

APPROVED BY

BUREAU OF EXPLOSIVES

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DATE *11/3/70*

LOADING AND BRACING (CL & LCL) IN BOX CARS OF M44 SERIES CLUSTER GENERATOR PACKED ONE PER WOODEN CONTAINER

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DRAFTER <i>JD</i>	PROJ ENG <i>HMN</i>	APSA PROJ SPEC <i>CF</i>	SUBMITTED <i>W R Dickson</i>
CHECKED <i>JDS</i>	AMC AMMO CTR <i>John Royal</i>	<i>C. M. H.</i>	EXAMINED AND APPROVED <i>S. G. Beiermann</i>
REVISIONS			AMMUNITION PROCUREMENT & SUPPLY AGENCY
			APPROVED BY ORDER OF COMMANDING GENERAL U. S. ARMY MATERIEL COMMAND
			<i>B. D. Hail</i>
			U. S. ARMY MATERIEL COMMAND
			9 FEBRUARY 1971
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			19 48 4559 CB5A1

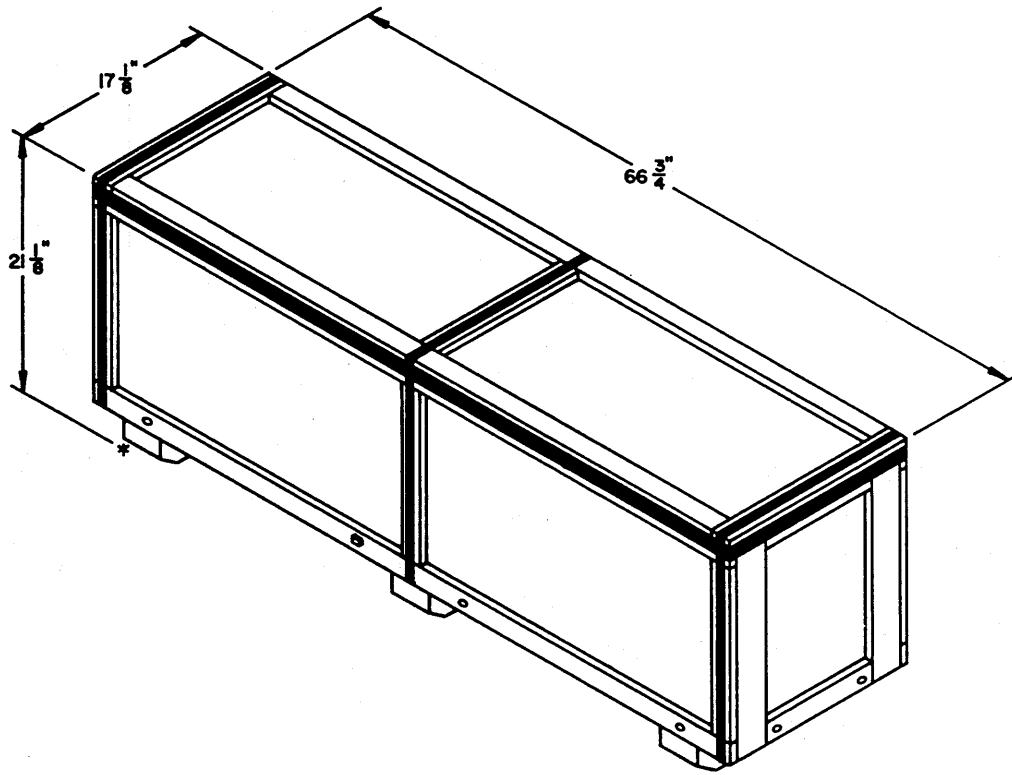
DO NOT SCALE

GENERAL NOTES

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AMCR 740-13, AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. **DETAIL OF THE CONTAINER**
UNIT DIMENSIONS - 66-3/4" LONG BY 17-1/8" WIDE BY 21-1/8" HIGH.
GROSS WEIGHT ----- 350 POUNDS (APPROX).
- C. THE LOAD AS SHOWN ON PAGES 4 AND 5 IS 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.
- D. 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.
- E. THE NUMBER OF LADING UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE BOXCAR BEING LOADED OR THE QUANTITY OF ITEMS TO BE SHIPPED, AND COMBINATIONS OF THE OUTLOADING PROCEDURES SPECIFIED FOR THE VARIOUS LOADS SHOWN MAY BE USED AS REQUIRED. HOWEVER, THE APPROVED METHODS SPECIFIED FOR FULL OR PARTIAL CARLOADS MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING, AND STAYING OF THE DESIGNATED ITEMS.
- F. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN BOXCARS WHICH ARE PARTIALLY LOADED WITH THE DESIGNATED ITEM, PROVIDING THE TOTAL LOAD IS COMPATIBLE, EXISTING DIRECTIVES ARE NOT VIOLATED AND THE OTHER LADING ITEMS ARE BLOCKED AND BRACED TO EQUAL THE BLOCKING AND BRACING CRITERIA SPECIFIED.
- G. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 2" X 4" MATERIAL IS ACTUALLY 1-5/8" THICK BY 3-5/8" WIDE AND 1" X 6" MATERIAL IS ACTUALLY 3/4" THICK BY 5-5/8" WIDE.
- H. **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.
- J. 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.
- K. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "CONTAINER DETAIL" ON PAGE 3 AND TO THE "SPECIAL NOTES" SECTION WHICH IS IMMEDIATELY ADJACENT TO DEPICTED OUTLOADING METHODS.

