

APPROVED BY
BUREAU OF EXPLOSIVES

O R / Lealy

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LOADING AND BRACING (CL & LCL) IN BOXCARS OF CBU-52/E OR CBU-58/B DISPENSERS PACKED IN CNU-126/E SHIPPING AND STORAGE CONTAINERS

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- THIS OUTLOADING 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	DRAFTSMAN	TECHNICIAN	ENGINEER
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U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL	SEPTEMBER 1996		
	CLASS	DIVISION	DRAWING
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DO NOT SCALE

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 CBU-52/E OR CBU-58/B MUNITIONS PACKED IN CNU-126/E CONTAINERS. SEE THE CONTAINER DETAILS ON PAGE 5.
- C. THE OUTLOADING PROCEDURES DEPICTED WITHIN THIS DOCUMENT ARE APPLICABLE FOR SHIPMENTS IN CONVENTIONAL TYPE BOX-CARS, 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 CONTAINERS 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 38 FOR GUIDANCE.
- E. THE SELECTION OF RAILCARS FOR THE TRANSPORT OF CBU-52/E OR CBU-58/B MUNITIONS 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 41 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.

(CONTINUED AT RIGHT)

MATERIAL SPECIFICATIONS

LUMBER	SEE TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC MM-L-751.
NAILS	FED SPEC FF-N-105; COMMON.
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.
STRAPPING, STEEL	ASTM D3953; FLAT STRAPPING, TYPE 1, HEAVY DUTY, FINISH A, B (GRADE 2), OR C.
SEAL, STRAP	ASTM D3953; CLASS H, FINISH A, B (GRADE 2), OR C, DOUBLE NOTCH TYPE, STYLE I, II, OR IV.
STAPLE, STRAP	COMMERCIAL GRADE.
HARDBOARD	ANSI/AHA A135.4, CLASS 1.
FIBERBOARD	FED SPEC PPP-F-320, TYPE SF (SOLID FIBERBOARD), CLASS DOMESTIC, ALL GRADES.
ANTI-CHAFING MATERIAL	MIL-B 121 (OR EQUAL) NEUTRAL BARRIER MATERIAL.

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 COMPLETE ROUNDS, 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" OR 4" X 6" MATERIAL, IT IS PERMISSIBLE TO USE TWO LAMINATED PIECES OF 2" X 6" MATERIAL IN LIEU OF EACH 4" X 4" OR 4" X 6" 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 A COMMERCIAL GRADE, OF A QUALITY EQUIVALENT TO THOSE MANUFACTURED BY Senco PRODUCTS INCORPORATED. **NOTE:** STAPLES WILL NOT BE SUBSTITUTED FOR NAILS IN ANY LOAD RESTRAINING FLOOR DUNNAGE APPLICATION.
- 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 39 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.
- 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 25.4 MM AND ONE POUND EQUALS 0.454 KG.

(CONTINUED ON PAGE 3)

GENERAL NOTES

(FOR CONVENTIONAL TYPE BOXCARS)

- S. 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.
- T. NOTICE: WHEN POSITIONING CONTAINERS IN A CAR, THEY SHOULD BE PLACED TIGHTLY AGAINST A CAR SIDEWALL, AS APPLICABLE, 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.
- U. LOAD-BLOCKING STRUTS WHICH ARE 48" OR LONGER MUST BE STIFFENED BY THE APPLICATION OF HORIZONTAL AND VERTICAL STRUT BRACING AS SHOWN BY KEY NUMBERS (B) AND (C) ON PAGE 8. 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.
- V. 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 39 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.
- W. WHERE 2" X 2" PIECES ARE SPECIFIED FOR STRUT LEDGERS, 2" X 4" MATERIAL MAY BE SUBSTITUTED, IF DESIRED.
- X. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

GENERAL NOTES

(FOR BOXCARS EQUIPPED WITH MECHANICAL BRACING DEVICES)

- Y. 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.
- Z. 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.
- AA. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTION WHICH IS IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHOD.

GENERAL NOTES

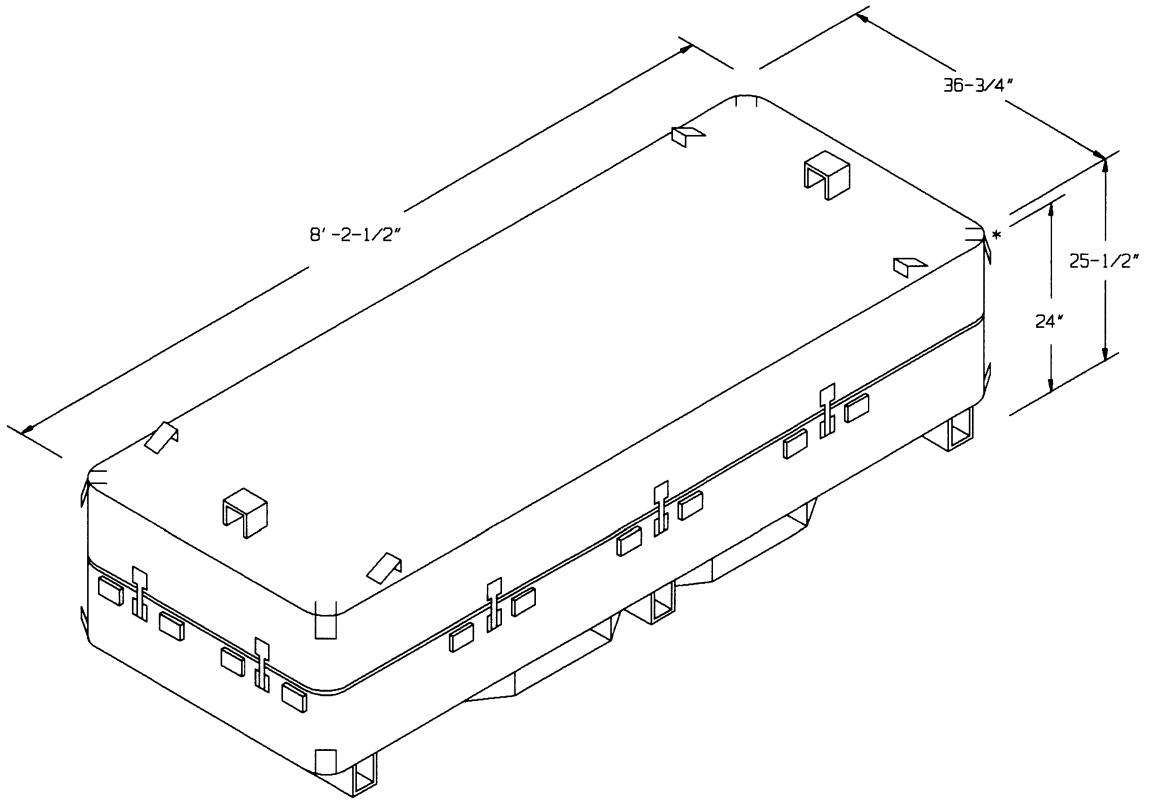
(GENERAL NOTES CONTINUED)

(FOR CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS)

- BB. 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.
- CC. 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 COMPLETE ROUNDS. 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.
- DD. 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 43 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 43, THE "FILL PIECE" MATERIAL IS NOT REQUIRED.
- EE. 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.
- FF. 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 "GG-2" BELOW. DETAILS OF STRUT ASSEMBLIES FOR USE BETWEEN 2-PIECE BULKHEADS AND BETWEEN 1-PIECE BULKHEADS ARE SHOWN ON PAGE 42.

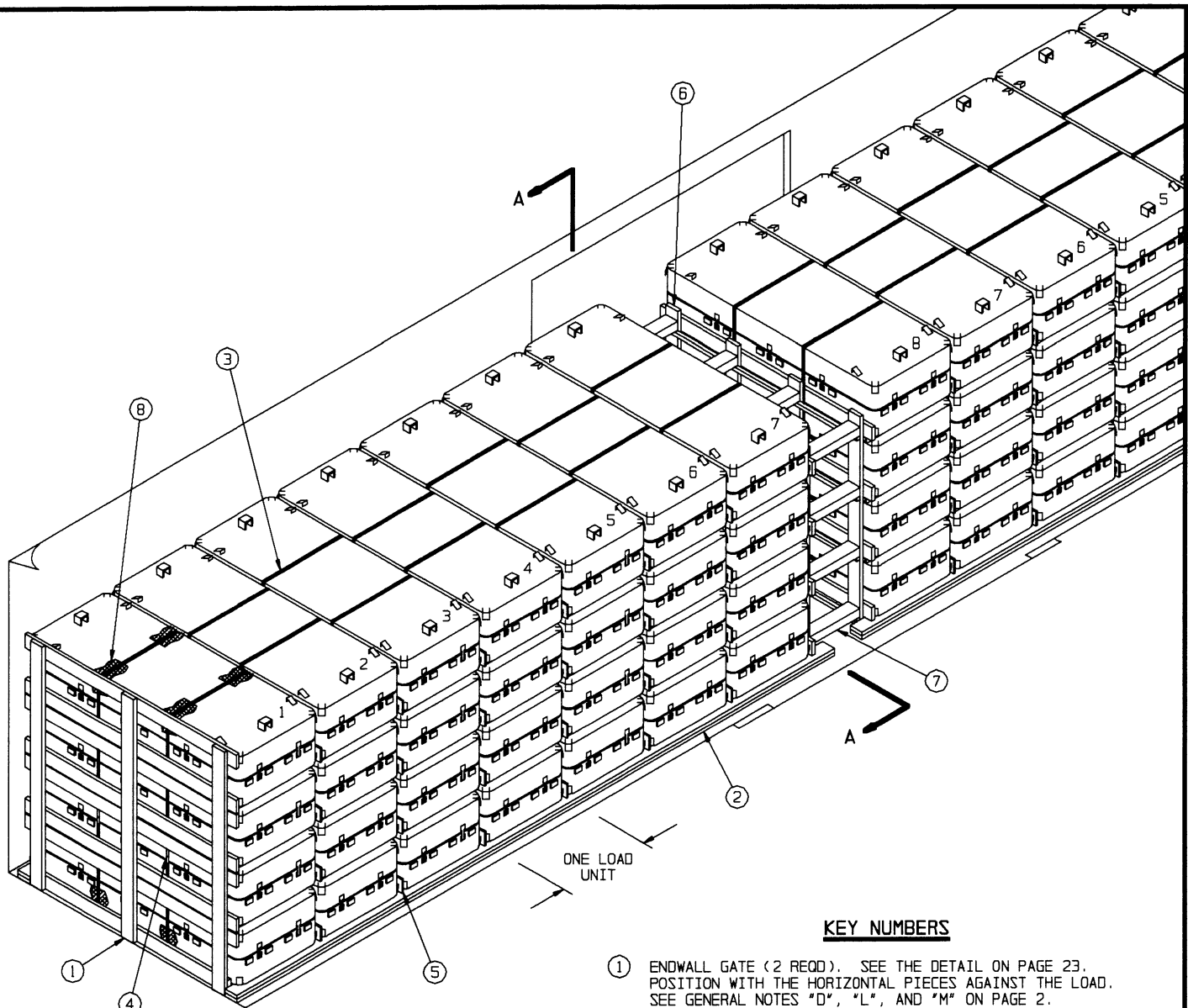
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- GG. THE NORMAL LOADING PATTERN IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS IS TO POSITION THE LADING BETWEEN A CAR ENDWALL AND A LOAD DIVIDER BULKHEAD IN FULL LAYERS. OBVIOUSLY, A LOAD QUANTITY MUST THEN BE A MULTIPLE OF THE NUMBER OF PALLET UNITS 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 PAGES 30 AND 31 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 6 OR 8 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 36 OR WITH KNEE BRACE ASSEMBLIES, AS SHOWN ON PAGE 34.
- HH. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTION WHICH IS IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHOD.

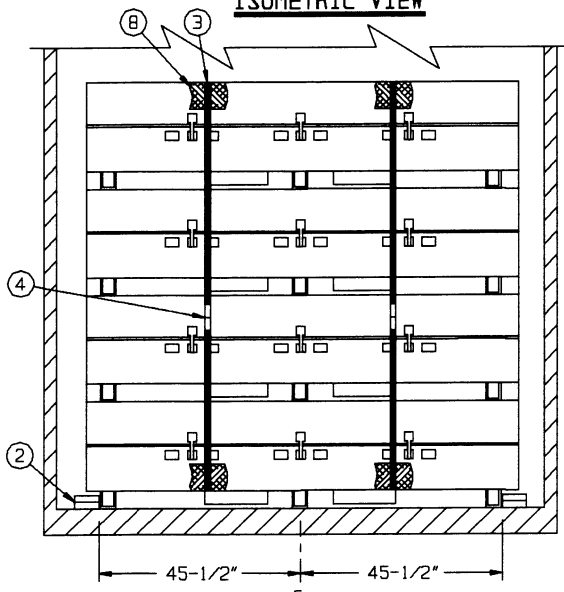


CNU-126/E CONTAINER

DIMENSIONS - - - - - 98-1/2" LONG X 36-3/4" WIDE X 25-1/2" HIGH
 (24" STACKING HEIGHT)
 GROSS WEIGHT W/CNU-52/E MUNITIONS - - - - - 2,032 POUNDS (APPROX)
 GROSS WEIGHT W/CNU-58/B MUNITIONS - - - - - 2,160 POUNDS (APPROX)
 CUBE - - - - - 49.3 CUBIC FEET



ISOMETRIC VIEW



SECTION A-A

KEY NUMBERS

- ① ENDWALL GATE (2 REQD). SEE THE DETAIL ON PAGE 23. POSITION WITH THE HORIZONTAL PIECES AGAINST THE LOAD. SEE GENERAL NOTES "D", "L", AND "M" ON PAGE 2.
- ② SIDE BLOCKING, 2" X 6" BY LOAD LENGTH PLUS 9" (DOUBLED) (4 REQD). PRE-POSITION. 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 GENERAL NOTE "L" ON PAGE 2, AND SPECIAL NOTE 3 ON PAGE 7.
- ③ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 23'-6" LONG STEEL STRAPPING (30 REQD). SEE SPECIAL NOTE 5 ON PAGE 7.
- ④ SEAL FOR 1-1/4" STRAPPING (60 REQD, 2 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE GENERAL NOTE "N" ON PAGE 2.
- ⑤ SEPARATOR GATE (13 REQD). POSITION WITH THE TIE PIECES AGAINST THE ALREADY LOADED CONTAINERS. SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 22.
- ⑥ CENTER GATE (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 23, AND SPECIAL NOTE 4 ON PAGE 7.
- ⑦ STRUT, 4" X 6" BY A LENGTH TO SUIT (REF: 23-1/4") (16 REQD). TOENAIL TO PIECES MARKED ⑥ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "U" AND "V" ON PAGE 3.
- ⑧ ANTI-CHAFING MATERIAL (AS REQD). POSITION UNDER ALL STRAPS AT POINTS OF CONTACT WITH CONTAINER.

SPECIAL NOTES:

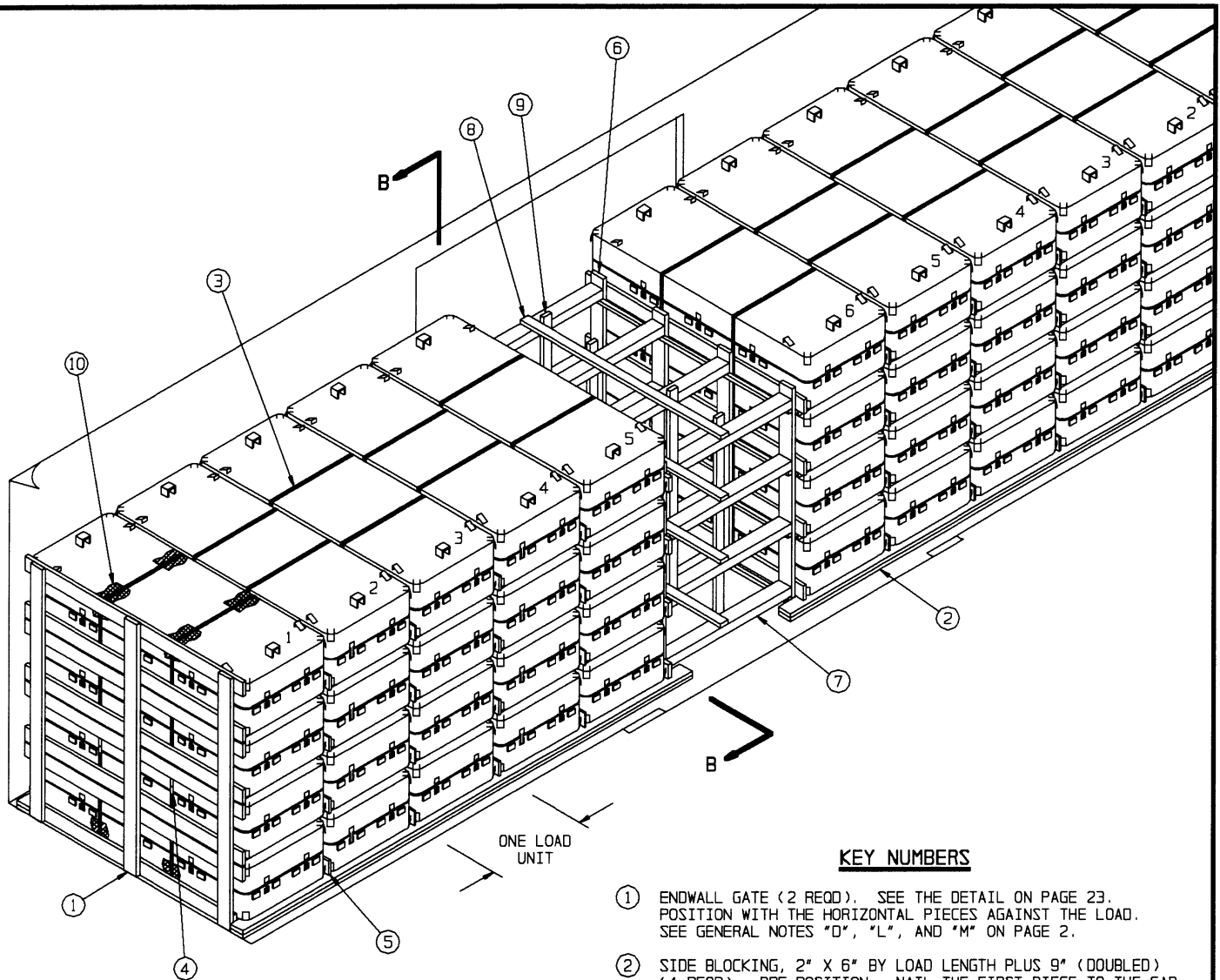
1. A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL TYPE BOXCAR WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED.
2. A MAXIMUM OF 72 CONTAINERS FOR AN APPROXIMATE LADING WEIGHT OF 155,520 POUNDS CAN BE PLACED IN A 60'-8" LONG BOXCAR WHEN USING THE DEPICTED PROCEDURES. FOR A 40'-6" LONG BOXCAR, SEE THE LOAD VIEW ON PAGE 8.
3. SIDE BLOCKING, PIECES MARKED ②, MUST EXTEND AT LEAST 9" PAST THE CONTAINERS. PRE-POSITION THE SIDE BLOCKING ON EACH SIDE OF THE CAR APPROXIMATELY 7'-7" APART, AND NAIL TO THE CAR FLOOR PRIOR TO LOADING. THE DISTANCE BETWEEN THE SIDE BLOCKING MAY BE INCREASED OR DECREASED AS REQUIRED TO ALLOW NO MORE THAN 1/2" OF LATERAL SPACE BETWEEN THE CONTAINER SKIDS AND THE SIDE BLOCKING.
4. CENTER GATE "A" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD, IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE PLYWOOD CENTER GATE ALTERNATIVE DETAIL ON PAGE 37 FOR GUIDANCE.
5. STACK UNITIZING STRAPS, PIECES MARKED ③, MUST BE PRE-POSITIONED. THREAD THRU THE FORKLIFT POCKETS OF THE BOTTOM CONTAINER AND INSTALL TO ENCIRCLE THE REST OF THE CONTAINER STACK. POSITION THE STRAPS AS FAR APART AS THE FORKLIFT POCKETS PERMIT.
6. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD, OR ONE THRU THREE ENTIRE TIERS CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, REFER TO THE TYPICAL LCL PROCEDURES ON PAGES 31 THRU 36 FOR GUIDANCE.

BILL OF MATERIAL

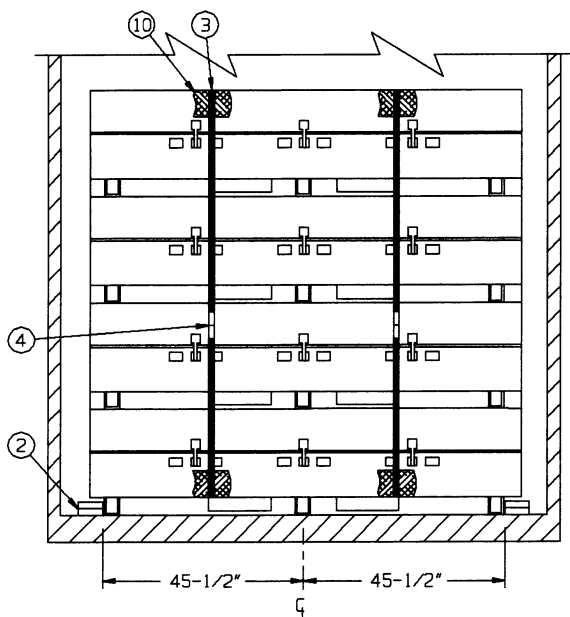
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	943	472
2" X 2"	61	21
2" X 4"	16	11
2" X 6"	504	504
4" X 6"	31	62
NAILS	NO. REQD	POUNDS
6d (2")	780	5
10d (3")	340	5-1/4
16d (3-1/2")	364	8
STEEL STRAPPING, 1-1/4" -- 705' REQD -- 100.71 LBS		
SEAL FOR 1-1/4" STRAPPING -- 60 REQD -- 2.73 LBS		
ANTI-CHAFING MATERIAL -- -- AS REQD -- -- NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
DUNNAGE	-----	2,262 LBS
CONTAINER	60 -----	129,600 LBS
TOTAL WEIGHT		----- 131,862 LBS (APPROX)



ISOMETRIC VIEW



SECTION B-B

KEY NUMBERS

- ① ENDWALL GATE (2 REOD). SEE THE DETAIL ON PAGE 23. POSITION WITH THE HORIZONTAL PIECES AGAINST THE LOAD. SEE GENERAL NOTES "D", "L", AND "M" ON PAGE 2.
- ② SIDE BLOCKING, 2" X 6" BY LOAD LENGTH PLUS 9" (DOUBLED) (4 REOD). PRE-POSITION. 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 GENERAL NOTE "L" ON PAGE 2, AND SPECIAL NOTE 2 ON PAGE 9.
- ③ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 23'-6" LONG STEEL STRAPPING (22 REOD). SEE SPECIAL NOTE 5 ON PAGE 9.
- ④ SEAL FOR 1-1/4" STRAPPING (44 REOD, 2 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE GENERAL NOTE "N" ON PAGE 2.
- ⑤ SEPARATOR GATE (9 REOD). POSITION WITH THE TIE PIECES AGAINST THE ALREADY LOADED CONTAINERS. SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 22.
- ⑥ CENTER GATE (2 REOD). SEE THE "CENTER GATE A" DETAIL ON PAGE 23, AND SPECIAL NOTE 3 ON PAGE 9.
- ⑦ STRUT, 4" X 6" BY A LENGTH TO SUIT (REF: 53-1/4") (16 REOD). TOENAIL TO PIECES MARKED ⑥ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "U" AND "V" ON PAGE 3.
- ⑧ HORIZONTAL STRUT BRACING, 2" X 4" BY CONTAINER WIDTH MINUS 8-1/2" (4 REOD). NAIL TO STRUTS MARKED ⑥ W/3-10d NAILS AT EACH JOINT.
- ⑨ VERTICAL STRUT BRACING, 2" X 4" X 7'-0" (4 REOD). NAIL TO STRUTS MARKED ⑥ W/3-10d NAILS AT EACH JOINT.
- ⑩ ANTI-CHAFING MATERIAL (AS REOD). POSITION UNDER ALL STRAPS AT POINTS OF CONTACT WITH CONTAINER.

