APPROVED BY
BUREAU OF EXPLOSIVES
J. H. Glenman
DATE 5/19/91

LOADING AND BRACING (CL & LCL) IN BOX CARS ⌖ OF PALLETIZED PROPELLING CHARGES PACKED IN CYLINDRICAL METAL CONTAINERS

PA 103 SERIES CONTAINER

INDEX

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

DO NOT SCALE

REVISIONS				DRAFTSMAN	TYPIST	CHECKER	TECHNICIAN	ENGINEER
		DEV		A.Y.J.	TM	GRG	PB	
		DEO		SMCAC-DEV		SMCAC-DEO		SMCAC-DE
		DE			TT	W. Zwicke		W. Ernst
		DEV		APPROVED, U.S. ARMY ARMAMENT, MUNITIONS AND CHEMICAL COMMAND				
		DEO		Daniel E. Hardwick				
		DE		APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND (AMC)				
		DEV		John L. Lynch				
		DEO		U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL				
		DE		U.S. ARMY MATERIEL COMMAND				
		DEV		JANUARY 1992				
		DEO		CLASS	DIVISION	DRAWING	FILE	
		DE		19	48	4042 B/21	5PM 1000	

PROJECT FSA 43B/21-63

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 PROPELLING CHARGES (NSN-1320-01-202-8939) PACKED IN PA103 SERIES CONTAINER WHEN UNITIZED ON A 35" X 45-1/2" PALLET. SEE THE PICTORIAL VIEWS ON PAGE 4. REFER TO THE U.S. ARMY AMC (DARCOM) DRAWING 19-48-4042A/22-20PM1001 FOR UNITIZATION PROCEDURES FOR THE PA103 SERIES CONTAINER.

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

D. CAUTION: METAL PROPELLING CHARGE CONTAINERS THAT OVERHANG THE PALLET END MUST NOT BE ALLOWED TO CONTACT STEEL SIDEWALLS OR END WALLS OF BOX CARS. THIS TYPE OF UNIT LOAD SHOULD BE SHIPPED IN BOX CARS HAVING WOOD SIDEWALLS AND/OR END WALLS. IF CARS WITH WOOD SIDEWALLS AND/OR END WALLS ARE NOT AVAILABLE, AND ALL-STEEL CARS ARE USED, THE SIDEWALLS AND/OR END WALLS MUST BE LINED WITH DIMENSIONAL LUMBER, PLYWOOD, HARDBOARD, OR SOLID FIBERBOARD. THE LINING SHOULD BE PROVIDED WHEREVER METAL-OF-CONTAINER TO METAL-OF-CAR CONTACT IS POSSIBLE, REFER TO PAGE 73 FOR GUIDANCE.

E. PALLET UNITS WILL BE POSITIONED WITH THE BASE ENDS OF THE CONTAINERS AGAINST THE CAR END WALL OR SIDEWALL AS APPLICABLE TO THE LOAD BEING SHIPPED. LONGITUDINALLY ADJACENT LENGTHWISE UNITS WILL BE POSITIONED WITH THE BASE END AGAINST BASE END OR BELL END AGAINST BELL END OF CONTAINERS.

F. ALL THE LOADS SHOWN HEREIN ARE TYPICAL. BECAUSE OF THIS FACT IT IS MOST LIKELY THAT THE ACTUAL QUANTITY TO BE SHIPPED WILL NOT BE DEPICTED IN ANY OF THE LOADING PROCEDURES. A LOAD PLAN SHOULD BE DEVELOPED WHICH WILL BE THE MOST EFFICIENT AS TO THE AMOUNT OF DUNNAGE REQUIRED AND AS TO THE EASE OF LOADING FOR THE QUANTITY TO BE SHIPPED. THE LOAD PLANNING CHARTS ON PAGE 48 MAY BE USED IN CONJUNCTION WITH THE DEPICTED LOADING PROCEDURES FOR GUIDANCE.

G. THE SELECTION OF RAIL CARS FOR THE TRANSPORT OF PALLETIZED UNITS OF PROPELLING CHARGES 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.

H. WHEN SELECTING RAIL CARS, EVERY EFFORT SHOULD BE MADE TO OBTAIN BOX CARS THAT DO NOT HAVE BOWED END WALLS. CARS HAVING BOWED ENDS CAN BE USED, HOWEVER, IF AN END WALL IS BOWED OUTWARD MORE THAN TWO INCHES (2"), EITHER FROM SIDE TO SIDE OR FROM FLOOR TO ROOF, AN END OF CAR BULKHEAD MUST BE INSTALLED TO PROVIDE A "SQUARED OFF" SURFACE FOR THE LOAD AT THE END OF THE CAR. REFER TO PAGE 74 FOR GUIDANCE.

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

(CONTINUED AT RIGHT)

MATERIAL SPECIFICATIONS

LUMBER ---------- : FED SPEC MM-L-751; DUNNAGE LUMBER. SEE TM 743-200-1.

NAILS ---------- : FED SPEC FF-N-105; COMMON.

STAPLES --------- : FED SPEC FF-N-105; SENCO QUALITY OR EQUAL.

STRAPPING STEEL - : ASTM D 3953; FLAT STRAPPING, TYPE I OR 2, HEAVY DUTY, COATED FINISH (ORGANIC), ZINC-COATED (GRADE 2), OR UNCOATED.

STRAP SEAL ------ : ASTM D 3953; CLASS H, FINISH A, B (GRADE 2), OR C, TYPE D, STYLE I, II, OR IV.

STRAP STAPLE ---- : COMMERCIAL GRADE.

PLYWOOD ------ : GROUP B , CONSTRUCTION AND INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D, FED SPEC NN-P-530. IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER INTERIOR OR AN EXTERIOR GRADE MAY BE SUBSTITUTED.

WIRE ---------- : FED SPEC QQ-W-461.

HARDBOARD ---- : ANSI/AHA A135.4, CLASS 1.

SOLID FIBERBOARD : FED SPEC PP-F-320; TYPE SF, CLASS DOMESTIC, GRADE 175 OR STRONGER; OR TYPE SF, CLASS WEATHER-RESISTANT, GRADE W6S OR STRONGER.

(GENERAL NOTES CONTINUED)

K. THE USE OF AN OFFSET LOADING PATTERN WILL FACILITATE LOADING AND UNLOADING OPERATIONS IN THE DOORWAY AREA OF THE CAR. WHEN POSSIBLE TO DO SO, 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.

L. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN CARS WHICH ARE PARTIALLY LOADED WITH PALLETIZED UNITS OF PROPELLING CHARGES, 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.

M. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 2" X 4" MATERIAL IS ACTUALLY 1-1/2" THICK BY 3-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE. IF THOSE MEMBERS SPECIFICALLY IDENTIFIED AS "STRUTS" WITHIN THE KEY NUMBERS OF A DEPICTED LOAD ARE SPECIFIED TO BE 4" X 4" MATERIAL, IT IS PERMISSIBLE TO USE TWO LAMINATED PIECES OF 2" X 6" MATERIAL IN LIEU OF EACH 4" X 4" STRUT. DOUBLED 2" X 6" STRUTS WILL BE LAMINATED W/1-10d NAIL EVERY 6".

N. 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.

O. POWER DRIVEN STAPLES MAY BE USED AS ALTERNATIVE FASTENERS FOR NAILS WHEN CONSTRUCTING DUNNAGE ASSEMBLIES WHICH ARE TO BE USED IN THE DELINEATED CARLOADS 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" OR LESS IN LENGTH SHOULD BE IN ACCORDANCE WITH FEDERAL SPECIFICATION FF-N-105 AS NEARLY AS PRACTICABLE. STAPLES WHICH ARE LONGER THAN 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.

P. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF ONE (1) SEAL WITH TWO (2) PAIR OF NOTCHES WILL BE USED TO SEAL THE JOINT WHEN A NOTCH-TYPE SEALER IS BEING USED. A MINIMUM OF TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) 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 19 FOR GUIDANCE.

Q. THROUGHOUT THIS PROCEDURAL DRAWING, PORTIONS OF THE BLOCKING COMPONENTS AND OF THE DEPICTED CARS, SUCH AS A CAR SIDE WALL, HAVE BEEN OMITTED FROM THE LOAD VIEW FOR CLARITY PURPOSES.

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

S. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES, AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS 0.454KG.

(FOR CONVENTIONAL TYPE BOX CAR)

T. 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 PROTECTION" 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 "N" ABOVE.

U. NOTICE: WHEN POSITIONING PALLETIZED UNITS IN A CAR THEY SHOULD BE PLACED TIGHTLY AGAINST A CAR SIDEWALL 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 PALLETIZED UNITS IN TO 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 PALLETIZED UNITS, SUCH AS THE JOINTS BETWEEN THE LAYERS OF CONTAINERS ON THE UNIT. PADDING, OF 2-INCH (2") THICK LUMBER OR ANY OTHER MATERIAL OF SIMILAR CONSISTENCY, SHOULD BE PLACED BETWEEN THE JACK AND THE LADING.

(CONTINUED ON PAGE 3)

(GENERAL NOTES CONTINUED)

V. LOAD BLOCKING STRUTS WHICH ARE 48" OR LONGER MUST BE STIFFENED BY THE APPLICATION OF HORIZONTAL AND VERTICAL STRUT BRACING AS SHOWN BY THE "STRUT BRACING" DETAIL ON PAGE 76. BRACING IS NOT REQUIRED IF THE STRUTS FOR THE LOAD BEING SHIPPED ARE SHORTER THAN 48". THE LENGTH OF THE LOAD BLOCKING STRUTS SHOULD BE KEPT AS SHORT AS POSSIBLE (APPROX 18" MINIMUM), BUT IN THE EVENT IT IS NECESSARY TO USE STRUTS WHICH ARE 8'-0" OR MORE IN LENGTH, IT WILL BE NECESSARY TO APPLY AN ADDITIONAL SET OF HORIZONTAL AND VERTICAL STRUT BRACING PIECES. STRUT BRACING SHOULD BE APPLIED SO AS TO PROVIDE NEARLY EQUAL SPACES BETWEEN THE BRACING PIECES AND THE CENTER GATES AND/OR BETWEEN ADJACENT STRUT BRACING PIECES. NOTE THAT HORIZONTAL STRUT BRACING PIECES FOR THE UPPER LEVEL OF STRUTS FOR ALL BUT THE UPPERMOST TIER OF A LOAD MAY BE DIFFICULT TO APPLY TO THE TOP SURFACES OF THE STRUTS AS DEPICTED. STRUT BRACING WILL BE EQUALLY EFFECTIVE IF APPLIED TO THE UNDER SIDE OF THOSE STRUTS.

W. TO ACHIEVE A TIGHTLY BLOCKED LOAD, A STRUT WILL BE CUT SLIGHTLY LONGER THAN THE MEASURED DISTANCE BETWEEN THE STRUT BEARING AREAS ON THE TWO CENTER GATES. ONE END OF THE STRUT WILL BE POSITIONED AT ITS BEARING AREA JUST ABOVE THE STRUT LEDGER ON ONE GATE. THE OTHER END, WHICH CAN BE BEVELED ON THE LOWER CORNER IF DESIRED WILL THEN BE DRIVEN DOWNWARD UNTIL IT CONTACTS THE STRUT LEDGER ON THE OTHER GATE. EACH END OF THE STRUT WILL BE TOENAILED TO THE ADJACENT CENTER GATE, AS SPECIFIED WITHIN THE KEY NUMBERS FOR A LOAD, IN SUCH A MANNER SO THAT AS NEARLY AS PRACTICAL EQUAL LENGTHS OF A NAIL ARE EMBEDDED IN THE STRUT AND IN THE VERTICAL PIECE OF THE CENTER GATE. SEE THE "BEVEL CUT" DETAIL ON PAGE 76 FOR BEVELING INSTRUCTIONS AND THE "STRUT INSTALLATION" DETAIL ON THAT PAGE FOR A PICTORIAL VIEW SHOWING THE PROPER POSITIONING OF A BEVELED STRUT FOR INSTALLATION. NOTE THAT THE UPPER CORNER NEEDS TO BE BEVELED ONLY IF THE STRUTS ARE VERY SHORT. IF ONLY ONE END IS BEVEL CUT, THE BEVELED EDGE WILL BE PLACED IN THE DOWNWARD POSITION SO THAT IT WILL ALLOW THE STRUT END TO SLIDE MORE FREELY DOWN THE FACE OF THE VERTICAL PIECE ON THE ADJACENT CENTER GATE AS THE STRUT IS DRIVEN DOWN INTO ITS FINAL BLOCKING POSITION.

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

GENERAL NOTES

(FOR BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES)

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

1. FOR BLOCKING THE LOADS WHICH ARE DEPICTED, A CROSS MEMBER WILL NOT BE RELIED UPON TO RETAIN MORE LADING ON EITHER SIDE THAN AS SHOWN. VOIDS LENGTHWISE WITHIN THE LOAD MUST BE HELD TO A MINIMUM AND CROSS MEMBERS MUST BE PLACED AGAINST THE LADING AS TIGHTLY AS THE SPACING OF THE LOCKING HOLES IN THE WALL MEMBERS PERMIT. LOCKING BARS (LEVER JACKS) SHOULD BE USED FOR THIS PURPOSE. AN ADDITIONAL 1/2" OF ADJUSTMENT CAN BE MADE BY TURNING A CROSS MEMBER END-FOR-END WHEN LOCKING PINS ON THE CROSS MEMBERS ARE OFF-CENTER. NOTE: IT IS RECOMMENDED THAT EACH CROSS MEMBER BE INSTALLED WITH THE ENDS ATTACHED AS NEARLY AS POSSIBLE IN "MATED" POSITIONS (AT EQUAL HEIGHTS AND AT EQUAL DISTANCES FROM THE END OF THE CAR).

2. CAUTION: ALL BLOCKING AND BRACING COMPONENTS IN EMPTY CARS AND ALL UNUSED COMPONENTS IN LOADED CARS MUST BE "SECURED" FOR SHIPMENT-ADJUSTABLE WALL MEMBERS TO VERTICAL WALL ATTACHMENT RAILS, AND CROSS MEMBERS TO ADJUSTABLE WALL MEMBERS OR TO FIXED HORIZONTAL WALL MEMBERS OR TO DOORWAY MEMBERS, AND DOORWAY MEMBERS TO DOOR POSTS. COMPONENTS ASSIGNED TO EACH CAR MUST REMAIN THEREWITH EVEN THOUGH UNUSED DURING SOME SHIPMENTS.

Z. IN A CAR EQUIPPED WITH ADJUSTABLE WALL MEMBERS, PROVIDING THE FIXED WALL MEMBERS WHICH ARE PRESENT IN SOME "ADJUSTABLE" CARS ARE NOT PROPERLY POSITIONED TO PROVIDE SIDE BEARING SURFACES BETWEEN THE UNITS AND THE CAR SIDEWALLS, ADJUSTABLE WALL MEMBERS (AS REQUIRED) MUST BE INSTALLED TO PROVIDE A MINIMUM OF ONE SURFACE AREA FOR SIDE BEARING AT SOME LOCATION WITHIN THE UPPER HALF OF EACH UNIT.

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

GENERAL NOTES

(FOR CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS)

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

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

DD. IF NAILING TO A CAR SIDEWALL IS NOT REQUIRED, BOX CARS 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 82 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 82, THE "FILL PIECE" MATERIAL IS NOT REQUIRED.

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

FF. A "STRUT ASSEMBLY" MUST BE INSTALLED BETWEEN THE LOAD DIVIDER BULKHEADS IF THE CAR CONTAINS CLASS A OR CLASS B EXPLOSIVES AND THE LOAD IN EITHER END OF THE CAR WEIGHS 50,000 POUNDS OR MORE. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF CLASS C EXPLOSIVES. NOTE THAT THE STRUT ASSEMBLY MAY BE OMITTED FROM LOADS OF CLASS A OR B EXPLOSIVES WEIGHING 50,000 POUNDS WHEN THE LADING AND ADEQUATE BLOCKING AND BRACING ARE POSITIONED TO COMPLETELY FILL THE SPACE BETWEEN THE INSTALLED BULKHEADS AS SPECIFIED IN GENERAL NOTE "GG" BELOW. DETAILS OF STRUT ASSEMBLIES FOR USE BETWEEN 2-PIECE BULKHEADS AND BETWEEN 1-PIECE BULKHEADS ARE SHOWN ON PAGE 81.

GG. THE NORMAL LOADING PATTERN IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS IS TO POSITION THE LADING BETWEEN A CAR END WALL AND A LOAD DIVIDER BULKHEAD IN FULL LAYERS. OBVIOUSLY, A LOAD QUANTITY MUST THEN BE A MULTIPLE OF THE NUMBER OF PALLETIZED 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.

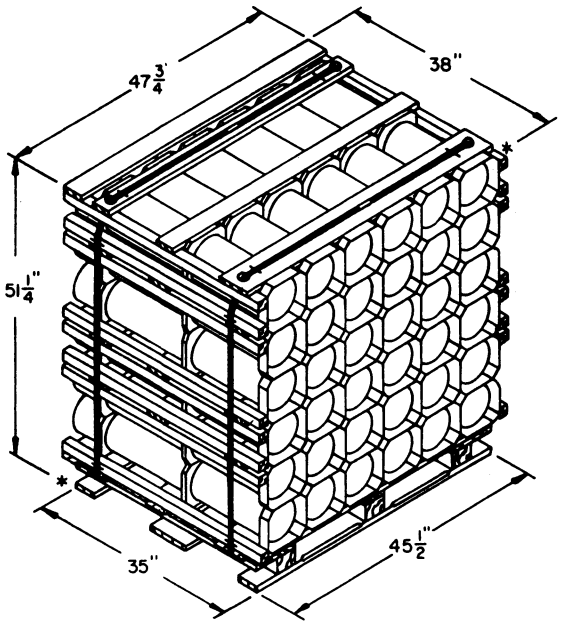
1. ONE OR MORE RISERS CAN BE POSITIONED WITHIN A LOAD TO INCREASE A LOAD QUANTITY. SEE THE RISER PROCEDURES AND DETAILS ON PAGES 54 THRU 57.

2. THE "GATES AND STRUTS" METHOD OF OMITTING A PALLET UNIT MAY BE USED TO ADJUST A LOAD QUANTITY DOWNWARD BY OTHER THAN A MULTIPLE OF A LOAD UNIT. SEE THE PROCEDURES ON PAGES 50 THRU 53 FOR GUIDANCE.

3. AT LOCATION (S) WHERE K-BRACE 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 EVEN LAYERS WHICH ARE ONE OR MORE LESS IN HEIGHT THAN THE LOAD IN THE ENDS OF THE CAR. INSTALL CENTER GATES, STRUTS AND GATE HOLD DOWNS AS SHOWN IN THE APPLICABLE CONVENTIONAL BOX CAR DRAWING HEREIN, TO PROVIDE FOR A TIGHT LOAD BETWEEN THE BULKHEADS.

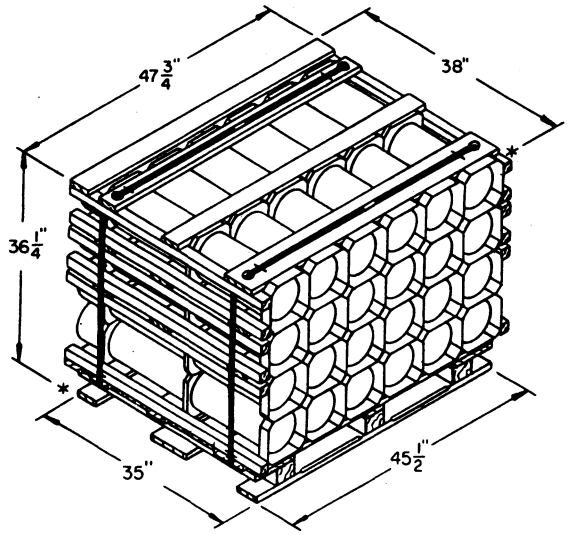
4. ONE OR MORE UNITS CAN BE POSITIONED IN CONTACT WITH A LOAD DIVIDER ON THE CENTER-OF-CAR SIDE. BLOCK AND BRACE WITH LCL BRACES AS SHOWN ON PAGE 68, OR WITH KNEE BRACE ASSEMBLIES, AS SHOWN ON PAGE 64.

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



INCREASED HEIGHT UNIT (6 LAYERS)

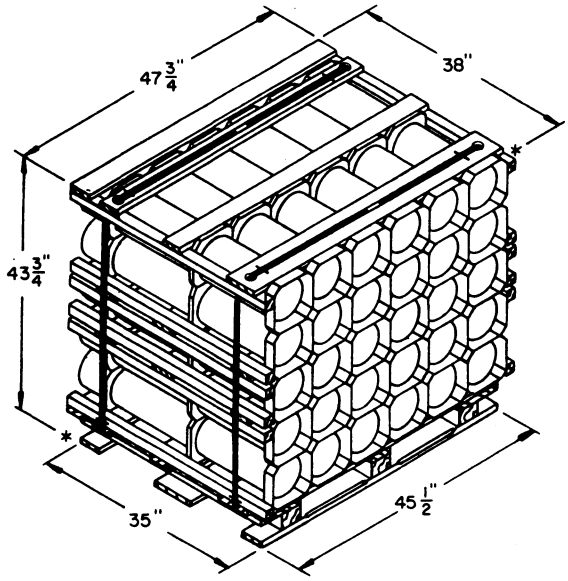
CONTAINER ---------- 36 EACH @ --------- 52 LBS (APPROX)
CUBE ---------- 53.8 CUBIC FEET (APPROX)
GROSS WEIGHT ---------- 2,100 LBS (APPROX) *



BASIC HEIGHT UNIT (FOUR LAYERS)

CONTAINER ---------- 24 EACH @ ----------52 LBS (APPROX)
CUBE ---------- 38.06 CUBIC FEET (APPROX)
GROSS WEIGHT ---------- 1,370 LBS (APPROX) *

* THE UNIT WEIGHTS THROUGHOUT THIS PROCEDURAL DRAWING ARE BASED ON PROPELLING CHARGES HAVING NSN-1320-01-202-8939. THE UNIT WEIGHT FOR PROPELLING CHARGES HAVING NSN 1320 -01-202-8938 WILL BE 2,028 POUNDS, 1,699 POUNDS, OR 1,387 POUNDS RESPECTIVELY.



INCREASED HEIGHT UNIT (5 LAYERS)

CONTAINER ---------- 30 EACH @ ---------- 52 LBS (APPROX)
CUBE ----------49.5 CUBIC FEET (APPROX)
GROSS WEIGHT ----------1,759 LBS (APPROX) *

PALLET UNIT DETAILS

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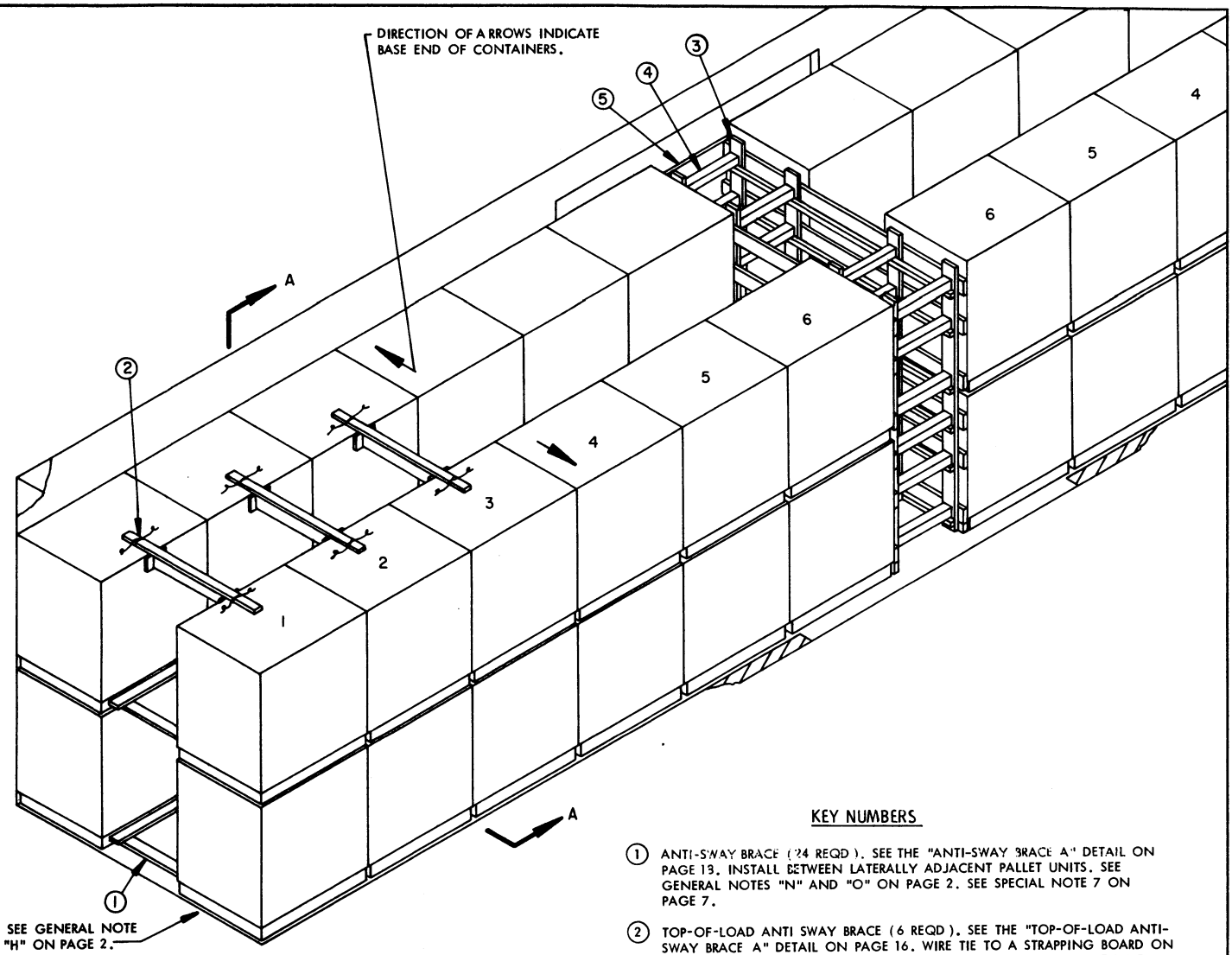


ISOMETRIC VIEW

KEY NUMBERS

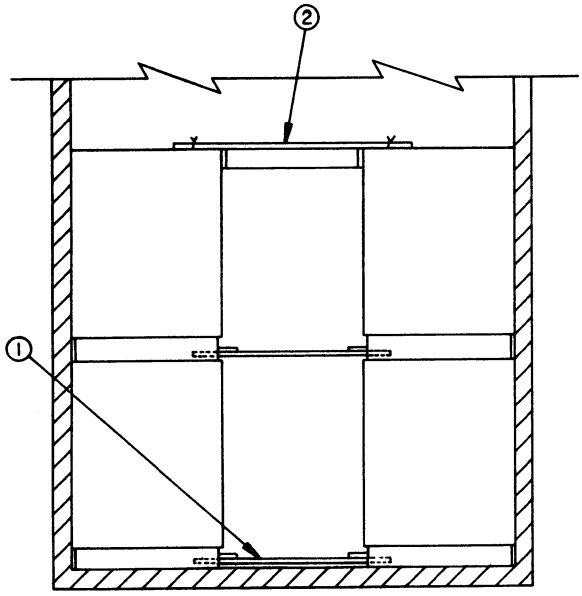
(1) ANTI-SWAY BRACE (24 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 13. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2. SEE SPECIAL NOTE 7 ON PAGE 7.

(2) TOP-OF-LOAD ANTI SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 16. WIRE TIE TO A STRAPPING BOARD ON UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 74. SEE SPECIAL NOTE 3 ON PAGE 7.

(3) CENTER GATE (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 14. SEE SPECIAL NOTES 4 AND 5 ON PAGE 7.

(4) STRUT, 4" X 4" BY CUT TO FIT (REF: 27") (24 REQD). TOENAIL TO PIECES MARKED (3) W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "M" ON PAGE 2. SEE GENERAL NOTES "V" AND "W" ON PAGE 3.

(5) DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION A" DETAIL ON PAGE 14. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTES 6 AND 7 ON PAGE 7.



SECTION A-A

SIX LAYER PALLET UNIT
48-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR

PROJECT FSA 43B/21-63

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOXCAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.

2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 6 IS THE 6-LAYER UNIT. A MAXIMUM OF FIFTY-SIX (56) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 117,600 POUNDS, CAN BE PLACED IN A 60'-8" LONG CAR WHEN USING THE DEPICTED PROCEDURES; THIRTY-SIX (36) UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 75,600 POUNDS, CAN BE OUTLOADED IN A 40'-6" LONG CAR.

3. TOP-OF-LOAD ANTI SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 6 MUST BE INSTALLED IN EACH END OF THE CAR. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A 60' CAR. THREE (3) BRACES ARE REQUIRED IN EACH END OF A 40' OR 50' CAR.

4. CENTER GATE "A" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD, IS DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE" DETAIL ON PAGE 75 FOR GUIDANCE.

5. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR-WIDTH GATES. IN LIEU OF EACH "CENTER GATE A", SHOWN AS PIECE MARKED ③ IN THE LOAD ON PAGE 6, INSTALL TWO (2) "CENTER GATES B" AS SHOWN ON PAGE 15. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TIE PIECE APPLICATION" DETAIL ON PAGE 75.

6. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY ONE-HALF OR MORE OF THE STACK WIDTH OR LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED ④ IN THE LOAD ON PAGE 6, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED SIDE BLOCKING AND DOORWAY PROTECTION STRAPS MAY BE USED. REFER TO PAGES 78 THRU 80 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH PLUG TYPE DOORS. IF THE CAR TO BE LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, NAILED SIDE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED.

7. IF NAILED SIDE BLOCKING AND DOORWAY PROTECTION STRAPS ARE USED, OMIT EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA. IN LIEU OF PIECE MARKED ⑤ ON PAGE 6 USE PIECES MARKED ③ THRU ⑦ ON PAGE 12. SEE SPECIAL NOTE 4 ON PAGE 13 FOR GUIDANCE.

8. THE DEPICTED LOAD CAN BE INCREASED TO SUIT THE QUANTITY TO BE SHIPPED BY USING THE COMBINATION LOADING PROCEDURES SHOWN ON PAGES 48 AND 49.

9. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) PALLET UNITS OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD, OR THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 47 THRU 68 FOR GUIDANCE.

10. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 69 AND 72 FOR SHIPPING GUIDANCE.

11. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 71 FOR GUIDANCE.

BILL OF MATERIAL

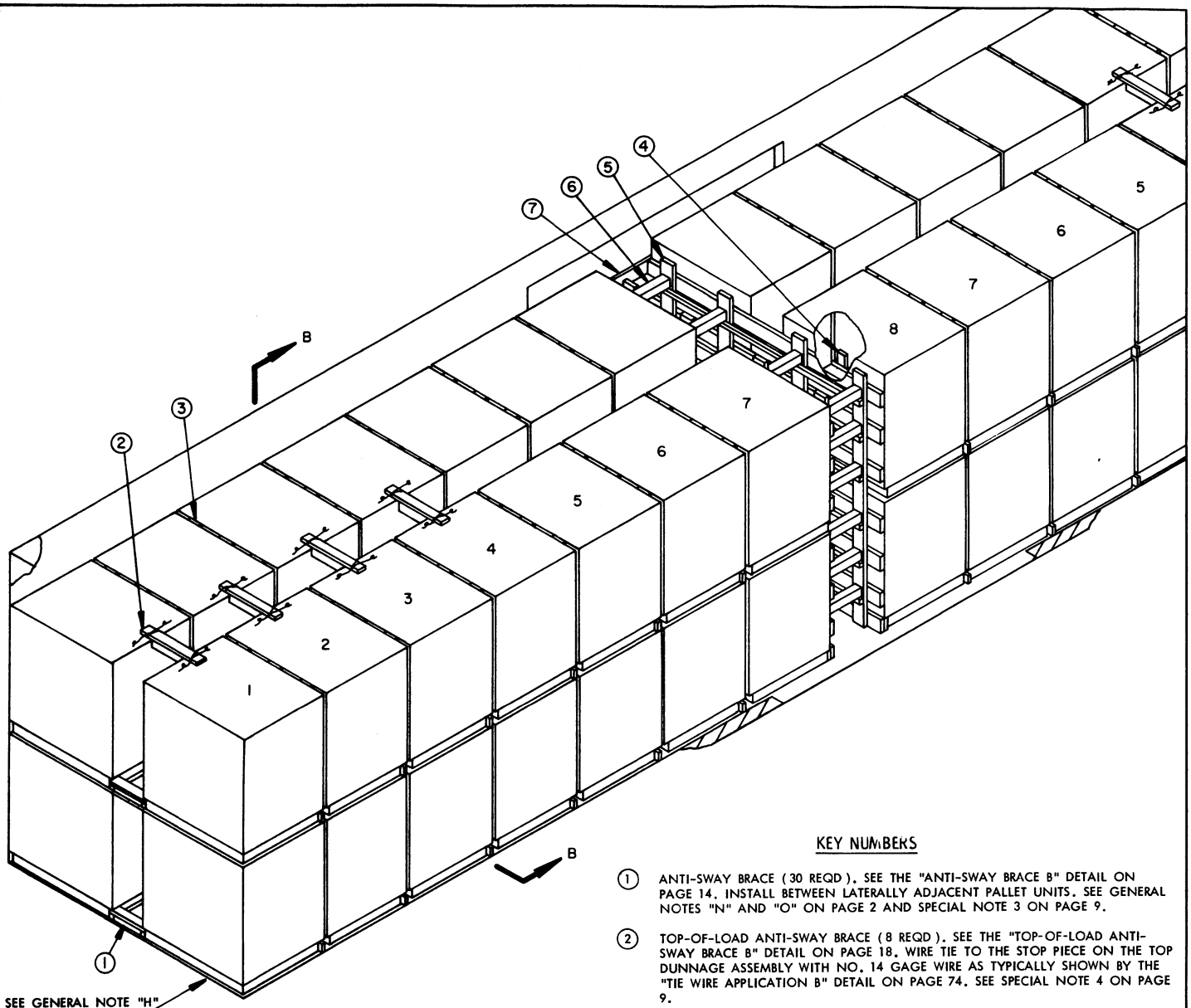
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	80	40
2" X 2"	102	51
2" X 3"	33	17
2" X 4"	387	258
2" X 6"	203	203
4" X 4"	54	72

NAILS	NO. REQD	POUNDS
6d (2")	48	1/2
10d (3")	600	9-1/4
12d (3-1/4")	80	1-1/2
16d (3-1/2")	96	2-1/4

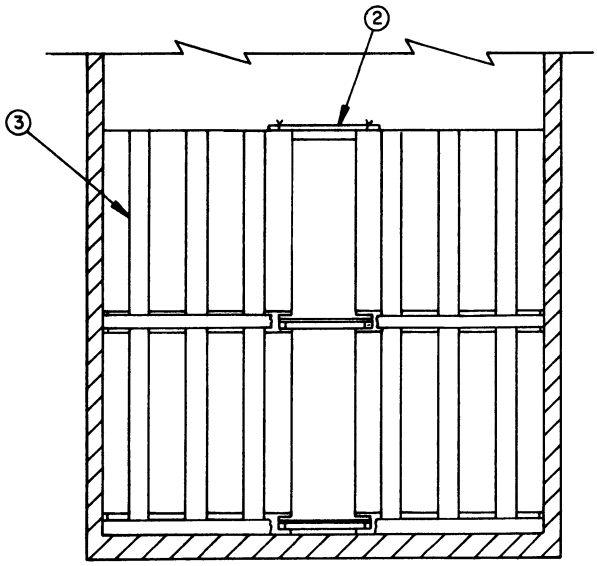
WIRE, NO. 14 GAGE ---------- 120' REQD ---------- 2 LBS

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	48	100,800 LBS
DUNNAGE		1,297 LBS
	TOTAL WEIGHT	102,097 LBS



ISOMETRIC VIEW



SECTION B-B

KEY NUMBERS

(1) ANTI-SWAY BRACE (30 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 9.

(2) TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 18. WIRE TIE TO THE STOP PIECE ON THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 74. SEE SPECIAL NOTE 4 ON PAGE 9.

(3) SEPARATOR GATE (13 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 15. POSITION WITH THE TIE PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 5 AND 7 ON PAGE 9.

(4) STOP PIECE, 1" X 4" X 60" (2 REQD). INSTALL ON THE SIDE OPPOSITE THE VERTICAL PIECES OF THE SEPARATOR GATE, PIECE MARKED (3), WHICH IS IN THE DOORWAY AREA. POSITION IN CONTACT WITH THE ADJACENT PALLET UNITS AND NAIL TO THE TIE PIECES W/3-6d NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 6 ON PAGE 9.

(5) CENTER GATE (2 REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 16. SEE SPECIAL NOTES 8 AND 9 ON PAGE 9.

(6) STRUT, 4" X 4" BY CUT TO FIT (REF: 20") (24 REQD). TOENAIL TO PIECES MARKED (5) W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "M" ON PAGE 2. SEE GENERAL NOTES "V" AND "W" ON PAGE 3.

(7) DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION B" DETAIL ON PAGE 16. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 10 ON PAGE 9.

SIX LAYER PALLET UNIT
60-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR

PROJECT FSA 43B/21-63

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOXCAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.

2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 8 IS THE 6-LAYER UNIT. A MAXIMUM OF SEVENTY-TWO (72) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 151,200 POUNDS, CAN BE PLACED IN A 60'-8" LONG CAR WHEN USING THE DEPICTED PROCEDURES; FORTY-FOUR (44) UNITS, FOR AN APPROXIMATE WEIGHT OF 92,400 POUNDS, CAN BE OUTLOADED IN A 40'-6" LONG CAR.

3. ANTI-SWAY BRACING IS REQUIRED BETWEEN LATERALLY ADJACENT PALLET UNITS. TO PREVENT DISPLACEMENT OF THE ANTI-SWAY BRACE BETWEEN THE UPPER UNITS, A STOP PIECE MUST BE NAILED TO EACH CENTER GATE "C" AS SHOWN ON THE DETAIL ON PAGE 16. SEE SPECIAL NOTE 11.

4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 8 MUST BE INSTALLED IN EACH END OF THE CAR. FIVE (5) BRACES ARE REQUIRED IN EACH END OF A 60' CAR. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A 40' OR 50' CAR.

5. TO FACILITATE POSITIONING OF THE PALLET UNITS AS LOADING PROGRESSES, WHEN LOADING THE BOXCAR, POSITION PALLET UNIT STACKS AGAINST THE END WALL, THEN POSITION A SEPARATOR GATE, SHOWN AS PIECE MARKED ③, SO THE 1" X 4" TIE PIECES ARE LOCATED UNDER THE "OVERHANG" OF THE PALLET UNITS. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.

6. SEPARATOR GATES IN THE DOORWAY MUST BE PREVENTED FROM SHIFTING INTO A DOOR OPENING BY THE APPLICATION OF THE STOP PIECES, PIECES MARKED ④. IN CARS EQUIPPED WITH STAGGERED DOORS, STOP PIECES MAY BE REQUIRED ON UP TO FOUR SEPARATOR GATES. IF SPECIAL NOTE 11 APPLIES OMIT PIECES MARKED ④. IN LIEU OF "SEPARATOR GATE A" IN THE DOORWAY, USE "SEPARATOR GATE J" DETAILED ON PAGE 77.

7. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLYWOOD IN LIEU OF DIMENSIONAL LUMBER, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 74 FOR CONSTRUCTION GUIDANCE.

8. CENTER GATE "C" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE " DETAIL ON PAGE 75 FOR GUIDANCE.

9. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR WIDTH GATES. IN LIEU OF EACH "CENTER GATE C", SHOWN AS PIECE MARKED ⑤ IN THE LOAD ON PAGE 8 INSTALL TWO (2) "CENTER GATES D" AS SHOWN ON PAGE 17. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TIE PIECE APPLICATION" DETAIL ON PAGE 75.

10. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY ONE-HALF OR MORE OF THE STACK LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECES MARKED ⑦ IN THE LOAD ON PAGE 8, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED SIDE BLOCKING AND DOORWAY PROTECTION STRAPS MAY BE USED. REFER TO PAGES 78 THRU 80 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR TO BE LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, NAILED SIDE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED.

11. IF NAILED SIDE BLOCKING AND DOORWAY PROTECTION STRAPS ARE USED, OMIT EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA; IN LIEU OF PIECE MARKED ⑦, USE PIECES MARKED ⑤ THRU ⑧ ON PAGE 26. SEE SPECIAL NOTE 7 ON PAGE 27 FOR GUIDANCE.

12. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) PALLET UNITS OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD, OR THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 46 THRU 68 FOR GUIDANCE.

13. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 70 FOR SHIPPING GUIDANCE.

14. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 71 FOR GUIDANCE.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	363	121
1" X 6"	743	372
2" X 2"	283	95
2" X 3"	40	20
2" X 4"	134	90
2" X 6"	193	193
4" X 4"	40	54
NAILS	**NO. REQD**	**POUNDS**
6d (2")	1,008	6
10d (3")	416	6-1/2
12d (3-1/4")	56	1
16d (3-1/2")	96	2-1/4
WIRE, NO. 14 GAGE ---------- 48' REQD ---------- 1 LB		

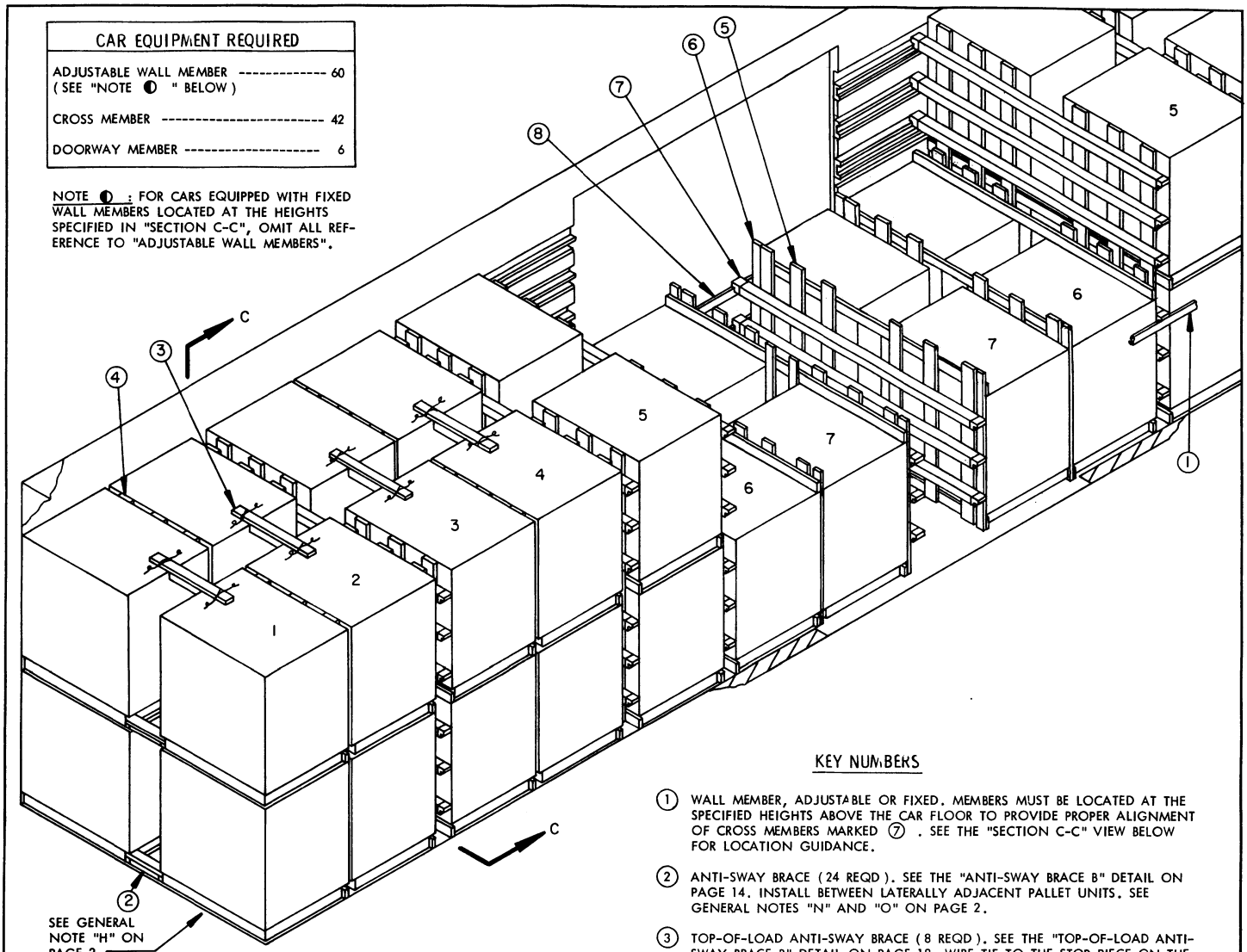
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	60	126,000 LBS
DUNNAGE		1,907 LBS
TOTAL WEIGHT		127,907 LBS

SIX LAYER PALLET UNIT
60-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR

CAR EQUIPMENT REQUIRED	
ADJUSTABLE WALL MEMBER (SEE "NOTE ◐ " BELOW)	60
CROSS MEMBER	42
DOORWAY MEMBER	6

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



ISOMETRIC VIEW

KEY NUMBERS

(1) WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED (7) . SEE THE "SECTION C-C" VIEW BELOW FOR LOCATION GUIDANCE.

(2) ANTI-SWAY BRACE (24 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2.

(3) TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 18. WIRE TIE TO THE STOP PIECE ON THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 74. SEE SPECIAL NOTE 4 ON PAGE 11.

(4) SEPARATOR GATE FOR 2-HIGH (14 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 15. AS APPLICABLE, POSITION WITH THE TIE PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 5 AND 7 ON PAGE 11.

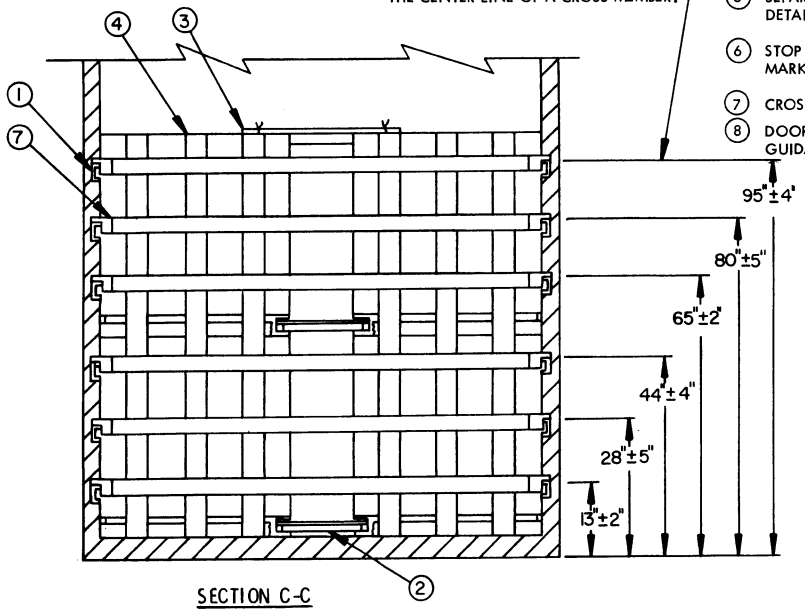
(5) SEPARATOR GATE FOR 1-HIGH (6 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 15. SEE SPECIAL NOTE 6 ON PAGE 11.

(6) STOP PIECE, 1" X 4" X 58" (8 REQD). NAIL TO THE TIE PIECES OF PIECE MARKED (6) W/2-6d NAILS AT EACH JOINT AND CLINCH.

(7) CROSS MEMBER (42 REQD). SEE GENERAL NOTE "Y" ON PAGE 3.

(8) DOORWAY MEMBER (6 REQD). SEE THE "SECTION C-C" VIEW AT LEFT FOR LOCATION GUIDANCE. SEE SPECIAL NOTE 8 ON PAGE 11.

EACH DIMENSIONED HEIGHT ABOVE THE CAR FLOOR TO AN ADJUSTABLE OR FIXED WALL MEMBER MARKED (1) AND/OR A DOORWAY MEMBER MARKED (8) IS SPECIFIED TO LOCATE THE CENTER LINE OF A CROSS MEMBER.



SECTION C-C

6-LAYER PALLET UNIT
48-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOXCAR EQUIPPED WITH MECHANICAL BRACING DEVICES

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE (INSIDE CLEARANCE) WOOD-LINED BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS, AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.

2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 10 IS THE 6-LAYER UNIT. A MAXIMUM OF FORTY-FOUR (44) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 92,400 POUNDS, CAN BE PLACED IN A 40'-6" LONG CAR.

3. IF A CAR HAS BOWED END WALLS WHICH ARE BOWED OUTWARD TWO INCHES (2") OR MORE EITHER FROM SIDE-TO-SIDE OR FROM FLOOR-TO-ROOF, CROSS MEMBERS CAN BE INSTALLED NEAR THE END WALL OF THE CAR TO PROVIDE A "SQUARED END" RATHER THAN INSTALLING DUNNAGE AS SPECIFIED IN GENERAL NOTE "H" ON PAGE 2. THESE CROSS MEMBERS SHOULD BE INSTALLED AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE LOAD AS BLOCKING MEMBERS. A SEPARATOR GATE, SHOWN AS PIECE MARKED ④, MUST BE POSITIONED AGAINST THESE CROSS MEMBERS PRIOR TO LOADING.

4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ③ IN THE LOAD ON PAGE 10 MUST BE INSTALLED IN EACH END OF THE CAR. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.

5. TO FACILITATE POSITIONING OF THE PALLET UNITS AS LOADING PROGRESSES, POSITION PALLET UNIT STACKS AGAINST THE END WALL, THEN POSITION A SEPARATOR GATE, SHOWN AS PIECE MARKED ④, SO THE 1" X 4" TIE PIECES ARE LOCATED UNDER THE "OVERHANG" OF THE PALLET UNITS. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.

6. SEPARATOR GATES IN THE DOORWAY MUST BE PREVENTED FROM SHIFTING INTO A DOOR OPENING BY THE APPLICATION OF THE STOP PIECES, PIECES MARKED ⑥. IN CARS EQUIPPED WITH STAGGERED DOORS, STOP PIECES MAY BE REQUIRED ON UP TO FOUR SEPARATOR GATES.

7. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLYWOOD IN LIEU OF DIMENSIONAL LUMBER, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 74 FOR CONSTRUCTION GUIDANCE.

8. IF THE CAR BEING LOADED IS EQUIPPED WITH AT LEAST TWELVE (12) DOORWAY MEMBERS, AN ADDITIONAL EIGHT (8) PALLET UNITS CAN BE LOADED, PROVIDING THE WEIGHT LIMIT FOR THE CAR IS NOT EXCEEDED.

9. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A LOAD MAY BE REDUCED BY MULTIPLES OF TWO (2) PALLET UNITS BY OMITTING LATERALLY ADJACENT UNITS FROM THE TOP LAYER OF ONE OR MORE LOAD UNITS, OR BY MULTIPLES OF FOUR (4) PALLET UNITS BY OMITTING ONE OR MORE ENTIRE LOAD UNITS. TO REDUCE A LOAD BY ONE (1) PALLET UNIT, REFER TO THE LCL PROCEDURES ON PAGES 44 AND 45 FOR GUIDANCE.

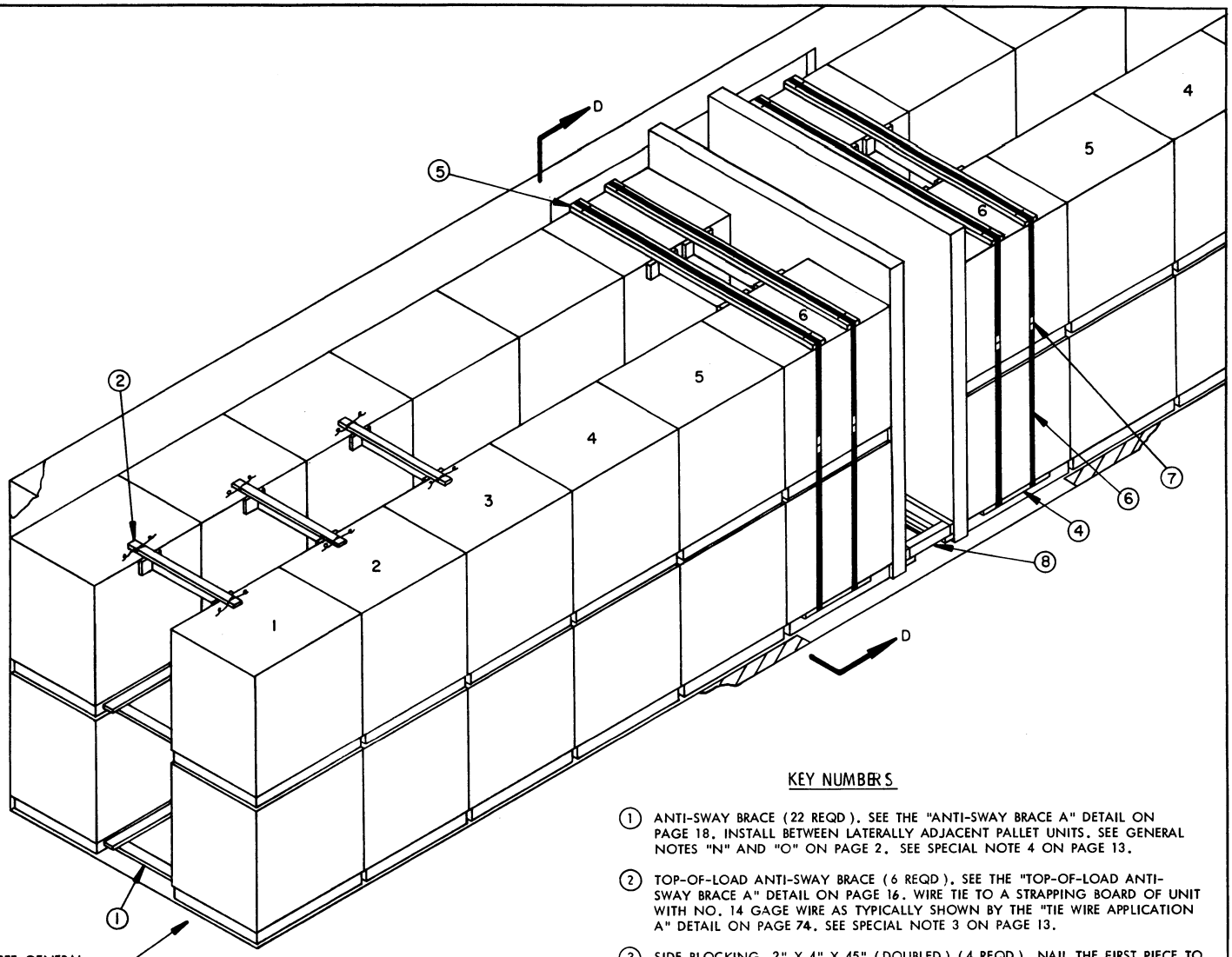
10. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 71 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	161	54
1" X 6"	894	447
2" X 2"	148	50
2" X 4"	100	67
NAILS	NO. REQD	POUNDS
6d (2")	1,136	17-1/2
10d (3")	96	1-1/2
12d (3-1/4")	24	1/2
WIRE, NO. 14 GAGE ---------- 48' REQD ---------- 1 LB		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	48	100,800 LBS
DUNNAGE		1,256 LBS
TOTAL WEIGHT		102,056 LBS

SIX LAYER PALLET UNIT
48-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOXCAR EQUIPPED WITH MECHANICAL BRACING DEVICES



SEE GENERAL NOTE "H" ON PAGE 2.

