APPROVED BY
BUREAU OF EXPLOSIVES

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DATE 4-27-95

LOADING AND BRACING (CL & LCL) IN BOXCARS⊕ OF BLU-109/B BOMBS IN CNU-417/E CONTAINERS

INDEX

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

U.S. ARMY MATERIEL COMMAND DRAWING

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

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REVISION NO. 1	JANUARY 1995

SEE THE REVISION LISTING ON PAGE 2

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GENERAL NOTES

A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 (CHAPTER 5).

B. THE OUTLOADING PROCEDURES SPECIFIED IN THIS DRAWING ARE APPLICABLE TO BLU-109/B BOMBS PACKED TWO PER CNU-417/E CONTAINER. SEE THE CONTAINER DETAIL OF PAGE 5. SUBSEQUENT REFERENCE TO CONTAINER MEANS THE CNU-417/E CONTAINER WITH CONTENTS.

C. THE OUTLOADING PROCEDURES DEPICTED WITHIN THIS DOCUMENT ARE APPLICABLE FOR SHIPMENTS IN CONVENTIONAL TYPE BOXCARS AND FOR SHIPMENTS IN CUSHIONED BOXCARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.

D. THE SELECTION OF RAILCARS FOR THE TRANSPORT OF BLU-109/B BOMBS IS THE RESPONSIBILITY OF THE ORIGINATING CARRIER AND THE SHIPPER. ONLY CARS WHICH HAVE "SOUND" FLOORS AND ARE IN OTHERWISE PROPER CONDITION, IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPLICABLE REGULATORY DOCUMENTS, WILL BE SELECTED.

E. WHEN SELECTING RAILCARS, EVERY EFFORT SHOULD BE MADE TO OBTAIN BOXCARS THAT DO NOT HAVE BOWED ENDWALLS. CARS HAVING BOWED ENDS CAN BE USED, HOWEVER, IF AN ENDWALL IS BOWED OUTWARD MORE THAN 2" EITHER FROM SIDE TO SIDE OR FROM FLOOR TO ROOF, AN END-OF-CAR BULKHEAD MUST BE INSTALLED TO PROVIDE A "SQUARED OFF" SURFACE FOR THE LOAD AT THE END OF THE CAR. REFER TO PAGE 14 FOR GUIDANCE.

F. CONVENTIONAL BOXCARS EQUIPPED WITH SLIDING DOORS HAVE BEEN SHOWN, HOWEVER, THE DEPICTED OUTLOADING PROCEDURES ARE ALSO APPLICABLE FOR CONVENTIONAL CARS EQUIPPED WITH PLUG DOORS. CAUTION: DUNNAGE MATERIAL MUST NOT BE NAILED TO ANY PLUG DOOR, WHETHER AUXILIARY OR MAIN. ALSO, AFTER THE PLUG DOORS ON A CAR ARE CLOSED AND READY FOR THE INSTALLATION OF CAR SEALS, A PIECE OF WIRE OF SUITABLE SIZE WILL BE USED IN ADDITION TO AND IN CONJUNCTION WITH EACH CAR SEAL USED TO SEAL THE CAR. THE WIRE WILL BE THREADED THRU THE HOLES IN THE DOOR LATCH ASSEMBLY ONE OR MORE TIMES, AND THE WIRE ENDS WILL BE TWISTED TOGETHER.

G. 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.

H. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN CARS WHICH ARE PARTIALLY LOADED WITH BLU-109/B BOMBS PACKED IN CNU-417/E CONTAINERS, 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.

J. 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.

(CONTINUED AT RIGHT)

(GENERAL NOTES CONTINUED)

K. NOTICE: A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES. ALSO, A STAGGERED NAILING PATTERN WILL BE USED WHEN DUNNAGE IS NAILED TO THE FLOOR OR SIDEWALL OF THE TRANSPORTING VEHICLE, OR WHEN LAMINATING DUNNAGE. THE NAILING PATTERN WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL DOES NOT PENETRATE INTO OR NEAR A CRACK BETWEEN FLOOR BOARDS OR SIDEWALL BOARDS. ADDITIONALLY, THE NAILING PATTERN FOR AN UPPER PIECE OF LAMINATED DUNNAGE WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL FOR THAT PIECE WILL NOT BE DRIVEN THROUGH ONTO, OR RIGHT BESIDE A NAIL IN A LOWER PIECE.

L. POWER DRIVEN STAPLES MAY BE USED AS ALTERNATIVE FASTENERS FOR NAILS WHEN CONSTRUCTING DUNNAGE ASSEMBLIES WHICH ARE TO BE USED IN THE DELINEATED BOXCAR LOADS SHOWN THROUGHOUT THIS DRAWING. THE STAPLES TO BE USED MUST BE EQUAL IN LENGTH TO THE SPECIFIED NAIL SIZE AND MUST BE SUBSTITUTED ON A ONE STAPLE FOR ONE NAIL BASIS. STAPLES WHICH ARE 2-1/2" OR LESS IN LENGTH SHOULD BE IN ACCORDANCE WITH FEDERAL SPECIFICATION FF-N-105 AS NEARLY AS PRACTICABLE. STAPLES WHICH ARE LONGER THAN 2-1/2" WILL BE A COMMERCIAL GRADE, OF A QUALITY EQUIVALENT TO THOSE MANUFACTURED BY SENCO PRODUCTS INCORPORATED. NOTE: STAPLES WILL NOT BE SUBSTITUTED FOR NAILS IN ANY LOAD RESTRAINING FLOOR DUNNAGE APPLICATION.

M. 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 15 FOR GUIDANCE.

N. 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.

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

P. CAUTION: WHEN POWER OR PNEUMATIC NAILERS ARE BEING USED IN THE APPLICATION OF NAILED FLOORLINE BLOCKING OR BRACING, CONTAINERS BEING LOADED INTO THE CONVEYANCE MUST BE POSITIONED TO ALLOW A CLEAR PATH OF EXIT FOR THE OPERATOR AT ALL TIMES, SHOULD AN EMERGENCY EXIT BECOME NECESSARY.

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 25.4 MM AND ONE POUND EQUALS 0.454 KG.

(CONTINUED ON PAGE 3)

MATERIAL SPECIFICATIONS

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

REVISIONS

REVISION NUMBER 1, DATED JANUARY 1995, CONSISTS OF:

1. CHANGING HEIGHT OF CONTAINER AND THE ASSOCIATED DUNNAGE ASSEMBLIES.
2. ADDING PROCEDURES FOR CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.

GENERAL NOTES

(FOR CONVENTIONAL TYPE BOXCARS)

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 "K" ON PAGE 2.

S. NOTICE: WHEN POSITIONING CONTAINERS IN A CAR, THEY SHOULD BE PLACED 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 THE FRAME OF THE SUBASSEMBLY WHICH IS THE STRONG POINT OF THE CONTAINER. 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 72" OR LONGER MUST BE STIFFENED BY THE APPLICATION OF HORIZONTAL AND VERTICAL STRUT BRACING AS SHOWN BY THE "TYPICAL STRUT BRACING" DETAIL ON PAGE 15. BRACING IS NOT REQUIRED IF THE STRUTS FOR THE LOAD BEING SHIPPED ARE SHORTER THAN 72". 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 12'-0" OR MORE IN LENGTH, IT WILL BE NECESSARY TO APPLY AN ADDITIONAL SET OF HORIZONTAL AND VERTICAL STRUT BRACING PIECES. STRUT BRACING SHOULD BE APPLIED SO AS TO PROVIDE NEARLY EQUAL SPACES BETWEEN THE BRACING PIECES AND THE CENTER GATES AND/OR BETWEEN ADJACENT STRUT BRACING PIECES.

U. TO ACHIEVE A TIGHTLY BLOCKED LOAD, A STRUT WILL BE CUT APPROXIMATELY 1/4" TO 3/8" LONGER THAN THE MEASURED DISTANCE BETWEEN THE STRUT BEARING AREAS ON THE TWO CENTER GATES. MEASUREMENTS FOR STRUT LENGTHS NEED TO BE ACCOMPLISHED AT SEVERAL PLACES DURING THE BLOCKING AND BRACING PROCESS. CARE MUST BE EXERCISED WHEN MEASURING FOR AND INSTALLING STRUTS. THE SPECIFIED APPROXIMATE DIMENSION FOR A STRUT LENGTH MAY BE ADJUSTED, AS NECESSARY, TO PROVIDE FOR A TIGHTLY BLOCKED LOAD WITHOUT DISTORTING, DENTING OR OTHERWISE DAMAGING THE CONTAINERS. ONE END OF THE STRUT WILL BE POSITIONED AT ITS BEARING AREA JUST ABOVE THE STRUT LEDGER ON ONE GATE. THE OTHER END 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.

V. WHERE 2" X 2" PIECES ARE SPECIFIED FOR STRUT LEDGERS, 2" X 4" MATERIAL MAY BE SUBSTITUTED, IF DESIRED.

W. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

(CONTINUED ON PAGE 4)

GENERAL NOTES

(FOR CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS)

AA. CAUTION: FOR CUSHIONED BOXCARS EQUIPPED WITH LOAD DIVIDER BULKHEADS, ONLY CARS EQUIPPED WITH LOAD DIVIDERS MANUFACTURED BY EVANS, EQUIPCO, OR PRECO MAY BE USED. LOAD DIVIDERS MANUFACTURED BY TRANSCO ARE NOT ACCEPTABLE WHETHER OF ALUMINUM OR STEEL CONSTRUCTION. THE DEPICTED PROCEDURES ARE APPLICABLE FOR CARS OF VARIOUS LENGTHS AND WIDTHS. THE AAR MECHANICAL DESIGNATION CLASS FOR THESE CARS, AS IDENTIFIED IN "THE OFFICIAL RAILWAY EQUIPMENT REGISTER", WILL BE RBL, XL, OR XLI.

BB. THE USE OF LOAD DIVIDER EQUIPPED CARS WILL ELIMINATE THE NEED FOR CENTER GATES AND STRUTS, AND GATE HOLD DOWNS (WHEN APPLICABLE) WHICH ARE REQUIRED IN CONVENTIONAL BOXCAR LOADS. THIS WILL ACCOUNT FOR A CONSIDERABLE SAVING IN MATERIAL AND LABOR COSTS. THEREFORE, EVERY EFFORT SHOULD BE MADE TO ACQUIRE CUSHIONED CARS EQUIPPED WITH LOAD DIVIDERS FOR SHIPMENT OF BLU-109/B BOMBS. NOTICE: ONLY CUSHIONED CARS THAT HAVE SLIDING CENTER SILL TYPE CUSHIONED DEVICES OR END-OF-CAR TYPE DEVICES WHICH HAVE AT LEAST 15" OF TRAVEL ARE ACCEPTABLE.

CC. IF NAILING TO A CAR SIDEWALL IS NOT REQUIRED, BOXCARS EQUIPPED WITH ADJUSTABLE SIDE FILLERS THAT HAVE 3/8" OR THICKER PANELS MAY BE USED, HOWEVER, THESE SIDE FILLERS MUST NOT BE USED FOR LATERAL BLOCKING; THEY MUST BE RETRACTED AND LOCKED AGAINST THE CAR SIDEWALL. A "FILL PIECE" MUST BE INSTALLED IN THE VOID BETWEEN THE CAR SIDEWALL AND THE SIDE FILLER PANEL. SEE THE "TYPICAL TYPE A" VIEW ON PAGE 25 FOR GUIDANCE. IF THE BACK OF THE SIDE FILLER PANELS ARE REINFORCED WITH VERTICAL AND HORIZONTAL STEEL MEMBERS AS SHOWN IN THE "TYPICAL TYPE B" VIEW ON PAGE 25, THE "FILL PIECE" MATERIAL IS NOT REQUIRED.

DD. NOTICE: AFTER THE LOAD DIVIDER BULKHEADS ARE POSITIONED AGAINST THE LADING, AND THE LOCKING PINS ARE ENGAGED IN THE HOLES OF THE RAILS, THE LOWER LOCKING PINS MUST BE INSPECTED TO ENSURE THAT THE PINS ARE FULLY ENGAGED IN THE LOCKING HOLES. IF THE PINS ARE NOT FULLY SEATED IN THE LOCKING HOLES, THE LINKAGE MECHANISM WILL BE ADJUSTED AS REQUIRED SO THAT THE PINS WILL BE FULLY SEATED INTO THE LOCKING HOLES OF THE LOWER RAILS. IF PRESENT, DEBRIS MUST BE REMOVED FROM BENEATH THE LOCKING HOLES WHICH HAVE BEEN SELECTED FOR SECURING A LOAD DIVIDER BULKHEAD.

EE. A "STRUT ASSEMBLY" MUST BE INSTALLED BETWEEN THE LOAD DIVIDER BULKHEADS IF THE CAR CONTAINS HAZARD CLASS AND DIVISION 1.1, 1.2, OR 1.3 EXPLOSIVES AND THE LOAD IN EITHER END OF THE CAR WEIGHS 50,000 POUNDS OR MORE. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF HAZARD CLASS AND DIVISION 1.4 EXPLOSIVES. NOTE THAT THE STRUT ASSEMBLY MAY BE OMITTED FROM LOADS OF HAZARD CLASS AND DIVISION 1.1, 1.2, OR 1.3 EXPLOSIVES WEIGHING 50,000 POUNDS WHEN THE LADING AND ADEQUATE BLOCKING AND BRACING ARE POSITIONED TO COMPLETELY FILL THE SPACE BETWEEN THE INSTALLED BULKHEADS AS SPECIFIED IN GENERAL NOTE "FF-2" BELOW.

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 METHOD OF OMITTING A CONTAINER DEPICTED ON PAGE 21 MAY BE USED TO ADJUST A LOAD QUANTITY DOWNWARD BY OTHER THAN A MULTIPLE OF A LOAD UNIT.

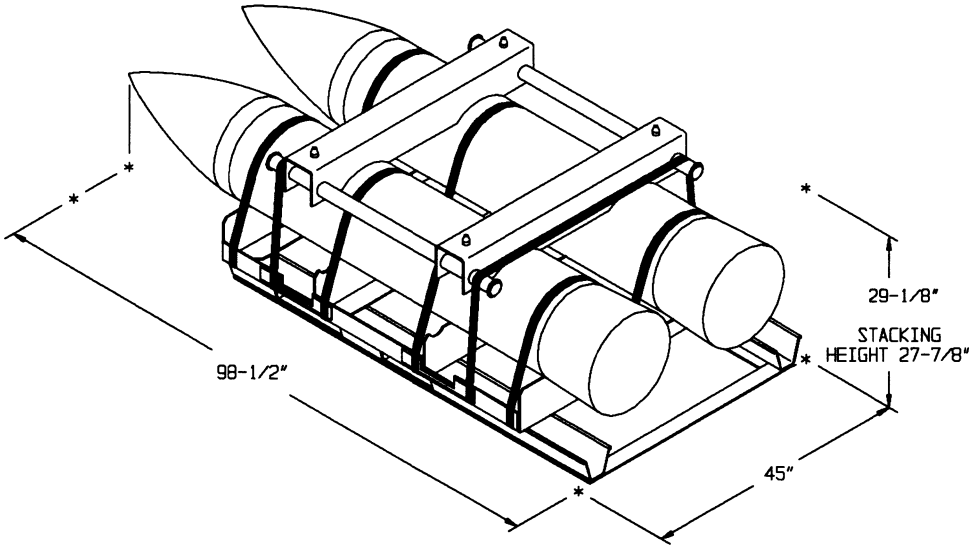
2. AT LOCATION(S) WHERE K-BRACES MIGHT NORMALLY BE USED IN A LOAD IN A CONVENTIONAL CAR, LOAD DIVIDER BULKHEADS CAN BE POSITIONED. LOADING CAN THEN CONTINUE TOWARD THE CENTER OF THE CAR FROM EACH INSTALLED LOAD DIVIDER BULKHEAD IN A ONE-HIGH OR TWO-HIGH LOADING PATTERN. INSTALL CENTER GATES AND STRUTS AS SHOWN ON PAGE 6 OF THE CONVENTIONAL BOXCAR DRAWING HEREIN TO PROVIDE FOR A TIGHT LOAD BETWEEN THE BULKHEADS.

