

APPROVED BY

BUREAU OF EXPLOSIVES  
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# LOADING AND BRACING (TL) IN VAN TYPE TRAILERS OF "TOTE BIN" CONTAINERS LOADED WITH BULK EXPLOSIVES

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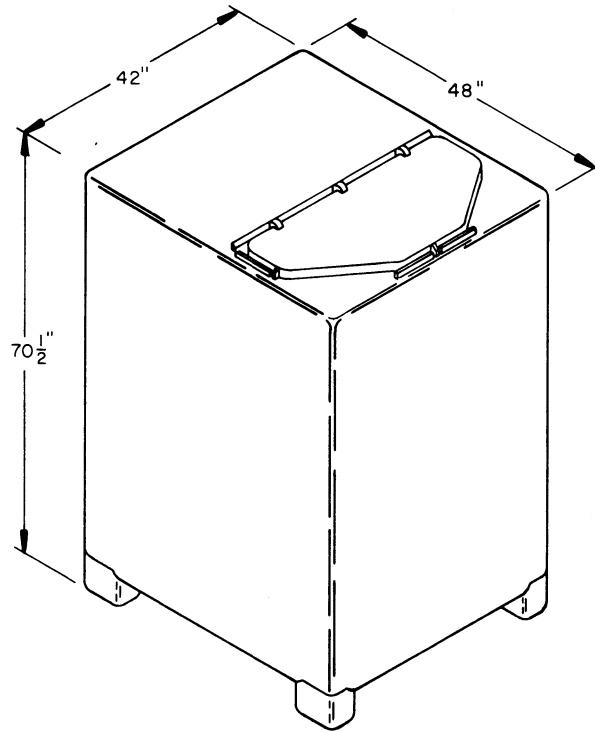
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GENERAL NOTES

- 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 VAN TYPE TRAILERS 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 THIS DRAWING WILL BE USED UNTIL CANCELLED AND/OR SUPERSEDED BY A USAMC 19-48 SERIES DRAWING.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
  - TARE WEIGHT----- 255 POUNDS
  - GROSS WEIGHT ----- 5,255 POUNDS (MAX)
  - CUBE----- 82.3 CUBIC FEET
- D. THE OUTLOADING PROCEDURES DEPICTED ON PAGES 4 THROUGH 7 ARE BASED ON CONVENTIONAL TYPE CLOSED OR OPEN TOP VAN TRAILERS WHICH ARE 90" THROUGH 92" WIDE (INSIDE DIMENSION) AND WHICH ARE 40'-0" LONG. THE PROCEDURES ARE APPLICABLE TO VAN TRAILERS HAVING WOOD OR WOOD AND METAL FLOORS, THESE PROCEDURES REQUIRE A TRAILER HAVING A NAILABLE FLOOR.
- E. THE OUTLOADING PROCEDURE DEPICTED ON PAGES 8 AND 9 IS BASED ON CONVENTIONAL TYPE CLOSED OR OPEN TOP VAN TRAILERS WHICH ARE 90" THROUGH 92" WIDE (INSIDE DIMENSION) AND WHICH ARE 40'-0" LONG. THIS PROCEDURE IS APPLICABLE TO VAN TRAILERS HAVING WOOD, WOOD AND METAL, AND METAL FLOORS. THIS PROCEDURE DOES NOT REQUIRE A TRAILER HAVING A NAILABLE FLOOR.
- F. THE GROSS WEIGHT AND AXLE DISTRIBUTION OF WEIGHT FOR A LOAD WILL BE THE RESPONSIBILITY OF THE CARRIER. THE CARRIER WILL ADVISE THE SHIPPER OF THE APPLICABLE LOADING REQUIREMENTS; AND THE SHIPPER WILL LOAD ACCORDINGLY.
- G. THE NUMBER OF LADING UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE TRAILER TO BE LOADED OR THE QUANTITY TO BE SHIPPED. HOWEVER, THE APPROVED METHODS SHOWN HEREIN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING, AND STAYING OF THE DESIGNATED ITEMS.
- H. OTHER TYPES OF LADING ITEMS MAY BE LOADED INTO TRAILERS WHICH ARE PARTIALLY LOADED WITH THE DESIGNATED 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.
- J. THE OUTLOADING PROCEDURES SPECIFIED HEREIN CAN ALSO BE UTILIZED FOR SHIPMENT OF THE TOTE BIN CONTAINERS WHEN THEY ARE EMPTY OR LOADED WITH AN ITEM WHICH IS IDENTIFIED DIFFERENTLY BY NOMENCLATURE THAN THE ITEM DESIGNATED WITHIN THE DRAWING TITLE.
- K. WHEN ANY STRAP IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) PAIR OF CRIMPS PER SEAL MUST BE USED. CAUTION: EXERCISE CARE DURING TENSIONING TO PREVENT DAMAGE TO THE CONTAINERS.
- L. 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.
- M. 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.
- N. PORTIONS OF THE TRAILER BODIES DEPICTED WITHIN THIS PROCEDURAL DRAWING, SUCH AS ONE OF THE SIDE WALLS, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.
- O. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

