

APPROVED BY
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DATE

J. H. Sherman
11/5/92

LOADING AND BRACING (CL & LCL) IN BOX CARS OF CBU-58 AND CBU-71 MUNITIONS PACKED IN CNU-180B/E OR CNU-180/E SERIES METAL CONTAINERS

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

U.S. ARMY MATERIEL COMMAND DRAWING

APPROVED, U.S. ARMY ARMAMENT, MUNITIONS AND
CHEMICAL COMMAND

J. R. Fore

APPROVED BY ORDER OF COMMANDING GENERAL, U.S.
ARMY MATERIEL COMMAND

William J. Ernst

U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL

DRAFTSMAN

P. BELLICH

TECHNICIAN

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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 CBU-58 AND CBU-71 MUNITIONS PACKED IN CNU-180/E CONTAINERS, OR CNU-180B/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 BOX CARS EQUIPPED WITH VARIOUS TYPES OF SELF-CONTAINED MECHANICAL BRACING DEVICES, AND FOR SHIPMENTS IN CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.
- D. THE SELECTION OF RAIL CARS FOR THE TRANSPORT OF CBU-58 AND CBU-71 MUNITIONS IS THE RESPONSIBILITY OF 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. CAUTION: METAL CONTAINERS MUST NOT BE ALLOWED TO CONTACT STEEL SIDEWALLS OR ENDWALLS OF BOX CARS. THIS TYPE OF LOAD SHOULD BE SHIPPED IN BOX CARS HAVING WOOD SIDEWALLS AND/OR ENDWALLS. IF CARS WITH WOOD SIDEWALLS AND/OR ENDWALLS ARE NOT AVAILABLE, AND ALL-STEEL CARS ARE USED, THE SIDEWALLS AND/OR 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 43 FOR GUIDANCE.
- F. WHEN SELECTING RAIL CARS, EVERY EFFORT SHOULD BE MADE TO OBTAIN BOX CARS THAT DO NOT HAVE BOWED END WALLS. CARS HAVING BOWED ENDS CAN BE USED, HOWEVER, IF AN END WALL IS 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. REFER TO PAGE 47 FOR GUIDANCE.
- G. BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS HAVE BEEN SHOWN. HOWEVER, THE DEPICTED OUTLOADING PROCEDURES ARE ALSO APPLICABLE FOR 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 - - - - - : FED SPEC MM-L-751. SEE TM 743-200-1 (DUNNAGE LUMBER).
- NAILS - - - - - : FED SPEC FF-N-105; COMMON.
- STAPLES - - - - - : FED SPEC FF-N105; Senco QUALITY OR EQUAL.
- STRAPPING, STEEL - - : ASTM D3953; FLAT STRAPPING, TYPE 1 OR 2, HEAVY DUTY, COATED FINISH (ORGANIC), ZINC-COATED (GRADE 2), OR UNCOATED.
- SEAL, STRAP - - - - - : ASTM D3953; CLASS H FINISH A, B (GRADE 2), OR C, TYPE D, STYLE I, II, OR IV.
- STAPLE, STRAP - - - - : COMMERCIAL GRADE.
- PLYWOOD - - - - - : COMMERCIAL ITEM DESCRIPTION A-A-55057, TYPE A, CONSTRUCTION AND INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D. IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER INTERIOR OR AN EXTERIOR GRADE MAY BE SUBSTITUTED.
- HARDBOARD - - - - - : ANSI/H 135.4, CLASS 1.
- SOLID FIBERBOARD - - - : FED SPEC PP-F-320, TYPE SF, CLASS DOMESTIC, GRADE 175 OR STRONGER, OR TYPE SF, CLASS WEATHER-RESISTANT, GRADE W65 OR STRONGER.

- 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 CBU MUNITIONS, 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 6" MATERIAL, IT IS PERMISSIBLE TO USE TWO LAMINATED PIECES OF 2" X 6" MATERIAL IN LIEU OF EACH 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 WHENEVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES. ALSO, A STAGGERED NAILING PATTERN WILL BE USED WHEN DUNNAGE IS NAILED TO THE FLOOR 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 BOX CAR 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 44 FOR GUIDANCE.
- O. THROUGHOUT THIS PROCEDURAL DRAWING, PORTIONS OF THE BLOCKING COMPONENTS AND OF THE DEPICTED CARS, SUCH AS A CAR SIDEWALL, HAVE BEEN OMITTED FROM THE LOAD VIEW FOR CLARITY PURPOSES.
- P. THE NUMBER OF LADING UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE BOX CAR 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 RAIL CAR IN COMPLIANCE WITH THE WEIGHT DISTRIBUTION REQUIREMENTS OF THE AAR.
- Q. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES, AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS 0.454KG.

(CONTINUED ON PAGE 3)

GENERAL NOTES

(FOR CONVENTIONAL TYPE BOX CARS)

- R. 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.
- S. 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 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. PADDING, OF 2" THICK LUMBER OR ANY OTHER MATERIAL OF SIMILAR CONSISTENCY, SHOULD BE PLACED BETWEEN THE JACK AND THE LADING.
- T. LOAD-BLOCKING STRUTS WHICH ARE 48" OR LONGER MUST BE STIFFENED BY THE APPLICATION OF HORIZONTAL AND VERTICAL STRUT BRACING AS SHOWN IN THE LOAD VIEW ON PAGE 14. 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 GATE 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.
- U. TO ACHIEVE A TIGHTLY BLOCKED LOAD, A STRUT WILL BE CUT SLIGHTLY LONGER THAN THE MEASURED DISTANCE BETWEEN THE STRUT BEARING AREAS ON THE TWO CENTER GATES. 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 44 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 NEED TO BE BEVELED ONLY IF THE STRUTS ARE VERY SHORT. IF ONLY ONE END IS BEVELED, 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.
- V. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

GENERAL NOTES

(FOR BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES)

- W. THE OUTLOADING PROCEDURES FOR BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES MAY BE ADAPTED AS REQUIRED TO FACILITATE THE USE OF BOX CARS 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: BOX CARS EQUIPPED WITH MEMBERS WHICH DO NOT MEET THE LOCATION REQUIREMENTS MUST NOT BE USED.
1. A CROSS MEMBER WILL NOT BE RELIED UPON TO RETAIN MORE THAN 4,000 POUNDS OF LADING. 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.
- X. 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 CONTAINERS 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 CONTAINER.
- Y. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTION WHICH IS IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHOD.

(GENERAL NOTES)

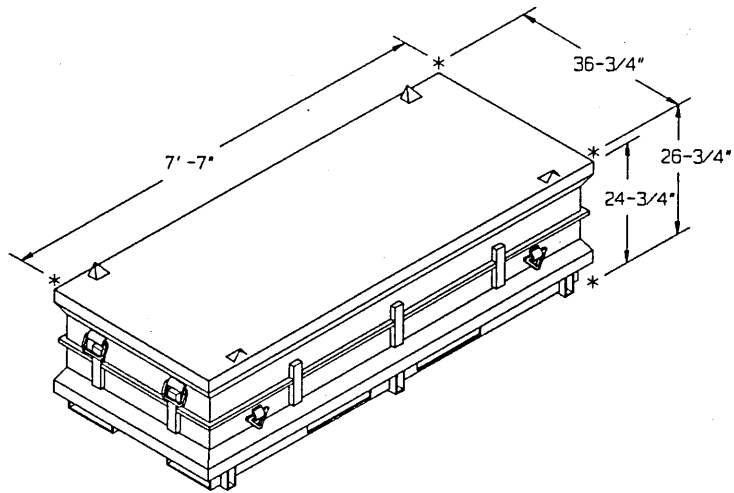
(FOR CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS)

- AA. CAUTION: FOR CUSHIONED BOX CARS 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.
- 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 BOX CAR 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 CBU MUNITIONS. NOTICE: ONLY CUSHIONED CARS THAT HAVE SLIDING CENTER SILL TYPE CUSHION DEVICES OR END-OF-CAR TYPE DEVICES WHICH HAVE AT LEAST 15' OF TRAVEL ARE ACCEPTABLE.
- CC. IF NAILING TO A CAR SIDEWALL IS NOT REQUIRED, BOX CARS EQUIPPED WITH ADJUSTABLE SIDE FILLERS THAT HAVE 3/8" OR THICKER PANES 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 44 FOR GUIDANCE. IF THE BACK OF THE SIDE FILLER PANEL ARE REINFORCED WITH VERTICAL AND HORIZONTAL STEEL MEMBERS AS SHOWN IN THE "TYPICAL TYPE B" VIEW ON PAGE 49, THE "FILL PIECE" MATERIAL IS NOT REQUIRED.
- 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 CLASS A OR CLASS B 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 CLASS C EXPLOSIVES. NOTE THAT THE STRUT ASSEMBLY MAY BE OMITTED FROM LOADS OF CLASS A OR B 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 43.

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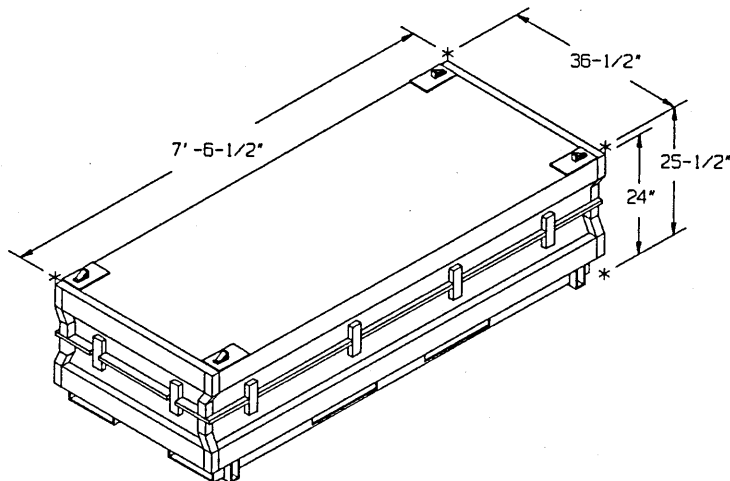
(GENERAL NOTES CONTINUED)

- 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 "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 36 AND 37 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, STRUTS, AND GATE HOLD-DOWNS AS SHOWN IN THE APPLICABLE CONVENTIONAL BOX CAR 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 42 OR WITH KNEE BRACE ASSEMBLIES, AS SHOWN ON PAGE 40.
- GG. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTION WHICH IS IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHOD.



CNU-180/E CONTAINER

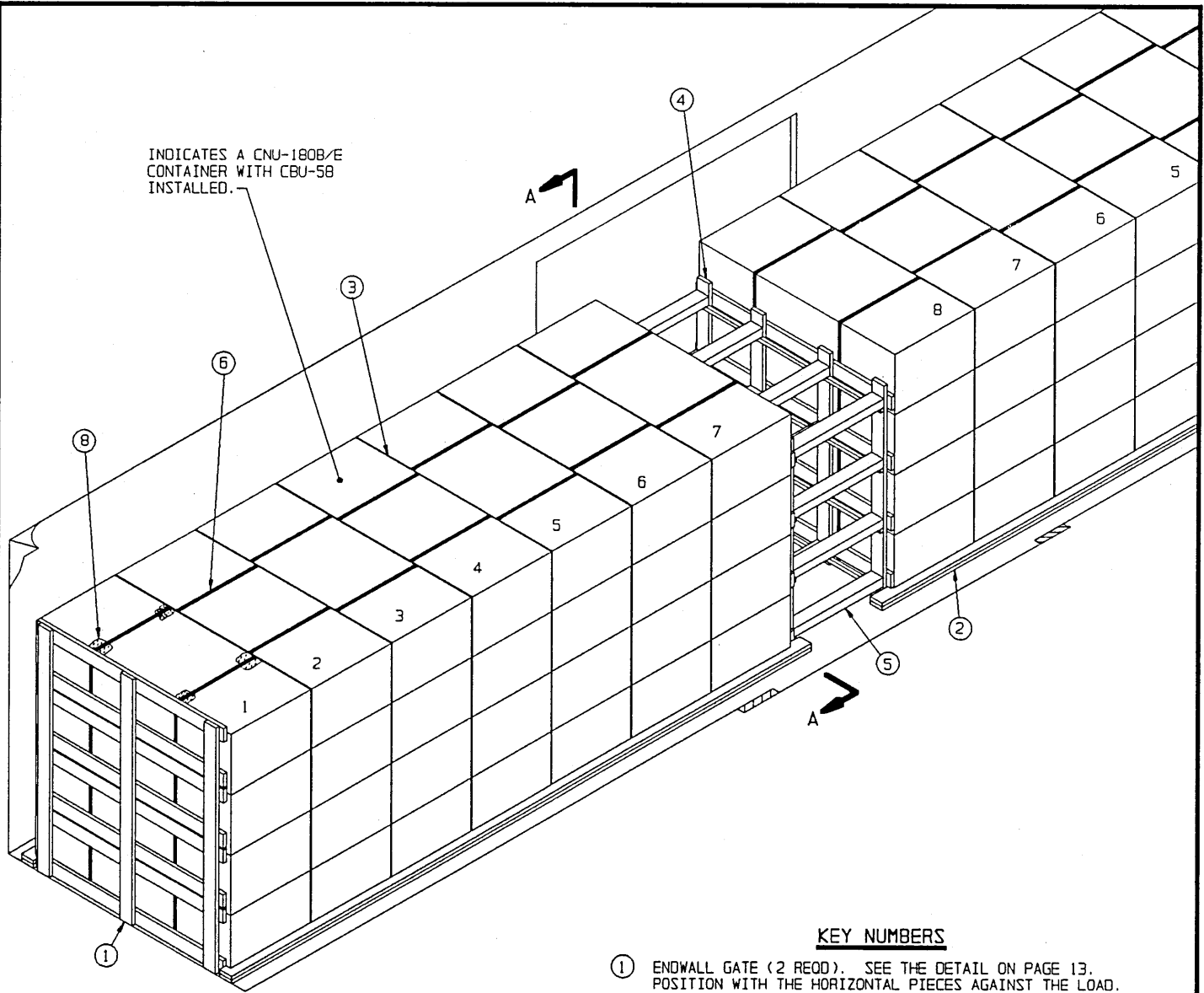
CONTAINER WEIGHT
 FOR CBU-58 - - - - - 2.084 LBS (APPROX)
 FOR CBU-71 - - - - - 2.064 LBS (APPROX)
 CONTAINER CUBE - - - - - 47.9 CU FT (APPROX)



CNU-180B/E CONTAINER

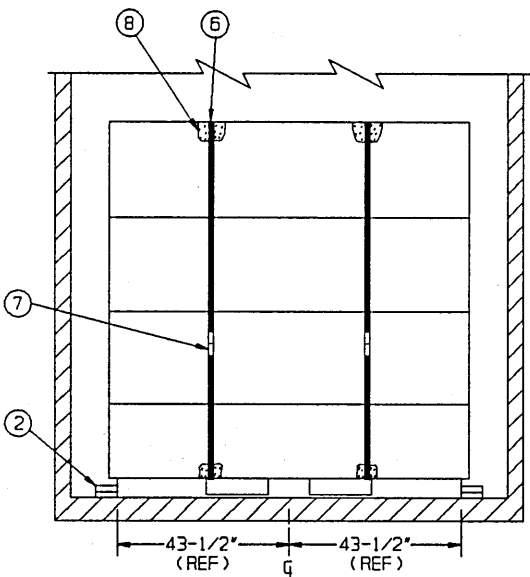
CONTAINER WEIGHT
 FOR CBU-58 - - - - - 2.084 LBS (APPROX)
 FOR CBU-71 - - - - - 2.064 LBS (APPROX)
 CONTAINER CUBE - - - - - 45.9 CU FT (APPROX)

CONTAINER DETAILS



INDICATES A CNU-180B/E CONTAINER WITH CBU-58 INSTALLED.

ISOMETRIC VIEW



SECTION A-A

**60-CONTAINER LOAD
IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR**

KEY NUMBERS

- ① ENDWALL GATE (2 REOD). SEE THE DETAIL ON PAGE 13. POSITION WITH THE HORIZONTAL PIECES AGAINST THE LOAD. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTE 4 ON PAGE 7.
- 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 5 ON PAGE 7.
- ③ SEPARATOR GATE (13 REOD). POSITION WITH TIE PIECES AGAINST THE CONTAINERS. SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 10, AND SPECIAL NOTE 6 ON PAGE 7.
- ④ CENTER GATE (2 REOD). SEE THE "CENTER GATE A" DETAIL ON PAGE 11, AND SPECIAL NOTE 7 ON PAGE 7.
- ⑤ STRUT, 4" X 6" BY A LENGTH TO SUIT (REF: 41") (16 REOD). TOENAIL TO PIECES MARKED ④ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "T" AND "U" ON PAGE 3, AND SPECIAL NOTE 8 ON PAGE 7.
- ⑥ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 23'-6" LONG STEEL STRAPPING (30 REOD). SEE SPECIAL NOTE 9 ON PAGE 7.
- ⑦ SEAL FOR 1-1/4" STRAPPING (30 REOD, 1 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES. SEE GENERAL NOTE "N" ON PAGE 2.
- ⑧ ANTI-CHAFING MATERIAL (AS REOD). POSITION UNDER ALL STRAPS AT POINTS OF CONTACT WITH CONTAINER.

(SPECIAL NOTES CONTINUED)

8. DOUBLED 2" X 6" STRUTS MAY BE USED IN LIEU OF THE 4" X 6" STRUTS SHOWN IN THE LOAD ON PAGE 6. LAMINATE W/2-10d NAILS EVERY 6". SEE GENERAL NOTE "K" ON PAGE 2.
9. STACK UNITIZING STRAPS, PIECES MARKED ⑥, MUST BE PRE-POSITIONED, THREADED THRU THE FORKLIFT POCKETS OF THE BOTTOM CONTAINER AND INSTALLED TO ENCIRCLE THE REST OF THE CONTAINER STACK. POSITION THE STRAPS AS FAR APART AS THE FORKLIFT POCKETS PERMIT.
10. 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 37 THRU 42 FOR GUIDANCE.
11. FOR CNU-180/E CONTAINERS. "SEPARATOR GATE B" DETAILED ON PAGE 12 MUST BE INSTALLED IN LIEU OF PIECE MARKED ③, OR "ALTERNATIVE SEPARATOR GATE A" DETAILED ON PAGE 10 MAY BE USED.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE SPECIAL NOTE 2 BELOW.
2. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS. SEE GENERAL NOTES "AA THRU "FF" ON PAGE 4 FOR GUIDANCE. OMIT PIECES MARKED ④ AND ⑤, AND INSTALL TWO ADDITIONAL SEPARATOR GATES MARKED ③, BETWEEN CONTAINERS AND BULKHEADS.
3. CNU-180B/E CONTAINERS W/CBU-58 ARE SHOWN IN THE LOAD VIEW ON PAGE 6. A MAXIMUM OF 48 CONTAINERS FOR AN APPROXIMATE LADING WEIGHT OF 100,032 POUNDS CAN BE PLACED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES. SEVENTY-SIX CONTAINERS FOR AN APPROXIMATE LADING WEIGHT OF 158,384 POUNDS CAN BE LOADED IN A 60'-8" LONG CAR. THE DEPICTED PROCEDURES ARE APPLICABLE FOR BOTH OF THE CONTAINERS DEPICTED ON PAGE 5.
4. FILL PIECES AND SHIM MATERIAL MUST BE INSTALLED ON ALL ENDWALL GATES WHEN THE ENDWALLS ARE BOWED OUTWARD 2" OR MORE EITHER FROM SIDE-TO-SIDE OR FROM FLOOR-TO-ROOF. TO PROVIDE FOR A UNIFORM LOAD BEARING SURFACE. NAIL HORIZONTAL 2" X 6" FILL PIECES TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT, ONE REQUIRED FOR EACH HORIZONTAL PIECE ON THE OPPOSITE SIDE. THEN INSTALL SHIM MATERIAL, 6" WIDE PLYWOOD OR DIMENSIONAL LUMBER OF A THICKNESS AND LENGTH AS REQUIRED TO FILL THE VOID BETWEEN THE CAR ENDWALL AND THE ENDWALL GATE. NAIL TO THE FILL PIECE AND/OR LAMINATE W/1 APPLICABLY SIZED NAIL EVERY 6".
5. 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'-3" 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.
6. SEPARATOR GATES MAY BE FORMED FROM 1/2" OR THICKER PLYWOOD IN LIEU OF 3/8", OR THEY MAY BE CONSTRUCTED FROM DIMENSIONAL LUMBER AS SHOWN BY THE "ALTERNATIVE SEPARATOR GATE A" DETAIL ON PAGE 10. SEE SPECIAL NOTE 11.
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 46 FOR GUIDANCE.

(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 2"	58	20
2" X 3"	26	13
2" X 4"	23	15
2" X 6"	477	477
4" X 6"	55	110
NAILS	NO. REQD	POUNDS
4d (1-1/2")	208	1/2
10d (3")	344	5-1/2
16d (3-1/2")	348	7-1/2
3/8" PLYWOOD	26 SHEETS REQD	858 LBS
1-1/4" STEEL STRAPPING	705' REQD	146 LBS
SEAL FOR 1-1/4" STRAPPING	60 REQD	3 LBS
ANTI-CHAFING MATERIAL	AS REQD	NIL

*THE TOTAL WEIGHT W/CBU-71 WILL BE 126.131 POUNDS.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER (W/CBU-58)	60	125,040 LBS
DUNNAGE		2,291 LBS

* TOTAL WEIGHT - - - - - 127.331 LBS (APPROX)

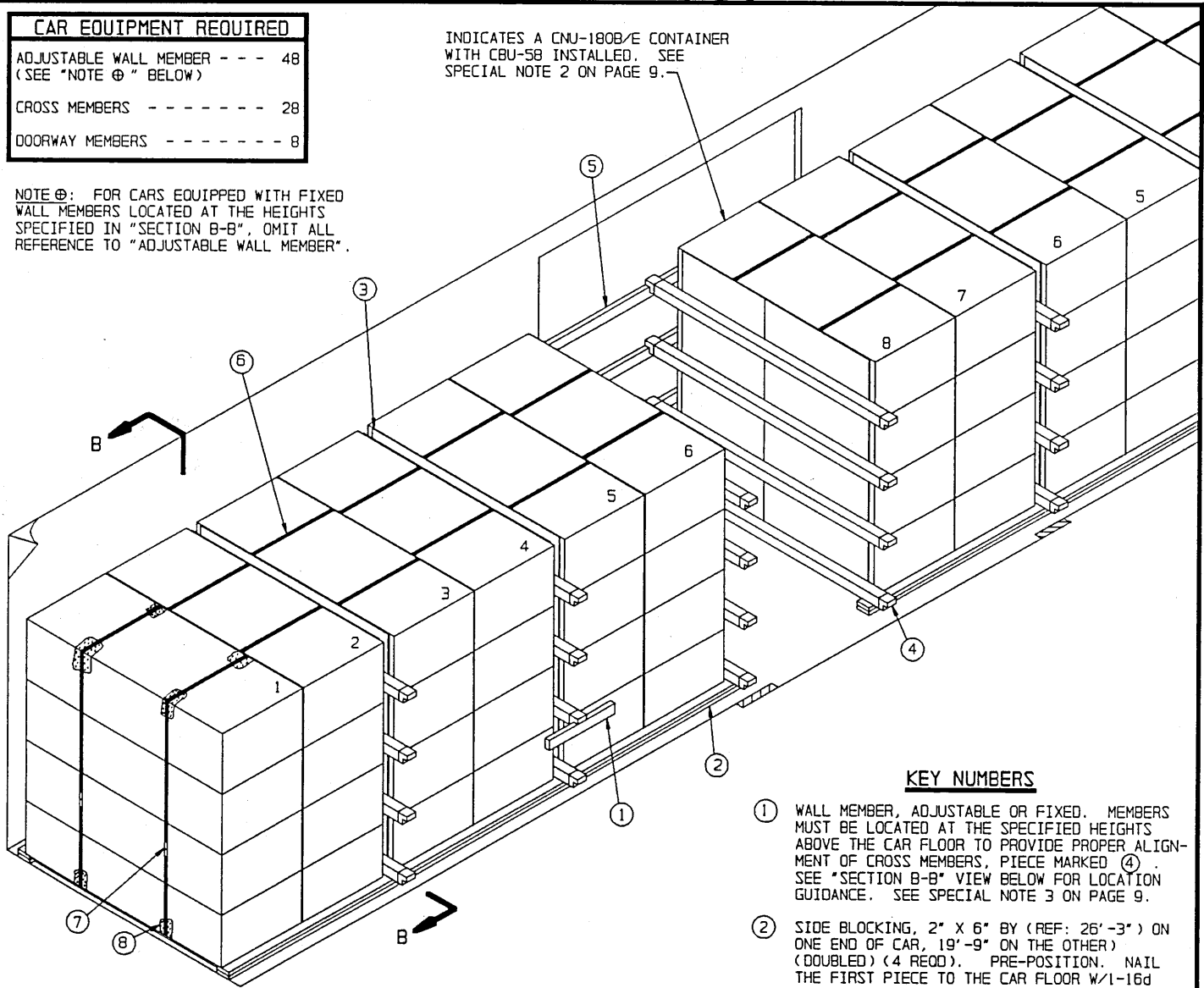
60-CONTAINER LOAD
IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR

CAR EQUIPMENT REQUIRED

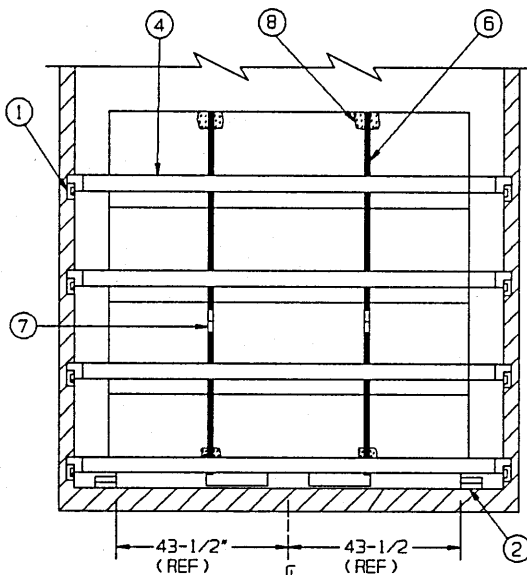
ADJUSTABLE WALL MEMBER - - - - -	48
(SEE "NOTE ④" BELOW)	
CROSS MEMBERS - - - - -	28
DOORWAY MEMBERS - - - - -	8

INDICATES A CNU-180B/E CONTAINER WITH CBU-58 INSTALLED. SEE SPECIAL NOTE 2 ON PAGE 9.

