APPROVED BY

BUREAU OF EXPLOSIVES

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# LOADING AND BRACING IN VAN TYPE TRAILERS OF M55 ROCKETS, M23 MINES, AND MISCELLANEOUS ITEMS OF CHEMICAL AMMUNITION

ITEM	INDEX	
<u> </u>		PAGE(S)
GENERAL NOTES, AND MATERIAL SPECIFICATION	S	2
UNIT DETAILS		3
15-UNIT LOAD OF M55 ROCKETS		7, /
TYPICAL PARTIAL LOAD OF M55 ROCKETS		
16-UNIT LOAD OF M23 MINES		Ο, ,
TYPICAL PARTIAL LOAD OF M23 MINES		
TYPICAL MIXED LOAD OF M55 ROCKETS AND M2		
DETAILS	]	4-18, 20

CAUTION: THE PROCEDURES SHOWN HEREIN ARE ONLY APPLICABLE FOR HIGHWAY MOVEMENTS, NOT FOR CONTAINER/TRAILER-ON-FLAT-CAR MOVEMENTS.

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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 HEREIN FOR FIVE SEPARATE VAN LOADS ARE APPLICABLE TO THE 15-ROUND PALLET UNIT OF M55 ROCKETS, AND THE 12-DRUM PALLET UNIT OF M23 MINES.
- THE DEPICTED PROCEDURES ARE BASED ON VAN TYPE TRAILERS WHICH ARE 40'-0" LONG THE DEPICTED WIDE (INSIDE DIMENSION) WITH WOOD, WOOD AND METAL, OR ALL METAL FLOORS. THE PROCEDURES ARE ALSO APPLICABLE FOR TRAILERS WHICH ARE EIGHTYNINE INCHES (89") THRU NINETY-THREE INCHES (93") IN WIDTH AND FOR TRAILERS OF OTHER LENGTHS, UP TO AND INCLUDING 45"-0" LONG.
- D. FOR DETAIL OF THE PALLET UNIT OF M55 ROCKETS, SEE DRAWING NO. D90-6-62 ( CHEMICAL CORPS ) AND PAGE 3 OF THIS DRAWING.

ITEM DIMENSIONS---83-3/4" LONG BY 31" WIDE BY 27-3/4" HIGH. GROSS WEIGHT-----1,350 POUNDS (APPROX ).

FOR DETAIL OF THE PALLET UNIT OF M23 MINES, SEE DRAWING NO. D-N-4169 (FMC CORPORATION ) AND PAGE 3 OF THIS DRAWING.

ITEM DIMENSIONS---35-1/2" LONG BY 52-1/4" WIDE BY 49-1/8" HIGH. GROSS WEIGHT-----1,400 POUNDS ( APPROX ).

- E. CAUTION: NON-COMPATIBLE ITEMS MUST NOT BE OUTLOADED IN THE SAME TRAILER.
- F. SELECTION OF A VEHICLE USED TO TRANSPORT THE DESIGNATED ITEMS MUST COMPLY WITH AR 55-355, CHAPTER 213, FOR EXPLOSIVES AND OTHER DANGEROUS ARTICLES, IN FULL.
- G. GROSS WEIGHT AND AXLE DISTRIBUTION OF WEIGHT FOR A LOAD WILL BE THE RESPON-SIBILITY OF THE CARRIER. THE CARRIER WILL ADVISE THE SHIPPER OF THE APPLICABLE LOADING REQUIREMENTS, AND THE SHIPPER WILL LOAD ACCORDINGLY.
- NOTICE: A SHIPMENT WILL BE POSITIONED IN THE TRAILER CONSISTENT WITH THE STATE WEIGHT LAWS. THE NUMBER OF UNITS MAY BE ADJUSTED TO FIT THE QUANTITY TO BE SHIPPED; HOWEVER, THE APPROVED METHODS CONTAINED HEREIN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING, AND STAYING OF THE DESIGNATED ITEMS.
- NOTICE: A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN 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. THE NAILING PATTERN WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL DOES NOT PENETRATE INTO OR NEAR A CRACK BETWEEN FLOOR 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. 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.
- 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. <u>CAUTION:</u> EXERCISE CARE DURING TENSIONING TO PREVENT DAMAGE TO THE PALLET UNITS.
- M. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN A TRAILER WHICH IS PARTIALLY LOADED WITH THE DESIGNATED ITEMS, 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.
- N. PORTIONS OF THE SEMITRAILER BODIES DEPICTED WITHIN THIS DRAWING, SUCH AS ONE OF THE SIDEWALLS, 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

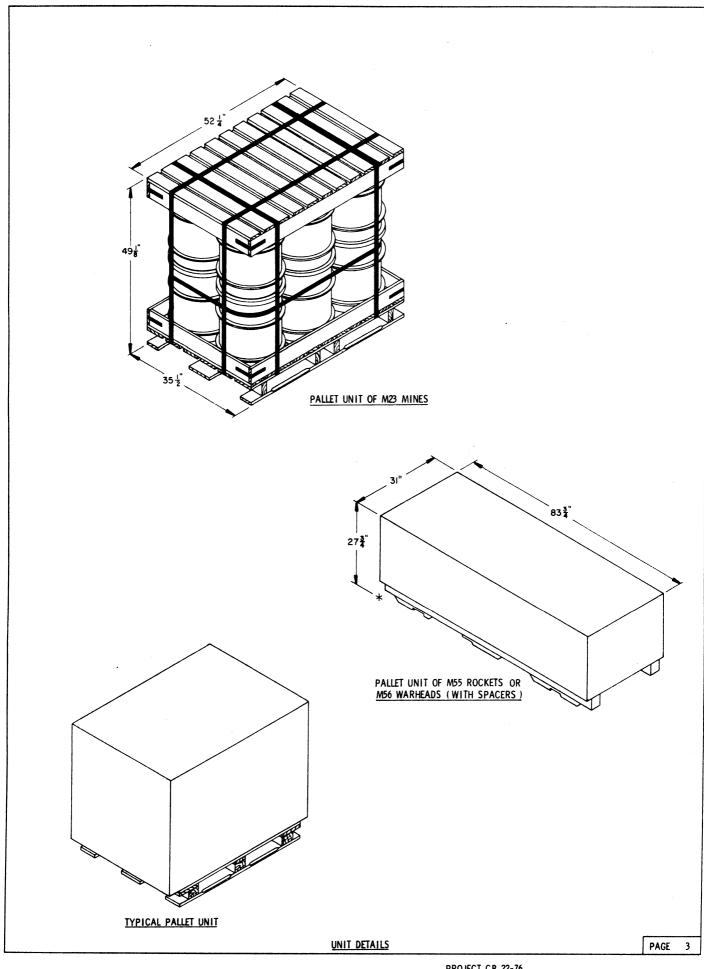
LUMBER ----- SEE TM 743-200-1, DUNNAGE LUMBER; FED SPEC MM-L-751.

