

APPROVED BY
BUREAU OF EXPLOSIVES

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DATE 8/6/96

LOADING AND BRACING (CL & LCL) IN BOXCARS[⊕] OF SPARROW (AIM-7F) MISSILES PACKED IN CNU-305/E SHIPPING AND STORAGE CONTAINER

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⊕ THIS OUTLOADING DRAWING INCLUDES PROCEDURES FOR CONVENTIONAL TYPE BOXCARS AND CUSHIONED BOXCARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.

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DO NOT SCALE

GENERAL NOTES

(GENERAL NOTES CONTINUED)

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE OUTLOADING PROCEDURES SPECIFIED IN THIS DRAWING ARE APPLICABLE FOR THE SPARROW (AIM-7F) MISSILE PACKED IN THE CNU-305/E CONTAINER. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CNU-305/E CONTAINER WITH MISSILES INSTALLED. SEE PAGE 4 FOR DETAILS OF THE CONTAINER.
- C. THE OUTLOADING PROCEDURES DEPICTED WITHIN THIS DOCUMENT ARE APPLICABLE FOR SHIPMENTS IN CONVENTIONAL TYPE BOX-CARS AND FOR SHIPMENTS IN CUSHIONED BOXCARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.
- D. THE SELECTION OF RAILCARS FOR THE TRANSPORT OF SPARROW MISSILES 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.
- E. 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 15 FOR GUIDANCE.
- F. 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.
- G. 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.
- H. 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".
- J. 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.
- K. 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.
- L. 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 17 FOR GUIDANCE.
- M. 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.
- N. 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.
- O. 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.
- P. 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.

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MATERIAL SPECIFICATIONS

LUMBER	---	SEE TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC MM-L-751.
NAILS	---	FED SPEC FF-N-105; COMMON.
STRAPPING, STEEL	--	ASTM D3953; FLAT STRAPPING, TYPE 1, HEAVY DUTY, FINISH A, B (GRADE 2), OR C.
SEAL, STRAP	---	ASTM D3953; CLASS H, FINISH A, B (GRADE 2), OR C, DOUBLE NOTCH TYPE, STYLE I, II, OR IV.
WIRE, CARBON STEEL	--	ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, .0800" DIA, GRADE 1006 OR BETTER.

GENERAL NOTES

(FOR CONVENTIONAL TYPE BOXCARS)

- Q. 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 "J" ON PAGE 2.
- R. NOTICE: WHEN POSITIONING CONTAINERS IN A CAR, THEY SHOULD BE PLACED TIGHTLY AGAINST A CAR SIDEWALL AND ARE TO BE PRESSED TIGHTLY TOGETHER LENGTHWISE, IF APPLICABLE, 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 CONTAINERS 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 CONTAINERS, SUCH AS THE ENDS OF THE CONTAINER SKIDS. PADDING, OF 2" THICK LUMBER OR ANY OTHER MATERIAL OF SIMILAR CONSISTENCY, SHOULD BE PLACED BETWEEN THE JACK AND THE LADING.
- S. 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 ⑥ AND ⑦ 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.
- T. 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.
- U. WHERE 2" X 2" PIECES ARE SPECIFIED FOR STRUT LEDGERS, 2" X 4" MATERIAL MAY BE SUBSTITUTED, IF DESIRED.
- V. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

GENERAL NOTES

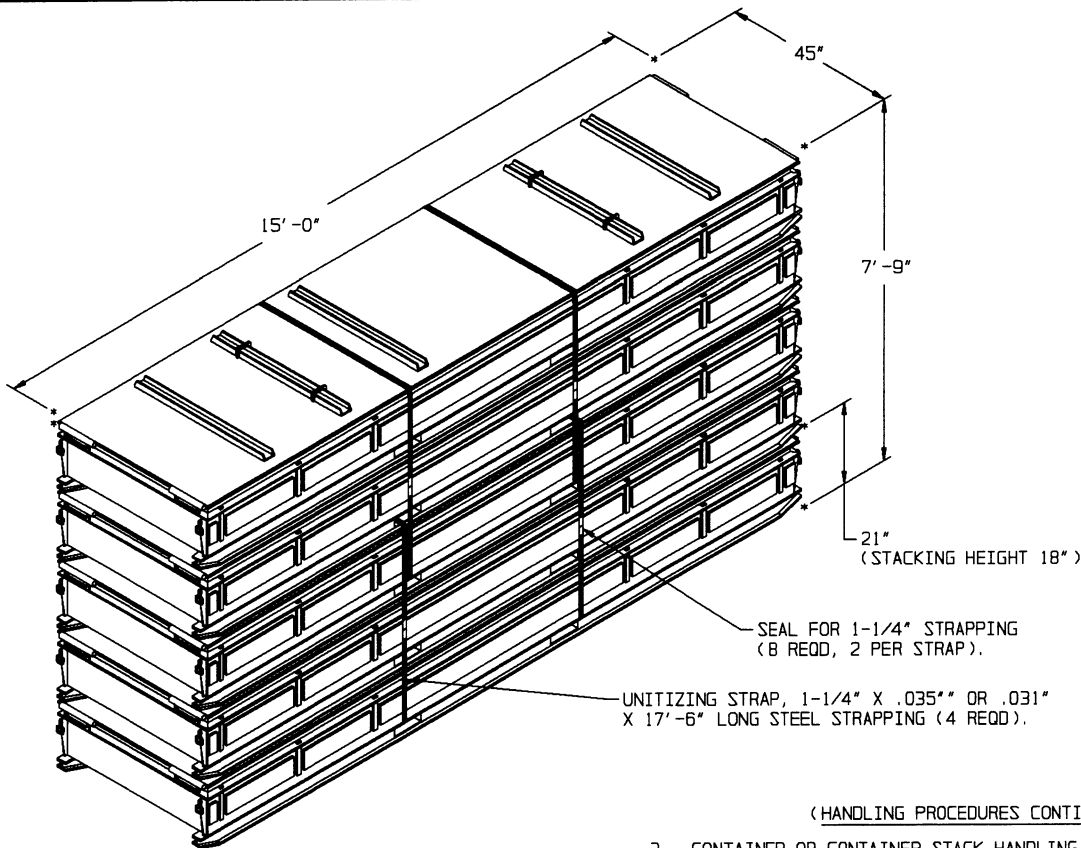
(FOR CARS EQUIPPED WITH LOAD DIVIDERS)

- AA. 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

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(GENERAL NOTES CONTINUED)

- 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.
- BB. 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 SPARROW MISSILES. NOTICE: ONLY CUSHIONED CARS THAT END-OF-CAR TYPE DEVICES WHICH HAVE AT LEAST 15" OF TRAVEL ARE ACCEPTABLE.
- CC. 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 24 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 24, THE "FILL PIECE" MATERIAL IS NOT REQUIRED.
- DD. 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.
- EE. 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 "FF-3" BELOW. DETAILS OF STRUT ASSEMBLIES FOR USE BETWEEN 2-PIECE BULKHEADS AND BETWEEN 1-PIECE BULKHEADS ARE SHOWN ON PAGE 23.
- FF. 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 CONTAINERS 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 "CONTAINER OMITTED" METHOD OF OMITTING A CONTAINER MAY BE USED TO ADJUST A LOAD QUANTITY DOWNWARD BY OTHER THAN A MULTIPLE OF A LOAD UNIT. SEE THE PROCEDURES ON PAGE 19 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. A CONTAINER STACK CAN THEN BE POSITIONED BETWEEN THE LOAD DIVIDER BULKHEADS IN A LOADING PATTERN WHICH IS ONE OR MORE LESS IN HEIGHT THAN THE BALANCE OF THE LOAD. 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.
 4. ONE OR MORE UNITS CAN BE POSITIONED IN CONTACT WITH A LOAD DIVIDER BULKHEAD ON THE CENTER-OF-CAR SIDE. BLOCK AND BRACE WITH FLOORLINE BLOCKING AS SHOWN ON PAGE 22 OR WITH KNEE BRACE ASSEMBLIES, AS SHOWN ON PAGE 21.
- GG. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTION WHICH IS IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHOD.



CONTAINER STACK DETAIL

CNU-305/E CONTAINER:

DIMENSIONS - - - - 15'-0" LONG BY 45" WIDE BY 21" HIGH.
 CUBE - - - - - 98.5 CU FT (APPROX)
 GROSS WEIGHT - - - 2,855 LBS (APPROX)

UNITIZING AND HANDLING GUIDANCE

1. STACKING CONTAINERS FOR UNITIZING.

- A. AN UPPER CONTAINER SHOULD BE PLACED AS CLOSE AS POSSIBLY IN VERTICAL ALIGNMENT WITH THE NEXT LOWER CONTAINER.
- B. POSITION THE AFT END OF AN UPPER CONTAINER ABOVE THE AFT END OF THE NEXT LOWER CONTAINER.
- C. THE CONTAINER SKIDS OF AN UPPER CONTAINER SHOULD BE FULLY SEATED AGAINST THE SKID LOCATOR PIECES ON THE COVER OF THE NEXT LOWER CONTAINER.

2. INSTALLATION OF 1-1/4" X .035" OR .031" UNITIZING STRAPPING.

- A. EACH OF THE TWO SETS OF UNITIZING STRAPS SHOULD BE POSITIONED AROUND THE CONTAINERS AS SHOWN. PLACE STRAPPING THROUGH FORK RECEPTACLES OF A LOWER CONTAINER, AND SO THAT STRAPPING LAYS FLAT AND STRAIGHT WITH THE BODY SURFACES OF THE CONTAINERS; I.E., VERTICAL ALONG SIDES AND STRAIGHT ACROSS TOP AND BOTTOM OF THE STACK.
- B. STRAPPING WILL BE FIRMLY TENSIONED, AND EACH END-OVER-END LAP JOINT WILL BE SEALED WITH TWO DOUBLE CRIMPED STRAP SEALS AS SHOWN. THE LAP JOINTS WILL BE MADE ALONG THE SIDE OF THE STACK. DURING STRAP TENSIONING, CARE SHOULD BE EXERCISED TO ENSURE THAT THE CONTAINERS ARE NOT DAMAGED. EXCESS STRAPPING (STRAP ENDS) SHOULD BE CUT OFF OR BROKEN OFF NEAR THE JOINT SEALS.

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(HANDLING PROCEDURES CONTINUED)

3. CONTAINER OR CONTAINER STACK HANDLING.

NOTES: (1) APPROVED MATERIAL HANDLING EQUIPMENT (FORKLIFT TRUCKS, CRANES, HAND TRUCKS, DOLLIES, ROLLER ASSEMBLIES, SLINGS, SPREADER BARS, ETC.) IS SPECIFIED ELSEWHERE.

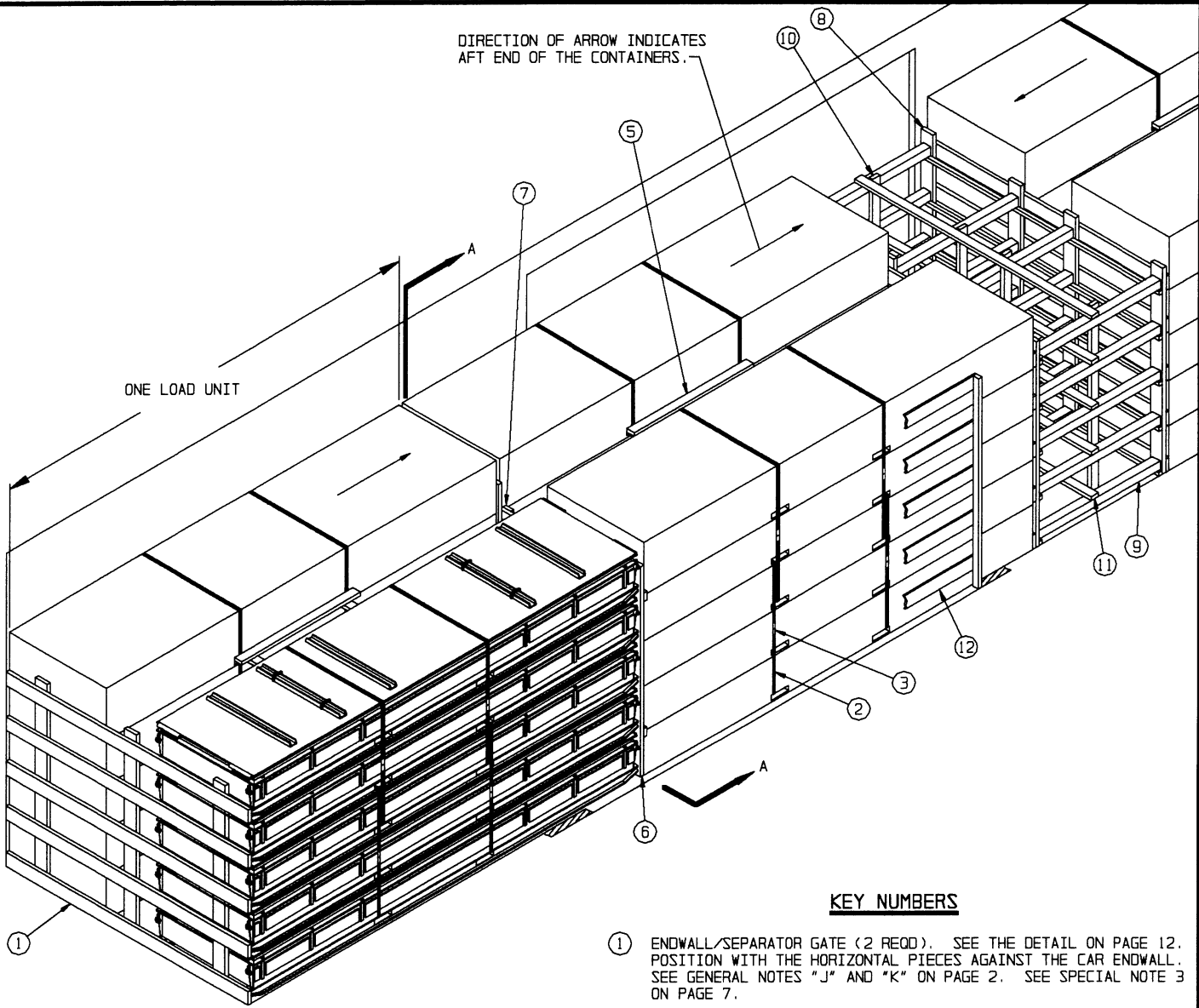
(2) PRECAUTIONARY HANDLING TECHNIQUES NORMALLY EMPLOYED OR AS SPECIFIED FOR THE TYPE OF COMMODITY INVOLVED WILL BE OBSERVED.

