| APPROVED BY                    |
|--------------------------------|
| BUREAU JOF EXPLOSIVES          |
| S. J. Grasomuck                |
| DATE 5/8/70 BILITARY ADDISTANT |

# LOADING AND BRACING (TL & LTL) IN CLOSED OR OPEN TOP VAN TRAILERS OF CBU\* ITEMS PACKED IN SKIDDED WOOD CONTAINERS

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|-----------|---------------------|----------------|---------|-------|
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|           |                     |                |         |       |
| 42-UNIT L | DAD IN A 40'-O" LON | G CONVENTIONAL | TRAILER | -4.5  |
|           |                     |                |         | •     |
|           |                     |                |         |       |

\*RELOAD KITS FOR CBU 42/A MUNITIONS.

THIS DOCUMENT INCLUDES PROCEDURES FOR CONVENTIONAL TYPE TRAILERS AND FOR TRAILERS EQUIPPED WITH MECHANICAL BRACING DEVICES AS APPROVED BY THE BUREAU OF EXPLOSIVES, ASSOCIATION OF AMERICAN RAILROADS.

CAUTION:

PROCEDURES SHOWN HEREIN FOR MECHANICAL
BRACING DEVICE EQUIPPED TRAILERS ARE ONLY
APPLICABLE FOR HIGHWAY MOVEMENT, NOT FOR
CONTAINER/TRAILER-ON-FLAT-CAR MOVEMENTS.

THIS DRAWING SUPERSEDES 19-48-4071 - IIAI003

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|                           | U. S. ARMY MATERIEL COMMAND JULY 1970 |
|                           | CLASS DIVISION DRAWING FILE           |
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#### GENERAL NOTES

- THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AMCR 740-13, AND AUGMENTS TM-743-200-1 (CHAPTER 5).
- B. THE OUTLOADING PROCEDURES SPECIFIED HEREIN ARE APPLICABLE TO THE RELOAD KITS FOR CBU 42/A MUNITIONS, WHEN THEY ARE PACKAGED IN THE SMALL OR LARGE SKIDDED WOOD CONTAINER. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE SKIDDED WOOD CONTAINER WITH CONTENTS.
- C. FOR DETAILS OF THE SMALL CONTAINER, SEE DRAWING NO. 9248145. CONTAINER DIMENSIONS -- 43-1/8" LONG BY 39" WIDE BY 26-3/4" HIGH. GROSS WEIGHT ------ 950 POUNDS (APPROX).
- D. FOR DETAILS OF THE LARGE CONTAINER, SEE DRAWING NO. 9248143. CONTAINER DIMENSIONS --43-1/4" LONG BY 43-1/2" WIDE BY 28-3/4" HIGH. GROSS WEIGHT ----- 950 POUNDS (APPROX)
- E. THE 42-UNIT LOAD SHOWN ON PAGES 4 AND 5 IS BASED ON A 40'-0" LONG BY 7'-6" WIDE (INSIDE DIMENSION) VAN TRAILER. OTHER LENGTH AND OTHER WIDTH TRAILERS CAN BE USED. THE DEPICTED PROCEDURES ARE BASED ON TRAILERS OF THE CONVENTIONAL TYPE OR ARE BASED ON TRAILERS WHICH ARE EQUIPPED WITH VARIOUS TYPES OF SELF-CONTAINED MECHANICAL BRACING DEVICES (CROSS MEMBERS AND WALL MEMBERS) AND APPLY TO TRAILERS HAVING WOOD OR WOOD AND METAL, OR METAL FLOORS.
- F. IF THE TRAILER BEING USED IS EQUIPPED WITH A MECHANICAL LOAD BLOCKING SYSTEM, THE CROSS MEMBER ATTACHMENT FACILITIES WITHIN THE TRAILER MUST PROVIDE FOR THE INSTALLATION OF LOAD BLOCKING CROSS MEMBERS AT THE HEIGHTS SPECIFIED HEREIN. <u>CAUTION</u>: TRAILERS EQUIPPED WITH FACILITIES WHICH DO NOT MEET THE LOCATION REQUIREMENTS MUST NOT BE USED. THE HEIGHT REQUIREMENTS SPECIFIED WITHIN THIS DRAWING FOR INSTALLATION OF CROSS MEMBERS ARE IDENTICAL WITH THOSE RECOMMENDED BY THE BUREAU OF EXPLOSIVES PAMPHLET 6C, AND APPENDICES THERETO.
  - I. VOIDS LENGTHWISE WITHIN A LOAD MUST BE HELD TO A MINIMUM.
    CROSS MEMBERS MUST BE PLACED AGAINST THE LADING AS TIGHTLY AS
    THE HOLE SPACING IN THE CROSS MEMBER ATTACHMENT FACILITY
    PERMITS. EACH CROSS MEMBER WILL 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 TRAILER).
  - CROSS MEMBERS IN EMPTY TRAILERS OR THOSE UNUSED IN LOADED TRAILERS MUST BE SECURED FOR SHIPMENT. COMPONENTS ASSIGNED TO EACH TRAILER MUST REMAIN THEREWITH EVEN THOUGH UNUSED DURING SOME SHIPMENTS.
- G. 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.
- H. 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 C 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.
- J. THE OUTLOADING PROCEDURES SPECIFIED HEREIN CAN ALSO BE UTILIZED FOR THE SHIPMENT OF THE DEPICTED CONTAINERS WHEN THEY ARE EMPTY OR ARE LOADED WITH EMPTY CANISTERS, OR ARE LOADED WITH DIFFERENT ITEMS WHICH DO NOT REQUIRE IN-TRANSIT MONITORING.
- K. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN A TRAILER WHICH IS PARTIALLY LOADED WITH THE DESIGNATED ITEM, PROVIDING THE TOTAL LOAD IS COMPATIBLE, EXISTING DIRECTIVES ARE NOT VIOLATED, AND THE OTHER LADING ITEMS ARE BLOCKED AND BRACED TO EQUAL THE BLOCKING AND BRACING CRITERIA SPECIFIED HEREIN.
- L. CAUTION: DO NOT NAIL BLOCKING SHOWN HEREIN TO THE TRAILER WALLS.
  ALL NAILING WILL BE WITHIN THE DUNNAGE OR TO THE TRAILER FLOOR, AS INDICATED.
- M. 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.

