

APPROVED
 BUREAU OF EXPLOSIVES
A. J. Grasmuck
 MILITARY ASSISTANT
 DATE 7/2/65

LOADING & BRACING OF BOX - PACKED AMMUNITION IN VAN TYPE TRAILERS AND/OR CONTAINERS WITH BUILT-IN BLOCKING EQUIPMENT

| ITEM | INDEX | PAGE(S) |
|---|-------|---------|
| GENERAL NOTES AND MATERIAL SPECIFICATIONS----- | | 2 |
| BOX POSITIONS (OTHER THAN WP OR PWP)----- | | 3 |
| EXCESS WIDTH POSITIONS (OTHER THAN WP OR PWP)----- | | 4 |
| BOX AND EXCESS WIDTH POSITIONS (FOR WP OR PWP)----- | | 5 |
| TYPICAL HIGHWAY LOAD (OTHER THAN WP OR PWP)----- | | 6 |
| TYPICAL TOFC & COFC LOADS (OTHER THAN WP OR PWP)--- | | 7 & 8 |
| TYPICAL HIGHWAY LOAD (FOR WP OR PWP)----- | | 9 |
| TYPICAL TOFC & COFC LOADS (FOR WP OR PWP)----- | | 10 & 11 |
| DETAILS----- | | 12 & 13 |

CAUTION:

"SUCH TRAILERS MUST NOT BE USED FOR SHIPMENTS OF EXPLOSIVES SUCH AS DYNAMITE, I.N.T., BLACK POWDER, SMOKE-LESS POWDER (PROPELLENT EXPLOSIVES), TETRYL AND SIMILAR EXPLOSIVES (EXCEPT AS A COMPONENT PART OF AMMUNITION OR PROPELLING CHARGES) WHICH ARE LIABLE TO SIFT OR BECOME LODGED IN THE MECHANISM OF THE LOADING AND BRACING DEVICE IN THE EVENT OF CONTAINER FAILURE."

DO NOT SCALE

| | | | |
|----------------------------|-----------------------------------|--------------------|--|
| DRAFTSMAN E.G.G. | PROJ ENG <i>R.W.M./P.L.</i> | APBA <i>gob</i> | SUBMITTED <i>[Signature]</i> |
| CHECKER <i>JDS/BBB</i> | SAC AMMO CTR <i>R.T. Quinn</i> | | COMMANDING OFFICER, AVIATION ARMY DEPOT |
| REVISIONS | | | EXAMINED AND APPROVED <i>[Signature]</i> |
| | | | AMMUNITION PROCUREMENT & SUPPLY AGENCY |
| | | | APPROVED BY CHIEF OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND |
| | | | U. S. ARMY MATERIEL COMMAND |
| | | | 10 SEPTEMBER 1965 |
| | | | CLASS DIVISION DRAWING FILE |
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GENERAL NOTES

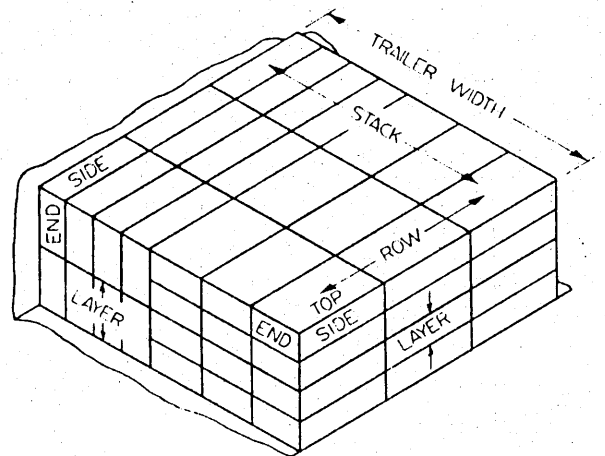
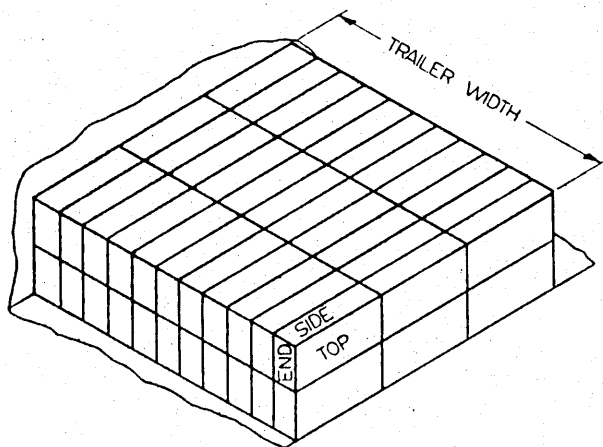
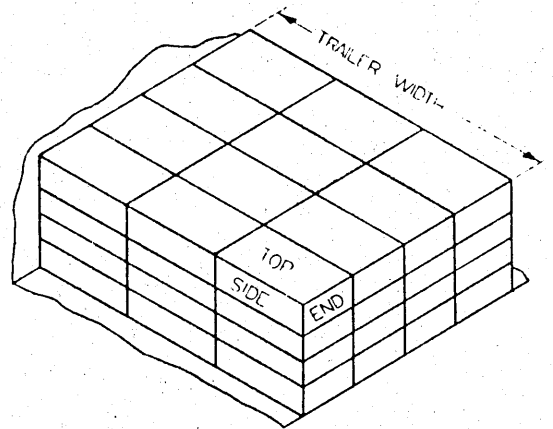
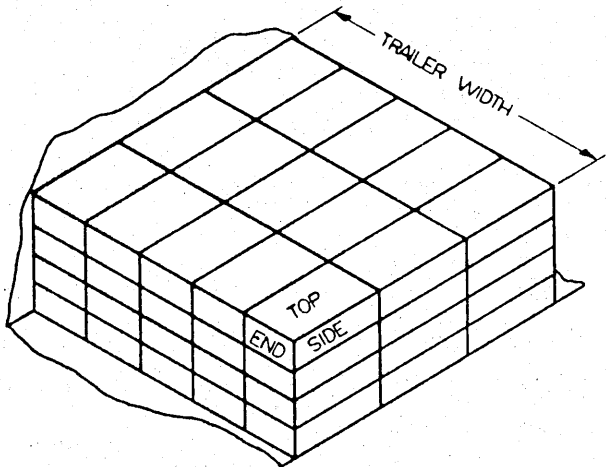
- A. LOADING AND BRACING PROCEDURES SHOWN ARE TYPICAL AND ARE BASED ON TRAILERS AND/OR CONTAINERS WITH MECHANICAL BRACING DEVICES APPROVED BY THE BUREAU OF EXPLOSIVES PAMPHLET NO. 66, APPENDIX 1, JANUARY 1965. CAUTION: TRAILERS AND/OR CONTAINERS EQUIPPED WITH WALL MEMBERS WHICH DO NOT MEET THE LOCATION REQUIREMENTS MUST NOT BE USED.
- B. VOIDS LENGTHWISE BETWEEN LOADS MUST BE MINIMUM. CROSS MEMBERS MUST BE PLACED AGAINST THE LADING AS TIGHTLY AS THE WALL MEMBER LOCKING HOLE SPACING PERMITS. CROSS MEMBERS WILL BE INSTALLED WITH EACH END ATTACHED AS NEARLY AS POSSIBLE IN "MATED" POSITIONS, AT EQUAL HEIGHTS AND AT EQUAL DISTANCES FROM END OF TRAILER AND/OR CONTAINER.
- C. CROSS MEMBERS IN EMPTY TRAILERS AND/OR CONTAINERS AND THOSE UNUSED IN LOADED TRAILERS AND/OR CONTAINERS MUST BE SECURED FOR SHIPMENT. COMPONENTS ASSIGNED TO EACH TRAILER AND/OR CONTAINER MUST REMAIN THEREWITH EVEN THOUGH UNUSED DURING SOME SHIPMENTS.
- D. A CROSS MEMBER WHEN USED FOR SHIPMENTS IN TRAILER-ON-FLAT-CAR (TOFC) AND/OR CONTAINER-ON-FLAT-CAR (COFC) WILL BE POSITIONED IN SUCH MANNER THAT IT WILL NOT BE RELIED ON TO RETAIN MORE THAN 2,000 POUNDS OF LADING ON EITHER SIDE.
- E. GROSS WEIGHT AND AXLE DISTRIBUTION OF WEIGHT AND COMPLIANCE WITH "WEIGHT LAWS" IS A RESPONSIBILITY OF THE CARRIER. THE CARRIER WILL ADVISE THE SHIPPER OF THE APPLICABLE LOADING REQUIREMENTS. THE SHIPPER WILL LOAD ACCORDINGLY.
- F. THE NUMBER OF BOXES PER LOAD MAY BE INCREASED OR DECREASED IN ORDER TO FIT THE VEHICLE CONCERNED AND THE QUANTITY TO BE SHIPPED. HOWEVER, THE APPROVED METHODS SHOWN MUST BE FOLLOWED.
- G. DO NOT NAIL GATES, SOLID FILL, RISERS OR ANY OTHER PART OF THE BLOCKING SHOWN TO THE VEHICLE WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.
- H. CAUTION: WP AND/OR PWP LOADED ITEMS OF AMMUNITION WILL ALWAYS BE POSITIONED "NOSE END UP" IN SHIPPING, EXCEPT FOR 3.5" WP FILLED ROCKETS WHICH WILL BE SHIPPED "NOSE END DOWN".
- J. CARE SHOULD BE EXERCISED WHEN LOADS ARE BUILT (SELECTION OF BOX POSITIONING, NUMBER OF LAYERS, ETC.) TO INSURE THE MINIMUM USAGE OF INTERNAL BLOCKING AND BRACING.
- K. THERE ARE NO ABSOLUTE REQUIREMENTS FOR THE VERTICAL DISTANCES BETWEEN CROSS MEMBERS. BUT THE NUMBER OF CROSS MEMBERS USED AND THE SPACING BETWEEN CROSS MEMBERS MUST BE ADEQUATE TO MEET THE REQUIREMENTS OF GENERAL NOTES "B" AND "D". WHEREVER POSSIBLE IT IS DESIRABLE TO HAVE ONE CROSS MEMBER FOR EACH LAYER.
- L. FOR SHIPMENTS OF TRAILER-ON-FLAT-CAR (TOFC) OR CONTAINER-ON-FLAT-CAR (COFC), CROSS MEMBERS WILL BE POSITIONED A MINIMUM OF 6" FROM TRAILER FRONT WALL.

