

APPROVED BY
 BUREAU OF EXPLOSIVES
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 MILITARY ASSISTANT
 DATE 10/31/69

LOADING AND BRACING (CL & LCL) IN BOX CARS OF SKIDDED UNITS (STRAPPED) OF BOMB FUZES, M914, M166, AND M188 SERIES, PACKED IN METAL DRUM

INDEX

ITEM	PAGE(S)
GENERAL NOTES, AND MATERIAL SPECIFICATIONS -----	2
DETAIL OF SKIDDED UNIT (STRAPPED)-----	3
LOADS FOR CONVENTIONAL TYPE BOX CARS:	
89-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOX CAR-----	4,5
PARTIAL LAYER BRACING PROCEDURES-----	6,7
TYPICAL LCL (1-UNIT LOAD)-----	8
TYPICAL LCL (5-UNIT LOAD)-----	9
DETAILS-----	10-13
LOADS FOR BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES HAVING ADJUSTABLE AND/OR FIXED WALL MEMBERS:	
84-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOX CAR-----	14, 15
PARTIAL LAYER BRACING PROCEDURES-----	16
DETAILS-----	17

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

● THIS OUTLOADING PROCEDURE DRAWING ALSO INCLUDES UNITIZATION PROCEDURES,

DO NOT SCALE

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			AMMUNITION PROCUREMENT & SUPPLY AGENCY
			APPROVED BY ORDER OF COMMANDING GENERAL U. S. ARMY MATERIEL COMMAND
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			U. S. ARMY MATERIEL COMMAND
			JANUARY 1970
			CLASS DIVISION DRAWING FILE
			19 48 4092 5M100

GENERAL NOTES

(GENERAL NOTES CONTINUED)

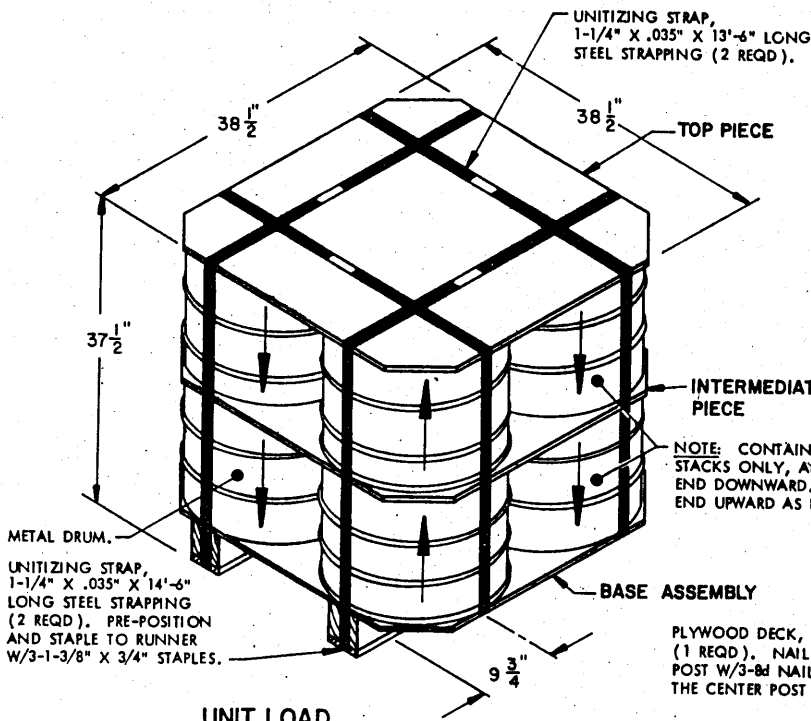
- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AMCR 740-13, AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE OUTLOADING PROCEDURES SPECIFIED HEREIN ARE APPLICABLE TO SKIDDED UNITS (STRAPPED) OF BOMB FUZES, PACKED IN METAL DRUMS. SUBSEQUENT REFERENCE TO UNIT HEREIN MEANS THE SKIDDED UNIT OF DRUMS WITH CONTENTS.
- C. FOR DETAIL OF DRUM SEE DRAWING NO. 76-16-492 AND 76-16-493.
DRUM DIMENSIONS ----- 19-9/16" DIA BY 15-3/4" HIGH.
GROSS WEIGHT ----- 58 LBS (APPROX).
- D. FOR DETAIL OF STRAPPED UNIT SEE PAGE 3 OF THIS DRAWING.
UNIT DIMENSIONS ----- 38-1/2" LONG X 38-1/2" WIDE X 37-1/2" HIGH.
GROSS WEIGHT ----- 534 LBS (APPROX).
CUBE ----- 32.17 CUBIC FEET.
- E. THIS ITEM IS A DOT CLASS "A" EXPLOSIVE. THE OUTLOADING PROCEDURES SPECIFIED HEREIN CAN ALSO BE UTILIZED FOR THE SHIPMENT OF THE DEPICTED UNITS WHEN THEY ARE LOADED WITH AN ITEM WHICH IS IDENTIFIED DIFFERENTLY BY NOMENCLATURE THAN THE ITEM DESIGNATED WITHIN THE DRAWING TITLE.
- F. THE LOADS AS SHOWN HEREIN ARE BASED ON CONVENTIONAL BOX CARS, OR ARE BASED ON BOX CARS HAVING MECHANICAL BRACING DEVICES WHICH HAVE ADJUSTABLE AND/OR FIXED WALL MEMBERS. NOTE: ALL METAL CARS CAN BE USED FOR THE LOADS DELINEATED ON PAGES 4 AND 8 PROVIDING THE CARS BEING USED HAVE NAILABLE FLOORS. ALL METAL CARS CAN NOT BE USED FOR LOADS REQUIRING A K-BRACE TYPE OF PARTIAL LAYER BLOCKING AS DEPICTED ON PAGES 6 AND 7, OR A LCL LOAD AS DEPICTED ON PAGE 9.
- G. THE LOADS AS SHOWN ARE BASED ON CARS WHICH HAVE 10'-0" WIDE DOORS OF THE CONVENTIONAL SLIDING TYPE. CARS WITH CONVENTIONAL TYPE DOORS OF LESS THAN 8'-0" SHOULD NOT BE ORDERED; HOWEVER, IF NECESSARY, CARS WITH LESS THAN 8'-0" WIDE DOORS CAN BE USED. ALSO, CARS EQUIPPED WITH WIDER OR STAGGERED DOORS CAN BE USED. CAUTION: DUNNAGE MATERIAL MUST NOT BE NAILED TO ANY PLUG DOOR, EXCEPT TO A NAILING STRIP IF A DOOR IS SO EQUIPPED, FOR SECURING SUCH ITEMS AS GATE HOLD DOWN OR DOORWAY SPANNER DUNNAGE, WHETHER AUXILIARY OR MAIN; ALSO, SPECIAL PROVISIONS MUST BE IMPLEMENTED AS DIRECTED WITHIN THE "SPECIAL NOTES" SECTION WHICH APPLIES TO THE BASIC LOAD INVOLVED. 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. 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.
- H. THE OUTLOADING PROCEDURES SPECIFIED ON PAGES 14 AND 15 ARE FOR 50'-6" LONG BY 9'-2" WIDE BOX CARS WHICH ARE EQUIPPED WITH MECHANICAL BRACING DEVICES, AND THE PROCEDURES 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 WHICH ARE EQUIPPED WITH MEMBERS WHICH DO NOT MEET THE LOCATION REQUIREMENTS MUST NOT BE USED. NARROWER OR WIDER CARS CAN BE USED.
- I. A CROSS MEMBER, WHEN USED AS SPECIFIED BY ANY ONE OF THE OUTLOADING METHODS SPECIFIED 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 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, AND DOORWAY MEMBERS TO DOOR POSTS. COMPONENTS ASSIGNED TO EACH CAR MUST REMAIN THEREWITH EVEN THOUGH UNUSED DURING SOME SHIPMENTS.
3. A CROSS MEMBER WILL NOT BE RELIED UPON TO RETAIN MORE UNITS THAN SHOWN IN THE LOAD VIEWS.
- J. 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.
- K. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN BOX CARS 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 HEREIN.
- L. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT FOR A STRAP APPLICATION OTHER THAN DEPICTED FOR BUILDING THE UNIT AS SHOWN ON PAGE 3, A MINIMUM OF TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) PAIR OF CRMPs PER SEAL MUST BE USED TO SEAL THE JOINT. CAUTION: EXERCISE CARE DURING TENSIONING TO PREVENT DAMAGE TO CONTAINERS.
- M. 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.
- N. 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.
- O. 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.
- P. THROUGHOUT THIS PROCEDURAL DRAWING, PORTIONS OF THE BLOCKING COMPONENT AND OF THE DEPICTED CARS, SUCH AS A CAR SIDE WALL, HAVE BEEN OMITTED FROM THE LOAD VIEWS FOR CLARITY PURPOSES.

(CONTINUED AT THE 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 THE SAME SIZE.
- STRAPPING, STEEL: TYPE I OR IV, CLASS A OR B FOR UNITIZING AND CLASS A,
B, OR C FOR OUTLOADING, FED SPEC QQ-5-781.
- WIRE ----- : FED SPEC QQ-W-461.
- STRAP SEALS,
STRAP STAPLES - : COMMERCIAL GRADE.
- PLYWOOD ----- : GROUP B OR C, GRADE *C-D (EXTERIOR), FED SPEC NN-P-530.

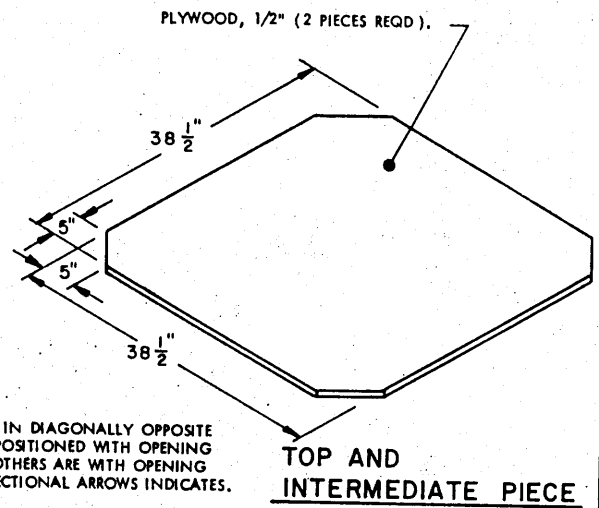
* IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER EXTERIOR GRADE MAY BE SUBSTITUTED.



