

APPROVED BY  
 BUREAU OF EXPLOSIVES  
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 DATE 7/3/69

# LOADING AND BRACING (CL & LCL) IN BOX CARS OF CBU ITEMS\* PACKED IN THE CNU-98/E CONTAINER

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\* ITEMS SUCH AS THE CBU-15/A THAT REQUIRE SPECIAL IN-TRANSIT MONITORING

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DO NOT SCALE

## GENERAL NOTES

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AMCR 740-13, AND AUGMENTS 743-200-1 (CHAPTER 5).
- B. THE OUTLOADING PROCEDURES SPECIFIED HEREIN ARE APPLICABLE TO CBU ITEMS WHEN THEY ARE PACKAGED IN THE CNU-98/E CONTAINER. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CNU-98/E CONTAINER WITH CONTENTS. SEE GENERAL NOTE "F" BELOW.
- C. FOR DETAILS OF THE CNU-98/E CONTAINER SEE DRAWING NO. 921181.  
CONTAINER DIMENSIONS ---- 103-5/8" LONG BY 31-3/8" WIDE BY 31-1/4" HIGH.  
GROSS WEIGHT ----- 1,178 POUNDS (APPROX).
- D. THE OUTLOADING PROCEDURES SPECIFIED IN THIS DRAWING ARE FOR CONVENTIONAL TYPE BOXCARS OF VARIOUS LENGTH AND WIDTH COMBINATIONS.
- E. THE LOADS AS SHOWN ARE BASED ON CARS WHICH HAVE DOORS OF THE CONVENTIONAL SLIDING TYPE; HOWEVER, 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 IF A DOOR IS SO EQUIPPED, FOR SECURING SUCH ITEMS AS GATE HOLD DOWNS, OR DOORWAY SPANNER DUNNAGE. 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.
- F. THE DUNNAGE ASSEMBLIES AND OTHER BLOCKING AND BRACING COMPONENTS AND THE LOADING PATTERNS SHOWN HEREIN ARE DESIGNED TO FACILITATE THE INTRANSIT INSPECTION/MONITORING OF THE DESIGNATED ITEM. CONTAINERS MUST BE POSITIONED IN THE CAR AS INDICATED BY THE ARROWS ON THE LOAD VIEWS TO AVOID RENDERING THE INSPECTION/MONITORING PORTS ON THE CONTAINERS INACCESSIBLE.
- G. THE NUMBER OF LADING UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE BOXCAR BEING LOADED OR THE QUANTITY 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.
- H. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN BOXCARS WHICH ARE PARTIALLY LOADED WITH ITEMS WHICH ARE PACKED IN THE CNU-98/E CONTAINER, PROVIDING THE TOTAL LOAD IS COMPATIBLE, EXISTING DIRECTIVES ARE NOT VIOLATED, THE INSPECTION/MONITORING PORT OF THIS ITEM IS ACCESSIBLE, AND THE OTHER LADING ITEMS ARE BLOCKED AND BRACED TO EQUAL THE BLOCKING AND BRACING CRITERIA SPECIFIED HEREIN.
- J. THE OUTLOADING PROCEDURES SPECIFIED HEREIN CAN ALSO BE UTILIZED FOR SHIPMENT OF THE DEPICTED CONTAINERS WHEN THEY ARE EMPTY OR LOADED WITH AN ITEM WHICH IS IDENTIFIED DIFFERENTLY BY NOMENCLATURE THAN THE ITEMS DESIGNATED WITHIN THE DRAWING TITLE.
- K. ONE AND ONE-QUARTER INCH (1-1/4") STEEL STRAPPING WILL BE USED TO UNITIZE STACKED CONTAINERS AS SHOWN ON PAGE 3, AND AS SPECIFIED BY THE APPLICABLE OUTLOADING METHODS SPECIFIED HEREIN. IF THE CAPACITY OF THE MATERIAL HANDLING EQUIPMENT USED TO LOAD THE CONTAINERS ABOARD A CAR PERMITS, IT IS RECOMMENDED THAT THE CONTAINERS BE UNITIZED PRIOR TO PLACEMENT WITHIN THE CAR. **NOTICE:** IN SOME CASES, CONTAINERS WILL ALREADY BE UNITIZED WHEN OFFERED FOR LOADING. THESE UNITIZED STACKS SHOULD BE INSPECTED AND AS REQUIRED, LOOSE UNITIZING STEEL STRAPPING MUST BE REPLACED.
- L. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT AS SHOWN, A MINIMUM OF TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) PAIR OF CRIMPS PER SEAL MUST BE USED TO SEAL THE JOINT.

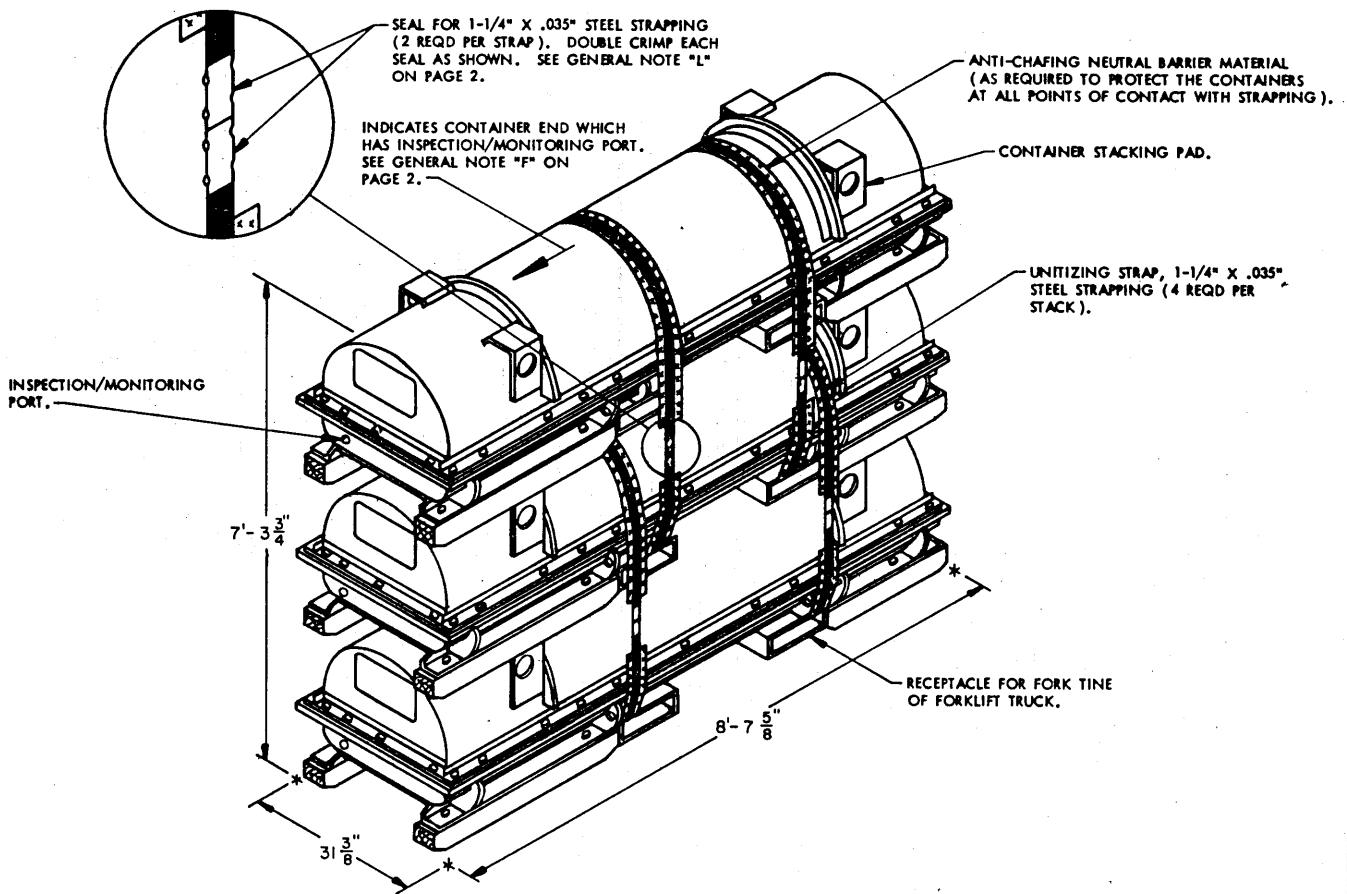
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## (GENERAL NOTES CONTINUED)

- M. IF THE CAR BEING USED 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. ALSO, IF THE LOCATION OF PIECES NAILED TO THE CAR FLOOR IS SUCH THAT PROPER NAILING INTO THE NAILING CHANNELS IN THE CAR FLOOR CANNOT BE ACHIEVED, THE LENGTH AND/OR WIDTH OF THESE PIECES MAY BE INCREASED AS NECESSARY.
- N. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 1" X 4" MATERIAL IS ACTUALLY 3/4" THICK BY 3-5/8" WIDE AND 2" X 3" MATERIAL IS ACTUALLY 1-5/8" THICK BY 2-5/8" WIDE.
- 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 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 OF A LOWER PIECE.
- 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 VIEWS FOR CLARITY PURPOSES.
- R. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "UNITIZATION AND HANDLING PROCEDURES" ON PAGE 3 AND TO THE "SPECIAL NOTES" SECTION WHICH IS IMMEDIATELY ADJACENT TO DEPICTED OUTLOADING METHODS.
- S. THE "DOORWAY AREA" WITHIN A CAR IS DEFINED AS THE CARGO SPACE THAT IS ADJACENT TO A CONVENTIONAL TYPE AND/OR A 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.

## MATERIAL SPECIFICATIONS

- LUMBER ----- : SEE TM 743-200-1, DUNNAGE LUMBER; FED SPEC MM-L-751.
- NAILS ----- : COMMON, CEMENT COATED OR CHEMICALLY ETCHED.  
REF: 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.
- ANTI-CHAFING MATERIAL: NEUTRAL BARRIER MATERIAL, MIL-B-121 (OR EQUAL).



**TYPICAL STACK DETAIL**

**UNITIZING AND HANDLING PROCEDURAL GUIDANCE**

1. STACKING CONTAINERS FOR UNITIZING.
  - A. AN UPPER CONTAINER SHOULD BE PLACED AS CLOSE AS POSSIBLE IN VERTICAL ALIGNMENT WITH THE NEXT LOWER CONTAINER.
  - B. POSITION THE INSPECTION/MONITORING PORT OF AN UPPER CONTAINER ABOVE THE INSPECTION/MONITORING PORT OF THE NEXT LOWER CONTAINER. SEE GENERAL NOTE "F" ON PAGE 2.
  - C. THE CONTAINER SKIDS OF AN UPPER CONTAINER SHOULD BE FULLY SEATED UPON THE STACKING PADS ON THE COVER OF THE NEXT LOWER CONTAINER.
2. INSTALLATION OF 1-1/4" X .035" UNITIZING STEEL STRAPPING. SEE GENERAL NOTE "K" ON PAGE 2.
  - A. EACH OF THE TWO SETS OF UNITIZING STRAPS SHOULD BE POSITIONED AROUND THE CONTAINERS AS SHOWN. PLACE STRAPPING THROUGH THE RECEPTACLE FOR FORK TINE OF FORKLIFT TRUCK AND OVER THE COVER OF THE NEXT CONTAINER ABOVE, AS NEAR AS POSSIBLE TO THE INSIDE ENDS OF THE CONTAINER SKIDS. PLACE STRAPPING SO THAT IT LAYS FLAT AND STRAIGHT WITH THE CONTOUR OF THE CONTAINERS; I.E. VERTICAL ALONG THE SIDES AND STRAIGHT ACROSS THE TOP AND BOTTOM OF THE STACK.
  - B. PLACE ANTI-CHAFING MATERIAL UNDER THE STRAPPING AT ALL POINTS OF STRAPPING/CONTAINER CONTACT, AND SECURE TO PREVENT DISLODGE MENT DURING AND AFTER STRAP APPLICATION. STRIPS OF ANTI-CHAFING MATERIAL MAY BE TAPED OR STRING-TIED TO THE CONTAINER OR STRAPPING, OR IT CAN BE FORMED INTO STRAP ENCIRCLING TUBES BY WINDING THE MATERIAL AROUND THE STRAPPING TO FORM A SELF-HOLDING UNIT.
  - C. STRAPPING WILL BE FIRMLY TENSIONED, AND EACH END-OVER-END LAP JOINT WILL BE SEALED WITH TWO DOUBLE CRIMPED STRAP SEALS AS SHOWN. THE LAP JOINT WILL BE MADE ALONG THE SIDE OF THE STACK SO THAT THE SEALS WILL NOT BE IN CONTACT WITH THE CONTAINERS. DURING STRAP TENSIONING, CARE SHOULD BE EXERCISED TO ENSURE THAT THE CONTAINERS ARE NOT DAMAGED. EXCESS STRAPPING (STRAP ENDS) SHOULD BE CUT OFF OR BROKEN OFF NEAR THE JOINT SEALS.