SPECIAL NOTES:

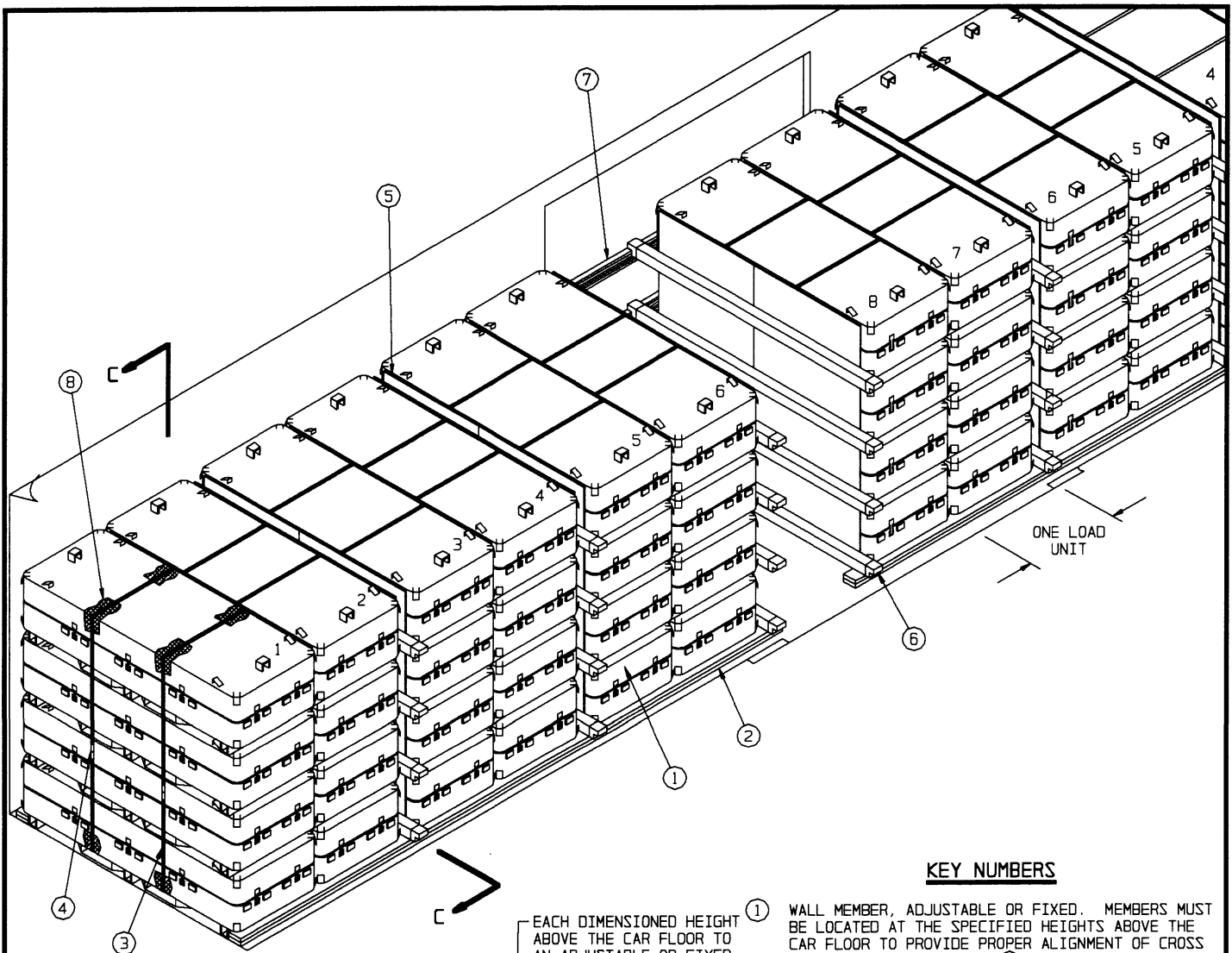
1. A 40'-6" LONG BY 9'-4" WIDE CONVENTIONAL TYPE BOXCAR WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED.
2. SIDE BLOCKING, PIECES MARKED ②, MUST EXTEND AT LEAST 9" PAST THE CONTAINERS. PRE-POSITION THE SIDE BLOCKING ON EACH SIDE OF THE CAR APPROXIMATELY 7'-7" APART, AND NAIL TO THE CAR FLOOR PRIOR TO LOADING. THE DISTANCE BETWEEN THE SIDE BLOCKING MAY BE INCREASED OR DECREASED AS REQUIRED TO ALLOW NO MORE THAN 1/2" OF LATERAL SPACE BETWEEN THE CONTAINER SKIDS AND THE SIDE BLOCKING.
3. CENTER GATE "A" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD, IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE PLYWOOD CENTER GATE ALTERNATIVE DETAIL ON PAGE 37 FOR GUIDANCE.
4. DOUBLED 2" X 6" STRUTS MAY BE USED IN LIEU OF THE 4" X 6" STRUTS SHOWN IN THE LOAD ON PAGE 8. LAMINATE W/2-10d NAILS EVERY 6". SEE GENERAL NOTE "K" ON PAGE 2.
5. STACK UNITIZING STRAPS, PIECES MARKED ③, MUST BE PRE-POSITIONED. THREAD THRU THE FORKLIFT POCKETS OF THE BOTTOM CONTAINER AND INSTALL TO ENCIRCLE THE REST OF THE CONTAINER STACK. POSITION THE STRAPS AS FAR APART AS THE FORKLIFT POCKETS PERMIT.
6. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD, OR ONE THRU THREE ENTIRE TIERS CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, REFER TO THE TYPICAL LCL PROCEDURES ON PAGES 31 THRU 36 FOR GUIDANCE.

BILL OF MATERIAL

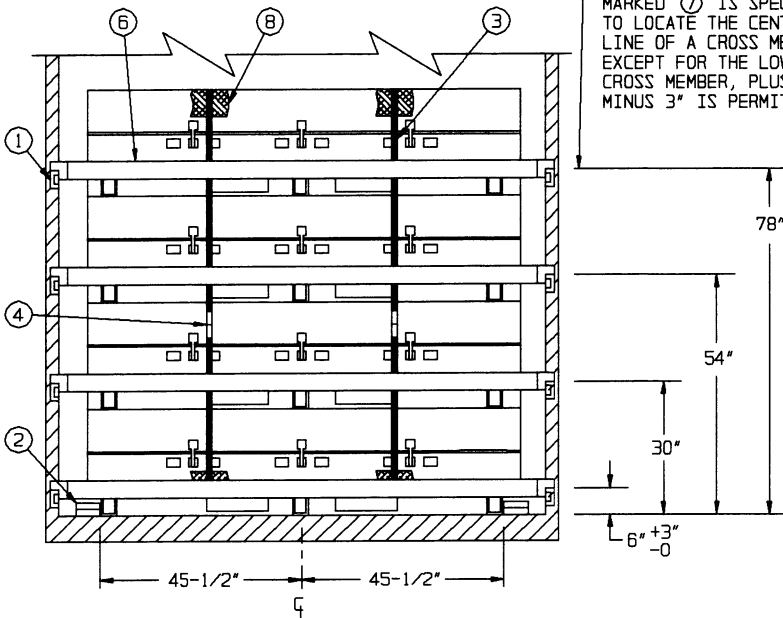
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	652	326
2" X 2"	61	21
2" X 4"	103	70
2" X 6"	450	450
4" X 6"	75	100
NAILS	NO. REOD	POUNDS
6d (2")	540	3-1/4
10d (3")	436	7-1/2
16d (3-1/2")	284	6-1/4
STEEL STRAPPING, 1-1/4" --	517' REOD --	73.86 LBS
SEAL FOR 1-1/4" STRAPPING --	44 REOD --	2.00 LBS
ANTI-CHAFING MATERIAL --	AS REOD --	NIL

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
DUNNAGE	-----	2,027 LBS
CONTAINER	44	95,040 LBS
TOTAL WEIGHT		97,067 LBS (APPROX)



ISOMETRIC VIEW



SECTION C-C

PIECE MARKED 5 HAS BEEN OMITTED FOR CLARITY.

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, PIECES MARKED ⑥. SEE "SECTION C-C" VIEW BELOW FOR LOCATION GUIDANCE. SEE GENERAL NOTE "F" ON PAGE 2.
- ② SIDE BLOCKING, 2" X 6" BY LOAD LENGTH PLUS 6" (REF: 27'-3" ON ONE END OF THE CAR, 20'-6" ON THE OTHER) (DOUBLED) (4 REOD). 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 GENERAL NOTE "L" ON PAGE 2, AND SPECIAL NOTE 2 ON PAGE 11.
- ③ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 23'-6" LONG STEEL STRAPPING (28 REOD). PRE-POSITION. SEE SPECIAL NOTE 4 ON PAGE 11.
- ④ SEAL FOR 1-1/4" STRAPPING (56 REOD, 2 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE GENERAL NOTE "N" ON PAGE 2.
- ⑤ SEPARATOR GATE (19 REOD). POSITION WITH THE TIE PIECES AGAINST THE CONTAINERS. SEE THE "ALTERNATIVE SEPARATOR GATE A" DETAIL ON PAGE 22, AND SPECIAL NOTE 3 ON PAGE 11.
- ⑥ CROSS MEMBER (28 REOD). SEE GENERAL NOTE "Y" ON PAGE 3.
- ⑦ DOORWAY MEMBER (8 REOD). SEE THE "SECTION C-C" VIEW AT LEFT FOR LOCATION GUIDANCE.
- ⑧ ANTI-CHAFING MATERIAL (AS REOD). POSITION UNDER ALL STRAPS AT POINTS OF CONTACT WITH CONTAINER.

SPECIAL NOTES:

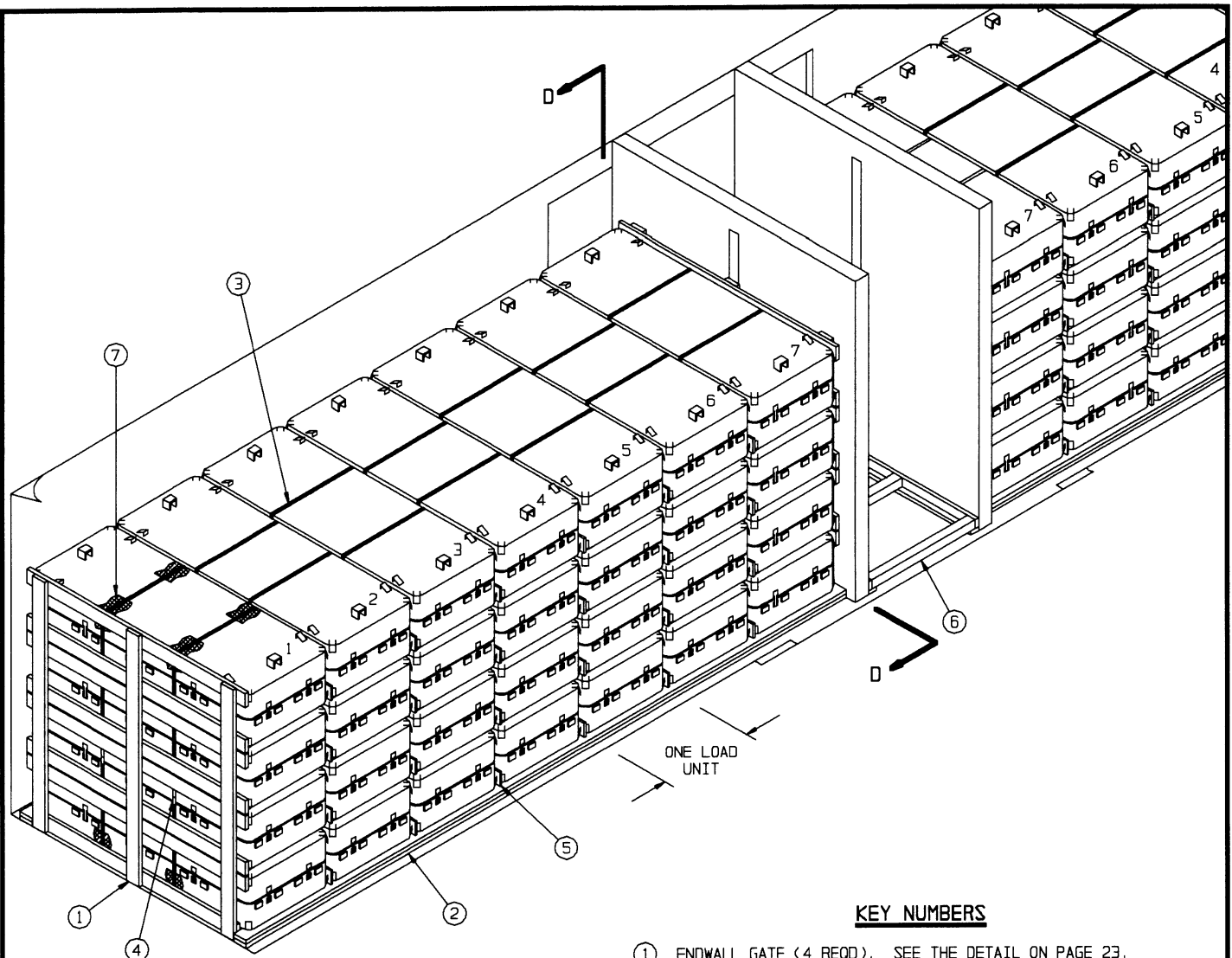
1. A 50'-6" LONG BY 9'-4" WIDE (INSIDE DIMENSION) WOOD-LINED BOXCAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED.
2. SIDE BLOCKING, PIECES MARKED ②, MUST EXTEND AT LEAST 6" PAST THE CONTAINERS. PRE-POSITION THE SIDE BLOCKING ON EACH SIDE OF THE CAR, APPROXIMATELY 7'-7" APART AND NAIL TO THE CAR FLOOR PRIOR TO LOADING. THE DISTANCE BETWEEN THE SIDE BLOCKING MAY BE INCREASED OR DECREASED AS REQUIRED TO ALLOW NO MORE THAN 1/2" OF LATERAL SPACE BETWEEN THE CONTAINER SKIDS AND THE SIDE BLOCKING.
3. SEPARATOR GATES, PIECES MARKED ⑤, MAY BE FORMED FROM 5/8" OR THICKER PLYWOOD IN LIEU OF THE 1/2" PLYWOOD SHOWN, OR THEY MAY BE CONSTRUCTED FROM DIMENSIONAL LUMBER. SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 22.
4. UNITIZING STRAPS, PIECES MARKED ③, MUST BE PRE-POSITIONED. THREAD THRU THE FORKLIFT POCKETS OF THE BOTTOM CONTAINER AND INSTALL TO ENCIRCLE THE REST OF THE CONTAINER STACK. POSITION THE STRAPS AS FAR APART AS THE FORKLIFT POCKETS PERMIT.
5. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A LOAD MAY BE REDUCED BY OMITTING ONE OR TWO CONTAINERS FROM A STACK OR BY OMITTING ONE OR MORE COMPLETE STACKS.

BILL OF MATERIAL

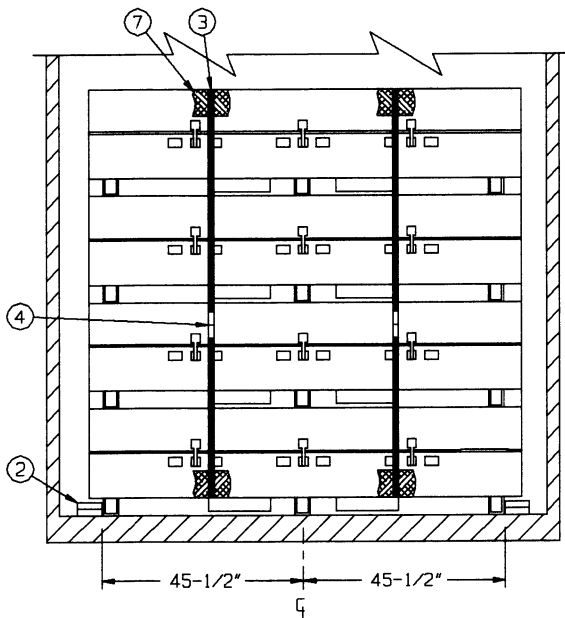
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	57	19
2" X 6"	191	191
NAILS	NO. REQD	POUNDS
4d (1-1/2")	342	3/4
16d (3-1/2")	280	6-1/4
STEEL STRAPPING, 1-1/4" -- 658' REQD -- 94.00 LBS		
SEAL FOR 1-1/4" STRAPPING -- 56 REQD -- 2.55 LBS		
PLYWOOD, 1/2" -- 1216 SQ FT REQD -- 1672 LBS		
ANTI-CHAFING MATERIAL -- AS REQD -- NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
DUNNAGE	-----	2,196 LBS
CONTAINER	56	120,960 LBS
TOTAL WEIGHT		123,156 LBS (APPROX)



ISOMETRIC VIEW



SECTION D-D

PIECE MARKED ① HAS BEEN OMITTED FROM "SECTION D-D" FOR CLARITY.

KEY NUMBERS

- ① ENDWALL GATE (4 REQD). SEE THE DETAIL ON PAGE 23. POSITION WITH THE VERTICAL PIECES AGAINST THE ENDWALL AND/OR THE BULKHEAD. SEE GENERAL NOTES "F", "L", AND "M" ON PAGE 2.
- ② SIDE BLOCKING, 2" X 6" BY LOAD LENGTH (DOUBLED) (4 REQD). PRE-POSITION. 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 GENERAL NOTE "L" ON PAGE 2 AND SPECIAL NOTE 2 ON PAGE 13.
- ③ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 23'-6" LONG STEEL STRAPPING (28 REQD).
- ④ SEAL FOR 1-1/4" STRAPPING (56 REQD, 2 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE GENERAL NOTE "N" ON PAGE 2.
- ⑤ SEPARATOR GATE (12 REQD). POSITION SO THAT THE VERTICAL PIECES ARE AGAINST THE ALREADY LOADED CONTAINERS. SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 22 AND SPECIAL NOTE 3 ON PAGE 13.
- ⑥ STRUT ASSEMBLY (1 REQD). SEE THE "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL ON PAGE 42. INSTALL BETWEEN THE LOAD DIVIDER BULKHEADS. SEE SPECIAL NOTE 4 ON PAGE 13.
- ⑦ ANTI-CHAFING MATERIAL (AS REQD). POSITION UNDER ALL STRAPS AT POINTS OF CONTACT WITH CONTAINER.

SPECIAL NOTES:

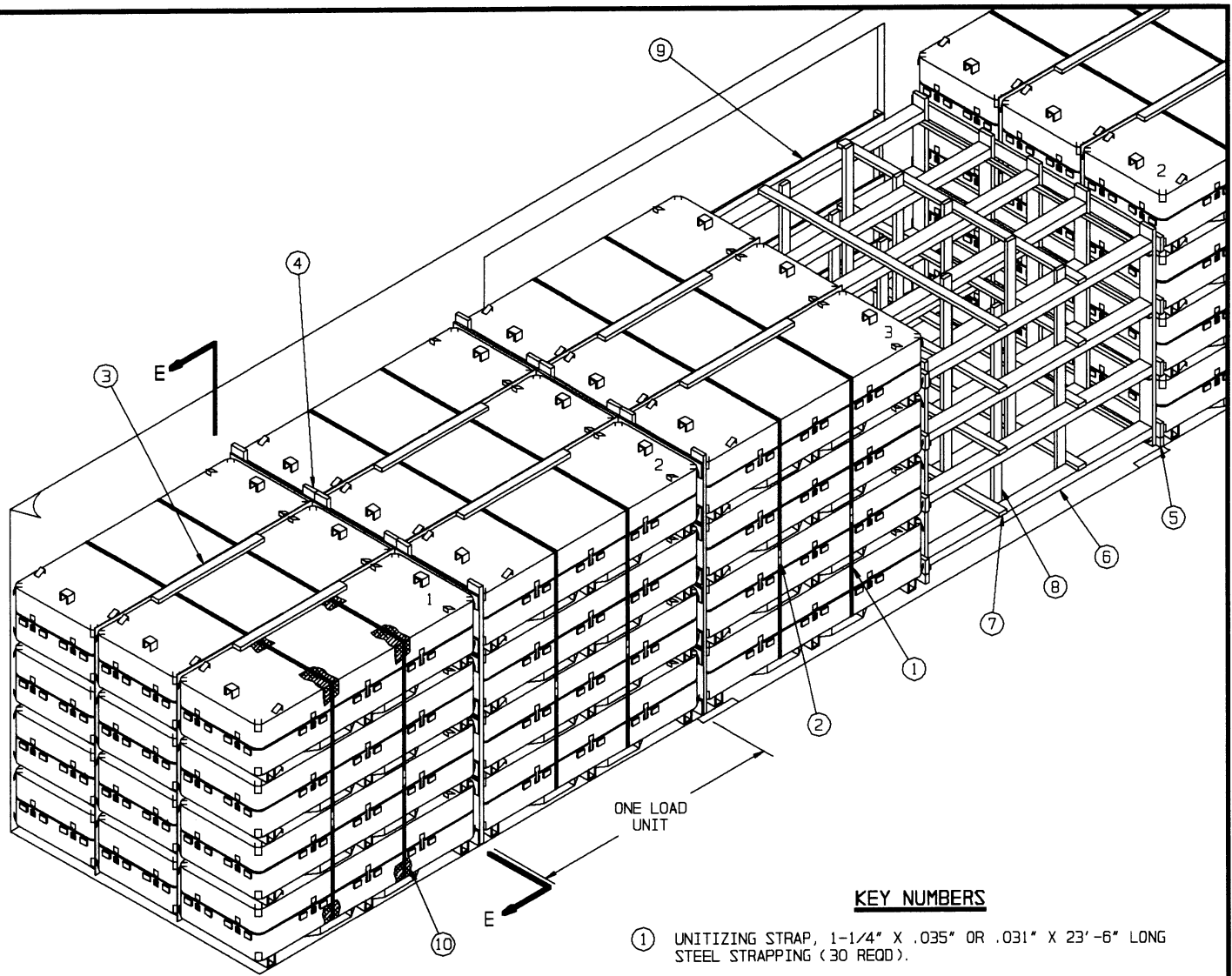
1. A 50'-6" LONG BY 9'-4" WIDE CUSHIONED BOXCAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "BB" THRU "FF" ON PAGE 4.
2. DUE TO THE BOXCAR BULKHEADS, SIDE BLOCKING, PIECES MARKED ②, MUST NOT EXTEND PAST THE CONTAINERS. PRE-POSITION THE SIDE BLOCKING ON EACH SIDE OF THE CAR APPROXIMATELY 7'-7" APART AND NAIL TO THE CAR FLOOR PRIOR TO LOADING. THE DISTANCE BETWEEN THE SIDE BLOCKING MAY BE INCREASED OR DECREASED AS REQUIRED TO ALLOW NO MORE THAN 1/2" OF LATERAL SPACE BETWEEN THE CONTAINER SKIDS AND THE SIDE BLOCKING.
3. SEPARATOR GATES, SHOWN AS PIECES MARKED ⑤, MAY BE FORMED FROM 1/2" OR THICKER PLYWOOD IN LIEU OF THE DIMENSIONAL LUMBER SHOWN. SEE THE "ALTERNATIVE SEPARATOR GATE A" DETAIL ON PAGE 22.
4. THE STRUT ASSEMBLY, SHOWN AS PIECE MARKED ⑥, IS REQUIRED WHEN THE LOAD IN EITHER END OF THE CAR IS 50,000 POUNDS OR GREATER.
5. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD, OR ONE THRU THREE ENTIRE TIERS CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, REFER TO THE TYPICAL LCL PROCEDURES ON PAGES 31 THRU 36.
6. A MAXIMUM OF 48 CONTAINERS, FOR AN APPROXIMATE LADING WEIGHT OF 103,680 POUNDS CAN BE LOADED IN A 40'-6" LONG CAR USING THE DEPICTED PROCEDURES.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	869	435
1" X 8"	17	12
2" X 4"	37	25
2" X 6"	541	541
4" X 4"	16	22
NAILS	NO. REQD	POUNDS
6d (2")	738	4-1/2
10d (3")	306	4-3/4
12d (3-1/4")	16	1/2
16d (3-1/2")	272	6
STEEL STRAPPING, 1-1/4" -- 658' REQD -- 94.00 LBS		
SEAL FOR 1-1/4" STRAPPING -- 56 REQD -- 2.55 LBS		
ANTI-CHAFING MATERIAL -- AS REQD -- NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
DUNNAGE	---	2,183 LBS
CONTAINER	56	120,960 LBS
TOTAL WEIGHT		123,143 LBS (APPROX)

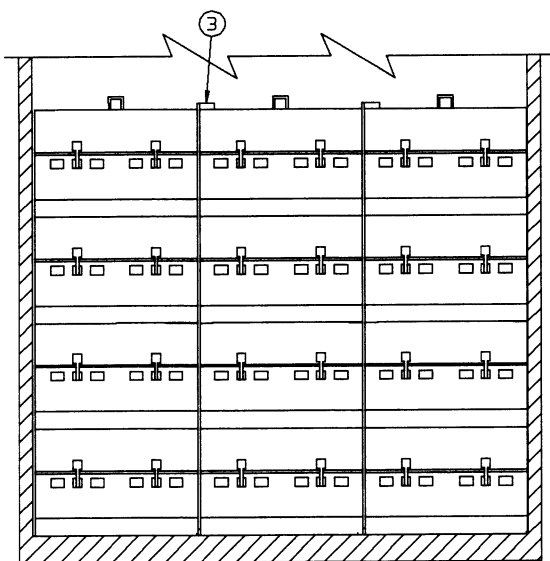


ISOMETRIC VIEW

ONE LOAD UNIT

KEY NUMBERS

- ① UNITIZING STRAP, 1-1/4" X .035" OR .031" X 23'-6" LONG STEEL STRAPPING (30 REQD).
- ② SEAL FOR 1-1/4" STRAPPING (60 REQD, 2 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE GENERAL NOTE "N" ON PAGE 2.
- ③ ANTI-CHAFING (10 REQD). SEE THE "ANTI-CHAFING ASSEMBLY A" DETAIL ON PAGE 24, AND SPECIAL NOTE 3 ON PAGE 15.
- ④ SEPARATOR GATE (4 REQD). POSITION SO THAT THE HORIZONTAL PIECES ARE LOCATED AGAINST THE ALREADY LOADED CONTAINERS. SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 25 AND SPECIAL NOTE 4 ON PAGE 15.
- ⑤ CENTER GATE (2 REQD). SEE THE "CENTER GATE B" DETAIL ON PAGE 26.
- ⑥ STRUT, 4" X 6" BY A LENGTH TO SUIT (REF: 8'-4-1/4") (20 REQD). TOENAIL TO PIECES MARKED ⑤ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "U" AND "V" ON PAGE 3 AND SPECIAL NOTE 5 ON PAGE 15.
- ⑦ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 4-1/2" (8 REQD). NAIL TO THE STRUTS MARKED ⑥ W/3-10d NAILS AT EACH JOINT.
- ⑧ VERTICAL STRUT BRACING, 2" X 4" X 7'-0" (10 REQD). NAIL TO THE STRUTS MARKED ⑥ W/3-10d NAILS AT EACH JOINT.
- ⑨ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION" DETAIL ON PAGE 26 AND SPECIAL NOTE 6 ON PAGE 15.
- ⑩ ANTI-CHAFING MATERIAL (AS REQD). POSITION UNDER ALL STRAPS AT POINTS OF CONTACT WITH CONTAINER.