UNIT LOAD

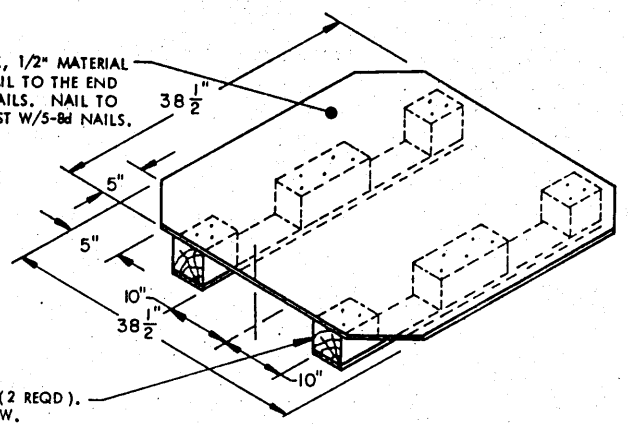
UNIT LOAD DATA

METAL DRUM W/CONTENTS ----- 8 @ 58 LBS ----- 464 LBS
 DUNNAGE ----- 70 LBS
 TOTAL WEIGHT ----- 534 LBS (APPROX)



TOP AND INTERMEDIATE PIECE

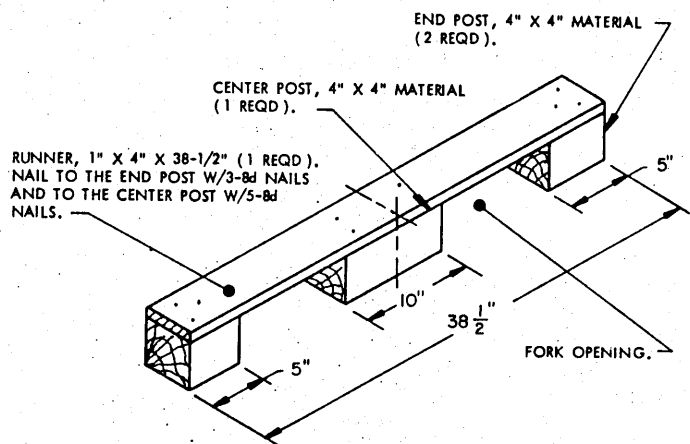
NOTE: CONTAINERS IN DIAGONALLY OPPOSITE STACKS ONLY, ARE POSITIONED WITH OPENING END DOWNWARD. OTHERS ARE WITH OPENING END UPWARD AS DIRECTIONAL ARROWS INDICATES.



BASE ASSEMBLY

BILL OF MATERIAL / UNIT LOAD			
LUMBER	NO. REQD	LINEAR FEET	BOARD FEET
1" X 4" X 38-1/2"	2	6.42	2.14
4" X 4" X 5"	4	1.67	2.23
4" X 4" X 10"	2	1.67	2.23
PLYWOOD	NO. PCS	SQUARE FEET	
1/2" X 38-1/2" X 38-1/2"	3	31	
NAILS	NO. REQD	POUND	
8d (2-1/2")	44	1/2	
STEEL STRAPPING, 1-1/4" X .035"	56' REQD	8 LBS	
SEAL FOR 1-1/4" STRAPPING	4 REQD	NIL	
STAPLES, 1-3/8" X 3/4"	6 REQD	NIL	

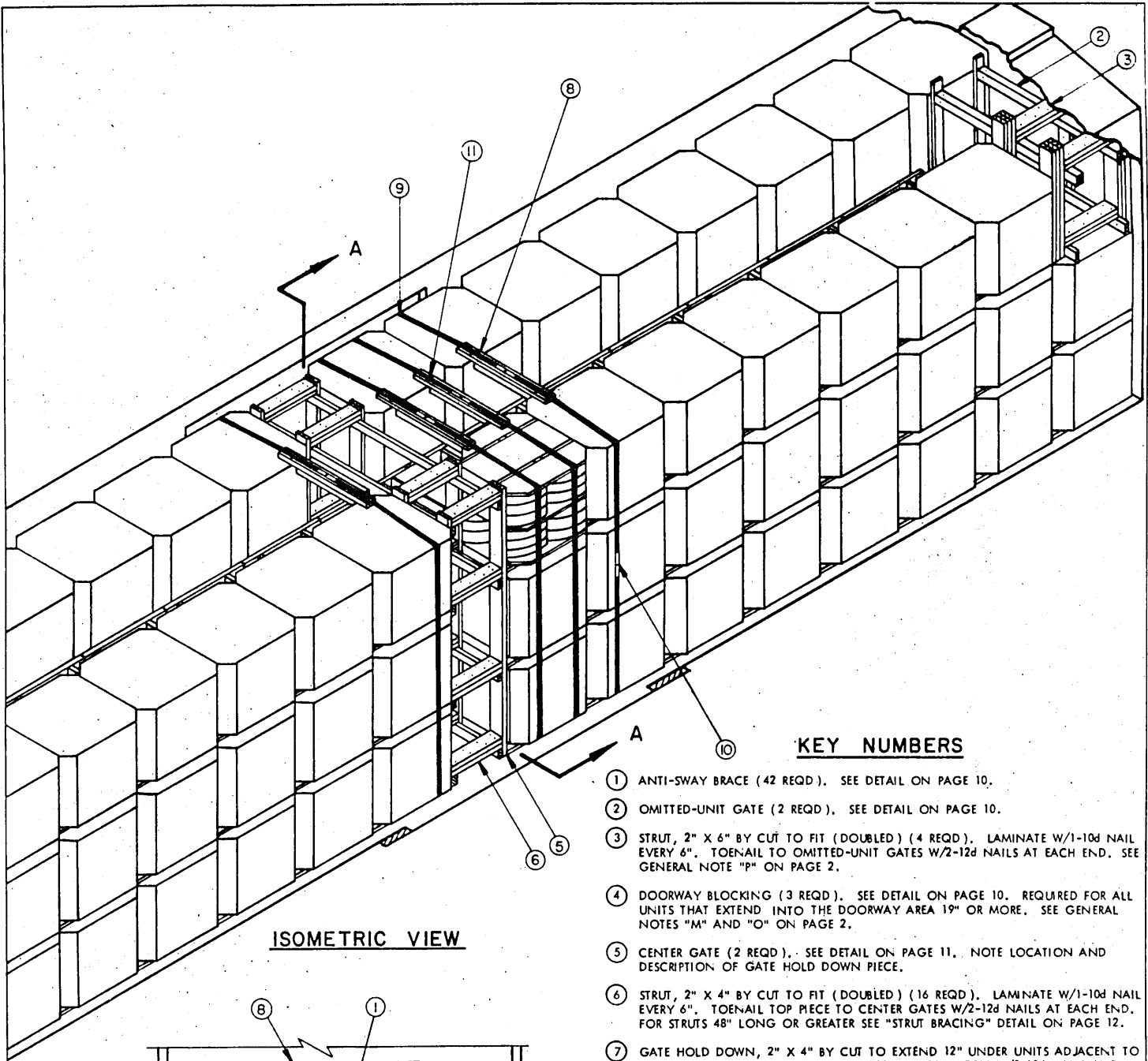
FOR MATERIAL SPECIFICATIONS SEE PAGE 2.



DETAIL - SKID ASSEMBLY

(2 REQD PER BASE ASSEMBLY)
 SKID ASSEMBLY IS SHOWN IN AN INVERTED POSITION.

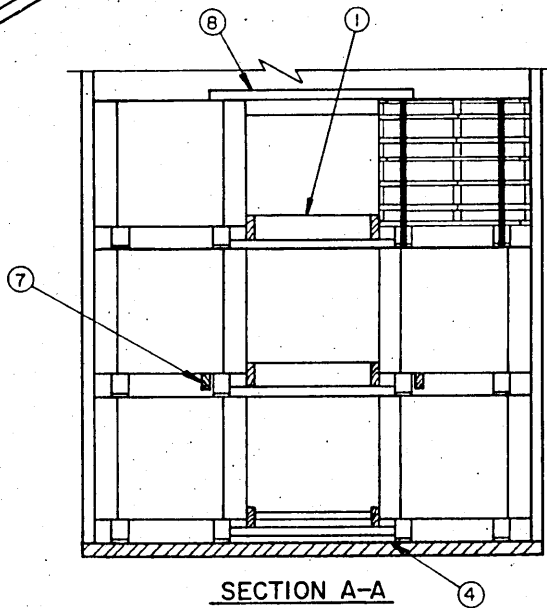
DETAIL OF STRAPPED UNIT (STRAPPED)



ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE (42 REQD). SEE DETAIL ON PAGE 10.
- ② OMITTED-UNIT GATE (2 REQD). SEE DETAIL ON PAGE 10.
- ③ STRUT, 2" X 6" BY CUT TO FIT (DOUBLED) (4 REQD). LAMINATE W/1-10d NAIL EVERY 6". TOENAIL TO OMITTED-UNIT GATES W/2-12d NAILS AT EACH END. SEE GENERAL NOTE "P" ON PAGE 2.
- ④ DOORWAY BLOCKING (3 REQD). SEE DETAIL ON PAGE 10. REQUIRED FOR ALL UNITS THAT EXTEND INTO THE DOORWAY AREA 19" OR MORE. SEE GENERAL NOTES "M" AND "O" ON PAGE 2.
- ⑤ CENTER GATE (2 REQD). SEE DETAIL ON PAGE 11. NOTE LOCATION AND DESCRIPTION OF GATE HOLD DOWN PIECE.
- ⑥ STRUT, 2" X 4" BY CUT TO FIT (DOUBLED) (16 REQD). LAMINATE W/1-10d NAIL EVERY 6". TOENAIL TOP PIECE TO CENTER GATES W/2-12d NAILS AT EACH END. FOR STRUTS 48" LONG OR GREATER SEE "STRUT BRACING" DETAIL ON PAGE 12.
- ⑦ GATE HOLD DOWN, 2" X 4" BY CUT TO EXTEND 12" UNDER UNITS ADJACENT TO THE CENTER GATES. NAIL TO THE GATE VERTICAL PIECES W/2-10d NAILS AND NAIL TO THE STRUTS W/6-10d NAILS AT EACH LOCATION. ALSO, SEE "ALTERNATIVE GATE HOLD-DOWN" DETAIL ON PAGE 12.
- ⑧ STRAPPING BOARD (4 REQD). SEE DETAIL ON PAGE 11.
- ⑨ UNITIZING STRAP, 1-1/4" X .035" X 39'-0" LONG STEEL STRAPPING (4 REQD). SEE GENERAL NOTE "M" ON PAGE 2.
- ⑩ SEAL FOR 1-1/4" STRAP (8 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL.
- ⑪ STAPLE, 1-3/8" X 3/4" (8 REQD). SECURE UNITIZING STRAP TO STRAPPING BOARD W/2-1-3/8" X 3/4" STAPLE EACH STRAP.



