LOADING AND BRACING⬢ IN MILVAN CONTAINERS⊕ OF MXU-650/B AND MXU-651/B AIRFOIL GROUPS PACKAGED IN METAL DRUMS (PALLETIZED AND UNPALLETIZED)

⬢ LOADING AND BRACING SPECIFICATIONS SET FORTH WITHIN THIS DRAWING ARE APPLICABLE TO LOADS THAT ARE TO BE SHIPPED BY TRAILER/CONTAINER-ON-FLATCAR (T/COFC) RAIL CARRIER SERVICE. THESE SPECIFICATIONS MAY ALSO BE USED FOR LOADS THAT ARE TO BE MOVED BY MOTOR OR WATER CARRIERS.

⊕ ONLY MILVAN CONTAINERS WHICH HAVE BEEN MODIFIED TO INCLUDE A MECHANICAL LOAD-BRACING SYSTEM THAT SATISFIES THE REQUIREMENTS OF THE BUREAU OF EXPLOSIVES PAMPHLET 6C WILL BE USED FOR THE MOVEMENT OF AMMUNITION BY T/COFC SERVICE. CAUTION: OTHER REQUIREMENTS OF PAMPHLET 6C ALSO APPLY.

U.S. ARMY MATERIEL COMMAND DRAWING

APPROVED, U.S. ARMY INDUSTRIAL OPERATIONS COMMAND

David E. Steckwick

APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND

Gary W. Adair

U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL

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MARCH 1996

CLASS	DIVISION	DRAWING	FILE
19	48	8607	SP15PF2

DO NOT SCALE

PROJECT SP 305-95

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 ARE APPLICABLE TO LOADS OF MXU-650/B AIRFOIL GROUPS PACKAGED IN 55-GALLON METAL DRUMS AND MXU-651/B AIRFOIL GROUPS PACKAGED IN 80-GALLON METAL DRUMS (UNPALLETIZED AND PALLETIZED). THESE PROCEDURES WILL ALSO APPLY TO OTHER ITEMS WHEN PACKAGED IN THE 55-GALLON OR 80-GALLON METAL DRUMS. FOR CONTAINER DETAILS, SEE USAF TPO 00-427-9099 AND THE CONTAINER DETAILS ON PAGE 3. CAUTION: REGARDLESS OF QUANTITY OF UNITS TO BE SHIPPED, THE "MAXIMUM GROSS WEIGHT" OF THE MILVAN MUST NOT BE EXCEEDED.

C. THE LOADS AS SHOWN ARE BASED ON A 20' LONG BY 8' WIDE BY 8' HIGH MILVAN CONTAINER WITH INSIDE DIMENSIONS OF 19'-4" LONG BY 92" WIDE BY 87" HIGH. THE LOADS ARE DESIGNED FOR TRAILER/CONTAINER-ON-FLATCAR (T/COFC) SHIPMENT.

D. THE SPECIFIED OUTLOADING PROCEDURES ARE FOR CONTAINERS EQUIPPED WITH SELF-CONTAINED MECHANICAL BRACING DEVICES AS DESCRIBED WITHIN BUREAU OF EXPLOSIVES PAMPHLET 6C. CROSS MEMBER ATTACHMENT FACILITIES WITHIN THESE CONTAINERS MUST PROVIDE FOR THE INSTALLATION OF LOAD BLOCKING CROSS MEMBERS AT THE HEIGHTS SPECIFIED. THE WEIGHT DIMENSIONS SPECIFIED WITHIN THIS DRAWING FOR THE INSTALLATION OF CROSS MEMBERS CONFORM WITH THE BUREAU OF EXPLOSIVES PAMPHLET 6C, WITH THE EXCEPTION THAT TWO ADDITIONAL BELT RAILS HAVE BEEN HAVE BEEN SHOWN: ONE AT 72" AND ONE AT 83" HIGH FROM THE CONTAINER FLOOR. VOIDS LENGTHWISE WITHIN THE LOAD MUST BE HELD TO A MINIMUM. CROSS MEMBERS MUST BE PLACED AGAINST THE LADING AS TIGHTLY AS THE HOLE SPACING IN THE CROSS MEMBER ATTACHMENT FACILITY PERMITS. EACH CROSS MEMBER WILL BE INSTALLED WITH THE ENDS ATTACHED AS NEARLY AS POSSIBLE IN "MATED" POSITIONS (AT EQUAL HEIGHT AND AT EQUAL DISTANCES FROM THE END OF THE CONTAINER). CROSS MEMBERS IN EMPTY CONTAINERS AND THOSE NOT USED IN LOADED CONTAINERS MUST BE FASTENED INTO BELT RAILS FOR SHIPMENT. COMPONENTS ASSIGNED TO EACH CONTAINER MUST REMAIN THEREWITH EVEN THOUGH UNUSED DURING SOME SHIPMENTS. SEE THE "FILL DETAIL" ON PAGE 5 FOR THE DUNNAGING METHOD REQUIRED TO ELIMINATE AN EXCESSIVE LENGTHWISE VOID WITHIN A LOAD. THE LOAD BLOCKING COMPONENT DESIGNATED AS "CROSS MEMBER" HEREIN, IS IDENTIFIED AS "BEAM ASSEMBLY" WITHIN TM 55-8115-200-23 & P, DATED DECEMBER 1979. THE BEAM ASSEMBLY IS FURTHER IDENTIFIED AS NSN 8115-00-165-6623.

E. DUNNAGE LUMBER SPECIFIED IS OF A NOMINAL SIZE. FOR EXAMPLE, 1" X 4" MATERIAL IS ACTUALLY 3/4" THICK BY 3-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE.

F. CAUTION: DO NOT NAIL DUNNAGE MATERIAL TO THE MILVAN WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.

G. A STAGGERED NAILING PATTERN WILL BE USED WHENEVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES OR WHEN LAMINATING DUNNAGE. ADDITIONALLY, THE NAILING PATTERN FOR AN UPPER PIECE OF LAMINATED DUNNAGE WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL FOR THAT PIECE WILL NOT BE DRIVEN THROUGH ONTO OR RIGHT BESIDE A NAIL IN A LOWER PIECE.

H. PORTIONS OF THE MILVAN DEPICTED WITHIN THIS DRAWING, SUCH AS ONE OF THE SIDEWALLS, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.

(CONTINUED AT RIGHT)

(GENERAL NOTES CONTINUED)

J. 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 25.4 MM AND ONE POUND EQUALS 0.454 KG.

K. MAXIMUM LOAD WEIGHT CRITERIA:

THE MAXIMUM LOAD WEIGHTS ARE CONTROLLED BY EQUIPMENT CAPABILITY FACTORS. ALTHOUGH THE HEAVIEST MAXIMUM LOADS ARE DELINEATED IN THE LOAD VIEWS, PROVISIONS ARE INCLUDED WITHIN THIS DRAWING SO THAT THE BASIC LOADS CAN BE ADJUSTED TO SATISFY A LESSER QUANTITY OF LADING UNITS. DEPENDING ON TRANSPORTATION ROUTING, IT MAY BE NECESSARY TO REDUCE THE LOAD WEIGHT TO SATISFY "WEIGHT LAWS" OF CERTAIN STATES. ALSO, IT MAY BE NECESSARY TO REDUCE THE LOAD WEIGHT TO SATISFY OTHER WEIGHT RESTRICTIONS IMPOSED ON THE INTERMODAL CONTAINER SYSTEM.

L. SPECIAL T/COFC NOTES:

1. CAUTION: LOADED CONTAINERS MUST BE ON CHASSIS EQUIPPED WITH TWO BOGIE ASSEMBLIES WHEN BEING MOVED IN TOFC SERVICE, REGARDLESS OF THE LOAD WEIGHT WITHIN THE CONTAINER.

2. LOAD LIMITS OF T/COFC RAIL CARS MUST NOT BE EXCEEDED, NOR WILL A CAR BE LOADED SO THAT THE TRUCK UNDER ONE END OF THE CAR CARRIES MORE THAN ONE-HALF OF THE LOAD LIMIT FOR THAT CAR.

3. CHASSIS/CONTAINERS COUPLED INTO A 40-FOOT TRAILER CONFIGURATION MUST BE PLACED AT THE B-END OF A TOFC RAIL CAR. THE REAR END OF THE 40-FOOT UNIT WILL OVERHANG THE END OF THE CAR IF IT IS PLACED AT THE A-END. TWENTYFOOT AND 40-FOOT UNITS CAN BE LOADED ON THE SAME CAR.

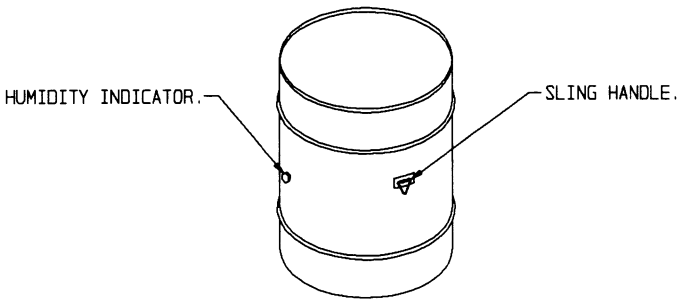
M. WHEN LOADING CONTAINERS, THEY ARE TO BE POSITIONED SO AS TO ACHIEVE A TIGHT LOAD (TIGHT AGAINST THE DUNNAGE ASSEMBLIES). THE UNBLOCKED SPACE ACROSS THE WIDTH OF A LOAD BAY IS NOT TO EXCEED 1-1/2".