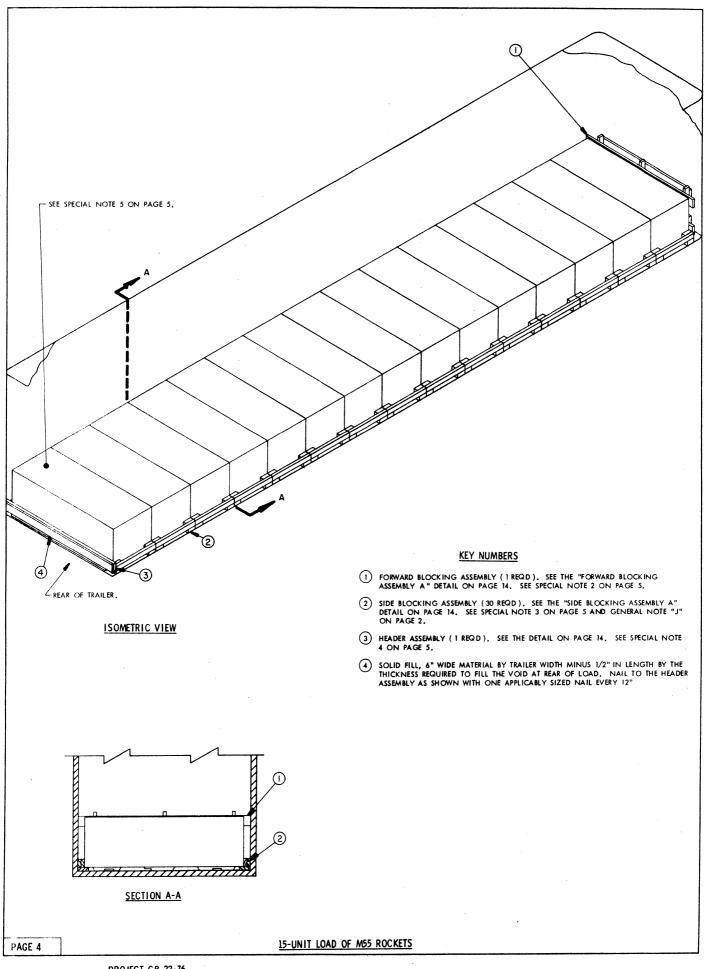
NAILS ----- COMMON, CEMENT COATED OR CHEMICALLY ETCHED, FED ALT: ANNULAR-RING TYPE NAIL OF THE SAME SIZE.

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

SEAL, STRAP ----: TYPE D, STYLE I, II, OR IV, CLASS H; FED SPEC QQ-S-781.

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



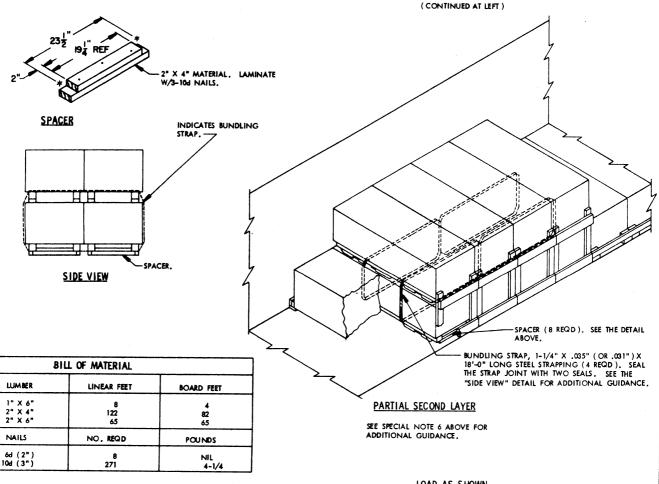


#### (SPECIAL NOTES CONTINUED)

6. WHEN A LOAD CONTAINS A PARTIAL SECOND LAYER, ALL PALLET UNITS IN THE SECOND LAYER WILL BE SECURED TO PALLET UNITS IN THE FIRST LAYER WITH BUNDLING STRAPS. THE BUNDLING STRAPS WILL BE INSTALLED JUST INWARD OF THE END BUBBING STRIPS AND SO AS TO PASS UNDER THE SKIDS OF TWO LOWER UNITS AND OVER THE TOP OF THE SKIDS OF THE TWO UPPER UNITS TO FORM A GROUP OF FOUR AS SHOWN IN THE "SIDE VIEW" DETAIL BELOW, OR UNDER THE SKIDS OF THREE LOWER UNITS AND OVER THE TOP OF THE SKIDS OF THE THREE UPPER UNITS TO FORM A GROUP OF SIX PALLET UNITS. EACH LOWER LAYER PALLET UNIT WHICH IS INCLUDED IN A BUNDLED GROUP MUST HAVE A SPACER POSITIONED BETWEEN THE SKIDS AT EACH END OF THE UNIT TO PREVENT DISPLACEMENT OF THE SKIDS WHEN TENSIONING THE BUNDLING STRAPS. NOTICE: NOT LESS THAN TWO PALLET UNITS MAY BE SECURED IN A PARTIAL SECOND LAYER. ALSO, A PARTIAL LOWER LAYER.

#### SPECIAL NOTES:

- A 15-UNIT LOAD OF PALLETIZED M55 ROCKETS IS SHOWN IN A 40'-0" LONG BY 7'-6" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER. TRAILERS OF OTHER DIMENSIONS CAN BE USED.
- 2. A TRAILER HAVING ROUNDED CORNERS AT THE FORWARD END IS SHOWN, IF THE TRAILER BEING USED IS EQUIPPED WITH A SQUARE FRONT OR WITH AN INSTALLED BULKHEAD, OMIT THE FORWARD BLOCKING ASSEMBLY, PIECE MARKED (1), AND POSITION THE PALLET UNITS DIRECTLY AGAINST THE FORWARD PORTION OF THE TRAILER.
- 3. THE SIDE BLOCKING ASSEMBLY, SHOWN AS PIECE MARKED ② ON PAGE 4, IS DESIGNED FOR A TRAILER WHICH IS NINETY INCHES (90") WIDE. IF A WIDER TRAILER IS PURNISHED FOR LOADING AND THE TOTALE EXCESS SPACE ACROSS THE TRAILER IS CREATER THAN THREE-FOURTHS INCH (3/4"), 6" WIDE MATERIAL OF SUFFICIENT THICKNESS MUST BE LAMINATED TO THE BEARING PIECE OF THE ASSEMBLIES ON ONE OR BOTH SIDES OF THE LOAD TO PROVIDE FOR PROPER LATERAL BRACING.
- 4. IF THE SPACE BETWEEN THE REAR OF THE LOAD AND THE TRAILER DOORS IS MORE THAN 9", REAR BLOCKING AS SHOWN BY THE "REAR BLOCKING ASSEMBLY A" DETAIL ON PAGE 15 SHOULD BE USED IN LIEU OF PIECES MARKED ③ AND ④, IF THE EXCESS SPACE IS GREATER THAN 60" THE REAR BLOCKING SHOWN ON PAGE 6 AS PIECES MARKED ③ THRU ② MAY BE USED.
- 5. IF IT IS NECESSARY TO SHIP MORE THAN FIFTEEN PALLET UNITS, OR IF FIFTEEN PALLET UNITS WILL NOT FIT ON THE FLOOR OF THE TRAILER BEING LOADED, A PARTIAL SECOND LAYER MAY BE POSITIONED NEAR THE REAR OF THE TRAILER. SEE THE "PARTIAL SECOND LAYER" DETAIL BELOW FOR GUIDANCE. CAUTION: A LOAD MUST BE DESIGNED IN SUCH A MANNER THAT THERE WILL BE AT LEAST TWO (2) PALLET UNITS IN THE UPPER LAYER. SEE SPECIAL NOTE 6 AT LEFT FOR ADDITIONAL GUIDANCE.