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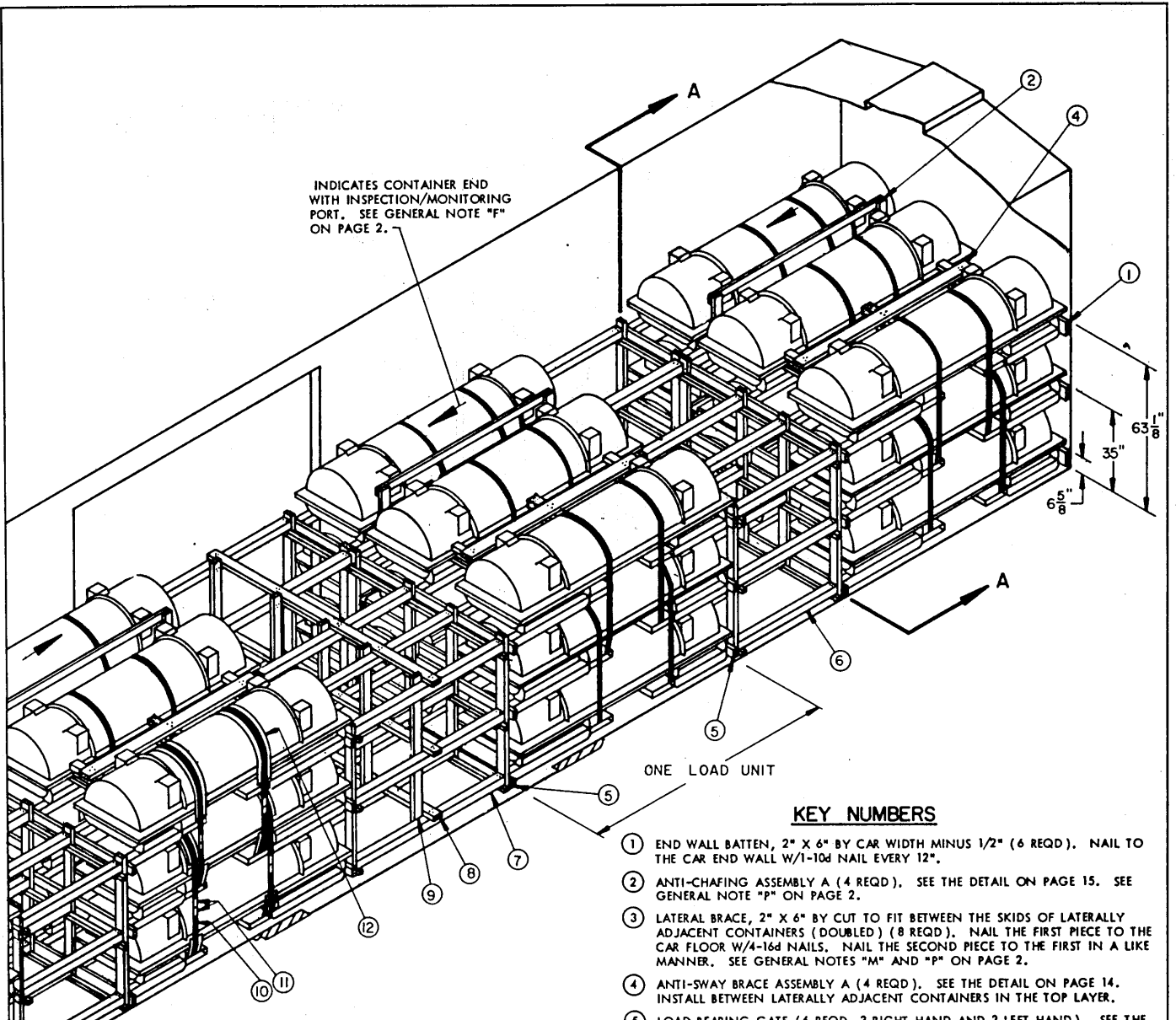
**(UNITIZING AND HANDLING PROCEDURAL GUIDANCE CONTINUED)**

3. CONTAINER OR CONTAINER STACK HANDLING.
 

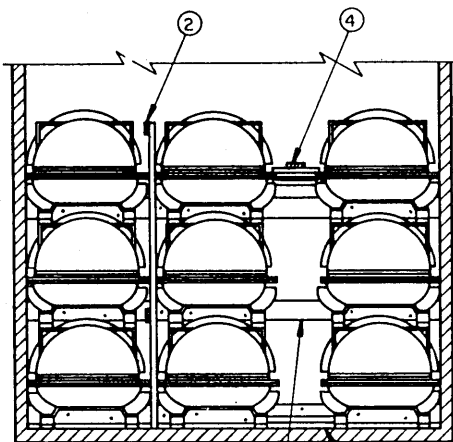
**NOTES:** (1) APPROVED MATERIAL HANDLING EQUIPMENT (FORKLIFT TRUCKS, CRANES, HAND TRUCKS, DOLLIES, ROLLER ASSEMBLIES, SLINGS, SPREADER BARS, ETC) IS SPECIFIED ELSEWHERE THAN HEREIN.

(2) PRECAUTIONARY HANDLING TECHNIQUES NORMALLY EMPLOYED OR AS SPECIFIED FOR THE TYPE OF COMMODITY INVOLVED WILL BE OBSERVED.

  - A. ONLY APPROVED AND APPROPRIATELY SIZED MATERIAL HANDLING EQUIPMENT WILL BE USED FOR HANDLING THE DEPICTED CONTAINERS.
  - B. IF HANDLING IS ACCOMPLISHED WITH A FORKLIFT TRUCK, THE CONTAINERS SHOULD BE HANDLED FROM A SIDE POSITION. CAUTION: THE USUALLY APPLIED END HANDLING IS NOT PERMITTED; HOWEVER, THE FORK TINES MAY BE PLACED UNDER THE SKIDS FROM AN END POSITION. CARE MUST BE EXERCISED WHEN INSERTING FORK TINES UNDER A CONTAINER TO PREVENT DAMAGE TO THE CONTAINER BY THE FORK TINES OR THE FORKLIFT PACKAGE GUARD. FOR VERY SHORT "INCHING" SPEED MOVEMENTS, SUCH AS WILL BE EXPERIENCED DURING CARLOADING, A TWO OR THREE-HIGH CONTAINER STACK MAY BE HANDLED BY INSERTING THE FORKS OF A FORKLIFT TRUCK UNDER THE BODY OF AN UPPER CONTAINER.
  - C. IF ONE CONTAINER IS HANDLED BY SLINGING, THE SLING MAY BE ATTACHED TO THE LIFTING POINTS OF THE CONTAINER. HOWEVER, IF A TWO OR THREE-HIGH CONTAINER STACK IS HANDLED BY SLINGING, DO NOT ATTACH THE SLING TO THE LIFTING POINTS OF A CONTAINER. THE SLING MUST BE OF SUCH A DESIGN THAT LIFTING IS DONE ON THE BOTTOM OF THE LOWEST CONTAINER.



ISOMETRIC VIEW

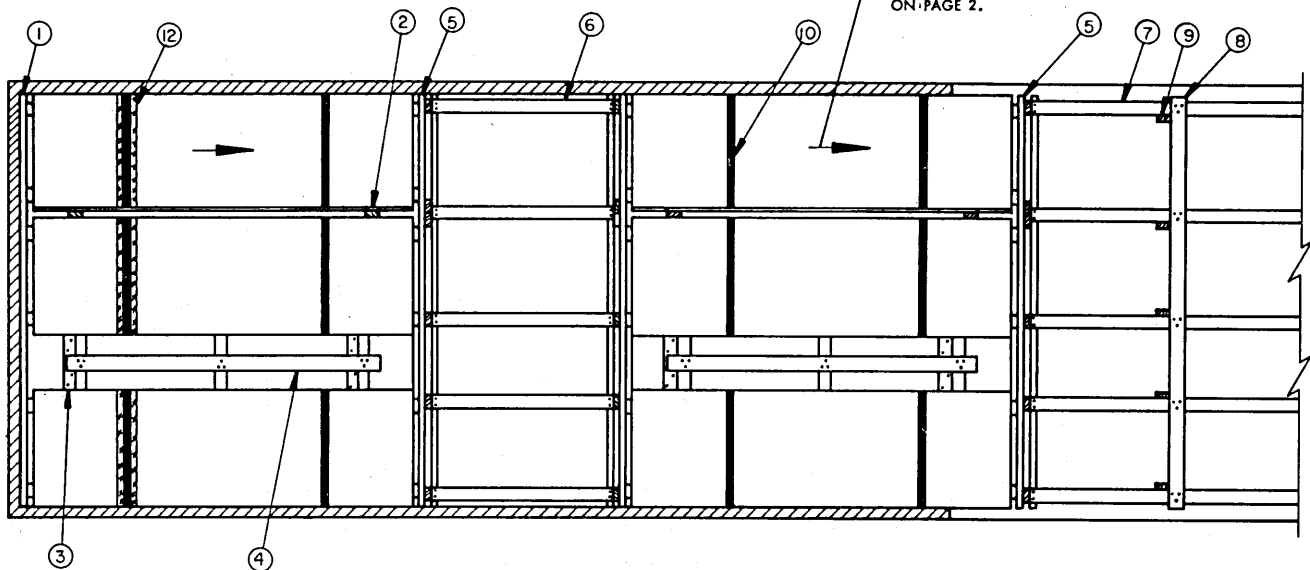


SECTION A-A

**KEY NUMBERS**

- ① END WALL BATTEN, 2" X 6" BY CAR WIDTH MINUS 1/2" (6 REQD). NAIL TO THE CAR END WALL W/1-10d NAIL EVERY 12".
- ② ANTI-CHAFING ASSEMBLY A (4 REQD). SEE THE DETAIL ON PAGE 15. SEE GENERAL NOTE "P" ON PAGE 2.
- ③ LATERAL BRACE, 2" X 6" BY CUT TO FIT BETWEEN THE SKIDS OF LATERALLY ADJACENT CONTAINERS (DOUBLED) (8 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/4-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTES "M" AND "P" ON PAGE 2.
- ④ ANTI-SWAY BRACE ASSEMBLY A (4 REQD). SEE THE DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT CONTAINERS IN THE TOP LAYER.
- ⑤ LOAD BEARING GATE (6 REQD, 3 RIGHT HAND AND 3 LEFT HAND). SEE THE "GATE A" DETAIL ON PAGE 12.
- ⑥ STRUT, 4" X 4" X 48" (MAX) (30 REQD). TOENAIL TO THE LOAD BEARING GATES, PIECES MARKED ⑤, W/2-16d NAILS AT EACH END.
- ⑦ STRUT, 4" X 4" BY CUT TO FIT (15 REQD). TOENAIL TO THE LOAD BEARING GATES, PIECES MARKED ⑤, W/2-16d NAILS AT EACH END. WHEN STRUTS ARE LONGER THAN 48", SEE PIECES MARKED ⑧ AND ⑨ AND "STRUT BRACING DETAIL" ON PAGE 16.
- ⑧ LATERAL STRUT BRACING, 2" X 4" BY CAR WIDTH (3 REQD). NAIL TO THE STRUTS, PIECES MARKED ⑦, W/3-10d NAILS AT EACH JOINT.
- ⑨ VERTICAL STRUT BRACING, 2" X 4" X 64" (5 REQD). NAIL TO THE STRUTS, PIECES MARKED ⑦, W/3-10d NAILS AT EACH JOINT. SEE THE "STRUT BRACING DETAIL".
- ⑩ UNITIZING STRAP, 1-1/4" X .035" X 15'-0" (48 REQD). SEE THE "UNITIZATION AND HANDLING PROCEDURES" ON PAGE 3 AND GENERAL NOTES "K" AND "L" ON PAGE 2.
- ⑪ SEAL FOR 1-1/4" STRAPPING (% REQD, 2 PER STRAP JOINT). DOUBLE CRIMP EACH SEAL.
- ⑫ ANTI-CHAFING, NEUTRAL BARRIER MATERIAL (AS REQD). POSITION UNDER ALL STRAPPING MARKED ⑩ AT ALL POINTS OF STRAPPING/CONTAINER CONTACT.

INDICATES CONTAINER END WITH INSPECTION/MONITORING PORT. SEE GENERAL NOTE "F" ON PAGE 2.



