

LOADING AND BRACING (CL & LCL) IN BOX CARS OF VARIOUS SIZE BOMB BODIES

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		SEPTEMBER 1990				
		CLASS	DIVISION	DRAWING	FILE	
		19	48	4218	5B43	

DO NOT SCALE

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 WITHIN THIS DOCUMENT ARE APPLICABLE TO VARIOUS SIZE EMPTY BOMB BODIES IN CONVENTIONAL TYPE BOX CARS.
- C. FOR DETAILS OF THE SPECIFIC BOMB BODIES SHOWN WITHIN THIS DRAWING, SEE THE DETAILS ON PAGE 3.
- D. THE SELECTION OF RAIL CARS FOR THE TRANSPORT OF BOMB BODIES IS THE RESPONSIBILITY OF THE ORIGINATING CARRIER AND THE SHIPPER. ONLY CARS WHICH HAVE "SOUND" FLOORS AND ARE IN OTHERWISE PROPER CONDITION, IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPLICABLE REGULATORY DOCUMENTS, WILL BE SELECTED.
- E. BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS HAVE BEEN SHOWN. HOWEVER, THE DEPICTED OUTLOADING PROCEDURES ARE ALSO APPLICABLE FOR CARS EQUIPPED WITH PLUG DOORS. CAUTION: DUNNAGE MATERIAL MUST NOT BE NAILED TO ANY PLUG DOOR, WHETHER AUXILIARY OR MAIN. ALSO, AFTER THE PLUG DOORS ON A CAR ARE CLOSED AND READY FOR THE INSTALLATION OF CAR SEALS, A PIECE OF WIRE OF SUITABLE SIZE WILL BE USED IN ADDITION TO, AND IN CONJUNCTION WITH, EACH CAR SEAL USED TO SEAL THE CAR. THE WIRE WILL BE THREADED THRU THE HOLES IN THE DOOR LATCH ASSEMBLY ONE OR MORE TIMES, AND THE WIRE ENDS WILL BE TWISTED TOGETHER.
- F. PORTIONS OF THE BOX CARS DEPICTED WITHIN THIS PROCEDURAL DRAWING, SUCH AS SIDEWALLS, END WALLS, AND ROOFS, AND PORTIONS OF THE BLOCKING AND BRACING COMPONENTS, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.
- G. IF THE CAR BEING USED FOR A SHIPMENT IS EQUIPPED WITH A NAILABLE METAL FLOOR AND A NAIL SIZE FOR FLOOR NAILING IS MARKED ON THE SIDEWALL OF THE CAR, THAT GUIDANCE SHOULD BE APPLIED WHEN NAILING DUNNAGE TO THE CAR FLOOR.
- H. 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 AND 4" X 4" MATERIAL IS ACTUALLY 3-1/2" THICK BY 3-1/2" WIDE.
- J. 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. POWER DRIVEN STAPLES MAY BE USED AS ALTERNATIVE FASTENERS FOR NAILS WHEN CONSTRUCTING DUNNAGE ASSEMBLIES WHICH ARE TO BE USED IN THE DELINEATED LOADS SHOWN THROUGHOUT THIS DRAWING. THE STAPLES TO BE USED MUST BE EQUAL IN LENGTH TO THE SPECIFIED NAIL SIZE AND MUST BE SUBSTITUTED ON A ONE STAPLE FOR ONE NAIL BASIS. STAPLES WHICH ARE 2-1/2" OR LESS IN LENGTH SHOULD BE IN ACCORDANCE WITH FEDERAL SPECIFICATION FF-N-105 AS NEARLY AS PRACTICABLE. STAPLES WHICH ARE LONGER THAN 2-1/2" WILL BE A COMMERCIAL GRADE, OF A QUALITY EQUIVALENT TO THOSE MANUFACTURED BY SENCO PRODUCTS INCORPORATED. NOTE: STAPLES WILL NOT BE SUBSTITUTED FOR NAILS IN ANY LOAD RESTRAINING FLOOR DUNNAGE APPLICATION.

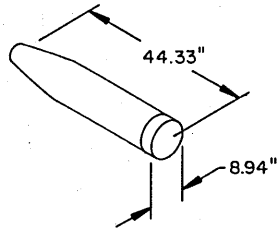
(CONTINUED AT RIGHT)

(GENERAL NOTES CONTINUED)

- L. THROUGHOUT THIS PROCEDURAL DRAWING, CORRUGATED RUBBER MATTING FASTENED TO THE FLOOR DUNNAGE OR INTERMEDIATE DUNNAGE IS SPECIFIED TO PROTECT THE PAINTED SURFACE OF THE BOMB BODIES. CORRUGATED RUBBER MATTING OF THE TYPE SHOWN IS AVAILABLE FROM MC MASTER-CARR SUPPLY COMPANY, CHICAGO, IL, AND IS LISTED AS CATALOG NUMBER 6974T3. THIS RUBBER MATTING WILL HAVE TO BE CUT TO A WIDTH OF 5-1/2" AND FASTENED TO THE DUNNAGE EITHER WITH THE USE OF AN APPROPRIATE ADHESIVE OR BY SMALL NAILS OR STAPLES PLACED SO AS NOT TO CONTACT THE BOMB BODIES.
- M. NOTICE: IT IS IMPORTANT THAT THE PAINTED SURFACE OF THE BOMB BODIES BE THOROUGHLY DRY PRIOR TO LOADING IN THE TRANSPORTING VEHICLE.
- N. THE NUMBER OF LADING UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE BOX CAR BEING LOADED OR THE QUANTITY TO BE SHIPPED. HOWEVER, THE APPROVED METHODS SPECIFIED HEREIN FOR FULL OR PARTIAL CARLOADS MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING AND STAYING OF THE DESIGNATED ITEMS.
- O. THE LOAD LIMIT OF A CAR MUST NOT BE EXCEEDED. LIKEWISE, THE LOAD IN ONE END OF A CAR MUST NOT EXCEED ONE HALF OF THE LOAD LIMIT WHICH IS STENCILED ON THE OUTSIDE OF THE CAR. THE CENTER OF GRAVITY (CG) OF A LOAD HAVING AN EQUAL NUMBER OF UNITS IN EACH END OF THE CAR WILL BE AT THE LONGITUDINAL CENTER OF THE CAR AND THEREFORE THE TOTAL WEIGHT OF THE LADING AND DUNNAGE MAY EQUAL BUT MUST NOT EXCEED THE STENCILED LOAD LIMIT. HOWEVER, FOR A LOAD CONSTRUCTED IN AN OFFSET LOADING PATTERN, THE CG WILL BE LOCATED TOWARD THE LONG-LOAD END FROM THE LONGITUDINAL CENTER OF THE CAR SO THE LONG LOAD END WILL BE THE HEAVIEST. THE TOTAL WEIGHT OF THE LADING AND DUNNAGE MUST THEN BE LESS THAN THE STENCILED LOAD LIMIT.
- P. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT A MINIMUM OF ONE (1) SEAL WITH TWO (2) PAIR OF NOTCHES WILL BE USED TO SEAL THE JOINT WHEN A NOTCH-TYPE SEALER IS BEING USED. A MINIMUM OF TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) PAIR OF CRIMPS PER SEAL WILL BE USED TO SEAL THE JOINT WHEN A CRIMP-TYPE SEALER IS BEING USED. REFER TO THE "STRAP JOINT A" AND "STRAP JOINT B" DETAILS ON PAGE 11 FOR GUIDANCE.
- Q. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES, AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS .4545 KG.

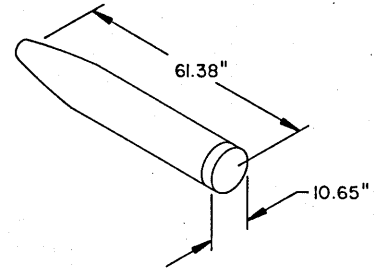
MATERIAL SPECIFICATIONS

- LUMBER -----: SEE TM 743-200-1, DUNNAGE LUMBER, FED SPEC MM-L-751.
- NAILS -----: COMMON, FED SPEC FF-N-105.
- STRAPPING STEEL ---: FED SPEC QQ-S-781; CLASS I, TYPE I OR IV, HEAVY DUTY, FINISH A, B (GRADE 2), OR C.
- SEAL, STRAP -----: FED SPEC QQ-S-781; TYPE D, STYLE I, II OR IV, CLASS H, FINISH A, B (GRADE 2), OR C.
- MAT, RUBBER -----: MAT, FLOOR, STANDING, MIL-M-910 (OR EQUAL).
- ANTI-CHAFING MATERIAL -----: NEUTRAL BARRIER MATERIAL, MIL-B-121 (OR EQUAL).



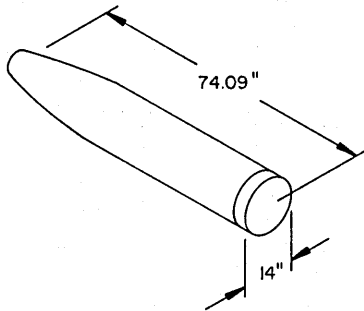
250 POUND MK 81 MOD 1

GROSS WEIGHT ----- 135 LBS
NAVARSYSCOM DWG NO. 923A5114 (REV A)



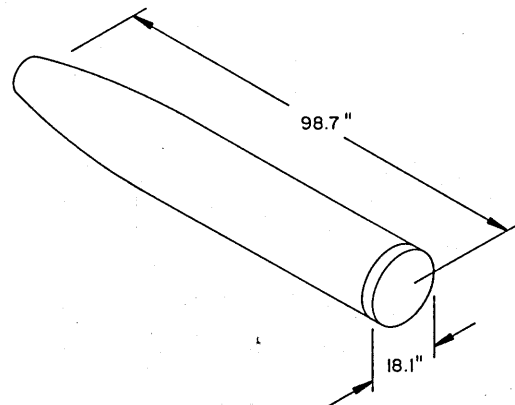
500 POUND MK 82 MOD 1

GROSS WEIGHT ----- 301 LBS
NAVARSYSCOM DWG NO. 1380545 (REV AA)