ISOMETRIC VIEW

KEY NUMBERS

(1) ANTI-SWAY BRACE (22 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 18. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2. SEE SPECIAL NOTE 4 ON PAGE 13.

(2) TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 16. WIRE TIE TO A STRAPPING BOARD OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 74. SEE SPECIAL NOTE 3 ON PAGE 13.

(3) SIDE BLOCKING, 2" X 4" X 45" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/6-16D NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 4 ON PAGE 13.

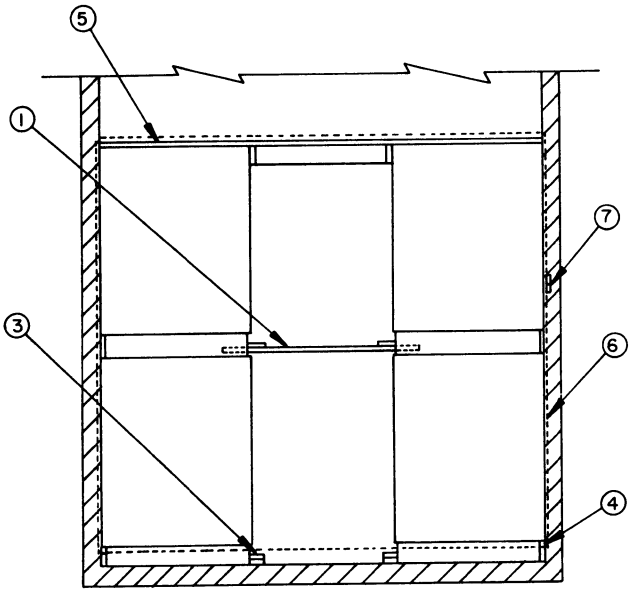
(4) BATTEN, 2" X 2" X 30" OR A LENGTH TO SUIT (4 REQD). POSITION UNDER CONTAINER ENDS PRIOR TO TENSIONING STRAP.

(5) STRAPPING BOARD (4 REQD). SEE THE "STRAPPING BOARD ASSEMBLY A" DETAIL ON PAGE 18.

(6) DOORWAY PROTECTION STRAP, 1-1/4" X .035" OR .031" X 37'-0" LONG STEEL STRAPPING (4 REQD). INSTALL TO ENCIRCLE THE LOAD UNITS IN THE DOORWAY AREA. STAPLE TO THE STRAPPING BOARD W/2 STAPLES.

(7) SEAL FOR 1-1/4" STRAPPING (8 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "P" ON PAGE 2.

(8) STRUT ASSEMBLY (1 REQD). SEE THE "STRUT ASSEMBLY FOR 1 PIECE BULKHEADS" DETAIL ON PAGE 81. INSTALL BETWEEN THE LOAD DIVIDER BULKHEADS. SEE SPECIAL NOTE 5 ON PAGE 13.



SECTION D-D

SIX LAYER PALLET UNIT

48-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOXCAR EQUIPPED WITH LOAD DIVIDER BULKHEADS

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED, CUSHIONED BOX CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "BB" THRU "FF" ON PAGE 3.

2. THE PALLET UNIT SHOWN IN THE LOAD ON PAGE 12 IS THE 6-LAYER UNIT. A MAXIMUM OF FIFTY-SIX (56) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 117,600 POUNDS CAN BE PLACED IN A 60'-8" LONG CAR, OR A MAXIMUM OF THIRTY-SIX (36) UNITS CAN BE LOADED IN A 40'-6" CAR FOR AN APPROXIMATE LADING WEIGHT OF 75,600 POUNDS, WHEN USING THE DEPICTED PROCEDURES. IF THE LENGTH-WISE LOADING PATTERN SHOWN ON PAGE 8 IS EMPLOYED, THEN SEVENTY-TWO (72) PALLET UNITS FOR AN APPROXIMATE LADING WEIGHT OF 151,200 POUNDS CAN BE PLACED IN A 60'-8" LONG CAR, FIFTY-SIX (56) UNITS CAN BE LOADED IN A 50'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 117,600 POUNDS, AND FORTY-FOUR (44) UNITS CAN BE LOADED IN A 40'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 92,400 POUNDS.

3. TOP-OF-LOAD ANTI-SWAY BRACES SHOWN AS PIECE MARKED (2) MUST BE INSTALLED IN EACH END OF THE LOAD. THREE (3) ASSEMBLIES ARE REQUIRED IN EACH END OF 40' AND 50' CARS. FOUR (4) ARE REQUIRED IN EACH END OF A 60' CAR.

4. DOORWAY PROTECTION IS REQUIRED FOR ALL THE LOAD UNITS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY ONE-HALF OR MORE OF THE UNIT WIDTH. SIDE BLOCKING SHOWN AS PIECE MARKED (3) IN THE LOAD VIEW, MUST BE USED IN LIEU OF THE LOWER ANTI-SWAY BRACE MARKED (1) FOR ALL UNITS REQUIRING DOORWAY PROTECTION STRAPS. TWO (2) DOORWAY PROTECTION STRAPS ARE REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS COMPLETELY WITHIN THE DOORWAY AREA OR WHICH IS NOT RETAINED BY AT LEAST SIX INCHES (6") OF THE SIDEWALL ON BOTH SIDES OF THE CAR. ONE (1) DOORWAY PROTECTION STRAP IS REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS RETAINED BY FROM 6" TO ONE-HALF THE PALLET/LOAD UNIT LENGTH OR WIDTH. IF THE CAR BEING LOADED IS EQUIPPED WITH SLIDING DOORS, A WOODEN GATE TYPE OF DOORWAY PROTECTION SUCH AS SHOWN IN THE LOAD ON PAGE 6, OR ANY OF THE ALTERNATIVES ON PAGES 78 THRU 80 MAY BE USED.

5. THE STRUT ASSEMBLY, SHOWN AS PIECE MARKED (8) IN THE LOAD ON PAGE 12, IS REQUIRED WHEN THE LOAD IN EITHER END OF A CAR IS 50,000 POUNDS OR MORE. FOR THE DEPICTED LOAD THE STRUT ASSEMBLY WOULD NOT BE REQUIRED IF THE LOAD CONSISTED OF FIVE (5) LOAD UNITS IN EACH END OF THE CAR. THE STRUT ASSEMBLY WILL ALWAYS BE REQUIRED FOR FULL LOADS IN 50' OR LONGER CARS.

6. THE DEPICTED LOAD CAN BE REDUCTED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) PALLET UNITS OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. OR, THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 48 THRU 57 AND GENERAL NOTE "GG" ON PAGE 3 FOR GUIDANCE.

7. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 69 AND/OR PAGES 70 AND 72 FOR SHIPPING GUIDANCE.

8. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 71 FOR GUIDANCE.

BILL OF MATERIAL

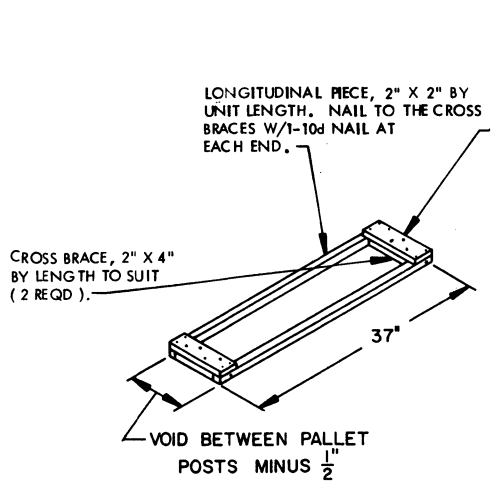
LUMBER	LINEAR FEET	BOARD FEET
1" X 8"	17	12
2" X 2"	10	4
2" X 4"	402	268
2" X 6"	80	80
4" X 4"	6	8
NAILS		POUNDS
6d (2")	16	NIL
10d (3")	320	5
12d (3-1/4")	96	1-1/2
16d (3-1/2")	48	1

STEEL STRAPPING, 1-1/4" ------- 148' REQD ---------- 22 LBS
SEAL FOR 1-1/4" STRAPPING-------- 8 REQD ---------- NIL
STAPLE FOR 1-1/4" STRAPPING------ 8 REQD ---------- NIL
WIRE, NO. 14 GAGE ---------- 120' REQD ---------- 2 LBS

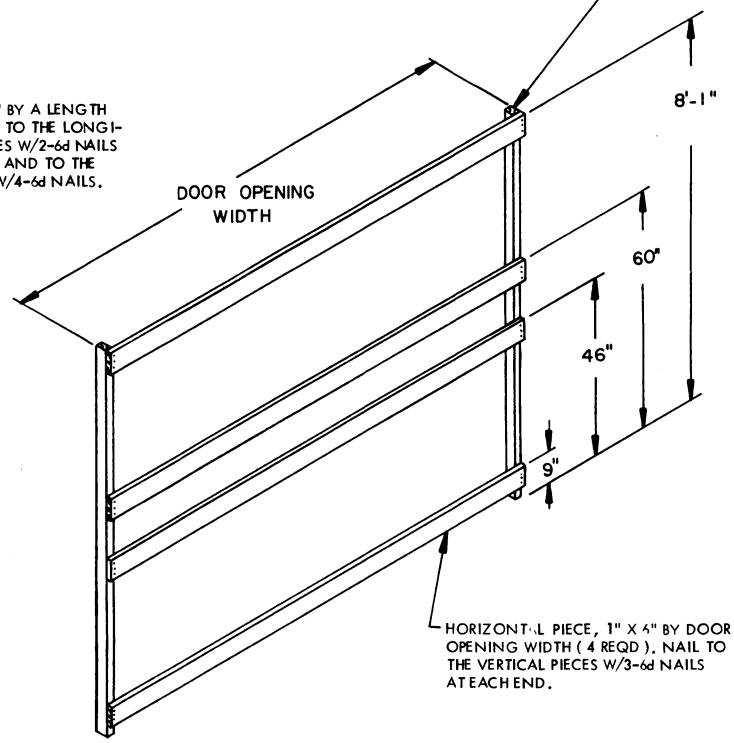
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	48	100,800 LBS
DUNNAGE		774 LBS
TOTAL WEIGHT		101,574 LBS

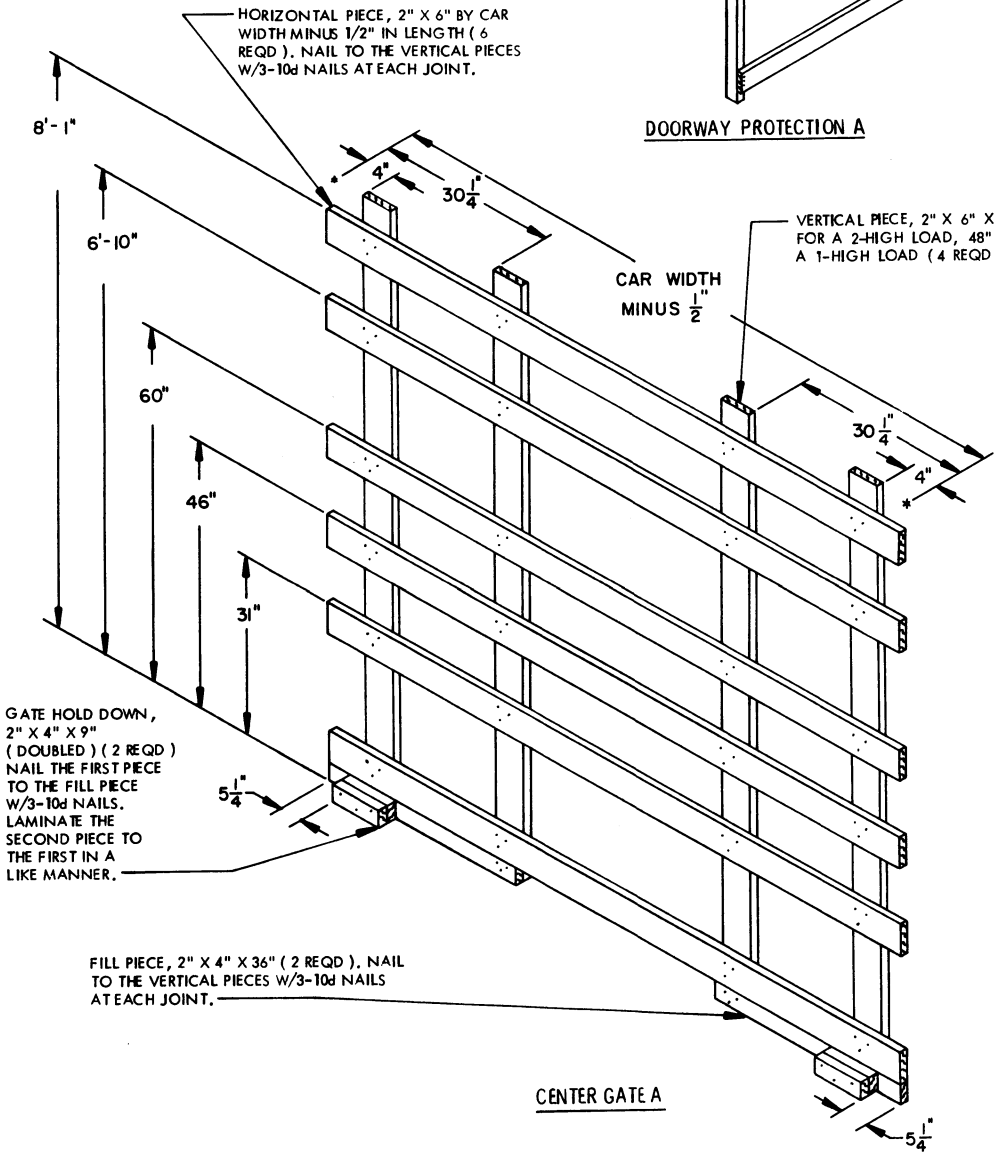
SIX LAYER PALLET UNIT
48-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOXCAR EQUIPPED WITH LOAD DIVIDER BULKHEADS



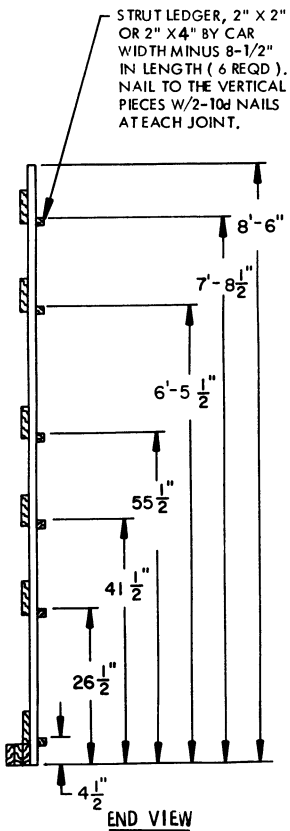
ANTI SWAY BRACE B



DOORWAY PROTECTION A

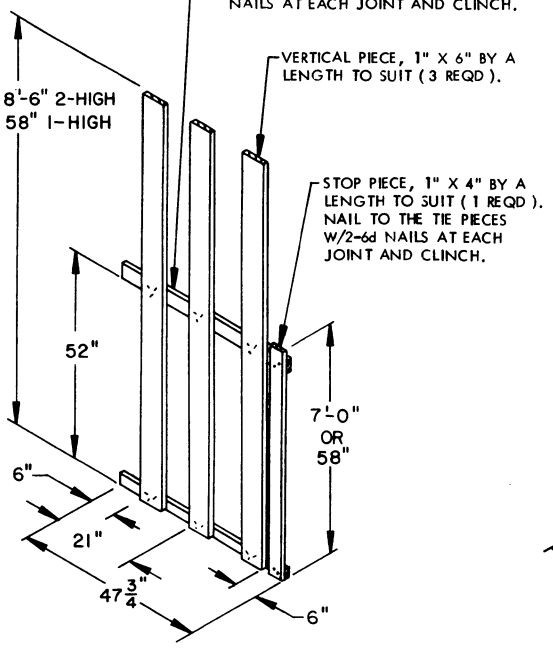


CENTER GATE A

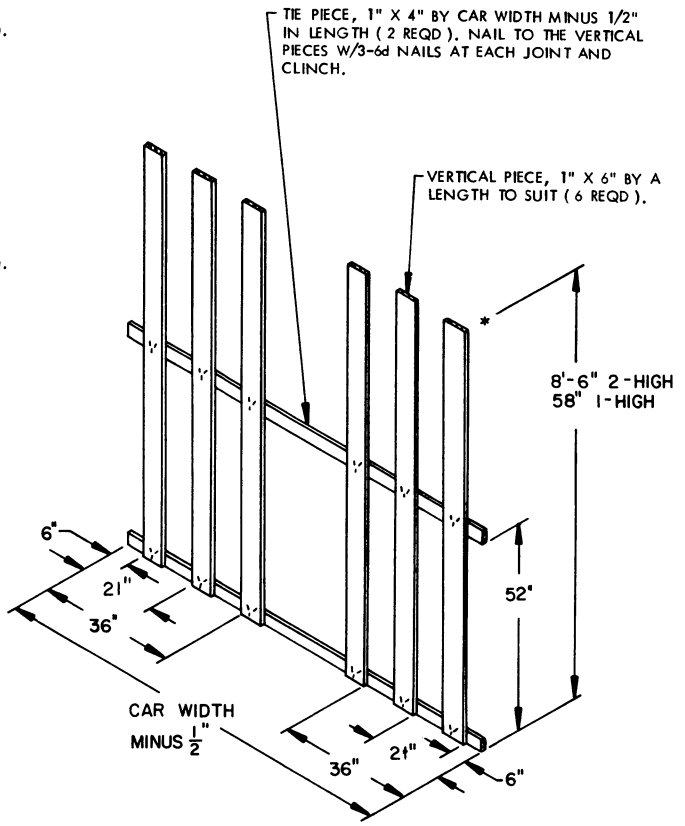


END VIEW

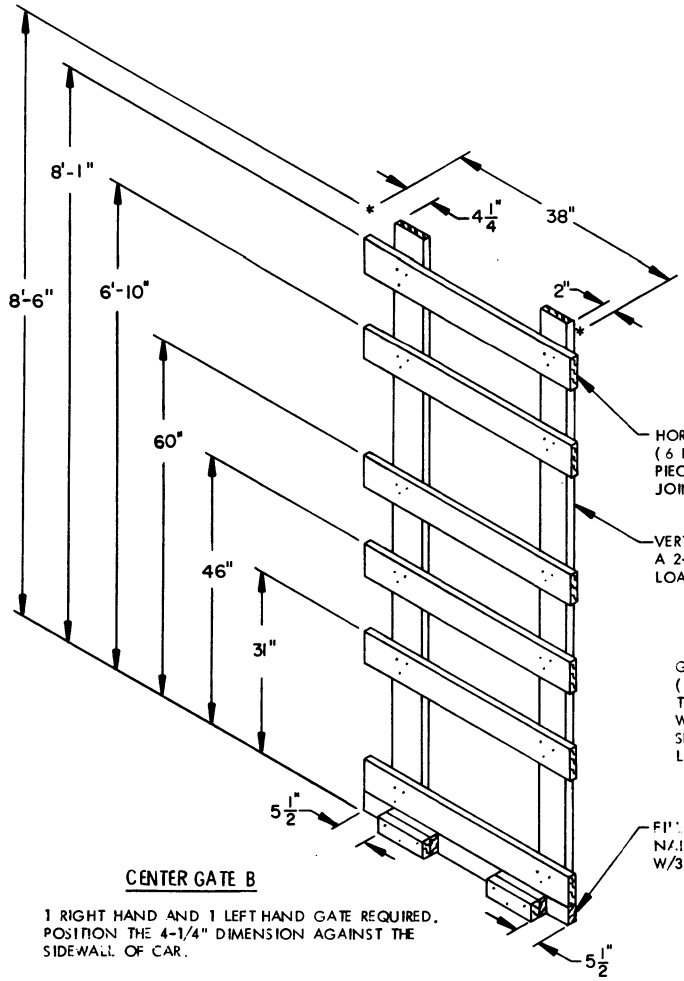
DETAILS FOR SIX-LAYER UNIT



SEPARATOR GATE B

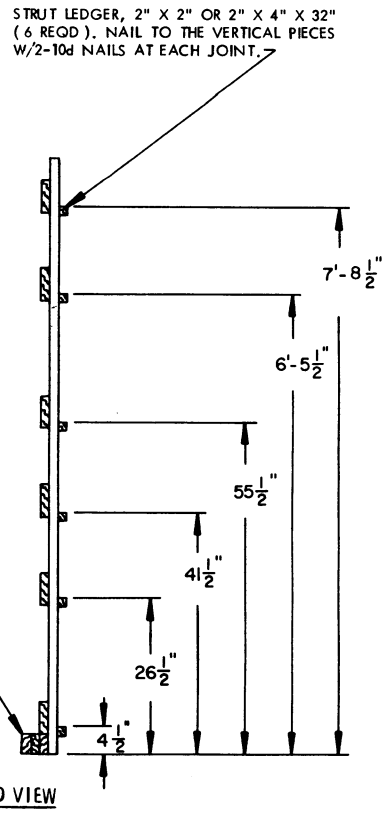


SEPARATOR GATE A



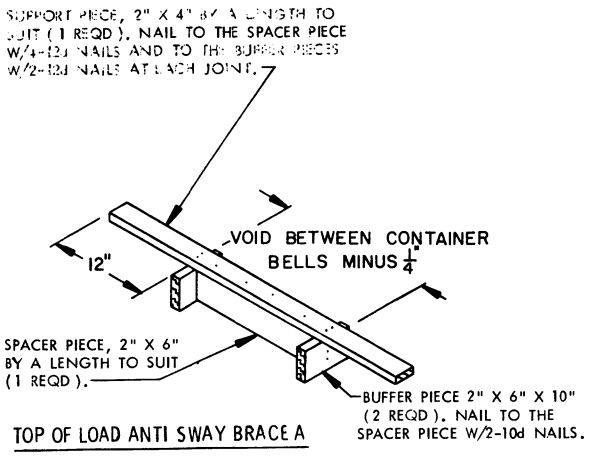
CENTER GATE B

1 RIGHT HAND AND 1 LEFT HAND GATE REQUIRED. POSITION THE 4-1/4" DIMENSION AGAINST THE SIDEWALL OF CAR.

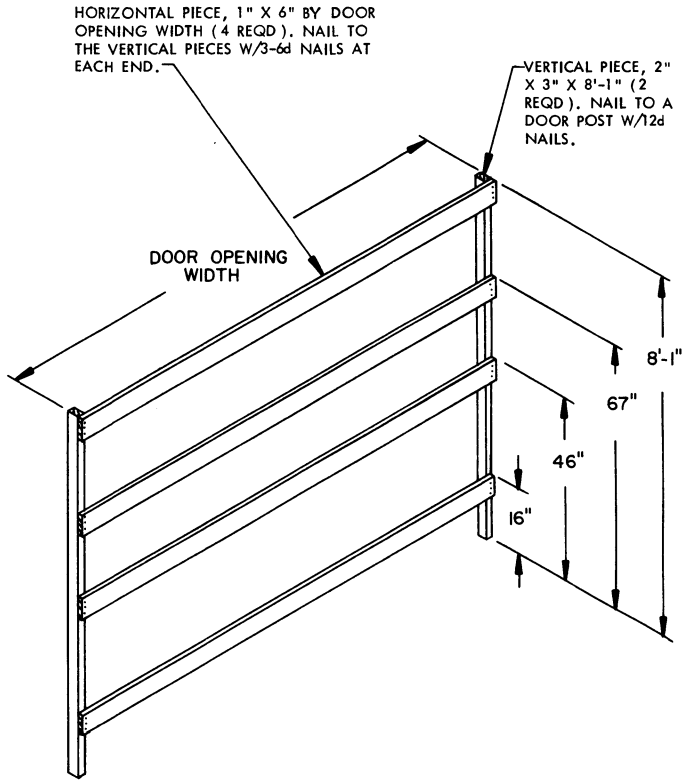


END VIEW

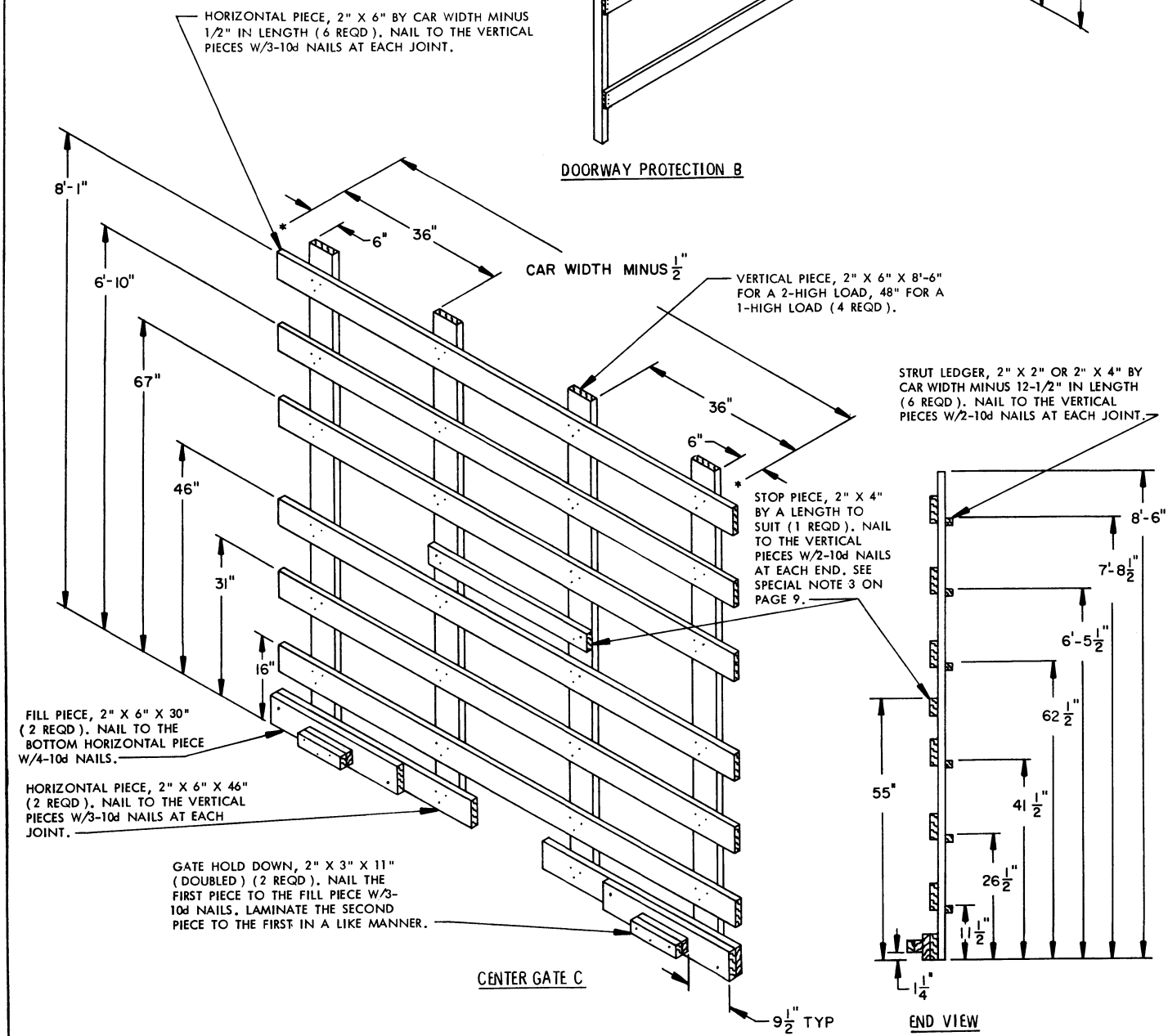
DETAILS FOR SIX LAYER UNIT



TOP OF LOAD ANTI SWAY BRACE A



DOORWAY PROTECTION B



CENTER GATE C

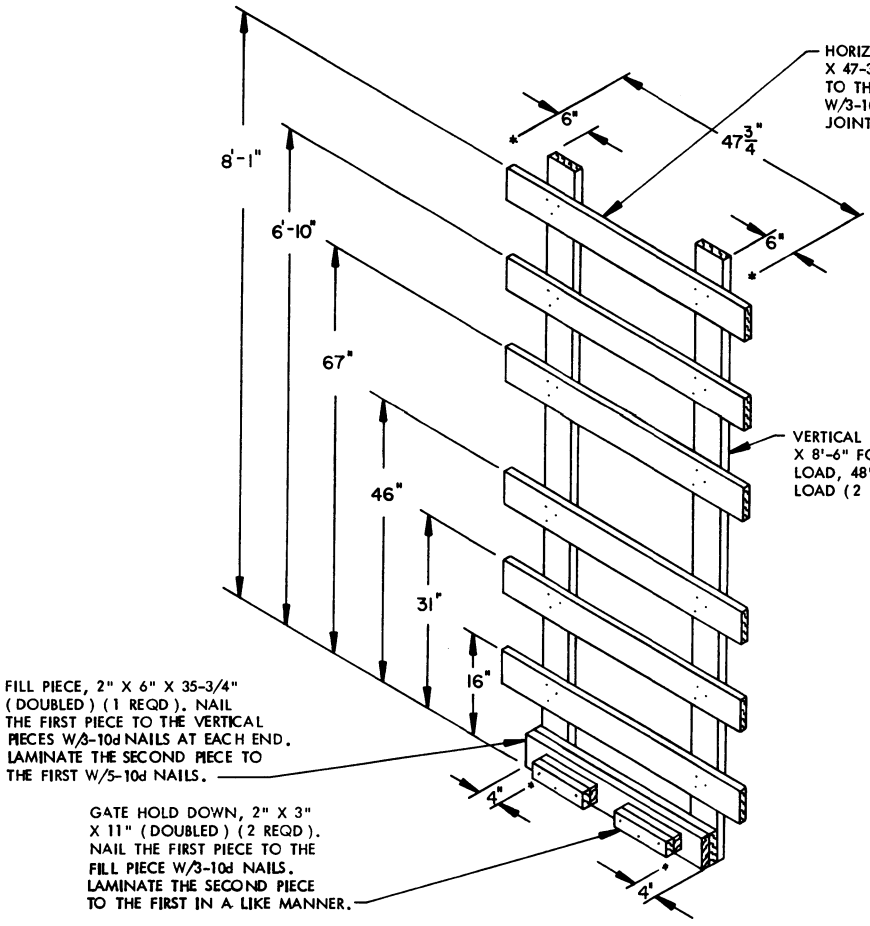
END VIEW

DETAILS FOR SIX LAYER UNIT

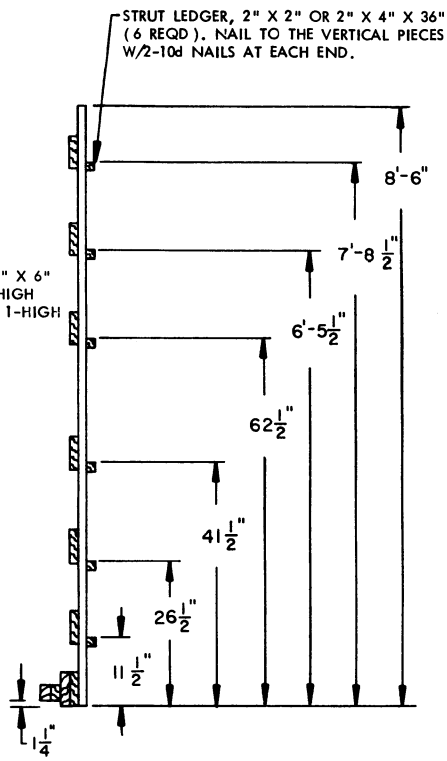
SMCAC FORM 6-1, 1 NOV 87

PROJECT FSA 43B/21-63

SUPERSEDES SMCAC FORM 6, 1 NOV 85

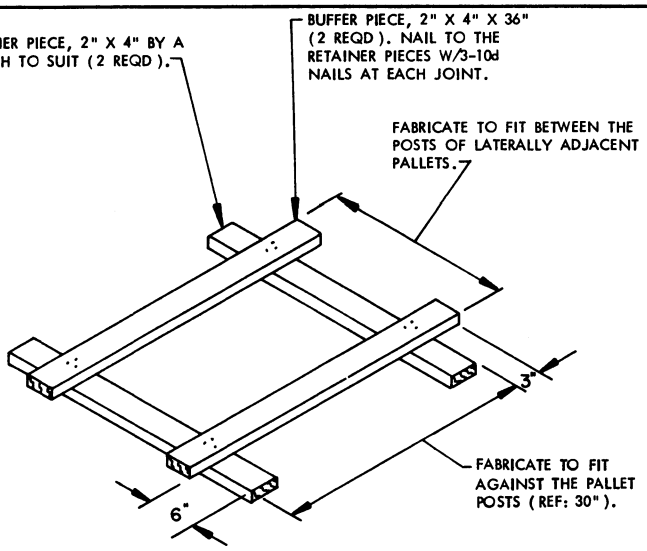


CENTER GATE D



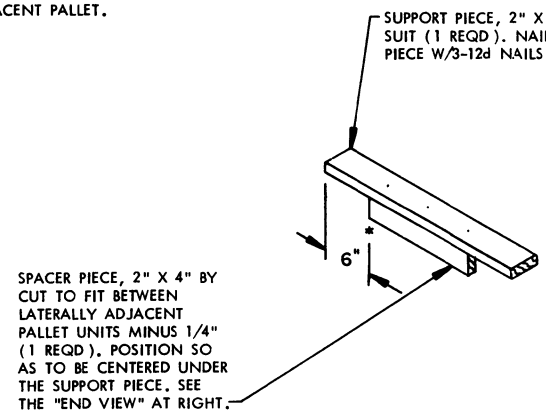
END VIEW

DETAILS FOR SIX LAYER UNIT

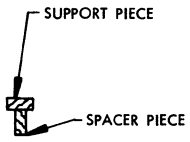


ANTI SWAY BRACE A

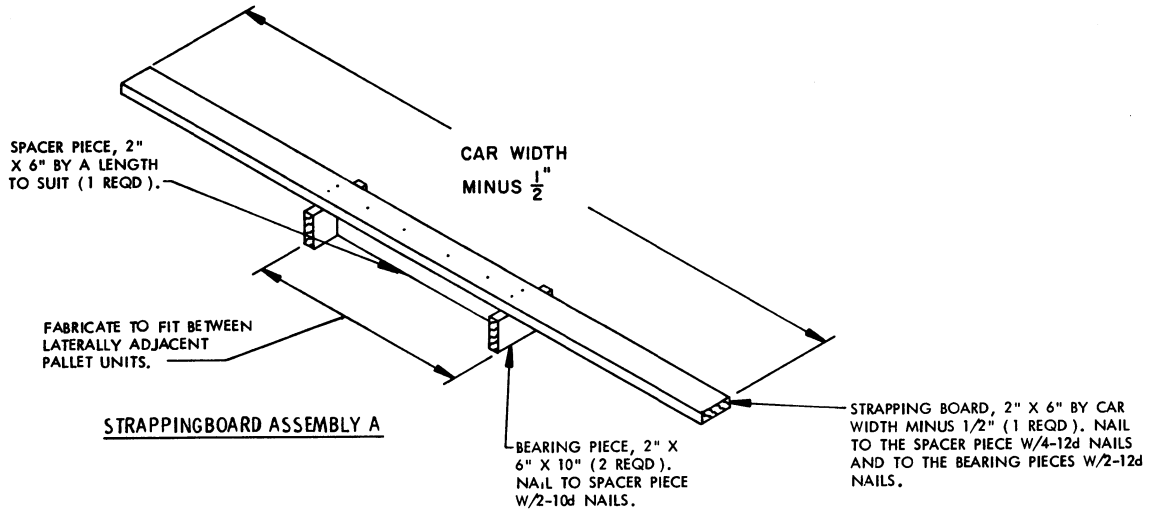
IF DESIRED, THE ANTI-SWAY BRACE CAN BE PARTIALLY PRE-ASSEMBLED; ONE BUFFER PIECE CAN BE NAILED TO BOTH RETAINER PIECES. THE LONG ENDS OF THE ASSEMBLY CAN THEN BE INSTALLED INTO THE FORKLIFT OPENING OF A LOADED PALLET PRIOR TO POSITIONING THE LATERALLY ADJACENT PALLET.



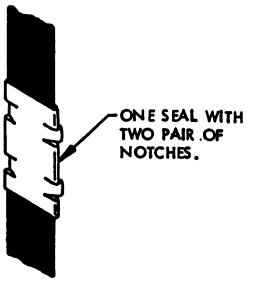
TOP OF LOAD ANTI SWAY BRACE B



END VIEW



STRAPPINGBOARD ASSEMBLY A

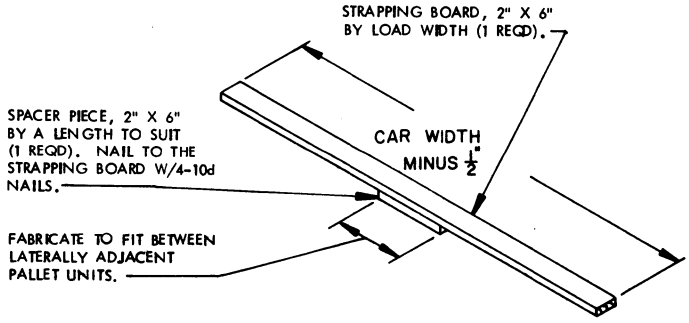


STRAP JOINT A

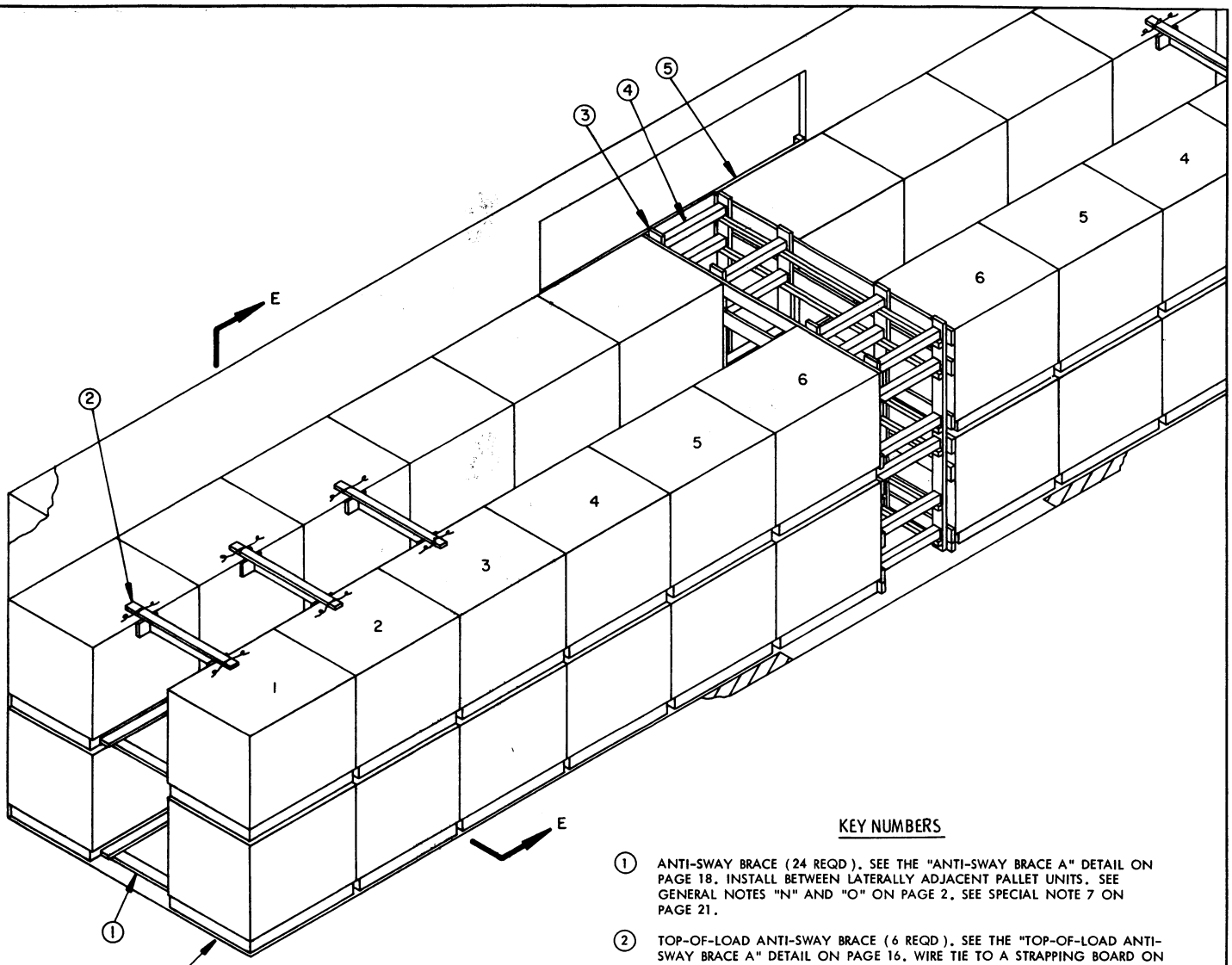
METHOD OF SECURING A STRAP JOINT WHEN USING A NOTCH-TYPE SEALER.

STRAP JOINT B

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



STRAPPING BOARD ASSEMBLY "B"



ISOMETRIC VIEW

KEY NUMBERS

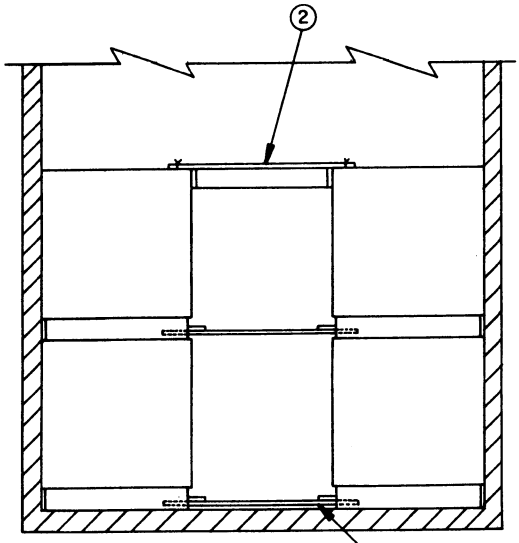
(1) ANTI-SWAY BRACE (24 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 18. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2. SEE SPECIAL NOTE 7 ON PAGE 21.

(2) TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 16. WIRE TIE TO A STRAPPING BOARD ON UNIT WITH NO. 14 GATE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 74. SEE SPECIAL NOTE 3 ON PAGE 21.

(3) CENTER GATE (2 REQD). SEE THE "CENTER GATE E" DETAIL ON PAGE 28. SEE SPECIAL NOTES 4 AND 5 ON PAGE 21.

(4) STRUT, 4" X 4" BY CUT TO FIT (REF: 27") (24 REQD). TOENAIL TO PIECES MARKED (3) W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "M" ON PAGE 2. SEE GENERAL NOTES "V" AND "W" ON PAGE 3.

(5) DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION C" DETAIL ON PAGE 28. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTES 6 AND 7 ON PAGE 21.



SECTION E-E

FIVE LAYER PALLET UNIT
48 UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOXCAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.

2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 20 IS THE 5-LAYER UNIT. A MAXIMUM OF FIFTY-SIX (56) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 98,504 POUNDS, CAN BE PLACED IN A 60'-8" LONG CAR WHEN USING THE DEPICTED PROCEDURES; THIRTY-SIX (36) UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 63,324 POUNDS, CAN BE OUTLOADED IN A 40'-6" LONG CAR.

3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 20 MUST BE INSTALLED IN EACH END OF THE CAR. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A 60' CAR. THREE (3) BRACES ARE REQUIRED IN EACH END OF A 40' OR 50' CAR.

4. CENTER GATE "E" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD, IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE" DETAIL ON PAGE 75 FOR GUIDANCE.

5. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR WIDTH GATES. IN LIEU OF EACH "CENTER GATE E", SHOWN AS PIECE MARKED ③ IN THE LOAD ON PAGE 20, INSTALL TWO (2) "CENTER GATES F" AS SHOWN ON PAGE 29. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TIE PIECE APPLICATION" DETAIL ON PAGE 75.

6. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY ONE-HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECES MARKED ⑤ IN THE LOAD ON PAGE 20, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED SIDE BLOCKING AND DOORWAY PROTECTION STRAPS MAY BE USED. REFER TO PAGES 78 THRU 80 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR TO BE LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, NAILED SIDE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED.

7. IF NAILED SIDE BLOCKING AND DOORWAY PROTECTION STRAPS ARE USED, OMIT EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA. IN LIEU OF PIECE MARKED ⑤ ON PAGE 20 USE PIECES MARKED ③ THRU ⑦ ON PAGE 12 SEE SPECIAL NOTE 4 ON PAGE 13 FOR GUIDANCE.

8. THE DEPICTED LOAD CAN BE INCREASED TO SUIT THE QUANTITY TO BE SHIPPED BY USING THE COMBINATION LOADING PROCEDURES SHOWN ON PAGES 48 AND 49.

9. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) PALLET UNITS OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD, OR THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 47 THRU 68 FOR GUIDANCE.

10. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 69 AND 72 FOR SHIPPING GUIDANCE.

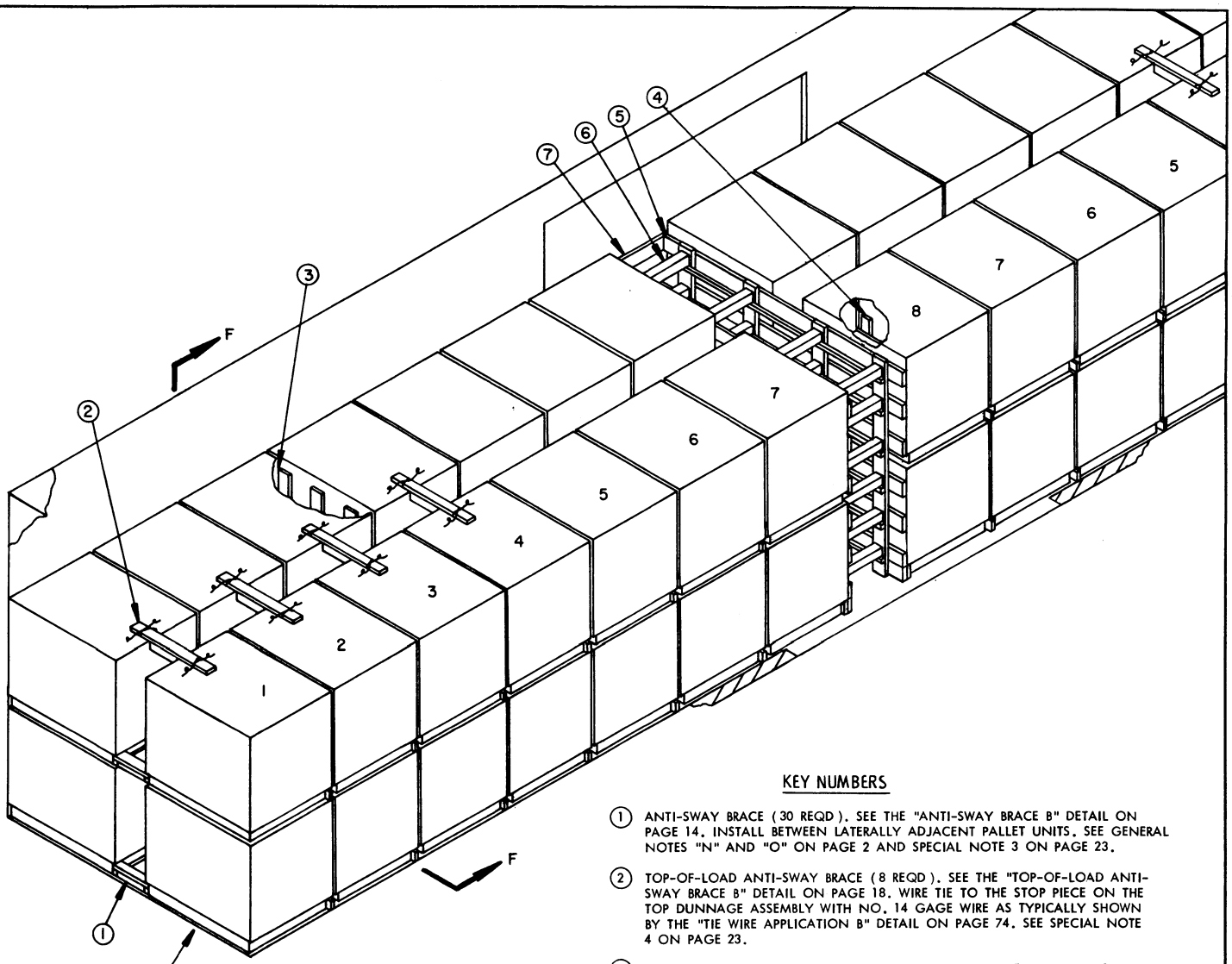
11. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 71 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	80	40
2" X 2"	102	34
2" X 3"	30	15
2" X 4"	387	258
2" X 6"	197	197
4" X 4"	54	72
NAILS	NO. REQD	POUNDS
6d (2")	48	1/2
10d (3")	600	9-1/4
12d (3-1/4")	76	1-1/4
16d (3-1/2")	96	2-1/4
WIRE, NO. 14 GAGE ---------- 120' REQD ---------- 2		

LOAD AS SHOWN

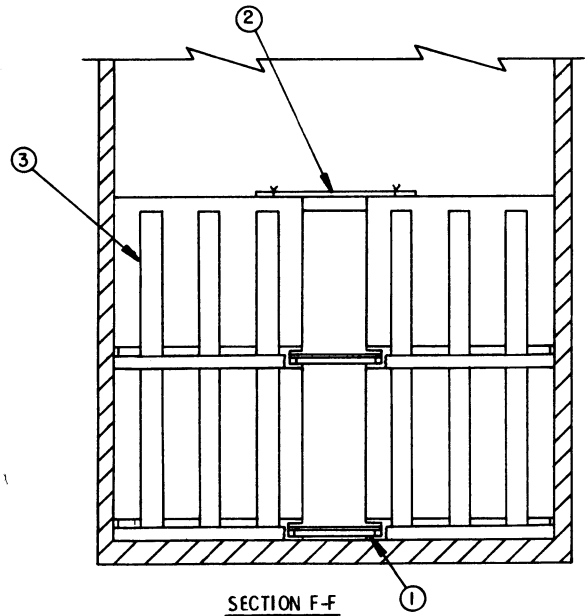
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	48	84,432 LBS
DUNNAGE		1,247 LBS
TOTAL WEIGHT		85,679 LBS

FIVE LAYER PALLET UNIT
48-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR



SEE GENERAL NOTE "H" ON PAGE 2.

ISOMETRIC VIEW



SECTION F-F

KEY NUMBERS

(1) ANTI-SWAY BRACE (30 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 23.

(2) TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 18. WIRE TIE TO THE STOP PIECE ON THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 74. SEE SPECIAL NOTE 4 ON PAGE 23.

(3) SEPARATOR GATE (13 REQD). SEE THE "SEPARATOR GATE C" DETAIL ON PAGE 29. POSITION WITH THE TIE PIECES AGAINST THE ALREADY LOADED UNITS. SEE SPECIAL NOTES 5 AND 7 ON PAGE 23.

(4) STOP PIECE, 1" X 4" X 60" (2 REQD). INSTALL ON THE SIDE OPPOSITE THE VERTICAL PIECES OF THE SEPARATOR GATE, PIECE MARKED (3), WHICH IS IN THE DOORWAY AREA. POSITION IN CONTACT WITH THE ADJACENT PALLET UNITS AND NAIL TO THE TIE PIECES W/3-6d NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 6 ON PAGE 23.

(5) CENTER GATE (2 REQD). SEE THE "CENTER GATE G" DETAIL ON PAGE 30. SEE SPECIAL NOTES 8 AND 9 ON PAGE 23.

(6) STRUT, 4" X 4" BY CUT TO FIT (REF: 20") (24 REQD). TOENAIL TO PIECES MARKED (5) W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "M" ON PAGE 2. SEE GENERAL NOTES "V" AND "W" ON PAGE 3.

(7) DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION D" DETAIL ON PAGE 30. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 10 ON PAGE 23.

5-LAYER PALLET UNIT
60-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOXCAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.

2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 22 IS THE 5-LAYER UNIT. A MAXIMUM OF SEVENTY-TWO (72) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 126,648 POUNDS, CAN BE PLACED IN A 60'-8" LONG CAR WHEN USING THE DEPICTED PROCEDURES; FORTY-FOUR (44) UNITS, FOR AN APPROXIMATE WEIGHT OF 77,396 POUNDS, CAN BE OUTLOADED IN A 40'-6" LONG CAR.

3. ANTI-SWAY BRACING IS REQUIRED BETWEEN LATERALLY ADJACENT PALLET UNITS. TO PREVENT DISPLACEMENT OF THE ANTI-SWAY BRACE BETWEEN THE UPPER UNITS, A STOP PIECE MUST BE NAILED TO EACH CENTER GATE "G" AS SHOWN ON THE DETAIL ON PAGE 30. SEE SPECIAL NOTE 11.

4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 26 MUST BE INSTALLED IN EACH END OF THE CAR. FIVE (5) BRACES ARE REQUIRED IN EACH END OF A 60' CAR. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A 40' OR 50' CAR.

5. TO FACILITATE POSITIONING OF THE PALLET UNITS AS LOADING PROGRESSES, WHEN LOADING THE BOXCAR, POSITION PALLET UNIT STACKS AGAINST THE END WALL, THEN POSITION A SEPARATOR GATE, SHOWN AS PIECE MARKED ③, SO THE 1" X 4" TIE PIECES ARE LOCATED UNDER THE "OVERHANG" OF THE PALLET UNITS. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.

6. SEPARATOR GATES IN THE DOORWAY MUST BE PREVENTED FROM SHIFTING INTO A DOOR OPENING BY THE APPLICATION OF THE STOP PIECES, PIECES MARKED ④. IN CARS EQUIPPED WITH STAGGERED DOORS, STOP PIECES MAYBE REQUIRED ON UP TO FOUR SEPARATOR GATES. IF SPECIAL NOTE 11 APPLIES OMIT PIECES MARKED ④. IN LIEU OF "SEPARATOR GATE C" IN THE DOORWAY USE "SEPARATOR GATE J" DETAILED ON PAGE 77.

7. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLYWOOD IN LIEU OF DIMENSIONAL LUMBER, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 74 FOR CONSTRUCTION GUIDANCE.

8. CENTER GATE "G" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD, IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE" DETAIL ON PAGE 75 FOR GUIDANCE.

9. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR WIDTH GATES. IN LIEU OF EACH "CENTER GATE G", SHOWN AS PIECE MARKED ⑤ IN THE LOAD ON PAGE 22, INSTALL TWO (2) "CENTER GATES N" AS SHOWN ON PAGE 31. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TIE PIECE APPLICATION DETAIL ON PAGE 75.

10. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY ONE-HALF OR MORE OF THE STACK WIDTH OR LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECES MARKED ⑦ IN THE LOAD ON PAGE 22, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED SIDE BLOCKING AND DOORWAY PROTECTION STRAPS MAY BE USED. REFER TO PAGES 78 THRU 80 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR TO BE LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, NAILED SIDE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED.

11. IF NAILED SIDE BLOCKING AND DOORWAY PROTECTION STRAPS ARE USED, OMIT EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA. IN LIEU OF PIECE MARKED ⑦ ON PAGE 22, USE PIECES MARKED ⑤ THRU ⑧ ON PAGE 26. SEE SPECIAL NOTE 7 ON PAGE 27 FOR GUIDANCE.

12. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BEREDUCED BY A MULTIPLE OF FOUR (4) PALLET UNITS OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. OR, THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 46 THRU 68 FOR GUIDANCE.

13. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 70 FOR SHIPPING GUIDANCE.

14. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 71 FOR GUIDANCE.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	362	121
1" X 6"	626	313
2" X 2"	283	95
2" X 3"	35	18
2" X 4"	134	90
2" X 6"	183	183
4" X 4"	40	53
NAILS	**NO. REQD**	**POUNDS**
6d (2")	1,008	6
10d (3")	416	6-1/2
12d (3-1/4")	52	1
16d (3-1/2")	96	2-1/4

LOAD AS SHOWN

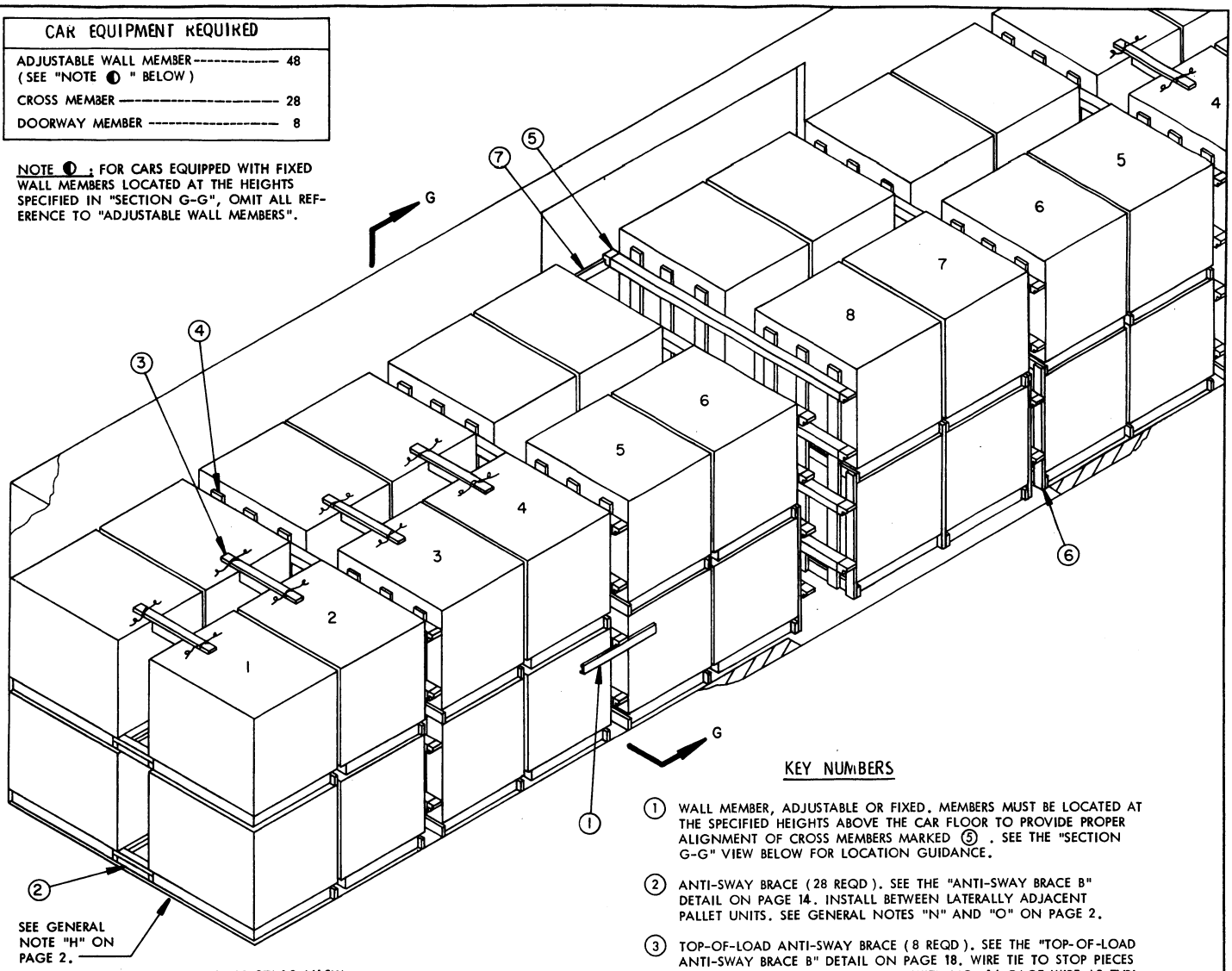
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	60	105,540 LBS
DUNNAGE		1,762 LBS
TOTAL WEIGHT		107,302 LBS

5-LAYER PALLET UNIT

60-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR

CAR EQUIPMENT REQUIRED	
ADJUSTABLE WALL MEMBER (SEE "NOTE ◐ " BELOW)	48
CROSS MEMBER	28
DOORWAY MEMBER	8

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



SEE GENERAL NOTE "H" ON PAGE 2.

ISOMETRIC VIEW

KEY NUMBERS

(1) WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED (5) . SEE THE "SECTION G-G" VIEW BELOW FOR LOCATION GUIDANCE.

(2) ANTI-SWAY BRACE (28 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2.

(3) TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 18. WIRE TIE TO STOP PIECES ON THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 74. SEE SPECIAL NOTE 4 ON PAGE 25.

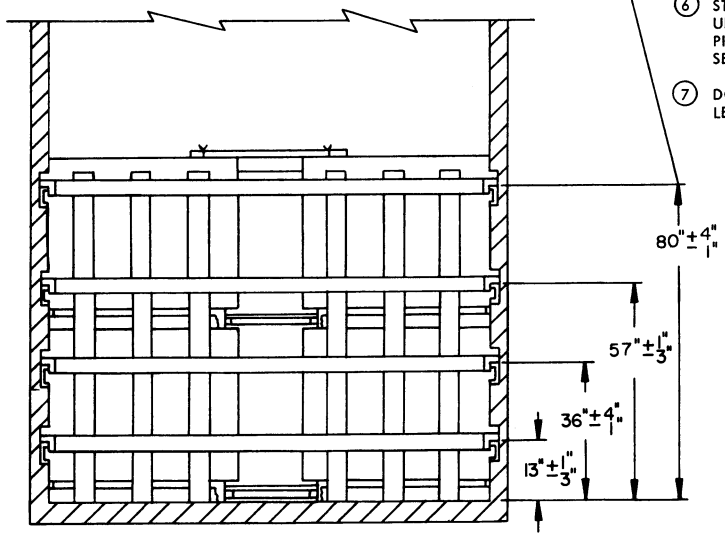
(4) SEPARATOR GATE (19 REQD). SEE THE "SEPARATOR GATE C" DETAIL ON PAGE 29 AS APPLICABLE, POSITION WITH TIE PIECES AGAINST THE ALREADY LOADED UNITS. SEE SPECIAL NOTES 5 AND 7 ON PAGE 25.

(5) CROSS MEMBER (28 REQD). SEE GENERAL NOTE "Y" ON PAGE 3.

(6) STOP PIECE, 1" X 4" X 48" (10 REQD). POSITION AGAINST PALLET UNITS IN THE DOORWAY AREA AND NAIL TO THE TIE PIECES OF PIECE MARKED (4) W/2-6d NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 6 ON PAGE 25.

(7) DOORWAY MEMBER (8 REQD). SEE THE "SECTION G-G" VIEW AT LEFT FOR LOCATION GUIDANCE.

EACH DIMENSIONED HEIGHT ABOVE THE CAR FLOOR TO AN ADJUSTABLE OR FIXED WALL MEMBER MARKED (1) AND/OR A DOORWAY MEMBER MARKED (7) IS SPECIFIED TO LOCATE THE CENTER LINE OF A CROSS MEMBER.



SECTION G-G

FIVE LAYER PALLET UNIT
56-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOXCAR EQUIPPED WITH MECHANICAL BRACING DEVICES

SMCAC FORM 6-1, 1 NOV 87

PROJECT FSA 43B/21-63

SUPERSEDES SMCAC FORM 6, 1 NOV 85

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE (INSIDE CLEARANCE) WOOD-LINED BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS, AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.

2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 24 IS THE 5-LAYER UNIT. A MAXIMUM OF FORTY-FOUR (44) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 77,396 POUNDS, CAN BE PLACED IN A 40'-6" LONG CAR.

3. IF A CAR HAS BOWED END WALLS WHICH ARE BOWED OUTWARD TWO INCHES (2") OR MORE EITHER FROM SIDE TO SIDE OR FROM FLOOR-TO ROOF, CROSS MEMBERS CAN BE INSTALLED NEAR THE END WALL OF THE CAR TO PROVIDE A "SQUARED END" RATHER THAN INSTALLING DUNNAGE AS SPECIFIED IN GENERAL NOTE "H" ON PAGE 2. THESE CROSS MEMBERS SHOULD BE INSTALLED AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE LOAD AS BLOCKING MEMBERS. A SEPARATOR GATE, SHOWN AS PIECE MARKED ④ , MUST BE POSITIONED AGAINST THESE CROSS MEMBERS PRIOR TO LOADING.

4. TOP OF LOAD ANTI SWAY BRACES, SHOWN AS PIECES MARKED ③ IN THE LOAD ON PAGE 24 MUST BE INSTALLED IN EACH END OF THE CAR FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.

5. TO FACILITATE POSITIONING OF THE PALLET UNITS AS LOADING PROGRESSES, POSITION PALLET UNIT STACKS AGAINST THE END WALL, THEN POSITION A SEPARATOR GATE, SHOWN AS PIECE MARKED ④ , SO THE 1" X 4" TIE PIECES ARE LOCATED UNDER THE "OVERHANG" OF THE PALLET UNITS. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.

6. SEPARATOR GATES IN THE DOORWAY MUST BE PREVENTED FROM SHIFTING INTO A DOOR OPENING BY THE APPLICATION OF THE STOP PIECES, PIECES MARKED ⑥ . IN CARS EQUIPPED WITH STAGGERED DOORS, STOP PIECES MAY BE REQUIRED ON UP TO FOUR SEPARATOR GATES.

7. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLYWOOD IN LIEU OF DIMENSIONAL LUMBER, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 74 FOR CONSTRUCTION GUIDANCE.

8. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A LOAD MAY BE REDUCED BY MULTIPLES OF TWO (2) PALLET UNITS BY OMITTING LATERALLY ADJACENT UNITS FROM THE TOP LAYER OF ONE OR MORE LOAD UNITS, OR BY MULTIPLES OF FOUR (4) PALLET UNITS BY OMITTING ONE OR MORE ENTIRE LOAD UNITS. TO REDUCE A LOAD BY ONE (1) PALLET UNIT, REFER TO THE LCL PROCEDURES ON PAGES 44 AND 45 FOR GUIDANCE.

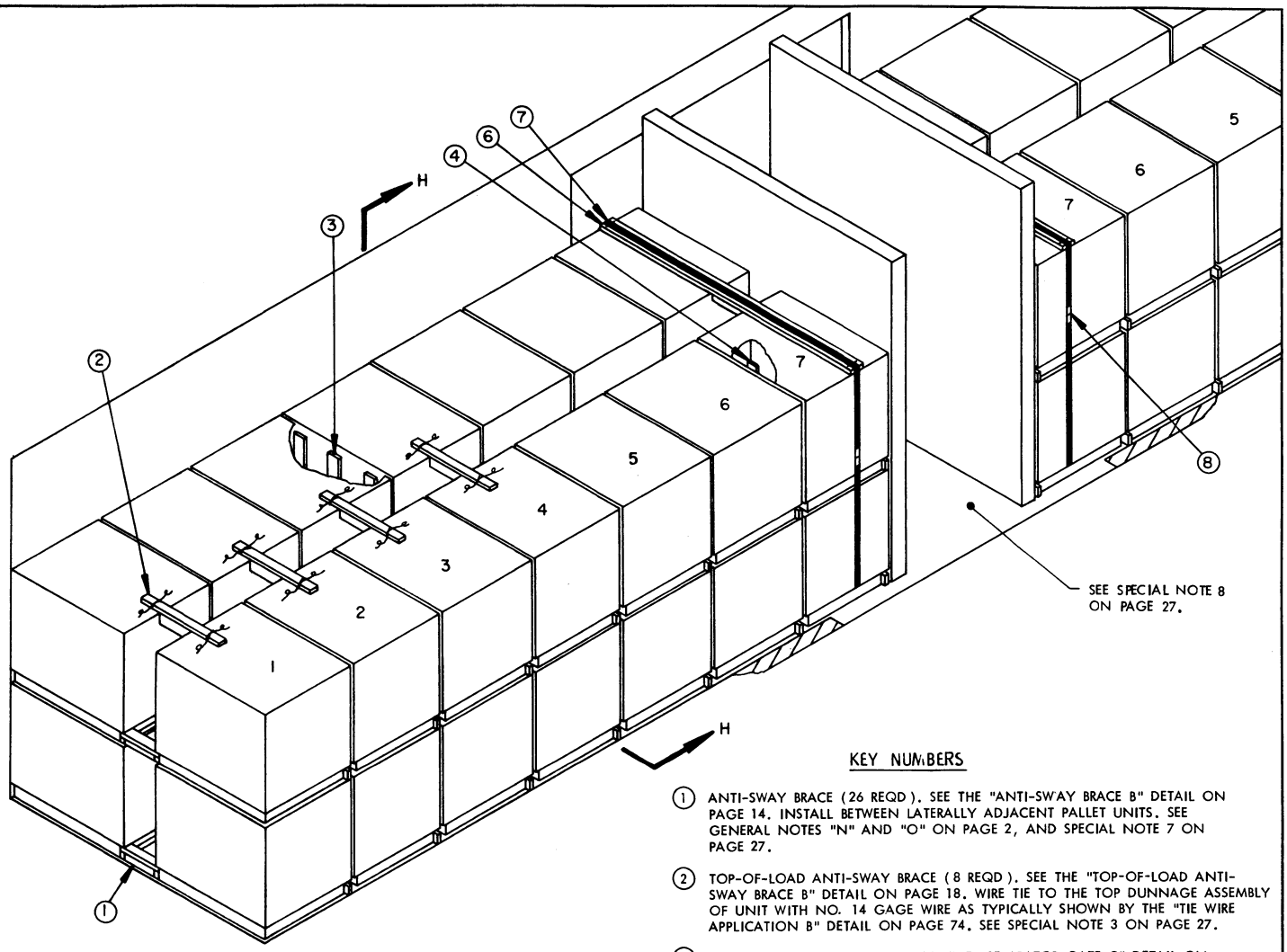
9. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 71 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4" 1" X 6" 2" X 2" 2" X 4"	495 798 220 121	165 399 74 81
NAILS	NO. REQD	POUNDS
6d (2") 10d (3") 12d (3-1/4")	1,172 112 24	7 1-3/4 1/2
WIRE, NO. 14 GAGE ---------- 48' REQD ----------1		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT ---------	56 ----------	98,504 LBS
DUNNAGE ----------		1,449 LBS
	TOTAL WEIGHT --------	99,953 LBS

FIVE LAYER PALLET UNIT
56 UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOXCAR EQUIPPED WITH MECHANICAL BRACING DEVICES



SEE GENERAL NOTES "D" AND "H" ON PAGE 2.

ISOMETRIC VIEW

KEY NUMBERS

(1) ANTI-SWAY BRACE (26 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2, AND SPECIAL NOTE 7 ON PAGE 27.

(2) TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 18. WIRE TIE TO THE TOP DUNNAGE ASSEMBLY OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 74. SEE SPECIAL NOTE 3 ON PAGE 27.

(3) SEPARATOR GATE (14 REQD). SEE THE "SEPARATOR GATE C" DETAIL ON PAGE 29. POSITION WITH THE TIE PIECES AGAINST THE ALREADY LOADED UNITS. SEE SPECIAL NOTES 4 AND 6 ON PAGE 27.

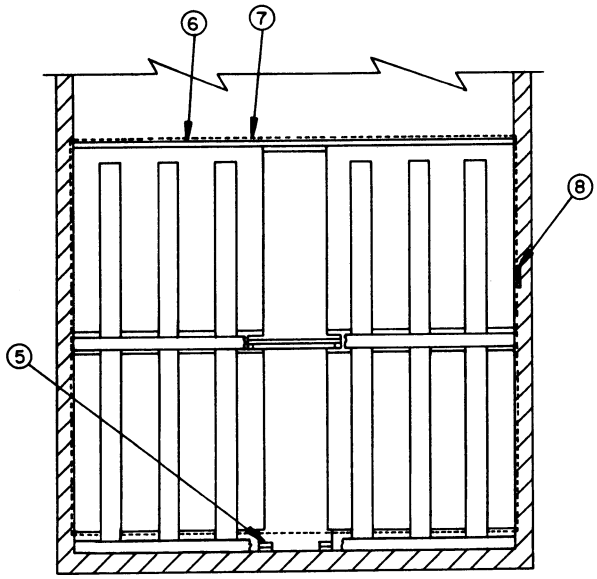
(4) STOP PIECE, 1" X 4" X 52" (4 REQD). INSTALL ON THE SIDE OPPOSITE THE VERTICAL PIECES OF THE SEPARATOR GATES, PIECES MARKED (3), WHICH ARE IN THE DOORWAY AREA. POSITION IN CONTACT WITH THE ADJACENT PALLET UNITS AND NAIL TO THE TIE PIECES W/3-6d NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 5 ON PAGE 27.

(5) SIDE BLOCKING, 2" X 4" X 35" (DOUBLED) (4 REQD). 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 7 ON PAGE 27.

(6) STRAPPING BOARD ASSEMBLY "B" (2 REQD). SEE THE DETAIL ON PAGE 19.

(7) DOORWAY PROTECTION STRAP, 1-1/4" X .031" OR .035" X 34'-6" LONG STEEL STRAPPING (2 REQD). STAPLE TO THE STRAPPING BOARD W/2 STAPLES.

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



SECTION H-H

FIVE LAYER PALLET UNIT
56 UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOX CAR EQUIPPED WITH LOAD DIVIDERS

PROJECT FSA 43B/21-63

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED, CUSHIONED BOX CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "BB" THRU "FF" ON PAGE 3.

2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 26 IS THE 5-LAYER UNIT. MAXIMUM OF SEVENTY-TWO (72) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 126,648 POUNDS CAN BE PLACED IN A 60'-8" LONG CAR, OR A MAXIMUM OF FORTY-FOUR (44) UNITS CAN BE LOADED IN A 40'-6" CAR FOR AN APPROXIMATE LADING WEIGHT OF 77,396 POUNDS, WHEN USING THE DEPICTED PROCEDURES. IF THE CROSSWISE LOADING PATTERN SHOWN ON PAGE 20 IS EMPLOYED, THEN FIFTY-SIX (56) PALLET UNITS FOR AN APPROXIMATE LADING WEIGHT OF 98,504 POUNDS CAN BE PLACED IN A 60'-8" LONG CAR, FORTY-FOUR (44) UNITS CAN BE LOADED IN A 50'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 77,396 POUNDS, AND THIRTY-SIX (36) UNITS CAN BE LOADED IN A 40'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 63,324 POUNDS.

3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECE MARKED (2) MUST BE INSTALLED IN EACH END OF THE LOAD. FOUR (4) ASSEMBLIES ARE REQUIRED IN EACH END OF 40' AND 50' CARS. FIVE (5) ARE REQUIRED IN EACH END OF A 60' CAR.

4. TO FACILITATE POSITIONING OF THE PALLET UNITS AS LOADING PROGRESSES POSITION PALLET UNIT STACKS AGAINST THE END WALL, THEN POSITION A SEPARATOR GATE, SHOWN AS PIECE MARKED (3), SO THE 1" X 4" TIE PIECES ARE LOCATED UNDER THE "OVERHANG" OF THE PALLET UNITS. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.

5. SEPARATOR GATES IN THE DOORWAY MUST BE PREVENTED FROM SHIFTING INTO A DOOR OPENING BY THE APPLICATION OF THE STOP PIECES, PIECES MARKED (4). IN CARS EQUIPPED WITH STAGGERED DOORS, STOP PIECES MAY BE REQUIRED ON UP TO FOUR SEPARATOR GATES.

6. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLYWOOD IN LIEU OF DIMENSIONAL LUMBER, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 74 FOR CONSTRUCTION GUIDANCE.

7. DOORWAY PROTECTION IS REQUIRED FOR ALL THE LOAD UNITS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY ONE-HALF OR MORE OF THE UNIT WIDTH. SIDE BLOCKING SHOWN AS PIECE MARKED (5) IN THE LOAD VIEW, MUST BE USED IN LIEU OF THE LOWER ANTI-SWAY BRACE MARKED (1) FOR ALL UNITS REQUIRING DOORWAY PROTECTION STRAPS. TWO (2) DOORWAY PROTECTION STRAPS ARE REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS COMPLETELY WITHIN THE DOORWAY AREA OR WHICH IS NOT RETAINED BY AT LEAST SIX INCHES (6") OF THE SIDEWALL ON BOTH SIDES OF THE CAR. ONE (1) DOORWAY PROTECTION STRAP IS REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS RETAINED BY FROM 6" TO ONE-HALF THE PALLET/LOAD UNIT LENGTH OR WIDTH. IF THE CAR BEING LOADED IS EQUIPPED WITH SLIDING DOORS, A WOODEN GATE TYPE OF DOORWAY PROTECTION SUCH AS SHOWN IN THE LOAD ON PAGE 22, OR ANY OF THE ALTERNATIVES ON PAGES THRU 80 MAY BE USED.

8. A "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS", DETAIL SHOWN ON PAGE 81 IS REQUIRED WHEN THE LOAD IN EITHER END OF A CAR IS 50,000 POUNDS OR MORE. FOR THE DEPICTED LOAD THE STRUT ASSEMBLY WOULD BE REQUIRED IF THE LOAD CONSISTED OF EIGHT (8) LOAD UNITS IN EITHER END OF THE CAR. THE STRUT ASSEMBLY WILL ALWAYS BE REQUIRED FOR FULL LOADS IN 60' OR LONGER CARS.

9. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) PALLET UNITS OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD OR, THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 48 THRU 57 AND GENERAL NOTE "GG" ON PAGE 3 FOR GUIDANCE.

10. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 69 AND/OR PAGES 70 AND 72 FOR SHIPPING GUIDANCE.

11. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 71 FOR GUIDANCE.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	373	125
1" X 6"	588	294
2" X 2"	161	54
2" X 4"	140	94
2" X 6"	19	19
NAILS	**NO. REQD**	**POUNDS**
6d (2")	936	5-1/2
10d (3")	104	3/4
12d (3-1/4")	30	1/2
16d (3-1/2")	32	3/4

STEEL STRAPPING, 1-1/4" ---------- 69' REQD ---------- 10 LBS
SEAL FOR 1-1/4" STRAPPING ------ 4 REQD ---------- NIL
STAPLE FOR 1-1/4" STRAPPING ---- 4 REQD ---------- NIL

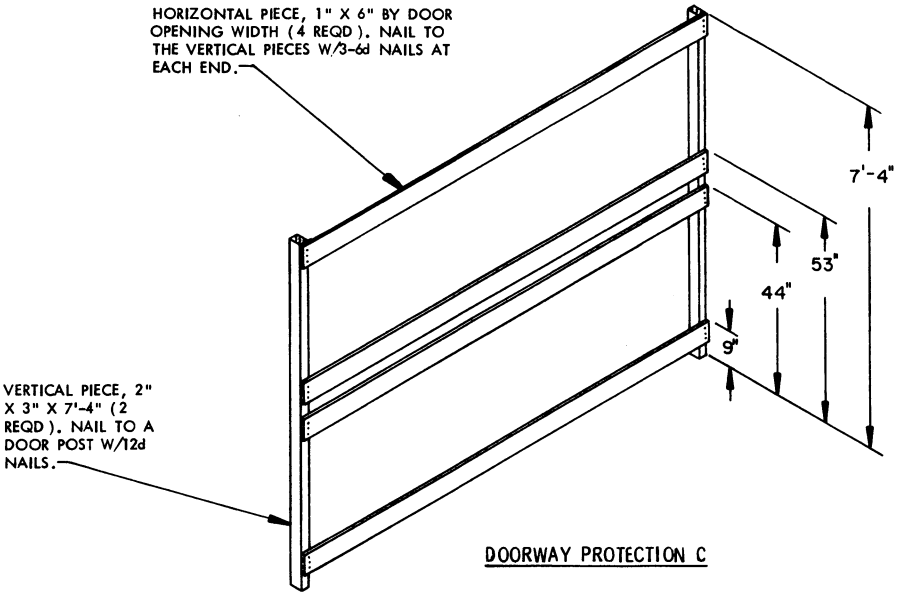
WIRE, NO. 14 GAGE ---------- 48' REQD ---------- 1

LOAD AS SHOWN

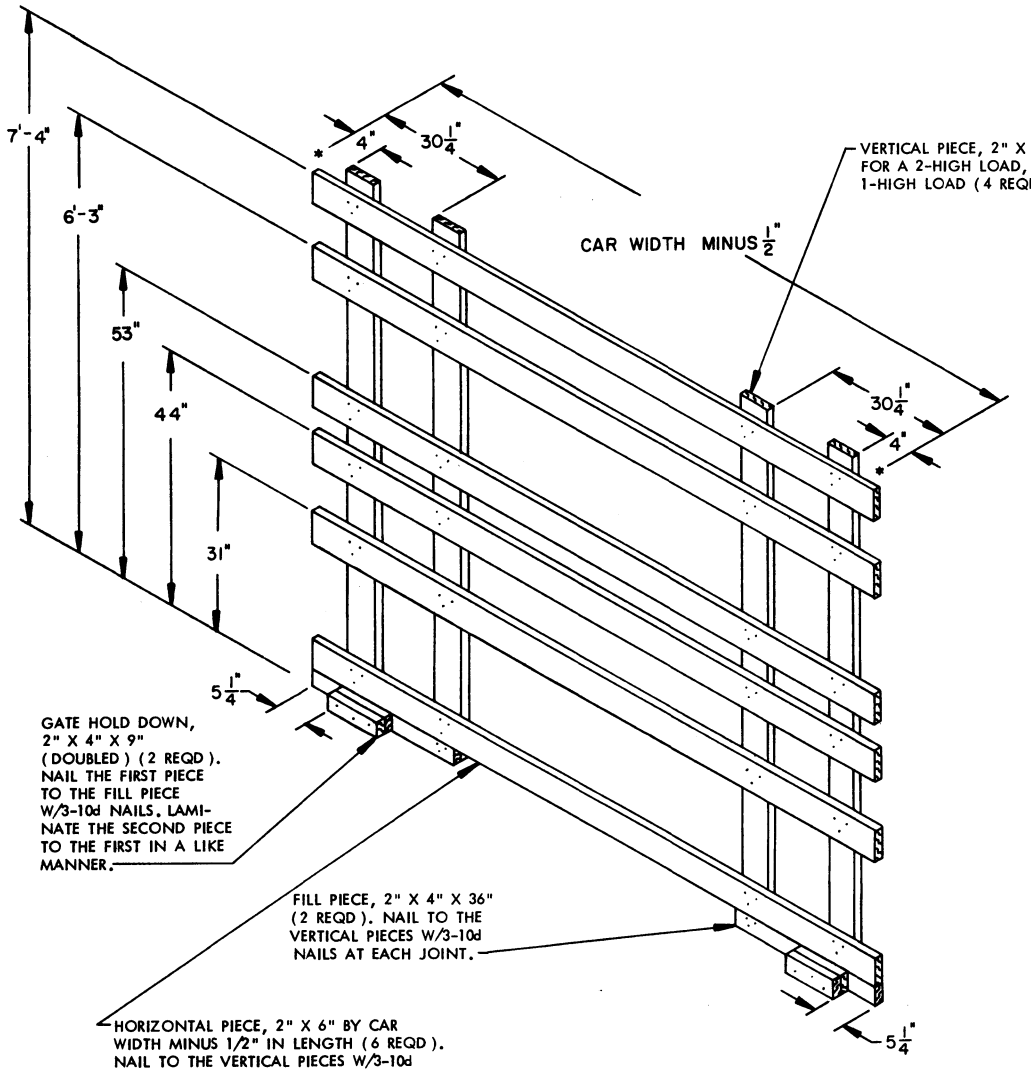
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	56	98,504 LBS
DUNNAGE		1,191 LBS
	TOTAL WEIGHT	99,695 LBS

FIVE LAYER PALLET UNIT

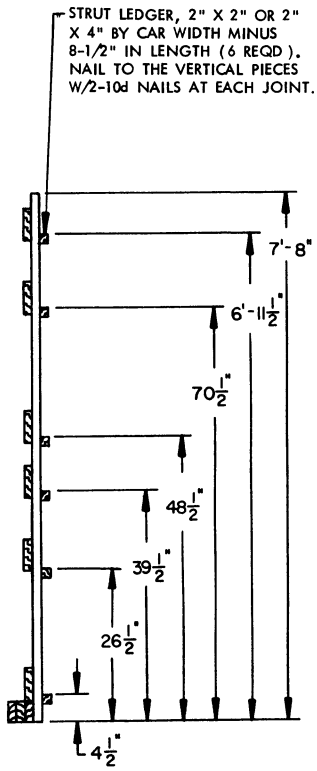
60 UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOXCAR EQUIPPED WITH LOAD DIVIDER BULKHEADS



DOORWAY PROTECTION C

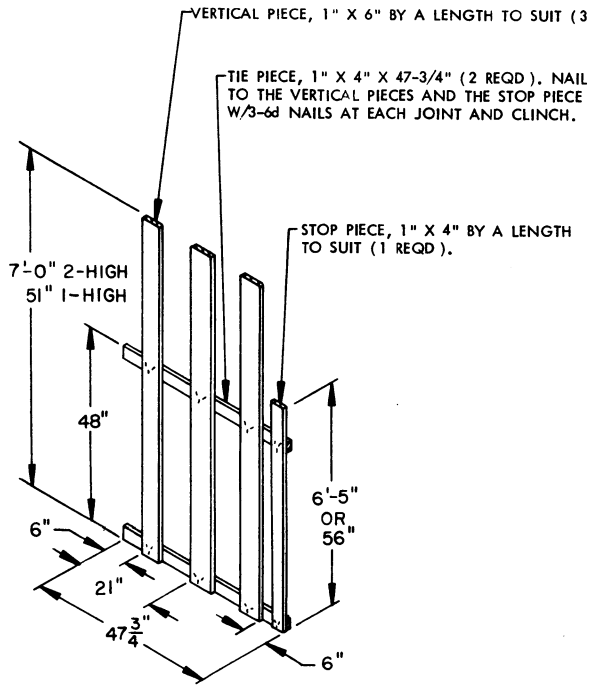


CENTER GATE E



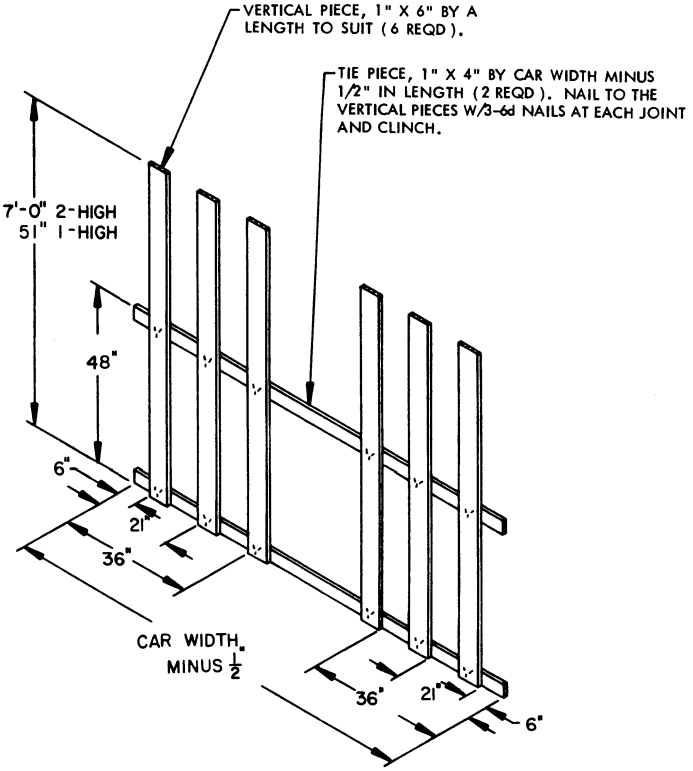
END VIEW

DETAILS FOR FIVE LAYER PALLET UNIT

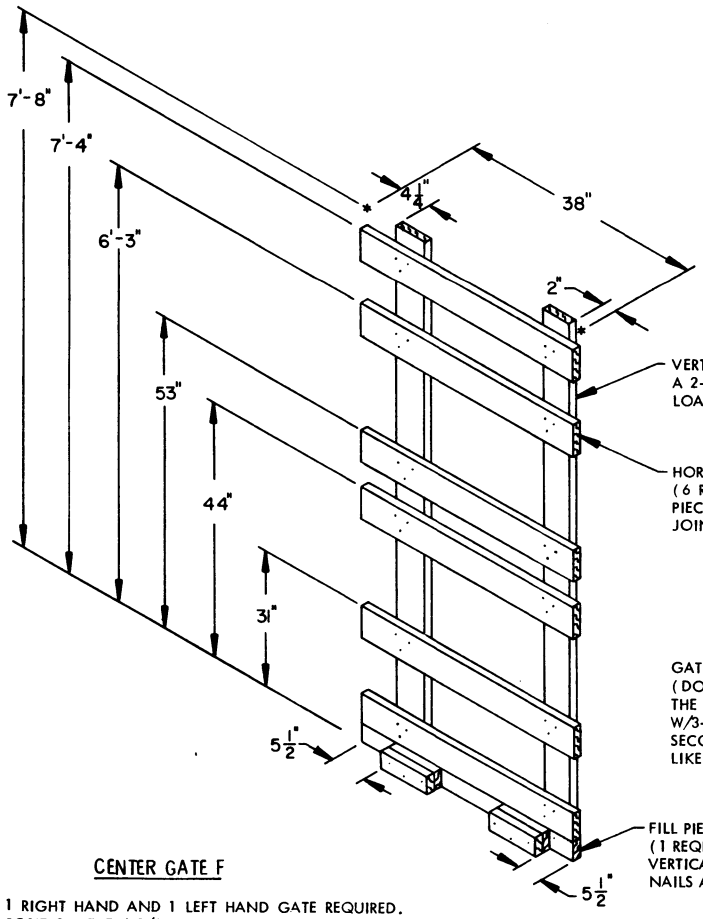


SEPARATOR GATE D

RIGHT HAND AND LEFT HAND GATES ARE REQUIRED. A RIGHT HAND GATE IS SHOWN.

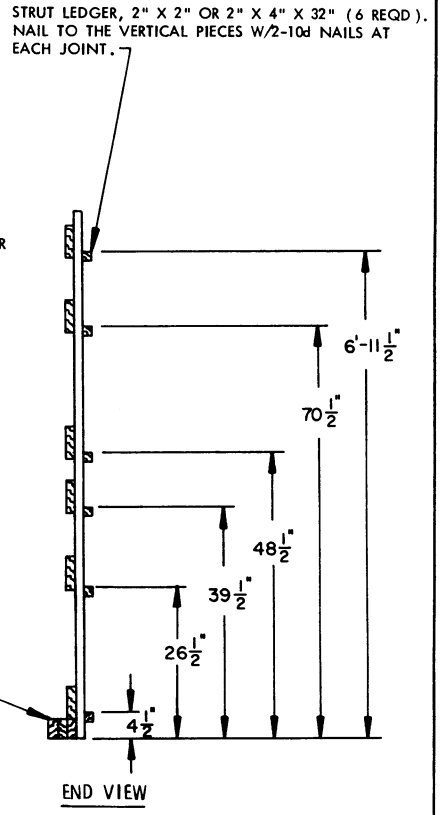


SEPARATOR GATE C



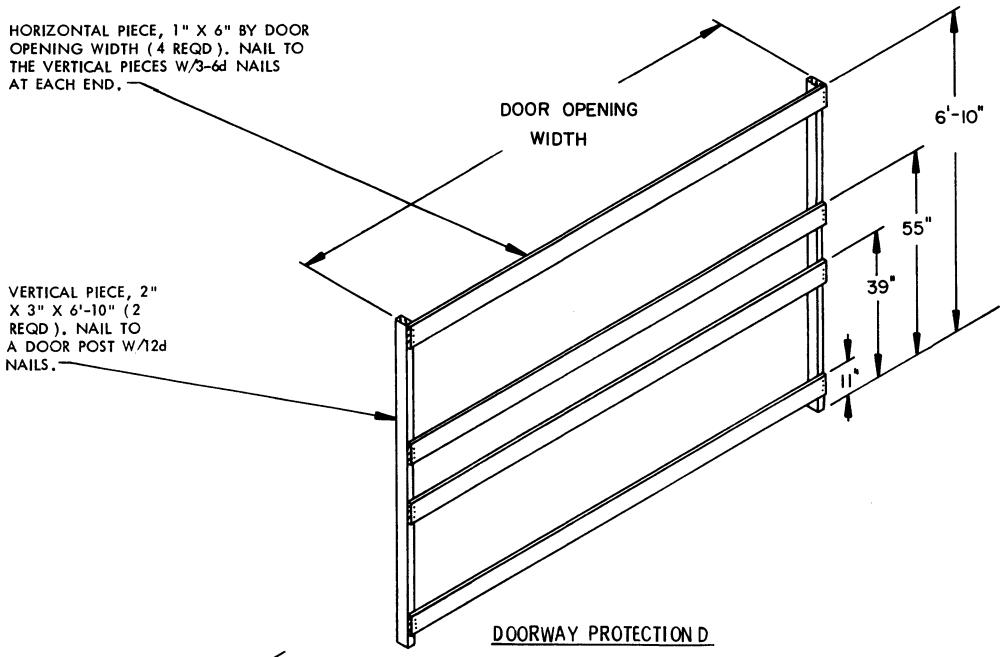
CENTER GATE F

1 RIGHT HAND AND 1 LEFT HAND GATE REQUIRED. POSITION THE 4-1/4" DIMENSION AGAINST THE SIDEWALL OF CAR.

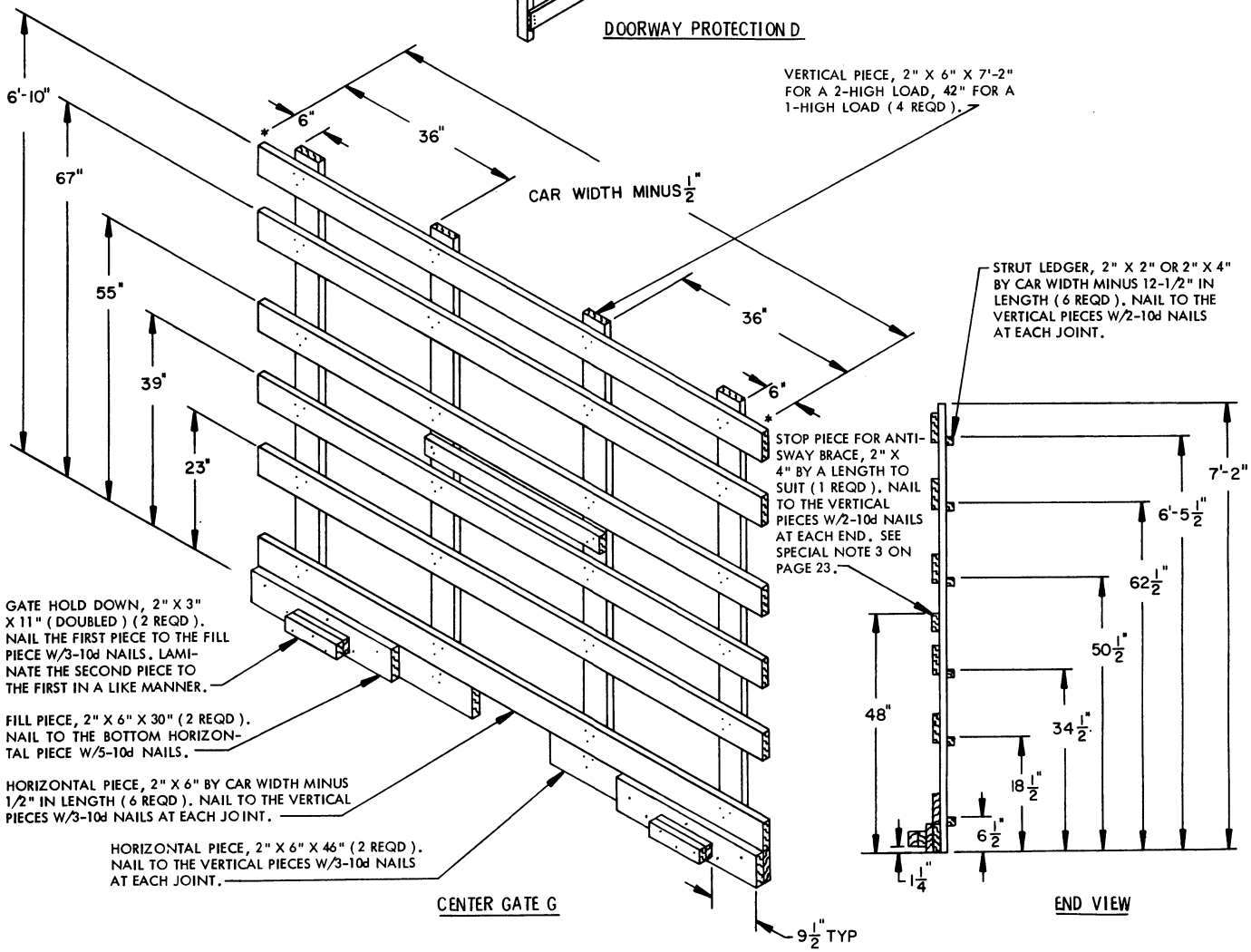


END VIEW

DETAILS FOR FIVE LAYER PALLET UNIT



DOORWAY PROTECTION D



CENTER GATE G

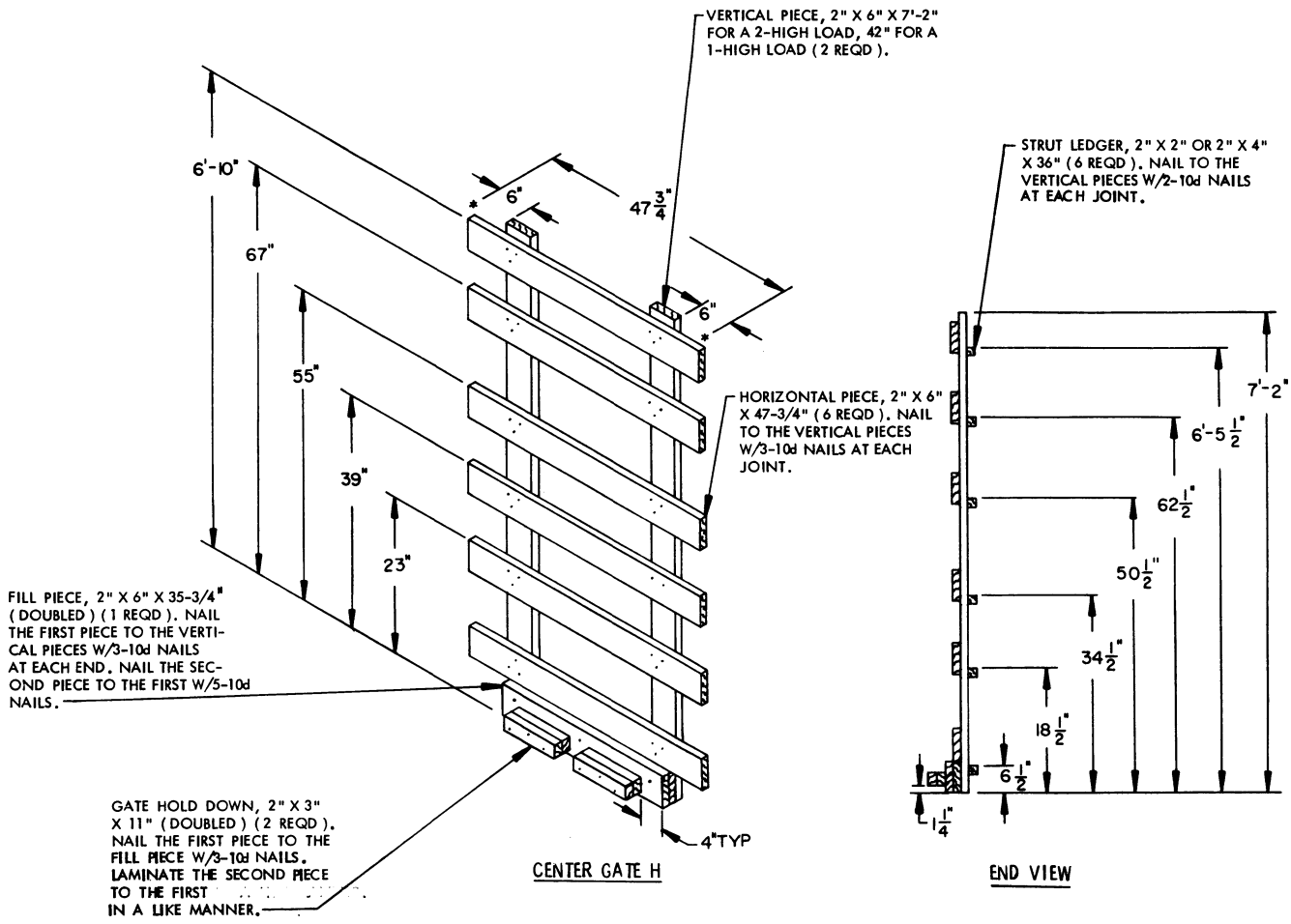
END VIEW

DETAILS FOR FIVE LAYER PALLET UNIT

SMCAC FORM 6-1, 1 NOV 87

SUPERSEDES SMCAC FORM 6, 1 NOV 85

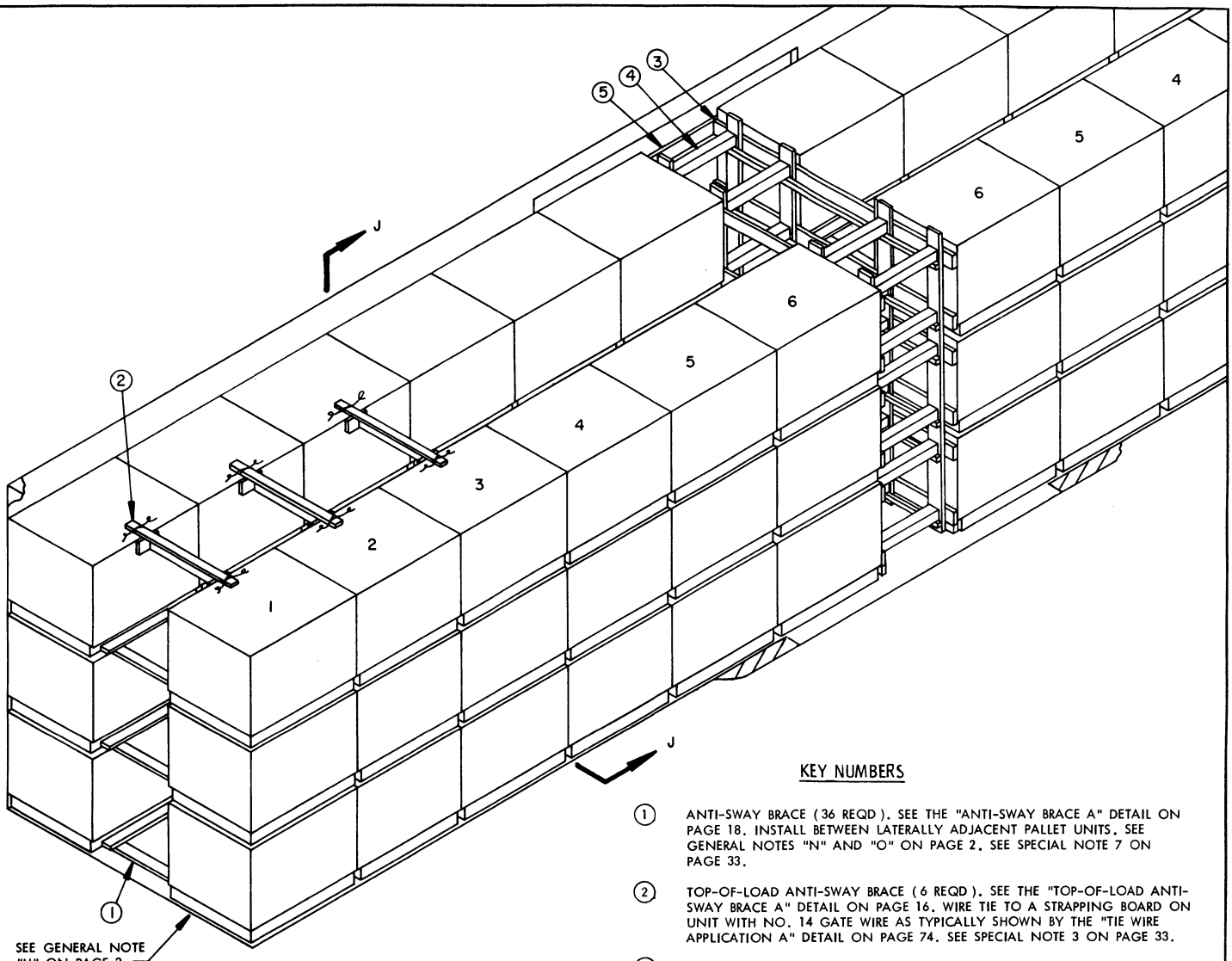
PROJECT FSA 43B/21-63



CENTER GATE H

END VIEW

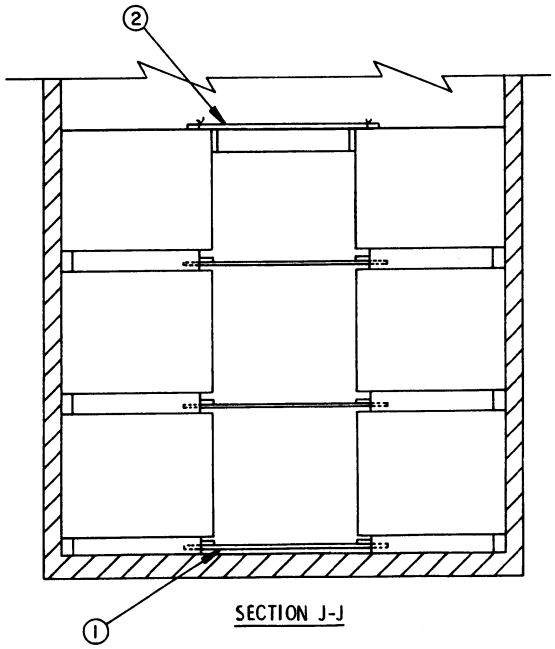
DETAILS FOR FIVE-LAYER PALLET UNIT



ISOMETRIC VIEW

KEY NUMBERS

1. ANTI-SWAY BRACE (36 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 18. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2. SEE SPECIAL NOTE 7 ON PAGE 33.
2. TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 16. WIRE TIE TO A STRAPPING BOARD ON UNIT WITH NO. 14 GATE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 74. SEE SPECIAL NOTE 3 ON PAGE 33.
3. CENTER GATE (2 REQD). SEE THE "CENTER GATE J" DETAIL ON PAGE 40. SEE SPECIAL NOTES 4 AND 5 ON PAGE 33.
4. STRUT, 4" X 4" BY CUT TO FIT (REF: 27" (24 REQD). TOENAIL TO PIECES MARKED (3) W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "M" ON PAGE 2. SEE GENERAL NOTES "V" AND "W" ON PAGE 3.
5. DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION E" DETAIL ON PAGE 40. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTES 6 AND 7 ON PAGE 33.



SECTION J-J

FOUR LAYER PALLET UNIT (BASIC HEIGHT)
72-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOXCAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.

2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 32 IS THE 4-LAYER (BASIC HEIGHT) UNIT. A MAXIMUM OF EIGHTY-FOUR (84) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 120,540 POUNDS, CAN BE PLACED IN A 60'-8" LONG CAR WHEN USING THE DEPICTED PROCEDURES; FIFTY-FOUR (54) UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 77,490 POUNDS, CAN BE OUTLOADED IN A 40'-6" LONG CAR.

3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 32 MUST BE INSTALLED IN EACH END OF THE CAR. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A 60' CAR. THREE (3) BRACES ARE REQUIRED IN EACH END OF A 40' OR 50' CAR.

4. CENTER GATE "J" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWWOD, IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE" DETAIL ON PAGE 75 FOR GUIDANCE.

5. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR WIDTH GATES. IN LIEU OF EACH "CENTER GATE J", SHOWN AS PIECE MARKED ③ IN THE LOAD ON PAGE 32, INSTALL TWO (2) "CENTER GATES K" AS SHOWN ON PAGE 41. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TIE PIECE APPLICATION" DETAIL ON PAGE 75.

6. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY ONE-HALF OR MORE OF THE STACK WIDTH OR LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECES MARKED ⑤ IN THE LOAD ON PAGE 32, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED SIDE BLOCKING AND DOORWAY PROTECTION STRAPS MAY BE USED. REFER TO PAGES 78 THRU 80 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR TO BE LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, NAILED SIDE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED.

7. IF NAILED SIDE BLOCKING AND DOORWAY PROTECTION STRAPS ARE USED, OMIT EACH LOWER ANTI SWAY BRACE IN THE DOORWAY AREA; IN LIEU OF PIECES MARKED ⑤ , USE PIECES MARKED ③ THRU ⑦ ON PAGE 12. SEE SPECIAL NOTE 4 ON PAGE 13 FOR GUIDANCE.

8. THE DEPICTED LOAD CAN BE INCREASED TO SUIT THE QUANTITY TO BE SHIPPED BY USING THE COMBINATION LOADING PROCEDURES SHOWN ON PAGES 48 AND 49.

9. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 3-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF SIX (6) PALLET UNITS, A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) PALLET UNITS OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD, OR THE ENTIRE ONE OR TWO TOP TIERS CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 47 THRU 68 FOR GUIDANCE.

10. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 69 AND 72 FOR SHIPPING GUIDANCE.

11. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 71 FOR GUIDANCE.

