

APPROVED BY
 HAZARDOUS MATERIALS SYSTEMS
 (BOE) ASSOCIATION OF AMERICAN
 RAILROADS
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 DATE 11/13/87

LOADING AND BRACING (CL & LCL) IN BOX CARS OF CBU-87/B AND CBU- 89/B MUNITIONS PACKED IN CNU- 411/E SERIES METAL CONTAINERS

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THIS OUTLOADING PROCEDURE DRAWING INCLUDES PROCEDURES FOR CONVENTIONAL TYPE BOX CARS, BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES OF VARIOUS DESIGN AND MANUFACTURE, AND CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.

DO NOT SCALE

REVISIONS				DRAFTSMAN	dh	PROJ ENG	
				<i>D. J. ...</i>		<i>W. R. ...</i>	<i>W. R. ...</i>
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<i>William A. ...</i>							
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DECEMBER 1987							
CLASS	DIVISION	DRAWING	FILE				
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GENERAL NOTES

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE OUTLOADING PROCEDURES SPECIFIED WITHIN THIS DOCUMENT ARE APPLICABLE TO CBU-87/B AND CBU-89/B MUNITIONS PACKED IN CNU-411/E CONTAINERS. SEE THE CONTAINER DETAIL LOCATED ON PAGE 4.
- C. THE OUTLOADING PROCEDURES DEPICTED WITHIN THIS DOCUMENT ARE APPLICABLE FOR SHIPMENTS IN BOX CARS OF ANY LENGTH, WITH A CAR WIDTH OF 9'-4" OR WIDER AND HAVING A 10'-0" DOOR OPENING. BOX CARS WITH DOORS LESS THAN 10'-0" WIDE CAN BE USED BUT LOADING AND UNLOADING BECOMES PROGRESSIVELY MORE DIFFICULT.
- D. THE SELECTION OF THE RAIL CARS FOR TRANSPORTING CBU-87/B AND CBU-89/B MUNITIONS IS THE RESPONSIBILITY OF THE ORIGINATING CARRIER AND THE SHIPPER. ONLY CARS WHICH HAVE SOUND FLOORS AND ARE IN OTHERWISE PROPER CONDITION IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPLICABLE REGULATORY DOCUMENTS WILL BE SELECTED.
- E. BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS HAVE BEEN SHOWN. HOWEVER, THE DEPICTED OUTLOADING PROCEDURES ARE ALSO APPLICABLE FOR CARS EQUIPPED WITH PLUG DOORS. CAUTION: DUNNAGE MATERIAL MUST NOT BE NAILED TO ANY PLUG DOOR, WHETHER AUXILIARY OR MAIN. 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 THRU THE HOLES IN THE DOOR LATCH ASSEMBLY ONE OR MORE TIMES, AND THE WIRE ENDS WILL BE TWISTED TOGETHER.
- F. THE USE OF AN OFFSET LOADING PATTERN WILL FACILITATE LOADING AND UNLOADING OPERATIONS IN THE DOORWAY AREA OF THE CAR. WHEN POSSIBLE TO DO SO, A FULL LOAD SHOULD BE BUILT USING AN OFFSET LOADING PATTERN. FOR INSTANCE, A LOAD CONSISTING OF AN EVEN NUMBER OF LOAD UNITS AND HAVING TWO MORE LOAD UNITS IN ONE END OF THE CAR THAN IN THE OPPOSITE END, OR A LOAD CONSISTING OF AN ODD NUMBER OF LOAD UNITS AND HAVING ONE MORE LOAD UNIT IN ONE END THAN IN THE OTHER IS CONSIDERED TO BE AN OFFSET LOAD.
- G. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN CARS WHICH ARE PARTIALLY LOADED WITH CBU-87/B OR CBU-89/B MUNITIONS PACKED IN CNU-411/E CONTAINERS 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.
- H. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 2" X 4" MATERIAL IS ACTUALLY 1-1/2" THICK BY 3-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE. SEE GENERAL NOTE "J" BELOW.
- J. NOTICE: A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES. ALSO, A STAGGERED NAILING PATTERN WILL BE USED WHEN DUNNAGE IS NAILED TO THE FLOOR OR SIDEWALL OF THE TRANSPORTING VEHICLE, OR WHEN LAMINATING DUNNAGE. THE NAILING PATTERN WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL DOES NOT PENETRATE INTO OR NEAR A CRACK BETWEEN FLOOR BOARDS OR SIDEWALL BOARDS. ADDITIONALLY, THE NAILING PATTERN FOR AN UPPER PIECE OF LAMINATED DUNNAGE WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL FOR THAT PIECE WILL NOT BE DRIVEN THROUGH ONTO OR RIGHT BESIDE A NAIL IN A LOWER PIECE.
- K. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF ONE (1) SEAL WITH TWO (2) PAIR OF NOTCHES WILL BE USED TO SEAL THE JOINT WHEN A NOTCH-TYPE SEALER IS BEING USED. A MINIMUM OF TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) PAIR OF CRIMPS PER SEAL WILL BE USED TO SEAL THE JOINT WHEN A CRIMP-TYPE SEALER IS BEING USED. REFER TO THE "STRAP JOINT A" AND "STRAP JOINT B" DETAILS ON PAGE 5 FOR GUIDANCE.
- L. THROUGHOUT THIS PROCEDURAL DRAWING, PORTIONS OF THE BLOCKING COMPONENTS OF THE DEPICTED CARS, SUCH AS A CAR SIDE WALL, HAVE BEEN OMITTED FROM THE LOAD VIEW FOR CLARITY PURPOSES.

(CONTINUED AT RIGHT)

MATERIAL SPECIFICATIONS

LUMBER -----: SEE TM 743-200-1, DUNNAGE LUMBER; FED SPEC MM-L-751.

NAILS -----: COMMON, FED SPEC FF-N-105.

STRAPPING, STEEL -: CLASS I, TYPE I OR IV, HEAVY DUTY, FINISH A, B (GRADE 2), OR C, FED SPEC QQ-5-781.

STRAP SEAL -----: TYPE D, STYLE I, II, OR IV, CLASS H, FINISH A, B (GRADE 2), OR C, FED SPEC QQ-5-781.

STRAP STAPLE -----: COMMERCIAL GRADE.

WIRE -----: ANNEALED, BLACK; FED SPEC QQ-W-461.

ANTI-CHAFING MATERIAL -----: NEUTRAL BARRIER MATERIAL; MIL-B-121 (OR EQUAL).

PAGE 2

(GENERAL NOTES CONTINUED)

- M. THE NUMBER OF LADING UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE BOX CAR BEING LOADED OR THE QUANTITY TO BE SHIPPED. HOWEVER, THE APPROVED METHODS SPECIFIED HEREIN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING, AND STAYING OF THE UNITS. NOTICE: A SHIPMENT WILL BE POSITIONED IN THE RAIL CAR IN COMPLIANCE WITH THE WEIGHT DISTRIBUTION REQUIREMENTS OF THE AAR.
- N. IF THE CAR BEING USED FOR A SHIPMENT IS EQUIPPED WITH A NAILABLE FLOOR AND A NAIL SIZE FOR FLOOR NAILING IS MARKED ON THE SIDEWALL OF THE CAR, THAT GUIDANCE SHOULD BE APPLIED TO THE NAILING OF THE "DOORWAY BLOCKING" PIECES IN THE FULL LOADS AND TO THE NAILING TO THE CAR FLOOR OF THE LCL BRACES AND KNEE BRACE ASSEMBLIES IN THE LESS-THAN-FULL LOADS. IF A NAIL SIZE IS NOT SPECIFIED IN THE CAR, 30# NAILS SHOULD BE USED IN LIEU OF THOSE SPECIFIED IN THE APPLICABLE KEY NUMBERS.
- O. THE SPACE BETWEEN THE LOAD UNITS MUST BE KEPT TO A MINIMUM. TO ACHIEVE A TIGHT LOAD, HYDRAULIC JACKS CAN BE USED FOR THIS OPERATION. CAUTION: WHEN USING A JACK TO COMPACT A LOAD, THE JACK MUST BE USED AGAINST STRONG POINTS OF THE CONTAINERS, SUCH AS THE JOINTS BETWEEN THE LAYERS OF CONTAINERS. PADDING, OF 2-INCH (2") THICK LUMBER OR ANY OTHER MATERIAL OF SIMILAR CONSISTENCY, SHOULD BE PLACED BETWEEN THE JACK AND THE LADING.
- P. LOAD-BLOCKING STRUTS WHICH ARE 48" OR LONGER MUST BE STIFFENED BY THE APPLICATION OF HORIZONTAL AND VERTICAL STRUT BRACING AS SHOWN BY THE "STRUT BRACING" DETAIL ON PAGE 5. BRACING IS NOT REQUIRED IF THE STRUTS FOR THE LOAD BEING SHIPPED ARE SHORTER THAN 48". THE LENGTH OF THE LOAD-BLOCKING STRUTS SHOULD BE KEPT AS SHORT AS POSSIBLE (APPROX 18" MINIMUM), BUT IN THE EVENT IT IS NECESSARY TO USE STRUTS WHICH ARE 8'-0" OR MORE IN LENGTH, IT WILL BE NECESSARY TO APPLY AN ADDITIONAL SET OF HORIZONTAL AND VERTICAL STRUT BRACING PIECES. STRUT BRACING SHOULD BE APPLIED SO AS TO PROVIDE NEARLY EQUAL SPACES BETWEEN THE BRACING PIECES AND THE CENTER GATES AND BETWEEN ADJACENT STRUT BRACING PIECES. NOTE THAT HORIZONTAL STRUT BRACING PIECES FOR THE UPPER LEVEL OF STRUTS FOR ALL BUT THE UPPERMOST TIER OF A LOAD MAY BE DIFFICULT TO APPLY TO THE TOP SURFACE OF THE STRUTS AS DEPICTED. STRUT BRACING WILL BE EQUALLY EFFECTIVE IF APPLIED TO THE UNDER SIDE OF THOSE STRUTS.
- Q. TO ACHIEVE A TIGHTLY BLOCKED LOAD, A STRUT WILL BE CUT SLIGHTLY LONGER THAN THE MEASURED DISTANCE BETWEEN THE STRUT BEARING AREAS ON THE TWO CENTER GATES. ONE END OF THE STRUT WILL BE POSITIONED AT ITS BEARING AREA JUST ABOVE THE STRUT LEDGER ON ONE GATE. THE OTHER END, WHICH CAN BE BEVELED ON THE LOWER CORNER IF DESIRED, WILL THEN BE DRIVEN DOWNWARD UNTIL IT CONTACTS THE STRUT LEDGER ON THE OTHER GATE. EACH END OF THE STRUT WILL BE TOENAILED TO THE ADJACENT CENTER GATE, AS SPECIFIED WITHIN THE KEY NUMBERS FOR A LOAD, IN SUCH A MANNER SO THAT AS NEARLY AS PRACTICAL EQUAL LENGTHS OF A NAIL ARE EMBEDDED IN THE STRUT AND IN THE VERTICAL PIECE OF THE CENTER GATE. SEE THE "BEVEL CUT" DETAIL ON PAGE 5 FOR BEVELING INSTRUCTIONS AND THE "STRUT INSTALLATION" DETAIL ON THAT PAGE FOR A PICTORIAL VIEW SHOWING THE PROPER POSITIONING OF A BEVELED STRUT FOR INSTALLATION. NOTE THAT THE UPPER CORNER NEEDS TO BE BEVELED ONLY IF THE STRUTS ARE VERY SHORT. IF ONLY ONE END IS BEVEL-CUT, THE BEVELED EDGE WILL BE PLACED IN THE DOWNWARD POSITION SO THAT IT WILL ALLOW THE STRUT END TO SLIDE MORE FREELY DOWN THE FACE OF THE VERTICAL PIECE ON THE ADJACENT CENTER GATE AS THE STRUT IS DRIVEN DOWN INTO ITS FINAL BLOCKING POSITION.
- R. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.
- S. CONVERSION TO METRIC EQUIVALENTS:
DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES, AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS 0.454KG.
- T. POWER DRIVEN STAPLES MAY BE USED AS ALTERNATIVE FASTENERS FOR NAILS WHEN CONSTRUCTING DUNNAGE ASSEMBLIES WHICH ARE TO BE USED IN THE DELINEATED BOX CAR LOADS SHOWN THROUGHOUT THIS DRAWING. THE STAPLES TO BE USED MUST BE EQUAL IN LENGTH TO THE SPECIFIED NAIL SIZE AND MUST BE SUBSTITUTED ON A ONE STAPLE FOR ONE NAIL BASIS. STAPLES WHICH ARE 2-1/2" OR LESS IN LENGTH SHOULD BE IN ACCORDANCE WITH FEDERAL SPECIFICATION FF-N-105 AS NEARLY AS PRACTICABLE. STAPLES WHICH ARE LONGER THAN 2-1/2" WILL BE A COMMERCIAL GRADE, OF A QUALITY EQUIVALENT TO THOSE MANUFACTURED BY SENCO PRODUCTS INCORPORATED. NOTE: STAPLES WILL NOT BE SUBSTITUTED FOR NAILS IN ANY LOAD RESTRAINING FLOOR DUNNAGE APPLICATION.
- U. END WALL GATES ARE NOT REQUIRED FOR BOX CARS HAVING WOOD LINED END WALLS WHICH ARE BOWED TWO INCHES (2") OR LESS FROM SIDE TO SIDE OR FROM FLOOR TO ROOF. END WALL GATES ARE REQUIRED FOR ALL BOX CARS HAVING METAL LINED END WALLS. NOTE: FILL PIECES MUST ALSO BE INSTALLED ON ALL END WALL GATES WHEN THE END WALLS ARE BOWED OUTWARD TWO INCHES (2") OR MORE EITHER FROM SIDE TO SIDE OR FROM FLOOR TO ROOF, TO PROVIDE FOR A UNIFORM LOAD BEARING SURFACE. NAIL 1" X 6" AND/OR 2" X 6" FILL PIECES TO THE END WALL GATE HORIZONTAL PIECE AS REQUIRED AND NAIL W/1-APPROPRIATELY SIZED NAIL EVERY SIX INCHES (6").