NOTE ④: FOR CARS EQUIPPED WITH FIXED WALL MEMBERS LOCATED AT THE HEIGHTS SPECIFIED IN "SECTION B-B", OMIT ALL REFERENCE TO "ADJUSTABLE WALL MEMBER".



ISOMETRIC VIEW



SECTION B-B

EACH DIMENSIONED HEIGHT ABOVE THE CAR FLOOR TO AN ADJUSTABLE OR FIXED WALL MEMBER MARKED ① AND/OR A DOORWAY MEMBER MARKED ⑤ 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 ④. SEE "SECTION B-B" VIEW BELOW FOR LOCATION GUIDANCE. SEE SPECIAL NOTE 3 ON PAGE 9.
- ② SIDE BLOCKING, 2" X 6" BY (REF: 26'-3" ON ONE END OF CAR, 19'-9" ON THE OTHER) (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 4 ON PAGE 9.
- ③ SEPARATOR GATE (19 REOD). POSITION WITH THE TIE PIECES AGAINST THE CONTAINERS. SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 10, AND SPECIAL NOTE 5 ON PAGE 9.
- ④ CROSS MEMBER (28 REOD). SEE GENERAL NOTE "W" ON PAGE 3.
- ⑤ DOORWAY MEMBER (8 REOD). SEE THE "SECTION B-B" VIEW AT LEFT FOR LOCATION GUIDANCE.
- ⑥ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 23'-6" LONG STEEL STRAPPING (28 REOD). PRE-POSITION. SEE SPECIAL NOTE 6 ON PAGE 9.
- ⑦ SEAL FOR 1-1/4" STRAPPING (28 REOD, 1 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES. SEE GENERAL NOTE "N" ON PAGE 2.
- ⑧ ANTI-CHAFING MATERIAL (AS REOD). POSITION UNDER ALL STRAPS AT POINTS OF CONTACT WITH CONTAINER.

NOTE: PIECE MARKED ③ HAS BEEN OMITTED FROM "SECTION B-B" FOR CLARITY.

56-CONTAINER LOAD

IN A 50'-6" LONG BY 9'-0" WIDE BOX CAR EQUIPPED WITH MECHANICAL BRACING DEVICES

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-0" WIDE (INSIDE DIMENSION) WOOD-LINED BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS, AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE SPECIAL NOTE 3 BELOW.
2. CNU-180B/E CONTAINERS W/CBU-58 ARE SHOWN IN THE LOAD VIEW ON PAGE 8. A MAXIMUM OF 48 CONTAINERS FOR AN APPROXIMATE LADING WEIGHT OF 100,032 POUNDS CAN BE PLACED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES. THE DEPICTED PROCEDURES ARE APPLICABLE FOR BOTH OF THE CONTAINERS DEPICTED ON PAGE 5.
3. IF A CAR HAS BOWED ENDWALLS WHICH ARE BOWED OUTWARD 2" OR MORE EITHER FROM SIDE-TO-SIDE OR FROM FLOOR-TO-ROOF, CROSS MEMBERS CAN BE INSTALLED NEAR THE ENDWALL OF THE CAR TO PROVIDE A "SQUARED END" RATHER THAN INSTALLING DUNNAGE AS SPECIFIED IN GENERAL NOTE "F" ON PAGE 2. THESE CROSS MEMBERS SHOULD BE INSTALLED AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE LOAD AS BLOCKING MEMBERS. A SEPARATOR GATE, SHOWN AS PIECE MARKED ③, OR "ALTERNATIVE SEPARATOR GATE B" DETAILED ON PAGE 12, MUST BE POSITIONED AGAINST THESE CROSS MEMBERS PRIOR TO LOADING.
4. 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'-3" 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.
5. SEPARATOR GATES, PIECES MARKED ③ MAY BE FORMED FROM 1/2" OR THICKER PLYWOOD IN LIEU OF 3/8", OR THEY MAY BE CONSTRUCTED FROM DIMENSIONAL LUMBER. SEE THE "ALTERNATIVE SEPARATOR GATE A" DETAIL ON PAGE 10, AND THE "ALTERNATIVE SEPARATOR GATE B" DETAIL ON PAGE 12. NOTE THAT ALTERNATIVE SEPARATOR GATE "A" IS DESIGNED FOR USE BETWEEN CONTAINER STACKS ONLY, AND ALTERNATIVE SEPARATOR GATE "B" IS DESIGNED TO BE USED AT CROSS MEMBER LOCATIONS. POSITION WITH THE VERTICAL PIECES AGAINST THE CONTAINERS.
6. UNITIZING STRAPS, PIECES MARKED ⑥ MUST BE PRE-POSITIONED, THREADED THRU THE FORKLIFT POCKETS OF THE BOTTOM CONTAINER, AND INSTALLED TO ENCIRCLE THE REST OF THE CONTAINER STACK. POSITION THE STRAPS AS FAR APART AS THE FORKLIFT POCKETS PERMIT.
7. 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
2" X 3"	38	19
2" X 6"	184	184
NAILS	NO. REQD	POUNDS
4d (1-1/2")	304	3/4
16d (3-1/2")	276	6
3/8" PLYWOOD	38 SHEETS REQD	1,254 LBS
1-1/4" STEEL STRAPPING	952' REQD	136 LBS
SEAL FOR 1-1/4" STRAPPING	56 REQD	3 LBS
ANTI-CHAFING MATERIAL	AS REQD	NIL

* THE TOTAL WEIGHT W/CBU-71 WILL BE 117,390 LBS.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER (W/CBU-58)	56	116,704 LBS
DUNNAGE		1,806 LBS

* TOTAL WEIGHT - - - - - 118,510 LBS (APPROX)

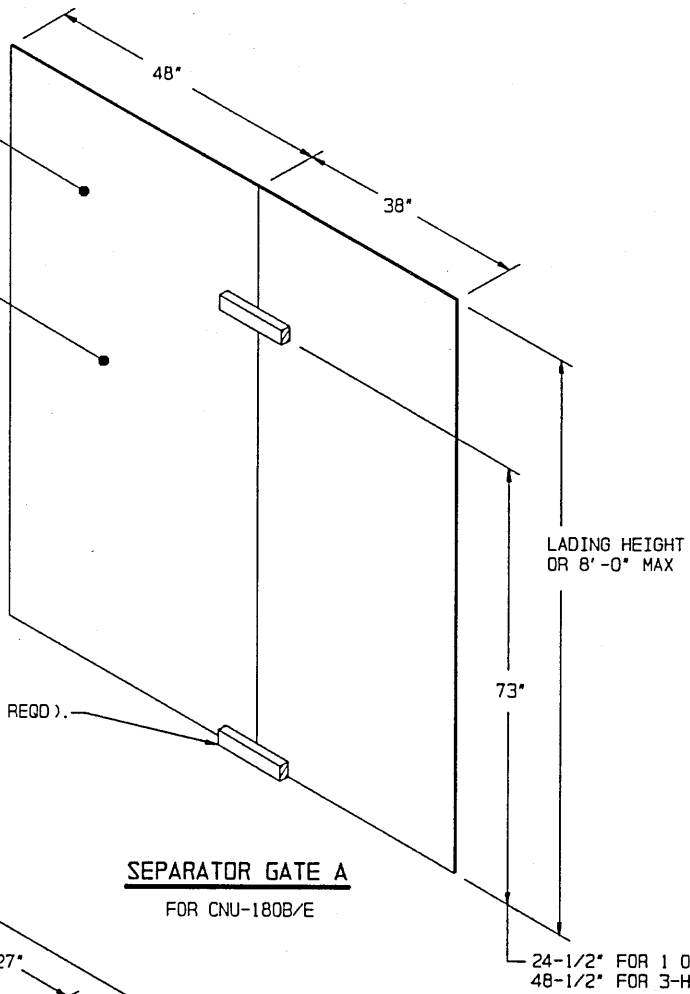
MINUS 3" IS PERMITTED.

**56-CONTAINER LOAD
IN A 50'-6" LONG BY 9'-0" WIDE BOX CAR EQUIPPED WITH MECHANICAL BRACING DEVICES**

3/8" OR THICKER PLYWOOD, 38" WIDE BY LOAD HEIGHT AND 48" WIDE BY LOAD HEIGHT (1 EACH REQD). NAIL TO THE TIE PIECES W/4-6d NAILS AT EACH JOINT.

POSITION THIS SIDE AGAINST CONTAINERS.

TIE PIECE, 2" X 3" X 12" (2 REQD).



SEPARATOR GATE A

FOR CNU-180B/E

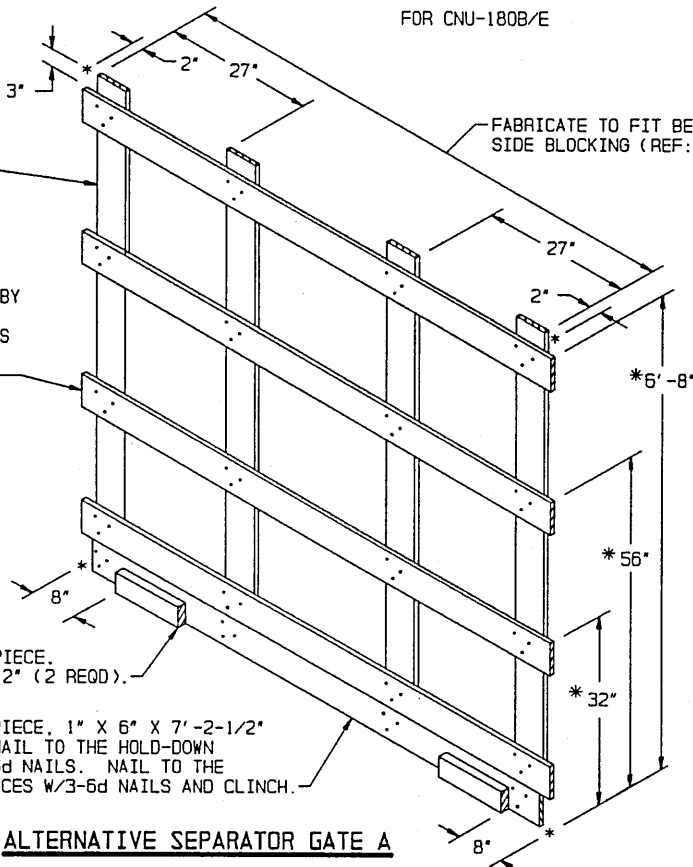
VERTICAL PIECE, 1" X 6" BY HEIGHT OF TOP HORIZONTAL PIECE PLUS 3" (4 REQD).

HORIZONTAL PIECE, 1" X 6" BY CONTAINER LENGTH (4 REQD). NAIL TO THE VERTICAL PIECES W/3-6d NAILS AT EACH JOINT AND CLINCH.

HOLD-DOWN PIECE, 2" X 4" X 12" (2 REQD).

HORIZONTAL PIECE, 1" X 6" X 7'-2-1/2" (1 REQD). NAIL TO THE HOLD-DOWN PIECES W/3-6d NAILS. NAIL TO THE VERTICAL PIECES W/3-6d NAILS AND CLINCH.

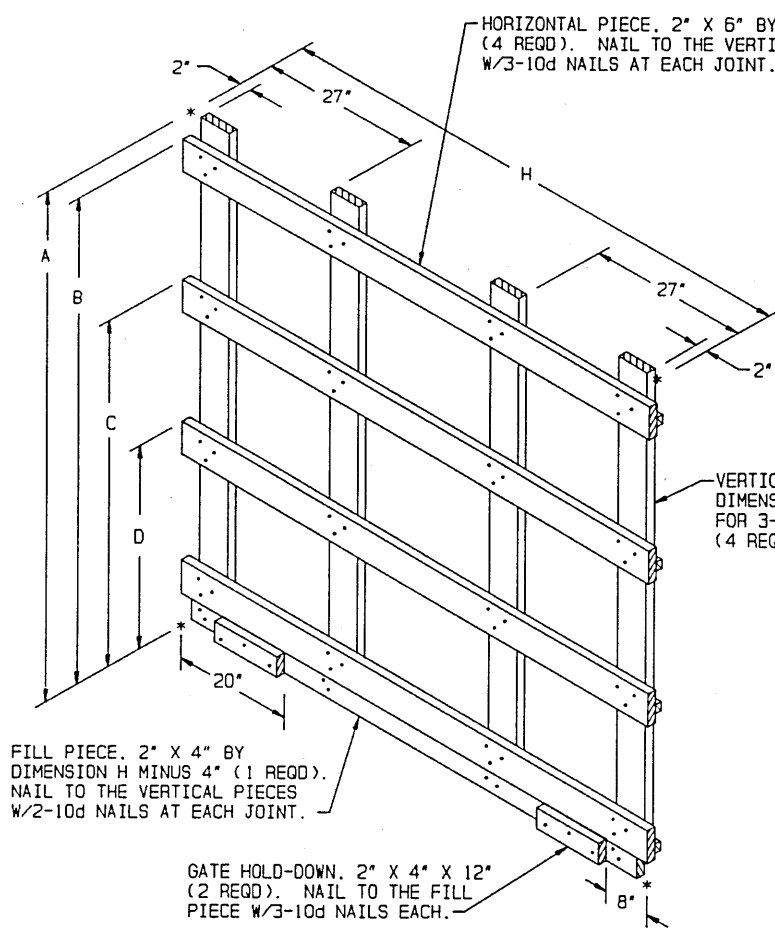
FABRICATE TO FIT BETWEEN INSTALLED SIDE BLOCKING (REF: 7'-2-1/2")



*THESE DIMENSIONS WILL BE 33", 57", AND 6'-10" RESPECTIVELY FOR CNU-180/E CONTAINERS.

ALTERNATIVE SEPARATOR GATE A

FOR CNU-180B/E AND 180/E CNTRS.

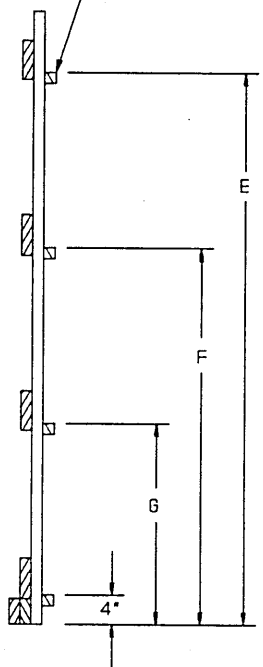


STRUT LEDGER, 2" X 2" OR 2" X 4" BY DIMENSION H MINUS 4" (4 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.

VERTICAL PIECE, 2" X 6" BY DIMENSION C OR D PLUS 4" FOR 3-HIGH OR 2-HIGH LOADS (4 REQD).

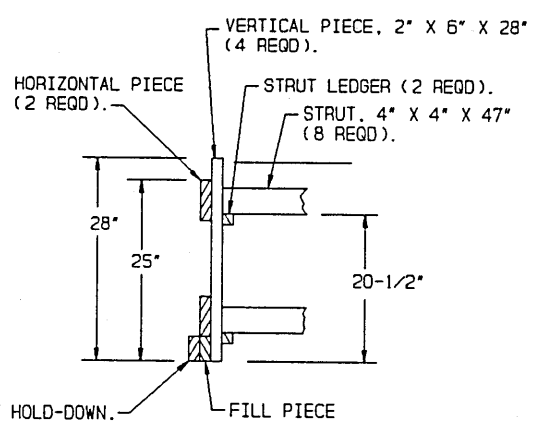
FILL PIECE, 2" X 4" BY DIMENSION H MINUS 4" (1 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.

GATE HOLD-DOWN, 2" X 4" X 12" (2 REQD). NAIL TO THE FILL PIECE W/3-10d NAILS EACH.



END VIEW

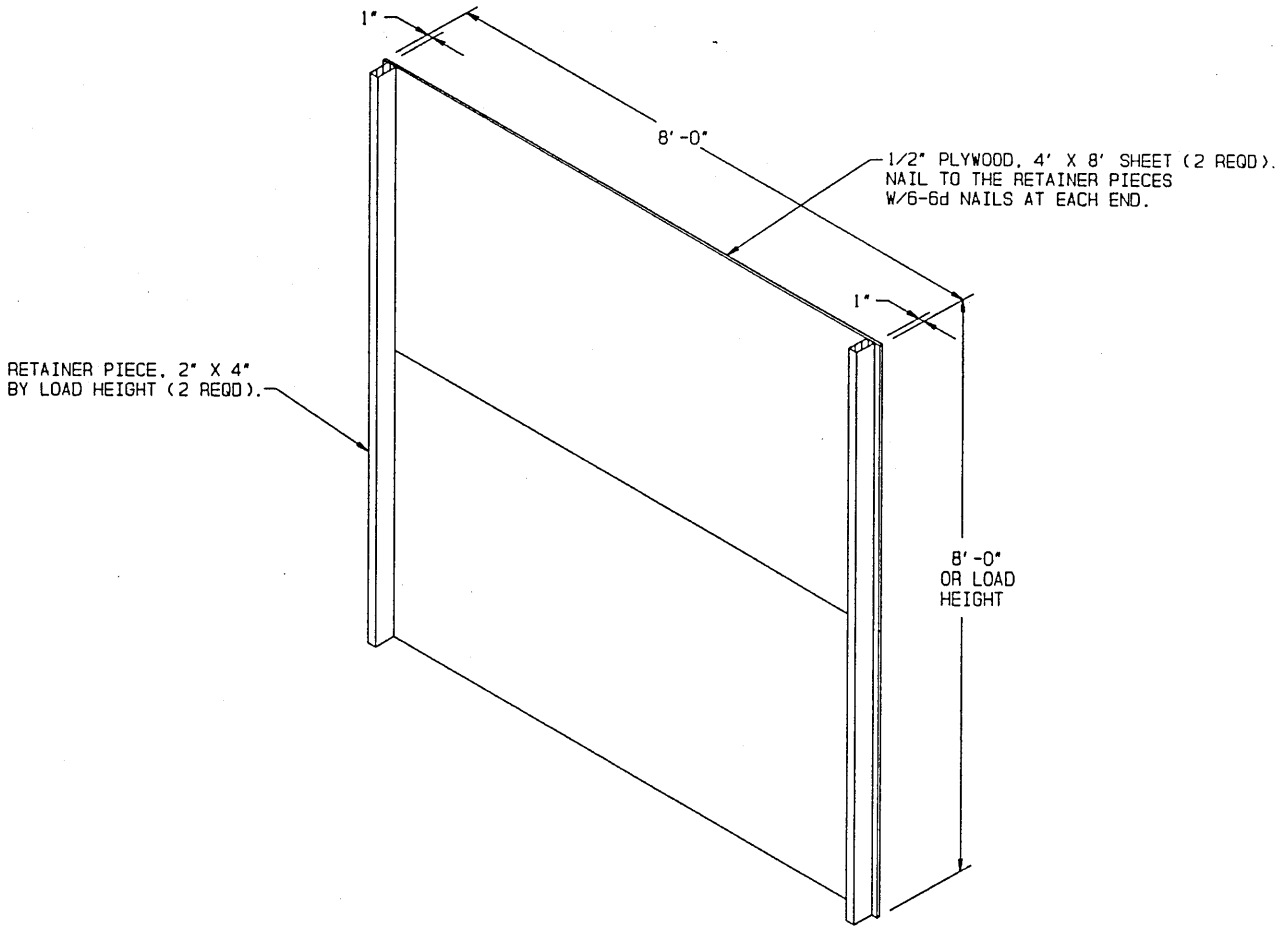
CENTER GATE A



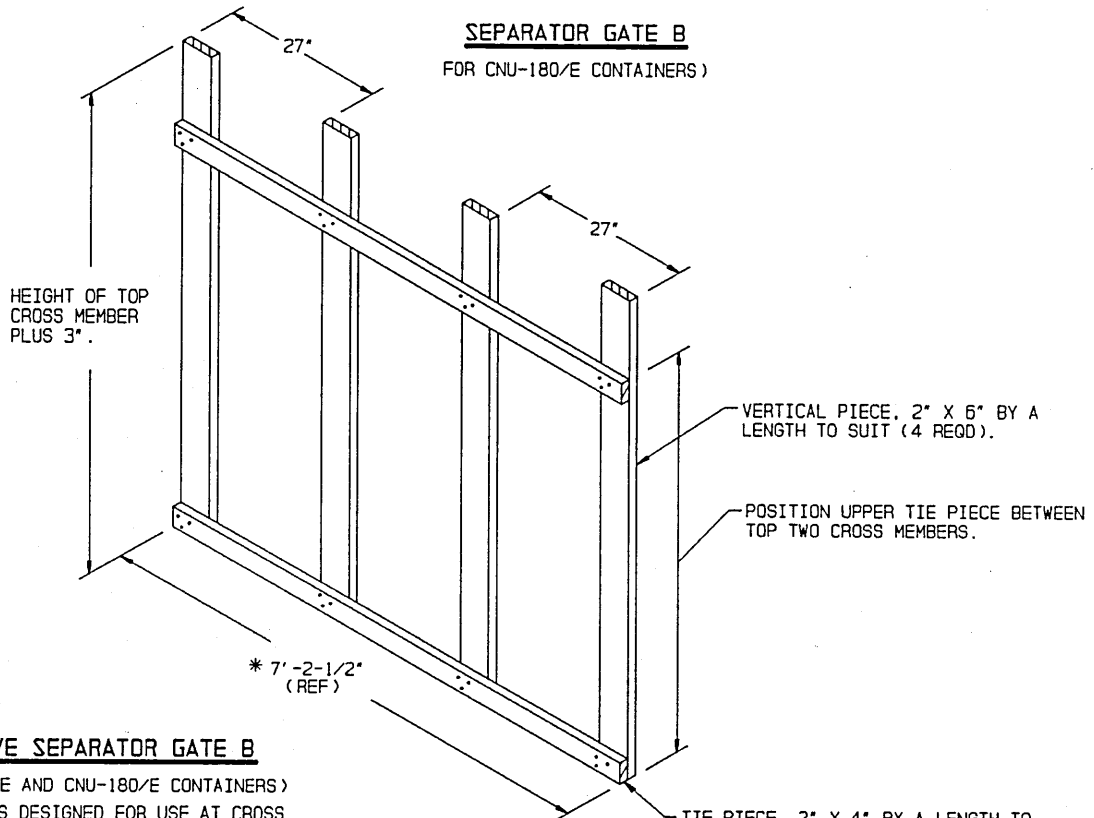
END VIEW

THE END VIEW ABOVE DEPICTS A CENTER GATE FOR A 1-HIGH LOAD. NOTE THAT THE STRUTS ARE 4" X 4" MATERIAL POSITIONED AT THE UPPER AND LOWER BEARING SURFACES OF THE CONTAINER. REFER TO "CENTER GATE A" ABOVE FOR NAILING GUIDANCE, DIMENSIONS AND PLACEMENT OF PIECES WHICH ARE NOT SHOWN ABOVE.