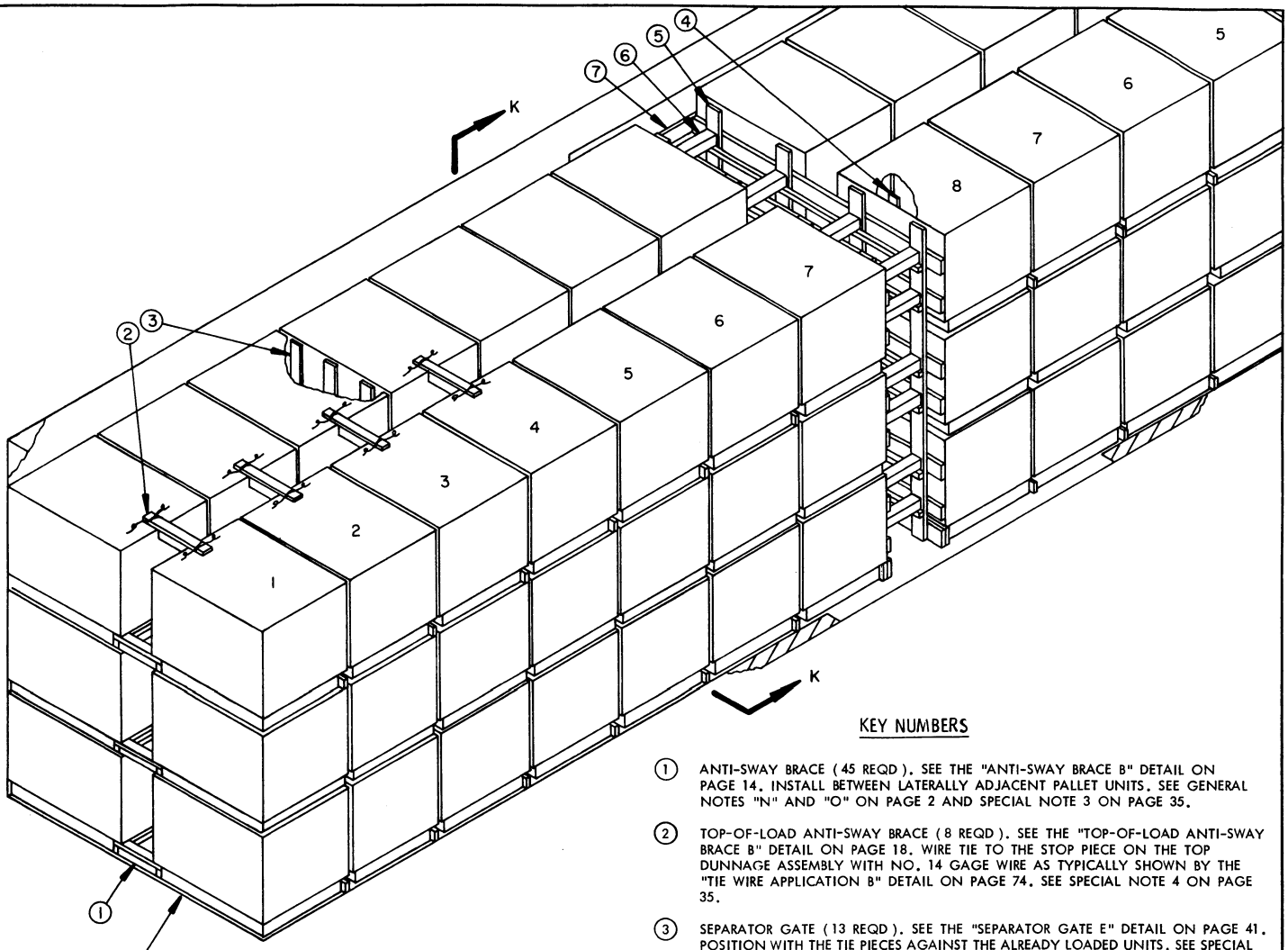
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	120	60
2" X 2"	102	34
2" X 3"	35	18
2" X 4"	557	372
2" X 6"	207	207
4" X 4"	54	72
NAILS	**NO. REQD**	**POUNDS**
6d (2")	72	1-1/2
10d (3")	744	11-1/4
12d (3-1/4")	80	1-1/2
16d (3-1/2")	96	2-1/4

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	72	98,640 LBS
DUNNAGE		1,545 LBS
TOTAL WEIGHT		100,185 LBS

FOUR LAYER PALLET UNIT (BASIC HEIGHT)
72-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR



ISOMETRIC VIEW

KEY NUMBERS

① ANTI-SWAY BRACE (45 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 35.

② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 18. WIRE TIE TO THE STOP PIECE ON THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 74. SEE SPECIAL NOTE 4 ON PAGE 35.

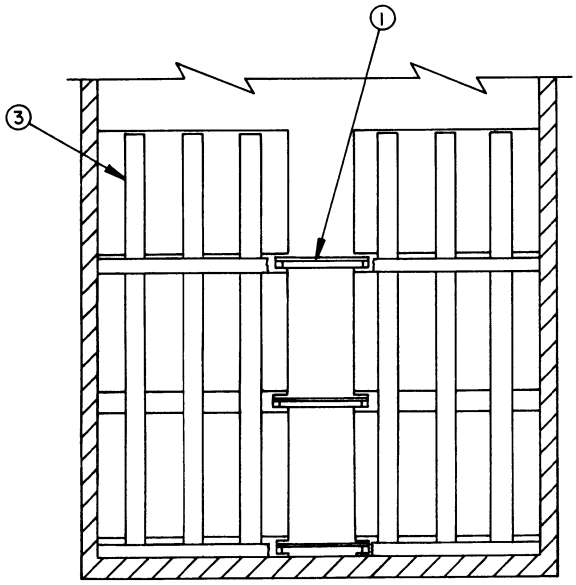
③ SEPARATOR GATE (13 REQD). SEE THE "SEPARATOR GATE E" DETAIL ON PAGE 41. POSITION WITH THE TIE PIECES AGAINST THE ALREADY LOADED UNITS. SEE SPECIAL NOTES 5 AND 7 ON PAGE 35.

④ STOP PIECE, 1" X 4" X 7'-0" (2 REQD). INSTALL ON THE SIDE OPPOSITE THE VERTICAL PIECES OF THE SEPARATOR GATE, PIECE MARKED ③ , WHICH IS IN THE DOORWAY AREA. POSITION IN CONTACT WITH THE ADJACENT PALLET UNITS AND NAIL TO THE TIE PIECES W/3-6d NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 6 ON PAGE 35.

⑤ CENTER GATE (2 REQD). SEE THE "CENTER GATE L" DETAIL ON PAGE 42. SEE SPECIAL NOTES 8 AND 9 ON PAGE 35.

⑥ STRUT, 4" X 4" CUT TO FIT (REF: 20") (24 REQD). TOENAIL TO PIECES MARKED ⑤ W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "M" ON PAGE 2. SEE GENERAL NOTES "V" AND "W" ON PAGE 3.

⑦ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION F" DETAIL ON PAGE 42. NAIL TO THE DOORPOSTS W/12d NAILS. SEE SPECIAL NOTE 10 ON PAGE 35.



SECTION K-K

FOUR LAYER PALLET UNIT (BASIC HEIGHT)

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

PROJECT FSA 43B/21-63

SPECIAL NOTES:

1. A 60'-8" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOXCAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.

2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 34 IS THE 4-LAYER (BASIC HEIGHT) UNIT. A MAXIMUM OF ONE HUNDRED-EIGHT (108) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 154,980 POUNDS, CAN BE PLACED IN A 60'-8" LONG CAR WHEN USING THE DEPICTED PROCEDURES; SIXTY-SIX (66) UNITS, FOR AN APPROXIMATE WEIGHT OF 94,710 POUNDS, CAN BE OUTLOADED IN A 40'-6" LONG CAR.

3. ANTI SWAY BRACING IS REQUIRED BETWEEN LATERALLY ADJACENT PALLET UNITS. TO PREVENT DISPLACEMENT OF THE ANTI-SWAY BRACES BETWEEN THE UPPER UNITS, A STOP PIECE MUST BE NAILED TO EACH CENTER GATE "L" AS SHOWN ON THE DETAIL ON PAGE 42. SEE SPECIAL NOTE 11.

4. TOP-OF-LOAD ANTI SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 34 MUST BE INSTALLED IN EACH END OF THE CAR. FIVE (5) BRACES ARE REQUIRED IN EACH END OF A 60' CAR. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A 40' OR 50' CAR.

5. TO FACILITATE POSITIONING OF THE PALLET UNITS AS LOADING PROGRESSES, WHEN LOADING THE BOXCAR, POSITION PALLET UNIT STACKS AGAINST THE END WALL, THEN POSITION A SEPARATOR GATE, SHOWN AS PIECE MARKED ③ SO THE 1" X 4" TIE PIECES ARE LOCATED UNDER THE "OVERHANG" OF THE PALLET UNITS. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.

6. SEPARATOR GATES IN THE DOORWAY MUST BE PREVENTED FROM SHIFTING INTO A DOOR OPENING BY THE APPLICATION OF THE STOP PIECES, PIECES MARKED ④ . IN CARS EQUIPPED WITH STAGGERED DOORS, STOP PIECES MAY BE REQUIRED ON UP TO FOUR SEPARATOR GATES. IF SPECIAL NOTE 11 APPLIES OMIT PIECES MARKED ④ , IN LIEU OF "SEPARATOR GATE E" IN THE DOORWAY, USE "SEPARATOR GATE J" DETAILED ON PAGE 77.

7. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLYWOOD IN LIEU OF DIMENSIONAL LUMBER, IF DESIRED, FOR ONE OR TWO LAYER LOADS; PLYWOOD SEPARATOR GATES FOR 3-HIGH LOADS ARE NOT ECONOMICALLY FEASIBLE. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 74 FOR CONSTRUCTION GUIDANCE.

8. CENTER GATE "L" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD, IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE" DETAIL ON PAGE 75 FOR GUIDANCE.

9. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR WIDTH GATES. IN LIEU OF EACH "CENTER GATE L", SHOWN AS PIECE MARKED ⑤ IN THE LOAD ON PAGE 34, INSTALL TWO (2) "CENTER GATES M" AS SHOWN ON PAGE 43. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TIE PIECE APPLICATION" DETAIL ON PAGE 75.

10. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY ONE-HALF OR MORE OF THE STACK LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECES MARKED ⑦ IN THE LOAD ON PAGE 34, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED SIDE BLOCKING AND DOORWAY PROTECTION STRAPS MAY BE USED. REFER TO PAGES 78 THRU 80 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR TO BE LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, NAILED SIDE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED.

11. IF NAILED SIDE BLOCKING AND DOORWAY PROTECTION STRAPS ARE USED, OMIT EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA; IN LIEU OF PIECE MARKED ⑦ ON PAGE 34, USE PIECES MARKED ⑤ THRU ⑧ ON PAGE 38. SEE SPECIAL NOTE 7 ON PAGE 39 FOR GUIDANCE.

12. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 3-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF SIX (6) PALLET UNITS, A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) PALLET UNITS OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD, OR THE ENTIRE TOP ONE OR TWO TIERS CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 46 THRU 68 FOR GUIDANCE.

13. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 70 FOR SHIPPING GUIDANCE.

14. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 71 FOR GUIDANCE.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	463	155
1" X 6"	822	411
2" X 2"	450	150
2" X 3"	42	21
2" X 4"	190	127
2" X 6"	197	197
4" X 4"	40	54
NAILS	**NO. REQD**	**POUNDS**
6d (2")	1,324	8
10d (3")	484	7-1/2
12d (3-1/4")	56	1
16d (3-1/2")	96	2-1/4

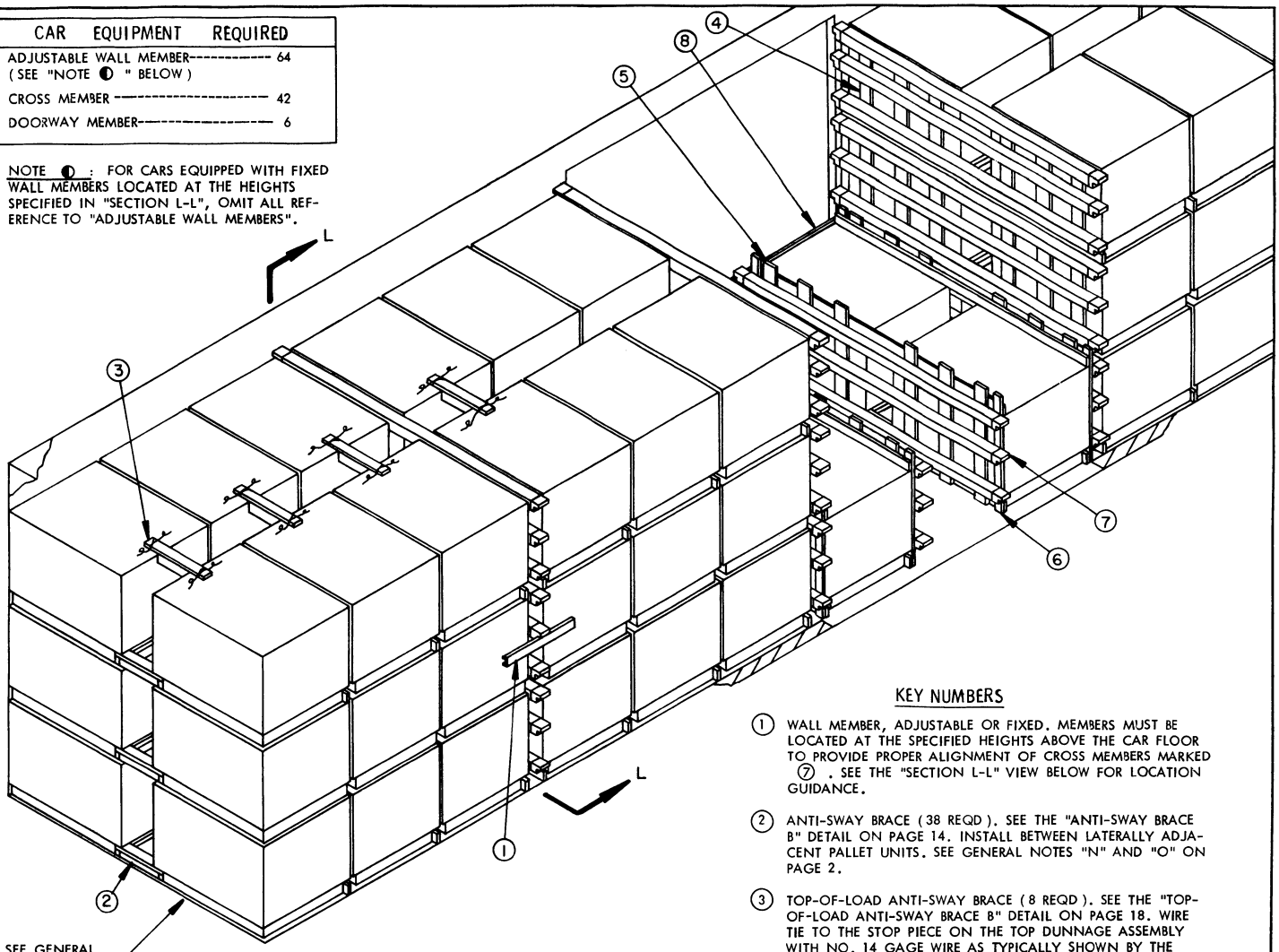
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	90	123,300 LBS
DUNNAGE		2,250 LBS
TOTAL WEIGHT		125,550 LBS

FOUR LAYER PALLET UNIT (BASIC HEIGHT)
90-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR

CAR EQUIPMENT REQUIRED	
ADJUSTABLE WALL MEMBER (SEE "NOTE ◐ " BELOW)	64
CROSS MEMBER	42
DOORWAY MEMBER	6

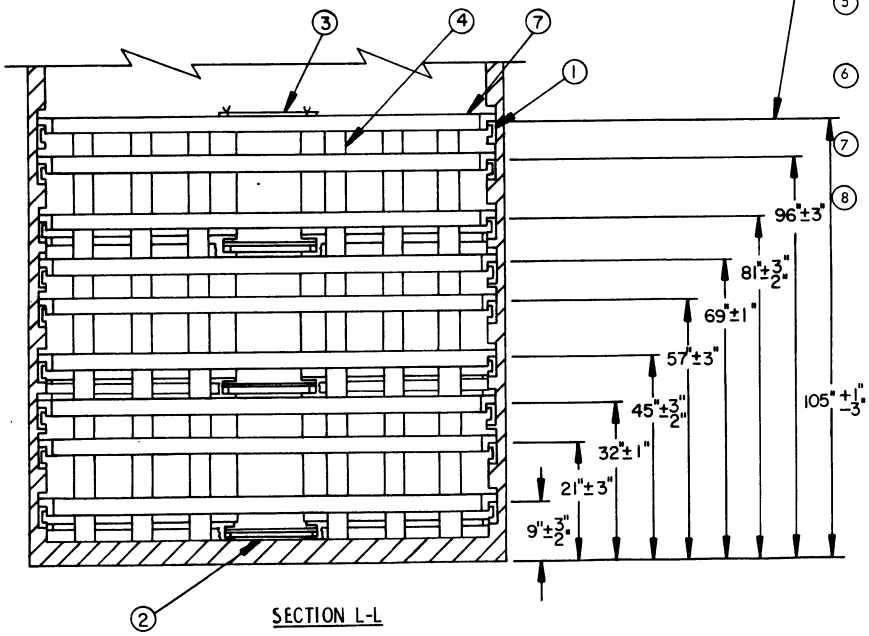
NOTE ◐ : FOR CARS EQUIPPED WITH FIXED WALL MEMBERS LOCATED AT THE HEIGHTS SPECIFIED IN "SECTION L-L", OMIT ALL REFERENCE TO "ADJUSTABLE WALL MEMBERS".



SEE GENERAL NOTE "H" ON PAGE 2.

ISOMETRIC VIEW

EACH DIMENSIONED HEIGHT ABOVE THE CAR FLOOR TO AN ADJUSTABLE OR FIXED WALL MEMBER MARKED (1) AND/OR A DOORWAY MEMBER MARKED (8) IS SPECIFIED TO LOCATE THE CENTER LINE OF A CROSS MEMBER.



SECTION L-L

KEY NUMBERS

(1) WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED (7) . SEE THE "SECTION L-L" VIEW BELOW FOR LOCATION GUIDANCE.

(2) ANTI-SWAY BRACE (38 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2.

(3) TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 18. WIRE TIE TO THE STOP PIECE ON THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 74. SEE SPECIAL NOTE 4 ON PAGE 37.

(4) SEPARATOR GATE FOR 3-HIGH (14 REQD). SEE THE "SEPARATOR GATE E" DETAIL ON PAGE 41. AS APPLICABLE, POSITION WITH TIE PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 5 AND 7 ON PAGE 37.

(5) SEPARATOR GATE FOR 1-HIGH (4 REQD). SEE THE "SEPARATOR GATE E" DETAIL ON PAGE 41. SEE SPECIAL NOTE 6 ON PAGE 37.

(6) STOP PIECE, 1" X 4" X 40" (8 REQD). NAIL TO THE TIE PIECES OF PIECE MARKED (5) W/3-6d NAILS AT EACH JOINT AND CLINCH.

(7) CROSS MEMBER (42 REQD). SEE GENERAL NOTE "Y" ON PAGE 3.

(8) DOORWAY MEMBER (6 REQD). SEE THE "SECTION L-L" VIEW AT LEFT FOR LOCATION GUIDANCE. SEE SPECIAL NOTE 8 ON PAGE 37.

FOUR-LAYER PALLET UNIT (BASIC HEIGHT)
76-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOX CAR EQUIPPED WITH MECHANICAL BRACING DEVICES

PROJECT FSA 43B/21-63

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE (INSIDE CLEARANCE) WOOD-LINED BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS, AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.

2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 36 IS THE 4-LAYER (BASIC HEIGHT) UNIT. A MAXIMUM OF SIXTY-SIX (66) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 94,710 POUNDS, CAN BE PLACED IN A 40'-6" LONG CAR.

3. IF A CAR HAS BOWED END WALLS WHICH ARE BOWED OUTWARD TWO INCHES (2") OR MORE EITHER FROM SIDE-TO-SIDE OR FROM FLOOR-TO-ROOF, CROSS MEMBERS CAN BE INSTALLED NEAR THE END WALL OF THE CAR TO PROVIDE A "SQUARED END" RATHER THAN INSTALLING DUNNAGE AS SPECIFIED IN GENERAL NOTE "H" ON PAGE 2. THESE CROSS MEMBERS SHOULD BE INSTALLED AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE LOAD AS BLOCKING MEMBERS. A SEPARATOR GATE, SHOWN AS PIECE MARKED ④ , MUST BE POSITIONED AGAINST THESE CROSS MEMBERS PRIOR TO LOADING.

4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ③ IN THE LOAD ON PAGE 36, MUST BE INSTALLED IN EACH END OF THE CAR. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.

5. TO FACILITATE POSITIONING OF THE PALLET UNITS AS LOADING PROGRESSES, POSITION PALLET UNIT STACKS AGAINST THE END WALL, THEN POSITION A SEPARATOR GATE, SHOWN AS PIECE MARKED ④ , SO THE 1" X 4" TIE PIECES ARE LOCATED UNDER THE "OVERHANG" OF THE PALLET UNITS. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.

6. SEPARATOR GATES IN THE DOORWAY MUST BE PREVENTED FROM SHIFTING INTO A DOOR OPENING BY THE APPLICATION OF THE STOP PIECES, PIECES MARKED ⑥ . IN CARS EQUIPPED WITH STAGGERED DOORS, STOP PIECES MAY BE REQUIRED ON UP TO FOUR SEPARATOR GATES.

7. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLYWOOD IN LIEU OF DIMENSIONAL LUMBER, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 74 FOR CONSTRUCTION GUIDANCE.

8. IF THE CAR BEING LOADED IS EQUIPPED WITH AT LEAST TWELVE (12) DOOR DOORWAY MEMBERS, AN ADDITIONAL FOUR PALLET UNITS CAN BE LOADED IN THE DOORWAY AREA.

9. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A LOAD MAY BE REDUCED BY MULTIPLES OF TWO (2) PALLET UNITS BY OMITTING LATERALLY ADJACENT UNITS FROM THE TOP LAYER OF ONE OR MORE LOAD UNITS, OR BY MULTIPLES OF SIX (6) PALLET UNITS BY OMITTING ONE OR MORE ENTIRE LOAD UNITS. TO REDUCE A LOAD BY ONE (1) PALLET UNIT, REFER TO THE LCL PROCEDURES ON PAGES 44 AND 45 FOR GUIDANCE.

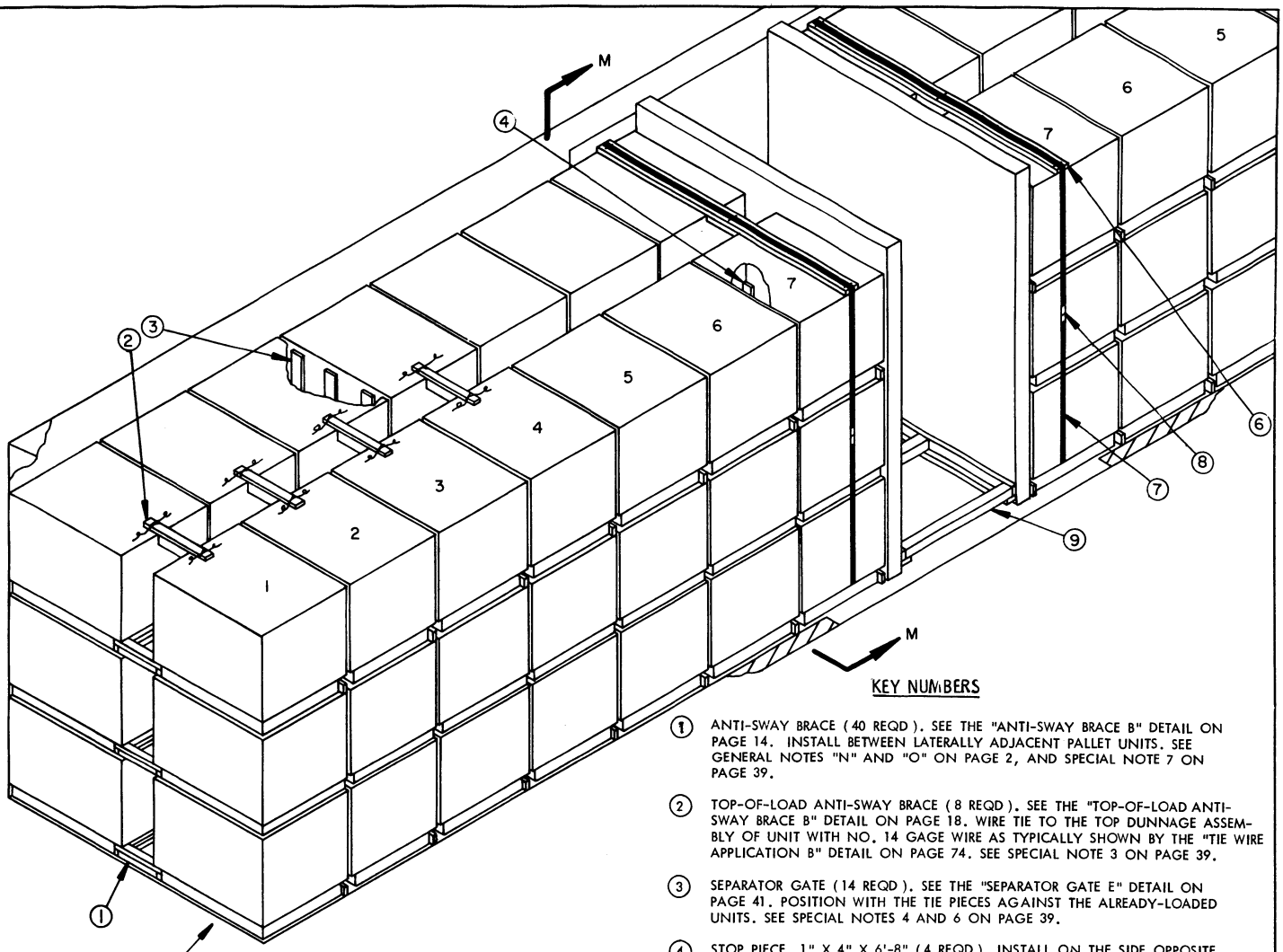
10. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 71 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4" 1" X 6" 2" X 2" 2" X 4"	546 836 235 154	182 418 79 103
NAILS	NO. REQD	POUNDS
6d (2") 10d (3") 12d (3-1/4")	1,344 152 24	8 2-1/2 1/2
WIRE, NO. 14 GAGE --------- 48' REQD---------- 1		

LOAD AS SHOWN

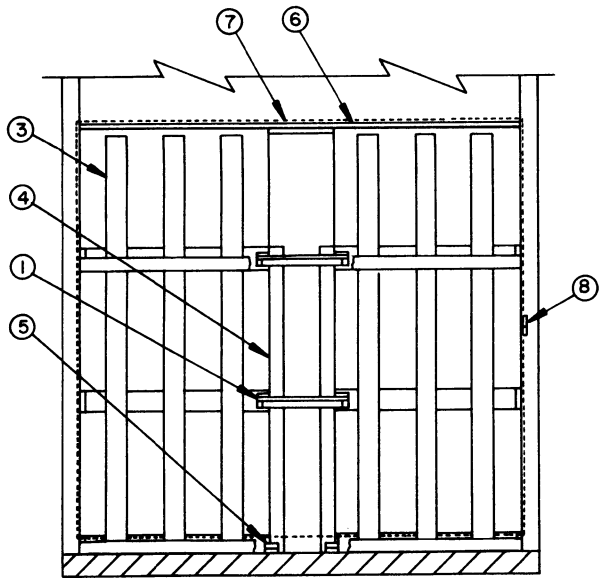
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	76	104,120 LBS
DUNNAGE		1,576 LBS
TOTAL WEIGHT		105,696 LBS

FOUR-LAYER PALLET UNIT (BASIC HEIGHT)
76-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOX CAR EQUIPPED WITH MECHANICAL BRACING DEVICES



SEE GENERAL NOTE "H" ON PAGE 2.

ISOMETRIC VIEW



SECTION M-M

KEY NUMBERS

(1) ANTI-SWAY BRACE (40 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2, AND SPECIAL NOTE 7 ON PAGE 39.

(2) TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 18. WIRE TIE TO THE TOP DUNNAGE ASSEMBLY OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 74. SEE SPECIAL NOTE 3 ON PAGE 39.

(3) SEPARATOR GATE (14 REQD). SEE THE "SEPARATOR GATE E" DETAIL ON PAGE 41. POSITION WITH THE TIE PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 4 AND 6 ON PAGE 39.

(4) STOP PIECE, 1" X 4" X 6'-8" (4 REQD). INSTALL ON THE SIDE OPPOSITE THE VERTICAL PIECES OF THE SEPARATOR GATES, PIECES MARKED (3), WHICH ARE IN THE DOORWAY AREA. POSITION IN CONTACT WITH THE ADJACENT PALLET UNITS AND NAIL TO THE TIE PIECES W/3-6d NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 5 ON PAGE 39.

(5) SIDE BLOCKING, 2" X 4" X 35" (DOUBLED) (4 REQD). 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 7 ON PAGE 39.

(6) STRAPPING BOARD ASSEMBLY "B" (2 REQD). SEE THE DETAIL ON PAGE 19.

(7) DOORWAY PROTECTION STRAP, 1-1/4" X .031" OR .035" X 38'-0" LONG STEEL STRAPPING (2 REQD). STAPLE TO THE STRAPPING BOARD W/3 STAPLES.

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

(9) STRUT ASSEMBLY (1 REQD). SEE THE "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL ON PAGE 81. INSTALL BETWEEN THE LOAD DIVIDER BULKHEADS. SEE SPECIAL NOTE 8 ON PAGE 39.

FOUR LAYER PALLET UNIT (BASIC HEIGHT)
84-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOXCAR EQUIPPED WITH LOAD DIVIDERS

PROJECT FSA 43B/21-63

(SPECIAL NOTES CONTINUED)

9. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 3-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF SIX (6) PALLET UNITS, OR A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) UNITS, OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. OR, THE ENTIRE ONE OR TWO TOP TIERS CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 48 THRU 57 AND GENERAL NOTE "GG" ON PAGE 3 FOR GUIDANCE.

10. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 70 FOR SHIPPING GUIDANCE.

11. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINRS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFT CONTAINERS" ON PAGE 71 FOR GUIDANCE.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CUSHIONED BOX CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING NARROWER OR WIDER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "BB" THRU "FF" ON PAGE 3.

2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 38 IS THE 4-LAYER (BASIC HEIGHT) UNIT. A MAXIMUM OF ONE HUNDRED-EIGHT (108) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 154,980 POUNDS, CAN BE PLACED IN A 60'-8" LONG CAR, OR A MAXIMUM OF SIXTY-SIX (66) UNITS CAN BE LOADED IN A 40'-6" CAR FOR AN APPROXIMATE LADING WEIGHT OF 94,710 POUNDS, WHEN USING THE DEPICTED PROCEDURES. IF THE CROSSWISE LOADING PATTERN SHOWN ON PAGE 32 IS EMPLOYED, EIGHTY-FOUR (84) PALLET UNITS FOR AN APPROXIMATE LADING WEIGHT OF 120,540 POUNDS CAN BE PLACED IN A 60'-8" LONG CAR, SIXTY-SIX (66) UNITS CAN BE LOADED IN A 50'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 94,710 POUNDS, AND FIFTY-FOUR (54) UNITS CAN BE LOADED IN A 40'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 77,490 POUNDS.

3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 38, MUST BE INSTALLED IN EACH END OF THE CAR. FOUR (4) ASSEMBLIES ARE REQUIRED IN EACH END OF A LOAD IN 40' OR 50' CARS. FIVE (5) ARE REQUIRED IN EACH END OF A 60' CAR.

4. TO FACILITATE POSITIONING OF THE PALLET UNITS AS LOADING PROGRESSES, POSITION PALLET UNIT STACKS AGAINST THE END WALL, THEN POSITION A SEPARATOR GATE, SHOWN AS PIECE MARKED ③, SO THE 1" X 4" TIE PIECES ARE LOCATED UNDER THE "OVERHANG" OF THE PALLET UNITS. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.

5. SEPARATOR GATES IN THE DOORWAY MUST BE PREVENTED FROM SHIFTING INTO A DOOR OPENING BY THE APPLICATION OF THE STOP PIECES, PIECES MARKED ④. IN CARS EQUIPPED WITH STAGGERED DOORS, STOP PIECES MAY BE REQUIRED ON UP TO FOUR SEPARATOR GATES.

6. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLYWOOD IN LIEU OF DIMENSIONAL LUMBER, IF DESIRED, FOR ONE OR TWO-LAYER LOADS; PLYWOOD SEPARATOR GATES FOR 3-HIGH LOADS ARE NOT ECONOMICALLY FEASIBLE. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 74 FOR CONSTRUCTION GUIDANCE.

7. DOORWAY PROTECTION IS REQUIRED FOR ALL THE LOAD UNITS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY ONE-HALF OR MORE OF THE UNIT WIDTH. SIDE BLOCKING SHOWN AS PIECE MARKED ⑤ IN THE LOAD VIEW, MUST BE USED IN LIEU OF THE LOWER ANTI-SWAY BRACE MARKED ① FOR ALL UNITS REQUIRING DOORWAY PROTECTION STRAPS. TWO (2) DOORWAY PROTECTION STRAPS ARE REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS COMPLETELY WITHIN THE DOORWAY AREA OR WHICH IS NOT RETAINED BY AT LEAST SIX INCHES (6") OF THE SIDEWALL ON BOTH SIDES OF THE CAR. ONE (1) DOORWAY PROTECTION STRAP IS REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS RETAINED BY FROM 6" TO ONE-HALF THE PALLET/LOAD UNIT LENGTH OR WIDTH. IF THE CAR BEING LOADED IS EQUIPPED WITH SLIDING DOORS, A WOODEN GATE TYPE OF DOORWAY PROTECTION SUCH AS SHOWN IN THE LOAD ON PAGE 34, OR ANY OF THE ALTERNATIVES ON PAGES 78 THRU 80 MAY BE USED.

8. THE STRUT ASSEMBLY, SHOWN AS PIECE MARKED ⑨ IN THE LOAD ON PAGE 38, IS REQUIRED WHEN THE LOAD IN EITHER END OF A CAR IS 50,000 POUNDS OR MORE. FOR THE DEPICTED LOAD THE STRUT ASSEMBLY WOULD NOT BE REQUIRED IF THE LOAD CONSISTED OF FIVE (5) LOAD UNITS IN EACH END OF THE CAR. THE STRUT ASSEMBLY WILL ALWAYS BE REQUIRED FOR FULL LOADS IN 50' OR LONGER CARS.

(CONTINUED AT LEFT)

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	479	160
1" X 6"	756	378
1" X 8"	17	12
2" X 2"	247	83
2" X 4"	198	132
2" X 6"	44	44
4" X 4"	16	22

NAILS	NO. REQD	POUNDS
6d (2")	1,240	7-1/4
10d (3")	186	3
12d (3-1/4")	40	3/4
16d (3-1/2")	32	3/4

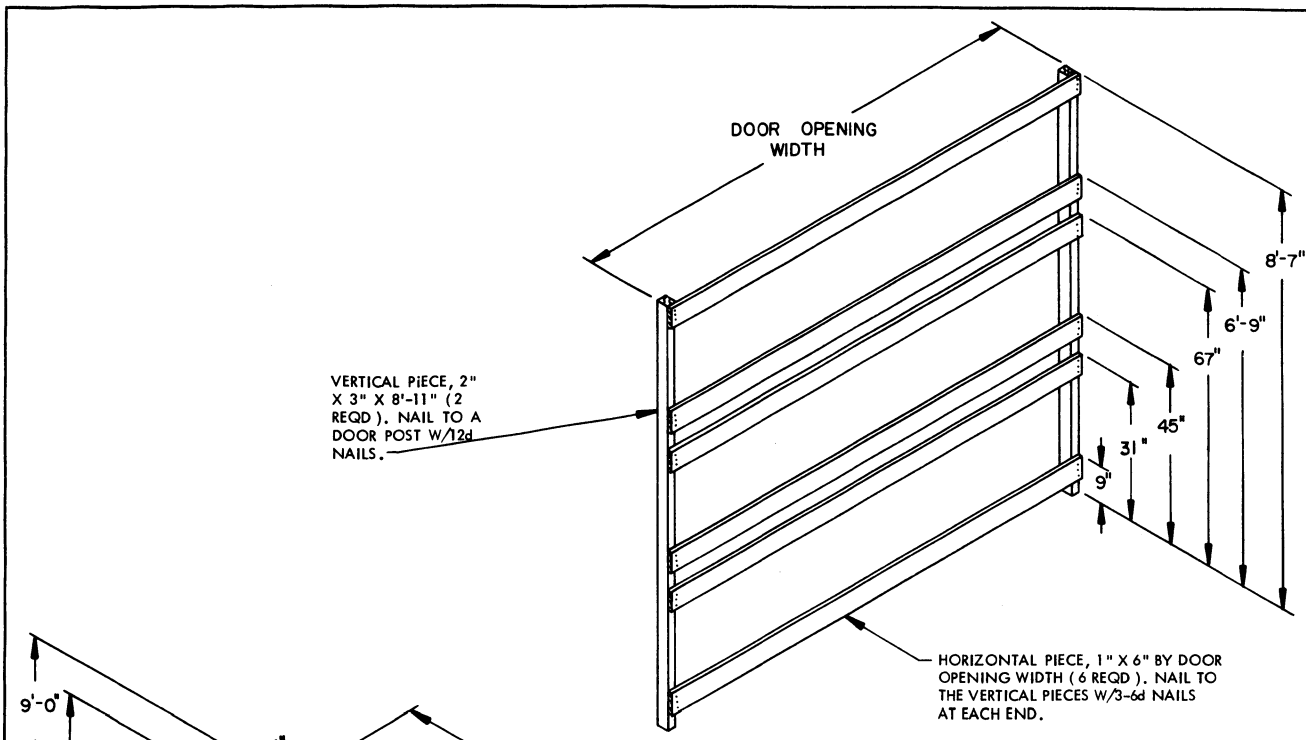
STEEL STRAPPING, 1-1/4"	76'	REQD	11 LBS
SEAL FOR 1-1/4" STRAPPING	4	REQD	NIL
STAPLE FOR 1-1/4" STRAPPING	4	REQD	NIL
WIRE, NO. 14 GAGE	48'	REQD	1 LB

LOAD AS SHOWN

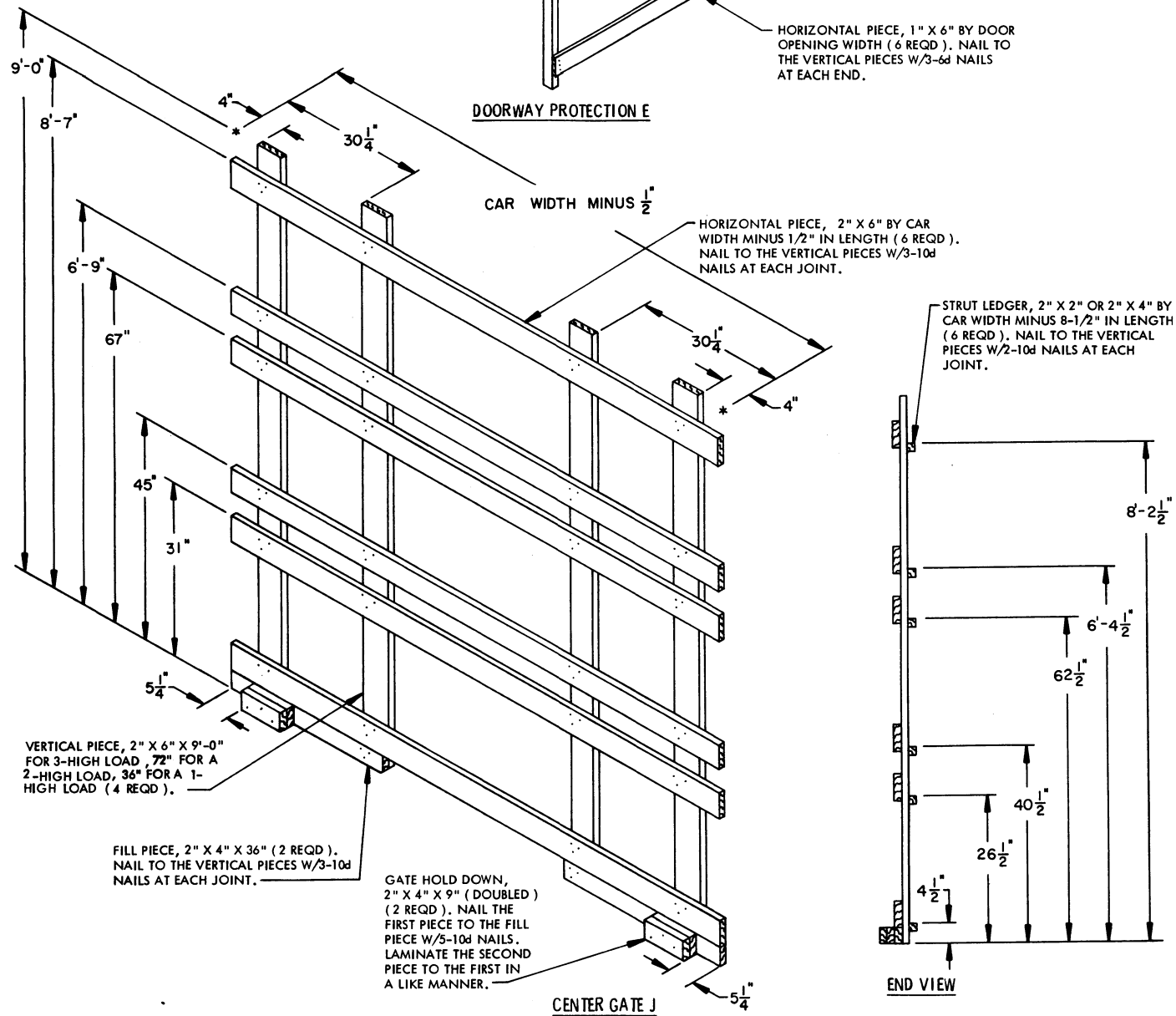
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	90	123,300 LBS
DUNNAGE		1,686 LBS
TOTAL WEIGHT		124,986 LBS

FOUR LAYER PALLET UNIT (BASIC HEIGHT)

90-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOXCAR EQUIPPED WITH LOAD DIVIDERS

