APPROVED BY
BUREAU OF EXPLOSIVES

DATE 5/13/64

LOADING AND BRACING (CL & LCL) IN BOXCARS⊕ OF 750-POUND HIGH EXPLOSIVE BOMBS, PACKED TWO PER WOODEN PALLET

INDEX

⊕ INCLUDES BOXCARS EQUIPPED WITH MECHANICAL BRACING DEVICES OF VARIOUS DESIGN AND MANUFACTURE, CONVENTIONAL TYPE BOXCARS, AND CUSHIONED BOXCARS EQUIPPED WITH LOAD DIVIDERS.

U.S. ARMY MATERIEL COMMAND DRAWING

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

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

U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL

REVISION NO. 2	DECEMBER 1993
SEE THE REVISION LISTING ON PAGE 2	

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DECEMBER 1966

CLASS	DIVISION	DRAWING	FILE
19	48	4049	5PB1000

DO NOT SCALE

PROJECT FSA 48-65

GENERAL NOTES

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

B. THE OUTLOADING PROCEDURES SPECIFIED IN THIS DRAWING ARE APPLICABLE FOR THE OUTLOADING OF 750-POUND BOMBS PALLETIZED TWO BOMBS PER PALLET. BOMBS EQUIPPED WITH CONICAL NOSE PLUGS AND WITH FLAT NOSE PLUGS HAVE BEEN SHOWN THROUGHOUT THE DRAWING.

C. THE OUTLOADING PROCEDURES DEPICTED WITHIN THIS DOCUMENT ARE APPLICABLE FOR SHIPMENTS IN CONVENTIONAL TYPE BOX CARS, FOR SHIPMENTS IN BOXCARS EQUIPPED WITH VARIOUS TYPES OF SELF-CONTAINED MECHANICAL BRACING DEVICES, AND FOR SHIPMENTS IN CUSHIONED BOXCARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.

D. DETAILS OF THE 750-POUND PALLET UNIT (TPO 1325-926-1868)

DIMENSIONS - - 52-1/4" LONG (55" WITH CONICAL NOSE PLUGS) BY 32-1/4" WIDE BY 22-7/8" HIGH

GROSS WEIGHT - 1,540 TO 1,575 POUNDS (APPROX)

E. THE SELECTION OF RAIL CARS FOR THE TRANSPORT OF PALLET UNITS OF 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.

F. WHEN SELECTING RAILCARS, EVERY EFFORT SHOULD BE MADE TO OBTAIN BOXCARS THAT DO NOT HAVE BOWED ENDWALLS. CARS HAVING BOWED ENDS CAN BE USED, HOWEVER, IF AN ENDWALL IS BOWED OUTWARD MORE THAN 2" EITHER FROM SIDE TO SIDE OR FROM FLOOR TO ROOF, AN END-OF-CAR BULKHEAD MUST BE INSTALLED TO PROVIDE A "SQUARED OFF" SURFACE FOR THE LOAD AT THE END OF THE CAR. REFER TO THE "END-OF CAR BULKHEAD B" DETAIL ON PAGE 15 FOR AN ASSEMBLY TO BE USED AT THE END OF A LOAD OF LENGTHWISE-LOADED BOMBS, OR THE "END-OF-CAR BULKHEAD C" DETAIL ON PAGE 47 FOR AN ASSEMBLY TO BE USED AT THE END OF A LOAD OF CROSSWISE-LOADED BOMBS.

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

(CONTINUED AT RIGHT)

MATERIAL SPECIFICATIONS

LUMBER - - - - - - - - :	SEE TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC MM-L-751.
NAILS - - - - - - - - :	FED SPEC FF-N-105; COMMON.
PLYWOOD - - - - - - :	COMMERCIAL ITEM DESCRIPTION A-A-55057, TYPE A, CONSTRUCTION AND INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D. IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER INTERIOR OR AN EXTERIOR GRADE MAY BE SUBSTITUTED.
STRAPPING, STEEL - -:	ASTM D3953; FLAT STRAPPING, TYPE 1, HEAVY DUTY, FINISH A, B, (GRADE 2) OR C.
SEAL, STRAP - - - -:	ASTM D3953; CLASS H, FINISH A, B (GRADE 2), OR C, DOUBLE NOTCH TYPE, STYLE I, II, OR IV.
WIRE, CARBON STEEL -:	ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, .0800" DIA, GRADE 1006 OR BETTER.
ANTI-CHAFING MATERIAL - - - - - -:	MIL-B-121 (OR EQUAL); NEUTRAL BARRIER MATERIAL.

(GENERAL NOTES CONTINUED)

H. THE USE OF AN OFFSET LOADING PATTERN WILL FACILITATE LOADING AND UNLOADING OPERATIONS IN THE DOORWAY AREA OF THE CAR. UNLESS PROHIBITED WITHIN THE SPECIAL NOTES, A FULL LOAD SHOULD BE BUILT USING AN OFFSET LOADING PATTERN. FOR INSTANCE, A LOAD CONSISTING OF AN EVEN NUMBER OF LOAD UNITS AND HAVING TWO MORE LOAD UNITS IN ONE END OF THE CAR THAN IN THE OPPOSITE END, OR A LOAD CONSISTING OF AN ODD NUMBER OF LOAD UNITS AND HAVING ONE MORE LOAD UNIT IN ONE END THAN IN THE OTHER IS CONSIDERED TO BE AN OFFSET LOAD.

J. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN CARS WHICH ARE PARTIALLY LOADED WITH PALLET UNITS OF BOMBS, 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 TRIPLED 2" X 6" MATERIAL, IT IS PERMISSIBLE TO USE LAMINATED 4" X 6" AND 2" X 6" MATERIAL. LAMINATE A 2" X 6" TO A 4" X 6" W/1-10d NAIL EVERY 6".

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

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

N. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF ONE SEAL WITH TWO PAIR OF NOTCHES WILL BE USED TO SEAL THE JOINT WHEN A NOTCH-TYPE SEALER IS BEING USED. A MINIMUM OF TWO SEALS, BUTTED TOGETHER, WITH TWO PAIR OF CRIMPS PER SEAL WILL BE USED TO SEAL THE JOINT WHEN A CRIMP-TYPE SEALER IS BEING USED. REFER TO THE "STRAP JOINT A" AND "STRAP JOINT B" DETAILS ON PAGE 56 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.

(GENERAL NOTES CONTINUED ON PAGE 3)

REVISIONS

REVISION NO. 1, DATED NOVEMBER 1971, CONSISTS OF:

1. CHANGING THE SPACER ASSEMBLIES (ANTI-SWAY BRACES).
2. ADDING PROCEDURES FOR 3-TIER LOADS.
3. ADDING PROCEDURES FOR LOAD DIVIDER EQUIPPED CARS.
4. ADAPTING PROCEDURES TO ALSO COVER BOMBS FITTED WITH THE FLAT TYPE NOSE PLUG.

REVISION NO. 2, DATED DECEMBER 1993, CONSISTS OF:

1. ADDING PROCEDURES FOR LENGTHWISE-POSITIONED BOMBS.
2. CHANGING THE CONSTRUCTION OF ANTI-SWAY BRACES "C" AND "D".
3. UPDATING THE GENERAL NOTES AND MATERIAL SPECIFICATIONS.

(GENERAL NOTES CONTINUED)

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

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

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 "L" ON PAGE 2.

S. NOTICE: WHEN POSITIONING PALLET UNITS IN A CAR, THEY SHOULD BE PLACED TIGHTLY AGAINST A CAR SIDEWALL AND/OR A SIDE FILL ASSEMBLY, AS APPLICABLE, AND ARE TO BE PRESSED TIGHTLY TOGETHER LENGTHWISE SO AS TO ACHIEVE A TIGHT LOAD. TO AID IN ACHIEVING TIGHTNESS LENGTHWISE IN A FULL LOAD, A LOAD-COMPRESSING JACK MAY BE EMPLOYED IN THE AREA OF THE CENTER GATES TO MOVE THE PALLET UNITS INTO THEIR FINAL SHIPPING POSITION. A HYDRAULIC JACK IS RECOMMENDED FOR THIS OPERATION. CAUTION: WHEN USING A JACK TO COMPACT A LOAD, THE JACK MUST BE USED AGAINST STRONG POINTS OF THE PALLET UNITS, SUCH AS THE END OF A STRINGER OR SKID. 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 KEY NUMBERS ⑦ AND ⑧ ON PAGE 8. 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 10'-0" OR MORE IN LENGTH, IT WILL BE NECESSARY TO APPLY AN ADDITIONAL SET OF HORIZONTAL AND VERTICAL STRUT BRACING PIECES. STRUT BRACING SHOULD BE APPLIED SO AS TO PROVIDE NEARLY EQUAL SPACES BETWEEN THE BRACING PIECES AND THE CENTER GATES AND/OR BETWEEN ADJACENT STRUT BRACING PIECES. NOTE THAT HORIZONTAL STRUT BRACING PIECES FOR THE UPPER LEVEL OF STRUTS FOR ALL BUT THE UPPERMOST TIER OF A LOAD MAY BE DIFFICULT TO APPLY TO THE TOP SURFACES OF THE STRUT AS DEPICTED. STRUT BRACING WILL BE EQUALLY EFFECTIVE IF APPLIED TO THE UNDER SIDE OF THOSE STRUTS.

U. WHERE 2" X 2" PIECES ARE SPECIFIED FOR STRUT LEDGERS, 2" X 4" MATERIAL MAY BE SUBSTITUTED, IF DESIRED, EXCEPT FOR A STRUT LEDGER WHICH IS ON THE BOTTOM OF A GATE WHICH MUST BE 2" X 2" MATERIAL.

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

GENERAL NOTES

(FOR BOXCARS EQUIPPED WITH MECHANICAL BRACING DEVICES)

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

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(GENERAL NOTES CONTINUED)

1. FOR BLOCKING THE LOAD WHICH IS DEPICTED, A CROSS MEMBER WILL NOT BE RELIED UPON TO RETAIN MORE LADING ON EITHER SIDE THAN AS SHOWN. CAUTION: A CROSS MEMBER WILL NOT BE RELIED UPON TO RETAIN MORE THAN 2,000 POUNDS OF LADING ON EITHER SIDE IF THE LADING UNITS ARE POSITIONED WITHIN A CAR IN ACCORDANCE WITH A LOADING PATTERN NOT SHOWN, SUCH AS 1-WIDE DOWN THE CENTER OF THE CAR. 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 UNITS AND THE CAR SIDEWALLS, ADJUSTABLE WALL MEMBERS (AS REQUIRED) MUST BE INSTALLED TO PROVIDE A MINIMUM OF ONE SURFACE AREA FOR SIDE BEARING.

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

GENERAL NOTES

(FOR CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS)

Z. 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.

AA. 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 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.

BB. 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 58 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 58, THE "FILL PIECE" MATERIAL IS NOT REQUIRED.

(CONTINUED ON PAGE 4)

CC. 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.

DD. 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 EE.1 BELOW. DETAILS OF STRUT ASSEMBLIES FOR USE BETWEEN 2-PIECE BULKHEADS AND BETWEEN 1-PIECE BULKHEADS ARE SHOWN ON PAGE 57.

EE. THE NORMAL LOADING PATTERN IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS IS TO POSITION THE LADING BETWEEN A CAR ENDWALL AND A LOAD DIVIDER BULKHEAD IN FULL LAYERS. OBVIOUSLY, A LOAD QUANTITY MUST THEN BE A MULTIPLE OF THE NUMBER OF PALLET UNITS WHICH ARE IN ONE LOAD UNIT. A LOAD UNIT IS DEFINED AS A STACK OF CONTAINERS WHICH IS FULL CAR WIDTH BY FULL LOAD HEIGHT BY ONE UNIT IN LENGTH. IF THE QUANTITY TO BE SHIPPED CANNOT BE ATTAINED BY ADJUSTING THE NUMBER OF TIERS IN ONE OR BOTH ENDS OF A CAR, OR BY ADJUSTING THE NUMBER OF LOAD UNITS IN EITHER END OF THE CAR, ONE OF THE FOLLOWING PROCEDURES MUST BE USED IN ORDER TO OBTAIN THE DESIRED QUANTITY.

1. 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 PAGES 6 AND 7 OF THE CONVENTIONAL BOXCAR DRAWINGS HEREIN FOR THE LENGTHWISE LOADS OR PAGES 22 AND 26 FOR THE CROSSWISE LOADS TO PROVIDE FOR A TIGHT LOAD BETWEEN THE BULKHEADS.

2. ONE OR MORE UNITS CAN BE POSITIONED IN CONTACT WITH A LOAD DIVIDER BULKHEAD ON THE CENTER-OF-CAR SIDE. BLOCK AND BRACE WITH WITH BACK-UP CLEATS AS SHOWN ON PAGE 14 FOR THE LENGTHWISE PALLET UNITS OR WITH LCL BRACES AS SHOWN ON PAGE 39 OR WITH KNEE BRACE ASSEMBLIES, AS SHOWN ON PAGE 38 FOR THE CROSSWISE PALLET UNITS.

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

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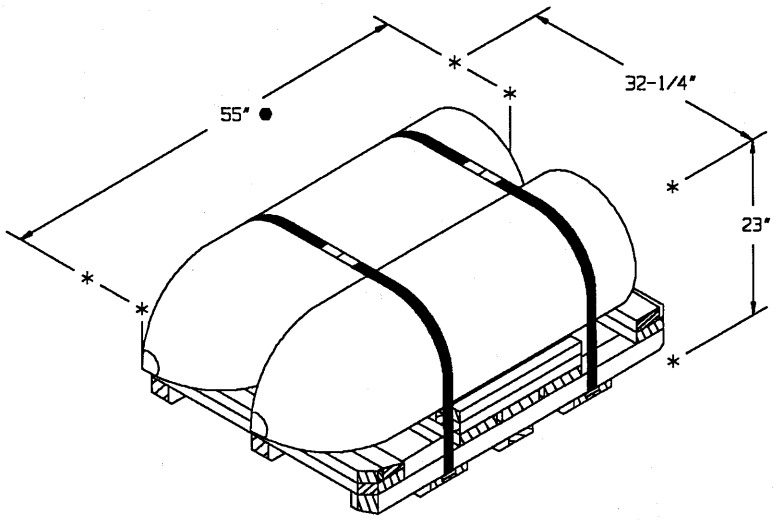
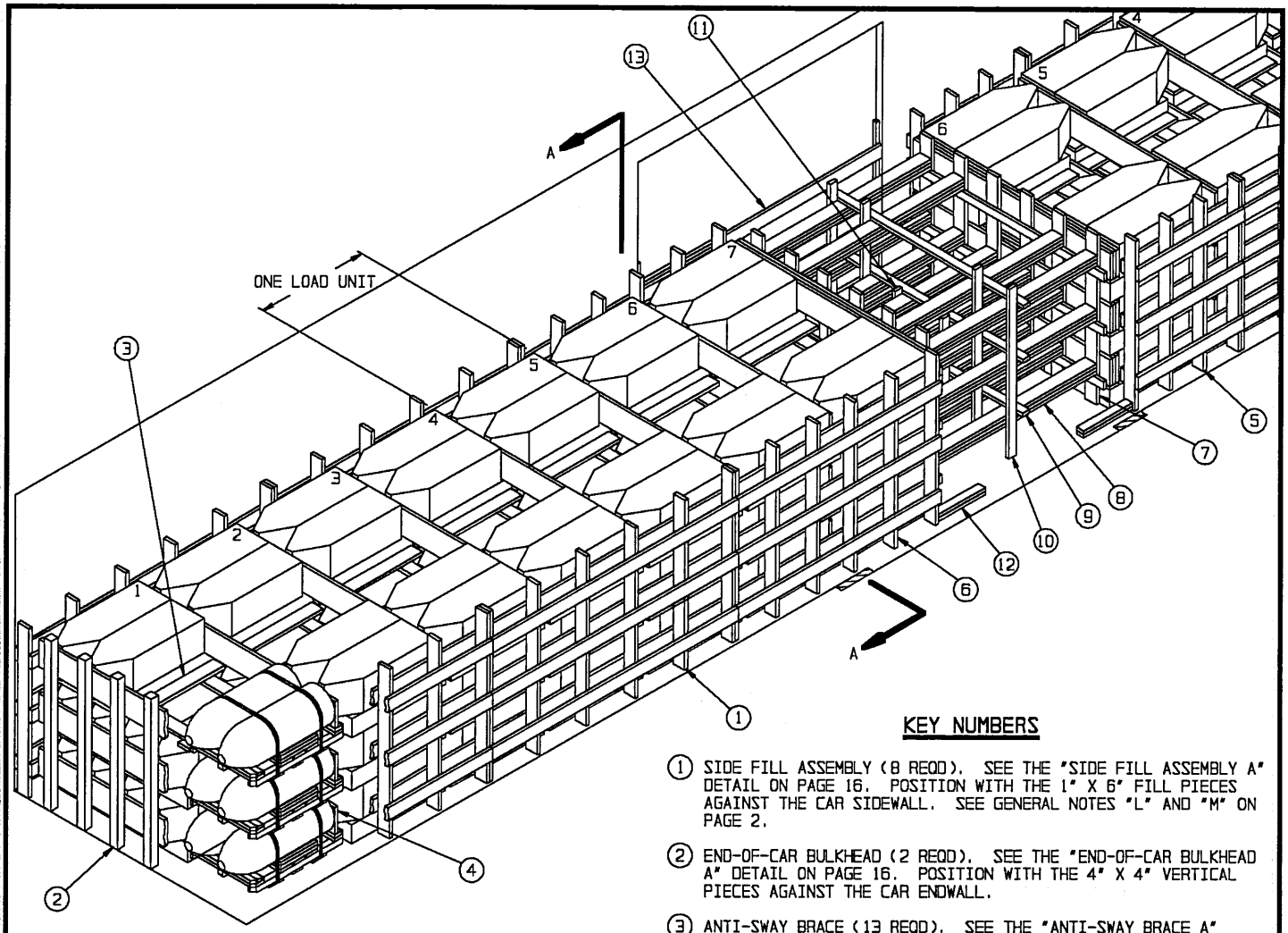


PALLET UNIT

FOR DETAILS OF THE PALLET UNIT
SEE AIR FORCE TPO 1325-926-1868.

● UNIT LENGTH FOR BOMBS EQUIPPED WITH CONICAL NOSE PLUGS IS 55". UNIT LENGTH FOR BOMBS EQUIPPED WITH FLAT TYPE NOSE PLUGS IS 52-1/4"



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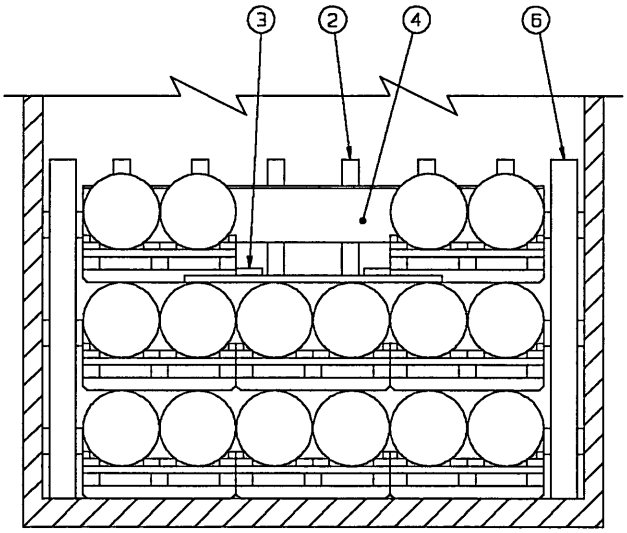


SECTION A-A

KEY NUMBERS

(1) SIDE FILL ASSEMBLY (8 REQD). SEE THE "SIDE FILL ASSEMBLY A" DETAIL ON PAGE 16. POSITION WITH THE 1" X 6" FILL PIECES AGAINST THE CAR SIDEWALL. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.

(2) END-OF-CAR BULKHEAD (2 REQD). SEE THE "END-OF-CAR BULKHEAD A" DETAIL ON PAGE 16. POSITION WITH THE 4" X 4" VERTICAL PIECES AGAINST THE CAR ENDWALL.

(3) ANTI-SWAY BRACE (13 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 17. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS IN THE TOP LAYER. SEE SPECIAL NOTE 3 ON PAGE 7.

(4) BUFFER PIECE, 2" X 12" X 8'-0" (33 REQD). POSITION ON EDGE ON THE AFT END STOP PIECE OF THE BOMB PALLET.

(5) SIDE FILL ASSEMBLY (2 REQD). SEE THE "SIDE FILL ASSEMBLY B" DETAIL ON PAGE 17. POSITION WITH THE 1" X 6" FILL PIECES AGAINST THE CAR SIDEWALL.

(6) SIDE FILL ASSEMBLY (2 REQD). SEE THE "SIDE FILL ASSEMBLY C" DETAIL ON PAGE 18. POSITION WITH THE 1" X 6" FILL PIECES AGAINST THE CAR SIDEWALL. SEE SPECIAL NOTE 4 ON PAGE 7.

(7) CENTER GATE (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 18.

(8) STRUT, 2" X 6" BY CUT TO FIT (REF: 6'-10") (TRIPLED) (16 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 AND TOENAIL TO THE VERTICAL PIECES OF THE CENTER GATES, PIECE MARKED (7), W/2-12d NAILS AT EACH END. SEE GENERAL NOTE "K" ON PAGE 2.

(9) HORIZONTAL STRUT BRACING, 2" X 4" X 8'-0" (3 REQD). NAIL TO THE STRUTS, PIECE MARKED (8), W/3-10d NAILS AT EACH JOINT. SEE GENERAL NOTE "T" ON PAGE 3.

(10) VERTICAL STRUT BRACING, 2" X 4" X 72" (4 REQD). NAIL TO THE STRUTS, PIECE MARKED (8), W/3-10d NAILS AT EACH JOINT.

(11) VERTICAL STRUT BRACING, 2" X 4" X 43" (2 REQD). NAIL TO THE STRUTS, PIECE MARKED (8), W/3-10d NAILS AT EACH JOINT.

(12) SIDE FILL ASSEMBLY STOP PIECE, 2" X 4" X 24" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/3-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/3-10d NAILS.

(13) DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION A" DETAIL ON PAGE 19. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTES 5 AND 6 ON PAGE 7.

LENGTHWISE-LOADED FLAT NOSE
104-UNIT LOAD IN A 60'-8" LONG BY 9'-6" WIDE CONVENTIONAL BOXCAR

PROJECT FSA 48-65

(SPECIAL NOTES CONTINUED)

7. A LOAD MAY BE INCREASED OR DECREASED AS NECESSARY TO SUIT THE QUANTITY TO BE SHIPPED AND/OR THE LOAD LIMIT OF THE CAR BEING LOADED. THE FOLLOWING TABLE MAY BE USED AS GUIDANCE IN DETERMINING A LOAD PATTERN.

NO. LONG	NO. PER LOAD UNIT	LOAD QUANTITY	LOAD WEIGHT (LBS)	MINIMUM LOAD LIMIT(LBS)
14	9	126	198,450	202,300
14	8	112	176,400	180,500
14	7	98	154,350	158,500
14	6	84	132,300	136,500
14	5	70	110,250	NA
13	9	117	184,275	192,100
13	8	104	163,800	173,800
13	7	91	143,325	150,200
13	6	78	122,850	129,900
13	5	65	102,375	NA
12	9	108	170,100	174,800
12	8	96	151,200	156,300
12	6	72	113,400	119,100
12	5	60	94,500	NA

8. A LOAD MAY BE REDUCED BY ONE PALLET BY POSITIONING A FILLER ASSEMBLY IN THE PLACE OF AN OMITTED PALLET UNIT. SEE THE "FILLER ASSEMBLY A" DETAIL ON PAGE 21. A FILLER ASSEMBLY SHOULD BE PLACED NEAR THE CENTER OF THE LOAD BUT NOT IN THE DOORWAY. NOTE THAT THERE SHOULD BE AT LEAST ONE PALLET UNIT BETWEEN THE FILLER ASSEMBLY AND A CENTER GATE.

9. A PARTIAL LAYER OF NOT MORE THAN TWO PALLET UNITS MAY BE SHIPPED BY INSTALLING A K-BRACE IN THE END OF THE CAR. SEE THE "TYPE "A" K-BRACE" DETAIL ON PAGE 45.

10. IF A 50'-6" LONG CAR IS FURNISHED FOR LOADING, REFER TO THE PROCEDURES ON PAGES 8 AND 9 FOR GUIDANCE.

SPECIAL NOTES:

1. A 104-UNIT LOAD OF LENGTHWISE-LOADED FLAT NOSE BOMBS IS SHOWN. THESE PROCEDURES CANNOT BE USED FOR BOMBS EQUIPPED WITH CONICAL NOSE PLUGS. SEE SPECIAL NOTE 7 BELOW FOR GUIDANCE IN THE SHIPMENT OF OTHER QUANTITIES.

2. A 60'-8" LONG BY 9'-6" WIDE CONVENTIONAL TYPE BOXCAR IS SHOWN. CARS OF OTHER LENGTHS MAY BE USED AND NARROWER CARS MAY BE USED.

3. ANTI-SWAY BRACES, PIECE MARKED ③, ARE REQUIRED WHEN A LOAD UNIT CONSISTS OF SEVEN OR EIGHT PALLET UNITS. ANTI-SWAY BRACES MUST BE INSTALLED AT THE SAME LOCATION WITHIN EACH AND EVERY LOAD UNIT THROUGHOUT THE LENGTH OF THE LOAD; ANTI-SWAY BRACES WILL NOT PROVIDE FOR LONGITUDINAL RETENTION OF PALLET UNITS.

4. IF THE LOAD CONSISTS OF SIX LOAD UNITS IN EACH END OF THE CAR, THE SIDE FILL ASSEMBLIES, PIECE MARKED ⑥, WILL NOT BE REQUIRED; THE SIDE FILL ASSEMBLIES, PIECE MARKED ⑤, WILL BE USED IN BOTH ENDS OF THE CAR.

5. DOORWAY PROTECTION IS REQUIRED IN CARS EQUIPPED WITH SLIDING DOORS FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY IN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED ⑬ IN THE LOAD ON PAGE 6, IS APPLICABLE FOR BOXCARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. PIECE MARKED ⑬ WILL NOT BE REQUIRED IF THE LOAD CONSISTS OF SIX LOAD UNITS IN EACH END OF A CAR HAVING THRU DOOR OPENINGS UP TO 11'-0" WIDE.

6. IN CARS EQUIPPED WITH PLUG TYPE DOORS WIDER THAN 7'-0", NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED. SEE PIECES MARKED ⑤, ⑥, AND ⑦ ON PAGE 12 FOR GUIDANCE. FOR DOOR OPENINGS UP TO 10'-0" WIDE, USE TWO SIDE FILL ASSEMBLIES "A", PIECE MARKED ①, AND ONE SIDE FILL ASSEMBLY "B", PIECE MARKED ⑤, FOR LATERAL BRACING FOR SIX LOAD UNITS IN EACH END AND AT EACH SIDE OF THE LOAD. FOR LOAD UNIT NUMBER 7, POSITION DOUBLED 2" X 6" X 42" PIECES AGAINST PIECE MARKED ⑤ AND AGAINST THE SKIDS OF THE PALLETS ON BOTH SIDES OF THE LOAD. NAIL TO THE CAR FLOOR W/9-16d NAILS EACH LAYER. INSTALL TWO BUNDLING STRAPS AROUND LOAD UNIT 7. FOR 15'-0" STAGGERED DOOR OPENINGS, USE TWO SIDE FILL ASSEMBLIES "A", WITH 2" X 6" X 54" PIECES, NAILED W/9-16d NAILS EACH LAYER, AGAINST THE LAST FILL ASSEMBLY AND AGAINST THE SKIDS OF THE PALLET IN LOAD UNIT 6. PLACE 2" X 6" X 42" AGAINST THE SKIDS OF THE PALLET IN LOAD UNIT 7. THIS IS APPLICABLE FOR THE LOAD TO THE LEFT OF THE DOOR ON THE LOADING SIDE AND TO THE SIDE OPPOSITE THE LOADING SIDE TO THE RIGHT OF THE DOOR. THE SIDE OPPOSITE THE LOADING SIDE TO THE LEFT OF THE DOOR WILL REQUIRE TWO SIDE FILL ASSEMBLIES "A" AND ONE SIDE FILL ASSEMBLY "C". THE LOADING SIDE TO THE RIGHT OF THE DOOR WILL REQUIRE TWO SIDE FILL ASSEMBLIES "A" AND ONE SIDE FILL ASSEMBLY "B". INSTALL TWO BUNDLING STRAPS AROUND LOAD UNIT 6 IN EACH END OF THE CAR AND TWO AROUND LOAD UNIT 7. FOR 16'-0" STAGGERED DOOR OPENINGS, USE ONE EACH SIDE FILL ASSEMBLY "A" AND "C" TO THE LEFT OF THE DOOR ON THE LOADING SIDE AND ON THE SIDE OPPOSITE THE LOADING SIDE TO THE RIGHT OF THE DOOR. POSITION DOUBLED 2" X 6" X 18" PIECES AGAINST SIDE FILL ASSEMBLY "C" AND NAIL W/4-16d NAILS EACH LAYER. APPLY 42" LONG SIDE BLOCKING FOR LOAD UNITS 6 AND 7 ON THE LOADING SIDE OF THE CAR. INSTALL ONE BUNDLING STRAP AROUND LOAD UNITS 5 AND TWO STRAPS EACH AROUND LOAD UNITS 6 IN EACH END OF THE LOAD, AND TWO STRAPS AROUND LOAD UNIT 7. NOTE THAT THE DOORWAY PROTECTION FOR CARS EQUIPPED WITH PLUG TYPE DOORS MAY BE USED IN CARS EQUIPPED WITH SLIDING DOORS, IF DESIRED.

(CONTINUED AT LEFT)

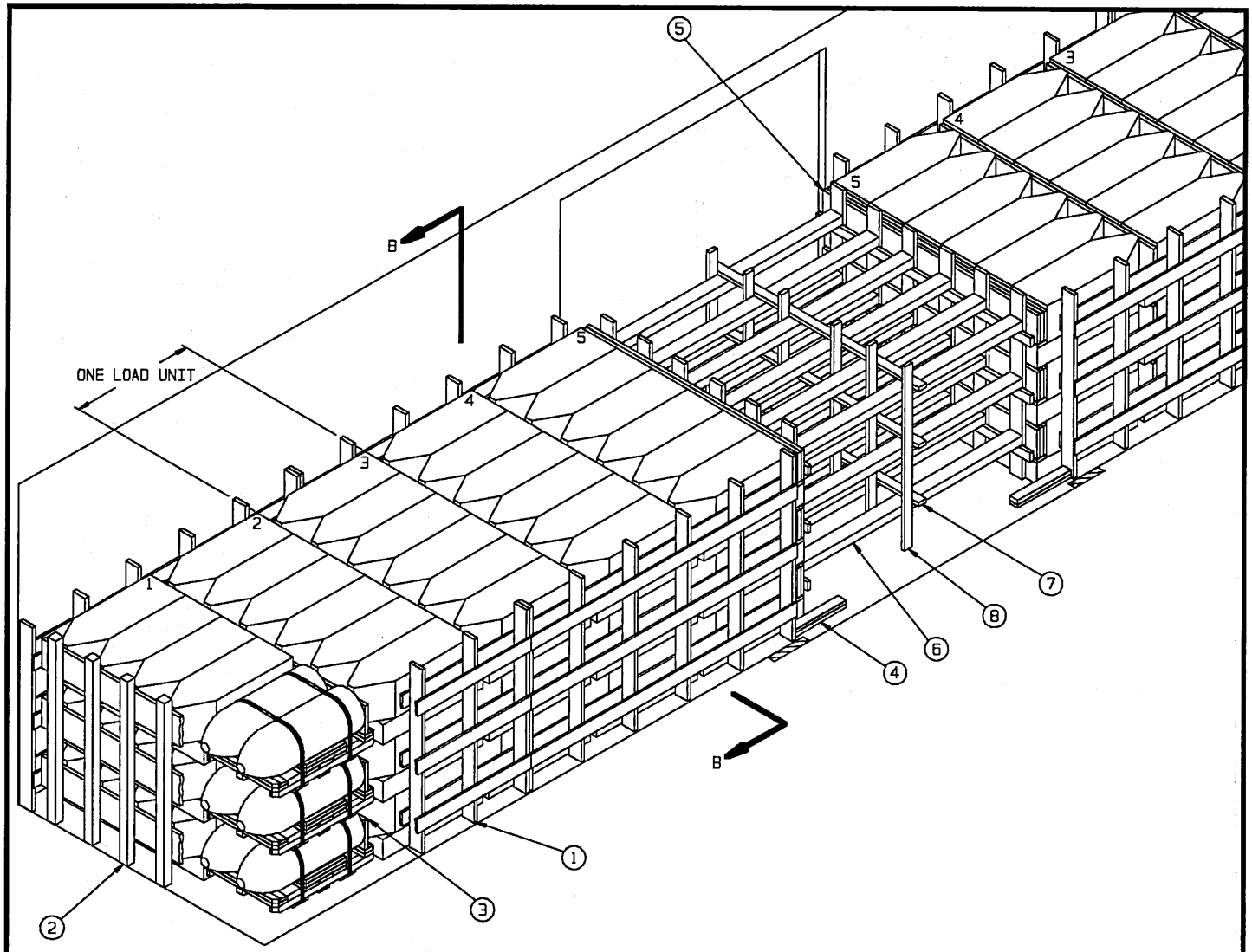
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	320	160
2" X 2"	24	8
2" X 4"	137	92
2" X 6"	1399	1399
2" X 12"	456	912
4" X 4"	72	96
NAILS	NO. REQD	POUNDS
6d (2")	612	3-3/4
10d (3")	1432	22
12d (3-1/4")	88	1-1/2
16d (3-1/2")	348	7-3/4

* BASED ON A PALLET UNIT WEIGHT OF 1,575 POUNDS.

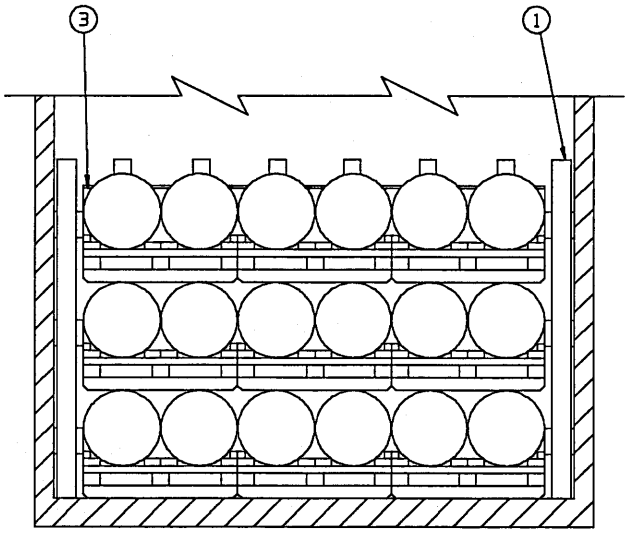
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	104	163,800 LBS *
DUNNAGE		5,369 LBS
TOTAL WEIGHT		169,169 LBS (APPROX)

LENGTHWISE-LOADED FLAT NOSE
104-UNIT LOAD IN A 60'-8" LONG BY 9'-6" WIDE CONVENTIONAL BOXCAR



ISOMETRIC VIEW



SECTION B-B

KEY NUMBERS

(1) SIDE FILL ASSEMBLY (8 REQD). SEE THE "SIDE FILL ASSEMBLY A" DETAIL ON PAGE 16. POSITION WITH THE 1" X 6" FILL PIECES AGAINST THE CAR SIDEWALL. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.

(2) END-OF-CAR BULKHEAD (2 REQD). SEE THE "END-OF-CAR BULKHEAD A" DETAIL ON PAGE 16. POSITION WITH THE 4" X 4" VERTICAL PIECES AGAINST A CAR ENDWALL. SEE SPECIAL NOTE 3 ON PAGE 6.

(3) BUFFER PIECE, 2" X 12" X 8'-0" (24 REQD). POSITION ON EDGE ON THE AFT END STOP PIECE OF THE BOMB PALLET.

(4) SIDE FILL ASSEMBLY STOP PIECE, 2" X 4" X 24" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/3-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/3-10d NAILS.

(5) CENTER GATE (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 18.

(6) STRUT, 4" X 6" BY CUT TO FIT (REF: 8'-9") (18 REQD). POSITION FLATWISE ON THE STRUT LEDGERS AND TOENAIL TO THE VERTICAL PIECES OF THE CENTER GATES, PIECE MARKED (5), W/4-16d NAILS AT EACH END, TWO ON THE TOP SURFACE AND ONE AT EACH SIDE. SEE GENERAL NOTE "K" ON PAGE 2 AND SPECIAL NOTE 4 ON PAGE 9.

(7) HORIZONTAL STRUT BRACING, 2" X 4" X 8'-0" (3 REQD). NAIL TO THE STRUTS, PIECE MARKED (6), W/3-10d NAILS AT EACH JOINT. SEE GENERAL NOTE "T" ON PAGE 3.

(8) VERTICAL STRUT BRACING, 2" X 4" X 72" (6 REQD). NAIL TO THE STRUTS, PIECE MARKED (6), W/3-10d NAILS AT EACH JOINT.

LENGTHWISE-LOADED FLAT NOSE
90-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR

PROJECT FSA 48-65

(SPECIAL NOTES CONTINUED)

7. A LOAD MAY BE INCREASED OR DECREASED AS NECESSARY TO SUIT THE QUANTITY TO BE SHIPPED AND/OR THE LOAD LIMIT OF THE CAR BEING USED. A LOAD UNIT MAY BE ADDED TO THE DEPICTED 90-UNIT LOAD, OR 1, 2, OR 3 LAYERS MAY BE OMITTED FROM THE CENTER ROW OF THE DEPICTED LOAD OR FROM A PERMITTED 11 LOAD-UNIT LOAD. REFER TO PIECE MARKED ③ ON PAGE 6 FOR A TYPICAL INSTALLATION OF AN ANTI-SWAY BRACE WHICH MUST BE USED WHEN OMITTING A CENTER ROW PALLET UNIT. NOTE THAT THE ENTIRE ROW MUST BE OMITTED; ANTI-SWAY BRACES ARE FOR LATERAL RESTRAINT ONLY. THE FOLLOWING TABLE MAY BE USED AS GUIDANCE IN DETERMINING A LOAD PATTERN.

NO. LONG	NO. PER LOAD UNIT	LOAD QUANTITY	LOAD WEIGHT(LBS)	MINIMUM LOAD LIMIT(LBS)
10	8	80	126,000	130,500
10	7	70	110,250	115,000
10	6	60	94,500	99,500
10	5	50	78,750	NA
11	9	99	155,925	161,600
11	8	88	138,600	144,600
11	7	77	121,275	127,400
11	6	66	103,950	110,300
11	5	55	86,625	NA

8. A LOAD MAY BE REDUCED BY ONE PALLET BY POSITIONING A FILLER ASSEMBLY IN THE PLACE OF AN OMITTED PALLET UNIT. SEE THE "FILLER ASSEMBLY A" DETAIL ON PAGE 21. A FILLER ASSEMBLY SHOULD BE PLACED NEAR THE CENTER OF THE LOAD BUT NOT IN THE DOORWAY. NOTE THAT THERE SHOULD BE AT LEAST ONE PALLET UNIT BETWEEN THE FILLER ASSEMBLY AND A CENTER GATE.

9. A PARTIAL LAYER OF NOT MORE THAN TWO PALLET UNITS MAY BE SHIPPED BY INSTALLING A K-BRACE IN THE END OF THE CAR. SEE THE "TYPE "A" K-BRACE" DETAIL ON PAGE 45.

10. IF A 60'-6" LONG CAR IS FURNISHED FOR LOADING, REFER TO THE PROCEDURES ON PAGE 6 FOR GUIDANCE.

SPECIAL NOTES:

1. A 90-UNIT LOAD OF LENGTHWISE-LOADED FLAT NOSED BOMBS IS SHOWN. THESE PROCEDURES CANNOT BE USED FOR BOMBS EQUIPPED WITH CONICAL NOSE PLUGS. SEE SPECIAL NOTE 7 AT LEFT FOR GUIDANCE IN THE SHIPMENT OF OTHER QUANTITIES.

2. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOXCAR IS SHOWN. CARS OF OTHER LENGTHS AND WIDTHS MAY BE USED.

3. THE DEPICTED 90-UNIT LOAD REQUIRES A CAR HAVING A LOAD LIMIT OF AT LEAST 145,900 POUNDS. THE LOAD MAY BE DECREASED BY ONE OR MORE UNITS, AND LIKEWISE, THE REQUIRED LOAD LIMIT WILL BE REDUCED, BY POSITIONING ONE OR MORE FILLER ASSEMBLIES WITHIN THE TOP LAYER OF THE CENTER ROW. SEE THE "FILLER ASSEMBLY A" DETAIL ON PAGE 21. A FILLER ASSEMBLY SHOULD BE POSITIONED NEAR THE CENTER OF THE LOAD BUT NOT IN THE DOORWAY. ALSO, THERE SHOULD BE AT LEAST ONE PALLET UNIT BETWEEN THE FILLER ASSEMBLY AND A CENTER GATE. SEE SPECIAL NOTE 7 FOR GUIDANCE IN THE SHIPMENT OF OTHER QUANTITIES.

4. IF 4" X 6" MATERIAL IS NOT AVAILABLE FOR THE STRUTS, PIECE MARKED ⑥, OR IF DESIRED, DOUBLED 2" X 6" MATERIAL MAY BE USED. LAMINATE THE 2" X 6" MATERIAL W/1-10d NAIL EVERY 6" AND TOENAIL THE TOP PIECE TO THE VERTICAL PIECES OF THE CENTER GATES, PIECE MARKED ⑤, W/2-12d NAILS AT EACH END.

5. A CAR HAVING 10'-0" WIDE SLIDING TYPE THRU DOOR OPENINGS IS SHOWN. FOR THE LOAD SHOWN, IF A CAR HAVING STAGGERED DOOR OPENINGS IS USED, DOORWAY PROTECTION MUST BE INSTALLED. DOORWAY PROTECTION IS REQUIRED IF A PALLET UNIT IS COMPLETELY WITHIN THE DOOR OPENING OR IF ONE-HALF OR MORE OF THE UNIT LENGTH EXTENDS INTO THE DOORWAY. SEE THE "DOORWAY PROTECTION A" DETAIL ON PAGE 19. SEE PIECE MARKED ⑬ ON PAGE 6 FOR A TYPICAL INSTALLATION. DOORWAY PROTECTION IS ALSO REQUIRED FOR THE DEPICTED LOAD IF THE LOAD CONSISTS OF 11 LOAD UNITS AS PERMITTED BY SPECIAL NOTE 7 AT LEFT.

