

APPROVED BY

BUREAU OF EXPLOSIVES

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DATE *11/3/70*

LOADING AND BRACING (TL & LTL) IN CLOSED OR OPEN TOP VAN TRAILERS OF M44 SERIES CLUSTER GENERATOR PACKED ONE PER WOODEN CONTAINER

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DRAFTSMAN <i>WMA</i>	PROJ ENG <i>WMA</i>	APSA PROJ SPEC <i>WMA</i>	SUBMITTED <i>WMA</i>
CHECKER <i>WMA</i>	JDS	AMC AMMO CTR. <i>John Boyd</i>	<i>W R Dickson</i> COMMANDING OFFICER, SAVANNAH ARMY DEPOT
REVISIONS			EXAMINED AND APPROVED <i>W R Dickson</i> AMMUNITION PROCUREMENT & SUPPLY AGENCY
			APPROVED BY ORDER OF COMMANDING GENERAL U. S. ARMY MATERIEL COMMAND <i>A. V. Keil</i>
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			19 48 4603 CBIIA2

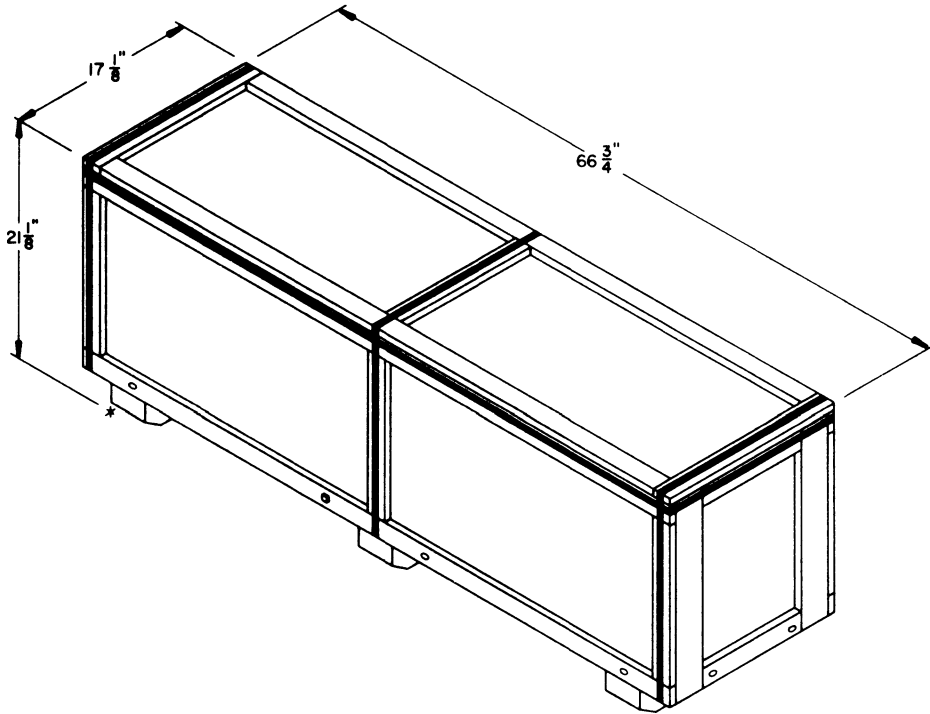
DO NOT SCALE

GENERAL NOTES

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AMCR 740-13, AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE OUTLOADING PROCEDURES SPECIFIED IN THIS DRAWING ARE APPLICABLE TO THE M44 SERIES CLUSTER GENERATOR PACKED ONE PER WOODEN CONTAINER. SUBSEQUENT REFERENCE TO CONTAINER MEANS THE WOODEN CONTAINER WITH CONTENTS.
- FOR DETAILS OF THE WOODEN CONTAINER
- CONTAINER DIMENSIONS -- 66-3/4" LONG BY 17-1/8" WIDE BY 21-1/8" HIGH.
GROSS WEIGHT ----- 350 POUNDS (APPROX).
- D. THE LOADS AS SHOWN ARE FOR CLOSED OR OPEN TOP VAN TRAILERS 7'-6" WIDE HAVING WOOD, WOOD AND METAL, OR METAL FLOORS. THE DELINEATED OUTLOADING PROCEDURES ARE ALSO APPLICABLE TO TRAILERS WHICH ARE EIGHTY-NINE INCHES (89") THROUGH NINETY-THREE INCHES (93") IN WIDTH.
- E. 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.
- F. NOTICE: A SHIPMENT WILL BE POSITIONED IN THE TRAILER CONSISTENT WITH STATE WEIGHT LAWS. 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 MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING AND STAYING OF THE DESIGNATED ITEMS.
- G. THE OUTLOADING PROCEDURES SPECIFIED CAN ALSO BE UTILIZED FOR THE SHIPMENT OF THE DEPICTED CONTAINERS WHEN THEY ARE EMPTY, OR LOADED WITH AN ITEM IDENTIFIED DIFFERENTLY BY NOMENCLATURE THAN THE ITEM DESIGNATED WITHIN THE DRAWING TITLE.
- H. OTHER TYPES OF LADING ITEMS MAY BE LOADED INTO TRAILERS WHICH ARE PARTIALLY LOADED WITH THE DEPICTED ITEM, PROVIDING THE TOTAL LOAD IS COMPATIBLE, EXISTING DIRECTIVES ARE NOT VIOLATED, AND OTHER LADING ITEMS ARE BLOCKED AND BRACED TO EQUAL THE BLOCKING AND BRACING CRITERIA SPECIFIED IN THIS DRAWING.
- J. 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 TO SEAL THE JOINT. CAUTION: EXERCISE CARE DURING TENSIONING TO PREVENT DAMAGE TO CONTAINERS.
- K. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 1" X 4" MATERIAL IS ACTUALLY 3/4" THICK BY 3-5/8" WIDE AND 2" X 4" MATERIAL IS ACTUALLY 1-5/8" THICK BY 3-5/8" WIDE.
- L. 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.
- M. PORTIONS OF THE TRAILER BODIES DEPICTED WITHIN THIS PROCEDURAL DRAWING, SUCH AS ONE OF THE SIDE WALLS, HAVE BEEN OMITTED FROM THE LOAD VIEWS FOR CLARITY PURPOSES.
- N. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "CONTAINER DETAIL" ON PAGE 3, AND TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