N. WHETHER A CONTAINER IS FULL OR IS LOADED WITH A REDUCED QUANTITY OF LADING UNITS, THE LENGTHWISE CENTER OF GRAVITY OF THE LOAD MUST BE WITHIN 12", IN EITHER DIRECTION, OF THE MID-POINT OF THE CONTAINER.

O. THE 55-GALLON METAL DRUM IS DESIGNED TO "NEST" WHEN STACKED, THEREFORE NO DECKING IS REQUIRED BETWEEN LAYERS. THE 80-GALLON DRUM IS AN OPEN HEAD TYPE AND WILL NOT NEST. DECKING IS REQUIRED WHEN STACKING THIS DRUM.

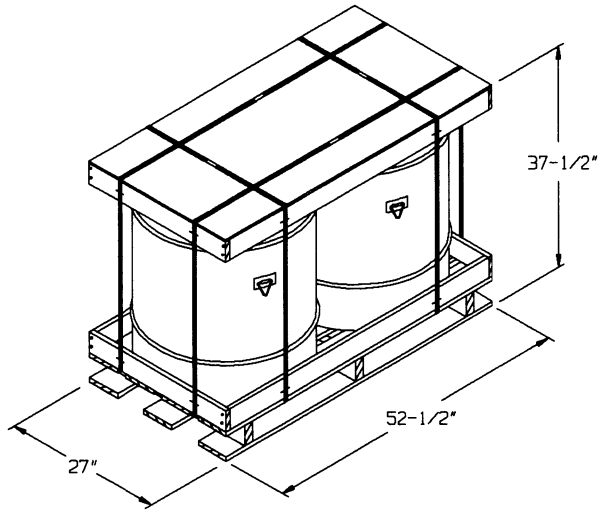
MATERIAL SPECIFICATIONS

LUMBER - - - - - - - - :	SEE TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC MM-L-751.
NAILS - - - - - - - - :	FED SPEC FF-N-105; COMMON.
WIRE, CARBON STEEL - :	ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, .0800" DIA, GRADE 1006 OR BETTER.



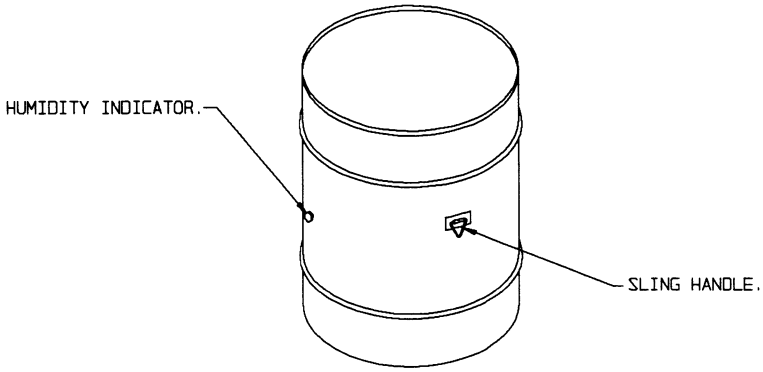
AIRFOIL GROUP MXU-650/B

25-1/2" DIA BY 34-1/2" HIGH
CUBE - - - - - - 12.23 CU. FT. (APPROX)
GROSS WEIGHT - - 154 LBS (APPROX)



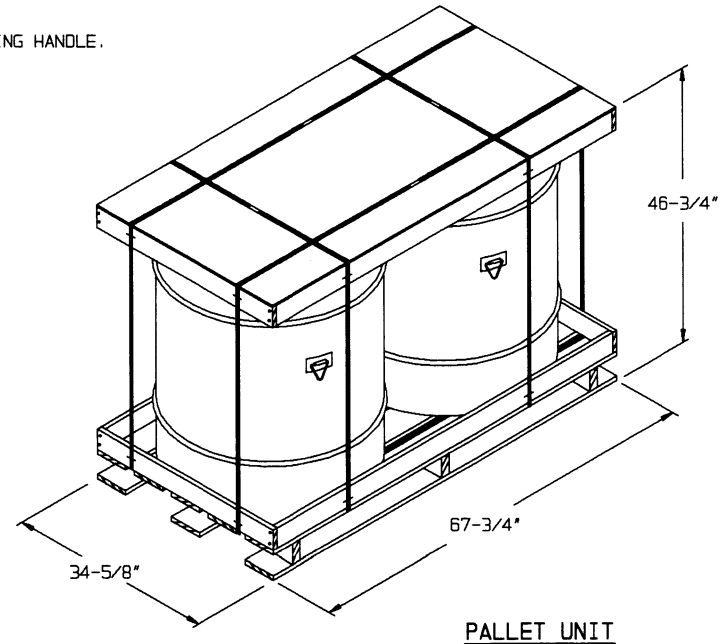
PALLET UNIT

CUBE - - - 30.76 CU. FT. (APPROX)
WEIGHT - - 383 POUNDS (APPROX)



AIRFOIL GROUP MXU-651/B

33-1/8" DIA BY 41-1/2" HIGH
CUBE - - - - - - 26.35 CU. FT. (APPROX)
GROSS WEIGHT - - 196 LBS (APPROX)

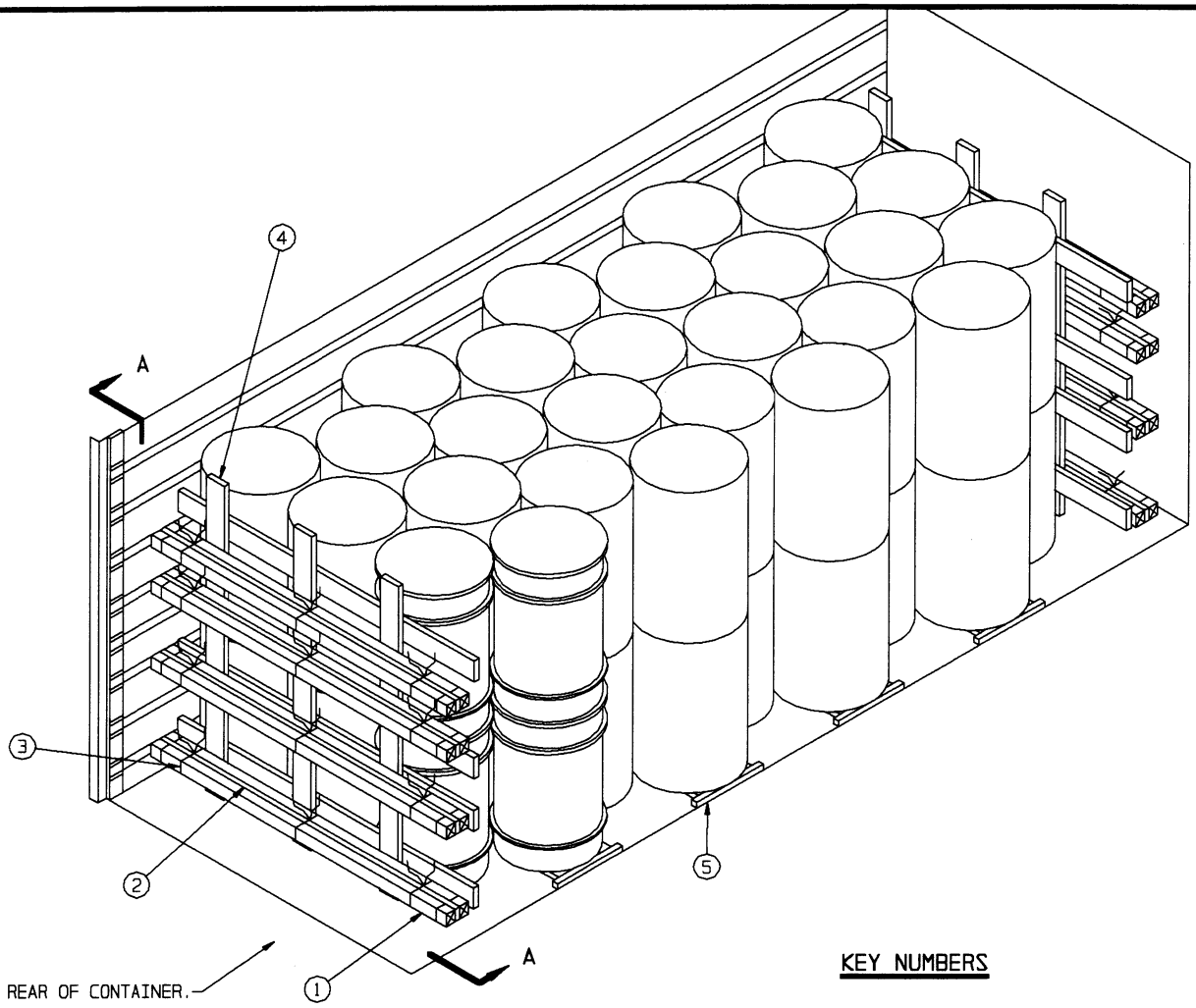


PALLET UNIT

CUBE - - - 63.47 CU. FT. (APPROX)
WEIGHT - - 492 POUNDS (APPROX)