(CONTINUED AT RIGHT)

(GENERAL NOTES CONTINUED)

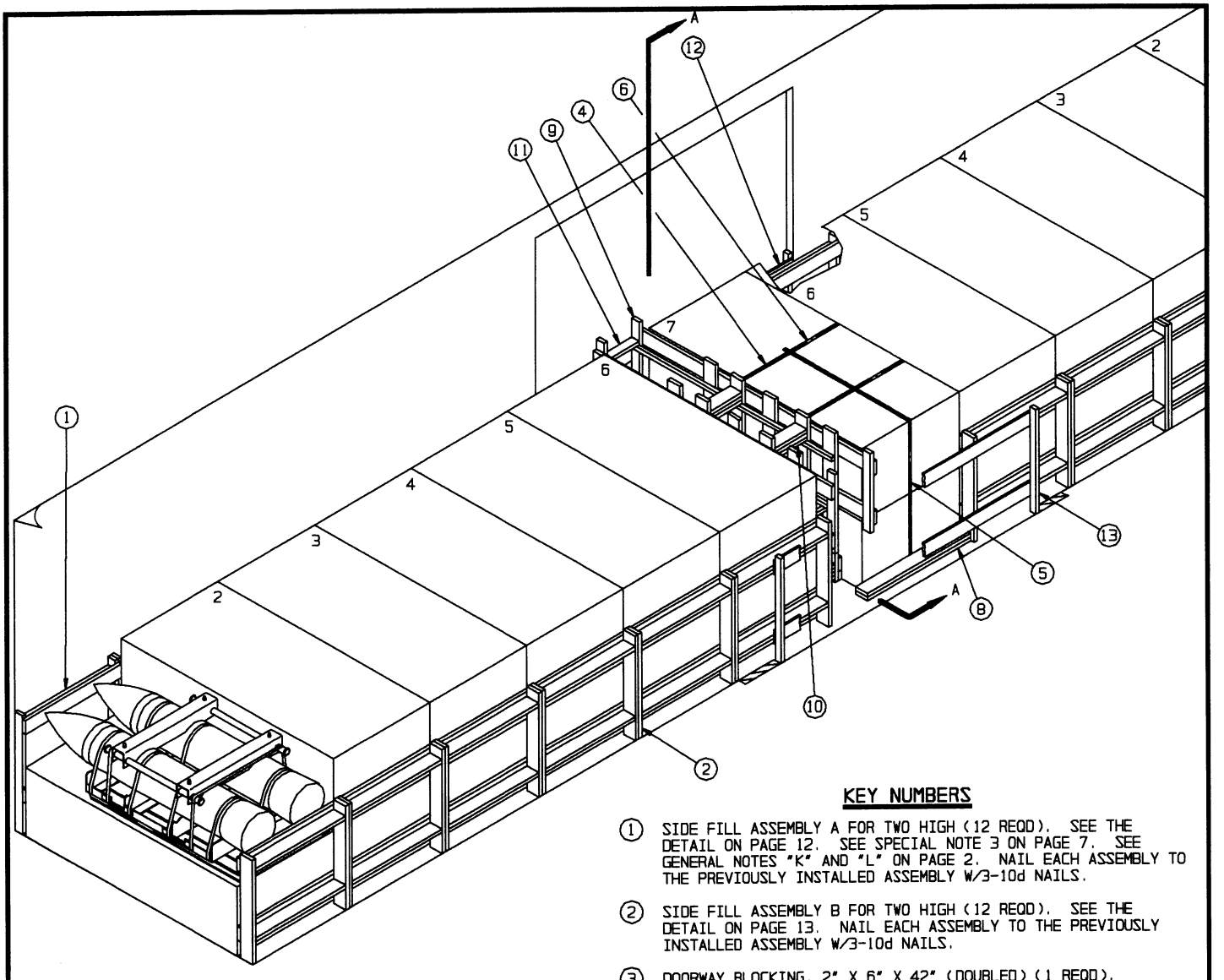
3. ONE OR MORE UNITS CAN BE POSITIONED IN CONTACT WITH A LOAD DIVIDER BULKHEAD ON THE CENTER-OF-CAR SIDE. BLOCK AND BRACE WITH KNEE BRACE ASSEMBLIES, AS SHOWN ON PAGE 22.

GG. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTION WHICH IS IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHOD. SEE PAGE 11.

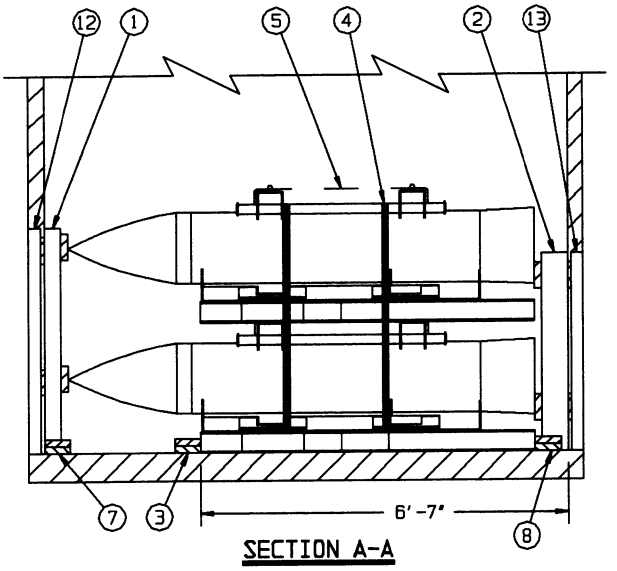


CONTAINER DETAIL

GROSS WEIGHT - - - - - - - - - 4,470 LBS (APPROX)
CUBE - - - - - - - - - - - - - 74.7 FT (APPROX)



ISOMETRIC VIEW



SECTION A-A

KEY NUMBERS

① SIDE FILL ASSEMBLY A FOR TWO HIGH (12 REQD). SEE THE DETAIL ON PAGE 12. SEE SPECIAL NOTE 3 ON PAGE 7. SEE GENERAL NOTES "K" AND "L" ON PAGE 2. NAIL EACH ASSEMBLY TO THE PREVIOUSLY INSTALLED ASSEMBLY W/3-10d NAILS.

② SIDE FILL ASSEMBLY B FOR TWO HIGH (12 REQD). SEE THE DETAIL ON PAGE 13. NAIL EACH ASSEMBLY TO THE PREVIOUSLY INSTALLED ASSEMBLY W/3-10d NAILS.

③ DOORWAY BLOCKING, 2" X 6" X 42" (DOUBLED) (1 REQD). PRE-POSITION SO THE LOAD BEARING SIDE IS 6'-7" FROM THE LOADING SIDE OF THE CAR AND ONE END IS EVEN WITH THE END OF STACK NUMBER 6 IN THE LONG-LOAD END OF THE CAR. NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE THE "SECTION A-A" VIEW BELOW.

④ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 16'-0" LONG STEEL STRAPPING (2 REQD). INSTALL TO LONGITUDINALLY ENCIRCLE THE TWO UNITS IN STACK NUMBER 7. SEE SPECIAL NOTE 5 ON PAGE 7.

⑤ BUNDLING STRAP, 1-1/4" X .035" OR .031" X 21'-0" LONG STEEL STRAPPING (1 REQD). INSTALL TO LATERALLY ENCIRCLE THE TWO UNITS IN STACK NUMBER 7.

⑥ SEAL FOR 1-1/4" STEEL STRAPPING (6 REQD, 2 PER STRAP). SEE GENERAL NOTE "M" ON PAGE 2 AND THE "END-OVER-END LAP JOINT DETAILS" ON PAGE 15.

⑦ SIDE FILL ASSEMBLY A STOP PIECE, 2" X 6" X 12" (DOUBLED) (1 REQD). POSITION AGAINST SIDE FILL ASSEMBLY A, PIECE MARKED ①, AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/2-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE THE "SECTION A-A" VIEW BELOW.

⑧ DOORWAY BLOCKING/SIDE FILL ASSEMBLY STOP PIECE, 2" X 6" X 48" (DOUBLED) (1 REQD). POSITION AGAINST THE BASE OF THE CONTAINER SKIDS AND AGAINST THE SIDE FILL ASSEMBLY B, PIECE MARKED ②. NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.

⑨ CENTER GATE A (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE DETAIL ON PAGE 12.

(CONTINUED ON PAGE 7)

26-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL BOXCAR

(KEY NUMBERS CONTINUED FROM PAGE 6)

⑩ STRUT, 2" X 6" BY CUT TO FIT (REF: 15") (TRIPLED) (12 REQD). LAMINATE THE SECOND PIECE TO THE FIRST W/1-10d NAIL EVERY 6". LAMINATE THE THIRD PIECE TO THE SECOND IN A LIKE MANNER. TOENAIL THE TOP PIECE TO THE CENTER GATES, PIECES MARKED ⑨, W/2-12d NAILS AT EACH END. SEE THE "TYPICAL STRUT BRACING" DETAIL ON PAGE 15 FOR STRUT LOCATION GUIDANCE. SEE GENERAL NOTES "T" AND "U" ON PAGE 3.

⑪ STRUT, 2" X 4" BY CUT TO FIT (REF: 15") (2 REQD). TOENAIL TO THE VERTICAL PIECES OF THE CENTER GATES, PIECES MARKED ⑨, W/2-12d NAILS AT EACH END.

⑫ DOORWAY PROTECTION A (1 REQD). SEE THE DETAIL ON PAGE 13. INSTALL IN THE DOOR OPENING ON THE SIDE OPPOSITE THE LOADING SIDE. NAIL TO THE DOORPOSTS W/12d NAILS. SEE SPECIAL NOTE 4 AT RIGHT.

⑬ DOORWAY PROTECTION B (1 REQD). SEE THE DETAIL ON PAGE 13. INSTALL IN THE DOOR OPENING ON THE LOADING SIDE. NAIL TO THE DOORPOSTS W/12d NAILS.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL TYPE BOXCAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER SIZES AND CARS HAVING OTHER WIDTH (8'-0" MINIMUM) DOOR OPENINGS CAN BE USED.

2. A MAXIMUM OF TWENTY CNU-417/E CONTAINERS, FOR AN APPROXIMATE LADING WEIGHT OF 89,400 POUNDS, CAN BE PLACED IN A 40'-6" LONG BOXCAR WHEN USING THE DEPICTED PROCEDURES.

3. THE SIDE FILL ASSEMBLY A, PIECE MARKED ① ON PAGE 6, SHOWN WITH 2" X 4" VERTICAL PIECES AND FILL PIECES, IS APPLICABLE ONLY FOR A 9'-4" WIDE CAR. IF THE CAR TO BE USED IS 9'-2" WIDE, THE VERTICAL PIECES AND FILL PIECES WILL BE 2" X 2" MATERIAL. IF A 9'-6" WIDE CAR IS FURNISHED FOR LOADING, THE VERTICAL PIECES AND FILL PIECES OF THE ASSEMBLIES WILL BE 2" X 6" MATERIAL. SIDE FILL ASSEMBLY B, PIECE MARKED ② ON PAGE 6, WILL ALWAYS BE CONSTRUCTED USING 2" X 6" MATERIAL.

4. THE DOORWAY PROTECTION ASSEMBLIES ARE REQUIRED TO PROVIDE LATERAL RETENTION FOR THE CENTER GATES, PIECES MARKED ⑨, AND FOR THE SIDE FILL ASSEMBLIES, PIECES MARKED ① AND ②, WHEN THEY ARE WITHIN THE DOORWAY AREA. IF THE CAR FURNISHED HAS PLUG TYPE DOORS, THE DOORWAY PROTECTION, PIECES MARKED ⑫ AND ⑬, WILL NOT BE REQUIRED. IF THE CAR IS EQUIPPED WITH STAGGERED DOOR OPENINGS AND THE AUXILIARY DOOR OPENINGS ARE OF THE SLIDING TYPE, DOORWAY PROTECTION, PIECES MARKED ⑫ AND ⑬, WILL BE REQUIRED THERE. IF THE DOORPOSTS OF THE AUXILIARY DOOR OPENINGS ARE NOT NAILABLE, SEE THE "ALTERNATIVE DOORWAY PROTECTION" DETAIL ON PAGE 14 FOR GUIDANCE.

5. THE UNITIZING STRAPS, PIECES MARKED ④, SHOULD BE POSITIONED THRU THE FORKLIFT POCKETS OR OTHER STRAP OPENINGS OF THE BOTTOM LAYER CONTAINER IN STACK NUMBER 7 PRIOR TO LOADING THE CONTAINER INTO THE CAR. IF THE AVAILABLE MATERIAL HANDLING EQUIPMENT IS OF ADEQUATE CAPACITY, THE CONTAINERS CAN BE UNITIZED PRIOR TO PLACEMENT INTO THEIR FINAL LOADING POSITION.

6. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED BY OMITTING ONE OR MORE CONTAINER STACKS FROM THE LOAD, OR THE ENTIRE TOP TIER CAN BE OMITTED. SEE SPECIAL NOTE 7 FOR GUIDANCE. FOR OTHER METHODS OF REDUCING A LOAD, REFER TO THE TYPICAL LCL PROCEDURES ON PAGES 17 THRU 21 FOR GUIDANCE.

7. IF A ONE-LAYER LOAD IS TO BE SHIPPED, NAILED LATERAL BLOCKING MAY BE USED IN LIEU OF USING SIDE FILL ASSEMBLIES A AND B. PIECE MARKED ③ WHICH IS IN THE DOORWAY AREA MAY BE USED THROUGHOUT THE LENGTH OF THE LOAD IN LIEU OF SIDE FILL ASSEMBLY A, PIECE MARKED ①. IT MUST BE PRE-POSITIONED AS SHOWN IN THE "SECTION A-A" VIEW. PIECE MARKED ⑧ IN THE DOORWAY MAY BE USED THROUGHOUT THE LOAD IN LIEU OF SIDE FILL ASSEMBLY B, PIECE MARKED ②. IF NAILED LATERAL BLOCKING IS USED, THE DOORWAY PROTECTION GATES, PIECES MARKED ⑫ AND ⑬, WILL NOT BE REQUIRED. CENTER GATE B, AS DETAILED ON PAGE 16, MUST BE USED IN LIEU OF CENTER GATE A, PIECE MARKED ⑨. SEVEN TRIPLED 2" X 6" STRUTS WILL BE REQUIRED, WITH THE UPPER LEVEL OF STRUTS POSITIONED AS MARKED WITH AN "X" ON THE CENTER GATE B DETAIL ON PAGE 16.

8. IF A 60'-8" LONG BOXCAR IS FURNISHED FOR LOADING, REFER TO PAGES 8 AND 9 FOR GUIDANCE.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	32	16
2" X 2"	42	14
2" X 3"	21	11
2" X 4"	204	136
2" X 6"	506	506
NAILS	**NO. REQD**	**POUNDS**
6d (2")	24	1/4
10d (3")	876	14-3/4
12d (3-1/4")	70	1-1/4
16d (3-1/2")	28	3/4

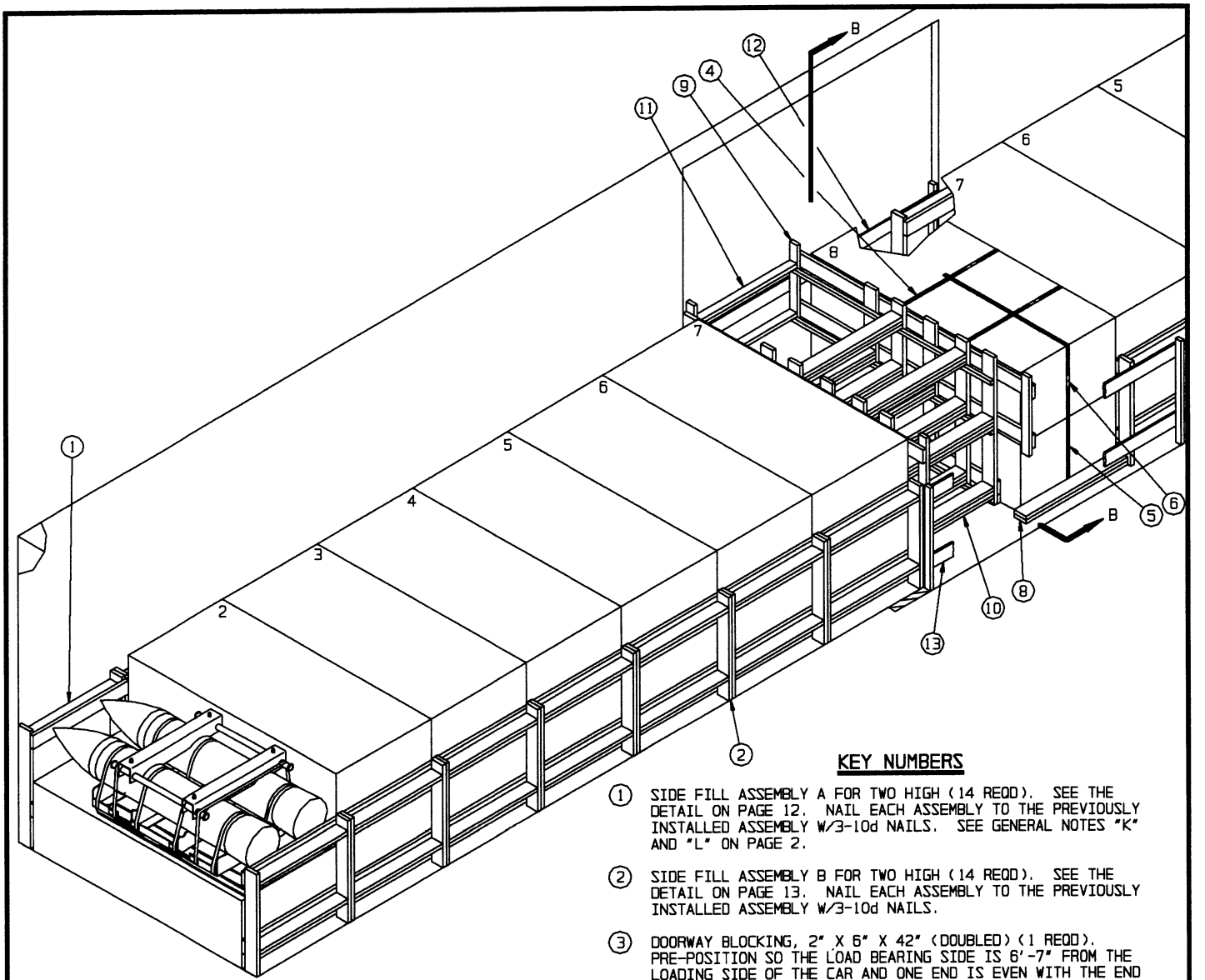
STEEL STRAPPING, 1-1/4" - - 53' REQD - - - - 8 LBS
SEAL FOR 1-1/4" STRAPPING - - 6 REQD - - - 1/2 LB