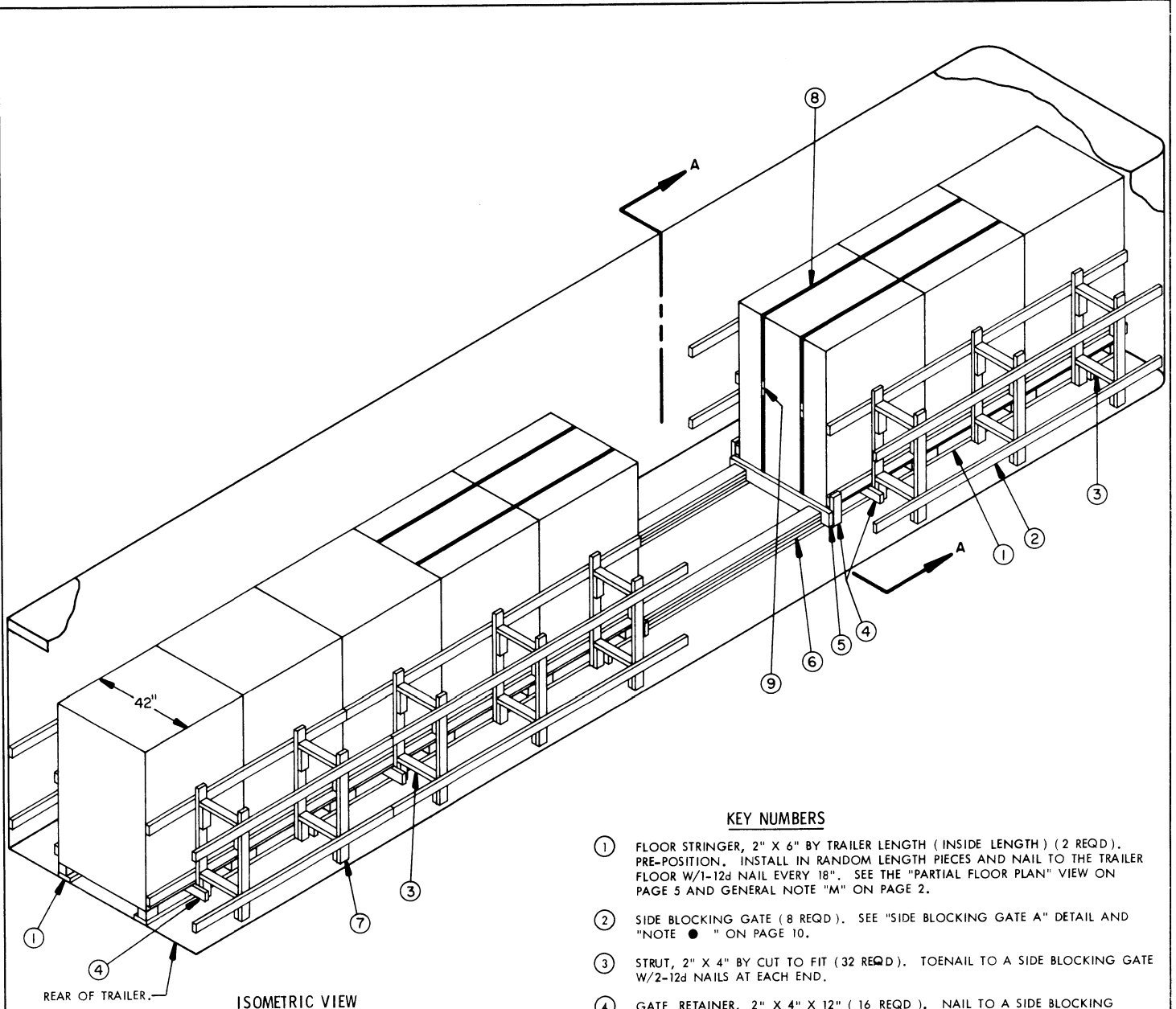
MATERIAL SPECIFICATIONS

- LUMBER ----- : SEE TM 743-200-1, DUNNAGE LUMBER; FED SPEC MM-L-751.
- NAILS----- : COMMON, CEMENT COATED OR CHEMICALLY ETCHED,  
FED SPEC FF-N-105.  
ALT: ANNULAR-RING TYPE NAIL OF SAME SIZE.
- STRAPPING, STEEL-- : TYPE I OR IV, CLASS A OR B; FED SPEC QQ-S-781.
- STRAP SEAL----- : COMMERCIAL GRADE.