SECTION E-E

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 WIDER DIMENSIONS AND HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "E" AND "F" ON PAGE 2.
2. A MAXIMUM OF 84 CONTAINERS FOR AN APPROXIMATE LADING WEIGHT OF 181,440 POUNDS CAN BE PLACED IN A 60'-8" LONG BOXCAR USING THE DEPICTED PROCEDURES IF THE LOAD LIMIT PERMITS. FOR A 40'-6" LONG BOXCAR SEE THE LOAD ON PAGE 16 FOR GUIDANCE.
3. ANTI-CHAFING, SHOWN AS PIECE MARKED ③, MAY BE FORMED FROM 3/8" OR THICKER PLYWOOD, IF DESIRED. IF THE CAR TO BE LOADED IS AT LEAST 9'-6" WIDE, ANTI-CHAFING ASSEMBLY "B" MAY BE INSTALLED IN LIEU OF PIECE MARKED ③. SEE THE "ANTI-CHAFING ASSEMBLY B" DETAIL ON PAGE 24.
4. SEPARATOR GATES, SHOWN AS PIECE MARKED ④, MAY BE FORMED FROM 1/2" OR THICKER PLYWOOD IN LIEU OF DIMENSIONAL LUMBER. SEE THE "ALTERNATIVE SEPARATOR GATE B" DETAIL ON PAGE 25.
5. DOUBLED 2" X 6" STRUTS MAY BE USED IN LIEU OF THE 4" X 6" STRUTS SHOWN IN THE LOAD VIEW ON PAGE 14. LAMINATE W/1-10d NAIL EVERY 6". SEE GENERAL NOTE "K" ON PAGE 2.
6. DOORWAY PROTECTION IS REQUIRED FOR ALL CONTAINER STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY 1/2 OR MORE OF THE CONTAINER LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED ⑤, IS APPLICABLE FOR BOXCARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MAY BE USED INSTEAD. REFER TO PAGES 40 AND 41 FOR OTHER TYPES OF DOORWAY PROTECTION. NOTE: 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 PIECES MARKED ②, ⑤, ⑥, AND ⑦ ON PAGE 20 AND SPECIAL NOTE 5 ON PAGE 21 FOR INSTALLATION GUIDANCE.
7. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 4-TIER, 3-TIER, 2-TIER, OR 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF 12, 9, 6, OR 3 CONTAINERS RESPECTIVELY BY OMITTING ONE LOAD UNIT FROM THE CENTER PORTION OF THE LOAD. ALSO, A 4-TIER LOAD CAN BE REDUCED BY 5 CONTAINERS BY OMITTING THE CENTER ROW OF THE TOP TIER AS SHOWN ON PAGE 38, OR THE ENTIRE TOP TIER CAN BE OMITTED. TO REDUCE A LOAD BY ONE CONTAINER, REFER TO THE "TYPICAL LCL PROCEDURES" ON PAGE 30.

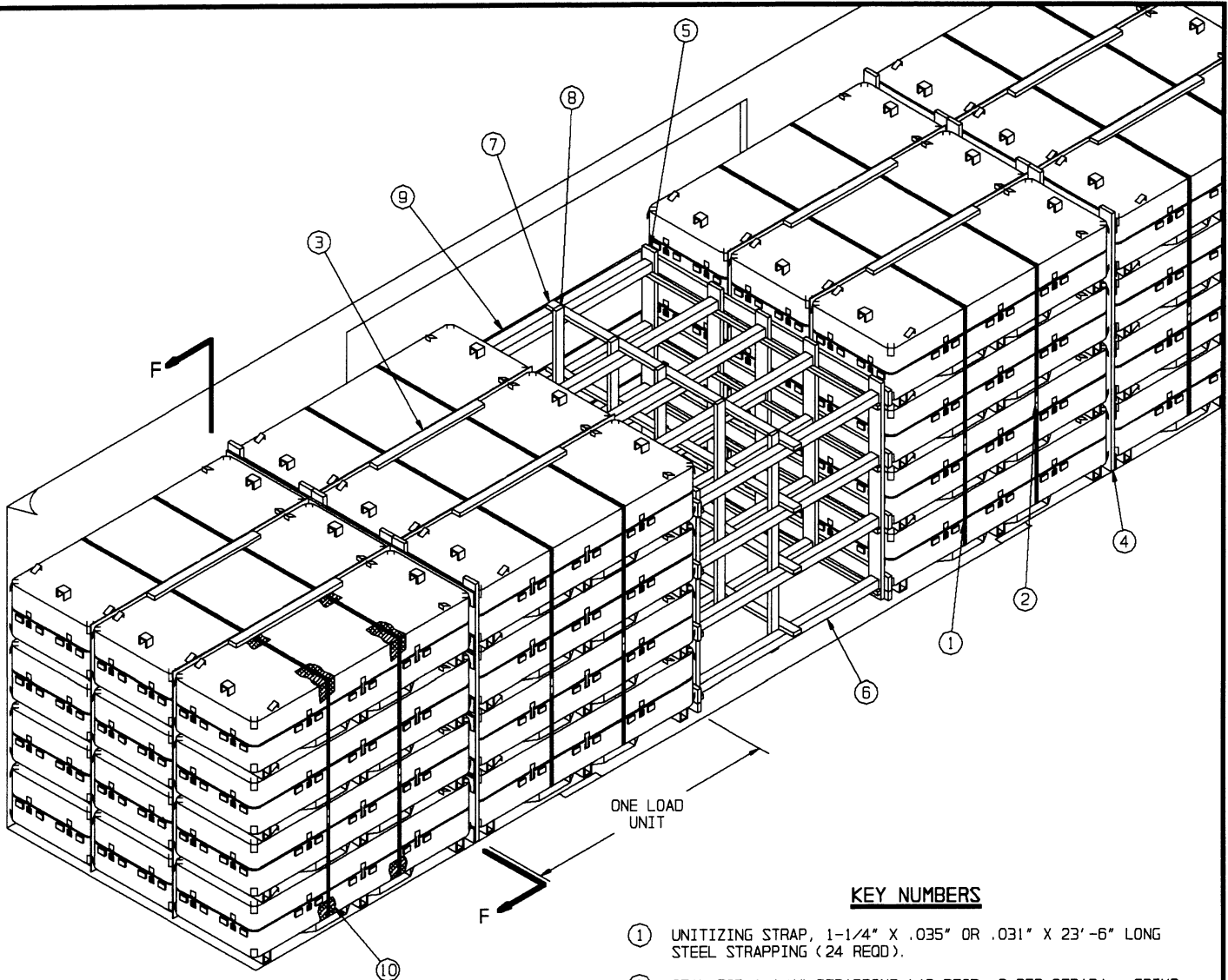
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	343	172
2" X 2"	75	25
2" X 3"	27	14
2" X 4"	211	141
2" X 6"	295	295
4" X 6"	168	336
NAILS	NO. REQD	POUNDS
6d (2")	540	3-1/4
10d (3")	376	6
12d (3-1/4")	32	3/4
16d (3-1/2")	80	1-3/4
STEEL STRAPPING, 1-1/4" -- 705' REQD -- 100.71 LBS		
SEAL FOR 1-1/4" STRAPPING -- 60 REQD -- 2.73 LBS		
PLYWOOD, 1/4" -- 640 SQ FT REQD -- 440 LBS		
ANTI-CHAFING MATERIAL -- AS REQD -- NIL		

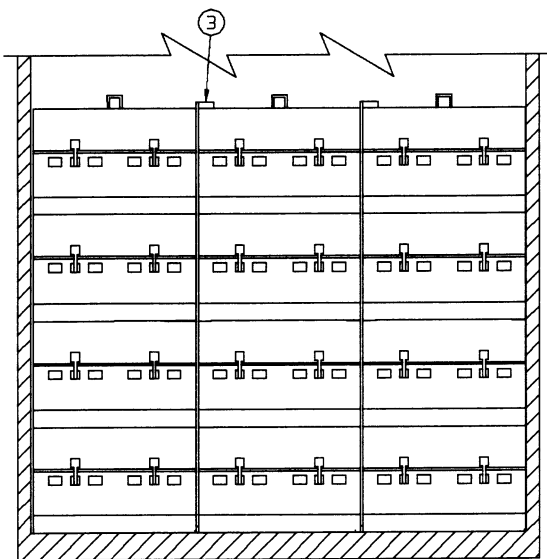
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
DUNNAGE	-----	2,522 LBS
CONTAINER	60	129,600 LBS

TOTAL WEIGHT ----- 132,122 LBS (APPROX)



ISOMETRIC VIEW



SECTION F-F

KEY NUMBERS

- ① UNITIZING STRAP, 1-1/4" X .035" OR .031" X 23'-6" LONG STEEL STRAPPING (24 REQD).
- ② SEAL FOR 1-1/4" STRAPPING (48 REQD, 2 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE GENERAL NOTE "N" ON PAGE 2.
- ③ ANTI-CHAFING (8 REQD). SEE THE "ANTI-CHAFING ASSEMBLY A" DETAIL ON PAGE 24, AND SPECIAL NOTE 2 ON PAGE 17.
- ④ SEPARATOR GATE (2 REQD). POSITION SO THAT THE HORIZONTAL PIECES ARE LOCATED AGAINST THE ALREADY LOADED CONTAINERS. SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 25 AND SPECIAL NOTE 3 ON PAGE 17.
- ⑤ CENTER GATE (2 REQD). SEE THE "CENTER GATE B" DETAIL ON PAGE 26.
- ⑥ STRUT, 4" X 4" BY A LENGTH TO SUIT (REF: 7'-9-1/2") (20 REQD). TOENAIL TO PIECES MARKED ⑤ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "U" AND "V" ON PAGE 3 AND SPECIAL NOTE 4 ON PAGE 17.
- ⑦ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 4-1/2" (4 REQD). NAIL TO THE STRUTS MARKED ⑥ W/3-10d NAILS AT EACH JOINT.
- ⑧ VERTICAL STRUT BRACING, 2" X 4" X 7'-0" (5 REQD). NAIL TO THE STRUTS MARKED ⑥ W/3-10d NAILS AT EACH JOINT.
- ⑨ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION" DETAIL ON PAGE 26 AND SPECIAL NOTE 5 ON PAGE 15.
- ⑩ ANTI-CHAFING MATERIAL (AS REQD). POSITION UNDER ALL STRAPS AT POINTS OF CONTACT WITH CONTAINER.

SPECIAL NOTES:

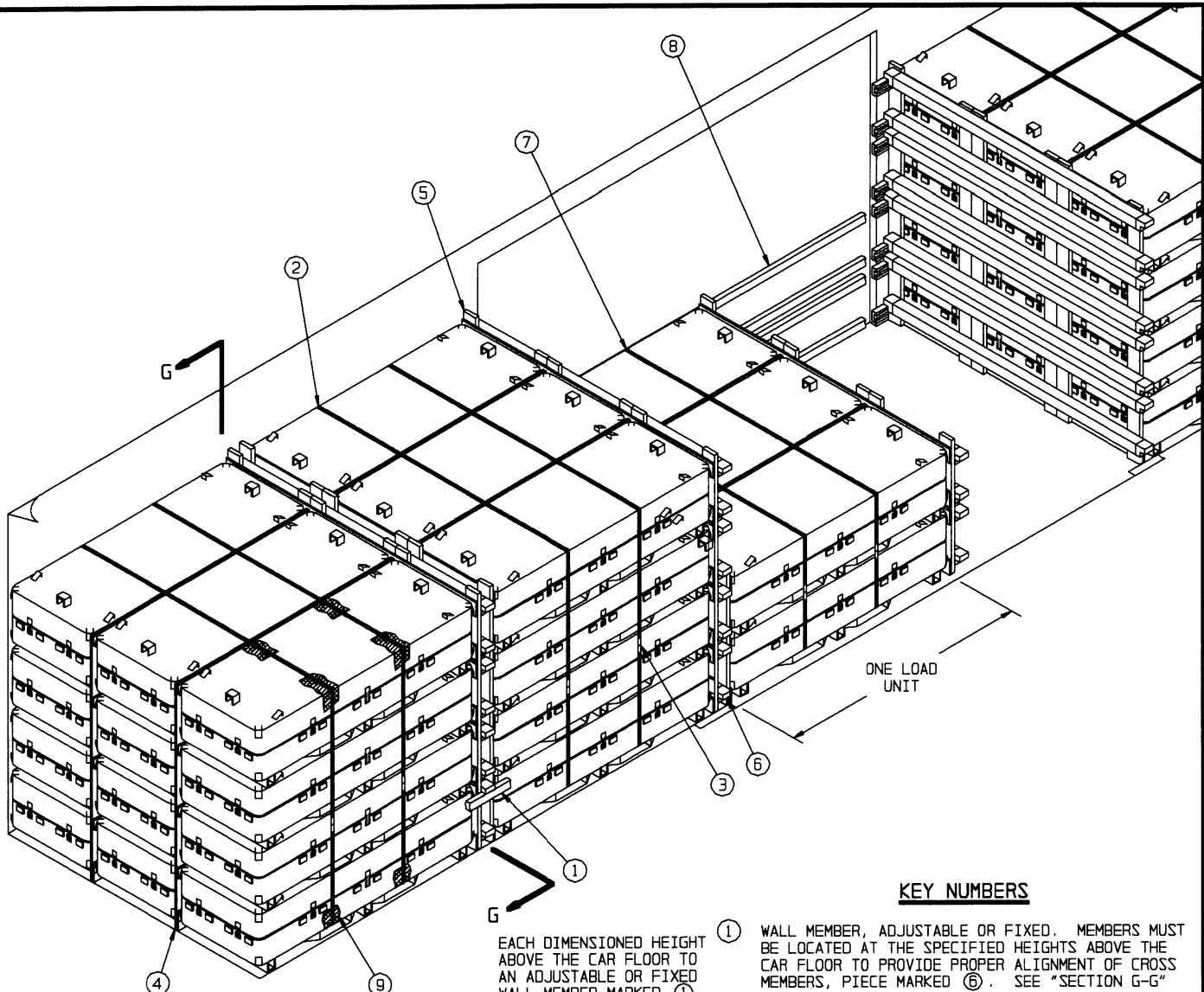
1. A 40'-6" LONG BY 9'-4" WIDE WOOD-LINED CONVENTIONAL TYPE BOXCAR EQUIPPED WITH 15'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF WIDER DIMENSIONS AND HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "E" AND "F" ON PAGE 2.
2. ANTI-CHAFING, SHOWN AS PIECE MARKED ③, MAY BE FORMED FROM 3/8" OR THICKER PLYWOOD, IF DESIRED. IF THE CAR TO BE LOADED IS AT LEAST 9'-6" WIDE, ANTI-CHAFING ASSEMBLY "B" MAY BE INSTALLED IN LIEU OF PIECE MARKED ③. SEE THE "ANTI-CHAFING ASSEMBLY B" DETAIL ON PAGE 24.
3. SEPARATOR GATES, SHOWN AS PIECE MARKED ④, MAY BE FORMED FROM 1/2" OR THICKER PLYWOOD IN LIEU OF DIMENSIONAL LUMBER. SEE THE "ALTERNATIVE SEPARATOR GATE B" DETAIL ON PAGE 25.
4. DOUBLED 2" X 6" STRUTS MAY BE USED IN LIEU OF THE 4" X 4" STRUTS SHOWN IN THE LOAD VIEW ON PAGE 16. LAMINATE W/1-10d NAIL EVERY 6".
5. DOORWAY PROTECTION IS REQUIRED FOR ALL CONTAINER STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY 1/2 OR MORE OF THE CONTAINER LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED ④, IS APPLICABLE FOR BOXCARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MAY BE USED INSTEAD. REFER TO PAGES 40 AND 41 FOR OTHER TYPES OF DOORWAY PROTECTION. NOTE: 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 PIECES MARKED ②, ⑤, ⑥, AND ⑦ ON PAGE 20 AND SPECIAL NOTE 5 ON PAGE 21 FOR INSTALLATION GUIDANCE.
6. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 4-TIER, 3-TIER, 2-TIER, OR 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF 12, 9, 6, OR 3 CONTAINERS RESPECTIVELY BY OMITTING ONE LOAD UNIT FROM THE CENTER PORTION OF THE LOAD. ALSO, A 4-TIER LOAD CAN BE REDUCED BY 4 CONTAINERS BY OMITTING THE CENTER ROW OF THE TOP TIER AS SHOWN ON PAGE 38, OR THE ENTIRE TOP TIER CAN BE OMITTED. TO REDUCE A LOAD BY ONE CONTAINER, REFER TO THE "TYPICAL LCL PROCEDURES" ON PAGE 30.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	269	135
2" X 2"	75	25
2" X 3"	27	14
2" X 4"	131	89
2" X 6"	245	245
4" X 4"	136	182
NAILS	NO. REQD	POUNDS
6d (2")	384	2-1/2
10d (3")	316	5
12d (3-1/4")	32	3/4
16d (3-1/2")	80	1-3/4
STEEL STRAPPING, 1-1/4" -- 564' REQD -- 80.57 LBS		
SEAL FOR 1-1/4" STRAPPING -- 48 REQD --- 2.18 LBS		
PLYWOOD, 1/4" - - - - 512 SQ FT REQD - - - 352 LBS		
ANTI-CHAFING MATERIAL - - - - AS REQD - - - - NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
DUNNAGE	-----	1,776 LBS
CONTAINER	48	103,680 LBS

TOTAL WEIGHT ----- 105,456 LBS (APPROX)

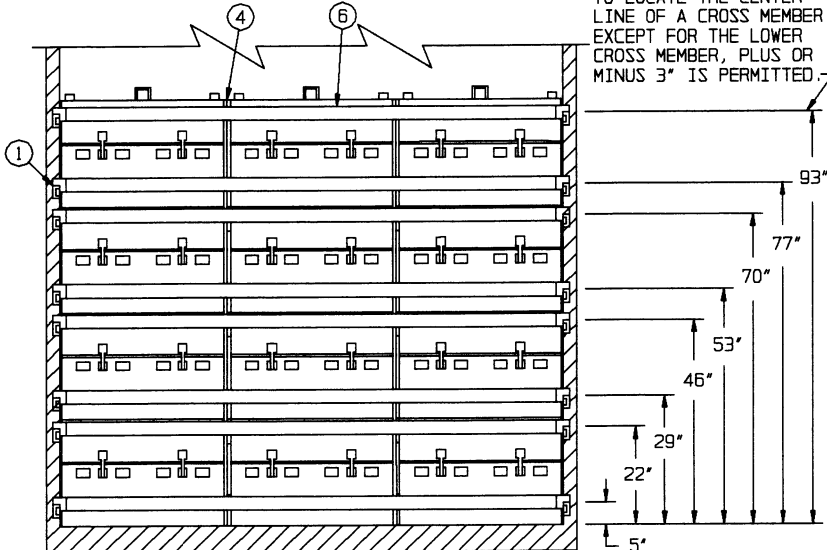


ISOMETRIC VIEW

EACH DIMENSIONED HEIGHT ABOVE THE CAR FLOOR TO AN ADJUSTABLE OR FIXED WALL MEMBER MARKED ① AND/OR A DOORWAY MEMBER MARKED ⑧ IS SPECIFIED TO LOCATE THE CENTER LINE OF A CROSS MEMBER. EXCEPT FOR THE LOWER CROSS MEMBER, PLUS OR MINUS 3" IS PERMITTED.

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, PIECE MARKED ⑥. SEE "SECTION G-G" VIEW BELOW FOR LOCATION GUIDANCE.
- ② UNITIZING STRAP, 1-1/4" X .035" OR .031" X 23'-6" LONG STEEL STRAPPING (24 REOD). SEE SPECIAL NOTE 3 ON PAGE 2.
- ③ SEAL FOR 1-1/4" STRAPPING (60 REOD, 2 PER STRAP) CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE GENERAL NOTE "N" ON PAGE 2.
- ④ ANTI-CHAFING (10 REOD, EIGHT 4-HIGH AND TWO 2-HIGH). SEE THE "ANTI-CHAFING ASSEMBLY B" DETAIL ON PAGE 24.
- ⑤ SEPARATOR GATE (8 REOD, SIX 4-HIGH AND TWO 2-HIGH). SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 25. POSITION WITH THE HORIZONTAL PIECES AGAINST THE CONTAINERS.
- ⑥ CROSS MEMBER (36 REOD). SEE GENERAL NOTE "Y" ON PAGE 3.
- ⑦ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 15'-5" LONG STEEL STRAPPING (6 REOD).
- ⑧ DOORWAY MEMBER (8 REOD). SEE THE "SECTION G-G" VIEW AT LEFT FOR LOCATION GUIDANCE. SEE SPECIAL NOTE 4 ON PAGE 19.
- ⑨ ANTI-CHAFING MATERIAL (AS REOD). POSITION UNDER ALL STRAPS AT POINTS OF CONTACT WITH CONTAINERS.