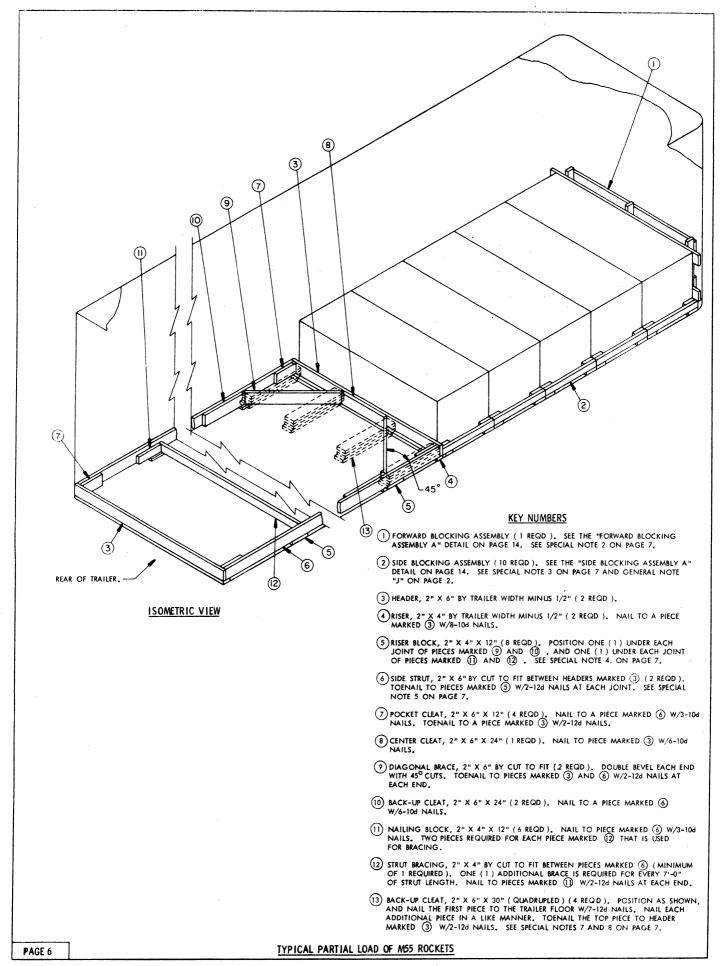


## LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT	(APPROX)
	ALLET 15		
	TOTAL WEIGHT	20,557 LBS	

15-UNIT LOAD OF M55 ROCKETS

PAGE 5



- A 5-UNIT LOAD OF PALLETIZED M55 ROCKETS IS SHOWN IN A 7'-6" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER. WIDER TRAILERS CAN BE USED.
- 2. A TRAILER HAVING ROUNDED CORNERS AT THE FORWARD END IS SHOWN. IF THE TRAILER BEING USED IS EQUIPPED WITH A SQUARE FRONT OR WITH AN INSTALLED BULKHEAD, OMIT THE FORWARD BLOCKING ASSEMBLY, PIECE MARKED ①, AND POSITION THE PALLET UNITS DIRECTLY AGAINST THE FORWARD PORTION OF THE TRAILER.
- 3. THE SIDE BLOCKING ASSEMBLY, SHOWN AS PIECE MARKED ② ON PAGE 6, IS DESIGNED FOR A TRAILER WHICH IS NINETY INCHES (90") WIDE. IF A WIDER TRAILER IS RIKNISHED FOR LOADING AND THE TOTAL EXCESS SPACE ACROSS THE TRAILER IS GREATER THAN THREE-FOURTHS INCH (3/4"), 6" WIDE MATERIAL OF SUFFICIENT THICKNESS MUST BE LAMINATED TO THE BEARING PIECE OF THE ASSEMBLIES ON ONE OR BOTH SIDES OF THE LOAD TO PROVIDE FOR PROPER LATERAL BRACING.
- 4. THE QUANTITIES SPECIFIED WITHIN THE KEY NUMBERS ON PAGE 6 FOR PIECES MARKED (3), (11), AND (22) ARE APPLICABLE WHEN SHIPPING A 5-UNIT LOAD OF M55 ROCKETS IN A 40-FOOT LONG TRAILER. THE QUANTITIES MAY NEED TO BE ADJUSTED WHEN SHIPPING A DIFFERENT NUMBER OF UNITS OR WHEN A DIFFERENT TRAILER IS BIRDINGIED FOR LOADING.
- 5. DEPENDING ON THE NUMBER OF PALLET UNITS BEING SHIPPED AND THE LENGTH OF THE TRAILER TO BE LOADED, EACH OF THE SIDE STRUTS, PIECES MARKED (1). MAY NEED TO BE FORMED FROM MORE THAN ONE PIECE OF MATERIAL, IF SUCH IS THE CASE, THE SIDE STRUTS MUST BE SPLICED. SPLICING CAN BE ACCOMPLISHED BY CENTERING A 2" X 6" X 24" PIECE ON THE JOINT OF THE SIDE STRUTS AND NAILING IT TO THE SIDE STRUTS W/A-101 NAILS AT EACH END. IF DESIRED, THE STRUT BRACING PIECE (S), PIECE MARKED (1), MAY BE NAILED TO THESE SPLICE PIECES IN LIEU OF USING ADDITIONAL NAILING BLOCKS, PIECES MARKED (1).
- 6. THE "K-BRACE" TYPE BLOCKING, SHOWN AS PIECES MARKED ③ THRU ②, IS ADEQUATE FOR RETAINING NOT MORE THAN FOURTEEN (14) PALLET UNITS. NOTE THAT AT LEAST 60" SPACE IS REQUIRED AT THE REAR OF THE LOAD FOR THE INSTALLATION OF THE DEPICTED K-BRACE BLOCKING. FOR A SPACE OF LESS THAN 60", REFER TO THE "REAR BLOCKING ASSEMBLY A" DETAIL ON PAGE 15 FOR GUIDANCE. THAT BLOCKING AND BRACING MAY ALSO BE USED FOR A VOID OF MORE THAN 60", AND IS ADEQUATE FOR RETAINING A MAXIMUM SIZE LOAD.
- 7. PIECES MARKED (3) ARE FOR USE IN A TRAILER WHICH HAS A NAILABLE FLOOR AND MAY BE USED, IF DESIRED, IN LIEU OF PIECES MARKED (3) THRU (2) WHICH APPLY TO TRAILERS HAVING NON-NAILABLE FLOORS.
- 8. FOUR (4) BACK-UP CLEATS, SHOWN AS PIECES MARKED (3), ARE ADEQUATE FOR RETAINING NOT MORE THAN ELEVEN (11) PALLET UNITS. HOWEVER, BY LENGTHENING THESE PIECES TO 36" OR 42" AND USING 9 OR 11 NAILS PER LAYER, RESPECTIVELY, THEY WOULD BE ADEQUATE FOR RETAINING 14 OR 19 PALLET UNITS, RESPECTIVELY.
- 9. THE LOAD DEPICTED ON PAGE 6 SHOWS A TYPICAL LOAD OF FIVE (5) M55 ROCKET PALLET UNITS BUT IS NOT RESTRICTED TO THAT QUANTITY. THE NUMBER OF UNITS MAY BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED, WITHIN THE LIMITATIONS OF SPECIAL NOTES 6 AND 8 ABOVE. ALSO, OTHER COMPATIBLE ITEMS MAY BE SHIPPED IN THE SAME LOAD WITH THE M55 ROCKETS, PROVIDING PROPER BLOCKING AND BRACING IS INSTALLED FOR THE ADDED ITEMS. SEE THE "ISOMETRIC VIEW" AND THE "BRACE" DETAIL ON PAGE 20 FOR GUIDANCE IN BLOCKING AND BRACING THE ADDED ITEMS.