- A. ONLY APPROVED AND APPROPRIATELY SIZED MATERIALS HANDLING EQUIPMENT WILL BE USED FOR HANDLING THE DEPICTED CONTAINERS.
- B. IF HANDLING IS ACCOMPLISHED WITH A FORKLIFT TRUCK, THE CONTAINERS SHOULD BE HANDLED FROM A SIDE POSITION AS MUCH AS POSSIBLE. CARE MUST BE EXERCISED WHEN INSERTING FORKS UNDER A CONTAINER, TO PREVENT DAMAGE TO THE CONTAINER BY THE FORK TINES OR THE FORKLIFT PACKAGE GUARD. FOR VERY SHORT "INCHING" SPEED MOVEMENTS, SUCH AS WILL BE EXPERIENCED DURING CAR LOADING, A UNITIZED CONTAINER STACK MAY BE HANDLED BY INSERTING THE FORKS OF A FORKLIFT TRUCK INTO THE FORK RECEPTACLES OF AN UPPER CONTAINER.
- C. IF ONE CONTAINER IS HANDLED BY SLINGING, THE SLING MAY BE ATTACHED TO THE LIFTING POINTS ON THE CONTAINER. HOWEVER, IF A TWO, THREE, FOUR, OR FIVE-HIGH STACK IS HANDLED BY SLINGING, DO NOT ATTACH THE SLING TO THE LIFTING POINTS ON A CONTAINER. THE SLING USED MUST BE OF SUCH A DESIGN THAT THE LIFTING IS DONE ON THE BOTTOM OF THE LOWEST CONTAINER.
- D. WHEN LOADING A CONTAINER OR CONTAINER STACK, THE CONTAINER OR STACK WILL BE PARTIALLY PLACED INTO THE DOORWAY OF THE BOXCAR BY HANDLING WITH A FORKLIFT FROM THE SIDE. THE FORKLIFT THEN MUST INSERT ITS TINES FROM THE END OF THE CONTAINER OR STACK, LIFT THE END SLIGHTLY, THEN PROCEED TO PUSH THE CONTAINER OR STACK INTO ITS FINAL POSITION WITHIN THE BOXCAR. CARE MUST BE EXERCISED TO AVOID DAMAGE TO THE CONTAINER ENDS, ETC., DURING PUSHING OPERATIONS.
- E. WHEN UNLOADING A CONTAINER OR CONTAINER STACK FROM THE BOXCAR, THE FORKLIFT TINES WILL BE INSERTED UNDER THE LOWER CONTAINER, THE FORKLIFT WILL THEN ELEVATE THE END SLIGHTLY ABOVE THE FLOOR, AND BEGIN DRAGGING THE CONTAINER OR STACK FROM THE BOXCAR AFTER ATTACHING A CHAIN OR WEB STRAP FROM A LOWER CONTAINER LIFT POINT AROUND THE FORKLIFT MAST TO A LOWER LIFT POINT ON THE OPPOSITE SIDE OF THE CONTAINER.

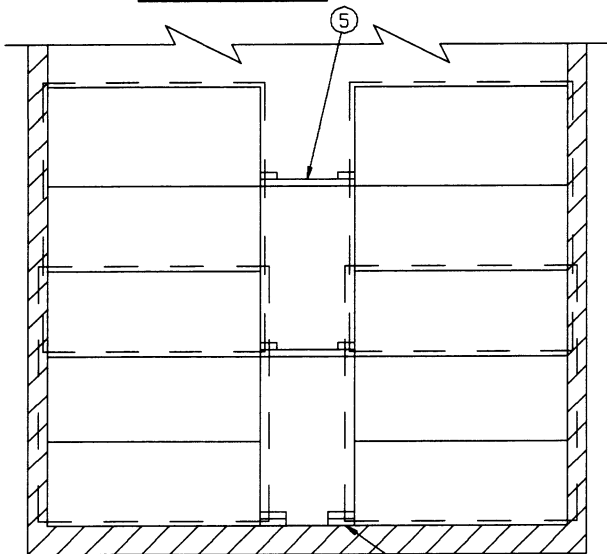
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DIRECTION OF ARROW INDICATES
AFT END OF THE CONTAINERS.

ONE LOAD UNIT



ISOMETRIC VIEW



SECTION A-A

KEY NUMBERS

- ① ENDWALL/SEPARATOR GATE (2 REOD). SEE THE DETAIL ON PAGE 12. POSITION WITH THE HORIZONTAL PIECES AGAINST THE CAR ENDWALL. SEE GENERAL NOTES "J" AND "K" ON PAGE 2. SEE SPECIAL NOTE 3 ON PAGE 7.
- ② UNITIZING STRAP, 1-1/4" X .035" OR .031" X 17'-6" LONG STEEL STRAPPING (24 REOD). INSTALL THRU THE FORK POCKET OF THE BOTTOM CONTAINER AND/OR THE THIRD-LAYER CONTAINER AND TO ENCIRCLE THREE CONTAINERS. SEE THE "UNITIZING AND HANDLING GUIDANCE" ON PAGE 4. SEE SPECIAL NOTE 4 ON PAGE 7.
- ③ SEAL FOR 1-1/4" STEEL STRAPPING (48 REOD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.
- ④ SIDE BLOCKING, 2" X 6" X 42" (DOUBLED) (12 REOD). POSITION TO EXTEND FROM A FORK POCKET TOWARD THE ADJACENT END OF A CONTAINER. NAIL THE FIRST PIECE TO THE CAR FLOOR W/9-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE "SECTION A-A" VIEW AT LEFT. SEE SPECIAL NOTE 5 ON PAGE 7.
- ⑤ ANTI-SWAY BRACE (6 REOD). SEE THE DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT CONTAINERS IN THE THIRD LAYER AND IN THE TOP LAYER.
- ⑥ SEPARATOR GATE (1 REOD). SEE THE DETAIL ON PAGE 12. INSTALL BETWEEN LOAD UNITS, WITH THE VERTICAL PIECES AGAINST THE SKIDS OF THE ALREADY-LOADED CONTAINERS.
- ⑦ SEPARATOR GATE STOP PIECE, 2" X 4" X 60" (1 REOD). POSITION AGAINST CONTAINERS ON THE SIDE OPPOSITE THE LOADING SIDE AND NAIL TO THE TIE PIECES OF THE SEPARATOR GATE, PIECE MARKED ⑥, W/2-10d NAILS AT EACH JOINT. THIS PIECE IS ONLY REQUIRED IN CARS EQUIPPED WITH 15'-0" WIDE STAGGERED DOOR OPENINGS.
- ⑧ CENTER GATE A (2 REOD). SEE THE DETAIL ON PAGE 13. SEE SPECIAL NOTES 6 AND 7 ON PAGE 7.

(CONTINUED ON PAGE 7)

(KEY NUMBERS CONTINUED FROM PAGE 6)

- ⑨ STRUT, 4" X 4" BY CUT TO FIT (REF: 56"). TOENAIL TO THE CENTER GATES, PIECES MARKED ⑨, W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "T" ON PAGE 3.
- ⑩ VERTICAL STRUT BRACING, 2" X 4" X 6'-7" (4 REQD). POSITION NEAR CENTER OF THE STRUTS, PIECES MARKED ⑩, AND NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT. SEE GENERAL NOTE "S" ON PAGE 3.
- ⑪ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 1/2" (5 REQD). POSITION ADJACENT TO THE VERTICAL STRUT BRACING, PIECE MARKED ⑪, AND NAIL TO THE STRUTS, PIECES MARKED ⑨, W/3-10d NAILS AT EACH JOINT.
- ⑫ DOORWAY PROTECTION (2 REQD, 1 FOR THE AUXILIARY DOOR OPENING ON THE LOADING SIDE AND 1 FOR THE MAIN DOOR ON THE OPPOSITE SIDE). SEE THE DETAIL ON PAGE 13. NAIL TO THE DOORPOSTS W/12d NAILS. SEE SPECIAL NOTE 9 ON THIS PAGE.

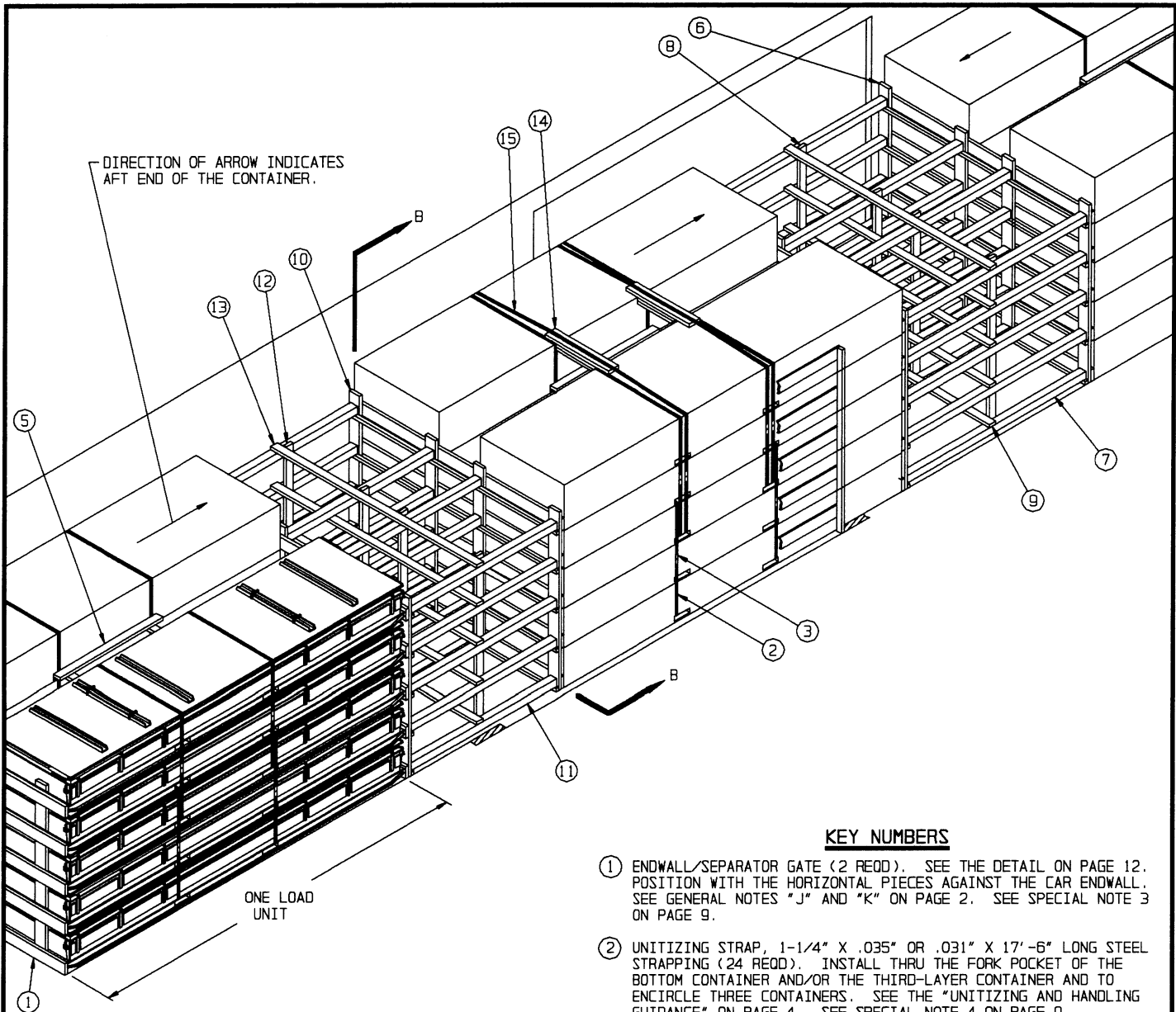
SPECIAL NOTES:

1. A 38-UNIT LOAD IS SHOWN IN A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL BOXCAR. CARS OF OTHER LENGTHS AND WIDTHS MAY BE USED.
2. THE CAR SHOWN IS EQUIPPED WITH 15'-0" WIDE STAGGERED DOORS. CARS HAVING 16'-0" WIDE STAGGERED DOOR OPENINGS OR 16'-0" WIDE THRU DOORS MAY BE USED. CARS EQUIPPED WITH NARROWER DOOR OPENINGS CANNOT BE USED.
3. IF THE CAR TO BE LOADED HAS NAILABLE ENDWALLS, BATTENS MAY BE NAILED TO THE ENDWALL IN LIEU OF USING THE ENDWALL GATE, PIECE MARKED ①. POSITION AT THE HEIGHTS AS SHOWN FOR THE ENDWALL/SEPARATOR GATE AND NAIL TO THE CAR ENDWALL W/1-10d NAIL EVERY 12".
4. CONTAINERS SHOULD BE STACKED IN THE DOORWAY AREA OF THE CAR FOR UNITIZING. AFTER THE STACK IS COMPLETED AND THE UNITIZING STRAPS HAVE BEEN INSTALLED, THE CONTAINER STACK CAN, AS APPLICABLE, BE PARTIALLY LIFTED FROM THE END AND PUSHED INTO PLACE.
5. IF DESIRED, ANTI-SWAY BRACES MAY BE INSTALLED BETWEEN THE Laterally adjacent containers in the bottom layer in lieu of using the nailed side blocking, pieces marked ④.
6. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR WIDTH GATES. IN LIEU OF EACH "CENTER GATE A", PIECE MARKED ⑧, INSTALL TWO "CENTER GATE B" AS DETAILED ON PAGE 16. AFTER THE SPLIT GATES HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TIE PIECE APPLICATION" DETAIL ON PAGE 16.
7. 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 15 FOR GUIDANCE.
8. IN LIEU OF USING 4" X 4" STRUTS, PIECES MARKED ⑨, DOUBLED 2" X 6" STRUTS MAY BE USED, IF DESIRED. LAMINATE THE DOUBLED 2" X 6" STRUTS W/1-10d NAIL EVERY 6".
9. IF THE CAR BEING LOADED IS EQUIPPED WITH SLIDING DOORS WHICH HAVE NON-NAILABLE DOORPOSTS, REFER TO THE ALTERNATIVE DOORWAY PROTECTION DETAILS ON PAGES 17 AND 18. IF THE CAR IS EQUIPPED WITH PLUG TYPE DOORS, REFER TO THE LOAD ON PAGE 10 FOR LOADING GUIDANCE.
10. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. THE LOAD CAN BE REDUCED BY ONE OR MORE CONTAINERS BY EMPLOYING THE "OMITTED CONTAINER PROCEDURES" ON PAGE 19. THE LOAD CAN BE REDUCED BY MULTIPLES OF 6 CONTAINERS BY OMITTING ONE OR MORE LAYERS FROM THE LOAD.
11. A FULL LOAD CANNOT BE LOADED IN A 40'-6" LONG BOXCAR.
12. THE AVAILABLE WALL SPACE IN A 50'-6" LONG CAR EQUIPPED WITH 15'-0" WIDE STAGGERED DOOR OPENINGS IS NOT SUFFICIENT FOR THE INSTALLATION OF A K-BRACE. IF THE CAR IS EQUIPPED WITH 16'-0" WIDE THRU DOORS A K-BRACE MAY BE USED. A K-BRACE IS NOT PRACTICAL BECAUSE THE HORIZONTAL WALL CLEATS MUST SPAN THE DOOR OPENING.

