



**GENERAL NOTES**

**(GENERAL NOTES CONTINUED)**

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1, AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE OUTLOADING PROCEDURES SPECIFIED IN THIS DRAWING ARE APPLICABLE TO THE SIMULATOR, ATOMIC EXPLOSION, M142, PACKED 1 PER METAL DRUM, UNITIZED. SUBSEQUENT REFERENCE TO SKIDDED UNIT HEREIN MEANS THE SKIDDED UNIT OF TWO (2) DRUMS WITH CONTENTS.
- C. FOR DETAIL OF THE SKIDDED UNIT, SEE PAGE 3 OF THIS DRAWING AND US ARMY DARCOM DRAWING 19-48-4138/105-20PA1000.

DIMENSIONS = 25-1/4" LONG X 49-1/2" WIDE X 41" HIGH.  
GROSS WEIGHT = 311 POUNDS (APPROX).

- D. THE OUTLOADING PROCEDURES SPECIFIED HEREIN ARE BASED ON CONVENTIONAL BOX CARS, OR ARE BASED ON BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES HAVING ADJUSTABLE AND/OR FIXED WALL MEMBER. PROCEDURES ARE ALSO INCLUDED FOR SHIPMENTS IN CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS. THE LOAD VIEWS DEPICT BOX CARS HAVING VARIOUS WIDTH THROUGH DOOR OPENINGS WITH DOORS OF THE CONVENTIONAL SLIDING TYPE. HOWEVER, THE DEPICTED PROCEDURES ARE ALSO APPLICABLE TO CARS WHICH ARE EQUIPPED WITH STAGGERED DOORS AND/OR PLUG TYPE DOORS. SEE GENERAL NOTES "E", "F" AND "G" BELOW FOR ADDITIONAL REQUIREMENTS APPLICABLE TO THE SPECIFIC TYPE OF CAR TO BE LOADED.
- E. THE LOADS AS SHOWN ON PAGES 4 THROUGH 13 ARE FOR CONVENTIONAL TYPE BOX CARS HAVING NAILABLE FLOORS. ALL METAL CARS, WITH NAILABLE FLOORS CAN BE USED, EXCEPT FOR SHIPMENT OF A PARTIAL LAYER REQUIRING THE USE OF A K-BRACE AS TYPICALLY SHOWN IN THE LOAD VIEW ON PAGE 8. THE TYPICAL PROCEDURES DEPICTED ON PAGE 6 CAN BE USED EFFECTIVELY TO SHIP A REDUCED QUANTITY OF PALLET UNITS IN AN ALL-METAL BOX CAR.
- F. THE LOADS AS SHOWN ON PAGES 20 THROUGH 23 ARE FOR BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES, AND 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 HEREIN. **CAUTION:** BOX CARS EQUIPPED WITH MEMBERS WHICH DO NOT MEET THE LOCATION REQUIREMENTS MUST NOT BE USED.
  - 1. A CROSS MEMBER, WHEN USED AS SPECIFIED BY ANY ONE OF THE DEPICTED OUTLOADING METHODS, WILL NOT BE RELIED UPON TO RETAIN MORE THAN 4,000 POUNDS OF LADING ON EITHER SIDE OF THE MEMBER. 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 PERMITS. 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.
  - 3. IF A CAR HAS A "BOWED END", RATHER THAN SQUARING OFF THE END BY INSTALLING DUNNAGE, ADDITIONAL CROSS MEMBERS CAN BE INSTALLED NEAR THE END OF THE CAR TO PROVIDE A "SQUARED" END. THESE CROSS MEMBERS MUST BE INSTALLED IN THE SAME QUANTITY AND AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE LOAD AS LOAD BLOCKING MEMBERS.

- G. THE LOADS AS SHOWN ON PAGES 24 THROUGH 26 ARE FOR CUSHIONED BOX CARS WHICH ARE EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH OR WITHOUT ADJUSTABLE SIDE FILLERS. **CAUTION:** 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

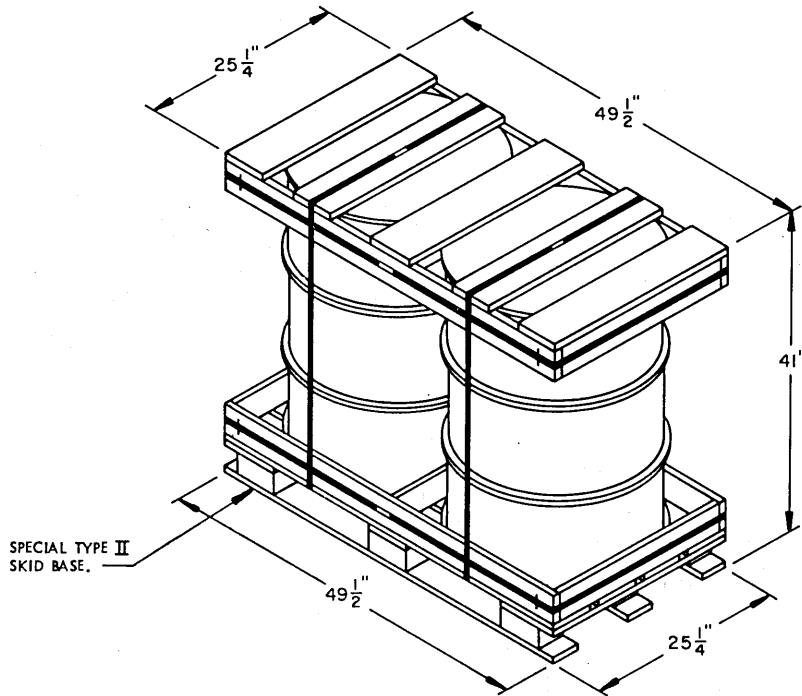
**MATERIAL SPECIFICATIONS**

- LUMBER** ----- : SEE TM 743-200-1, DUNNAGE LUMBER; FED SPEC MM-L-751.
- NAILS** ----- : FED SPEC FF-N-105, COMMON.
- STRAPPING, STEEL** --- : CLASS I, TYPE I OR IV, HEAVY DUTY, FINISH A OR B (GRADE 2), OR C; FED SPEC QQ-S-781.
- SEAL, STRAP** ----- : TYPE D, STYLE I, II, OR IV, CLASS H; FED SPEC QQ-S-781.
- STAPLE, STRAP** ----- : TYPE III, STYLE 3, 1-17/32" SIDE BY 3/4" LEG LENGTH, OR EQUIVALENT; FED SPEC FF-N-105.
- PLYWOOD** ----- : GROUP B OR C, GRADE C-D (EXTERIOR); FED SPEC NN-P-530. IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER EXTERIOR GRADE MAY BE SUBSTITUTED.
- WIRE** ----- : FED SPEC QQ-W-461.

STEEL CONSTRUCTION. ALSO, 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.

- 1. 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 26 FOR GUIDANCE. IF THE BACKS OF THE SIDE FILLER PANELS ARE REINFORCED WITH VERTICAL AND HORIZONTAL STEEL MEMBERS AS SHOWN IN THE "TYPICAL TYPE B" VIEW ON PAGE 26 THE "FILL PIECE" MATERIAL IS NOT REQUIRED. **NOTE:** DUNNAGE MATERIALS MUST NOT BE NAILED TO SIDE FILLERS.
- 2. 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.
- 3. **CAUTION:** THE WEIGHT OF THE LOAD TO BE RETAINED BY ONE LOAD DIVIDER BULKHEAD MUST NOT EXCEED ONE-HALF OF THE LOAD LIMIT WHICH IS STENCILED ON THE SIDE OF THE CAR.
- H. **NOTICE:** A SHIPMENT WILL BE POSITIONED IN THE CAR IN COMPLIANCE WITH THE WEIGHT DISTRIBUTION REQUIREMENTS OF THE AAR. THE TOTAL WEIGHT OF A LOAD IN A CAR MUST NOT EXCEED THE LOAD LIMIT WHICH IS STENCILED ON THE SIDE OF THE CAR. ALSO, THE LOAD WEIGHT ON THE TRUCK UNDER ONE END OF THE CAR MUST NOT EXCEED ONE-HALF OF THE LOAD LIMIT.
- J. 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 DESIGNATED ITEMS.
- K. THE OUTLOADING PROCEDURES SPECIFIED HEREIN CAN ALSO BE UTILIZED FOR THE SHIPMENT OF THE DEPICTED CONTAINERS WHEN THEY ARE EMPTY OR LOADED WITH AN ITEM WHICH IS IDENTIFIED DIFFERENTLY BY NOMENCLATURE THAN THE ITEM DESIGNATED WITHIN THE DRAWING TITLE.
- L. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN A CAR WHICH IS PARTIALLY LOADED WITH THE DESIGNATED ITEM, PROVIDING THE 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.
- M. DOORWAY PROTECTION REQUIREMENTS WITHIN THE "DOORWAY AREA" OF A CAR ARE INCLUDED IN THE PROCEDURES AND ARE APPLICABLE TO CARS HAVING EITHER CONVENTIONAL SLIDING AND/OR PLUG TYPE DOORS. THE "DOORWAY AREA" WITHIN A CAR IS DEFINED AS THE CARGO SPACE THAT IS ADJACENT TO A CONVENTIONAL TYPE AND/OR PLUG TYPE DOOR. THE LENGTH OF A "DOORWAY AREA" CAN BE AS MUCH AS 24 FEET IN SOME CARS THAT ARE EQUIPPED WITH STAGGERED DOORS. **CAUTION:** DUNNAGE MATERIAL MUST NOT BE NAILED TO ANY PLUG DOOR, WHETHER AUXILIARY OR MAIN, EXCEPT TO A NAILING STRIP FOR SECURING SUCH ITEMS AS THE DOORWAY SPANNER PIECE OF A K-BRACE ASSEMBLY, IF A DOOR IS SO EQUIPPED. 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 THROUGH THE HOLES IN THE DOOR LATCH ASSEMBLY ONE OR MORE TIMES, AND THE WIRE ENDS WILL BE TWISTED TOGETHER.
- N. IF THE CAR BEING USED FOR A SHIPMENT IS EQUIPPED WITH A NAILABLE METAL FLOOR AND THE NAIL SIZE FOR FLOOR NAILING IS MARKED ON THE SIDE WALL OF THE CAR, THAT GUIDANCE SHOULD BE APPLIED FOR THE NAILING OF THE APPLICABLE DUNNAGE PIECES. IF THE NAIL SIZE IS NOT SPECIFIED IN THE CAR, 30d NAILS SHOULD BE USED IN LIEU OF THOSE SPECIFIED IN THE KEY NUMBERS.
- O. 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".
- P. **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.
- Q. WHEN ANY STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) PAIR OF CRIMPS PER SEAL WILL BE USED TO SEAL THE JOINT. **CAUTION:** EXERCISE CARE DURING TENSIONING TO PREVENT DAMAGE TO THE LADING ITEMS.
- R. 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 VIEWS FOR CLARITY PURPOSES.

(CONTINUED ON PAGE 3)



**SKIDDED UNIT**

2 DRUMS (SIMULATOR; 1 PER DRUM) @ 104 LBS.  
 GROSS WEIGHT ----- 311 LBS (APPROX).  
 CUBE ----- 29.7 CU FT.

(GENERAL NOTES CONTINUED)

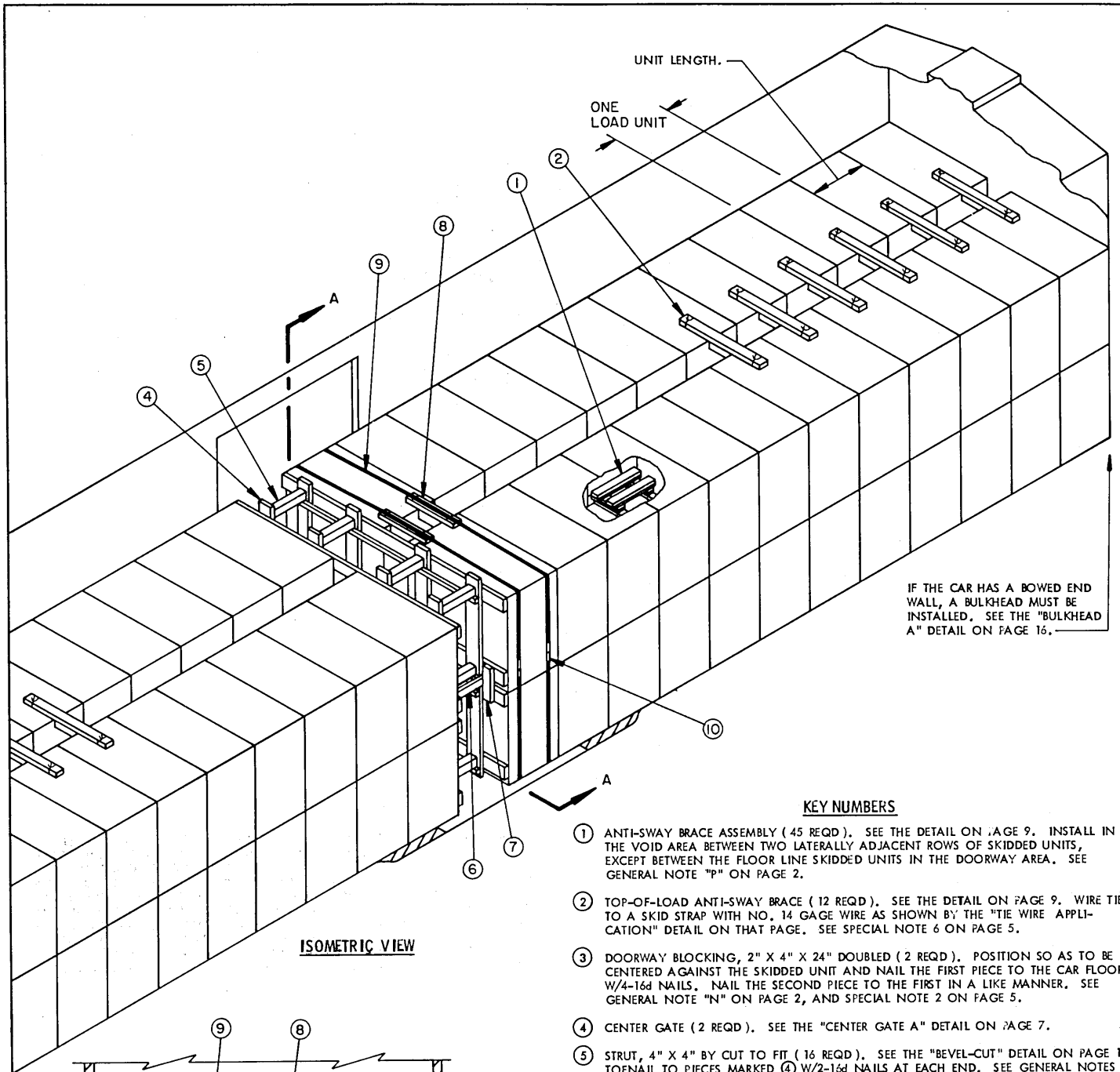
- S. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.
- T. LOAD-BLOCKING STRUTS WHICH ARE 48" OR LONGER MUST BE STIFFENED BY THE APPLICATION OF HORIZONTAL AND VERTICAL STRUT BRACING AS SHOWN ON PAGE 6. THESE PIECES ARE 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, 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.
- U. 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 OR THREE MORE LOAD UNITS IN ONE END THAN IN THE OTHER IS CONSIDERED TO BE AN OFFSET LOAD.
- 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, THEN THE OTHER END, WHICH CAN BE BEVELED ON THE LOWER CORNER IF DESIRED, WILL 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 17 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.

