USING THE PROCEDURES SHOWN FOR THESE CARS AS GUIDANCE.
- K. 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. IF THOSE MEMBERS SPECIFICALLY IDENTIFIED AS "STRUTS" WITHIN THE KEY NUMBERS OF A DEPICTED LOAD ARE SPECIFIED TO BE 4" X 4" MATERIAL, IT IS PERMISSIBLE TO USE TWO LAMINATED PIECES OF 2" X 6" MATERIAL IN LIEU OF EACH 4" X 4" STRUT. DOUBLED 2" X 6" STRUTS WILL BE LAMINATED W/1-10d NAIL EVERY 6".
- 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 DUNNAGE IS NAILED TO THE FLOOR OR SIDEWALL 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 OR SIDEWALL BOARDS. ADDITIONALLY, THE NAILING PATTERN FOR AN UPPER PIECE OF LAMINATED DUNNAGE WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL FOR THAT PIECE WILL NOT BE DRIVEN THROUGH ONTO, OR RIGHT BESIDE A NAIL IN A LOWER PIECE.
- M. POWER DRIVEN STAPLES MAY BE USED AS ALTERNATIVE FASTENERS FOR NAILS WHEN CONSTRUCTING DUNNAGE ASSEMBLIES WHICH ARE TO BE USED IN THE DELINEATED BOXCAR 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 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.
- N. 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 44 FOR GUIDANCE.
- O. THROUGHOUT THIS PROCEDURAL DRAWING, PORTIONS OF THE BLOCKING COMPONENTS AND OF THE DEPICTED CARS, SUCH AS A CAR SIDEWALL, HAVE BEEN OMITTED FROM THE LOAD VIEW FOR CLARITY PURPOSES.
- P. THE NUMBER OF LADING UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE BOXCAR BEING LOADED OR THE QUANTITY TO BE SHIPPED, HOWEVER, THE APPROVED METHODS SPECIFIED HEREIN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING, AND STAYING OF THE UNITS. NOTICE: A SHIPMENT WILL BE POSITIONED IN THE RAILCAR IN COMPLIANCE WITH THE WEIGHT DISTRIBUTION REQUIREMENTS OF THE AAR.
- Q. CAUTION: WHEN POWER OR PNEUMATIC NAILERS ARE BEING USED IN THE APPLICATION OF NAILED FLOORLINE BLOCKING OR BRACING, PALLET UNITS 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.

(CONTINUED ON PAGE 3)

(GENERAL NOTES CONTINUED)

- R. 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.
- S. AS REQUIRED BY THE ASSOCIATION OF AMERICAN RAILROADS (AAR), ALL 1-1/4" AND 2" STEEL STRAPPING USED FOR LOAD RESTRAINT MUST BE MARKED AS SPECIFIED WITHIN THE APPLICABLE AAR RULES GOVERNING LOADING, BLOCKING AND BRACING OF FREIGHT WITHIN THE CONVEYANCE. FOR THE SPECIFIC MARKING SIZE, FREQUENCY, ETC., REQUIRED, REFER TO THE APPROPRIATE AAR LOADING RULES.

(FOR CONVENTIONAL TYPE BOXCARS)

- T. IF THE CAR BEING USED FOR A SHIPMENT IS EQUIPPED WITH A NAILABLE METAL FLOOR AND A NAIL SIZE FOR FLOOR NAILING IS MARKED ON THE SIDEWALL OF THE CAR, THAT GUIDANCE SHOULD BE APPLIED TO THE NAILING OF THE "DOORWAY BLOCKING" PIECES IN THE FULL LOADS AND TO THE NAILING TO THE CAR FLOOR OF THE LCL BRACES AND KNEE BRACE ASSEMBLIES IN THE LESS-THAN-FULL LOADS. IF A NAIL SIZE IS NOT SPECIFIED IN THE CAR, 30d NAILS SHOULD BE USED IN LIEU OF THOSE SPECIFIED IN THE APPLICABLE KEY NUMBERS. SEE GENERAL NOTE "L" ON PAGE 2.
- U. NOTICE: WHEN POSITIONING PALLET UNITS IN A CAR, THEY SHOULD BE PLACED TIGHTLY AGAINST A CAR SIDEWALL AND ARE TO BE PRESSED TIGHTLY TOGETHER LENGTHWISE SO AS TO ACHIEVE A TIGHT LOAD. TO AID IN ACHIEVING TIGHTNESS LENGTHWISE IN A FULL LOAD, A LOAD-COMPRESSING JACK MAY BE EMPLOYED IN THE AREA OF THE CENTER GATES TO MOVE THE PALLET UNITS INTO THEIR FINAL SHIPPING POSITION. A HYDRAULIC JACK IS RECOMMENDED FOR THIS OPERATION. CAUTION: WHEN USING A JACK TO COMPACT A LOAD, THE JACK MUST BE USED AGAINST STRONG POINTS OF THE PALLET UNITS, SUCH AS THE JOINTS BETWEEN THE LAYERS OF CONTAINERS ON THE UNIT. PADDING, OF 2" THICK LUMBER OR ANY OTHER MATERIAL OF SIMILAR CONSISTENCY, SHOULD BE PLACED BETWEEN THE JACK AND THE LADING.
- V. LOAD-BLOCKING STRUTS WHICH ARE 48" OR LONGER MUST BE STIFFENED BY THE APPLICATION OF HORIZONTAL AND VERTICAL STRUT BRACING. BRACING IS NOT REQUIRED IF THE STRUTS FOR THE LOAD BEING SHIPPED ARE SHORTER THAN 48". THE LENGTH OF THE LOAD-BLOCKING STRUTS SHOULD BE KEPT AS SHORT AS POSSIBLE (APPROX 18" MINIMUM), BUT IN THE EVENT IT IS NECESSARY TO USE STRUTS WHICH ARE 8'-0" OR MORE IN LENGTH, IT WILL BE NECESSARY TO APPLY AN ADDITIONAL SET OF HORIZONTAL AND VERTICAL STRUT BRACING PIECES. STRUT BRACING SHOULD BE APPLIED SO AS TO PROVIDE NEARLY EQUAL SPACES BETWEEN THE BRACING PIECES AND THE CENTER GATES AND/OR BETWEEN ADJACENT STRUT BRACING PIECES. NOTE THAT HORIZONTAL STRUT BRACING PIECES FOR THE UPPER LEVEL OF STRUTS FOR ALL BUT THE UPPERMOST TIER OF A LOAD MAY BE DIFFICULT TO APPLY TO THE TOP SURFACES OF THE STRUT AS DEPICTED. STRUT BRACING WILL BE EQUALLY EFFECTIVE IF APPLIED TO THE UNDER SIDE OF THOSE STRUTS.

- W. TO ACHIEVE A TIGHTLY BLOCKED LOAD, A STRUT WILL BE CUT APPROXIMATELY 1/4" TO 3/8" LONGER THAN THE MEASURED DISTANCE BETWEEN THE STRUT BEARING AREAS ON THE TWO CENTER GATES. MEASUREMENTS FOR STRUT LENGTHS NEED TO BE ACCOMPLISHED AT SEVERAL PLACES DURING THE BLOCKING AND BRACING PROCESS. CARE MUST BE EXERCISED WHEN MEASURING FOR AND INSTALLING STRUTS. THE SPECIFIED APPROXIMATE DIMENSION FOR A STRUT LENGTH MAY BE ADJUSTED, AS NECESSARY, TO PROVIDE FOR A TIGHTLY BLOCKED LOAD WITHOUT DISTORTING, DENTING OR OTHERWISE DAMAGING THE CONTAINERS. ONE END OF THE STRUT WILL BE POSITIONED AT ITS BEARING AREA JUST ABOVE THE STRUT LEDGER ON ONE GATE. THE OTHER END, WHICH CAN BE BEVELED ON THE LOWER CORNER IF DESIRED, WILL THEN BE DRIVEN DOWNWARD UNTIL IT CONTACTS THE STRUT LEDGER ON THE OTHER GATE. EACH END OF THE STRUT WILL BE TOENAILED TO THE ADJACENT CENTER GATE, AS SPECIFIED WITHIN THE KEY NUMBERS FOR A LOAD, IN SUCH A MANNER SO THAT AS NEARLY AS PRACTICAL EQUAL LENGTHS OF A NAIL ARE EMBEDDED IN THE STRUT AND IN THE VERTICAL PIECE OF THE CENTER GATE. SEE THE "BEVEL CUT" DETAIL ON PAGE 45 FOR BEVELING INSTRUCTIONS AND THE "STRUT INSTALLATION" DETAIL ON THAT PAGE FOR A PICTORIAL VIEW SHOWING THE PROPER POSITIONING OF A BEVELED STRUT FOR INSTALLATION. NOTE THAT THE UPPER CORNER NEEDS TO BE BEVELED ONLY IF THE STRUTS ARE VERY SHORT. IF ONLY ONE END IS BEVEL CUT, THE BEVELED EDGE WILL BE PLACED IN THE DOWNWARD POSITION SO THAT IT WILL ALLOW THE STRUT END TO SLIDE MORE FREELY DOWN THE FACE OF THE VERTICAL PIECE ON THE ADJACENT CENTER GATE AS THE STRUT IS DRIVEN DOWN INTO ITS FINAL BLOCKING POSITION.

(CONTINUED AT RIGHT)

(GENERAL NOTES CONTINUED)

- X. WHERE 2" X 2" PIECES ARE SPECIFIED FOR STRUT LEDGERS, 2" X 4" MATERIAL MAY BE SUBSTITUTED, IF DESIRED.
- Y. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

(FOR BOXCARS EQUIPPED WITH MECHANICAL BRACING DEVICES)

- Z. THE OUTLOADING PROCEDURES FOR BOXCARS EQUIPPED WITH MECHANICAL BRACING DEVICES MAY BE ADAPTED AS REQUIRED TO FACILITATE THE USE OF BOXCARS EQUIPPED WITH VARIOUS TYPES OF SELF-CONTAINED MECHANICAL BRACING DEVICES, HOWEVER, FIXED OR ADJUSTABLE WALL MEMBERS AND DOORWAY MEMBERS WITHIN THESE CARS MUST PROVIDE FOR THE INSTALLATION OF LOAD BLOCKING CROSS MEMBERS AT THE HEIGHTS SPECIFIED. CAUTION: BOXCARS EQUIPPED WITH MEMBERS WHICH DO NOT MEET THE LOCATION REQUIREMENTS MUST NOT BE USED.

1. FOR BLOCKING THE LOAD WHICH IS DEPICTED, A CROSS MEMBER WILL NOT BE RELIED UPON TO RETAIN MORE LADING ON EITHER SIDE THAN AS SHOWN. VOIDS LENGTHWISE WITHIN THE LOAD MUST BE HELD TO A MINIMUM AND CROSS MEMBERS MUST BE PLACED AGAINST THE LADING AS TIGHTLY AS THE SPACING OF THE LOCKING HOLES IN THE WALL MEMBERS PERMIT. LOCKING BARS (LEVER JACKS) SHOULD BE USED FOR THIS PURPOSE. AN ADDITIONAL 1/2" OF ADJUSTMENT CAN BE MADE BY TURNING A CROSS MEMBER END-FOR-END WHEN LOCKING PINS ON THE MEMBER ARE OFF-CENTER. NOTE: IT IS RECOMMENDED THAT EACH CROSS MEMBER BE INSTALLED WITH THE ENDS ATTACHED AS NEARLY AS POSSIBLE IN "MATED" POSITIONS (AT EQUAL HEIGHTS AND AT EQUAL DISTANCES FROM THE END OF THE CAR).
2. CAUTION: ALL BLOCKING AND BRACING COMPONENTS IN EMPTY CARS AND ALL UNUSED COMPONENTS IN LOADED CARS MUST BE "SECURED" FOR SHIPMENT -- ADJUSTABLE WALL MEMBERS TO VERTICAL WALL ATTACHMENT RAILS, AND CROSS MEMBERS TO ADJUSTABLE WALL MEMBERS OR TO FIXED HORIZONTAL WALL MEMBERS OR TO DOORWAY MEMBERS, AND DOORWAY MEMBERS TO DOOR POSTS. COMPONENTS ASSIGNED TO EACH CAR MUST REMAIN THEREWITH EVEN THOUGH UNUSED DURING SOME SHIPMENTS.

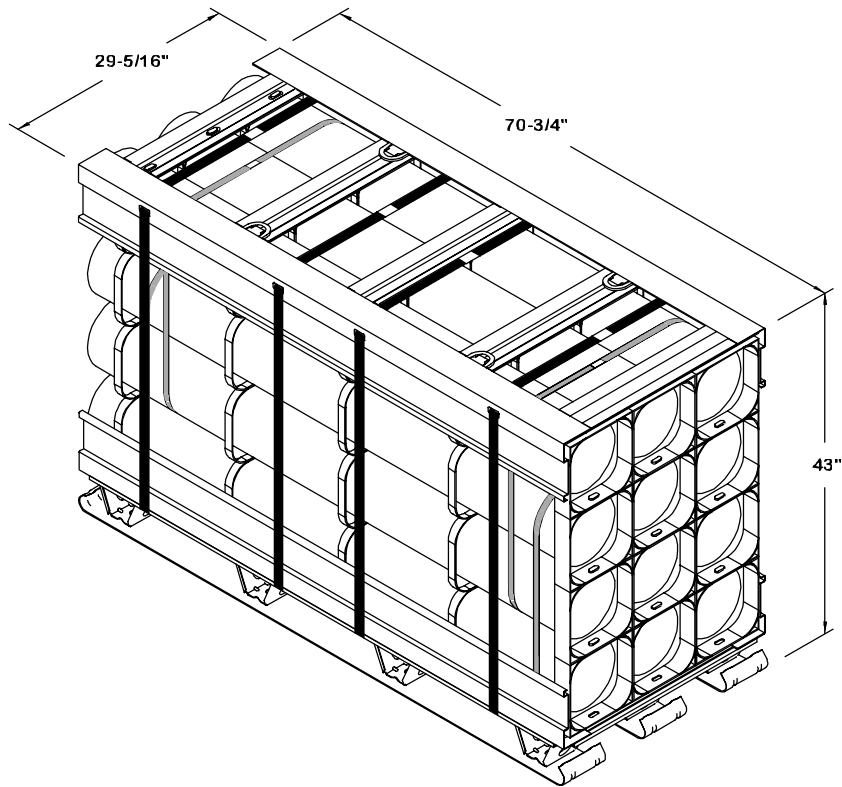
- AA. IN A CAR EQUIPPED WITH ADJUSTABLE WALL MEMBERS, PROVIDING THE FIXED WALL MEMBERS WHICH ARE PRESENT IN SOME "ADJUSTABLE" CARS ARE NOT PROPERLY POSITIONED TO PROVIDE SIDE BEARING SURFACES BETWEEN THE UNITS AND THE CAR SIDEWALLS, ADJUSTABLE WALL MEMBERS (AS REQUIRED) MUST BE INSTALLED TO PROVIDE A MINIMUM OF ONE SURFACE AREA FOR SIDE BEARING AT SOME LOCATION WITHIN THE UPPER HALF OF EACH UNIT.
- BB. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTION WHICH IS IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHOD.

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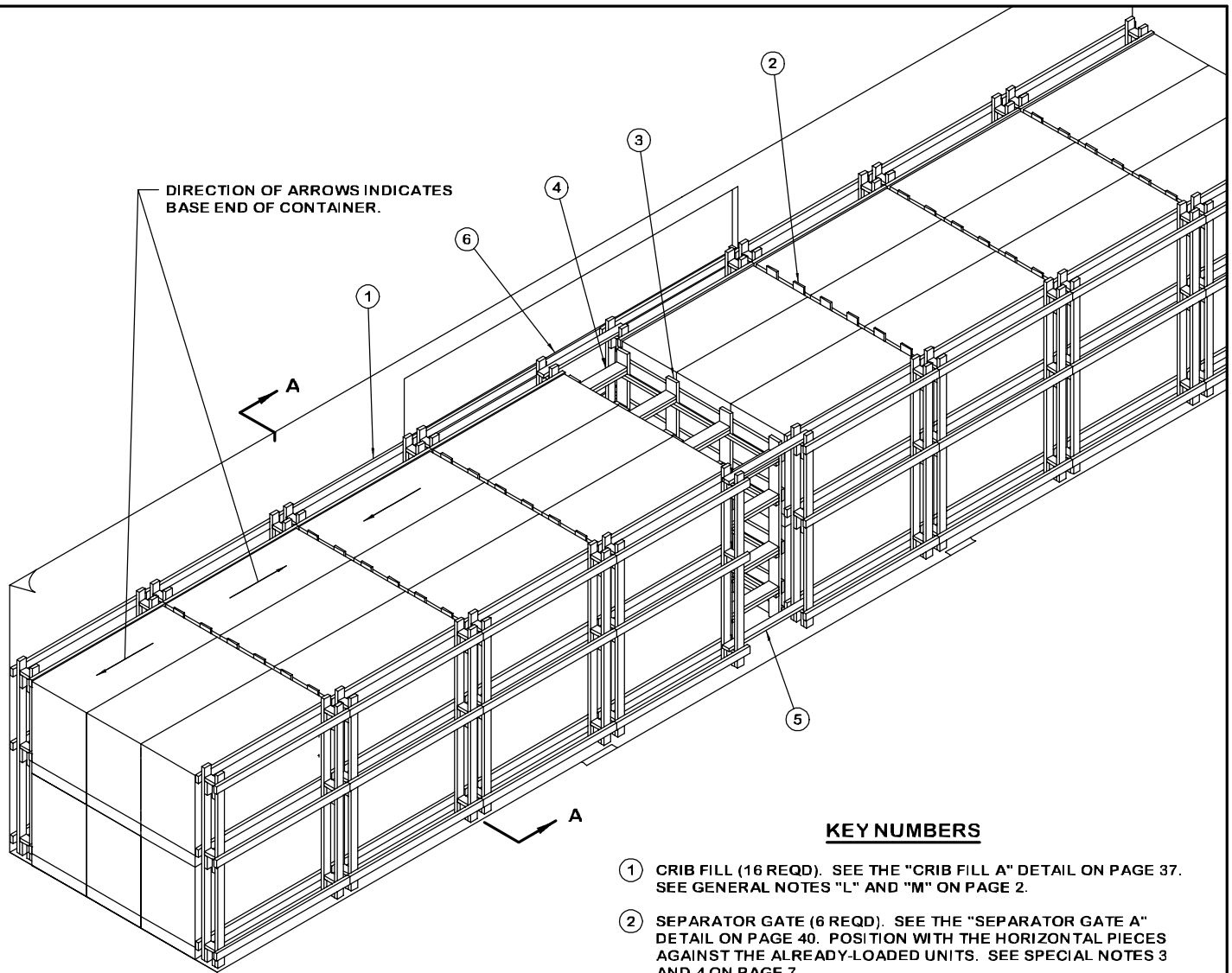
- CC. **CAUTION:** FOR CUSHIONED BOXCARS EQUIPPED WITH LOAD DIVIDER BULKHEADS, ONLY CARS EQUIPPED WITH LOAD DIVIDERS MANUFACTURED BY EVANS, EQUIPCO, OR PRECO MAY BE USED. LOAD DIVIDERS MANUFACTURED BY TRANSCO ARE NOT ACCEPTABLE WHETHER OF ALUMINUM OR STEEL CONSTRUCTION. THE DEPICTED PROCEDURES ARE APPLICABLE FOR CARS OF VARIOUS LENGTHS AND WIDTHS. THE AAR MECHANICAL DESIGNATION CLASS FOR THESE CARS, AS IDENTIFIED IN "THE OFFICIAL RAILWAY EQUIPMENT REGISTER", WILL BE RBL, XL, OR XLI.
- DD. THE USE OF LOAD DIVIDER EQUIPPED CARS WILL ELIMINATE THE NEED FOR CENTER GATES AND STRUTS, AND GATE HOLD DOWNS (WHEN APPLICABLE) WHICH ARE REQUIRED IN CONVENTIONAL BOXCAR LOADS. THIS WILL ACCOUNT FOR A CONSIDERABLE SAVING IN MATERIAL AND LABOR COSTS. THEREFORE, EVERY EFFORT SHOULD BE MADE TO ACQUIRE CUSHIONED CARS EQUIPPED WITH LOAD DIVIDERS FOR SHIPMENT OF ROCKETS. **NOTICE:** ONLY CUSHIONED CARS THAT HAVE SLIDING CENTER SILL TYPE CUSHIONED DEVICES OR END-OF-CAR TYPE DEVICES WHICH HAVE AT LEAST 15" OF TRAVEL ARE ACCEPTABLE.
- EE. IF NAILING TO A CAR SIDEWALL IS NOT REQUIRED, BOXCARS EQUIPPED WITH ADJUSTABLE SIDE FILLERS THAT HAVE 3/8" OR THICKER PANELS MAY BE USED, HOWEVER, THESE SIDE FILLERS MUST NOT BE USED FOR LATERAL BLOCKING; THEY MUST BE RETRACTED AND LOCKED AGAINST THE CAR SIDEWALL. A "FILL PIECE" MUST BE INSTALLED IN THE VOID BETWEEN THE CAR SIDEWALL AND THE SIDE FILLER PANEL. SEE THE "TYPICAL TYPE A" VIEW ON PAGE 49 FOR GUIDANCE. IF THE BACK OF THE SIDE FILLER PANELS ARE REINFORCED WITH VERTICAL AND HORIZONTAL STEEL MEMBERS AS SHOWN IN THE "TYPICAL TYPE B" VIEW ON PAGE 49, THE "FILL PIECE" MATERIAL IS NOT REQUIRED.
- FF. **NOTICE:** AFTER THE LOAD DIVIDER BULKHEADS ARE POSITIONED AGAINST THE LADING, AND THE LOCKING PINS ARE ENGAGED IN THE HOLES OF THE RAILS, THE LOWER LOCKING PINS MUST BE INSPECTED TO ENSURE THAT THE PINS ARE FULLY ENGAGED IN THE LOCKING HOLES. IF THE PINS ARE NOT FULLY SEATED IN THE LOCKING HOLES, THE LINKAGE MECHANISM WILL BE ADJUSTED AS REQUIRED SO THAT THE PINS WILL BE FULLY SEATED INTO THE LOCKING HOLES OF THE LOWER RAILS. IF PRESENT, DEBRIS MUST BE REMOVED FROM BENEATH THE LOCKING HOLES WHICH HAVE BEEN SELECTED FOR SECURING A LOAD DIVIDER BULKHEAD.
- GG. A "STRUT ASSEMBLY" MUST BE INSTALLED BETWEEN THE LOAD DIVIDER BULKHEADS IF THE CAR CONTAINS HAZARD CLASS AND DIVISION 1.1, 1.2, OR 1.3 EXPLOSIVES AND THE LOAD IN EITHER END OF THE CAR WEIGHS 50,000 POUNDS OR MORE. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF HAZARD CLASS AND DIVISION 1.4 EXPLOSIVES. NOTE THAT THE STRUT ASSEMBLY MAY BE OMITTED FROM LOADS OF HAZARD CLASS AND DIVISION 1.1, 1.2, OR 1.3 EXPLOSIVES WEIGHING 50,000 POUNDS WHEN THE LADING AND ADEQUATE BLOCKING AND BRACING ARE POSITIONED TO COMPLETELY FILL THE SPACE BETWEEN THE INSTALLED BULKHEADS AS SPECIFIED IN GENERAL NOTE "HH-2" BELOW. DETAILS OF STRUT ASSEMBLIES FOR USE BETWEEN 2-PIECE BULKHEADS AND BETWEEN 1-PIECE BULKHEADS ARE SHOWN ON PAGE 48.
- HH. THE NORMAL LOADING PATTERN IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS IS TO POSITION THE LADING BETWEEN A CAR ENDWALL AND A LOAD DIVIDER BULKHEAD IN FULL LAYERS. OBVIOUSLY, A LOAD QUANTITY MUST THEN BE A MULTIPLE OF THE NUMBER OF PALLET UNITS WHICH ARE IN ONE LOAD UNIT. A LOAD UNIT IS DEFINED AS A STACK OF CONTAINERS WHICH IS FULL CAR WIDTH BY FULL LOAD HEIGHT BY ONE UNIT IN LENGTH. IF THE QUANTITY TO BE SHIPPED CANNOT BE ATTAINED BY ADJUSTING THE NUMBER OF TIERS IN ONE OR BOTH ENDS OF A CAR, OR BY ADJUSTING THE NUMBER OF LOAD UNITS IN EITHER END OF THE CAR, ONE OF THE FOLLOWING PROCEDURES MUST BE USED IN ORDER TO OBTAIN THE DESIRED QUANTITY.
1. THE "GATES AND STRUTS" METHOD OF OMITTING A PALLET UNIT MAY BE USED TO ADJUST A LOAD QUANTITY DOWNWARD BY OTHER THAN A MULTIPLE OF A LOAD UNIT. SEE THE PROCEDURES ON PAGE 18 FOR GUIDANCE.
 2. AT LOCATION(S) WHERE K-BRACES MIGHT NORMALLY BE USED IN A LOAD IN A CONVENTIONAL CAR, LOAD DIVIDER BULKHEADS CAN BE POSITIONED. LOADING CAN THEN CONTINUE TOWARD THE CENTER OF THE CAR FROM EACH INSTALLED LOAD DIVIDER BULKHEAD IN A ONE-HIGH LOADING PATTERN. INSTALL CENTER GATES AND STRUTS AS SHOWN ON PAGE 16 OF THE CONVENTIONAL BOXCAR DRAWING HEREIN TO PROVIDE FOR A TIGHT LOAD BETWEEN THE BULKHEADS.
 3. ONE OR MORE UNITS CAN BE POSITIONED IN CONTACT WITH A LOAD DIVIDER BULKHEAD ON THE CENTER-OF-CAR SIDE. BLOCK AND BRACE WITH LCL BRACES AS SHOWN ON PAGE 32 OR WITH KNEE BRACE ASSEMBLIES, AS SHOWN ON PAGE 26, OR WITH GATES AND STRUTS AS SHOWN ON PAGE 16.
- JJ. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTION WHICH IS IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHOD.

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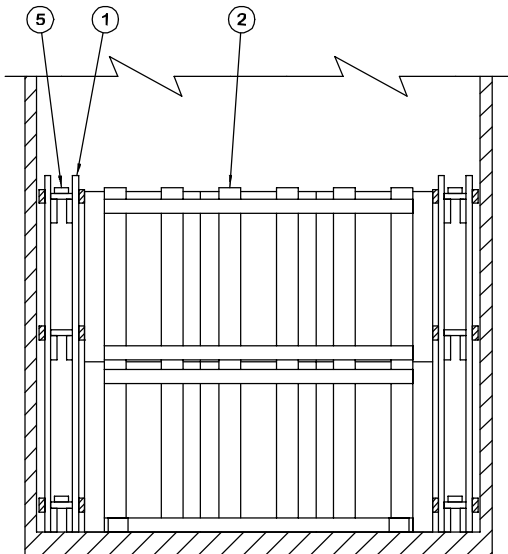
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PALLET UNIT



ISOMETRIC VIEW



SECTION A-A

KEY NUMBERS

- ① CRIB FILL (16 REQD). SEE THE "CRIB FILL A" DETAIL ON PAGE 37. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ② SEPARATOR GATE (6 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 40. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 3 AND 4 ON PAGE 7.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 39. SEE SPECIAL NOTE 5 ON PAGE 7.
- ④ STRUT, 2" X 6" BY CUT-TO-FIT (REF: 25") (DOUBLED) (16 REQD). LAMINATE W/1-10d NAIL EVERY 6". TOENAIL THE TOP PIECE TO THE VERTICAL PIECE OF THE CENTER GATE, PIECE MARKED ③, W/2-12d NAILS AT EACH END.
- ⑤ CRIB FILL RETAINER, 2" X 4" BY A LENGTH TO SUIT (REF: 45") (4 REQD). POSITION TO SPAN THE UPPER AND LOWER STRUTS OF THE LONGITUDINALLY ADJACENT CRIB FILL "A" ASSEMBLIES AT THE CENTER OF THE CAR AND NAIL TO EACH STRUT W/3-10d NAILS AT EACH END.
- ⑥ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION A" DETAIL ON PAGE 41. NAIL TO THE DOORPOSTS W/12d NAILS. SEE SPECIAL NOTE 5 ON PAGE 7.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-4" WIDE WOOD-LINED CONVENTIONAL TYPE BOXCAR EQUIPPED WITH 15'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.
2. A MAXIMUM OF 36 UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 73,044 POUNDS, CAN BE PLACED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES; 54 UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 109,566 POUNDS, CAN BE LOADED IN A 60'-8" LONG CAR.
3. TO FACILITATE POSITIONING OF THE PALLET UNITS AS LOADING PROGRESSES, POSITION PALLET UNIT STACKS AGAINST THE END-WALL, THEN POSITION A SEPARATOR GATE, SHOWN AS PIECE MARKED (2), SO THAT THE 1" X 4" HORIZONTAL PIECES ARE LOCATED AGAINST THE ALREADY LOADED UNITS.
4. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLY-WOOD IN LIEU OF DIMENSIONAL LUMBER, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 40 FOR CONSTRUCTION GUIDANCE.
5. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED (8) IN THE LOAD ON PAGE 6, IS APPLICABLE FOR BOXCARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 46 AND 47 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, NAILED FLOORLINE BLOCKING AND LOAD BUNDLING STRAPS MUST BE USED. SEE THE PROCEDURES USED ON PAGES 14 AND 15 FOR GUIDANCE.
6. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF SIX UNITS, OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF THREE UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. NOTE THAT VERTICAL AND HORIZONTAL STRUT BRACING WILL BE REQUIRED WHEN OMITTING ONE LOAD UNIT FROM THE DEPICTED LOAD. ALSO, THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING THE LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGE 18 AND PAGES 26 THROUGH 32 FOR GUIDANCE.
7. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 33 FOR SHIPPING GUIDANCE.
8. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 36 FOR GUIDANCE.