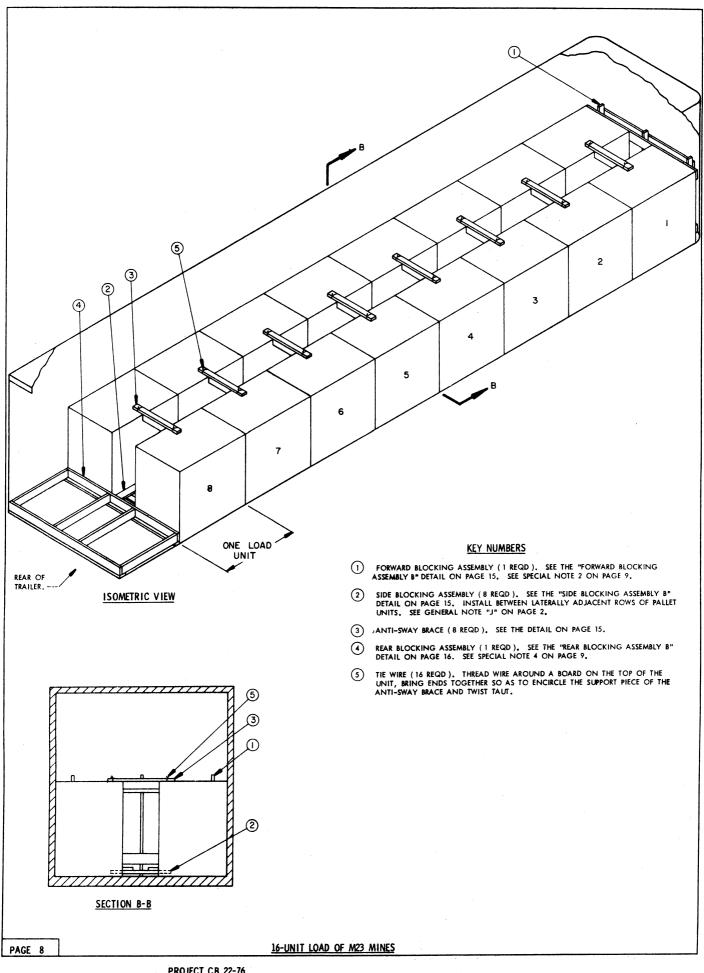
	BILL OF MATERIAL	
LUMBER	LINEAR FEET	BOARD FEET
2" X 4" 2" X 6"	94 121	63 121
NAILS	NO. REQD	POUNDS
10d (3") 12d (3-1/4")	180 44	3 3/4

### LOAD AS SHOWN

| M55 ROCKET PALLET ------ 5 --------- 6,750 LBS | DUNNAGE ------ 7,122 LBS | TOTAL WEIGHT ------ 7,122 LBS |

TYPICAL PARTIAL LOAD OF M55 ROCKETS

PAGE 7



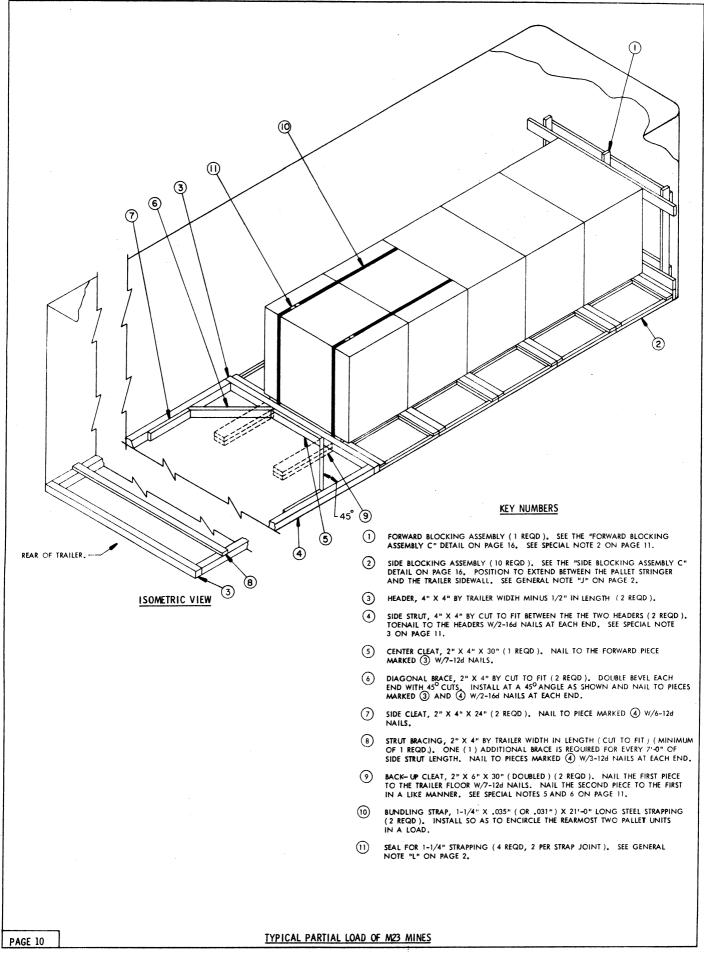
- A 16-UNIT LOAD OF PALLETIZED M23 MINES IS SHOWN IN A 40'-0" LONG BY 7'-6" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER. TRAILERS OF OTHER DIMENSIONS CAN BE USED.
- 2. A TRAILER HAVING ROUNDED CORNERS AT THE FORWARD END IS SHOWN.

  IF THE TRAILER BEING USED IS EQUIPPED WITH A SQUARE FRONT OR WITH AN INSTALLED BULKHEAD, OMIT THE FORWARD BLOCKING ASSEMBLY, PIECE MARKED ①, AND POSITION THE PALLET UNITS DIRECTLY AGAINST THE FORWARD PORTION OF THE TRAILER.
- 3. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 60", THE "K-BRACE" TYPE BLOCKING SHOWN ON PAGE 6 AS PIECES MARKED ③
  THRU ② MAY BE USED IN LIEU OF THE DEPICTED REAR BLOCKING
  ASSEMBLY, PIECE MARKED ④ . <u>CAUTION</u>: THE "K-BRACE" TYPE BLOCKING
  IS ADEQUATE FOR RETAINING NOT MORE THAN FOURTEEN (14) PALLET UNITS.
- 4. IF THE SPACE AT THE REAR OF THE LOAD IS 9" OR LESS, SOLID FILL TYPE BLOCKING WILL BE USED IN LIEU OF THE DEPICTED REAR BLOCKING ASSEMBLY, PIECE MARKED 4. SOLID FILL SHOULD CONSIST OF 8" WIDE BY TRAILER WIDTH MINUS 1/2" IN LENGTH MATERIAL OF A THICKNESS AS REQUIRED TO FILL THE VOID BETWEEN THE REAR OF THE LOAD AND THE TRAILER DOORS, LAMINATE W/5 APPLICABLY SIZED NAILS, IF APPLICABLE.
- 5. THE DEPICTED LOAD CAN BE REDUCED BY MULTIPLES OF TWO PALLET UNITS BY OMITTING ONE OR MORE LOAD UNITS. INCREASE THE LENGTH OF REAR BLOCKING AS NECESSARY. IF FIFTEEN (15) PALLET UNITS ARE TO BE SHIPPED, OMIT THE REAR LOAD UNIT FROM THE DEPICTED LOAD. BETWEEN LOAD UNITS SIX AND SEVEN, POSITION ONE PALLET UNIT IN THE CENTER OF THE TRAILER WIDTH, WITH THE 52-1/4" DIMENSION OF THE UNIT CROSSWISE. INSTALL SIDE BLOCKING FOR THAT UNIT AS SHOWN BY PIECES MARKED (2) ON PAGE 10. SIMILAR PROCEDURES MAY BE APPLIED TO OBTAIN OTHER UNITY OF QUANTITIES. NOTE THAT FOR LOADS OF THIRTEEN OR LESS PALLET UNITS, THE OUTLOADING PROCEDURES SHOWN ON PAGE 10 MAY BE APPLIED.
- 6. IF IT IS NECESSARY TO SHIP A PALLET UNIT OF M23 MINES WHICH CONTAINS LESS THAN THE FULL QUANTITY OF 12 DRUMS, IT WILL BE NECESSARY TO CONSTRUCT A FILLER ASSEMBLY FOR PLACEMENT WITHIN THE PALLET UNIT IN THE PLACE OF THE OMITTED DRUMS. THE "FILLER ASSEMBLY A" DETAIL ON PAGE 17 DEPICTS A TYPICAL FILLER FOR USE IN THE PLACE OF FOUR (4) OMITTED DRUMS. THE ASSEMBLY CAN BE ALTERED FOR USE IN THE OMISSION OF ONE OR TWO DRUMS. NOTE THAT A PALLET UNIT CONSISTING OF LESS THAN THE FULL QUANTITY OF DRUMS SHOULD BE LOCATED WITHIN THE REARMOST LOAD UNIT IN THE TRAILER.