TOTE BIN

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

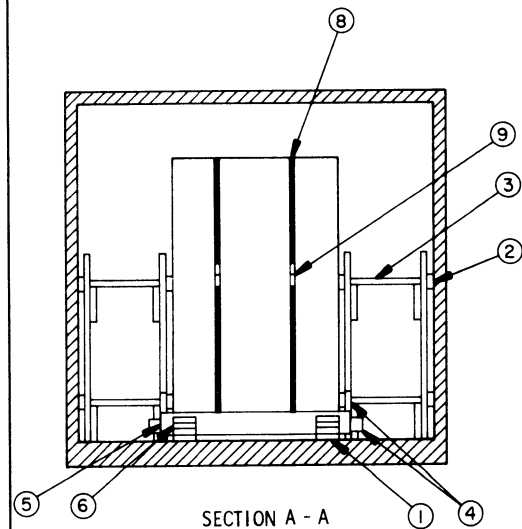


ISOMETRIC VIEW

REAR OF TRAILER

KEY NUMBERS

- ① FLOOR STRINGER, 2" X 6" BY TRAILER LENGTH ( INSIDE LENGTH ) ( 2 REQD ). PRE-POSITION. INSTALL IN RANDOM LENGTH PIECES AND NAIL TO THE TRAILER FLOOR W/1-12d NAIL EVERY 18". SEE THE "PARTIAL FLOOR PLAN" VIEW ON PAGE 5 AND GENERAL NOTE "M" ON PAGE 2.
- ② SIDE BLOCKING GATE ( 8 REQD ). SEE "SIDE BLOCKING GATE A" DETAIL AND "NOTE ● " ON PAGE 10.
- ③ STRUT, 2" X 4" BY CUT TO FIT ( 32 REQD ). TOENAIL TO A SIDE BLOCKING GATE W/2-12d NAILS AT EACH END.
- ④ GATE RETAINER, 2" X 4" X 12" ( 16 REQD ). NAIL TO A SIDE BLOCKING GATE W/3-10d NAILS.
- ⑤ BEARING PIECE, 2" X 6" X 48" ( 2 REQD ).
- ⑥ STRUTS, 2" X 6" MATERIAL, REFERENCE: 7'-3" ( TRIPLED ) ( 2 REQD ). NAIL THE FIRST PIECE TO THE FLOOR STRINGER W/1-12d NAIL EVERY 6". NAIL EACH ADDITIONAL PIECE IN A LIKE MANNER. SEE GENERAL NOTE "M" ON PAGE 2. TOENAIL THE TOP PIECE TO THE BEARING PIECE W/2-12d NAILS AT EACH JOINT.
- ⑦ SIDE BLOCKING GATE ( 4 REQD ). SEE "SIDE BLOCKING GATE B" ON PAGE 10.
- ⑧ UNITIZING STRAP, 1-1/4" X .035" X 30'-0" LONG STEEL STRAPPING ( 4 REQD ). PRE-POSITION.
- ⑨ SEAL FOR 1-1/4" STRAPPING ( 8 REQD, 2 PER STRAP ). SEE GENERAL NOTE "K" ON PAGE 2.

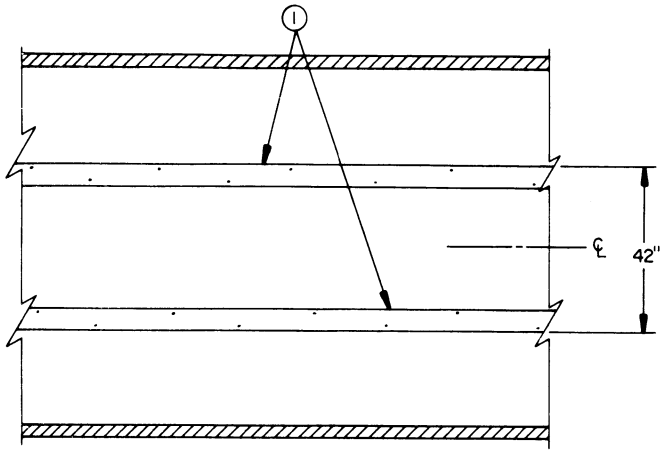


SECTION A - A

8-UNIT LOAD IN A TRAILER WHICH IS EQUIPPED WITH  
AVAILABLE FLOORS ( ONE-CONTAINER WIDE LOAD )

**SPECIAL NOTES:**

1. AN 8-UNIT LOAD IS SHOWN IN A 40'-0" LONG BY 7'-6" WIDE ( INSIDE DIMENSION ) TRAILER THAT HAS ROUNDED CORNERS AT THE FORWARD END. A WIDER OR NARROWER TRAILER CAN BE USED. A SHORTER TRAILER CAN ALSO BE USED.
2. THE LOAD AS SHOWN ON PAGE 4 MAY BE ADJUSTED AS REQUIRED TO SATISFY THE NUMBER OF CONTAINERS TO BE SHIPPED.



**PARTIAL FLOOR PLAN**

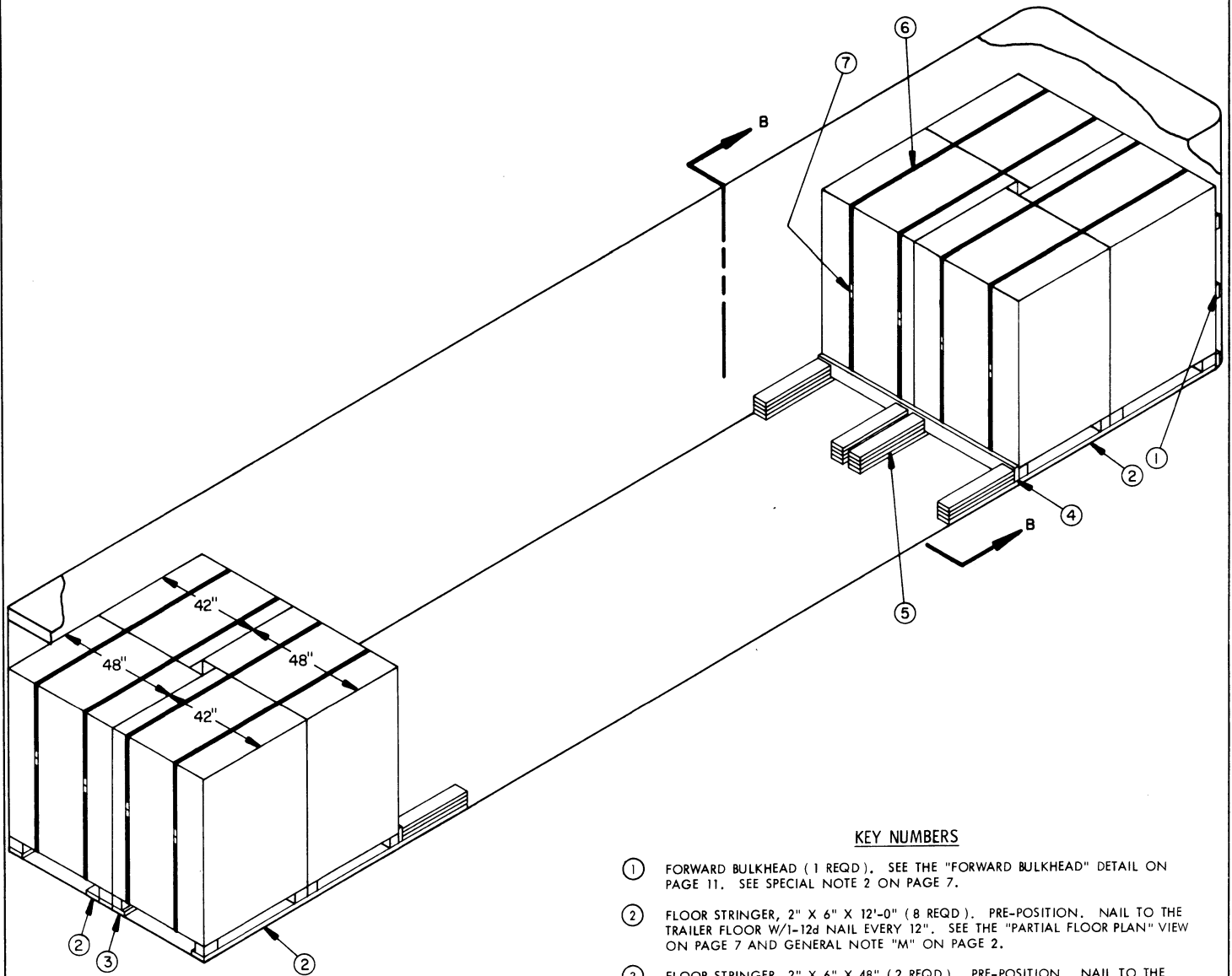
THE DETAIL ABOVE DEPICTS LOCATION OF THE PRE-POSITIONED FLOOR STRINGERS, PIECE MARKED ① .

