REV NO.1 APPROVED BY
BUREAU OF EXPLOSIVES

A.J. SUPERVISOR, BILITARY & INTERMODAL SERVICES

DATE 3/7/14

LOADING AND BRACING IN A CONTAINER/ TRAILER OF UNPALLETIZED BOX PACKED WHITE PHOSPHORUS (WP) AND PLASTICIZED WHITE PHOSPHORUS (PWP) AMMUNITION FOR CONTAINER/TRAILER-ON-FLAT-CAR (C/TOFC) SHIPMENT

INDEX

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GENERAL NOTES, AND MATERIAL SPECIFICATIONS TYPICAL BOX POSITIONS WP AND PWP AMMUNITION (UNPALLETIZED) TYPICAL LOAD IN A TRAILER HAVING 35'-0' BETWEEN FIXED BULKHEADS TYPICAL LOAD IN A TRAILER HAVING 38'-6' BETWEEN FIXED BULKHEADS TYPICAL LOAD IN A TRAILER HAVING 30'-4-1/2' TO 37'-8' BETWEEN ADJUSTABLE BULKHEADS	3 4-7 8, 9
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NOTE:

REFER TO DRAWING 19-48-4036-15PA1000 FOR GUIDANCE CONCERNING PALLETIZED AND SKIDDED UNIT LOADS OF BOXED AMMUNITION FOR C/TOFC SHIPMENT.

THIS DRAWING, INCLUDING REVISION NO. 1, SUPERSEDES DRAWING 19-48-4035-15A1001, DATED 4 MAY 1961.

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DO NOT SCALE

GENERAL NOTES

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AMOR 740-13, AND AUGMENTS TM-743-200-1 (CHAPTER 5).
- THIS PROCEDURAL DRAWING IS APPLICABLE TO TRAILERS AND/OR CONTAINERS WHICH ARE EQUIPPED WITH SPECIAL BULKHEAD SYSTEMS AS SPECIFIED WITHIN THE BUREAU OF EXPLOSIVES PAMPHLET NO. 6C AND APPENDICES THERETO . SUBSEQUENT REFERENCE TO A TRAILER THROUGHOUT THIS DOCUMENT MEANS A TRAILER OR CONTAINER FOR TOFC AND/OR COFC SHIPMENTS. ONLY RAILCARS WHICH ARE SPECIFIED BY THE BUREAU OF EXPLOSIVES PAMPHLET NO. 6C, OR THE AFOREMENTIONED APPENDICES WILL BE LISED AFOREMENTIONED APPENDICES, WILL BE USED.
- C. TYPICAL LOADS SHOWN ARE BASED ON THE FOLLOWING TRAILERS.

 1. TRAILERS WHICH ARE EQUIPPED WITH SPECIAL BULKHEAD BRACES HAVING
 35"-0" BETWEEN THE BULKHEAD BOARDS. THESE LOADS REQUIRE THE USE OF
 - 35'-UP BETWEEN THE BULKHEAD BOARDS. THESE LOADS RELEDIES THE LOSE OF STRAPPING TO SECURE THE UPRIGHT BRACES. SEE PAGES 4 THRU 7.

 2. TRAILERS WHICH HAVE A: BULKHEAD BUILT INTO THE FRONT WALL AND ARE EQUIPPED WITH A SPECIAL BULKHEAD BRACE AT THE REAR OF THE TRAILER. THE DISTANCE FROM THE FRONT WALL TO THE BULKHEAD BOARDS AT THE REAR.
 - INE DISTANCE FROM THE ROUTED FOR THESE LOADS, SEE PAGES 8 AND 9.