**PLAN VIEW**

**SPECIAL NOTES:**

1. A 50'-6" LONG BY 9'-2" WIDE BOXCAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. A WIDER CAR CAN BE USED FOR THE SHIPMENT OF THE DEPICTED LOAD; HOWEVER, A CAR OF LESSER WIDTH IS NOT RECOMMENDED.
2. A CAR WITH WIDER OR STAGGERED DOORS CAN BE USED FOR THE SHIPMENT OF THE DEPICTED LOAD. **NOTE:** FOUR (4) LOAD UNITS CAN BE LOADED INTO A CAR WITH 8'-0" WIDE DOOR OPENINGS. IF THE CAR BEING USED IS EQUIPPED WITH STAGGERED DOORS, IT WILL BE NECESSARY TO ENCIRCLE THE END OF EACH 9-CONTAINER LOAD UNIT WITH A DOORWAY PROTECTION STRAP AS SHOWN BY PIECES MARKED (6) AND (7) ON PAGES 6 AND 7, IF THE UNIT EXTENDS MORE THAN ONE-HALF THE LENGTH OF A CONTAINER INTO THE DOORWAY AREA ON EITHER SIDE OF THE CAR. TWO DOORWAY PROTECTION STRAPS WILL BE REQUIRED IF LESS THAN ONE FOOT (1') OF A LOAD UNIT LENGTH IS NOT RETAINED BY THE SIDE WALL OF A CAR.
3. IF THE DELINEATED OUTLOADING METHOD IS USED FOR THE SHIPMENT OF A LOAD WHICH CONTAINS A LOAD UNIT OF ONE LESS CONTAINER THAN IS SHOWN, TO SATISFY A LESS-THAN-FULL-LOAD QUANTITY, IT WILL BE NECESSARY TO SUBSTITUTE A "FILLER ASSEMBLY" IN THE PLACE OF THE OMITTED CONTAINER. SEE THE "APPLICATION OF FILLER ASSEMBLY" DETAIL ON PAGE 17 AND "DETAIL B" ON PAGE 10.

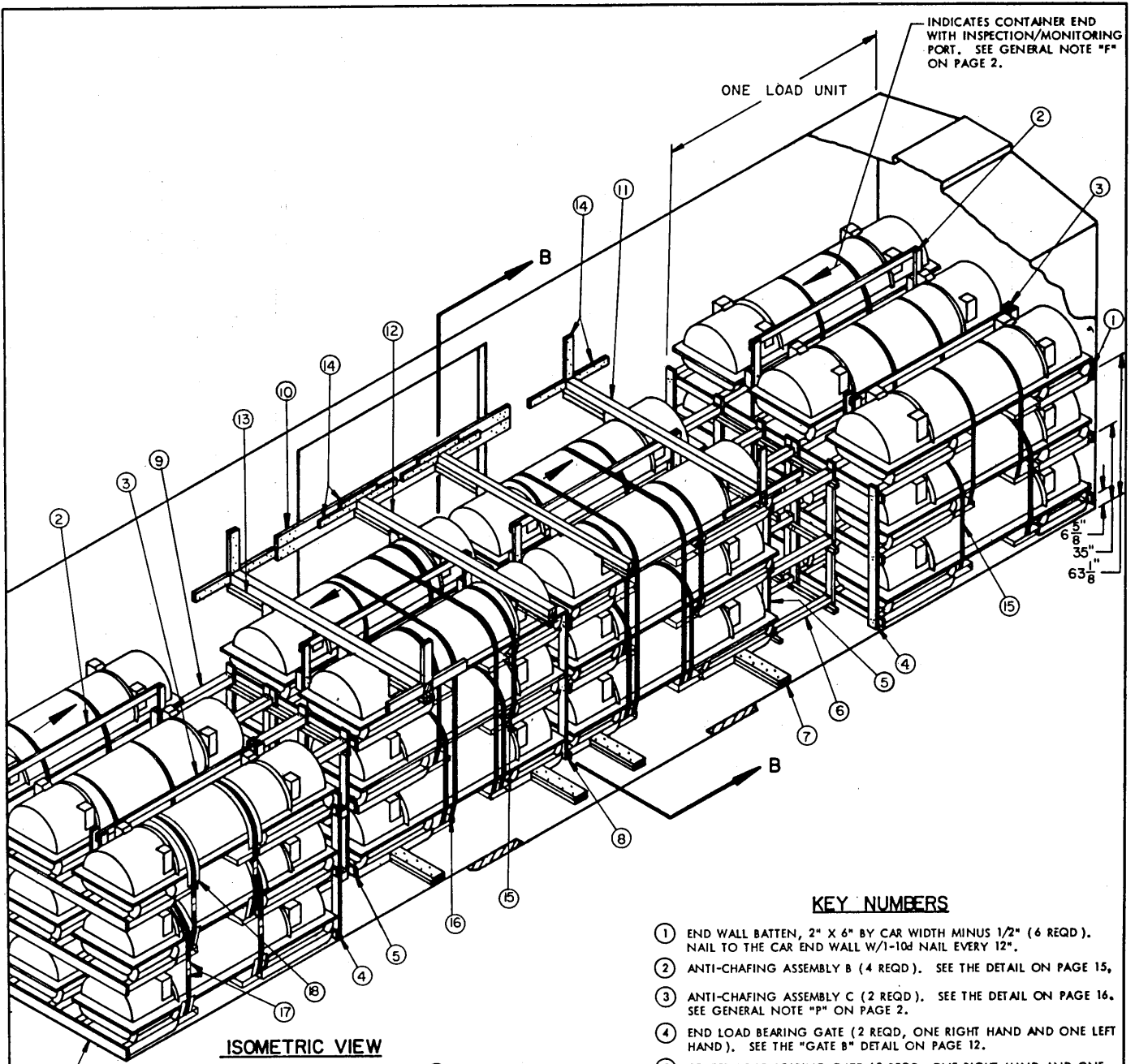
**BILL OF MATERIAL**

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	77	26
2" X 2"	165	55
2" X 3"	10-1/4	5
2" X 4"	548	183
2" X 6"	105	105
4" X 4"	211	281
NAILS	NO. REQD	POUNDS
6d (2")	108	1
10d (3")	1038	16
16d (3-1/2")	244	5
STEEL STRAPPING, 1-1/4" X .035"	720' REQD	103 LBS
SEALS FOR 1-1/4" STRAPPING	96 REQD	4 LBS
ANTI-CHAFING MATERIAL	AS REQD	NIL

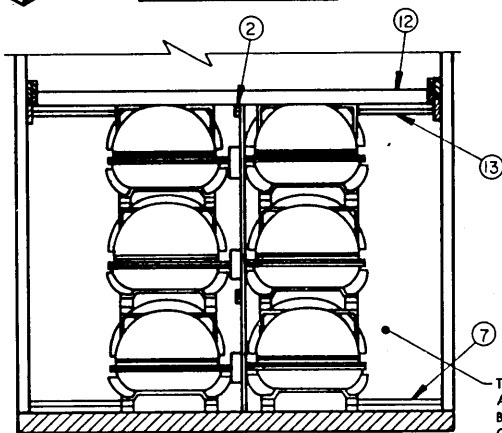
**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER (W/CBU ITEM)	36	42,408 LBS
DUNNAGE		1,766 LBS
<b>TOTAL WEIGHT</b>		<b>44,174 LBS</b>

**36-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CAR**



**ISOMETRIC VIEW**



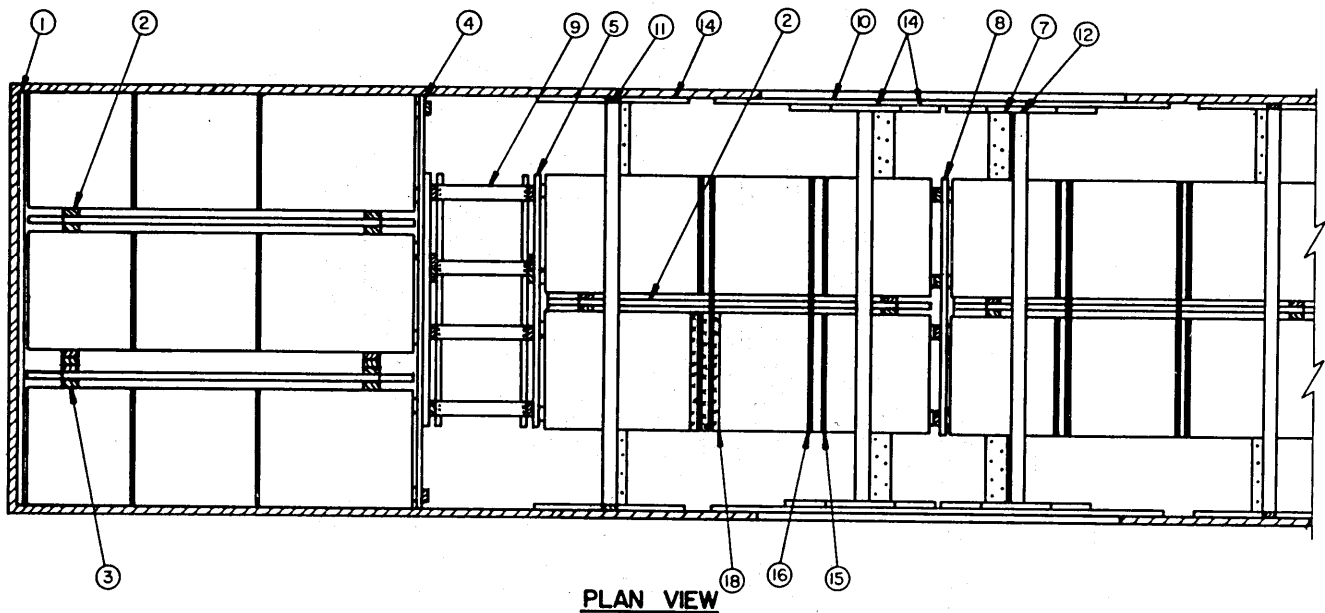
**SECTION B-B**

**30-UNIT LOAD IN A 40'-6" LONG BY A 9'-2" WIDE CAR**

**KEY NUMBERS**

- ① END WALL BATTEN, 2" X 6" BY CAR WIDTH MINUS 1/2" (6 REQD). NAIL TO THE CAR END WALL W/1-10d NAIL EVERY 12".
- ② ANTI-CHAFING ASSEMBLY B (4 REQD). SEE THE DETAIL ON PAGE 15.
- ③ ANTI-CHAFING ASSEMBLY C (2 REQD). SEE THE DETAIL ON PAGE 16. SEE GENERAL NOTE "P" ON PAGE 2.
- ④ END LOAD BEARING GATE (2 REQD, ONE RIGHT HAND AND ONE LEFT HAND). SEE THE "GATE B" DETAIL ON PAGE 12.
- ⑤ CENTER LOAD BEARING GATE (2 REQD, ONE RIGHT HAND AND ONE LEFT HAND). SEE THE "GATE C" DETAIL ON PAGE 13.
- ⑥ STRUT, 4" X 4" X 24" (12 REQD). TOENAIL TO THE LOAD BEARING GATES, PIECES MARKED ④ AND ⑤, W/2-16d NAILS AT EACH END. SEE THE "STRUT BRACING" DETAIL ON PAGE 16.
- ⑦ LATERAL BRACE, 2" X 6" X 24" (DOUBLED) (8 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/7-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTE "M" ON PAGE 2.
- ⑧ INTERMEDIATE GATE (1 REQD). SEE THE "GATE D" DETAIL ON PAGE 13.
- ⑨ STRUT, 4" X 4" BY CUT TO FIT (12 REQD). TOENAIL TO THE LOAD BEARING GATES, PIECES MARKED ④ AND ⑤, W/2-16d NAILS AT EACH END. SEE THE "STRUT BRACING" DETAIL ON PAGE 16.
- ⑩ DOORWAY SPANNER, 2" X 6" BY DOOR OPENING WIDTH PLUS 24" (4 REQD). NAIL TO THE CAR SIDE WALL W/5-12d NAILS AT EACH END. SEE SPECIAL NOTE 2 ON PAGE 7.
- ⑪ ANTI-SWAY BRACE, 4" X 4" BY CAR WIDTH (CUT TO FIT) (2 REQD).
- ⑫ ANTI-SWAY BRACE, 4" X 4" BY CAR WIDTH MINUS 3-1/4" (2 REQD).

(CONTINUED ON PAGE 7)



**PLAN VIEW**

**SPECIAL NOTES:**

1. A 40'-6" LONG BY 9'-2" WIDE BOXCAR EQUIPPED WITH 8'-0" WIDE DOOR OPENINGS IS SHOWN. A WIDER CAR CAN BE USED FOR THE SHIPMENT OF THE DEPICTED LOAD; HOWEVER, A CAR OF LESSER WIDTH IS NOT RECOMMENDED.
2. A CAR WITH WIDER OR STAGGERED DOORS CAN BE USED FOR THE SHIPMENT OF THE DEPICTED LOAD. IF THE DOOR OPENING WIDTH IS GREATER THAN 8'-0", PIECES MARKED (10) MUST BE LONG ENOUGH TO PROVIDE A NAILING SURFACE FOR ALL PIECES MARKED (14). A CAR WITH PLUG DOORS CAN ALSO BE USED FOR THE SHIPMENT OF THE DEPICTED LOAD. IF THE DOOR OPENING WIDTH IS GREATER THAN 8'-0", PIECES MARKED (10) MUST BE LONG ENOUGH TO PROVIDE A NAILING SURFACE FOR ALL PIECES MARKED (14). DUNNAGE WILL NOT BE NAILED TO A PLUG DOOR EXCEPT AS PERMITTED BY CRITERIA WITHIN GENERAL NOTE "E" ON PAGE 2.
3. IF THE DELINEATED OUTLOADING METHOD IS USED FOR THE SHIPMENT OF A LOAD WHICH CONTAINS A LOAD UNIT OF ONE LESS CONTAINER THAN SHOWN TO SATISFY A LESS-THAN-FULL-LOAD QUANTITY, IT WILL BE NECESSARY TO SUBSTITUTE A "FILLER ASSEMBLY" IN THE PLACE OF THE OMITTED CONTAINER. SEE THE "APPLICATION OF FILLER ASSEMBLY" DETAIL ON PAGE 10.