CENTER GATE "A" DIM CHART		
DIM	CNU-180B/E	CNU-180/E
A	7'-0"	7'-2"
B	6'-8"	6'-10"
C	56.0"	57.5"
D	32.0"	33.0"
E	6'-3.5"	6'-5.5"
F	51.5"	53"
G	27.5"	28.5"
H	7'-6.5"	7'-7"



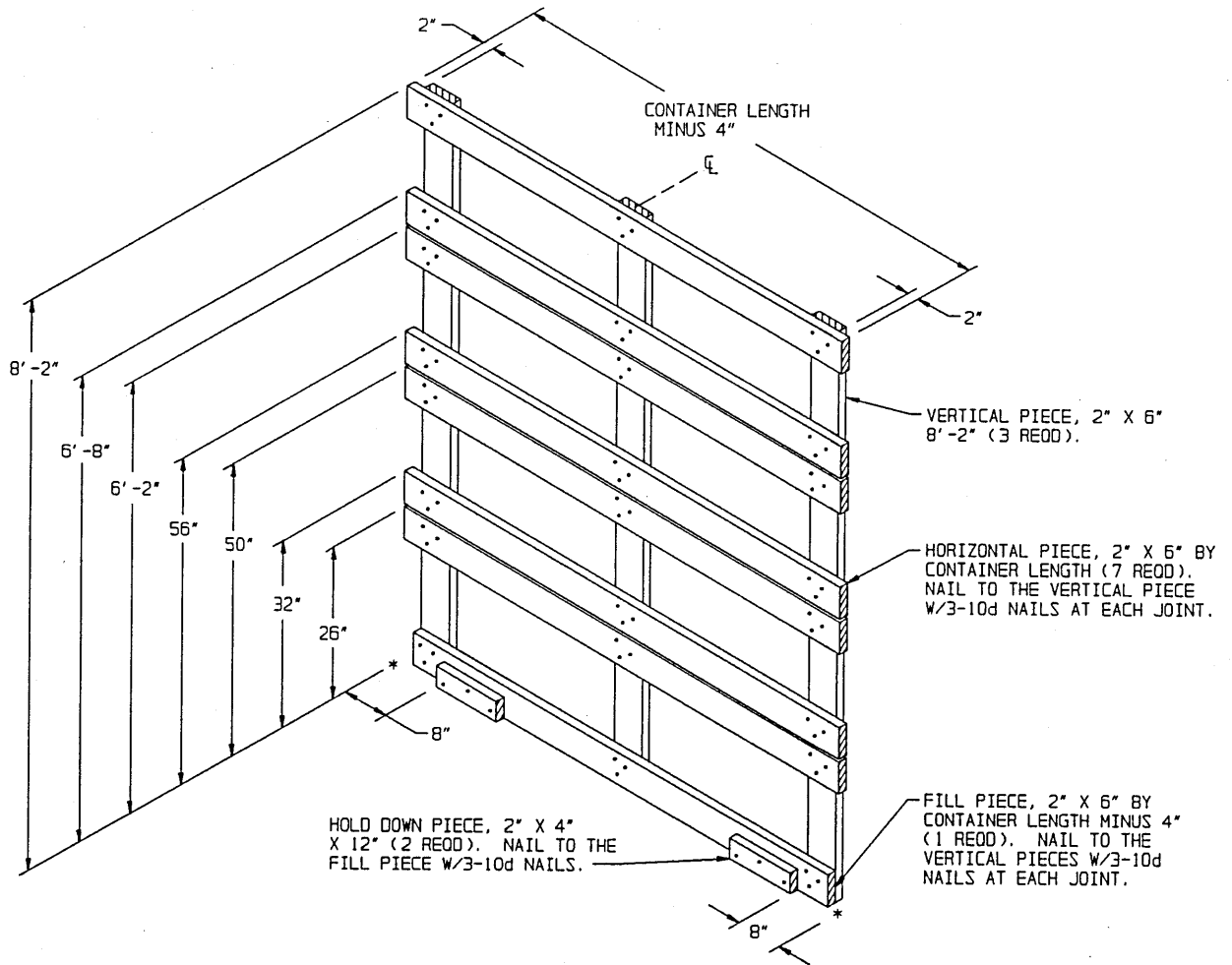
SEPARATOR GATE B
(FOR CNU-180/E CONTAINERS)



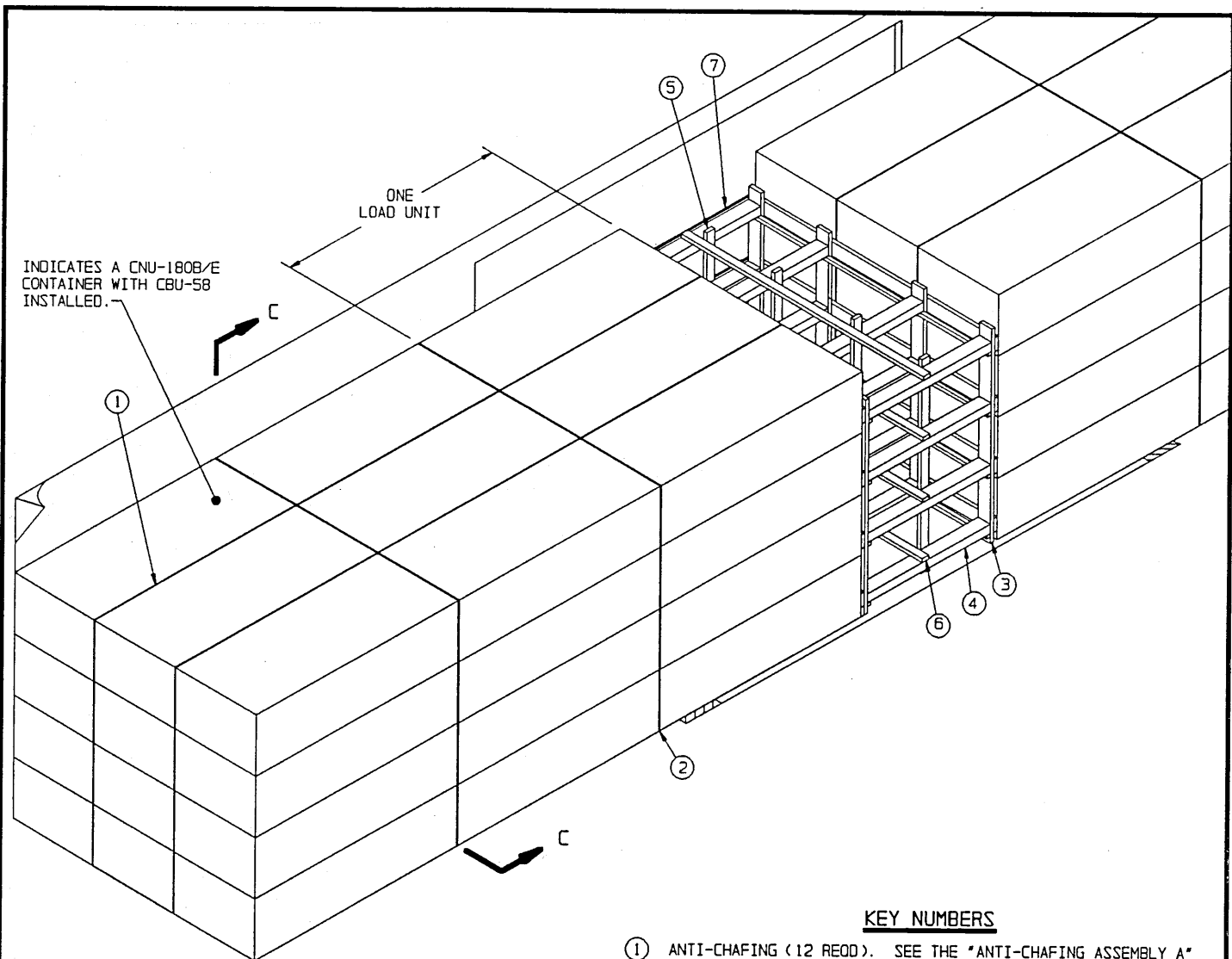
ALTERNATIVE SEPARATOR GATE B

(FOR CNU-180B/E AND CNU-180/E CONTAINERS)
THIS ASSEMBLY IS DESIGNED FOR USE AT CROSS MEMBER LOCATIONS ONLY. AS AN ALTERNATIVE TO PLYWOOD SEPARATOR GATES. POSITION WITH VERTICAL PIECES AGAINST THE CONTAINERS.

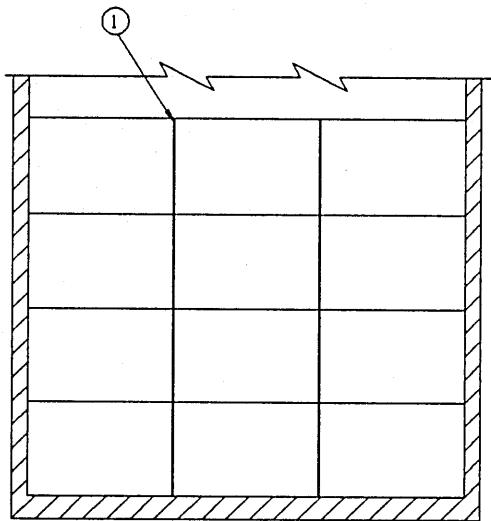
* THIS REFERENCE DIMENSION WILL BE 7'-3" FOR THE CNU-180/E CONTAINER.



ENDWALL GATE



ISOMETRIC VIEW



SECTION C-C

KEY NUMBERS

- ① ANTI-CHAFING (12 REOD). SEE THE "ANTI-CHAFING ASSEMBLY A" DETAIL ON PAGE 20, AND SPECIAL NOTE 3 ON PAGE 15.
- ② SEPARATOR GATE (4 REOD). POSITION SO THAT THE TIE PIECES ARE LOCATED UNDER THE OVERHANG OF THE CONTAINERS. SEE THE "SEPARATOR GATE C" DETAIL ON PAGE 21. SEE SPECIAL NOTE 4 ON PAGE 15.
- ③ CENTER GATE (2 REOD). SEE THE "CENTER GATE B" DETAIL ON PAGE 22, AND SPECIAL NOTE 5 ON PAGE 15.
- ④ STRUT, 4" X 6" BY A LENGTH TO SUIT (REF: 55") (16 REOD). TOENAIL TO PIECES MARKED ③ $\frac{1}{2}$ "-16d NAILS AT EACH END. SEE GENERAL NOTES "T" AND "U" ON PAGE 3, AND SPECIAL NOTE 6 ON PAGE 15.
- ⑤ VERTICAL STRUT BRACING, 2" X 4" X 7'-0" (4 REOD). NAIL TO STRUT MARKED ④ $\frac{1}{2}$ "-10d NAILS AT EACH JOINT.
- ⑥ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 1/2" (4 REOD). NAIL TO STRUT MARKED ④ $\frac{1}{2}$ "-10d NAILS AT EACH JOINT.
- ⑦ DOORWAY PROTECTION (2 REOD). SEE THE "DOORWAY PROTECTION A" DETAIL ON PAGE 23, AND SPECIAL NOTE 7 ON PAGE 15.

NOTE: SEPARATOR GATES, PIECES MARKED ②, HAVE BEEN OMITTED FROM THE SECTION VIEW FOR CLARITY.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-4" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR (HI-VOLUME) EQUIPPED WITH 16'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS, HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "E" AND "F" ON PAGE 2.
2. CNU-180B/E CONTAINERS W/CBU-58 ARE SHOWN IN THE LOAD VIEW ON PAGE 14. IF THE LOAD LIMIT PERMITS, A MAXIMUM OF 60 CONTAINERS FOR AN APPROXIMATE LADING WEIGHT OF 125,040 POUNDS CAN BE PLACED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES. EIGHTY-FOUR CONTAINERS FOR AN APPROXIMATE LADING WEIGHT OF 175,056 POUNDS CAN BE LOADED IN A 60'-8" LONG CAR, IF THE LOAD LIMIT PERMITS.
3. ANTI-CHAFING, SHOWN AS PIECE MARKED ① MAY BE FORMED FROM 1/2" 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 ①. SEE THE "ANTI-CHAFING ASSEMBLY B" DETAIL ON PAGE 20; NOTE THAT THE THICKNESS OF ANTI-CHAFING WILL DEPEND ON WHETHER OR NOT SIDEWALL LINING IS REQUIRED.
4. SEPARATOR GATES SHOWN AS PIECE MARKED ② MAY BE FORMED FROM 5/8" OR THICKER PLYWOOD IN LIEU OF 1/2", OR THEY MAY BE FABRICATED FROM DIMENSIONAL LUMBER. SEE THE "ALTERNATIVE SEPARATOR GATE C" DETAIL ON PAGE 21.
5. CENTER GATE "B" 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 46.
6. 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.
7. 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 ⑦ IN THE LOAD ON PAGE 14 IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND AVAILABLE DOOR POSTS; OR NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MAY BE USED. REFER TO PAGES 45 AND 46 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 ③ THRU ⑥ ON PAGE 18 AND SPECIAL NOTE 6 ON PAGE 19 FOR INSTALLATION GUIDANCE.
8. 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 34, OR THE ENTIRE TOP TIER CAN BE OMITTED. TO REDUCE A LOAD BY ONE CONTAINER, REFER TO THE "TYPICAL LCL PROCEDURES" ON PAGE 36.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 2"	75	25
2" X 3"	78	39
2" X 4"	102	68
2" X 6"	131	131
4" X 6"	110	220
NAILS	NO. REQD	POUNDS
4d (1-1/2")	256	3/4
6d (2")	48	1/4
10d (3")	372	5-3/4
12d (3-1/4")	32	1/2
16d (3-1/2")	96	1/2
1/4" PLYWOOD	24 SHEETS REQD	528 LBS
1/2" PLYWOOD	8 SHEETS REQD	352 LBS

* THE TOTAL WEIGHT W/CBU-71 WILL BE 150,070 POUNDS.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER (W/CBU-58)	72	150,048 LBS
DUNNAGE		1,856 LBS

* TOTAL WEIGHT - - - - - 151,904 LBS (APPROX)

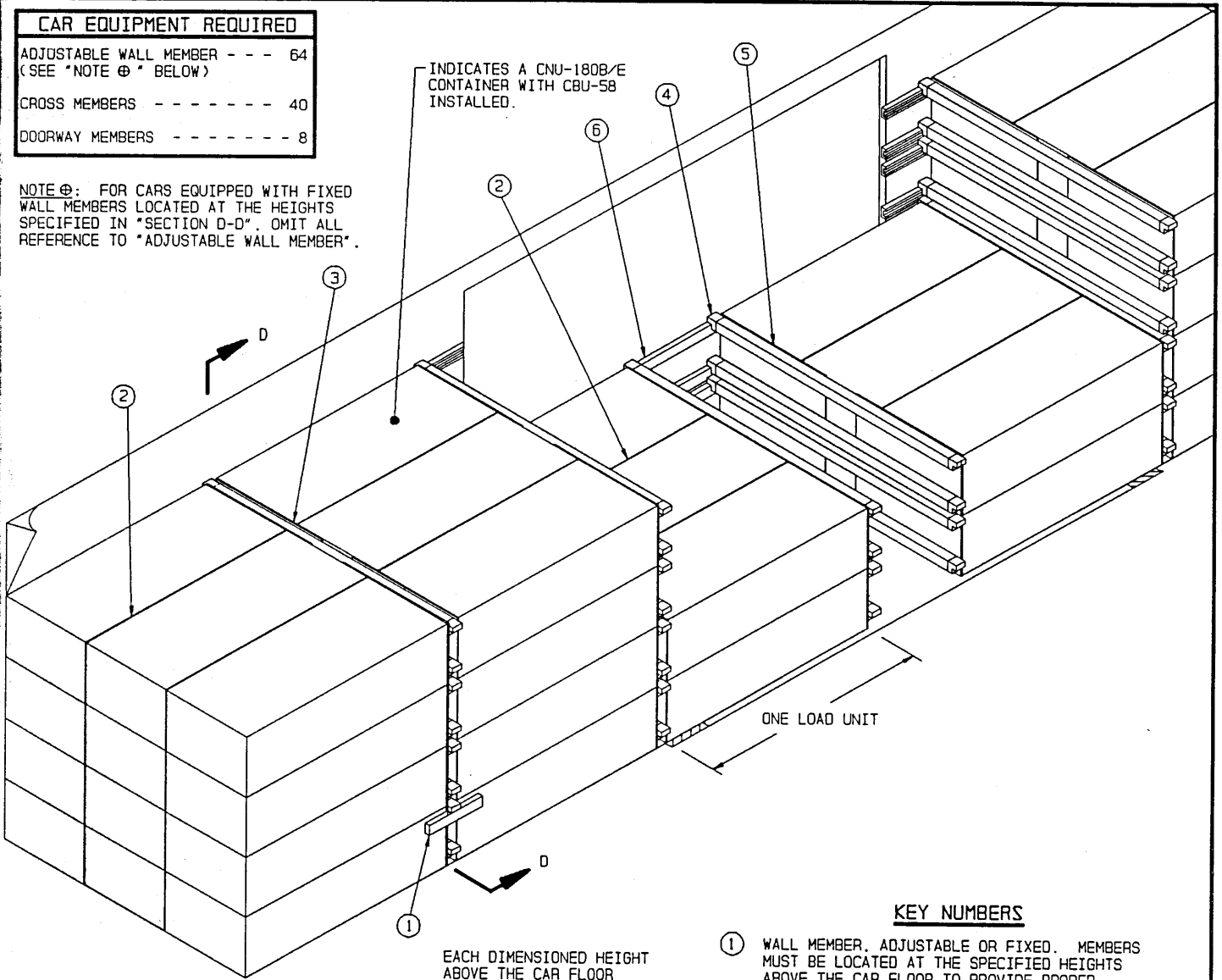
**72-CONTAINER LOAD
IN A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL BOX CAR**

CAR EQUIPMENT REQUIRED

ADJUSTABLE WALL MEMBER - - -	64
(SEE "NOTE ④" BELOW)	
CROSS MEMBERS - - - - -	40
DOORWAY MEMBERS - - - - -	8

NOTE ④: FOR CARS EQUIPPED WITH FIXED WALL MEMBERS LOCATED AT THE HEIGHTS SPECIFIED IN "SECTION D-D". OMIT ALL REFERENCE TO "ADJUSTABLE WALL MEMBER".

INDICATES A CNU-180B/E CONTAINER WITH CBU-58 INSTALLED.

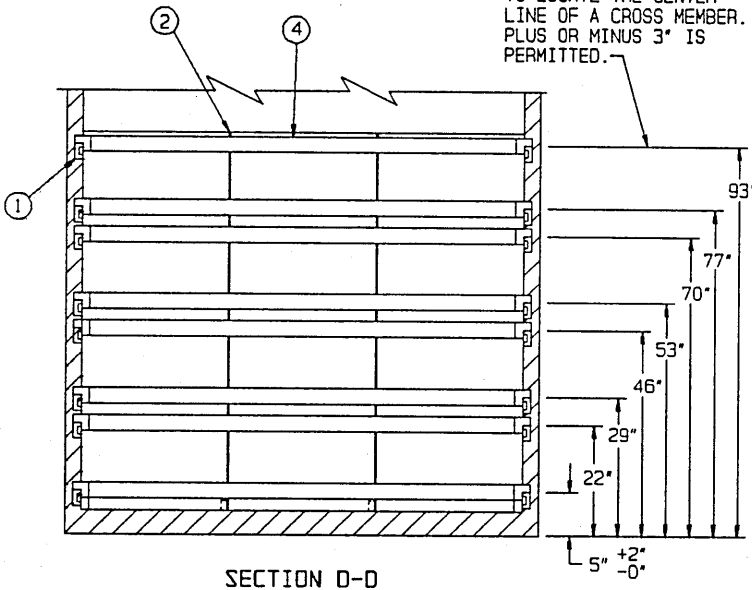


ISOMETRIC VIEW

EACH DIMENSIONED HEIGHT ABOVE THE CAR FLOOR TO AN ADJUSTABLE OR FIXED WALL MEMBER MARKED ① AND/OR DOORWAY MEMBER MARKED ⑥ IS SPECIFIED TO LOCATE THE CENTER LINE OF A 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 ④. SEE "SECTION D-D" VIEW BELOW FOR LOCATION GUIDANCE.
- ② ANTI-CHAFING (12 REQD, EIGHT 4-HIGH, AND FOUR 2-HIGH). SEE THE "ANTI-CHAFING ASSEMBLY A" DETAIL ON PAGE 20, AND SPECIAL NOTE 3 ON PAGE 17.
- ③ SEPARATOR GATE FOR 4-HIGH (6 REQD). SEE THE "SEPARATOR GATE C" DETAIL ON PAGE 21. POSITION WITH THE TIE PIECES UNDER THE OVERHANG OF THE CONTAINERS. SEE SPECIAL NOTES 4 AND 5 ON PAGE 17.
- ④ CROSS MEMBER (40 REQD). SEE GENERAL NOTE "W" ON PAGE 3.
- ⑤ SEPARATOR GATE FOR 2-HIGH (4 REQD). SEE THE "SEPARATOR GATE C" DETAIL ON PAGE 21. POSITION WITH THE TIE PIECES UNDER THE OVERHANG OF THE CONTAINERS.
- ⑥ DOORWAY MEMBER (8 REQD). SEE THE "SECTION D-D" VIEW AT LEFT FOR LOCATION GUIDANCE. SEE SPECIAL NOTE 6 ON PAGE 17.



SECTION D-D

60-CONTAINER LOAD
IN A 50'-6" LONG BY 9'-4" WIDE BOX CAR EQUIPPED WITH MECHANICAL BRACING DEVICES

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-4" WIDE (INSIDE DIMENSION) (HI-VOLUME) WOOD-LINED BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS, AND WITH 16'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "E" AND "F" ON PAGE 2 AND SPECIAL NOTE 4 BELOW.
2. CNU-180B/E CONTAINERS W/CBU-58 ARE SHOWN IN THE LOAD VIEW ON PAGE 16. IF THE LOAD LIMIT PERMITS, A MAXIMUM OF 48 CONTAINERS FOR AN APPROXIMATE LADING WEIGHT OF 100,032 POUNDS CAN BE PLACED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES.
3. ANTI-CHAFING, SHOWN AS PIECES MARKED ② MAY BE FORMED FROM 1/2" OR THICKER PLYWOOD IN LIEU OF 1/4". IF DESIRED. IF THE CAR TO BE LOADED IS AT LEAST 9'-6" WIDE, "ANTI-CHAFING ASSEMBLY B" DETAILED ON PAGE 20 MAY BE USED IN LIEU OF PIECE MARKED ②, PROVIDED SIDEWALL LINING IS NOT REQUIRED.
4. IF A CAR HAS BOWED ENDWALLS WHICH ARE BOWED OUTWARD 2" OR MORE EITHER FROM SIDE-TO-SIDE OR FROM FLOOR-TO-ROOF, CROSS MEMBERS CAN BE INSTALLED NEAR THE ENDWALL OF THE CAR TO PROVIDE A "SQUARED END" RATHER THAN INSTALLING DUNNAGE AS SPECIFIED IN GENERAL NOTE "F" ON PAGE 2. THESE CROSS MEMBERS SHOULD BE INSTALLED AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE LOAD AS BLOCKING MEMBERS. A SEPARATOR GATE, SHOWN AS PIECE MARKED ③, MUST BE POSITIONED AGAINST THESE CROSS MEMBERS PRIOR TO LOADING.
5. SEPARATOR GATES, SHOWN AS PIECES MARKED ③ AND ⑤ MAY BE FORMED FROM 5/8" OR THICKER PLYWOOD IN LIEU OF 3/8". OR THEY MAY BE CONSTRUCTED FROM DIMENSIONAL LUMBER. SEE THE "ALTERNATIVE SEPARATOR GATE C" DETAIL ON PAGE 21. POSITION WITH THE HORIZONTAL PIECES AGAINST THE CONTAINERS.
6. IF THE CAR TO BE LOADED IS EQUIPPED WITH AT LEAST 12 DOORWAY MEMBERS, AND IF THE LOAD LIMIT PERMITS, AN ADDITIONAL 12 CONTAINERS CAN BE LOADED IN THE DOORWAY AREA.
7. 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 MULTIPLES OF 6 BY OMITTING ONE OR TWO ENTIRE LOAD UNITS.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 3"	84	42
NAILS	NO. REQD	POUNDS
4d (1-1/2")	192	1/2
6d (2")	240	1-1/2
1/4" PLYWOOD - - - -	20 SHEETS REQD - - - -	440 LBS
1/2" PLYWOOD - - - -	16 SHEETS REQD - - - -	704 LBS

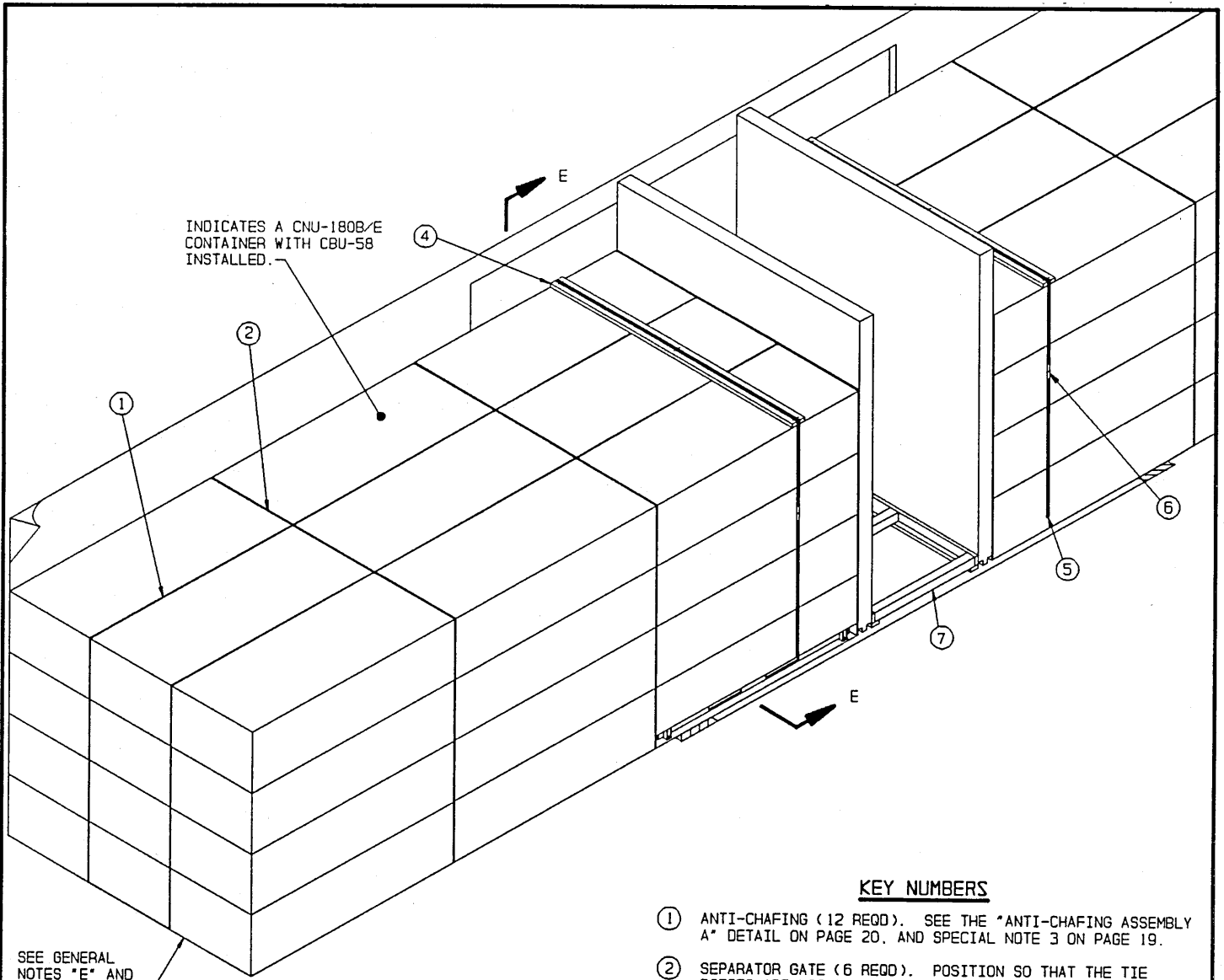
*THE TOTAL WEIGHT W/CBU-71
WILL BE 125.070 POUNDS.