	BILL OF MATERIAL	
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	93	61
2" X 6" 4" X 4"	122 13	122 18
NAILS	NO. REQD	POUNDS
10d (3")	172	2-3/4
12d ( 3-1/4" )	32	1/2

# LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT ( APPROX )
	PALLET 16	409 LBS
	TOTAL WEIGHT	



- A 5-UNIT LOAD OF PALLETIZED M23 MINES IS SHOWN IN A 7'-6" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER, WIDER TRAILERS CAN BE USED.
- 2. A TRAILER HAVING ROUNDED CORNERS AT THE FORWARD END IS SHOWN. IF THE TRAILER BEING USED IS EQUIPPED WITH A SQUARE FRONT OR WITH AN INSTALLED BULKHEAD, OMIT THE FORWARD BLOCKING ASSEMBLY, PIECE MARKED ①, AND POSITION THE PALLET UNITS DIRECTLY AGAINST THE FORWARD PORTION OF THE TRAILER.
- 3. DEPENDING ON THE NUMBER OF PALLET UNITS BEING SHIPPED AND THE LENGTH OF THE TRAILER TO BE LOADED, EACH OF THE SIDE STRUTS, PIECES MARKED (4), MAY NEED TO BE FORMED FROM MORE THAN ONE PIECE OF MATERIAL. IF SUCH IS THE CASE, THE SIDE STRUTS MUST BE SPLICED. SPLICING CAN BE ACCOMPLISHED BY CENTERING A 2" X 4" X 24" PIECE ON THE JOINT OF THE SIDE STRUTS AND NAILING IT TO THE SIDE STRUTS W/4-10d NAILS AT EACH END.
- 4. THE "K-BRACE" TYPE BLOCKING, SHOWN AS PIECES MARKED ③ THRU ⑧ , IS ADEQUATE FOR RETAINING A MAXIMUM SIZE 1-WIDE LOAD. NOTE THAT AT LEAST 60" SPACE IS REQUIRED AT THE REAR OF THE LOAD FOR THE INSTALLATION OF THE DEPICTED K-BRACE BLOCKING. FOR A SPACE OF LESS THAN 60", REFER TO THE "REAR BLOCKING ASSEMBLY C" DETAIL ON PAGE 17 FOR GUIDANCE. THAT BLOCKING AND BRACING MAY ALSO BE USED FOR A VOID OF MORE THAN 60", AND IS ADEQUATE FOR RETAINING A MAXIMUM SIZE LOAD.
- 5. PIECES MARKED (9) ARE FOR USE IN A TRAILER WHICH HAS A NAILABLE FLOOR AND MAY BE USED, IF DESIRED, IN LIEU OF PIECES MARKED (3) THRU (8) WHICH APPLY TO TRAILERS HAVING NON-NAILABLE FLOORS.
- 6. TWO (2) BACK-UP CLEATS, SHOWN AS PIECES MARKED (9), ARE ADEQUATE FOR RETAINING NOT MORE THAN FIVE (5) PALLET UNITS. HOWEVER, BY LENGTHENING THESE PIECES TO 36" OR 42" AND USING 9 OR 11 NAILS PER LAYER, RESPECTIVELY, THEY WOULD BE ADEQUATE FOR RETAINING 7 OR 9 PALLET UNITS, RESPECTIVELY. AS AN ALTERNATIVE FOR USE WHEN SHIPPING MORE THAN FIVE PALLET UNITS, AN ADDITIONAL BACK-UP CLEAT CAN BE CENTERED ON THE WIDTH OF THE PALLET UNIT. THEN THREE (3) EACH 30", 36", OR 42" LONG BACK-UP CLEATS WITH 7, 9 OR 11 NAILS PER LAYER, RESPECTIVELY, WILL BE ADEQUATE FOR RETAINING 7, 10 OR 13 PALLET UNITS, RESPECTIVELY.
- 7. IF IT IS NECESSARY TO SHIP A PALLET UNIT OF M23 MINES WHICH CONTAINS LESS THAN THE FULL QUANTITY OF 12 DRUMS, IT WILL BE NECESSARY TO CONSTRUCT A FILLER ASSEMBLY FOR PLACEMENT WITHIN THE PALLET UNIT IN THE PLACE OF THE OMITTED DRUMS. THE "FILLER ASSEMBLY A" DETAIL ON PAGE 17 DEPICTS A TYPICAL FILLER FOR USE IN THE PLACE OF FOUR (4) OMITTED DRUMS. THE ASSEMBLY CAN BE ALTERED FOR USE IN THE OMISSION OF ONE OR TWO DRUMS. NOTE THAT A PALLET UNIT CONSISTING OF LESS THAN THE FULL QUANTITY OF DRUMS SHOULD BE LOCATED WITHIN THE REARMOST LOAD UNIT IN THE TRAILER.
- 8. THE LOAD DEPICTED ON PAGE 10 SHOWS A TYPICAL LOAD OF FIVE (5) M23 MINE PALLET UNITS BUT IS NOT RESTRICTED TO THAT QUANTITY. THE NUMBER OF UNITS MAY BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED, WITHIN THE LIMITATIONS OF SPECIAL NOTES 4 AND 6 ABOVE. ALSO, OTHER COMPATIBLE ITEMS MAY BE SHIPPED IN THE SAME LOAD WITH THE M23 MINES, PROVIDING PROPER BLOCKING AND BRACING IS INSTALLED FOR THE ADDED ITEMS. SEE THE "ISOMETRIC VIEW" AND THE "BRACE" DETAIL ON PAGE 20 FOR GUIDANCE IN BLOCKING AND BRACING THE ADDED ITEMS.

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	39	14
2" X 2"	59	20
2" X 4"	83	56
2" X 6"	35	35
4" X 4"	63	84
NAILS	NO. REQD	POUNDS
6d (2")	140	1
10d (3")	125	2
12d (3-1/4")	37	3/4
16d (3-1/2")	16	1/2

STEEL STRAPPING, 1-1/4" X .035" (OR .031") -- 42' REQD--- 6 LBS SEAL FOR 1-1/4" STRAPPING ------ 4 REQD--- NIL

#### LOAD AS SHOWN

 ITEM
 QUANTITY
 WEIGHT (APPROX )