6. IN CARS EQUIPPED WITH PLUG TYPE DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED IF SIX LOAD UNITS ARE TO BE SHIPPED IN ONE END OF THE CAR. SEE PIECES MARKED ⑤, ⑥, AND ⑦ ON PAGE 12 FOR GUIDANCE. FOR THRU DOOR OPENINGS UP TO 8'-0" WIDE, USE TWO SIDE FILL ASSEMBLIES "A", PIECE MARKED ①, FOR LATERAL BRACING IF SIX LOAD UNITS ARE LOADED IN ONE END. FOR LOAD UNIT 6, POSITION DOUBLED 2" X 6" X 42" LONG PIECES AGAINST PIECE MARKED ① AND AGAINST THE PALLET SKIDS. NAIL W/9-16d NAILS IN EACH LAYER. INSTALL ONE DOORWAY PROTECTION STRAP AROUND LOAD UNIT 6. DOUBLED 2" X 6" X 42" PIECES W/9-16d NAILS EACH LAYER AND TWO DOORWAY PROTECTION STRAPS ARE REQUIRED FOR LOAD UNIT 6 FOR THRU DOORS WIDER THAN 8'-0". FOR 15'-0" OR 16'-0" STAGGERED DOOR OPENINGS, USE ONE EACH SIDE FILL ASSEMBLY "A", PIECE MARKED ①, AND ONE SIDE FILL ASSEMBLY "B", AS DETAILED ON PAGE 17, FOR LATERAL BRACING FOR THREE LOAD UNITS. POSITION DOUBLED 2" X 6" X 42" PIECES AGAINST SIDE FILL ASSEMBLY "B" AND AGAINST THE PALLET SKIDS OF LOAD UNIT 4. INSTALL ONE DOORWAY PROTECTION STRAP AROUND LOAD UNIT 4. APPLY 42" LONG SIDE BLOCKING AND TWO DOORWAY PROTECTION STRAPS FOR LOAD UNIT 5, AND LOAD UNIT 6, IF APPLICABLE. THIS GUIDANCE APPLIES FOR THE LOAD TO THE LEFT OF THE DOOR ON THE LOADING SIDE AND FOR THE SIDE OPPOSITE THE LOADING SIDE TO THE RIGHT OF THE DOOR. THE SIDE OPPOSITE THE LOADING SIDE TO THE LEFT OF THE DOOR AND THE LOADING SIDE TO THE RIGHT OF THE DOOR WILL REQUIRE TWO PIECES MARKED ①. NOTE THAT THE DOORWAY PROTECTION FOR CARS EQUIPPED WITH PLUG TYPE DOORS MAY BE USED IN CARS EQUIPPED WITH SLIDING DOORS, IF DESIRED.

(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	240	120
2" X 4"	144	96
2" X 6"	603	603
2" X 12"	384	768
4" X 4"	72	96
4" X 6"	158	316
NAILS	NO. REQD	POUNDS
6d (2")	432	2-3/4
10d (3")	580	9
16d (3-1/2")	468	10-1/4

* BASED ON A PALLET UNIT WEIGHT OF 1,575 POUNDS.

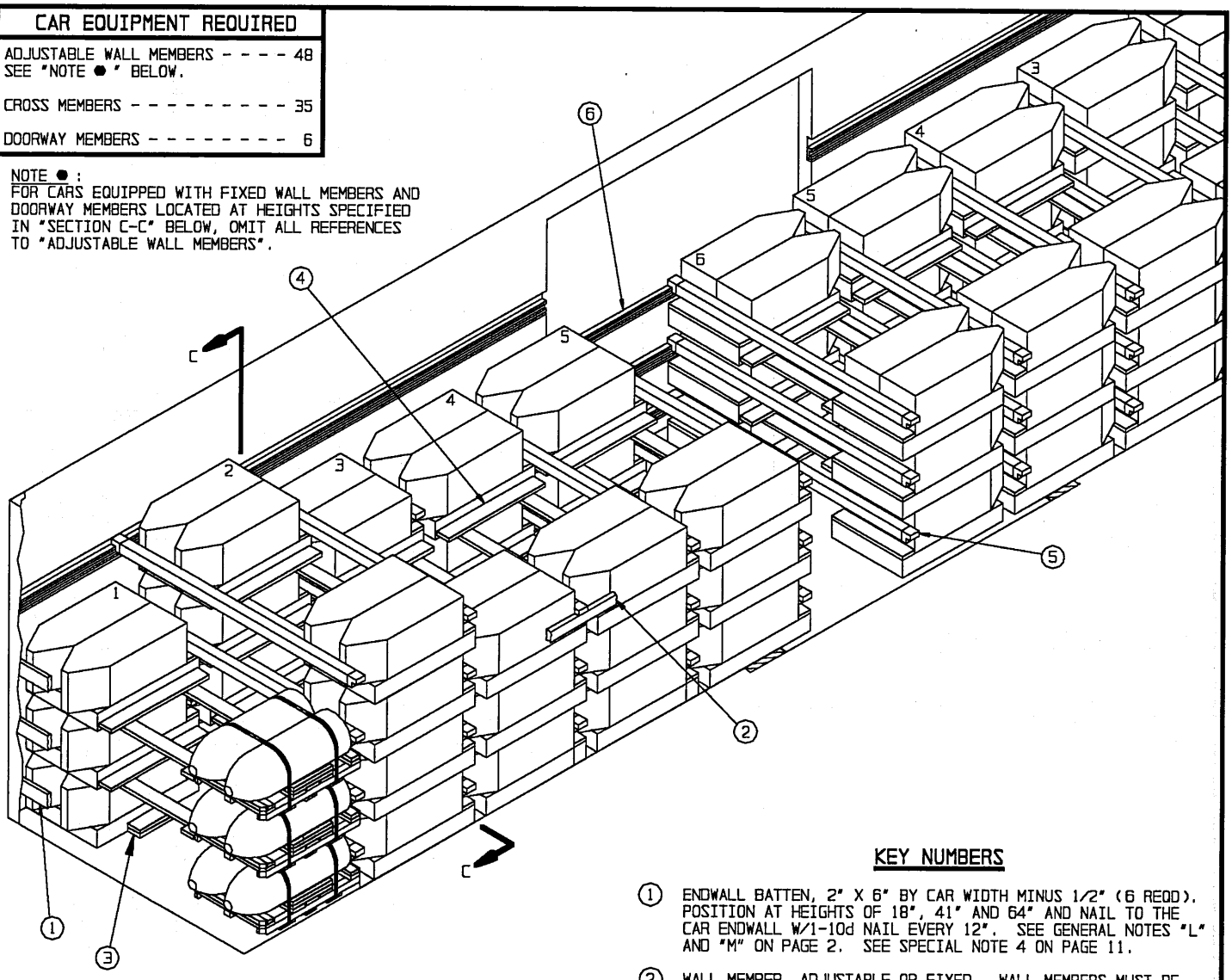
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	90	141,750 LBS *
DUNNAGE		4,020 LBS
TOTAL WEIGHT		145,770 LBS (APPROX)

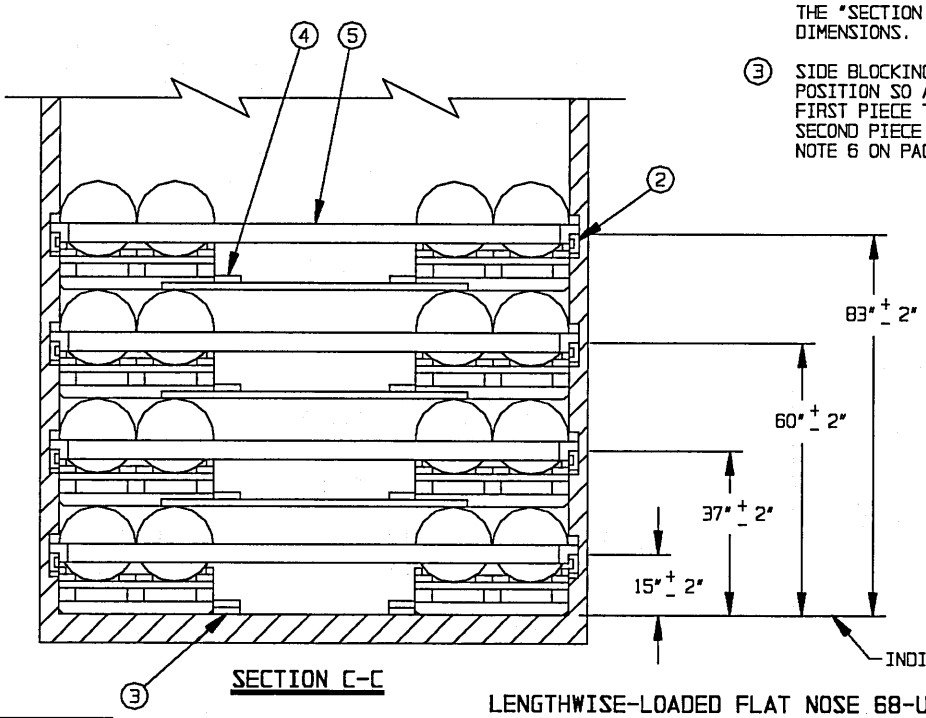
LENGTHWISE-LOADED FLAT NOSE
90-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR

CAR EQUIPMENT REQUIRED	
ADJUSTABLE WALL MEMBERS SEE "NOTE ● " BELOW.	48
CROSS MEMBERS	35
DOORWAY MEMBERS	6

NOTE ● :
FOR CARS EQUIPPED WITH FIXED WALL MEMBERS AND DOORWAY MEMBERS LOCATED AT HEIGHTS SPECIFIED IN "SECTION C-C" BELOW, OMIT ALL REFERENCES TO "ADJUSTABLE WALL MEMBERS".



ISOMETRIC VIEW



SECTION C-C

KEY NUMBERS

(1) ENDWALL BATTEN, 2" X 6" BY CAR WIDTH MINUS 1/2" (6 REQD). POSITION AT HEIGHTS OF 18", 41" AND 64" AND NAIL TO THE CAR ENDWALL W/1-10d NAIL EVERY 12". SEE GENERAL NOTES "L" AND "M" ON PAGE 2. SEE SPECIAL NOTE 4 ON PAGE 11.

(2) WALL MEMBER, ADJUSTABLE OR FIXED. WALL MEMBERS MUST BE LOCATED AT SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED (5). SEE THE "SECTION C-C" VIEW AT LEFT FOR SPECIFIED HEIGHT DIMENSIONS.

(3) SIDE BLOCKING, 2" X 6" X 18" (DOUBLED) (22 REQD). POSITION SO AS TO BE CENTERED ON PALLET SKIDS AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/4-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 6 ON PAGE 11.

(4) ANTI-SWAY BRACE (35 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 17.

(5) CROSS MEMBER (35 REQD). POSITION AT HEIGHTS SPECIFIED BY THE "SECTION C-C" VIEW AT LEFT. SEE GENERAL NOTE "W" ON PAGE 3. SEE SPECIAL NOTE 7 ON PAGE 11.

(6) DOORWAY MEMBER (6 REQD). POSITION AT HEIGHTS SPECIFIED BY THE "SECTION C-C" VIEW AT LEFT.

LENGTHWISE-LOADED FLAT NOSE 68-UNIT LOAD
IN A 50'-6" LONG BY 8'-11" WIDE BOXCAR EQUIPPED WITH MECHANICAL BRACING DEVICES

PROJECT FSA 48-65

SPECIAL NOTES:

1. A 68-UNIT LOAD OF LENGTHWISE-POSITIONED FLAT NOSE BOMBS IS SHOWN. THESE PROCEDURES CANNOT BE USED FOR BOMBS EQUIPPED WITH CONICAL NOSE PLUGS.

2. A 50'-6" LONG BY 8'-11" WIDE (INSIDE CLEARANCE) BOXCAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS IS SHOWN. CARS OF OTHER LENGTHS AND WIDTHS MAY BE USED.

3. A CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS EQUIPPED WITH OTHER WIDTH AND/OR STAGGERED DOORS MAY BE USED.

4. IF DESIRED, IN LIEU OF USING THE ENDWALL BATTENS, PIECE MARKED ①, CROSS MEMBERS MAY BE INSTALLED IN EACH END OF THE CAR. POSITION AT THE SAME HEIGHT LOCATIONS AS THE CROSS MEMBERS USED THROUGHOUT THE REST OF THE LOAD.

5. IF THE CAR TO BE LOADED HAS BOWED ENDWALLS WHICH ARE BOWED OUTWARD MORE THAN 2" EITHER FROM SIDE TO SIDE OR FROM THE FLOOR TO THE ROOF, A BULKHEAD MUST BE INSTALLED. SEE THE "END-OF-CAR BULKHEAD B" DETAIL ON PAGE 17. IN LIEU OF USING A BULKHEAD, CROSS MEMBERS MAY BE INSTALLED AT THE END OF THE CAR. POSITION AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE REST OF THE LOAD.

6. IF DESIRED, ANTI-SWAY BRACES, PIECE MARKED ④, MAY BE USED AT THE FLOOR LEVEL IN LIEU OF INSTALLING THE SIDE BLOCKING, PIECE MARKED ③.

7. BOMB PALLETS WILL NOT BE LOADED THREE WIDE IN A BAY; A CROSS MEMBER WILL NOT RETAIN THREE PALLET UNITS.

8. THE 68-UNIT LOAD SHOWN REQUIRES A CAR HAVING A LOAD LIMIT OF AT LEAST 109,800 POUNDS.

9. THE DEPICTED LOAD MAY BE INCREASED BY ADDING TWO PALLET UNITS TO THE LOAD IN THE END HAVING SIX BAYS. A LOAD LIMIT OF AT LEAST 110,500 POUNDS WILL BE REQUIRED.

10. A LOAD MAY BE REDUCED BY MULTIPLES OF TWO PALLET UNITS BY OMITTING LATERALLY ADJACENT PALLET UNITS FROM A BAY. THE LOAD SHOULD HAVE AN EQUAL NUMBER OF UNITS IN EACH END TO THE MAXIMUM EXTENT POSSIBLE.

11. A LOAD MAY BE REDUCED BY ONE PALLET UNIT BY EMPLOYING THE PROCEDURES SHOWN ON PAGE 15.

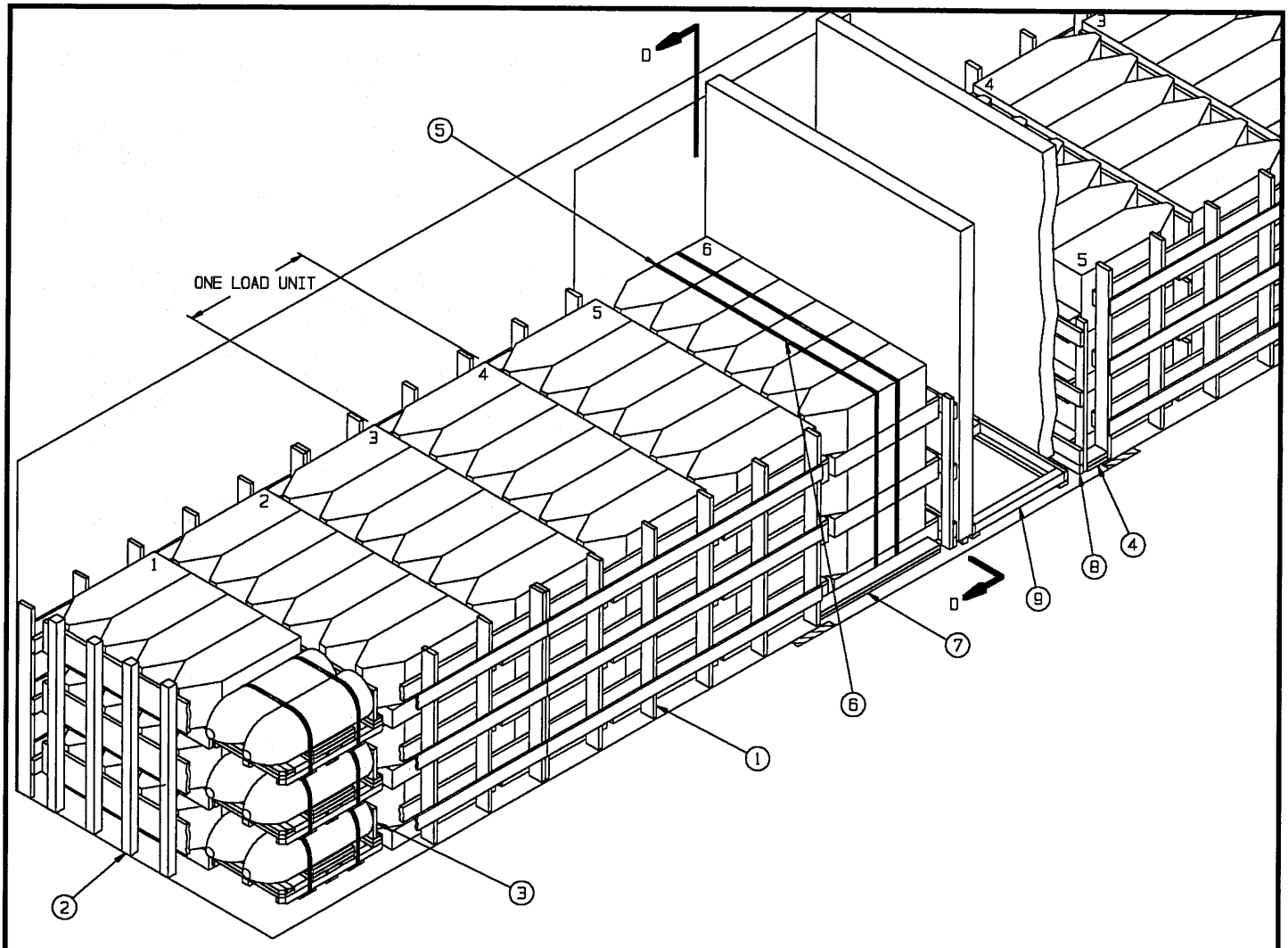
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 6"	479	479
NAILS	NO. REQD	POUNDS
10d (3") 16d (3-1/2")	406 176	6-1/4 4

*BASED ON A PALLET UNIT WEIGHT OF 1,575 POUNDS.

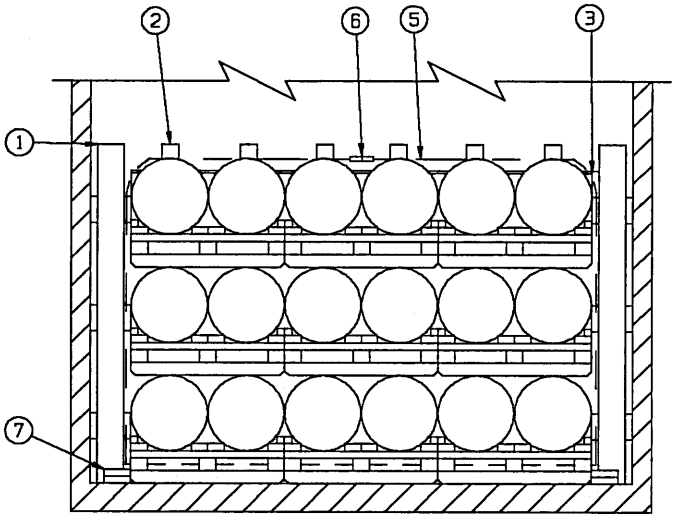
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	68	107,100 LBS *
DUNNAGE		969 LBS
TOTAL WEIGHT		108,069 LBS (APPROX)

LENGTHWISE-LOADED FLAT NOSE 68-UNIT LOAD
IN A 50'-6" LONG BY 8'-11" WIDE BOXCAR EQUIPPED WITH MECHANICAL BRACING DEVICES



ISOMETRIC VIEW



SECTION D-D

KEY NUMBERS

① SIDE FILL ASSEMBLY (8 REQD). SEE THE "SIDE FILL ASSEMBLY A" DETAIL ON PAGE 16. POSITION WITH THE 1" X 6" FILL PIECES AGAINST THE CAR SIDEWALL. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.

② END-OF-CAR BULKHEAD (2 REQD). SEE THE "END-OF-CAR BULKHEAD A" DETAIL ON PAGE 16. POSITION WITH THE 4" X 4" VERTICAL PIECES AGAINST THE CAR ENDWALL.

③ BUFFER PIECE, 2" X 12" X 8'-0" (27 REQD). POSITION ON EDGE ON THE AFT END STOP PIECE OF THE BOMB PALLET.

④ SIDE FILL ASSEMBLY STOP PIECE, 2" X 6" X 8" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/2-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/2-10d NAILS.

⑤ DOORWAY PROTECTION STRAP, 1-1/4" X .035" OR .031" X 28'-0" LONG STEEL STRAPPING (2 REQD). POSITION TO ENCIRCLE THE PALLET UNITS IN THE DOORWAY AREA. SEE SPECIAL NOTES 5 AND 6 ON PAGE 13.

⑥ SEAL FOR 1-1/4" STRAPPING (4 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "N" ON PAGE 2.

⑦ DOORWAY BLOCKING, 2" X 6" X 54" (DOUBLED) (2 REQD). POSITION AGAINST THE SIDE FILL ASSEMBLY, PIECE MARKED ①, AND AGAINST THE SKIDS OF THE PALLET UNIT. NAIL THE FIRST PIECE TO THE CAR FLOOR W/9-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.

⑧ LOAD BEARING GATE (2 REQD). SEE THE "LOAD BEARING GATE A" DETAIL ON PAGE 19. POSITION WITH THE HORIZONTAL PIECES AGAINST THE LOAD DIVIDER BULKHEAD.

⑨ STRUT ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 57. SEE SPECIAL NOTE 8 ON PAGE 13.

LENGTHWISE-LOADED FLAT NOSE 99-UNIT LOAD
IN A 50'-6" LONG BY 9'-6" WIDE BOXCAR EQUIPPED WITH LOAD DIVIDERS

PROJECT FSA 48-65

SPECIAL NOTES:

1. A 99-UNIT LOAD OF LENGTHWISE-LOADED FLAT NOSE BOMBS IS SHOWN. THESE PROCEDURES CANNOT BE USED FOR BOMBS EQUIPPED WITH CONICAL NOSE PLUGS.

2. A 50'-6" LONG BY 9'-6" WIDE CUSHIONED BOXCAR EQUIPPED WITH LOAD DIVIDERS IS SHOWN. CARS OF OTHER LENGTHS AND WIDTHS MAY BE USED.

3. THE DEPICTED 99-UNIT LOAD REQUIRES A CAR HAVING A LOAD LIMIT OF AT LEAST 160,500 POUNDS. SEE SPECIAL NOTE 7 BELOW.

4. A LOAD BEARING GATE MUST BE INSTALLED BETWEEN THE PALLET UNITS AND A LOAD DIVIDER BULKHEAD IN ORDER TO DISTRIBUTE THE FORCES ACROSS THE FACE OF THE BULKHEAD. SEE THE "LOAD BEARING GATE A" DETAIL ON PAGE 19.

5. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNITS WHICH ARE COMPLETELY IN THE DOOR OPENING OR WHICH EXTEND INTO THE DOOR OPENING BY ONE-HALF OR MORE OF THE UNIT LENGTH. DOORWAY PROTECTION FOR THE DEPICTED LOAD IS PROVIDED BY THE DOORWAY PROTECTION STRAPS AND SEALS, PIECES MARKED ⑤ AND ⑥, AND THE DOORWAY BLOCKING, PIECE MARKED ⑦.

6. A CAR EQUIPPED WITH 10'-0" WIDE PLUG TYPE DOORS IS SHOWN. CARS WITH WIDER, NARROWER, OR STAGGERED DOORS MAY BE USED. THE PROCEDURES ARE ALSO APPLICABLE FOR CARS EQUIPPED WITH SLIDING DOORS.

7. THE DEPICTED LOAD MAY BE DECREASED BY MULTIPLES OF NINE PALLET UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM EITHER END OF THE LOAD. A LOAD MAY BE REDUCED BY ONE PALLET UNIT BY INSTALLING A FILLER ASSEMBLY IN THE PLACE OF AN OMITTED PALLET UNIT. SEE THE "FILLER ASSEMBLY A" DETAIL ON PAGE 21.

8. A STRUT ASSEMBLY MUST BE INSTALLED BETWEEN THE LOAD DIVIDER BULKHEADS IF THE LOAD IN EITHER END OF THE CAR WEIGHS 50,000 POUNDS OR MORE. THE STRUT ASSEMBLY IS NOT REQUIRED WHEN PALLET UNITS ARE LOADED, BLOCKED, AND BRACED BETWEEN THE LOAD DIVIDER BULKHEADS.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 8"	18	12
2" X 4"	681	454
2" X 6"	343	343
2" X 12"	264	528
4" X 4"	86	115
NAILS	**NO. REQD**	**POUNDS**
6d (2")	18	1/4
10d (3")	746	11-1/2
12d (3-1/4")	16	1/4
16d (3-1/2")	184	4

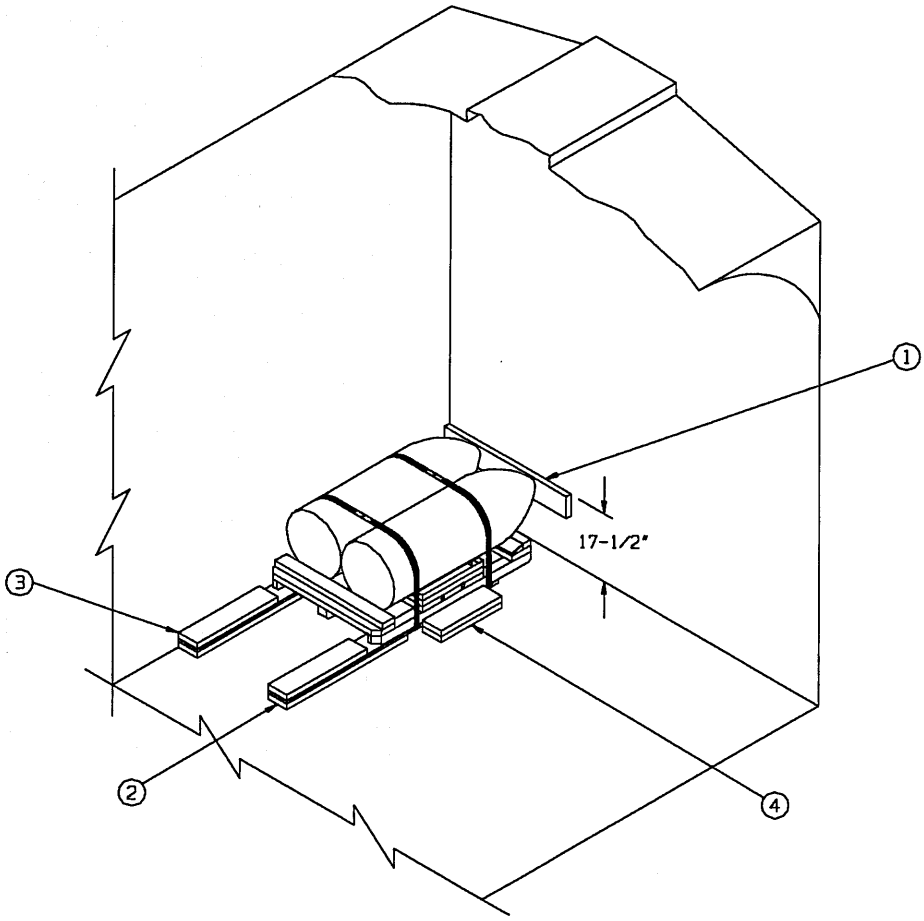
STEEL STRAPPING, 1-1/4" - - - 56' REQD - - - 8 LBS
SEAL FOR 1-1/4" STRAPPING - - - 4 REQD - - - NIL

* BASED ON A PALLET UNIT WEIGHT OF 1,575 POUNDS.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	99	155,925 LBS *
DUNNAGE		2,928 LBS
TOTAL WEIGHT		158,853 LBS (APPROX)

LENGTHWISE-LOADED FLAT NOSE 99-UNIT LOAD
IN A 50'-6" LONG BY 9'-6" WIDE BOXCAR EQUIPPED WITH LOAD DIVIDERS



ISOMETRIC VIEW

SPECIAL NOTES:

1. A 1-UNIT LOAD IS SHOWN IN A 9'-2" WIDE CONVENTIONAL TYPE BOXCAR. CARS OF OTHER WIDTHS MAY BE USED.
2. TWO BACK-UP CLEATS, PIECES MARKED ② AND ③, ARE ADEQUATE FOR RETAINING NOT MORE THAN FOUR PALLET UNITS. WHEN LOADING PALLET UNITS END TO END, BUFFER PIECES, SHOWN AS PIECE MARKED ④ ON PAGE 6, MUST BE POSITIONED ON TOP OF THE BASE END STOP PIECES OF THE PALLETS PRIOR TO PLACING THE NEXT PALLET UNITS. INSTALL ADDITIONAL SIDE BLOCKING PIECES, AS REQUIRED.

KEY NUMBERS

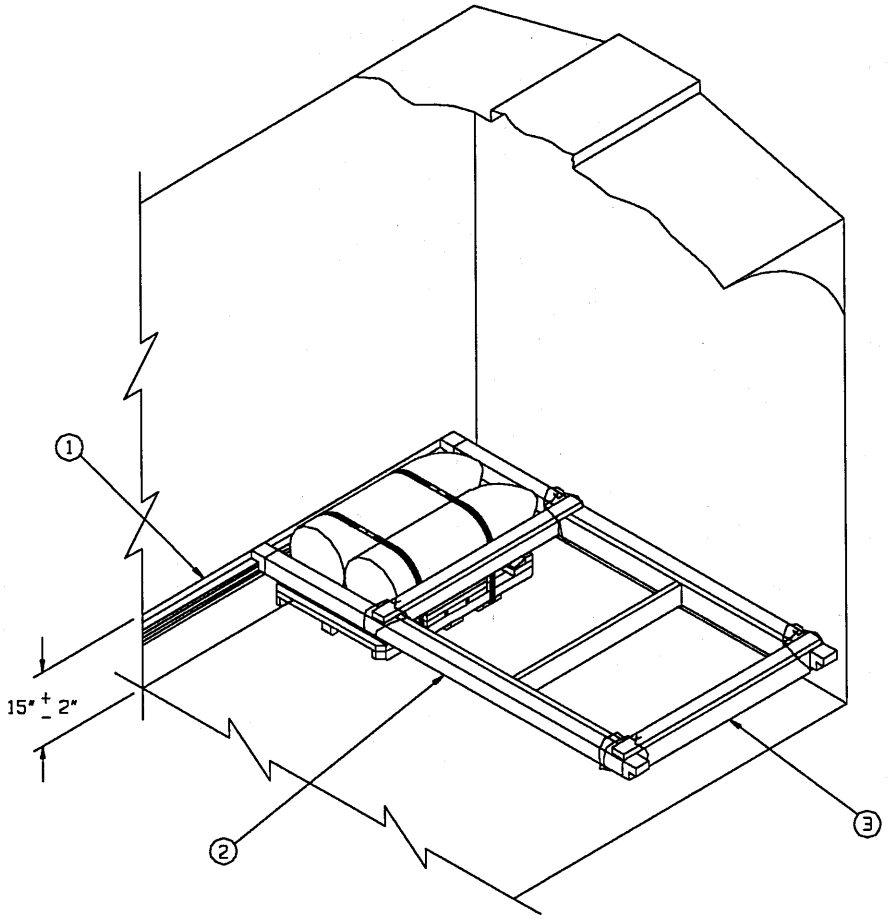
① END WALL BATTEN, 2' X 6" X 36" (1 REQD). POSITION AS SHOWN AND NAIL TO THE CAR ENDWALL W/5-10d NAILS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.

② BACK-UP CLEAT, 2" X 6" X 36" AND 1" X 6" X 36" (2 EACH REQD). POSITION UNDER THE OUTER STRINGERS OF THE PALLET AND SO AS TO BE IN CONTACT WITH A SKID. NAIL THE 1" X 6" PIECE THRU THE 2" X 6" PIECE W/5-20d NAILS. SEE SPECIAL NOTE 2 AT LEFT.

③ BACK-UP CLEAT, 2" X 6" X 24" (2 REQD). NAIL TO PIECE MARKED ② W/5-40d NAILS.

④ SIDE BLOCKING, 2" X 6" X 18" (DOUBLED) (1 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/4-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.

LENGTHWISE-LOADED FLAT NOSE TYPICAL LCL 1-UNIT LOAD



ISOMETRIC VIEW

SPECIAL NOTES:

1. A 1-UNIT LOAD IS SHOWN IN AN 8'-11" WIDE (INSIDE CLEARANCE) BOXCAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS. OTHER WIDTH CARS MAY BE USED. SEE GENERAL NOTE "W" ON PAGE 3.
2. ONE UNIT IS SHOWN AS A TYPICAL LOAD QUANTITY. THE NUMBER OF UNITS CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED.
3. IF TWO PALLET UNITS OR A MULTIPLE OF TWO UNITS ARE TO BE SHIPPED, ANTI-SWAY BRACES WILL BE USED FOR LATERAL BRACING IN LIEU OF USING THE SPACER ASSEMBLY, PIECE MARKED ③. SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 17.
4. IF THREE OR MORE PALLET UNITS ARE TO BE LOADED, THEY MUST BE PLACED IN MORE THAN ONE BAY; ONE CROSS MEMBER IS ADEQUATE FOR RETAINING NOT MORE THAN TWO PALLET UNITS.
5. THE SPACER ASSEMBLY, PIECE MARKED ③, IS SHOWN FOR THE OMISSION OF A PALLET UNIT FROM A FIRST LAYER BAY. THE PROCEDURES MAY ALSO BE APPLIED FOR THE OMISSION OF A PALLET UNIT FROM AN UPPER LAYER OF A BAY. IF DESIRED, WHEN OMITTING A PALLET UNIT FROM A FIRST LAYER, DOUBLED 2" X 6" X 18" SIDE BLOCKING MAY BE USED IN LIEU OF THE SPACER ASSEMBLY. POSITION AGAINST THE PALLET SKIDS AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/4-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.

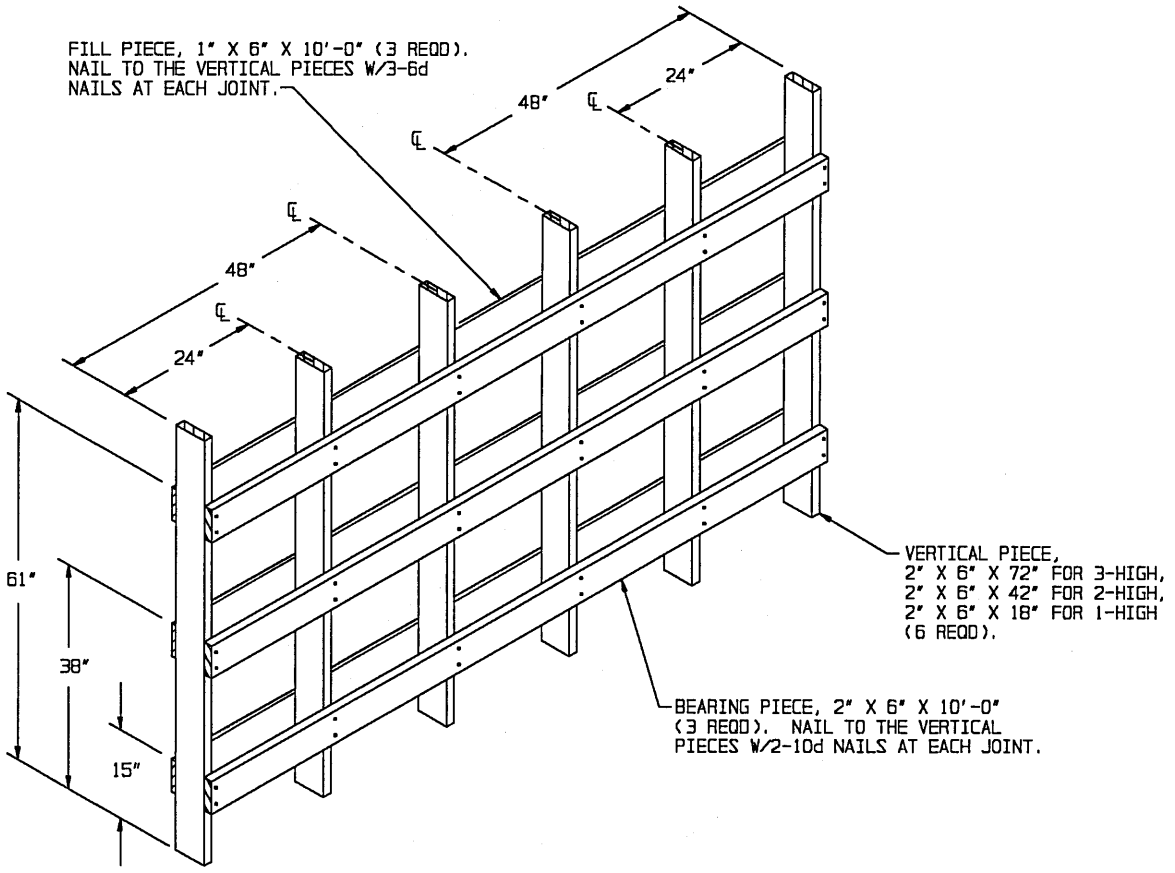
KEY NUMBERS

① WALL MEMBER, ADJUSTABLE OR FIXED. WALL MEMBERS MUST BE LOCATED AT SPECIFIED HEIGHTS ABOVE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED ②.

② CROSS MEMBER (2 REQD). POSITION AT HEIGHT SPECIFIED BY THE "ISOMETRIC VIEW" ABOVE.

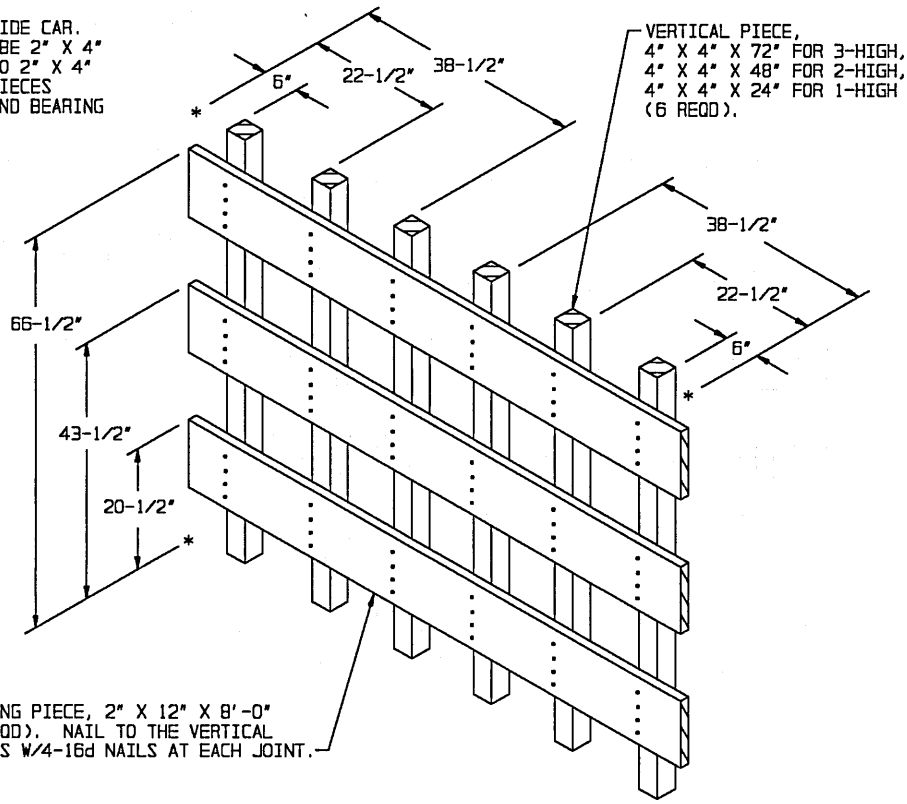
③ SPACER ASSEMBLY (1 REQD). SEE THE "SPACER ASSEMBLY A" DETAIL ON PAGE 20. WIRE TIE TO CROSS MEMBER W/2 WRAPS OF NO. 14 GAGE WIRE AT EACH CORNER. SEE SPECIAL NOTE 5 AT LEFT.

LENGTHWISE-LOADED FLAT NOSE
TYPICAL LCL 1-UNIT LOAD IN A BOXCAR EQUIPPED WITH MECHANICAL BRACING DEVICES



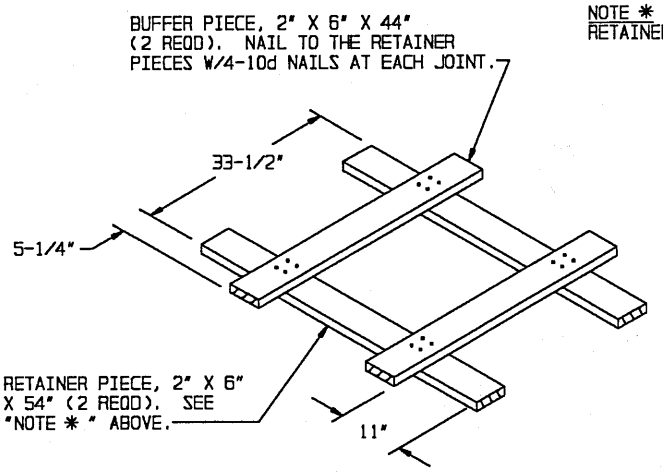
SIDE FILL ASSEMBLY A

THIS ASSEMBLY AS SHOWN IS FOR USE IN A 9'-6" WIDE CAR. FOR A 9'-4" WIDE CAR THE VERTICAL PIECES WILL BE 2" X 4" MATERIAL AND THE FILL PIECES WILL BE CHANGED TO 2" X 4" MATERIAL. FOR A 9'-2" WIDE CAR THE VERTICAL PIECES WILL BE 2" X 4" MATERIAL AND THE FILL PIECES AND BEARING PIECES WILL BE AS SHOWN.



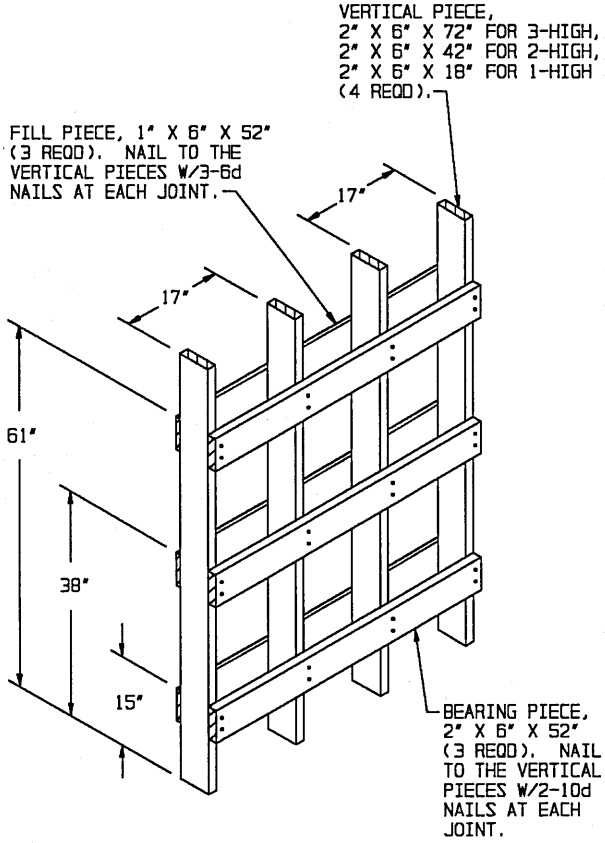
END-OF-CAR BULKHEAD A

NOTE * : FOR THE LOAD ON PAGE 10 THE RETAINER PIECE WILL BE 64-1/2" LONG.



