

APPROVED BY

BUREAU OF EXPLOSIVES

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DATE *3/19/70*

# LOADING AND BRACING (CL & LCL) IN BOX CARS OF THE M36 SERIES INCENDIARY BOMB (CLUSTER) PACKED TWO PER WOOD PALLET

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INCLUDES PROCEDURES FOR CONVENTIONAL BOX CARS AND BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES OF VARIOUS DESIGN AND MANUFACTURE.

**CAUTION:** THE DEPICTED PALLET UNIT MUST NOT BE SHIPPED LENGTHWISE IN RAIL CARS. IT WILL ONLY BE SHIPPED CROSSWISE AS SHOWN.

DO NOT SCALE

<small>                 DESIGNED BY <i>APSA/</i>                  DRAWN BY <i>APSA/</i>                  CHECKED BY <i>APSA/</i>                  DATE <i>3/19/70</i> </small>	<small>                 PROJECT NO. <i>APSA/</i>                  TITLE <i>CBH.</i>                  DRAWING NO. <i>CBH.</i> </small>	<small>                 SUBMITTED BY <i>C. R. Fort, Col., Ord C</i>                  COMMANDING OFFICER, SAVANNAH ARMY DEPOT             </small>	
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## GENERAL NOTES

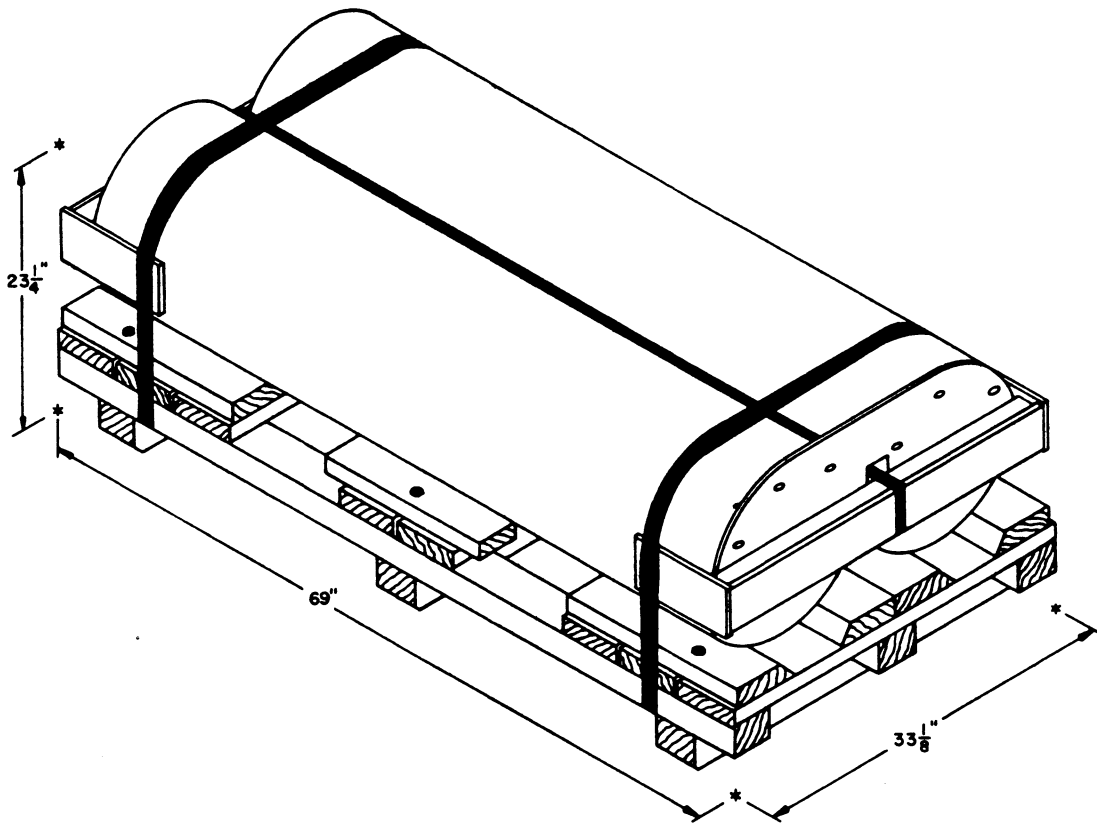
(GENERAL NOTE: CONTINUED)

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AMCR 740-13, AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. FOR DETAILS OF THE M36 SERIES INCENDIARY BOMB (CLUSTER), PALLETIZED 2 PER PALLET, SEE AIR FORCE TPO 1325-143-7124.  
UNIT DIMENSIONS --- 69" LONG X 33-1/8" WIDE X 23-1/4" HIGH.  
GROSS WEIGHT ----- 1,910 POUNDS (APPROX).
- C. THE LOADS AS SHOWN HEREIN ARE BASED ON CONVENTIONAL BOX CARS, OR ARE BASED ON BOX CARS HAVING MECHANICAL BRACING DEVICES WHICH HAVE ADJUSTABLE WALL MEMBERS. **NOTE:** ALL METAL CARS CAN BE USED FOR THE LOADS DELINEATED ON PAGES 6 THROUGH 8, EXCEPT THAT THE CAR USED FOR THE LOAD ON PAGE 8 MUST HAVE NAILABLE METAL FLOOR. ALL METAL CARS CAN ALSO BE USED FOR THE LOADS DEPICTED ON PAGES 4 AND 5 BY COMPLYING WITH REQUIREMENTS SET FORTH IN THE "SPECIAL NOTES" SECTION ON PAGE 5. ALL METAL CARS CANNOT BE USED FOR LOADS REQUIRING A K-BRACE TYPE OF PARTIAL LAYER BLOCKING AS DEPICTED ON PAGE 9.
- D. THE OUTLOADING PROCEDURES SPECIFIED ON PAGES 4 THROUGH 9 ARE FOR CONVENTIONAL TYPE BOX CARS WHICH ARE 9'-2" WIDE AND OF VARIOUS LENGTHS. WIDER OR NARROWER CARS CAN BE USED.
- E. THE LOADS AS SHOWN ON PAGES 4 THROUGH 7 ARE BASED ON CARS WHICH HAVE 6'-0" WIDE THROUGH DOORS OF THE CONVENTIONAL SLIDING TYPE. CARS EQUIPPED WITH WIDER OR STAGGERED DOORS CAN BE USED. THE "DOORWAY AREA" WITHIN A CAR IS DEFINED AS THE CARGO SPACE THAT IS ADJACENT TO A CONVENTIONAL TYPE OR A PLUG TYPE DOOR. THE LENGTH OF A "DOORWAY AREA" CAN BE AS MUCH AS TWENTY-FOUR FEET IN SOME CARS THAT ARE EQUIPPED WITH STAGGERED DOORS.
- F. THE DEPICTED OUTLOADING PROCEDURES ARE ALSO APPLICABLE TO CARS WHICH ARE EQUIPPED WITH PLUG 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 DOORWAY SPANNER DUNNAGE, IF A DOOR IS SO EQUIPPED. ALSO, AFTER THE PLUG DOORS 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.
- G. THE OUTLOADING PROCEDURES SPECIFIED ON PAGES 14 THROUGH 16 ARE FOR 50'-6" LONG BY 9'-0" WIDE BOX CARS WHICH ARE EQUIPPED WITH MECHANICAL BRACING DEVICES. WIDER OR NARROWER CARS CAN BE USED. THE PROCEDURES SHOWN MAY BE ADAPTED AS REQUIRED TO FACILITATE THE USE OF BOX CARS EQUIPPED WITH VARIOUS TYPES OF SELF-CONTAINED MECHANICAL BRACING DEVICES. HOWEVER, FIXED AND 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 WHICH ARE EQUIPPED WITH MEMBERS WHICH DO NOT MEET THE LOCATION REQUIREMENTS MUST NOT BE USED.
- I. A CROSS MEMBER, WHEN USED AS SPECIFIED BY ANY ONE OF THE OUTLOADING METHODS CONTAINED HEREIN, WILL NOT BE RELIED UPON TO RETAIN MORE LADING WEIGHT ON EITHER SIDE THAN AS SHOWN FOR THE SPECIFIC OUTLOADING METHOD BEING USED. 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.
- H. THE NUMBER OF LADING UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE BOX CAR BEING LOADED OR THE QUANTITY OF ITEMS TO BE SHIPPED, AND COMBINATIONS OF THE OUTLOADING PROCEDURES SPECIFIED FOR THE VARIOUS LOADS SHOWN HEREIN MAY BE USED AS REQUIRED. HOWEVER, THE APPROVED METHODS SPECIFIED HEREIN FOR FULL OR PARTIAL CARLOADS MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING, AND STAYING OF THE DESIGNATED ITEMS.
- J. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN BOX CARS WHICH ARE PARTIALLY LOADED WITH THE PALLETIZED M36 SERIES INCENDIARY BOMB, PROVIDING THE TOTAL LOAD IS COMPATIBLE, EXISTING DIRECTIVES ARE NOT VIOLATED, AND OTHER LADING ITEMS ARE BLOCKED AND BRACED TO EQUAL THE BLOCKING AND BRACING CRITERIA SPECIFIED HEREIN.
- K. 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 SIDE WALL OF THE CAR, THAT GUIDANCE SHOULD BE APPLIED FOR THE NAILING OF THE APPLICABLE DUNNAGE PIECES. IF A NAIL SIZE IS NOT SPECIFIED, 30d NAILS SHOULD BE USED.
- L. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 2" X 6" MATERIAL IS ACTUALLY 1-5/8" THICK BY 5-5/8" WIDE AND 4" X 4" MATERIAL IS ACTUALLY 3-5/8" THICK BY 3-5/8" WIDE.
- 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 A SIDE WALL OF THE TRANSPORTING VEHICLE, OR WHEN LAMINATING DUNNAGE. 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. 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.
- O. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "DETAIL OF PALLET UNIT" ON PAGE 3 AND TO THE "SPECIAL NOTES" SECTION WHICH IS IMMEDIATELY ADJACENT TO DEPICTED OUTLOADING METHODS.
- P. WHEN STEEL 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 MUST BE USED TO SEAL THE JOINT. **CAUTION:** EXERCISE CARE DURING TENSIONING TO PREVENT DAMAGE TO ITEMS.