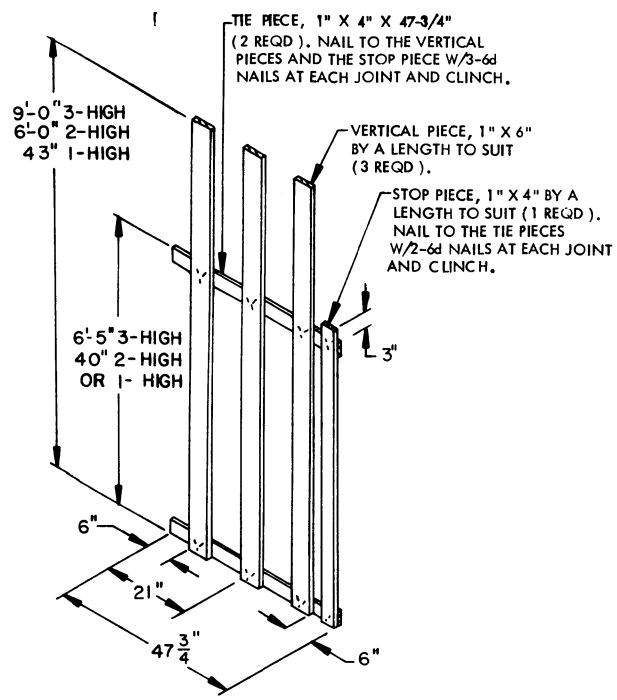


DOORWAY PROTECTION E

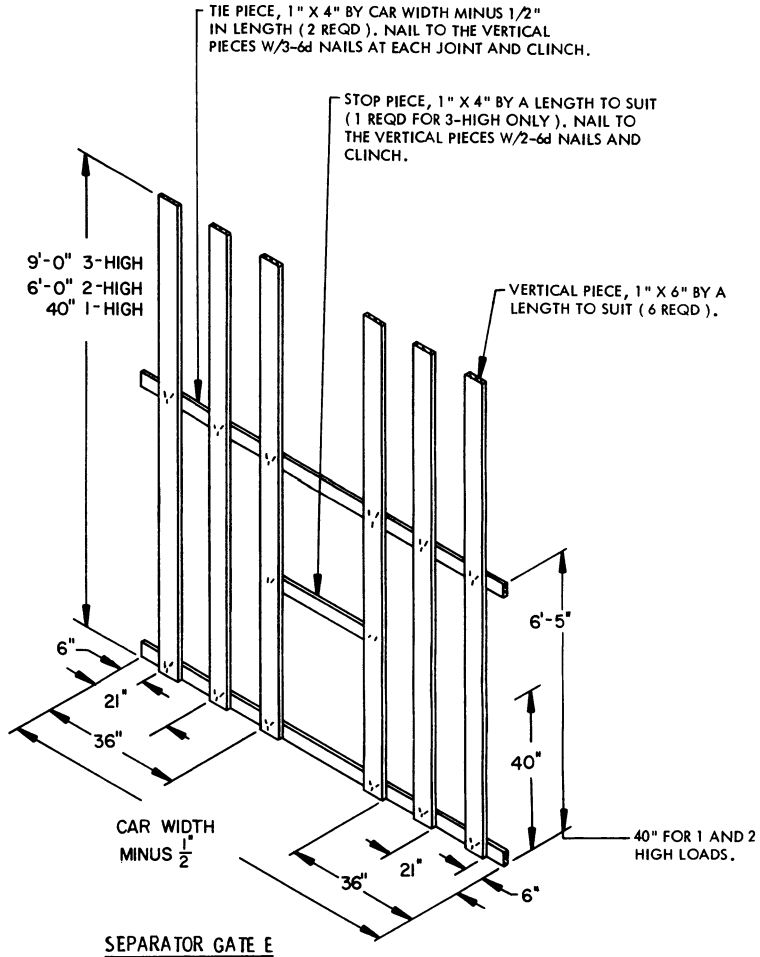


CENTER GATE J

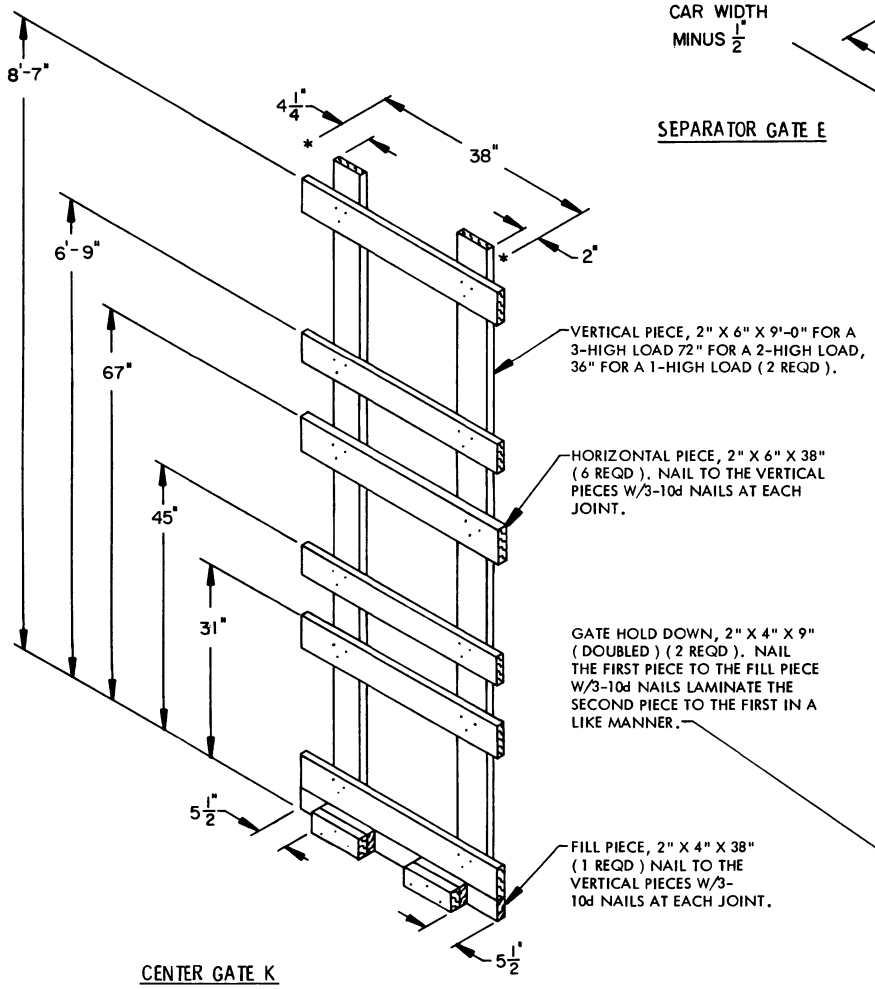
DETAILS FOR A FOUR LAYER PALLET UNIT



SEPARATOR GATE F

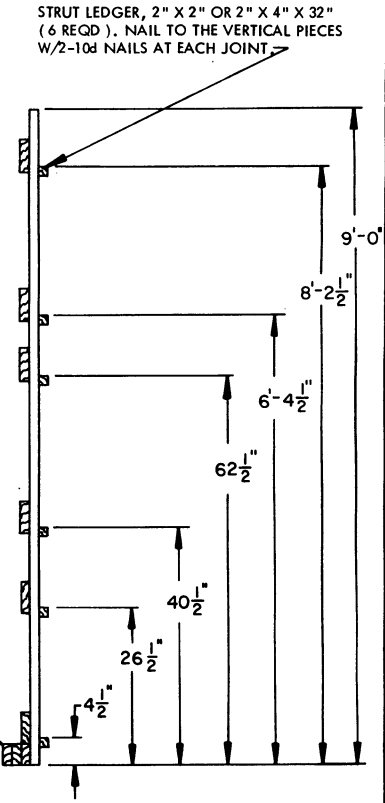


SEPARATOR GATE E



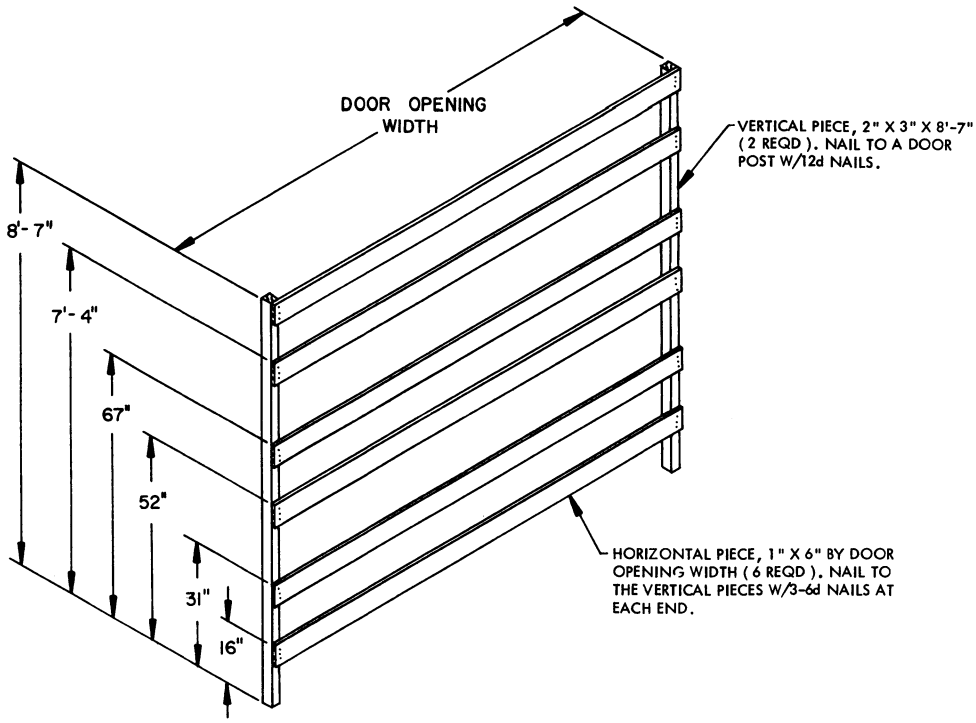
CENTER GATE K

1 RIGHT HAND AND 1 LEFT HAND GATE REQUIRE. POSITION THE 4-1/4" DIMENSION AGAINST THE SIDEWALL OF CAR.

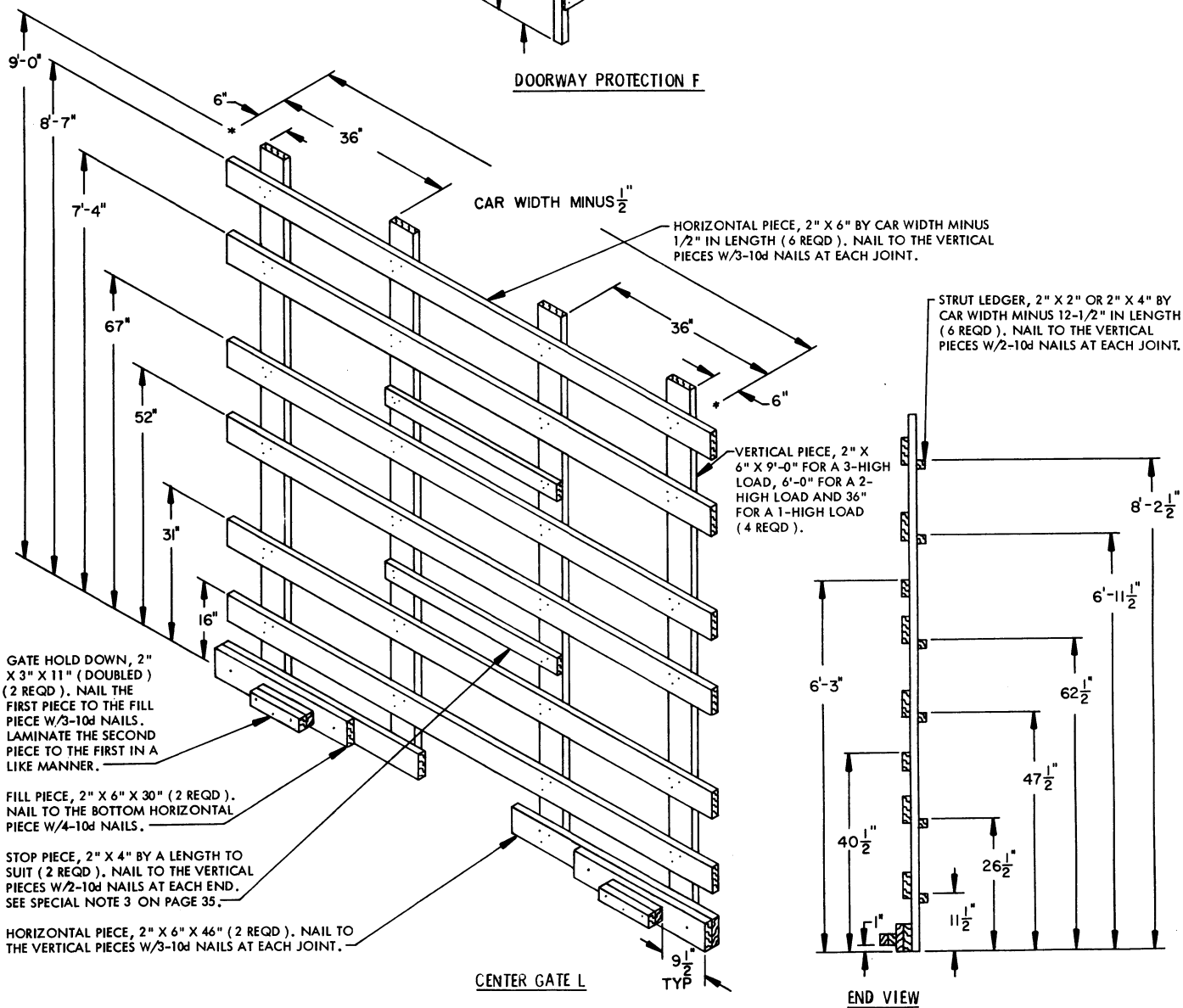


END VIEW

DETAILS FOR A FOUR LAYER PALLET UNIT



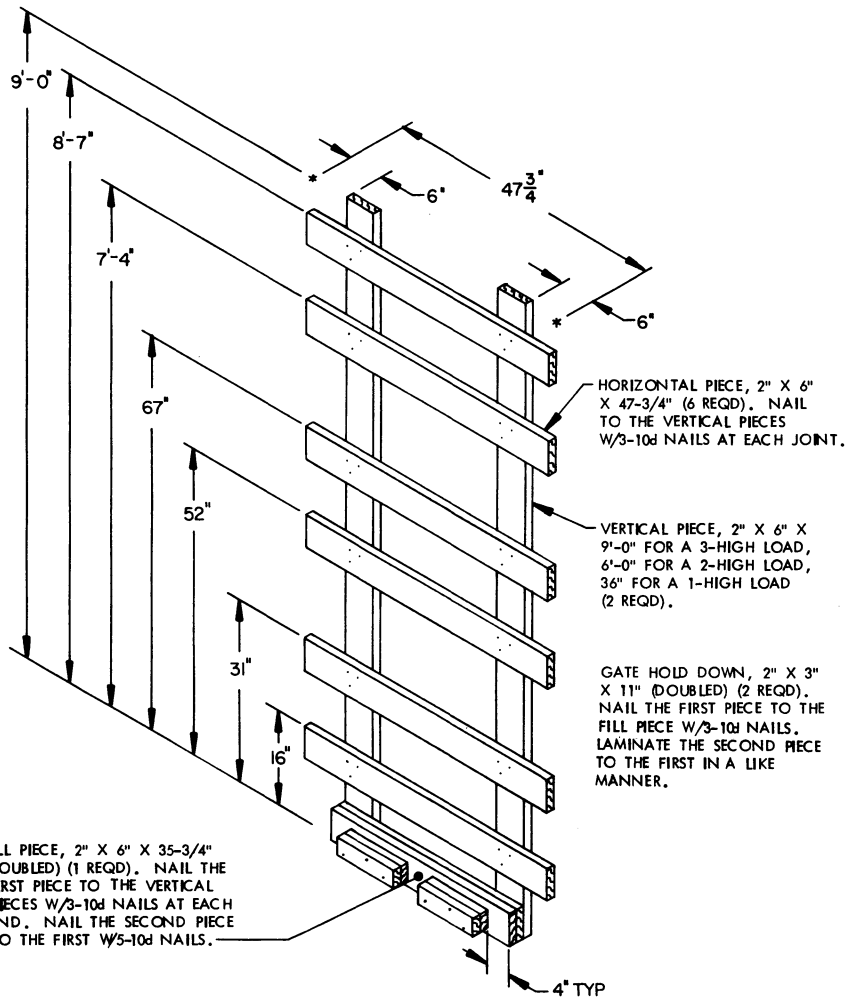
DOORWAY PROTECTION F



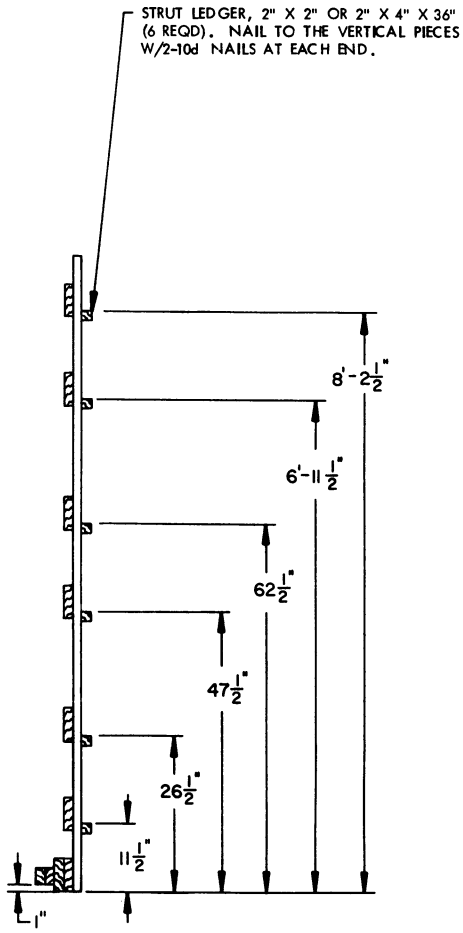
CENTER GATE L

END VIEW

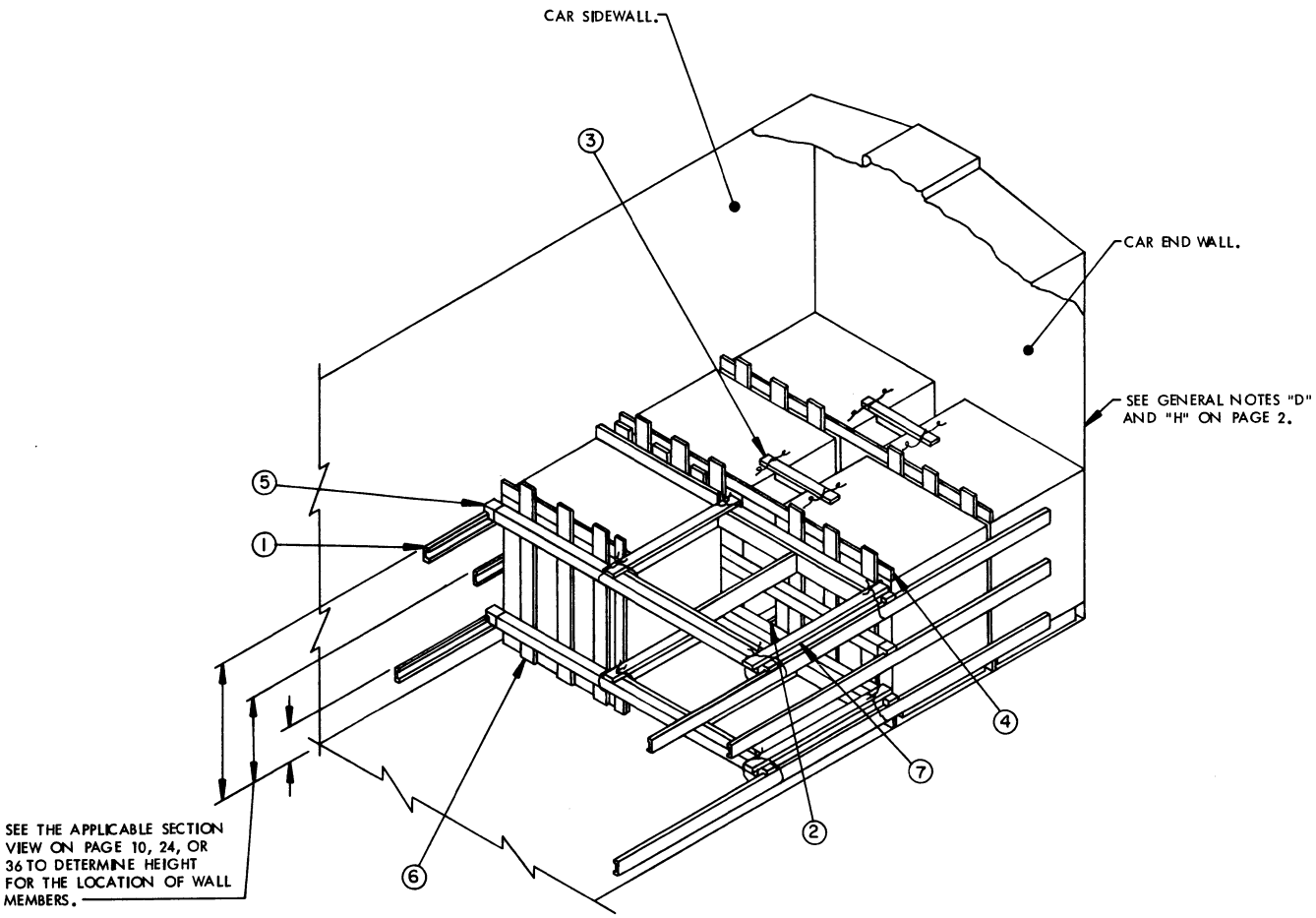
DETAILS FOR A FOUR LAYER PALLET UNIT



CENTER GATE M



END VIEW



ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-0" WIDE (INSIDE CLEARANCE) WOOD-LINED BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBER IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LCL LOAD IS THE 6-LAYER UNIT. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. FIVE (5) UNITS ARE SHOWN AS A TYPICAL LOAD QUANTITY. THE NUMBER OF UNITS CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ③ , MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO A UNIT WITH NO. 14 GAGE WIRE. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH. SEE "NOTE● " BELOW.
5. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLYWOOD IN LIEU-OF DIMENSIONAL LUMBER, IF DESIRED. CONSTRUCT EACH GATE TO BE CAR WIDTH MINUS 1/2" IN LENGTH BY UNIT HEIGHT, OR UNIT WIDTH BY UNIT HEIGHT, AS APPLICABLE.
6. THE SPACER ASSEMBLIES, SHOWN AS PIECES MARKED ⑦, MAY ALSO BE USED IN AN UPPER LAYER OF A LOAD FOR THE OMISSION OF A PALLET UNIT. IF THE ASSEMBLIES ARE USED NEXT TO THE CAR END WALL IN EITHER A FIRST LAYER OR IN AN UPPER LAYER, AND THE END WALL IS WOOD-LINED, CUT THE ADJACENT ENDS OFF THE SUPPORT PIECES FLUSH WITH THE LATERAL PIECE. EACH ASSEMBLY CAN THEN BE SUPPORTED BY NAILING THE LATERAL PIECE TO THE CAR END WALL W/6-10d NAILS. IF THE END WALL IS NON-NAILABLE, CROSS MEMBERS MUST BE INSTALLED AT THE END OF THE LOAD TO SUPPORT THE SPACER ASSEMBLIES.

KEY NUMBERS

① WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNEMENT OF CROSS MEMBERS MARKED ⑤.

② ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTE "N" AND "O" ON PAGE 2.

③ TOP-OF-LOAD ANTI-SWAY BRACE (2 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 18. WIRE TIE TO PALLET UNITS AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 74.

④ SEPARATOR GATE FOR 1-HIGH AND 2-WIDE (2 REQD). SEE THE APPLICABLE SEPARATOR GATE DETAIL FOR TWO UNITS WIDE ON PAGE 15, 29, OR 41. POSITION WITH THE 1" X 4" TIE PIECES AGAINST THE ALREADY-LOADED UNITS.

⑤ CROSS MEMBER (5 REQD). SEE GENERAL NOTE "Y" ON PAGE 3.

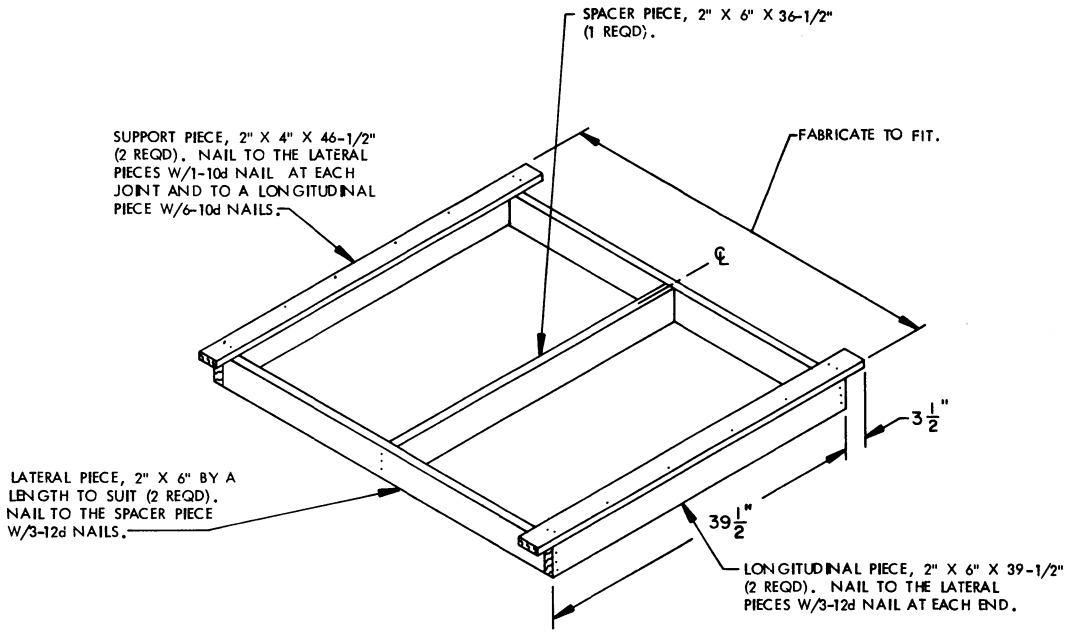
⑥ SEPARATOR GATE FOR 1-HIGH AND 1-WIDE (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE APPLICABLE SEPARATOR GATE DETAIL FOR ONE UNIT WIDE ON PAGE 15, 29, OR 41. AS APPLICABLE, POSITION WITH THE 1" X 4" TIE PIECES AGAINST THE ALREADY-LOADED UNITS.

⑦ SPACER ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 45 AND SPECIAL NOTE 6 AT LEFT. WIRE TIE TO CROSS MEMBER W/2 WRAPS OF NO. 14 GAGE WIRE AT EACH CORNER.

NOTE ● :

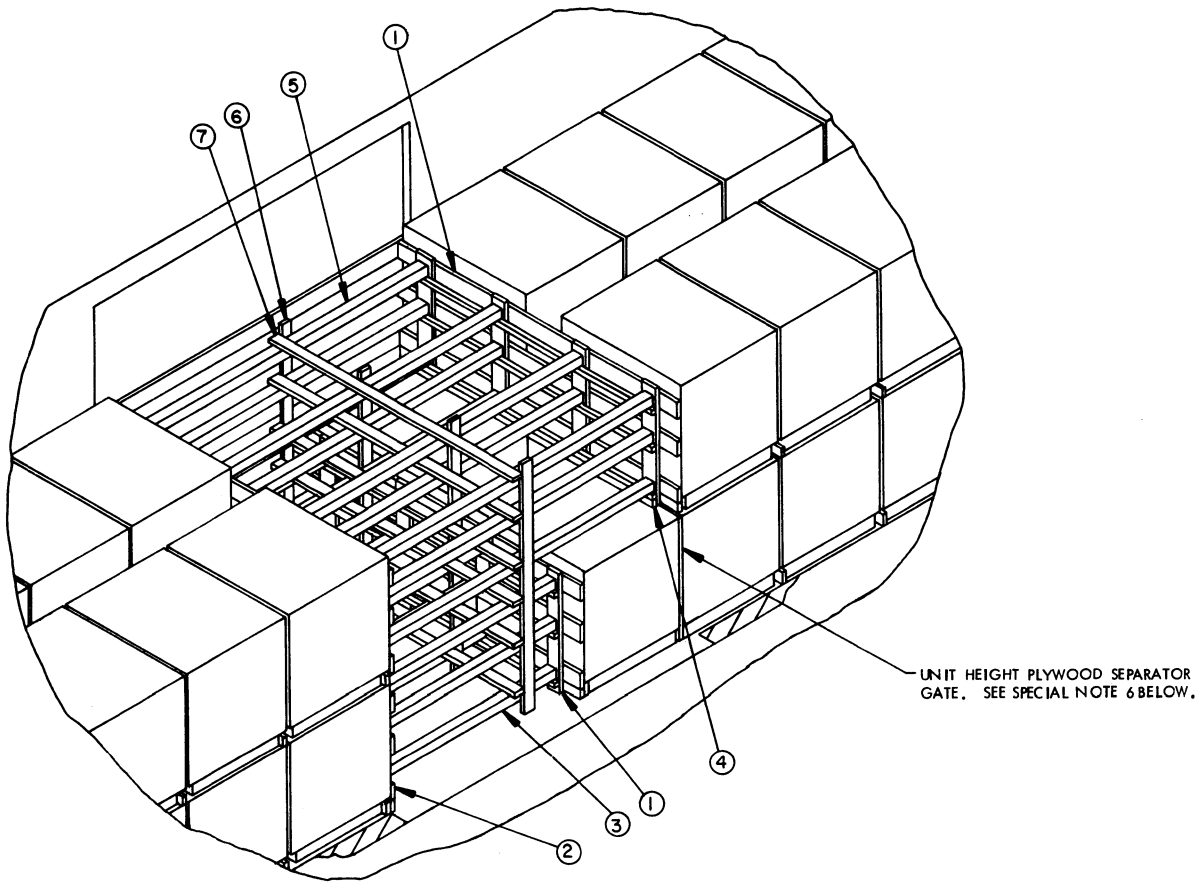
ALTHOUGH SPECIAL NOTE 4 SPECIFIES THAT FOUR (4) TOP-OF-LOAD ANTI-SWAY BRACES ARE REQUIRED IN EACH END OF A LOAD, THIS MAY NOT APPLY SUCH AS SHOWN IN THE ISOMETRIC VIEW ABOVE. THE FOUR BRACES WILL APPLY TO A LOAD OF EIGHT (8) OR MORE PALLET UNITS.

TYPICAL LCL (5-UNIT LOAD) IN A BOX CAR EQUIPPED WITH
MECHANICAL BRACING DEVICES HAVING ADJUSTABLE OR FIXED WALL MEMBERS



SPACER ASSEMBLY

TYPICAL LCL (5-UNIT LOAD) IN A BOXCAR EQUIPPED WITH
MECHANICAL BRACING DEVICES HAVING ADJUSTABLE OR FIXED WALL MEMBERS



ISOMETRIC VIEW

SPECIAL NOTES:

1. ONLY THE CENTER PORTION OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN TO PORTRAY THE STRUTTED GATE METHOD OF PARTIAL-LAYER BRACING. WIDER CARS CAN ALSO BE USED.

2. THE PALLET UNIT SHOWN IS THE 5-LAYER UNIT. THE DEPICTED PROCEDURES ARE ALSO ADAPTABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.

3. THE PROCEDURES FOR THE ADJUSTMENT OF A LOAD QUANTITY BY THE OMISSION OF THE TOP LAYER FROM ONE (1) LOAD UNIT ARE SHOWN AS TYPICAL. THE PRINCIPLES MAY ALSO BE APPLIED FOR THE OMISSION OF THE TOP LAYER FROM TWO (2) LOAD UNITS.

4. ONLY THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO PERMIT THE OMISSION OF THE UNITS FROM THE TOP LAYER ARE SHOWN.

5. THE CENTER GATE "G" USED IS ONLY APPLICABLE FOR THE 5-LAYER UNIT DEPICTED. THE PROPER CENTER GATE TO BE USED WILL DEPEND UPON THE UNIT BEING SHIPPED. THE QUANTITY REQUIRED FOR DUNNAGE PIECES, SUCH AS THE NUMBER OF STRUTS OR THE NUMBER OF STRUT BRACING PIECES, WILL ALSO VARY DEPENDENT UPON THE UNIT BEING LOADED.

6. THE 1-LAYER PALLET UNITS MUST BE POSITIONED SO THAT THE BELL END OF THE CONTAINERS ARE LOCATED UNDER THE CENTER GATE, PIECE MARKED (1). ALSO, A PLYWOOD SEPARATOR GATE DETAILED ON PAGE 74 WILL BE USED AT THE LOCATION SHOWN ABOVE, TO ALLOW INSTALLATION OF THE CENTER GATE.

KEY NUMBERS

(1) CENTER GATE FOR 1-HIGH (2 REQD). SEE THE "CENTER GATE G" DETAIL ON PAGE 30. SEE GENERAL NOTES "N" AND "O" ON PAGE 2 AND SPECIAL NOTE 5 AT THE LEFT.

(2) CENTER GATE FOR 2-HIGH (1 REQD). SEE THE "CENTER GATE G" DETAIL ON PAGE 30.

(3) STRUT, 4" X 4" BY CUT TO FIT (AS REQD). POSITION BETWEEN THE CENTER GATES, PIECES MARKED (1) AND (2), IN THE FIRST LAYER AND TOENAIL W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "M" ON PAGE 2. SEE GENERAL NOTES "V" AND "W" ON PAGE 3.

(4) GATE SUPPORT PIECE, 2" X 4" BY A LENGTH TO SUIT (1 REQD). NAIL TO THE VERTICAL PIECES OF THE CENTER GATE USED IN THE SECOND LAYER W/2-10d NAILS AT EACH JOINT.

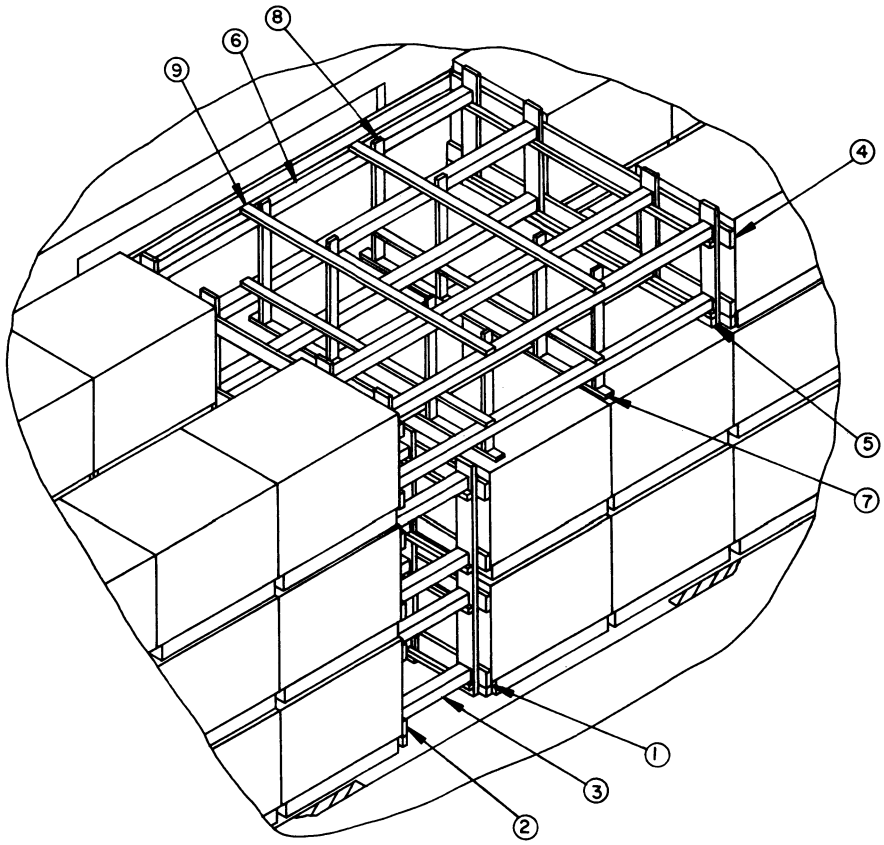
(5) STRUT, 4" X 4" BY CUT TO FIT (AS REQD). POSITION BETWEEN THE CENTER GATES, PIECES MARKED (1) AND (2), IN THE SECOND LAYER AND TOENAIL W/2-16d NAILS AT EACH END.

(6) VERTICAL STRUT BRACING, 2" X 4" BY CUT TO EXTEND 3" ABOVE THE TOP STRUT (AS REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

(7) HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 6" IN LENGTH (AS REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

LENGTHWISE POSITIONED PALLET UNITS

TYPICAL LCL LOAD USING STRUTED GATE METHOD OF PARTIAL-LAYER BRACING



ISOMETRIC VIEW

SPECIAL NOTES:

1. ONLY THE CENTER PORTION OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN TO PORTRAY THE STRUTTED GATE METHOD OF PARTIAL-LAYER BRACING. CARS OF OTHER WIDTHS CAN ALSO BE USED.

2. THE PALLET UNIT SHOWN IS THE 4-LAYER UNIT (BASIC HEIGHT). THE DEPICTED PROCEDURES ARE ALSO ADAPTABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.

3. THE PROCEDURES FOR THE ADJUSTMENT OF A LOAD QUANTITY BY THE OMISSION OF THE TOP LAYER FROM TWO (2) LOAD UNITS ARE SHOWN AS TYPICAL. THE PRINCIPLES MAY ALSO BE APPLIED FOR THE OMISSION OF THE TOP LAYER FROM JUST ONE (1) LOAD UNIT.

4. ONLY THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO PERMIT THE OMISSION OF THE UNITS FROM THE TOP LAYER ARE SHOWN.

5. THE CENTER GATE "J" IS ONLY APPLICABLE FOR THE 4-LAYER UNIT DEPICTED. THE PROPER CENTER GATE TO BE USED WILL DEPEND UPON THE UNIT BEING SHIPPED. THE QUANTITY REQUIRED FOR DUNNAGE PIECES, SUCH AS THE NUMBER OF STRUTS OR THE NUMBER OF STRUT BRACING PIECES, WILL ALSO VARY DEPENDENT UPON THE UNIT BEING LOADED.

6. TO PROTECT THE LADING FROM BEING PUNCTURED WHEN A SET OF VERTICAL STRUT BRACING IS INSTALLED ABOVE THE LOWER LAYER OF A LOAD, A SUITABLE LENGTH PAD OF 2" X 4" MATERIAL, SHOWN AS PIECE MARKED (7), MUST BE POSITIONED UNDER AND SECURED TO EACH APPLICABLE VERTICAL STRUT BRACING PIECE.

KEY NUMBERS

(1) CENTER GATE FOR 2-HIGH (1 REQD). SEE THE "CENTER GATE J" DETAIL ON PAGE 40. SEE SPECIAL NOTE 5 AT LEFT.

(2) CENTER GATE FOR 3-HIGH (1 REQD). SEE THE "CENTER GATE J" DETAIL ON PAGE 40.

(3) STRUT, 4" X 4" BY CUT TO FIT (16 REQD). TOENAIL TO PIECES MARKED (1) AND (2) W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "M" ON PAGE 2. SEE GENERAL NOTES "V" AND "W" ON PAGE 3.

(4) CENTER GATE FOR 1-HIGH (1 REQD). SEE THE "CENTER GATE J" DETAIL ON PAGE 40.

(5) GATE SUPPORT PIECE, 2" X 3" BY CAR WIDTH MINUS 1/2" IN LENGTH (1 REQD). NAIL TO THE VERTICAL PIECES ON CENTER GATE "J", SHOWN AS PIECE MARKED (4). W/2-10d NAILS AT EACH JOINT.

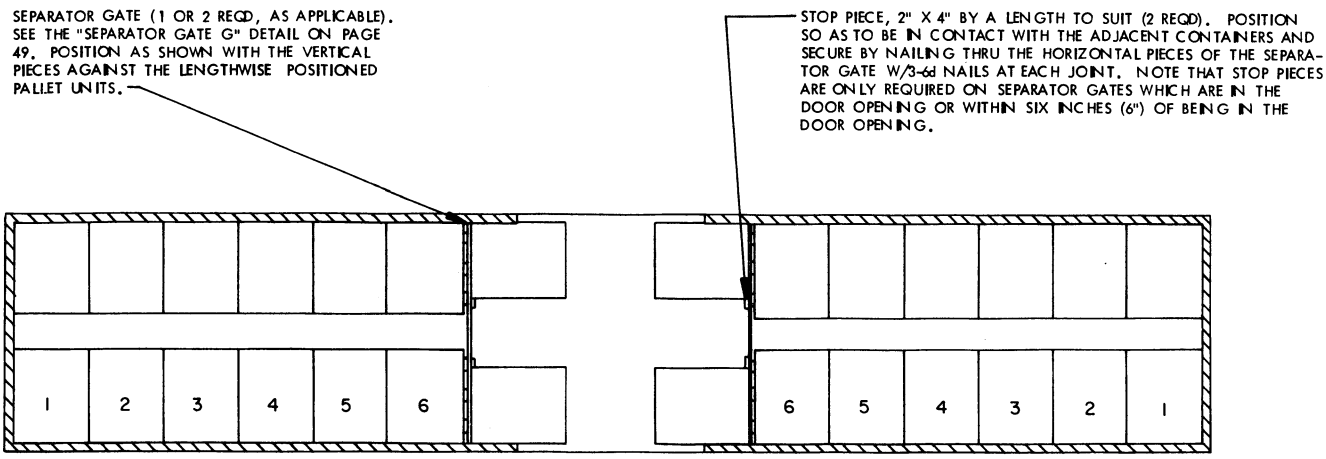
(6) STRUT, 4" X 4" BY CUT TO FIT (8 REQD). TOENAIL TO PIECES MARKED (2) AND (4) W/2-16d NAILS AT EACH END.

(7) STRUT BRACING PAD, 2" X 4" BY LENGTH TO SUIT (2 REQD). POSITION UNDER THE VERTICAL STRUT BRACING AS SHOWN.

(8) VERTICAL STRUT BRACING, 2" X 4" BY CUT TO EXTEND 3" ABOVE THE TOP STRUT (8 REQD). NAIL TO THE STRUTS MARKED (6) W/3-10d NAILS AT EACH JOINT. TOENAIL TO THE STRUT BRACING PAD, PIECE MARKED (7), W/1-10d NAIL AT EACH JOINT. SEE SPECIAL NOTE 6 AT LEFT.

(9) HORIZONTAL STRUT BRACING, 2" X 4" BY A LENGTH TO SUIT (4 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

CROSSWISE POSITIONED PALLET UNITS
TYPICAL LCL LOAD USING STRUTTED GATE METHOD OF PARTIAL LAYER BRACING



TYPICAL COMBINATION LOAD PATTERN PLAN VIEW

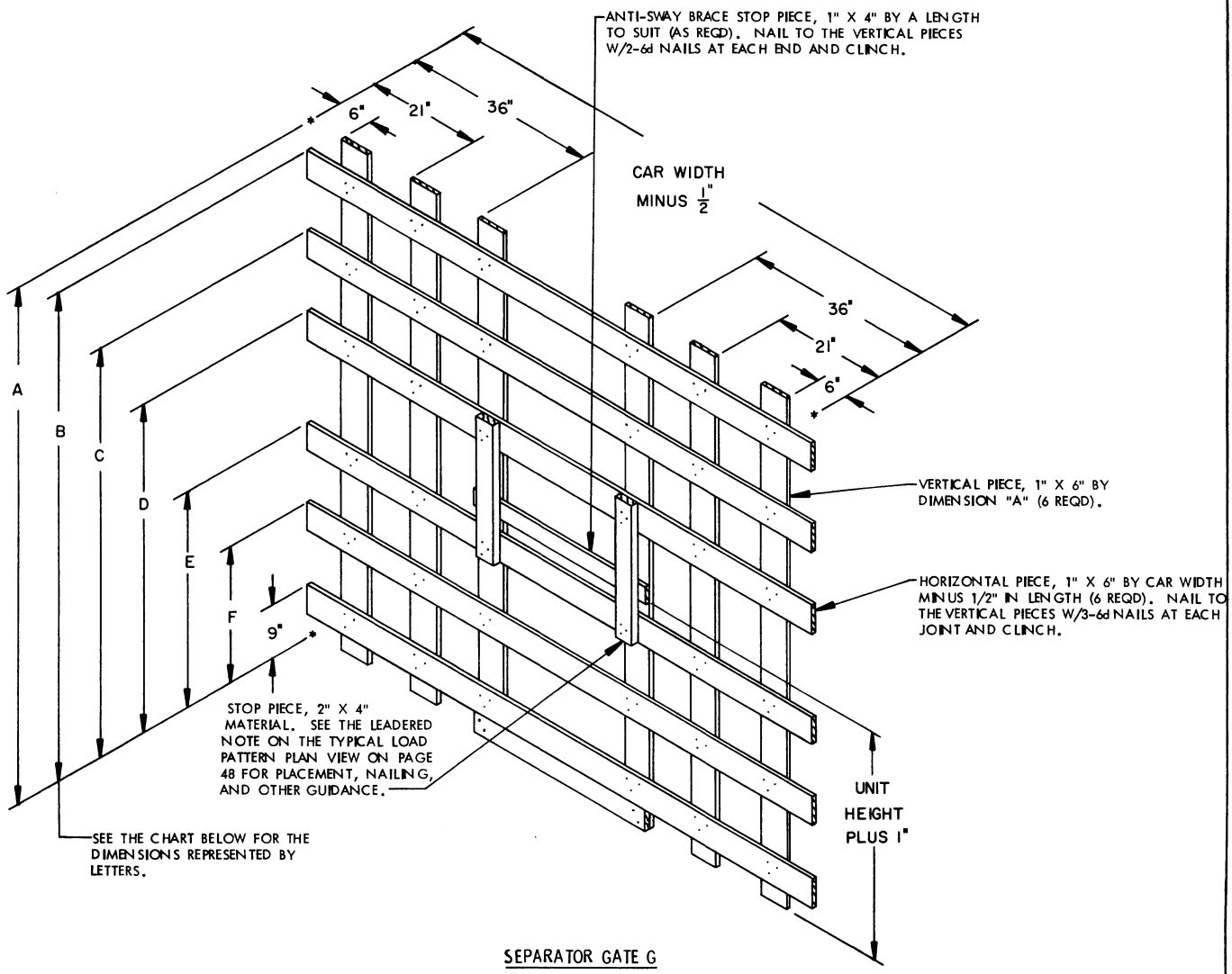
12 LENGTHWISE PLUS 2 CROSSWISE LOAD UNITS ARE SHOWN.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. WIDER CARS AND CARS OF OTHER LENGTHS CAN BE USED.
2. THE PROCEDURES ON THIS PAGE AND ON PAGE 49 ARE PRESENTED TO PROVIDE A METHOD OF OBTAINING A LOAD QUANTITY WHICH MAY NOT BE READILY ATTAINABLE BY ANY OF THE OTHER METHODS OF ADJUSTING A LOAD QUANTITY SPECIFIED HEREIN, INCLUDING THE DEPICTED LCL PROCEDURES.
3. THE BLOCKING AND BRACING FOR THE COMBINATION LOAD, OTHER THAN SEPARATOR GATE "G", HAS NOT BEEN SHOWN. REFER TO THE APPLICABLE LOAD PAGES FOR BLOCKING AND BRACING SPECIFICATIONS. A SEPARATOR GATE "G" MUST BE INSTALLED AT EVERY LOCATION WHERE THE DIRECTION OF THE UNITS CHANGE. THE GATE MUST BE POSITIONED SO THAT THE VERTICAL PIECES ARE AGAINST THE LENGTHWISE UNITS OF THE LOAD.
4. THE CHART AT RIGHT SHOWS THE VARIOUS QUANTITIES (PER LAYER) WHICH CAN BE ATTAINED BY THE COMBINATION LOAD METHOD, AND THE PATTERNS REQUIRED TO PROVIDE THESE QUANTITIES, ARE SPECIFIED. FOR COMPARISON PURPOSES, THE OTHER TYPE LOADS WHICH CAN BE USED TO ATTAIN A LIKE QUANTITY, OR A QUANTITY WITHIN THE RANGE OF THE COMBINATION LOAD METHOD, AS WELL AS THE APPROXIMATE LENGTH OF THE STRUTS, ARE ALSO INCLUDED IN THE CHART.

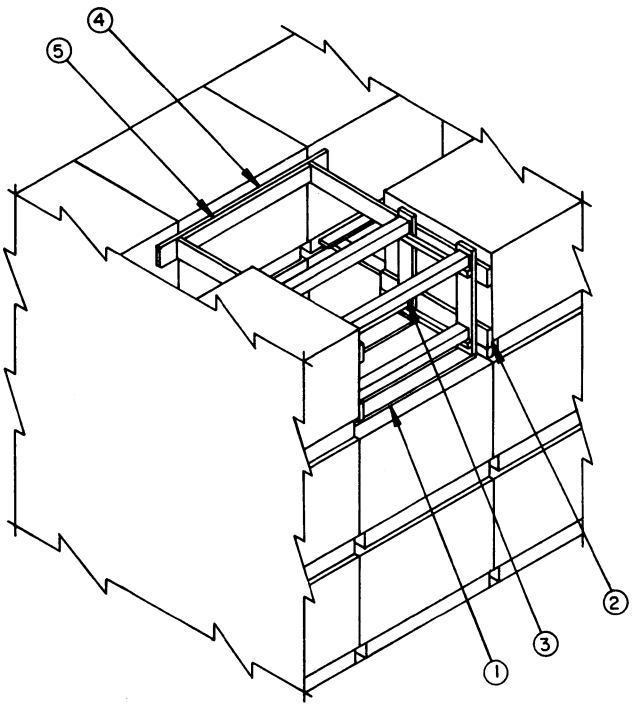
CAR LENGTH	UNITS PER LAYER	LOAD PATTERN	APPROX STRUT LENGTH
40'-6" CAR	22	LENGTHWISE LOAD ON PAGE 8, 22, & 34	55"
	20	6' LONG AT 38" PLUS 4 AT 47-3/4"	52"
	18	CROSSWISE LOAD ON PAGE 6, 20, & 32	50"
50'-6" CAR	30	LENGTHWISE LOAD ON PAGE 8, 22, & 34	20"
	28	12 LONG AT 38" PLUS 2 AT 47-3/4"	38"
	26	5 LONG AT 38" PLUS 8 AT 47-3/4"	22"
	24	CROSSWISE LOAD ON PAGE 6, 20, & 32	27"
60'-8" CAR	36	LENGTHWISE LOAD ON PAGE 8, 22, & 34	26"
	34	13 LONG AT 38" PLUS 4 AT 47-3/4"	25"
	32	7 LONG AT 38" PLUS 9 AT 47-3/4"	19"
	30	2 LONG AT 38" PLUS 13 AT 47-3/4"	22"
	28	CROSSWISE LOAD ON PAGE 6, 20, & 32	53"

TYPICAL COMBINATION LOAD IN A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL BOXCAR



SEPARATOR GATE G

PALLET UNIT	DIMENSIONS					
	A	B	C	D	E	F
6-LAYER	8' - 6"	8' - 1"	6' - 10"	60"	46"	31"
5-LAYER	7' - 8"	7' - 4"	6' - 3"	53"	44"	31"
4-LAYER	9' - 0"	8' - 7"	6' - 10"	67"	45"	31"



ISOMETRIC VIEW

SPECIAL NOTES:

1. A PARTIAL VIEW OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. THE PALLET UNIT SHOWN IS THE 4-LAYER UNIT (BASIC HEIGHT). THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. A UNIT OMITTED FROM THE TOP LAYER OF A 3-LAYER LOAD IS SHOWN AS TYPICAL. THE PROCEDURES ARE ALSO APPLICABLE FOR THE OMISSION OF A TOP-LAYER PALLET UNIT FROM A 2-LAYER LOAD.
4. THE OMITTED-UNIT PROCEDURE SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE OMITTED UNIT AND A CENTER GATE.
5. ONLY THE BLOCKING AND BRACING FOR THE OMITTED UNIT IS SHOWN; REFER TO THE APPLICABLE LOAD PAGE FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.

KEY NUMBERS

(1) SUPPORT PIECE, 2" X 6" BY UNIT WIDTH (2 REQD). POSITION BENEATH THE VERTICAL PIECES OF THE LOAD BEARING GATE, PIECE MARKED (2).

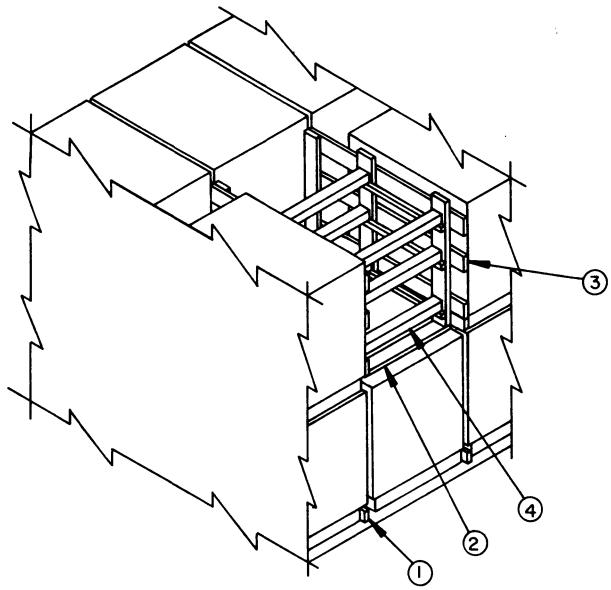
(2) LOAD BEARING GATE (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE "LOAD BEARING GATE A" DETAIL ON PAGE 52. NAIL TO THE FILLER PIECE, PIECE MARKED (5), W/3-10d NAILS. TOENAIL TO THE SUPPORT PIECE, PIECE MARKED (1), W/2-10d NAILS AT EACH JOINT. CAUTION: USE CARE NOT TO TOENAIL INTO A CONTAINER.

(3) STRUT, 4" X 4" BY CUT TO FIT(REF: 41-3/4"), (AS REQD). TOENAIL TO PIECES MARKED (2) W/2-16d NAILS AT EACH END.

(4) ANTI-SWAY BEARING PIECE, 2" X 6" X 72" (1 REQD).

(5) FILLER PIECE, 2" X 6" X 44-3/4" (1 REQD). NAIL TO THE ANTI-SWAY BEARING PIECE, PIECE MARKED (4), W/5-10d NAILS.

TYPICAL LCL ONE PALLET UNIT OMITTED FROM THE TOP LAYER OF A CROSSWISE LOAD



ISOMETRIC VIEW

SPECIAL NOTES:

1. A PARTIAL VIEW OF A 9'-4" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. WIDER OR NARROWER CARS CAN BE USED.
2. THE PALLET UNIT SHOWN IS THE 5-LAYER UNIT. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. A UNIT OMITTED FROM THE TOP LAYER OF A 2-LAYER LOAD IS SHOWN AS TYPICAL. THE PROCEDURES ARE ALSO APPLICABLE FOR THE OMISSION OF A TOP-LAYER PALLET UNIT FROM A 3-LAYER LOAD.
4. THE OMITTED-UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE OMITTED UNIT AND A CENTER GATE.
5. ONLY THE BLOCKING AND BRACING FOR THE OMITTED UNIT IS SHOWN. REFER TO THE APPLICABLE LOAD PAGE FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.
6. NOTE THAT THE TOP TIE PIECE OF EACH SEPARATOR GATE WHICH IS ADJACENT TO THE OMITTED UNIT AREA MUST BE 1" X 2" MATERIAL IN LIEU OF 1" X 4" AND MAY NEED TO BE ADJUSTED IN HEIGHT SO AS TO PROVIDE CLEARANCE BETWEEN IT AND THE CONTAINERS ON THE UNIT BELOW AS WELL AS CLEARANCE BETWEEN IT AND THE LOAD BEARING GATE, PIECE MARKED ③ .

KEY NUMBERS

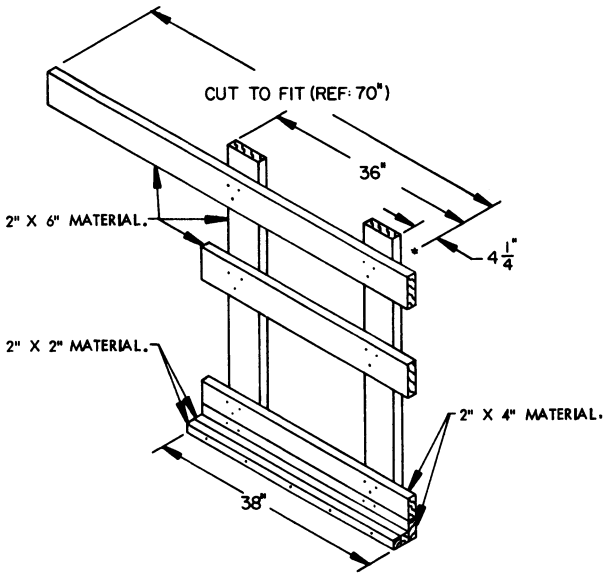
① MODIFIED SEPARATOR GATE (2 REQD). SEE THE APPLICABLE SEPARATOR GATE DETAIL ON PAGE 15, 29, OR 41 FOR POSITIONING OF THE VERTICAL PIECES. SEE SPECIAL NOTE 6 AT LEFT FOR GATE MODIFICATIONS. POSITION GATE SO THE TIE PIECES ARE AWAY FROM THE OMITTED UNIT AREA.

② SUPPORT PIECE, 2" X 6" X 38" (2 REQD). POSITION SO AS TO BE UNDER THE VERTICAL PIECES OF THE LOAD BEARING GATE, PIECE MARKED ③ .

③ LOAD BEARING GATE (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE "LOAD BEARING GATE B" DETAIL ON PAGE 53. TOENAIL TO THE SUPPORT PIECE, PIECE MARKED ② , W/2-10d NAILS AT EACH JOINT. CAUTION: USE CARE NOT TO TOENAIL INTO A CONTAINER.

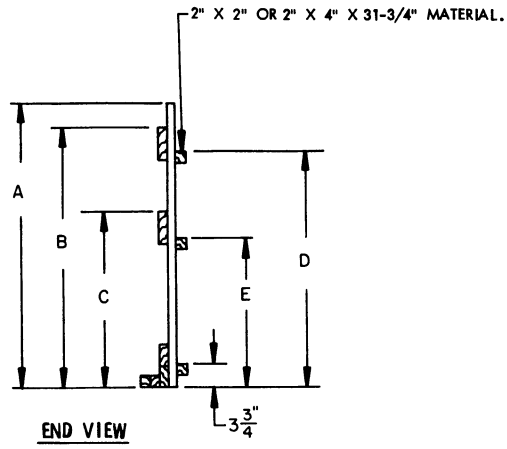
④ STRUT, 4" X 4" BY CUT TO FIT (REF: 33-1/2") (AS REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END.

TYPICAL LCL ONE PALLET UNIT OMITTED FROM THE TOP LAYER OF A LENGTHWISE LOAD



LOAD BEARING GATE A

SEE SPECIAL NOTE 1. SEE SPECIAL NOTE 3 FOR NAILING GUIDANCE. ONE RIGHT HAND AND ONE LEFT HAND GATE REQUIRED. A LEFT HAND GATE IS SHOWN.



END VIEW

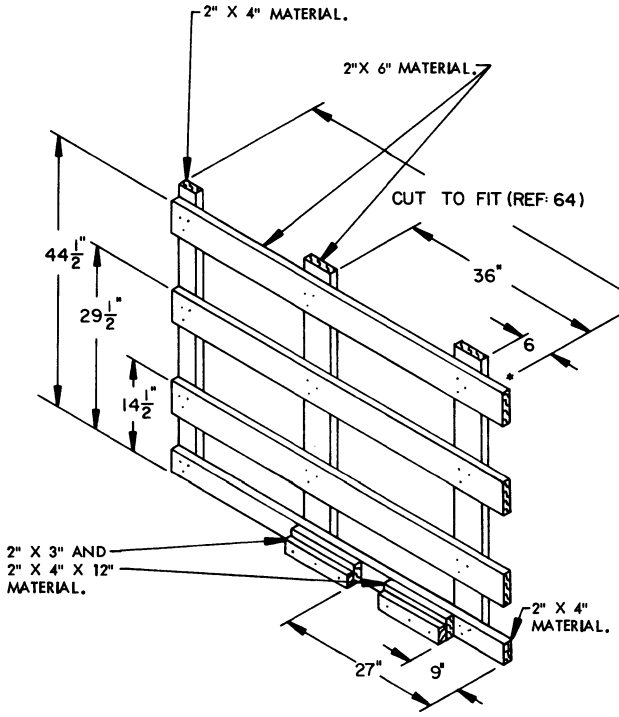
DIMENSIONAL CHART			
DIM	6-LAYER UNIT	5-LAYER UNIT	4-LAYER UNIT
A	48"	45"	33"
B	44-1/2"	42"	29-1/2"
C	29-1/2"	29-1/2"	---
D	40"	37-1/2"	25"
E	25"	25"	---

SPECIAL NOTES:

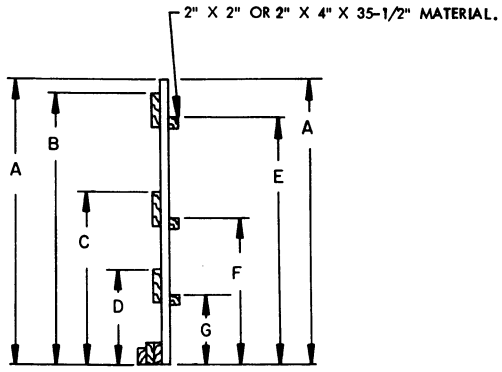
1. THE GATE ON THIS PAGE IS FOR USE WITH BASIC AND/OR INCREASED-HEIGHT UNITS IN THE LCL PROCEDURES SHOWN ON PAGE 50. THOSE PROCEDURES DEPICT THE OMISSION OF A PALLET UNIT FROM A LOAD OF CROSSWISE-POSITIONED PALLET UNITS.

2. THE REFERENCE DIMENSION GIVEN FOR THE CUT-TO-FIT PIECES IS BASED ON AN INSIDE CAR WIDTH OF 9'-2". THIS DIMENSION WILL HAVE TO BE INCREASED WHEN LOADING WIDER CARS.

3. SEE THE CHART AT LEFT FOR DIMENSIONS REPRESENTED BY LETTERS. THE NAILING OF THE VARIOUS PARTS OF THE GATES WILL BE AS FOLLOWS: NAIL THE 2" X 4" OR 2" X 6" HORIZONTAL PIECE (S) TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. NAIL THE DOUBLED 2" X 2" GATE HOLD DOWN PIECES TO A HORIZONTAL PIECE W/5-10d NAILS EACH LAYER. NAIL THE 2" X 2" STRUT LEDGERS TO THE VERTICAL PIECES W/2-10d NAILS AT EACH END.



LOAD BEARING GATE B



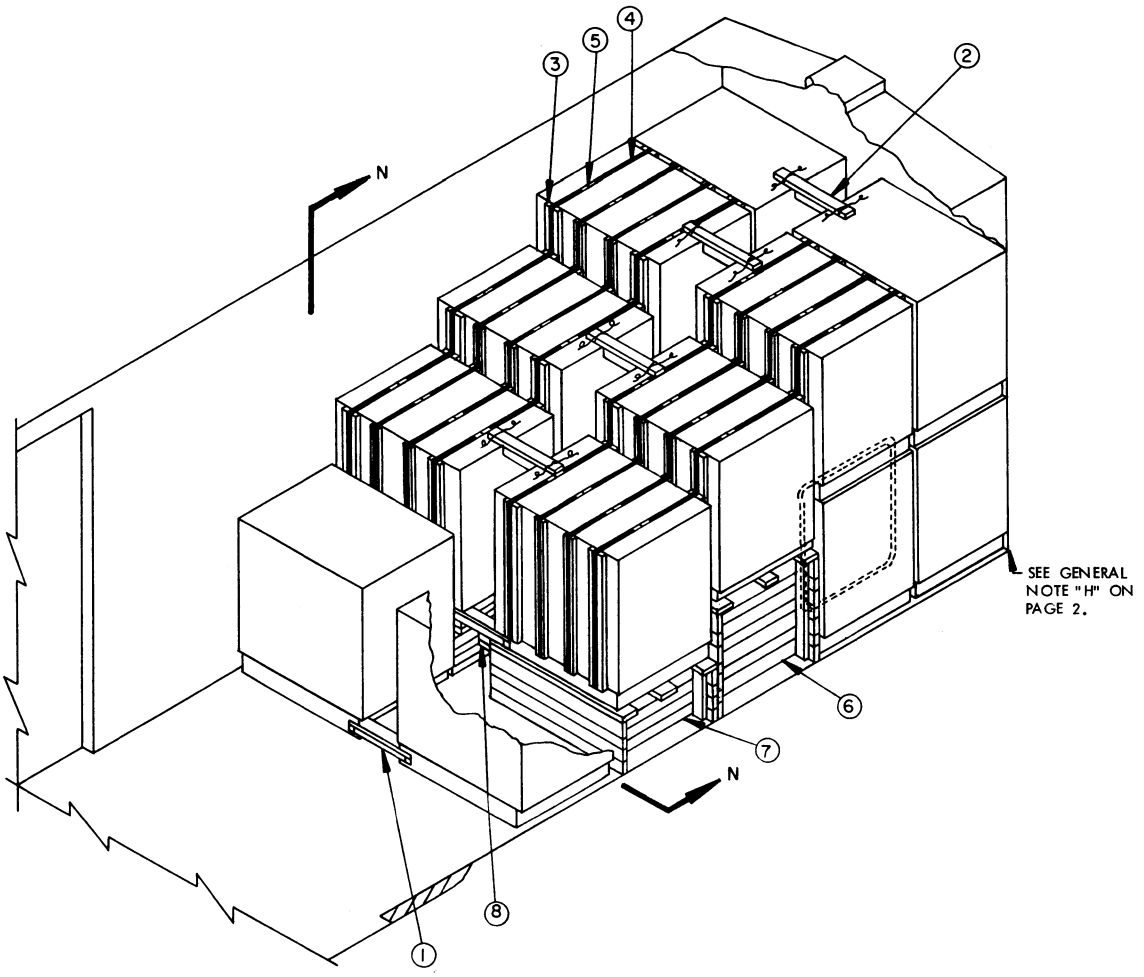
END VIEW

SEE SPECIAL NOTE 1. SEE SPECIAL NOTE 3 FOR NAILING GUIDANCE. ONE RIGHT HAND AND ONE LEFT HAND GATE REQUIRED. A LEFT HAND GATE IS SHOWN.

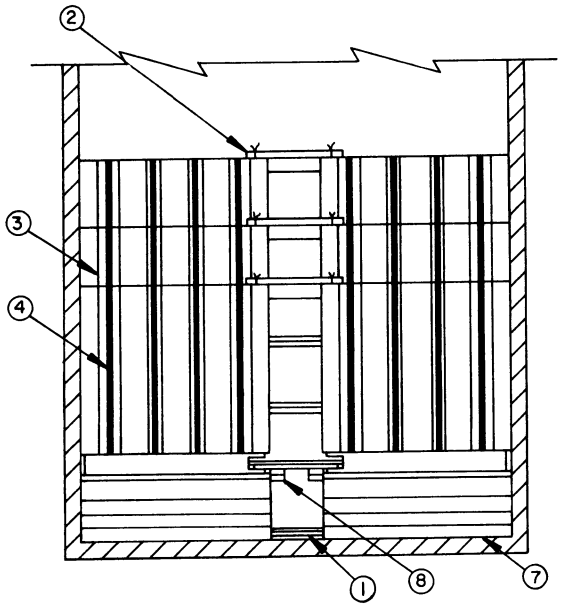
DIMENSIONAL CHART			
DIM	6-LAYER UNIT	5-LAYER UNIT	4-LAYER UNIT
A	48"	40"	33"
B	44-1/2"	37"	29-1/2"
C	29-1/2"	22"	---
D	14-1/2"	9"	14-1/2
E	40"	32-1/2"	25"
F	25"	17-1/2"	---
G	10"	4-1/2"	10"

SPECIAL NOTE

1. THE GATE ON THIS PAGE IS FOR USE WITH INCREASED AND/OR BASIC-HEIGHT UNITS IN THE LCL PROCEDURES SHOWN ON PAGE 51. THOSE PROCEDURES DEPICT THE OMISSION OF A PALLET UNIT FROM A LOAD OF LENGTHWISE POSITIONED PALLET UNITS.
2. THE REFERENCE DIMENSION GIVEN FOR THE CUT-TO-FIT PIECES IS BASED ON AN INSIDE CAR WIDTH OF 9'-4". THIS DIMENSION WILL HAVE TO BE ADJUSTED WHEN LOADING CARS OF OTHER WIDTHS.
3. THE NAILING OF VARIOUS PARTS OF THE GATES WILL BE AS FOLLOWS: NAIL THE 2" X 4", OR 2" X 6" HORIZONTAL PIECE (5) TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. NAIL THE 2" X 4" AND 2" X 3" GATE HOLD DOWN PIECES TO A HORIZONTAL PIECE W/3-10d NAILS EACH LAYER. NAIL THE 2" X 2" STRUT LEDGERS TO THE VERTICAL PIECES W/2-10d NAILS AT EACH END.



ISOMETRIC VIEW



SECTION N-N

KEY NUMBERS

(1) ANTI-SWAY BRACE (7 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNIT. SEE GENERAL NOTES "N" AND "O" ON PAGE 2 AND SPECIAL NOTE 5 ON PAGE 55.

(2) TOP-OF-LOAD ANTI-SWAY BRACE (4 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 18. WIRE TIE TO THE STOP PIECE ON THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 74.

(3) STRAPPING BOARD, 2" X 4" AND 2" X 6" X 46" (64 REQD, 4 OF EACH PER PALLET UNIT). POSITION AS SHOWN IN THE "METHOD A" DETAIL ON PAGE 56. SEE SPECIAL NOTES 6 AND 7 ON PAGE 55.

(4) REINFORCING STRAP, 1-1/4" X .035" X 16'-6" LONG (REF) STEEL STRAPPING (32 REQD). INSTALL TO ENCIRCLE THE PALLET UNIT AND THE STRAPPING BOARDS. SECURE TO A STRAPPING BOARD W/3 STAPLES. SEE THE "METHOD A" DETAIL ON PAGE 56.