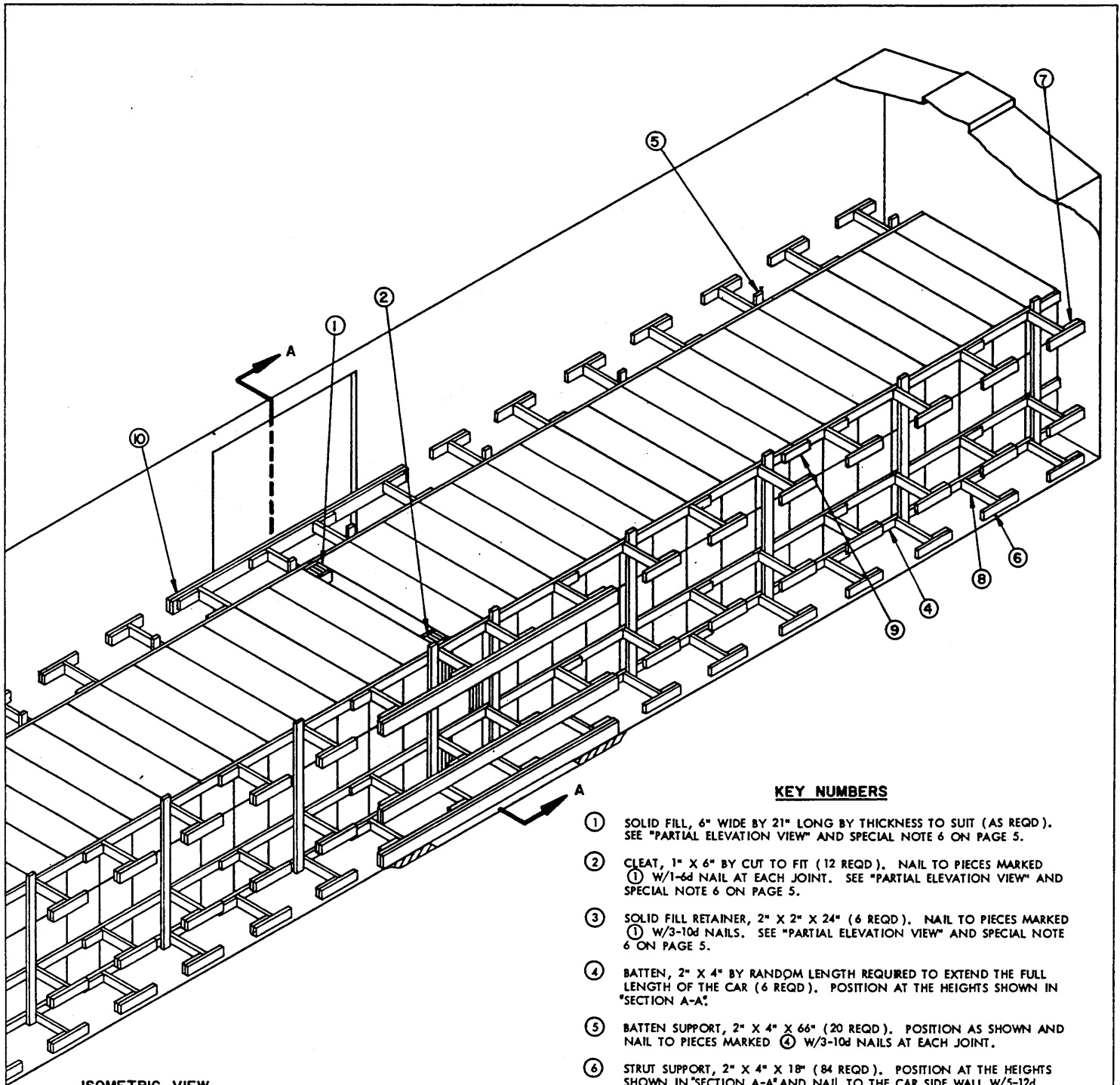
MATERIAL SPECIFICATIONS

- 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 THE SAME SIZE.



SHIPPING CONTAINER

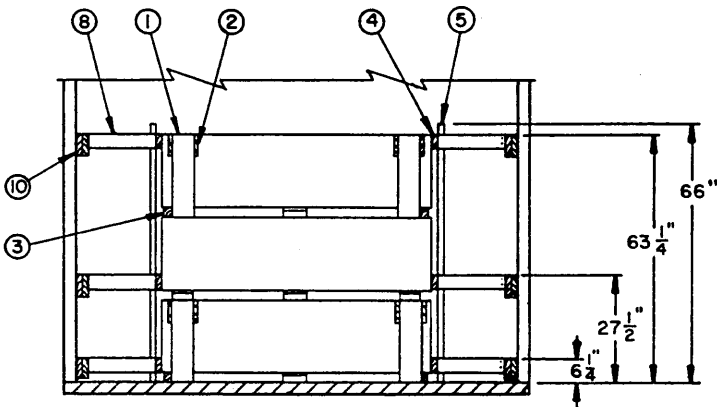
STACK HEIGHT IS LIMITED TO THREE
CONTAINERS HIGH.