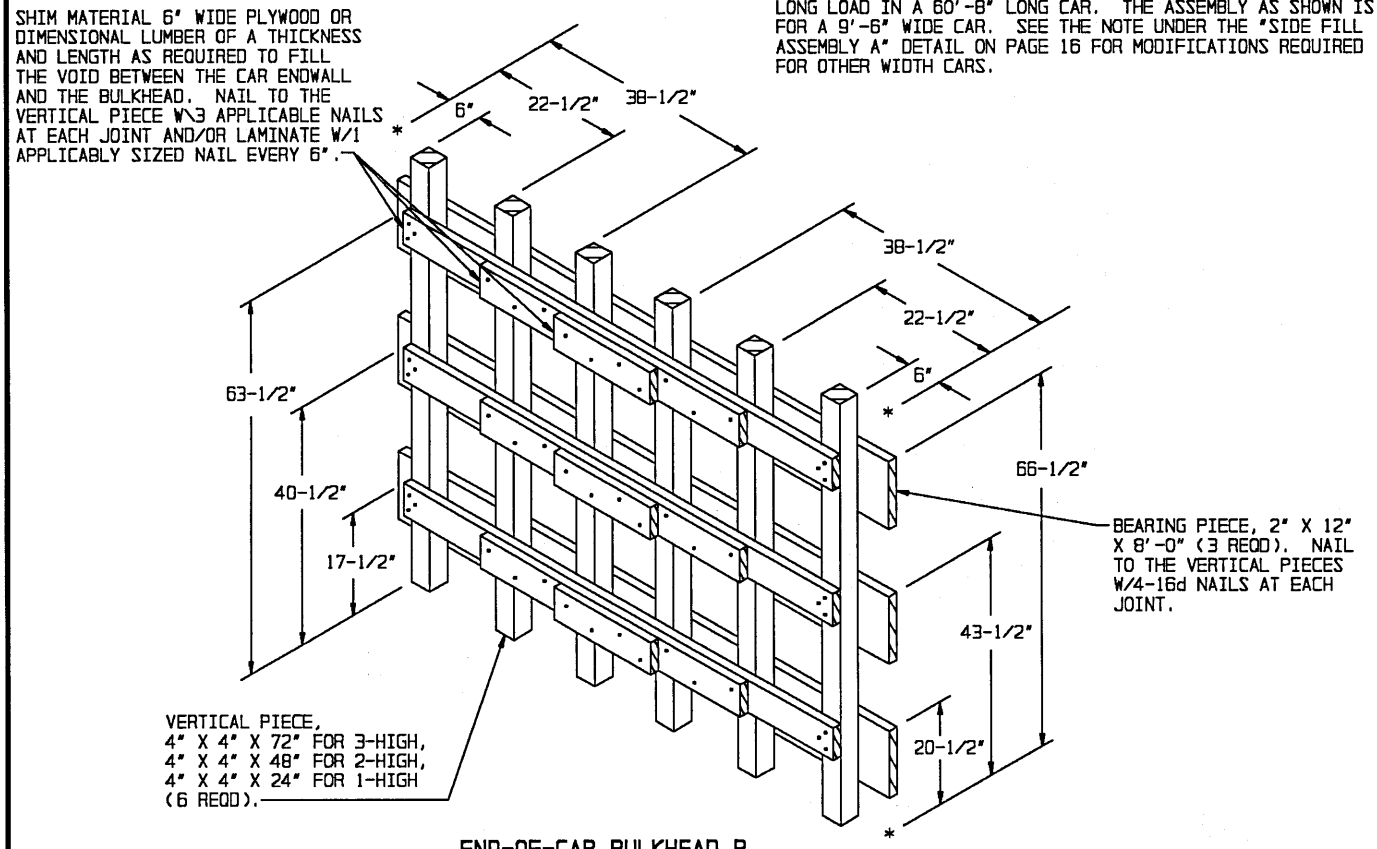
ANTI-SWAY BRACE A

PARTIALLY ASSEMBLE THE ANTI-SWAY BRACE BY NAILING ONE BUFFER PIECE TO THE RETAINER PIECES. AFTER ONE PALLET UNIT HAS BEEN POSITIONED IN THE LOAD UNIT LAYER IN WHICH THE ANTI-SWAY IS TO BE USED, INSERT THE LONG ENDS OF THE RETAINER PIECES SO AS TO EXTEND BETWEEN THE OUTER DECK BOARDS OF THE PALLET. SLIDE THE PARTIAL ASSEMBLY IN UNDER THE BOMBS ON THE PALLET UNIT. POSITION THE OTHER PALLET UNIT. PULL THE PARTIAL ASSEMBLY OUT AND INSERT THE SHORT ENDS OF THE RETAINER PIECES UNDER THE LAST PALLET SO THE BUFFER PIECE BEARS AGAINST THE NOSE END STOP AND THE AFT END STOP PIECES. POSITION THE REMAINING BUFFER PIECE AGAINST THE FIRST PALLET UNIT AND NAIL IN PLACE.

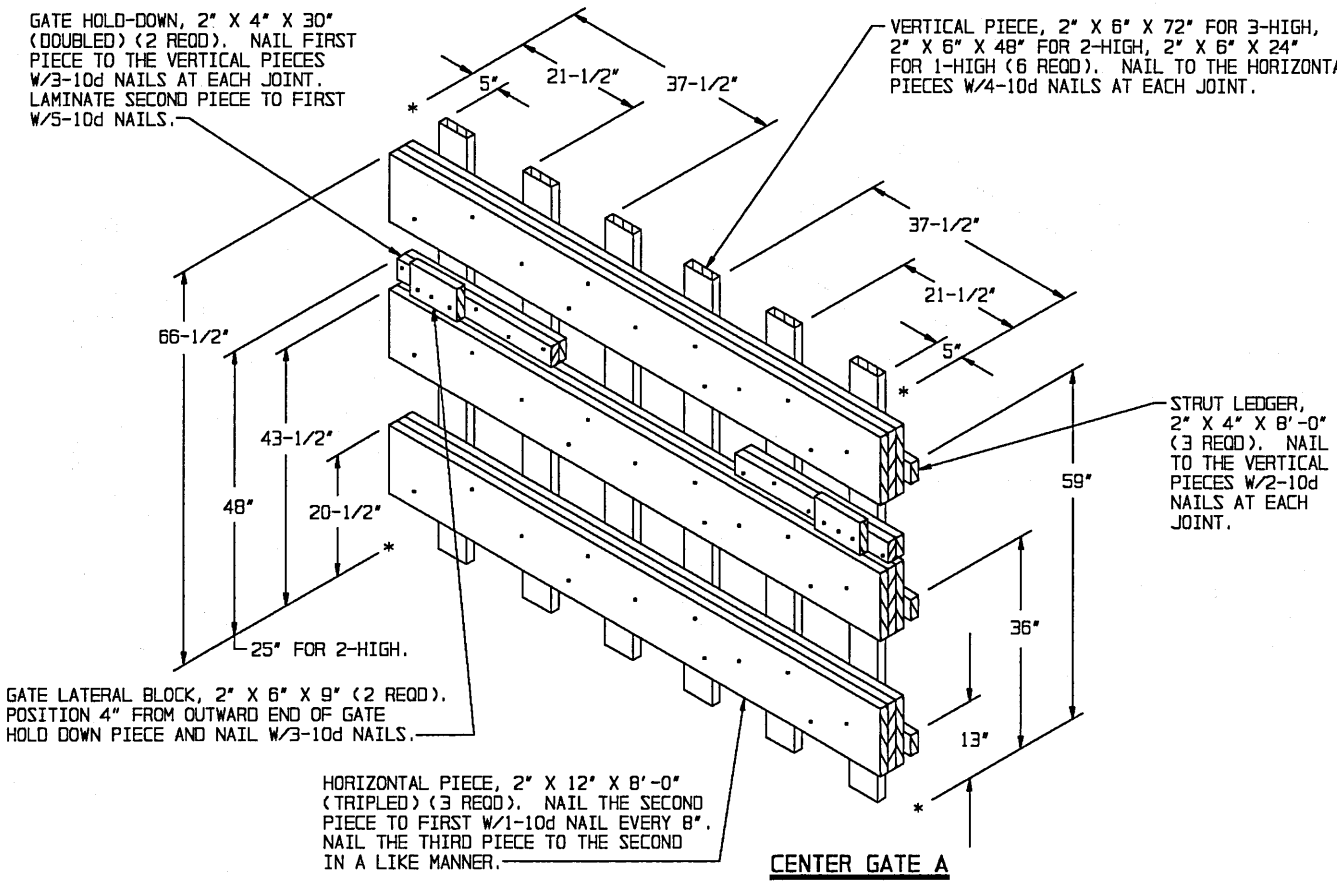


SIDE FILL ASSEMBLY B

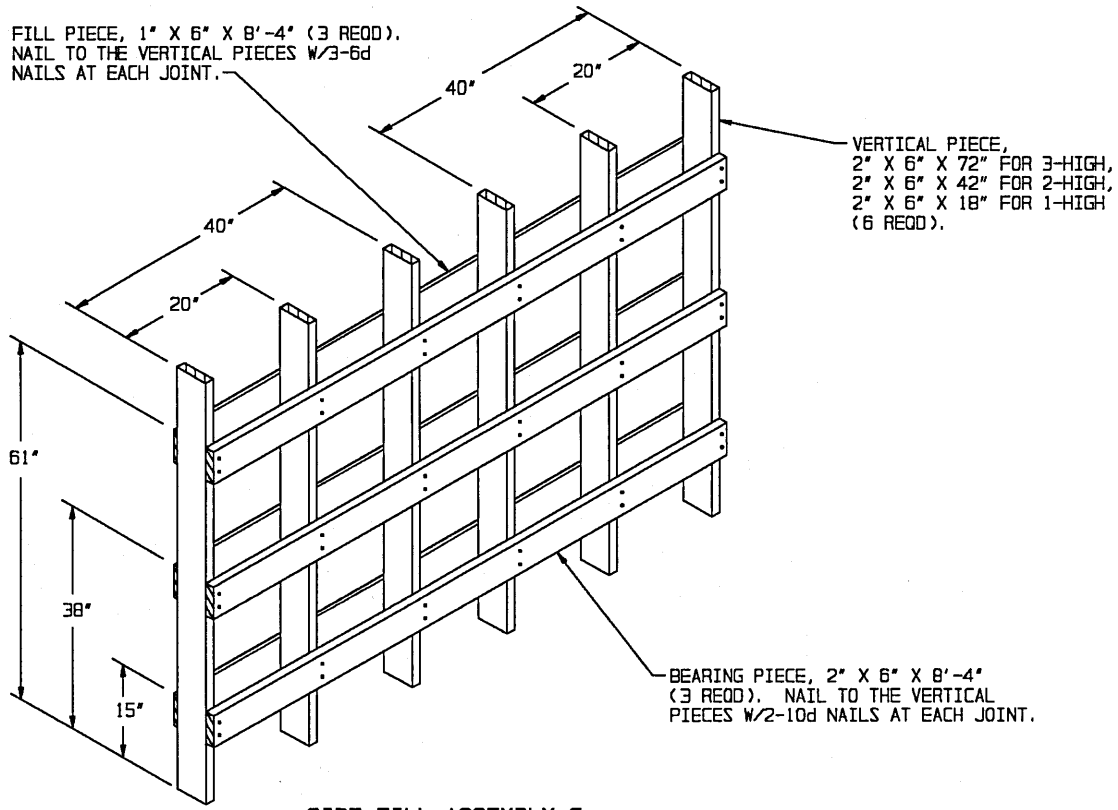
THIS ASSEMBLY IS FOR USE WITH TWO EACH "SIDE FILL ASSEMBLY A" FOR LATERAL BRACING AT EACH SIDE OF A 6-UNIT LONG LOAD IN A 60'-8" LONG CAR. THE ASSEMBLY AS SHOWN IS FOR A 9'-6" WIDE CAR. SEE THE NOTE UNDER THE "SIDE FILL ASSEMBLY A" DETAIL ON PAGE 16 FOR MODIFICATIONS REQUIRED FOR OTHER WIDTH CARS.



END-OF-CAR BULKHEAD B

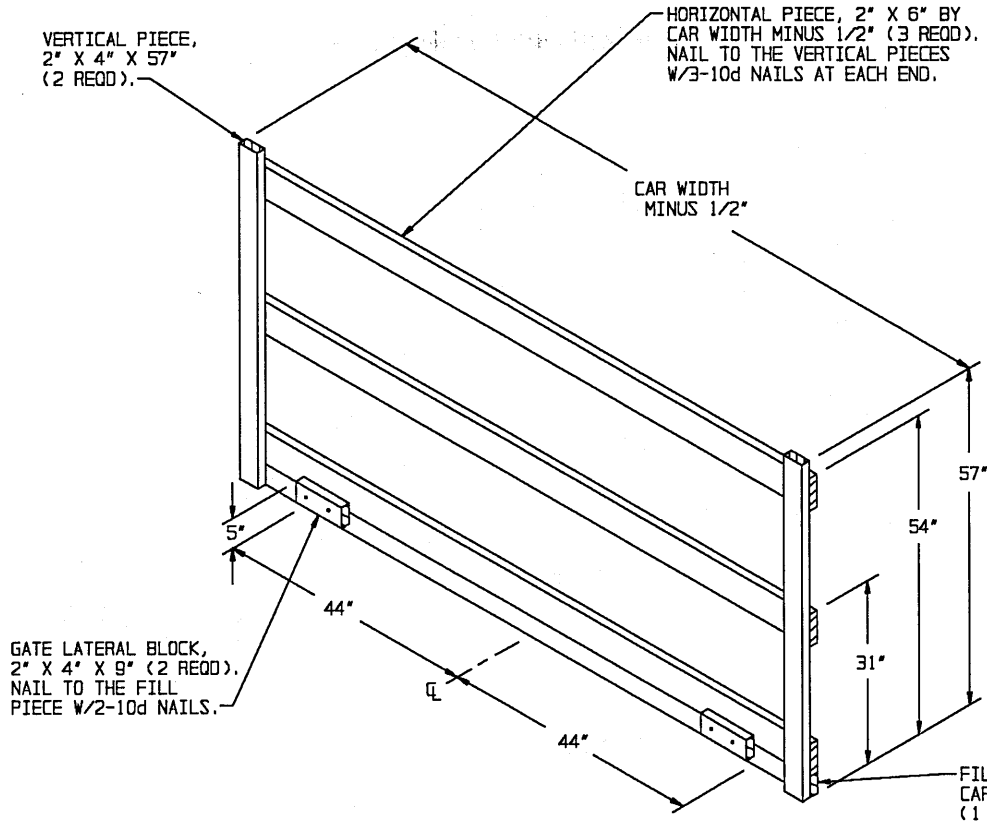


CENTER GATE A



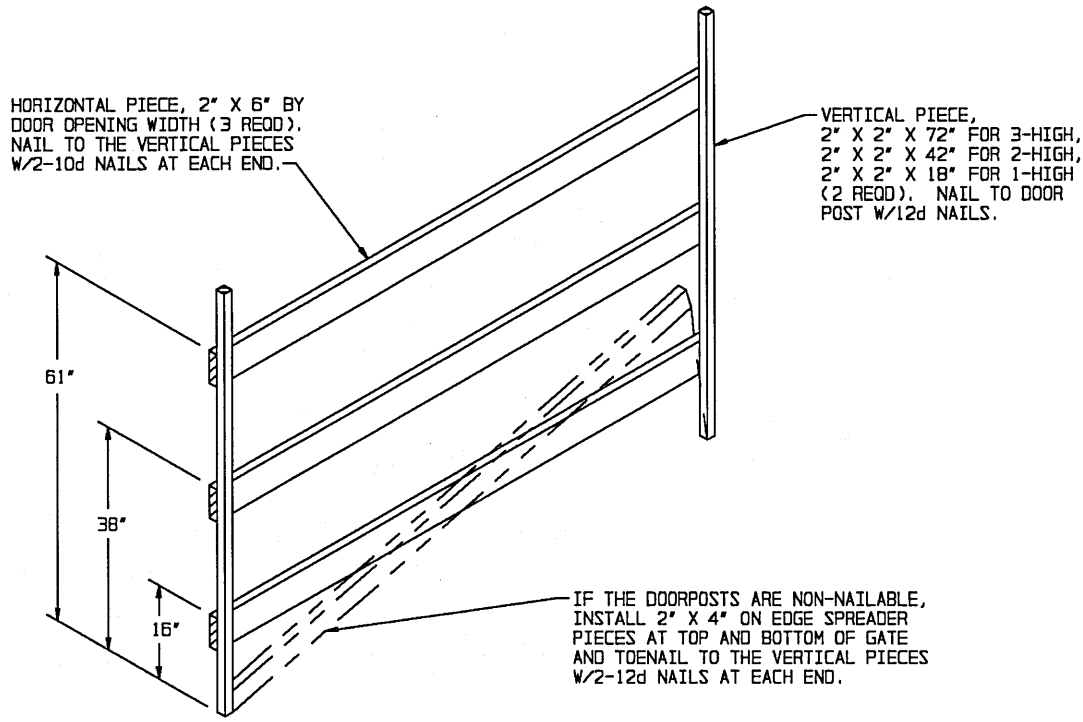
SIDE FILL ASSEMBLY C

THIS ASSEMBLY IS FOR USE IN CONJUNCTION WITH TWO EACH "SIDE FILL ASSEMBLY A" FOR LATERAL BRACING AT EACH SIDE OF A 7-UNIT LONG LOAD IN A 60'-8" LONG CAR. THE ASSEMBLY AS SHOWN IS FOR A 9'-6" WIDE CAR. SEE THE NOTE UNDER THE "SIDE FILL ASSEMBLY A" DETAIL ON PAGE 16 FOR MODIFICATIONS REQUIRED FOR OTHER WIDTH CARS.



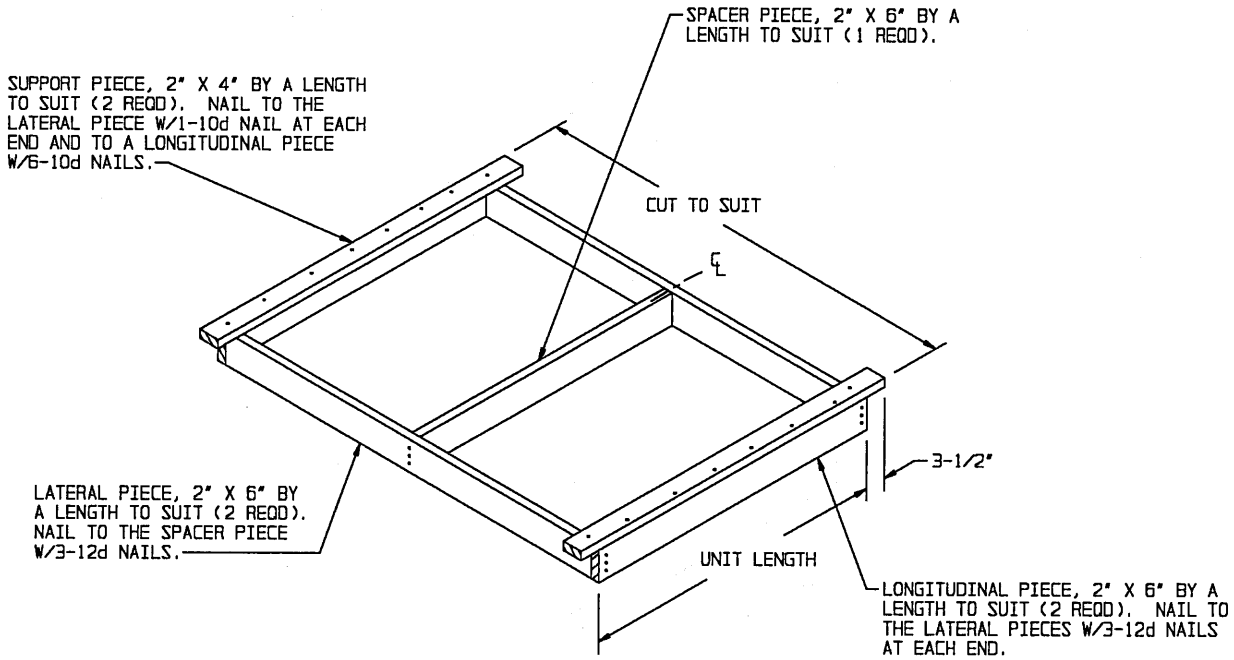
LOAD BEARING GATE A

FOR LENGTHWISE-POSITIONED BOMBS
IN A LOAD DIVIDER CAR.

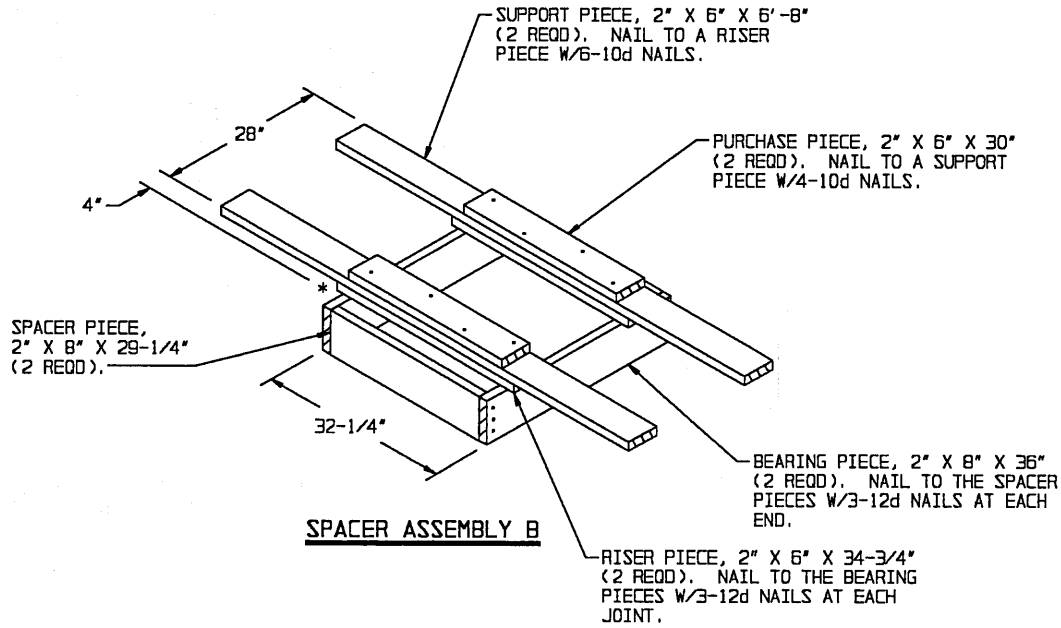


DOORWAY PROTECTION A

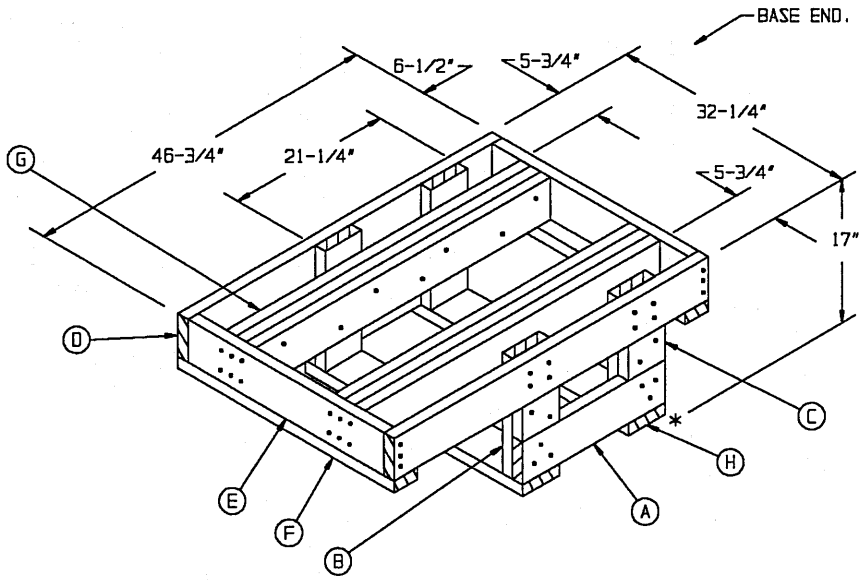
THIS ASSEMBLY IS FOR USE WITH
LENGTHWISE-POSITIONED PALLET UNITS.



SPACER ASSEMBLY A



SPACER ASSEMBLY B



FILLER ASSEMBLY A

KEY LETTERS

(A) SPANNER PIECE, 2" X 6" X 21-1/4" (2 REQD). NAIL TO THE SUPPORT LEGS, PIECE MARKED (B), W/3-10d NAILS AT EACH END. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.

(B) SUPPORT LEG, 2" X 6" X 15-1/2" (4 REQD).

(C) FILL PIECE, 2" X 6" X 4-1/2" (4 REQD). NAIL TO A SUPPORT LEG, PIECE MARKED (B), W/2-10d NAILS.

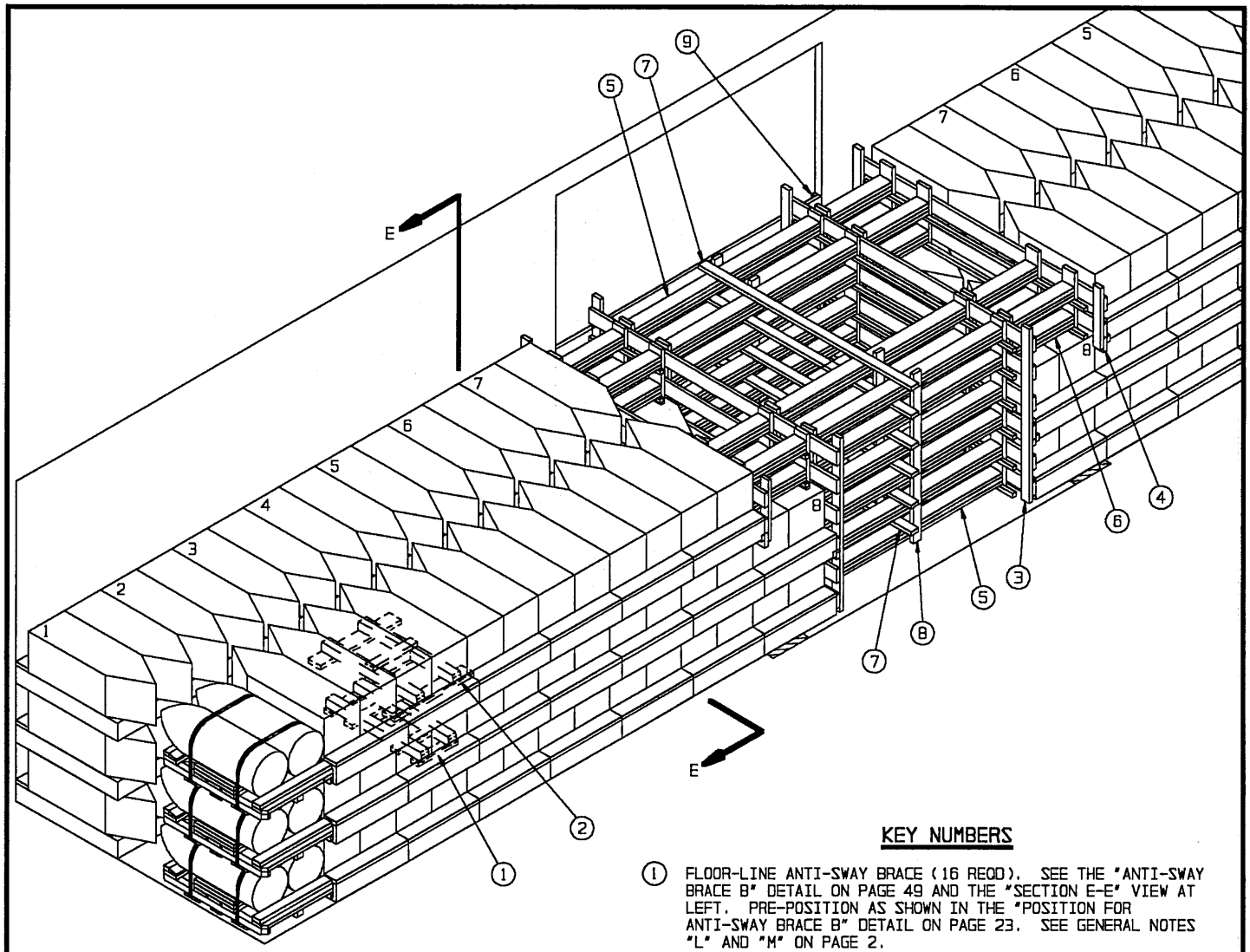
(D) LONGITUDINAL PIECE, 2" X 6" X 46-3/4" (2 REQD). NAIL TO THE SUPPORT LEGS W/4-16d NAILS AT EACH JOINT AND CLINCH. NAIL TO THE LATERAL PIECES, PIECE MARKED (E), W/3-16d NAILS AT EACH END.

(E) LATERAL PIECE, 2" X 6" X 29-1/4" (2 REQD). NAIL TO THE LAMINATED STRUT PIECE, PIECE MARKED (G), W/6-12d NAILS AT EACH JOINT.

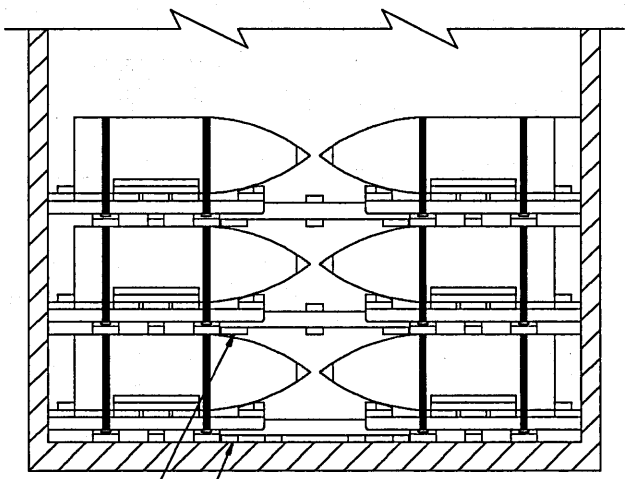
(F) LEDGER PIECE, 2" X 4" X 32-1/4" (2 REQD). NAIL TO A LATERAL PIECE, PIECE MARKED (E), W/3-10d NAILS. NAIL TO THE LONGITUDINAL PIECES, PIECE MARKED (D), W/2-10d NAILS AT EACH END AND TO THE LAMINATED STRUT PIECE, PIECE MARKED (G), W/2-10d NAILS AT EACH JOINT.

(G) STRUT, 2" X 6" X 43-3/4" (TRIPLED) (2 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.

(H) SUPPORT PIECE, 2" X 6" X 29-1/4" (2 REQD). NAIL TO THE SPANNER PIECES AND THE SUPPORT LEGS, PIECES MARKED (A) AND (B), RESPECTIVELY, W/2-10d NAILS AT EACH JOINT.



ISOMETRIC VIEW



② ① SECTION E-E

KEY NUMBERS

① FLOOR-LINE ANTI-SWAY BRACE (16 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 49 AND THE "SECTION E-E" VIEW AT LEFT. PRE-POSITION AS SHOWN IN THE "POSITION FOR ANTI-SWAY BRACE B" DETAIL ON PAGE 23. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.

② UPPER-LAYER ANTI-SWAY BRACE (30 REQD). SEE THE "ANTI-SWAY BRACE C" DETAIL ON PAGE 49 AND THE "SECTION E-E" VIEW AT LEFT. POSITION ON TOP OF THE BOMBS ON THE ALREADY-POSITIONED PALLETS PRIOR TO LOADING THE NEXT LAYER OF PALLETS. SEE THE "POSITION FOR ANTI-SWAY BRACE C" DETAIL ON PAGE 23 FOR GUIDANCE.

③ CENTER GATE (2 REQD). SEE THE "CENTER GATE B" DETAIL ON PAGE 52. SEE SPECIAL NOTES 3 AND 4 ON PAGE 23.

④ PARTIAL-LAYER GATE (2 REQD). SEE THE "PARTIAL LAYER GATE A" DETAIL ON PAGE 52.

⑤ STRUT, 2" X 6" BY CUT TO FIT (TRIPLED) (24 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 AND TOENAIL TO THE VERTICAL PIECES OF PIECE MARKED ③ W/2-12d NAILS AT EACH END. SEE SPECIAL NOTE 5 ON PAGE 23.

⑥ STRUT, 2" X 6" BY CUT TO FIT (TRIPLED) (16 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 AND TOENAIL TO THE VERTICAL PIECES OF PIECE MARKED ③ AND/OR ④ W/2-12d NAILS AT EACH END.

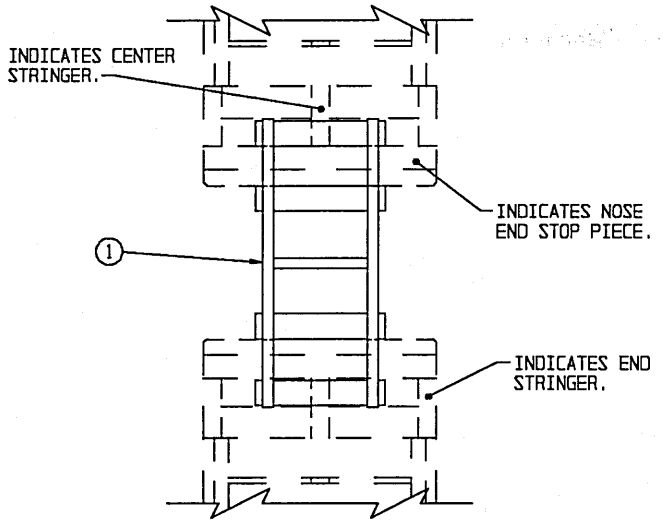
⑦ HORIZONTAL STRUT BRACING, 2" X 4" X 8'-0" (6 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT. SEE SPECIAL NOTE 6 ON PAGE 23.

⑧ VERTICAL STRUT BRACING, 2" X 4" X 66" (4 REQD). POSITION BOTTOM END ON FLOOR AND NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

⑨ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION B" DETAIL ON PAGE 48. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 7 ON PAGE 23.

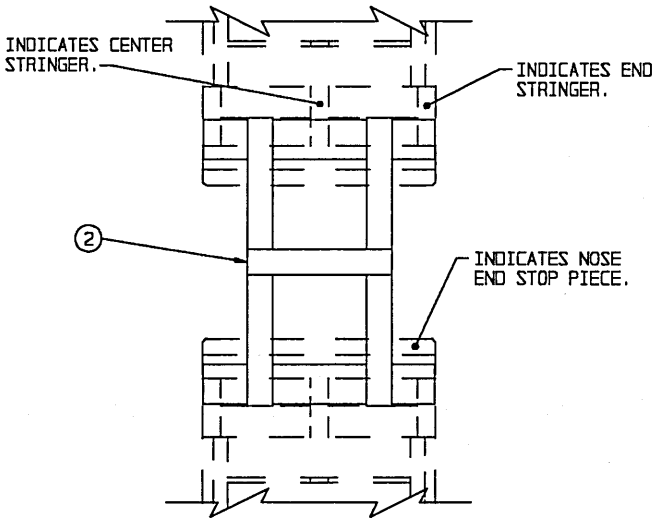
CROSSWISE-LOADED FLAT NOSE OR CONICAL NOSE
92-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL BOXCAR

PROJECT FSA 48-65



POSITION FOR ANTI-SWAY BRACE B

THIS VIEW SHOWS THE LOCATION OF THE ANTI-SWAY BRACE WHICH IS USED FOR LATERAL BRACING IN THE BOTTOM LAYER OF A LOAD.



POSITION FOR ANTI-SWAY BRACE C

THIS VIEW SHOWS THE LOCATION OF THE ANTI-SWAY BRACE WHICH IS USED FOR LATERAL BRACING IN THE SECOND AND THIRD LAYERS OF A LOAD.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 2"	144	48
2" X 3"	43	22
2" X 4"	422	282
2" X 6"	1061	1061
4" X 4"	249	332
NAILS	NO. REQD	POUNDS
10d (3")	1556	24
12d (3-1/4")	500	8-1/2
16d (3-1/2")	360	8
40d (5")	120	7-1/4

SPECIAL NOTES:

1. AN 92-UNIT LOAD OF CROSSWISE-LOADED CONICAL NOSE BOMBS IS SHOWN. THE DEPICTED PROCEDURE MAY ALSO BE USED FOR PALLET UNITS OF BOMBS EQUIPPED WITH FLAT NOSE PLUGS. NOTE THAT A NARROWER CAR, 8'-9" OR WIDER, CAN BE USED WHEN SHIPPING BOMBS HAVING FLAT NOSE PLUGS.

2. A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL TYPE BOXCAR IS SHOWN. CARS OF OTHER LENGTHS AND WIDTHS MAY BE USED, PROVIDING THEY ARE AT LEAST 9'-2-1/2" WIDE.

3. IF DESIRED, IN LIEU OF USING THE 2" X 3" GATE HOLD DOWN PIECES ON THE CENTER GATES, 2" X 6" DOOR SPANNER PIECES OF A LENGTH TO SPAN THE DOOR OPENING PLUS 24", OR TO EXTEND 12" BEYOND THE VERTICAL SUPPORT PIECE ON EACH CENTER GATE, WHICHEVER IS GREATER, MAY BE USED. APPLY 2" X 4" X 18" GATE HOLD DOWN CLEATS TO THE SPANNER PIECES SO AS TO BE CENTERED OVER THE VERTICAL SUPPORT PIECES OF THE CENTER GATES. REFER TO PAGE 55 FOR GUIDANCE.

4. EACH OF THE UPPER FIVE STRUT LEDGERS ON ONE CENTER GATE OF A SET OF TWO SHOULD NOT BE NAILED TO THE GATE UNTIL THE NEXT LOWER LEVEL OF STRUTS HAS BEEN INSTALLED.

5. IN LIEU OF USING TRIPLED 2" X 6" STRUTS AS SHOWN IN THE LOAD VIEW, LAMINATED 4" X 6" AND 2" X 6" MATERIAL MAY BE USED. LAMINATE A 2" X 6" TO A 4" X 6" W/1-10d NAIL EVERY 6".

6. ONE SET OF STRUT BRACING, PIECES MARKED ⑦ AND ⑧, IS REQUIRED FOR EVERY 72" OF TRIPLED 2" X 6" OR LAMINATED 4" X 6" AND 2" X 6" STRUT LENGTH. BRACES ARE NOT REQUIRED IF STRUTS ARE LESS THAN 72" IN LENGTH.

7. A CAR EQUIPPED WITH 10'-0" WIDE DOORS OF THE CONVENTIONAL SLIDING TYPE IS SHOWN. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR CARS EQUIPPED WITH OTHER WIDTH AND/OR STAGGERED DOORS. IF THE CAR IS EQUIPPED WITH PLUG DOORS, REFER TO PAGES 54 AND 55 FOR A SPECIAL CENTER GATE AND SPECIAL PROVISIONS FOR DOORWAY PROTECTION WHICH MUST BE UTILIZED. IF DESIRED, THESE SPECIAL PLUG DOOR PROVISIONS MAY BE USED IN CARS WHICH ARE EQUIPPED WITH CONVENTIONAL SLIDING DOORS IN LIEU OF USING THE DOORWAY PROTECTION GATE SHOWN.

8. THE 92-UNIT LOAD SHOWN REQUIRES A CAR HAVING A LOAD LIMIT OF AT LEAST 149,300 POUNDS.

9. IF THE LOAD LIMIT OF A CAR PERMITS, TWO OR FOUR PALLETS MAY BE ADDED TO THE DEPICTED LOAD; A LOAD LIMIT OF AT LEAST 153,100 POUNDS IS REQUIRED FOR TWO ADDED PALLETS. FOUR ADDITIONAL PALLET UNITS WILL REQUIRE A CAR HAVING A LOAD LIMIT OF AT LEAST 155,200 POUNDS. AS APPLICABLE, A PARTIAL-LAYER GATE, PIECE MARKED ④, AND EIGHT STRUTS, PIECE MARKED ⑥, WILL BE OMITTED. ADDITIONALLY, CENTER GATE "C" WILL BE USED IN LIEU OF CENTER GATE "B" WHEN PALLET UNITS ARE ADDED. SEE THE CENTER GATE "C" DETAIL ON PAGE 48.

10. TWO OR FOUR PALLETS CAN BE OMITTED FROM THE DEPICTED LOAD BY INCREASING THE LENGTH OF THE STRUTS, PIECE MARKED ⑥. ONE PALLET UNIT CAN BE OMITTED BY USING THE GUIDANCE SHOWN ON PAGE 43.

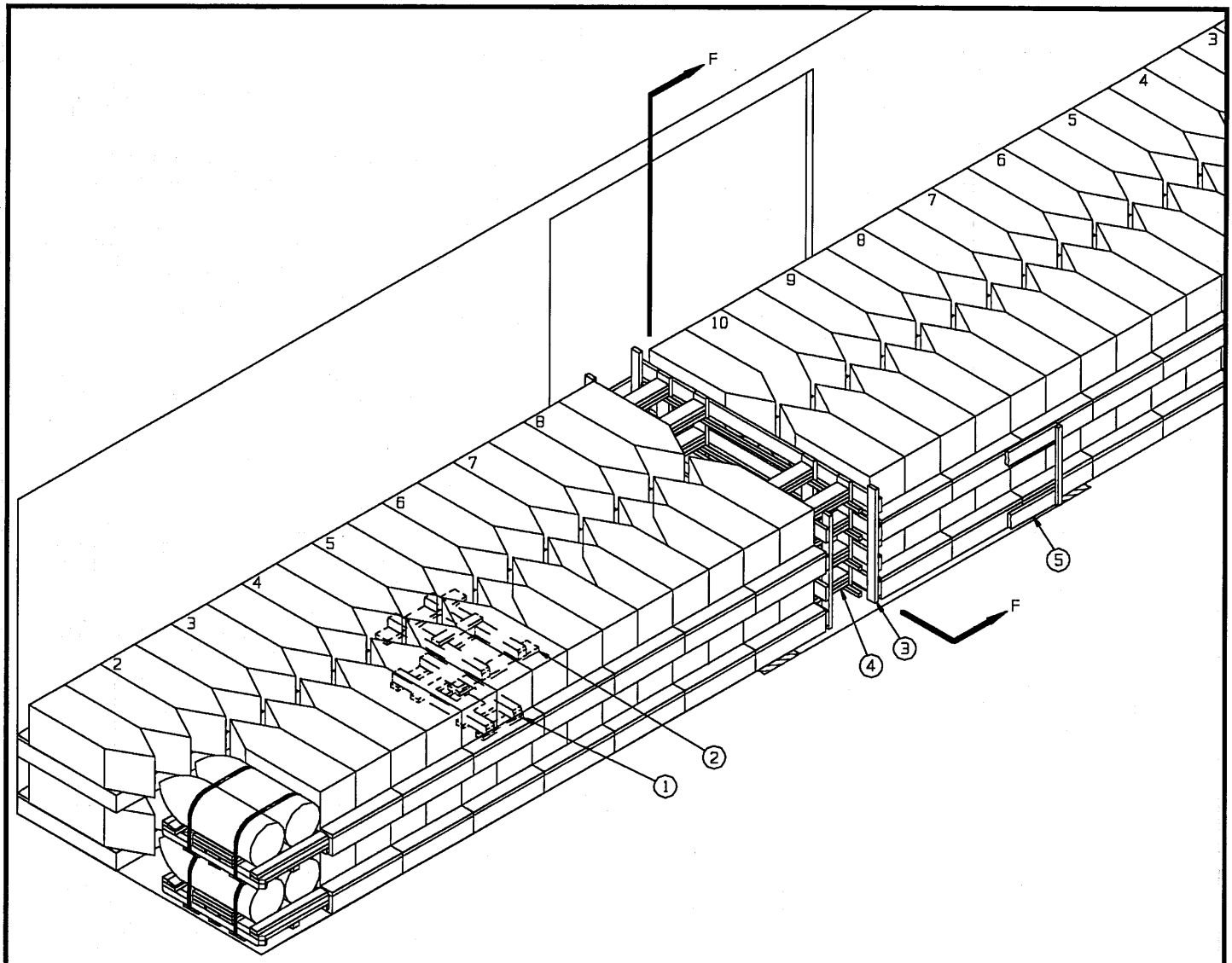
11. NOTICE: THE DELINEATED PROCEDURES ARE ESPECIALLY APPLICABLE TO READILY AVAILABLE "HIGH-CAPACITY" BOXCARS. IT IS TO BE NOTED THESE PROCEDURES CAN BE ADJUSTED TO FULLY UTILIZE "EXTRA-HIGH CAPACITY" BOXCARS BY INCREASING THE NUMBER OF STACKS IN ONE OR BOTH ENDS OF THE CARLOAD, PROVIDING THE PRINCIPLES OF THE CRITERIA WITHIN NOTES 8 AND 9 ABOVE ARE APPLIED.