CONTAINER DETAIL

PROJECT SP 305-95



ISOMETRIC VIEW

KEY NUMBERS

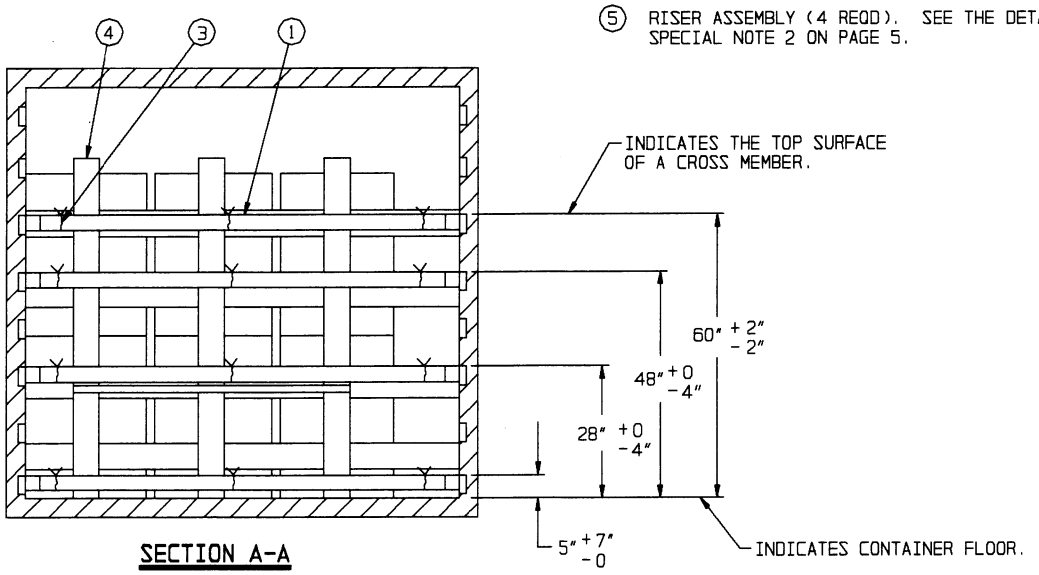
(1) CROSS MEMBER (16 REQD). POSITION AT THE HEIGHTS SPECIFIED IN THE "SECTION A-A" VIEW. SEE GENERAL NOTE "D" ON PAGE 2, AND THE "FILL DETAIL" ON PAGE 5.

(2) FILL MATERIAL, 1-3/8" X 3-1/2" BY INSIDE CONTAINER WIDTH MINUS 1" (8 REQD). SEE THE "FILL MATERIAL INSTALLATION" DETAIL ON PAGE 5.

(3) TIE WIRE, NO. 14 GAGE WIRE 24" LONG (24 REQD). SEE THE "FILL MATERIAL INSTALLATION" DETAIL ON PAGE 5.

(4) LOAD BEARING GATE (2 REQD). SEE THE "LOAD BEARING GATE A" DETAIL ON PAGE 12. SEE GENERAL NOTE "G" ON PAGE 2.

(5) RISER ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 14 AND SPECIAL NOTE 2 ON PAGE 5.

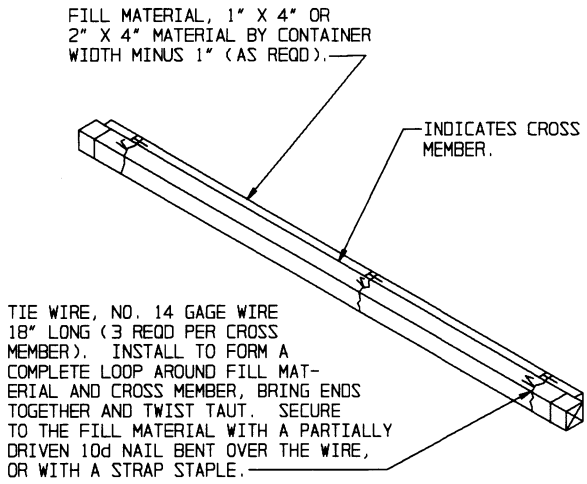


SECTION A-A

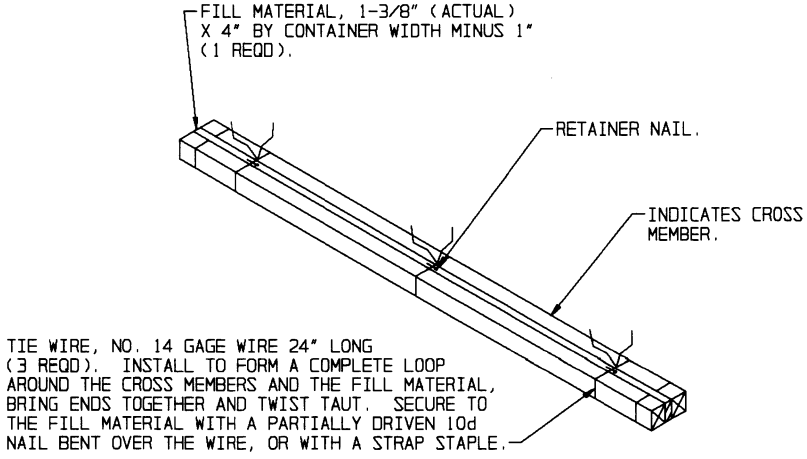
55-GALLON DRUMS (UNPALLETIZED)

SPECIAL NOTES:

1. A 54-DRUM LOAD IS SHOWN IN A MILVAN CONTAINER.
2. IF DESIRED, THE "ALTERNATIVE RISER ASSEMBLY" SHOWN ON PAGE 16 MAY BE USED IN LIEU OF THE "RISER ASSEMBLY" SHOWN IN THE LOAD ON PAGE 4.



FILL DETAIL



FILL MATERIAL INSTALLATION

SEE GENERAL NOTE "D" ON PAGE 2.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 2" 2" X 4" 2" X 6"	21 118 97	7 79 97
NAILS	NO. REQD	POUNDS
10d (3")	140	2-1/4
WIRE, NO. 14 GAGE - - - 48' REQD - - - - - - - - 1 LB		
CROSS MEMBER - - - - - - - - - - - - - - - - - 16 REQD		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
55-GALLON DRUM	54	8,316 LBS
DUNNAGE		369 LBS
CONTAINER		5,700 LBS
TOTAL WEIGHT		14,385 LBS (APPROX)

55-GALLON DRUMS (UNPALLETIZED)

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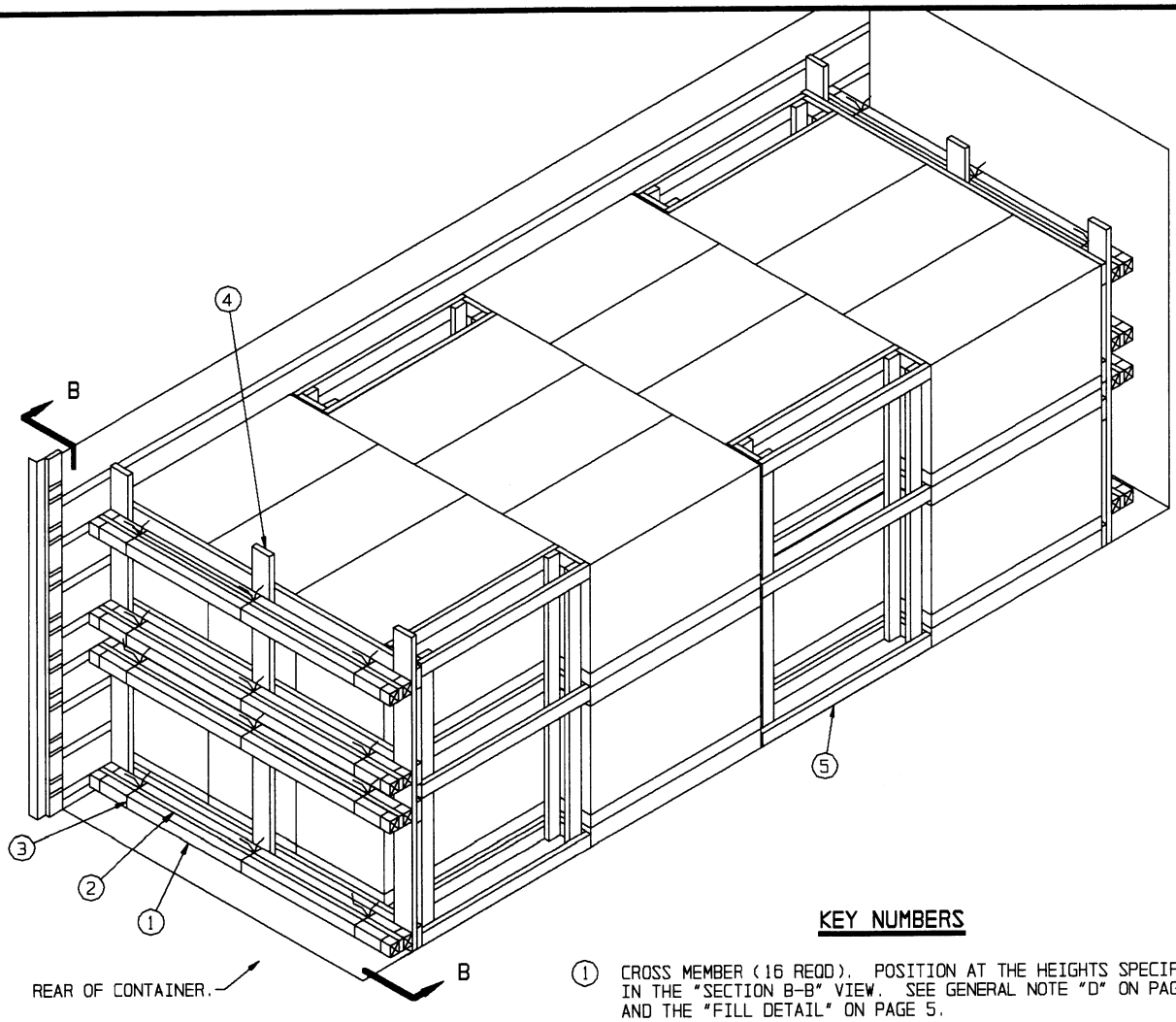


