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 RAILROADS  
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# LOADING AND BRACING (CL & LCL) IN BOX CARS OF PALLETIZED PROPELLING CHARGES PACKED IN CYLINDRICAL METAL CONTAINERS M18 SERIES CONTAINER

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

THIS DRAWING SUPERSEDES THE CARLOADING PORTIONS DELINEATED ON PAGES 42 THRU 73 OF DRAWING 19-48-4042-1-2-5-11-14PM1000, DATED 8 FEBRUARY 1965 AND REVISION 1, DATED 29 AUGUST 1969.

DO NOT SCALE

REVISIONS				DATE	BY	CHECKED	DATE	BY
				19	48	4042B/5	5PM	1000
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## GENERAL NOTES

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE OUTLOADING PROCEDURES SPECIFIED IN THIS DRAWING ARE APPLICABLE FOR THE M18 SERIES PROPELLING CHARGE CONTAINER WHEN UNITIZED ON A 40" X 48" PALLET. SEE THE PICTORIAL VIEWS ON PAGE 4. REFER TO THE U.S. ARMY DARCOM DRAWING 19-48-4042A/5-20PM1001 FOR UNITIZATION PROCEDURES FOR THE M18 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 93 FOR GUIDANCE.
- E. 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 HEREIN. A LOAD PLAN SHOULD BE DEVELOPED WHICH WILL BE THE MOST EFFICIENT AS TO THE AMOUNT OF DUNNAGE REQUIRED AND THE EASE OF LOADING, FOR THE QUANTITY TO BE SHIPPED. THE LOAD PLANNING CHARTS ON PAGE 68 MAY BE USED IN CONJUNCTION WITH THE DEPICTED LOADING PROCEDURES FOR GUIDANCE.
- F. 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.
- G. 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 94 FOR GUIDANCE.
- H. 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.
- J. 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.

(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	FED SPEC QQ-S-781; CLASS I, TYPE I OR IV, HEAVY DUTY, FINISH A, B (GRADE 2), OR C.
STRAP SEAL	FED SPEC QQ-S-781; TYPE D, STYLE I, II, OR IV, CLASS H, FINISH A, B (GRADE 2) OR C.
STRAP STAPLE	COMMERCIAL GRADE.
PLYWOOD	GROUP B, CONSTRUCTION AND INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D, FED SPEC NN-P-330. IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER INTERIOR OR AN EXTERIOR GRADE MAY BE SUBSTITUTED.
WIRE	FED SPEC QQ-W-461.
HARDBOARD	FED SPEC LL-B-810.
SOLID FIBERBOARD	FED SPEC PP-F-320; TYPE 5F, CLASS DOMESTIC, GRADE 175 OR STRONGER; OR TYPE 5F, CLASS WEATHER-RESISTANT, GRADE W65 OR STRONGER.

## ( GENERAL NOTES CONTINUED )

- K. 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.
- L. 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".
- M. **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.
- N. POWER DRIVEN STAPLES MAY BE USED AS ALTERNATIVE FASTENERS FOR NAILS WHEN CONSTRUCTING DUNNAGE ASSEMBLIES WHICH ARE TO BE USED IN THE DELINEATED CAR LOADS SHOWN THROUGHOUT THIS DRAWING. THE STAPLES TO BE USED MUST BE EQUAL IN LENGTH TO THE SPECIFIED NAIL SIZE AND MUST BE SUBSTITUTED ON A ONE STAPLE FOR ONE NAIL BASIS. STAPLES WHICH ARE 2" 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.
- O. 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 100 FOR GUIDANCE.
- P. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES, AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS 0.454KG.
- 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.

## GENERAL NOTES

( FOR CONVENTIONAL TYPE BOX CARS )

- S. IF THE CAR BEING USED FOR A SHIPMENT IS EQUIPPED WITH A NAILABLE METAL FLOOR AND A NAIL SIZE FOR FLOOR NAILING IS MARKED ON THE SIDEWALL OF THE CAR, THAT GUIDANCE SHOULD BE APPLIED TO THE NAILING OF THE "DOORWAY BLOCKING" PIECES IN THE FULL LOADS AND TO THE NAILING TO THE CAR FLOOR OF THE LCL BRACES AND KNEE BRACE ASSEMBLIES IN THE LESS-THAN-FULL LOADS. IF A NAIL SIZE IS NOT SPECIFIED IN THE CAR, 30d NAILS SHOULD BE USED IN LIEU OF THOSE SPECIFIED IN THE APPLICABLE KEY NUMBERS. SEE GENERAL NOTE "M" ABOVE.
- T. **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 INTO THEIR FINAL SHIPPING POSITION. A HYDRAULIC JACK IS RECOMMENDED FOR THIS OPERATION. **CAUTION:** WHEN USING A JACK TO COMPACT A LOAD, THE JACK MUST BE USED AGAINST STRONG POINTS OF THE 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.

( GENERAL NOTES CONTINUED )

- U. 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" IN THE LOAD VIEWS ON PAGES 22, 26 AND 28. 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.
- V. 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 99 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.
- W. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

GENERAL NOTES

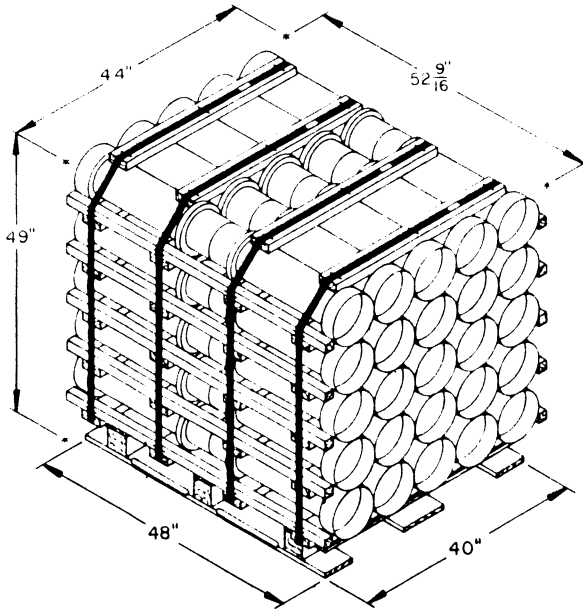
( FOR BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES )

- X. 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 MEMBER ARE OFF-CENTER. NOTE: IT IS RECOMMENDED THAT EACH CROSS MEMBER BE INSTALLED WITH THE ENDS ATTACHED AS NEARLY AS POSSIBLE IN "MATED" POSITIONS ( AT EQUAL HEIGHTS AND AT EQUAL DISTANCES FROM THE END OF THE CAR ).
  2. CAUTION: ALL BLOCKING AND BRACING COMPONENTS IN EMPTY CARS AND ALL UNUSED COMPONENTS IN LOADED CARS MUST BE "SECURED" FOR SHIPMENT—ADJUSTABLE WALL MEMBERS TO VERTICAL WALL ATTACHMENT RAILS, AND CROSS MEMBERS TO ADJUSTABLE WALL MEMBERS OR TO FIXED HORIZONTAL WALL MEMBERS OR TO DOORWAY MEMBERS, AND DOORWAY MEMBERS TO DOOR POSTS. COMPONENTS ASSIGNED TO EACH CAR MUST REMAIN THEREWITH EVEN THOUGH UNUSED DURING SOME SHIPMENTS.
- Y. 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.
- Z. 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 )

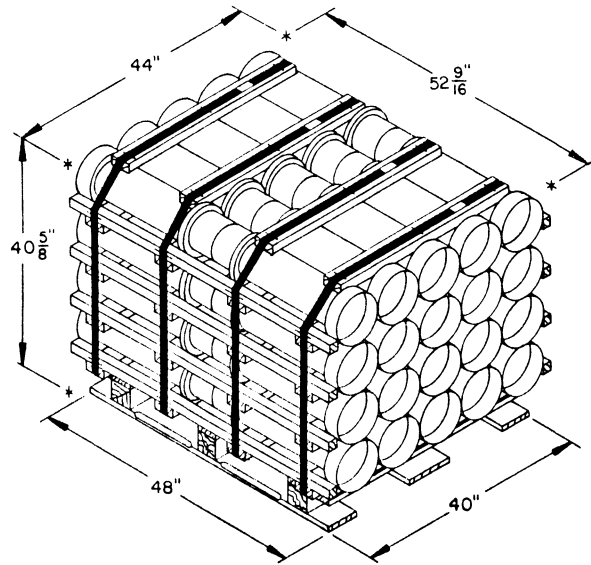
- AA. CAUTION: FOR CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS, ONLY CARS EQUIPPED WITH LOAD DIVIDERS MANUFACTURED BY EVANS, EQUIPCO, OR PRECO MAY BE USED. LOAD DIVIDERS MANUFACTURED BY TRANSCO ARE NOT ACCEPTABLE, WHETHER OF ALUMINUM OR STEEL CONSTRUCTION. THE DEPICTED PROCEDURES ARE APPLICABLE FOR CARS OF VARIOUS LENGTHS AND WIDTHS. THE AAR MECHANICAL DESIGNATION CLASS FOR THESE CARS, AS IDENTIFIED IN "THE OFFICIAL RAILWAY EQUIPMENT REGISTER", WILL BE RBL, XL, OR XLI.
- BB. THE USE OF LOAD DIVIDER EQUIPPED CARS WILL ELIMINATE THE NEED FOR CENTER GATES AND STRUTS, AND GATE HOLD DOWNS ( WHEN APPLICABLE ) WHICH ARE REQUIRED IN CONVENTIONAL BOX CAR LOADS. THIS WILL ACCOUNT FOR A CONSIDERABLE SAVING IN MATERIAL AND LABOR COSTS. THEREFORE, EVERY EFFORT SHOULD BE MADE TO ACQUIRE CUSHIONED CARS EQUIPPED WITH LOAD DIVIDERS FOR SHIPMENT OF 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.
- CC. 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 102 FOR GUIDANCE. IF THE BACK OF THE SIDE FILL PANELS ARE REINFORCED WITH VERTICAL AND HORIZONTAL STEEL MEMBERS AS SHOWN IN THE "TYPICAL TYPE B" VIEW ON PAGE 102, THE "FILL PIECE" MATERIAL IS NOT REQUIRED.
- DD. NOTICE: AFTER THE LOAD DIVIDER BULKHEADS ARE POSITIONED AGAINST THE LADING, AND THE LOCKING PINS ARE ENGAGED IN THE HOLES OF THE RAILS, THE LOWER LOCKING PINS MUST BE INSPECTED TO ENSURE THAT THE PINS ARE FULLY ENGAGED IN THE LOCKING HOLES. IF THE PINS ARE NOT FULLY SEATED IN THE LOCKING HOLES, THE LINKAGE MECHANISM WILL BE ADJUSTED AS REQUIRED SO THAT THE PINS WILL BE FULLY SEATED INTO THE LOCKING HOLES OF THE LOWER RAILS. IF PRESENT, DEBRIS MUST BE REMOVED FROM BENEATH THE LOCKING HOLES WHICH HAVE BEEN SELECTED FOR SECURING A LOAD DIVIDER BULKHEAD.
- EE. A "STRUT ASSEMBLY" MUST BE INSTALLED BETWEEN THE LOAD DIVIDER BULKHEADS IF THE CAR CONTAINS CLASS A OR CLASS B EXPLOSIVES AND THE LOAD IN EITHER END OF THE CAR WEIGHS 50,000 POUNDS OR MORE. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF CLASS C EXPLOSIVES. NOTE THAT THE STRUT ASSEMBLY MAY BE OMITTED FROM LOADS OF CLASS A OR B EXPLOSIVES WEIGHING 50,000 POUNDS WHEN THE LADING AND ADEQUATE BLOCKING AND BRACING ARE POSITIONED TO COMPLETELY FILL THE SPACE BETWEEN THE SPACE BETWEEN THE INSTALLED BULKHEADS AS SPECIFIED IN GENERAL NOTE "FF-3" BELOW. DETAILS OF STRUT ASSEMBLIES FOR USE BETWEEN 2-PIECE BULKHEADS AND BETWEEN 1-PIECE BULKHEADS ARE SHOWN ON PAGE 101.
- FF. 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 74 THRU 77.
  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 70 THRU 73 FOR GUIDANCE.
  3. AT LOCATION ( S ) WHERE K-BRACES MIGHT NORMALLY BE USED IN A LOAD IN A CONVENTIONAL CAR, LOAD DIVIDER BULKHEADS CAN BE POSITIONED. LOADING CAN THEN CONTINUE TOWARD THE CENTER OF THE CAR FROM EACH INSTALLED LOAD DIVIDER BULKHEAD, IN 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 BULKHEAD ON THE CENTER-OF-CAR SIDE. BLOCK AND BRACE WITH LCL BRACES AS SHOWN ON PAGE 88, OR WITH KNEE BRACE ASSEMBLIES, AS SHOWN ON PAGE 84.
- GG. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.



**FLAT DUNNAGE METHOD UNIT ( BASIC HEIGHT )**

CONTAINER ----- 50 EACH @ 31 LBS ( APPROX )  
 CUBE ----- 65.6 CUBIC FEET ( APPROX )  
 GROSS WEIGHT ----- 1,779 LBS ( APPROX )

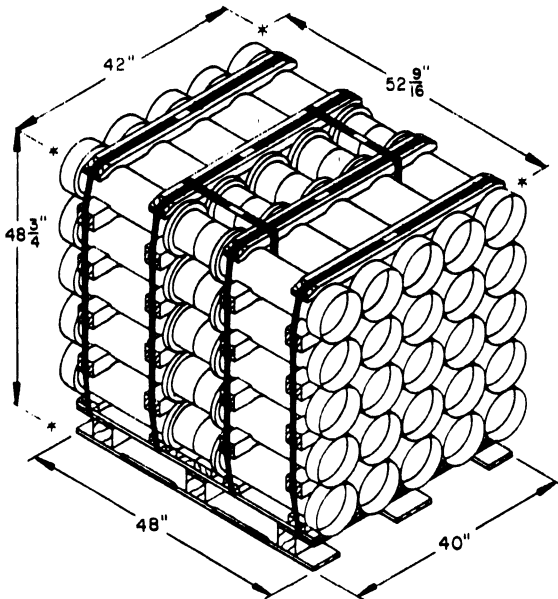
REFER TO PAGES 6 THRU 15 FOR UNLOADING PROCEDURES.



**FLAT DUNNAGE METHOD UNIT ( DECREASED HEIGHT )**

CONTAINER ----- 40 EACH @ 31 LBS ( APPROX )  
 CUBE ----- 54.4 CUBIC FEET ( APPROX )  
 GROSS WEIGHT ----- 1,443 LBS ( APPROX )

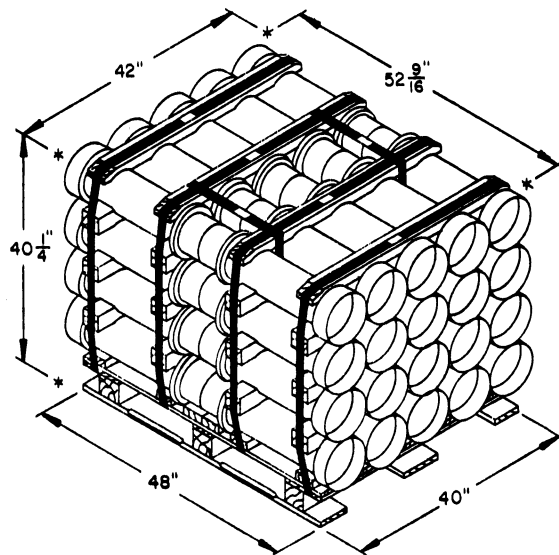
REFER TO PAGES 22 THRU 33 FOR UNLOADING PROCEDURES.



**ROUTED DUNNAGE METHOD UNIT ( BASIC HEIGHT )**

CONTAINER ----- 50 EACH @ 31 LBS ( APPROX )  
 CUBE ----- 62.3 CUBIC FEET ( APPROX )  
 GROSS WEIGHT ----- 1,792 LBS ( APPROX )

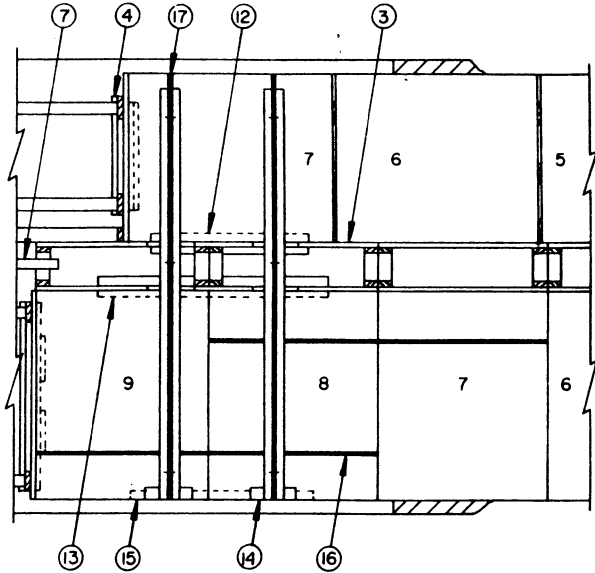
REFER TO PAGES 38 THRU 47 FOR UNLOADING PROCEDURES.



**ROUTED DUNNAGE METHOD UNIT ( DECREASED HEIGHT )**

CONTAINER ----- 40 EACH @ 31 LBS ( APPROX )  
 CUBE ----- 51.4 CUBIC FEET ( APPROX )  
 GROSS WEIGHT ----- 1,453 LBS ( APPROX )

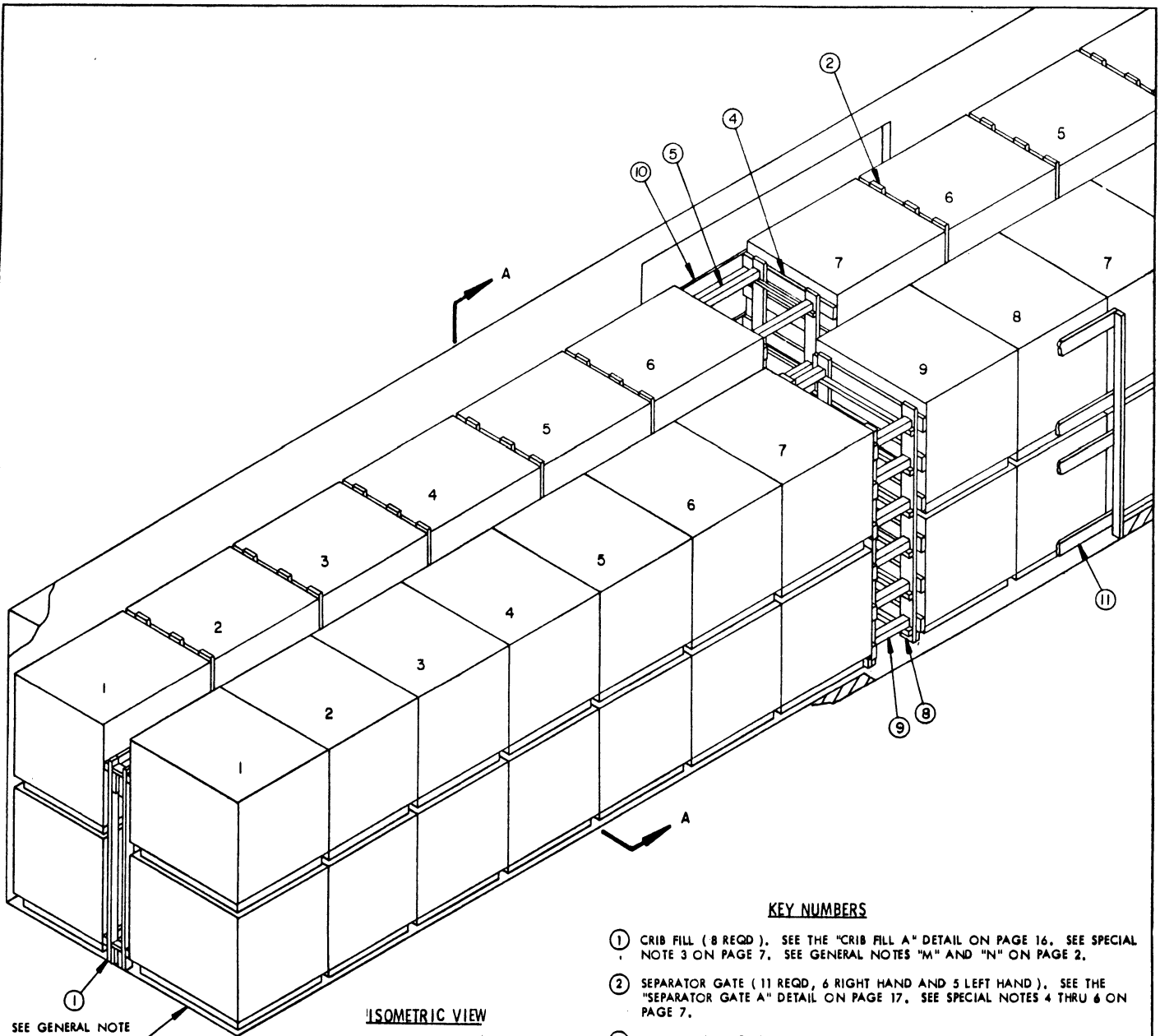
REFER TO PAGES 52 THRU 61 FOR UNLOADING PROCEDURES.



**PARTIAL PLAN VIEW B**  
(LOAD VIEW PAGE 6)

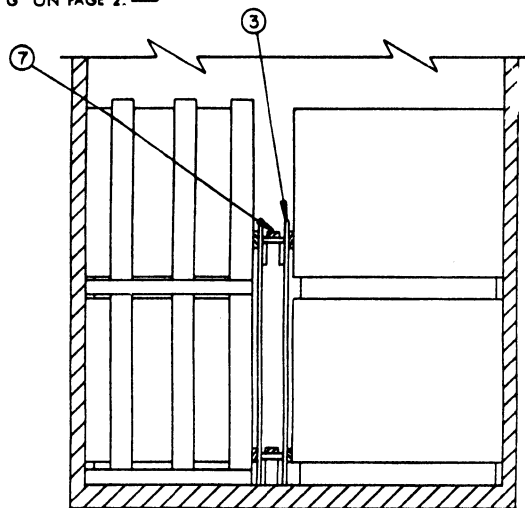
**KEY NUMBERS**

- ⑫ SIDE BLOCKING, 2" X 6" X 40" OR A LENGTH TO SUIT (DOUBLED) (1 REQD). POSITION AS SHOWN. NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ⑬ SIDE BLOCKING, 2" X 6" X 60" OR A LENGTH TO SUIT (DOUBLED) (1 REQD). PRE-POSITION 51" FROM THE NEAR SIDE CAR WALL AND NAIL AS DIRECTED IN KEY NUMBER ⑫ ABOVE W/8-16d NAILS.
- ⑭ STRAPPING BOARD/SPACER ASSEMBLY D (12 REQD). SEE THE DETAIL ON PAGE 21.
- ⑮ BATTEN, 2" X 2-1/2" (ACTUAL SIZE) X 36" OR A LENGTH TO SUIT (DOUBLED) (1 REQD). LAMINATE W/6-10d NAILS. POSITION UNDER CONTAINER ENDS PRIOR TO TENSIONING STRAP.
- ⑯ BUNDLING STRAP, 1-1/4" X .031" OR .035" X 32'-6" LONG STEEL STRAPPING (2 REQD). PRE-POSITION THE FIRST STRAP BEFORE LOADING PALLET STACK NO. 7, PRE-POSITION THE SECOND STRAP BEFORE LOADING PALLET STACK NO. 8. TENSION AND SEAL THE STRAP THAT ENCIRCLES PALLET STACK NUMBERS 7 AND 8, THEN REPEAT THE PROCEDURE FOR PALLET STACKS 8 AND 9.
- ⑰ BUNDLING STRAP, 1-1/4" X .031" OR .035" X 36'-0" LONG STEEL STRAPPING (2 REQD). POSITION AS SHOWN. STAPLE TO STRAPPING BOARD MARKED ⑭ W/3 STAPLES.
- ⑱ SEAL FOR 1-1/4" STRAPPING (8 REQD, 2 PER JOINT). SEE GENERAL NOTE "O" ON PAGE 2. NOTE: THE SEAL IS NOT SHOWN.



ISOMETRIC VIEW

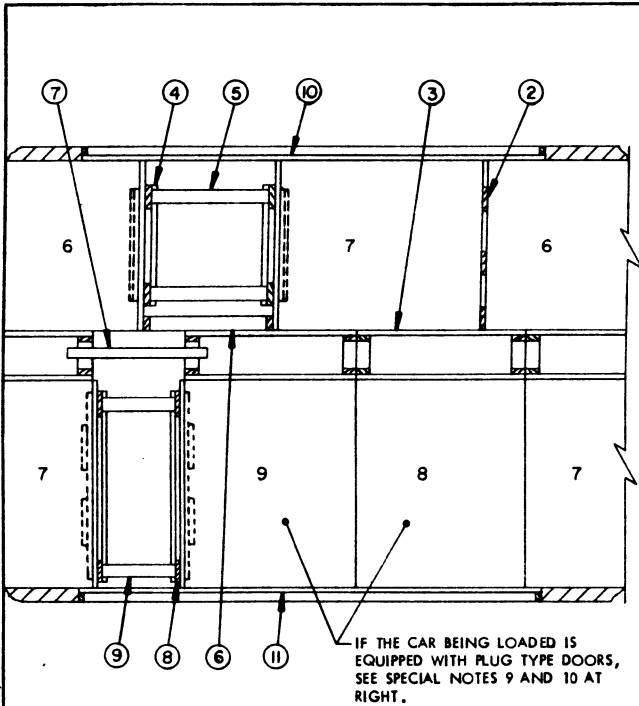
SEE GENERAL NOTE "G" ON PAGE 2.



SECTION A-A

KEY NUMBERS

- ① CRIB FILL ( 8 REQD ). SEE THE "CRIB FILL A" DETAIL ON PAGE 16. SEE SPECIAL NOTE 3 ON PAGE 7. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.
- ② SEPARATOR GATE ( 11 REQD, 6 RIGHT HAND AND 5 LEFT HAND ). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 17. SEE SPECIAL NOTES 4 THRU 6 ON PAGE 7.
- ③ CRIB FILL ( 8 REQD ). SEE THE "CRIB FILL B" DETAIL ON PAGE 16.
- ④ CENTER GATE ( 2 REQD ). SEE THE "CENTER GATE A" DETAIL ON PAGE 16. SEE SPECIAL NOTE 7 ON PAGE 7.
- ⑤ STRUT, 4" X 4" BY CUT TO FIT ( REF: 30" ) ( 8 REQD ). TOENAIL TO PIECES MARKED ④ W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "L" ON PAGE 2, AND GENERAL NOTES "U" AND "V" ON PAGE 3.
- ⑥ STRUT, 2" X 4" BY CUT TO FIT ( REF: 30" ) ( 2 REQD ). TOENAIL TO THE STOP PIECES OF PIECE MARKED ④ W/2-12d NAILS AT EACH END. SEE THE "PARTIAL PLAN VIEW A" DETAIL ON PAGE 7.
- ⑦ CRIB FILL RETAINER, 2" X 4" BY A LENGTH TO SUIT ( REF: 36" ) ( 2 REQD ). POSITION TO SPAN THE STRUTS OF LONGITUDINALLY ADJACENT CRIB FILL "B" ASSEMBLIES AND NAIL TO EACH STRUT W/3-10d NAILS. SEE THE "PARTIAL PLAN VIEW A" ON PAGE 7.
- ⑧ CENTER GATE ( 2 REQD ). SEE THE "CENTER GATE B" DETAIL ON PAGE 17.
- ⑨ STRUT, 4" X 4" BY CUT TO FIT ( REF: 18" ) ( 12 REQD ). TOENAIL TO PIECES MARKED ⑧ W/2-16d NAILS AT EACH END.
- ⑩ DOORWAY PROTECTION ( 1 REQD ). SEE THE "DOORWAY PROTECTION A" DETAIL ON PAGE 18. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 8 ON PAGE 7.
- ⑪ DOORWAY PROTECTION ( 1 REQD ). SEE THE "DOORWAY PROTECTION B" DETAIL ON PAGE 19. NAIL TO THE DOOR POSTS W/12d NAILS.



**PARTIAL PLAN VIEW A**

**SPECIAL NOTES:**

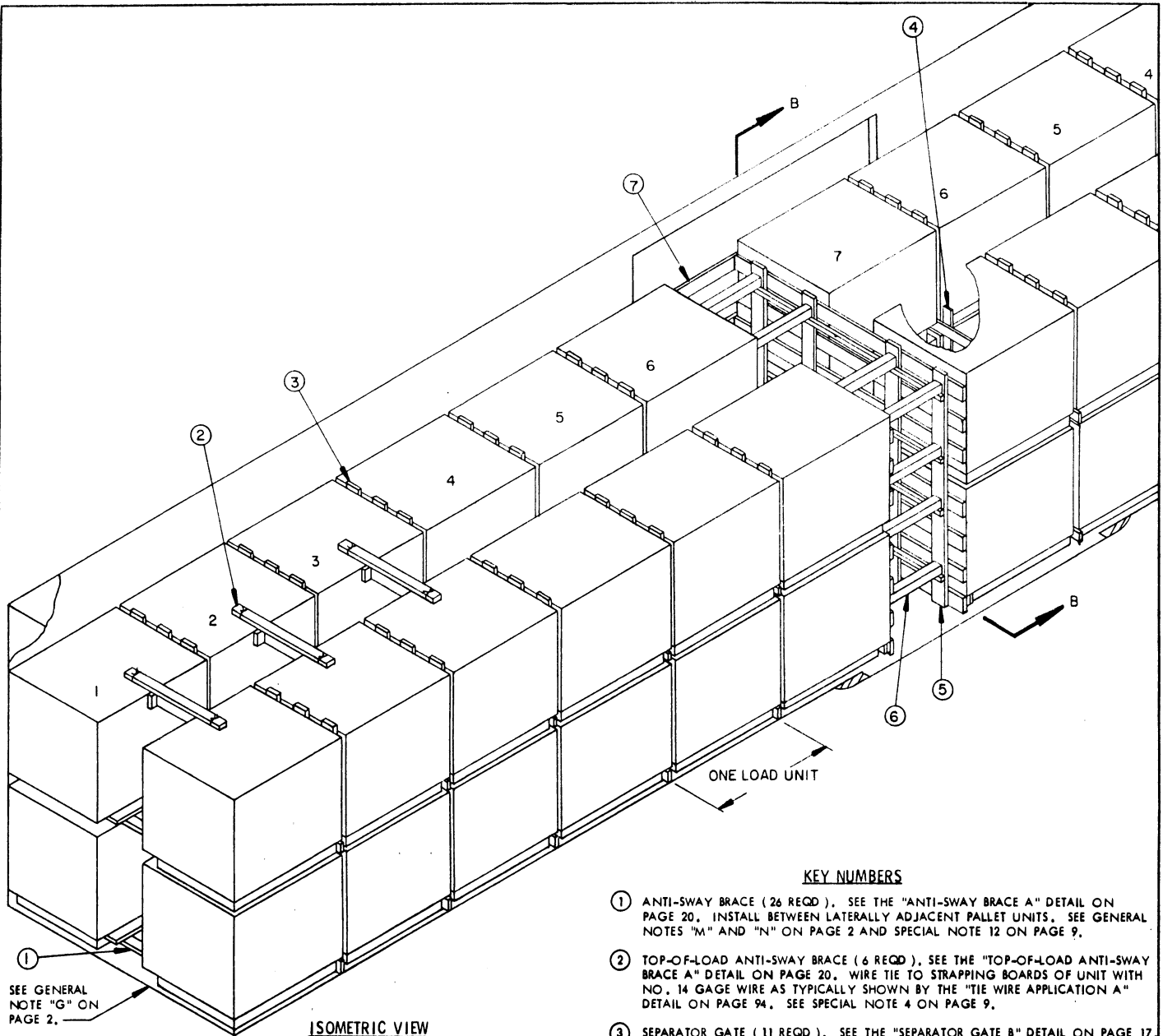
1. A 60'-8" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 6 IS THE FLAT DUNNAGE METHOD UNIT (BASIC HEIGHT). A MAXIMUM OF FORTY-EIGHT (48) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 85,392 POUNDS, CAN BE PLACED IN A 50'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES THIRTY-SIX (36) UNITS, FOR A LADING WEIGHT OF 64,044 POUNDS, CAN BE OUTLOADED IN A 40'-6" LONG CAR.
3. THE "HIGH" CRIB, SHOWN AS PIECE MARKED ①, MUST BE INSTALLED IN EACH END OF THE LOAD. FOUR (4) ASSEMBLIES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
4. THE SEPARATOR GATES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 6, ARE DESIGNATED "RIGHT HAND" AND "LEFT HAND" TO FACILITATE POSITIONING OF THE PALLET UNITS AS LOADING PROGRESSES. WHEN LOADING THE CAR, POSITION A PALLET UNIT STACK AGAINST THE END WALL, THEN POSITION A SEPARATOR GATE SO THE 1" X 4" TIE PIECES ARE LOCATED UNDER THE "OVERHANG" OF THE BOTTOM AND TOP PALLET UNITS IN THE FIRST STACK. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.
5. ALL SEPARATOR GATES WHICH ARE WITHIN THE DOORWAY AREA OF A CAR EQUIPPED WITH CONVENTIONAL SLIDING DOORS MUST BE WIRE TIED TO THE ADJACENT CRIB FILL TO PREVENT DISPLACEMENT. ENCIRCLE A VERTICAL PIECE OF THE SEPARATOR GATE AND THE UPPER HORIZONTAL PIECE OF THE CRIB FILL WITH NO. 14 GAGE WIRE AND TWIST TAUT.
6. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLYWOOD IN LIEU OF DIMENSIONAL LUMBER, IF DESIRED. CONSTRUCT EACH GATE 44" WIDE BY 8'-0" LONG.
7. CENTER GATES "A" AND "B" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD, IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE" DETAIL ON PAGE 95 FOR GUIDANCE.
8. 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 ⑩ AND ⑪ 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 LOAD BUNDLING STRAPS MAY BE USED. REFER TO PAGES 97 THRU 99 FOR OTHER TYPES OF DOORWAY PROTECTION.
9. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED SIDE BLOCKING AND LOAD BUNDLING STRAPS MUST BE USED. SEE THE "PARTIAL PLAN VIEW B" DETAIL, AND KEY NUMBERS ⑫ THRU ⑬ ON PAGE 5 FOR GUIDANCE. NOTE THAT THE CRIB FILL MARKED ③ MUST HAVE 3" CUT OFF EACH VERTICAL AND BOTTOM SUPPORT PIECE THAT RESTS ON THE SIDE BLOCKING; ALSO CENTER GATE "A" MUST BE WIRE TIED TO PIECE MARKED ⑦ TO PREVENT DISPLACEMENT.
10. IF THE PALLET STACKS IN THE DOORWAY ARE POSITIONED SO THE FORKLIFT OPENINGS ARE NOT CLOSE ENOUGH IN ALIGNMENT TO RECEIVE TWO (2) BUNDLING STRAPS ACROSS THE LOAD WIDTH; THAT PALLET STACK MUST BE UNITIZED TO THE LONGITUDINALLY ADJACENT PALLET STACK AS SHOWN IN THE "PARTIAL PLAN VIEW B" DETAIL ON PAGE 5.
11. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY ONE OR MORE PALLET UNITS BY EMPLOYING THE PROCEDURES ON PAGE 70, OR FOUR (4) UNITS CAN BE OMITTED FROM A 2-TIER LOAD BY LEAVING OUT THE LENGTHWISE STACKS NO. 7 AND THE CROSSWISE STACK NO. 9. NOTE THAT STRUT BRACING WILL THEN BE REQUIRED. OR, THE ENTIRE TOP TIER CAN BE OMITTED. A PARTIAL 1-TIER LOAD CAN BE SHIPPED IN ONE OR BOTH ENDS OF A CAR BY USING KNEE BRACES AS SHOWN ON PAGES 84 AND 85.
12. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 89 FOR SHIPPING GUIDANCE FOR LENGTHWISE UNITS, AND PAGES 90 AND 92 FOR CROSSWISE UNITS.
13. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 91 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	86	29
1" X 6"	353	177
2" X 2"	69	23
2" X 3"	35	18
2" X 4"	792	528
2" X 6"	168	168
4" X 4"	38	51
NAILS	NO. REQD	POUNDS
6d (2")	256	1-1/2
10d (3")	1,174	19
12d (3-1/4")	40	3/4
16d (3-1/2")	80	1-3/4

**LOAD AS SHOWN**

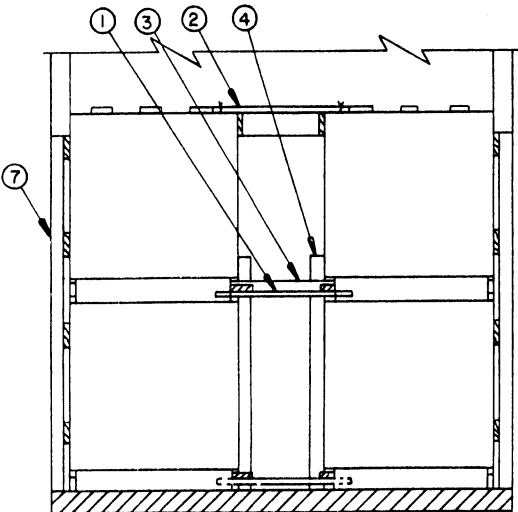
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNITS	58	103,182 LBS
DUNNAGE		2,011 LBS
<b>TOTAL WEIGHT</b>		<b>105,193 LBS</b>

FLAT DUNNAGE METHOD UNIT (BASIC HEIGHT)  
58-UNIT LOAD IN A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR



SEE GENERAL NOTE "G" ON PAGE 2.

ISOMETRIC VIEW



SECTION B-B

**KEY NUMBERS**

- ① ANTI-SWAY BRACE (26 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 20. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTE 12 ON PAGE 9.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 20. WIRE TIE TO STRAPPING BOARDS OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 94. SEE SPECIAL NOTE 4 ON PAGE 9.
- ③ SEPARATOR GATE (11 REQD). SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 17. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTE 5 AND 7 ON PAGE 9.
- ④ STOP PIECE, 1" X 4" X 56" (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 HORIZONTAL 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 18. SEE SPECIAL NOTES 8, 9, AND 10 ON PAGE 9.
- ⑥ STRUT, 4" X 4" BY CUT-TO-FIT (REF: 30") (16 REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "L" ON PAGE 2 AND GENERAL NOTES "U" AND "V" ON PAGE 3.
- ⑦ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION A" DETAIL ON PAGE 18. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 11 ON PAGE 9.

FLAT DUNNAGE METHOD UNIT (BASIC HEIGHT)

52-UNIT LOAD IN A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR



( SPECIAL NOTES CONTINUED )

- 13. 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 68 THRU 88 FOR GUIDANCE. NOTE THAT THE STRUT BRACING METHOD OF PARTIAL TIER BRACING SHOWN ON PAGE 26 MAY ALSO BE USED TO REDUCE A LOAD BY ONE OR MORE UNITS. A 3-HIGH LOAD IS SHOWN HOWEVER, THE BASIC PRINCIPLES ALSO APPLY FOR A 2-HIGH LOAD.
- 14. IF PALLETIZED UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 89 FOR SHIPPING GUIDANCE.
- 15. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 91 FOR GUIDANCE.

SPECIAL NOTES:

- 1. A 60'-8" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2 AND SPECIAL NOTE 3 BELOW.
- 2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 8 IS THE FLAT DUNNAGE METHOD UNIT ( BASIC HEIGHT ). A MAXIMUM OF FORTY ( 40 ) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 71,160 POUNDS, CAN BE PLACED IN A 50'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES; THIRTY-TWO ( 32 ) UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 56,928 POUNDS, CAN BE OUTLOADED IN A 40'-6" LONG CAR.
- 3. THE DEPICTED LOADING PATTERN IS ADEQUATE FOR CARS HAVING DOOR OPENINGS 8' THRU 10' OR WIDER. IF THE CAR TO BE LOADED HAS DOOR OPENINGS LESS THAN 8'-0" WIDE AND NOT OF SUFFICIENT HEIGHT TO ALLOW PERSONNEL TO EXIT THE CAR OVER THE TOP OF THE LOAD, THE PALLETS SHOULD BE POSITIONED SO THERE ARE SIX ( 6 ) LOAD UNITS IN EACH END. NOTE THAT ALTHOUGH CARS HAVING DOOR OPENINGS AS NARROW AS 6'-0" WIDE CAN BE USED FOR FULL LOADS, LOADING IS PROGRESSIVELY MORE DIFFICULT AS THE WIDTH OF THE DOOR OPENING DECREASES.
- 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. THREE ( 3 ) 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 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.
- 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 94 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 95 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 A" AS SHOWN ON PAGE 16. 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 95. OMIT THE STOP PIECES FROM "CENTER GATE A".
- 10. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE 1" X 4" AND 2" X 4" MATERIAL NAILED TO "CENTER GATE C" PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 96 FOR GUIDANCE.
- 11. 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 PIECE 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 LOAD BUNDLING STRAPS MAY BE USED. REFER TO PAGES 97 THRU 99 FOR OTHER TYPES OF DOORWAY PROTECTION.
- 12. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED SIDE BLOCKING AND LOAD BUNDLING STRAPS MUST BE 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 14. SEE SPECIAL NOTES 8 AND 9 ON PAGE 15 FOR GUIDANCE.

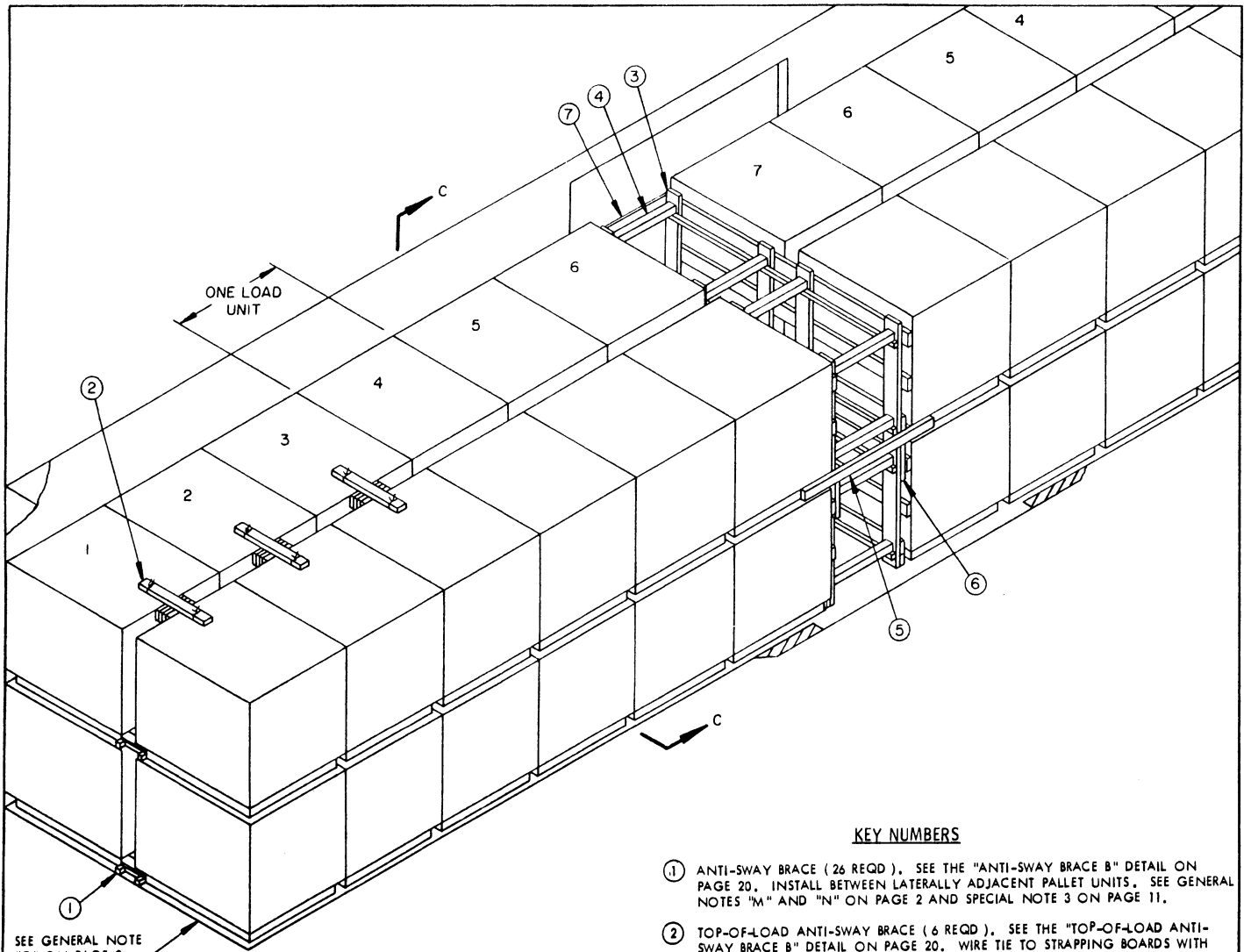
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BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	216	72
1" X 6"	630	315
2" X 2"	65	22
2" X 3"	32	16
2" X 4"	261	174
2" X 6"	288	288
4" X 4"	110	54
NAILS	NO. REQD	POUNDS
6d ( 2" )	476	2-3/4
10d ( 3" )	648	10
12d ( 3-1/4" )	32	1/2
16d ( 3-1/2" )	64	1-1/2
WIRE, NO. 14 GAGE -----60' REQD----- 1 LB		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT ( APPROX )
PALLET UNITS-----	52-----	92,508 LBS
DUNNAGE-----	-----	1,897 LBS
TOTAL WEIGHT-----		94,405 LBS

FLAT DUNNAGE METHOD UNIT ( BASIC HEIGHT )  
52-UNIT LOAD IN A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR

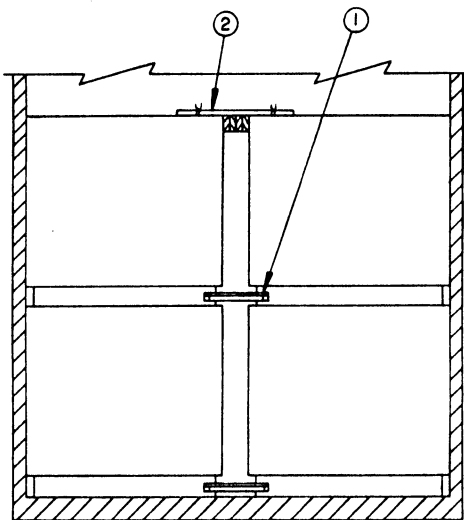


SEE GENERAL NOTE "G" ON PAGE 2.

ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE (26 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 20. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 11.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 20. WIRE TIE TO STRAPPING BOARDS WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 94. SEE SPECIAL NOTE 4 ON PAGE 11.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE D" DETAIL ON PAGE 19. SEE SPECIAL NOTES 5, 6, AND 11 ON PAGE 11.
- ④ STRUT, 4" X 4" BY CUT TO FIT (REF: 28") (16 REQD). TOENAIL TO PIECES MARKED ③ W/2-10d NAILS AT EACH END. SEE GENERAL NOTE "L" ON PAGE 2 AND GENERAL NOTES "U" AND "V" ON PAGE 3.
- ⑤ GATE HOLD DOWN, 2" X 4" BY LENGTH OF CENTER VOID PLUS 24" (2 REQD). POSITION UNDER THE ENDS OF THE CONTAINERS AND NAIL TO THE VERTICAL PIECES OF THE CENTER GATES W/2-10d NAILS AT EACH JOINT. SEE SPECIAL NOTE 7 ON PAGE 11.
- ⑥ GATE HOLD DOWN SUPPORT PIECE, 2" X 2" X 15" (4 REQD). POSITION UNDER PIECE MARKED ⑤ AND NAIL TO A VERTICAL PIECE OF PIECE MARKED ③ W/4-10d NAILS.
- ⑦ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION B" DETAIL ON PAGE 19. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTES 8 AND 9 ON PAGE 11.



SECTION C-C

FLAT DUNNAGE METHOD UNIT (BASIC HEIGHT)  
52-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL BOX CAR

**SPECIAL NOTES:**

1. A 50'-6" LONG BY 9'-4" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 8'-0" WIDE DOOR OPENINGS IS SHOWN. WIDER CARS OF OTHER LENGTHS 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 10 IS THE FLAT DUNNAGE METHOD UNIT (BASIC HEIGHT). A MAXIMUM OF FORTY (40) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 71,160 POUNDS, CAN BE PLACED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES, SIXTY-FOUR (64) PALLET UNITS FOR AN APPROXIMATE LADING WEIGHT OF 113,856 POUNDS CAN BE LOADED IN A 60'-8" LONG CAR.
3. ANTI-SWAY BRACING IS REQUIRED BETWEEN LATERALLY ADJACENT PALLET UNITS. TO PREVENT LONGITUDINAL DISPLACEMENT OF THE ANTI-SWAY BRACE BETWEEN THE UPPER UNITS, A STOP PIECE MUST BE NAILED TO EACH CENTER GATE "D" AS SHOWN ON THE DETAIL ON PAGE 19. IF DESIRED, IN CARS HAVING NAILABLE SIDEWALLS, 1" X 6" OR 2" X 6" FILL MATERIAL MAY BE NAILED TO ONE OR BOTH SIDEWALLS AT HEIGHTS SPECIFIED FOR THE DOORWAY PROTECTION HORIZONTAL PIECES, IN LIEU OF USING THE ANTI-SWAY BRACES. NOTE THAT THE TOTAL ACCUMULATED SPACE ACROSS A CAR SHOULD NOT EXCEED TWO INCHES (2").
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 10, MUST BE INSTALLED IN EACH END OF THE CAR. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
5. CENTER GATE "D" 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 95 FOR GUIDANCE.
6. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR-WIDTH GATES. IN LIEU OF EACH "CENTER GATE D" SHOWN AS PIECE MARKED ③ IN THE LOAD ON PAGE 10, INSTALL TWO (2) "CENTER GATES B" AS SHOWN ON PAGE 17. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DIRECTED BY THE "TIE PIECE APPLICATION" DETAIL ON PAGE 95.
7. AN ALTERNATIVE TO THE GATE HOLD DOWN SHOWN AS PIECES MARKED ⑤ AND ⑥ IN THE LOAD ON PAGE 10 MAY BE USED, IF DESIRED, WHEN THE CAR FURNISHED FOR LOADING IS EQUIPPED WITH 8'-0" OR WIDER DOORS. AN ALTERNATIVE MUST BE USED WHEN THE CAR FURNISHED HAS DOOR OPENINGS LESS THAN 8'-0" WIDE. DOOR SPANNER TYPE HOLD DOWN AS SHOWN BY THE DETAILS ON PAGE 96 MAY BE USED IF THE CAR HAS NAILABLE SIDEWALLS, OR HOLD DOWN PIECES MAY BE APPLIED TO THE CENTER GATES AS SHOWN BY THE CENTER GATE "D" DETAIL ON PAGE 19.
8. 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 PIECE MARKED ⑦ IN THE LOAD ON PAGE 10, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED SIDE BLOCKING AND LOAD BUNDLING STRAPS MAY BE USED. REFER TO PAGES 97 THRU 99 FOR OTHER TYPES OF DOORWAY PROTECTION.
9. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED SIDE BLOCKING AND LOAD BUNDLING STRAPS MUST BE USED, OMIT EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA, IN LIEU OF PIECE MARKED ⑦, USE PIECES MARKED ③ THRU ⑥ ON PAGE 60. SEE SPECIAL NOTES 9 AND 10 ON PAGE 61 FOR GUIDANCE. NOTE THAT STRAPPING BOARD/SPACER ASSEMBLY "B" DETAIL ON PAGE 21 MUST BE USED IN LIEU OF "C", AND THE BUNDLING STRAP WILL BE 36'-6" LONG.
10. 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 OF 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 68 THRU 88 FOR GUIDANCE. NOTE THAT THE STRUT BRACING METHOD OF PARTIAL TIER BRACING SHOWN ON PAGE 28 MAY ALSO BE USED TO REDUCE A LOAD BY ONE OR MORE UNITS. A 3-HIGH LOAD IS SHOWN HOWEVER THE BASIC PRINCIPLES ALSO APPLY FOR A 2-HIGH LOAD.
11. IF A FULL LOAD IS TO BE SHIPPED IN A 60'-0" LONG CAR, SIX (6) STRUTS WILL BE REQUIRED PER ROW/TIER. TO ACCOMMODATE THESE ADDITIONAL STRUTS, A STRUT LEDGER MUST BE ADDED TO CENTER GATE "D" FOR EACH TIER AS SHOWN BY THE DOTTED LINES ON THE DETAIL ON PAGE 19.
12. IF PALLETIZED UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 90 AND 92 FOR SHIPPING GUIDANCE.
13. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 91 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	78	26
1" X 6"	64	32
2" X 2"	267	89
2" X 3"	31	16
2" X 4"	95	64
2" X 6"	216	216
4" X 4"	38	51
NAILS	NO. REQD	POUNDS
6d (2")	412	2-1/2
10d (3")	566	8-3/4
12d (3-1/4")	32	1/2
16d (3-1/2")	64	1-1/2
WIRE, NO. 14 GAGE ----- 60' REQD ----- 1 LB		

**LOAD AS SHOWN**

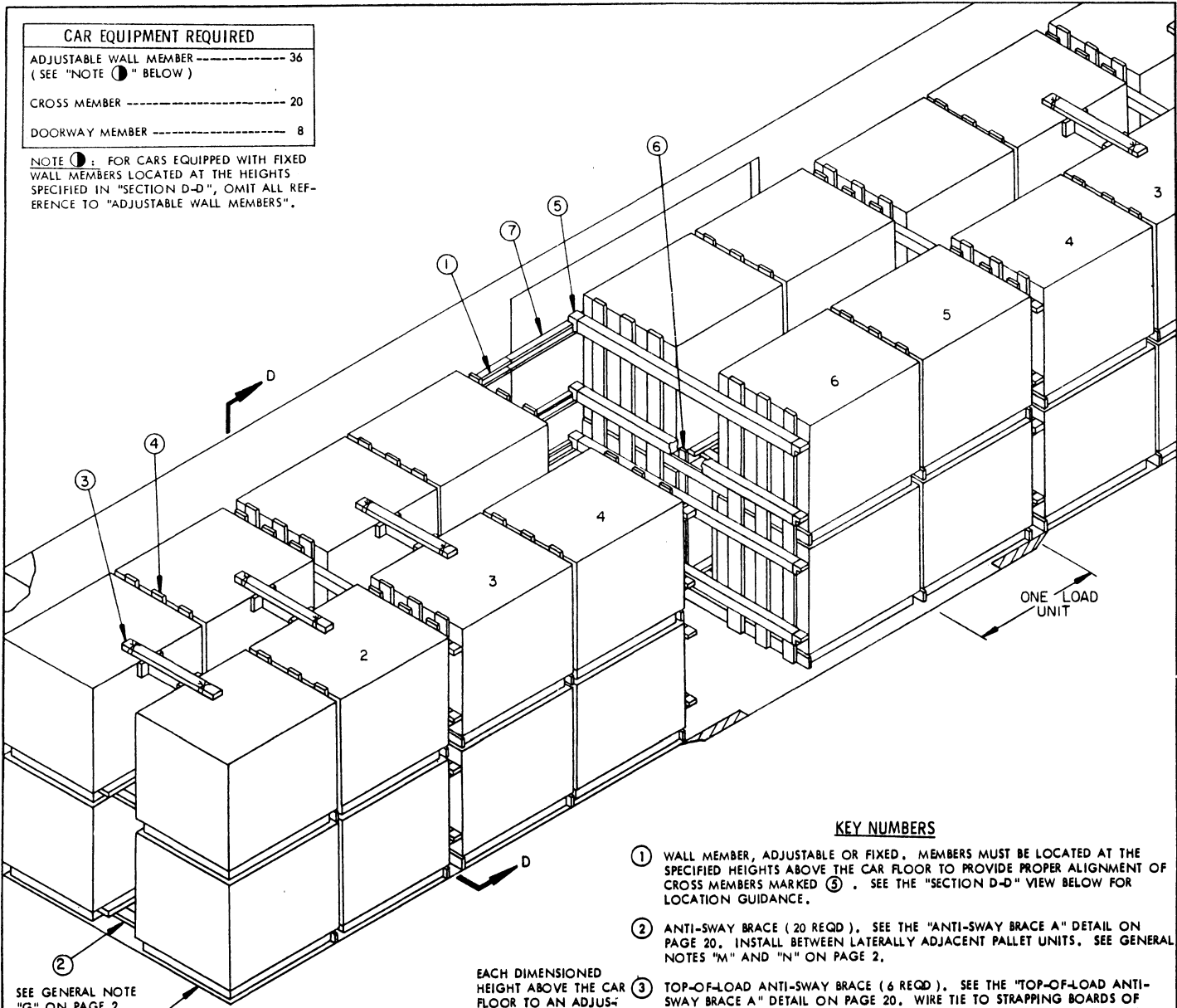
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNITS -----	52 -----	92,508 LBS
DUNNAGE -----	-----	1,003 LBS
TOTAL WEIGHT -----		93,511 LBS

FLAT DUNNAGE METHOD UNIT (BASIC HEIGHT)  
52-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL BOX CAR

**CAR EQUIPMENT REQUIRED**

ADJUSTABLE WALL MEMBER -----	36
(SEE "NOTE 1" BELOW)	
CROSS MEMBER -----	20
DOORWAY MEMBER -----	8

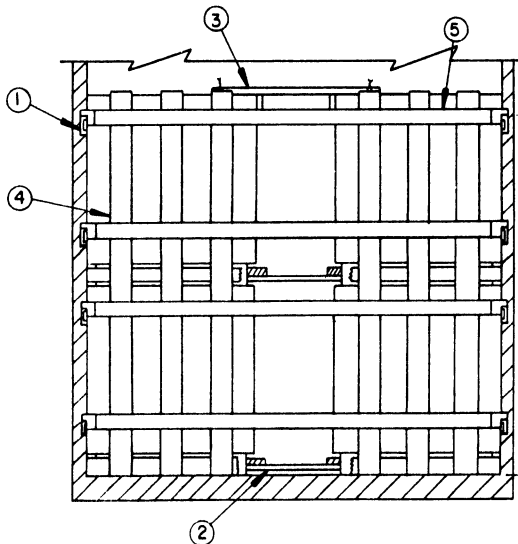
NOTE 1: FOR CARS EQUIPPED WITH FIXED WALL MEMBERS LOCATED AT THE HEIGHTS SPECIFIED IN "SECTION D-D", OMIT ALL REFERENCE TO "ADJUSTABLE WALL MEMBERS".



SEE GENERAL NOTE "G" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 13.

**ISOMETRIC VIEW**

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 D-D**

**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 D-D" VIEW BELOW FOR LOCATION GUIDANCE.
- 2 ANTI-SWAY BRACE (20 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 20. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.
- 3 TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 20. WIRE TIE TO STRAPPING BOARDS OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 94. SEE SPECIAL NOTE 4 ON PAGE 13.
- 4 SEPARATOR GATE FOR 2-HIGH (13 REQD). SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 17. AS APPLICABLE, POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 5 AND 7 ON PAGE 13.
- 5 CROSS MEMBER (20 REQD). SEE GENERAL NOTE "X" ON PAGE 3.
- 6 STOP PIECE, 1" X 4" X 56" (4 REQD). INSTALL ON THE SIDE OPPOSITE THE VERTICAL PIECES OF THE SEPARATOR GATES, PIECES MARKED 4, WHICH ARE IN THE DOORWAY AREA. POSITION IN CONTACT WITH THE ADJACENT PALLET UNITS AND NAIL TO THE HORIZONTAL PIECES W/3-6d NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 6 ON PAGE 13.
- 7 DOORWAY MEMBER (8 REQD). SEE THE "SECTION D-D" VIEW AT LEFT FOR LOCATION GUIDANCE.

FLAT DUNNAGE METHOD UNIT (BASIC HEIGHT)

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

**SPECIAL NOTES:**

1. A 50'-6" LONG BY 9'-0" WIDE (INSIDE 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 12 IS THE FLAT DUNNAGE METHOD UNIT (BASIC HEIGHT). A MAXIMUM OF THIRTY-TWO (32) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 56,928 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 "G" 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 12, MUST BE INSTALLED IN EACH END OF THE CAR. THREE (3) 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 ⑤. 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 94 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 66 AND 67 FOR GUIDANCE.
9. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 91 FOR GUIDANCE.

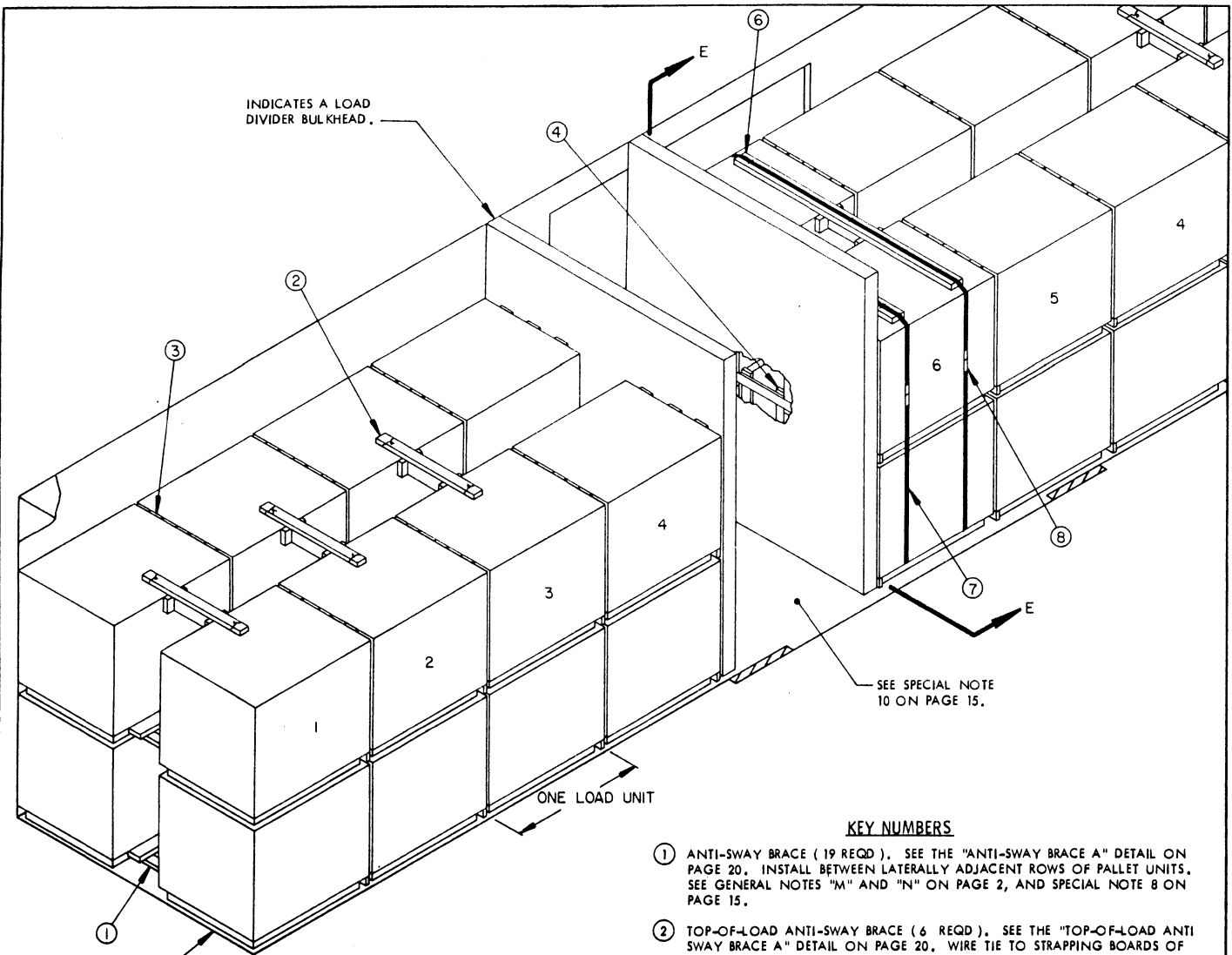
**BILL OF MATERIAL**

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	252	84
1" X 6"	650	325
2" X 4"	194	130
2" X 6"	82	82
NAILS	NO. REQD	POUNDS
6d (2")	492	3
10d (3")	324	5
WIRE, NO. 14 GAGE ----- 60' REQD ----- 1 LB		

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT -----	40 -----	71,160 LBS
DUNNAGE -----	-----	1,251 LBS
TOTAL WEIGHT -----		72,411 LBS

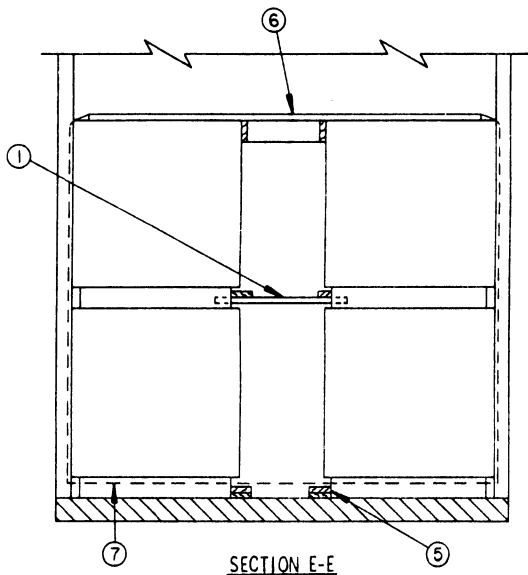
FLAT DUNNAGE METHOD UNIT (BASIC HEIGHT)  
 40-UNIT LOAD IN A 50'-6" LONG BY 9'-0" WIDE BOX CAR EQUIPPED WITH MECHANICAL BRACING DEVICES



ISOMETRIC VIEW

**KEY NUMBERS**

- ① ANTI-SWAY BRACE ( 19 REQD ). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 20. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2, AND SPECIAL NOTE 8 ON PAGE 15.
- ② TOP-OF-LOAD ANTI-SWAY BRACE ( 6 REQD ). SEE THE "TOP-OF-LOAD ANTI SWAY BRACE A" DETAIL ON PAGE 20. WIRE TIE TO STRAPPING BOARDS OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 94. SEE SPECIAL NOTE 3 ON PAGE 15.
- ③ SEPARATOR GATE ( 10 REQD ). SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 17. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 4 AND 6 ON PAGE 15.
- ④ STOP PIECE, 1" X 4" X 56" ( 4 REQD ). POSITION AGAINST PALLET UNITS IN THE DOORWAY AREA AND NAIL TO THE HORIZONTAL PIECES OF PIECE MARKED ③ W/3-6d NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 5 ON PAGE 15.
- ⑤ SIDE BLOCKING, 2" X 6" X 40" ( DOUBLED ) ( 2 REQD ). NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 8 ON PAGE 15.
- ⑥ STRAPPING BOARD/SPACER ASSEMBLY "A" ( 2 REQD ). SEE THE DETAIL ON PAGE 21.
- ⑦ BUNDLING STRAP, 1-1/4" X .031" OR .031" X 35'-6" LONG STEEL STRAPPING ( 2 REQD ). STAPLE TO STRAPPING BOARD W/3 STAPLES. SEE SPECIAL NOTE 9 ON PAGE 15.
- ⑧ SEAL FOR 1-1/4" STRAPPING ( 4 REQD, 2 PER STRAP ). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "O" ON PAGE 2.