* BASED ON A PALLET UNIT WEIGHT OF 1,575 POUNDS.

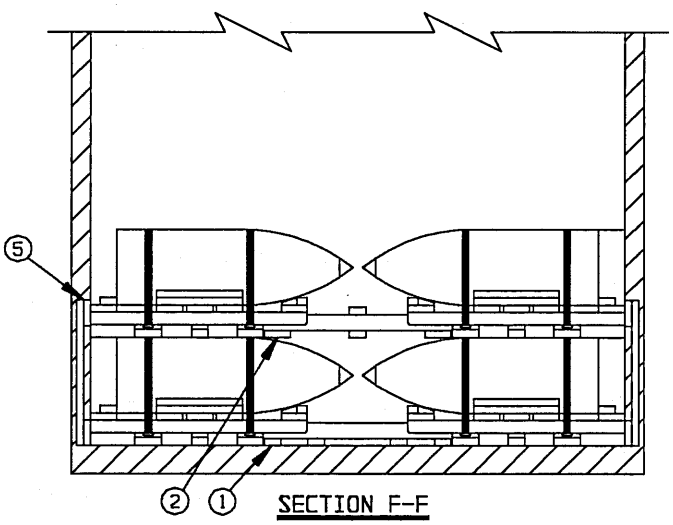
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	92	144,900 LBS *
DUNNAGE		4,377 LBS
TOTAL WEIGHT		149,277 LBS (APPROX)

CROSSWISE-LOADED FLAT NOSE OR CONICAL NOSE
92-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL BOXCAR



ISOMETRIC VIEW



SECTION F-F

KEY NUMBERS

(1) FLOOR-LINE ANTI-SWAY BRACE (18 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 49 AND THE "SECTION F-F" VIEW AT LEFT. PRE-POSITION AS SHOWN IN THE "POSITION FOR ANTI-SWAY BRACE B" DETAIL ON PAGE 23. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.

(2) SECOND-LAYER ANTI-SWAY BRACE (18 REQD). SEE THE "ANTI-SWAY BRACE C" DETAIL ON PAGE 49 AND THE "SECTION F-F" VIEW AT LEFT. POSITION ON TOP OF THE FIRST-LAYER BOMBS PRIOR TO LOADING THE TOP LAYER OF PALLETS. SEE THE "POSITION FOR ANTI-SWAY BRACE C" DETAIL ON PAGE 23.

(3) CENTER GATE (2 REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 48. SEE SPECIAL NOTES 3 AND 4 ON PAGE 25.

(4) STRUT, 2" X 6" BY CUT TO FIT (REF: 19-1/2") (TRIPLED) (16 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 AND TOENAIL TO THE VERTICAL PIECES OF THE CENTER GATES, PIECE MARKED (3), W/2-12d NAILS AT EACH END. SEE SPECIAL NOTE 5 ON PAGE 25.

(5) DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION B" DETAIL ON PAGE 48. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 6 ON PAGE 25.

CROSSWISE-LOADED FLAT NOSE OR CONICAL NOSE
72-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL BOXCAR

PROJECT FSA 48-65

SPECIAL NOTES:

1. A 72-UNIT LOAD OF CROSSWISE-LOADED CONICAL NOSE BOMBS IS SHOWN. THE PROCEDURES ARE ALSO APPLICABLE FOR SHIPMENT OF FLAT NOSE BOMBS. NOTE THAT A NARROWER CAR, 8'-9" OR WIDER, CAN BE USED WHEN SHIPPING BOMBS HAVING FLAT NOSE PLUGS.

2. A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL TYPE BOXCAR IS SHOWN. CARS OF OTHER LENGTHS AND WIDTHS MAY BE USED PROVIDING THEY ARE AT LEAST 9'-2-1/2" WIDE.

3. IF DESIRED, IN LIEU OF USING THE 2" X 3" GATE HOLD DOWN PIECES ON THE CENTER GATES, 2" X 6" DOOR SPANNER PIECES OF A LENGTH TO SPAN THE DOOR OPENING PLUS 24", OR TO EXTEND 12" BEYOND THE VERTICAL SUPPORT PIECES ON EACH CENTER GATE, WHICHEVER IS GREATER, MAY BE USED. APPLY 2" X 4" X 18" GATE HOLD DOWN CLEATS TO THE SPANNER PIECES SO AS TO BE CENTERED OVER THE VERTICAL SUPPORT PIECES OF THE CENTER GATES. REFER TO PAGE 55 FOR GUIDANCE.

4. EACH OF THE UPPER THREE STRUT LEDGERS ON ONE CENTER GATE OF A SET OF TWO SHOULD NOT BE NAILED TO THE GATE UNTIL THE NEXT LOWER LEVEL OF STRUTS HAS BEEN INSTALLED.

5. IN LIEU OF USING TRIPLED 2" X 6" STRUTS AS SHOWN IN THE LOAD VIEW, LAMINATED 4" X 6" AND 2" X 6" MATERIAL MAY BE USED. LAMINATE A 2" X 6" TO A 4" X 6" W/1-10d NAIL EVERY 6".

6. A CAR EQUIPPED WITH 10'-0" WIDE DOORS OF THE CONVENTIONAL SLIDING TYPE IS SHOWN. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR CARS EQUIPPED WITH OTHER WIDTH AND/OR STAGGERED DOORS. IF THE CAR IS EQUIPPED WITH PLUG DOORS, REFER TO PAGES 54 AND 55 FOR A SPECIAL CENTER GATE AND SPECIAL PROVISIONS FOR DOORWAY PROTECTION WHICH MUST BE UTILIZED. IF DESIRED, THESE SPECIAL PLUG DOOR PROVISIONS MAY BE USED IN CARS WHICH ARE EQUIPPED WITH CONVENTIONAL SLIDING DOORS, IN LIEU OF USING THE DOORWAY PROTECTION GATE SHOWN.

7. THE 72-UNIT LOAD SHOWN REQUIRES A CAR HAVING A LOAD LIMIT OF AT LEAST 115,200 POUNDS.

8. MULTIPLES OF TWO PALLET UNITS MAY BE ADDED TO THE DEPICTED LOAD IF THE LOAD LIMIT OF THE CAR PERMITS. FOR TWO ADDED PALLET UNITS IN EITHER OR BOTH ENDS OF THE CAR, THE LOAD LIMIT MUST BE AT LEAST 119,600 POUNDS. FOR FOUR ADDED PALLET UNITS IN EITHER OR BOTH ENDS OF THE CAR, THE LOAD LIMIT MUST BE AT LEAST 122,800 POUNDS. "K-BRACING" SPECIFICATIONS ON PAGE 41 WILL APPLY.

9. MULTIPLES OF FOUR PALLET UNITS CAN BE OMITTED FROM THE DEPICTED LOAD BY INCREASING THE LENGTH OF THE STRUTS. IF MORE THAN ONE MULTIPLE OF FOUR IS OMITTED, STRUT BRACING MUST BE APPLIED SIMILAR TO PIECES MARKED ⑦ AND ⑧ ON PAGE 22. TWO PALLETS CAN BE OMITTED BY SUBSTITUTING A CENTER GATE "B" FOR A CENTER GATE "C", AND INSTALLING A PARTIAL-LAYER GATE "A" (DETAILED ON PAGE 52) AND STRUTS SIMILAR TO THE INSTALLATION OF PIECES MARKED ④ AND ⑥ ON PAGE 22. ONE PALLET UNIT CAN BE OMITTED BY USING THE PROVISIONS SHOWN ON PAGE 43.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 2" 2" X 3" 2" X 4" 2" X 6" 4" X 4"	96 32 341 369 150	32 16 228 369 200
NAILS	NO. REQD	POUNDS
10d (3") 12d (3-1/4") 16d (3-1/2") 40d (5")	492 436 216 72	7-3/4 7-1/2 4-3/4 4-1/4

*BASED ON A PALLET UNIT WEIGHT OF 1,575 POUNDS.

LOAD AS SHOWN

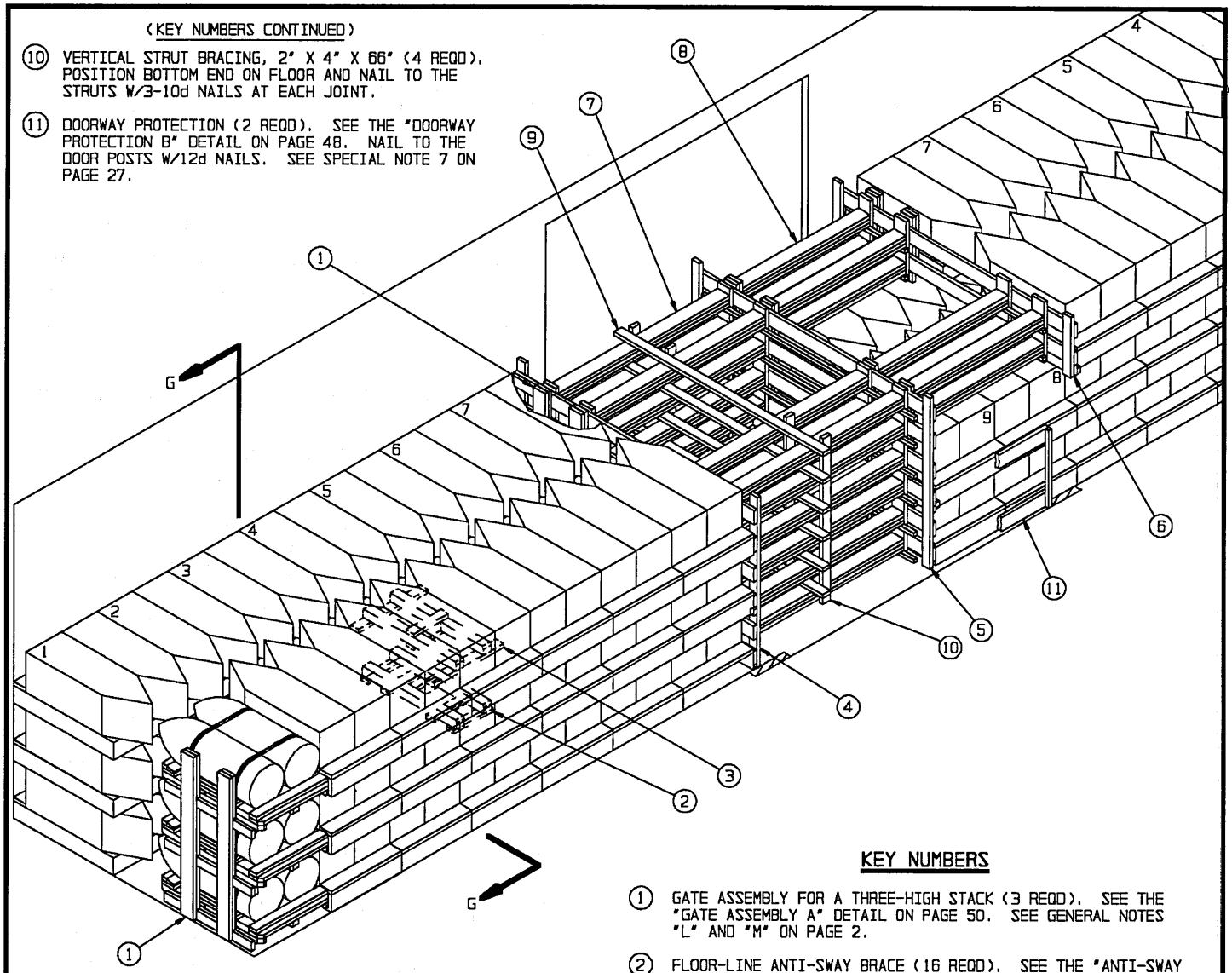
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	72	113,400 LBS*
DUNNAGE		2,117 LBS
TOTAL WEIGHT		115,517 LBS (APPROX)

CROSSWISE-LOADED FLAT NOSE OR CONICAL NOSE
72-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL BOXCAR

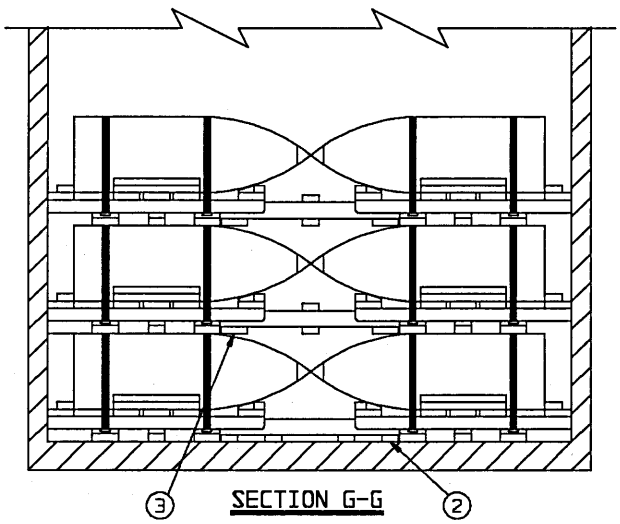
(KEY NUMBERS CONTINUED)

⑩ VERTICAL STRUT BRACING, 2" X 4" X 66" (4 REQD). POSITION BOTTOM END ON FLOOR AND NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

⑪ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION B" DETAIL ON PAGE 48. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 7 ON PAGE 27.



ISOMETRIC VIEW



SECTION G-G

KEY NUMBERS

① GATE ASSEMBLY FOR A THREE-HIGH STACK (3 REQD). SEE THE "GATE ASSEMBLY A" DETAIL ON PAGE 50. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.

② FLOOR-LINE ANTI-SWAY BRACE (16 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 49 AND THE "SECTION G-G" VIEW AT LEFT. PRE-POSITION AS SHOWN IN THE "POSITION FOR ANTI-SWAY BRACE B" DETAIL ON PAGE 35.

③ UPPER-LAYER ANTI-SWAY BRACE (30 REQD). SEE THE "ANTI-SWAY BRACE D" DETAIL ON PAGE 49 AND THE "SECTION G-G" VIEW AT LEFT. POSITION ON TOP OF THE BOMBS ON THE ALREADY-POSITIONED PALLETS PRIOR TO LOADING THE NEXT LAYER OF PALLETS. SEE THE "POSITION FOR ANTI-SWAY BRACE D" DETAIL ON PAGE 35 FOR GUIDANCE.

④ CENTER GATE (1 REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 48. SEE SPECIAL NOTES 3 AND 4 ON PAGE 27.

⑤ CENTER GATE (1 REQD). SEE THE "CENTER GATE D" DETAIL ON PAGE 51.

⑥ PARTIAL-LAYER GATE (1 REQD). SEE THE "PARTIAL-LAYER GATE B" DETAIL ON PAGE 51.

⑦ STRUT, 2" X 6" BY CUT TO FIT (TRIPLED) (24 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 AND TOENAIL TO THE VERTICAL PIECES OF THE CENTER GATES, PIECES MARKED ④ AND ⑤, W/2-12d NAILS AT EACH END.

⑧ STRUT, 2" X 6" BY CUT TO FIT (TRIPLED) (8 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 AND TOENAIL TO THE VERTICAL PIECES OF THE CENTER GATES, PIECES MARKED ⑤ AND ⑥ W/2-12d NAILS AT EACH END.

⑨ HORIZONTAL STRUT BRACING, 2" X 4" X 8'-0" (6 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT. SEE SPECIAL NOTE 6 ON PAGE 27.

(CONTINUED ABOVE)

CROSSWISE-LOADED CONICAL NOSE
92-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR

SPECIAL NOTES:

1. A 92-UNIT LOAD OF CROSSWISE-POSITIONED CONICAL NOSE BOMBS IS SHOWN. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR SHIPMENT OF FLAT NOSE BOMBS. NOTE THAT A NARROWER CAR, 8'-9" MINIMUM, MAY BE USED WHEN LOADING FLAT NOSE BOMBS.

2. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOXCAR IS SHOWN. CARS OF OTHER LENGTHS AND WIDTHS CAN BE USED.

3. IF DESIRED, IN LIEU OF USING THE 2" X 3" GATE HOLD-DOWN PIECES ON THE CENTER GATES, 2" X 6" DOOR SPANNER PIECES OF A LENGTH TO SPAN THE DOOR OPENING PLUS 24", OR TO EXTEND 12" BEYOND THE VERTICAL SUPPORT PIECES ON EACH CENTER GATE, WHICHEVER IS GREATER, MAY BE USED. APPLY 2" X 4" X 18" GATE HOLD DOWN CLEATS TO THE SPANNER PIECES SO AS TO BE CENTERED OVER THE VERTICAL SUPPORT PIECES OF THE CENTER GATES. REFER TO PAGE 55 FOR GUIDANCE.

4. EACH OF THE UPPER FIVE STRUT LEDGERS ON CENTER GATE "C" SHOULD NOT BE NAILED TO THE GATE UNTIL THE NEXT LOWER OF STRUTS HAS BEEN INSTALLED.

5. IN LIEU OF USING TRIPLED 2" X 6" STRUTS AS SHOWN IN THE LOAD VIEW, LAMINATED 4" X 6" AND 2" X 6" MATERIAL MAY BE USED. LAMINATE A 2" X 6" TO A 4" X 6" W/1-10d NAIL EVERY 6".

6. ONE SET OF STRUT BRACING, PIECES MARKED ⑨ AND ⑩, IS REQUIRED FOR EVERY 72" OF TRIPLED STRUT LENGTH. BRACING IS NOT REQUIRED IF THE STRUTS ARE LESS THAN 72" LONG.

7. A CAR EQUIPPED WITH 10'-0" WIDE DOORS OF THE CONVENTIONAL SLIDING TYPE IS SHOWN. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR CARS EQUIPPED WITH OTHER WIDTH AND/OR STAGGERED DOORS. IF THE CAR IS EQUIPPED WITH PLUG DOORS, REFER TO PAGES 54 AND 55 FOR A SPECIAL CENTER GATE AND SPECIAL PROVISIONS FOR DOORWAY PROTECTION WHICH MUST BE UTILIZED. IF DESIRED, THESE SPECIAL PLUG DOOR PROVISIONS MAY BE USED IN CARS WHICH ARE EQUIPPED WITH CONVENTIONAL SLIDING DOORS, IN LIEU OF USING THE DOORWAY PROTECTION GATE SHOWN.

8. THE 92-UNIT LOAD SHOWN REQUIRES A CAR HAVING A LOAD LIMIT OF AT LEAST 151,200 POUNDS.

9. IF THE LOAD LIMIT OF THE CAR PERMITS, TWO OR FOUR PALLET UNITS MAY BE ADDED TO THE DEPICTED LOAD. THE LOAD LIMIT REQUIRED FOR TWO ADDITIONAL PALLET UNITS WILL BE AT LEAST 151,800 POUNDS. THE LOAD LIMIT REQUIRED FOR FOUR ADDITIONAL PALLET UNITS WILL BE AT LEAST 153,400 POUNDS. AS APPLICABLE, THE STRUTS, PIECE MARKED ⑧, WILL BE SHORTENED OR OMITTED. WHEN FOUR PALLET UNITS ARE ADDED, THE PARTIAL-LAYER GATE, PIECE MARKED ⑥, WILL BE OMITTED AND CENTER GATE C, AS DETAILED ON PAGE 48, WILL BE USED ON LIEU OF CENTER GATE D.

10. TWO OR FOUR PALLET UNITS CAN BE OMITTED FROM THE DEPICTED LOAD BY USING PIECES MARKED ⑤, ⑥, AND ⑧ IN BOTH ENDS OF THE LOAD. ONE PALLET UNIT CAN BE OMITTED BY USING THE GUIDANCE SHOWN ON PAGE 43.

11. NOTICE: THE DELINEATED PROCEDURES ARE ESPECIALLY APPLICABLE TO READILY AVAILABLE "HIGH-CAPACITY" BOXCARS. IT IS TO BE NOTED THAT THESE PROCEDURES CAN BE ADJUSTED TO FULLY UTILIZE "EXTRA-HIGH CAPACITY" BOXCARS BY INCREASING THE NUMBER OF STACKS IN ONE END OF A CARLOAD, PROVIDING THE PRINCIPLES OF THE CRITERIA WITHIN NOTES 7 AND 8 ARE APPLIED. IF TWO STACKS ARE ADDED, IT WILL BE NECESSARY TO USE "SOLID FILL" TYPE BLOCKING AS SPECIFIED FOR THE LOAD SHOWN ON PAGE 28, IN LIEU OF STRUTS MARKED ⑦.

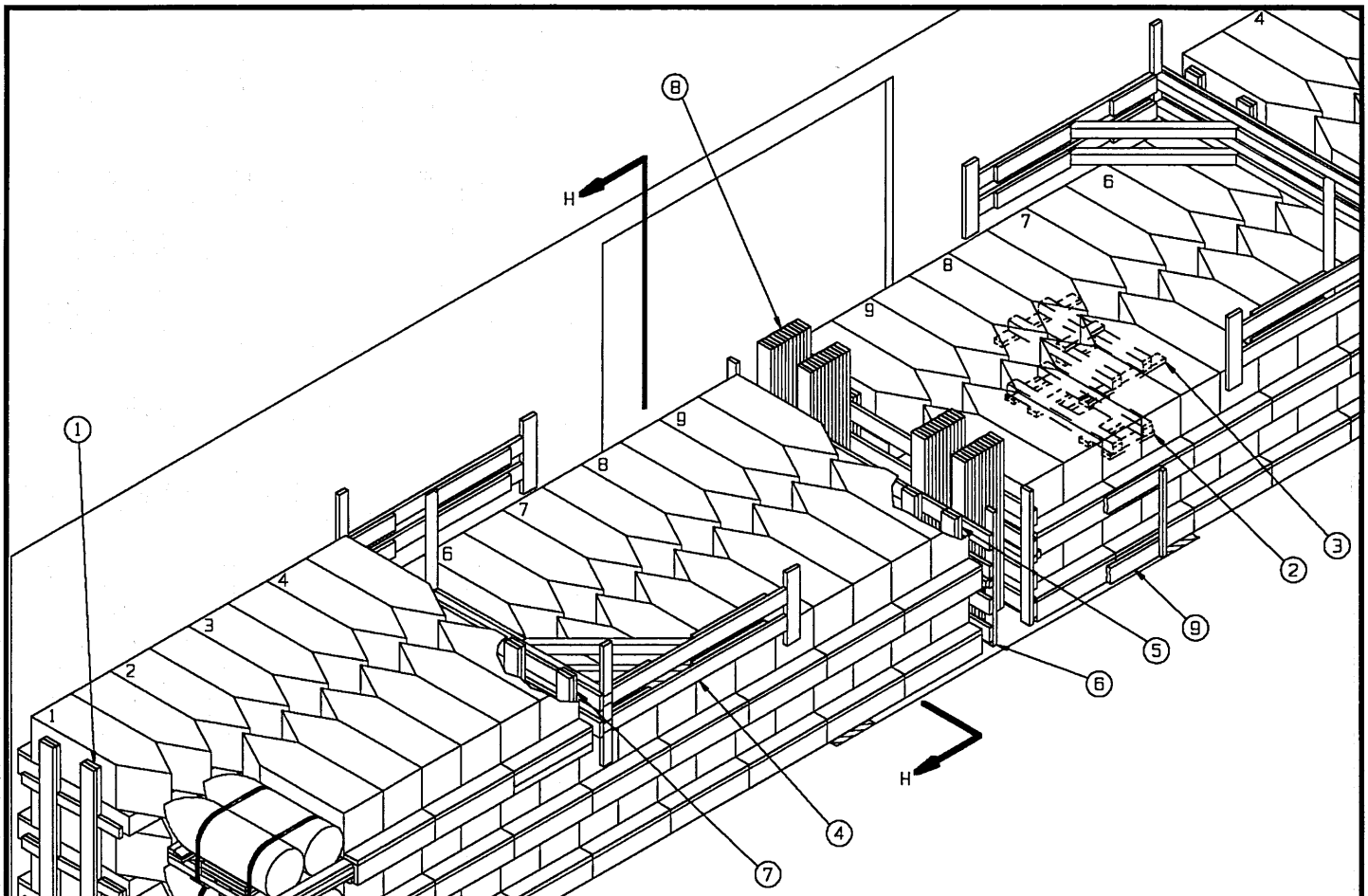
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 2"	112	38
2" X 3"	29	15
2" X 4"	437	292
2" X 6"	1097	1097
4" X 4"	249	332
NAILS	NO. REQD	POUNDS
10d (3")	1604	24-3/4
12d (3-1/4")	468	8
16d (3-1/2")	360	8
40d (5")	120	7-1/4

* BASED ON A PALLET UNIT WEIGHT OF 1,575 POUNDS.

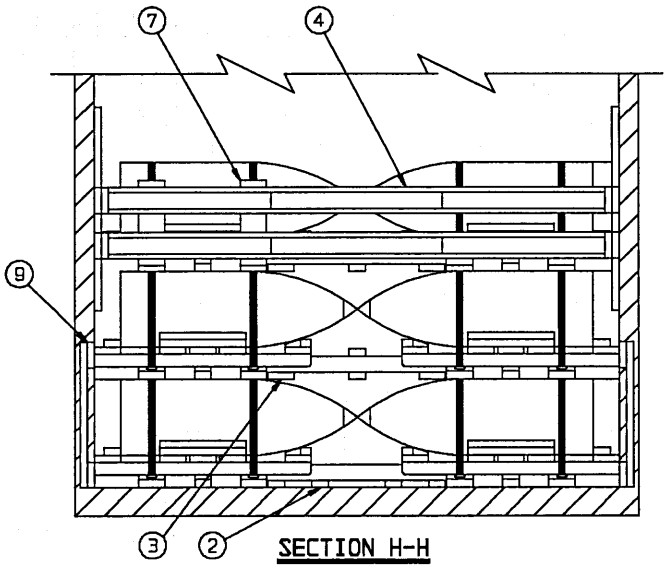
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	92	144,900 LBS *
DUNNAGE		4,455 LBS
TOTAL WEIGHT		149,355 LBS (APPROX)

CROSSWISE-LOADED CONICAL NOSE
92-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR



ISOMETRIC VIEW



SECTION H-H

KEY NUMBERS

(1) GATE ASSEMBLY FOR A THREE-HIGH STACK (2 REQD). SEE THE "GATE ASSEMBLY A" DETAIL ON PAGE 50. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.

(2) FLOOR-LINE ANTI-SWAY BRACE (18 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 49 AND THE "SECTION H-H" VIEW AT LEFT. PRE-POSITION AS SHOWN IN THE "POSITION FOR ANTI-SWAY BRACE B" DETAIL ON PAGE 35.

(3) UPPER-LAYER ANTI-SWAY BRACE (26 REQD). SEE THE "ANTI-SWAY BRACE D" DETAIL ON PAGE 49 AND THE "SECTION H-H" VIEW AT LEFT. POSITION ON TOP OF THE BOMBS ON THE ALREADY-POSITIONED PALLETS PRIOR TO LOADING THE NEXT LAYER OF PALLETS. SEE THE "POSITION FOR ANTI-SWAY BRACE D" DETAIL ON PAGE 35 FOR GUIDANCE.

(4) K-BRACE (2 REQD). SEE THE "K-BRACE ASSEMBLY B" DETAIL ON PAGE 46. SEE SPECIAL NOTE 4 ON PAGE 29.

(5) GATE ASSEMBLY FOR A TWO-HIGH STACK (2 REQD). SEE THE "GATE ASSEMBLY A" DETAIL ON PAGE 50.

(6) CENTER GATE (2 REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 48. NOTE THAT THE STRUT LEDGERS MUST BE OMITTED FROM THE GATES AND THE VERTICAL PIECES OF ONE OF THE GATES MUST BE INCREASED TO 60" WHEN SOLID FILL TYPE CENTER BLOCKING IS USED. SEE SPECIAL NOTE 3 ON PAGE 29.

(7) SOLID FILL, 6" WIDE MATERIAL BY 18" LONG BY THE THICKNESS REQUIRED TO FILL THE VOID BETWEEN THE K-BRACE AND THE STAGGERED PALLET OF THE PARTIAL LAYER AT FOUR PLACES AS SHOWN. NAIL THE FIRST PIECE TO PIECE MARKED (2) OF THE K-BRACE, AS DETAILED ON PAGE 46, W/3-10d NAILS AT EACH JOINT. LAMINATE ADDITIONAL PIECES W/4-10d NAILS.

(8) SOLID FILL, 6" WIDE MATERIAL BY 60" LONG BY THE THICKNESS REQUIRED TO FILL THE VOID BETWEEN THE VERTICAL PIECES OF THE CENTER GATES (REQD AT 4 PLACES). NAIL TO THE VERTICAL PIECES AND/OR TOGETHER W/4-10d NAILS.

(9) DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION B" DETAIL ON PAGE 48. NAIL TO THE DOORPOSTS W/12d NAILS. SEE SPECIAL NOTE 5 ON PAGE 29.

CROSSWISE-LOADED CONICAL NOSE
B8-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR

PROJECT FSA 48-65

SPECIAL NOTES:

1. AN 88-UNIT LOAD OF CROSSWISE-POSITIONED CONICAL NOSE BOMBS IS SHOWN IN THE LOAD VIEWS. THE DEPICTED PROCEDURES SHOULD NOT BE USED FOR SHIPMENT OF BOMBS EQUIPPED WITH FLAT NOSE PLUGS, UNLESS THE CAR IS NARROWER THAN 8'-9". CARS 8'-9" OR WIDER SHOULD BE LOADED IN ACCORDANCE WITH THE PROCEDURES ON PAGES 22 AND 23.

2. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOXCAR IS SHOWN. CARS OF OTHER LENGTHS AND WIDTHS MAY BE USED.

3. IF DESIRED, IN LIEU OF USING THE 2" X 3" GATE HOLD DOWN PIECES ON THE CENTER GATES, 2" X 6" DOOR SPANNER PIECES OF A LENGTH TO SPAN THE DOOR OPENING PLUS 24", OR TO EXTEND 12" BEYOND THE VERTICAL SUPPORT PIECES ON EACH CENTER GATE, WHICHEVER IS GREATER, MAY BE USED. APPLY 2" X 4" X 18" GATE HOLD DOWN CLEATS TO THE SPANNER PIECES SO AS TO BE CENTERED OVER THE VERTICAL SUPPORT PIECES OF THE CENTER GATES. REFER TO PAGE 55 FOR GUIDANCE.

4. A K-BRACE, SHOWN AS PIECE MARKED ④, IS ADEQUATE FOR RETAINING NOT MORE THAN EIGHT PALLET UNITS IN EACH END OF A CAR.

5. A CAR EQUIPPED WITH 10'-0" WIDE DOORS OF THE CONVENTIONAL SLIDING TYPE IS SHOWN. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR CARS EQUIPPED WITH OTHER WIDTH AND/OR STAGGERED DOORS. IF THE CAR IS EQUIPPED WITH PLUG DOORS, REFER TO PAGES 54 AND 55 FOR A SPECIAL CENTER GATE AND SPECIAL PROVISIONS FOR DOORWAY PROTECTION WHICH MUST BE UTILIZED. NOTE THAT THE STRUT LEDGERS MUST BE OMITTED FROM THE SPECIAL GATE AND THE VERTICAL PIECES MUST BE INCREASED TO 60" FOR A 2-HIGH LOAD OR TO 6'-6" FOR A 3-HIGH LOAD WHEN SOLID FILL TYPE CENTER BLOCKING IS TO BE USED IN THE LOAD. IF DESIRED, THE SPECIAL PLUG DOOR PROVISIONS MAY BE USED IN CARS WHICH ARE EQUIPPED WITH CONVENTIONAL SLIDING DOORS, IN LIEU OF USING THE DOORWAY PROTECTION GATE SHOWN.

6. THE 88-UNIT LOAD SHOWN REQUIRES A CAR HAVING A LOAD LIMIT OF AT LEAST 141,900 POUNDS.

7. MULTIPLES OF TWO PALLET UNITS MAY BE OMITTED FROM THE THIRD LAYER OF THE DEPICTED LOAD. SEE THE PROCEDURES ON PAGE 43 FOR GUIDANCE IN ADJUSTING A LOAD QUANTITY BY ONE PALLET UNIT.

BILL OF MATERIAL

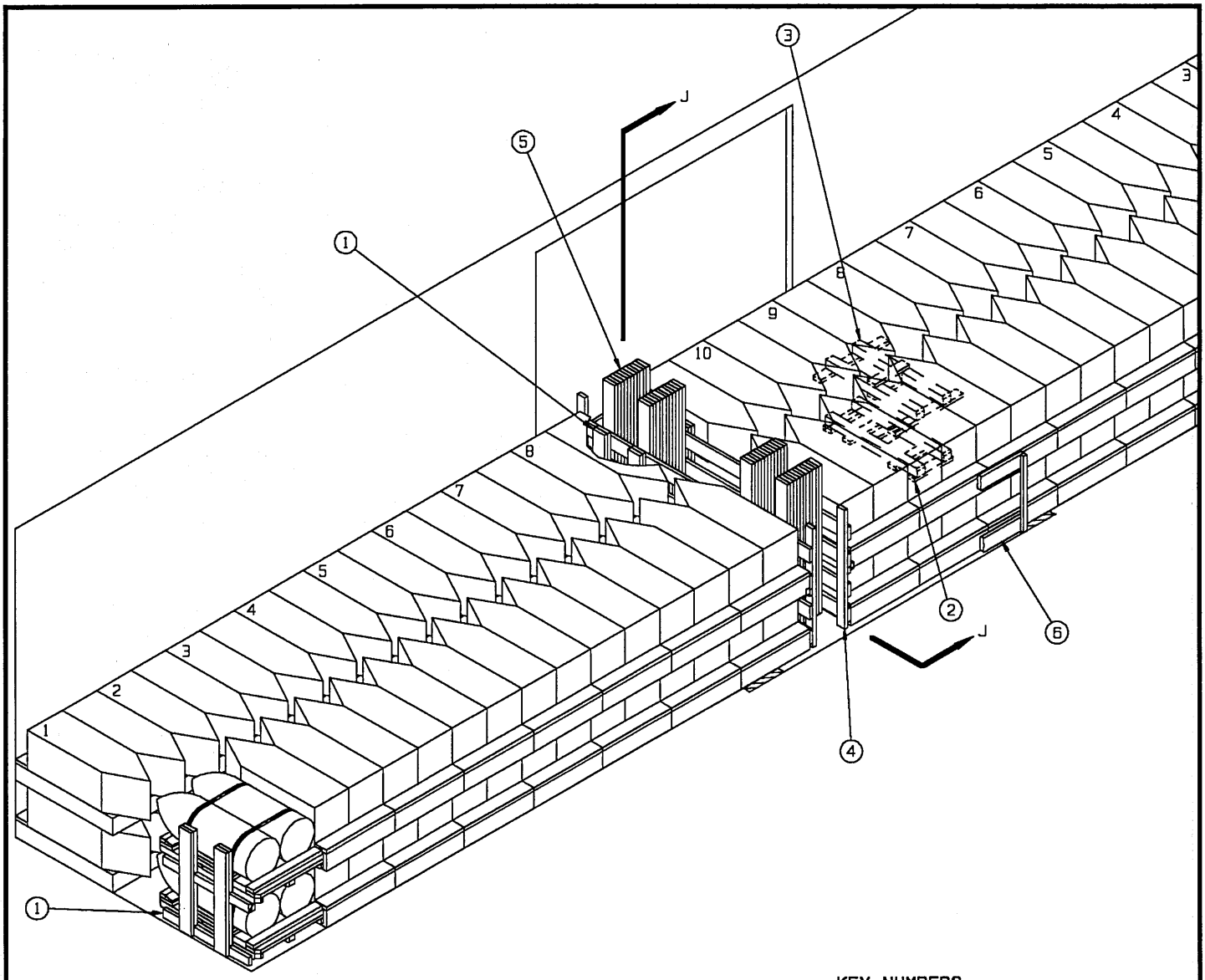
LUMBER	LINEAR FEET	BOARD FEET
2" X 2"	21	11
2" X 4"	413	276
2" X 6"	632	632
4" X 4"	276	368
NAILS	**NO. REQD**	**POUNDS**
10d (3")	474	7-1/2
12d (3-1/4")	680	11-1/2
16d (3-1/2")	480	10-1/2
40d (5")	104	6-1/4
60d (6")	16	1-3/4

* BASED ON A PALLET UNIT WEIGHT OF 1,575 POUNDS.

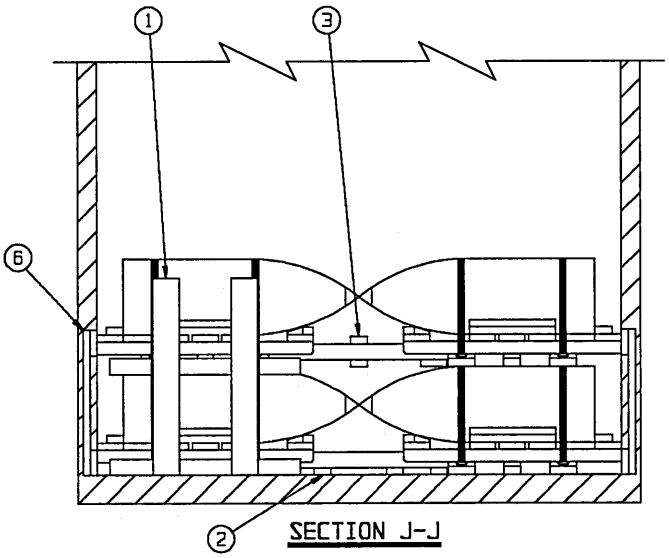
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	88	138,600 LBS *
DUNNAGE		3,242 LBS
TOTAL WEIGHT		141,842 LBS (APPROX)

CROSSWISE-LOADED CONICAL NOSE
88-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR



ISOMETRIC VIEW



SECTION J-J

KEY NUMBERS

(1) GATE ASSEMBLY (4 REQD). SEE THE "GATE ASSEMBLY A" DETAIL FOR A TWO-HIGH STACK ON PAGE 50. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.

(2) FLOOR-LINE ANTI-SWAY BRACE (18 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 49 AND THE "SECTION J-J" VIEW AT LEFT. PRE-POSITION AS SHOWN IN THE "POSITION FOR ANTI-SWAY BRACE B" DETAIL ON PAGE 35.

(3) SECOND-LAYER ANTI-SWAY BRACE (18 REQD). SEE THE "ANTI-SWAY BRACE D" DETAIL ON PAGE 49 AND THE "SECTION J-J" VIEW AT LEFT. POSITION ON TOP OF THE FIRST-LAYER BOMBS PRIOR TO LOADING THE TOP LAYER OF PALLETS. SEE THE "POSITION FOR ANTI-SWAY BRACE D" DETAIL ON PAGE 35 FOR GUIDANCE.

(4) CENTER GATE (2 REQD). SEE THE "CENTER GATE C" DETAIL FOR A 2-HIGH LOAD ON PAGE 48. NOTE THAT THE STRUT LEDGERS MUST BE OMITTED FROM THE GATES AND THE VERTICAL PIECES ON ONE OF THE GATES MUST BE INCREASED TO 60" WHEN SOLID FILL BLOCKING IS TO BE USED. SEE SPECIAL NOTE 3 ON PAGE 31.

(5) SOLID FILL, 6" WIDE MATERIAL BY 60" LONG BY THE THICKNESS REQUIRED TO FILL THE VOID BETWEEN THE VERTICAL PIECES OF THE CENTER GATES (REQUIRED AT 4 PLACES). NAIL TO THE VERTICAL PIECES AND/OR TOGETHER W/4-10d NAILS.

(6) DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION B" DETAIL ON PAGE 48. NAIL TO THE DOORPOSTS W/12d NAILS. SEE SPECIAL NOTE 4 ON PAGE 31.

CROSSWISE-LOADED CONICAL NOSE
72-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR

PROJECT FSA 48-65

SPECIAL NOTES:

1. A 72-UNIT LOAD OF CROSSWISE-LOADED CONICAL NOSE BOMBS IS SHOWN. THE DEPICTED PROCEDURES SHOULD NOT BE USED FOR SHIPMENT OF BOMBS EQUIPPED WITH THE FLAT TYPE NOSE PLUGS, UNLESS THE CAR IS NARROWER THAN 8'-9". CARS 8'-9" OR WIDER SHOULD BE LOADED IN ACCORDANCE WITH THE PROCEDURES ON PAGES 22 AND 23.

2. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOXCAR IS SHOWN. CARS OF OTHER LENGTHS AND WIDTHS CAN BE USED.

3. IF DESIRED, IN LIEU OF USING THE 2" X 3" GATE HOLD DOWN PIECES ON THE CENTER GATES, 2" X 6" DOOR SPANNER PIECES OF A LENGTH TO SPAN THE DOOR OPENING PLUS 24", OR TO EXTEND 12" BEYOND THE VERTICAL SUPPORT PIECE ON EACH CENTER GATE, WHICHEVER IS GREATER, MAY BE USED. APPLY 2" X 4" X 18" GATE HOLD DOWN CLEATS TO THE SPANNER PIECES SO AS TO BE CENTERED OVER THE VERTICAL SUPPORT PIECES OF THE CENTER GATES. REFER TO PAGE 55 FOR GUIDANCE.

4. A CAR EQUIPPED WITH 10'-0" WIDE DOORS OF THE CONVENTIONAL SLIDING TYPE IS SHOWN. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR CARS EQUIPPED WITH OTHER WIDTH AND/OR STAGGERED DOORS. IF THE CAR IS EQUIPPED WITH PLUG DOORS, REFER TO PAGES 54 AND 55 FOR A SPECIAL CENTER GATE AND SPECIAL PROVISIONS FOR DOORWAY PROTECTION WHICH MUST BE UTILIZED. NOTE THAT THE STRUT LEDGERS MUST BE OMITTED FROM THE SPECIAL GATE AND THE VERTICAL PIECES MUST BE INCREASED TO 60" FOR A 2-HIGH LOAD OR TO 6'-6" FOR A 3-HIGH LOAD, WHEN SOLID FILL TYPE CENTER BLOCKING IS TO BE USED IN THE LOAD. IF DESIRED, THE SPECIAL PLUG DOOR PROVISIONS MAY BY USED IN CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS, IN LIEU OF USING THE DOORWAY PROTECTION GATE SHOWN.