ISOMETRIC VIEW

KEY NUMBERS

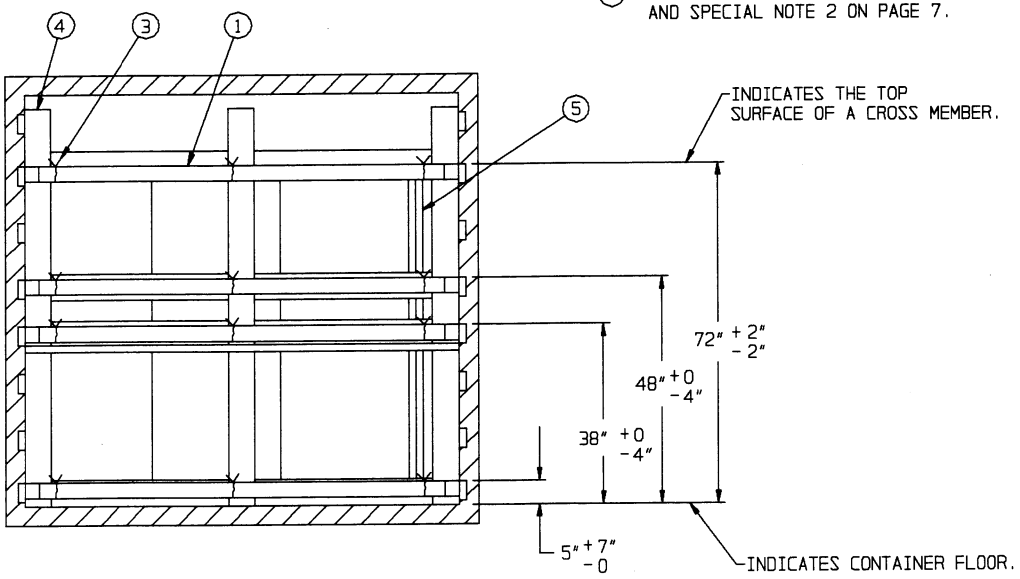
(1) CROSS MEMBER (16 REQD). POSITION AT THE HEIGHTS SPECIFIED IN THE "SECTION B-B" VIEW. SEE GENERAL NOTE "D" ON PAGE 2, AND THE "FILL DETAIL" ON PAGE 5.

(2) FILL MATERIAL, 1-3/8" X 3-1/2" BY INSIDE CONTAINER WIDTH MINUS 1" (8 REQD). SEE THE "FILL MATERIAL INSTALLATION" DETAIL ON PAGE 5.

(3) TIE WIRE, NO. 14 GAGE WIRE 24" LONG (24 REQD). SEE THE "FILL MATERIAL INSTALLATION" DETAIL ON PAGE 5.

(4) LOAD BEARING GATE (2 REQD). SEE THE "LOAD BEARING GATE B" DETAIL ON PAGE 12. SEE GENERAL NOTE "G" ON PAGE 2.

(5) CRIB FILL (4 REQD). SEE THE "CRIB FILL A" DETAIL ON PAGE 15 AND SPECIAL NOTE 2 ON PAGE 7.



SECTION B-B

55-GALLON DRUMS (PALLETIZED)

PROJECT SP 305-95

SPECIAL NOTES:

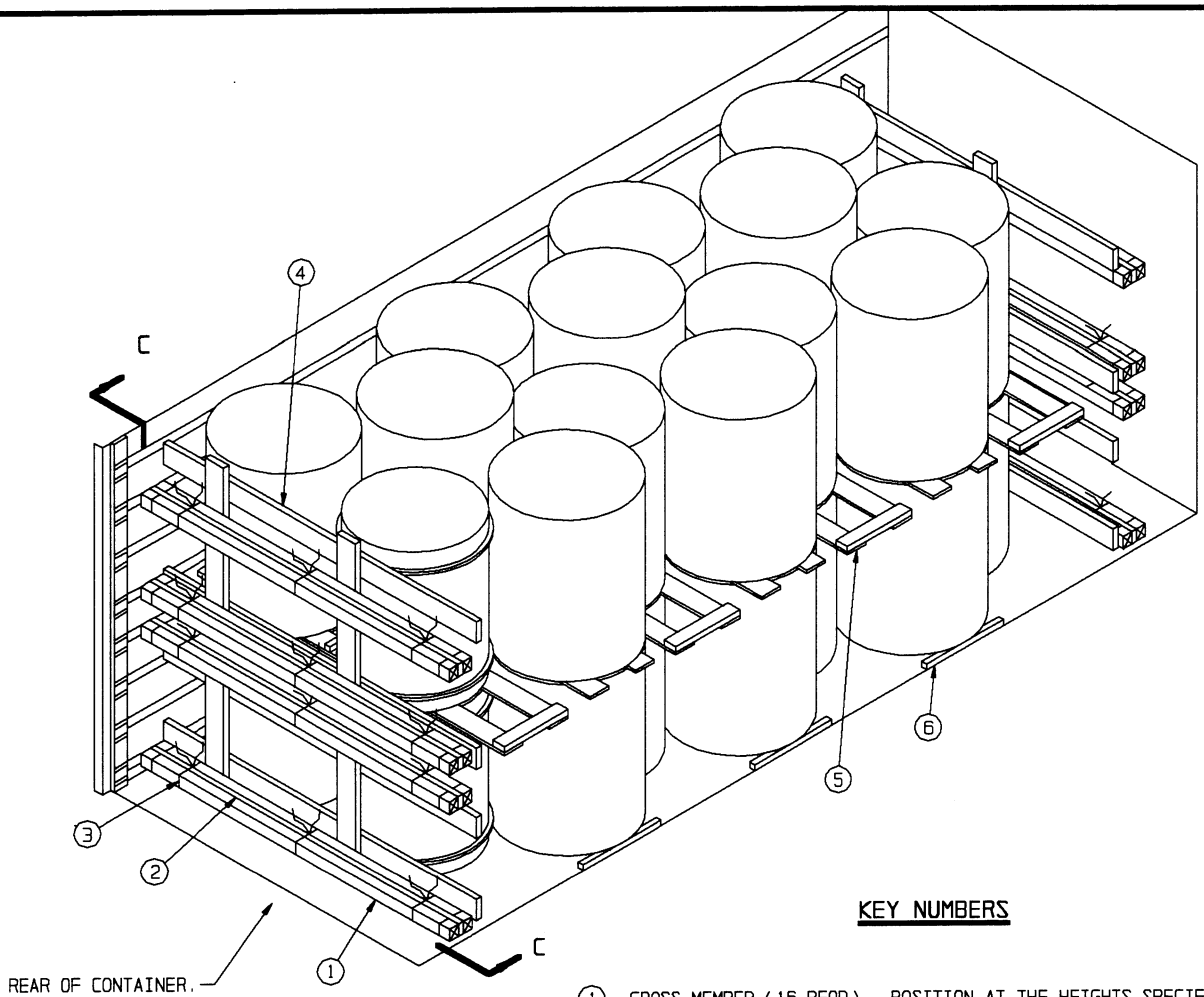
1. A 24-PALLET UNIT LOAD IS SHOWN IN A MILVAN CONTAINER.
2. THE WIDTH OF THE CRIB FILL ASSEMBLY A MAY BE ADJUSTED AS NECESSARY TO PROVIDE FOR A TIGHT LOAD ACROSS THE WIDTH OF A LOAD BAY.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 2" 2" X 4" 2" X 6"	15 276 102	5 184 102
NAILS	NO. REQD	POUNDS
10d (3")	300	4-1/2
WIRE, NO. 14 GAGE - - - 48' REQD - - - - - - - - 1 LB		
CROSS MEMBER - - - - - - - - - - - - - - - - - - 16 REQD		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	24	9,192 LBS
DUNNAGE		588 LBS
CONTAINER		5,700 LBS
TOTAL WEIGHT		15,480 LBS (APPROX)