LOAD AS SHOWN

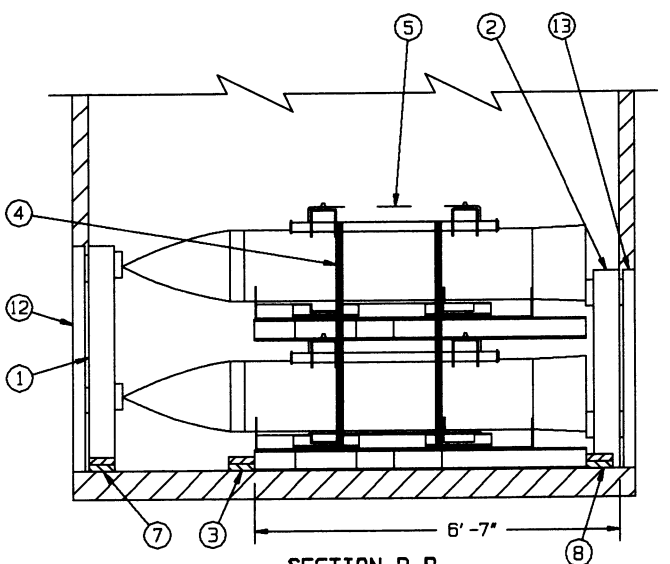
ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINERS	26	116,220 LBS
DUNNAGE		1,392 LBS
TOTAL WEIGHT		117,612 LBS (APPROX)

26-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL BOXCAR

PROJECT SP 128/1-85



ISOMETRIC VIEW



SECTION B-B

KEY NUMBERS

(1) SIDE FILL ASSEMBLY A FOR TWO HIGH (14 REQD). SEE THE DETAIL ON PAGE 12. NAIL EACH ASSEMBLY TO THE PREVIOUSLY INSTALLED ASSEMBLY W/3-10d NAILS. SEE GENERAL NOTES "K" AND "L" ON PAGE 2.

(2) SIDE FILL ASSEMBLY B FOR TWO HIGH (14 REQD). SEE THE DETAIL ON PAGE 13. NAIL EACH ASSEMBLY TO THE PREVIOUSLY INSTALLED ASSEMBLY W/3-10d NAILS.

(3) DOORWAY BLOCKING, 2" X 6" X 42" (DOUBLED) (1 REQD). PRE-POSITION SO THE LOAD BEARING SIDE IS 6'-7" FROM THE LOADING SIDE OF THE CAR AND ONE END IS EVEN WITH THE END OF STACK NUMBER 7 IN THE LONG-LOAD END OF THE CAR. NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE THE "SECTION B-B" VIEW BELOW.

(4) UNITIZING STRAP, 1-1/4" X .035" OR .031" X 16'-0" LONG STEEL STRAPPING (2 REQD). INSTALL TO LONGITUDINALLY ENCIRCLE THE TWO UNITS IN STACK NUMBER 8. SEE SPECIAL NOTE 3 ON PAGE 9.

(5) BUNDLING STRAP, 1-1/4" X .035" OR .031" X 21'-0" LONG STEEL STRAPPING (1 REQD). INSTALL TO LATERALLY ENCIRCLE THE TWO UNITS IN STACK NUMBER 8.

(6) SEAL FOR 1-1/4" STEEL STRAPPING (6 REQD, 2 PER STRAP). SEE GENERAL NOTE "M" ON PAGE 2 AND THE "END-OVER-END LAP JOINT DETAILS" ON PAGE 15.

(7) SIDE FILL ASSEMBLY A STOP PIECE, 2" X 6" X 12" (DOUBLED) (1 REQD). POSITION AGAINST SIDE FILL ASSEMBLY A ON THE SIDE OPPOSITE THE LOADING SIDE OF THE CAR. NAIL THE FIRST PIECE TO THE CAR FLOOR W/2-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE THE "SECTION B-B" VIEW BELOW.

(8) DOORWAY BLOCKING/SIDE FILL ASSEMBLY STOP PIECE, 2" X 6" X 48" (DOUBLED) (1 REQD). POSITION AGAINST BASE OF THE CONTAINER SKIDS AND AGAINST THE SIDE FILL ASSEMBLY B, PIECE MARKED (2). NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.

(9) CENTER GATE A (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE DETAIL ON PAGE 12.

(CONTINUED ON PAGE 9)

30-UNIT LOAD IN A 60'-8" LONG BY 9'-6" WIDE CONVENTIONAL BOXCAR

(KEY NUMBERS CONTINUED FROM PAGE 8)

⑩ STRUT, 2" X 6" BY CUT TO FIT (REF: 47") (TRIPLED) (12 REQD). LAMINATE THE SECOND PIECE TO THE FIRST W/1-10d NAIL EVERY 6". LAMINATE THE THIRD PIECE TO THE SECOND IN A LIKE MANNER. TOENAIL THE TOP PIECE TO THE CENTER GATES, PIECES MARKED ⑨, W/2-12d NAILS AT EACH END. SEE THE "TYPICAL STRUT BRACING" DETAIL ON PAGE 15 FOR STRUT LOCATION GUIDANCE. SEE GENERAL NOTES "T" AND "U" ON PAGE 3.

⑪ STRUT, 2" X 4" BY CUT TO FIT (REF: 47") (2 REQD). TOENAIL TO THE VERTICAL PIECES OF THE CENTER GATES, PIECES MARKED ⑨, W/2-12d NAILS AT EACH END.

⑫ DOORWAY PROTECTION A (1 REQD). SEE THE DETAIL ON PAGE 13. INSTALL IN THE DOOR OPENING ON THE SIDE OPPOSITE THE LOADING SIDE. NAIL TO THE DOORPOSTS W/12d NAILS. SEE SPECIAL NOTE 3 AT RIGHT.

⑬ DOORWAY PROTECTION B (1 REQD). SEE THE DETAIL ON PAGE 13. INSTALL IN THE DOOR OPENING ON THE LOADING SIDE. NAIL TO THE DOORPOSTS W/12d NAILS.

SPECIAL NOTES:

1. A 60'-8" LONG BY 9'-6" WIDE CONVENTIONAL TYPE BOXCAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER SIZES AND CARS HAVING OTHER WIDTH (8'-0" MINIMUM) DOOR OPENINGS CAN BE USED.

2. THE SIDE FILL ASSEMBLY A, PIECE MARKED ① ON PAGE 8, SHOWN WITH 2" X 6" VERTICAL PIECES AND FILL PIECES, IS APPLICABLE ONLY FOR A 9'-6" WIDE CAR. IF THE CAR TO BE USED IS 9'-2" WIDE, THE VERTICAL PIECES AND FILL PIECES WILL BE 2" X 2" MATERIAL. IF A 9'-4" WIDE CAR IS FURNISHED FOR LOADING, THE VERTICAL PIECES AND FILL PIECES OF THE ASSEMBLIES WILL BE 2" X 4" MATERIAL. SIDE FILL ASSEMBLY B, PIECE MARKED ② ON PAGE 8, WILL ALWAYS BE CONSTRUCTED USING 2" X 6" MATERIAL.

3. THE DOORWAY PROTECTION ASSEMBLIES ARE REQUIRED TO PROVIDE LATERAL RETENTION FOR THE CENTER GATES, PIECES MARKED ⑨, WHEN THEY ARE WITHIN THE DOORWAY AREA. IF THE CAR FURNISHED FOR LOADING HAS PLUG TYPE DOORS, THE DOORWAY PROTECTION, PIECES MARKED ⑫ AND ⑬, WILL NOT BE REQUIRED. IF THE CAR IS EQUIPPED WITH STAGGERED DOOR OPENINGS AND THE AUXILIARY DOOR OPENINGS ARE OF THE SLIDING TYPE, DOORWAY PROTECTION, PIECES MARKED ⑫ AND ⑬ WILL BE REQUIRED THERE TO PROVIDE SUPPORT FOR THE SIDE FILL ASSEMBLIES, PIECES MARKED ① AND ②.

4. THE UNITIZING STRAPS, PIECES MARKED ④, SHOULD BE POSITIONED THRU THE FORKLIFT POCKETS OR OTHER STRAP OPENINGS OF THE BOTTOM LAYER CONTAINER IN STACK NUMBER 8 PRIOR TO LOADING THE CONTAINER INTO THE CAR. IF THE AVAILABLE MATERIAL HANDLING EQUIPMENT IS OF ADEQUATE CAPACITY, THE CONTAINERS CAN BE UNITIZED PRIOR TO PLACEMENT INTO THEIR FINAL LOADING POSITION.

5. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED BY OMITTING ONE OR MORE CONTAINER STACKS FROM THE LOAD, OR THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, REFER TO THE TYPICAL LCL PROCEDURES ON PAGES 17 THRU 21 FOR GUIDANCE.

6. IF A ONE-LAYER LOAD IS TO BE SHIPPED, REFER TO SPECIAL NOTE 7 ON PAGE 7 FOR GUIDANCE.

7. IF A 50'-6" LONG BOXCAR IS FURSNISHED FOR LOADING, REFER TO PAGES 6 AND 7 FOR GUIDANCE.

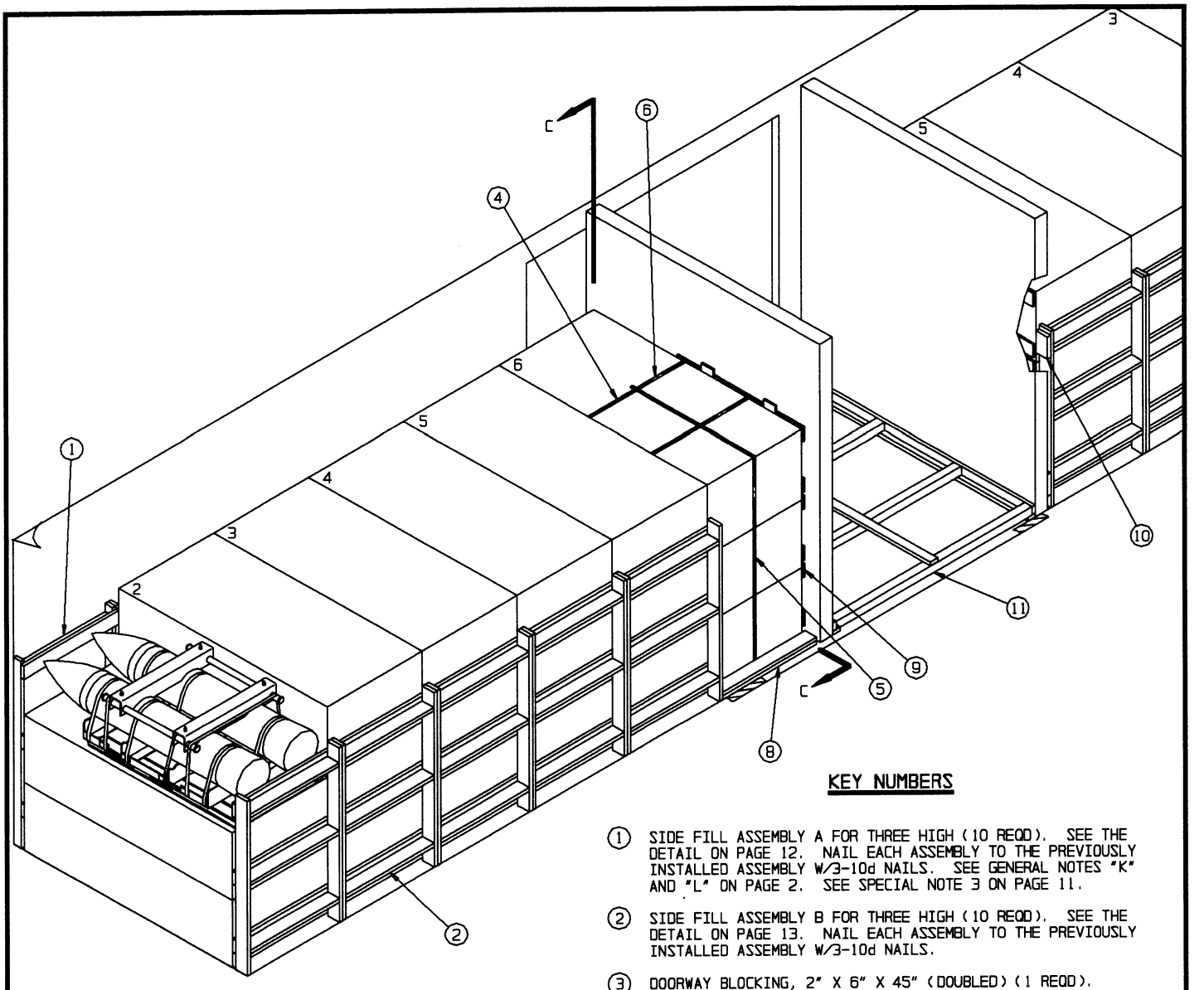
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	40	20
2" X 2"	42	14
2" X 3"	20	10
2" X 4"	29	20
2" X 6"	1,281	1,281
NAILS	**NO. REQD**	**POUNDS**
6d (2")	24	1/4
10d (3")	1,156	19-1/2
12d (3-1/4")	56	1
16d (3-1/2")	24	3/4

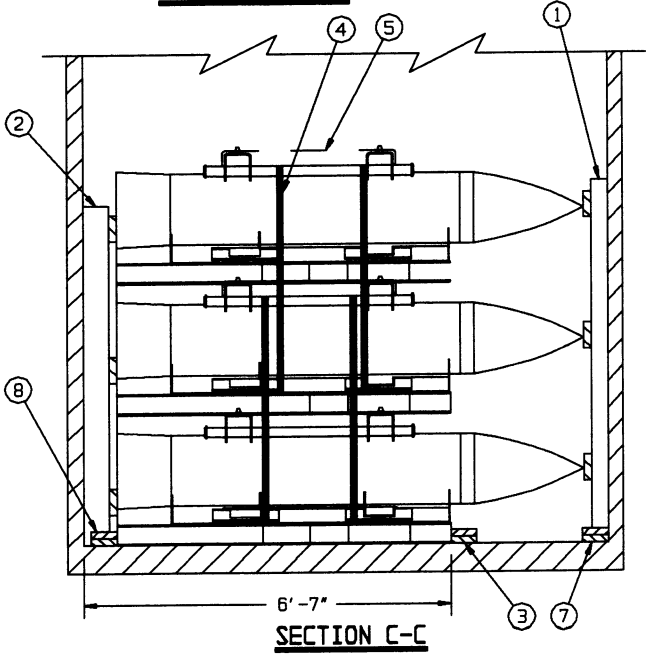
STEEL STRAPPING, 1-1/4" - - 53' REQD - - - - 8 LBS
SEAL FOR 1-1/4" STRAPPING - - 6 REQD - - - 1/2 LB

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINERS	30	134,100 LBS
DUNNAGE		2,720 LBS
TOTAL WEIGHT		136,820 LBS (APPROX)



ISOMETRIC VIEW



SECTION C-C

KEY NUMBERS

① SIDE FILL ASSEMBLY A FOR THREE HIGH (10 REQD). SEE THE DETAIL ON PAGE 12. NAIL EACH ASSEMBLY TO THE PREVIOUSLY INSTALLED ASSEMBLY W/3-10d NAILS. SEE GENERAL NOTES "K" AND "L" ON PAGE 2. SEE SPECIAL NOTE 3 ON PAGE 11.

② SIDE FILL ASSEMBLY B FOR THREE HIGH (10 REQD). SEE THE DETAIL ON PAGE 13. NAIL EACH ASSEMBLY TO THE PREVIOUSLY INSTALLED ASSEMBLY W/3-10d NAILS.

③ DOORWAY BLOCKING, 2" X 6" X 45" (DOUBLED) (1 REQD). PRE-POSITION SO THE LOAD BEARING SIDE IS 6'-7" FROM THE LOADING SIDE OF THE CAR AND ONE END IS EVEN WITH THE END OF STACK NUMBER 5 IN THE LONG-LOAD END OF THE CAR. NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.

④ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 16'-0" LONG STEEL STRAPPING (4 REQD). INSTALL TO LONGITUDINALLY ENCIRCLE THE BOTTOM TWO AND THE TOP TWO UNITS IN STACK NUMBER 6. SEE SPECIAL NOTES 4 AND 5 ON PAGE 11.

⑤ BUNDLING STRAP, 1-1/4" X .035" OR .031" X 26'-0" LONG STEEL STRAPPING (1 REQD). INSTALL TO LATERALLY ENCIRCLE THE THREE UNITS IN STACK NUMBER 6.

