

APPROVED BY

BUREAU OF EXPLOSIVES
A. J. Grossnick
SUPERVISOR, MILITARY & INTERMODAL SERVICES
DATE *1/15/74*

LOADING AND BRACING (CL) IN BOX CARS OF "TOTE BIN" CONTAINERS LOADED WITH BULK EXPLOSIVES

CAUTION:

CARS WHICH ARE EQUIPPED WITH MECHANICAL BRACING SYSTEMS MUST NOT BE USED FOR SHIPMENTS OF EXPLOSIVES SUCH AS DYNAMITE, T. N. T., BLACK POWDER, SMOKELESS POWDER (PROPELLENT EXPLOSIVES), TETRYL AND SIMILAR EXPLOSIVES (EXCEPT AS A COMPONENT PART OF AMMUNITION OR PROPELLING CHARGES) WHICH ARE LIABLE TO SIFT OR BECOME LODGED IN THE MECHANISM OF THE LOADING AND BRACING DEVICE IN THE EVENT OF CONTAINER FAILURE. SEE GENERAL NOTE "S" ON PAGE 2 FOR SPECIAL GUIDANCE APPLICABLE TO THIS RESTRICTION.

DO NOT SCALE

REVISIONS			DRAFTSMAN <i>AA</i>	PROJ ENG <i>GLP/MLW</i>	<i>GN</i>
			CHECKER <i>WPK</i>	LAG ENGINE OFFICE <i>John S. Gery</i>	
			APPROVED	<i>7/3 H. Benton</i>	
			U. S. ARMY ARMAMENT COMMAND		
			APPROVED BY ORDER OF COMMANDING GENERAL, U. S. ARMY MATERIEL COMMAND		
			<i>John A. Boyd</i>		
			U. S. ARMY MATERIEL COMMAND		
			FEBRUARY 1974		
			AMC AMMO CEN DWG NO		
			D-AMXAC-4342		

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. THE OUTLOADING PROCEDURES SPECIFIED IN THIS DRAWING ARE "INTERIM PROCEDURES" APPLICABLE TO THE OUTLOADING IN BOX CARS OF BULK EXPLOSIVES PACKED IN THE "TOTE BIN" CONTAINER. THIS DRAWING WILL BE USED UNTIL CANCELLED AND/OR SUPERSEDED BY A USAMC 19-48 SERIES DRAWING. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE "TOTE BIN" CONTAINER WITH CONTENTS.
- C. CONTAINER DATA:
- DIMENSIONS (APPROX) -- 48" LONG X 42" WIDE X 70-1/2" HIGH
GROSS WEIGHT ----- 5,255 POUNDS (MAX)
CUBE ----- 82.3 CUBIC FEET
- D. THE BASIC LOAD DEPICTED ON PAGE 4 IS BASED ON 50'-6" LONG BY 9'-2" WIDE BOX CARS THAT HAVE 10'-0" WIDE DOORS OF THE CONVENTIONAL SLIDING TYPE. CARS WHICH ARE A FEW INCHES LONGER OR SHORTER THAN 50'-6" MAY ALSO BE USED TO SHIP THE LOADS SPECIFIED WITHIN THIS DRAWING. ALSO, 40-FOOT BOX CARS CAN BE USED, PROVIDING THE LOADING AND BRACING SPECIFICATIONS SET FORTH FOR THE 50-FOOT CARS ARE APPLIED AND PROVIDING THE CRITERIA CONTAINED HEREIN ARE SATISFIED. NOTE THAT ONLY 22 CONTAINERS CAN BE LOADED IN A 40-FOOT BOX CAR. ADDITIONALLY, CARS HAVING OTHER WIDTHS THAN DEPICTED CAN BE USED. CARS THAT ARE 8'-6" AND UPWARD IN WIDTH CAN BE USED PROVIDING THE APPLICABLE DUNNAGE ASSEMBLIES ARE ADJUSTED IN SIZE TO SUIT (CENTER GATES, END-OF-CAR BULKHEADS AND ANTI-SWAY BRACES). ALTHOUGH IT IS RECOMMENDED THAT CARS WHICH HAVE 10'-0" WIDE DOORS BE USED, CARS WITH DOORS OF ANY WIDTH FROM 8'-0" AND UPWARD CAN BE USED. ALSO, CARS WITH DIFFERENT STYLE DOORS, SUCH AS "PLUG" OR "STAGGERED" OR "COMBINATION SLIDING AND PLUG" CAN BE USED. SPECIAL DOORWAY BLOCKING SPECIFICATIONS ARE ALSO INCLUDED IN THIS DRAWING FOR USE WHEN USING CARS WHICH HAVE A DIFFERENT SIZE AND/OR STYLE DOOR FROM WHAT IS DEPICTED FOR THE BASIC LOAD.
- E. THE BASIC LOAD AS SHOWN IS BASED ON CARS WHICH HAVE DOORS OF THE CONVENTIONAL SLIDING TYPE; HOWEVER, AS STATED ABOVE, 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. ALSO, AFTER THE PLUG DOORS ON A CAR ARE CLOSED AND READY FOR THE INSTALLATION OF "CAR SEALS", A PIECE OF WIRE OF SUITABLE SIZE WILL BE USED IN ADDITION TO, AND IN CONJUNCTION WITH, EACH CAR SEAL USED TO "SEAL" THE CAR. THE WIRE WILL BE THREADED THROUGH THE HOLES IN THE DOOR LATCH ASSEMBLY ONE OR MORE TIMES, AND THE WIRE ENDS WILL BE TWISTED TOGETHER.
- F. THE SELECTION OF RAIL CARS FOR THE TRANSPORT OF THE DESIGNATED ITEM IS THE RESPONSIBILITY OF THE CARRIER AND SHIPPER. ONLY CARS WHICH HAVE "SOUND" BODIES AND ARE OTHERWISE IN PROPER CONDITION TO SAFELY TRANSPORT THE LADING TO DESTINATION WITHOUT DAMAGE WILL BE SELECTED. SEE GENERAL NOTES "O", "R" AND "S" FOR SPECIAL REQUIREMENTS.
- G. CAUTION: THE TOTAL WEIGHT OF A LOAD IN A CAR MUST NOT EXCEED THE LOAD LIMIT WHICH IS STENCILED ON THE SIDE OF THE CAR. ALSO, THE LOAD WEIGHT ON ONE TRUCK MUST NOT EXCEED ONE-HALF OF THE LOAD LIMIT OF THE CAR. FOR THE LOAD AS SHOWN ON PAGE 4, A CAR WITH A LOAD LIMIT OF NOT LESS THAN 141,000 POUNDS MUST BE USED. IF A 28-BIN LOAD IS SHIPPED IN A 50-FOOT CAR, THAT CAR MUST HAVE A LOAD LIMIT OF NOT LESS THAN 149,000 POUNDS. IF A 22-BIN LOAD IS SHIPPED IN A 40-FOOT CAR, THAT CAR MUST HAVE A LOAD LIMIT OF NOT LESS THAN 120,000 POUNDS. THESE "LOAD LIMIT" REQUIREMENTS CAN BE PROPORTIONALLY REDUCED WHEN SHIPPING CONTAINERS THAT WEIGH LESS THAN 5,255 POUNDS EACH.
- H. THE OUTLOADING PROCEDURES SPECIFIED HEREIN CAN ALSO BE UTILIZED FOR SHIPMENT OF THE DEPICTED CONTAINERS WHEN THEY ARE EMPTY OR LOADED WITH AN ITEM WHICH IS IDENTIFIED DIFFERENTLY BY NOMENCLATURE THAN THE ITEMS DESIGNATED WITHIN THE DRAWING TITLE, PROVIDING THE GROSS WEIGHT OF A LOADED TOTE BIN DOES NOT EXCEED 5,255 POUNDS.
- J. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE, FOR EXAMPLE, 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE OR 1-5/8" THICK BY 5-5/8" WIDE AND 2" X 4" IS ACTUALLY 1-1/2" THICK BY 3-1/2" WIDE OR 1-5/8" THICK BY 3-5/8" WIDE.
- K. NOTICE: A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES. ALSO, A STAGGERED NAILING PATTERN WILL BE USED WHEN DUNNAGE IS NAILED TO THE FLOOR OF THE TRANSPORTING VEHICLE, OR WHEN LAMINATING DUNNAGE. ADDITIONALLY, THE NAILING PATTERN FOR AN UPPER PIECE OF LAMINATED DUNNAGE WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL FOR THAT PIECE WILL NOT BE DRIVEN THROUGH ONTO OR RIGHT BESIDE A NAIL IN A LOWER PIECE.