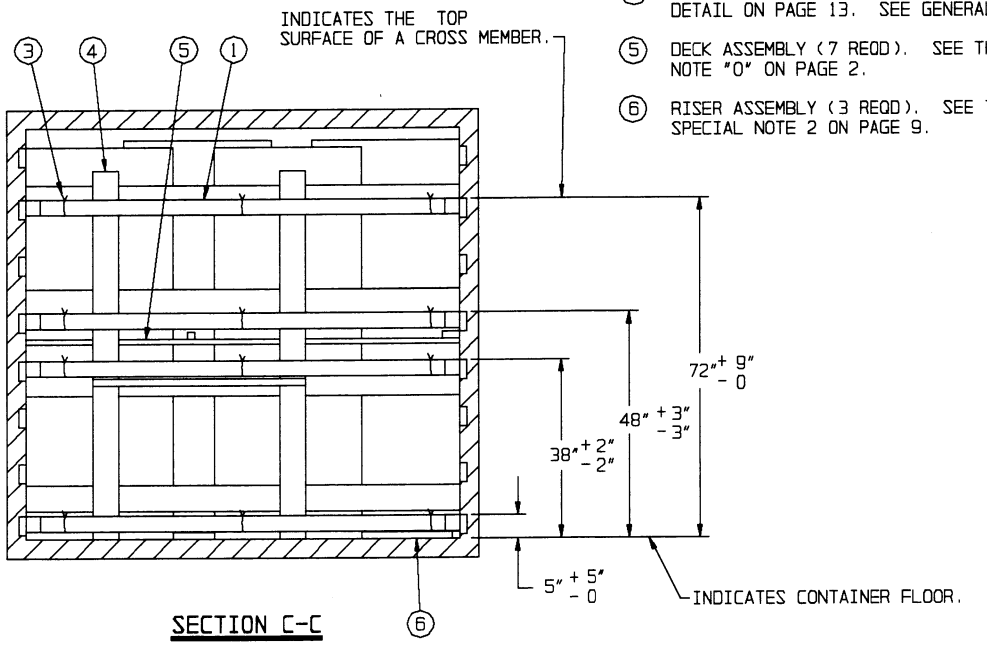
55-GALLON DRUMS (PALLETIZED)



ISOMETRIC VIEW

KEY NUMBERS

1. CROSS MEMBER (16 REQD). POSITION AT THE HEIGHTS SPECIFIED IN THE "SECTION C-C" VIEW. SEE GENERAL NOTE "D" ON PAGE 2, AND THE "FILL DETAIL" ON PAGE 5.
2. FILL MATERIAL, 1-3/8" X 3-1/2" BY INSIDE CONTAINER WIDTH MINUS 1" (8 REQD). SEE THE "FILL MATERIAL INSTALLATION" DETAIL ON PAGE 5.
3. TIE WIRE, NO. 14 GAGE WIRE 24" LONG (24 REQD). SEE THE "FILL MATERIAL INSTALLATION" DETAIL ON PAGE 5.
4. LOAD BEARING GATE (2 REQD). SEE THE "LOAD BEARING GATE C" DETAIL ON PAGE 13. SEE GENERAL NOTE "G" ON PAGE 2.
5. DECK ASSEMBLY (7 REQD). SEE THE DETAIL ON PAGE 14 AND GENERAL NOTE "O" ON PAGE 2.
6. RISER ASSEMBLY (3 REQD). SEE THE DETAIL ON PAGE 14 AND SPECIAL NOTE 2 ON PAGE 9.



SECTION C-C

80-GALLON DRUMS (UNPALLETIZED)

SPECIAL NOTES:

1. A 28-DRUM LOAD IS SHOWN IN A MILVAN CONTAINER.
2. IF DESIRED, THE "ALTERNATIVE RISER ASSEMBLY" SHOWN ON PAGE 16 MAY BE USED IN LIEU OF THE "RISER ASSEMBLY" SHOWN IN THE LOAD ON PAGE 8.

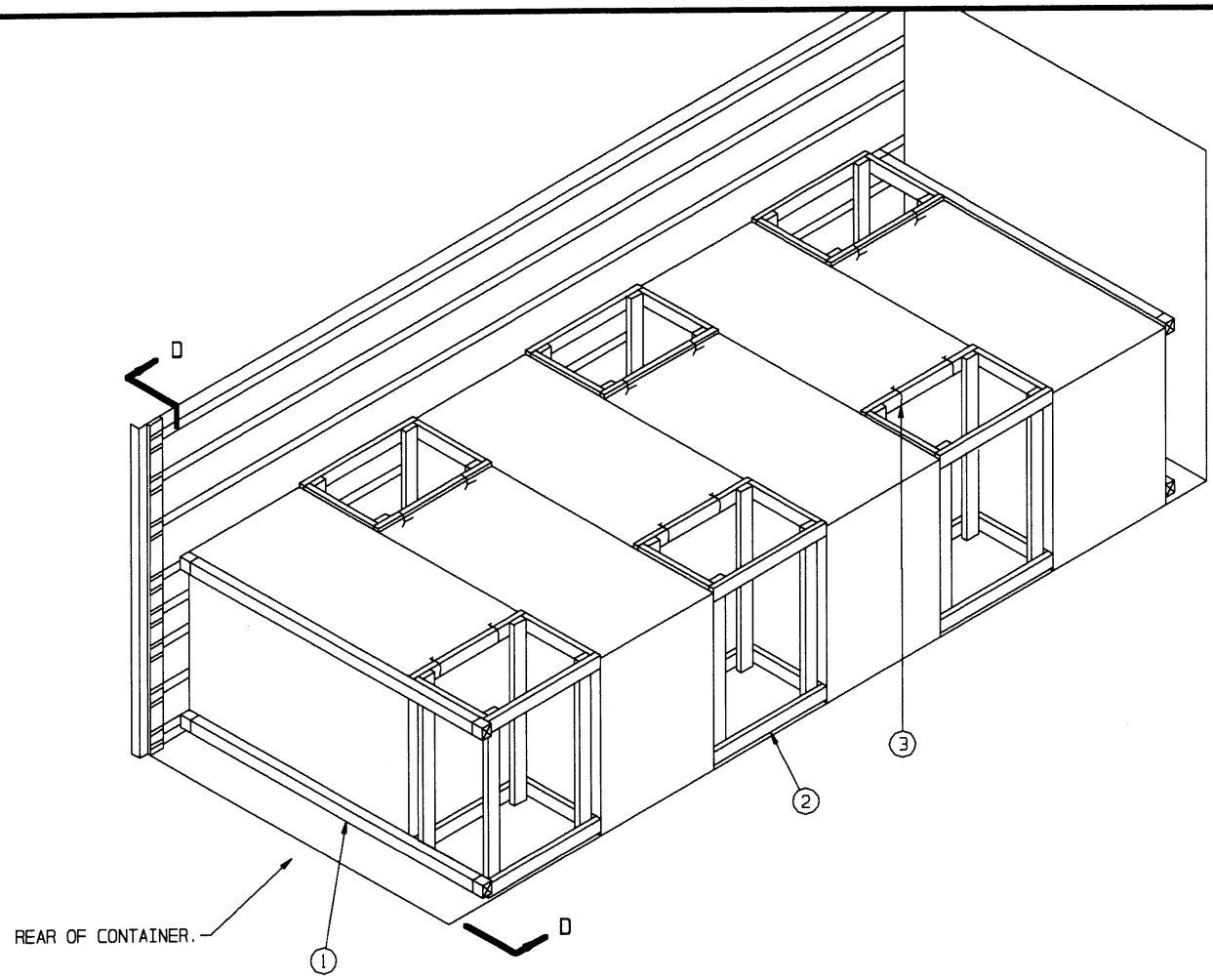
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6" 2" X 2" 2" X 4" 2" X 6"	105 28 114 84	53 9 76 84
NAILS	NO. REQD	POUNDS
6d (2") 10d (3")	84 104	1/2 1-1/2
WIRE, NO. 14 GAGE - - - 48' REQD - - - - - - - - 1 LB		
CROSS MEMBER - - - - - - - - - - - - - - - - - 16 REQD		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
80-GALLON DRUM	28	5,488 LBS
DUNNAGE		447 LBS
CONTAINER		5,700 LBS
TOTAL WEIGHT		11,635 LBS (APPROX)

80-GALLON DRUMS (UNPALLETIZED)