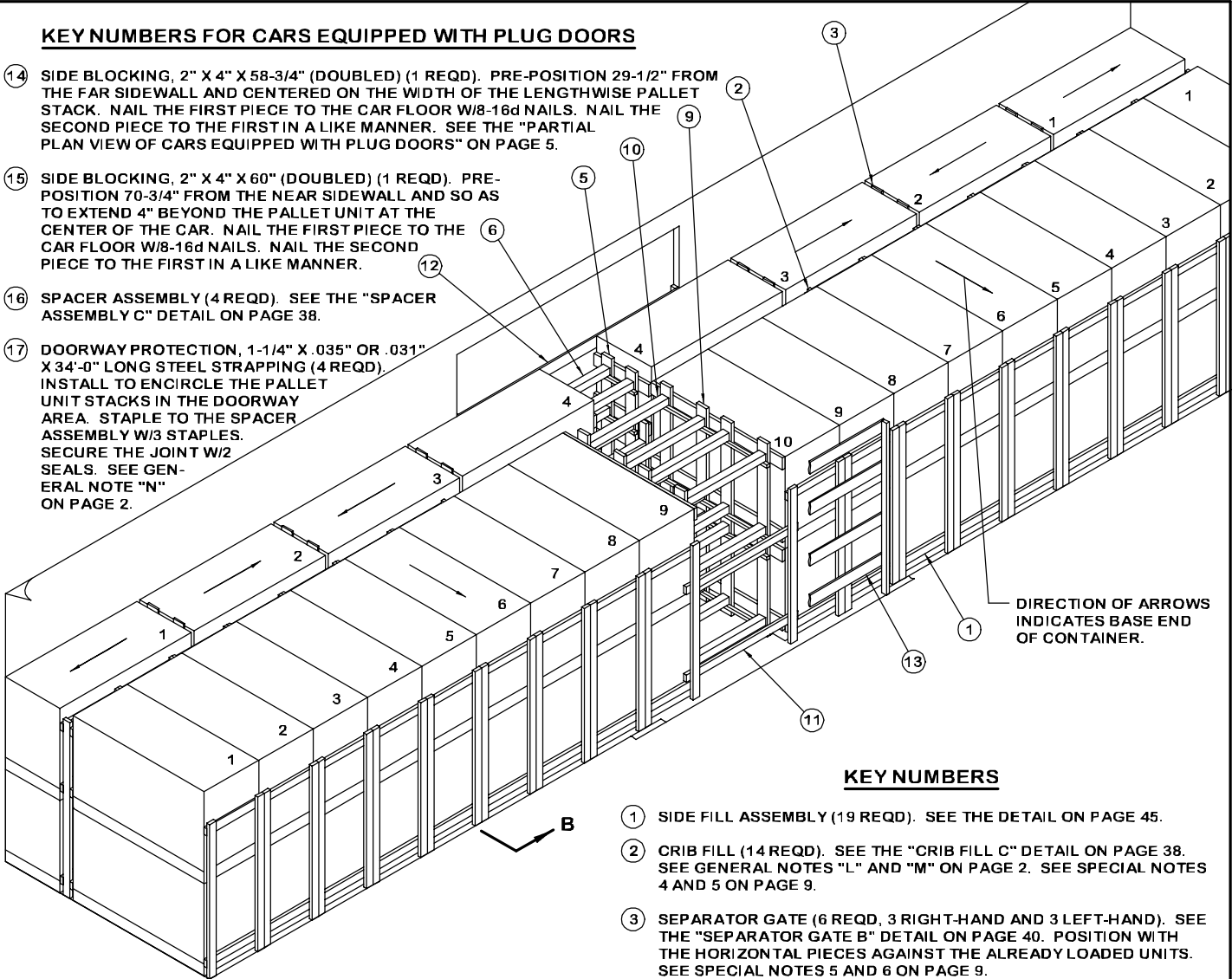
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	156	52
1" X 6"	381	191
2" X 2"	59	20
2" X 3"	29	15
2" X 4"	1,225	817
2" X 6"	192	192
NAILS	NO. REQD	POUNDS
6d (2")	480	3
10d (3")	1,680	26
12d (3-1/4")	92	1-3/4

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT -----	48 -----	97,392 LBS
DUNNAGE -----		2,605 LBS
TOTAL WEIGHT -----		99,997 LBS (APPROX)

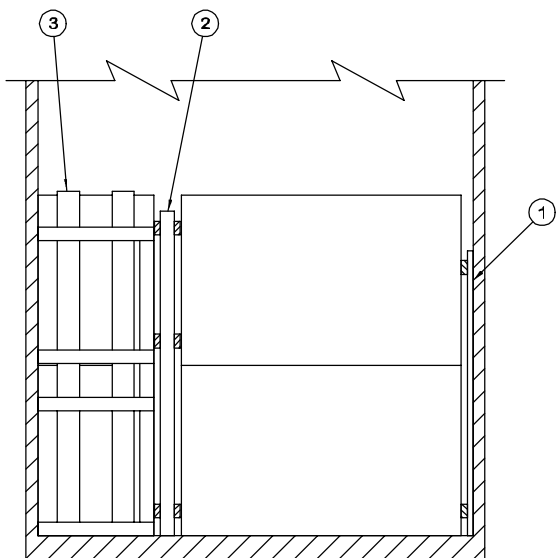
KEY NUMBERS FOR CARS EQUIPPED WITH PLUG DOORS

- ⑭ SIDE BLOCKING, 2" X 4" X 58-3/4" (DOUBLED) (1 REQD). PRE-POSITION 29-1/2" FROM THE FAR SIDEWALL AND CENTERED ON THE WIDTH OF THE LENGTHWISE PALLET STACK. NAIL THE FIRST PIECE TO THE CAR FLOOR W/8-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE THE "PARTIAL PLAN VIEW OF CARS EQUIPPED WITH PLUG DOORS" ON PAGE 5.
- ⑮ SIDE BLOCKING, 2" X 4" X 60" (DOUBLED) (1 REQD). PRE-POSITION 70-3/4" FROM THE NEAR SIDEWALL AND SO AS TO EXTEND 4" BEYOND THE PALLET UNIT AT THE CENTER OF THE CAR. NAIL THE FIRST PIECE TO THE CAR FLOOR W/8-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ⑯ SPACER ASSEMBLY (4 REQD). SEE THE "SPACER ASSEMBLY C" DETAIL ON PAGE 38.
- ⑰ DOORWAY PROTECTION, 1-1/4" X .035" OR .031" X 34'-0" LONG STEEL STRAPPING (4 REQD). INSTALL TO ENCIRCLE THE PALLET UNIT STACKS IN THE DOORWAY AREA. STAPLE TO THE SPACER ASSEMBLY W/3 STAPLES. SECURE THE JOINT W/2 SEALS. SEE GENERAL NOTE "N" ON PAGE 2.



DIRECTION OF ARROWS INDICATES BASE END OF CONTAINER.

ISOMETRIC VIEW

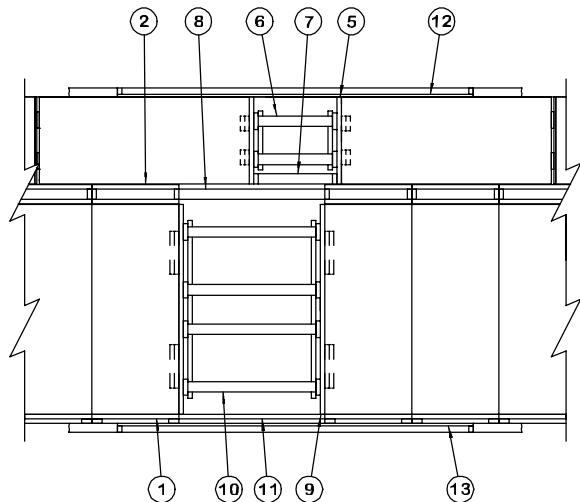


SECTION B-B

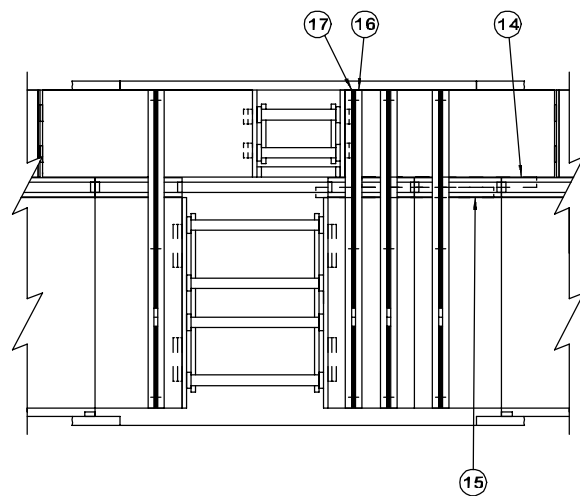
KEY NUMBERS

- ① SIDE FILL ASSEMBLY (19 REQD). SEE THE DETAIL ON PAGE 45.
- ② CRIB FILL (14 REQD). SEE THE "CRIB FILL C" DETAIL ON PAGE 38. SEE GENERAL NOTES "L" AND "M" ON PAGE 2. SEE SPECIAL NOTES 4 AND 5 ON PAGE 9.
- ③ SEPARATOR GATE (6 REQD, 3 RIGHT-HAND AND 3 LEFT-HAND). SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 40. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY LOADED UNITS. SEE SPECIAL NOTES 5 AND 6 ON PAGE 9.
- ④ CRIB FILL (5 REQD). SEE THE "CRIB FILL D" DETAIL ON PAGE 38. SEE SPECIAL NOTE 8 ON PAGE 9.
- ⑤ CENTER GATE (2 REQD, 1 RIGHT-HAND AND 1 LEFT-HAND). SEE THE "CENTER GATE B" DETAIL ON PAGE 39. SEE SPECIAL NOTE 8 ON PAGE 9.
- ⑥ STRUT, 4" X 4" BY CUT-TO-FIT (REF: 25") (8 REQD). TOENAIL TO PIECES MARKED ⑤ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "V" AND "W" ON PAGE 3.
- ⑦ STRUT, 2" X 4" BY CUT-TO-FIT (REF: 25") (2 REQD). TOENAIL TO THE STOP PIECES OF PIECE MARKED ⑤ W/2-12d NAILS AT EACH END.
- ⑧ CRIB FILL RETAINER, 2" X 4" BY A LENGTH TO SUIT (REF: 49"). (2 REQD). TOENAIL TO THE STRUT LEDGERS ON THE MODIFIED CRIB FILL "C" ASSEMBLIES AT THE CENTER OF THE CAR W/2-12d NAILS AT EACH END.
- ⑨ CENTER GATE (2 REQD, 1 RIGHT-HAND AND 1 LEFT-HAND). SEE THE "CENTER GATE C" DETAIL ON PAGE 39.
- ⑩ STRUT, 4" X 4" BY CUT-TO-FIT (REF: 43") (16 REQD). TOENAIL TO PIECES MARKED ⑨ W/2-16d NAILS AT EACH END.
- ⑪ SIDE FILL ASSEMBLY RETAINER, 2" X 4" BY A LENGTH TO SUIT (REF: 60") (2 REQD). POSITION AT 12" AND 53" ABOVE THE CAR FLOOR AND SECURE BY NAILING THRU THE VERTICAL PIECES OF PIECE MARKED ① W/3-10d NAILS AT EACH JOINT.
- ⑫ DOORWAY PROTECTION (1 REQD). SEE THE "DOORWAY PROTECTION A" DETAIL ON PAGE 41. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 10 ON PAGE 9.
- ⑬ DOORWAY PROTECTION (1 REQD). SEE THE "DOORWAY PROTECTION B" DETAIL ON PAGE 41. NAIL TO THE DOOR POSTS W/12d NAILS.

SPECIAL NOTES:



PARTIAL PLAN VIEW OF CAR EQUIPPED WITH SLIDING DOORS



PARTIAL PLAN VIEW OF CAR EQUIPPED WITH PLUG DOORS

(SPECIAL NOTES CONTINUED)

11. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 33 OR 34 FOR GUIDANCE.
12. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS ON PAGE 36 FOR GUIDANCE.

1. A 50'-6" LONG BY 9'-2" CONVENTIONAL TYPE BOXCAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING NARROWER OR WIDER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.
2. IF DESIRED IN CARS WITH NAILABLE SIDEWALLS, DOUBLED 2" X 4" MATERIAL MAY BE USED IN LIEU OF THE SIDE FILL ASSEMBLIES, PIECES MARKED (1), FROM THE END OF THE CAR TO THE DOORWAY. THE LENGTH OF THE SIDE FILL SHOULD BE SUCH THAT IT WILL CONTACT ALL PALLET UNIT STACKS WHICH DO NOT EXTEND INTO THE DOORWAY. RANDOM LENGTH MATERIAL MAY BE USED. THE SIDE FILL WILL BE INSTALLED AT THE HEIGHTS OF THE HORIZONTAL PIECES OF THE SIDE FILL ASSEMBLY. NAIL THE FIRST PIECE TO THE CAR SIDEWALL W/1-10d NAIL EVERY 24". LAMINATE THE SECOND PIECE IN A LIKE MANNER.
3. IN CARS WITH PLUG DOORS, ELIMINATE THE SIDE FILL ASSEMBLIES IN THE DOORWAY AREA AND THE SIDE FILL ASSEMBLY RETAINER, PIECE MARKED (1).
4. THE SEPARATOR GATES, SHOWN AS PIECE MARKED (3) IN THE LOAD ON PAGE 8, ARE DESIGNATED "RIGHT-HAND" AND "LEFT-HAND" TO FACILITATE POSITIONING OF THE PALLET UNITS AS LOADING PROGRESSES. WHEN LOADING THE CAR, POSITION A PALLET UNIT STACK AGAINST THE ENDWALL, THEN POSITION A SEPARATOR GATE SO THE HORIZONTAL PIECES CONTACT THE ALREADY LOADED CONTAINER. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.
5. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLYWOOD IN LIEU OF DIMENSIONAL LUMBER, IF DESIRED. SEE THE ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 40 FOR CONSTRUCTION GUIDANCE.
6. SEPARATOR GATES IN THE DOORWAY OR WITHIN 6" OF BEING IN THE DOORWAY OF A CAR EQUIPPED WITH SLIDING DOORS MUST BE WIRE TIED TO AN HORIZONTAL PIECE OF THE ADJACENT CRIB FILL, PIECE MARKED (4), TO PREVENT DISPLACEMENT.
7. NOTE THAT THE CRIB FILL USED IN THE CENTER OF THE CAR MUST HAVE STRUT LEDGERS ADDED TO IT AS SHOWN BY THE PHANTOM LINES ON THE DETAIL SHOWN ON PAGE 38 SO AS TO BE ABLE TO INSTALL THE CRIB FILL RETAINER, PIECE MARKED (8).
8. CENTER GATES "B" AND "C" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD, IF DESIRED, IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE" DETAIL ON PAGE 44 FOR GUIDANCE.
9. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE HALF OR MORE OF THE STACK WIDTH OR LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECES MARKED (2) AND (3) IN THE LOAD ON PAGE 8, IS APPLICABLE FOR BOXCARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 46 AND 47 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED. SEE THE "PARTIAL PLAN VIEW OF CAR EQUIPPED WITH PLUG DOORS" FOR GUIDANCE. NOTE THAT THE VERTICAL PIECES OF THE CRIB FILL, PIECE MARKED (4), IN THE DOORWAY MUST HAVE 3" CUT OFF THE BOTTOM END OF SOME OF THE PIECES SO THE CRIB WILL REST EVENLY ON THE NAILED SIDE BLOCKING. NOTE: TWO DOORWAY PROTECTION STRAPS ARE REQUIRED FOR EACH PALLET STACK WHICH IS COMPLETELY WITHIN THE DOORWAY AREA OR WHICH IS NOT RETAINED BY AT LEAST 6" OF CAR SIDEWALL. ONE DOORWAY PROTECTION STRAP IS REQUIRED FOR EACH PALLET STACK WHICH IS RETAINED BY FROM 6" TO ONE-HALF THE STACK LENGTH OR WIDTH.
10. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED. THE LOAD CAN BE REDUCED BY ONE PALLET UNIT BY EMPLOYING THE PROCEDURES SHOWN ON PAGES 18 OR 19. THE LOAD CAN BE REDUCED BY TWO PALLET UNITS BY OMITTING THE CROSSWISE STACK NO. 9. NOTE THAT STRUT BRACING MUST BE APPLIED TO THE STRUTS, PIECES MARKED (10). THE LOAD CAN BE REDUCED BY FOUR PALLETS BY OMITTING ONE STACK OF CROSSWISE UNITS AND ONE STACK OF LENGTHWISE UNITS. STRUT BRACING WILL BE REQUIRED FOR THE STRUTS MARKED (7) AND (10).

(CONTINUED AT LEFT)

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	54	109,566 LBS
DUNNAGE		2,007 LBS

TOTAL WEIGHT ----- 111,573 LBS (APPROX)

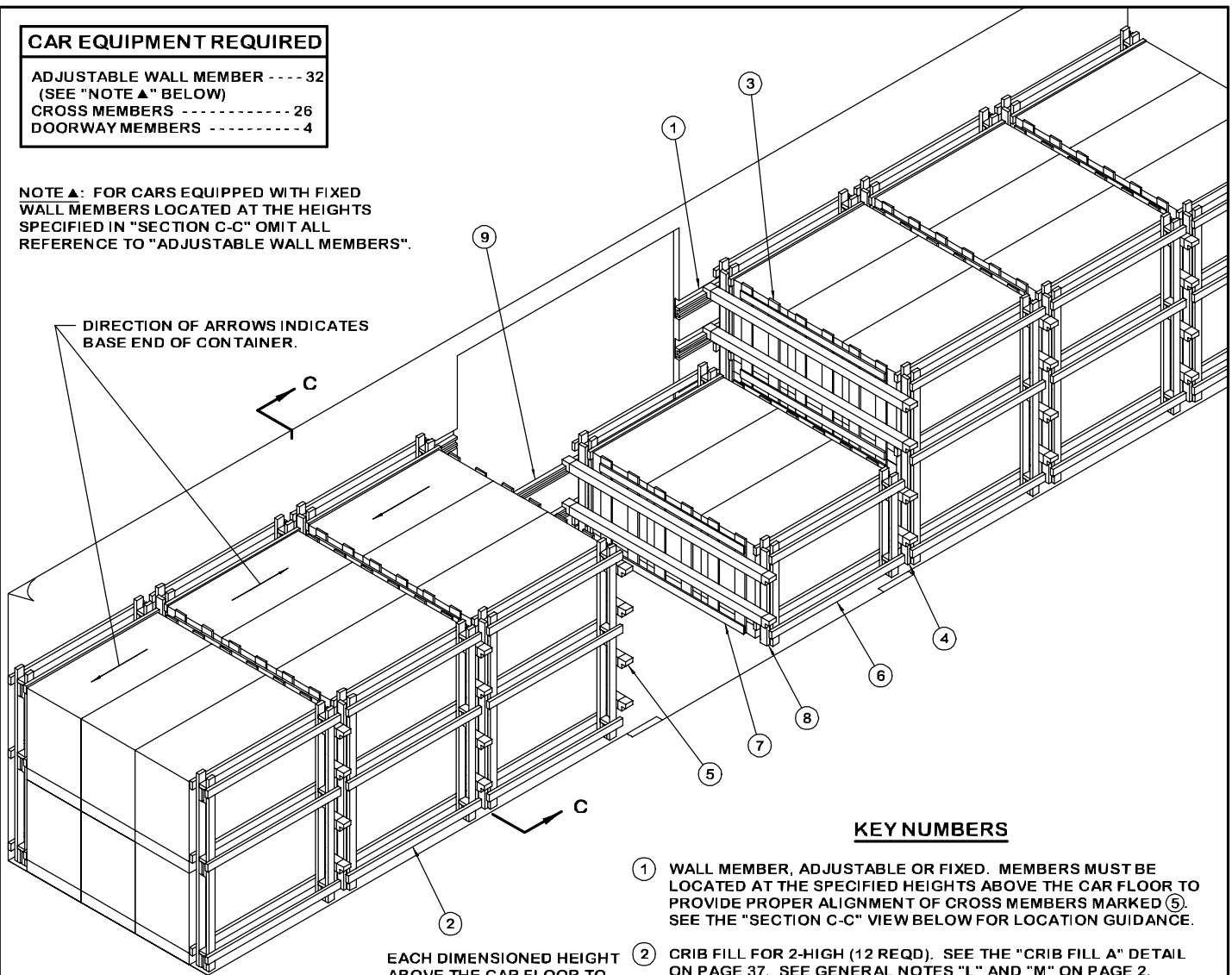
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	98	33
1" X 6"	167	84
2" X 2"	54	18
2" X 3"	39	20
2" X 4"	852	568
2" X 6"	171	171
4" X 4"	75	100
NAILS	NO. REQD	POUNDS
6d (2")	240	1-1/2
10d (3")	924	14-1/4
12d (3-1/4")	52	1
16d (3-1/2")	96	2-1/4

54-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR

CAR EQUIPMENT REQUIRED

ADJUSTABLE WALL MEMBER ---- 32
 (SEE "NOTE ▲" BELOW)
 CROSS MEMBERS ----- 26
 DOORWAY MEMBERS ----- 4

NOTE ▲: FOR CARS EQUIPPED WITH FIXED WALL MEMBERS LOCATED AT THE HEIGHTS SPECIFIED IN "SECTION C-C" OMIT ALL REFERENCE TO "ADJUSTABLE WALL MEMBERS".

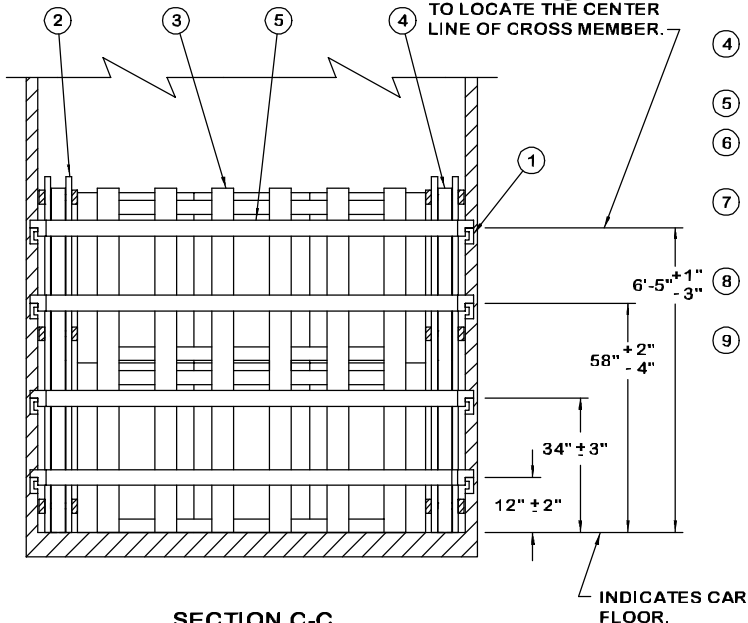


ISOMETRIC VIEW

EACH DIMENSIONED HEIGHT ABOVE THE CAR FLOOR TO AN ADJUSTABLE OR FIXED WALL MEMBER MARKED ① AND/OR A DOORWAY MEMBER MARKED ⑨ IS SPECIFIED TO LOCATE THE CENTER LINE OF CROSS MEMBER.

KEY NUMBERS

- ① WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED ⑤. SEE THE "SECTION C-C" VIEW BELOW FOR LOCATION GUIDANCE.
- ② CRIB FILL FOR 2-HIGH (12 REQD). SEE THE "CRIB FILL A" DETAIL ON PAGE 37. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ③ SEPARATOR GATE FOR 2-HIGH (10 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 40. AS APPLICABLE, POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY LOADED UNITS. SEE SPECIAL NOTES 4 AND 5 ON PAGE 11.
- ④ STOP PIECE FOR 2-HIGH CRIB FILL, 2" X 4" X 7'-3" (20 REQD). SEE SPECIAL NOTE 6 ON PAGE 11.
- ⑤ CROSS MEMBER (26 REQD). SEE GENERAL NOTE "Z" ON PAGE 3.
- ⑥ CRIB FILL FOR 1-HIGH (2 REQD). SEE THE CRIB FILL "B" DETAIL ON PAGE 37.
- ⑦ SEPARATOR GATE FOR 1-HIGH (2 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 40. SEE SPECIAL NOTES 4 AND 5 ON PAGE 11.
- ⑧ STOP PIECE FOR 1-HIGH CRIB FILL, 2" X 4" X 44" (4 REQD). SEE SPECIAL NOTE 6 ON PAGE 11.
- ⑨ DOORWAY MEMBER (4 REQD). SEE THE "SECTION C-C" VIEW AT LEFT FOR LOCATION GUIDANCE. SEE SPECIAL NOTES 2 AND 7 ON PAGE 11.



SECTION C-C

SPECIAL NOTES:

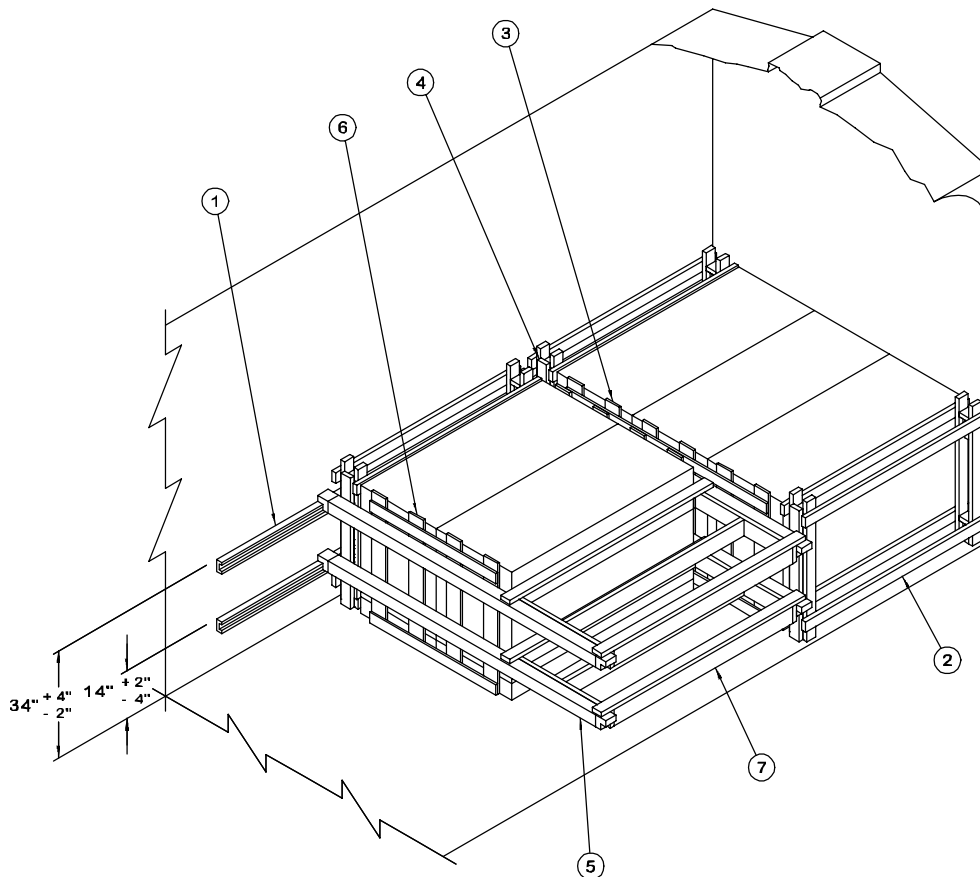
1. A 50'-6" LONG BY 9'-0" WIDE (INSIDE CLEARANCE) WOOD-LINED BOX-CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS, AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.
2. THIRTY-THREE PALLET UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 66,957 POUNDS, CAN BE PLACED IN A 40'-6" LONG CAR. FIFTY-ONE PALLET UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 103,479 POUNDS, CAN BE PLACED IN A 60'-8" LONG CAR HAVING 10'-0" OR NARROWER DOOR OPENINGS.
3. IF A CAR HAS BOWED ENDWALLS WHICH ARE BOWED OUTWARD 2" OR MORE EITHER FROM SIDE-TO-SIDE OR FROM FLOOR-TO-ROOF, CROSS MEMBERS CAN BE INSTALLED NEAR THE ENDWALL OF THE CAR TO PROVIDE A "SQUARED END" RATHER THAN INSTALLING DUNNAGE AS SPECIFIED IN GENERAL NOTE "F" ON PAGE 2. THESE CROSS MEMBERS SHOULD BE INSTALLED AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE LOAD AS BLOCKING MEMBERS. A SEPARATOR GATE, SHOWN AS PIECE MARKED ③, MUST BE POSITIONED AGAINST THESE CROSS MEMBERS PRIOR TO LOADING.
4. SEPARATOR GATES, PIECES MARKED ③ AND ⑦, TO BE POSITIONED AGAINST CROSS MEMBERS PRIOR TO LOADING, SHOULD BE PLACED WITH THE HORIZONTAL PIECES LOCATED ON THE BACK SIDE BETWEEN THE CROSS MEMBERS.
5. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLY-WOOD IN LIEU OF DIMENSIONAL LUMBER, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 40 FOR CONSTRUCTION GUIDANCE.
6. STOP PIECES, PIECES MARKED ④, ARE REQUIRED AT EACH SIDE OF A CROSS MEMBER BLOCKING STATION WHERE THE ADJACENT LOAD IS TWO UNITS HIGH. PIECES MARKED ⑧ ARE REQUIRED WHERE THE LOAD ON THE SIDE OF A CROSS MEMBER BLOCKING STATION IS ONE UNIT HIGH. A STOP PIECE ON THE END-OF-CAR SIDE OF A CROSS MEMBER BLOCKING STATION WILL BE SECURED TO THE ADJACENT CRIB FILL BY ENCIRCLING THE TOP STRUT OF THE CRIB FILL WITH NO. 14 GAGE WIRE AND TWISTING TAUT, AND THEN ENCIRCLING THE TOP OF THE STOP PIECE AND TWISTING TAUT. THE STOP PIECE ON THE CENTER-OF-CAR SIDE OF A CROSS MEMBER BLOCKING STATION WILL BE SECURED TO THE UPPER CROSS MEMBER IN A SIMILAR MANNER, PRIOR TO PLACEMENT OF THE LADING AND THE CRIB FILL.
7. IF THE CAR BEING LOADED IS EQUIPPED WITH AT LEAST EIGHT DOORWAY MEMBERS, AN ADDITIONAL THREE PALLET UNITS CAN BE LOADED IN THE DOORWAY AREA.
8. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A LOAD MAY BE REDUCED BY MULTIPLES OF THREE PALLET UNITS BY OMITTING LATERALLY ADJACENT UNITS FROM THE TOP LAYER OF ONE OR MORE LOAD UNITS, OR BY MULTIPLES OF SIX PALLET UNITS BY OMITTING ONE OR MORE ENTIRE LOAD UNITS. TO REDUCE A LOAD BY ONE PALLET UNIT, REFER TO THE LCL PROCEDURES ON PAGE 12 FOR GUIDANCE.
9. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 36 FOR GUIDANCE

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	312	104
1" X 6"	479	240
2" X 4"	1,158	772
NAILS	NO. REQD	POUNDS
6d (2")	864	5-1/4
10d (3")	1,216	18-3/4
WIRE, NO. 14 GAGE ----- 60' REQD -----		1 LB

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT -----	39 -----	79,131 LBS
DUNNAGE -----		2,257 LBS
TOTAL WEIGHT -----		81,388 LBS (APPROX)



ISOMETRIC VIEW

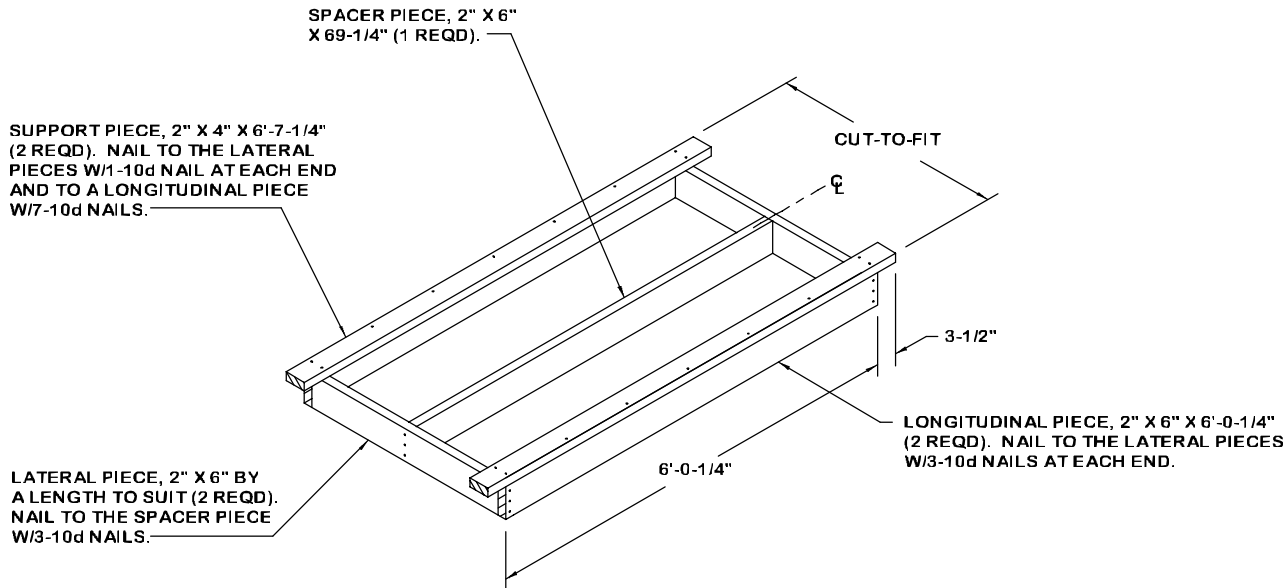
SPECIAL NOTES:

1. A 9'-0" WIDE (INSIDE CLEARANCE) WOOD-LINED BOXCAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.
2. FIVE UNITS ARE SHOWN AS A TYPICAL LOAD QUANTITY. THE NUMBER OF LOAD UNITS CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED.
3. STOP PIECES, PIECE MARKED ④, ARE REQUIRED AT EACH SIDE OF A CROSS MEMBER BLOCKING STATION WHERE THERE IS A CRIB FILL ASSEMBLY TO BE RETAINED. A STOP PIECE ON THE END-OF-CAR SIDE OF A CROSS MEMBER BLOCKING STATION WILL BE SECURED TO THE ADJACENT CRIB FILL BY ENCIRCLING THE TOP STRUT OF THE CRIB FILL WITH NO. 14 GAGE WIRE AND TWISTING TAUT, AND THEN ENCIRCLING THE TOP OF THE STOP PIECE AND TWISTING TAUT. THE STOP PIECE ON THE CENTER-OF-CAR SIDE OF A CROSS MEMBER BLOCKING STATION WILL BE SECURED TO THE UPPER CROSS MEMBER IN A SIMILAR MANNER PRIOR TO PLACEMENT OF THE LADING AND THE CRIB FILL.
4. THE SPACER ASSEMBLIES, PIECE MARKED ⑦, MAY ALSO BE USED IN THE TOP LAYER OF A LOAD FOR THE OMISSION OF A PALLET UNIT. IF THE ASSEMBLIES ARE USED NEXT TO THE CAR ENDWALL IN EITHER A FIRST OR SECOND LAYER, AND THE END WALL IS WOOD-LINED, CUT THE ADJACENT ENDS OFF THE SUPPORT PIECES FLUSH WITH THE LATERAL PIECE. EACH ASSEMBLY CAN THEN BE SUPPORTED BY NAILING THE LATERAL PIECE TO THE CAR ENDWALL W/6-10d NAILS IF OMITTING ONE PALLET UNIT OR W/9-10d NAILS IF OMITTING TWO PALLET UNITS. IF THE ENDWALL IS NON-NAILABLE, CROSS MEMBERS MUST BE INSTALLED AT THE END OF THE LOAD TO SUPPORT THE SPACER ASSEMBLIES. NOTE THAT "SPACER ASSEMBLY B" WILL BE USED WHEN OMITTING TWO PALLET UNITS.