SECTION A-A

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE (INSIDE CLEARANCE) CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. THE LOAD AS SHOWN MAY ALSO BE SHIPPED IN CARS WHICH HAVE NARROWER, WIDER, OR STAGGERED DOOR OPENINGS. NOTE: THE MINIMUM DOOR OPENING HEIGHT IS 9'-6" FOR A THREE (3) UNIT HIGH LOAD.
2. A WIDER OR NARROWER WIDTH CAR CAN BE USED FOR SHIPPING THE DEPICTED LOAD BY ADJUSTING THE WIDTH OF ANTI-SWAY BRACES, DOORWAY BLOCKING, CENTER GATES, AND STRAPPING BOARDS.
3. THE USE OF THE "OMITTED-UNIT GATES" AND "STRUTS" ARE SPECIFIED FOR THE DEPICTED LOAD ONLY TO SHOW A TYPICAL APPLICATION. THE "OMITTED-UNIT GATES" AND "STRUTS" MAY BE USED WITH THE "PARTIAL LAYER BRACING" AS DEPICTED ON PAGES 7 AND 8 WHEN SHIPPING AN ODD NUMBER OF UNITS.
4. IF THE CAR BEING LOADED HAS PLUG DOORS AND LESS THAN ONE-HALF OF A UNIT EXTENDS INTO THE DOORWAY AREA, NO DOORWAY PROTECTION IS REQUIRED. IF MORE THAN ONE-HALF OF A UNIT EXTENDS INTO THE DOORWAY AREA, DOOR PROTECTION AS SHOWN BY PIECES MARKED ④, ⑧, ⑨, ⑩, AND ⑪ MUST BE USED. SEE GENERAL NOTE "L" ON PAGE 2.

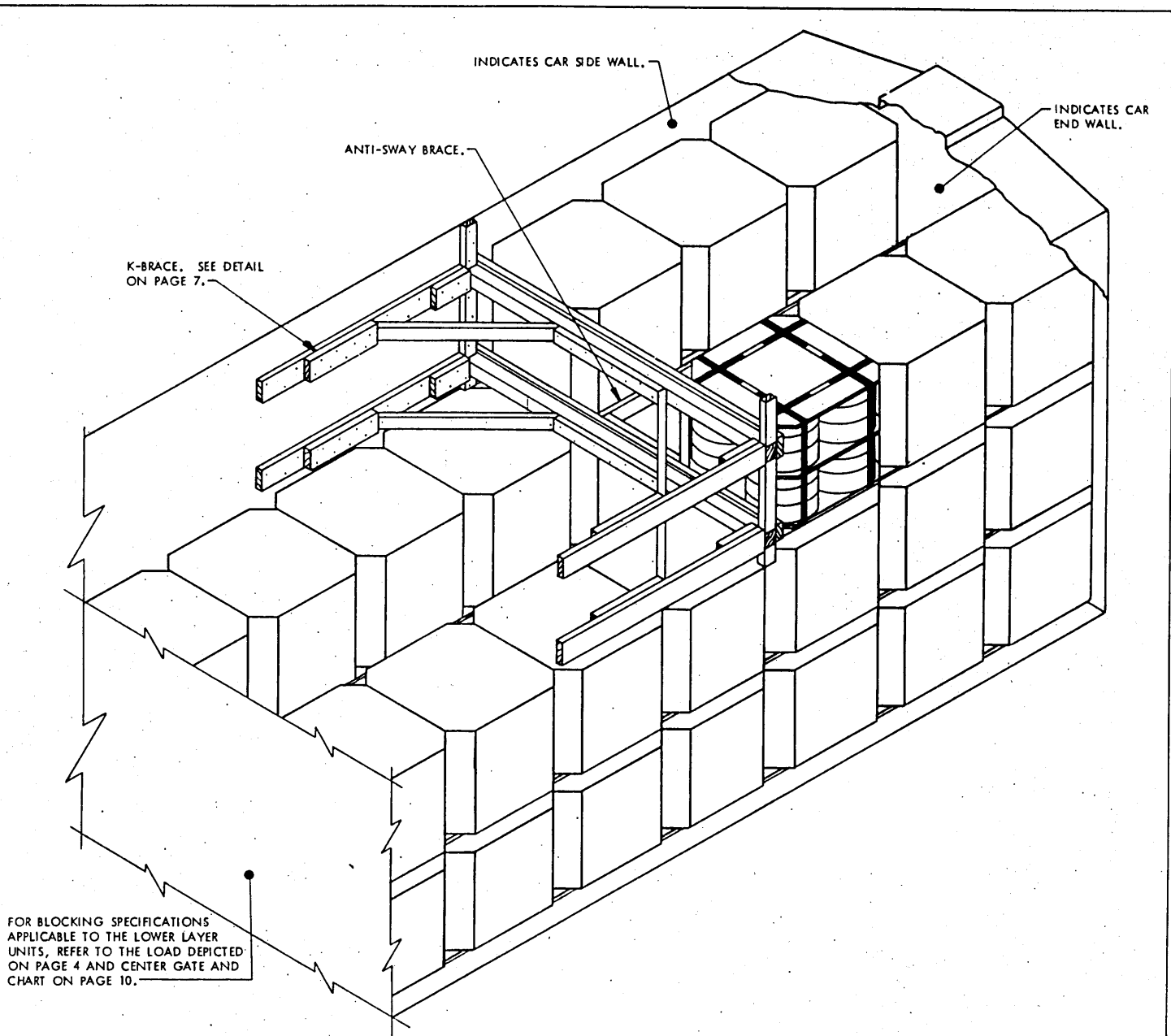
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	567	378
2" X 6"	624	624
4" X 4"	12	16
NAILS	NO. REQD	POUNDS
10d (3")	304	4-3/4
12d (3-1/4")	1120	18-1/2
16d (3-1/2")	120	2-3/4
STEEL STRAPPING, 1-1/4" X .035" -----	156' REQD -----	22 LBS
SEALS FOR 1-1/4" STRAPPING -----	8 REQD -----	NIL
STAPLES, 1-3/4" X 3/4" -----	8 REQD -----	NIL

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
UNITS -----	89 -----	47,526 LBS
DUNNAGE -----	-----	2,593 LBS
TOTAL WEIGHT -----		50,119 LBS

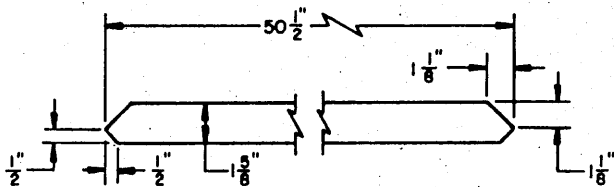
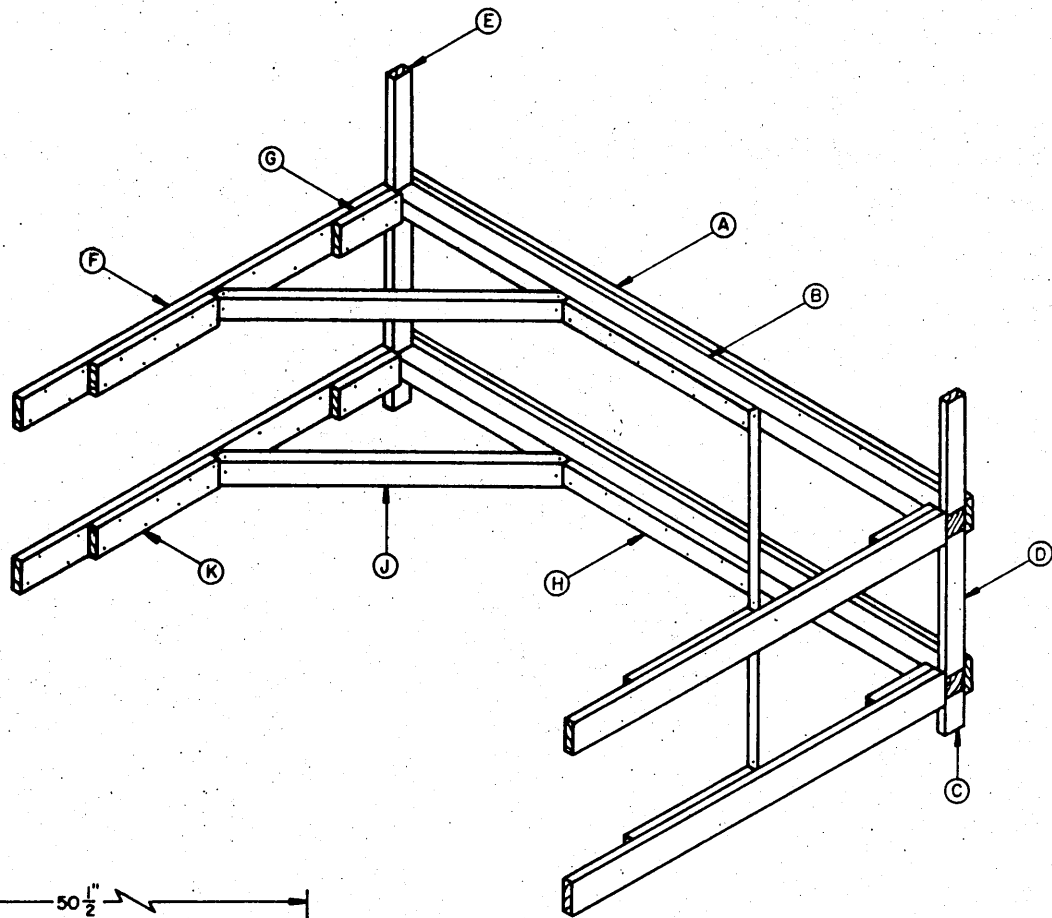
89-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOX CAR



ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-2" WIDE (INSIDE DIMENSION) CONVENTIONAL TYPE BOX CAR IS SHOWN.
2. A K-BRACE ASSEMBLY AS SHOWN IS ADEQUATE FOR RETAINING A MAXIMUM PARTIAL LAYER LOAD OF 14,000 POUNDS. **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 DUNNAGE. PIECES MARKED (A), (B), (C), (D), (E), AND (F) MUST BE SUPPORTED AT THE SIDES OF THE 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 PIECES MARKED (F) MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE.