(KEY NUMBERS CONTINUED FROM PAGE 6)

- (13) ANTI-SWAY BLOCK, 2" X 4" BY CUT TO FIT BETWEEN THE CONTAINER STACKING PAD AND CAR SIDE WALL AND/OR DOOR SPANNER, PIECE MARKED (10) (DOUBLED) (8 REQD). NAIL THE FIRST PIECE TO THE ANTI-SWAY BRACE W/5-12d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- (14) POCKET CLEAT, 2" X 4" X 18" (24 REQD). NAIL TO THE CAR SIDE WALL AND/OR DOOR SPANNER, PIECES MARKED (10), W/5-10d NAILS.
- (15) UNITIZING STRAP, 1-1/4" X .035" X 15'-0" STEEL STRAPPING (40 REQD). SEE THE "UNITIZATION AND HANDLING PROCEDURES" ON PAGE 3 AND GENERAL NOTES "K" AND "L" ON PAGE 2.
- (16) DOORWAY PROTECTION STRAPPING, 1-1/4" X .035" X 33'-0" STEEL STRAPPING (4 REQD). INSTALL TO ENCIRCLE THE LOAD UNITS IN THE DOORWAY AREA AS SHOWN.
- (17) SEAL FOR 1-1/4" STRAPPING (88 REQD, 2 PER STRAP JOINT). DOUBLE CRIMP EACH SEAL.
- (18) ANTI-CHAFING, NEUTRAL BARRIER MATERIAL (AS REQD). POSITION UNDER ALL STRAPPING MARKED (17) AND (18) AT ALL POINTS OF STRAPPING/CONTAINER CONTACT.

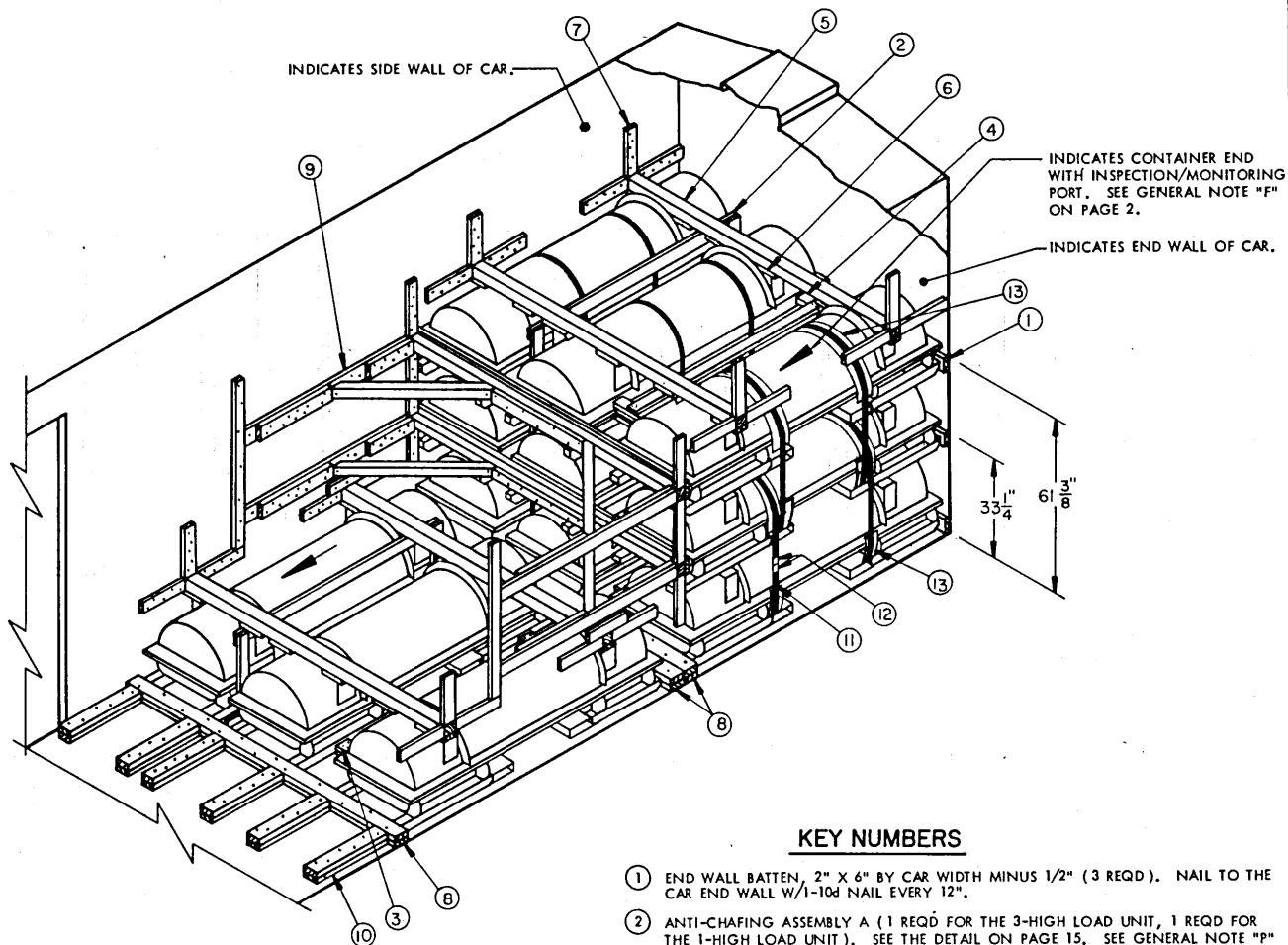
**BILL OF MATERIAL**

LUMBER	LINEAR FEET	BOARD FEET
2" X 2"	67	22-1/3
2" X 3"	8	4
2" X 4"	583	388
2" X 6"	127	127
4" X 4"	115	154
NAILS	NO. REQD	POUNDS
10d (3")	828	13
12d (3-1/4")	120	2
16d (3-1/2")	316	7
STEEL STRAPPING, 1-1/4" X .035" -----	732' REQD -----	105 LBS
SEAL FOR 1-1/4" STRAPPING -----	88 REQD -----	4 LBS
ANTI-CHAFING MATERIAL -----	AS REQD -----	NIL

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER (W/CBU ITEM) -----	30 -----	35,340 LBS
DUNNAGE -----	-----	1,869 LBS
<b>TOTAL WEIGHT -----</b>	<b>-----</b>	<b>37,209 LBS</b>

**30-UNIT LOAD IN A 40'-6" LONG BY 9'-2" WIDE CAR**



**ISOMETRIC VIEW**

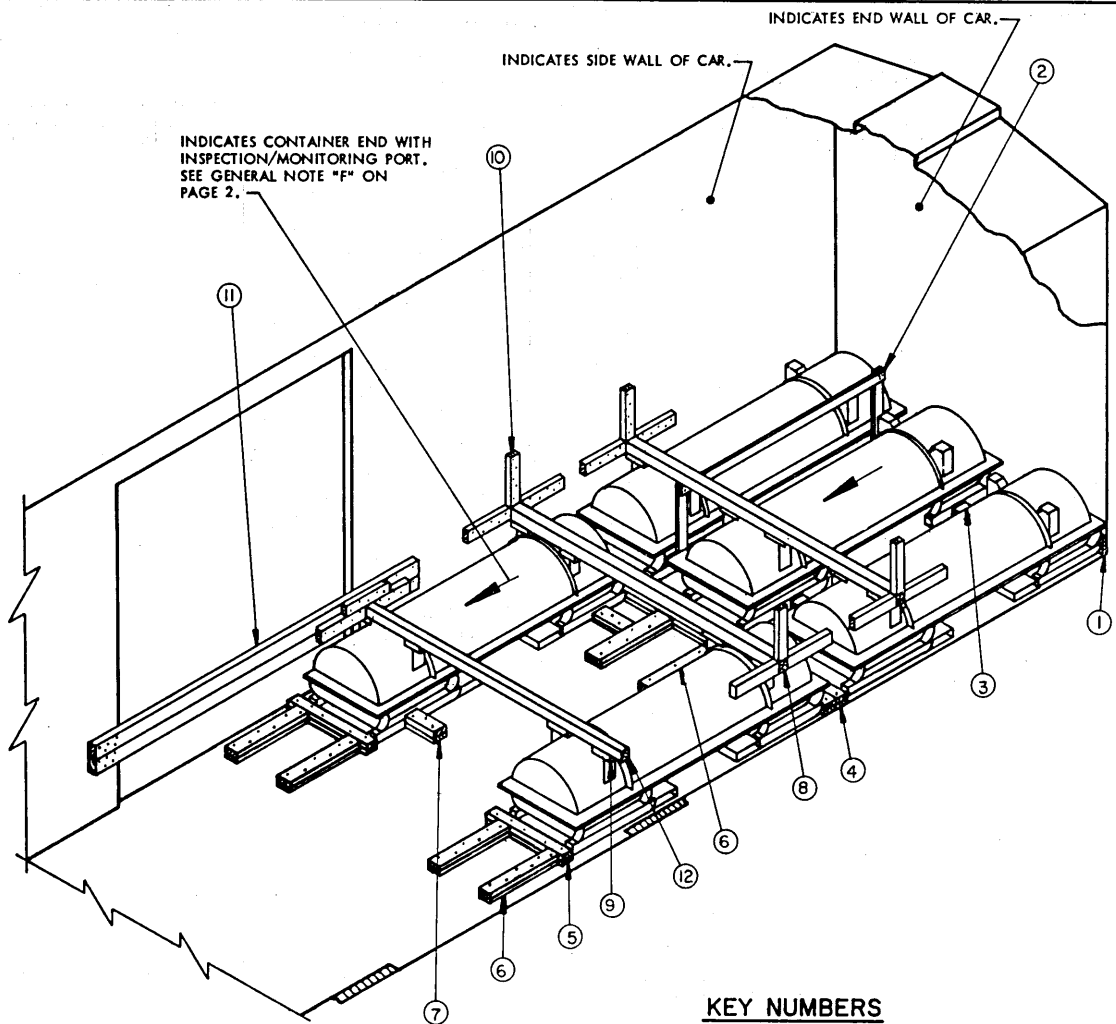
**SPECIAL NOTES:**

1. A PORTION OF A 50'-6" LONG BY 9'-2" WIDE CAR WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. A 40'-6" LONG CAR CAN BE USED FOR THE SHIPMENT OF THE DEPICTED LOAD; HOWEVER, THE CONTAINER HOLD-DOWN OVER THE NEAR END OF THE SECOND LOAD UNIT FROM THE END OF THE CAR WILL BE IN THE DOORWAY AND MUST BE BLOCKED AS SHOWN BY PIECES ⑩ AND ⑪ ON PAGE 9. IF THE DOOR OPENING IS WIDER THAN 7'-0" IN A 40'-6" CAR, OR IF A 50'-6" CAR WITH A STAGGERED DOOR IS BEING USED, REFER TO THE "CAUTION" NOTE ON PAGE 11 FOR PROVISIONS WHICH WILL APPLY.
2. SIX (6) BACK-UP CLEATS, SHOWN AS PIECES MARKED ⑫, ARE ADEQUATE FOR RETAINING A MAXIMUM ONE-LAYER LCL LOAD.
3. THE COMPLETE "K-BRACE" ASSEMBLY, SHOWN AS PIECE MARKED ⑩, IS TYPICAL ONLY AND IS ADEQUATE FOR RETAINING 14,000 POUNDS IN TWO (2) PARTIAL LAYERS. ONE-HALF OF THE DEPICTED ASSEMBLY, MINUS THE 2" X 6" X 54" VERTICAL PIECE AT THE END OF THE HORIZONTAL WALL CLEATS, MAY BE USED INDEPENDENTLY FOR THE BRACING OF ONE (1) PARTIAL LAYER OF NOT MORE THAN 6,500 POUNDS.