5. THE 72-UNIT LOAD SHOWN REQUIRES A CAR HAVING A LOAD LIMIT OF AT LEAST 116,100 POUNDS.

6. IF THE LOAD LIMIT OF THE CAR PERMITS, MULTIPLES OF TWO PALLET UNITS MAY BE ADDED TO THE DEPICTED LOAD BY ADDING A PARTIAL LAYER IN ONE OR BOTH ENDS OF THE CAR. THIS PARTIAL LAYER MUST BE BLOCKED BY INSTALLING A K-BRACE, AS DETAILED ON PAGE 46 AND SHOWN IN THE LOAD VIEW ON PAGE 28.

7. TWO PALLET UNITS CAN BE OMITTED FROM THE HEAVY END OF THE DEPICTED LOAD BY SUBSTITUTING A "CENTER GATE D" FOR A "CENTER GATE C", AND INSTALLING A "PARTIAL-LAYER GATE B" AND STRUTS AS SHOWN BY PIECES MARKED ⑥ AND ⑧ ON PAGE 26. SEE THE "CENTER GATE D" AND "PARTIAL-LAYER GATE B" DETAILS ON PAGE 51. MULTIPLES OF FOUR PALLET UNITS CAN BE OMITTED FROM THE HEAVY END OF THE CAR BY INSTALLING TRIPLED STRUTS IN LIEU OF THE SOLID FILL BLOCKING SHOWN. NOTE THAT IF THE STRUTS ARE LONGER THAN 72", STRUT BRACING AS SHOWN BY PIECES MARKED ⑨ AND ⑩ ON PAGE 26 MUST BE INSTALLED. ONE PALLET UNIT CAN BE OMITTED BY USING THE GUIDANCE SHOWN ON PAGE 43.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 3" 2" X 4" 2" X 6" 4" X 4"	32 361 404 150	16 241 404 200
NAILS	NO. REQD	POUNDS
10d (3") 12d (3-1/4") 16d (3-1/2") 40d (5")	468 372 216 72	7-1/4 6-1/4 4-3/4 4-1/4

* BASED ON A PALLET UNIT WEIGHT OF 1,575 POUNDS.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	72	113,400 LBS *
DUNNAGE		2,126 LBS
TOTAL WEIGHT		115,526 LBS (APPROX)

CROSSWISE-LOADED CONICAL NOSE
72-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR

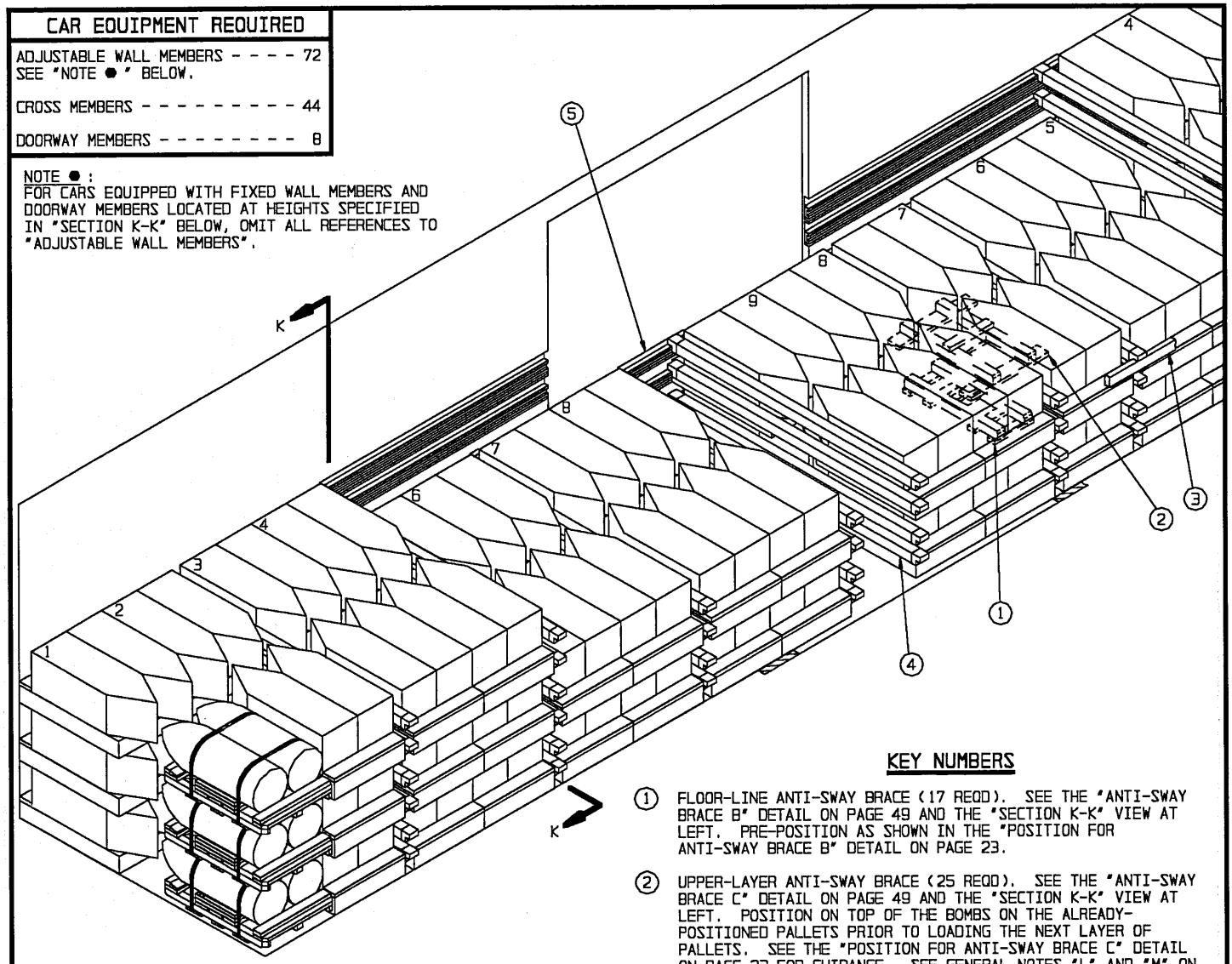
CAR EQUIPMENT REQUIRED

ADJUSTABLE WALL MEMBERS - - - - 72
SEE "NOTE ● " BELOW.

CROSS MEMBERS - - - - - - - - - 44

DOORWAY MEMBERS - - - - - - - - 8

NOTE ● :
FOR CARS EQUIPPED WITH FIXED WALL MEMBERS AND DOORWAY MEMBERS LOCATED AT HEIGHTS SPECIFIED IN "SECTION K-K" BELOW, OMIT ALL REFERENCES TO "ADJUSTABLE WALL MEMBERS".



ISOMETRIC VIEW

KEY NUMBERS

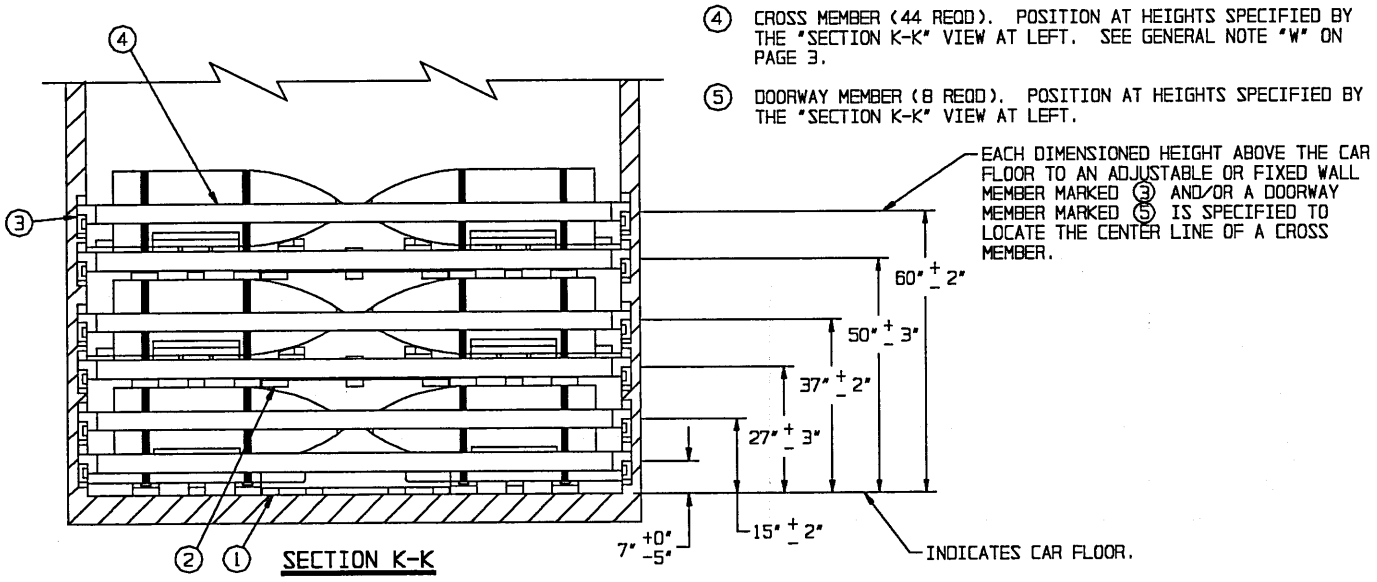
① FLOOR-LINE ANTI-SWAY BRACE (17 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 49 AND THE "SECTION K-K" VIEW AT LEFT. PRE-POSITION AS SHOWN IN THE "POSITION FOR ANTI-SWAY BRACE B" DETAIL ON PAGE 23.

② UPPER-LAYER ANTI-SWAY BRACE (25 REQD). SEE THE "ANTI-SWAY BRACE C" DETAIL ON PAGE 49 AND THE "SECTION K-K" VIEW AT LEFT. POSITION ON TOP OF THE BOMBS ON THE ALREADY-POSITIONED PALLETS PRIOR TO LOADING THE NEXT LAYER OF PALLETS. SEE THE "POSITION FOR ANTI-SWAY BRACE C" DETAIL ON PAGE 23 FOR GUIDANCE. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.

③ WALL MEMBER, ADJUSTABLE OR FIXED. WALL MEMBERS MUST BE LOCATED AT SPECIFIED HEIGHTS ABOVE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED ④. SEE THE "SECTION K-K" VIEW AT LEFT FOR HEIGHT DIMENSIONS.

④ CROSS MEMBER (44 REQD). POSITION AT HEIGHTS SPECIFIED BY THE "SECTION K-K" VIEW AT LEFT. SEE GENERAL NOTE "W" ON PAGE 3.

⑤ DOORWAY MEMBER (8 REQD). POSITION AT HEIGHTS SPECIFIED BY THE "SECTION K-K" VIEW AT LEFT.



SECTION K-K

CROSSWISE-LOADED FLAT NOSE OR CONICAL NOSE
84-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE BOXCAR (MECHANICAL)

PROJECT FSA 48-65

SPECIAL NOTES:

1. AN 84-UNIT LOAD OF CROSSWISE-LOADED BOMBS IS SHOWN IN A 50-6" LONG BY 9'-4" WIDE (INSIDE CLEARANCE) BOXCAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS. OTHER WIDTH CARS MAY BE USED, PROVIDING THEY ARE AT LEAST 9'-2-1/2" WIDE.

2. BOMBS EQUIPPED WITH CONICAL NOSE PLUGS ARE SHOWN IN THE LOAD VIEWS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR SHIPMENTS OF BOMBS EQUIPPED WITH THE FLAT NOSE PLUGS. NOTE THAT A NARROWER CAR, 8'-9" OR WIDER, CAN BE USED WHEN SHIPPING BOMBS HAVING FLAT NOSE PLUGS.

3. A CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS EQUIPPED WITH OTHER WIDTH OR STAGGERED DOORS MAY BE USED.

4. IN A 40'-6" LONG CAR, TWENTY-SIX PALLET UNITS CAN BE LOADED IN EACH OF THE FIRST TWO LAYERS. UNLESS THE CAR IS EQUIPPED WITH TWELVE DOORWAY MEMBERS, LOADING IN THE THIRD LAYER WILL BE LIMITED TO NOT MORE THAN TEN PALLET UNITS IN EACH END OF THE CAR.

5. THE 84-UNIT LOAD SHOWN REQUIRES A CAR HAVING A LOAD LIMIT OF AT LEAST 134,300 POUNDS, BASED ON A PALLET UNIT WEIGHT OF 1,575 POUNDS.

6. THE DEPICTED LOAD MAY BE INCREASED BY MULTIPLES OF TWO OR FOUR PALLET UNITS BY ADDING A LAYER TO A 1-LONG OR TWO-LONG BAY, RESPECTIVELY. THE LOAD MAY BE DECREASED BY OMITTING TWO OR FOUR PALLET UNITS. TO ADJUST A LOAD QUANTITY BY ONE PALLET UNIT, SEE THE PROCEDURES ON PAGES 42 AND 44.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4" 2" X 6" 4" X 4"	315 134 216	210 134 288
NAILS	NO. REQD	POUNDS
12d (3-1/4") 16d (3-1/2") 40d (5")	340 300 100	5-3/4 6-1/2 6

* BASED ON A PALLET UNIT WEIGHT OF 1,575 POUNDS.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	84	132,300 LBS *
DUNNAGE		1,571 LBS
TOTAL WEIGHT		133,871 LBS (APPROX)

CROSSWISE-LOADED FLAT NOSE OR CONICAL NOSE
84-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE BOXCAR (MECHANICAL)

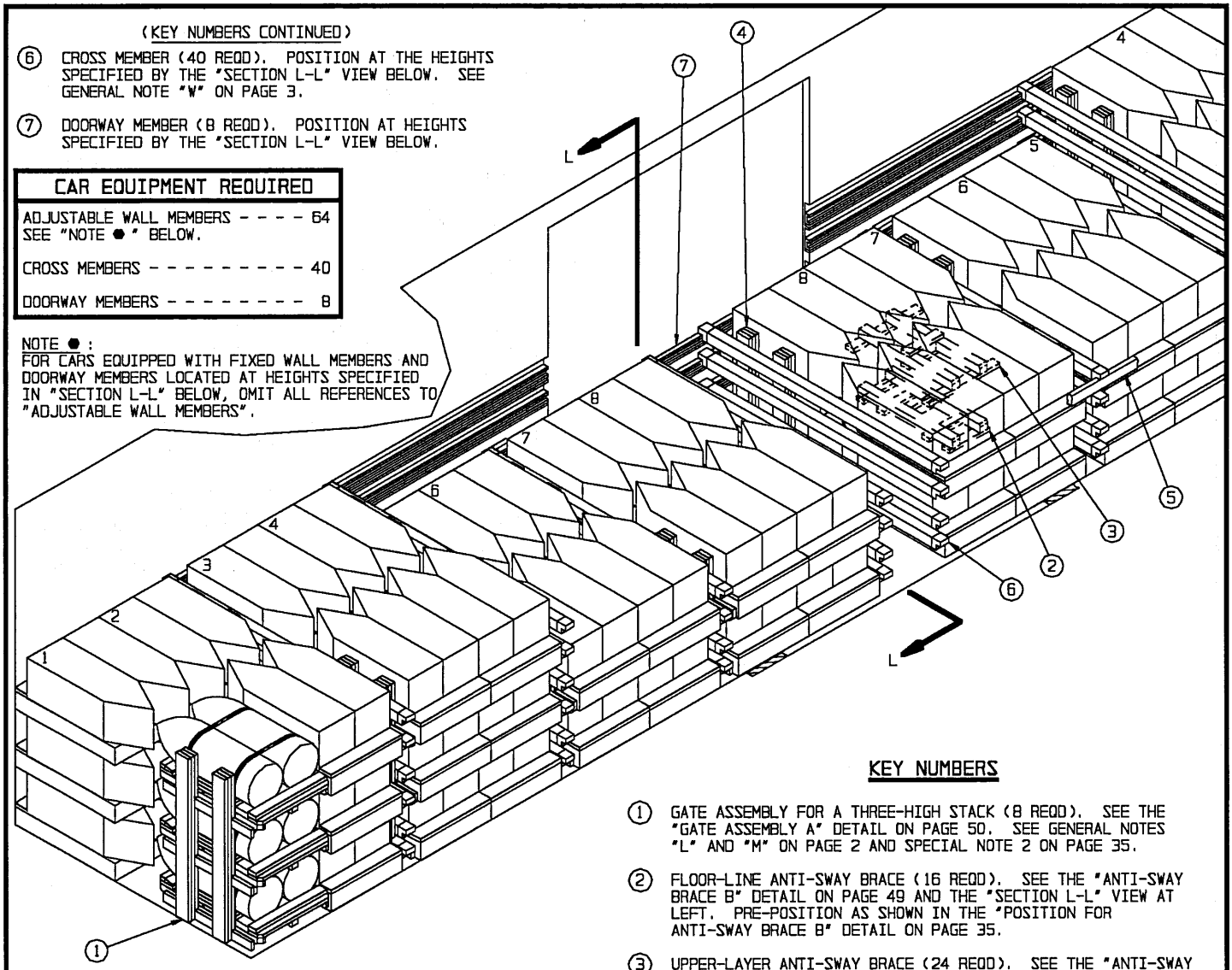
(KEY NUMBERS CONTINUED)

⑥ CROSS MEMBER (40 REQD). POSITION AT THE HEIGHTS SPECIFIED BY THE "SECTION L-L" VIEW BELOW. SEE GENERAL NOTE "W" ON PAGE 3.

⑦ DOORWAY MEMBER (8 REQD). POSITION AT HEIGHTS SPECIFIED BY THE "SECTION L-L" VIEW BELOW.

CAR EQUIPMENT REQUIRED	
ADJUSTABLE WALL MEMBERS - - - - SEE "NOTE ● " BELOW.	64
CROSS MEMBERS - - - - - - - - - -	40
DOORWAY MEMBERS - - - - - - - -	8

NOTE ●:
FOR CARS EQUIPPED WITH FIXED WALL MEMBERS AND DOORWAY MEMBERS LOCATED AT HEIGHTS SPECIFIED IN "SECTION L-L" BELOW, OMIT ALL REFERENCES TO "ADJUSTABLE WALL MEMBERS".



ISOMETRIC VIEW

KEY NUMBERS

① GATE ASSEMBLY FOR A THREE-HIGH STACK (8 REQD). SEE THE "GATE ASSEMBLY A" DETAIL ON PAGE 50. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTE 2 ON PAGE 35.

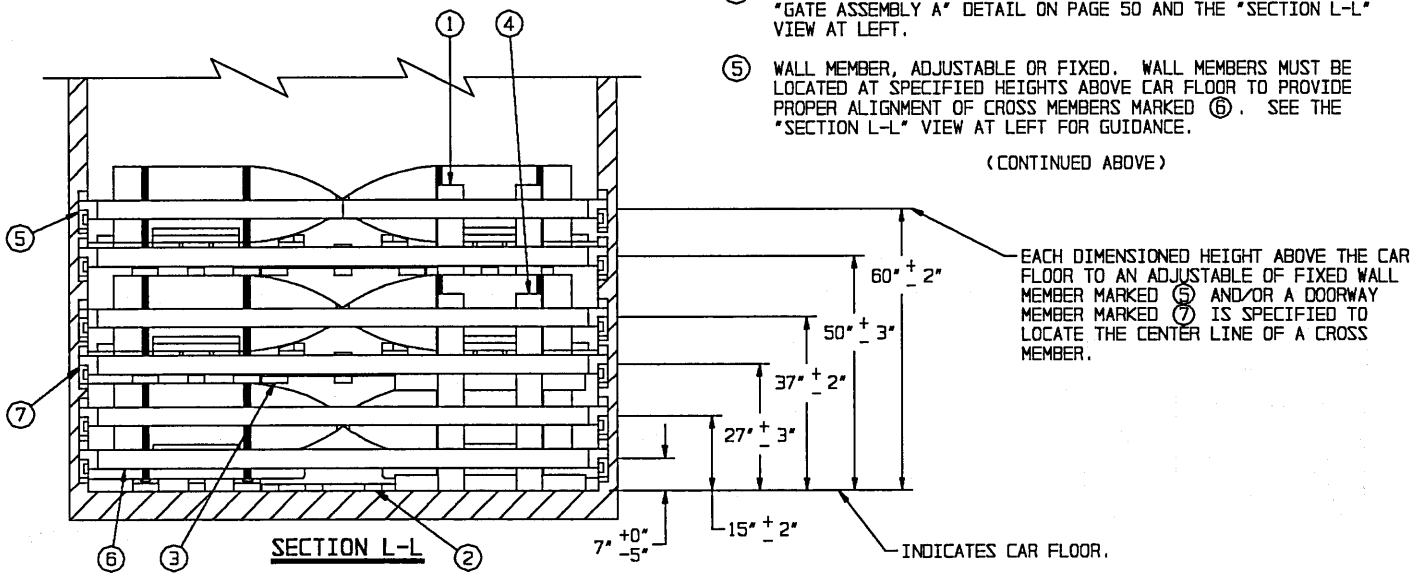
② FLOOR-LINE ANTI-SWAY BRACE (16 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 49 AND THE "SECTION L-L" VIEW AT LEFT. PRE-POSITION AS SHOWN IN THE "POSITION FOR ANTI-SWAY BRACE B" DETAIL ON PAGE 35.

③ UPPER-LAYER ANTI-SWAY BRACE (24 REQD). SEE THE "ANTI-SWAY BRACE D" DETAIL ON PAGE 49 AND THE "SECTION L-L" VIEW AT LEFT. POSITION ON TOP OF THE BOMBS ON THE ALREADY-POSITIONED PALLETS PRIOR TO LOADING THE NEXT LAYER OF PALLETS. SEE THE "POSITION FOR ANTI-SWAY BRACE D" DETAIL ON PAGE 35 FOR GUIDANCE.

④ GATE ASSEMBLY FOR A TWO-HIGH STACK (8 REQD). SEE THE "GATE ASSEMBLY A" DETAIL ON PAGE 50 AND THE "SECTION L-L" VIEW AT LEFT.

⑤ WALL MEMBER, ADJUSTABLE OR FIXED. WALL MEMBERS MUST BE LOCATED AT SPECIFIED HEIGHTS ABOVE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED ⑥. SEE THE "SECTION L-L" VIEW AT LEFT FOR GUIDANCE.

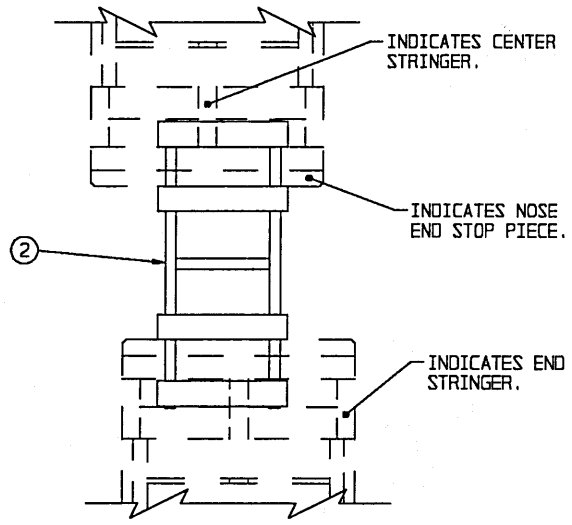
(CONTINUED ABOVE)



SECTION L-L

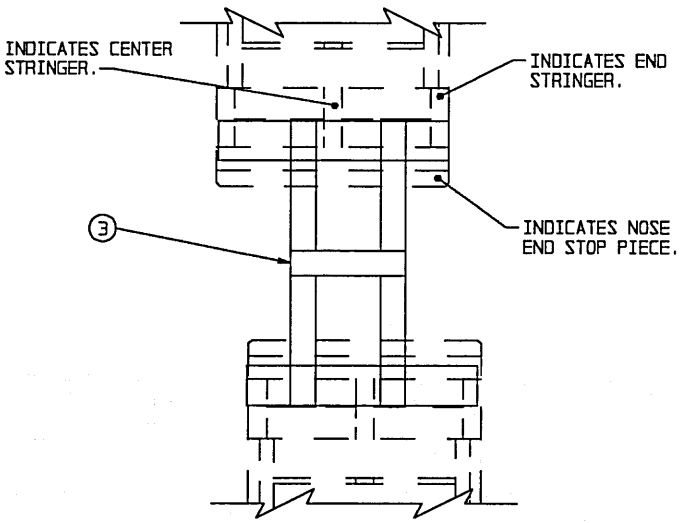
CROSSWISE-LOADED CONICAL NOSE
80-UNIT LOAD IN A 50'-6" LONG BY 8'-11" WIDE BOXCAR (MECHANICAL)

PROJECT FSA 48-65



POSITION FOR ANTI-SWAY BRACE B

THIS VIEW SHOWS THE LOCATION OF THE ANTI-SWAY BRACE WHICH IS USED FOR LATERAL BRACING IN THE BOTTOM LAYER OF AN OFFSET LOAD.



POSITION FOR ANTI-SWAY BRACE D

THIS VIEW SHOWS THE LOCATION OF THE ANTI-SWAY BRACE WHICH IS USED FOR LATERAL BRACING IN THE SECOND AND THIRD LAYERS OF A LOAD.

SPECIAL NOTES:

1. AN 80-UNIT LOAD OF CROSSWISE-LOADED BOMBS IS SHOWN IN A 50'-6" LONG BY 8'-11" WIDE (INSIDE CLEARANCE) BOXCAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS. OTHER WIDTH CARS MAY BE USED.
2. BOMBS EQUIPPED WITH CONICAL NOSE PLUGS ARE SHOWN IN THE LOAD VIEWS. THE DEPICTED PROCEDURES SHOULD NOT BE USED FOR SHIPMENTS OF BOMBS EQUIPPED WITH THE FLAT TYPE NOSE PLUGS. BOMBS EQUIPPED WITH FLAT TYPE NOSE PLUGS SHOULD BE LOADED IN ACCORDANCE WITH THE PROCEDURES SHOWN ON PAGES 32 AND 33.
3. A CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS EQUIPPED WITH OTHER WIDTH AND/OR STAGGERED DOORS MAY BE USED.
4. IN A 40'-6" LONG CAR, TWENTY-SIX PALLET UNITS CAN BE LOADED IN EACH OF THE FIRST TWO LAYERS. UNLESS THE CAR IS EQUIPPED WITH TWELVE DOORWAY MEMBERS, LOADING IN THE THIRD LAYER WILL BE LIMITED TO NOT MORE THAN TEN PALLET UNITS IN EACH END OF THE CAR IF THE CAR HAS 8'-0" OR NARROWER DOORS, OR EIGHT PALLET UNITS FOR CARS HAVING WIDER DOORS.
5. THE 80-UNIT LOAD SHOWN REQUIRES A CAR HAVING A LOAD LIMIT OF AT LEAST 128,400 POUNDS.
6. THE DEPICTED LOAD MAY BE INCREASED OR DECREASED BY MULTIPLES OF FOUR PALLET UNITS BY ADDING A LAYER TO OR OMITTING A LAYER FROM A BAY. INCREASING A LOAD BY TWO PALLET UNITS CAN BEST BE ACCOMPLISHED BY FORMING A 1-LONG BAY AT THE CENTER OF THE LOAD BY PLACING A FOUR PALLET UNIT STACK FROM THE BAY ON TOP OF A 2-LAYER BAY AND PLACING THE CROSS MEMBERS AND GATE ASSEMBLY AGAINST THE REMAINING FOUR PALLET UNITS. A 1-LONG 2-UNIT BAY CAN THEN BE FORMED. ONE PALLET UNIT CAN BE PLACED IN THIS BAY BY EMPLOYING THE PROCEDURES SHOWN ON PAGE 42.

BILL OF MATERIAL

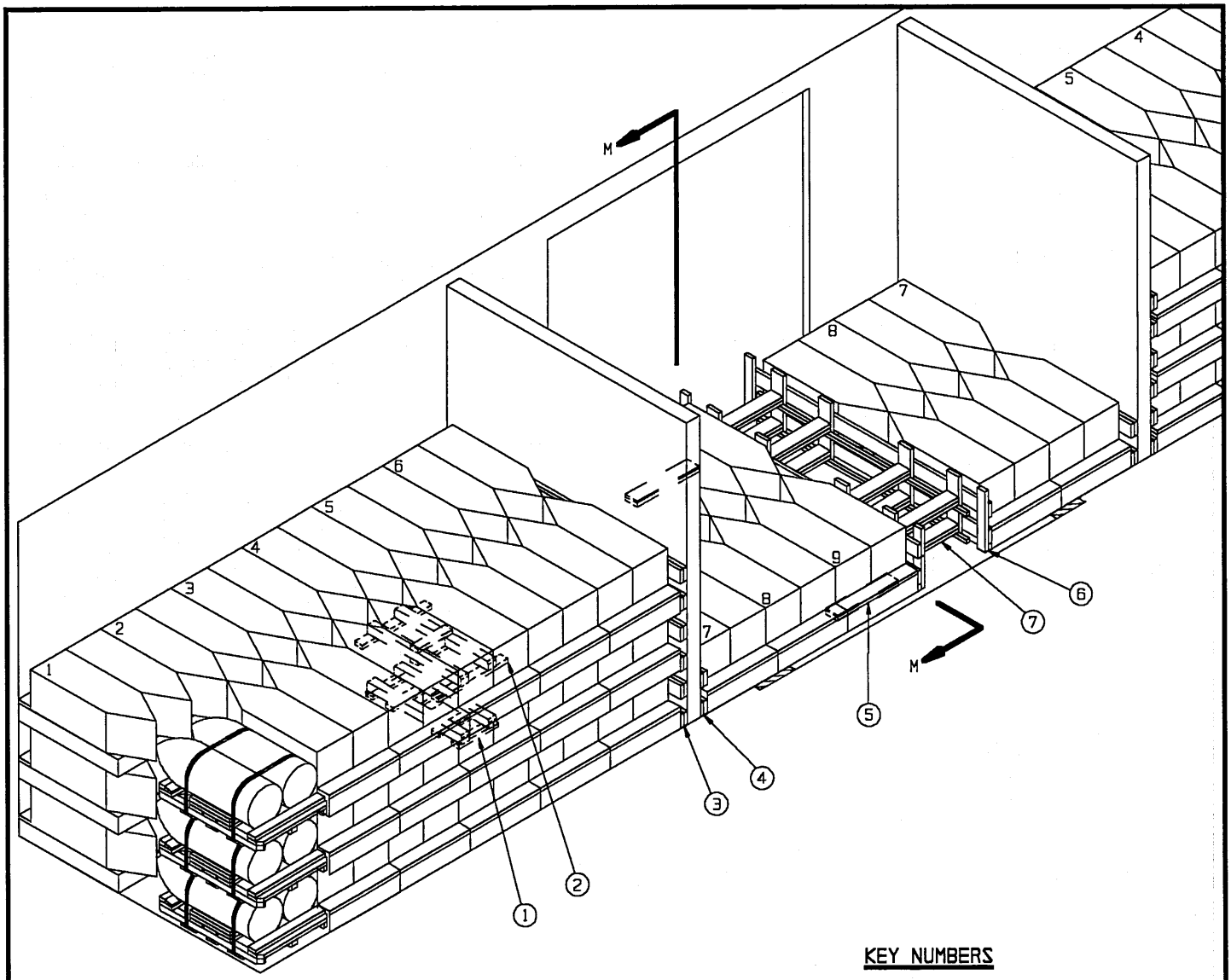
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	434	290
2" X 6"	390	390
4" X 4"	198	264
NAILS	**NO. REQD**	**POUNDS**
10d (3")	656	10-1/4
12d (3-1/4")	320	5-1/2
16d (3-1/2")	288	6-1/4
40d (5")	96	5-3/4

* BASED ON A PALLET UNIT WEIGHT OF 1,575 POUNDS.

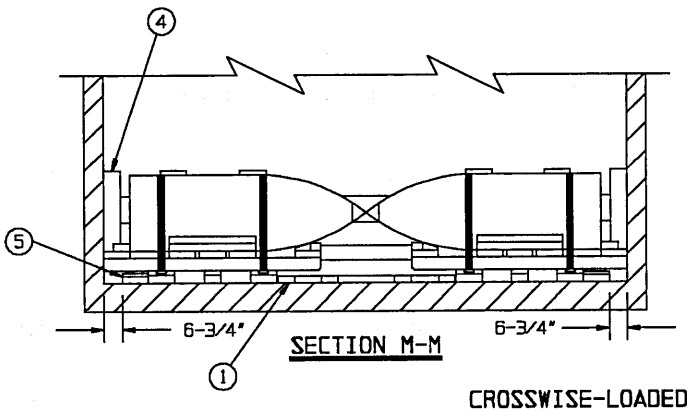
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	80	126,000 LBS *
DUNNAGE		2,366 LBS
TOTAL WEIGHT		128,366 LBS (APPROX)

CROSSWISE-LOADED CONICAL NOSE
80-UNIT LOAD IN A 50'-6" LONG BY 8'-11" WIDE BOXCAR (MECHANICAL)



ISOMETRIC VIEW



SECTION M-M

KEY NUMBERS

① FLOOR-LINE ANTI-SWAY BRACE (17 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 49 AND THE "SECTION M-M" VIEW AT LEFT. PRE-POSITION AS SHOWN IN THE "POSITION FOR ANTI-SWAY BRACE B" DETAIL ON PAGE 23. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.

② UPPER-LAYER ANTI-SWAY BRACE (24 REQD). SEE THE "ANTI-SWAY BRACE C" DETAIL ON PAGE 49. POSITION ON TOP OF THE BOMBS ON THE ALREADY-POSITIONED PALLETS PRIOR TO LOADING THE NEXT LAYER OF PALLETS. SEE THE "POSITION FOR ANTI-SWAY BRACE C" DETAIL ON PAGE 23 FOR GUIDANCE.

③ LOAD BEARING GATE FOR THE 3-HIGH PORTION OF THE LOAD (2 REQD). SEE THE "LOAD BEARING GATE B" DETAIL ON PAGE 56. POSITION BETWEEN THE LADING AND A LOAD DIVIDER BULKHEAD. SEE SPECIAL NOTE 4 ON PAGE 37.

④ LOAD BEARING GATE FOR THE 1-HIGH PORTION OF THE LOAD (2 REQD). SEE THE "LOAD BEARING GATE B" DETAIL ON PAGE 56. POSITION BETWEEN A LOAD DIVIDER BULKHEAD AND THE LADING.

⑤ SIDE BLOCKING, 2" X 6" X 28" AND 1" X 6" X 28" (6 EACH REQD). PRE-POSITION AS SHOWN BY THE "SECTION M-M" VIEW AND NAIL THE 1" X 6" PIECE THRU THE 2" X 6" PIECE INTO THE CAR FLOOR W/6-20d NAILS. SEE SPECIAL NOTE 5 ON PAGE 37.

⑥ CENTER GATE (2 REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 48.

⑦ STRUT, 2" X 6" BY CUT TO FIT (DOUBLED) (8 REQD). LAMINATE W/1-10d NAIL EVERY 6". TOENAIL THE TOP PIECE TO PIECES MARKED ⑥ W/2-12d NAILS AT EACH END. SEE SPECIAL NOTE 9 ON PAGE 37.

CROSSWISE-LOADED FLAT NOSE OR CONICAL NOSE
82-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE BOXCAR EQUIPPED WITH LOAD DIVIDERS

SPECIAL NOTES:

1. AN 82-UNIT LOAD OF CROSSWISE-LOADED CONICAL NOSE BOMBS IS SHOWN. THE DEPICTED PROCEDURE MAY ALSO BE USED FOR PALLET UNITS OF BOMBS EQUIPPED WITH FLAT NOSE PLUGS. NOTE THAT A NARROWER CAR, 8'-9" OR WIDER, CAN BE USED WHEN SHIPPING BOMBS HAVING FLAT NOSE PLUGS.

2. A 50'-6" LONG BY 9'-4" WIDE CUSHIONED BOXCAR EQUIPPED WITH LOAD DIVIDERS IS SHOWN. CARS OF OTHER LENGTHS AND WIDTHS MAY BE USED.

3. THE 82-UNIT LOAD SHOWN REQUIRES A CAR HAVING A LOAD LIMIT OF AT LEAST 133,500 POUNDS.

4. A LOAD BEARING GATE MUST BE INSTALLED BETWEEN THE PALLET UNITS AND A LOAD DIVIDER BULKHEAD IN ORDER TO DISTRIBUTE THE FORCES ACROSS THE FACE OF THE BULKHEAD. A GATE CONSTRUCTED OF DIMENSIONAL LUMBER IS SHOWN IN THE LOAD VIEW. HOWEVER, IF 1/2" OR THICKER PLYWOOD IS AVAILABLE, AND IF DESIRED, A PLYWOOD LOAD BEARING GATE MAY BE USED IN LIEU OF THE ONE DEPICTED. SEE THE "ALTERNATIVE LOAD BEARING GATE B" DETAIL ON PAGE 56.

5. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNITS WHICH ARE COMPLETELY IN THE DOOR OPENING OR WHICH EXTEND INTO THE DOOR OPENING BY ONE-HALF OR MORE OF THE UNIT LENGTH. DOORWAY PROTECTION FOR THE DEPICTED LOAD IS PROVIDED BY THE SIDE BLOCKING, PIECE MARKED ⑤. PIECE MARKED ⑤ IS APPLICABLE FOR USE IN CARS HAVING EITHER PLUG TYPE OR SLIDING TYPE DOORS. IF DESIRED IN CARS HAVING SLIDING TYPE DOORS, THE WOODEN GATE TYPE DOORWAY PROTECTION MAY BE USED. SEE THE "DOORWAY PROTECTION B" DETAIL ON PAGE 48.

6. A CAR EQUIPPED WITH 10'-0" WIDE PLUG TYPE DOORS IS SHOWN. CARS WITH WIDER, NARROWER, OR STAGGERED DOORS MAY BE USED. THE PROCEDURES ARE ALSO APPLICABLE FOR CARS EQUIPPED WITH SLIDING DOORS.

7. A LOAD SHOULD BE DESIGNED SO THAT THE LENGTH OF THE STRUTS, PIECE MARKED ⑦ IS LESS THAN 48". IN THE EVENT THIS IS NOT POSSIBLE, HORIZONTAL AND VERTICAL STRUT BRACING MUST BE APPLIED TO THE STRUTS. SEE PIECES MARKED ⑦ AND ⑧ ON PAGE 22 FOR GUIDANCE.

8. THE NORMAL LOADING PATTERN IN A CAR EQUIPPED WITH LOAD DIVIDERS IS TO ONLY LOAD FROM THE CAR ENDWALL TO THE LOAD DIVIDER BULKHEAD IN FULL, EVEN LAYERS IN BOTH ENDS OF THE CAR. LOADING BETWEEN THE LOAD DIVIDER BULKHEADS IS SHOWN ONLY TO DEPICT A TYPICAL SITUATION. LOADING BETWEEN THE BULKHEADS PROVIDES A METHOD OF OBTAINING A LOAD QUANTITY WHICH CANNOT BE READILY ACHIEVED BY ADJUSTING THE QUANTITIES IN THE ENDS OF THE LOAD, AND THEREFORE SHOULD NOT BE OF A QUANTITY EQUAL TO THE QUANTITY IN A LOAD UNIT.

9. IF THE LOAD LIMIT OF A CAR PERMITS, A LOAD MAY BE INCREASED BY ADDING A LOAD UNIT IN ONE OR BOTH ENDS OF THE CAR. THE LOAD LIMIT MUST BE AT LEAST 139,800 POUNDS IF A LOAD UNIT OF SIX BOMBS IS ADDED TO THE LOAD IN THE NEAR END FOR A LOAD QUANTITY OF EIGHTY-SIX BOMBS. IF ANOTHER LOAD UNIT OF SIX IS ADDED IN THE OPPOSITE END, FOR A LOAD QUANTITY OF 90 BOMBS, A LOAD LIMIT OF 144,200 POUNDS OR GREATER IS REQUIRED.

10. A PALLET UNIT CAN BE OMITTED FROM A LOAD BY INSTALLING TWO LOAD BEARING GATES AND STRUTS SIMILAR TO THE PROCEDURES SHOWN ON PAGE 43. DO NOT OMIT A PALLET UNIT FROM A LOAD UNIT NEXT TO A LOAD DIVIDER BULKHEAD.

11. A STRUT ASSEMBLY, AS DETAILED ON PAGE 57, MUST BE INSTALLED BETWEEN THE LOAD DIVIDER BULKHEADS IF THE LOAD IN EITHER END OF THE CAR WEIGHS 50,000 POUNDS OR MORE. THE STRUT ASSEMBLY IS NOT REQUIRED WHEN PALLET UNITS ARE LOADED, BLOCKED, AND BRACED BETWEEN THE LOAD DIVIDER BULKHEADS AS SHOWN.

* BASED ON A PALLET UNIT WEIGHT OF 1,575 POUNDS.