(CONTINED AT RIGHT)

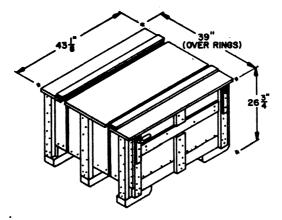
## MATERIAL SPECIFICATIONS

| LUMBER;           | SEE TM 743-200-1, DUNNAGE LUMBER; FED SPEC MM-L-751.   |
|-------------------|--|
| <u>NAILS</u> ;    | 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-5-781.   |
| STRAP SEAL:       | COMMERCIAL GRADE.  |

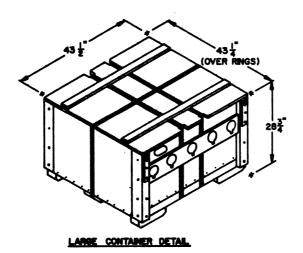
#### (GENERAL NOTES CONTINUED)

- N. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 2" X 6" MATERIAL IS ACTUALLY 1-5/8" THICK BY 3-5/8" WIDE AND 4" X 4" MATERIAL IS ACTUALLY 3-5/8" THICK BY 3-5/8" WIDE.
- O. NOTICE: A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES. ALSO, A STAGGERED NAILING PATTERN WILL BE USED WHEN DUNNAGE IS NAILED TO THE FLOOR OF THE TRANSPORTING VEHICLE, OR WHEN LAMINATING DUNNAGE. ADDITIONALLY, THE NAILING PATTERN FOR AN UPPER PIECE OF LAMINATED DUNNAGE WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL FOR THAT PIECE WILL NOT BE DRIVEN THROUGH ONTO OR RIGHT BESIDE A NAIL IN A LOWER PIECE
- P. 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.
- Q. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