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	496	330
2" X 6"	130	130
NAILS	NO. REQD	POUNDS
10d ( 3" )	480	7
12d ( 3-1/4" )	280	4-1/2
STEEL STRAPPING, 1-1/4" X .035"----- 120' REQD----- 17 LBS		
SEAL, FOR 1-1/4" STRAPPING ----- 8 REQD----- 1 LB		

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT ( APPROX )
CONTAINER -----	8 -----	42,040 LBS
DUNNAGE -----	-----	1,180 LBS
TOTAL WEIGHT-----		43,220 LBS

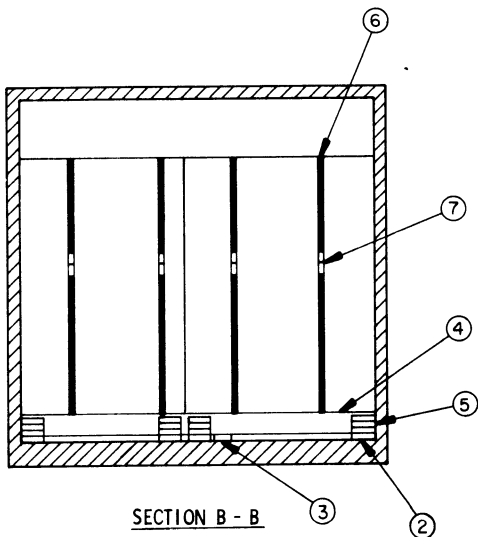
**8-UNIT LOAD IN A TRAILER WHICH IS EQUIPPED WITH AVAILABLE FLOORS ( ONE-CONTAINER WIDE LOAD )**



ISOMETRIC VIEW

KEY NUMBERS

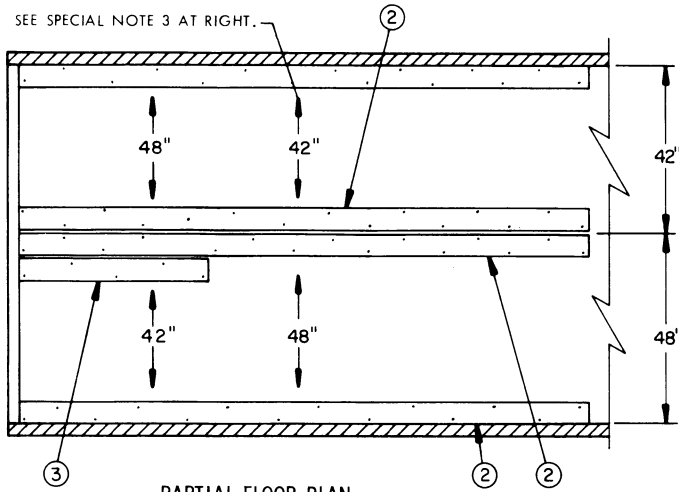
- ① FORWARD BULKHEAD ( 1 REQD ). SEE THE "FORWARD BULKHEAD" DETAIL ON PAGE 11. SEE SPECIAL NOTE 2 ON PAGE 7.
- ② FLOOR STRINGER, 2" X 6" X 12'-0" ( 8 REQD ). PRE-POSITION. NAIL TO THE TRAILER FLOOR W/1-12d NAIL EVERY 12". SEE THE "PARTIAL FLOOR PLAN" VIEW ON PAGE 7 AND GENERAL NOTE "M" ON PAGE 2.
- ③ FLOOR STRINGER, 2" X 6" X 48" ( 2 REQD ). PRE-POSITION. NAIL TO THE TRAILER FLOOR W/5-12d NAILS.
- ④ BEARING PIECE, 2" X 6" BY TRAILER WIDTH MINUS 1/2" ( 2 REQD ).
- ⑤ BACK-UP CLEAT, 2" X 6" X 30" ( TRIPLED ) ( 8 REQD ). NAIL FIRST PIECE TO THE FLOOR STRINGER W/7-12d NAILS. NAIL EACH ADDITIONAL PIECE IN A LIKE MANNER. TOENAIL TOP PIECE TO BEARING PIECE W/2-12d NAILS.
- ⑥ UNITIZING STRAP, 1-1/4" X .035" X 29'-0" LONG STEEL STRAPPING ( 8 REQD ). PRE-POSITION.
- ⑦ SEAL FOR 1-1/4" STRAP ( 16 REQD, 2 PER STRAP ). SEE GENERAL NOTE "K" ON PAGE 2.