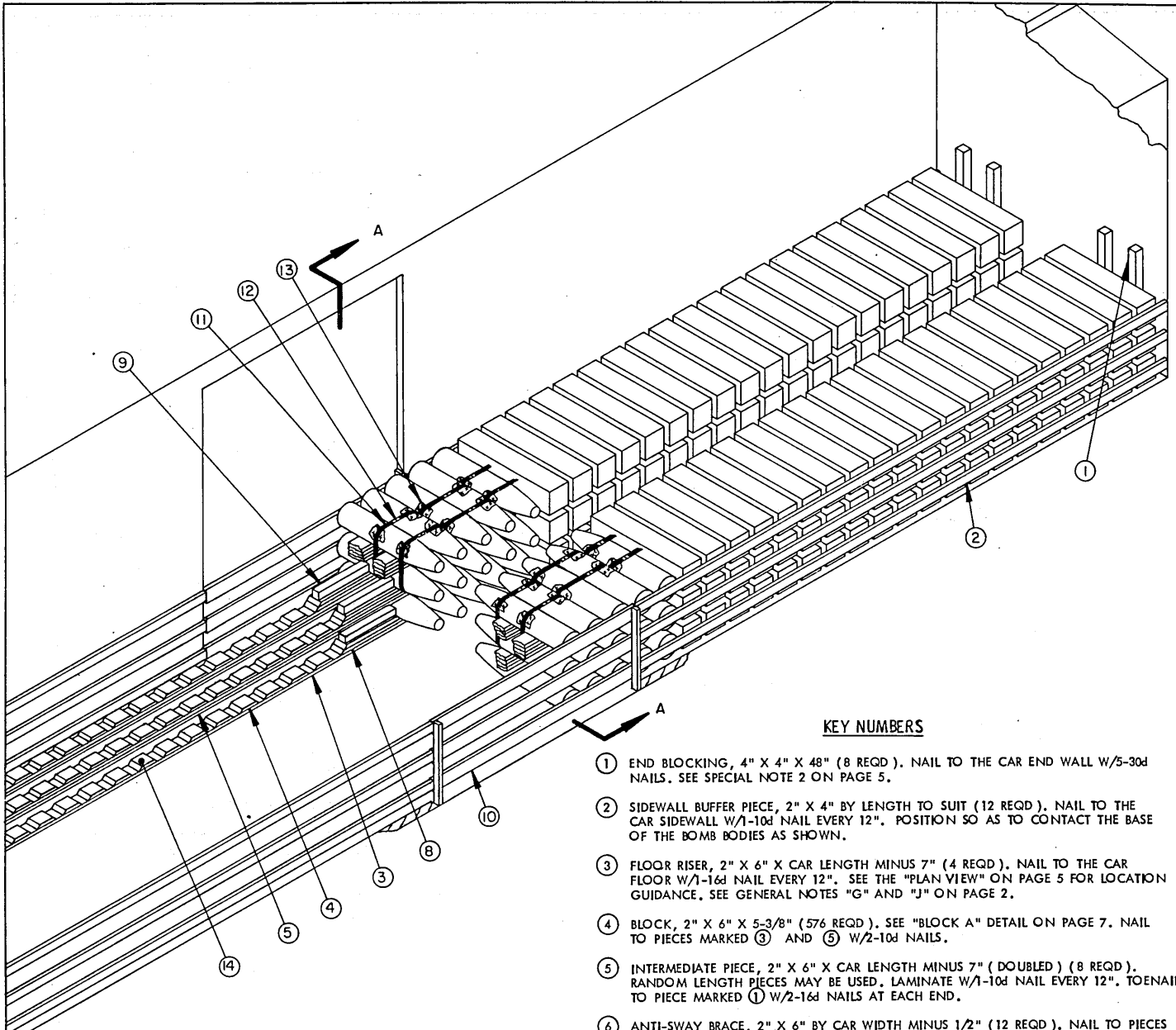
1000 POUND MK 83 MOD 4

GROSS WEIGHT ----- 475 LBS
NAVARSYSCOM DWG NO. 2841464 (REV M)



2000 POUND MK 84 MOD 4

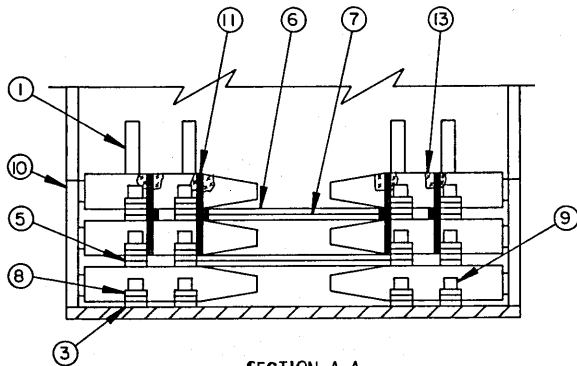
GROSS WEIGHT ----- 950 LBS
NAVARSYSCOM DWG NO. 923A5105 (REV A)



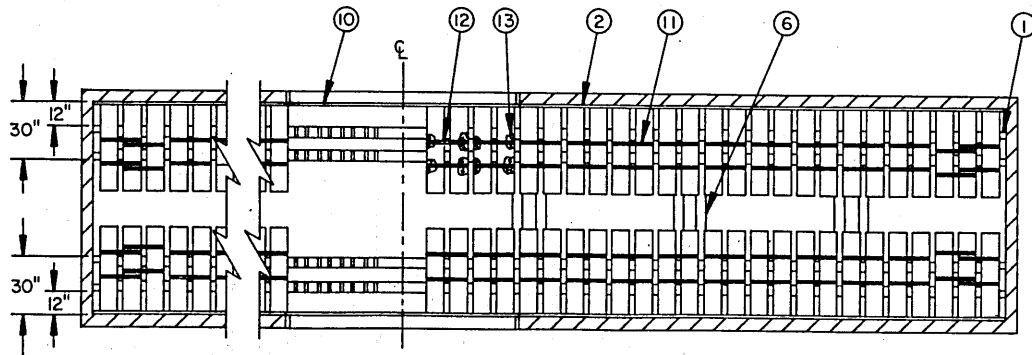
ISOMETRIC VIEW

KEY NUMBERS

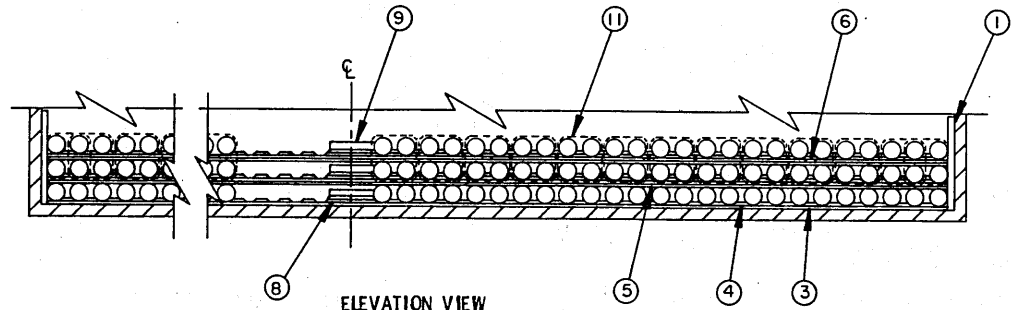
- ① END BLOCKING, 4" X 4" X 48" (8 REQD). NAIL TO THE CAR END WALL W/5-30d NAILS. SEE SPECIAL NOTE 2 ON PAGE 5.
- ② SIDEWALL BUFFER PIECE, 2" X 4" BY LENGTH TO SUIT (12 REQD). NAIL TO THE CAR SIDEWALL W/1-10d NAIL EVERY 12". POSITION SO AS TO CONTACT THE BASE OF THE BOMB BODIES AS SHOWN.
- ③ FLOOR RISER, 2" X 6" X CAR LENGTH MINUS 7" (4 REQD). NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 12". SEE THE "PLAN VIEW" ON PAGE 5 FOR LOCATION GUIDANCE. SEE GENERAL NOTES "G" AND "J" ON PAGE 2.
- ④ BLOCK, 2" X 6" X 5-3/8" (576 REQD). SEE "BLOCK A" DETAIL ON PAGE 7. NAIL TO PIECES MARKED ③ AND ⑤ W/2-10d NAILS.
- ⑤ INTERMEDIATE PIECE, 2" X 6" X CAR LENGTH MINUS 7" (DOUBLED) (8 REQD). RANDOM LENGTH PIECES MAY BE USED. LAMINATE W/1-10d NAIL EVERY 12". TOENAIL TO PIECE MARKED ① W/2-16d NAILS AT EACH END.
- ⑥ ANTI-SWAY BRACE, 2" X 6" BY CAR WIDTH MINUS 1/2" (12 REQD). NAIL TO PIECES MARKED ⑤ W/3-10d NAILS AT EACH JOINT. SEE THE "ELEVATION VIEW" ON PAGE 5 AND "DETAIL A" ON PAGE 11.
- ⑦ SPACER, 2" X 6" BY LENGTH TO SUIT (12 REQD). NAIL TO THE UNDERSIDE OF PIECE MARKED ⑥ W/6-10d NAILS.
- ⑧ BLOCK (DOUBLED) (12 REQD). SEE THE "BLOCK B" DETAIL ON PAGE 7. NAIL THE FIRST PIECE TO PIECES MARKED ③ AND ⑤ W/6-10d NAILS. LAMINATE THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ⑨ CENTER BLOCKING, 4" X 4" BY CUT-TO-FIT (12 REQD). NAIL TO PIECE MARKED ⑧ W/4-50d NAILS.
- ⑩ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION A" DETAIL ON PAGE 15.
- ⑪ STEEL STRAPPING, 1-1/4" X .035" OR .031" X 10'-0" LONG (104 REQD). INSTALL SO AS TO ENCIRCLE FOUR (4) BOMB BODIES AS SHOWN.
- ⑫ SEAL FOR 1-1/4" STRAPPING (208 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "P" ON PAGE 2.
- ⑬ ANTI-CHAFING MATERIAL (AS REQD). PLACE UNDER STRAPPING AT ALL POINTS OF CONTACT WITH THE BOMB BODIES.
- ⑭ RUBBER MATTING, 5-1/2" WIDE BY LENGTH TO SUIT (20 REQD). SEE SPECIAL NOTE 3 ON PAGE 5, "INSTALLATION OF RUBBER MATTING" ON PAGE 7, AND GENERAL NOTE "L" ON PAGE 2.