(CONTINUED AT RIGHT)

## MATERIAL SPECIFICATIONS

- LUMBER** ----- : SEE TM 743-200-1, DUNNAGE LUMBER; FED SPEC MM-L-751.
- NAILS** ----- : COMMON, CEMENT COATED OR CHEMICALLY ETCHED,  
FED SPEC FF-N-105.  
ALT: ANNULAR-RING TYPE NAIL OF SAME SIZE.
- STRAPPING, STEEL:** TYPE I OR IV, CLASS A, B, OR C, FED SPEC QQ-5-781.
- STRAP SEAL;  
STRAP STAPLE** ---- : COMMERCIAL GRADE.
- WIRE** ----- : FED SPEC QQ-W-461.

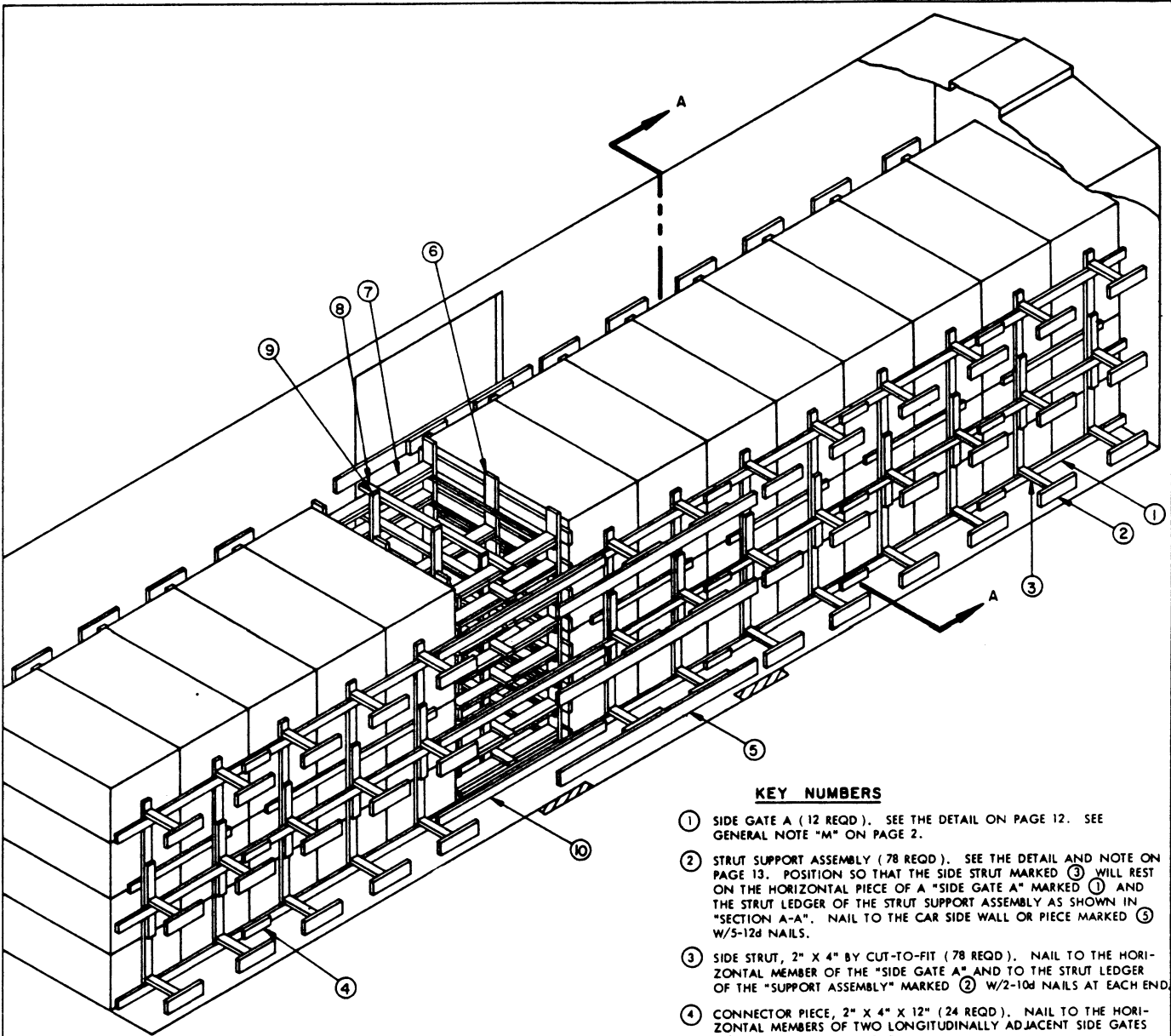


PALLET UNIT DATA:

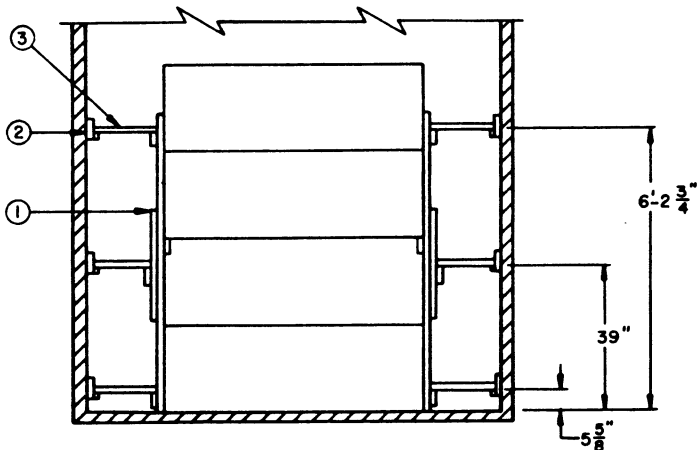
NUMBER OF BOMBS ---- TWO (2)  
 GROSS WEIGHT ----- 1,910 POUNDS (APPROX).  
 CUBE ----- 30.8 CUBIC FEET.

UNIT DETAIL

FOR ADDITIONAL UNIT DATA,  
 SEE AIR FORCE TPO 1325-143-7124.



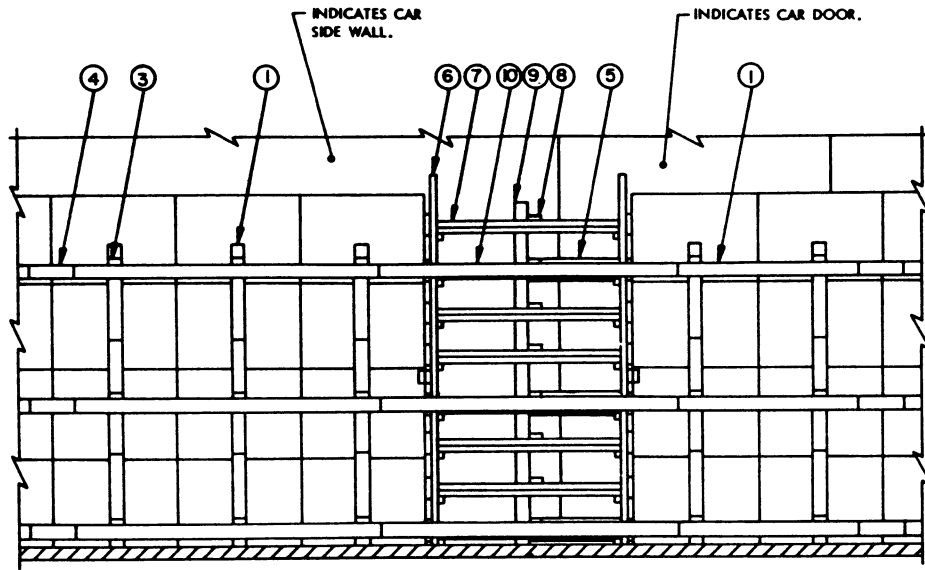
ISOMETRIC VIEW



SECTION A-A

**KEY NUMBERS**

- ① SIDE GATE A (12 REQD). SEE THE DETAIL ON PAGE 12. SEE GENERAL NOTE "M" ON PAGE 2.
- ② STRUT SUPPORT ASSEMBLY (78 REQD). SEE THE DETAIL AND NOTE ON PAGE 13. POSITION SO THAT THE SIDE STRUT MARKED ③ WILL REST ON THE HORIZONTAL PIECE OF A "SIDE GATE A" MARKED ① AND THE STRUT LEDGER OF THE STRUT SUPPORT ASSEMBLY AS SHOWN IN "SECTION A-A". NAIL TO THE CAR SIDE WALL OR PIECE MARKED ⑤ W/5-12d NAILS.
- ③ SIDE STRUT, 2" X 4" BY CUT-TO-FIT (78 REQD). NAIL TO THE HORIZONTAL MEMBER OF THE "SIDE GATE A" AND TO THE STRUT LEDGER OF THE "SUPPORT ASSEMBLY" MARKED ② W/2-10d NAILS AT EACH END.
- ④ CONNECTOR PIECE, 2" X 4" X 12" (24 REQD). NAIL TO THE HORIZONTAL MEMBERS OF TWO LONGITUDINALLY ADJACENT SIDE GATES W/2-10d NAILS AT EACH END.
- ⑤ DOORWAY SPANNER, 2" X 6" BY DOOR OPENING WIDTH PLUS 24" (6 REQD). NAIL TO THE CAR SIDE WALL W/5-12d NAILS AT EACH END.
- ⑥ CENTER GATE A (2 REQD). SEE THE DETAIL ON PAGE 11.
- ⑦ CENTER STRUT, 2" X 6" BY CUT-TO-FIT (DOUBLED) (20 REQD). LAMINATE W/1-10d NAIL EVERY 6". TOENAIL TO THE CENTER GATES MARKED ⑥ W/2-12d NAILS AT EACH END.
- ⑧ HORIZONTAL STRUT BRACING, 2" X 4" X 72" (8 REQD). NAIL TO THE CENTER STRUTS MARKED ⑦ W/3-10d NAILS AT EACH JOINT.
- ⑨ VERTICAL STRUT BRACING, 2" X 4" X 7'-6" (3 REQD). NAIL TO THE CENTER STRUTS MARKED ⑦ W/3-10d NAILS AT EACH JOINT.
- ⑩ SPANNER ASSEMBLY (6 REQD). SEE THE DETAIL ON PAGE 13. POSITION AS SHOWN AND NAIL TO THE HORIZONTAL PIECES OF LONGITUDINALLY ADJACENT SIDE GATES W/4-10d NAILS AT EACH END.



**PARTIAL ELEVATION VIEW**

PIECES MARKED ② AND ⑤ HAVE BEEN OMITTED FROM THE NEAR SIDE OF THIS LOAD VIEW FOR CLARITY.