LOAD AS SHOWN

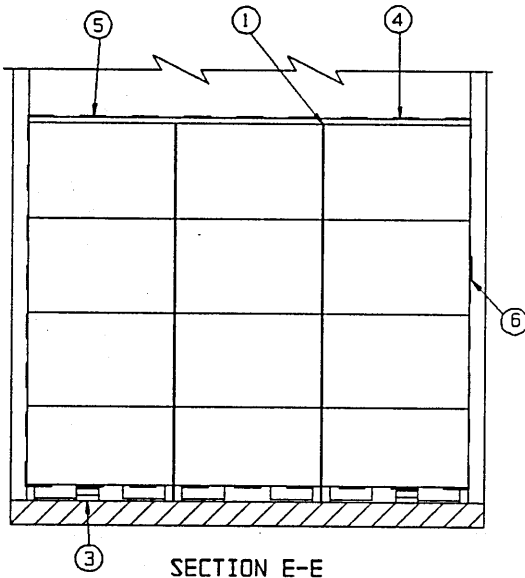
ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER (W/CBU-58)	60	125,040 LBS
DUNNAGE		1,230 LBS

*TOTAL WEIGHT - - - - - 126,270 LBS (APPROX)

**60-CONTAINER LOAD
IN A 50'-6" LONG BY 9'-4" WIDE BOXCAR EQUIPPED WITH MECHANICAL BRACING DEVICES**



ISOMETRIC VIEW

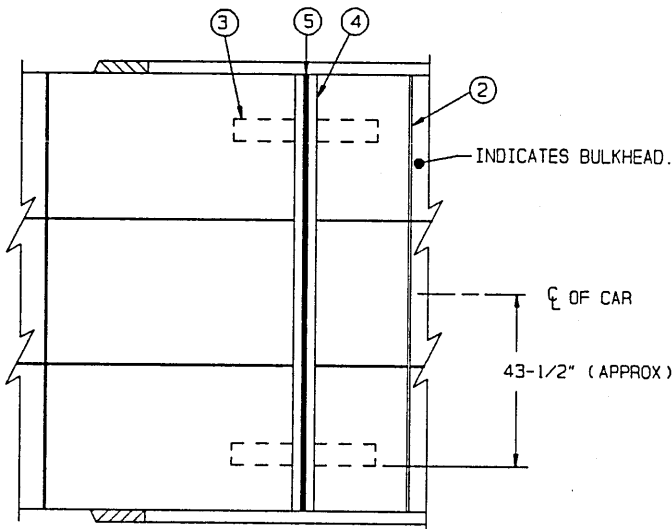


KEY NUMBERS

- ① ANTI-CHAFING (12 REQD). SEE THE "ANTI-CHAFING ASSEMBLY A" DETAIL ON PAGE 20, AND SPECIAL NOTE 3 ON PAGE 19.
- ② SEPARATOR GATE (6 REQD). POSITION SO THAT THE TIE PIECES ARE LOCATED UNDER THE OVERHANG OF THE CONTAINERS. SEE THE "SEPARATOR GATE C" DETAIL ON PAGE 21. SEE SPECIAL NOTE 4 ON PAGE 19.
- ③ FLOORLINE BLOCKING, 2" X 6" X 36" (DOUBLED) (4 REQD). PRE-POSITION AS SHOWN BY THE "PARTIAL PLAN VIEW" ON PAGE 19. NAIL THE FIRST PIECE TO THE CAR FLOOR W/8-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTES "L" ON PAGE 2, AND "R" ON PAGE 3. SEE SPECIAL NOTES 5 AND 6 ON PAGE 19.
- ④ STRAPPING BOARD, 2" X 6" BY LOAD WIDTH (2 REQD).
- ⑤ DOORWAY PROTECTION STRAP, 1-1/4" X .031" OR .035" X 36'-0" LONG STEEL STRAPPING (2 REQD). STAPLE TO STRAPPING BOARD W/3 STAPLES.
- ⑥ SEAL FOR 1-1/4" STRAPPING (4 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "N" ON PAGE 2.
- ⑦ STRUT ASSEMBLY (1 REQD). SEE THE "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL ON PAGE 48. INSTALL BETWEEN THE LOAD DIVIDER BULKHEADS. SEE SPECIAL NOTE 7 ON PAGE 19.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-4" WIDE WOOD-LINED CUSHIONED BOX CAR (HIGH VOLUME) EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 16'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "AA" THRU "EE" ON PAGE 4.
2. CNU 180B/E CONTAINERS W/CBU-58 ARE SHOWN IN THE LOAD VIEW ON PAGE 18. IF THE LOAD LIMIT PERMITS, A MAXIMUM OF 48 CONTAINERS FOR AN APPROXIMATE LADING WEIGHT OF 100,032 POUNDS CAN BE PLACED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES. EIGHTY-FOUR CONTAINERS FOR AN APPROXIMATE LADING WEIGHT OF 175,056 POUNDS CAN BE LOADED IN A 60'-8" LONG CAR IF THE LOAD LIMIT PERMITS.
3. ANTI-CHAFING, SHOWN AS PIECE MARKED ① MAY BE FORMED FROM 1/2" OR THICKER PLYWOOD IN LIEU OF 1/4". IF DESIRED. NOTE: PLYWOOD ANTI-CHAFING WHICH IS POSITIONED IN THE DOORWAY MUST BE NOTCHED TO ACCOMMODATE THE DOORWAY PROTECTION STRAPS, PIECES MARKED ⑤. IF THE CAR TO BE LOADED IS AT LEAST 9'-6" WIDE, "ANTI-CHAFING ASSEMBLY B" MUST BE INSTALLED IN LIEU OF PIECE MARKED ①. SEE THE "ANTI-CHAFING ASSEMBLY B" DETAIL ON PAGE 20; NOTE THAT THE THICKNESS OF ANTI-CHAFING WILL DEPEND ON WHETHER OR NOT SIDEWALL LINING IS REQUIRED.
4. SEPARATOR GATES, SHOWN AS PIECES MARKED ② MAY BE FORMED FROM 5/8" OR THICKER PLYWOOD IN LIEU OF 1/2". OR THEY MAY BE CONSTRUCTED FROM DIMENSIONAL LUMBER. SEE THE "ALTERNATIVE SEPARATOR GATE C" DETAIL ON PAGE 21.
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 ⑦ IN THE LOAD ON PAGE 14 IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MAY BE USED. REFER TO PAGES 45 AND 46 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.
6. FLOORLINE LINE BLOCKING, SHOWN AS PIECE MARKED ③ 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 FROM 6" TO 1/2 THE CONTAINER/LOAD UNIT LENGTH.
7. THE STRUT ASSEMBLY, SHOWN AS PIECE MARKED ⑦, IS REQUIRED WHEN THE LOAD IN EITHER END OF THE CAR IS 50,000 POUNDS OR MORE.
8. 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 34. OR THE ENTIRE TOP TIER CAN BE OMITTED. TO REDUCE A LOAD BY ONE CONTAINER, REFER TO THE "TYPICAL LCL PROCEDURES" ON PAGE 36. FOR OTHER METHODS OF REDUCING A LOAD, SEE GENERAL NOTE "FF" ON PAGE 4.



PARTIAL PLAN VIEW

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 8"	17	12
2" X 3"	60	30
2" X 4"	37	25
2" X 6"	43	43
4" X 4"	15	20
NAILS	NO. REQD	POUNDS
4d (1-1/2")	192	1/2
6d (2")	304	1-3/4
10d (3")	16	1/4
12d (3-1/4")	16	1/2
16d (3-1/2")	64	1-1/2
1/4" PLYWOOD	24 SHEETS REQD	528 LBS
1/2" PLYWOOD	12 SHEETS REQD	528 LBS
1-1/4" STEEL STRAPPING	72" REQD	11 LBS
SEAL FOR 1-1/4" STRAPPING	4 REQD	NIL
STAPLE FOR 1-1/4" STRAPPING	6 REQD	NIL

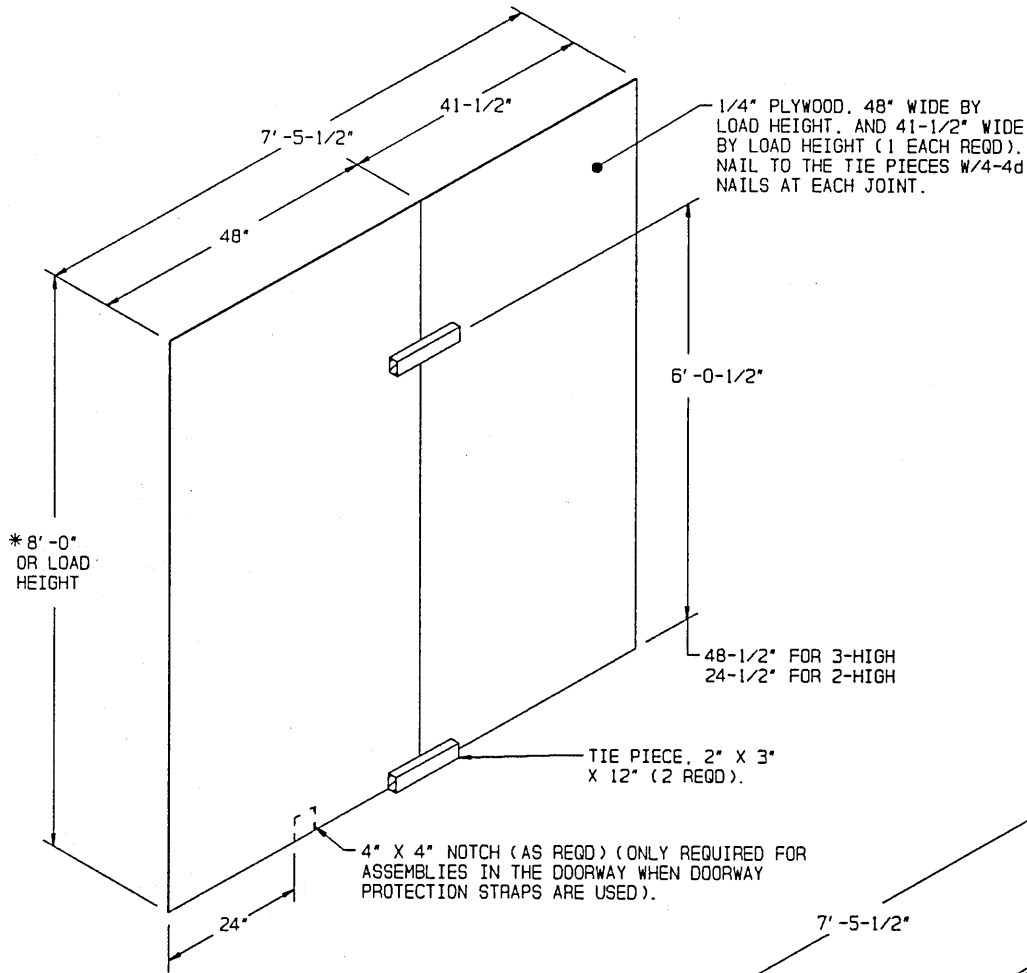
*THE TOTAL WEIGHT W/CBU-71 WILL BE 149,940 POUNDS.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER (W/CBU-58)	72	150,048 LBS
DUNNAGE		1,332 LBS

*TOTAL WEIGHT ----- 151,380 LBS (APPROX)

**72-CONTAINER LOAD
IN A 50'-6" LONG BY 9'-4" WIDE BOX CAR EQUIPPED WITH LOAD DIVIDERS**



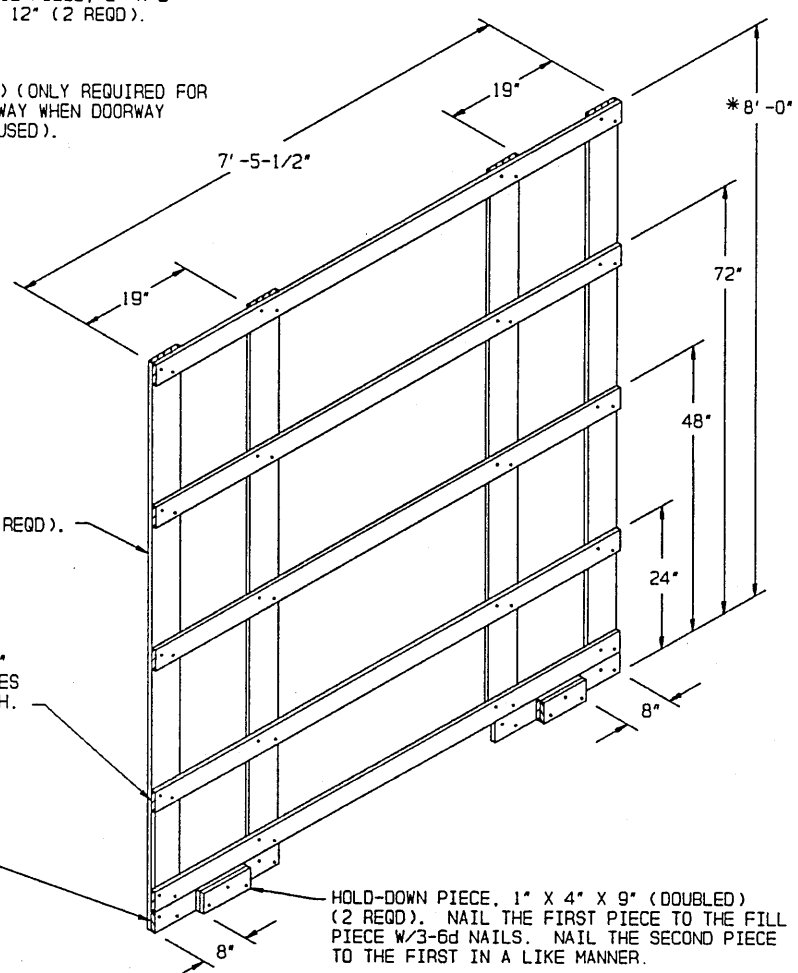
*THIS DIMENSION WILL BE 7'-11" FOR ANTI-CHAFING IN THE DOORWAY AREA WHEN DOORWAY PROTECTION STRAPS ARE USED.

ANTI-CHAFING ASSEMBLY A

VERTICAL PIECE, 1" X 6" X 8'-0" (4 REQD).

HORIZONTAL PIECE, 1" X 4" X 7'-5-1/2" (5 REQD). NAIL TO THE VERTICAL PIECES W/2-6d NAILS AT EACH JOINT AND CLINCH.

FILL PIECE, 1" X 4" X 24" (2 REQD). NAIL TO THE VERTICAL PIECES W/2-6d NAILS AT EACH END AND CLINCH.



HOLD-DOWN PIECE, 1" X 4" X 9" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE FILL PIECE W/3-6d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.

ANTI-CHAFING ASSEMBLY B

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

DETAILS

POSITION 1/2"
BENEATH OVERHANG
OF TOP CONTAINER.

1/2" PLYWOOD, 48" WIDE BY A
HEIGHT TO SUIT (2 REQD). NAIL
TO EACH TIE PIECE W/6-6d NAILS
AT EACH JOINT.

CAR WIDTH
MINUS 1/2"

LADING HEIGHT
8'-0" MAX

TIE PIECE, 2" X
3" X 36" (2 REQD).

* 31-1/2"

CAR WIDTH
MINUS 1/2"

SEPARATOR GATE C

* 31-1/2"

* THIS DIMENSION WILL BE
32-1/2" FOR A 9'-6"
WIDE CAR.

8'-4"

8'-1"

6'-9"

6'-1"

56"

49"

32"

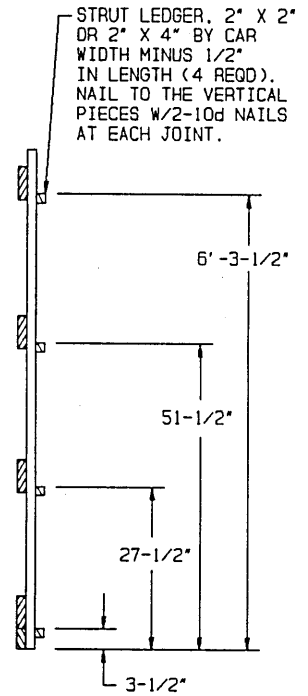
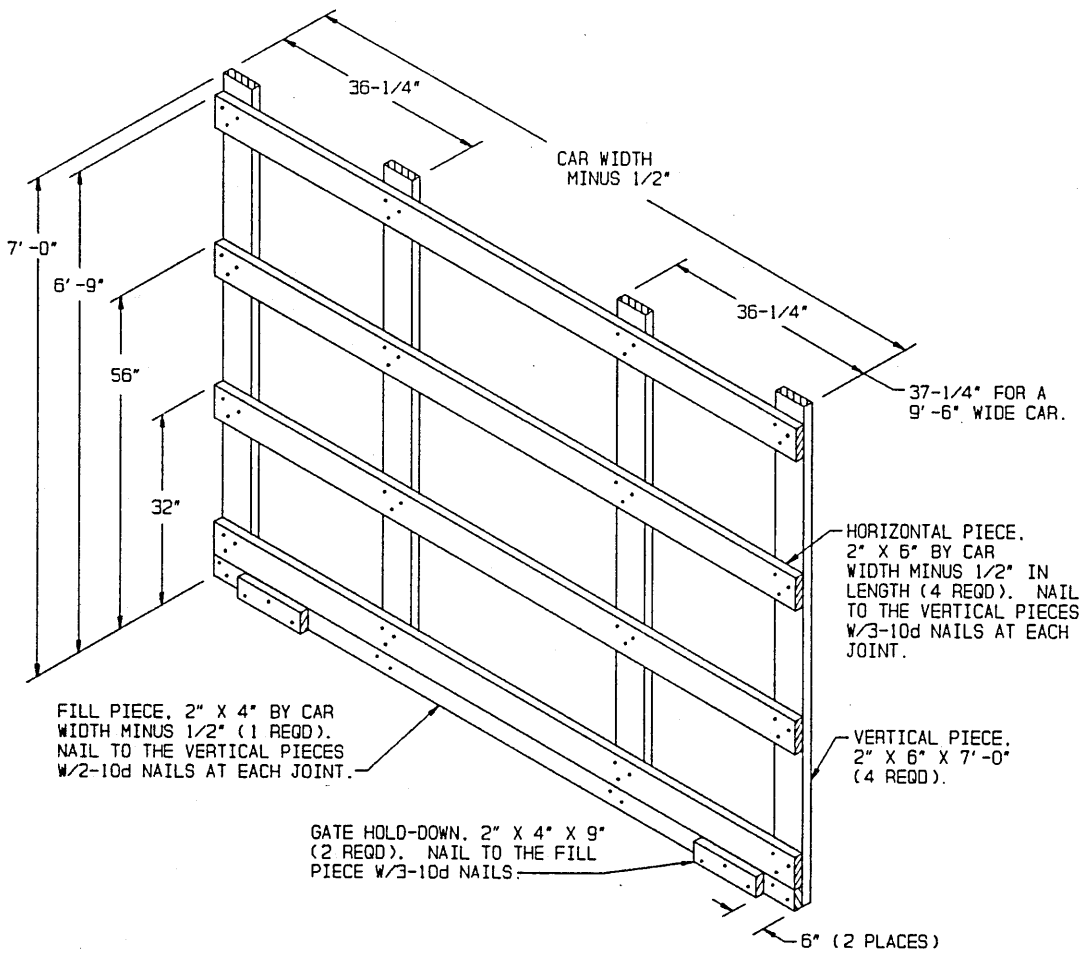
25"

VERTICAL PIECE, 2" X 6"
BY 8'-4" OR A LENGTH
TO SUIT (6 REQD).

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

ALTERNATIVE SEPARATOR GATE C

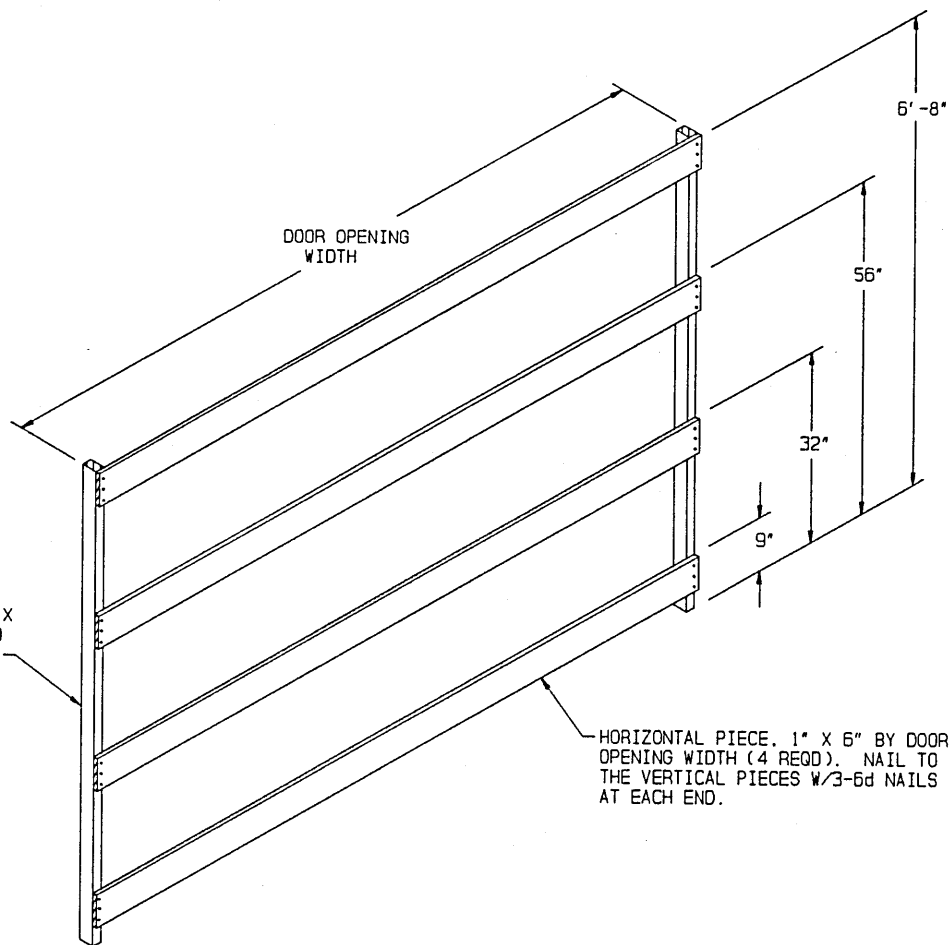
DETAILS



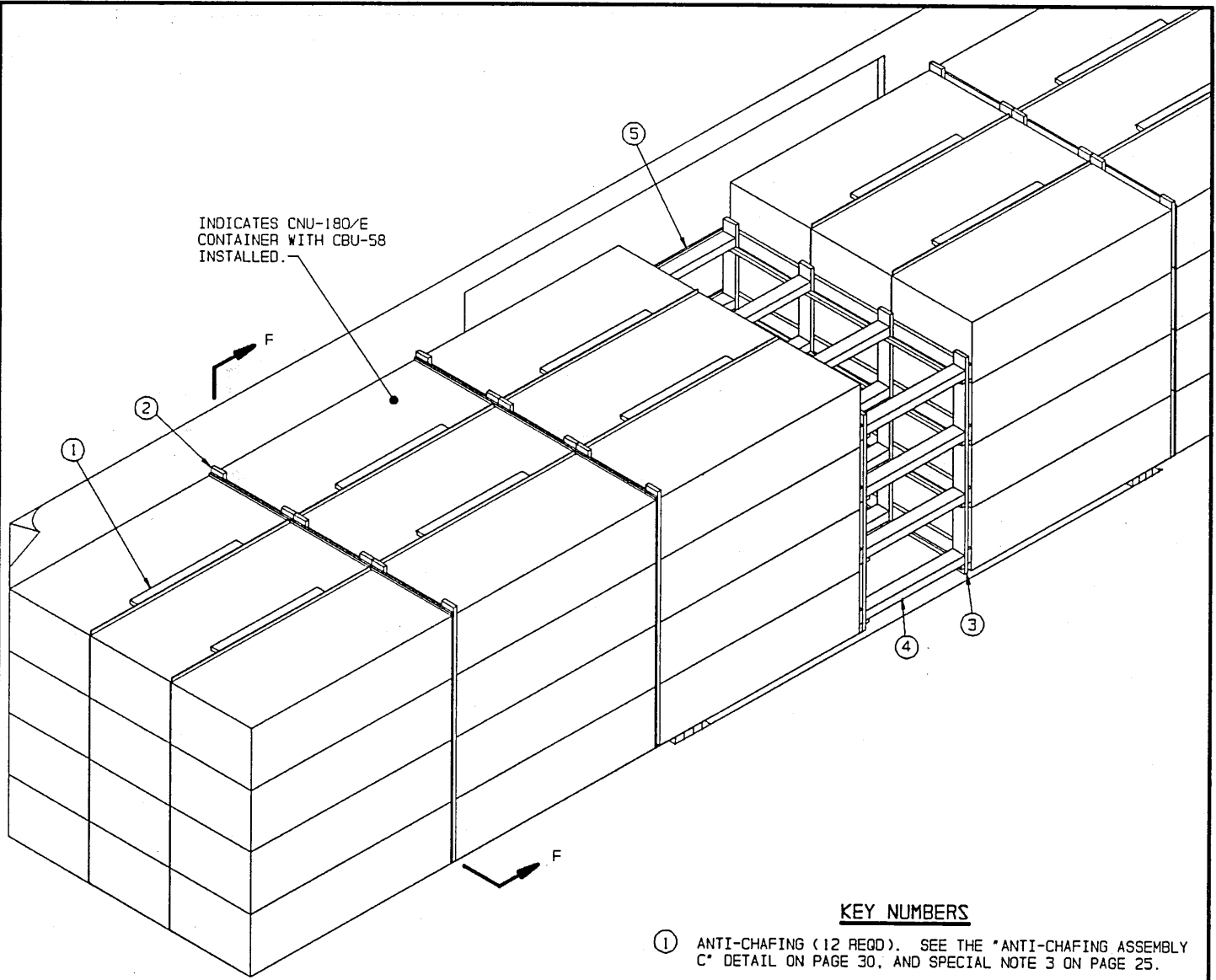
END VIEW

CENTER GATE B

VERTICAL PIECE, 2" X 3" X
6'-8" (2 REQD). NAIL TO
A DOOR POST W/12d NAILS.



DOORWAY PROTECTION A

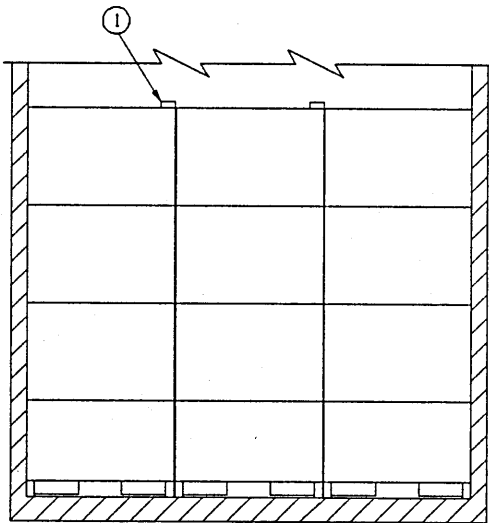


INDICATES CNU-180/E
CONTAINER WITH CBU-58
INSTALLED.

ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-CHAFING (12 REQD). SEE THE "ANTI-CHAFING ASSEMBLY C" DETAIL ON PAGE 30, AND SPECIAL NOTE 3 ON PAGE 25.
- ② SEPARATOR GATE (6 REQD). POSITION SO THAT THE HORIZONTAL PIECES ARE LOCATED AGAINST THE CONTAINERS. SEE THE "SEPARATOR GATE D" DETAIL ON PAGE 31, AND SPECIAL NOTE 4 ON PAGE 25.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 32, AND SPECIAL NOTE 5 ON PAGE 25.
- ④ STRUT, 4" X 6" BY A LENGTH TO SUIT (REF: 45") (16 REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "T" AND "U" ON PAGE 3, AND SPECIAL NOTE 6 ON PAGE 25.
- ⑤ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION B" DETAIL ON PAGE 32, AND SPECIAL NOTE 7 ON PAGE 25.



SECTION F-F

72-CONTAINER LOAD
IN A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL BOXCAR

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-4" WIDE (HI-VOLUME) WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 16'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS, HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "E" AND "F" ON PAGE 2.
2. CNU-180/E CONTAINERS W/CBU-58 ARE SHOWN IN THE LOAD VIEW ON PAGE 24. IF THE LOAD LIMIT PERMITS, A MAXIMUM OF 60 CONTAINERS FOR AN APPROXIMATE LADING WEIGHT OF 125,040 POUNDS CAN BE PLACED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES. EIGHTY-FOUR CONTAINERS FOR AN APPROXIMATE LADING WEIGHT OF 175,056 POUNDS CAN BE LOADED IN A 60'-8" LONG CAR IF THE LOAD LIMIT PERMITS.
3. IF THE CAR TO BE LOADED IS MORE THAN 9'-4" WIDE, AND SIDEWALL LINING IS NOT REQUIRED, ANTI-CHAFING, SHOWN AS PIECE MARKED ① MAY BE FORMED FROM 1/2" OR THICKER PLYWOOD IN LIEU OF 1/4", OR "ANTI-CHAFING ASSEMBLY D" DETAILED ON PAGE 30 MAY BE INSTALLED.
4. FOR 1-HIGH THRU 3-HIGH LOADS, SEPARATOR GATES MAY BE FORMED FROM 1/2" OR THICKER PLYWOOD, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE D" DETAIL ON PAGE 31.
5. CENTER GATE "C" 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 46.
6. DOUBLED 2" X 6" STRUTS MAY BE USED IN LIEU OF THE 4" X 6" STRUTS SHOWN IN THE LOAD VIEW ON PAGE 24. LAMINATE W/1-10d NAIL EVERY 6". SEE GENERAL NOTE "K" ON PAGE 2.
7. 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 ⑦ IN THE LOAD ON PAGE 24 IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MAY BE USED. REFER TO PAGES 45 AND 46 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 ③ THRU ⑥ ON PAGE 28 AND SPECIAL NOTE 6 ON PAGE 29 FOR INSTALLATION GUIDANCE.
8. 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 6 CONTAINERS BY OMITTING THE CENTER ROW OF THE TOP TIER AS SHOWN ON PAGE 34, OR THE ENTIRE TOP TIER CAN BE OMITTED. TO REDUCE A LOAD BY ONE CONTAINER, REFER TO THE "TYPICAL LCL PROCEDURES" ON PAGE 36.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	426	213
2" X 2"	75	25
2" X 3"	52	26
2" X 4"	71	47
2" X 6"	336	336
4" X 6"	60	120
NAILS	NO. REQD	POUNDS
4d (1-1/2")	144	1/4
6d (2")	576	3-1/2
10d (3")	188	3-1/2
12d (3-1/4")	64	1-1/2
16d (3-1/2")	64	1-1/2
1/4" PLYWOOD - - - - - 24 SHEETS REQD - - - - - 528 LBS		

* THE TOTAL WEIGHT W/CBU-71 WILL BE 150,679 POUNDS.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER (W/CBU-58)	72	150,048 LBS
DUNNAGE		2,071 LBS

* TOTAL WEIGHT - - - - - 152,119 LBS (APPROX)

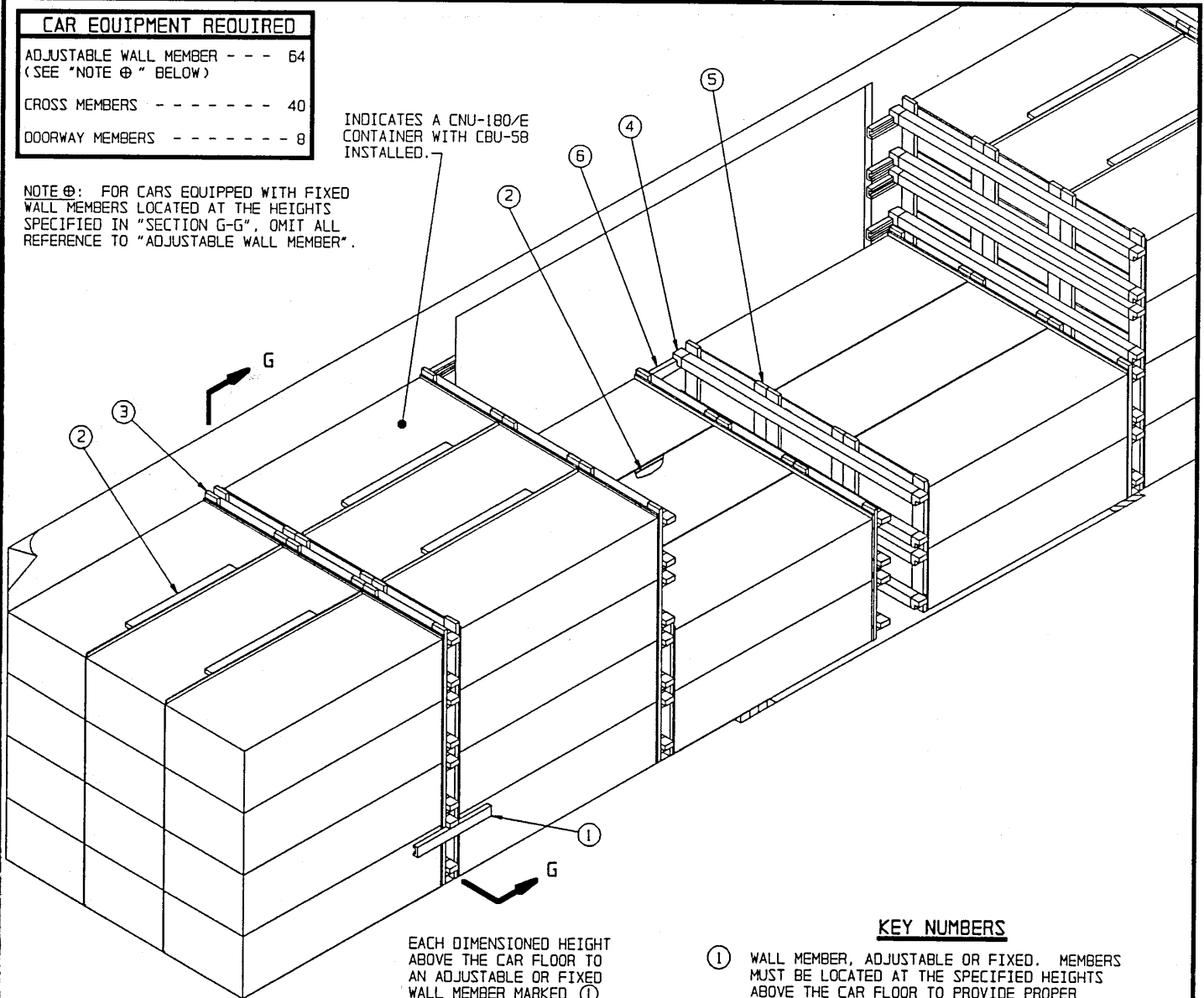
**72-CONTAINER LOAD
IN A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL BOX CAR**

CAR EQUIPMENT REQUIRED

ADJUSTABLE WALL MEMBER - - - -	64
(SEE "NOTE ④" BELOW)	
CROSS MEMBERS - - - - -	40
DOORWAY MEMBERS - - - - -	8

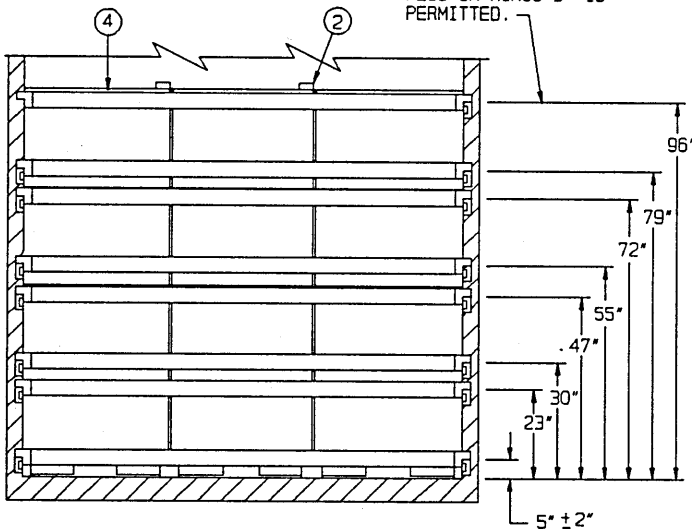
INDICATES A CNU-180/E CONTAINER WITH CBU-58 INSTALLED.

NOTE ④: FOR CARS EQUIPPED WITH FIXED WALL MEMBERS LOCATED AT THE HEIGHTS SPECIFIED IN "SECTION G-G", OMIT ALL REFERENCE TO "ADJUSTABLE WALL MEMBER".



ISOMETRIC VIEW

EACH DIMENSIONED HEIGHT ABOVE THE CAR FLOOR TO AN ADJUSTABLE OR FIXED WALL MEMBER MARKED ① AND/OR A DOORWAY MEMBER MARKED ⑥ IS SPECIFIED TO LOCATE THE CENTER LINE OF A CROSS MEMBER. PLUS OR MINUS 3" IS PERMITTED.



SECTION G-G

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 ④. SEE "SECTION G-G" VIEW BELOW FOR LOCATION GUIDANCE.
- ② ANTI-CHAFING (12 REOD, EIGHT 4-HIGH, AND FOUR 2-HIGH). SEE THE "ANTI-CHAFING ASSEMBLY C" DETAIL ON PAGE 30.
- ③ SEPARATOR GATE FOR 4-HIGH (6 REOD). SEE THE "SEPARATOR GATE D" DETAIL ON PAGE 31. POSITION WITH THE HORIZONTAL PIECES AGAINST THE CONTAINER. SEE SPECIAL NOTE 3 ON PAGE 27.
- ④ CROSS MEMBER (40 REOD). SEE GENERAL NOTE "W" ON PAGE 3.
- ⑤ SEPARATOR GATE FOR 2-HIGH (4 REOD). SEE THE "SEPARATOR GATE D" DETAIL ON PAGE 31. POSITION WITH THE TIE PIECES UNDER THE OVERHANG OF THE CONTAINERS. SEE SPECIAL NOTE 4 ON PAGE 27.
- ⑥ DOORWAY MEMBER (8 REOD). SEE THE "SECTION G-G" VIEW AT LEFT FOR LOCATION GUIDANCE. SEE SPECIAL NOTE 5 ON PAGE 27.

60-CONTAINER LOAD

IN A 50'-6" LONG BY 9'-4" WIDE BOX CAR EQUIPPED WITH MECHANICAL BRACING DEVICES

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-4" WIDE (INSIDE DIMENSION) WOOD-LINED BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS, AND WITH 16'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "E" AND "F" ON PAGE 2, AND SPECIAL NOTE 3 BELOW.
2. CNU-180/E CONTAINERS W/CBU-58 ARE SHOWN IN THE LOAD VIEW ON PAGE 26. IF THE LOAD LIMIT PERMITS, A MAXIMUM OF 48 CONTAINERS FOR AN APPROXIMATE LADING WEIGHT OF 100,032 POUNDS CAN BE PLACED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES.
3. IF A CAR HAS BOWED ENDWALLS WHICH ARE BOWED OUTWARD 2" OR MORE EITHER FROM SIDE-TO-SIDE OR FROM FLOOR-TO-ROOF, CROSS MEMBERS CAN BE INSTALLED NEAR THE ENDWALL OF THE CAR TO PROVIDE A "SQUARED END" RATHER THAN INSTALLING DUNNAGE AS SPECIFIED IN GENERAL NOTE "F" ON PAGE 2. THESE CROSS MEMBERS SHOULD BE INSTALLED AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE LOAD AS BLOCKING MEMBERS. A SEPARATOR GATE, SHOWN AS PIECE MARKED ③, MUST BE POSITIONED AGAINST THESE CROSS MEMBERS PRIOR TO LOADING.
4. SEPARATOR GATES MAY BE FORMED FROM 1/2" OR THICKER PLYWOOD IN LIEU OF DIMENSIONAL LUMBER, FOR 1-HIGH THRU 3-HIGH LOADS, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE D" DETAIL ON PAGE 31.
5. IF THE CAR TO BE LOADED IS EQUIPPED WITH AT LEAST 12 DOORWAY MEMBERS, AND IF THE LOAD LIMIT PERMITS, AN ADDITIONAL 12 CONTAINERS CAN BE LOADED IN THE DOORWAY AREA.
6. 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 MULTIPLES OF 6 BY OMITTING ONE OR TWO ENTIRE LOAD UNITS.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	598	299
2" X 3"	24	12
2" X 4"	24	16
2" X 6"	414	414
NAILS	NO. REQD	POUNDS
4d (1-1/2")	72	1/4
6d (2")	1200	7
1/4" PLYWOOD - - - -	20 SHEETS REQD - - - -	440 LBS

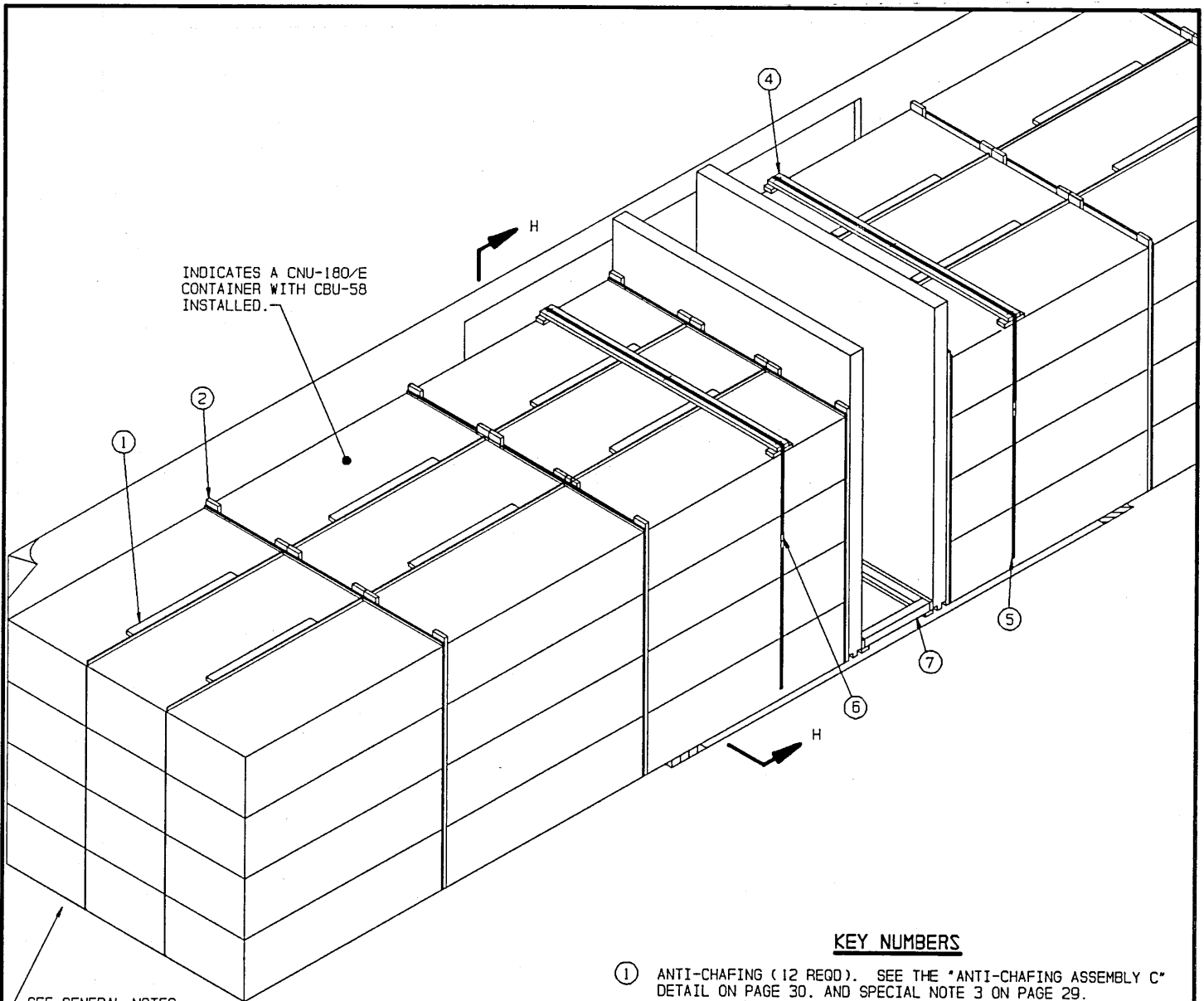
*THE TOTAL WEIGHT W/CBU-71
WILL BE 125.770 POUNDS.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER (W/CBU-58)	60	125,040 LBS
DUNNAGE		1,930 LBS

* TOTAL WEIGHT - - - - - 126,970 LBS (APPROX)

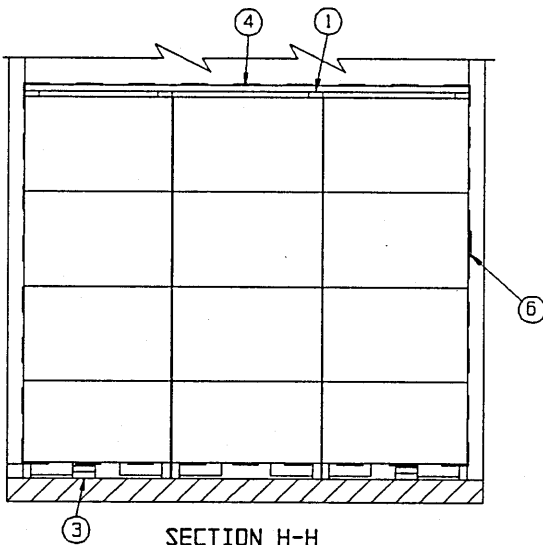
60-CONTAINER LOAD
IN A 50'-6" LONG BY 9'-0" WIDE BOX CAR EQUIPPED WITH MECHANICAL BRACING DEVICES



INDICATES A CNU-180/E CONTAINER WITH CBU-58 INSTALLED.

SEE GENERAL NOTES "E" AND "F" ON PAGE 2.

ISOMETRIC VIEW



SECTION H-H

KEY NUMBERS

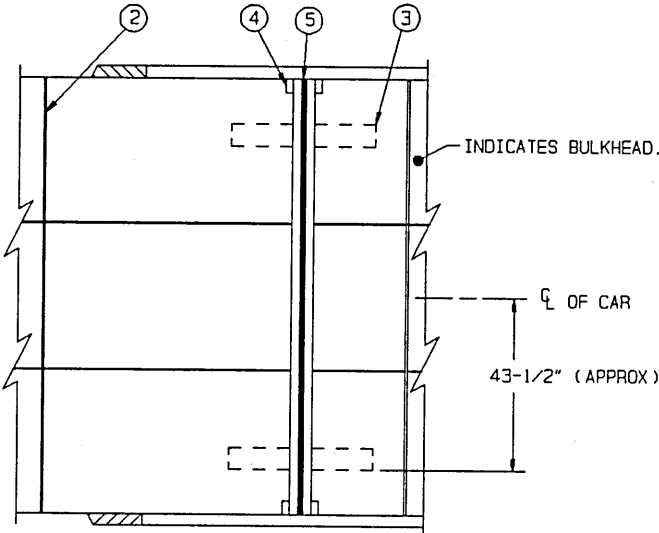
- ① ANTI-CHAFING (12 REQD). SEE THE "ANTI-CHAFING ASSEMBLY C" DETAIL ON PAGE 30. AND SPECIAL NOTE 3 ON PAGE 29.
- ② SEPARATOR GATE (6 REQD). POSITION WITH THE HORIZONTAL PIECES AGAINST THE CONTAINERS. SEE THE "SEPARATOR GATE D" DETAIL ON PAGE 31. SEE SPECIAL NOTE 4 ON PAGE 29.
- ③ FLOORLINE BLOCKING, 2" X 6" X 30" (DOUBLED) (4 REQD). PRE-POSITION AS SHOWN BY THE "PARTIAL PLAN VIEW" ON PAGE 29. NAIL THE FIRST PIECE TO THE CAR FLOOR W/4-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTES "L" ON PAGE 2, AND "R" ON PAGE 3. SEE SPECIAL NOTES 5 AND 6 ON PAGE 29.
- ④ STRAPPING BOARD, 2" X 6" BY LOAD WIDTH (2 REQD). SEE THE "STRAPPING BOARD ASSEMBLY A" DETAIL ON PAGE 32.
- ⑤ DOORWAY PROTECTION STRAP, 1-1/4" X .031" OR .035" X 36'-0" LONG STEEL STRAPPING (2 REQD). STAPLE TO STRAPPING BOARD W/3 STAPLES. SEE SPECIAL NOTE 6 ON PAGE 29.
- ⑥ SEAL FOR 1-1/4" STRAPPING (4 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "N" ON PAGE 2.
- ⑦ STRUT ASSEMBLY (1 REQD). SEE THE "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL ON PAGE 48. INSTALL BETWEEN THE LOAD DIVIDER BULKHEADS. SEE SPECIAL NOTE 7 ON PAGE 29.

72-CONTAINER LOAD

IN A 50'-6" LONG BY 9'-4" WIDE BOXCAR EQUIPPED WITH LOAD DIVIDERS

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-4" WIDE WOOD-LINED CUSHIONED BOXCAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 16'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "AA" THRU "EE" ON PAGE 4.
2. CNU-180/E CONTAINERS W/CBU-58 ARE SHOWN IN THE LOAD VIEW ON PAGE 28. IF THE LOAD PERMITS, A MAXIMUM OF 48 CONTAINERS FOR AN APPROXIMATE LADING WEIGHT OF 100,032 POUNDS CAN BE PLACED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES. EIGHTY-FOUR CONTAINERS FOR AN APPROXIMATE LADING WEIGHT OF 175,056 POUNDS CAN BE LOADED IN A 60'-8" LONG CAR IF THE LOAD LIMIT PERMITS.
3. IF THE CAR TO BE LOADED IS MORE THAN 9'-4" WIDE, ANTI-CHAFING, SHOWN AS PIECE MARKED ① MAY BE FORMED FROM 1/2" OR THICKER PLYWOOD IN LIEU OF 1/4". IF DESIRED. NOTE: PLYWOOD ANTI-CHAFING WHICH IS POSITIONED IN THE DOORWAY MUST BE NOTCHED TO ACCOMMODATE THE DOORWAY PROTECTION STRAPS, PIECES MARKED ⑤. IF THE CAR TO BE LOADED IS AT LEAST 9'-6" WIDE, 1" PLYWOOD ANTI-CHAFING MAY BE USED, OR "ANTI-CHAFING ASSEMBLY D" DETAILED ON PAGE 30 MUST BE INSTALLED.
4. FOR 1-HIGH THRU 3-HIGH LOADS, SEPARATOR GATES MAY BE FORMED FROM 1/2" OR THICKER PLYWOOD, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE D" DETAIL ON PAGE 31.
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 ⑦ IN THE LOAD ON PAGE 24 IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MAY BE USED. REFER TO PAGES 45 AND 46 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.
6. FLOORLINE LINE BLOCKING, SHOWN AS PIECE MARKED ③ 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 FROM 6" TO 1/2 THE CONTAINER/LOAD UNIT LENGTH.
7. THE STRUT ASSEMBLY, SHOWN AS PIECE MARKED ⑦, IS REQUIRED WHEN THE LOAD IN EITHER END OF THE CAR IS 50,000 POUNDS OR MORE.
8. 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 34. OR THE ENTIRE TOP TIER CAN BE OMITTED. TO REDUCE A LOAD BY ONE CONTAINER, REFER TO THE "TYPICAL LCL PROCEDURES" ON PAGE 36. FOR OTHER METHODS OF REDUCING A LOAD, SEE GENERAL NOTE "FF" ON PAGE 4.



BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	448	224
1" X 8"	17	12
2" X 3"	24	12
2" X 4"	88	59
2" X 6"	335	335
4" X 4"	15	20
NAILS	NO. REQD	POUNDS
4d (1-1/2")	72	1/2
6d (2")	952	14-1/2
10d (3")	24	1/2
12d (3-1/4")	16	1/2
16d (3-1/2")	32	3/4
1/4" PLYWOOD - - - - - 24 SHEETS REQD - - - - - 528 LBS		
1-1/4" STEEL STRAPPING - - - - - 73" REQD - - - - - 11 LBS		
SEAL FOR 1-1/4" STRAPPING - - - 4 REQD - - - - - NIL		
STAPLE FOR 1-1/4" STRAPPING - 6 REQD - - - - - NIL		

*THE TOTAL WEIGHT W/CBU-71 WILL BE 149,940 POUNDS.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER (W/CBU-58)	72	150,048 LBS
DUNNAGE		1,880 LBS

*TOTAL WEIGHT - - - - - 151,928 LBS (APPROX)

**72-CONTAINER LOAD
IN A 50'-6" LONG BY 9'-4" WIDE BOX CAR EQUIPPED WITH LOAD DIVIDERS**

SUPPORT PIECE. 2" X 4" X 48"
(1 REQD). (THIS PIECE
WILL BE OMITTED FOR A
2-HIGH LOAD).