(CONTINUED AT RIGHT)

(GENERAL NOTES CONTINUED)

- W. THE SELECTION OF RAIL CARS FOR THE TRANSPORT OF THE DESIGNATED ITEMS 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 DOCUMENT, WILL BE SELECTED. WHEN SELECTING RAIL CARS, EVERY EFFORT SHOULD BE MADE TO OBTAIN BOX CARS THAT DO NOT HAVE BOWED END WALLS. CARS WITH 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 16 FOR GUIDANCE.

SKIDDED UNIT DETAIL

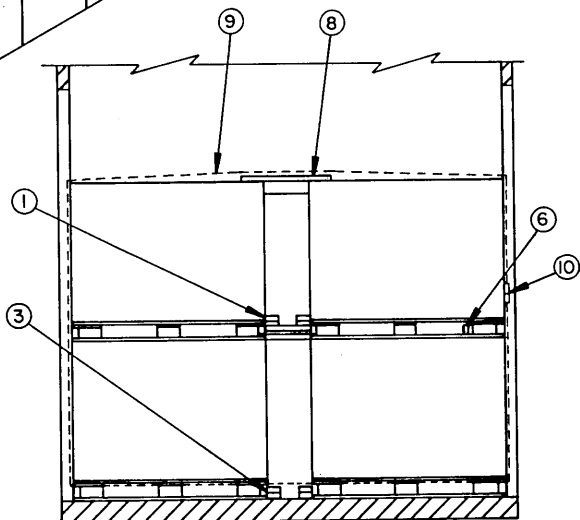


IF THE CAR HAS A BOWED END WALL, A BULKHEAD MUST BE INSTALLED. SEE THE "BULKHEAD A" DETAIL ON PAGE 16.

ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE ASSEMBLY ( 45 REQD ). SEE THE DETAIL ON PAGE 9. INSTALL IN THE VOID AREA BETWEEN TWO LATERALLY ADJACENT ROWS OF SKIDDED UNITS, EXCEPT BETWEEN THE FLOOR LINE SKIDDED UNITS IN THE DOORWAY AREA. SEE GENERAL NOTE "P" ON PAGE 2.
- ② TOP-OF-LOAD ANTI-SWAY BRACE ( 12 REQD ). SEE THE DETAIL ON PAGE 9. WIRE TIE TO A SKID STRAP WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON THAT PAGE. SEE SPECIAL NOTE 6 ON PAGE 5.
- ③ DOORWAY BLOCKING, 2" X 4" X 24" DOUBLED ( 2 REQD ). POSITION SO AS TO BE CENTERED AGAINST THE SKIDDED UNIT AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/4-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTE "N" ON PAGE 2, AND SPECIAL NOTE 2 ON PAGE 5.
- ④ CENTER GATE ( 2 REQD ). SEE THE "CENTER GATE A" DETAIL ON PAGE 7.
- ⑤ STRUT, 4" X 4" BY CUT TO FIT ( 16 REQD ). SEE THE "BEVEL-CUT" DETAIL ON PAGE 17. TOENAIL TO PIECES MARKED ④ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "T" AND "V" ON PAGE 3.
- ⑥ GATE HOLD-DOWN ASSEMBLY ( 2 REQD ). SEE THE "GATE HOLD-DOWN ASSEMBLY" DETAIL ON PAGE 17. POSITION TO EXTEND UNDER SKIDDED UNITS AND NAIL TO PIECES MARKED ④ W/2-10d NAILS AT EACH JOINT.
- ⑦ GATE HOLD-DOWN RETAINER PIECE, 2" X 4" X 15" ( 4 REQD ). POSITION AGAINST PIECE MARKED ⑥ AND NAIL TO THE HORIZONTAL PIECES OF A CENTER GATE W/3-10d NAILS AT EACH END.
- ⑧ SPACER ( 2 REQD ). SEE THE DETAIL ON PAGE 9.
- ⑨ DOORWAY PROTECTION STRAP, 1-1/4" X .035" OR .031" X 34'-0" LONG STEEL STRAPPING ( 2 REQD ). INSTALL TO ENCIRCLE THE LOAD UNIT WHICH EXTENDS INTO THE DOORWAY AREA. SECURE TO PIECE MARKED ⑧ W/2 STAPLES. SEE SPECIAL NOTE 2 ON PAGE 5.
- ⑩ SEAL FOR 1-1/4" STRAPPING ( 4 REQD, 2 PER STRAP ). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "Q" ON PAGE 2.



SECTION A-A

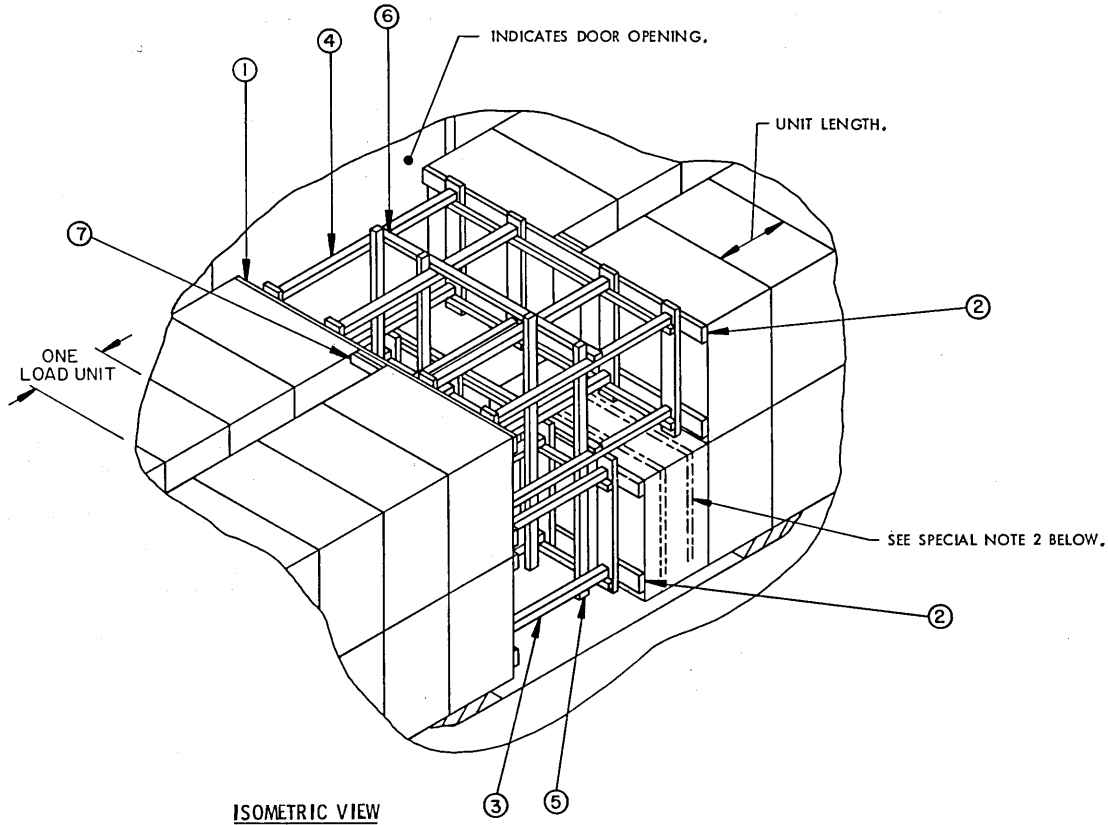
SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 6'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING DOOR OPENINGS OF OTHER WIDTHS OR STAGGERED DOORWAYS MAY ALSO BE USED.
2. DOORWAY PROTECTION IS REQUIRED FOR ALL LOAD UNITS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY BY ONE-HALF OR MORE OF THE UNIT LENGTH. FOR ALTERNATIVE DOORWAY PROTECTION REFER TO PAGE 18.
3. IF THE DELINEATED OUTLOADING METHOD IS USED FOR THE SHIPMENT OF A LOAD WHICH CONTAINS LESS UNITS THAN SHOWN IN ORDER TO SATISFY A LESS-THAN-FULL-LOAD QUANTITY, AND THE QUANTITY CANNOT BE SATISFIED BY OMITTING A COMPLETE LAYER, A "FILLER ASSEMBLY" AS DETAILED ON PAGE 15 MUST BE SUBSTITUTED IN THE PLACE OF EACH OMITTED UNIT AS SHOWN ON PAGE 14. FOR SOME LESS-THAN-FULL-LOAD QUANTITIES, IT MAY BE DESIRABLE TO USE "PARTIAL LAYER (TIER) BRACING" AS SHOWN ON PAGE 6 OR ONE OR TWO "K-BRACE" ASSEMBLIES AS DETAILED ON PAGE 8. A "FILLER ASSEMBLY" MAY BE USED IN CONJUNCTION WITH EITHER THE "PARTIAL LAYER (TIER) BRACING" OR THE "K-BRACE", IF NECESSARY, FOR FURTHER ADJUSTMENT.
4. FOR SHIPMENT OF LESS-THAN-CAR-LOADS, REFER TO THE APPLICABLE GUIDANCE ON PAGES 10 AND 12.
5. IF A BOX CAR TO BE LOADED HAS BOWED END WALLS WHICH ARE BOWED OUTWARD TWO INCHES (2") OR MORE 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 CENTER GATE, SHOWN AS KEY NUMBER ④ ON PAGE 4, MAY BE USED FOR THE BULKHEAD. OMIT THE STRUT LEDGER AND POSITION WITH THE HORIZONTAL PIECES PLACED AGAINST THE LADING. SHIM MATERIAL OF A THICKNESS AND LENGTH AS REQUIRED WILL BE POSITIONED TO FILL THE VOID BETWEEN THE CAR ENDWALL AND THE BULKHEAD, AND SHALL BE NAILED TO THE VERTICAL PIECES W/3 APPLICABLE SIZED NAILS AT EACH JOINT. SEE "BULKHEAD A" ON PAGE 16.
6. THE ANTI-SWAY BRACE ASSEMBLY, SHOWN AS PIECES MARKED ①, AND THE TOP-OF-LOAD ANTI-SWAY BRACE, SHOWN AS PIECES MARKED ②, MAY BE OMITTED IF THE SPACE BETWEEN LATERALLY ADJACENT UNITS IS 6" OR LESS.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	248	83
2" X 2"	60	20
2" X 3"	8	4
2" X 4"	504	336
2" X 6"	131	131
4" X 4"	28	38
NAILS	NO. REQD	POUNDS
10d (3")	200	3-1/4
12d (3-1/4")	402	6-3/4
16d (3-1/2")	80	1-3/4
20d (4")	360	13
STEEL STRAPPING, 1-1/4" X .035" -----	72' REQD	11 LBS
SEAL FOR 1-1/4" STRAPPING -----	4 REQD	NIL
STAPLES -----	4 REQD	NIL
WIRE -----	48' REQD	NIL

LOAD AS SHOWN

<u>ITEM</u>	<u>QUANTITY</u>	<u>WEIGHT (APPROX)</u>
SKIDDED UNIT -----	92 -----	28,612 LBS
DUNNAGE -----		1,260 LBS
TOTAL WEIGHT -----		29,872 LBS



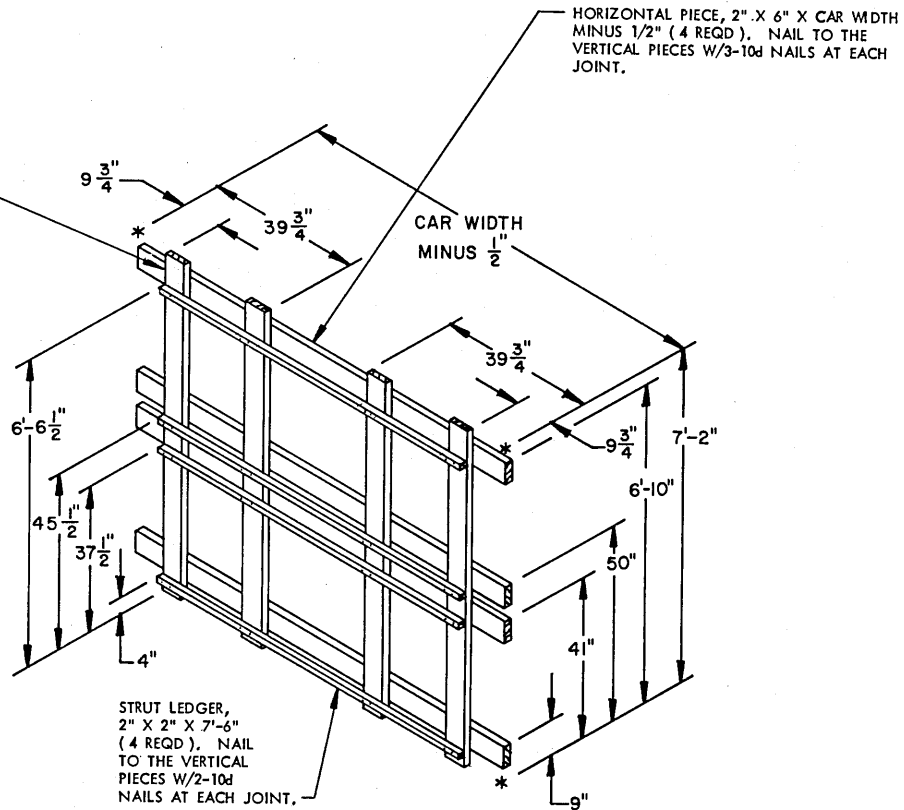
**SPECIAL NOTES:**

1. THE PROCEDURES FOR THE ADJUSTMENT OF A LOAD QUANTITY BY THE OMISSION OF THE TOP TIER FROM A LOAD UNIT IS SHOWN AS TYPICAL.
2. ONLY THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO PERMIT THE OMISSION OF THE UNITS FROM THE TOP TIER ARE SHOWN. THE ANTI-SWAY BRACING AND TOP-OF-LOAD ANTI-SWAY BRACING, AS REQUIRED, AND THE DOORWAY PROTECTION BLOCKING ARE NOT DEPICTED. REFER TO PAGE 4 FOR THE SPECIFICATIONS FOR THOSE ITEMS.
3. THE METHOD OF CENTER GATE HOLD DOWN USED WITHIN THE FULL LOADS OF LENGTHWISE-POSITIONED UNITS ( 2" X 3" MATERIAL ON EDGE AS PART OF AN ASSEMBLY WHICH EXTENDS UNDER SECOND-TIER UNITS ADJACENT TO THE CENTER GATES ) CANNOT BE USED FOR 1-TIER LOADS OR FOR GATES IN THE TOP 1-TIER PORTIONS OF A LOAD. THE "GATE HOLD DOWN" PROCEDURES AS SHOWN ON PAGE 7 MUST BE INSTALLED ON CENTER GATES, PIECES MARKED ① AND ② IN THE ABOVE LOAD.
4. THE LENGTH OF THE LOWER LEVEL OF STRUTS AND/OR LENGTH OF THE OMITTED UNITS MAY REQUIRE THAT MORE THAN ONE SET OF VERTICAL STRUT BRACING BE INSTALLED. TO PROTECT THE LADING FROM BEING PUNCTURED WHEN A SET OF VERTICAL STRUT BRACING IS INSTALLED ABOVE THE LOWER TIERS OF A LOAD, A SUITABLE LENGTH PAD OF 2" X 4" OR 2" X 6" MATERIAL MUST BE POSITIONED UNDER AND SECURED TO EACH APPLICABLE VERTICAL STRUT BRACING PIECE.