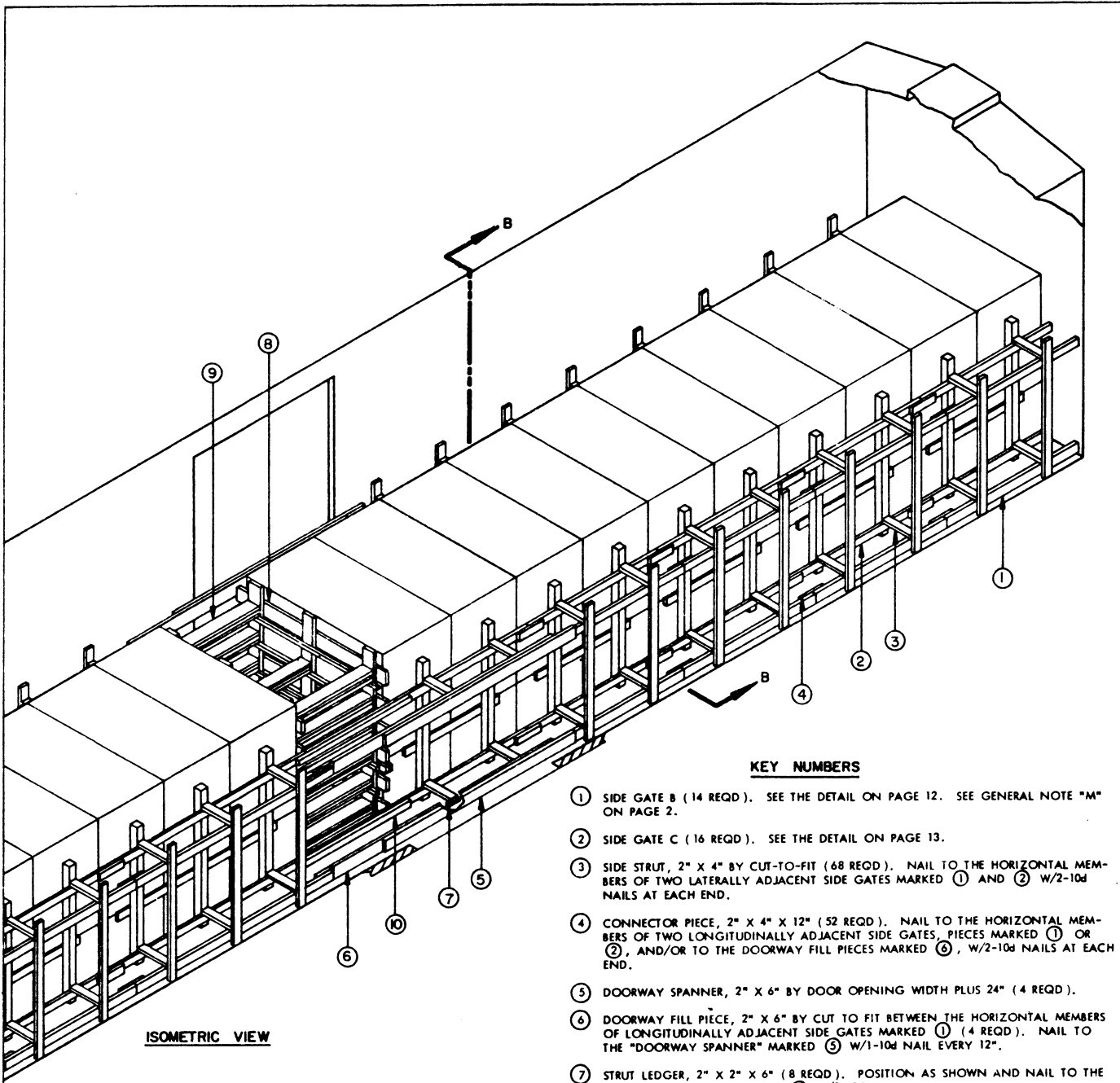
**SPECIAL NOTES:**

1. A 40'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR EQUIPPED WITH 6'-0" WIDE DOOR OPENINGS IS SHOWN. WIDER OR NARROWER CARS CAN BE USED. IF THE CAR BEING USED IS EQUIPPED WITH 9'-0" OR WIDER DOORS, THE DEPICTED LOADING PATTERN SHOULD BE ADJUSTED TO PROVIDE SIX (6) STACKS OF PALLET UNITS IN ONE END AND SEVEN (7) STACKS IN THE OPPOSITE END OF THE CAR.
2. FOR THE SHIPMENT OF A 3-LAYER LOAD, PROCEDURES DEPICTED ON PAGES 6 AND 7 SHOULD BE USED.
3. IF THE DELINEATED OUTLOADING METHOD IS USED FOR THE SHIPMENT OF A LOAD WHICH CONTAINS LESS UNITS THAN SHOWN TO SATISFY A LESS-THAN-FULL-LOAD QUANTITY, AND THE QUANTITY CANNOT BE SATISFIED BY OMITTING A COMPLETE LAYER OR STACK, A "FILLER ASSEMBLY", AS DETAILED ON PAGE 10, MUST BE SUBSTITUTED FOR EACH OMITTED UNIT. A "FILLER ASSEMBLY" CAN BE USED ON TOP OF ANY STACK, EXCEPT THOSE ADJACENT TO A CENTER GATE.
4. IF THE QUANTITY TO BE SHIPPED CANNOT BE READILY ACHIEVED BY THE SUBSTITUTION OF ONE OR MORE FILLER ASSEMBLIES FOR THE OMITTED UNITS, IT WILL BE NECESSARY TO INSTALL A K-BRACE ASSEMBLY TO RETAIN A PARTIAL LAYER. REFER TO PAGE 9 FOR BRACE AND INSTALLATION SPECIFICATIONS.
5. ALL METAL CARS MAY BE USED FOR SHIPMENT OF THE DEPICTED LOAD. HOWEVER, IN LIEU OF THE STRUT SUPPORT ASSEMBLIES MARKED ②, "SIDE GATE B" ASSEMBLIES, AS DETAILED FOR A 4-HIGH LOAD ON PAGE 12, MUST BE USED AGAINST THE CAR SIDE WALLS. THE QUANTITY OF CONNECTOR PIECES MARKED ④ MUST BE INCREASED AS REQUIRED TO CONNECT THE HORIZONTAL MEMBERS OF LONGITUDINALLY ADJACENT "SIDE GATE B" ASSEMBLIES. OMIT PIECES MARKED ⑤ AND SUBSTITUTE PIECES MARKED ⑥, ⑦ AND ⑧ SPECIFIED IN THE PROCEDURES ON PAGE 6. CONNECT EACH END OF A PIECE MARKED ⑥ TO A HORIZONTAL MEMBER OF THE ADJACENT "SIDE GATE B" WITH A PIECE MARKED ④.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 2"	135	45
2" X 4"	810	540
2" X 6"	472	472
NAILS	NO. REQD	POUNDS
10d (3")	1,640	25-1/4
12d (3-1/4")	530	9

**LOAD AS SHOWN**

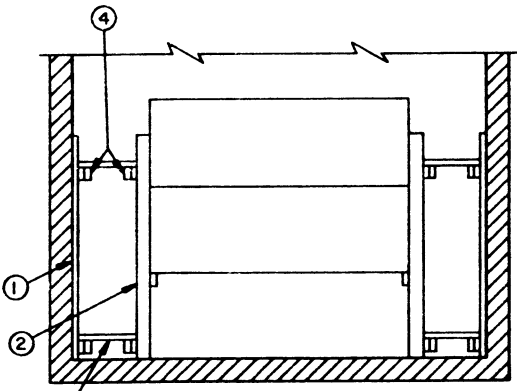
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	52	99,320 LBS
DUNNAGE		2,677 LBS
<b>TOTAL WEIGHT</b>		<b>101,997 LBS</b>



ISOMETRIC VIEW

**KEY NUMBERS**

- ① SIDE GATE B (14 REQD). SEE THE DETAIL ON PAGE 12. SEE GENERAL NOTE "M" ON PAGE 2.
- ② SIDE GATE C (16 REQD). SEE THE DETAIL ON PAGE 13.
- ③ SIDE STRUT, 2" X 4" BY CUT-TO-FIT (68 REQD). NAIL TO THE HORIZONTAL MEMBERS OF TWO LATERALLY ADJACENT SIDE GATES MARKED ① AND ② W/2-10d NAILS AT EACH END.
- ④ CONNECTOR PIECE, 2" X 4" X 12" (52 REQD). NAIL TO THE HORIZONTAL MEMBERS OF TWO LONGITUDINALLY ADJACENT SIDE GATES, PIECES MARKED ① OR ②, AND/OR TO THE DOORWAY FILL PIECES MARKED ⑥, W/2-10d NAILS AT EACH END.
- ⑤ DOORWAY SPANNER, 2" X 6" BY DOOR OPENING WIDTH PLUS 24" (4 REQD).
- ⑥ DOORWAY FILL PIECE, 2" X 6" BY CUT TO FIT BETWEEN THE HORIZONTAL MEMBERS OF LONGITUDINALLY ADJACENT SIDE GATES MARKED ① (4 REQD). NAIL TO THE "DOORWAY SPANNER" MARKED ⑤ W/1-10d NAIL EVERY 12".
- ⑦ STRUT LEDGER, 2" X 2" X 6" (8 REQD). POSITION AS SHOWN AND NAIL TO THE DOORWAY FILL PIECE MARKED ⑥ W/2-10d NAILS.
- ⑧ CENTER GATE B (2 REQD). SEE THE DETAIL ON PAGE 11.
- ⑨ CENTER STRUT, 2" X 6" BY CUT-TO-FIT (TRIPLED) (15 REQD). LAMINATE W/1-10d NAIL EVERY 6". TOENAIL TO THE CENTER GATES MARKED ⑧ W/2-12d NAILS AT EACH END.
- ⑩ SPANNER ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 13. POSITION AS SHOWN AND NAIL TO THE HORIZONTAL MEMBERS OF LONGITUDINALLY ADJACENT SIDE GATES MARKED ② W/4-10d NAILS AT EACH END.