Ⓢ ALL REFERENCE TO TRAILERS THROUGHOUT THIS DRAWING INCLUDES CONTAINERS. FOR TOFC AND COFC SHIPMENTS, USE ONLY RAILCARS APPROVED BY BUREAU OF EXPLOSIVES PAMPHLET 66, AUGUST 1961, AND APPENDIX 1, JANUARY 1965.

MATERIAL SPECIFICATIONS

LUMBER: SEE TM 715-5500-1; DUNNAGE LUMBER, FED SPEC MM-L-751.

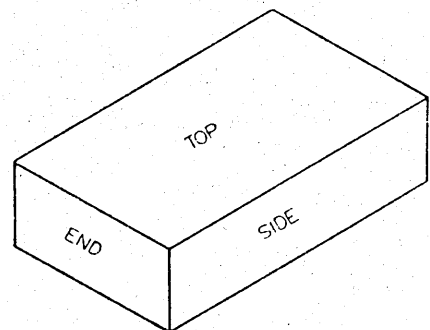
NAILS: COMMON, CEMENT COATED, FED SPEC FF-N-105.
ALT: ANNULAR-RING TYPE NAIL OF SAME SIZE.



NOTES:

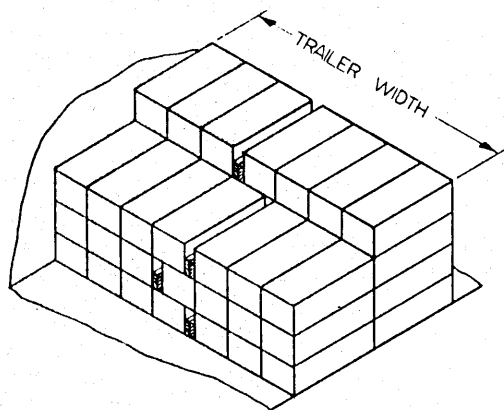
1. BOXED AMMUNITION AND COMPONENTS MAY BE LOADED IN TRAILERS USING ANY ONE OR COMBINATION OF BOX POSITIONS SHOWN, UNLESS THE BOX IS SPECIFICALLY MARKED "THIS SIDE UP"; SUCH BOXES MUST BE POSITIONED AS DIRECTED.
2. WHEN BOXES ARE LOADED IN TWO OR MORE POSITIONS IN THE SAME TRAILER, ALL BOXES IN ANY ONE ROW MUST BE LOADED IN THE SAME DIRECTION. THE END OF ONE BOX AND THE SIDE OF ANOTHER MUST NEVER BE IN CONTACT IN THE LONGITUDINAL DIRECTION.

COMBINATION OF POSITIONS

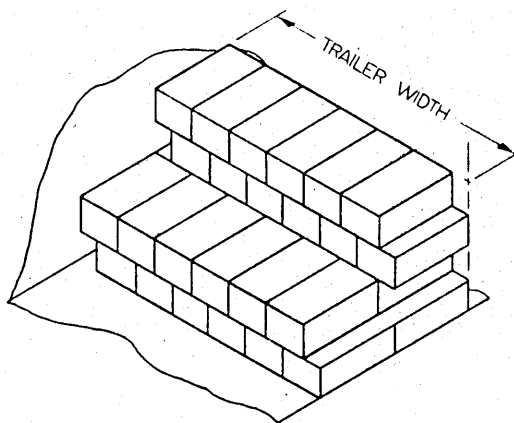


KEY TO BOX POSITIONS

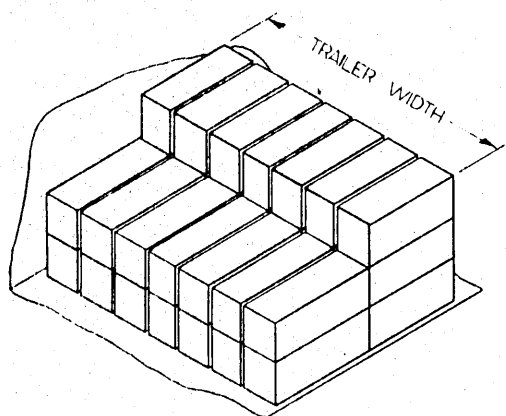
BOX POSITIONS (OTHER THAN WP OR PWP)



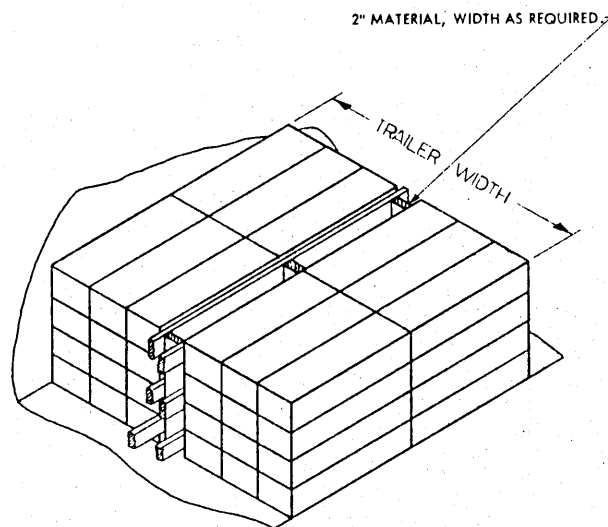
SOLID FILLER (NOTE 2)



ALTERNATING LAYERS



DISTRIBUTING SPACES

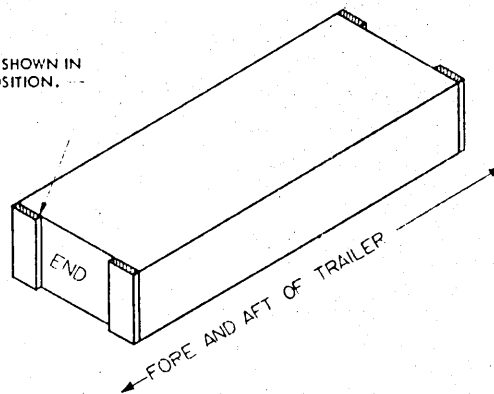


CRIB FILLER (NOTE 2)