FLAT DUNNAGE METHOD UNIT ( BASIC HEIGHT )

40-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOX CAR EQUIPPED WITH LOAD DIVIDERS

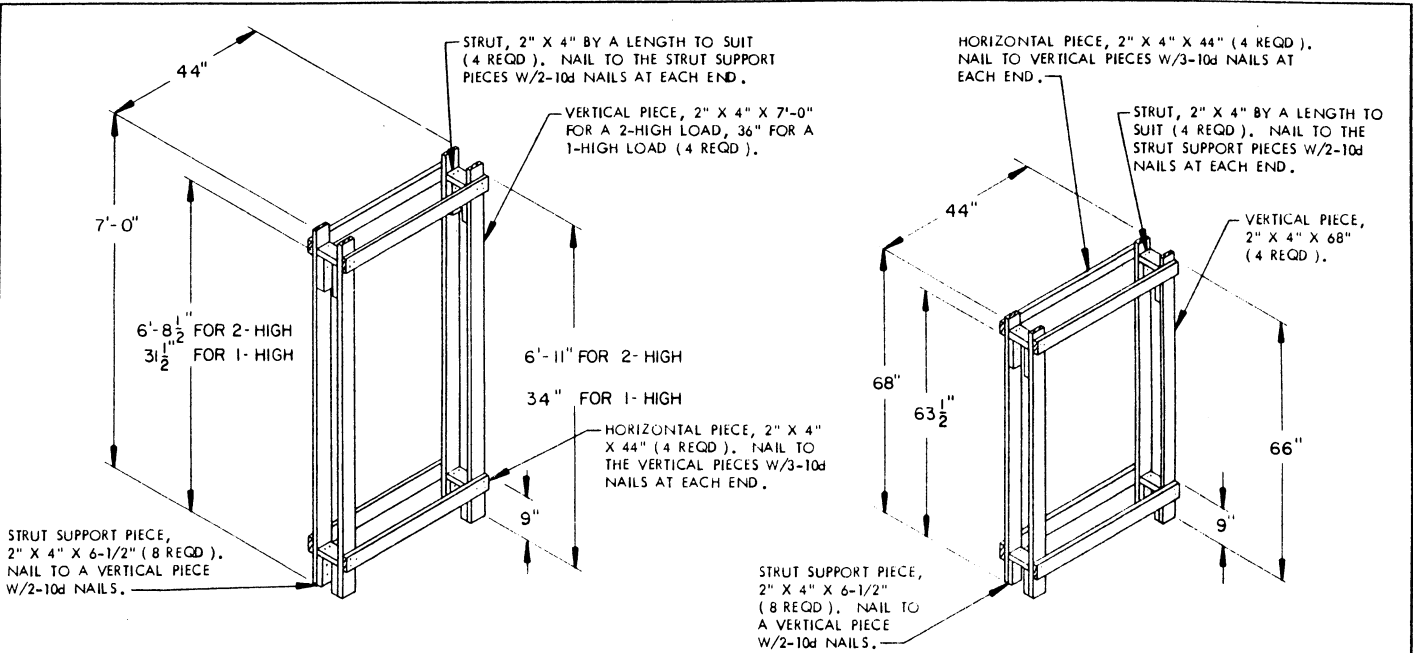
**SPECIAL NOTES:**

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 "AA" THRU "EE" ON PAGE 3.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 14 IS THE FLAT DUNNAGE METHOD UNIT (BASIC HEIGHT). A MAXIMUM OF FORTY-EIGHT (48) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 85,392 POUNDS, CAN BE PLACED IN A 60'-8" LONG CAR, OR A MAXIMUM OF THIRTY-TWO UNITS CAN BE LOADED IN A 40'-6" CAR FOR AN APPROXIMATE LADING WEIGHT OF 56,928 POUNDS, WHEN USING THE DEPICTED PROCEDURES. IF THE CROSSWISE LOADING PATTERN SHOWN ON PAGE 10 IS EMPLOYED, SIXTY (60) PALLET UNITS FOR AN APPROXIMATE LADING WEIGHT OF 106,740 POUNDS CAN BE PLACED IN A 60'-8" LONG CAR, FIFTY (50) UNITS CAN BE PLACED IN A 50'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 88,950 POUNDS, AND FORTY (40) UNITS CAN BE LOADED IN A 40'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 71,160 POUNDS.
3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 14, MUST BE INSTALLED IN EACH END OF THE CAR. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
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 94 FOR CONSTRUCTION GUIDANCE.
7. 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 PIECE 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 LOAD BUNDLING STRAPS MARKED (5) THRU (8) ON PAGE 14 MAY BE USED. REFER TO PAGES 97 THRU 99 FOR OTHER TYPES OF DOORWAY PROTECTION.
8. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED SIDE BLOCKING AND LOAD BUNDLING STRAPS MUST BE USED. SIDE BLOCKING MARKED (5) IN THE LOAD VIEW MUST BE USED IN LIEU OF THE LOWER ANTI-SWAY BRACE MARKED (1) FOR ALL UNITS REQUIRING BUNDLING STRAPS. IF THE PALLET UNITS ARE POSITIONED CROSSWISE, SEE KEY NUMBERS (3) THRU (8) ON PAGE 32.
9. TWO (2) BUNDLING 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 CAR SIDEWALL ON BOTH SIDES OF THE CAR. ONE (1) BUNDLING 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.
10. A STRUT ASSEMBLY IS REQUIRED WHEN THE LOAD IN EITHER END OF A CAR IS 50,000 POUNDS OR MORE. THE STRUT ASSEMBLY WILL ALWAYS BE REQUIRED FOR FULL LOADS IN 60'-0" OR LONGER CARS IF THE PALLET UNITS ARE POSITIONED CROSSWISE. SEE THE "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL ON PAGE 101.
11. 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 68 THRU 81 AND GENERAL NOTE "FF" ON PAGE 3 FOR GUIDANCE.
12. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 89 AND/OR PAGES 90 AND 92 FOR SHIPPING GUIDANCE.
13. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 91 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	202	68
1" X 6"	500	250
2" X 4"	193	129
2" X 6"	118	118
NAILS	NO. REQD	POUNDS
6d (2")	384	2-1/4
10d (3")	340	5-1/4
16d (3-1/2")	20	1/2
STEEL STRAPPING, 1-1/4" -----	71' REQD -----	10 LBS
SEAL FOR 1-1/4" STRAPPING ----	4 REQD -----	NIL
STAPLE -----	6 REQD -----	NIL
WIRE, NO. 14 GAGE -----	60' REQD -----	1 LB

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT -----	40 -----	71,160 LBS
DUNNAGE -----	-----	1,150 LBS
TOTAL WEIGHT -----		72,310 LBS

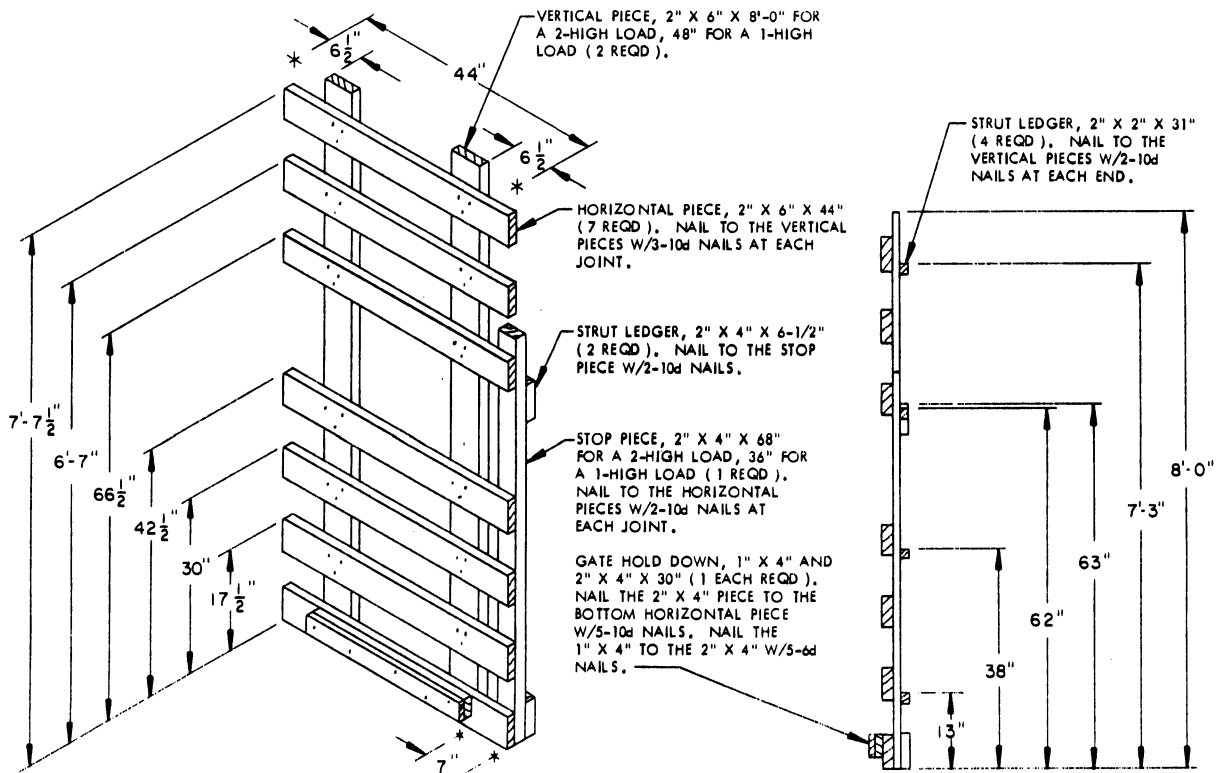


**CRIB FILL A**

CRIB FILL ASSEMBLIES "A" AND "B" SHOULD BE PRE-FABRICATED. CONSTRUCT TO BE 1/2" TO 3/4" LESS IN WIDTH THAN THE DISTANCE BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS.

**CRIB FILL B**

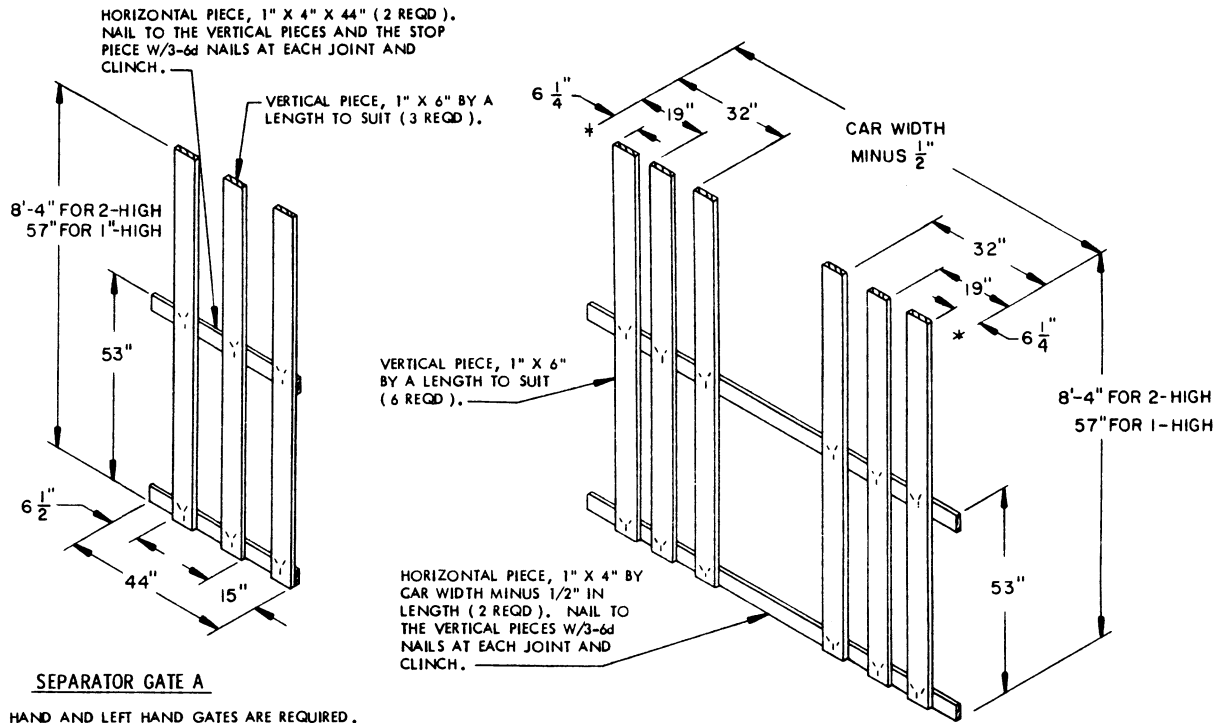
CRIB FILL "B" IS NOT REQUIRED FOR A 1-HIGH LOAD; USE CRIB FILL "A" THROUGHOUT THE LENGTH OF THE LOAD.



**CENTER GATE A**

1 RIGHT HAND AND 1 LEFT HAND GATE REQUIRED.

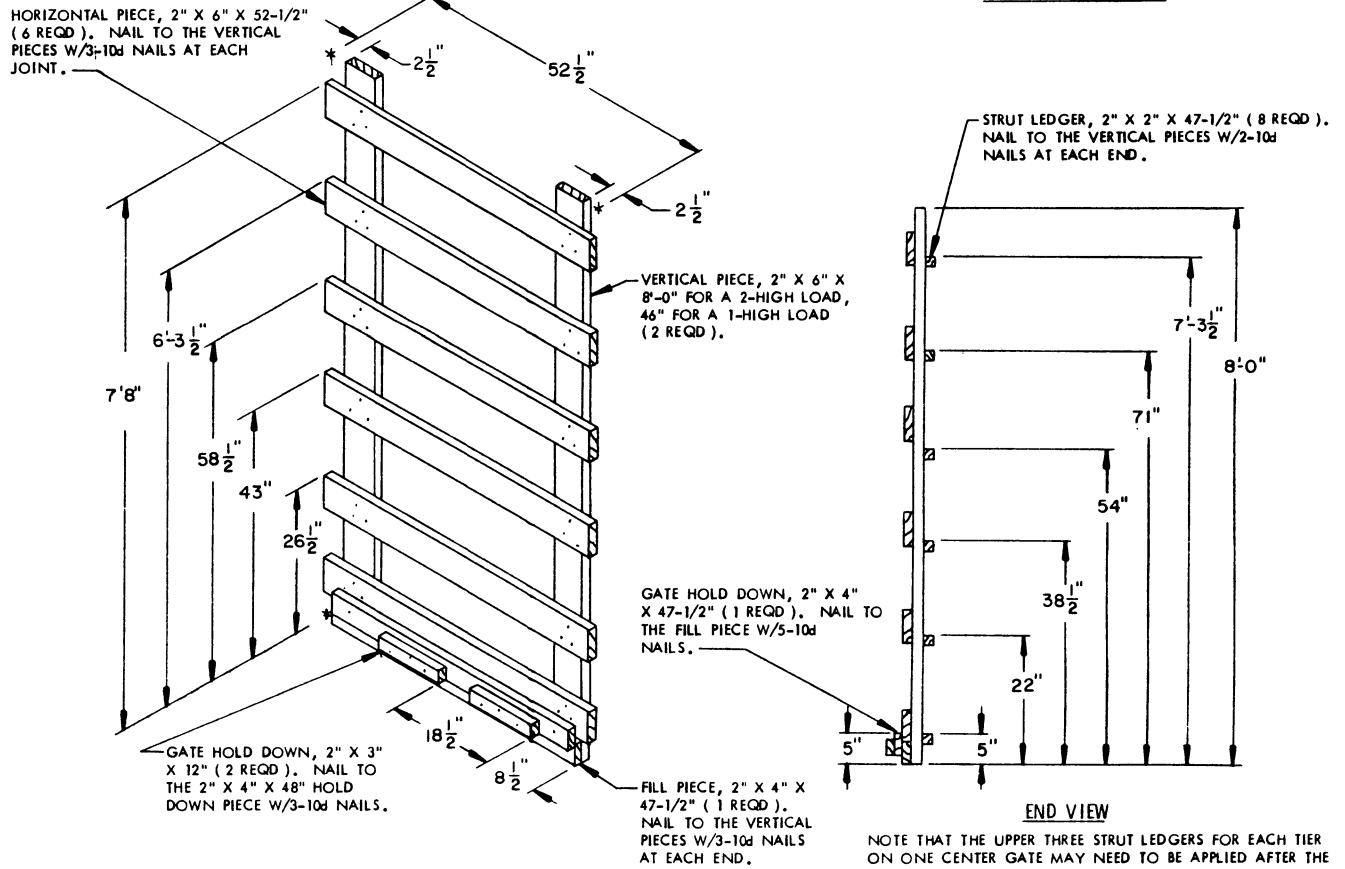




**SEPARATOR GATE A**

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

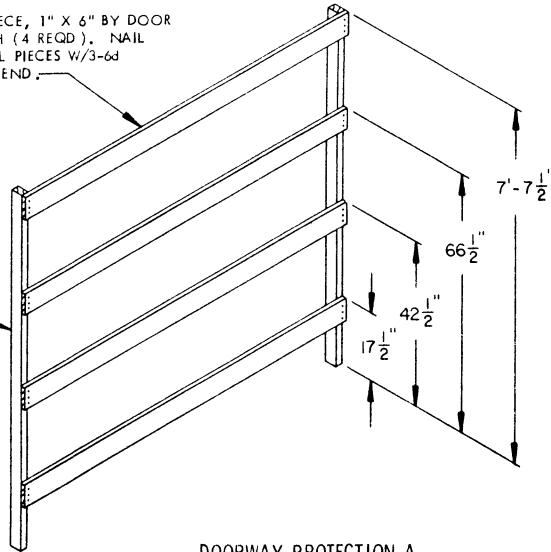
**SEPARATOR GATE B**



**CENTER GATE B**

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

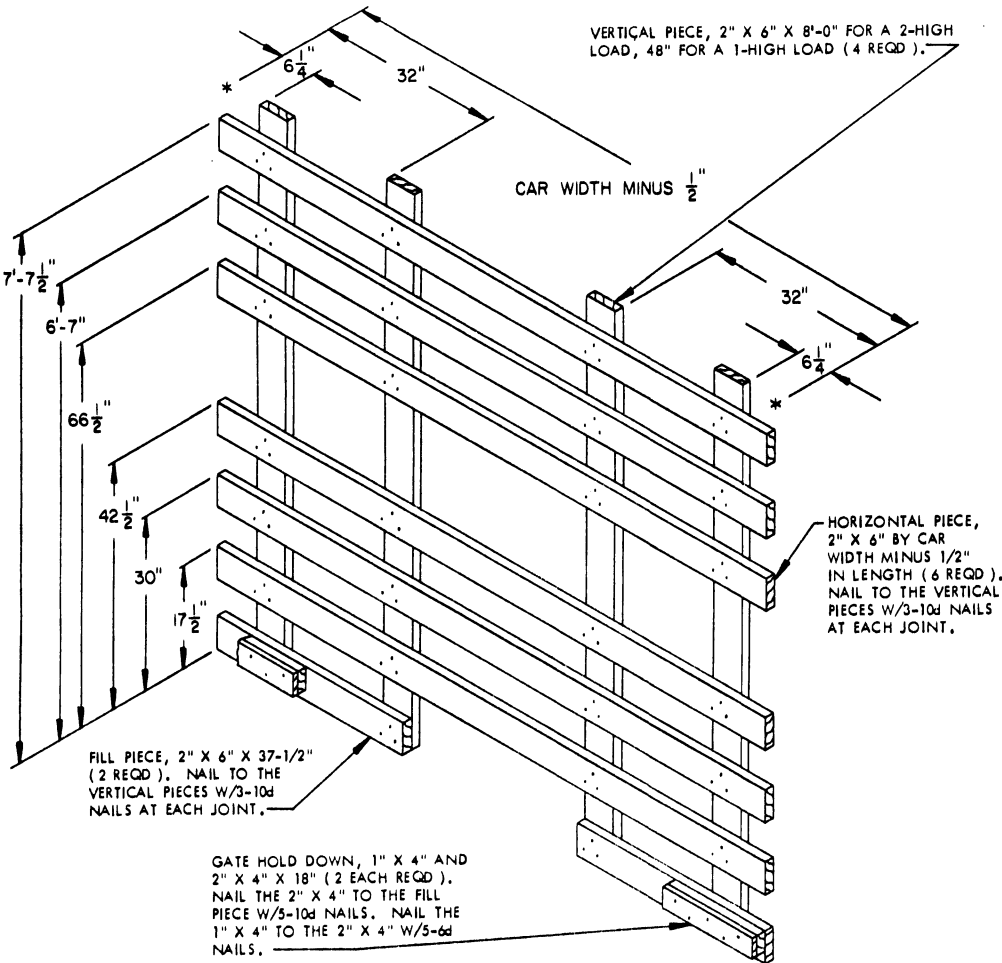
VERTICAL PIECE, 2" X 3" X 7'-7-1/2" (2 REQD). NAIL TO A DOOR POST W/12d NAILS.



DOORWAY PROTECTION A

VERTICAL PIECE, 2" X 6" X 8'-0" FOR A 2-HIGH LOAD, 48" FOR A 1-HIGH LOAD (4 REQD).

CAR WIDTH MINUS 1/2"



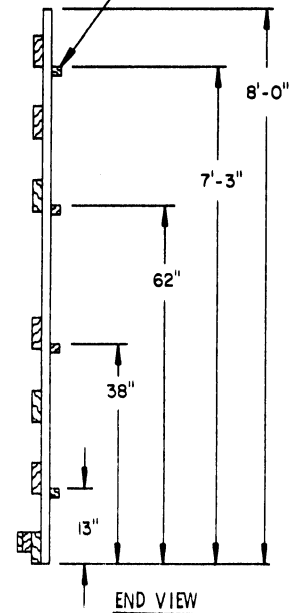
STRUT LEDGER, 2" X 2" BY CAR WIDTH MINUS 12-1/2" IN LENGTH (4 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.

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

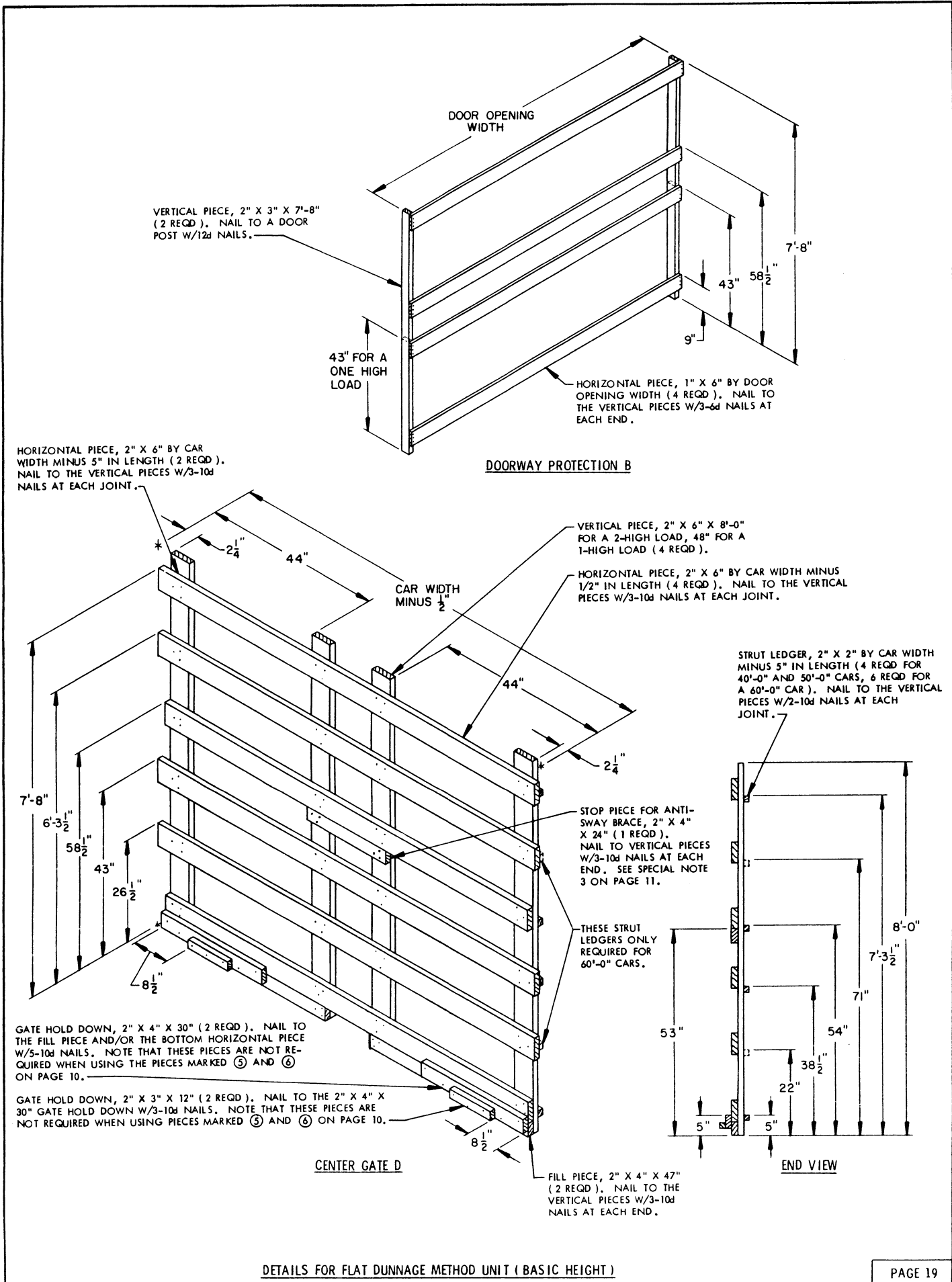
FILL PIECE, 2" X 6" X 37-1/2" (2 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.

GATE HOLD DOWN, 1" X 4" AND 2" X 4" X 18" (2 EACH REQD). NAIL THE 2" X 4" TO THE FILL PIECE W/3-10d NAILS. NAIL THE 1" X 4" TO THE 2" X 4" W/5-6d NAILS.

CENTER GATE C



END VIEW



SUPPORT PIECE, 2" X 4" BY A LENGTH TO SUIT (1 REQD). NAIL TO SPACER PIECE W/4-10d NAILS AND TO THE BUFFER PIECES W/2-10d NAILS AT EACH JOINT.

SPACER PIECE, 2" X 6" BY A LENGTH TO SUIT (1 REQD).

VOID BETWEEN CONTAINER BODIES MINUS  $\frac{1}{4}$ "

BUFFER PIECE, 2" X 6" X 8" (2 REQD). NAIL TO THE SPACER PIECE W/3-10d NAILS.

**TOP-OF-LOAD ANTI-SWAY BRACE A**

RETAINER PIECE, 2" X 4" BY A LENGTH TO SUIT (2 REQD).

BUFFER PIECE, 2" X 6" X 39" (1 REQD). NAIL TO THE RETAINER PIECES W/3-10d NAILS AT EACH JOINT.

FABRICATE TO FIT BETWEEN THE POSTS OF LATERALLY ADJACENT PALLETS.

BUFFER PIECE, 2" X 4" X 39" (1 REQD). NAIL TO THE RETAINER PIECES W/3-10d NAILS AT EACH JOINT.

**ANTI-SWAY BRACE A**

IF DESIRED, THE ANTI-SWAY BRACE CAN BE PARTIALLY PRE-ASSEMBLED; 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.

SUPPORT PIECE, 2" X 4" BY A LENGTH TO SUIT (1 REQD). NAIL TO THE SPACER PIECES W/6-10d NAILS.

VOID BETWEEN CONTAINER BELLS MINUS  $\frac{1}{4}$ "

SPACER PIECE, 1" X 6" AND/OR 2" X 6" X 12" (AS REQD). LAMINATE W/3-6d AND/OR 10d NAILS.

12"

**TOP-OF-LOAD ANTI-SWAY BRACE B**

CROSS BRACE, 2" X 4" BY A LENGTH TO SUIT (2 REQD).

LONGITUDINAL PIECE, 2" X 2" BY UNIT LENGTH (2 REQD). NAIL TO THE CROSS BRACES W/2-10d NAILS AT EACH JOINT.

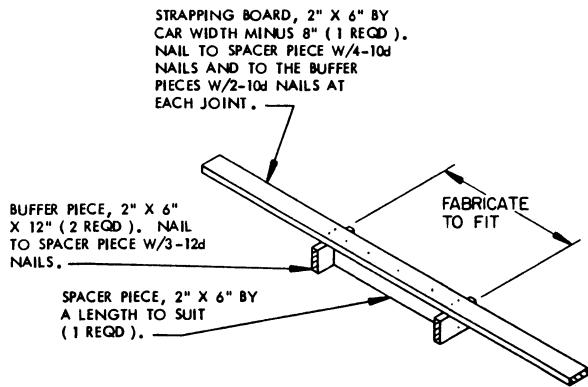
3"

UNIT LENGTH

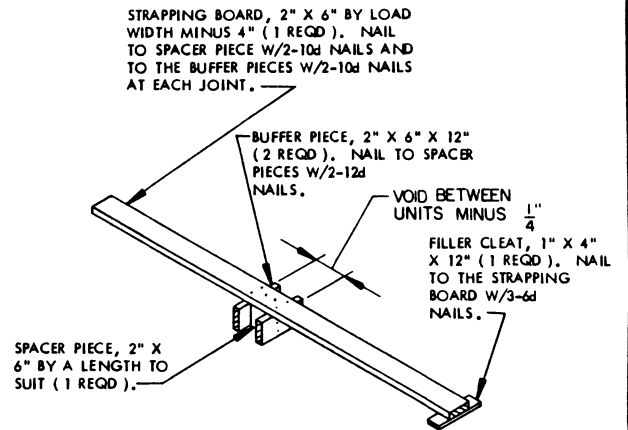
CLEAT, 1" X 4" BY A LENGTH TO SUIT. NAIL TO THE LONGITUDINAL PIECES W/2-6d NAILS AT EACH END AND TO A CROSS BRACE W/3-6d NAILS.

VOID BETWEEN PALLET POSTS MINUS  $\frac{1}{2}$ "

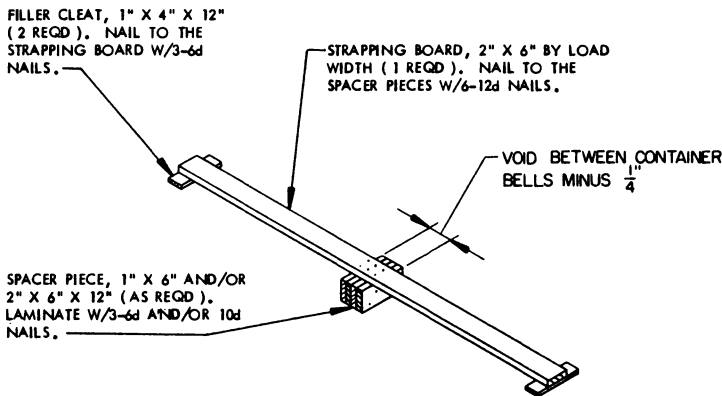
**ANTI-SWAY BRACE B**



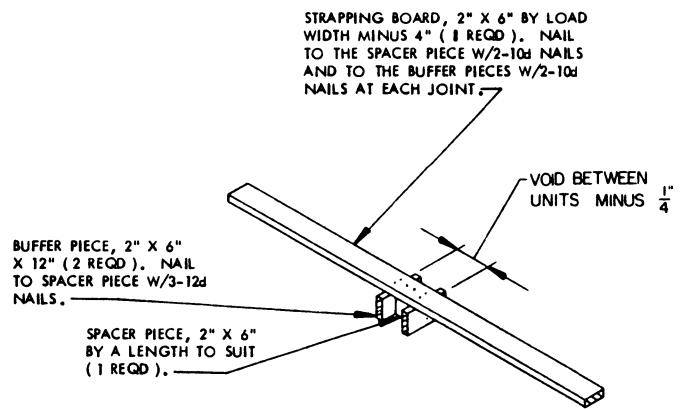
**STRAPPING BOARD/SPACER ASSEMBLY A**



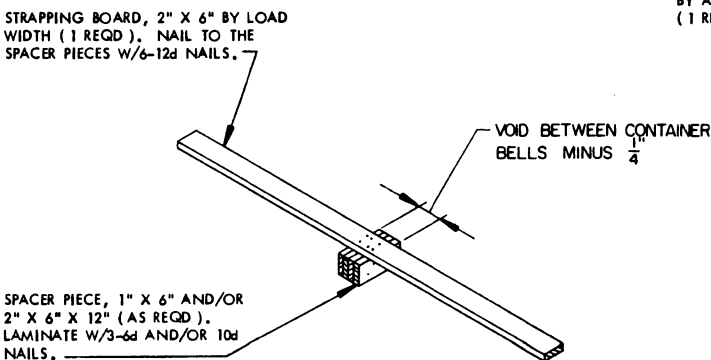
**STRAPPING BOARD/SPACER ASSEMBLY D**



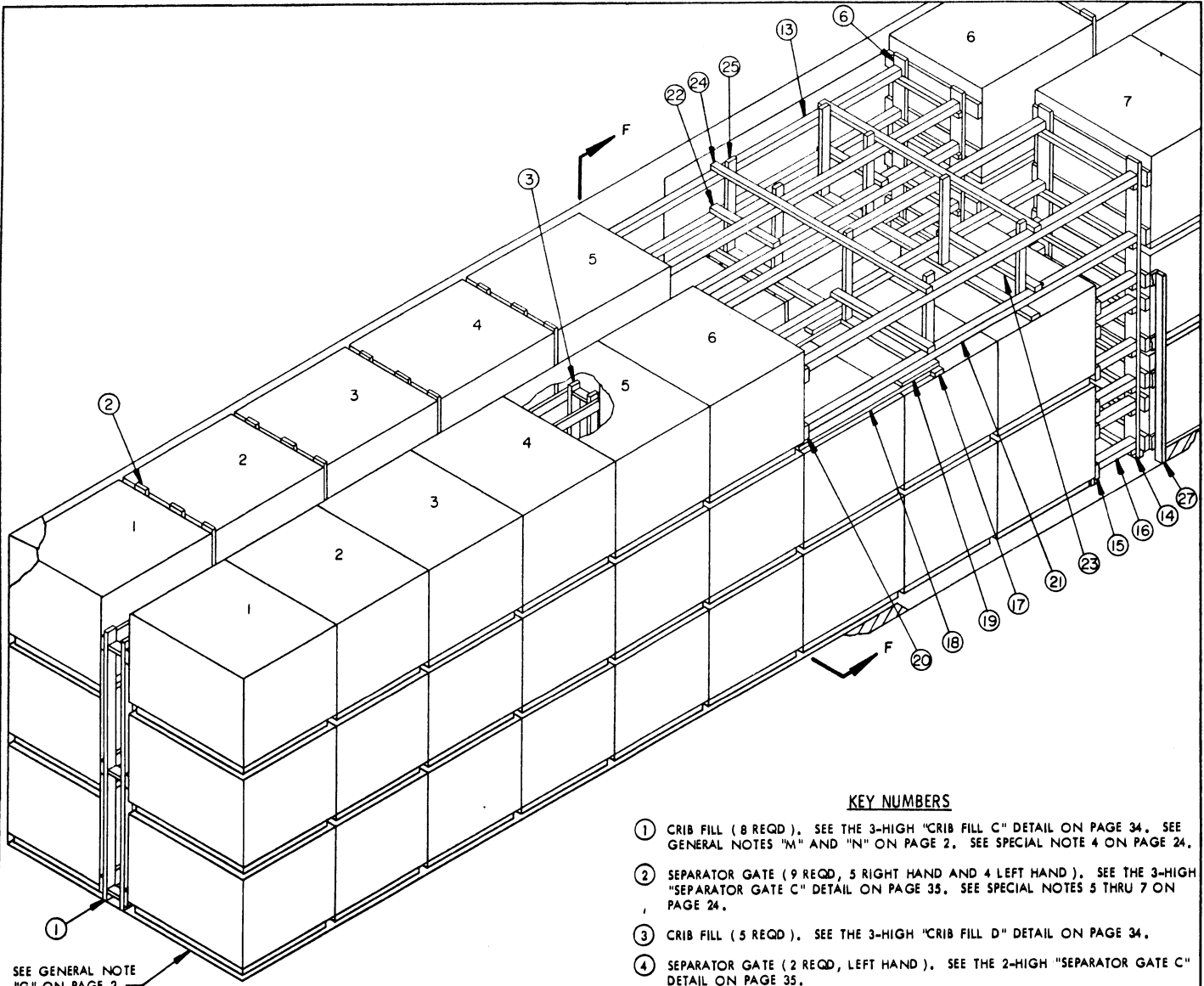
**STRAPPING BOARD/SPACER ASSEMBLY B**



**STRAPPING BOARD/SPACER ASSEMBLY E**



**STRAPPING BOARD/SPACER ASSEMBLY C**

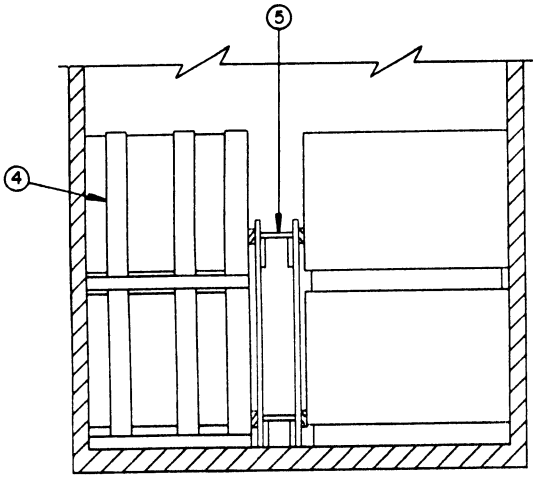


SEE GENERAL NOTE "G" ON PAGE 2.

ISOMETRIC VIEW

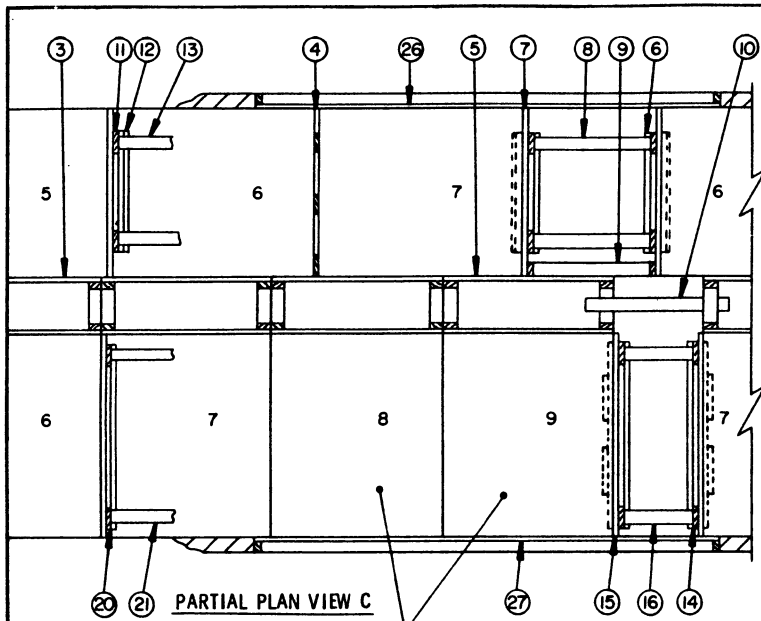
**KEY NUMBERS**

- ① CRIB FILL ( 8 REQD ). SEE THE 3-HIGH "CRIB FILL C" DETAIL ON PAGE 34. SEE GENERAL NOTES "M" AND "N" ON PAGE 2. SEE SPECIAL NOTE 4 ON PAGE 24.
- ② SEPARATOR GATE ( 9 REQD, 5 RIGHT HAND AND 4 LEFT HAND ). SEE THE 3-HIGH "SEPARATOR GATE C" DETAIL ON PAGE 35. SEE SPECIAL NOTES 5 THRU 7 ON PAGE 24.
- ③ CRIB FILL ( 5 REQD ). SEE THE 3-HIGH "CRIB FILL D" DETAIL ON PAGE 34.
- ④ SEPARATOR GATE ( 2 REQD, LEFT HAND ). SEE THE 2-HIGH "SEPARATOR GATE C" DETAIL ON PAGE 35.
- ⑤ CRIB FILL ( 3 REQD ). SEE THE 2-HIGH "CRIB FILL D" DETAIL ON PAGE 34.
- ⑥ CENTER GATE FOR 3-HIGH ( 1 RIGHT HAND REQD ). SEE THE "CENTER GATE E" DETAIL ON PAGE 34. SEE SPECIAL NOTE 8 ON PAGE 24.
- ⑦ CENTER GATE FOR 2-HIGH ( 1 LEFT HAND REQD ). SEE THE "CENTER GATE E" DETAIL ON PAGE 34.
- ⑧ STRUT, 4" X 4" BY CUT TO FIT ( 8 REQD ). TOENAIL TO PIECES MARKED ④ AND ⑦ W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "L" ON PAGE 2, AND GENERAL NOTES "U" AND "V" ON PAGE 3.
- ⑨ STRUT, 2" X 4" BY CUT TO FIT ( REF: 30" ) ( 2 REQD ). TOENAIL TO THE STOP PIECES OF PIECES MARKED ④ AND ⑦ W/2-12d NAILS AT EACH END. SEE THE "PARTIAL PLAN VIEW C" ON PAGE 23.
- ⑩ CRIB FILL RETAINER, 2" X 4" BY A LENGTH TO SUIT ( REF: 36" ) ( 2 REQD ). POSITION TO SPAN THE STRUTS OF LONGITUDINALLY ADJACENT CRIB FILL "D" ASSEMBLIES AND NAIL TO EACH STRUT W/3-10d NAILS. SEE THE "PARTIAL PLAN VIEW C" ON PAGE 23.
- ⑪ CENTER GATE FOR 1-HIGH ( 1 REQD ). SEE THE "CENTER GATE E" DETAIL, AND "NOTE:" ON PAGE 34.
- ⑫ GATE SUPPORT, 2" X 4" X 30" ( DOUBLED ) ( 1 REQD ). NAIL THE FIRST PIECE TO THE VERTICAL PIECES OF CENTER GATE MARKED ⑪ W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/5-10d NAILS.
- ⑬ STRUT, 4" X 4" BY CUT TO FIT ( 4 REQD ). TOENAIL TO PIECES MARKED ⑥ AND ⑪ W/2-16d NAILS AT EACH END.
- ⑭ CENTER GATE FOR 3-HIGH ( 1 REQD ). SEE THE "CENTER GATE F" DETAIL ON PAGE 35.
- ⑮ CENTER GATE FOR 2-HIGH ( 1 REQD ). SEE THE "CENTER GATE F" DETAIL ON PAGE 35.
- ⑯ STRUT, 4" X 4" BY CUT TO FIT ( 12 REQD ). TOENAIL TO PIECES MARKED ⑭ AND ⑮ W/2-16d NAILS AT EACH END.



SECTION F-F

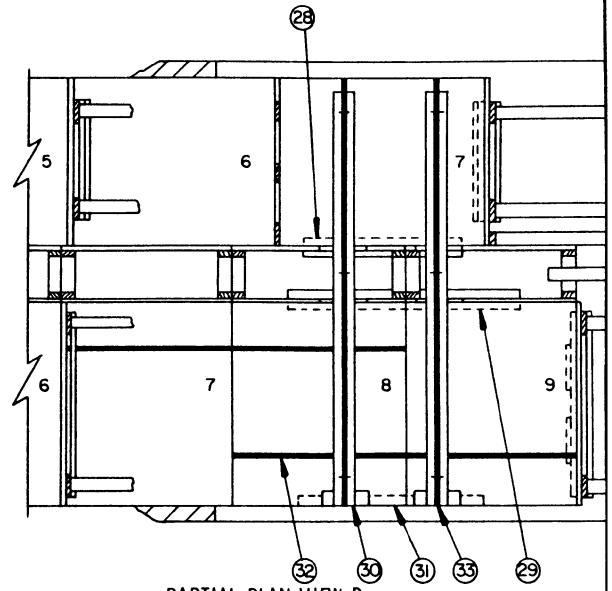
FLAT DUNNAGE METHOD UNIT ( DECREASED HEIGHT )  
 82-UNIT LOAD IN A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR ( CONTINUED ON PAGE 23 )



IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, SEE SPECIAL NOTES 11 AND 12 ON PAGE 24.

( KEY NUMBERS CONTINUED )

- 17 STRUT BRACING PAD, 2" X 4" BY LENGTH TO SUIT ( 2 REQD ). POSITION ON A LENGTHWISE PALLET STRAPPING BOARD, AND UNDER THE VERTICAL STRUT BRACING AS SHOWN. SEE SPECIAL NOTE 9 ON PAGE 24.
- 18 GATE SUPPORT, 2" X 6" BY A LENGTH TO SUIT ( REF: 60" ) ( 2 REQD ). POSITION AGAINST STRUT BRACING PAD MARKED 17, AND EXTEND UNDER VERTICAL OF "CENTER GATE F" MARKED 20. WIRE TIE TO PALLET STRAPPING BOARD ON THE END NEAREST THE CENTER GATE.
- 19 HOLD DOWN PIECE, 2" X 4" X 18" ( 2 REQD ). NAIL TO PIECES MARKED 17 AND 18 W/5-10d NAILS.
- 20 CENTER GATE FOR 1-HIGH ( 1 REQD ). SEE THE "CENTER GATE F" DETAIL AND NOTE ON PAGE 35.
- 21 STRUT, 4" X 4" BY CUT TO FIT ( 4 REQD ). TOENAIL TO PIECES MARKED 14 AND 24 W/2-16d NAILS AT EACH END.
- 22 HORIZONTAL STRUT BRACING, 2" X 4" BY A LENGTH TO SUIT ( 2 REQD ). NAIL TO STRUTS MARKED 13 W/3-10d NAILS AT EACH JOINT. SEE GENERAL NOTE "5" ON PAGE 2.
- 23 HORIZONTAL STRUT BRACING, 2" X 4" BY A LENGTH TO SUIT ( 2 REQD ). NAIL TO STRUTS MARKED 21 W/3-10d NAILS AT EACH JOINT.
- 24 HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 9" ( 2 REQD ). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- 25 VERTICAL STRUT BRACING, 2" X 4" X 36" ( 8 REQD ). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT. TOENAIL TO PIECE MARKED 17 W/1-10d NAIL.
- 26 DOORWAY PROTECTION FOR 2-HIGH ( 1 REQD ). SEE THE "DOORWAY PROTECTION C" DETAIL ON PAGE 36. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTES 10 AND 11 ON PAGE 24.
- 27 DOORWAY PROTECTION FOR 2-HIGH ( 1 REQD ). SEE THE DOORWAY PROTECTION D" DETAIL ON PAGE 37. NAIL TO THE DOOR POSTS W/12d NAILS.



PARTIAL PLAN VIEW D

( KEY NUMBERS CONTINUED )

- 28 SIDE BLOCKING, 2" X 6" X 40" OR A LENGTH TO SUIT ( DOUBLED ) ( 1 REQD ). POSITION AS SHOWN IN THE "PARTIAL PLAN VIEW D" ABOVE. NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 11 ON PAGE 24.
- 29 SIDE BLOCKING, 2" X 6" X 60" OR A LENGTH TO SUIT ( DOUBLED ) ( 1 REQD ). PRE-POSITION 51" FROM THE NEAR SIDE CAR WALL AND NAIL AS DIRECTED IN KEY NUMBER 28 ABOVE W/8-16d NAILS.
- 30 STRAPPING BOARD/SPACER ASSEMBLY D, ( 2 REQD ). SEE THE DETAIL ON PAGE 21.
- 31 BATTEN, 2" X 2-1/2" ( ACTUAL SIZE ) X 36" OR A LENGTH TO SUIT ( DOUBLED ) ( 1 REQD ). LAMINATE W/6-10d NAILS. POSITION UNDER CONTAINER BELLS PRIOR TO TENSIONING STRAP.
- 32 BUNDLING STRAP, 1-1/4" X .031" OR .035" X 30'-0" LONG STEEL STRAPPING ( 2 REQD ). PRE-POSITION THE FIRST STRAP BEFORE LOADING PALLET STACK NO. 7, PRE-POSITION THE SECOND STRAP BEFORE LOADING PALLET STACK NO. 8. TENSION AND SEAL THE STRAP THAT ENCIRCLES PALLET STACKS NO. 7 AND 8, THEN REPEAT THE PROCEDURE FOR PALLET STACKS NO. 8 AND 9. SEE SPECIAL NOTE 12 ON PAGE 24.
- 33 BUNDLING STRAP, 1-1/4" X .031" OR .035" X 33'-6" LONG STEEL STRAPPING ( 2 REQD ). POSITION AS SHOWN. STAPLE TO STRAPPING BOARD MARKED 30 W/3 STAPLES.
- 34 SEAL FOR 1-1/4" STRAPPING ( 8 REQD, 2 PER JOINT ). SEE GENERAL NOTE "O" ON PAGE 2. NOTE: THE SEAL IS NOT SHOWN.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	169	57
1" X 6"	318	159
2" X 2"	96	32
2" X 3"	31	16
2" X 4"	1,189	793
2" X 6"	211	211
4" X 4"	134	179
NAILS	NO. REQD	POUNDS
6d ( 2" )	261	1-1/2
10d ( 3" )	1,751	27
12d ( 3-1/4" )	40	1
16d ( 3-1/2" )	112	2-1/2
WIRE, NO. 14 GAGE ----- 3' REQD ----- NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT ( APPROX )
PALLET UNIT -----	82 -----	118,326 LBS
DUNNAGE -----		2,926 LBS
TOTAL WEIGHT -----		121,252 LBS

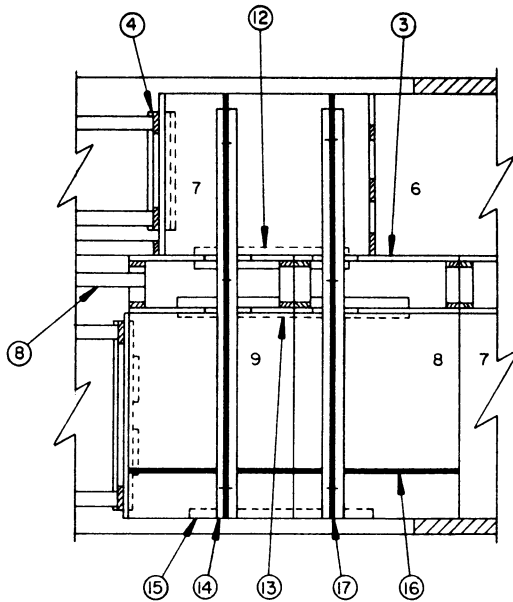
FLAT DUNNAGE METHOD UNIT ( DECREASED HEIGHT )  
82-UNIT LOAD IN A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR

SPECIAL NOTES:

1. A 60'-8" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2 AND SPECIAL NOTE 3 BELOW.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 22 IS THE FLAT DUNNAGE METHOD UNIT (DECREASED HEIGHT). A MAXIMUM OF SIXTY-SIX (66) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 95,238 POUNDS, CAN BE PLACED IN A 50'-6" LONG CAR. FIFTY (50) UNITS FOR A LADING WEIGHT OF 72,150 POUNDS, CAN BE OUTLOADED IN A 40'-6" LONG CAR.  
NOTE: IF THE DOOR HEIGHT PERMITS ENTRY OF A 3-HIGH PALLET STACK, THE LOAD CAN BE INCREASED BY FIVE (5) UNITS.
3. IF A CAR HAVING DOOR OPENINGS LESS THAN 10'-0" WIDE IS TO BE LOADED, THE CROSSWISE UNITS SHOULD BE LOADED EIGHT (8) STACKS LONG IN EACH END.
4. THE "HIGH" CRIB, SHOWN AS PIECE MARKED ①, MUST BE INSTALLED IN EACH END OF THE LOAD. FOUR (4) ASSEMBLIES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
5. THE SEPARATOR GATES, SHOWN AS PIECES MARKED ② AND ④ IN THE LOAD ON PAGE 22, ARE DESIGNATED "RIGHT HAND" AND "LEFT HAND" TO FACILITATE POSITIONING OF THE PALLET UNITS AS LOADING PROGRESSES. WHEN LOADING THE CAR, POSITION A PALLET UNIT STACK AGAINST THE END WALL, THEN POSITION A SEPARATOR GATE SO THE 1" X 4" TIE PIECES ARE LOCATED UNDER THE "OVERHANG" OF THE BOTTOM AND TOP PALLET UNITS. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.
6. ALL SEPARATOR GATES, WHICH ARE WITHIN THE DOORWAY AREA OF A CAR EQUIPPED WITH CONVENTIONAL SLIDING DOORS MUST BE WIRE TIED TO THE ADJACENT CRIB FILL TO PREVENT DISPLACEMENT. ENCIRCLE A VERTICAL PIECE OF THE SEPARATOR GATE AND THE UPPER HORIZONTAL PIECE OF THE CRIB FILL WITH NO. 14 GAGE WIRE AND TWIST TAUT.
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 A 3-LAYER LOAD ARE NOT ECONOMICALLY FEASIBLE. CONSTRUCT EACH SEPARATOR GATE FOR ONE OR TWO-LAYER LOADS FROM 44" WIDE PLYWOOD OF AN APPROPRIATE LENGTH.
8. CENTER GATES "E" AND "F" 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 95 FOR GUIDANCE.
9. 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. NOTE THAT THE NUMBER OF STRUTS AND STRUT BRACING PIECES WILL VARY DEPENDENT UPON THE QUANTITY TO BE LOADED.
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 ⑤ AND 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 LOAD BUNDLING STRAPS MAY BE USED. REFER TO PAGES 97 THRU 99 FOR OTHER TYPES OF DOORWAY PROTECTION.
11. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED FLOORLINE BLOCKING AND LOAD BUNDLING STRAPS MUST BE USED. SEE THE "PARTIAL PLAN VIEW D" DETAIL, AND KEY NUMBERS ③ THRU ⑥ ON PAGE 23 FOR GUIDANCE. NOTE THAT CRIB FILL MARKED ⑤ MUST HAVE 3" CUT OFF EACH VERTICAL AND BOTTOM SUPPORT PIECE THAT RESTS ON THE SIDE BLOCKING; ALSO "CENTER GATE E" MARKED ⑥ MUST BE WIRE TIED TO PIECE MARKED ⑩ TO PREVENT DISPLACEMENT.
12. IF THE PALLET STACKS IN THE DOORWAY ARE POSITIONED SO THE FORKLIFT OPENINGS ARE NOT CLOSE ENOUGH IN ALIGNMENT FOR EACH PALLET STACK TO RECEIVE TWO (2) BUNDLING STRAPS ACROSS THE LOAD WIDTH; THAT PALLET STACK MUST BE UNITIZED TO THE LONGITUDINALLY ADJACENT PALLET STACK AS SHOWN IN THE "PARTIAL PLAN VIEW D" DETAIL ON PAGE 23.
13. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. THE LOAD CAN BE REDUCED BY ONE OR MORE PALLET UNITS BY EMPLOYING THE PROCEDURES SHOWN ON PAGE 68. FOUR (4) PALLET UNITS CAN BE OMITTED FROM A 2-TIER LOAD BY LEAVING OUT THE LENGTHWISE STACK NUMBERED 7, THE CROSSWISE STACK NUMBERED 9 AND THE ADJACENT CRIB FILL. NOTE THAT STRUT BRACING MUST BE APPLIED TO ALL THE STRUTS. OR, THE ENTIRE ONE OR TWO TOP TIERS CAN BE OMITTED. A PARTIAL 1-TIER LOAD CAN BE SHIPPED IN ONE OR BOTH ENDS OF A CAR BY USING KNEE BRACES AS SHOWN ON PAGE 84 AND 85.
14. IF PALLETIZED UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 89 FOR SHIPPING GUIDANCE FOR LENGTHWISE UNITS AND PAGE 90 FOR CROSSWISE UNITS.
15. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 91 FOR GUIDANCE.

FLAT DUNNAGE METHOD UNIT ( DECREASED HEIGHT )  
82-UNIT LOAD IN A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR

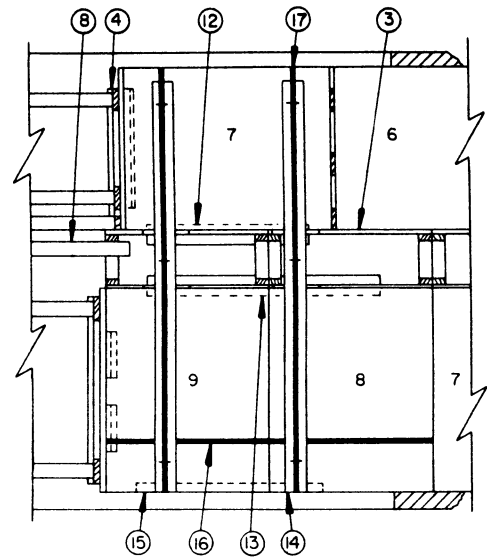




**PARTIAL PLAN VIEW F**  
(LOAD VIEW PAGE 38)

**KEY NUMBERS:**

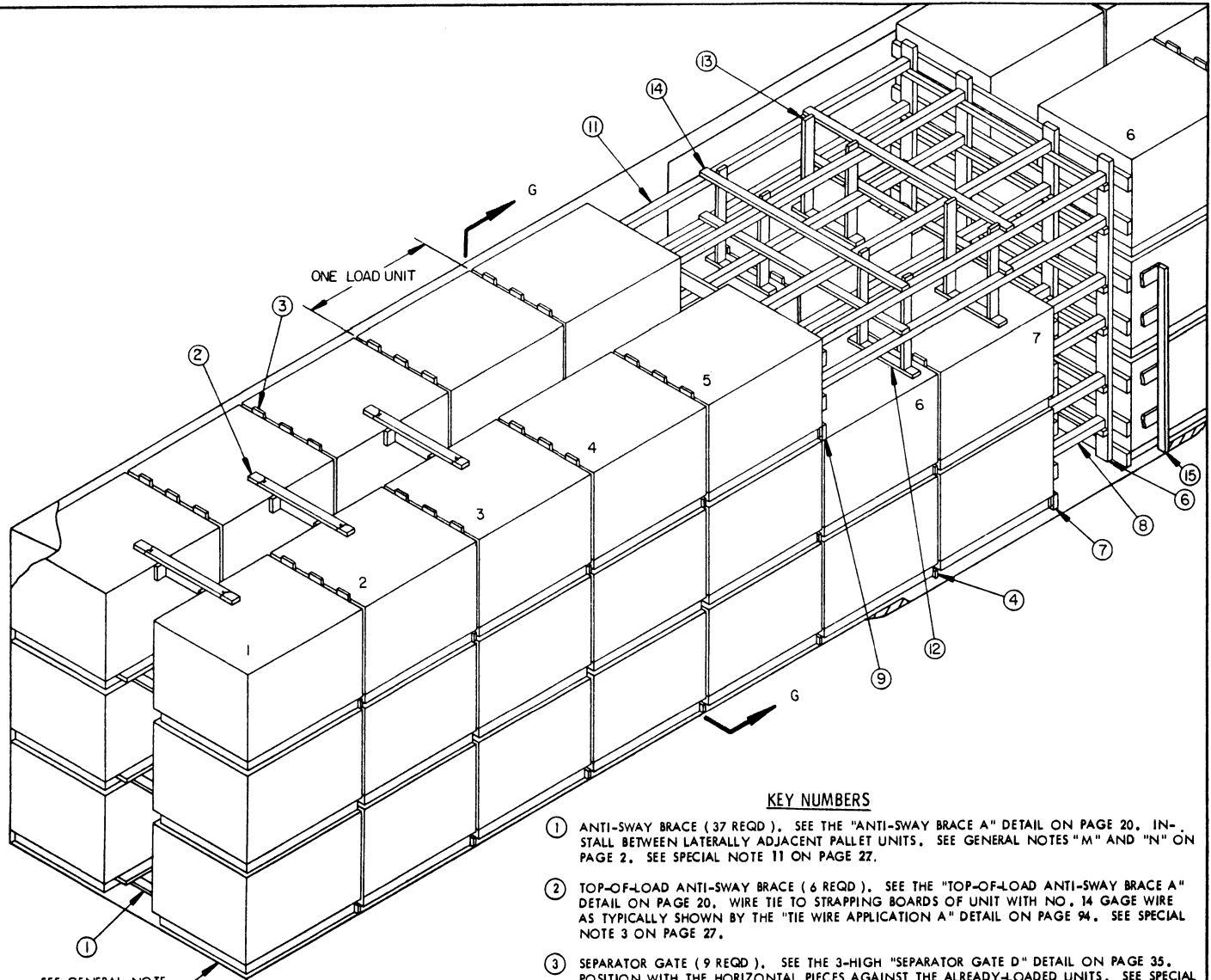
- ⑫ SIDE BLOCKING, 2" X 6" X 40" OR A LENGTH TO SUIT (DOUBLED) (1 REQD). POSITION AS SHOWN. NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ⑬ SIDE BLOCKING, 2" X 6" X 60" OR A LENGTH TO SUIT (DOUBLED) (1 REQD). PRE-POSITION 51" FROM THE NEAR SIDE CAR WALL AND NAIL AS DIRECTED IN KEY NUMBER ⑫ ABOVE W/8-16d NAILS.
- ⑭ STRAPPING BOARD/SPACER ASSEMBLY E (2 REQD). SEE THE DETAIL ON PAGE 21.
- ⑮ BATTEN, 2" X 2-1/2" (ACTUAL SIZE) X 36" OR A LENGTH TO SUIT (DOUBLED) (1 REQD). LAMINATE W/6-10d NAILS. POSITION UNDER CONTAINER BELLS PRIOR TO TENSIONING STRAP.
- ⑯ BUNDLING STRAP, 1-1/4" X .031" OR .035" X 32'-0" LONG STEEL STRAPPING (1 REQD). PRE-POSITION THE STRAP, ENCIRCLE PALLET STACK NUMBERS 8 AND 9, TENSION AND SEAL.
- ⑰ BUNDLING STRAP, 1-1/4" X .031" OR .035" X 36'-0" LONG STEEL STRAPPING (2 REQD). POSITION AS SHOWN. STAPLE TO STRAPPING BOARD MARKED ⑭ W/3 STAPLES.
- ⑱ SEAL FOR 1-1/4" STRAPPING (6 REQD, 2 PER JOINT). SEE GENERAL NOTE "O" ON PAGE 2. NOTE: THE SEAL IS NOT SHOWN.



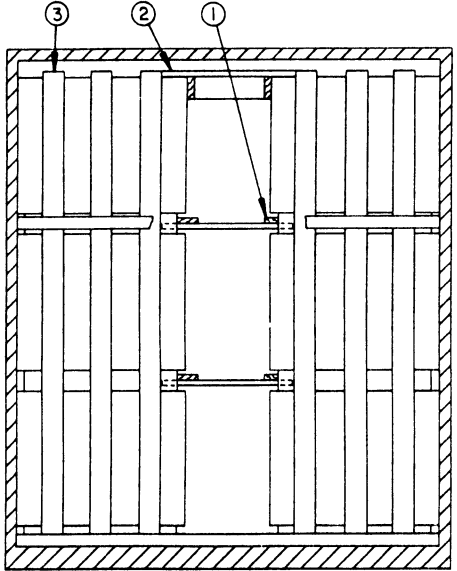
**PARTIAL PLAN VIEW H**  
(LOAD VIEW PAGE 52)

**KEY NUMBERS**

- ⑫ SIDE BLOCKING, 2" X 6" X 40" OR A LENGTH TO SUIT (DOUBLED) (1 REQD). POSITION AS SHOWN. NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ⑬ SIDE BLOCKING, 2" X 6" X 60" OR A LENGTH TO SUIT (DOUBLED) (1 REQD). PRE-POSITION 51" FROM THE NEAR SIDE CAR WALL AND NAIL AS DIRECTED IN KEY NUMBER ⑫ ABOVE W/8-16d NAILS.
- ⑭ STRAPPING BOARD/SPACER ASSEMBLY E. (2 REQD). SEE THE DETAIL ON PAGE 21.
- ⑮ BATTEN, 2" X 2-1/2" (ACTUAL SIZE) X 48" OR A LENGTH TO SUIT (DOUBLED) (1 REQD). LAMINATE W/6-10d NAILS. POSITION UNDER CONTAINER BELLS PRIOR TO TENSIONING STRAP.
- ⑯ BUNDLING STRAP, 1-1/4" X .031" OR .035" X 29'-0" LONG STEEL STRAPPING (1 REQD). PRE-POSITION THE STRAP, ENCIRCLE PALLET STACK NUMBERS 8 AND 9, TENSION AND SEAL.
- ⑰ BUNDLING STRAP, 1-1/4" X .031" OR .035" X 33'-6" LONG STEEL STRAPPING (2 REQD). POSITION AS SHOWN. STAPLE TO STRAPPING BOARD MARKED ⑭ W/3 STAPLES.
- ⑱ SEAL FOR 1-1/4" STRAPPING (6 REQD, 2 PER JOINT). SEE GENERAL NOTE "O" ON PAGE 2. NOTE: THE SEAL IS NOT SHOWN.



ISOMETRIC VIEW



SECTION G-G

**KEY NUMBERS**

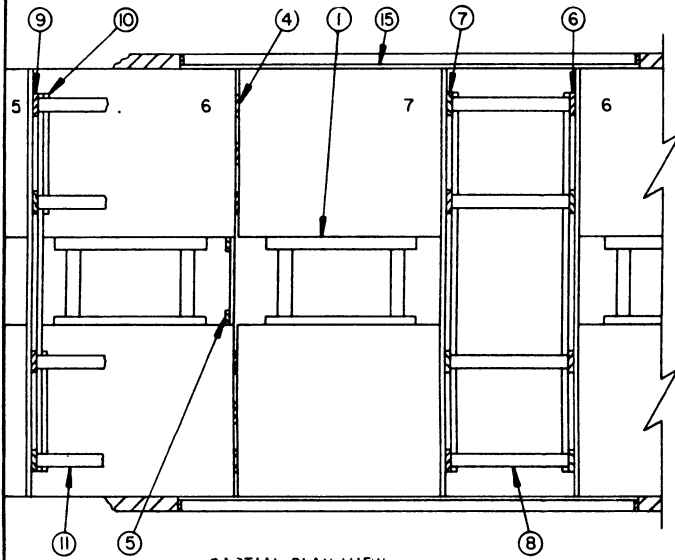
- ① ANTI-SWAY BRACE (37 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 20. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2. SEE SPECIAL NOTE 11 ON PAGE 27.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 20. WIRE TIE TO STRAPPING BOARDS OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 94. SEE SPECIAL NOTE 3 ON PAGE 27.
- ③ SEPARATOR GATE (9 REQD). SEE THE 3-HIGH "SEPARATOR GATE D" DETAIL ON PAGE 35. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 4 THRU 6 ON PAGE 27.
- ④ SEPARATOR GATE (2 REQD). SEE THE 2-HIGH "SEPARATOR GATE D" DETAIL ON PAGE 35.
- ⑤ STOP PIECE, 1" X 4" X 48" (2 REQD). POSITION AGAINST PALLET UNITS IN THE DOORWAY AREA AND NAIL TO THE HORIZONTAL PIECES OF PIECE MARKED ④ W/3-6d NAILS AT EACH JOINT AND CLINCH. SEE THE "PARTIAL PLAN VIEW" AND SPECIAL NOTE 5 ON PAGE 27.
- ⑥ CENTER GATE FOR 3-HIGH (1 REQD). SEE THE "CENTER GATE G" DETAIL ON PAGE 36. SEE SPECIAL NOTE 11 ON PAGE 27.
- ⑦ CENTER GATE FOR 2-HIGH (1 REQD). SEE THE "CENTER GATE G" DETAIL ON PAGE 36.
- ⑧ STRUT, 4" X 4" BY CUT TO FIT (16 REQD). TOENAIL TO PIECES MARKED ⑥ AND ⑦ W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "L" ON PAGE 2, AND GENERAL NOTES "U" AND "V" ON PAGE 3.
- ⑨ CENTER GATE FOR 1-HIGH (1 REQD). SEE THE "CENTER GATE G" DETAIL ON PAGE 36.
- ⑩ GATE SUPPORT, 2" X 4" X 30" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE VERTICAL PIECES OF CENTER GATE MARKED ⑥ W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/5-10d NAILS. SEE THE PARTIAL PLAN VIEW ON PAGE 27.
- ⑪ STRUT, 4" X 4" BY CUT TO FIT (8 REQD). TOENAIL TO PIECES MARKED ⑥ AND ⑨ W/2-16d NAILS AT EACH END.
- ⑫ STRUT BRACING PAD, 2" X 4" BY LENGTH TO SUIT (4 REQD). POSITION UNDER THE VERTICAL STRUT BRACING AS SHOWN. SEE SPECIAL NOTE 9 ON PAGE 27.
- ⑬ VERTICAL STRUT BRACING, 2" X 4" X 36" (8 REQD). NAIL TO THE 4" X 4" STRUTS MARKED ① W/3-10d NAILS AT EACH JOINT. TOENAIL TO THE STRUT BRACING PAD, PIECE MARKED ⑫, W/1-10d NAIL AT EACH JOINT.
- ⑭ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 9" (4 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑮ DOORWAY PROTECTION (2 REQD). SEE THE 2-HIGH "DOORWAY PROTECTION C" DETAIL ON PAGE 36. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 10 ON PAGE 27.