SECTION A-A



PLAN VIEW



ELEVATION VIEW

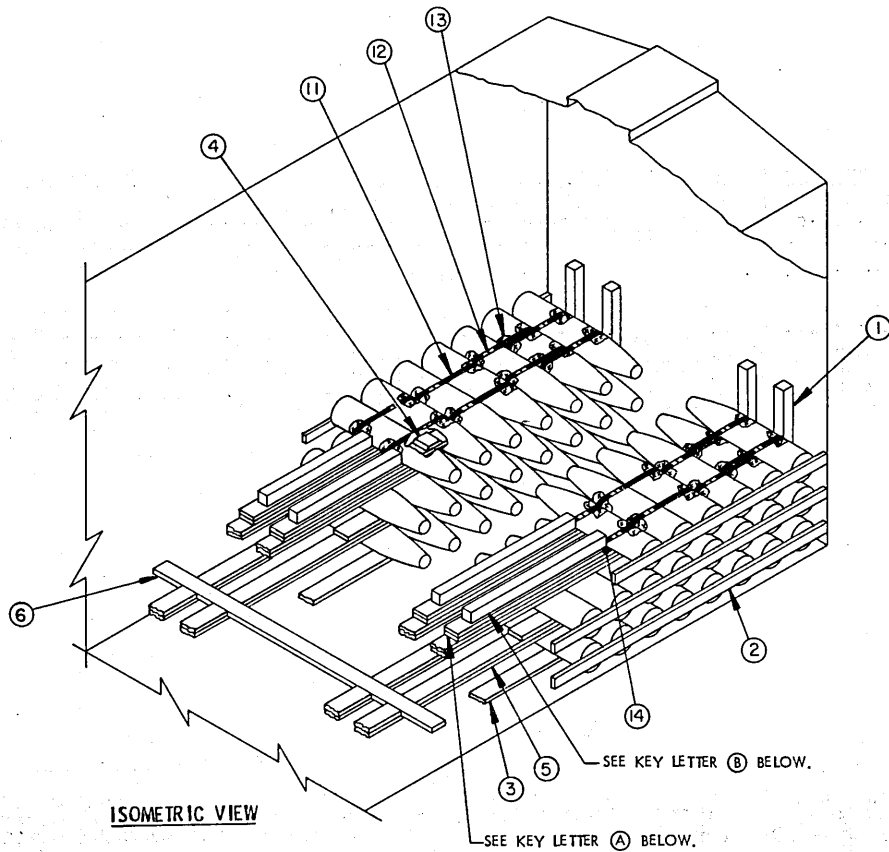
SPECIAL NOTES:

1. A 300-UNIT LOAD OF EMPTY 250 POUND BOMB BODIES IS SHOWN IN A 50'-6" LONG BY 9'-2" WIDE BOX CAR EQUIPPED WITH 8'-0" WIDE DOOR OPENINGS. CARS OF OTHER DIMENSIONS AND CARS WITH WIDER OR NARROWER DOOR OPENINGS MAY BE USED.
2. IF A BOX CAR TO BE LOADED HAS BOWED END WALLS, LAMINATIONS OF A THICKNESS AS REQUIRED MAY BE NAILED TO THE END BLOCKING SO AS TO PROVIDE A "SQUARED OFF" SURFACE AT THE END OF THE CAR.
3. RUBBER MATTING, DESCRIBED WITHIN GENERAL NOTE "L" ON PAGE 2 AND SHOWN ON PAGE 7, IS TO BE USED TO PROTECT THE SPECIAL PAINTED FINISH AND PREVENT DAMAGE TO THE BOMB BODIES. IN ADDITION, CARE MUST BE EXERCISED DURING LOADING OPERATIONS TO ENSURE THAT THE MATTING IS NOT TORN WHEN THE BOMBS ARE PLACED UPON IT. ALSO, NOTE THAT THE MATTING IS TO BE PLACED BETWEEN THE BOMBS AND DUNNAGE BOTH ON TOP OF AND UNDERNEATH EACH BOMB, AS APPLICABLE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	267	178
2" X 6"	1,364	1,364
4" X 4"	56	75
NAILS	NO. REQD	POUNDS
10d (3")	1,759	27
12d (3-1/4")	12	1/4
16d (3-1/2")	216	4-3/4
30d (4-1/2")	40	2
50d (5-1/2")	48	3-3/4
STEEL STRAPPING, 1-1/4" X .035" OR .031" - 1,040' REQD - 149 LBS		
SEAL FOR 1-1/4" STRAPPING ----- 208 REQD - 9 LBS		
RUBBER MAT, 1/4" X 5-1/2" ----- 1,000' REQD - 192 LBS		
ANTI-CHAFING MATERIAL ----- AS REQD ----- NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
250 LB BOMB	300	40,500 LBS
DUNNAGE		3,622 LBS
TOTAL WEIGHT		44,122 LBS



ISOMETRIC VIEW

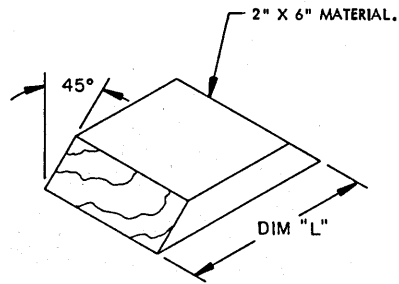
SPECIAL NOTES:

1. A PARTIAL LAYER LOAD OF 250 POUND BOMB BODIES IS SHOWN IN A 9'-2" WIDE WOOD LINED BOX CAR. WOOD LINED BOX CARS OF OTHER WIDTHS MAY BE USED.
2. ALTHOUGH THE VIEW ON THIS PAGE DEPICTS EIGHT STACKS OF BOMB BODIES IN THE FIRST AND SECOND LAYERS, IN ACTUALITY THESE SHOULD BE FULL LAYERS AS SHOWN IN THE LOAD ON PAGE 4.
3. THE THIRD LAYER MAY CONTAIN EITHER MORE OR LESS BOMB BODIES THAN SHOWN IN THE ABOVE ISOMETRIC VIEW. HOWEVER, THIRD LAYER BOMB BODIES MUST BE SECURED TO THE SECOND LAYER WITH STEEL STRAPPING AS DEPICTED ABOVE.

FOR "KEY NUMBERS", SEE PAGE 4.

KEY LETTERS

- (A) BLOCK, 2" X 6" X 60" (DOUBLED) (4 REQD). BEVEL ONE END AT 45°. NAIL THE FIRST PIECE TO PIECE MARKED (3) OR (5) W/7-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- (B) END BLOCK, 4" X 4" X 54" (4 REQD). NAIL TO PIECES MARKED (A) AS SHOWN W/7-50d NAILS.

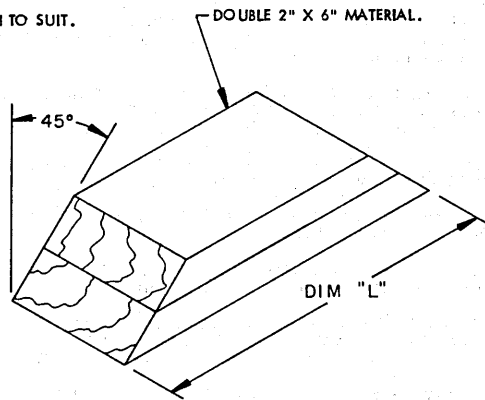


BLOCK A

SEE CHART BELOW FOR DIMENSION "L".

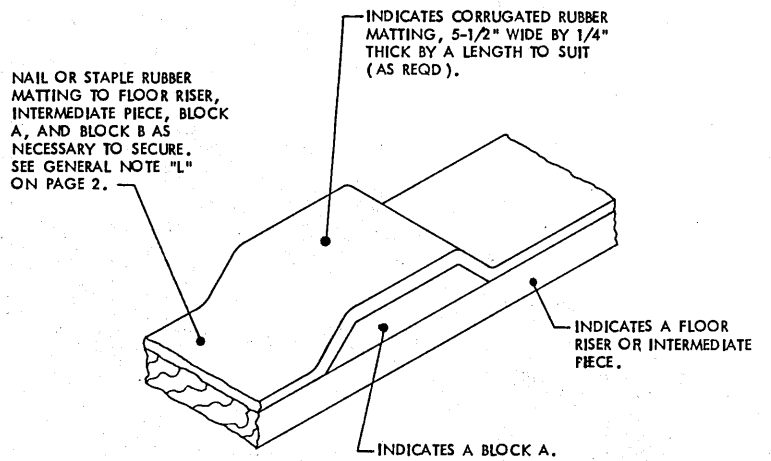
BOMB	BLOCK STYLE	"L" LENGTH
250 LBS	A	5-3/8" LTS *
	B	LTS *
	C	LTS
500 LBS	A	7" LTS *
	B	LTS *
	C	LTS
1,000 LBS	A	22-1/4" LTS *
	B	LTS *
	C	LTS
2,000 LBS	A	12-7/8" LTS *
	B	LTS *

* LTS = LENGTH TO SUIT.



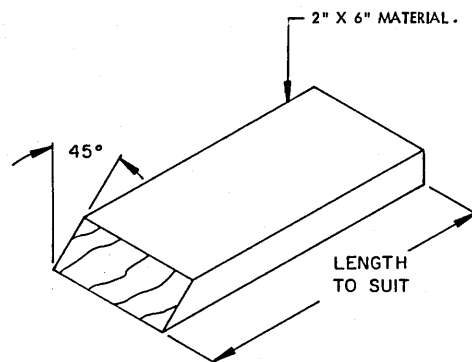
BLOCK B

SEE CHART ABOVE FOR DIMENSION "L".