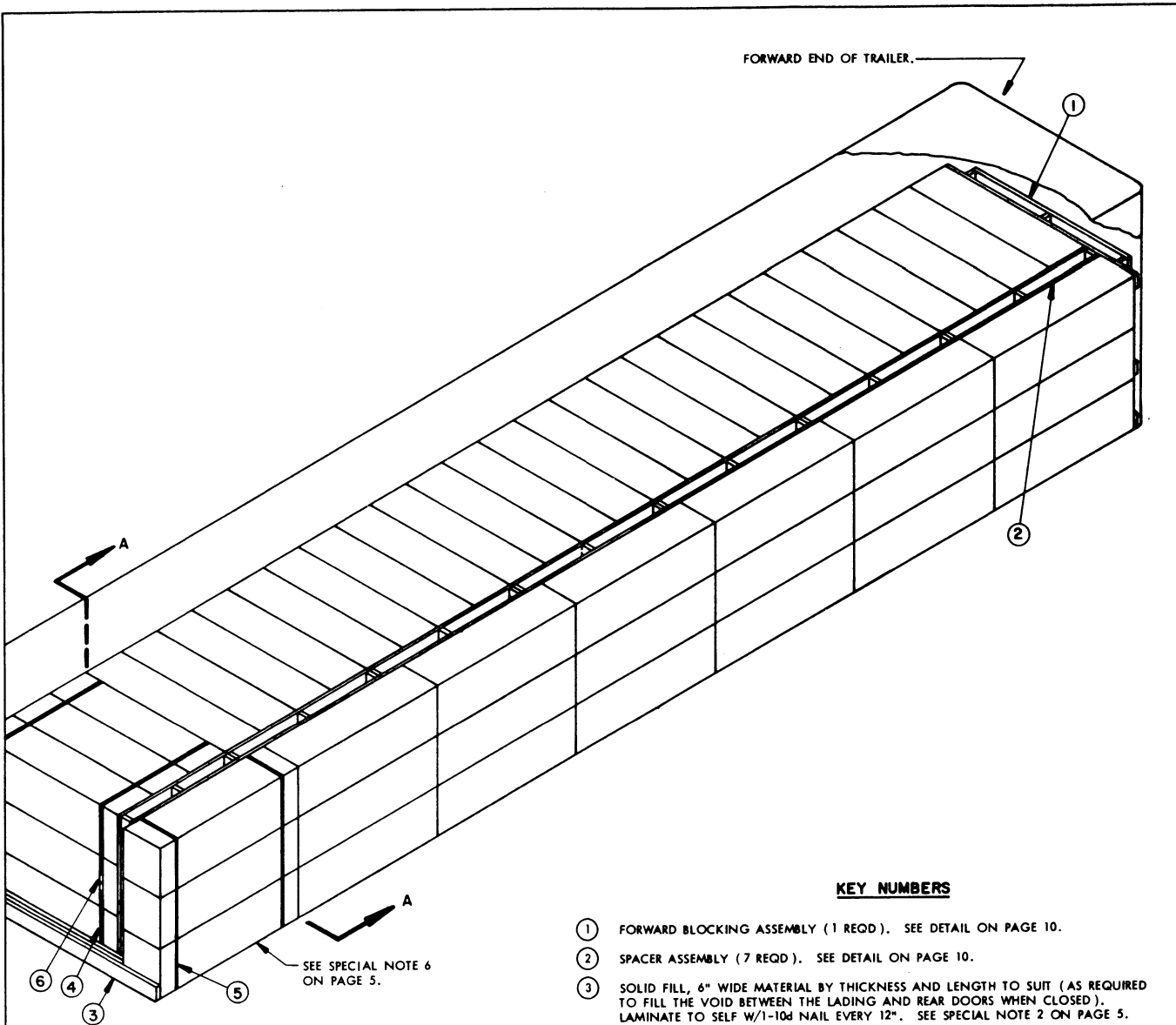
MATERIAL SPECIFICATIONS

- 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.

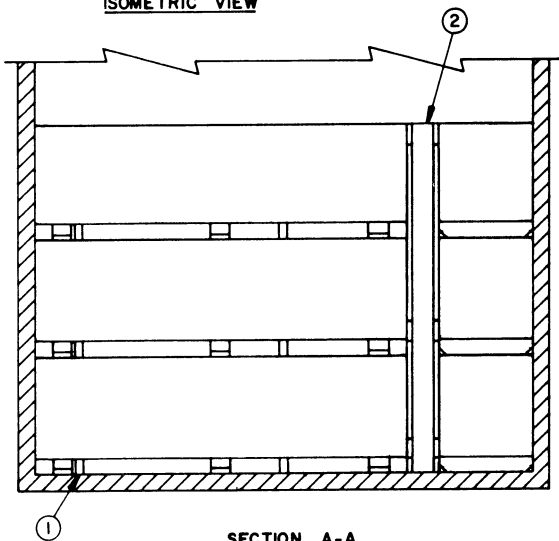


SHIPPING CONTAINER

STACK HEIGHT IS LIMITED TO THREE
CONTAINERS.



ISOMETRIC VIEW



SECTION A-A

FORWARD END OF TRAILER.