( SPECIAL NOTES CONTINUED )

13. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 89 FOR SHIPPING GUIDANCE.
14. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 91 FOR GUIDANCE.

SPECIAL NOTES:

1. A 60'-8" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2 AND SPECIAL NOTE 3 BELOW.
2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 26 IS THE FLAT DUNNAGE METHOD UNIT (DECREASED HEIGHT). A MAXIMUM OF FIFTY-SIX (56) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 80,808 POUNDS, CAN BE PLACED IN A 50'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES; FORTY-FOUR (44) UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 63,492 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 26, MUST BE INSTALLED IN EACH END OF THE CAR. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
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 PIECES MARKED ③ AND ④, SO THE 1" X 4" TIE PIECES ARE LOCATED UNDER THE "OVERHANG" OF THE BOTTOM AND TOP 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 ⑤. 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 A 3-LAYER LOAD ARE NOT ECONOMICALLY FEASIBLE. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 94 FOR CONSTRUCTION GUIDANCE.
7. 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 95 FOR GUIDANCE.
8. 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 PIECES MARKED ④, ⑦ AND ⑨ IN THE LOAD ON PAGE 26, INSTALL TWO (2) "CENTER GATES E" AS SHOWN ON PAGE 34. 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 95. OMIT THE STOP PIECES FROM "CENTER GATE E".
9. 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 ⑫, MUST BE POSITIONED UNDER AND SECURED TO EACH APPLICABLE VERTICAL STRUT BRACING PIECE.
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. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED ⑮ IN THE LOAD ON PAGE 26, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILABLE SIDE BLOCKING AND LOAD BUNDLING STRAPS MAY BE USED. REFER TO PAGES 97 THRU 99 FOR OTHER TYPES OF DOORWAY PROTECTION.
11. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILABLE SIDE BLOCKING AND LOAD BUNDLING STRAPS MUST BE USED; OMIT EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA, IN LIEU OF PIECE MARKED ⑬, USE PIECES MARKED ③ THRU ⑧ ON PAGE 14. SEE SPECIAL NOTES 8 AND 9 ON PAGE 15 FOR GUIDANCE. NOTE THAT THE BUNDLING STRAP MARKED ⑦ WILL BE 33'-6" LONG. ALSO, THE CENTER GATES MUST BE RESTRAINED FROM LATERAL MOVEMENT BY NAILING TO THE CAR FLOOR A DOUBLED 2" X 4" X 18" POSITIONED LONGITUDINALLY SO AS TO BE CENTERED AGAINST THE FILL PIECES OF A CENTER GATE. TWO (2) PIECES WILL BE REQUIRED FOR EACH CENTER GATE WHICH IS IN THE DOOR OPENING, OR WITHIN SIX INCHES (6") OF IT.
12. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED BY OMITTING 2, 4, 6, OR 8 UNITS FROM THE 2-HIGH 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 68 THRU 88 FOR GUIDANCE.



PARTIAL PLAN VIEW

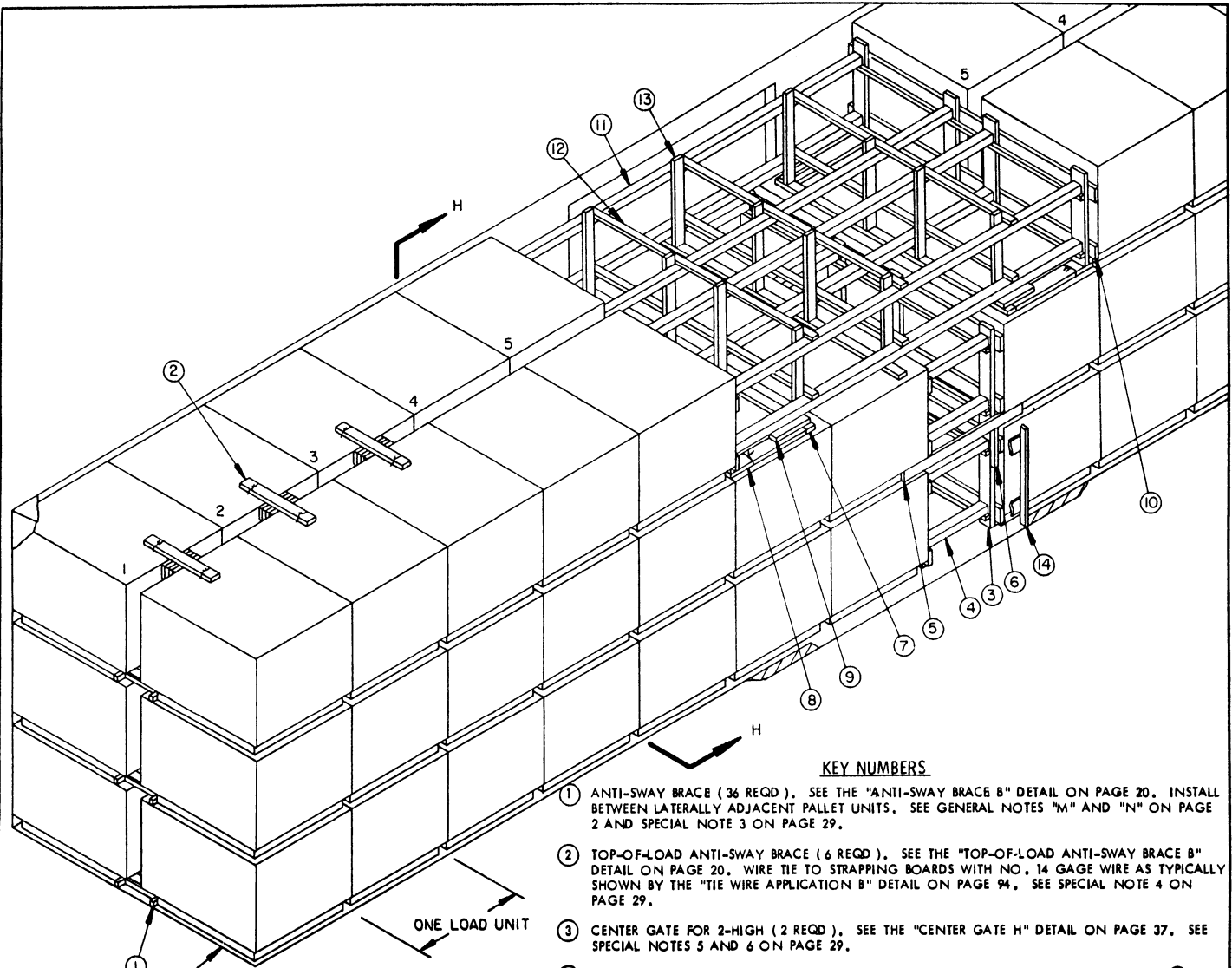
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	218	73
1" X 6"	715	358
2" X 3"	97	33
2" X 3"	25	13
2" X 4"	440	294
2" X 6"	344	344
4" X 4"	132	176
NAILS	NO. REQD	POUNDS
6d (2")	486	3
10d (3")	960	15
12d (3-1/4")	24	1/2
16d (3-1/2")	96	2
WIRE, NO. 14 GAGE	60' REQD	1 LB

(CONTINUED AT LEFT)

LOAD AS SHOWN

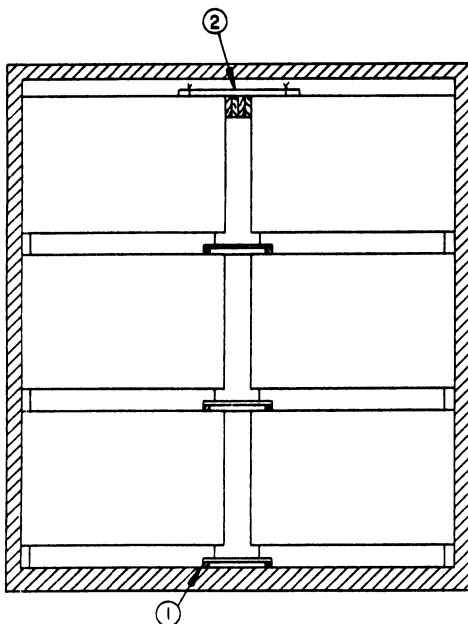
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	74	106,782 LBS
DUNNAGE		2,603 LBS
TOTAL WEIGHT		109,385 LBS

FLAT DUNNAGE METHOD UNIT (DECREASED HEIGHT)  
74-UNIT LOAD IN A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR



SEE GENERAL NOTE "G" ON PAGE 2.

ISOMETRIC VIEW

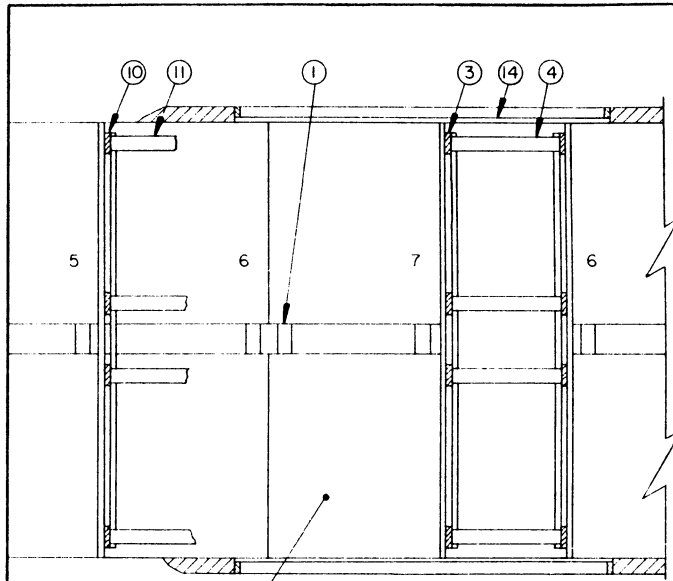


SECTION H-H

**KEY NUMBERS**

- ① ANTI-SWAY BRACE (36 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 20. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 29.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 20. WIRE TIE TO STRAPPING BOARDS WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 94. SEE SPECIAL NOTE 4 ON PAGE 29.
- ③ CENTER GATE FOR 2-HIGH (2 REQD). SEE THE "CENTER GATE H" DETAIL ON PAGE 37. SEE SPECIAL NOTES 5 AND 6 ON PAGE 29.
- ④ STRUT, 4" X 4" BY CUT TO FIT (REF: 28") (16 REQD). TOENAIL TO PIECES MARKED ⑤ W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "L" ON PAGE 2 AND GENERAL NOTES "U" AND "V" ON PAGE 3.
- ⑤ GATE HOLD DOWN, 2" X 4" BY LENGTH OF CENTER VOID PLUS 24" (2 REQD). POSITION UNDER THE ENDS OF THE CONTAINERS AND NAIL TO THE VERTICAL PIECES OF THE CENTER GATES W/2-10d NAILS AT EACH JOINT. SEE SPECIAL NOTE 7 ON PAGE 29.
- ⑥ GATE HOLD DOWN SUPPORT PIECE, 2" X 2" X 15" (4 REQD). POSITION UNDER PIECE MARKED ⑤ AND NAIL TO A VERTICAL PIECE OF PIECE MARKED ⑧ W/4-10d NAILS.
- ⑦ STRUT BRACING PAD, 2" X 4" BY LENGTH TO SUIT (3 REQD). POSITION UNDER THE VERTICAL STRUT BRACING AS SHOWN. SEE SPECIAL NOTE 8 ON PAGE 29.
- ⑧ GATE SUPPORT, 2" X 6" BY LENGTH TO SUIT (4 REQD). POSITION AGAINST STRUT BRACING PAD MARKED ⑦ AND EXTEND UNDER VERTICAL OF CENTER GATE MARKED ⑩. WIRE TIE TO PALLET STRAPPING BOARD ON THE END NEAREST THE CENTER GATE.
- ⑨ HOLD DOWN PIECE, 2" X 4" X 15" (4 REQD). NAIL TO PIECES MARKED ⑦ AND ⑧ W/5-10d NAILS.
- ⑩ CENTER GATE FOR 1-HIGH (2 REQD). SEE THE "CENTER GATE H" DETAIL ON PAGE 37.
- ⑪ STRUT, 4" X 4" BY CUT TO FIT (8 REQD). TOENAIL TO PIECES MARKED ⑩ W/2-16d NAILS AT EACH END.
- ⑫ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 6" (6 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑬ VERTICAL STRUT BRACING, 2" X 4" X 36" (12 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT. TOENAIL TO PIECE MARKED ⑦ W/1-10d NAIL.
- ⑭ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION D" DETAIL ON PAGE 37. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTES 9 AND 10 ON PAGE 29.

FLAT DUNNAGE METHOD UNIT (DECREASED HEIGHT)  
72-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL BOX CAR



IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, SEE SPECIAL NOTES 9 AND 10 BELOW.

PARTIAL PLAN VIEW

**SPECIAL NOTES:**

1. A 50'-6" LONG BY 9'-4" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 8'-0" WIDE DOOR OPENINGS IS SHOWN. WIDER CARS OF OTHER LENGTHS 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 28 IS THE FLAT DUNNAGE METHOD UNIT (DECREASED HEIGHT). A MAXIMUM OF FIFTY-SIX (56) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 80,808 POUNDS, CAN BE PLACED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES. IF A 60'-8" LONG BY 9'-4" OR WIDER CAR IS AVAILABLE, EIGHTY-FOUR (84) PALLET UNITS FOR AN APPROXIMATE LADING WEIGHT OF 121,212 POUNDS CAN BE LOADED. NOTE: IF THE DOCK HEIGHT PERMITS ENTRY OF A 3-HIGH PALLET STACK, THE LOAD MAY BE INCREASED BY SIX (6) UNITS.
3. ANTI-SWAY BRACING IS REQUIRED BETWEEN LATERALLY ADJACENT PALLET UNITS. TO PREVENT LONGITUDINAL DISPLACEMENT OF THE ANTI-SWAY BRACE BETWEEN THE UPPER UNITS, A STOP PIECE MUST BE NAILED TO EACH CENTER GATE "H" AS SHOWN ON THE DETAIL ON PAGE 39. IF DESIRED IN CARS HAVING AVAILABLE SIDEWALLS, 1" X 6" OR 2" X 6" FILL MATERIAL MAY BE NAILED TO ONE OR BOTH SIDEWALLS AT HEIGHTS SPECIFIED FOR THE DOORWAY PROTECTION HORIZONTAL PIECES, IN LIEU OF USING THE ANTI-SWAY BRACES. NOTE THAT THE TOTAL ACCUMULATED SPACE ACROSS A CAR SHOULD NOT EXCEED TWO INCHES (2").
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 28, MUST BE INSTALLED IN EACH END OF THE CAR. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
5. CENTER GATE "H" 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 95 FOR GUIDANCE.
6. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR-WIDTH GATES. IN LIEU OF EACH "CENTER GATE H" SHOWN AS PIECES MARKED ③ AND ⑩ IN THE LOAD ON PAGE 28, INSTALL TWO (2) "CENTER GATES F" AS SHOWN ON PAGE 35. 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 95.
7. AN ALTERNATIVE TO THE GATE HOLD DOWN SHOWN AS PIECES MARKED ⑤ AND ⑥ IN THE LOAD ON PAGE 28 MAY BE USED. IF DESIRED, HOLD DOWN PIECES MAY BE APPLIED TO THE CENTER GATES AS SHOWN BY THE CENTER GATE "H" DETAIL ON PAGE 37.
8. 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.
9. 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 PIECE MARKED ④ IN THE LOAD ON PAGE 28, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED SIDE BLOCKING AND LOAD BUNDLING STRAPS MAY BE USED. REFER TO PAGES 97 THRU 99 FOR OTHER TYPES OF DOORWAY PROTECTION. NOTE: IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED FLOORLINE BLOCKING AND LOAD BUNDLING STRAPS MUST BE USED.
10. IF THE SIDE BLOCKING/BUNDLING STRAP TYPE DOORWAY PROTECTION IS USED IN LIEU OF THE WOODEN GATE TYPE MARKED ④, OMIT EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA. SEE PIECES MARKED ③ THRU ⑧ ON PAGE 60, AND SPECIAL NOTES 9 AND 10 ON PAGE 61 FOR GUIDANCE. NOTE THAT STRAPPING BOARD/SPACER ASSEMBLY "B" DETAILED ON PAGE 20 WILL BE USED, AND THE BUNDLING STRAP, PIECE MARKED ⑦ WILL BE 33'-6" LONG.
11. 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) UNITS, 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 68 THRU 90 FOR GUIDANCE.
12. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 90 AND 92 FOR SHIPPING GUIDANCE.
13. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 91 FOR GUIDANCE.

**BILL OF MATERIAL**

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	96	32
1" X 6"	64	32
2" X 2"	576	126
2" X 3"	30	15
2" X 4"	282	188
2" X 6"	211	211
4" X 4"	144	192
NAILS	NO. REQD	POUNDS
6d (2")	552	3-1/4
10d (3")	894	13-1/2
12d (3-1/4")	24	1/2
16d (3-1/2")	96	2-1/4

**LOAD AS SHOWN**

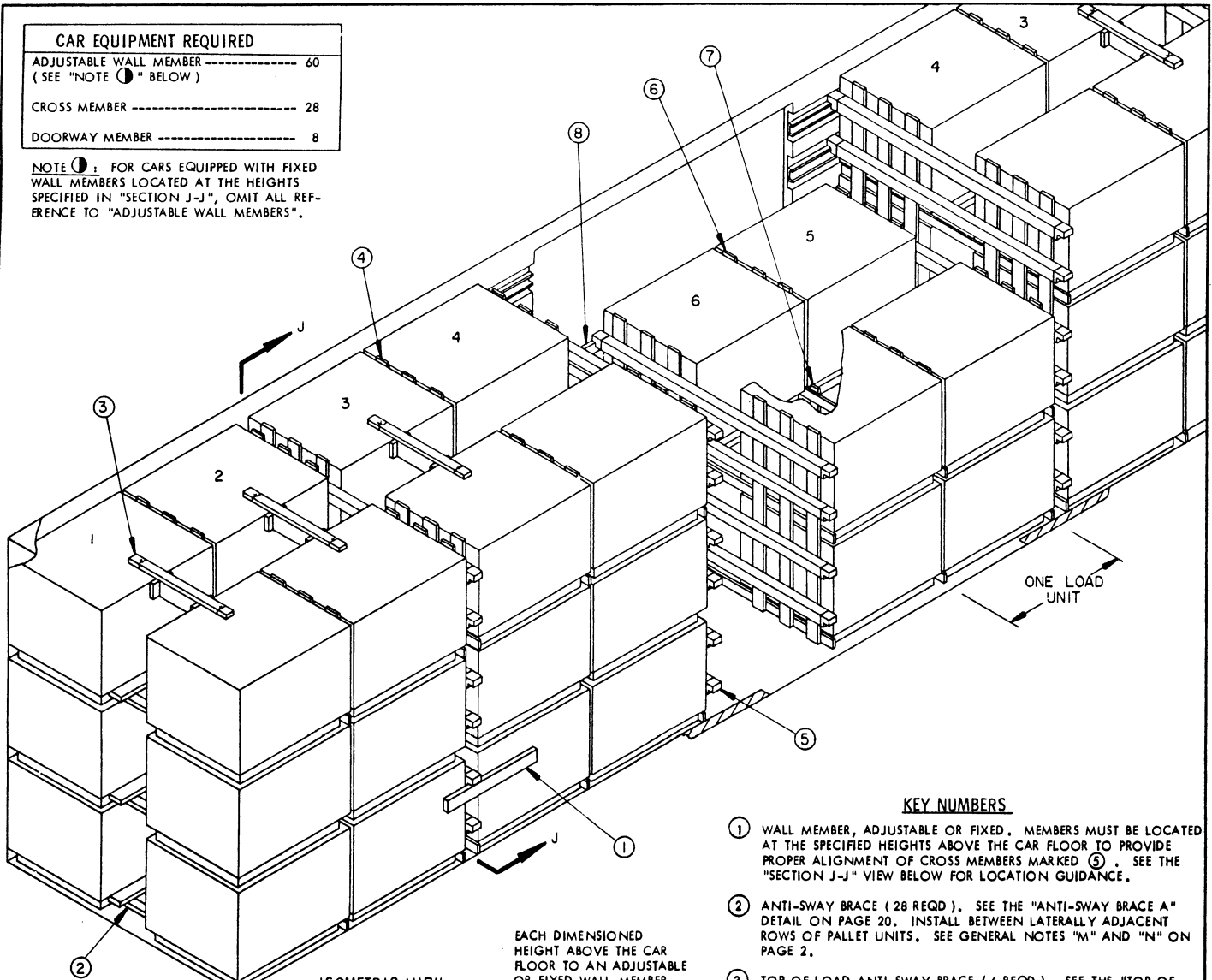
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	72	103,896 LBS
DUNNAGE		1,612 LBS
TOTAL WEIGHT		105,508 LBS

FLAT DUNNAGE METHOD UNIT (DECREASED HEIGHT)  
72 UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL BOX CAR

**CAR EQUIPMENT REQUIRED**

ADJUSTABLE WALL MEMBER (SEE "NOTE 1" BELOW)	60
CROSS MEMBER	28
DOORWAY MEMBER	8

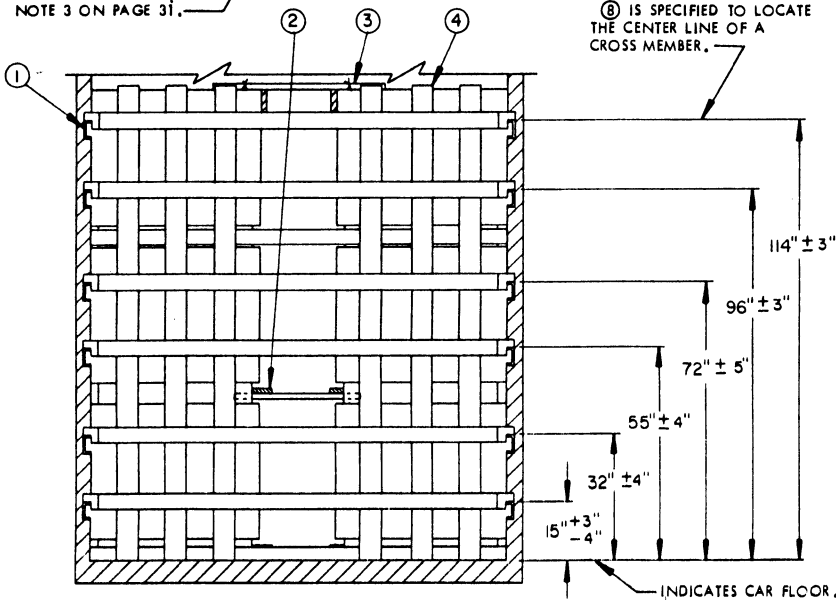
**NOTE 1:** FOR CARS EQUIPPED WITH FIXED WALL MEMBERS LOCATED AT THE HEIGHTS SPECIFIED IN "SECTION J-J", OMIT ALL REFERENCE TO "ADJUSTABLE WALL MEMBERS".



**ISOMETRIC VIEW**

SEE GENERAL NOTE "G" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 31.

EACH DIMENSIONED HEIGHT ABOVE THE CAR FLOOR TO AN ADJUSTABLE OR FIXED WALL MEMBER 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 J-J**

**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 J-J" VIEW BELOW FOR LOCATION GUIDANCE.
- 2 ANTI-SWAY BRACE (28 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 20. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.
- 3 TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 20. WIRE TIE TO STRAPPING BOARDS OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 94. SEE SPECIAL NOTE 4 ON PAGE 31.
- 4 SEPARATOR GATE FOR 3-HIGH (10 REQD). SEE THE "SEPARATOR GATE D" DETAIL ON PAGE 35. AS APPLICABLE, POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 5 AND 7 ON PAGE 31.
- 5 CROSS MEMBER (28 REQD). SEE GENERAL NOTE "X" ON PAGE 3.
- 6 SEPARATOR GATE FOR 2-HIGH (3 REQD). SEE THE "SEPARATOR GATE D" DETAIL ON PAGE 35.
- 7 STOP PIECE, 1" X 4" X 48" (4 REQD). POSITION AGAINST PALLET UNITS IN THE DOORWAY AND NAIL TO THE HORIZONTAL PIECES OF PIECE MARKED 6 W/3-6d NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 6 ON PAGE 31.
- 8 DOORWAY MEMBER (8 REQD). SEE THE "SECTION J-J" VIEW AT LEFT FOR LOCATION GUIDANCE. SEE SPECIAL NOTE 8 ON PAGE 31.

FLAT DUNNAGE METHOD UNIT (DECREASED HEIGHT)

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

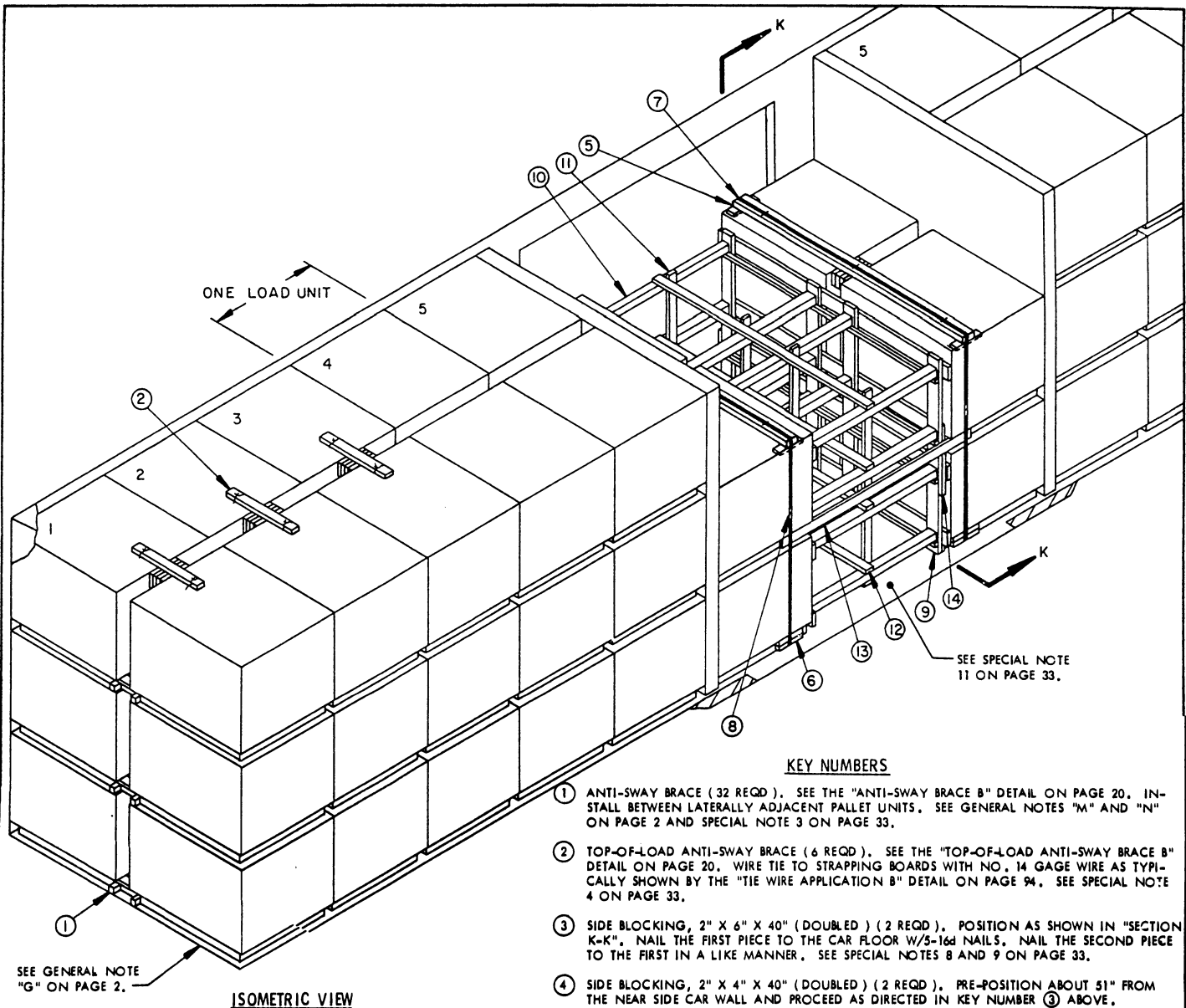
**SPECIAL NOTES:**

1. A 50'-6" LONG BY 9'-0" WIDE ( INSIDE 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 PALLETIZED UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 30 IS THE FLAT DUNNAGE METHOD UNIT ( DECREASED HEIGHT ). A MAXIMUM OF FORTY-FOUR ( 44 ) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 63,492 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 "G" 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 30, MUST BE INSTALLED IN EACH END OF THE CAR, THREE ( 3 ) 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 BOTTOM AND TOP 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 ⑦. 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, FOR ONE OR TWO-LAYER LOADS; PLYWOOD SEPARATOR GATES FOR A 3-LAYER LOAD ARE NOT ECONOMICALLY FEASIBLE. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 94 FOR CONSTRUCTION GUIDANCE.
8. IF THE CAR BEING LOADED IS EQUIPPED WITH AT LEAST TWELVE ( 12 ) DOORWAY MEMBERS, AND THE DOOR OPENING IS AT LEAST 10'-3" HIGH, 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 ONE OR TWO LAYERS 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 66 AND 67 FOR GUIDANCE.
10. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 91 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	249	83
1" X 6"	737	367
2" X 4"	263	176
2" X 6"	108	108
NAILS	NO. REQD	POUNDS
6d ( 2" )	492	3
10d ( 3" )	420	6-1/2
WIRE, NO. 14 GAGE ----- 60' REQD ----- 1 LB		

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT ( APPROX )
PALLET UNIT -----	56 -----	80,808 LBS
DUNNAGE -----	-----	1,479 LBS
TOTAL WEIGHT -----		82,287 LBS

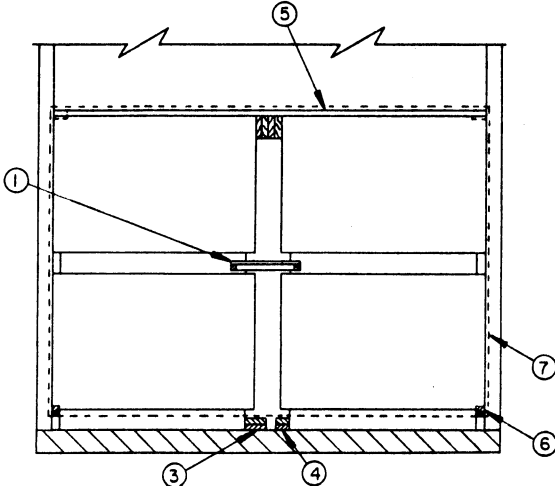


ISOMETRIC VIEW

SEE GENERAL NOTE "G" ON PAGE 2.

**KEY NUMBERS**

- ① ANTI-SWAY BRACE (32 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 20. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 33.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 20. WIRE TIE TO STRAPPING BOARDS WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 94. SEE SPECIAL NOTE 4 ON PAGE 33.
- ③ SIDE BLOCKING, 2" X 6" X 40" (DOUBLED) (2 REQD). POSITION AS SHOWN IN "SECTION K-K". NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTES 8 AND 9 ON PAGE 33.
- ④ SIDE BLOCKING, 2" X 4" X 40" (DOUBLED) (2 REQD). PRE-POSITION ABOUT 51" FROM THE NEAR SIDE CAR WALL AND PROCEED AS DIRECTED IN KEY NUMBER ③ ABOVE.
- ⑤ STRAPPING BOARD/SPACER ASSEMBLY "B" (2 REQD). SEE THE DETAIL ON PAGE 21.
- ⑥ BATTEN, 2" X 2-1/2" (ACTUAL SIZE) X 12" OR A LENGTH TO SUIT (DOUBLED) (4 REQD). LAMINATE W/3-10d NAILS. POSITION UNDER CONTAINER BELLS PRIOR TO TENSIONING STRAP.
- ⑦ BUNDLING STRAP, 1-1/4" X .031" OR .035" X 33'-0" LONG STEEL STRAPPING (2 REQD). STAPLE TO STRAPPING BOARD MARKED ⑤ W/3 STAPLES. SEE SPECIAL NOTE 10 ON PAGE 33.
- ⑧ SEAL FOR 1-1/4" STRAPPING (4 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "O" ON PAGE 2.
- ⑨ CENTER GATE (2 REQD). SEE THE "CENTER GATE H" DETAIL ON PAGE 37. SEE SPECIAL NOTES 6 AND 7 ON PAGE 33.
- ⑩ STRUT, 4" X 4" BY CUT TO FIT (REF: 60") (16 REQD). TOENAIL TO PIECES MARKED ⑨ W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "L" ON PAGE 2, AND GENERAL NOTES "U" AND "V" ON PAGE 3.
- ⑪ VERTICAL STRUT BRACING, 2" X 4" X 6'-6" (4 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑫ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 6" (4 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑬ GATE HOLD DOWN, 2" X 4" BY LENGTH OF CENTER VOID PLUS 24" (2 REQD). POSITION UNDER THE ENDS OF THE CONTAINERS AND NAIL TO THE VERTICAL PIECES OF THE CENTER GATES W/2-10d NAILS AT EACH JOINT. SEE SPECIAL NOTE 7 ON PAGE 33.
- ⑭ GATE HOLD DOWN SUPPORT PIECE, 2" X 2" X 15" (4 REQD). POSITION UNDER PIECE MARKED ⑬ AND NAIL TO A VERTICAL PIECE OF PIECE MARKED ⑨ W/4-10d NAILS.



SECTION K-K

**FLAT DUNNAGE METHOD UNIT (DECREASED HEIGHT)**

68-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE BOX CAR EQUIPPED WITH LOAD DIVIDERS



( SPECIAL NOTES CONTINUED )

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, OR A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR ( 4 ) UNITS, OR A 2-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 68 THRU 77 AND GENERAL NOTE "FF" ON PAGE 3 FOR GUIDANCE.
13. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 90 AND 92 FOR SHIPPING GUIDANCE.
14. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 91 FOR GUIDANCE.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-4" WIDE WOOD-LINED CUSHIONED BOX CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 10'-0" WIDE BY 10'-0" HIGH DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND OTHER DOOR SIZES CAN BE USED. SEE GENERAL NOTES "AA" THRU "EE" ON PAGE 3.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 32 IS THE FLAT DUNNAGE METHOD UNIT (DECREASED HEIGHT). A MAXIMUM OF EIGHTY-FOUR ( 84 ) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 121,212 POUNDS, CAN BE PLACED IN A 60'-8" LONG CAR, OR A MAXIMUM OF FIFTY-SIX ( 56 ) UNITS CAN BE LOADED IN A 40'-6" CAR FOR AN APPROXIMATE LADING WEIGHT OF 80,808 POUNDS, WHEN USING THE DEPICTED PROCEDURES. IF THE LENGTHWISE LOADING PATTERN SHOWN ON PAGE 26 IS EMPLOYED, SEVENTY ( 70 ) PALLET UNITS FOR AN APPROXIMATE LADING WEIGHT OF 101,010 POUNDS CAN BE PLACED IN A 60'-8" LONG CAR, FIFTY-SIX ( 56 ) UNITS CAN BE PLACED IN A 50'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 80,808 POUNDS, AND FORTY-FOUR ( 44 ) UNITS CAN BE LOADED IN A 40'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 63,492 POUNDS. **NOTE:** IF THE DOOR HEIGHT PERMITS ENTRY OF A 3-HIGH PALLET STACK, THE LOAD MAY BE INCREASED BY FOUR ( 4 ) UNITS. PLACE ADDED UNITS BEHIND THE LOAD DIVIDERS AND OMIT PIECES MARKED ③ THRU ⑭.
3. ANTI-SWAY BRACING IS REQUIRED BETWEEN LATERALLY ADJACENT PALLET UNITS. TO PREVENT LONGITUDINAL DISPLACEMENT OF THE ANTI-SWAY BRACE BETWEEN THE UPPER UNITS, A STOP PIECE MUST BE NAILED TO EACH CENTER GATE "H" AS SHOWN ON THE DETAIL ON PAGE 37. IF DESIRED IN CARS HAVING NAILABLE SIDEWALLS, 1" X 6" OR 2" X 6" FILL MATERIAL MAY BE NAILED TO ONE OR BOTH SIDEWALLS AT HEIGHTS SPECIFIED FOR THE DOORWAY PROTECTION HORIZONTAL PIECES, IN LIEU OF USING THE ANTI-SWAY BRACES. NOTE THAT THE TOTAL ACCUMULATED SPACE ACROSS A CAR SHOULD NOT EXCEED TWO INCHES ( 2" ).
4. 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. THREE ( 3 ) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
5. CENTER GATE "H" 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 95 FOR GUIDANCE.
6. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR-WIDTH GATES. IN LIEU OF EACH "CENTER GATE H", SHOWN AS PIECE MARKED ⑨ IN THE LOAD ON PAGE 32, INSTALL TWO ( 2 ) "CENTER GATES F" AS SHOWN ON PAGE 35. 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 95.
7. AN ALTERNATIVE TO THE GATE HOLD DOWN SHOWN AS PIECES MARKED ⑬ AND ⑭ IN THE LOAD ON PAGE 32 MAY BE USED. IF DESIRED, HOLD DOWN PIECES MAY BE APPLIED TO THE CENTER GATES AS SHOWN BY THE CENTER GATE "H" DETAIL ON PAGE 37.
8. 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 PIECE MARKED ⑭ IN THE LOAD ON PAGE 28, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED SIDE BLOCKING AND LOAD BUNDLING STRAPS MARKED ③ THRU ⑥ ON PAGE 32 MAY BE USED. REFER TO PAGES 97 THRU 99 FOR OTHER TYPES OF DOORWAY PROTECTION.
9. **NOTE:** IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED SIDE BLOCKING AND LOAD BUNDLING STRAPS MUST BE USED. SIDE BLOCKING MARKED ③ AND ④ IN THE LOAD VIEW MUST BE USED IN LIEU OF THE LOWER ANTI-SWAY BRACE MARKED ① FOR ALL UNITS REQUIRING BUNDLING STRAPS. IF THE PALLET UNITS ARE POSITIONED LENGTHWISE, SEE KEY NUMBERS ⑤ THRU ⑧ ON PAGE 14.
10. TWO ( 2 ) BUNDLING 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 CAR SIDEWALL ON BOTH SIDES OF THE CAR. ONE ( 1 ) BUNDLING 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.
11. A "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL SHOWN ON PAGE 101, IS REQUIRED BETWEEN THE LOAD DIVIDER BULKHEADS WHEN CENTER GATES ARE NOT USED, AND THE LOAD IN EITHER END OF THE CAR IS 50,000 POUNDS OR MORE. FOR THE DEPICTED PALLET UNIT, A STRUT ASSEMBLY WILL BE REQUIRED IF THE LOAD IN ONE END OF THE CAR CONSISTS OF MORE THAN FIVE ( 5 ) LOAD UNITS. THE STRUT ASSEMBLY WILL ALWAYS BE REQUIRED FOR FULL LOADS IN 60'-0" OR LONGER CARS.

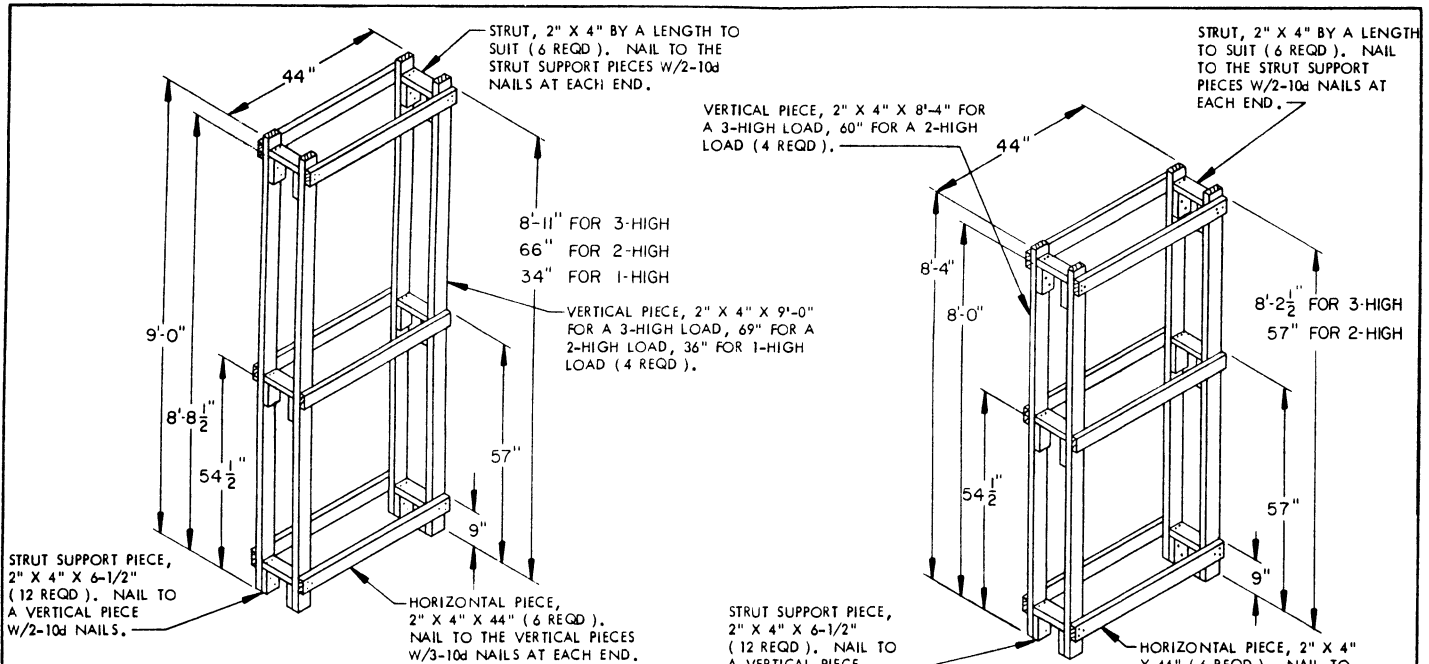
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	100	34
2" X 2"	319	107
2" X 4"	215	144
2" X 6"	191	191
NAILS	NO. REQD	POUNDS
6d ( 2" )	460	2-3/4
10d ( 3" )	716	11
16d ( 3-1/4" )	104	2-1/4
STEEL STRAPPING, 1-1/4" -----	66' REQD -----	10 LBS
SEAL FOR 1-1/4" STRAP -----	4 REQD -----	NIL
STAPLE -----	6 REQD -----	NIL
WIRE, NO. 14 GAGE -----	60' REQD -----	1 LB

( CONTINUED AT LEFT )

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT ( APPROX )
PALLET UNIT -----	68 -----	98,124 LBS
DUNNAGE -----	-----	979 LBS
TOTAL WEIGHT -----		99,103 LBS

FLAT DUNNAGE METHOD UNIT ( DECREASED HEIGHT )  
68-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE BOX CAR EQUIPPED WITH LOAD DIVIDERS

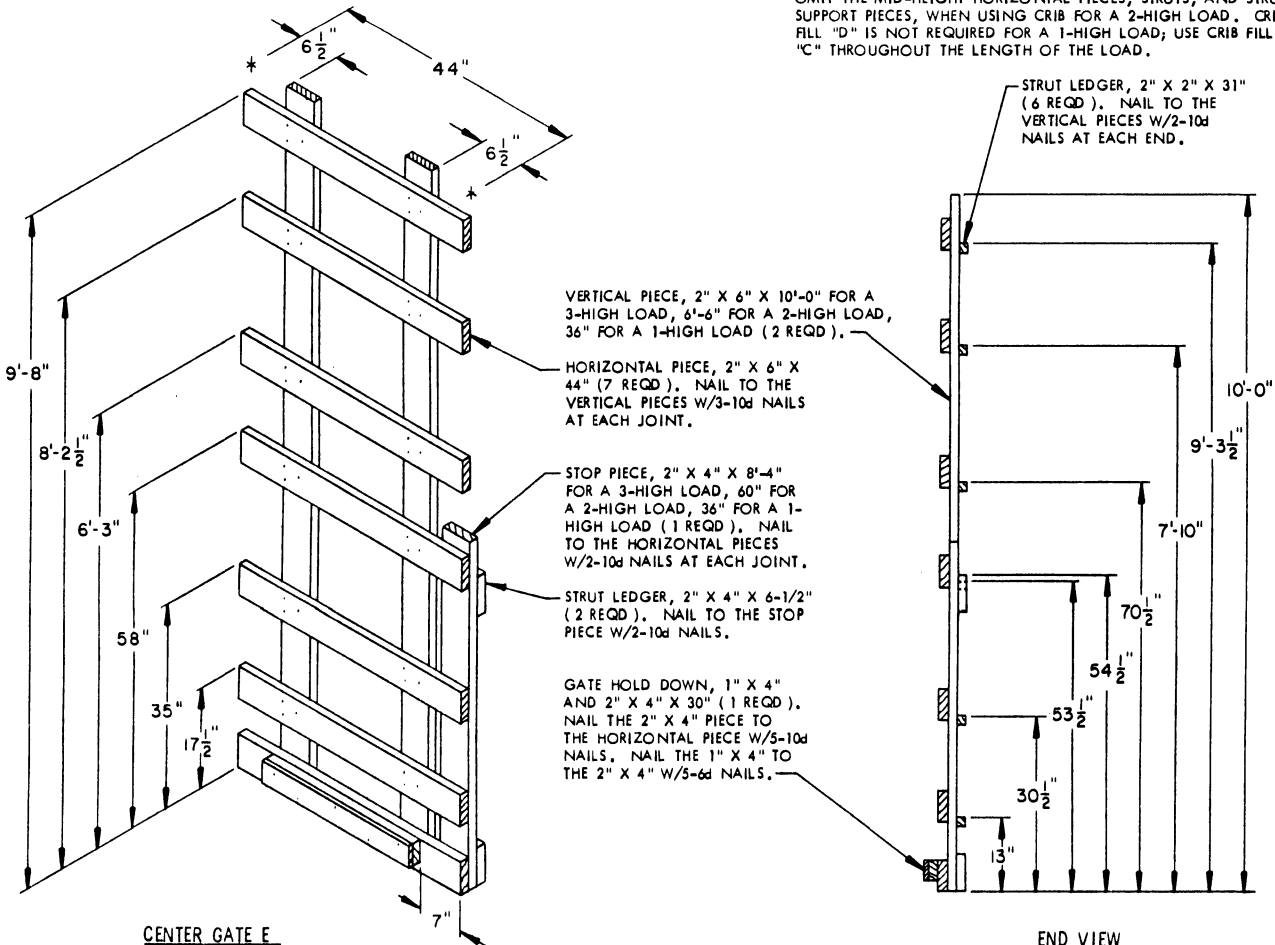


**CRIB FILL C**

CRIB FILL ASSEMBLIES "C" AND "D" SHOULD BE PRE-POSITIONED. CONSTRUCT TO BE 1/2" TO 3/4" LESS IN WIDTH THAN THE DISTANCE BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. OMIT THE MID-HEIGHT HORIZONTAL PIECES, STRUTS, AND STRUT SUPPORT PIECES WHEN USING CRIB FOR A 1 OR 2-HIGH LOAD.

**CRIB FILL D**

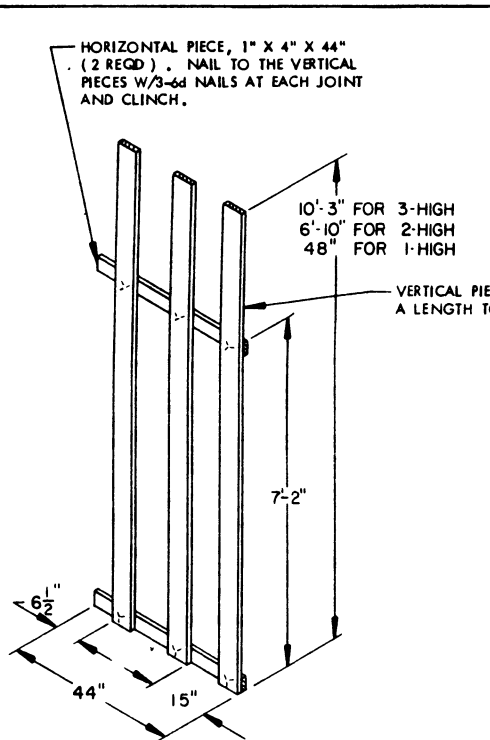
OMIT THE MID-HEIGHT HORIZONTAL PIECES, STRUTS, AND STRUT SUPPORT PIECES, WHEN USING CRIB FOR A 2-HIGH LOAD. CRIB FILL "D" IS NOT REQUIRED FOR A 1-HIGH LOAD; USE CRIB FILL "C" THROUGHOUT THE LENGTH OF THE LOAD.



**CENTER GATE E**

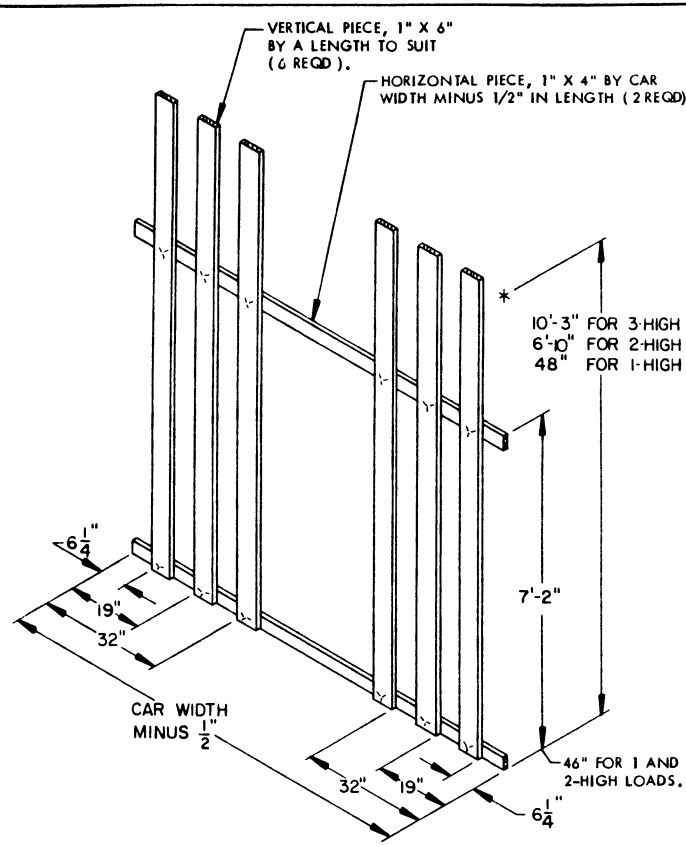
1 RIGHT HAND AND 1 LEFT HAND GATE REQUIRED. NOTE THAT THE TOP 2" X 2" STRUT LEDGER MUST BE 37-1/2" LONG FOR A 1-HIGH LOAD. NOTE: FOR THE 1-HIGH CENTER GATE "E" MARKED ① ON PAGE 22, OMIT THE STOP PIECES.

**END VIEW**

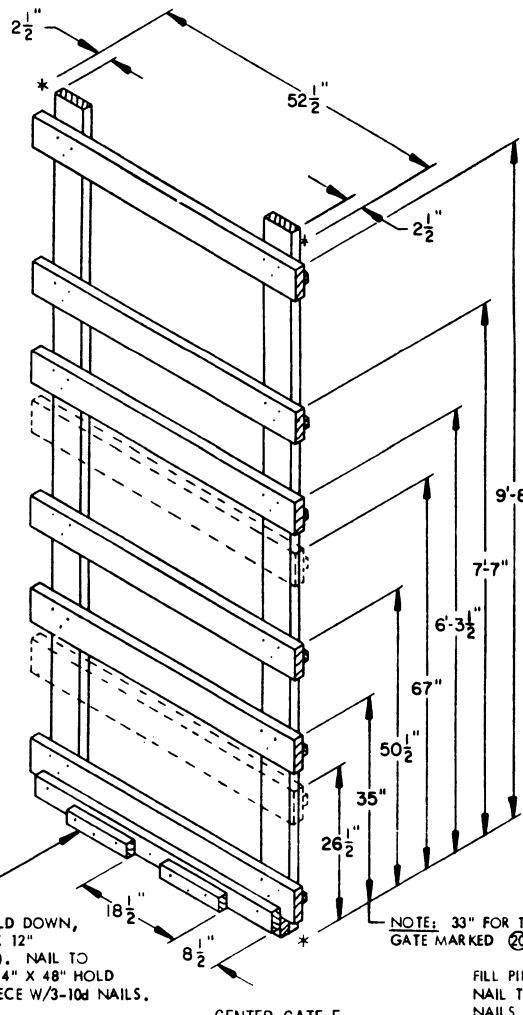


**SEPARATOR GATE C**

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



**SEPARATOR GATE D**



**CENTER GATE F**

GATE HOLD DOWN, 2" X 3" X 12" (2 REQD). NAIL TO THE 2" X 4" X 48" HOLD DOWN PIECE W/3-10d NAILS.

VERTICAL PIECE, 2" X 6" X 10'-0" FOR A 3-HIGH LOAD, 6'-6" FOR A 2-HIGH LOAD, 36" FOR A 1-HIGH LOAD (2 REQD).

HORIZONTAL PIECE, 2" X 6" X 52-1/2" (8 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.

DOTTED HORIZONTAL AND STRUT LEDGERS REQUIRED IN COMBINATION LOAD ON PAGE 22 ONLY.

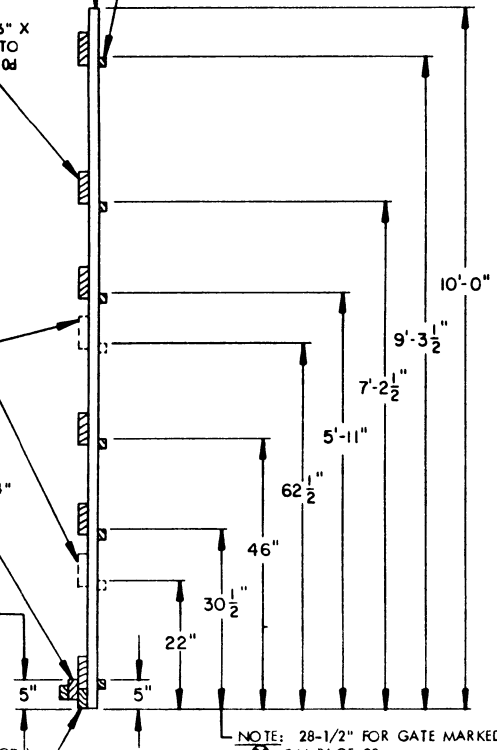
GATE HOLD DOWN, 2" X 4" X 47-1/2" (1 REQD). NAIL TO THE FILL PIECE W/5-10d NAILS.

NOTE: 3-1/2" FOR 1-HIGH CENTER GATE MARKED 20 ON PAGE 22.

NOTE: 33" FOR THE 1-HIGH CENTER GATE MARKED 20 ON PAGE 22.

FILL PIECE, 2" X 4" X 47-1/2" (1 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH END.

STRUT LEDGER, 2" X 2" X 48" (8 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH END.



**END VIEW**

NOTE: 28-1/2" FOR GATE MARKED 20 ON PAGE 22.

**DETAILS FOR FLAT DUNNAGE METHOD UNIT (DECREASED HEIGHT)**

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

DOOR OPENING WIDTH

VERTICAL PIECE, 2" X 3" X 9'-8" (2 REQD). NAIL TO A DOOR POST W/12d NAILS.

FOR 2-HIGH STACK.

FOR 3-HIGH STACK.

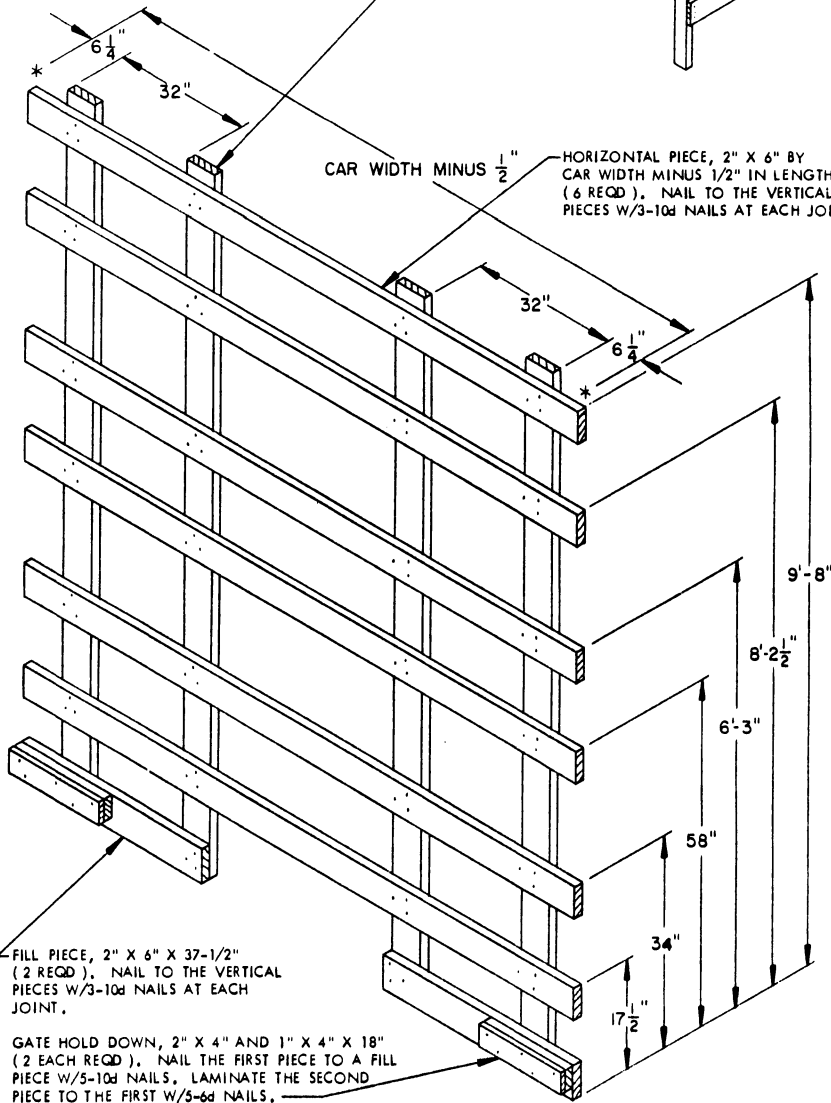
DOORWAY PROTECTION C

VERTICAL PIECE, 2" X 6" X 10'-0" FOR A 3-HIGH LOAD, 6'-6" FOR A 2-HIGH LOAD, 36" FOR A 1-HIGH LOAD (4 REQD).

CAR WIDTH MINUS  $\frac{1}{2}$ "

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

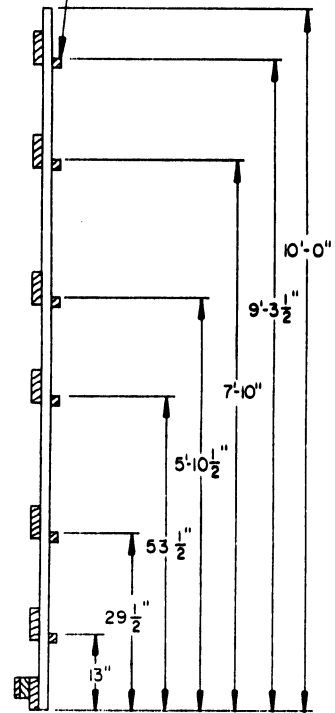
STRUT LEDGER, 2" X 2" X CAR WIDTH MINUS  $13\frac{1}{2}$ " IN LENGTH (6 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.



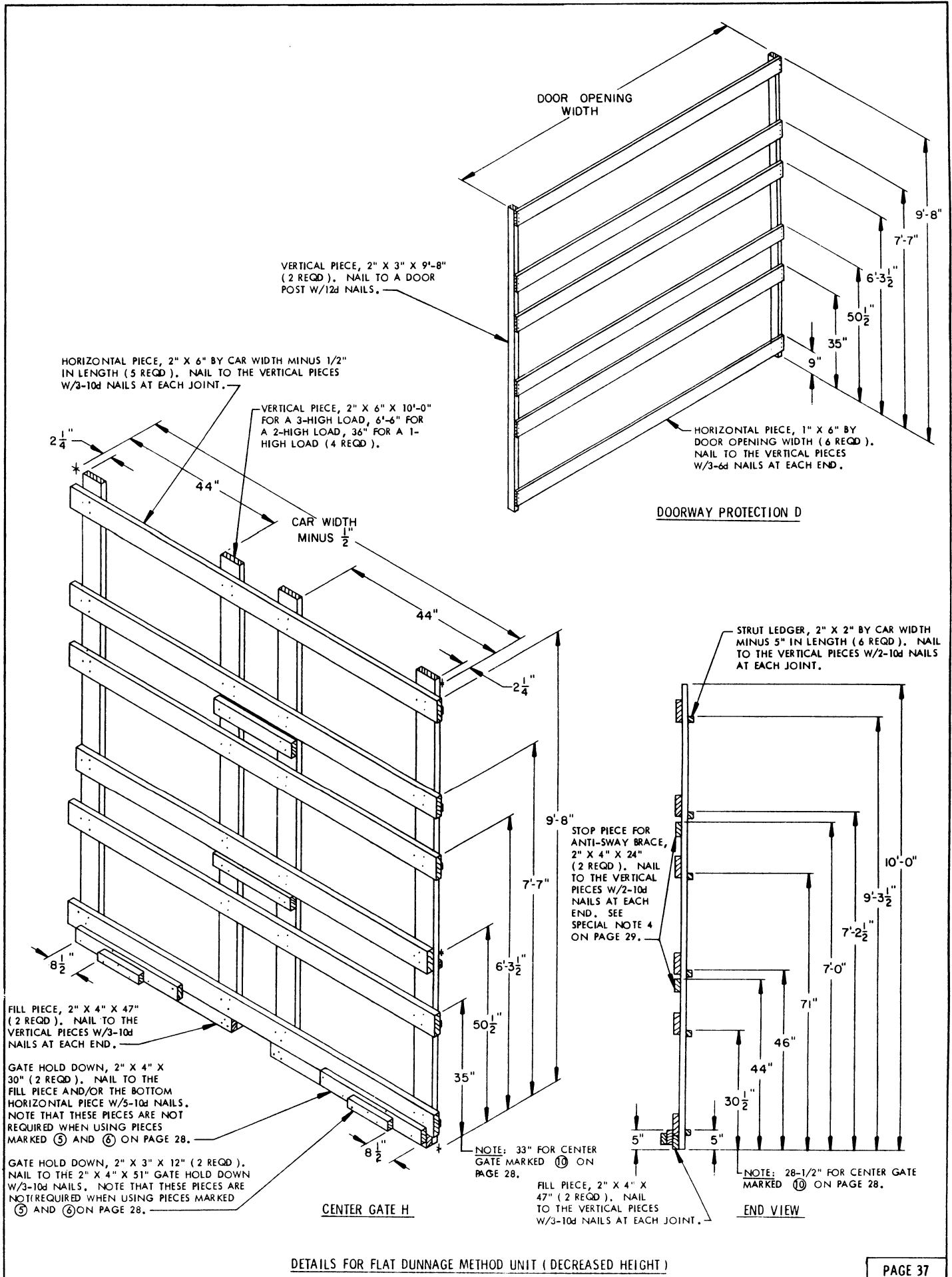
FILL PIECE, 2" X 6" X 37-1/2" (2 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.

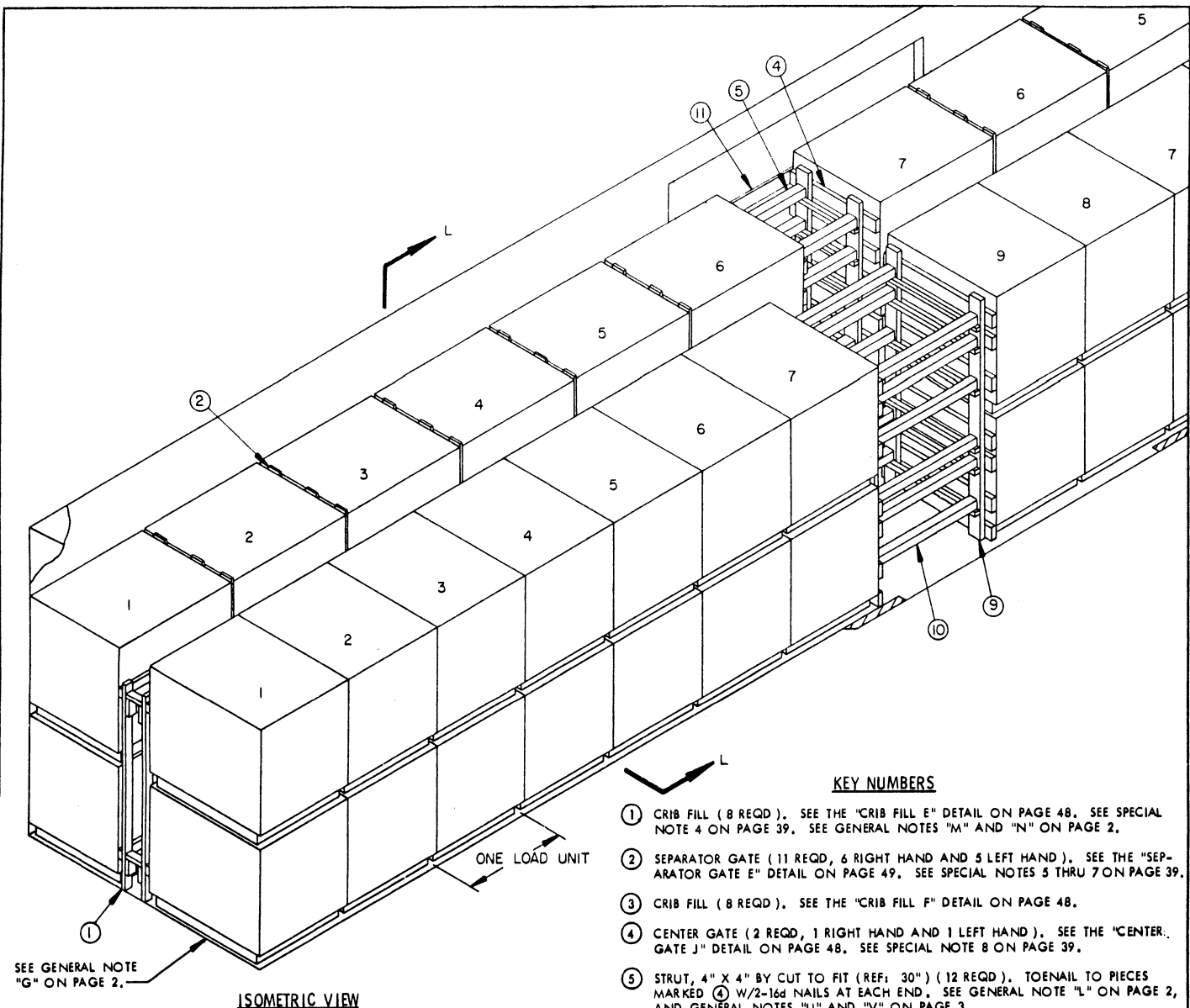
GATE HOLD DOWN, 2" X 4" AND 1" X 4" X 18" (2 EACH REQD). NAIL THE FIRST PIECE TO A FILL PIECE W/5-10d NAILS. LAMINATE THE SECOND PIECE TO THE FIRST W/5-6d NAILS.