NOTES:

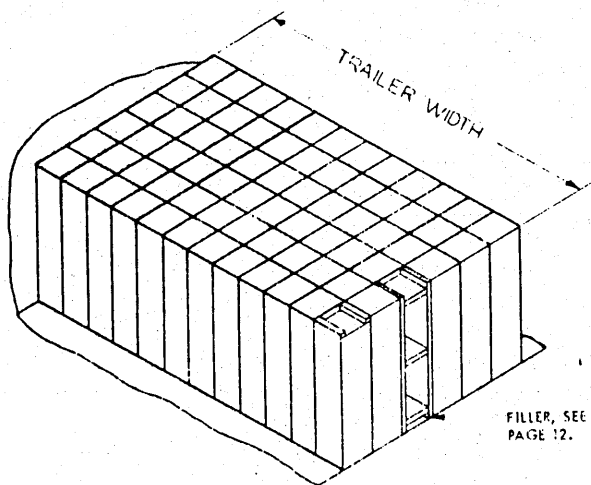
1. EXCESS SPACE ACROSS WIDTH OF TRAILER MUST NOT EXCEED ONE-THIRD THE WIDTH OF A BOX. WHEN BOXES WITH END CLEATS ARE POSITIONED WITH THE CLEATS VERTICAL, AND FACING FORE AND AFT, THE TOTAL EXCESS SPACE MUST BE LESS THAN THE WIDTH OF A CLEAT. SEE "END CLEAT DETAIL".
2. NORMALLY, EXCESS SPACE IN WIDTH OF TRAILER CAN BE LIMITED SATISFACTORILY BY USING A COMBINATION OF BOX POSITIONS AS SHOWN ON PAGE 3; OR ALTERNATING LAYERS, OR DISTRIBUTING SPACE AS SHOWN ABOVE. SOLID FILLER & CRIB FILLER WILL REQUIRE VERY LIMITED USE.

END CLEATS SHOWN IN VERTICAL POSITION.



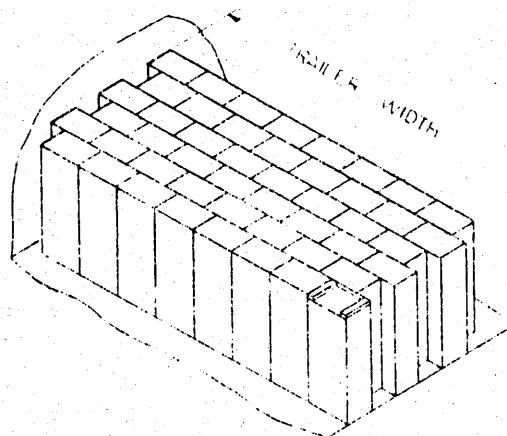
END CLEAT DETAIL (NOTE 1)

EXCESS WIDTH PROVISIONS (OTHER THAN WP OR PWP)



BOX POSITION "A"

FILLER, SEE DETAIL "D",
PAGE 12.



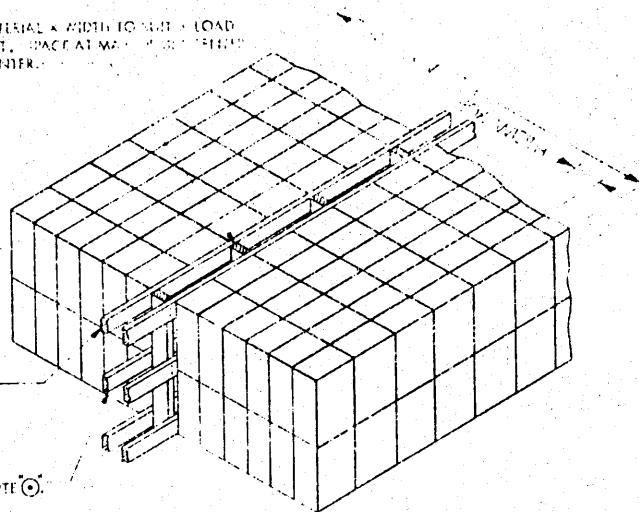
BOX POSITION "B"

(STAGGERED ROWS)

NOTE:

USE BOX POSITIONS SHOWN TO UTILIZE THE MAXIMUM TRAILER WIDTH. ROWS OF BOXES MAY BE STAGGERED (SEE DETAIL, BOX POSITION "B"). HOWEVER, IF EXCESS SPACE ACROSS TRAILER EXCEEDS 1/3 OF THE BOX DIMENSION, "CRIB FILLER" WILL BE USED.

2" MATERIAL & WIDTH TO MEET LOAD HEIGHT. SPACE AT MAXIMUM POINTS TO CENTER.

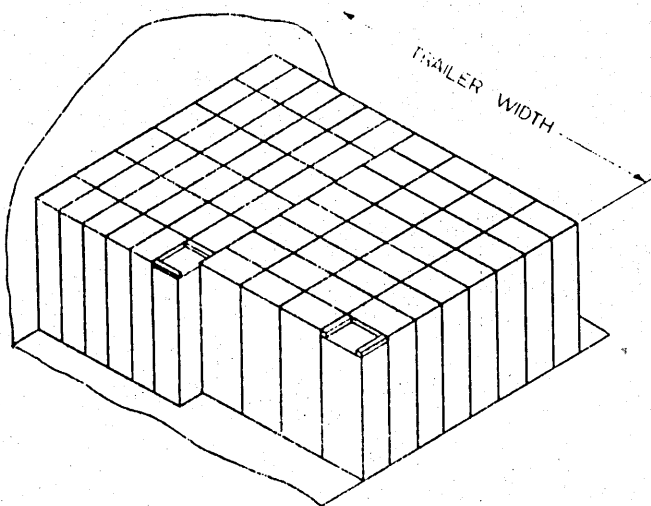


2" X 4" X LENGTH TO SUIT.
NAIL W/2-10d NAILS EACH JOINT.

SEE NOTE

CRIB FILLER

RECOMMENDED TO FILL SPACE IN EXCESS OF 1/3 BOX WIDTH.

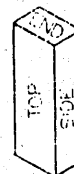


BOX POSITION "A" - "B"

COMBINATION OF POSITIONS

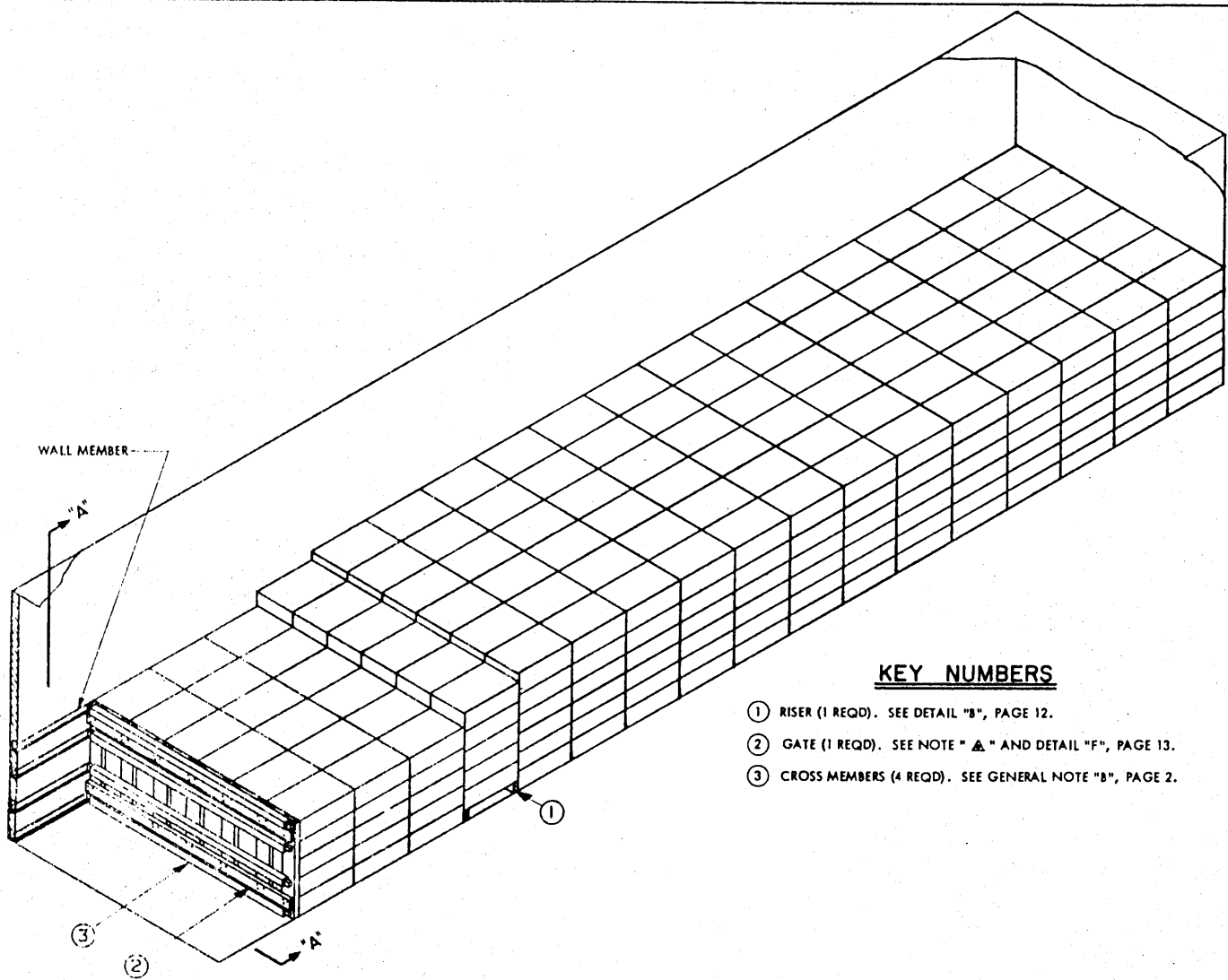
NOTE:

WHEN LOADS ARE MORE THAN ONE (1) LAYER IN HEIGHT, HORIZONTAL LOAD LENGTH 2" X 4'S SHALL BE USED AT JUNCTION OF LAYERS. FOR ONE (1) LAYER LOADS, 2" X 4" HORIZONTALS AT TOP & BOTTOM ONLY.



KEY TO BOX POSITIONS

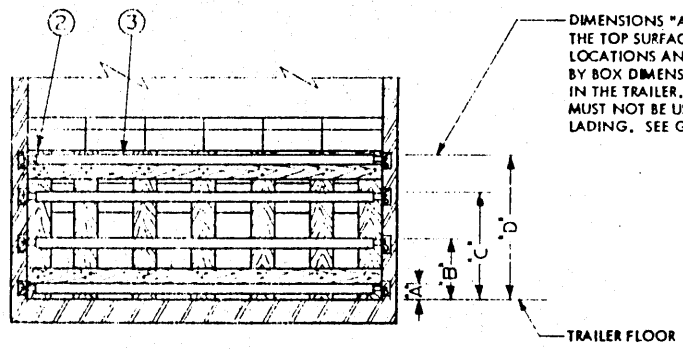
BOX AND EXCESS WIDTH POSITIONS (FOR WP OR PWP)



KEY NUMBERS

- ① RISER (1 REQD). SEE DETAIL "B", PAGE 12.
- ② GATE (1 REQD). SEE NOTE "▲" AND DETAIL "F", PAGE 13.
- ③ CROSS MEMBERS (4 REQD). SEE GENERAL NOTE "B", PAGE 2.

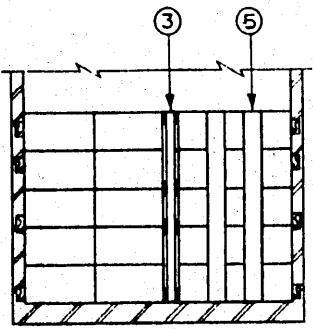
ISOMETRIC VIEW



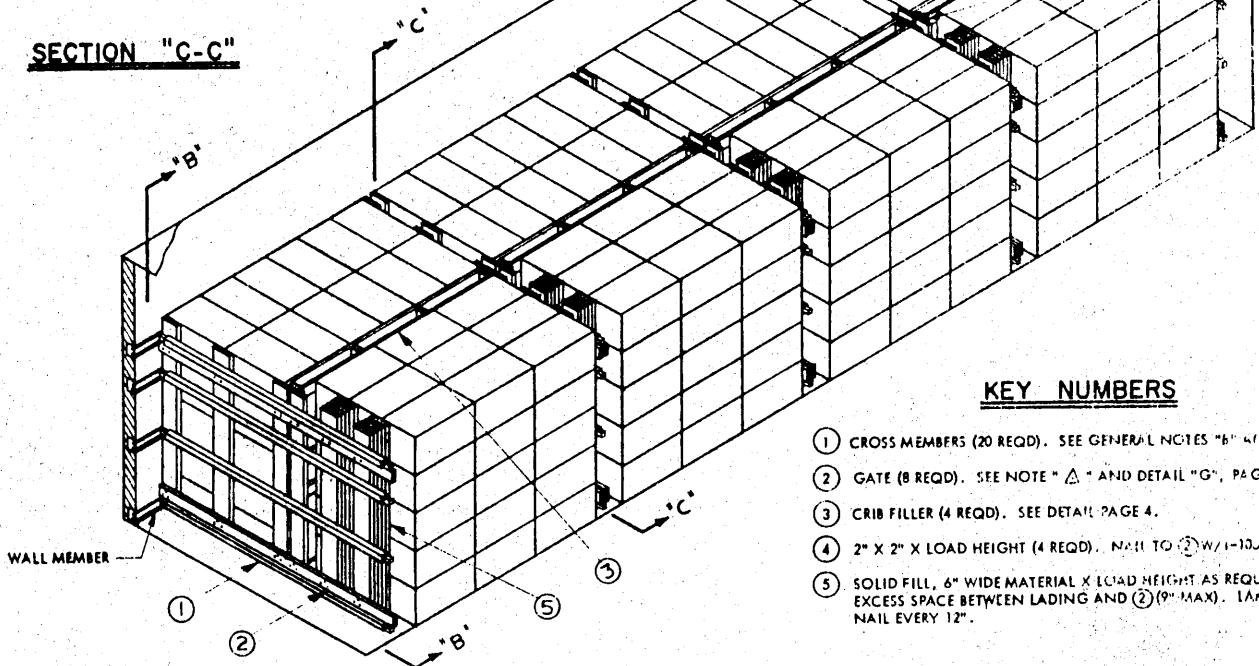
DIMENSIONS "A", "B", "C" AND "D" ARE SHOWN TO INDICATE THE TOP SURFACE OF WALL AND CROSS MEMBERS. THE ACTUAL LOCATIONS AND NUMBER OF CROSS MEMBERS WILL BE DETERMINED BY BOX DIMENSIONS, WEIGHT AND NUMBER OF LAYERS LOADED IN THE TRAILER. FOR HIGHWAY SHIPMENT, EACH CROSS MEMBER MUST NOT BE USED TO RETAIN MORE THAN 13,500 POUNDS OF LADING. SEE GENERAL NOTE "K", PAGE 2.