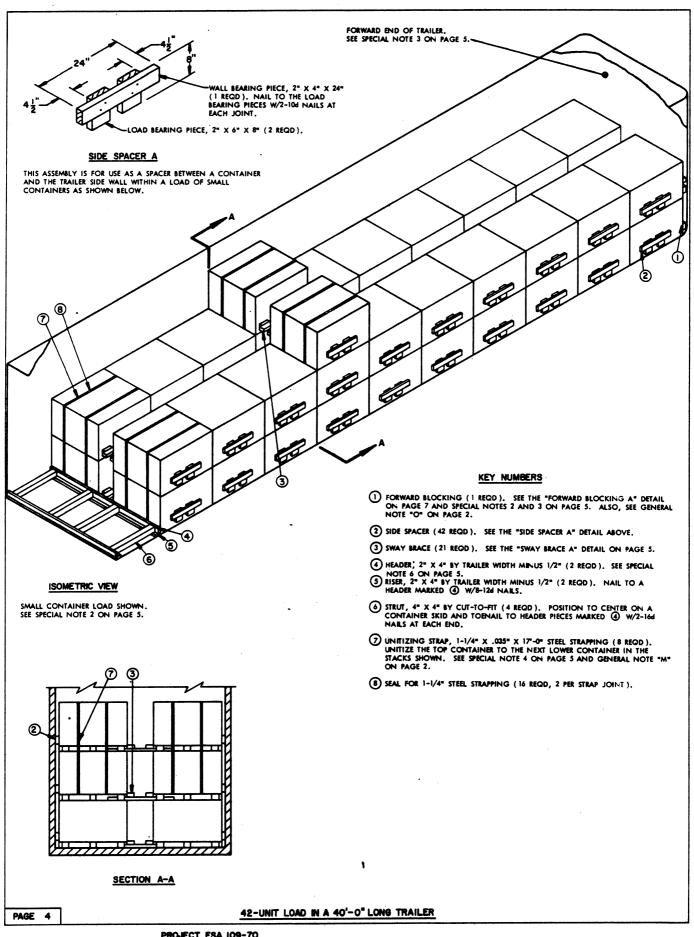
2



SMALL CONTAINER DETAIL



DETAILS OF CONTAINERS



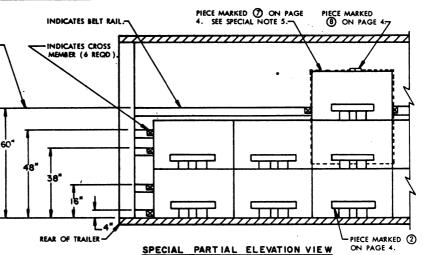
THESE DIMENSIONED HEIGHTS SPECIFY THE DISTANCE
THE TOP SURFACE OF A CROSS MEMBER IS TO BE
ABOVE THE TRAILER FLOOR, A TOLERANCE OF PLUS
OR MINUS TWO INCHES (22) WILL BE ALLOWED
FOR EACH DIMENSIONED HEIGHT:
NOTES.