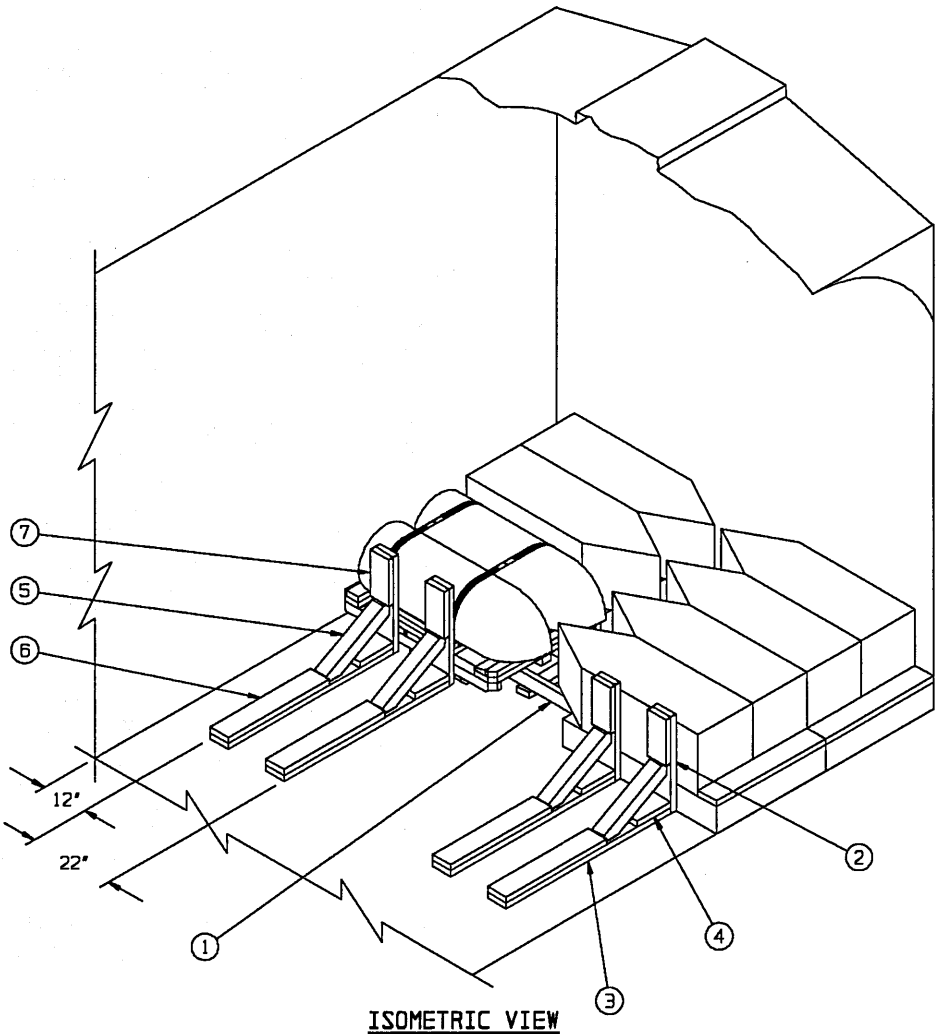
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	82	129,150 LBS *
DUNNAGE		2,253 LBS
TOTAL WEIGHT		131,403 LBS (APPROX)

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	15	8
2" X 3"	23	12
2" X 4"	360	240
2" X 6"	481	481
4" X 4"	119	159
NAILS	**NO. REQD**	**POUNDS**
10d (3")	528	8-1/4
12d (3-1/4")	372	6-1/4
16d (3-1/2")	252	5-1/2
20d (4")	36	1-1/2
40d (5")	132	8

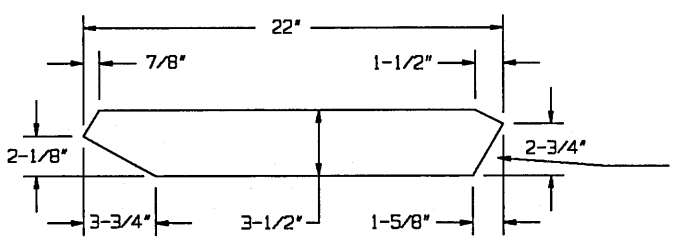
CROSSWISE-LOADED FLAT NOSE OR CONICAL NOSE
82-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOXCAR EQUIPPED WITH LOAD DIVIDERS



ISOMETRIC VIEW

SPECIAL NOTES:

1. A 4-UNIT LOAD IS SHOWN IN A 9'-4" WIDE CONVENTIONAL BOXCAR. OTHER WIDTH CARS MAY BE USED, PROVIDING THEY ARE AT LEAST 9'-2-1/2" WIDE.
2. BOMBS EQUIPPED WITH CONICAL NOSE PLUGS ARE SHOWN IN THE LOAD VIEW. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR SHIPMENT OF BOMBS EQUIPPED WITH THE FLAT TYPE NOSE PLUGS. NOTE THAT A NARROWER CAR, 8'-9" OR WIDER, CAN BE USED WHEN SHIPPING BOMBS HAVING FLAT NOSE PLUGS.
3. THESE OUTLOADING PROCEDURES DEPICT THE USE OF KNEE BRACES FOR THE BLOCKING AND BRACING OF A PARTIAL 1-LAYER LOAD.
4. A 4-UNIT LOAD IS SHOWN AS TYPICAL. THE QUANTITY MAY BE ADJUSTED TO SUIT THE NUMBER OF UNITS TO BE SHIPPED. IF AN UNEVEN QUANTITY IS TO BE TRANSPORTED, SIDE BLOCKING MUST BE INSTALLED TO BRACE THE ODD UNIT. SEE PIECE MARKED ④ ON PAGE 40 FOR GUIDANCE.
5. TWO KNEE BRACES ARE ADEQUATE FOR RETAINING NOT MORE THAN FIVE PALLET UNITS. NOT LESS THAN TWO BRACES WILL BE USED AT A BLOCKING STATION; BRACES MUST ALWAYS BE USED IN PAIRS (4 BRACES OR 2 PAIR ARE SHOWN ABOVE).



BRACE

KEY NUMBERS

① ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 49. PRE-POSITION AS SHOWN IN THE "POSITION FOR ANTI-SWAY BRACE B" DETAIL ON PAGE 23.

② VERTICAL PIECE, 2" X 6" X 25" (4 REQD). LOCATE AS SHOWN BY THE DIMENSIONS BESIDE THE ISOMETRIC VIEW.

③ FLOOR CLEAT, 2" X 6" X 49" (4 REQD). ALIGN WITH PIECE MARKED ②. NAIL TO THE CAR FLOOR W/9-16d NAILS. SEE GENERAL NOTE "L" ON PAGE 2.

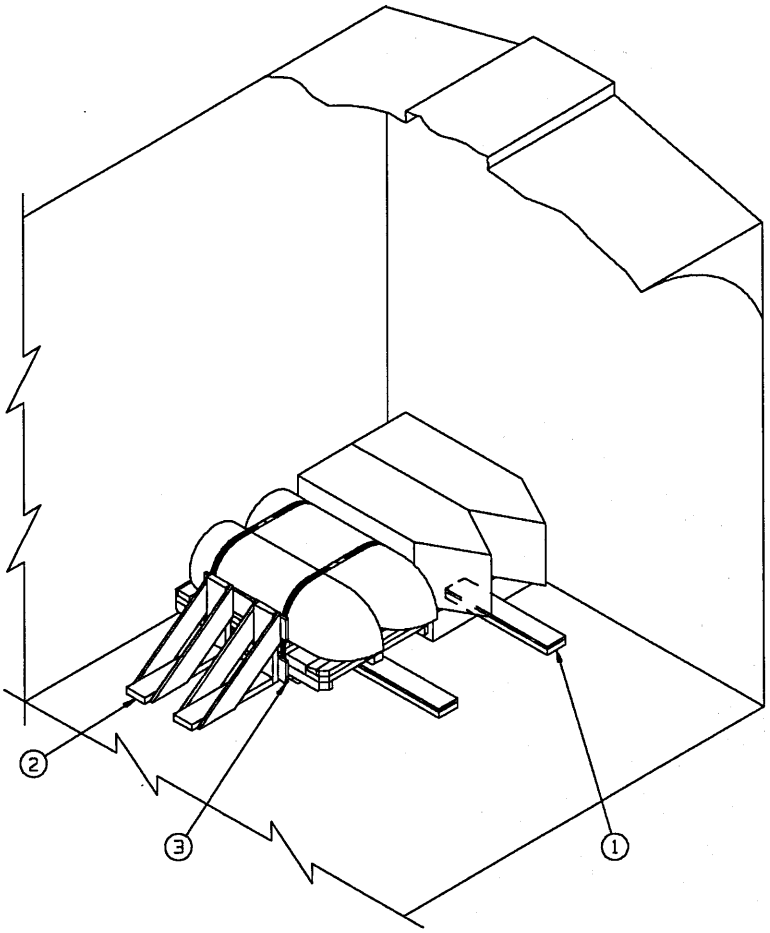
④ SUPPORT CLEAT, 2" X 6" X 10" (4 REQD). NAIL TO PIECE MARKED ③ W/4-16d NAILS. TOENAIL TO PIECE MARKED ② W/2-12d NAILS.

⑤ BRACE, 4" X 4" X 22" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO PIECES MARKED ② AND/OR ③ W/2-16d NAILS AT EACH END. SEE SPECIAL NOTE 5 AT LEFT.

⑥ BACK-UP CLEAT, 2" X 6" X 30" (4 REQD). POSITION AGAINST PIECE MARKED ⑤ AND NAIL TO PIECE MARKED ③ W/6-40d NAILS.

⑦ HOLD-DOWN CLEAT, 2" X 6" X 12" (4 REQD). POSITION AGAINST PIECE MARKED ⑤ AND NAIL TO PIECE MARKED ② W/5-10d NAILS.

CROSSWISE-LOADED FLAT NOSE OR CONICAL NOSE, TYPICAL LCL, 4-UNIT LOAD (KNEE BRACE METHOD)



ISOMETRIC VIEW

SPECIAL NOTES:

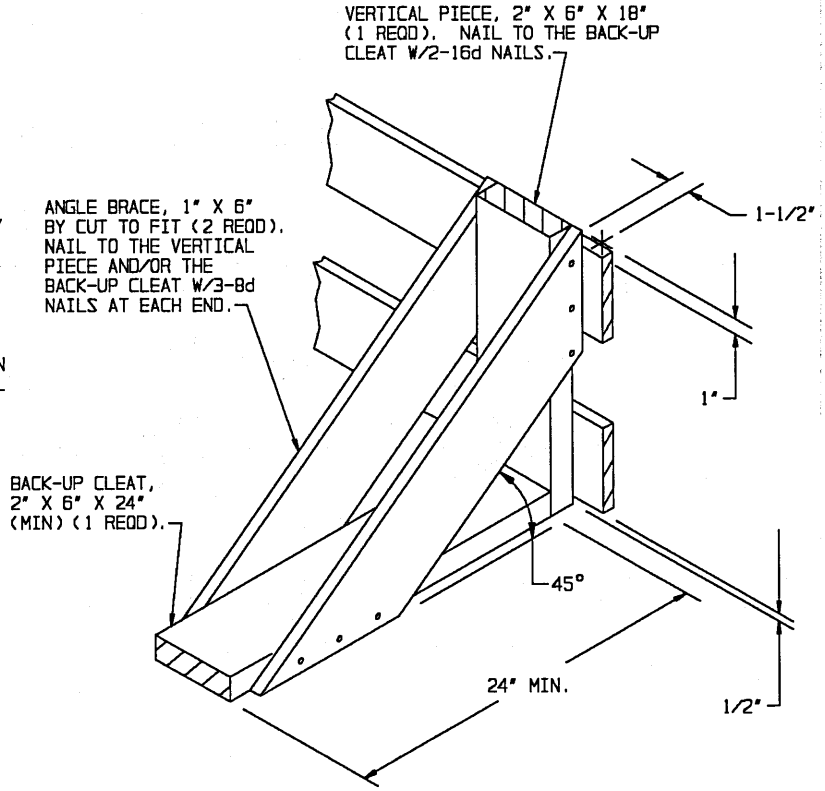
1. A 2-UNIT LOAD IS SHOWN IN AN 8'-6" WIDE CONVENTIONAL BOXCAR. HOWEVER, ANY WIDTH CAR CAN BE USED FOR THE 1-WIDE OUTLOADING DEPICTED.
2. EACH LCL BRACE AS APPLIED FOR LONGITUDINAL BRACING WILL SUPPORT 2,000 POUNDS OF LADING. A MINIMUM OF TWO BRACES MUST BE USED FOR LONGITUDINAL BRACING.
3. THE BLOCKING PROCEDURES SHOWN ON THIS PAGE ARE RESTRICTED TO LCL SHIPMENTS THAT ARE ONLY ONE LAYER IN HEIGHT.
4. BOMBS EQUIPPED WITH CONICAL NOSE PLUGS ARE SHOWN IN THE LOAD VIEW. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR SHIPMENTS OF BOMBS EQUIPPED WITH THE FLAT TYPE NOSE PLUGS.

KEY NUMBERS

(1) SIDE BLOCKING, 2" X 6" X 30" AND 1" X 6" X 30" (1 EACH REQD). POSITION UNDER THE CENTER STRINGER OF THE PALLET AND SO AS TO BE IN CONTACT WITH A SKID. NAIL THE 1" X 6" PIECE THRU THE 2" X 6" PIECE INTO THE CAR FLOOR W/3-20d NAILS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.

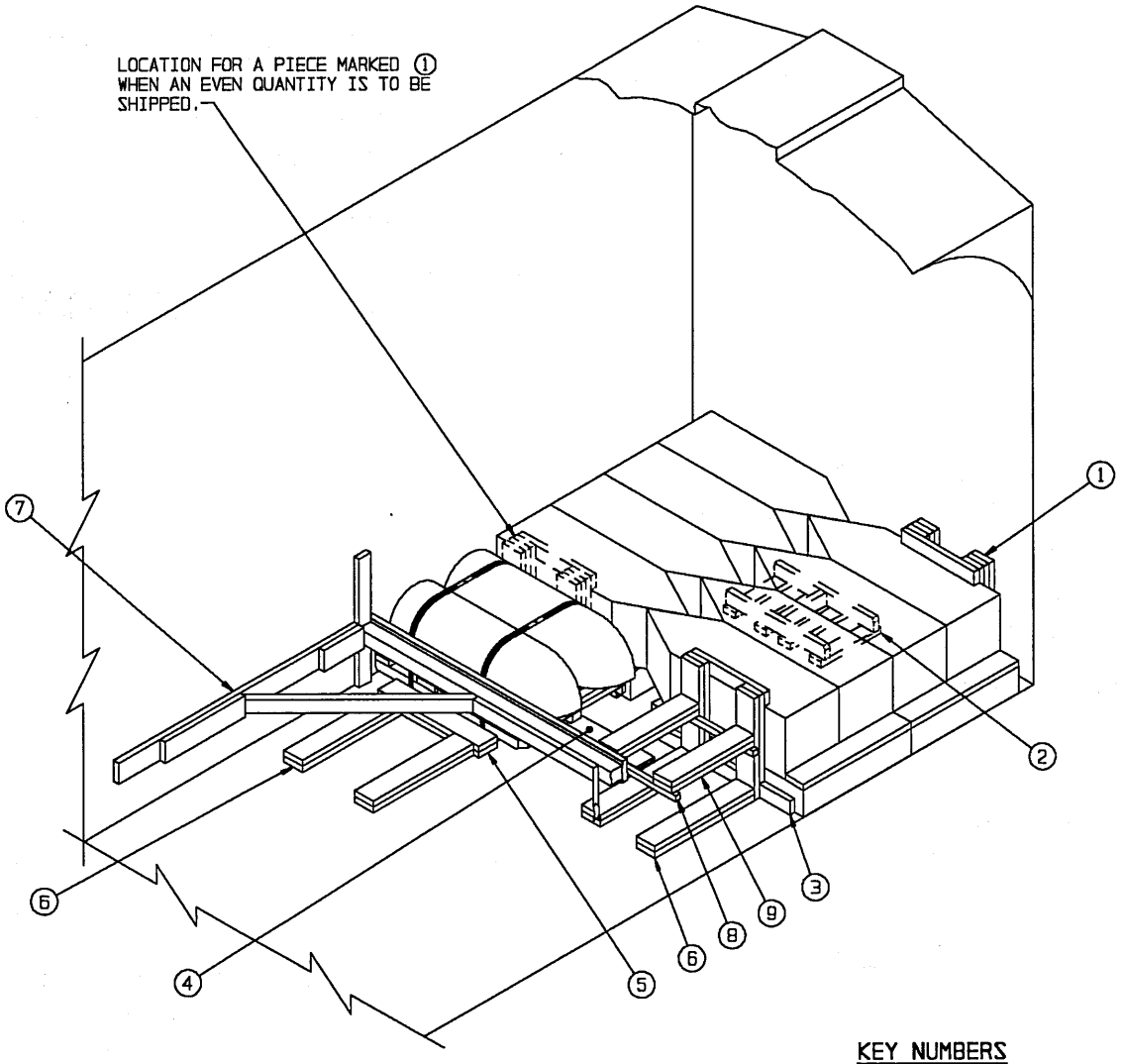
(2) LCL BRACE (2 REQD). SEE THE DETAIL AT RIGHT AND SPECIAL NOTE 2 ABOVE. NAIL TO THE CAR FLOOR W/7-16d NAILS.

(3) HORIZONTAL PIECE, 1" X 6" X 24" (2 REQD). POSITION AT THE HEIGHTS SHOWN BY THE LCL BRACE DETAIL. NAIL TO THE VERTICAL BRACES OF THE LCL BRACES W/3-6d NAILS AT EACH JOINT PRIOR TO POSITIONING AGAINST THE LADING.



LCL BRACE

CROSSWISE-LOADED FLAT NOSE OR CONICAL NOSE, TYPICAL LCL, 2-UNIT LOAD (LCL BRACE METHOD)



ISOMETRIC VIEW

SPECIAL NOTES:

1. A 5-UNIT LOAD IS SHOWN IN AN 9'-4" WIDE CONVENTIONAL BOXCAR. OTHER WIDTH CARS MAY BE USED PROVIDING THEY ARE AT LEAST 9'-2-1/2" WIDE.
2. THESE OUTLOADING PROCEDURES DEPICT THE USE OF A "K-BRACE" IN CONJUNCTION WITH HEADERS AND BACK-UP CLEATS FOR THE BLOCKING AND BRACING OF A PARTIAL 1-LAYER LOAD.
3. BOMBS EQUIPPED WITH CONICAL NOSE PLUGS ARE SHOWN IN THE LOAD VIEW. THE DEPICTED PROCEDURES SHOULD NOT BE USED FOR SHIPMENT OF BOMBS EQUIPPED WITH THE FLAT TYPE NOSE PLUGS, UNLESS THE CAR IS NARROWER THAN 8'-9". IN CARS WHICH ARE 8'-9" OR WIDER, PALLET UNITS OF BOMBS EQUIPPED WITH THE FLAT TYPE NOSE PLUGS SHOULD BE LOADED DIRECTLY OPPOSITE EACH OTHER (NO OFFSET). OMIT PIECE MARKED ①.
4. A 5-UNIT LOAD IS SHOWN AS TYPICAL TO INDICATE THE METHOD OF BLOCKING AND BRACING AN ODD QUANTITY. THESE PROCEDURES ARE ALSO APPLICABLE FOR SHIPMENT OF THREE UNITS. IF TWO OR FOUR UNITS ARE BEING SHIPPED, AN ADDITIONAL PIECE MARKED ①, AS SHOWN BY THE PHANTOM LINES, WILL BE REQUIRED. OMIT PIECE MARKED ③.

KEY NUMBERS

① GATE ASSEMBLY (1 REQD). SEE THE "GATE ASSEMBLY B" DETAIL ON PAGE 50. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTES 3 AND 4 AT LEFT.

② ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 49.

③ GATE ASSEMBLY (1 REQD). SEE THE "GATE ASSEMBLY C" DETAIL ON PAGE 50.

④ SIDE BLOCKING, 2" X 6" X 30" AND 1" X 6" X 30" (1 EACH REQD). POSITION UNDER THE CENTER STRINGER OF THE PALLET AND SO AS TO BE IN CONTACT WITH A SKID. NAIL THE 1" X 6" PIECE THRU THE 2" X 6" PIECE INTO THE CAR FLOOR W/3-20d NAILS.

⑤ HEADER, 2" X 6" X 30" (DOUBLED) (1 REQD). POSITION SO AS TO CENTER ON PALLET SKIDS AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/5-40d NAILS.

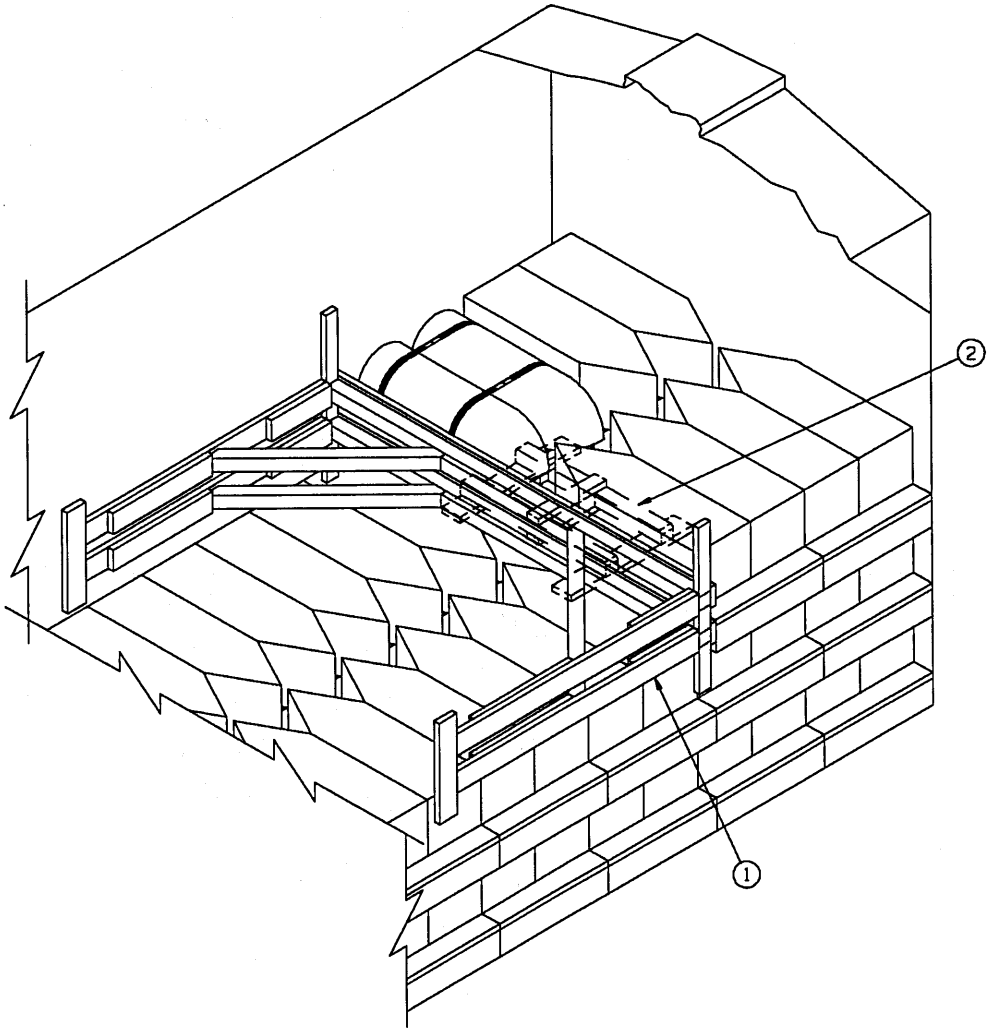
⑥ BACK-UP CLEAT, 2" X 6" X 30" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/6-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/6-40d NAILS. AS APPLICABLE, TOENAIL THE TOP PIECE TO PIECE MARKED ③ W/2-12d NAILS.

⑦ K-BRACE (1 REQD). SEE THE "TYPE "A" K-BRACE" DETAIL ON PAGE 45. SEE SPECIAL NOTE 5 AT LEFT.

⑧ STRUT LEDGER, 2 X 2" X 24" (2 REQD). POSITION AT HEIGHTS SPECIFIED BY THE "GATE ASSEMBLY C" DETAIL ON PAGE 50. NAIL TO PIECE MARKED ③ W/2-10d NAILS AT EACH JOINT AND/OR TO PIECE MARKED ⑦ W/4-10d NAILS.

⑨ STRUT, 2" X 6" BY CUT TO FIT (DOUBLED) (2 REQD). LAMINATE W/1-10d NAIL EVERY 6". TOENAIL THE TOP PIECE TO PIECE MARKED ③ AND/OR PIECE MARKED ⑦ W/2-12d NAILS.

CROSSWISE-LOADED FLAT NOSE OR CONICAL NOSE, TYPICAL LCL, 5-UNIT LOAD (K-BRACE METHOD)



ISOMETRIC VIEW

SPECIAL NOTES:

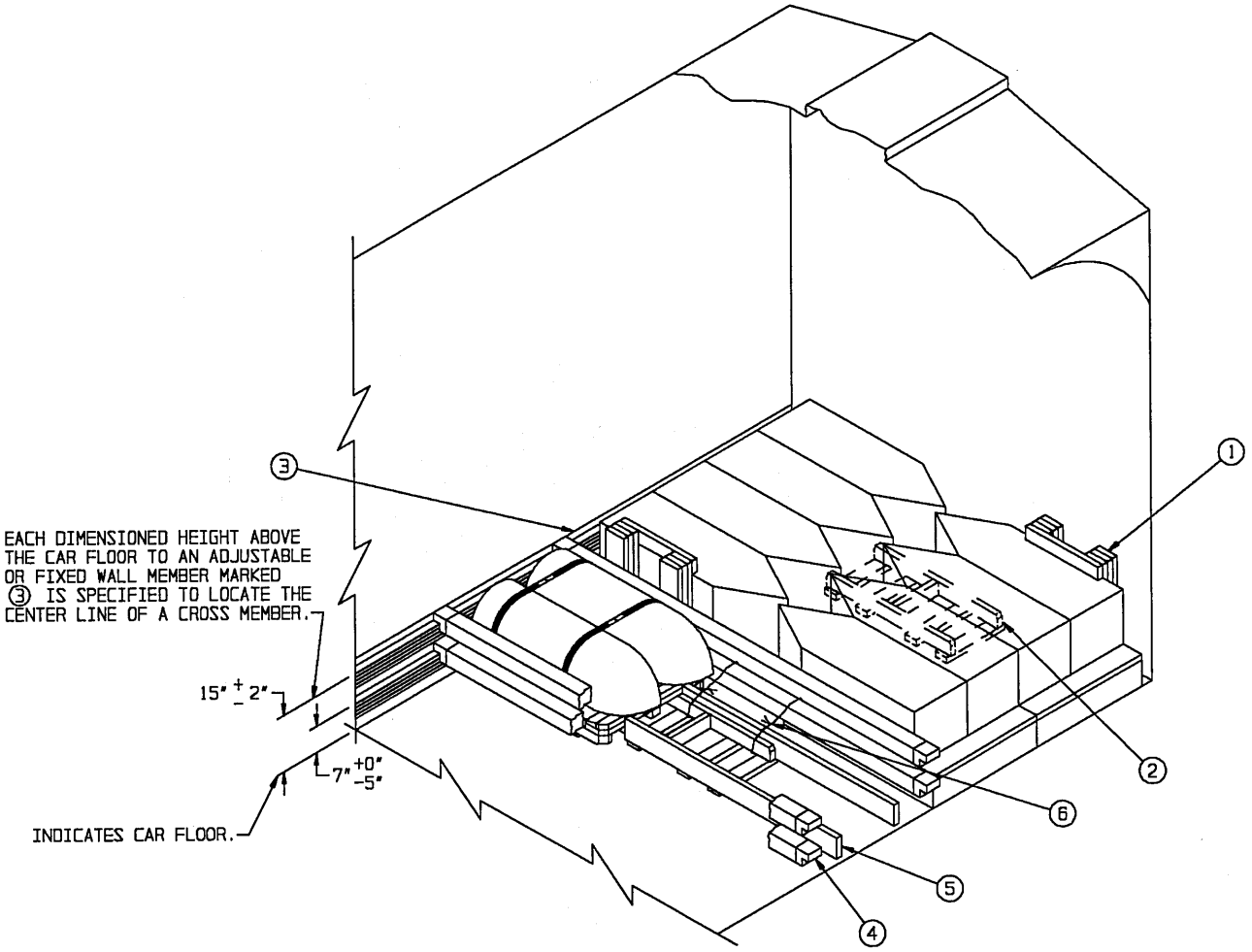
1. THESE OUTLOADING PROCEDURES DEPICT THE USE OF A "K-BRACE ASSEMBLY" FOR BLOCKING A PARTIAL-LAYER LOAD IN A BOXCAR HAVING NAILABLE SIDEWALLS. THIS METHOD MAY BE USED WITH PARTIAL FIRST, SECOND, OR THIRD LAYERS.
2. BOMBS EQUIPPED WITH CONICAL NOSE PLUGS ARE SHOWN IN A CAR WHICH IS WIDER THAN 9'-2". THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR BOMBS EQUIPPED WITH THE FLAT TYPE NOSE PLUGS IN CARS WHICH ARE 8'-9" OR WIDER.
3. FOR A METHOD OF OMITTING A PALLET UNIT, SEE THE PROCEDURES SHOWN ON PAGE 43.
4. THE DEPICTED K-BRACE IS ADEQUATE FOR RETAINING A MAXIMUM PARTIAL-LAYER LOAD OF NOT MORE THAN EIGHT PALLET UNITS.

KEY NUMBERS

(1) K-BRACE (1 REQD). SEE THE "TYPE "B" K-BRACE" DETAIL ON PAGE 46.

(2) ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY BRACE C" DETAIL ON PAGE 49.

CROSSWISE-LOADED FLAT NOSE OR CONICAL NOSE, TYPICAL LCL, PARTIAL-LAYER BRACING METHOD



ISOMETRIC VIEW

SPECIAL NOTES:

1. A 5-UNIT LOAD OF CROSSWISE-POSITIONED BOMBS IS SHOWN IN A 9'-2" WIDE (INSIDE CLEARANCE) BOXCAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS. OTHER WIDTH CARS MAY BE USED.
2. BOMBS EQUIPPED WITH CONICAL NOSE PLUGS ARE SHOWN. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR SHIPMENTS OF BOMBS EQUIPPED WITH THE FLAT TYPE NOSE PLUGS. NOTE THAT A NARROWER CAR, 8'-9" OR WIDER, CAN BE USED WHEN SHIPPING BOMBS HAVING FLAT NOSE PLUGS.
3. IF THE CAR BEING USED IS 9'-2-1/2" OR WIDER, THE PALLETS SHOULD BE LOADED DIRECTLY OPPOSITE EACH OTHER (NOT OFFSET). OMIT PIECE MARKED ①.
4. A 5-UNIT LOAD IS SHOWN AS A TYPICAL METHOD OF BLOCKING AND BRACING AN ODD QUANTITY. THE NUMBER OF UNITS CAN BE ADJUSTED, AS DESIRED. IF AN EVEN QUANTITY IS BEING SHIPPED, PIECES MARKED ⑤ AND ⑥ WILL NOT BE REQUIRED.

KEY NUMBERS

① GATE ASSEMBLY (2 REQD). SEE THE "GATE ASSEMBLY B" DETAIL ON PAGE 50. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.

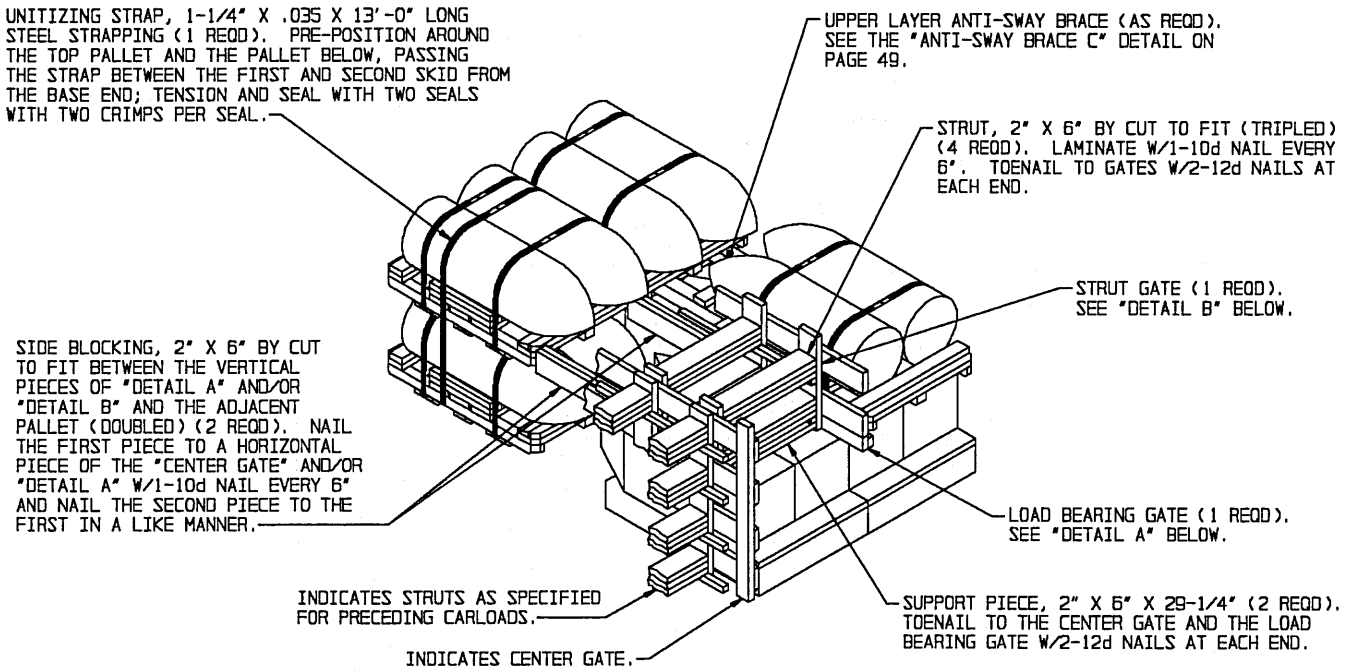
② ANTI-SWAY BRACE (3 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 49. PRE-POSITION AS SHOWN IN THE "POSITION FOR ANTI-SWAY BRACE B" DETAIL ON PAGE 35.

③ WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED ④.

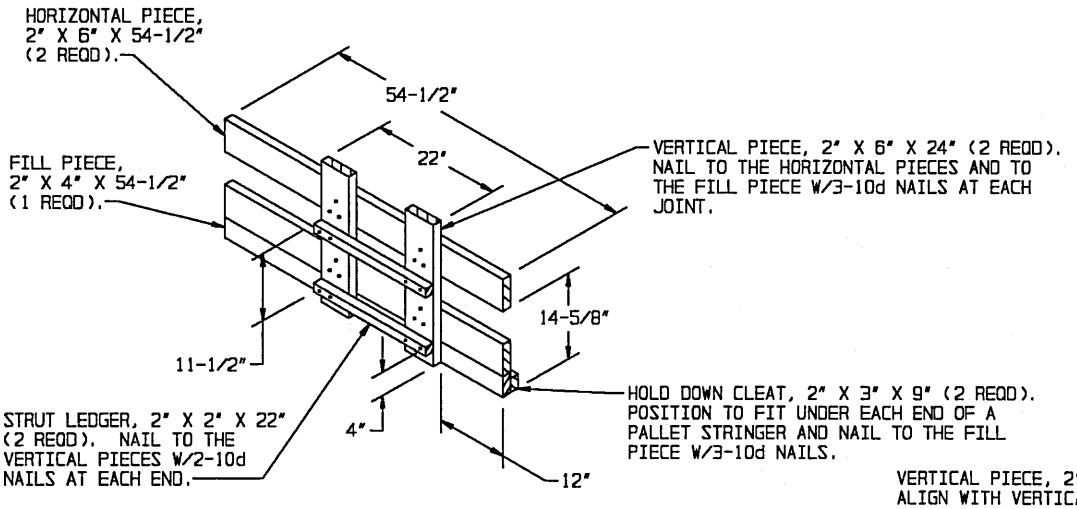
④ CROSS MEMBER (4 REQD). SEE GENERAL NOTE "W" ON PAGE 3.

⑤ SIDE BLOCKING, 2 X 6" BY CUT TO FIT BETWEEN THE PALLET AND THE SIDEWALL OF THE CAR (2 REQD). POSITION AS SHOWN, ON TOP OF SUPPORT PIECES OF PIECE MARKED ② AND NAIL TO PIECE MARKED ② W/5-10d NAILS.

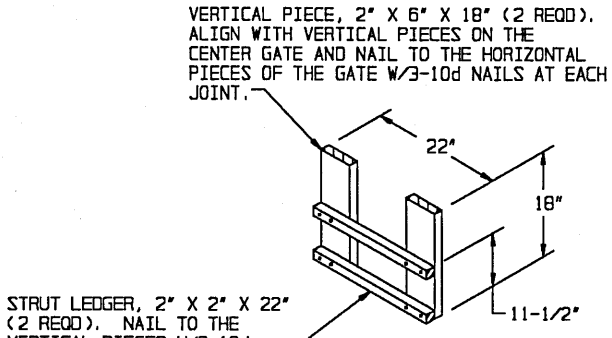
⑥ TIE WIRE, NO. 14 GAGE BLACK ANNEALED WIRE 48" LONG (4 REQD). INSTALL TO ENCIRCLE PIECES MARKED ②, ④, AND ⑤ AND TWIST TAUT.



ISOMETRIC VIEW

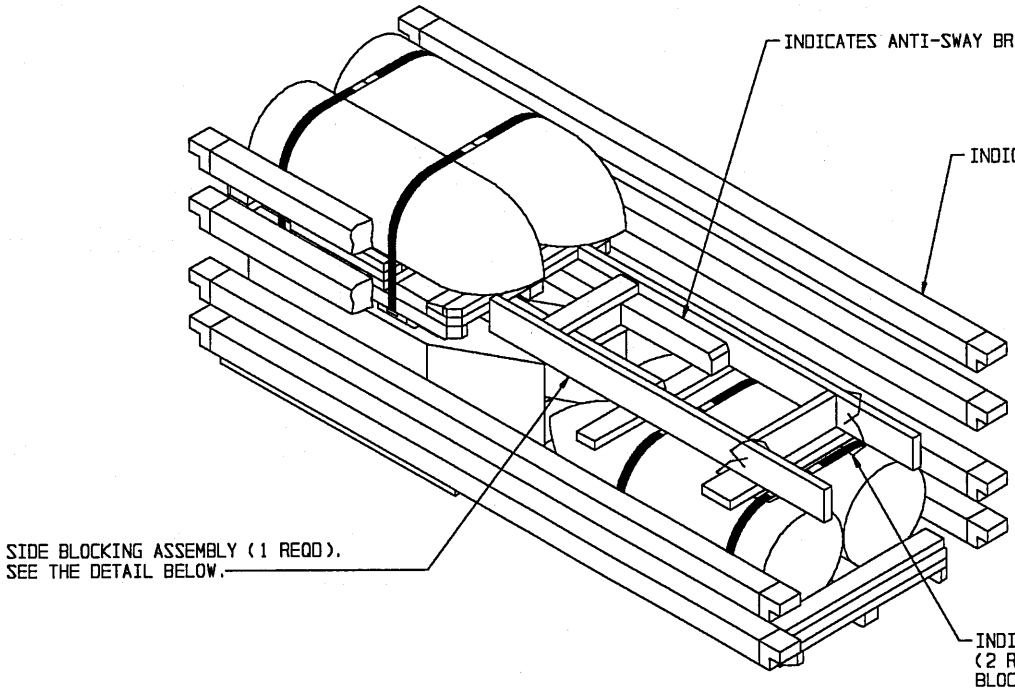


DETAIL A



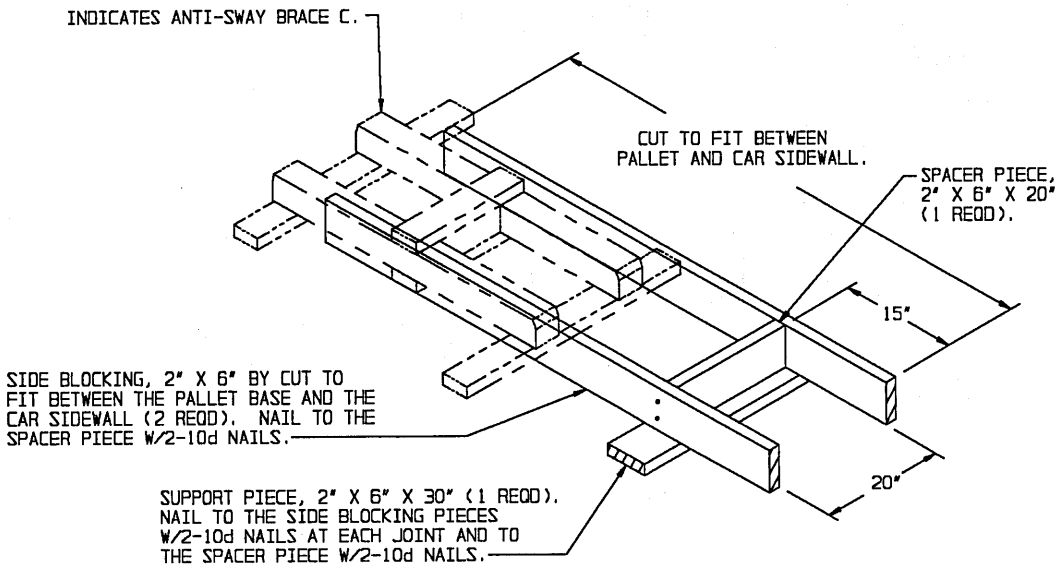
DETAIL B

CROSSWISE-LOADED FLAT NOSE OR CONICAL NOSE, PROVISIONS FOR OMITTED PALLET



ISOMETRIC VIEW

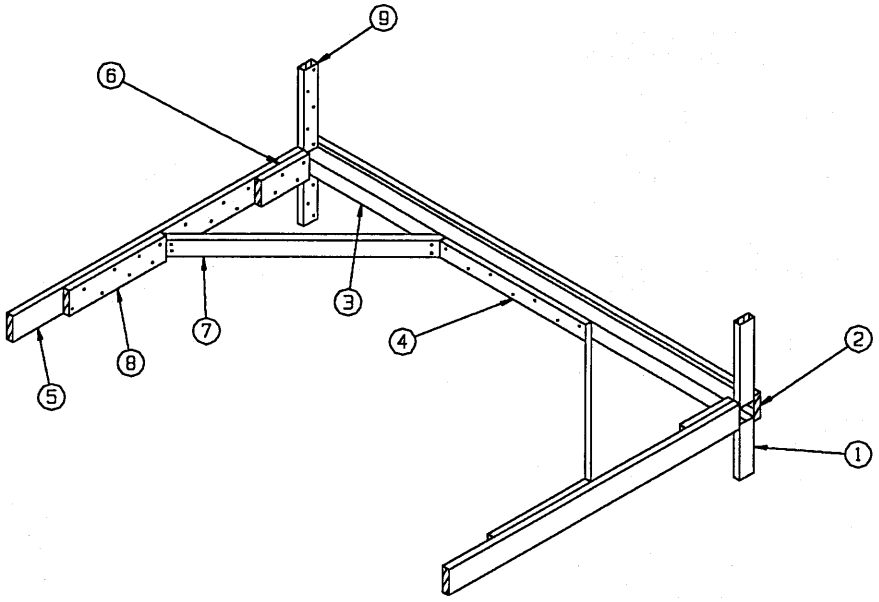
THIS METHOD OF SIDE BLOCKING MAY ONLY BE USED IN UPPER LAYERS OF THE LOAD SHOWN ON PAGE 32.



SIDE BLOCKING ASSEMBLY

CROSSWISE-LOADED FLAT NOSE OR CONICAL NOSE
PROVISIONS FOR OMITTED PALLET IN MECHANICAL BOXCAR

PROJECT FSA 48-65



ISOMETRIC VIEW

A "K-BRACE ASSEMBLY A" AS SHOWN IS ADEQUATE FOR RETAINING A MAXIMUM PARTIAL-LAYER LOAD OF TWO PALLETS; TWO BRACE ASSEMBLIES INSTALLED AGAINST ONE PARTIAL LAYER WILL RETAIN FOUR PALLETS. SEE THE SPECIAL NOTE 2 BELOW.

SPECIAL NOTES:

1. THE TYPE "A" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN TWO PALLET UNITS. IF IT IS NECESSARY TO BLOCK THREE OR FOUR PALLET UNITS, REFER TO THE DETAILS ON PAGE 46 FOR AN APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE.

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

3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ④, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.

4. REFER TO PAGE 40 FOR A TYPICAL INSTALLATION OF A K-BRACE.

KEY NUMBERS

① SUPPORT CLEAT, 2" X 4" X 12" (2 REQD). POSITION VERTICALLY AS SHOWN SO AS TO CENTER PIECES MARKED ② AND ③ ON THE CENTER OF THE BOMB. NAIL TO THE CAR SIDEWALL W/4-12d NAILS.

② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (1 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTE "L" ON PAGE 2.