SECTION "A-A"

TYPICAL HIGHWAY LOAD (OTHER THAN WP OR PWP)



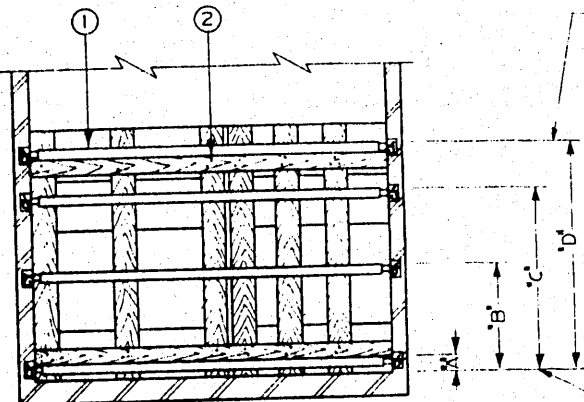
SECTION "C-C"



ISOMETRIC VIEW

KEY NUMBERS

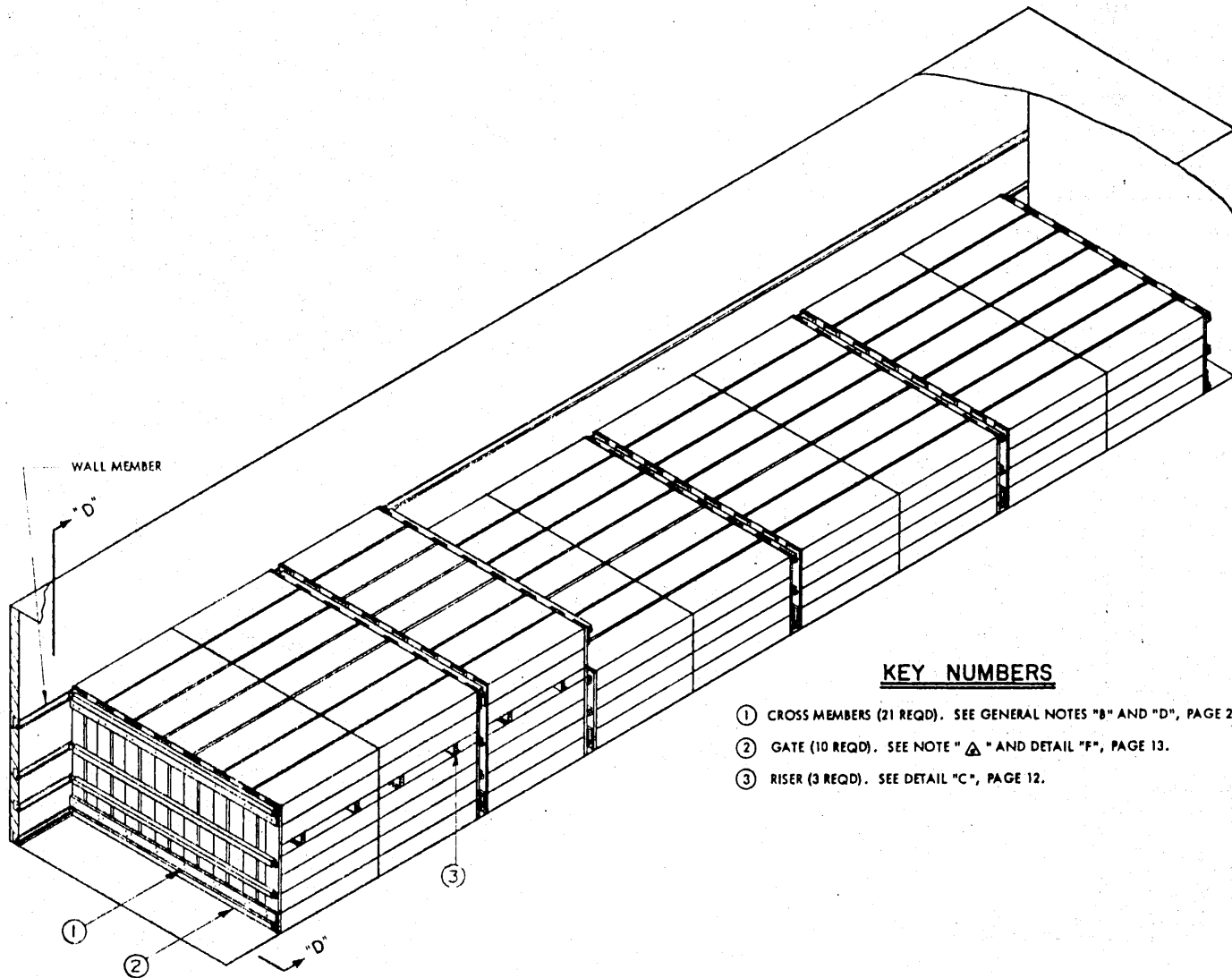
- ① CROSS MEMBERS (20 REQD). SEE GENERAL NOTES "B" AND "D", PAGE 2
- ② GATE (8 REQD). SEE NOTE "A" AND DETAIL "G", PAGE 13
- ③ CRIB FILLER (4 REQD). SEE DETAIL PAGE 4.
- ④ 2" X 2" X LOAD HEIGHT (4 REQD). NAIL TO ② W/1-10D NAIL EVERY 8"
- ⑤ SOLID FILL, 6" WIDE MATERIAL X LOAD HEIGHT AS REQUIRED TO FILL EXCESS SPACE BETWEEN LADING AND ② (9" MAX). LAMINATE W/1-10d NAIL EVERY 12".



SECTION "B-B"

DIMENSIONS "A", "B", "C" AND "D" ARE SHOWN TO INDICATE THE TOP SURFACE OF WALL AND CROSS MEMBERS. THE ACTUAL LOCATIONS AND NUMBER OF CROSS MEMBERS WILL BE DETERMINED BY BOX DIMENSIONS, WEIGHT AND NUMBER OF LAYERS LOADED IN THE TRAILER. SEE GENERAL NOTE "K", PAGE 2.

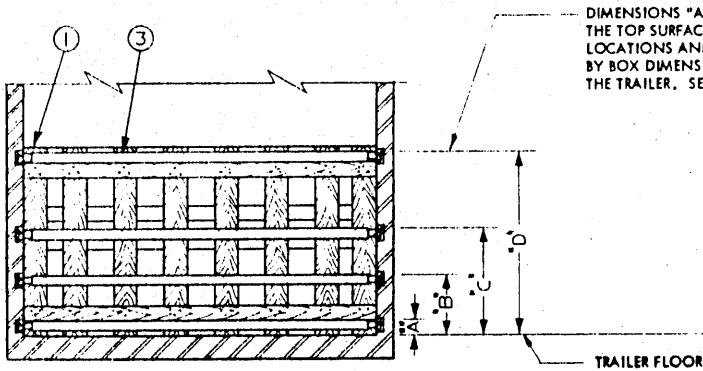
TYPICAL TOFC & COFC LOADS (OTHER THAN WP OR PWP)



KEY NUMBERS

- ① CROSS MEMBERS (21 REQD). SEE GENERAL NOTES "B" AND "D", PAGE 2.
- ② GATE (10 REQD). SEE NOTE "A" AND DETAIL "F", PAGE 13.
- ③ RISER (3 REQD). SEE DETAIL "C", PAGE 12.