⑥ SEAL FOR 1-1/4" STEEL STRAPPING (10 REQD, 2 PER STRAP). SEE GENERAL NOTE "M" ON PAGE 2 AND THE "END-OVER-END LAP JOINT DETAILS" ON PAGE 15.

⑦ SIDE FILL ASSEMBLY STOP PIECE, 2" X 6" X 16" (DOUBLED) (1 REQD). POSITION AGAINST SIDE FILL ASSEMBLY A ON THE SIDE OPPOSITE THE LOADING SIDE OF THE CAR. NAIL THE FIRST PIECE TO THE CAR FLOOR W/2-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE THE "SECTION C-C" VIEW BELOW.

⑧ DOORWAY BLOCKING/SIDE FILL ASSEMBLY STOP PIECE, 2" X 6" X 45" (DOUBLED) (1 REQD). POSITION AGAINST BASE OF THE CONTAINER SKIDS AND AGAINST THE SIDE FILL ASSEMBLY B, PIECE MARKED ②. NAIL THE FIRST PIECE TO THE CAR FLOOR W/10-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.

(CONTINUED ON PAGE 11)

(KEY NUMBERS CONTINUED FROM PAGE 10)

⑨ SEPARATOR GATE (2 REQD). SEE THE DETAIL ON PAGE 15. POSITION WITH THE VERTICAL PIECES AGAINST THE CONTAINERS. SECURE TO THE PALLET UNIT AT TWO LOCATIONS WITH NO. 14 GAGE WIRE BY ENCIRCLING THE VERTICAL PIECE OF THE SEPARATOR GATE AND A UNIT STRAP. TWIST TAUT.

⑩ STOP BLOCK, 2" X 6" X 9" (4 REQD). POSITION FLUSH WITH THE LOAD BEARING PIECES OF THE SIDE FILL ASSEMBLIES, PIECES MARKED ① AND/OR ②, AT TOP AND BOTTOM OF THE ASSEMBLIES. NAIL TO THE SIDE FILL ASSEMBLY W/2-10d NAILS.

⑪ STRUT ASSEMBLY (1 REQD). SEE THE "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL ON PAGE 24 AND GENERAL NOTE "E-E" ON PAGE 4.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-4" WIDE CUSHIONED BOXCAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND HAVING 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER SIZES AND CARS HAVING OTHER WIDTH (8'-0" MINIMUM) DOOR OPENINGS CAN BE USED.

2. FORTY CONTAINERS, FOR AN APPROXIMATE LADING WEIGHT OF 178,800 POUNDS, LOAD LIMIT PERMITTING, CAN BE LOADED IN A 60'-8" LONG CAR AND 18 CONTAINERS, FOR AN APPROXIMATE LADING WEIGHT OF 80,460 POUNDS, CAN BE LOADED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES. NOTE THAT THE STRUT ASSEMBLY, PIECE MARKED ⑪, IS NOT REQUIRED IN A 40'-6" LONG CAR.

3. THE SIDE FILL ASSEMBLY A, PIECE MARKED ① ON PAGE 10, SHOWN WITH 2" X 4" VERTICAL PIECES AND FILL PIECES, IS APPLICABLE ONLY FOR A 9'-4" WIDE CAR. IF THE CAR TO BE USED IS 9'-2" WIDE, THE VERTICAL PIECES AND FILL PIECES WILL BE 2" X 2" MATERIAL. IF A 9'-6" WIDE CAR IS FURNISHED FOR LOADING, THE VERTICAL PIECES AND FILL PIECES OF THE ASSEMBLIES WILL BE 2" X 6" MATERIAL. SIDE FILL ASSEMBLY B, PIECE MARKED ② ON PAGE 10, WILL ALWAYS BE CONSTRUCTED USING 2" X 6" MATERIAL.

4. IF THE CAR FURNISHED FOR LOADING HAS PLUG TYPE DOORS, ADDITIONAL SIDE FILL ASSEMBLIES, PIECES MARKED ① AND ②, MAY BE USED FOR LATERAL BRACING OF LOAD UNIT NUMBER 6 IN LIEU OF USING PIECES MARKED ③ THRU ⑧ FOR THE LATERAL BRACING OF THE LOAD UNIT IN THE DOORWAY AREA.

5. THE UNITIZING STRAPS, PIECES MARKED ④, WHEN REQUIRED, SHOULD BE POSITIONED THRU THE FORKLIFT POCKETS OR OTHER STRAP OPENINGS OF THE CONTAINERS IN STACK NUMBER 6 PRIOR TO LOADING THE CONTAINERS INTO THE CAR. TWO STRAPS SHOULD BE POSITIONED UNDER THE BOTTOM PALLET AND TWO SHOULD BE POSITIONED UNDER THE SECOND-LAYER PALLET. IF THE AVAILABLE MATERIAL HANDLING EQUIPMENT IS OF ADEQUATE CAPACITY, THE CONTAINERS CAN BE UNITIZED PRIOR TO PLACEMENT INTO THEIR FINAL LOADING POSITION.

6. THE STRUT ASSEMBLY, PIECE MARKED ⑪ ON PAGE ⑩, IS REQUIRED WHEN THE LOAD IN EITHER END OF THE CAR IS 50,000 POUNDS OR MORE.

7. THE DEPICTED LOAD CAN BE REDUCED BY MULTIPLES OF THREE CONTAINERS TO SUIT THE QUANTITY TO BE SHIPPED BY OMITTING ONE OR MORE LOAD UNITS FROM THE LOAD, OR ONE OR TWO ENTIRE TOP TIERS CAN BE OMITTED. ONE CONTAINER CAN BE OMITTED BY EMPLOYING THE PROCEDURES ON PAGE 21 AS GUIDANCE.

8. THE LOAD CAN BE INCREASED, LOAD LIMIT OF THE CAR PERMITTING, BY PLACING ONE CONTAINER BETWEEN THE LOAD DIVIDER BULKHEADS AND BRACING WITH KNEE BRACES AS SHOWN ON PAGES 22 AND 23. TWO OR THREE CONTAINERS CAN BE STACKED BETWEEN THE LOAD DIVIDER BULKHEADS AND BRACED WITH CENTER GATES AND STRUTS SIMILAR TO THE LOAD ON PAGE 6. PIECES MARKED ③ THRU ⑥ AND PIECE MARKED ⑧ MAY BE USED FOR THE STACK, OR SIDE FILL ASSEMBLIES, PIECES MARKED ① AND ② CAN BE USED. INSTALL A SEPARATOR GATE, PIECE MARKED ⑨, BETWEEN THE LOAD DIVIDER BULKHEAD AND THE PALLET STACK. WIRE TIE TO THE PALLETS.

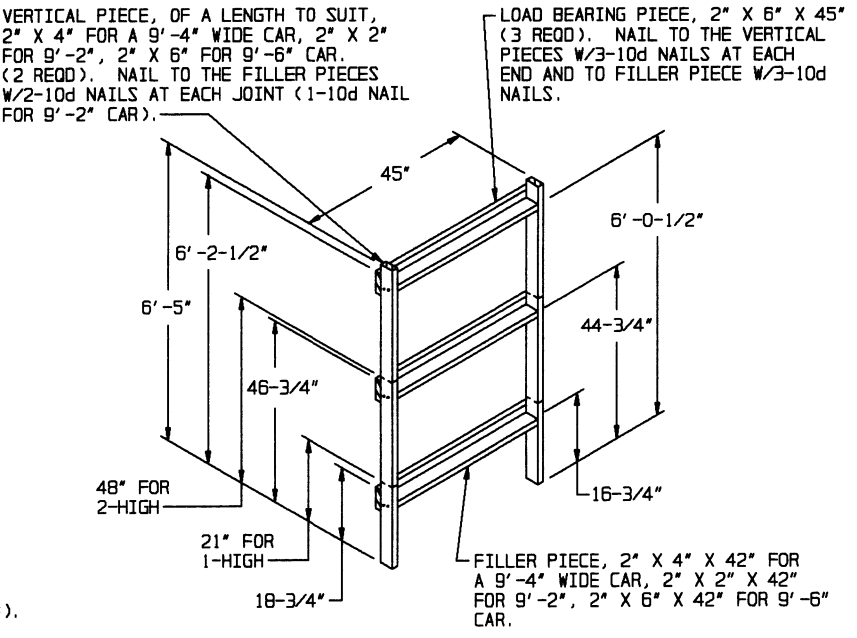
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	90	45
1" X 8"	18	12
2" X 4"	271	181
2" X 6"	471	471
4" X 4"	32	43
NAILS	**NO. REQD**	**POUNDS**
6d (2")	90	3/4
10d (3")	806	12-1/2
12d (3-1/4")	16	1/2
16d (3-1/2")	34	3/4

STEEL STRAPPING, 1-1/4" - - 90' REQD - - - - 13 LBS
SEAL FOR 1-1/4" STRAPPING - - 10 REQD - - - 1/2 LB
WIRE, NO. 14 GAGE - - - - - 10' REQD - - - - NIL

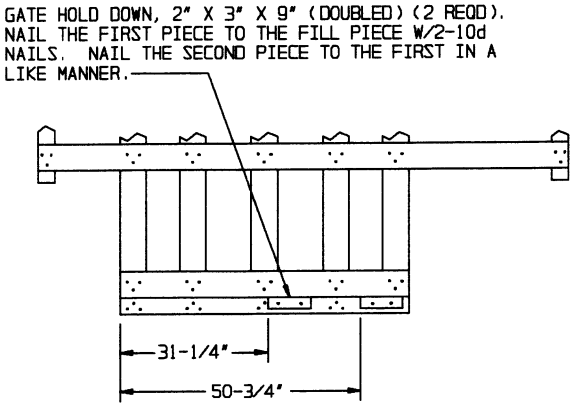
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINERS	33	147,510 LBS
DUNNAGE		1,532 LBS
TOTAL WEIGHT		149,042 LBS (APPROX)

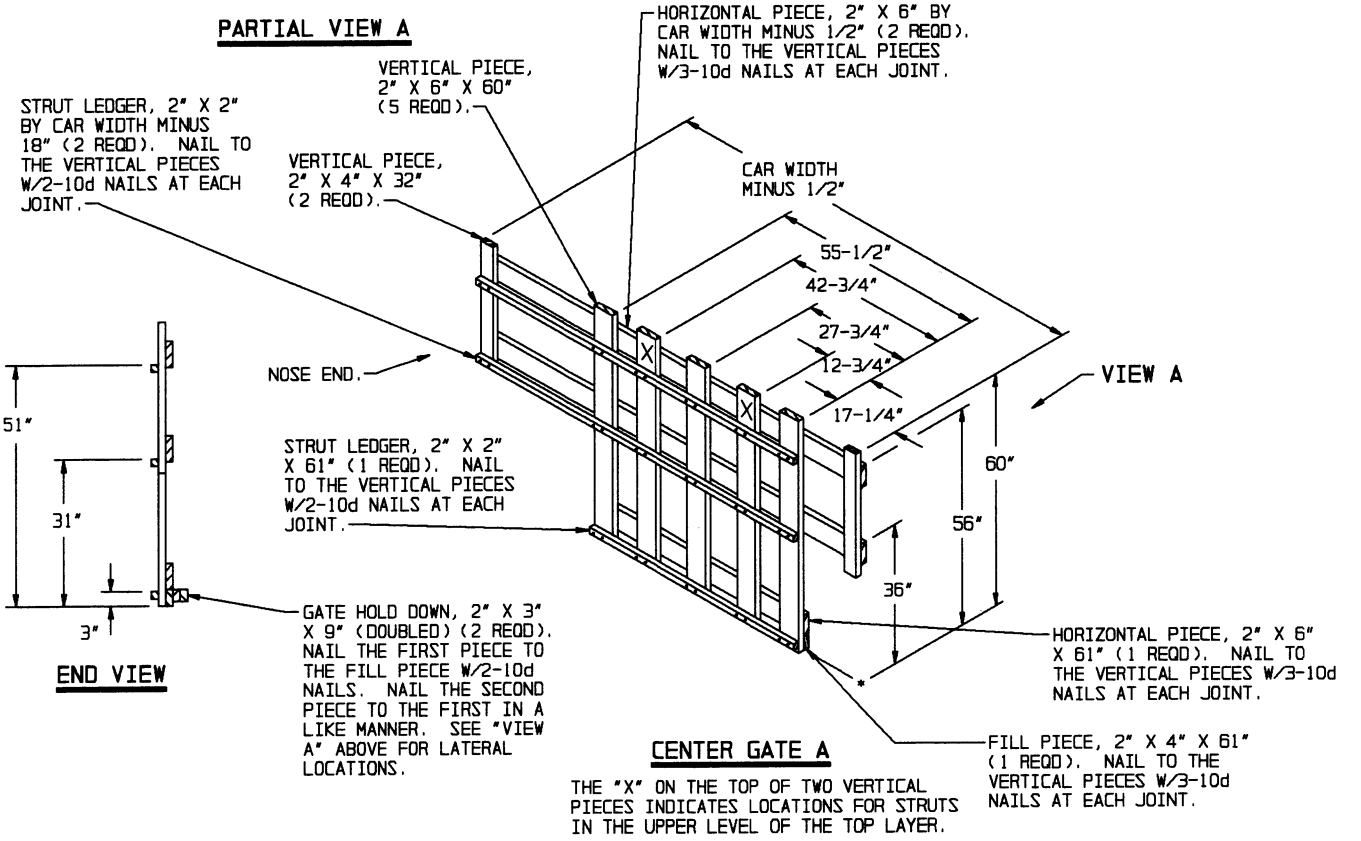


SIDE FILL ASSEMBLY A

THIS ASSEMBLY IS FOR USE AGAINST THE NOSE ENDS OF BOMBS. THE ASSEMBLY IS SHOWN 180° FROM THE POSITION IT WILL BE WITHIN A LOAD.



PARTIAL VIEW A

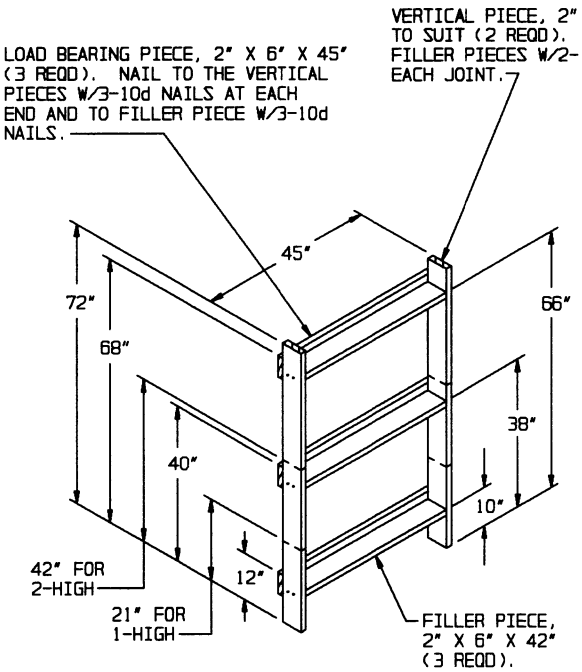


END VIEW

CENTER GATE A

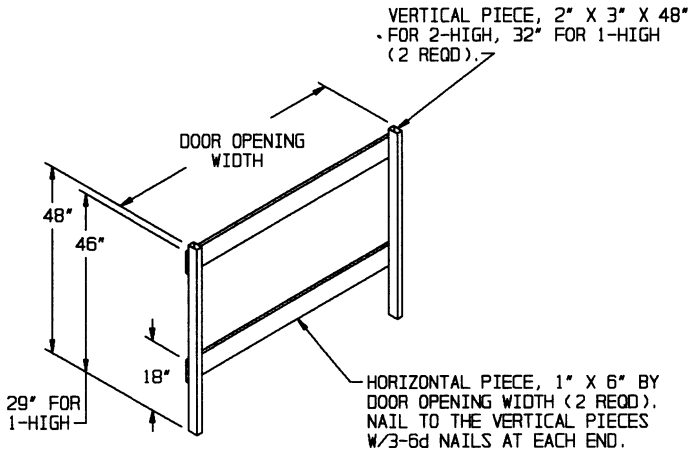
THE "X" ON THE TOP OF TWO VERTICAL PIECES INDICATES LOCATIONS FOR STRUTS IN THE UPPER LEVEL OF THE TOP LAYER.

DETAILS



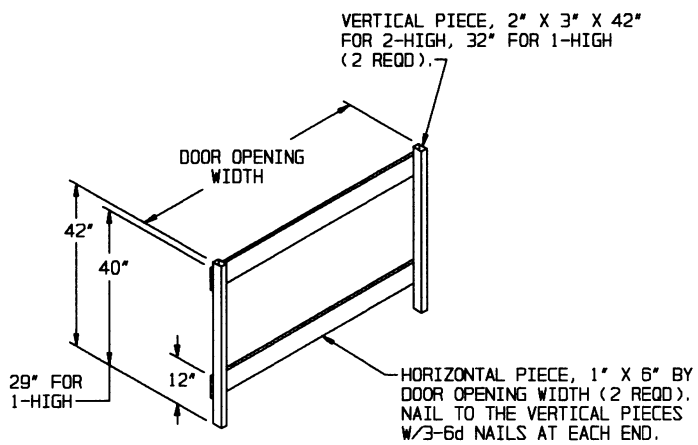
SIDE FILL ASSEMBLY B

THIS ASSEMBLY IS FOR USE AGAINST THE BASE ENDS OF BOMBS.