 3. TRAILERS WHICH ARE EQUIPPED WITH A CAMUS IN RESTRAINING SYSTEM.

 1HIS SYSTEM CONSISTS OF ADJUSTABLE BULKHEADS AT THE FRONT AND REAR

 OF THE TRAILER. THE DISTANCE BETWEEN THE BULKHEADS AT THE MAXIMUM OPEN POSITION IS 37"-8-1/2", THE DISTANCE AT THE MINIMUM CLOSED POSITION IS 30"-4-1/2". SEE PAGES 10 AND 11.
- ALL LOADS SHOWN ARE BASED ON TRAILERS WHICH ARE 40'-0" LONG BY 7'-8-1/2" WIDE (INSIDE DIMENSION) WITH WOOD, WOOD AND METAL, OR METAL FLOORS. THE DELINEATED OUTLOADING PROCEDURES ARE ALSO APPLICABLE TO NARROWER
- 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. NOTICE: A SHIPMENT WILL BE POSITIONED IN A TRAILER CONSISTENT WITH THE WEIGHT LAWS OF THE STATES THRU WHICH THE TRAILER WILL BE TRANSPORTED BY HIGHWAY (ACTOR CAPPER) HIGHWAY (MOTOR CARRIER).
- 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 ITEM.
- G. 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.
- H. IF SPECIAL AUTHORITY IS GRANTED BY HIGHER HEADQUARTERS, AND PROVIDING THEY ARE FURNISHED BY THE CARRIER, REUSABLE WEB STRAP ASSEMBLIES IDENTIFIED AS AEROQUIP CORPORATION PART NO. FEZODOTYC MAY BE UTILIZED IN LIEU OF THE SPECIFIED 2" STEEL STRAPPING FOR THE SECUREMENT OF THE UPRIGHT BRACE IN THE LOADS DEPICTED ON PAGES 4 THRU 7. THE SHIPPER IS RESPONSIBLE FOR CLOSE INSPECTION OF THE WEB STRAP ASSEMBLIES DURING INSTALLATION TO ENSURE THAT ASSEMBLIES WHICH HAVE BEEN DAMAGED SUFFICIENTLY TO IMPAIR THEIR STRENGTH WILL NOT BE USED. SCUFF SLEEVES WILL BE POSITIONED TO PROVIDE PADDING WHERE A WEB STRAP IS BEARING ON AN UPRIGHT BRACE. THE STRAPPING WILL BE DRAWN TAUT WHEN ASSEMBLIES ARE TENSIONED, AND MUST FORM AT LEAST ONE AND ONE-HALF COMPLETE WRAPS ON A TAKEUP SPOOL OF A TENSIONING DEVICE, A SOCKET WEENCH HAVING AN 18" HANDLE CAN BE USED TO ACHIEVE PROPER STRAP TAUTNESS. ONE MAN, UNASSISTED AND USING THE LEVER ADVANTAGE OF AN 18" LONG WRENCH HANDLE TO ITS FULLEST EXTENT, CAN ACHIEVE THE PROPER PRESTRESS IN A WEB STRAP ASSEMBLY. FULLEST EXTENT, CAN ACHIEVE THE PROPER PRESTRESS IN A WEB STRAP ASSEMBLY.
- 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 OR 3/4" THICK BY 3-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY -5/8" THICK BY 5-5/8" WIDE OR 1-1/2" THICK BY 5-1/2" WIDE.
- K. NOTICE: A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES, OR WHEN LAMINATING DUNNAGE. 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.
- DO NOT NAIL BLOCKING TO THE TRAILER WALLS OR FLOOR OR BULKHEADS, ALL NAILING WILL BE WITHIN THE DUNNAGE.
- M. PORTIONS OF THE TRAILER BODIES DEPICTED WITHIN THIS PROCEDURAL DRAWING SUCH AS ONE OF THE SIDEWALLS, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.

(CONTINUED AT RIGHT)

MATERIAL SPECIFICATIONS

--- : SEE TM 743-200-1, DUNNAGE LUMBER; FED SPEC MM-L-751. LUMBER -------: COMMON, CEMENT COATED OR CHEMICALLY ETCHED; FED SPEC FF-N-105. ALT: ANNULAR-RING TYPE NAIL OF SAME SIZE. <u>NAILS</u>----STRAPPING, STEEL-- : TYPE I OR IV, CLASS A OR B FOR 1-1/4" STRAPPING AND CLASS A, B, OR C FOR 2" STRAPPING, FED SPEC QQ-S-781F.

STRAP SEAL : COMMERCIAL GRADE.

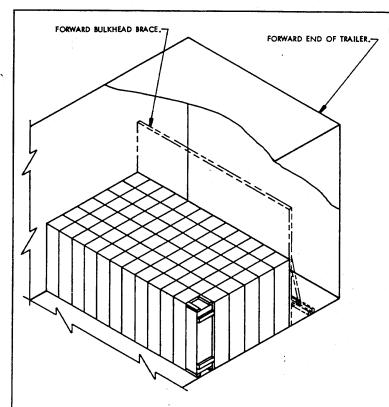
(GENERAL NOTES CONTINUED)

- N. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTION WHICH IS IMMEDIATELY ADJACENT TO A DEPICTED OUTLOADING METHOD
- O. CARE SHOULD BE EXERCISED WHEN LOADS ARE BUILT (SELECTION OF BOX POSITIONS, NUMBER OF LAYERS, ETC.) TO INSURE THE MINIMUM USAGE OF INTERNAL BLOCKING AND BRACING.

REVISIONS

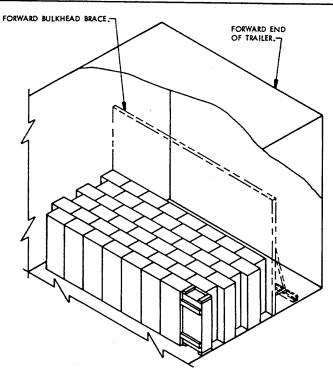
REVISION NO. 1, DATED JANUARY 74, CONSISTS OF

- DELETING PROCEDURES FOR TRAILERS HAVING 25'-0" BETWEEN BULKHEADS.
 ADDING PROCEDURES FOR TRAILERS HAVING 35'-0" BETWEEN BULKHEADS.
 ADDING PROCEDURES FOR TRAILERS HAVING 38'-6" BETWEEN BULKHEADS.
 ADDING PROCEDURES FOR TRAILERS EQUIPPED WITH CAMUS III RESTRAINING
 SYSTEMS HAVING 30'-4-1/2" TO 37'-8-1/2" BETWEEN ADJUSTABLE BULKHEADS.
- CHANGES NECESSARY TO UPDATE THE DRAWING FORMAT.



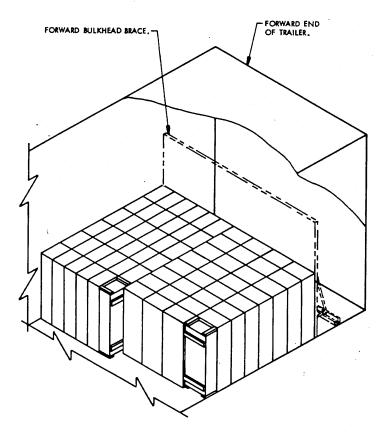
BOX POSITION A

EXCESS SPACE ACROSS THE TRAILER WIDTH MUST NOT EXCEED 1/3 OF THE BOX DIMENSION. SEE "NOTE • " BELOW.