③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT TO FIT) (1 REQD).

④ CENTER CLEAT, 2" X 4" X 36" (1 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.

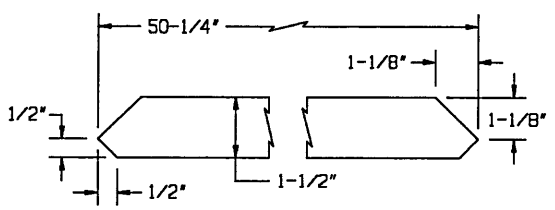
⑤ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (2 REQD). NAIL TO THE CAR SIDEWALL W/16-12d NAILS.

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 END.

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/5-12d NAILS.



DIAGONAL BRACE
2" X 4" MATERIAL

TYPE "A" K-BRACE

PROJECT FSA 48-65

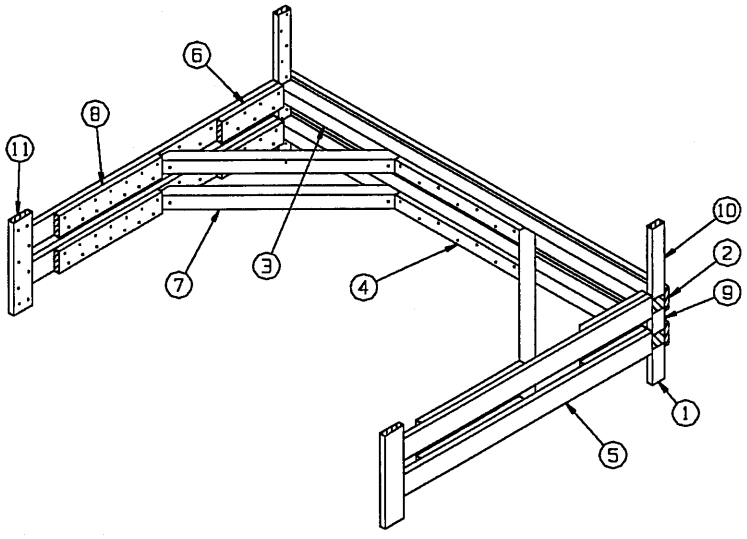
SPECIAL NOTES:

1. THE TYPE "B" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN EIGHT PALLET UNITS. IF IT IS NECESSARY TO BLOCK MORE THAN SIX PALLET UNITS, REFER TO THE DETAILS ON PAGES 28 AND 29 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE. IF ONLY TWO OR FOUR PALLET UNITS ARE TO BE SHIPPED IN THE PARTIAL LAYER, THE TYPE "A" K-BRACE DEPICTED ON PAGE 45 MAY BE USED.

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

3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ④, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.

4. REFER TO PAGE 41 FOR A TYPICAL INSTALLATION OF A K-BRACE.



ISOMETRIC VIEW

KEY NUMBERS

① SUPPORT CLEAT, 2" X 4" X 9" (2 REQD). POSITION VERTICALLY AS SHOWN SO AS TO CENTER THE LOWER PIECES MARKED ② AND ③ ON THE JOINT BETWEEN THE STRINGER AND THE DECK BOARDS ON THE UNITS. NAIL TO THE CAR SIDEWALL W/3-12d NAILS.

② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTE "L" ON PAGE 2.

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

④ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.

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

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

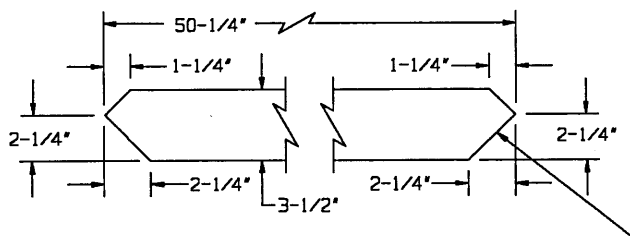
⑦ DIAGONAL BRACE, 4" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL-CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/1-60d NAIL AT EACH END.

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

⑨ SPACER CLEAT, 2" X 4" X 6" (2 REQD). NAIL TO THE CAR SIDEWALL W/2-12d 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 24" (2 REQD). NAIL TO THE CAR SIDEWALL W/8-12d NAILS.

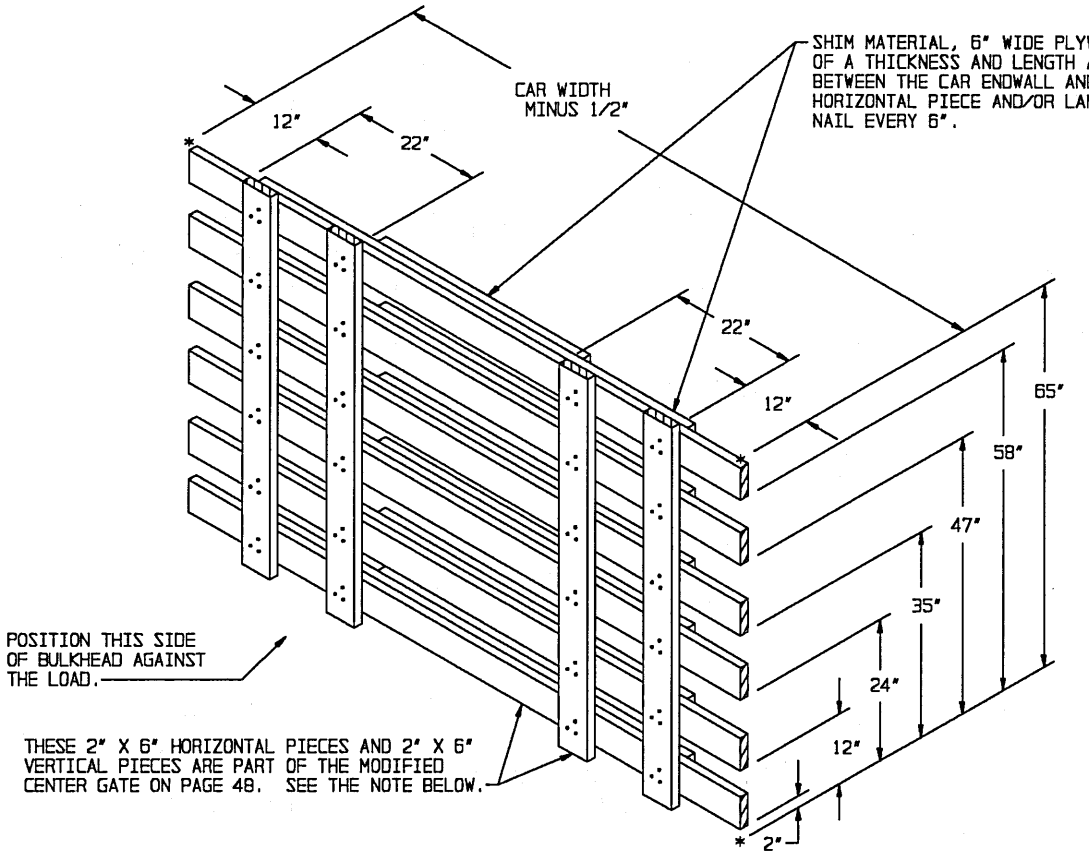


DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

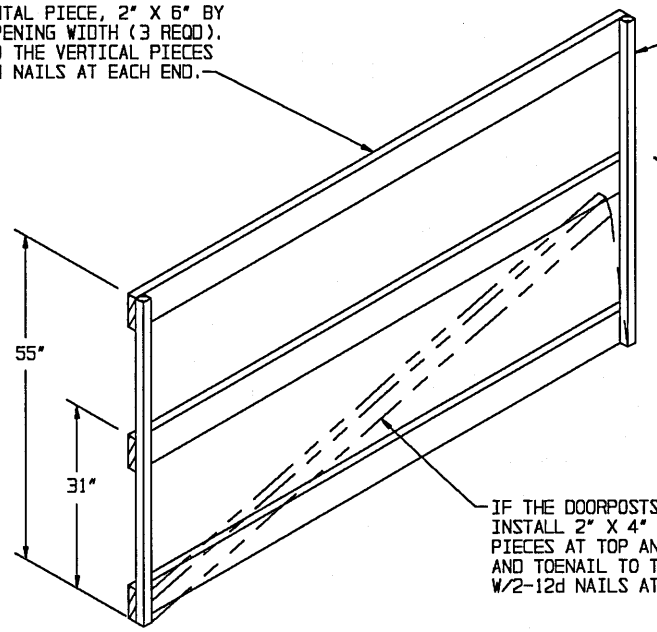
THIS BEARING SURFACE MUST BE POSITIONED SO AS TO BE IN CONTACT WITH A CROSS CAR BRACE, PIECE MARKED ③, OR A HORIZONTAL WALL CLEAT, PIECE MARKED ⑤.

TYPE "B" K-BRACE



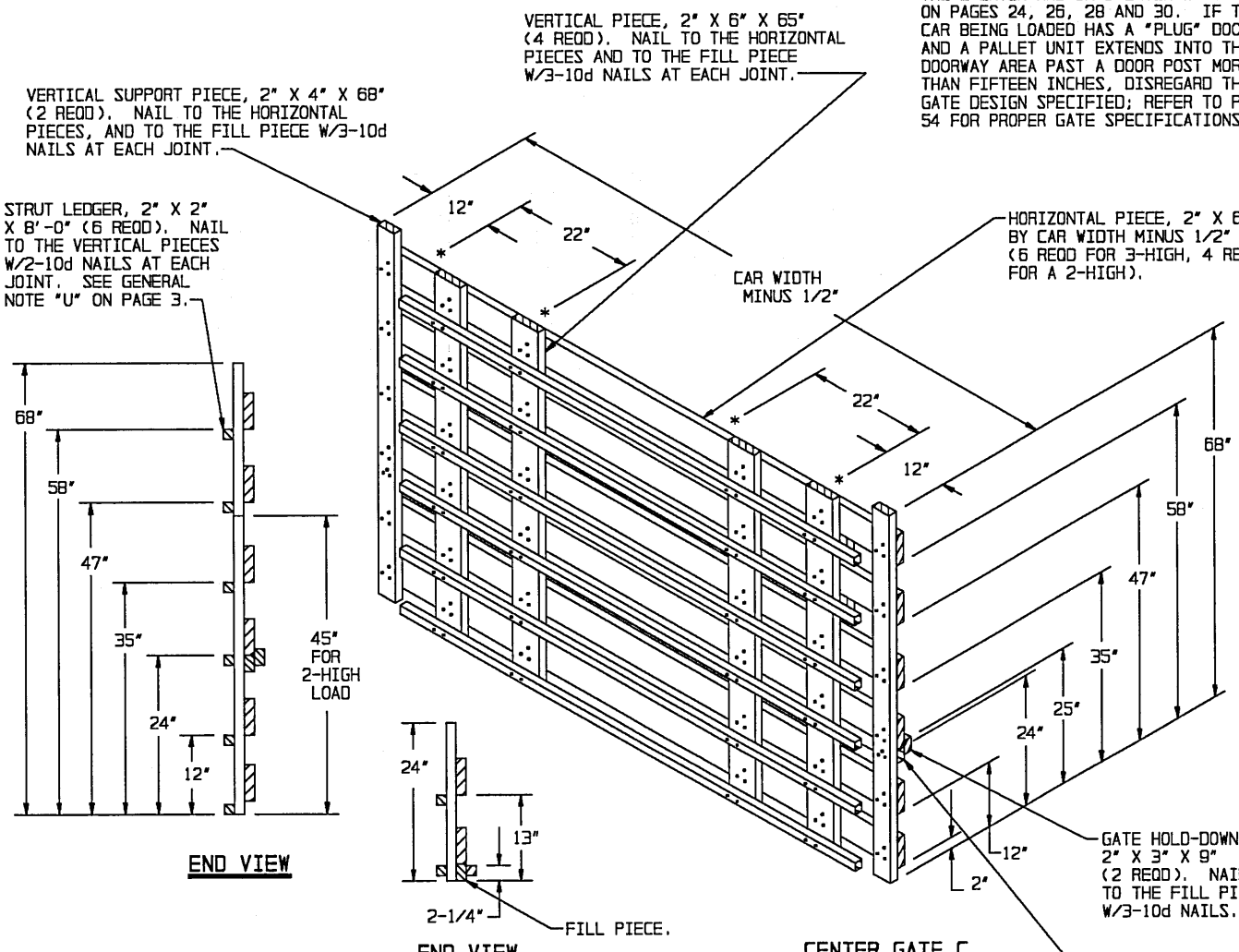
END-OF-CAR BULKHEAD C

NOTE: IF A BOXCAR TO BE LOADED HAS BOWED ENDWALLS WHICH ARE 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. THE BULKHEAD IS APPLICABLE FOR USE AT THE END OF A LOAD IN A CONVENTIONAL BOXCAR, 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. A CENTER GATE FOR A LOAD MAY BE MODIFIED FOR USE AS AN END-OF-CAR BULKHEAD. 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 "C", AS DETAILED ON PAGE 48, IS SHOWN AS TYPICAL.



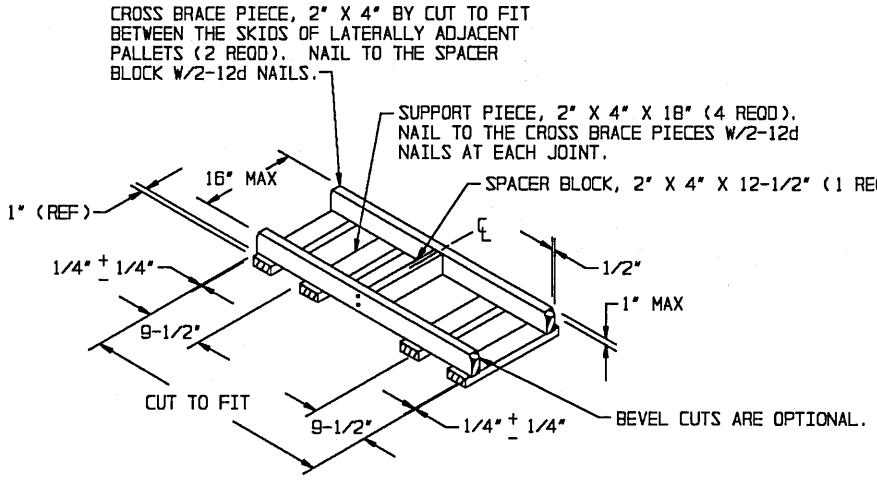
DOORWAY PROTECTION B

NOTE:
CENTER GATE C IS DESIGNED FOR USE IN THE 2-LAYER AND/OR 3-LAYER LOADS SHOWN ON PAGES 24, 26, 28 AND 30. IF THE CAR BEING LOADED HAS A "PLUG" DOOR AND A PALLET UNIT EXTENDS INTO THE DOORWAY AREA PAST A DOOR POST MORE THAN FIFTEEN INCHES, DISREGARD THE GATE DESIGN SPECIFIED; REFER TO PAGE 54 FOR PROPER GATE SPECIFICATIONS.



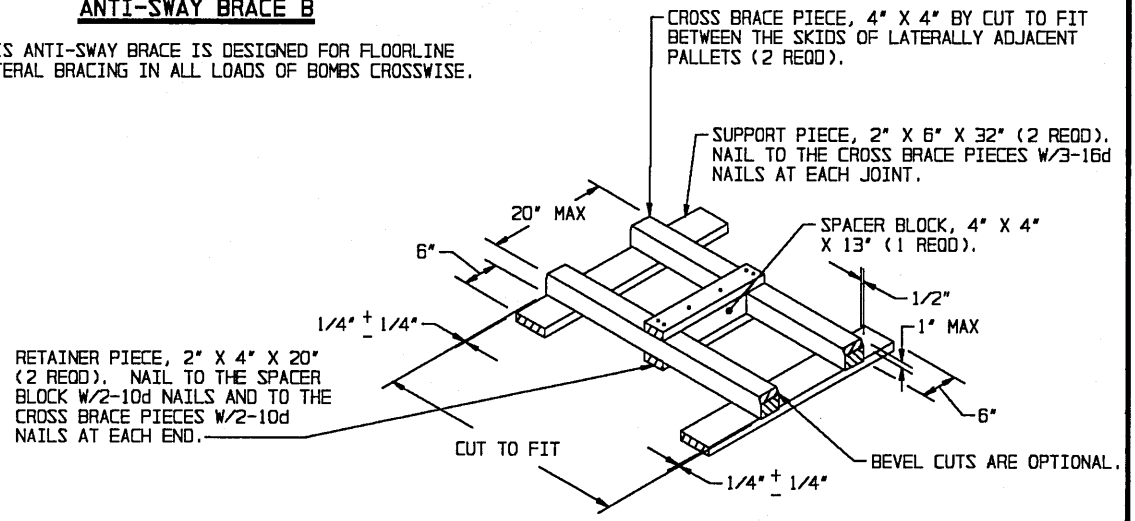
CENTER GATE C

(SEE THE NOTE ABOVE).



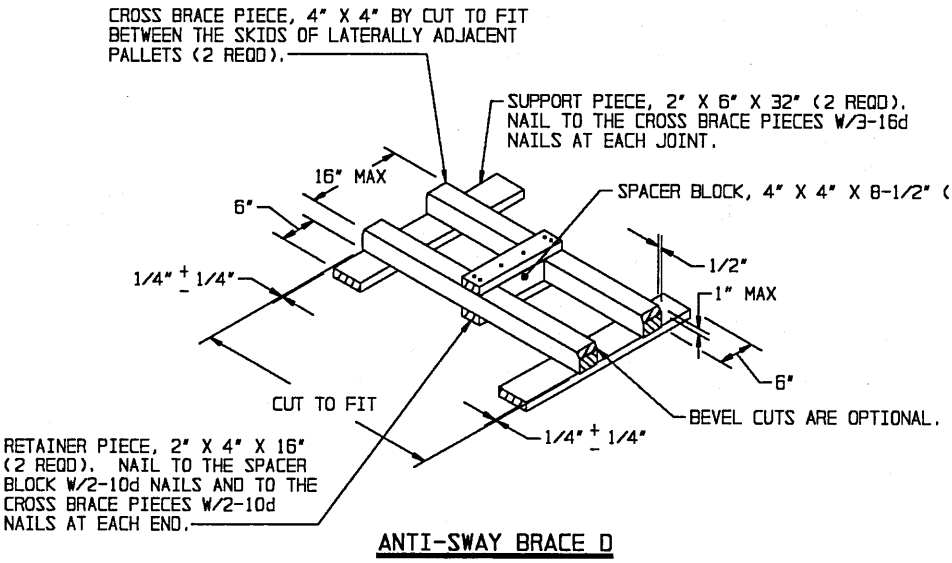
ANTI-SWAY BRACE B

THIS ANTI-SWAY BRACE IS DESIGNED FOR FLOORLINE LATERAL BRACING IN ALL LOADS OF BOMBS CROSSWISE.



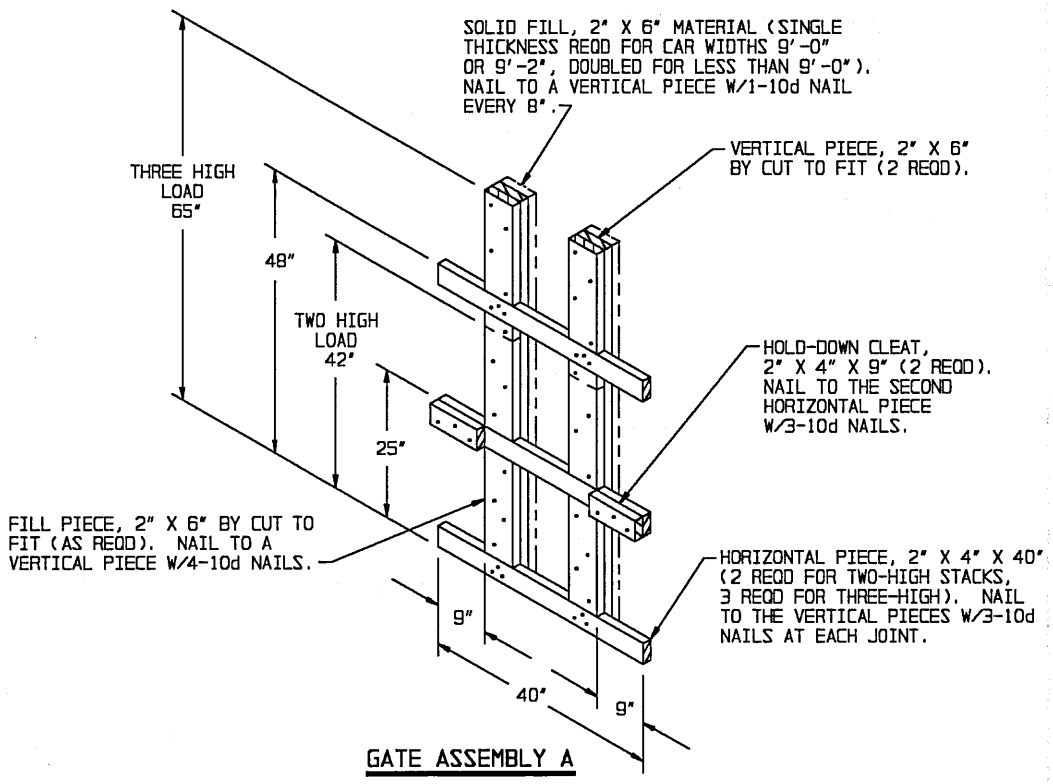
ANTI-SWAY BRACE C

THIS ANTI-SWAY BRACE IS DESIGNED FOR LATERAL BRACING IN A SECOND AND/OR THIRD LAYER OF A BOMBS CROSSWISE LOAD WHEN THE BOMB NOSES ON ONE SIDE OF THE CAR ARE DIRECTLY OPPOSITE FROM THE BOMB NOSES ON THE OTHER SIDE OF THE CAR.



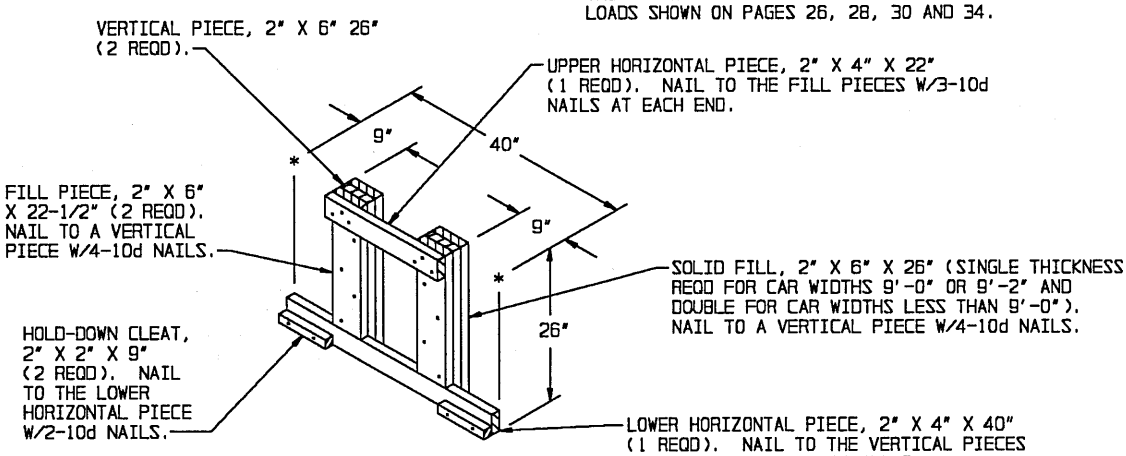
ANTI-SWAY BRACE D

THIS ANTI-SWAY BRACE IS DESIGNED FOR LATERAL BRACING IN A SECOND AND/OR THIRD LAYER OF A BOMBS CROSSWISE LOAD WHEN THE BOMB NOSES ON ONE SIDE OF THE CAR HAVE BEEN OFFSET FROM THE BOMB NOSES ON THE OTHER SIDE OF THE CAR.



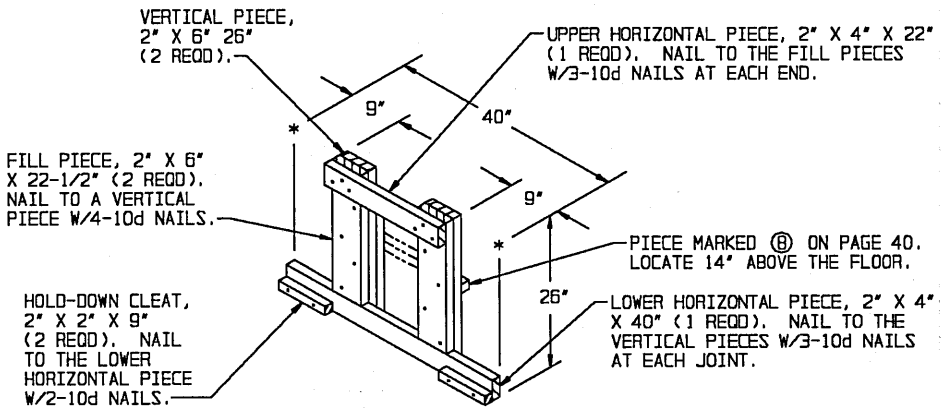
GATE ASSEMBLY A

THIS GATE IS DESIGNED FOR USE IN THE "OFFSET" LOADS SHOWN ON PAGES 26, 28, 30 AND 34.



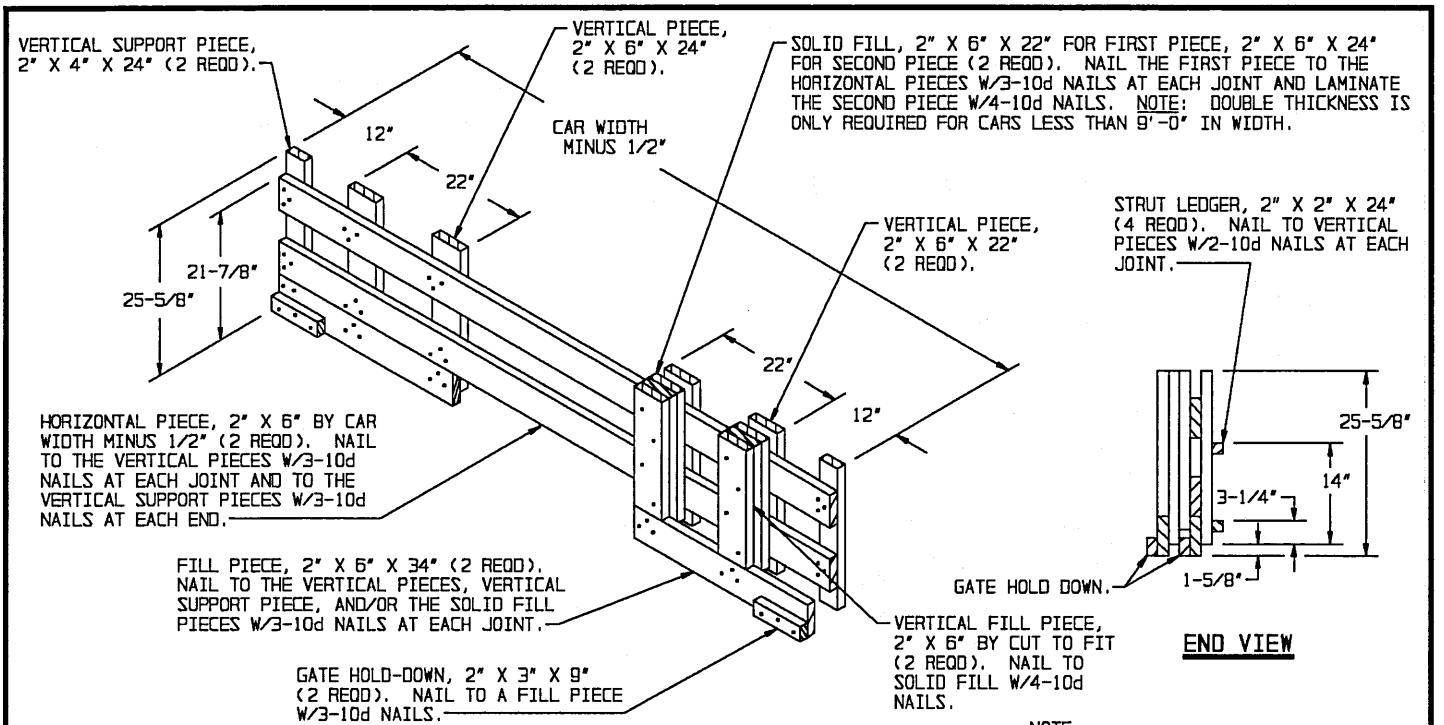
GATE ASSEMBLY B

THIS GATE IS DESIGNED FOR USE IN THE "OFFSET" LOADS SHOWN ON PAGES 40 AND 42.



GATE ASSEMBLY C

THIS GATE IS DESIGNED FOR USE IN THE LOAD SHOWN ON PAGE 40 WHEN A PALLET UNIT IS OMITTED.

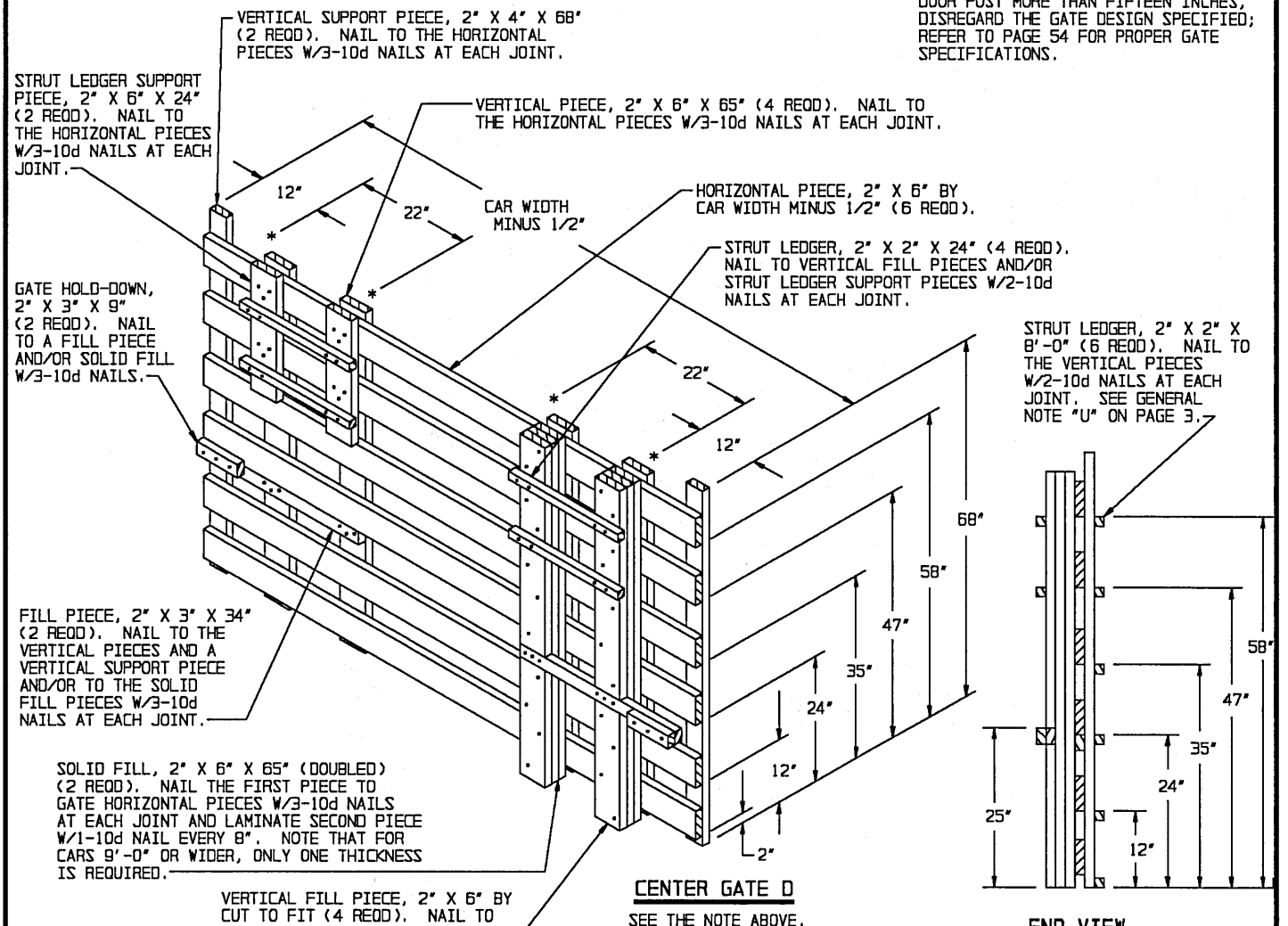


END VIEW

PARTIAL-LAYER GATE B

THIS PARTIAL-LAYER GATE IS DESIGNED FOR USE IN THE LOAD SHOWN ON PAGE 26.

NOTE:
CENTER GATE D IS DESIGNED FOR USE IN THE 2-LAYER AND/OR 3-LAYER LOAD SHOWN ON PAGE 26. IF THE CAR BEING LOADED HAS A "PLUG" DOOR AND A PALLET UNIT EXTENDS INTO THE DOORWAY AREA PAST A DOOR POST MORE THAN FIFTEEN INCHES, DISREGARD THE GATE DESIGN SPECIFIED; REFER TO PAGE 54 FOR PROPER GATE SPECIFICATIONS.



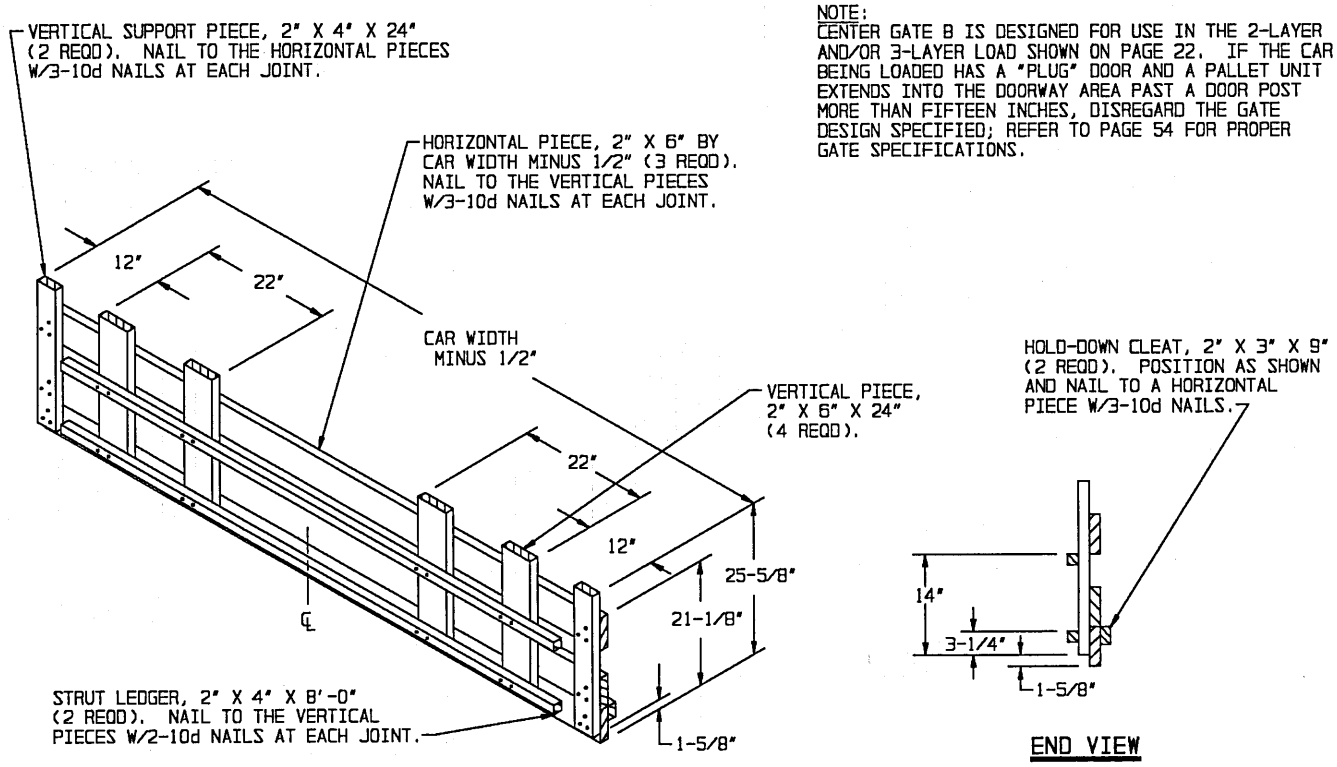
CENTER GATE D

SEE THE NOTE ABOVE.

END VIEW

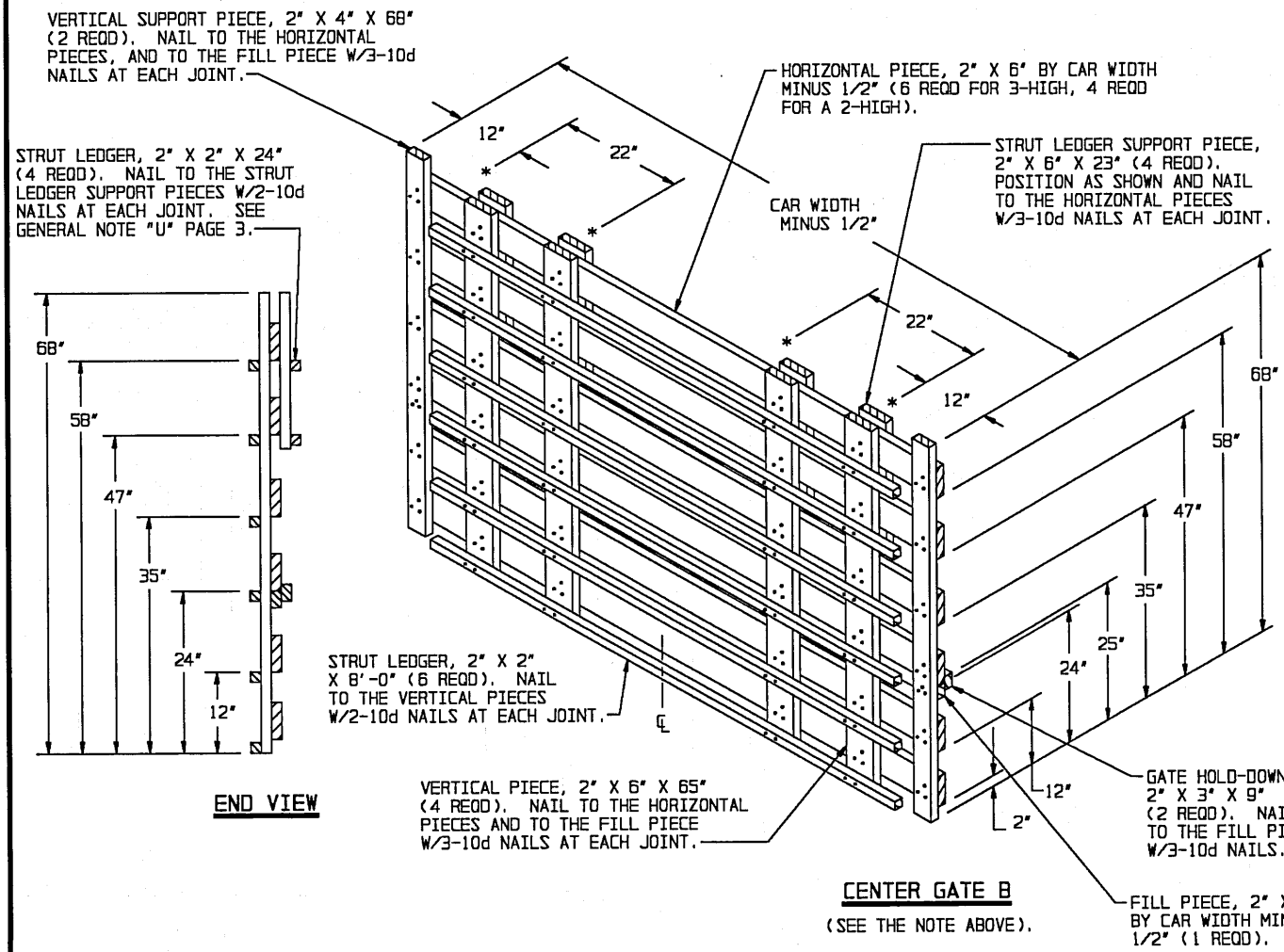
DETAILS

NOTE:
CENTER GATE B IS DESIGNED FOR USE IN THE 2-LAYER AND/OR 3-LAYER LOAD SHOWN ON PAGE 22. IF THE CAR BEING LOADED HAS A "PLUG" DOOR AND A PALLET UNIT EXTENDS INTO THE DOORWAY AREA PAST A DOOR POST MORE THAN FIFTEEN INCHES, DISREGARD THE GATE DESIGN SPECIFIED; REFER TO PAGE 54 FOR PROPER GATE SPECIFICATIONS.



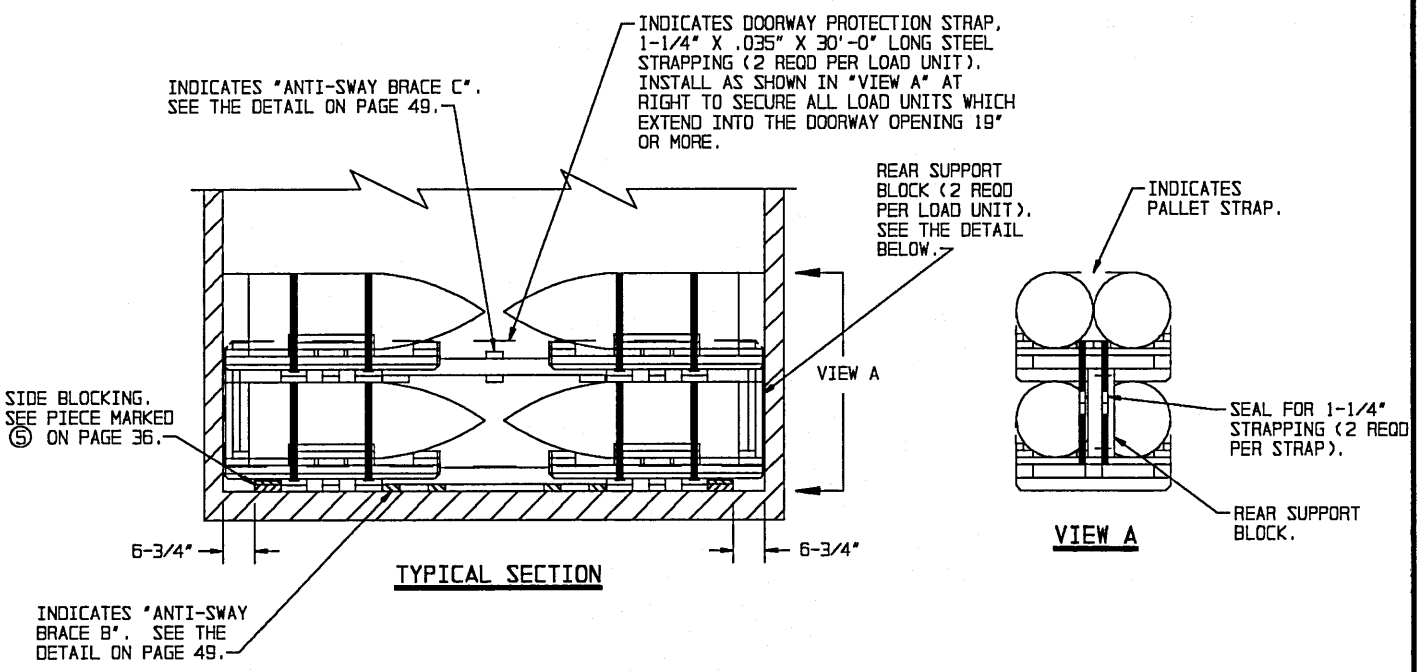
PARTIAL-LAYER GATE A

THIS PARTIAL-LAYER GATE IS DESIGNED FOR USE IN THE LOAD SHOWN ON PAGE 22.