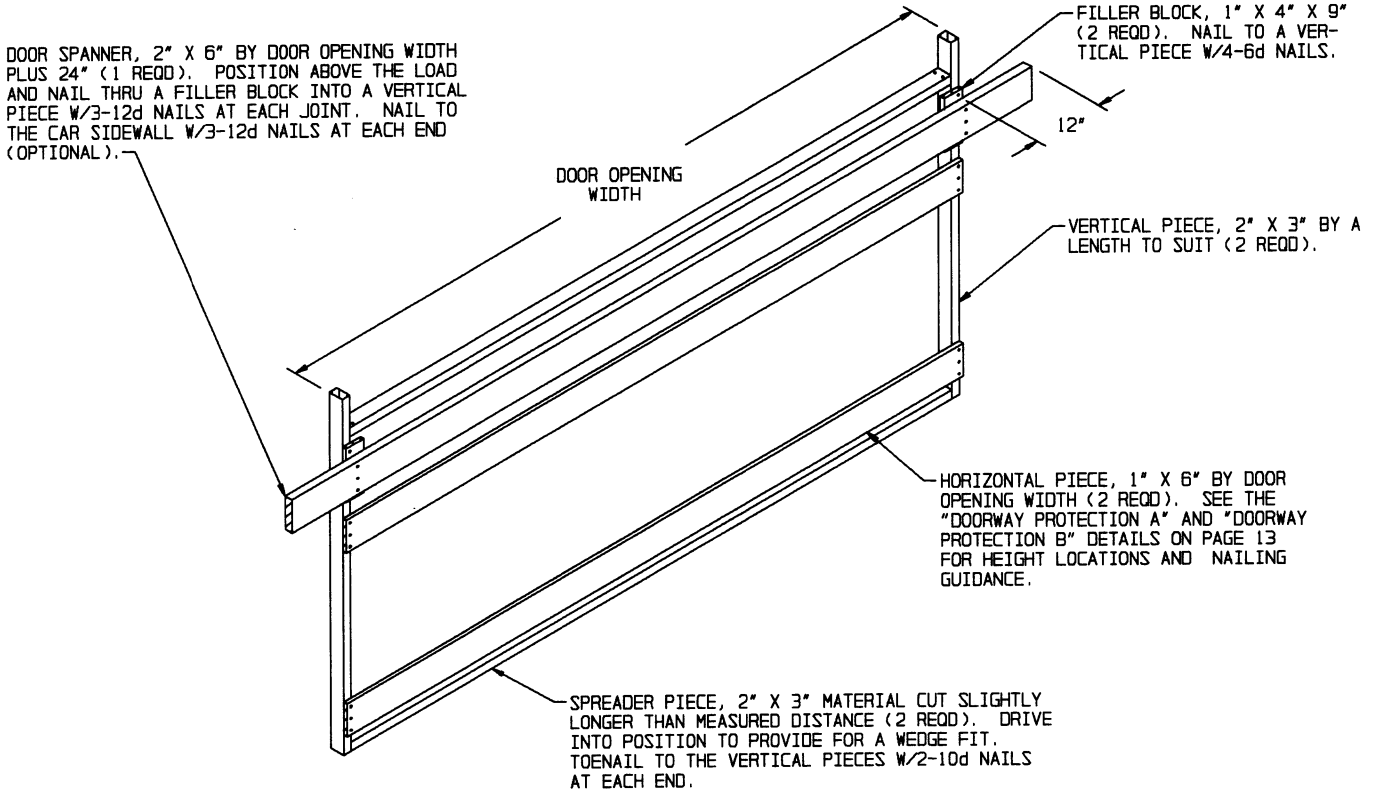
DOORWAY PROTECTION A

THIS ASSEMBLY IS FOR USE ON THE NOSE-END SIDE OF THE CAR.



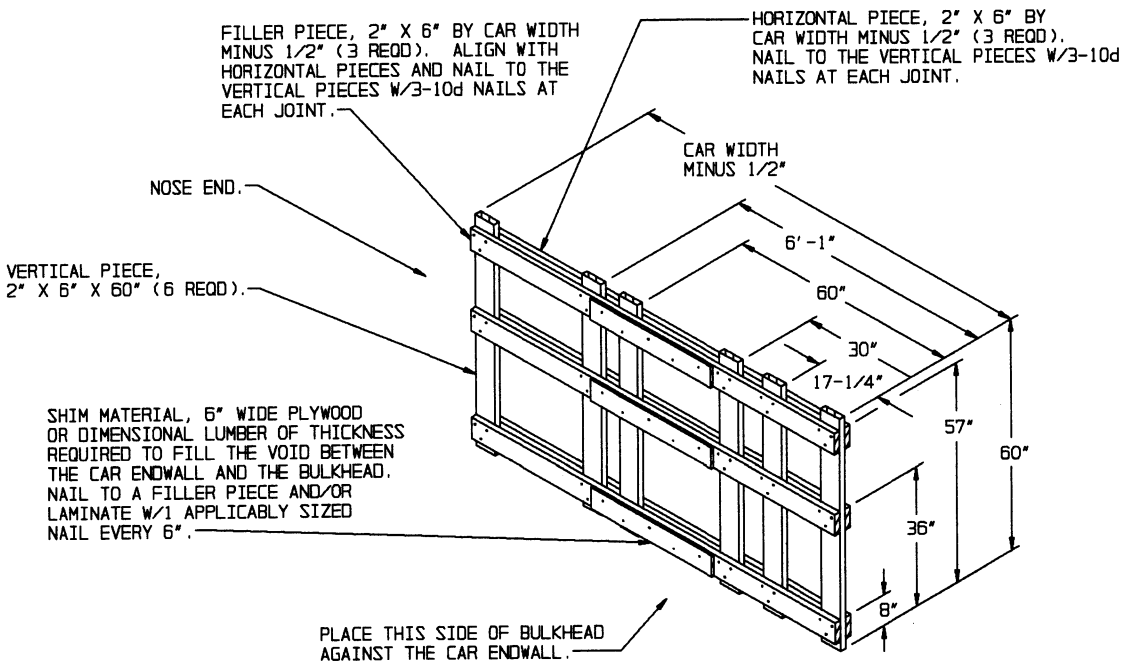
DOORWAY PROTECTION B

THIS ASSEMBLY IS FOR USE ON THE BASE-END SIDE OF THE CAR.



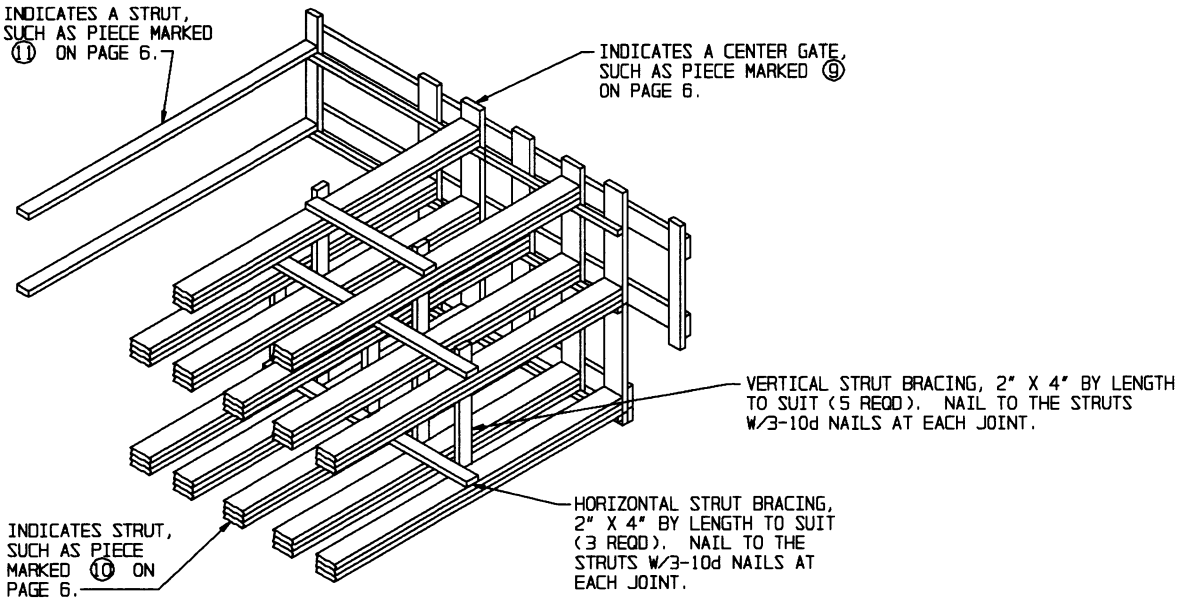
ALTERNATIVE DOORWAY PROTECTION

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



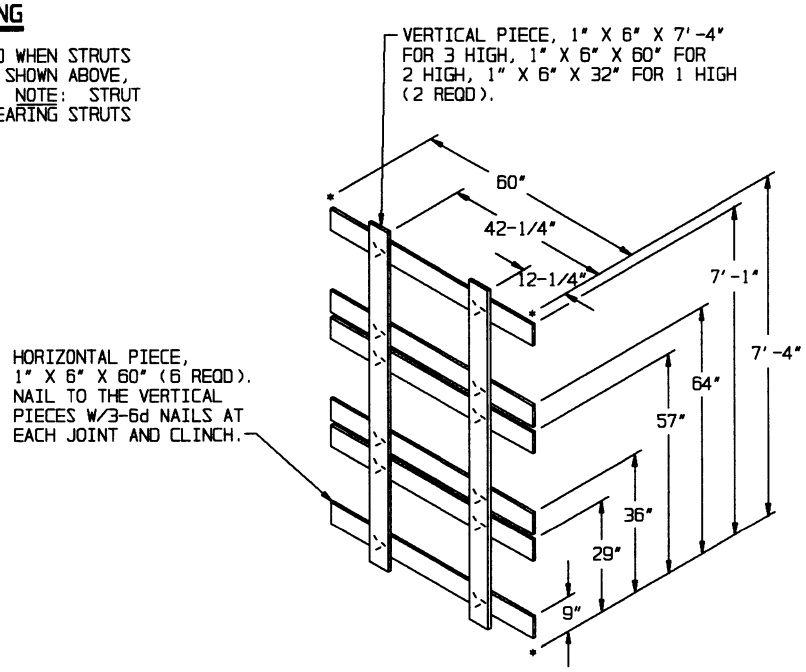
BULKHEAD GATE

THE ABOVE BULKHEAD IS FOR USE AT THE END OF CAR WHEN THE ENDWALL IS BOWED OUTWARD MORE THAN TWO INCHES EITHER FROM SIDE TO SIDE OR FROM FLOOR TO CEILING. A LEFT HAND GATE IS SHOWN FOR USE IN THE NEAR END OF THE DEPICTED LOADS. A RIGHT HAND GATE IS REQUIRED FOR USE IN THE FAR END OF A CAR. FOR USE AT THE END OF A 3-LAYER LOAD IN A LOAD DIVIDER CAR, POSITION A HORIZONTAL PIECE AT 64" IN LIEU OF AT 57" AND ADD ONE AT 7'-1", CHANGE THE VERTICAL PIECES TO 7'-4" IN HEIGHT.

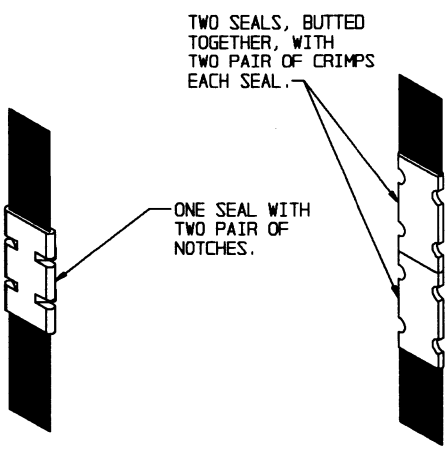


TYPICAL STRUT BRACING

STRUT BRACING AS DEPICTED ABOVE IS REQUIRED WHEN STRUTS ARE 72" OR GREATER IN LENGTH. ONE SET, AS SHOWN ABOVE, IS REQUIRED FOR EVERY 72" OF STRUT LENGTH. NOTE: STRUT BRACING IS NOT REQUIRED FOR THE NON-LOAD BEARING STRUTS SHOWN AS PIECE MARKED (11) ON PAGE 6.