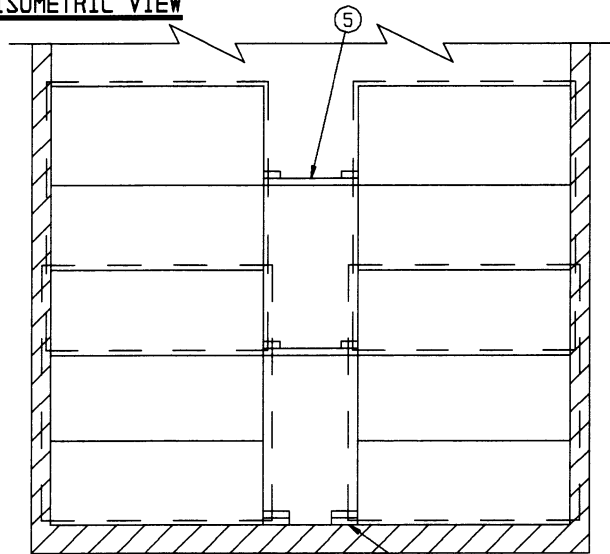
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	75	38
2" X 2"	93	31
2" X 3"	28	14
2" X 4"	158	106
2" X 6"	421	421
4" X 4"	94	126
NAILS	NO. REQD	POUNDS
6d (2")	90	3/4
10d (3")	550	8-1/2
12d (3-1/4")	28	1/2
16d (3-1/2")	296	6-1/2
STEEL STRAPPING, 1-1/4" - - 420' REQD - - -		60 LBS
SEAL FOR 1-1/4" STRAPPING - - 48 REQD - - -		2 LBS

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER - - - - -	30 - - - - -	85,650 LBS
DUNNAGE - - - - -	- - - - -	1,551 LBS
TOTAL WEIGHT - - - - -		87,201 LBS (APPROX)



ISOMETRIC VIEW



SECTION B-B

KEY NUMBERS

- ① ENDWALL/SEPARATOR GATE (2 REQD). SEE THE DETAIL ON PAGE 12. POSITION WITH THE HORIZONTAL PIECES AGAINST THE CAR ENDWALL. SEE GENERAL NOTES "J" AND "K" ON PAGE 2. SEE SPECIAL NOTE 3 ON PAGE 9.
- ② UNITIZING STRAP, 1-1/4" X .035" OR .031" X 17'-6" LONG STEEL STRAPPING (24 REQD). INSTALL THRU THE FORK POCKET OF THE BOTTOM CONTAINER AND/OR THE THIRD-LAYER CONTAINER AND TO ENCIRCLE THREE CONTAINERS. SEE THE "UNITIZING AND HANDLING GUIDANCE" ON PAGE 4. SEE SPECIAL NOTE 4 ON PAGE 9.
- ③ SEAL FOR 1-1/4" STEEL STRAPPING (52 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.
- ④ SIDE BLOCKING, 2" X 6" X 42" (DOUBLED) (12 REQD). POSITION TO EXTEND FROM A FORK POCKET TOWARD THE ADJACENT END OF A CONTAINER. NAIL THE FIRST PIECE TO THE CAR FLOOR W/8-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE "SECTION B-B" VIEW AT LEFT. SEE SPECIAL NOTE 5 ON PAGE 9.
- ⑤ ANTI-SWAY BRACE (6 REQD). SEE THE DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT CONTAINERS IN THE THIRD LAYER AND IN THE TOP LAYER.
- ⑥ CENTER GATE A (2 REQD). SEE THE DETAIL ON PAGE 13. SEE SPECIAL NOTES 6 AND 7 ON PAGE 9.
- ⑦ STRUT, 4" X 4" X 8'-0" (20 REQD). TOENAIL TO THE CENTER GATES, PIECES MARKED ⑥, W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "T" ON PAGE 3. SEE SPECIAL NOTE 8 ON PAGE 9.
- ⑧ VERTICAL STRUT BRACING, 2" X 4" X 6'-7" (4 REQD). POSITION NEAR CENTER OF THE STRUTS, PIECES MARKED ⑦, AND NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT. SEE GENERAL NOTE "S" ON PAGE 3.
- ⑨ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 1/2" (5 REQD). POSITION ADJACENT TO THE VERTICAL STRUT BRACING, PIECES MARKED ⑧, AND NAIL TO THE STRUTS, PIECES MARKED ⑦, W/3-10d NAILS AT EACH JOINT.

(CONTINUED ON PAGE 9)

(KEY NUMBERS CONTINUED FROM PAGE 8)

- ⑩ CENTER GATE A (2 REQD). SEE THE DETAIL ON PAGE 13.
- ⑪ STRUT, 4" X 4" BY CUT TO FIT (REF: 6'-2") (20 REQD). TOENAIL TO THE CENTER GATES, PIECES MARKED ⑩, W/2-16d NAILS AT EACH END.
- ⑫ VERTICAL STRUT BRACING, 2" X 4" X 6'-7" (4 REQD). POSITION NEAR CENTER OF THE STRUTS, PIECES MARKED ⑪, AND NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑬ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 1/2" (5 REQD). POSITION ADJACENT TO THE VERTICAL STRUT BRACING, PIECE MARKED ⑫, AND NAIL TO THE STRUTS, PIECES MARKED ⑪, W/3-10d NAILS AT EACH JOINT.
- ⑭ SPACER ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 14. POSITION UNDER THE DOORWAY PROTECTION STRAP, PIECE MARKED ⑮, AND BETWEEN THE TOPS OF THE CONTAINER STACKS WHICH EXTEND INTO THE DOORWAY. SPECIAL NOTE 9 ON THIS PAGE.
- ⑮ DOORWAY PROTECTION STRAP, 1-1/4" X .035" OR .031" X 27'-0" LONG STEEL STRAPPING (2 REQD). INSTALL THRU THE FORK POCKETS OF THE BOTTOM CONTAINERS AND TO ENCIRCLE THE TWO STACKS. STAPLE TO THE SPACER ASSEMBLY, PIECE MARKED ⑭, W/2 STAPLES.

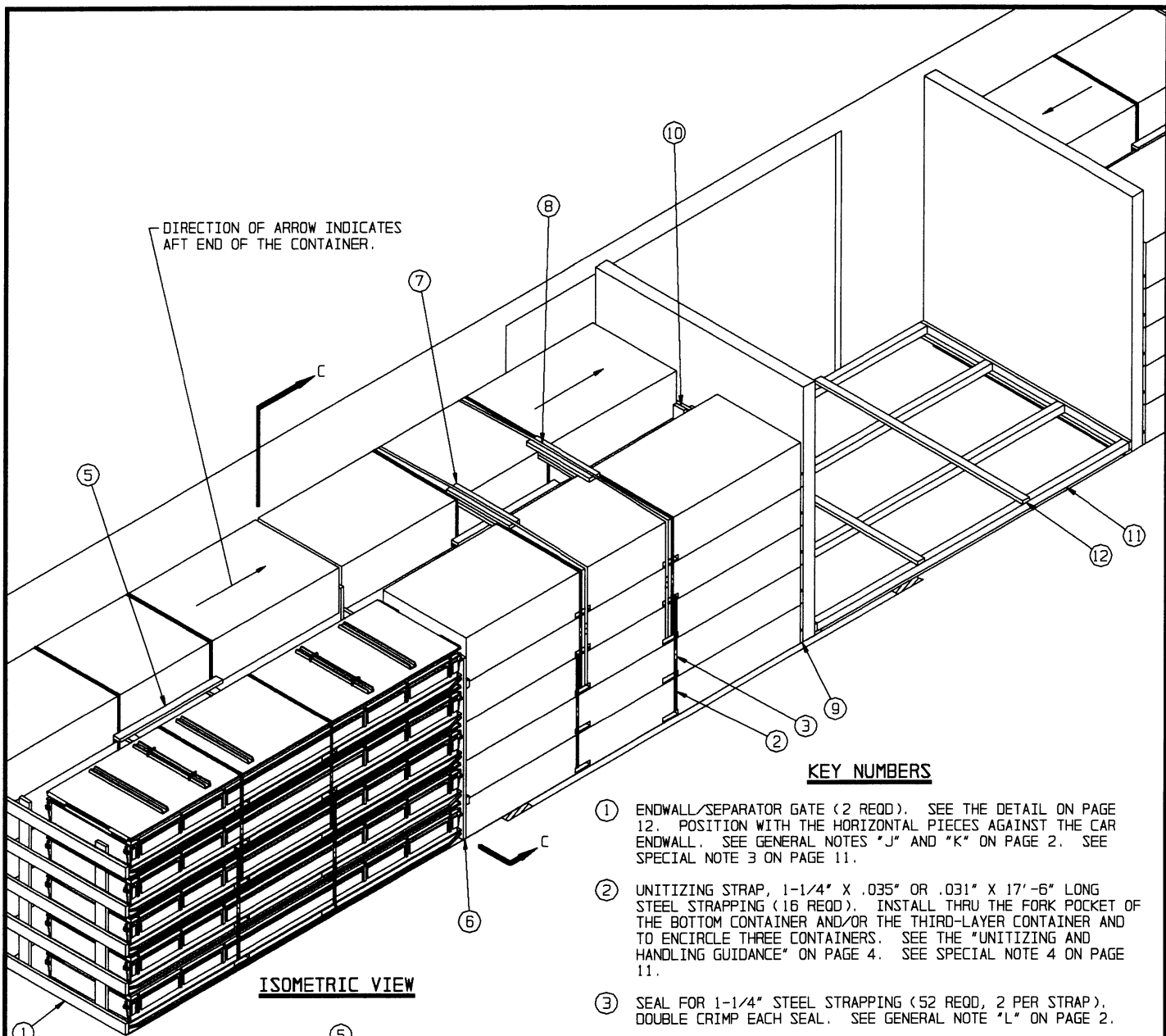
SPECIAL NOTES:

- 1. A 38-UNIT LOAD IS SHOWN IN A 60'-8" LONG BY 9'-4" WIDE CONVENTIONAL BOXCAR. CARS OF OTHER LENGTHS AND WIDTHS MAY BE USED.
- 2. THE CAR SHOWN IS EQUIPPED WITH 15'-0" WIDE STAGGERED DOORS. CARS HAVING 16'-0" WIDE STAGGERED DOOR OPENINGS OR 16'-0" WIDE THRU DOORS MAY BE USED. CARS EQUIPPED WITH NARROWER DOOR OPENINGS CANNOT BE USED.
- 3. IF THE CAR TO BE LOADED HAS NAILABLE ENDWALLS, BATTENS MAY BE NAILED TO THE ENDWALL IN LIEU OF USING THE ENDWALL/SEPARATOR GATE, PIECE MARKED ①. POSITION AT THE HEIGHTS AS SHOWN FOR THE ENDWALL/SEPARATOR GATE AND NAIL TO THE CAR ENDWALL W/1-10d NAIL EVERY 12".
- 4. CONTAINERS SHOULD BE STACKED IN THE DOORWAY AREA OF THE CAR FOR UNITIZING. AFTER THE STACK IS COMPLETED AND THE UNITIZING STRAPS HAVE BEEN INSTALLED, THE CONTAINER STACK CAN, AS APPLICABLE, BE PARTIALLY LIFTED FROM THE END AND PUSHED INTO PLACE.
- 5. IF DESIRED, ANTI-SWAY BRACES MAY BE INSTALLED BETWEEN THE LATERALLY ADJACENT CONTAINERS IN THE BOTTOM LAYER IN LIEU OF USING THE NAILED SIDE BLOCKING, PIECES MARKED ④.
- 6. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR WIDTH GATES. IN LIEU OF EACH "CENTER GATE A", PIECES MARKED ⑥ AND ⑩, INSTALL TWO "CENTER GATE B" AS DETAILED ON PAGE 16. AFTER THE SPLIT GATES HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TIE PIECE APPLICATION" DETAIL ON PAGE 16.
- 7. 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 15 FOR GUIDANCE.
- 8. IN LIEU OF USING 4" X 4" STRUTS, PIECES MARKED ⑦ AND ⑪, DOUBLED 2" X 6" STRUTS MAY BE USED, IF DESIRED. LAMINATE THE DOUBLED 2" X 6" STRUTS W/1-10d NAIL EVERY 6".
- 9. THE DEPICTED DOORWAY PROTECTION, PIECES MARKED ⑭ AND ⑮, IS APPLICABLE FOR USE IN CARS EQUIPPED WITH EITHER SLIDING DOORS OR PLUG TYPE DOORS. IF THE CAR IS EQUIPPED WITH SLIDING DOORS, THE DOORWAY PROTECTION SHOWN ON PAGE 6 AS PIECE MARKED ⑫ MAY BE USED. IF THE DOORPOSTS ARE NON-NAILABLE, REFER TO THE ALTERNATIVE DOORWAY PROTECTION DETAILS ON PAGE 17.
- 10. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. THE LOAD CAN BE REDUCED BY ONE OR MORE CONTAINERS BY EMPLOYING THE "OMITTED CONTAINER PROCEDURES" ON PAGE 19. THE LOAD CAN BE REDUCED BY MULTIPLES OF 6 CONTAINERS BY OMITTING ONE OR MORE LAYERS FROM THE LOAD.
- 11. A K-BRACE MAY BE USED FOR BRACING OF ONE OR TWO CONTAINERS IN EITHER OR BOTH ENDS OF THE CAR. A K-BRACE IS NOT PRACTICAL BECAUSE THE HORIZONTAL WALL CLEATS MUST SPAN THE DOOR OPENING.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 2"	186	62
2" X 4"	242	162
2" X 6"	554	554
4" X 4"	284	379
NAILS	NO. REQD	POUNDS
10d (3")	898	14
16d (3-1/2")	376	8-1/4
STEEL STRAPPING, 1-1/4" - - 474' REQD - - -		68 LBS
SEAL FOR 1-1/4" STRAPPING - - 52 REQD - - -		2-1/2 LBS

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER - - - - -	30 - - - - -	85,650 LBS
DUNNAGE - - - - -	- - - - -	2,407 LBS
TOTAL WEIGHT - - - - -		88,057 LBS (APPROX)

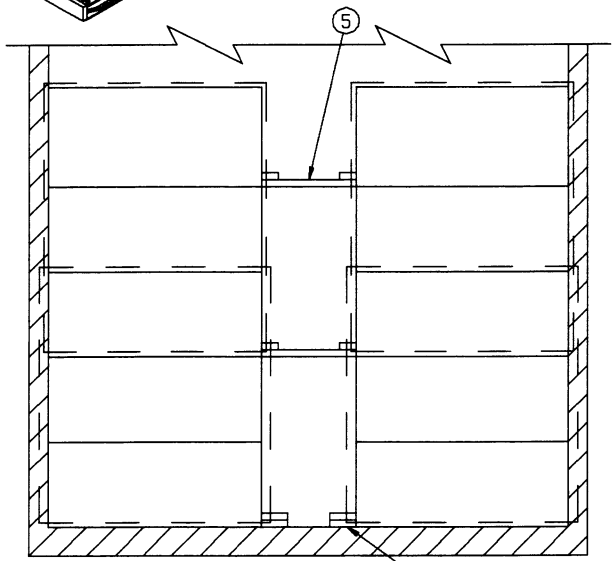


ISOMETRIC VIEW

KEY NUMBERS

- ① ENDWALL/SEPARATOR GATE (2 REQD). SEE THE DETAIL ON PAGE 12. POSITION WITH THE HORIZONTAL PIECES AGAINST THE CAR ENDWALL. SEE GENERAL NOTES "J" AND "K" ON PAGE 2. SEE SPECIAL NOTE 3 ON PAGE 11.
- ② UNITIZING STRAP, 1-1/4" X .035" OR .031" X 17'-6" LONG STEEL STRAPPING (16 REQD). INSTALL THRU THE FORK POCKET OF THE BOTTOM CONTAINER AND/OR THE THIRD-LAYER CONTAINER AND TO ENCIRCLE THREE CONTAINERS. SEE THE "UNITIZING AND HANDLING GUIDANCE" ON PAGE 4. SEE SPECIAL NOTE 4 ON PAGE 11.
- ③ SEAL FOR 1-1/4" STEEL STRAPPING (52 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.
- ④ SIDE BLOCKING, 2" X 6" X 42" (DOUBLED) (12 REQD). POSITION TO EXTEND FROM A FORK POCKET TOWARD THE ADJACENT END OF A CONTAINER. NAIL THE FIRST PIECE TO THE CAR FLOOR W/9-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 5 ON PAGE 11.
- ⑤ ANTI-SWAY BRACE (6 REQD). SEE THE DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT CONTAINERS IN THE THIRD LAYER AND IN THE TOP LAYER.
- ⑥ SEPARATOR GATE (1 REQD). SEE THE DETAIL ON PAGE 12. POSITION BETWEEN LONGITUDINALLY ADJACENT LOAD UNITS.
- ⑦ SPACER ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 14. POSITION UNDER THE DOORWAY PROTECTION STRAP, PIECE MARKED ⑧, AND BETWEEN THE TOPS OF THE CONTAINER STACKS WHICH EXTEND INTO THE DOORWAY.
- ⑧ DOORWAY PROTECTION STRAP, 1-1/4" X .035" OR .031" X 27'-0" LONG STEEL STRAPPING (2 REQD). PRE-POSITION ONE THRU EACH FORK POCKET (NEAR THE OUTER EDGE) OF THE BOTTOM CONTAINER IN THE CONTAINER STACK WHICH IS AGAINST THE CAR SIDEWALL ON THE SIDE OPPOSITE THE LOADING SIDE. EXTEND STRAP OVER TOP OF THE CONTAINER STACK AND TEMPORARILY SECURE UNTIL THE OTHER CONTAINER STACK OF THE LOAD UNIT IS IN PLACE. STAPLE TO THE SPACER ASSEMBLY, PIECE MARKED ⑦, W/2 STAPLES.
- ⑨ ENDWALL/SEPARATOR GATE (2 REQD). SEE THE DETAIL ON PAGE 12. POSITION WITH THE HORIZONTAL PIECES AGAINST THE LOAD DIVIDER BULKHEAD.