KEY NUMBERS

- ① FORWARD BLOCKING ASSEMBLY (1 REQD). SEE DETAIL ON PAGE 10.
- ② SPACER ASSEMBLY (7 REQD). SEE DETAIL ON PAGE 10.
- ③ SOLID FILL, 6" WIDE MATERIAL BY THICKNESS AND LENGTH TO SUIT (AS REQUIRED TO FILL THE VOID BETWEEN THE LADING AND REAR DOORS WHEN CLOSED). LAMINATE TO SELF W/1-10d NAIL EVERY 12". SEE SPECIAL NOTE 2 ON PAGE 5.
- ④ UNITIZING STRAP, 1-1/4" X .035" X 21'-0" STEEL STRAPPING (2 REQD). PRE-POSITION STRAP TO ENCIRCLE THREE (3) STACKS AS SHOWN. SEE GENERAL NOTE "J" ON PAGE 2 AND SPECIAL NOTE 5 ON PAGE 5.
- ⑤ UNITIZING STRAP, 1-1/4" X .035" X 15'-0" STEEL STRAPPING (2 REQD). PRE-POSITION STRAP TO ENCIRCLE ONE (1) STACK AS SHOWN. SEE GENERAL NOTE "J" ON PAGE 2 AND SPECIAL NOTE 5 ON PAGE 5.
- ⑥ SEAL FOR 1-1/4" STRAPPING (8 REQD).

SPECIAL NOTES:

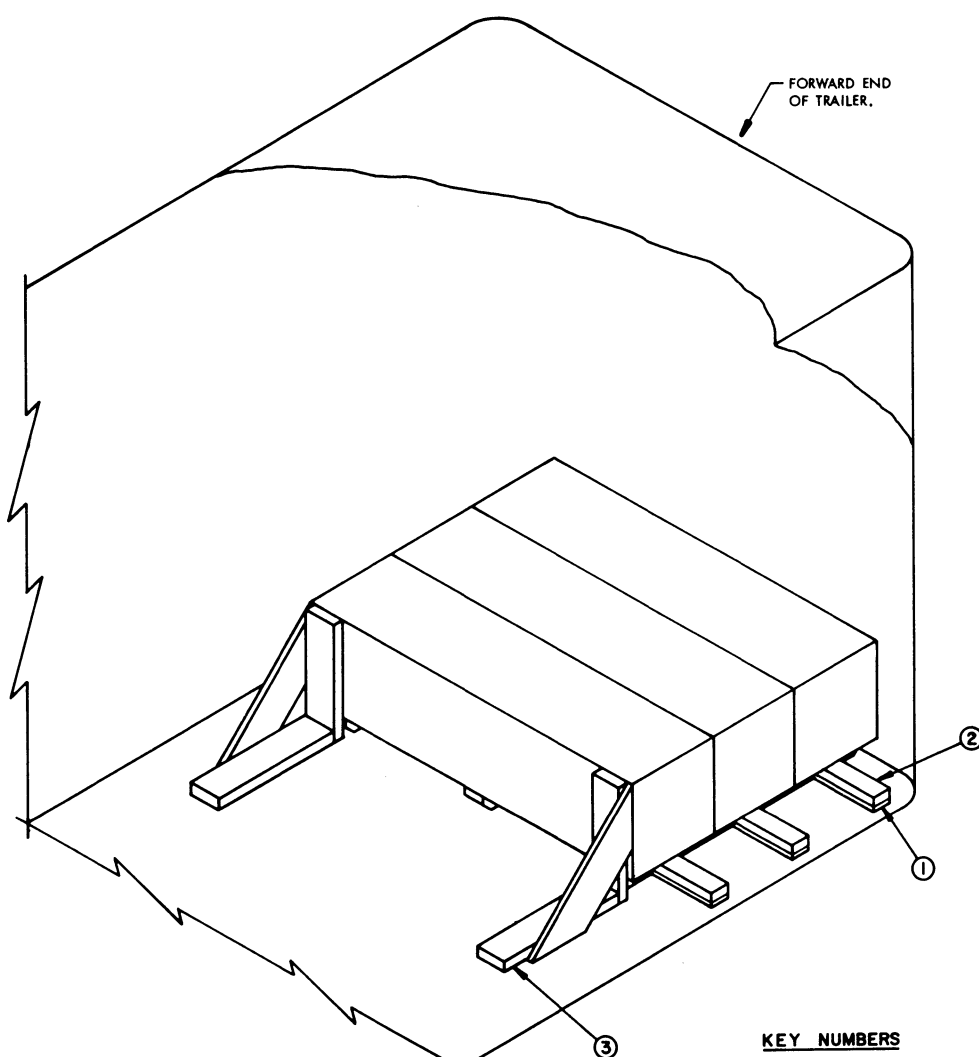
1. A 102-UNIT LOAD IS SHOWN IN A 40'-0" LONG BY 7'-6" WIDE (INSIDE DIMENSION) TRAILER WHICH HAS ROUNDED CORNERS AT THE FORWARD END AND IS NOT EQUIPPED WITH REAR CORNER POSTS AT THE REAR END. A WIDER OR NARROWER TRAILER MAY BE USED.
2. WHEN THE DISTANCE BETWEEN THE REAR OF THE LOAD AND THE REAR DOORS OF THE TRAILER WHEN THEY ARE CLOSED MEASURES 12" OR MORE, USE THE "ALTERNATIVE REAR BLOCKING" AS SHOWN ON PAGE 8 IN LIEU OF PIECE MARKED ③ ON PAGE 4.
3. IF THE TRAILER BEING OUTLOADED HAS A SQUARE FRONT, DO NOT USE THE FORWARD BLOCKING ASSEMBLY SHOWN AS PIECE MARKED ① ON PAGE 4. POSITION THE CONTAINERS DIRECTLY AGAINST THE TRAILER FRONT WALL.
4. IF IT IS NECESSARY TO OMIT ONE OR TWO CONTAINERS FROM A LOAD, A "FILLER ASSEMBLY" MUST BE SUBSTITUTED IN PLACE OF EACH OMITTED CONTAINER. THE "FILLER ASSEMBLY" MUST BE USED IN THE TOP LAYER ONLY. SEE THE "FILLER ASSEMBLY" DETAIL ON PAGE 9 AND "ALTERNATIVE REAR BLOCKING" DETAIL ON PAGE 8.
5. TWO (2) UNITIZING STRAPS SHOWN AS PIECES MARKED ④ AND ⑤ ARE REQUIRED AT THE REAR OF THE LOAD TO RETAIN THE SECOND AND THIRD LAYER CONTAINERS.
6. IF IT IS IMPOSSIBLE TO LOAD SEVEN (7) LENGTHWISE POSITIONED CONTAINER STACKS IN THE TRAILER, IT WILL BE NECESSARY TO INSTALL AN ASSEMBLY SIMILAR TO THAT SHOWN BY PIECES MARKED ⑥ THRU ⑦ ON PAGE 8 TO "SQUARE-OFF" THE REAR OF THE LOAD. SEE THE "ALTERNATIVE REAR BLOCKING" VIEW ON PAGE 8 FOR GUIDANCE.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	232	78
2" X 4"	127	85
2" X 6"	61	61
NAILS	NO. REQD	POUNDS
6d (2")	252	1-1/2
10d (3")	58	1
STEEL STRAPPING, 1-1/4" X .035" --- 72' REQD ----- 11 LBS		
SEALS FOR 1-1/4" STRAPPING ----- 8 REQD ----- NH		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER -----	102 -----	35,700 LBS
DUNNAGE -----		574 LBS
TOTAL WEIGHT -----		36,274 LBS