1/4" PLYWOOD. 7'-6" LONG BY A HEIGHT
TO SUIT (AS REQD). NAIL THE UPPER PLYWOOD
SHEET TO THE SUPPORT PIECE W/6 APPLICABLY
SIZED NAILS AND TO THE HOLD-DOWN PIECES
W/3 APPLICABLY SIZED NAILS EACH.

HOLD-DOWN PIECE.
2" X 3" X 12"
(2 REQD).

3" X 4-1/2" NOTCH (AS REQD)
(ONLY REQUIRED FOR ASSEMBLIES
POSITIONED IN THE DOORWAY
WHEN DOORWAY PROTECTION
STRAPS ARE USED).

VERTICAL PIECE. 1" X 6"
BY A LENGTH TO SUIT
(4 REQD).

1/4" TO 1/2" PLYWOOD.
7'-6" LONG BY 48" WIDE
(2 REQD). NAIL TO
THE VERTICAL PIECES
W/6 APPLICABLY SIZED
NAILS AT EACH JOINT.

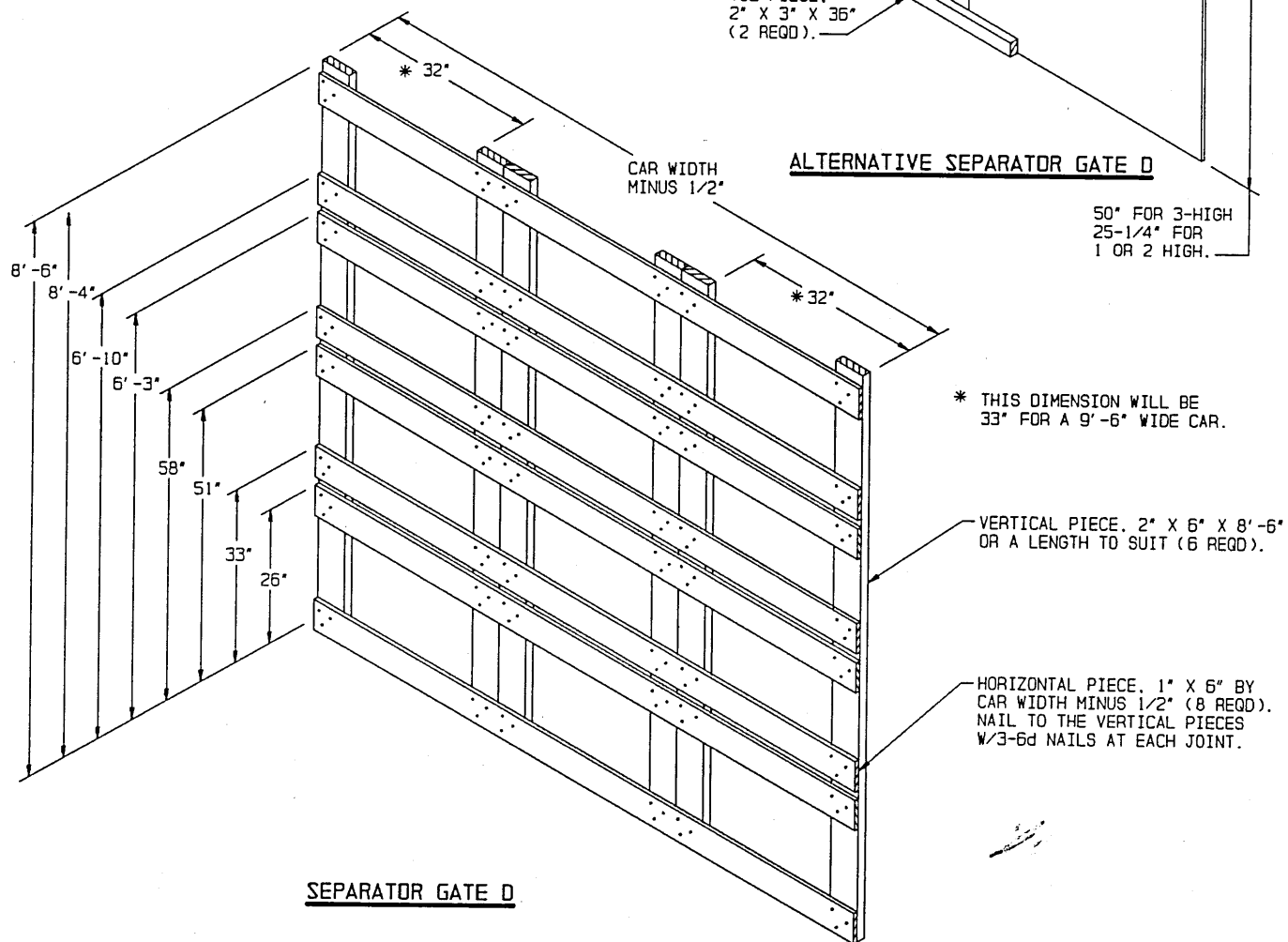
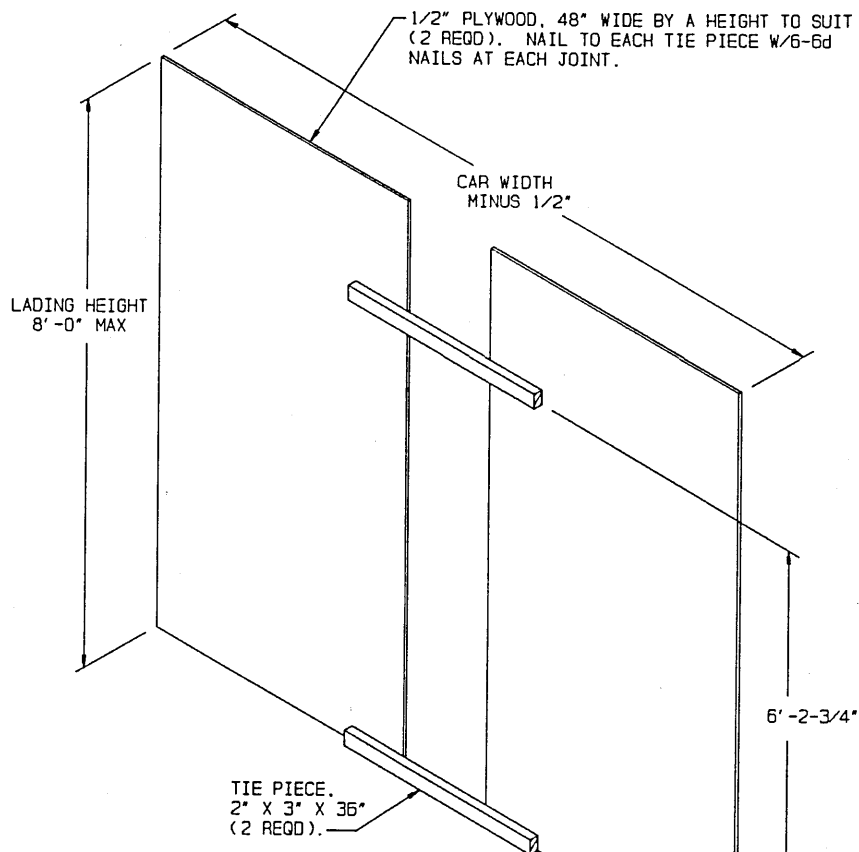
ANTI-CHAFING ASSEMBLY C

ANTI-CHAFING ASSEMBLY D

* THIS DIMENSION WILL BE 8'-2" FOR
ANTI-CHAFING IN THE DOORWAY
AREA, WHEN DOORWAY PROTECTION
STRAPS ARE USED.

* 8'-6"
OR LOAD
HEIGHT
PLUS 3"

3" X 4-1/2" NOTCH (1 OR 2 REQD) (ONLY REQUIRED
FOR ASSEMBLIES POSITIONED IN THE DOORWAY
WHEN DOORWAY PROTECTION
STRAPS ARE USED).

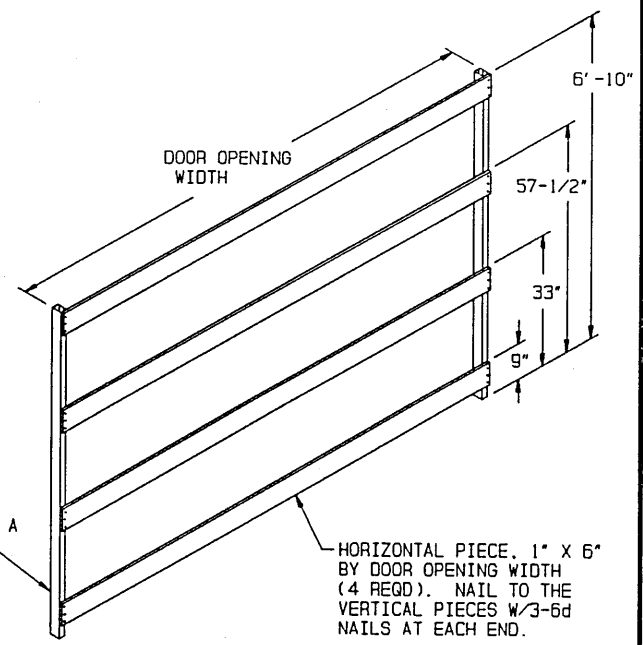


DETAILS

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).

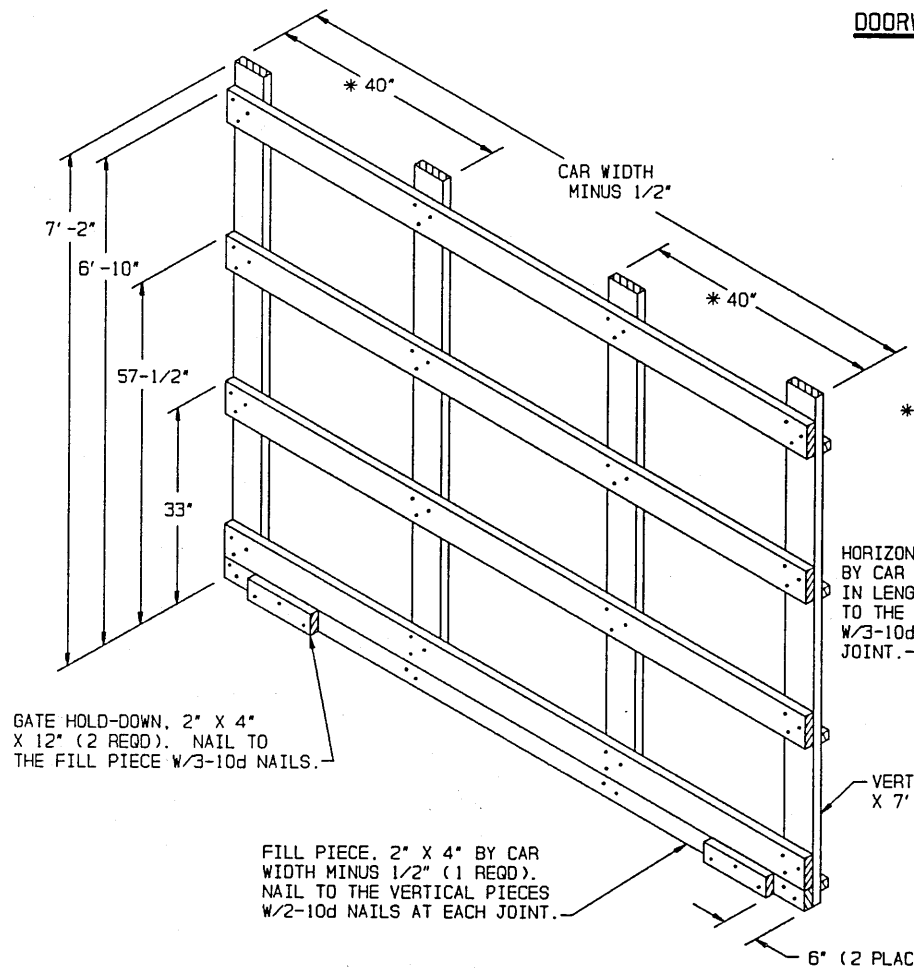
STRAPPING BOARD A



VERTICAL PIECE, 2" X 3" X
6'-10" (2 REQD). NAIL TO A
DOOR POST W/12d NAILS.

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

DOORWAY PROTECTION B



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

* 41" FOR A
9'-6" WIDE CAR.

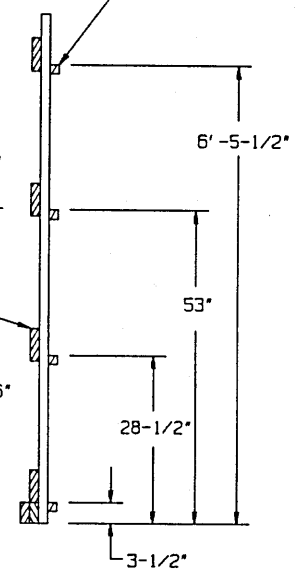
HORIZONTAL PIECE, 2" X 6"
BY CAR WIDTH MINUS 1/2"
IN LENGTH (4 REQD). NAIL
TO THE VERTICAL PIECES
W/3-10d NAILS AT EACH
JOINT.

GATE HOLD-DOWN, 2" X 4"
X 12" (2 REQD). NAIL TO
THE FILL PIECE W/3-10d NAILS.

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

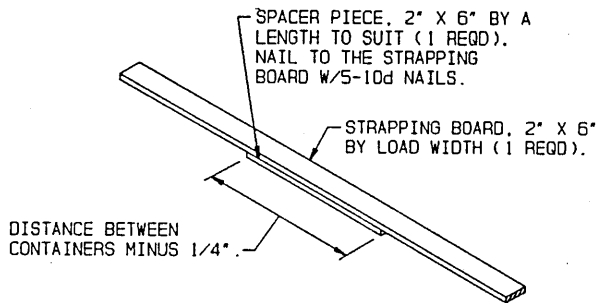
VERTICAL PIECE, 2" X 6"
X 7'-2" (4 REQD).

6" (2 PLACES)

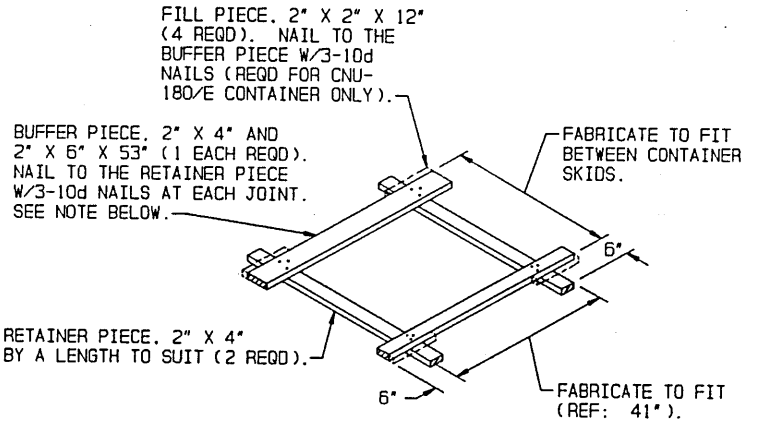


END VIEW

CENTER GATE C

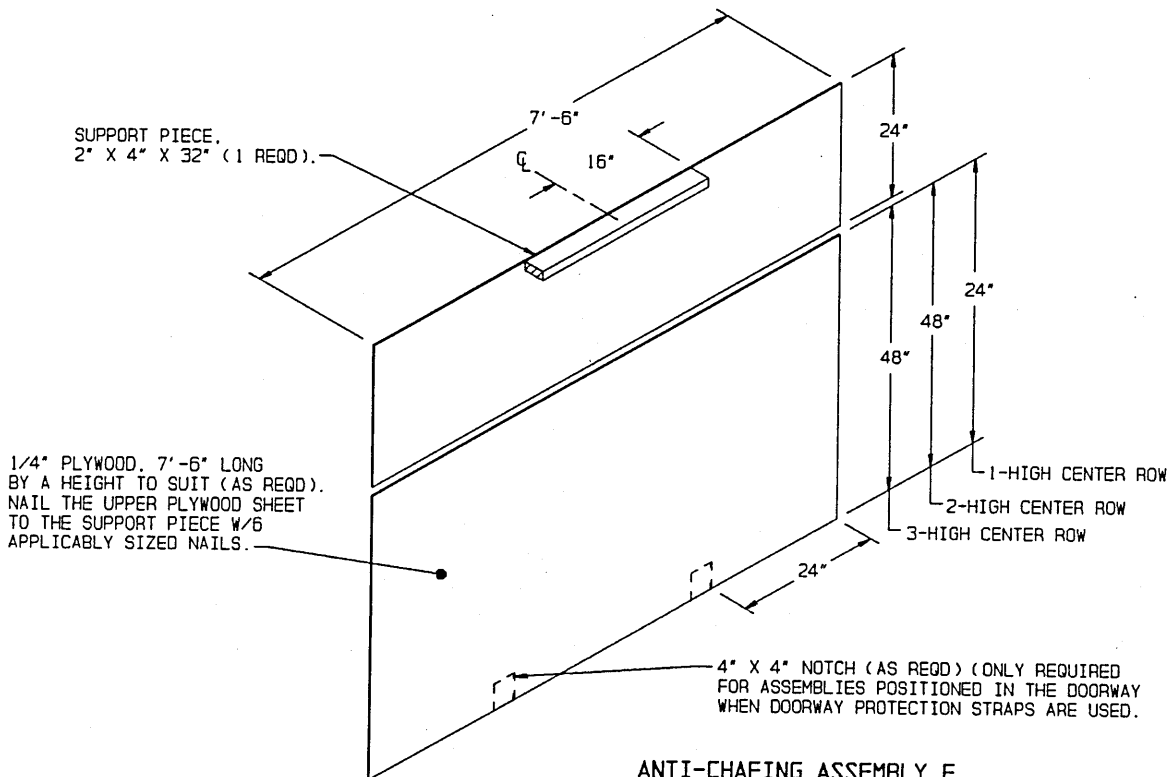


STRAPPING BOARD B



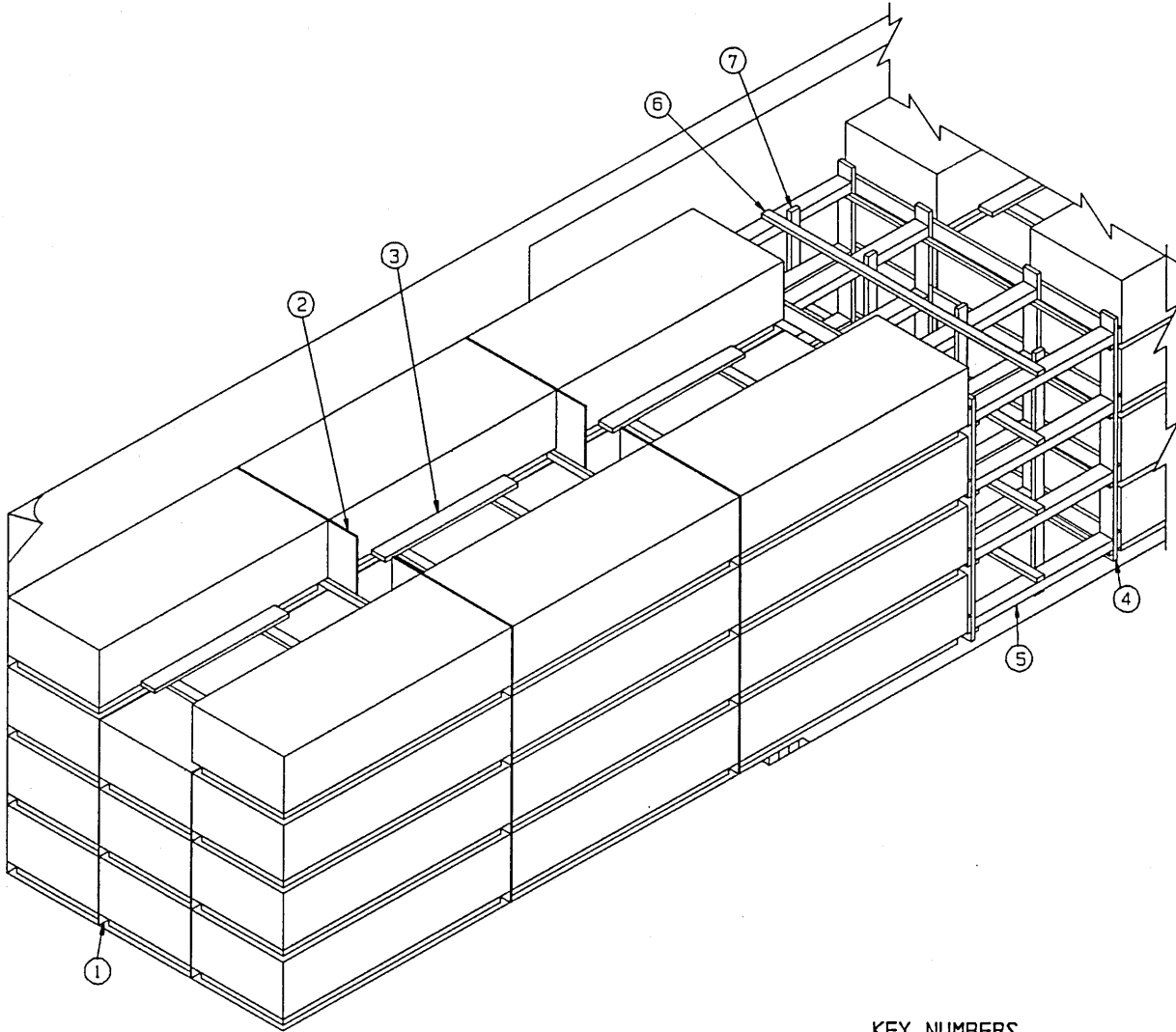
ANTI-SWAY BRACE

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 OPENING 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.



ANTI-CHAFING ASSEMBLY E

FOR CNU-180/E ONLY



ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-CHAFING (12 REQD). SEE THE "ANTI-CHAFING ASSEMBLY A" DETAIL ON PAGE 20, AND SPECIAL NOTE 4 ON PAGE 35.
- ② SEPARATOR GATE (4 REQD). SEE THE LOAD VIEW ON PAGE 14 OR 24 FOR INSTALLATION GUIDANCE.
- ③ ANTI-SWAY BRACE (6 REQD). SEE THE "ANTI-SWAY BRACE" DETAIL ON PAGE 33. INSTALL BETWEEN LATERALLY ADJACENT TOP-LAYER CONTAINERS.
- ④ CENTER GATE (2 REQD). SEE THE LOAD VIEW ON PAGE 14 OR 24 FOR INSTALLATION GUIDANCE.
- ⑤ STRUT, 4" X 6" BY A LENGTH TO SUIT (16 REQD). SEE THE LOAD VIEW ON PAGE 14 OR 24 FOR INSTALLATION GUIDANCE.
- ⑥ VERTICAL STRUT BRACING, 2" X 4" X BY A LENGTH TO SUIT (4 REQD). SEE THE LOAD VIEW ON PAGE 14 FOR GUIDANCE.
- ⑦ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 1/2" (4 REQD). SEE THE LOAD VIEW ON PAGE 14 FOR GUIDANCE.

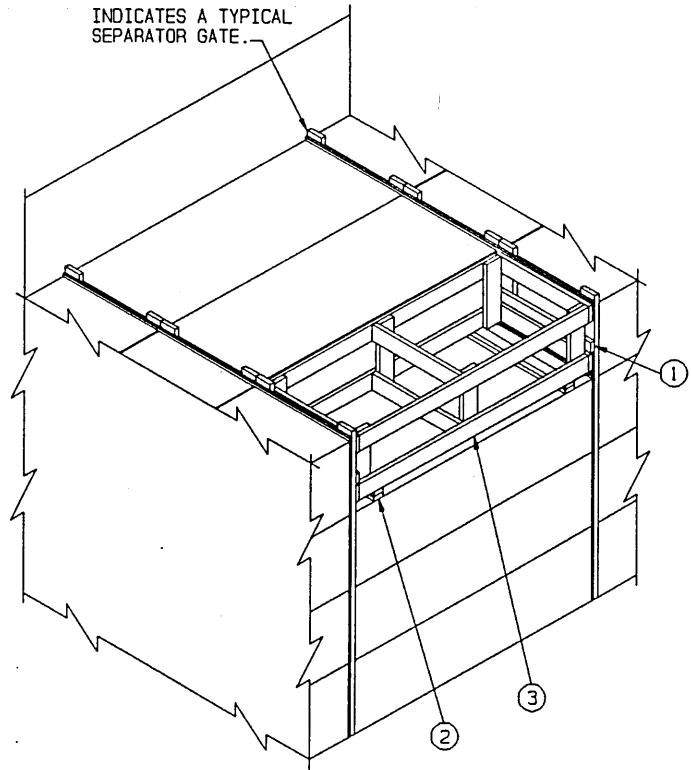
SPECIAL NOTES:

1. ONLY THE END PORTION OF A 9'-4" WIDE CONVENTIONAL TYPE BOX CAR 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. ONLY 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. NOTE: THE HEIGHT OF THE ANTI-CHAFING, PIECE MARKED ① WILL BE THE HEIGHT OF THE CENTER ROW OF CONTAINERS MINUS 1" FOR ANTI-CHAFING ASSEMBLIES "A" AND "B" DETAILED ON PAGE 20, AND ANTI-CHAFING ASSEMBLY "D" DETAILED ON PAGE 30. ANTI-CHAFING ASSEMBLY "E" DETAILED ON PAGE 33 IS TO BE USED FOR CNU-180/E CONTAINERS ONLY WHEN THE CENTER ROW OF THE TOP LAYER IS OMITTED.
5. IF NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS ARE USED, AS SHOWN BY KEY NUMBER ④ ON PAGES 18 AND 28, "STRAPPING BOARD ASSEMBLY B" DETAILED ON PAGE 33 MUST BE POSITIONED UNDER EACH DOORWAY PROTECTION STRAP.

SPECIAL NOTES:

1. A PARTIAL VIEW OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR 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.
5. CNU-180/E CONTAINERS ARE SHOWN IN THE ISOMETRIC VIEW AT RIGHT. HOWEVER, THE DEPICTED PROCEDURES ARE APPLICABLE FOR BOTH OF THE CONTAINERS SHOWN ON PAGE 5 OF THIS DRAWING.