SECTION B-B

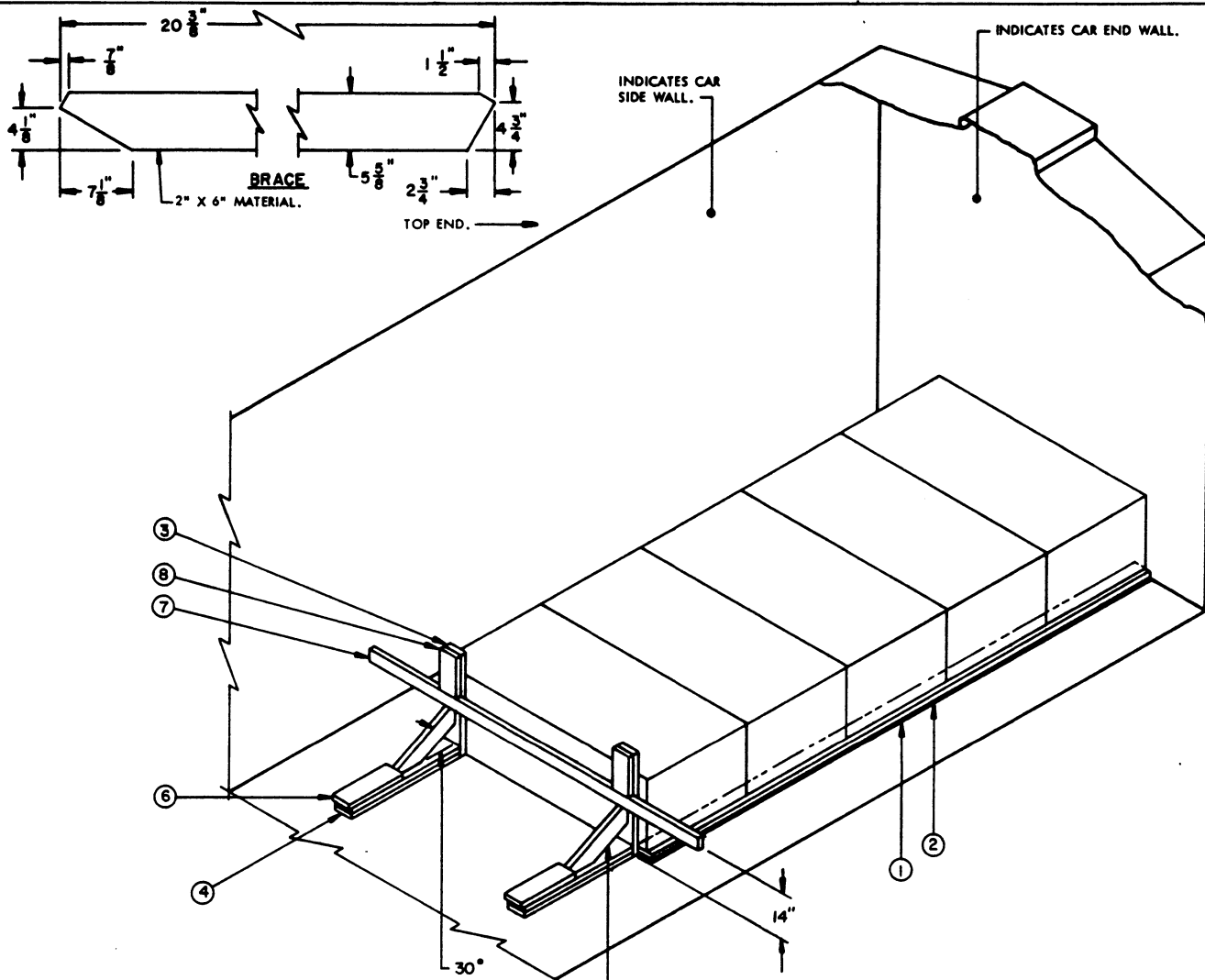
SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE ALL-METAL CONVENTIONAL BOXCAR EQUIPPED WITH 6'-0" WIDE DOOR OPENINGS IS SHOWN. WIDER OR NARROWER CARS CAN BE USED FOR SHIPMENT OF THE DEPICTED LOAD. IF THE CAR BEING USED IS EQUIPPED WITH 12'-0" OR WIDER DOORS, THE DEPICTED LOADING PATTERN SHOULD BE ADJUSTED TO PROVIDE EIGHT (8) STACKS OF PALLET UNITS IN ONE END AND NINE (9) STACKS IN THE OPPOSITE END OF THE CAR.
2. THE DEPICTED LOADING PATTERN MAY ALSO BE USED FOR THE SHIPMENT OF A 4-LAYER 68-UNIT LOAD IN A CAR WHICH HAS A LOAD LIMIT OF NOT LESS THAN 141,000 POUNDS. FOR THE SHIPMENT OF A 4-LAYER LOAD, THE FOLLOWING WILL BE APPLICABLE:
  - A. IN LIEU OF PIECES MARKED ①, USE "SIDE GATE B" ASSEMBLIES AS DETAILED FOR A 4-HIGH LOAD ON PAGE 12.
  - B. IN LIEU OF PIECES MARKED ②, USE "SIDE GATE A" ASSEMBLIES AS DETAILED ON PAGE 12.
  - C. INCREASE THE QUANTITY OF PIECES MARKED ③ THRU ⑦ AND ⑩ TO PROVIDE FOR THREE (3) LAYERS OF SIDE STRUTS.
  - D. IN LIEU OF PIECES MARKED ⑧, USE "CENTER GATE A" ASSEMBLIES AS DETAILED ON PAGE 11.
  - E. THE QUANTITY OF CENTER STRUTS, PIECES MARKED ⑨, MUST BE INCREASED TO TWENTY (20), TO PROVIDE FOR EIGHT (8) LAYERS OF CENTER STRUTS.
3. IF THE DELINEATED OUTLOADING METHOD IS USED FOR THE SHIPMENT OF A LOAD WHICH CONTAINS LESS UNITS THAN SHOWN TO SATISFY A LESS-THAN-FULL-LOAD QUANTITY, AND THE QUANTITY CANNOT BE SATISFIED BY OMITTING A FULL LAYER OR STACK, A "FILLER ASSEMBLY", AS DETAILED ON PAGE 10, MUST BE SUBSTITUTED FOR EACH OMITTED UNIT. A "FILLER ASSEMBLY" CAN BE USED ON TOP OF ANY STACK, EXCEPT THOSE ADJACENT TO A CENTER GATE.
4. IF THE CAR BEING USED IS EQUIPPED WITH NAILABLE SIDE WALLS AND THE QUANTITY OF UNITS TO BE SHIPPED CANNOT BE READILY ACHIEVED BY THE SUBSTITUTION OF ONE OR MORE FILLER ASSEMBLIES FOR THE OMITTED UNITS, A K-BRACE ASSEMBLY MAY BE USED TO RETAIN A PARTIAL LAYER. REFER TO PAGE 9 FOR BRACE AND INSTALLATION SPECIFICATIONS.
5. IF A CAR WITH NAILABLE SIDE WALLS IS USED FOR SHIPMENT OF THE DEPICTED LOAD, "STRUT SUPPORT ASSEMBLIES" PIECES MARKED ② ON PAGE 4, MAY BE USED IN LIEU OF "SIDE GATE B" ASSEMBLIES SPECIFIED AS PIECE MARKED ①.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 2"	80	27
2" X 4"	777	518
2" X 6"	317	317
4" X 4"	170	227
NAILS	NO. REQD	POUNDS
10d (3")	1,356	21
12d (3-1/4")	60	1

LOAD AS SHOWN

<u>ITEM</u>	<u>QUANTITY</u>	<u>WEIGHT (APPROX)</u>
PALLET UNIT -----	51 -----	97,410 LBS
DUNNAGE -----		2,745 LBS
TOTAL WEIGHT -----		100,155 LBS



ISOMETRIC VIEW

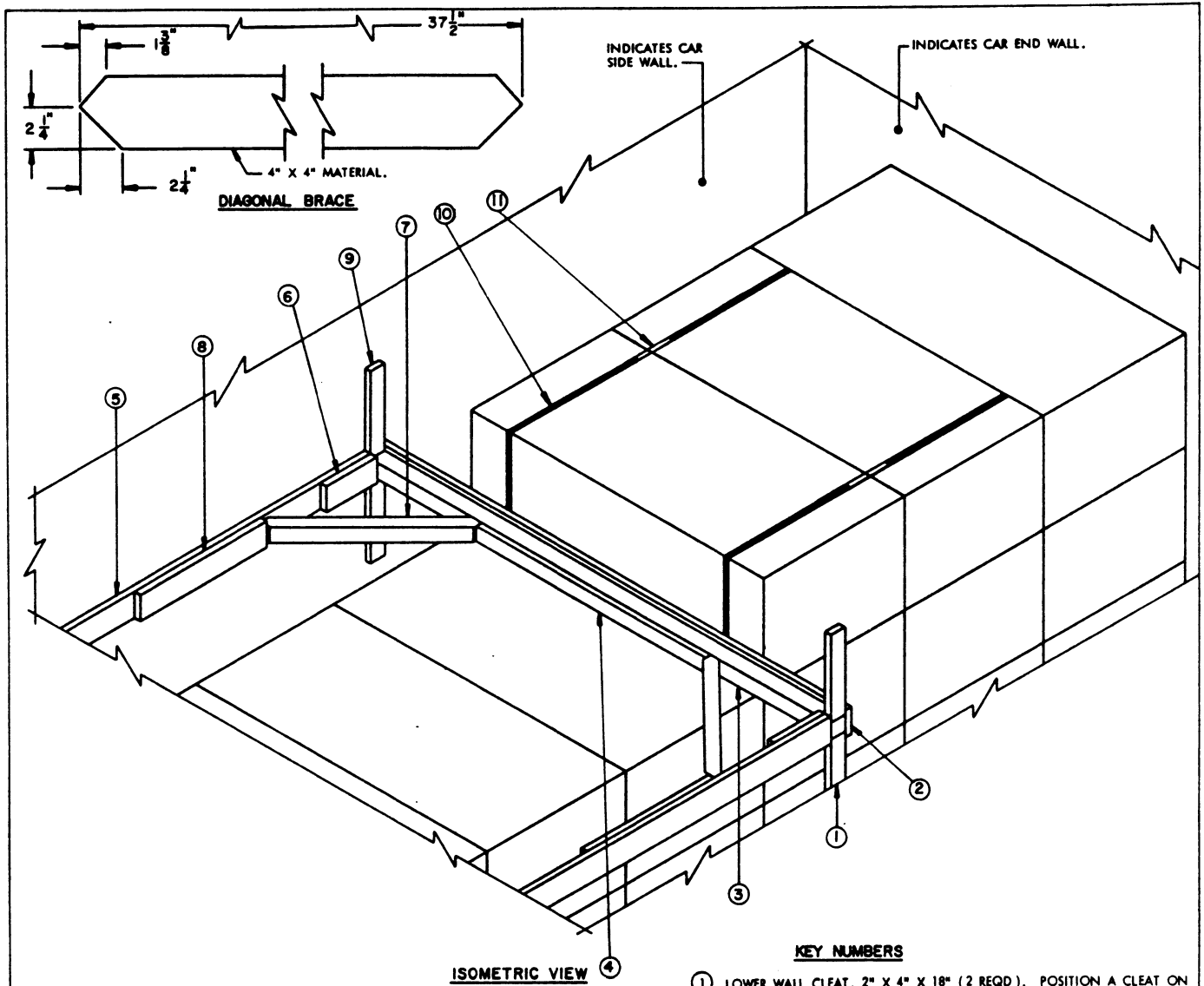
KEY NUMBERS

SPECIAL NOTES:

1. A 9'-2" WIDE BOX CAR IS SHOWN; HOWEVER, ANY WIDTH CAR, WHICH HAS A NAILABLE FLOOR, CAN BE USED FOR THE DEPICTED UNLOADING PROCEDURE.
2. THE LCL BRACE ASSEMBLY AS SHOWN IS ADEQUATE FOR RETAINING AN LCL LOAD OF NOT MORE THAN FIVE (5) PALLET UNITS. NOT LESS THAN TWO (2) KNEE BRACES WILL BE USED FOR BLOCKING AN LCL LOAD.
3. THE BLOCKING PROCEDURES SHOWN ON THIS PAGE ARE RESTRICTED TO LCL SHIPMENTS OF ONLY ONE (1) LAYER HIGH.
4. IF THE CAR BEING USED IS EQUIPPED WITH A NAILABLE METAL FLOOR, SEE GENERAL NOTE "K" ON PAGE 2 FOR GUIDANCE.

- ① SIDE BLOCKING, 1" X 6" X 13'-9" (2 REQD). PRE-POSITION 61-1/2" APART AND SO THAT THE PALLET UNITS WILL BE CENTERED ACROSS THE WIDTH OF THE CAR. NAIL TO THE CAR FLOOR W/1-10d NAIL EVERY 8". SEE GENERAL NOTE "M" ON PAGE 2.
- ② SIDE BLOCKING, 2" X 6" X 13'-9" (2 REQD). PRE-POSITION ON TOP OF AND NAIL THROUGH PIECE MARKED ① INTO THE CAR FLOOR W/1-16d NAIL EVERY 8".
- ③ VERTICAL PIECE, 2" X 6" X 30" (2 REQD). NAIL TO THE FLOOR CLEAT MARKED ④ W/2-16d NAILS.
- ④ FLOOR CLEAT, 2" X 6" X 36" (DOUBLED) (2 REQD). POSITION TO ALIGN WITH THE OUTER SKIDS OF THE PALLET UNIT AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/7-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/7-40d NAILS.
- ⑤ KNEE BRACE, 2" X 6" X 20-3/8" (2 REQD). SEE THE "BRACE" DETAIL ABOVE. TOENAIL TO THE VERTICAL PIECE MARKED ③ AND TO THE FLOOR CLEAT MARKED ④ W/2-16d NAILS AT EACH END.
- ⑥ BACK-UP CLEAT, 2" X 6" X 18" (2 REQD). POSITION AGAINST THE DIAGONAL BRACE MARKED ⑤ AND NAIL TO THE FLOOR CLEAT MARKED ④ W/5-40d NAILS.
- ⑦ LATERAL SUPPORT PIECE, 2" X 4" BY CAR WIDTH MINUS 1/2" (1 REQD). POSITION AGAINST THE DIAGONAL BRACE MARKED ⑤ AND NAIL TO THE VERTICAL PIECES MARKED ③ W/3-10d NAILS AT EACH JOINT.
- ⑧ HOLD-DOWN CLEAT, 2" X 6" X 12" (2 REQD). POSITION AS SHOWN AND NAIL TO THE VERTICAL PIECES MARKED ③ W/4-10d NAILS.



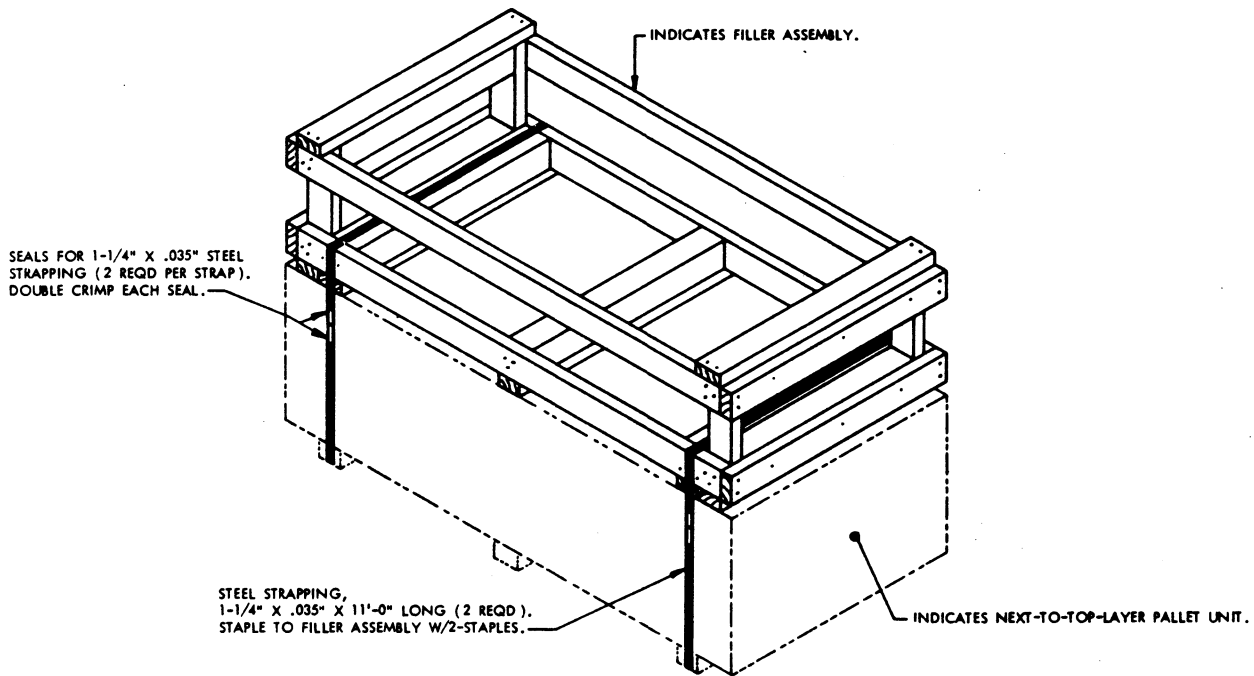
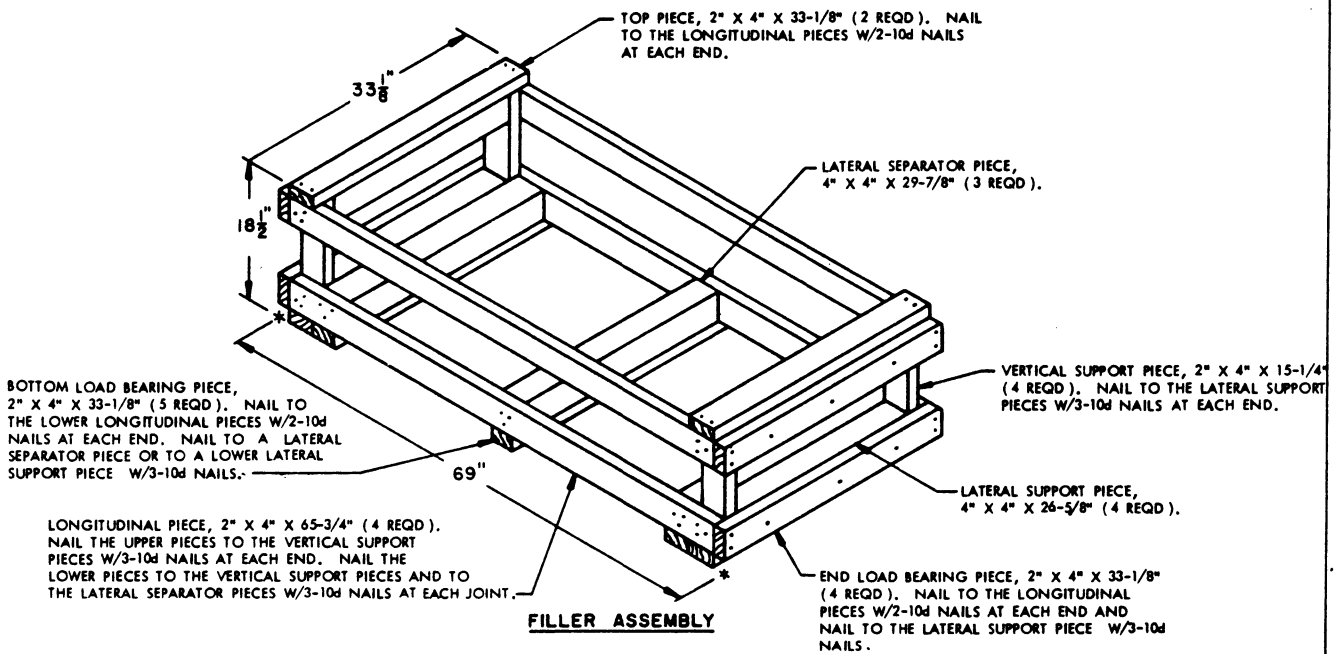