GENERAL NOTES

(FOR BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES)

- V. THE OUTLOADING PROCEDURES FOR BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES 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. **CAUTION:** BOX CARS EQUIPPED WITH MEMBERS WHICH DO NOT MEET THE LOCATION REQUIREMENTS MUST NOT BE USED.
1. FOR BLOCKING THE LOADS WHICH ARE DEPICTED, A CROSS MEMBER WILL NOT BE RELIED UPON TO RETAIN MORE THAN 4,000 POUNDS OF LADING. 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 PERMIT. 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.
- W. IN A CAR EQUIPPED WITH ADJUSTABLE WALL MEMBERS, PROVIDING THE FIXED WALL MEMBERS WHICH ARE PRESENT IN SOME "ADJUSTABLE" CARS ARE NOT PROPERLY POSITIONED TO PROVIDE SIDE BEARING SURFACES BETWEEN THE UNITS AND THE CAR SIDEWALLS, ADJUSTABLE WALL MEMBERS (AS REQUIRED) MUST BE INSTALLED TO PROVIDE A MINIMUM OF ONE SURFACE AREA FOR SIDE BEARING AT SOME LOCATION WITHIN THE UPPER HALF OF EACH UNIT.
- X. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

GENERAL NOTES

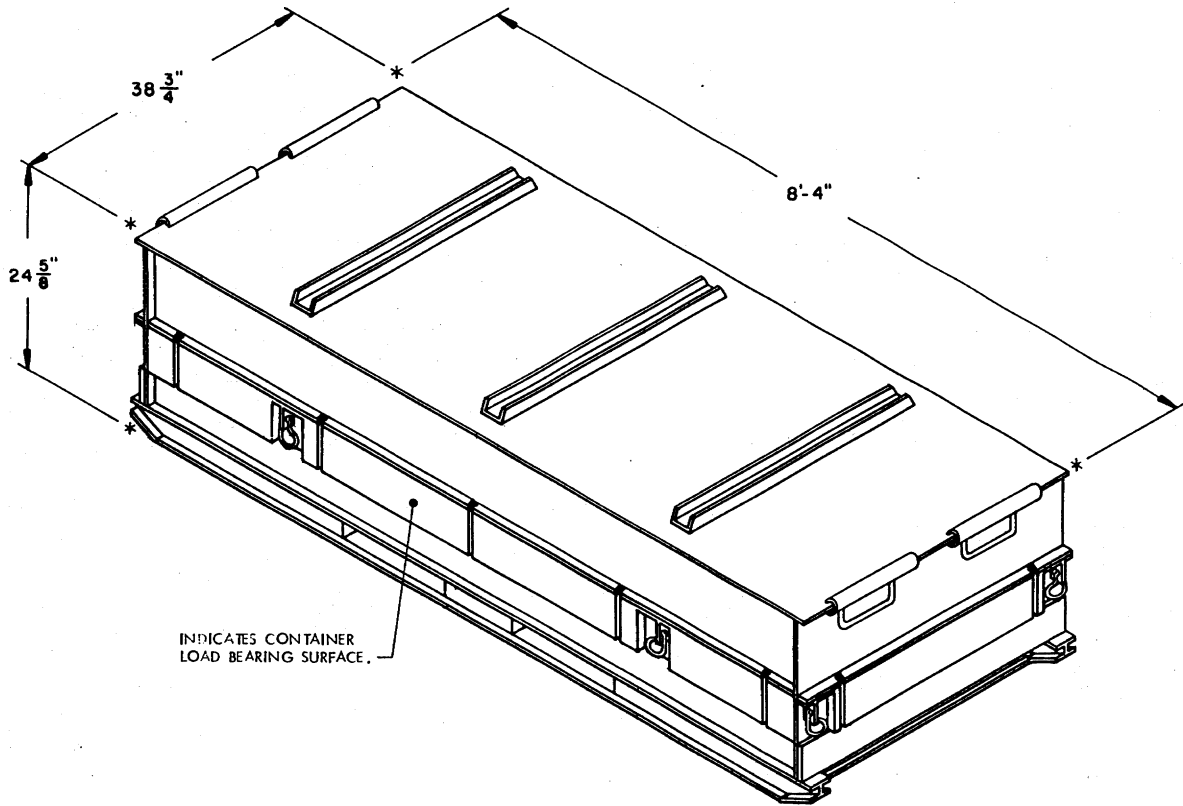
(FOR CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS)

- AA. **CAUTION:** FOR CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS, ONLY CARS EQUIPPED WITH LOAD DIVIDERS MANUFACTURED BY EVANS, EQUIPCO, OR PRECO MAY BE USED. LOAD DIVIDERS MANUFACTURED BY TRANSOCO ARE NOT ACCEPTABLE, WHETHER OF ALUMINIUM OR STEEL CONSTRUCTION. THE DEPICTED PROCEDURES ARE APPLICABLE FOR CARS OF VARIOUS LENGTHS AND WIDTHS. THE AAR MECHANICAL DESIGNATION CLASS FOR THESE CARS, AS IDENTIFIED IN "THE OFFICIAL RAILWAY EQUIPMENT REGISTER," WILL BE RBL, XL, OR XLJ.
- BB. THE USE OF LOAD DIVIDER EQUIPPED CARS WILL ELIMINATE THE NEED FOR CENTER GATES AND STRUTS, AND GATE HOLD DOWNS (WHEN APPLICABLE) WHICH ARE REQUIRED IN CONVENTIONAL BOX CAR LOADS. THIS WILL ACCOUNT FOR A CONSIDERABLE SAVING IN MATERIAL AND LABOR COSTS. THEREFORE, EVERY EFFORT SHOULD BE MADE TO ACQUIRE CUSHIONED CARS EQUIPPED WITH LOAD DIVIDERS FOR SHIPMENT OF CNU-411/E CONTAINERS. **NOTICE:** ONLY CUSHIONED CARS THAT HAVE SLIDING CENTER SILL TYPE CUSHIONING DEVICES OR END-OF-CAR TYPE DEVICES WHICH HAVE AT LEAST FIFTEEN INCHES (15") OF TRAVEL ARE ACCEPTABLE.
- CC. IF NAILING TO A CAR SIDEWALL IS NOT REQUIRED, BOX CARS EQUIPPED WITH ADJUSTABLE SIDE FILLERS THAT HAVE 3/8" OR THICKER PANELS MAY BE USED. HOWEVER, THESE SIDE FILLERS MUST NOT BE USED FOR LATERAL BLOCKING, THEY MUST BE RETRACTED AND LOCKED AGAINST THE CAR SIDEWALL.
- DD. **NOTICE:** AFTER THE LOAD DIVIDER BULKHEADS ARE POSITIONED AGAINST THE LADING, AND THE LOCKING PINS ARE ENGAGED IN THE HOLES OF THE RAILS, THE LOWER LOCKING PINS MUST BE INSPECTED TO ENSURE THAT THE PINS ARE FULLY ENGAGED IN THE LOCKING HOLES. IF THE PINS ARE NOT FULLY SEATED IN THE LOCKING HOLES, THE LINKAGE MECHANISM WILL BE ADJUSTED AS REQUIRED SO THAT THE PINS WILL BE FULLY SEATED INTO THE LOCKING HOLES OF THE LOWER RAILS. IF PRESENT, DEBRIS MUST BE REMOVED FROM BENEATH THE LOCKING HOLES WHICH HAVE BEEN SELECTED FOR SECURING A LOAD DIVIDER BULKHEAD.
- EE. A "STRUT ASSEMBLY" MUST BE INSTALLED BETWEEN THE LOAD DIVIDER BULKHEADS IF THE CAR CONTAINS CLASS A OR CLASS B EXPLOSIVES AND THE LOAD IN EITHER END OF THE CAR WEIGHS 50,000 POUNDS OR MORE. A STRUT ASSEMBLY IS NOT REQUIRED

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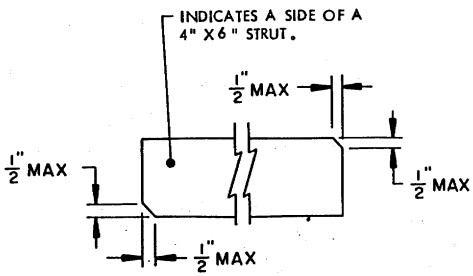
(GENERAL NOTES CONTINUED)

- FOR LOADS OF CLASS C EXPLOSIVES REGARDLESS OF THE WEIGHT OF THE LOAD, NOTE THAT THE STRUT ASSEMBLY MAY BE OMITTED FROM LOADS OF CLASS A OR B EXPLOSIVES WEIGHING 50,000 POUNDS WHEN THE LADING AND ADEQUATE BLOCKING AND BRACING ARE POSITIONED TO COMPLETELY FILL THE SPACE BETWEEN THE INSTALLED BULKHEADS AS SPECIFIED IN GENERAL NOTE "FF-3" BFLOW. DETAILS OF STRUT ASSEMBLIES FOR USE BETWEEN 1 PIECE BULKHEADS ARE SHOWN ON PAGE 24.
- FF. THE NORMAL LOADING PATTERN IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS IS TO POSITION THE LADING BETWEEN A CAR END WALL AND A LOAD DIVIDER BULKHEAD IN FULL LAYERS. OBVIOUSLY, A LOAD QUANTITY MUST THEN BE A MULTIPLE OF THE NUMBER OF CONTAINERS WHICH ARE IN ONE LOAD UNIT. A LOAD UNIT IS DEFINED AS A STACK OF CONTAINERS WHICH IS FULL LOAD HEIGHT BY ONE UNIT IN LENGTH. IF THE QUANTITY TO BE SHIPPED CANNOT BE ATTAINED BY ADJUSTING THE NUMBER OF TIERS IN ONE OR BOTH ENDS OF A CAR, ONE OF THE FOLLOWING PROCEDURES MUST BE USED IN ORDER TO OBTAIN THE DESIRED QUANTITY.
1. THE "GATES AND STRUTS" METHOD OF OMITTING A CONTAINER MAY BE USED TO ADJUST A LOAD QUANTITY DOWNWARD BY OTHER THAN A MULTIPLE OF A LOAD UNIT. SEE THE PROCEDURES ON PAGES 12 AND 13 FOR GUIDANCE.
 2. AT LOCATION (5) WHERE K-BRACES MIGHT NORMALLY BE USED IN A LOAD IN A CONVENTIONAL CAR, LOAD DIVIDER BULKHEADS CAN BE POSITIONED. LOADING CAN THEN CONTINUE TOWARD THE CENTER OF THE CAR FROM EACH INSTALLED LOAD DIVIDER BULKHEAD, IN EVEN LAYERS WHICH ARE ONE OR MORE LESS IN HEIGHT THAN THE LOAD IN THE ENDS OF THE CAR. INSTALL CENTER GATES, STRUTS AND GATE HOLD DOWNS AS SHOWN IN THE APPLICABLE CONVENTIONAL BOX CAR DRAWING HEREIN, TO PROVIDE FOR A TIGHT LOAD BETWEEN THE BULKHEADS.
 3. ONE OR MORE UNITS CAN BE POSITIONED IN CONTACT WITH A LOAD DIVIDER BULKHEAD ON THE CENTER-OF-CAR SIDE. BLOCK AND BRACE WITH LCL BRACES AS SHOWN ON PAGE 20, OR WITH KNEE BRACE ASSEMBLIES, AS SHOWN ON PAGE 18 AND 19.
- GG. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.



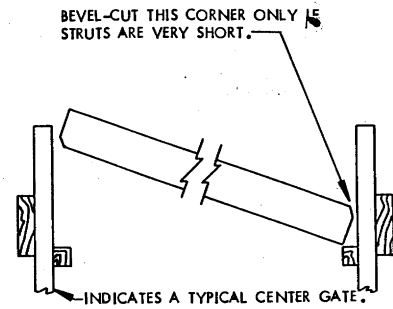
CNU-411/E CONTAINER DETAIL

CUBE ----- 55,3 CUBIC FEET (APPROX)
 GROSS WEIGHT (CBU-87/B) ----- 2,370 LBS (APPROX)
 GROSS WEIGHT (CBU-89/B) ----- 1,930 LBS (APPROX)



BEVEL-CUT

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



STRUT INSTALLATION

SEE GENERAL NOTE "Q" ON PAGE 2 FOR ADDITIONAL STRUT INSTALLATION GUIDANCE.



ONE SEAL WITH TWO PAIR OF NOTCHES.

STRAP JOINT A

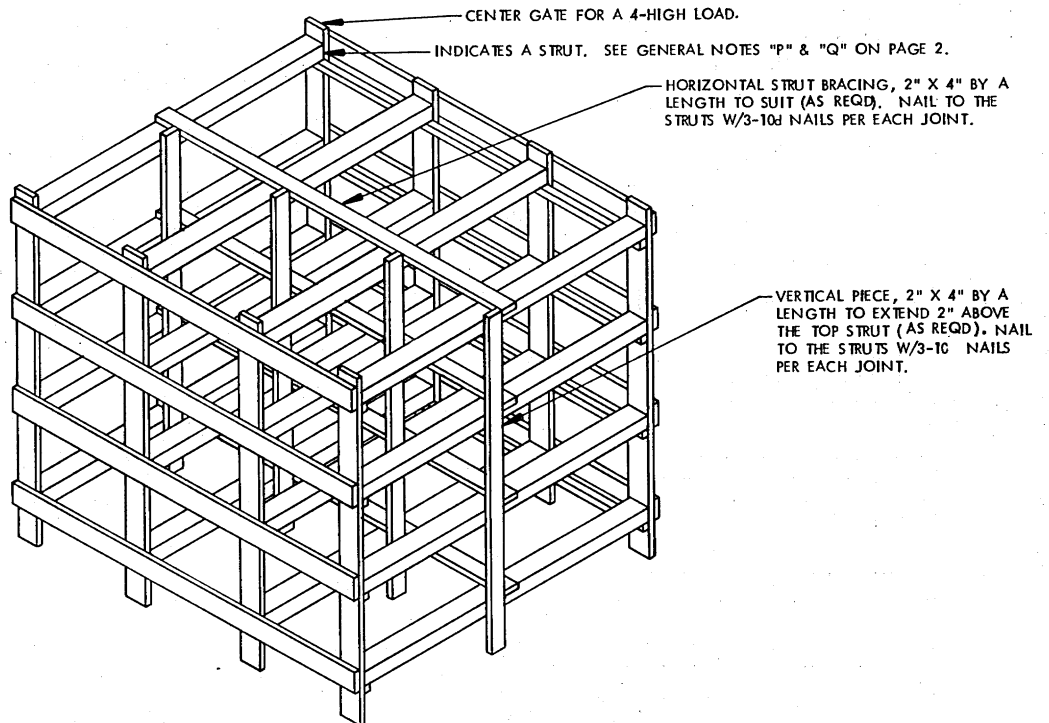
METHOD OF SECURING A STRAP JOINT WHEN USING A NOTCH-TYPE SEALER.



TWO SEALS, BUTTED TOGETHER, WITH TWO PAIR OF CRIMPS EACH SEAL.