**KEY NUMBERS**

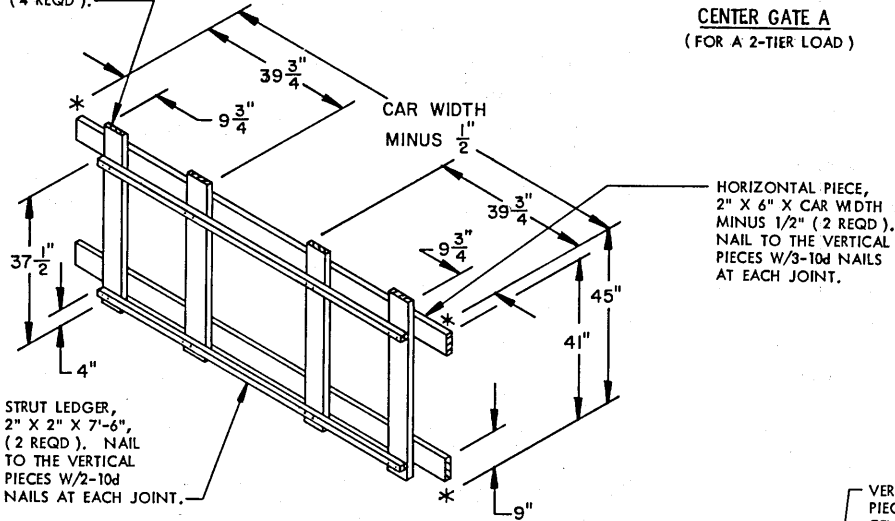
- ① CENTER GATE FOR TWO TIER HIGH LOAD ( 1 REQD ). SEE "CENTER GATE A" DETAIL ON PAGE 7. SEE GENERAL NOTE "P" ON PAGE 2 AND SPECIAL NOTE 3 AT LEFT.
- ② CENTER GATE FOR ONE TIER HIGH LOAD ( 2 REQD ). SEE "CENTER GATE B" DETAIL ON PAGE 7. SEE SPECIAL NOTE 3 AT LEFT.
- ③ STRUT FOR BOTTOM TIER, 4" X 4" X CUT-TO-FIT ( 8 REQD ). TOENAIL TO PIECES MARKED ① AND ② W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "T" AND "V" ON PAGE 3.
- ④ STRUT FOR UPPER TIER, 4" X 4" X CUT-TO-FIT ( 8 REQD ). TOENAIL TO PIECES MARKED ① AND ② W/2-16d NAILS AT EACH END. SEE SPECIAL NOTE 4 AT LEFT.
- ⑤ VERTICAL STRUT BRACING, 2" X 4" X 7'-2" ( 4 REQD ). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑥ HORIZONTAL STRUT BRACING, 2" X 4" X 7'-8" ( 2 REQD ). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑦ GATE LOCK PIECE, 2" X 4" BY CUT-TO-FIT BETWEEN LATERALLY ADJACENT UNITS ( DOUBLED ) ( 3 REQD, 1 PER GATE ). NAIL FIRST PIECE TO TOP HORIZONTAL OF GATE W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.

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



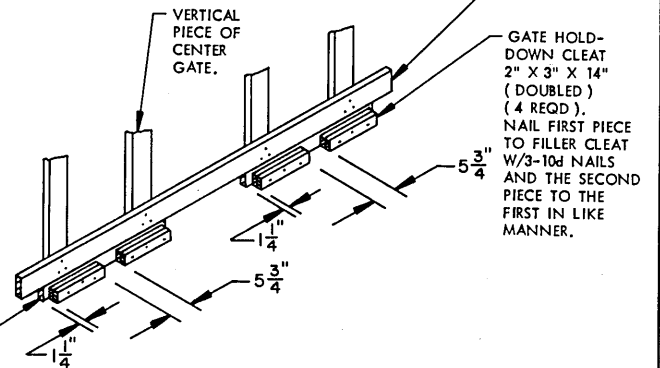
**CENTER GATE A**  
(FOR A 2-TIER LOAD)

VERTICAL PIECE,  
2" X 6" X 45"  
(4 REQD).



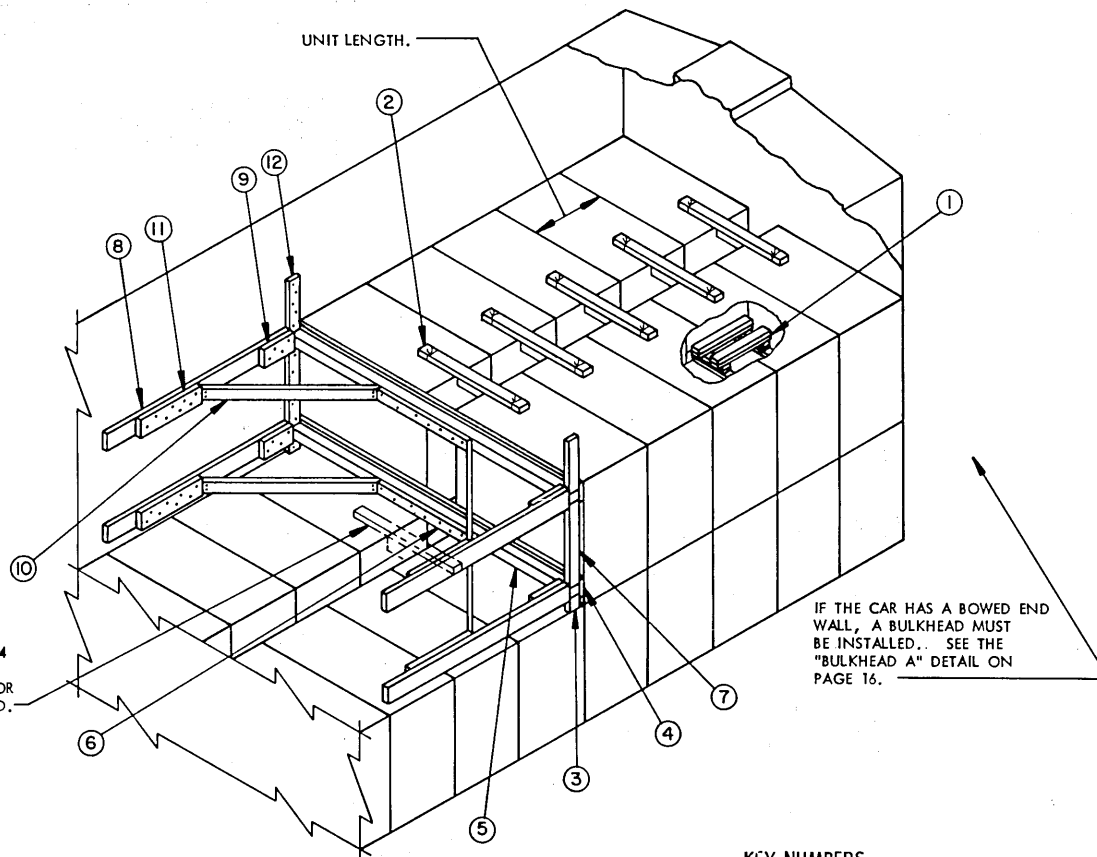
**CENTER GATE B**  
(FOR A 1-TIER LOAD)

FILLER CLEAT, 2" X 4" X 36"  
(2 REQD PER GATE).  
CENTER ON THE TWO (2)  
VERTICALS AND NAIL W/3-10d  
NAILS AT EACH END.



**GATE HOLD DOWN**

SEE SPECIAL NOTE 3 ON PAGE 6.



ONLY THE BLOCKING AND BRACING FOR THE PARTIAL TIER IS SHOWN; REFER TO THE FULL LOAD ON PAGE 4 FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.

IF THE CAR HAS A BOWED END WALL, A BULKHEAD MUST BE INSTALLED. SEE THE "BULKHEAD A" DETAIL ON PAGE 16.

### ISOMETRIC VIEW

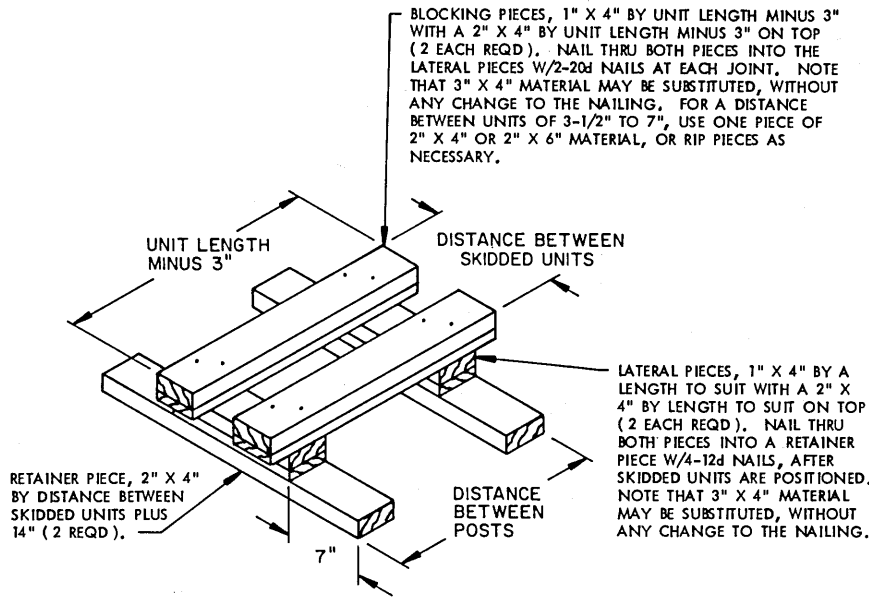
#### SPECIAL NOTES:

1. A 9'-2" WIDE CONVENTIONAL WOOD-LINED BOX CAR IS SHOWN. WOOD-LINED CARS OF OTHER WIDTHS CAN BE USED.
2. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ③, ④, ⑤, ⑦, ⑨ 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 ⑩ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑧ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF 60"), TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑧ TO THE FIRST W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑧ IS DOUBLED.
3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ⑥, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.

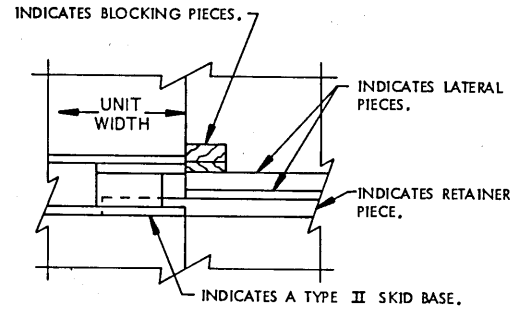
#### KEY NUMBERS

- ① ANTI-SWAY BRACE ASSEMBLY (AS REQD). SEE THE "ANTI-SWAY BRACE" DETAIL ON PAGE 9. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF SKIDDED UNITS. SEE GENERAL NOTE "P" ON PAGE 2 AND SPECIAL NOTE 6 ON PAGE 5.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (5 REQD). SEE THE DETAIL ON PAGE 9. WIRE TIE EACH END TO A SKID STRAP OF A UNIT WITH NO. 14 GAGE WIRE AS SHOWN ON THAT PAGE.
- ③ SUPPORT CLEAT, 2" X 4" X 5" (2 REQD). NAIL TO THE CAR SIDEWALL W/2-12d NAILS. SEE SPECIAL NOTE 2 AT LEFT.
- ④ HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑤, W/1-12d NAIL EVERY 6".
- ⑤ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD).
- ⑥ CENTER CLEAT 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑤, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.
- ⑦ SPACER CLEAT, 2" X 4" X 28" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.
- ⑧ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (4 REQD). NAIL TO CAR SIDEWALL W/16-12d NAILS EACH.
- ⑨ POCKET CLEAT, 2" X 6" X 12" (4 REQD). NAIL TO PIECE MARKED ⑥ W/4-16d NAILS.
- ⑩ DIAGONAL BRACE, 2" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL ON PAGE 9 FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑤ AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑧, W/2-16d NAILS AT EACH END.
- ⑪ BACK-UP CLEAT, 2" X 6" X 24" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑧, W/8-16d NAILS.
- ⑫ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO CAR SIDEWALL W/5-12d NAILS.



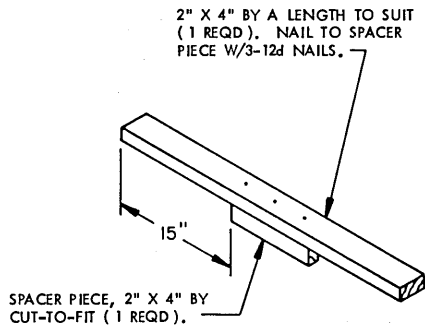


**ANTI-SWAY BRACE**



**INSTALLATION VIEW**

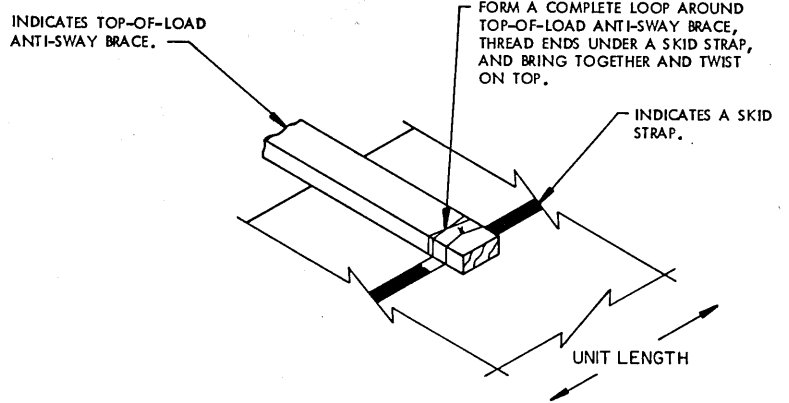
THIS VIEW DEPICTS AN ANTI-SWAY BRACE AS INSTALLED BETWEEN LATERALLY ADJACENT UNITS IN AN UPPER TIER. THE ASSEMBLY IS ALSO USED BETWEEN FIRST-TIER UNITS.