**KEY NUMBERS**

- ① END WALL BATTEN, 2" X 6" BY CAR WIDTH MINUS 1/2" (3 REQD). NAIL TO THE CAR END WALL W/1-10d NAIL EVERY 12".
- ② ANTI-CHAFING ASSEMBLY A (1 REQD FOR THE 3-HIGH LOAD UNIT, 1 REQD FOR THE 1-HIGH LOAD UNIT). SEE THE DETAIL ON PAGE 15. SEE GENERAL NOTE "P" ON PAGE 2.
- ③ LATERAL BRACE, 2" X 6" BY CUT TO FIT BETWEEN THE SKIDS OF LATERALLY ADJACENT CONTAINERS (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/4-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTE "M" ON PAGE 2.
- ④ ANTI-SWAY BRACE ASSEMBLY B (1 REQD). SEE THE DETAIL ON PAGE 14.
- ⑤ CONTAINER HOLD DOWN, 4" X 4" BY CAR WIDTH (CUT TO FIT) (4 REQD). POSITION ON THE STACKING PADS OF THE CONTAINERS AS SHOWN.
- ⑥ FILLER CLEAT, 2" X 4" X 8" (24 REQD). POSITION TO CONTACT THE STACKING PAD ON THE CONTAINER AND NAIL TO A CONTAINER HOLD DOWN, PIECE MARKED ⑤, W/2-12d NAILS.
- ⑦ POCKET CLEAT, 2" X 4" X 18" (24 REQD). NAIL TO A CAR SIDE WALL W/5-10d NAILS.
- ⑧ HEADER, 2" X 6" BY CAR WIDTH (DOUBLED) (3 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/1-16d NAIL EVERY 8". NAIL THE SECOND PIECE TO THE FIRST W/1-40d NAIL EVERY 8".
- ⑨ K-BRACE ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 11 AND SPECIAL NOTE 3.
- ⑩ BACK-UP CLEAT, 2" X 6" X 30" (DOUBLED) (6 REQD). ALIGN WITH A CONTAINER SKID AND NAIL TO THE CAR FLOOR W/6-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/6-40d NAILS. SEE SPECIAL NOTE 2 AT LEFT.
- ⑪ UNITIZING STRAP, 1-1/4" X .035" X 15'-0" STEEL STRAPPING (12 REQD). SEE THE "UNITIZATION AND HANDLING PROCEDURES" ON PAGE 3 AND GENERAL NOTES "K" AND "L" ON PAGE 2.
- ⑫ SEAL FOR 1-1/4" STRAPPING (24 REQD, 2 PER STRAP JOINT). DOUBLE CRIMP EACH SEAL.
- ⑬ ANTI-CHAFING, NEUTRAL BARRIER MATERIAL (AS REQD). POSITION UNDER ALL STRAPPING MARKED ⑪ AT ALL POINTS OF STRAPPING/CONTAINER CONTACT.





**ISOMETRIC VIEW**

**KEY NUMBERS**

**SPECIAL NOTES:**

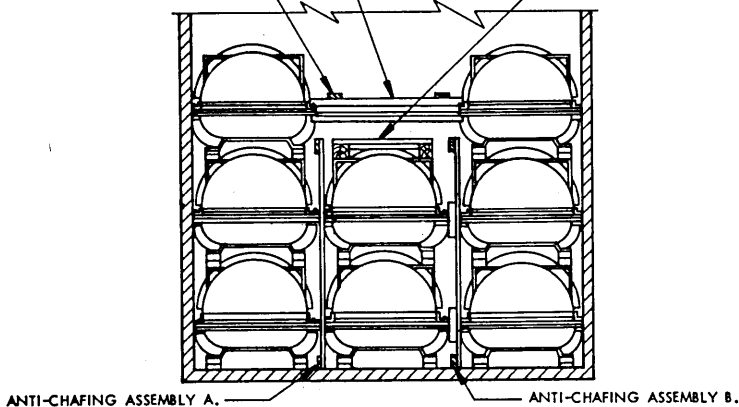
1. A PORTION OF A 40'-4" LONG BY 9'-2" WIDE CAR WITH 8'-0" WIDE DOOR OPENINGS IS SHOWN. A LONGER CAR OR A CAR OF DIFFERENT WIDTH CAN BE USED FOR THE SHIPMENT OF THE DEPICTED LOAD. ALSO, THE DOOR-OPENING WIDTH CAN BE OTHER THAN 8'-0".
2. TWO (2) BACK-UP CLEATS, SHOWN AS PIECES MARKED (6), ARE ADEQUATE FOR RETAINING A MAXIMUM LCL LOAD OF 9,000 POUNDS.
3. THE DEPICTED OUTLOADING PROCEDURES CAN BE USED FOR THE SHIPMENT OF A ONE (1) OR TWO (2) CONTAINER LCL LOAD.
  - A. TO SHIP ONE CONTAINER, POSITION THE CONTAINER IN THE CORNER OF THE CAR AND BLOCK WITH PIECES (3), (6), AND (7). LAMINATE TWO PIECES MARKED (9) TO PIECE (8) AND SECURE THE ASSEMBLY IN PLACE WITH PIECES MARKED (10). AN ADDITIONAL PIECE (10) WILL BE REQUIRED UNDER PIECE (8) ON THE SIDE OF THE CAR OPPOSITE THE CONTAINER.
  - B. TO SHIP TWO CONTAINERS, POSITION THE CONTAINERS IN OPPOSITE CORNERS AT ONE END OF THE CAR AND BLOCK EACH CONTAINER WITH PIECES (3), (6), AND (7). LAMINATE FOUR PIECES MARKED (9) TO PIECE (8) AND SECURE THE ASSEMBLY IN PLACE WITH PIECES MARKED (10).
4. IF A CAR WITH WIDER OR STAGGERED DOORS IS USED FOR SHIPMENT OF THE DEPICTED LOAD, PIECE MARKED (11) MUST BE LONG ENOUGH TO EXTEND AT LEAST 12" PAST THE DOOR OPENING AND ALSO TO PROVIDE A NAILING SURFACE FOR ALL PIECES MARKED (10).

- (1) END WALL BATTEN, 2" X 6" BY CAR WIDTH MINUS 1/2" (1 REQD). NAIL TO THE CAR END WALL W/1-10d NAIL EVERY 12".
- (2) ANTI-CHAFING ASSEMBLY A (1 REQD). SEE THE DETAIL ON PAGE 15. SEE GENERAL NOTE "P" ON PAGE 2.
- (3) LATERAL BRACE, 2" X 6" BY CUT TO FIT BETWEEN SKIDS OF LATERALLY ADJACENT CONTAINERS (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/4-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTE "M" ON PAGE 2.
- (4) INTERMEDIATE HEADER, 2" X 6" BY CAR WIDTH MINUS 1/2" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/1-16d NAIL EVERY 8". NAIL THE SECOND PIECE TO THE FIRST W/1-40d NAIL EVERY 8".
- (5) HEADER, 2" X 6" X 32" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/5-40d NAILS.
- (6) BACK-UP CLEAT, 2" X 6" X 30" (DOUBLED) (6 REQD). ALIGN WITH A CONTAINER SKID AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/6-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/6-40d NAILS. SEE SPECIAL NOTE 2 AT LEFT.
- (7) SIDE BLOCKING, 2" X 6" X 12" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/3-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- (8) CONTAINER HOLD DOWN, 4" X 4" BY CAR WIDTH (CUT TO FIT) (2 REQD). POSITION ABOVE THE STACKING PADS ON THE CONTAINER AS SHOWN.
- (9) FILLER CLEAT, 2" X 4" X 8" (14 REQD). POSITION TO CONTACT A STACKING PAD ON A CONTAINER AND NAIL TO A PIECE MARKED (8) W/2-12d NAILS.
- (10) POCKET CLEAT, 2" X 4" X 18" (18 REQD). NAIL TO A CAR SIDE WALL AND/OR DOOR SPANNER, PIECE MARKED (11) W/5-10d NAILS.
- (11) DOOR SPANNER, 2" X 6" BY DOORWAY OPENING WIDTH PLUS 36" (4 REQD). POSITION AS SHOWN AND NAIL TO A CAR SIDE WALL W/5-10d NAILS AT EACH END. SEE SPECIAL NOTE 4 AT LEFT.
- (12) CONTAINER HOLD DOWN, 4" X 4" BY CAR WIDTH MINUS 3-1/4" (1 REQD). POSITION ABOVE STACKING PADS ON THE CONTAINERS AS SHOWN.

ONE ADDITIONAL LONGITUDINAL TIE PIECE IS REQUIRED ON ANTI-SWAY BRACE ASSEMBLY WHEN USED WITH FILLER ASSEMBLY.

ANTI-SWAY BRACE ASSEMBLY A (1 REQD FOR EACH OMITTED CONTAINER). SEE DETAIL ON PAGE 14 AND THE TYPICAL INSTALLATION IN THE LOAD VIEW ON PAGE 4.

FILLER ASSEMBLY (AS REQD). SEE THE "FILLER ASSEMBLY" AND "APPLICATION OF FILLER ASSEMBLY" DETAILS ON PAGE 17.



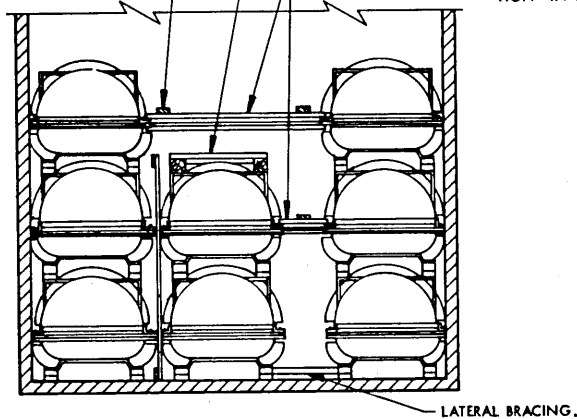
**DETAIL A**

THIS VIEW DEPICTS A TYPICAL SECTION OF AN 8'-6" WIDE CAR, SHOWING THE USE OF A FILLER ASSEMBLY IN PLACE OF AN OMITTED CONTAINER. AN ANTI-SWAY BRACE ASSEMBLY MUST BE USED TO BRACE THE OUTSIDE ROWS OF CONTAINERS IN EACH LOAD UNIT FROM WHICH A CONTAINER IS OMITTED.  
**NOTE:** IF THE ENTIRE THIRD LAYER IS OMITTED FROM THE MIDDLE ROW, IT WILL NOT BE NECESSARY TO INSTALL FILLER ASSEMBLIES IN THAT ROW.

ONE ADDITIONAL LONGITUDINAL TIE PIECE IS REQUIRED ON ANTI-SWAY BRACE ASSEMBLY WHEN USED WITH FILLER ASSEMBLY.

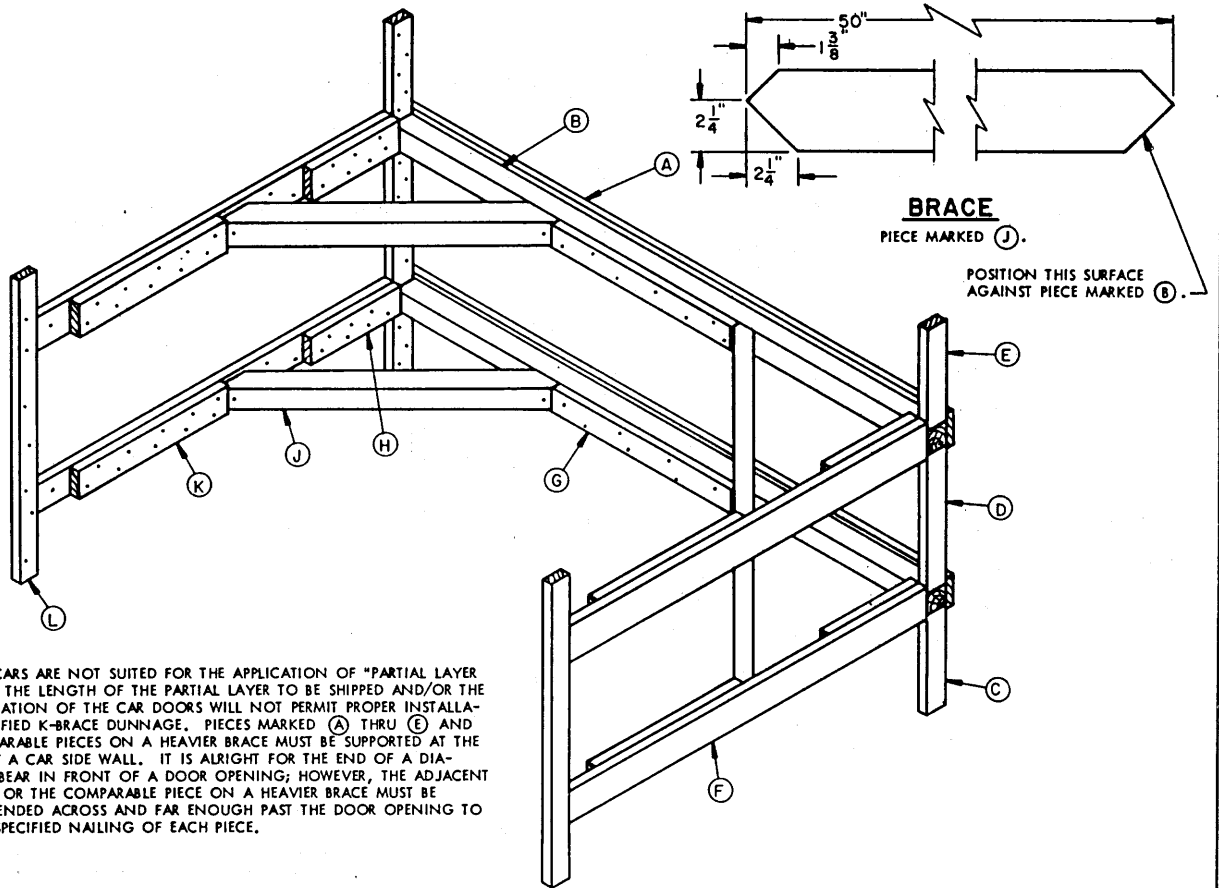
FILLER ASSEMBLY (AS REQD). SEE THE "FILLER ASSEMBLY" AND "APPLICATION OF FILLER ASSEMBLY" DETAILS ON PAGE 17.