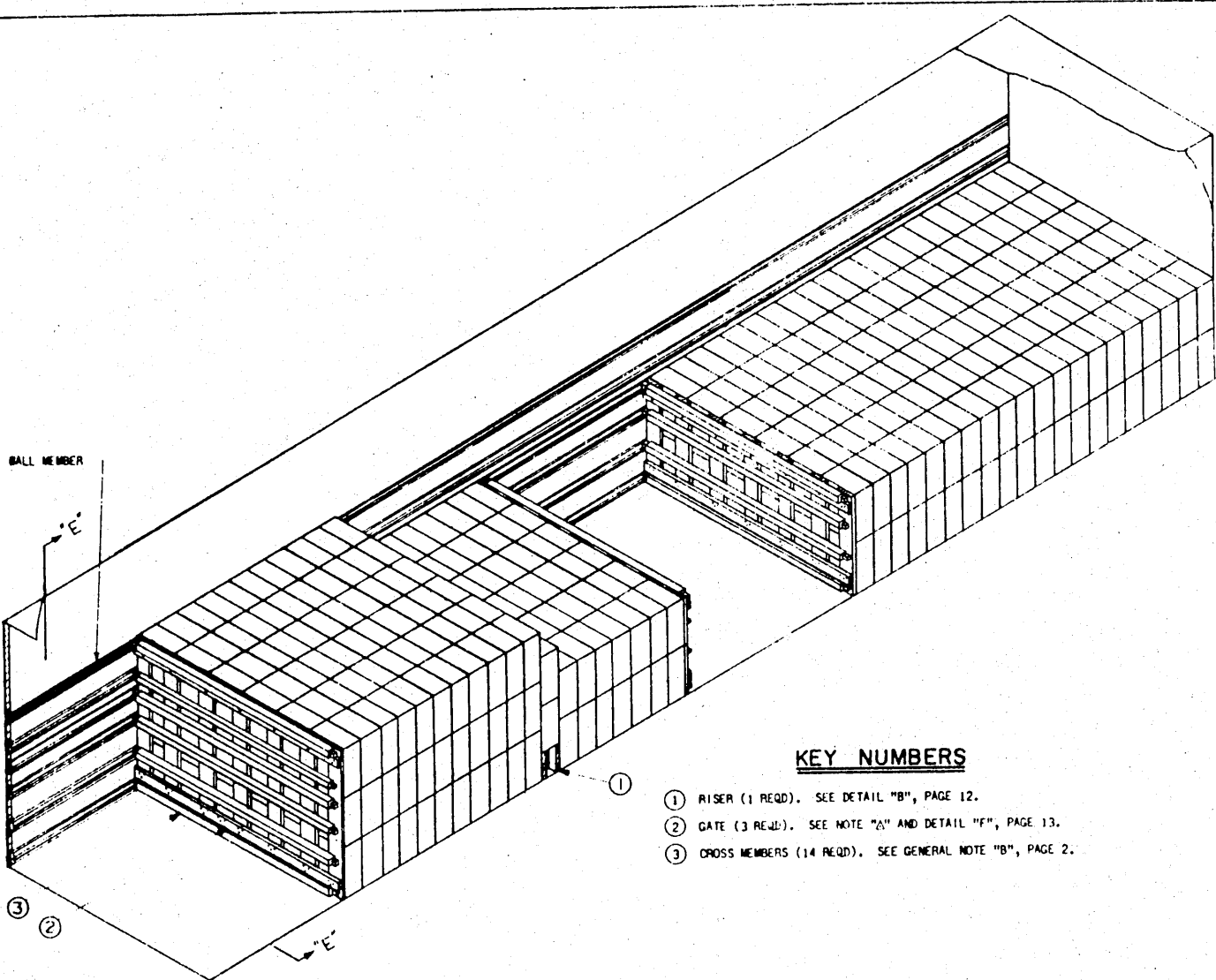
ISOMETRIC VIEW



DIMENSIONS "A", "B", "C" AND "D" ARE SHOWN TO INDICATE THE TOP SURFACE OF WALL AND CROSS MEMBERS. THE ACTUAL LOCATIONS AND NUMBER OF CROSS MEMBERS WILL BE DETERMINED BY BOX DIMENSIONS, WEIGHT AND NUMBER OF LAYERS LOADED IN THE TRAILER. SEE GENERAL NOTE "K", PAGE 2.

SECTION "D-D"

TYPICAL TOFC & COFC LOADS (OTHER THAN WP OR PWP)

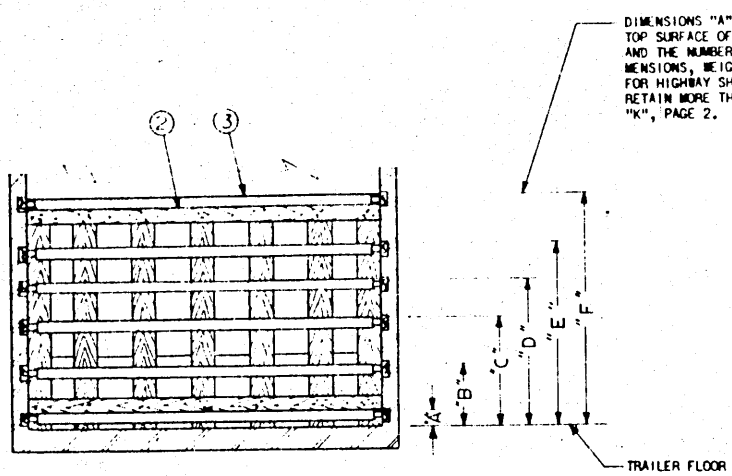


KEY NUMBERS

- ① RISER (1 REQD). SEE DETAIL "B", PAGE 12.
- ② GATE (3 REQD). SEE NOTE "A" AND DETAIL "F", PAGE 13.
- ③ CROSS MEMBERS (14 REQD). SEE GENERAL NOTE "B", PAGE 2.

ISOMETRIC VIEW

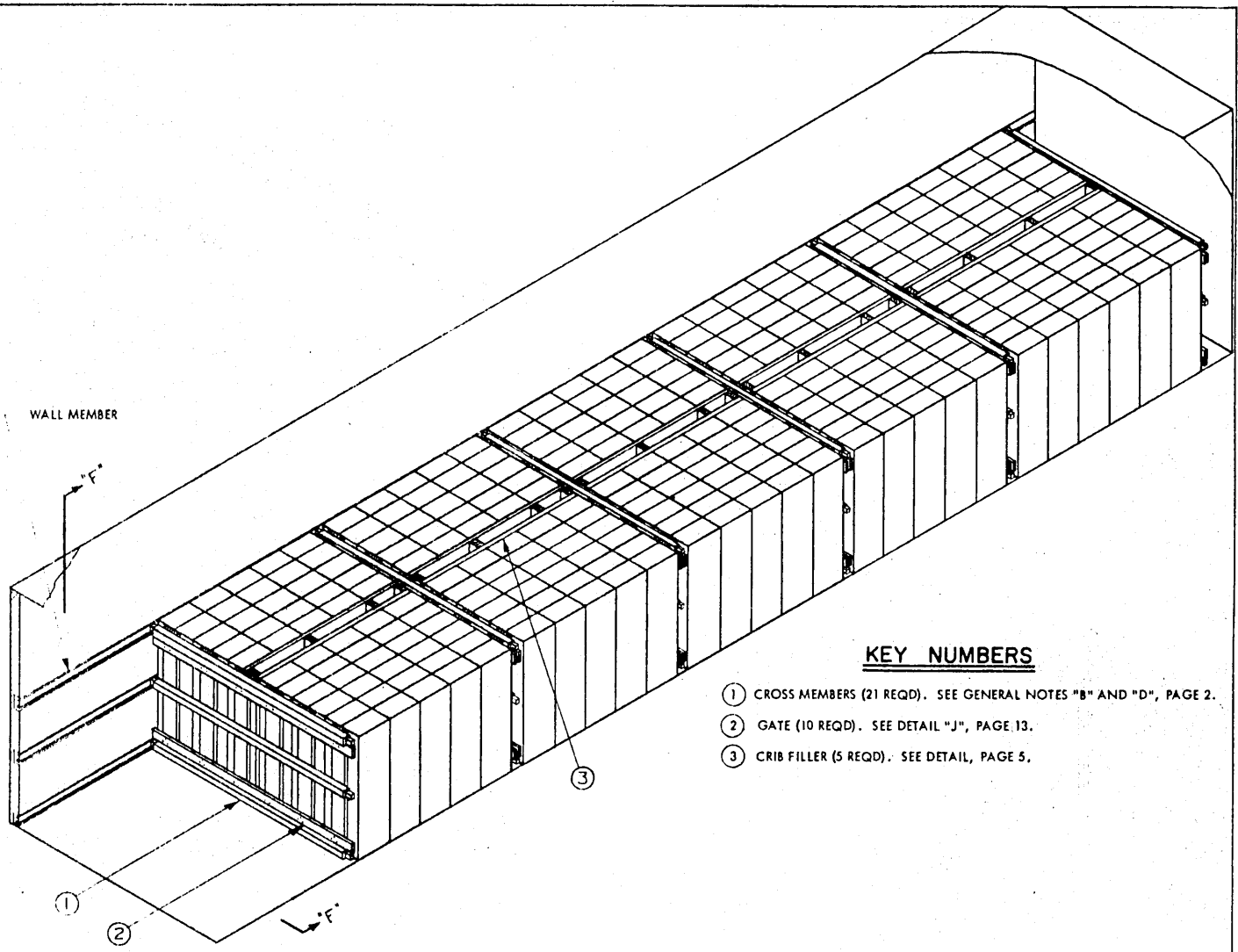
CAUTION: THIS METHOD MUST BE USED FOR SHIPMENTS OF HEAVY BOXES IN 40'-0" LONG TRAILERS WHEN THE LOAD CARRYING CAPACITY OF THE CENTRAL PORTION OF THE TRAILER IS LIMITED.