(CONTINUED AT RIGHT)

MATERIAL SPECIFICATIONS

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

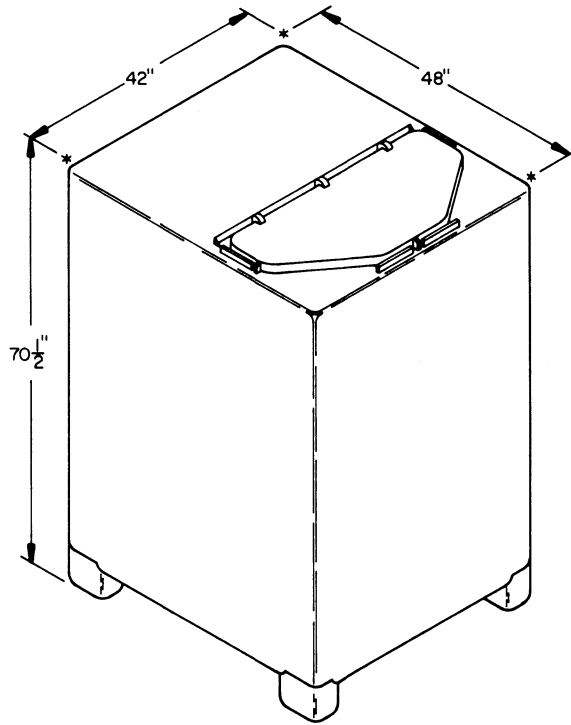
NAILS ----- : COMMON, CEMENT COATED OR CHEMICALLY ETCHED;
FED SPEC FF-N-105.
ALT: ANNULAR-RING TYPE NAIL OF THE SAME SIZE.

WIRE ----- : FED SPEC QQ-W-461.

STRAPPING, STEEL: TYPE I OR IV, CLASS A OR B; FED SPEC QQ-5-781.

SEAL, STRAPPING : COMMERCIAL GRADE.

- L. IF THE CAR BEING USED IS EQUIPPED WITH A NAILABLE METAL FLOOR AND A NAIL SIZE FOR FLOOR NAILING IS MARKED ON THE SIDE WALL OF THE CAR, THAT GUIDANCE SHOULD BE APPLIED FOR THE NAILING OF THE APPLICABLE DUNNAGE PIECES. IF A NAIL SIZE IS NOT SPECIFIED, 20d NAILS SHOULD BE USED. HOWEVER, IF 20d NAILS CANNOT BE PROPERLY NAILED, 16d NAILS CAN BE USED, BUT NOTHING SMALLER THAN 16d NAILS. ALSO, IF THE LOCATION OF PIECES NAILED TO THE CAR FLOOR IS SUCH THAT PROPER NAILING INTO THE NAILING CHANNELS IN THE CAR FLOOR CANNOT BE ACHIEVED, THE LENGTH AND/OR WIDTH OF THESE PIECES MAY BE INCREASED AS NECESSARY.
- M. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT AS SHOWN, A MINIMUM OF TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) PAIR OF CRIMPS PER SEAL MUST BE USED TO SEAL THE JOINT. ALL SEALING MUST BE ACCOMPLISHED ON TOP OF A LOAD.
- N. PORTIONS OF THE DEPICTED CARS, SUCH AS A CAR SIDE WALL, HAVE BEEN OMITTED FROM THE LOAD VIEWS FOR CLARITY PURPOSES.
- O. CAUTION: CARS SELECTED FOR SHIPMENT OF THE SPECIFIED LOADS MUST ALSO MEET THE FOLLOWING SPECIFICATIONS: WOOD FLOORS MUST BE AT LEAST 2-1/4" THICK. THE CAR MUST HAVE AT LEAST THREE LONGITUDINAL FLOOR STRINGERS BETWEEN THE CENTER SILL AND THE SIDE SILL ON EACH SIDE OF THE CAR. THESE MUST BE 3" FULL LENGTH STEEL "Z" SECTIONS WEIGHING 6.7 LBS PER FT, OR THREE STEEL "I" SECTIONS WEIGHING 5.7 LBS PER FT (OR ANOTHER SECTION OF EQUIVALENT STRENGTH). NOTICE: WHEN ORDERING A CAR FOR SHIPMENT OF A LOAD, THE SHIPPER HAS THE RESPONSIBILITY OF NOTIFYING THE SERVING CARRIER THAT THE CAR IS TO BE USED FOR LOADING A CONCENTRATED WEIGHT OF A HEAVY COMMODITY. IT IS ALSO THE SHIPPER'S RESPONSIBILITY TO LOAD ONLY CARS WHICH HAVE BEEN INSPECTED IN ACCORDANCE WITH THE "CAUTION" PORTION OF THIS NOTE. REFERENCE IS MADE TO RULE 1 (B) (1) OF ASSOCIATION OF AMERICAN RAILROADS CIRCULAR NO. 42-D, "GENERAL RULES COVERING LOADING OF CARLOAD SHIPMENTS OF COMMODITIES IN CLOSED CARS", DATED JUNE 15, 1967.
- P. NOTICE: WHEN POSITIONING TOTE BINS INTO A CAR, THEY ARE TO BE PLACED TIGHTLY AGAINST A CAR WALL AND PRESSED TOGETHER LENGTHWISE SO AS TO ELIMINATE AS MUCH OF THE SIDE WALL BULGE FROM THE BINS AS IS PRACTICAL. DUE TO EXCESSIVE CONTAINER SIDE WALL BOWING UNDER LOADED CONDITIONS, OR JUST TO ACHIEVE A TIGHT LOAD, A LOAD-COMPRESSING JACK MAY BE NECESSARY TO MOVE THE CONTAINERS INTO THEIR FINAL SHIPPING POSITION, PREVENTING VOIDS BETWEEN CONTAINERS AND BETWEEN CONTAINERS AND THE CAR SIDE WALLS. A HYDRAULIC TYPE JACK IS RECOMMENDED FOR THIS OPERATION. CAUTION: WHEN USING A JACK TO POSITION A CONTAINER OR TO COMPACT A LOAD THE JACK MUST BE USED AGAINST A CONTAINER STRONG POINT. THE STRONG POINTS ARE LOCATED AT THE BASE OF THE CONTAINER BODY AND JUST ABOVE THE CONTAINER LEGS. JACKING MUST NOT BE USED DIRECTLY AGAINST THE LOWER PART OF ANY LEG. ALSO, A SUITABLE PADDING IS NECESSARY BETWEEN THE JACK AND THE CONTAINERS TO PREVENT DAMAGE TO THE CONTAINERS. TWO-INCH (2") THICK LUMBER OR ANY OTHER MATERIAL OF SIMILAR CONSISTENCY MAY BE USED AS PADDING. PRIOR TO INSTALLING THE CENTER GATES, THE OPPOSITE FACES OF A LOAD SHOULD BE "SQUARED UP", SO THAT ALL OF THE LOAD-BLOCKING STRUTS OR SOLID FILL PIECES WILL BE NEARLY THE SAME LENGTH OR THICKNESS.
- Q. CAUTION: IF A FORKLIFT TRUCK IS USED TO LOAD A CAR, THE USE OF A SUITABLE PADDING SUCH AS RUBBER MATTING FASTENED TO THE VERTICAL PORTION OF THE FORKLIFT TINES MAY BE NECESSARY TO PREVENT MARRING, SCRATCHING, OR ANY OTHER DAMAGE TO THE TOTE BINS DURING CARLOADING OPERATIONS.
- R. WHEN SELECTING RAIL CARS, EVERY EFFORT SHOULD BE MADE TO GET BOX CARS THAT DO NOT HAVE BOWED END WALLS. CARS WITH BOWED ENDS CAN BE USED, HOWEVER, IF AN END WALL IS BOWED OUTWARD MORE THAN ONE-INCH (1"), EITHER FROM SIDE TO SIDE OR FROM FLOOR TO EAVE, AN END-OF-CAR BULKHEAD AS SPECIFIED ON PAGE 7 MUST BE INSTALLED TO PROVIDE A "SQUARED OFF" SURFACE FOR THE LOAD AT THE END OF THE CAR.
- S. ALTHOUGH THEY SHOULD BE AVOIDED TO THE MAXIMUM EXTENT POSSIBLE, ALL-METAL CARS OR CARS WITH METAL FLOORS OR CARS EQUIPPED FOR MECHANICAL LOAD-BRACING SYSTEMS CAN BE USED. HOWEVER, ALL EXPOSED METAL SURFACES WITHIN THE CARS MUST BE COVERED WITH SUITABLE NON-METALLIC CAR LINING MATERIAL, SUCH AS FIBERBOARD OR THIN PLYWOOD. LINING IS TO BE USED ON SIDE AND END WALLS TO COVER ANY EXPOSED METAL, FROM THE FLOOR TO AT LEAST ONE-FOOT ABOVE THE LOAD. METAL-COVERING MATERIAL WILL BE SECURED SUFFICIENTLY TO PREVENT DISPLACEMENT DURING SHIPMENT. IN ADDITION TO THE REQUIREMENT FOR COVERING EXPOSED METAL, THE FOLLOWING CRITERIA ARE ALSO VALID AND MUST BE OBSERVED.
1. CARS CONTAINING "LOAD DIVIDER" BULKHEADS MUST NOT BE USED. HOWEVER, CARS WITHOUT LOAD DIVIDERS BUT EQUIPPED FOR THEIR INSTALLATION CAN BE USED PROVIDING THE METAL LATCH RAILS IN THE FLOOR ARE COVERED AS SPECIFIED ABOVE.
 2. CARS EQUIPPED WITH A MECHANICAL BRACING SYSTEM* CONSISTING OF ADJUSTABLE WALL MEMBERS AND CROSS MEMBERS (LOAD-SHORING BEAMS) CAN BE USED IF THE ADJUSTABLE WALL MEMBERS AND CROSS MEMBERS ARE REMOVED FROM THE CAR AND THE EXPOSED METAL SURFACES ARE COVERED AS SPECIFIED ABOVE.
 3. CARS EQUIPPED WITH A MECHANICAL BRACING SYSTEM* CONSISTING OF PERMANENTLY FIXED WALL RAILS AND CROSS MEMBERS (LOAD-SHORING BEAMS) CAN BE USED IF THE CROSS MEMBERS ARE REMOVED FROM THE CAR OR LOCKED INTO WALL RAILS AT LEAST ONE-FOOT ABOVE THE LOAD, AND PROVIDING THE EXPOSED METAL WALL RAILS ARE COVERED AS SPECIFIED ABOVE.
- *SOME MECHANICAL SYSTEMS ALSO HAVE DOOR SPANNING BEAMS TO PROVIDE DOOR PROTECTION. BEFORE A MECHANICAL CAR CAN BE USED, THESE BEAMS MUST ALSO BE REMOVED FROM THE CAR OR LOCKED INTO THE DOOR POSTS OF THE CAR AT LEAST ONE-FOOT ABOVE THE HEIGHT OF THE LOAD.