(CONTINUED ON PAGE 11)



SECTION C-C

(KEY NUMBERS CONTINUED FROM PAGE 10)

- ⑩ ENDWALL/SEPARATOR GATE STOP PIECE, 2" X 6" X 24" (2 REQD). POSITION AGAINST CONTAINER SKIDS AND TO SPAN THE TOP TWO HORIZONTAL PIECES OF THE ENDWALL/SEPARATOR GATE, PIECE MARKED ④. NAIL TO THE HORIZONTAL PIECES W/2-10d NAILS AT EACH JOINT.
- ⑪ STRUT ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 23. SEE SPECIAL NOTE 6 AT RIGHT.
- ⑫ STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 1/2" (3 REQD). POSITION TO PROVIDE EQUAL SPACES ON THE STRUTS. NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

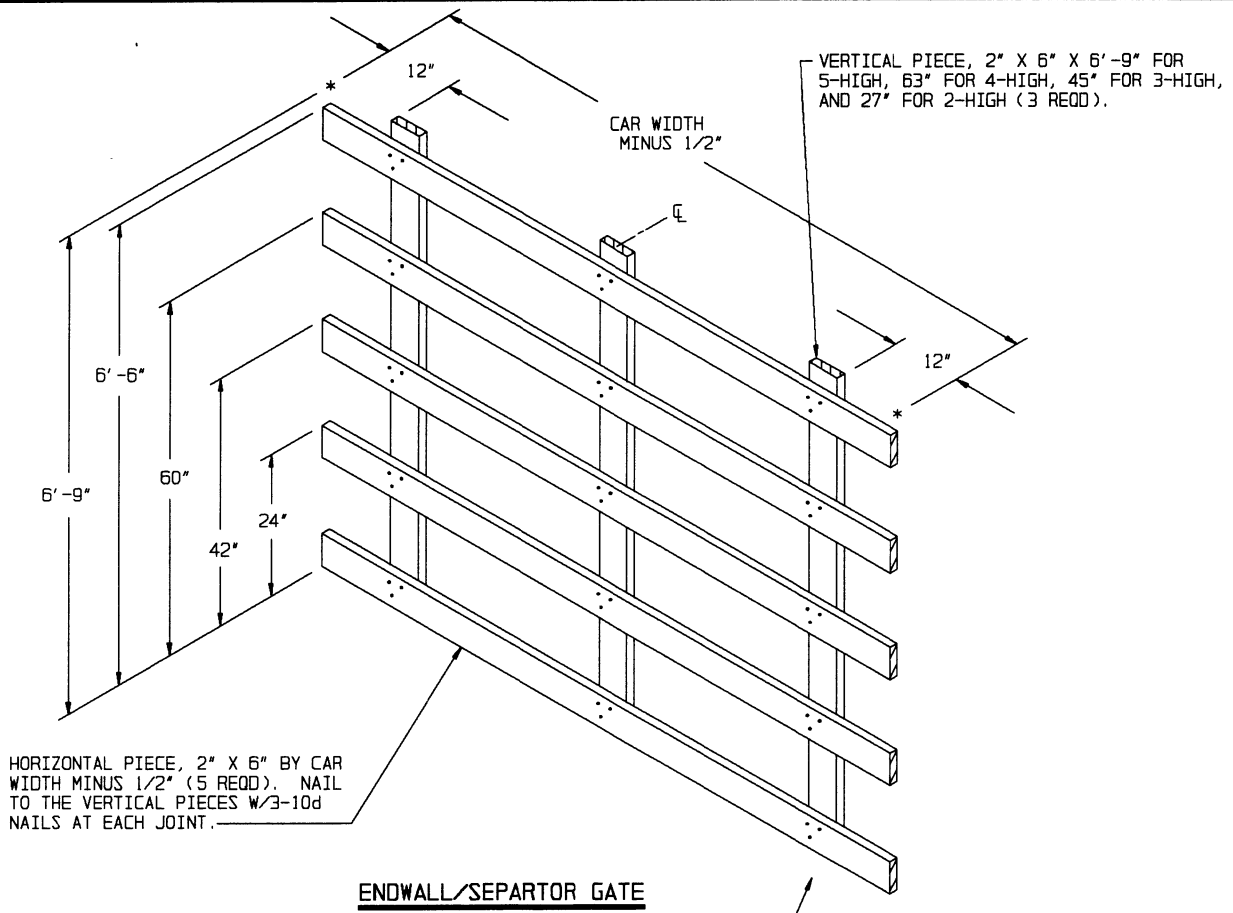
SPECIAL NOTES:

1. A 30-UNIT LOAD IS SHOWN IN A 60'-8" LONG BY 9'-4" WIDE CUSHIONED BOXCAR EQUIPPED WITH LOAD DIVIDER BULKHEADS. CARS OF OTHER LENGTHS AND WIDTHS MAY BE USED.
2. THE CAR SHOWN IS EQUIPPED WITH 15'-0" WIDE STAGGERED DOORS. CARS HAVING 16'-0" WIDE STAGGERED DOOR OPENINGS MAY BE USED. CARS HAVING 16'-0" WIDE THRU DOORS MAY BE USED BUT LOADING WILL BE MORE DIFFICULT. CARS EQUIPPED WITH NARROWER DOOR OPENINGS CANNOT BE USED.
3. IF THE CAR TO BE LOADED HAS NAILABLE ENDWALLS, BATTENS MAY BE NAILED TO THE ENDWALL IN LIEU OF USING THE ENDWALL/SEPARATOR GATE, PIECE MARKED ⑩. POSITION AT THE HEIGHTS AS SHOWN FOR THE ENDWALL/SEPARATOR GATE AND NAIL TO THE CAR ENDWALL W/1-10d NAIL EVERY 12".
4. CONTAINERS SHOULD BE STACKED IN THE DOORWAY AREA OF THE CAR FOR UNITIZING. AFTER THE STACK IS COMPLETED AND THE UNITIZING STRAPS HAVE BEEN INSTALLED, THE CONTAINER STACK CAN, AS APPLICABLE, BE PARTIALLY LIFTED FROM THE END AND PUSHED INTO PLACE.
5. IF DESIRED, ANTI-SWAY BRACES MAY BE INSTALLED BETWEEN THE LATERALLY ADJACENT CONTAINERS IN THE BOTTOM LAYER IN EACH END LOAD UNIT IN LIEU OF USING THE NAILED SIDE BLOCKING, PIECES MARKED ④. THE NAILED SIDE BLOCKING, PIECE MARKED ④, MUST BE USED FOR THE LOAD UNIT WHICH EXTENDS INTO THE DOORWAY AREA UNLESS THE CAR IS EQUIPPED WITH SLIDING TYPE DOORS AND DOORWAY PROTECTION GATES ARE INSTALLED.
6. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, THE ENDWALL/SEPARATOR GATE STOP PIECE, PIECE MARKED ⑩, WILL NOT BE REQUIRED. IF THE CAR IS EQUIPPED WITH SLIDING DOORS, THE DOORWAY PROTECTION SHOWN IN THE LOAD ON PAGE 6 AS PIECE MARKED ⑫ MAY BE USED IN LIEU OF PIECES MARKED ⑦ AND ⑧. NOTE THAT DOORWAY PROTECTION GATES ARE ONLY REQUIRED FOR THE THRU DOORS.
7. IF THE LOAD IN THE NEAR END OF THE CAR IS ONLY FOUR LAYERS IN HEIGHT, THE STRUT ASSEMBLY AND STRUT BRACING, PIECES MARKED ⑪ AND ⑫, WILL NOT BE REQUIRED.
8. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. THE LOAD CAN BE REDUCED BY ONE CONTAINER BY EMPLOYING THE "OMITTED-CONTAINER PROCEDURES" ON PAGE 19. THE LOAD CAN BE REDUCED BY MULTIPLES OF 4 CONTAINERS BY OMITTING ONE OR MORE LAYERS FROM THE NEAR END OF THE LOAD OR CAN BE REDUCED BY MULTIPLES OF TWO CONTAINERS BY OMITTING ONE OR MORE LAYERS FROM THE FAR END OF THE LOAD. THE LOAD CAN BE REDUCED BY 10 CONTAINERS BY OMITTING A FULL-HEIGHT LOAD UNIT.
9. THIRTY CONTAINERS CAN BE LOADED IN A 50'-6" LONG CAR EQUIPPED WITH 16'-0" THRU DOORS OR 15'-0" OR 16'-0" WIDE STAGGERED DOORS OR 16'-0" WIDE THRU DOORS.
10. TWENTY CONTAINERS CAN BE LOADED IN A 40'-6" LONG BOXCAR FOR AN APPROXIMATE LADING WEIGHT OF 57,180 POUNDS. A CAR HAVING 15'-0" OR 16'-0" WIDE STAGGERED DOOR OPENINGS IS REQUIRED.

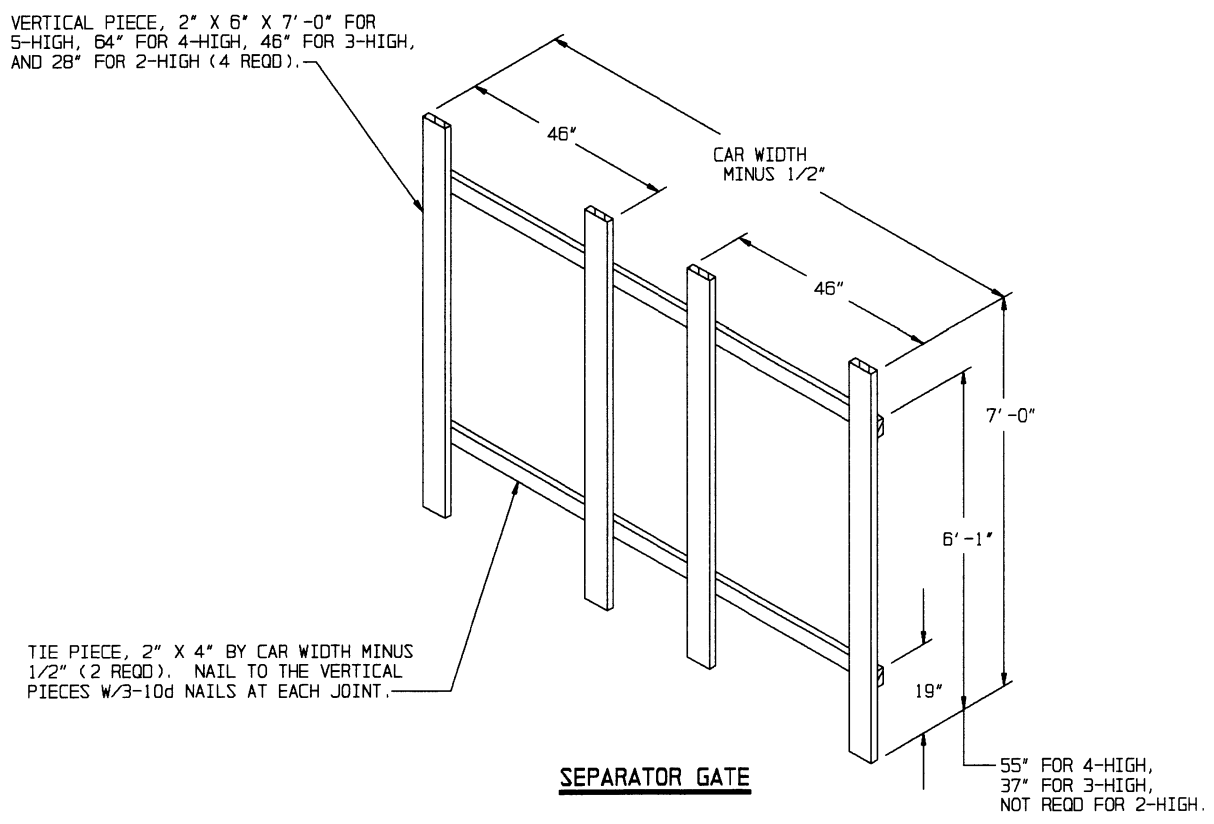
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 8"	9	6
2" X 4"	148	99
2" X 6"	424	424
4" X 4"	56	75
NAILS	NO. REQD	POUNDS
6d (2")	18	NIL
10d (3")	354	5-1/2
12d (3-1/4")	16	1/2
16d (3-1/2")	216	4-3/4
STEEL STRAPPING, 1-1/4" --- 474' REQD --- 68 LBS		
SEAL FOR 1-1/4" STRAPPING --- 52 REQD --- 2-1/2 LBS		
STAPLES FOR 1-1/4" STRAPPING - 4 REQD --- NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER	30	85,650 LBS
DUNNAGE		1,290 LBS
TOTAL WEIGHT		86,940 LBS (APPROX)

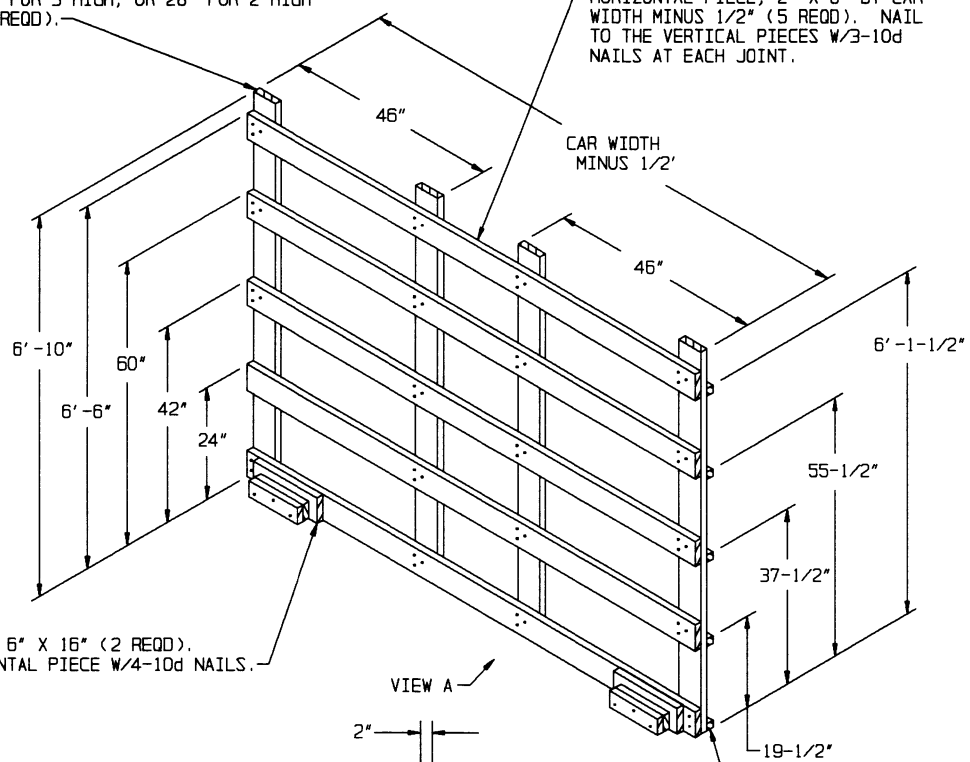


POSITION THIS SIDE AGAINST CAR ENDWALL.