SECTION G-G

PIECE MARKED ⑤ HAS BEEN OMITTED FOR CLARITY.

SPECIAL NOTES:

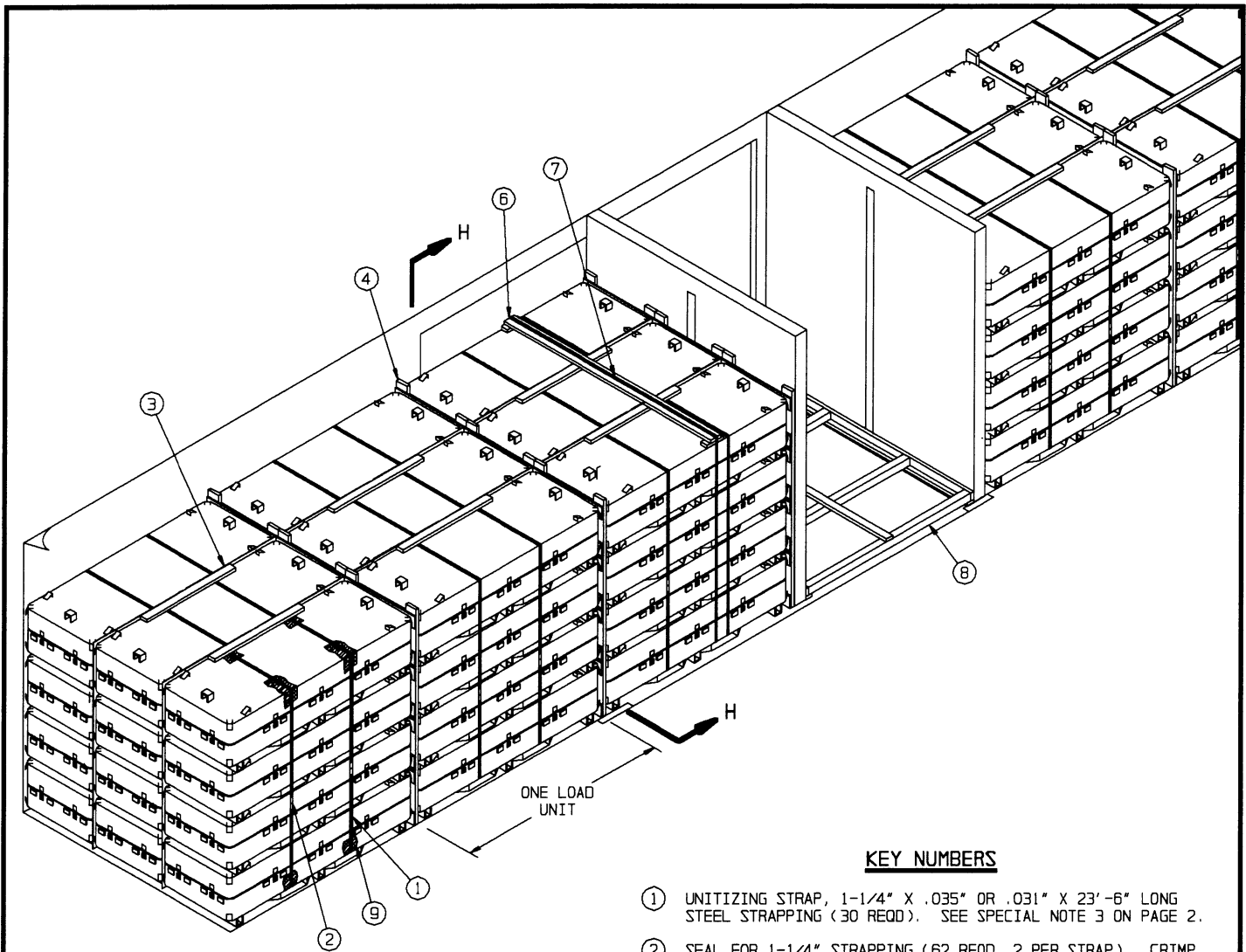
1. A 50'-6" LONG BY 9'-6" WIDE (INSIDE DIMENSION) WOOD-LINED BOXCAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED.
2. SEPARATOR GATES, PIECES MARKED ⑤, MAY BE FORMED FROM 1/2" OR THICKER PLYWOOD IN LIEU OF DIMENSIONAL LUMBER SHOWN ON PAGE 18. SEE THE "ALTERNATIVE SEPARATOR GATE B" DETAIL ON PAGE 25.
3. UNITIZING STRAPS, PIECES MARKED ②, MUST BE PRE-POSITIONED. THREAD THRU THE FORKLIFT POCKETS OF THE BOTTOM CONTAINER AND INSTALL TO ENCIRCLE THE REST OF THE CONTAINER STACK. POSITION THE STRAPS AS FAR APART AS THE FORKLIFT POCKETS PERMIT.
4. IF THE CAR TO BE LOADED IS EQUIPPED WITH AT LEAST 12 DOORWAY MEMBERS, AND IF THE LOAD LIMIT PERMITS, AN ADDITIONAL 6 CONTAINERS CAN BE LOADED IN THE DOORWAY AREA.
5. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A LOAD MAY BE REDUCED BY MULTIPLES OF 3 CONTAINERS BY OMITTING LATERALLY ADJACENT CONTAINERS FROM THE TOP LAYER OF ONE OR MORE LOAD UNITS, OR BY 6 BY OMITTING THE TWO-HIGH STACK, OR BY A MULTIPLE OF 12 BY OMITTING ONE OR MORE FOUR-HIGH LOAD UNITS.

BILL OF MATERIAL

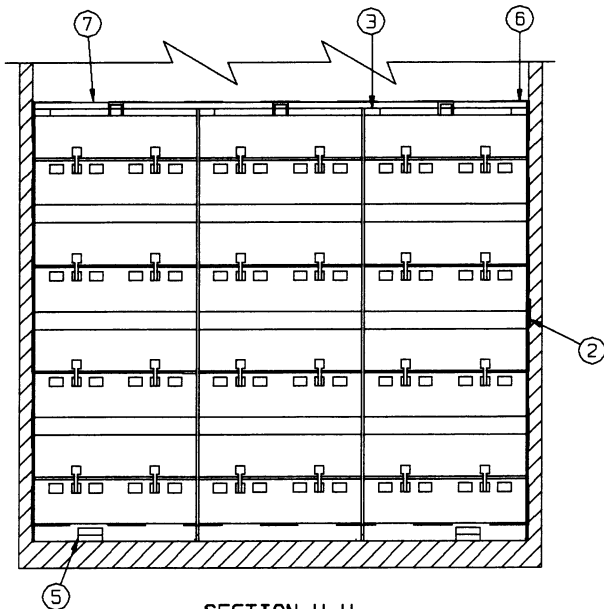
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	418	140
1" X 6"	818	409
2" X 4"	15	10
2" X 6"	352	352
NAILS	NO. REQD	POUNDS
6d (2")	1576	9-1/2
STEEL STRAPPING, 1-1/4" -- 657' REQD -- 93.86 LBS		
SEAL FOR 1-1/4" STRAPPING -- 60 REQD -- 2.73 LBS		
ANTI-CHAFING MATERIAL -- -- AS REQD -- -- NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
DUNNAGE	-----	1,929 LBS
CONTAINER	54	116,640 LBS
TOTAL WEIGHT		118,569 LBS (APPROX)



ISOMETRIC VIEW



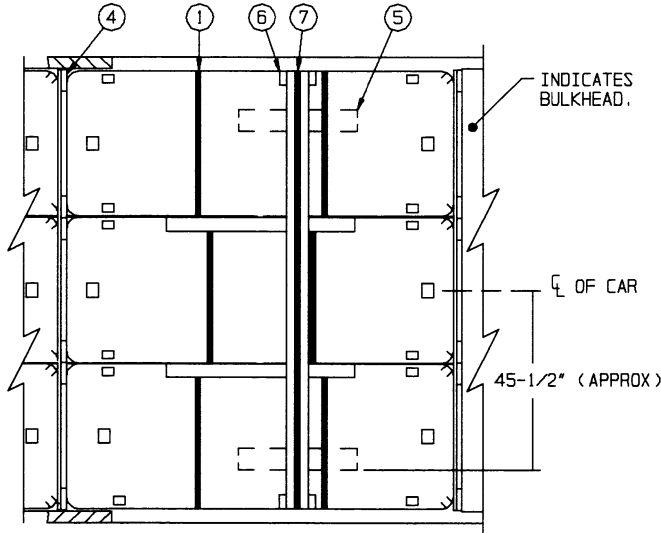
SECTION H-H

KEY NUMBERS

- ① UNITIZING STRAP, 1-1/4" X .035" OR .031" X 23'-6" LONG STEEL STRAPPING (30 REQD). SEE SPECIAL NOTE 3 ON PAGE 2.
- ② SEAL FOR 1-1/4" STRAPPING (62 REQD, 2 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE GENERAL NOTE "N" ON PAGE 2.
- ③ ANTI-CHAFING (10 REQD). SEE THE "ANTI-CHAFING ASSEMBLY B" DETAIL ON PAGE 24.
- ④ SEPARATOR GATE (5 REQD). POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY LOADED CONTAINERS. SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 25. SEE SPECIAL NOTE 2 ON PAGE 21.
- ⑤ FLOORLINE BLOCKING, 2" X 6" X 30" (DOUBLED) (2 REQD). PRE-POSITION AS SHOWN BY THE "PARTIAL PLAN VIEW" ON PAGE 21. NAIL THE FIRST PIECE TO THE CAR FLOOR WITH 8-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTES "L" ON PAGE 2 AND "S" ON PAGE 3. SEE SPECIAL NOTES 3 AND 4 ON PAGE 21.
- ⑥ STRAPPING BOARD ASSEMBLY (1 REQD). SEE THE "STRAPPING BOARD ASSEMBLY A" DETAIL ON PAGE 27.
- ⑦ DOORWAY PROTECTION STRAP, 1-1/4" X .035" OR .031" X 36'-0" LONG STEEL STRAPPING (1 REQD). STAPLE TO STRAPPING BOARD W/3 STAPLES. SEE SPECIAL NOTE 4 ON PAGE 21.
- ⑧ STRUT ASSEMBLY (1 REQD). SEE THE "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL ON PAGE 42. INSTALL BETWEEN THE LOAD DIVIDER BULKHEADS. SEE SPECIAL NOTE 5 ON PAGE 21.
- ⑨ ANTI-CHAFING MATERIAL (AS REQD). POSITION UNDER ALL STRAPS AT POINTS OF CONTAINER CONTACT.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-4" WIDE CUSHIONED BOXCAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND 15'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "BB" THRU "FF" ON PAGE 4.
2. SEPARATOR GATES, SHOWN AS PIECES MARKED ④, MAY BE FORMED FROM 1/2" OR THICKER PLYWOOD IN LIEU OF THE DIMENSIONAL LUMBER SHOWN FOR ONE-HIGH THRU THREE-HIGH LOADS. SEE THE ALTERNATIVE SEPARATOR GATE B' DETAIL ON PAGE 25.
3. DOORWAY PROTECTION IS REQUIRED FOR ALL CONTAINER STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY 1/2 OR MORE OF THE CONTAINER LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS THE PIECE MARKED ⑨ IN THE LOAD ON PAGE 14 IS APPLICABLE FOR BOXCARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MAY BE USED. REFER TO PAGES 40 AND 41 FOR OTHER TYPES OF DOORWAY PROTECTION. **NOTE:** 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.
4. FLOORLINE BLOCKING, SHOWN AS PIECE MARKED ⑤ IN THE "PARTIAL PLAN VIEW" AT LEFT, MUST BE USED FOR ALL LOAD UNITS REQUIRING DOORWAY PROTECTION STRAPS. TWO DOORWAY PROTECTION STRAPS ARE REQUIRED FOR EACH CONTAINER STACK AND/OR LOAD UNIT WHICH IS COMPLETELY WITHIN THE DOORWAY AREA OR WHICH IS NOT RETAINED BY AT LEAST 6" OF CAR SIDEWALL ON BOTH SIDES OF THE CAR. ONE DOORWAY PROTECTION STRAP IS REQUIRED FOR EACH CONTAINER STACK AND/OR LOAD UNIT WHICH IS RETAINED BY 6" TO 1/2 THE CONTAINER/LOAD UNIT LENGTH.
5. THE STRUT ASSEMBLY, SHOWN AS PIECE MARKED ⑧, IS REQUIRED WHEN THE LOAD IN EITHER END OF THE CAR IS 50,000 POUNDS OR GREATER.
6. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 4-TIER, 3-TIER, 2-TIER, OR 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF 12, 9, 6, OR 3 CONTAINERS RESPECTIVELY BY OMITTING ONE LOAD UNIT FROM THE CENTER PORTION OF THE LOAD. ALSO, A 4-TIER LOAD CAN BE REDUCED BY 3 OR 6 CONTAINERS BY OMITTING THE CENTER ROW OF THE TOP TIER AS SHOWN ON PAGE 28, OR THE ENTIRE TOP TIER CAN BE OMITTED. TO REDUCE A LOAD BY ONE CONTAINER, REFER TO THE "TYPICAL LCL PROCEDURES" ON PAGE 30. FOR OTHER METHODS OF REDUCING A LOAD, SEE GENERAL NOTE "GG" ON PAGE 4.
7. A MAXIMUM OF 48 CONTAINERS, FOR AN APPROXIMATE LADING WEIGHT OF 103,680 POUNDS CAN BE LOADED IN A 40'-6" LONG CAR USING THE DEPICTED PROCEDURES.

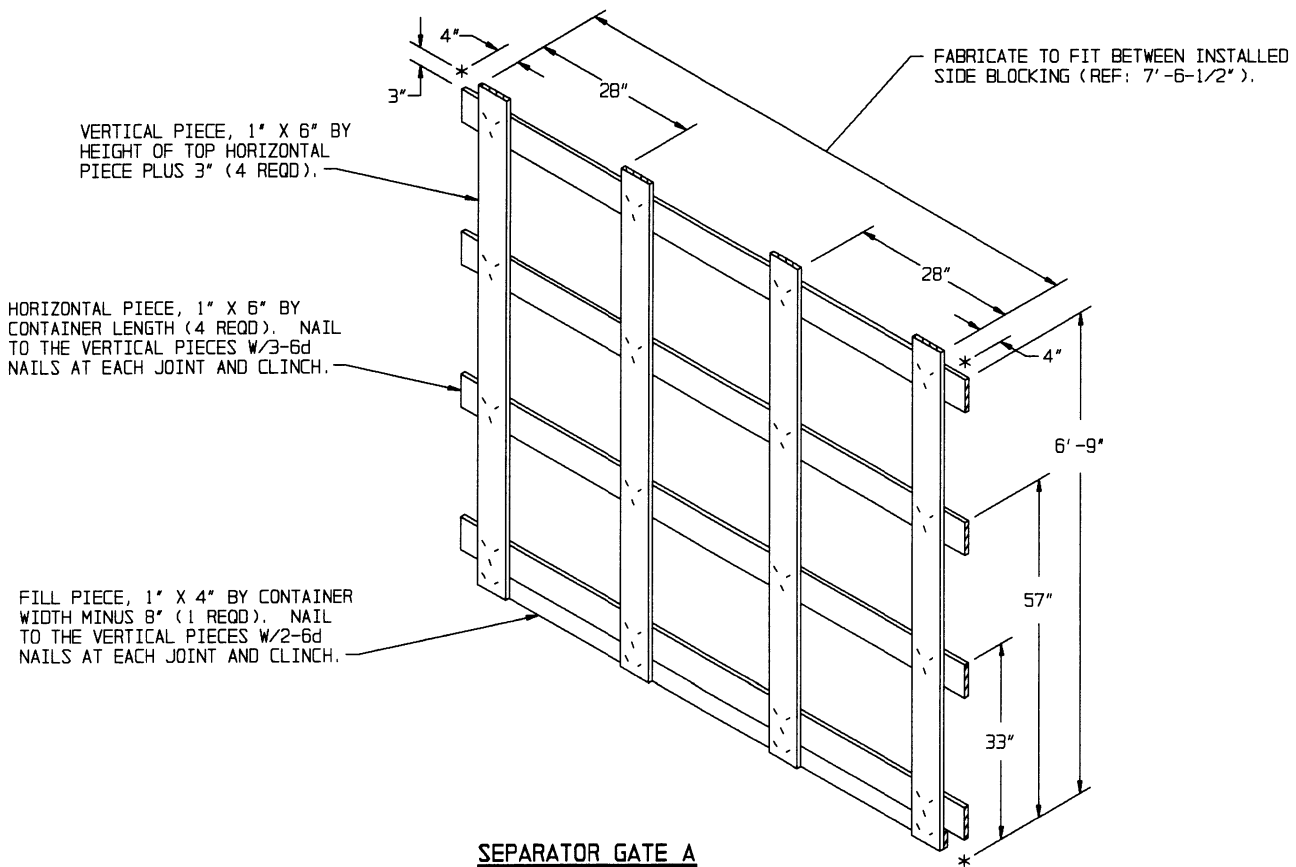


PARTIAL PLAN VIEW

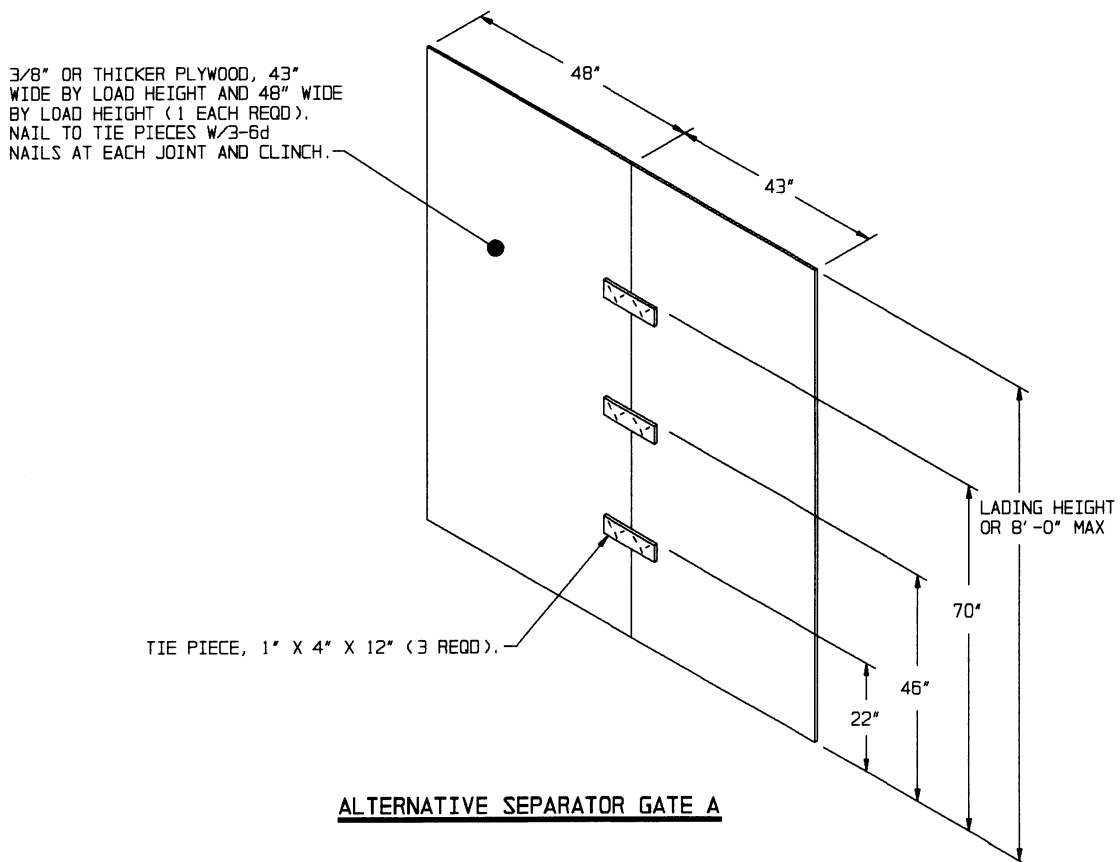
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	372	186
1" X 8"	17	12
2" X 4"	91	61
2" X 6"	270	270
4" X 4"	30	40
NAILS	NO. REQD	POUNDS
6d (2")	738	4-1/2
10d (3")	34	3/4
12d (3-1/4")	16	1/2
16d (3-1/2")	16	1/2
STEEL STRAPPING, 1-1/4"	741' REQD	105.86 LBS
SEAL FOR 1-1/4" STRAPPING	62 REQD	2.82 LBS
PLYWOOD, 1/4"	640 SQ FT REQD	440 LBS
ANTI-CHAFING MATERIAL	AS REQD	NIL

LOAD AS SHOWN

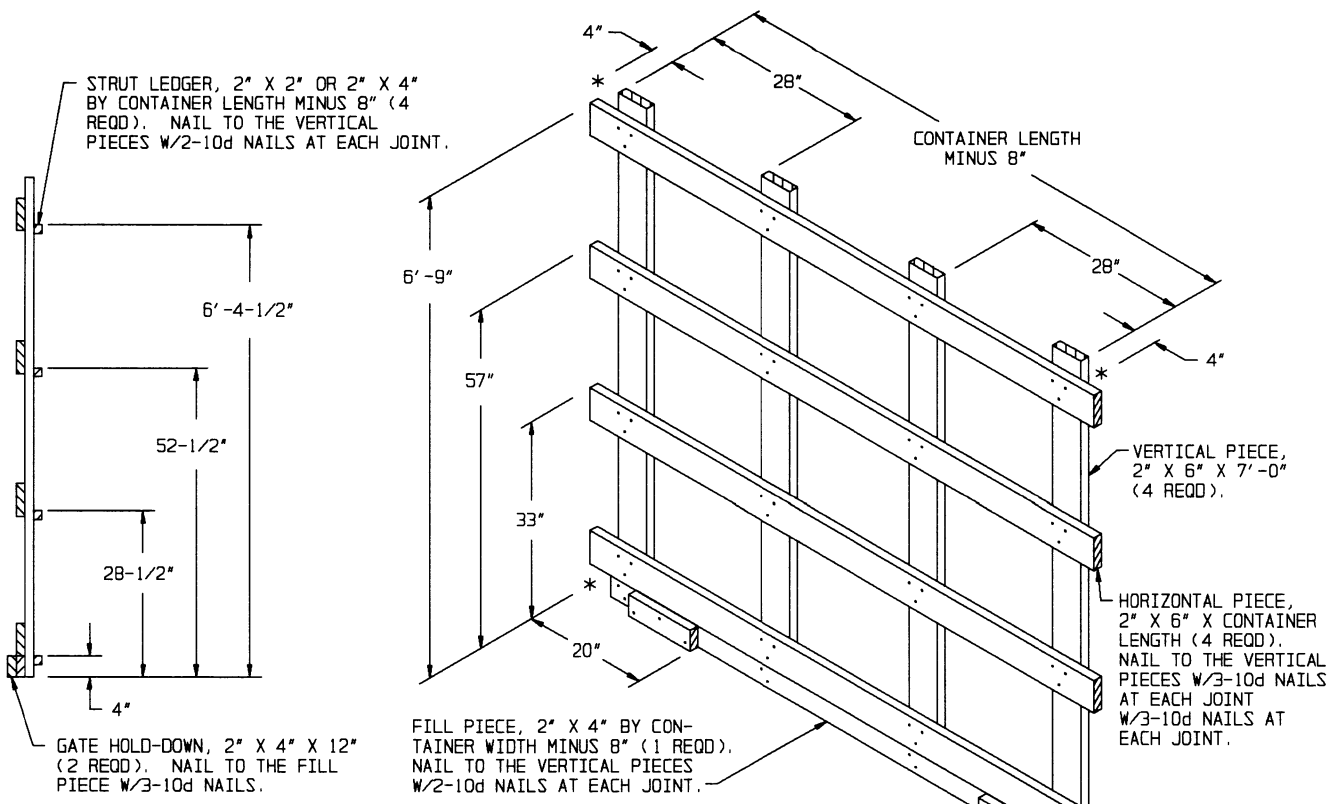
ITEM	QUANTITY	WEIGHT (APPROX)
DUNNAGE	-----	1,693 LBS
CONTAINER	60	129,600 LBS
TOTAL WEIGHT		131,293 LBS (APPROX)