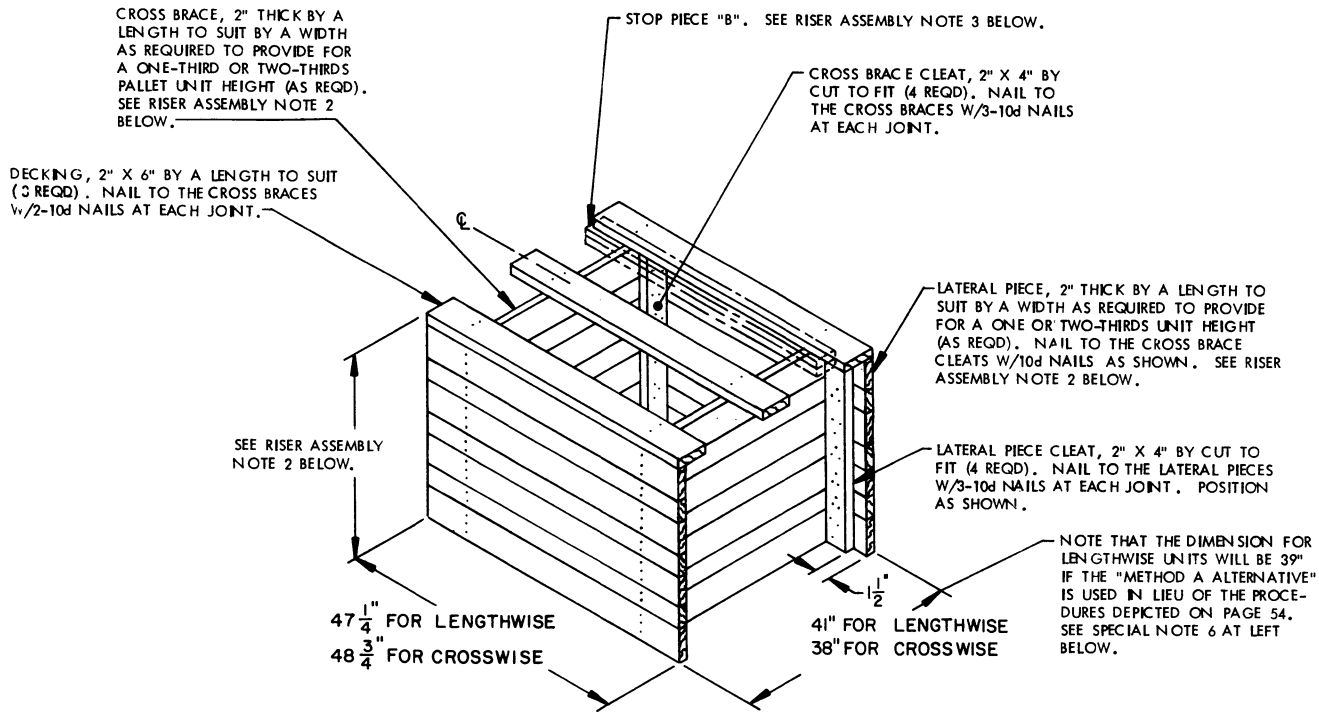
(5) SEAL FOR 1-1/4" STRAPPING (64 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "P" ON PAGE 2.

(6) RISER ASSEMBLY (2 REQD). THE HEIGHT OF THESE RISER ASSEMBLIES WILL BE TWO-THIRDS OF THE PALLET UNIT HEIGHT. SEE THE "RISER ASSEMBLY" DETAIL ON PAGE 55.

(7) RISER ASSEMBLY (2 REQD). THE HEIGHT OF THESE RISER ASSEMBLIES WILL BE ONE-THIRD OF THE PALLET UNIT HEIGHT. SEE THE "RISER ASSEMBLY" DETAIL ON PAGE 55.

(8) STOP PIECE, (4 REQD). SEE THE "STOP PIECE "A", LOCATION " DETAIL ON PAGE 56 FOR LOACTION AND NAILING GUIDANCE.

TYPICAL LCL LOAD USING RISER METHOD OF PARTIAL LAYER BRACING



RISER ASSEMBLY

SPECIAL NOTES FOR LOAD:

1. A 9'-2" WIDE CONVENTIONAL TYPE WOOD - LINED BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 54 IS THE 6-LAYER UNIT. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS SHOWN ON PAGE 4 OF THIS DRAWING.
3. THE RISER METHOD OF PARTIAL-LAYER BRACING IS TYPICALLY SHOWN WITH THE PALLET UNITS POSITIONED LENGTHWISE IN THE CAR. THE PROCEDURES ARE ALSO APPLICABLE FOR CROSSWISE POSITIONED UNITS. SEE SPECIAL NOTES 5 THRU 7.
4. ONLY THE BLOCKING AND BRACING FOR THE RISER METHOD OF PARTIAL-LAYER BRACING IS SHOWN. REFER TO THE APPLICABLE LOAD FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.
5. ANTI-SWAY BRACE "B" IS APPLICABLE FOR ALL LENGTHWISE POSITIONED UNITS. NOTE THAT STOP PIECES, SHOWN AS PIECE MARKED (8) ON PAGE 54 ARE REQUIRED ON THE ANTI-SWAY BRACES WHICH ARE LOCATED OVER THE LATERALLY ADJACENT RISER ASSEMBLIES.
6. IF DESIRED, PLYWOOD SIDE FILL, DETAILED ON PAGE 57, MAY BE USED IN LIEU OF THE 2" X 4" AND 2" X 6" STRAPPING BOARDS SHOWN AS PIECES MARKED (3) ON PAGE 54.
7. FOR CROSS WISE POSITIONED UNITS, THE STRAPPING BOARD SHOWN AS PIECES MARKED (3) WILL NOT BE REQUIRED. SEE THE "METHOD B" DETAIL ON PAGE 57 FOR MODIFICATIONS TO BE ACCOMPLISHED IN LIEU OF USING STRAPPING BOARDS.

SPECIAL NOTES FOR RISER ASSEMBLY:

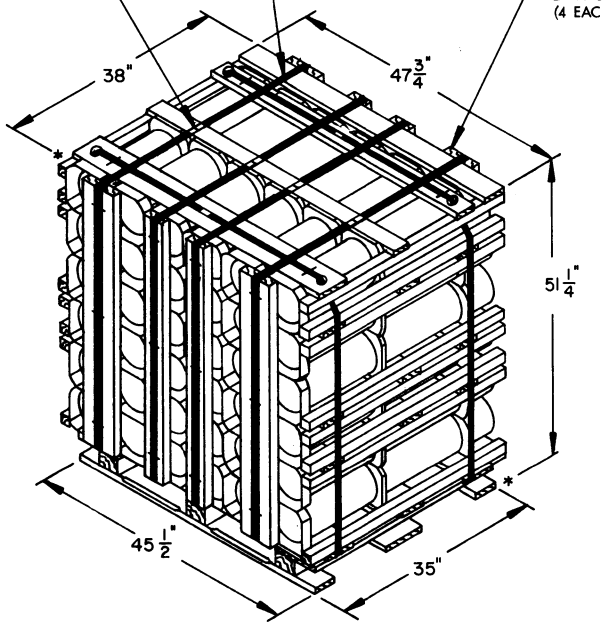
1. THE TYPICAL RISER ASSEMBLY SHOWN ABOVE IS FOR THE BASIC HEIGHT UNIT. THE HEIGHT OF THE BASIC UNIT IS 51-1/4". A TWO-THIRDS UNIT HEIGHT RISER IS SHOWN ABOVE, AND AS KEY NUMBER (6) IN THE LOAD ON PAGE 54. EACH CROSS BRACE AND EACH LATERAL PIECE OF THE RISER IS FABRICATED FROM FOUR (4) PIECES OF 2" X 6" MATERIAL AND THREE (3) PIECES OF 2" X 4" MATERIAL TO PROVIDE FOR A TOTAL HEIGHT OF 34" AFTER THE DECKING IS IN PLACE. A ONE-THIRD HEIGHT RISER, SHOWN AS KEY NUMBER (7) IN THE LOAD ON PAGE 54 WILL BE FABRICATED FROM ONE (1) PIECE OF 2" X 6" AND THREE (3) PIECES OF 2" X 4" MATERIAL FOR EACH CROSS BRACE AND EACH LATERAL PIECE, TO PROVIDE FOR A TOTAL HEIGHT OF 17-1-2" AFTER THE DECKING IS IN PLACE.
2. SELECT THE PROPER WIDTH COMBINATIONS FOR THE LATERAL CROSS BRACE PIECES PRIOR TO CONSTRUCTING A RISER ASSEMBLY, TO ASSURE THAT THE TOTAL HEIGHT OF THE RISER ASSEMBLY IS ONE-THIRD OR TWO-THIRDS OF THE PALLET UNIT HEIGHT, BASED ON THE PALLET UNIT BEING LOADED AND THE LOCATION OF THE RISER ASSEMBLY WITHIN THE LOAD. NOTE: A PLUS OR MINUS 1" TOLERANCE IS PERMISSIBLE ON THE RISER HEIGHT.
3. THE STOP PIECE "B" SHOWN ON THE RISER ASSEMBLY ABOVE IS ONLY REQUIRED WHEN THE PALLET UNITS ARE POSITIONED CROSSWISE IN THE CAR. POSITION A DOUBLED 2" X 4" X 45" SO AS TO BE AGAINST THE DECKING PIECE WHICH IS ADJACENT TO THE CENTER OF THE CAR AND NAIL THE FIRST PIECE TO THE CROSS BRACE W/2-10d NAILS AT EACH JOINT. LAMINATE THE SECOND PIECE TO THE FIRST W/4-10d NAILS.

TYPICAL LCL LOAD USING RISER METHOD OF PARTIAL LAYER BRACING

SEAL FOR 1-1/4" STRAPPING (8 REQD, 2 PER STRAP). SEE GENERAL NOTE "P" ON PAGE 2.

REINFORCING STRAP, 1-1/4" X .35" X 16'- 6" LONG STEEL STRAPPING FOR A 6-LAYER UNIT, 15'-6" LONG FOR A 5-LAYER UNIT AND 14'-0" LONG FOR A 4-LAYER UNIT (4 REQD). INSTALL TO ENCIRCLE THE PALLET UNIT AND STRAPPING BOARDS. SECURE TO EACH STRAPPING BOARD W/3 STAPLES.

STRAPPING BOARD; 2" X 4" AND 2" X 6" X 45" FOR 6-LAYER UNIT, 2" X 6" X 38" FOR 5-LAYER UNIT AND 30" FOR 4-LAYER UNIT (4 EACH REQD). POSITION AS SHOWN.

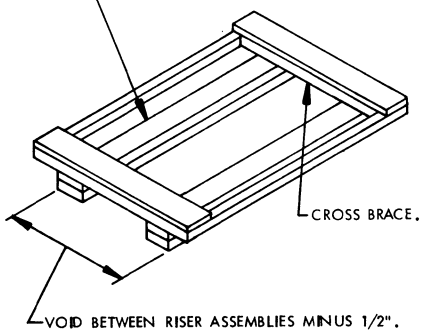


METHOD A
6-LAYER UNIT SHOWN

NOTE:

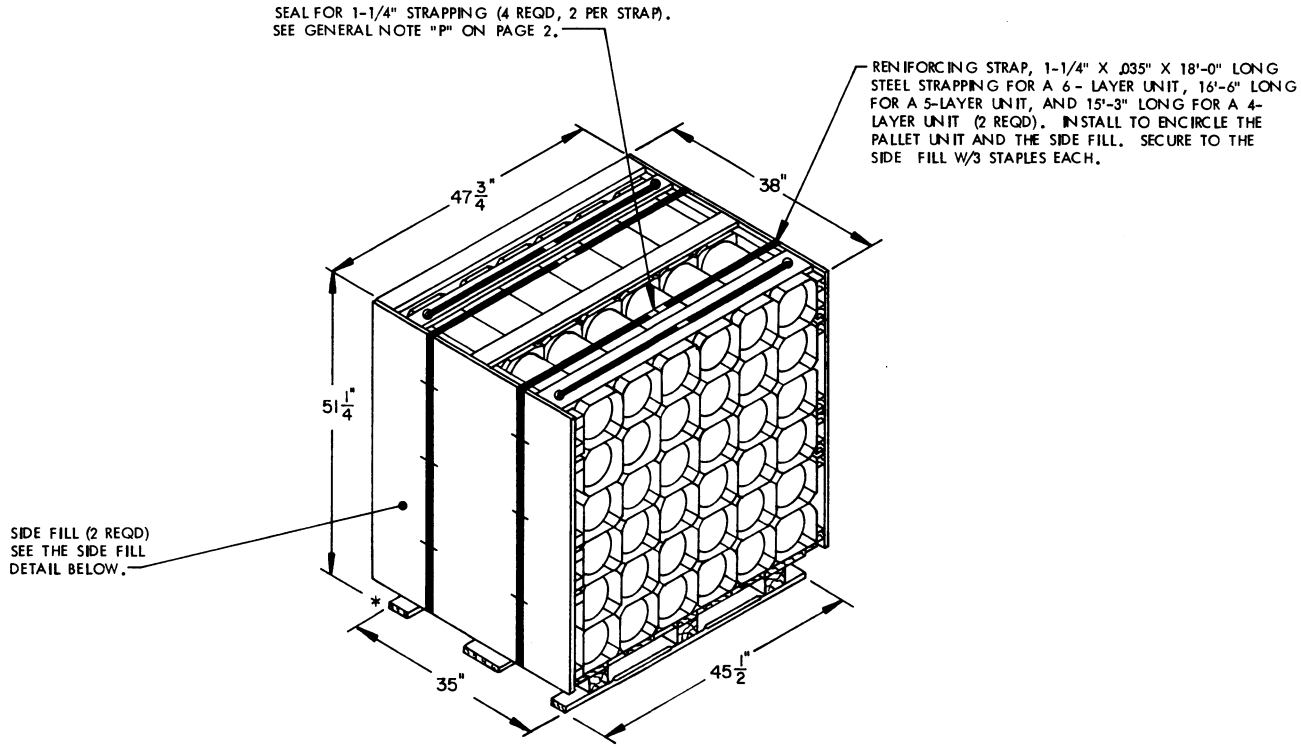
THE "METHOD A" DETAIL ABOVE SHOWS THE MODIFICATION REQUIRED FOR PALLET UNITS WHICH ARE TO BE POSITIONED LENGTHWISE IN A CAR WHEN USING THE RISER METHOD OF PARTIAL-LAYER BRACING SHOWN ON PAGE 54. THE 6-LAYER UNIT IS SHOWN, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS SHOWN ON PAGE 4 OF THIS DRAWING. FOR MODIFICATION OF UNITS TO BE POSITIONED CROSSWISE IN A CAR, REFER TO THE "METHOD B" DETAIL ON PAGE 57.

STOP PIECE "A", 2" X 4" X 38" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE CROSS BRACE W/3-8d NAILS AT EACH END. NAIL THE SECOND PIECE TO THE FIRST W/5-10d NAILS.



STOP PIECE "A" LOCATION DETAIL

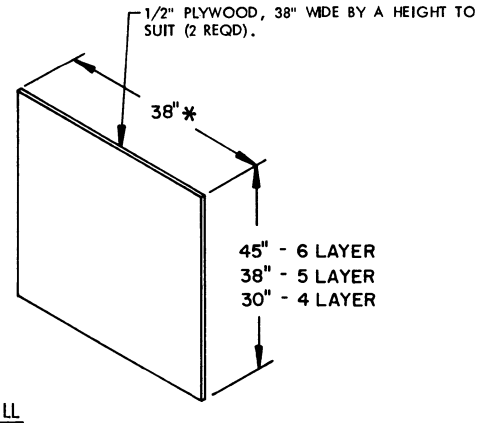
TYPICAL LCL LOAD USING RISER METHOD OF PARTIAL LAYER BRACING



METHOD B
6-LAYER UNIT SHOWN

NOTE:

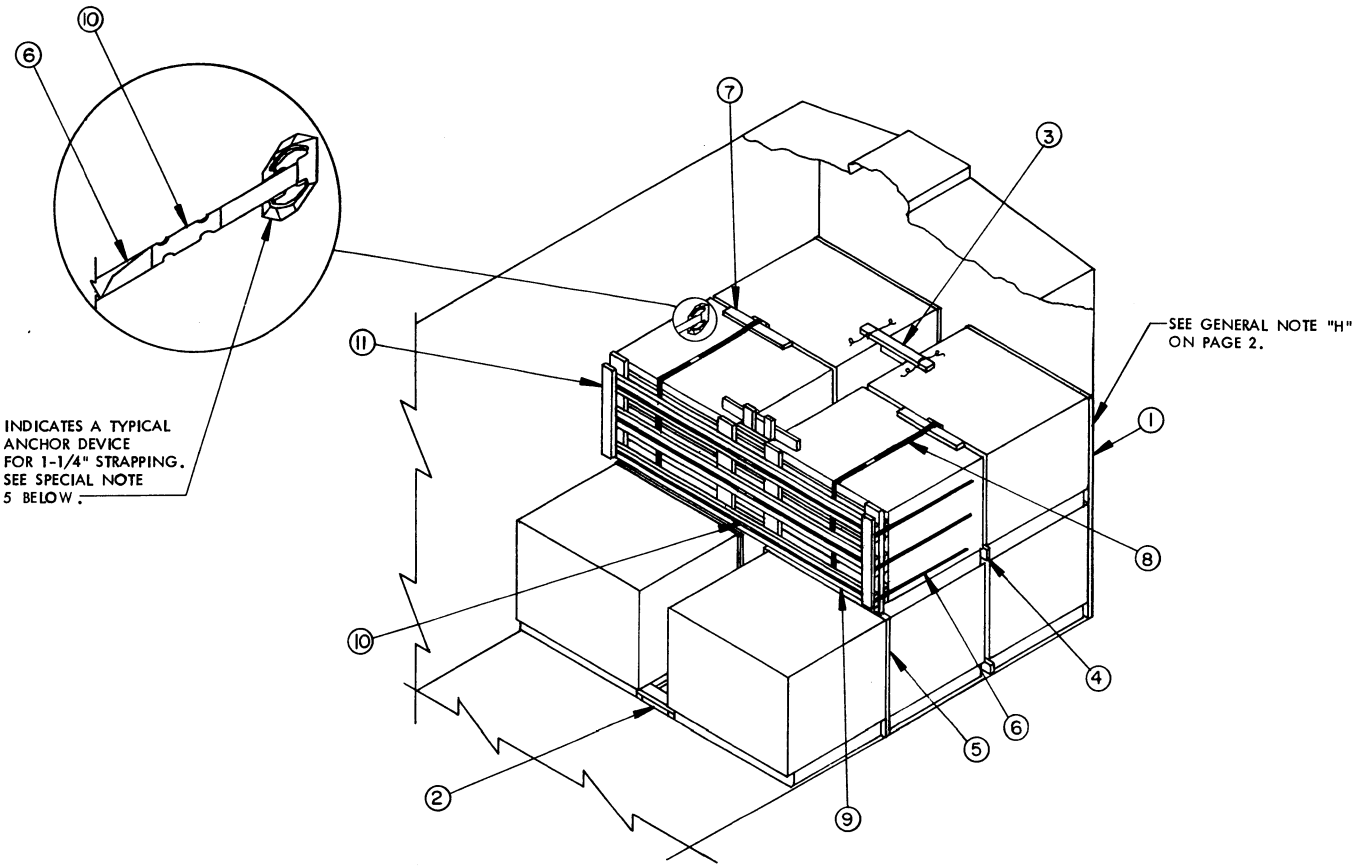
THE "METHOD B" DETAIL ABOVE SHOWS THE MODIFICATION REQUIRED FOR UNITS WHICH ARE TO BE POSITIONED CROSSWISE IN A CAR WHEN USING THE RISER METHOD OF PARTIAL-LAYER BRACING SHOWN ON PAGE 54. THE 6-LAYER UNIT IS SHOWN, HOWEVER, THE PROCEDURE IS ALSO APPLICABLE FOR THE OTHER UNITS SHOWN ON PAGE 4 OF THIS DRAWING. FOR MODIFICATION OF UNITS TO BE POSITIONED LENGTHWISE IN A CAR, REFER TO THE "METHOD A" DETAIL ON PAGE 56.



SIDE FILL

*NOTE THAT THIS DIMENSION WILL BE BE 48" IF SIDE FILL IS USED IN LIEU OF STRAPPING BOARDS, AS SPECIFIED BY SPECIAL NOTE 6 ON PAGE 55.

TYPICAL LCL LOAD USING RISER METHOD OF PARTIAL LAYER BRACING



ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-4" WIDE ALL-METAL BOXCAR EQUIPPED WITH STRAP ANCHOR DEVICES AND HAVING AN AAR MECHANICAL DESIGNATION CLASS OF XL IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LCL LOAD IS THE 4-LAYER UNIT (BASIC HEIGHT). THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. THE BULKHEAD GATE METHOD OF PARTIAL-LAYER BRACING IS ONLY APPLICABLE FOR USE IN LOADS OF LENGTHWISE POSITIONED PALLET UNITS AS SHOWN IN THE VIEW ABOVE. PARTIAL LAYERS OF CROSSWISE POSITIONED PALLET UNITS WILL NOT BE RETAINED BY THE BULKHEAD GATE METHOD.
4. A BULKHEAD GATE USED IN CONJUNCTION WITH THREE (3) BULKHEAD STRAPS WILL RETAIN UP TO 7,500 POUNDS OF LADING; A BULKHEAD GATE WITH TWO (2) STRAPS WILL RETAIN NOT MORE THAN 5,000 POUNDS. IF ONLY TWO STRAPS ARE USED, THEY MUST BE APPLIED OVER THE UPPER AND LOWER STRAPPING BOARDS. SEE THE "MAXIMUM NUMBER OF UNITS" CHART BELOW FOR QUANTITY OF THE PALLET UNITS COVERED BY THIS DOCUMENT WHICH CAN BE RETAINED USING THE BULKHEAD GATE METHOD OF PARTIAL-LAYER BRACING.
5. THE ANCHOR DEVICES TO BE USED FOR THE ATTACHMENT OF THE BULKHEAD STRAPS MUST BE LOCATED AT LEAST THIRTY-SIX (36") TOWARD THE CAR END WALL FROM THE OPPOSITE-THE-LOAD SIDE OF THE BULKHEAD GATE. IF THE ANCHOR DEVICES IN THE CAR BEING LOADED ARE NOT LOCATED NEAR ENOUGH TO THE END OF THE CAR SO THAT THE 36" REQUIREMENT CAN BE SATISFIED, IT WILL BE NECESSARY TO INSTALL GATES AND STRUTS AT THE END OF THE CAR. THESE GATES WILL BE 1-HIGH GATES FOR THE ITEM BEING LOADED AND WILL BE INSTALLED SIMILAR TO THE STRUTTED GATE METHOD SHOWN ON PAGE 46 FOR AN EVEN QUANTITY OF UNITS, OR THE PALLET UNIT OMITTED PROCEDURES ON PAGE 51 FOR A SINGLE UNIT.

(CONTINUED ON PAGE 59)

KEY NUMBERS

① END-WALL LINING (1 REQD). SEE THE DETAIL ON PAGE 73. SEE GENERAL NOTE "D" ON PAGE 2. NOTE THAT IF AN END-OF-CAR BULKHEAD, AS DETAILED ON PAGE 74 IS USED, THE END-WALL LINING IS NOT REQUIRED.

② ANTI-SWAY BRACE (4 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 14. INSTALL BETWEEN THE LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2.

③ TOP-OF-LOAD ANTI-SWAY BRACE (1 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 18. WIRE TIE TO PALLET UNITS AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 74.

④ SEPARATOR GATE FOR 2-HIGH LOAD (1 REQD). SEE THE APPLICABLE DETAIL ON PAGE 15, 29, OR 41. POSITION WITH THE TIE PIECES AGAINST THE ALREADY-LOADED UNITS. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 74.

⑤ SEPARATOR GATE FOR 1-HIGH LOAD (1 REQD). SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 74.

⑥ BULKHEAD STRAP, 1-1/4" X .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (3 REQD). INSTALL FROM 2 EQUAL LENGTH PIECES. ATTACH TO AN ANCHOR WITH 1 SEAL. SEE THE "STRAP APPLICATION PLAN VIEW" ON PAGE 59 FOR INSTALLATION GUIDANCE. SEE SPECIAL NOTES 4 AND 5 AT LEFT.

⑦ STRAPPING BOARD (2 REQD). SEE THE""STRAPPING BOARD ASSEMBLY" DETAIL ON PAGE 59.

⑧ BUNDLING STRAP, 1-1/4" X .035" X 15'-6" LONG (REF) STEEL STRAPPING (2 REQD). ENCIRCLE THE PALLET UNIT, THE HORIZONTAL PIECES OF THE BULKHEAD GATE, AND A STRAPPING BOARD, PIECE MARKED ⑦. TENSION AND SEAL AFTER TENSIONING THE BULKHEAD STRAPS, PIECES MARKED ⑥.

⑨ BULKHEAD GATE (1 REQD). SEE THE DETAIL ON PAGE 59. SEE SPECIAL NOTE 3 AT LEFT.

⑩ SEAL FOR 1-1/4" STRAPPING (14 REQD, 4 PER BULKHEAD STRAP, PIECE MARKED ⑥, AND 1 PER BUNDLING STRAP, PIECE MARKED ⑧). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "P" ON PAGE 2.

⑪ STRAP RETAINER, 2" X 4" BY A LENGTH TO SUIT (2 REQD). NAIL TO THE BULKHEAD GATE W/2-12d NAILS ABOVE AND BELOW EACH BULKHEAD STRAP.

MAXIMUM NUMBER OF UNITS			
NO. OF STRAPS	6-LAYER UNIT	5-LAYER UNIT	4-LAYER UNIT
3	3	4	5
2	2	2	3

TYPICAL LCL LOAD USING BULKHEAD GATE METHOD OF PARTIAL LAYER BRACING

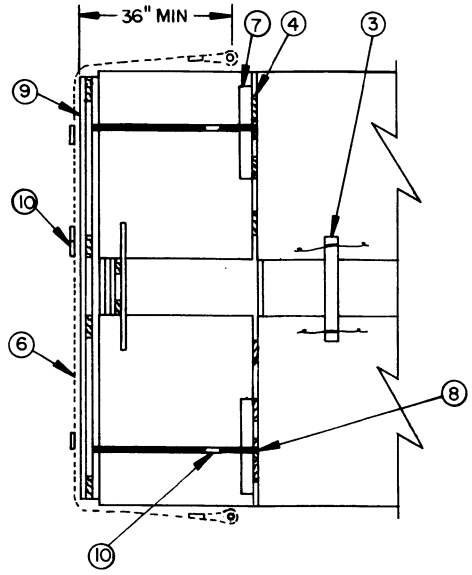
SMCAC FORM 6-1, 1 NOV 87

SUPERSEDES SMCAC FORM 6, 1 NOV 85

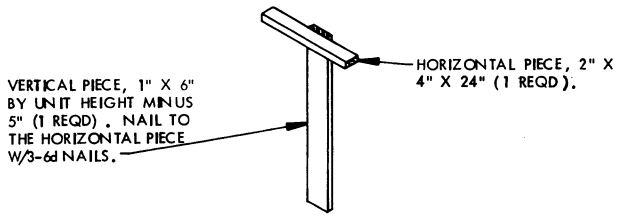
PROJECT FSA 43B/21-63

(SPECIAL NOTES CONTINUED)

6. THE STRAPPING BOARDS ON A BULKHEAD GATE ARE TO BE ALIGNED AS NEARLY AS POSSIBLE WITH THE ANCHOR DEVICES IN THE CAR TO WHICH THE BULKHEAD STRAPS ARE ATTACHED. TOLERANCES ARE SPECIFIED ON THE END VIEW OF THE BULKHEAD GATE BELOW FOR THE LOCATION OF THE HORIZONTAL PIECES IN RELATION TO THE LOCATION OF THE STRAPPING BOARDS. THE STRAPPING BOARDS/HORIZONTAL PIECES SHOULD BE LOCATED WITHIN THESE TOLERANCES. IF THIS IS NOT POSSIBLE, ADDITIONAL HORIZONTAL PIECES MUST BE APPLIED, AS NECESSARY TO PROVIDE PROPER BEARING AGAINST THE CONTAINERS.

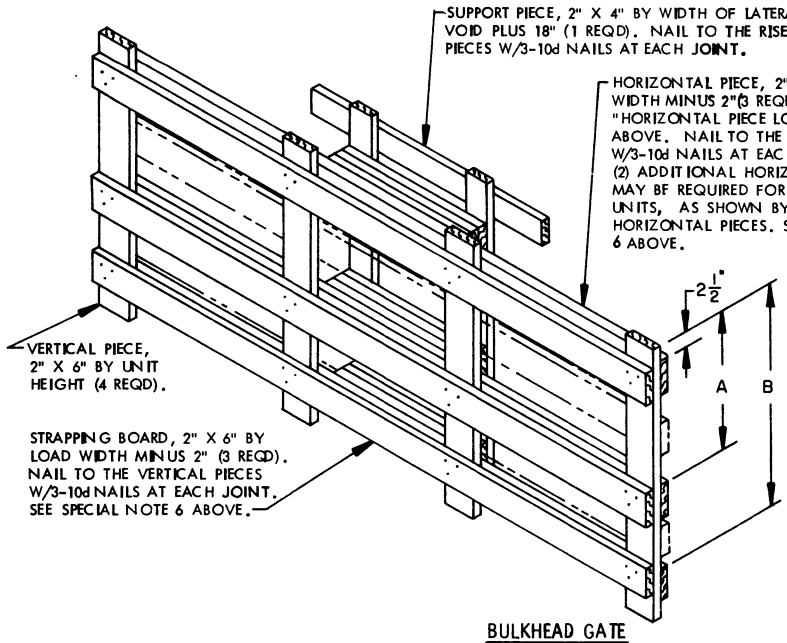


STRAP APPLICATION PLAN VIEW

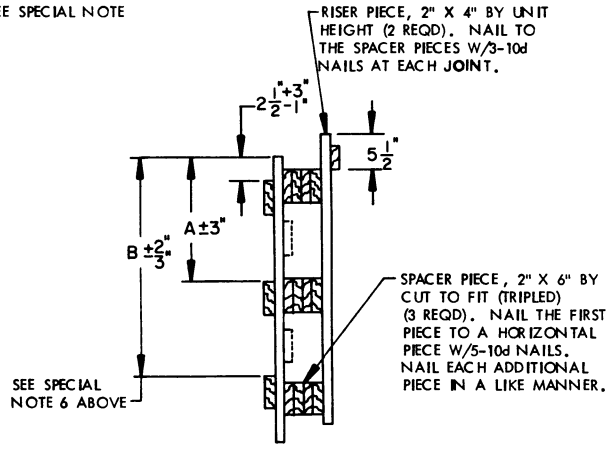


STRAPPING BOARD

HORIZONTAL PIECE LOCATION					
6 - LAYER		5 - LAYER		4 - LAYER	
DIM A	DIM B	DIM A	DIM B	DIM A	DIM B
22-1/2" ± 1"	44" ± 1"	15" ± 1"	36-1/2" ± 1"	15" ± 1"	29" ± 1"

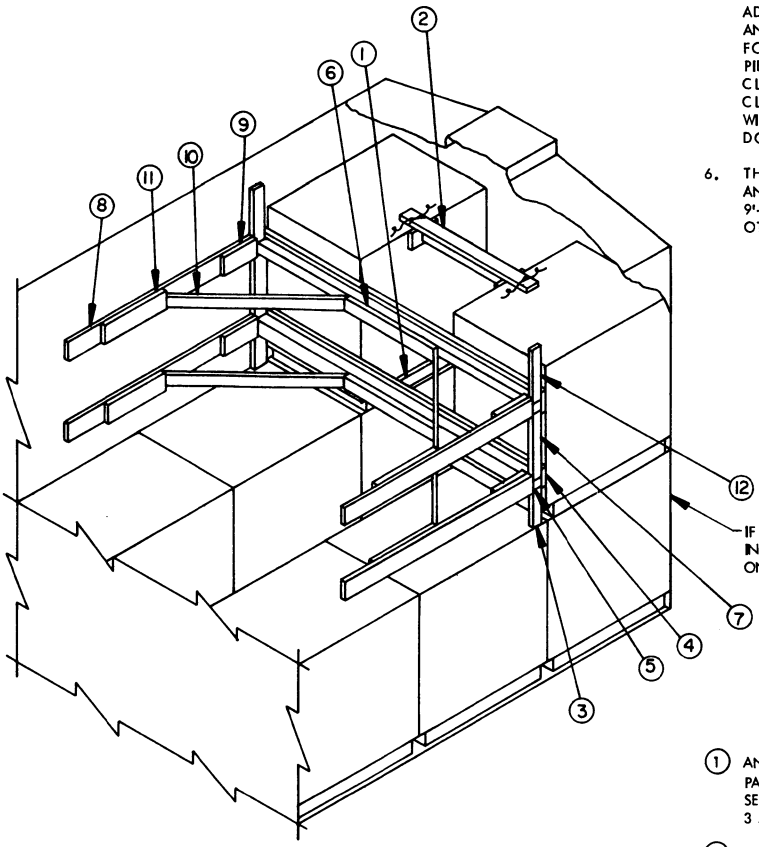


BULKHEAD GATE



END VIEW

TYPICAL LCL LOAD USING BULKHEAD GATE METHOD OF PARTIAL LAYER BRACING



ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-2" WIDE CONVENTIONAL WOOD-LINED BOX CAR IS SHOWN. WOOD-LINED CARS OF OTHER WIDTHS CAN BE USED.

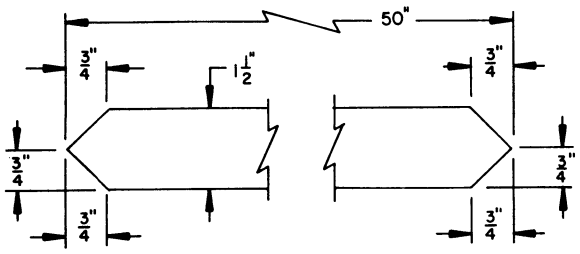
2. THE PALLET UNIT SHOWN IN THE TYPICAL LCL LOAD IS THE 6-LAYER UNIT. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.

3. PARTIAL-LAYER BRACING MAY BE APPLIED FOR ANY OF THE CONVENTIONAL CARLOADS DEPICTED HEREIN. A CROSSWISE LOAD IS SHOWN AS TYPICAL. THE BLOCKING AND BRACING WILL VARY FOR LENGTHWISE LOAD. NOTE THAT FOR A LENGTHWISE PARTIAL TIER, THE PIECES MARKED ④ SHOULD BE LOCATED SO AS TO BEAR AGAINST THE PALLET UNITS IN THE SAME LOCATION AS THE HORIZONTAL PIECES OF A CENTER GATE, AND THAT A LOAD BEARING ASSEMBLY, DETAILED ON PAGE 61, WILL BE REQUIRED. REFER TO THE "ISOMETRIC VIEW" ON THAT PAGE FOR PLACEMENT GUIDANCE.

4. THE K-BRACE METHOD OF PARTIAL-LAYER (TIER) BRACING SHOWN MAY BE USED IN WOOD-LINED CARS FOR THE SECUREMENT OF A PARTIAL TOP TIER, BE IT A SECOND TIER, THIRD TIER, OR FIRST. THE TYPE "A" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 8,000 POUNDS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGES 61, 62, AND 63 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE.

5. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ③ ④, ⑤, ⑦, ⑧, ⑨, AND ⑫, MUST BE SUPPORTED AT THE SIDES OF A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑩ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE

(CONTINUED AT RIGHT ABOVE)



DIAGONAL B ACE

(SPECIAL NOTES CONTINUED)

ADJACENT PIECE MARKED ⑧ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF: 60"), TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑧ 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 ⑧ IS DOUBLED.

6. THE CENTER CLEAT, SHOWN AS PIECE MARKED ⑥, 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 PROPORTIONATLEY FOR CARS OF OTHER WIDTHS.

IF THE CAR HAS A BOWED END WALL, A BULKHEAD MUST BE INSTALLED. SEE THE "END-OF-CAR BULKHEAD" DETAIL ON PAGE 74.

KEY NUMBERS

① ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY A" DETAIL ON PAGE 18. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2 AND SPECIAL NOTE 3 AT LEFT.

② TOP-OF-LOAD ANTI-SWAY BRACE (1 REQD). SEE THE "TOP-OF-LOAD, ANTI-SWAY BRACE A" DETAIL ON PAGE 16. WIRE TIE TO PALLET UNITS AS SHOWN BY THE APPLICABLE TIE WIRE APPLICATION DETAIL ON PAGE 74. NOTE THAT THE QUANTITY IS ONLY FOR THE PARTIAL-TIER UNITS.

③ SUPPORT CLEAT, 2" X 4" 10" (2 REQD). NAIL TO THE CAR SIDEWALL W/4-12d NAILS. POSITION SO AS TO CENTER PIECES MARKED ④ AND ⑤ ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. SEE SPECIAL NOTE 5 AT LEFT.

④ HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑤, W/1-12d NAIL EVERY 6". SEE SPECIAL NOTE 3 AT LEFT.

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

⑥ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑤, W/7-16d NAILS. SEE SPECIAL NOTE 6 ABOVE.

⑦ SPACER CLEAT, 2" X 4" X 26" FOR 6-LAYER UNITS, 19" FOR 5-LAYER UNITS AND 11" FOR 4-LAYER UNITS (2 REQD). NAIL TO THE CAR SIDEWALL W/3, 4, OR 5-12d NAILS.

⑧ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (4 REQD). NAIL TO THE CAR SIDEWALL W/16-12d NAILS.

⑨ POCKET CLEAT, 2" X 6 X 12" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑧, W/4-16d NAILS.

⑩ DIAGONAL BRACE, 2" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑤, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑧, W/2-16d NAILS AT EACH END.

⑪ BACK-UP CLEAT, 2" X 6" X 24" (4 REQD). NAILS TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑧, W/8-16d NAILS.

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

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

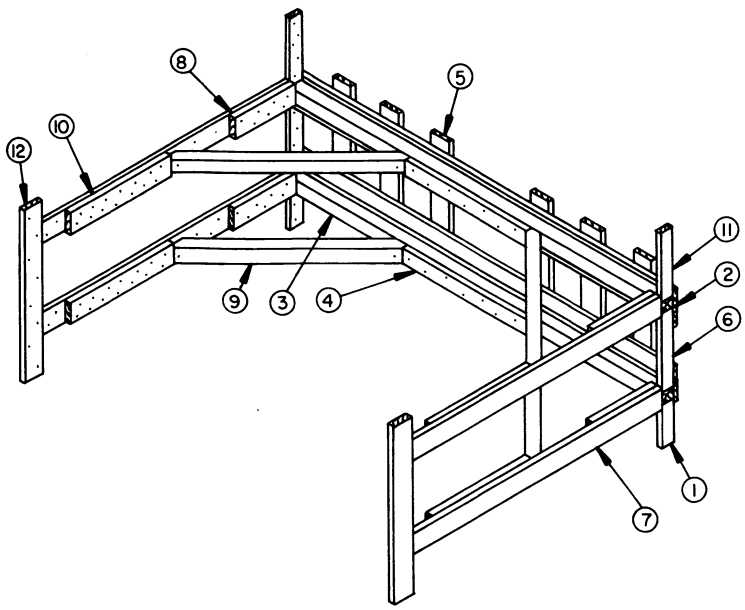
SPECIAL NOTES:

1. THE TYPE "B" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 14,000 POUNDS. THIS WILL BE NOT MORE THAN SIX (6) 6-LAYER UNITS, SEVEN (7) 5-LAYER UNITS, OR NINE (9) 4-LAYER UNITS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGES 62 AND 63 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE. IF THE PARTIAL TIER TO BE BRACED WEIGHS 8,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 60 MAY BE USED.

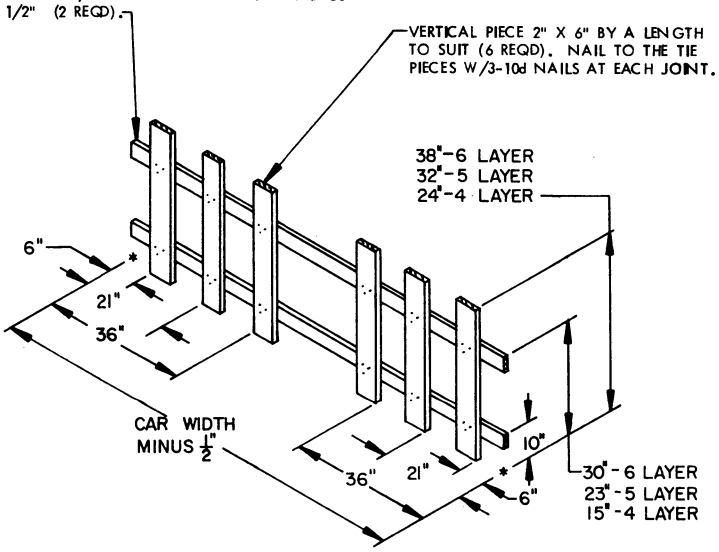
2. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ⑥, ⑩, ⑪, AND ⑫ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑨ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑦ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF 54") TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑦ TO THE FIRST W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑦ 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 60 FOR A TYPICAL INSTALLATION OF A K-BRACE.



ISOMETRIC VIEW



LOAD BEARING ASSEMBLY

KEY NUMBERS

① SUPPORT CLEAT, 2" X 4" X 10" (2 REQD). NAIL TO THE CAR SIDEWALL W/2-12d NAILS. POSITION SO AS TO CENTER PIECES MARKED ② AND ③ ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. SEE SPECIAL NOTE 2 AT LEFT.

② HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTE "N" 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 LOAD BEARING ASSEMBLY (1 REQD FOR LENGTHWISE POSITIONED UNITS ONLY). SEE THE DETAIL AT LEFT. POSITION ASSEMBLY WITH THE LOWER TIE PIECE ON TOP OF THE LOWER HORIZONTAL PIECE, PIECE MARKED ②.

⑥ SPACER CLEAT, 2" X 4" X 26" LONG FOR 6-LAYER UNITS, 19" FOR 5-LAYER UNITS, AND 11" FOR 4-LAYER UNITS (2 REQD). NAIL TO THE CAR SIDEWALL W/3, 4, OR 5-12d NAILS.

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

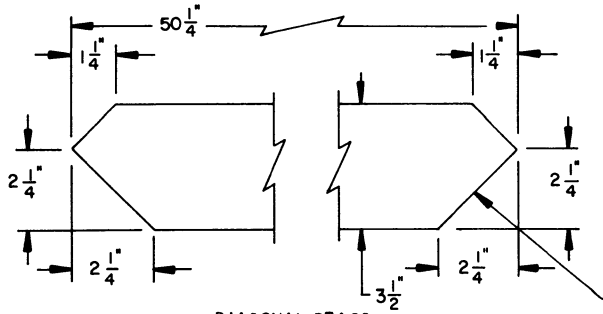
⑧ POCKET CLEAT, 2" X 6" X 18" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑦, W/7-16d NAILS.

⑨ 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 ⑦, W/1-60d NAIL AT EACH END.

⑩ BACK-UP CLEAT, 2" X 6" X30" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑦, W/14-16d NAILS.

⑪ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

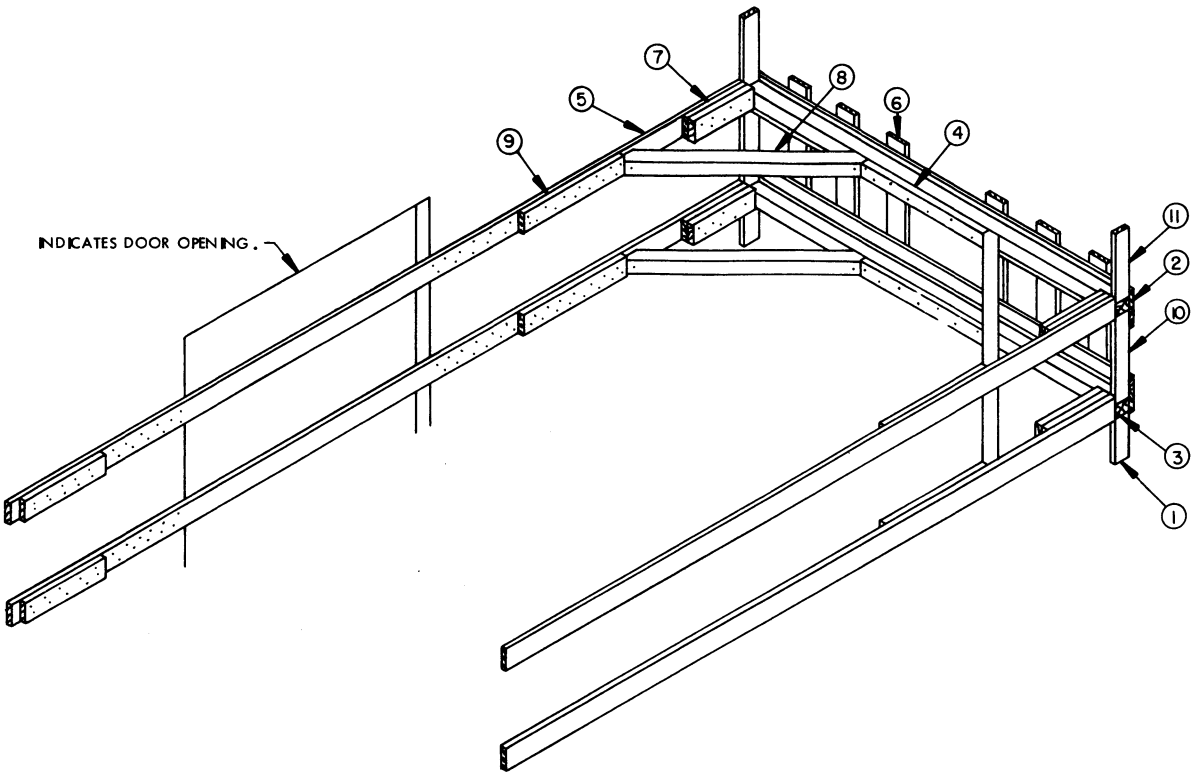
⑫ VERTICAL BACK-UP CLEAT, 2" X 6" BY UNIT HEIGHT (2 REQD). NAIL TO THE CAR SIDEWALL W/8-12d NAILS.



DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

TYPE "B" K-BRACE



ISOMETRIC VIEW

KEY NUMBERS

(1) SUPPORT CLEAT, 2" X 4" X 10" (2 REQD). NAIL TO THE CAR SIDEWALL W/2-12d NAILS. POSITION SO AS TO CENTER PIECES MARKED (2) AND (3) ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. SEE SPECIAL NOTE 2 AT LEFT.

(2) HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE THE CROSS CAR BRACE, PIECE MARKED (3), W1-12d NAIL EVERY 6". SEE GENERAL NOTE "N" AND "O" 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" BY CUT TO FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND ACROSS AND FAR ENOUGH PAST THE DOOR OPENINGS TO CONTACT PIECE MARKED (3) OF THE K-BRACE IN THE OPPOSITE END OF THE CAR. NAIL TO THE CAR SIDEWALL W/40-12d NAILS.

(6) LOAD BEARING ASSEMBLY (1 REQD FOR LENGTHWISE POSITIONED UNITS ONLY). SEE THE DETAIL ON PAGE 61. POSITION ASSEMBLY WITH THE LOWER TIE PIECE ON TOP OF THE LOWER HORIZONTAL PIECE, PIECE MARKED (2).

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

(8) 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.

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

(10) SPACER CLEAT, 2" X 4" X 26" LONG FOR 6-LAYER UNITS, 19" FOR 5-LAYER UNITS, AND 11" LONG FOR 4-LAYER UNITS (2 REQD). NAIL TO THE CAR SIDEWALL W/3, 4, OR 5-12d NAILS.

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

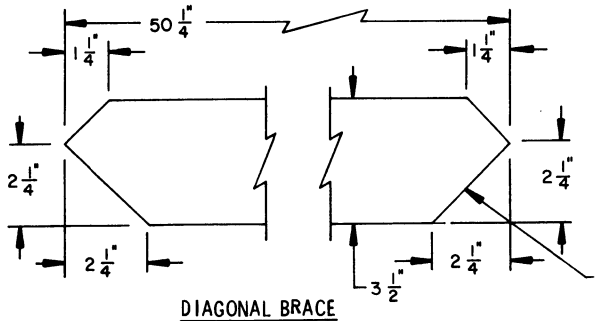
SPECIAL NOTES:

1. THE TYPE "C" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 20,000 POUNDS. THIS WILL BE NOT MORE THAN NINE (9) 6-LAYER UNITS, ELEVEN (11) 5-LAYER UNITS OR THIRTEEN (13) 4-LAYER UNITS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAIL ON PAGE 63 FOR THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE. IF THE PARTIAL TIER TO BE BRACED WEIGHS BETWEEN 8,000 POUNDS AND 14,000 POUNDS, THE TYPE "B" K-BRACE DEPICTED ON PAGE 61 MAY BE USED. IF THE PARTIAL TIER TO BE BRACED WEIGHS 8,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 60 WILL BE ADEQUATE.

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), (7), (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 (8) TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED (5) MUST BE DOUBLED. LAMINATE THE SECOND PIECE TO THE FIRST W/40-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED (5) IS DOUBLED.

3. THE CENTER CLEAT, SHOWN AS PIECE MARKED (4), WILL BE 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.

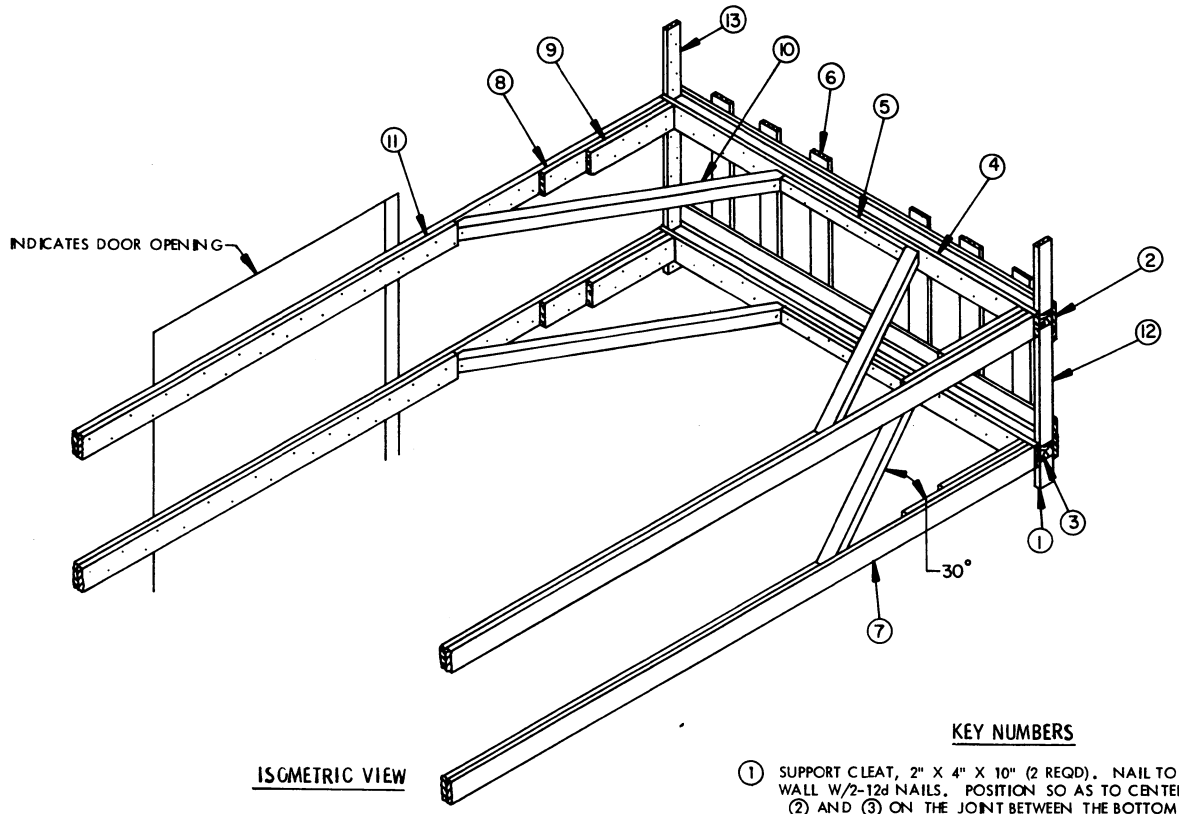
4. CAUTION: A TYPE "C" K-BRACE MUST BE USED IN BOTH ENDS OF THE CAR; THE BRACE IS NOT DESIGNED FOR USE IN ONLY ONE END. NOTE THAT EXCEPT FOR PIECES MARKED (5), THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.



DIAGONAL BRACE
SEE SPECIAL NOTE 2 ABOVE

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

TYPE "C" K-BRACE



ISOMETRIC VIEW

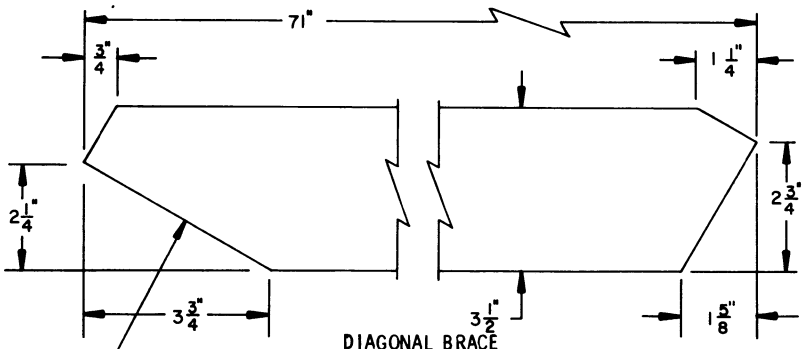
SPECIAL NOTES:

1. THE TYPE "D" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 25,000 POUNDS. THIS WILL BE NOT MORE THAN ELEVEN (11) 6-LAYER UNITS, FOURTEEN (14) 5-LAYER UNITS, OR SEVENTEEN (17) 4-LAYER UNITS. IF THE PARTIAL TIER TO BE BRACED WEIGHS BETWEEN 14,000 POUNDS AND 20,000 POUNDS, THE TYPE "C" K-BRACE DEPICTED ON PAGE 62 MAY BE USED. FOR A PARTIAL TIER OF 8,000 POUNDS TO 14,000 POUNDS, THE TYPE "B" K-BRACE DEPICTED ON PAGE 61 MAY BE USED. IF THE PARTIAL TIER TO BE BRACED WEIGHS 8,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 60 WILL BE ADEQUATE.

2. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ④, ⑧, ⑨, ⑫, AND ⑬ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑩ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑦ MUST BE DOUBLED. LAMINATE THE SECOND PIECE TO THE FIRST W/40-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 70-1/4" LONG IN LIEU OF 71" LONG WHEN PIECE MARKED ⑦ IS DOUBLED.

3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ⑤, 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. CAUTION: A TYPE "D" K-BRACE MUST BE USED IN BOTH ENDS OF THE CAR; THE BRACE IS NOT DESIGNED FOR USE IN ONLY ONE END. NOTE THAT EXCEPT FOR PIECES MARKED ⑦ AND ⑪, THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.



DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE

THIS BEARING SURFACE MUST BE POSITIONED SO AS TO BE IN CONTACT WITH A HORIZONTAL WALL CLEAT, PIECE MARKED ⑦.

KEY NUMBERS

① SUPPORT CLEAT, 2" X 4" X 10" (2 REQD). NAIL TO THE CAR SIDEWALL W/2-12d NAILS. POSITION SO AS TO CENTER PIECES MARKED ② AND ③ ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. SEE SPECIAL NOTE 2 AT LEFT.

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

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

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

⑤ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE REINFORCING PIECE, PIECE MARKED ④, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.

⑥ LOAD BEARING ASSEMBLY, (1 REQD FOR LENGTHWISE POSITIONED UNITS ONLY). SEE THE DETAIL ON PAGE 61. POSITION ASSEMBLY WITH THE LOWER TIE PIECE ON TOP OF THE LOWER HORIZONTAL PIECE, PIECE MARKED ②.