**END VIEW**

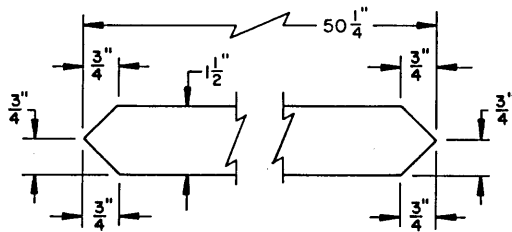
**TOP-OF-LOAD ANTI-SWAY BRACE**

THIS ASSEMBLY IS DESIGNED FOR USE BETWEEN THE TOPS OF LATERALLY ADJACENT SKIDDED UNIT STACKS IN EACH END OF A CAR TO PREVENT UNITS FROM TOPPLING INTO THE VOID AREA. THE ASSEMBLY WILL BE WIRE TIED TO UNIT STRAPS TO PREVENT DISPLACEMENT.



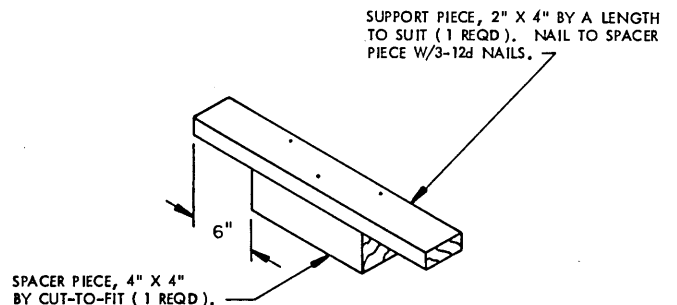
**TIE WIRE APPLICATION**

THIS VIEW DEPICTS THE SECUREMENT OF A TOP-OF-LOAD ANTI-SWAY BRACE TO THE TOP OF A SKIDDED UNIT BY WIRE TYING TO THE SKID STRAP WITH NO. 14 GAGE WIRE. THIS PROCEDURE IS APPLICABLE FOR UNITS POSITIONED LENGTHWISE IN THE CAR.



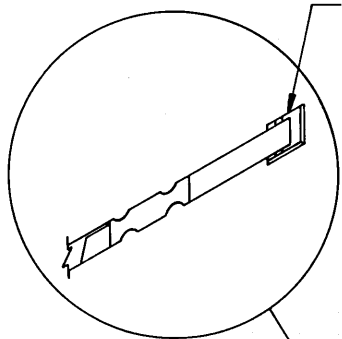
**DIAGONAL BRACE**

2" X 4" MATERIAL



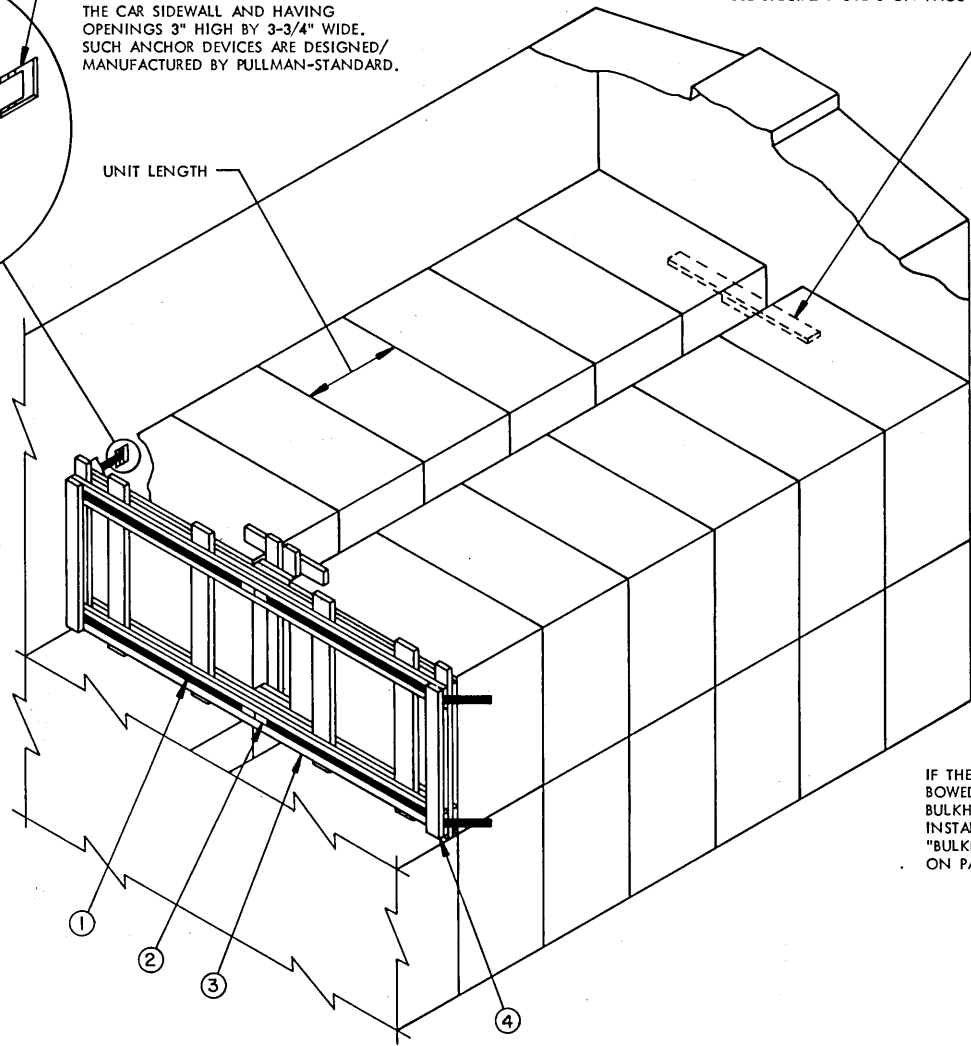
**SPACER**

THIS ASSEMBLY IS DESIGNED FOR USE BETWEEN THE TOPS OF LATERALLY ADJACENT SKIDDED UNIT STACKS IN THE DOORWAY AREA OF A CAR IN CONJUNCTION WITH DOORWAY PROTECTION STRAPS. THE STRAPPING WILL BE STAPLED TO THE SPACER TO PREVENT DISPLACEMENT.



A 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 SPECIAL NOTE 6 ON PAGE 11.



IF THE CAR HAS A BOWED END WALL A BULKHEAD MUST BE INSTALLED. SEE THE "BULKHEAD A" DETAIL ON PAGE 16.

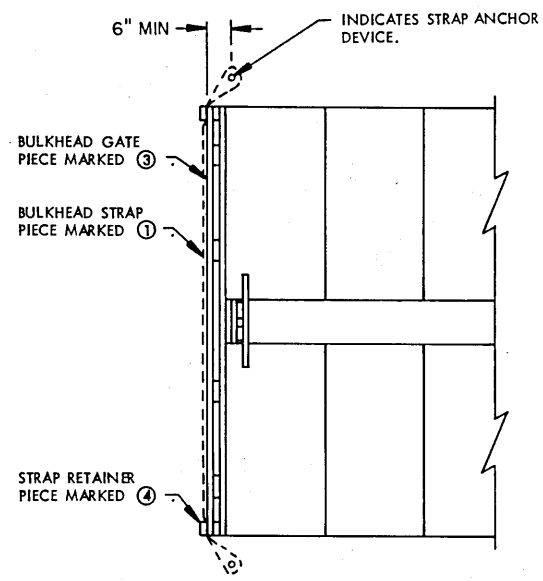
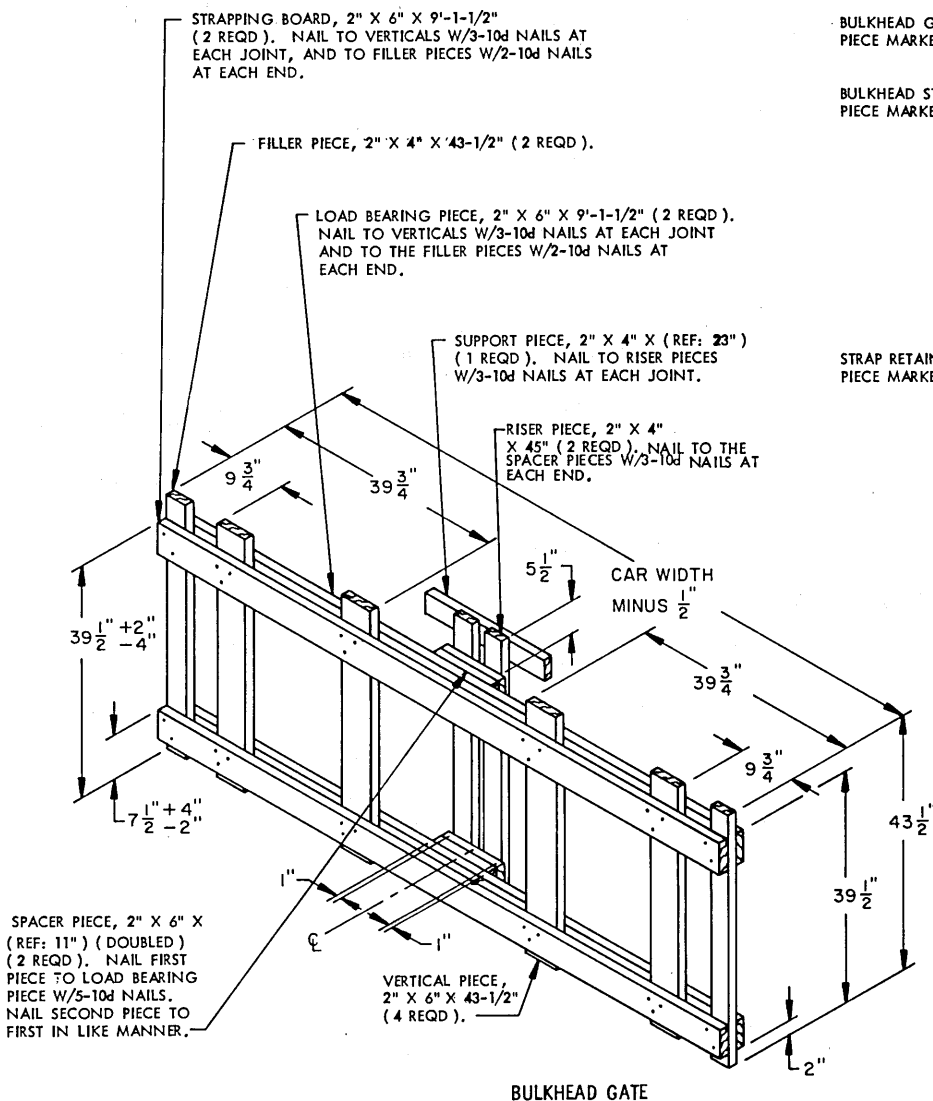
**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① BULKHEAD STRAP, 2" X .050" X 34'-0" LONG (REF "LOAD PATTERN/STRAP APPLICATION" DETAIL ON PAGE 11. SEE GENERAL NOTE "P" ON PAGE 2 AND SPECIAL NOTES 3 AND 4 ON PAGE 11.
- ② SEAL FOR 2" STRAPPING ( 12 REQD, 6 PER STRAP ). DOUBLE CRIMP EACH SEAL. SEE GENERAL "Q" PAGE 2.
- ③ BULKHEAD GATE ( 1 REQD ). SEE THE "BULKHEAD GATE" DETAIL ON PAGE 11. SEE SPECIAL NOTE 3 ON PAGE 11.
- ④ STRAP RETAINER, 2" X 4" B' LENGTH TO SUIT ( REF: 37-1/2" ) ( 2 REQD ). NAIL TO BULKHEAD GATE W/2-12d NAILS.

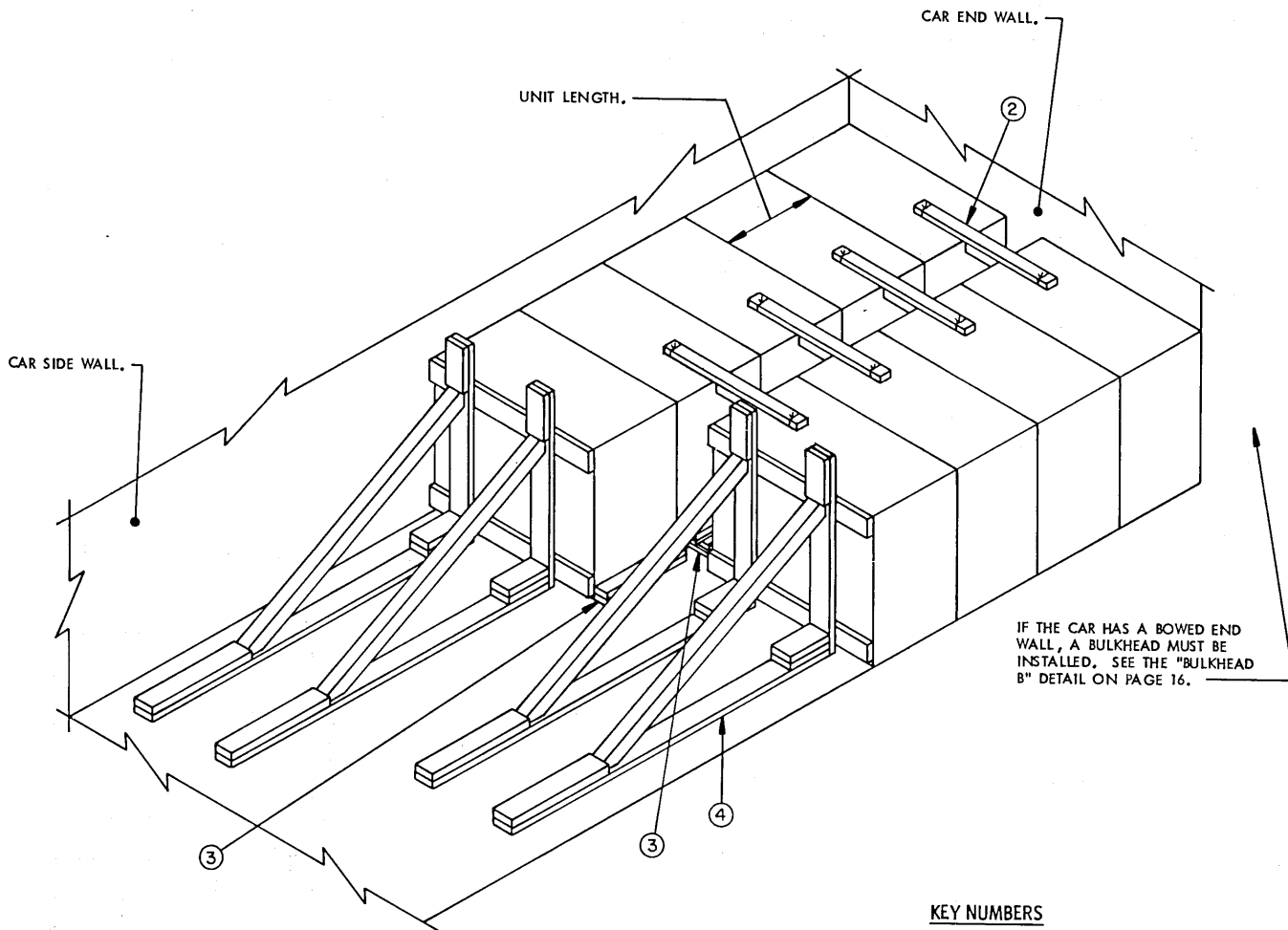
**SPECIAL NOTES:**

1. A 9'-6" 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 PROCEDURES SHOWN DEPICTING THE BULKHEAD GATE METHOD OF PARTIAL-LAYER (TIER) BRACING FOR THE ADJUSTMENT OF A LOAD QUANTITY IS TYPICAL.
3. A BULKHEAD GATE USED IN CONJUNCTION WITH TWO (2) STRAPS WILL RETAIN UP TO 12,000 POUNDS OF LADING.
4. 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 UNITS. THE STRAP ENDS OF EACH PAIR OF LONG AND SHORT LEGS WILL BE SECURED WITH TWO (2) SEALS BUTTED TOGETHER AND DOUBLE CRIMPED.
5. 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. A TOLERANCE IS ALLOWED ON DIMENSIONS TO PROVIDE FOR THIS ALIGNMENT.
6. ONLY THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO DEPICT THE PROCEDURES ARE SHOWN. REFER TO THE APPLICABLE LOAD PAGE FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.