TOTE BIN

TARE WEIGHT----- 255 POUNDS
GROSS WEIGHT----- 5,255 POUNDS (MAX).
CUBE----- 82.3 CUBIC FEET.

INDICATES SIDE OF
PIECES MARKED ③

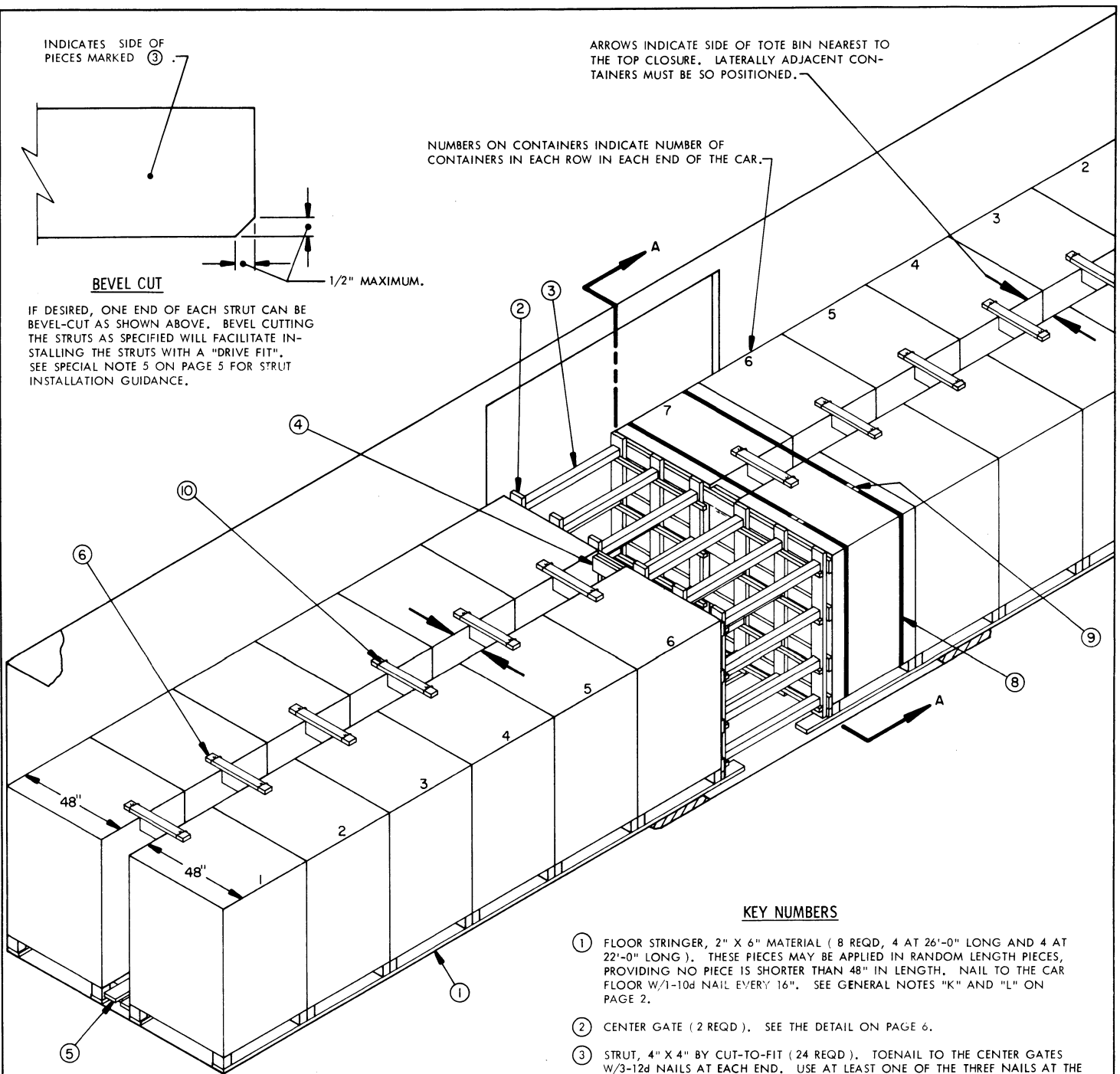
ARROWS INDICATE SIDE OF TOTE BIN NEAREST TO
THE TOP CLOSURE. LATERALLY ADJACENT CON-
TAINERS MUST BE SO POSITIONED.

NUMBERS ON CONTAINERS INDICATE NUMBER OF
CONTAINERS IN EACH ROW IN EACH END OF THE CAR.

BEVEL CUT

1/2" MAXIMUM.

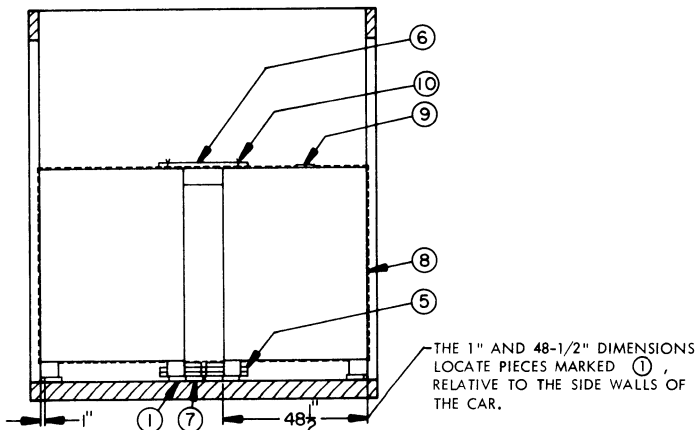
IF DESIRED, ONE END OF EACH STRUT CAN BE
BEVEL-CUT AS SHOWN ABOVE. BEVEL CUTTING
THE STRUTS AS SPECIFIED WILL FACILITATE IN-
STALLING THE STRUTS WITH A "DRIVE FIT".
SEE SPECIAL NOTE 5 ON PAGE 5 FOR STRUT
INSTALLATION GUIDANCE.