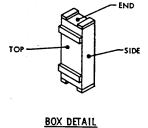
BOX POSITION B

ROWS OF BOXES MAY BE STAGGERED AS SHOWN ABOVE. EXCESS SPACE ACROSS THE TRAILER WIDTH MUST NOT EXCEED 1/3 OF THE BOX DIMENSION. SEE "NOTE • BELOW.



BOX POSITION AB

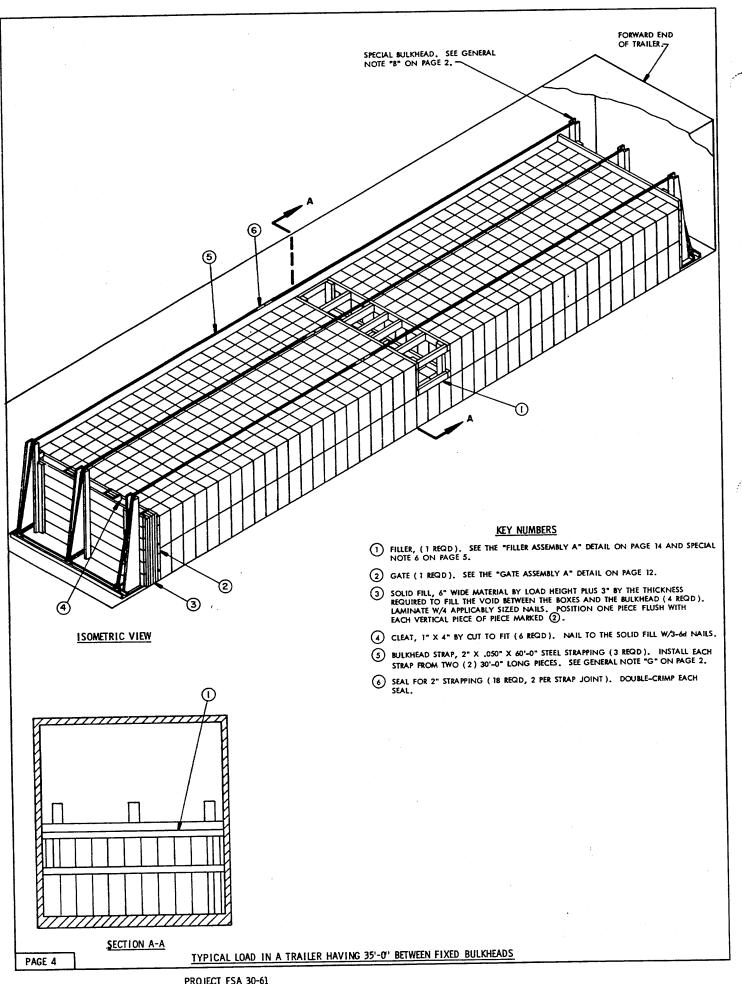
A COMBINATION OF BOX POSITIONS MAY BE USED TO UTILIZE THE MAXIMUM SPACE ACROSS THE TRAILER WIDTH, EXCESS SPACE ACROSS THE TRAILER WIDTH MUST NOT EXCEED 1/3 OF THE SMALLEST BOX DIMENSION, SEE="NOTE".



NOTE :

IF EXCESS SPACE ACROSS THE TRAILER WIDTH EXCEEDS 1/3 OF THE BOX DIMENSION A SPACER ASSEMBLY, SUCH AS SHOWN IN THE LOAD ON PAGE 10, MUST BE USED.

TYPICAL AUTHORIZED BOX POSITIONS



SPECIAL NOTES:

- 3FCLAR TYPICAL LOAD OF UNPALLETIZED WP AND PWP AMMUNITION IS SHOWN IN A 7'-8-1/2" WIDE (INSIDE DIMENSION) TRAILER HAVING 35'-0" BETWEEN THE INSTALLED BULKHEADS. THE PROCEDURES SHOWN WILL APPLY TO ALL UNPALLETIZED WP AND PWP AMMUNITION LOADED IN TRAILERS OF VARIOUS INSIDE WIDTH AND LENGTH.
- 2. BOX DETAIL: 57MM CARTRIDGE IS SHOWN AS TYPICAL.

 DIMENSIONS —— 21-7/8" LONG X 8-3/8" WIDE X 9-1/8" HIGH.

 GROSS WEIGHT —— 43.5 POUNDS (APPROX).
- 3. IF THE EXCESS SPACE BETWEEN THE REAR OF THE LADING AND THE INSTALLED BULKHEAD IS GREATER THAN 18" USE A GATE AND STRUTS, AS SHOWN IN THE LOAD ON PAGE 8, IN LIEU OF SOLID FILL.
- A COMBINATION OF LOADING PROCEDURES, AS SHOWN IN THE LOAD ON PAGE 6, MAY BE USED TO ATTAIN A MAXIMUM QUANTITY AND/OR BEST UTILIZATION OF TRAILER SPACE.
- IF THE EXCESS SPACE ACROSS THE WIDTH OF THE TRAILER EXCEEDS ONE THIRD OF THE BOX DIMENSION LATERAL BRACING, SUCH AS SHOWN IN THE LOAD ON PAGE 10, WILL BE REQUIRED.
- 6. "FILLER ASSEMBLY A" MUST ONLY BE USED IN THE TOP LAYER OF A LOAD.