**LOAD PATTERN/ STRAP INSTALLATION PLAN**

THE PARTIAL TOP VIEW SHOWN ABOVE DEPICTS THE POSITION OF PIECES MARKED ①, ③, AND ④



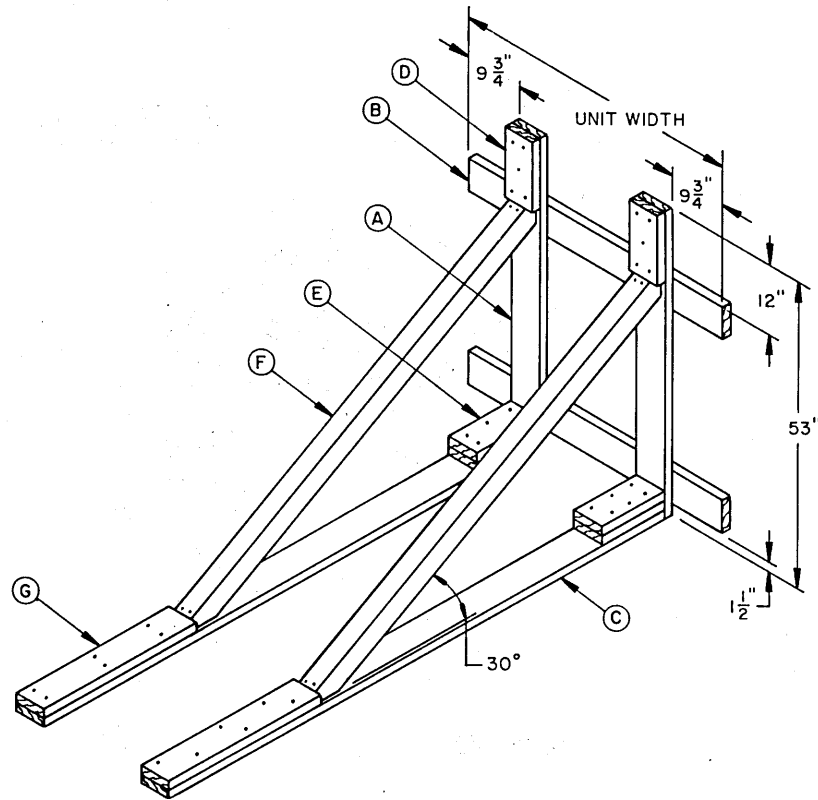
**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① ANTI-SWAY BRACE (4 REQD). SEE THE "ANTI-SWAY BRACE" DETAIL ON PAGE 9. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF SKIDDED UNITS. SEE GENERAL NOTE "P" ON PAGE 2 AND SPECIAL NOTE 6 ON PAGE 5.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (4 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE" DETAIL ON PAGE 9. WIRE TIE EACH END TO A SKID STRAP OF A UNIT WITH NO. 14 GAGE WIRE AS SHOWN ON THAT PAGE.
- ③ SIDE BLOCKING, 2" X 4" X 24" (DOUBLED) (1 REQD). POSITION AGAINST THE SKIDDED UNIT AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ④ KNEE BRACE ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 13 FOR CONSTRUCTION SPECIFICATIONS.

**SPECIAL NOTES:**

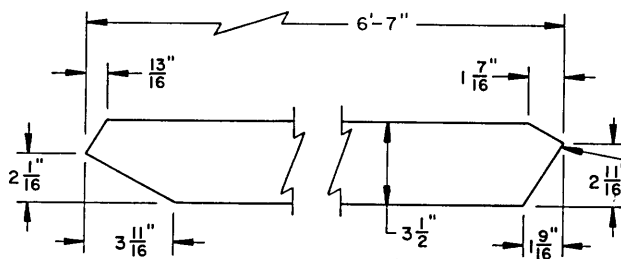
- 1. THIS LCL OUTLOADING PROCEDURE DEPICTS THE USE OF KNEE-BRACE ASSEMBLY BLOCKING IN A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR HAVING A WOOD OR NAILABLE METAL FLOOR. CARS OF OTHER WIDTHS CAN BE USED.
- 2. THE LOAD SHOWN FOR PARTIAL-LAYER BRACING (BOTTOM TIER ONLY) IS TYPICAL. THE PROCEDURES ARE ALSO APPLICABLE FOR OTHER QUANTITIES AT ONE AND/OR BOTH ENDS OF THE CAR.



**KNEE BRACE ASSEMBLY**

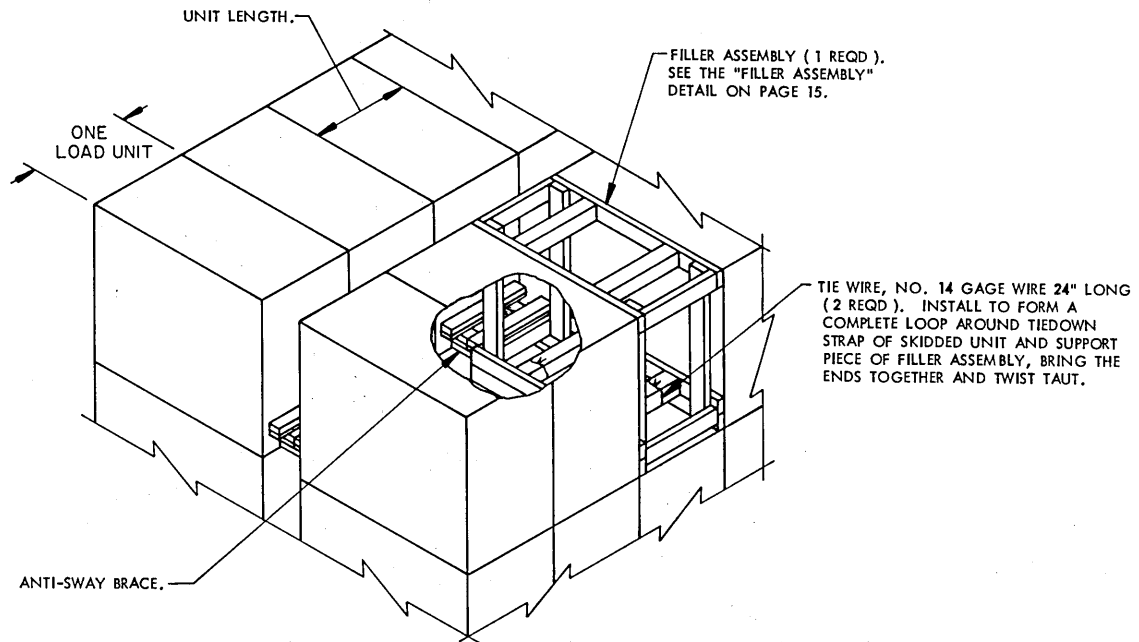
**KEY LETTERS**

- (A) VERTICAL PIECE, 2" X 6" X 53" (2 REQD).
- (B) HORIZONTAL PIECE, 2" X 6" X 49-1/2" (2 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.
- (C) FLOOR CLEAT, 2" X 6" X 8'-2" (2 REQD). ALIGN WITH A VERTICAL PIECE AND NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 8".
- (D) HOLD-DOWN CLEAT, 2" X 6" X 12" (2 REQD). NAIL TO A VERTICAL PIECE W/5-10d NAILS.
- (E) POCKET CLEAT, 2" X 6" X 12" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE FLOOR CLEAT, PIECE MARKED (C), W/4-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER AND TOENAIL IT TO THE VERTICAL PIECE, PIECE MARKED (A), W/2-16d NAILS.
- (F) BRACE, 4" X 4" X 6'-7" (2 REQD). SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TOENAIL TO THE VERTICAL PIECE AND TO THE FLOOR CLEAT, PIECES MARKED (A) AND (C), W/2-16d NAILS AT EACH END.
- (G) BACK-UP CLEAT, 2" X 6" X 30" (2 REQD). NAIL TO THE FLOOR CLEAT, PIECE MARKED (C), W/6-40d NAILS.



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

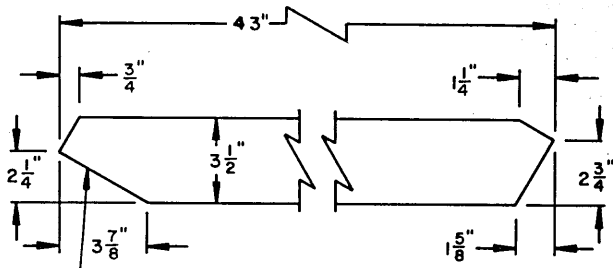
**BRACE**  
4" X 4" MATERIAL



ISOMETRIC VIEW

SPECIAL NOTES:

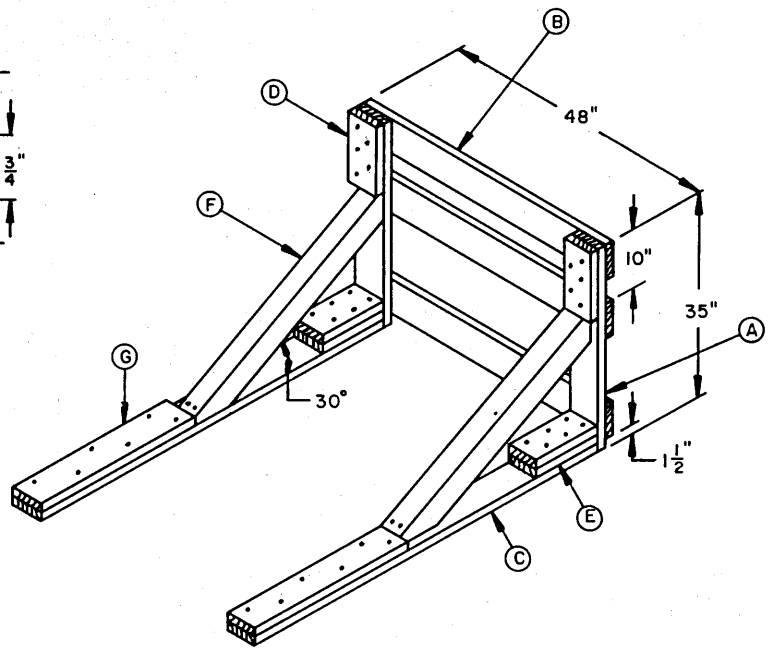
1. A PARTIAL VIEW OF A LOAD IN A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR HAVING ONE SKIDDED UNIT OMITTED FROM THE TOP LAYER IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. THIS METHOD OF PARTIAL-LAYER ( TIER ) BRACING ( OMITTING A UNIT FROM THE TOP TIER FOR ADJUSTMENT OF LOAD QUANTITY ) IS APPLICABLE FOR USE IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS AS WELL AS CONVENTIONAL BOX CARS. THE OMISSION OF A SECOND-TIER UNIT IS SHOWN AS TYPICAL.
3. THE OMITTED-UNIT PROCEDURE SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA OF THE CAR. ALSO, THERE SHOULD BE AT LEAST ONE ( 1 ) LOAD UNIT BETWEEN THE OMITTED UNIT AND A LOAD DIVIDER BULKHEAD, OR BETWEEN THE OMITTED UNIT AND A CENTER GATE FOR A LOAD IN A CONVENTIONAL BOX CAR.
4. ONLY THE BLOCKING AND BRACING FOR THE OMITTED UNIT IS SHOWN; REFER TO THE APPLICABLE LOAD PAGE FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.



THIS BRACE MUST BE INSTALLED WITH THIS BEARING SURFACE IN CONTACT WITH THE FLOOR CLEAT MARKED ©.

**DIAGONAL BRACE B**

4" X 4" MATERIAL. SEE KEY LETTER MARKED © ON THIS PAGE.

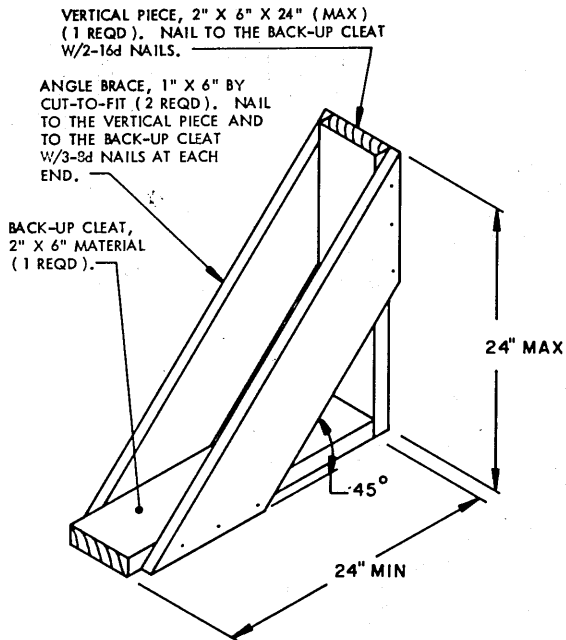


**KNEE BRACE ASSEMBLY**

THE KNEE BRACE ASSEMBLY SHOWN ABOVE AND ON PAGE 14 IS FOR USE AGAINST THE SIDE OF A PALLETIZED UNIT. IF IT IS TO BE USED AGAINST THE END OF A PALLETIZED UNIT CHANGE THE LENGTH OF PIECES MARKED © TO 41" IN LIEU OF 48" AND ALIGN THE TOP TWO PIECES MARKED © WITH THE HORIZONTAL STRAPPING BOARDS ON THE PALLETIZED UNIT.