ANTI-SWAY BRACE ASSEMBLY A (AS REQD). SEE DETAIL ON PAGE 14 AND THE "TYPICAL INSTALLATION" IN THE LOAD VIEW ON PAGE 4.



**DETAIL B**

THIS VIEW DEPICTS A TYPICAL SECTION OF A 9'-2" WIDE CAR, SHOWING THE USE OF A FILLER ASSEMBLY AS USED IN PLACE OF AN OMITTED CONTAINER. IN EACH LOAD UNIT FROM WHICH A CONTAINER IS OMITTED, AN ANTI-SWAY BRACE ASSEMBLY MUST BE USED TO BRACE THE OUTSIDE ROWS OF CONTAINERS AND MUST ALSO BE USED BETWEEN THE SECOND LAYER CONTAINERS AS SHOWN.  
**NOTE:** IF THE ENTIRE THIRD LAYER IS OMITTED FROM THE MIDDLE ROW, IT WILL NOT BE NECESSARY TO INSTALL FILLER ASSEMBLIES IN THAT ROW.



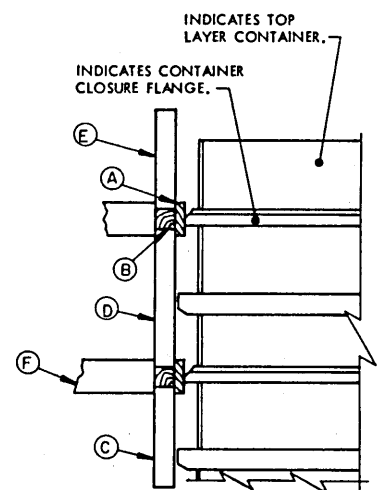
**CAUTION:** SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL LAYER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED (A) THRU (E) AND (H) OR THE COMPARABLE PIECES ON 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 TO BEAR IN FRONT OF A DOOR OPENING; HOWEVER, THE ADJACENT PIECE MARKED (F) OR THE COMPARABLE PIECE ON A HEAVIER BRACE MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE.

### K-BRACE ASSEMBLY

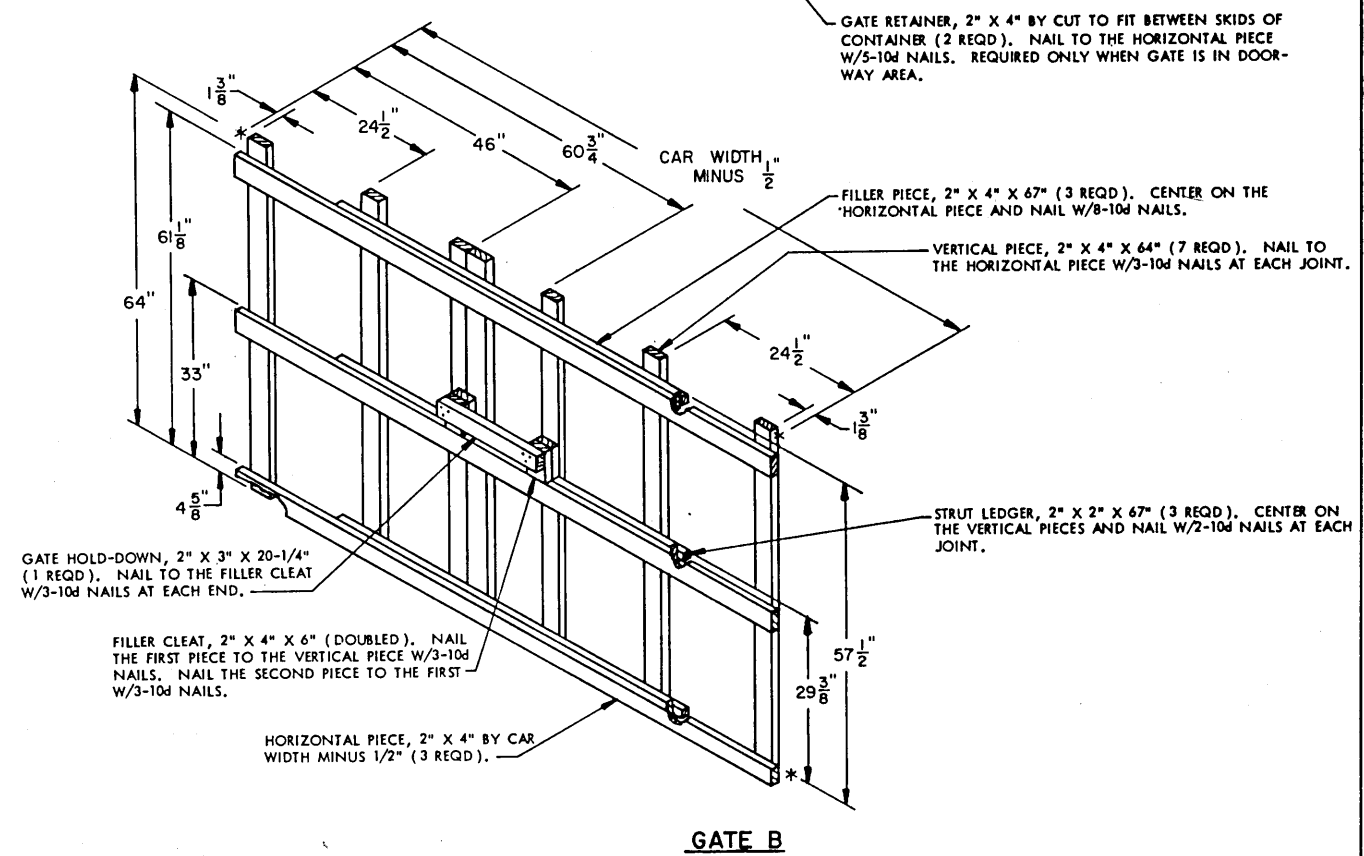
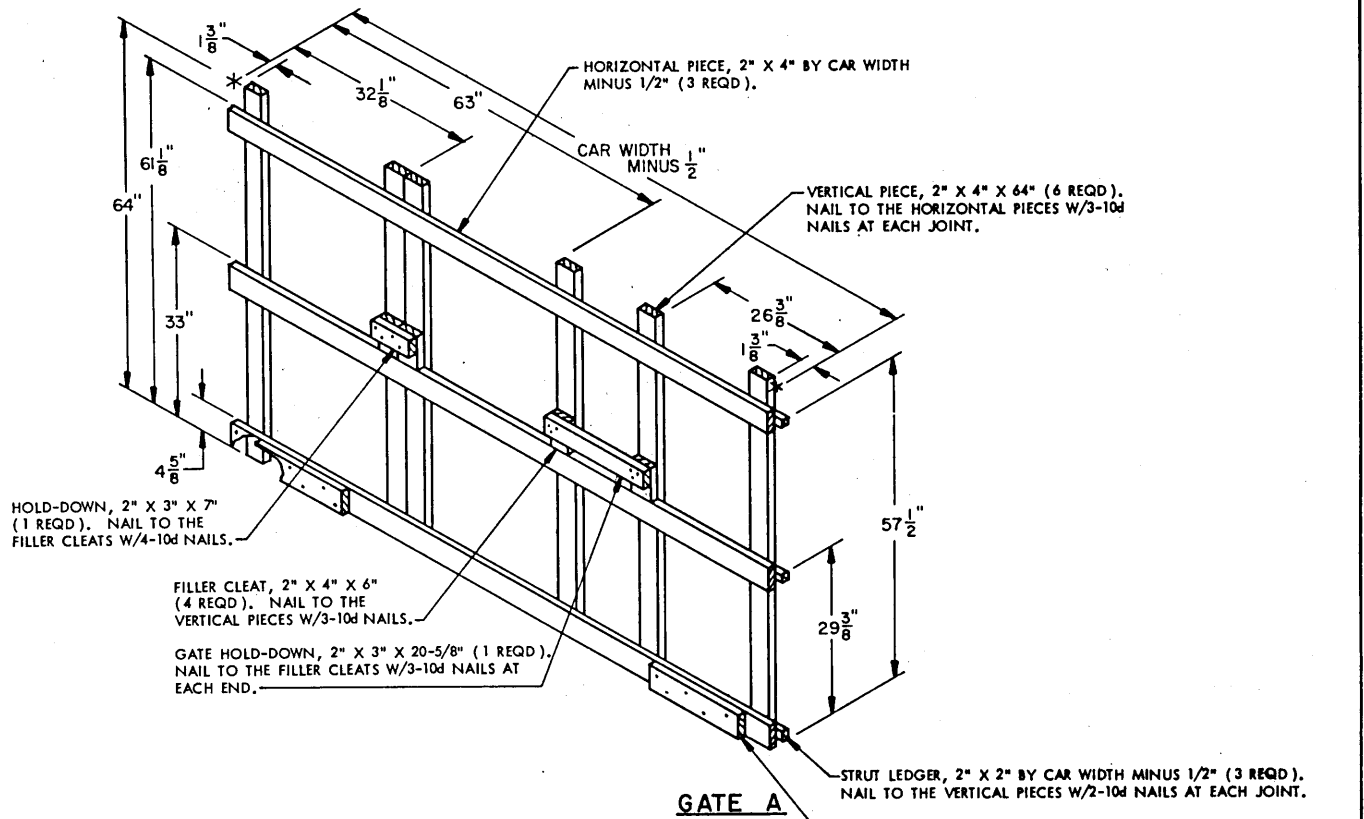
K-BRACE ASSEMBLY AS SHOWN ABOVE IS ADEQUATE FOR RETAINING A MAXIMUM LCL OR PARTIAL LAYER LOAD OF 14,000 POUNDS. A K-BRACE ASSEMBLY FOR THE BRACING OF A SINGLE LAYER (ONE-HALF OF THE ABOVE DETAIL AND WITHOUT PIECE MARKED (L)) IS ADEQUATE FOR RETAINING A MAXIMUM PARTIAL LAYER LOAD OF 6,500 POUNDS. SEE "CAUTION" NOTE ABOVE.