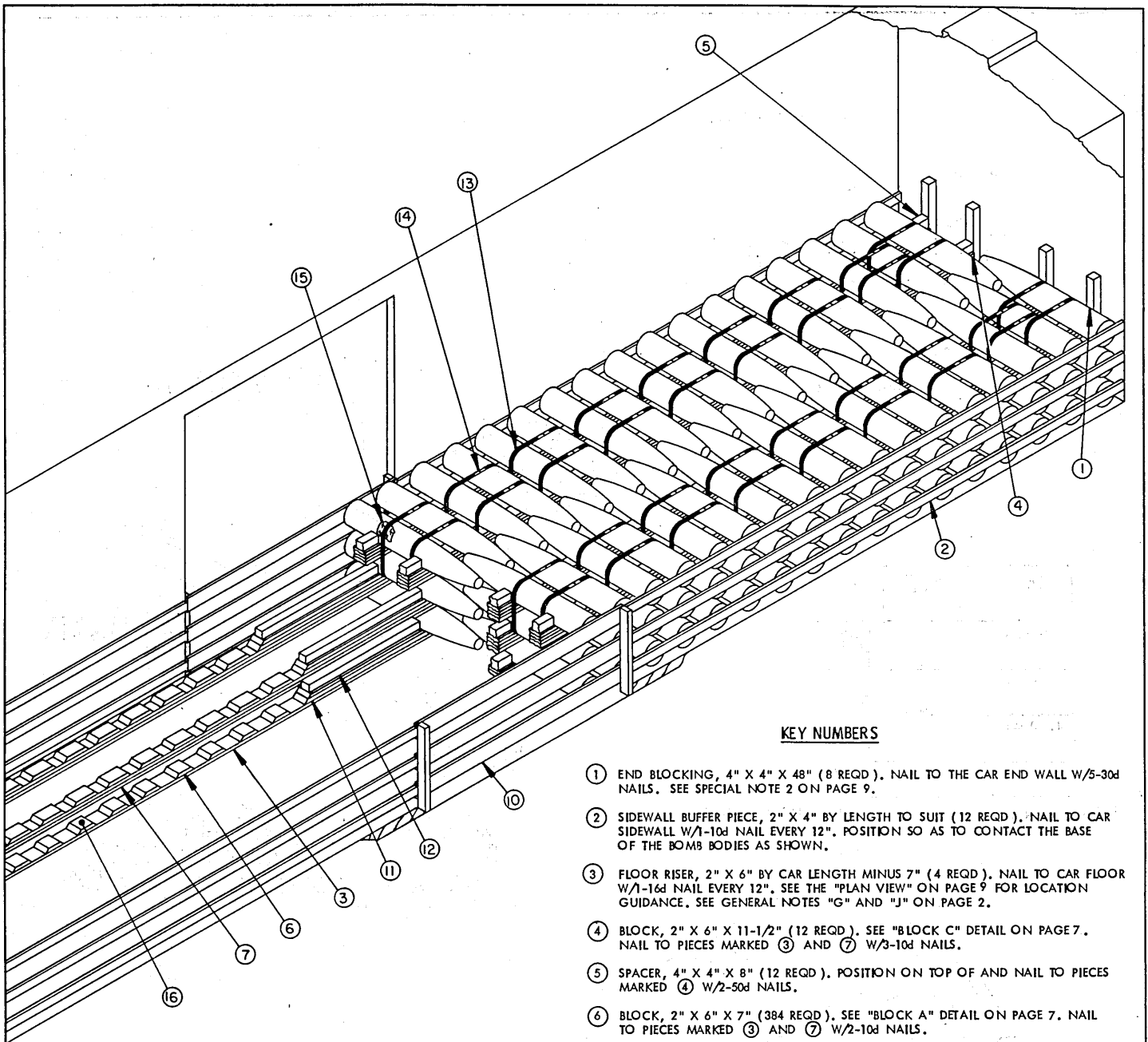


INSTALLATION OF RUBBER MATTING

CORRUGATED RUBBER MATTING AS SPECIFIED WITHIN THE MATERIAL SPECIFICATIONS ON PAGE 2, MUST BE ATTACHED TO THE FLOOR RISERS, INTERMEDIATE PIECES, BLOCKS A, B, AND C WHEREVER THEY CONTACT THE BOMB BODIES. THE MATTING SHALL BE SECURED IN SUCH A MANNER SO AS TO PREVENT IT FROM BECOMING DISLODGED DURING SHIPMENT. SEE SPECIAL NOTE 3 ON PAGE 5 AND GENERAL NOTE "L" ON PAGE 2.



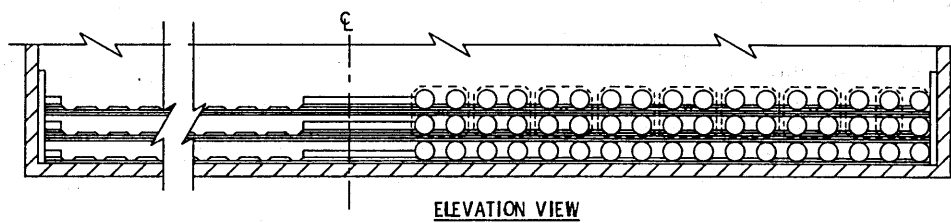
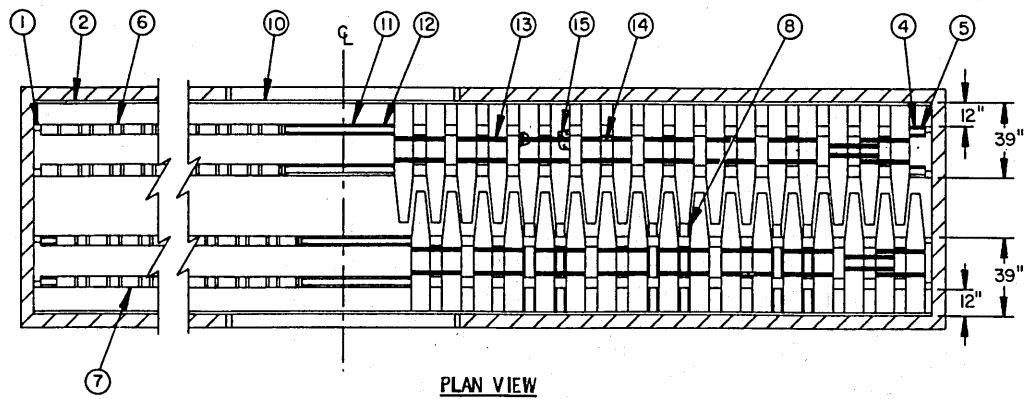
BLOCK C



ISOMETRIC VIEW

KEY NUMBERS

- ① END BLOCKING, 4" X 4" X 48" (8 REQD). NAIL TO THE CAR END WALL W/5-30d NAILS. SEE SPECIAL NOTE 2 ON PAGE 9.
- ② SIDEWALL BUFFER PIECE, 2" X 4" BY LENGTH TO SUIT (12 REQD). NAIL TO CAR SIDEWALL W/1-10d NAIL EVERY 12". POSITION SO AS TO CONTACT THE BASE OF THE BOMB BODIES AS SHOWN.
- ③ FLOOR RISER, 2" X 6" BY CAR LENGTH MINUS 7" (4 REQD). NAIL TO CAR FLOOR W/1-16d NAIL EVERY 12". SEE THE "PLAN VIEW" ON PAGE 9 FOR LOCATION GUIDANCE. SEE GENERAL NOTES "G" AND "J" ON PAGE 2.
- ④ BLOCK, 2" X 6" X 11-1/2" (12 REQD). SEE "BLOCK C" DETAIL ON PAGE 7. NAIL TO PIECES MARKED ③ AND ⑦ W/3-10d NAILS.
- ⑤ SPACER, 4" X 4" X 8" (12 REQD). POSITION ON TOP OF AND NAIL TO PIECES MARKED ④ W/2-50d NAILS.
- ⑥ BLOCK, 2" X 6" X 7" (384 REQD). SEE "BLOCK A" DETAIL ON PAGE 7. NAIL TO PIECES MARKED ③ AND ⑦ W/2-10d NAILS.
- ⑦ INTERMEDIATE PIECE, 2" X 6" BY CAR LENGTH MINUS 7" (DOUBLED) (8 REQD). RANDOM LENGTH PIECES MAY BE USED. LAMINATE W/1-10d NAIL EVERY 12". TOENAIL TO PIECE MARKED ① W/2-16d NAILS AT EACH END.
- ⑧ ANTI-SWAY BRACE, 2" X 6" BY CAR WIDTH MINUS 1/2" (12 REQD). NAIL TO PIECES MARKED ⑦ W/3-10d NAILS AT EACH JOINT. SEE THE "ELEVATION VIEW" ON PAGE 9 AND "DETAIL A" ON PAGE 11.
- ⑨ SPACER, 2" X 6" BY LENGTH TO SUIT (12 REQD). NAIL TO THE UNDERSIDE OF PIECE MARKED ⑧ W/4-10d NAILS.
- ⑩ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION A" DETAIL ON PAGE 15.
- ⑪ BLOCK (DOUBLED) (12 REQD). SEE "BLOCK B" DETAIL ON PAGE 7. NAIL THE FIRST PIECE TO PIECES MARKED ③ AND ⑦ W/6-10d NAILS. LAMINATE THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ⑫ CENTER BLOCKING, 4" X 4" BY CUT TO FIT (12 REQD). NAIL TO PIECE MARKED ① W/4-50d NAILS.
- ⑬ STEEL STRAPPING, 1-1/4" X .035" X 10'-0" LONG (72 REQD). INSTALL SO AS TO ENCIRCLE FOUR (4) BOMB BODIES AS SHOWN.
- ⑭ SEAL FOR 1-1/4" STRAPPING (144 REQD; 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "P" ON PAGE 2.
- ⑮ ANTI-CHAFING MATERIAL (AS REQD). PLACE UNDER STRAPPING AT ALL POINTS OF CONTACT WITH THE BOMB BODIES.
- ⑯ RUBBER MATTING, 5-1/2" WIDE BY LENGTH TO SUIT (20 REQD). SEE SPECIAL NOTE 3 ON PAGE 5, "INSTALLATION OF RUBBER MATTING" ON PAGE 7, AND GENERAL NOTE "L" ON PAGE 2.

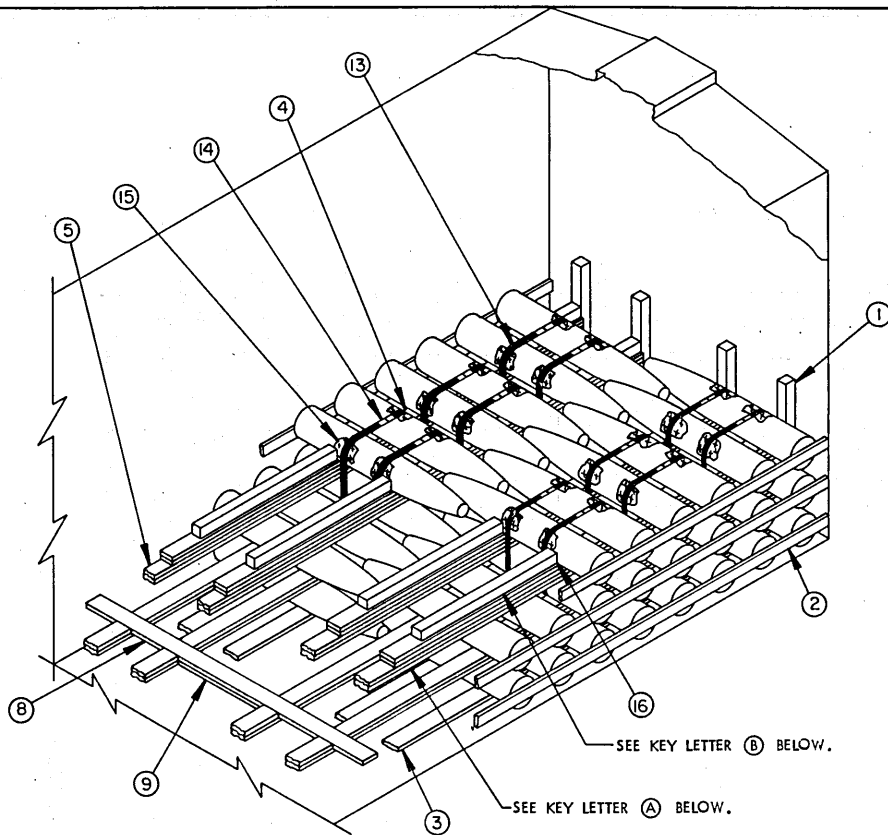


SPECIAL NOTES:

1. A 204-UNIT LOAD OF EMPTY 500 POUND BOMB BODIES IS SHOWN IN A 50'-6" LONG BY 9'-2" WIDE BOX CAR EQUIPPED WITH 8'-0" WIDE DOOR OPENINGS. CARS OF OTHER DIMENSIONS AND OTHER DOOR SIZES MAY BE USED.
2. IF A BOX CAR TO BE LOADED HAS BOWED END WALLS, LAMINATIONS OF A THICKNESS AS REQUIRED MAY BE NAILED TO THE END BLOCKING SO AS TO PROVIDE A "SQUARED OFF" SURFACE AT THE END OF THE CAR.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	271	181
2" X 6"	1,516	1,516
4" X 4"	100	133
NAILS	NO. REQD	POUNDS
10d (3")	2,169	33-1/4
12d (3-1/4")	16	1/4
16d (3-1/2")	231	5
30d (4-1/2")	40	2-1/2
50d (5-1/2")	72	5-1/2
STEEL STRAPPING, 1-1/4" X .035" OR .031" - 720' REQD -- 103 LBS		
SEAL FOR 1-1/4" STRAPPING ----- 144 REQD -- 6 LBS		
RUBBER MATTING, 1/4" X 5-1/2" ----- 1,040' REQD -- 149 LBS		
ANTI-CHAFING MATERIAL ----- AS REQD -- NIL		

ITEM	LOAD AS SHOWN QUANTITY	WEIGHT (APPROX)
500 LB BOMBS	204	61,404 LBS
DUNNAGE		3,962 LBS
TOTAL WEIGHT		65,366 LBS



ISOMETRIC VIEW

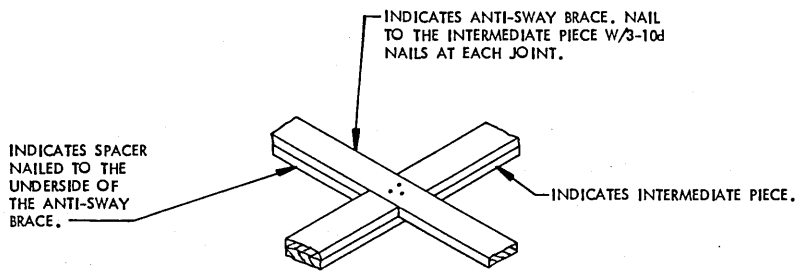
SPECIAL NOTES:

1. A PARTIAL LAYER LOAD OF 500 POUND BOMB BODIES IS SHOWN IN A 9'-2" WIDE WOOD LINED BOX CAR. WOOD LINED BOX CARS OF OTHER SIZES MAY BE USED.
2. ALTHOUGH THE VIEW ON THIS PAGE DEPICTS EIGHT STACKS OF BOMB BODIES IN THE FIRST AND SECOND LAYERS, IN ACTUALITY THESE SHOULD BE FULL LAYERS AS SHOWN IN THE LOAD ON PAGE 8.
3. THE THIRD LAYER MAY CONTAIN EITHER MORE OR LESS BOMB BODIES THAN SHOWN IN THE ABOVE ISOMETRIC VIEW. HOWEVER, THIRD LAYER BOMB BODIES MUST BE SECURED TO THE SECOND LAYER WITH STEEL STRAPPING AS DEPICTED ABOVE.

FOR "KEY NUMBERS", SEE PAGE 8.

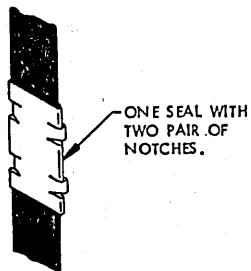
KEY LETTERS

- (A) BLOCK, 2" X 6" X 60" (DOUBLED) (4 REQD). BEVEL ONE END AT 45°. NAIL THE FIRST PIECE TO PIECE MARKED (3) OR (7) W/7-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- (B) END BLOCK, 4" X 4" X 52" (4 REQD). NAIL TO PIECES MARKED (A) AS SHOWN W/7-50d NAILS.



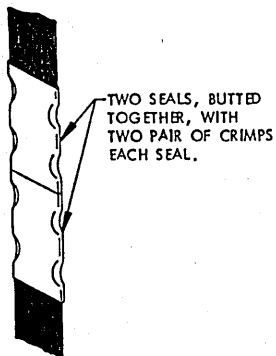
DETAIL A

THE ABOVE DETAIL DEPICTS THE POSITION AND NAILING OF THE ANTI-SWAY BRACE TO THE INTERMEDIATE PIECES AS SHOWN WITHIN THIS DRAWING.



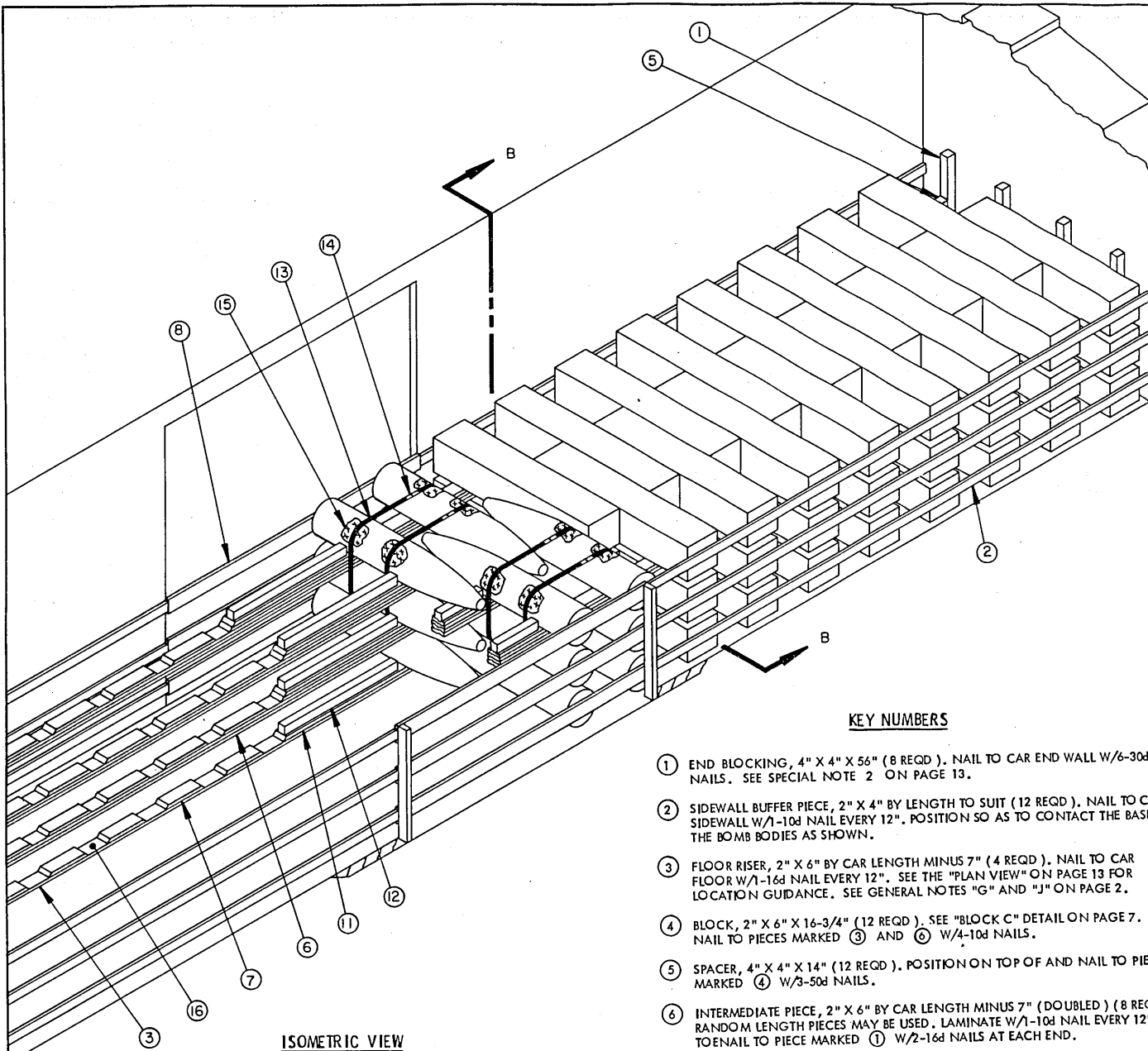
STRAP JOINT A

METHOD OF SECURING A STRAP JOINT WHEN USING A NOTCH-TYPE SEALER.



STRAP JOINT B

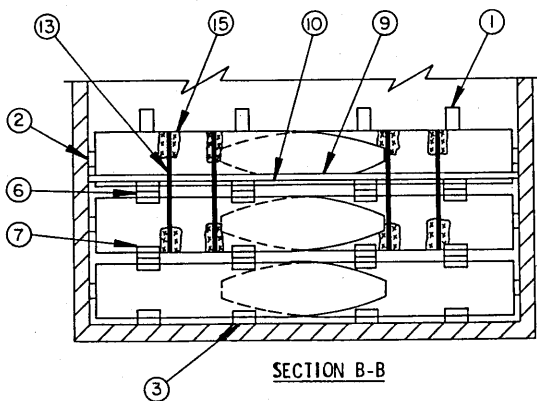
METHOD OF SECURING A STRAP JOINT WHEN USING A CRIMP-TYPE SEALER.