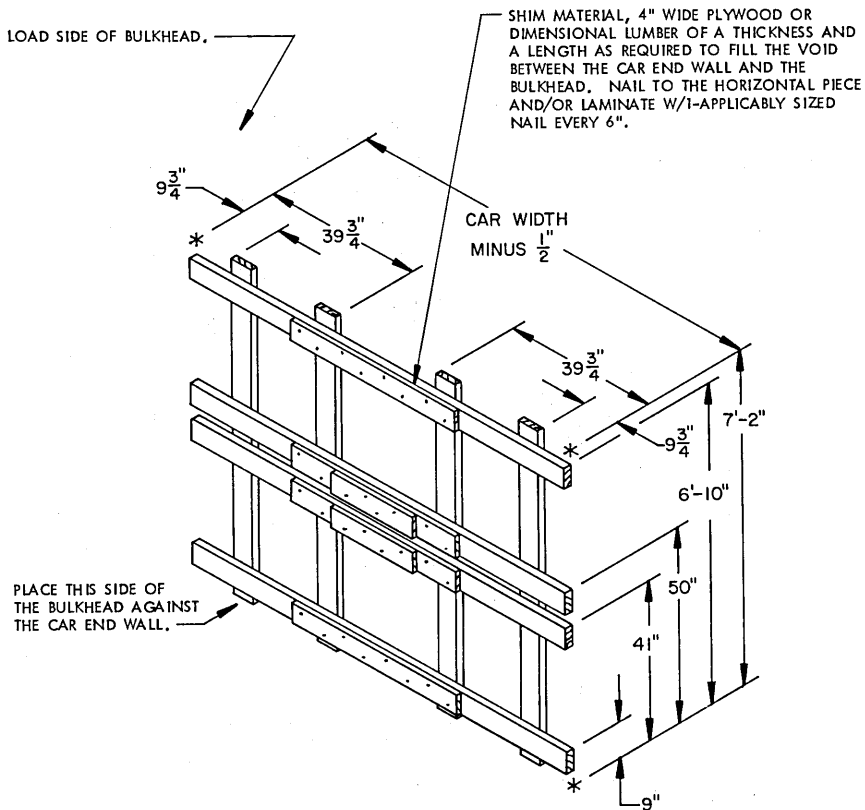
**KEY LETTERS**

- © VERTICAL PIECE, 2" X 6" X 35" (2 REQD).
- © HORIZONTAL PIECE, 2" X 6" X 48" (3 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH END.
- © FLOOR CLEAT, 2" X 6" X 67-1/4" (2 REQD). ALIGN WITH A VERTICAL PIECE AND NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 8".
- © HOLD-DOWN CLEAT, 2" X 6" X 12" (2 REQD). NAIL TO A VERTICAL PIECE W/5-10d NAILS.
- © POCKET CLEAT, 2" X 6" X 12" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE FLOOR CLEAT W/4-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER AND TOENAIL IT TO THE VERTICAL PIECE W/2-16d NAILS.
- © DIAGONAL BRACE, 4" X 4" BY CUT-TO-FIT (43" REF) (2 REQD). SEE THE DETAIL ABOVE FOR BEVEL CUTS REQUIRED. TOENAIL TO THE VERTICAL PIECE AND TO THE FLOOR CLEAT W/2-16d NAILS AT EACH END.
- © BACK-UP CLEAT, 2" X 6" X 30" (2 REQD). NAIL TO THE FLOOR CLEAT W/6-40d NAILS.



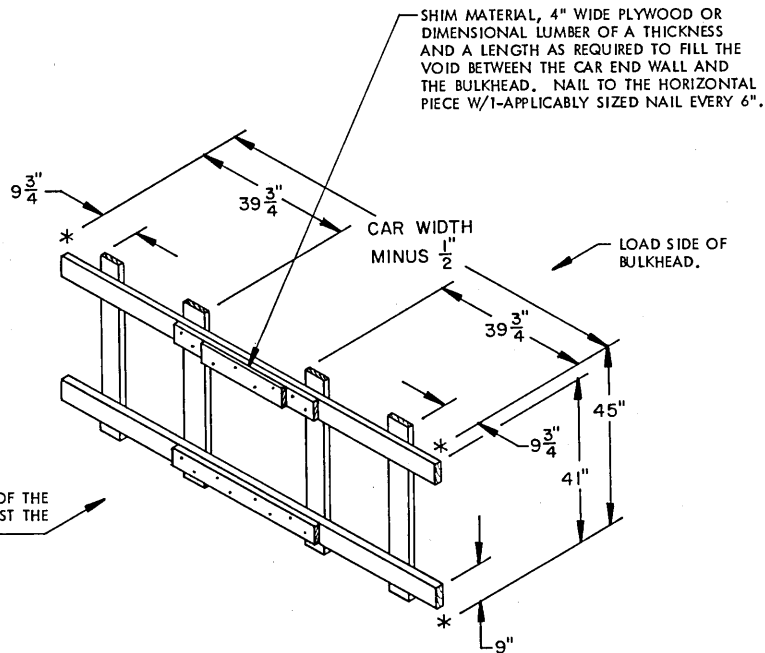
**LCL BRACE ASSEMBLY**

EACH LCL BRACE AS APPLIED FOR LONGITUDINAL BRACING WILL RETAIN 2,000 POUNDS OF LADING. A MINIMUM OF TWO (2) LCL BRACES MUST BE USED FOR LONGITUDINAL BRACING. EACH LCL BRACE AS APPLIED FOR LATERAL BRACING WILL SUPPORT 8,000 POUNDS OF LADING.



**BULKHEAD A**

THIS BULKHEAD IS DESIGNED FOR USE IN THE END OF A CAR TO PROVIDE FOR A SQUARE END. THE SPECIFIED GATE IS APPLICABLE FOR A TWO-TIER LOAD. USE DIMENSIONAL GUIDANCE AS SPECIFIED ON "CENTER GATE A" DETAIL ON PAGE 7.

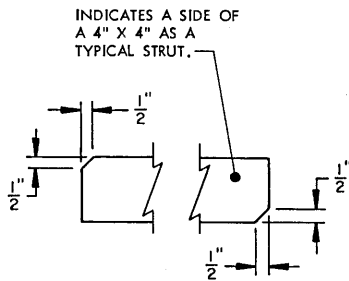


**BULKHEAD B**

THIS BULKHEAD IS DESIGNED FOR USE IN THE END OF A CAR TO PROVIDE FOR A SQUARE END. THE SPECIFIED GATE IS APPLICABLE FOR A ONE-TIER LOAD. USE DIMENSIONAL GUIDANCE AS SPECIFIED ON "CENTER GATE B" DETAIL ON PAGE 7.

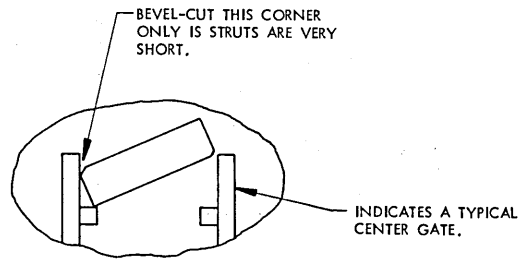
**DETAILS**





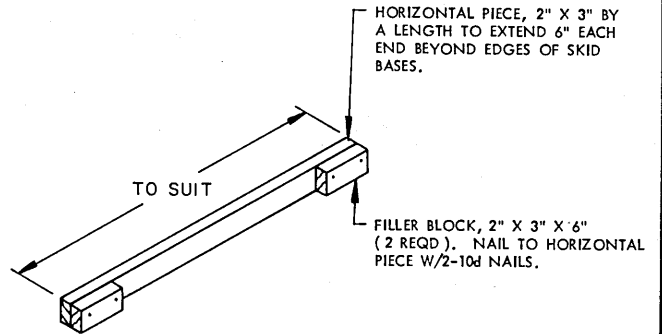
**BEVEL CUT**

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

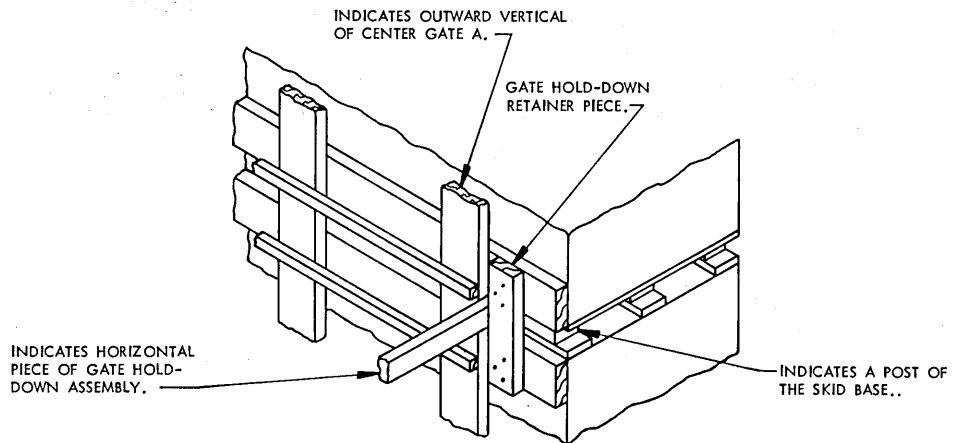


**STRUT INSTALLATION**

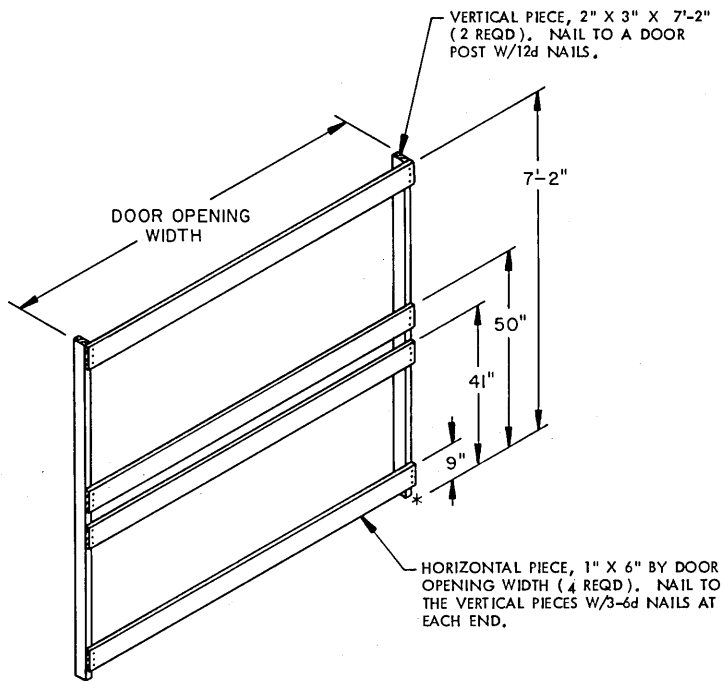
SEE GENERAL NOTE "V" ON PAGE 3 FOR ADDITIONAL STRUT INSTALLATION GUIDANCE.