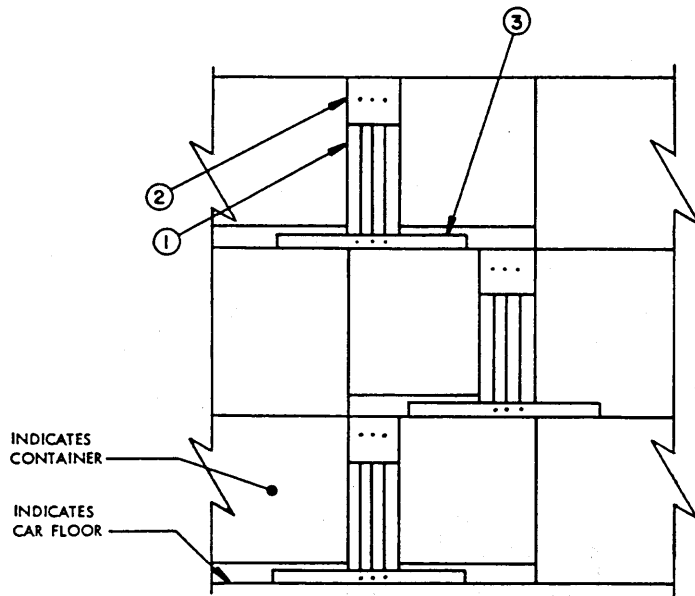
KEY NUMBERS

- ① SOLID FILL, 6" WIDE BY 21" LONG BY THICKNESS TO SUIT (AS REQD). SEE "PARTIAL ELEVATION VIEW" AND SPECIAL NOTE 6 ON PAGE 5.
- ② CLEAT, 1" X 6" BY CUT TO FIT (12 REQD). NAIL TO PIECES MARKED ① W/1-6d NAIL AT EACH JOINT. SEE "PARTIAL ELEVATION VIEW" AND SPECIAL NOTE 6 ON PAGE 5.
- ③ SOLID FILL RETAINER, 2" X 2" X 24" (6 REQD). NAIL TO PIECES MARKED ① W/3-10d NAILS. SEE "PARTIAL ELEVATION VIEW" AND SPECIAL NOTE 6 ON PAGE 5.
- ④ BATTEN, 2" X 4" BY RANDOM LENGTH REQUIRED TO EXTEND THE FULL LENGTH OF THE CAR (6 REQD). POSITION AT THE HEIGHTS SHOWN IN "SECTION A-A".
- ⑤ BATTEN SUPPORT, 2" X 4" X 66" (20 REQD). POSITION AS SHOWN AND NAIL TO PIECES MARKED ④ W/3-10d NAILS AT EACH JOINT.
- ⑥ STRUT SUPPORT, 2" X 4" X 18" (84 REQD). POSITION AT THE HEIGHTS SHOWN IN "SECTION A-A" AND NAIL TO THE CAR SIDE WALL W/5-12d NAILS.
- ⑦ KICKER, 2" X 4" X 9" (156 REQD). POSITION AS SHOWN AND NAIL TO PIECES MARKED ④, ⑥ AND/OR ⑩ W/2-10d NAILS.
- ⑧ SIDE STRUT, 2" X 4" BY CUT TO FIT (108 REQD). POSITION IN LINE WITH EVERY OTHER JOINT BETWEEN THE CONTAINERS AND NAIL TO PIECES MARKED ⑦ AND/OR ⑤ W/2-10d NAILS AT EACH END.
- ⑨ SPLICE, 2" X 4" X 12" (AS REQD). CENTER ON THE JOINT OF PIECES MARKED ② AND NAIL W/2-10d NAILS AT EACH END.
- ⑩ DOORWAY SPANNER, 2" X 6" BY DOOR OPENING WIDTH PLUS 48" (DOUBLED) (6 REQD). POSITION AT THE HEIGHTS SHOWN IN "SECTION A-A" AND NAIL THE FIRST PIECE TO THE CAR SIDE WALL W/10-12d NAILS AT EACH END. NAIL THE SECOND PIECE TO THE FIRST W/1-10d NAIL EVERY 12".

ISOMETRIC VIEW



SECTION A-A



PARTIAL ELEVATION VIEW

THIS VIEW DEPICTS THE STAGGERED CENTER BLOCKING SHOWN AS PIECES MARKED ① THROUGH ③. PIECES MARKED ④, ⑤, ⑦, ⑧ AND ⑩ HAVE BEEN OMITTED FOR CLARITY. SEE SPECIAL NOTE 6 ON THIS PAGE.