INDICATES A TYPICAL SEPARATOR GATE.



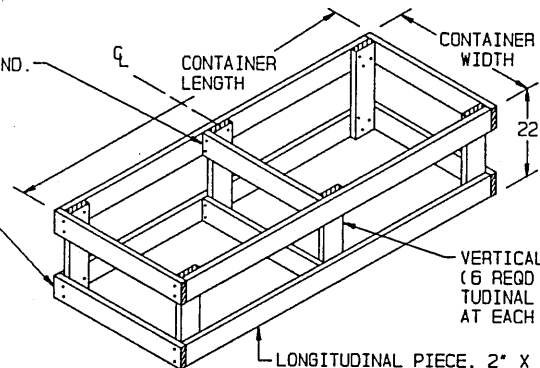
ISOMETRIC VIEW

KEY NUMBERS

- ① HOLD-DOWN PIECE, 2" X 4" X 36" (2 REQD). POSITION 9" ABOVE 3-HIGH CONTAINER. NAIL TO THE VERTICAL PIECES OF 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. NAIL THE SECOND PIECE TO THE FIRST W/3-10d NAILS.
- ③ FILLER ASSEMBLY (1 REQD). SEE THE DETAIL BELOW.

BRACE, 2" X 6" BY CONTAINER WIDTH MINUS 3" (2 REQD). NAIL TO THE CENTER VERTICAL PIECE W/2-10d NAILS AT EACH END.

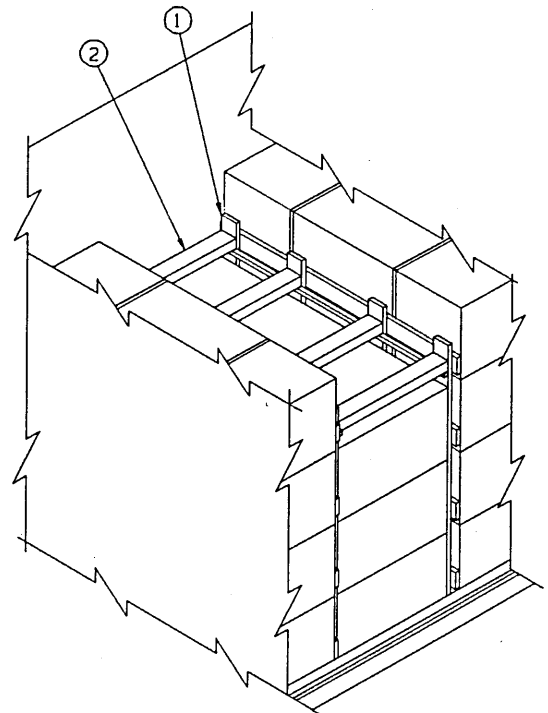
LATERAL PIECE, 2" X 6" BY CONTAINER WIDTH (4 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.



FILLER ASSEMBLY

SPECIAL NOTES:

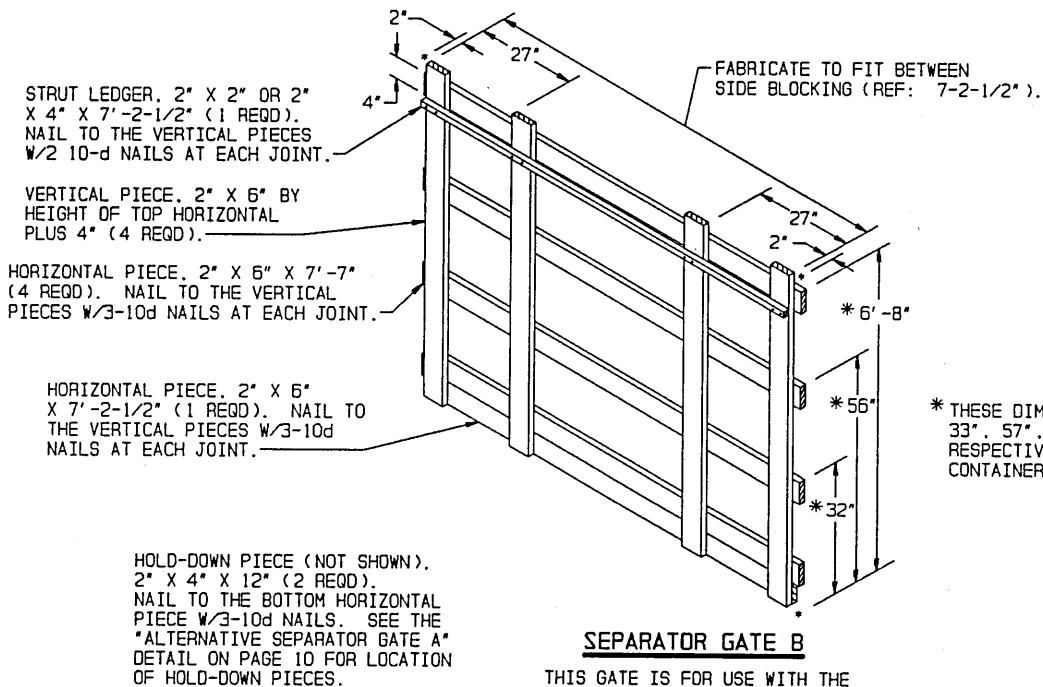
1. A PARTIAL VIEW OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. OTHER CAR WIDTHS CAN ALSO BE USED.
2. A UNIT OMITTED FROM THE TOP LAYER OF A 4-LAYER LOAD IS SHOWN AS TYPICAL. THE PROCEDURES ARE ALSO APPLICABLE FOR THE OMIS-SION OF A TOP-LAYER CONTAINER FROM A 3-LAYER OR 2-LAYER LOAD.
3. THE OMITTED UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE OMITTED UNIT AND THE CENTER GATE.
4. ONLY THE BLOCKING AND BRACING FOR THE OMITTED UNIT IS SHOWN. REFER TO PAGES 6 AND 7 FOR THE BLOCKING AND BRACING REQUIRE-MENTS FOR THE BALANCE OF THE LOAD.



ISOMETRIC VIEW

KEY NUMBERS

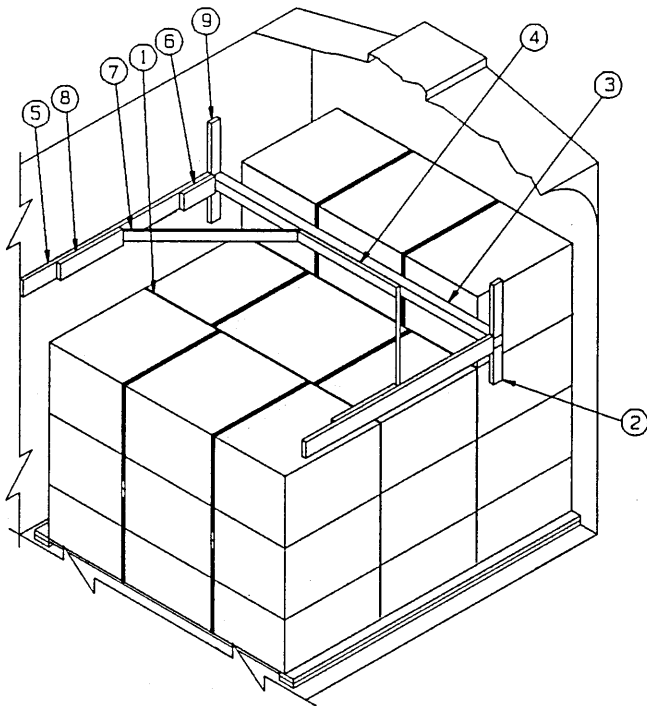
- ① SEPARATOR GATE (2 REQD). SEE THE "SEPARATOR GATE B" DETAIL BELOW. SEE GENERAL NOTES "J" AND "T" ON PAGE 2.
- ② STRUT, 4" X 6" BY CUT TO FIT (4 REQD). TOENAIL TO THE SEPARATOR GATES, PIECES MARKED ①. W/2-16d NAILS AT EACH END. SEE THE "STRUT INSTALLATION" DETAIL ON PAGE 44. SEE SPECIAL NOTES 2 AND 3 AT LEFT.



* THESE DIMENSIONS WILL BE 33", 57", AND 6'-10" RESPECTIVELY, FOR CNU-180/E CONTAINERS.

KEY NUMBERS

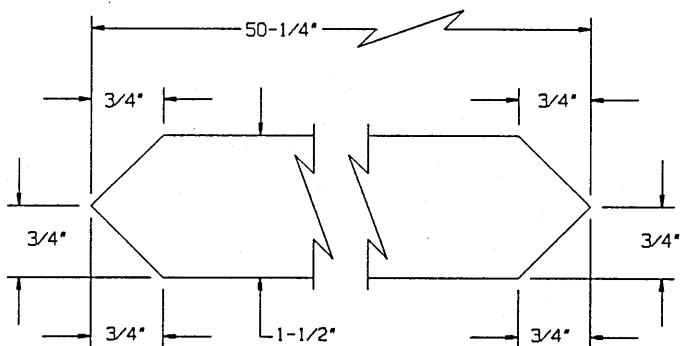
- ① SEPARATOR GATE (AS REQD). SEE "SEPARATOR GATE A" OR "ALTERNATIVE SEPARATOR GATE A" DETAILS ON PAGE 10.
- ② SUPPORT CLEAT, 2" X 4" X 12" (2 REQD). NAIL TO THE CAR SIDEWALL W/3-10d NAILS. POSITION SO AS TO CENTER PIECE MARKED ③ ON THE CONTAINER LOAD BEARING SURFACE.
- ③ CROSS CAR BRACE, 4" X 4" X CAR WIDTH (CUT-TO-FIT) (1 REQD).
- ④ CENTER CLEAT, 2" X 4" X 36" (1 REQD). CENTER ON 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 SIDE WALL 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, 2" 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 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-10d NAILS.



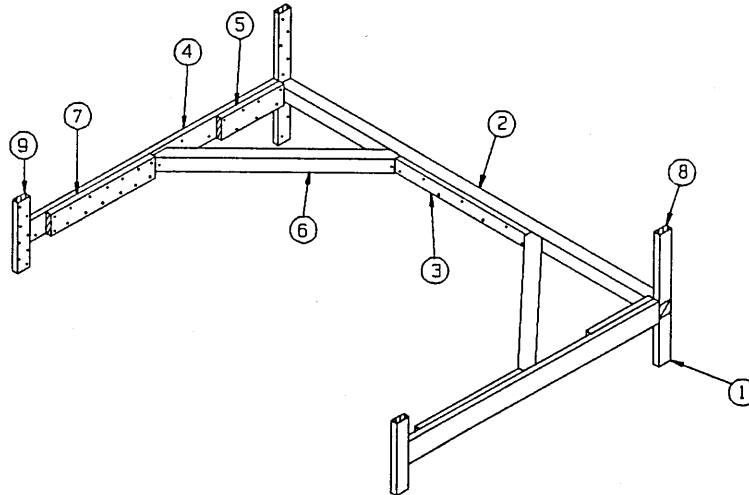
ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-2" WIDE WOOD-LINED (ENDWALLS AND SIDEWALLS) CONVENTIONAL BOX CAR 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 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 39.
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 K-BRACE. DUNNAGE PIECES MARKED ②, ③, ⑥, 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, PIECE 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, PIECE 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 AVAILABLE 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.



DIAGONAL BRACE



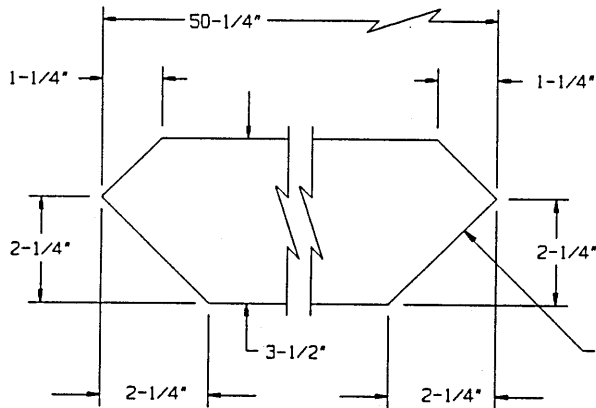
ISOMETRIC VIEW

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 38 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, PIECE 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, WITH THE DELETION OF PIECE MARKED ⑤. NAIL THE FIRST PIECE TO THE SECOND W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOORWAY AREA. 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 38 FOR A TYPICAL INSTALLATION OF THE K-BRACE.

KEY NUMBERS

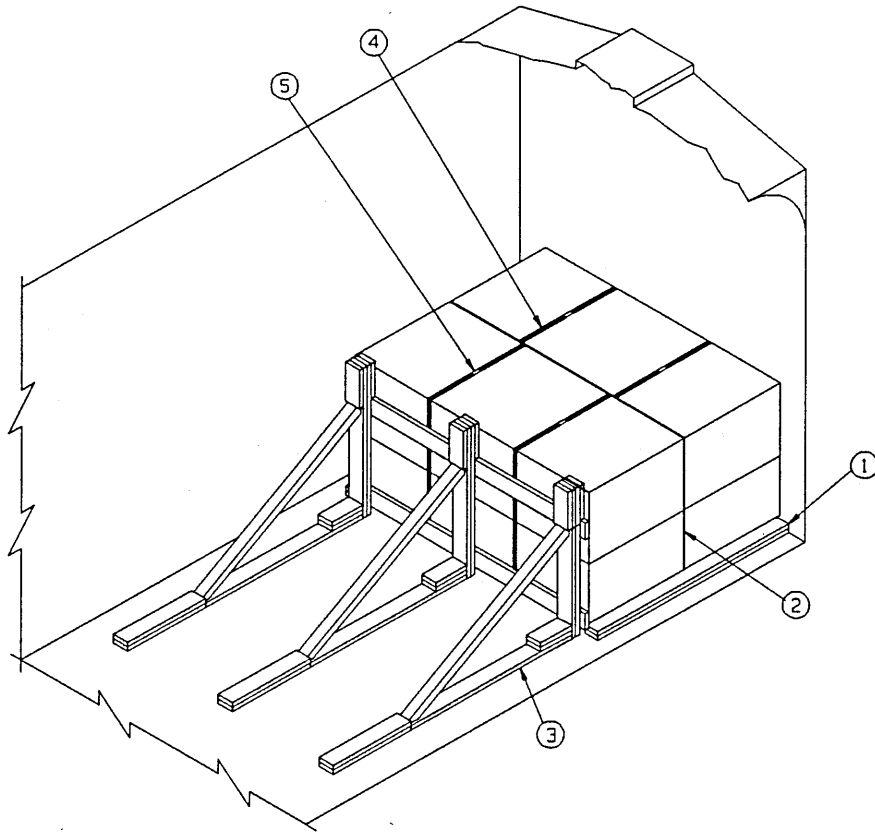
- ① SUPPORT CLEAT, 2" X 4" X 12" (2 REQD). NAIL TO THE CAR SIDEWALL W/3-10d NAILS. POSITION SO AS TO CENTER PIECE MARKED ② ON THE CONTAINER LOAD BEARING SURFACE.
- ② CROSS CAR BRACE, 4" X 4" X CAR WIDTH (CUT-TO-FIT) (1 REQD).
- ③ CENTER CLEAT, 2" X 4" X 38" (1 REQD). CENTER ON THE CROSS CAR BRACE, PIECE MARKED ②. 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 SIDE WALL 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, 2" 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 4" 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). CENTER ON PIECE MARKED ④ AND NAIL W/3-12d NAILS.



DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

TYPE "B" K-BRACE DETAILS



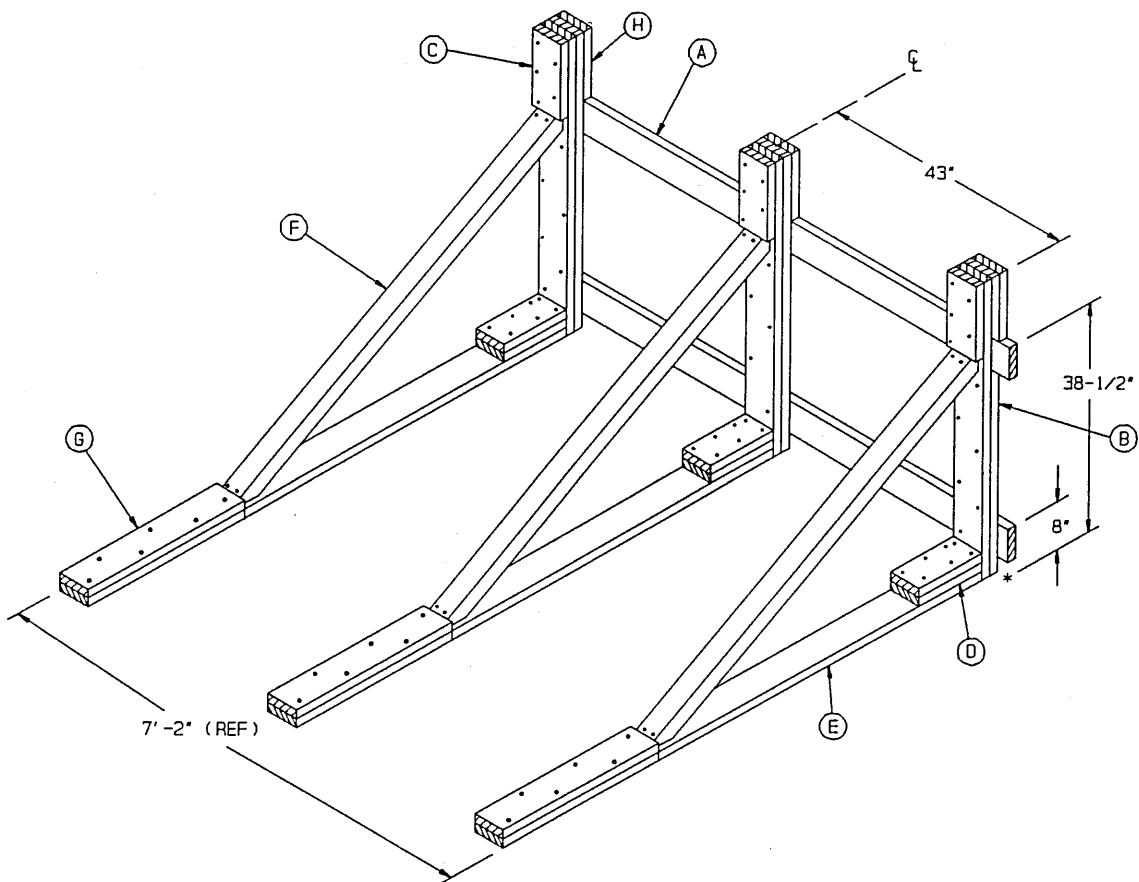
ISOMETRIC VIEW

SPECIAL NOTES:

1. A FOUR CONTAINER LOAD IS SHOWN IN A 9'-2" WIDE CONVENTIONAL BOX CAR. 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

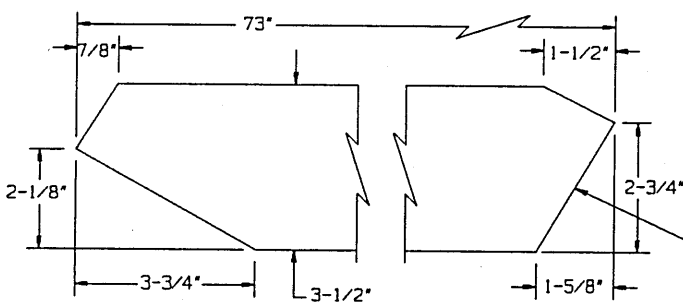
- ① SIDE BLOCKING, 2" X 6" X LOAD LENGTH (DOUBLED) (2 REQD). PRE-POSITION. NAIL THE FIRST PIECE TO THE CAR FLOOR W/1-16d NAIL EVERY 8". LAMINATE THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ② SEPARATOR GATE (1 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 10.
- ③ KNEE BRACE ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 41 AND SPECIAL NOTE 2 AT LEFT.
- ④ UNITIZING STRAP, 1-1/4" X .035" OR .031" BY A LENGTH TO SUIT (REF: 15'-6") (4 REQD).
- ⑤ SEAL FOR 1-1/4" STRAPPING (4 REQD, 1 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES. SEE GENERAL NOTE "N" ON PAGE 2.



ISOMETRIC VIEW

KEY LETTERS

- (A) LOAD BEARING PIECE, 2" X 6" X 7'-6" (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 THE VERTICAL PIECE, PIECE MARKED (B), W/5-10d NAILS.
- (D) POCKET CLEAT, 2" X 6" X 12" (DOUBLED) (3 REQD). NAIL THE FIRST PIECE TO THE FLOOR CLEAT, PIECE MARKED (E), W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. TOENAIL TO THE VERTICAL PIECE W/2-16d NAILS.
- (E) FLOOR CLEAT, 2" X 6" X 7'-8" (3 REQD). NAIL TO THE CAR FLOOR W/1-6d NAIL EVERY 8". SEE GENERAL NOTE "L" ON PAGE 2.
- (F) BRACE, 4" X 4" X 73" (3 REQD). SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TOENAIL TO THE VERTICAL PIECE AND FLOOR CLEAT, PIECES MARKED (B) AND (E) W/2-16d NAILS AT EACH JOINT.
- (G) BACK-UP CLEAT, 2" X 6" X 30" (3 REQD). NAIL TO THE FLOOR CLEAT, PIECE MARKED (E) W/6-40d NAILS.
- (H) FILL PIECE, 2" X 6" X 11-1/2" (3 REQD). NAIL TO THE VERTICAL PIECE W/3-10d NAILS.

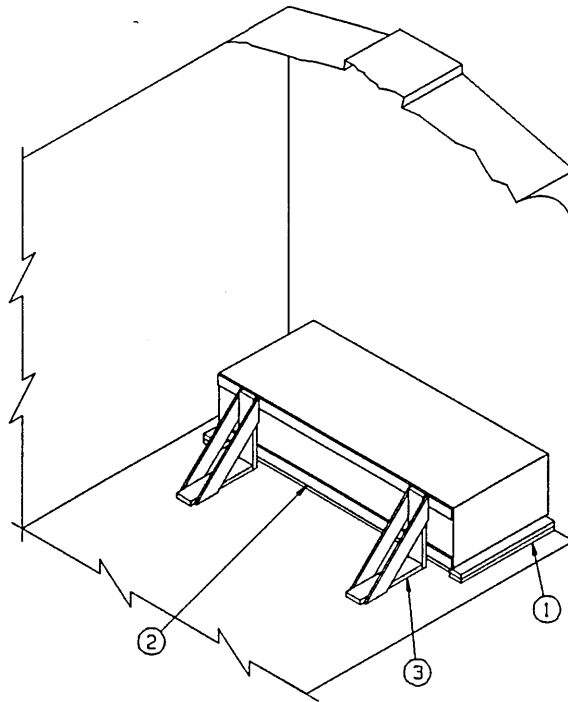


DIAGONAL BRACE

4" X 4" MATERIAL

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

TYPICAL LCL USING KNEE BRACE METHOD OF PARTIAL-LAYER BRACING



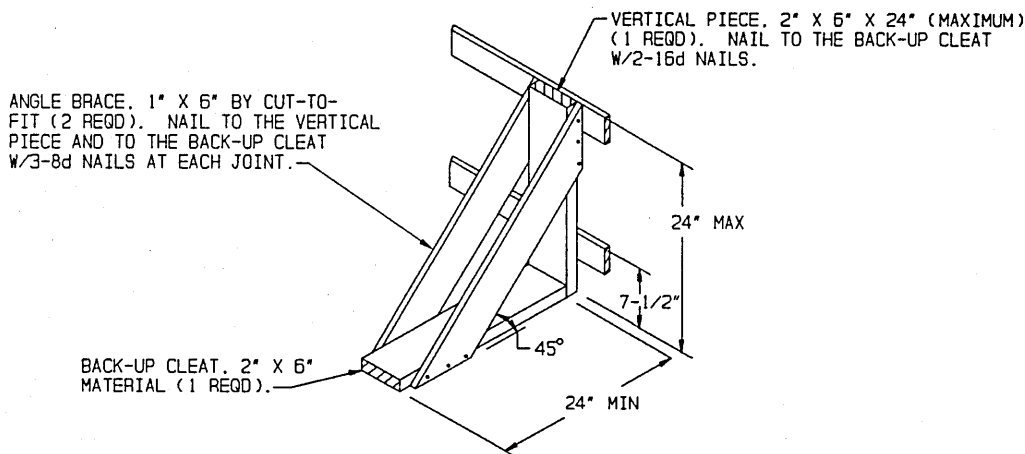
ISOMETRIC VIEW

SPECIAL NOTES:

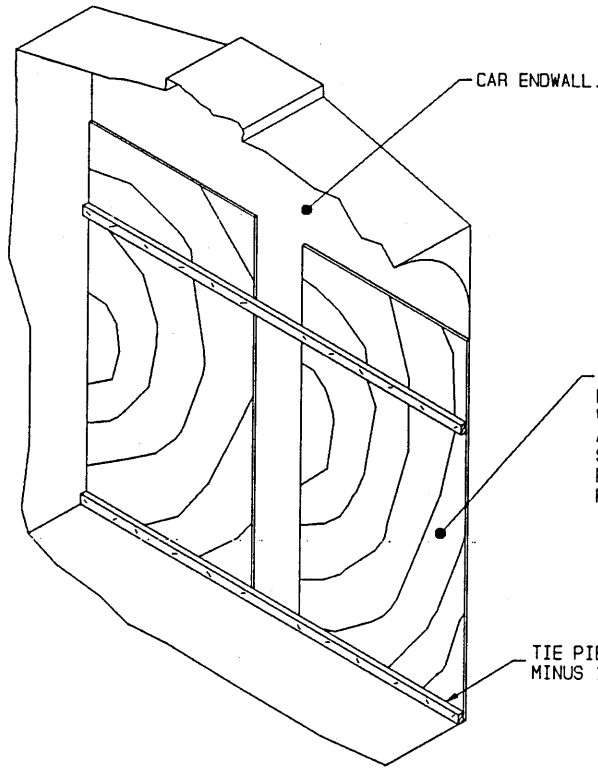
1. AN 8'-6" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR HAVING A WOOD OR NAILABLE METAL FLOOR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED. SEE GENERAL NOTE "E" ON PAGE 2.
2. EACH LCL BRACE AS APPLIED FOR LONGITUDINAL BRACING WILL RETAIN 2,000 POUNDS OF LADING. EACH LCL BRACE AS APPLIED FOR LATERAL BRACING WILL SUPPORT 8,000 POUNDS OF LADING. A MINIMUM OF TWO BRACES MUST BE USED FOR LONGITUDINAL BRACING.