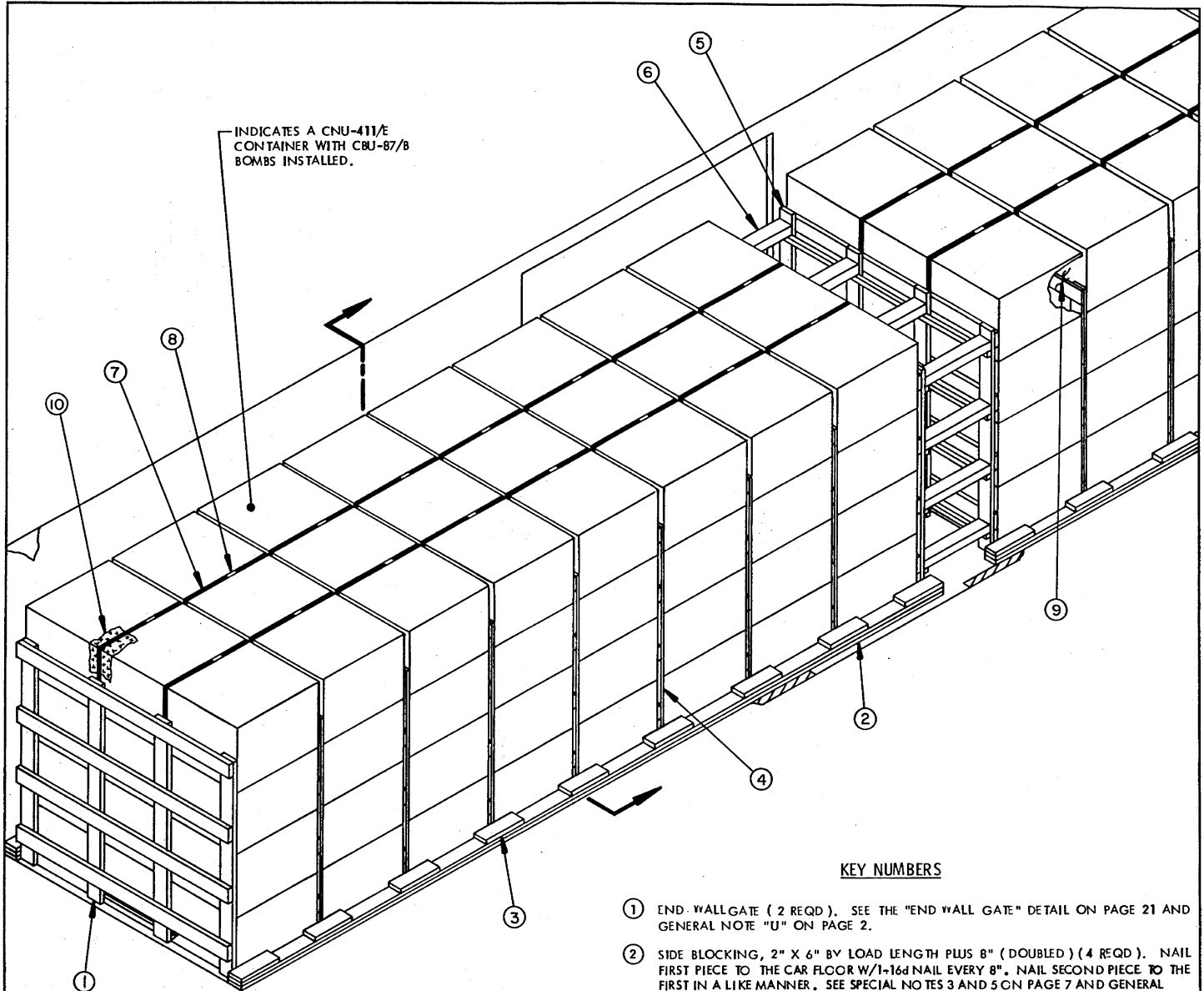
STRAP JOINT B

METHOD OF SECURING A STRAP JOINT WHEN USING A CRIMP-TYPE SEALER.



TYPICAL STRUT BRACING

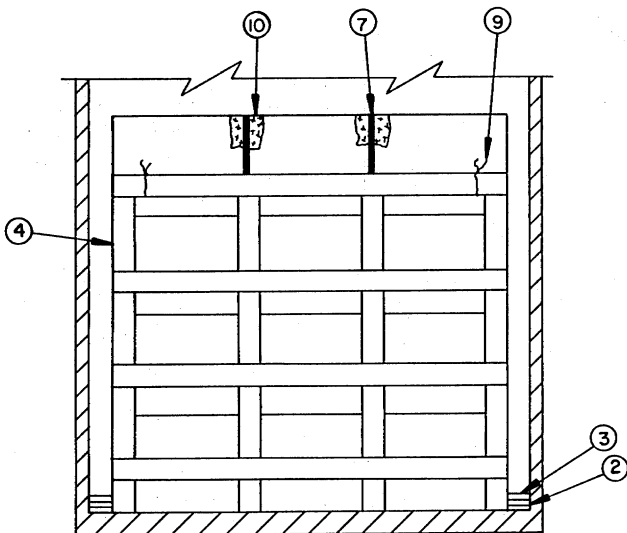
DETAILS



ISOMETRIC VIEW

KEY NUMBERS

- ① END WALL GATE (2 REQD). SEE THE "END WALL GATE" DETAIL ON PAGE 21 AND GENERAL NOTE "U" ON PAGE 2.
- ② SIDE BLOCKING, 2" X 6" BY LOAD LENGTH PLUS 8" (DOUBLED) (4 REQD). NAIL FIRST PIECE TO THE CAR FLOOR W/1-16d NAIL EVERY 8". NAIL SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTES 3 AND 5 ON PAGE 7 AND GENERAL NOTE "J" ON PAGE 2.
- ③ FILL PIECE, 2" X 6" X 18" (32 REQD). POSITION AS SHOWN AND NAIL TO SIDE BLOCKING, PIECE MARKED ②, W/5-16d NAILS EACH.
- ④ SEPARATOR GATE (12 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 21.
- ⑤ CENTER GATE, (2 REQD). SEE THE DETAIL ON PAGE 22.
- ⑥ STRUT, 4" X 6" BY A LENGTH TO SUIT (REF: 30") (16 REQD). TOENAIL TO PIECES MARKED ⑤ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "H", "P" AND "Q" ON PAGE 2 AND SPECIAL NOTE 4 ON PAGE 7.
- ⑦ UNITIZING STRAP, 1-1/4" X .035 OR .031 BY A LENGTH TO SUIT (REF: 24'-0") (28 REQD). SEE SPECIAL NOTE 7 ON PAGE 7.
- ⑧ SEAL FOR 1-1/4" STRAPPING (28 REQD, 1 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES. SEE GENERAL NOTE "L" ON PAGE 2.
- ⑨ TIE WIRE, 14 GAGE BY A LENGTH TO SUIT (REF: 24") (24 REQD). FASTEN THE SEPARATOR GATE, PIECE MARKED ③, IN TWO PLACES AS PER "TIE WIRE APPLICATION C" DETAIL ON PAGE 23.
- ⑩ ANTI-CHAFING MATERIAL, (AS REQD). POSITION UNDER ALL STRAPS AT POINTS OF CONTACT WITH THE CONTAINERS.



SECTION A-A

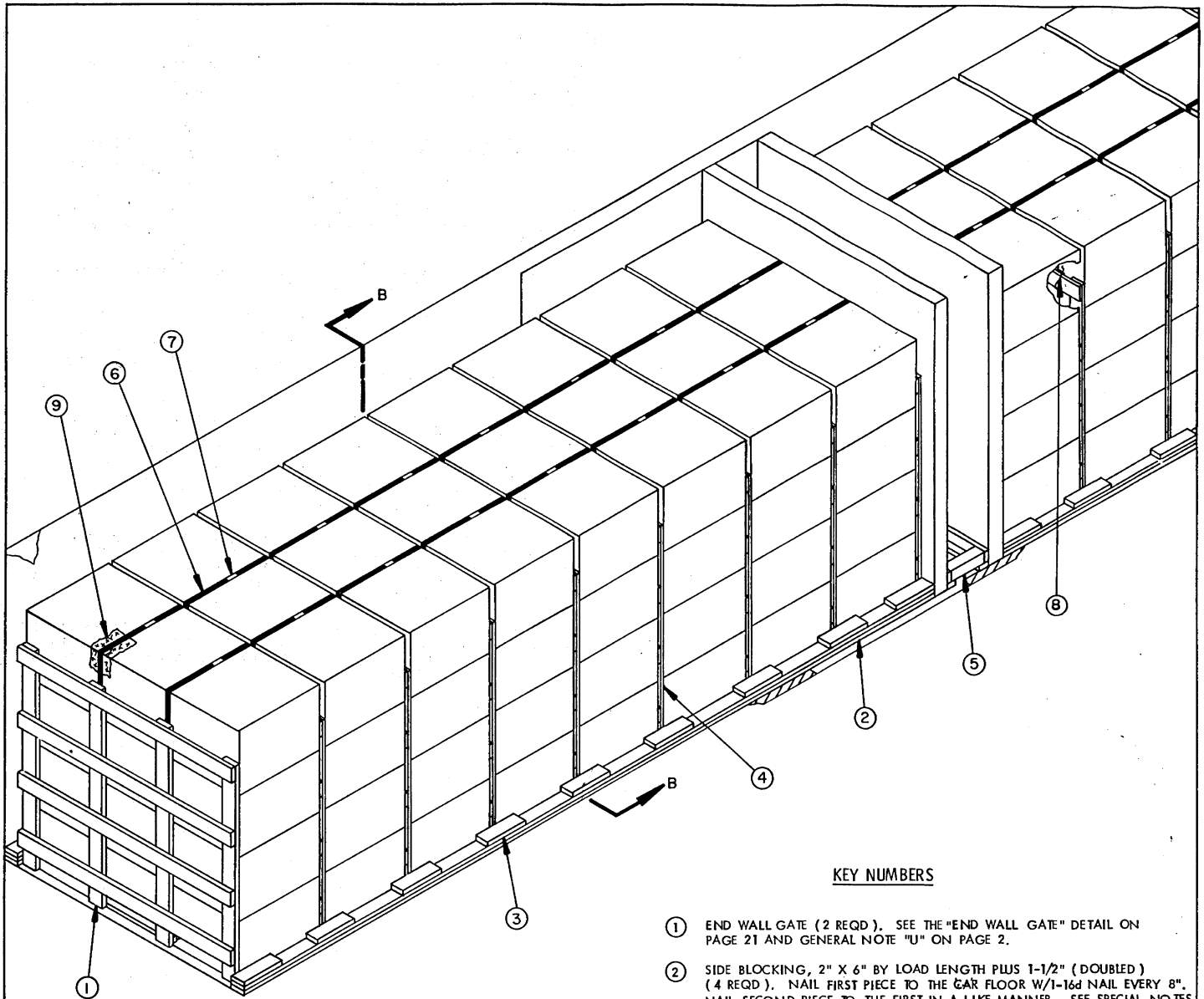
SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-4" WIDE WOOD LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH A 10'-0" WIDE DOOR OPENING IS SHOWN. WIDER CARS OF OTHER LENGTHS AND CARS HAVING OTHER DOOR WIDTHS CAN BE USED. SEE GENERAL NOTE "C" ON PAGE 2.
2. A MAXIMUM OF FORTY-FOUR (44) OF THE CNU-411/E CONTAINERS FOR AN APPROXIMATE LOADING WEIGHT OF 104,280 POUNDS WITH CBU-87/B BOMBS INSTALLED OR 84,920 POUNDS WITH CBU-89/B BOMBS INSTALLED CAN BE SHIPPED IN A 40'-6" LONG BOX CAR USING THE DEPICTED PROCEDURES. IF A 60'-8" LONG BOX CAR IS AVAILABLE, SIXTY-EIGHT (68) CONTAINERS FOR AN APPROXIMATE LADING OF 161,160 POUNDS WITH CBU-87/B BOMBS INSTALLED OR 131,240 POUNDS WITH CBU-89/B BOMBS INSTALLED CAN BE SHIPPED, LOAD LIMIT OF THE CAR PERMITTING.
3. SIDE BLOCKING, PIECE MARKED ② MUST EXTEND AT LEAST EIGHT INCHES (8") PAST THE CONTAINER SKIDS IN THE DOORWAY AREA OF THE CAR.
4. TRIPLED 2" X 6" STRUTS MAY BE USED IN LIEU OF THE 4" X 6" STRUTS SHOWN IN THE LOAD ON PAGE 6 FOR THE SHIPMENT OF CBU-87/B BOMBS. IF CBU-89/B BOMBS ARE BEING SHIPPED DOUBLED 2" X 6" STRUTS MAY BE USED IN LIEU OF THE 4" X 6" STRUTS SHOWN ON PAGE 6. LAMINATE EACH 2" X 6" MEMBER TO THE OTHER W/1-10d NAIL EVERY SIX INCHES (6"). SEE GENERAL NOTE "J" ON PAGE 2.
5. PREPOSITION THE SIDE BLOCKING PIECE MARKED ② LONGITUDINALLY DOWN BOTH SIDES OF THE CAR 8'-4-1/2" APART AND FASTEN TO THE FLOOR PRIOR TO LOADING. THE DISTANCE BETWEEN THE SIDE BLOCKING MAY BE INCREASED OR DECREASED AS REQUIRED TO ALLOW NO MORE THAN ONE HALF INCH (1/2") OF LATERAL VOID BETWEEN THE CONTAINER SKIDS AND SIDE BLOCKING. ALSO PREPOSITION THE FILL PIECES, PIECE MARKED ③, SO AS TO AS TO BE CENTERED ON THE TWO LONGITUDINALLY ADJACENT CONTAINER SKIDS.
6. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY BEING SHIPPED BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. AN ENTIRE TOP TIER CAN ALSO BE OMITTED. FOR OTHER METHODS OF REDUCING THE LOAD REFER TO TYPICAL LCL PROCEDURES ON PAGES 12 THROUGH 20 FOR GUIDANCE.
7. THE STACK UNITIZING STRAPS, PIECES MARKED ⑦, WILL BE THREADED THROUGH THE FORKLIFT POCKETS OF THE BOTTOM CONTAINER AND INSTALLED TO ENCIRCLE THE REST OF THE CONTAINER STACK. **NOTE:** THE STRAPS ARE TO BE POSITIONED AS FAR APART AS THE FORKLIFT POCKETS PERMIT.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 3"	8	2
1" X 6"	750	375
2" X 2"	67	23
2" X 3"	7	4
2" X 6"	495	495
4" X 6"	44	28
NAILS	NO. REQD	POUNDS
6d (2")	576	3-1/2
10d (3")	292	4-1/2
16d (3-1/2")	516	11-1/4
STEEL STRAPPING, 1-1/4" X .035" OR .031" -- 676' REQD -- 96-1/2 LBS		
SEAL FOR 1-1/4" STRAPPING ----- 28 REQD -- 1-1/4 LBS		
WIRE, NO. 14 GAGE ----- 48' REQD -- 3/4 LB		
ANTI-CHAFING MATERIAL ----- AS REQD ----- NIL		

LOAD AS SHOWN

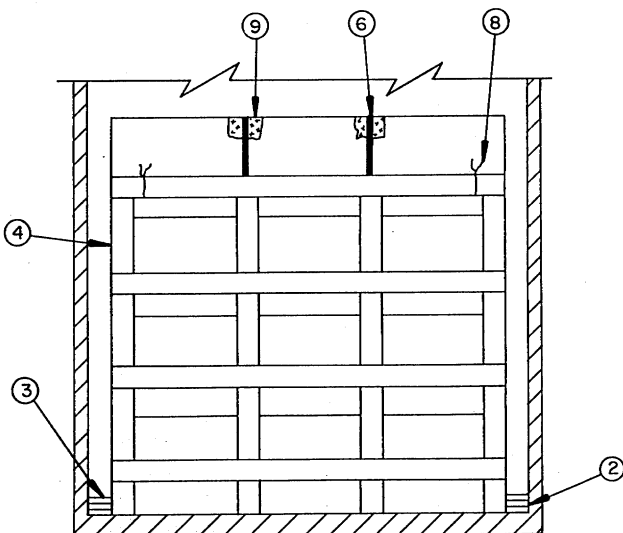
ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER -----	56 -----	132,720 LBS
DUNNAGE -----	-----	1,972 LBS
TOTAL WEIGHT -----		134,692 LBS



ISOMETRIC VIEW

KEY NUMBERS

- ① END WALL GATE (2 REQD). SEE THE "END WALL GATE" DETAIL ON PAGE 21 AND GENERAL NOTE "U" ON PAGE 2.
- ② SIDE BLOCKING, 2" X 6" BY LOAD LENGTH PLUS 1-1/2" (DOUBLED) (4 REQD). NAIL FIRST PIECE TO THE CAR FLOOR W/1-16d NAIL EVERY 8". NAIL SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTES 3 AND 5 ON PAGE 9 AND GENERAL NOTE "J" ON PAGE 2.
- ③ FILL PIECE, 2" X 6" X 18" (32 REQD). POSITION AS SHOWN AND NAIL TO SIDE BLOCKING, PIECE MARKED ②, W/5-16d NAILS EACH.
- ④ SEPARATOR GATE (14 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 21.
- ⑤ STRUT ASSEMBLY (1 REQD). SEE THE "STRUT ASSEMBLY" DETAIL ON PAGE 24 AND GENERAL NOTE "E-E" ON PAGE 3.
- ⑥ UNITIZING STRAP, 1-1/4" X .035" OR .031" BY A LENGTH TO SUIT (REF: 24'-0") (28 REQD). SEE SPECIAL NOTE 5 ON PAGE 9.
- ⑦ SEAL FOR 1-1/4" STRAPPING (28 REQD; 1 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES. SEE GENERAL NOTE "L" ON PAGE 2.
- ⑧ TIE WIRE, NO. 14 GAGE BY A LENGTH TO SUIT (REF: 24") (24 REQD). FASTEN THE SEPARATOR GATE, PIECE MARKED ④, IN TWO PLACES AS PER "TIE WIRE APPLICATION C" DETAIL ON PAGE 23.
- ⑨ ANTI-CHAFING MATERIAL (AS REQD). POSITION UNDER ALL STRAPS AT POINTS OF CONTACT WITH THE CONTAINERS.