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	4	2
2" X 4"	66	44
2" X 6"	100	100
NAILS	NO. REQD	POUNDS
6d (2")	18	1/4
10d (3")	124	1-3/4
12d (3-1/4")	56	1 1

LOAD AS SHOWN

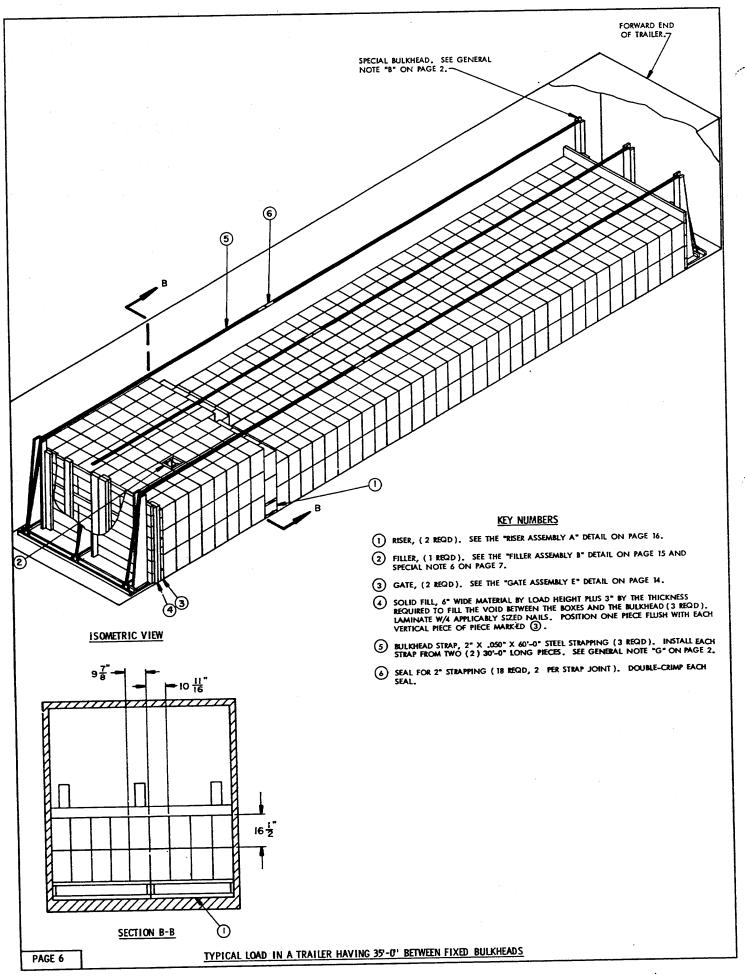
ITEM

QUANTITY

WEIGHT (APPROX)

TOTAL WEIGHT ----- 42,062 LBS

TYPICAL LOAD IN A TRAILER HAVING 35'-O' BETWEEN FIXED BULKHEADS



SPECIAL NOTES:

- 1. A TYPICAL LOAD OF UNPALLETIZED WP AND PWP AMMUNITION IS SHOWN IN A 7'-8-1/2" WIDE (INSIDE DIMENSION) TRAILER HAVING 35'-0" BETWEEN THE INSTALLED BULKHEADS. THE PROCEDURES SHOWN WILL APPLY TO ALL UNPALLETIZED WP AND PWP AMMUNITION LOADED IN TRAILERS OF VARIOUS WIDTH-AND LENGTH.
- 2. BOX DETAIL: 60MM CARTRIDGE IS SHOWN AS TYPICAL.
 DIMENSIONS------- 16-1/2" LONG X 9-7/8" WIDE X 10-11/16" HIGH.
 GROSS WEIGHT ----- 52 POUNDS (APPROX).
- 3. IF THE EXCESS SPACE BETWEEN THE REAR OF THE LADING AND THE INSTALLED BULKHEAD IS GREATER THAN 18" USE GATES AND STRUTS, AS SHOWN IN THE LOAD ON PAGE 8, IN LIEU OF SOLID FILL.
- 4. A COMBINATION OF LOADING PROCEDURES, AS SHOWN, MAY BE USED TO ATTAIN A MAXIMUM QUANTITY AND/OR BEST UTILIZATION OF TRAILER SPACE.
- 5. WHEN USING RISER ASSEMBLIES CARE MUST BE TAKEN TO ASSURE THAT BOXES ARE RETAINED LATERALLY.
- 6. "FILLER ASSEMBLY B" MUST ONLY BE USED IN THE TOP LAYER OF A LOAD.
- 7. DIMENSIONS SHOWN IN SECTION B-B ON PAGE 6 APPLY ONLY TO THE 60MM CARTRIDGE BOX AND ARE SHOWN FOR INFORMATION PURPOSES ONLY. THESE DIMENSIONS WILL BE DIFFERENT FOR OTHER LADING ITEMS. THIS PROCEDURE SHOWS A TYPICAL BOX POSITION AB AS IDENTIFIED ON PAGE 3.

LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	40	27
2" X 6"	80	80
NAILS	NO. REQD	POUNDS
10d (3")	66	1.
12d (3-1/4")	72	1-1/4

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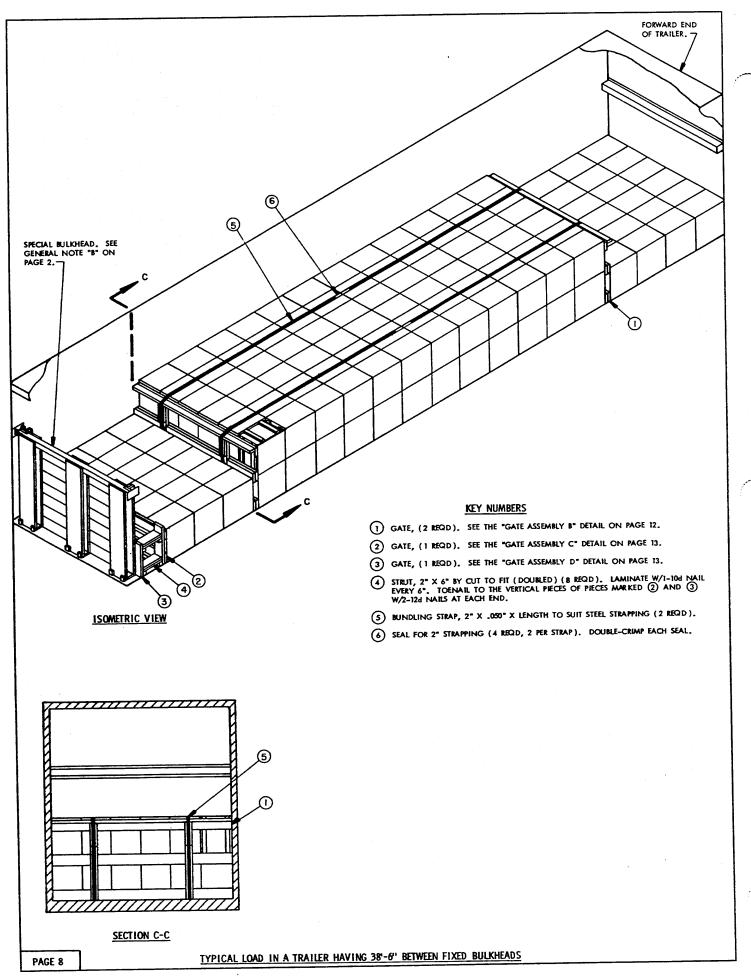
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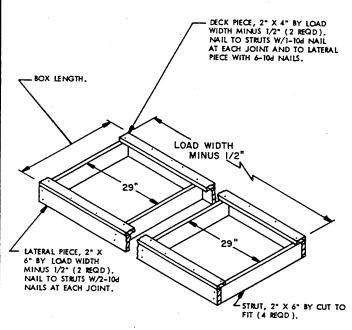
QUANTITY

WEIGHT (APPROX)

TOTAL WEIGHT------ 41,778 LBS

TYPICAL LOAD IN A TRAILER HAVING 35'-O' BETWEEN FIXED BULKHEADS





RISER ASSEMBLY B

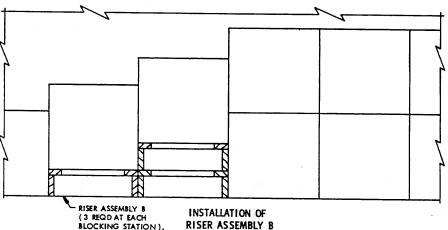
THE ASSEMBLY AS DEPICTED IS DESIGNED FOR STEPPING UP OR STEPPING DOWN A LOAD THAT IS SIX CONTAINERS WIDE. THE 29" SPACING DIMENSION FOR THE STRUTS IS BASED ON THE BOX TYPICALLY SHOWN IN THE LOAD ON PAGE 8. THE SPACING AND NUMBER USED WILL BE DEPENDENT ON THE BOX BEING SHIPPED. ENOUGH STRUTS WILL BE USED TO INSURE THAT EACH ROW WITHIN A LOAD IS BLOCKED.

SPECIAL NOTES:

- 1. A TYPICAL LOAD OF UNPALLETIZED WP AND PWP AMMUNITION IS SHOWN IN A 7'-8-1/2" WIDE (INSIDE DIMENSION) TRAILER HAVING 38'-6" BETWEEN THE BULKHEAD AT THE FRONT (BUILT INTO THE FRONT WALL) AND THE INSTALLED BULKHEAD AT THE REAR. THE PROCEDURES SHOWN WILL APPLY TO ALL UNPALLETIZED WP AND PWP AMMUNITION LOADED IN TRAILERS OF VARIOUS INSIDE WIDTH AND LENGTH.
- 2. BOX DETAIL: 2.75" ROCKET IS SHOWN AS TYPICAL.

 DIMENSIONS -------- 23-1/6" LONG X 14-7/8" WIDE X 21-27/32" HIGH.