**SPECIAL NOTES:**

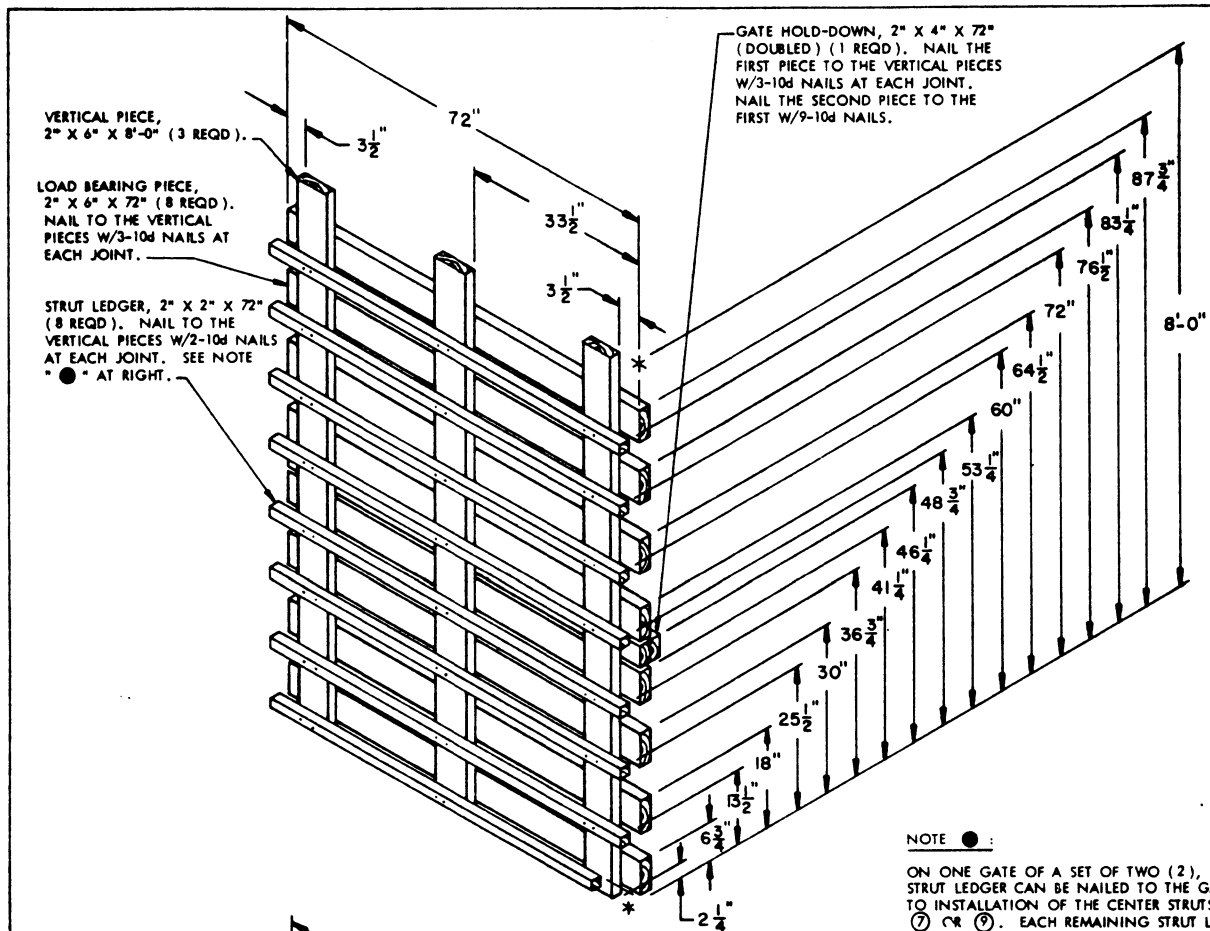
1. A PARTIAL LAYER LOAD IS SHOWN IN A 9'-2" WIDE BOX CAR; HOWEVER, ANY WIDTH CAR CAN BE USED. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO DRAWING 19-48-4016-SM1001 FOR THE PROPER SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE SELECTED BRACE.
2. A "K-BRACE" ASSEMBLY AS SHOWN IS ADEQUATE FOR RETAINING A PARTIAL LAYER LOAD OF 7,000 POUNDS.
3. **CAUTION:** SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL LAYER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS ON THE CAR BEING USED WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES ①, ②, ③, ⑥ AND ⑨ OR THE COMPARABLE PIECES FOR A HEAVIER BRACE MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDE WALL. IT IS ALRIGHT FOR THE END OF A DIAGONAL BRACE MARKED ⑦, OR THE COMPARABLE PIECE FOR A HEAVIER BRACE TO BEAR IN FRONT OF A DOOR OPENING; HOWEVER, THE ADJACENT PIECE MARKED ③, OR THE COMPARABLE PIECE ON A HEAVIER BRACE, MUST BE DOUBLED TO EXTEND ACROSS AND FAR ENOUGH PAST THE DOOR OPENING TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE.

**KEY NUMBERS**

- ① LOWER WALL CLEAT, 2" X 4" X 18" (2 REQD). POSITION A CLEAT ON EACH SIDE OF THE LOAD SO THAT THE TOP OF THE CROSS CAR BRACE MARKED ③ WILL ALIGN WITH THE TOP OF THE PALLET DECK BOARDS. NAIL TO THE CAR SIDE WALL W/5-12d NAILS. SEE GENERAL NOTE "M" ON PAGE 2.
- ② HORIZONTAL, 2" X 6" BY CAR WIDTH IN LENGTH (CUT TO FIT) (1 REQD). NAIL TO THE CROSS CAR BRACE MARKED ③ W/1-12d NAIL EVERY 6".
- ③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH IN LENGTH (CUT TO FIT) (1 REQD).
- ④ CENTER CLEAT, 2" X 4" X 54" (1 REQD). NAIL TO THE CROSS BRACE W/9-20d NAILS.
- ⑤ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (2 REQD). NAIL TO THE CAR SIDE WALL W/16-12d NAILS.
- ⑥ POCKET CLEAT, 2" X 6" X 12" (2 REQD). NAIL TO THE HORIZONTAL WALL CLEAT W/4-20d NAILS.
- ⑦ DIAGONAL BRACE, 4" X 4" X 37-1/2" (2 REQD). TOENAIL TO THE HORIZONTAL WALL CLEAT AND CROSS CAR BRACE W/2-20d NAILS AT EACH END.
- ⑧ BACK-UP CLEAT, 2" X 6" X 30" (2 REQD). NAIL TO THE HORIZONTAL WALL CLEAT W/11-20d NAILS.
- ⑨ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDE WALL W/5-12d NAILS.
- ⑩ UNITIZING STRAP, 1-1/4" X .035" X 16'-0" LONG STEEL STRAPPING (2 REQD). INSTALL TO ENCIRCLE THE TWO ADJACENT PALLET UNITS IN THE TOP LAYER AS SHOWN.
- ⑪ SEAL FOR 1-1/4" STEEL STRAPPING (4 REQD, 2 PER STRAP). POSITION JOINT AT VOID BETWEEN UNITS. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "P" ON PAGE 2.



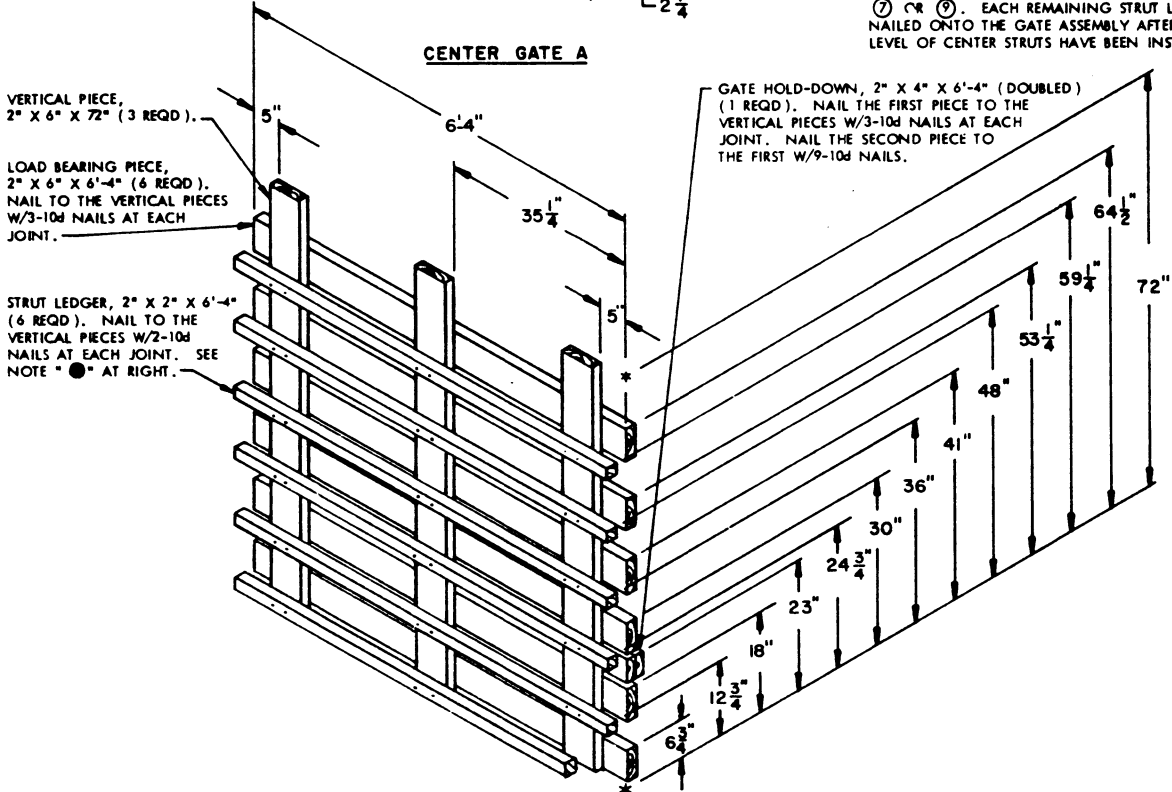
**APPLICATION OF FILLER ASSEMBLY**



NOTE ● :

ON ONE GATE OF A SET OF TWO (2), ONLY THE BOTTOM STRUT LEDGER CAN BE NAILED TO THE GATE ASSEMBLY PRIOR TO INSTALLATION OF THE CENTER STRUTS, PIECES MARKED ⑦ OR ⑧. EACH REMAINING STRUT LEDGER SHOULD BE NAILED ONTO THE GATE ASSEMBLY AFTER THE NEXT LOWER LEVEL OF CENTER STRUTS HAVE BEEN INSTALLED.