SPECIAL NOTES:

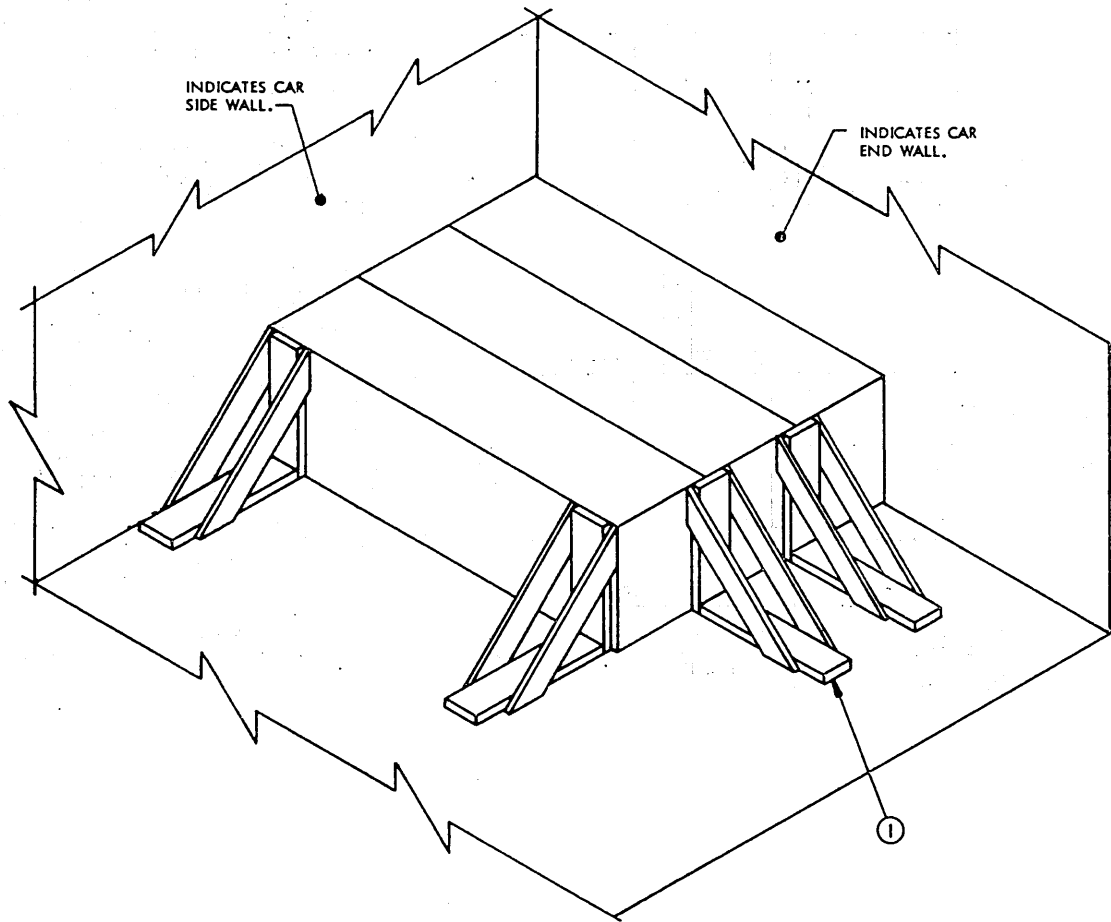
1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 6'-0" WIDE DOOR OPENINGS IS SHOWN. THE LOAD AS SHOWN CAN ALSO BE SHIPPED IN CARS WHICH HAVE WIDER OR STAGGERED DOOR OPENINGS.
2. A NARROWER OR WIDER CAR CAN BE USED FOR SHIPPING THE DEPICTED LOAD; HOWEVER, 40'-6" CARS ARE NOT RECOMMENDED.
3. IF THE DELINEATED OUTLOADING METHOD IS USED FOR THE SHIPMENT OF A LOAD WHICH CONTAINS LESS UNITS THAN SHOWN, A "FILLER ASSEMBLY", AS DETAILED ON PAGE 8, MUST BE SUBSTITUTED FOR EACH OMITTED UNIT. A "FILLER ASSEMBLY" CAN ONLY BE USED ON THE TOP LAYER AND MUST NOT BE POSITIONED ADJACENT TO "SOLID FILL" OR 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 7 FOR K-BRACE AND INSTALLATION SPECIFICATIONS.
5. NO SPECIAL PROVISIONS ARE REQUIRED FOR A CAR THAT IS EQUIPPED WITH PLUG DOORS. SEE GENERAL NOTE "D" ON PAGE 2.
6. IF THE EXCESS SPACE AT THE CENTER OF THE CAR IS 7" OR MORE, OMIT THREE CONTAINERS AND USE CENTER GATES WITH STRUTS IN LIEU OF PIECES MARKED ① THROUGH ③. SEE "CENTER GATE" AND "APPLICATION OF CENTER GATE" DETAILS ON PAGE 9.
7. FOR A TWO LAYER LOAD FOLLOW THE SAME BLOCKING PROCEDURES AS SHOWN ON PAGE 4. REDUCE THE HEIGHT OF PIECE MARKED ③ TO 48" AND POSITION THE SECOND LAYER SIDE STRUT, SHOWN AS PIECE MARKED ⑧, AT A HEIGHT OF 42".
8. THE CONTAINER MUST NOT BE STACKED MORE THAN THREE HIGH AND MUST BE POSITIONED IN THE CAR WITH THE LONGITUDINAL DIMENSION OF THE CONTAINER PARALLEL TO THE CAR WIDTH AS SHOWN.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	7	4
2" X 2"	12	4
2" X 4"	822	548
2" X 6"	162	162
NAILS	NO. REQD	POUNDS
6d (2")	48	1/2
10d (3")	1,008	16
12d (3-1/4")	540	9