CENTER GATE G



END VIEW



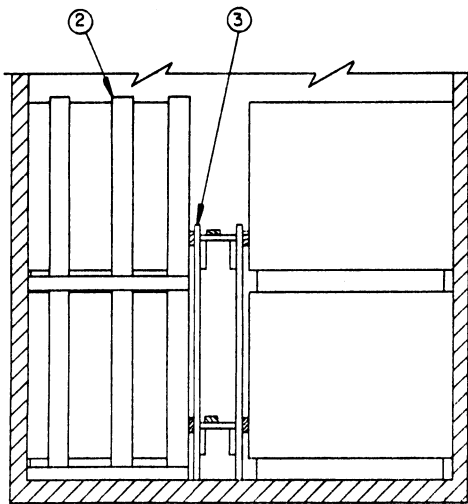


ISOMETRIC VIEW

SEE GENERAL NOTE "G" ON PAGE 2.

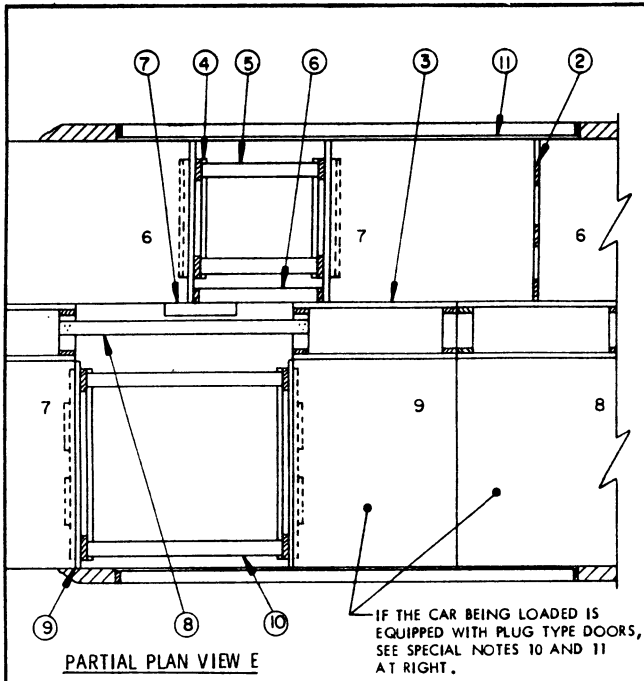
**KEY NUMBERS**

- ① CRIB FILL ( 8 REQD ). SEE THE "CRIB FILL E" DETAIL ON PAGE 48. SEE SPECIAL NOTE 4 ON PAGE 39. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.
- ② SEPARATOR GATE ( 11 REQD, 6 RIGHT HAND AND 5 LEFT HAND ). SEE THE "SEPARATOR GATE E" DETAIL ON PAGE 49. SEE SPECIAL NOTES 5 THRU 7 ON PAGE 39.
- ③ CRIB FILL ( 8 REQD ). SEE THE "CRIB FILL F" DETAIL ON PAGE 48.
- ④ CENTER GATE ( 2 REQD, 1 RIGHT HAND AND 1 LEFT HAND ). SEE THE "CENTER GATE J" DETAIL ON PAGE 48. SEE SPECIAL NOTE 8 ON PAGE 39.
- ⑤ STRUT, 4" X 4" BY CUT TO FIT ( REF: 30" ) ( 12 REQD ), TOENAIL TO PIECES MARKED ④ W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "L" ON PAGE 2, AND GENERAL NOTES "U" AND "V" ON PAGE 3.
- ⑥ STRUT, 2" X 4" BY CUT TO FIT ( REF: 30" ) ( 2 REQD ). TOENAIL TO THE STOP PIECES OF PIECES MARKED ④ W/2-12d NAILS AT EACH END. SEE THE "PARTIAL PLAN VIEW" ON PAGE 39.
- ⑦ SIDE BLOCKING FOR CENTER GATE "J", 2" X 4" X 18" ( DOUBLED ) ( 1 REQD ). NAIL THE FIRST PIECE TO THE CAR FLOOR W/4-16d NAILS. NAIL SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE THE "PARTIAL PLAN VIEW" ON PAGE 39.
- ⑧ CRIB FILL RETAINER, 2" X 4" BY A LENGTH TO SUIT ( REF: 63" ) ( 2 REQD ), POSITION TO SPAN THE STRUTS OF LONGITUDINALLY ADJACENT CRIB FILL "F" ASSEMBLIES AND NAIL TO EACH STRUT W/3-10d NAILS. SEE "PARTIAL PLAN VIEW E" ON PAGE 39.
- ⑨ CENTER GATE ( 2 REQD ). SEE THE "CENTER GATE K" DETAIL ON PAGE 49.
- ⑩ STRUT, 4" X 4" BY CUT TO FIT ( REF: 50" ) ( 12 REQD ), TOENAIL TO PIECES MARKED ⑨ W/2-16d NAILS AT EACH END.
- ⑪ DOORWAY PROTECTION ( 2 REQD ). SEE THE "DOORWAY PROTECTION E" DETAIL ON PAGE 50. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 9 ON PAGE 39.



SECTION L-L

ROUTED DUNNAGE METHOD UNIT ( BASIC HEIGHT )  
58-UNIT LOAD IN A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR



**PARTIAL PLAN VIEW E**

(SPECIAL NOTES CONTINUED)

13. IF PALLETIZED UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 89 FOR SHIPPING GUIDANCE FOR LENGTHWISE UNITS AND PAGES 90 AND 92 FOR CROSSWISE UNITS.
14. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 91 FOR GUIDANCE.

**SPECIAL NOTES:**

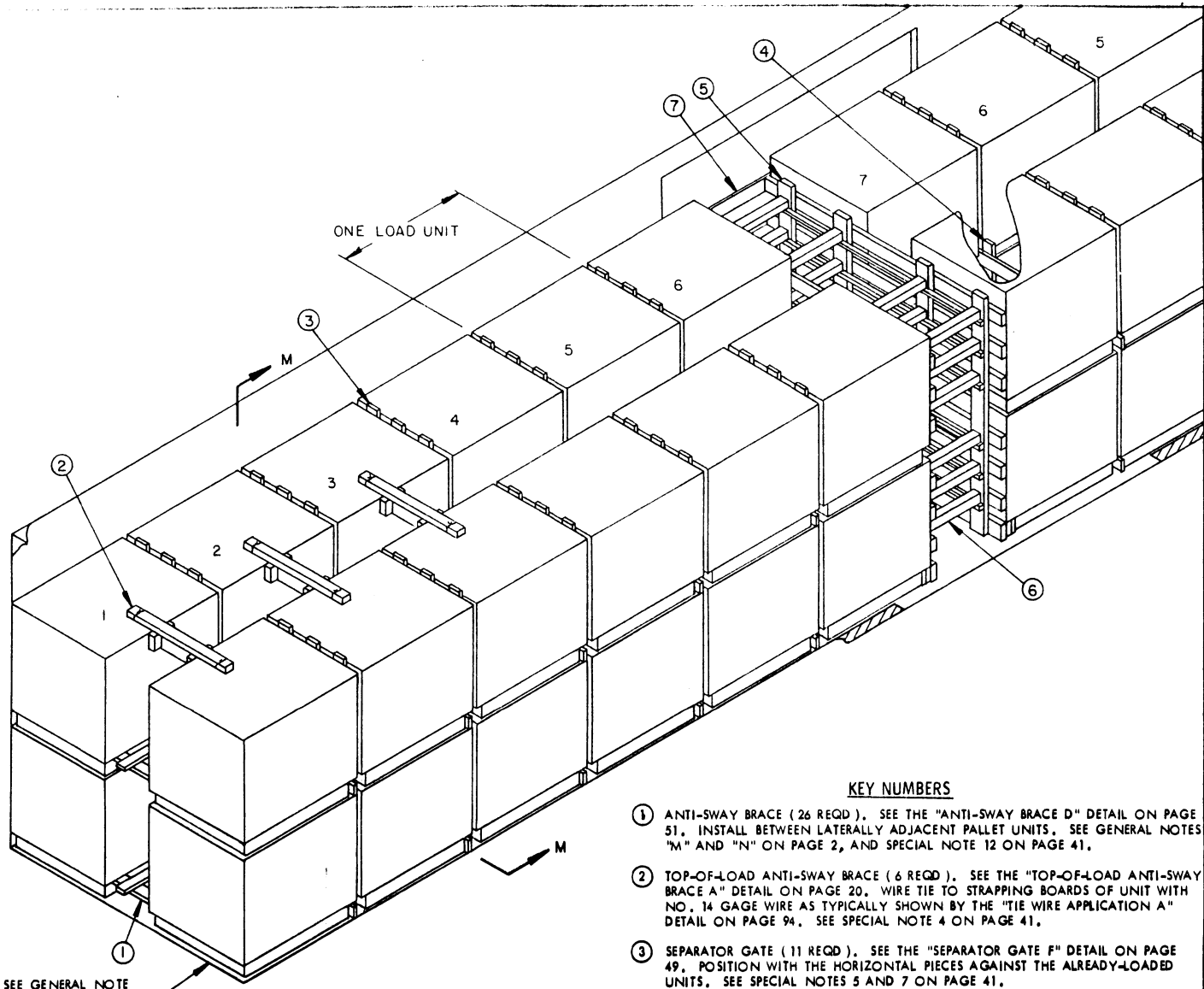
1. A 60'-8" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2 AND SPECIAL NOTE 3 BELOW.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 38 IS THE ROUTED DUNNAGE METHOD UNIT (BASIC HEIGHT). A MAXIMUM OF FORTY-EIGHT (48) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 86,106 POUNDS, CAN BE PLACED IN A 50'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES THIRTY-EIGHT (38) UNITS, FOR A LADING WEIGHT OF 68,096 POUNDS, CAN BE OUTLOADED IN A 40'-6" LONG CAR.
3. THE DEPICTED LOAD PATTERN IS ADEQUATE FOR CARS HAVING DOOR OPENINGS AS NARROW AS 7'-0". IF THE CAR TO BE LOADED HAS DOOR OPENINGS LESS THAN 7'-0" WIDE AND NOT OF SUFFICIENT HEIGHT TO ALLOW PERSONNEL TO EXIT OVER THE TOP OF THE LOAD, THE LENGTHWISE UNITS SHOULD BE LOADED SIX (6) STACKS LONG IN EACH END OF THE CAR AND THE CROSSWISE UNITS SHOULD BE LOADED EIGHT (8) STACKS LONG IN EACH END. PIECE MARKED ⑦ WILL BE OMITTED, AND STRUT BRACING WILL BE REQUIRED; THE BALANCE OF THE DUNNAGE WILL NOT CHANGE.
4. THE "HIGH" CRIB, SHOWN AS PIECE MARKED ①, MUST BE INSTALLED IN EACH END OF THE LOAD. FOUR (4) ASSEMBLIES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
5. THE SEPARATOR GATES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 38, ARE DESIGNATED "RIGHT HAND" AND "LEFT HAND" TO FACILITATE POSITIONING OF THE PALLET UNITS AS LOADING PROGRESSES. WHEN LOADING THE CAR, POSITION A PALLET UNIT STACK AGAINST THE END WALL, THEN POSITION A SEPARATOR GATE SO THE 1" X 4" TIE PIECES ARE LOCATED UNDER THE "OVERHANG" OF THE PALLET UNITS IN THE FIRST STACK. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.
6. ALL SEPARATOR GATES, PIECES MARKED ②, WHICH ARE WITHIN THE DOORWAY AREA OF A CAR EQUIPPED WITH CONVENTIONAL SLIDING DOORS MUST BE WIRE TIED TO THE ADJACENT CRIB FILL TO PREVENT DISPLACEMENT. ENCIRCLE A VERTICAL PIECE OF THE SEPARATOR GATE AND THE UPPER HORIZONTAL PIECE OF THE CRIB FILL WITH NO. 14 GAGE WIRE AND TWIST TAUT.
7. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLYWOOD IN LIEU OF DIMENSIONAL LUMBER, IF DESIRED. CONSTRUCT EACH GATE 42" WIDE BY 8'-0" LONG.
8. CENTER GATES "J" AND "K" 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 95 FOR GUIDANCE.
9. 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 ⑨ IN THE LOAD ON PAGE 38, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILABLE SIDE BLOCKING AND LOAD BUNDLING STRAPS MAY BE USED. REFER TO PAGES 97 THRU 99 FOR OTHER TYPES OF DOORWAY PROTECTION.
10. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILABLE SIDE BLOCKING AND LOAD BUNDLING STRAPS MUST BE USED. SEE THE "PARTIAL PLAN VIEW F" DETAIL, AND KEY NUMBERS ⑩ THRU ⑫ ON PAGE 25 FOR GUIDANCE. NOTE THAT THE CRIB FILL MARKED ③ MUST HAVE 3" CUT OFF EACH VERTICAL AND BOTTOM SUPPORT PIECE THAT RESTS ON THE SIDE BLOCKING; ALSO CENTER GATE "J" MUST BE WIRE TIED TO PIECE MARKED ⑧ TO PREVENT DISPLACEMENT.
11. IF THE PALLET STACKS IN THE DOORWAY ARE POSITIONED SO THE FORKLIFT OPENINGS ARE NOT CLOSE ENOUGH IN ALIGNMENT TO RECEIVE TWO (2) BUNDLING STRAPS ACROSS THE LOAD WIDTH; THAT PALLET STACK MUST BE UNITIZED TO THE LONGITUDINALLY ADJACENT PALLET STACK AS SHOWN IN THE "PARTIAL PLAN VIEW F" DETAIL ON PAGE 25.
12. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY ONE OR MORE PALLET UNITS BY EMPLOYING THE PROCEDURES ON PAGE 70. FOUR (4) UNITS CAN BE OMITTED FROM A 2-TIER LOAD BY LEAVING OUT THE LENGTHWISE STACK NO. 7 AND THE CROSSWISE STACK NO. 9. NOTE THAT STRUT BRACING WILL THEN BE REQUIRED THE ENTIRE TOP TIER CAN BE OMITTED, OR A PARTIAL 1-TIER LOAD CAN BE SHIPPED IN ONE OR BOTH ENDS OF A CAR BY USING KNEE BRACES AS SHOWN ON PAGES 84 AND 85.

(CONTINUED AT LEFT)

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	58	103,936 LBS
DUNNAGE		2,094 LBS
<b>TOTAL WEIGHT</b>		<b>106,030 LBS</b>

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	82	28
1" X 6"	313	157
2" X 2"	80	27
2" X 3"	39	20
2" X 4"	781	521
2" X 6"	175	175
4" X 4"	80	107
NAILS	NO. REQD	POUNDS
6d (2")	256	1-1/2
10d (3")	1,234	19
12d (3-1/4")	38	3/4
16d (3-1/2")	104	2-1/4

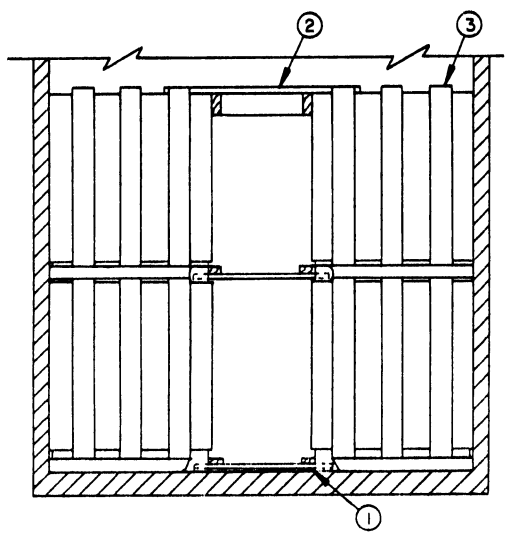


SEE GENERAL NOTE "G" ON PAGE 2.

ISOMETRIC VIEW

**KEY NUMBERS**

- ① ANTI-SWAY BRACE (26 REQD). SEE THE "ANTI-SWAY BRACE D" DETAIL ON PAGE 51. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2, AND SPECIAL NOTE 12 ON PAGE 41.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 20. WIRE TIE TO STRAPPING BOARDS OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 94. SEE SPECIAL NOTE 4 ON PAGE 41.
- ③ SEPARATOR GATE (11 REQD). SEE THE "SEPARATOR GATE F" DETAIL ON PAGE 49. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 5 AND 7 ON PAGE 41.
- ④ STOP PIECE, 1" X 4" X 56" (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 ADJACENT PALLET UNITS AND NAIL TO THE HORIZONTAL PIECES W/3-6d NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 6 ON PAGE 41.
- ⑤ CENTER GATE (2 REQD). SEE THE "CENTER GATE L" DETAIL ON PAGE 50. SEE SPECIAL NOTES 8 AND 9 ON PAGE 41.
- ⑥ STRUT, 4" X 4" BY CUT TO FIT (REF: 30") (24 REQD). TOENAIL TO PIECES MARKED ⑤ W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "L" ON PAGE 2, AND GENERAL NOTES "U" AND "V" ON PAGE 3.
- ⑦ DOORWAY PROTECTION (2 REQD). SEE "DOORWAY PROTECTION E" DETAIL ON PAGE 50. NAIL TO DOOR POSTS W/12d NAILS. SEE SPECIAL NOTES 11 AND 12 ON PAGE 41.



SECTION M-M

ROUTED DUNNAGE METHOD UNIT ( BASIC HEIGHT )  
 52-UNIT LOAD IN A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR



( SPECIAL NOTES CONTINUED )

- 13. 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 68 THRU 88 FOR GUIDANCE. NOTE THAT THE STRUT BRACING METHOD OF PARTIAL TIER BRACING SHOWN ON PAGE 26 MAY ALSO BE USED TO REDUCE A LOAD BY ONE OR MORE UNITS. A 3-HIGH LOAD IS SHOWN HOWEVER THE BASIC PRINCIPLES ALSO APPLY FOR A 2-HIGH LOAD.
- 14. IF PALLETIZED UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 89 FOR SHIPPING GUIDANCE.
- 15. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 91 FOR GUIDANCE.

SPECIAL NOTES:

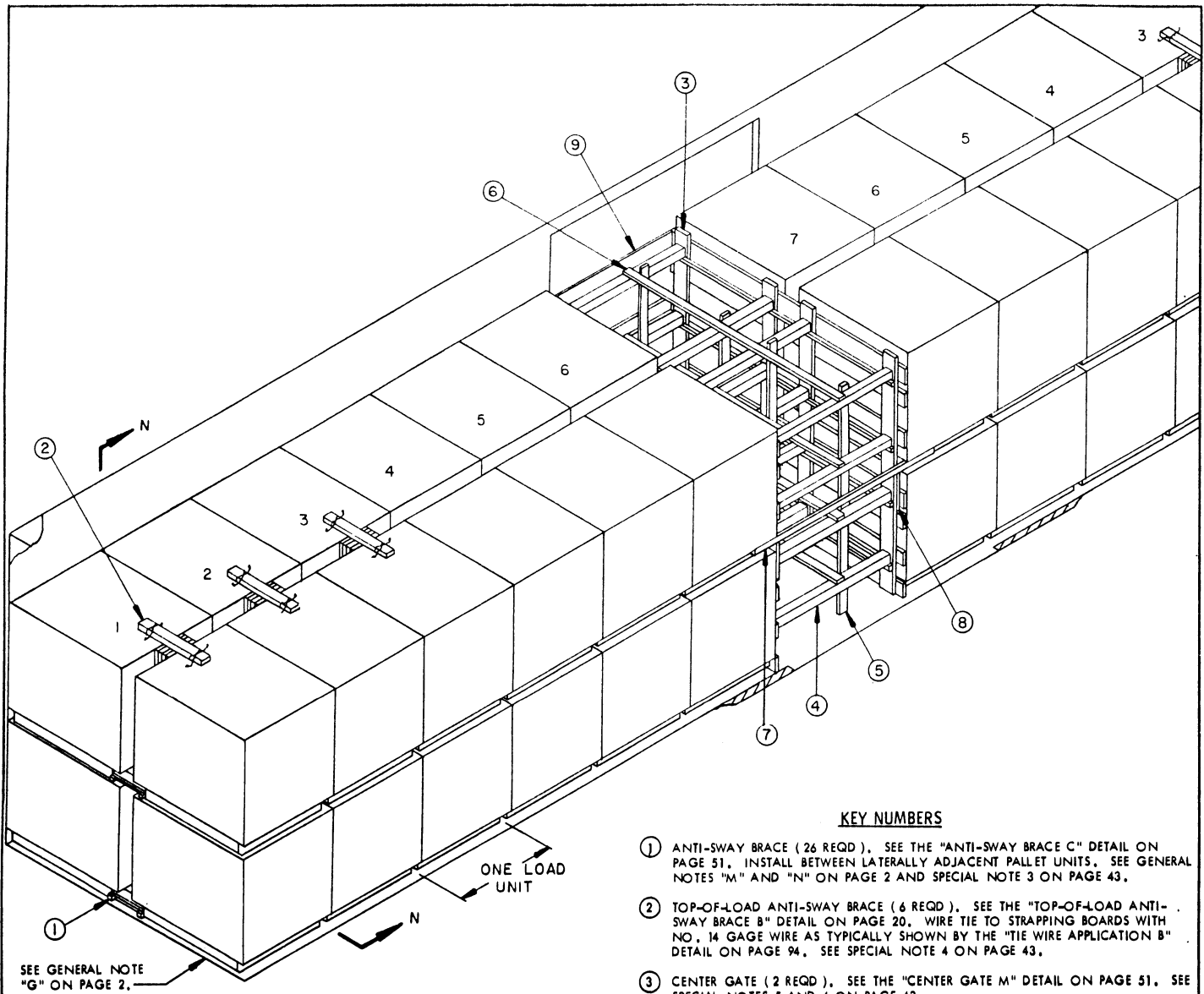
- 1. A 60'-8" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2 AND SPECIAL NOTE 3 BELOW.
- 2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 40 IS THE ROUTED DUNNAGE METHOD UNIT (BASIC HEIGHT). A MAXIMUM OF FORTY ( 40 ) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 71,680 POUNDS, CAN BE PLACED IN A 50'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES; THIRTY-TWO ( 32 ) UNITS, FOR AN APPROXIMATE WEIGHT OF 57,344 POUNDS, CAN BE OUTLOADED IN A 40'-6" LONG CAR.
- 3. THE DEPICTED LOADING PATTERN IS ADEQUATE FOR CARS HAVING DOOR OPENINGS 8'-0" THRU 10'-0", OR WIDER. IF THE CAR TO BE LOADED HAS DOOR OPENINGS LESS THAN 8'-0" WIDE AND NOT OF SUFFICIENT HEIGHT TO ALLOW PERSONNEL TO EXIT THE CAR OVER THE TOP OF THE LOAD, THE PALLETS SHOULD BE POSITIONED SO THERE ARE SIX ( 6 ) LOAD UNITS IN EACH END. NOTE THAT ALTHOUGH CARS HAVING DOOR OPENINGS AS NARROW AS 6'-0" WIDE CAN BE USED FOR FULL LOADS, LOADING IS PROGRESSIVELY MORE DIFFICULT AS THE WIDTH OF THE DOOR OPENING DECREASES.
- 4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 40, MUST BE INSTALLED IN EACH END OF THE CAR. THREE ( 3 ) 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 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 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.
- 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 94 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 95 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 40, INSTALL TWO ( 2 ) "CENTER GATES J" AS SHOWN ON PAGE 48. 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 95. OMIT THE STOP PIECES FROM "CENTER GATE J".
- 10. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE 1" X 4" AND 2" X 4" MATERIAL NAILED TO CENTER GATE "L", PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 96 FOR GUIDANCE.
- 11. 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 PIECE MARKED ⑦ IN THE LOAD ON PAGE 40, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE FLOOR POSTS; OR NAILED SIDE BLOCKING AND LOAD BUNDLING STRAPS MAY BE USED. REFER TO PAGES 97 THRU 99 FOR OTHER TYPES OF DOORWAY PROTECTION.
- 12. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED SIDE BLOCKING AND LOAD BUNDLING STRAPS MUST BE 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 46. SEE SPECIAL NOTES 8 AND 9 ON PAGE 47 FOR GUIDANCE. ALSO, THE CENTER GATES MUST BE RESTRAINED FROM LATERAL MOVEMENT BY NAILING TO THE CAR FLOOR A DOUBLED 2" X 4" X 18" POSITIONED LONGITUDINALLY SO AS TO BE CENTERED AGAINST THE FILL PIECES OF A CENTER GATE. TWO ( 2 ) PIECES WILL BE REQUIRED FOR EACH CENTER GATE WHICH IS IN THE DOOR OPENING, OR WITHIN SIX INCHES ( 6" ) OF IT.

( CONTINUED AT LEFT )

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT ( APPROX )
PALLET UNIT -----	52 -----	93,184 LBS
DUNNAGE -----		1,904 LBS
TOTAL WEIGHT -----		95,088 LBS

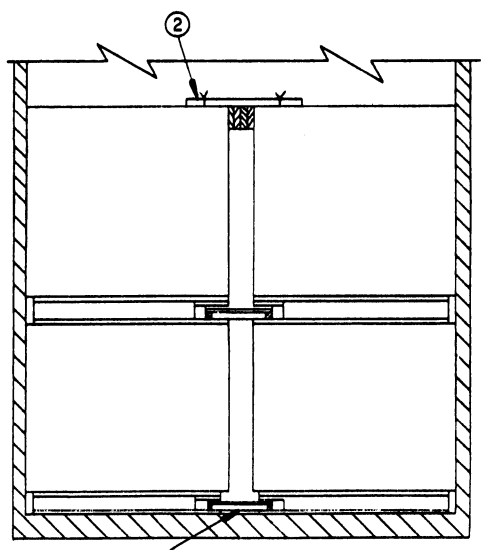
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	216	72
1" X 6"	625	313
2" X 2"	100	34
2" X 3"	32	16
2" X 4"	325	217
2" X 6"	205	205
4" X 4"	60	90
NAILS	NO. REQD	POUNDS
6d ( 2" )	476	2-3/4
10d ( 3" )	680	10-1/2
12d ( 3-1/4" )	32	3/4
16d ( 3-1/2" )	96	2-1/4
WIRE, NO. 14 GAGE ----- 60' REQD ----- 1 LB		



**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① ANTI-SWAY BRACE (26 REQD). SEE THE "ANTI-SWAY BRACE C" DETAIL ON PAGE 51. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 43.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 20. WIRE TIE TO STRAPPING BOARDS WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 94. SEE SPECIAL NOTE 4 ON PAGE 43.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE M" DETAIL ON PAGE 51. SEE SPECIAL NOTES 5 AND 6 ON PAGE 43.
- ④ STRUT, 4" X 4" BY CUT TO FIT (REF: 54") (16 REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "L" ON PAGE 2, AND GENERAL NOTES "U" AND "V" ON PAGE 3.
- ⑤ VERTICAL STRUT BRACING, 2" X 4" X 7'-8" (4 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑥ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 6" (4 REQD). NAIL TO THE STRUT W/3-10d NAILS AT EACH JOINT.
- ⑦ GATE HOLD DOWN, 2" X 4" BY LENGTH OF CENTER VOID PLUS 24" (REF: 7'-0") (2 REQD). POSITION UNDER THE ENDS OF THE CONTAINERS AND NAIL TO THE VERTICAL PIECES OF THE CENTER GATES W/2-10d NAILS AT EACH JOINT. SEE SPECIAL NOTE 7 ON PAGE 43.
- ⑧ GATE HOLD DOWN SUPPORT PIECE, 2" X 2" X 15" (4 REQD). POSITION UNDER PIECE MARKED ⑦ AND NAIL TO A VERTICAL PIECE OF PIECE MARKED ③ W/4-10d NAILS.
- ⑨ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION E" DETAIL ON PAGE 50. NAIL TO DOOR POSTS W/12d NAILS. SEE SPECIAL NOTES B AND 9 ON PAGE 43.



**SECTION N-N**

ROUTED DUNNAGE METHOD UNIT ( BASIC HEIGHT )  
 52-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL BOX CAR

( SPECIAL NOTES CONTINUED )

10. 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 68 THRU 88 FOR GUIDANCE. NOTE THAT THE STRUT BRACING METHOD OF PARTIAL TIER BRACING SHOWN ON PAGE 26 CAN ALSO BE USED TO REDUCE A LOAD BY ONE OR MORE UNITS. A 3-HIGH LOAD IS SHOWN, HOWEVER THE BASIC PRINCIPLES ALSO APPLY FOR A 2-HIGH LOAD.
11. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 90 AND 92 FOR SHIPPING GUIDANCE.
12. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 91 FOR GUIDANCE.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-4" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 8'-0" WIDE DOOR OPENINGS IS SHOWN. WIDER CARS OF OTHER LENGTHS 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 42 IS THE ROUTED DUNNAGE METHOD UNIT ( BASIC HEIGHT ). A MAXIMUM OF FORTY ( 40 ) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 58,120 POUNDS CAN BE PLACED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES. IF A 60'-8" LONG CAR IS USED, SIXTY-FOUR ( 64 ) PALLET UNITS FOR AN APPROXIMATE LADING WEIGHT OF 92,992 POUNDS CAN BE LOADED. SEE THE "CENTER GATE M" DETAIL ON PAGE 51 FOR MODIFICATIONS WHICH MAY BE REQUIRED IF 60'-0" LONG CARS ARE TO BE USED.
3. ANTI-SWAY BRACING IS REQUIRED BETWEEN LATERALLY ADJACENT PALLET UNITS. TO PREVENT LONGITUDINAL DISPLACEMENT OF THE ANTI-SWAY BRACE BETWEEN THE UPPER UNITS, A STOP PIECE MUST BE NAILED TO EACH CENTER GATE "M" AS SHOWN ON THE DETAIL ON PAGE 51. IF DESIRED IN CARS HAVING NAILABLE SIDEWALLS, 1" X 6" OR 2" X 6" FILL MATERIAL MAY BE NAILED TO ONE OR BOTH SIDEWALLS AT HEIGHTS SPECIFIED FOR THE DOORWAY PROTECTION HORIZONTAL PIECES, IN LIEU OF USING THE ANTI-SWAY BRACES. NOTE THAT THE TOTAL ACCUMULATED SPACE ACROSS A CAR SHOULD NOT EXCEED TWO INCHES ( 2" ).
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 42, MUST BE INSTALLED IN EACH END OF THE CAR. THREE ( 3 ) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
5. CENTER GATE "M" 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 95 FOR GUIDANCE.
6. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR-WIDTH GATES. IN LIEU OF EACH "CENTER GATE "M", SHOWN AS PIECE MARKED ③ IN THE LOAD ON PAGE 42, INSTALL TWO ( 2 ) "CENTER GATES K" AS SHOWN ON PAGE 49. 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 95.
7. AN ALTERNATIVE TO THE GATE HOLD DOWN SHOWN AS PIECES MARKED ⑦ AND ⑧ IN THE LOAD ON PAGE 42 MAY BE USED, IF DESIRED, WHEN THE CAR FURNISHED FOR LOADING IS EQUIPPED WITH 8'-0" OR WIDER DOORS. NOTE THAT IN A CAR HAVING DOOR OPENINGS JUST 8'-0" WIDE IT MAY BE NECESSARY TO LAMINATE ONE OR TWO THICKNESS OF 2-INCH MATERIAL TO THE ADJACENT CENTER GATE VERTICAL PIECES TO PROVIDE AN AREA FOR NAILING OF PIECES MARKED ⑦ AND ⑧. AN ALTERNATIVE HOLD DOWN MUST BE USED WHEN THE CAR FURNISHED HAS DOOR OPENINGS LESS THAN 8'-0" WIDE. DOOR SPANNER TYPE HOLD DOWN AS SHOWN ON PAGE 96 MAY BE USED IF THE CAR HAS NAILABLE SIDEWALLS, OR DOUBLED 2" X 3" HOLD DOWN PIECES MAY BE APPLIED TO THE CENTER GATES AS SHOWN BY THE CENTER GATE "M" DETAIL ON PAGE 51.
8. 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 PIECE MARKED ⑨ IN THE LOAD ON PAGE 42, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED SIDE BLOCKING AND LOAD BUNDLING STRAPS MAY BE USED. REFER TO PAGES 97 THRU 99 FOR OTHER TYPES OF DOORWAY PROTECTION.
9. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED SIDE BLOCKING AND LOAD BUNDLING STRAPS MUST BE USED; OMIT EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA, IN LIEU OF PIECE MARKED ⑤, USE PIECES MARKED ③ THRU ⑧ ON PAGE 60. SEE SPECIAL NOTES 9 AND 10 ON PAGE 61 FOR GUIDANCE.

( CONTINUED AT LEFT )

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	78	26
1" X 6"	64	32
2" X 2"	258	86
2" X 3"	31	16
2" X 4"	164	110
2" X 6"	216	216
4" X 4"	72	96
NAILS	NO. REQD	POUNDS
6d ( 2" )	412	2-1/2
10d ( 3" )	660	10
12d ( 3-1/4" )	28	1/2
16d ( 3-1/2" )	64	1-1/2
WIRE, NO. 14 GAGE ----- 60' REQD ----- 1 LB		

LOAD AS SHOWN

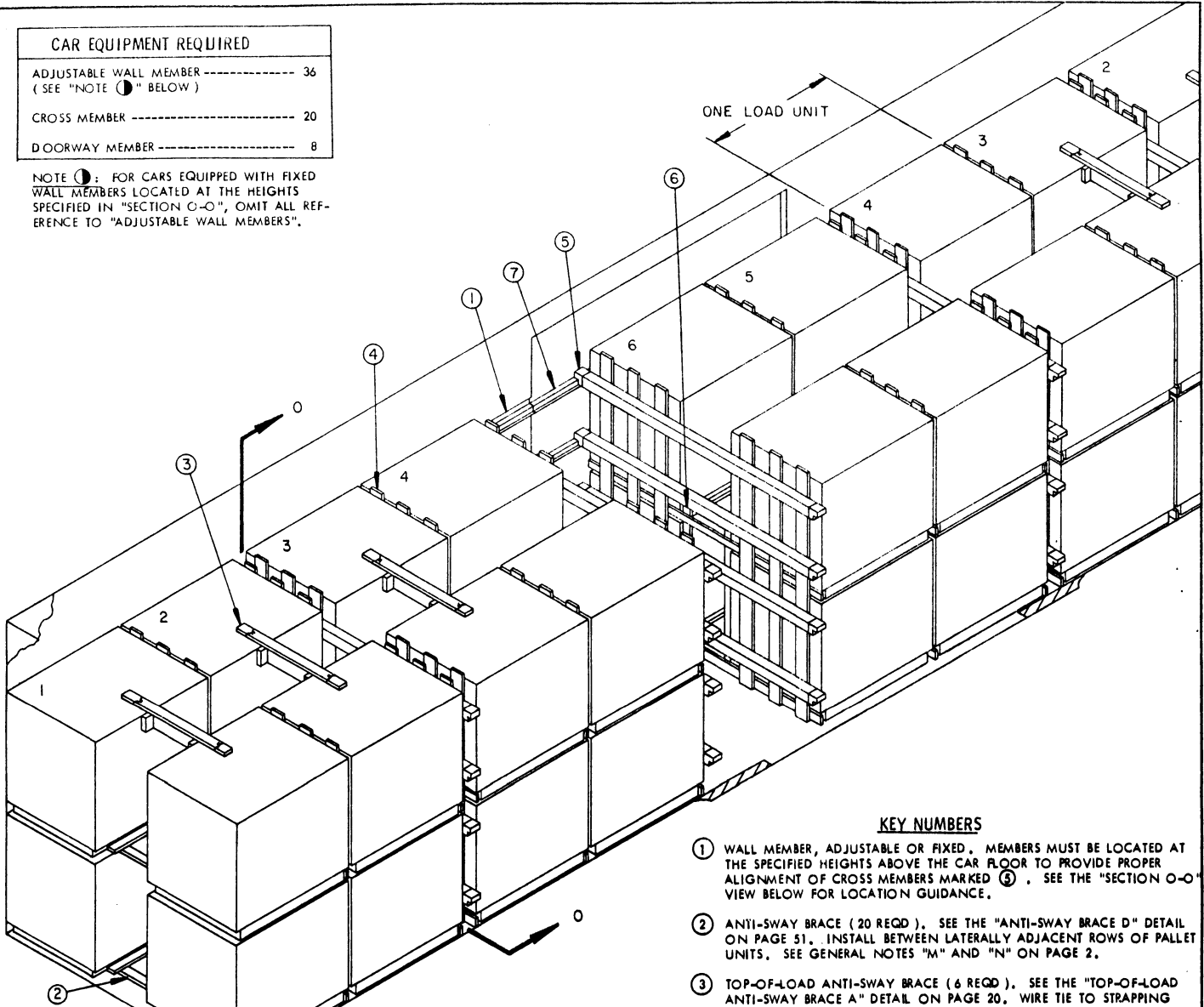
ITEM	QUANTITY	WEIGHT ( APPROX )
PALLET UNIT -----	52 -----	93,184 LBS
DUNNAGE -----	-----	1,180 LBS
TOTAL WEIGHT -----		94,364 LBS

ROUTED DUNNAGE METHOD UNIT ( BASIC HEIGHT )  
52-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL BOX CAR

**CAR EQUIPMENT REQUIRED**

ADJUSTABLE WALL MEMBER -----	36
(SEE "NOTE 1" BELOW)	
CROSS MEMBER -----	20
DOORWAY MEMBER -----	8

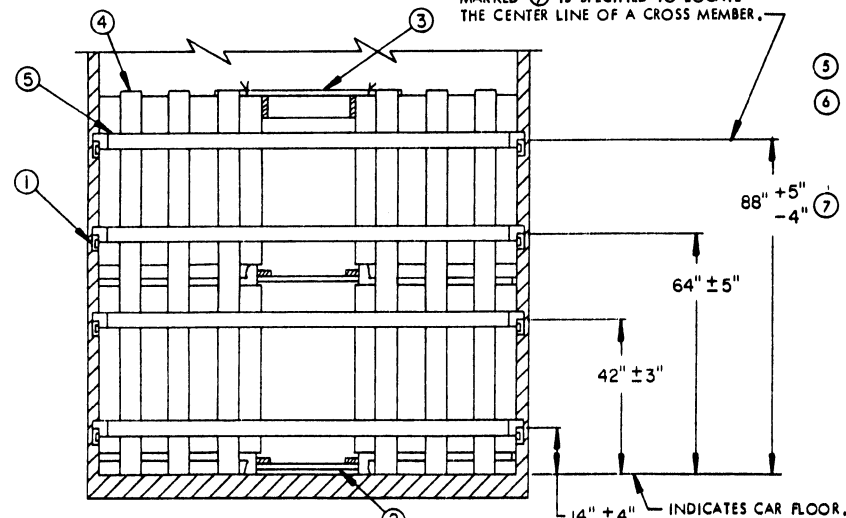
NOTE 1: FOR CARS EQUIPPED WITH FIXED WALL MEMBERS LOCATED AT THE HEIGHTS SPECIFIED IN "SECTION O-O", OMIT ALL REFERENCE TO "ADJUSTABLE WALL MEMBERS".



SEE GENERAL NOTE "G" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 45.

**ISOMETRIC VIEW**

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 O-O**

**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 3. SEE THE "SECTION O-O" VIEW BELOW FOR LOCATION GUIDANCE.
- 2 ANTI-SWAY BRACE (20 REQD). SEE THE "ANTI-SWAY BRACE D" DETAIL ON PAGE 51. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.
- 3 TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 20. WIRE TIE TO STRAPPING BOARDS OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 94. SEE SPECIAL NOTE 4 ON PAGE 45.
- 4 SEPARATOR GATE FOR 2-HIGH (13 REQD). SEE THE "SEPARATOR GATE F" DETAIL ON PAGE 49. AS APPLICABLE, POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 5 AND 7 ON PAGE 45.
- 5 CROSS MEMBER (20 REQD). SEE GENERAL NOTE "X" ON PAGE 3.
- 6 STOP PIECE, 1" X 4" X 56" (4 REQD). INSTALL ON THE SIDE OPPOSITE THE VERTICAL PIECES OF THE SEPARATOR GATES, PIECES MARKED 4, WHICH ARE IN THE DOORWAY AREA. POSITION IN CONTACT WITH THE ADJACENT PALLET UNITS AND NAIL TO THE HORIZONTAL PIECES W/3-6d NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 6 ON PAGE 45.
- 7 DOORWAY MEMBER (8 REQD). SEE THE "SECTION O-O" VIEW AT LEFT FOR LOCATION GUIDANCE.

ROUTED DUNNAGE METHOD UNIT ( BASIC HEIGHT )

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

**SPECIAL NOTES:**

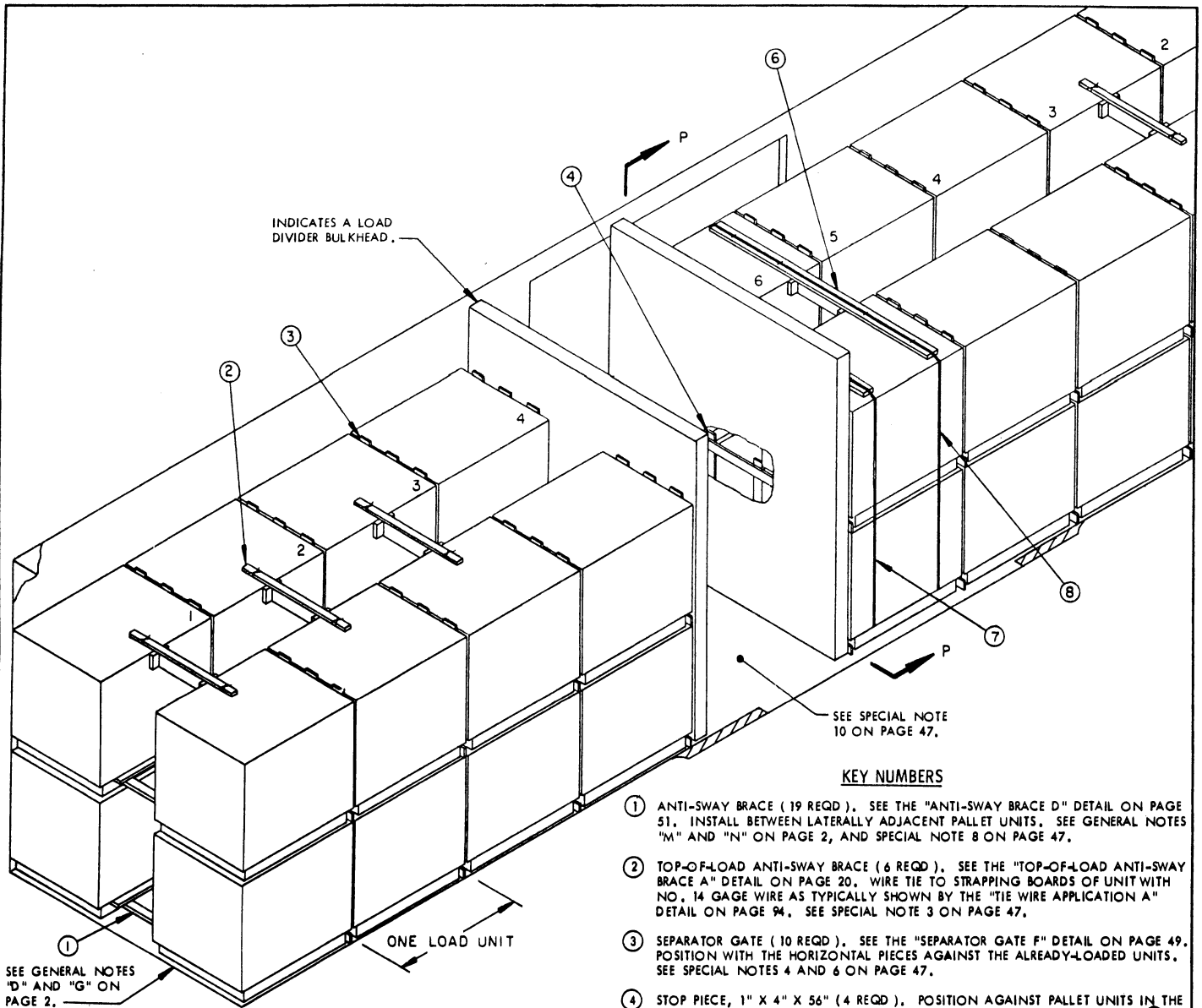
1. A 50'-6" LONG BY 9'-0" WIDE ( INSIDE CLEARANCE ) WOOD-LINED BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS, AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.
2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 44 IS THE ROUTED DUNNAGE METHOD UNIT ( BASIC HEIGHT ). A MAXIMUM OF THIRTY-TWO ( 32 ) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 57,344 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 "G" 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 44, MUST BE INSTALLED IN EACH END OF THE CAR. THREE ( 3 ) 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 ④. 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 94 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 FROM THE CENTER PORTION OF THE LOAD. TO REDUCE A LOAD BY ONE ( 1 ) PALLET UNIT, REFER TO THE LCL PROCEDURES ON PAGES 66 AND 67 FOR GUIDANCE.
9. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 91 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	228	76
1" X 6"	644	322
2" X 4"	268	179
2" X 6"	19	19
NAILS	NO. REQD	POUNDS
6d ( 2" )	492	3
10d ( 3" )	324	5
WIRE, NO. 14 GAGE ----- 60' REQD ----- 1 LB		

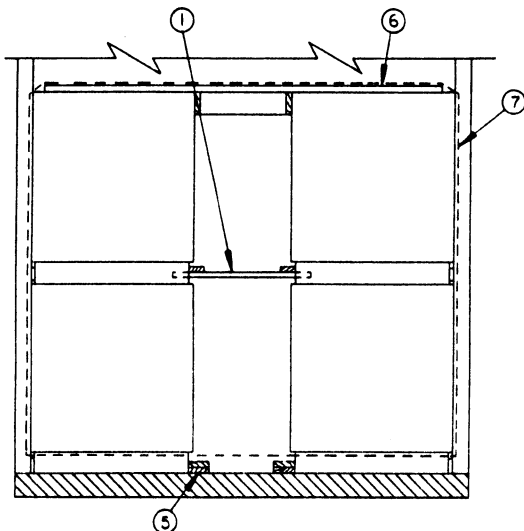
**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT ( APPROX )
PALLET UNIT -----	40 -----	71,680 LBS
DUNNAGE -----	-----	1,201 LBS
TOTAL WEIGHT -----		72,881 LBS

ROUTED DUNNAGE METHOD UNIT ( BASIC HEIGHT )  
**40-UNIT LOAD IN A 50'-6" LONG BY 9'-0" WIDE BOX CAR EQUIPPED WITH MECHANICAL BRACING DEVICES**



ISOMETRIC VIEW



SECTION P-P

KEY NUMBERS

- ① ANTI-SWAY BRACE (19 REQD). SEE THE "ANTI-SWAY BRACE D" DETAIL ON PAGE 51. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2, AND SPECIAL NOTE 8 ON PAGE 47.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 20. WIRE TIE TO STRAPPING BOARDS OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 94. SEE SPECIAL NOTE 3 ON PAGE 47.
- ③ SEPARATOR GATE (10 REQD). SEE THE "SEPARATOR GATE F" DETAIL ON PAGE 49. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 4 AND 6 ON PAGE 47.
- ④ STOP PIECE, 1" X 4" X 56" (4 REQD). POSITION AGAINST PALLET UNITS IN THE DOORWAY AREA AND NAIL TO THE HORIZONTAL PIECES OF PIECE MARKED ③ W/3-6d NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 5 ON PAGE 47.
- ⑤ SIDE BLOCKING, 2" X 4" X 40" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 7 ON PAGE 47.
- ⑥ STRAPPING BOARD/SPACER ASSEMBLY "A" (2 REQD). SEE THE DETAIL ON PAGE 21.
- ⑦ BUNDLING STRAP, 1-1/4" X .031" OR .035" X 35'-6" LONG STEEL STRAPPING (2 REQD). STAPLE TO THE STRAPPING BOARD W/3 STAPLES. SEE SPECIAL NOTE 9 ON PAGE 47.
- ⑧ SEAL FOR 1-1/4" STRAPPING (4 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "O" ON PAGE 2.

ROUTED DUNNAGE METHOD UNIT (BASIC HEIGHT)

40-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOX CAR EQUIPPED WITH LOAD DIVIDERS

( SPECIAL NOTES CONTINUED )

11. 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 68 THRU 77 AND GENERAL NOTE "FF" ON PAGE 3 FOR GUIDANCE.
12. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 89 AND/OR PAGES 90 AND 92 FOR SHIPPING GUIDANCE.
13. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 91 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 "AA" THRU "EE" ON PAGE 3.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 46 IS THE ROUTED DUNNAGE METHOD UNIT (BASIC HEIGHT). A MAXIMUM OF FORTY-EIGHT (48) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 86,106 POUNDS, CAN BE PLACED IN A 60'-8" LONG CAR, OR A MAXIMUM OF THIRTY-TWO (32) UNITS CAN BE LOADED IN A 40'-6" CAR FOR AN APPROXIMATE LADING WEIGHT OF 57,344 POUNDS, WHEN USING THE DEPICTED PROCEDURES. IF THE CROSSWISE LOADING PATTERN SHOWN ON PAGE 60 IS EMPLOYED, SIXTY-FOUR (64) PALLET UNITS FOR AN APPROXIMATE LADING WEIGHT OF 114,688 POUNDS CAN BE PLACED IN A 60'-8" LONG CAR, FIFTY-TWO (52) UNITS CAN BE LOADED IN A 50'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 93,184 POUNDS, AND FORTY (40) UNITS CAN BE LOADED IN A 40'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 71,680 POUNDS.
3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 46, MUST BE INSTALLED IN EACH END OF THE CAR. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
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 94 FOR CONSTRUCTION GUIDANCE.
7. 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 PIECE MARKED ⑦ IN THE LOAD ON PAGE 40, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILABLE SIDE BLOCKING AND LOAD BUNDLING STRAPS MARKED ⑤ THRU ⑧ ON PAGE 46 MAY BE USED. REFER TO PAGES 97 THRU 99 FOR OTHER TYPES OF DOORWAY PROTECTION.
8. NOTE: IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILABLE SIDE BLOCKING AND LOAD BUNDLING STRAPS MUST BE USED. SIDE BLOCKING MARKED ⑤ IN THE LOAD VIEW MUST BE USED IN LIEU OF THE LOWER ANTI-SWAY BRACE MARKED ① FOR ALL UNITS REQUIRING BUNDLING STRAPS. IF THE PALLET UNITS ARE POSITIONED CROSSWISE, SEE KEY NUMBERS ③ THRU ⑧ ON PAGE 60.
9. TWO (2) BUNDLING 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 CAR SIDEWALL ON BOTH SIDES OF THE CAR. ONE (1) BUNDLING 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.
10. A STRUT ASSEMBLY IS REQUIRED WHEN THE LOAD IN EITHER END OF A CAR IS 50,000 POUNDS OR MORE. THE STRUT ASSEMBLY WILL ALWAYS BE REQUIRED FOR FULL LOADS IN 60'-0" OR LONGER CARS. SEE THE "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL ON PAGE 101.

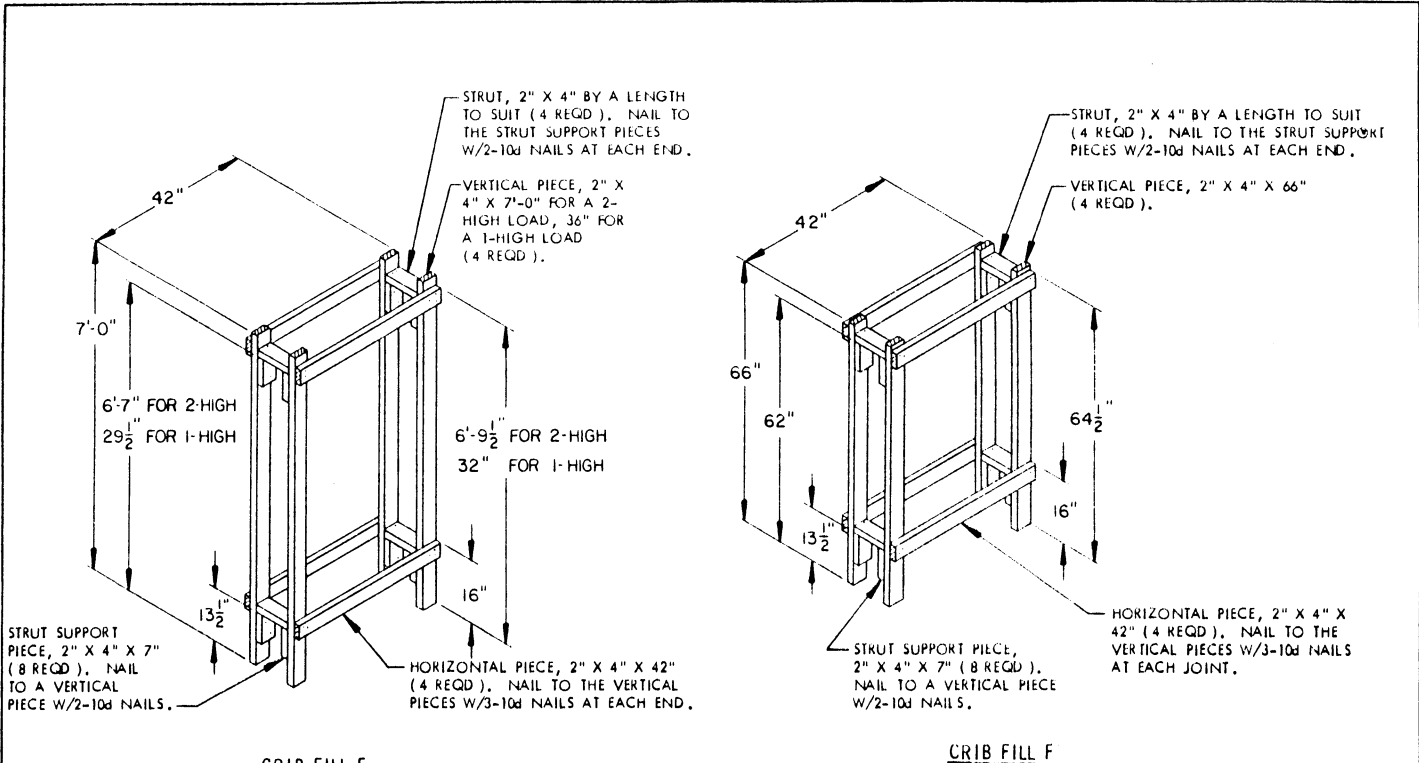
( CONTINUED AT LEFT )

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	201	67
1" X 6"	495	248
2" X 4"	279	186
2" X 6"	43	43
NAILS	NO. REQD	POUNDS
6d (2")	384	2-1/4
10d (3")	340	5-1/4
16d (3-1/2")	20	1/2
STEEL STRAPPING, 1-1/4" -----	71' REQD -----	10 LBS
SEAL FOR 1-1/4" STRAPPING ----	4 REQD -----	NIL
STAPLE -----	6 REQD -----	NIL
WIRE, NO. 14 GAGE -----	60' REQD -----	1 LB

LOAD AS SHOWN

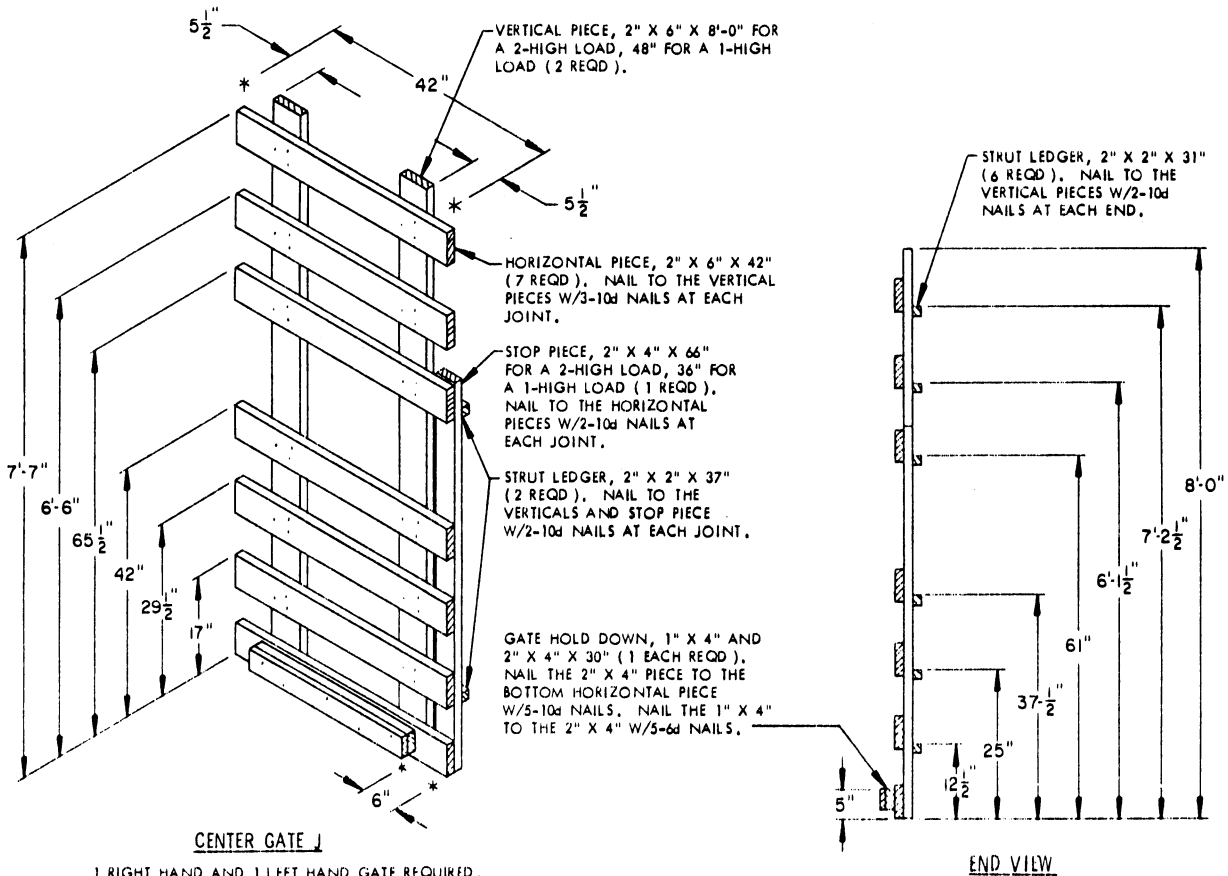
ITEM	QUANTITY	WEIGHT ( APPROX )
PALLET UNIT -----	40 -----	71,680 LBS
DUNNAGE -----	-----	1,107 LBS
TOTAL WEIGHT -----		72,787 LBS

ROUTED DUNNAGE METHOD UNIT ( BASIC HEIGHT )  
40-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOX CAR EQUIPPED WITH LOAD DIVIDERS



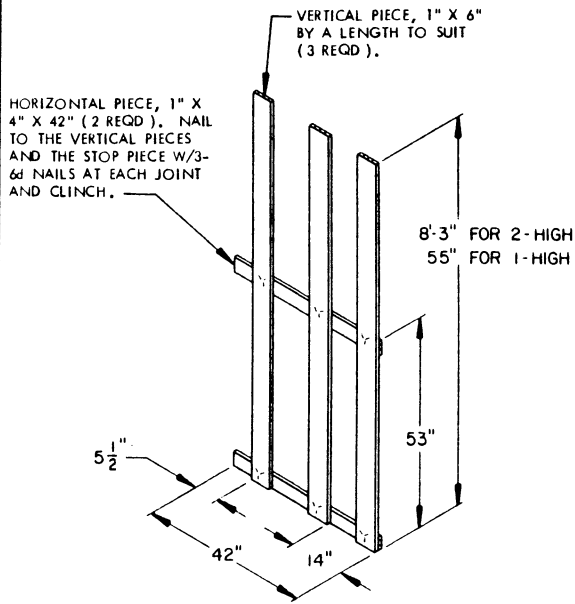
CRIB FILL ASSEMBLIES "E" AND "F" SHOULD BE PRE-FABRICATED. CONSTRUCT TO BE 1/2" TO 3/4" LESS IN WIDTH THAN THE DISTANCE BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS.

CRIB FILL "F" IS NOT REQUIRED FOR A 1-HIGH LOAD; THE CRIB FILL "E" WILL BE USED THROUGHOUT THE LENGTH OF THE LOAD.



1 RIGHT HAND AND 1 LEFT HAND GATE REQUIRED.



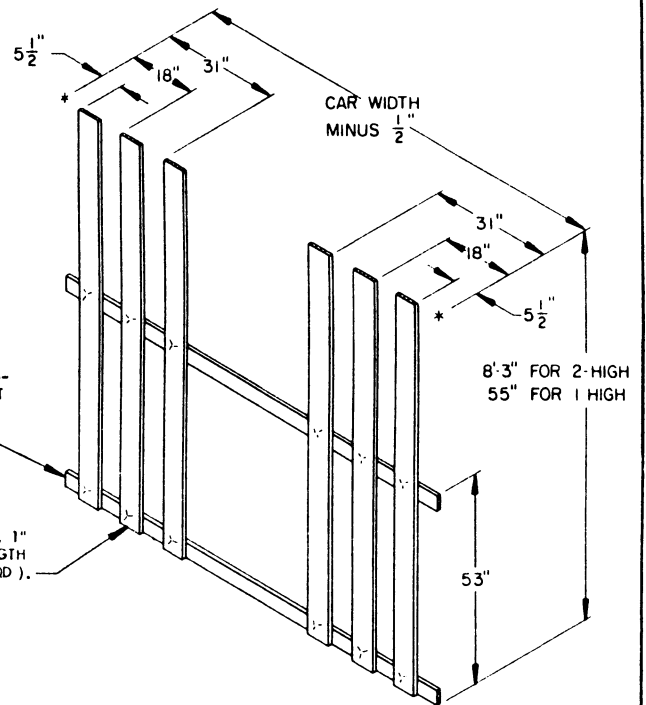


**SEPARATOR GATE E**

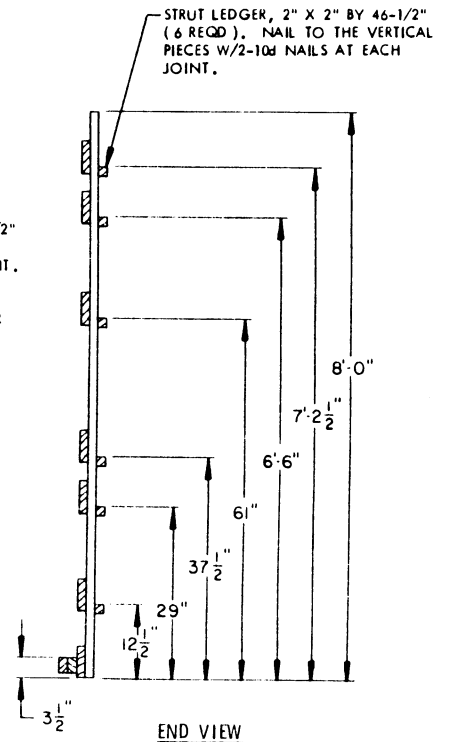
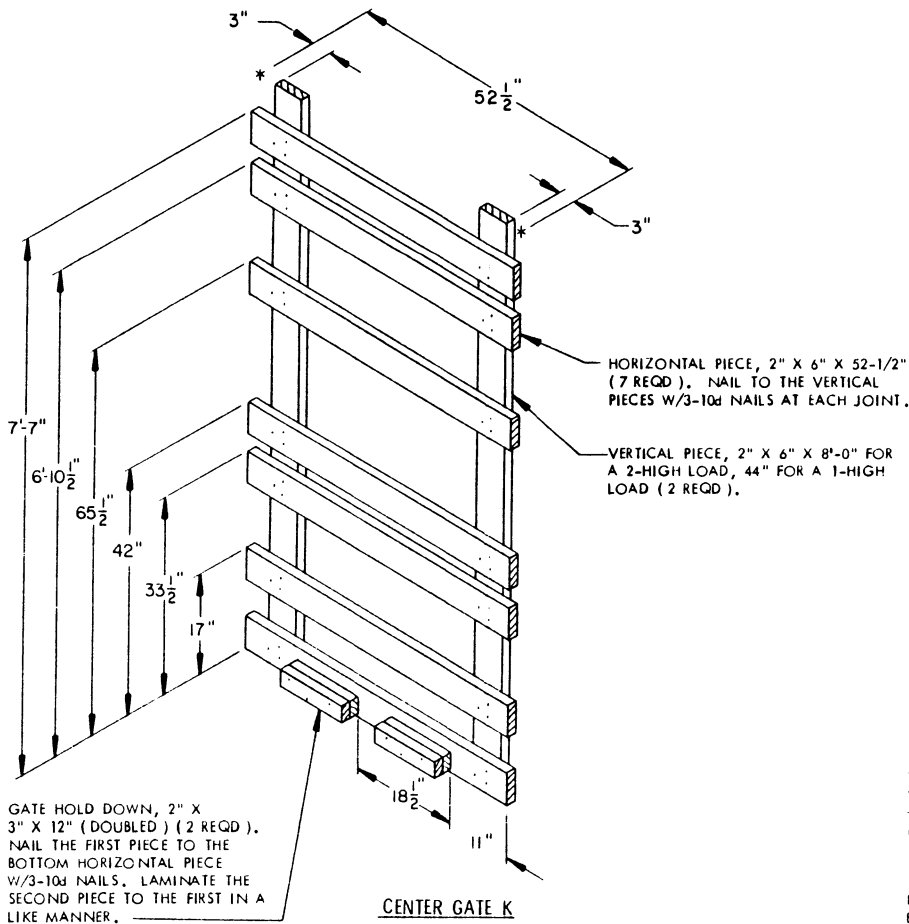
RIGHT HAND AND LEFT HAND GATES ARE REQUIRED. A RIGHT HAND GATE IS SHOWN.