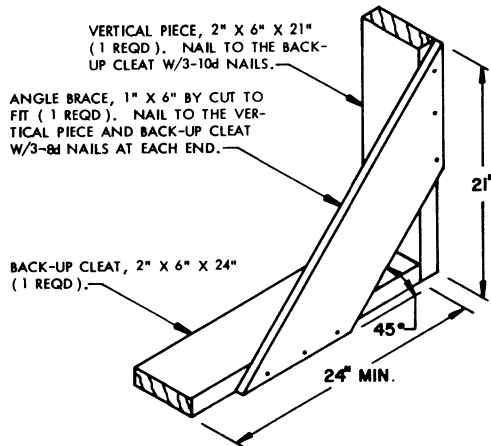
ISOMETRIC VIEW

KEY NUMBERS

- ① SIDE BLOCKING, 1" X 4" X 12" (6 REQD). POSITION AGAINST THE CONTAINER SKID.
- ② SIDE BLOCKING, 2" X 4" X 12" (6 REQD). POSITION ON TOP OF PIECE MARKED ① AND NAIL THROUGH PIECE MARKED ① TO THE TRAILER FLOOR, W/3-20d NAILS.
- ③ LTL BRACE (2 REQD). SEE DETAIL ON THIS PAGE. POSITION AS SHOWN AND NAIL TO THE TRAILER FLOOR W/10-10d NAILS.

SPECIAL NOTES:

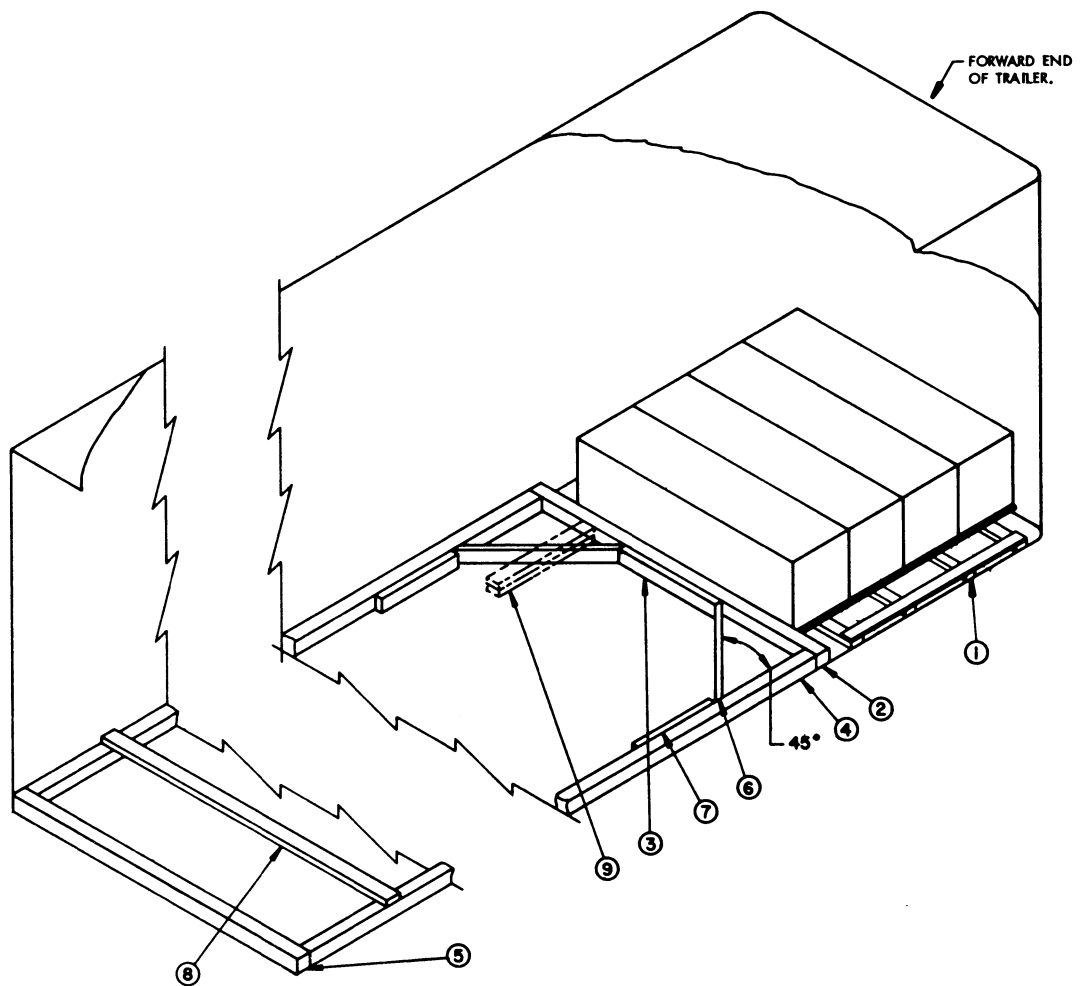
1. THESE LTL OUTLOADING PROCEDURES DEPICT THE USE OF BLOCKING THAT IS ONLY APPLICABLE TO TRAILERS WHICH HAVE NAILABLE FLOORS.
2. EACH "LTL BRACE" AS SPECIFIED WILL RETAIN 2,000 POUNDS OF LADING; HOWEVER, A MINIMUM OF TWO (2) BRACES MUST BE USED TO BLOCK THE LOAD.