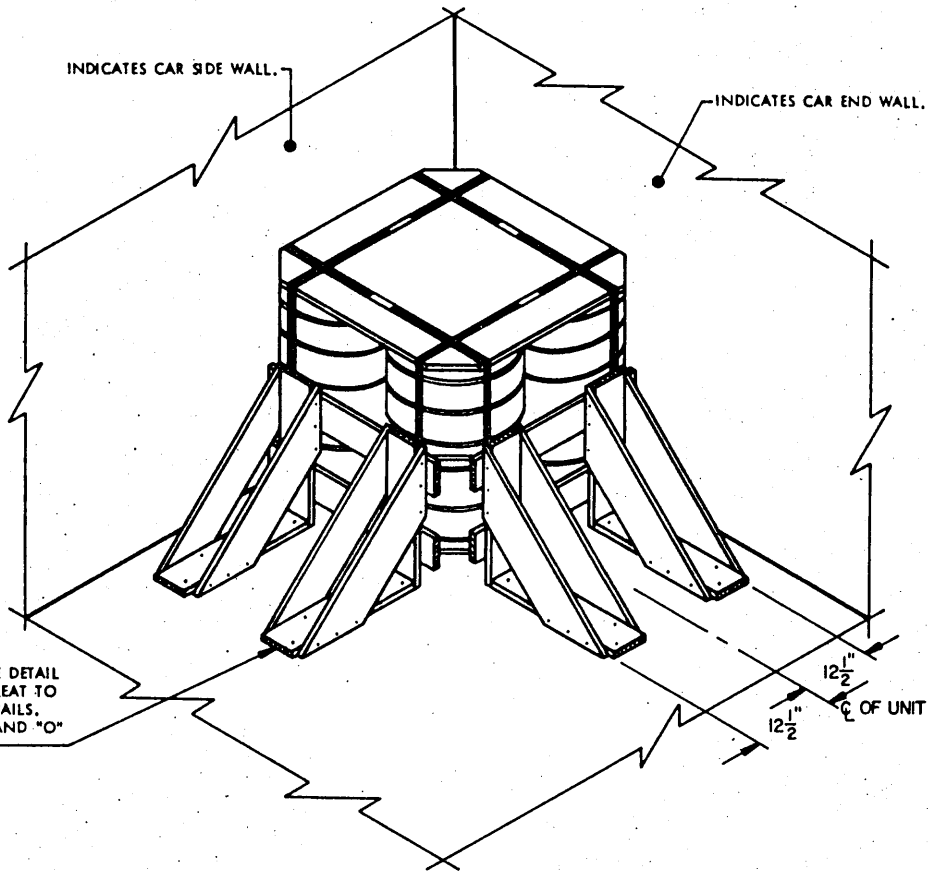
DETAIL OF BRACE
PIECE MARKED (J).

K - BRACE ASSEMBLY

LUMBER AND NAILING CHART				
PC MK	LUMBER SIZE	NO. REQD	NAIL TO	NUMBER AND SIZE OF NAILS
(C)	2" X 4" X 6"	2	CAR WALL	3-10d
(A)	2" X 6" BY CAR WIDTH (SEE "NOTE ⊕" BELOW).	2	(B)	1-12d EVERY 12"
(B)	4" X 4" BY CAR WIDTH	2	-----	-----
(H)	2" X 4" X 36" FOR A 9'-2" CAR OR 2" X 4" X 28" FOR A 8'-6" CAR	2	(B)	7-12d
(F)	2" X 6" X 72"	4	CAR WALL	16-10d
(G)	2" X 6" X 12"	4	(F)	4-16d
(J)	2" X 4" MATERIAL (SEE DETAIL OF BRACE)	4	(B) & (F)	2-16d EACH END
(K)	2" X 6" X 24"	4	(F)	8-16d
(D)	2" X 4" X 29-1/2"	2	CAR WALL	6-10d
(E)	2" X 4" X 18"	2	CAR WALL	4-10d

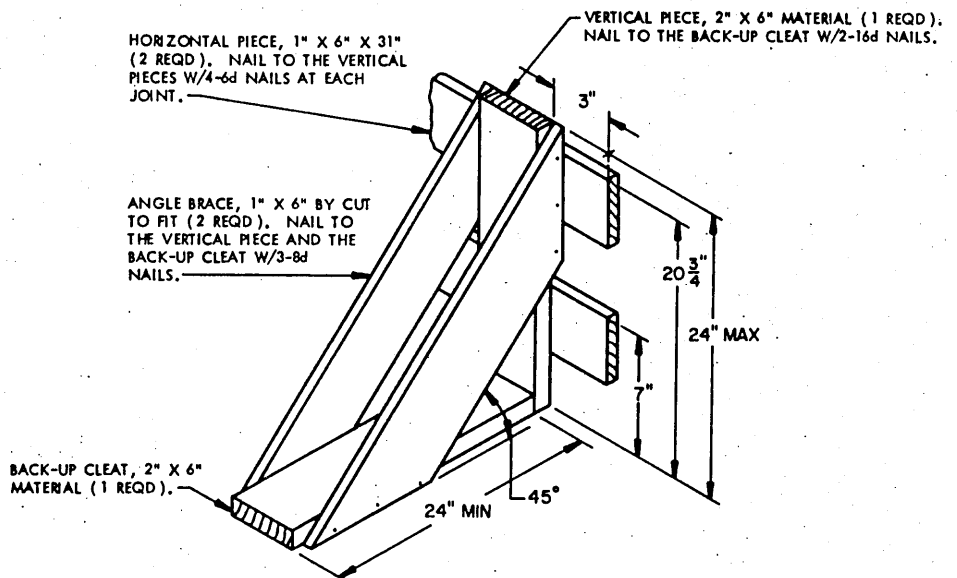
NOTE ⊕ :

IF DESIRED, 1/2" PLYWOOD MAY BE SUBSTITUTED FOR PIECE MARKED (A). THE PLYWOOD MUST BE CAR WIDTH BY UNIT HEIGHT. SECURE THE PLYWOOD TO PIECE MARKED (B) W/1-6d NAIL EVERY 12".



ISOMETRIC VIEW

ONE PALLET UNIT SHOWN
DEPICTING THE USE OF LCL
BRACES.



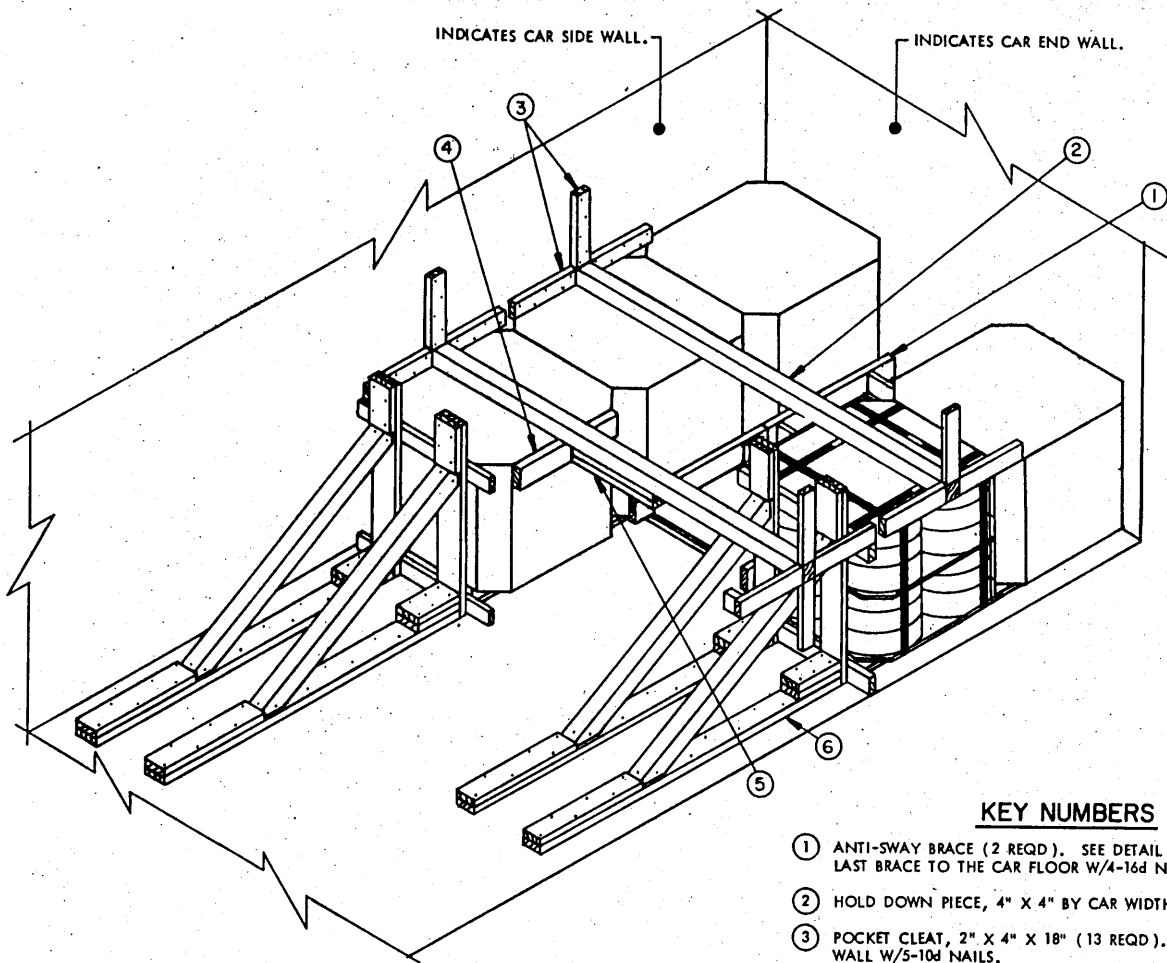
LCL BRACE

SEE "NOTE ▲" AT LEFT.