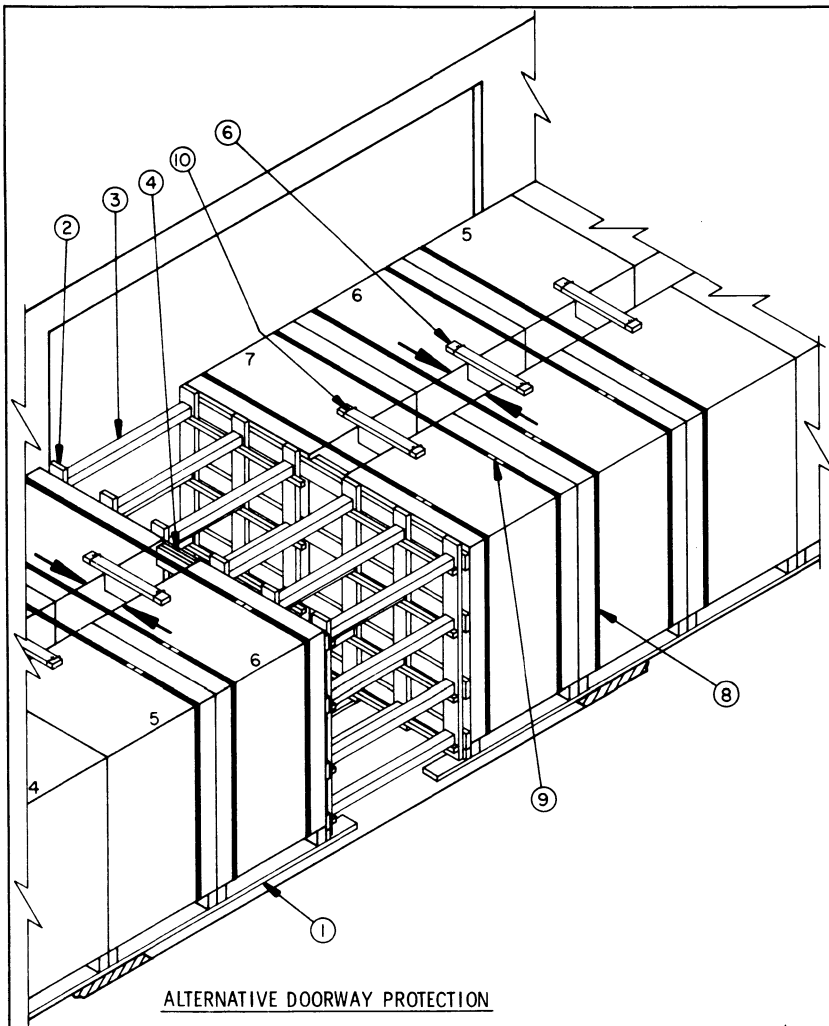
ISOMETRIC VIEW

KEY NUMBERS

- ① FLOOR STRINGER, 2" X 6" MATERIAL (8 REQD, 4 AT 26'-0" LONG AND 4 AT 22'-0" LONG). THESE PIECES MAY BE APPLIED IN RANDOM LENGTH PIECES, PROVIDING NO PIECE IS SHORTER THAN 48" IN LENGTH. NAIL TO THE CAR FLOOR W/1-10d NAIL EVERY 16". SEE GENERAL NOTES "K" AND "L" ON PAGE 2.
- ② CENTER GATE (2 REQD). SEE THE DETAIL ON PAGE 6.
- ③ STRUT, 4" X 4" BY CUT-TO-FIT (24 REQD). TOENAIL TO THE CENTER GATES W/3-12d NAILS AT EACH END. USE AT LEAST ONE OF THE THREE NAILS AT THE SIDE OF THE STRUT. SEE "BEVEL CUT" DETAIL ABOVE.
- ④ GATE LOCATOR, 2" X 6" BY CUT-TO-FIT IN LENGTH (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE CENTER GATE W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ⑤ LOWER ANTI-SWAY BRACE (12 REQD). SEE THE DETAIL ON PAGE 6. NOTE THAT THE RETAINER PIECES ON ONE ASSEMBLY MUST BE DOUBLED AS SPECIFIED WITHIN THE BRACE DETAIL, AND THAT ALL OF THE ASSEMBLIES MUST BE FABRICATED WITHIN THE LOAD IN THEIR LOAD-BLOCKING LOCATIONS.
- ⑥ TOP ANTI-SWAY BRACE (13 REQD). SEE THE DETAIL ON PAGE 6.
- ⑦ DOORWAY PROTECTION, 2" X 6" X 48" (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/10-12d NAILS. NAIL THE SECOND PIECE TO THE FIRST AND THE THIRD PIECE TO THE SECOND IN A LIKE MANNER. SEE GENERAL NOTE "K" ON PAGE 2 AND THE "PARTIAL PLAN VIEW" DETAIL ON PAGE 5 FOR SPECIFIC INSTALLATION GUIDANCE.
- ⑧ DOORWAY PROTECTION, 1-1/4" X .035 X 32'-0" LONG STEEL STRAPPING (2 REQD FOR LOAD SHOWN), SEE SPECIAL NOTE 2 ON PAGE 5.
- ⑨ SEAL FOR 1-1/4" STRAPPING (4 REQD, 2 PER STRAP). SEE SPECIAL NOTE 4 ON PAGE 5.
- ⑩ TIE WIRE, NO. 14 GAGE WIRE 24" LONG (26 REQD). THREAD THE WIRE THROUGH THE SECURITY LOCK ASSEMBLY ON THE ADJACENT CONTAINER, OVER AND AROUND THE TOP ANTI-SWAY BRACE FORMING TWO (2) COMPLETE LOOPS. BRING THE TWO (2) ENDS TOGETHER AND TWIST TAUT.



SECTION A-A

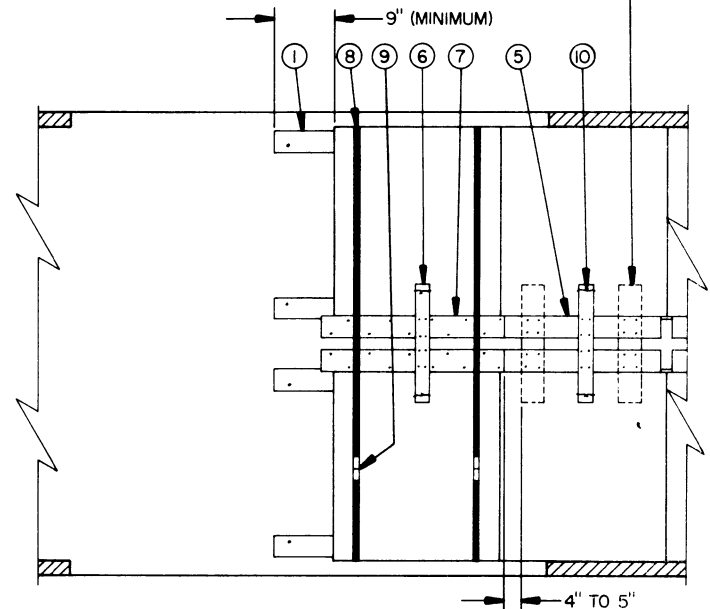


ALTERNATIVE DOORWAY PROTECTION

THE LOAD VIEW ABOVE DEPICTS A TYPICAL 26-CONTAINER LOAD IN A CAR WITH 14'-0" WIDE STAGGERED DOORS. IF THE CAR HAS A 15'-0" WIDE OR WIDER DOOR OPENING, TWO (2) ADDITIONAL PIECES MARKED ⑧ WILL BE REQUIRED. ATTENTION IS DIRECTED TO SPECIAL NOTE 2 ABOVE FOR ADDITIONAL GUIDANCE.