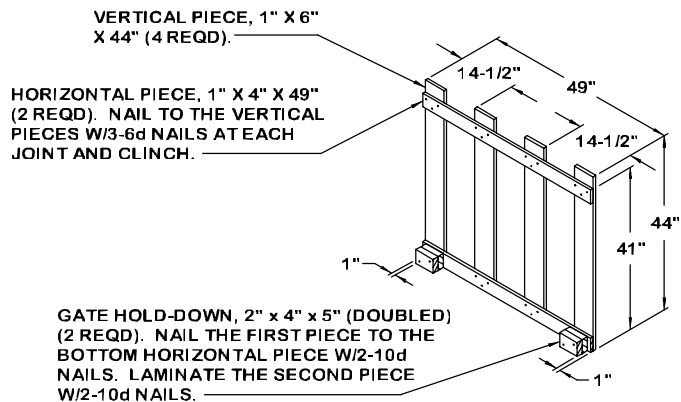
KEY NUMBERS

- ① WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED ⑤.
- ② CRIB FILL (3 REQD). SEE THE "CRIB FILL B" DETAIL ON PAGE 37. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ③ SEPARATOR GATE FOR 1-HIGH BY 3-WIDE (1 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 40. POSITION AS SHOWN WITH THE VERTICAL PIECES AGAINST THE ALREADY LOADED UNITS. SEE SPECIAL NOTES 4 AND 5 ON PAGE 11.
- ④ CRIB FILL STOP PIECE, 2" X 4" X 44" (4 REQD). SEE SPECIAL NOTE 3 AT LEFT.
- ⑤ CROSS MEMBER (4 REQD). SEE GENERAL NOTE "Z" ON PAGE 3.
- ⑥ SEPARATOR GATE FOR 1-HIGH BY 2-WIDE (2 REQD). SEE THE "SEPARATOR GATE C" DETAIL ON PAGE 13.
- ⑦ SPACER ASSEMBLY (2 REQD). SEE THE "SPACER ASSEMBLY A" DETAIL ON PAGE 13. WIRE TIE TO CROSS MEMBER W/2 WRAPS OF NO. 14 GAGE WIRE AT EACH CORNER. SEE SPECIAL NOTE 4 AT LEFT.

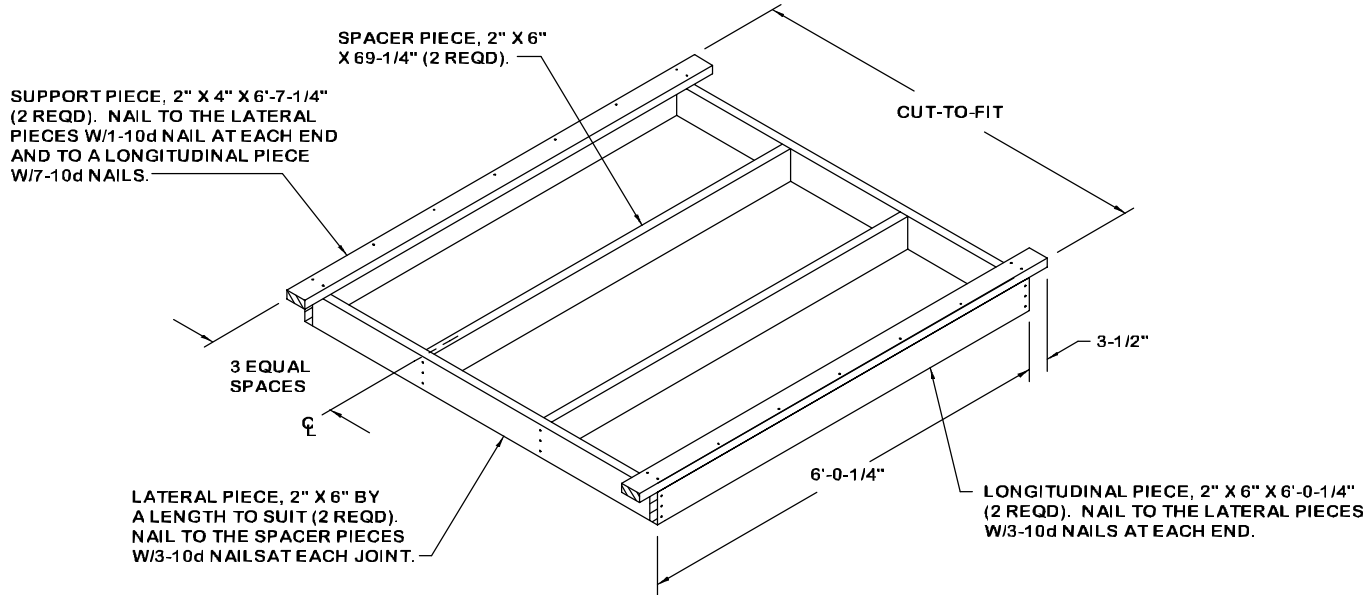
TYPICAL LCL (5-UNIT LOAD) IN A BOXCAR EQUIPPED WITH MECHANICAL BRACING DEVICES HAVING ADJUSTABLE AND/OR FIXED MEMBERS



SPACER ASSEMBLY A
(FOR THE OMISSION OF ONE PALLET UNIT)

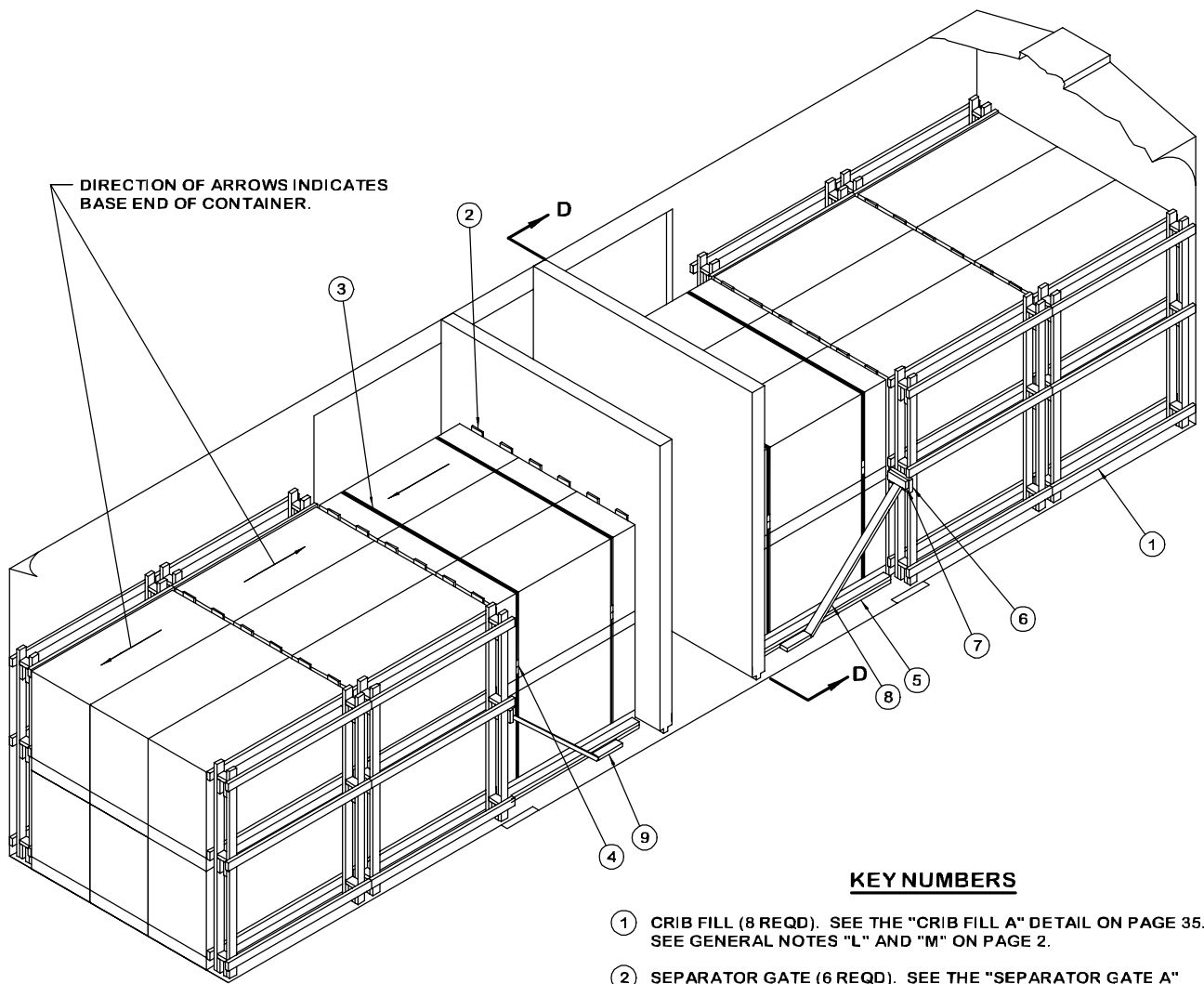


SEPARATOR GATE C



SPACER ASSEMBLY B
(FOR THE OMISSION OF TWO PALLET UNITS)

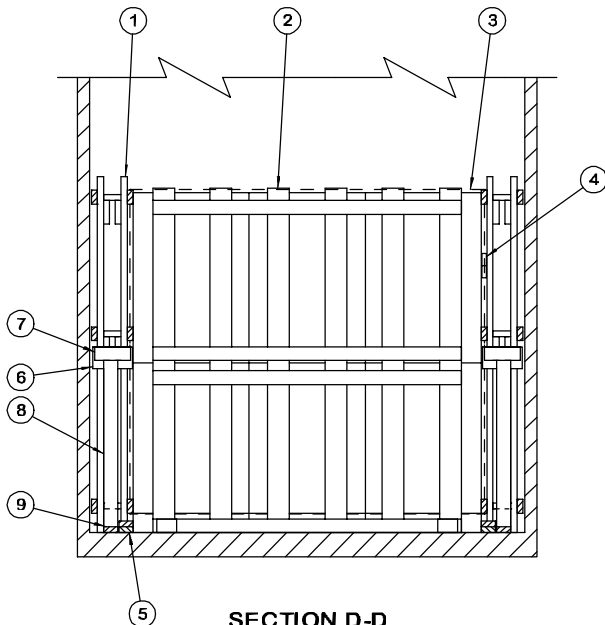
TYPICAL LCL (5-UNIT LOAD) IN A BOXCAR EQUIPPED WITH
MECHANICAL BRACING DEVICES HAVING ADJUSTABLE AND/OR FIXED MEMBERS



ISOMETRIC VIEW

KEY NUMBERS

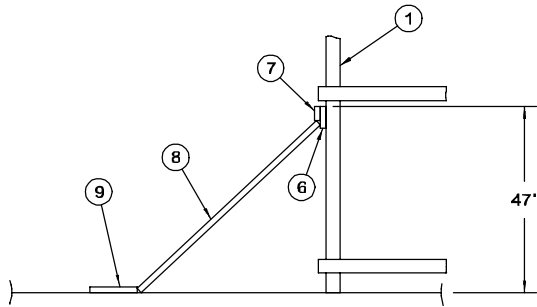
- ① CRIB FILL (8 REQD). SEE THE "CRIB FILL A" DETAIL ON PAGE 35. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ② SEPARATOR GATE (6 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 40. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY LOADED UNITS. SEE SPECIAL NOTES 3 AND 4 ON PAGE 15.
- ③ BUNDLING STRAP, 1-1/4" X .035" OR .031" X 30'-0" LONG STEEL STRAPPING (4 REQD). INSTALL TO ENCIRCLE THE PALLET UNIT STACKS IN THE DOORWAY AREA. SEE SPECIAL NOTE 5 ON PAGE 15.
- ④ SEAL FOR 1-1/4" STRAPPING (8 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "N" ON PAGE 2.
- ⑤ SIDE BLOCKING, 2" X 4" X 68" (DOUBLED) (4 REQD). POSITION AGAINST THE PALLET UNITS IN THE DOORWAY AREA AS SHOWN ABOVE. NAIL THE FIRST PIECE TO THE CAR FLOOR W/1-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 5 ON PAGE 15.
- ⑥ BEARING PIECE, 2" X 6" BY A LENGTH TO SPAN THE VERTICAL PIECES OF THE CRIB FILL, PIECE MARKED ①, PLUS 2" (REF: 10") (4 REQD). SEE THE "HEIGHT PLACEMENT OF CRIB FILL BRACING" DETAIL ON PAGE 15 FOR PLACEMENT GUIDANCE. NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH END.
- ⑦ HOLD-DOWN PIECE, 2" X 4" X 9" (4 REQD). SEE THE "HEIGHT PLACEMENT OF THE CRIB FILL BRACING" DETAIL ON PAGE 15 FOR PLACEMENT GUIDANCE. NAIL TO THE BEARING PIECE, PIECE MARKED ⑥, W/3-10d NAILS.
- ⑧ DIAGONAL BRACE, 2" X 4" X 62" (4 REQD). POSITION AS SHOWN AND NAIL TO THE BEARING PIECE, PIECE MARKED ⑥, AND TO THE CAR FLOOR W/1-16d NAIL AT EACH END.
- ⑨ BACK-UP CLEAT, 2" X 4" X 12" (4 REQD). POSITION ONE END AGAINST THE DIAGONAL BRACE, PIECE MARKED ⑧, AND NAIL TO THE CAR FLOOR W/3-16d NAILS.



SECTION D-D

SPECIAL NOTES:

1. A 40'-6" LONG BY 9'-2" WIDE WOOD-LINED CUSHIONED BOXCAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 15'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING NARROWER OR WIDER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "CC" THROUGH "GG" ON PAGE 4.
2. A LOAD OF 42 UNITS FOR AN APPROXIMATE LADING WEIGHT OF 85,218 POUNDS CAN BE PLACED IN A 50'-6" LONG CAR USING THE PROCEDURES ON PAGE 14. SEE PAGE 16 FOR THE LOADING OF 44 UNITS IN A 50'-6" LONG BOXCAR. A LOAD OF 54 UNITS FOR AN APPROXIMATE LADING WEIGHT OF 109,566 POUNDS CAN BE LOADED IN A 60'-8" LONG CAR USING THE DEPICTED PROCEDURES.
3. TO FACILITATE POSITIONING OF THE PALLET UNITS AS LOADING PROGRESSES, POSITION PALLET UNIT STACKS AGAINST THE END-WALL, THEN POSITION A SEPARATOR GATE, SHOWN AS PIECE MARKED (2), SO THAT THE 1" X 4" HORIZONTAL PIECES ARE LOCATED AGAINST THE ALREADY LOADED UNITS.
4. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLY-WOOD IN LIEU OF DIMENSIONAL LUMBER, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 40 FOR CONSTRUCTION GUIDANCE.
5. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK LENGTH. THE DEPICTED DOORWAY PROTECTION IS APPLICABLE FOR CARS EQUIPPED WITH EITHER SLIDING TYPE OR PLUG TYPE DOORS, OR A COMBINATION THEREOF. IF THE CAR BEING LOADED IS EQUIPPED WITH SLIDING TYPE DOORS, WOODEN DOOR GATES, SHOWN AS PIECE MARKED (6) ON PAGE 6, OR ANY OF THE ALTERNATIVES ON PAGES 46 AND 47, MAY BE USED.
6. A STRUT ASSEMBLY, SHOWN ON PAGE 48 IS REQUIRED BETWEEN THE LOAD DIVIDER BULKHEADS WHEN THE LOAD IN EITHER END OF THE CAR IS 50,000 POUNDS OR MORE.
7. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF SIX UNITS, OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF THREE UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD, OR THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGE 20 AND PAGES 26 THROUGH 32 FOR GUIDANCE.
8. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 33 FOR SHIPPING GUIDANCE.
9. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 36 FOR GUIDANCE.

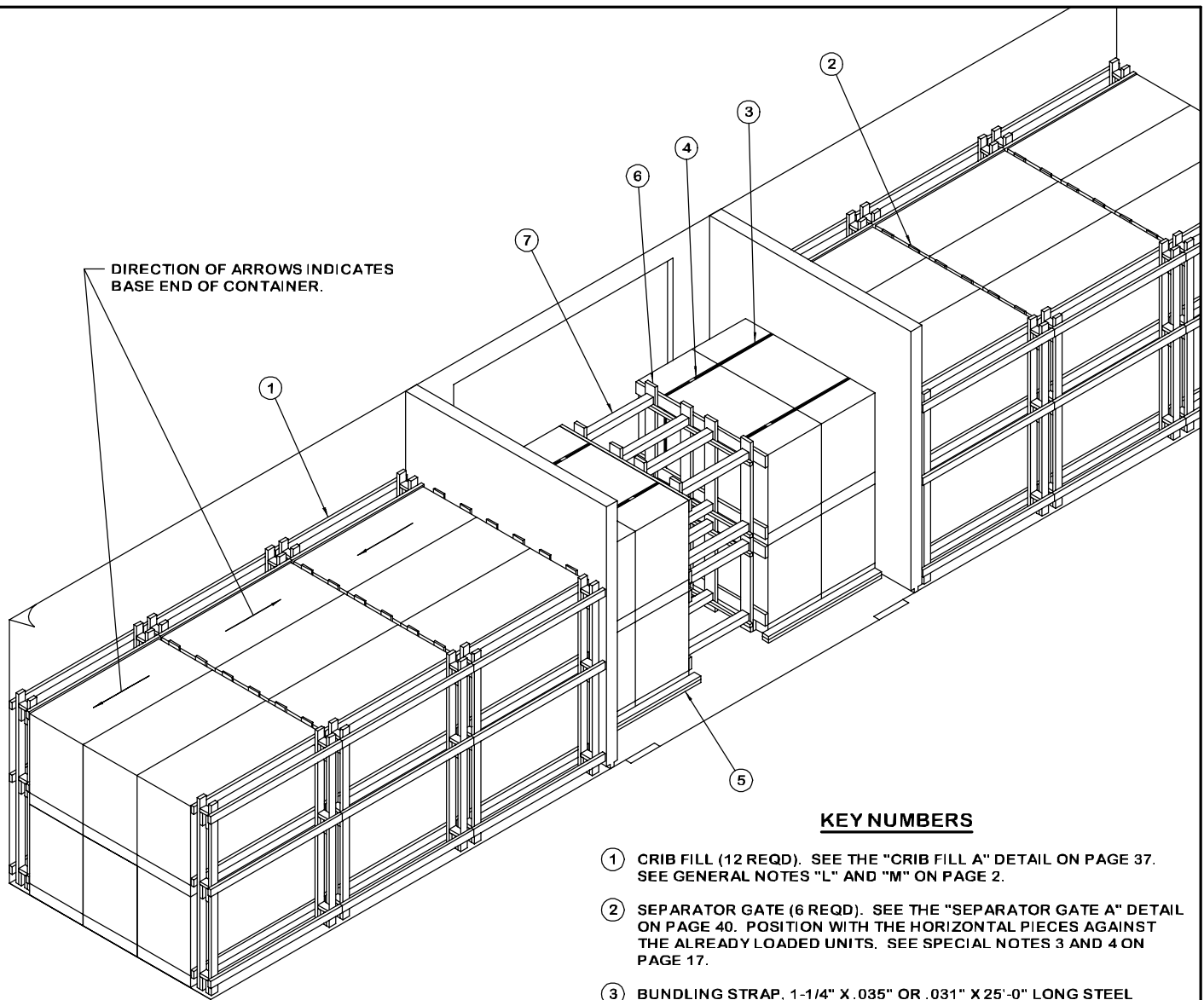


HEIGHT PLACEMENT OF CRIB FILL BRACING

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	156	52
1" X 6"	261	131
2" X 4"	935	637
2" X 6"	4	4
NAILS	NO. REQD	POUNDS
6d (2")	432	2-3/4
10d (3")	748	11-3/4
16d (3-1/2")	108	2-1/2
STEEL STRAPPING, 1-1/4" ---- 120' REQD ----- 17-1/4 LBS		
SEAL FOR 1-1/4" STRAPPING --- 8 REQD ----- 1/2 LB		

LOAD AS SHOWN

<u>ITEM</u>	<u>QUANTITY</u>	<u>WEIGHT (APPROX)</u>
PALLET UNIT -----	36 -----	73,044 LBS
DUNNAGE -----		1,767 LBS
TOTAL WEIGHT -----		74,811 LBS (APPROX)



DIRECTION OF ARROWS INDICATES
BASE END OF CONTAINER.

KEY NUMBERS

- ① CRIB FILL (12 REQD). SEE THE "CRIB FILL A" DETAIL ON PAGE 37. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ② SEPARATOR GATE (6 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 40. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY LOADED UNITS. SEE SPECIAL NOTES 3 AND 4 ON PAGE 17.
- ③ BUNDLING STRAP, 1-1/4" X .035" OR .031" X 25'-0" LONG STEEL STRAPPING (4 REQD). INSTALL TO ENCIRCLE THE PALLET UNIT STACKS IN THE DOORWAY AREA. SEE SPECIAL NOTE 5 ON PAGE 17.
- ④ SEAL FOR 1-1/4" STRAPPING (8 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "N" ON PAGE 2.
- ⑤ SIDE BLOCKING, 2" X 4" BY LOAD LENGTH PLUS 3" (REF: 61-5/8"). POSITION AGAINST THE PALLET UNITS IN THE DOORWAY AREA AS SHOWN ABOVE. NAIL THE FIRST PIECE TO THE CAR FLOOR W/1-16d NAIL EVERY 8". NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 5 ON PAGE 17.
- ⑥ CENTER GATE (2 REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 39. SEE SPECIAL NOTE 6 ON PAGE 17.
- ⑦ STRUT, 4" X 4" BY CUT-TO-FIT (REF: 37-1/4") (16 REQD). TOENAIL TO PIECE MARKED ⑥ W/2-16d NAILS AT EACH END.

SPECIAL NOTES:

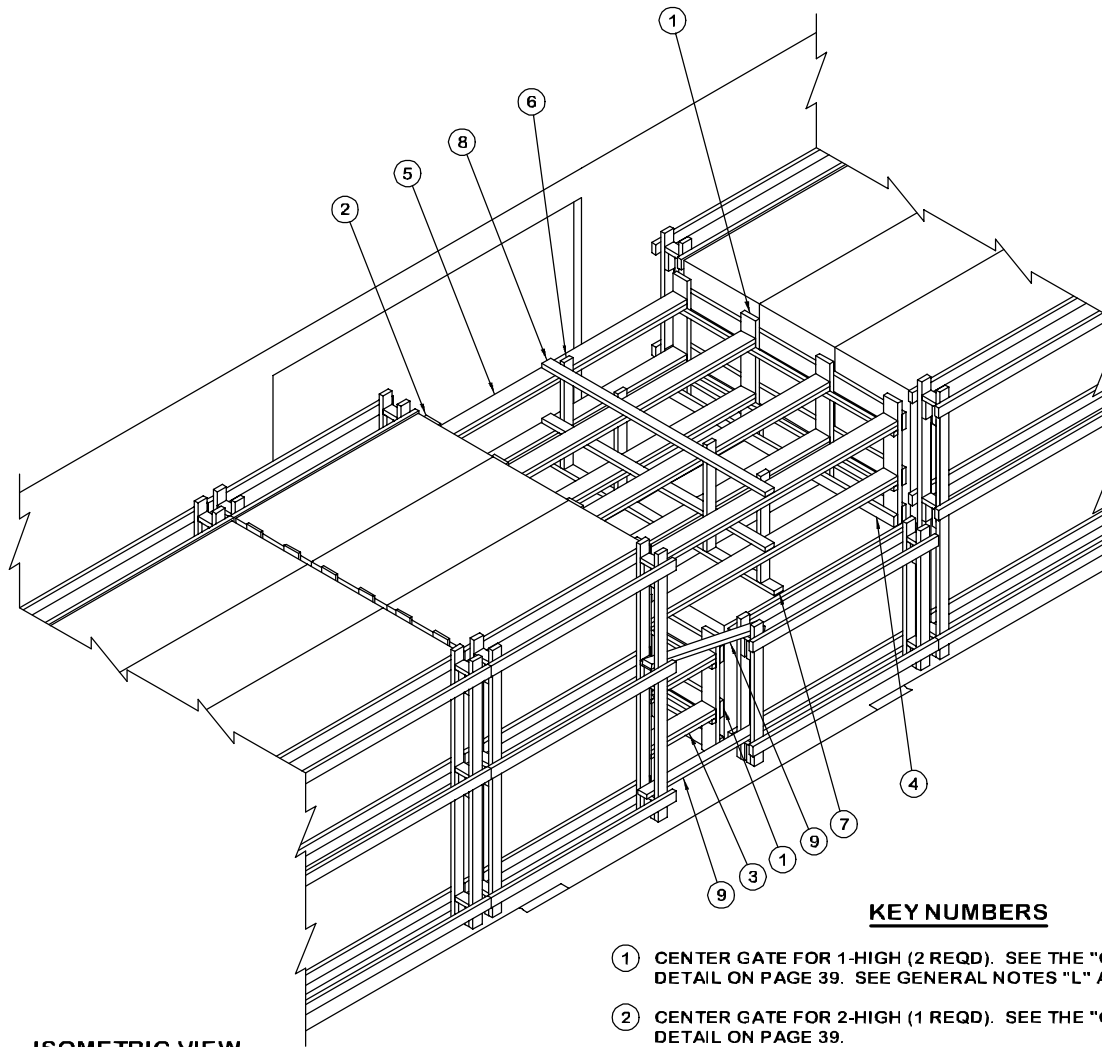
1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CUSHIONED BOXCAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING NARROWER OR WIDER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "CC" THROUGH "GG" ON PAGE 4.
2. A LOAD OF 34 UNITS FOR AN APPROXIMATE LADING WEIGHT OF 68,986 POUNDS CAN BE PLACED IN A 40'-6" LONG CAR USING THE PROCEDURES ON PAGE 16. A LOAD OF 54 UNITS FOR AN APPROXIMATE LADING WEIGHT OF 109,566 POUNDS CAN BE LOADED IN A 60'-8" LONG CAR USING THE DEPICTED PROCEDURES.
3. TO FACILITATE POSITIONING OF THE PALLET UNITS AS LOADING PROGRESSES, POSITION PALLET UNIT STACKS AGAINST THE END-WALL, THEN POSITION A SEPARATOR GATE, SHOWN AS PIECE MARKED (2), SO THAT THE 1" X 4" HORIZONTAL PIECES ARE LOCATED AGAINST THE ALREADY LOADED UNITS.
4. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLY-WOOD IN LIEU OF DIMENSIONAL LUMBER, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 40 FOR CONSTRUCTION GUIDANCE.
5. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK LENGTH. THE DEPICTED DOORWAY PROTECTION IS APPLICABLE FOR CARS EQUIPPED WITH EITHER SLIDING TYPE OR PLUG TYPE DOORS, OR A COMBINATION THEREOF. IF THE CAR BEING LOADED IS EQUIPPED WITH SLIDING TYPE DOORS, WOODEN DOOR GATES, SHOWN AS PIECE MARKED (6) ON PAGE 6, OR ANY OF THE ALTERNATIVES ON PAGES 46 AND 47, MAY BE USED.
6. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF SIX UNITS, OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF THREE UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD, OR THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGE 20 AND PAGES 26 THROUGH 32 FOR GUIDANCE.
7. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 33 FOR SHIPPING GUIDANCE.
8. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 36 FOR GUIDANCE.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	156	52
1" X 6"	261	131
2" X 2"	40	14
2" X 4"	935	637
2" X 6"	117	117
4" X 4"	50	67
NAILS	NO. REQD	POUNDS
6d (2")	432	2-3/4
10d (3")	1,272	19-9/4
16d (3-1/2")	128	2-1/4
STEEL STRAPPING, 1-1/4" ---- 100' REQD ----- 14-1/2 LBS		
SEAL FOR 1-1/4" STRAPPING --- 8 REQD ----- 1/2 LB		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT -----	44 -----	89,276 LBS
DUNNAGE -----		2,076 LBS
TOTAL WEIGHT -----		91,352 LBS (APPROX)



ISOMETRIC VIEW

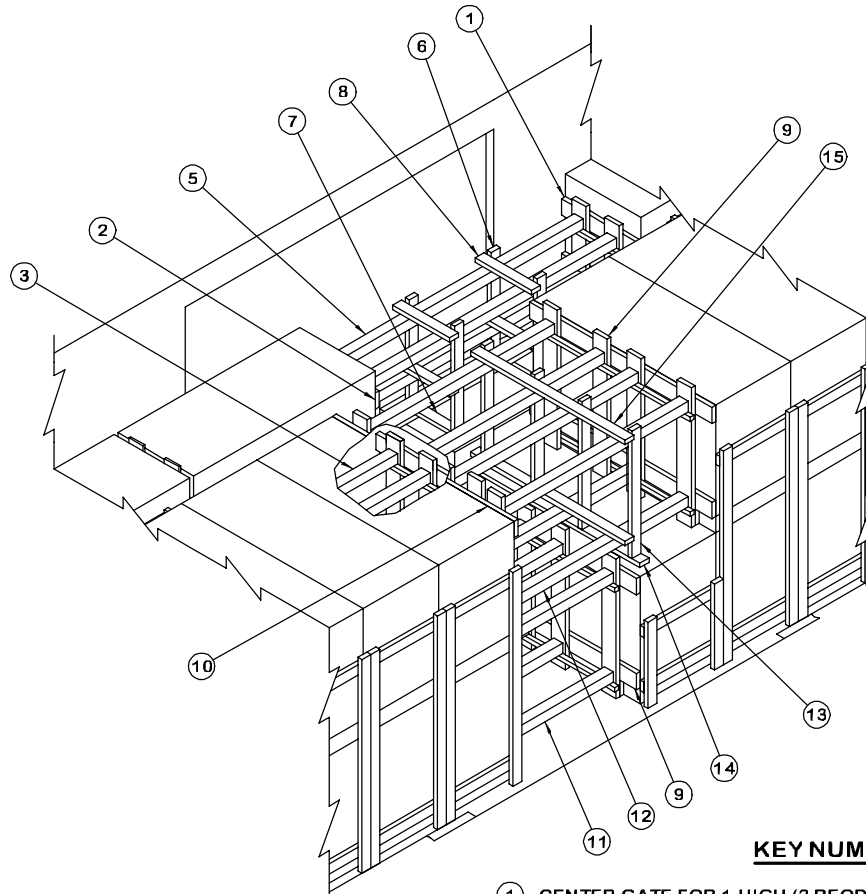
KEY NUMBERS

- ① CENTER GATE FOR 1-HIGH (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 39. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ② CENTER GATE FOR 2-HIGH (1 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 39.
- ③ STRUT, 2" X 6" X CUT-TO-FIT (REF: 25") (DOUBLED) (8 REQD). LAMINATE W/1-10d NAIL EVERY 6". POSITION BETWEEN PIECES MARKED ① AND ② IN THE FIRST LAYER AND TOENAIL W/2-12d NAILS AT EACH END. SEE GENERAL NOTES "V" AND "W" ON PAGE 3.
- ④ SUPPORT PIECE, 2" X 4" X 7'-3-1/2" (1 REQD). NAIL TO THE VERTICAL PIECES OF CENTER GATE "A", PIECE MARKED ①, IN THE SECOND LAYER.
- ⑤ STRUT, 2" X 6" BY CUT-TO-FIT (REF: 7'-11-3/4") (DOUBLED) (8 REQD). LAMINATE W/1-10d NAIL EVERY 6". POSITION BETWEEN PIECES MARKED ① AND ② IN THE TOP LAYER AND TOENAIL W/2-12d NAILS AT EACH END.
- ⑥ VERTICAL STRUT BRACING, 2" X 4" X 36" (4 REQD). NAIL TO THE STRUTS MARKED ⑤ W/3-10d NAILS AT EACH JOINT. TOENAIL TO THE STRUT BRACING PAD, PIECE MARKED ⑦, W/1-10d NAIL. SEE SPECIAL NOTE 4 AT LEFT.
- ⑦ STRUT BRACING PAD, 2" X 4" X 7'-3" (1 REQD). POSITION UNDER THE VERTICAL STRUT BRACING AS SHOWN.
- ⑧ HORIZONTAL STRUT BRACING, 2" X 4" X 7'-3" (2 REQD). NAIL TO THE STRUTS MARKED ⑤ W/3-10d NAILS AT EACH JOINT.
- ⑨ CRIB FILL RETAINER, 2" X 4" BY A LENGTH TO SUIT (REF: 44") (4 REQD). POSITION TO SPAN THE STRUTS OF THE ADJACENT CRIB FILL ASSEMBLIES AT THE CENTER OF THE CAR AND NAIL TO EACH STRUT W/3-10d NAILS. NOTE THAT THE TOP RETAINER WILL BE PLACED AT AN ANGLE SO AS TO RETAIN THE 1-HIGH AND THE 2-HIGH CRIB FILLS AS SHOWN ABOVE.