SECTION B - B

8-UNIT LOAD IN A TRAILER WHICH IS EQUIPPED WITH NAILABLE FLOORS ( CHIMNEY PATTERN )

SEE SPECIAL NOTE 3 AT RIGHT.



THE DETAIL ABOVE DEPICTS THE LOCATION OF THE PRE-POSITIONED FLOOR STRINGERS, PIECES MARKED ② AND ③.

**SPECIAL NOTES:**

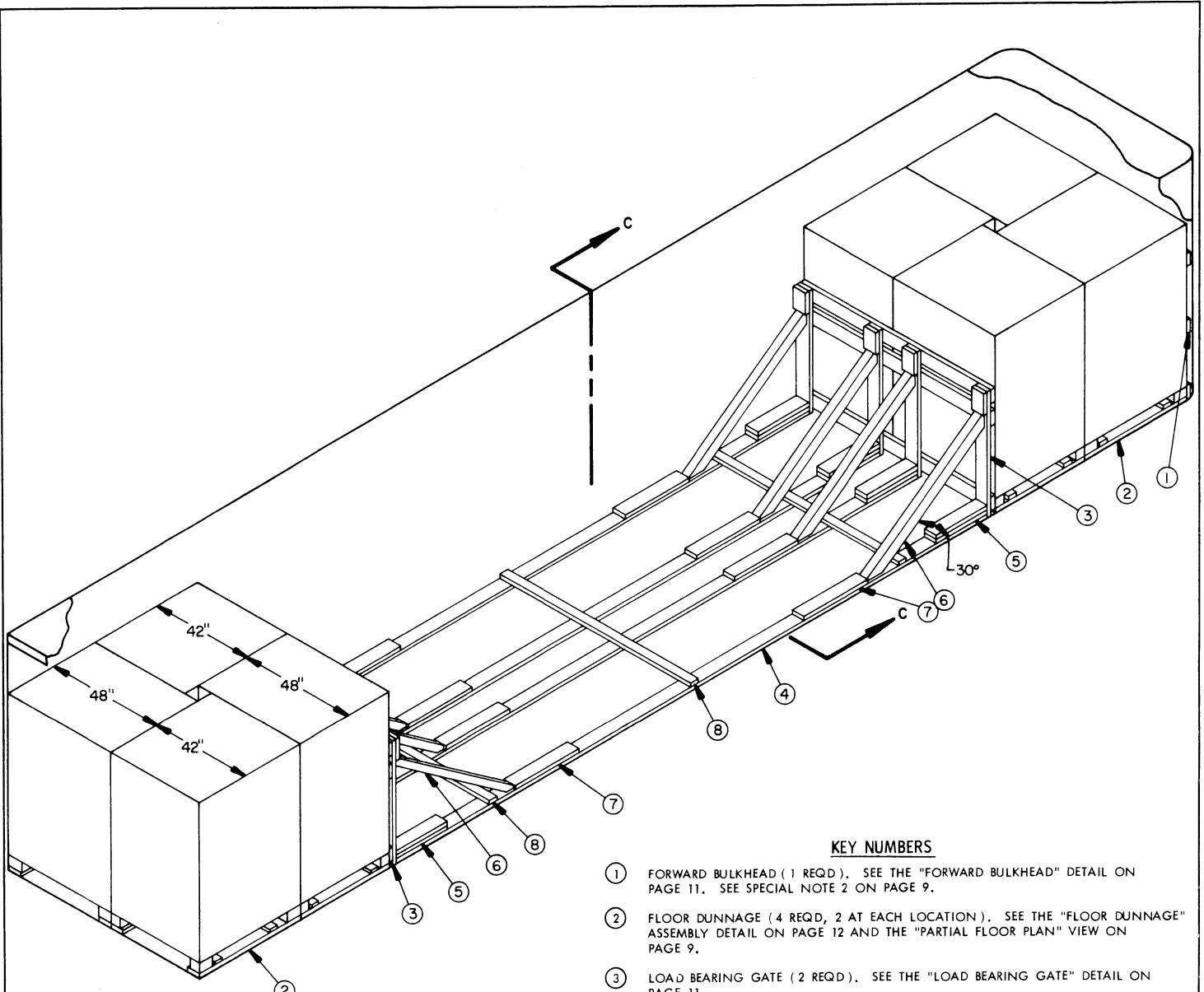
1. AN 8-UNIT LOAD IS SHOWN IN A 40'-0" LONG BY 7'-6" WIDE ( INSIDE DIMENSION ) TRAILER THAT HAS ROUNDED CORNERS AT THE FORWARD END. A WIDER TRAILER CAN BE USED. A SHORTER TRAILER CAN ALSO BE USED.
2. A TRAILER WITH ROUNDED CORNERS AT THE FORWARD END IS SHOWN IN THE LOAD VIEW. IF THE TRAILER BEING USED HAS SQUARE CORNERS, OMIT THE FORWARD BULKHEAD, AND POSITION THE CONTAINERS DIRECTLY AGAINST THE FRONT WALL OF THE TRAILER.
3. THE FOUR CONTAINERS FORMING A CHIMNEY PATTERN MUST BE POSITIONED ON THE FLOOR STRINGERS AS DENOTED BY THE 42 AND 48 INCH DIMENSIONS, AS SHOWN ON THE PARTIAL FLOOR PLAN VIEW.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	20	13
2" X 6"	213	213
NAILS	NO. REQD	POUNDS
10d ( 3" )	72	1
12d ( 3-1/4" )	198	3-1/4
STEEL STRAPPING, 1-1/4" X .035" ----- 232' REQD ----- 33 LBS		
SEAL, FOR 1-1/4" STRAPPING ----- 16 REQD ----- 1 LB		