LTL BRACE

SEE SPECIAL NOTE 2.

TYPICAL LTL



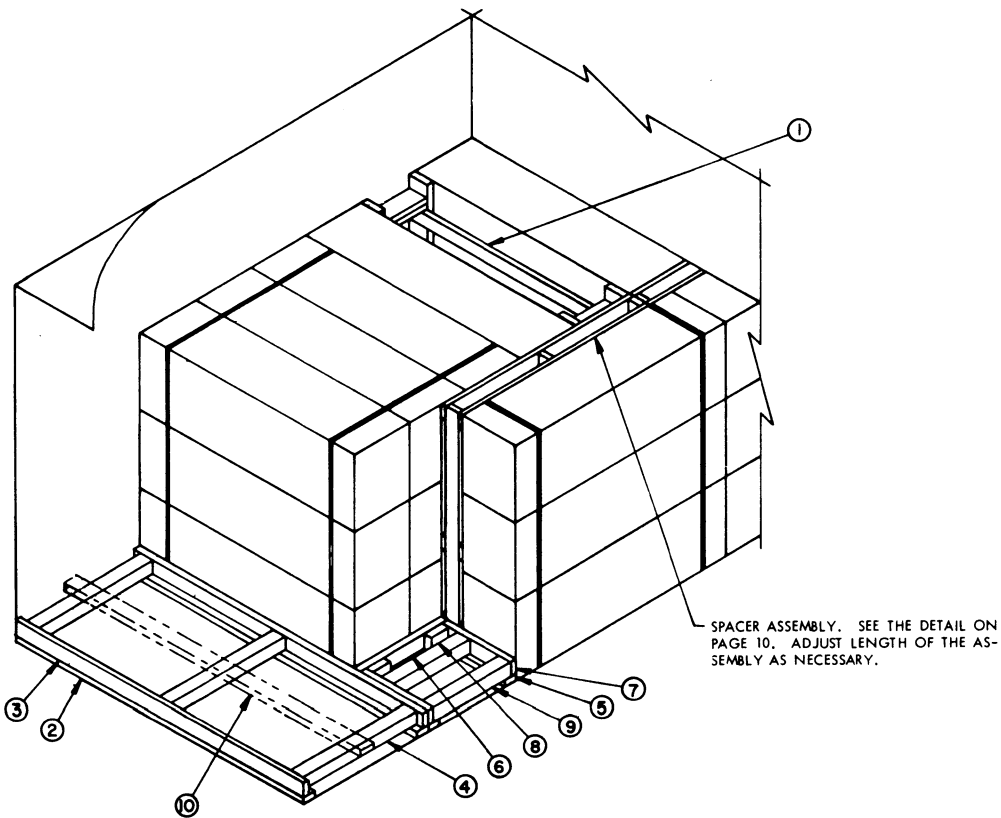
ISOMETRIC VIEW

KEY NUMBERS

SPECIAL NOTES:

1. THESE LTL OUTLOADING PROCEDURES DEPICT THE USE OF "K-BRACE" BLOCKING AND "NAILED FLOOR-LINE" BLOCKING, FOR THE BRACING OF A PARTIAL LOAD SHIPMENT.
2. THE "K-BRACE" BLOCKING, SHOWN AS PIECES MARKED ② THROUGH ⑧ IS ADEQUATE FOR RETAINING A MAXIMUM LTL LOAD OF 24,000 POUNDS.
3. IF THE TRAILER BEING OUTLOADED HAS REAR CORNER POSTS, POSITION PIECE MARKED ⑤ AGAINST THE CORNER POSTS.
4. ONE (1) STRUT BRACE, SHOWN AS PIECE MARKED ⑧, IS REQUIRED FOR EVERY 7'-0" LENGTH OF SIDE STRUT.
5. WHEN OUTLOADING TRAILERS WITH A WOOD OR A WOOD AND METAL FLOOR, PIECES MARKED ② MAY BE USED IN LIEU OF PIECES MARKED ③ THROUGH ⑧ WHICH APPLY TO TRAILERS HAVING ALL METAL FLOORS.
6. TWO (2) BACK-UP CLEATS, SHOWN AS PIECE MARKED ⑨, ARE ADEQUATE FOR RETAINING NOT MORE THAN 5,000 POUNDS OF LADING. BACK-UP CLEATS ARE FOR USE IN A TRAILER WHICH HAS A NAILABLE FLOOR AND SHOULD BE USED, IF POSSIBLE, IN LIEU OF PIECES MARKED ③ THROUGH ⑧. FOR CLARITY, ONLY ONE (1) PIECE MARKED ⑨ IS SHOWN.
7. THE LTL PROCEDURES SPECIFIED ON THIS PAGE CAN ALSO BE USED FOR TWO (2) OR THREE (3) HIGH LOADS, PROVIDING THE UPPER LAYER CONTAINS AT LEAST THREE CONTAINERS SO THAT THE "UNITIZING PROCEDURES" SPECIFIED ON PAGES 4 AND 5 CAN BE APPLIED. (REFERENCE IS MADE TO PIECES MARKED ④ AND ⑥ ON PAGE 4).
8. IF THE TRAILER BEING OUTLOADED HAS A NAILABLE FLOOR, SIDE BLOCKING SHOWN AS PIECES MARKED ① AND ② ON PAGE 6 MAY BE USED IN LIEU OF THE "SIDE BLOCKING ASSEMBLY" SHOWN AS PIECE MARKED ① ON THIS PAGE.