SECTION B-B 56-CONTAINER LOAD IN A 50'-6" LONG BY 9'-4" WIDE BOXCAR
EQUIPPED WITH LOAD DIVIDER BULKHEADS

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-4" WIDE WOOD-LINED CUSHIONED BOX CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING NARROWER OR WIDER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "C" AND "AA" THRU "GG" ON PAGES 2 AND 3.
2. A MAXIMUM OF FORTY-FOUR (44) OF THE CNU-4/1/E CONTAINERS FOR AN APPROXIMATE LADING WEIGHT OF 104,280 POUNDS WITH CBU-87/B BOMBS INSTALLED OR 84,920 POUNDS WITH CBU-89/B BOMBS INSTALLED CAN BE SHIPPED IN A 40'-6" LONG BOX CAR USING THE DEPICTED PROCEDURES. IF A 60'-8" LONG BOX CAR IS AVAILABLE, SIXTY-EIGHT (68) CONTAINERS FOR AN APPROXIMATE LADING OF 161,160 POUNDS WITH CBU-87/B BOMBS INSTALLED OR 131,240 POUNDS WITH CBU-89/B BOMBS INSTALLED CAN BE SHIPPED, LOAD LIMIT OF THE CAR PERMITTING.
3. PREPOSITION THE SIDE BLOCKING PIECE MARKED (2) LONGITUDINALLY DOWN BOTH SIDES OF THE CAR 8'-4-1/2" APART AND FASTEN TO THE FLOOR PRIOR TO LOADING. THE DISTANCE BETWEEN THE SIDE BLOCKING MAY BE INCREASED OR DECREASED AS REQUIRED TO ALLOW NO MORE THAN ONE HALF INCH (1/2") OF LATERAL VOID BETWEEN THE CONTAINER SKIDS AND SIDE BLOCKING. ALSO PREPOSITION THE FILL PIECES, PIECE MARKED (3), SO AS TO BE CENTERED ON THE TWO LONGITUDINALLY ADJACENT CONTAINER SKIDS.
4. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. THE LOAD AS SHOWN CAN BE REDUCED BY MULTIPLES OF FOUR (4) BY OMITTING ONE OR MORE LOAD UNITS, FROM THE CENTER PORTION OF THE LOAD. THE LOAD MAY ALSO BE REDUCED BY OMITTING THE ENTIRE TOP LAYER. FOR OTHER METHODS OF REDUCING LOADS AND FOR TYPICAL LCL PROCEDURE REFER TO PAGES 12 THRU 20.
5. THE STACK UNITIZING STRAPS, PIECES MARKED (7), WILL BE THREADED THROUGH THE FORKLIFT POCKETS OF THE BOTTOM CONTAINER AND INSTALLED TO ENCIRCLE THE REST OF THE CONTAINER STACK. **NOTE:** THE STRAPS ARE TO BE POSITIONED AS FAR APART AS THE FORKLIFT POCKETS PERMIT.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 3"	8	2
1" X 6"	875	438
1" X 8"	13	9
2" X 3"	7	4
2" X 4"	38	26
2" X 6"	366	366
4" X 4"	7	10
NAILS	NO. REQD	POUNDS
6d (2")	686	4-1/4
10d (3")	152	2-1/2
12d (3-1/4")	16	1/2
16d (3-1/2")	378	8-1/4
STEEL STRAPPING, 1-1/4" X .035" X .031" ---	672' REQD	96 LBS
SEAL FOR 1-1/4" STRAPPING	28 REQD	1-1/4 LBS
WIRE, NO. 14 GAGE	48' REQD	3/4 LB
ANTI-CHAFING MATERIAL	AS REQD	NIL

LOAD AS SHOWN

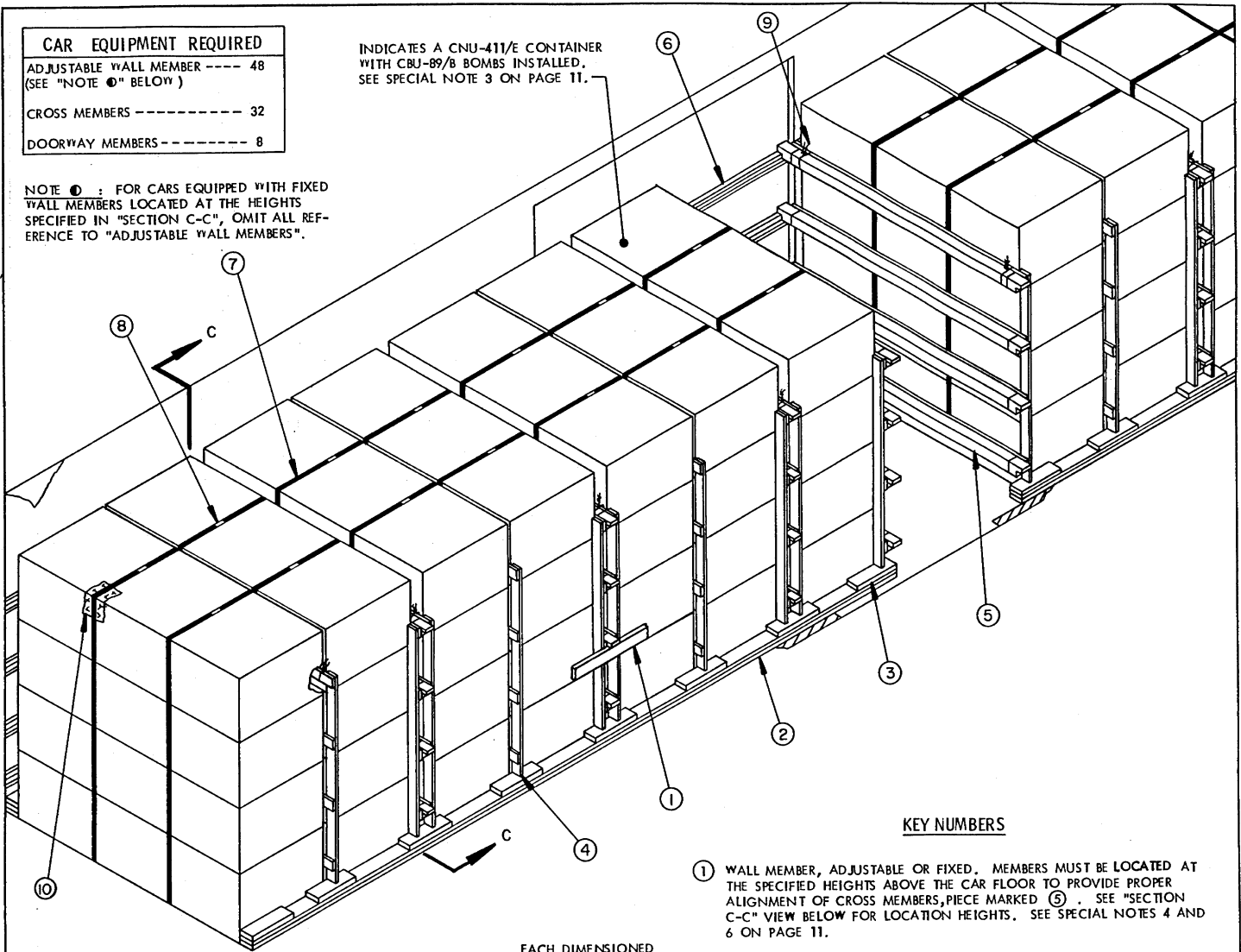
ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER	56	132,720 LBS
DUNNAGE		1,824 LBS
TOTAL WEIGHT		134,544 LBS

CAR EQUIPMENT REQUIRED

ADJUSTABLE WALL MEMBER -----	48
(SEE "NOTE 1" BELOW)	
CROSS MEMBERS -----	32
DOORWAY MEMBERS -----	8

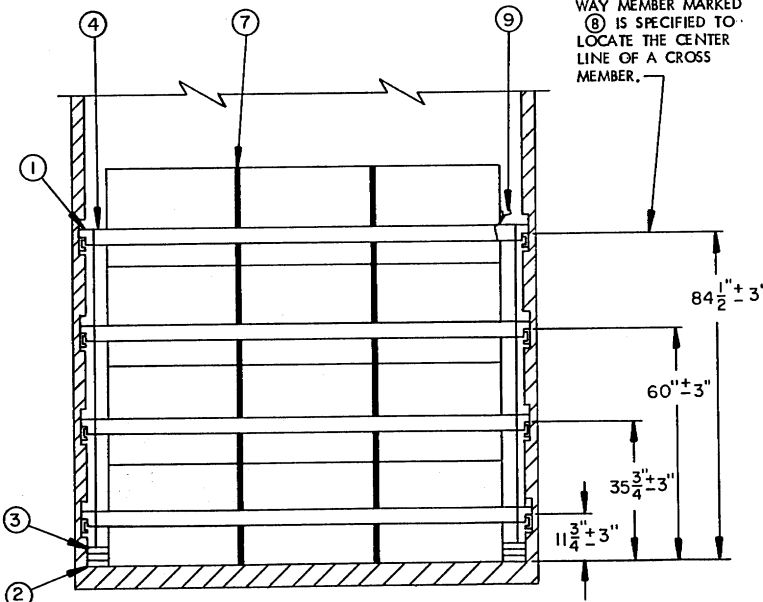
INDICATES A CNU-411/E CONTAINER WITH CBU-89/B BOMBS INSTALLED. SEE SPECIAL NOTE 3 ON PAGE 11.

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



ISOMETRIC VIEW

EACH DIMENSIONED HEIGHT ABOVE THE CAR FLOOR TO AN ADJUSTABLE OR FIXED WALL MEMBER MARKED 1 AND/OR A DOORWAY MEMBER MARKED 8 IS SPECIFIED TO LOCATE THE CENTER LINE OF A CROSS MEMBER.



SECTION C-C

KEY NUMBERS

- 1 WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS, PIECE MARKED 5. SEE "SECTION C-C" VIEW BELOW FOR LOCATION HEIGHTS. SEE SPECIAL NOTES 4 AND 6 ON PAGE 11.
- 2 SIDE BLOCKING, 2" X 6" X LOAD LENGTH PLUS 5" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE FLOOR W/1-16d NAIL EVERY 8". NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTE "J" ON PAGE 2.
- 3 FILL PIECE, 2" X 6" X 18" (30 REQD). CENTER BETWEEN THE CONTAINERS OR ALIGN WITH THE ENDS OF THE SIDE BLOCKING PIECE MARKED 2 AND NAIL W/5-16d NAILS. SEE GENERAL NOTE "J" ON PAGE 2.
- 4 SEPARATOR GATE (18 REQD). SEE "SEPARATOR GATE B" DETAIL ON PAGE 22.
- 5 CROSS MEMBER (32 REQD). SEE GENERAL NOTE "W" ON PAGE 3.
- 6 DOORWAY MEMBER (8 REQD). SEE THE SECTION C-C VIEW AT LEFT FOR LOCATION GUIDANCE.
- 7 UNITIZING STRAP, 1-1/4" X .035" OR .031" BY A LENGTH TO SUIT (REF: 24'-0") (26 REQD). SEE SPECIAL NOTE 5 ON PAGE 9.
- 8 SEAL FOR 1-1/4" STRAPPING (26 REQD, 1 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES. SEE GENERAL NOTE "L" ON PAGE 2.
- 9 TIE WIRE, NO. 14 GAGE BY A LENGTH TO SUIT (REF: 24") (28 REQD). FASTEN THE SEPARATOR GATE, PIECE MARKED 4, IN TWO PLACES AS PER "TIE WIRE APPLICATION A AND B" DETAILS ON PAGE 23.
- 10 ANTI-CHAFING MATERIAL (AS REQD). POSITION UNDER ALL STRAPS AT POINTS OF CONTACT WITH THE CONTAINERS.

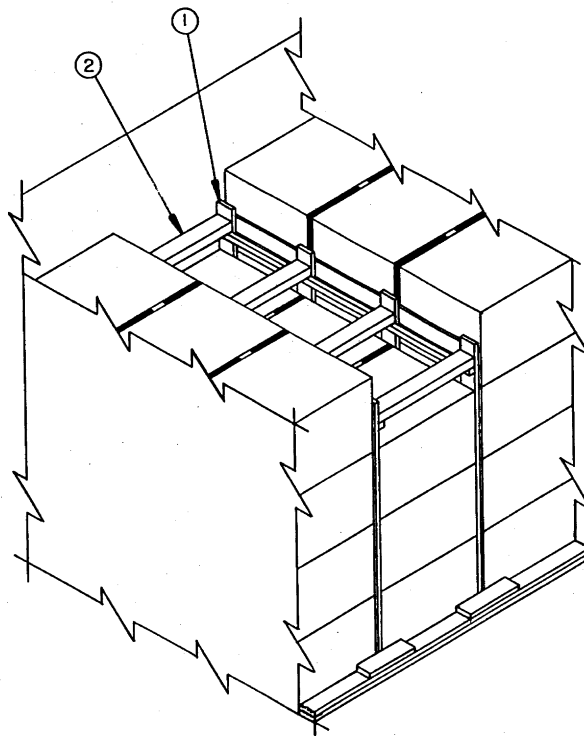
SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-4" WIDE (INSIDE CLEARANCE) WOOD-LINED BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS, AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2 AND SPECIAL NOTE 6 BELOW.
2. A MAXIMUM OF 40 CNU-411/E CONTAINERS CAN BE SHIPPED IN A 40'-6" LONG BY 9'-4" WIDE BOX CAR FOR AN APPROXIMATE LADING WEIGHT OF 77,200 POUNDS IF CBU-87/B BOMBS ARE BEING SHIPPED, OR 94,800 POUNDS IF CBU-87/B BOMBS ARE BEING SHIPPED. SEE SPECIAL NOTE 3 BELOW.
3. FOUR CROSS MEMBERS, PIECE MARKED ⑤ ARE REQUIRED BETWEEN EACH LOAD STACK IF CBU-87/B BOMBS ARE BEING SHIPPED, FOR A TOTAL OF 56 CROSS MEMBERS FOR THE LOAD SHOWN ON PAGE 10. SEE GENERAL NOTE "X" ON PAGE 3.
4. IF A CAR HAS BOWED END WALLS WHICH ARE BOWED OUTWARD TWO INCHES (2") OR MORE EITHER FROM SIDE TO SIDE OR FROM FLOOR-TO-ROOF, CROSS MEMBERS, PIECES ⑤, SHOULD BE INSTALLED WITH A SEPARATOR GATE, PIECE MARKED ④, PRIOR TO LOADING NEAR THE END WALL OF THE CAR TO PROVIDE A "SQUARED END". THE CROSS MEMBERS SHOULD BE INSTALLED AT THE SAME HEIGHTS AS CROSS MEMBERS USED THROUGHOUT THE LOAD AS BLOCKING MEMBERS.
5. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A LOAD MAY BE REDUCED BY MULTIPLES OF ONE (1), OR TWO (2) BY OMITTING CONTAINERS FROM THE TOP LAYER OF THE LOAD OR BY MULTIPLES OF FOUR (4) BY OMITTING ONE OR MORE ENTIRE LOAD UNITS. NOTE: WHERE APPLICABLE, IF ONE (1) CONTAINER IS REMOVED FROM THE TOP LAYER OF THE LOAD, POSITION THE CROSS MEMBER TIGHT AGAINST THE REMAINING CONTAINER, SINCE THE UNITIZING STRAPS ARE NOT DESIGNED TO RESTRAIN THE REMAINING CONTAINER FROM LONGITUDINAL MOVEMENT.
6. IF THE BOX CAR BEING USED TO SHIP THE CNU-411/E CONTAINER HAS METAL END WALLS 4 CROSS MEMBERS MUST BE INSTALLED AT THE HEIGHTS SHOWN IN SECTION C-C ON PAGE 10 WITH ONE SEPARATOR GATE, PIECE MARKED ④, BEING WIRE TIED TO THE CROSS MEMBER AS SHOWN ON PAGE 23, TO AVOID METAL TO METAL CONTACT WITH THE CONTAINERS AND END WALL.
7. THE STACK UNITIZING STRAPS, PIECES MARKED ⑦, WILL BE THREADED THROUGH THE FORKLIFT POCKETS OF THE BOTTOM CONTAINER AND INSTALLED TO ENCIRCLE THE REST OF THE CONTAINER STACK. NOTE: THE STRAPS ARE TO BE POSITIONED AS FAR APART AS THE FORKLIFT POCKETS PERMIT.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	870	290
2" X 6"	228	228
NAILS	NO. REQD	POUNDS
6d (2")	432	2-3/4
16d (3-1/2")	435	9-1/2
STEEL STRAPPING, 1-1/4" X .035" X .031" -----	624'	REQD ---89-1/4 LBS
SEAL FOR 1-1/4" STRAPPING -----	26	REQD --- 1-1/4 LBS
WIRE, NO. 14 GAGE -----	56'	REQD ----- 1 LB
ANTI-CHAFING MATERIAL -----	AS	REQD ----- NIL