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT ( APPROX )
CONTAINER -----	8	42,040 LBS
DUNNAGE-----		603 LBS
TOTAL WEIGHT -----		42,643 LBS

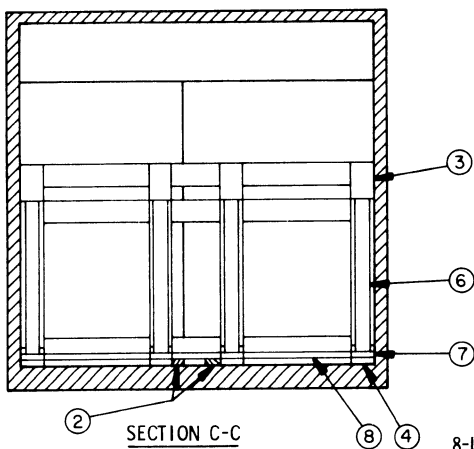
**8-UNIT LOAD IN A TRAILER WHICH IS EQUIPPED WITH AVAILBLE FLOORS ( CHIMNEY PATTERN )**



ISOMETRIC VIEW

**KEY NUMBERS**

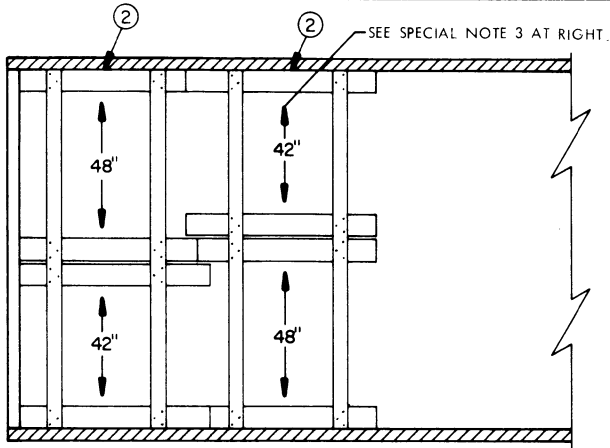
- ① FORWARD BULKHEAD (1 REQD). SEE THE "FORWARD BULKHEAD" DETAIL ON PAGE 11. SEE SPECIAL NOTE 2 ON PAGE 9.
- ② FLOOR DUNNAGE (4 REQD, 2 AT EACH LOCATION). SEE THE "FLOOR DUNNAGE" ASSEMBLY DETAIL ON PAGE 12 AND THE "PARTIAL FLOOR PLAN" VIEW ON PAGE 9.
- ③ LOAD BEARING GATE (2 REQD). SEE THE "LOAD BEARING GATE" DETAIL ON PAGE 11.
- ④ STRUT, 2" X 6" BY CUT TO FIT BETWEEN LOAD BEARING GATES (4 REQD).
- ⑤ BACK-UP CLEAT, 2" X 6" X 24" (DOUBLED) (8 REQD). NAIL THE FIRST PIECE TO THE STRUT W/6-12d NAILS. NAIL THE SECOND PIECE TO THE FIRST PIECE IN A LIKE MANNER AND TOENAIL TO THE LOAD BEARING GATE W/2-12d NAILS AT EACH JOINT. SEE GENERAL NOTE "M" ON PAGE 2.
- ⑥ DIAGONAL BRACE, 4" X 4" X 6'-11-1/4" (8 REQD). SEE "BRACE" DETAIL ON PAGE 11. TOENAIL TO THE LOAD BEARING GATE AND STRUT W/2-16d NAILS AT EACH JOINT.
- ⑦ BACK-UP CLEAT, 2" X 6" X 30" (8 REQD). NAIL TO THE FLOOR STRINGER W/7-12d NAILS.
- ⑧ STRUT BRACING, 2" X 4" BY TRAILER WIDTH MINUS 1/2" (3 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.



SECTION C-C

8-UNIT LOAD IN A TRAILER WHICH IS EQUIPPED WITH NON-NAILABLE FLOORS (CHIMNEY PATTERN)





**PARTIAL FLOOR PLAN**

THE DETAIL ABOVE DEPICTS THE LOCATION OF THE PRE-POSITIONED FLOOR DUNNAGE, PIECE MARKED ②.

**SPECIAL NOTES:**

1. AN 8-UNIT LOAD IS SHOWN IN A 40'-0" LONG BY 7'-6" WIDE ( INSIDE DIMENSION ) TRAILER THAT HAS ROUNDED CORNERS AT THE FORWARD END. A WIDER TRAILER CAN BE USED. A SHORTER TRAILER CAN ALSO BE USED.
2. A TRAILER WITH ROUNDED CORNERS AT THE FORWARD END IS SHOWN. IF THE TRAILER BEING USED HAS SQUARE CORNERS, OMIT THE FORWARD BULKHEAD AND POSITION THE CONTAINERS DIRECTLY AGAINST THE FRONT WALL OF THE TRAILER.
3. THE FOUR CONTAINERS FORMING A CHIMNEY PATTERN MUST BE POSITIONED ON THE FLOOR STRINGERS AS DENOTED BY THE 42 AND 48 INCH DIMENSIONS, AS SHOWN ON THE PARTIAL FLOOR PLAN VIEW.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	103	68
2" X 6"	331	331
4" X 4"	56	75
NAILS	NO. REQD	POUNDS
10d ( 3" )	291	4-1/2
12d ( 3-1/4" )	168	2-3/4
16d ( 3-1/2" )	32	3/4