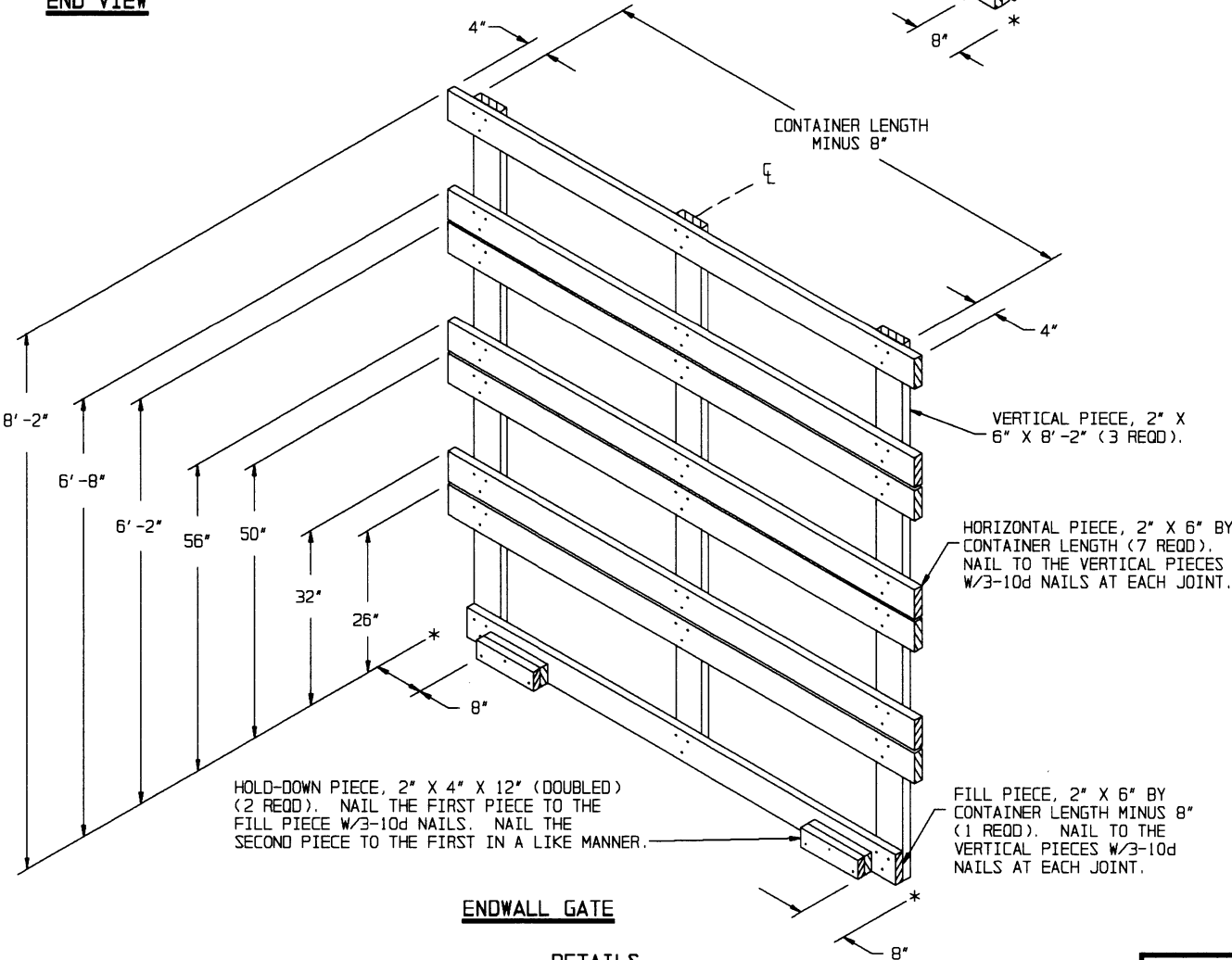
SEPARATOR GATE A



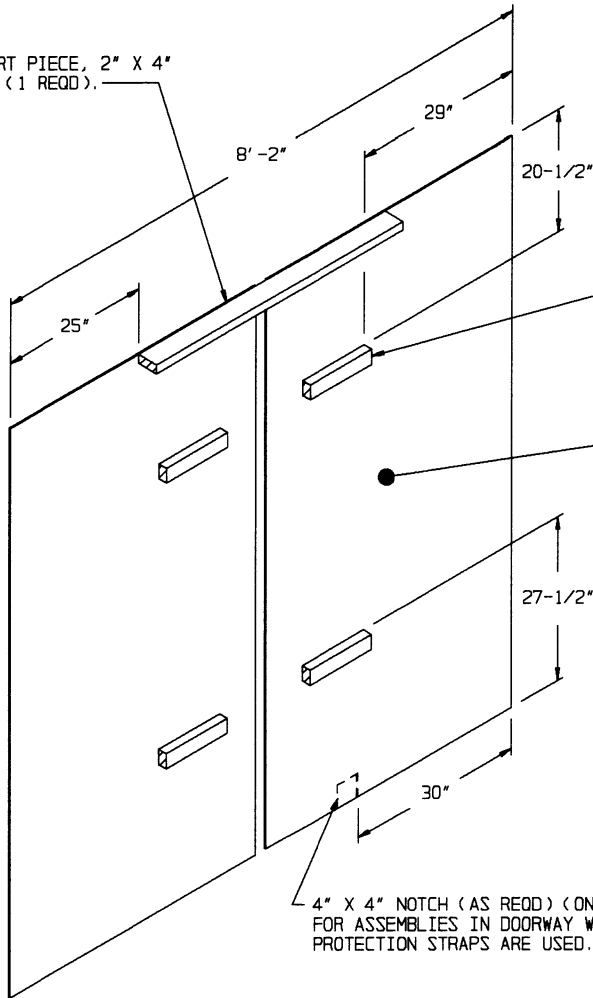
ALTERNATIVE SEPARATOR GATE A



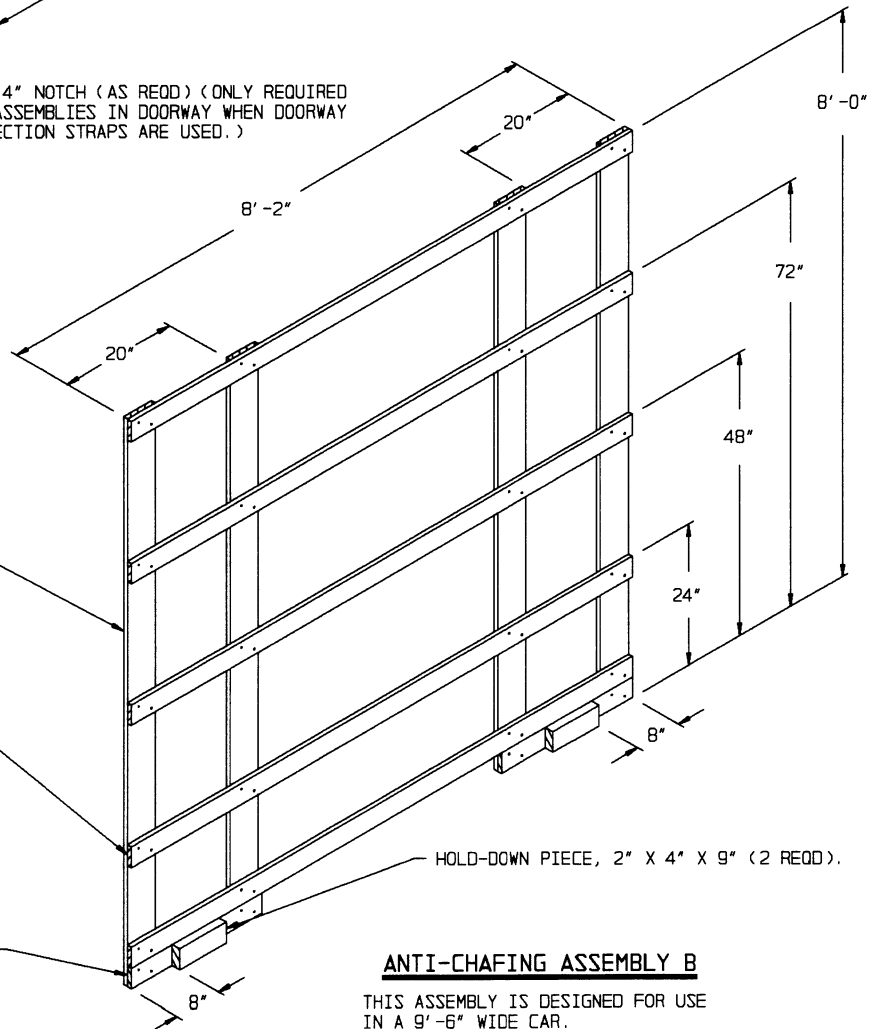
END VIEW



SUPPORT PIECE, 2" X 4" X 48" (1 REQD).



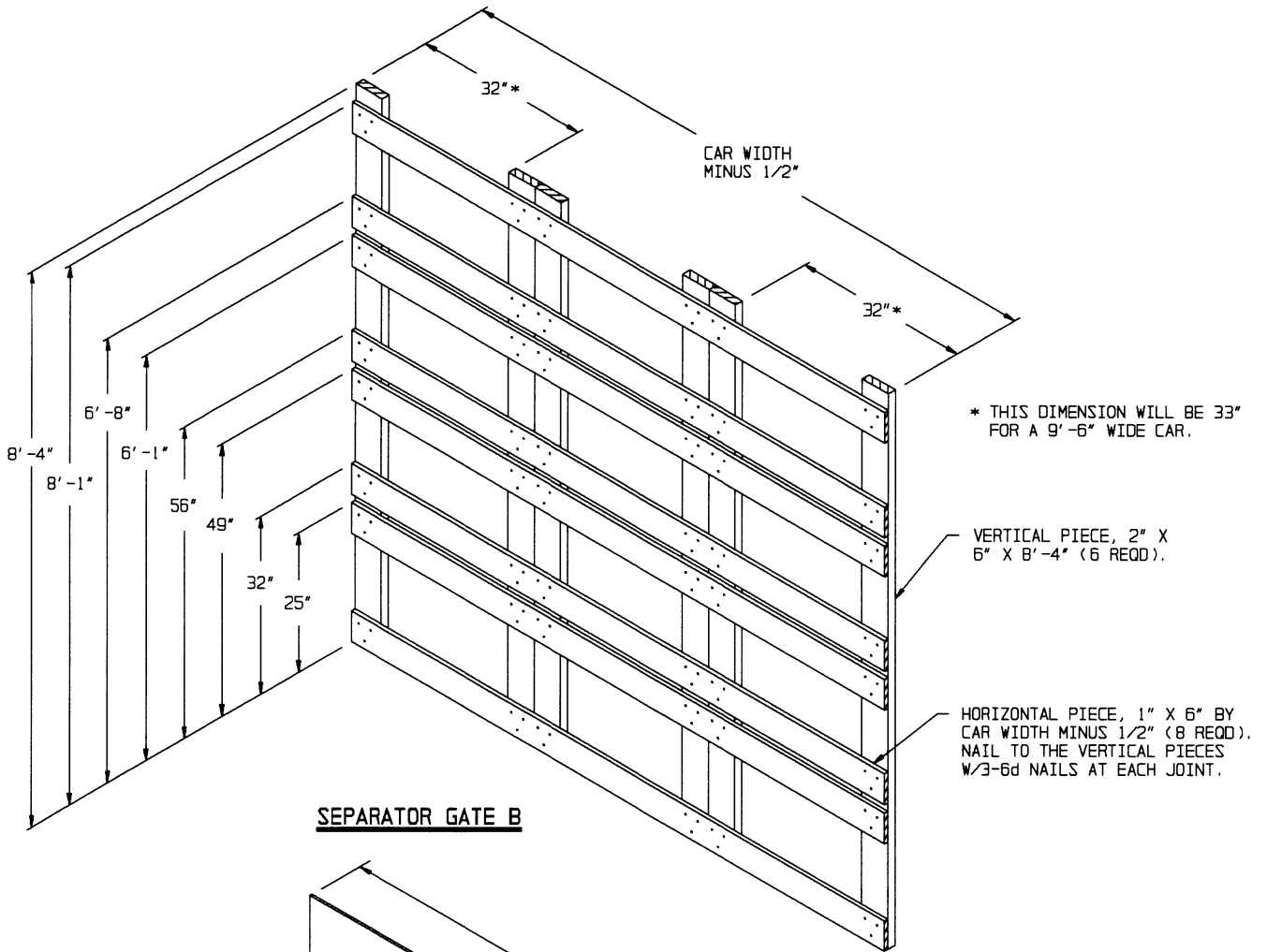
ANTI-CHAFING ASSEMBLY A



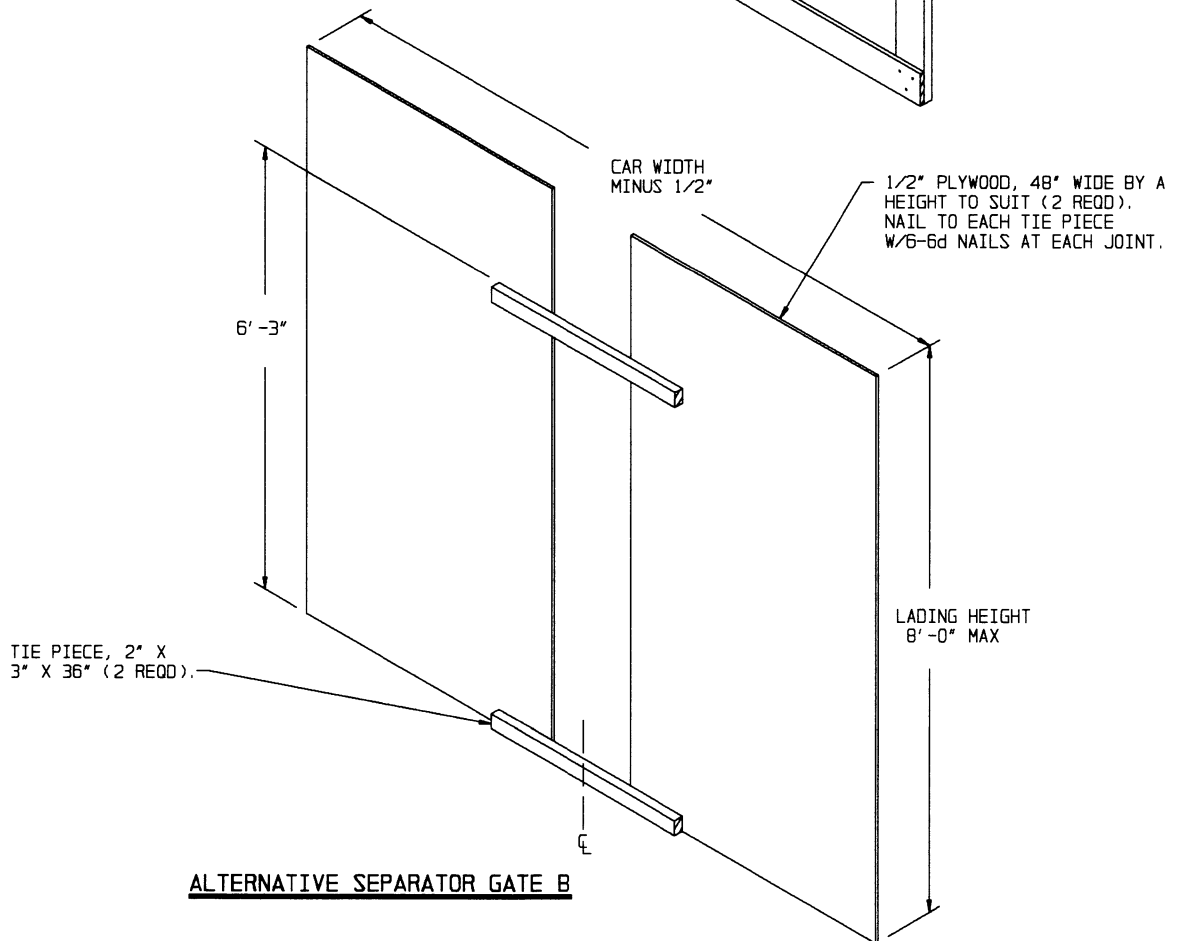
ANTI-CHAFING ASSEMBLY B

THIS ASSEMBLY IS DESIGNED FOR USE IN A 9'-6" WIDE CAR.

DETAILS

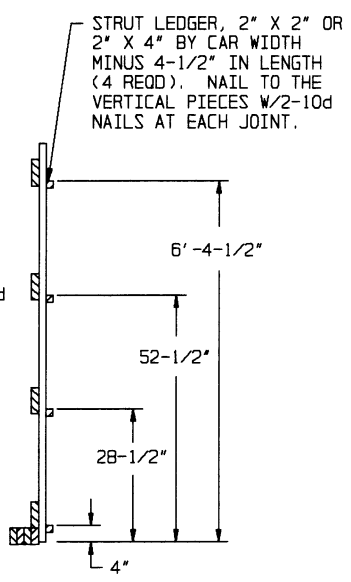
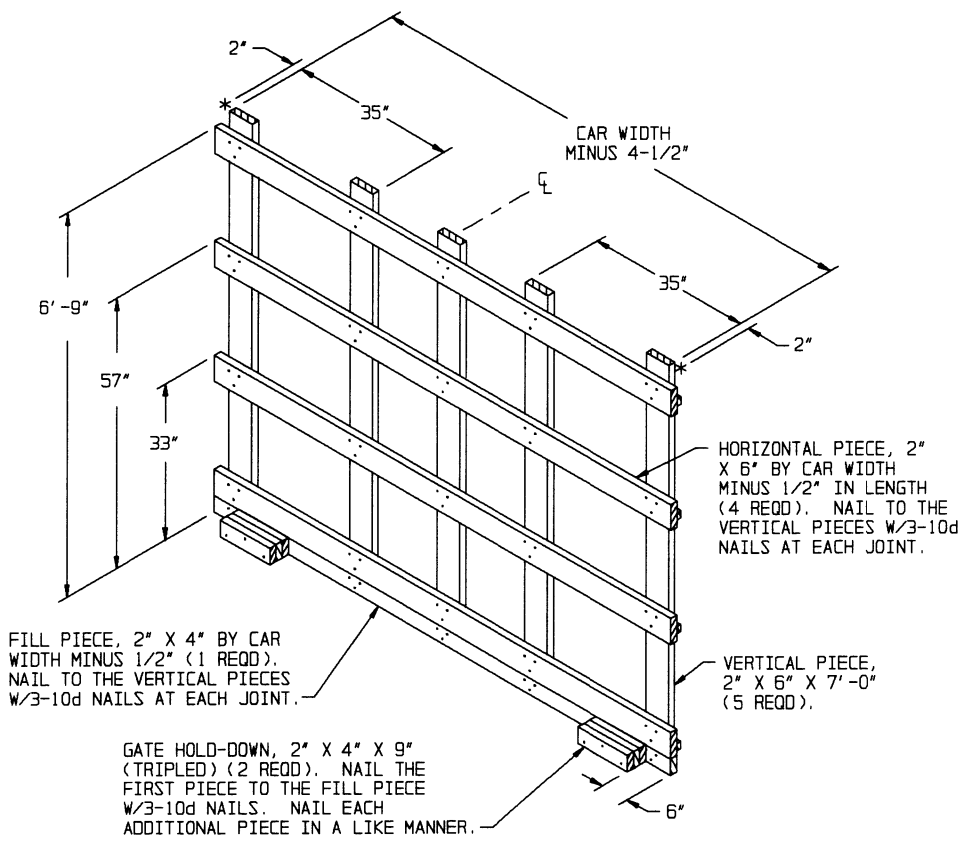


SEPARATOR GATE B



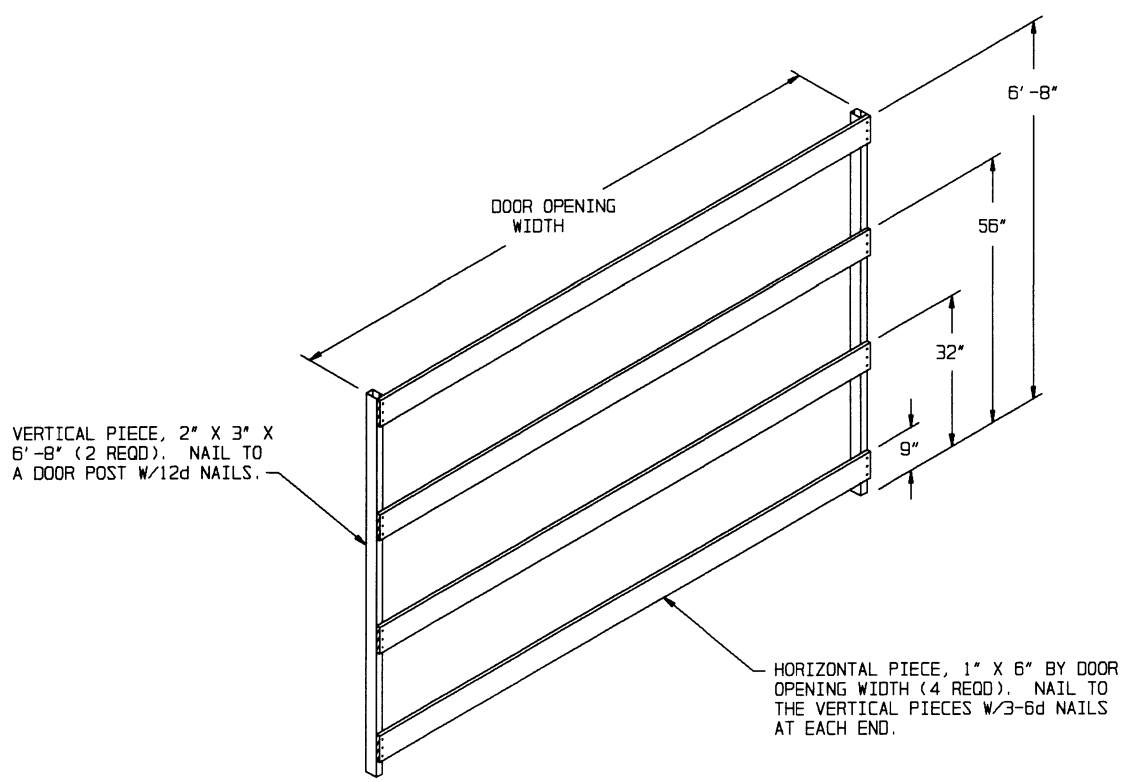
ALTERNATIVE SEPARATOR GATE B

DETAILS



CENTER GATE B

END VIEW



DOORWAY PROTECTION A

DETAILS

SUPPORT PIECE, 2" X 4" X 9" (2 REQD). NAIL TO THE STRAPPING BOARD W/2-10d NAILS.

STRAPPING BOARD, 2" X 6" BY LOAD WIDTH (1 REQD).

STRAPPING BOARD ASSEMBLY A

SPACER PIECE, 2" X 6" BY THE DISTANCE BETWEEN CONTAINERS MINUS 1/4" (1 REQD). NAIL TO THE STRAPPING BOARD W/5-10d NAILS.

STRAPPING BOARD, 2" X 6" BY LOAD WIDTH (1 REQD).

STRAPPING BOARD ASSEMBLY B

BUFFER PIECE, 2" X 4" AND 2" X 6" X 55" (1 EACH REQD). NAIL TO THE RETAINER PIECES W/3-10d NAILS AT EACH JOINT.