CENTER GATE B

(SEE THE NOTE ABOVE).



TYPICAL SECTION

VIEW A

SPECIAL NOTES:

1. DOORWAY PROTECTION MUST BE PROVIDED WHEN PALLET UNITS ARE LOADED COMPLETELY IN THE DOORWAY AREA OR WHEN AT LEAST 19" OF A PALLET UNIT EXTENDS INTO THE DOORWAY AREA OF BOXCARS EQUIPPED WITH LOAD DIVIDERS AND HAVING PLUG TYPE DOORS. THE PROCEDURES MAY ALSO BE USED IN CONVENTIONAL TYPE BOXCARS HAVING EITHER PLUG TYPE OR CONVENTIONAL SLIDING DOORS.

2. THE "TYPICAL SECTION" VIEW ABOVE DEPICTS BLOCKING AND BRACING PROCEDURES WHICH MUST BE USED WHEN THE LADING BEHIND THE LOAD DIVIDER DOORS EXTENDS INTO THE DOORWAY AREA OF A CAR EQUIPPED WITH PLUG TYPE DOORS. THESE PROCEDURES WILL ALSO BE USED IF IT IS NECESSARY TO LOAD PALLET UNITS TWO LAYERS HIGH BETWEEN THE BULKHEADS IN ORDER TO OBTAIN A DESIRED QUANTITY IN A 3-LAYER LOAD. IF A LOAD BETWEEN THE BULKHEADS EXTENDS TOWARD THE ENDWALL AT LEAST 36" BEYOND THE DOOR OPENING AT EACH END, AND IF THE CAR IS NOT EQUIPPED WITH ADJUSTABLE SIDE FILLERS, THE PLUG DOOR PROVISIONS SHOWN ON PAGES 54 AND 55 MAY BE USED IN LIEU OF THE METHOD DEPICTED ABOVE.

3. INSTALL THE SPECIAL DOOR PROTECTION DUNNAGE IN THE FOLLOWING MANNER:

   A. PRE-POSITION THE SIDE BLOCKING ON THE SIDE OPPOSITE THE LOADING SIDE.

   B. POSITION THE FIRST-LAYER PALLET AGAINST THIS SIDE BLOCKING. POSITION THE SECOND-LAYER PALLET DIRECTLY ABOVE THE FIRST PALLET, INSTALLING THE REAR SUPPORT BLOCK BETWEEN THE PALLETS.

   C. INSTALL THE FLOOR-LINE ANTI-SWAY BRACE, "ANTI-SWAY BRACE B".

   D. PRE-POSITION THE SIDE BLOCKING ON THE LOADING SIDE OF THE CAR.

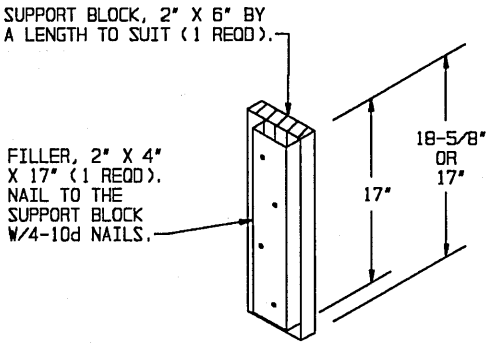
   E. LOAD THE FIRST-LAYER PALLET ON THE NEAR SIDE OF THE CAR.

   F. INSTALL THE SECOND-LAYER ANTI-SWAY BRACE, "ANTI-SWAY BRACE C".

   G. LOAD THE SECOND-LAYER PALLET ON THE NEAR SIDE WHILE POSITIONING THE REAR SUPPORT BLOCK ON THE NEAR SIDE OF THE CAR.

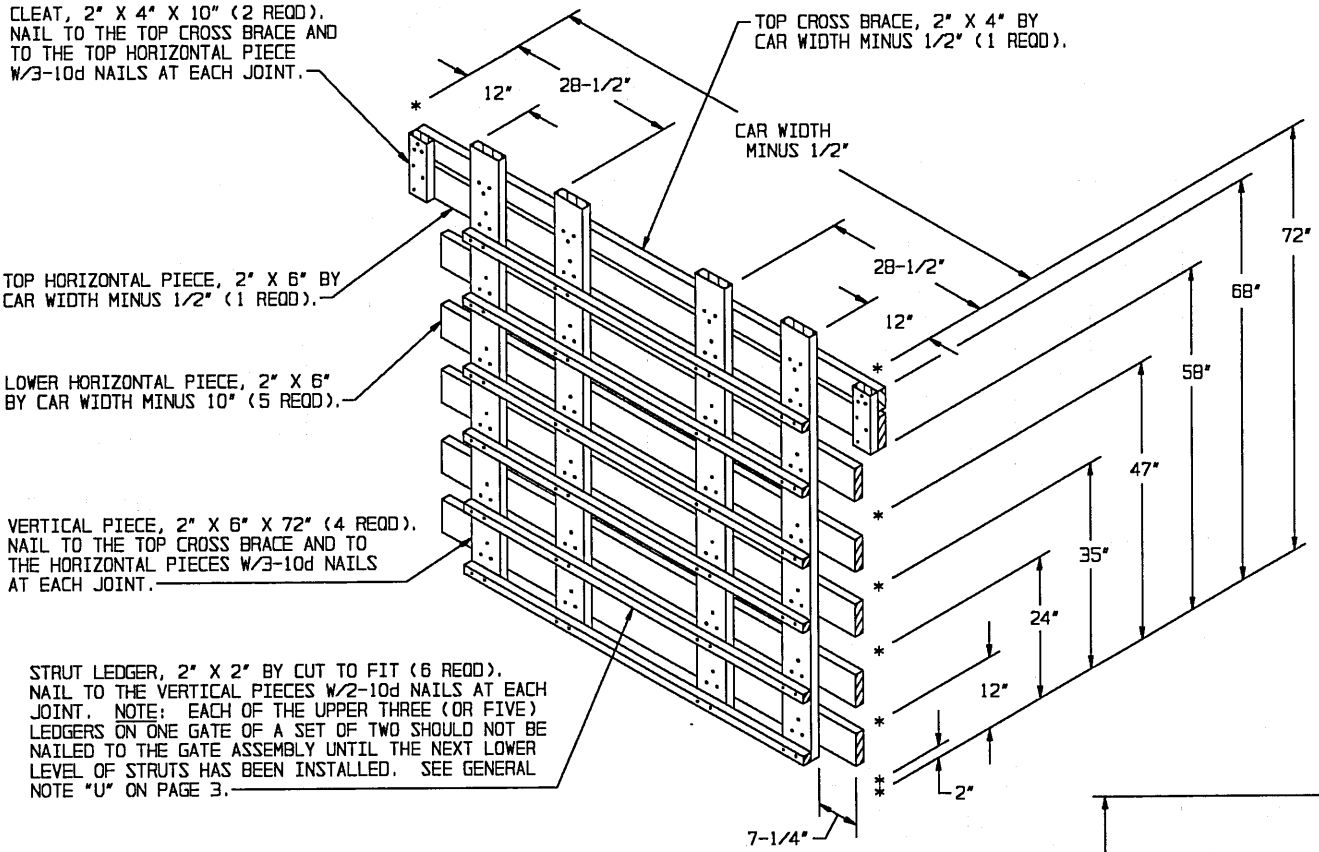
   H. THREAD THE DOORWAY PROTECTION STRAP THRU AND AROUND THE PALLETS AS SHOWN. TENSION AND SEAL WITH TWO SEALS WITH TWO CRIMPS PER SEAL. STAPLE TO EACH REAR SUPPORT BLOCK W/2 STAPLES.

4. NOTICE: IF THE CAR BEING USED IS NOT EQUIPPED WITH PLUG TYPE DOORS, AND IF DESIRED, A DOORWAY PROTECTION GATE "B" AS DETAILED AT THE TOP OF PAGE 48 MAY BE USED ON LIEU OF THE DOOR PROTECTION PROCEDURES SPECIFIED ABOVE.



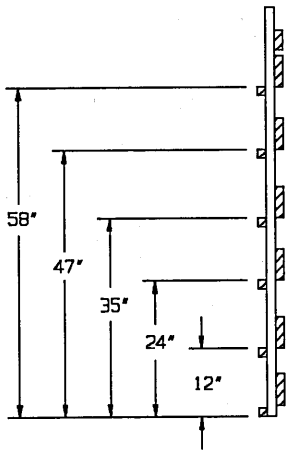
REAR SUPPORT BLOCK

SEE "TYPICAL SECTION" ABOVE).



SPECIAL CENTER GATE

THIS GATE IS DESIGNED FOR USE IN CARS EQUIPPED WITH PLUG DOORS. NOTE THAT IF SOLID FILL TYPE CENTER BLOCKING IS TO BE USED IN LIEU OF STRUTS, THE STRUT LEDGERS MUST BE OMITTED AND THE VERTICAL PIECES ON ONE GATE WILL BE 36" FOR 1-HIGH, OR 60" FOR 2-HIGH.



END VIEW

THIS VIEW DEPICTS THE HEIGHT DIMENSIONS FOR THE LOCATION OF STRUT LEDGERS.

SPECIAL NOTES:

1. THIS PAGE AND PAGE 55 DELINEATE SPECIAL PROVISIONS WHICH CAN BE UTILIZED WHEN OUTLOADING CROSSWISE LOADED BOMBS IN A CONVENTIONAL TYPE BOXCAR WHICH HAS PLUG DOORS, PROVIDING THE LOAD IS OF A CONFIGURATION SO THAT A PALLET UNIT EXTENDS INTO THE DOORWAY AREA OF A PLUG DOOR AT LEAST FIFTEEN INCHES. CARS WITHIN THIS CATEGORY CAN HAVE DOORS OF MANY CONFIGURATIONS: A CONVENTIONAL SLIDING MAIN DOOR WITH A PLUG AUXILIARY DOOR, OR A SINGLE PLUG DOOR, OR A DOUBLE PLUG DOOR. ALL OF THESE DOOR CONFIGURATIONS CAN BE ON CARS EITHER AS "THROUGH" DOORS OR AS "STAGGERED" DOORS. SEE SPECIAL NOTE 8 BELOW.
2. AN 8'-0" WIDE DOOR OPENING IS SHOWN IN THESE SPECIAL PROVISIONS, HOWEVER, THE PROVISIONS AS SHOWN ARE APPLICABLE TO ANY WIDTH DOOR OPENING.
3. THE PURPOSE OF THESE SPECIAL PROVISIONS IS TO PROVIDE THE SPECIFICATIONS FOR INSTALLING ADEQUATE DOOR PROTECTION DUNNAGE.
4. EACH OF THE 4" X 4" PIECES USED TO SPAN A DOOR MUST BE OF ONE-PIECE MATERIAL; SPLICING IS NOT PERMITTED.
5. IF A CAR HAS A "COMBINATION" DOOR (1-SLIDING AND 1-PLUG INSTALLED SIDE BY SIDE), THE ONE-PIECE 4" X 4" DOOR SPANNERS MUST BE OF AN ADEQUATE LENGTH TO SPAN BOTH DOORS AS THOUGH THEY WERE ONE.
6. THE METHOD FOR INSTALLING THE SPECIAL DOOR PROTECTION DUNNAGE ON THE OFF-SIDE OF A CAR IS OBVIOUS. ON THE NEAR SIDE, THE LOADING SIDE, SPECIAL HANDLING WILL BE REQUIRED IN SOME CARS. AFTER PLACING THE LOWER LAYER PALLETS INTO THE LOADING SIDE DOORWAY AREA, IT WILL BE NECESSARY TO:

   A. SLIDE ONE END OF THE LOWER 4" X 4" DOOR SPANNER PIECE BACK OVER THE TOP OF ONE OF THE PRE-POSITIONED WALL CLEATS A SHORT DISTANCE TO FACILITATE LOWERING THE OTHER END TO THE PROPER LEVEL.

(SPECIAL NOTES CONTINUED AT RIGHT)

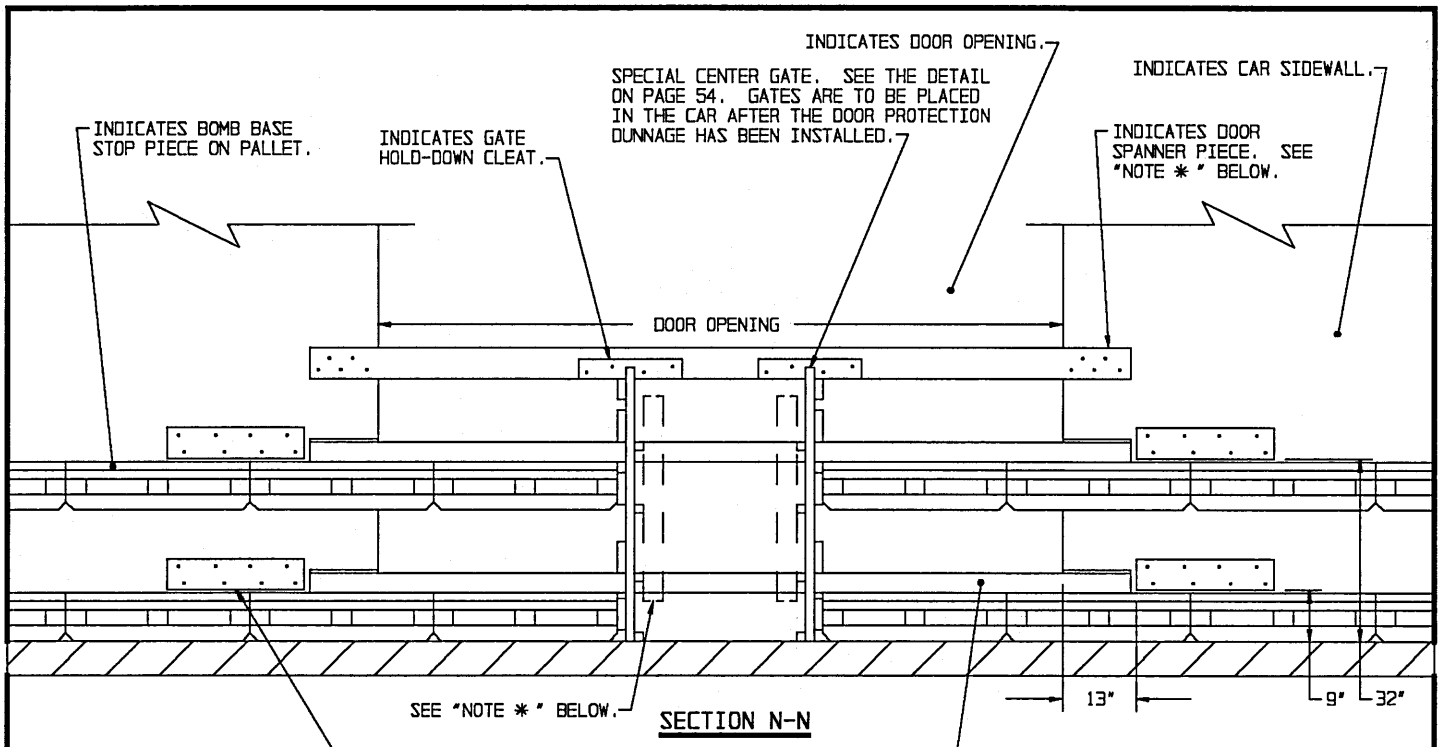
(SPECIAL NOTES CONTINUED)

   B. LOWER THE OTHER END OF THE DOOR SPANNER UNTIL IT IS JUST ABOVE THE BOMB BASE STOP PIECE ON THE LOWER LAYER PALLETS.

   C. SLIDE THE SPANNER IN THE DIRECTION OPPOSITE OF THE DIRECTION USED WITHIN STEP "A" AT LEFT, AND UNTIL ITS END CONTACTS THE IMMEDIATELY ADJACENT PRE-POSITIONED WALL CLEAT.

   D. PRESS THE SPANNER DOWNWARD ALONG ITS ENTIRE LENGTH SO THAT THE BOTTOM SURFACE IS IN CONTACT WITH THE TOP SURFACE OF EACH BOMB BASE STOP PIECE ON THE LOWER LAYER PALLETS.

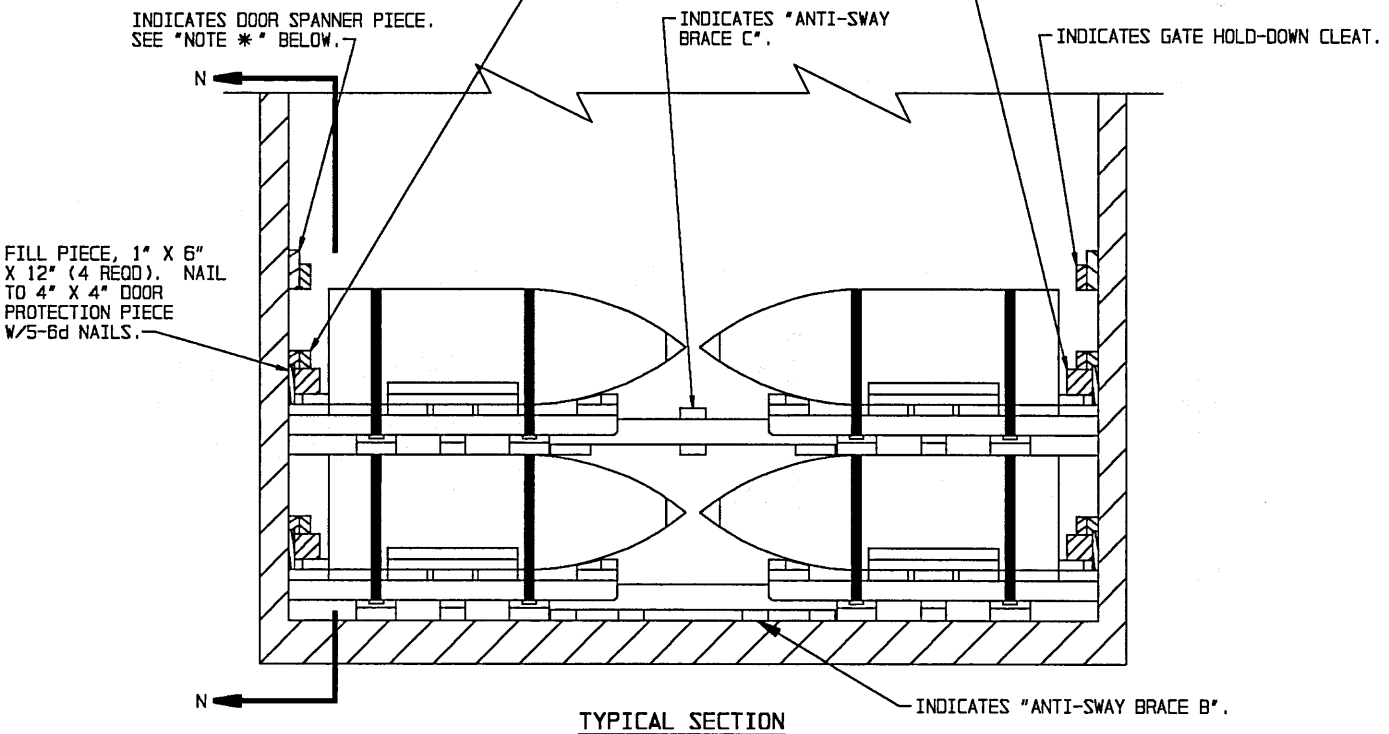
7. AFTER THE DOORS ON A CAR ARE CLOSED AND READY FOR THE INSTALLATION OF "CAR SEALS", A PIECE OF WIRE OF SUITABLE SIZE WILL BE USED IN ADDITION TO, AND IN CONJUNCTION WITH, EACH CAR SEAL USED TO "SEAL" THE CAR. THE WIRE WILL BE THREADED THROUGH THE HOLE IN THE DOOR LATCH ONE OR MORE TIMES, AND THE WIRE ENDS WILL BE TWISTED TOGETHER.
8. IF DESIRED, THE DOORWAY PROTECTION PROCEDURES ON PAGE 53 MAY BE USED IN LIEU OF THESE SPECIFICATIONS, PROVIDING THE CAR BEING USED HAS "THROUGH DOORS" AND THE DOORWAY-AREA STACKS TO BE STRAPPED EXTEND AT LEAST 19" INTO THE DOORWAY AREA.



SECTION N-N

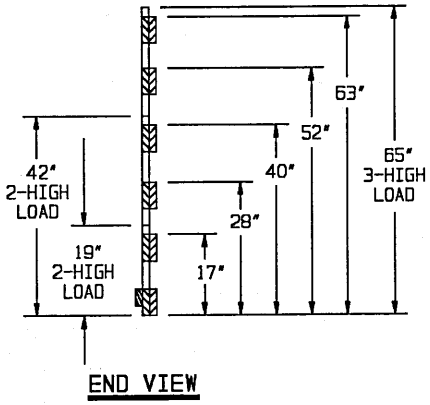
WALL CLEAT, 2" X 6" X 24" (DOUBLED) (8 REQD). PRE-POSITION THE FIRST PIECE AS SHOWN AND NAIL TO THE CAR SIDEWALL W/8-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE "NOTE * " BELOW.

DOOR PROTECTION, 4" X 4" BY DOOR OPENING WIDTH PLUS 24" (4 REQD).

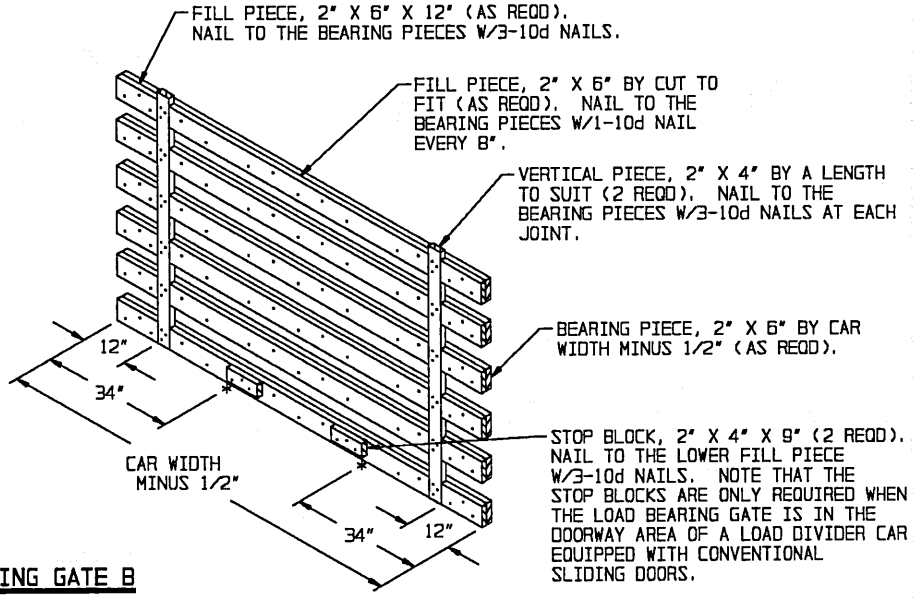


TYPICAL SECTION

NOTE * :
IF THE CAR BEING LOADED IS EQUIPPED WITH METAL SIDEWALLS, OR IF DESIRED IN CARS HAVING NAILABLE WALLS, THE DOOR PROTECTION 4" X 4" PIECES CAN BE PREVENTED FROM SHIFTING LONGITUDINALLY BY PLACING A 2" X 4" X 36" LONG PIECE VERTICALLY SO AS TO BE IN CONTACT WITH THE HORIZONTAL PIECES OF THE SPECIAL CENTER GATE AND NAIL TO THE DOOR PROTECTION 4" X 4" PIECES W/3-10d NAILS AT EACH JOINT. SEE THE "SECTION N-N" ABOVE. IN LIEU OF USING THE DOOR SPANNER PIECES AND GATE HOLD-DOWN CLEATS, THE CENTER GATES CAN BE HELD DOWN BY APPLYING "FILL PIECES" AND "GATE HOLD-DOWN" PIECES TO THE GATE. SEE THE "CENTER GATE C" DETAIL ON PAGE 48 FOR GUIDANCE.

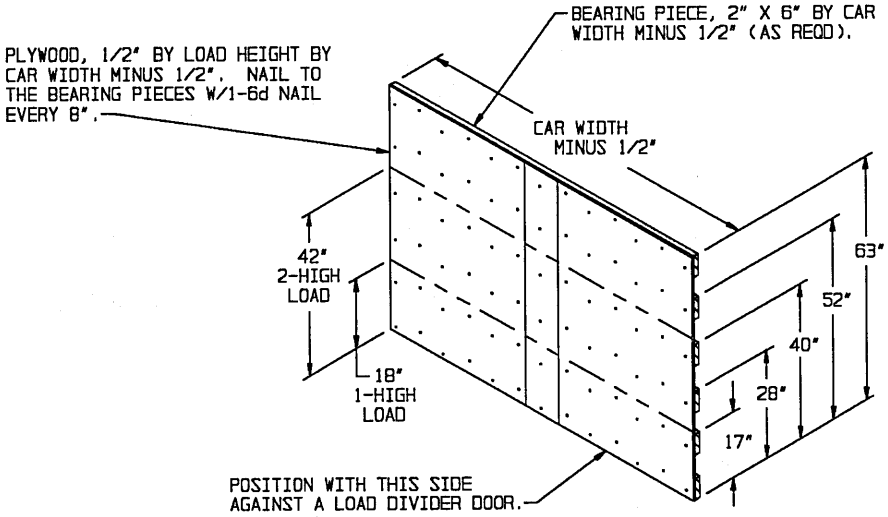


END VIEW



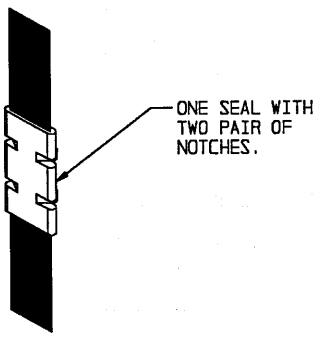
LOAD BEARING GATE B

THIS GATE IS DESIGNED FOR USE BETWEEN THE LADING AND A LOAD DIVIDER DOOR IN THE LOAD SHOWN ON PAGE 36. IF 1/2" OR THICKER PLYWOOD IS AVAILABLE, THE "ALTERNATIVE LOAD BEARING GATE B" MAY BE USED IN LIEU OF THIS GATE. SEE THE DETAIL BELOW.



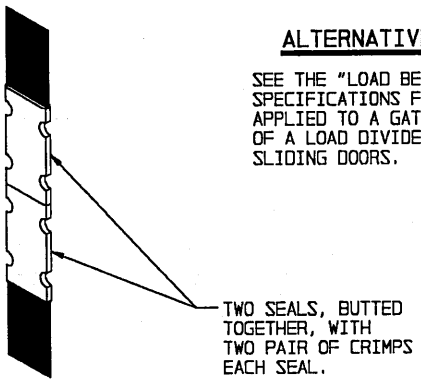
ALTERNATIVE LOAD BEARING GATE B

SEE THE "LOAD BEARING GATE B" DETAIL ABOVE FOR SPECIFICATIONS FOR "STOP BLOCKS" WHICH MUST BE APPLIED TO A GATE WHICH IS IN THE DOORWAY AREA OF A LOAD DIVIDER CAR EQUIPPED WITH CONVENTIONAL SLIDING DOORS.



STRAP JOINT A

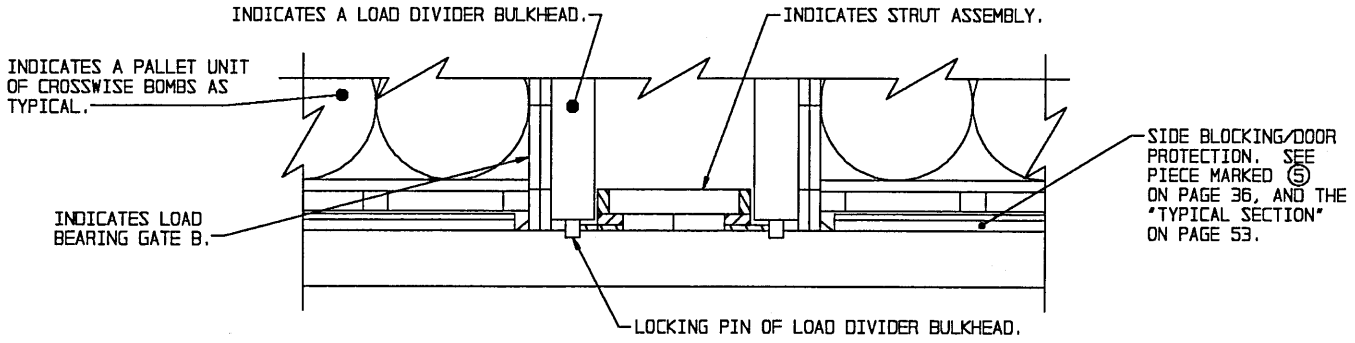
METHOD OF SECURING A STRAP JOINT WHEN USING A NOTCH-TYPE SEALER.



STRAP JOINT B

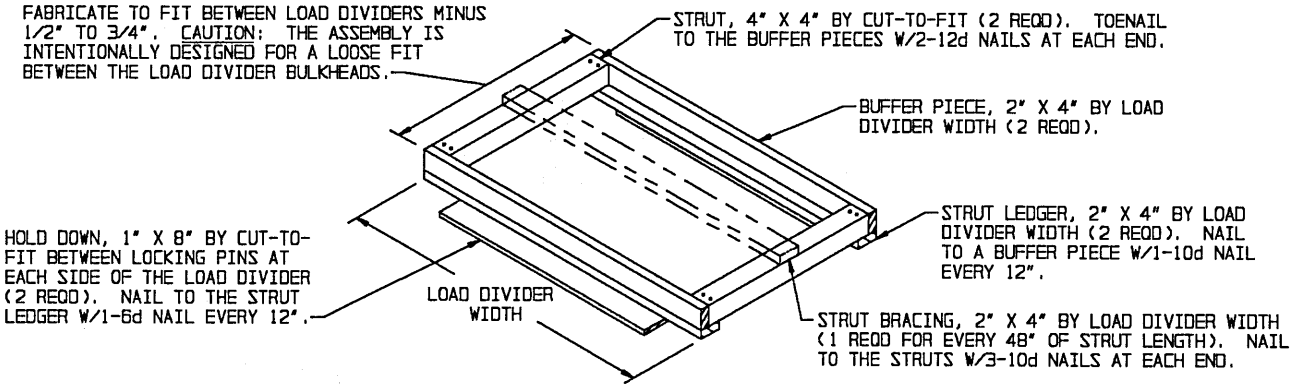
METHOD OF SECURING A STRAP JOINT WHEN USING A CRIMP-TYPE SEALER.

END-OVER-END LAP JOINT DETAILS



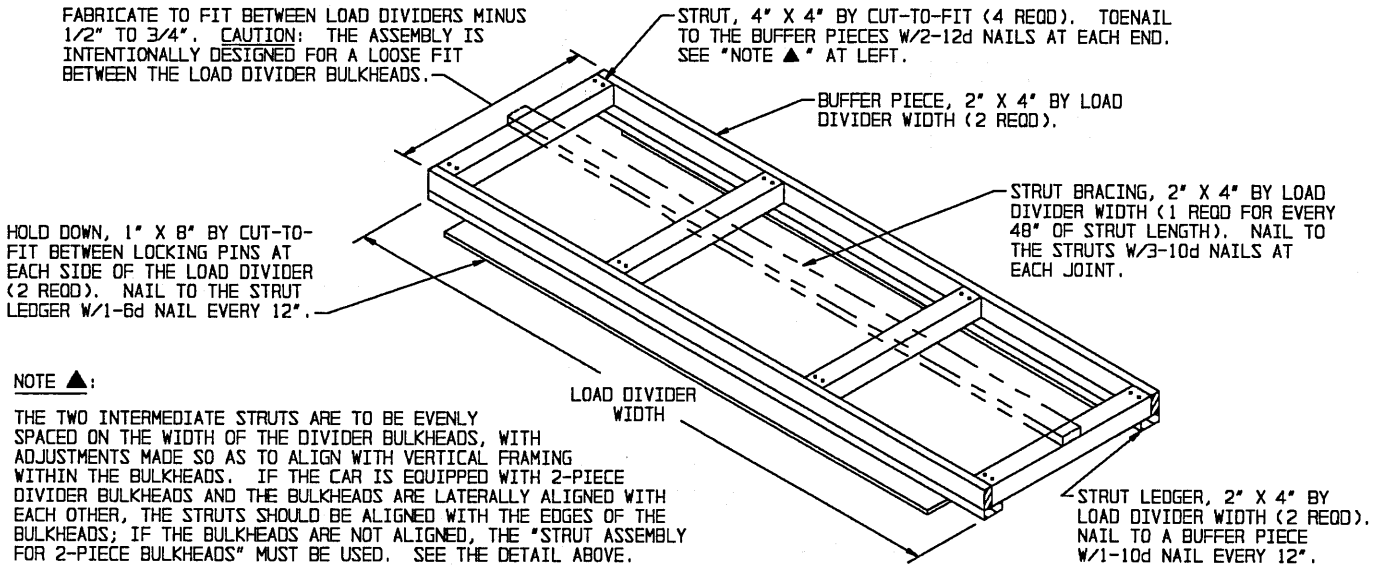
INSTALLATION OF STRUT ASSEMBLY

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.

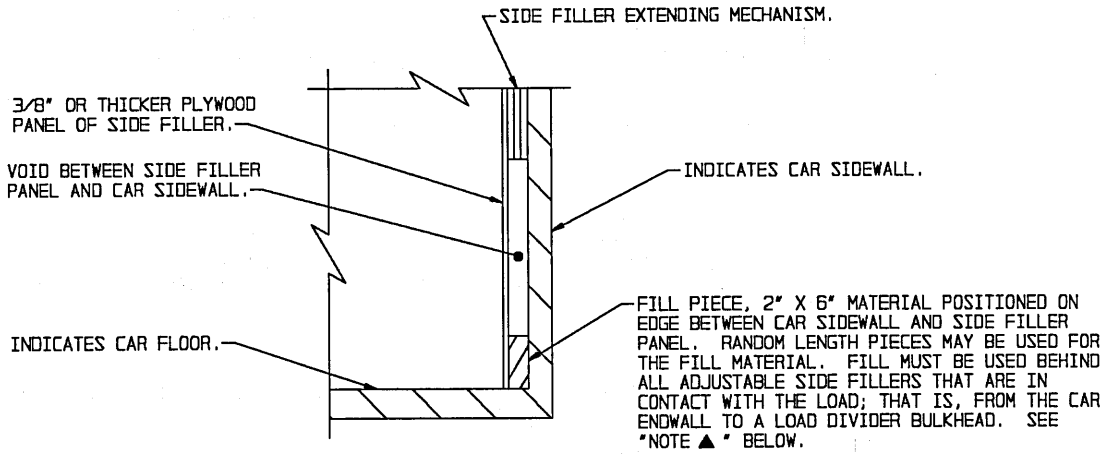


NOTE ▲:

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.

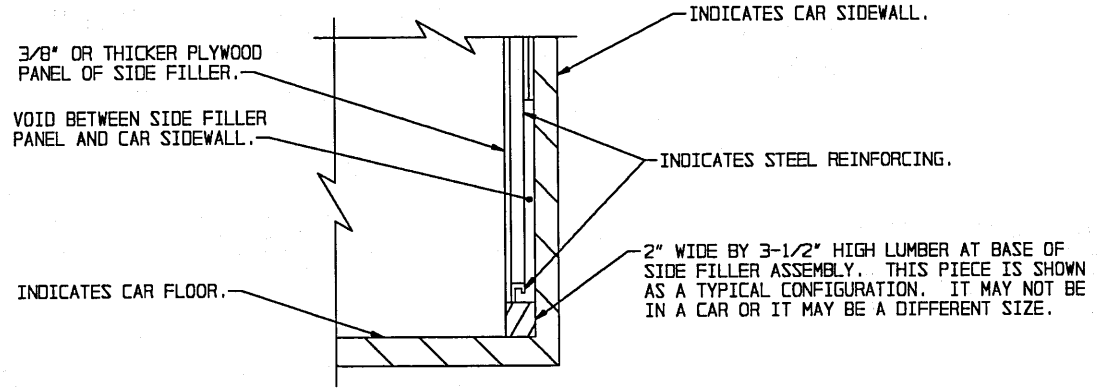


TYPICAL TYPE A

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

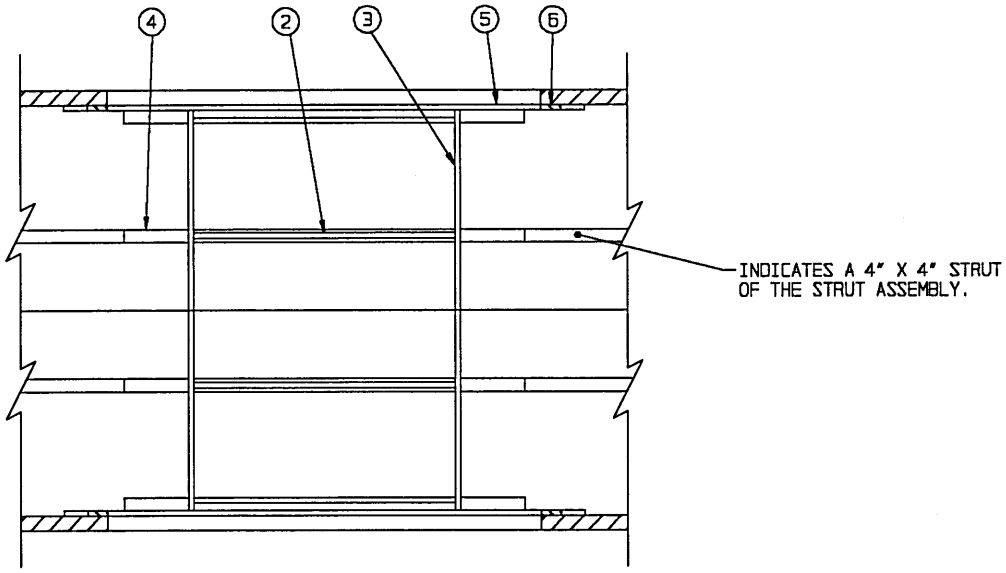
NOTE ▲:

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".



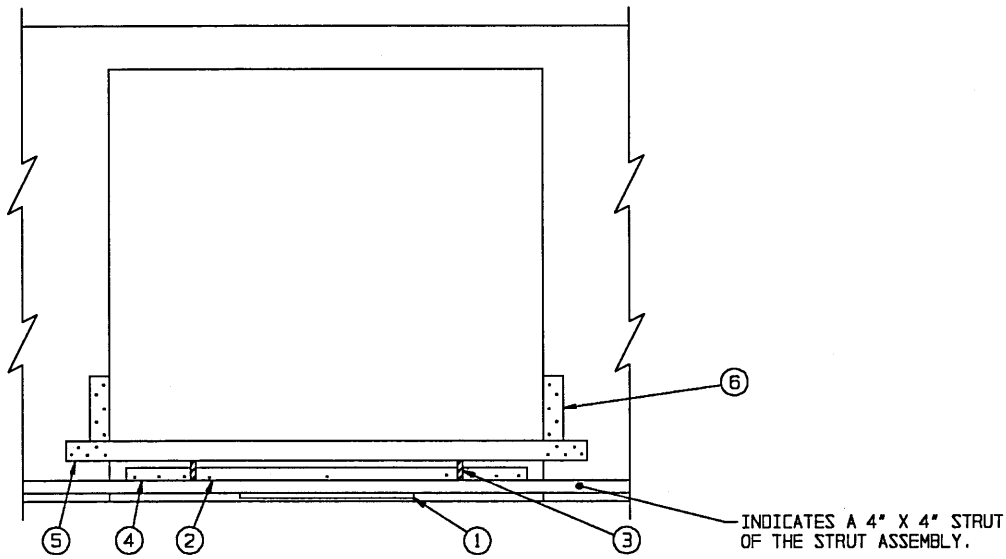
TYPICAL TYPE B

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.



PLAN VIEW OF STRUT ASSEMBLY HOLD-DOWN

THIS PLAN VIEW AND THE SIDE ELEVATION VIEW BELOW DEPICT THE HOLD-DOWN BLOCKING WHICH IS REQUIRED WHEN THE STRUTS OF THE "STRUT ASSEMBLY" USED IN A LOAD DIVIDER CAR ARE LONGER THAN 12'-0". NOTE THAT THE SPECIAL STRUT HOLD-DOWN AND THE STRUT ASSEMBLY ARE ONLY REQUIRED IF THE LOAD BEHIND EITHER DOOR IS MORE THAN 50,000 POUNDS.



SIDE ELEVATION VIEW OF STRUT ASSEMBLY HOLD-DOWN

KEY NUMBERS

(1) FILLER PIECE, 2" X 4" X 48" (4 REQD). POSITION SO AS TO BE CENTERED IN THE DOORWAY AREA AND NAIL TO THE BOTTOM SURFACE OF A STRUT W/4-10d NAILS.

(2) SPACER PIECE, 2" X 4" X 72" (4 REQD). POSITION ON EDGE AND SO AS TO BE CENTERED IN THE DOORWAY AREA AND TOENAIL TO A STRUT W/3-12d NAILS ON EACH SIDE.

(3) HOLD-DOWN PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT IF THE CAR HAS PLUG DOORS, OR 2" X 6" BY CAR WIDTH PLUS 4" IF THE CAR HAS CONVENTIONAL SLIDING DOORS) (2 REQD). NAIL TO PIECE MARKED (3) W/2-12d NAILS AT EACH JOINT AND TOENAIL TO THE STRUTS W/2-12d NAILS AT EACH JOINT.

(4) BRACE PIECE, 4" X 4" X 18" (8 REQD). POSITION AGAINST A PIECE MARKED (3) AND TOENAIL TO A STRUT W/3-12d NAILS ON EACH SIDE.

(5) DOOR SPANNER PIECE, 2" X 6" BY DOOR OPENING WIDTH PLUS 24" (2 REQD). NAIL TO A CAR DOOR POST/SIDEWALL OR TO A NAILING STRIP W/5-12d NAILS AT EACH END. NOTE: PRIOR TO NAILING THESE PIECES IN PLACE, THE STRUTS OF THE STRUT ASSEMBLY ARE TO BE PRESSED DOWNWARD UNTIL THE PIECES MARKED (1) ARE TOUCHING OR ARE ALMOST TOUCHING THE FLOOR OF THE CAR.

(6) HOLD-DOWN CLEAT, 2" X 6" X 18" (4 REQD). NAIL TO A CAR DOOR POST/SIDEWALL OR TO A NAILING STRIP W/5-12d NAILS.