#### SPECIAL NOTES

- 1. A 42-UNIT LOAD IS SHOWN IN A 40'-0" LONG BY 7'-6" WIDE (INSIDE DIMENSION) TRAILER THAT HAS RO LINDED CORNERS AT THE FORWARD BND. A WIDER OR NARROWER TRAILER MAY BE USED. A 37'-6" LONG TRAILER IS THE MINIMUM LENGTH TRAILER THAT MAY BE USED FOR SHIPMENT OF THE DEPICTED LOAD; HOWEVER, A SHOWTER TRAILER CAN BE USED BY INCREASING THE LENGTH OF THE PARTIAL THIRD LAYER.
- THE ISOMETRIC VIEW ON PAGE 4 DEPICTS A LOAD OF SMALL CONTAINERS; HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE TO THE LARGE CONTAINER. FOR THE SHIPMENT OF LARGE CONTAINERS, THE FOLLOWING ADJUSTMENTS WILL BE MADE:
  - A. IN LIEU OF PIECE MARKED (), USE THE "FORWARD BLOCKING B" ASSEMBLY AS DETAILED ON PAGE 7.
  - B. AN OFFSET LOADING PATTERN WILL BE USED AS SHOWN IN THE "PARTIAL PLAN VIEW" ON PAGE 7.
  - C. IN LIEU OF PIECES MARKED ② , USE "SIDE SPACER B-1" AND "SIDE SPACER B-2" ASSEMBLIES AS DETAILED ON PAGE 8. TWENTY-ONE (21) OF EACH ASSEMBLY WILL BE REQUIRED.
  - D. IN LIEU OF PIECES MARKED ③ , USE "SWAY BRACE B" ASSEMBLIES AS DETAILED ON PAGE 8.
  - E. PIECES MARKED 7 WILL BE INCREASED TO 19"-0" IN LENGTH.
- 3. FOR ROUNDED-CORNER TRAILERS WHERE THE RADIUS OF THE CORNERS IS GREATER THAN SEVEN INCHES (7"), ADDITIONAL DUNNAGE OF A THICKNESS TO SUIT MUST BE LAMINATED TO THE FRONT HORIZONTAL PIECES OF THE FORWARD BLOCKING SO AS TO PROVIDE A "SQUARE" FRONT FOR THE LOAD. ALSO, IF THE TRAILER BEING USED HAS A SQUARE FRONT, OMIT THE FORWARD BLOCKING ASSEMBLY MARKED (1), AND POSITION THE CONTAINERS DIRECTLY AGAINST THE TRAILER FRONT WALL.
- 4. IF THE DELINEATED OUTLOADING METHOD IS USED FOR THE SHIPMENT OF A LOAD WHICH CONTAINS LESS UNITS THAN SHOWN TO SATISFY A LESS-THAN-FULL-LOAD QUANTITY, THE QUANTITY MAY BE REDUCED BY MULTIPLES OF TWO CONTAINERS BY OMITTING LATERALLY ADJACENT CONTAINERS FROM A LAYER AND/OR LATERALLY ADJACENT STACKS. HOWEVER, IF AN UNEVEN QUANTITY OF CONTAINERS IS TO BE SHIPPED IN A THIRD LAYER, THE THREE-HIGH STACK LATERALLY ADJACENT TO AN OMITTED CONTAINER MUST BE UNITIES WITH STACK LATERALLY ADJACENT TO AN THE FULL HEIGHT OF THE STACK. ALSO, IF A SECOND LAYER CONTAINS AN UNEVEN QUANTITY OF CONTAINERS, THE PROCEDURES DEPICTED IN THE LILL LOAD VIEW ON PAGE 6 MUST BE USED FOR BLOCKING THE TWO-HIGH STACK LATERALLY ADJACENT TO AN OMITTED CONTAINER.
- 5. IF THE TRAILER BEING OUTLOADED CONTAINS MECHANICAL BRACING DEVICES, SUCH AS WALL BELT RAILS AND LOAD BLOCKING CROSS MEMBERS, WHICH CONFORM TO SPECIFICATIONS SET FORTH WITHIN THE BUREAU OF EXPLOSIVES PAMPHLET GC AND THE APPENDICES THERETO, THEY MAY BE USED AT THE LOCATIONS AND HEIGHTS AS SPECIFIED IN THE "SPECIAL PARTIAL ELEVATION VIEW" DEPICTED ON THIS PAGE, PIECES MARKED ③ THRU ⑤ WILL BE OMITTED. IF THE TRAILER BEING USED IS EQUIPPED WITH BELT RAILS WHICH PERMIT A CROSS MEMBER TO BE PLACED ON EACH END OF THE THIRD. LAYER CONTAINERS AT A HEIGHT OF 72" THRU 76", PIECES MARKED ⑦ AND ⑥ MAY ALSO BE OMITTED AND THE CROSS MEMBERS SHOWN AT THE 60" HEIGHT WILL NOT BE REQUIRED. THE LOADING PATTERN AS SHOWN REQUIRES A MECHANICAL SYSTEM LENGTH OF AT LEAST 36'-10" FOR A LOAD OF SMALL CONTAINERS, AND 37'-2" FOR A LOAD OF LARGE CONTAINERS, AS MEASURED FROM THE FRONT WALL OF THE TRAILER. IN TRAILERS HAVING ROUNDED CORNERS AT THE FORWARD END, THE FORWARD BLOCKING ASSEMBLY MARKED ① MAY BE OMITTED BY INSTALLING TWO (2) CROSS MEMBERS FOR EACH LAYER OF CONTAINERS AT THE FRONT OF THE LOAD NOT THE FRONT OF THE LOAD NOT AT THE SAME HEIGHTS SPECIFIED FOR REAR-OF-LOAD MEMBERS.

(CONTINUED AT RIGHT)

| LUMBER       | LINEAR FEET | BOARD FEET |
|--------------|-------------|------------|
| 2" X 2"      | 20          | 7          |
| 2" X 4"      | 387         | 258        |
| 2" X 6"      | 56          | 56         |
| 4" X 4"      | 25          | . 34       |
| NAILS        | NO. REQD    | POUNDS     |
| 104 (3")     | 572         | ,          |
| 124 (3-1/4") | 16          | 1/4        |
| 16d (3-1/2°) | 16          | 1/2        |



LOAD BEARING PIECE, 2" X 4" X 36"
(2 REOD). NAIL TO THE SUPPORT
PIECES W/3-10d NAILS AT EACH
JOINT.