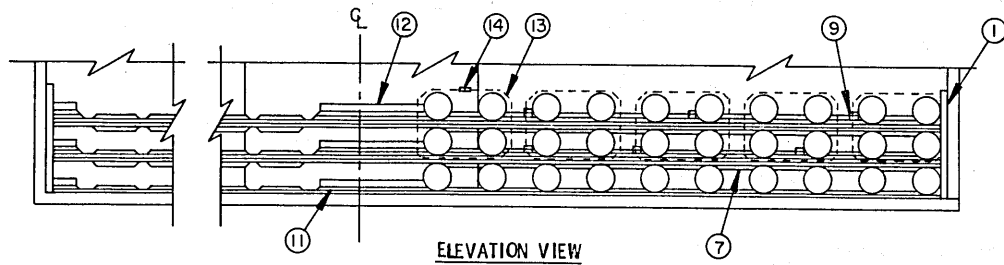
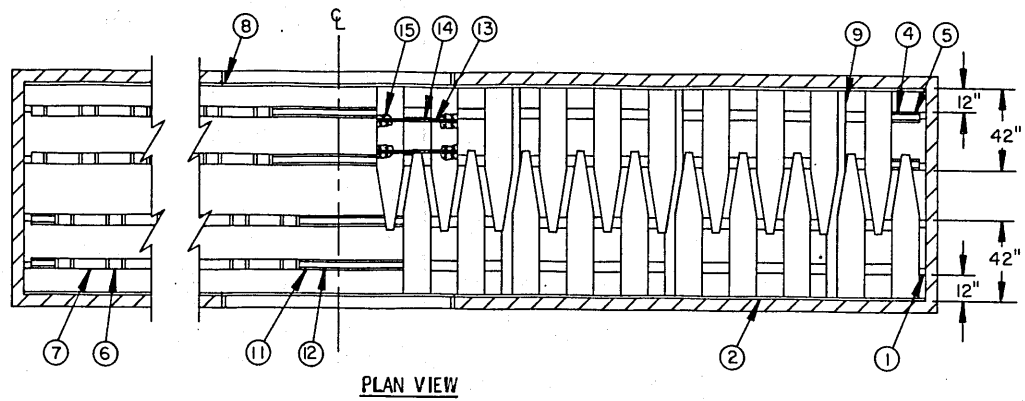
ISOMETRIC VIEW

KEY NUMBERS

- ① END BLOCKING, 4" X 4" X 56" (8 REQD). NAIL TO CAR END WALL W/6-30d NAILS. SEE SPECIAL NOTE 2 ON PAGE 13.
- ② SIDEWALL BUFFER PIECE, 2" X 4" BY LENGTH TO SUIT (12 REQD). NAIL TO CAR SIDEWALL W/1-10d NAIL EVERY 12". POSITION SO AS TO CONTACT THE BASE OF THE BOMB BODIES AS SHOWN.
- ③ FLOOR RISER, 2" X 6" BY CAR LENGTH MINUS 7" (4 REQD). NAIL TO CAR FLOOR W/1-16d NAIL EVERY 12". SEE THE "PLAN VIEW" ON PAGE 13 FOR LOCATION GUIDANCE. SEE GENERAL NOTES "G" AND "J" ON PAGE 2.
- ④ BLOCK, 2" X 6" X 16-3/4" (12 REQD). SEE "BLOCK C" DETAIL ON PAGE 7. NAIL TO PIECES MARKED ③ AND ⑥ W/4-10d NAILS.
- ⑤ SPACER, 4" X 4" X 14" (12 REQD). POSITION ON TOP OF AND NAIL TO PIECES MARKED ④ W/3-50d NAILS.
- ⑥ INTERMEDIATE PIECE, 2" X 6" BY CAR LENGTH MINUS 7" (DOUBLED) (8 REQD). RANDOM LENGTH PIECES MAY BE USED. LAMINATE W/1-10d NAIL EVERY 12". TOENAIL TO PIECE MARKED ① W/2-16d NAILS AT EACH END.
- ⑦ BLOCK, 2" X 6" X 22-1/4" (360 REQD). SEE "BLOCK A" DETAIL ON PAGE 7. NAIL TO PIECES MARKED ③ AND ⑥ W/4-10d NAILS.
- ⑧ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION A" DETAIL ON PAGE 15.
- ⑨ ANTI-SWAY BRACE, 2" X 6" X CAR WIDTH (12 REQD). NAIL TO PIECE MARKED ⑥ W/3-10d NAILS AT EACH JOINT. SEE THE "ELEVATION VIEW" ON PAGE 13 FOR LOCATION GUIDANCE. SEE "DETAIL A" ON PAGE 11.
- ⑩ SPACER, 2" X 6" BY LENGTH TO SUIT (12 REQD). NAIL TO THE UNDERSIDE OF PIECE MARKED ⑦ W/6-10d NAILS. SEE "SECTION B-B" AT LEFT.
- ⑪ BLOCK (DOUBLED) (12 REQD). SEE "BLOCK B" ON PAGE 7. NAIL THE FIRST PIECE TO PIECES MARKED ③ AND ⑥ W/6-10d NAILS. LAMINATE THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ⑫ CENTER BLOCKING, 4" X 4" BY CUT-TO-FIT (12 REQD). NAIL TO PIECE MARKED ⑪ W/4-50d NAILS.
- ⑬ STEEL STRAPPING, 1-1/4" X .035" OR .031" X 10'-0" LONG STEEL STRAPPING (40 REQD). ENCIRCLE FOUR (4) BOMB BODIES AS SHOWN.
- ⑭ SEAL FOR 1-1/4" STRAPPING (80 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "P" ON PAGE 2.
- ⑮ ANTI-CHAFING MATERIAL (AS REQD). PLACE UNDER STRAPPING AT ALL POINTS OF CONTACT WITH THE BOMB BODIES.
- ⑯ RUBBER MATTING, 5-1/2" WIDE BY LENGTH TO SUIT (20 REQD). SEE SPECIAL NOTE 3 ON PAGE 5, "INSTALLATION OF RUBBER MATTING" ON PAGE 7, AND GENERAL NOTE "L" ON PAGE 2.



SECTION B-B



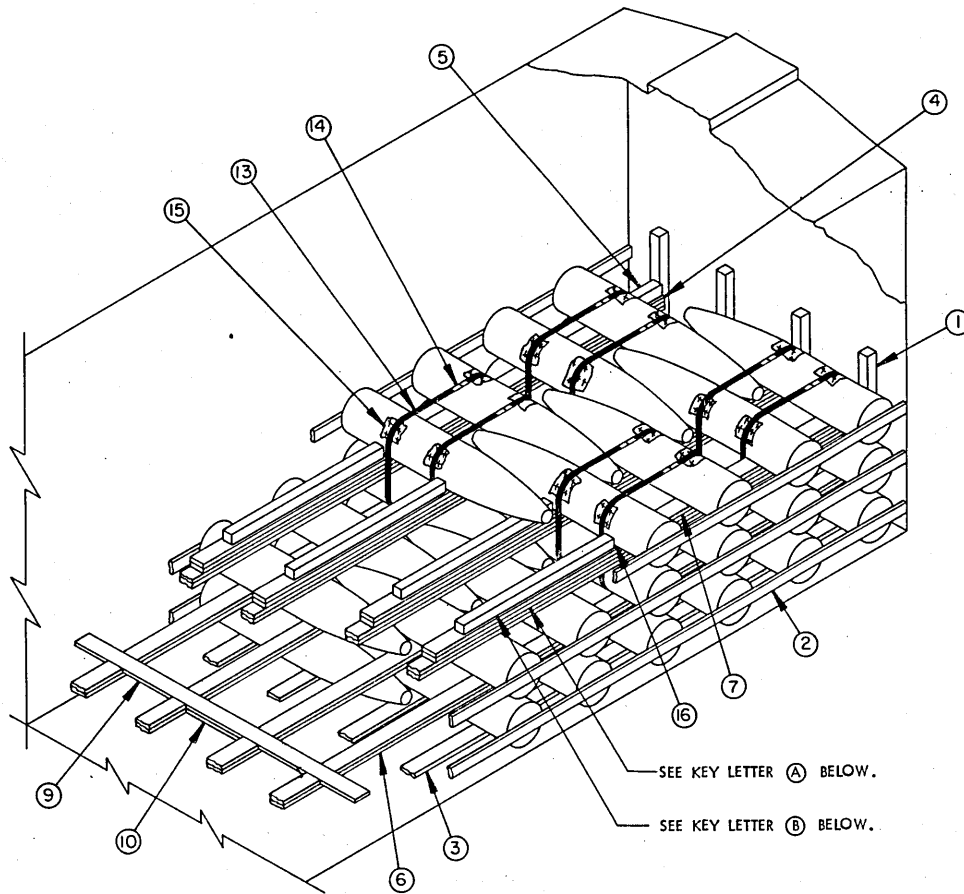
SPECIAL NOTES:

1. A 120-UNIT LOAD OF EMPTY 1,000 POUND BOMB BODIES IS SHOWN IN A 50'-6" LONG BY 9'-2" WIDE BOX CAR EQUIPPED WITH 8'-0" WIDE DOOR OPENINGS. CARS OF OTHER DIMENSIONS AND OTHER DOOR SIZES MAY BE USED.
2. IF A BOX CAR TO BE LOADED HAS BOWED END WALLS, LAMINATIONS OF A THICKNESS AS REQUIRED MAY BE NAILED TO THE END BLOCKING SO AS TO PROVIDE A "SQUARED OFF" SURFACE AT THE END OF THE CAR.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	505	336
2" X 6"	1,962	1,962
4" X 4"	105	140
NAILS	NO. REQD	POUNDS
10d (3")	2,770	42-1/2
12d (3-1/4")	16	1/4
16d (3-1/2")	232	5
30d (4-1/2")	48	2-1/2
50d (5-1/2")	84	6-1/2
STEEL STRAPPING, 1-1/4" X .035" OR .031" - 520' REQD		74 LBS
SEALS FOR 1-1/4" STRAPPING	80 REQD	3-1/2 LBS
RUBBER MAT, 1/4" X 5-1/2"	1,040' REQD	149 LBS
ANTI-CHAFING MATERIAL	AS REQD	NIL

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
1,000 POUND BOMB	120	57,000 LBS
DUNNAGE		5,160 LBS
TOTAL WEIGHT		62,160 LBS



ISOMETRIC VIEW

SPECIAL NOTES:

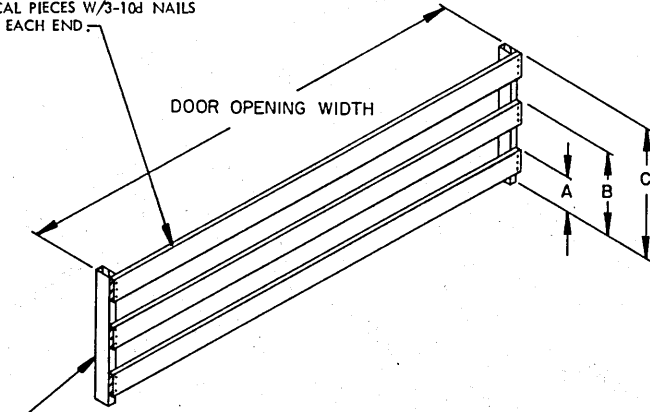
1. A PARTIAL LAYER LOAD OF 1,000 POUND BOMB BODIES IS SHOWN IN A 9'-2" WIDE WOOD LINED BOX CAR. WOOD LINED BOX CARS OF A WIDER SIZE MAY BE USED.
2. ALTHOUGH THE VIEW ON THIS PAGE DEPICTS SIX STACKS OF BOMB BODIES IN THE FIRST AND SECOND LAYERS, IN ACTUALITY THESE SHOULD BE FULL LAYERS AS SHOWN IN THE LOAD ON PAGE 12.
3. THE THIRD LAYER MAY CONTAIN EITHER MORE OR LESS BOMB BODIES THAN SHOWN IN THE ABOVE VIEW. HOWEVER, THIRD LAYER BOMB BODIES MUST BE SECURED TO THE SECOND LAYER WITH 1-1/4" STEEL STRAPPING AS DEPICTED ABOVE.