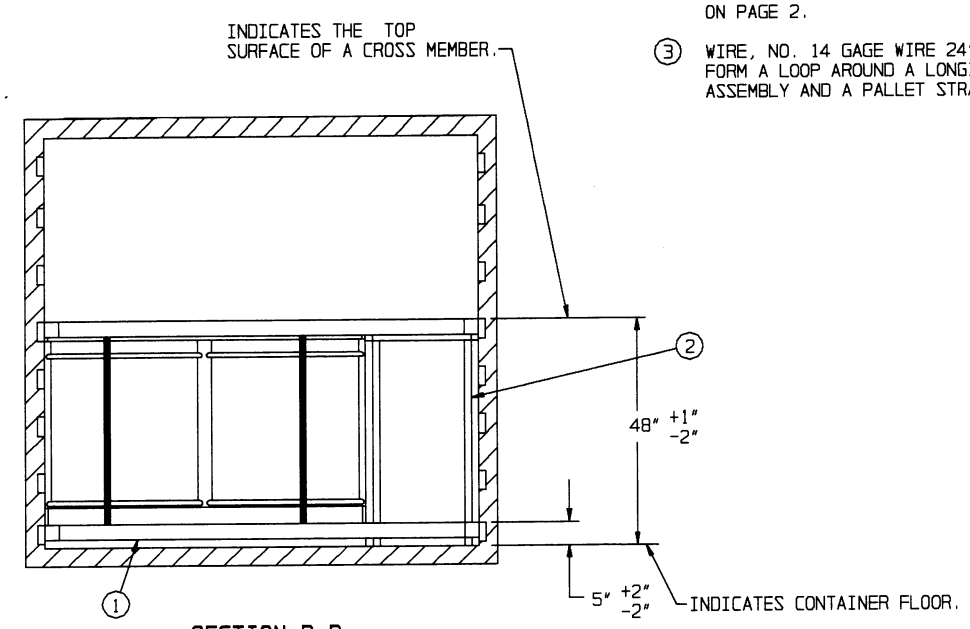
PROJECT SP 305-95



ISOMETRIC VIEW

KEY NUMBERS

1. CROSS MEMBER (4 REQD). POSITION AT THE HEIGHTS SPECIFIED IN THE "SECTION D-D" VIEW. SEE GENERAL NOTE "D" ON PAGE 2.
2. CRIB FILL (6 REQD). SEE THE "CRIB FILL B" DETAIL ON PAGE 15 AND SPECIAL NOTE 2 ON PAGE 11. SEE GENERAL NOTE "G" ON PAGE 2.
3. WIRE, NO. 14 GAGE WIRE 24" LONG (12 REQD). INSTALL SO AS TO FORM A LOOP AROUND A LONGITUDINAL PIECE OF A CRIB FILL ASSEMBLY AND A PALLET STRAP.



SECTION D-D

80-GALLON DRUMS (PALLETIZED)

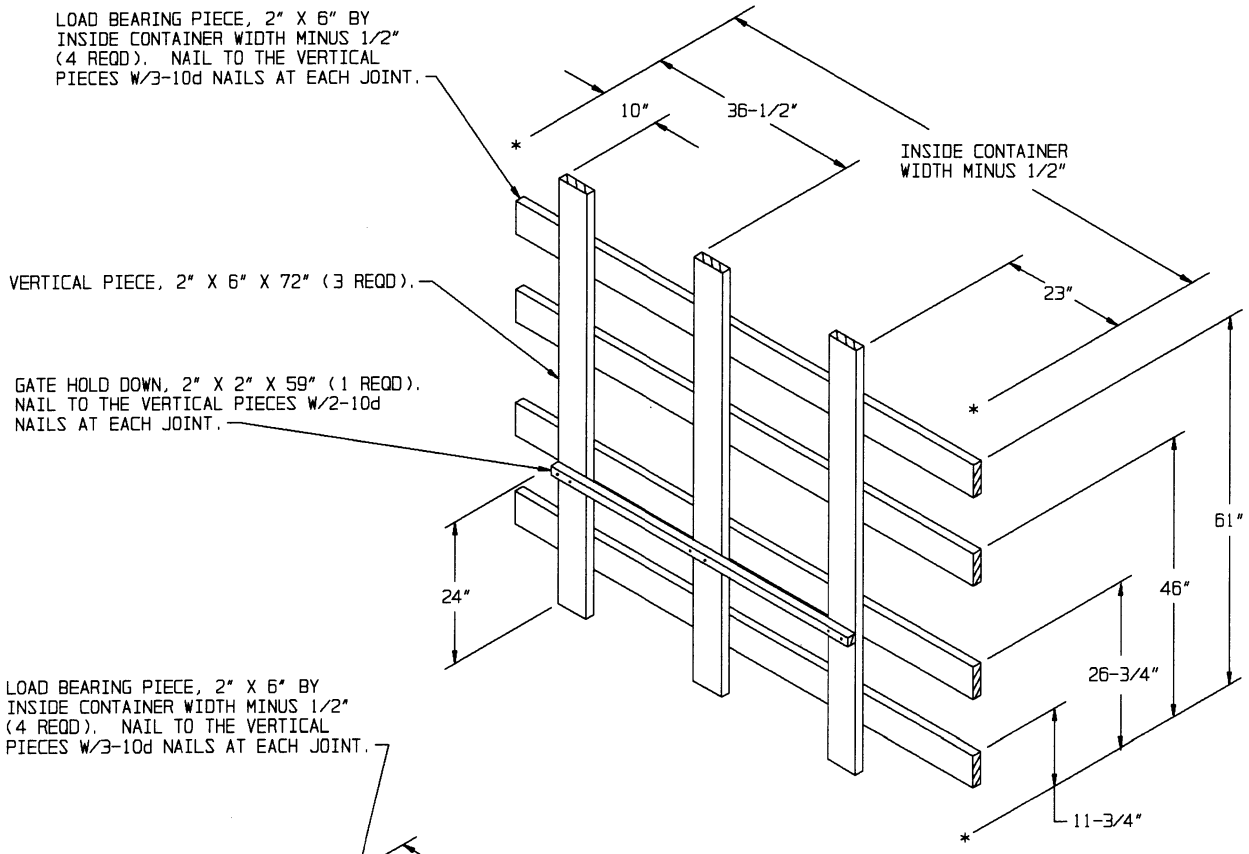
SPECIAL NOTES:

1. A 6-PALLET UNIT LOAD IS SHOWN IN A MILVAN CONTAINER.
2. THE WIDTH OF THE CRIB FILL ASSEMBLY B MAY BE ADJUSTED AS NECESSARY TO PROVIDE FOR A TIGHT LOAD ACROSS THE WIDTH OF A LOAD BAY.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	201	134
NAILS	NO. REQD	POUNDS
10d (3")	192	3
WIRE, NO. 14 GAGE - - - 24' REQD - - - - - - 1/2 LB		
CROSS MEMBER - - - - - - - - - - - - - - - - - 4 REQD		

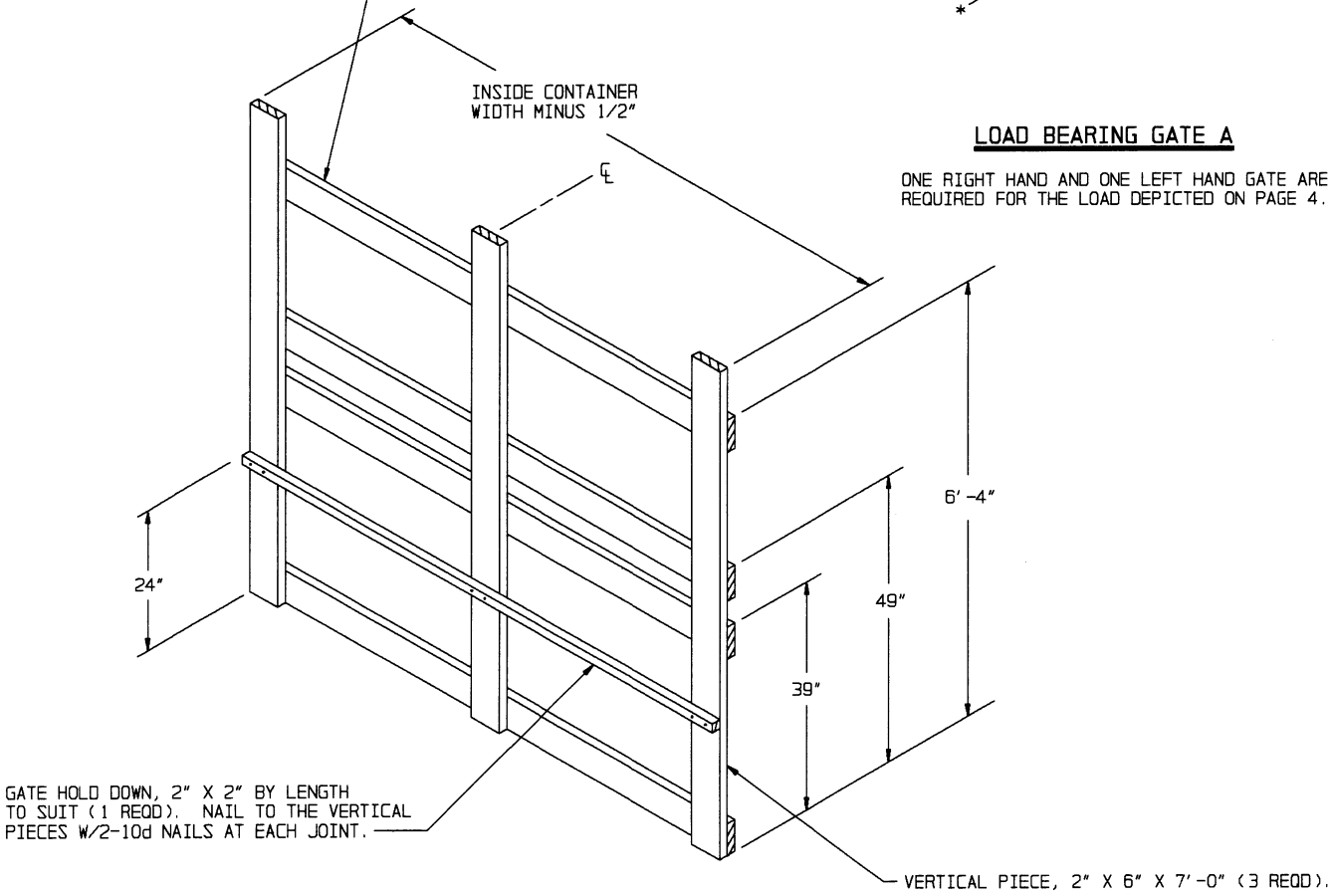
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	6	2,952 LBS
DUNNAGE		272 LBS
CONTAINER		5,700 LBS
TOTAL WEIGHT		8,924 LBS (APPROX)