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINERS -----	52-----	100,360 LBS
DUNNAGE-----	-----	1,139 LBS
TOTAL WEIGHT-----		101,499 LBS (APPROX)



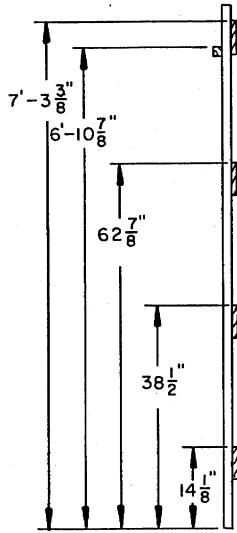
ISOMETRIC VIEW

KEY NUMBERS

SPECIAL NOTES:

1. A PARTIAL VIEW OF A 9'-4" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. OTHER WIDER WIDTH CARS CAN ALSO BE USED.
2. A UNIT OMITTED FROM THE TOP LAYER OF A 4-LAYER LOAD IS SHOWN AS TYPICAL. THE PROCEDURES ARE ALSO APPLICABLE FOR THE OMISSION OF A TOP-LAYER CONTAINER FROM A 3-LAYER OR 2-LAYER LOAD.
3. THE OMITTED UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE OMITTED UNIT AND THE CENTER GATE.
4. ONLY THE BLOCKING AND BRACING FOR THE OMITTED CONTAINER IS SHOWN. REFER TO PAGES 6 AND 7 FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.

- ① SEPARATOR GATE (2 REQD). SEE THE "SEPARATOR GATE C" DETAIL ON PAGE 13.
- ② STRUT, 4" X 6" BY CUT-TO-FIT (REF: 38-3/4") (4 REQD). TOENAIL THE STRUT TO THE SEPARATOR GATES, PIECE MARKED ①, W/2-16d NAILS AT EACH END. SEE THE "STRUT INSTALLATION" DETAIL ON PAGE 5 AND SPECIAL NOTES 2 AND 3 AT LEFT.
- ③ UNITIZING STRAP, 1-1/4" X .035" OR .031" BY A LENGTH TO SUIT (REF: 20'-0") (2 REQD). INSTALL THROUGH THE FORK LIFT OPENINGS OF THE FIRST LAYER AND OVER THE LOAD UNIT AS SHOWN ABOVE. STRAPS SHOULD BE POSITIONED AS FAR APART AS FORK LIFT OPENINGS PERMIT.
- ④ SEAL FOR 1-1/4" STRAPPING, (2 REQD). SEAL PIECE MARKED ③ WITH ONE SEAL CRIMPED WITH TWO PAIR OF NOTCHES. SEE GENERAL NOTE "K" ON PAGE 2.

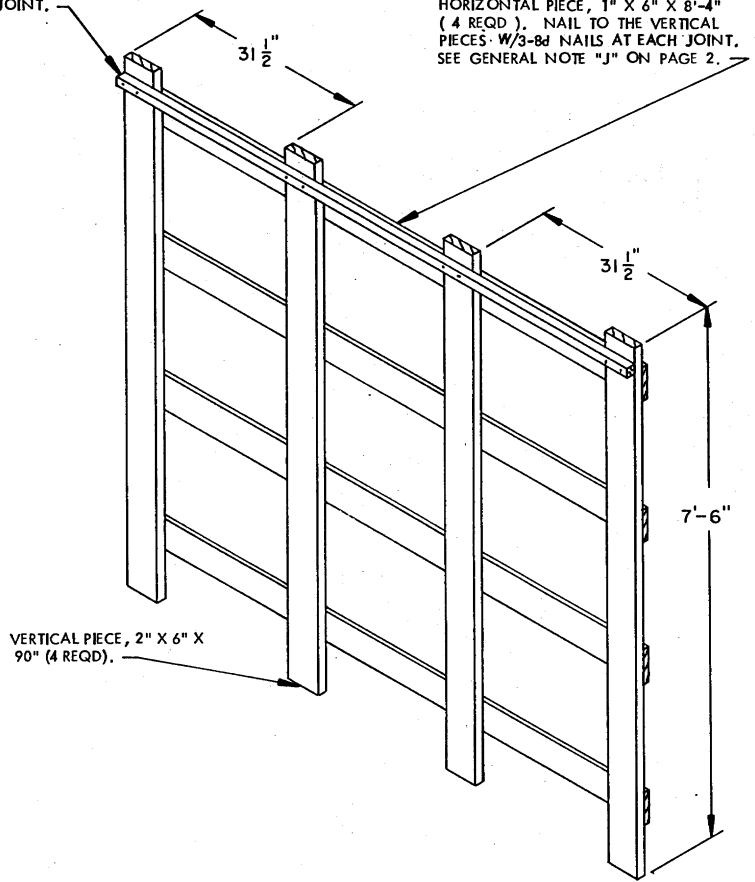


SIDE VIEW

NOTE: IF STRUTS ARE REQUIRED FOR THE FIRST, SECOND, OR THIRD LAYERS, POSITION THE TOP OF THE STRUT LEDGER AT 9-5/8", 34", OR 58-3/8", RESPECTIVELY.

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

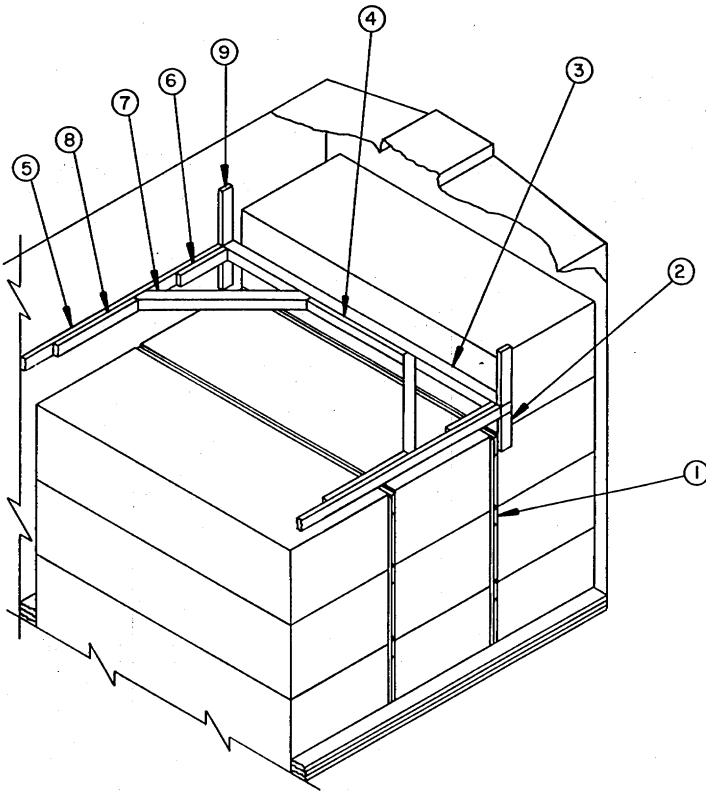
HORIZONTAL PIECE, 1" X 6" X 8'-4" (4 REQD). NAIL TO THE VERTICAL PIECES W/3-8d NAILS AT EACH JOINT. SEE GENERAL NOTE "J" ON PAGE 2.



VERTICAL PIECE, 2" X 6" X 90" (4 REQD).

SEPARATOR GATE C

KEY NUMBERS

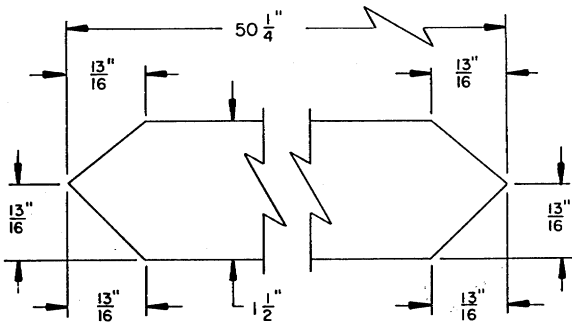


ISOMETRIC VIEW

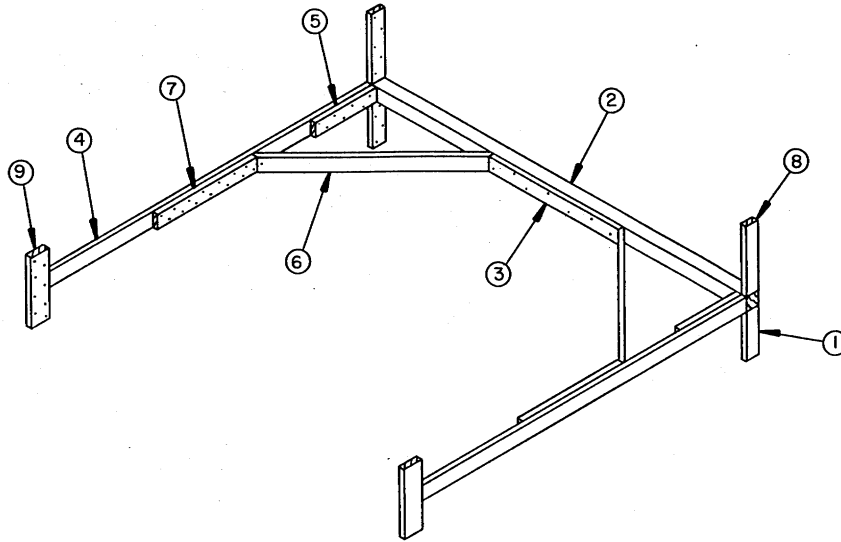
- ① SEPARATOR GATE (AS REQD). SEE "SEPARATOR GATE A" DETAIL ON PAGE 21.
- ② SUPPORT CLEAT, 2" X 4" X 12" (2 REQD). NAIL TO THE CAR SIDEWALL W/3-10d NAILS. POSITION SO AS TO CENTER PIECE MARKED ③ ON THE CONTAINER LOAD BEARING SURFACE.
- ③ CROSS CAR BRACE, 4" X 4" X CAR WIDTH (CUT-TO-FIT) (1 REQD).
- ④ CENTER CLEAT, 2" X 4" X 38" (1 REQD). CENTER ON THE CROSS CAR BRACE MARKED ③, AND NAIL WITH 7-16d NAILS. SEE SPECIAL NOTE 4 BELOW.
- ⑤ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (2 REQD). NAIL TO THE CAR SIDE WALL W/16-12d NAILS. SEE GENERAL NOTE "J" ON PAGE 2.
- ⑥ POCKET CLEAT, 2" X 6" X 12" (2 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/4-16d NAILS.
- ⑦ DIAGONAL BRACE, 2" X 4" X 50-1/4" (2 REQD). SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/2-16d NAILS AT EACH JOINT.
- ⑧ BACK-UP CLEAT, 2" X 6" X 24" (2 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤ W/8-16d NAILS. SEE GENERAL NOTE "J" ON PAGE 2.
- ⑨ HOLD DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-10d NAILS. SEE GENERAL NOTE J ON PAGE 2.

SPECIAL NOTES:

- 1. A 9'-4" WIDE WOOD LINED (END WALLS AND SIDEWALLS) CONVENTIONAL BOX CAR IS SHOWN WITH TYPE "A" K-BRACE. OTHER WOOD LINED BOX CARS OF WIDER WIDTHS CAN BE USED.
- 2. THE K-BRACE METHOD OF PARTIAL-LAYER (TIER) BRACING SHOWN MAY BE USED IN A WOOD LINED CAR FOR THE SECUREMENT OF A PARTIAL TOP TIER, BE IT A FIRST, SECOND, OR THIRD TIER. THE TYPE "A" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 4,000 POUNDS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGES 15 THROUGH 17, FOR SELECTION OF THE APPLICABLE SIZED K-BRACE TO BE USED AND THE DESIGN SPECIFICATIONS FOR THE BRACE.
- 3. **CAUTION:** SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE K-BRACE DUNNAGE. PIECES MARKED ②, ③, ⑥, AND ⑨ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES, PIECE MARKED ⑦, TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑤ MUST BE DOUBLED WITH THE DELETION OF THE POCKET CLEATS, PIECE MARKED ⑥, AND EXTENDED FROM THE CROSS CAR BRACE, PIECE MARKED ③, ACROSS THE DOORWAY AREA FAR ENOUGH TO ALLOW A MINIMUM OF 60" OF NAILABLE SURFACE AREA. NAIL WITH 16d NAILS EVERY 6" CLINCHING NAILS WHICH ARE EXPOSED IN THE DOORWAY AREA. NOTE THE DIAGONAL BRACE WILL BE 49-1/8" IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑤ IS DOUBLED. SEE GENERAL NOTE "J" ON PAGE 2.
- 4. THE CENTER CLEAT, SHOWN AS PIECE MARKED ④ WILL BE 38" LONG FOR A 9'-4" WIDE CAR AND 40" LONG FOR A 9'-6" WIDE CAR, ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.