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER-----	105	36,750 LBS
DUNNAGE-----		1,821 LBS
TOTAL WEIGHT-----		38,571 LBS



ISOMETRIC VIEW

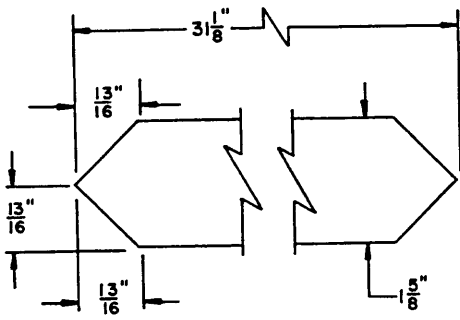
KEY NUMBER

- ① LCL BRACE (AS REQD). SEE "LCL BRACE" DETAIL ON PAGE 8. NAIL TO THE CAR FLOOR W/7-16d NAILS.

SPECIAL NOTES:

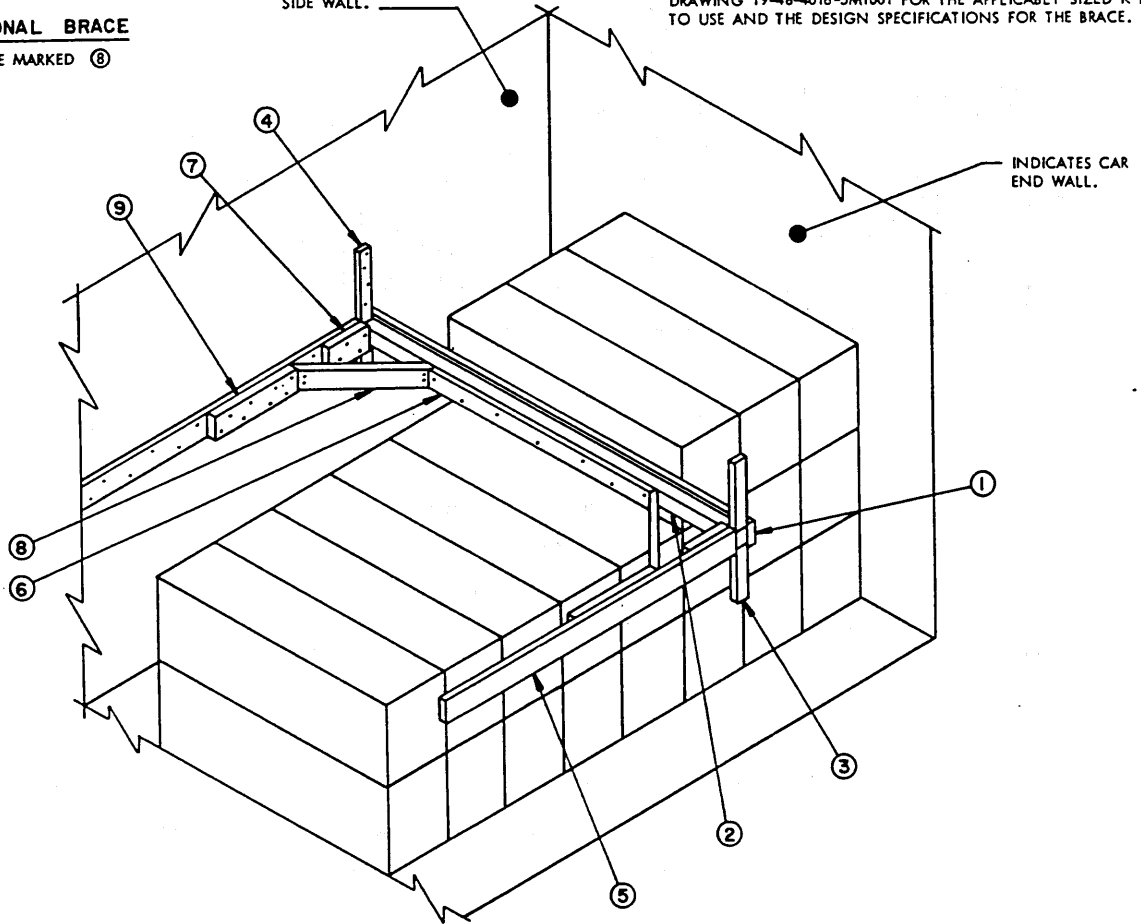
1. A 9'-2" WIDE CAR IS SHOWN; HOWEVER, ANY WIDTH CAR CAN BE USED.
2. EACH LCL BRACE AS APPLIED WILL SUPPORT 2,000 POUNDS OF LADING LONGITUDINALLY OR 8,000 POUNDS OF LADING LATERALLY. A MINIMUM OF TWO (2) BRACES MUST BE USED FOR LONGITUDINAL BRACING.
3. THE BLOCKING PROCEDURES SHOWN ON THIS PAGE ARE RESTRICTED TO LCL SHIPMENTS THAT ARE ONLY ONE (1) LAYER HIGH.