SPECIAL NOTES:

- 1. ONLY THE CENTER PORTION OF A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL TYPE BOXCAR IS SHOWN TO PORTRAY THE STRUTTED GATE METHOD OF PARTIAL-LAYER BRACING. CARS OF OTHER WIDTHS CAN ALSO BE USED.
- 2. THE PROCEDURES FOR THE ADJUSTMENT OF A LOAD QUANTITY BY THE OMISSION OF THE TOP LAYER FROM ONE LOAD UNIT ARE SHOWN. IF SIX PALLET UNITS ARE TO BE OMITTED, IT IS RECOMMENDED THAT AN ENTIRE LOAD UNIT BE OMITTED RATHER THAN OMITTING THE TOP LAYER FROM TWO LOAD UNITS.
- 3. ONLY THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO PERMIT THE OMISSION OF THE UNITS FROM THE TOP LAYER ARE SHOWN. REFER TO PAGE 6 FOR LATERAL BRACING, SEPARATOR GATES, AND DOORWAY PROTECTION REQUIREMENTS. NOTE THAT TWO 1-HIGH CRIB FILL ASSEMBLIES WILL BE USED AS SHOWN ABOVE.
- 4. TO PROTECT THE LADING FROM BEING PUNCTURED WHEN A SET OF VERTICAL STRUT BRACING IS INSTALLED ABOVE THE LOWER LAYER OF A LOAD, A SUITABLE LENGTH PAD OF 2" X 4" MATERIAL, SHOWN AS PIECE MARKED ⑦, MUST BE POSITIONED UNDER AND SECURED TO EACH VERTICAL STRUT BRACING PIECE.
- 5. THE DEPICTED PROCEDURES ARE APPLICABLE FOR A 50'-6" LONG CAR. THE PROCEDURES ARE ADAPTABLE FOR THE OMISSION OF THREE PALLET UNITS FROM A LOAD IN A 40'-6" LONG CAR AND A 60'-8" LONG CAR.

**LENGTHWISE LOAD OF PALLETS
TYPICAL LCL LOAD USING STRUTTED GATE METHOD OF PARTIAL LAYER BRACING**



ISOMETRIC VIEW

KEY NUMBERS

SPECIAL NOTES:

1. ONLY THE CENTER PORTION OF A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOXCAR IS SHOWN TO PORTRAY THE STRUTTED GATE METHOD OF PARTIAL-LAYER BRACING. CARS OF OTHER LENGTHS AND/OR WIDTHS MAY BE USED.
2. ONLY THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO PERMIT THE OMISSION OF THE UNITS FROM THE TOP LAYER ARE SHOWN. REFER TO PAGE 8 FOR LATERAL BRACING, DOORWAY PROTECTION, AND OTHER BRACING.
3. TO PROTECT THE LADING FROM BEING PUNCTURED WHEN SET OF VERTICAL STRUT BRACING IS INSTALLED ABOVE THE LOWER LAYER OF A LOAD, SUITABLE LENGTH PADS OF 2" X 4" MATERIAL, SHOWN AS PIECES MARKED 7 AND 14, MUST BE POSITIONED UNDER AND SECURED TO EACH APPLICABLE VERTICAL STRUT BRACING PIECE.
4. A 52-UNIT LCL LOAD IS SHOWN. THE DEPICTED PROCEDURES MAY BE ADJUSTED TO KEEP LONGITUDINAL WEIGHT DISTRIBUTION AS EQUAL AS POSSIBLE. A UNIT SHOULD BE OMITTED FROM THE ROW THAT PROTRUDES THE FARTHEST. THIS SHOULD ENSURE THAT THE CRIB FILL, IF USED, WILL HAVE BEARING ON EACH ROW TO PROVIDE LATERAL BRACING OF THE REMAINING PALLET UNITS.

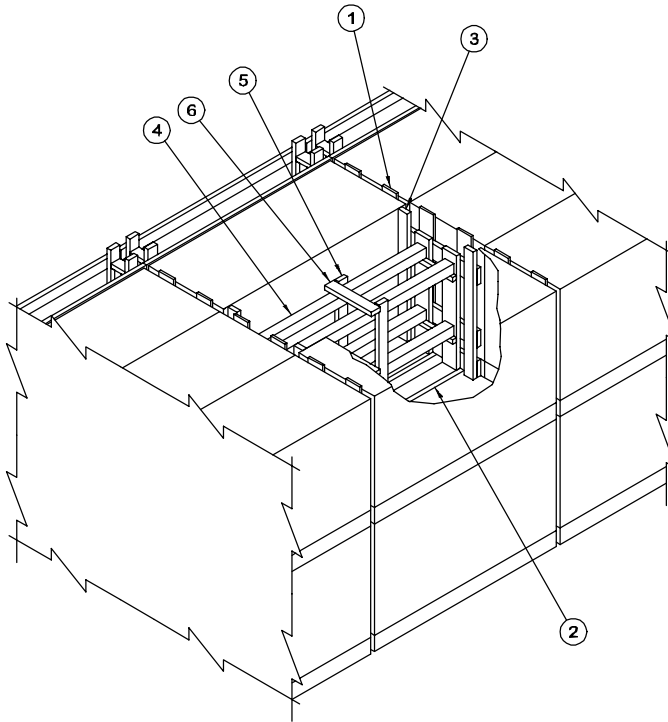
(KEY NUMBERS CONTINUED)

- 13 VERTICAL STRUT BRACING, 2" X 4" X 43" (1 REQD). NAIL TO THE STRUTS MARKED 12 W/3-10d NAILS AT EACH JOINT. TOENAIL TO THE STRUT BRACING PAD, PIECE MARKED 14, W/1-10d NAIL.
- 14 STRUT BRACING PAD, 2" X 4" X 64" (1 REQD). POSITION UNDER THE VERTICAL STRUT BRACING, PIECE MARKED 13. SEE SPECIAL NOTE 3 BELOW.
- 15 HORIZONTAL STRUT BRACING, 2" X 4" X 60" (2 REQD). NAIL TO THE STRUTS, PIECES MARKED 12, W/3-10d NAILS AT EACH JOINT.

- 1 CENTER GATE FOR 1-HIGH (2 REQD). SEE THE "CENTER GATE B" DETAIL ON PAGE 39. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- 2 CENTER GATE FOR 2-HIGH (1 REQD). SEE THE "CENTER GATE B" DETAIL ON PAGE 39.
- 3 STRUT, 4" X 4" BY CUT-TO-FIT (REF: 25") (4 REQD). POSITION BETWEEN PIECES MARKED 1 AND 2 IN THE FIRST LAYER AND TOENAIL W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "K" ON PAGE 2 AND GENERAL NOTES "V" AND "W" ON PAGE 3.
- 4 STRUT, 2" X 4" BY CUT-TO-FIT (REF: 25") (2 REQD). TOENAIL TO THE STOP PIECES OF PIECES MARKED 1 AND 2 W/2-12d NAILS AT EACH END. THIS PIECE IS NOT SHOWN IN THE ABOVE VIEW. SEE PIECE MARKED 7 ON PAGE 8 FOR GUIDANCE.
- 5 STRUT, 4" X 4" BY CUT-TO-FIT (REF: 7'-11-3/4") (4 REQD). POSITION BETWEEN PIECES MARKED 1 AND 2 IN THE SECOND LAYER AND TOENAIL W/2-16d NAILS AT EACH END.
- 6 VERTICAL STRUT BRACING, 2" X 4" X 36" (4 REQD). NAIL TO THE STRUTS MARKED 5 W/3-10d NAILS AT EACH JOINT. TOENAIL TO THE STRUT BRACING PAD, PIECE MARKED 7, W/1-10d NAIL. SEE SPECIAL NOTE 3 AT LEFT.
- 7 STRUT BRACING PAD, 2" X 4" X 24" (2 REQD). POSITION UNDER THE VERTICAL STRUT BRACING, PIECE MARKED 6. SEE SPECIAL NOTE 3 AT LEFT.
- 8 HORIZONTAL STRUT BRACING, 2" X 4" X 22" (6 REQD). NAIL TO THE STRUTS MARKED 3 AND 5 W/3-10d NAILS AT EACH JOINT.
- 9 CENTER GATE FOR 1-HIGH (2 REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 39.
- 10 CENTER GATE FOR 2-HIGH (1 REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 39.
- 11 STRUT, 4" X 4" BY CUT-TO FIT (REF: 43") (8 REQD). POSITION BETWEEN PIECES MARKED 9 AND 10 IN THE FIRST LAYER AND TOENAIL W/2-16d NAILS AT EACH END.
- 12 STRUT, 4" X 4" BY CUT-TO-FIT (REF: 6'-0-3/8") (8 REQD). POSITION BETWEEN PIECES MARKED 9 AND 10 IN THE SECOND LAYER AND TOENAIL W/2-16d NAILS AT EACH END.

(CONTINUED AT LEFT)

**COMBINATION LOAD OF PALLETS
TYPICAL LCL LOAD USING STRUTTED GATE METHOD OF PARTIAL-LAYER BRACING**



ISOMETRIC VIEW

SPECIAL NOTES:

1. A PARTIAL VIEW OF A 9'-2" WIDE CONVENTIONAL TYPE BOXCAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. A UNIT OMITTED FROM THE TOP LAYER OF A 2-LAYER LOAD IS SHOWN AS TYPICAL. THE PROCEDURES ARE ALSO APPLICABLE FOR THE OMISSION OF A PALLET UNIT FROM A 1-LAYER LOAD. USE SEPARATOR GATE "D" ON PAGE 29 FOR 1-HIGH LOADS.
3. THE OMITTED-UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE LOAD UNIT BETWEEN THE OMITTED UNIT AND A CENTER GATE.
4. ONLY THE BLOCKING AND BRACING FOR THE OMITTED UNIT IS SHOWN; REFER TO PAGE 6 FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.

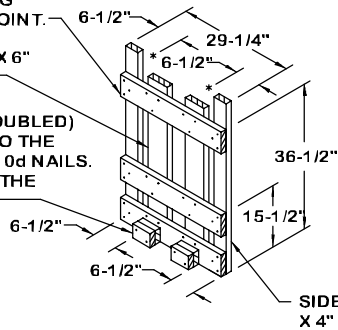
KEY NUMBERS

- ① SEPARATOR GATE (2 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 40. POSITION AS SHOWN IN THE VIEW ABOVE.
- ② SUPPORT PIECE, 2" X 6" X 70-3/4" (2 REQD). POSITION BENEATH THE 2" X 6" VERTICAL PIECES OF THE LOAD BEARING GATE, PIECE MARKED ③.
- ③ LOAD BEARING GATE (2 REQD). SEE THE "LOAD BEARING GATE A" DETAIL BELOW. TOENAIL TO THE SUPPORT PIECE, PIECE MARKED ②. W/2-10d NAILS AT EACH JOINT. **CAUTION:** USE CARE NOT TO TOENAIL INTO A CONTAINER.
- ④ STRUT, 4" X 4" X 64-3/4" (4 REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END.
- ⑤ VERTICAL STRUT BRACING, 2" X 4" X 40" (2 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT. BRACING MUST REST ON THE SUPPORT PIECE, PIECE MARKED ②. TOENAIL TO THE SUPPORT PIECE W/1-10d NAIL. **CAUTION:** USE CARE NOT TO TOENAIL INTO CONTAINER.
- ⑥ HORIZONTAL STRUT BRACING, 2" X 4" X 20" (2 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

HORIZONTAL PIECE, 2" X 6" X 29-1/4" (3 REQD). NAIL TO THE VERTICAL PIECES AND TO THE SIDE BEARING PIECES W/3-10d NAILS AT EACH JOINT.

VERTICAL PIECE, 2" X 6" X 38-1/2" (2 REQD).

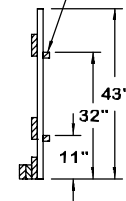
GATE HOLD-DOWN, 2" X 4" X 5" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE BOTTOM HORIZONTAL PIECE W/2-10d NAILS. LAMINATE THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.



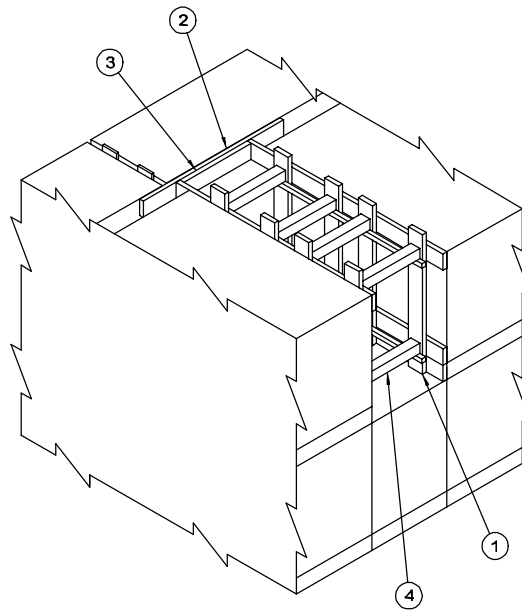
SIDE BEARING PIECE, 2" X 4" X 43" (2 REQD).

LOAD BEARING GATE A

STRUT LEDGER, 2" X 2" X 16-1/4" (2 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.



END VIEW



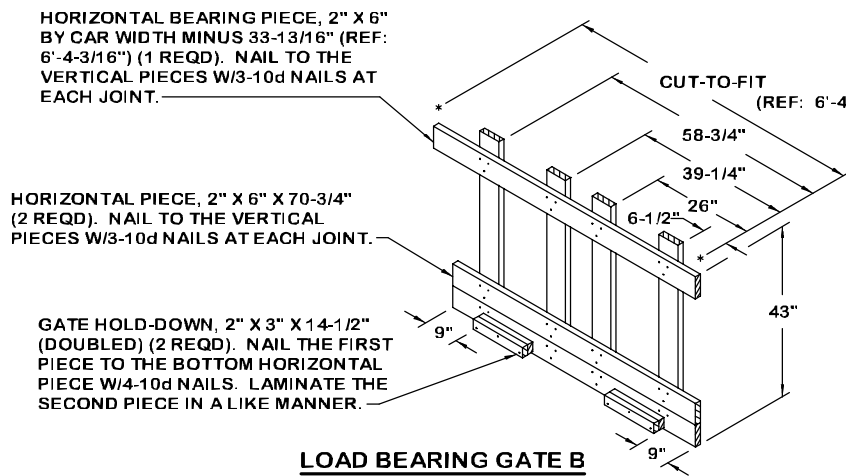
ISOMETRIC VIEW

SPECIAL NOTES:

1. A PARTIAL VIEW OF A 9'-2" WIDE CONVENTIONAL TYPE BOXCAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. A UNIT OMITTED FROM THE TOP LAYER OF A 2-LAYER COMBINATION LOAD IS SHOWN AS TYPICAL. THE PROCEDURES ARE ALSO APPLICABLE FOR THE OMISSION OF A PALLET UNIT FROM A 1-LAYER LOAD.
3. THE OMITTED UNIT PROCEDURE SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE PALLET UNIT BETWEEN THE OMITTED UNIT AND A CENTER GATE.
4. ONLY THE BLOCKING AND BRACING FOR THE OMITTED UNIT IS SHOWN; REFER TO PAGE 8 FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.
5. THE REFERENCE DIMENSION GIVEN FOR THE CUT-TO-FIT ON THE LOAD BEARING GATE IS BASED ON AN INSIDE CAR WIDTH OF 9'-2". THIS DIMENSION WILL HAVE TO BE INCREASED WHEN LOADING WIDER CARS.

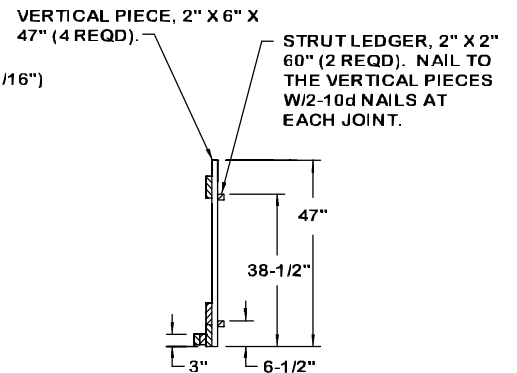
KEY NUMBERS

- ① LOAD BEARING GATE (2 REQD, 1 RIGHT-HAND AND 1 LEFT-HAND). SEE THE "LOAD BEARING GATE B" DETAIL BELOW. NAIL TO THE FILLER PIECE, PIECE MARKED ③, W/3-10d NAILS.
- ② ANTI-SWAY BEARING PIECE, 2" X 6" X 55" (1 REQD).
- ③ FILLER PIECE, 2" X 6" X 26-5/16" (1 REQD). NAIL TO THE ANTI-SWAY BEARING PIECE, PIECE MARKED ②, W/5-10d NAILS.
- ④ STRUT, 4" X 4" X 23-5/16" (8 REQD). TOENAIL TO PIECES MARKED ① W/2-16d NAILS AT EACH END.



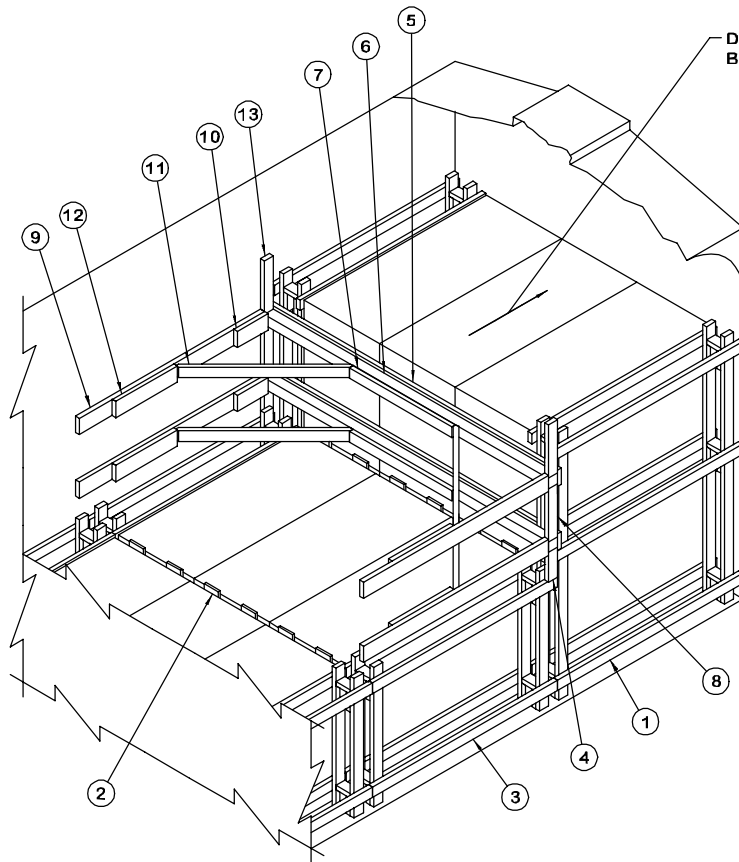
LOAD BEARING GATE B

(1 RIGHT-HAND AND 1 LEFT-HAND GATE REQUIRED.)



END VIEW

TYPICAL LCL-ONE PALLET UNIT OMITTED FROM THE TOP LAYER OF A CROSSWISE-POSITIONED UNIT IN A COMBINATION LOAD



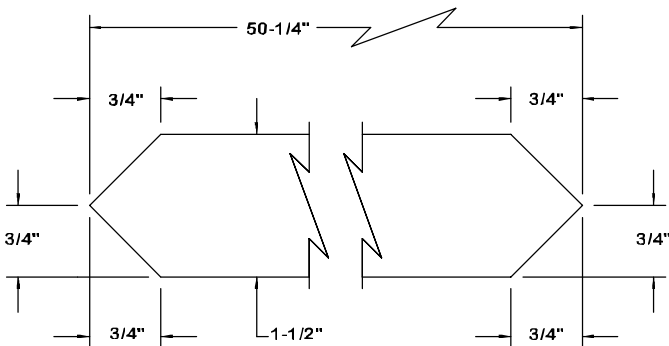
ISOMETRIC VIEW

KEY NUMBERS

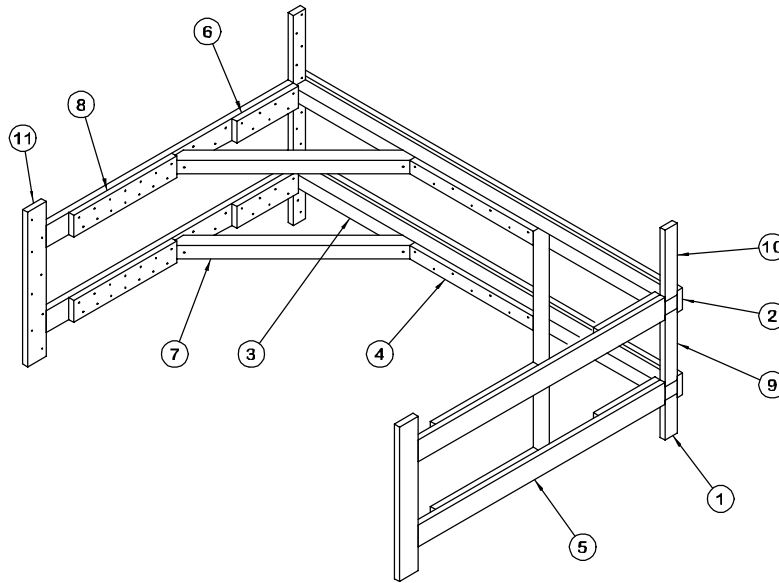
SPECIAL NOTES:

1. A 9'-4" WIDE CONVENTIONAL WOOD-LINED BOXCAR IS SHOWN. WOOD-LINED CARS OF OTHER WIDTHS CAN BE USED.
2. THE K-BRACE METHOD OF PARTIAL-LAYER (TIER) BRACING SHOWN MAY BE USED IN WOOD-LINED CARS FOR THE SECUREMENT OF A PARTIAL SECOND TIER OR FIRST TIER. THE TYPE "A" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 8,000 LBS (THREE PALLET UNITS). IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGES 23 THRU 25 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE.
3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ⑥, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. THE OMITTED UNITS PROCEDURES ON PAGES 20 AND 21 MAY BE USED IN REDUCING THE QUANTITY OF UNITS IN A PARTIAL LAYER.

- ① CRIB FILL (2 REQD). SEE THE "CRIB FILL A" DETAIL ON PAGE 37.
- ② SEPARATOR GATE FOR 1-HIGH (2 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 40.
- ③ CRIB FILL (AS REQD). SEE THE "CRIB FILL B" DETAIL ON PAGE 37.
- ④ SUPPORT CLEAT, 2" X 4" X 10" (2 REQD). POSITION VERTICALLY AS SHOWN SO AS TO CENTER PIECES MARKED ⑤ AND ⑥ ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. NAIL TO THE CAR SIDEWALL W/3-12d NAILS.
- ⑤ HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH IN LENGTH (CUT-TO-FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑥, W/1-12d NAIL EVERY 6"
- ⑥ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH IN LENGTH (CUT-TO-FIT) (2 REQD).
- ⑦ CENTER CLEAT, 2" X 4" X 38" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑥, W/7-16d NAILS. SEE SPECIAL NOTE 4 AT LEFT.
- ⑧ SPACER CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.
- ⑨ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (4 REQD). NAIL TO THE CAR SIDEWALL W/16-12d NAILS.
- ⑩ POCKET CLEAT, 2" X 6" X 12" (2 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑨, W/4-16d NAILS.
- ⑪ DIAGONAL BRACE, 2" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL AT LEFT FOR BEVEL-CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑥, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑨, W/2-16d NAILS AT EACH END.
- ⑫ BACK-UP CLEAT, 2" X 6" X 24" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑨, W/8-16d NAILS.
- ⑬ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.



DIAGONAL BRACE



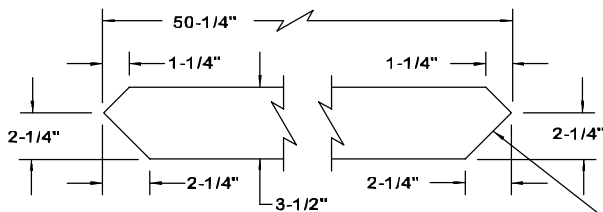
ISOMETRIC VIEW

SPECIAL NOTES:

1. THE TYPE "B" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN SIX PALLET UNITS. IF IT IS NECESSARY TO BLOCK MORE THAN SIX PALLET UNITS, REFER TO THE DETAILS ON PAGES 24 AND 25 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE. IF ONLY TWO OR FOUR PALLET UNITS ARE TO BE SHIPPED IN THE PARTIAL LAYER, THE TYPE "A" K-BRACE DEPICTED ON PAGE 22 MAY BE USED.
2. **CAUTION:** SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ⑥, ⑨, ⑩, AND ⑪, MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑦ TO BEAR IN FRONT OF A DOOR OPENING. HOWEVER, THE ADJACENT PIECE MARKED ⑤ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF: 54") TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑤ TO THE FIRST W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑤ IS DOUBLED.
3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ④, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. REFER TO PAGE 22 FOR A TYPICAL INSTALLATION OF A K-BRACE.

KEY NUMBERS

- ① SUPPORT CLEAT, 2" X 4" X 10" (2 REQD). POSITION VERTICALLY AS SHOWN SO AS TO CENTER PIECES MARKED ② AND ③ ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. NAIL TO THE CAR SIDEWALL W/3-12d NAILS.
- ② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT-TO-FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTE "L" ON PAGE 2.
- ③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT-TO-FIT) (2 REQD).
- ④ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.
- ⑤ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (4 REQD). NAIL TO THE CAR SIDEWALL W/16-12d NAILS.
- ⑥ POCKET CLEAT, 2" X 6" X 18" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/7-16d NAILS.
- ⑦ DIAGONAL BRACE, 4" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL-CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/1-60d NAIL AT EACH END.
- ⑧ BACK-UP CLEAT, 2" X 6" X 30" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/14-16d NAILS.
- ⑨ SPACER CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.
- ⑩ HOLD-DOWN CLEAT, 2" X 6" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.
- ⑪ VERTICAL BACK-UP CLEAT, 2" X 6" X 40" (2 REQD). NAIL TO THE CAR SIDEWALL W/8-12d NAILS.