DIAGONAL BRACE



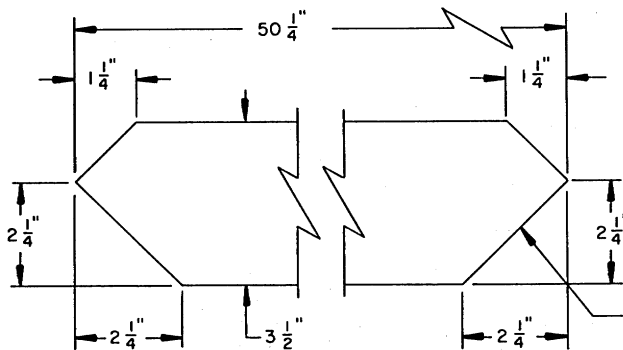
ISOMETRIC VIEW

KEY NUMBERS

- ① SUPPORT CLEAT, 2" X 4" X 12" (2 REQD). NAIL TO THE CAR SIDE-WALL W/3-10d NAILS. POSITION SO AS TO CENTER PIECE MARKED ② ON THE CONTAINER LOAD BEARING SURFACE.
- ② CROSS CAR BRACE, 4" X 4" X CAR WIDTH (CUT-TO-FIT) (1 REQD).
- ③ CENTER CLEAT, 2" X 4" X 38" (1 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ② W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.
- ④ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (2 REQD). NAIL TO THE CAR SIDE WALL W/16-12d NAILS. SEE GENERAL NOTE "J" ON PAGE 2.
- ⑤ POCKET CLEAT, 2" X 6" X 18" (2 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ④, W/7-16d NAILS. SEE GENERAL NOTE "J" ON PAGE 2.
- ⑥ DIAGONAL BRACE, 4" X 4" X 50-1/4" (2 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ② AND THE HORIZONTAL WALL CLEAT, PIECE MARKED ④, W/1-60d NAIL AT EACH END.
- ⑦ BACK-UP CLEAT, 2" X 6" X 30" (2 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ④, W/14-16d NAILS. SEE GENERAL NOTE "J" ON PAGE 2.
- ⑧ HOLD DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDE WALL W/5-12d NAILS.
- ⑨ VERTICAL BACK-UP CLEAT, 2" X 6" X 18" (2 REQD). CENTER ON PIECE MARKED ④ AND NAIL W/8-12d NAILS.

SPECIAL NOTES:

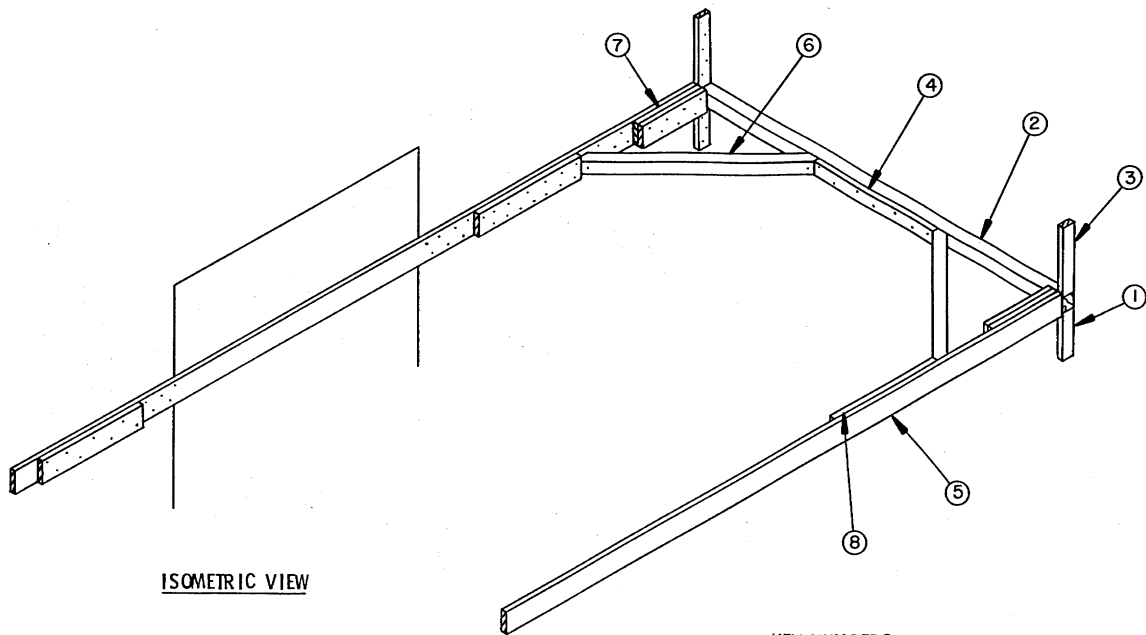
1. THE TYPE "B" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL-LAYER (TIER) OF NOT MORE THAN 7,000 POUNDS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO TYPE "C" K-BRACE ON PAGE 16. IF THE PARTIAL TIER TO BE BRACED WEIGHS 4,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 14 MAY BE USED.
2. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE. DUNNAGE PIECES MARKED ①, ②, ⑤, ⑧, AND ⑨ MUST BE SUPPORTED AT THE SIDES OF A CAR BY THE CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES, PIECE MARKED ⑥, TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ④ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF: 54") TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE, WITH THE DELETION OF PIECE MARKED ⑤. NAIL THE FIRST PIECE TO THE SECOND W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOORWAY AREA. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ④ IS DOUBLED.
3. THE CENTER CLEAT SHOWN AS PIECE MARKED ③ WILL BE 38" LONG FOR A 9'-4" WIDE CAR AND 40" LONG FOR A 9'-6" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. REFER TO PAGE 14 FOR A TYPICAL INSTALLATION OF THE K-BRACE.



DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

THIS BEARING SURFACE MUST BE POSITIONED SO AS TO BE IN CONTACT WITH A CROSS CAR BRACE, PIECE MARKED ②, AND THE HORIZONTAL WALL CLEAT, PIECE MARKED ④.



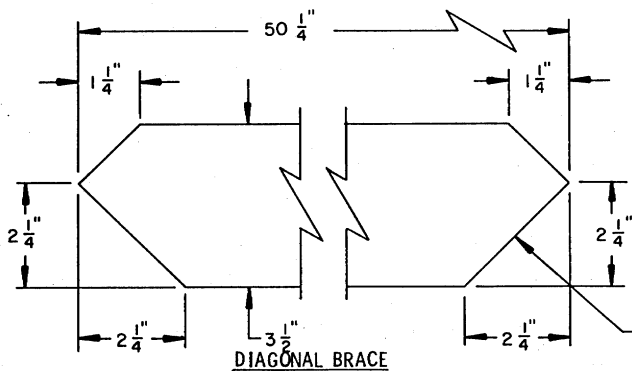
ISOMETRIC VIEW

KEY NUMBERS

SPECIAL NOTES:

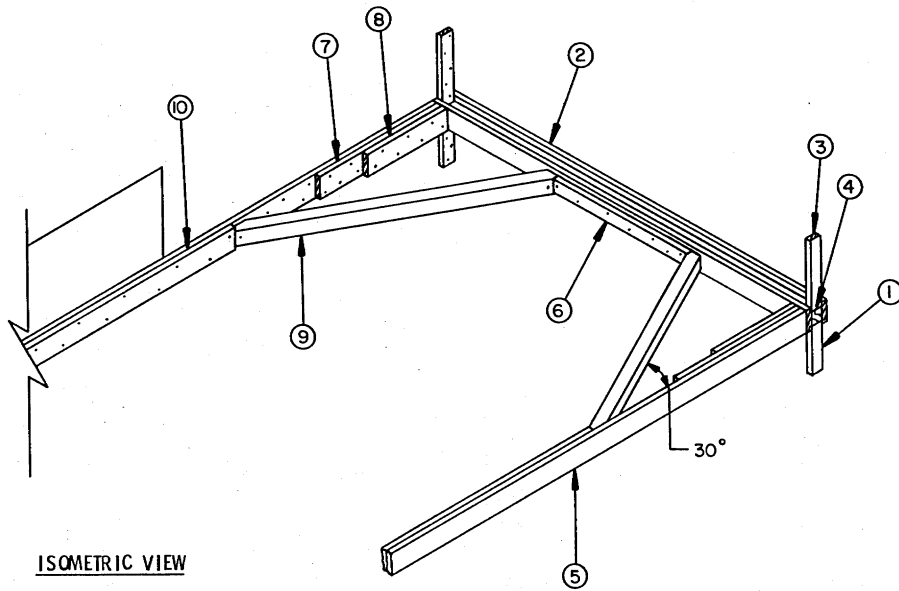
1. THE TYPE "C" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL LAYER (TIER) OF NOT MORE THAN 10,000 POUNDS. IF THE PARTIAL LAYER IS NO MORE THAN 7,000 POUNDS USE TYPE "B" K-BRACE ON PAGE 15. LIKEWISE, IF THE TOTAL WEIGHT OF THE PARTIAL LAYER DOES NOT EXCEED 4,000 POUNDS, TYPE "A" K-BRACE SHOULD BE USED WHICH IS DEPICTED ON PAGE 14.
2. **CAUTION:** SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, AND ⑦ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACE, PIECE MARKED ⑥, TO BEAR IN FRONT OF A DOOR OPENING. HOWEVER, THE ADJACENT PIECE MARKED ⑤ MUST BE DOUBLED WITH THE DELETION OF THE POCKET CLEATS, PIECE MARKED ⑦, AND LAMINATED TOGETHER $\frac{w}{1-16d}$ EVERY 6" WITH THE NAILS IN THE DOORWAY AREA BEING CLINCHED. NOTE THAT THE DIAGONAL BRACE WILL BE $49-1/8$ " LONG IN LIEU OF $50-1/4$ " WHEN PIECE MARKED ⑤ IS DOUBLED. SEE GENERAL NOTE "J" ON PAGE 2.
3. THE CENTER CLEAT, PIECE MARKED ④, WILL BE 38" LONG FOR A 9'-4" WIDE CAR AND 40" LONG FOR 9'-6" WIDE CARS. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. **CAUTION:** A TYPE "C" K-BRACE MUST BE USED IN BOTH ENDS OF THE CAR, THE BRACE IS NOT DESIGNED FOR USE IN ONLY ONE END. NOTE THAT EXCEPT FOR PIECES MARKED ⑤, THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.

- ① SUPPORT CLEAT, 2" X 4" X 12" (2 REQD). NAIL TO THE CAR SIDEWALL W/3-12d NAILS. POSITION SO AS TO CENTER PIECE MARKED ② ON THE LOAD BEARING SURFACE OF THE CONTAINER.
- ② CROSS CAR BRACE, 4" X 4" X CAR WIDTH (CUT-TO-FIT) (1 REQD).
- ③ HOLD DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.
- ④ CENTER CLEAT, 2" X 4" X 38" (1 REQD). NAIL TO THE CROSS CAR BRACE PIECE MARKED ②, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.
- ⑤ HORIZONTAL WALL CLEAT, 2" X 6" BY CUT-TO-FIT (2 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND ACROSS AND FAR ENOUGH PAST THE DOOR OPENINGS TO CONTACT PIECE MARKED ② OF THE K-BRACE IN THE OPPOSITE END OF THE CAR. NAIL TO THE CAR SIDEWALL W/40-12d NAILS.
- ⑥ DIAGONAL BRACE, 4" X 4" X $50-1/4$ " (2 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ②, AND THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/ 1-60d NAIL AT EACH END.
- ⑦ POCKET CLEAT, 2" X 6" X 18" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/7-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTE "J" ON PAGE 2.
- ⑧ BACK-UP CLEAT, 2" X 6" X 30" (2 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/14-16d NAILS. SEE GENERAL NOTE "J" ON PAGE 2.



SEE SPECIAL NOTE 2 ABOVE.

THIS BEARING SURFACE MUST BE POSITIONED SO AS TO BE IN CONTACT WITH A CROSS CAR BRACE, PIECE MARKED ②, OR A HORIZONTAL WALL CLEAT, PIECE MARKED ⑤.



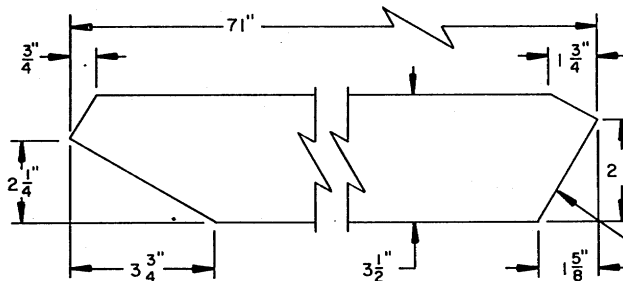
ISOMETRIC VIEW

SPECIAL NOTES:

1. THE TYPE "D" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 12,500 POUNDS. IF THE PARTIAL TIER TO BE BRACED WEIGHS BETWEEN 7,000 POUNDS AND 10,000 POUNDS THE TYPE "C" K-BRACE DEPICTED ON PAGE 16 MAY BE USED. FOR A PARTIAL TIER OF 4,000 TO 7,000 POUNDS, THE TYPE "B" K-BRACE DEPICTED ON PAGE 15 MAY BE USED. IF THE PARTIAL TIER TO BE BRACED WEIGHS 4,000 POUNDS OR LESS THE TYPE "A" K-BRACE DEPICTED ON PAGE 14 WILL BE ADEQUATE.
2. **CAUTION:** SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ④, ⑦, AND ⑧ MUST BE SUPPORTED AT THE SIDES BY THE CAR SIDE WALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES, PIECE MARKED ⑨, TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑤ MUST BE DOUBLED WITH THE DELETION OF PIECE MARKED ⑦. LAMINATE THE SECOND PIECE TO THE FIRST W/40-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 70-1/4" LONG IN LIEU OF 71" LONG WHEN PIECE MARKED ⑤ IS DOUBLED.
3. THE CENTER CLEAT, PIECE MARKED ⑥, WILL BE 38" LONG FOR A 9'-4" WIDE BOX CAR AND 40" LONG FOR A 9'-6" WIDE BOX CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. **CAUTION:** A TYPE "D" K-BRACE MUST BE USED IN BOTH ENDS OF THE CAR; THE BRACE IS NOT DESIGNED FOR USE IN ONLY ONE END. NOTE THAT EXCEPT FOR PIECES MARKED ⑤ AND ⑩ THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.

KEY NUMBERS

- ① SUPPORT CLEAT, 2" X 4" X 12" (2 REQD). NAIL TO THE CAR SIDE WALL W/3-12d NAILS. POSITION SO AS TO CENTER PIECES ② AND ④ ON THE CONTAINER LOAD BEARING SURFACE.
- ② HORIZONTAL PIECE, 2" X 6" X CAR WIDTH (CUT-TO-FIT) (2 REQD). CENTER ON THE CROSS CAR BRACE PIECE MARKED ④ AND NAIL W/1-12d NAIL EVERY 6". SEE GENERAL NOTE "J" ON PAGE 2.
- ③ HOLD DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDE WALL W/5-12d NAILS.
- ④ CROSS CAR BRACE, 4" X 4" X CAR WIDTH (CUT-TO-FIT) (1 REQD).
- ⑤ HORIZONTAL WALL CLEAT, 2" X 6" X CUT-TO-FIT (2 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND ACROSS AND FAR ENOUGH PAST THE DOOR OPENING TO CONTACT PIECE MARKED ④ OF THE K-BRACE IN THE OPPOSITE END OF THE CAR. NAIL TO THE CAR SIDE WALL W/40-12d NAILS.
- ⑥ CENTER CLEAT, 2" X 4" X 38" (1 REQD). NAIL TO THE HORIZONTAL PIECE, MARKED ②, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.
- ⑦ POCKET CLEAT, 2" X 6" X 36" (2 REQD). NAIL TO THE HORIZONTAL PIECE, MARKED ⑤, W/10-16d NAILS.
- ⑧ POCKET CLEAT, 2" X 6" X 24" (2 REQD). NAIL TO THE POCKET CLEAT, PIECE, MARKED ⑦, W/7-16d NAILS.
- ⑨ DIAGONAL BRACE, 4" X 4" X 71" (2 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE HORIZONTAL PIECE, PIECE MARKED ② AND HORIZONTAL WALL CLEAT, PIECE MARKED ⑤ W/1-60d NAIL AT EACH JOINT.
- ⑩ BACK-UP CLEAT, 2" X 6" BY CUT-TO-FIT (2 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND TO CONTACT THE DIAGONAL BRACE, PIECE MARKED ⑨, IN THE OPPOSITE END OF THE CAR. NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/18-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING, IF APPLICABLE.