SPECIAL NOTES:

1. A 26-CONTAINER LOAD IS SHOWN IN A 50'-6" LONG BY 9'-2" WIDE BOX CAR WHICH HAS 10'-0" WIDE CONVENTIONAL SLIDING DOORS. SEE SPECIAL NOTE 3 BELOW.
2. FOR EACH CONTAINER STACK OF TWO CONTAINERS WHICH EXTENDS MORE THAN 36" PAST A DOOR POST INTO THE DOORWAY AREA ON ONE OR BOTH SIDES OF THE CAR BEING LOADED, PIECES MARKED ⑦ AND ⑧ MUST BE INSTALLED AS DEPICTED IN THE LOAD VIEW ON PAGE 4. FOR EACH STACK OF TWO CONTAINERS THAT EXTEND FROM 21" TO 36" PAST A DOOR POST, PIECES MARKED ⑦ AND ONE (1) PIECE MARKED ⑧ MUST BE INSTALLED FOR THAT CONTAINER STACK. SEE THE "ALTERNATIVE DOORWAY PROTECTION" DETAIL TO THE LEFT FOR SPECIFIC GUIDANCE.
3. WHEN LOADING A 28-CONTAINER LOAD, SEE THE "PROVISIONS FOR SOLID FILL" DETAIL AND THE SPECIAL NOTES ON PAGE 8 FOR SPECIAL BLOCKING PROVISIONS THAT MUST BE APPLIED.
4. STRAP SEALS, PIECES MARKED ⑨, MUST BE INSTALLED ON TOP OF THE LOAD AS SHOWN.
5. 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, THEN THE OTHER END WHICH CAN BE BEVELLED IF DESIRED, WILL 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 KEY NUMBER ③ (PAGE 4) AND SO THAT AS NEARLY AS PRACTICAL, EQUAL LENGTHS OF A NAIL IS EMBEDDED IN THE STRUT AND IN THE VERTICAL PIECE OF THE CENTER GATE. NOTE THAT IF A STRUT END IS BEVEL-CUT, THE BEVELLED 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.
LOWER ANTI-SWAY BRACE ASSEMBLY THAT REQUIRES DOUBLED RETAINER PIECES BECAUSE IT IS ADJACENT TO A "STRAPPED STACK". THE ADDITIONAL HEIGHT WILL PROVIDE CLEARANCE FOR THE TRIPLED PIECES MARKED ② AS A LOAD COMPACTS AND MOVES A FEW INCHES BACK AND FORTH DURING SHIPMENT.



PARTIAL PLAN VIEW

THE DETAIL ABOVE DEPICTS LOCATION OF DOORWAY PROTECTION DUNNAGE, PIECE MARKED ②, PRIOR TO INSTALLING CENTER GATES AND STRUTS WHICH ARE NOT SHOWN. NOTE THAT THE 4" TO 5" DIMENSION MUST BE OBSERVED WHEN LOADING A CARLOAD. THIS DIMENSION IS MEASURED FROM THE RETAINER PIECE ON THE LOWER ANTI-SWAY BRACE ASSEMBLY TO THE END OF THE DOORWAY PROTECTION PIECES MARKED ⑦.

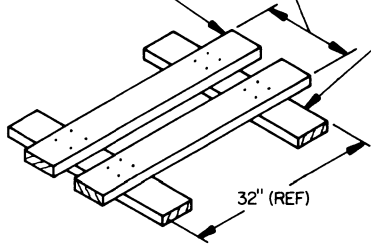
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 2"	64	22
2" X 4"	69	46
2" X 6"	528	528
4" X 4"	100	133
NAILS	NO. REQD	POUNDS
8d (2-1/2")	180	2-1/2
10d (3")	594	9-1/4
12d (3-1/4")	174	3
WIRE, NO. 14 GAGE	52' REQD	1 LB
STEEL STRAPPING, 1-1/4" X .035"	64' REQD	9 LBS
SEAL FOR 1-1/4" STRAPPING	4 REQD	NIL

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER	26	136,630 LBS (MAX)
DUNNAGE		1,848 LBS
TOTAL WEIGHT		138,478 LBS

BRACING PIECE, 2" X 6" X 40" (2 REQD).
NAIL TO THE RETAINER PIECES W/4-10d
NAILS AT EACH JOINT.

FABRICATE TO FIT
BETWEEN LATERALLY
ADJACENT CONTAINERS.

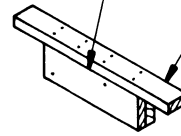


RETAINER PIECE, 2" X 6" X 30"
(2 REQD). NOTE: DOUBLE THE
PIECES THAT ARE USED ON AN
ASSEMBLY THAT IS BRACING A
STACK WHICH IS IMMEDIATELY
ADJACENT TO A "STRAPPED STACK".
LAMINATE W/3-10d NAILS.

LOWER ANTI-SWAY BRACE

THIS ASSEMBLY MUST BE FABRICATED
IN PLACE.

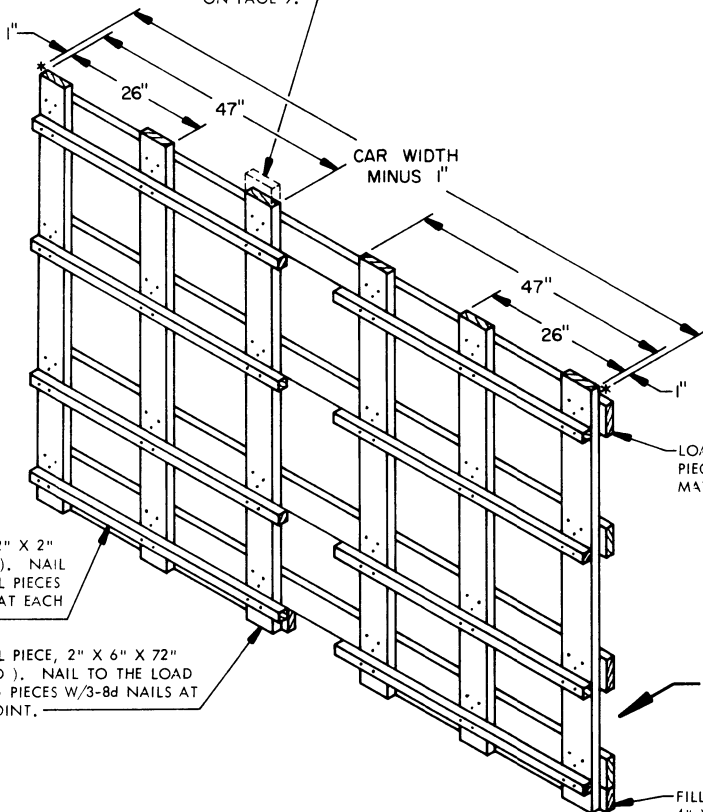
SPACER PIECE, 2" X 6" X
CUT-TO-FIT BETWEEN LATERALLY
ADJACENT CONTAINERS (DOUBLED)
(1 REQD). LAMINATE W/4-10d
NAILS (2 EACH SIDE).



RETAINER PIECE, 2" X 4" X 30"
(1 REQD). NAIL TO EACH
2" X 6" PIECE OF THE SPACER
PIECE W/4-10d NAILS.

TOP ANTI-SWAY BRACE

VERTICAL PIECES WILL BE 2" X 6" X 75"
INSTEAD OF 2" X 6" X 72" WHEN GATES
ARE CONSTRUCTED TO BLOCK A 28-UNIT
LOAD WITH SOLID FILL TYPE CENTER BLOCKING
(6 REQD ON ONE (1) OF A SET OF TWO (2)
GATES). SEE THE "SOLID FILL KEEPER INSTALL-
ATION" AND "SOLID FILL INSTALLATION" DETAILS
ON PAGE 9.

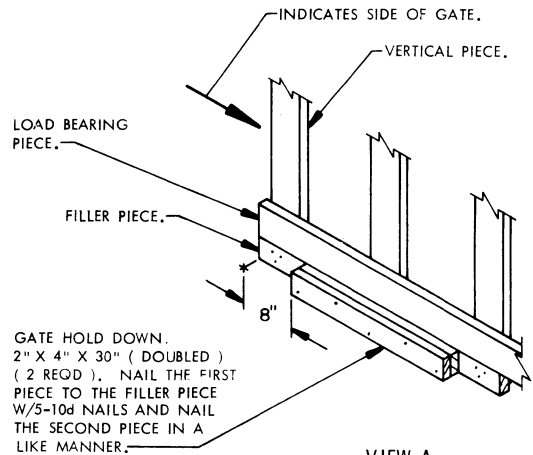


STRUT LEDGER, 2" X 2"
X 48" (8 REQD). NAIL
TO THE VERTICAL PIECES
W/2-10d NAILS AT EACH
JOINT.

VERTICAL PIECE, 2" X 6" X 72"
(6 REQD). NAIL TO THE LOAD
BEARING PIECES W/3-8d NAILS AT
EACH JOINT.