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

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

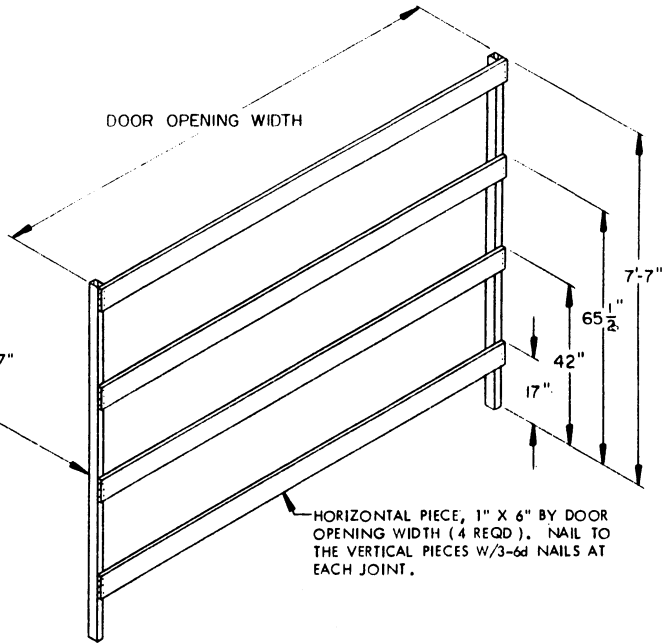


**SEPARATOR GATE F**



NOTE THAT THE TWO UPPER STRUT LEDGERS FOR EACH TIER MAY NEED TO BE APPLIED AFTER THE NEXT LOWER LEVEL STRUTS HAVE BEEN INSTALLED.

VERTICAL PIECE, 2" X 3" X 7'-7"  
(2 REQD). NAIL TO A DOOR  
POST W/17d NAILS.



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

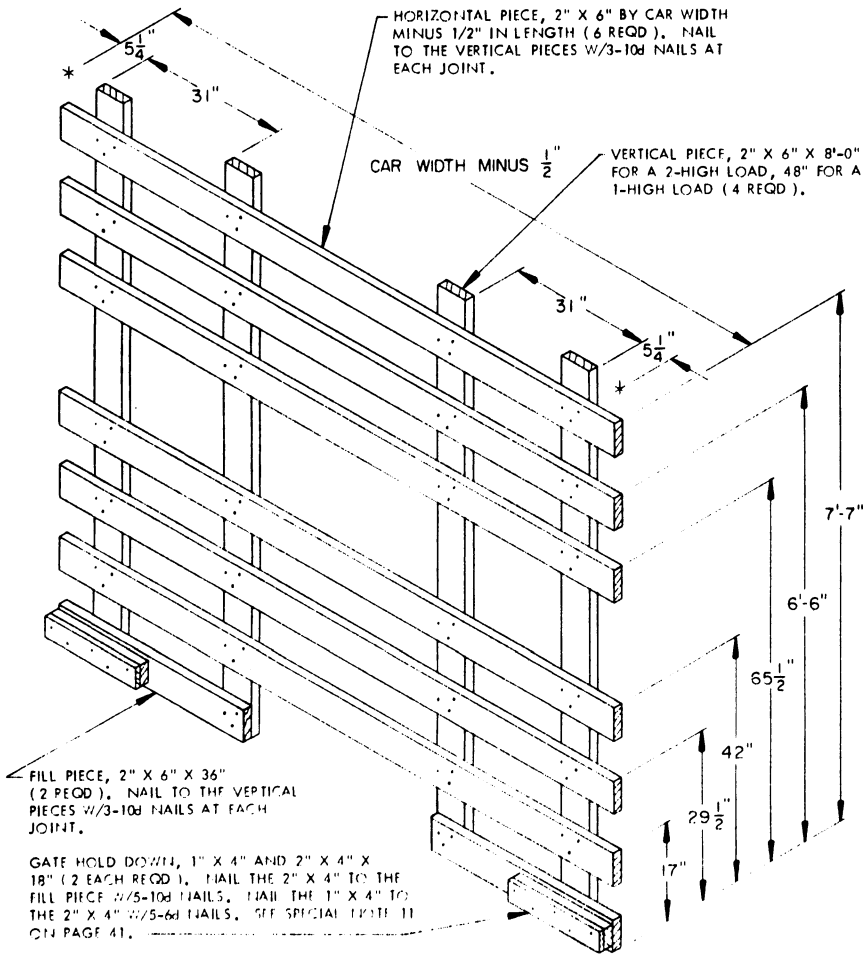
DOORWAY PROTECTION E

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

CAR WIDTH MINUS 1/2"

VERTICAL PIECE, 2" X 6" X 8'-0"  
FOR A 2-HIGH LOAD, 48" FOR A  
1-HIGH LOAD (4 REQD).

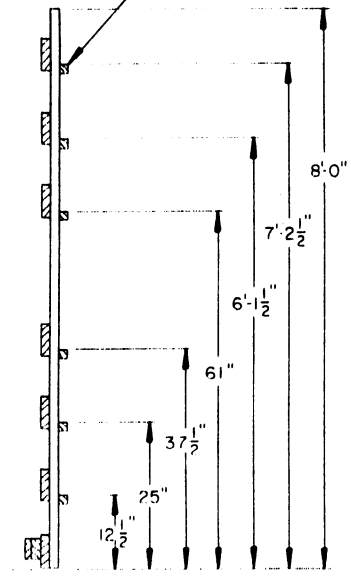
STRUT LEDGER, 2" X 2" BY CAR WIDTH  
MINUS 10-1/2" IN LENGTH (6 REQD).  
NAIL TO THE VERTICAL PIECES W/2-10d  
NAILS AT EACH JOINT.



FILL PIECE, 2" X 6" X 36"  
(2 REQD). NAIL TO THE VERTICAL  
PIECES W/3-10d NAILS AT EACH  
JOINT.

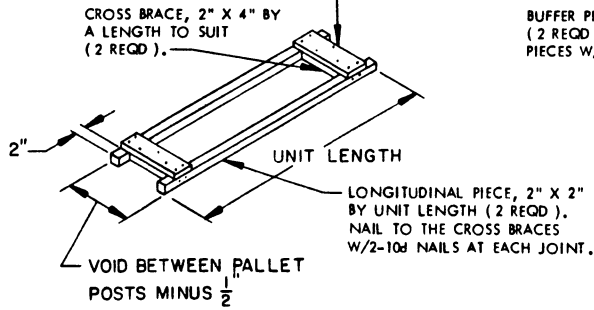
GATE HOLD DOWN, 1" X 4" AND 2" X 4" X  
18" (2 EACH REQD). NAIL THE 2" X 4" TO THE  
FILL PIECE W/5-10d NAILS. NAIL THE 1" X 4" TO  
THE 2" X 4" W/5-6d NAILS. SEE SPECIAL NOTE 11  
ON PAGE 41.

CENTER GATE L



END VIEW

CLEAT, 1" X 4" BY A LENGTH TO SUIT. NAIL TO THE LONGITUDINAL PIECES W/2-6d NAILS AT EACH END AND TO A CROSS BRACE W/3-6d NAILS.

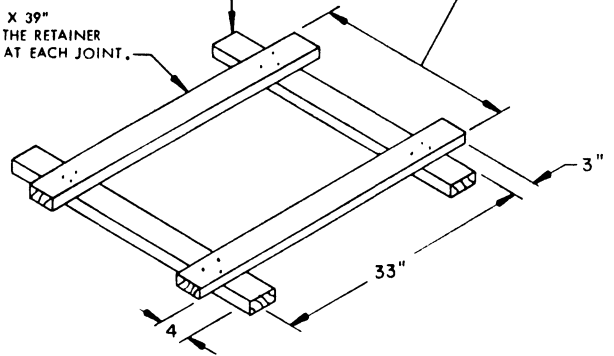


**ANTI-SWAY BRACE C**

RETAINER PIECE, 2" X 4" BY A LENGTH TO SUIT (2 REQD).

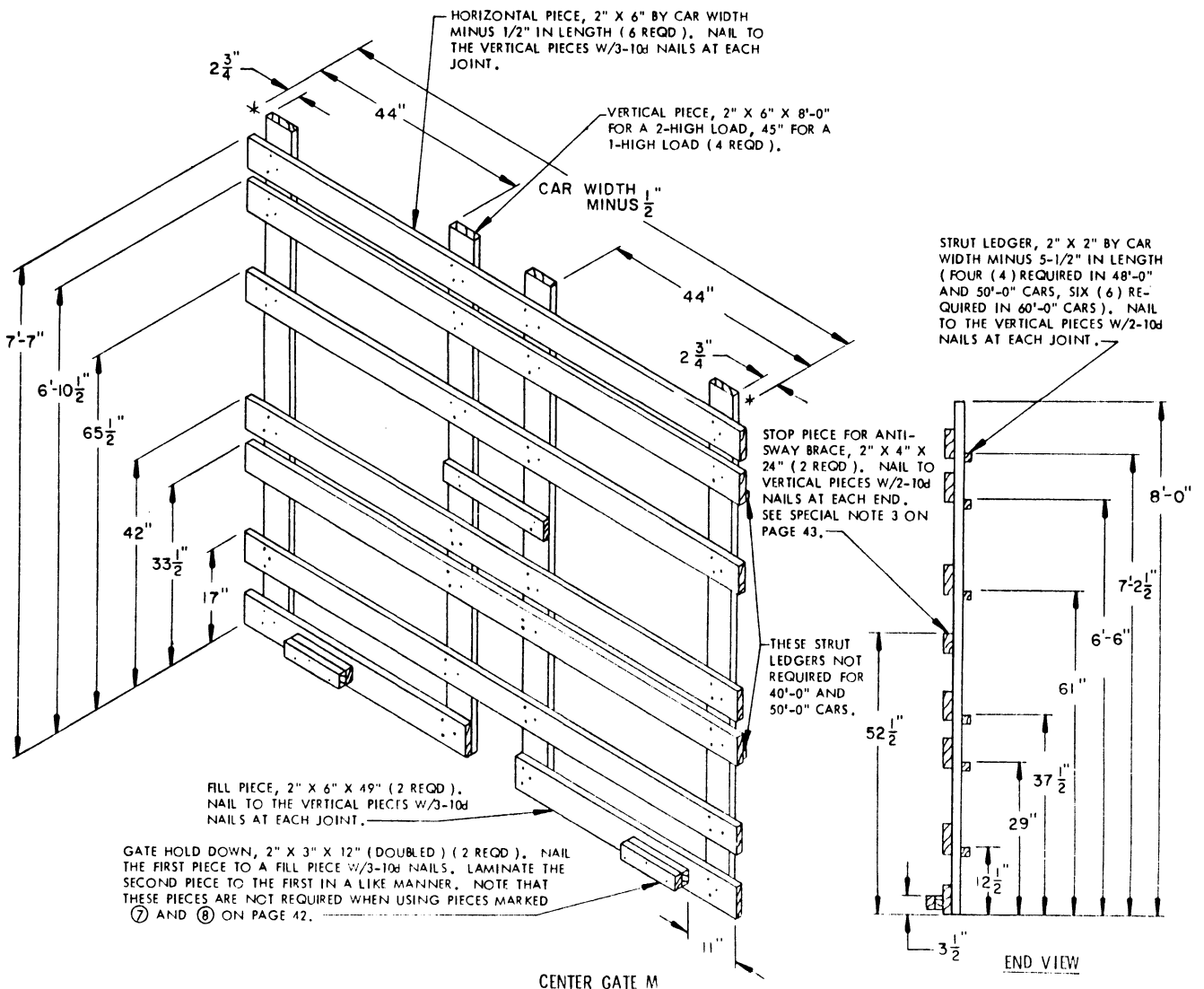
BUFFER PIECE, 2" X 4" X 39" (2 REQD), NAIL TO THE RETAINER PIECES W/3-10d NAILS AT EACH JOINT.

FABRICATE TO FIT BETWEEN THE POSTS OF LATERALLY ADJACENT PALLETS.



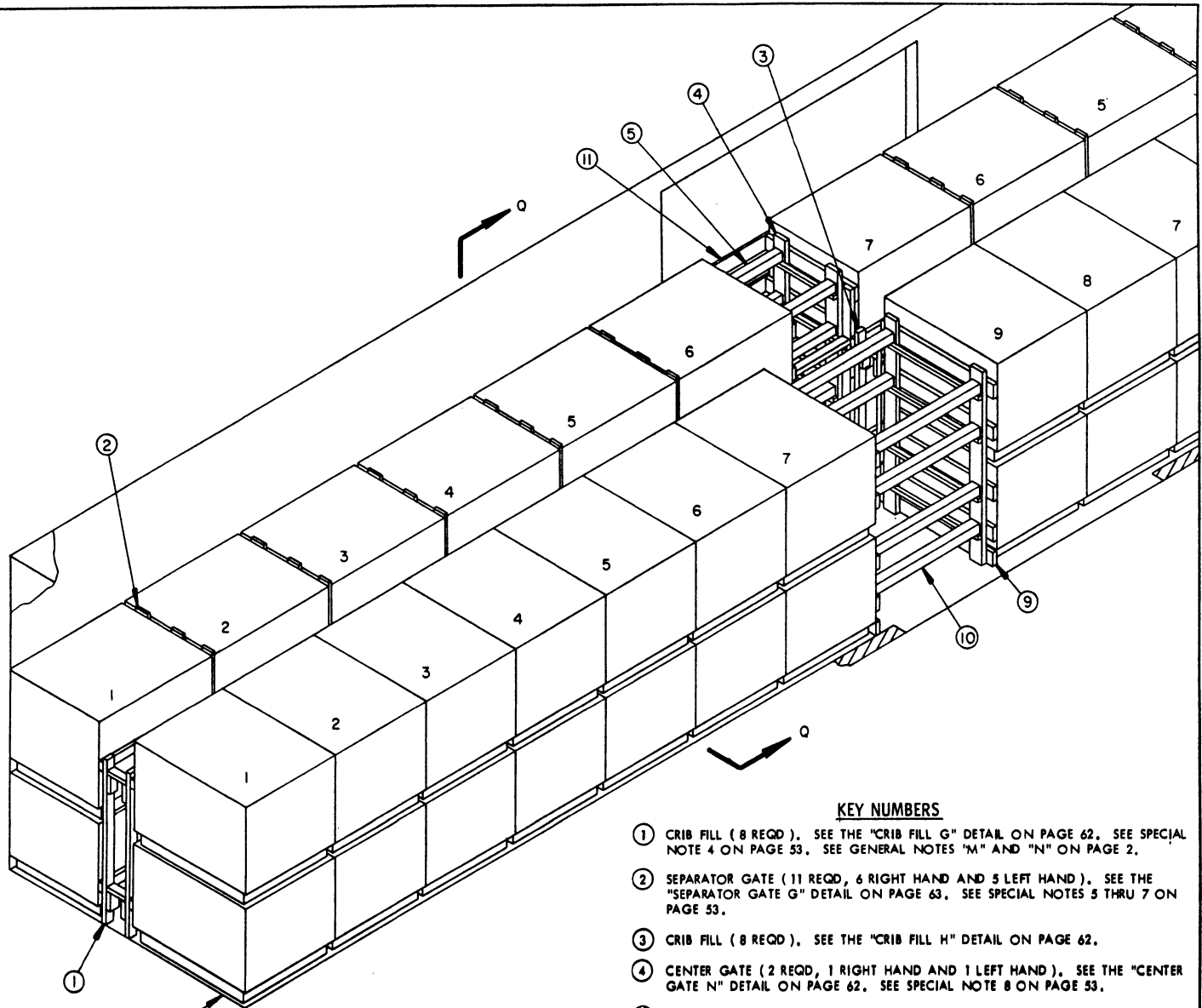
**ANTI-SWAY BRACE D**

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.



**CENTER GATE M**

**END VIEW**

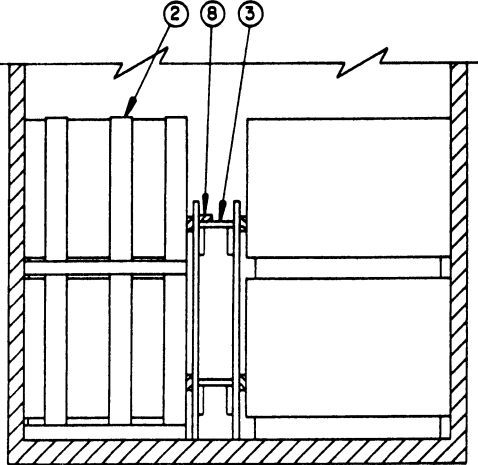


SEE GENERAL NOTE "G" ON PAGE 2.

**ISOMETRIC VIEW**

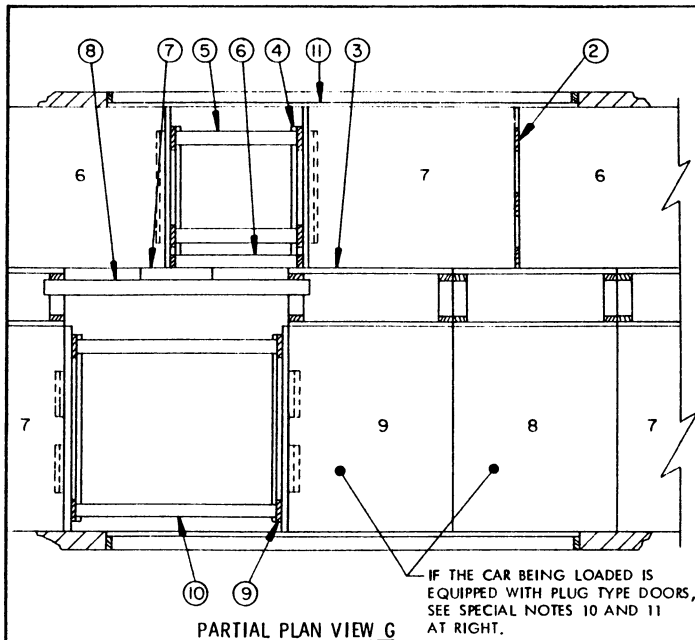
**KEY NUMBERS**

- ① CRIB FILL ( 8 REQD ). SEE THE "CRIB FILL G" DETAIL ON PAGE 62. SEE SPECIAL NOTE 4 ON PAGE 53. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.
- ② SEPARATOR GATE ( 11 REQD, 6 RIGHT HAND AND 5 LEFT HAND ). SEE THE "SEPARATOR GATE G" DETAIL ON PAGE 63. SEE SPECIAL NOTES 5 THRU 7 ON PAGE 53.
- ③ CRIB FILL ( 8 REQD ). SEE THE "CRIB FILL H" DETAIL ON PAGE 62.
- ④ CENTER GATE ( 2 REQD, 1 RIGHT HAND AND 1 LEFT HAND ). SEE THE "CENTER GATE N" DETAIL ON PAGE 62. SEE SPECIAL NOTE 8 ON PAGE 53.
- ⑤ STRUT, 4" X 4" BY CUT TO FIT ( REF: 30" ) ( 8 REQD ), TOENAIL TO PIECES MARKED ④ W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "L" ON PAGE 2 AND GENERAL NOTES "U" AND "V" ON PAGE 3.
- ⑥ STRUT, 2" X 4" BY CUT TO FIT ( REF: 30" ) ( 2 REQD ), TOENAIL TO THE STOP PIECES OF PIECES MARKED ④ W/2-12d NAILS AT EACH END. SEE THE "PARTIAL PLAN VIEW G" DETAIL ON PAGE 53.
- ⑦ SIDE BLOCKING FOR CENTER GATE "N", 2" X 4" X 18" ( DOUBLED ) ( 1 REQD ). NAIL THE FIRST PIECE TO THE CAR FLOOR W/4-16d NAILS. NAIL SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE THE "PARTIAL PLAN VIEW G" ON PAGE 53.
- ⑧ CRIB FILL RETAINER, 2" X 4" BY A LENGTH TO SUIT ( REF: 66" ) ( 2 REQD ), POSITION TO SPAN THE STRUTS OF LONGITUDINALLY ADJACENT CRIB FILL "H". ASSEMBLIES AND NAIL TO EACH STRUT W/3-10d NAILS. SEE "PARTIAL PLAN VIEW G" ON PAGE 53.
- ⑨ CENTER GATE ( 2 REQD ). SEE THE "CENTER GATE O" DETAIL ON PAGE 63.
- ⑩ STRUT, 4" X 4" BY CUT TO FIT ( REF: 50" ) ( 8 REQD ), TOENAIL TO PIECES MARKED ⑦ W/2-16d NAILS AT EACH END.
- ⑪ DOORWAY PROTECTION ( 2 REQD ). SEE THE "DOORWAY PROTECTION F" DETAIL ON PAGE 64. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 9 ON PAGE 53.



**SECTION Q-Q**

**ROUTED DUNNAGE METHOD UNIT ( DECREASED HEIGHT )  
58-UNIT LOAD IN A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR**



PARTIAL PLAN VIEW G

(SPECIAL NOTES CONTINUED)

12. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. THE LOAD CAN BE REDUCED BY ONE OR MORE PALLET UNITS BY EMPLOYING THE PROCEDURES SHOWN ON PAGE 70. FOUR (4) PALLET UNITS CAN BE OMITTED FROM A 2-TIER LOAD BY LEAVING OUT THE LENGTHWISE STACK NUMBERED 7, THE CROSSWISE STACK NUMBERED 9, AND THE ADJACENT CRIB FILL. NOTE THAT STRUT BRACING MUST BE APPLIED TO ALL THE STRUTS. OR, THE ENTIRE TOP TIER CAN BE OMITTED. A PARTIAL 1-TIER LOAD CAN BE SHIPPED IN ONE OR BOTH ENDS OF A CAR BY USING KNEE BRACES AS SHOWN ON PAGES 84 AND 85.
13. IF PALLETIZED UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 89 FOR SHIPPING GUIDANCE FOR LENGTHWISE UNITS AND PAGES 90 AND 92 FOR CROSSWISE UNITS.
14. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 91 FOR GUIDANCE.

**SPECIAL NOTES:**

1. A 60'-8" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2 AND SPECIAL NOTE 3 BELOW.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 52 IS THE ROUTED DUNNAGE METHOD UNIT (DECREASED HEIGHT). A MAXIMUM OF FORTY-EIGHT (48) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 69,744 POUNDS, CAN BE PLACED IN A 50'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES; THIRTY-EIGHT (38) UNITS, FOR A LADING WEIGHT OF 55,214 POUNDS, CAN BE OUTLOADED IN A 40'-6" LONG CAR. NOTE: IF THE DOOR HEIGHT PERMITS ENTRY OF A 3-HIGH PALLET STACK, THE LOAD MAY BE INCREASED BY 29 UNITS.
3. THE DEPICTED LOAD PATTERN IS ADEQUATE FOR CARS HAVING DOOR OPENINGS AS NARROW AS 7'-0". IF A CAR HAVING DOOR OPENINGS LESS THAN 7'-0" WIDE IS TO BE LOADED, THE LENGTHWISE UNITS SHOULD BE LOADED SIX (6) STACKS LONG IN EACH END OF THE CAR AND THE CROSSWISE UNITS SHOULD BE LOADED EIGHT (8) STACKS LONG IN EACH END. PIECE MARKED (7) WILL BE OMITTED AND STRUT BRACING WILL BE REQUIRED; THE BALANCE OF THE DUNNAGE WILL NOT CHANGE.
4. THE "HIGH" CRIB, SHOWN AS PIECE MARKED (1), MUST BE INSTALLED IN EACH END OF THE LOAD. FOUR (4) ASSEMBLIES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
5. THE SEPARATOR GATES, SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 52, ARE DESIGNATED "RIGHT HAND" AND "LEFT HAND" TO FACILITATE POSITIONING OF THE PALLET UNITS AS LOADING PROGRESSES. WHEN LOADING THE CAR, POSITION A PALLET UNIT STACK AGAINST THE END WALL, THEN POSITION A SEPARATOR GATE, SO THE 1" X 4" TIE PIECES ARE LOCATED UNDER THE "OVERHANG" OF THE BOTTOM AND TOP PALLET UNITS. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.
6. ALL SEPARATOR GATES, PIECES MARKED (2), WHICH ARE WITHIN THE DOORWAY AREA OF A CAR EQUIPPED WITH CONVENTIONAL SLIDING DOORS MUST BE WIRE TIED TO THE ADJACENT CRIB FILL TO PREVENT DISPLACEMENT. ENIRCLE A VERTICAL PIECE OF THE SEPARATOR GATE AND THE UPPER HORIZONTAL PIECE OF THE CRIB FILL WITH NO. 14 GAGE WIRE AND TWIST TAUT.
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 A THREE-LAYER LOAD ARE NOT ECONOMICALLY FEASIBLE. CONSTRUCT EACH SEPARATOR GATE FOR ONE OR TWO-LAYER LOADS FROM 42" WIDE PLYWOOD OF AN APPROPRIATE LENGTH.
8. CENTER GATES "N" AND "O" 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 95 FOR GUIDANCE.
9. 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 (1) IN THE LOAD ON PAGE 52, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED SIDE BLOCKING AND LOAD BUNDLING STRAPS MAY BE USED. REFER TO PAGES 97 THRU 99 FOR OTHER TYPES OF DOORWAY PROTECTION.
10. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED SIDE BLOCKING AND LOAD BUNDLING STRAPS MUST BE USED. SEE THE "PARTIAL PLAN VIEW H" DETAIL AND KEY NUMBERS (12) THRU (18) ON PAGE 25 FOR GUIDANCE. NOTE THAT THE CRIB FILL MARKED (3) MUST HAVE 3" CUT OFF EACH VERTICAL AND BOTTOM SUPPORT PIECE THAT RESTS ON THE SIDE BLOCKING; ALSO CENTER GATE "N" MUST BE WIRE TIED TO PIECE MARKED (8) TO PREVENT DISPLACEMENT.
11. IF THE PALLET STACKS IN THE DOORWAY ARE POSITIONED SO THE FORKLIFT OPENINGS ARE NOT CLOSE ENOUGH IN ALIGNMENT TO RECEIVE TWO (2) BUNDLING STRAPS ACROSS THE LOAD WIDTH; THAT PALLET STACK MUST BE UNITIZED TO THE LONGITUDINALLY ADJACENT PALLET STACK AS SHOWN IN THE "PARTIAL PLAN VIEW H" DETAIL ON PAGE 25.

**BILL OF MATERIAL**

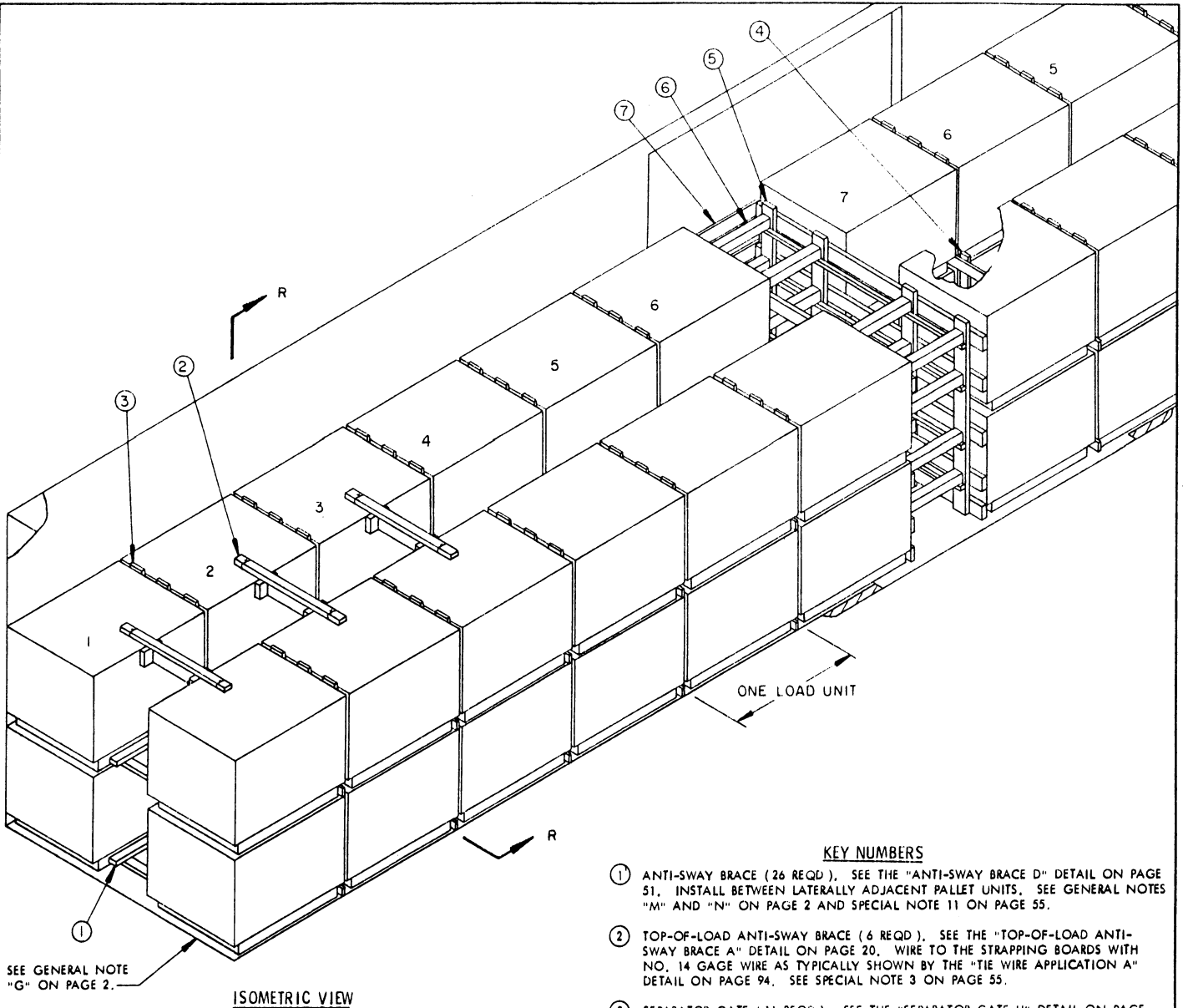
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	85	28
1" X 6"	303	152
2" X 2"	54	18
2" X 3"	21	11
2" X 4"	722	482
2" X 6"	131	131
4" X 4"	54	72
NAILS	NO. REQD	POUNDS
6d (2")	288	1-3/4
10d (3")	1,138	17-1/2
12d (3-1/4")	40	3/4
16d (3-1/2")	77	1-1/2
WIRE, NO. 14 GAGE	3' REQD	NIL

(CONTINUED AT LEFT)

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	58	84,274 LBS
DUNNAGE		1,810 LBS
<b>TOTAL WEIGHT</b>		<b>86,084 LBS</b>

ROUTED DUNNAGE METHOD UNIT (DECREASED HEIGHT)  
58-UNIT LOAD IN A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR

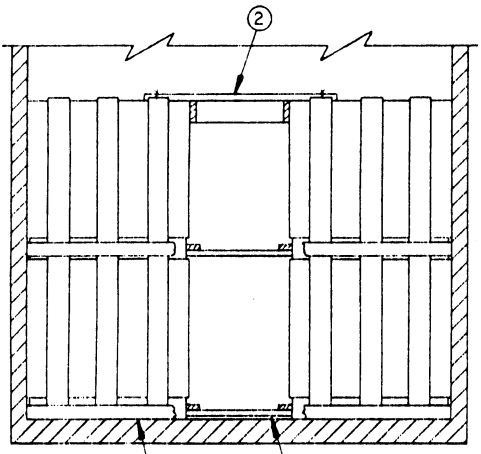


SEE GENERAL NOTE "G" ON PAGE 2.

ISOMETRIC VIEW

**KEY NUMBERS**

- ① ANTI-SWAY BRACE (26 REQD), SEE THE "ANTI-SWAY BRACE D" DETAIL ON PAGE 51. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTE 11 ON PAGE 55.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD), SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 20. WIRE TO THE STRAPPING BOARDS WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 94. SEE SPECIAL NOTE 3 ON PAGE 55.
- ③ SEPARATOR GATE (11 REQD), SEE THE "SEPARATOR GATE H" DETAIL ON PAGE 63. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 4 AND 6 ON PAGE 55.
- ④ STOP PIECE, 1" X 4" X 48" (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 HORIZONTAL PIECES W/3-6d NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 5 ON PAGE 55.
- ⑤ CENTER GATE (2 REQD), SEE THE "CENTER GATE P" DETAIL ON PAGE 64. SEE SPECIAL NOTES 7, 8, 9 AND 11 ON PAGE 55.
- ⑥ STRUT, 4" X 4" BY CUT TO FIT (REF: 30") (16 REQD). TOENAIL TO PIECES MARKED ⑤ W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "L" ON PAGE 2, AND GENERAL NOTES "U" AND "V" ON PAGE 3.
- ⑦ DOORWAY PROTECTION (2 REQD), SEE THE "DOORWAY PROTECTION F" DETAIL ON PAGE 64. SEE SPECIAL NOTES 10 AND 11 ON PAGE 55.



SECTION R-R

ROUTED DUNNAGE METHOD UNIT (DECREASED HEIGHT)  
52-UNIT LOAD IN A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR

( SPECIAL NOTES CONTINUED )

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 68 THRU 88 FOR GUIDANCE. NOTE THAT THE STRUT BRACING METHOD OF PARTIAL TIER BRACING SHOWN ON PAGE 26 CAN ALSO BE USED TO REDUCE A LOAD BY ONE OR MORE UNITS. A 3-HIGH LOAD IS SHOWN HOWEVER THE BASIC PRINCIPLES ALSO APPLY FOR A 2-HIGH LOAD.
13. IF PALLETIZED UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 89 FOR SHIPPING GUIDANCE.
14. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 91 FOR GUIDANCE.

SPECIAL NOTES:

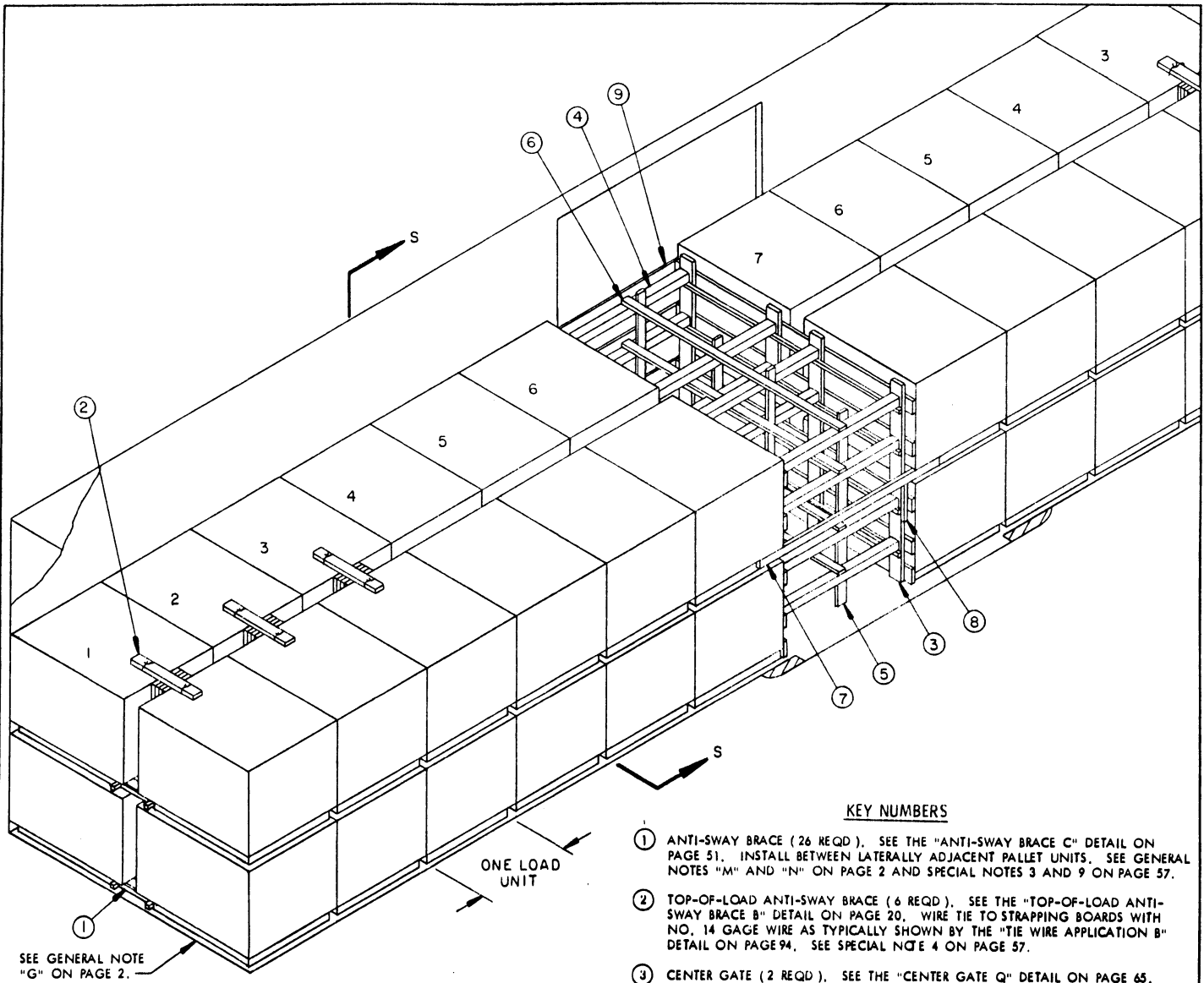
1. A 60'-8" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 54 IS THE ROUTED DUNNAGE METHOD UNIT (DECREASED HEIGHT). A MAXIMUM OF FORTY (40) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 58,120 POUNDS, CAN BE PLACED IN A 50'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES; THIRTY-TWO (32) UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 46,496 POUNDS, CAN BE OUTLOADED IN A 40'-6" LONG CAR. NOTE: IF THE DOOR HEIGHT PERMITS ENTRY FOR A 3-HIGH PALLET STACK, THE LOAD CAN BE INCREASED BY 26 UNITS.
3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 54, MUST BE INSTALLED IN EACH END OF THE CAR. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
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 STOP PIECES. A 7'-0" LONG STOP PIECE IS REQUIRED FOR A 3-LAYER LOAD AND 48" LONG STOP PIECES ARE REQUIRED FOR 1 AND 2-LAYER LOADS. SEE PIECE MARKED ④ ON PAGE 54 FOR A TYPICAL INSTALLATION. 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 94 FOR CONSTRUCTION GUIDANCE.
7. CENTER GATE "P" 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 95 FOR GUIDANCE.
8. 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 P", SHOWN AS PIECE MARKED ⑤ IN THE LOAD ON PAGE 54, INSTALL TWO (2) "CENTER GATES N" AS SHOWN ON PAGE 62. 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 95. OMIT THE STOP PIECES FROM "CENTER GATE N".
9. DOORWAY SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE 1" X 4" AND 2" X 4" MATERIAL NAILED TO CENTER GATE "P", PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 96 FOR GUIDANCE.
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. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED ⑦ IN THE LOAD ON PAGE 54, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED SIDE BLOCKING AND LOAD BUNDLING STRAPS MAY BE USED. REFER TO PAGES 97 THRU 99 FOR OTHER TYPES OF DOORWAY PROTECTION.
11. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED SIDE BLOCKING AND LOAD BUNDLING STRAPS MUST BE USED; OMIT EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA, IN LIEU OF PIECE MARKED ⑧, USE PIECES MARKED ⑤ THRU ⑧ ON PAGE 46. SEE SPECIAL NOTES 8 AND 9 ON PAGE 47 FOR GUIDANCE. ALSO, THE CENTER GATES MUST BE RESTRAINED FROM LATERAL MOVEMENT BY NAILING TO THE CAR FLOOR A DOUBLED 2" X 4" X 18" POSITIONED LONGITUDINALLY SO AS TO BE CENTERED AGAINST THE FILL PIECES OF A CENTER GATE. TWO (2) PIECES WILL BE REQUIRED FOR EACH CENTER GATE WHICH IS IN THE DOOR OPENING, OR WITHIN SIX INCHES (6") OF IT.

( CONTINUED AT LEFT )

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	215	72
1" X 6"	263	132
2" X 2"	67	23
2" X 3"	13	7
2" X 4"	356	238
2" X 6"	158	158
4" X 4"	40	54
NAILS	NO. REQD	POUNDS
6d (2")	346	2
10d (3")	536	8-1/4
12d (3-1/4")	24	1/2
16d (3-1/2")	64	1-1/2
WIRE, NO. 14 GAGE	60' REQD	1 LB

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	52	75,556 LBS
DUNNAGE		1,382 LBS
TOTAL WEIGHT		76,938 LBS



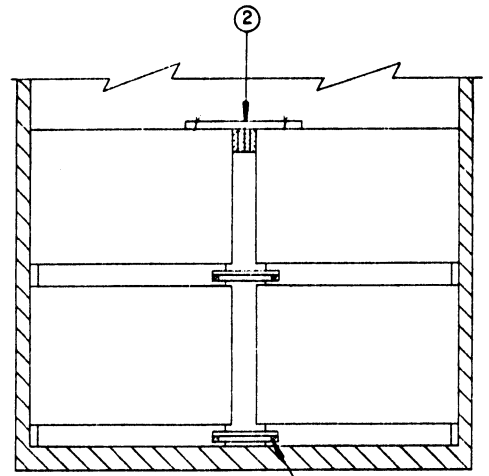
ISOMETRIC VIEW

SEE GENERAL NOTE "G" ON PAGE 2.

ONE LOAD UNIT

KEY NUMBERS

- ① ANTI-SWAY BRACE (26 REQD). SEE THE "ANTI-SWAY BRACE C" DETAIL ON PAGE 51. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTES 3 AND 9 ON PAGE 57.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 20. WIRE TIE TO STRAPPING BOARDS WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 94. SEE SPECIAL NOTE 4 ON PAGE 57.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE Q" DETAIL ON PAGE 65. SEE SPECIAL NOTES 5 AND 6 ON PAGE 57.
- ④ STRUT, 4" X 4" BY CUT TO FIT (REF: 54") (16 REQD). TOENAIL TO PIECES MARKED ③ W/2-10d NAILS AT EACH END. SEE GENERAL NOTE "L" ON PAGE 2, AND GENERAL NOTES "U" AND "V" ON PAGE 3.
- ⑤ VERTICAL STRUT BRACING, 2" X 4" X 6'-6" (4 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑥ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 6" (4 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑦ GATE HOLD DOWN, 2" X 4" BY LENGTH OF CENTER VOID PLUS 24" (REF: 7'-0") (2 REQD). NAIL TO THE VERTICAL PIECES OF THE CENTER GATES W/2-10d NAILS AT EACH JOINT. SEE SPECIAL NOTE 7 ON PAGE 57.
- ⑧ GATE HOLD DOWN SUPPORT PIECE, 2" X 2" X 15" (4 REQD). POSITION UNDER PIECE MARKED ⑦ AND NAIL TO A VERTICAL PIECE OF PIECE MARKED ③ W/4-10d NAILS.
- ⑨ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION F" DETAIL ON PAGE 64. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 8 ON PAGE 57.



SECTION S-S

ROUTED DUNNAGE METHOD UNIT (DECREASED HEIGHT)  
52-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL BOX CAR



( SPECIAL NOTES CONTINUED )

- 11. 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 68 THRU 88 FOR GUIDANCE. NOTE THAT THE STRUT BRACING METHOD OF PARTIAL TIER BRACING SHOWN ON PAGE 28 MAY ALSO BE USED TO REDUCE A LOAD BY ONE OR MORE UNITS. A 3-HIGH LOAD IS SHOWN, HOWEVER THE BASIC PRINCIPLES ALSO APPLY FOR A 2-HIGH LOAD.
- 12. IF THE DOOR HEIGHT PERMITS ENTRY OF A 3-HIGH PALLET STACK, THE DEPICTED LOAD CAN BE INCREASED BY ONE COMPLETE LAYER, OR IT CAN BE INCREASED BY 20 UNITS IF THE STRUT BRACING METHOD SHOWN ON PAGE 28 IS USED.
- 13. IF PALLETIZED UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 90 AND 92 FOR GUIDANCE.
- 14. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 91 FOR GUIDANCE.

SPECIAL NOTES:

- 1. A 50'-6" LONG BY 9'-4" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 8'-0" WIDE DOOR OPENINGS IS SHOWN. WIDER CARS OF OTHER LENGTHS 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 56 IS THE ROUTED DUNNAGE METHOD UNIT (DECREASED HEIGHT). A MAXIMUM OF FORTY (40) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 58,120 POUNDS, CAN BE PLACED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES. SIXTY-FOUR (64) UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 92,992 POUNDS, CAN BE OUTLOADED IN A 60'-8" LONG CAR. SEE SPECIAL NOTE 11.
- 3. ANTI-SWAY BRACING IS REQUIRED BETWEEN LATERALLY ADJACENT PALLET UNITS. TO PREVENT LONGITUDINAL DISPLACEMENT OF THE ANTI-SWAY BRACE BETWEEN THE UPPER UNITS, A STOP PIECE MUST BE NAILED TO EACH CENTER GATE "Q" AS SHOWN ON THE DETAIL ON PAGE 65. IF DESIRED IN CARS HAVING NAILABLE SIDEWALLS, 1" X 6" OR 2" X 6" FILL MATERIAL MAY BE NAILED TO ONE OR BOTH SIDEWALLS AT HEIGHTS SPECIFIED FOR THE DOORWAY PROTECTION HORIZONTAL PIECES, IN LIEU OF USING THE ANTI-SWAY BRACES. NOTE THAT THE TOTAL ACCUMULATED SPACE ACROSS A CAR SHOULD NOT EXCEED TWO INCHES (2").
- 4. THE "HIGH" CRIB, SHOWN AS PIECE MARKED ①, MUST BE INSTALLED IN EACH END OF THE LOAD. FOUR (4) ASSEMBLIES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH. IF DESIRED IN CARS HAVING NAILABLE SIDEWALLS, 1" X 6" OR 2" X 6" FILL MATERIAL MAY BE NAILED TO ONE OR BOTH SIDEWALLS AT HEIGHTS SPECIFIED FOR THE DOORWAY PROTECTION HORIZONTAL PIECES, IN LIEU OF USING THE ANTI-SWAY BRACES. NOTE THAT THE TOTAL ACCUMULATED SPACE ACROSS A CAR SHOULD NOT EXCEED TWO INCHES (2").
- 5. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 56, MUST BE INSTALLED IN EACH END OF THE CAR. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
- 6. CENTER GATE "Q" 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 95 FOR GUIDANCE.
- 7. 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 Q" SHOWN AS PIECE MARKED ③ IN THE LOAD ON PAGE 56, INSTALL TWO (2) "CENTER GATES Q" AS SHOWN ON PAGE 63. 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 95.
- 8. AN ALTERNATIVE TO THE GATE HOLD DOWN SHOWN AS PIECE MARKED ⑦ IN THE LOAD ON PAGE 56 MAY BE USED, IF DESIRED, WHEN THE CAR FURNISHED FOR LOADING IS EQUIPPED WITH 8'-0" OR WIDER DOORS. NOTE THAT IN A CAR HAVING DOOR OPENINGS JUST 8'-0" WIDE IT MAY BE NECESSARY TO LAMINATE ONE OR TWO THICKNESS OF 2-INCH MATERIAL TO THE ADJACENT CENTER GATE VERTICAL PIECES TO PROVIDE AN AREA FOR NAILING OF PIECES MARKED ⑦ AND ⑧. AN ALTERNATIVE HOLD DOWN MUST BE USED WHEN THE CAR FURNISHED HAS DOOR OPENINGS LESS THAN 8'-0" WIDE. DOOR SPANNER TYPE HOLD DOWN AS SHOWN ON PAGE 96 MAY BE USED IF THE CAR HAS NAILABLE SIDEWALLS, OR DOUBLED 2" X 3" HOLD DOWN PIECES MAY BE APPLIED TO THE CENTER GATES AS SHOWN BY THE CENTER GATE "Q" DETAIL ON PAGE 65.
- 9. 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 PIECE MARKED ⑨ IN THE LOAD ON PAGE 56, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED SIDE BLOCKING AND LOAD BUNDLING STRAPS MAY BE USED. REFER TO PAGES 97 THRU 99 FOR OTHER TYPES OF DOORWAY PROTECTION.
- 10. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED SIDE BLOCKING AND LOAD BUNDLING STRAPS MUST BE USED; OMIT EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA, IN LIEU OF PIECE MARKED ⑨, USE PIECES MARKED ③ THRU ⑧ ON PAGE 60. SEE SPECIAL NOTES 9 AND 10 ON PAGE 61 FOR GUIDANCE.

( CONTINUED AT LEFT )

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	78	26
1" X 6"	64	32
2" X 2"	258	86
2" X 3"	25	13
2" X 4"	160	107
2" X 6"	167	167
4" X 4"	72	96
NAILS	NO. REQD	POUNDS
6d (2")	412	2-1/2
10d (3")	534	8-1/4
12d (3-1/4")	24	1/2
16d (3-1/2")	64	1-1/2
WIRE, NO. 14 GAGE ----- 36' REQD ----- 1/2 LB		

LOAD AS SHOWN

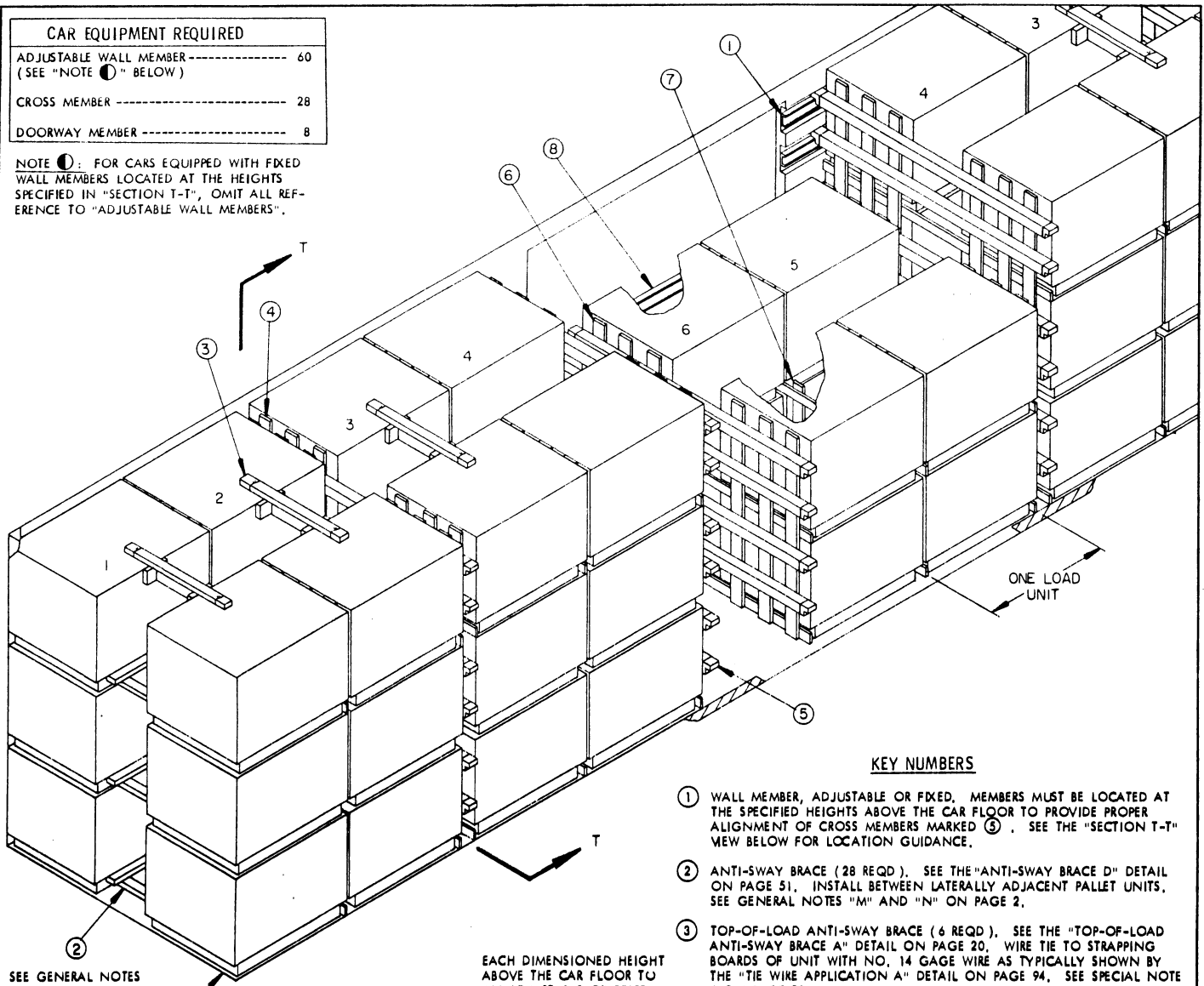
ITEM	QUANTITY	WEIGHT ( APPROX )
PALLET UNIT -----	52 -----	75,556 LBS
DUNNAGE -----	-----	1,067 LBS
TOTAL WEIGHT -----	-----	76,623 LBS

ROUTED DUNNAGE METHOD UNIT ( DECREASED HEIGHT )  
52-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL BOX CAR

**CAR EQUIPMENT REQUIRED**

ADJUSTABLE WALL MEMBER -----	60
(SEE "NOTE 1" BELOW)	
CROSS MEMBER -----	28
DOORWAY MEMBER -----	8

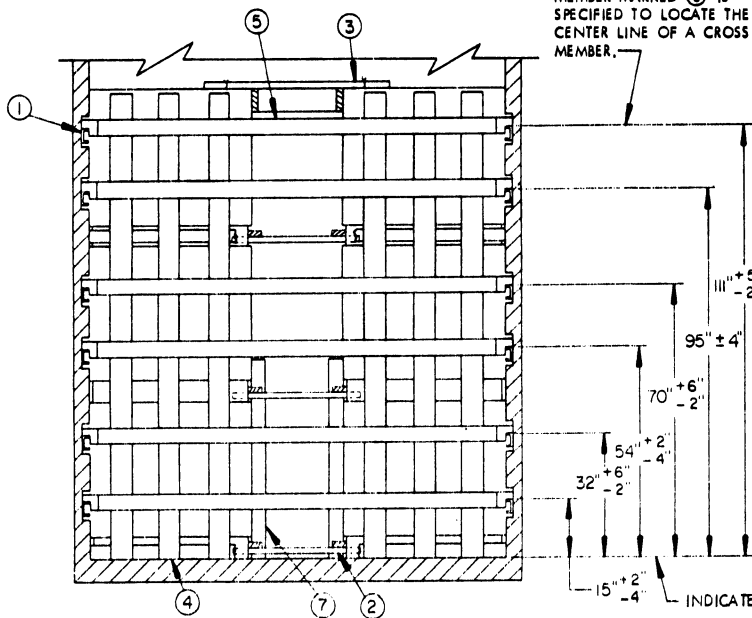
NOTE 1: FOR CARS EQUIPPED WITH FIXED WALL MEMBERS LOCATED AT THE HEIGHTS SPECIFIED IN "SECTION T-T", OMIT ALL REFERENCE TO "ADJUSTABLE WALL MEMBERS".



SEE GENERAL NOTES "D" AND "G" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 59.

**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 T-T**

INDICATES CAR FLOOR.

**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 28. SEE THE "SECTION T-T" VIEW BELOW FOR LOCATION GUIDANCE.
- 2 ANTI-SWAY BRACE (28 REQD). SEE THE "ANTI-SWAY BRACE D" DETAIL ON PAGE 51. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.
- 3 TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 20. WIRE TIE TO STRAPPING BOARDS OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 94. SEE SPECIAL NOTE 4 ON PAGE 59.
- 4 SEPARATOR GATE FOR 3-HIGH (10 REQD). SEE THE "SEPARATOR GATE H" DETAIL ON PAGE 63. AS APPLICABLE, POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 5 AND 7 ON PAGE 59.
- 8 CROSS MEMBER (28 REQD). SEE GENERAL NOTE "X" ON PAGE 3.
- 6 SEPARATOR GATE FOR 2-HIGH (3 REQD). SEE THE "SEPARATOR GATE H" DETAIL ON PAGE 63. AS APPLICABLE, POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS.
- 7 STOP PIECE, 1" X 4" X 48" (4 REQD). POSITION AGAINST PALLET UNITS IN THE DOORWAY AND NAIL TO THE HORIZONTAL PIECES ON PIECE MARKED 6 W/3-6d NAILS AT EACH JOINT AND CLINGH. SEE SPECIAL NOTE 6 ON PAGE 59.
- 8 DOORWAY MEMBER (8 REQD). SEE THE "SECTION T-T" VIEW AT LEFT FOR PROPER LOCATION GUIDANCE. SEE SPECIAL NOTE 8 ON PAGE 59.

ROUTED DUNNAGE METHOD UNIT (DECREASED HEIGHT)

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

**SPECIAL NOTES:**

1. A 50'-6" LONG BY 9'-0" WIDE ( INSIDE CLEARANCE ) 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.
2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 58 IS THE ROUTED DUNNAGE METHOD UNIT ( DECREASED HEIGHT ). A MAXIMUM OF FORTY-FOUR ( 44 ) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 63,932 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 "G" 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 58, MUST BE INSTALLED IN EACH END OF THE CAR. THREE ( 3 ) 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 BOTTOM AND TOP 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 ( 7 ). 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 FOR ONE OR TWO-LAYER LOADS; PLYWOOD SEPARATOR GATES FOR A 3-LAYER LOAD ARE NOT ECONOMICALLY FEASIBLE. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 94 FOR CONSTRUCTION GUIDANCE.
8. IF THE CAR BEING LOADED IS EQUIPPED WITH AT LEAST TWELVE ( 12 ) DOORWAY MEMBERS, AN ADDITIONAL FOUR PALLET UNITS CAN BE LOADED IN THE DOORWAY AREA IF THE DOOR IS 10'-4" HIGH.
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 ONE OR TWO LAYERS 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 66 AND 67 FOR GUIDANCE.
10. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 91 FOR GUIDANCE.

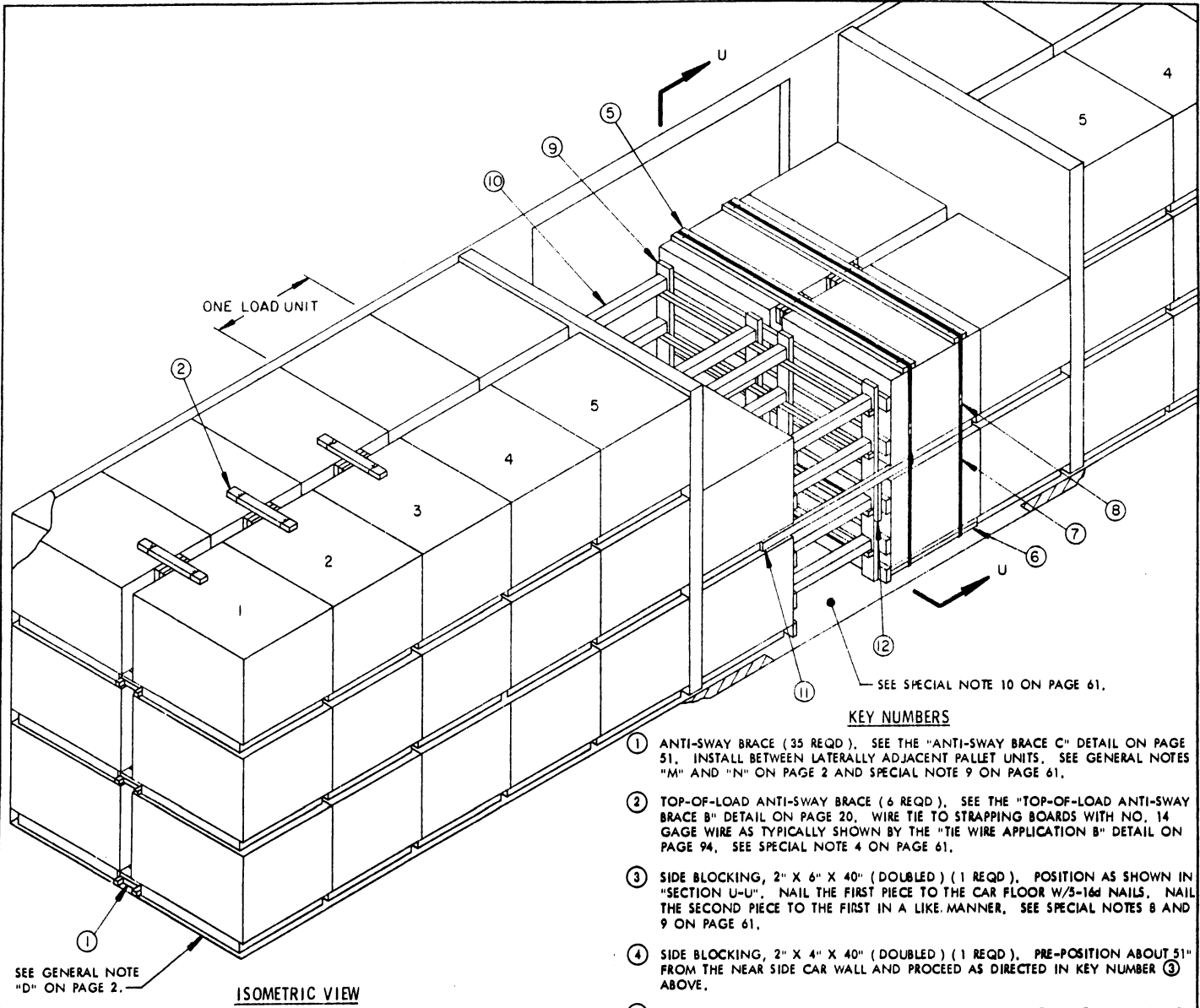
**BILL OF MATERIAL**

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	250	84
1" X 6"	722	361
2" X 4"	365	244
2" X 6"	19	19
NAILS	NO. REQD	POUNDS
6d ( 2" )	492	3
10d ( 3" )	420	6-1/2
WIRE, NO. 14 GAGE	60' REQD	1 LB

**LOAD AS SHOWN**

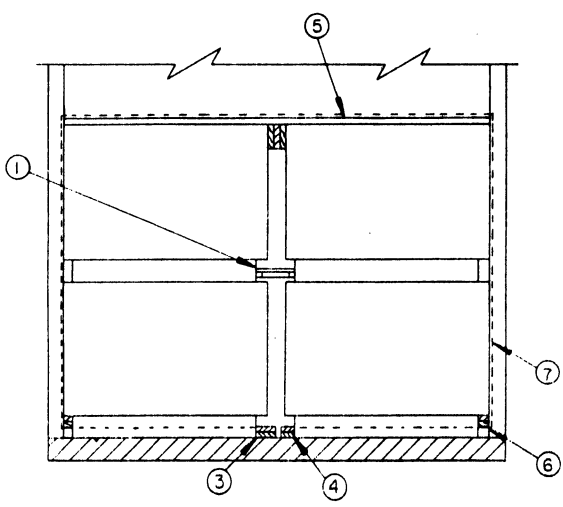
ITEM	QUANTITY	WEIGHT ( APPROX )
PALLET UNIT	56	81,368 LBS
DUNNAGE		1,426 LBS
TOTAL WEIGHT		82,794 LBS

ROUTED DUNNAGE METHOD UNIT ( DECREASED HEIGHT )  
 56-UNIT LOAD IN A 50'-6" LONG BY 9'-0" WIDE BOX CAR EQUIPPED WITH MECHANICAL BRACING DEVICES



SEE GENERAL NOTE "D" ON PAGE 2.

ISOMETRIC VIEW



SECTION U-U

SEE SPECIAL NOTE 10 ON PAGE 61.

KEY NUMBERS

- ① ANTI-SWAY BRACE (35 REQD). SEE THE "ANTI-SWAY BRACE C" DETAIL ON PAGE 51. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTE 9 ON PAGE 61.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 20. WIRE TIE TO STRAPPING BOARDS WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 94. SEE SPECIAL NOTE 4 ON PAGE 61.
- ③ SIDE BLOCKING, 2" X 6" X 40" (DOUBLED) (1 REQD). POSITION AS SHOWN IN "SECTION U-U". NAIL THE FIRST PIECE TO THE CAR FLOOR W/3-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTES 8 AND 9 ON PAGE 61.
- ④ SIDE BLOCKING, 2" X 4" X 40" (DOUBLED) (1 REQD). PRE-POSITION ABOUT 51" FROM THE NEAR SIDE CAR WALL AND PROCEED AS DIRECTED IN KEY NUMBER ③ ABOVE.
- ⑤ STRAPPING BOARD/SPACER ASSEMBLY "C" (2 REQD). SEE THE DETAIL ON PAGE 21.
- ⑥ BATTEN, 2" X 2-1/2" (ACTUAL SIZE) BY A LENGTH TO SUIT (DOUBLED) (2 REQD). LAMINATE W/1-10d NAIL EVERY 8". POSITION UNDER THE CONTAINER BELL PRIOR TO TENSIONING STRAP.
- ⑦ BUNDLING STRAP, 1-1/4" X .031" OR .035" X 32'-6" LONG STEEL STRAPPING (2 REQD). STAPLE TO STRAPPING BOARD MARKED ⑤ W/3 STAPLES. SEE SPECIAL NOTE 10 ON PAGE 61.
- ⑧ SEAL FOR 1-1/4" STRAPPING (4 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "O" ON PAGE 2.
- ⑨ CENTER GATE (2 REQD). SEE THE "CENTER GATE Q" DETAIL ON PAGE 65. SEE SPECIAL NOTES 5 AND 6 ON PAGE 61.
- ⑩ STRUT, 4" X 4" BY CUT TO FIT (REF: 42") (16 REQD). TOENAIL TO PIECES MARKED ⑨ W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "L" ON PAGE 2, AND GENERAL NOTES "U" AND "V" ON PAGE 3.
- ⑪ GATE HOLD DOWN, 2" X 4" BY LENGTH OF CENTER VOID PLUS 24" (2 REQD). POSITION UNDER THE ENDS OF THE CONTAINERS AND NAIL TO THE VERTICAL PIECES OF THE CENTER GATES W/2-10d NAILS AT EACH JOINT. SEE SPECIAL NOTE 7 ON PAGE 61.
- ⑫ GATE HOLD DOWN SUPPORT PIECE, 2" X 2" X 15" (4 REQD). POSITION UNDER PIECE MARKED ⑪ AND NAIL TO A VERTICAL PIECE OF PIECE MARKED ⑨ W/4-10d NAILS.