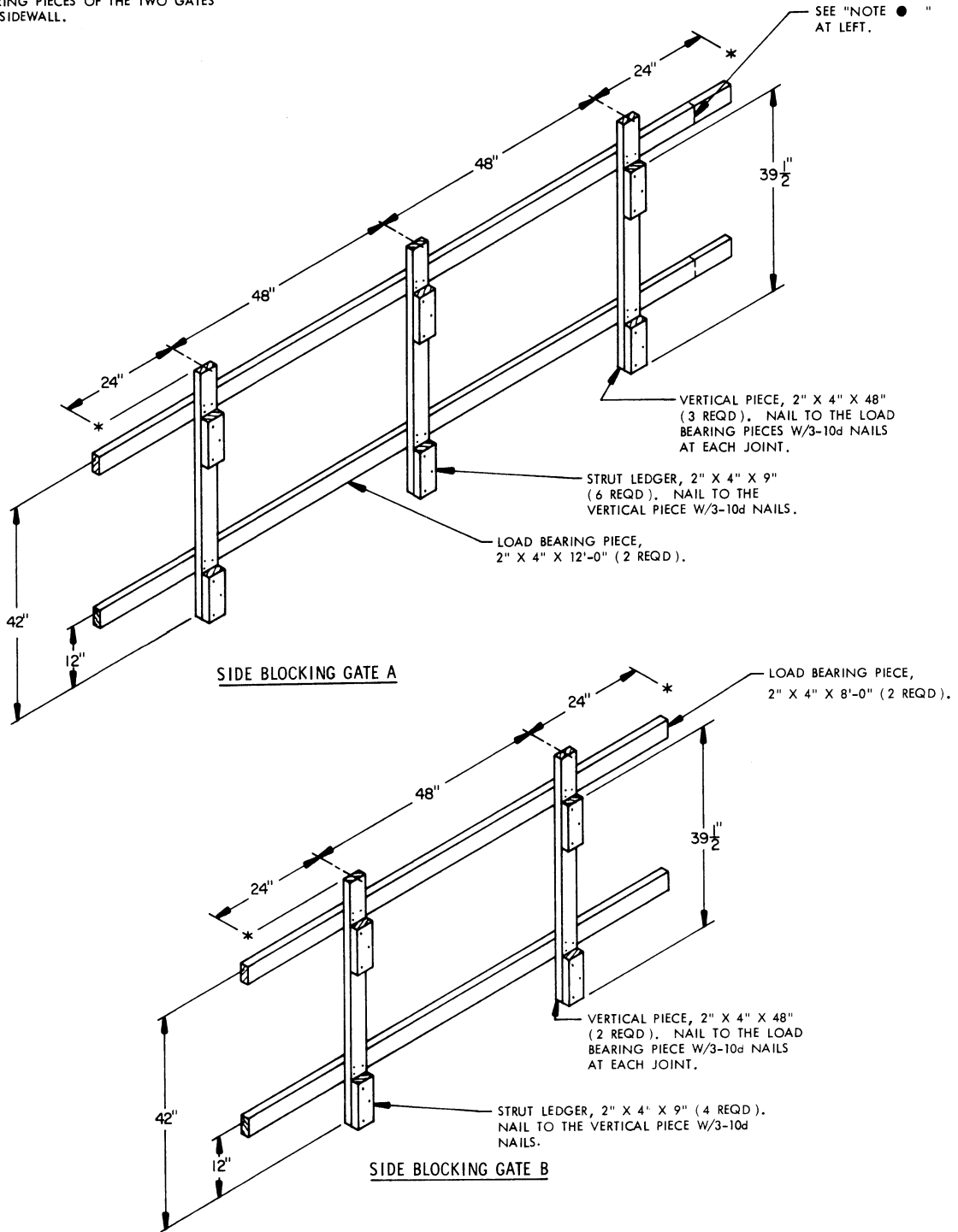
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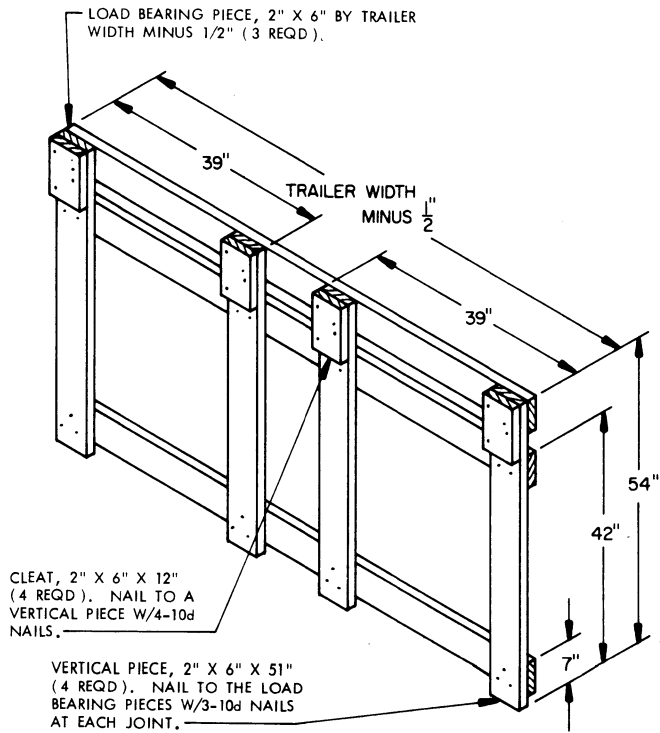
ITEM	QUANTITY	WEIGHT ( APPROX )
CONTAINER -----	8 -----	42 040 LBS
DUNNAGE -----	-----	1,193 LBS
TOTAL WEIGHT -----		43,233 LBS

8-UNIT LOAD IN A TRAILER WHICH IS EQUIPPED WITH NON-NAILABLE FLOORS ( CHIMNEY PATTERN )