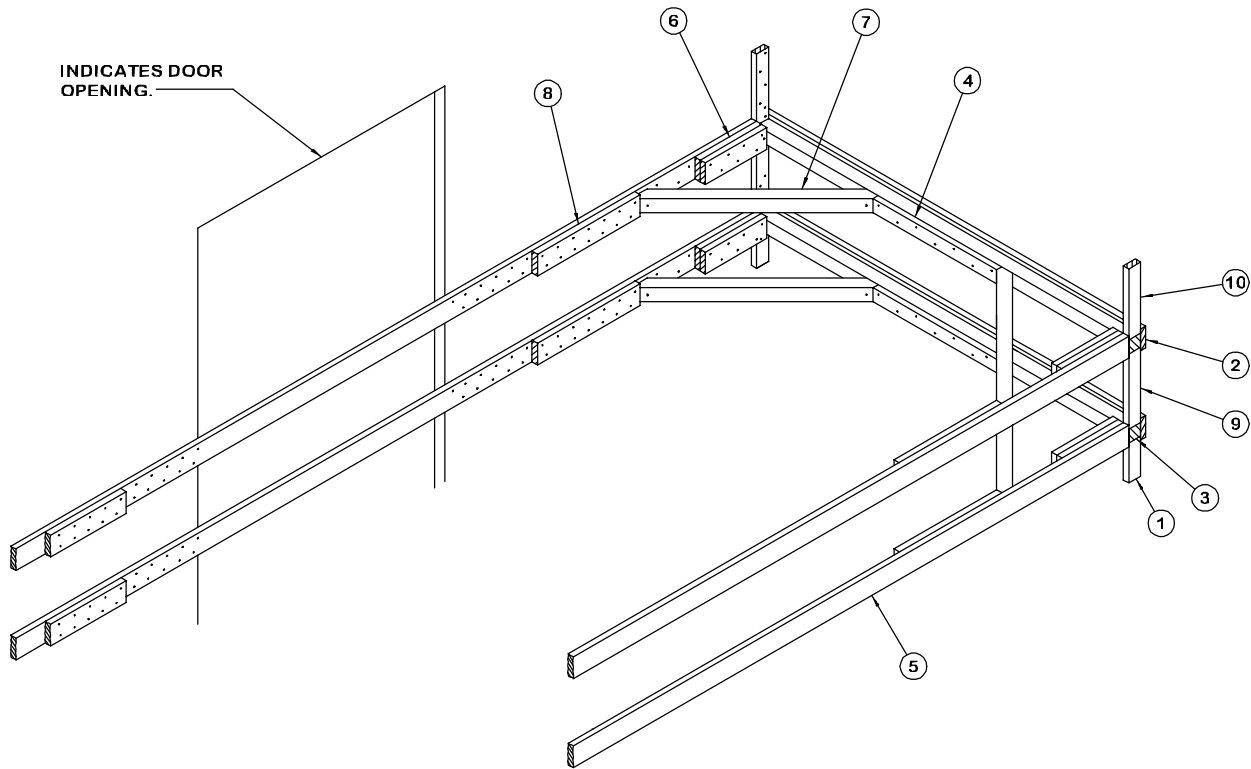


DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

THIS BEARING SURFACE MUST BE POSITIONED SO AS TO BE IN CONTACT WITH A CROSS CAR BRACE, PIECE MARKED ③, OR A HORIZONTAL WALL CLEAT, PIECE MARKED ⑤.

TYPE "B" K-BRACE



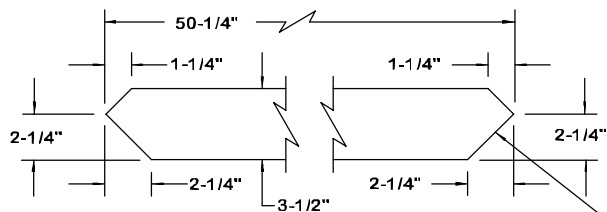
ISOMETRIC VIEW

SPECIAL NOTES:

1. THE TYPE "C" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 20,000 POUNDS. IF IT IS NECESSARY TO A HEAVIER LOAD, REFER TO THE DETAIL ON PAGE 25 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE. FOR SHIPMENT OF A LIGHTER LOAD, REFER TO THE DETAILS ON PAGES 22 AND 23 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS OF THE BRACE.
2. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ⑥, ⑨, AND 10 MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑦ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑤ MUST BE DOUBLED. LAMINATE THE SECOND PIECE TO THE FIRST W/40-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑤ IS DOUBLED.
3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ④, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. CAUTION: A TYPE "C" K-BRACE MUST BE USED IN BOTH ENDS OF THE CAR; THE BRACE IS NOT DESIGNED FOR USE IN ONLY ONE END. NOTE THAT EXCEPT FOR PIECES MARKED ⑤, THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.

KEY NUMBERS

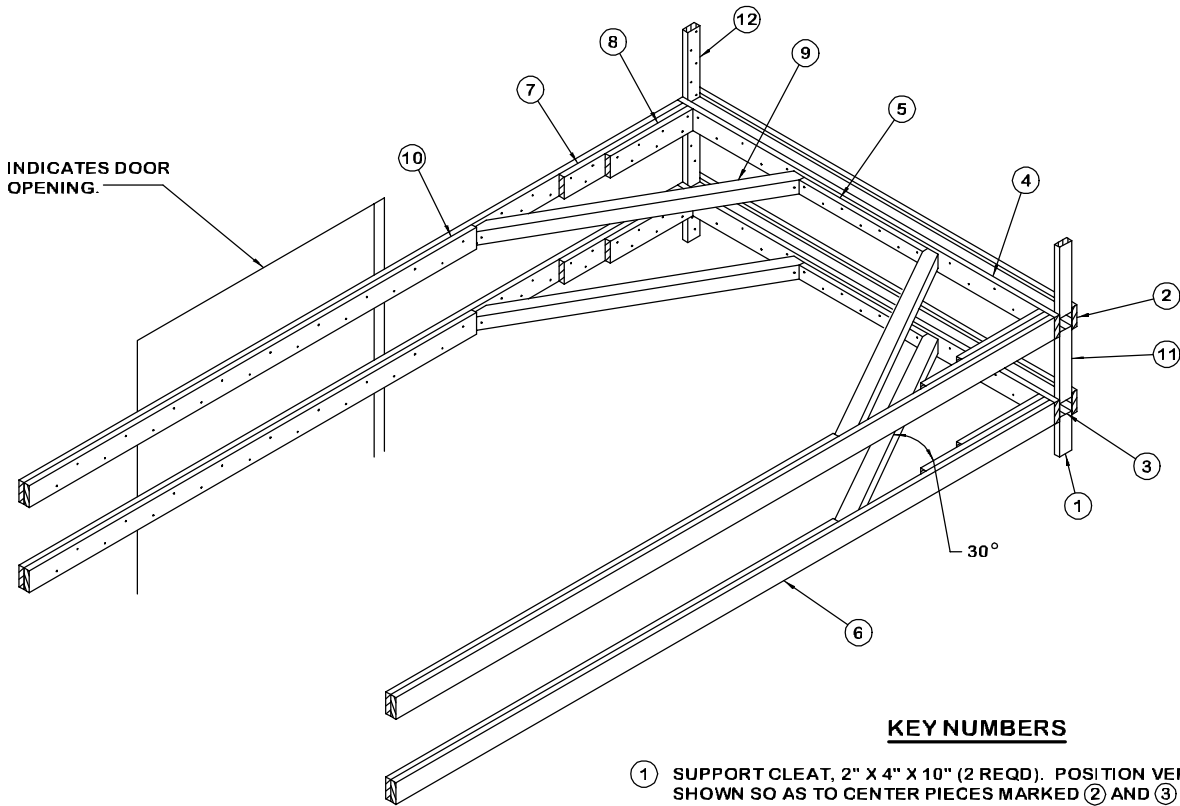
- ① SUPPORT CLEAT, 2" X 4" X 10" (2 REQD). POSITION VERTICALLY AS SHOWN SO AS TO CENTER PIECES MARKED ② AND ③ ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. NAIL TO THE CAR SIDEWALL W/3-12d NAILS.
- ② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT-TO-FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTE "L" ON PAGE 2.
- ③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT-TO-FIT) (2 REQD).
- ④ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.
- ⑤ HORIZONTAL WALL CLEAT, 2" X 6" BY CUT TO FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND ACROSS AND FAR ENOUGH PAST THE DOOR OPENINGS TO CONTACT PIECE MARKED ③ OF THE K-BRACE IN THE OPPOSITE END OF THE CAR. NAIL TO THE CAR SIDEWALL W/40-12d NAILS.
- ⑥ POCKET CLEAT, 2" X 6" X 18" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/7-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ⑦ DIAGONAL BRACE, 4" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL-CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/1-60d NAIL AT EACH END.
- ⑧ BACK-UP CLEAT, 2" X 6" X 30" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/14-16d NAILS.
- ⑨ SPACER CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.
- ⑩ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.



DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

THIS BEARING SURFACE MUST BE POSITIONED SO AS TO BE IN CONTACT WITH A CROSS CAR BRACE, PIECE MARKED ③, OR A HORIZONTAL WALL CLEAT, PIECE MARKED ⑤.



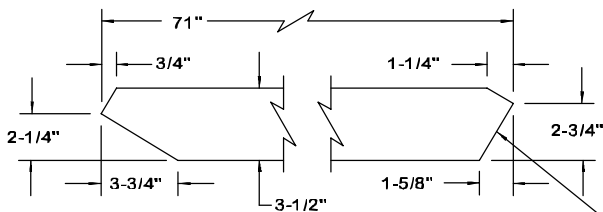
ISOMETRIC VIEW

KEY NUMBERS

- ① SUPPORT CLEAT, 2" X 4" X 10" (2 REQD). POSITION VERTICALLY AS SHOWN SO AS TO CENTER PIECES MARKED ② AND ③ ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. NAIL TO THE CAR SIDEWALL W/3-12d NAILS.
- ② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT-TO-FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTE "L" ON PAGE 2.
- ③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT-TO-FIT) (2 REQD).
- ④ HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH (CUT-TO-FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6".
- ⑤ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE HORIZONTAL PIECE, PIECE MARKED ④, W/1-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.
- ⑥ HORIZONTAL WALL CLEAT, 2" X 6" BY CUT-TO-FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND ACROSS AND FAR ENOUGH PAST THE DOOR OPENINGS TO CONTACT PIECE MARKED ④ OF THE K-BRACE IN THE OPPOSITE END OF THE CAR. NAIL TO THE CAR SIDEWALL W/40-12d NAILS.
- ⑦ POCKET CLEAT, 2" X 6" X 36" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/10-16d NAILS.
- ⑧ POCKET CLEAT, 2" X 6" X 24" (4 REQD). NAIL TO THE POCKET CLEAT, PIECE MARKED ⑦, W/7-16d NAILS.
- ⑨ DIAGONAL BRACE, 4" X 4" X 71" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL-CUTS REQUIRED. TOENAIL TO THE HORIZONTAL PIECE, PIECE MARKED ④, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/1-60d NAIL AT EACH END.
- ⑩ BACK-UP CLEAT, 2" X 6" BY CUT-TO-FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND TO CONTACT THE DIAGONAL BRACE, PIECE MARKED ⑨, IN THE OPPOSITE END OF THE CAR. NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/18-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING, IF APPLICABLE.
- ⑪ SPACER CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.
- ⑫ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

SPECIAL NOTES:

1. THE TYPE "D" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 25,000 POUNDS. THIS WILL BE NOT MORE THAN 12 PALLET UNITS. FOR SHIPMENT OF A LIGHTER LOAD, REFER TO THE DETAILS ON PAGES 22 THRU 24 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE.
2. **CAUTION:** SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ④, ⑦, ⑧, ⑪, AND ⑫ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑨ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑥ MUST BE DOUBLED. LAMINATE THE SECOND PIECE TO THE FIRST W/40-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 70-1/4" LONG IN LIEU OF 71" LONG WHEN PIECE MARKED ⑥ IS DOUBLED.
3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ⑤, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. **CAUTION:** A TYPE "D" K-BRACE MUST BE USED IN BOTH ENDS OF THE CAR; THE BRACE IS NOT DESIGNED FOR USE IN ONLY ONE END. NOTE THAT EXCEPT FOR PIECES MARKED ⑥ AND ⑩, THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.

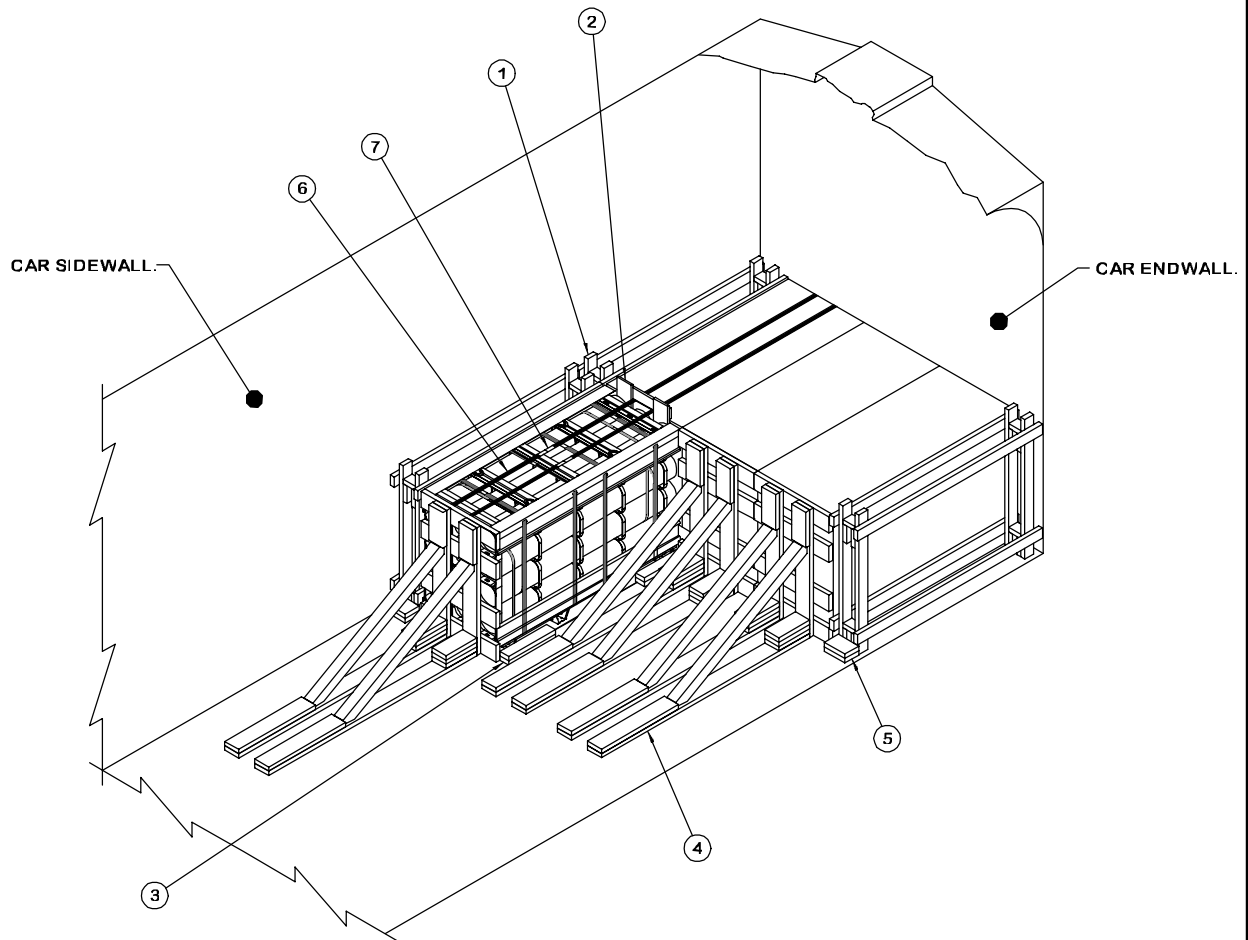


DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

THIS BEARING SURFACE MUST BE POSITIONED SO AS TO BE IN CONTACT WITH A CROSS CAR BRACE, PIECE MARKED ③.

TYPE "D" K-BRACE

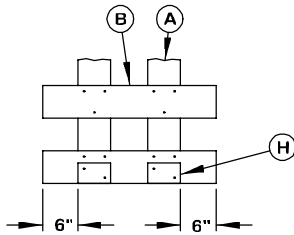


SPECIAL NOTES:

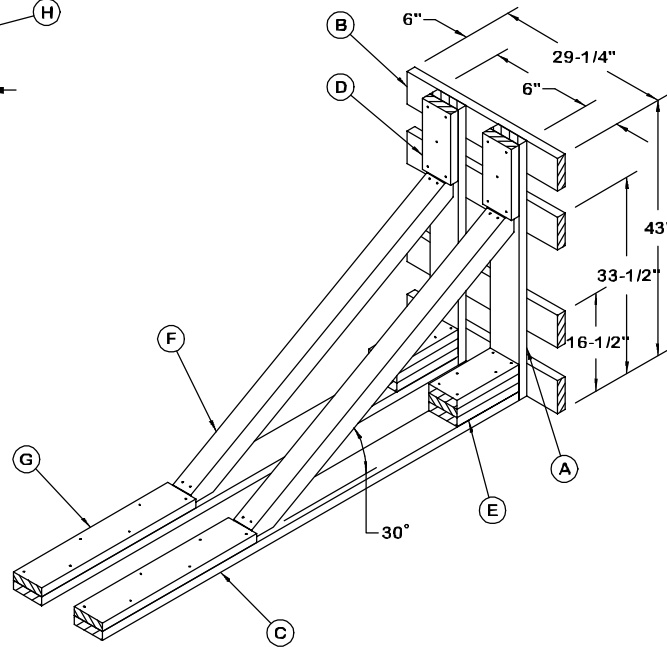
1. A 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR HAVING A WOOD OR NAILABLE METAL FLOOR IS SHOWN. CARS OF OTHER WIDTHS AND CARS HAVING METAL LININGS CAN BE USED.
2. THE KNEE BRACE METHOD OF LCL BRACING IS ONLY APPLICABLE FOR THE BRACING OF PALLET UNITS POSITIONED LENGTHWISE IN THE CAR.
3. THE LOAD SHOWN DEPICTING THE KNEE BRACE METHOD OF PARTIAL-LAYER BRACING IS TYPICAL. THE QUANTITY MAY BE ADJUSTED TO SUIT, PROVIDED THE LIMITATIONS OF THE KNEE BRACE AS SET FORTH IN SPECIAL NOTE 4 ARE NOT EXCEEDED.
4. A KNEE BRACE ASSEMBLY WILL BE USED FOR EACH ROW OF PALLET UNITS. ONE KNEE BRACE ASSEMBLY IS ADEQUATE FOR RETAINING A MAXIMUM OF 8,500 POUNDS.

KEY NUMBERS

- ① CRIB FILL (3 REQD). SEE THE "CRIB FILL A" DETAIL ON PAGE 37.
- ② SEPARATOR GATE (1 REQD). SEE THE "SEPARATOR GATE D" DETAIL ON PAGE 29. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNIT.
- ③ SIDE BLOCKING, 2" X 4" X 18" (DOUBLED) (2 REQD). POSITION AS SHOWN AGAINST EACH END OF THE METAL PALLET. NAIL THE FIRST PIECE TO THE CAR FLOOR W/4-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ④ KNEE BRACE ASSEMBLY (3 REQD). SEE THE "KNEE BRACE ASSEMBLY" DETAIL ON PAGE 27 FOR CONSTRUCTION SPECIFICATIONS AND NAILING REQUIREMENTS.
- ⑤ CRIB FILL BLOCKING 2" X 6" BY A LENGTH TO SUIT (REF: 8") (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/3-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ⑥ BUNDLING STRAP, 1-1/4" X .035" OR .031" X 32'-0" LONG STEEL STRAPPING (2 REQD). PRE-POSITION UNDER THE PALLET DECK AND THREAD THROUGH THE SEPARATOR GATE, PIECE MARKED ②.
- ⑦ SEAL FOR 1-1/4" STEEL STRAPPING (4 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "N" ON PAGE 2.



VIEW A

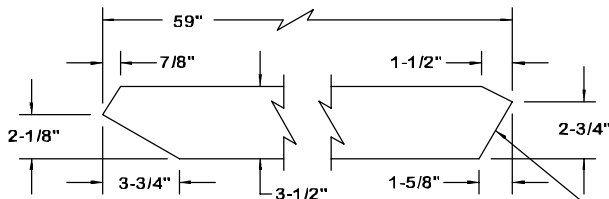


VIEW A

KNEE BRACE ASSEMBLY

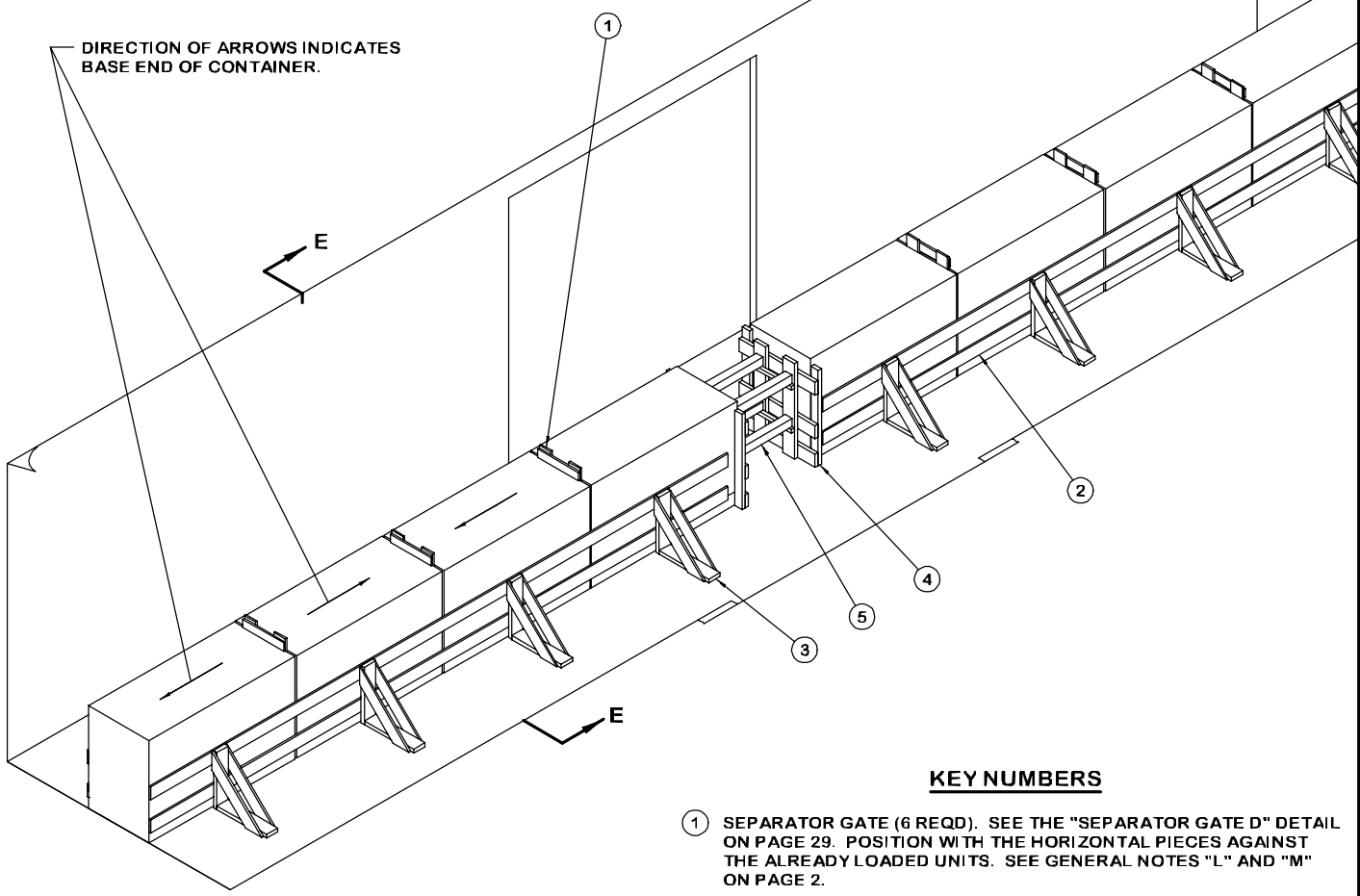
KEY LETTERS

- (A) VERTICAL PIECE, 2" X 6" X 43" (2 REQD).
- (B) HORIZONTAL PIECE, 2" X 6" X 29-1/4" (4 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- (C) FLOOR CLEAT, 2" X 6" X 6'-9" (2 REQD). ALIGN WITH A VERTICAL PIECE AND NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 8". SEE GENERAL NOTE "T" ON PAGE 3.
- (D) HOLD-DOWN CLEAT, 2" X 6" X 12" (2 REQD). NAIL TO A VERTICAL PIECE W/5-10d NAILS.
- (E) POCKET CLEAT, 2" X 6" X 12" (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO THE FLOOR CLEAT, PIECE MARKED (C), W/4-16d NAILS. NAIL THE SECOND AND THE THIRD PIECE IN A LIKE MANNER AND TOENAIL THE THIRD PIECE TO THE VERTICAL PIECE, PIECE MARKED (A), W 2-16d NAILS.
- (F) BRACE, 4" X 4" X 59" (2 REQD). SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TOENAIL TO THE VERTICAL PIECE AND TO THE FLOOR CLEAT, PIECES MARKED (A) AND (C), W/2-16d NAILS AT EACH END.
- (G) BACK-UP CLEAT, 2" X 6" X 30" (2 REQD). NAIL TO THE FLOOR CLEAT, PIECE MARKED (C), W/6-40d NAILS.
- (H) HOLD-DOWN CLEAT, 2" X 4" X 5-1/2" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO A HORIZONTAL PIECE W/2-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE "VIEW A" DETAIL ABOVE FOR LOCATION DIMENSIONS.

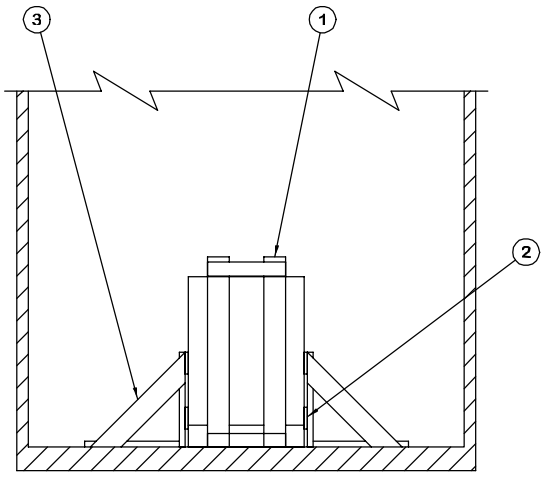


BRACE
4" X 4" MATERIAL

THE BRACE MUST BE INSTALLED SO THAT THIS BEARING SURFACE WILL BE IN CONTACT WITH THE VERTICAL PIECE MARKED (A).



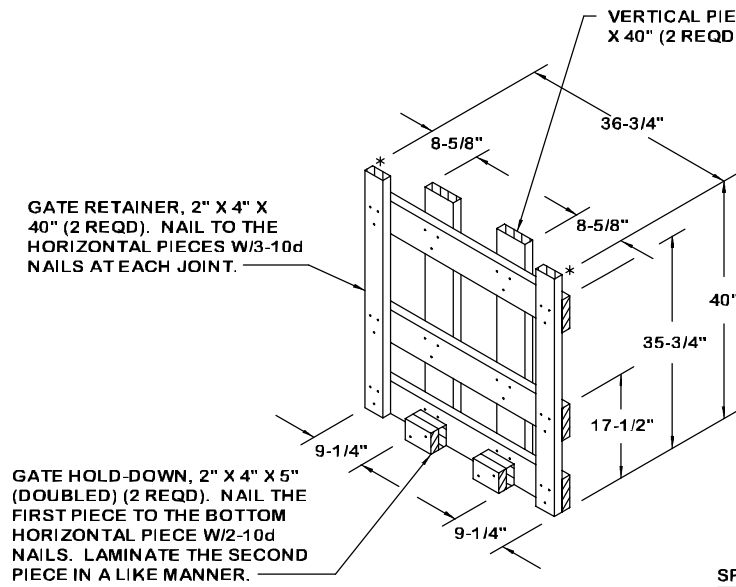
ISOMETRIC VIEW



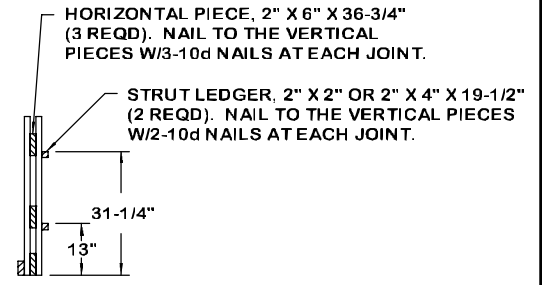
SECTION E-E

KEY NUMBERS

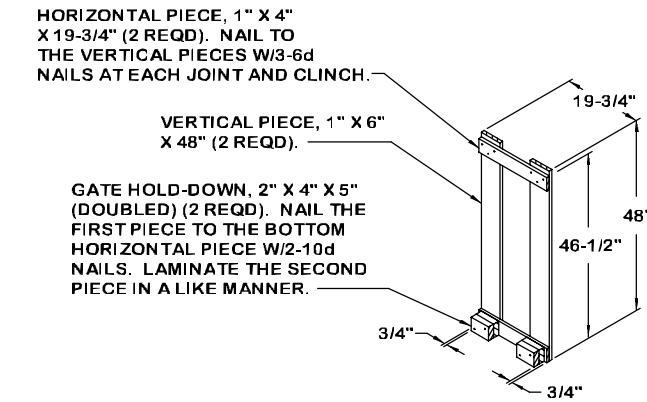
- ① SEPARATOR GATE (6 REQD). SEE THE "SEPARATOR GATE D" DETAIL ON PAGE 29. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY LOADED UNITS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ② HORIZONTAL PIECE, 1" X 6" BY A LENGTH TO SUIT (8 REQD). NAIL TO THE VERTICAL PIECES OF THE LTL BRACES W/3-6d NAILS AT EACH JOINT PRIOR TO PLACEMENT AGAINST THE LADING. SEE THE "LCL BRACE" DETAIL ON PAGE 32 FOR HEIGHT LOCATION GUIDANCE.
- ③ LCL BRACE (16 REQD). SEE THE DETAIL ON PAGE 32 AND SPECIAL NOTE 3 ON PAGE 29. NAIL TO THE CAR FLOOR W/7-16d NAILS. SEE GENERAL NOTE "T" ON PAGE 3.
- ④ CENTER GATE (2 REQD). SEE THE "CENTER GATE D" DETAIL ON PAGE 29. SEE SPECIAL NOTES 2 AND 3 ON PAGE 29.
- ⑤ STRUT, 4" X 4" BY CUT-TO-FIT (REF: 29-1/2") (4 REQD). TOENAIL TO PIECES MARKED ④ W/2-12d NAILS AT EACH END. SEE GENERAL NOTE "K" ON PAGE 2 AND GENERAL NOTE "W" ON PAGE 3.