ROUTED DUNNAGE METHOD UNIT (DECREASED HEIGHT)

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

(SPECIAL NOTES CONTINUED)

11. A "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL SHOWN ON PAGE 101 IS REQUIRED BETWEEN THE LOAD DIVIDER BULKHEADS WHEN CENTER GATES ARE NOT USED AND THE LOAD IN EITHER END OF THE CAR IS 50,000 POUNDS OR MORE. FOR THE DEPICTED PALLET UNIT, A STRUT ASSEMBLY WILL BE REQUIRED IF THE LOAD IN ONE END OF THE CAR CONSISTS OF MORE THAN FIVE (5) LOAD UNITS. THE STRUT ASSEMBLY WILL ALWAYS BE REQUIRED FOR FULL LOADS IN 60'-0" OR LONGER CARS.
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, 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 68 THRU 77 AND GENERAL NOTE "FF" ON PAGE 3 FOR GUIDANCE.
13. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 90 AND 92 FOR SHIPPING GUIDANCE.
14. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 91 FOR GUIDANCE.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-4" 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 "AA" THRU "EE" ON PAGE 3.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 60 IS THE ROUTED DUNNAGE METHOD UNIT (DECREASED HEIGHT). A MAXIMUM OF NINETY-TWO (92) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 133,616 POUNDS CAN BE PLACED IN A 60'-8" LONG CAR, OR A MAXIMUM OF FIFTY-SIX (56) UNITS CAN BE LOADED IN A 40'-6" CAR FOR AN APPROXIMATE LADING WEIGHT OF 81,368 POUNDS, WHEN USING THE DEPICTED PROCEDURES. IF A LENGTHWISE LOADING PATTERN SHOWN ON PAGE 46 IS EMPLOYED, THEN SEVENTY-TWO (72) PALLET UNITS FOR AN APPROXIMATE LADING WEIGHT OF 104,616 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 87,180 POUNDS, AND FORTY-FOUR (44) UNITS CAN BE LOADED IN A 40'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 63,932 POUNDS.
3. ANTI-SWAY BRACING IS REQUIRED BETWEEN LATERALLY ADJACENT PALLET UNITS. TO PREVENT LONGITUDINAL DISPLACEMENT OF THE ANTI-SWAY BRACE BETWEEN THE UPPER UNITS, A STOP PIECE MUST BE NAILED TO EACH CENTER GATE "Q" AS SHOWN ON THE DETAIL ON PAGE 65. IF DESIRED IN CARS HAVING NAILABLE SIDEWALLS, 1" X 6" OR 2" X 6" FILL MATERIAL MAY BE NAILED TO ONE OR BOTH SIDEWALLS AT HEIGHTS SPECIFIED FOR THE DOORWAY PROTECTION HORIZONTAL PIECES, IN LIEU OF USING THE ANTI-SWAY BRACES. NOTE THAT THE TOTAL ACCUMULATED SPACE ACROSS A CAR SHOULD NOT EXCEED TWO INCHES (2").
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 60, MUST BE INSTALLED IN EACH END OF THE CAR. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
5. CENTER GATE "Q" 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 95 FOR GUIDANCE.
6. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR-WIDTH GATES. IN LIEU OF EACH "CENTER GATE Q", SHOWN AS PIECE MARKED ⑨ IN THE LOAD ON PAGE 60, INSTALL TWO (2) "CENTER GATES O" AS SHOWN ON PAGE 63. 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 95.
7. AN ALTERNATIVE TO THE GATE HOLD DOWN SHOWN AS PIECES MARKED ① AND ② IN THE LOAD ON PAGE 60 MAY BE USED. IF DESIRED, DOUBLED 2" X 3" HOLD DOWN PIECES MAY BE APPLIED TO THE CENTER GATES AS SHOWN BY THE CENTER GATE "Q" DETAIL ON PAGE 65.
8. 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 PIECE MARKED ⑩ IN THE LOAD ON PAGE 56, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED SIDE BLOCKING AND LOAD BUNDLING STRAPS MARKED ③ THRU ⑧ ON PAGE 60 MAY BE USED. REFER TO PAGES 97 THRU 99 FOR OTHER TYPES OF DOORWAY PROTECTION.
9. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED SIDE BLOCKING AND LOAD BUNDLING STRAPS MUST BE USED. SIDE BLOCKING MARKED ③ AND ④ IN THE SECTION VIEW MUST BE USED IN LIEU OF THE LOWER ANTI-SWAY BRACE MARKED ① FOR ALL UNITS REQUIRING BUNDLING STRAPS. IF THE PALLET UNITS ARE POSITIONED LENGTHWISE, SEE KEY NUMBERS ⑤ THRU ⑧ ON PAGE 46.
10. TWO (2) BUNDLING 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 CAR SIDEWALL ON BOTH SIDES OF THE CAR. ONE (1) BUNDLING 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.

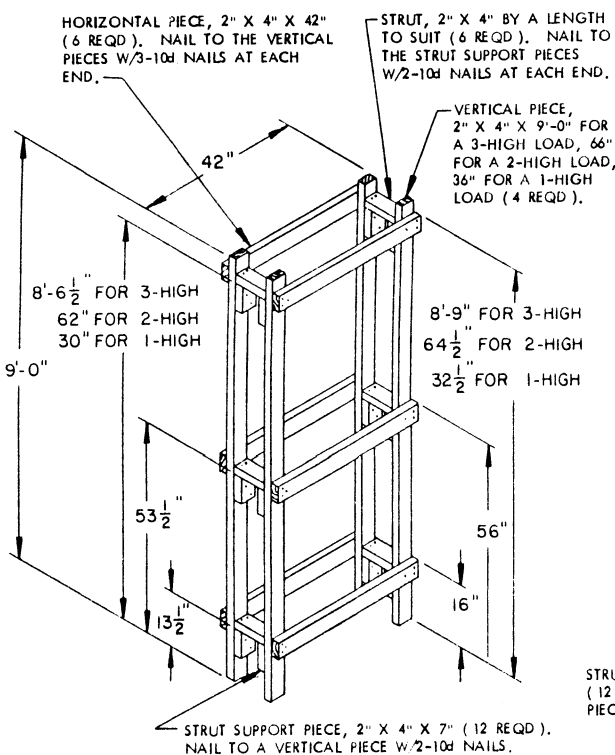
(CONTINUED AT LEFT)

**BILL OF MATERIAL**

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	94	32
2" X 2"	333	111
2" X 3"	8	4
2" X 4"	121	81
2" X 6"	191	191
4" X 4"	56	75
NAILS	NO. REQD	POUNDS
6d (2")	490	3
10d (3")	556	8-1/2
16d (3-1/2")	84	2
STEEL STRAPPING, 1-1/4" -----	65' REQD-----	6 LBS
SEAL FOR 1-1/4" STRAPPING -----	4 REQD-----	NIL
STAPLE -----	8 REQD-----	NIL
WIRE, NO. 14 GAGE -----	60' REQD-----	1 LB

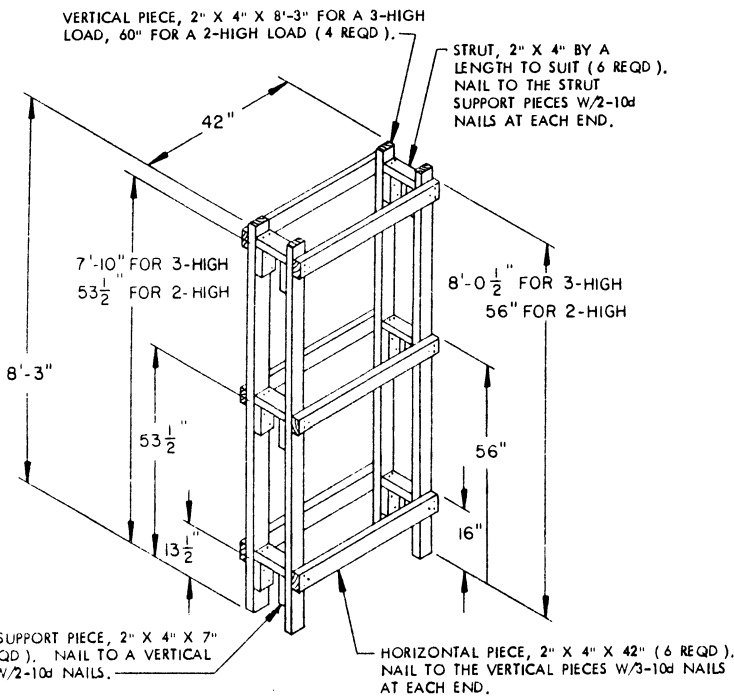
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT -----	72 -----	104,616 LBS
DUNNAGE -----	-----	1,009 LBS
TOTAL WEIGHT -----		105,625 LBS



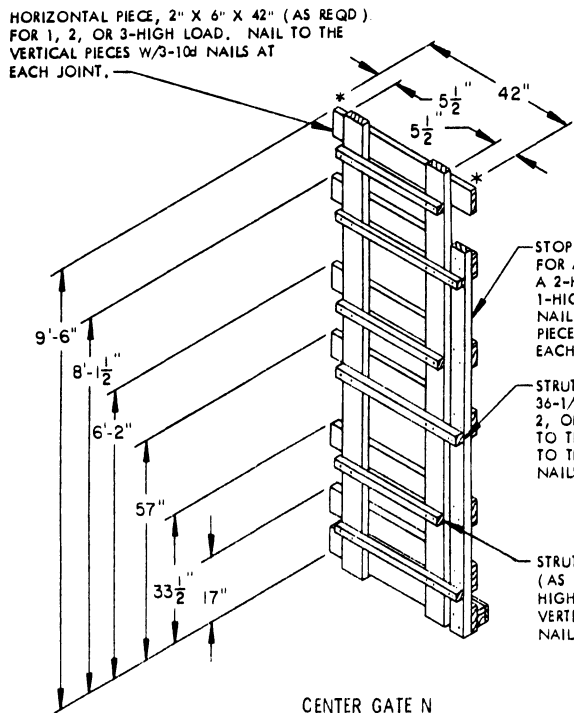
**CRIB FILL G**

CRIB FILL ASSEMBLIES "G" AND "H" SHOULD BE PRE-FABRICATED. CONSTRUCT TO BE 1/2" TO 3/4" LESS IN WIDTH THAN THE DISTANCE BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. OMIT THE MID-HEIGHT HORIZONTAL PIECES, STRUTS, AND STRUT SUPPORT PIECES WHEN USING CRIB FOR A 1 OR 2-HIGH LOAD.



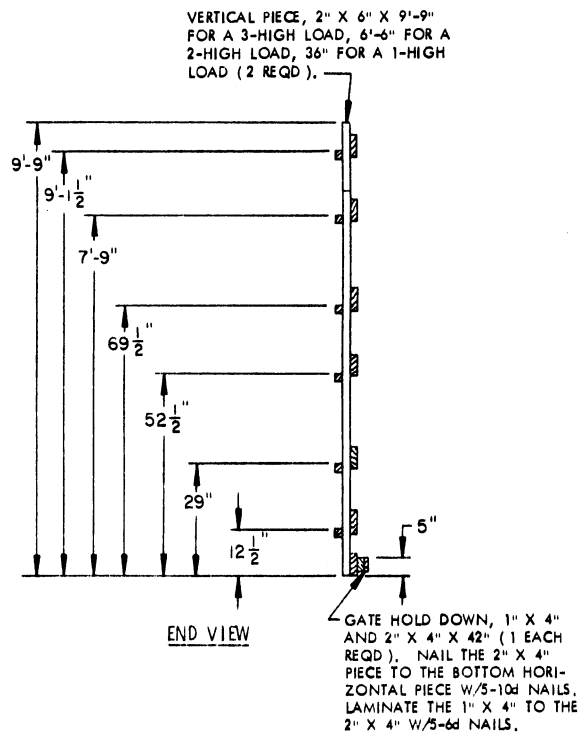
**CRIB FILL H**

OMIT THE MID-HEIGHT HORIZONTAL PIECES, STRUTS, AND STRUT SUPPORT PIECES WHEN USING CRIB FOR A 2-HIGH LOAD. CRIB FILL "H" IS NOT REQUIRED FOR A 1-HIGH LOAD; USE CRIB FILL "G" THROUGHOUT THE LENGTH OF THE LOAD.

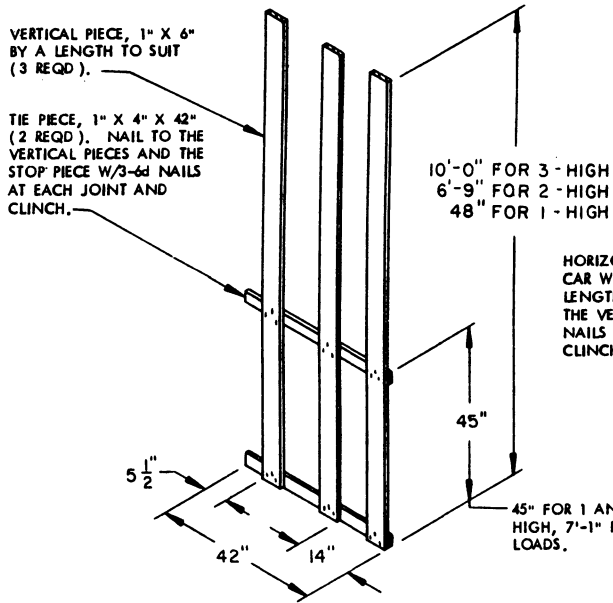


**CENTER GATE N**

1 RIGHT HAND AND 1 LEFT HAND GATE REQUIRED. NOTE THAT THE SECOND STRUT LEDGER FROM THE BOTTOM MUST BE 36-1/2" LONG FOR A 1-HIGH LOAD.

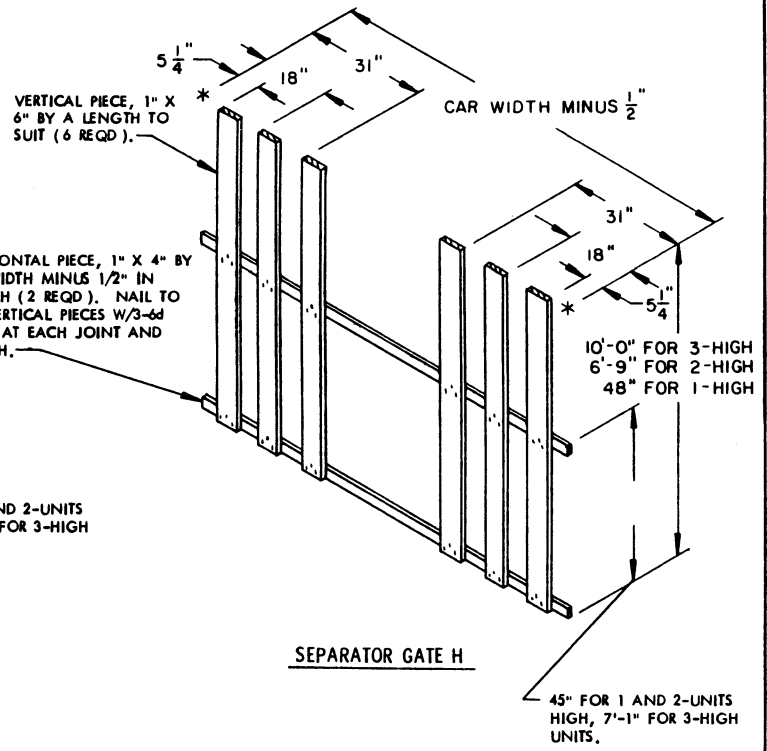


**END VIEW**

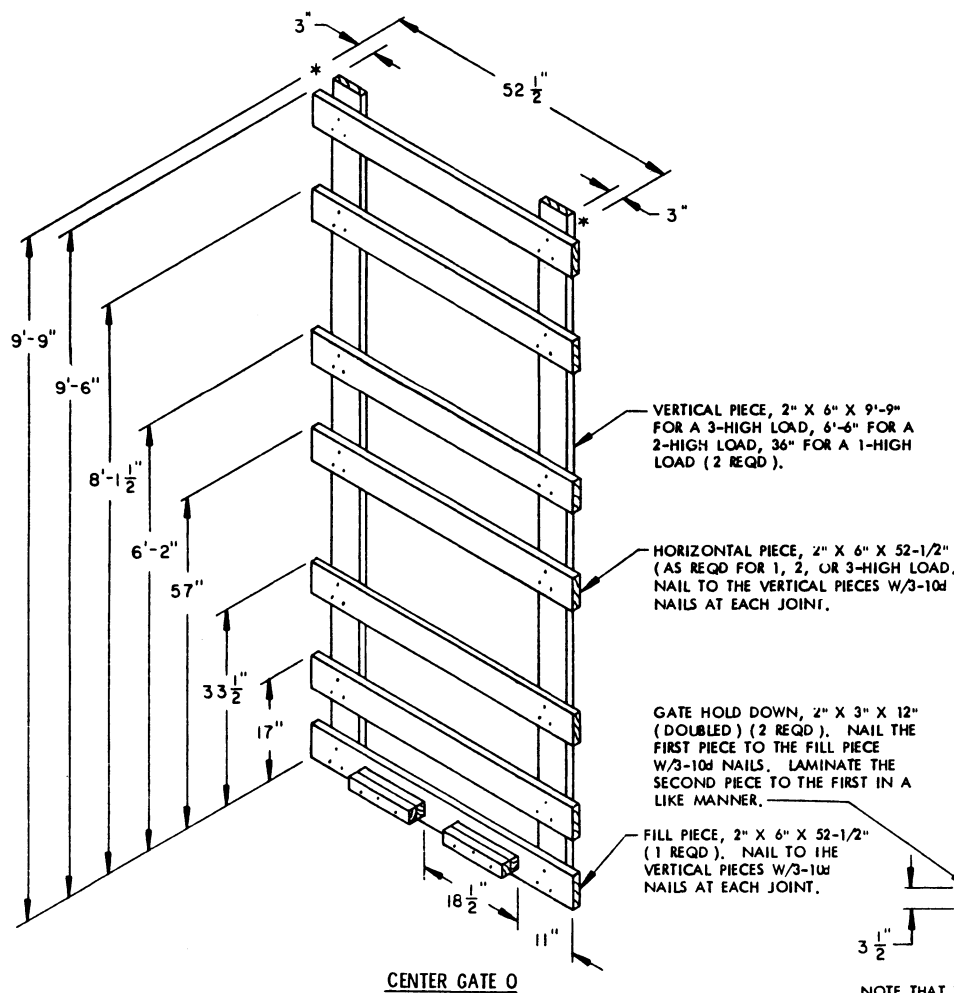


**SEPARATOR GATE G**

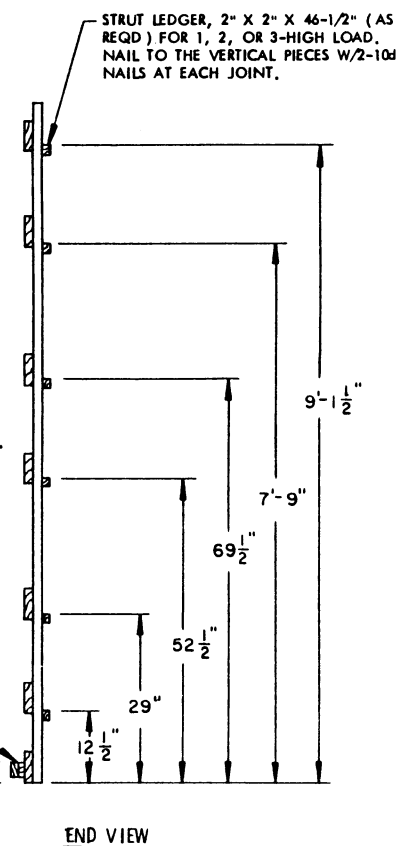
RIGHT HAND AND LEFT HAND GATES ARE REQUIRED. A RIGHT HAND GATE IS SHOWN.



**SEPARATOR GATE H**



**CENTER GATE O**



**END VIEW**

NOTE THAT THE UPPER STRUT LEDGER FOR EACH TIER ON ONE GATE MAY NEED TO BE APPLIED AFTER THE NEXT LOWER LEVEL STRUTS HAVE BEEN INSTALLED.

HORIZONTAL PIECE, 1" X 6" BY DOOR OPENING WIDTH (AS REQD) FOR 1, 2, OR 3-HIGH LOAD. NAIL TO THE VERTICAL PIECES W/3-6d NAILS AT EACH END.

DOOR OPENING WIDTH

VERTICAL PIECE, 2" X 3" BY A LENGTH TO SUIT (2 REQD). NAIL TO A DOOR POST W/12d NAILS.

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

5 1/4"

\*

31"

CAR WIDTH MINUS 1/2"

31"

5 1/4"

\*

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

GATE HOLD DOWN, 1" X 4" AND 2" X 4" X 18" (2 EACH REQD). NAIL THE 2" X 4" TO THE FILL PIECE W/5-10d NAILS. LAMINATE THE 1" X 4" TO THE 2" X 4" W/5-6d NAILS. SEE SPECIAL NOTE 9 ON PAGE 55.

VERTICAL PIECE, 2" X 6" X 9'-9" FOR A 3-HIGH LOAD, 6'-6" FOR A 2-HIGH LOAD, 36" FOR A 1-HIGH LOAD (4 REQD).

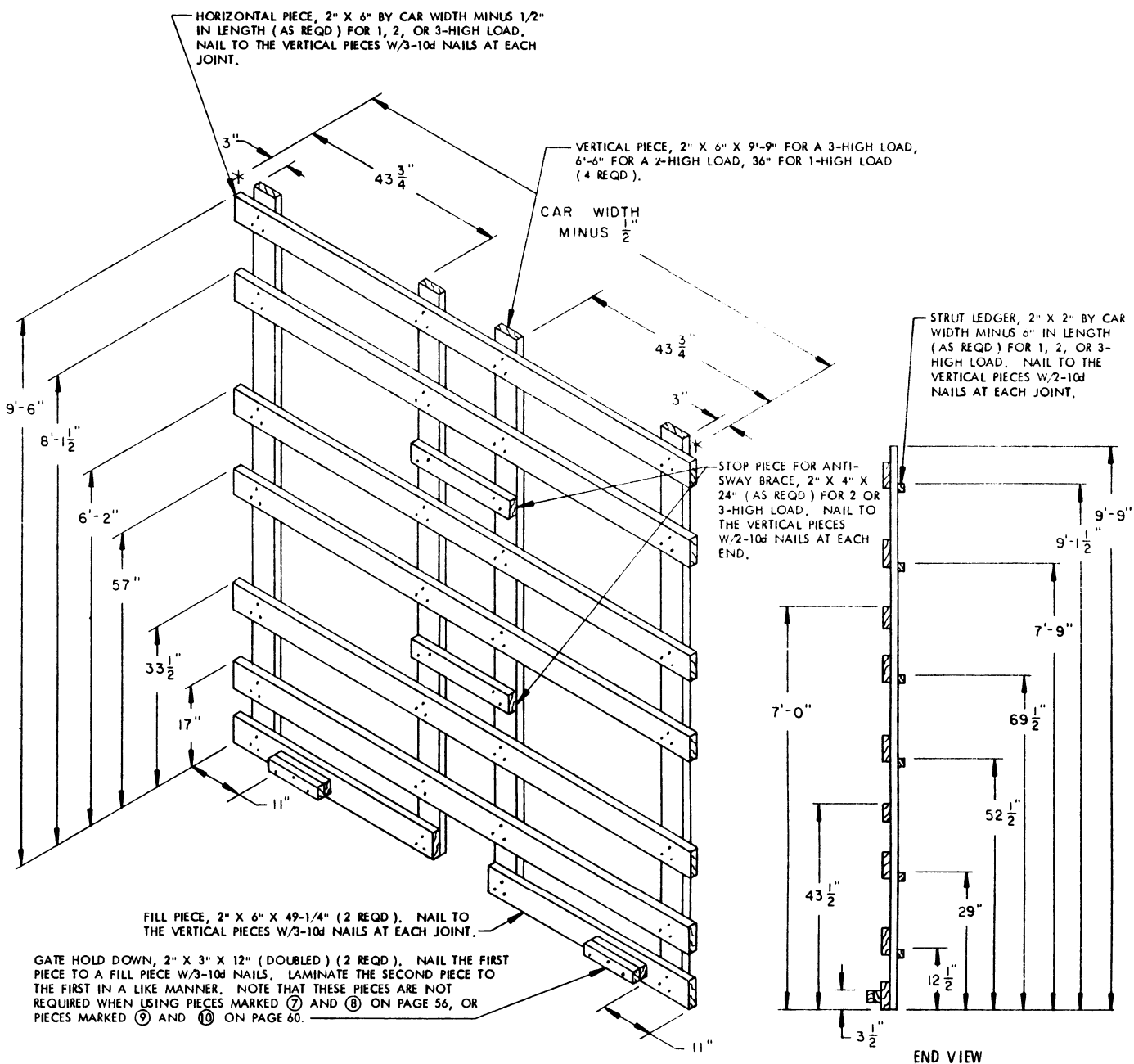
STRUT LEDGER, 2" X 3" BY CAR WIDTH MINUS 10-1/2" IN LENGTH (AS REQD) FOR 1, 2 OR 3-HIGH LOAD. NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.

DOORWAY PROTECTION F

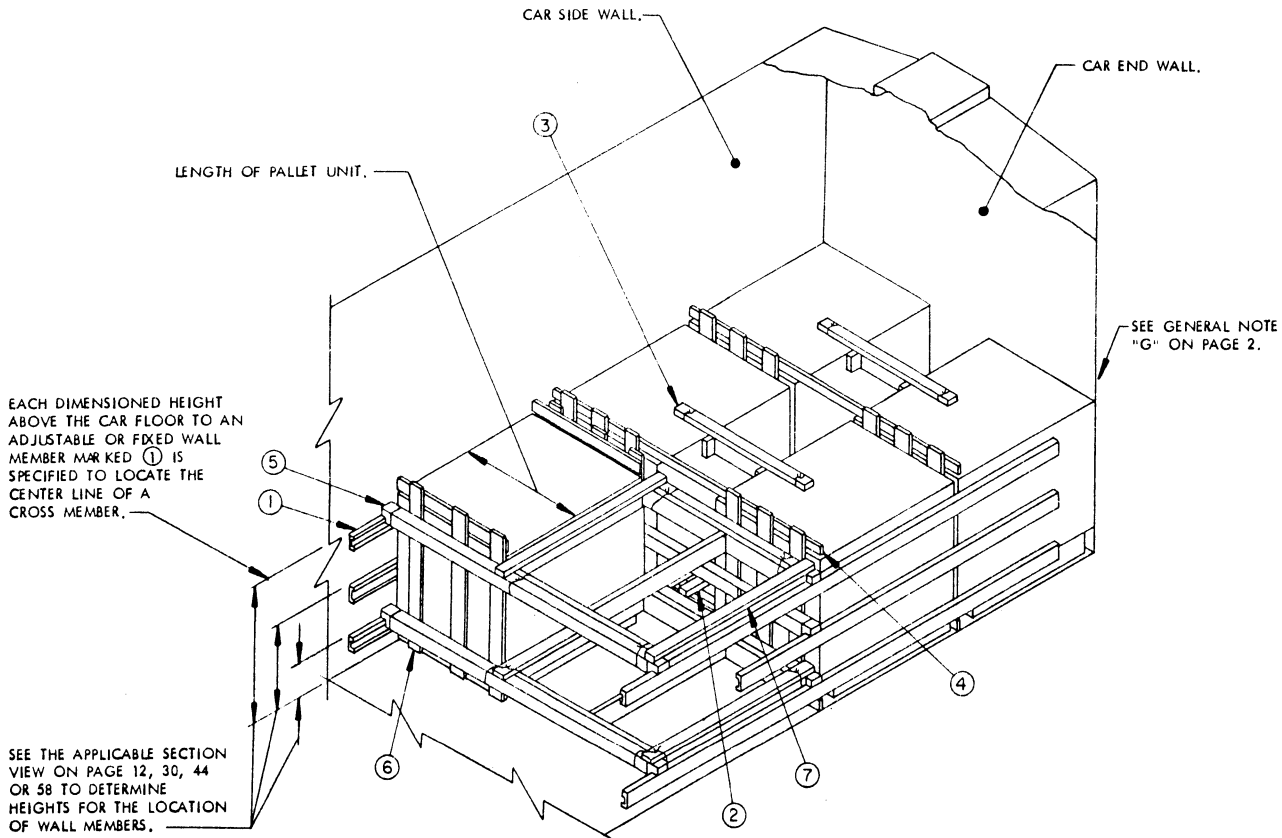
CENTER GATE P

END VIEW





CENTER GATE Q



ISOMETRIC VIEW

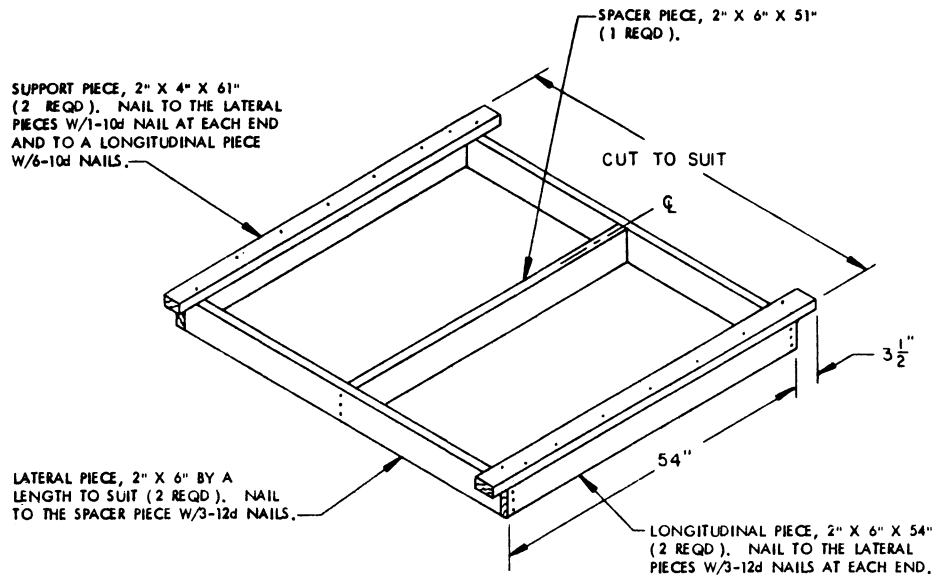
**SPECIAL NOTES:**

1. A 9'-0" WIDE (INSIDE CLEARANCE) WOOD-LINED BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS 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 ROUTED DUNNAGE METHOD UNIT (BASIC HEIGHT). 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. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
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 LENGTH IN 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 ALIGNMENT OF CROSS MEMBERS MARKED ⑤.
- ② ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 20. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (2 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 20 FOR THE FLAT OR ROUTED DUNNAGE METHOD UNITS. WIRE TIE TO PALLET UNITS AS SHOWN BY THE APPLICABLE TIE WIRE APPLICATION DETAIL ON PAGE 94.
- ④ SEPARATOR GATE FOR 1-HIGH AND 2-WIDE (2 REQD). SEE THE APPLICABLE SEPARATOR GATE DETAIL FOR TWO UNITS WIDE ON PAGE 17, 35, 49, OR 63. POSITION WITH THE 1" X 4" HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS.
- ⑤ CROSS MEMBER (5 REQD). SEE GENERAL NOTE "X" 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 17, 35, 49, OR 63. AS APPLICABLE, POSITION WITH THE 1" X 4" HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS.
- ⑦ SPACER ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 67 AND SPECIAL NOTE 6 AT LEFT. WIRE TIE TO CROSS MEMBER W/2 WRAPS OF NO. 14 GAGE WIRE AT EACH CORNER.

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

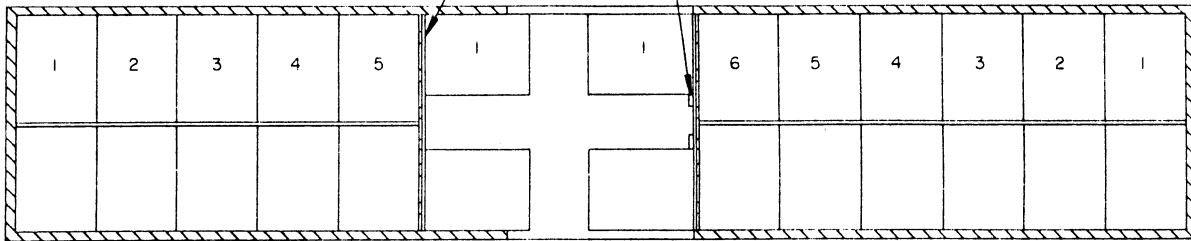


SPACER ASSEMBLY

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

SEPARATOR GATE ( 1 OR 2 REQD. AS APPLICABLE ).  
SEE THE "SEPARATOR GATE J" DETAIL ON PAGE 69.  
POSITION AS SHOWN WITH THE VERTICAL PIECES  
AGAINST THE CROSSWISE POSITIONED PALLET UNITS.

STOP PIECES, 2" X 4" BY A LENGTH TO SUIT ( 2 REQD ). POSITION  
SO AS TO BE IN CONTACT WITH THE ADJACENT CONTAINERS AND  
SECURE BY NAILING THRU THE HORIZONTAL PIECES OF THE SEPARATOR  
GATE W/3-6d NAILS AT EACH JOINT. NOTE THAT STOP PIECES ARE  
ONLY REQUIRED ON SEPARATOR GATES WHICH ARE IN THE DOOR OPEN-  
ING OR WITHIN 5dX INCHES ( 6" ) OF BEING IN THE DOOR OPENING.



TYPICAL COMBINATION LOAD PATTERN PLAN VIEW

11 CROSSWISE PLUS 2 LENGTHWISE LOAD UNITS ARE SHOWN.

**SPECIAL NOTES:**

1. A 50'-6" LONG BY 9'-4" 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 69 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 "J", HAS NOT BEEN SHOWN. REFER TO THE APPLICABLE LOAD PAGES FOR BLOCKING AND BRACING SPECIFICATIONS. A SEPARATOR GATE "J" MUST BE INSTALLED AT EVERY LOCATION WHERE THE DIRECTION OF THE UNITS CHANGES. THE GATE MUST BE POSITIONED SO THAT THE VERTICAL PIECES ARE AGAINST THE CROSSWISE UNITS OF THE LOAD.
4. A CHART FOR EACH OF THE TWO TYPES OF PALLET UNITS IS SHOWN ON THIS PAGE. 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 CHARTS.

**FLAT DUNNAGE METHOD UNIT**

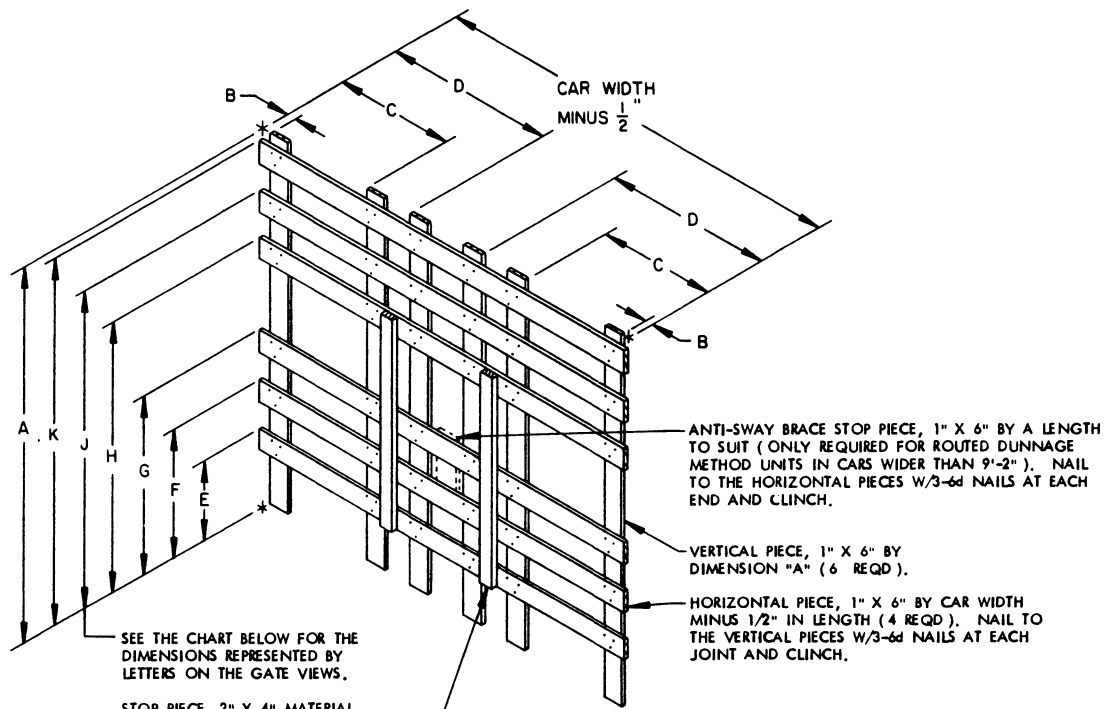
CAR LENGTH	UNITS PER LAYER	LOAD PATTERN	APPROX STRUT LENGTH
40'-6" CAR	20	CROSSWISE LOAD ON PAGE 10	40"
	20	9 LONG AT 44" PLUS 1 AT 52-9/16"	30"
	18*	5 LONG AT 44" PLUS 4 AT 52-9/16"	45"
	18*	4 LONG AT 44" PLUS 5 AT 52-9/16"	36"
	16	LENGTHWISE LOAD ON PAGE 8	55"
50'-6" CAR	26	CROSSWISE LOAD ON PAGE 10	28"
	24	11 LONG AT 44" PLUS 1 AT 52-9/16"	61"
	24	9 LONG AT 44" PLUS 3 AT 52-9/16"	42"
	24	8 LONG AT 44" PLUS 4 AT 52-9/16"	33"
	22	4 LONG AT 44" PLUS 7 AT 52-9/16"	49"
	22	3 LONG AT 44" PLUS 8 AT 52-9/16"	41"
20	LENGTHWISE LOAD ON PAGE 8	68"	
60'-8" CAR	32	CROSSWISE LOAD ON PAGE 10	18"
	30	12 LONG AT 44" PLUS 3 AT 52-9/16"	32"
	30	11 LONG AT 44" PLUS 4 AT 52-9/16"	23"
	28*	7 LONG AT 44" PLUS 7 AT 52-9/16"	39"
	26	3 LONG AT 44" PLUS 10 AT 52-9/16"	52"
	24	LENGTHWISE LOAD ON PAGE 8	30"

\*THE COMBINATION LOAD ON PAGE 6 MAY BE USED, IF DESIRED. STRUTS FOR THE COMBINATION LOAD WILL BE APPROXIMATELY 55" AND 40", 28" AND 15" AND 18" AND 30" IN 40'-0", 50'-0" AND 60'-0" CARS, RESPECTIVELY.

**ROUTED DUNNAGE METHOD UNIT**

CAR LENGTH	UNITS PER LAYER	LOAD PATTERN	APPROX STRUT LENGTH
40'-0" CAR	22	CROSSWISE LOAD ON PAGE 42 OR 56	18"
	20	9 LONG AT 42" PLUS 1 AT 52-9/16"	48"
	20	8 LONG AT 42" PLUS 2 AT 52-9/16"	35"
	18*	5 LONG AT 42" PLUS 4 AT 52-9/16"	56"
	18*	4 LONG AT 42" PLUS 5 AT 52-9/16"	46"
	16	LENGTHWISE LOAD ON PAGE 40 OR 54	55"
50'-6" CAR	26	CROSSWISE LOAD ON PAGE 42 OR 56	54"
	26	12 LONG AT 42" PLUS 1 AT 52-9/16"	40"
	26	11 LONG AT 42" PLUS 2 AT 52-9/16"	29"
	24	8 LONG AT 42" PLUS 4 AT 52-9/16"	50"
	24	7 LONG AT 42" PLUS 5 AT 52-9/16"	38"
	22	4 LONG AT 42" PLUS 7 AT 52-9/16"	56"
20	LENGTHWISE LOAD ON PAGE 40 OR 54	68"	
60'-8" CAR	32	CROSSWISE LOAD ON PAGE 42 OR 56	50"
	30	12 LONG AT 42" PLUS 3 AT 52-9/16"	56"
	30	11 LONG AT 42" PLUS 4 AT 52-9/16"	45"
	28	7 LONG AT 42" PLUS 7 AT 52-9/16"	53"
	28	6 LONG AT 42" PLUS 8 AT 52-9/16"	42"
	28	5 LONG AT 42" PLUS 9 AT 52-9/16"	30"
	26	2 LONG AT 42" PLUS 11 AT 52-9/16"	51"
	26	LENGTHWISE LOAD ON PAGE 40 OR 54	30"

\*THE COMBINATION LOAD ON PAGE 38 OR 52 MAY BE USED, IF DESIRED. STRUTS FOR THE COMBINATION LOAD WILL BE APPROXIMATELY 55" AND 18" LONG IN A 40'-6" LONG CAR, AND 30" AND 50" LONG IN A 60'-8" LONG CAR.



SEE THE CHART BELOW FOR THE DIMENSIONS REPRESENTED BY LETTERS ON THE GATE VIEWS.

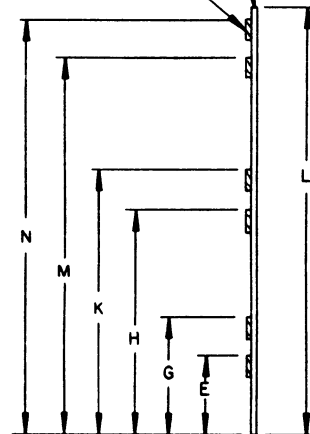
STOP PIECE, 2" X 4" MATERIAL. SEE THE LEADERED NOTE ON THE TYPICAL LOAD PATTERN PLAN VIEW ON PAGE 68 FOR PLACEMENT, NAILING, AND OTHER GUIDANCE.

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

VERTICAL PIECE, 1" X 6" BY DIMENSION "L" (4 REQD).

**SEPARATOR GATE J**

THIS VIEW DEPICTS A SEPARATOR GATE FOR A 2-HIGH LOAD, APPLICABLE TO ANY OF THE UNITS COVERED BY THIS DOCUMENT. SEE THE "END VIEW" BELOW FOR HEIGHT DIMENSIONS FOR THOSE UNITS WHICH CAN BE LOADED 3-HIGH.

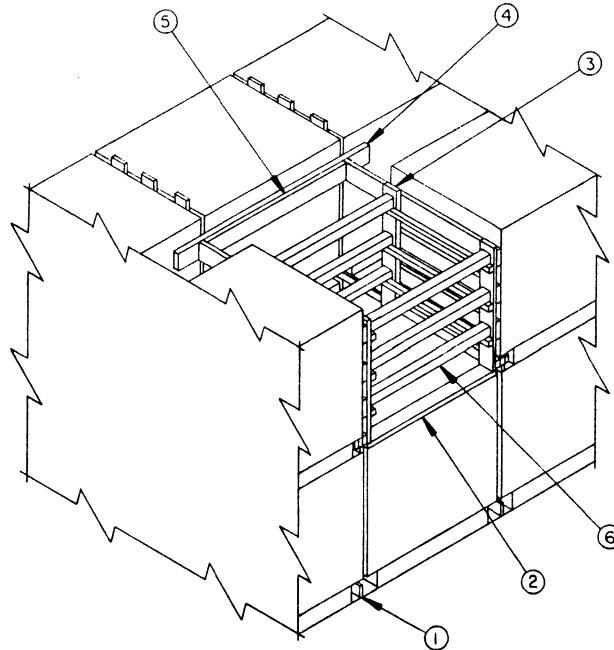


**END VIEW**

THIS VIEW DEPICTS A SEPARATOR GATE FOR A 3-HIGH LOAD WHICH IS ONLY APPLICABLE FOR UNITS 2 AND 4 AS IDENTIFIED AT THE LEFT.

PALLET UNIT IDENTIFICATION	SHOWN AS UNIT NUMBER
FLAT DUNNAGE METHOD (BASIC HEIGHT)	1
FLAT DUNNAGE METHOD (DECREASED HEIGHT)	2
ROUTED DUNNAGE METHOD (BASIC HEIGHT)	3
ROUTED DUNNAGE METHOD (DECREASED HEIGHT)	4

PALLET UNIT NUMBER	DIMENSIONS												
	A	B	C	D	E	F	G	H	J	K	L	M	N
1	8'-0"	2"	31"	44"	17-1/2"	30"	42-1/2"	66-1/2"	6'-7"	7'-1/2"	----	----	----
2	6'-6"	2"	31"	44"	17-1/2"	----	35"	58"	----	6'-3"	10'-0"	8'-1/2"	9'-8"
3	8'-0"	2-3/4"	32"	42"	17"	35"	42"	66"	6'-6"	7'-7"	----	----	----
4	6'-6"	2-3/4"	32"	42"	17"	----	33-1/2"	57"	----	6'-2"	9'-9"	8'-1/2"	9'-6"



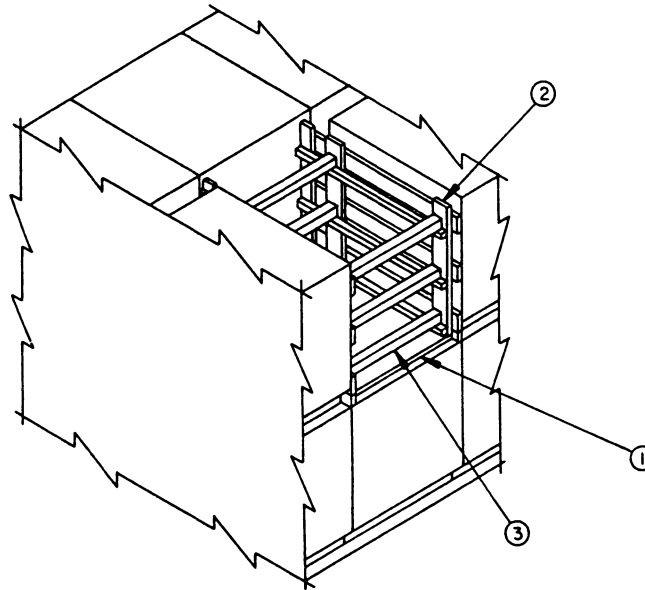
ISOMETRIC VIEW

**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 FLAT DUNNAGE METHOD 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 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 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.
6. NOTE THAT THE TOP HORIZONTAL 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 17, 35, 49, OR 63 FOR POSITIONING OF THE VERTICAL PIECES. SEE SPECIAL NOTE 6 AT LEFT FOR GATE MODIFICATIONS. POSITION GATE SO THE HORIZONTAL PIECES ARE AWAY FROM THE OMITTED UNIT AREA.
- ② SUPPORT PIECE, 2" X 6" X 52-1/2" (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 APPLICABLE DETAIL ON PAGE 72. NAIL TO THE FILLER PIECE, PIECE MARKED ⑤, W/3-10d NAILS. 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 ANTI-SWAY BEARING PIECE, 2" X 6" X 6'-0" (1 REQD).
- ⑤ FILLER PIECE, 2" X 6" X 51" (1 REQD). NAIL TO THE ANTI-SWAY BEARING PIECE, PIECE MARKED ④, W/5-10d NAILS.
- ⑥ STRUT, 4" X 4" BY CUT TO FIT (REF: 48") (AS REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END.



ISOMETRIC VIEW

SPECIAL NOTES:

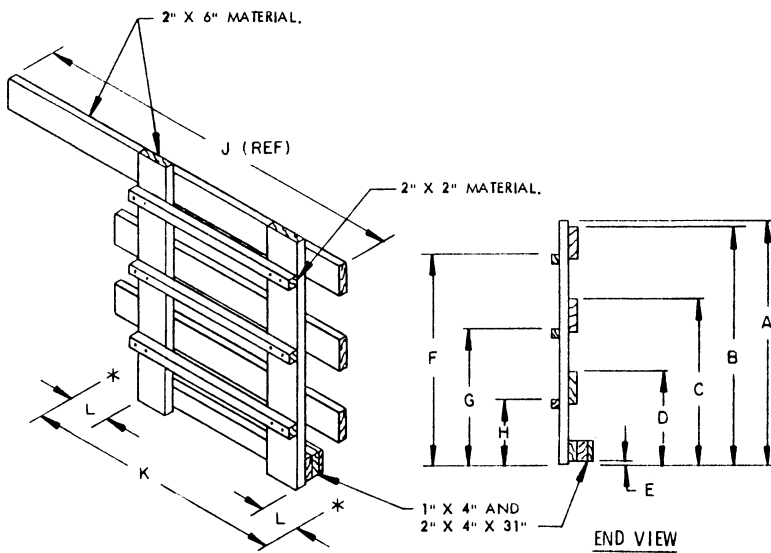
1. A PARTIAL VIEW OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. WIDER CARS CAN BE USED.
2. THE PALLET UNIT SHOWN IS THE FLAT DUNNAGE METHOD UNIT (BASIC HEIGHT). THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. A UNIT OMITTED FROM THE TOP LAYER OF A 2-LAYER 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.

KEY NUMBERS

- ① SUPPORT PIECE, 2" X 6" BY UNIT LENGTH (2 REQD). POSITION BENEATH THE 2" X 6" 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 APPLICABLE DETAIL ON PAGE 73. TOENAIL TO THE SUPPORT PIECE MARKED ① W/2-16d NAILS AT EACH JOINT. CAUTION: USE CARE NOT TO TOENAIL INTO A CONTAINER.
- ③ STRUT, 4" X 4" BY CUT TO FIT (AS REQD). TOENAIL TO PIECES MARKED ② W/2-16d NAILS AT EACH END.

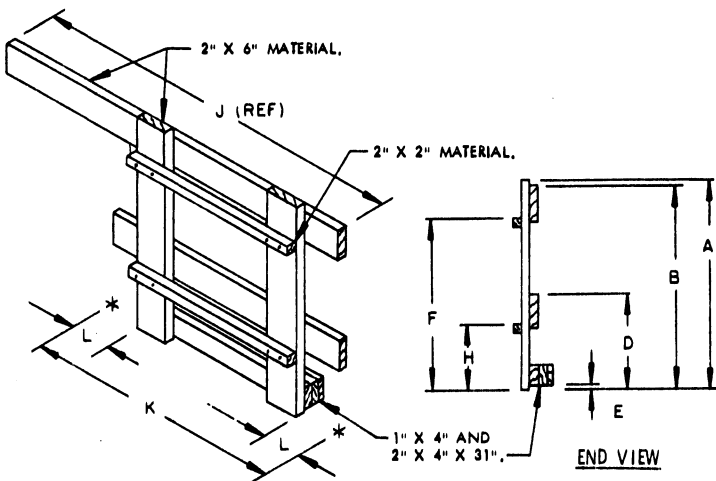
**SPECIAL NOTES:**

1. THE GATES SHOWN ON THIS PAGE ARE FOR USE WITH BASIC/DECREASED HEIGHT UNITS IN THE LCL PROCEDURES SHOWN ON PAGE 70. THOSE PROCEDURES DEPICT THE OMISSION OF A PALLET UNIT FROM A LOAD OF LENGTHWISE-POSITIONED PALLET UNITS.
2. THE REFERENCE DIMENSIONS GIVEN FOR THE CUT-TO-FIT PIECES ARE BASED ON AN INSIDE CAR WIDTH OF 9'-2". THESE DIMENSIONS WILL HAVE TO BE ADJUSTED WHEN LOADING CARS OF OTHER WIDTHS.
3. THE NAILING OF THE VARIOUS PARTS OF THE GATES WILL BE AS FOLLOWS: NAIL THE 2" X 4" OR 2" X 6" HORIZONTAL PIECE ( 5 ) TO THE 2" X 6" VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. NAIL THE DOUBLED 2" X 4" OR 1" X 4" GATE HOLD DOWN PIECES TO A 2" X 4" OR 2" X 6" HORIZONTAL PIECE, AS APPLICABLE, 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 A**

THIS GATE IS FOR USE IN A LOAD OF FLAT OR ROUTED DUNNAGE METHOD UNITS (BASIC HEIGHT). SEE SPECIAL NOTE 3 AND DIMENSIONAL CHART FOR NAILING GUIDANCE. ONE RIGHT HAND AND ONE LEFT HAND GATE REQUIRED. A RIGHT HAND GATE IS SHOWN.



**LOAD BEARING GATE B**

THIS GATE IS FOR USE IN A LOAD OF FLAT OR ROUTED DUNNAGE METHOD UNITS (DECREASED HEIGHT). SEE SPECIAL NOTE 3 AND DIMENSIONAL CHART FOR NAILING GUIDANCE. ONE RIGHT HAND AND ONE LEFT HAND GATE REQUIRED. A RIGHT HAND GATE IS SHOWN.

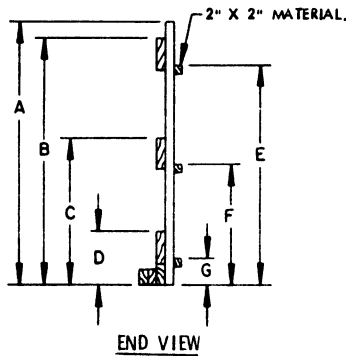
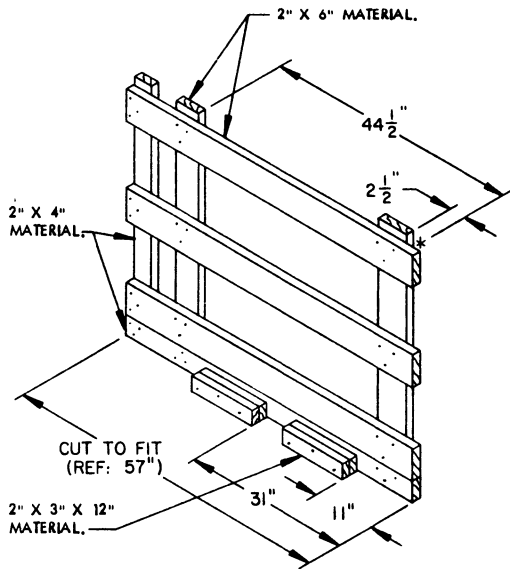
**DIMENSIONAL CHART**

DIM	BASIC HEIGHT		DECREASED HEIGHT	
	FLAT	ROUTED	FLAT	ROUTED
A	42"	42"	36"	36"
B	41"	40-1/2"	32-1/2"	32"
C	28-1/2"	28"	-----	-----
D	16"	15-1/2"	16"	15-1/2"
E	1"	1/2"	1"	1/2"
F	36-1/2"	36"	28"	27-1/2"
G	24"	23-1/2"	-----	-----
H	11-1/2"	11"	11-1/2"	11"
J	64-1/2"	66-1/2"	64-1/2"	66-1/2"
K	44"	42"	44"	42"
L	6-1/2"	5-1/2"	6-1/2"	5-1/2"



**SPECIAL NOTES:**

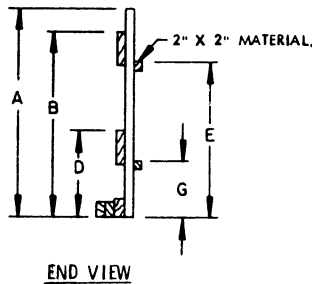
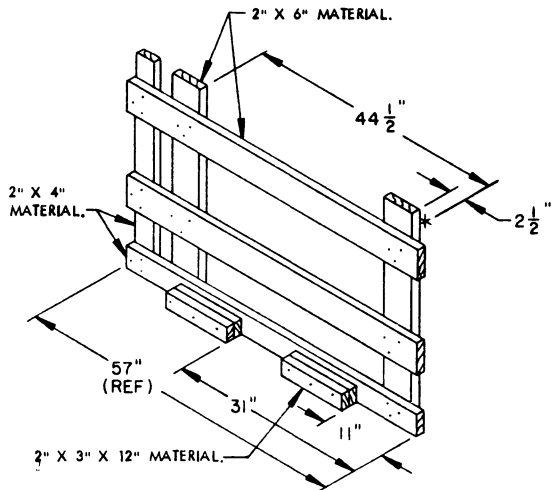
1. THE GATES ON THIS PAGE ARE FOR USE WITH BASIC (DECREASED-HEIGHT) UNITS IN THE LCL PROCEDURES SHOWN ON PAGE 71. THOSE PROCEDURES DEPICT THE OMISSION OF A PALLET UNIT FROM A LOAD OF CROSSWISE-POSITIONED PALLET UNITS.
2. THE REFERENCE DIMENSION GIVEN FOR THE CUT-TO-FIT PIECES IS BASED ON AN INSIDE CAR WIDTH OF 9'-4". THIS DIMENSION WILL HAVE TO BE INCREASED WHEN LOADING WIDER CARS.
3. THE NAILING OF THE VARIOUS PARTS OF THE GATES WILL BE AS FOLLOWS: NAIL THE 2" X 3", 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 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 JOINT.



**LOAD BEARING GATE C**

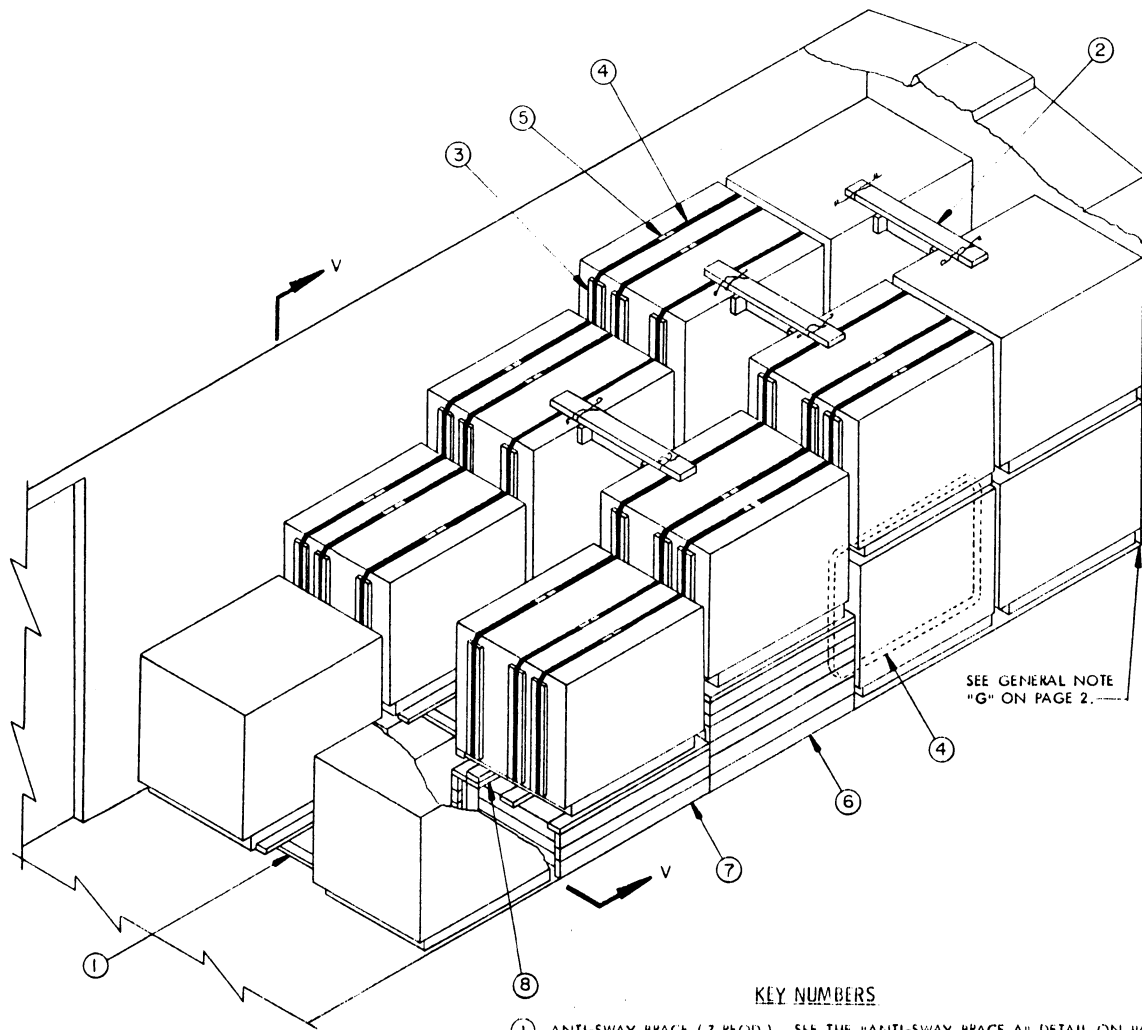
THIS GATE IS FOR USE IN A LOAD OF FLAT OR ROUTED DUNNAGE METHOD UNITS (BASIC HEIGHT). SEE SPECIAL NOTE 3 AND DIMENSIONAL CHART FOR NAILING GUIDANCE. ONE RIGHT HAND AND ONE LEFT HAND GATE REQUIRED. A RIGHT HAND GATE IS SHOWN.

DIM	DIMENSIONAL CHART			
	BASIC HEIGHT		DECREASED HEIGHT	
	FLAT	ROUTED	FLAT	ROUTED
A	45"	42"	36"	36"
B	42"	40-1/2"	33-1/2"	32"
C	25"	32"	-----	-----
D	9"	15"	9"	15"
E	37-1/2"	36"	29"	27-1/2"
F	20-1/2"	27-1/2"	-----	-----
G	4-1/2"	10-1/2"	4-1/2"	10-1/2"



**LOAD BEARING GATE D**

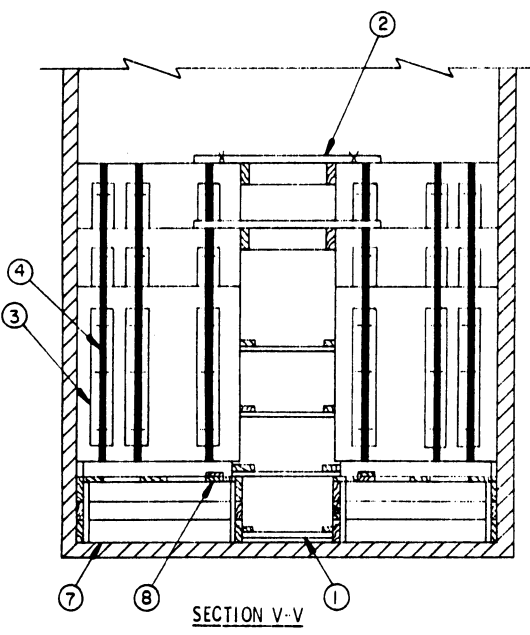
THIS GATE IS FOR USE IN A LOAD OF FLAT OR ROUTED DUNNAGE METHOD UNITS (DECREASED HEIGHT). SEE SPECIAL NOTE 3 AND DIMENSIONAL CHART FOR NAILING GUIDANCE. ONE RIGHT HAND AND ONE LEFT HAND GATE REQUIRED. A RIGHT HAND GATE IS SHOWN.



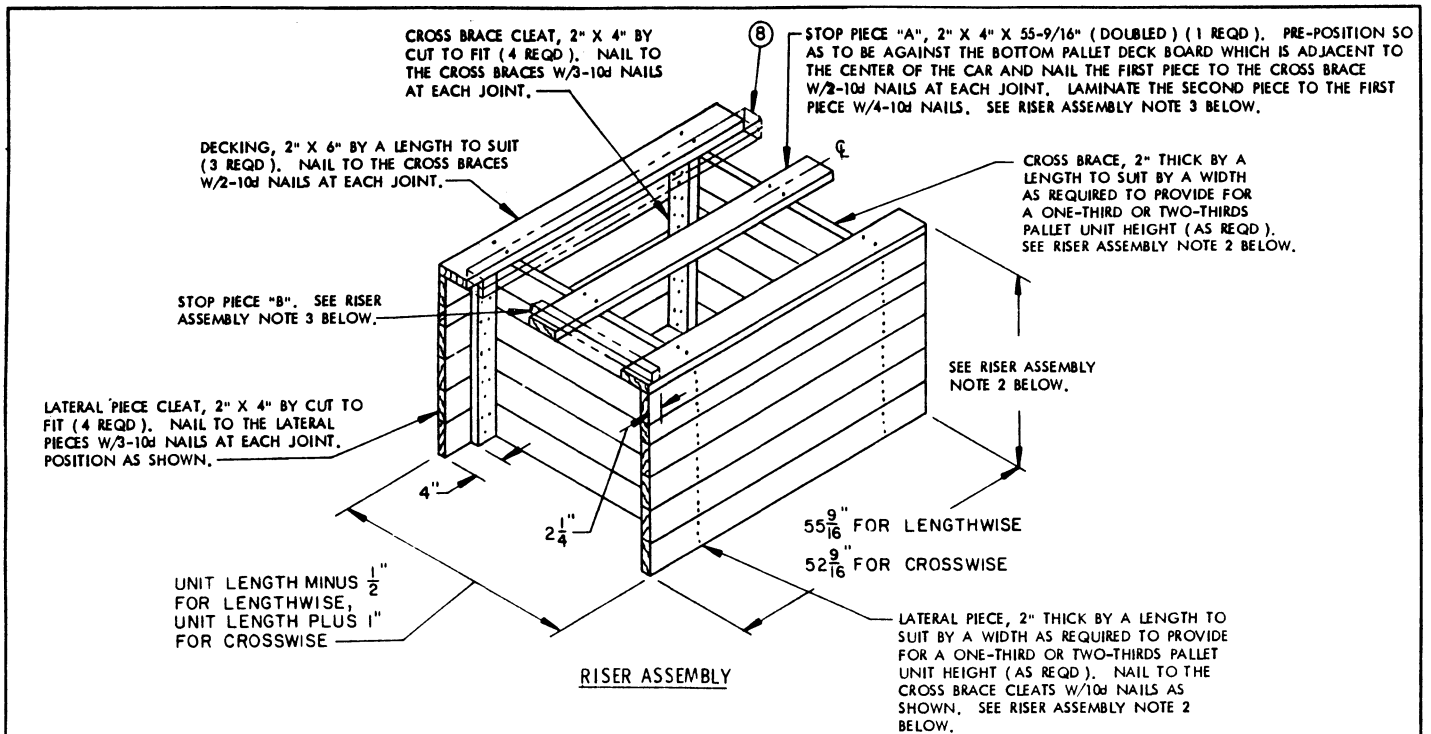
ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE (7 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 20. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2 AND SPECIAL NOTE 5 ON PAGE 75.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (3 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 20 FOR THE FLAT OR ROUNDED DUNNAGE METHOD UNITS. WIRE TIE TO PALLET UNITS AS SHOWN BY THE APPLICABLE TIE-WIRE APPLICATION DETAIL ON PAGE 94.
- ③ STRAPPING BOARD, 2" X 6" X 36" (48 REQD/6 PER PALLET UNIT). POSITION AS SHOWN IN THE "METHOD A" DETAIL ON PAGE 76. SEE SPECIAL NOTE 6 ON PAGE 75.
- ④ REINFORCING STRAP, 1-1/4" X .035" X 18'-0" LONG (REF) STEEL STRAPPING (24 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 76.
- ⑤ SEAL FOR 1-1/4" STRAPPING (32 REQD/2 PLR STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "N" 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 75.
- 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 75.
- ⑧ STOP PIECE "A" (4 REQD). SEE THE "RISER ASSEMBLY" DETAIL ON PAGE 75 FOR LOCATION AND NAILING GUIDANCE.



SECTION V-V



**SPECIAL NOTES FOR LOAD:**

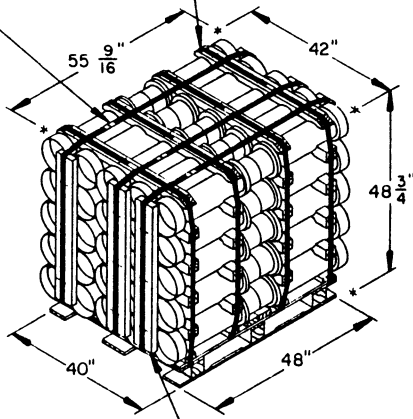
1. A 9'-2" WIDE CONVENTIONAL TYPE WOOD-LINED BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 74 IS THE FLAT DUNNAGE METHOD UNIT (BASIC HEIGHT). THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. THE RISER METHOD OF PARTIAL-LAYER BRACING IS TYPICALLY SHOWN WITH THE PALLET UNITS POSITIONED LENGTHWISE IN THE CAR. WITH MODIFICATIONS, THE PROCEDURES ARE ALSO APPLICABLE FOR CROSSWISE POSITIONED UNITS. SEE SPECIAL NOTES 5 AND 6.
4. ONLY THE BLOCKING AND BRACING FOR THE RISER METHOD OF PARTIAL-LAYER BRACING IS SHOWN. REFER TO THE APPLICABLE LOAD PAGE FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.
5. ANTI-SWAY BRACE "A" IS APPLICABLE FOR ALL THE LENGTHWISE POSITIONED UNITS. ANTI-SWAY BRACE "B", AS DETAILED ON PAGE 20, WILL BE USED FOR CROSSWISE POSITIONED UNITS IN CARS WIDER THAN 9'-2".
6. FOR CROSSWISE POSITIONED UNITS, THE STRAPPING BOARDS SHOWN AS PIECES MARKED ③ WILL NOT BE REQUIRED. SEE THE "METHOD B" AND "METHOD C" DETAILS ON PAGES 76 AND 77 FOR MODIFICATIONS TO BE ACCOMPLISHED IN LIEU OF USING STRAPPING BOARDS, WHEN THE PALLET UNITS ARE TO BE POSITIONED CROSSWISE IN THE CAR. ALSO, FOR LOADS OF CROSSWISE UNITS, STOP PIECE "B", AS SHOWN ON THE RISER DETAIL ABOVE, WILL BE USED IN LIEU OF STOP PIECE "A".