FOR "KEY NUMBERS", SEE PAGE 12.

KEY LETTERS

- (A) BLOCK, 2" X 6" X 72" (DOUBLED) (4 REQD). BEVEL ONE END AT 45°. NAIL THE FIRST PIECE TO PIECE MARKED (6) W/9-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- (B) END BLOCK, 4" X 4" X 60" (4 REQD). NAIL TO PIECES MARKED (A) AS SHOWN W/8-50d NAILS.

LOAD BEARING PIECE, 2" X 6" BY DOOR OPENING WIDTH (3 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH END.

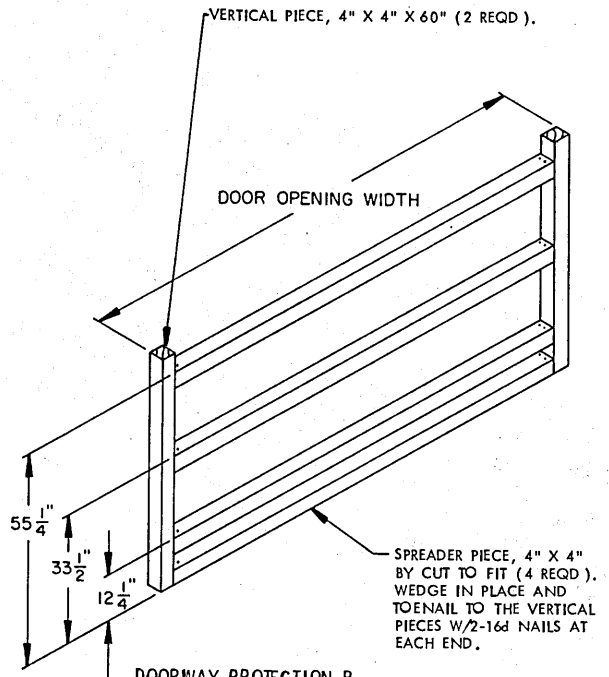


VERTICAL PIECE, 2" X 4" BY LENGTH TO SUIT (2 REQD); NAIL TO THE DOOR POSTS W/12d NAILS.

DOORWAY PROTECTION A

BOMB SIZE	DIMENSION		
	A	B	C
250 LB	8-3/4"	20-3/4"	32-3/4"
500 LB	9-3/4"	23-1/4"	36-3/4"
1,000 LB	11-1/4"	28-1/2"	45-3/4"

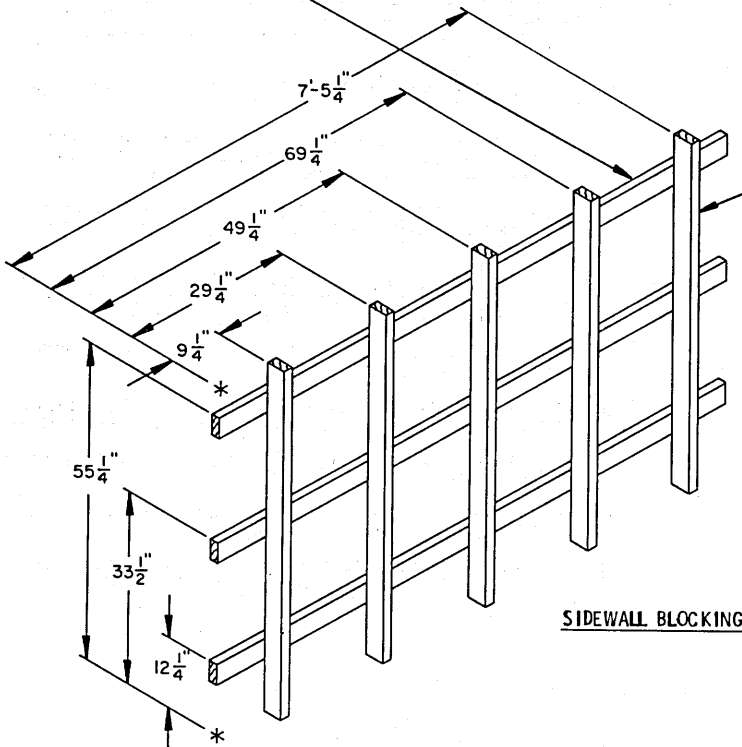
VERTICAL PIECE, 4" X 4" X 60" (2 REQD).



SPREADER PIECE, 4" X 4" BY CUT TO FIT (4 REQD). WEDGE IN PLACE AND TOENAIL TO THE VERTICAL PIECES W/2-16d NAILS AT EACH END.

DOORWAY PROTECTION B

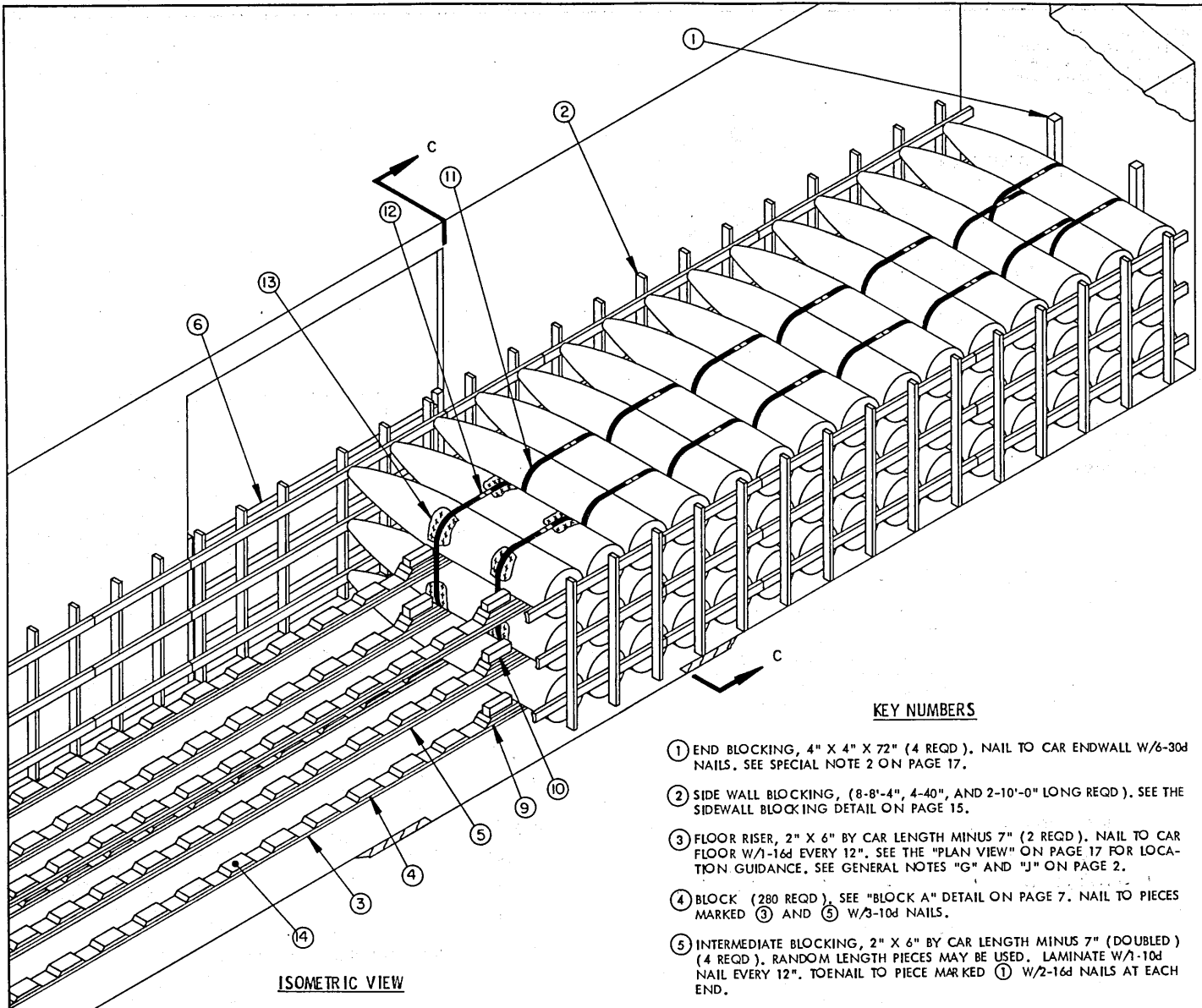
LOAD BEARING PIECE, 2" X 4" X 8'-4" (3 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS.



VERTICAL PIECE, 2" X 4" X 60" (5 REQD).

SIDEWALL BLOCKING

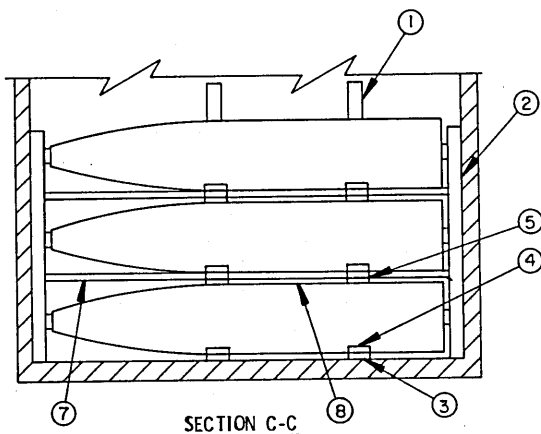
DETAILS



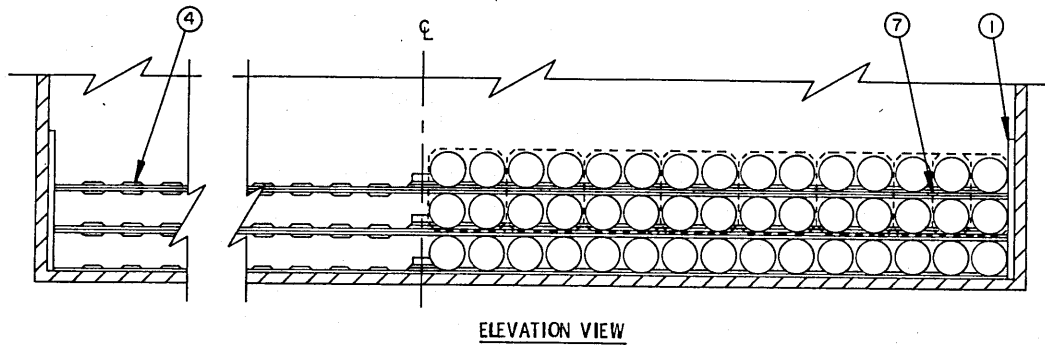
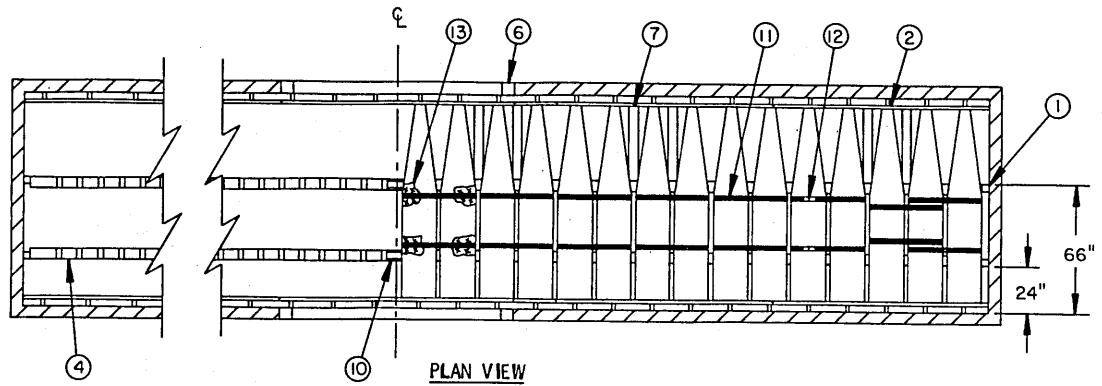
ISOMETRIC VIEW