⑦ HORIZONTAL WALL CLEAT, 2" X 6" BY CUT TO FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND ACROSS AND FAR ENOUGHT PAST THE DOOR OPENING TO CONTACT PIECE MARKED ④ OF THE K-BRACE IN THE OPPOSITE END OF THE CAR. NAIL TO THE CAR SIDEWALL W/40-12d NAILS.

⑧ POCKET CLEAT, 2" X 6" X 36" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑦, W/10-16d NAILS.

⑨ POCKET CLEAT, 2" X 6" X 24" (4 REQD). NAIL TO THE POCKET CLEAT, PIECE MARKED ⑧, W/7-16d NAILS.

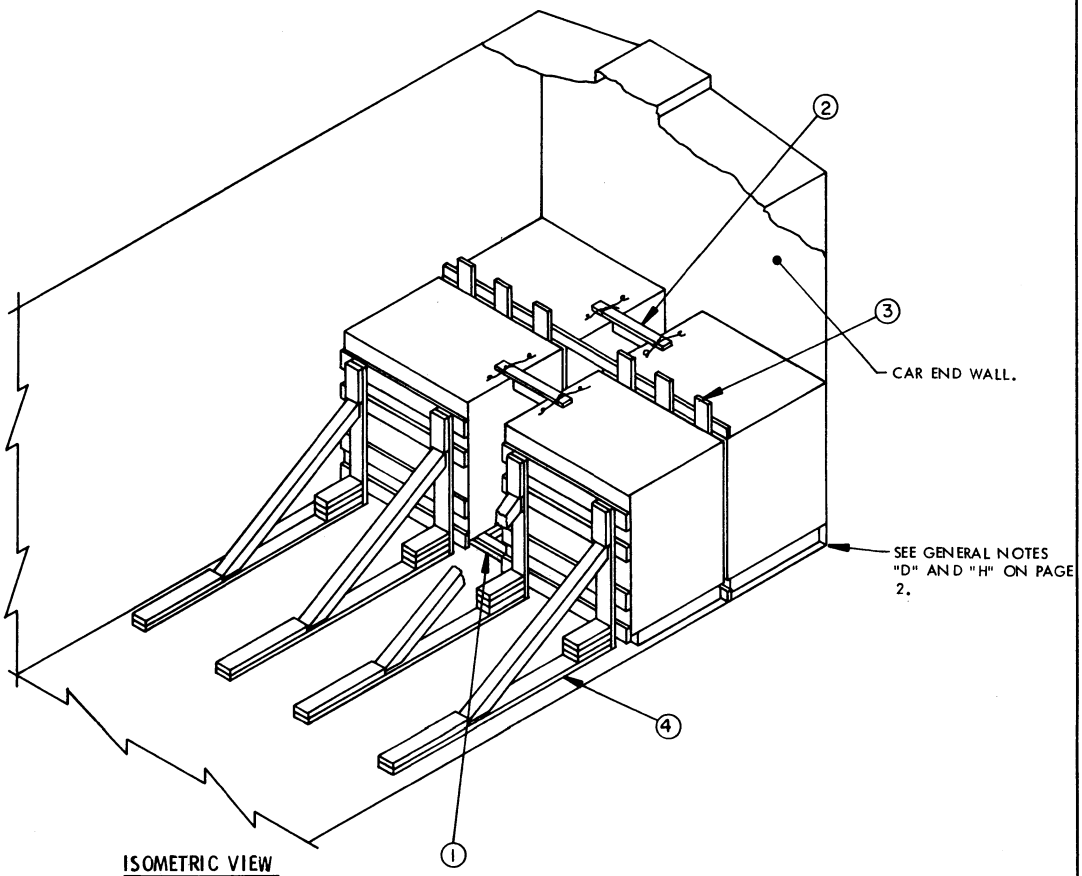
⑩ DIAGONAL BRACE, 4" X 4" X 71" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE REINFORCING PIECE MARKED ④, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑦, W/1-60d NAIL AT EACH END.

⑪ BACK-UP CLEAT, 2" X 6" BY CUT TO FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND TO CONTACT THE DIAGONAL BRACE, PIECE MARKED ⑩, IN THE OPPOSITE END OF THE CAR. NAIL TO THE HORIZONTAL WALL CLFAT, PIECE MARKED ⑦, W/18-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING, IF APPLICABLE.

⑫ SPACER CLEAT, 2" X 4" X 26" LONG FOR 6-LAYER UNITS, 19" FOR A 5-LAYER UNITS, AND 11" FOR A 4-LAYER UNITS (2 REQD). NAIL TO THE CAR SIDEWALL W/3, 4, OR 5-12d NAILS.

⑬ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

TYPE "D" K-BRACE



ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR HAVING A WOOD OR NAILABLE METAL FLOOR IS SHOWN. CARS OF OTHER WIDTHS AND CARS HAVING METAL LININGS CAN BE USED.
2. THE PALLET UNIT SHOWN IS THE 6-LAYER UNIT. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. THE LOAD SHOWN DEPICTING THE KNEE BRACE METHOD OF PARTIAL-LAYER BRACING IS TYPICAL. THE QUANTITY MAY BE ADJUSTED TO SUIT, PROVIDED THE LIMITATIONS OF THE KNEE BRACE AS SET FORTH IN SPECIAL NOTE 4 ARE NOT EXCEEDED.
4. A KNEE BRACE ASSEMBLY WILL BE USED FOR EACH ROW OF PALLET UNITS. ONE (1) KNEE BRACE ASSEMBLY IS ADEQUATE FOR RETAINING A MAXIMUM LCL LOAD OF NOT MORE THAN 8,500 POUNDS.
5. HOLD-DOWN CLEATS (GATE HOLD DOWN) MUST BE APPLIED TO THE BOTTOM HORIZONTAL PIECE OF A KNEE BRACE ASSEMBLY. THE PROPER MATERIAL SIZE AND PLACEMENT WILL BE AS DEPICTED BY THE "CENTER GATE D" DETAIL ON PAGE 17.

KEY NUMBERS

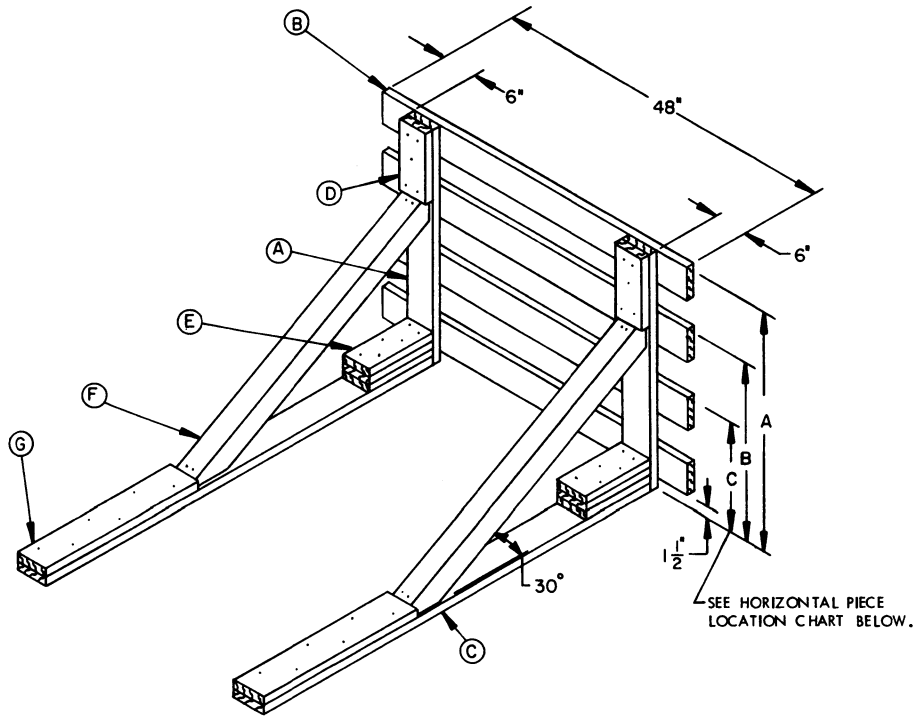
(1) ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2.

(2) TOP-OF-LOAD ANTI-SWAY BRACE (2 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE "B" ON PAGE 18. WIRE TIE TO TOP DUNNAGE ASSEMBLY OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 74.

(3) SEPARATOR GATE (1 REQD). SEE THE APPLICABLE SEPARATOR GATE DETAIL ON PAGE 15, 29, OR 41. POSITION WITH THE TIE PIECES AGAINST THE ALREADY-LOADED UNIT.

(4) KNEE BRACE ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 65 FOR CONSTRUCTION SPECIFICATIONS AND NAILING REQUIREMENTS.

TYPICAL LCL LOAD USING KNEE BRACE METHOD OF PARTIAL LAYER BRACING



KNEE BRACE ASSEMBLY

HORIZONTAL PIECE LOCATION			
PALLET UNIT	DIM A	DIM B	DIM C
6-LAYER	46"	31"	16"
5-LAYER	44"	31"	16"
4-LAYER	36"	23"	--

KEY LETTERS

(A) VERTICAL PIECE, 2" X 6" BY DIMENSION A (2 REQD). SEE THE CHART AT LEFT FOR VERTICAL PIECES OF OTHER LENGTHS.

(B) HORIZONTAL PIECE, 2" X 6" X 48" (AS REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. SEE GENERAL NOTES "N" AND "O" ON PAGE 2, AND SPECIAL NOTE 5 ON PAGE 64.

(C) FLOOR CLEAT, 2" X 6" BY LENGTH TO SUIT (.87 OR 7/8 TIMES LENGTH OF PIECE MARKED (F), PLUS 30") (2 REQD). ALIGN WITH A VERTICAL PIECE AND NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 8". SEE GENERAL NOTE "T" ON PAGE 2.

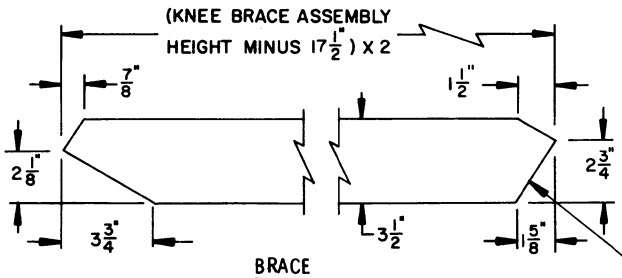
(D) HOLD-DOWN CLEAT, 2" X 6" X 16" (2 REQD). NAIL TO A VERTICAL PIECE W/5-10d NAILS.

(E) POCKET CLEAT, 2" X 6" X 12" (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO THE FLOOR CLEAT, PIECE MARKED (C), W/4-16d NAILS. NAIL THE SECOND AND THIRD PIECES IN A LIKE MANNER AND TOENAIL THE THIRD PIECE TO THE VERTICAL PIECE, PIECE MARKED (A), W/2-16d NAILS.

(F) BRACE, 4" X 4" BY CUT TO FIT (KNEE BRACE ASSEMBLY HEIGHT MINUS 17-1/2", TIMES 2) (2 REQD). SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TOENAIL TO THE VERTICAL PIECE AND TO THE FLOOR CLEAT, PIECES MARKED (A) AND (C), W/2-16d NAILS AT EACH JOINT.

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

(H) HOLD-DOWN CLEAT (NOT SHOWN). SEE SPECIAL NOTE 5 ON PAGE 64.



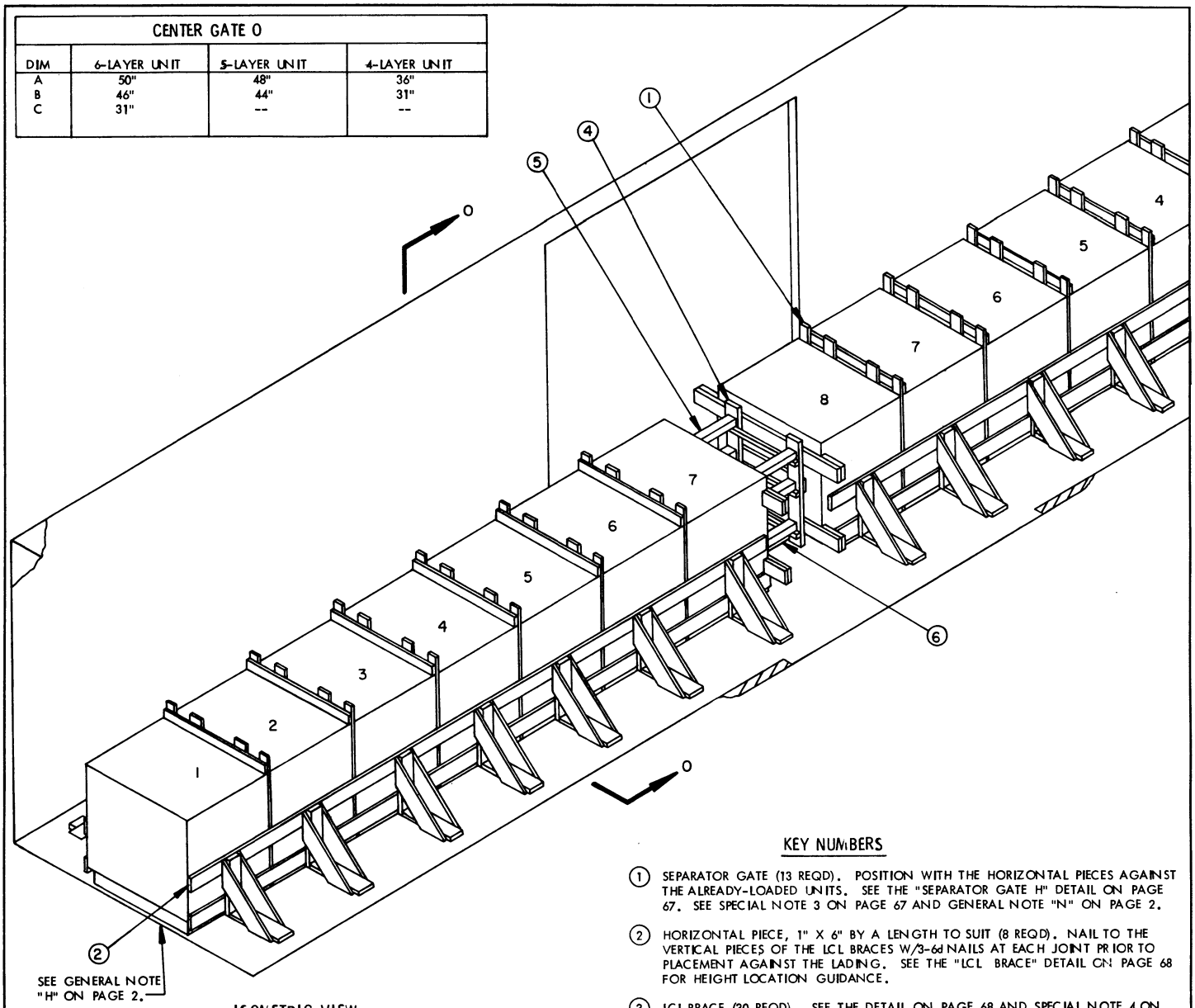
BRACE

4" X 4" MATERIAL

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

TYPICAL LCL LOAD USING KNEE BRACE METHOD OF PARTIAL LAYER BRACING

CENTER GATE O			
DIM	6-LAYER UNIT	5-LAYER UNIT	4-LAYER UNIT
A	50"	48"	36"
B	46"	44"	31"
C	31"	--	--



ISOMETRIC VIEW

KEY NUMBERS

(1) SEPARATOR GATE (13 REQD). POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE THE "SEPARATOR GATE H" DETAIL ON PAGE 67. SEE SPECIAL NOTE 3 ON PAGE 67 AND GENERAL NOTE "N" ON PAGE 2.

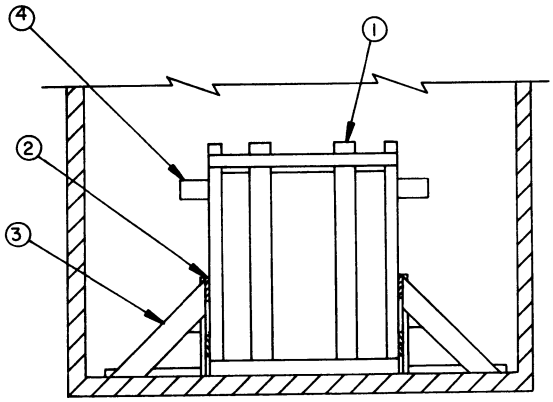
(2) HORIZONTAL PIECE, 1" X 6" BY A LENGTH TO SUIT (8 REQD). NAIL TO THE VERTICAL PIECES OF THE LCL BRACES W/3-6d NAILS AT EACH JOINT PRIOR TO PLACEMENT AGAINST THE LADING. SEE THE "LCL BRACE" DETAIL ON PAGE 68 FOR HEIGHT LOCATION GUIDANCE.

(3) LCL BRACE (30 REQD). SEE THE DETAIL ON PAGE 68 AND SPECIAL NOTE 4 ON PAGE 67. NAIL TO THE CAR FLOOR W/7-16d NAILS. SEE GENERAL NOTE "T" ON PAGE 2.

(4) CENTER GATE (2 REQD). SEE THE "CENTER GATE N" OR THE "CENTER GATE O" DETAIL ON PAGE 67 FOR LENGTHWISE OR CROSSWISE UNITS, RESPECTIVELY.

(5) STRUT, 4" X 4" BY CUT TO FIT (6 REQD FOR LENGTHWISE, 4 REQD FOR MOST CROSSWISE). TOENAIL TO PIECES MARKED (4) W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "V" AND "W" ON PAGE 3.

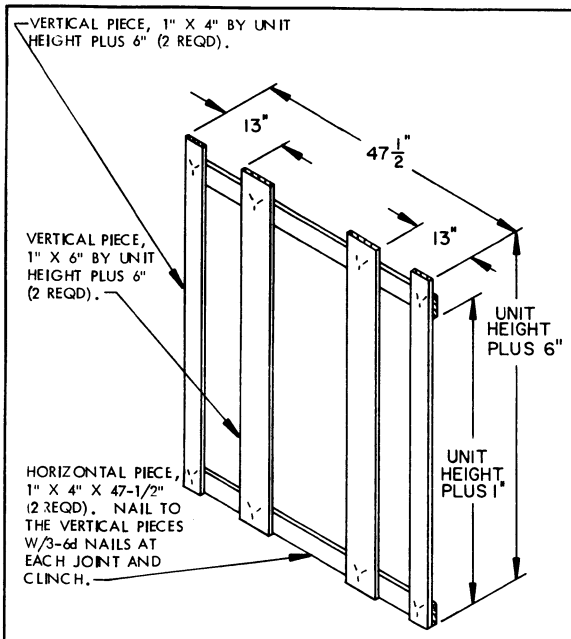
(6) GATE HOLD DOWN, 2" X 3" BY LENGTH OF CENTER VOID PLUS 24" (2 REQD). NAIL TO THE VERTICAL PIECES OF THE CENTER GATES W/2-10d NAILS AT EACH JOINT. SEE SPECIAL NOTE 5 ON PAGE 67.



SECTION O-O

CENTER GATE N			
DIM	6-LAYER UNIT	5-LAYER UNIT	4-LAYER UNIT
A	50"	48"	36"
B	46"	43"	31"
C	31"	30"	--

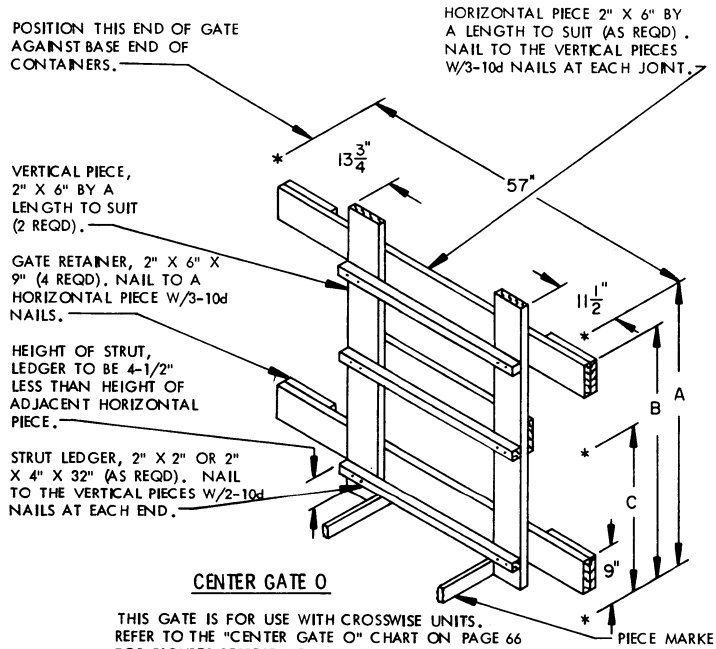
TYPICAL LCL LOAD USING 1-WIDE LOADING METHOD



SEPARATOR GATE H

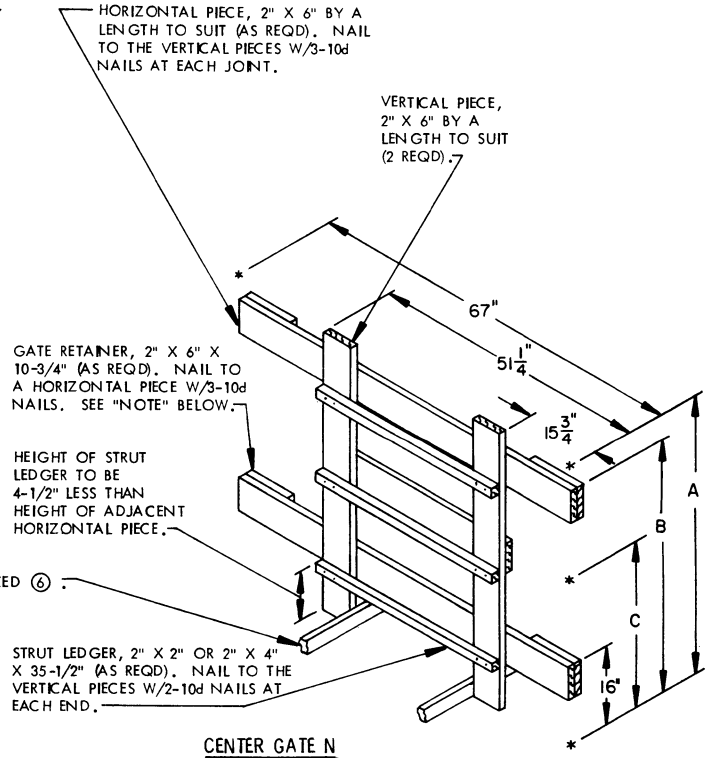
SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED, AND SHORTER BUT NOT LONGER CARS WILL BE USED.
2. THE PALLET UNIT SHOWN IN THE TYPICAL 1-WIDE LOAD IS THE 6-LAYER UNIT. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. A 1-WIDE LENGTHWISE LOAD IS SHOWN AS TYPICAL. A CHART IS GIVEN TO SPECIFY THE PROPER DIMENSIONS FOR THE LENGTH AND POSITIONING OF PIECES FOR THE CENTER GATES. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR 1-WIDE CROSSWISE LOADS FOR WHICH THERE IS ALSO A CHART WHICH SPECIFIES LENGTHS AND POSITIONING OF PIECES FOR THE CENTER GATES. NOTE THAT THE SEPARATOR GATES, PIECES MARKED ①, ARE NOT REQUIRED, AND THE QUANTITY OF LCL BRACES, PIECES MARKED ③, IS NOT CORRECT FOR CROSSWISE LOADS.
4. THE BILL OF MATERIAL AND LOAD AS SHOWN ARE BASED ON THE DEPICTED UNIT AND THEREFORE ARE ONLY TYPICAL.
5. IF DESIRED, GATE HOLD DOWN PIECES WITH THE ASSOCIATED FILL PIECES, AS SHOWN ELSEWHERE ON THE APPLICABLE CENTER GATE FOR A SINGLE ROW, MAY BE USED IN LIEU OF PIECE MARKED ⑥.



CENTER GATE O

THIS GATE IS FOR USE WITH CROSSWISE UNITS. REFER TO THE "CENTER GATE O" CHART ON PAGE 66 FOR FIGURES REPRESENTED BY LETTERS ON THE ABOVE DETAIL. RIGHT HAND AND LEFT HAD GATES ARE REQUIRED.



CENTER GATE N

THIS GATE IS FOR USE WITH LENGTHWISE UNITS. REFER TO THE "CENTER GATE N" CHART AT THE BOTTOM OF PAGE 66 FOR FIGURES REPRESENTED BY LETTERS ON THE DETAIL ABOVE. NOTE: THESE PIECES WILL BE 9-1/2" LONG IF THEY ALIGN WITH THE DUNNAGE ASSEMBLIES ON THE UNITS.

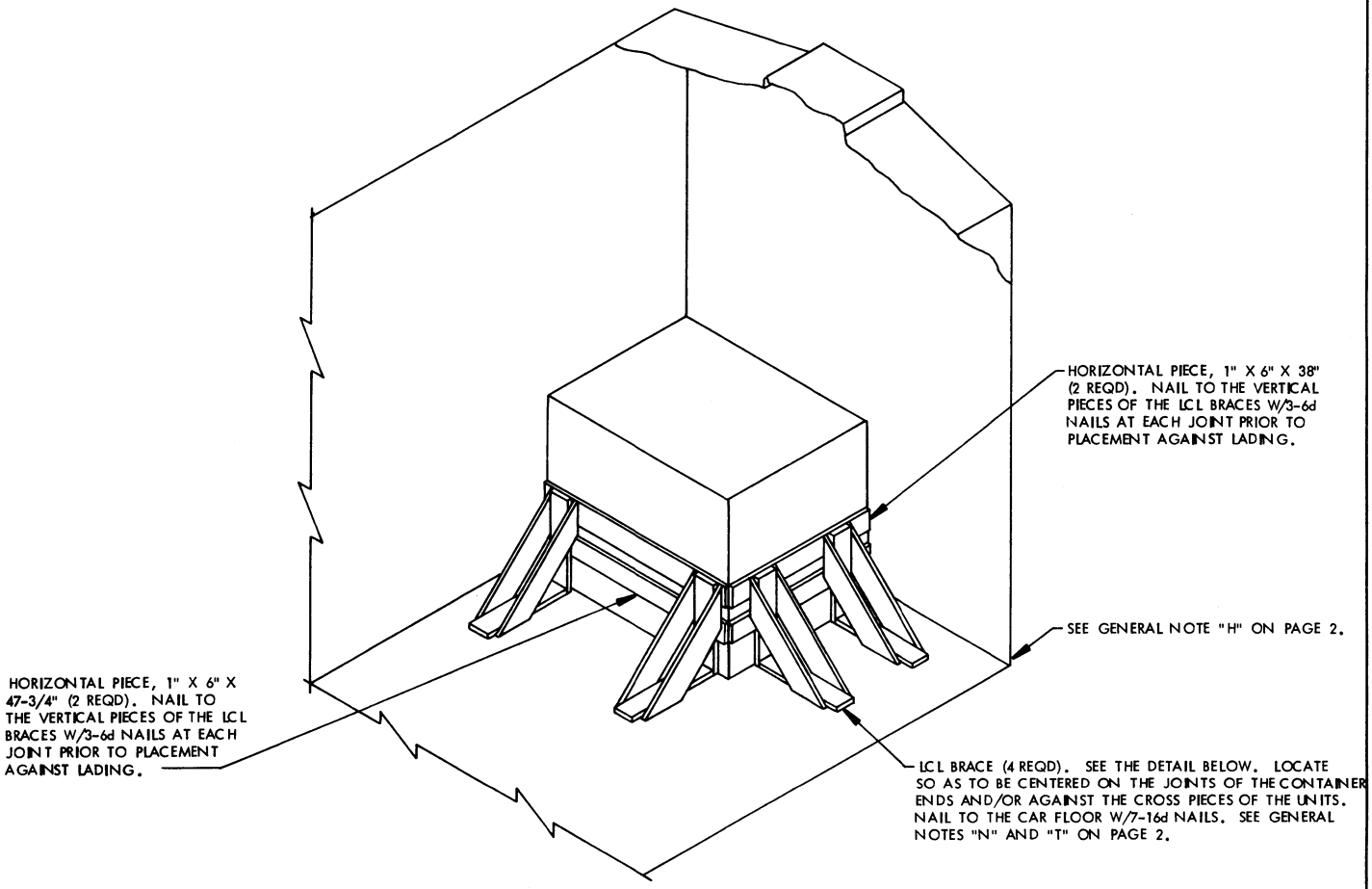
BILL OF MATERIAL (TYPICAL)

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	227	76
1" X 6"	458	229
2" X 2"	18	6
2" X 3"	9	5
2" X 6"	172	172
4" X 4"	10	14
NAILS	**NO. REQD**	**POUNDS**
6d (2")	492	7-3/4
8d (2-1/2")	360	4
10d (3")	92	1-1/2
16d (3-1/2")	294	6-1/2"

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	15	31,500 LBS
DUNNAGE		1,024 LBS
TOTAL WEIGHT		32,524 LBS (APPROX)

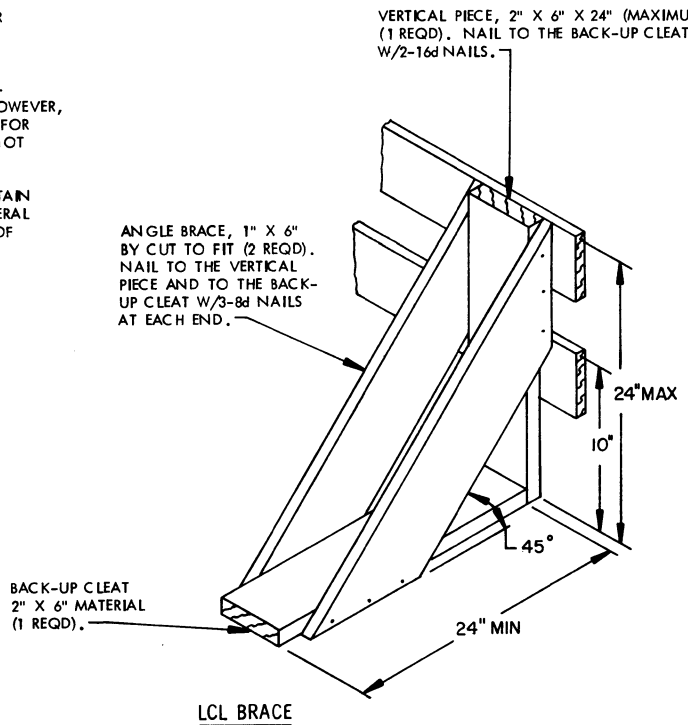
TYPICAL LCL LOAD USING 1-WIDE LOADING METHOD



ISOMETRIC VIEW

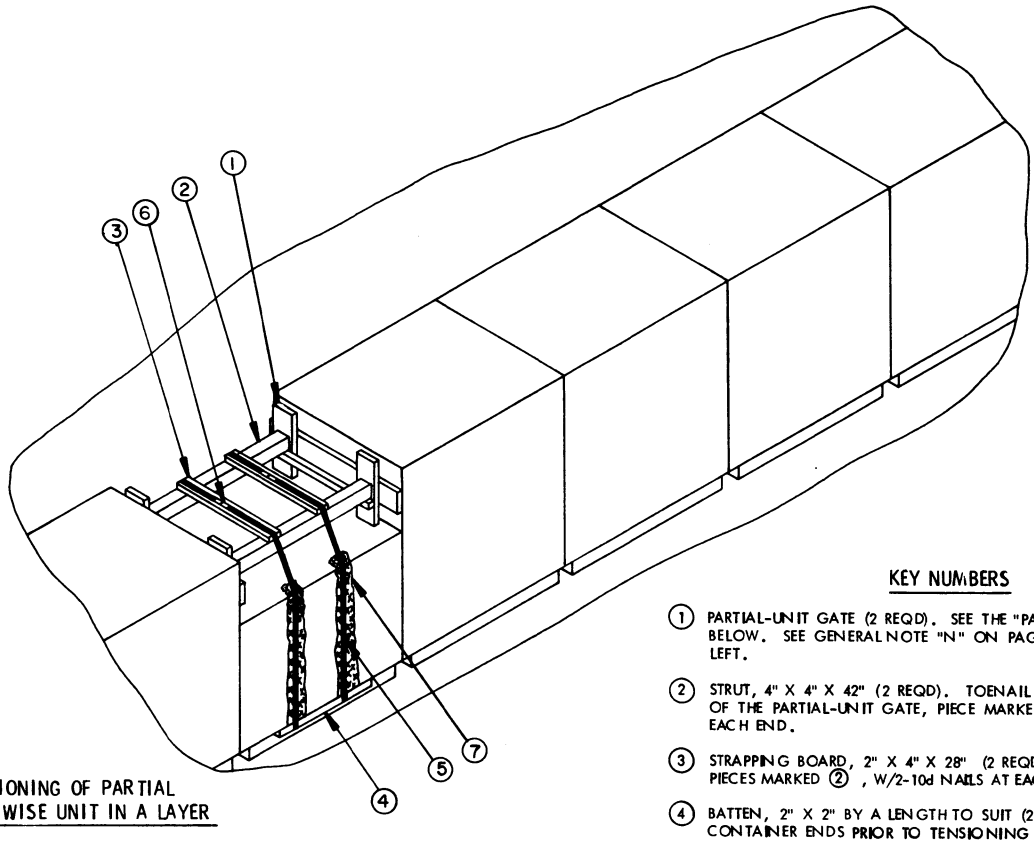
SPECIAL NOTES:

1. AN 8'-6" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR HAVING A WOOD OR NAILABLE METAL FLOOR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED. SEE GENERAL NOTES "T" AND "D" ON PAGE 2.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LCL LOAD IS THE 6-LAYER UNIT. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. THE LOAD SHOWN DEPICTING THE LCL BRACE METHOD OF PARTIAL-LAYER BRACING IS TYPICAL. A LENGTHWISE UNIT IS SHOWN. HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR CROSSWISE UNITS AND FOR OTHER QUANTITIES AS LONG AS THE CAPACITY OF THE BRACES IS NOT EXCEEDED. SEE SPECIAL NOTE 4.
4. EACH LCL BRACE AS APPLIED FOR LONGITUDINAL BRACING WILL RETAIN 2,000 POUNDS OF LADING. EACH LCL BRACE AS APPLIED FOR LATERAL BRACING WILL SUPPORT 8,000 POUNDS OF LADING. A MINIMUM OF TWO (2) BRACES MUST BE USED FOR LONGITUDINAL BRACING.



LCL BRACE

TYPICAL LCL LOAD USING LCL BRACE METHOD OF PARTIAL LAYER BRACING



POSITIONING OF PARTIAL CROSSWISE UNIT IN A LAYER

KEY NUMBERS

(1) PARTIAL-UNIT GATE (2 REQD). SEE THE "PARTIAL-UNIT GATE A" DETAIL BELOW. SEE GENERAL NOTE "N" ON PAGE 2 AND SPECIAL NOTE 3 AT LEFT.

(2) STRUT, 4" X 4" X 42" (2 REQD). TOENAIL TO THE VERTICAL PIECES OF THE PARTIAL-UNIT GATE, PIECE MARKED (1), W/2-16d NAILS AT EACH END.

(3) STRAPPING BOARD, 2" X 4" X 28" (2 REQD). NAIL TO THE STRUTS, PIECES MARKED (2), W/2-10d NAILS AT EACH END.

(4) BATTEN, 2" X 2" BY A LENGTH TO SUIT (2 REQD). POSITION UNDER CONTAINER ENDS PRIOR TO TENSIONING PIECE MARKED (5).

(5) UNITIZING STRAP, 1-1/4" X .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (2 REQD). PRE-POSITION THRU THE FORKLIFT OPENINGS OF THE PALLET.

(6) SEAL FOR 1-1/4" STEEL STRAPPING (4 REQD, 2 PER JOINT). SEE GENERAL NOTE "P" ON PAGE 2.

(7) ANTI-CHAFING NEUTRAL BARRIER MATERIAL. POSITION BETWEEN CONTAINERS AND STRAPPING AT POINTS OF CONTACT.

SPECIAL NOTES:

1. SHIPMENTS OF PROPELLING CHARGES SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE. HOWEVER, THE END OF A LOT, OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LESS-THAN-FULL PALLET UNITS WITHIN A LOAD. THE PROCEDURES ON THIS PAGE ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF A PARTIAL UNIT WITHIN A CROSSWISE LOAD.

2. THE PALLET UNIT SHOWN IN THE SHIPMENT OF PARTIAL UNITS VIEW IS THE 6-LAYER UNIT. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS CONVERED BY THIS DOCUMENT.

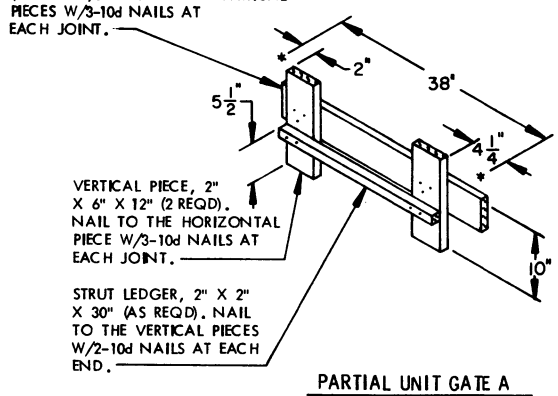
3. A LESS-THAN- FULL HEIGHT PALLET UNIT OF CROSSWISE -POSITIONED PROPELLING CHARGES WHICH IS TO BE SHIPPED WITHIN A LAYER OF A LOAD HAS NO LIMITATIONS AS TO THE NUMBER OF LAYERS OF CONTAINERS ON THE PARTIAL UNIT. THE DEPICTED PROCEDURES SHOW THE BRACING OF A 4-LAYER UNIT WITHIN A 6-LAYER LOAD. THE PRINCIPLES CAN BE ADAPTED TO SUIT OTHER SIZE PARTIAL UNITS.

4. A PARTIAL UNIT MUST CONSIST OF FULL LAYERS OF SIX (6) CONTAINERS, OR AN APPROVED FILLER ASSEMBLY, AS DETAILED BY DRAWING 19-48-4042A/ 22-20PM1001, MUST BE INSTALLED IN THE PLACE OF OMITTED CONTAINERS.

5. THE FILLERS AS REFERENCED IN SPECIAL NOTE 4 AND THE DUNNAGE DEPICTED ABOVE FOR THE SHIPMENT OF THE PARTIAL UNIT MAY BE REMOVED WHEN A SHIPMENT REACHES DESTINATION. OR IF DESIRED, THE FILLERS MAY REMAIN WITH THE UNIT DURING STORAGE (IF APPLICABLE) FOR POSSIBLE USE IN A FUTURE SHIPMENT.

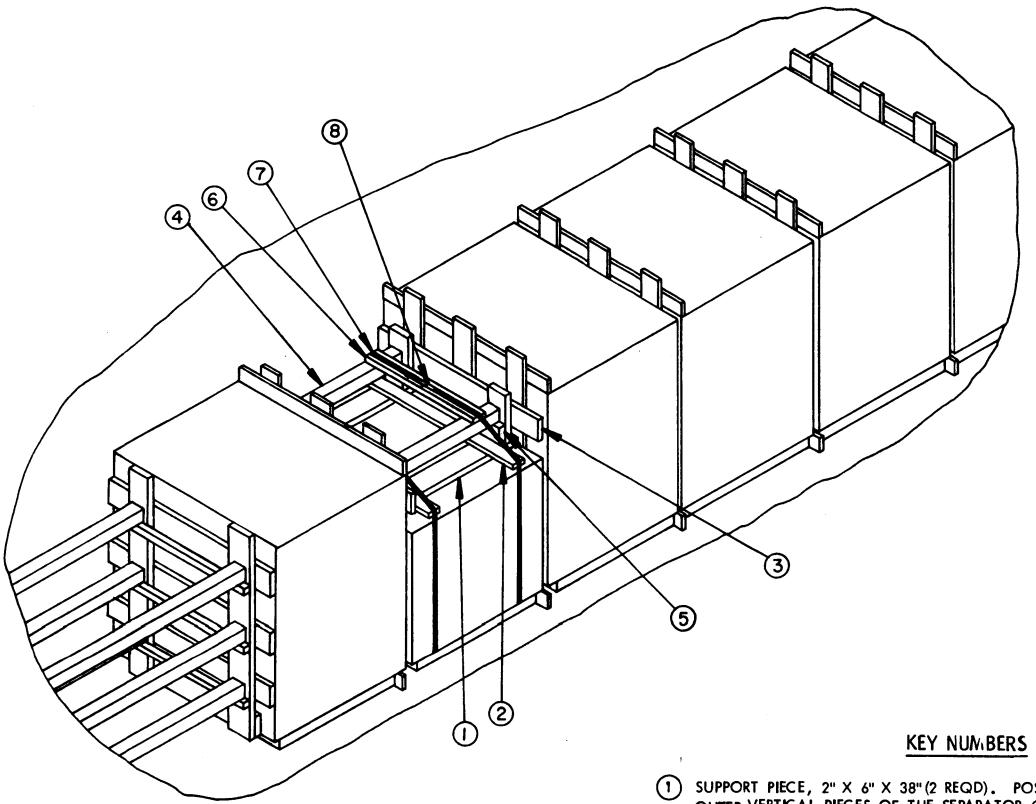
6. THE "POSITIONING OF PARTIAL CROSSWISE UNIT WITHIN A LAYER" VIEW ABOVE DEPICTS A PORTION OF A CONVENTIONAL BOX CAR LOAD, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LOADS IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.

7. THE PARTIAL-UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH BUT NOT IN THE DOORWAY. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE PARTIAL UNIT AND A CENTER GATE.



PARTIAL UNIT GATE A

POSITION GATE WITH THE 4-1/4" DIMENSION AGAINST THE BASE END OF THE CONTAINERS. RIGHT AND LEFT HAND GATES ARE REQUIRED.



POSITIONING OF PARTIAL LENGTH WISE UNIT IN A LAYER

SPECIAL NOTES:

1. SHIPMENTS OF PROPELLING CHARGES SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE. HOWEVER, THE END OF A LOT, OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LESS-THAN-FULL PALLET UNITS WITHIN A LOAD. THE PROCEDURES ON THIS PAGE ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF A PARTIAL UNIT WITHIN A LENGTHWISE LOAD.

2. THE PALLET UNIT SHOWN IN THE SHIPMENT OF PARTIAL UNITS VIEW IS THE 6 - LAYER UNIT . THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.

3. A LESS - THAN -FULL HEIGHT PALLET UNIT OF LENGTHWISE-POSITIONED PROPELLING CHARGES WHICH IS TO BE SHIPPED WITHIN A LAYER OF A LOAD HAS NO LIMITATIONS AS TO THE NUMBER OF LAYERS OF CONTAINERS ON THE PARTIAL UNIT. THE DEPICTED PROCEDURES SHOW THE BRACING OF A 4-LAYER UNIT WITHIN A 6-LAYER LOAD. THE PRINCIPLES CAN BE ADAPTED TO SUIT OTHER SIZE PARTIAL UNITS.

4. A PARTIAL UNIT MUST CONSIST OF FULL LAYERS OF SIX (6) CONTAINERS, OR AN APPROVED FILLER ASSEMBLY, AS DETAILED BY DRAWING 19-48-4042A/22-20PM1001, MUST BE INSTALLED IN THE PLACE OF OMITTED CONTAINERS.

5. THE FILLERS AS REFERENCED IN SPECIAL NOTE 4 AND THE DUNNAGE DEPICTED ABOVE FOR THE SHIPMENT OF THE PARTIAL UNIT MAY BE REMOVED WHEN A SHIPMENT REACHES DESTINATION. OR IF DESIRED, THE FILLERS MAY REMAIN WITH THE UNIT DURING STORAGE (IF APPLICABLE) FOR POSSIBLE USE IN A FUTURE SHIPMENT.

6. THE "POSITIONING OF PARTIAL LENGTHWISE UNIT WITHIN A LAYER "VIEW ABOVE DEPICTS A PORTION OF A CONVENTIONAL BOX CAR LOAD, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LOADS IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.

7. THE PARTIAL-UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH BUT NOT IN THE DOORWAY. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE PARTIAL UNIT AND A CENTER GATE.

KEY NUMBERS

(1) SUPPORT PIECE, 2" X 6" X 38" (2 REQD). POSITION TO ALIGN WITH THE TWO OUTER VERTICAL PIECES OF THE SEPARATOR GATES.

(2) RETAINER PIECE, 2" X 4" X 47" (2 REQD). NAIL TO THE SUPPORT PIECES MARKED (1), W/2-10d NAILS AT EACH JOINT.

(3) PARTIAL-UNIT GATE (2 REQD). SEE THE "PARTIAL - UNIT GATE B" DETAIL BELOW. SEE GENERAL NOTE "N" ON PAGE 2 AND SPECIAL NOTE 3 AT LEFT.

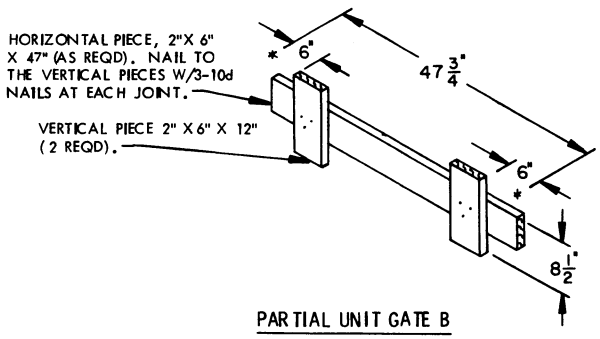
(4) STRUT, 4" X 4" X 32" (2 REQD). TOENAIL TO THE VERTICAL PIECES OF THE PARTIAL-UNIT GATE, PIECE MARKED (3), W/2-16d NAILS AT EACH END.

(5) STRUT SUPPORT PIECE, 2" X 4" X 5" (4 REQD). NAIL TO A VERTICAL PIECE OF THE PARTIAL - UNIT GATE W/ 2-10d NAILS.

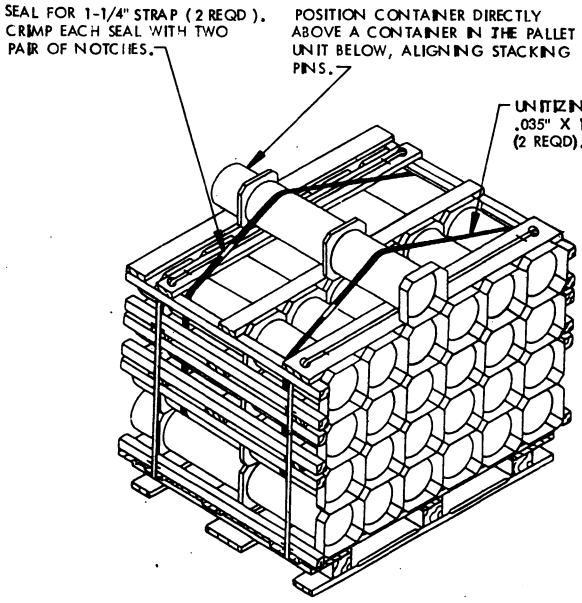
(6) STRAPPING BOARD, 2" X 4" X 34" (2 REQD). NAIL TO THE STRUTS, PIECES MARKED (4), W/3-10d NAILS AT EACH END.

(7) UNITIZING STRAP, 1-1/4" X .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (2 REQD). PRE - POSITION.

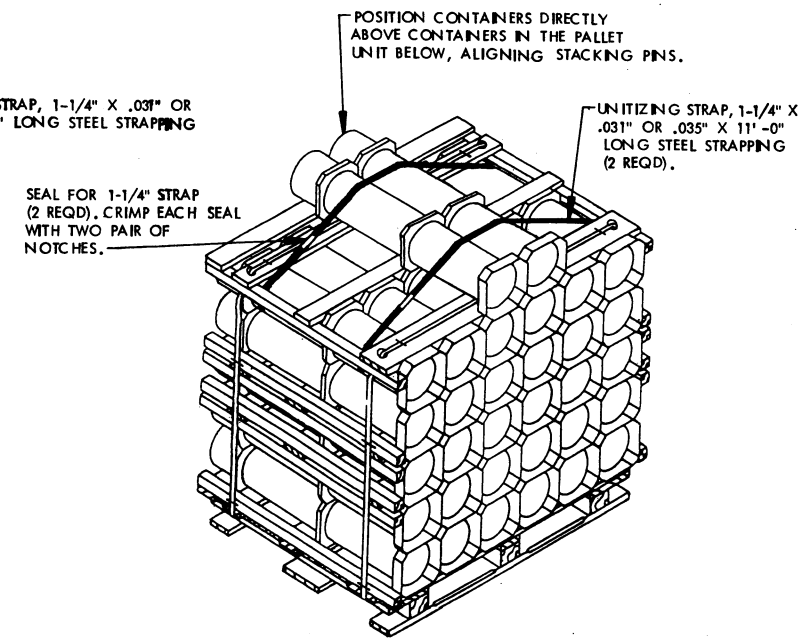
(8) SEAL FOR 1-1/4" STEEL STRAPPING (4 REQD, 2 PER JOINT). SEE GENERAL NOTE "P " ON PAGE 2.



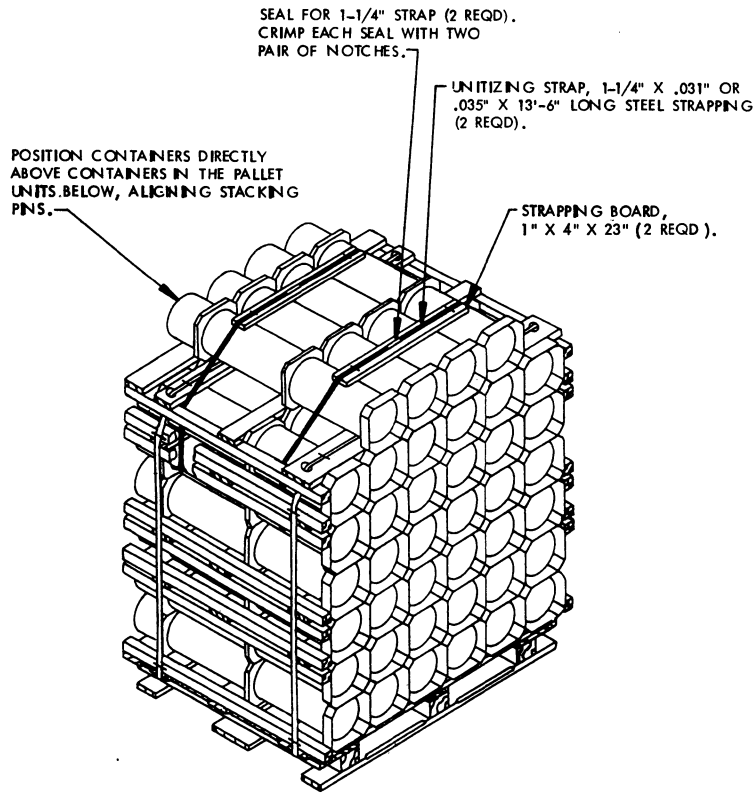
PARTIAL UNIT GATE B



SECUREMENT OF ONE CONTAINER



SECUREMENT OF TWO CONTAINERS



SECUREMENT OF FOUR CONTAINERS

SPECIAL NOTES:

1. SHIPMENT OF PROPELLING CHARGES SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE. HOWEVER, THE END OF A LOT, OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION, MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS. LEFTOVER CONTAINERS ARE DESCRIBED AS A QUANTITY OF CONTAINERS WHICH IS INSUFFICIENT TO FORM A FULL-LAYERED PARTIAL UNIT FOR SHIPMENT EITHER ON TOP OF A LOAD AS SHOWN ON PAGE 72 OR WITHIN A LAYER AS SHOWN ON PAGES 69 AND 70.
2. SHIPMENT OF LEFTOVER CONTAINERS IS APPLICABLE FOR CONUS AND OCONUS RAILROAD SHIPMENTS FROM DEPOT TO DEPOT OR FROM DEPOT TO POSTS, CAMPS AND STATIONS, OR, UPON APPROVAL FROM HIGHER HEADQUARTERS, FOR SHIPMENTS FROM LOAD, ASSEMBLE, AND PACK PLANTS TO DEPOTS. CAUTION: A LOAD CONTAINING LEFTOVER CONTAINERS IN AN AMOUNT WHICH IS LESS THAN A FULL LAYER, AND SECURED TO THE TOP OF A FULL OR PARTIAL UNIT, MUST NOT BE DESTINED FOR SHIPMENT OVERSEAS BY WATER CARRIER.
3. THE UNITIZING STRAPS MUST NOT GO AROUND THE INTERMEDIATE OR TOP DUNNAGE ASSEMBLY. THE STRAP MUST BE THREADED BEHIND THE 2" X 2" STOP PIECES OF THE ASSEMBLIES.
4. OBVIOUSLY, A PALLET UNIT WITH ONE OR MORE CONTAINERS STRAPPED TO THE TOP MUST BE POSITIONED IN THE TOP LAYER OF A LOAD. THE PREFERRED LOCATION WOULD BE NEAR THE CENTER AREA OF A CAR IF A FULL LOAD IS BEING SHIPPED.
5. THE PROCEDURES ON THIS PAGE ARE APPLICABLE FOR THE SHIPMENT OF LEFTOVER CONTAINERS IN ANY OF THE LOADS DEPICTED HEREIN.

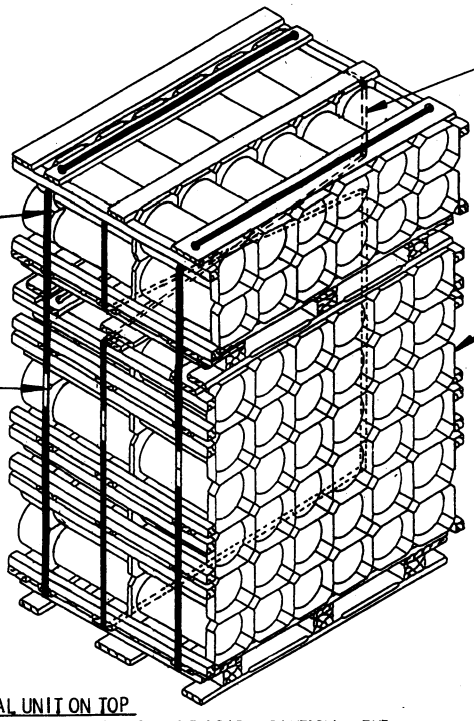


FIGURE - 8 UNITIZING STRAP, 1-1/4" X .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (1 REQD). POSITION NEAR THE CENTER OF THE UNIT LENGTH.

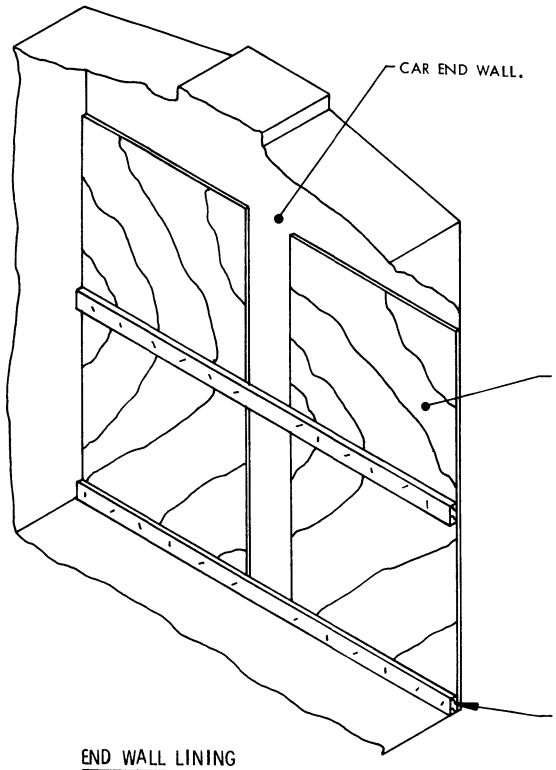
VERTICAL UNITIZING STRAP 1-1/4" X .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (2 REQD). POSITION OVER THE UNIT LOAD STRAP AS SHOWN.