 GROSS WEIGHT ------ 219 POUNDS (APPROX).
- IF THE EXCESS SPACE BETWEEN THE REAR OF THE LADING AND THE INSTALLED BULKHEAD IS 18" OR LESS USE SOLID FILL, AS SHOWN IN THE LOAD ON PAGE 4, IN LIEU OF GATE AND STRUTS.
- 4. TO PRECLUDE BOX CRUSHING, TWO (2) "GATE ASSEMBLIES B" MUST ALWAYS BE USED FOR THE SHIPMENT OF PARTIAL SECOND LAYERS EVEN THOUGH THE PARTIAL LAYER MIGHT BE POSITIONED DIRECTLY AGAINST ONE OF THE BULKHEADS.
- A COMBINATION OF LOADING PROCEDURES, AS SHOWN IN THE LOADS ON PAGES 6 AND 8, MAY BE USED TO ATTAIN A MAXIMUM QUANTITY AND/OR MEST UTILIZATION OF TRAILER SPACE. ALSO, SEE SPECIAL NOTE 7 BELOW.
- IF THE EXCESS SPACE ACROSS THE WIDTH OF THE TRAILER EXCEEDS 1/3 OF THE BOX DIMENSION LATERAL BRACING, SUCH AS SHOWN IN THE LOAD ON PAGE 10, WILL BE REQUIRED.
- 7. AS AN ALTERNATIVE TO THE SPECIFIED PARTIAL LAYER BRACING METHOD, A "RISER" METHOD AS DELINEATED ON THIS PAGE MAY BE USED. SIX (6) RISER ASSEMBLIES INSTALLED AS TWO SETS OF THREE (3) EACH IN A DOUBLE STEP ARRANGEMENT AS SHOWN IN THE DETAIL BELOW, WILL BE USED INSTEAD OF TWO (2) EACH GATES AND LOAD-BUNDLING STRAPS AS DEPICTED WITHIN THE LOAD VIEW ON PAGE 8.

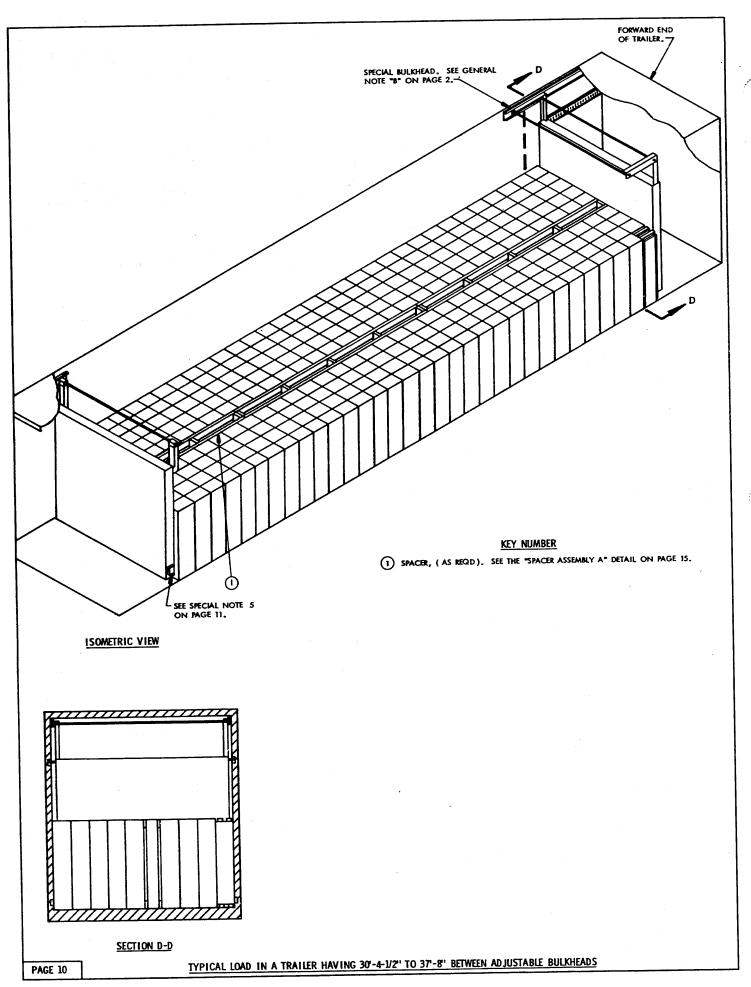


A PARTIAL SIDE ELEVATION OF THE LOAD DEPICTED ON PAGE 8 IS SHOWN, WITH THE LOADING PATTERN MODIFIED FOR THE USE OF RISER ASSEMBLIES.

LOAD AS SHOWN

TOTAL WEIGHT ----- 41, 165 LBS

TYPICAL LOAD IN A TRAILER HAVING 38'-6" BETWEEN FIXED BULKHEADS



SPECIAL NOTES:

- A TYPICAL LOAD OF UNPALLETIZED WP AND PWP AMMUNITION IS SHOWN IN A 40'-0" LONG BY 7'-6" WIDE (INSIDE DIMENSION) TRAILER WHICH IS EQUIPPED WITH A CAMUS III RESTRAINING SYSTEM. THE PROCEDURES SHOWN WILL APPLY TO ALL UNPALLETIZED WP AND PWP AMMUNITION LOADED IN TRAILERS OF VARIOUS INSIDE WIDTH AND LENGTH.
- 2. BOX DETAIL: 2.75" ROCKET IS SHOWN AS TYPICAL.

 DIMENSIONS ------ 46-13/16" LONG X 11-7/8" WIDE X 9-9/32" HIGH.