**SPECIAL NOTES FOR RISER ASSEMBLY:**

1. THE TYPICAL RISER ASSEMBLY SHOWN ABOVE IS FOR THE FLAT DUNNAGE METHOD UNIT (BASIC HEIGHT). THE HEIGHT OF THE BASIC UNIT IS 49". A TWO-THIRDS UNIT HEIGHT RISER IS SHOWN ABOVE AND AS KEY NUMBER ④ IN THE LOAD ON PAGE 74. EACH CROSS BRACE AND EACH LATERAL PIECE OF THE RISER IS FABRICATED FROM FIVE (5) PIECES OF 2" X 6" MATERIAL AND ONE (1) PIECE OF 2" X 4" MATERIAL TO PROVIDE FOR A TOTAL HEIGHT OF 32-1/2" AFTER THE DECKING IS IN PLACE. A ONE-THIRD HEIGHT RISER, SHOWN AS KEY NUMBER ⑦ IN THE LOAD ON PAGE 74, WILL BE FABRICATED FROM TWO (2) PIECES OF 2" X 6" AND ONE PIECE OF 2" X 4" MATERIAL FOR EACH CROSS BRACE AND EACH LATERAL PIECE, TO PROVIDE FOR A TOTAL HEIGHT OF 16" 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 "A" SHOWN ON THE RISER ASSEMBLY IS ONLY FOR USE WHEN THE PALLET UNITS ARE POSITIONED LENGTHWISE IN THE CAR, AS SHOWN IN THE LCL LOAD ON PAGE 74. IF THE PALLET UNITS ARE POSITIONED CROSSWISE IN THE CAR, POSITION A 2" X 2" BY A LENGTH TO SUIT PIECE ACROSS THE DECKING, ON THE END WHICH IS AGAINST THE CAR SIDEWALL, AND NAIL TO THE DECKING W/2-10d NAILS AT EACH JOINT. SEE STOP PIECE "B" ON THE RISER ASSEMBLY ABOVE FOR LOCATION GUIDANCE.

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

REINFORCED STRAP, 1-1/4" X .035" X 18'-0" LONG STEEL STRAPPING FOR 5 LAYER UNITS, 16'-0" LONG FOR 4 LAYER UNITS (3 REQD). INSTALL TO ENIRCLE THE PALLET UNIT AND THE STRAPPING BOARDS. SECURE TO EACH STRAPPING BOARD W/3 STAPLES.



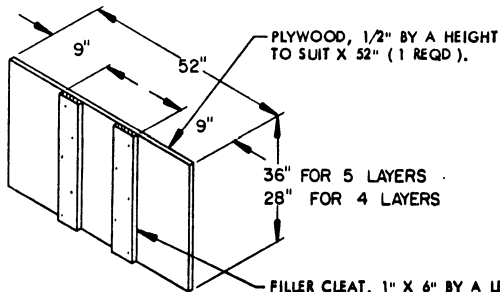
STRAPPING BOARD, 2" X 6" X 39" FOR 5-LAYER UNITS, 2" X 6" X 30" FOR 4-LAYER UNITS (6 REQD). POSITION SO AS TO CENTER ON THE JOINTS OF CONTAINERS.

**NOTE:**

THE "METHOD A" DETAIL AT LEFT 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 74. THE BASIC HEIGHT ROUTED DUNNAGE METHOD UNIT IS SHOWN. THE PROCEDURES ARE APPLICABLE FOR ALL THE UNITS COVERED BY THIS DOCUMENT. FOR MODIFICATIONS OF UNITS TO BE POSITIONED CROSSWISE IN A CAR, REFER TO THE "METHOD B" DETAIL BELOW AND/OR THE "METHOD C" DETAIL ON PAGE 79.

**METHOD A**

FOR ALL PALLET UNITS, THE ROUTED DUNNAGE METHOD UNIT (BASIC HEIGHT) IS SHOWN.



FILLER CLEAT, 1" X 6" BY A LENGTH TO SUIT (2 REQD). NAIL TO THE PLYWOOD W/5-6d NAILS AND CLINCH.

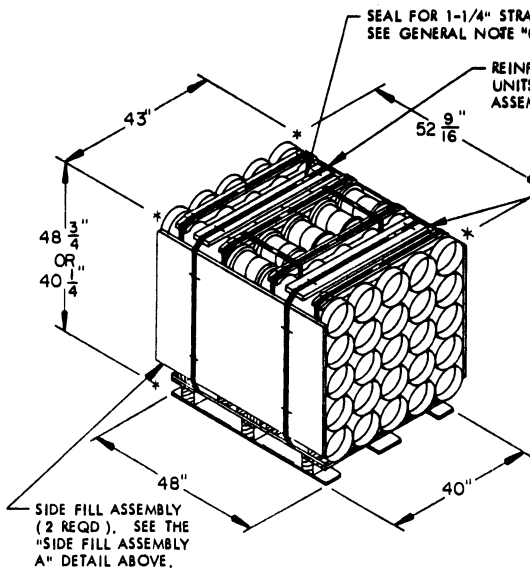
**SIDE FILL ASSEMBLY A**

FOR METHOD "B" BELOW.

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

REINFORCING STRAP, 1-1/4" X .035" X 16'-0" LONG STEEL STRAPPING FOR 5-LAYER UNITS, 14'-6" FOR 4-LAYER UNITS (2 REQD). INSTALL TO ENIRCLE THE PALLETIZED UNIT, THE STRAPPING BOARD, AND THE SIDE FILL ASSEMBLIES. SECURE TO THE STRAPPING BOARD AND THE SIDE FILL ASSEMBLIES W/STAPLES.

STRAPPING BOARD, 1" X 6" X 36" (2 REQD). POSITION AS SHOWN.

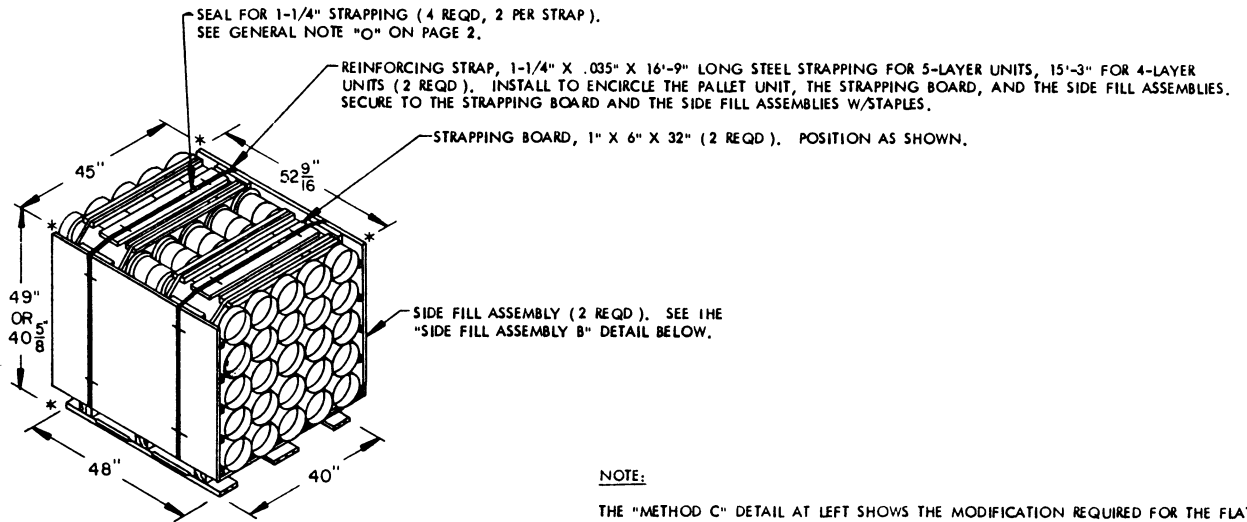


**NOTE:**

THE "METHOD B" DETAIL AT LEFT SHOWS THE MODIFICATION REQUIRED FOR THE ROUTED DUNNAGE METHOD UNITS WHICH ARE TO BE POSITIONED CROSSWISE IN A CAR WHEN USING THE RISER METHOD OF PARTIAL-LAYER BRACING SHOWN ON PAGE 74. THE BASIC HEIGHT UNIT IS SHOWN, HOWEVER, THE PROCEDURE IS ALSO APPLICABLE FOR THE DECREASED HEIGHT UNIT. FOR MODIFICATION OF ROUTED DUNNAGE METHOD UNITS, TO BE POSITIONED LENGTHWISE IN A CAR, REFER TO THE "METHOD A" DETAIL ABOVE.

**METHOD B**

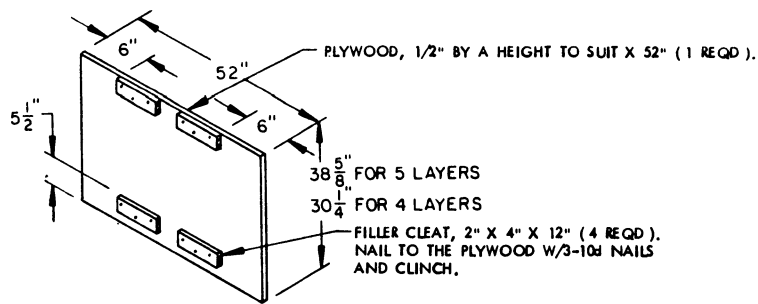
FOR ROUTED DUNNAGE METHOD UNITS, THE BASIC HEIGHT UNIT IS SHOWN.



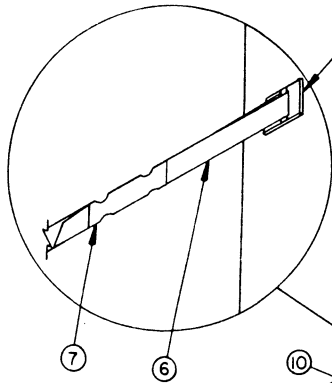
**METHOD C**  
FOR FLAT DUNNAGE  
METHOD UNITS.

**NOTE:**

THE "METHOD C" DETAIL AT LEFT SHOWS THE MODIFICATION REQUIRED FOR THE FLAT DUNNAGE METHOD UNITS WHICH ARE TO BE POSITIONED CROSSWISE IN A CAR WHEN USING THE RISER METHOD OF PARTIAL-LAYER BRACING SHOWN ON PAGE 74. THE BASIC HEIGHT UNIT IS SHOWN, HOWEVER, THE PROCEDURE IS ALSO APPLICABLE FOR THE DECREASED HEIGHT UNIT. FOR MODIFICATION OF FLAT DUNNAGE METHOD UNITS TO BE POSITIONED LENGTHWISE IN A CAR, REFER TO THE "METHOD A" DETAIL AT THE TOP OF PAGE 76.

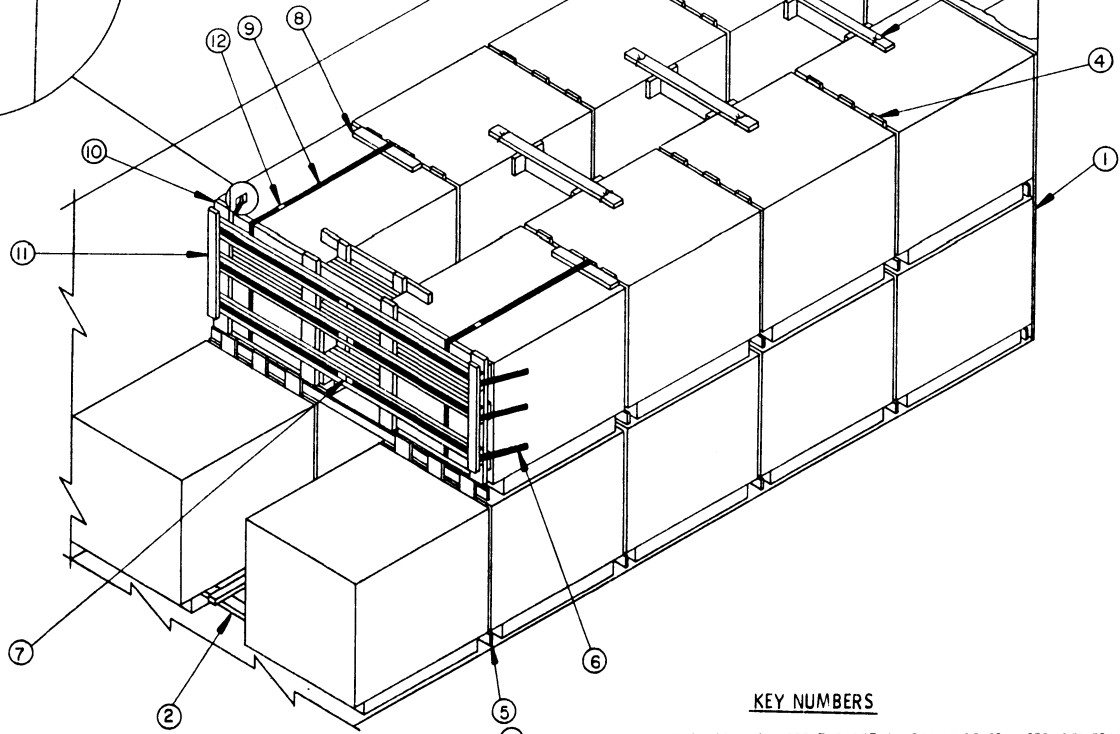


**SIDE FILL ASSEMBLY B**  
FOR METHOD "C" ABOVE.



TYPICAL ANCHOR DEVICE IS SHOWN HAVING A 7/8" DIAMETER CONTINUOUS ROD WELDED INSIDE THE CAR SIDEWALL AND HAVING OPENINGS 3" HIGH BY 3-3/4" WIDE. SUCH ANCHOR DEVICES ARE DESIGNED/MANUFACTURED BY PULLMAN-STANDARD.

SEE GENERAL NOTE "G" ON PAGE 2.



ISOMETRIC VIEW

KEY NUMBERS

- ① END-WALL LINING (1 REQD). SEE THE DETAIL ON PAGE 93. SEE GENERAL NOTE "D" ON PAGE 2. NOTE THAT IF AN END-OF-CAR BULKHEAD, AS DETAILED ON PAGE 94 IS USED, THE END-WALL LINING IS NOT REQUIRED.
- ② ANTI-SWAY BRACE (9 REQD). SEE THE "ANTI-SWAY BRACE D" DETAIL ON PAGE 51. INSTALL BETWEEN THE LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (3 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 20 FOR THE FLAT OR ROUTED DUNNAGE METHOD UNITS. WIRE TIE TO PALLET UNITS AS SHOWN BY THE APPLICABLE TIE WIRE APPLICATION DETAIL ON PAGE 94.
- ④ SEPARATOR GATE FOR 2-HIGH LOAD (3 REQD). SEE THE APPLICABLE DETAIL ON PAGES 17, 35, 49 OR 63 AND/OR THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 94. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS.
- ⑤ SEPARATOR GATE FOR 1-HIGH LOAD (1 REQD). SEE THE APPLICABLE DETAIL ON THE AFOREMENTIONED PAGES.
- ⑥ BULKHEAD STRAP, 2" X .050" X 23'-0" LONG (REF) STEEL STRAPPING (3 REQD). INSTALL FROM 2 EQUAL LENGTH PIECES. SEE THE "STRAP APPLICATION PLAN VIEW" ON PAGE 79 FOR INSTALLATION GUIDANCE. SEE SPECIAL NOTES 4 THRU 6 AT LEFT.
- ⑦ SEAL FOR 2" STRAPPING (18 REQD, 6 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "O" ON PAGE 2.
- ⑧ STRAPPING BOARD (2 REQD). SEE THE DETAIL ON PAGE 79.
- ⑨ BUNDLING STRAP, 1-1/4" X .035" X 25'-0" LONG (REF) STEEL STRAPPING (2 REQD). ENCIRCLE THE PALLET UNIT, THE HORIZONTAL PIECES OF THE BULKHEAD GATE, AND A STRAPPING BOARD, PIECE MARKED ⑧. TENSION AND SEAL AFTER TENSIONING THE BULKHEAD STRAPS, PIECES MARKED ④.
- ⑩ BULKHEAD GATE (1 REQD). SEE THE DETAIL ON PAGE 79. SEE SPECIAL NOTE 3 AT LEFT.
- 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.
- ⑫ SEAL FOR 1-1/4" STEEL STRAPPING (2 REQD, 1 PER STRAP). DOUBLE CRIMP EACH SEAL.

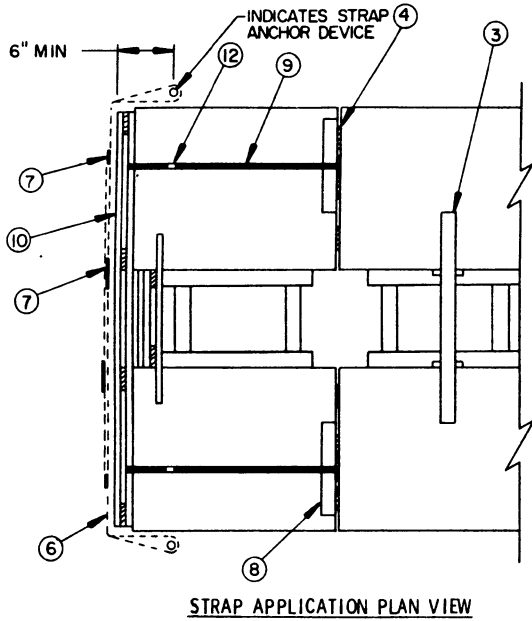
SPECIAL NOTES:

1. A 9'-4" WIDE ALL-METAL BOX CAR 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 ROUTED DUNNAGE METHOD 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 CONTAINERS AS SHOWN IN THE VIEW ABOVE. PARTIAL LAYERS OF CROSSWISE POSITIONED CONTAINERS 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 18,000 POUNDS OF LADING; A BULKHEAD GATE WITH TWO (2) STRAPS WILL RETAIN NOT MORE THAN 12,000 POUNDS. IF ONLY TWO STRAPS ARE USED, THEY MUST BE APPLIED OVER THE UPPER AND LOWER STRAPPING BOARDS.
5. THE ANCHOR DEVICES TO BE USED FOR THE ATTACHMENT OF THE BULKHEAD STRAPS MUST BE LOCATED AT LEAST SIX INCHES (6") TOWARD THE CAR END WALL FROM THE OPPOSITE-THE-LOAD SIDE OF THE BULKHEAD GATE.
6. BULKHEAD STRAPS WILL BE TWO INCH (2") WIDE STEEL STRAPPING; 1-1/4" STRAPPING MUST NOT BE USED. A BULKHEAD STRAP WILL BE OF A LENGTH TO SUIT AND WILL BE THREADED THRU THE ANCHOR DEVICE (PRIOR TO POSITIONING THE ADJACENT UNITS) FAR ENOUGH TO PROVIDE FOR ONE LEG BEING APPROXIMATELY 48" LONGER THAN THE OTHER. THE STRAP ATTACHED TO THE MATING ANCHOR DEVICE WILL HAVE THE OPPOSITE LEG EXTENDING 48". THE TWO LEGS OF EACH HALF OF A STRAP WILL BE SECURED NEAR THE ANCHOR DEVICE WITH ONE DOUBLE CRIMPED SEAL. NOTE THAT THIS SEAL MUST BE POSITIONED EITHER CLOSE ENOUGH TO OR FAR ENOUGH AWAY FROM THE ANCHOR DEVICE SO AS NOT TO BE AT THE POINT WHERE THE STRAP BENDS AROUND THE END OF THE BULKHEAD GATE OR AROUND THE CORNER OF THE ADJACENT UNIT. THE STRAP ENDS OF EACH PAIR OF LONG AND SHORT LEGS WILL BE SECURED WITH TWO (2) SEALS BUTTED TOGETHER AND DOUBLE CRIMPED.

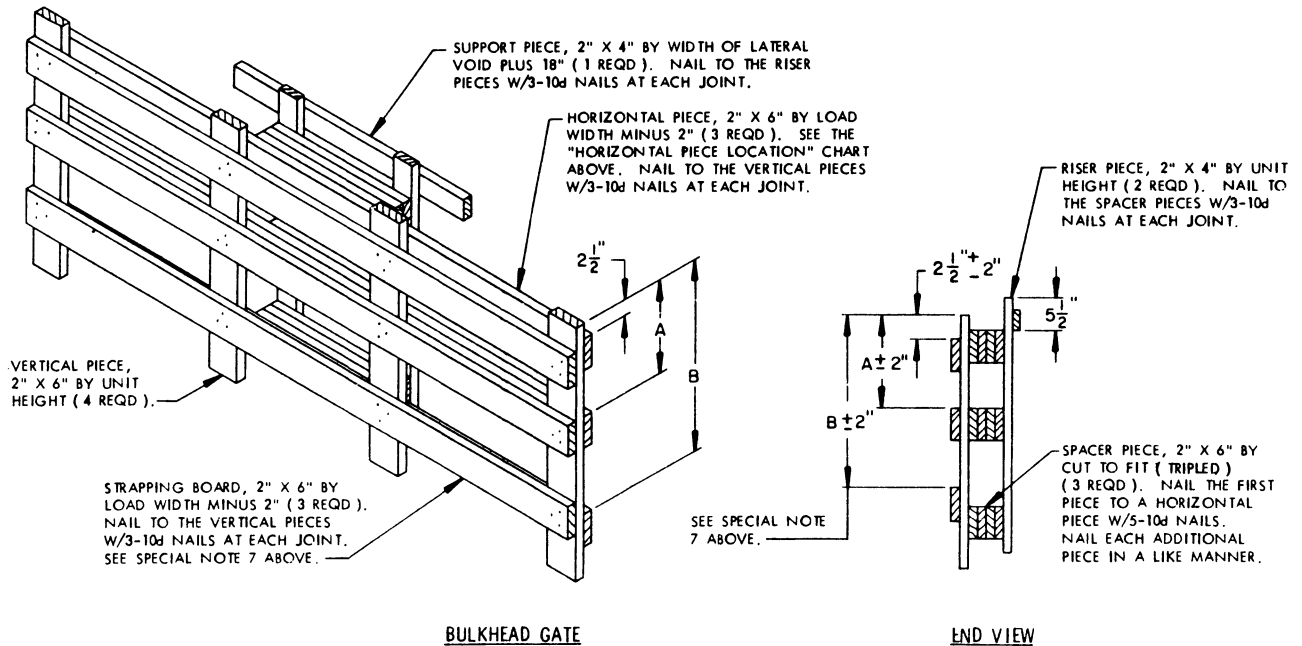
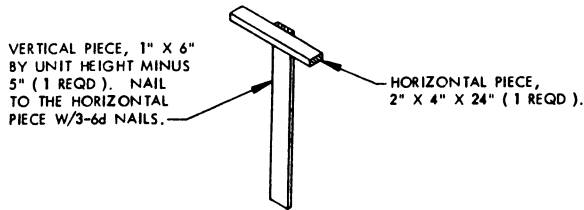
(CONTINUED ON PAGE 79)

( SPECIAL NOTES CONTINUED )

7. 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 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.



HORIZONTAL PIECE LOCATION				
UNIT	4-HIGH		5-HIGH	
	DIM A	DIM B	DIM A	DIM B
FLAT OR ROUTED DUNNAGE	15" ± 2"	25" ± 5"	19" ± 2"	34" ± 5"

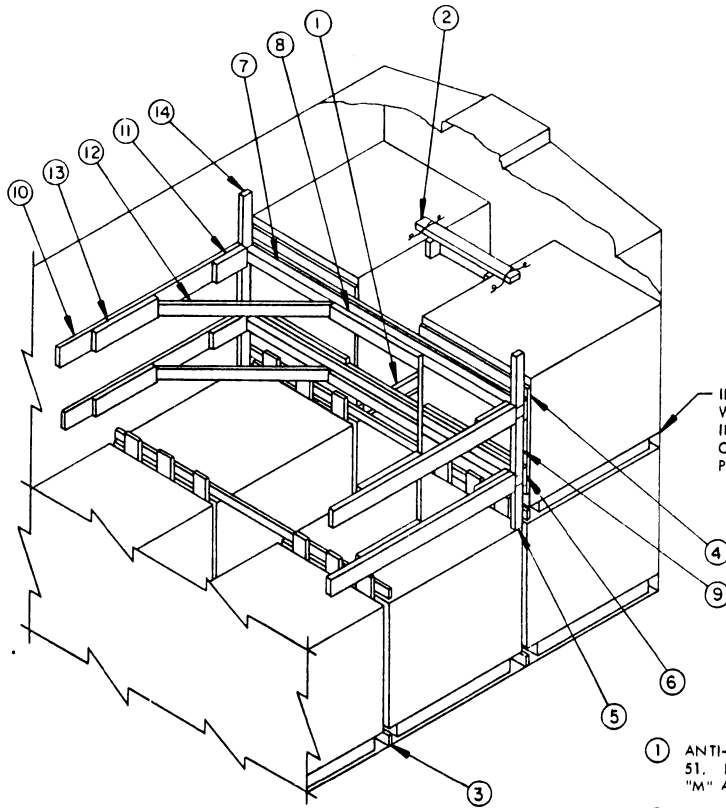


( SPECIAL NOTES CONTINUED )

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 ⑩ 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 ⑩ IS DOUBLED.

- 6. THE CENTER CLEAT, SHOWN AS PIECE MARKED ⑧, 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.

IF THE CAR HAS A BOWED END WALL, A BULKHEAD MUST BE INSTALLED. SEE THE "END-OF-CAR BULKHEAD" DETAIL ON PAGE 94.



ISOMETRIC VIEW

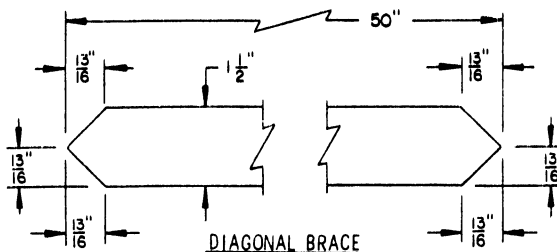
KEY NUMBERS

- ① ANTI-SWAY BRACE ( 2 REQD ) SEE THE "ANTI-SWAY BRACE D" DETAIL ON PAGE 51. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "M" AND "N" 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 20 FOR THE FLAT OR ROUTED DUNNAGE METHOD UNITS. WIRE TIE TO PALLET UNITS AS SHOWN BY THE APPLICABLE TIE WIRE APPLICATION DETAIL ON PAGE 94. NOTE THAT THE QUANTITY IS ONLY FOR THE PARTIAL-TIER UNITS.
- ③ SEPARATOR GATE ( 2 REQD ). SEE THE APPLICABLE DETAIL ON PAGE 17, 35, 49, OR 63 AND/OR THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 94.
- ④ PARTIAL LAYER GATE ( 2 REQD ). POSITION AS SHOWN. SEE THE DETAIL ON PAGE 81. SEE SPECIAL NOTE 3.
- ⑤ SUPPORT CLEAT, 2" X 4" X 10" ( 2 REQD ). NAIL TO THE CAR SIDEWALL W/4-12d NAILS. POSITION SO AS TO CENTER PIECES MARKED ⑥ AND ⑦ ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. SEE SPECIAL NOTE 5 AT LEFT.
- ⑥ LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH IN LENGTH ( CUT TO FIT ) ( 2 REQD ). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑦, W/1-12d NAIL EVERY 6". SEE SPECIAL NOTE 3 AT LEFT.
- ⑦ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH IN LENGTH ( CUT TO FIT ) ( 2 REQD ).
- ⑧ CENTER CLEAT, 2" X 4" X 36" ( 2 REQD ). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑦, W/7-16d NAILS. SEE SPECIAL NOTE 6 ABOVE.
- ⑨ SPACER CLEAT, 2" X 4" X 21-1/2" FOR 5-LAYER UNITS, 13-1/2" FOR 4-LAYER UNITS ( 2 REQD ). NAIL TO THE CAR SIDEWALL W/4-12d NAILS.
- ⑩ HORIZONTAL WALL CLEAT, 2" X 6" X 72" ( 4 REQD ). NAIL TO THE CAR SIDEWALL W/16-12d NAILS.
- ⑪ POCKET CLEAT, 2" X 6" X 12" ( 4 REQD ). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑩, W/4-16d NAILS.
- ⑫ DIAGONAL BRACE, 2" X 4" X 50-1/4" ( 4 REQD ). SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TO NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑦, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑩, W/2-16d NAILS AT EACH END.
- ⑬ BACK-UP CLEAT, 2" X 6" X 24" ( 4 REQD ). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑩, W/8-16d NAILS.
- ⑭ HOLD-DOWN CLEAT, 2" X 4" X 18" ( 2 REQD ). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

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 ROUTED DUNNAGE METHOD UNIT ( BASIC HEIGHT ). 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 EXCEPT THE COMBINATION LOADS ( 1 ROW LENGTHWISE AND 1 ROW CROSSWISE ). A LENGTHWISE LOAD IS SHOWN AS TYPICAL. THE BLOCKING AND BRACING WILL VARY FOR CROSSWISE LOADS. NOTE THAT FOR A CROSSWISE PARTIAL TIER, THE PIECES MARKED ⑤ SHOULD BE LOCATED SO AS TO BEAR AGAINST THE PALLET UNITS IN THE SAME LOCATION AS THE HORIZONTAL PIECES OF A CENTER GATE. NOTE THAT PIECE MARKED ④ IS REQUIRED FOR LENGTHWISE POSITIONED BASIC HEIGHT UNITS ONLY.
- 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 PAGE 81, 82, AND 83 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, ⑦, ⑨, ⑪, AND ⑭ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑫ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑩ MUST BE DOUBLED AND EXTENDED ACROSS AND

( CONTINUED AT RIGHT ABOVE )



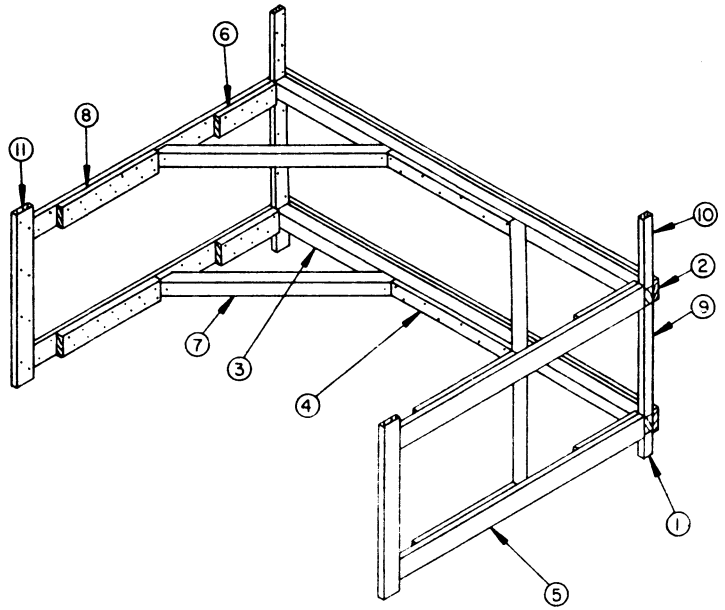
DIAGONAL BRACE

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



**SPECIAL NOTES:**

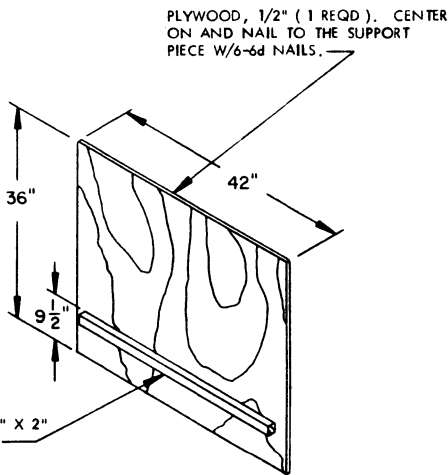
1. THE TYPE "B" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 14,000 POUNDS. THIS WILL BE NOT MORE THAN NINE (9) 4-LAYER UNITS OR SEVEN (7) 5-LAYER UNITS. IF IT IS NECESSARY TO PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE, PIECES MARKED ①, ②, ③, ④, ⑤, ⑥, ⑦, ⑧, ⑨, ⑩, AND ⑪ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑦ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑤ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF: 54") TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑤ TO THE FIRST W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑤ IS DOUBLED.
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, ⑤, ⑥, ⑦, ⑧, ⑨, ⑩, AND ⑪ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑦ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑤ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF: 54") TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑤ TO THE FIRST W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑤ IS DOUBLED.
3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ④, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. REFER TO PAGE 80 FOR A TYPICAL INSTALLATION OF A K-BRACE.



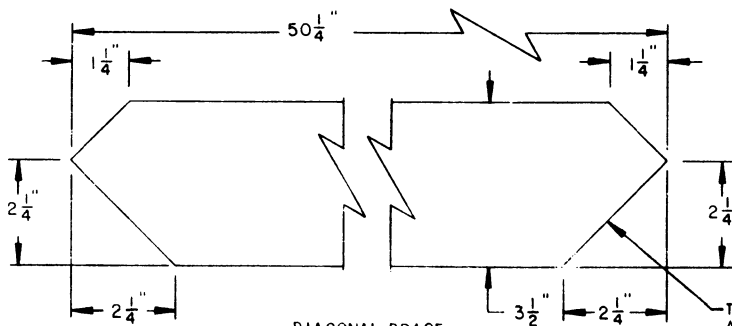
ISOMETRIC VIEW

**KEY NUMBERS**

- ① SUPPORT CLEAT, 2" X 4" X 7" (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 LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTES "M" AND "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 HORIZONTAL WALL CLEAT, 2" X 6" X 72" (4 REQD). NAIL TO THE CAR SIDEWALL W/16-12d NAILS.
- ⑥ POCKET CLEAT, 2" X 6" X 18" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/7-16d NAILS.
- ⑦ DIAGONAL BRACE, 4" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/1-60d NAIL AT EACH END.
- ⑧ BACK-UP CLEAT, 2" X 6" X 30" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/14-16d NAILS.
- ⑨ SPACER CLEAT, 2" X 4" X 27" FOR 5-LAYER UNITS, 19-1/2" FOR 4-LAYER UNITS (2 REQD). NAIL TO THE CAR SIDEWALL W/4-12d NAILS.
- ⑩ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.
- ⑪ VERTICAL BACK-UP CLEAT, 2" X 6" BY UNIT HEIGHT (2 REQD). NAIL TO THE CAR SIDEWALL W/8-12d NAILS.

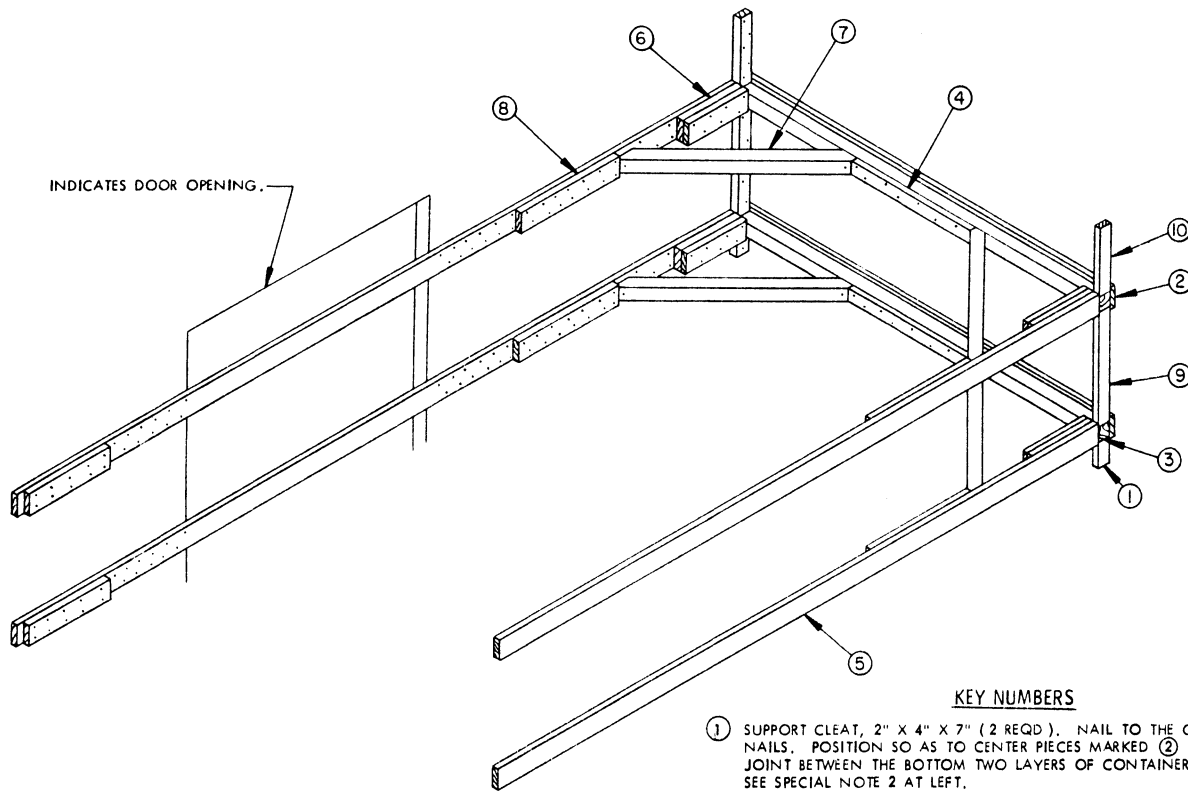


PARTIAL-LAYER GATE



DIAGONAL BRACE

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.



ISOMETRIC VIEW

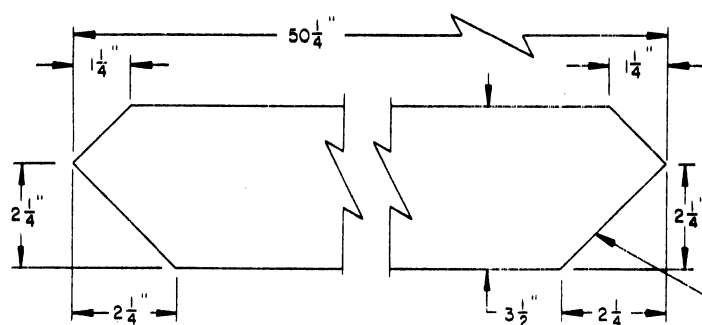
KEY NUMBERS

- ① SUPPORT CLEAT, 2" X 4" X 7" (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 LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTES "M" AND "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 BELOW.
- 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/4-12d NAILS.
- ⑥ POCKET CLEAT, 2" X 6" X 18" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/7-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ⑦ DIAGONAL BRACE, 4" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/1-60d NAIL AT EACH END.
- ⑧ BACK-UP CLEAT, 2" X 6" X 30" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/14-16d NAILS.
- ⑨ SPACER CLEAT, 2" X 4" X 27" FOR 5-LAYER UNITS, 19-1/2" FOR 4-LAYER UNITS (2 REQD). NAIL TO THE CAR SIDEWALL W/4-12d NAILS.
- ⑩ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

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 THIRTEEN (13) 4-LAYER UNITS OR ELEVEN (11) 5-LAYER UNITS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAIL ON PAGE 82 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 81 MAY BE USED. IF THE PARTIAL TIER TO BE BRACED WEIGHS 8,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 80 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, ⑤, ⑥, ⑧, ⑨, AND ⑩ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑦ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑤ MUST BE DOUBLED. LAMINATE THE SECOND PIECE 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 ④ IS DOUBLED.

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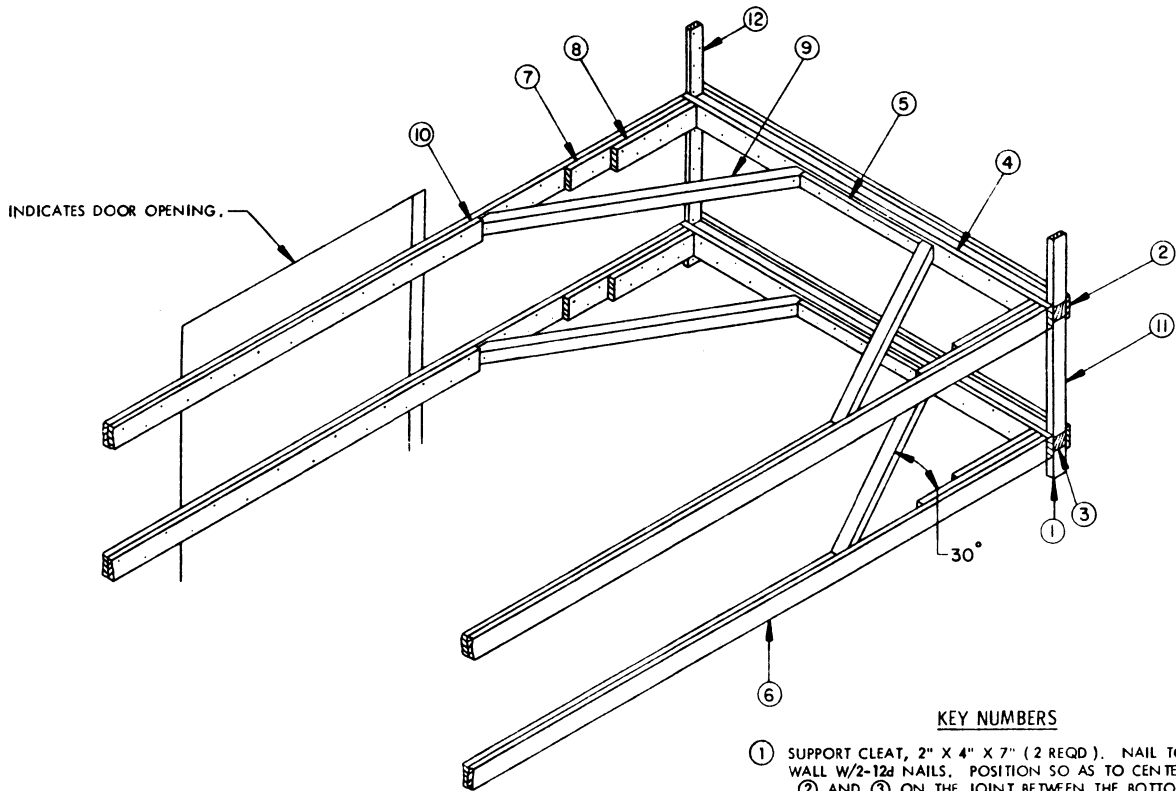
DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

(SPECIAL NOTES CONTINUED)

3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ④, WILL BE 38" LONG FOR AN 8'-6" WIDE CAR, 34" 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.

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.



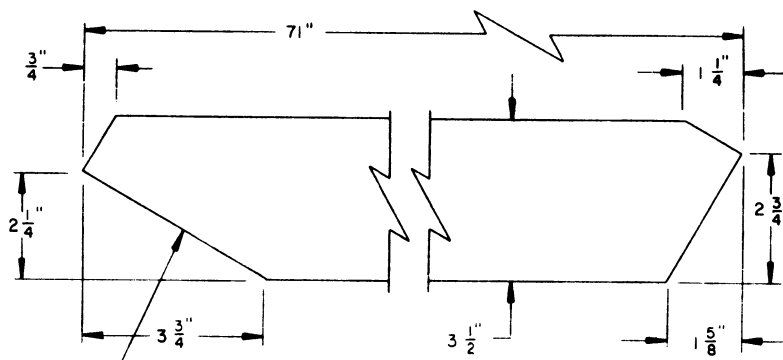
ISOMETRIC VIEW

**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 SEVENTEEN (17) 4-LAYER UNITS OR THIRTEEN (13) 5-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 82 MAY BE USED. FOR A PARTIAL TIER OF 8,000 POUNDS TO 14,000 POUNDS, THE TYPE "B" K-BRACE DEPICTED ON PAGE 81 MAY BE USED. IF THE PARTIAL TIER TO BE BRACED WEIGHS 8,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 80 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, ⑦, ⑧, ⑪ AND ⑫ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALLRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑨ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑥ MUST BE DOUBLED. LAMINATE THE SECOND PIECE 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 ⑥ 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 ⑥ AND ⑩, THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.

**KEY NUMBERS**

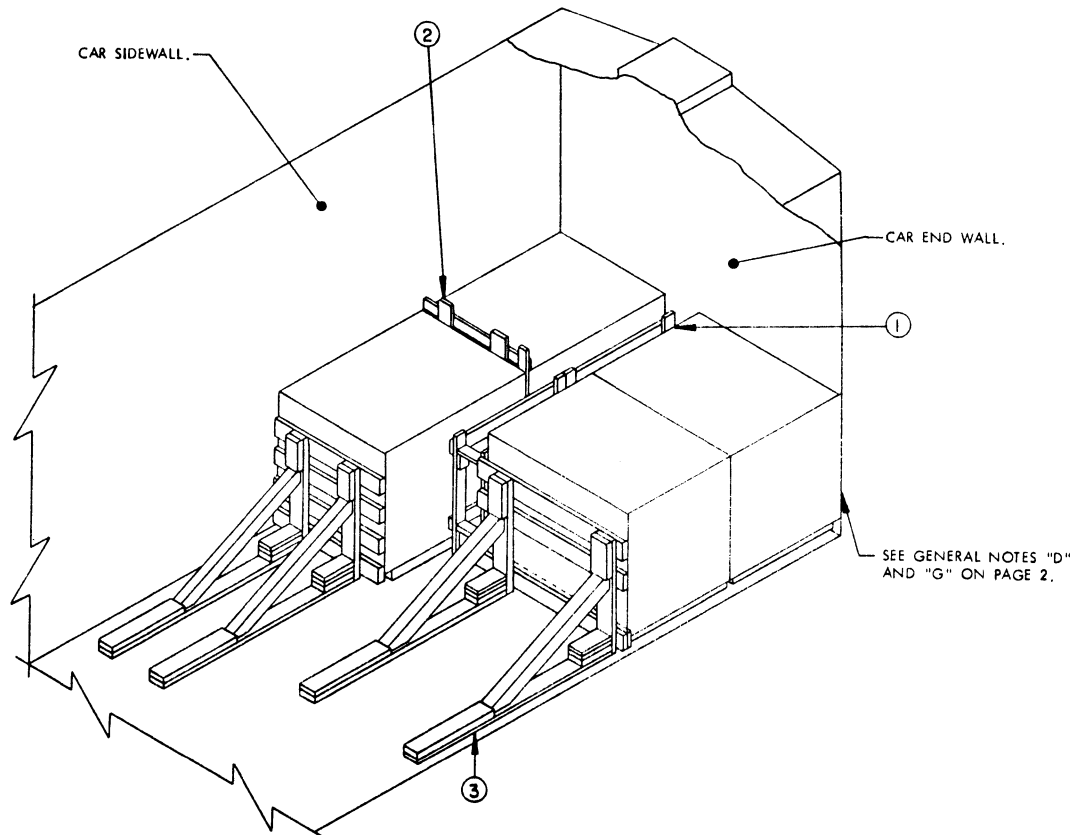
- ① SUPPORT CLEAT, 2" X 4" X 7" (2 REQD). NAIL TO THE CAR SIDEWALL W/2-12d NAILS. POSITION SO AS TO CENTER PIECES MARKED ② AND ③ ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. SEE SPECIAL NOTE 2 AT LEFT.
- ② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTES "M" AND "N" ON PAGE 2.
- ③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT TO FIT) (2 REQD).
- ④ HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6".
- ⑤ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE HORIZONTAL PIECE, PIECE MARKED ④, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.
- ⑥ HORIZONTAL WALL CLEAT, 2" X 6" BY CUT TO FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND ACROSS AND FAR ENOUGH PAST THE DOOR OPENING TO CONTACT PIECE MARKED ④ OF THE K-BRACE IN THE OPPOSITE END OF THE CAR. NAIL TO THE CAR SIDEWALL W/40-12d NAILS.
- ⑦ POCKET CLEAT, 2" X 6" X 36" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/10-16d NAILS.
- ⑧ POCKET CLEAT, 2" X 6" X 24" (4 REQD). NAIL TO THE POCKET CLEAT, PIECE MARKED ⑦, W/7-16d NAILS.
- ⑨ DIAGONAL BRACE, 4" X 4" X 71" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE HORIZONTAL PIECE, PIECE MARKED ④, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/1-60d NAIL AT EACH END.
- ⑩ BACK-UP CLEAT, 2" X 6" BY CUT TO FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND TO CONTACT THE DIAGONAL BRACE, PIECE MARKED ⑨, IN THE OPPOSITE END OF THE CAR. NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/18-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING, IF APPLICABLE.
- ⑪ SPACER CLEAT, 2" X 4" X 27" FOR 5-LAYER UNITS, 19-1/2" FOR 4-LAYER UNITS (2 REQD). NAIL TO THE CAR SIDEWALL W/4-12d NAILS.
- ⑫ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.



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 ⑥.

TYPE "D" K-BRACE



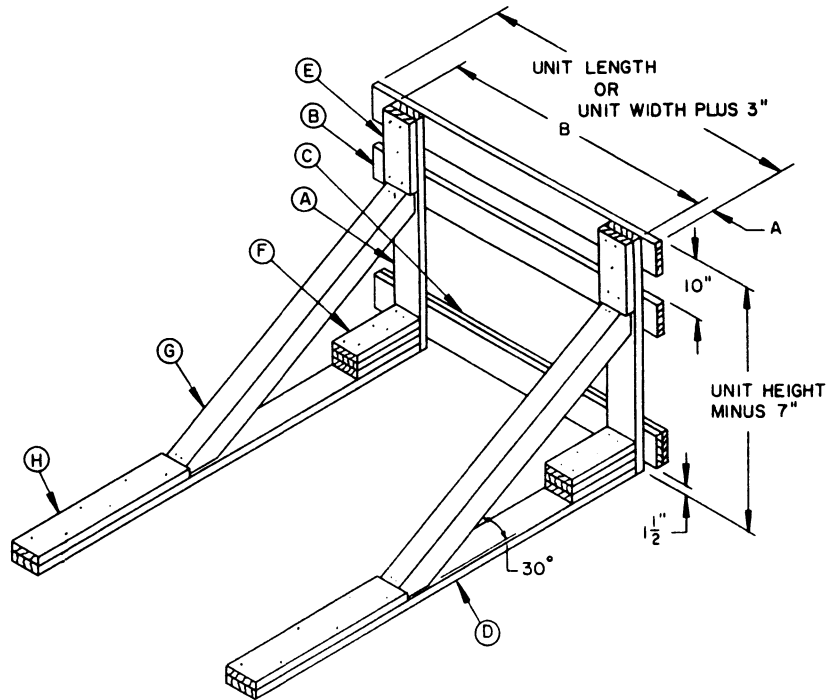
**ISOMETRIC VIEW**

**KEY NUMBERS**

**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 ROUTED DUNNAGE METHOD UNIT (BASIC HEIGHT). 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. ALSO, THE LOAD MAY CONSIST OF TWO LENGTHWISE ROWS, OR TWO CROSSWISE ROWS IN LIEU OF ONE OF EACH AS DEPICTED.
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 DETAILS FOR ONE ROW SPECIFIED ELSEWHERE. FOR HOLD DOWN PIECES TO BE APPLIED TO THE KNEE BRACE ASSEMBLY WHICH IS USED AGAINST THE LENGTHWISE ROW, REFER TO THE "CENTER GATE A" DETAIL ON PAGE 16 FOR THE FLAT DUNNAGE METHOD UNITS, OR THE "CENTER GATE J" DETAIL ON PAGE 48 FOR THE ROUTED DUNNAGE METHOD UNITS. FOR HOLD DOWN PIECES TO BE APPLIED TO THE KNEE BRACE ASSEMBLY WHICH IS USED AGAINST THE CROSSWISE ROW, REFER TO THE "CENTER GATE B" DETAIL ON PAGE 17 FOR THE FLAT DUNNAGE METHOD UNITS, OR THE "CENTER GATE K" DETAIL ON PAGE 49 FOR THE ROUTED DUNNAGE METHOD UNITS.

- ① CRIB FILL (2 REQD). SEE THE APPLICABLE CRIB FILL DETAIL ON PAGES 16, 34, 48, OR 62. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.
- ② SEPARATOR GATE (1 REQD). SEE THE APPLICABLE SEPARATOR GATE DETAIL ON PAGE 17, 35, 49, OR 63. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNIT.
- ③ KNEE BRACE ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 85 FOR CONSTRUCTION SPECIFICATIONS AND NAILING REQUIREMENTS.



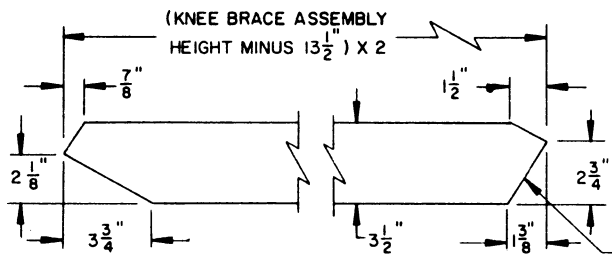
**KNEE BRACE ASSEMBLY**

VERTICAL PIECE PLACEMENT FOR CROSSWISE UNITS		
UNIT	DIM A	DIM B
FLAT DUNNAGE	2-1/2"	47-1/2"
ROUTED DUNNAGE	3"	46-1/2"

VERTICAL PIECE PLACEMENT FOR LENGTHWISE UNITS		
UNIT	DIM A	DIM B
FLAT DUNNAGE	6-1/2"	31"
ROUTED DUNNAGE	5-1/2"	31"

**KEY LETTERS**

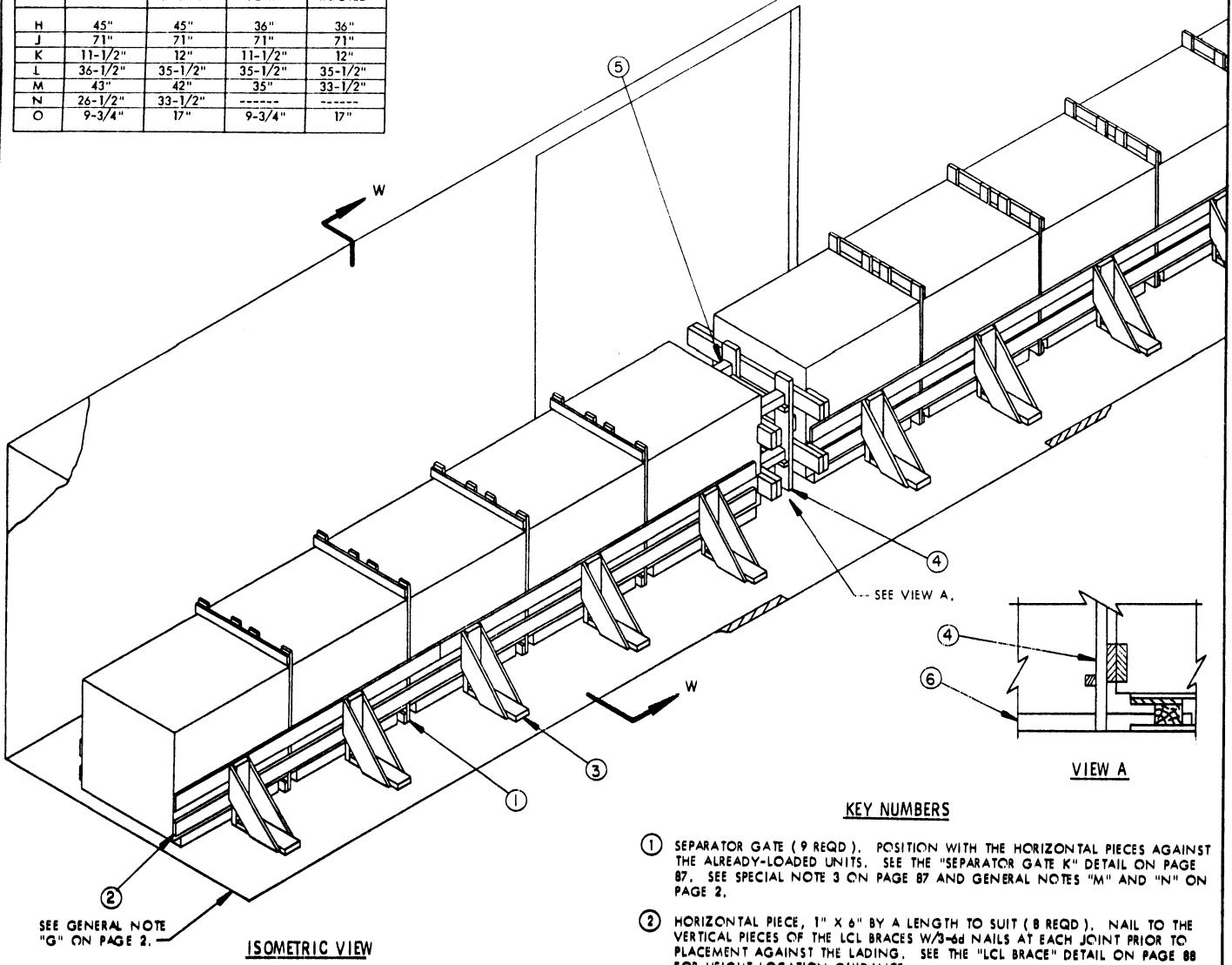
- (A) VERTICAL PIECE, 2" X 6" BY UNIT HEIGHT MINUS 9" (2 REQD). SEE THE CHARTS AT LEFT FOR PLACEMENT DIMENSIONS.
- (B) HORIZONTAL PIECE, 2" X 6" BY PALLET UNIT LENGTH, OR PALLET UNIT WIDTH PLUS 3", AS APPLICABLE. NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. SEE GENERAL NOTE "M" ON PAGE 2.
- (C) HORIZONTAL PIECE, 1" X 6" BY PALLET UNIT WIDTH OR LENGTH (1 REQD FOR ROUTED DUNNAGE METHOD UNITS ONLY). NAIL TO THE BOTTOM HORIZONTAL PIECE MARKED (B) W/1-6d NAIL EVERY 12".
- (D) FLOOR CLEAT, 2" X 6" BY LENGTH TO SUIT (.87 OR 7/8 TIMES LENGTH OF PIECE MARKED (C), PLUS 30") (2 REQD). ALIGN WITH A VERTICAL PIECE AND NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 8". SEE GENERAL NOTE "5" ON PAGE 2.
- (E) HOLD-DOWN CLEAT, 2" X 6" X 12" (2 REQD). NAIL TO A VERTICAL PIECE W/5-10d NAILS.
- (F) POCKET CLEAT, 2" X 6" X 12" (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO THE FLOOR CLEAT, PIECE MARKED (D), 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.
- (G) BRACE, 4" X 4" BY CUT TO FIT (KNEE BRACE ASSEMBLY HEIGHT MINUS 13-1/2" TIMES 2) (2 REQD). SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TOE-NAIL TO THE VERTICAL PIECE AND TO THE FLOOR CLEAT, PIECES MARKED (A) AND (D), W/2-16d NAILS AT EACH JOINT.
- (H) BACK-UP CLEAT, 2" X 6" X 30" (2 REQD). NAIL TO THE FLOOR CLEAT, PIECE MARKED (D), W/6-40d NAILS.
- (J) HOLD-DOWN CLEAT (NOT SHOWN). SEE SPECIAL NOTE 5 ON PAGE 84.



**BRACE**  
4" X 4" MATERIAL.

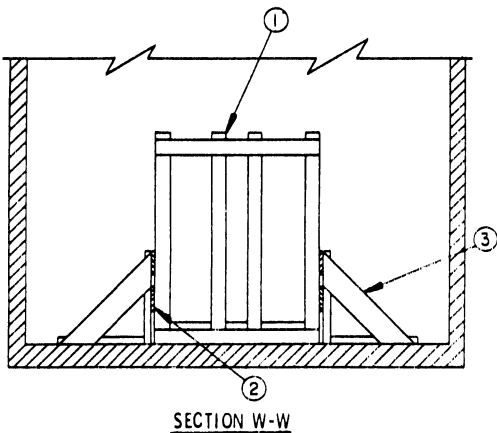
THE BRACE MUST BE INSTALLED SO THAT THIS BEARING SURFACE WILL BE IN CONTACT WITH THE VERTICAL PIECE MARKED (A)

CENTER GATE S				
DIM	BASIC HEIGHT		DECREASED HEIGHT	
	FLAT	ROUTED	FLAT	ROUTED
H	45"	45"	36"	36"
J	71"	71"	71"	71"
K	11-1/2"	12"	11-1/2"	12"
L	36-1/2"	35-1/2"	35-1/2"	35-1/2"
M	43"	42"	35"	33-1/2"
N	26-1/2"	33-1/2"	-----	-----
O	9-3/4"	17"	9-3/4"	17"



**KEY NUMBERS**

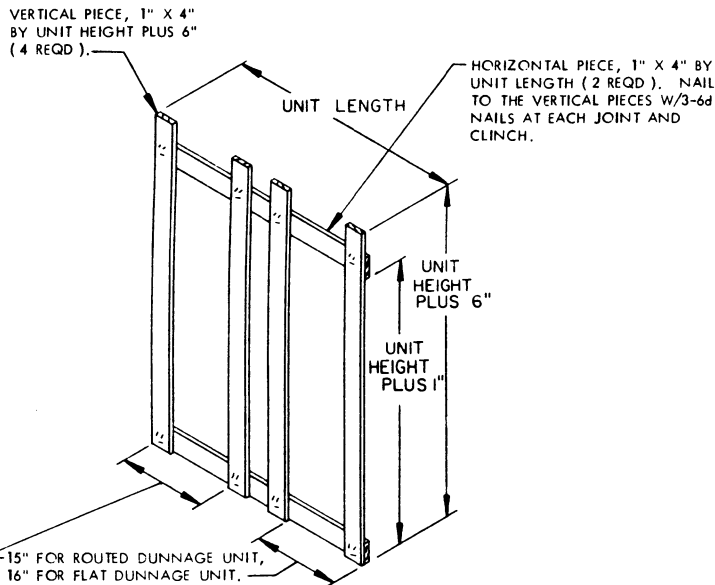
- ① SEPARATOR GATE ( 9 REQD ). POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE THE "SEPARATOR GATE K" DETAIL ON PAGE 87. SEE SPECIAL NOTE 3 ON PAGE 87 AND GENERAL NOTES "M" AND "N" ON PAGE 2.
- ② HORIZONTAL PIECE, 1" X 6" BY A LENGTH TO SUIT ( 8 REQD ). NAIL TO THE VERTICAL 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 88 FOR HEIGHT LOCATION GUIDANCE.
- ③ LCL BRACE ( 22 REQD ). SEE THE DETAIL ON PAGE 88 AND SPECIAL NOTE 4 ON PAGE 87. NAIL TO THE CAR FLOOR W/7-16d NAILS. SEE GENERAL NOTE "5" ON PAGE 2.
- ④ CENTER GATE ( 2 REQD ). SEE THE "CENTER GATE R" OR THE "CENTER GATE S" DETAIL ON PAGE 87 FOR LENGTHWISE OR CROSSWISE UNITS, RESPECTIVELY.
- ⑤ STRUT, 4" X 4" BY CUT TO FIT ( 4 REQD FOR LENGTHWISE, 6 REQD FOR MOST CROSSWISE ). NAIL TO PIECES MARKED ④ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "U" AND "V" 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 THE "CENTER GATE R" DETAIL ON PAGE 87 FOR LOCATION GUIDANCE. NOTE THAT FOR THE CROSSWISE UNITS, THE GATE HOLD DOWN PIECES WILL BE POSITIONED ON THE OUTWARD SIDE OF THE CENTER GATE VERTICAL PIECES. SEE SPECIAL NOTE 6 ON PAGE 87.



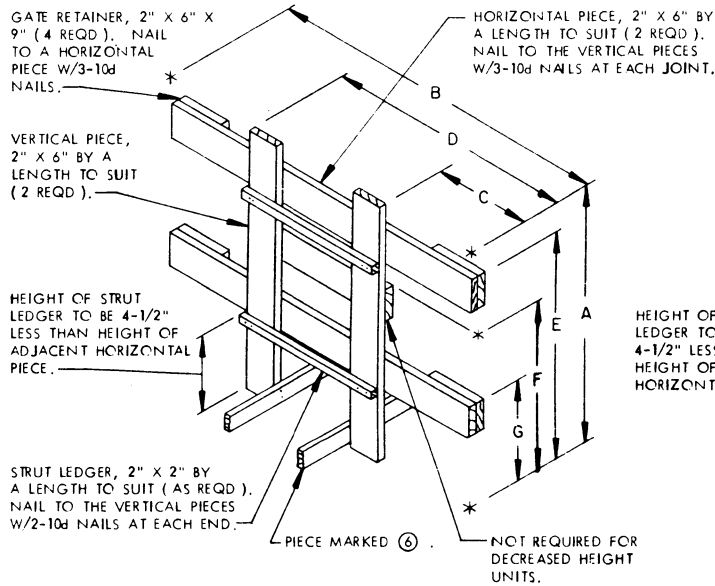
CENTER GATE R				
DIM	BASIC HEIGHT		DECREASED HEIGHT	
	FLAT	ROUTED	FLAT	ROUTED
A	45"	45"	36"	36"
B	62-1/2"	60-1/2"	62-1/2"	60-1/2"
C	15-1/2"	14-1/2"	15-1/2"	14-1/2"
D	41-1/2"	40-1/2"	41-1/2"	40-1/2"
E	42-1/2"	42"	34"	33-1/2"
F	30"	29-1/2"	-----	-----
G	17-1/2"	17"	17-1/2"	17"

**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 ROUTED DUNNAGE METHOD UNIT (BASIC HEIGHT). 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, WILL BE DIFFERENT FROM WHAT IS SHOWN FOR CROSSWISE LOADS.
4. ONE (1) LCL BRACE WILL BE USED AT EACH SIDE OF EACH PALLET UNIT. FOR CROSSWISE PALLET UNITS, THE BRACES WILL BE CENTERED ON THE LENGTH OF THE UNIT. FOR THE LENGTHWISE UNITS, THE BRACES WILL BE LOCATED NEAR THE CENTER OF THE UNIT WIDTH, WITH SLIGHT ADJUSTMENTS AS NECESSARY TO ALIGN A BRACE WITH THE INTERMEDIATE DUNNAGE PIECES OF THE ROUTED DUNNAGE METHOD UNIT, OR THE CROSS PIECE OF AN INTERMEDIATE DUNNAGE ASSEMBLY OF THE FLAT DUNNAGE METHOD UNIT.
5. THE BILL OF MATERIAL AND LOAD AS SHOWN ARE BASED ON THE DEPICTED UNIT AND THEREFORE ARE ONLY TYPICAL.
6. 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 PIECES MARKED ⑥.