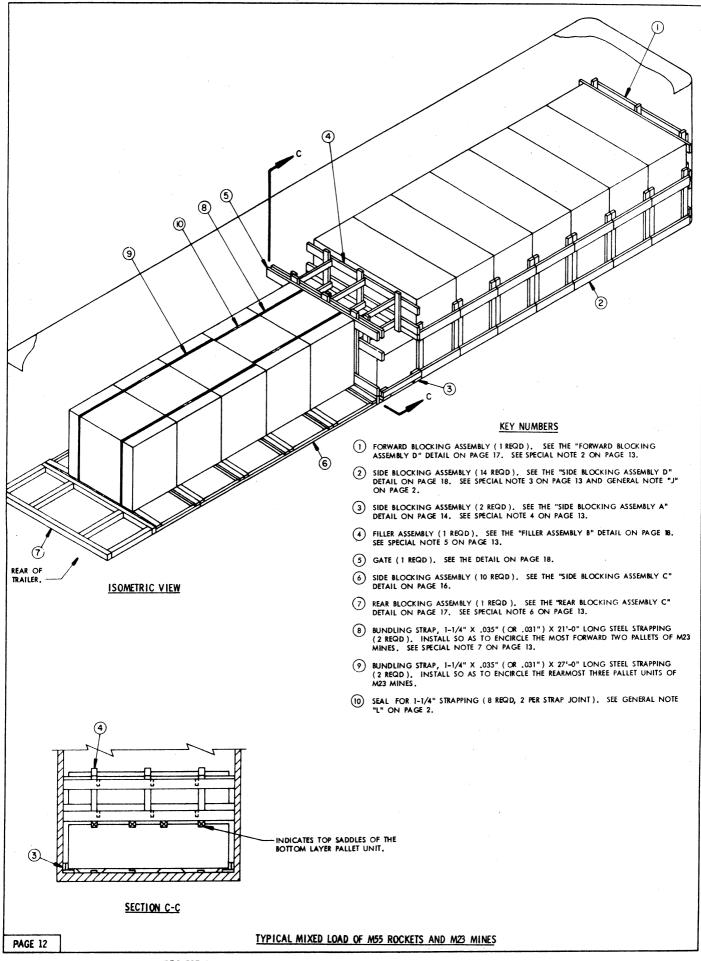
 M23 MINE PALLET
 5
 7,000 LBS

 DUNNAGE
 423 LBS

 TOTAL WEIGHT
 7,423 LBS

TYPICAL PARTIAL LOAD OF M23 MINES

PAGE 11

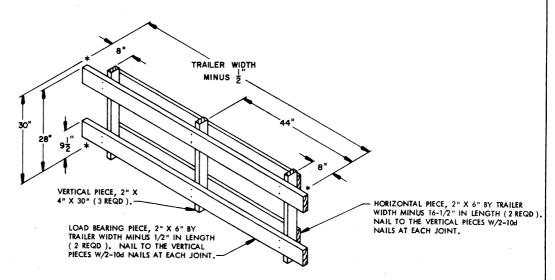


- A TYPICAL MIXED LOAD OF 15 PALLET UNITS OF M55 ROCKETS AND 5 PALLET UNITS OF M23 MINES IS SHOWN IN A 40'-0" LONG BY 7'-6" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER. TRAILERS OF OTHER DIMENSIONS CAN BE USED.
- A TRAILER HAVING ROUNDED CORNERS AT THE FORWARD END IS SHOWN. IF THE TRAILER BEING USED IS EQUIPPED WITH A SQUARE FRONT OR WITH AN INSTALLED BULKHEAD, OMIT THE FORWARD BLOCKING ASSEMBLY, PIECE MARKED (1), AND POSITION THE PALLET UNITS DIRECTLY AGAINST THE FORWARD PORTION OF THE TRAILER.
- 3. THE SIDE BLOCKING ASSEMBLY, SHOWN AS PIECE MARKED ② ON PAGE 12, IS DESIGNED FOR A TRAILER WHICH IS NINETY INCHES (90") WIDE. IF A WIDER TRAILER IS FURNISHED FOR LOADING AND THE TOTAL EXCESS SPACE ACROSS THE TRAILER IS CREATER THAN THREE-FOURTHS INCH (3/4"), 6" WIDE BY 31" LONG MATERIAL OF SUFFICIENT THICKNESS MUST BE LAMINATED TO THE BEARING PIECES OF THE ASSEMBLIES ON ONE OR BOTH SIDES OF THE LOAD TO PROVIDE FOR PROPER LATERAL BRACING.
- 4. THE SIDE BLOCKING ASSEMBLY, SHOWN AS PIECE MARKED ③ ON PAGE 12, IS DESIGNED FOR A TRAILER WHICH IS NINETY INCHES (90") WIDE. IF A WIDER TRAILER IS FURNISHED FOR LOADING AND THE TOTAL EXCESS SPACE ACROSS THE TRAILER IS GREATER THAN THREE-FOURTHS INCH (3/4"), 6" WIDE MATERIAL OF SUFFICIENT THICKNESS MUST BE LAMINATED TO THE BEARING PIECE OF THE ASSEMBLIES ON ONE OR BOTH SIDES OF THE LOAD TO PROVIDE FOR PROPER LATERAL BRACING.
- 5. THE FILLER ASSEMBLY, SHOWN AS PIECE MARKED (4) ON PAGE 12, SHOULD BE CONSTRUCTED OUTSIDE THE TRAILER AND INSTALLED AS A UNIT. THE FILLER ASSEMBLY IS ONLY REQUIRED WHEN A MIXED LOAD IS TO CONTAIN AN UNEVEN NUMBER OF PALLETIZED M55 ROCKETS. IF AN EVEN QUANTITY IS TO BE SHIPPED, OMIT THE FILLER ASSEMBLY AND POSITION THE GATE, PIECE MARKED (5), AGAINST THE REARMOST 2-HIGH STACK OF ROCKETS PRIOR TO LOADING THE M23 MINE PALLETS.
- 6. IF THE SPACE BETWEEN THE REAR OF THE LOAD AND THE TRAILER DOORS IS LESS THAN 12", SOLID FILL TYPE BLOCKING WILL BE USED IN LIEU OF THE DEPICTED REAR BLOCKING ASSEMBLY, PIECE MARKED (?). SOLID FILL SHOULD CONSIST OF 4" WIDE BY TRAILER. WIDTH MINUS 1/2" IN LENGTH MATERIAL OF A. THICKNESS AS REQUIRED TO FILL THE VOID BETWEEN THE REAR OF THE LOAD AND THE TRAILER DOORS. LAMINATE W/5 APPLICABLY SIZED NAILS. NOTE THAT THE MOST FORWARD HEADER OF THE REAR BLOCKING ASSEMBLY MAY BE USED AS A PORTION OF THIS SOLID FILL, IF DESIRED.
- 7. THE BUNDLING STRAPS AROUND THE MOST FORWARD TWO PALLET UNITS OF M23 MINES ARE ONLY REQUIRED WHEN SHIPPING AN UNEVEN QUANTITY OF M55 ROCKETS. IF AN EVEN NUMBER OF M55 ROCKETS IS LOADED, POSITION THE PALLETS OF M23 MINES DIRECTLY AGAINST THE GATE, PIECE MARKED (3), WITHOUT ENCIRCLING THEM WITH STRAPPING.
- 8. IF THE SPACE AT THE REAR OF THE LOAD IS 60" OR MORE, AND PROVIDING THE TOTAL LADING WEIGHT IS 24,000 POUNDS OR LESS, "K-BRACE" TYPE BLOCKING AS SHOWN ON PAGE 10 BY PIECES MARKED ③ THRU ⑧, MAY BE USED IN LIEU OF THE DEPICTED REAR BLOCKING ASSEMBLY, PIECE MARKED ⑦.
- 9. THE LOAD ON PAGE 12 DEPICTING 15 PALLET UNITS OF MS5 ROCKETS AND 5 PALLET UNITS OF M23 MINES REPRESENTS A TYPICAL MIXED LOAD, THE QUANTITIES OF EACH OF THE TWO ITEMS MAY BE ADJUSTED TO SUIT THE QUANTITY THAT IS TO BE SHIPPED, NOTE THAT THE DEPICTED PROCEDURES MUST BE FOLLOWED AS CLOSELY AS POSSIBLE.
- 10. IF IT IS NECESSARY TO SHIP A PALLET UNIT OF M23 MINES WHICH CONTAINS LESS THAN THE FULL QUANTITY OF 12 DRUMS, IT WILL BE NECESSARY TO CONSTRUCT A FILLER ASSEMBLY FOR PLACEMENT WITHIN THE PALLET UNIT IN THE PLACE OF THE OMITTED DRUMS. THE "FILLER ASSEMBLY A" DETAIL ON PAGE 17 DEPICTS A TYPICAL FILLER FOR USE IN THE PLACE OF FOUR (4) OMITTED DRUMS. THE ASSEMBLY CAN BE ALTERED FOR USE IN THE CMISSION OF ONE OR TWO DRUMS. NOTE THAT A PALLET UNIT CONSISTING OF LESS THAN THE FULL QUANTITY OF DRUMS SHOULD BE LOCATED WITHIN THE REARMOST LOAD UNIT IN THE TRAILER.