KEY NUMBERS

- ① END BLOCKING, 4" X 4" X 72" (4 REQD). NAIL TO CAR ENDWALL W/6-30d NAILS. SEE SPECIAL NOTE 2 ON PAGE 17.
- ② SIDE WALL BLOCKING, (8'-8"-4", 4'-40", AND 2'-10'-0" LONG REQD). SEE THE SIDEWALL BLOCKING DETAIL ON PAGE 15.
- ③ FLOOR RISER, 2" X 6" BY CAR LENGTH MINUS 7" (2 REQD). NAIL TO CAR FLOOR W/1-16d EVERY 12". SEE THE "PLAN VIEW" ON PAGE 17 FOR LOCATION GUIDANCE. SEE GENERAL NOTES "G" AND "J" ON PAGE 2.
- ④ BLOCK (280 REQD), SEE "BLOCK A" DETAIL ON PAGE 7. NAIL TO PIECES MARKED ③ AND ⑤ W/3-10d NAILS.
- ⑤ INTERMEDIATE BLOCKING, 2" X 6" BY CAR LENGTH MINUS 7" (DOUBLED) (4 REQD). RANDOM LENGTH PIECES MAY BE USED. LAMINATE W/1-10d NAIL EVERY 12". TOENAIL TO PIECE MARKED ① W/2-16d NAILS AT EACH END.
- ⑥ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION B" DETAIL ON PAGE 15.
- ⑦ ANTI-SWAY BRACE, 2" X 6" BY CAR WIDTH (12 REQD). NAIL TO PIECE MARKED ⑤ W/3-10d NAILS AT EACH JOINT. SEE THE "ELEVATION VIEW" ON PAGE 17 FOR LOCATION GUIDANCE. SEE "DETAIL A" ON PAGE 11.
- ⑧ SPACER, 2" X 6" BY LENGTH TO SUIT (12 REQD). NAIL TO THE UNDERSIDE OF THE ANTI-SWAY BRACE, PIECE MARKED ⑦, W/6-10d NAILS. SEE "SECTION C-C" AT LEFT.
- ⑨ BLOCK (DOUBLED) (6 REQD). SEE "BLOCK B" DETAIL ON PAGE 7. NAIL THE FIRST PIECE TO PIECES MARKED ③ AND ⑤ W/3-10d NAILS. LAMINATE THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ⑩ CENTER BLOCKING, 4" X 4" BY CUT TO FIT (6 REQD). NAIL TO PIECE MARKED ⑨ W/2-50d NAILS.
- ⑪ STEEL STRAPPING, 1-1/4" X .035" OR .031" X 9'-0" LONG STEEL STRAPPING (32 REQD). INSTALL SO AS TO ENCIRCLE FOUR (4) BOMB BODIES AS SHOWN.
- ⑫ SEAL FOR 1-1/4" STRAPPING (64 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "P" ON PAGE 2.
- ⑬ ANTI-CHAFING MATERIAL (AS REQD). PLACE UNDER STRAPPING AT ALL POINTS OF CONTACT WITH THE BOMB BODIES.
- ⑭ RUBBER MATTING, 5-1/2" WIDE BY A LENGTH TO SUIT (10 REQD). SEE SPECIAL NOTE 3 ON PAGE 5, "INSTALLATION OF RUBBER MATTING" ON PAGE 7, AND GENERAL NOTE "L" ON PAGE 2.



SECTION C-C



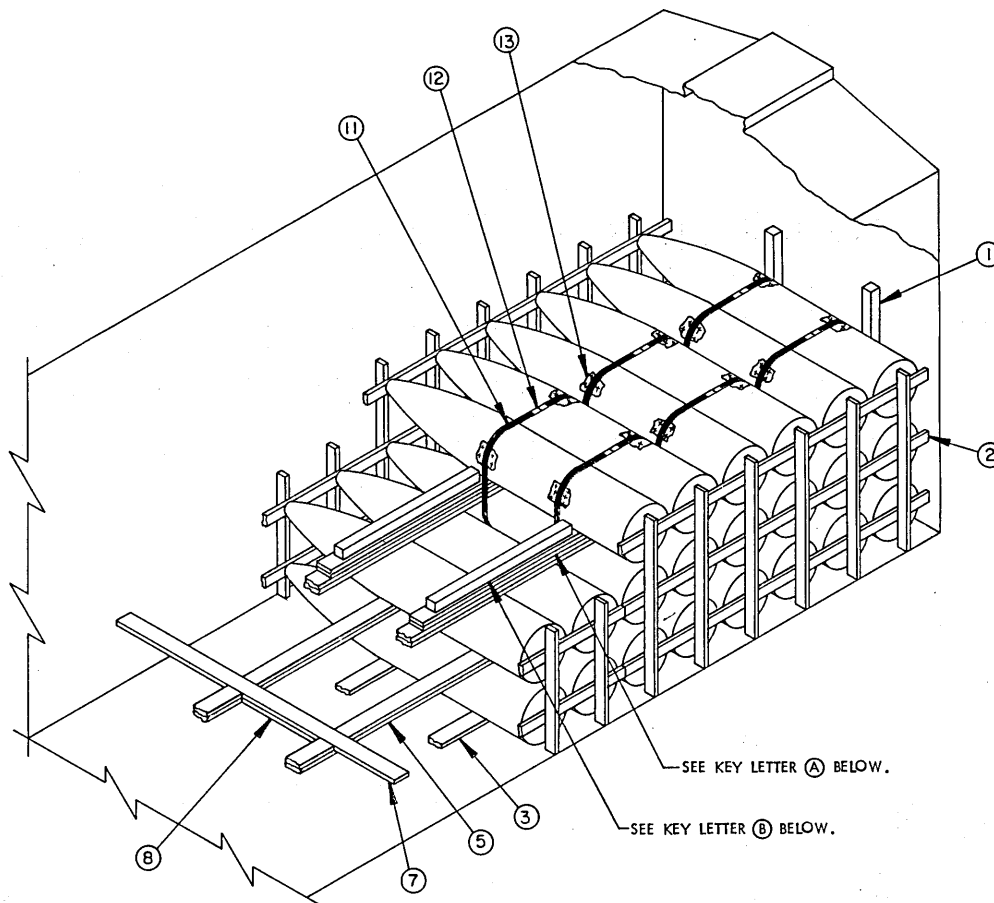
SPECIAL NOTES:

1. A 90-UNIT LOAD OF EMPTY 2,000 POUND BOMB BODIES IS SHOWN IN A 50'-6" LONG BY 9'-2" WIDE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS. CARS OF OTHER DIMENSIONS MAY BE USED, HOWEVER, CARS WITH LESS THAN 10'-0" WIDE DOOR OPENINGS ARE NOT RECOMMENDED.
2. IF A BOX CAR TO BE LOADED HAS BOWED END WALLS, LAMINATIONS OF A THICKNESS AS REQUIRED MAY BE NAILED TO THE END BLOCKING SO AS TO PROVIDE A "SQUARED OFF" SURFACE AT END OF THE CAR.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	556	371
2" X 6"	935	935
4" X 4"	125	167
NAILS	NO. REQD	POUNDS
10d (3")	1,628	25
16d (3-1/2")	116	2
30d (4-1/2")	24	1
50d (5-1/2")	12	1
STEEL STRAPPING, 1-1/4" X .035" OR .031" -- 288' REQD -- 41 LBS		
SEAL FOR 1-1/4" STRAPPING ----- 64 REQD -- 3 LBS		
RUBBER MAT, 1/4" X 5-1/2" ----- 510' REQD -- 74 LBS		
ANTI-CHAFING MATERIAL ----- AS REQD -- NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
2,000 LB BOMB	90	85,500 LBS
DUNNAGE		3,093 LBS
TOTAL WEIGHT		88,593 LBS



ISOMETRIC VIEW

SPECIAL NOTES:

1. A PARTIAL LAYER OF 2,000 POUND BOMB BODIES IS SHOWN IN A 9'-2" BOX CAR. CARS OF OTHER DIMENSIONS MAY BE USED.
2. ALTHOUGH THE VIEW ON THIS PAGE DEPICTS EIGHT STACKS OF BOMB BODIES IN THE FIRST AND SECOND LAYERS, IN ACTUALITY THESE SHOULD BE FULL LAYERS AS SHOWN IN THE LOAD ON PAGE 16.
3. THE THIRD LAYER MAY CONTAIN EITHER MORE OR LESS BOMB BODIES THAN SHOWN IN THE ABOVE VIEW.
4. SIDE WALL BLOCKING, SHOWN AS PIECE MARKED ②, MAY BE EXTENDED IN LENGTH AS NECESSARY SO AS TO CONTACT THE BOMB BODIES AS SHOWN.

FOR "KEY NUMBERS", SEE PAGE 16.

KEY LETTERS.

- Ⓐ BLOCK, 2" X 6" X 60" (DOUBLED) (2 REQD). BEVEL ONE END AT 45° NAIL THE FIRST PIECE TO PIECE MARKED ⑤ W/7-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- Ⓑ END BLOCK, 4" X 4" X 54" (2 REQD). NAIL TO PIECES MARKED Ⓐ AS SHOWN W/6-50d NAILS.