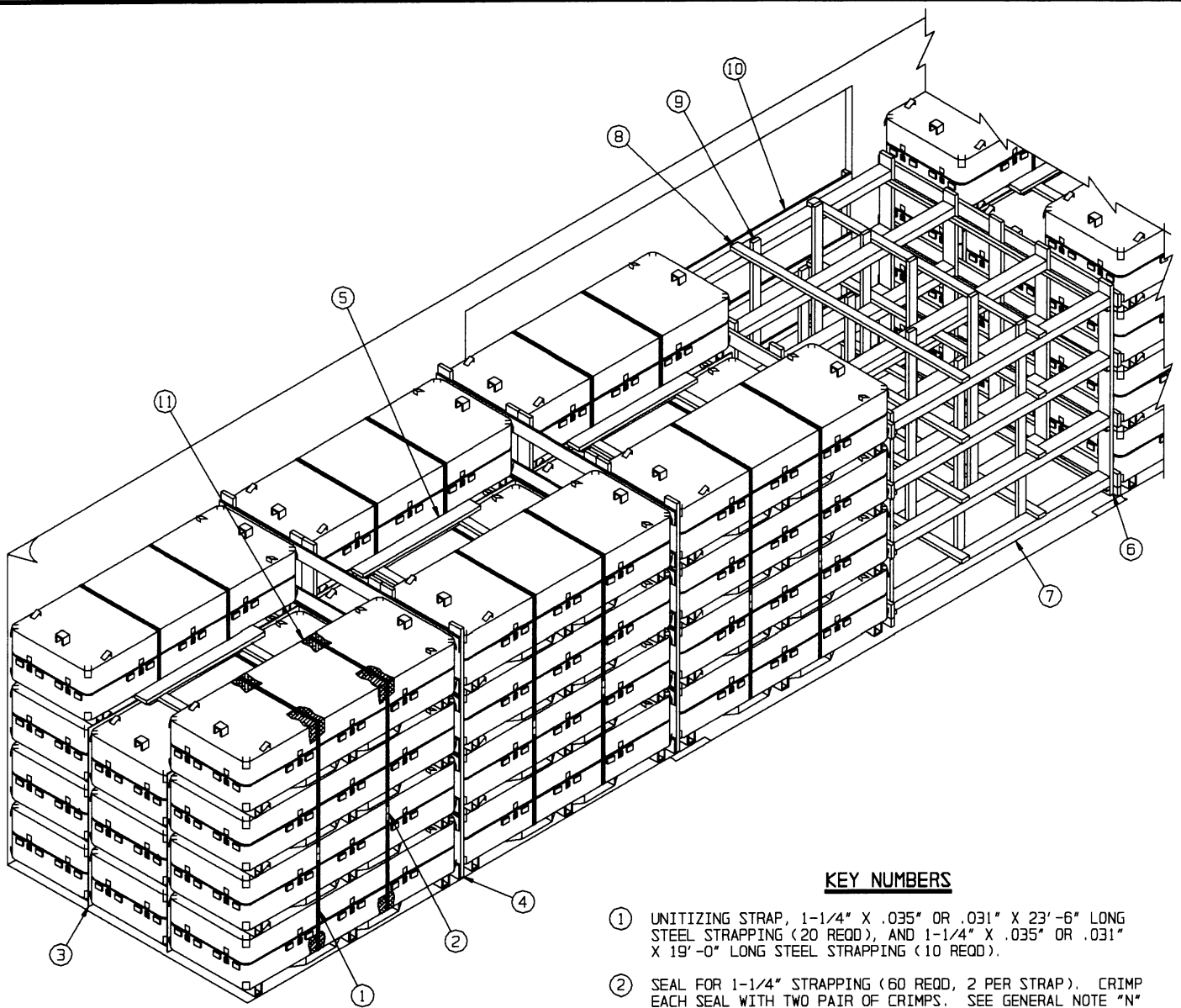
FABRICATE TO FIT BETWEEN CONTAINER SKIDS.

RETAINER PIECE, 2" X 4" BY A LENGTH TO SUIT (2 REQD).

FABRICATE TO FIT (REF: 43").

ANTI-SWAY BRACE

IF DESIRED, THE ANTI-SWAY BRACE CAN BE PARTIALLY PRE-ASSEMBLED; ONE BUFFER PIECE CAN BE NAILED TO BOTH RETAINER PIECES. THE LONG ENDS OF THE ASSEMBLY CAN THEN BE INSTALLED INTO THE FORKLIFT OPENINGS OF A LOADED CONTAINER, PRIOR TO POSITIONING THE LATERALLY ADJACENT CONTAINER. THE ASSEMBLY HAS A 2" X 6" BUFFER PIECE (APPLY LAST) ON ONE SIDE TO FACILITATE NAILING. BOTH BUFFER PIECES MAY BE 2" X 4" MATERIAL IF NAILING CAN BE ACCOMPLISHED.



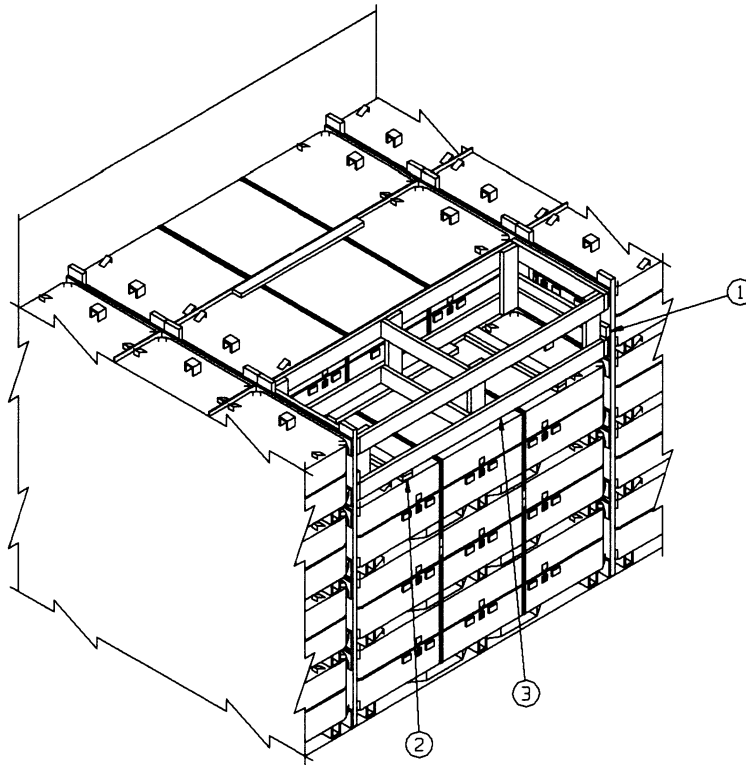
ISOMETRIC VIEW

KEY NUMBERS

- ① UNITIZING STRAP, 1-1/4" X .035" OR .031" X 23'-6" LONG STEEL STRAPPING (20 REQD), AND 1-1/4" X .035" OR .031" X 19'-0" LONG STEEL STRAPPING (10 REQD).
- ② SEAL FOR 1-1/4" STRAPPING (60 REQD, 2 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE GENERAL NOTE "N" ON PAGE 2.
- ③ ANTI-CHAFING (10 REQD). SEE THE "ANTI-CHAFING ASSEMBLY A" DETAIL ON PAGE 24, AND SPECIAL NOTE 3 ON PAGE 15.
- ④ SEPARATOR GATE (3 REQD). POSITION SO THAT THE HORIZONTAL PIECES ARE LOCATED AGAINST THE ALREADY LOADED CONTAINERS. SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 25 AND SPECIAL NOTE 4 ON PAGE 15.
- ⑤ ANTI-SWAY BRACE (5 REQD). SEE THE "ANTI-SWAY BRACE" DETAIL ON PAGE 27. INSTALL BETWEEN LATERALLY ADJACENT TOP-LAYER CONTAINERS.
- ⑥ CENTER GATE (2 REQD). SEE THE LOAD VIEW ON PAGE 14 FOR INSTALLATION GUIDANCE.
- ⑦ STRUT, 4" X 6" BY A LENGTH TO SUIT (REF: 8'-4-1/4") (19 REQD). SEE THE LOAD VIEW ON PAGE 14 FOR INSTALLATION GUIDANCE.
- ⑧ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 4-1/2" (8 REQD). SEE THE LOAD VIEW ON PAGE 14 FOR INSTALLATION GUIDANCE.
- ⑨ VERTICAL STRUT BRACING, 2" X 4" X 7'-0" (10 REQD). SEE THE LOAD VIEW ON PAGE 14 FOR INSTALLATION GUIDANCE.
- ⑩ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION" DETAIL ON PAGE 26 AND SPECIAL NOTE 6 ON PAGE 15.
- ⑪ ANTI-CHAFING MATERIAL (AS REQD). POSITION UNDER ALL STRAPS AT POINTS OF CONTACT WITH CONTAINER.

SPECIAL NOTES:

1. ONLY THE END PORTION OF A 9'-4" WIDE CONVENTIONAL TYPE BOXCAR IS SHOWN TO PORTRAY THE METHOD OF OMITTING THE CENTER ROW OF CONTAINERS FROM THE TOP LAYER.
2. THE PROCEDURES FOR THE ADJUSTMENT OF A LOAD QUANTITY BY THE OMISSION OF THE CENTER ROW OF CONTAINERS FROM THE TOP LAYER OF A 4-HIGH LOAD ARE SHOWN AS TYPICAL. THE PRINCIPLES MAY ALSO BE APPLIED FOR A 3-HIGH OR 2-HIGH LOAD.
3. ALL THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO PERMIT THE OMISSION OF THE CENTER ROW OF UNITS FROM THE TOP LAYER ARE SHOWN.
4. IF NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS ARE USED, AS SHOWN BY KEY NUMBERS ②, ⑤, ⑥, AND ⑦ ON PAGE 20, "STRAPPING BOARD ASSEMBLY B" DETAILED ON PAGE 27 MUST BE POSITIONED UNDER EACH DOORWAY STRAP.



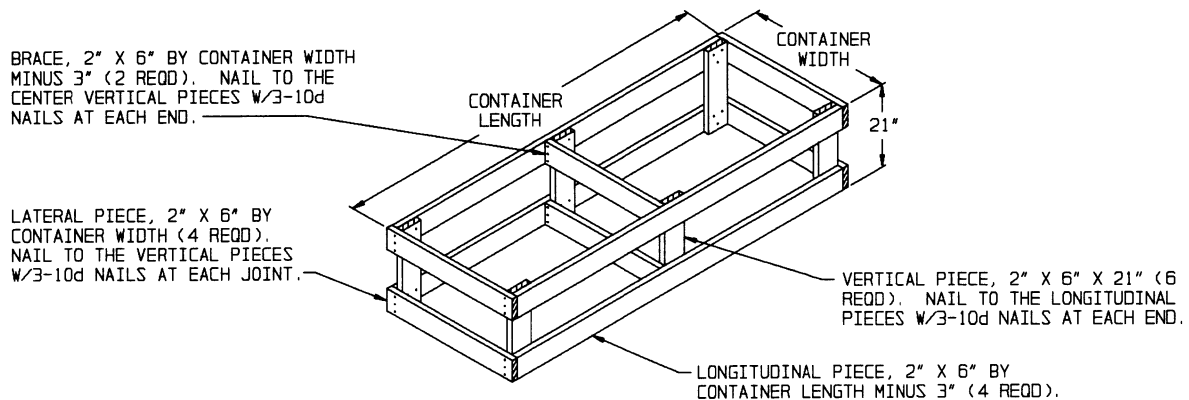
ISOMETRIC VIEW

SPECIAL NOTES:

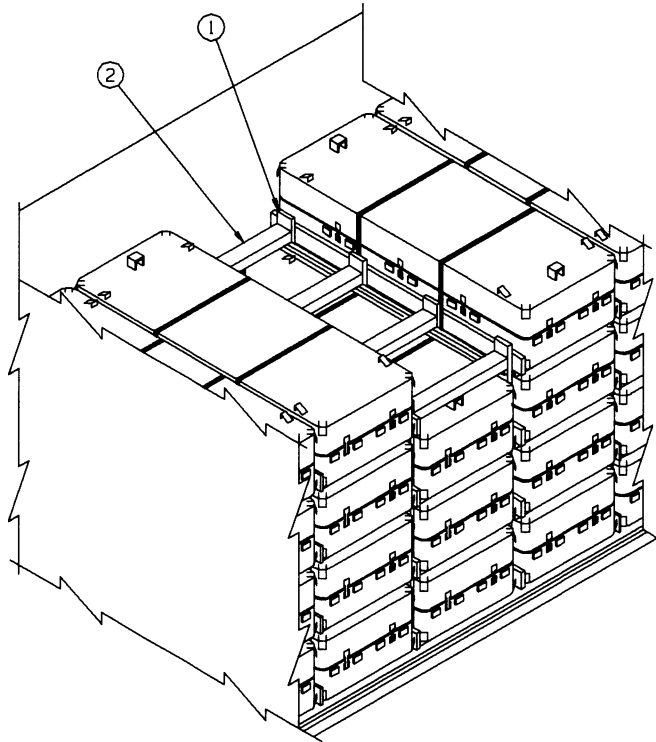
1. A PARTIAL VIEW OF A 9'-4" WIDE CONVENTIONAL TYPE BOXCAR IS SHOWN. WIDER CARS CAN ALSO BE USED.
2. A UNIT OMITTED FROM THE TOP LAYER OF A 4-LAYER LOAD IS SHOWN AS TYPICAL. THE PROCEDURES ARE ALSO APPLICABLE FOR THE OMISSION OF A TOP-LAYER CONTAINER FROM A 3-LAYER OR 2-LAYER LOAD.
3. THE OMITTED UNIT 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 THE CENTER GATE.
4. ONLY THE BLOCKING AND BRACING FOR THE OMITTED UNIT IS SHOWN; REFER TO THE APPLICABLE LOAD PAGE FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.

KEY NUMBERS

- ① HOLD-DOWN PIECE, 2" X 4" X 36" (2 REQD). POSITION 9" ABOVE 3-HIGH CONTAINER STACK. NAIL TO THE VERTICAL PIECES OF THE SEPARATOR GATE W/2-10d NAILS AT EACH END.
- ② SUPPORT PIECE, 2" X 4" X 36" (DOUBLED) (2 REQD). POSITION TO CLEAR THE CONTAINER STACKING PADS. NAIL THE FIRST PIECE TO THE LOWER LONGITUDINAL PIECES ON THE FILLER ASSEMBLY W/2-10d NAILS AT EACH END. NAIL THE SECOND PIECE TO THE FIRST W/3-10d NAILS.
- ③ FILLER ASSEMBLY (1 REQD). SEE THE DETAIL BELOW.



FILLER ASSEMBLY



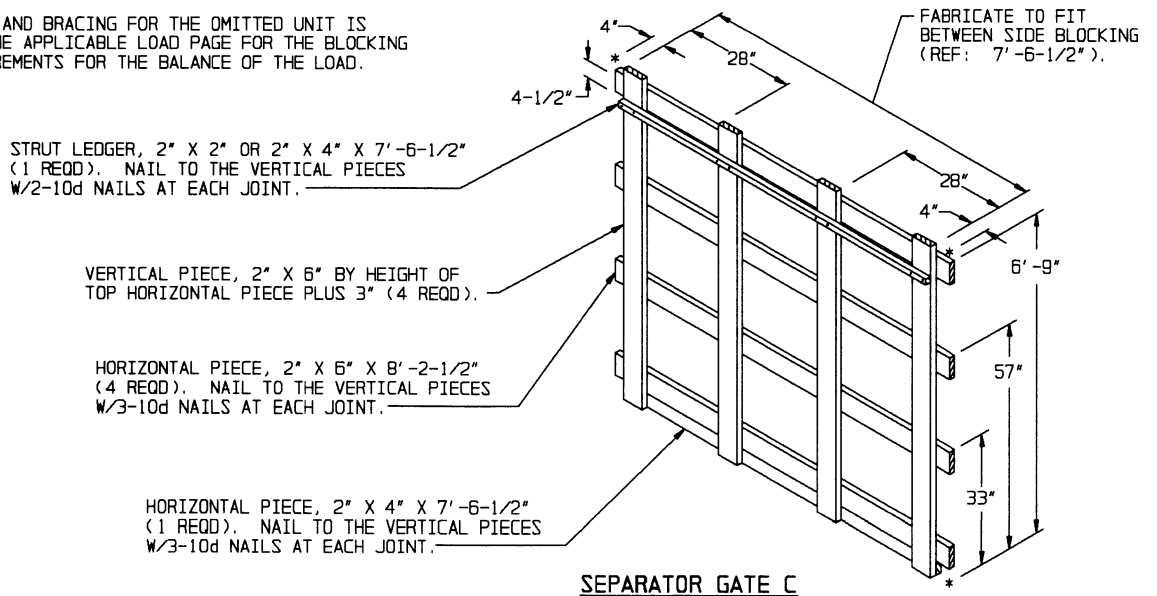
ISOMETRIC VIEW

SPECIAL NOTES:

1. A PARTIAL VIEW OF A 9'-2" WIDE CONVENTIONAL BOXCAR IS SHOWN. OTHER CAR WIDTHS CAN BE USED.
2. A UNIT OMITTED FROM THE TOP LAYER OF A 4-LAYER LOAD IS SHOWN AS TYPICAL. THE PROCEDURES ARE ALSO APPLICABLE FOR THE OMISSION OF A TOP-LAYER CONTAINER FROM A 3-LAYER OR 2-LAYER LOAD.
3. THE OMITTED UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH. ALSO, THERE SHOULD BE AT LEAST ONE LOAD UNIT BETWEEN THE OMITTED UNIT AND THE CENTER GATE.
4. ONLY THE BLOCKING AND BRACING FOR THE OMITTED UNIT IS SHOWN; REFER TO THE APPLICABLE LOAD PAGE FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.

KEY NUMBERS

- ① SEPARATOR GATE (2 REQD). SEE THE "SEPARATOR GATE C" DETAIL BELOW. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ② STRUT, 4" X 6" BY CUT-TO-FIT (4 REQD). TOENAIL TO THE SEPARATOR GATES, PIECES MARKED ①, W/2-16d NAILS AT EACH END. SEE THE "STRUT INSTALLATION" DETAIL ON PAGE 39. SEE SPECIAL NOTES 2 AND 3 AT LEFT.

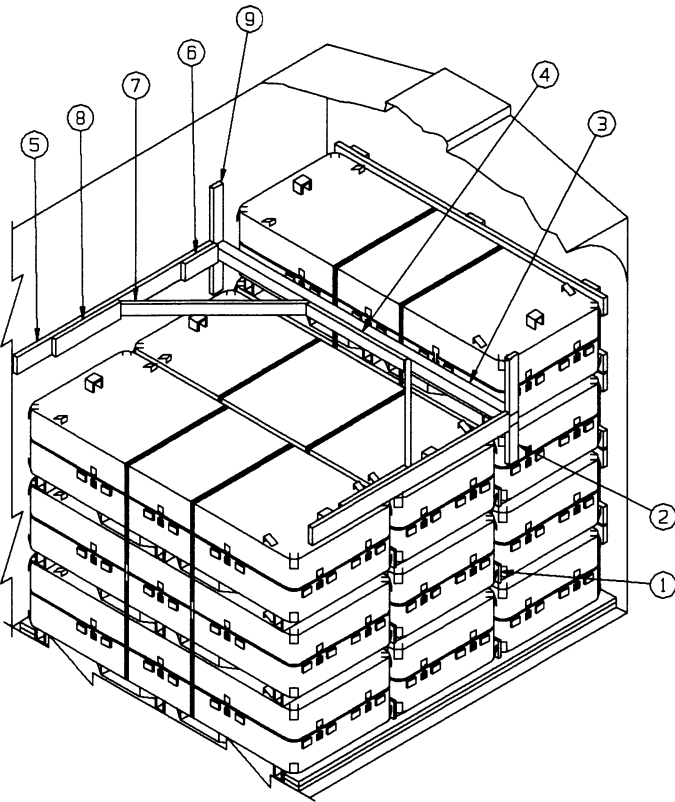


SEPARATOR GATE C

SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 22 FOR LOCATION OF HOLD-DOWN PIECES.

KEY NUMBERS

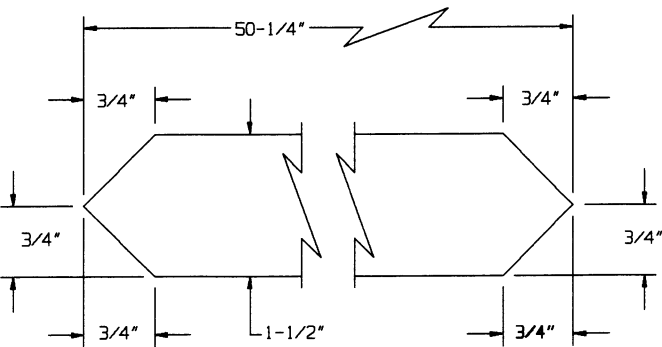
- ① SEPARATOR GATE (AS REQD). SEE THE "SEPARATOR GATE A" OR ALTERNATIVE SEPARATOR GATE A" DETAILS ON PAGE 22.
- ② SUPPORT CLEAT, 2" X 4" X 9" (2 REQD). POSITION VERTICALLY AS SHOWN SO AS TO CENTER PIECE MARKED ③ ON THE CONTAINER LOAD BEARING SURFACE. NAIL TO THE CAR SIDEWALL W/3-12d NAILS.
- ③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT-TO-FIT) (1 REQD).
- ④ CENTER CLEAT, 2" X 4" X 36" (1 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/7-16d NAILS. SEE SPECIAL NOTE 4 BELOW.
- ⑤ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (2 REQD). NAIL TO THE CAR SIDEWALL W/16-12d NAILS. SEE GENERAL NOTE "L" ON PAGE 2.
- ⑥ POCKET CLEAT, 2" X 6" X 12" (2 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/4-16d NAILS.
- ⑦ DIAGONAL BRACE, 4" X 4" X 50-1/4" (2 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/2-16d NAILS AT EACH JOINT.
- ⑧ BACK-UP CLEAT, 2" X 6" X 24" (2 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/8-16d NAILS.
- ⑨ HOLD-DOWN CLEAT, 2" X 6" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-10d NAILS.



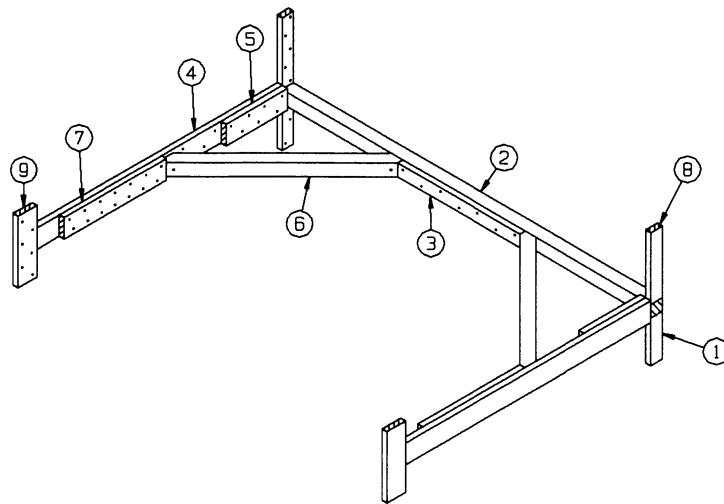
ISOMETRIC VIEW

SPECIAL NOTES:

- 1. A 9'-2" WIDE WOOD-LINED CONVENTIONAL BOXCAR IS SHOWN WITH A TYPICAL K-BRACE. CARS OF OTHER WIDTHS CAN BE USED.
- 2. THE K-BRACE METHOD OF PARTIAL-LAYER (TIER) BRACING SHOWN MAY BE USED IN A WOOD-LINED CAR FOR THE SECUREMENT OF A PARTIAL TOP-TIER, BE IT A FIRST, SECOND, THIRD, OR FOURTH TIER. THE TYPE "A" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 4,000 POUNDS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAIL ON PAGE 33.
- 3. 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 OF THE CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT THE PROPER INSTALLATION OF THE K-BRACE. DUNNAGE PIECES MARKED ②, ③, ⑥, AND ⑨, MUST BE SUPPORTED AT THE SIDES OF A CAR BY A SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES, PIECES MARKED ⑦, TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑤ MUST BE DOUBLED WITH THE DELETION OF THE POCKET CLEATS, PIECES MARKED ⑥, AND EXTENDED FROM THE CROSS CAR BRACE, PIECE MARKED ③, ACROSS THE DOORWAY AREA FAR ENOUGH TO ALLOW A MINIMUM OF 60" OF NAILABLE SURFACE AREA. NAIL WITH 16d NAILS EVERY 6", CLINCHING NAILS WHICH ARE EXPOSED IN THE DOORWAY AREA. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑤ IS DOUBLED. SEE GENERAL NOTE "L" ON PAGE 2.
- 4. THE CENTER CLEAT, SHOWN AS PIECE MARKED ④, WILL BE 38" LONG FOR A 9'-4" WIDE CAR AND 40" LONG FOR A 9'-6" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.