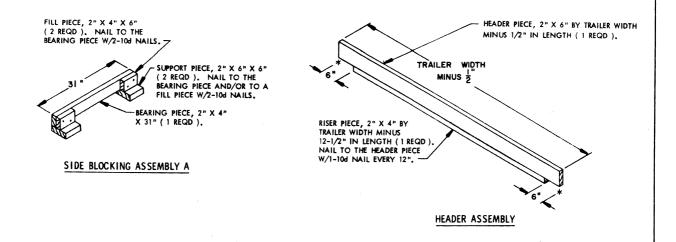
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	39	13
2" X 2"	60	20
2" X 4"	174	116
2" X 6"	195	195
4" X 4"	26	35
NAILS	NO. REQD	POUNDS
6d (2")	140	1
104 (3")	408	6-1/2
16d (3-1/2")	16	1/2

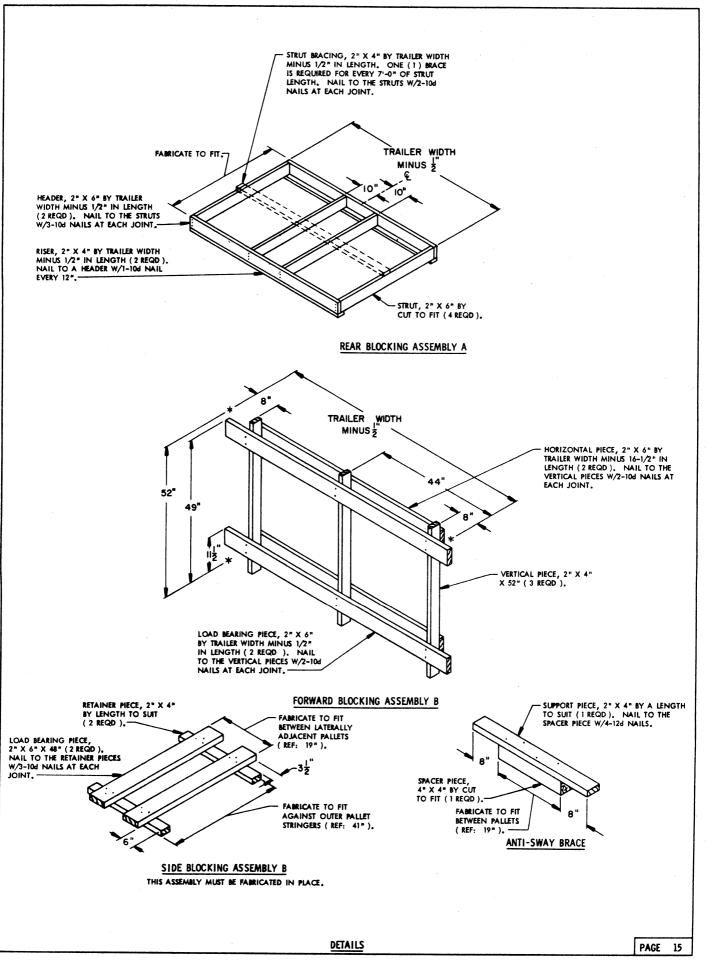
#### LOAD AS SHOWN

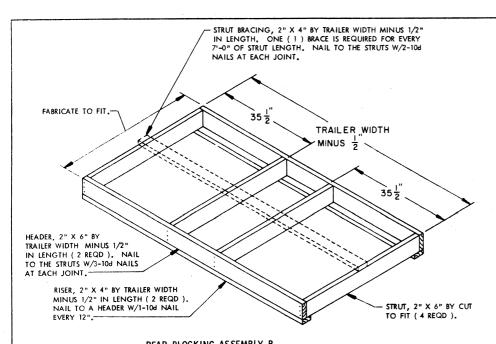
TEM	QUANTITY	WEIGHT (APPROX)
M55 ROCKE	T PALLET 15	20,250 LBS
M23 MINE	PALLET 5	7,000 LBS
<b>DUNNAGE</b>		780 LBS
A	TOTAL WEIGHT	28,030 LBS