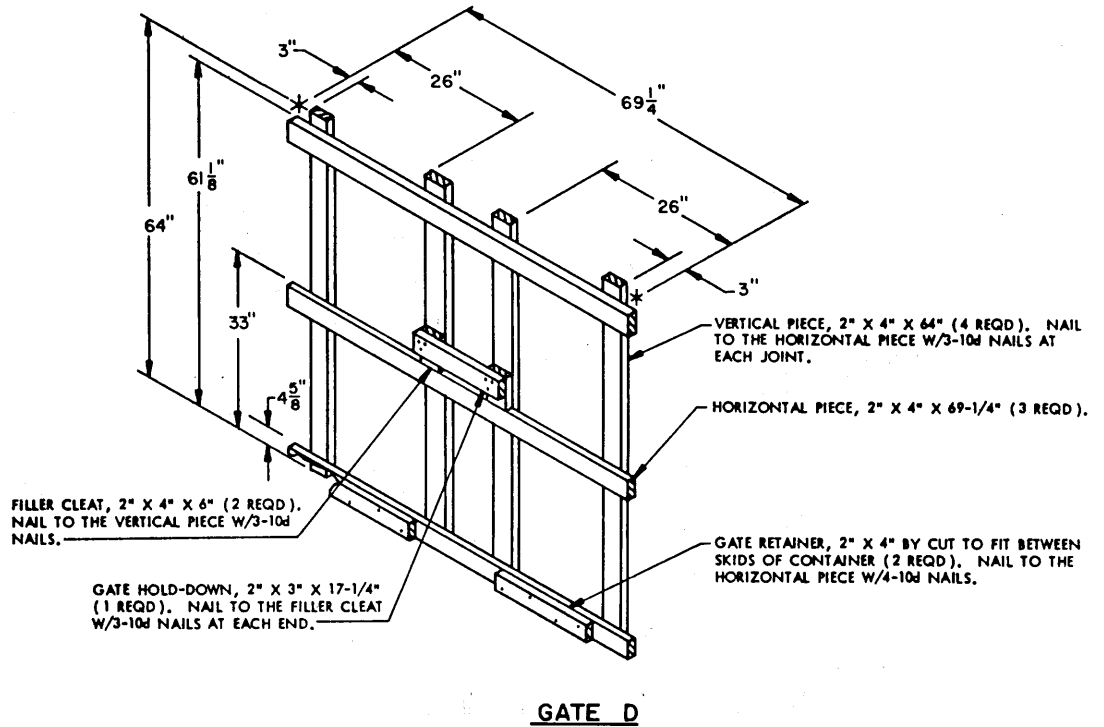
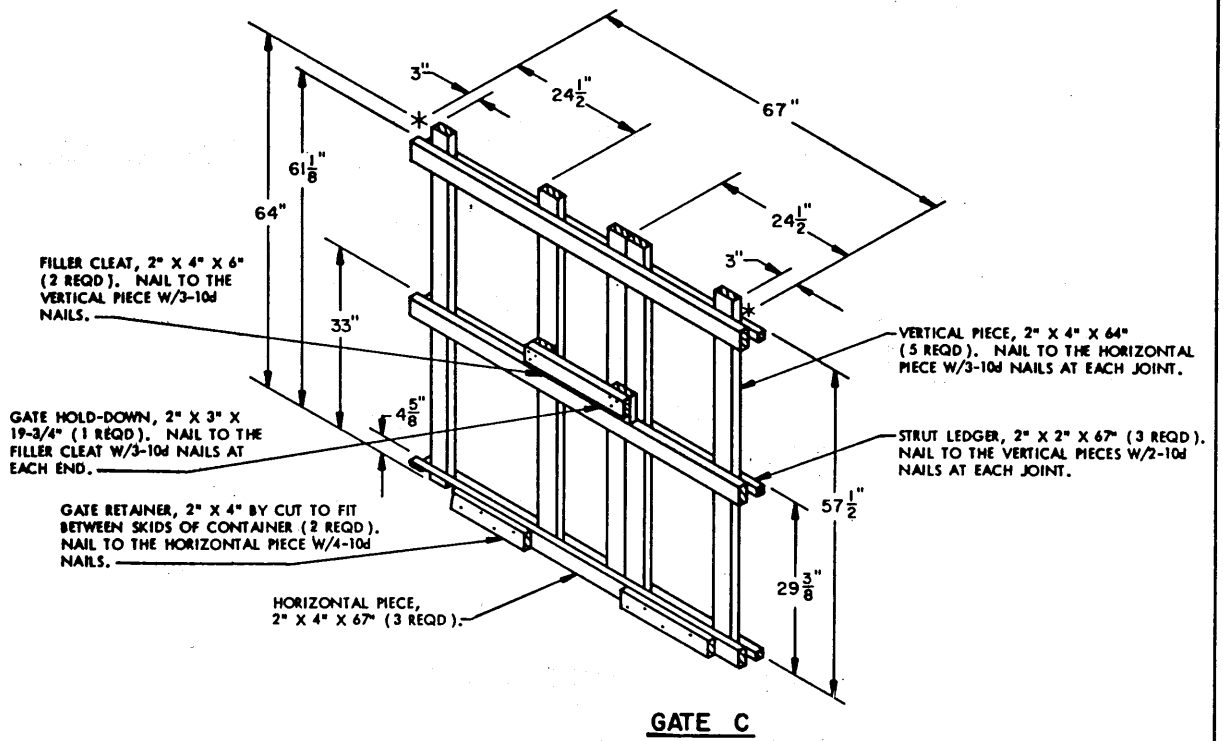
#### LUMBER AND NAILING DATA

PC MK	LUMBER SIZE	NO. REQD	NAIL TO	NUMBER AND SIZE OF NAILS
(A)	2" X 6" BY CAR WIDTH	2	(B)	1-12d EVERY 12"
(B)	4" X 4" BY CAR WIDTH	2		-----
(C)	2" X 4" X 18"	2	CAR WALL	5-10d
(D)	2" X 4" X 24-1/2"	2	CAR WALL	6-10d
(E)	2" X 4" X 18"	2	CAR WALL	5-10d
(F)	2" X 6" X 72"	4	CAR WALL	16-12d
(G)	2" X 4" X 36"	2	(B)	7-12d
(H)	2" X 6" X 18"	4	(F)	7-16d
(J)	4" X 4" MATERIAL. SEE "BRACE DETAIL" ABOVE.	4	(B) & (F)	1-40d NAIL AT EACH END.
(K)	2" X 6" X 30"	4	(F)	10-16d
(L)	2" X 6" X 54"	2	CAR WALL	7-12d

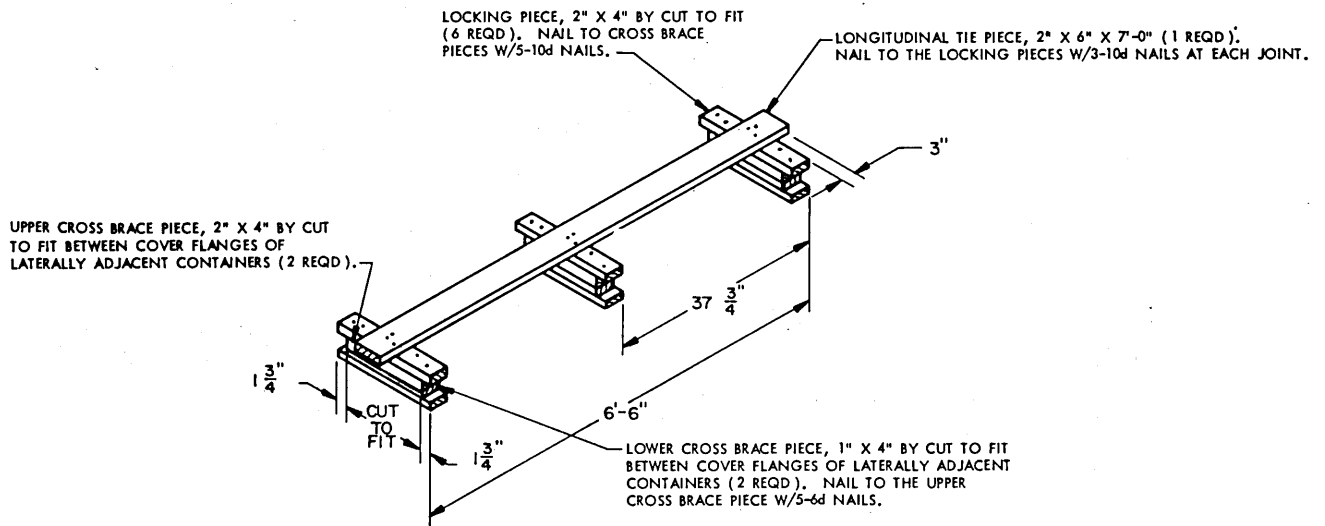


**K-BRACE PLACEMENT**



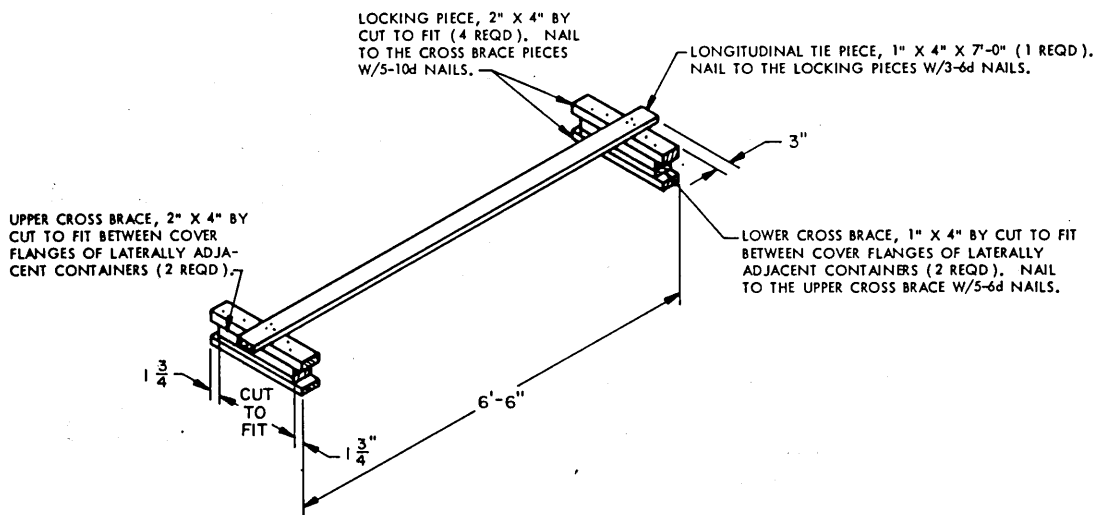


DETAILS



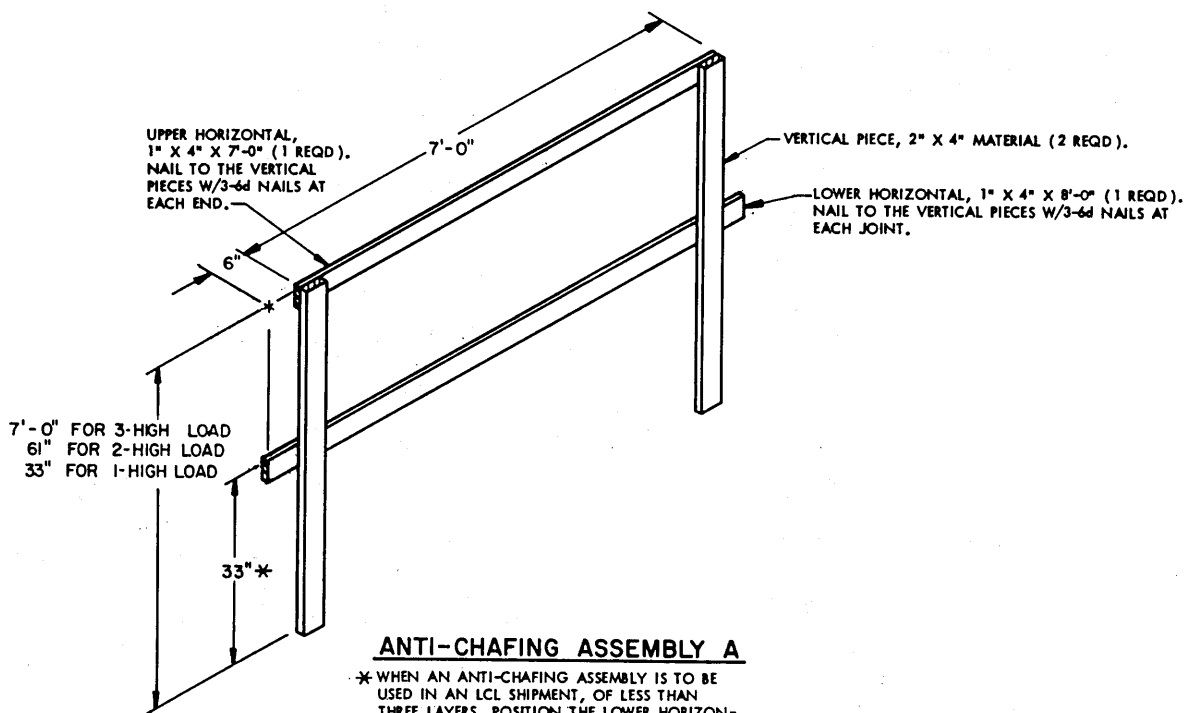
**ANTI-SWAY BRACE ASSEMBLY A**

ONE OF THE TWO LOCKING PIECES ON EACH ASSEMBLY MUST BE APPLIED AFTER THE CROSS BRACES AND THE OTHER LOCKING PIECE HAVE BEEN ASSEMBLED AND POSITIONED BETWEEN THE CONTAINERS. THE LONGITUDINAL TIE PIECE WILL BE APPLIED AFTER THE THREE ASSEMBLIES HAVE BEEN INSTALLED.