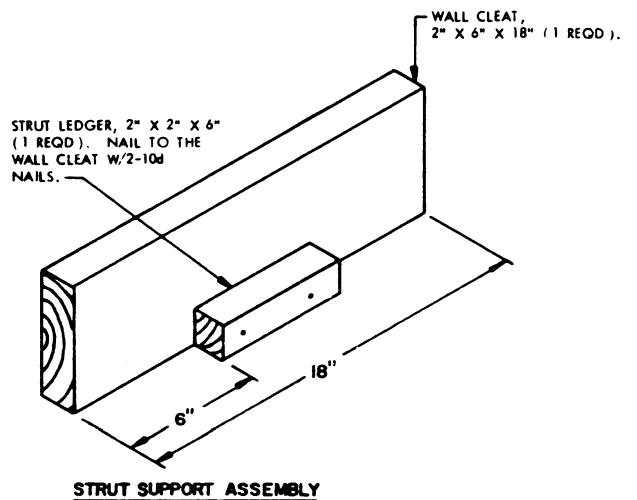
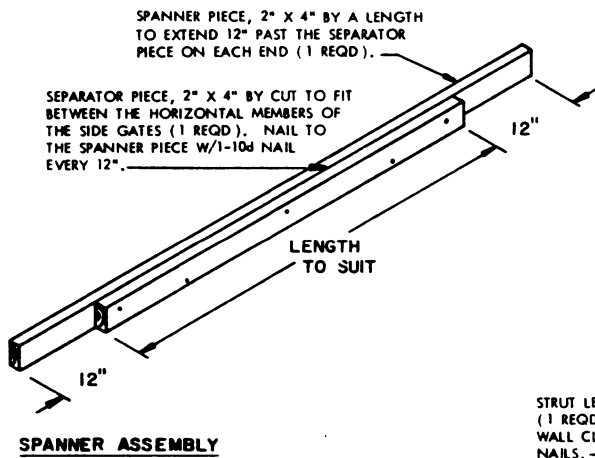
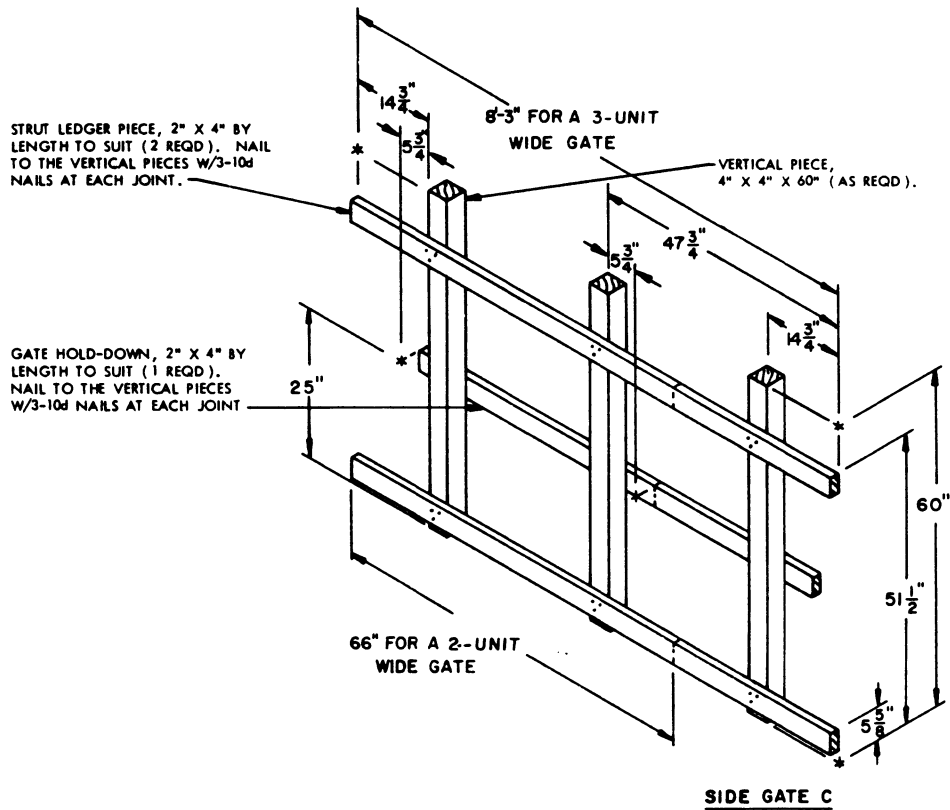
CENTER GATE A



CENTER GATE B

DETAILS

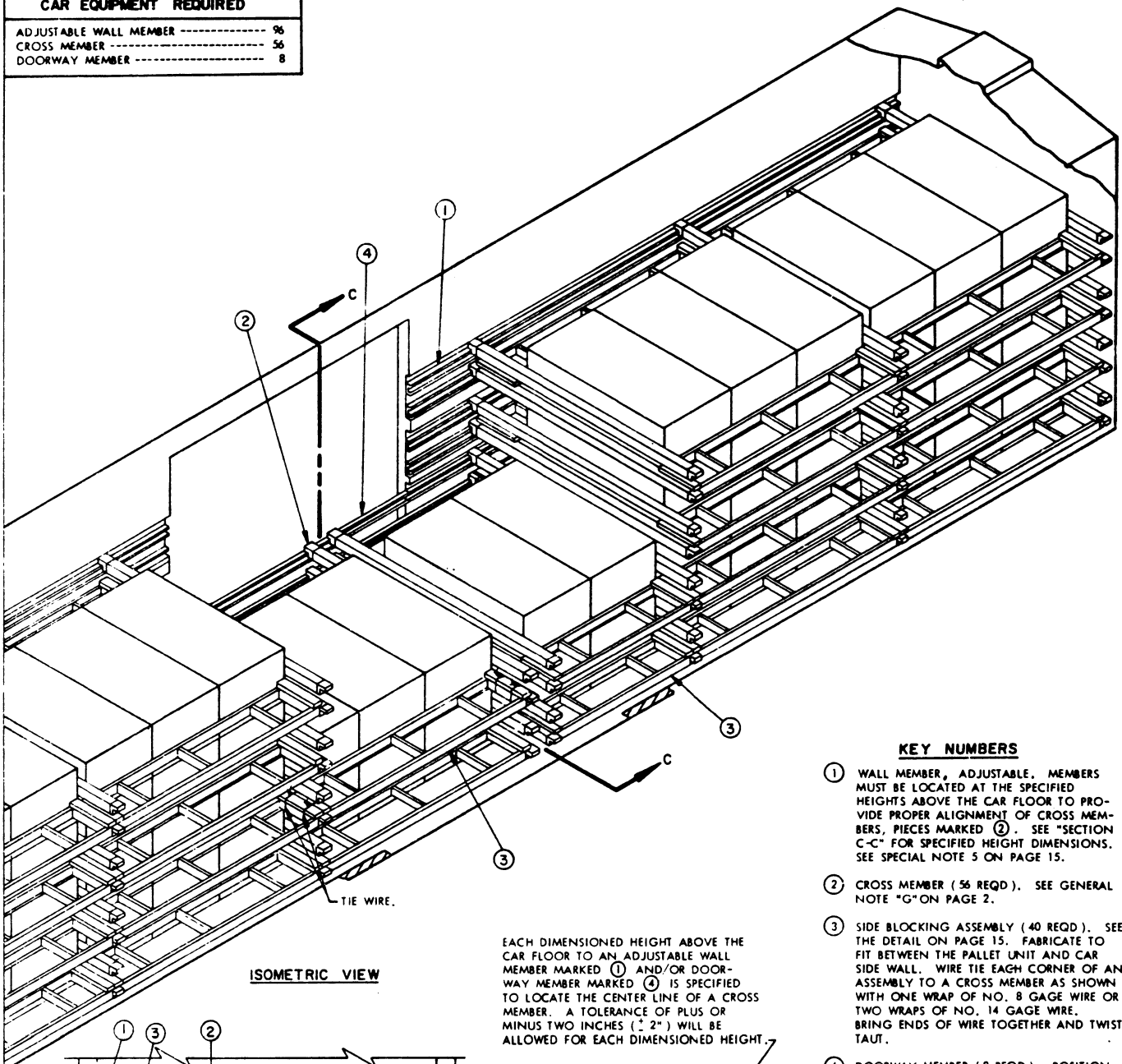




NOTE: IN LIEU OF FABRICATING STRUT SUPPORT ASSEMBLIES, RANDOM LENGTH MATERIAL MAY BE NAILED TO THE CAR SIDE WALLS AT THE SPECIFIED HEIGHTS THROUGHOUT THE LENGTH OF THE CAR.

**CAR EQUIPMENT REQUIRED**

ADJUSTABLE WALL MEMBER -----	96
CROSS MEMBER -----	56
DOORWAY MEMBER -----	8

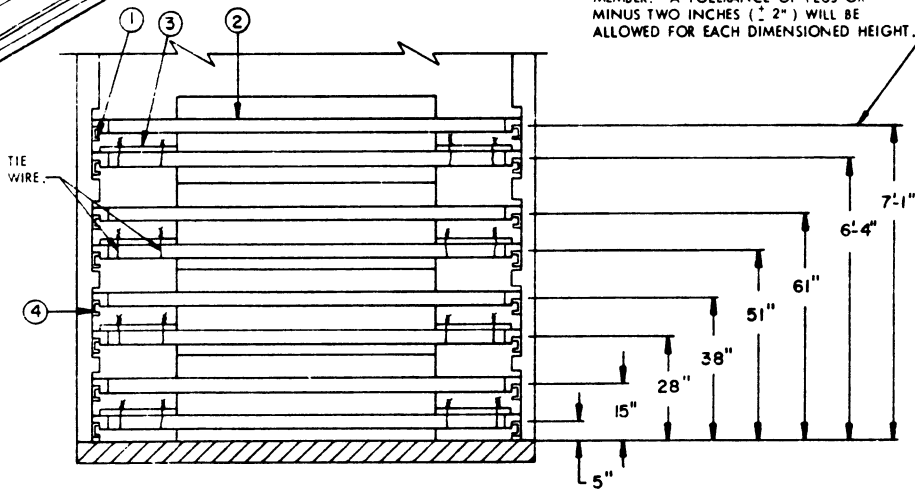


**ISOMETRIC VIEW**

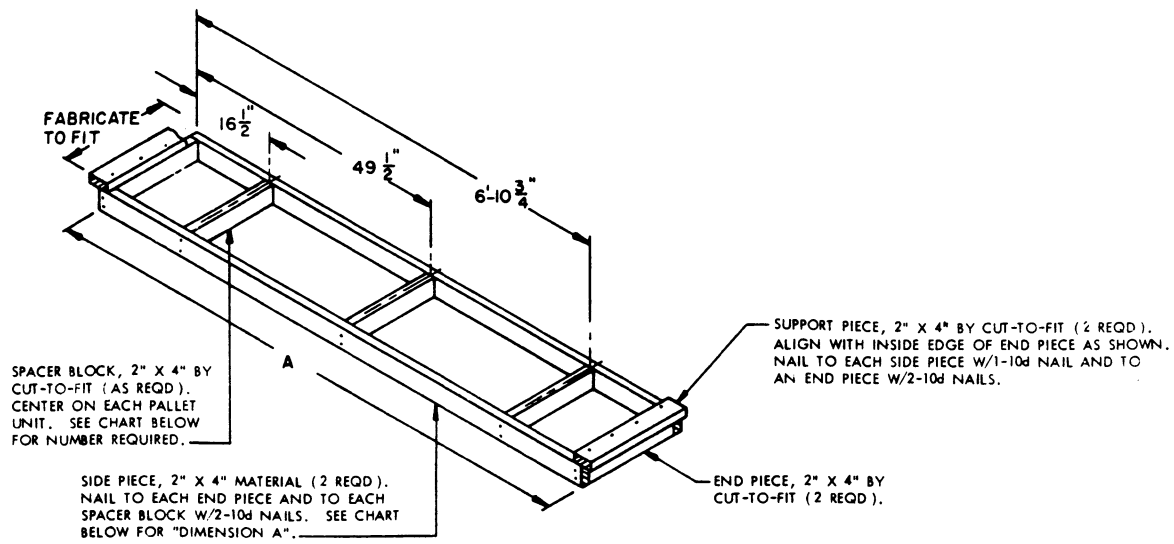
EACH DIMENSIONED HEIGHT ABOVE THE CAR FLOOR TO AN ADJUSTABLE WALL MEMBER MARKED ① AND/OR DOORWAY MEMBER MARKED ④ IS SPECIFIED TO LOCATE THE CENTER LINE OF A CROSS MEMBER. A TOLERANCE OF PLUS OR MINUS TWO INCHES ( $\pm 2"$ ) WILL BE ALLOWED FOR EACH DIMENSIONED HEIGHT.