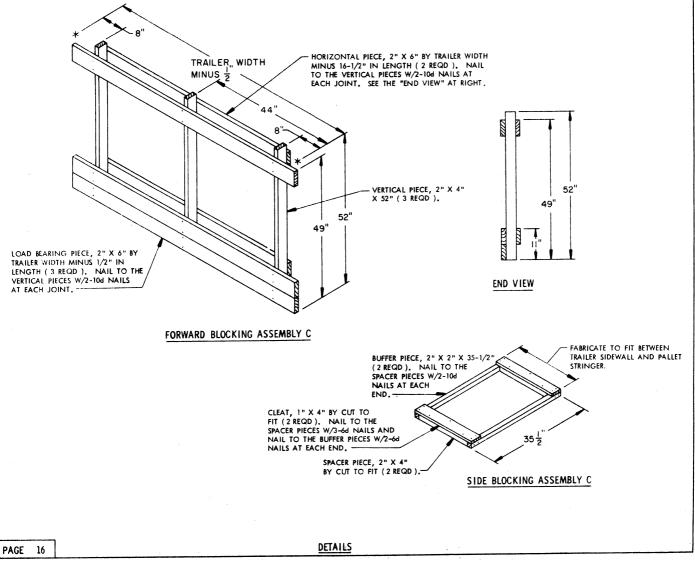
# FORWARD BLOCKING ASSEMBLY A

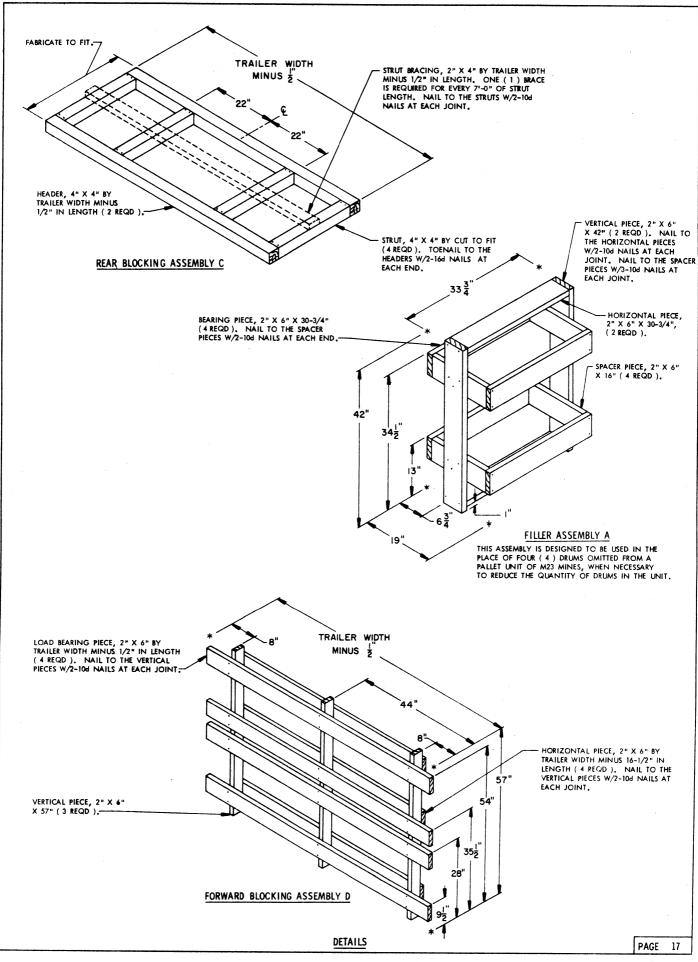


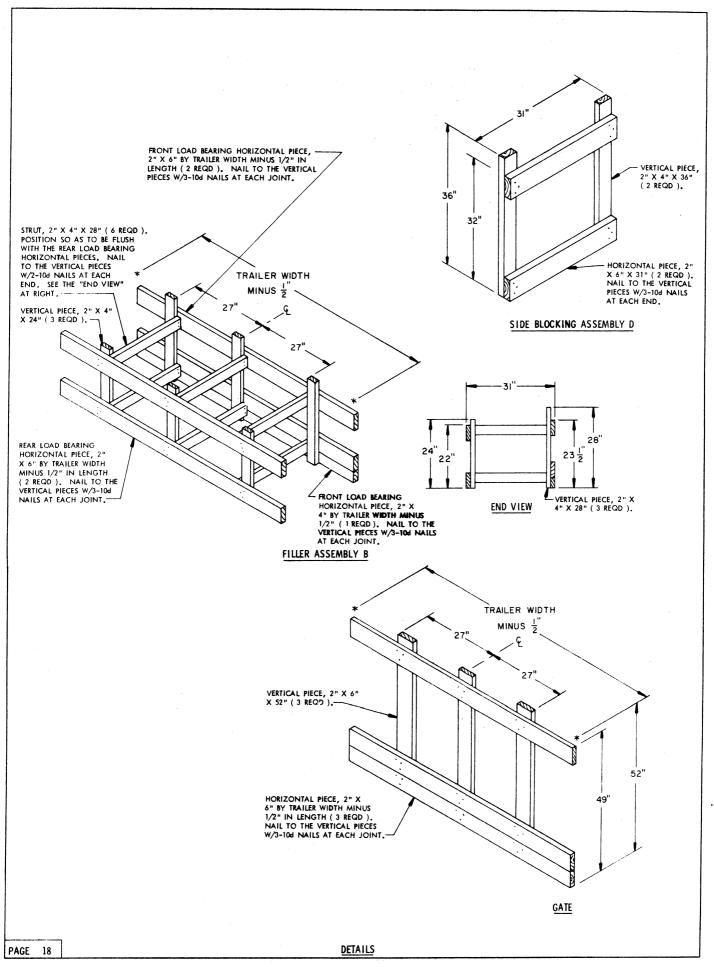


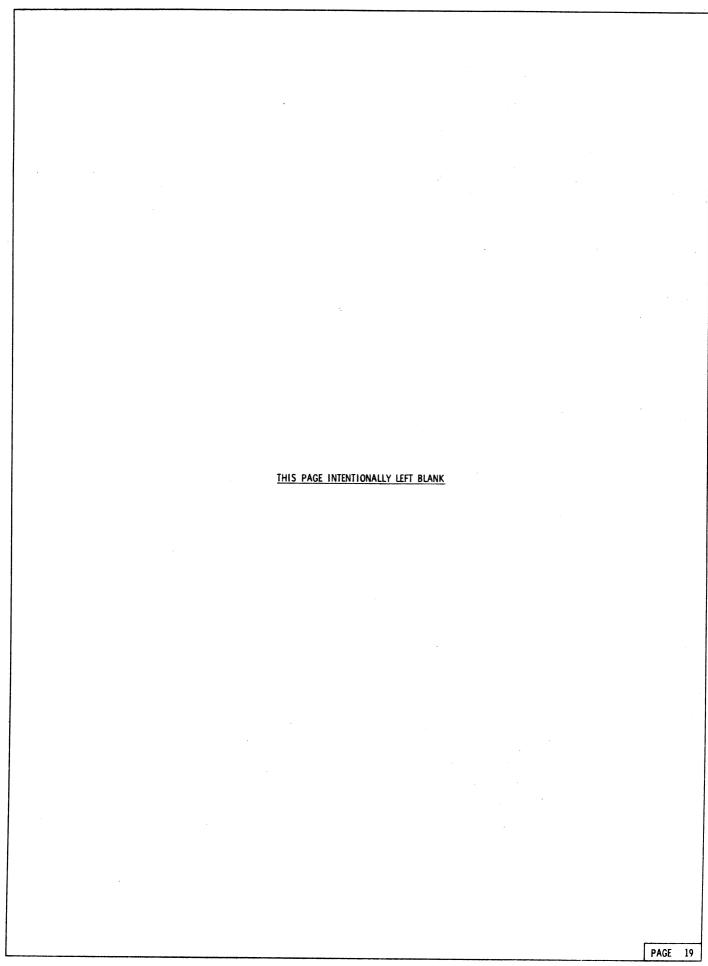


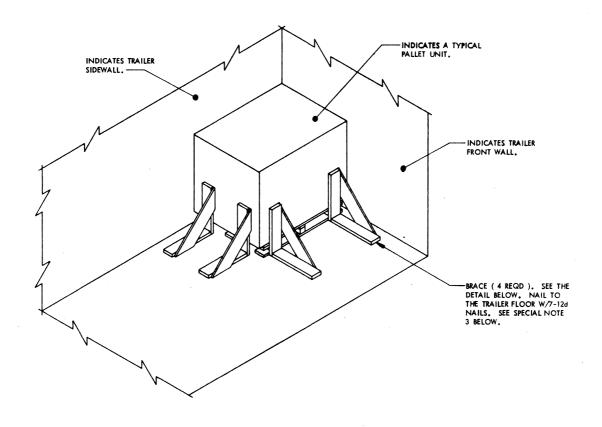
# REAR BLOCKING ASSEMBLY B







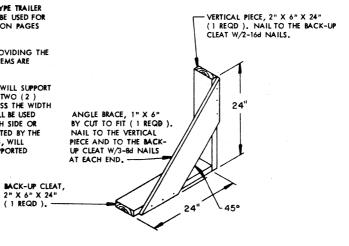




# ISOMETRIC VIEW

#### SPECIAL NOTES:

- A TYPICAL PALLET UNIT HAS BEEN DEPICTED IN A VAN TYPE TRAILER WHICH HAS A NAILABLE FLOOR. THIS PROCEDURE MAY BE USED FOR OUTLOADING OTHER PALLETIZED ITEMS NOT DEPICTED ON PAGES 4 THRU 13.
- MORE THAN ONE PALLET UNIT CAN BE OUTLOADED, PROVIDING THE CAPACITY OF THE BRACE IS NOT EXCEEDED, AND THE ITEMS ARE COMMONTALINE.
- 3. EACH BRACE AS APPLIED FOR LONGITUDINAL BRACING WILL SUPPORT 2,000 POUNDS OF LADING; HOWEVER, NOT LESS THAN TWO (2) BRACES WILL BE USED AGAINST EACH PALLET UNIT ACROSS THE WIDTH OF A TRAILER, OR NOT LESS THAN TWO (2) BRACES WILL BE USED AGAINST EACH PALLET UNIT FOR SIDE BLOCKING. EACH SIDE OR END OF A PALLET UNIT WHICH IS NOT PROPERLY SUPPORTED BY THE TRAILER WALLS, OTHER ITEMS, OR OTHER TYPE BLOCKING, WILL REQUIRE TWO (2) ADDITIONAL BRACES ON EACH UNSUPPORTED SIDE AND/OR END.



BRACE