CENTER GATE D



END VIEW



SEPARATOR GATE D

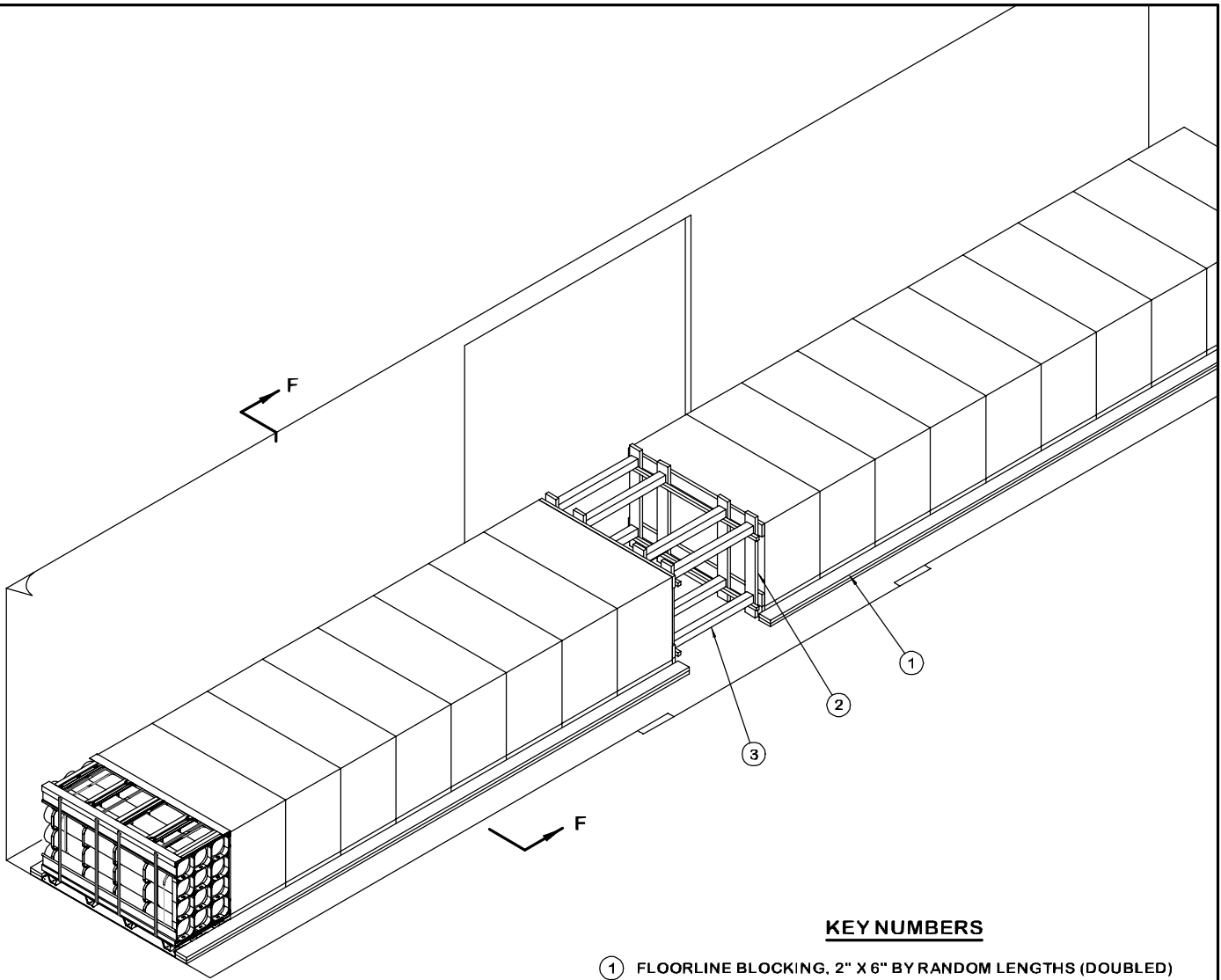
SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOXCAR IS SHOWN. CARS OF OTHER LENGTHS AND WIDTHS CAN BE USED. SEE SPECIAL NOTE 2.
2. A 1-WIDE LENGTHWISE LOAD IN A 50'-6" LONG CAR IS SHOWN AS TYPICAL. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR A 6-UNIT LENGTHWISE LOAD IN A 40'-6" LONG CAR, AND A 9-UNIT LOAD IN A 60'-8" LONG CAR. NOTE THAT HORIZONTAL AND VERTICAL STRUT BRACING WILL BE REQUIRED FOR A LOAD IN A 60'-8" LONG CAR.
3. ONE LCL BRACE WILL BE USED AT EACH SIDE OF EACH PALLET UNIT. THE BRACES WILL BE LOCATED NEAR THE CENTER OF THE LENGTH OF THE UNITS.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	20	7
1" X 6"	312	156
2" X 2"	7	3
2" X 4"	28	19
2" X 6"	65	65
4" X 4"	10	14
NAILS	NO. REQD	POUNDS
6d (2")	96	3/4
8d (2-1/2")	192	2-1/4
10d (3")	152	2-1/2
12d (3-1/4")	16	1/2
16d (3-1/2")	144	3-1/4

LOAD AS SHOWN

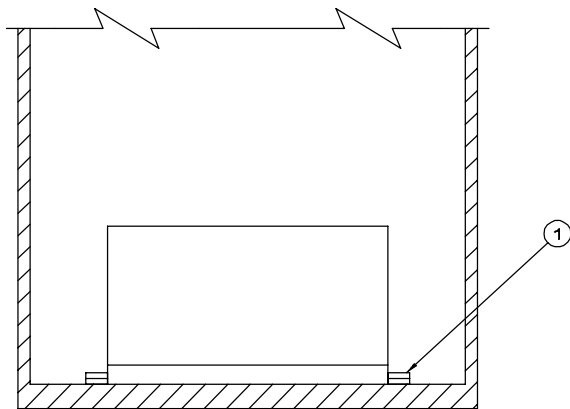
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	8	16,232 LBS
DUNNAGE		538 LBS
TOTAL WEIGHT		16,770 LBS (APPROX)



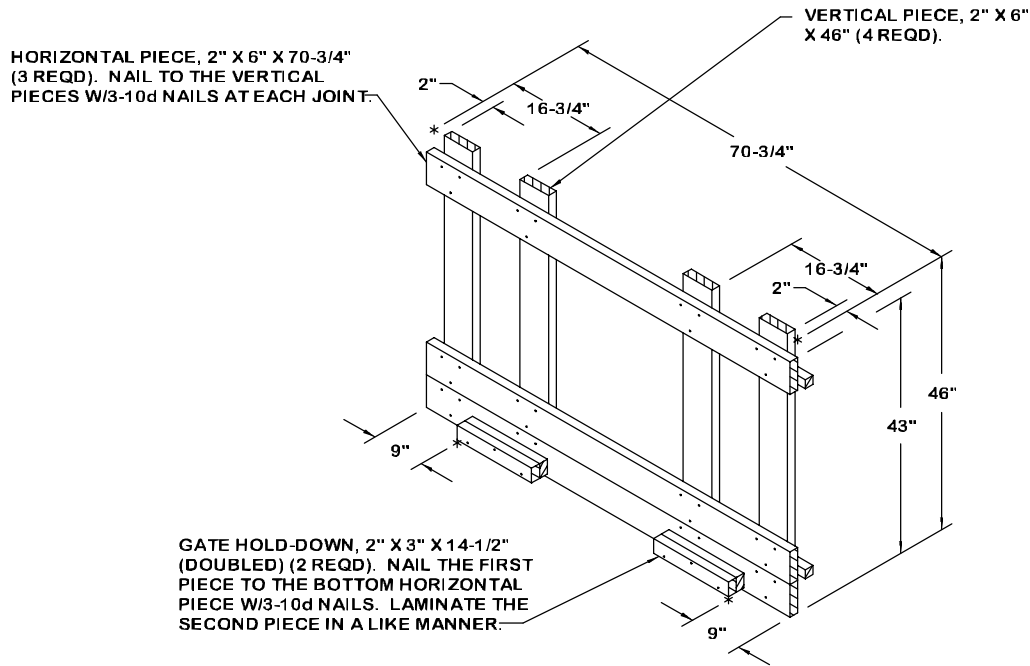
ISOMETRIC VIEW

KEY NUMBERS

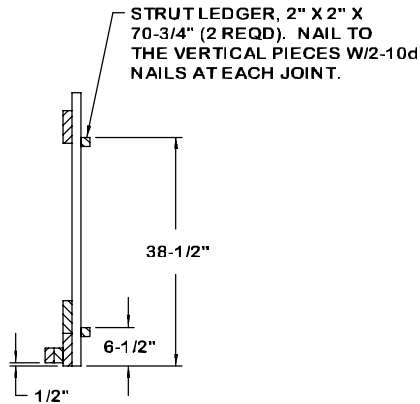
- ① FLOORLINE BLOCKING, 2" X 6" BY RANDOM LENGTHS (DOUBLED) (4 REQD). POSITION AGAINST THE PALLET AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/1-16d NAIL EVERY 12". NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTE "L" ON PAGE 2 AND GENERAL NOTE "T" ON PAGE 3.
- ② CENTER GATE (2 REQD). SEE THE "CENTER GATE E" DETAIL ON PAGE 31.
- ③ STRUT, 4" X 4" BY CUT-TO-FIT (8 REQD). TOENAIL TO PIECES MARKED ② W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "V" AND "W" ON PAGE 3.



SECTION F-F



CENTER GATE E



END VIEW

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOXCAR IS SHOWN. WIDER CARS AND CARS OF OTHER LENGTHS CAN BE USED. SEE SPECIAL NOTE 2.
2. A 1-WIDE CROSSWISE LOAD IN A 50'-6" LONG CAR IS SHOWN AS TYPICAL. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR A 15-UNIT CROSSWISE LOAD IN A 40'-6" LONG CAR, AND A 24-UNIT CROSSWISE LOAD IN A 60'-8" LONG CAR. IF A 60'-8" LONG CAR IS TO BE LOADED, THE STRUTS MUST BE DOUBLED 2" X 6" MATERIAL, LAMINATED W/1-10d NAIL EVERY 6".

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 3"	10	5
2" X 6"	255	255
4" X 4"	29	39
NAILS	NO. REQD	POUNDS
10d (3")	84	1-1/2
16d (3-1/2")	224	5

LOAD AS SHOWN

<u>ITEM</u>	<u>QUANTITY</u>	<u>WEIGHT (APPROX)</u>
PALLET UNIT -----	19 -----	38,551 LBS
DUNNAGE -----		605 LBS
TOTAL WEIGHT -----		39,156 LBS (APPROX)

HORIZONTAL PIECE, 1" X 6" X 70-3/4" (2 REQD). NAIL TO THE VERTICAL PIECES OF THE LCL BRACES W/3-6d NAILS AT EACH JOINT PRIOR TO PLACEMENT AGAINST THE LADING.

THE DIRECTION OF ARROW INDICATES BASE END OF CONTAINERS.

HORIZONTAL PIECE, 1" X 6" X 29-1/4" (2 REQD). NAIL TO THE VERTICAL PIECES OF THE LCL BRACES W/3-6d NAILS AT EACH JOINT PRIOR TO PLACEMENT AGAINST THE LADING.

SEE GENERAL NOTE "F" ON PAGE 2.

LCL BRACES (4 REQD). SEE THE DETAIL BELOW. LOCATE SO AS TO BE CENTERED ON THE JOINTS OF THE CONTAINER STACKS AND/OR NEAR THE ENDS OF THE CONTAINER LENGTH. NAIL TO THE CAR FLOOR W/7-16d NAILS. SEE GENERAL NOTE "T" ON PAGE 3.

ISOMETRIC VIEW

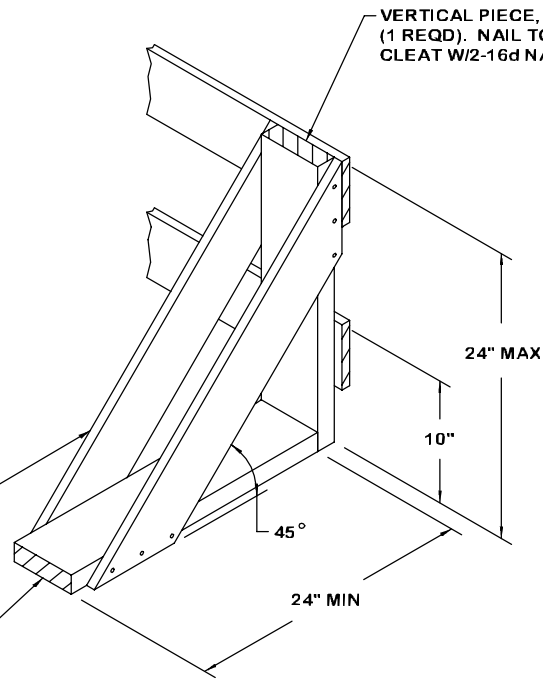
SPECIAL NOTES:

1. A 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOXCAR HAVING A WOOD OR NAILABLE METAL FLOOR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED. SEE GENERAL NOTES "D" AND "P" ON PAGE 2.
2. THE LOAD SHOWN DEPICTING THE LCL BRACE METHOD OF PARTIAL-LAYER BRACING IS TYPICAL. A CROSSWISE UNIT IS SHOWN, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LENGTHWISE UNITS AND FOR OTHER QUANTITIES AS LONG AS THE CAPACITY OF THE BRACES IS NOT EXCEEDED. SEE SPECIAL NOTE 3.
3. EACH LCL BRACE AS APPLIED FOR LONGITUDINAL BRACING WILL RETAIN 2,000 POUNDS OF LADING. EACH LCL BRACE AS APPLIED FOR LATERAL BRACING WILL SUPPORT 8,000 POUNDS OF LADING. A MINIMUM OF TWO BRACES MUST BE USED FOR LONGITUDINAL BRACING. BRACES MAY BE ADDED FOR LONGITUDINAL BRACING AS NECESSARY.

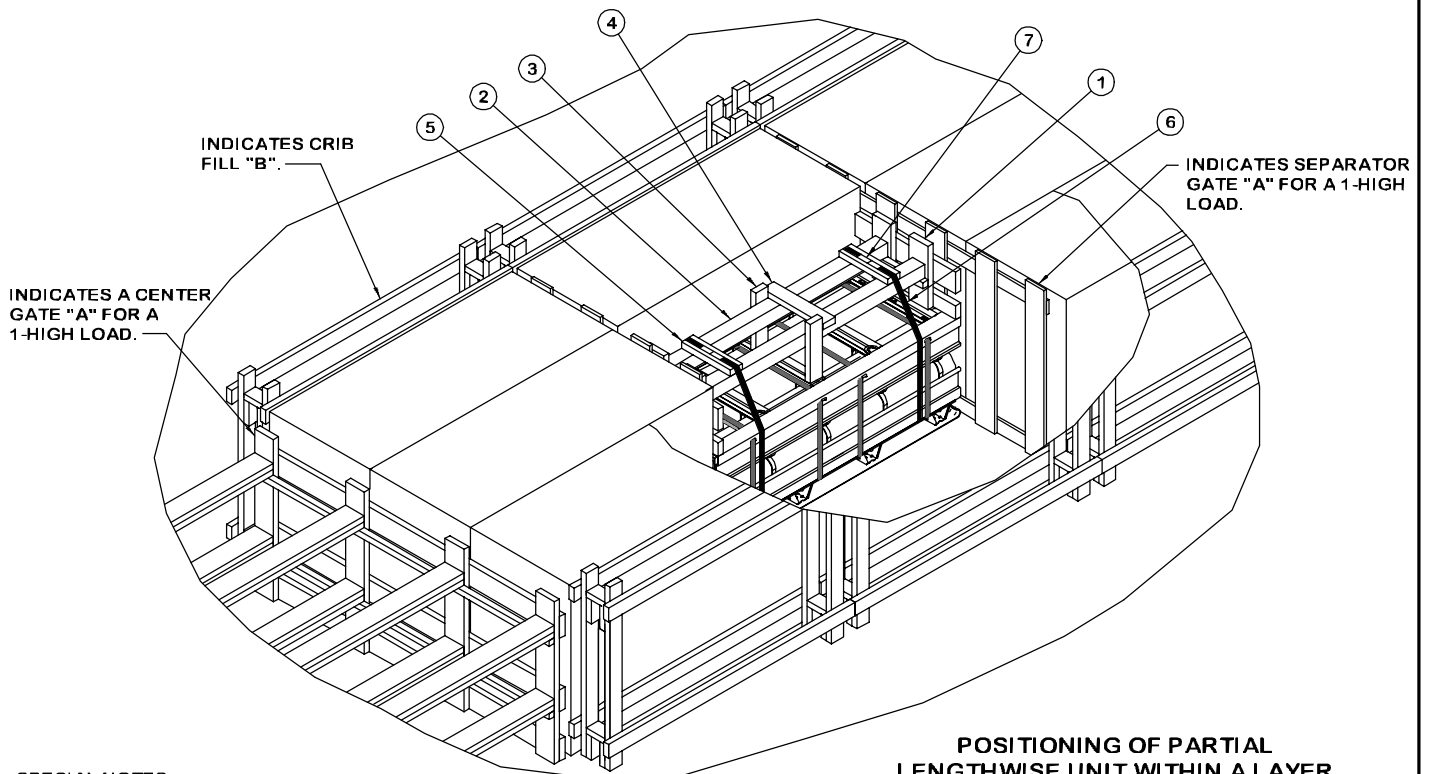
VERTICAL PIECE, 2" X 6" X 24" (1 REQD). NAIL TO THE BACK-UP CLEAT W/2-16d NAILS.

ANGLE BRACE, 1" X 6" BY CUT TO FIT (2 REQD). NAIL TO THE VERTICAL PIECE AND TO THE BACK-UP CLEAT W/3-8d NAILS AT EACH END.

BACK-UP CLEAT, 2" X 6" MATERIAL (1 REQD).



LCL BRACE



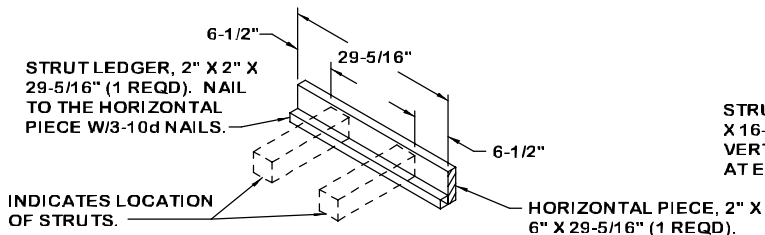
SPECIAL NOTES:

1. SHIPMENTS OF 2.75" HYDRA ROCKETS SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE, HOWEVER, THE END OF A LOT OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION, MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LESS-THAN-FULL PALLET UNITS WITHIN A LOAD. THE PROCEDURES ON THIS PAGE ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF A PARTIAL UNIT WITHIN A 1-LAYER LENGTHWISE LOAD. THE PRINCIPLES MAY ALSO BE APPLIED FOR SHIPMENT OF A PARTIAL PALLET UNIT IN THE SECOND LAYER.
2. A LESS-THAN-FULL HEIGHT PALLET UNIT OF LENGTHWISE POSITIONED ROCKETS WHICH IS TO BE SHIPPED WITHIN A LAYER OF A LOAD WILL BE LIMITED TO NOT LESS THAN TWO LAYERS OF CONTAINERS ON THE PARTIAL UNIT. THE DEPICTED PROCEDURES SHOW THE BRACING OF A 2-LAYER UNIT WITHIN A LOAD. THE PRINCIPLES CAN BE ADAPTED TO SUIT 3-LAYER PARTIAL UNITS. PARTIAL UNIT GATE DETAILS ARE SHOWN FOR UNITS REDUCED BY ONE AND TWO LAYERS.
3. A PARTIAL UNIT MUST CONSIST OF FULL LAYERS OF FOUR CONTAINERS, OR EMPTY CONTAINERS MUST BE POSITIONED IN THE PLACE OF OMITTED FILLED CONTAINERS. SEE GENERAL NOTE "K" OF THE "BASIC PROCEDURES" DRAWING 19-48-4231/61-20PM1006 FOR FURTHER GUIDANCE.
4. THE EMPTY CONTAINERS, AS REFERENCED IN SPECIAL NOTE 3, SHOULD REMAIN WITH THE UNIT DURING STORAGE (IF APPLICABLE) FOR POSSIBLE USE IN A FUTURE SHIPMENT; THE DUNNAGE DEPICTED ABOVE FOR THE SHIPMENT OF THE PARTIAL UNIT MAY BE REMOVED WHEN A SHIPMENT REACHES ITS DESTINATION.
5. THE "POSITIONING OF PARTIAL LENGTHWISE UNIT WITHIN A LAYER" VIEW ABOVE DEPICTS A PORTION OF A CONVENTIONAL BOXCAR LOAD, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LOADS IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.
6. THE PARTIAL UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE LOAD UNIT BETWEEN THE PARTIAL UNIT AND A CENTER GATE.

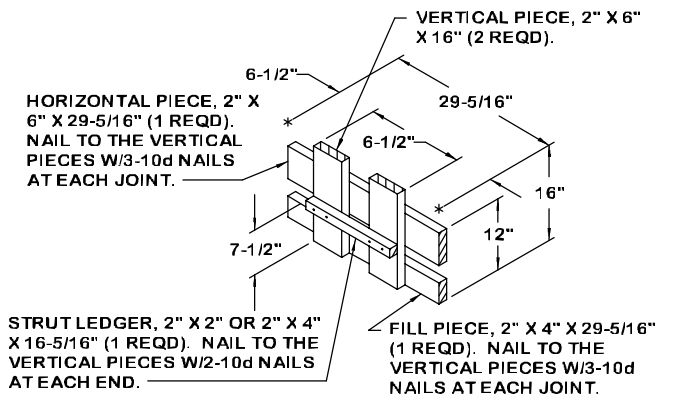
POSITIONING OF PARTIAL LENGTHWISE UNIT WITHIN A LAYER

KEY NUMBERS

- ① PARTIAL UNIT GATE (2 REQD). SEE THE "PARTIAL UNIT GATE A" DETAIL BELOW. SEE GENERAL NOTE "L" ON PAGE 2 AND SPECIAL NOTE 2 AT LEFT.
- ② STRUT, 4" X 4" X 64-3/4" (2 REQD). TOENAIL TO THE VERTICAL PIECES OF THE PARTIAL UNIT GATE, PIECE MARKED ①, W/2-16d NAILS AT EACH END.
- ③ VERTICAL STRUT BRACING, 2" X 4" X 15" (2 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT. BRACING MUST BE PLACED ON A CENTER BOW OF THE TOP FRAME ASSEMBLY SO AS TO PROTECT THE CONTAINERS.
- ④ HORIZONTAL STRUT BRACING, 2" X 4" X 18" (1 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH END.
- ⑤ STRAPPING BOARD, 2" X 4" X 14-1/4" (2 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH END.
- ⑥ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 14'-0" LONG STEEL STRAPPING (2 REQD). PRE-POSITION UNDER THE PALLET.
- ⑦ SEAL FOR 1-1/4" STRAPPING (4 REQD, 2 PER JOINT). SEE GENERAL NOTE "N" ON PAGE 2.

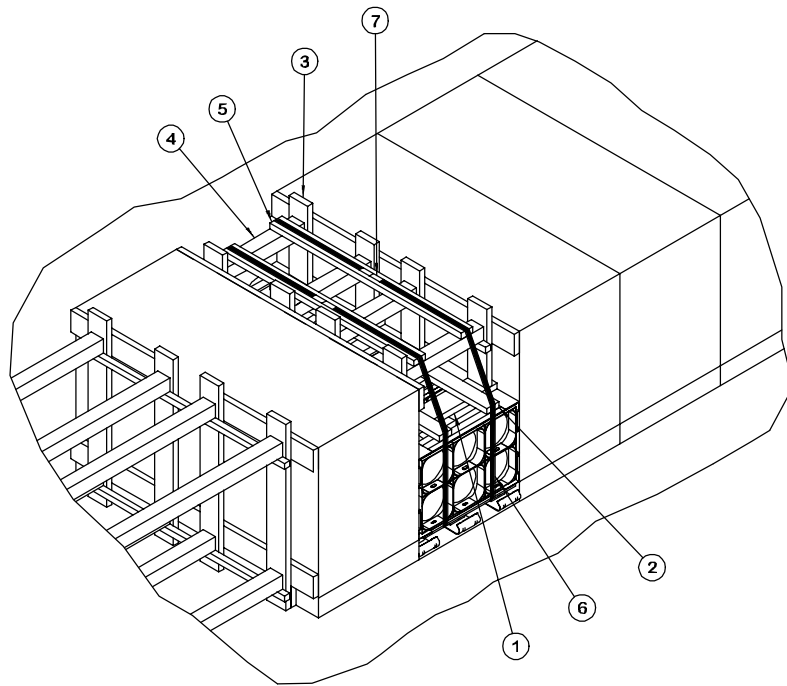


PARTIAL UNIT GATE B



PARTIAL UNIT GATE A

PROCEDURES FOR SHIPMENT OF PARTIAL UNITS LENGTHWISE



POSITIONING OF PARTIAL CROSSWISE UNIT WITHIN A LAYER

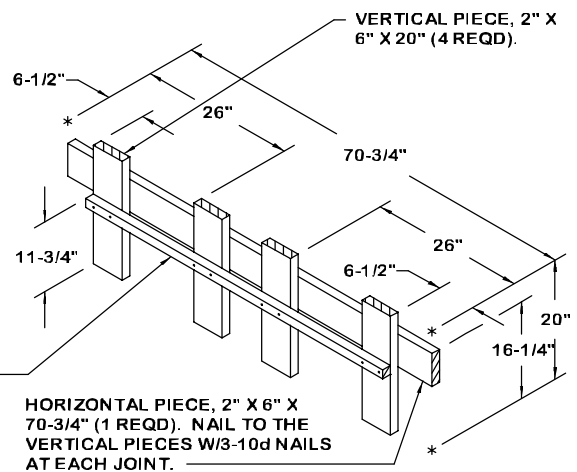
SPECIAL NOTES:

1. SHIPMENTS OF 2.75" HYDRA ROCKETS SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE, HOWEVER, THE END OF A LOT OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION, MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LESS-THAN-FULL PALLET UNITS WITHIN A LOAD. THE PROCEDURES ON THIS PAGE ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF A PARTIAL UNIT WITHIN A 1-LAYER CROSSWISE LOAD.
2. A LESS-THAN-FULL HEIGHT PALLET UNIT OF CROSSWISE POSITIONED ROCKETS WHICH IS TO BE SHIPPED WITHIN A LAYER OF A LOAD WILL BE LIMITED TO NOT LESS THAN TWO LAYERS OF CONTAINERS ON THE PARTIAL UNIT. THE DEPICTED PROCEDURES SHOW THE BRACING OF A 2-LAYER UNIT WITHIN A LOAD. THE PRINCIPLES CAN BE ADAPTED TO SUIT 3-LAYER PARTIAL UNITS.
3. A PARTIAL UNIT MUST CONSIST OF FULL LAYERS OF FOUR CONTAINERS, OR EMPTY CONTAINERS MUST BE POSITIONED IN THE PLACE OF OMITTED FILLED CONTAINERS. SEE GENERAL NOTE "K" OF THE "BASIC PROCEDURES" DRAWING 19-48-4231/61-20PM1006 FOR FURTHER GUIDANCE.
4. THE EMPTY CONTAINERS, AS REFERENCED IN SPECIAL NOTE 3, SHOULD REMAIN WITH THE UNIT DURING STORAGE (IF APPLICABLE) FOR POSSIBLE USE IN A FUTURE SHIPMENT; THE DUNNAGE DEPICTED ABOVE FOR THE SHIPMENT OF THE PARTIAL UNIT MAY BE REMOVED WHEN A SHIPMENT REACHES ITS DESTINATION.
5. THE "POSITIONING OF PARTIAL CROSSWISE UNIT WITHIN A LAYER" VIEW ABOVE DEPICTS A PORTION OF A CONVENTIONAL BOXCAR LOAD, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LOADS IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.
6. THE PARTIAL UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE LOAD UNIT BETWEEN THE PARTIAL UNIT AND A CENTER GATE.

KEY NUMBERS

- ① SUPPORT PIECE, 2" X 6" X 29-5/16" (4 REQD). POSITION ON TOP OF THE PARTIAL UNIT SO AS TO BE UNDER THE VERTICAL PIECES OF THE PARTIAL UNIT GATE, PIECE MARKED ③.
- ② RETAINER PIECE, 2" X 4" X 70-3/4" (2 REQD). NAIL TO THE SUPPORT PIECES, PIECES MARKED ①, W/2-10d NAILS AT EACH JOINT.
- ③ PARTIAL UNIT GATE (2 REQD). SEE THE "PARTIAL UNIT GATE C" DETAIL BELOW. SEE GENERAL NOTE "L" ON PAGE 2 AND SPECIAL NOTE 3 AT LEFT.
- ④ STRUT, 4" X 4" X 23-5/16" (4 REQD). TOENAIL TO THE PARTIAL UNIT GATE, PIECE MARKED ③, W/2-16d NAILS AT EACH END.
- ⑤ STRAPPING BOARD, 2" X 4" X 55-3/4" (2 REQD). NAIL TO THE STRUTS, PIECES MARKED ④, W/3-10d NAILS AT EACH JOINT.
- ⑥ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 19'-6" LONG STEEL STRAPPING (2 REQD). PRE-POSITION.
- ⑦ SEAL FOR 1-1/4" STRAPPING (4 REQD, 2 PER JOINT). SEE GENERAL NOTE "N" ON PAGE 2.

STRUT LEDGER, 2" X 2" OR 2" X 4" X 57-3/4" (1 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.



PARTIAL UNIT GATE C

UNITIZING STRAP, 1-1/4" X .035" OR .031" X 18'-0" LONG STEEL STRAPPING (2 REQD). INSTALL SO AS TO ENCIRCLE BOTH PALLETES. THREAD STRAPS THROUGH THE PALLET POSTS OF THE LOWER PALLET.

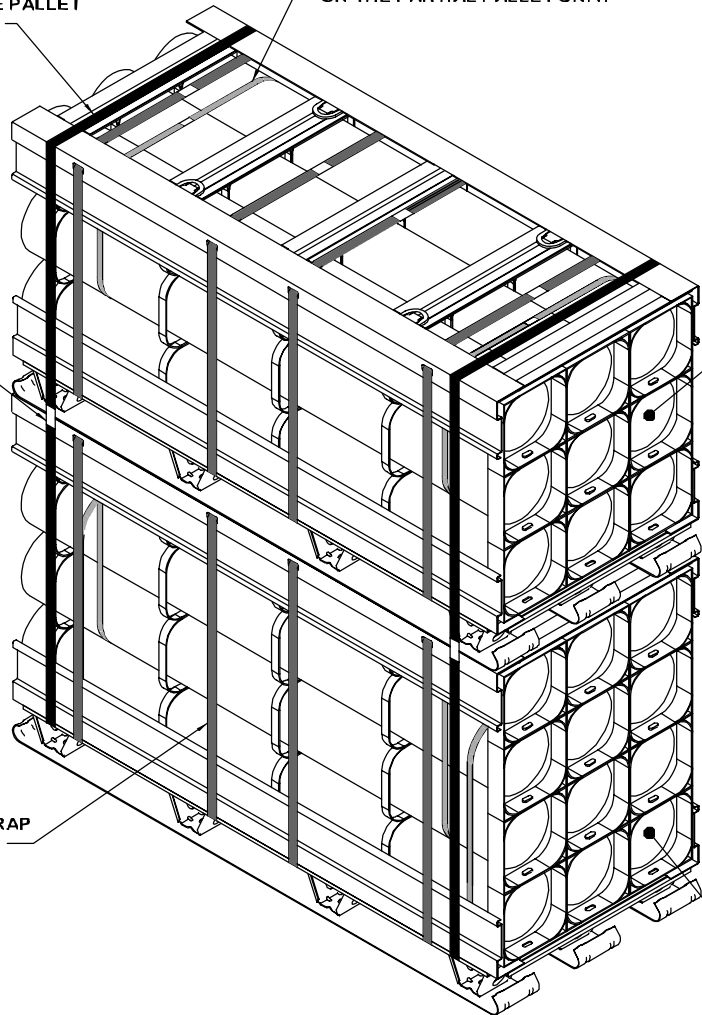
INDICATES A BUNDLING STRAP ON THE PARTIAL PALLET UNIT.

SEAL FOR 1-1/4" STRAPPING (2 REQD). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES.

INDICATES A TYPICAL 3-LAYER PARTIAL PALLET UNIT.

INDICATES A UNITIZING STRAP ON THE FULL PALLET UNIT.

INDICATES A TYPICAL PALLET UNIT AS SHOWN ON PAGE 5 OF THIS DRAWING.