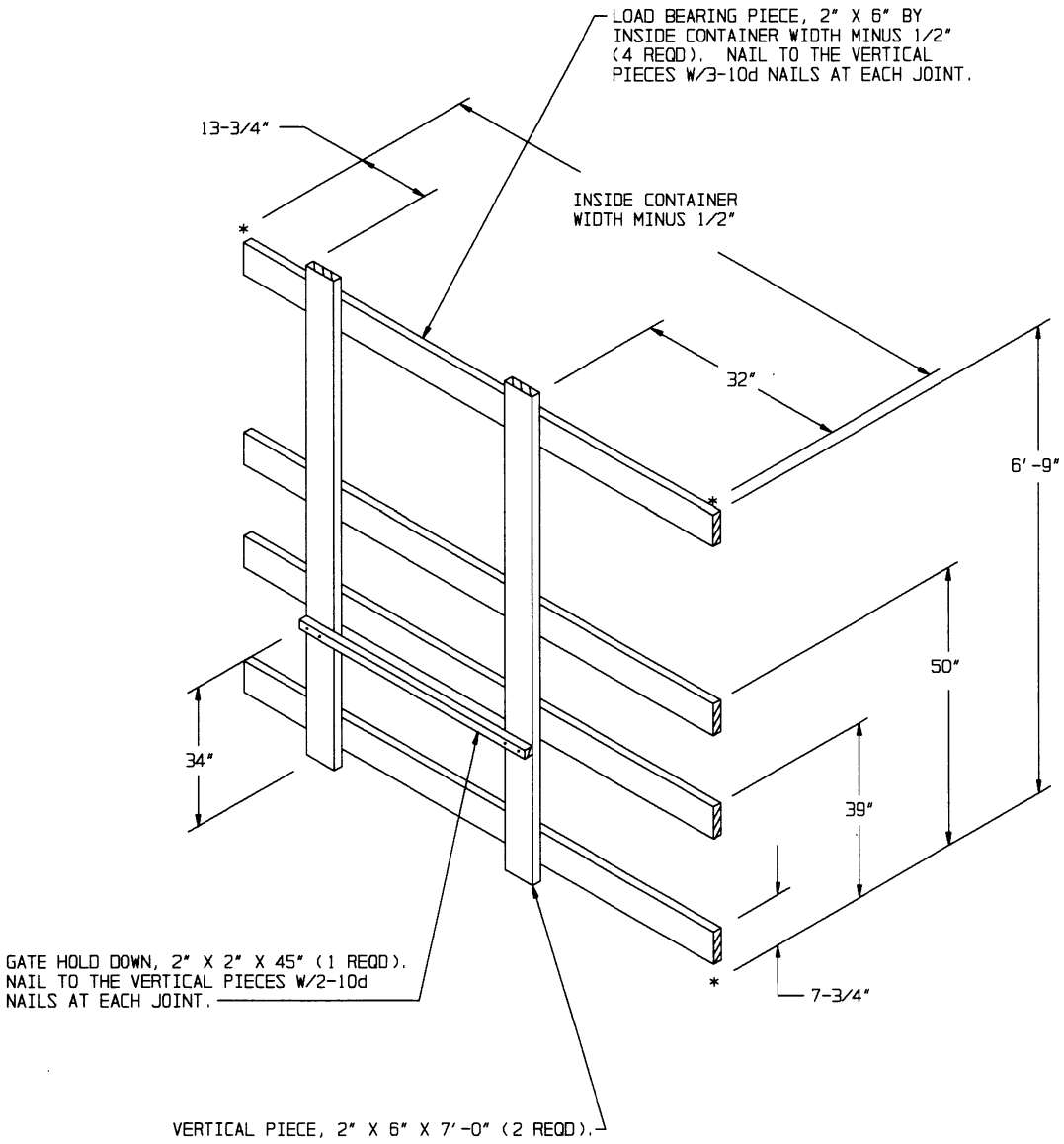


LOAD BEARING GATE A

ONE RIGHT HAND AND ONE LEFT HAND GATE ARE REQUIRED FOR THE LOAD DEPICTED ON PAGE 4.

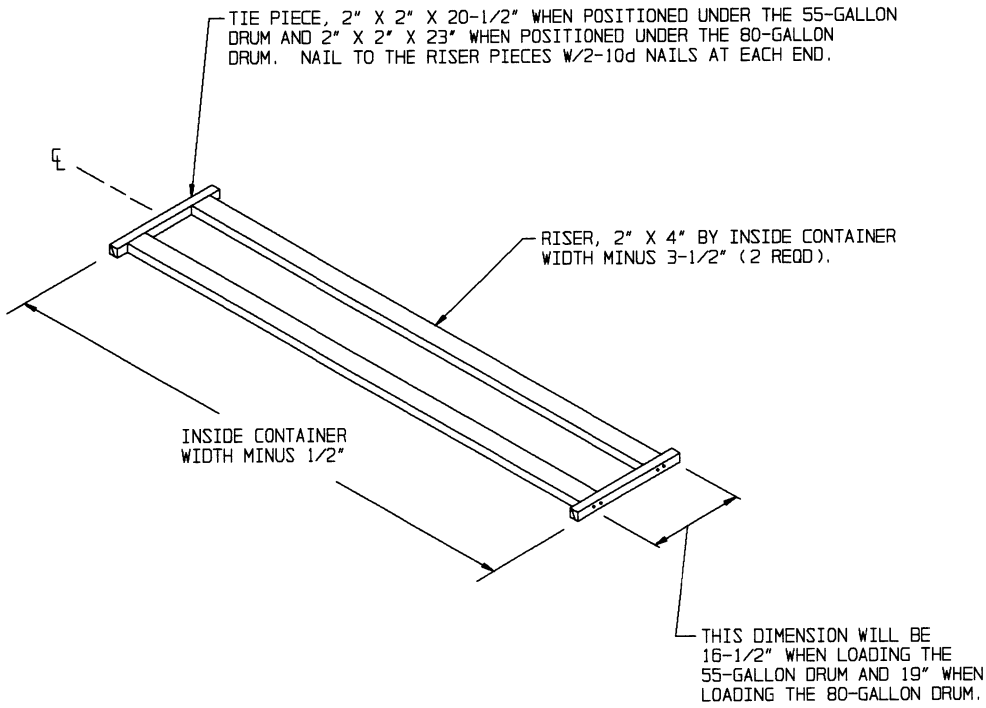


LOAD BEARING GATE B



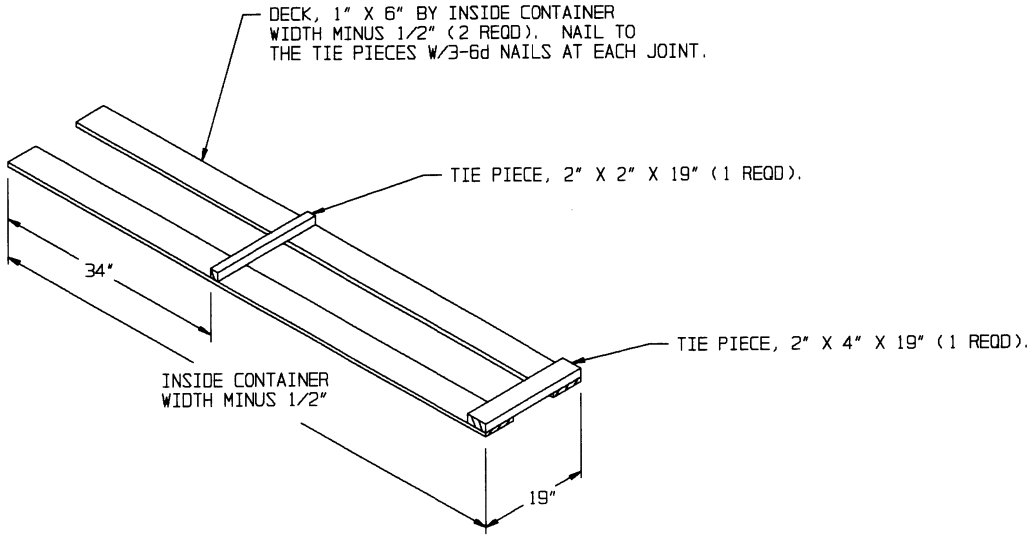
LOAD BEARING GATE C

ONE RIGHT HAND AND ONE LEFT HAND GATE ARE REQUIRED FOR THE LOAD DEPICTED ON PAGE 8.