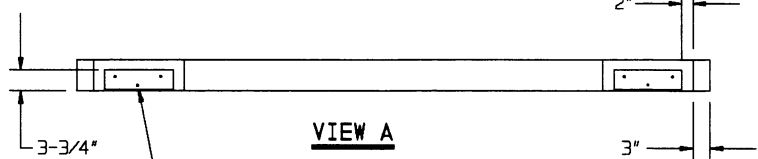
VERTICAL PIECE, 2" X 6" X 6'-10"
FOR A 5-HIGH LOAD, 64" FOR 4-HIGH,
45" FOR 3-HIGH, OR 28" FOR 2-HIGH
(4 REQD).

HORIZONTAL PIECE, 2" X 6" BY CAR
WIDTH MINUS 1/2" (5 REQD). NAIL
TO THE VERTICAL PIECES W/3-10d
NAILS AT EACH JOINT.



FILL PIECE, 2" X 6" X 16" (2 REQD).
NAIL TO A HORIZONTAL PIECE W/4-10d NAILS.

VIEW A

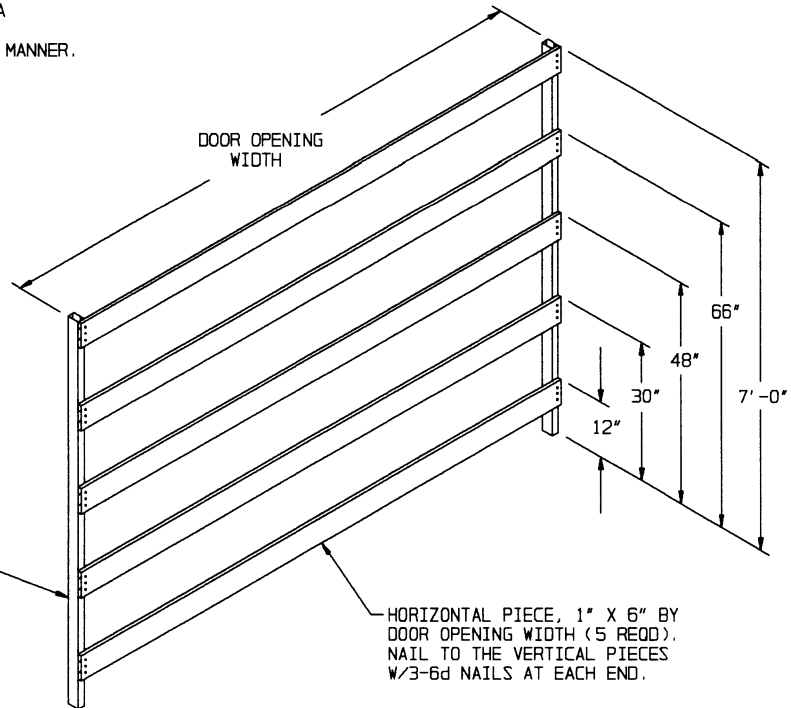


GATE HOLD DOWN, 2" X 4" X 12" (DOUBLED)
(2 REQD). NAIL THE FIRST PIECE TO A
FILL PIECE W/3-10d NAILS. NAIL THE
SECOND PIECE TO THE FIRST IN A LIKE MANNER.

CENTER GATE A

STRUT LEDGER, 2" X 2" OR 2" X 4"
BY CAR WIDTH MINUS 1/2" (5 REQD).
NAIL TO THE VERTICAL PIECES W/2-10d
NAILS AT EACH JOINT.

DOOR OPENING
WIDTH

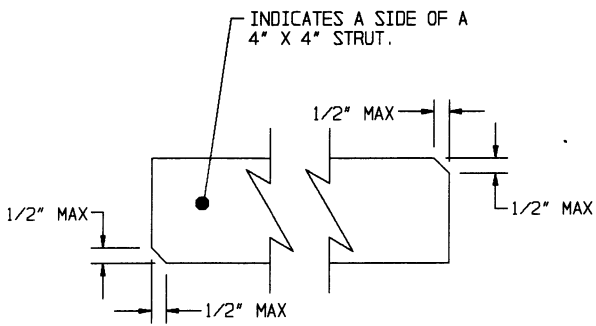


VERTICAL PIECE, 2" X 3"
X 7'-0" (2 REQD).

HORIZONTAL PIECE, 1" X 6" BY
DOOR OPENING WIDTH (5 REQD).
NAIL TO THE VERTICAL PIECES
W/3-6d NAILS AT EACH END.

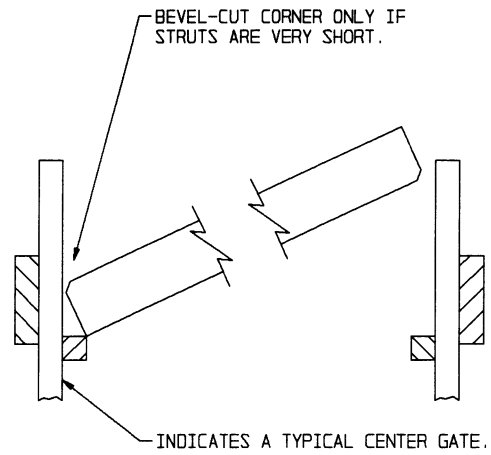
DOORWAY PROTECTION

DETAILS



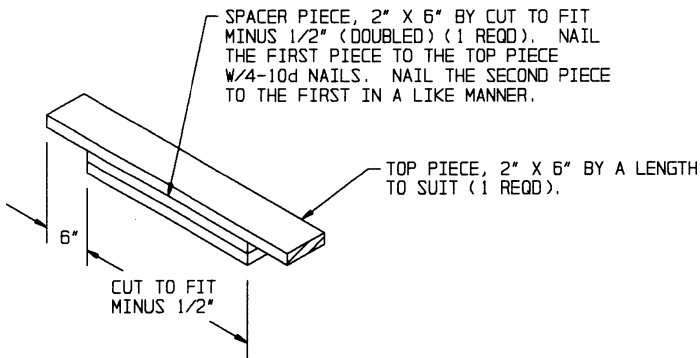
BEVEL-CUT

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").

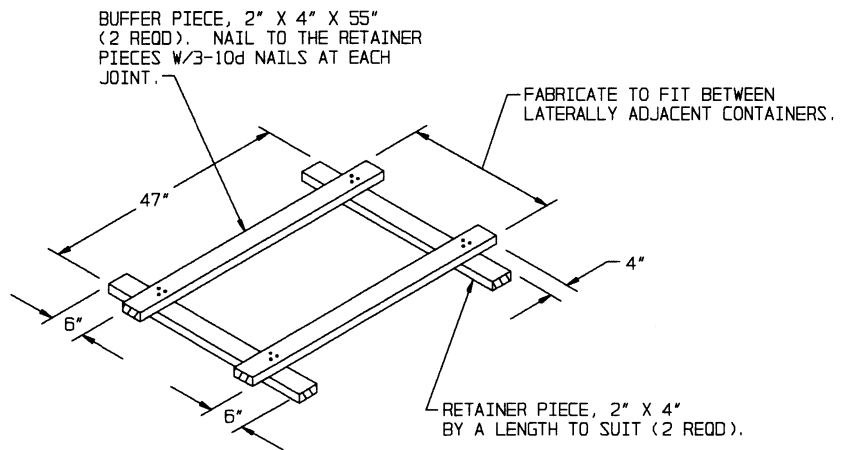


STRUT INSTALLATION

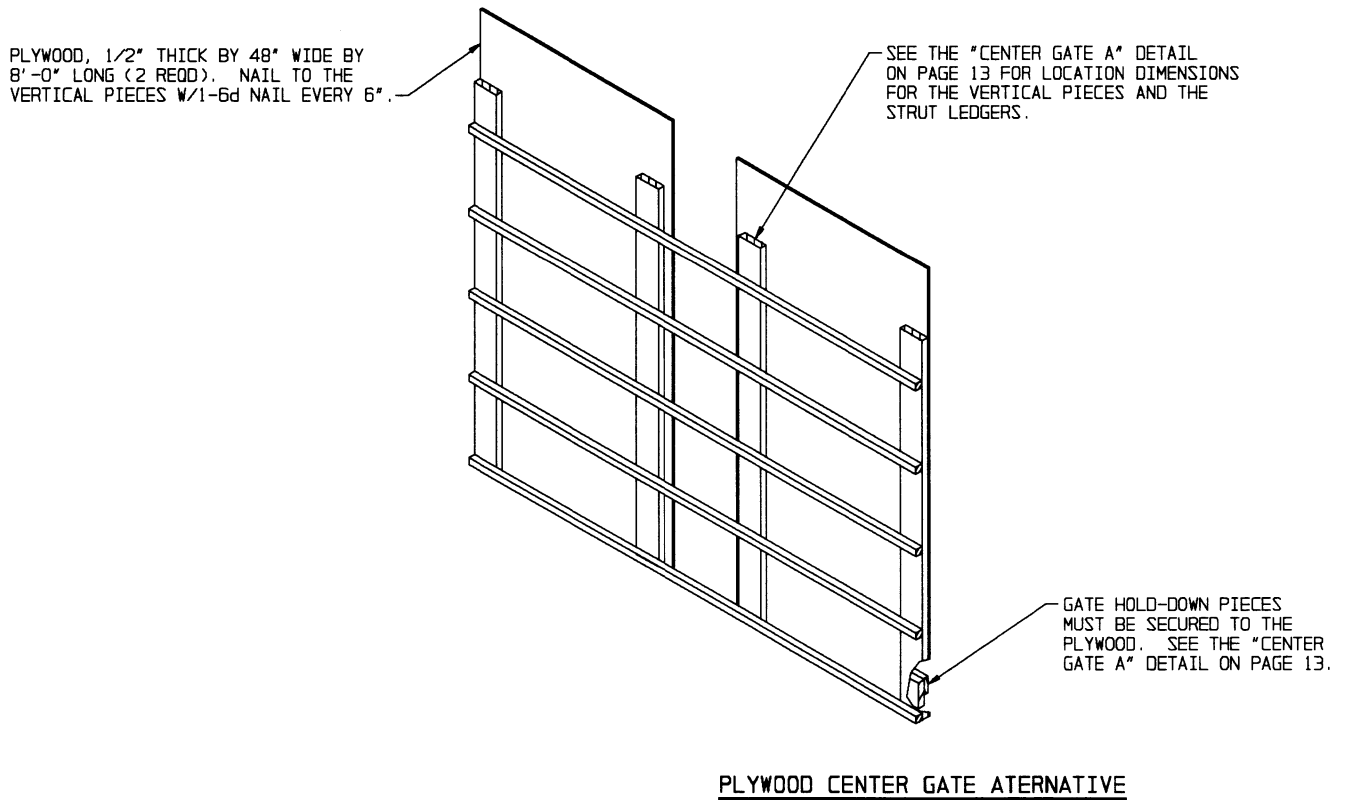
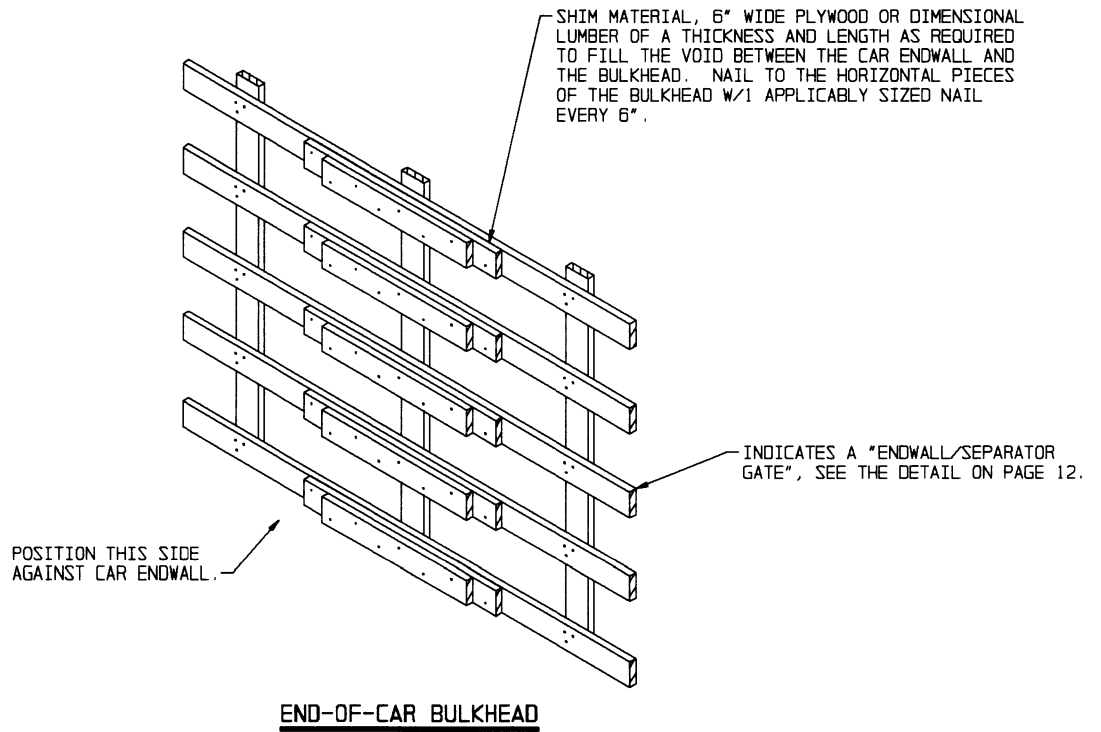
SEE GENERAL NOTE "T" ON PAGE 3 FOR ADDITIONAL STRUT INSTALLATION GUIDANCE.



SPACER ASSEMBLY



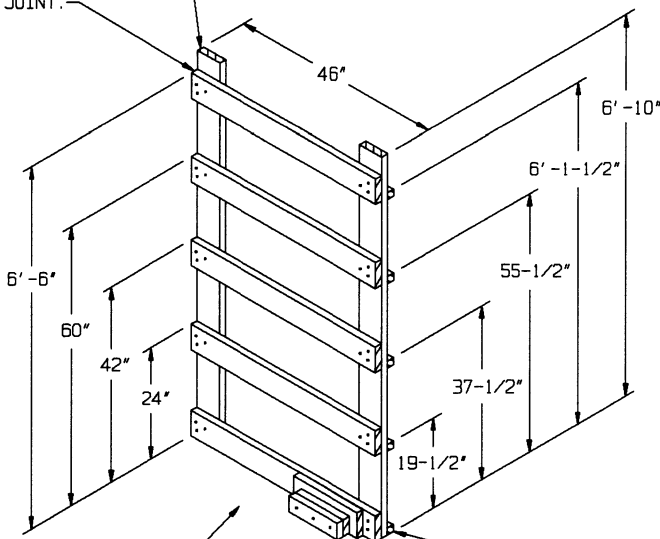
ANTI-SWAY BRACE



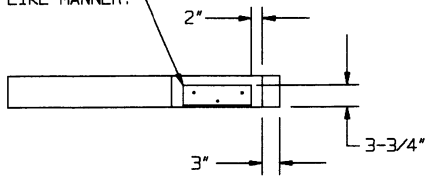
PLYWOOD MAY BE USED IN LIEU OF THE HORIZONTAL PIECES ON THE CENTER GATES DEPICTED HEREIN, INCLUDING THOSE WHICH ARE FOR THE BRACING OF A SINGLE ROW.

HORIZONTAL PIECE, 2" X 6" X 46"
(5 REQD). NAIL TO THE VERTICAL
PIECES W/3-10d NAILS AT EACH JOINT.