TYPICAL LCL (1-UNIT LOAD)

NOTE ▲:

EACH BRACE AS APPLIED FOR LONGITUDINAL OR LATERAL BRACING WILL SUPPORT 2,000 OR 8,000 POUNDS OF LADING, RESPECTIVELY.



ISOMETRIC VIEW

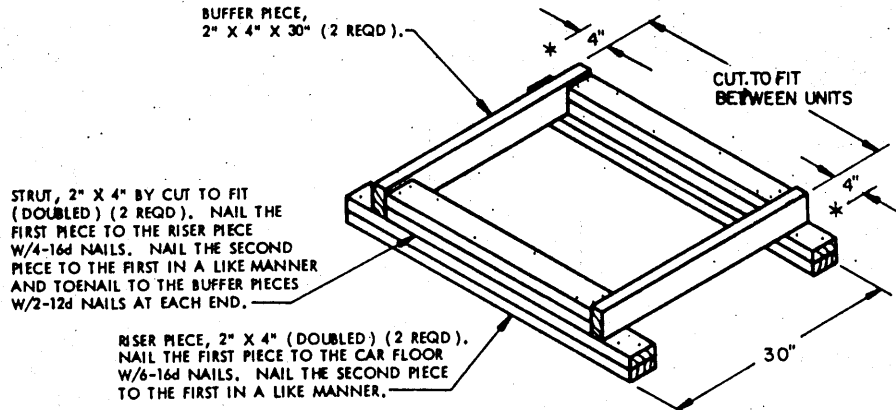
FIVE PALLET UNITS SHOWN DEPICTING THE USE OF KNEE BRACE BLOCKING.

SPECIAL NOTES:

1. A 9'-2" WIDE (INSIDE CLEARANCE) CONVENTIONAL TYPE BOX CAR IS SHOWN, A NARROWER CAR SHOULD BE USED.
2. IF THE LADING EXTENDS INTO A DOORWAY AREA USE TWO (2) PIECES OF DOOR-SPANNING 2" X 6" MATERIAL ACROSS EACH DOORWAY INVOLVED FOR SECUREMENT OF THE PIECES MARKED ② AND ③. A PIECE MARKED ② WILL BE CUT FOR A SNUG FIT AGAINST THE DOOR-SPANNING PIECES AND THE VERTICAL POCKET CLEATS MARKED ③ WILL BE INSTALLED IN A HORIZONTAL POSITION INSTEAD OF A VERTICAL POSITION AS SHOWN.
3. **CAUTION:** IF A UNIT EXTENDS MORE THAN 19" PAST A DOOR POST INTO THE DOORWAY AREA IN A CONVENTIONAL OR A PLUG DOOR, A PIECE OF DOOR SPANNING DUNNAGE OF 2" X 6" MATERIAL BY DOOR-OPENING WIDTH PLUS 24" IN LENGTH WILL BE POSITIONED ACROSS THE DOOR OPENING APPROXIMATELY 24" ABOVE THE CAR FLOOR AND NAILED TO THE CAR SIDE WALL W/5-12d NAILS AT EACH END.
4. TWO (2) KNEE BRACE ASSEMBLIES ARE ADEQUATE FOR RETAINING A MAXIMUM LCL SHIPMENT.

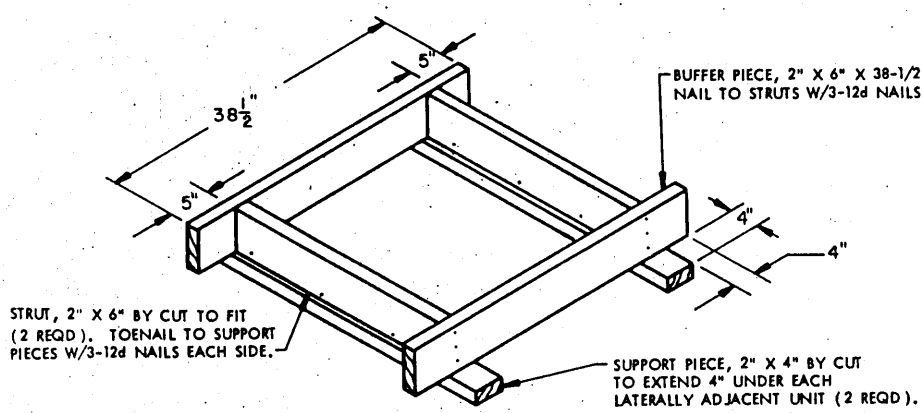
KEY NUMBERS

- ① ANTI-SWAY BRACE (2 REQD). SEE DETAIL ON PAGE 10. TOENAIL LAST BRACE TO THE CAR FLOOR W/4-16d NAILS.
- ② HOLD DOWN PIECE, 4" X 4" BY CAR WIDTH (2 REQD).
- ③ POCKET CLEAT, 2" X 4" X 18" (13 REQD). NAIL TO THE CAR SIDE WALL W/5-10d NAILS.
- ④ SIDE BLOCKING BUFFER, 2" X 4" X 28" (1 REQD). NAIL TO THE FIRST PIECE OF SIDE BLOCKING W/2-12d NAILS.
- ⑤ SIDE BLOCKING, 2" X 4" X 24" (DOUBLED) (1 REQD). NAIL THE FIRST PIECE TO HOLD DOWN PIECE W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. TOENAIL THE SECOND PIECE TO SIDE BLOCKING BUFFER PIECE W/2-12d NAILS.
- ⑥ KNEE BRACE ASSEMBLY (2 REQD). SEE DETAIL ON PAGE 13. SEE GENERAL NOTES "M" AND "O" ON PAGE 2.

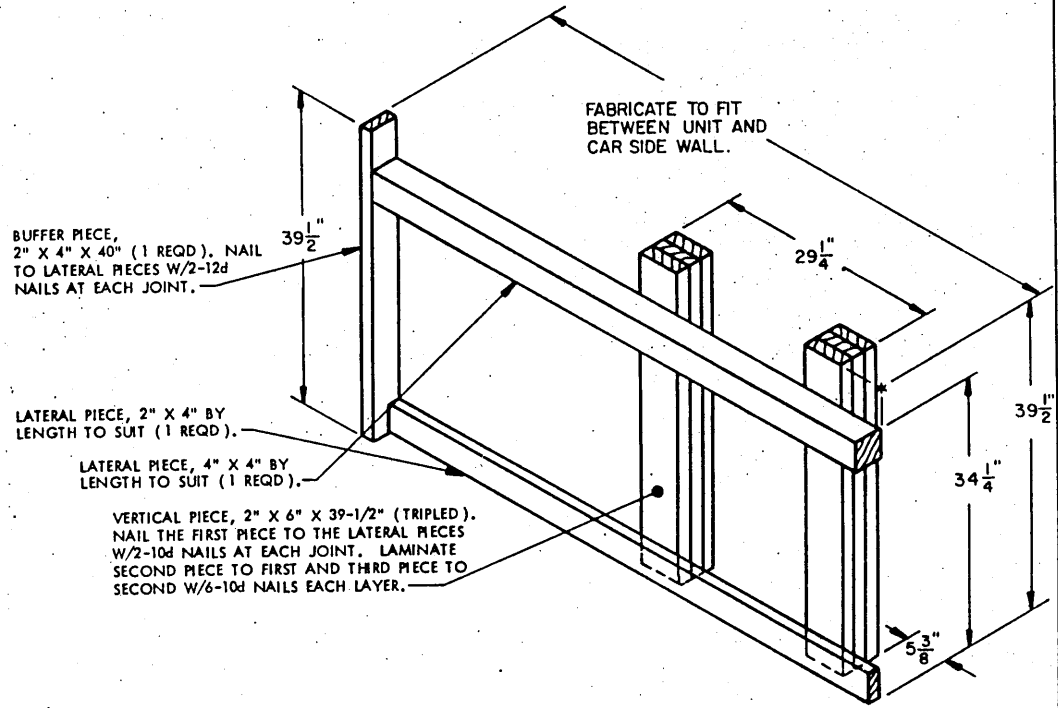


DOORWAY BLOCKING

TO BE FABRICATED IN POSITION, SEE GENERAL NOTES "M" AND "O" ON PAGE 2.

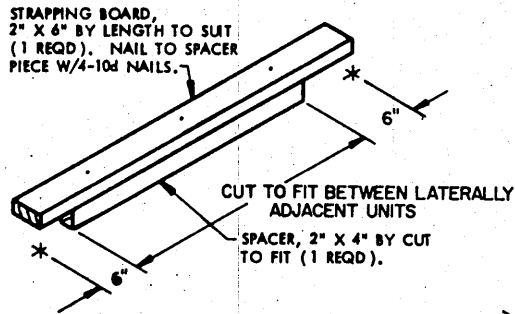


ANTI-SWAY BRACE



OMITTED - UNIT GATE

ONE (1) GATE REQUIRED AS SHOWN ABOVE AND ONE (1) GATE REQUIRED WITH LATERAL PIECES ON OPPOSITE SIDE OF THE VERTICAL PIECES.