CENTER GATE

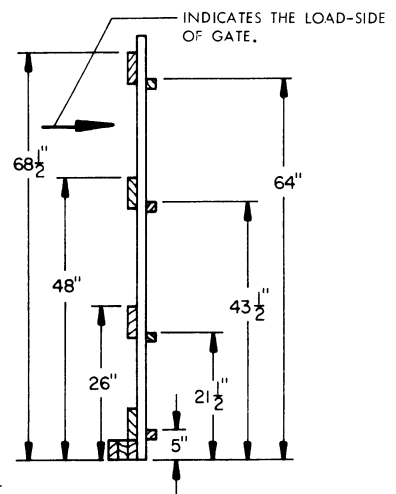
SEE "VIEW A" DETAIL ABOVE FOR
GUIDANCE APPLICABLE TO THE
"GATE HOLD DOWN" PIECES.



GATE HOLD DOWN,
2" X 4" X 30" (DOUBLED)
(2 REQD). NAIL THE FIRST
PIECE TO THE FILLER PIECE
W/5-10d NAILS AND NAIL
THE SECOND PIECE IN A
LIKE MANNER.

VIEW A

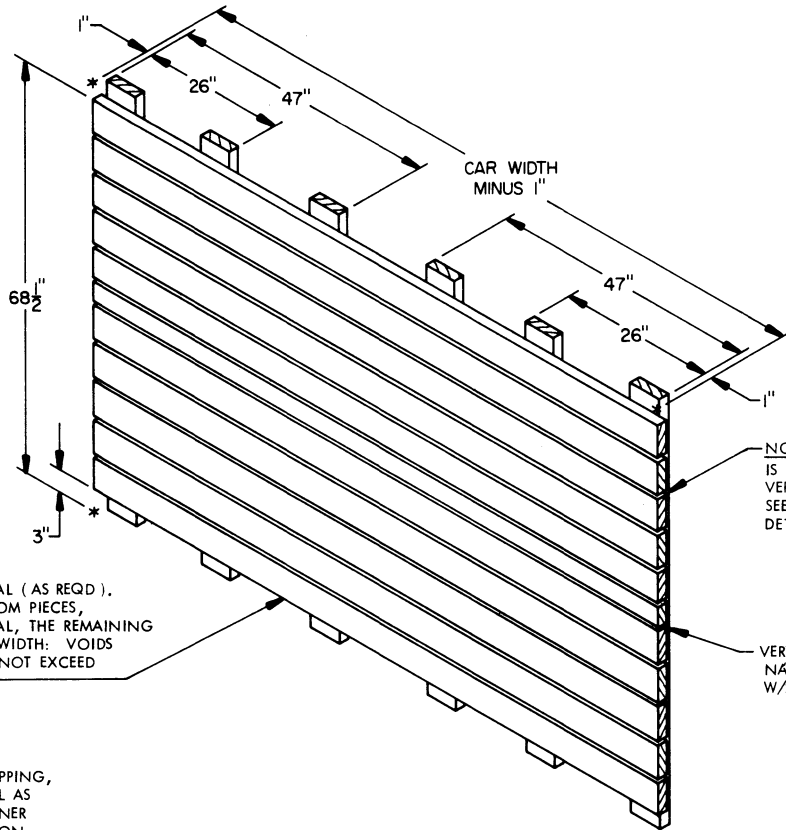
DEPicts LOCATION OF GATE
HOLD-DOWN PIECE.



END VIEW

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

FILLER PIECE, 2" X
4" X 48" (2 REQD).
NAIL TO THE VERTICAL
PIECES W/3-8d NAILS
AT EACH JOINT.



BEARING PIECE, 2" X 6" MATERIAL (AS REQD). EXCEPT FOR THE TOP AND BOTTOM PIECES, WHICH MUST BE 2" X 6" MATERIAL, THE REMAINING MATERIAL MAY BE OF RANDOM WIDTH: VOIDS BETWEEN BEARING PIECES MUST NOT EXCEED ONE INCH.

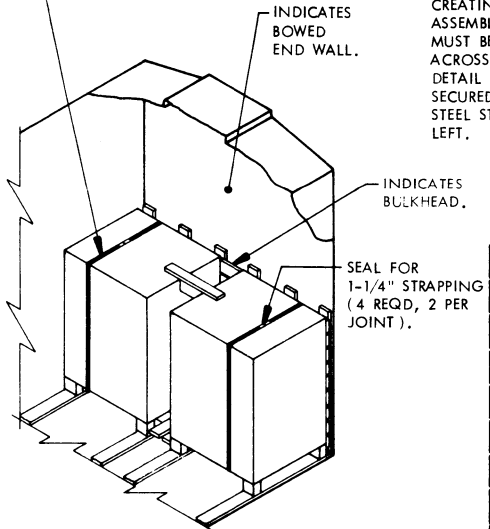
NOTE: ANY SHIM MATERIAL NECESSARY IS TO BE APPLIED TO THE BULKHEAD VERTICALS, OPPOSITE THE BEARING PIECES. SEE THE "SHIM MATERIAL APPLICATION" DETAILS BELOW.

VERTICAL PIECE, 2" X 6" X 72" (6 REQD). NAIL TO THE LOAD BEARING PIECES W/2-8d NAILS AT EACH JOINT.

BULKHEAD FOR CARS WITH BOWED END WALLS

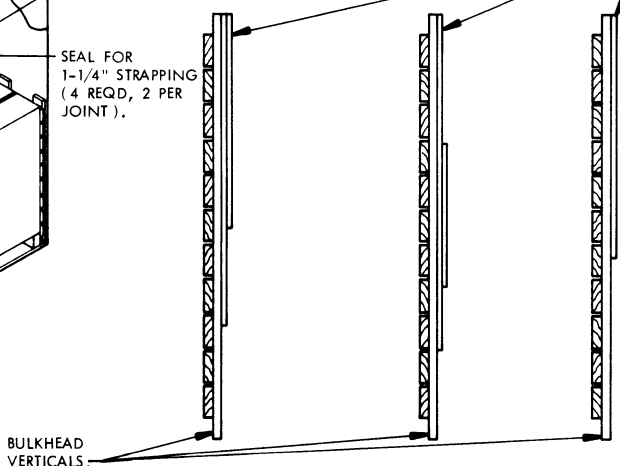
WHEN A BOX CAR HAS A BOWED END WALL IN EXCESS OF ONE-INCH, THUS CREATING AN UNEVEN BEARING SURFACE FOR THE CONTAINERS, A BULKHEAD ASSEMBLY AS DEPICTED ABOVE MUST BE USED. ADDITIONAL SHIM MATERIAL MUST BE FABRICATED AND NAILED TO THE VERTICALS TO INSURE FULL BEARING ACROSS THE BOWED END OF THE CAR. SEE THE "TYPICAL SHIM MATERIAL APPLICATION" DETAIL BELOW. NOTE: WHEN A BULKHEAD IS USED IN A CAR, IT WILL BE SECURED TO THE TWO ADJACENT CONTAINERS WITH TWO (2) 1-1/4" X .035" STEEL STRAPS AS SHOWN BY THE "BULKHEAD SECUREMENT" DETAIL TO THE LEFT.

STRAP, 1-1/4" X .035" STEEL STRAPPING, 19'-0" LONG (2 REQD). INSTALL AS SHOWN, TO ENCIRCLE A CONTAINER AND THE BULKHEAD AT A LOCATION SO AS TO MISS THE TOP COVER ASSEMBLY ON THE CONTAINER.



BULKHEAD SECUREMENT

SHIM MATERIAL, 1" X 6" BY CUT-TO-FIT IN LENGTH (AS REQD). NAIL TO THE BULKHEAD VERTICALS W/1-8d NAIL EVERY 12".