VERTICAL PIECE, 2" X 6" X 6'-10"
FOR A 5'-HIGH LOAD, 64" FOR 4'-HIGH,
45" FOR 3'-HIGH, OR 28" FOR 2'-HIGH
(2 REQD).



GATE HOLD DOWN, 2" X 4" X 12"
(DOUBLED) (2 REQD). NAIL THE
FIRST PIECE TO A FILL PIECE
W/3-10d NAILS. NAIL THE
SECOND PIECE TO THE FIRST
IN A LIKE MANNER.



VIEW B

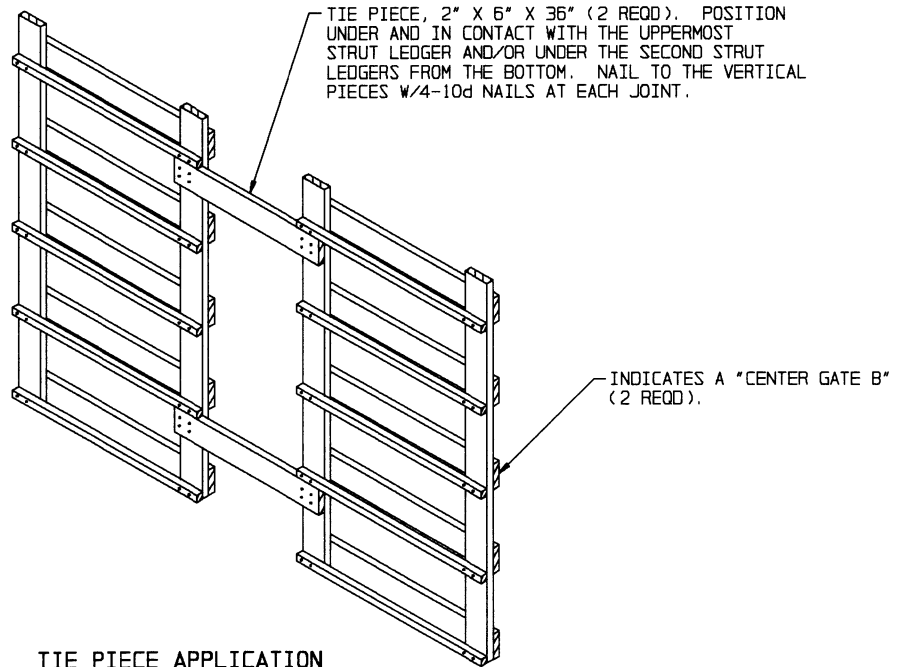
VIEW B

CENTER GATE B

RIGHT HAND AND LEFT HAND
GATES ARE REQUIRED.

STRUT LEDGER, 2" X 2" OR 2" X 4"
X 46" (5 REQD). NAIL TO THE
VERTICAL PIECES W/2-10d NAILS
AT EACH JOINT.

FILL PIECE, 2" X 6" X 16" (1 REQD).
NAIL TO A HORIZONTAL PIECE W/4-10d NAILS.



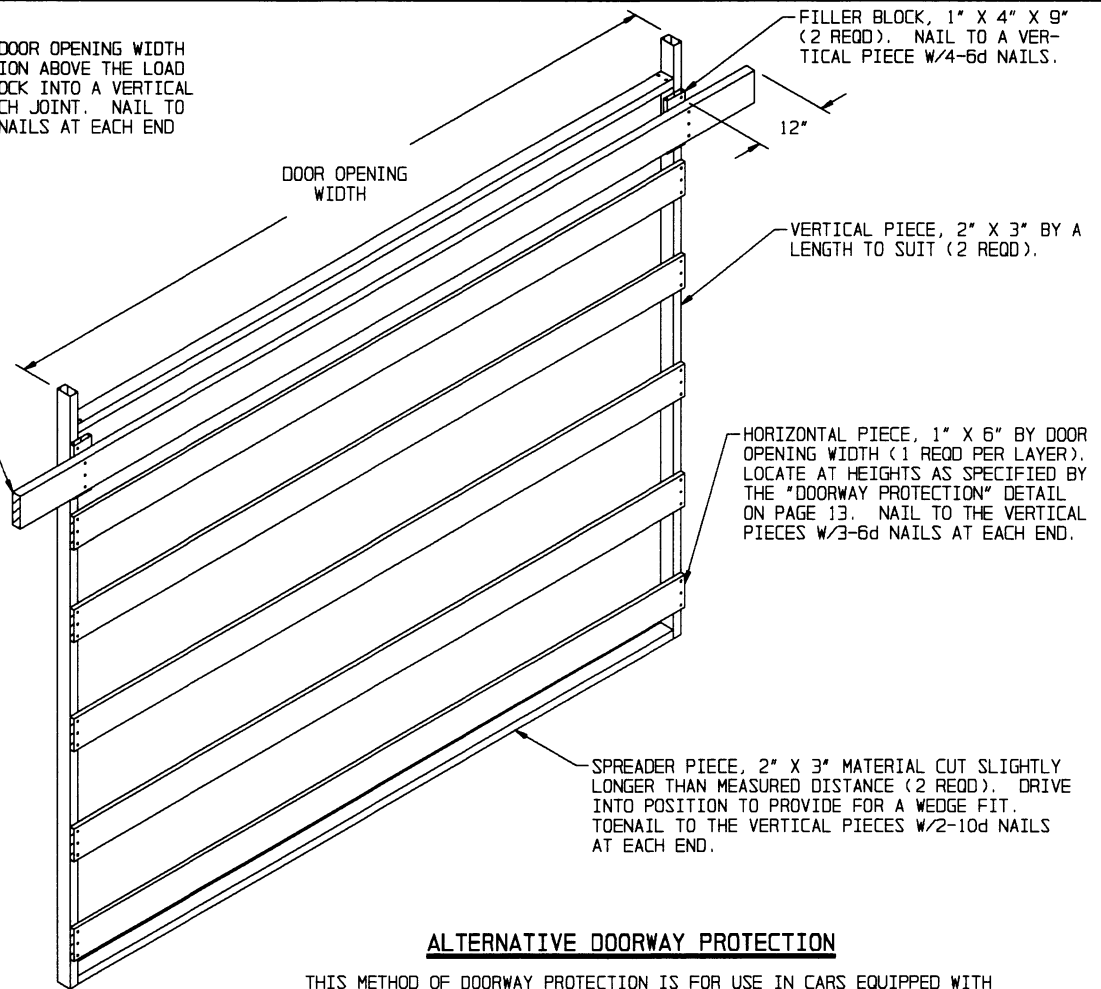
TIE PIECE, 2" X 6" X 36" (2 REQD). POSITION
UNDER AND IN CONTACT WITH THE UPPERMOST
STRUT LEDGER AND/OR UNDER THE SECOND
STRUT LEDGERS FROM THE BOTTOM. NAIL TO THE VERTICAL
PIECES W/4-10d NAILS AT EACH JOINT.

INDICATES A "CENTER GATE B"
(2 REQD).

TIE PIECE APPLICATION

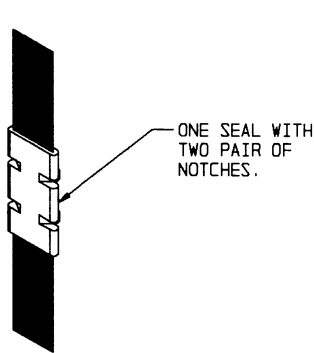
NOTE THAT THE TIE PIECES SHOULD BE APPLIED
AFTER THE GATES AND STRUTS HAVE BEEN INSTALLED.

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).



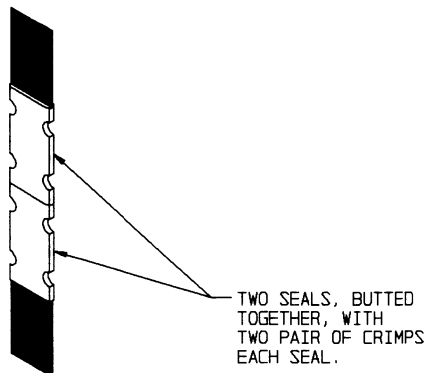
ALTERNATIVE DOORWAY PROTECTION

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS, WHEN THE DOOR POSTS ARE NOT AVAILABLE.



STRAP JOINT A

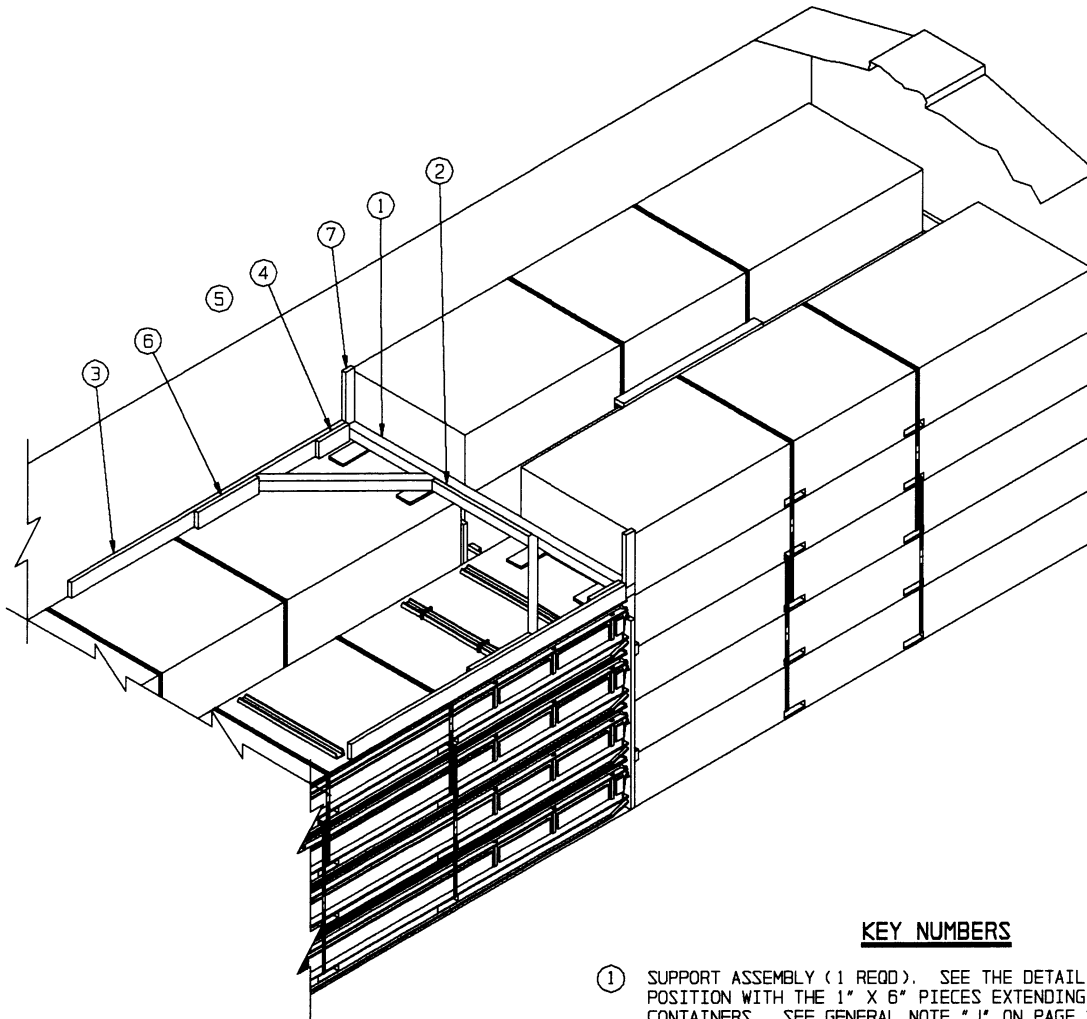
METHOD OF SECURING A STRAP JOINT WHEN USING A NOTCH-TYPE SEALER.



STRAP JOINT B

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

END-OVER-END LAP JOINT DETAILS



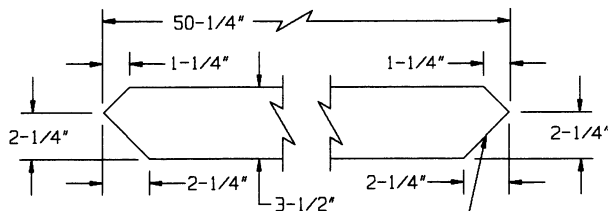
ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-4" WIDE WOOD-LINED (SIDEWALLS) CONVENTIONAL BOXCAR IS SHOWN WITH A TYPICAL K-BRACE. WOOD-LINED 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 FIFTH, FOURTH, OR OTHER TIER. THE TYPE "B" (MODIFIED) K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 7,000 POUNDS. THIS WILL BE NOT MORE THAN TWO CONTAINERS. NOTE THAT IT IS NOT PHYSICALLY POSSIBLE TO BLOCK AND BRACE A PARTIAL TIER OF MORE THAN TWO CONTAINERS IN EITHER END OF A FULL-LENGTH LOAD IN EITHER A 60'-8" LONG OR A 50'-6" LONG CAR.
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 OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ④, AND ⑦ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑤ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ③ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF: 60") TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ③ TO THE FIRST W/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 ③ IS DOUBLED.
4. THE CENTER CLEAT, SHOWN AS PIECE MARKED ②, WILL BE 40" LONG FOR A 9'-6" WIDE CAR, 36" FOR A 9'-2" CAR, AND 34" FOR A 9'-0" WIDE CAR.

KEY NUMBERS

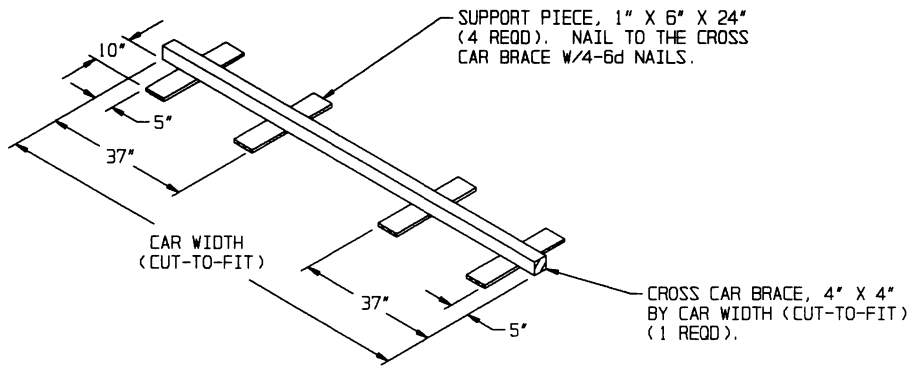
- ① SUPPORT ASSEMBLY (1 REQD). SEE THE DETAIL AT LEFT. POSITION WITH THE 1" X 6" PIECES EXTENDING UNDER THE CONTAINERS. SEE GENERAL NOTE "J" ON PAGE 2.
- ② CENTER CLEAT, 2" X 4" X 38" (1 REQD). NAIL TO THE SUPPORT ASSEMBLY, PIECE MARKED ①, W/7-16d NAILS. SEE SPECIAL NOTE 4 AT LEFT.
- ③ HORIZONTAL WALL CLEAT, 2" X 6" X 9'-0" (2 REQD). NAIL TO THE CAR SIDEWALL W/24-12d NAILS.
- ④ POCKET CLEAT, 2" X 6" X 12" (2 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ③, W/4-16d NAILS.
- ⑤ DIAGONAL BRACE, 4" X 4" X 50-1/4" (2 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE SUPPORT ASSEMBLY, PIECE MARKED ①, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ③, W/2-16d NAILS AT EACH END.
- ⑥ BACK-UP CLEAT, 2" X 6" X 24" (2 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ③, W/8-16d NAILS.
- ⑦ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.