TYPICAL LCL



DIAGONAL BRACE
PIECE MARKED ⑧

INDICATES CAR SIDE WALL.



ISOMETRIC VIEW

ABOVE VIEW DEPICTS PARTIAL-LAYER BLOCKING FOR LOAD SHOWN ON PAGE 4.

KEY NUMBERS

- ① HORIZONTAL, 2" X 6" BY CAR WIDTH (CUT TO FIT) (1 REQD). NAIL TO PIECE MARKED ② W/1-12d NAIL EVERY 12". SEE SPECIAL NOTE 2 ON THIS PAGE.
- ② CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT TO FIT) (1 REQD).
- ③ SUPPORT CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDE WALL W/5-12d NAILS.
- ④ HOLD DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDE WALL W/5-12d NAILS.
- ⑤ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (2 REQD). NAIL TO THE CAR SIDE WALL W/16-12d NAILS.
- ⑥ CENTER CLEAT, 2" X 4" X 62-3/4" (1 REQD). NAIL TO PIECE MARKED ② W/7-12d NAILS.
- ⑦ POCKET CLEAT, 2" X 6" X 12" (2 REQD). NAIL TO PIECE MARKED ⑤ W/4-16d NAILS.

(KEY NUMBERS CONTINUED AT RIGHT)

SPECIAL NOTES :

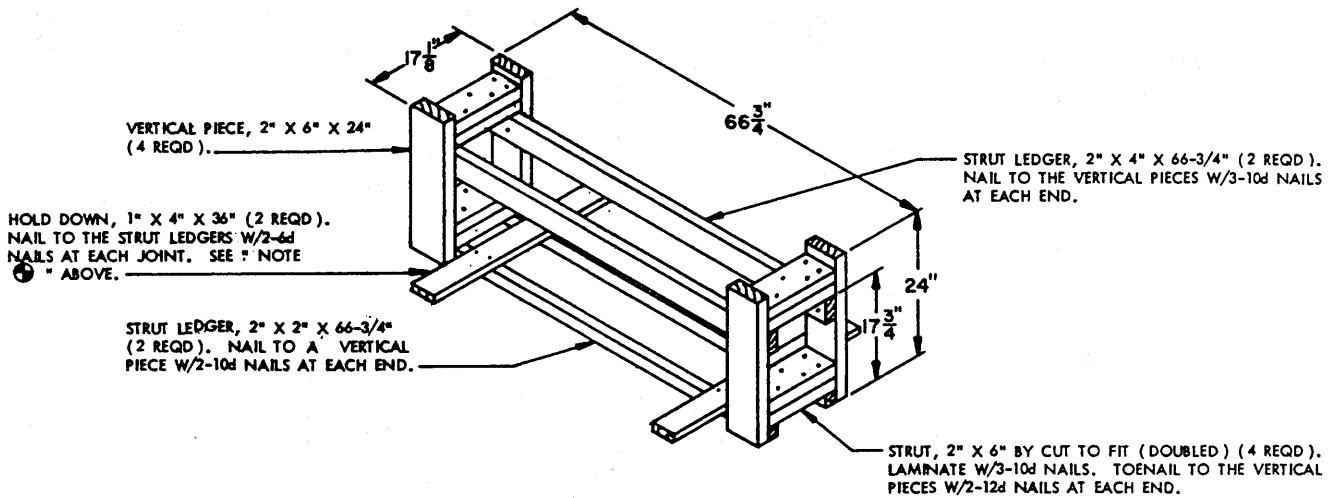
1. A PARTIAL-LAYER LOAD IS SHOWN IN A 9'-2" WIDE BOX CAR; HOWEVER, ANY WIDTH CAR CAN BE USED. FOR LATERAL BLOCKING AT SIDES OF CAR AND LONGITUDINAL BLOCKING AT CENTER OF CAR SEE PAGES 4 AND 5. SEE SPECIAL NOTE 4 ON PAGE 5.
2. A "K-BRACE" ASSEMBLY AS SHOWN IS ADEQUATE FOR RETAINING A PARTIAL-LAYER LOAD OF 4,000 POUNDS. POSITION THE "K-BRACE" AGAINST THE CENTER OF THE TOP LAYER CONTAINERS.
3. A "K-BRACE" ASSEMBLY AS SHOWN MAY BE USED AT EACH END OF THE CAR.
4. THE LENGTH OF THE DIAGONAL BRACE SHOWN AS PIECE MARKED ⑧ WILL VARY ACCORDING TO THE CAR WIDTH.
5. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO DRAWING 19-48-4016-5M1001 FOR THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE.