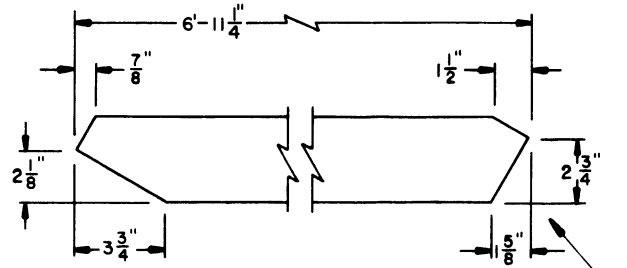
NOTE ● :

IF A TRAILER IS EQUIPPED WITH ROUNDED CORNERS AT THE FRONT, IT WILL BE NECESSARY TO REDUCE THE LENGTH OF THE LOAD BEARING PIECES OF THE TWO GATES ADJACENT TO THE TRAILER SIDEWALL.





**LOAD BEARING GATE**

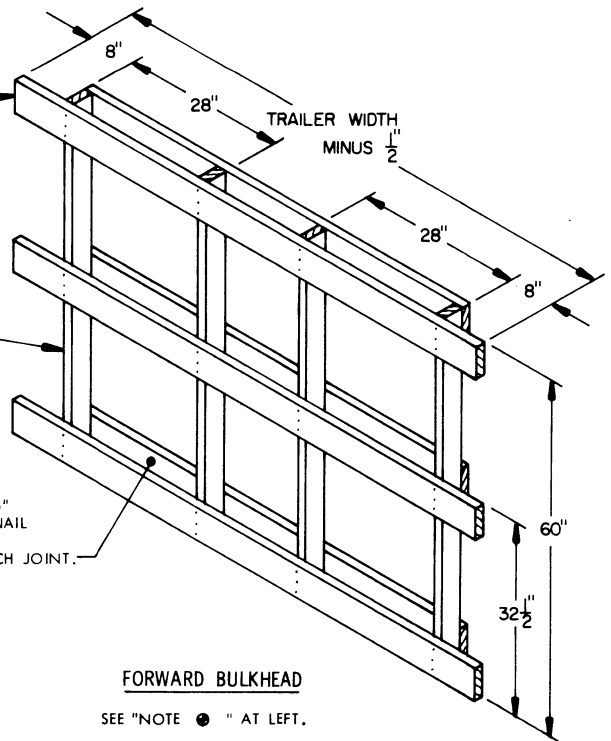


**BRACE**  
4" X 4" MATERIAL.

LOAD BEARING PIECE, 2" X 6" X TRAILER WIDTH MINUS 1/2" (3 REQD). NAIL TO THE SPACER PIECES W/3-10d NAILS AT EACH JOINT.

SPACER PIECE, 2" X 4" X 60" (4 REQD).

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

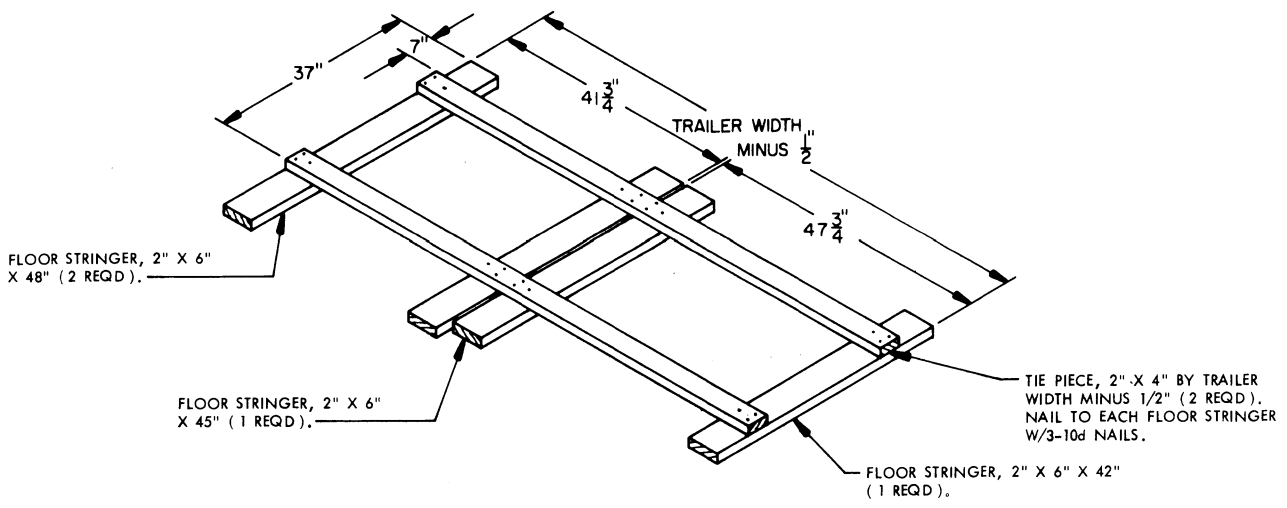


**FORWARD BULKHEAD**

SEE "NOTE ●" AT LEFT.

**NOTE ● :**

THE FORWARD BULKHEAD ASSEMBLY AS SHOWN IS DESIGNED FOR USE AT THE FORWARD END OF A TRAILER HAVING ROUNDED CORNERS WITH A RADIUS OF 8" OR LESS. FOR A TRAILER HAVING A RADIUS GREATER THAN 8" LAMINATE 6" WIDE MATERIAL TO THE LATERAL PIECES, ALSO, 2" X 6" MATERIAL MAY BE USED IN LIEU OF 2" X 4" MATERIAL FOR THE SPACER PIECES.



FLOOR DUNNAGE