DIAGONAL BRACE



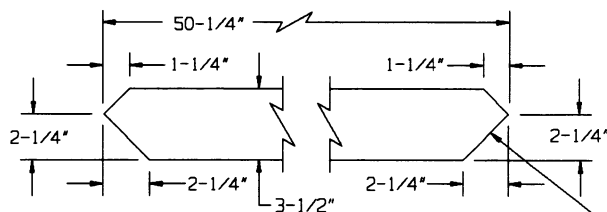
ISOMETRIC VIEW

SPECIAL NOTES:

1. THE TYPE "B" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL LAYER (TIER) OF NOT MORE THAN 7,000 POUNDS. IF THE PARTIAL TIER TO BE BRACED WEIGHS 4,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 32 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 K-BRACE. DUNNAGE PIECES MARKED ①, ②, ⑤, ⑧, AND ⑨, MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑥ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ④ 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 ④ 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 ④ IS DOUBLED.
3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ③, WILL BE 38" LONG FOR A 9'-4" WIDE CAR AND 40" LONG FOR A 9'-6" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. REFER TO PAGE 32 FOR A TYPICAL INSTALLATION OF A K-BRACE.

KEY NUMBERS

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

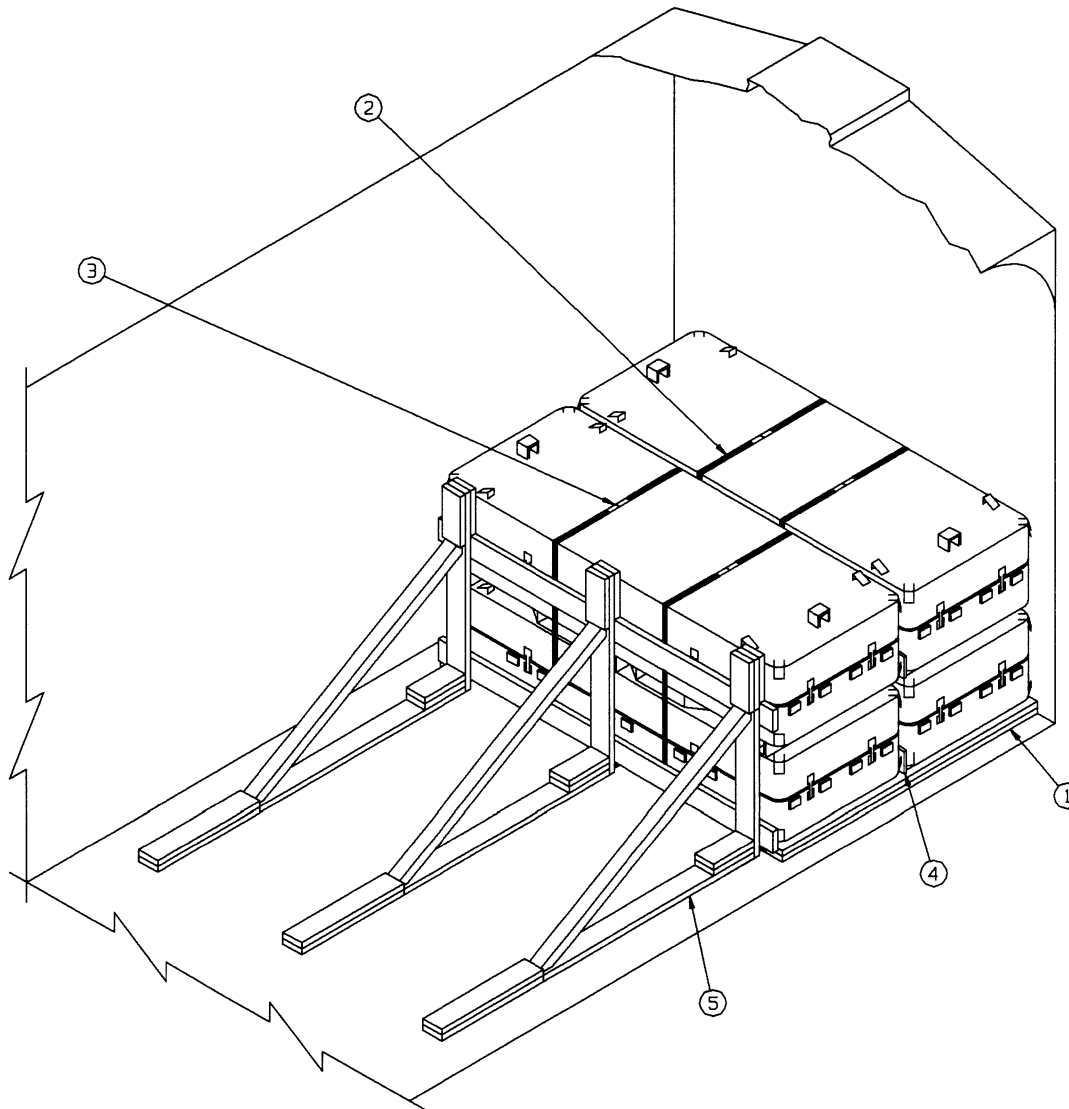


DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

THIS BEARING SURFACE MUST BE POSITIONED SO AS TO BE IN CONTACT WITH A CROSS CAR BRACE, PIECE MARKED ②, OR A HORIZONTAL WALL CLEAT, PIECE MARKED ④.

TYPE "B" K-BRACE



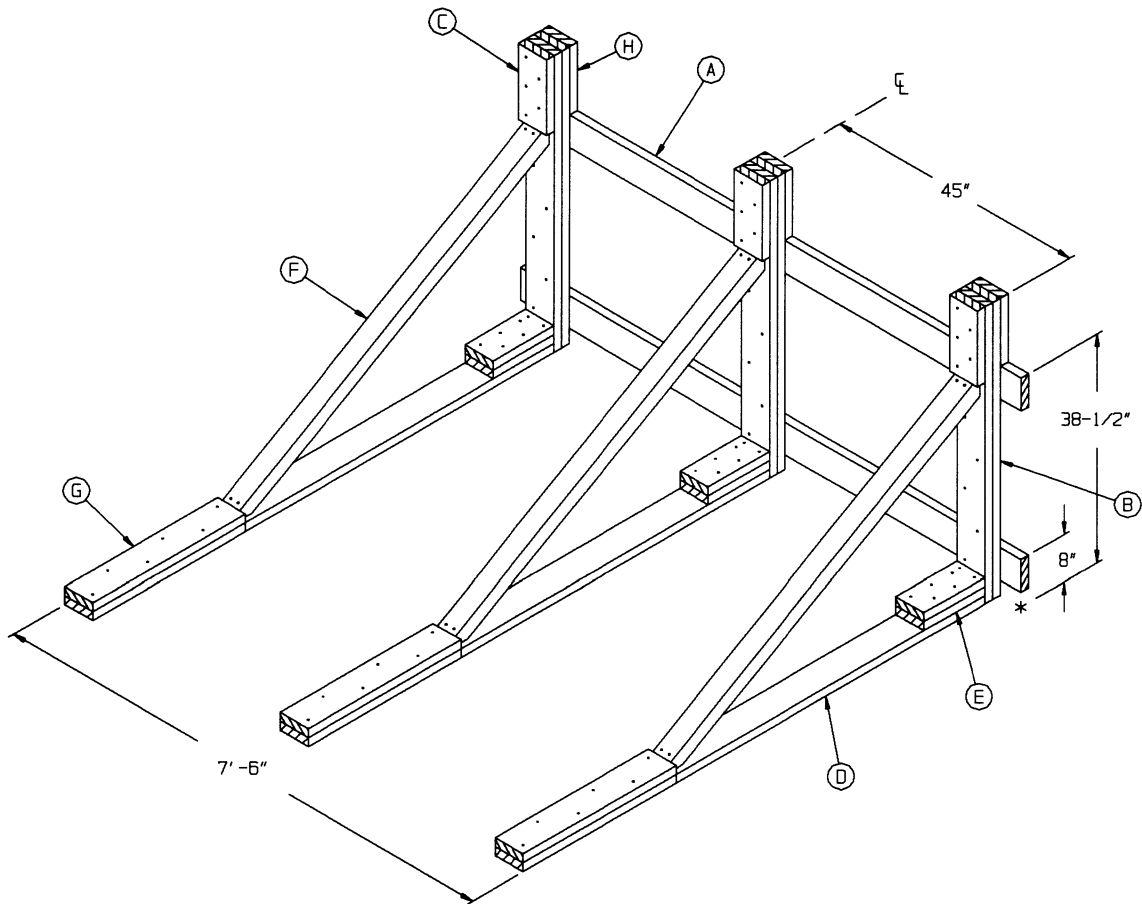
ISOMETRIC VIEW

SPECIAL NOTES:

1. A FOUR CONTAINER LOAD IS SHOWN IN A 9'-4" WIDE CONVENTIONAL BOXCAR. CARS OF OTHER WIDTHS CAN ALSO BE USED.
2. THE TOTAL KNEE BRACE ASSEMBLY IS ADEQUATE FOR RETAINING A MAXIMUM LCL LOAD OF NOT MORE THAN 12,750 POUNDS.

KEY NUMBERS

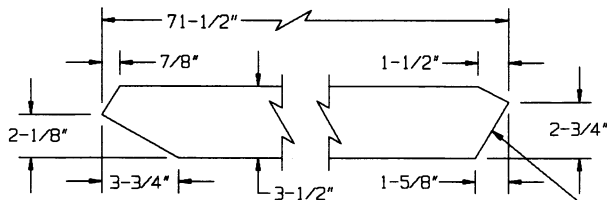
- ① SIDE BLOCKING, 2" X 6" BY LOAD LENGTH (DOUBLED) (2 REQD). PRE-POSITION. NAIL THE FIRST PIECE TO THE CAR FLOOR W/1-16d NAIL EVERY 8". LAMINATE THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ② UNITIZING STRAP, 1-1/4" X .035" OR .031" X 15'-6" LONG STEEL STRAPPING (4 REQD). POSITION THRU THE FORK TINE POCKETS OF THE BOTTOM CONTAINERS.
- ③ SEAL FOR 1-1/4" STRAPPING (8 REQD, 2 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE GENERAL NOTE "N" ON PAGE 2.
- ④ SEPARATOR GATE (1 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 22.
- ⑤ KNEE BRACE ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 35 AND SPECIAL NOTE 2 AT LEFT.



ISOMETRIC VIEW

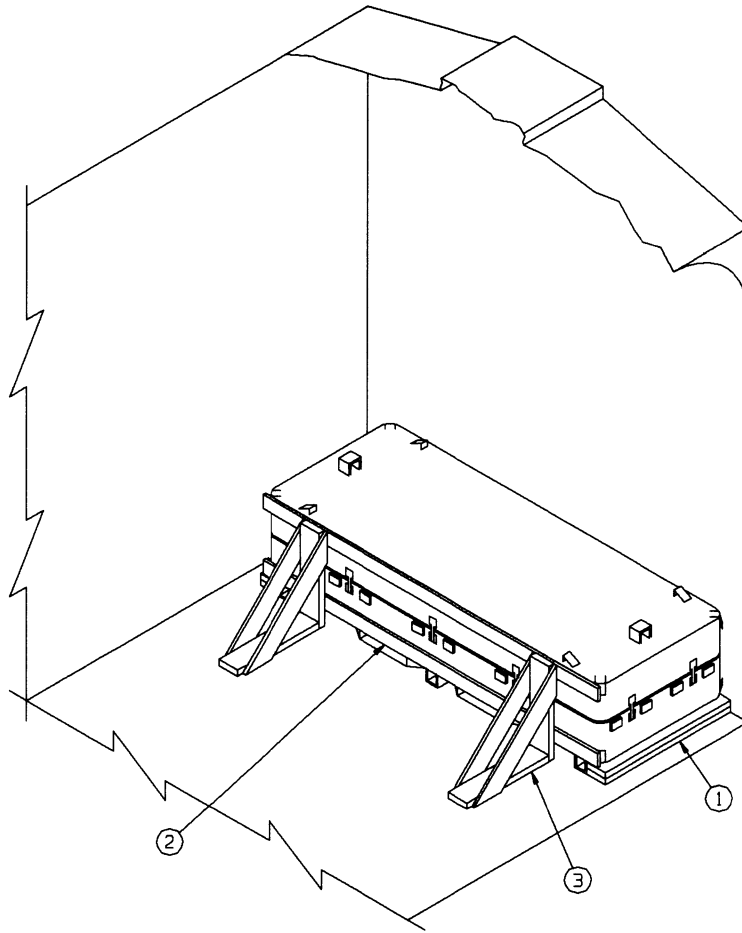
KEY LETTERS

- (A) LOAD BEARING PIECE, 2" X 6" X 6'-2" (2 REQD). NAIL TO THE VERTICAL PIECES, PIECE MARKED (B), W/3-10d NAILS AT EACH JOINT.
- (B) VERTICAL PIECE, 2" X 6" X 50" (DOUBLED) (3 REQD). NAIL THE FIRST PIECE TO THE SECOND W/1-10d NAIL EVERY 6". SEE GENERAL NOTE "L" ON PAGE 2.
- (C) HOLD-DOWN CLEAT, 2" X 6" X 12-3/4" (3 REQD). NAIL TO A VERTICAL PIECE, PIECE MARKED (B), W/5-10d NAILS.
- (D) FLOOR CLEAT, 2" X 6" X 7'-8" (3 REQD). NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 8". SEE GENERAL NOTE "L" ON PAGE 2.
- (E) POCKET CLEAT, 2" X 6" X 12" (DOUBLED) (3 REQD). NAIL THE FIRST PIECE TO THE FLOOR CLEAT, PIECE MARKED (D), W/5-16d NAILS. NAIL THE SECOND PIECE IN A LIKE MANNER AND TOENAIL THE TOP PIECE TO THE VERTICAL PIECE, PIECE MARKED (B), W/2-16d NAILS.
- (F) BRACE, 4" X 4" X 71-1/2" (3 REQD). SEE THE DETAIL AT LEFT FOR BEVEL-CUTS REQUIRED. TOENAIL TO THE VERTICAL PIECE AND TO THE FLOOR CLEAT, PIECES MARKED (B) AND (D), 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 (D), W/6-40d NAILS.
- (H) HOLD-DOWN CLEAT, 2" X 6" X 11-1/2" (3 REQD). NAIL TO THE VERTICAL PIECE W/3-10d NAILS.



BRACE
4" X 4" MATERIAL

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



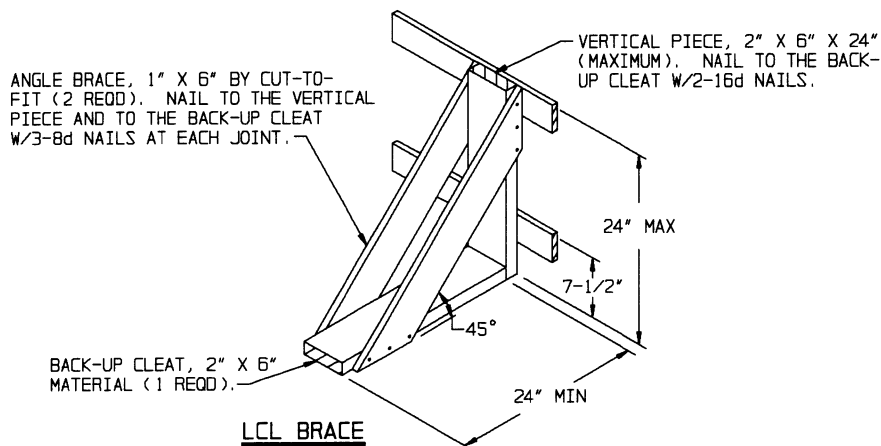
ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-4" WIDE WOOD-LINED CONVENTIONAL TYPE BOXCAR HAVING WOOD OR NAILABLE METAL FLOOR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED. SEE GENERAL NOTE "E" ON PAGE 2.
2. EACH LCL BRACE AS APPLIED FOR LONGITUDINAL BRACING WILL RETAIN 2,000 POUNDS OF LADING. A MINIMUM OF TWO LCL BRACES MUST BE USED.

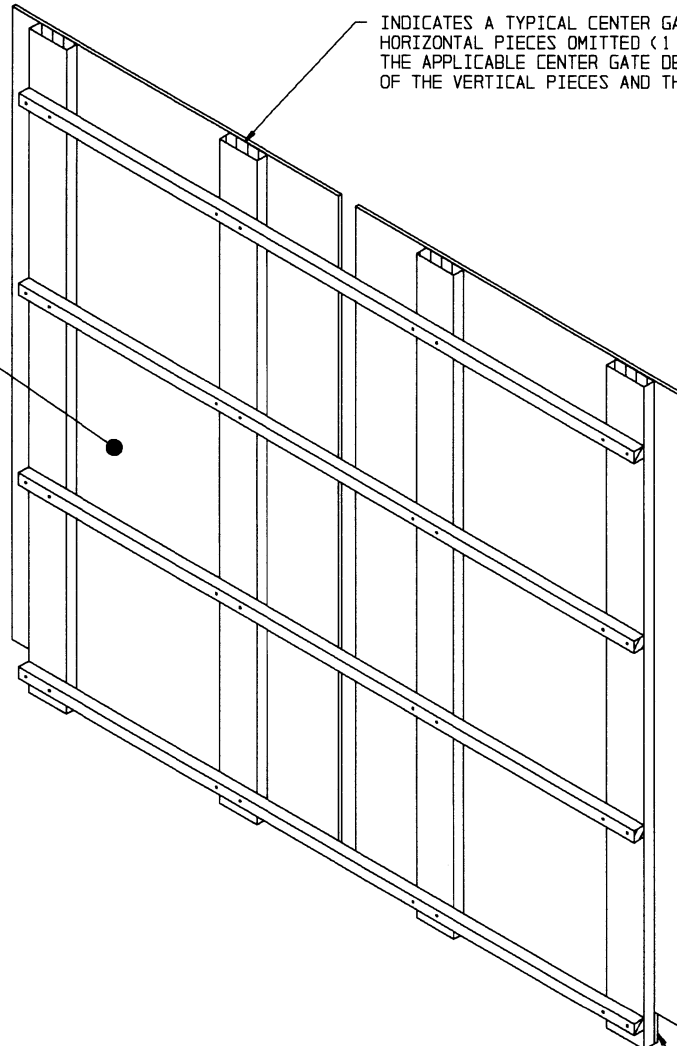
KEY NUMBERS

- ① SIDE BLOCKING, 2" X 6" BY LOAD LENGTH (DOUBLED) (2 REQD). PRE-POSITION. NAIL THE FIRST PIECE TO THE CAR FLOOR W/1-16d NAIL EVERY 8". LAMINATE THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTE "L" ON PAGE 2.
- ② HORIZONTAL PIECE, 1" X 4" X 8'-2" (2 REQD). NAIL TO THE LCL BRACE W/3-6d NAILS AT EACH JOINT.
- ③ LCL BRACE (2 REQD). SEE THE "LCL BRACE" DETAIL BELOW. NAIL TO THE CAR FLOOR W/7-16d NAILS. SEE GENERAL NOTE "L" ON PAGE 2, GENERAL NOTE "S" ON PAGE 3, AND SPECIAL NOTE 2 AT LEFT.



TYPICAL LCL LOAD USING LCL BRACE METHOD OF PARTIAL-LAYER BRACING

1/2" PLYWOOD, 48" WIDE BY THE HEIGHT OF THE VERTICAL PIECES OF THE CENTER GATE (2 REQD). NAIL TO THE VERTICAL PIECES W/1-6d NAIL EVERY 6".



INDICATES A TYPICAL CENTER GATE WITH THE HORIZONTAL PIECES OMITTED (1 REQD). SEE THE APPLICABLE CENTER GATE DETAIL FOR LOCATION OF THE VERTICAL PIECES AND THE STRUT LEDGERS.

GATE HOLD-DOWN PIECES MUST BE SECURED TO THE PLYWOOD.

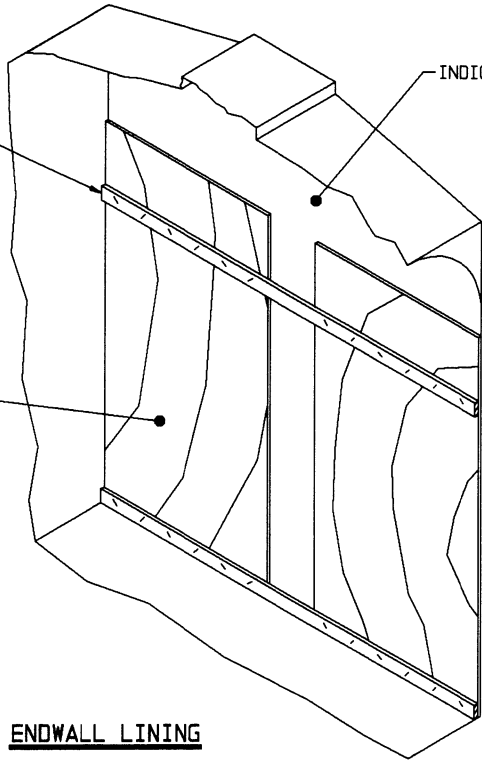
PLYWOOD CENTER GATE ALTERNATIVE

CENTER GATE "A" IS SHOWN AS TYPICAL.

4" X 4" NOTCH (2 REQD). POSITION OVER THE SIDE BLOCKING.

TIE PIECE, 1" X 4" BY CAR WIDTH
MINUS 1" (MINIMUM OF 2 REQ).

1/2" PLYWOOD, 4' X 8' SHEET
(2 REQ). NAIL TO THE TIE
PIECES W/1-APPLICABLY SIZED
NAIL EVERY 8", AND CLINCH.
NOTE THAT THE APPLICABLE
SEPARATOR GATE MAY BE USED
LIEU OF PLYWOOD. POSITION
WITH THE VERTICAL PIECES
AGAINST THE CAR ENDWALL.



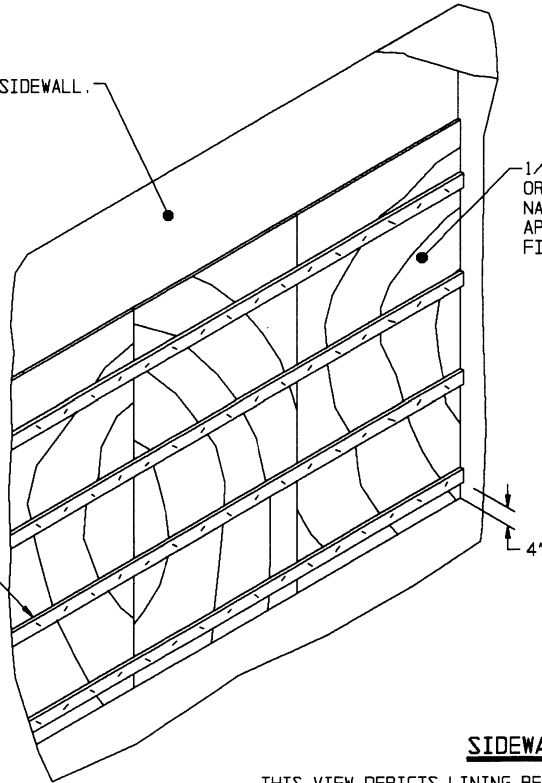
INDICATES CAR ENDWALL.

ENDWALL LINING

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

INDICATES CAR SIDEWALL.

TIE PIECE, 1" X 4" MATERIAL
OR 1/4" PLYWOOD RIPPED TO THE
SAME WIDTH BY RANDOM LENGTH.
LOCATE EACH TIE PIECE 4"
ABOVE THE BOTTOM OF CONTAINERS.