- ① SIDE BLOCKING ASSEMBLY (2 REQD). SEE DETAIL ON PAGE 9.
- ② HEADER, 4" X 4" BY TRAILER WIDTH MINUS 1/2" (1 REQD).
- ③ SPACER CLEAT, 2" X 4" X 30" (1 REQD). NAIL TO PIECE MARKED ② W/6-12d NAILS.
- ④ SIDE STRUT, 4" X 4" BY CUT TO FIT BETWEEN PIECES MARKED ② AND ⑤ (2 REQD). TOENAIL TO PIECES MARKED ② AND ⑤ W/2-16d NAILS AT EACH END.
- ⑤ CROSS BRACE, 4" X 4" BY TRAILER WIDTH MINUS 1/2" (1 REQD). SEE SPECIAL NOTE 3 ON THIS PAGE.
- ⑥ DIAGONAL BRACE, 2" X 4" BY CUT TO FIT (2 REQD). DOUBLE BEVEL EACH END WITH 45° ANGLE CUTS AND TOENAIL TO PIECES MARKED ② AND ④ W/2-16d NAILS AT EACH END.
- ⑦ SIDE CLEAT, 2" X 4" X 24" (2 REQD). NAIL TO PIECE MARKED ④ W/8-12d NAILS.
- ⑧ STRUT BRACING, 2" X 4" BY TRAILER WIDTH (CUT TO FIT) (MINIMUM OF 1 REQD). NAIL TO PIECES MARKED ④ W/3-10d NAILS AT EACH END. SEE SPECIAL NOTE 4 ON THIS PAGE.
- ⑨ BACK-UP CLEAT, 2" X 4" X 30" (DOUBLED) (2 REQD). ALIGN WITH OUTER SKIDS ON THE CONTAINER AND NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/7-12d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 6 ON THIS PAGE.



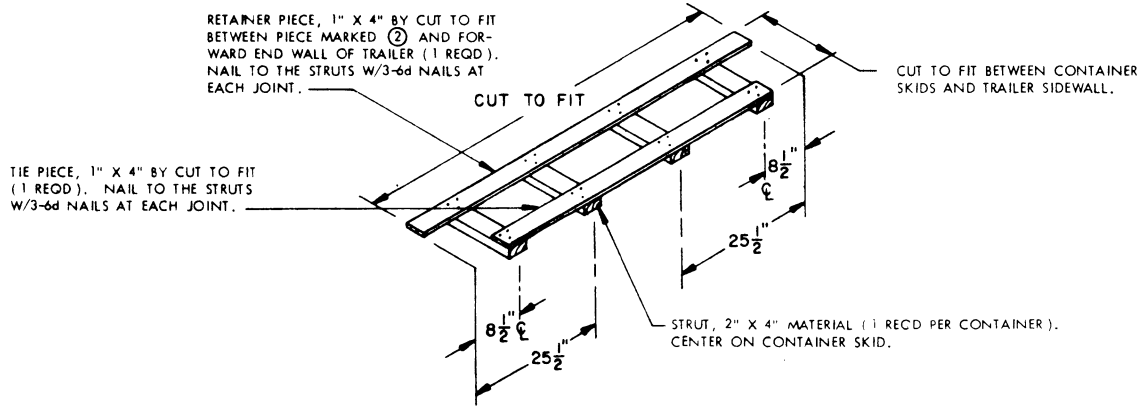
ALTERNATIVE REAR BLOCKING

SPECIAL NOTES:

1. THE PARTIAL VIEW SHOWN ABOVE DEPICTS AN ALTERNATIVE METHOD OF REAR BLOCKING WHEN IT IS NECESSARY TO OMIT CONTAINERS FROM THE LOAD SHOWN ON PAGE 4. A TYPICAL QUANTITY OF TEN (10) CONTAINERS WERE OMITTED.
2. IF THE TRAILER BEING LOADED HAS REAR CORNER POSTS, POSITION REAR PIECES MARKED ② AND ③ AGAINST THE CORNER POSTS AND LAMINATE 6" WIDE BY TRAILER WIDTH MINUS 6" LONG MATERIAL TO THE REAR SURFACE OF PIECE MARKED ③, AS REQUIRED TO FILL THE VOID BETWEEN REAR PIECES MARKED ② AND ③ AND THE REAR DOORS WHEN THEY ARE CLOSED.
3. A "STRUT BRACE", SHOWN AS PIECE MARKED ⑩, IS REQUIRED IF THE "STRUT" SHOWN AS PIECE MARKED ④ IS 7'-0" LONG OR LONGER. USE ONE STRUT BRACE FOR EVERY 7'-0" OF STRUT LENGTH.
4. IF IT IS NECESSARY TO USE A "FILLER ASSEMBLY" IN ORDER TO HAVE EVEN STACKS IN THE LOAD, IT MUST BE USED IN THE TOP LAYER ONLY.