DIMENSIONS "A", "B", "C" AND "D" ARE SHOWN TO INDICATE THE TOP SURFACE OF WALL AND CROSS MEMBERS. THE ACTUAL LOCATIONS AND THE NUMBER OF CROSS MEMBERS WILL BE DETERMINED BY BOX DIMENSIONS, HEIGHT AND NUMBER OF LAYERS LOADED IN THE TRAILER. FOR HIGHWAY SHIPMENT, EACH CROSS MEMBER MUST NOT BE USED TO RETAIN MORE THAN 13,500 POUNDS OF LADING. SEE GENERAL NOTE "K", PAGE 2.

SECTION "E-E"

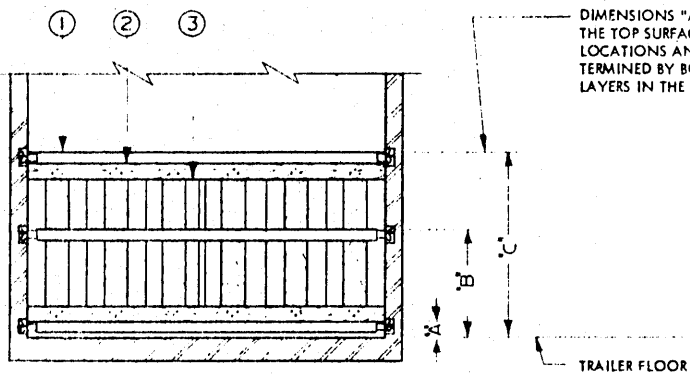
TYPICAL HIGHWAY LOAD (FOR WP OR PWP)



KEY NUMBERS

- ① CROSS MEMBERS (21 REQD). SEE GENERAL NOTES "B" AND "D", PAGE 2.
- ② GATE (10 REQD). SEE DETAIL "J", PAGE 13.
- ③ CRIB FILLER (5 REQD). SEE DETAIL, PAGE 5.

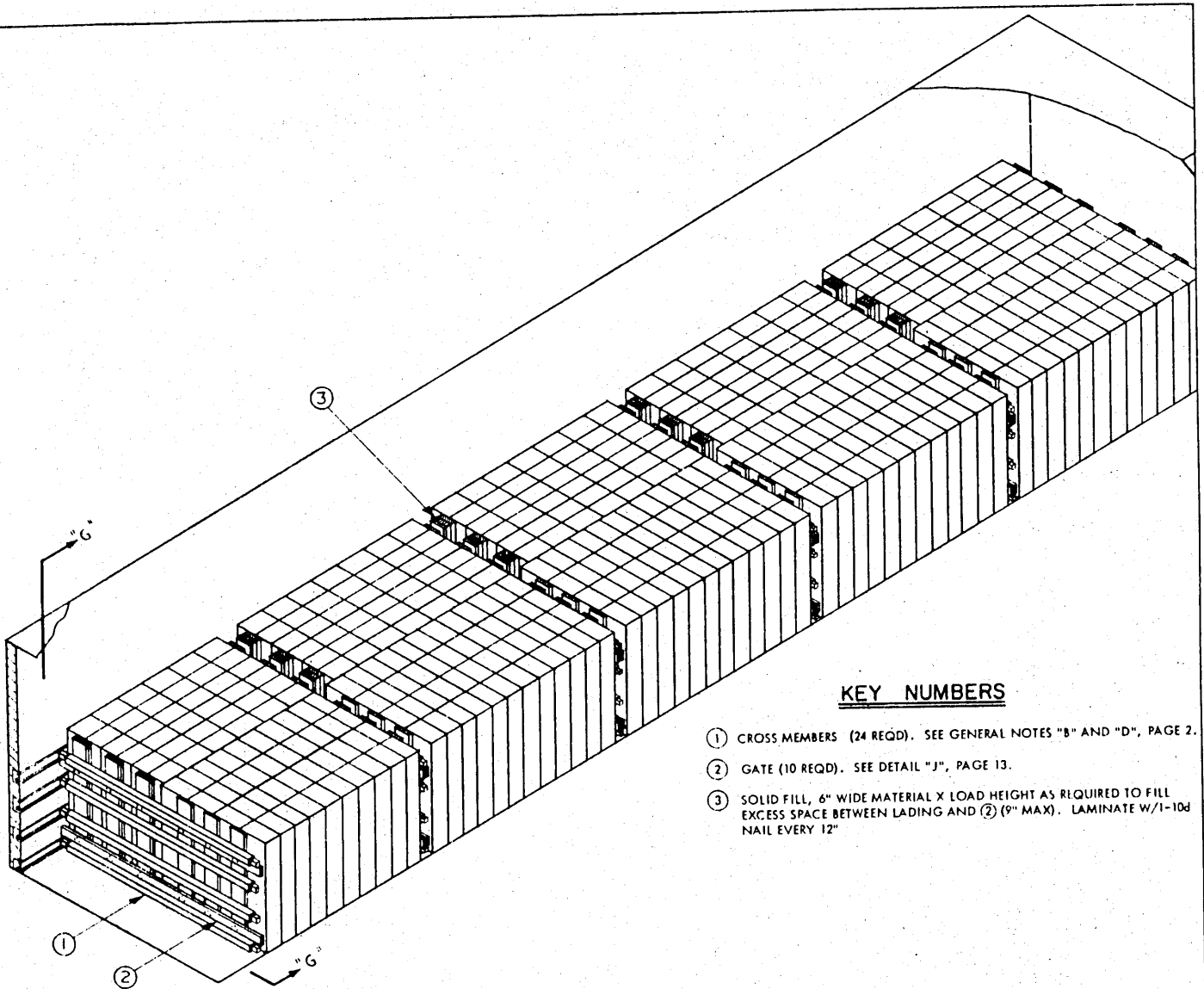
ISOMETRIC VIEW



DIMENSIONS "A", "B" AND "C" ARE SHOWN TO INDICATE THE TOP SURFACE OF WALL AND CROSS MEMBERS. THE ACTUAL LOCATIONS AND NUMBER OF CROSS MEMBERS WILL BE DETERMINED BY BOX DIMENSIONS, WEIGHT AND NUMBER OF LAYERS IN THE TRAILER. SEE GENERAL NOTE "K", PAGE 2.

SECTION "F-F"

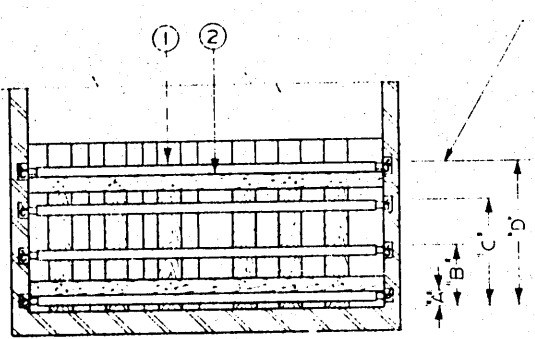
TYPICAL TOFC & COFC LOADS (FOR WP OR PWP)



KEY NUMBERS

- ① CROSS MEMBERS (24 REQD). SEE GENERAL NOTES "B" AND "D", PAGE 2.
- ② GATE (10 REQD). SEE DETAIL "J", PAGE 13.
- ③ SOLID FILL, 6" WIDE MATERIAL X LOAD HEIGHT AS REQUIRED TO FILL EXCESS SPACE BETWEEN LADING AND ② (9" MAX). LAMINATE W/1-10d NAIL EVERY 12"

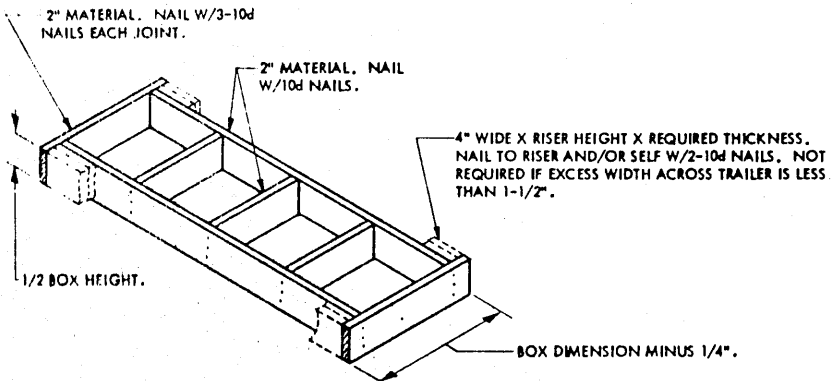
ISOMETRIC VIEW



DIMENSIONS "A", "B", "C" AND "D" ARE SHOWN TO INDICATE THE TOP SURFACE OF WALL AND CROSS MEMBERS. THE ACTUAL LOCATIONS AND NUMBER OF CROSS MEMBERS WILL BE DETERMINED BY BOX DIMENSIONS, WEIGHT AND NUMBER OF LAYERS LOADED IN THE TRAILER. SEE GENERAL NOTE "K", PAGE 2.