SECUREMENT OF A PARTIAL PALLET UNIT ON TOP OF A FULL PALLET UNIT

SPECIAL NOTES:

1. SHIPMENTS OF PALLET UNITS OF 2.75 INCH HYDRA ROCKETS SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE. HOWEVER, THE END OF A LOT OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LESS-THAN-FULL PALLET UNITS WITHIN A LOAD. THE PROCEDURES ON THIS PAGE ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF THESE PARTIAL UNITS.
2. A PARTIAL PALLET UNIT MUST CONSIST OF EITHER TWO OR THREE FULL LAYERS IN ORDER FOR THE TOP AND BOTTOM PALLET ADAPTER ASSEMBLIES TO PROPERLY FUNCTION. A LAYER MAY CONSIST OF EMPTY CONTAINERS, THOUGH, AS DESCRIBED IN THE GENERAL NOTES OF AMC DRAWING 19-48-4231-20PM1006.
3. ELIMINATE THE TWO LOWER BUNDLING STRAPS WHEN UNITIZING A THREE-HIGH PARTIAL PALLET, AND ELIMINATE ALL FOUR BUNDLING STRAPS WHEN UNITIZING A TWO-HIGH PARTIAL PALLET UNIT.

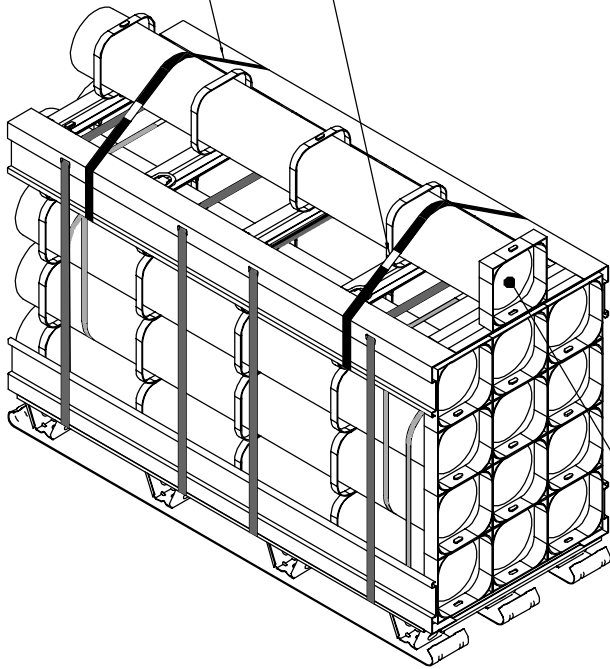
(SPECIAL NOTES CONTINUED AT RIGHT)

SPECIAL NOTES (CONT.)

4. A LESS-THAN-FULL HEIGHT PALLET UNIT CAN BE SHIPPED BY POSITIONING IT EITHER ON THE TOP TIER OF A LOAD OR ON THE TOP OF A LOWER PORTION OF A LOAD WHEN THE LOAD CONTAINS A PARTIAL TIER IN THE END OF THE BOXCAR. THE PARTIAL UNIT WILL BE STRAPPED TO THE PALLET UNIT DIRECTLY BELOW WITH TWO VERTICAL UNITIZING STRAPS. SEE THE "SECUREMENT OF A PARTIAL UNIT ON TOP OF A FULL PALLET UNIT" VIEW ABOVE FOR GUIDANCE.
5. A PARTIAL PALLET UNIT MUST NOT BE POSITIONED ON THE REARMOST PALLET UNIT IN THE LOAD.
6. LEFTOVER CONTAINERS, IN AN AMOUNT WHICH IS LESS THAN THE QUANTITY IN ONE LAYER OF A UNIT, CAN BE SECURED TO THE TOP OF A PARTIAL UNIT FOR SECUREMENT ON TOP OF A LOAD. THE LEFTOVER CONTAINERS MUST BE SECURED TO THE PARTIAL UNIT WITH THEIR OWN STRAPPING, SEPARATE FROM THE STRAPS FOR THE PARTIAL UNIT. SEE THE DETAILS ON PAGE 36 FOR GUIDANCE IN STRAP APPLICATION.

SEAL FOR 1-1/4" STRAPPING
(2 REQD). CRIMP EACH SEAL
WITH TWO PAIR OF NOTCHES.

UNITIZING STRAP, 1-1/4" X .035"
OR .031" X 9'-0" LONG STEEL
STRAPPING (2 REQD).



POSITION CONTAINER SO
AS TO BE CENTERED ON
THE LENGTH OF THE UNIT
AS NEAR AS PRACTICABLE.

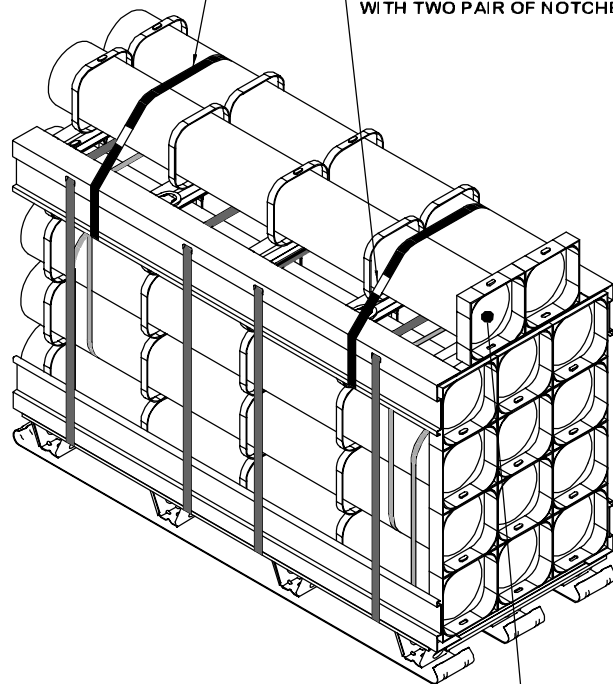
SECUREMENT OF ONE CONTAINER

SPECIAL NOTES:

1. SHIPMENTS OF PALLET UNITS OF 2.75 INCH HYDRA ROCKETS SHOULD CONSIST OF FULL-HEIGHT UNITS TO THE MAXIMUM EXTENT POSSIBLE. HOWEVER, THE END OF A LOT OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS. LEFTOVER CONTAINERS ARE DESCRIBED AS ANY QUANTITY OF CONTAINERS BETWEEN ONE AND FIVE.
2. SHIPMENT OF LEFTOVER CONTAINERS IS APPLICABLE FOR CONUS AND OCONUS MOTOR CARRIER SHIPMENTS FROM DEPOT TO DEPOT OR FROM DEPOTS TO POSTS, CAMPS, AND STATIONS, OR, UPON APPROVAL FROM HIGHER HEADQUARTERS, FOR SHIPMENTS FROM LOAD, ASSEMBLY, AND PACK PLANTS TO DEPOTS. CAUTION: A LOAD CONTAINING LEFTOVER CONTAINERS IN AN AMOUNT WHICH IS LESS THAN A FULL LAYER, AND SECURED TO THE TOP OF A FULL OR PARTIAL UNIT, MUST NOT BE DESTINED FOR SHIPMENT OVERSEAS BY WATER CARRIER.
3. THE PROCEDURES ON THIS PAGE ARE PRESENTED AS GUIDANCE IN THE SECUREMENT OF LEFTOVER CONTAINERS FOR SHIPMENT. THE PROCEDURES ARE ALSO APPLICABLE FOR SECUREMENT OF LEFTOVER CONTAINERS TO PARTIAL PALLET UNITS FOR SHIPMENT ON TOP OF A LOAD. SEE SPECIAL NOTE 6 ON PAGE 35 FOR LIMITATIONS. IN ADDITION, THE PROCEDURES ARE APPLICABLE FOR SECURING LEFTOVER CONTAINERS TO A PARTIAL UNIT FOR SHIPMENT WITHIN A TIER.
4. THE PROCEDURES DEPICTED ON THIS PAGE ARE APPLICABLE FOR THE SHIPMENT OF LEFTOVER CONTAINERS IN ANY OF THE LOADS DEPICTED HEREIN.

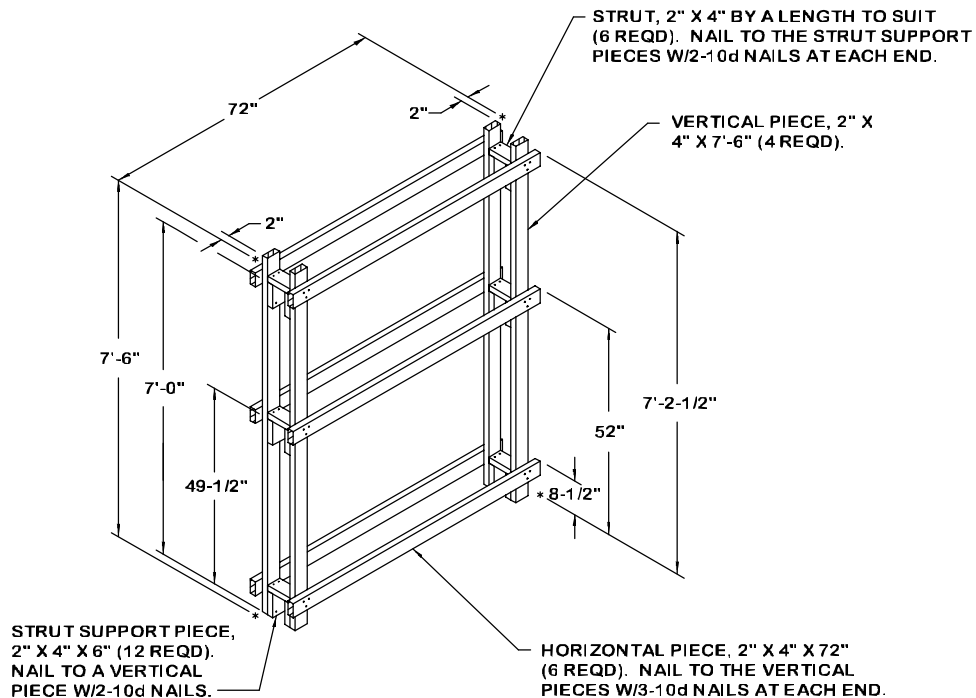
UNITIZING STRAP, 1-1/4" X .035"
OR .031" X 9'-6" LONG STEEL
STRAPPING (2 REQD).

SEAL FOR 1-1/4" STRAPPING
(2 REQD). CRIMP EACH SEAL
WITH TWO PAIR OF NOTCHES.



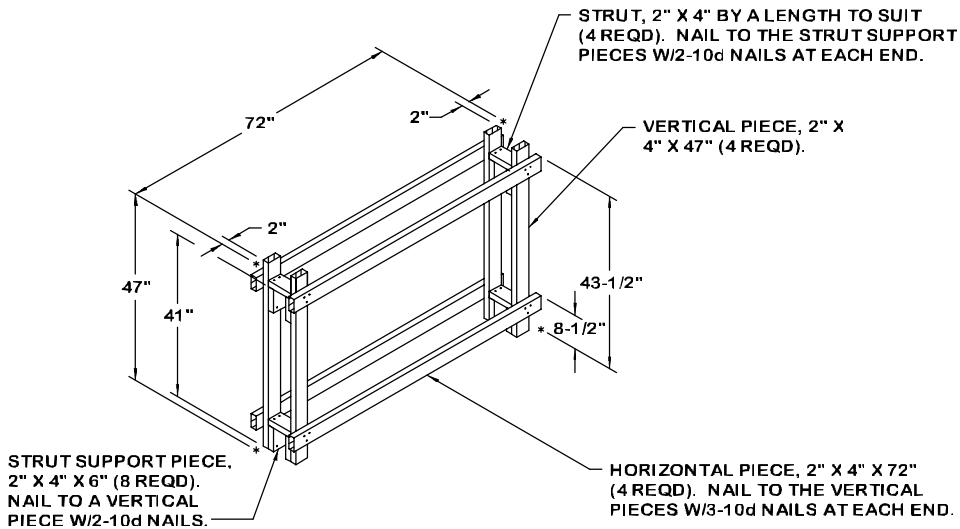
POSITION CONTAINERS SO
AS TO BE CENTERED ON
THE LENGTH OF THE UNIT
AS NEAR AS PRACTICABLE.

SECUREMENT OF TWO CONTAINERS

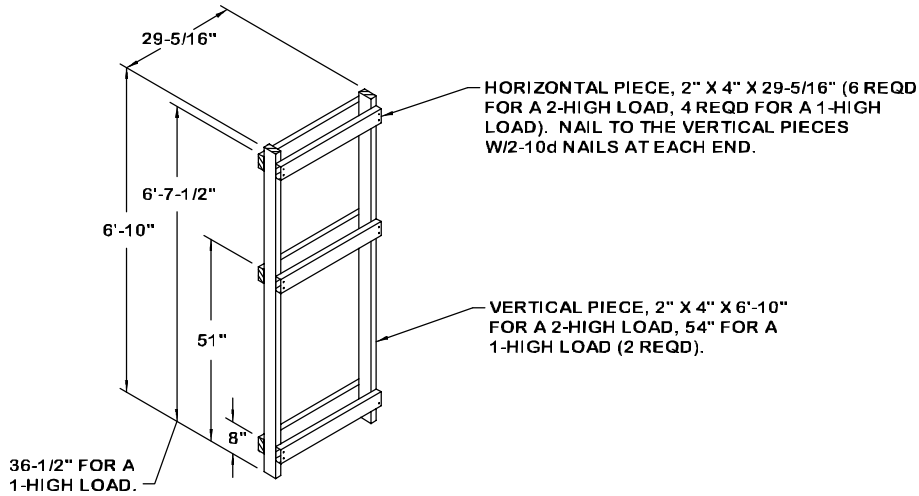


CRIB FILL A

CRIB FILL ASSEMBLIES "A" AND "B" SHOULD BE PRE-FABRICATED. CONSTRUCT TO BE 1/2" TO 3/4" LESS IN WIDTH THAN THE DISTANCE BETWEEN THE PALLET UNITS AND THE CAR WALL.

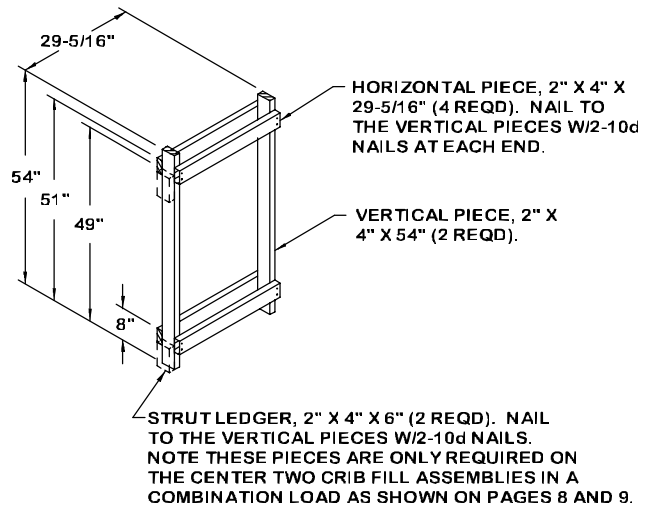


CRIB FILL B



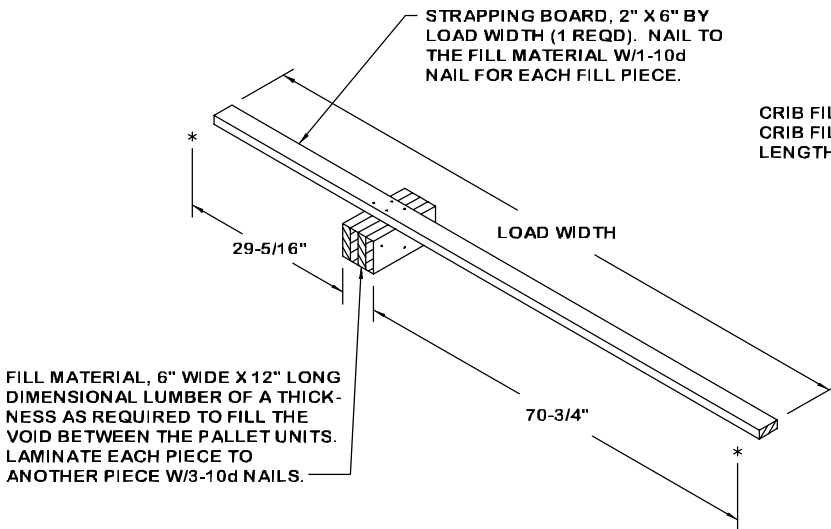
CRIB FILL C

CRIB FILL ASSEMBLIES "C" AND "D" SHOULD BE PRE-FABRICATED. CONSTRUCT TO BE 1/2" TO 3/4" LESS IN WIDTH THAN THE DISTANCE BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. NOTE THAT CRIB FILL ASSEMBLIES ARE DESIGNED FOR A 9'-2" WIDE CAR. FOR A LOAD IN A 9'-4" WIDE CAR, USE 2" X 6" VERTICAL PIECES; FOR A LOAD IN A 9'-6" WIDE CAR, USE 2" X 8" VERTICAL PIECES.



CRIB FILL D

CRIB FILL "D" IS NOT REQUIRED FOR A 1-HIGH LOAD. CRIB FILL "C" WILL BE USED THROUGHOUT THE LENGTH OF THE LOAD.



SPACER ASSEMBLY C

THIS ASSEMBLY IS FOR USE IN THE COMBINATION LOAD ON PAGE 8 WHEN THE CAR IS EQUIPPED WITH PLUG TYPE DOORS, OR AS AN ALTERNATIVE TO WOODEN DOOR GATE TYPE DOORWAY PROTECTION WHEN USED IN CONJUNCTION WITH STEEL STRAPPING.

HORIZONTAL PIECE, 2" X 6" X 7'-0"
(4 REQD). NAIL TO THE VERTICAL
PIECES W/3-10d NAILS AT EACH
JOINT.

VERTICAL PIECE, 2" X 6" X 7'-0"
FOR A 2-HIGH LOAD, 41" FOR
A 1-HIGH LOAD (4 REQD).

FILL PIECE, 2" X 6" X 32"
(2 REQD). NAIL TO THE
VERTICAL PIECES W/3-10d
NAILS AT EACH END.

GATE HOLD-DOWN, 2" X 4" X 5" (DOUBLED)
(2 REQD). NAIL THE FIRST PIECE TO THE
FILL PIECE W/2-10d NAILS. LAMINATE THE
SECOND PIECE IN A LIKE MANNER.

STRUT LEDGER, 2" X 2" OR
2" X 4" X 7'-3-1/2" (4 REQD).
NAIL TO THE VERTICAL
PIECES W/2-10d NAILS AT
EACH JOINT.

CENTER GATE A

STRUT LEDGER, 2" X 2" OR
2" X 4" X 20" (4 REQD). NAIL
TO THE VERTICAL PIECES
W/2-10d NAILS AT EACH JOINT.

HORIZONTAL PIECE, 2" X 6" X
29-5/16" (5 REQD). NAIL TO
THE VERTICAL PIECES W/3-10d
NAILS AT EACH JOINT.

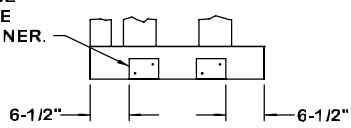
VERTICAL PIECE, 2" X 6" X 6'-10"
FOR A 2-HIGH LOAD, 39" FOR
A 1-HIGH LOAD (2 REQD).

STRUT LEDGER, 2" X 4" X 6"
(2 REQD). NAIL TO THE STOP
PIECE W/2-10d NAILS.

STOP PIECE, 2" X 4" X 61" FOR A 2-HIGH LOAD,
36-1/2" FOR A 1-HIGH LOAD (1 REQD). NAIL TO THE
HORIZONTAL PIECES W/2-10d NAILS AT EACH JOINT.

CENTER GATE B

GATE HOLD-DOWN, 2" X 4" X 5"
(DOUBLED) (2 REQD). NAIL THE
FIRST PIECE TO THE FILL PIECE
W/2-10d NAILS. LAMINATE THE
SECOND PIECE IN A LIKE MANNER.



VIEW A

VERTICAL PIECE, 2" X 6" X 7'-6"
FOR A 2-HIGH LOAD, 47" FOR
A 1-HIGH LOAD (4 REQD).

VIEW A

GATE HOLD-DOWN, 2" X 3" X
14-1/2" (DOUBLED) (2 REQD).
NAIL THE FIRST PIECE TO THE
BOTTOM HORIZONTAL PIECE
W/3-10d NAILS. LAMINATE THE
SECOND PIECE IN A LIKE MANNER.

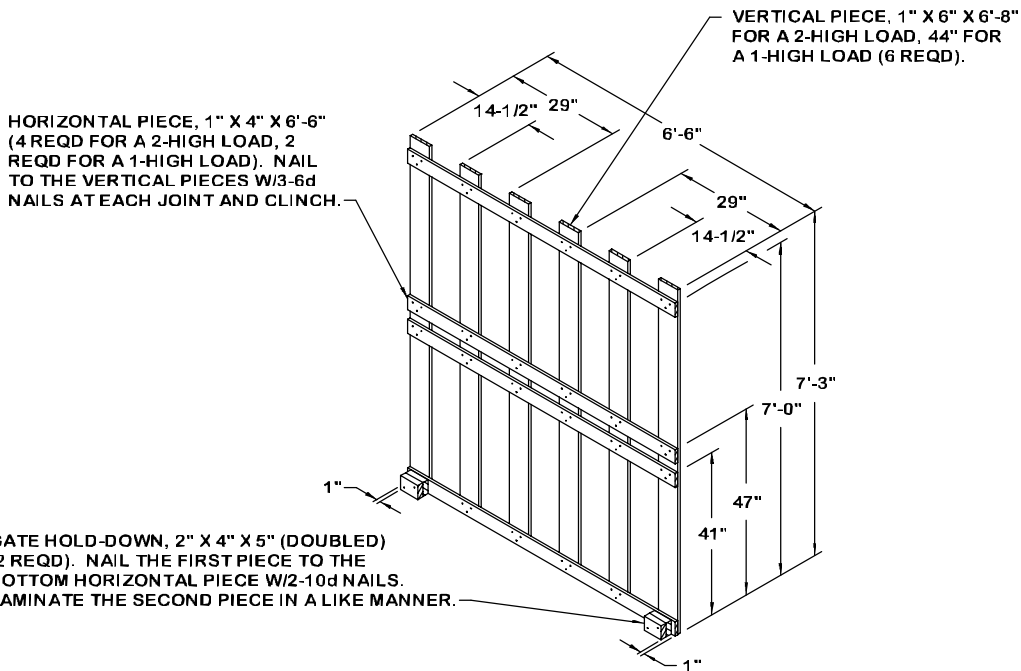
HORIZONTAL PIECE, 2" X 6"
X 57-3/4" (1 REQD). NAIL
TO THE VERTICAL PIECES
W/3-10d NAILS AT EACH JOINT.

CENTER GATE C

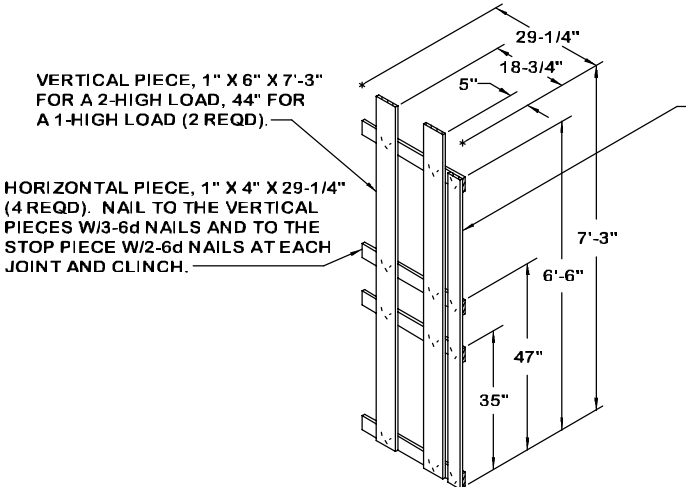
STRUT LEDGER, 2" X 2" OR
2" X 4" X 60" (4 REQD). NAIL
TO THE VERTICAL PIECES
W/2-10d NAILS AT EACH JOINT.

END VIEW

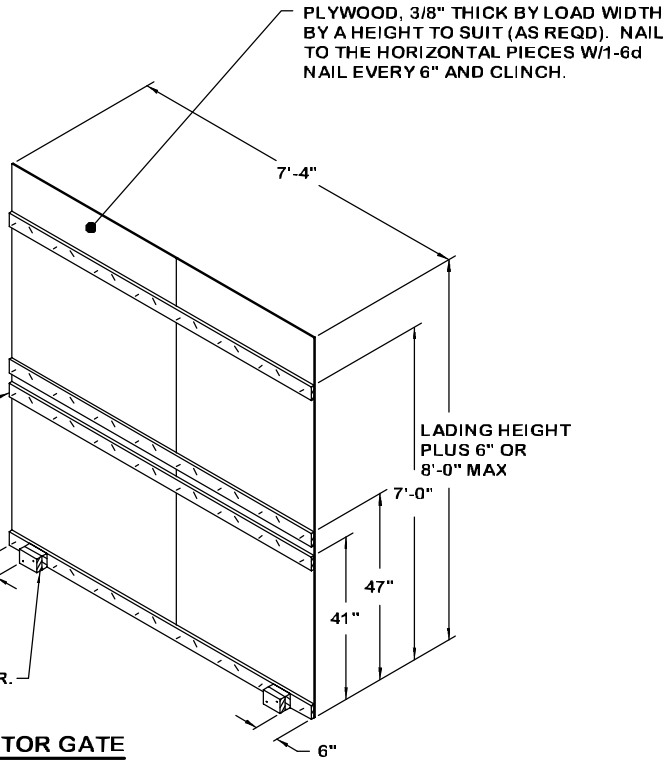
DETAILS



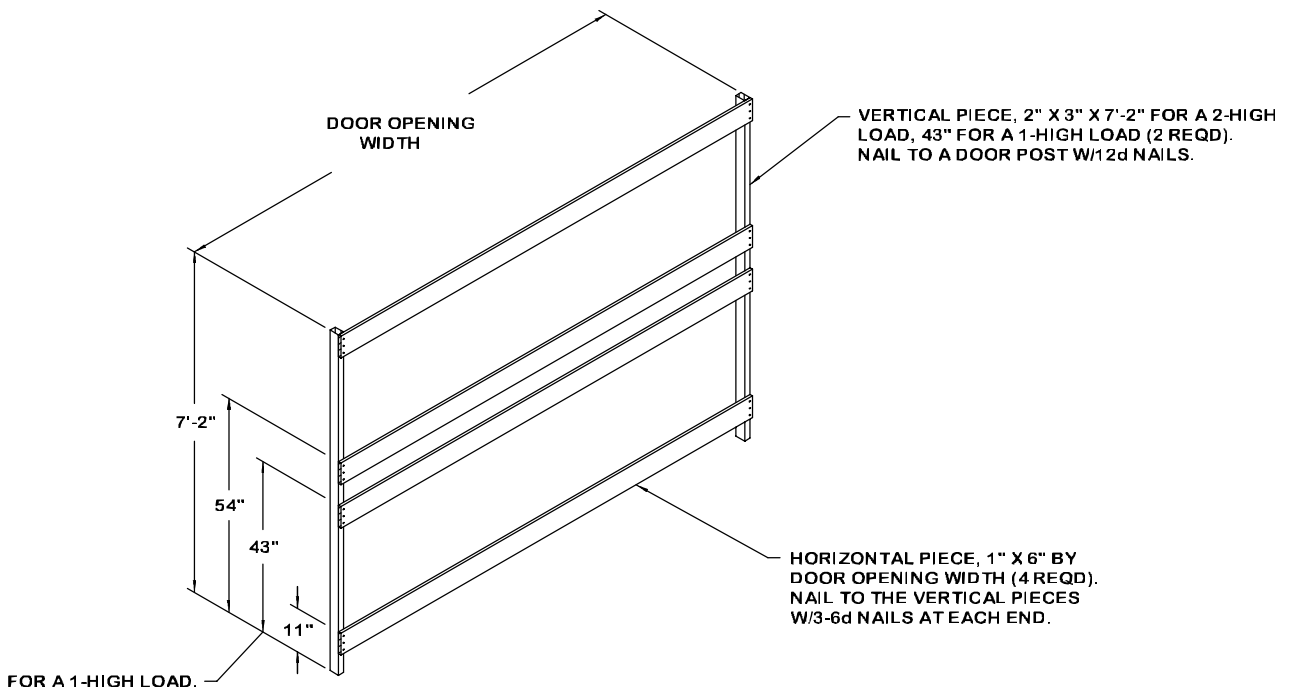
SEPARATOR GATE A



SEPARATOR GATE B

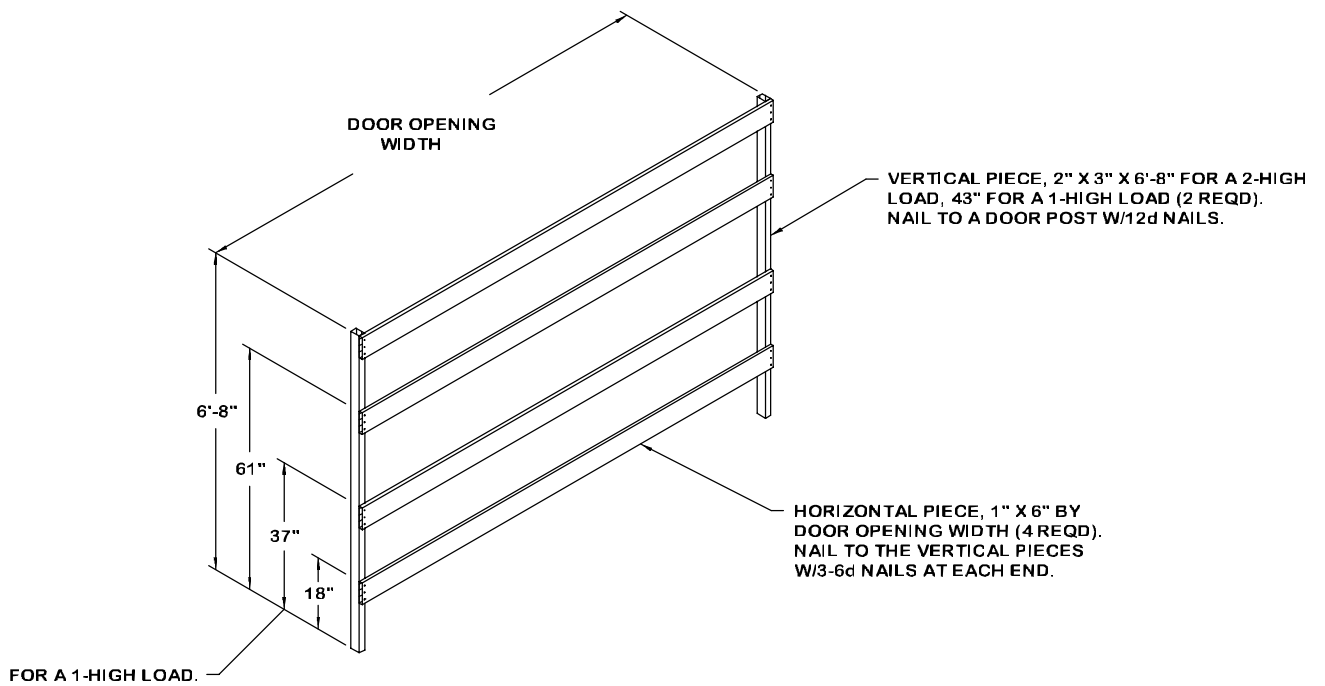


ALTERNATIVE SEPARATOR GATE



DOORWAY PROTECTION A

FOR USE IN THE LOAD ON PAGE 6 AND ON THE FAR SIDE IN THE LOAD ON PAGE 8.