2 4" FOR FIRST

LAYER CONTAINERS;
36" FOR SECOND
AND THIRD LAYERS.

FILL PIÈCE, 2" X 2" X 6" (4 REOD).
NAIL TO LOAD BEARING PIECE
W/2-10d NAILS. NOTE: ONLY
REQUIRED FOR FIRST LAYER
CONTAINERS.

SUPPORT PIECE, 2" X 4"
BY LENGTH TO SUIT
(2 REOD).

SEE SPECIAL NOTE 5.

#### SWAY BRACE A

THIS ASSEMBLY IS FOR USE BETWEEN LATERALLY ADJACENT CONTAINERS WITHIN A LOAD OF SMALL CONTAINERS AS SHOWN ON PAGE 4.

#### (SPECIAL NOTES CONTINUED)

THIS METHOD, HOWEVER, WILL REQUIRE A SYSTEM LENGTH OF NOT LESS THAN 36'-6" FOR THE SMALL-CONTAINER-LOAD AND 36'-10" FOR THE LARGE-CONTAINER-LOAD, AS MEASURED FROM THE FRONT FACE OF THE FORWARD CROSS MEMBERS TO THE REAR FACE OF THE REARWARD MEMBERS. CAUTION: TWO (2) CROSS MEMBERS LOCATED AT THE SPECIFIED HEIGHTS WILL NOT BE RELIED UPON TO RETAIN MORE THAN TWENTY (20) CONTAINERS WITHIN A LAYER. SEE GENERAL NOTE "F" ON PAGE 2.

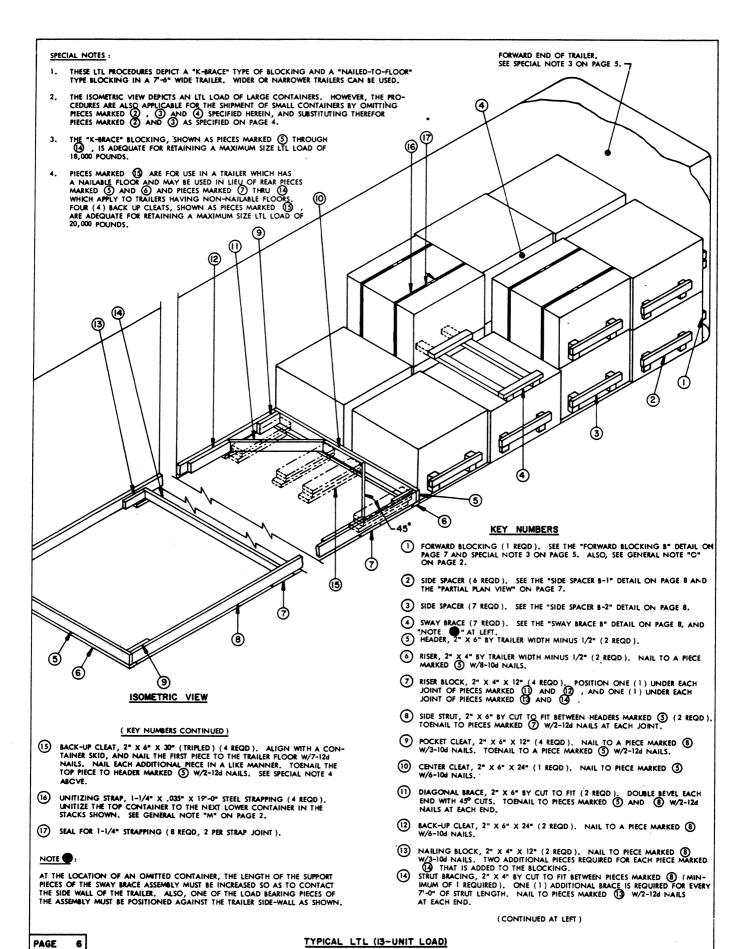
6. IF THE SPACE BETWEEN THE REAR OF THE LOAD AND THE REAR DOORS OF THE TRAILER WHEN THEY ARE CLOSED MEASURES NINE INCHES (9") OR LESS, SOLID FILL MATERIAL, SIX INCHES (6") WIDE BY TRAILER WIDTH IN LENGTH, MUST BE POSITIONED ON EDGE AND LAMINATED TO FILL THE VOID. SOLID FILL TYPE BLOCKING WILL BE USED IN LIEU OF PIECES MARKED (4), (5) AND (6).