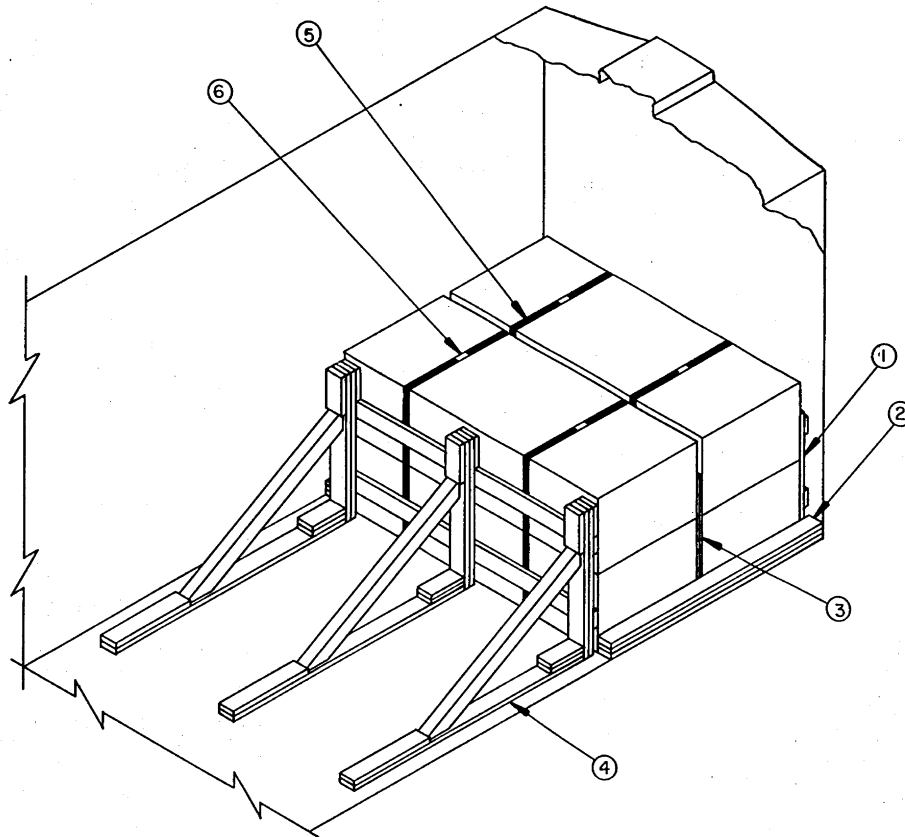


DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

THIS BEARING SURFACE MUST BE POSITIONED SO AS TO BE IN CONTACT WITH A HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, AND THE HORIZONTAL PIECE, PIECE MARKED ②.

TYPE "D" K-BRACE



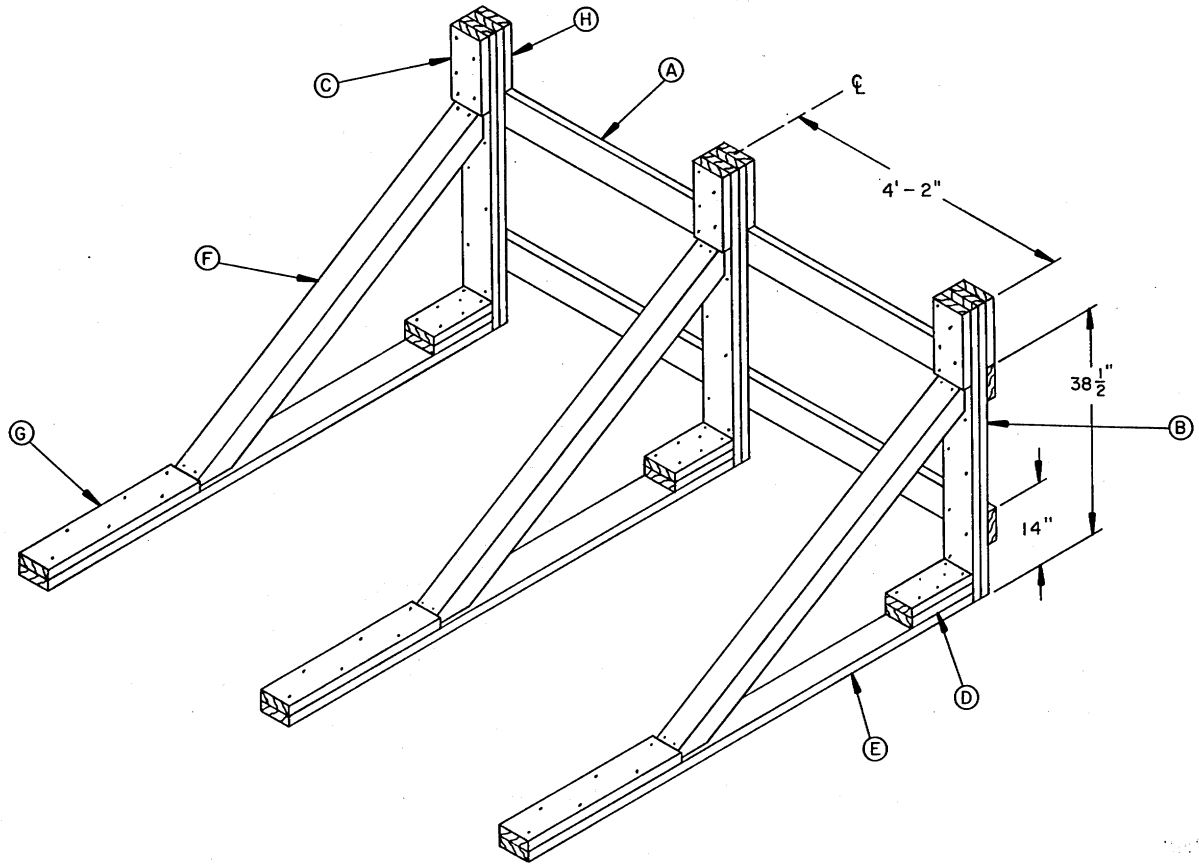
ISOMETRIC VIEW

SPECIAL NOTES:

1. A FOUR (4) CONTAINER LOAD IS SHOWN IN A 9'-4" WIDE CONVENTIONAL BOX CAR USING THE KNEE BRACE METHOD OF RESTRAINT. OTHER BOX CARS OF WIDER WIDTHS CAN ALSO BE USED.
2. THE TOTAL KNEE BRACE ASSEMBLY IS ADEQUATE FOR RETAINING A MAXIMUM LCL LOAD OF NOT MORE THAN 12,750 POUNDS.

KEY NUMBERS

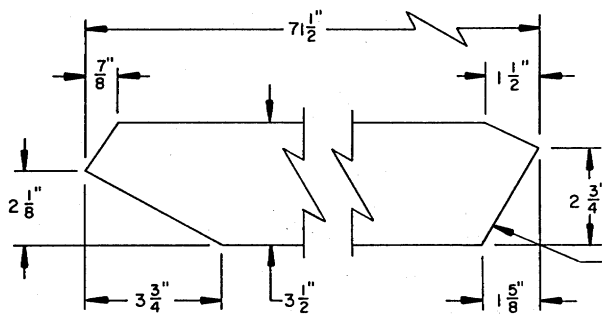
- ① END WALL GATE (1 REQD). SEE THE "END WALL GATE" DETAIL ON PAGE 21 AND GENERAL NOTE "U" ON PAGE 2.
- ② SIDE BLOCKING, 2" X 6" X LOAD LENGTH PLUS 6" (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/1-16d NAIL EVERY 8". LAMINATE EACH ADDITIONAL PIECE IN A LIKE MANNER.
- ③ SEPARATOR GATE (1 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 21.
- ④ KNEE BRACE ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 19 AND SPECIAL NOTE 2 AT LEFT.
- ⑤ UNITIZING STRAP, 1-1/4" X .035" OR .031" BY A LENGTH TO SUIT (REF: 16'-0") (4 REQD).
- ⑥ SEAL FOR 1-1/4" STRAPPING (4 REQD, 1 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES. SEE GENERAL NOTE "L" ON PAGE 2.



ISOMETRIC VIEW

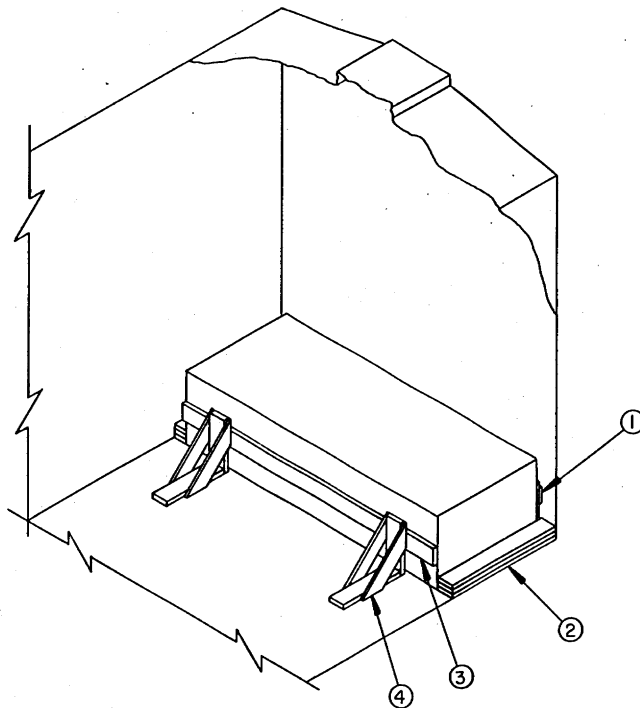
KEY LETTERS

- (A) LOAD BEARING PIECE, 2" X 6" X 8'-4" (2 REQD.). NAIL TO THE VERTICAL PIECES, PIECE MARKED (B), W/3-10d NAILS AT EACH JOINT.
- (B) VERTICAL PIECE, 2" X 6" X 50" (DOUBLED) (3 REQD.). NAIL THE FIRST PIECE TO THE SECOND W/1-10d NAIL EVERY 6". SEE GENERAL NOTE "J" ON PAGE 2.
- (C) HOLD-DOWN CLEAT, 2" X 6" X 12-3/4" (3 REQD.). NAIL TO THE VERTICAL PIECE, PIECE MARKED (B), W/5-10d NAILS.
- (D) POCKET CLEAT, 2" X 6" X 12" (DOUBLED) (3 REQD.). NAIL THE FIRST PIECE TO THE FLOOR CLEAT, PIECE MARKED (E), W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. TOENAIL TO THE VERTICAL PIECE W/2-16d NAILS.
- (E) FLOOR CLEAT, 2" X 6" X 7'-8-1/4" (3 REQD.). NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 8". SEE GENERAL NOTE "J" ON PAGE 2.
- (F) BRACE, 4" X 4" X 71-1/2" (3 REQD.). SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TOENAIL TO THE VERTICAL PIECE AND FLOOR CLEAT, PIECES MARKED (B) AND (E), W/2-16d NAILS AT EACH JOINT.
- (G) BACK-UP CLEAT, 2" X 6" X 30" (3 REQD.). NAIL TO THE FLOOR CLEAT, PIECE MARKED (E) W/6-40d NAILS.
- (H) FILL PIECE, 2" X 6" X 11-1/2" (3 REQD.). NAIL TO THE VERTICAL PIECE W/3-10d NAILS.



DIAGONAL BRACE
4" X 4" MATERIAL

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



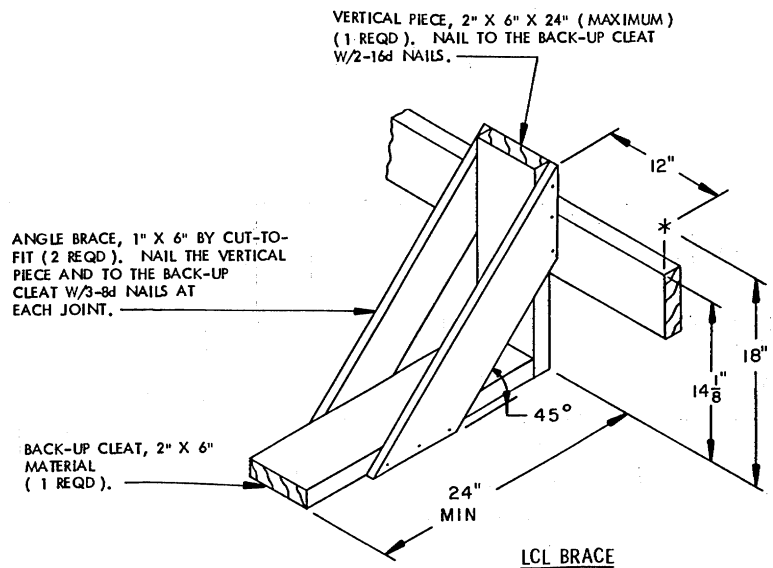
ISOMETRIC VIEW

SPECIAL NOTE:

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

KEY NUMBERS

- ① END WALL GATE (1 REQD). SEE "END WALL GATE" DETAIL ON PAGE 21. SEE GENERAL NOTE "U" ON PAGE 2.
- ② SIDE BLOCKING, 2" X 6" BY LOAD LENGTH PLUS 3". (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO THE FLOOR W/1-16d NAIL EVERY 8". LAMINATE THE SECOND AND THIRD PIECES TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTE "J" ON PAGE 2.
- ③ HORIZONTAL PIECE, 2" X 6" X 8'-4" (1 REQD). NAIL TO THE LCL BRACE W/3-10d NAILS AT EACH JOINT.
- ④ LCL BRACE (2 REQD). SEE THE "LCL BRACE" DETAIL BELOW. NAIL TO THE CAR FLOOR W/7-16d NAILS. SEE GENERAL NOTES "J" AND "N" ON PAGE 2 AND SPECIAL NOTE 1 AT LEFT.

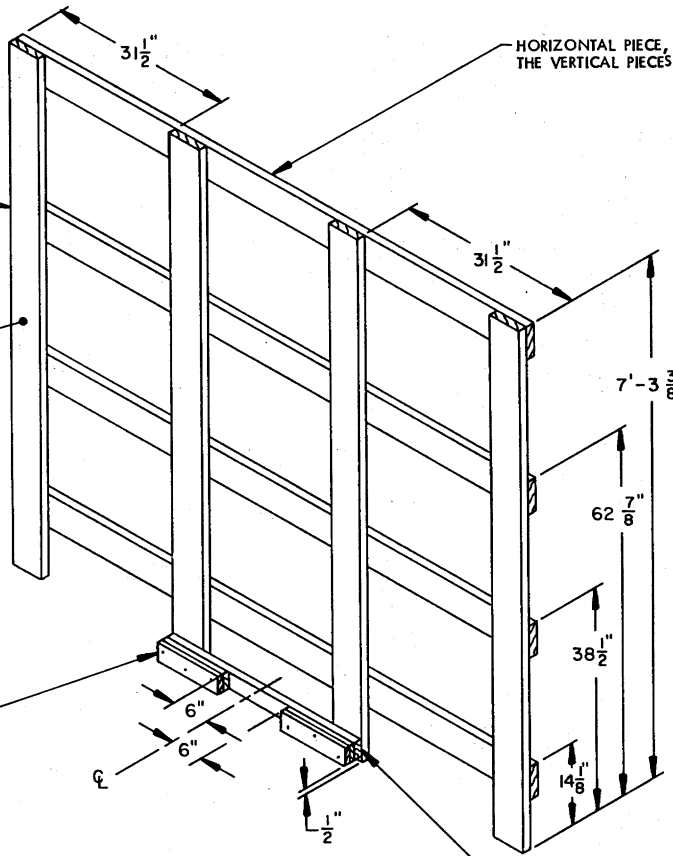


VERTICAL PIECE, 2" X 6" BY 7'-3-3/8"
FOR A 4-HIGH LOAD, 62-7/8" FOR
A 3-HIGH LOAD, 40-1/2" FOR A
2-HIGH LOAD, AND 16-1/8" FOR
A 1-HIGH LOAD (4 REQD.).