SEPARATOR GATE



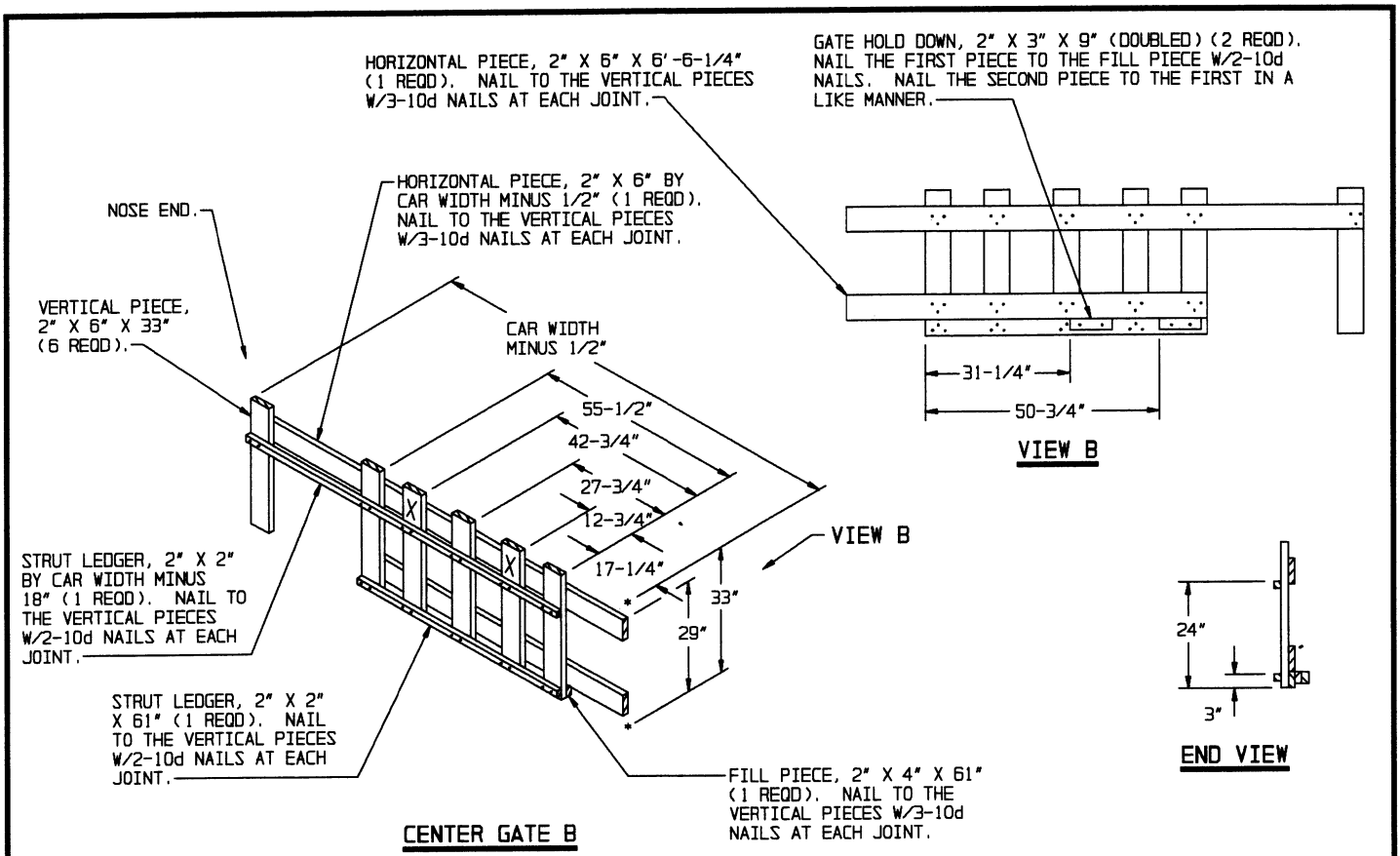
STRAP JOINT A

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

STRAP JOINT B

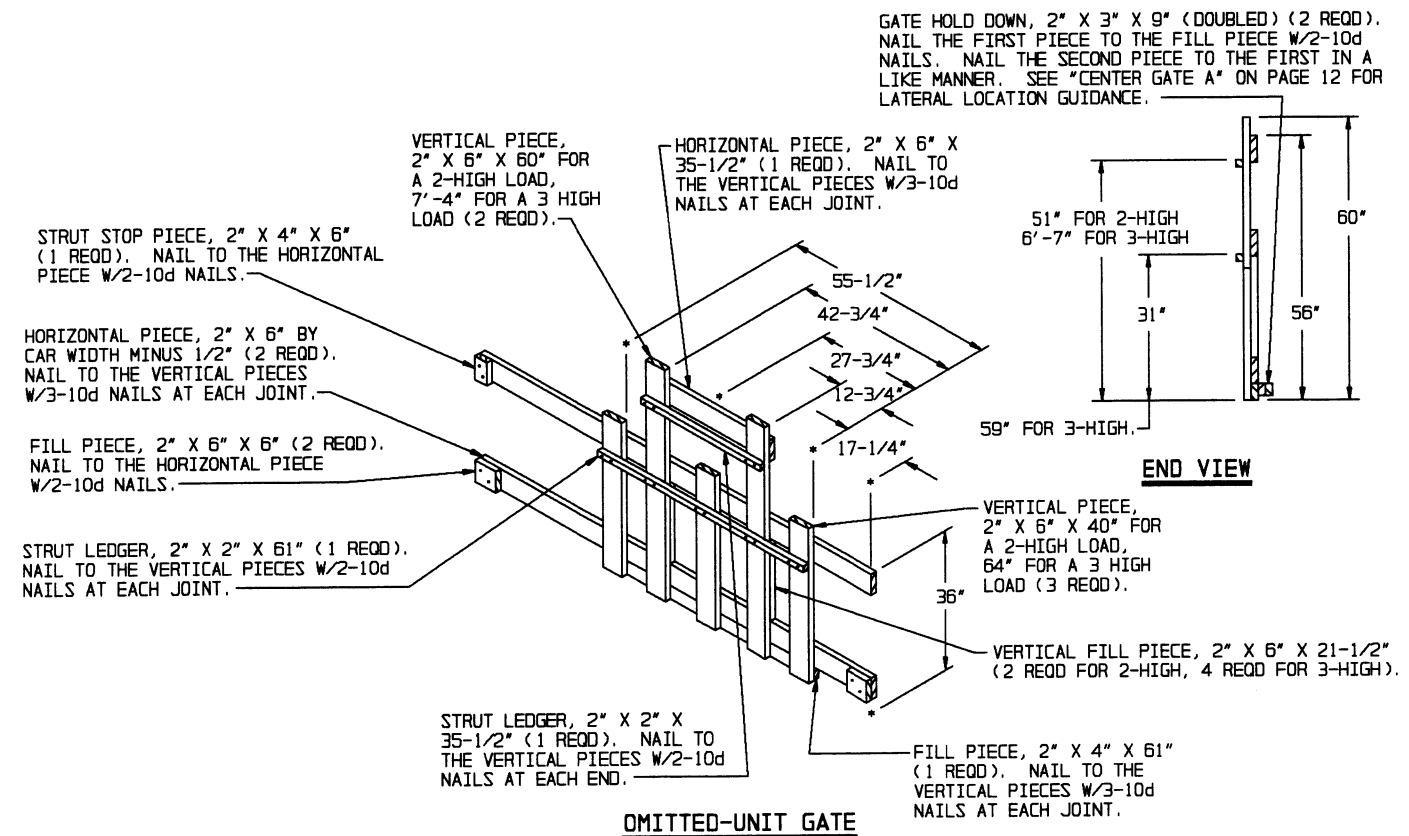
METHOD OF SECURING A STRAP JOINT WHEN USING A CRIMP-TYPE SEALER.

END-OVER-END LAP JOINT DETAILS



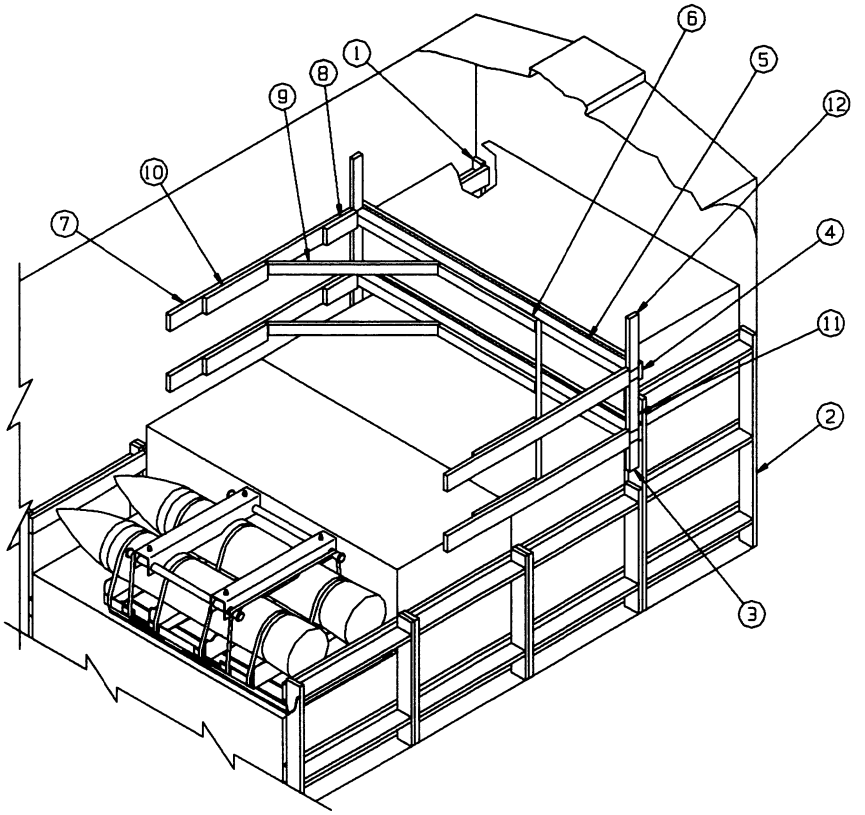
CENTER GATE B

THE ABOVE GATE IS FOR USE WITH A ONE-LAYER LOAD. RIGHT HAND AND LEFT HAND GATES ARE REQUIRED. THE "X" ON TOP OF TWO VERTICAL PIECES INDICATES LOCATIONS FOR STRUTS IN THE UPPER LEVEL.



OMITTED-UNIT GATE

THE ABOVE GATE IS FOR USE IN THE OMITTED-CONTAINER PROCEDURES ON PAGE 21. CHANGE THE HORIZONTAL PIECE AT 56" TO 61" AND ADD A 35-1/2" LONG HORIZONTAL PIECE AT 7'-0" IF THE GATE IS TO BE USED IN A 3-HIGH LOAD.



ISOMETRIC VIEW

SPECIAL NOTES:

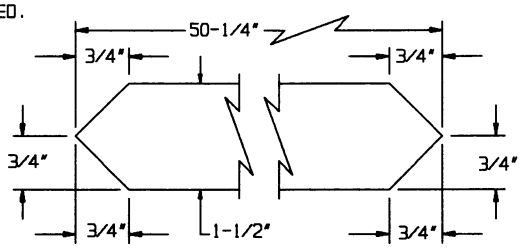
1. A 9'-4" WIDE WOOD-LINED (SIDEWALLS) CONVENTIONAL BOXCAR IS SHOWN WITH A TYPICAL K-BRACE. WOOD-LINED CARS OF OTHER WIDTHS CAN BE USED.

2. THE K-BRACE METHOD OF PARTIAL-LAYER (TIER) BRACING SHOWN MAY BE USED IN A WOOD-LINED CAR FOR THE SECUREMENT OF A PARTIAL TOP TIER, BE IT A FIRST, SECOND, OR THIRD TIER. THE TYPE "A" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 4,000 POUNDS. THIS WILL BE NOT MORE THAN ONE CONTAINER. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGES 18, 19 OR 20.

3. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ③, ④, ⑤ ⑧, AND ⑫ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑨ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑦ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF: 60") TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑦ TO THE FIRST W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑦ IS DOUBLED.

4. THE CENTER CLEAT, SHOWN AS PIECE MARKED ⑥, WILL BE 40" LONG FOR A 9'-6" WIDE CAR, 36" FOR A 9'-2" CAR, AND 34" FOR A 9'-0" WIDE CAR.

5. ONLY THE BLOCKING AND BRACING FOR THE PARTIAL LAYER IS KEY NUMBERED.



DIAGONAL BRACE

KEY NUMBERS

① SIDE FILL ASSEMBLY A FOR THREE HIGH (1 REQD). SEE THE DETAIL ON PAGE 12. SEE SPECIAL NOTE 3 AT LEFT. SEE GENERAL NOTES "J" AND "K" ON PAGE 2.

② SIDE FILL ASSEMBLY B FOR THREE HIGH (1 REQD). SEE THE DETAIL ON PAGE 13.

③ SUPPORT CLEAT, 2" X 4" X 12" (2 REQD). POSITION VERTICALLY AS SHOWN, 3-1/2" (TO THE TOP) ABOVE THE LOAD. NAIL TO THE CAR SIDEWALL W/4-12d NAILS.

④ LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑤, W/1-12d NAIL EVERY 6".

⑤ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD).

⑥ CENTER CLEAT, 2" X 4" X 38" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑤, W/7-16d NAILS. SEE SPECIAL NOTE 4 AT LEFT.

⑦ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (4 REQD). NAIL TO THE CAR SIDEWALL W/16-12d NAILS.

⑧ POCKET CLEAT, 2" X 6" X 12" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑦, W/4-16d NAILS.

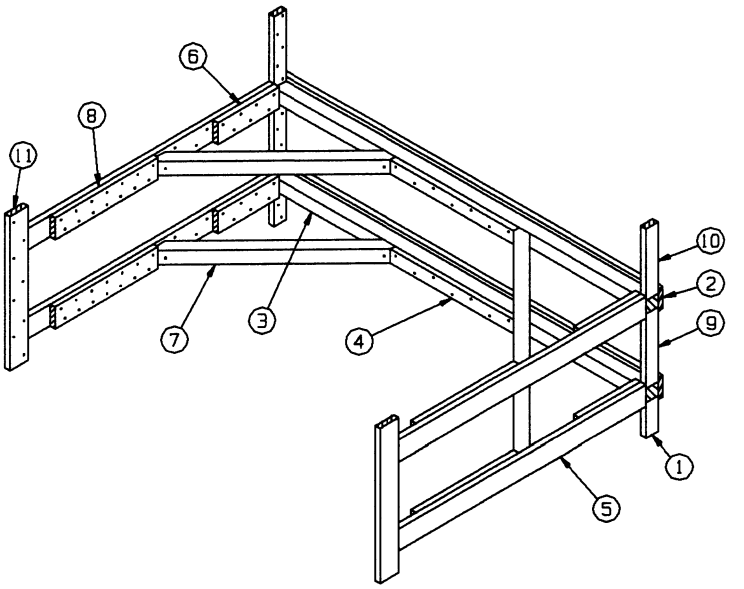
⑨ DIAGONAL BRACE, 2" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑤, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑦, W/2-16d NAILS AT EACH END.

⑩ BACK-UP CLEAT, 2" X 6" X 24" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑦, W/8-16d NAILS.

⑪ SPACER CLEAT, 2" X 4" X 16-1/2" (2 REQD). NAIL TO THE CAR SIDEWALL W/4-12d NAILS.

⑫ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

TYPICAL LCL LOAD USING K-BRACE METHOD OF PARTIAL-LAYER (TIER) BRACING



ISOMETRIC VIEW

SPECIAL NOTES:

1. THE TYPE "B" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 14,000 POUNDS. THIS WILL BE NOT MORE THAN THREE CONTAINERS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGES 19 AND 20 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE. IF THE PARTIAL TIER TO BE BRACED IS ONLY ONE CONTAINER, THE K-BRACE ON PAGE 17 MAY BE USED.

2. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ⑥, ⑨, ⑩ AND ⑪ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑦ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑤ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF: 54") TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑦ TO THE FIRST W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑤ IS DOUBLED.

3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ④, WILL BE 40" LONG FOR A 9'-6" WIDE CAR, 38' LONG FOR A 9'-4" CAR, 36" FOR A 9'-2" CAR, AND 34" FOR A 9'-0" WIDE CAR.

4. REFER TO PAGE 17 FOR A TYPICAL INSTALLATION OF A K-BRACE.

KEY NUMBERS

① SUPPORT CLEAT, 2" X 4" X 12" (2 REQD). POSITION VERTICALLY AS SHOWN, 3-1/2" (TO THE TOP) ABOVE THE LOAD. NAIL TO THE CAR SIDEWALL W/4-12d NAILS.

② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6".

③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD).

④ CENTER CLEAT, 2" X 4" X 38" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.

⑤ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (4 REQD). NAIL TO THE CAR SIDEWALL W/16-12d NAILS.

⑥ POCKET CLEAT, 2" X 6" X 18" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/7-16d NAILS.

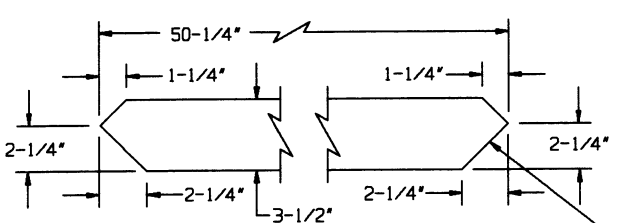
⑦ DIAGONAL BRACE, 4" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/1-60d NAIL AT EACH END.

⑧ BACK-UP CLEAT, 2" X 6" X 30" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/14-16d NAILS.

⑨ SPACER CLEAT, 2" X 4" X 16-1/2" (2 REQD). NAIL TO THE CAR SIDEWALL W/4-12d NAILS.

⑩ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

⑪ VERTICAL BACK-UP CLEAT, 2" X 6" X 36" (2 REQD). NAIL TO THE CAR SIDEWALL W/9-12d NAILS.

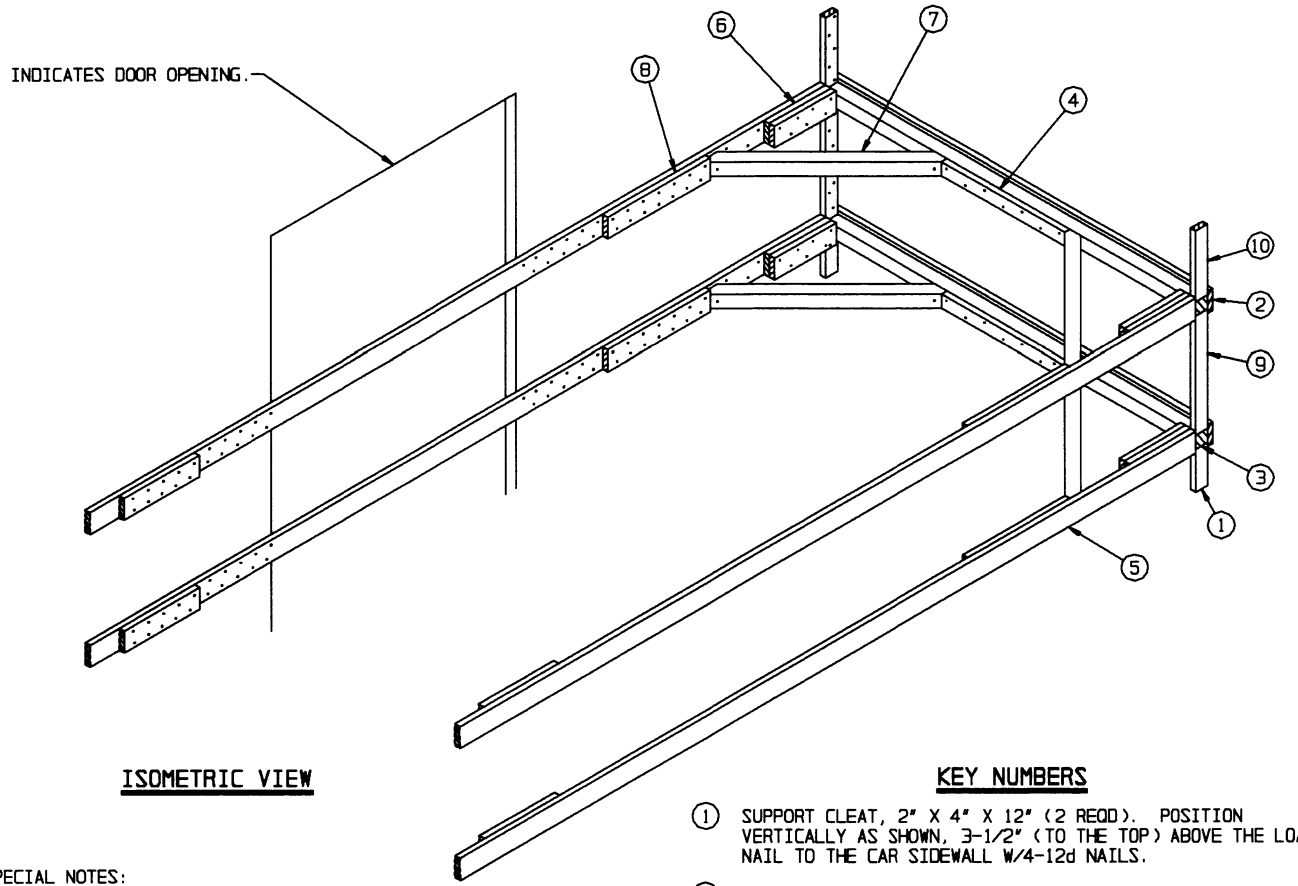


DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

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

TYPE "B" K-BRACE



ISOMETRIC VIEW

SPECIAL NOTES:

1. THE TYPE "C" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 20,000 POUNDS. THIS WILL BE NOT MORE THAN FOUR CONTAINERS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGE 20 FOR THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE. IF THE PARTIAL TIER TO BE BRACED IS ONLY THREE CONTAINERS, THE K-BRACE ON PAGE 18 MAY BE USED. IF THE PARTIAL TIER TO BE BRACED IS ONLY ONE CONTAINER, THE K-BRACE ON PAGE 17 MAY BE USED.

2. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ⑥, ⑨ AND ⑩ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑦ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑤ MUST BE DOUBLED. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑤ TO THE FIRST W/40-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑤ IS DOUBLED.

3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ④, WILL BE 40" LONG FOR A 9'-6" WIDE CAR, 38" LONG FOR A 9'-4" CAR, 36" FOR A 9'-2" CAR, AND 34" FOR A 9'-0" WIDE CAR.

4. REFER TO PAGE 17 FOR A TYPICAL INSTALLATION OF A K-BRACE.

KEY NUMBERS

① SUPPORT CLEAT, 2" X 4" X 12" (2 REQD). POSITION VERTICALLY AS SHOWN, 3-1/2" (TO THE TOP) ABOVE THE LOAD. NAIL TO THE CAR SIDEWALL W/4-12d NAILS.

② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6".

③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD).

④ CENTER CLEAT, 2" X 4" X 38" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.

⑤ HORIZONTAL WALL CLEAT, 2" X 6" BY CUT TO FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND ACROSS AND FAR ENOUGH PAST THE DOOR OPENING TO CONTACT PIECE MARKED ③ OF THE K-BRACE IN THE OPPOSITE END OF THE CAR. NAIL TO THE CAR SIDEWALL W/40-12d NAILS.

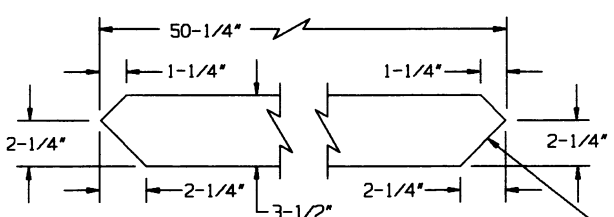
⑥ POCKET CLEAT, 2" X 6" X 18" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/7-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.

⑦ DIAGONAL BRACE, 4" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/1-60d NAIL AT EACH END.

⑧ BACK-UP CLEAT, 2" X 6" X 30" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/14-16d NAILS.

⑨ SPACER CLEAT, 2" X 4" X 16-1/2" (2 REQD). NAIL TO THE CAR SIDEWALL W/4-12d NAILS.

⑩ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

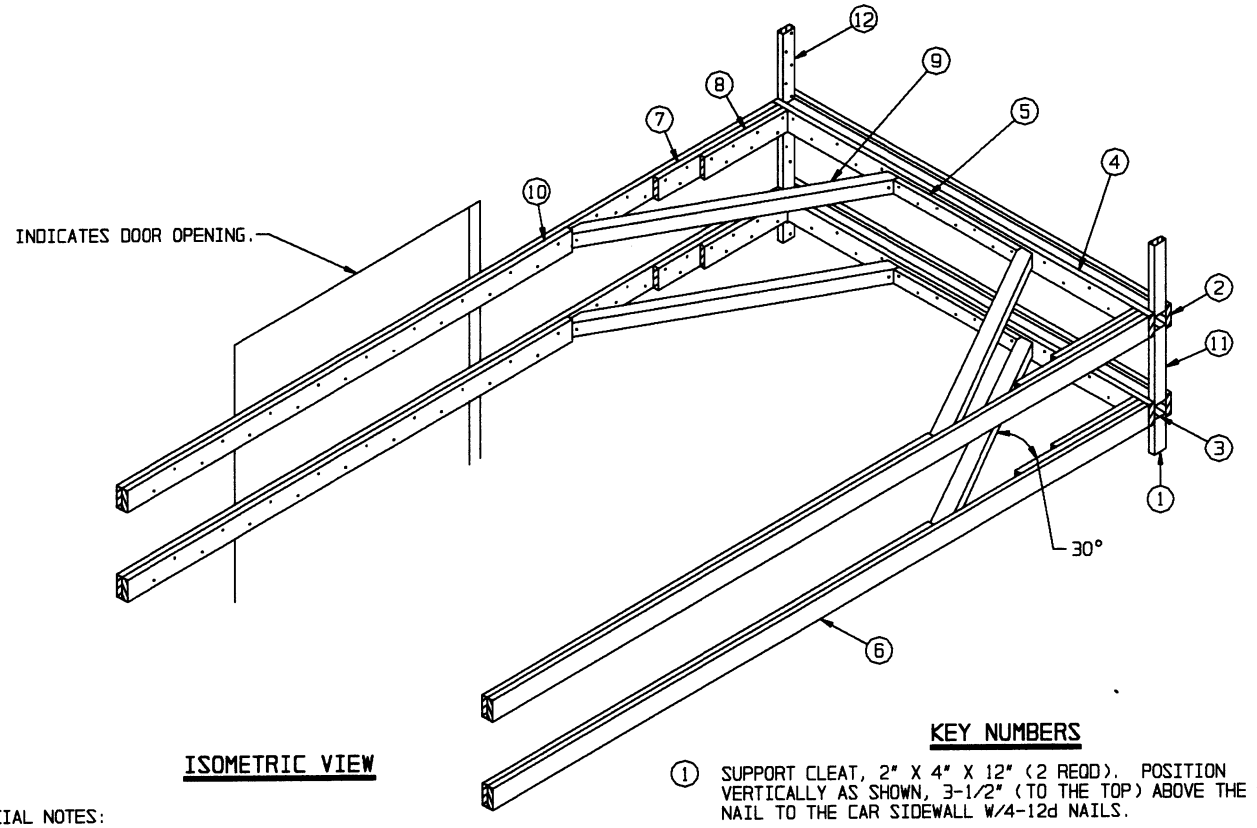


DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

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

TYPE "C" K-BRACE



ISOMETRIC VIEW

SPECIAL NOTES:

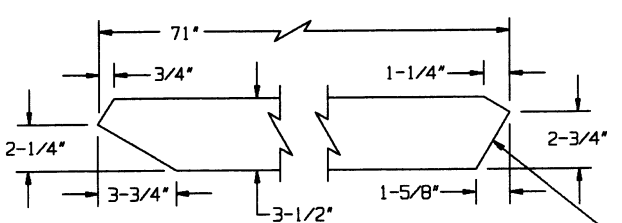
1. THE TYPE "D" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 25,000 POUNDS. THIS WILL BE NOT MORE THAN FIVE CONTAINERS. IF THE PARTIAL TIER TO BE BRACED IS ONLY FOUR CONTAINERS, THE K-BRACE DEPICTED ON PAGE 19 MAY BE USED. IF THE PARTIAL TIER IS ONLY THREE CONTAINERS, THE K-BRACE ON PAGE 18 MAY BE USED. IF THE PARTIAL TIER TO BE BRACED IS ONLY ONE CONTAINER, THE K-BRACE ON PAGE 17 MAY BE USED.

2. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ④ ⑦, ⑧, ⑪, AND ⑫ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑨ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑥ MUST BE DOUBLED. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑥ TO THE FIRST W/40-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 70-1/4" LONG IN LIEU OF 71" WHEN PIECE MARKED ⑥ IS DOUBLED.

3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ⑤, WILL BE 40" LONG FOR A 9'-6" WIDE CAR, 38" LONG FOR A 9'-4" CAR, 36" FOR A 9'-2" CAR, AND 34" FOR A 9'-0" WIDE CAR.

4. CAUTION: A TYPE "D" K-BRACE MUST BE USED IN BOTH ENDS OF THE CAR; THE BRACE IS NOT DESIGNED FOR USE IN ONLY ONE END. NOTE THAT EXCEPT FOR PIECES MARKED ⑥ AND ⑩, THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.

5. REFER TO PAGE 17 FOR A TYPICAL INSTALLATION OF A K-BRACE.



DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

KEY NUMBERS

① SUPPORT CLEAT, 2" X 4" X 12" (2 REQD). POSITION VERTICALLY AS SHOWN, 3-1/2" (TO THE TOP) ABOVE THE LOAD. NAIL TO THE CAR SIDEWALL W/4-12d NAILS.

② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6".

③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD).

④ HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6".

⑤ CENTER CLEAT, 2" X 4" X 38" (2 REQD). NAIL TO THE HORIZONTAL PIECE, PIECE MARKED ④, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.

⑥ HORIZONTAL WALL CLEAT, 2" X 6" BY CUT TO FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND ACROSS AND FAR ENOUGH PAST THE DOOR OPENING TO CONTACT PIECE MARKED ④ OF THE K-BRACE IN THE OPPOSITE END OF THE CAR. NAIL TO THE CAR SIDEWALL W/40-12d NAILS.

⑦ POCKET CLEAT, 2" X 6" X 36" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/10-16d NAILS.

⑧ POCKET CLEAT, 2" X 6" X 24" (4 REQD). NAIL TO THE POCKET CLEAT, PIECE MARKED ⑦, W/7-16d NAILS.

⑨ DIAGONAL BRACE, 4" X 4" X 71" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE HORIZONTAL PIECE, PIECE MARKED ④, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/1-60d NAIL AT EACH END.

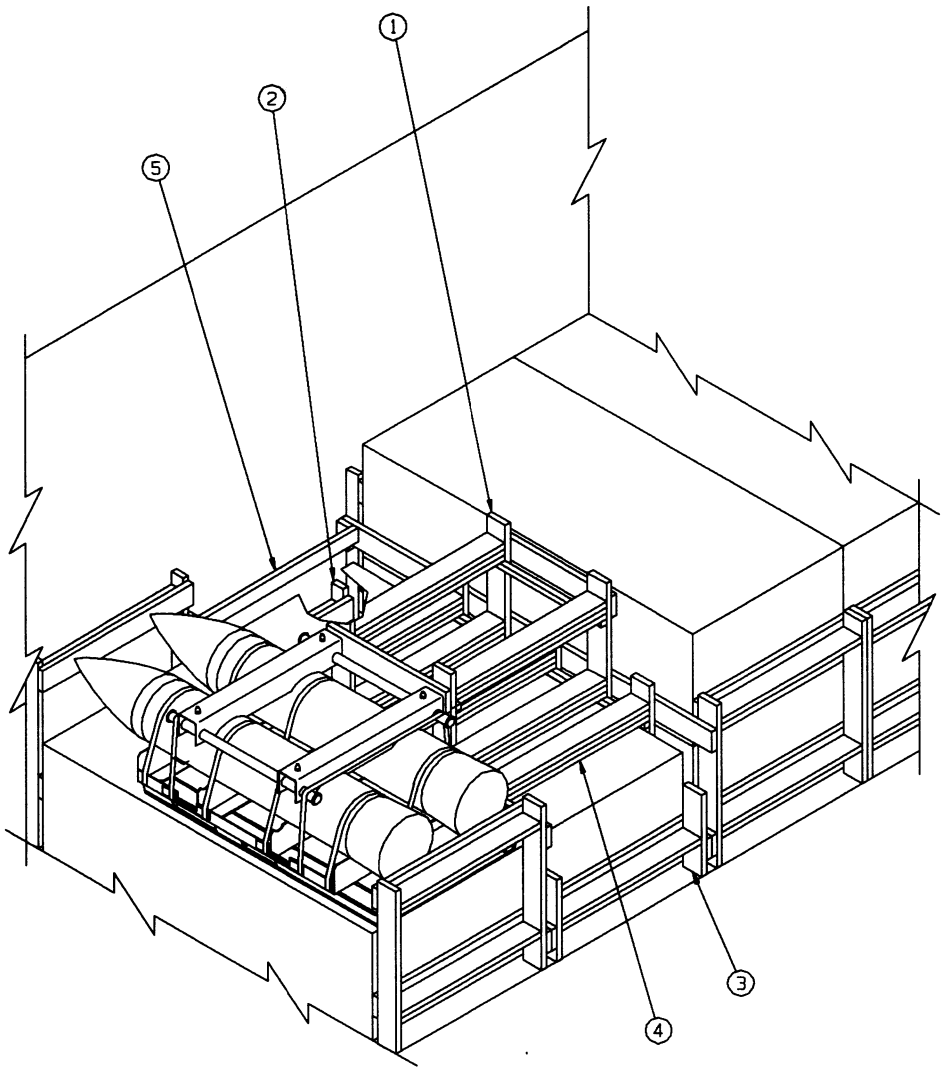
⑩ BACK-UP CLEAT, 2" X 6" BY CUT TO FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO CONTACT THE DIAGONAL BRACE, PIECE MARKED ⑨, IN THE OPPOSITE END OF THE CAR. NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/18-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING, IF APPLICABLE.

⑪ SPACER CLEAT, 2" X 4" X 16-1/2" (2 REQD). NAIL TO THE CAR SIDEWALL W/4-12d NAILS.

⑫ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

THIS BEARING SURFACE MUST BE POSITIONED SO AS TO BE IN CONTACT WITH A HORIZONTAL PIECE, PIECE MARKED ④.

TYPE "D" K-BRACE



ISOMETRIC VIEW

SPECIAL NOTES:

1. A PARTIAL VIEW OF A 9'-4" WIDE CONVENTIONAL TYPE BOXCAR IS SHOWN. CARS OF OTHER WIDTHS CAN ALSO BE USED.
2. THIS PROCEDURE IS APPLICABLE FOR THE OMISSION OF A CONTAINER FROM A LOAD IN EITHER A CONVENTIONAL TYPE BOXCAR OR A CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS.
3. THE OMITTED CONTAINER PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH. THERE SHOULD BE AT LEAST ONE CONTAINER BETWEEN THE OMITTED CONTAINER AND THE CENTER GATE OR BETWEEN THE OMITTED CONTAINER AND THE LOAD DIVIDER BULKHEAD. ALSO, A CONTAINER WILL NOT BE OMITTED FROM A STACK WHICH IS ENCIRCLED WITH A BUNDLING STRAP, PIECE MARKED ⑤.
4. ONLY THE BLOCKING AND BRACING FOR THE OMITTED CONTAINER AND THE CONTAINER BELOW IT IS IDENTIFIED WITHIN THE KEY NUMBERS. REFER TO A FULL LOAD PAGE FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.

KEY NUMBERS

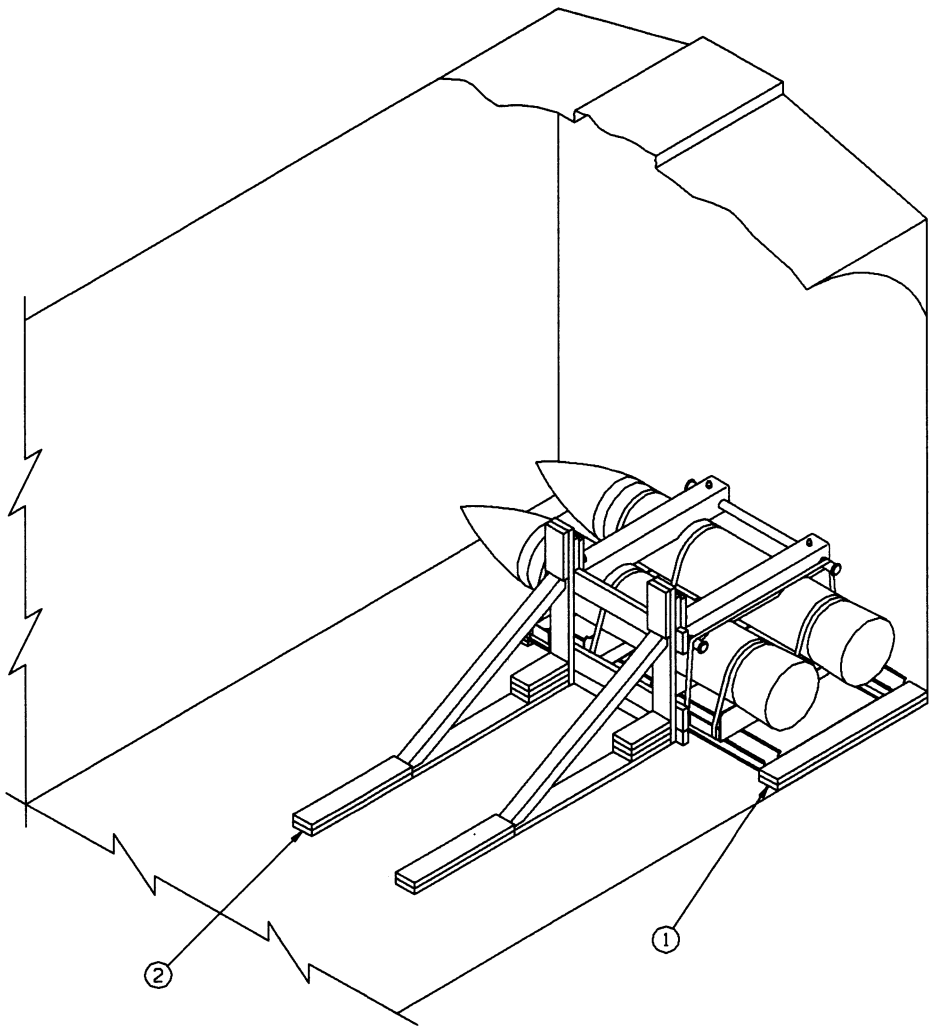
① OMITTED-UNIT GATE (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE DETAIL ON PAGE 16. SEE GENERAL NOTES "J" AND "K" ON PAGE 2.