THE 6 -LAYER PALLET UNIT IS SHOWN AS TYPICAL. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.

INDICATES TWO (2) 1-1/4" STRAP SEALS.

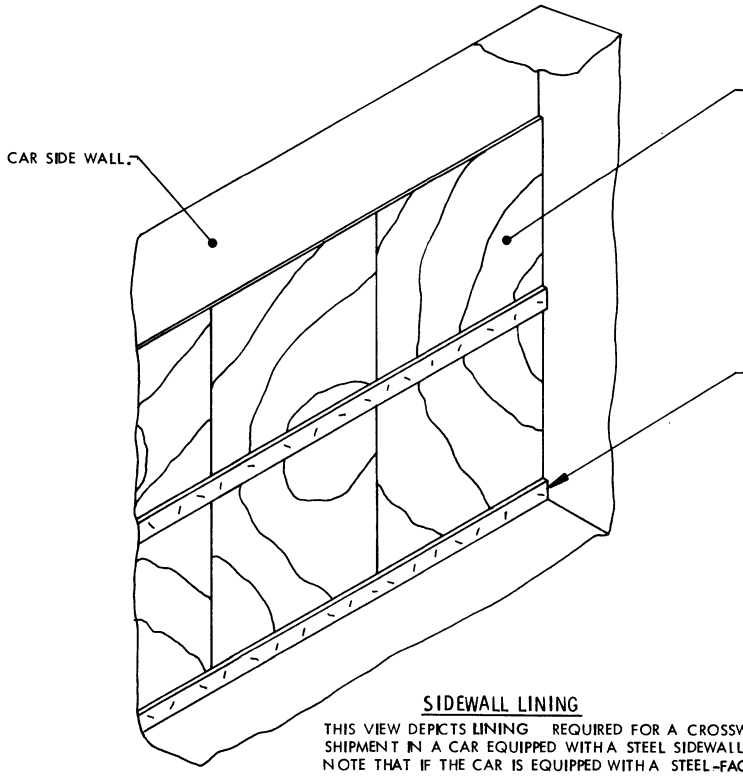
SECUREMENT OF PARTIAL UNIT ON TOP

THIS PROCEDURE IS APPLICABLE ONLY FOR USE IN A CROSSWISE LOAD. CAUTION: THE PARTIAL UNIT ON TOP IS LIMITED TO NOT MORE THAN TWO (2) LAYERS OF CONTAINERS. FOR SHIPMENT OF MORE THAN TWO LAYERS OF CONTAINERS, OR AN ALTERNATIVE FOR ONE OR TWO LAYERS, REFER TO THE PROCEDURES ON PAGE 69.



END WALL LINING

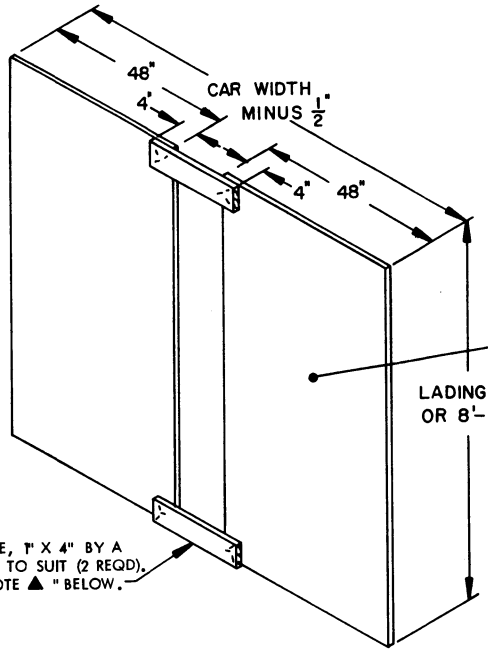
THIS VIEW DEPICTS LINING REQUIRED FOR A LENGTHWISE LOAD IN A CAR EQUIPPED WITH A STEEL END WALL.



SIDEWALL LINING

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

NOTE ●:
IF A BOX CAR TO BE LOADED HAS BOWED END WALLS WHICH ARE BOWED OUTWARD MORE THAN TWO INCHES (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 BOX CAR OR IN A CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS, OR AT THE END OF A CAR EQUIPPED WITH MECHANICAL BRACING DEVICES, IF DESIRED, IN LIEU OF USING CROSS MEMBERS. THE BULKHEAD MAY BE FABRICATED FROM A CENTER GATE FOR THE UNIT THAT IS TO BE LOADED AND FOR THE UNIT POSITIONING (LENGTHWISE OR CROSSWISE). NOTE THAT THE GATE MUST BE MODIFIED BY OMITTING THE 2" X 2" STRUT LEDGERS AND THE GATE HOLD DOWN PIECES. A MODIFIED CENTER GATE "C" AS DETAILED ON PAGE 16 IS SHOWN AS TYPICAL.



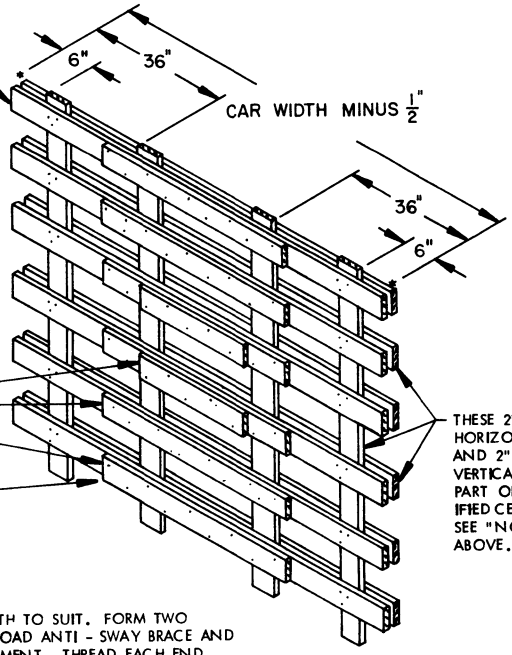
PLYWOOD, 3/8" X 48" WIDE BY A HEIGHT TO SUIT (2 REQD). NAIL TO EACH TIE PIECE W/3-4d NAILS AT EACH JOINT AND CLINCH.

TIE PIECE, 1" X 4" BY A LENGTH TO SUIT (2 REQD). SEE "NOTE ▲" BELOW.

ALTERNATIVE SEPARATOR GATE

NOTE ▲:
THE ALTERNATIVE SEPARATOR GATE MAY BE USED IN LIEU OF THE SEPARATOR GATE SHOWN WITHIN A LOAD, WHICH IS FABRICATED FROM 1" X 4" AND 1" X 6" MATERIAL. IN LIEU OF TIE PIECES SHOWN IN THE DETAIL ABOVE, THE PLYWOOD SHEETS CAN BE POSITIONED AGAINST THE UNITS, AND NAILED TO THE ADJACENT ANTI-SWAY BRACES MARKED ① IN THE LOAD VIEWS, W/1-6d NAIL EACH. ALSO, THE PLYWOOD MAY BE POSITIONED AN INCH OR TWO FROM THE CAR SIDEWALL TO PROVIDE A LARGER SURFACE FOR THE SPECIFIED NAILING OF GATES. IF SEPARATOR GATES IN THE DOORWAY AREA ARE ADJACENT TO NAILED FLOORLINE BLOCKING, THE CENTER-OF-CAR SIDE OF THE GATES MUST BE NOTCHED TO PREVENT DAMAGE TO GATE DURING LONGITUDINAL SHIFTING OF THE LOAD.

FILLER PIECE, 2"X 6" BY CAR WIDTH MINUS 1/2" IN LENGTH (ONE REQUIRED FOR EACH HORIZONTAL PIECE ON THE CENTER GATE). ALIGN WITH THE HORIZONTAL PIECES AND NAIL TO THE VERTICAL PIECES OF THE CENTER GATE W/3 - 10d NAILS AT EACH JOINT.



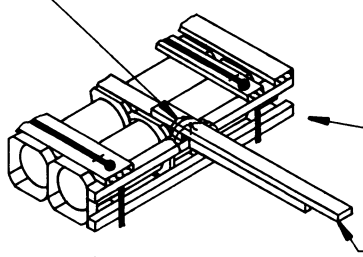
SHIM MATERIAL, 6" WIDE PLYWOOD OR DIMENSIONAL LUMBER OF A THICKNESS AND LENGTH AS REQUIRED TO FILL THE VOID BETWEEN THE CAR END WALL AND BULKHEAD. NAIL TO THE FILLER PIECE AND/OR LAMINATE W/1 APPLICABLY SIZED NAIL EVERY 6".

POSITION THIS SIDE OF BULKHEAD AGAINST THE CAR END WALL.

THESE 2" X 6" HORIZONTAL PIECES AND 2" X 6" VERTICAL PIECES ARE PART OF THE MODIFIED CENTER GATE. SEE "NOTE ●" ABOVE.

END OF CAR BULKHEAD
SEE "NOTE ●" ABOVE.

NO. 14 GAGE WIRE BY A LENGTH TO SUIT. FORM TWO LOOPS AROUND TOP-OF-LOAD ANTI-SWAY BRACE AND TWIST TO PREVENT DISPLACEMENT. THREAD EACH END OF WIRE UNDER AND AROUND THE 2" X 2" STOP PIECE ON THE TOP DUNNAGE ASSEMBLY. TWIST WIRE TO SELF, AS SHOWN.

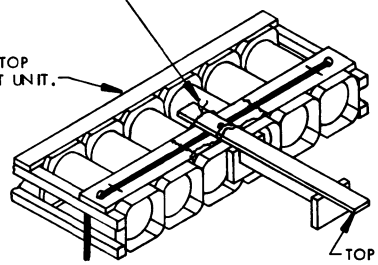


PARTIAL VIEW SHOWING TOP LAYER OF BASIC HEIGHT UNIT.

TOP-OF-LOAD ANTI-SWAY BRACE "B".

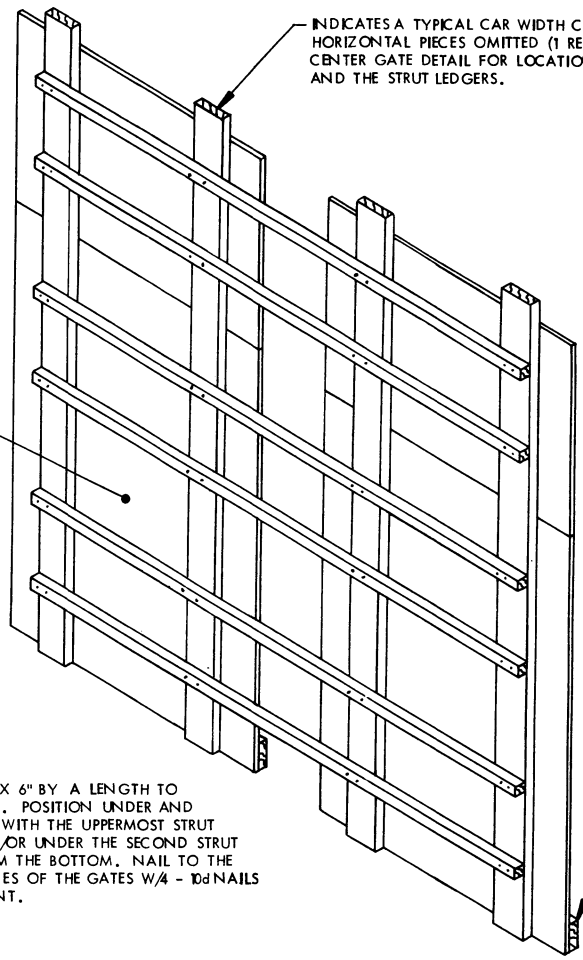
TIE WIRE APPLICATION B

NO. 14 GAGE WIRE BY LENGTH TO SUIT. FORM TWO LOOPS AROUND TOP-OF-LOAD ANTI-SWAY BRACE AND TWIST TO PREVENT DISLODGEMENT. THREAD EACH END OF WIRE UNDER AND AROUND A STRAPPING BOARD ON THE UNIT AND TWIST WIRE TO SELF, AS SHOWN.



TOP-OF-LOAD ANTI-SWAY BRACE "A".

TIE WIRE APPLICATION A



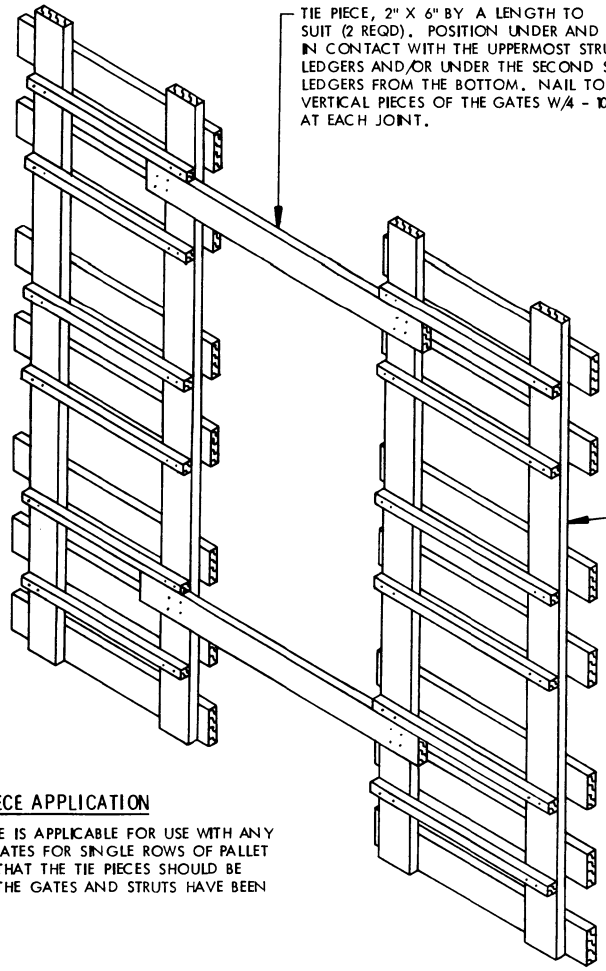
INDICATES A TYPICAL CAR WIDTH CENTER GATE, WITH THE HORIZONTAL PIECES OMITTED (1 REQD). SEE THE APPLICABLE CENTER GATE DETAIL FOR LOCATION OF THE VERTICAL PIECES AND THE STRUT LEDGERS.

PLYWOOD, 1/2" THICK BY THE UNIT WIDTH OR LENGTH BY THE LOAD HEIGHT (2 REQD). NAIL TO THE VERTICAL PIECES W/1 - 6d NAIL EVERY 6". NOTE: THE WIDTH OF THE PLYWOOD WILL BE UNIT WIDTH IF THE LENGTH OF THE UNIT IS PARALLEL WITH THE SIDEWALL OF A CAR, AS TYPICALLY SHOWN IN THE LOAD ON PAGE 8, OR UNIT LENGTH IF THE WIDTH OF THE UNIT IS PARALLEL WITH THE SIDEWALL OF A CAR, AS TYPICALLY SHOWN IN THE LOAD ON PAGE 6. PLYWOOD MAY BE ALLOWED TO EXTEND BEYOND THE UNIT LENGTH OR WIDTH, IF DESIRED.

FILL PIECES AND GATE GATE HOLD DOWN PIECES MUST BE SECURED TO THE PLYWOOD.

PLYWOOD CENTER GATE ALTERNATIVE

CENTER GATE "L" IS SHOWN AS TYPICAL. PLYWOOD MAY BE USED IN LIEU OF THE HORIZONTAL PIECES ON ANY CENTER GATE DEPICTED HEREIN, INCLUDING THOSE WHICH ARE FOR THE BRACING OF A SINGLE ROW.

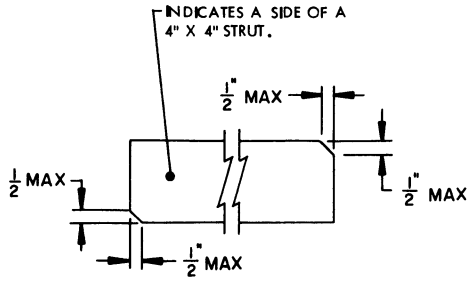


TIE PIECE, 2" X 6" BY A LENGTH TO SUIT (2 REQD). POSITION UNDER AND IN CONTACT WITH THE UPPERMOST STRUT LEDGERS AND/OR UNDER THE SECOND STRUT LEDGERS FROM THE BOTTOM. NAIL TO THE VERTICAL PIECES OF THE GATES W/4 - 10d NAILS AT EACH JOINT.

INDICATES A TYPICAL CENTER GATE FOR A SINGLE ROW (2 REQD). SEE THE APPLICABLE CENTER GATE DETAIL FOR THE UNIT BEING SHIPPED. A GATE FOR UNITS WHICH ARE POSITIONED WITH THE UNIT WIDTH PARALLEL TO THE CAR SIDEWALL IS SHOWN. THE PROCEDURE IS ALSO APPLICABLE TO GATES FOR UNITS WHICH ARE POSITIONED WITH THE UNIT LENGTH PARALLEL TO THE CAR SIDEWALL.

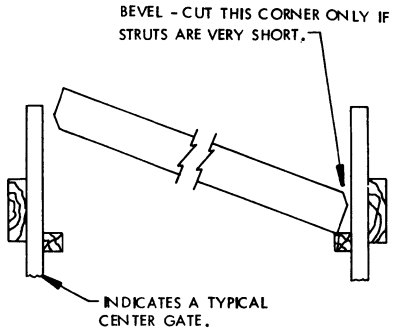
TIE PIECE APPLICATION

THIS PROCEDURE IS APPLICABLE FOR USE WITH ANY TWO CENTER GATES FOR SINGLE ROWS OF PALLET UNITS. NOTE THAT THE TIE PIECES SHOULD BE APPLIED AFTER THE GATES AND STRUTS HAVE BEEN INSTALLED.



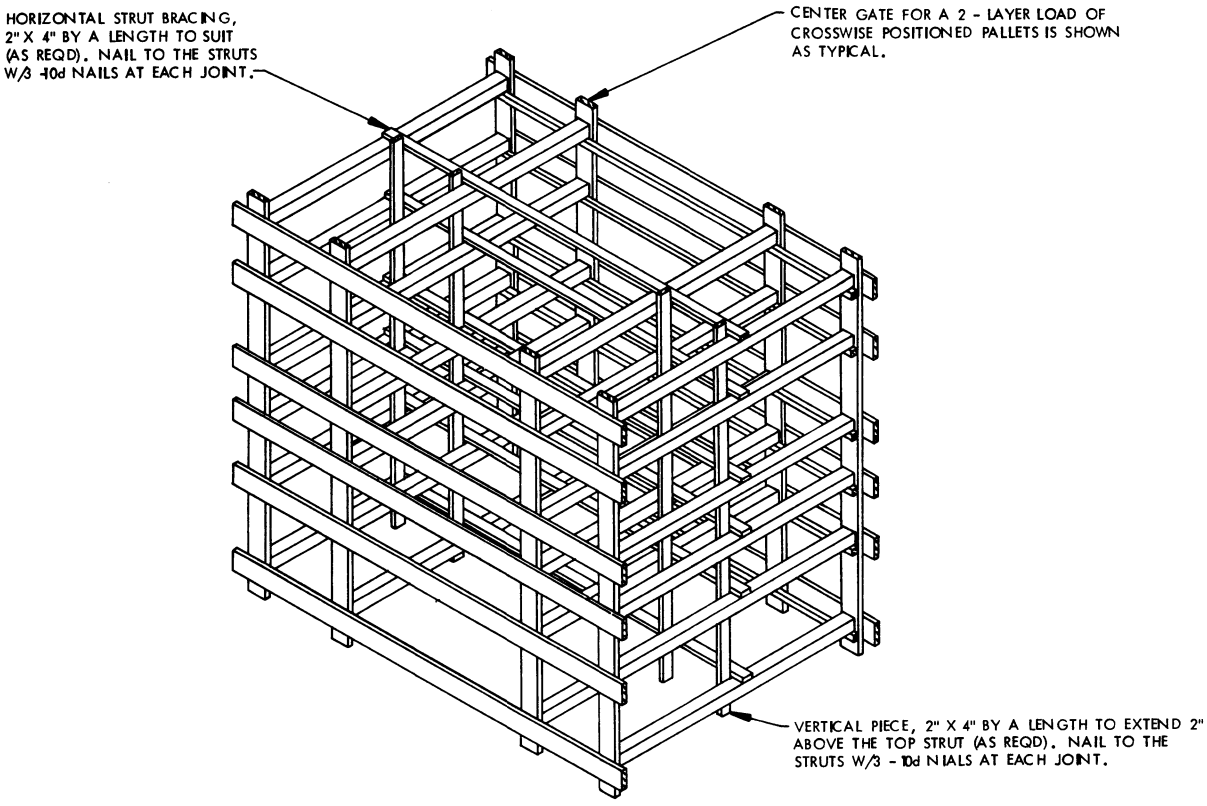
BEVEL CUT

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



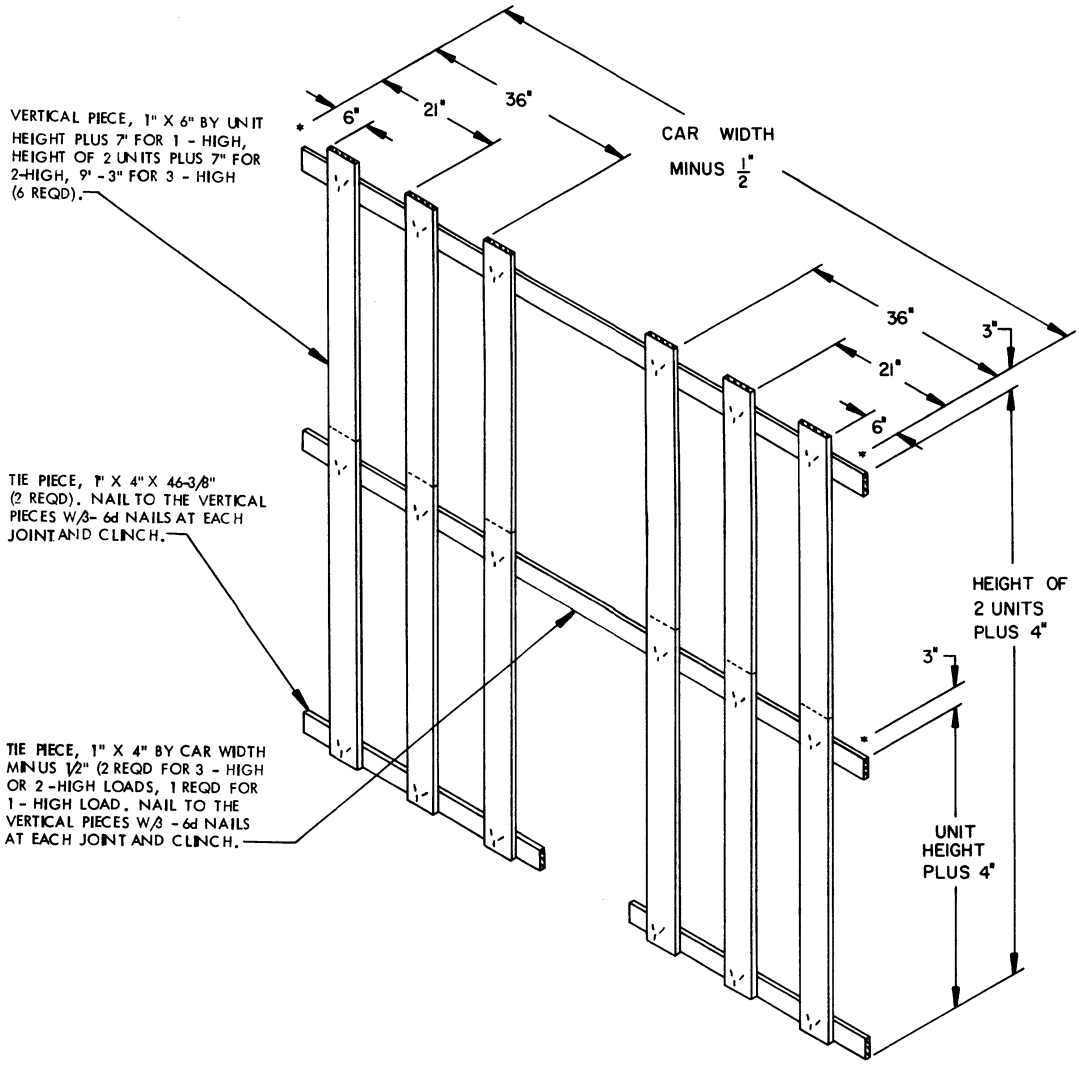
STRUT INSTALLATION

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

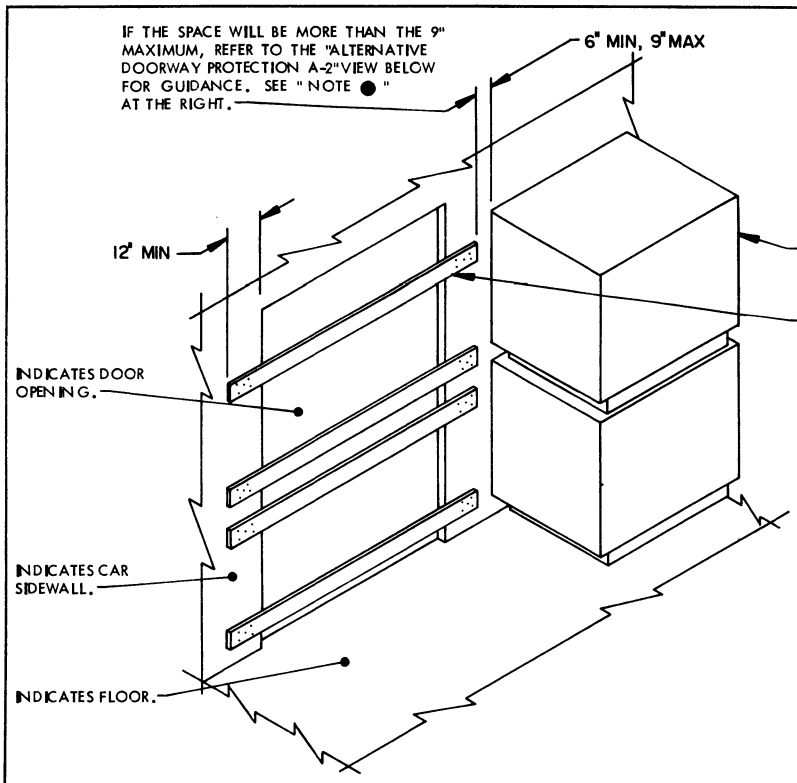


TYPICAL STRUT BRACING

SEE GENERAL NOTE "V" ON PAGE 3.



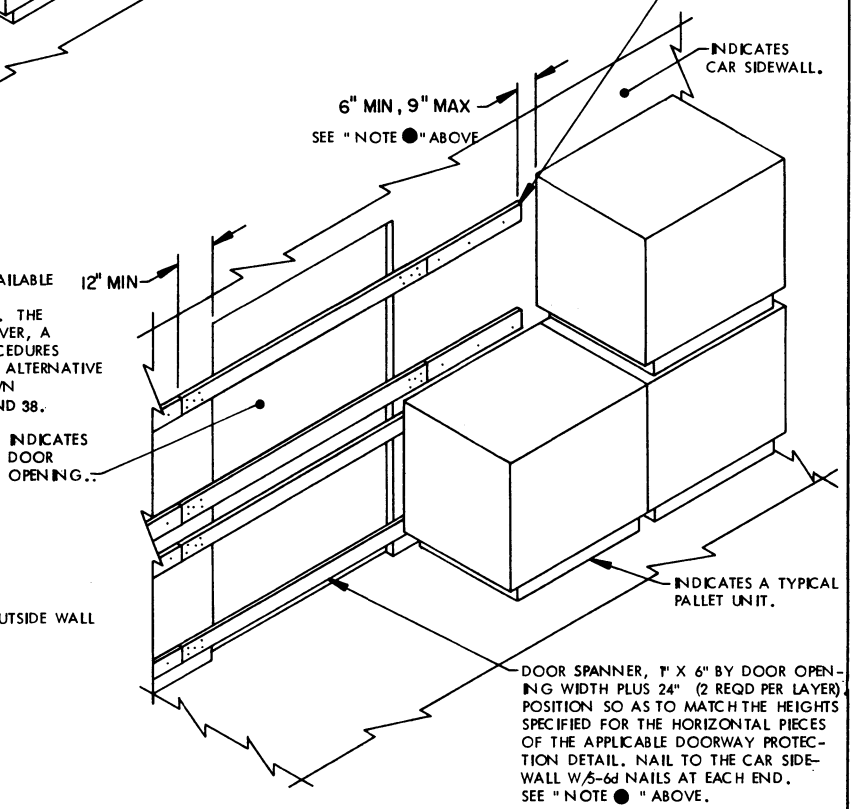
SEPARATOR GATE J



NOTE ● :
THE TOLERANCE DIMENSION (6" MIN, 9 MAX) IS ALLOWED TO PROVIDE FOR CLEARANCE DURING THE NORMAL LONGITUDINAL SHIFTING OF A LOAD IN TRANSIT.

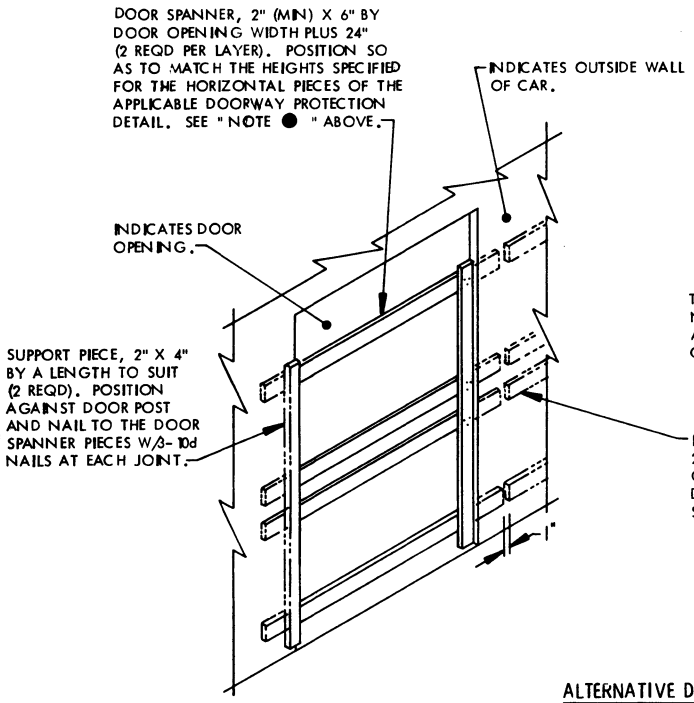
ALTERNATIVE DOORWAY PROTECTION A-1

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS HAVING NAILABLE SIDEWALLS AND EQUIPPED WITH CONVENTIONAL SLIDING DOORS, AND IS APPLICABLE ONLY FOR THE SIDE OPPOSITE THE LOADING SIDE OF THE CAR. THE METHOD CAN ALSO BE USED IN CARS EQUIPPED WITH PLUG DOORS; HOWEVER, A METHOD OTHER THAN THE "ALTERNATIVE DOORWAY PROTECTION A-3" PROCEDURES BELOW MUST BE USED ON THE LOADING SIDE OF THE CAR, SUCH AS THE " ALTERNATIVE DOORWAY PROTECTION C" PROCEDURES ON PAGE 79 OR THE NAILED-DOWN BLOCKING AND STEEL STRAPPING METHOD DEPICTED ON PAGES 12, 26, AND 38.



ALTERNATIVE DOORWAY PROTECTION A-2

THIS METHOD OF DOORWAY PROTECTION IF FOR USE IN CARS HAVING NAILABLE SIDEWALLS AND EQUIPPED WITH CONVENTIONAL SLIDING DOORS, AND IS APPLICABLE ONLY FOR THE SIDE OPPOSITE THE LOADING SIDE OF THE CAR. SEE THE NOTE UNDER THE "A- 1 " PROCEDURES.



ALTERNATIVE DOORWAY PROTECTION A-3

THIS VIEW DEPICTS THE DOOR OPENING OF A CAR AS IT APPEARS WHEN LOOKING AT IF FROM OUTSIDE OF THE CAR. THE METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS HAVING NAILABLE SIDEWALLS AND EQUIPPED WITH CONVENTIONAL SLIDING DOORS, AND IS APPLICABLE FOR THE LOADING SIDE OF THE CAR. NOTE THAT THE ADJACENT PALLET UNITS MUST BE POSITIONED APPROXIMATELY 1-3/4" (REF) FROM THE CAR SIDEWALL (1/4" MORE THAN THE THICKNESS OF THE DOOR SPANNER PIECES) TO FACILITATE THE INSTALLATION OF THESE DOOR SPANNER PIECES. THE VIEW SHOWN ABOVE IS FOR A TWO LAYER LOAD.

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

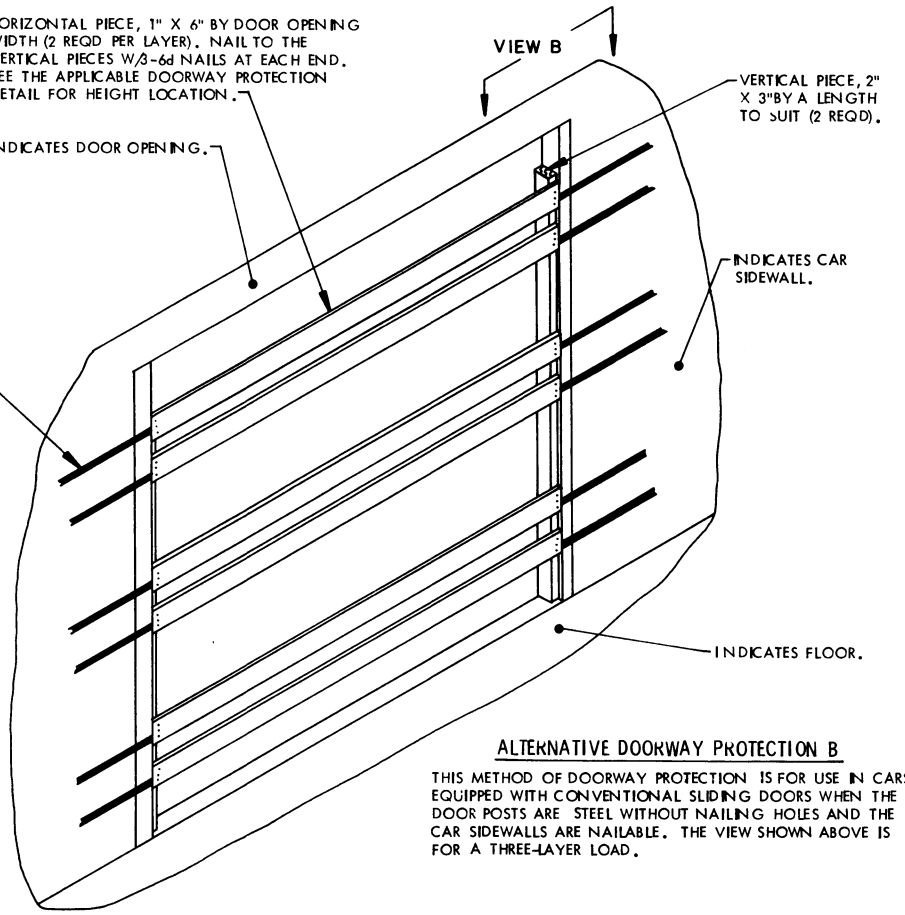
VIEW B

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

INDICATES DOOR OPENING.

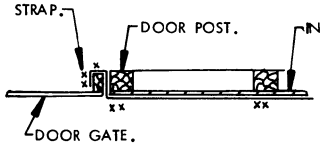
DOORWAY PROTECTION-GATE STRAP, 1-1/4" X .035" X 3'-0" (REF) NAIL-ON TYPE STEEL STRAPPING (4 REQD PER LAYER OF LOAD). NAIL TO GATE AND CAR SIDEWALL AS SHOWN BY THE "VIEW B" SKETCH BELOW. NOTE THAT TYPE 1 STRAPPING MAY BE PUNCHED FOR NAILING IF TYPE 2 STRAPPING IS NOT AVAILABLE.

INDICATES CAR SIDEWALL.



INDICATES FLOOR.

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



VIEW B

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

ALTERNATIVE DOORWAY PROTECTION B

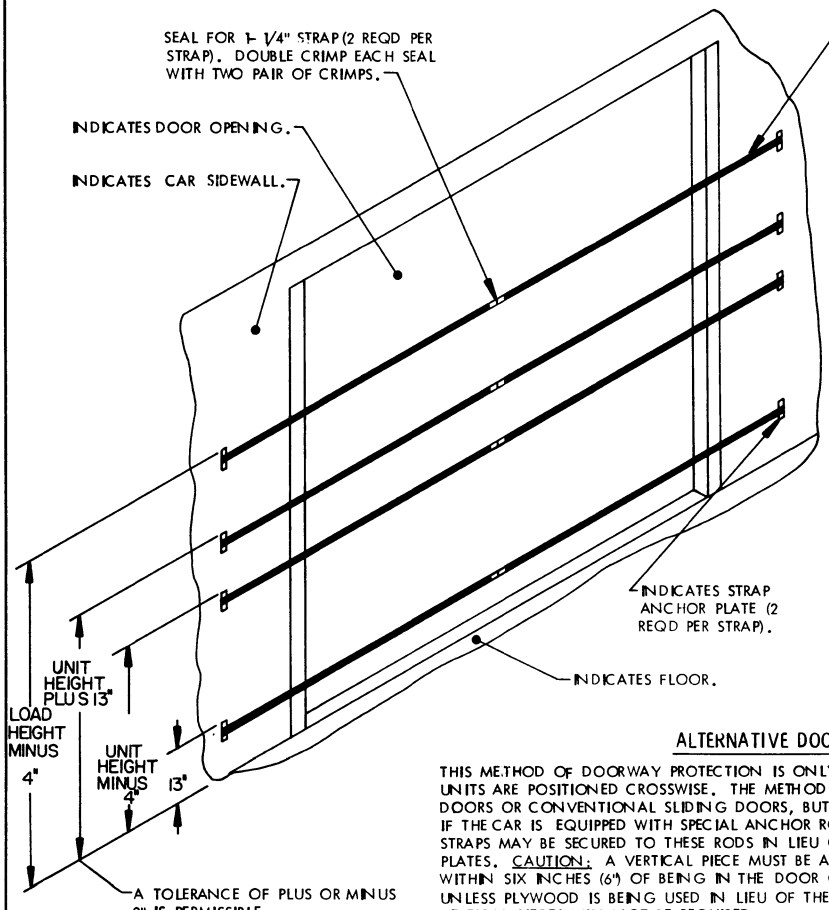
THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS WHEN THE DOOR POSTS ARE STEEL WITHOUT NAILING HOLES AND THE CAR SIDEWALLS ARE NAILABLE. THE VIEW SHOWN ABOVE IS FOR A THREE-LAYER LOAD.

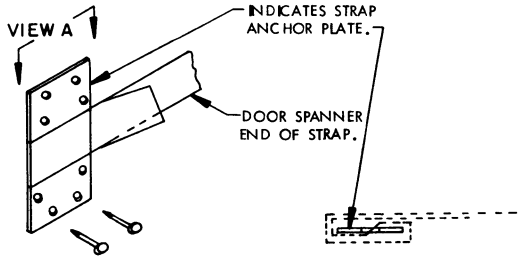
SEAL FOR 1-1/4" STRAP (2 REQD PER STRAP). DOUBLE CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS.

DOORWAY PROTECTION STRAP, 1-1/4" X .035" STEEL STRAPPING BY DOOR OPENING WIDTH PLUS 8'-0" IN LENGTH (2 REQD PER LAYER). INSTALL FROM TWO (2) PIECES. THREAD ONE END THRU A STRAP ANCHOR PLATE AS SHOWN BY THE "APPLICATION OF STRAPPING TO STRAP ANCHOR PLATE" DETAILS BELOW. NAIL STRAP ANCHOR PLATE TO CAR SIDEWALL W/4- SIGNODE NUMBER 27 RING-LOCK NAILS.

INDICATES DOOR OPENING.

INDICATES CAR SIDEWALL.





ISOMETRIC VIEW

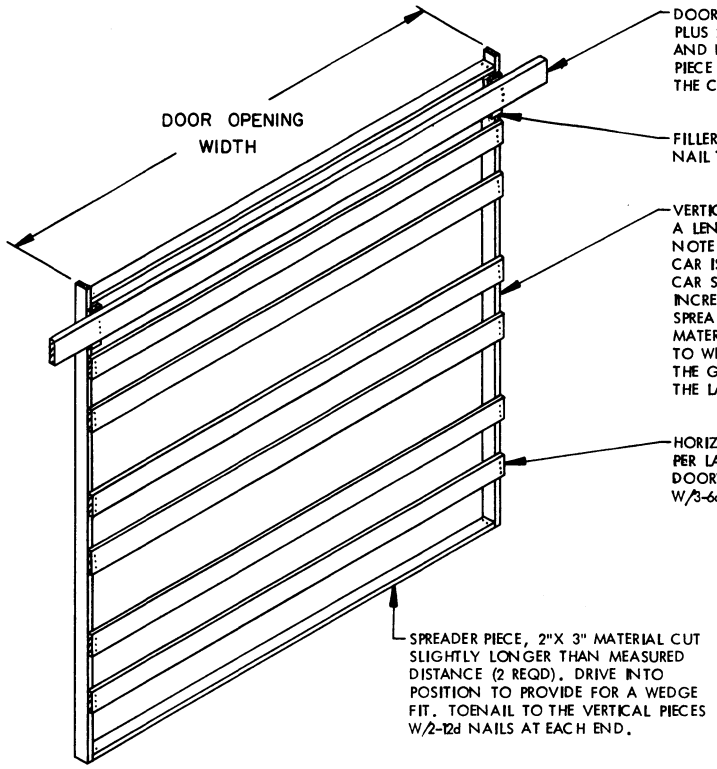
VIEW A

APPLICATION OF STRAPPING TO STRAP ANCHOR PLATE

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

ALTERNATIVE DOORWAY PROTECTION C

THIS METHOD OF DOORWAY PROTECTION IS ONLY FOR USE WITH THOSE LOADS IN WHICH THE PALLET UNITS ARE POSITIONED CROSSWISE. THE METHOD MAY BE USED IN CARS EQUIPPED WITH EITHER PLUG TYPE DOORS OR CONVENTIONAL SLIDING DOORS, BUT ONLY IF THE CAR IS EQUIPPED WITH NAILABLE SIDEWALLS. IF THE CAR IS EQUIPPED WITH SPECIAL ANCHOR RODS IN THE CAR DOOR POSTS, THE DOORWAY PROTECTION STRAPS MAY BE SECURED TO THESE RODS IN LIEU OF ATTACHING TO THE CAR SIDEWALL WITH STRAP ANCHOR PLATES. CAUTION: A VERTICAL PIECE MUST BE ADDED TO EACH END OF A CENTER GATE WHICH IS IN OR WITHIN SIX INCHES (6") OF BEING IN THE DOOR OPENING, TO PREVENT THE GATE FROM SHIFTING LATERALLY, UNLESS PLYWOOD IS BEING USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES IN WHICH CASE THE ADDED VERTICAL PIECES WILL NOT BE REQUIRED.



DOOR SPANNER, 2" X 6" BY DOOR OPENING WIDTH PLUS 24" (1 REQD). POSITION ABOVE THE LOAD AND NAIL THRU A FILLER BLOCK INTO A VERTICAL PIECE W/3-12d NAILS AT EACH JOINT. NAIL TO THE CAR SIDEWALL W/3-12d NAILS AT EACH END. (OPTIONAL)

FILLER BLOCK, 1" X 4" X 9" (2 REQD). NAIL TO A VERTICAL PIECE W/4-6d NAILS.

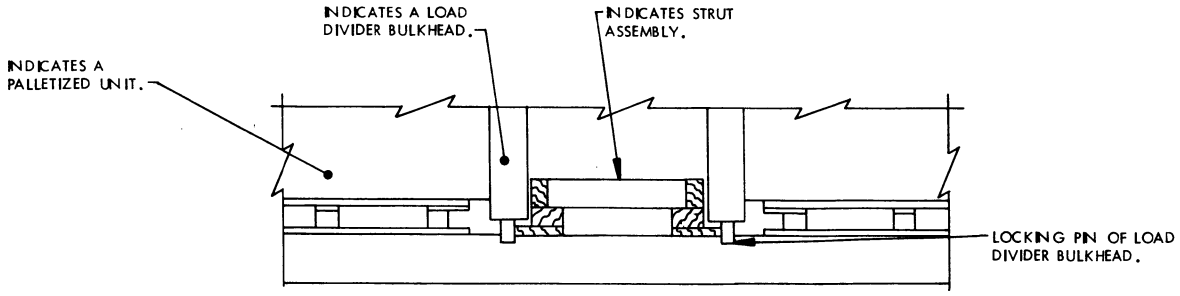
VERTICAL PIECE, 2" X 3" BY A LENGTH TO SUIT (2 REQD). NOTE THAT IF THE EXCESS SPACE ACROSS A CAR IS FILLED BY NAILING LUMBER TO THE CAR SIDEWALL, IT MAY BE NECESSARY TO INCREASE THE VERTICAL PIECES AND THE SPREADER PIECES TO 2"X 4" OR 2"X 6" MATERIAL. THIS WILL PROVIDE A SURFACE TO WEDGE BETWEEN THE DOOR POST WHEN THE GATE IS MOVED INWARD TO CONTACT THE LADING.

HORIZONTAL PIECE, 1"X 6" BY DOOR OPENING WIDTH (2 REQD PER LAYER). LOCATE AT HEIGHTS AS SPECIFIED BY THE APPLICABLE DOORWAY PROTECTION DETAIL. NAIL TO THE VERTICAL PIECES W/3-6d NAILS AT EACH END.

SPREADER PIECE, 2"X 3" MATERIAL CUT SLIGHTLY LONGER THAN MEASURED DISTANCE (2 REQD). DRIVE INTO POSITION TO PROVIDE FOR A WEDGE FIT. TOENAIL TO THE VERTICAL PIECES W/2-12d NAILS AT EACH END.

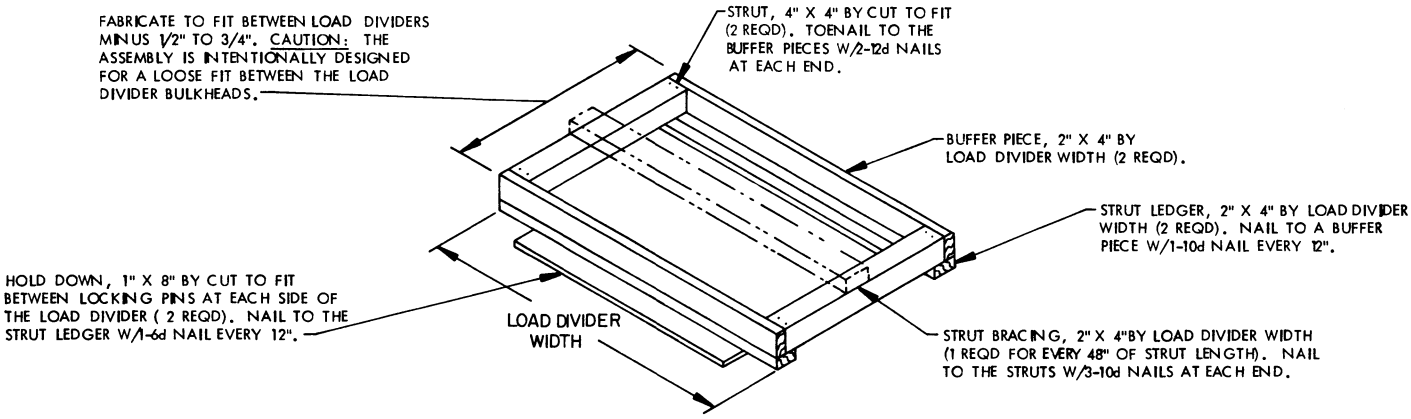
ALTERNATIVE DOORWAY PROTECTION D

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS WHEN THE DOOR POSTS ARE NOT NAILABLE. IF THE CAR HAS NAILABLE SIDEWALLS, NAIL-ON TYPE STRAPPING MAY BE USED TO SECURE THE GATE IN LIEU OF USING THE SPREADER PIECES. SEE THE "ALTERNATIVE DOORWAY PROTECTION B" DETAIL ON PAGE 79 FOR GUIDANCE.



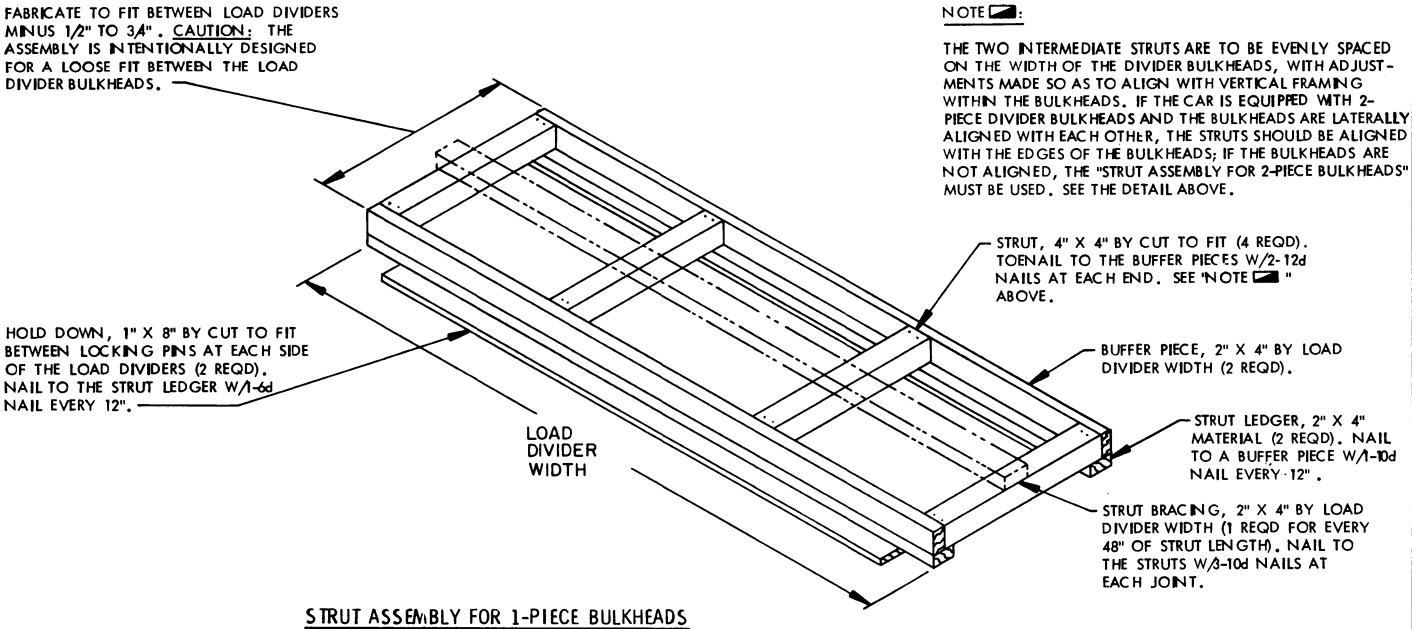
INSTALLATION OF STRUT ASSEMBLY

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



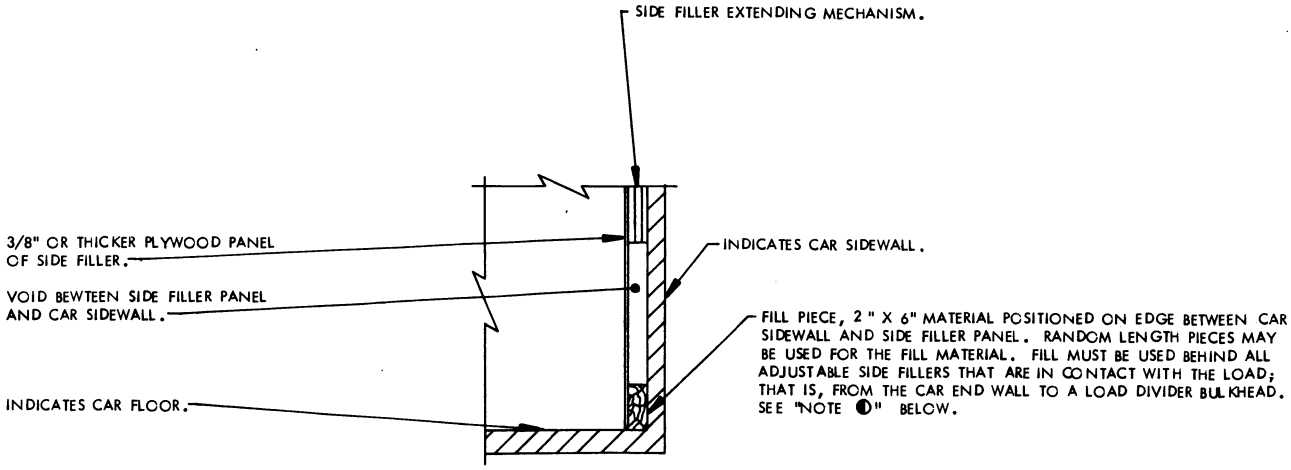
STRUT ASSEMBLY FOR 2-PIECE BULKHEADS

A STRUT ASSEMBLY IS REQUIRED WHEN THE LOAD BEHIND EITHER LOAD DIVIDER BULKHEADS EXCEEDS 50,000 POUNDS OF CLASS A OR CLASS B EXPLOSIVES. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF CLASS C EXPLOSIVES, REGARDLESS OF THE WEIGHT OF THE LOAD. NOTE: TWO (2) ASSEMBLIES AS SHOWN ARE REQUIRED FOR A 2-PIECE BULKHEAD IF NOT LATERALLY ALIGNED. SEE "NOTE ◪" BELOW.



STRUT ASSEMBLY FOR 1-PIECE BULKHEADS

A STRUT ASSEMBLY IS REQUIRED WHEN THE LOAD BEHIND EITHER LOAD DIVIDER BULKHEAD EXCEEDS 50,000 POUNDS OF CLASS A OR CLASS B EXPLOSIVES. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF CLASS C EXPLOSIVES, REGARDLESS OF THE WEIGHT OF THE LOAD.

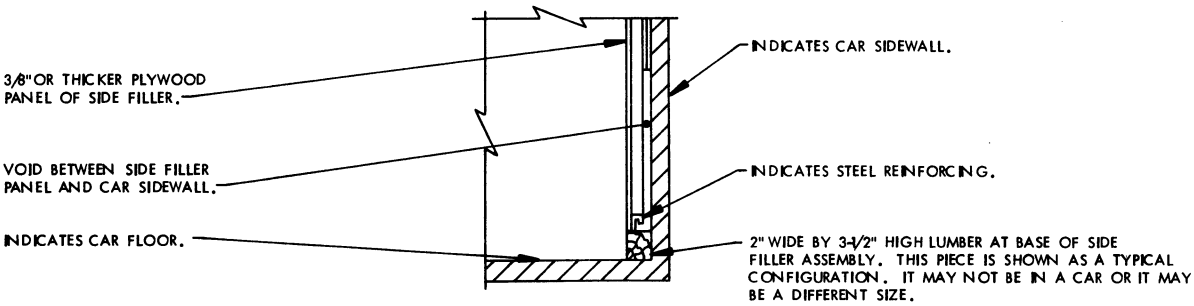


TYPICAL TYPE A

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.