LOAD SIDE OF GATE.

HOLD-DOWN PIECE, 1" X
3" X 12" (DOUBLED) (2 REQD.).
NAIL THE FIRST PIECE TO THE
SUPPORT PIECE W/3-8d NAILS.
NAIL THE SECOND PIECE TO THE
FIRST IN A LIKE MANNER.

HORIZONTAL PIECE, 2" X 6" X 8'-4" (4 REQD.). NAIL TO
THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.



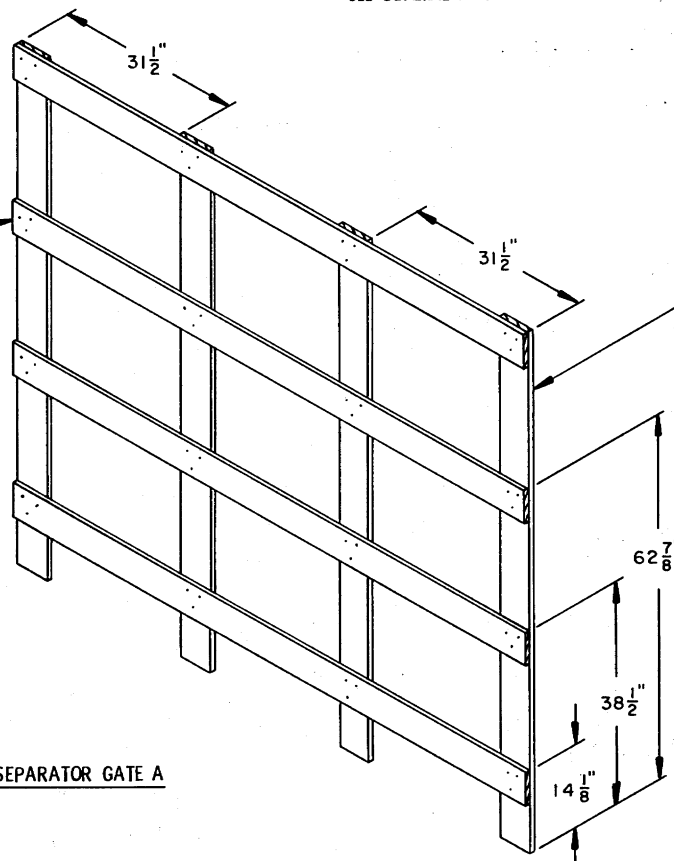
END WALL GATE

SEE GENERAL NOTE "U" ON PAGE 2.

SUPPORT PIECE, 2" X 3" X 37" (1 REQD.).
NAIL TO THE VERTICAL PIECE W/3-10d NAILS
AT EACH JOINT.

HORIZONTAL PIECE, 1" X
6" X 8'-4" (4 REQD.).
NAIL TO THE VERTICAL
PIECE W/3-6d NAILS
AT EACH JOINT AND
CLINCH.

SEPARATOR GATE A



VERTICAL PIECE, 1" X 6" BY 7'-3-3/8" FOR A 4-HIGH
LOAD, 62-7/8" FOR A 3-HIGH LOAD, 38-1/2" FOR A
2-HIGH LOAD, AND 14-1/8" FOR A 1-HIGH LOAD
(4 REQD.).

DETAILS

VERTICAL PIECE, 2" X 6" X 7'-5-3/8" FOR A 4-HIGH LOAD, 64-7/8" FOR A 3-HIGH LOAD, 40-1/2" FOR A 2-HIGH LOAD, AND 16-1/8" FOR A 1-HIGH LOAD.

HORIZONTAL PIECE, 2" X 6" X 8'-4" (4 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.

STRUT LEDGER, 2" X 2" X 8'-4" (4 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.

HOLD-DOWN PIECE, 1" X 3" X 12" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE SUPPORT PIECE W/3-8d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.

SUPPORT PIECE, 2" X 3" X 37" (1 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.

CENTER GATE

VERTICAL PIECE, 1" X 4" BY A LENGTH TO-SUIT (REF: 6'-10" FOR A 4-HIGH LOAD, 57-1/4" FOR A 3-HIGH LOAD, AND 33" FOR A 2-HIGH LOAD (2 REQD).

HORIZONTAL PIECE, 1" X 4" X 8'-11" (4 REQD). NAIL TO THE VERTICAL PIECES W/3-6d NAILS AT EACH END AND CLINCH.

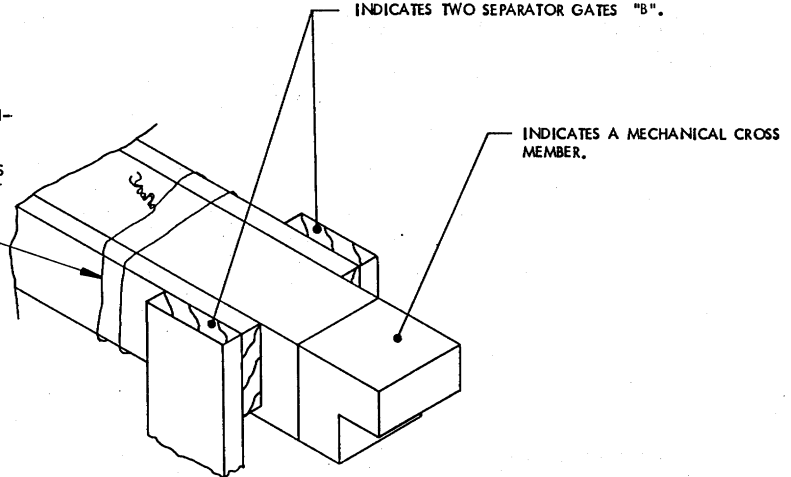
INDICATES SIDE IN CONTACT WITH THE MECHANICAL CROSS MEMBER.

* REFERENCE DIMENSION ONLY. POSITION AT THE SAME HEIGHT AS THE TOP OF THE MECHANICAL CROSS MEMBER.

SEPARATOR GATE B

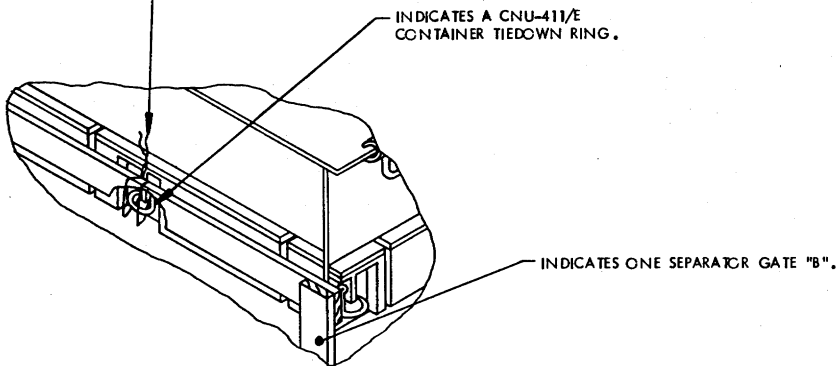
DETAILS

NO. 14 GAGE WIRE BY A LENGTH-TO-SUIT. FORM TWO LOOPS AROUND THE SEPARATOR GATES AND CROSS MEMBER, BRING ENDS TOGETHER AND TWIST TO PREVENT DISLODGE-
MENT.



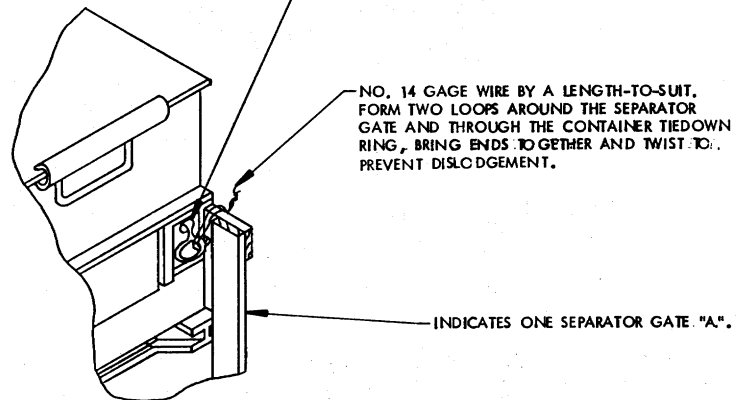
TIE WIRE APPLICATION A DETAIL

NO. 14 GAGE WIRE BY A LENGTH-TO-SUIT. FORM TWO LOOPS AROUND THE SEPARATOR GATE AND THROUGH THE CONTAINER TIEDOWN RINGS BRING ENDS TOGETHER AND TWIST TO PREVENT DISLODGE-
MENT.

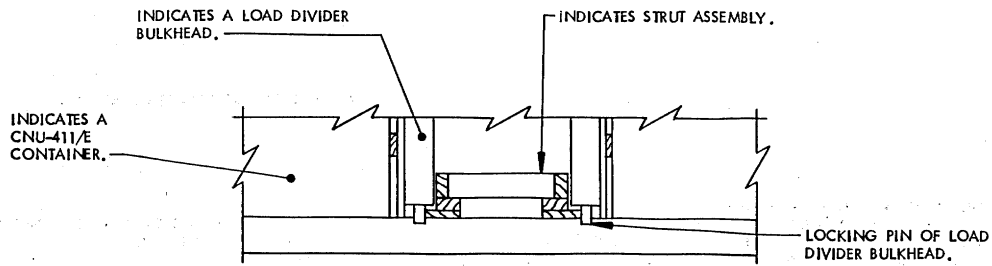


TIE WIRE APPLICATION "C" DETAIL

INDIATES A GNU-411/E CONTAINER TIEDOWN RING.

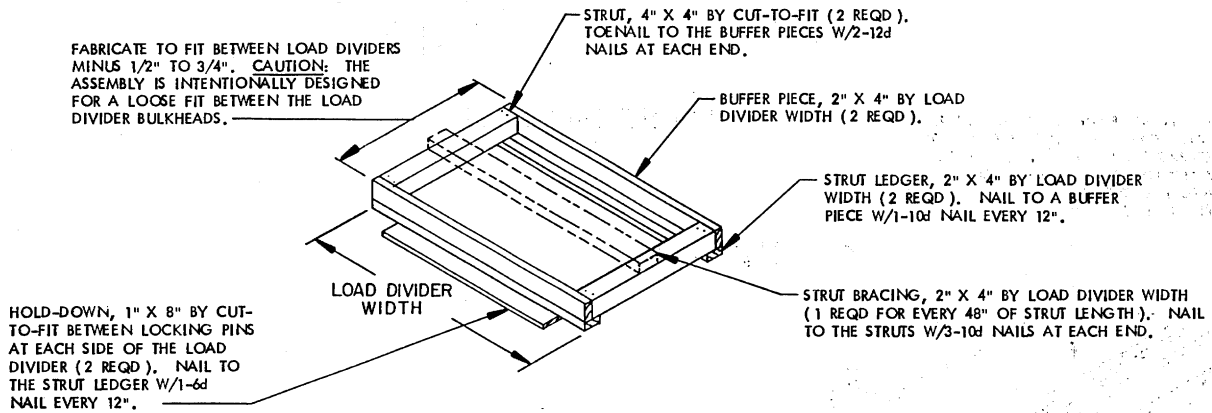


TIE WIRE APPLICATION B DETAIL



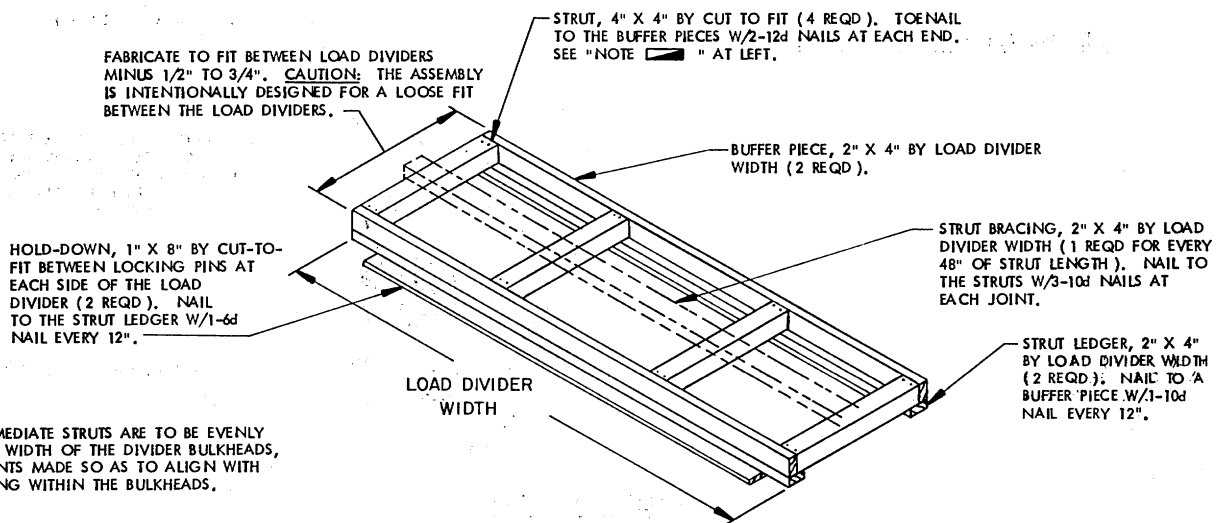
INSTALLATION OF STRUT ASSEMBLIES A OR B

THIS VIEW SHOWS THE STRUT ASSEMBLY INSTALLED BETWEEN THE LOAD DIVIDER BULKHEADS. NOTE THE 1/2" TO 3/4" (TOTAL) SPACE INTENTIONALLY PROVIDED BETWEEN THE ASSEMBLY AND THE BULKHEADS.



STRUT ASSEMBLY "A"

STRUT ASSEMBLY "A" IS DESIGNED FOR USE WITH 2-PIECE BULKHEADS, WITH TWO (2) ASSEMBLIES BEING REQUIRED PER LOAD. SEE GENERAL NOTE "EE" ON PAGE 3.



NOTE [Symbol] :

THE TWO INTERMEDIATE STRUTS ARE TO BE EVENLY SPACED ON THE WIDTH OF THE DIVIDER BULKHEADS, WITH ADJUSTMENTS MADE SO AS TO ALIGN WITH VERTICAL FRAMING WITHIN THE BULKHEADS.

STRUT ASSEMBLY "B"

STRUT ASSEMBLY "B" IS DESIGNED FOR USE WITH 1-PIECE BULKHEADS. SEE GENERAL NOTE "EE" ON PAGE 3.