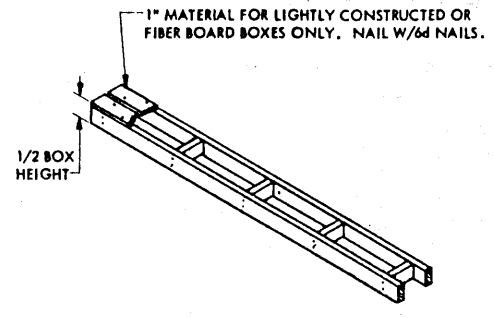
SECTION "G - G"

TYPICAL TOFC & COFC LOADS (FOR WP OR PWP)



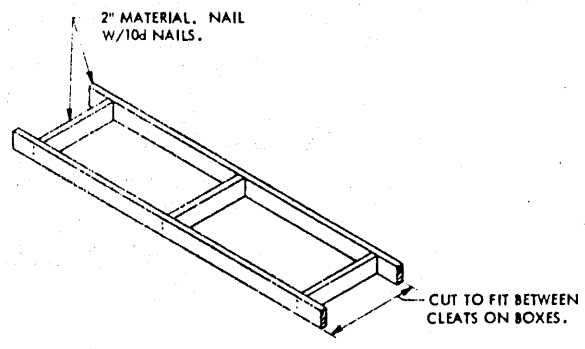
DETAIL "A"

FOR USE WITH SKIDDED BOXES WHEN SKIDS RUN PARALLEL TO WIDTH OF TRAILER. THIS RISER MUST BE POSITIONED ON TRAILER FLOOR.



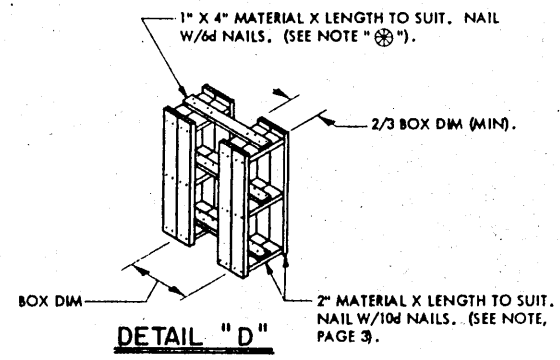
DETAIL "B"

RISER WITH 1" MATERIAL FOR DECKING MUST BE POSITIONED ON CAR FLOOR. PLAIN RISER MAY BE USED ON FLOOR OR UNDER ANY LAYER AS DESIRED.



DETAIL "C"

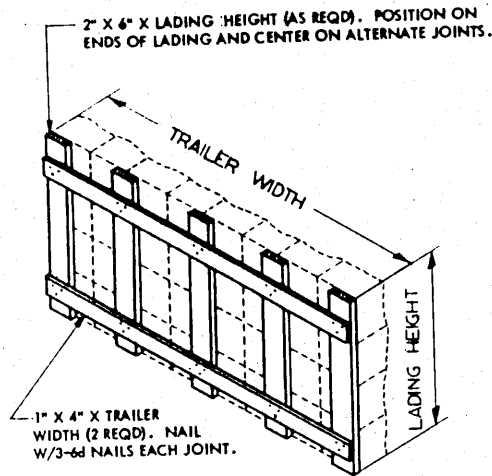
USED FOR RAISING LAYERS TO REQUIRED HEIGHT FOR PROPER CONTACT WITH CROSS MEMBER. POSITION BETWEEN LAYERS ONLY.



DETAIL "D"

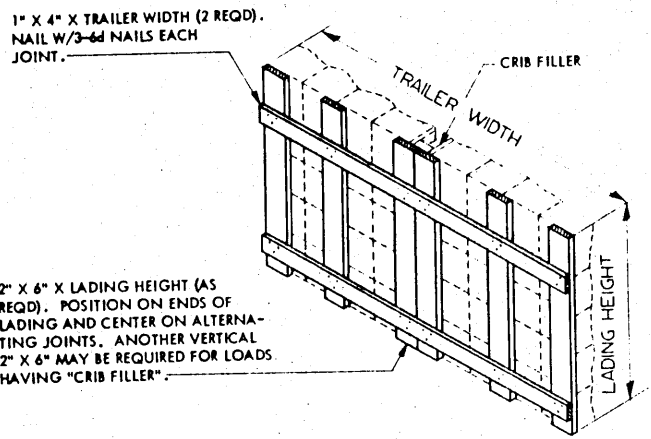
NOTE ⊗: NARROW FILLER UNITS, IF REQUIRED MAY BE CONSTRUCTED ONE PIECE IN WIDTH OR FABRICATED AS SHOWN. WHEN CONSTRUCTED OF SINGLE WIDTH PIECES, 1" X 4" PIECE IS NOT REQUIRED. FILLER UNITS MAY BE USED IN ANY MULTIPLES SIMILAR TO THAT SHOWN.

DETAILS



DETAIL " F "

SEE NOTE " A "

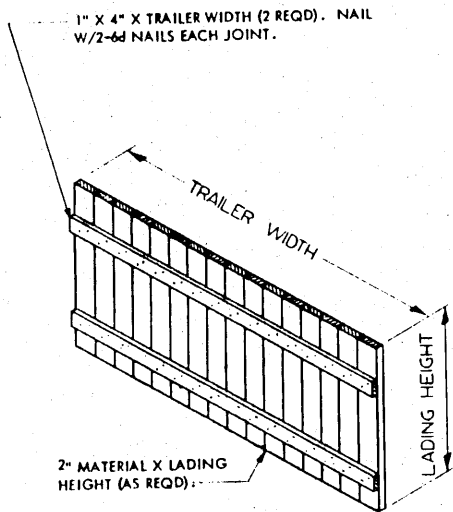


DETAIL " G "

SEE NOTE " A "

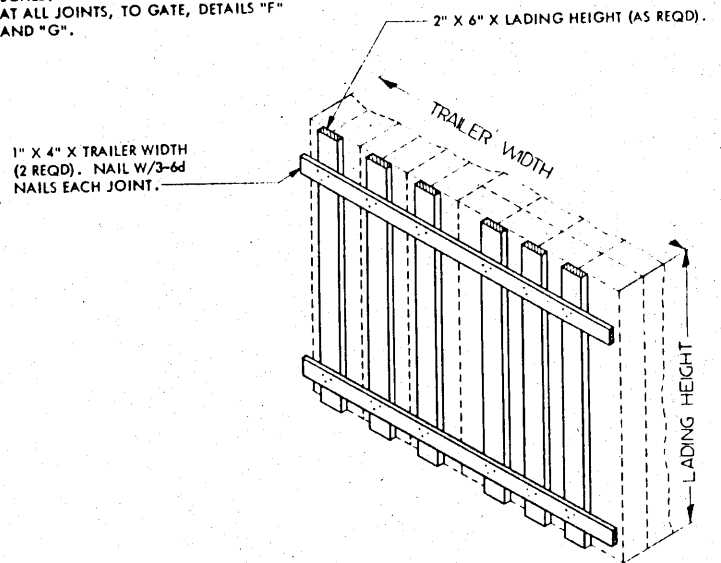
NOTE A :

FOR SHIPMENT OF LARGER AND HEAVIER BOXES. 2" X 6" VERTICALS MAY BE ADDED AT ALL JOINTS, TO GATE, DETAILS " F " AND " G ".



DETAIL " H "

GATE FOR USE BETWEEN LADING AND CROSS MEMBERS WHEN SHIPPING LIGHTLY CONSTRUCTED OR FIBER BOARD BOXES.



DETAIL " J "

GATE FOR USE BETWEEN LADING AND CROSS MEMBERS WHEN SHIPPING WP OR PWP AMMUNITION.

DETAILS