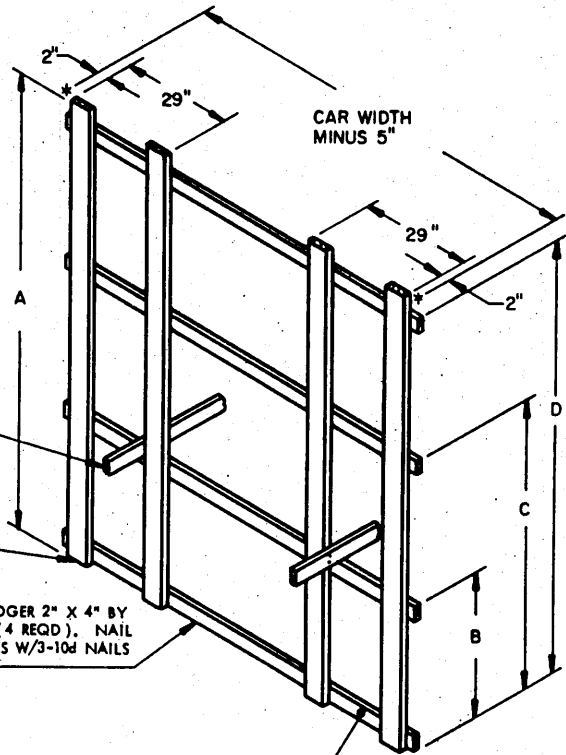
STRAPPING BOARD

ALIGN STRAPPING BOARD WITH UNITIZING STRAP OF UNIT.

LOCATION OF GATE HOLD-DOWN, PIECE MARKED 7, ON PAGE 4.

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

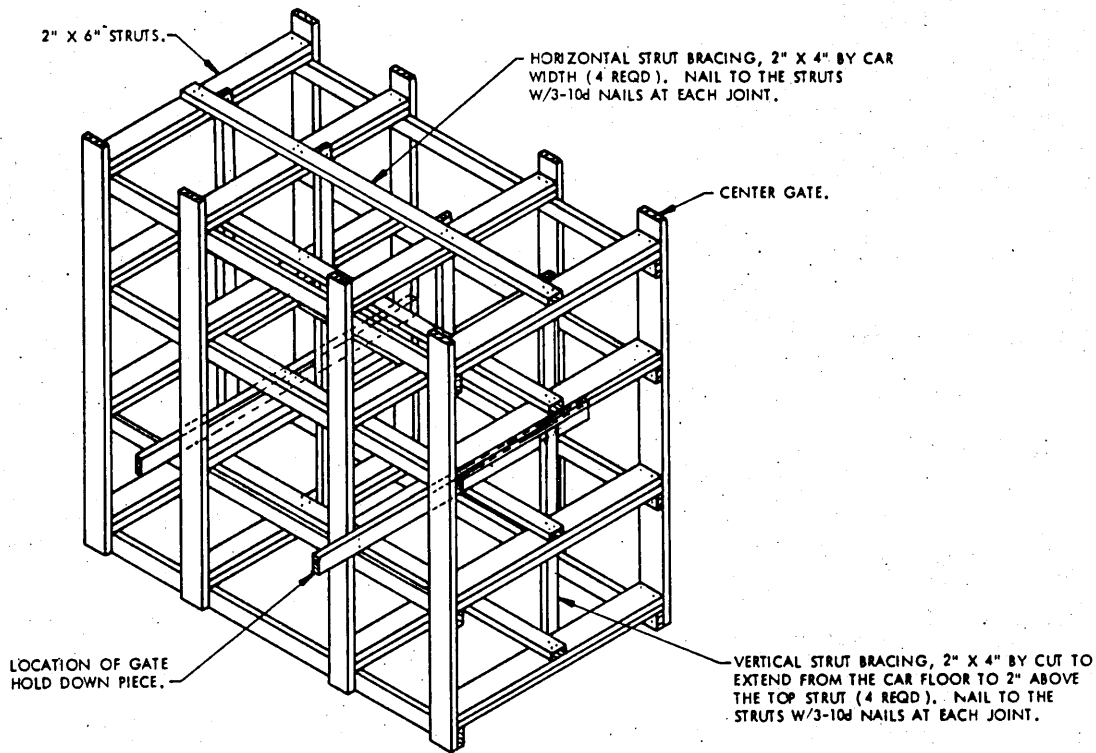
HORIZONTAL/STRUT LEDGER 2" X 4" BY CAR WIDTH MINUS 8" (4 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.



SEE ALTERNATIVE GATE HOLD-DOWN ON PAGE 12.

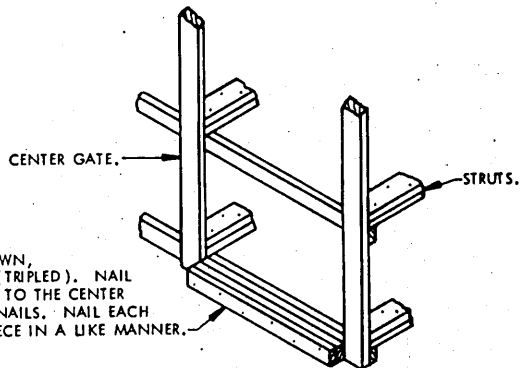
CENTER GATE

CENTER GATE CHART				
LOAD HEIGHT	DIMENSIONS			
	A	B	C	D
ONE UNIT HIGH	40"	34"	----	-----
TWO UNITS HIGH	77-1/2"	36-1/2"	71-1/2"	-----
THREE UNITS HIGH	9'-7"	36-1/2"	6'-1"	9'-1-1/2"



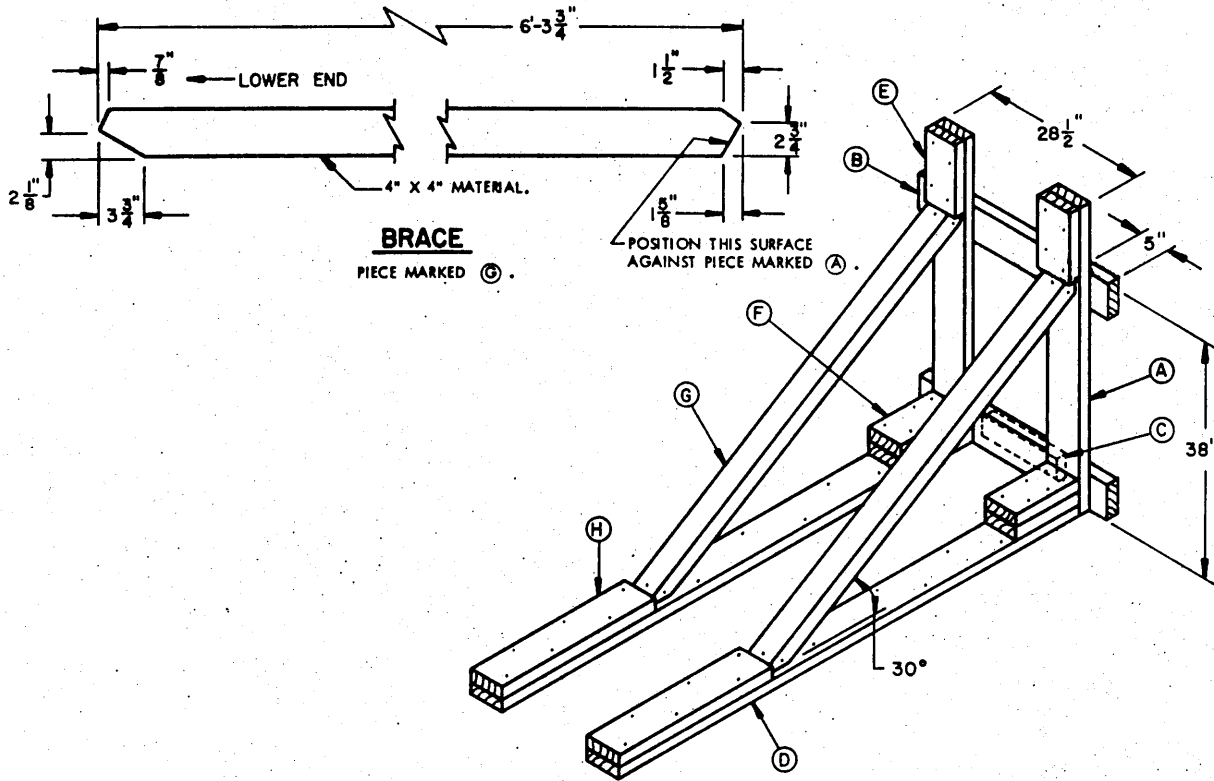
STRUT BRACING

STRUT BRACING IS REQUIRED WHEN STRUTS ARE 48" OR GREATER IN LENGTH. ONE (1) SET AS SHOWN ABOVE IS REQUIRED FOR EVERY 48" OF STRUT LENGTH.



ALTERNATIVE GATE HOLD-DOWN

THIS METHOD MAY BE USED IN LIEU OF THE METHOD AS DEPICTED ON PAGE 4. THIS GATE HOLD-DOWN IS REQUIRED AT TWO (2) LOCATIONS OF EACH CENTER GATE, TO PROTRUDE UNDER THE UNITIZED UNITS.