 GROSS WEIGHT ------- 141 POUNDS (APPROX).
- 3. NO BLOCKING IS REQUIRED BETWEEN THE REAR OF THE LADING AND THE REAR BULKHEAD WHEN USING A CAMUS TRAILER.
- IF THE EXCESS SPACE ACROSS THE WIDTH OF THE TRAILER EXCEEDS ONE THIRD OF THE BOX DIMENSION, LATERAL BRACING, SUCH AS SHOWN IN THE LOAD ON PAGE 10, WILL BE REQUIRED.
- FILLER BLOCKS, AS SHOWN IN "FILLER BLOCK DETAIL" ON PAGE 16, MUST BE USED TO REDUCE LATERAL MOVEMENT OF THE REAR BULKHEAD IN A CAMUS III TRAILER.

BILL OF MATERIAL			
LUMBER	LINEAR FEET	BOARD FEET	
2" X 4" 2" X 6"	127 51	85 51	
NAILS	NO. REQD	POUNDS	
10d (3")	96	1-1/2	

LOAD AS SHOWN

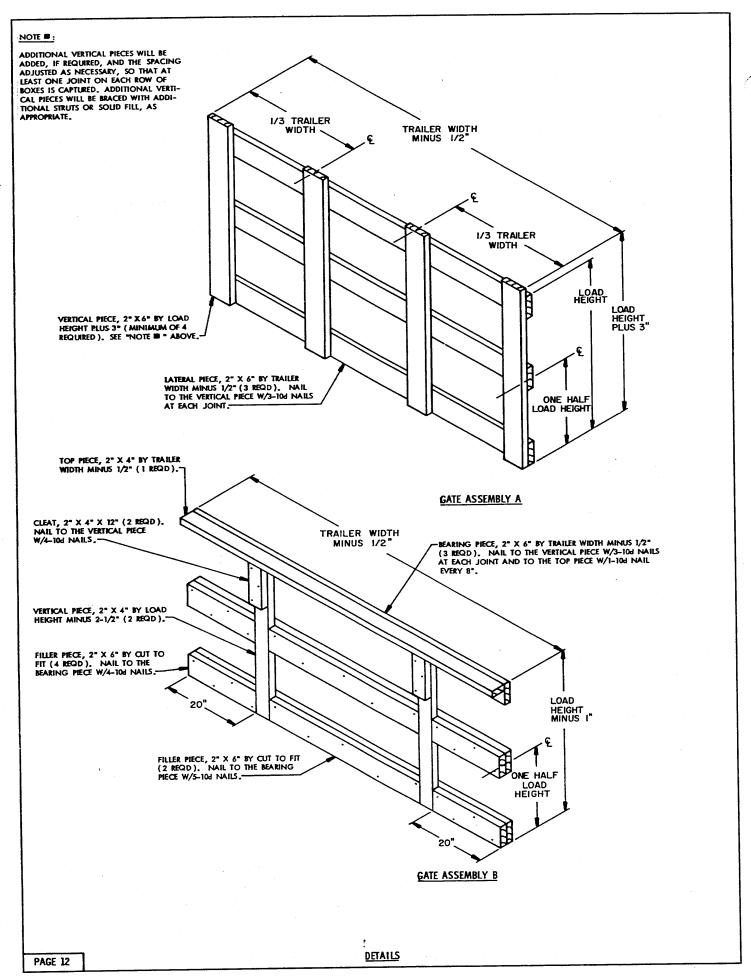
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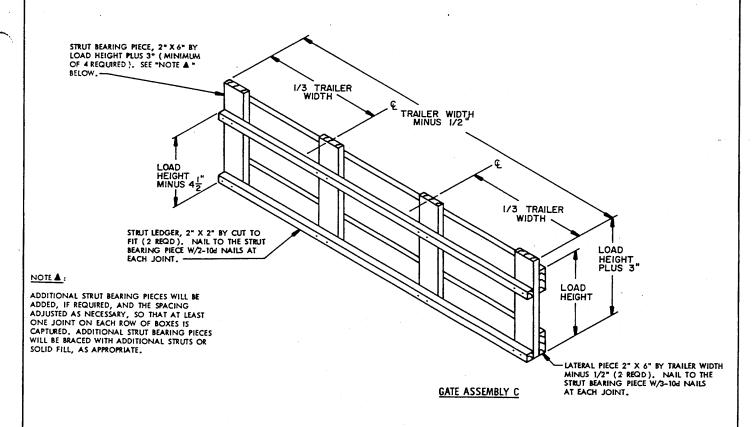
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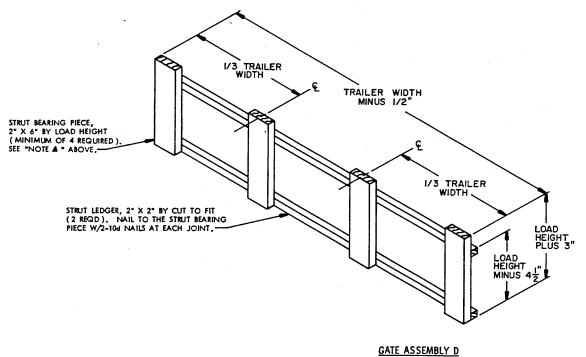
WEIGHT (APPROX)