(KEY NUMBERS CONTINUED)

- ⑧ DIAGONAL BRACE, 2" X 4" X 31-1/8" (2 REQD). SEE "DIAGONAL BRACE" DETAIL ON THIS PAGE. TOENAIL TO PIECES MARKED ② AND ⑤ W/2-16d NAILS AT EACH END. SEE SPECIAL NOTE 4 ON THIS PAGE.
- ⑨ BACK-UP CLEAT, 2" X 6" X 24" (2 REQD). NAIL TO PIECE MARKED ⑤ W/8-16d NAILS.

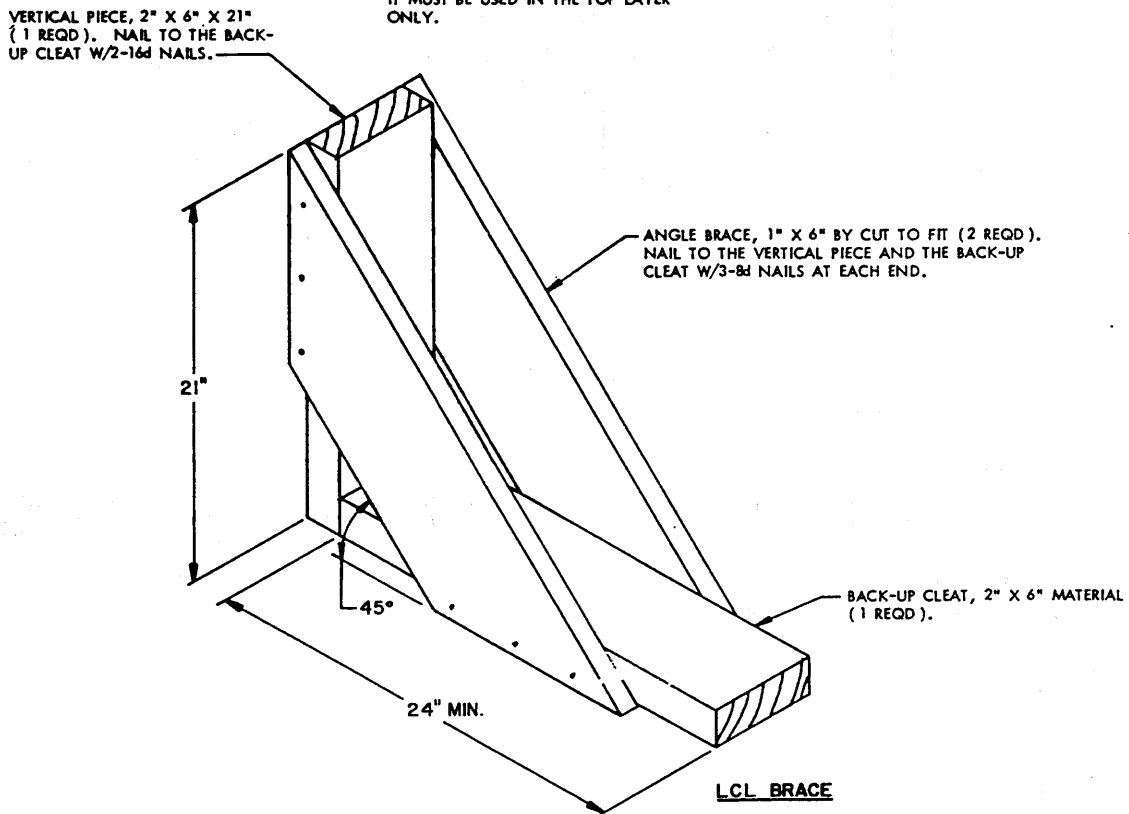
NOTE 1:

ASSEMBLE THE VERTICAL PIECES, STRUTS AND STRUT LEDGER PIECES AND POSITION THE ASSEMBLY IN THE VOID OF THE OMITTED CONTAINER, THEN POSITION THE HOLD DOWN PIECES TO EXTEND UNDER THE CONTAINERS ON EACH SIDE OF THE FILLER ASSEMBLY AND NAIL TO THE BOTTOM STRUT LEDGER W/2-6d NAILS AT EACH JOINT.