KNEE BRACE ASSEMBLY

LUMBER AND NAILING DATA				
PC MK	LUMBER SIZE	NO. REQD	NAIL TO	NUMBER AND SIZE OF NAILS
(A)	2" X 6" X 50"	2	-----	-----
(B)	2" X 6" X 40"	2	(A)	3-10d NAILS AT EACH JOINT
(C)	2" X 4" X 15"	1	(B)	3-10d
(D)	2" X 6" X 8'-1"	2	CAR FLOOR	1-16d EVERY 8"
(E)	2" X 6" X 12"	2	(A)	4-10d
(F)	2" X 4" X 12" (DOUBLED)	2	(D) AND SELF	4-10d
			(A)	TOENAIL W/2-12d
(G)	4" X 4" X 6'-3-3/4" SEE "BRACE" DETAIL	2	(A) & (D)	2-16d AT EACH END
(H)	2" X 6" X 30"	2	(D)	6-40d

NOTE ⊕ :

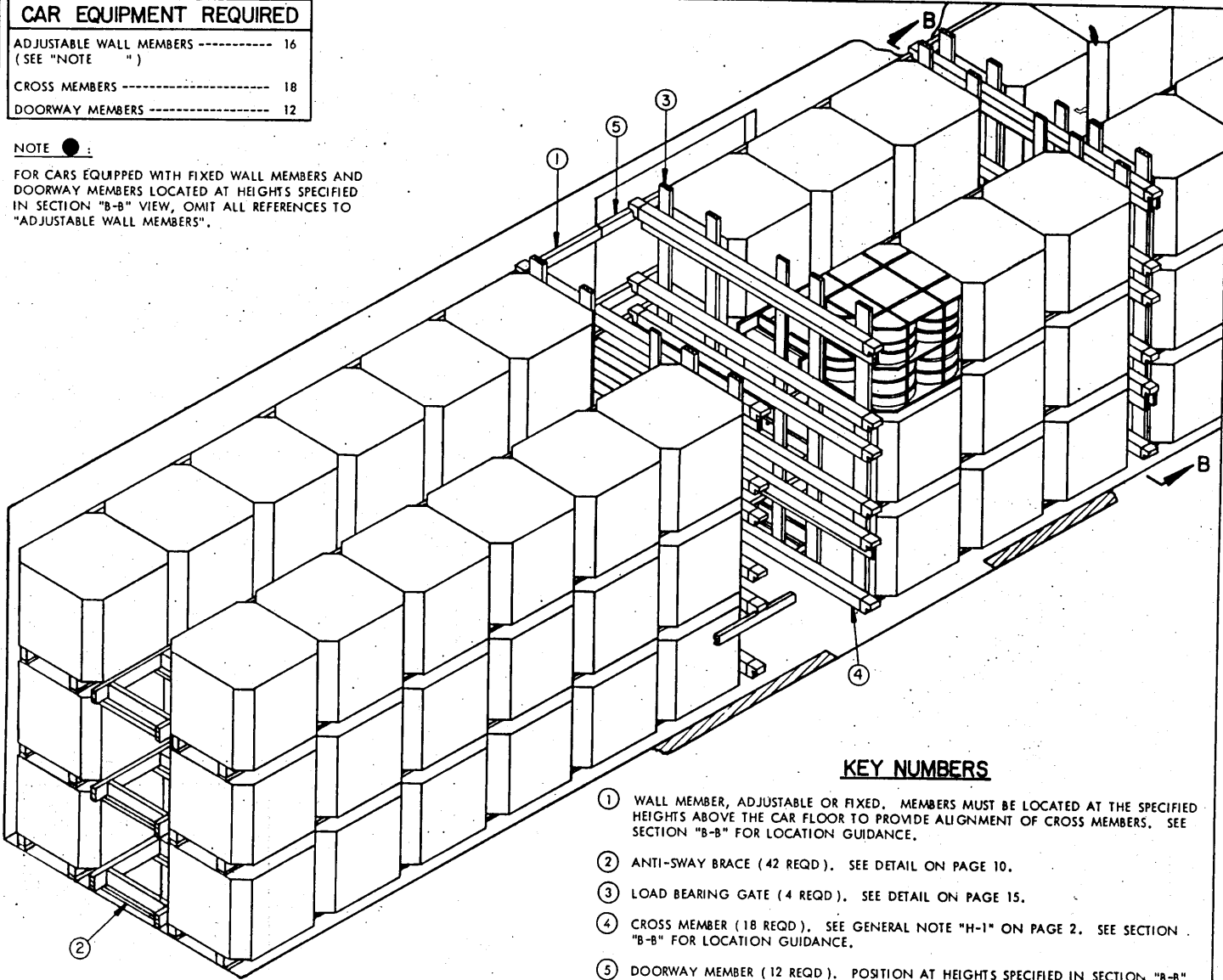
IF DESIRED, ONE PIECE OF 1/2" PLYWOOD MAY BE SUBSTITUTED FOR THE PIECES MARKED (B). THE PLYWOOD MUST BE 40" WIDE BY 38" HIGH. SECURE THE PLYWOOD TO EACH PIECE MARKED (A) W/3-6d NAILS. ALSO, NAIL TO PIECE MARKED (C) W/4-6d NAILS.

CAR EQUIPMENT REQUIRED

ADJUSTABLE WALL MEMBERS -----	16
(SEE "NOTE ")	
CROSS MEMBERS -----	18
DOORWAY MEMBERS -----	12

NOTE ● :

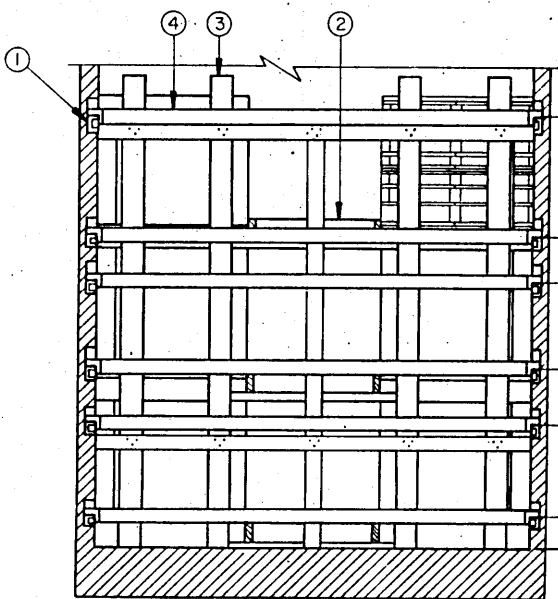
FOR CARS EQUIPPED WITH FIXED WALL MEMBERS AND DOORWAY MEMBERS LOCATED AT HEIGHTS SPECIFIED IN SECTION "B-B" VIEW, OMIT ALL REFERENCES TO "ADJUSTABLE WALL MEMBERS".



KEY NUMBERS

- ① WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE ALIGNMENT OF CROSS MEMBERS. SEE SECTION "B-B" FOR LOCATION GUIDANCE.
- ② ANTI-SWAY BRACE (42 REQD). SEE DETAIL ON PAGE 10.
- ③ LOAD BEARING GATE (4 REQD). SEE DETAIL ON PAGE 15.
- ④ CROSS MEMBER (18 REQD). SEE GENERAL NOTE "H-1" ON PAGE 2. SEE SECTION "B-B" FOR LOCATION GUIDANCE.
- ⑤ DOORWAY MEMBER (12 REQD). POSITION AT HEIGHTS SPECIFIED IN SECTION "B-B". SEE SPECIAL NOTE

ISOMETRIC VIEW



EACH DIMENSIONED HEIGHT ABOVE THE CAR FLOOR TO AN ADJUSTABLE OR FIXED WALL MEMBER MARKED ① AND/OR A DOORWAY MEMBER MARKED ⑤ IS SPECIFIED TO LOCATE THE CENTER LINE OF A CROSS MEMBER.

9'-0"±4"

6'-10"±3"

70"±3"

48"±6"

34"±3"

10" MAX

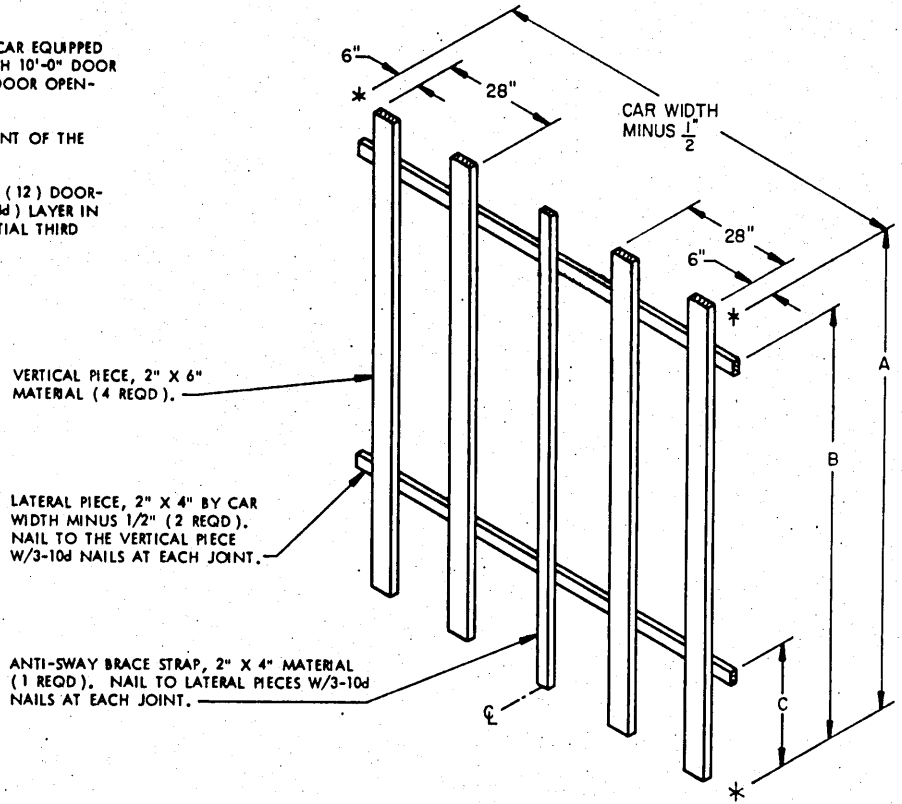
INDICATES CAR FLOOR.

SECTION B-B

84-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOX CAR (MECHANICAL)

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 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.
3. IF THE CAR BEING LOADED IS NOT EQUIPPED WITH TWELVE (12) DOORWAY MEMBERS, AS SOME CARS WILL NOT BE, THE THIRD (3d) LAYER IN THE DOOR AREA WILL BE OMITTED. FOR BLOCKING A PARTIAL THIRD (3d) LAYER SEE PROCEDURES DEPICTED ON PAGE 16.