DOORWAY PROTECTION B

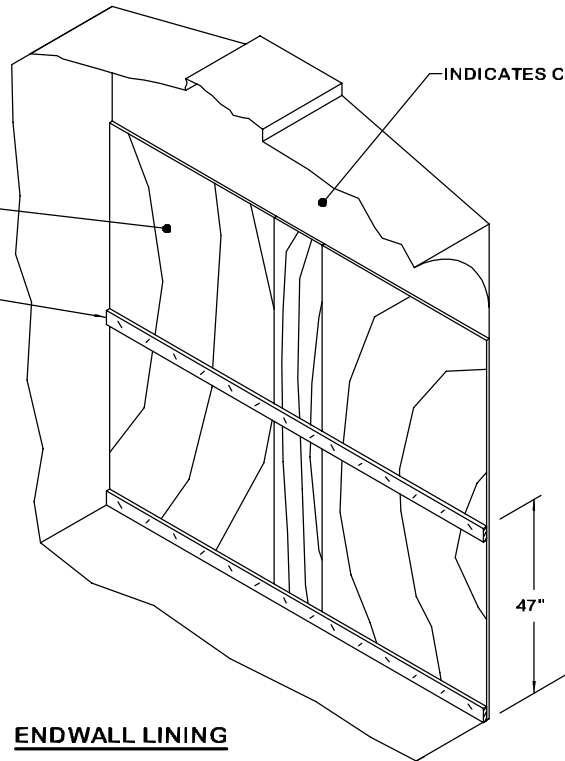
FOR USE ON THE NEAR SIDE IN THE LOAD ON PAGE 8.

DETAILS

1/2" MINIMUM THICK PLYWOOD BY CAR WIDTH MINUS 1" BY LOAD HEIGHT. NAIL TO THE TIE PIECES W/1 APPLICABLY SIZED NAIL EVERY 8" AND CLINCH. NOTE THAT SEPARATOR GATE "A" MAY BE USED IN LIEU OF PLYWOOD. POSITION WITH THE VERTICAL PIECES AGAINST THE CAR ENDWALL.

TIE PIECE, 1" X 4" BY CAR WIDTH MINUS 1" (2 REQD).

INDICATES CAR ENDWALL.



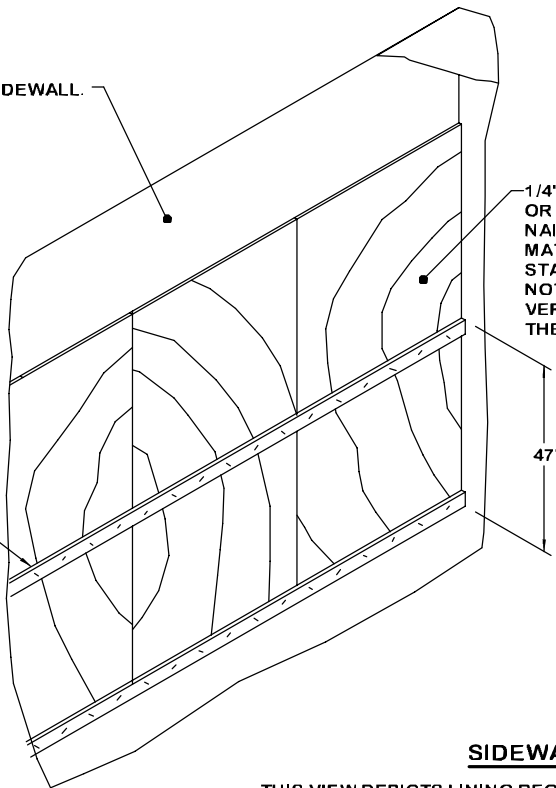
ENDWALL LINING

THIS VIEW DEPICTS LINING REQUIRED FOR A LOAD IN A CAR EQUIPPED WITH A STEEL ENDWALL.

INDICATES CAR SIDEWALL.

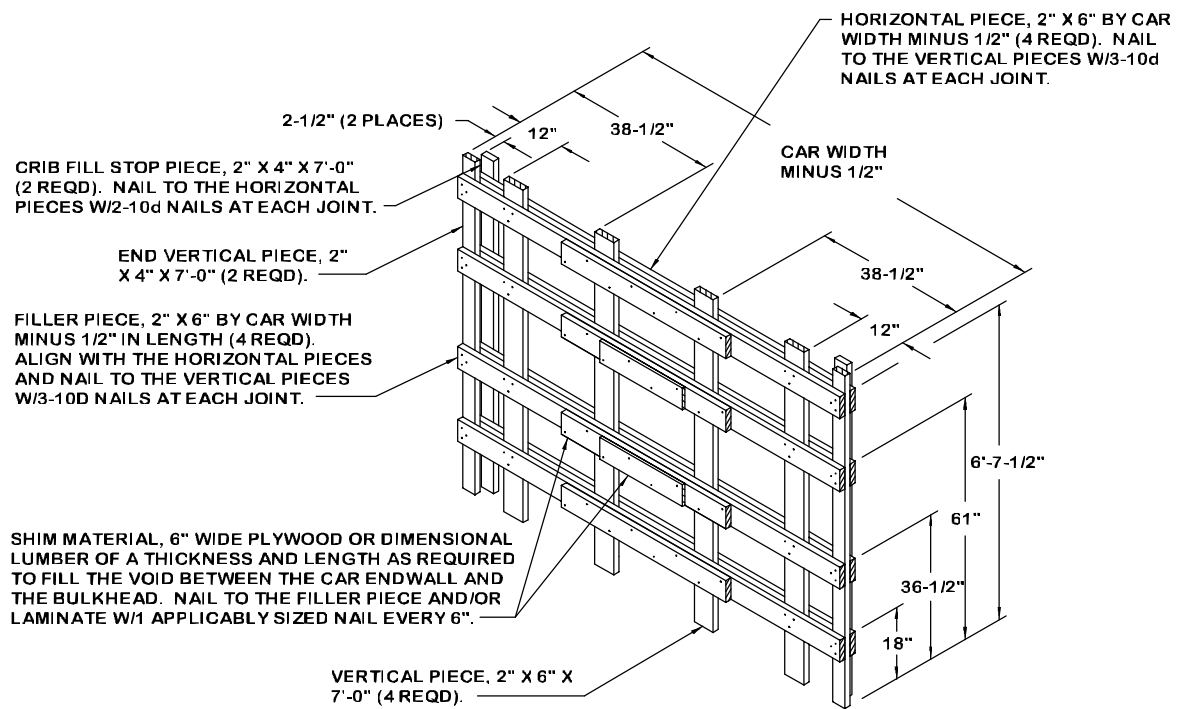
1/4" MINIMUM PLYWOOD, 1/8" MINIMUM HARDBOARD, OR .060" MINIMUM THICK SOLID WALL FIBERBOARD. NAIL PLYWOOD OR HARDBOARD TO THE 1" X 4" MATERIAL W/1 APPLICABLY SIZED NAIL EVERY 8". STAPLE FIBERBOARD TO 1" X 4" W/1 STAPLE EVERY 6". NOTE THAT SEPARATOR GATES OR SIMILARLY POSITIONED VERTICAL 1" X 6" LUMBER MAY BE USED PROVIDING THEY ARE TIED TOGETHER TO PREVENT DISLODGEEMENT.

TIE PIECE, 1" X 4" BY RANDOM LENGTH.



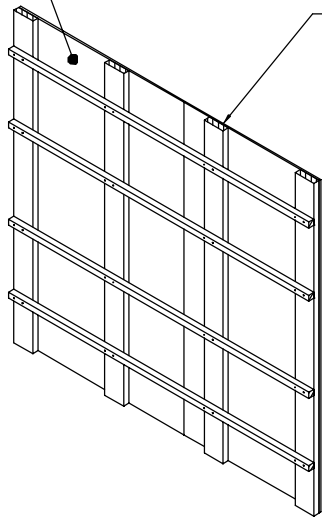
SIDEWALL LINING

THIS VIEW DEPICTS LINING REQUIRED FOR CROSSWISE POSITIONED PALLETS AS IN THE COMBINATION LOAD ON PAGE 8 IN A CAR EQUIPPED WITH A STEEL SIDEWALL. NOTE THAT IF THE CAR IS EQUIPPED WITH A STEEL-FACED PLUG DOOR, THE SPECIAL LINING WILL ALSO BE REQUIRED IN THE DOORWAY AREA IF THE SPECIFIED DOORWAY PROTECTION DOES NOT SUFFICE.



END-OF-CAR BULKHEAD

PLYWOOD, 1/2" THICK BY THE LOAD WIDTH BY THE LOAD HEIGHT (AS REQD). NAIL TO THE VERTICAL PIECES W/1-6d NAIL EVERY 6".



INDICATES A CENTER GATE "A" WITH THE HORIZONTAL PIECES OMITTED (1 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 39 FOR LOCATION OF THE VERTICAL PIECES AND THE STRUT LEDGERS.

PLYWOOD CENTER GATE ALTERNATIVE



ONE SEAL WITH TWO PAIR OF NOTCHES.

STRAP JOINT A

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

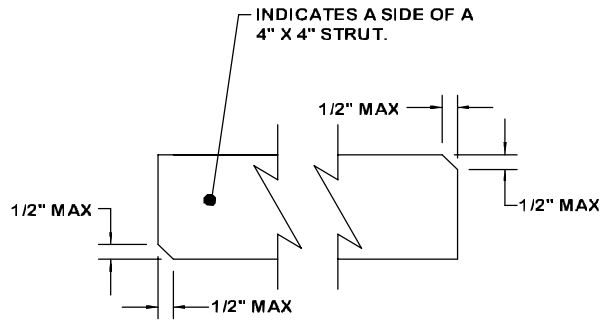


TWO SEALS, BUTTED TOGETHER, WITH TWO PAIR OF CRIMPS EACH SEAL.

STRAP JOINT B

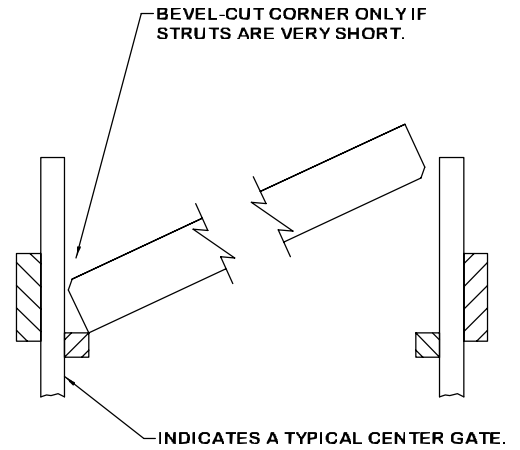
METHOD OF SECURING A STRAP JOINT WHEN USING A CRIMP-TYPE SEALER.

END-OVER-END LAP JOINT DETAILS



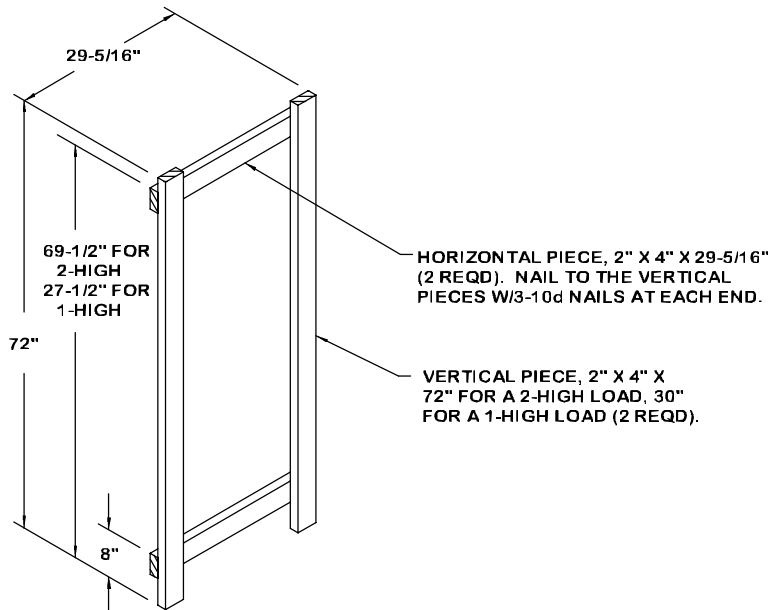
BEVEL-CUT

BEVEL CUTTING THE STRUTS AS SPECIFIED WILL FACILITATE INSTALLING THE STRUTS WITH A "DRIVE FIT". CAUTION: DO NOT BEVEL A CORNER MORE THAN ONE-HALF INCH (1/2").



STRUT INSTALLATION

SEE GENERAL NOTE "U" ON PAGE 3 FOR ADDITIONAL STRUT INSTALLATION GUIDANCE.

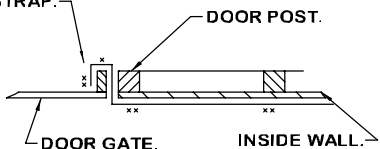


SIDE FILL ASSEMBLY

HORIZONTAL PIECE, 1" X 6" BY DOOR OPENING WIDTH (2 REQD PER LAYER). NAIL TO THE VERTICAL PIECES W/3-6d NAILS AT EACH END. SEE THE "DOORWAY PROTECTION" DETAIL ON PAGE 40 FOR HEIGHT LOCATIONS.

DOORWAY PROTECTION-GATE STRAP, 1-1/4" X .035" X 3'-0" (REF) NAIL-ON TYPE STEEL STRAPPING (4 REQD PER LAYER OF LOAD). NAIL TO GATE AND CAR SIDEWALL AS SHOWN BY THE "VIEW B" SKETCH BELOW. NOTE THAT TYPE 1 STRAPPING MAY BE PUNCHED FOR NAILING IF TYPE 2 STRAPPING IS NOT AVAILABLE.

INDICATES LOCATION OF 7 (MIN) 4d NAILS PER STRAP.



VIEW B

THIS VIEW DEPICTS THE LOCATION OF THE NAILS FOR SECURING THE DOORWAY PROTECTION GATE STRAP. NOTE THAT THE STRAPS MUST BE APPLIED TO THE CAR SIDEWALL PRIOR TO POSITIONING THE ADJACENT UNITS.

INDICATES DOOR OPENING.

VIEW B

VERTICAL PIECE, 2" X 3" BY A LENGTH TO SUIT (2 REQD).

INDICATES CAR SIDEWALL.

INDICATES FLOOR.

ALTERNATIVE DOORWAY PROTECTION A

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS WHEN THE DOOR POSTS ARE STEEL WITHOUT NAILING HOLES AND THE CAR SIDEWALLS ARE NAILABLE. THE VIEW SHOWN ABOVE IS FOR A TWO-LAYER LOAD.

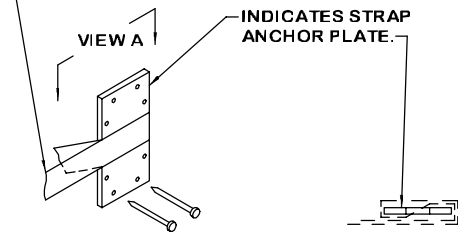
SEAL FOR 1-1/4" STRAP (2 REQD PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES.

INDICATES DOOR OPENING.

INDICATES CAR SIDEWALL.

DOORWAY PROTECTION STRAP, 1-1/4" X .035" OR .031" STEEL STRAPPING BY DOOR OPENING WIDTH PLUS 8'-0" IN LENGTH (2 REQD PER LAYER). INSTALL FROM TWO PIECES. THREAD ONE END THRU A STRAP ANCHOR PLATE AS SHOWN BY THE "APPLICATION OF STRAPPING TO STRAP ANCHOR PLATE" DETAILS BELOW. NAIL STRAP ANCHOR PLATE TO CAR SIDEWALL W/4 SIGNODE MICRO-LOCK NAILS.

DOOR SPANNER END OF STRAP.



ISOMETRIC VIEW

VIEW A

APPLICATION OF STRAPPING TO STRAP ANCHOR PLATE

THESE VIEWS DEPICT THE PROPER THREADING OF A DOORWAY PROTECTION STRAP THRU AN ANCHOR PLATE.

ALTERNATIVE DOORWAY PROTECTION B

THIS METHOD OF DOORWAY PROTECTION IS ONLY FOR USE WITH LOADS IN WHICH THE PALLET UNITS ARE POSITIONED CROSSWISE. THE METHOD MAY BE USED IN CARS EQUIPPED WITH EITHER PLUG TYPE DOORS OR CONVENTIONAL SLIDING DOORS, BUT ONLY IF THE CAR IS EQUIPPED WITH NAILABLE SIDEWALLS. IF THE CAR IS EQUIPPED WITH SPECIAL ANCHOR RODS IN THE CAR DOOR POSTS, THE DOORWAY PROTECTION STRAPS MAY BE SECURED TO THESE RODS IN LIEU OF ATTACHING TO THE CAR SIDEWALL WITH STRAP ANCHOR PLATES.

7'-1"

52"

42"

10"

INDICATES FLOOR.

INDICATES STRAP ANCHOR PLATE (2 REQD PER STRAP).

A TOLERANCE OF PLUS OR MINUS 1" IS PERMISSIBLE.

DOOR SPANNER, 2" X 6" BY DOOR OPENING WIDTH PLUS 24" (1 REQD). POSITION ABOVE THE LOAD AND NAIL THRU A FILLER BLOCK INTO A VERTICAL PIECE W/3-12d NAILS AT EACH JOINT. NAIL TO THE CAR SIDEWALL W/2-12d NAILS AT EACH END (OPTIONAL).

DOOR OPENING WIDTH

FILLER BLOCK, 1" X 4" X 9" (2 REQD). NAIL TO A VERTICAL PIECE W/4-6d NAILS.

12"

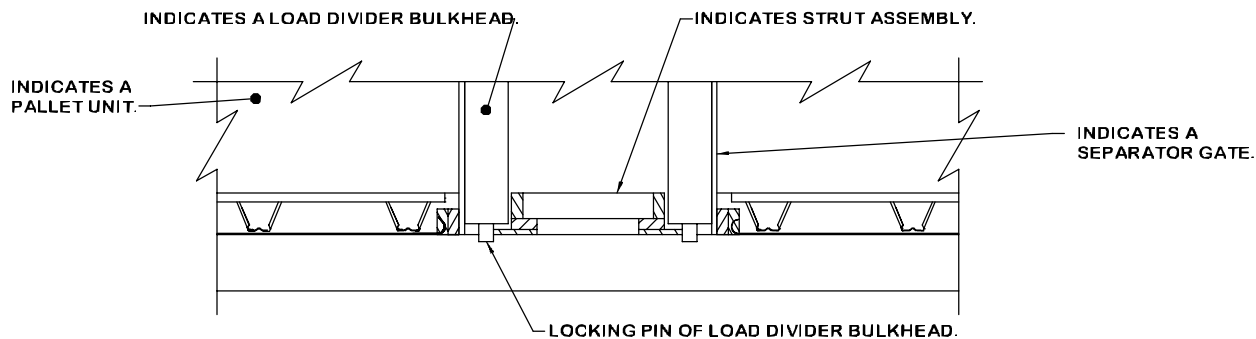
VERTICAL PIECE, 2" X 3" BY A LENGTH TO SUIT (2 REQD).

HORIZONTAL PIECE, 1" X 6" BY DOOR OPENING WIDTH (2 REQD PER LAYER). LOCATE AT HEIGHTS AS SPECIFIED BY THE "DOORWAY PROTECTION" DETAIL ON PAGE 41. NAIL TO THE VERTICAL PIECES W/3-6d NAILS AT EACH END.

SPREADER PIECE, 2" X 3" MATERIAL CUT SLIGHTLY LONGER THAN MEASURED DISTANCE (2 REQD). DRIVE INTO POSITION TO PROVIDE FOR A WEDGE FIT. TO NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH END.

ALTERNATIVE DOORWAY PROTECTION C

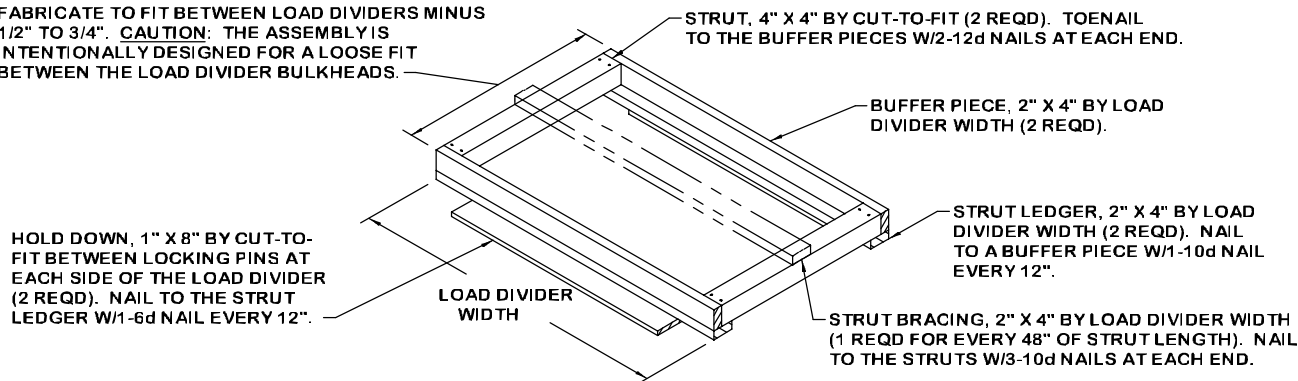
THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS, WHEN THE DOOR POSTS ARE NOT NAILABLE. IF THE CAR HAS NAILABLE SIDEWALLS, NAIL-ON TYPE STRAPPING MAY BE USED TO SECURE THE GATE IN LIEU OF USING THE SPREADER PIECES. SEE THE "ALTERNATIVE DOORWAY PROTECTION A" DETAIL ON PAGE 46 FOR GUIDANCE.



INSTALLATION OF STRUT ASSEMBLY

THIS SIDE ELEVATION VIEW SHOWS THE STRUT ASSEMBLY INSTALLED BETWEEN THE LOAD DIVIDER BULKHEADS. NOTE THE 1/2" TO 3/4" (TOTAL) SPACE INTENTIONALLY PROVIDED BETWEEN THE ASSEMBLY AND THE BULKHEADS.

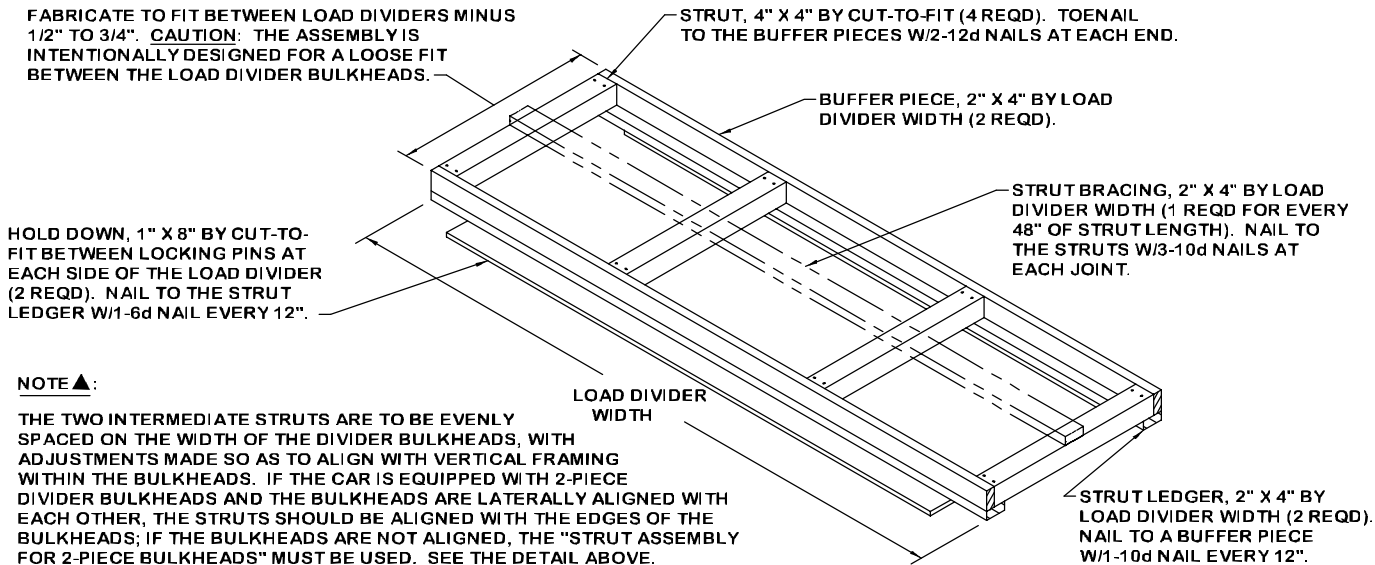
FABRICATE TO FIT BETWEEN LOAD DIVIDERS MINUS 1/2" TO 3/4". CAUTION: THE ASSEMBLY IS INTENTIONALLY DESIGNED FOR A LOOSE FIT BETWEEN THE LOAD DIVIDER BULKHEADS.



STRUT ASSEMBLY FOR 2-PIECE BULKHEADS

A STRUT ASSEMBLY IS REQUIRED WHEN THE LOAD BEHIND EITHER LOAD DIVIDER BULKHEAD EXCEEDS 50,000 POUNDS OF HAZARD CLASS AND DIVISION 1.1, 1.2, OR 1.3 EXPLOSIVES. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF HAZARD CLASS AND DIVISION 1.4 EXPLOSIVES, REGARDLESS OF THE WEIGHT OF THE LOAD. NOTE: TWO ASSEMBLIES AS SHOWN ARE REQUIRED FOR A 2-PIECE BULKHEAD IF NOT LATERALLY ALIGNED. SEE "NOTE ▲" BELOW.

FABRICATE TO FIT BETWEEN LOAD DIVIDERS MINUS 1/2" TO 3/4". CAUTION: THE ASSEMBLY IS INTENTIONALLY DESIGNED FOR A LOOSE FIT BETWEEN THE LOAD DIVIDER BULKHEADS.

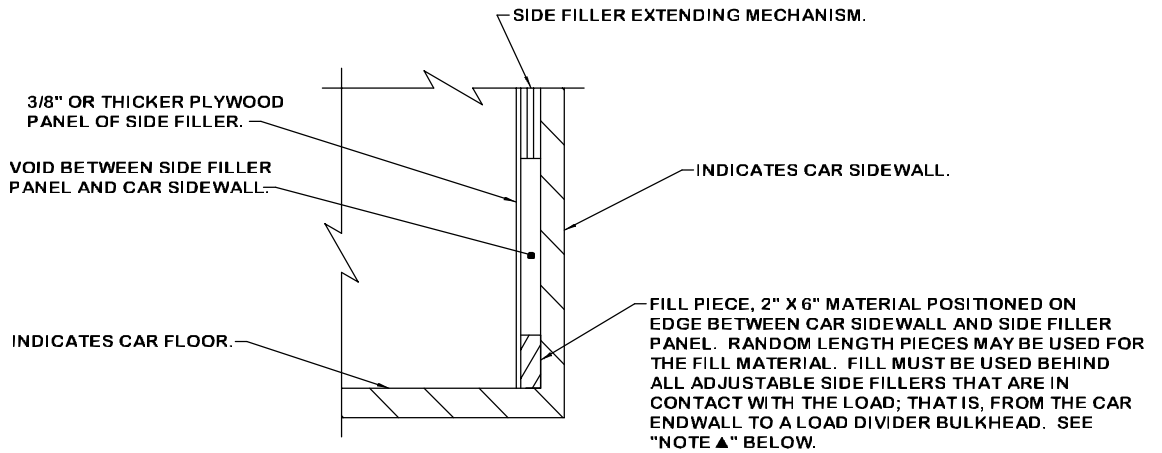


NOTE ▲:

THE TWO INTERMEDIATE STRUTS ARE TO BE EVENLY SPACED ON THE WIDTH OF THE DIVIDER BULKHEADS, WITH ADJUSTMENTS MADE SO AS TO ALIGN WITH VERTICAL FRAMING WITHIN THE BULKHEADS. IF THE CAR IS EQUIPPED WITH 2-PIECE DIVIDER BULKHEADS AND THE BULKHEADS ARE LATERALLY ALIGNED WITH EACH OTHER, THE STRUTS SHOULD BE ALIGNED WITH THE EDGES OF THE BULKHEADS; IF THE BULKHEADS ARE NOT ALIGNED, THE "STRUT ASSEMBLY FOR 2-PIECE BULKHEADS" MUST BE USED. SEE THE DETAIL ABOVE.

STRUT ASSEMBLY FOR 1-PIECE BULKHEADS

A STRUT ASSEMBLY IS REQUIRED WHEN THE LOAD BEHIND EITHER LOAD DIVIDER BULKHEAD EXCEEDS 50,000 POUNDS OF HAZARD CLASS AND DIVISION 1.1, 1.2, OR 1.3 EXPLOSIVES. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF HAZARD CLASS AND DIVISION 1.4 EXPLOSIVES, REGARDLESS OF THE WEIGHT OF THE LOAD.

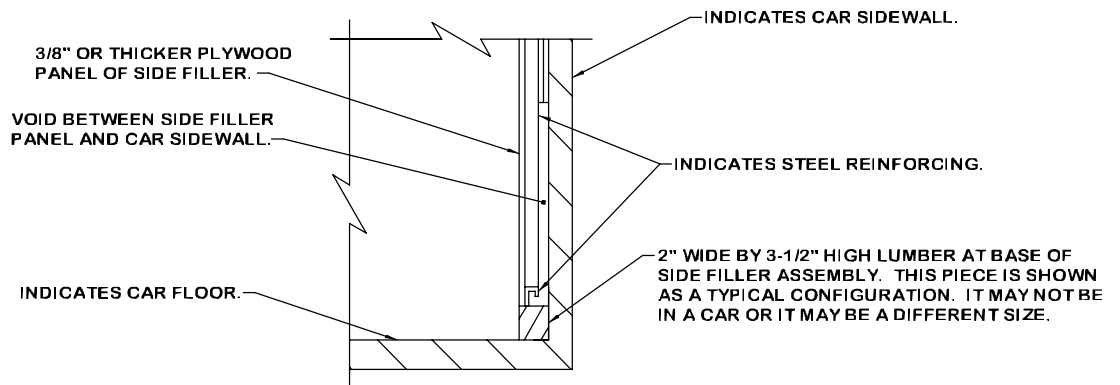


TYPICAL TYPE A

THIS VIEW SHOWS THE INSTALLATION OF A "FILL PIECE" IN A CAR EQUIPPED WITH A STANDARD ADJUSTABLE SIDE FILLER.

NOTE ▲:

NAILING OF "FILL PIECES" IS NOT REQUIRED EXCEPT THAT EACH "FILL PIECE" LOCATED NEAREST THE DOOR OPENINGS OF THE CAR WILL BE SECURED AGAINST LONGITUDINAL MOVEMENT W/1-6d NAIL DRIVEN THROUGH THE SIDE FILLER PANEL AND INTO THE "FILL PIECE".



TYPICAL TYPE B

THIS VIEW SHOWS A TYPICAL SECTION OF A CAR EQUIPPED WITH HEAVY DUTY, STEEL REINFORCED, ADJUSTABLE SIDE FILLERS. A "FILL PIECE", AS SHOWN IN THE "TYPICAL TYPE A" DETAIL ABOVE, IS NOT REQUIRED IN CARS SO EQUIPPED.