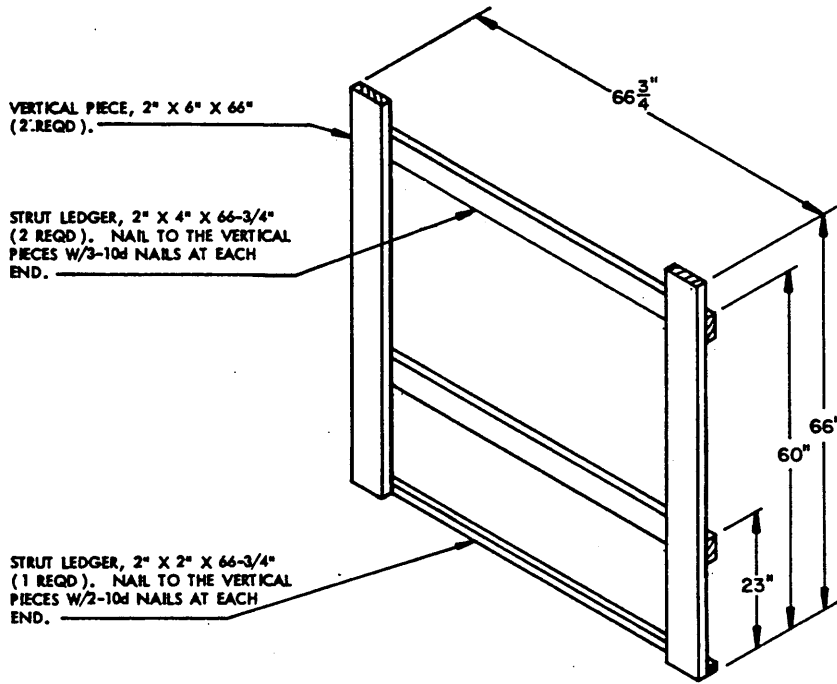


FILLER ASSEMBLY

THE FILLER ASSEMBLY AS SHOWN IS TO BE USED WITHIN LOADS TO TAKE THE PLACE OF AN OMITTED CONTAINER. IT MUST BE USED IN THE TOP LAYER ONLY.

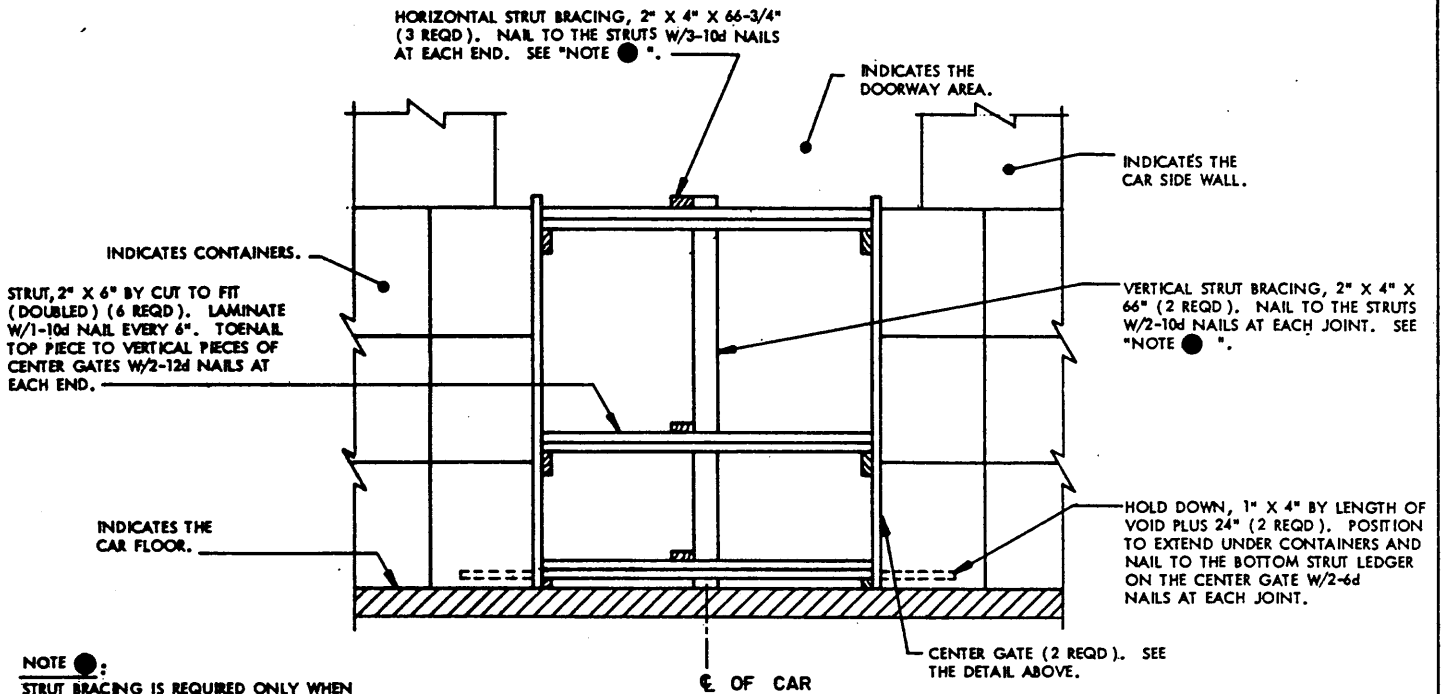


NOTE ④ :
 FOR A TWO LAYER LOAD REDUCE THE HEIGHTS OF THE VERTICAL
 PIECE TO 48" AND POSITION THE SECOND LAYER STRUT LEDGER
 AT A HEIGHT OF 42".



CENTER GATE

SEE "NOTE ④" ABOVE.



NOTE ⑤ :
 STRUT BRACING IS REQUIRED ONLY WHEN
 THE STRUTS ARE 48" OR GREATER IN LENGTH.
 A SET OF STRUT BRACING IS REQUIRED FOR
 EVERY 48" OF STRUT LENGTH.

APPLICATION OF CENTER GATE