② SIDE FILL ASSEMBLY A FOR ONE HIGH (1 REQD). SEE THE DETAIL ON PAGE 12. SEE SPECIAL NOTE 3 ON PAGE 7 OR SPECIAL NOTE 2 ON PAGE 9. NAIL TO THE OMITTED-UNIT GATE, PIECE MARKED ①, W/3-10d NAILS.

③ SIDE FILL ASSEMBLY B FOR ONE HIGH (1 REQD). SEE THE DETAIL ON PAGE 13. NAIL TO THE OMITTED-UNIT GATE, PIECE MARKED ①, W/3-10d NAILS.

④ STRUT, 2" X 6" X 45" (TRIPLED) (7 REQD). LAMINATE THE SECOND PIECE TO THE FIRST W/6-10d NAILS. LAMINATE THE THIRD PIECE TO THE SECOND IN A LIKE MANNER. TOENAIL THE TOP PIECE TO THE OMITTED-UNIT GATES, PIECES MARKED ①, W/2-12d NAILS AT EACH END.

⑤ STRUT, 2" X 4" X 48" (1 REQD). POSITION ON EDGE AND TOENAIL TO THE OMITTED-UNIT GATES, PIECES MARKED ①, W/2-12d NAILS AT EACH END.



ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-2" WIDE CONVENTIONAL TYPE BOXCAR HAVING A WOOD OR NAILABLE METAL FLOOR IS SHOWN. CARS OF OTHER WIDTHS MAY BE USED.

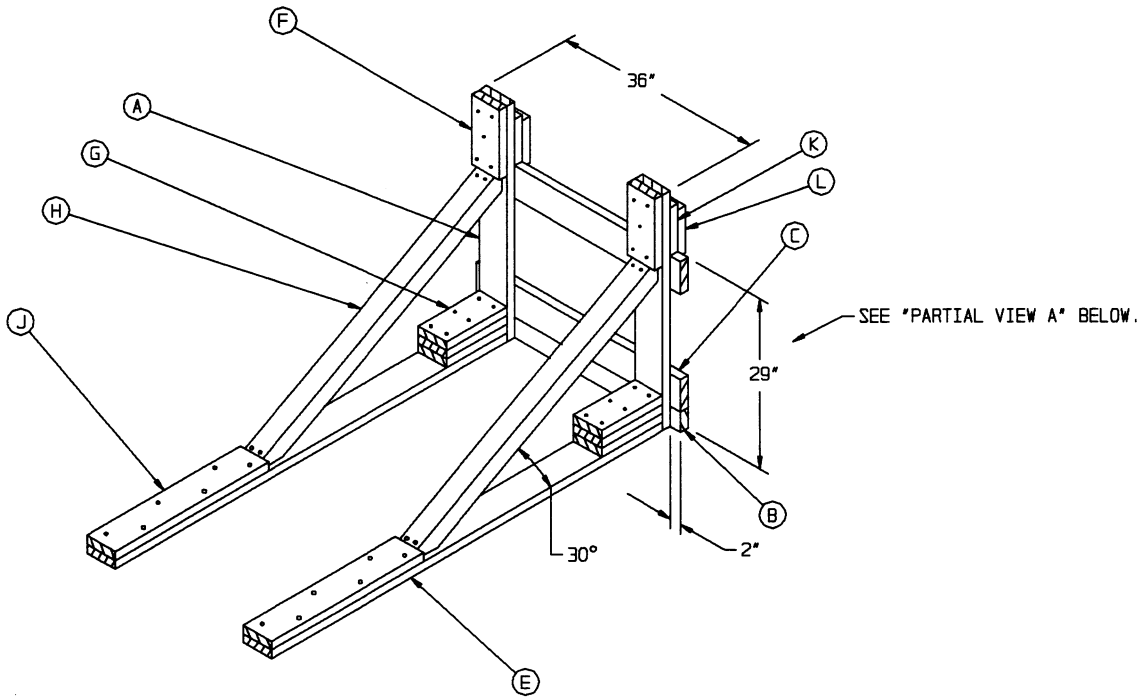
2. THE DEPICTED KNEE BRACE ASSEMBLY MUST NOT BE RELIED UPON TO RETAIN MORE THAN TWO CONTAINERS.

KEY NUMBERS

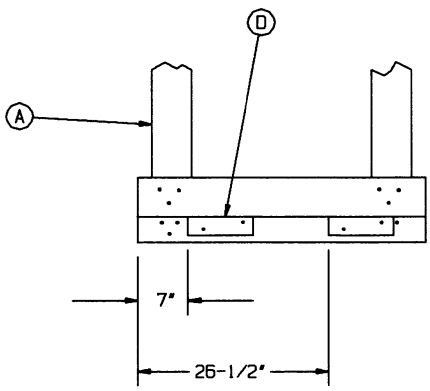
(1) LATERAL BLOCKING, 2" X 6" X 45" (DOUBLED) (2 REQD). PRE-POSITION ONE AT SIDE OF CAR AS SHOWN. PRE-POSITION THE OTHER SO THE LOAD BEARING SIDE IS 6'-7" FROM THE CAR SIDEWALL. NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTES "J" ON PAGE 2 AND "R" ON PAGE 3.

(2) KNEE BRACE ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 23. SEE SPECIAL NOTE 2 AT LEFT.

TYPICAL LCL (1-UNIT LOAD)



KNEE BRACE ASSEMBLY



PARTIAL VIEW A

KEY LETTERS

Ⓐ VERTICAL PIECE, 2" X 6" X 40" (2 REQD). NAIL TO THE FLOOR CLEAT, PIECE MARKED Ⓔ, W/2-16d NAILS.

Ⓑ HORIZONTAL PIECE, 2" X 4" X 40" (1 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. SEE GENERAL NOTE "J" ON PAGE 2.

Ⓒ HORIZONTAL PIECE, 2" X 6" X 40" (2 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.

Ⓓ HOLD-DOWN CLEAT, 2" X 3" X 9" (DOUBLED) (2 REQD). LOCATE AS SHOWN IN "VIEW A". NAIL THE FIRST PIECE TO THE 2" X 4" HORIZONTAL PIECE W/2-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.

Ⓔ FLOOR CLEAT, 2" X 6" X 6'-5" (2 REQD). NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 8".

Ⓕ HOLD-DOWN CLEAT, 2" X 6" X 12" (2 REQD). NAIL TO A VERTICAL PIECE W/5-10d NAILS.

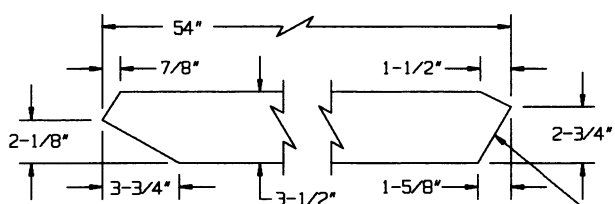
Ⓖ POCKET CLEAT, 2" X 6" X 12" (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO A FLOOR CLEAT, PIECE MARKED Ⓔ, W/4-16d NAILS. NAIL EACH ADDITIONAL PIECE IN A LIKE MANNER. TOENAIL THE TOP PIECE TO A VERTICAL PIECE, PIECE MARKED Ⓐ, W/2-16d NAILS.

Ⓗ BRACE, 4" X 4" X 54" (2 REQD). SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TOENAIL TO A VERTICAL PIECE AND TO A FLOOR CLEAT, PIECES MARKED Ⓐ AND Ⓔ, W/2-16d NAILS AT EACH END.

Ⓙ BACK-UP CLEAT, 2" X 6" X 30" (2 REQD). NAIL TO A FLOOR CLEAT, PIECE MARKED Ⓔ, W/6-40d NAILS.

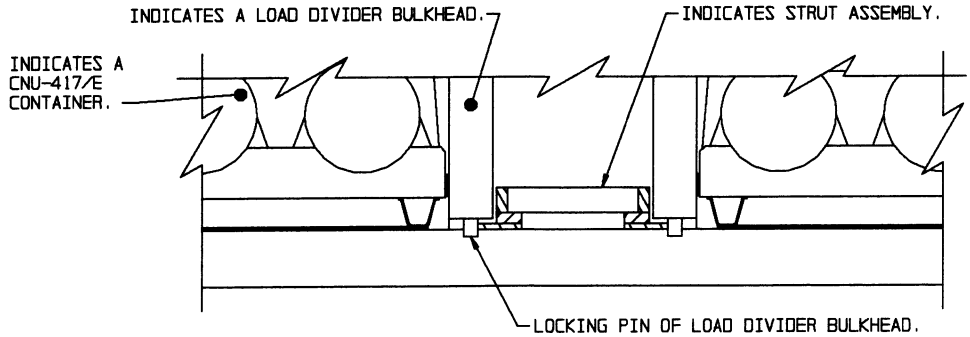
Ⓚ FILLER PIECE, 2" X 6" X 8" (2 REQD). NAIL TO A VERTICAL PIECE, PIECE MARKED Ⓐ, W/3-10d NAILS.

Ⓛ REINFORCING PIECE, 2" X 6" X 8" (2 REQD). POSITION TO CONTACT THE UPPER SADDLE OF THE CONTAINER. NAIL TO A FILLER PIECE, PIECE MARKED Ⓚ, W/3-10d NAILS.



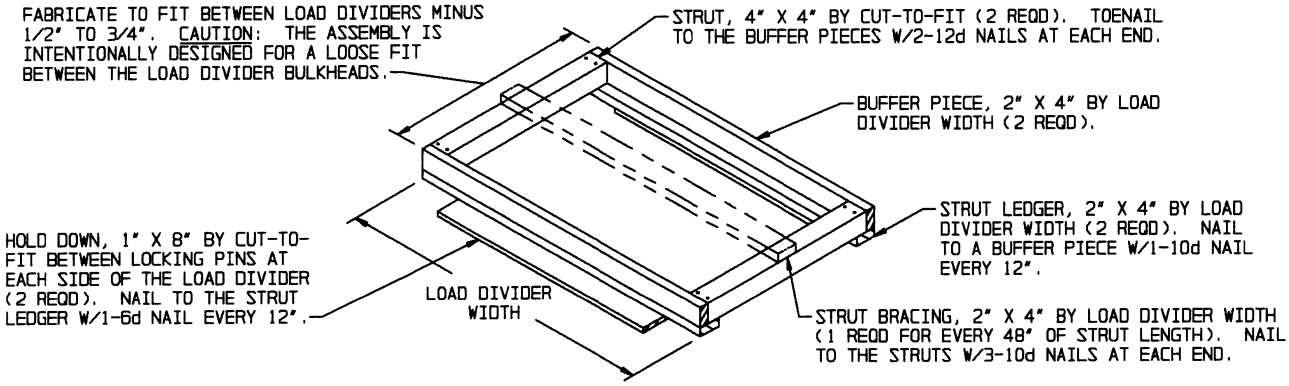
BRACE

4" X 4" MATERIAL



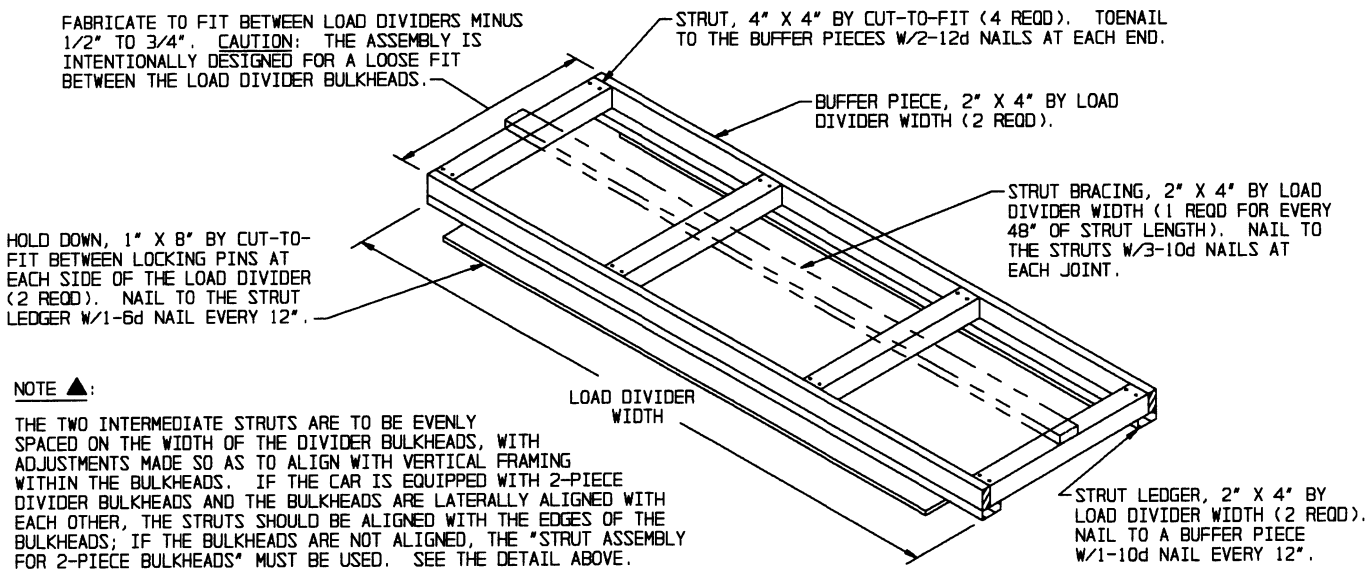
INSTALLATION OF STRUT ASSEMBLY

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



STRUT ASSEMBLY FOR 2-PIECE BULKHEADS

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

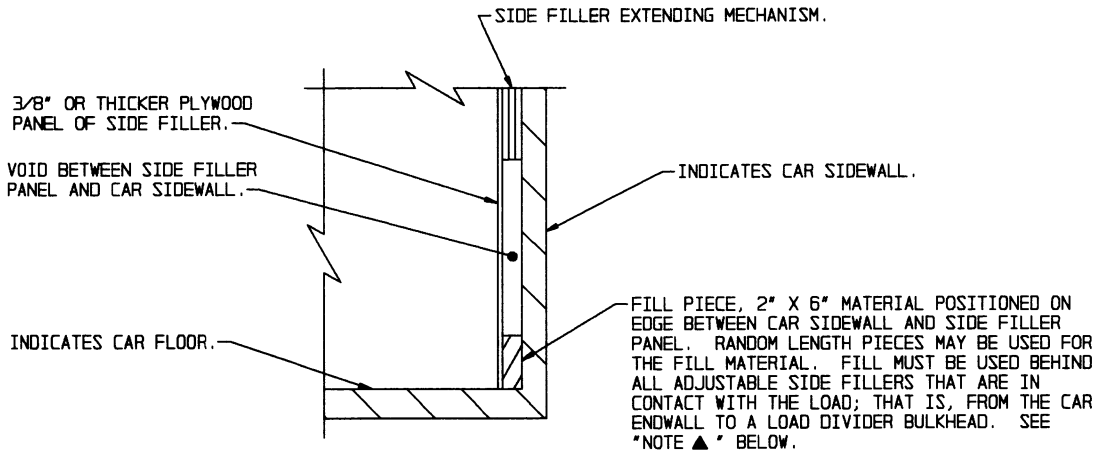


NOTE ▲:

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

STRUT ASSEMBLY FOR 1-PIECE BULKHEADS

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

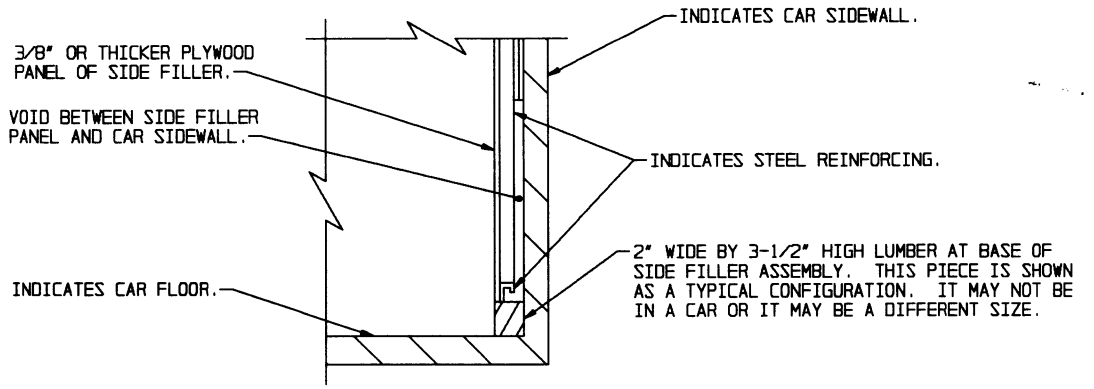


TYPICAL TYPE A

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

NOTE ▲:

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



TYPICAL TYPE B

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