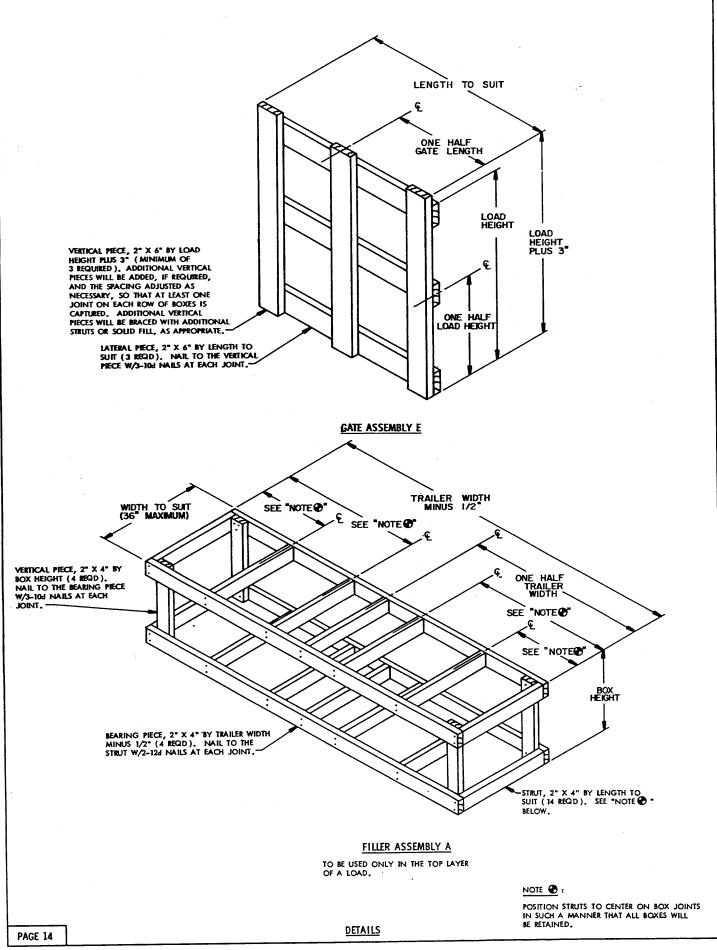
TOTAL WEIGHT ----- 40,950 LBS

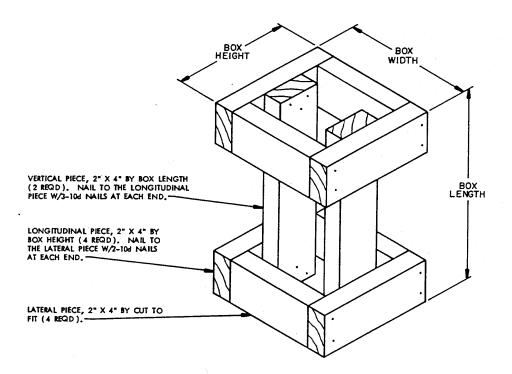
TYPICAL LOAD IN A TRAILER HAVING 30'-4-1/2' TO 37'-8' BETWEEN ADJUSTABLE BULKHEADS





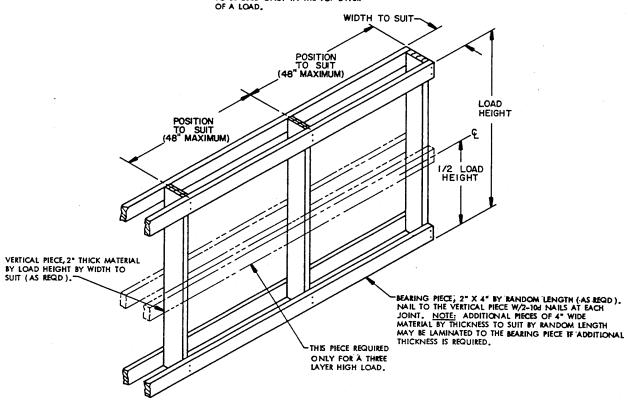






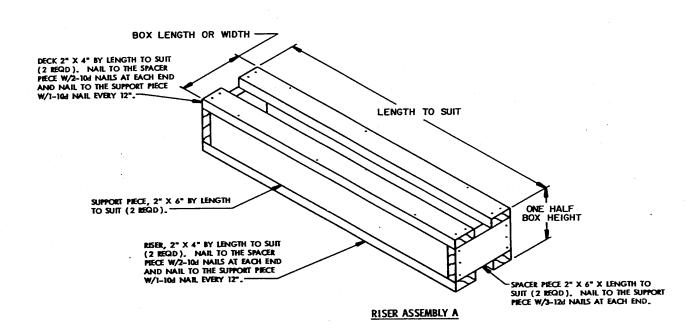
FILLER ASSEMBLY B

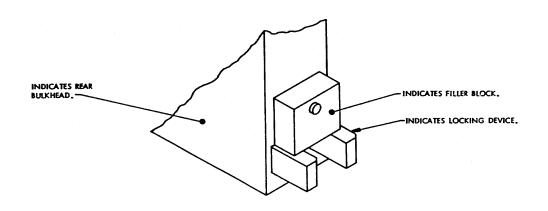
TO BE USED ONLY IN THE TOP LAYER OF A LOAD.



SPACER ASSEMBLY A

DETAILS





FILLER BLOCK DETAIL

INSTALLED BY THE CARRIER TO PREVENT SIDESWAY OF THE CAMUS III REAR BULKHEAD AND RESULTANT DISENGAGEMENT OF THE LOCKING PINS.