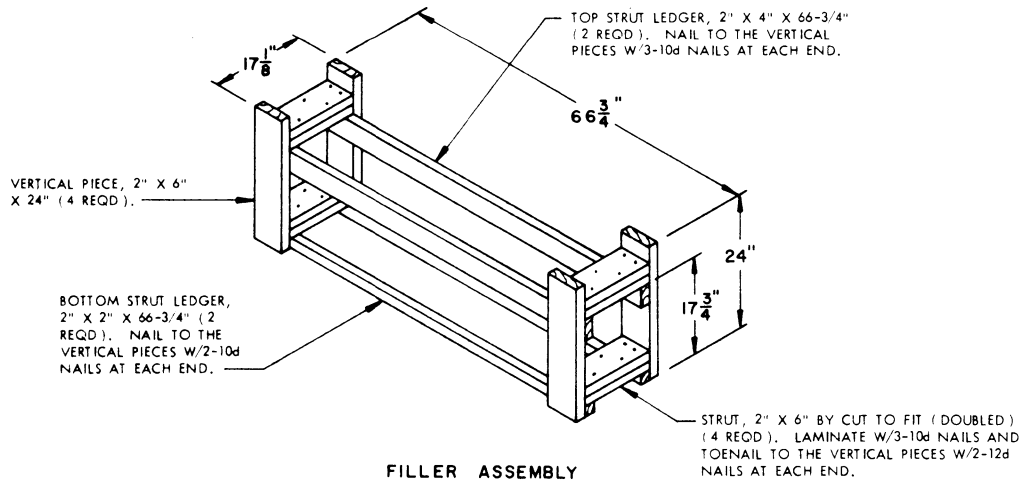
KEY NUMBERS

- ① FILLER ASSEMBLY (1 REQD). SEE DETAIL ON PAGE 9 AND SPECIAL NOTE 4 ON THIS PAGE.
- ② RISER, 2" X 4" BY TRAILER WIDTH MINUS 1/2" (2 REQD). NAIL TO PIECE MARKED ③ W/1-10d NAIL EVERY 12".
- ③ HEADER, 2" X 4" BY TRAILER WIDTH MINUS 1/2" (2 REQD). POSITION AS SHOWN.
- ④ STRUT, 4" X 4" BY CUT TO FIT BETWEEN PIECES MARKED ③ (3 REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END.
- ⑤ RISER, 2" X 4" BY CUT TO FIT BETWEEN THE TRAILER SIDE WALL AND THE CONTAINER SKID (2 REQD). NAIL TO PIECES MARKED ⑦ W/4-10d NAILS.
- ⑥ SIDE SUPPORT PIECE, 2" X 4" BY CUT TO FIT (1 REQD).
- ⑦ HEADER, 2" X 4" BY CUT TO FIT BETWEEN THE TRAILER SIDE WALL AND PIECE MARKED ⑥ (2 REQD).
- ⑧ SUPPORT BLOCK, 2" X 4" X 6" (2 REQD). POSITION AS SHOWN. NAIL TO PIECE MARKED ⑥ W/2-10d NAILS AND TOENAIL TO PIECE MARKED ⑦ W/2-12d NAILS.
- ⑨ STRUT, 4" X 4" BY CUT TO FIT BETWEEN PIECES MARKED ⑦ (2 REQD). TOENAIL TO PIECES MARKED ⑦ W/2-16d NAILS AT EACH END.
- ⑩ STRUT BRACE, 2" X 4" BY TRAILER WIDTH (CUT TO FIT) (AS REQD). NAIL TO PIECES MARKED ④ W/3-10d NAILS AT EACH JOINT. SEE SPECIAL NOTE 2 ON THIS PAGE.



SIDE BLOCKING ASSEMBLY

THE SIDE BLOCKING ASSEMBLY SHOWN ABOVE IS FOR THE TYPICAL LTL LOAD SHOWN ON PAGE 7. ADD OR DECREASE THE NUMBER OF STRUTS REQUIRED DEPENDING ON THE QUANTITY OF CONTAINERS IN THE LOAD.



FILLER ASSEMBLY

REQUIRED TO FILL A VOID WHERE A CONTAINER IS OMITTED. USE IN THE TOP LAYER ONLY.