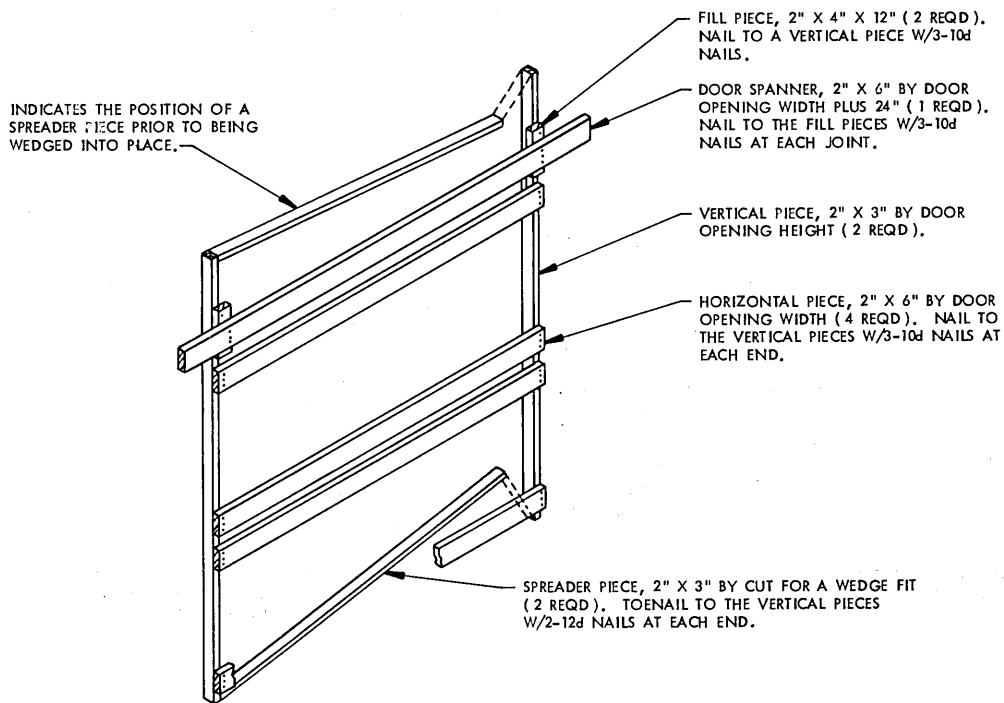
**GATE HOLD DOWN ASSEMBLY**



**INSTALLATION OF GATE HOLD DOWN**



DOORWAY PROTECTION GATE



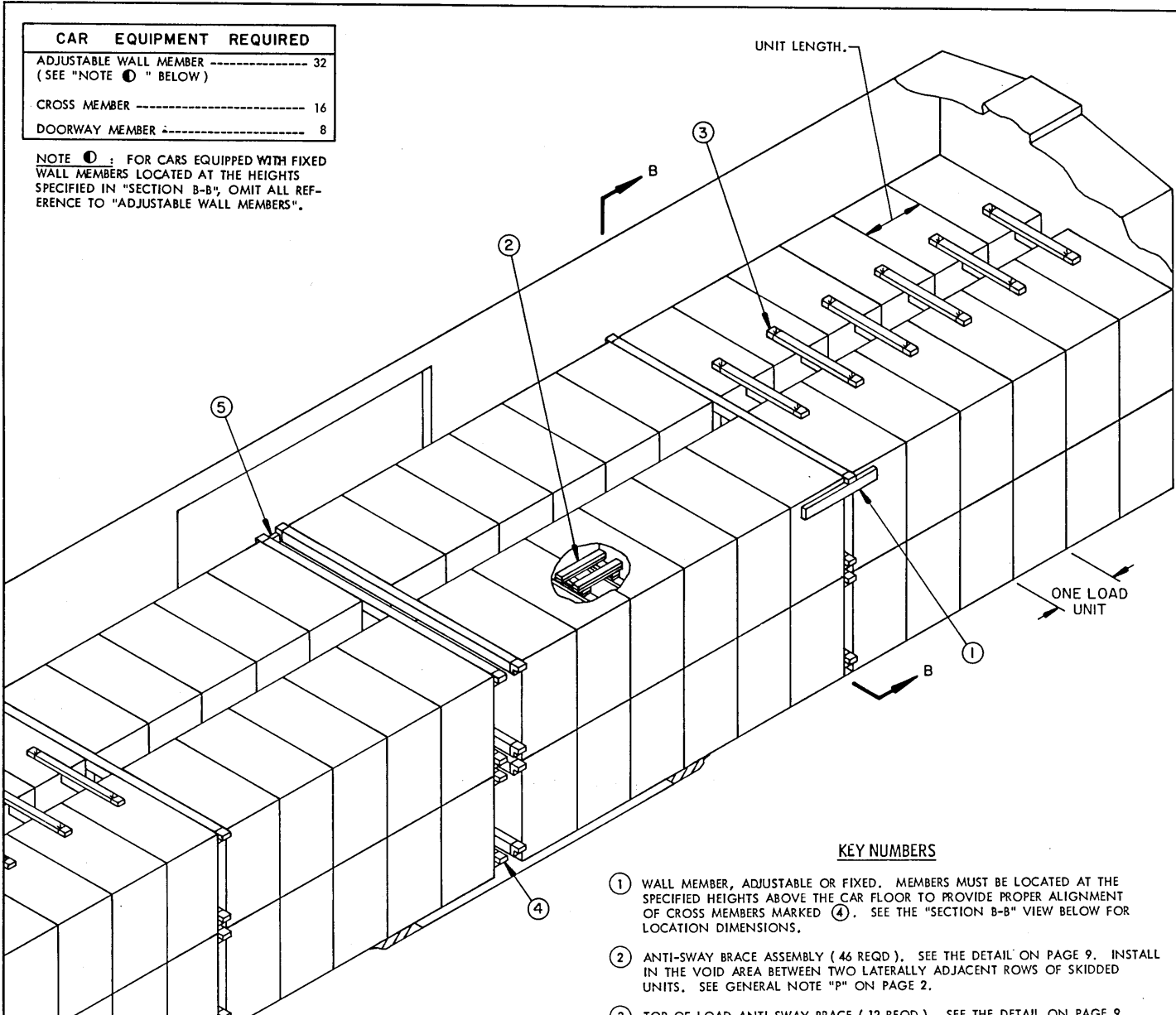
ALTERNATIVE DOORWAY PROTECTION

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**CAR EQUIPMENT REQUIRED**

ADJUSTABLE WALL MEMBER -----	32
(SEE "NOTE 1" BELOW)	
CROSS MEMBER -----	16
DOORWAY MEMBER -----	8

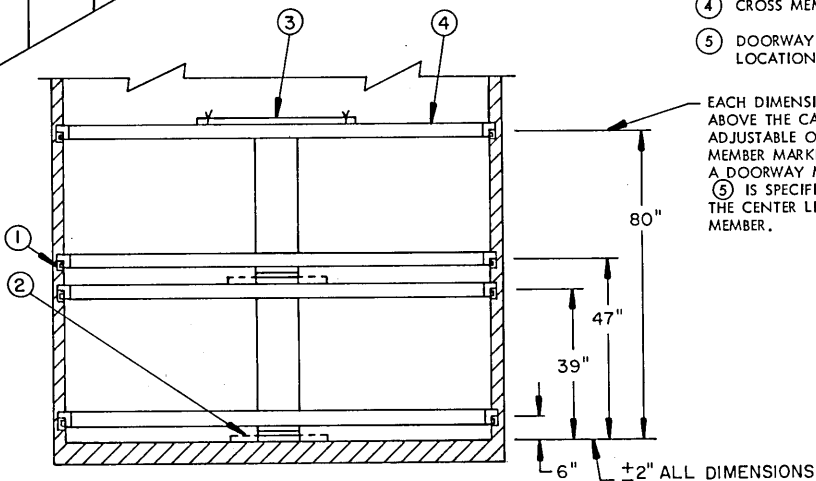
NOTE 1: FOR CARS EQUIPPED WITH FIXED WALL MEMBERS LOCATED AT THE HEIGHTS SPECIFIED IN "SECTION B-B", OMIT ALL REFERENCE TO "ADJUSTABLE WALL MEMBERS".



**ISOMETRIC VIEW**

**KEY NUMBERS**

- 1 WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED 4. SEE THE "SECTION B-B" VIEW BELOW FOR LOCATION DIMENSIONS.
- 2 ANTI-SWAY BRACE ASSEMBLY (46 REQD). SEE THE DETAIL ON PAGE 9. INSTALL IN THE VOID AREA BETWEEN TWO LATERALLY ADJACENT ROWS OF SKIDDED UNITS. SEE GENERAL NOTE "P" ON PAGE 2.
- 3 TOP-OF-LOAD ANTI-SWAY BRACE (12 REQD). SEE THE DETAIL ON PAGE 9. WIRE TIE TO A SKID STRAP WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON THAT PAGE. SEE SPECIAL NOTE 3 ON PAGE 21.
- 4 CROSS MEMBER (16 REQD). SEE GENERAL NOTE "F" ON PAGE 2.
- 5 DOORWAY MEMBER (8 REQD). SEE THE "SECTION B-B" VIEW BELOW FOR LOCATION DIMENSIONS.



**SECTION B-B**

**SPECIAL NOTES:**

1. A 50'-6" LONG BY 9'-2" WIDE ( INSIDE CLEARANCE ) BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS, AND WITH 8'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED.
2. FOR SHIPMENT OF LESS-THAN-CAR-LOADS, REFER TO THE APPLICABLE GUIDANCE ON PAGES 22 AND 23.
3. THE ANTI-SWAY BRACE ASSEMBLY A, SHOWN AS PIECES MARKED ②, AND THE TOP-OF-LOAD ANTI-SWAY BRACE, SHOWN AS PIECES MARKED ③, MAY BE OMITTED IF THE SPACE BETWEEN LATERALLY ADJACENT UNITS IS 6" OR LESS.
4. IF THE BOX CAR TO BE LOADED HAS BOWED END WALLS WHICH ARE BOWED OUTWARD TWO INCHES ( 2" ) OR MORE EITHER FROM SIDE TO SIDE OR FROM FLOOR TO ROOF, SEE GENERAL NOTE "F" ON PAGE 2.

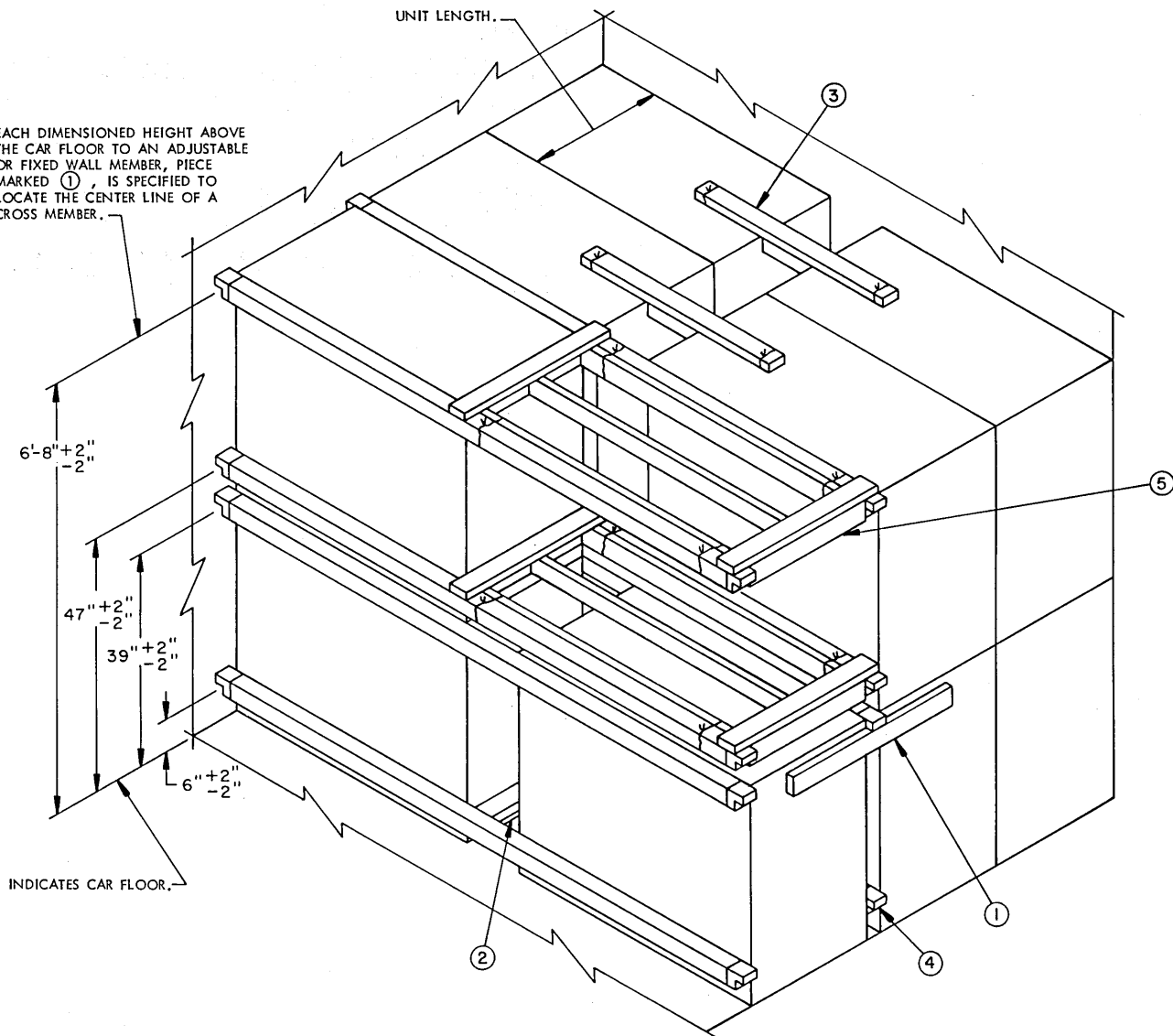
**BILL OF MATERIAL**

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	253	85
2" X 4"	496	331
NAILS	NO. REQD	POUNDS
12d ( 3-1/4" )	404	6-3/4
20d ( 4" )	368	13-1/4
WIRE, NO. 14 GAGE ----- 48' REQD ----- 1 LB		

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT ( APPROX )
SKIDDED UNIT -----	92 -----	28,612 LBS
DUNNAGE -----		853 LBS
<b>TOTAL WEIGHT -----</b>		<b>29,465 LBS</b>

EACH DIMENSIONED HEIGHT ABOVE THE CAR FLOOR TO AN ADJUSTABLE OR FIXED WALL MEMBER, PIECE MARKED ①, IS SPECIFIED TO LOCATE THE CENTER LINE OF A CROSS MEMBER.



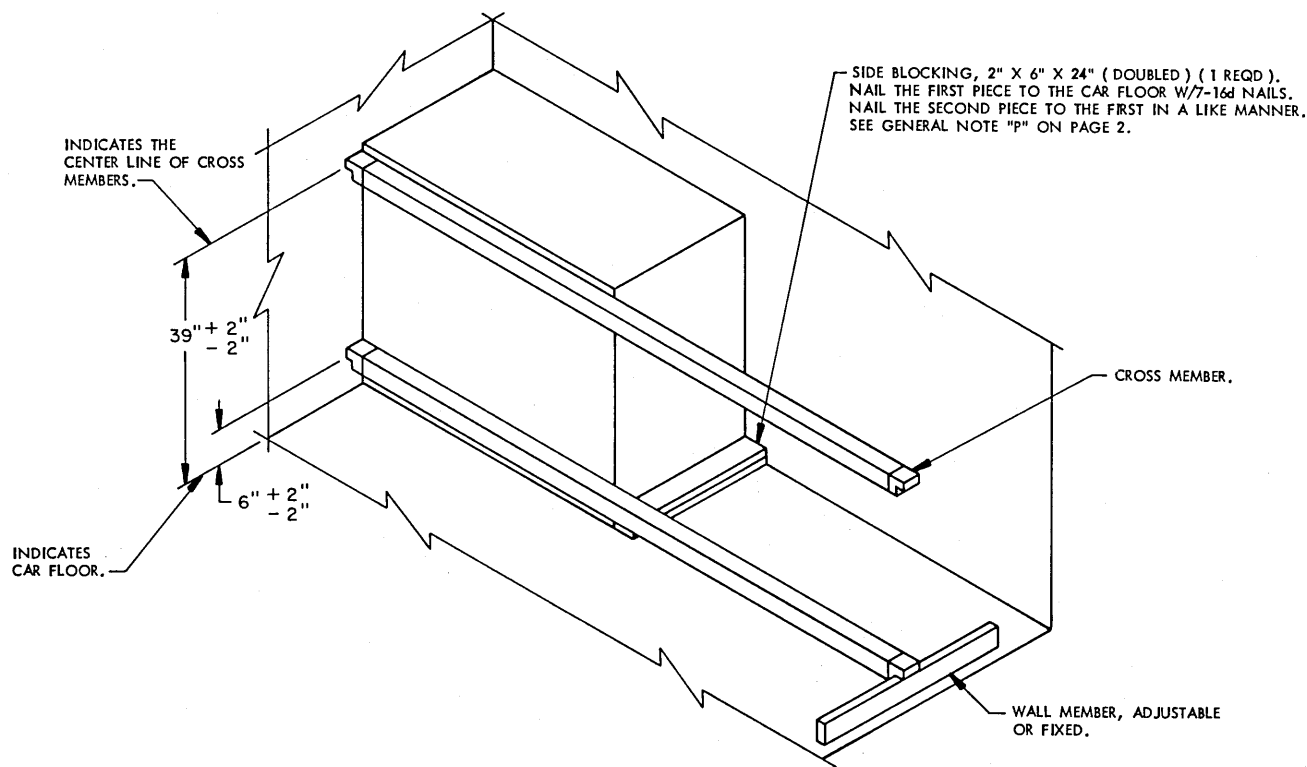
ISOMETRIC VIEW

KEY NUMBERS

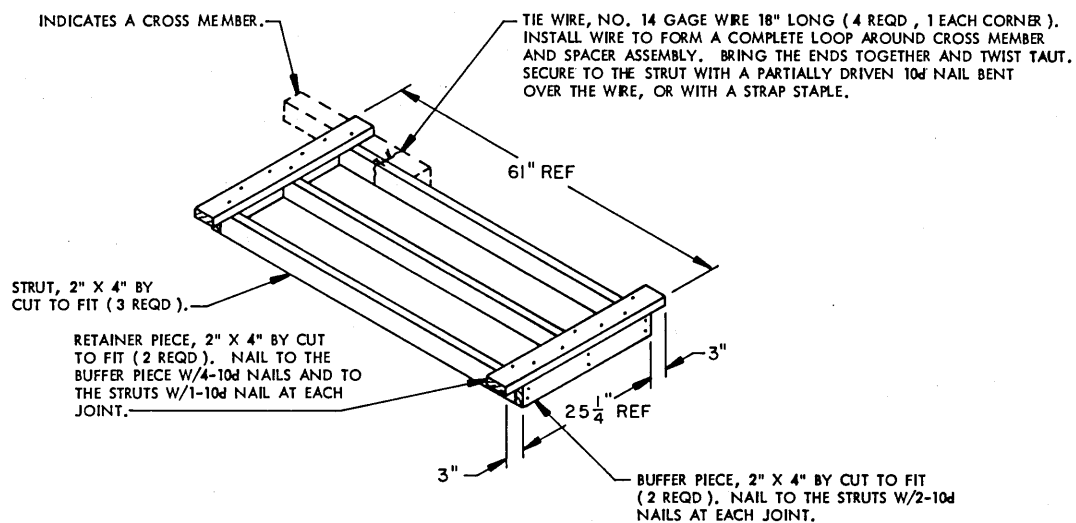
SPECIAL NOTES:

1. THE OUTLOADING PROCEDURE IS SHOWN DEPICTING THE METHOD FOR OUTLOADING A FULL LOAD MINUS ONE UNIT. ANY LOAD BAY CONTAINING LESS THAN A FULL STACK, MUST BE BAYED OFF WITH CROSS MEMBERS AT EACH END OF THE BAY.
2. THIS PROCEDURE MAY BE USED WHEN OUTLOADING A FULL LOAD MINUS ONE UNIT IN THE LOAD AS SHOWN ON PAGE 20.
3. THE SPACER ASSEMBLY, AS DETAILED ON PAGE 23, NEED NOT BE FABRICATED FOR A DRIVE FIT. THE ASSEMBLY SHOULD BE FABRICATED SO THAT IT CAN BE EASILY INSTALLED. HOWEVER, IT MUST FIT TIGHT ENOUGH SO AS TO NOT ALLOW MORE THAN ONE-HALF INCH (1/2") VOID ACROSS THE WIDTH OF A BRACED LOAD.

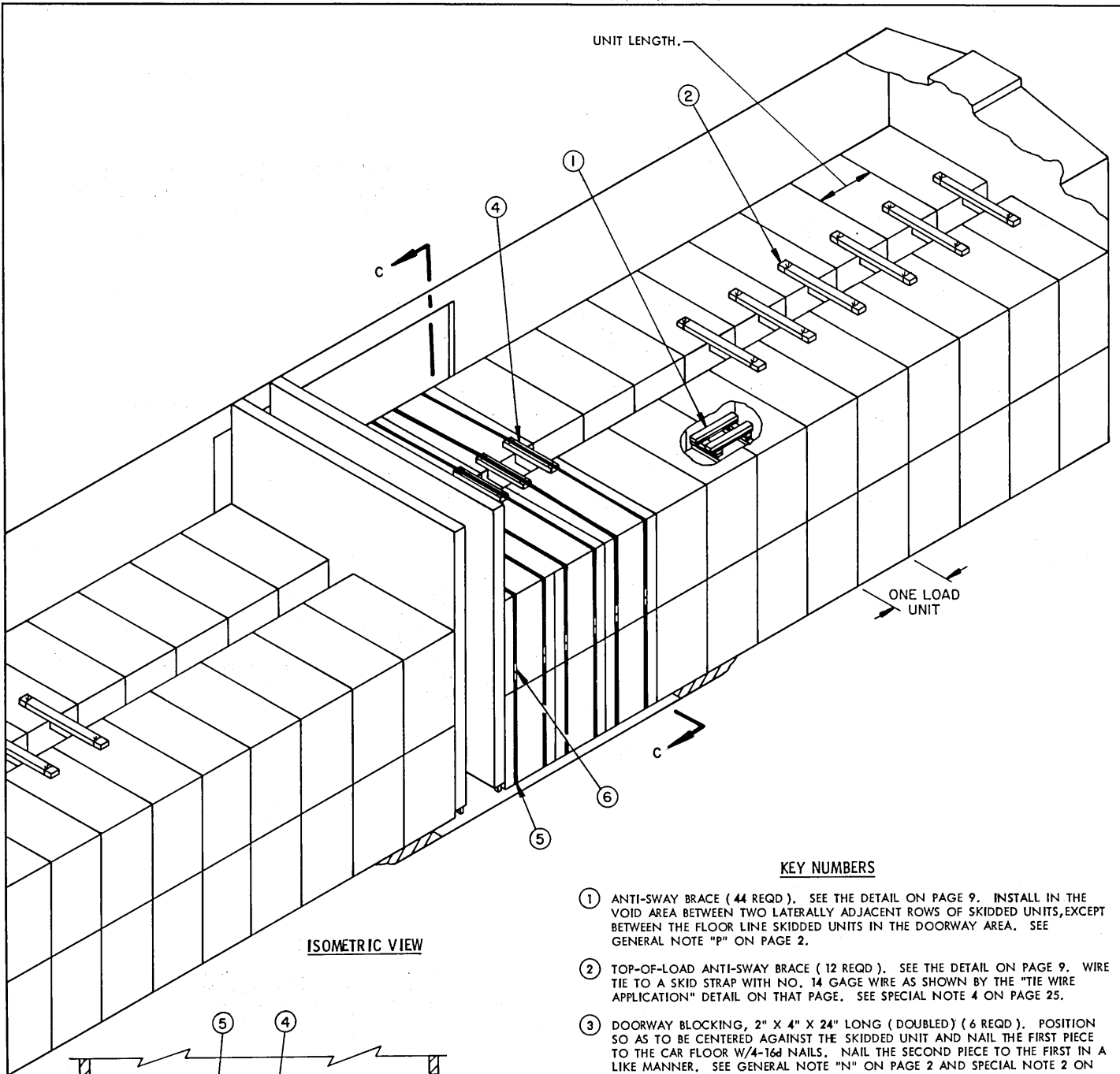
- ① WALL MEMBER, ADJUSTABLE OR FIXED MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED ④.
- ② ANTI-SWAY BRACE ASSEMBLY (5 REQD). SEE THE DETAIL ON PAGE 9. INSTALL IN THE VOID AREA BETWEEN TWO LATERALLY ADJACENT ROWS OF SKIDDED UNITS. SEE GENERAL NOTE "P" ON PAGE 2.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (2 REQD). SEE THE DETAIL ON PAGE 9. WIRE TIE TO A SKID STRAP WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON THAT PAGE. SEE SPECIAL NOTE 3 ON PAGE 21.
- ④ CROSS MEMBER (8 REQD). SEE GENERAL NOTE "F" ON PAGE 2.
- ⑤ SPACER ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 23.



**ISOMETRIC VIEW**



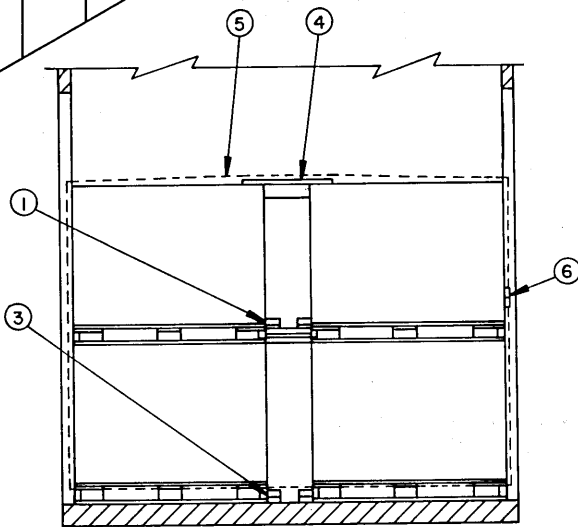
**SPACER ASSEMBLY**



**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① ANTI-SWAY BRACE (44 REQD). SEE THE DETAIL ON PAGE 9. INSTALL IN THE VOID AREA BETWEEN TWO LATERALLY ADJACENT ROWS OF SKIDDED UNITS, EXCEPT BETWEEN THE FLOOR LINE SKIDDED UNITS IN THE DOORWAY AREA. SEE GENERAL NOTE "P" ON PAGE 2.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (12 REQD). SEE THE DETAIL ON PAGE 9. WIRE TIE TO A SKID STRAP WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON THAT PAGE. SEE SPECIAL NOTE 4 ON PAGE 25.
- ③ DOORWAY BLOCKING, 2" X 4" X 24" LONG (DOUBLED) (6 REQD). POSITION SO AS TO BE CENTERED AGAINST THE SKIDDED UNIT AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/4-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTE "N" ON PAGE 2 AND SPECIAL NOTE 2 ON PAGE 25.
- ④ SPACER (6 REQD). SEE THE DETAIL ON PAGE 9.
- ⑤ DOORWAY PROTECTION STRAP, 1-1/4" X .035" OR (.031") X 34'-0" LONG STEEL STRAPPING (6 REQD). INSTALL TO ENCIRCLE THE LOAD UNITS WHICH EXTEND INTO THE DOORWAY AREA. SECURE TO PIECE MARKED ④ W/2 STAPLES. SEE SPECIAL NOTE 2 ON PAGE 25.
- ⑥ SEAL FOR 1-1/4" STRAPPING (12 REQD; 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "Q" ON PAGE 2.



**SECTION C-C**



**SPECIAL NOTES:**

1. A 50'-6" LONG BY 9'-2" WIDE CUSHIONED BOX CAR EQUIPPED WITH LOAD DIVIDERS BULKHEADS, AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING NARROWER AND WIDER DOOR OPENINGS CAN BE USED.
2. DOORWAY PROTECTION IS REQUIRED FOR ALL LOAD UNITS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY BY ONE-HALF OR MORE OF THE UNIT LENGTH. FOR ALTERNATIVE DOORWAY PROTECTION REFER TO PAGE 18.
3. IF THE DELINEATED OUTLOADING METHOD IS USED FOR THE SHIPMENT OF A LOAD WHICH CONTAINS LESS UNITS THAN SHOWN IN ORDER TO SATISFY A LESS-THAN-FULL-LOAD QUANTITY, AND THE QUANTITY CANNOT BE SATISFIED BY OMITTING A COMPLETE LAYER OR A COMPLETE STACK, A "FILLER ASSEMBLY" AS DETAILED ON PAGE 15 MUST BE SUBSTITUTED IN THE PLACE OF EACH OMITTED UNIT AS SHOWN ON PAGE 14. IF A UNIT IS TO BE OMITTED, IT MUST BE OMITTED FROM THE SECOND LAYER OF AN OUTSIDE ROW.
4. THE ANTI-SWAY BRACE ASSEMBLY, SHOWN AS PIECES MARKED ①, AND THE TOP-OF-LOAD ANTI-SWAY BRACE SHOWN AS PIECES MARKED ②, MAY BE OMITTED IF THE SPACE BETWEEN LATERALLY ADJACENT UNITS IS 6" OR LESS.

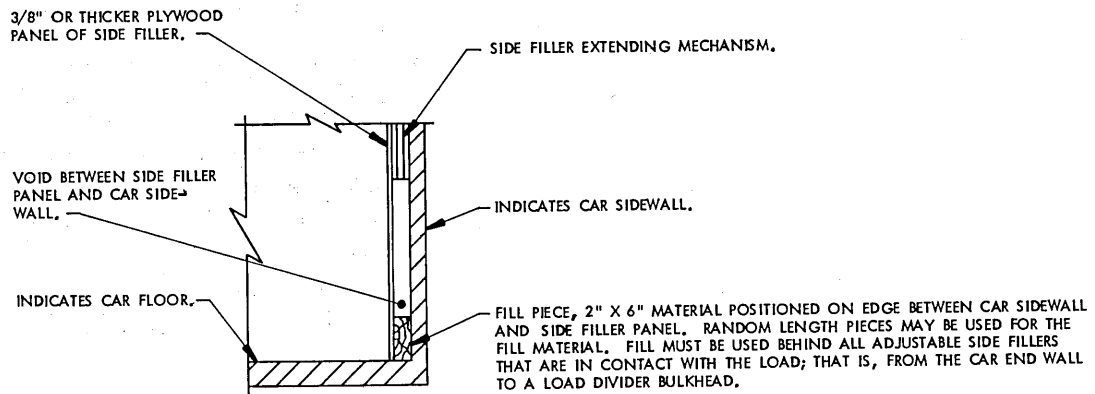
**BILL OF MATERIAL**

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	242	81
2" X 4"	513	342
4" X 4"	6	8
NAILS	NO. REQD	POUNDS
12d	406	7
16d	48	1-1/4
20d	352	12-1/2
STEEL STRAPPING, 1-1/4 X .035	204' REQD	30 LBS
SEAL FOR 1-1/4" STRAPPING	12 REQD	NIL
STAPLES	12 REQD	NIL
WIRE	48' REQD	NIL

**LOAD AS SHOWN**

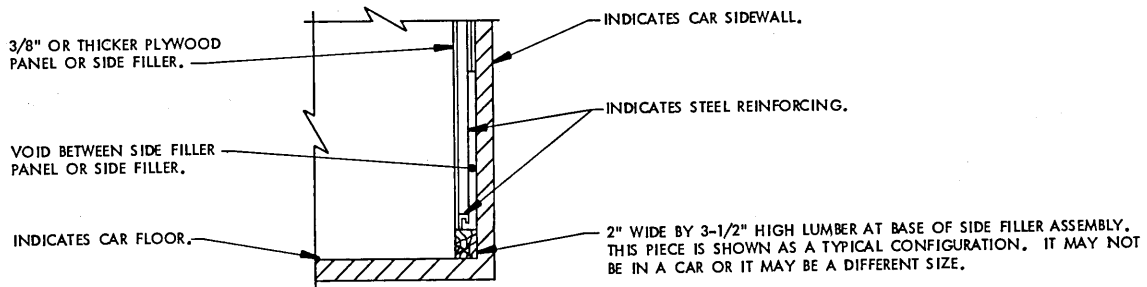
ITEM	QUANTITY	WEIGHT ( APPROX )
SKIDDED UNIT	92	28,612 LBS
DUNNAGE		913 LBS
<b>TOTAL WEIGHT</b>		<b>29,525 LBS</b>

92- UNIT LOAD IN A LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOX CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS



**TYPICAL TYPE A**

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



**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.