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, 2" X 4" X 7'-6" (2 REQD). NAIL TO THE LCL BRACE W/3-10d 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 "R" ON PAGE 3, AND SPECIAL NOTE 2 AT LEFT.

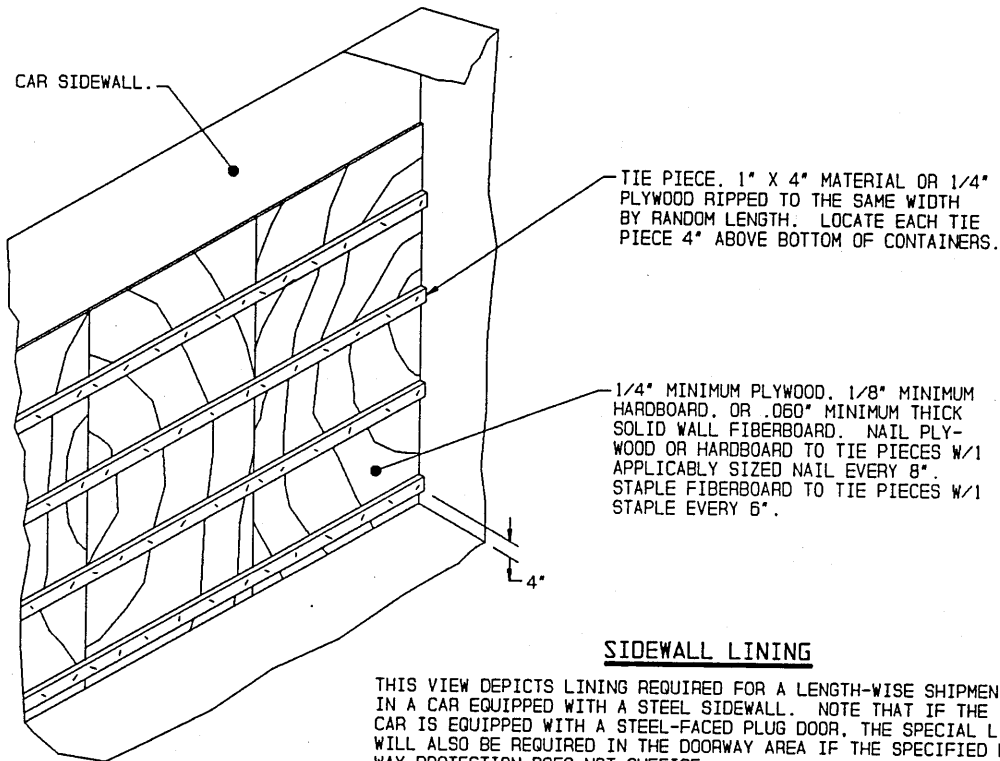


LCL BRACE



ENDWALL LINING

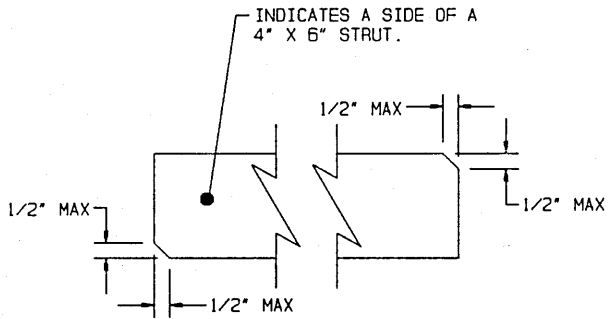
THIS VIEW DEPICTS LINING REQUIRED FOR A LENGTH-WISE LOAD IN A CAR EQUIPPED WITH A STEEL ENDWALL.



SIDEWALL LINING

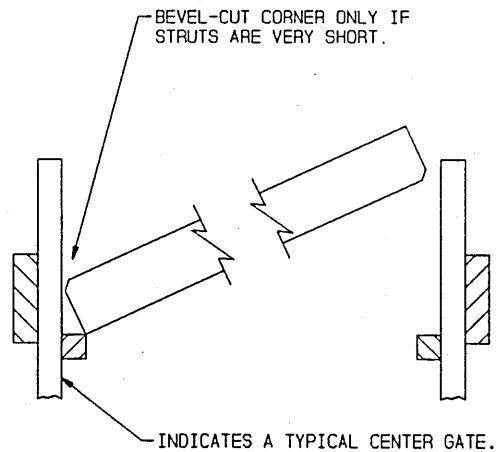
THIS VIEW DEPICTS LINING REQUIRED FOR A LENGTH-WISE SHIPMENT IN A CAR EQUIPPED WITH A STEEL SIDEWALL. NOTE THAT IF THE CAR IS EQUIPPED WITH A STEEL-FACED PLUG DOOR, THE SPECIAL LINING WILL ALSO BE REQUIRED IN THE DOORWAY AREA IF THE SPECIFIED DOORWAY PROTECTION DOES NOT SUFFICE.

DETAILS



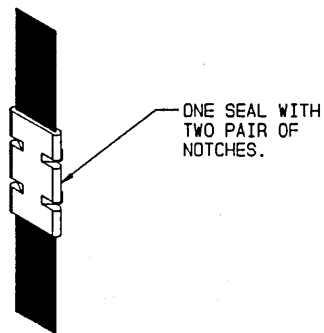
BEVEL-CUT

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



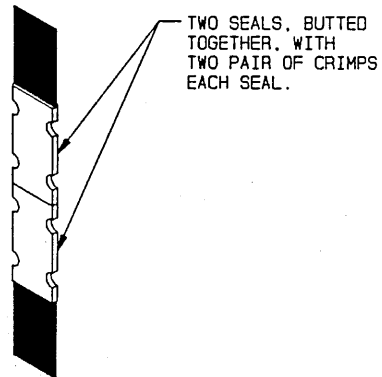
STRUT INSTALLATION

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



STRAP JOINT A

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



STRAP JOINT B

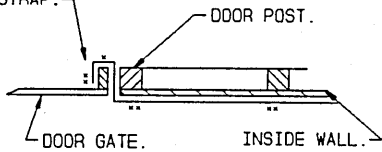
METHOD OF SECURING A STRAP JOINT WHEN USING A CRIMP-TYPE SEALER.

END-OVER-END LAP JOINT DETAILS

HORIZONTAL PIECE, 1" X 6" BY DOOR OPENING WIDTH (2 REQD PER LAYER). NAIL TO THE VERTICAL PIECES W/3-6d NAILS AT EACH END. SEE THE APPLICABLE DOORWAY PROTECTION DETAIL ON PAGE 23 OR 32 FOR HEIGHT LOCATIONS.

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

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



VIEW B

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

INDICATES DOOR OPENING.

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

INDICATES CAR SIDEWALL.

INDICATES FLOOR.

ALTERNATIVE DOORWAY PROTECTION A

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS WHEN THE DOOR POSTS ARE STEEL WITHOUT NAILING HOLES AND THE CAR SIDEWALLS ARE NAILABLE. THE VIEW SHOWN ABOVE IS FOR A 4-LAYER LOAD.

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

INDICATES DOOR OPENING.

INDICATES CAR SIDEWALL.

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

DOOR SPANNER END OF STRAP.

VIEW A

INDICATES STRAP ANCHOR PLATE.

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.

INDICATES STRAP ANCHOR PLATE (2 REQD PER STRAP).

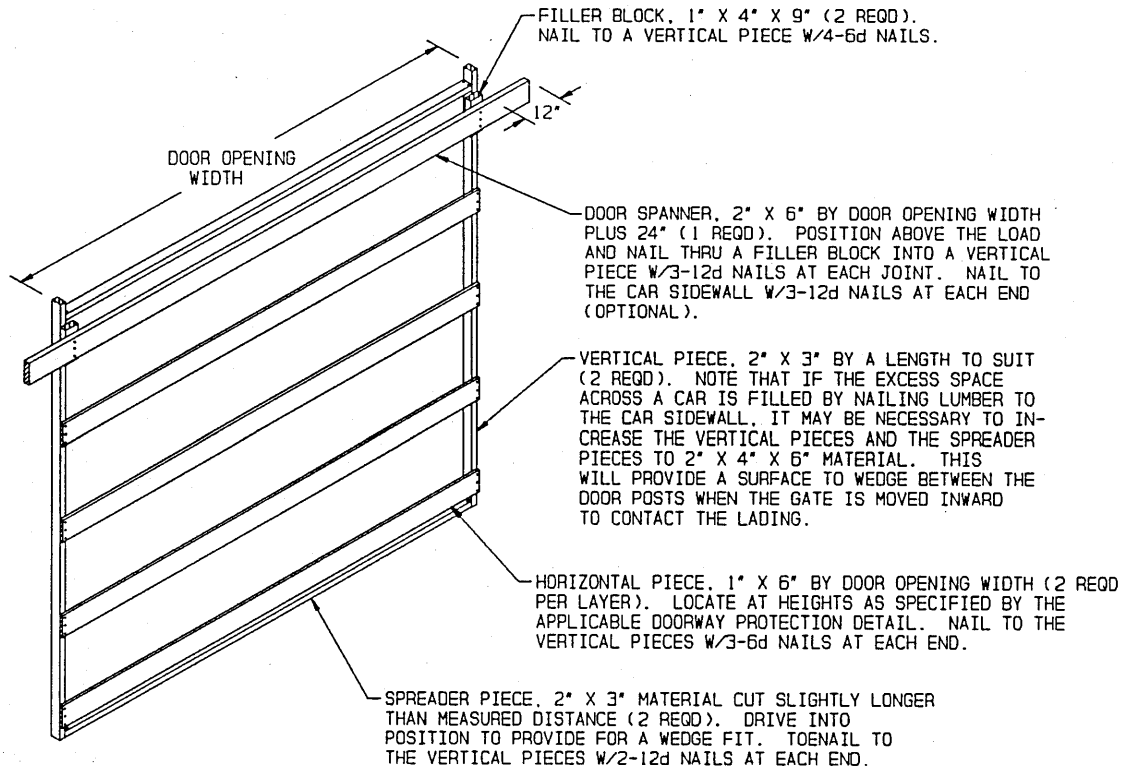
INDICATES FLOOR.

ALTERNATIVE DOORWAY PROTECTION B

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

A TOLERANCE OF PLUS OF MINUS 1" IS PERMISSIBLE. POSITION TO BEAR AGAINST LOWER BEARING SURFACE OF CONTAINERS.

DOORWAY PROTECTION



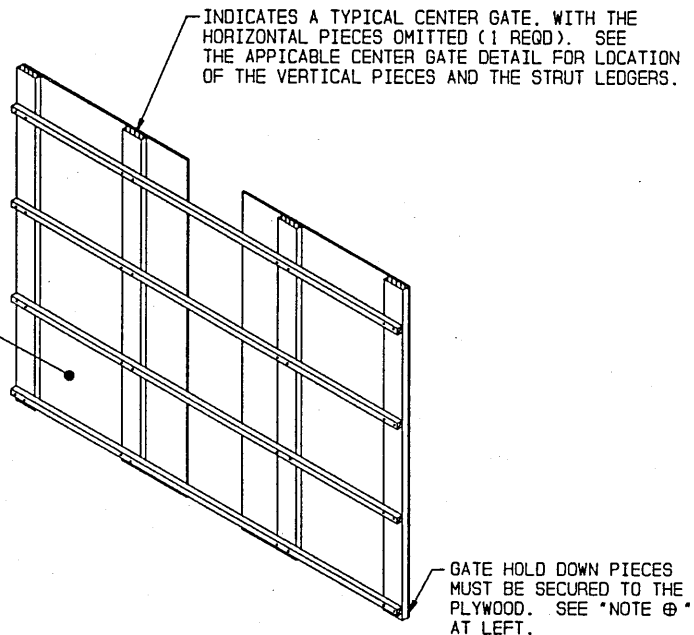
ALTERNATIVE DOORWAY PROTECTION C

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS WHEN THE DOOR POSTS ARE NOT AVAILABLE. IF THE CAR HAS AVAILABLE 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 45 FOR GUIDANCE.

PLYWOOD, 1/2" BY HEIGHT OF VERTICAL PIECES ON THE APPLICABLE CENTER GATE (2 REQD). NAIL TO THE VERTICAL PIECES W/1-6d NAIL EVERY 6". NOTE: THE WIDTH OF THE PLYWOOD WILL BE 48" IF THE LENGTH OF THE CONTAINERS ARE PARALLEL WITH THE SIDEWALL OF A CAR, AS TYPICALLY SHOWN IN THE IN THE LOAD ON PAGE 14, OR 45-1/2" WIDE IF THE WIDTH OF THE CONTAINERS ARE PARALLEL WITH THE SIDEWALL OF A CAR, AS TYPICALLY SHOWN IN THE LOAD ON PAGE 6.

NOTE ⊕:

IF PLYWOOD IS APPLIED TO CENTER GATE "A", A 2" WIDE BY 3-1/2" HIGH NOTCH MUST BE CUT ON THE LOWER OUTSIDE CORNERS. THIS WILL ALLOW THE PLYWOOD TO CLEAR THE SIDE BLOCKING SHOWN AS PIECE MARKED ① ON PAGE 6.



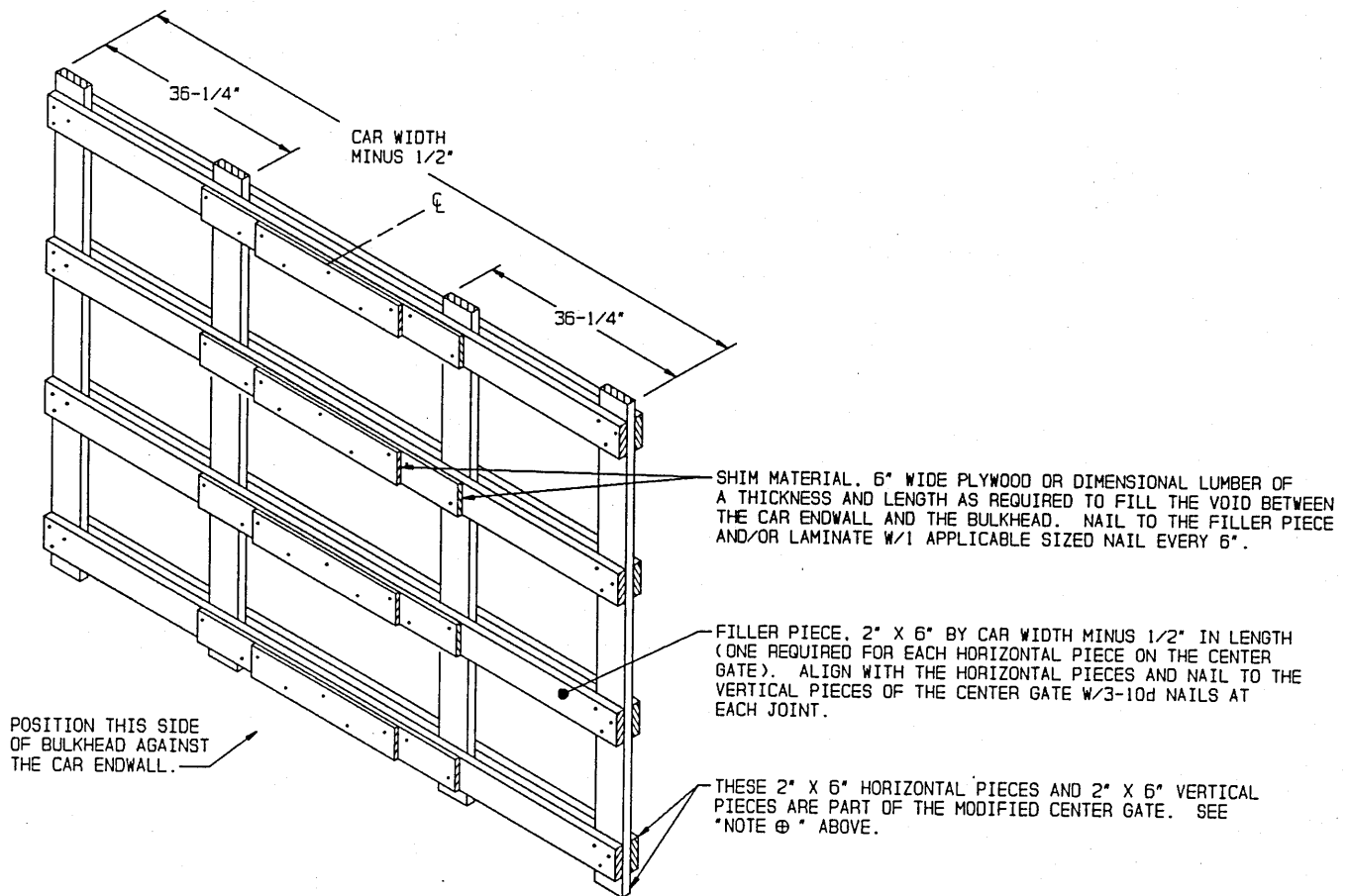
PLYWOOD CENTER GATE ALTERNATIVE

CENTER GATE "B" IS SHOWN AS TYPICAL.

DETAILS

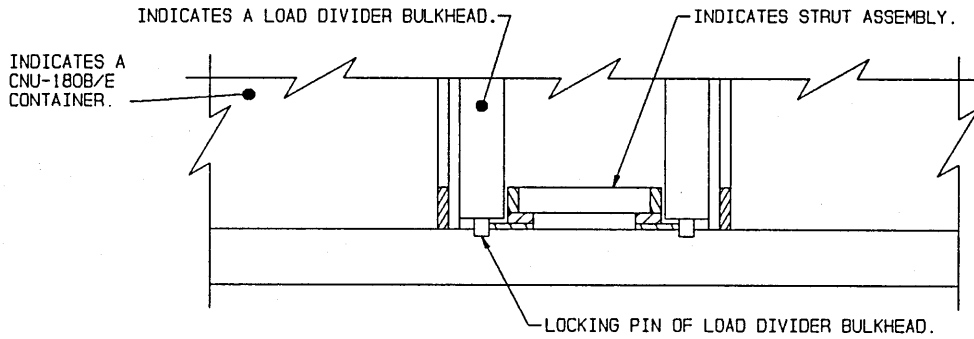
NOTE Ⓞ:

IF A BOX CAR 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 BOX CAR OR IN A CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS, OR AT THE END OF A CAR EQUIPPED WITH MECHANICAL BRACING DEVICES, IF DESIRED, IN LIEU OF USING CROSS MEMBERS. THE BULKHEAD MAY BE FABRICATED FROM A CENTER GATE FOR THE UNIT THAT IS TO BE LOADED 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 22, IS SHOWN AS TYPICAL.



END-OF-CAR BULKHEAD

SEE "NOTE Ⓞ" ABOVE.

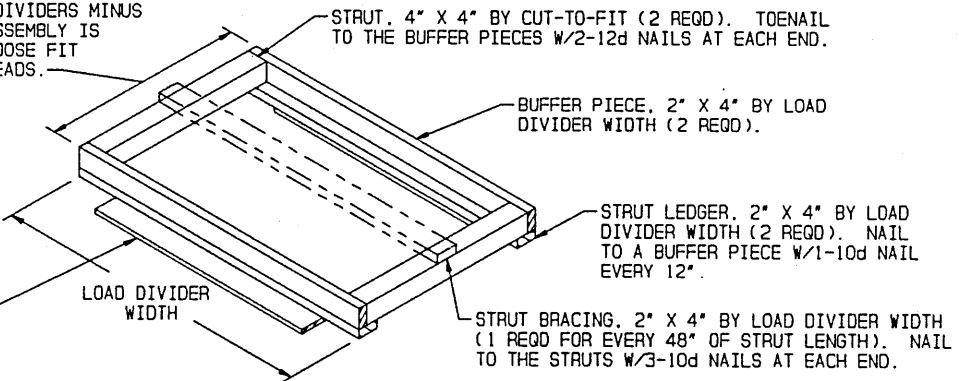


INSTALLATION OF STRUT ASSEMBLIES A OR B

THIS 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.

HOLD DOWN, 1" X 8" BY CUT-TO-FIT BETWEEN LOCKING PINS AT EACH SIDE OF THE LOAD DIVIDER (2 REQD). NAIL TO THE STRUT LEDGER W/1-6d NAIL EVERY 12".

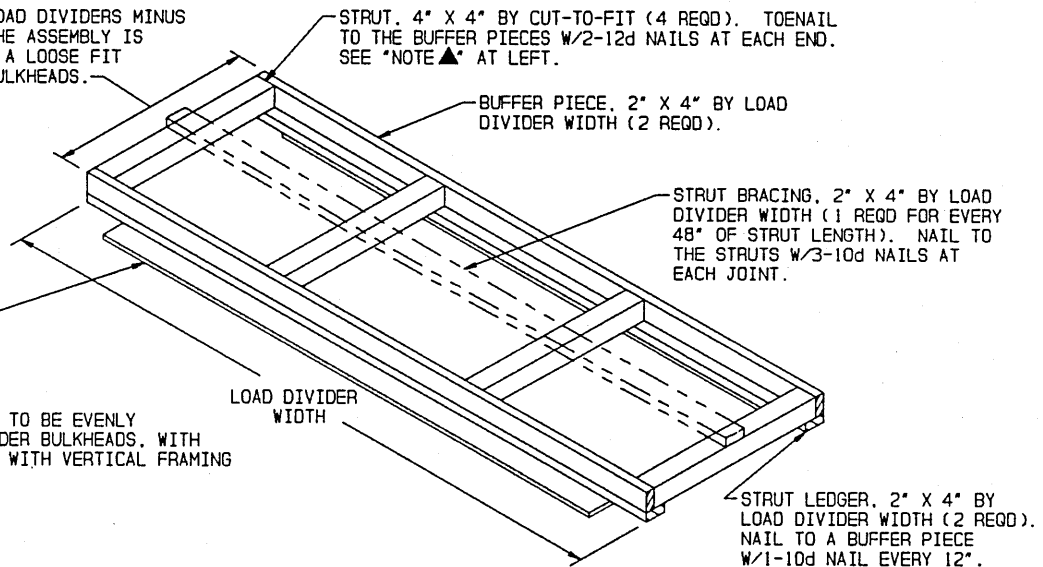


STRUT ASSEMBLY A

STRUT ASSEMBLY "A" IS DESIGNED FOR USE WITH 2-PIECE BULKHEADS. WITH 2 ASSEMBLIES BEING REQUIRED PER LOAD. SEE GENERAL NOTE "EE" ON PAGE 4.

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.

HOLD DOWN, 1" X 8" BY CUT-TO-FIT BETWEEN LOCKING PINS AT EACH SIDE OF THE LOAD DIVIDER (2 REQD). NAIL TO THE STRUT LEDGER W/1-6d NAIL EVERY 12".

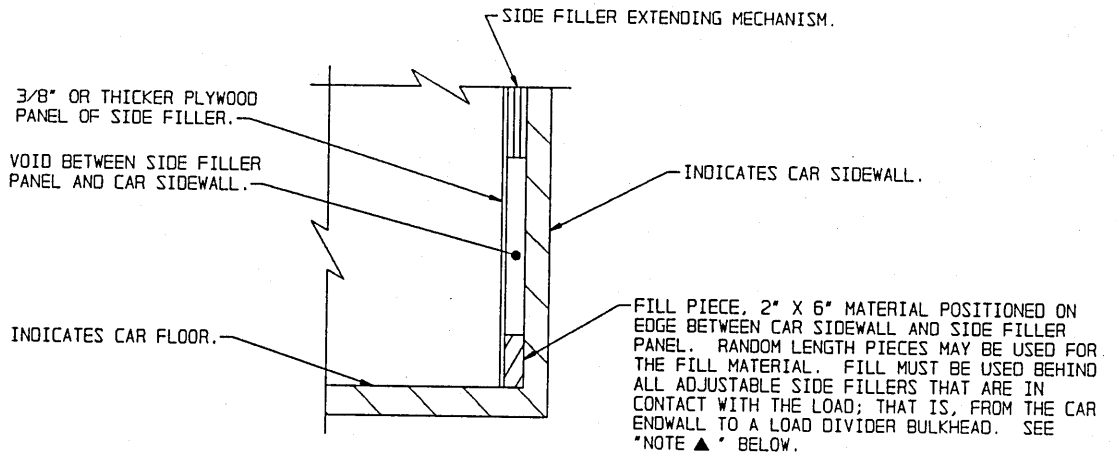


NOTE ▲:

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.

STRUT ASSEMBLY B

STRUT ASSEMBLY "B" IS DESIGNED FOR USE WITH 1-PIECE BULKHEADS. SEE GENERAL NOTE "EE" ON PAGE 4.

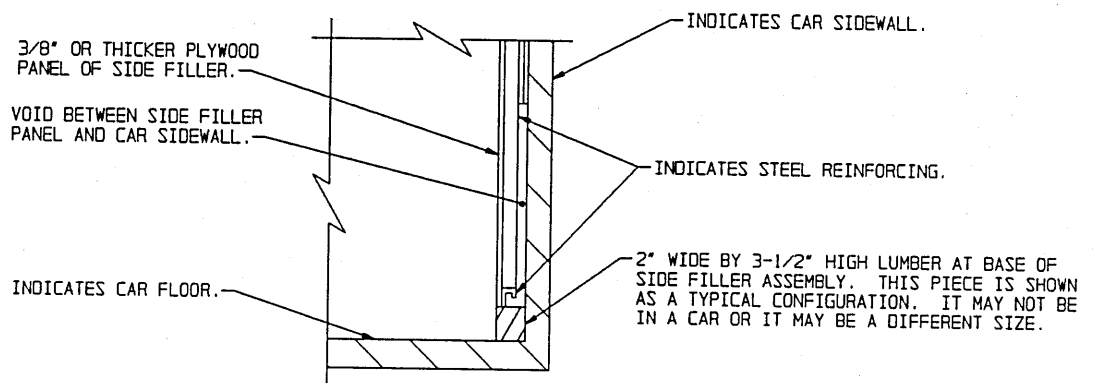


TYPICAL TYPE A

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.