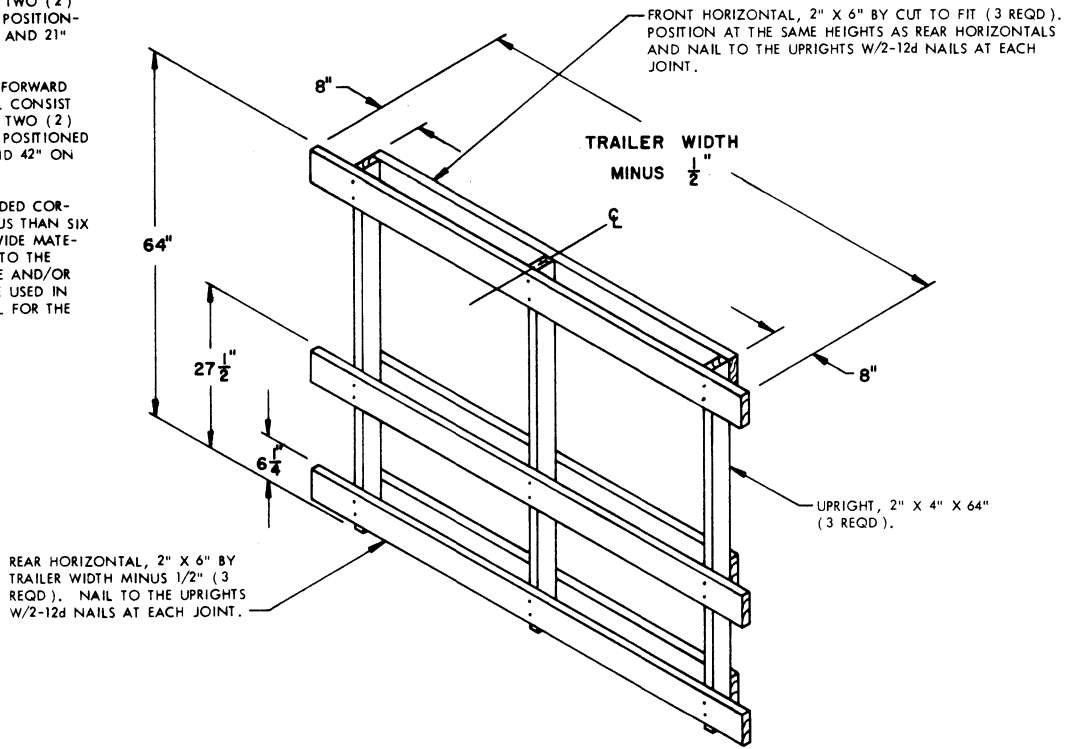
DETAILS

NOTE ● :

FOR A 1-HIGH LOAD THE FORWARD BLOCKING ASSEMBLY WILL CONSIST OF TWO (2) FRONT AND TWO (2) REAR HORIZONTAL PIECES POSITIONED AT HEIGHTS OF 6-1/4" AND 21" ON 24" HIGH UPRIGHTS.

FOR A 2-HIGH LOAD THE FORWARD BLOCKING ASSEMBLY WILL CONSIST OF TWO (2) FRONT AND TWO (2) REAR HORIZONTAL PIECES POSITIONED AT HEIGHTS OF 6-1/4" AND 42" ON 48" HIGH UPRIGHTS.

IF THE TRAILER HAS ROUNDED CORNERS OF A GREATER RADIUS THAN SIX INCHES, ADDITIONAL 6" WIDE MATERIAL MAY BE LAMINATED TO THE FRONT HORIZONTAL PIECE AND/OR 2" X 6" MATERIAL MAY BE USED IN LIEU OF 2" X 4" MATERIAL FOR THE UPRIGHTS.



FORWARD BLOCKING ASSEMBLY

SEE "NOTE ●" AT THE LEFT.

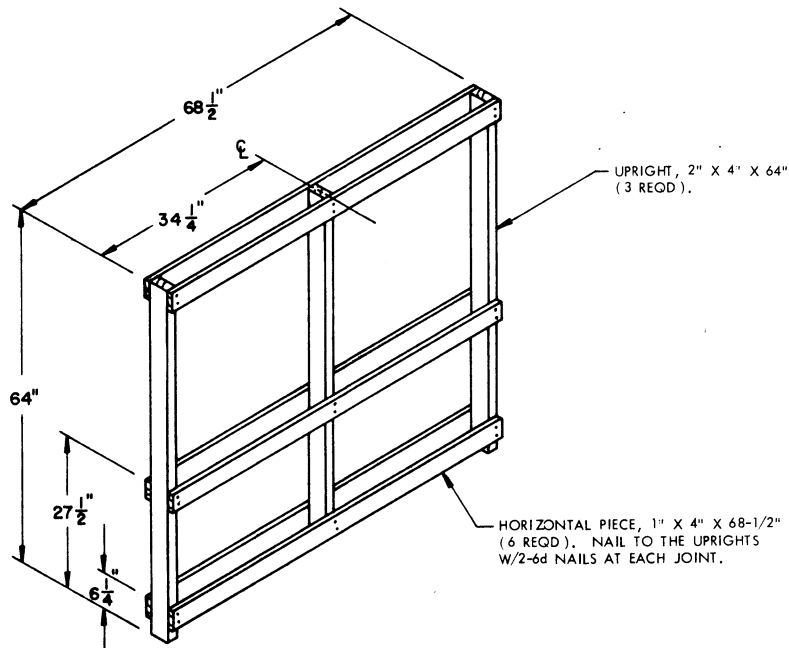
NOTE ⊕ :

FOR A 1-HIGH LOAD THE SPACER ASSEMBLY WILL CONSIST OF TWO (2) HORIZONTAL PIECES POSITIONED AT A HEIGHT OF 6-1/4" AND TWO (2) HORIZONTAL PIECES POSITIONED AT A HEIGHT OF 21" ON 24" HIGH UPRIGHTS.

FOR A 2-HIGH LOAD THE SPACER ASSEMBLY WILL CONSIST OF TWO (2) HORIZONTAL PIECES POSITIONED AT A HEIGHT OF 6-1/4" AND TWO (2) HORIZONTAL PIECES POSITIONED AT A HEIGHT OF 42" ON 48" HIGH UPRIGHTS.

IF THE TRAILER BEING LOADED HAS AN INSIDE WIDTH GREATER THAN 91", USE 2" X 6" MATERIAL IN LIEU OF 2" X 4" MATERIAL FOR THE UPRIGHTS.

THE LENGTH OF THE REAR-MOST SPACER ASSEMBLY USED IN THE LOAD MAY BE ADJUSTED AS NECESSARY. THE ASSEMBLY SHOWN IS DESIGNED FOR LATERAL BRACING OF FOUR (4) STACKS. AN ASSEMBLY FOR THE BRACING OF THREE (3) STACKS WILL BE 51" LONG WITH THE MIDDLE UPRIGHT CENTERED AT 25-1/2".



SPACER ASSEMBLY

SEE "NOTE ⊕" AT THE LEFT.

DETAILS