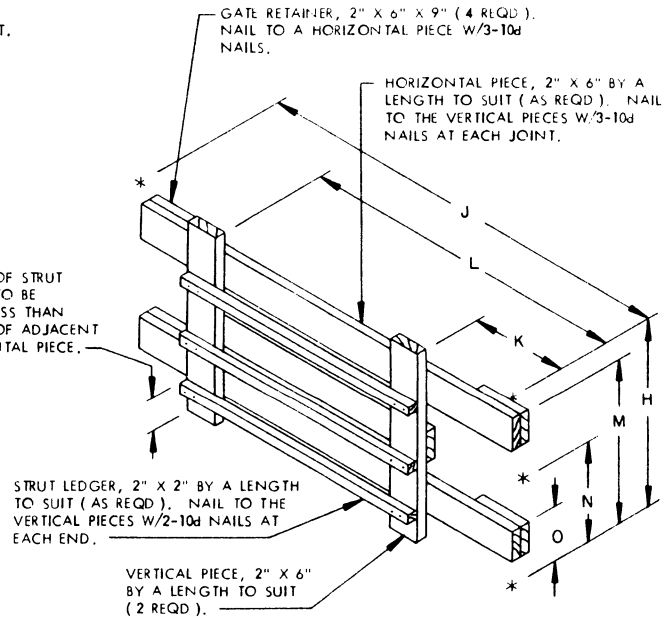


**SEPARATOR GATE K**



**CENTER GATE R**

THIS GATE IS FOR USE WITH LENGTHWISE UNITS. REFER TO THE "CENTER GATE R" CHART ON PAGE B6 FOR FIGURES REPRESENTED BY LETTERS ON THE ABOVE DETAIL.



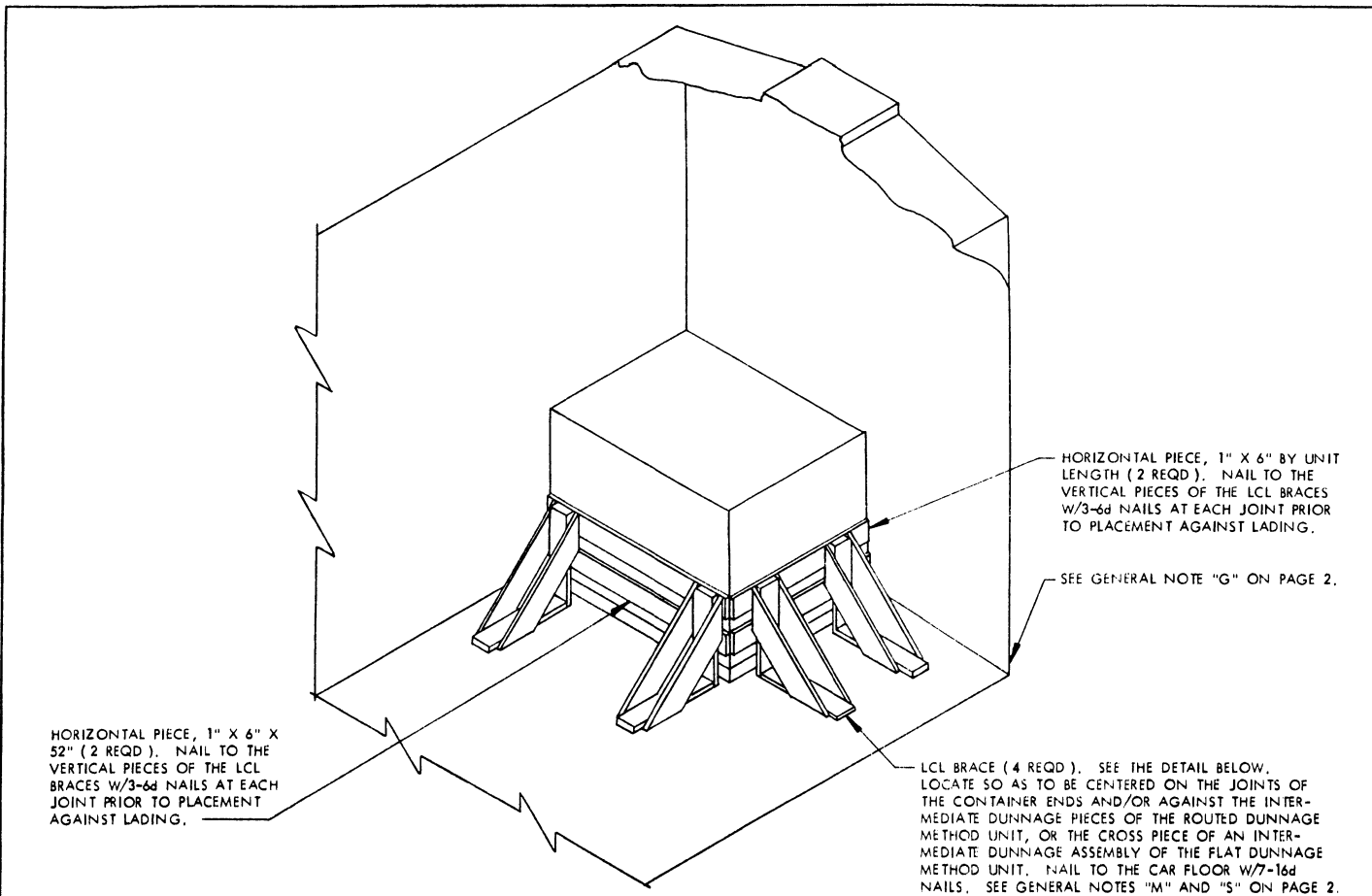
**CENTER GATE S**

THIS GATE IS FOR USE WITH CROSSWISE UNITS. REFER TO THE "CENTER GATE S" CHART AT TOP OF PAGE B6 FOR FIGURES REPRESENTED BY LETTERS ON THE DETAIL ABOVE.

BILL OF MATERIAL ( TYPICAL )		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	228	76
1" X 6"	331	166
2" X 2"	11	4
2" X 3"	8	4
2" X 6"	135	135
4" X 4"	5	7
NAILS	P.C. REQD.	POUNDS
6d (2")	348	2
8d (2-1/2")	264	2-3/4
10d (3")	84	1-1/4
16d (3-1/2")	214	4-3/4

**LOAD AS SHOWN ( TYPICAL )**

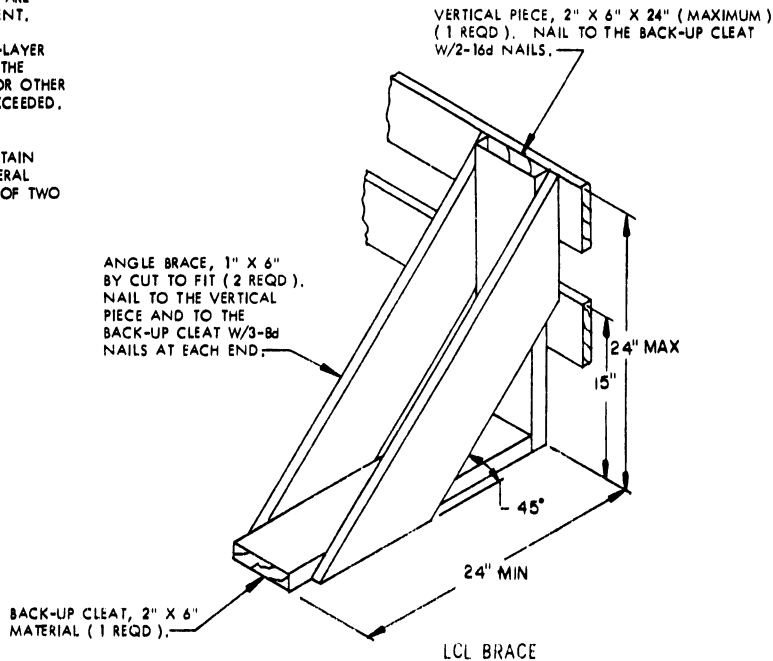
ITEM	QUANTITY	WEIGHT ( APPROX )
PALLET UNIT	11	19,712 LBS
DUNNAGE		795 LBS
<b>TOTAL WEIGHT</b>		<b>20,507 LBS</b>



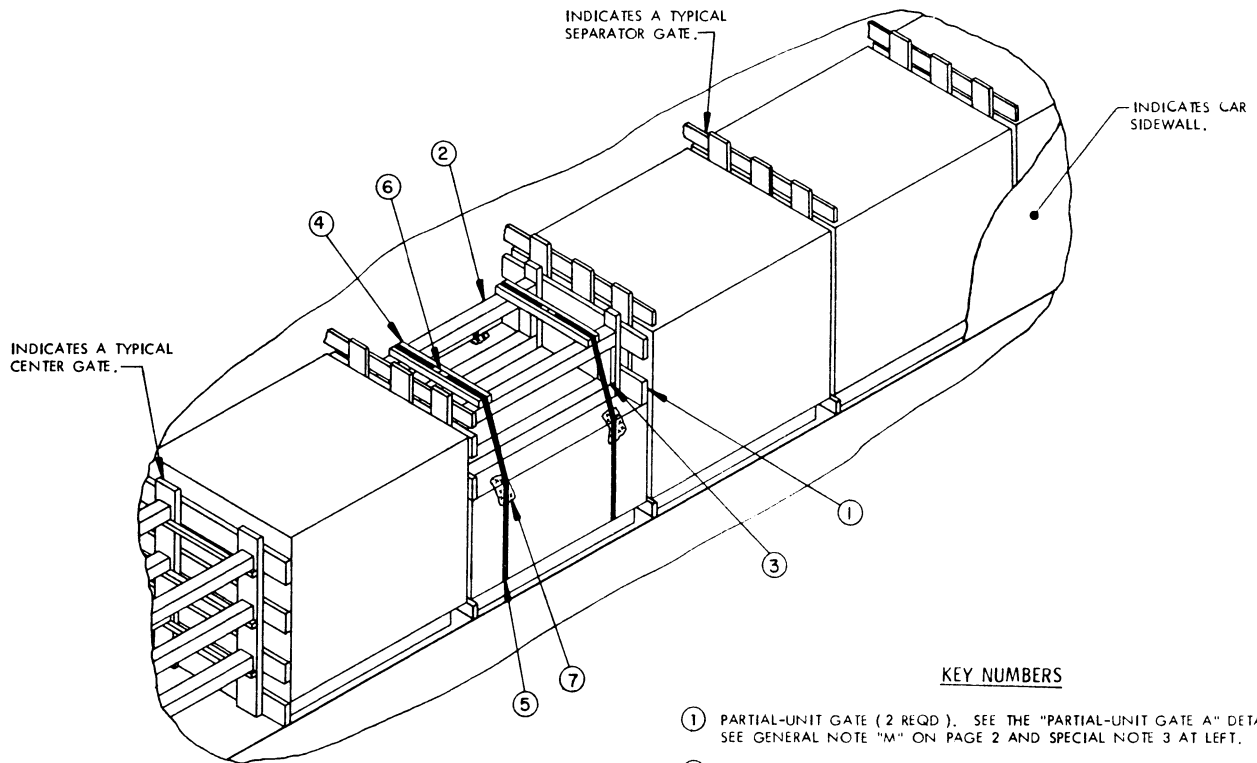
**ISOMETRIC VIEW**

**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 "D" AND "S" ON PAGE 2.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LCL LOAD IS THE ROUTED DUNNAGE METHOD UNIT (BASIC HEIGHT). 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 CROSSWISE UNIT IS SHOWN. HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LENGTHWISE 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 MAXIMUM OF TWO (2) BRACES MUST BE USED FOR LONGITUDINAL BRACING.







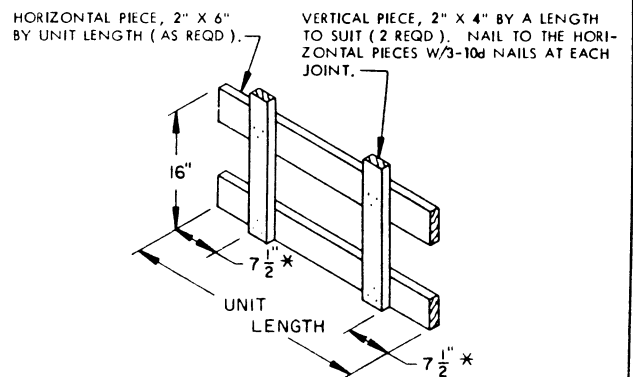
**POSITIONING OF PARTIAL LENGTHWISE UNIT WITHIN A LAYER**

**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 ROUTED DUNNAGE METHOD UNIT (BASIC HEIGHT). 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 3-LAYER UNIT WITHIN A 5-LAYER LOAD. THE PRINCIPLES CAN BE ADAPTED TO SUIT OTHER SIZE PARTIAL UNITS.
4. A PARTIAL UNIT MUST CONSIST OF FULL LAYERS OF FIVE (5) CONTAINERS OR AN APPROVED FILLER ASSEMBLY, AS DETAILED BY DRAWING 19-48-4042A/5 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.

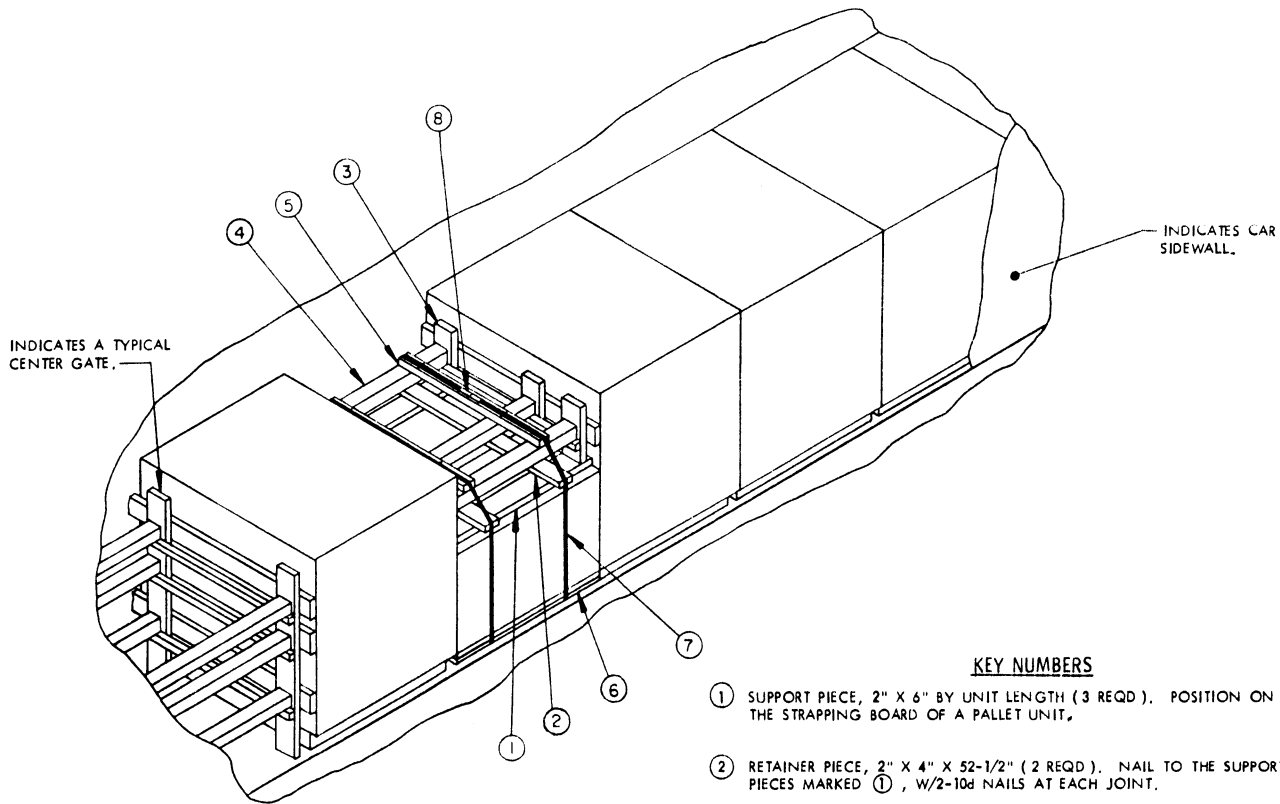
**KEY NUMBERS**

- ① PARTIAL-UNIT GATE (2 REQD). SEE THE "PARTIAL-UNIT GATE A" DETAIL BELOW. SEE GENERAL NOTE "M" ON PAGE 2 AND SPECIAL NOTE 3 AT LEFT.
- ② STRUT, 4" X 4" X 46-9/16" (4 REQD). TOENAIL TO THE VERTICAL PIECES OF THE PARTIAL-UNIT GATE, PIECE MARKED ①, W/2-16d NAILS AT EACH END.
- ③ STRUT SUPPORT PIECE, 2" X 4" X 8" (4 REQD). NAIL TO A VERTICAL PIECE OF THE PARTIAL-UNIT GATE W/3-10d NAILS.
- ④ STRAPPING BOARD, 2" X 4" X 31" (2 REQD). NAIL TO THE STRUTS, PIECES MARKED ③, W/3-10d NAILS AT EACH END.
- 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 "O" ON PAGE 2.
- ⑦ ANTI-CHAFING NEUTRAL BARRIER MATERIAL. POSITION BETWEEN CONTAINERS AND STRAPPING AT POINTS OF CONTACT.



**PARTIAL-UNIT GATE A**

THESE DIMENSIONS MUST BE ADJUSTED AS NECESSARY TO ALIGN THE VERTICAL PIECE WITH THE ADJACENT SEPARATOR GATES.



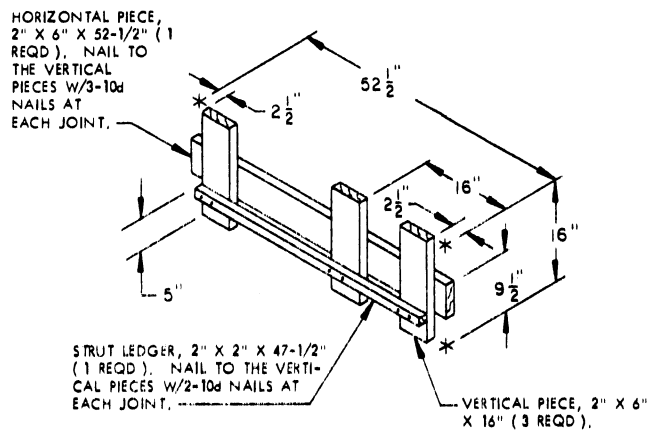
POSITIONING OF PARTIAL CROSSWISE UNIT IN A LAYER

**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 CROSSWISE LOAD.
2. THE PALLET UNIT SHOWN IN THE SHIPMENT OF PARTIAL UNITS VIEW IS THE ROUTED DUNNAGE METHOD UNIT (BASIC HEIGHT). THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED 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 ON THE PARTIAL UNIT. THE DEPICTED PROCEDURES SHOW THE BRACING OF A 3-LAYER UNIT WITHIN A 5-LAYER LOAD. THE PRINCIPLES CAN BE ADAPTED TO SUIT OTHER SIZE PARTIAL UNITS.
4. A PARTIAL UNIT MUST CONSIST OF FULL LAYERS OF FIVE (5) CONTAINERS, OR AN APPROVED FILLER ASSEMBLY, AS DETAILED BY DRAWING 19'48-4042A/5-20PM1001, 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 IN 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 BULK-HEADS.
7. FOR THE SHIPMENT OF A PARTIAL UNIT CONSISTING OF ONE OR TWO LAYERS, THE PROCEDURES SHOWN ON PAGE 92 MAY BE MORE ECONOMICAL.

**KEY NUMBERS**

- ① SUPPORT PIECE, 2" X 6" BY UNIT LENGTH (3 REQD). POSITION ON TOP OF THE STRAPPING BOARD OF A PALLET UNIT.
- ② RETAINER PIECE, 2" X 4" X 52-1/2" (2 REQD). NAIL TO THE SUPPORT PIECES, 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 "M" ON PAGE 2 AND SPECIAL NOTE 3 AT LEFT.
- ④ STRUT, 4" X 4" BY UNIT LENGTH MINUS 6" (3 REQD). TOENAIL TO THE PARTIAL-UNIT GATE, PIECE MARKED ③, W/2-16d NAILS AT EACH END.
- ⑤ STRAPPING BOARD, 2" X 4" BY A LENGTH TO SUIT (2 REQD). NAIL TO THE STRUTS, PIECES MARKED ④, W/3-10d NAILS AT EACH JOINT.
- ⑥ BATTEN, 2" X 2-1/2" (ACTUAL SIZE) BY A LENGTH TO SUIT (DOUBLED) (2 REQD). LAMINATE W/1-10d NAIL EVERY 8". POSITION UNDER CONTAINER BELL PRIOR TO TENSIONING STRAP.
- 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" STRAPPING (4 REQD, 2 PER JOINT). SEE GENERAL NOTE "O" ON PAGE 2.

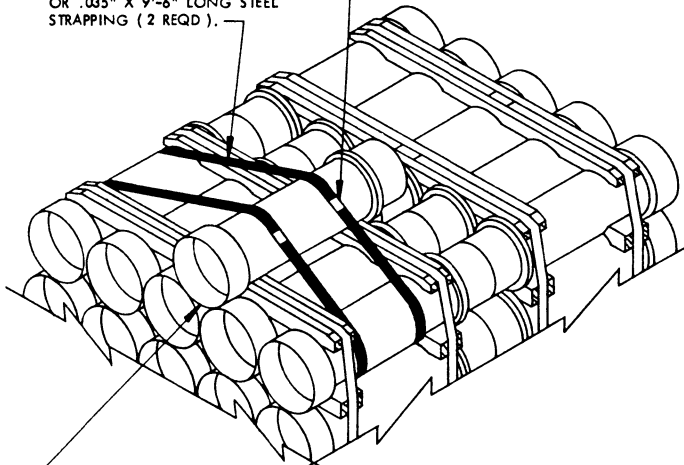


**PARTIAL-UNIT GATE B**

THE LOCATION OF THE VERTICAL PIECES MUST BE ADJUSTED TO MATCH THE VERTICAL PIECES OF THE APPLICABLE CENTER GATE, SO AS TO ALIGN WITH THE DUNNAGE PIECES OF A UNIT.

UNITIZING STRAP, 1-1/4" X .031" OR .035" X 9'-6" LONG STEEL STRAPPING (2 REQD.).

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



POSITION CONTAINER SO AS TO BE CENTERED ON THE JOINTS OF THE CONTAINERS BELOW.

SECUREMENT OF ONE CONTAINER

ROUTED DUNNAGE METHOD UNIT SHOWN AS TYPICAL.

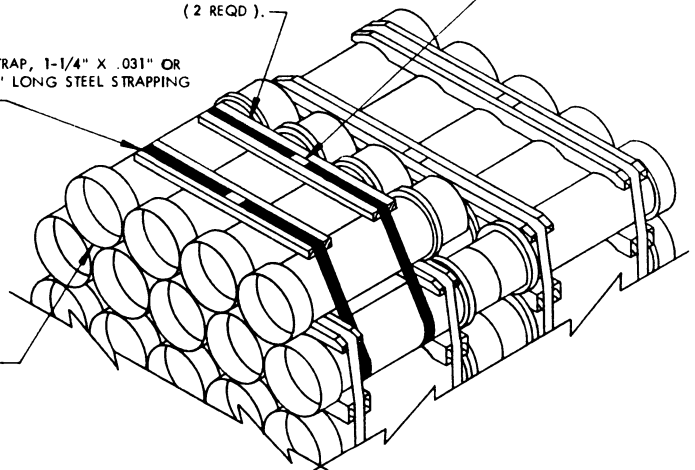
SPECIAL NOTES:

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 LEFTOVER CONTAINERS. LEFT-OVER 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 92 OR WITHIN A LAYER AS SHOWN ON PAGES 89 AND 90.
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, ASSEMBLY, 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 STRAP MUST NOT GO AROUND THE INTERMEDIATE DUNNAGE ASSEMBLY FOR THE FLAT DUNNAGE METHOD UNITS. THE STRAP MUST BE THREADED BEHIND THE 2" X 2" PIECES OF THE ASSEMBLIES AS SHOWN BELOW.
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 LEFT-OVER CONTAINERS IN ANY OF THE LOADS DEPICTED HEREIN.

STRAPPING BOARD, 1" X 4" X 26" (2 REQD.).

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

UNITIZING STRAP, 1-1/4" X .031" OR .035" X 11'-0" LONG STEEL STRAPPING (2 REQD.).



POSITION CONTAINERS SO AS TO BE CENTERED ON THE JOINTS OF CONTAINERS BELOW.

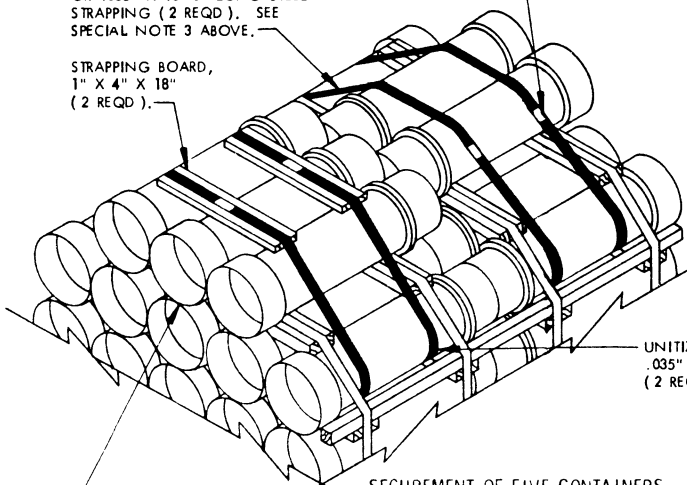
SECUREMENT OF FOUR CONTAINERS

ROUTED DUNNAGE METHOD UNIT SHOWN AS TYPICAL.

UNITIZING STRAP, 1-1/4" X .031" OR .035" X 10'-0" LONG STEEL STRAPPING (2 REQD.). SEE SPECIAL NOTE 3 ABOVE.

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

STRAPPING BOARD, 1" X 4" X 18" (2 REQD.).

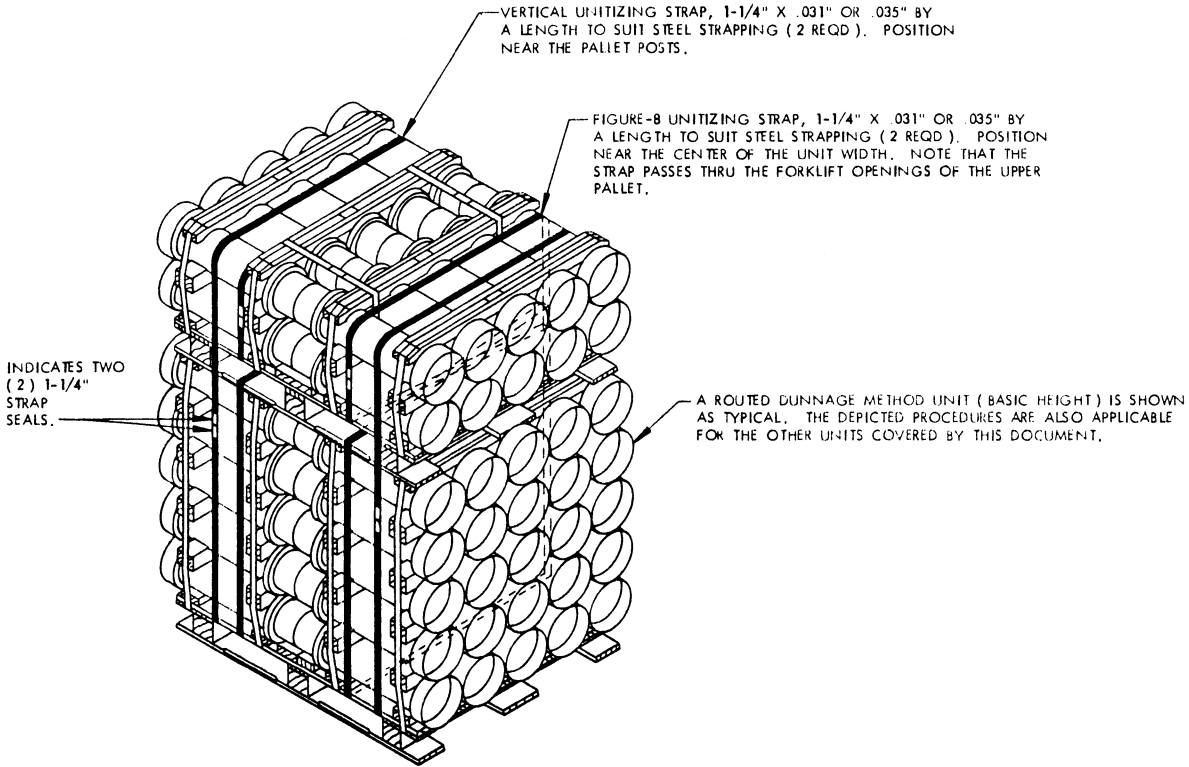


UNITIZING STRAP, 1-1/4" X .031" OR .035" X 10'-6" LONG STEEL STRAPPING (2 REQD.). SEE SPECIAL NOTE 3 ABOVE.

SECUREMENT OF FIVE CONTAINERS

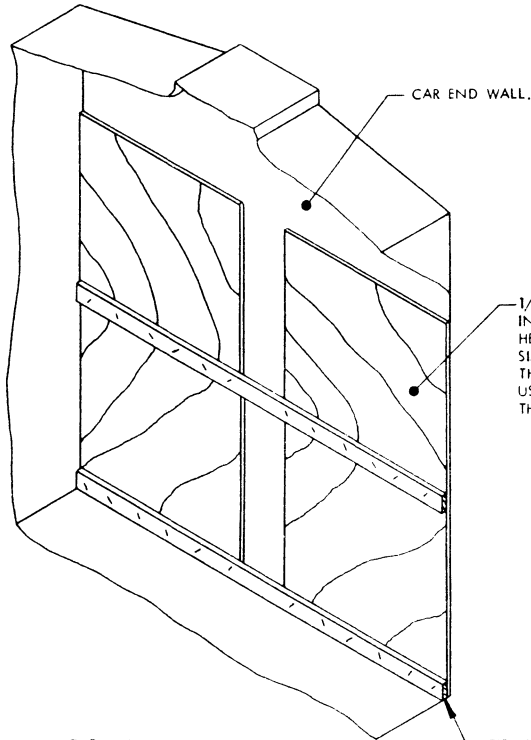
POSITION CONTAINER SO AS TO BE CENTERED ON THE LENGTH OF THE UNIT.

FLAT DUNNAGE METHOD UNIT SHOWN AS TYPICAL. SEE SPECIAL NOTE 3 ABOVE.



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 METHOD FOR ONE OR TWO LAYERS, REFER TO THE PROCEDURES ON PAGE 90.

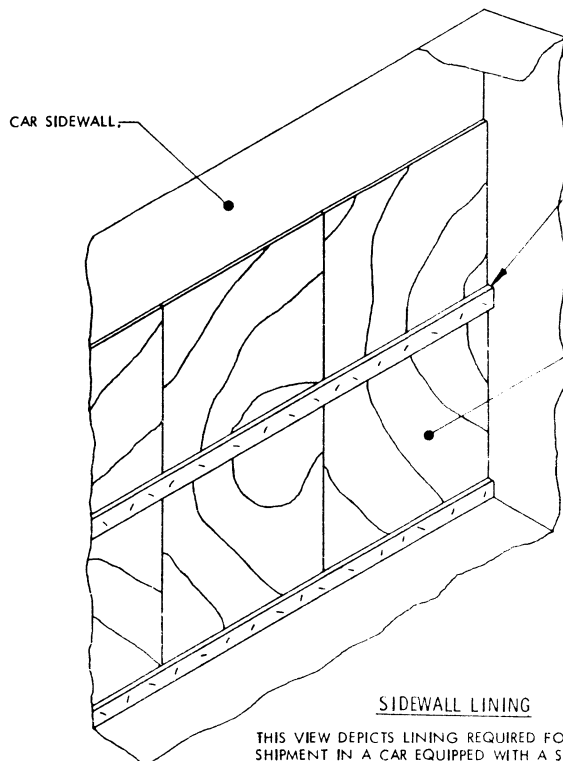


1/2" MINIMUM THICK PLYWOOD, UNIT LENGTH IN WIDTH (48" WIDE MAY BE USED) BY LOAD HEIGHT. NAIL TO THE TIE PIECES W/1-APPLICABLY SIZED NAIL EVERY 8" AND CLINCH. NOTE THAT THE APPLICABLE SEPARATOR GATE MAY BE USED IN LIEU OF PLYWOOD. POSITION WITH THE VERTICAL PIECES AGAINST THE CAR END WALL.

TIE PIECE, 1" X 4" BY CAR WIDTH MINUS 1" (MINIMUM OF 2 REQD.).

**END-WALL LINING**

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



TIE PIECE, 1" X 4" BY RANDOM LENGTH. LOCATE SO AS TO BE UNDER THE "OVERHANG" OF THE PALLET UNITS. NOTE THAT THE UPPER 1" X 4" PIECE MAY BE POSITIONED ABOVE THE TOP OF THE LOAD.

1/4" MINIMUM PLYWOOD, 1/8" MINIMUM HARDBOARD, OR .060" MINIMUM THICK SOLID WALL FIBERBOARD. NAIL PLYWOOD OR HARDBOARD TO 1" X 4" W/1 APPLICABLY SIZED NAIL EVERY 8". STAPLE FIBERBOARD TO 1" X 4" W/1 STAPLE EVERY 6". NOTE THAT SEPARATOR GATES, OR SIMILARLY POSITIONED VERTICAL 1" X 6" LUMBER, MAY BE USED PROVIDING THEY ARE TIED TOGETHER TO PREVENT DISLODGEEMENT.

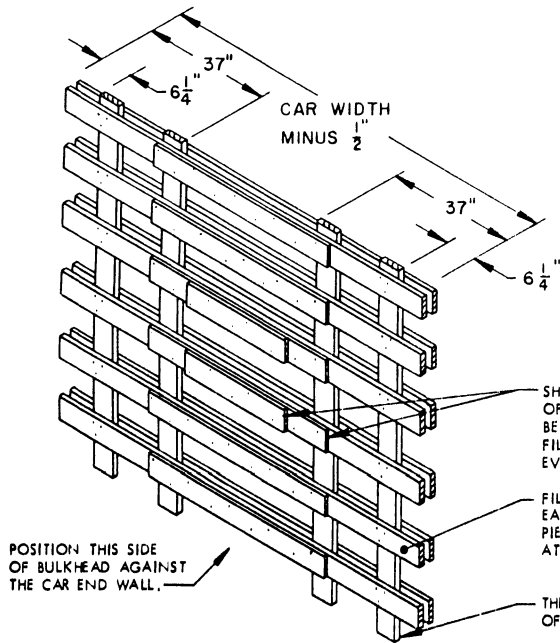
**SIDEWALL LINING**

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.

**DETAILS**

**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 18, IS SHOWN AS TYPICAL.



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 THE BULKHEAD. NAIL TO THE FILLER PIECE AND/OR LAMINATE W/1 APPLICABLY SIZED NAIL EVERY 6".

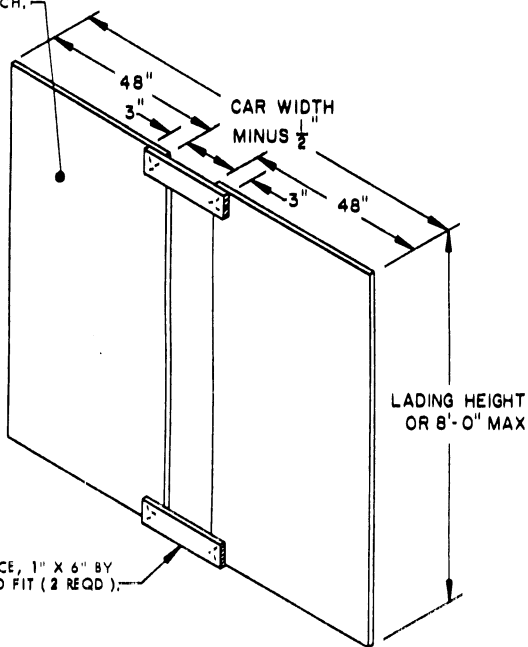
FILLER PIECE, 2" X 6" BY CAR WIDTH MINUS 1/2" IN LENGTH (ONE REQUIRED FOR EACH HORIZONTAL PIECE ON THE CENTER GATE). ALIGN WITH THE HORIZONTAL PIECES AND NAIL TO THE VERTICAL PIECES OF THE CENTER GATE W/3-10d NAILS AT EACH JOINT.

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

POSITION THIS SIDE OF BULKHEAD AGAINST THE CAR END WALL.

**END-OF-CAR BULKHEAD**  
SEE "NOTE ○" ABOVE.

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.

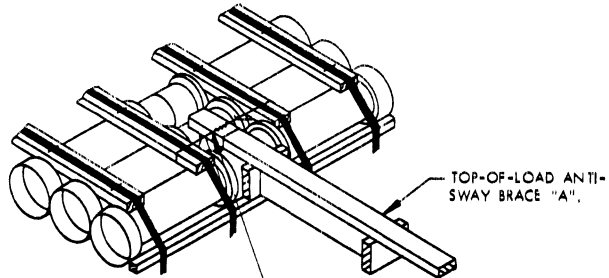


TIE PIECE, 1" X 6" BY CUT TO FIT (2 REQD).

**ALTERNATIVE SEPARATOR GATE**  
SEE "NOTE ▲" BELOW.

**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. THE ALTERNATIVE SEPARATOR GATE CAN ONLY BE USED IN LOADS WHICH ARE ONE OR TWO PALLET UNITS IN HEIGHT. PLYWOOD SEPARATOR GATES ARE NOT ECONOMICALLY FEASIBLE FOR A 3-LAYER LOAD.

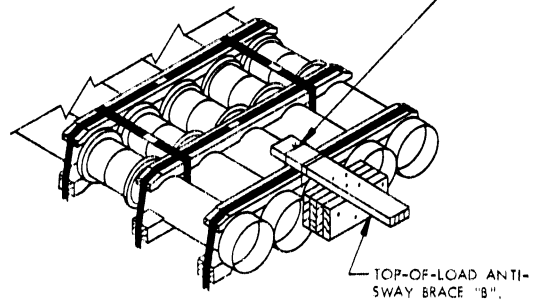


NO. 14 GAGE WIRE BY A LENGTH TO SUIT. FORM TWO LOOPS AROUND TOP-OF-LOAD ANTI-SWAY BRACE AND TWIST TO PREVENT DISPLACEMENT. THREAD EACH END OF WIRE UNDER AND AROUND A STRAPPING BOARD ON THE UNIT AND TWIST WIRE TO SELF, AS SHOWN.

**TIE WIRE APPLICATION A**

THE FLAT DUNNAGE METHOD UNIT SHOWN IS TYPICAL. THIS PROCEDURE IS APPLICABLE TO ALL CONTAINERS POSITIONED LENGTHWISE IN A LOAD.

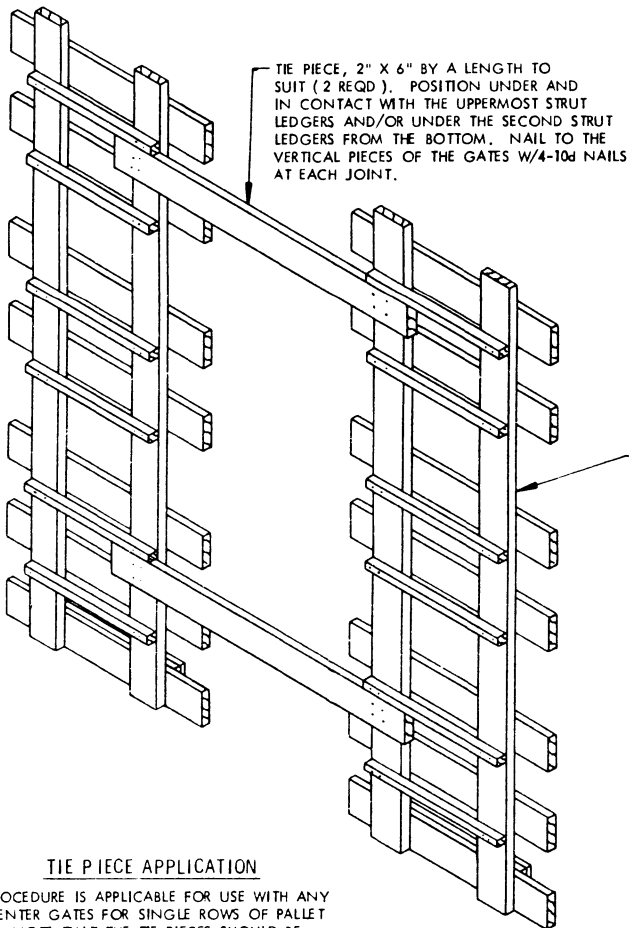
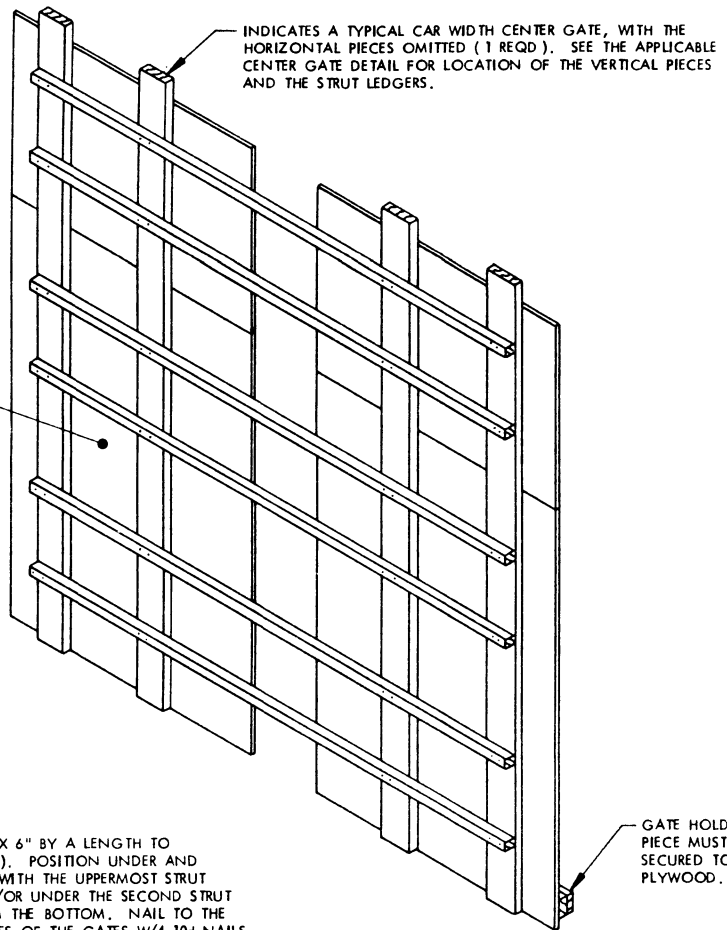
NO. 14 GAGE WIRE BY A LENGTH TO SUIT. FORM TWO LOOPS AROUND TOP-OF-LOAD ANTI-SWAY BRACE AND TWIST TO PREVENT DISPLACEMENT. THREAD EACH END OF WIRE UNDER AND AROUND A STRAPPING BOARD ON THE UNIT AND TWIST WIRE TO SELF, AS SHOWN.



**TIE WIRE APPLICATION B**

THE ROUTED DUNNAGE METHOD UNIT SHOWN IS TYPICAL. THE PROCEDURE SHOWN ABOVE IS APPLICABLE TO ALL CONTAINERS POSITIONED CROSSWISE IN A LOAD.

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 10, 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 8. PLYWOOD MAY BE ALLOWED TO EXTEND BEYOND THE UNIT LENGTH OR WIDTH, IF DESIRED.



PLYWOOD CENTER GATE ALTERNATIVE

CENTER GATE "G" 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.

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.

DETAILS

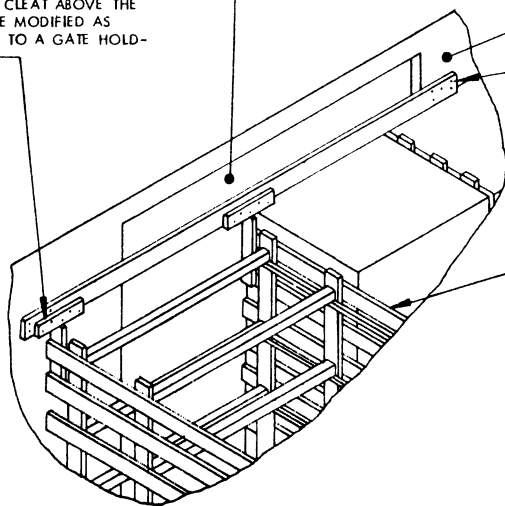
GATE HOLD-DOWN CLEAT, 2" X 4" X 18"  
(4 REQD). CENTER A CLEAT ABOVE THE  
RISER PIECE ON A GATE MODIFIED AS  
SHOWN BELOW. NAIL TO A GATE HOLD-  
DOWN W/5-10d NAILS.

INDICATES DOOR OPENING.

INDICATES CAR SIDEWALL.

GATE HOLD DOWN, 2" X 6" BY DOOR OPENING  
WIDTH PLUS 24" (MIN) (2 REQD). NAIL TO  
THE CAR SIDEWALL W/5-12d NAILS AT EACH END.

INDICATES A TYPICAL  
CENTER GATE.



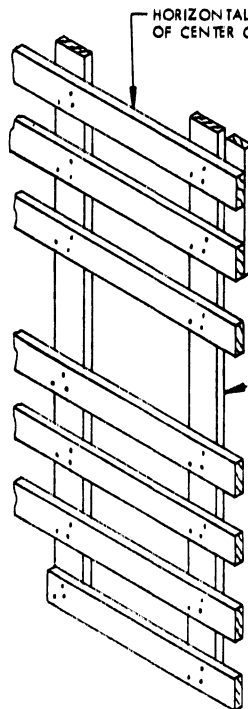
#### ALTERNATIVE GATE HOLD-DOWN

THIS VIEW DEPICTS AN ALTERNATIVE METHOD OF CENTER GATE HOLD DOWN WHICH CAN BE USED IF DESIRED, PROVIDING THE CAR HAS NAILABLE SIDEWALLS. THIS METHOD MAY BE APPLIED IN LIEU OF USING THE GATE HOLD DOWN PIECES WHICH ARE PART OF A CENTER GATE, OR IN LIEU OF THE 2" X 4" GATE HOLD DOWN PIECES WHICH SPAN THE CENTER VOID AREA AND ARE NAILED TO THE CENTER GATES. NOTE: FOR A GATE NOT LOCATED IN OR NEAR THE DOORWAY AREA, THE GATE HOLD-DOWN CLEAT MAY BE DOUBLED AND NAILED TO THE CAR SIDEWALL TO PROVIDE A HOLD-DOWN.

HORIZONTAL PIECE  
OF CENTER GATE.

RISER PIECE, 2" X 3" OR 2" X 4" BY A LENGTH TO SPAN AT LEAST  
TWO GATE HORIZONTAL PIECES AND TO EXTEND ABOVE THE LOAD  
(2 REQD PER GATE). SECURE BY NAILING TO THE HORIZONTAL  
PIECES ON THE CENTER GATE W/3-10d NAILS AT EACH JOINT.

VERTICAL PIECE OF  
CENTER GATE.

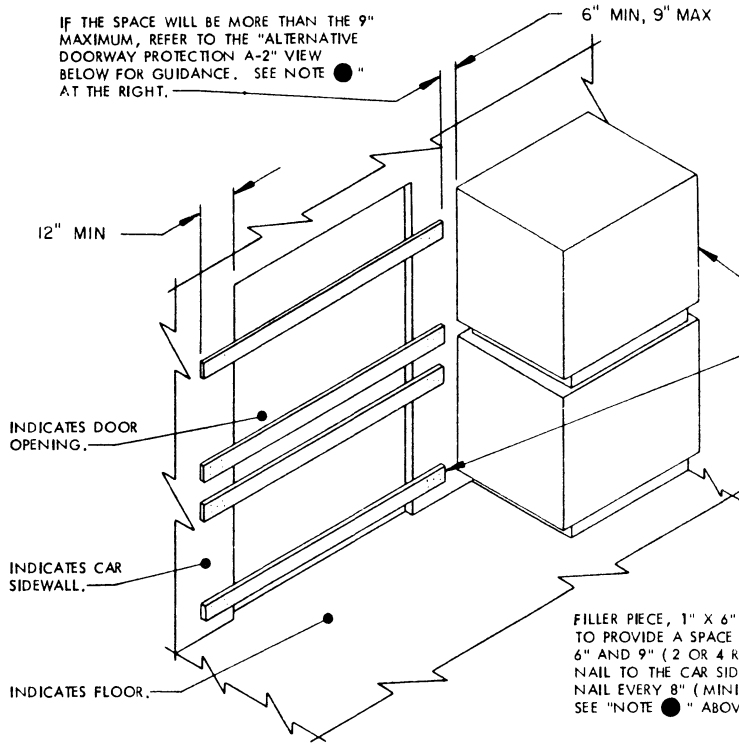


#### CENTER GATE MODIFICATION

THE MODIFICATION PROCEDURES SHOWN IN THIS VIEW ARE APPLICABLE FOR THE CENTER GATES WHICH HAVE THE VERTICAL PIECES INSET FROM THE END OF THE HORIZONTAL PIECES AS SHOWN ABOVE. THE RISER PIECE WILL PROVIDE A MEANS FOR CONTACTING THE GATE WITH THE GATE HOLD-DOWN AS SHOWN IN THE "ALTERNATIVE GATE HOLD-DOWN" DETAIL AT THE TOP OF THIS PAGE.



IF THE SPACE WILL BE MORE THAN THE 9" MAXIMUM, REFER TO THE "ALTERNATIVE DOORWAY PROTECTION A-2" VIEW BELOW FOR GUIDANCE. SEE NOTE ● AT THE RIGHT.



**NOTE ●:**

THE TOLERANCE DIMENSION (6" MIN, 9" MAX) IS ALLOWED TO PROVIDE FOR CLEARANCE DURING THE NORMAL LONGITUDINAL SHIFTING OF A LOAD IN TRANSIT, AND IS APPLICABLE WHEN ANTI-SWAY BRACING IS USED FOR A LOAD AND ALSO WHEN THE EXCESS SPACE ACROSS THE CAR IS SMALL ENOUGH THAT ANTI-SWAY BRACING OF ANY KIND IS NOT REQUIRED. IF AN EXCESS LATERAL SPACE IS FILLED BY FAILING LUMBER TO THE CAR SIDEWALL, AS IS PERMITTED FOR ALL LOADS OF CROSSWISE POSITIONED UNITS, THE DOOR SPANNERS WILL BE POSITIONED TO BUTT AGAINST THE FILL MATERIAL AND THE TOLERANCE DIMENSION WILL NOT APPLY. ALSO, THE FILLER PIECES SHOWN IN THE ALTERNATIVE DOORWAY PROTECTION A-2 VIEW WILL NOT BE USED. NOTE THAT THE THICKNESS OF THE DOOR SPANNER PIECES MUST EQUAL THE THICKNESS OF THE LUMBER FILL MATERIAL THAT IS NAILED TO THE CAR SIDEWALL.

**ALTERNATIVE DOORWAY PROTECTION A-1**

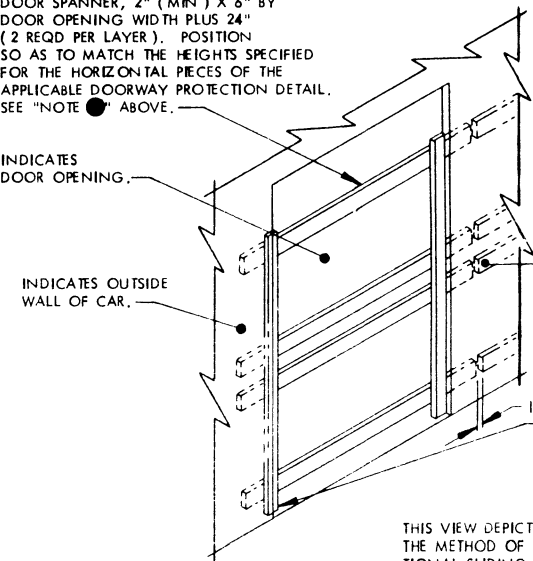
THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS HAVING NAILABLE SIDEWALLS AND EQUIPPED WITH CONVENTIONAL SLIDING DOORS, AND IS APPLICABLE ONLY FOR THE SIDE OPPOSITE THE LOADING SIDE OF THE CAR. THE METHOD CAN ALSO BE USED IN CARS EQUIPPED WITH PLUG DOORS; HOWEVER, A METHOD OTHER THAN THE "ALTERNATIVE 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 98, OR THE NAILED-DOWN BLOCKING AND STEEL STRAPPING METHOD DEPICTED IN THE LOAD VIEWS ON PAGES 14, 32, 46, AND 60.

DOOR SPANNER, 1" X 6" BY DOOR OPENING WIDTH PLUS 24" (2 REQD PER LAYER). POSITION SO AS TO MATCH THE HEIGHTS SPECIFIED FOR THE HORIZONTAL PIECES OF THE APPLICABLE DOORWAY PROTECTION DETAIL. NAIL TO THE CAR SIDEWALL W/5-6d NAILS AT EACH END. SEE "NOTE ●" ABOVE.

DOOR SPANNER, 2" (MIN) X 6" BY DOOR OPENING WIDTH PLUS 24" (2 REQD PER LAYER). POSITION SO AS TO MATCH THE HEIGHTS SPECIFIED FOR THE HORIZONTAL PIECES OF THE APPLICABLE DOORWAY PROTECTION DETAIL. SEE "NOTE ●" ABOVE.

INDICATES DOOR OPENING.

INDICATES OUTSIDE WALL OF CAR.



SUPPORT PIECE, 2" X 4" BY A LENGTH TO SUIT (2 REQD). POSITION AGAINST DOOR POST AND NAIL TO THE DOOR SPANNER PIECES W/3-10d NAILS AT EACH JOINT.

**ALTERNATIVE DOORWAY PROTECTION A-3**

THIS VIEW DEPICTS THE DOOR OPENING OF A CAR AS IT APPEARS WHEN LOOKING AT IT 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.

DOOR POST.

DOOR GATE. INSIDE WALL.

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.

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 RINGLOCK NAILS.

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

INDICATES DOOR OPENING.

INDICATES CAR SIDEWALL.

VIEW A

INDICATES STRAP ANCHOR PLATE.

DOOR SPANNER END OF STRAP.

ISOMETRIC VIEW

VIEW A

APPLICATION OF STRAPPING TO STRAP ANCHOR PLATE

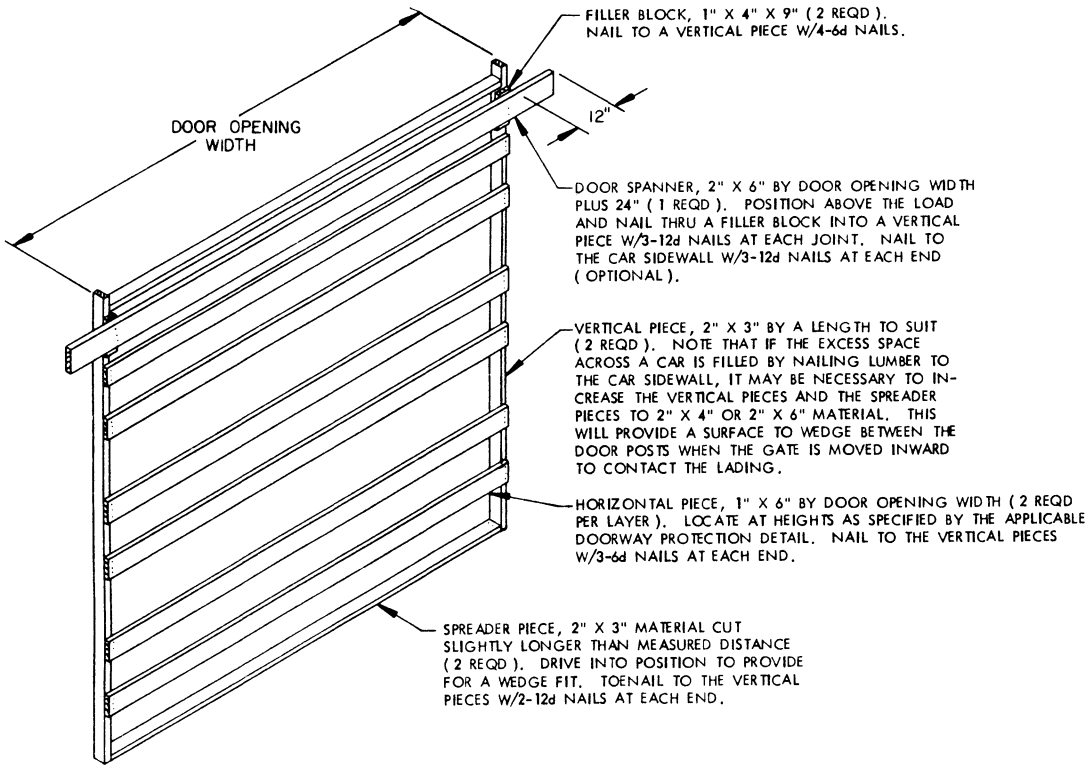
THESE VIEWS DEPICT THE PROPER THREADING OF A DOORWAY PROTECTION STRAP THRU AN ANCHOR PLATE.

ALTERNATIVE DOORWAY PROTECTION C

THIS METHOD OF DOORWAY PROTECTION IS ONLY FOR USE WITH THOSE LOADS IN WHICH THE PALLET UNIT 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.

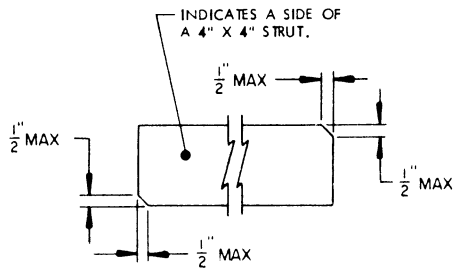
UNIT HEIGHT PLUS 11"  
LOAD HEIGHT MINUS 4"  
UNIT HEIGHT MINUS 4" 11"

A TOLERANCE OF PLUS OR MINUS 2" IS PERMISSIBLE.



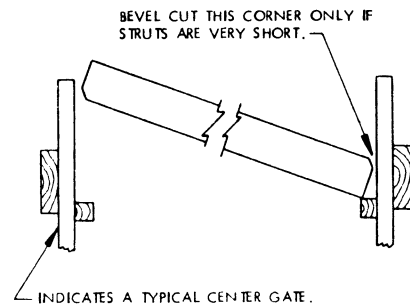
**ALTERNATIVE DOORWAY PROTECTION D**

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS WHEN THE DOOR POSTS ARE NOT AVAILABLE. IF THE CAR HAS AVAILABLE SIDEWALLS, NAIL-ON TYPE STRAPPING MAY BE USED TO SECURE THE GATE IN LIEU OF USING THE SPREADER PIECES. SEE THE "ALTERNATIVE DOORWAY PROTECTION B" DETAIL ON PAGE 98 FOR GUIDANCE. NOTE THAT THE DOOR SPANNER IN THIS DETAIL MAY BE USED AS A GATE HOLD-DOWN PIECE FOR THE "ALTERNATIVE GATE HOLD-DOWN" METHOD SHOWN ON PAGE 96.



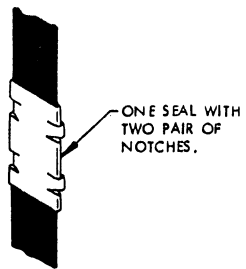
**BEVEL-CUT**

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 "V" ON PAGE 3 FOR ADDITIONAL STRUT INSTALLATION GUIDANCE.



ONE SEAL WITH  
TWO PAIR OF  
NOTCHES.

STRAP JOINT A

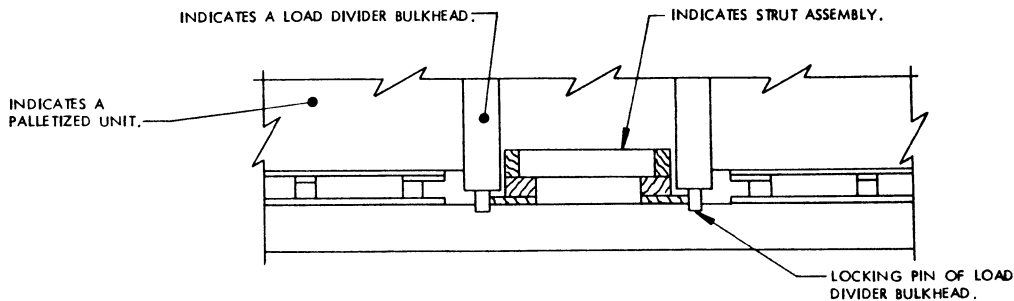
METHOD OF SECURING A  
STRAP JOINT WHEN USING  
A NOTCH-TYPE SEALER.



TWO SEALS, BUTTED  
TOGETHER, WITH  
TWO PAIR OF CRIMPS  
EACH SEAL.

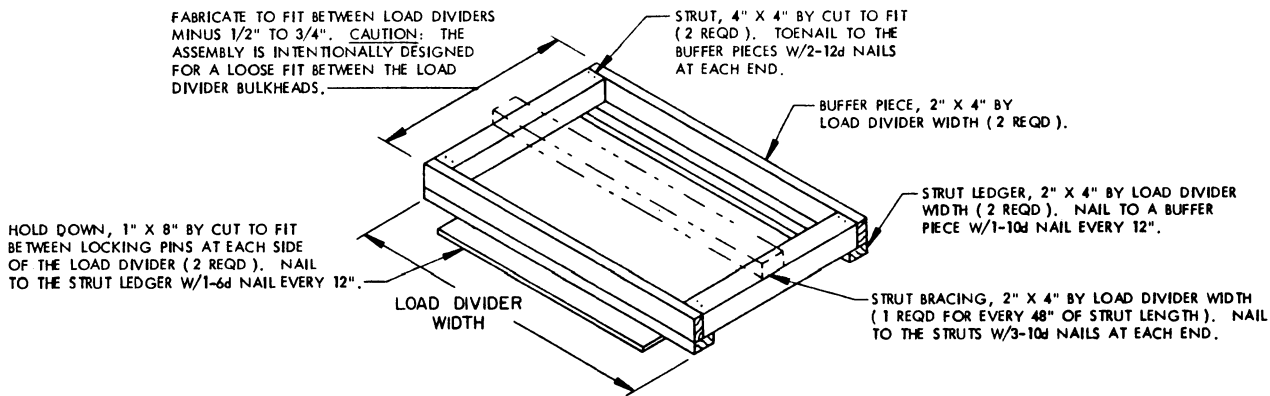
STRAP JOINT B

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



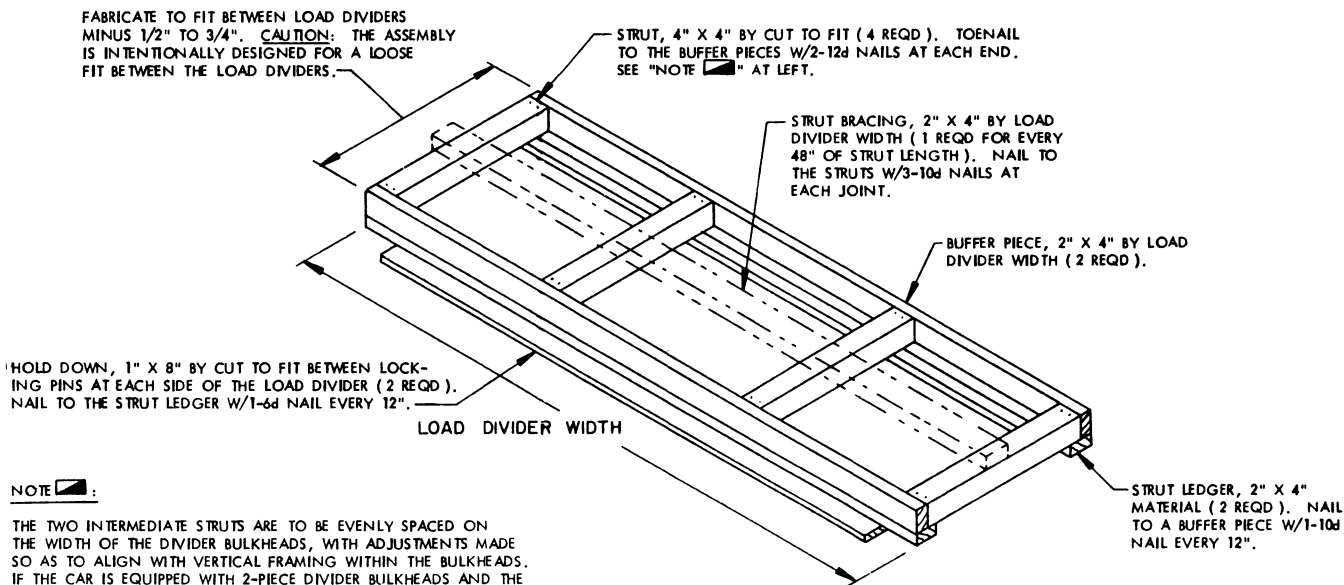
**INSTALLATION OF STRUT ASSEMBLY**

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 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. NOTE: TWO (2) ASSEMBLIES AS SHOWN ARE REQUIRED FOR A 2-PIECE BULKHEAD IF NOT LATERALLY ALIGNED. SEE "NOTE" BELOW.

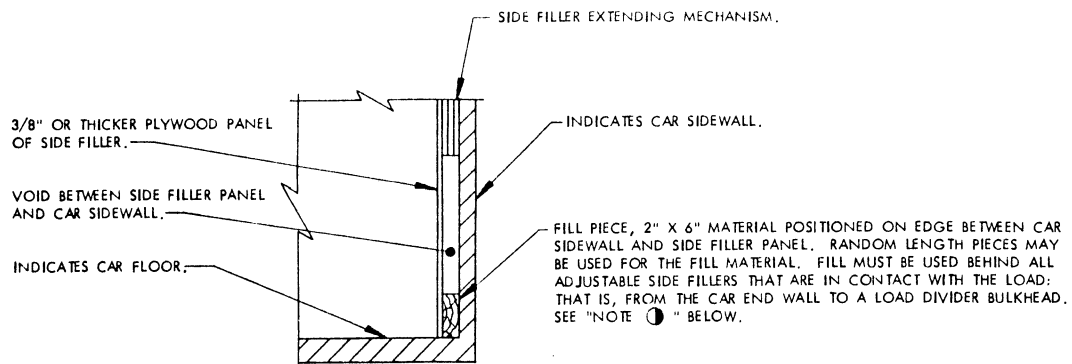


**NOTE:**

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

**STRUT ASSEMBLY FOR 1-PIECE BULKHEADS**

A STRUT ASSEMBLY IS REQUIRED WHEN THE LOAD BEHIND EITHER LOAD DIVIDER BULKHEAD EXCEEDS 50,000 POUNDS OF 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.

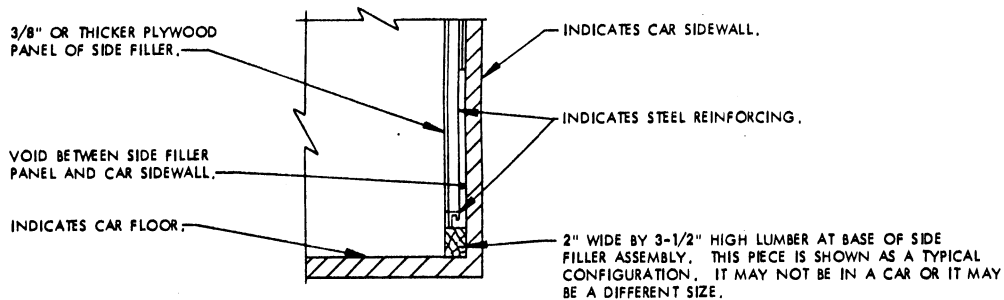


**TYPICAL TYPE A**

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

**NOTE 1:**

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.