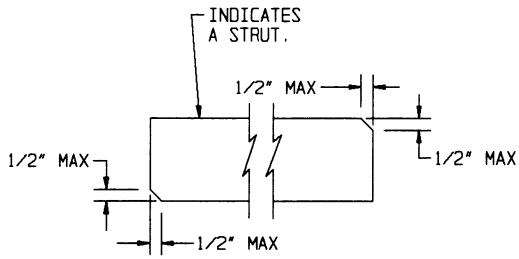


1/4" MINIMUM PLYWOOD, 1/8" MINIMUM HARDBOARD,
OR .060" MINIMUM THICK SOLID WALL FIBERBOARD.
NAIL PLYWOOD OR HARDBOARD TO 1" X 4" W/1
APPLICABLY SIZED NAIL EVERY 8". STAPLE
FIBERBOARD TO 1" X 4" W/1 STAPLE EVERY 6".

4"

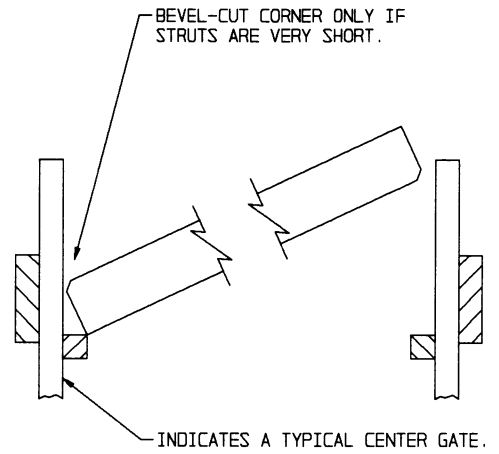
SIDEWALL LINING

THIS VIEW DEPICTS LINING REQUIRED FOR 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.



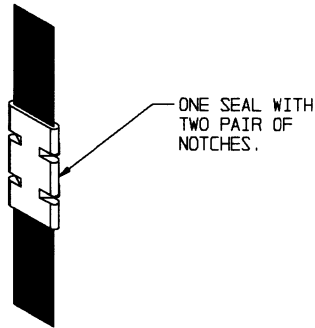
BEVEL-CUT

IF DESIRED, EACH END OF A STRUT MAY BE BEVEL-CUT AS SHOWN ABOVE TO FACILITATE INSTALLATION AND THE ACHIEVEMENT OF A TIGHTLY BLOCKED LOAD.



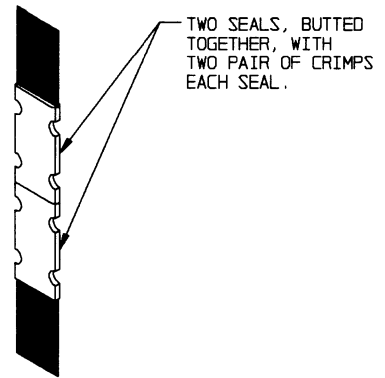
STRUT INSTALLATION

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



STRAP JOINT A

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



STRAP JOINT B

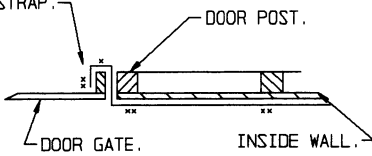
METHOD OF SECURING A STRAP JOINT WHEN USING A CRIMP-TYPE SEALER.

END-OVER-END LAP JOINT DETAILS

HORIZONTAL PIECE, 1" X 6" BY DOOR OPENING WIDTH (1 REQD PER LAYER). NAIL TO THE VERTICAL PIECES W/3-6d NAILS AT EACH END. SEE THE "DOORWAY PROTECTION" DETAIL ON PAGE 26 FOR HEIGHT LOCATIONS.

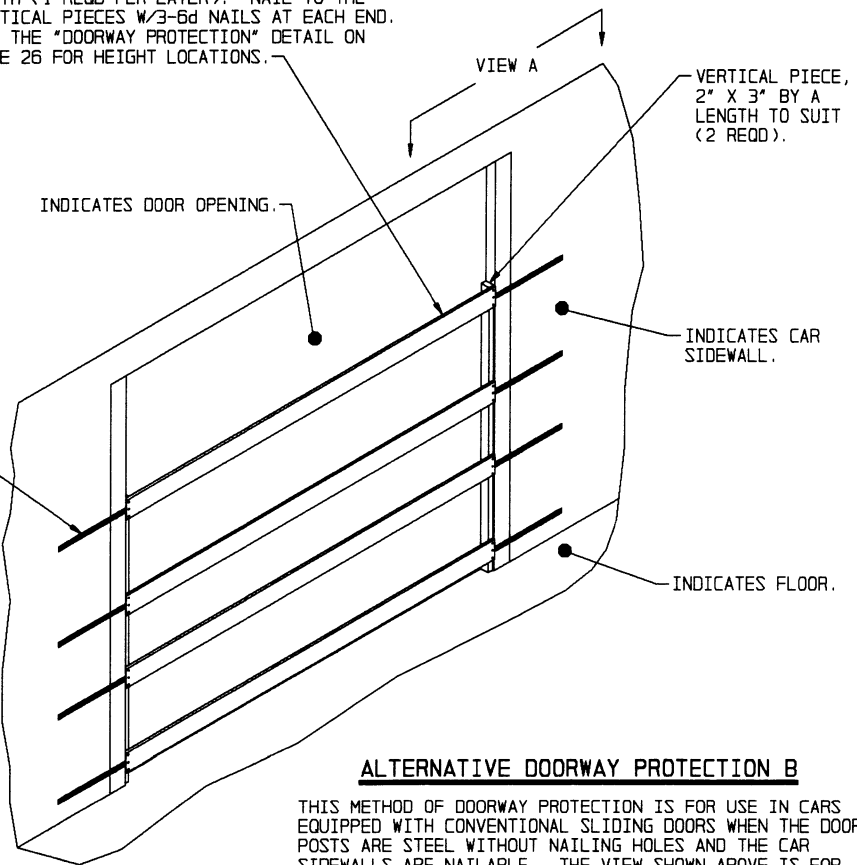
DOORWAY PROTECTION-GATE STRAP, 1-1/4" X .035" X 3'-0" (REF) NAIL-ON TYPE STEEL STRAPPING (2 REQD PER LAYER OF LOAD). NAIL TO GATE AND CAR SIDEWALL AS SHOWN BY THE "VIEW B" SKETCH BELOW. NOTE THAT TYPE 1 STRAPPING MAY BE PUNCHED FOR NAILING IF TYPE 2 STRAPPING IS NOT AVAILABLE.

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



VIEW A

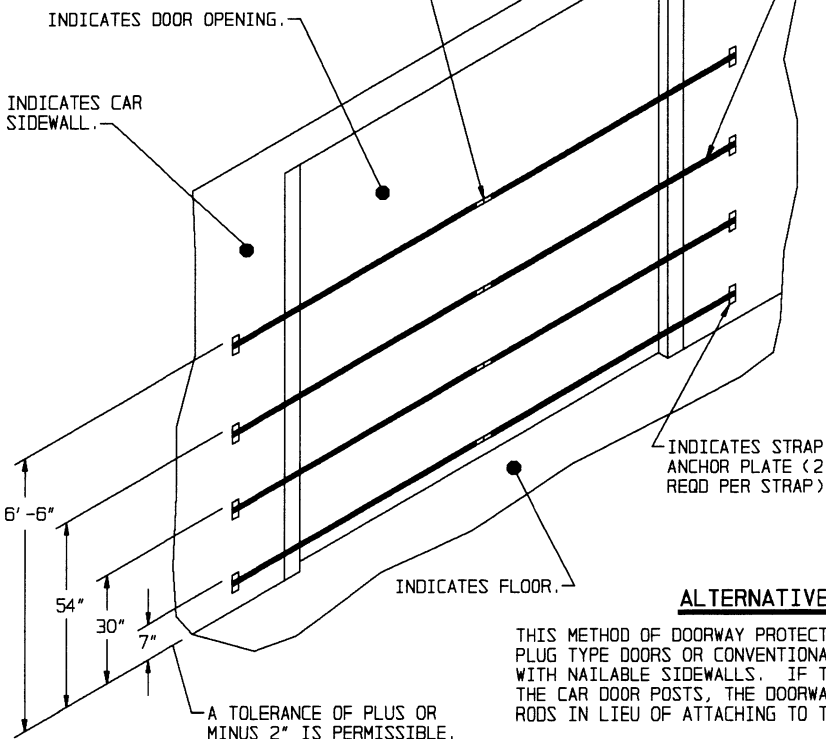
THIS VIEW DEPICTS THE LOCATION OF THE NAILS FOR SECURING THE DOORWAY PROTECTION GATE STRAP. NOTE THAT THE STRAPS MUST BE APPLIED TO THE CAR SIDEWALL PRIOR TO POSITIONING THE ADJACENT UNITS.



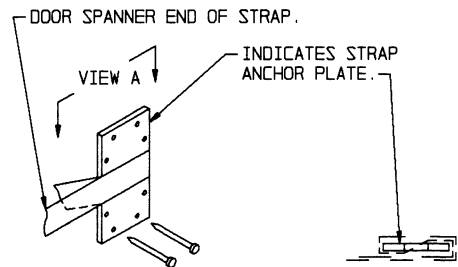
ALTERNATIVE DOORWAY PROTECTION B

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 FOUR-LAYER LOAD.

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



DOORWAY PROTECTION STRAP, 1-1/4" X .035" OR .031" STEEL STRAPPING BY DOOR OPENING WIDTH PLUS 8'-0" IN LENGTH (1 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.



ISOMETRIC VIEW

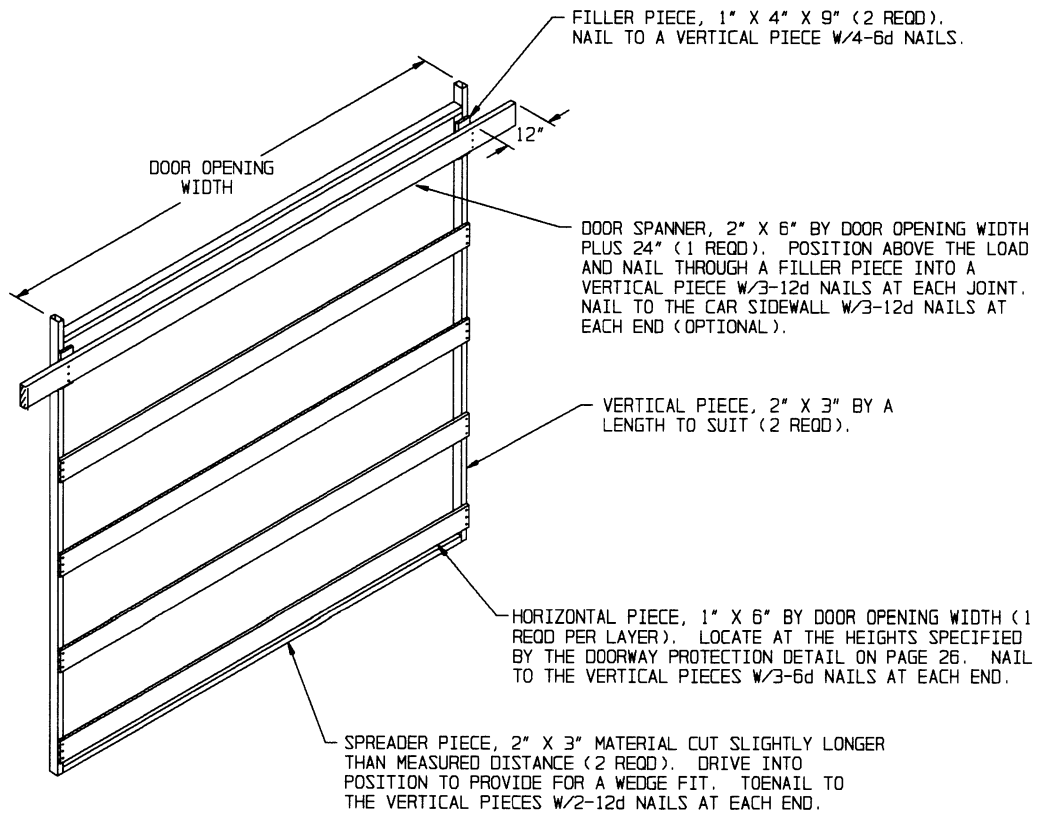
VIEW A

APPLICATION OF STRAPPING TO STRAP ANCHOR PLATE

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

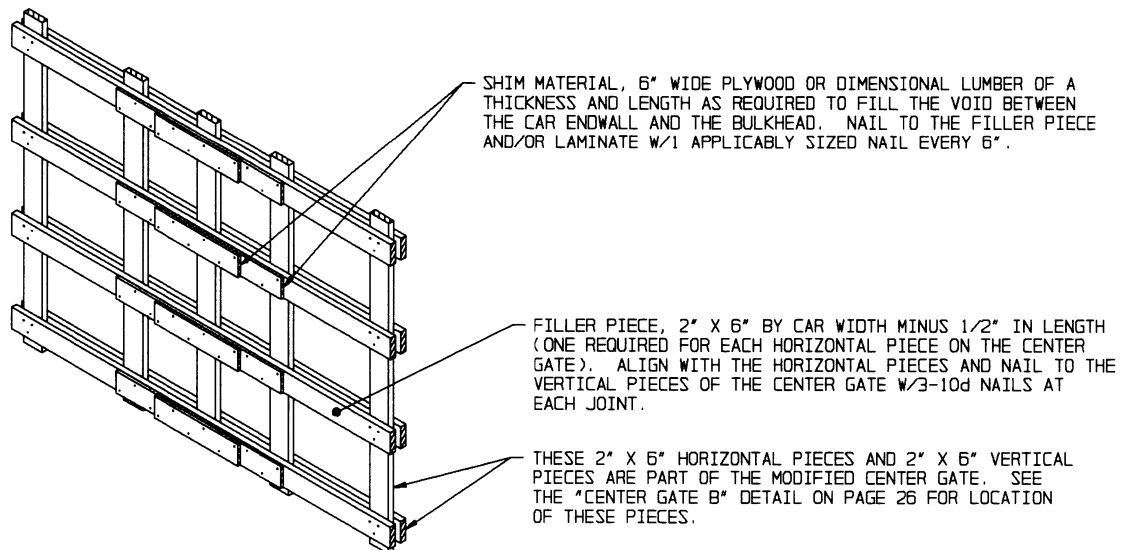
ALTERNATIVE DOORWAY PROTECTION C

THIS METHOD OF DOORWAY PROTECTION 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.



ALTERNATIVE DOORWAY PROTECTION D

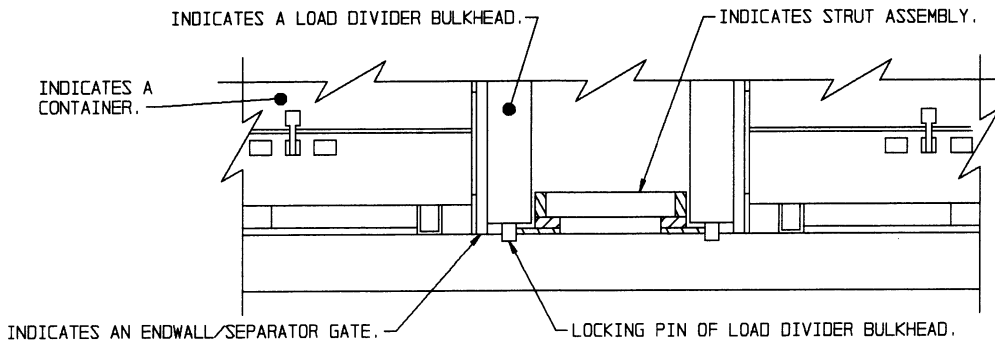
THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS WHEN THE DOOR POSTS ARE NOT NAILABLE. IF THE CAR HAS NAILABLE SIDEWALLS, NAIL-ON TYPE STRAPPING MAY BE USED TO SECURE THE GATE IN LIEU OF USING THE SPREADER PIECES. SEE THE "ALTERNATIVE DOORWAY PROTECTION A" DETAIL ON PAGE 40 FOR GUIDANCE.



END-OF-CAR BULKHEAD

IF A BOXCAR TO BE LOADED HAS BOWED ENDWALLS WHICH ARE BOWED OUTWARD MORE THAN TWO INCHES, 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. THE BULKHEAD IS APPLICABLE FOR USE AT THE END OF A LOAD IN A CONVENTIONAL BOXCAR OR IN A CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS, OR IN A CAR EQUIPPED WITH MECHANICAL BRACING DEVICES, IF DESIRED, IN LIEU OF CROSS MEMBERS. THE BULKHEAD MAY BE FABRICATED FROM A CENTER GATE FOR THE UNIT THAT IS TO BE SHIPPED AND FOR THE UNIT POSITIONING (LENGTHWISE OR CROSSWISE). NOTE THAT THE GATE MUST BE MODIFIED BY OMITTING THE 2" X 2" STRUT LEDGERS AND THE GATE HOLD-DOWN PIECES. A MODIFIED CENTER GATE "B" AS DETAILED ON PAGE 26 IS SHOWN AS TYPICAL.

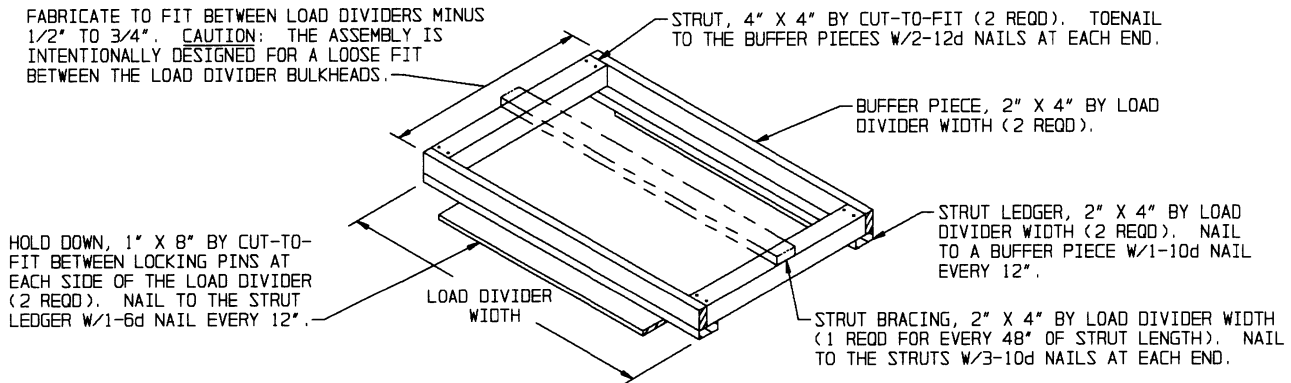
DETAILS



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.

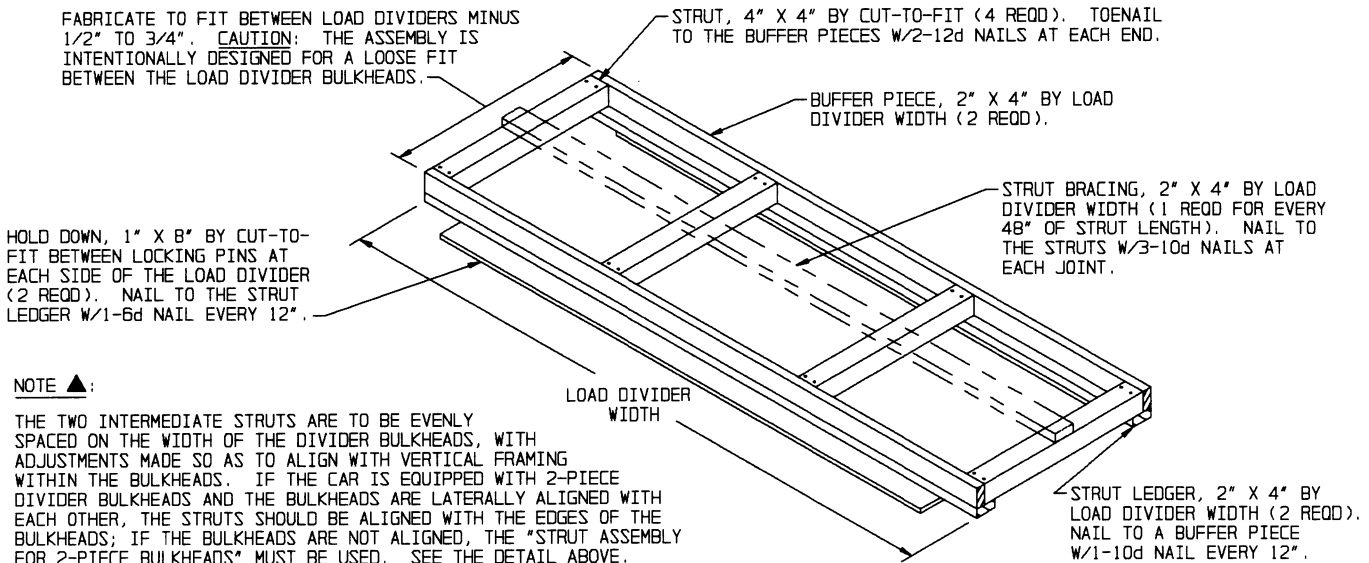
FABRICATE TO FIT BETWEEN LOAD DIVIDERS MINUS 1/2" TO 3/4". CAUTION: THE ASSEMBLY IS INTENTIONALLY DESIGNED FOR A LOOSE FIT BETWEEN THE LOAD DIVIDER BULKHEADS.



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.

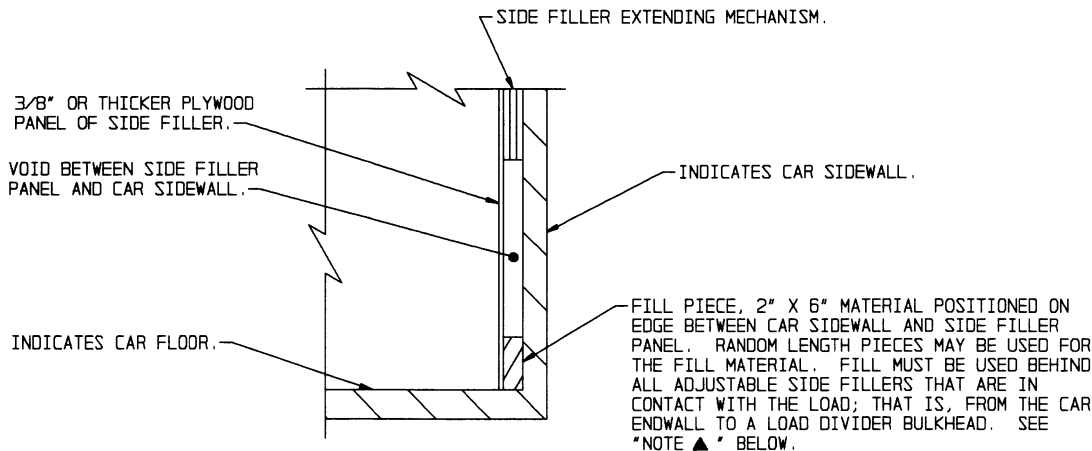


NOTE ▲:

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.

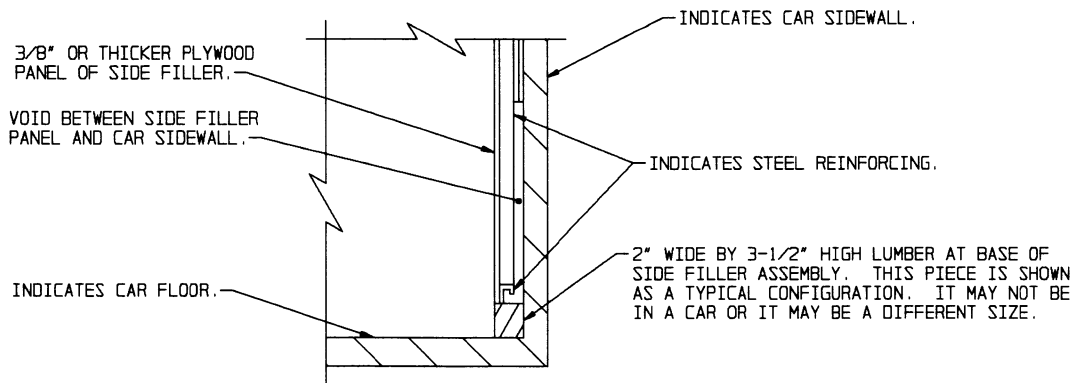


TYPICAL TYPE A

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.