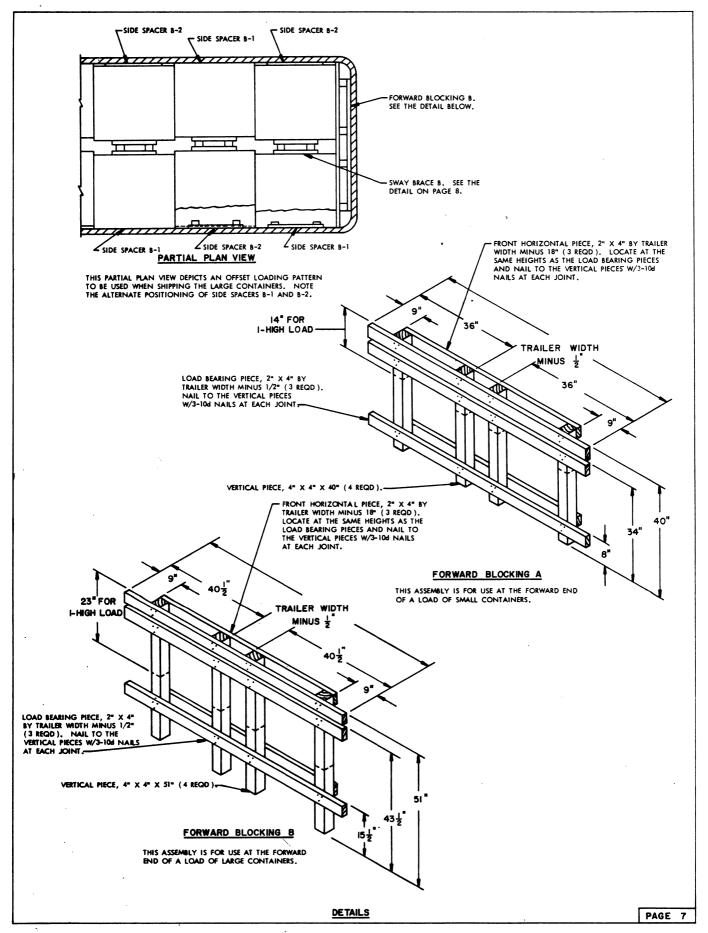
# LOAD AS SHOWN

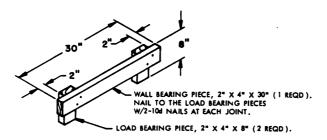
TOTAL WEIGHT ------ 40,819 LBS

42-UNIT LOAD IN A 40-0" LONG TRAILER

PAGE 5

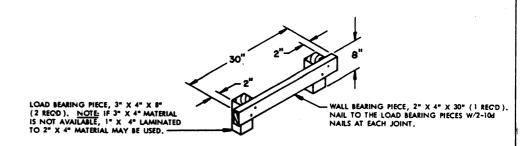






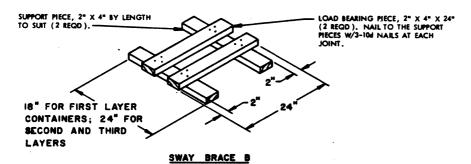
#### SIDE SPACER B-I

THIS ASSEMBLY IS FOR USE AS A SPACER BETWEEN A CONTAINER AND TRAILER SIDE WALL ON ALTERNATE SIDES OF THE TRAILER WITHIN A LOAD OF LARGE CONTAINERS.



# SIDE SPACER B-2

THIS ASSEMBLY IS FOR USE AS A SPACER BETWEEN A CONTAINER AND TRAILER SIDE WALL ON ALTERNATE SIDES OF THE TRAILER WITHIN A LOAD OF LARGE CONTAINERS.



# THIS ASSEMBLY IS FOR USE BETWEEN LATERALLY ADJACENT CONTAINERS WITHIN A LOAD OF LARGE CONTAINERS AS SHOWN IN THE "PARTIAL PLAN VIEW" ON PAGE 7.

PAGE 8 **DETAILS**