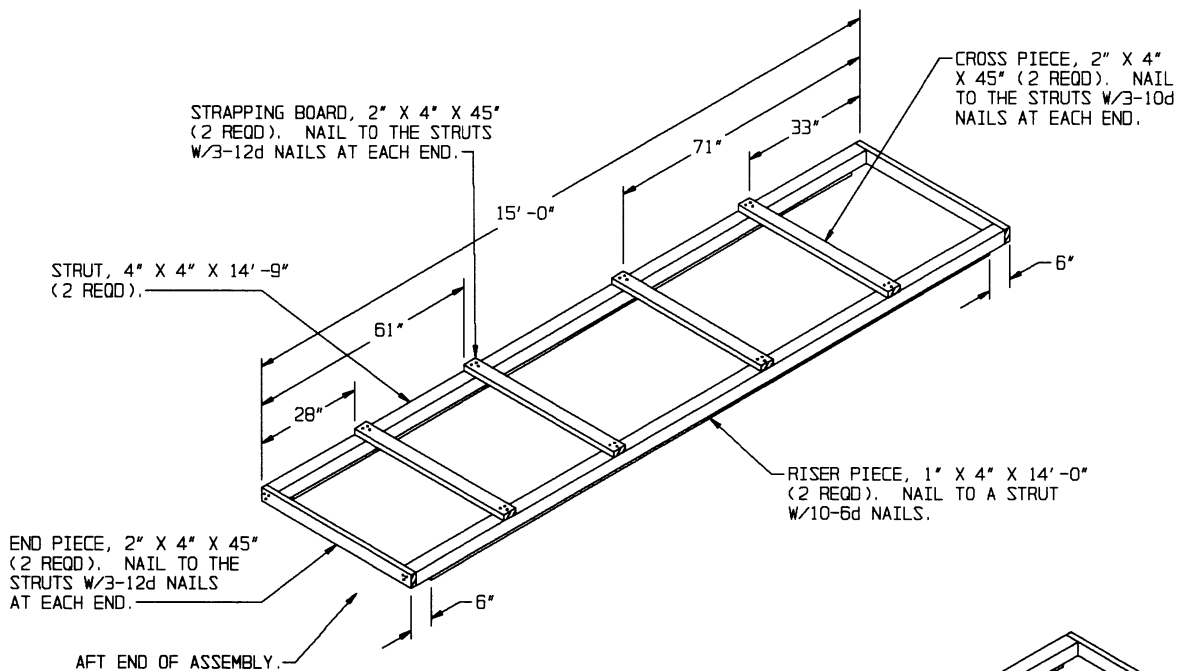
DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

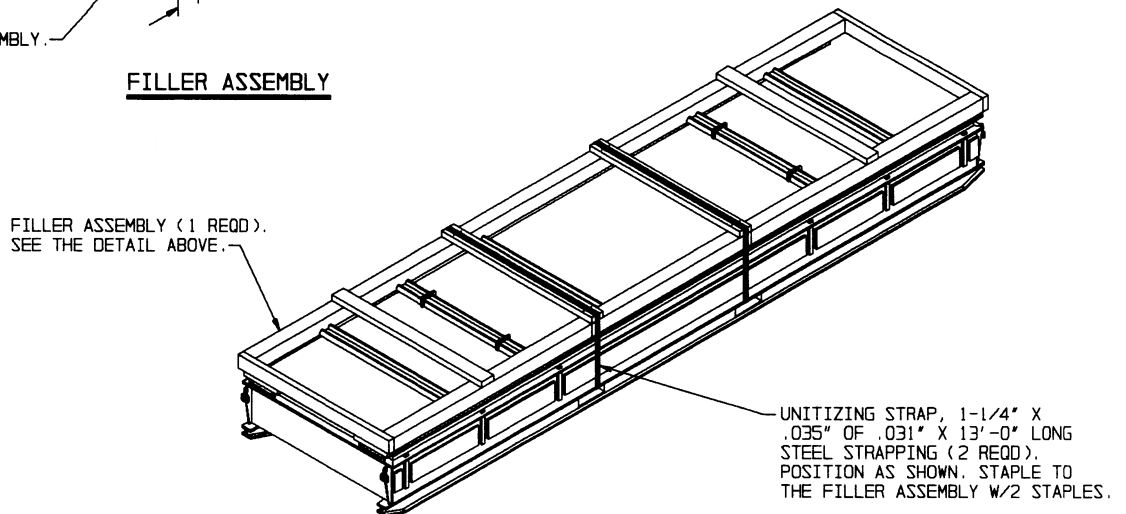
THIS BEARING SURFACE MUST BE POSITIONED SO AS TO BE IN CONTACT WITH A CENTER CLEAT, PIECE MARKED ②, OR A HORIZONTAL WALL CLEAT, PIECE MARKED ③.



SUPPORT ASSEMBLY



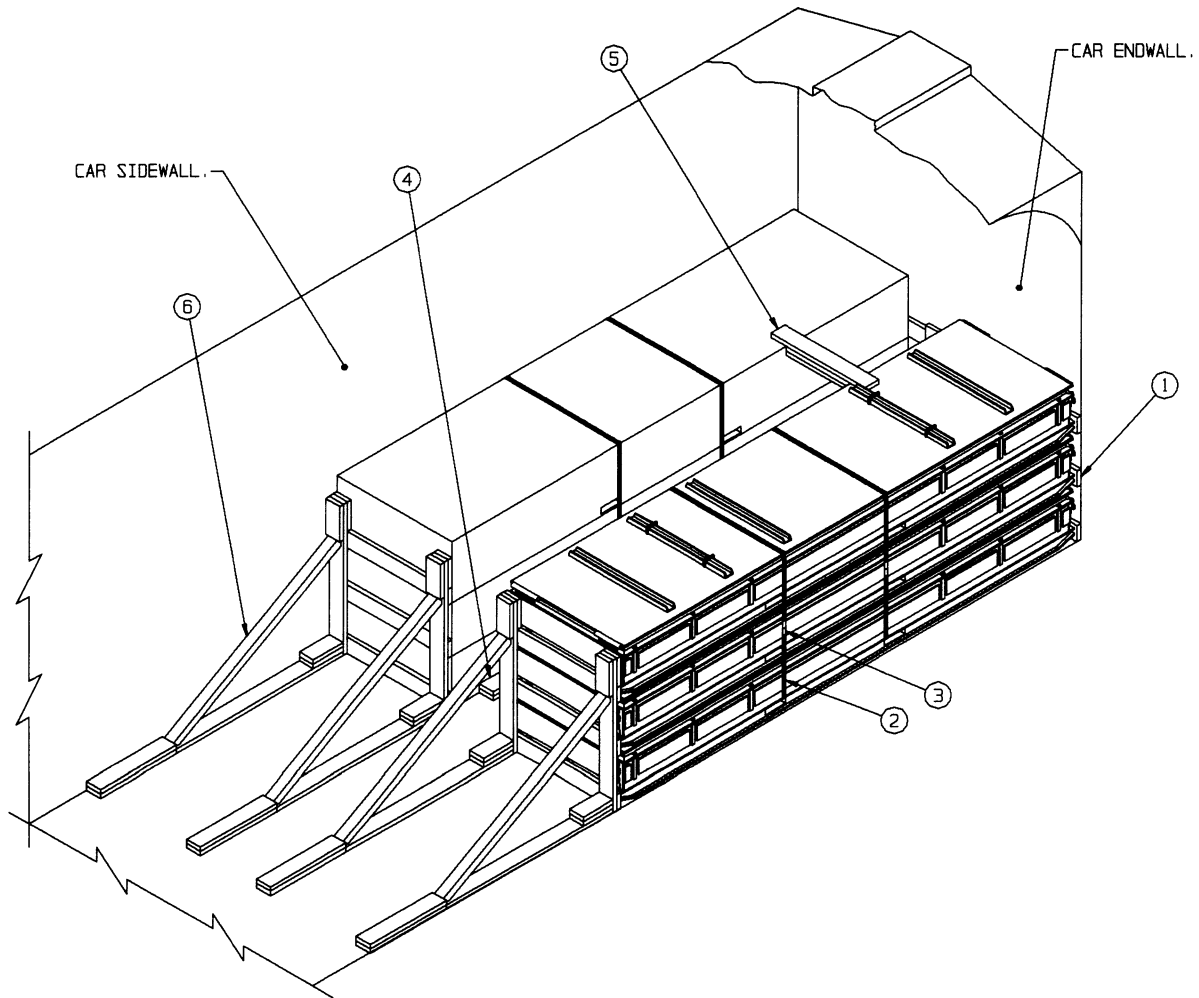
FILLER ASSEMBLY



APPLICATION OF FILLER ASSEMBLY

THE FILLER ASSEMBLY IS TO BE USED ONLY IN THE TOP LAYER OF A LOAD, PREFERABLY NEXT TO A CENTER GATE IF USED IN A CONVENTIONAL BOXCAR.

OMITTED-CONTAINER PROCEDURES



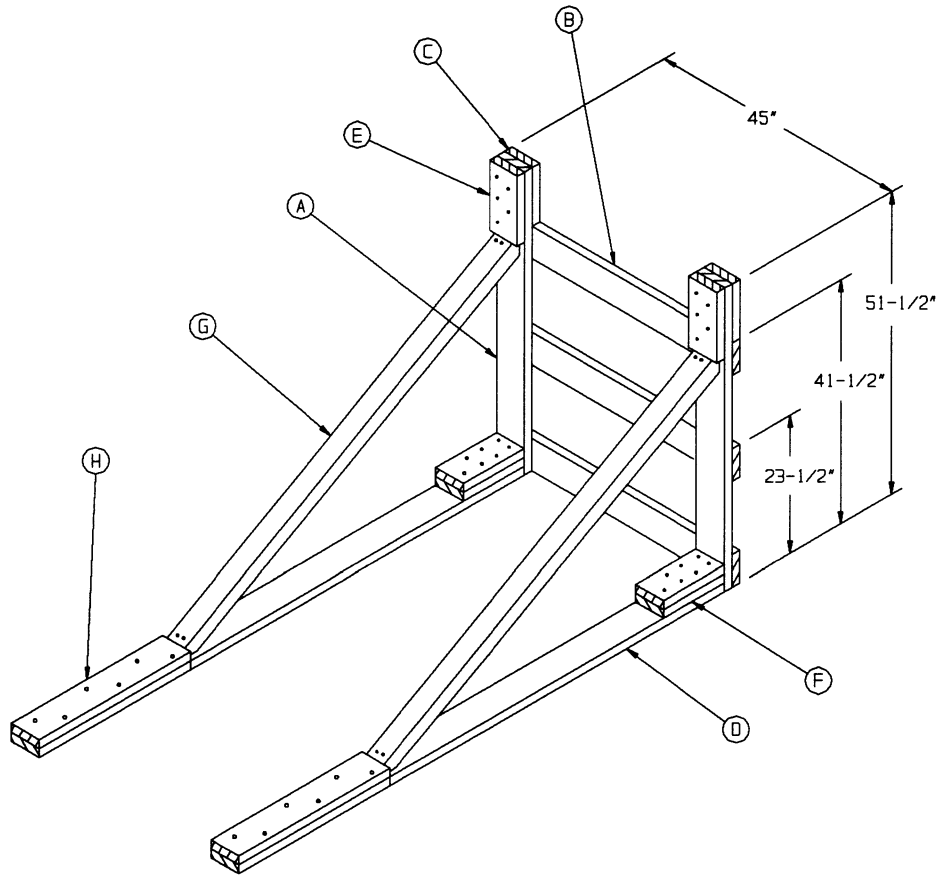
ISOMETRIC VIEW

SPECIAL NOTES:

1. A 6-UNIT LOAD IS SHOWN IN A 9'-4" WIDE CONVENTIONAL BOXCAR USING THE KNEE BRACE METHOD OF LOAD RESTRAINT. CARS OF OTHER WIDTHS MAY BE USED.
2. CONTAINERS SHOULD BE STACKED IN THE DOORWAY AREA OF THE CAR FOR UNITIZING. AFTER THE STACK IS COMPLETED AND THE UNITIZING STRAPS, PIECES MARKED ②, HAVE BEEN INSTALLED, THE CONTAINER STACK CAN BE PARTIALLY LIFTED FROM THE END AND PUSHED INTO PLACE.
3. IF DESIRED, ANTI-SWAY BRACES MAY BE INSTALLED BETWEEN THE LATERALLY ADJACENT CONTAINERS IN THE BOTTOM LAYER IN LIEU OF USING THE NAILED SIDE BLOCKING, PIECES MARKED ④. SEE THE DETAIL ON PAGE 14.
4. ONE KNEE BRACE ASSEMBLY IS ADEQUATE FOR RETAINING A MAXIMUM LCL LOAD OF NOT MORE THAN SIX CONTAINERS.
5. CONTAINERS WILL NOT BE STACKED MORE THAN THREE LAYERS HIGH FOR BRACING WITH KNEE BRACE ASSEMBLIES.

KEY NUMBERS

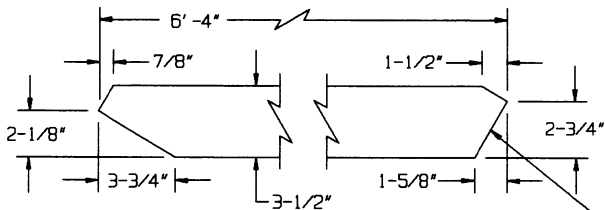
- ① ENDWALL/SEPARATOR GATE (1 REQD). SEE THE DETAIL ON PAGE 12. SEE GENERAL NOTES "J" AND "K" ON PAGE 2.
- ② UNITIZING STRAP, 1-1/4" X .035" OR .031" X 17'-6" LONG STEEL STRAPPING (4 REQD). INSTALL THRU THE FORK POCKET OF THE BOTTOM CONTAINER AND TO ENCIRCLE A STACK OF THREE CONTAINERS. SEE THE "UNITIZATION PROCEDURES" ON PAGE 4. SEE SPECIAL NOTE 2 AT LEFT.
- ③ SEAL FOR 1-1/4" STEEL STRAPPING (8 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.
- ④ SIDE BLOCKING, 2" X 6" X 36" (DOUBLED) (4 REQD). POSITION 12" FROM A FORK POCKET AND TO EXTEND TOWARD THE END OF A CONTAINER. NAIL THE FIRST PIECE TO THE CAR FLOOR W/8-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 3 AT LEFT.
- ⑤ SPACER ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 14. ALIGN WITH THE COVER LIFT LOOP NEAREST THE CAR END. SECURE TO EACH COVER LIFT LOOP WITH TWO WRAPS OF NO. 14 GAGE WIRE. SECURE WIRE TO THE SPACER ASSEMBLY W/1-10d NAIL BENT OVER THE WIRE.
- ⑥ KNEE BRACE ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 21 FOR CONSTRUCTION SPECIFICATIONS AND NAILING REQUIREMENTS.