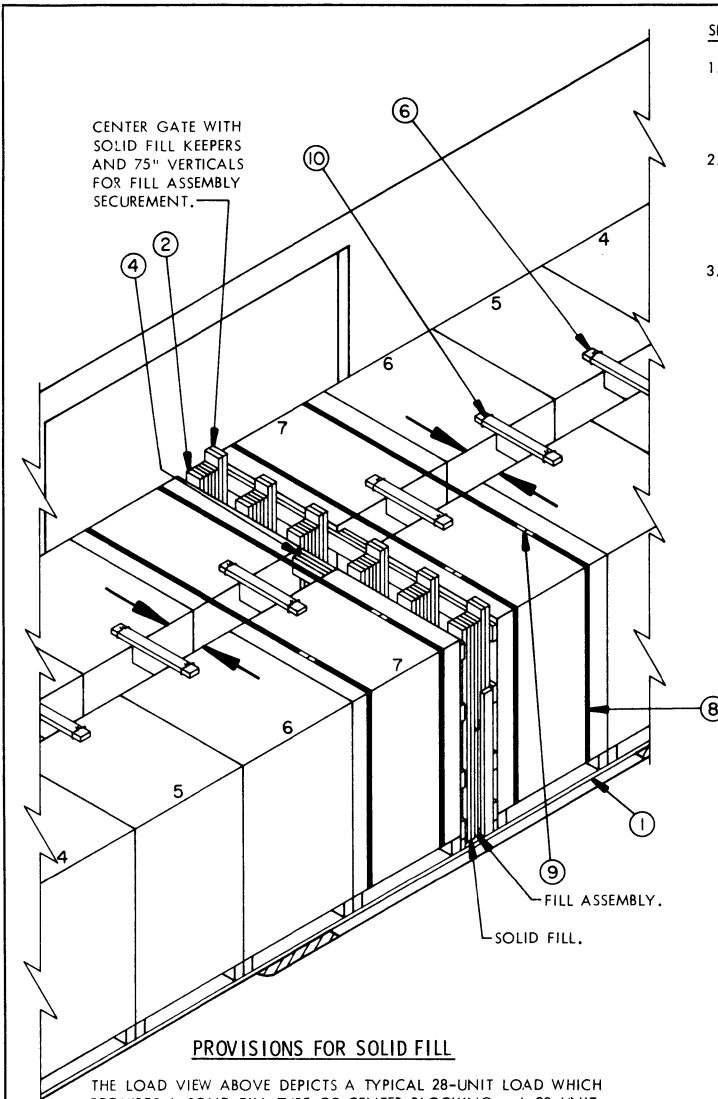


TYPICAL SHIM MATERIAL APPLICATION

THESE DETAILS DELINEATE TYPICAL METHODS OF APPLYING SHIM MATERIAL TO THE BULKHEAD VERTICALS. EACH VERTICAL OF THE BULKHEAD MAY REQUIRE DIFFERENT AMOUNTS OF SHIM MATERIAL TO INSURE EQUAL BEARING ACROSS THE WIDTH OF A BOWED END WALL.

SPECIAL NOTES:

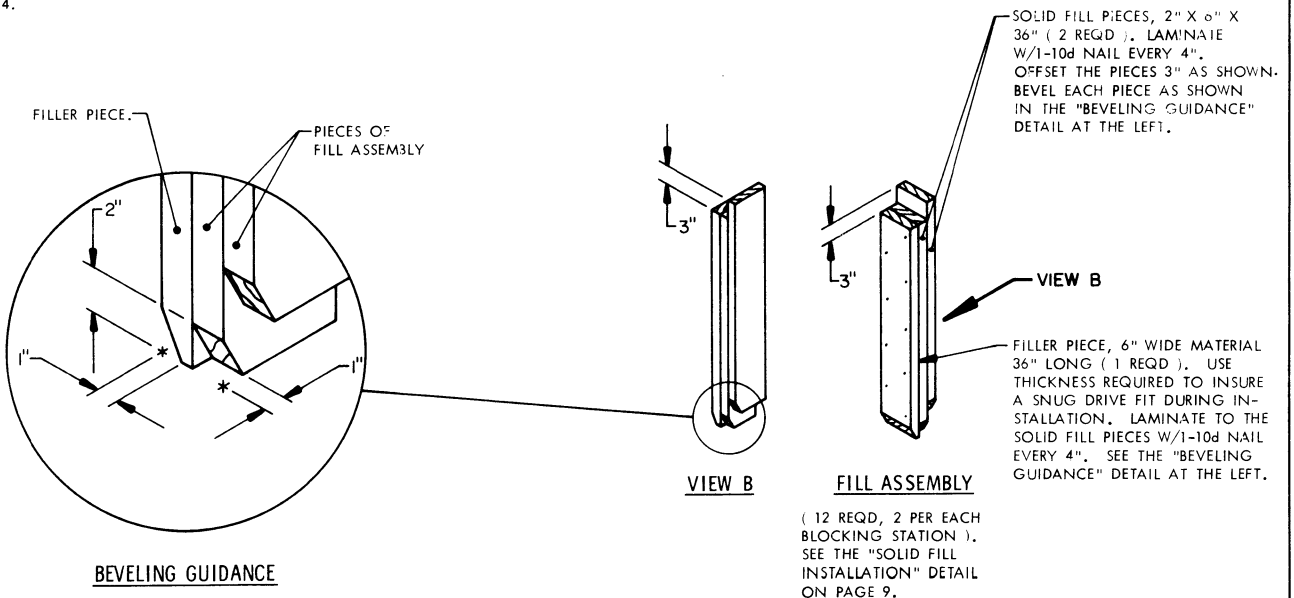
1. A 28-CONTAINER LOAD IS SHOWN IN A 50'-6" LONG BY 9'-2" WIDE BOX CAR WHICH HAS 10'-0" WIDE CONVENTIONAL SLIDING DOORS. LOADING AND BLOCKING WILL BE AS SPECIFIED FOR THE LOAD DEPICTED ON PAGE 4, EXCEPT AS DESCRIBED OTHERWISE ON THESE TWO PAGES, 8 AND 9.
2. WHEN CONSTRUCTING THE CENTER GATES, ONE (1) GATE WILL HAVE 75" VERTICALS AND SOLID FILL KEEPERS FOR THE SECUREMENT OF THE FILL ASSEMBLIES. SEE THE "SOLID FILL KEEPER INSTALLATION" DETAIL ON PAGE 9. THE OPPOSITE GATE WILL HAVE SOLID FILL MATERIAL LAMINATED DIRECTLY TO THE VERTICAL PIECES. SEE THE "SOLID FILL INSTALLATION" DETAIL ON PAGE 9.
3. THE GATE USED FOR SOLID FILL SECUREMENT WILL BE POSITIONED WITHIN THE LOAD FIRST. THE SECOND GATE WILL BE INSTALLED AFTER THE AMOUNT OF SOLID FILL REQUIRED HAS BEEN LAMINATED TO THE VERTICAL PIECES. THE AMOUNT OF SOLID FILL WILL NOT EXCEED A THICKNESS THAT WILL PREVENT THE GATE FROM BEING PLACED IN POSITION WHILE THE OPPOSITE GATE IS ALREADY IN POSITION, BECAUSE OF THE GATE HOLD DOWN PIECES ON THE LOAD SIDE OF THE GATE. WHEN BOTH GATES ARE IN POSITION, THE FILL ASSEMBLIES MAY BE DRIVEN INTO PLACE AS SHOWN IN THE "SOLID FILL INSTALLATION" DETAIL ON PAGE 9. THE THICKNESS OF THE FILLER PIECE, SHOWN IN THE "FILL ASSEMBLY" DETAIL BELOW, WILL BE OF A THICKNESS TO INSURE A SNUG DRIVE FIT WHEN INSTALLING. AFTER INSTALLING ALL TWELVE (12) FILL ASSEMBLIES, EACH OF THE TOP SIX (6) ASSEMBLIES WILL BE SECURED TO THE ADJACENT GATE VERTICAL PIECE W/5-10d NAILS. THE NAILS ARE TO BE DRIVEN THROUGH FROM THE LOAD SIDE IN THAT PORTION OF THE VERTICAL PIECE WHICH EXTENDS ABOVE THE LOAD. **NOTICE:** IN ACCORDANCE WITH CRITERIA OF GENERAL NOTE "P" ON PAGE 2, PRIOR TO INSTALLING THE CENTER GATES, THE OPPOSITE FACES OF A LOAD SHOULD BE "SQUARED UP" SO THAT THE THICKNESS OF THE SOLID FILL BLOCKING WILL BE NEARLY THE SAME AT EACH OF THE SIX BLOCKING STATIONS. TO AUGMENT THIS REQUIREMENT, IT IS RECOMMENDED THAT THE THICKNESS OF THE 72" LONG FILL PIECES THAT ARE ATTACHED TO THE VERTICALS OF ONE OF THE CENTER GATES AND THE THICKNESS OF THE "FILL ASSEMBLY" PIECES BE MADE THE SAME FOR EACH OF THE SIX BLOCKING STATIONS, TO THE MAXIMUM EXTENT POSSIBLE. USING PIECES OF THE SAME THICKNESS WILL ELIMINATE HIGH-PRESSURE POINTS WITHIN THE LOAD DURING SHIPMENT. TO ACHIEVE THIS BLOCKING FEATURE, IT IS PERMISSIBLE TO INSTALL SOME OF THE "FILL ASSEMBLY" PIECES WITH A LOOSER FIT THAN THE FIT ACCOMPLISHED WITH SOME OF THE OTHER PIECES, PROVIDING:
 - A. THE "FILL ASSEMBLY" PIECES AT ONE OR MORE OF THE SIX BLOCKING STATIONS ARE INSTALLED WITH A "DRIVE-FIT" DEGREE OF TIGHTNESS. **CAUTION:** THE THICKNESS OF THE TWO ASSEMBLIES USED AT ONE BLOCKING STATION MUST BE THE SAME.
 - B. NO MORE THAN ONE-INCH (1") OF UNFILLED SPACE IS TO BE ALLOWED AT ANY ONE OF THE SIX BLOCKING STATIONS.