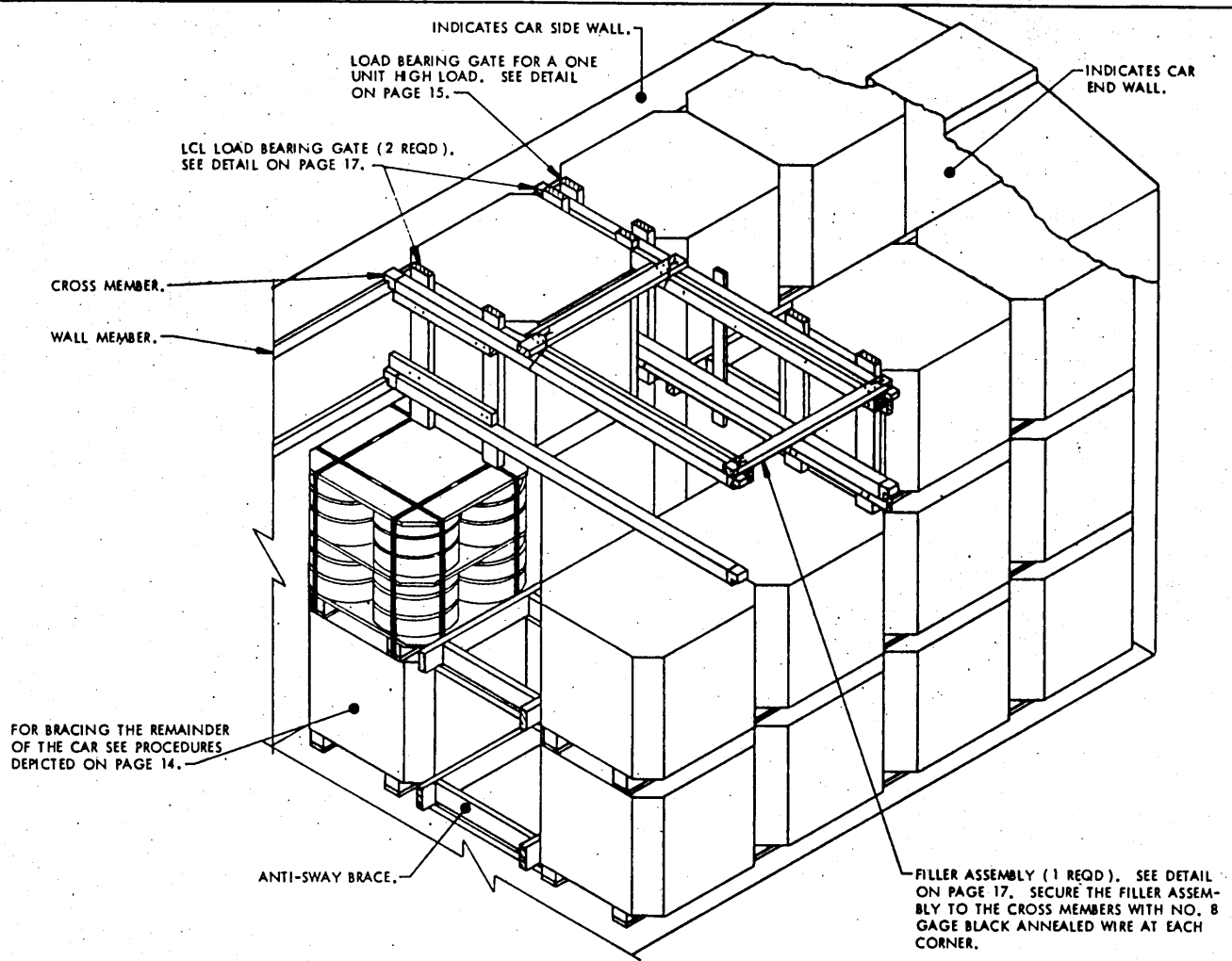


LOAD BEARING GATE

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	398	265
2" X 6"	630	630
NAILS	NO. REQD	POUNDS
10d (3")	120	2
12d (3-1/4")	1008	17

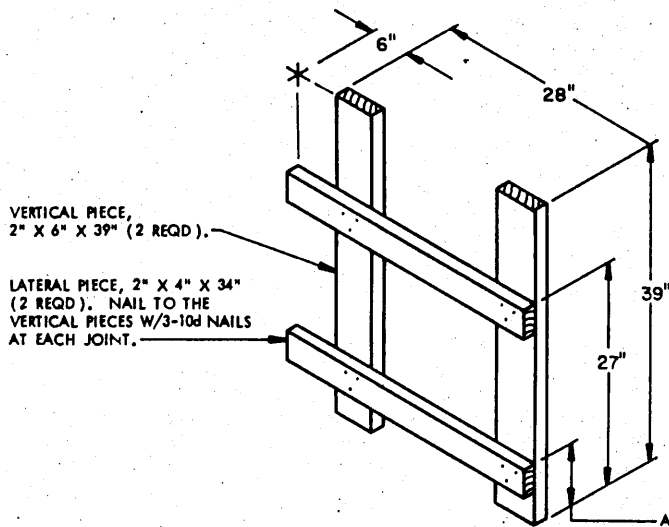
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
UNITS -----	84 -----	44,856 LBS
DUNNAGE -----	-----	2,256 LBS
TOTAL WEIGHT -----		47,112 LBS



ISOMETRIC VIEW

DEPICTING THE METHOD OF SECURING A PARTIAL LAYER AND A LAYER CONTAINING AN ODD NUMBER OF UNITS IN A CAR EQUIPPED WITH MECHANICAL BRACING DEVICES. THIS METHOD CAN ALSO BE USED TO BLOCK A PARTIAL ONE OR TWO LAYER LOAD. WHEN USED TO BLOCK A PARTIAL LAYER CONTAINING AN EVEN NUMBER OF UNITS, DELETE THE LCL LOAD BEARING GATES, THE FILLER ASSEMBLY, AND THE WIRE TIES. THE USE OF THESE PIECES IS SPECIFIED FOR THE DEPICTED LOAD TO SHOW A TYPICAL APPLICATION.

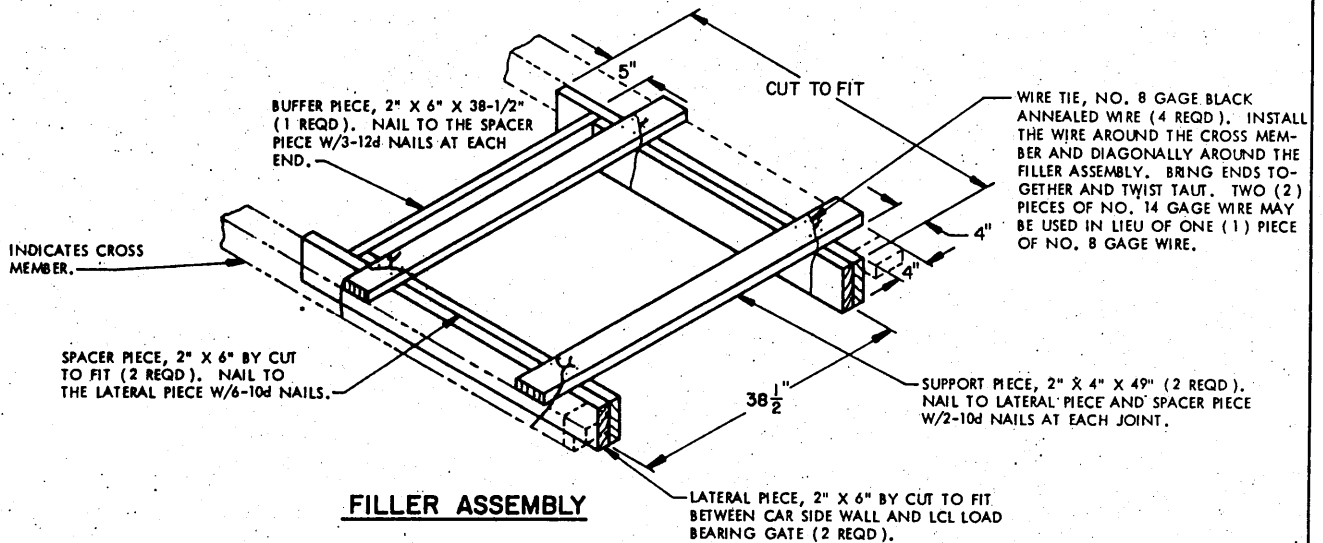


VERTICAL PIECE,
2" X 6" X 39" (2 REQD).

LATERAL PIECE, 2" X 4" X 34"
(2 REQD). NAIL TO THE
VERTICAL PIECES W/3-10d NAILS
AT EACH JOINT.

ADJUST THE HEIGHT LOCATION OF THE LOWER
LATERAL PIECE SO THAT THE BOTTOM OF THE
LATERAL PIECE IS APPROXIMATELY ONE INCH
(1") ABOVE THE LOWER CROSS MEMBER RETAIN-
ING THAT LAYER.

LCL LOAD BEARING GATE



BUFFER PIECE, 2" X 6" X 38-1/2"
(1 REQD). NAIL TO THE SPACER
PIECE W/3-12d NAILS AT EACH
END.

CUT TO FIT

WIRE TIE, NO. 8 GAGE BLACK
ANNEALED WIRE (4 REQD). INSTALL
THE WIRE AROUND THE CROSS MEM-
BER AND DIAGONALLY AROUND THE
FILLER ASSEMBLY. BRING ENDS TO-
GETHER AND TWIST TAUT. TWO (2)
PIECES OF NO. 14 GAGE WIRE MAY
BE USED IN LIEU OF ONE (1)
PIECE OF NO. 8 GAGE WIRE.

INDICATES CROSS
MEMBER.

SPACER PIECE, 2" X 6" BY CUT
TO FIT (2 REQD). NAIL TO
THE LATERAL PIECE W/6-10d NAILS.

SUPPORT PIECE, 2" X 4" X 49" (2 REQD).
NAIL TO LATERAL PIECE AND SPACER PIECE
W/2-10d NAILS AT EACH JOINT.

FILLER ASSEMBLY

LATERAL PIECE, 2" X 6" BY CUT TO FIT
BETWEEN CAR SIDE WALL AND LCL LOAD
BEARING GATE (2 REQD).