KNEE BRACE ASSEMBLY

KEY LETTERS

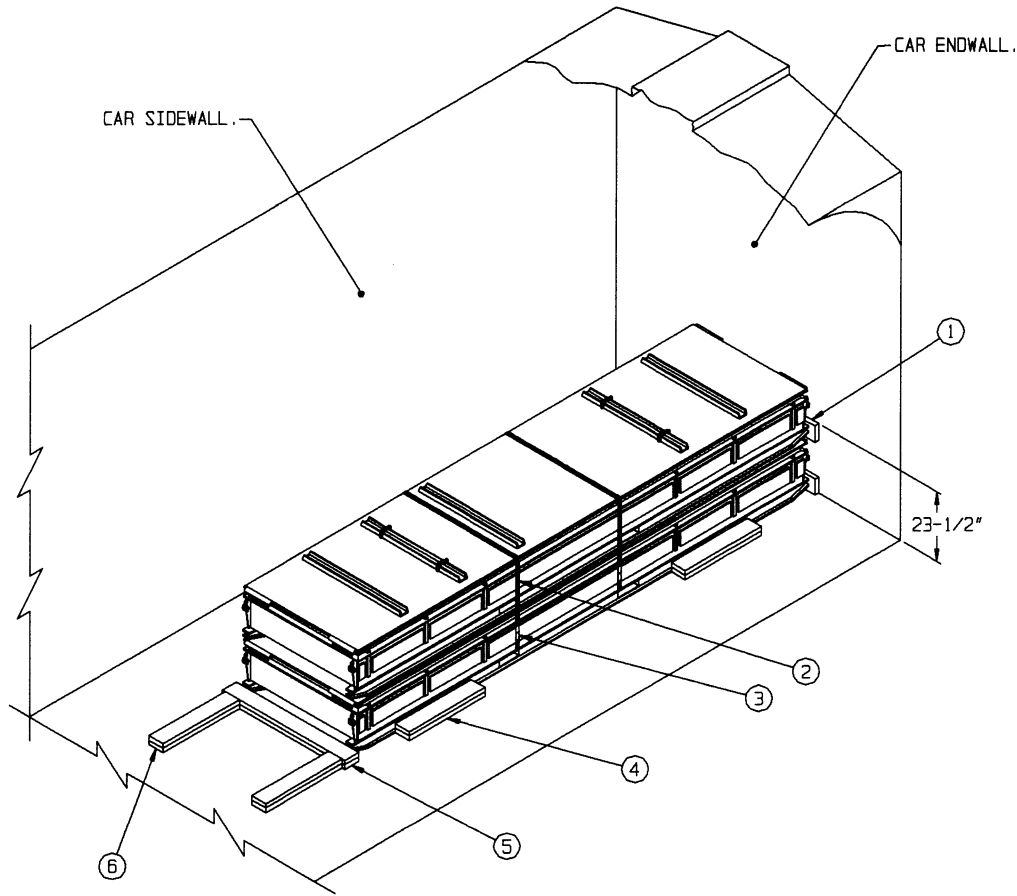
- (A) VERTICAL PIECE, 2" X 6" X 51-1/2" (2 REOD). NAIL TO THE FLOOR CLEAT, PIECE MARKED (D), W/2-16d NAILS. SEE GENERAL NOTES "J" AND "K" ON PAGE 2.
- (B) LOAD BEARING PIECE, 2" X 6" X 45" (3 REOD). NAIL TO THE VERTICAL PIECES, PIECES MARKED (A), W/3-10d NAILS AT EACH END.
- (C) SUPPORT BLOCK, 2" X 6" X 10" (2 REOD). POSITION IN CONTACT WITH PIECE MARKED (B) AND NAIL TO A VERTICAL PIECE, PIECE MARKED (A), W/ 5-10d NAILS.
- (D) FLOOR CLEAT, 2" X 6" X 8'-0" (2 REOD). NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 8". SEE GENERAL NOTE "O" ON PAGE 3.
- (E) HOLD-DOWN CLEAT, 2" X 6" X 12" (2 REOD). NAIL TO A VERTICAL PIECE, PIECE MARKED (A), W/5-10d NAILS.
- (F) POCKET CLEAT, 2" X 6" X 12" (DOUBLED) (2 REOD). NAIL THE FIRST PIECE TO A FLOOR CLEAT, PIECE MARKED (D), W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. TOENAIL THE TOP PIECE TO A VERTICAL PIECE, PIECE MARKED (A), W/2-10d NAILS.
- (G) BRACE, 4" X 4" X 6'-4" (2 REOD). SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TOENAIL TO THE VERTICAL PIECE AND TO THE FLOOR CLEAT, PIECES MARKED (A) AND (D), W/2-16d NAILS AT EACH END.
- (H) BACK-UP CLEAT, 2" X 6" X 30" (2 REOD). NAIL TO THE FLOOR CLEAT, PIECE MARKED (D), W/6-40d NAILS.



DIAGONAL BRACE

4" X 4" MATERIAL.

THIS BEARING SURFACE MUST BE POSITIONED SO AS TO BE IN CONTACT WITH A VERTICAL PIECE, PIECE MARKED (A).



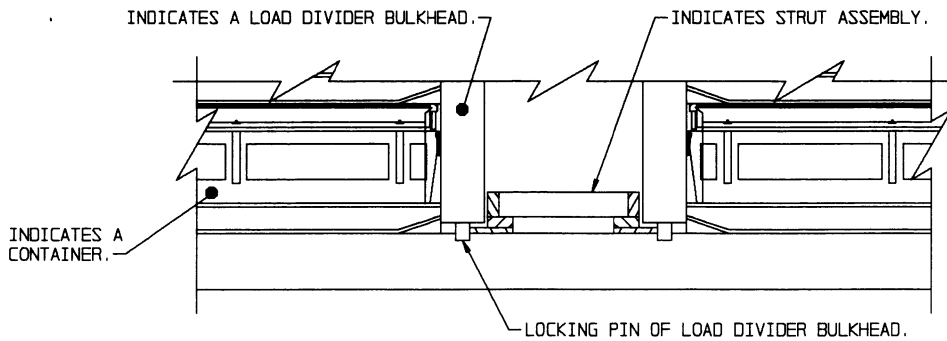
ISOMETRIC VIEW

SPECIAL NOTES:

1. A 2-UNIT LOAD IS SHOWN IN A 9'-4" WIDE CONVENTIONAL BOXCAR USING NAILED FLOORLINE TYPE OF LOAD RESTRAINT. CARS OF OTHER WIDTHS MAY BE USED.
2. IF THE CAR ENDWALL IS NOT NAILABLE OR IF DESIRED, AN ENDWALL/SEPARATOR GATE MAY BE POSITIONED IN THE END OF THE CAR IN LIEU OF USING PIECES MARKED ①.
3. CONTAINERS SHOULD BE STACKED IN THE DOORWAY AREA OF THE CAR FOR UNITIZING. AFTER THE STACK IS COMPLETE AND THE UNITIZING STRAPS, PIECES MARKED ②, HAVE BEEN INSTALLED, THE CONTAINER STACK CAN BE PARTIALLY LIFTED FROM THE END AND PUSHED INTO PLACE.
4. TWO 30" LONG BACK-UP CLEATS, PIECES MARKED ⑥, ARE ADEQUATE FOR RETAINING NOT MORE THAN 9,000 POUNDS. THIS WILL BE NOT MORE THAN THREE CONTAINERS.

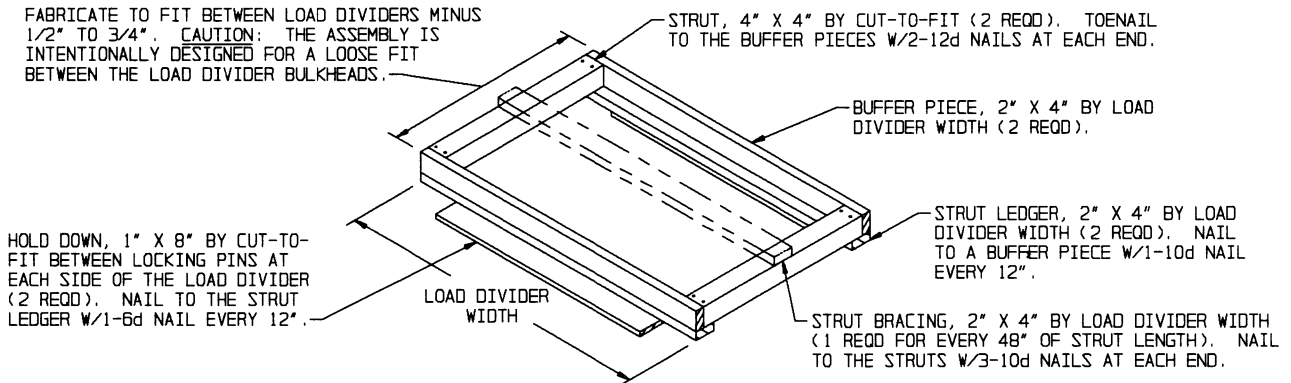
KEY NUMBERS

- ① ENDWALL BATTEN, 2" X 6" X 48" (2 REQD). POSITION AS SHOWN AND NAIL TO THE CAR ENDWALL W/4-10d NAILS. SEE GENERAL NOTE "J" ON PAGE 2. SEE SPECIAL NOTE 2 AT LEFT.
- ② UNITIZING STRAP, 1-1/4" X .035" OR .031" X 14'-6" LONG STEEL STRAPPING (2 REQD). INSTALL THRU THE FORK POCKET OF THE BOTTOM CONTAINER AND TO ENCIRCLE A STACK OF TWO CONTAINERS. SEE THE "UNITIZATION PROCEDURES" ON PAGE 4. SEE SPECIAL NOTE 3 AT LEFT.
- ③ SEAL FOR 1-1/4" STEEL STRAPPING (4 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.
- ④ SIDE BLOCKING, 2" X 6" X 30" (DOUBLED) (2 REQD). POSITION 12" FROM A FORK POCKET AND TO EXTEND TOWARD THE END OF A CONTAINER. NAIL THE FIRST PIECE TO THE CAR FLOOR W/7-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ⑤ HEADER, 2" X 6" X 48" (DOUBLED) (1 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/6-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/6-40d NAILS.
- ⑥ BACK-UP CLEAT, 2" X 6" X 30" (DOUBLED) (2 REQD). ALIGN WITH A CONTAINER SKID. NAIL THE FIRST PIECE TO THE CAR FLOOR W/6-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/6-40d NAILS. SEE SPECIAL NOTE 4 AT LEFT.



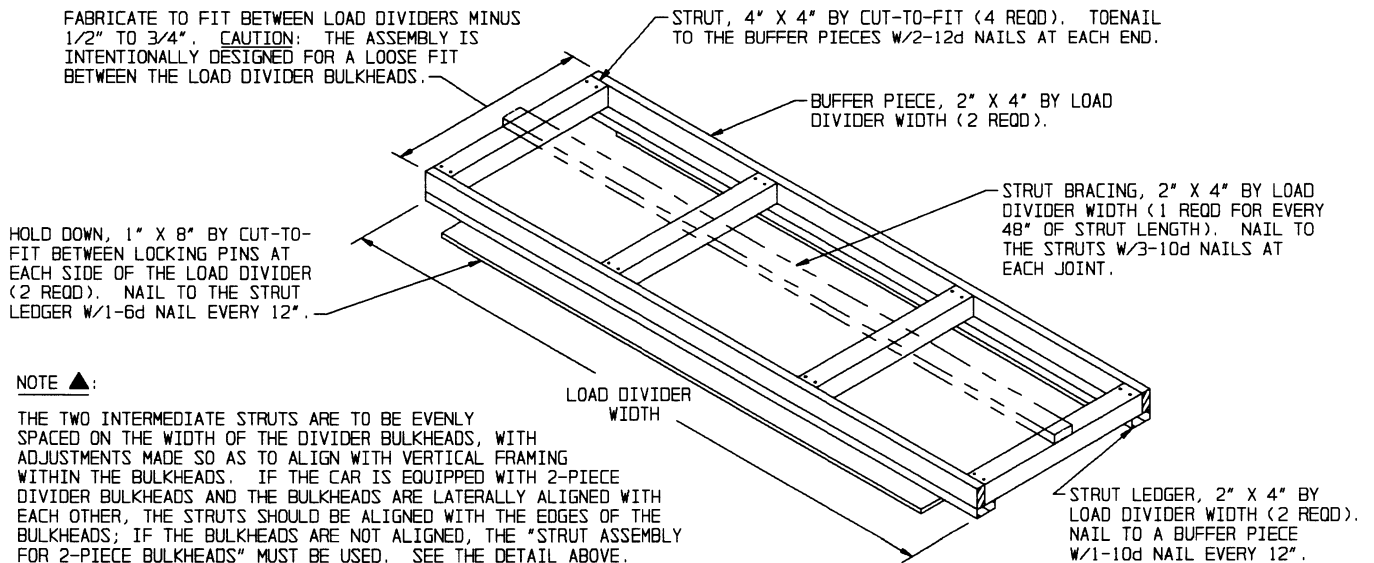
INSTALLATION OF STRUT ASSEMBLY

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.



STRUT ASSEMBLY FOR 2-PIECE BULKHEADS

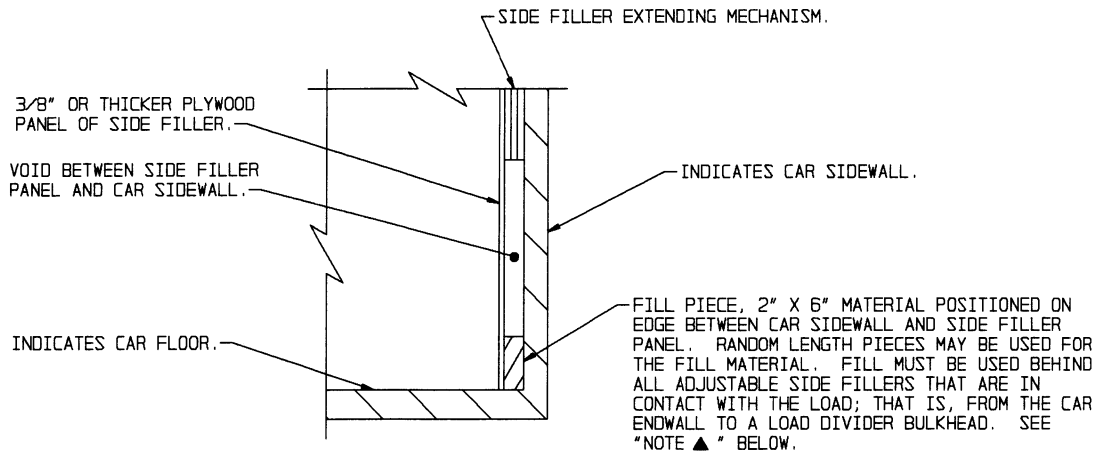
A STRUT ASSEMBLY IS REQUIRED WHEN THE LOAD BEHIND EITHER LOAD DIVIDER BULKHEAD EXCEEDS 50,000 POUNDS OF HAZARD CLASS AND DIVISION 1.1, 1.2, OR 1.3 EXPLOSIVES. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF HAZARD CLASS AND DIVISION 1.4 EXPLOSIVES, REGARDLESS OF THE WEIGHT OF THE LOAD. NOTE: TWO ASSEMBLIES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



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.

PROVISIONS FOR BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS

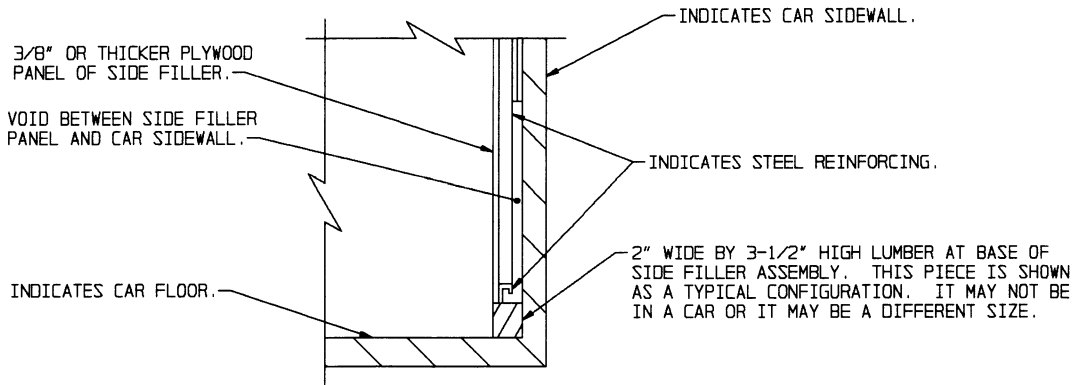


TYPICAL TYPE A

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.