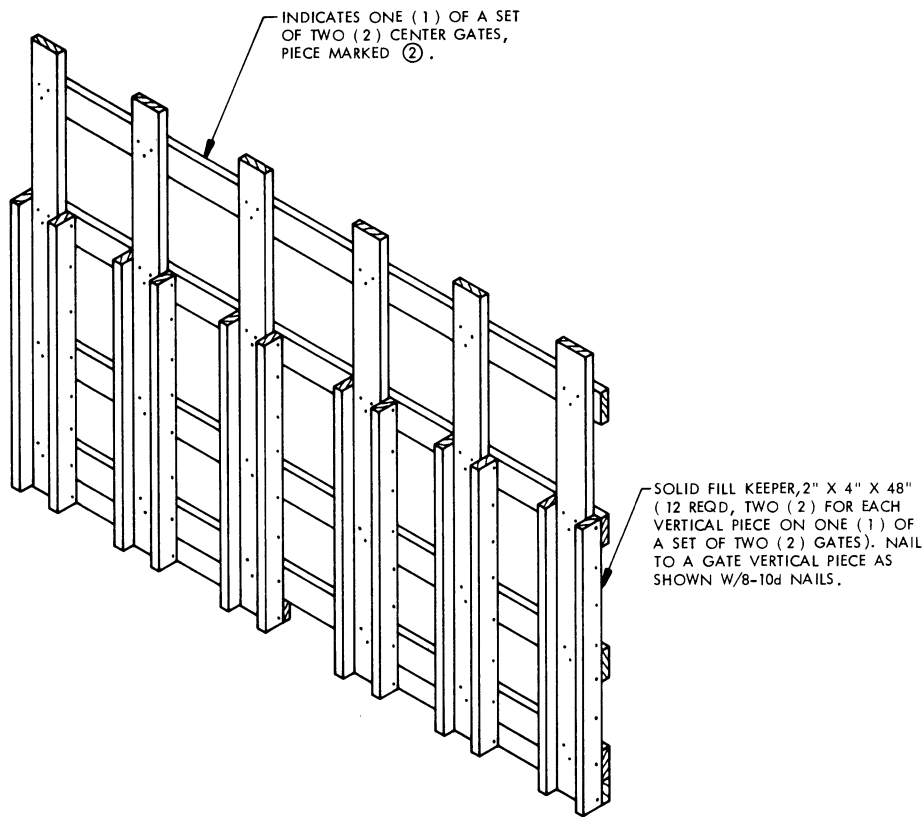


PROVISIONS FOR SOLID FILL

THE LOAD VIEW ABOVE DEPICTS A TYPICAL 28-UNIT LOAD WHICH REQUIRES A SOLID FILL TYPE OF CENTER BLOCKING. A 28-UNIT LOAD WILL BE LOADED AND BLOCKED IN ACCORDANCE WITH THE SPECIFICATIONS SET FORTH FOR THE 26-UNIT CARLOAD DEPICTED ON PAGE 4, EXCEPT FOR THE FOLLOWING:

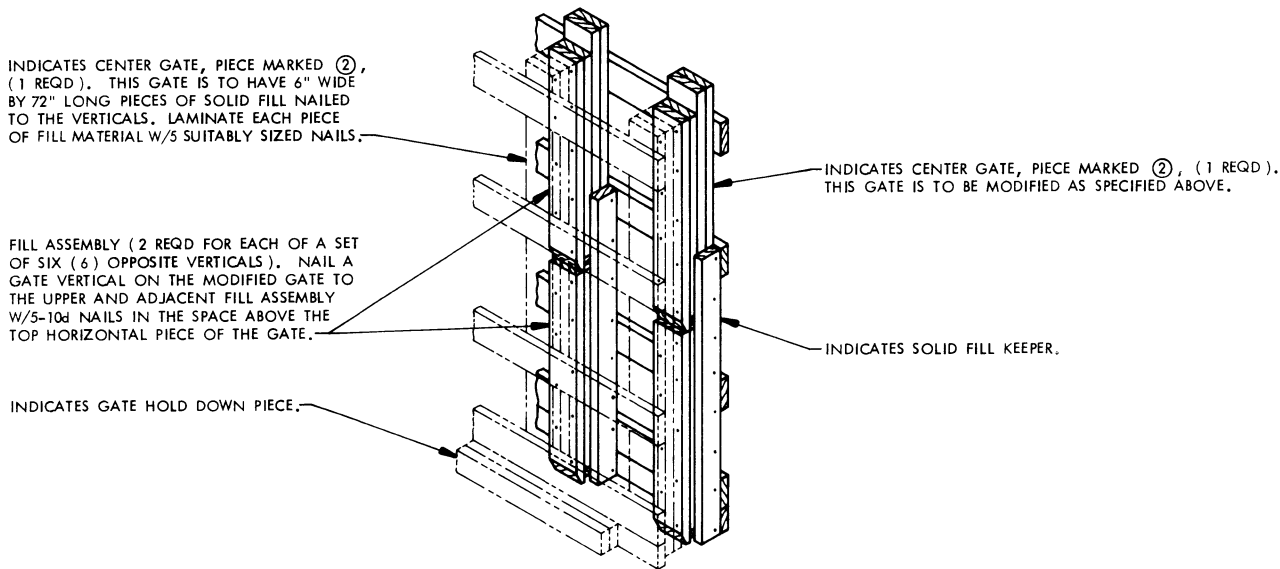
- A. PIECES MARKED ① MUST BE OF A LENGTH TO EXTEND FROM END WALL TO END WALL.
- B. ADDITIONAL PIECES MARKED ⑥ THRU ⑩ WILL BE REQUIRED TO SECURE THE ADDITIONAL STACK OF TWO CONTAINERS.
- C. A SOLID FILL TYPE OF CENTER BLOCKING WILL BE USED INSTEAD OF STRUTS, MARKED AS PIECES ③ FOR THE BASIC LOAD ON PAGE 4.





SOLID FILL KEEPER INSTALLATION

WHEN CONSTRUCTING CENTER GATES FOR SOLID FILL TYPE CENTER BLOCKING, THEY WILL BE CONSTRUCTED IN ACCORDANCE WITH GATE SPECIFICATIONS DELINEATED ON PAGE 6, EXCEPT THE 2" X 2" STRUTS LEDGERS WILL BE OMITTED AND ONE (1) OF A SET OF TWO (2) GATES WILL BE CONSTRUCTED WITH 75" INSTEAD OF 72" LONG VERTICAL PIECES. SOLID FILL KEEPERS AS DELINEATED ABOVE WILL BE ADDED TO ONE GATE. THIS GATE PROVIDES THE MEANS FOR SECURING THE "FILL ASSEMBLIES". THE OPPOSITE GATE WILL HAVE 6" WIDE BY 72" LONG PIECES OF SOLID FILL MATERIAL NAILED TO THE GATE VERTICALS, AS REQUIRED TO ELIMINATE VOIDS. CAUTION: THE AMOUNT OF FILL MATERIAL LAMINATED TO THE VERTICALS WILL NOT EXCEED A THICKNESS THAT WOULD PREVENT BOTH GATES TO BE POSITIONED WITHIN THE LOAD. SEE SPECIAL NOTE 3 ON PAGE 8.



SOLID FILL INSTALLATION

SEE SPECIAL NOTE 3 ON PAGE 8.