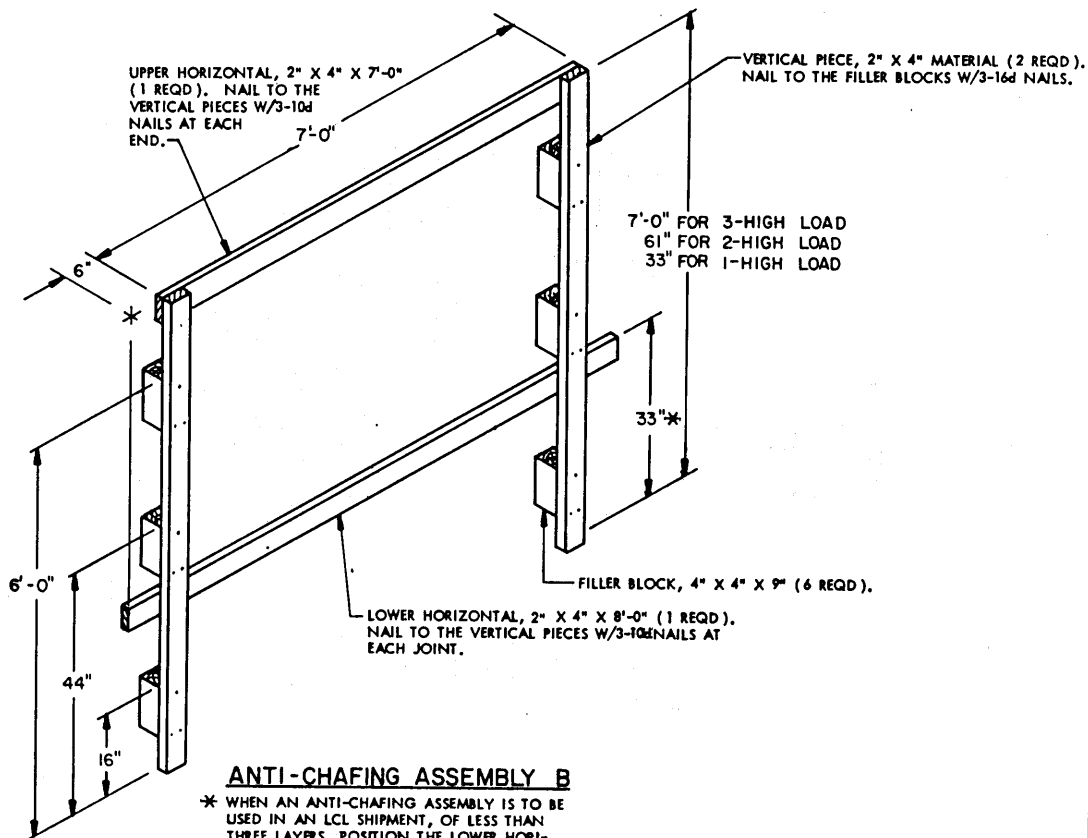
**ANTI-SWAY BRACE ASSEMBLY B**

ONE OF THE TWO LOCKING PIECES ON EACH END ASSEMBLY MUST BE APPLIED AFTER THE CROSS BRACES AND THE OTHER LOCKING PIECE HAVE BEEN ASSEMBLED AND POSITIONED BETWEEN THE CONTAINERS. THE LONGITUDINAL TIE PIECE WILL BE APPLIED AFTER THE END ASSEMBLIES HAVE BEEN INSTALLED.



**ANTI-CHAFING ASSEMBLY A**

\* WHEN AN ANTI-CHAFING ASSEMBLY IS TO BE USED IN AN LCL SHIPMENT, OF LESS THAN THREE LAYERS, POSITION THE LOWER HORIZONTAL PIECE ON THE FLOOR.

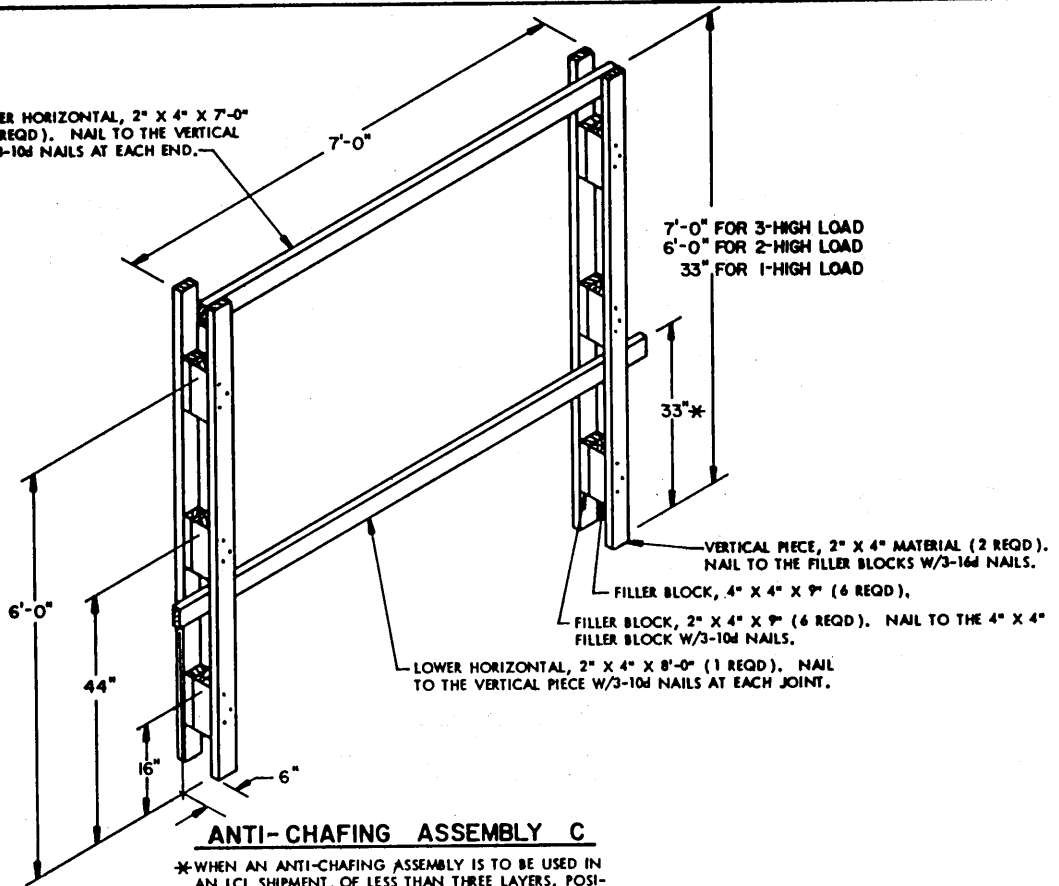


**ANTI-CHAFING ASSEMBLY B**

\* WHEN AN ANTI-CHAFING ASSEMBLY IS TO BE USED IN AN LCL SHIPMENT, OF LESS THAN THREE LAYERS, POSITION THE LOWER HORIZONTAL PIECE ON THE FLOOR.

**DETAILS**

UPPER HORIZONTAL, 2" X 4" X 7'-0"  
(1 REQD). NAIL TO THE VERTICAL  
W/3-10d NAILS AT EACH END.



7'-0" FOR 3-HIGH LOAD  
6'-0" FOR 2-HIGH LOAD  
33" FOR 1-HIGH LOAD

VERTICAL PIECE, 2" X 4" MATERIAL (2 REQD).  
NAIL TO THE FILLER BLOCKS W/3-10d NAILS.

FILLER BLOCK, 4" X 4" X 9" (6 REQD).

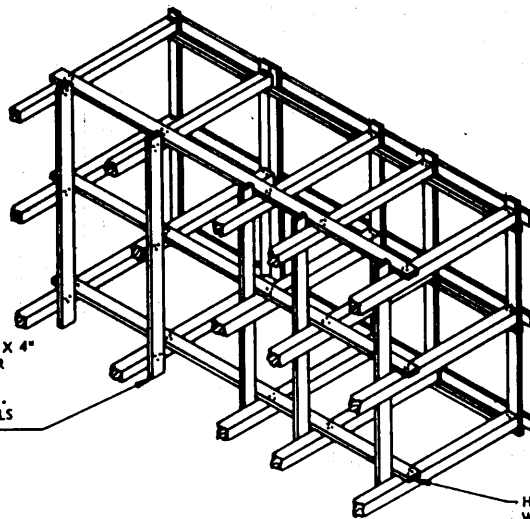
FILLER BLOCK, 2" X 4" X 9" (6 REQD). NAIL TO THE 4" X 4"  
FILLER BLOCK W/3-10d NAILS.

LOWER HORIZONTAL, 2" X 4" X 8'-0" (1 REQD). NAIL  
TO THE VERTICAL PIECE W/3-10d NAILS AT EACH JOINT.

**ANTI-CHAFING ASSEMBLY C**

\*WHEN AN ANTI-CHAFING ASSEMBLY IS TO BE USED IN  
AN LCL SHIPMENT, OF LESS THAN THREE LAYERS, POSI-  
TION THE LOWER HORIZONTAL PIECE ON THE FLOOR.

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

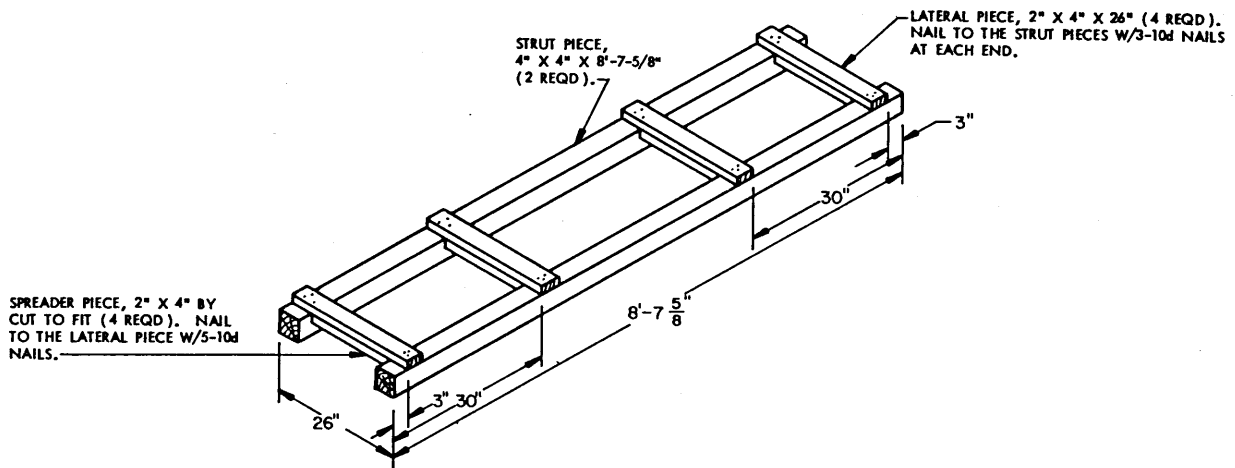


HORIZONTAL STRUT BRACING, 2" X 4" BY CAR  
WIDTH (1 REQD EACH LAYER OF STRUTS). NAIL  
TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

**STRUT BRACING DETAIL**

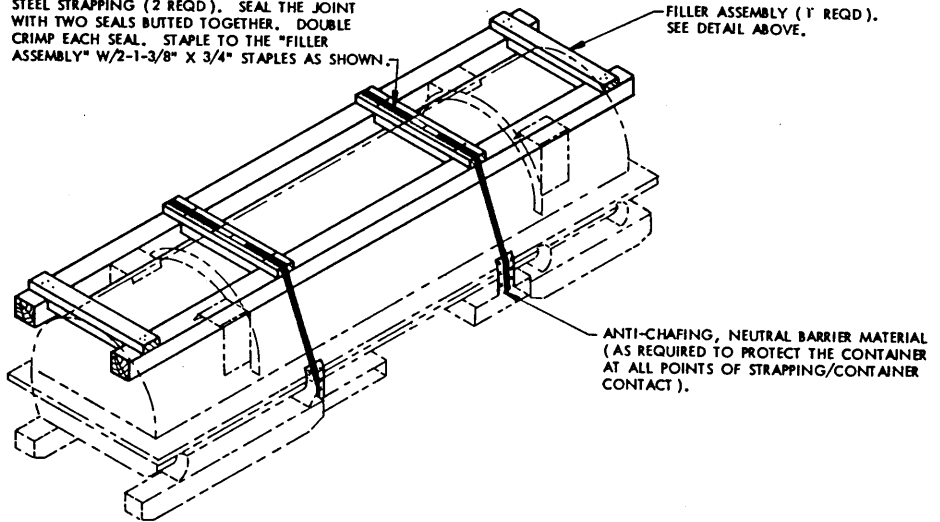
STRUT BRACING IS REQUIRED WHEN STRUTS ARE GREATER  
THAN 48" IN LENGTH. ONE SET AS SHOWN IS  
REQUIRED FOR EVERY 48" OF STRUT LENGTH.





**FILLER ASSEMBLY**

UNITIZING STRAP, 1-1/4" X .035" X 12'-0" LONG STEEL STRAPPING (2 REQD). SEAL THE JOINT WITH TWO SEALS BUTTED TOGETHER. DOUBLE CRIMP EACH SEAL. STAPLE TO THE "FILLER ASSEMBLY" W/2-1-3/8" X 3/4" STAPLES AS SHOWN.



**APPLICATION OF FILLER ASSEMBLY**

**DETAILS**