**KEY NUMBERS**

- ① WALL MEMBER, ADJUSTABLE. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS. PIECES MARKED ②. SEE "SECTION C-C" FOR SPECIFIED HEIGHT DIMENSIONS. SEE SPECIAL NOTE 5 ON PAGE 15.
- ② CROSS MEMBER (56 REQD). SEE GENERAL NOTE "G" ON PAGE 2.
- ③ SIDE BLOCKING ASSEMBLY (40 REQD). SEE THE DETAIL ON PAGE 15. FABRICATE TO FIT BETWEEN THE PALLET UNIT AND CAR SIDE WALL. WIRE TIE EACH CORNER OF AN ASSEMBLY TO A CROSS MEMBER AS SHOWN WITH ONE WRAP OF NO. 8 GAGE WIRE OR TWO WRAPS OF NO. 14 GAGE WIRE. BRING ENDS OF WIRE TOGETHER AND TWIST TAUT.
- ④ DOORWAY MEMBER (8 REQD). POSITION AT HEIGHTS SPECIFIED IN "SECTION C-C".



**SECTION C - C**



**SIDE BLOCKING ASSEMBLY**

CHART		NO. OF SPACER BLOCKS REQD
BAY LENGTH	DIM A	
ONE PALLET UNIT	33"	ONE (1)
TWO PALLET UNITS	66-1/8"	TWO (2)
THREE PALLET UNITS	99-1/4"	THREE (3)

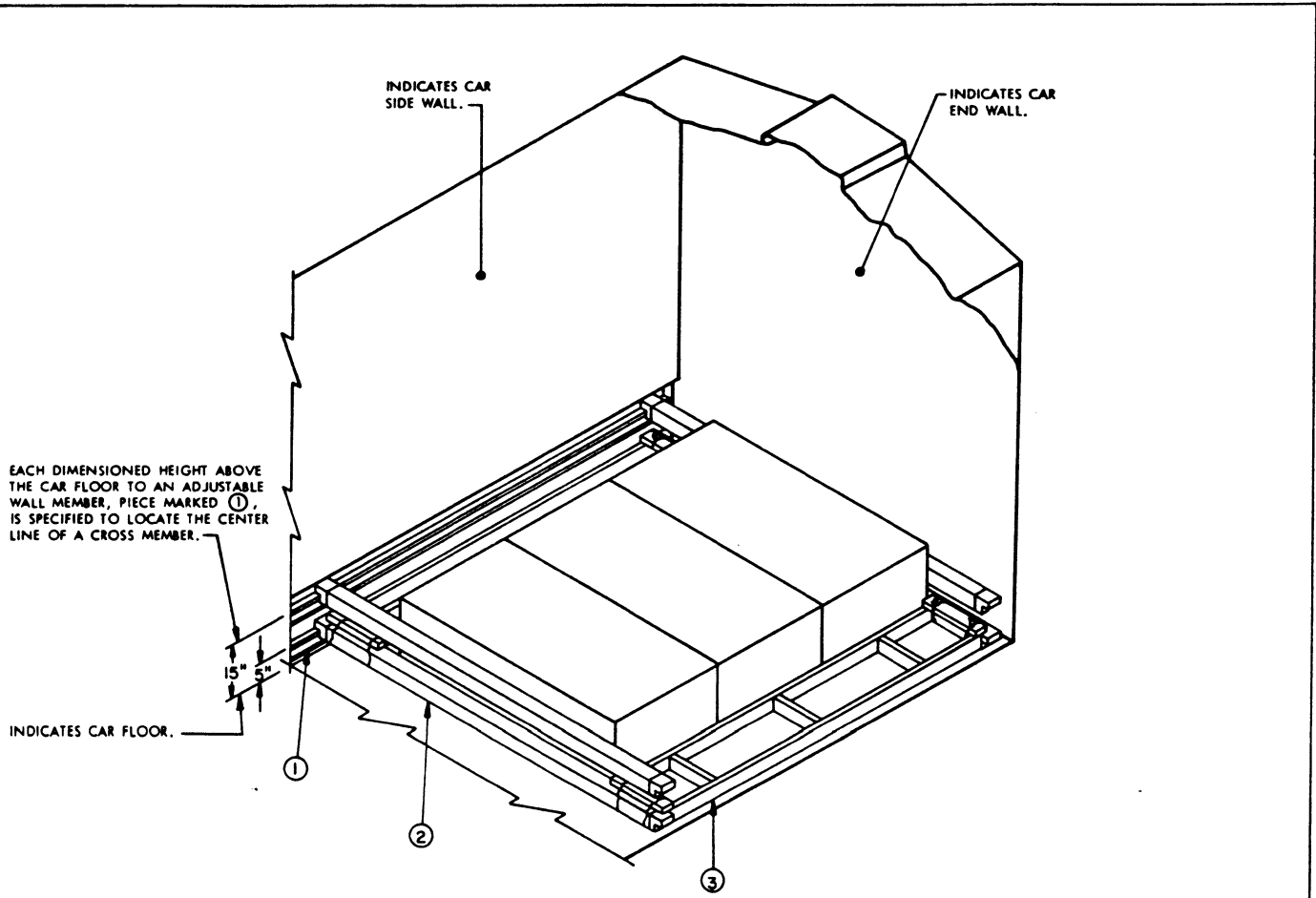
**SPECIAL NOTES:**

1. A 50'-6" LONG BY 9'-0" WIDE (INSIDE CLEARANCE) BOX CAR EQUIPPED WITH ADJUSTABLE WALL MEMBERS, AND WITH 10'-0" DOOR OPENINGS IS SHOWN. CARS WITH WIDER OR NARROWER DOOR OPENINGS MAY BE USED.
2. A NARROWER OR WIDER CAR CAN BE USED FOR THE SHIPMENT OF THE DEPICTED LOAD BY ADJUSTING THE WIDTH OF THE "SIDE BLOCKING ASSEMBLIES".
3. TO SATISFY A LESS-THAN-FULL-LOAD QUANTITY, ONE OR MORE PALLET UNITS MAY BE OMITTED FROM THE TOP LAYER OF THE LOAD. ADJUST THE LONGITUDINAL LOCATION OF THE CROSS MEMBERS RETAINING THE TOP LAYER.
4. IF THE CAR BEING USED CONTAINS TWELVE (12) DOORWAY MEMBERS, AND FOUR (4) MORE CROSS MEMBERS, A FULL THIRD LAYER OF PALLET UNITS MAY BE LOADED IN THE CAR, PROVIDING THE LOAD LIMIT OF THE CAR IS NOT EXCEEDED. LIKEWISE, SIXTEEN (16) DOORWAY MEMBERS AND EIGHT (8) MORE CROSS MEMBERS WILL ACCOMMODATE FOUR (4) FULL LAYERS THROUGHOUT THE ENTIRE LENGTH OF THE CAR.
5. THE WALL MEMBERS AT THE DIMENSIONED HEIGHTS OF 5", 28", 51", AND 6'-4" MUST FORM A CONTINUOUS RAIL THROUGHOUT THE LENGTH OF THE CAR, AS REQUIRED, TO SUPPORT THE "SIDE BLOCKING ASSEMBLIES".

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	1,032	688
NAILS	NO. REQD	POUNDS
10d (3")	1,104	17
WIRE, NO. 8 GAGE	236' REQD	22 LBS

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	58	110,780 LBS
DUNNAGE		1,759 LBS
TOTAL WEIGHT		112,539 LBS



**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① WALL MEMBER, ADJUSTABLE. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE FOR PROPER INSTALLATION OF CROSS MEMBERS, PIECES MARKED ②. SEE GENERAL NOTE "G" ON PAGE 2.
- ② CROSS MEMBER (4 REQD). SEE SPECIAL NOTE 2.
- ③ SIDE BLOCKING ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 15. WIRE TIE EACH CORNER OF AN ASSEMBLY TO A CROSS MEMBER AS SHOWN WITH ONE WRAP OF NO. 8 GAGE WIRE OR TWO WRAPS OF NO. 14 GAGE WIRE. BRING ENDS OF WIRE TOGETHER AND TWIST TAUT.

**SPECIAL NOTES:**

- 1. A 9'-0" WIDE CAR IS SHOWN. A WIDER OR NARROWER CAR CAN BE USED.
- 2. TWO (2) CROSS MEMBERS, SHOWN AS PIECES MARKED ②, ARE ADEQUATE FOR RETAINING A 3-UNIT, 1-LAYER LOAD. IF MORE THAN THREE (3) PALLET UNITS ARE TO BE LOADED IN THE CAR, ADDITIONAL BAYS AND/OR LAYERS MUST BE USED. SEE "SECTION C-C" ON PAGE 14 FOR HEIGHT LOCATIONS OF CROSS MEMBERS FOR ADDITIONAL LAYERS. ALSO, "SIDE BLOCKING ASSEMBLIES" MUST BE INSTALLED IN EACH LAYER WHEN THE LOAD IS MORE THAN ONE (1) LAYER IN HEIGHT, AS DEPICTED ON PAGE 14.