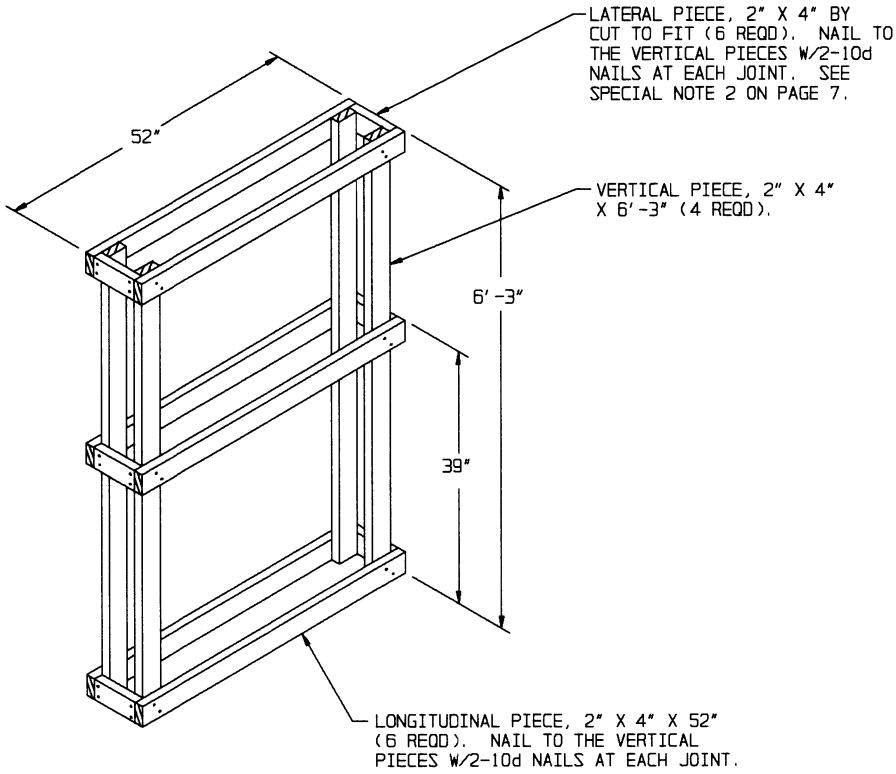
RISER ASSEMBLY

THIS RISER IS FOR USE WITH THE 55-GALLON DRUM OR THE 80-GALLON DRUM. WHEN FABRICATING THIS RISER FIELD CHECK DIMENSIONS WITHIN THE LOAD TO ASSURE A FIT BETWEEN ROWS OF DRUMS.

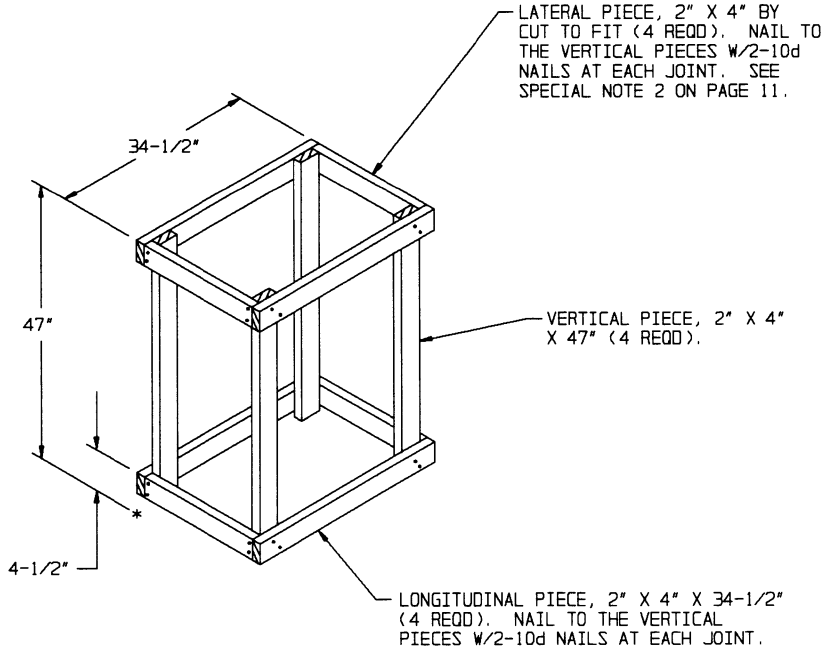


DECK ASSEMBLY

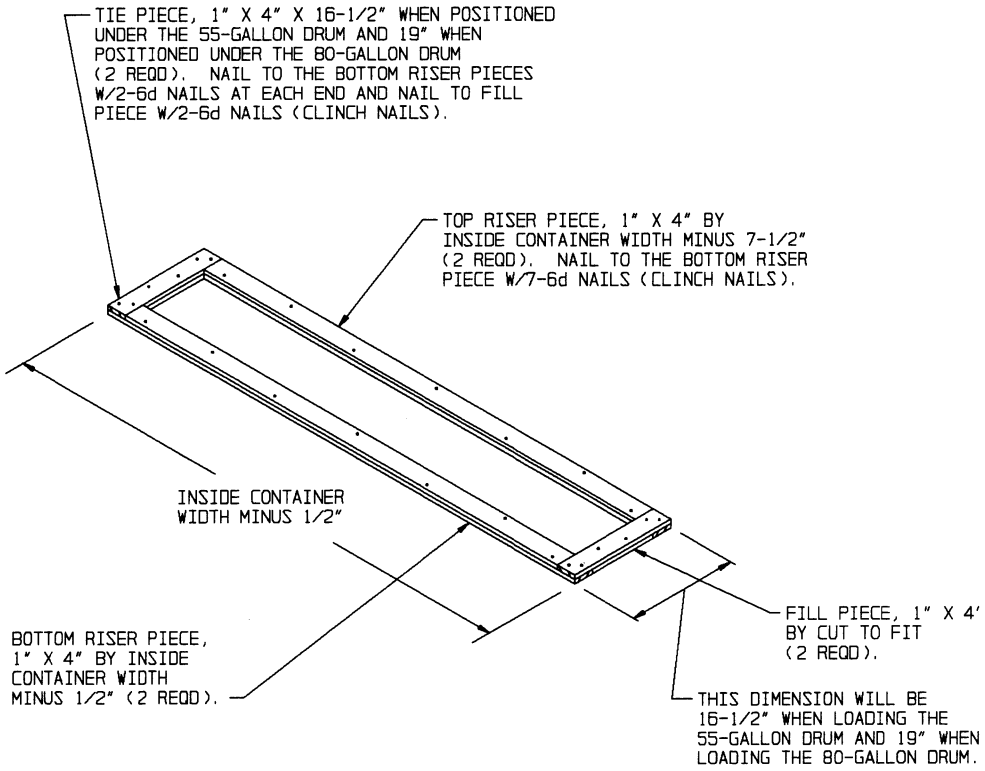
THIS ASSEMBLY IS FOR USE WITH THE 80-GALLON DRUM. WHEN FABRICATING THIS DECKING ASSEMBLY FIELD CHECK DIMENSIONS WITHIN THE LOAD TO ASSURE A FIT BETWEEN ROWS OF DRUMS.



CRIB FILL A



CRIB FILL B



ALTERNATIVE RISER ASSEMBLY

THIS RISER IS FOR USE WITH THE 55-GALLON DRUM OR THE 80-GALLON DRUM. WHEN FABRICATING THIS RISER FIELD CHECK DIMENSIONS WITHIN THE LOAD TO ASSURE A FIT BETWEEN ROWS OF DRUMS. THIS ALTERNATIVE RISER ASSEMBLY MAY BE USED IN LIEU OF THE "RISER ASSEMBLY A" IF DESIRED OR IF THE 2" X 2" TIE PIECE SPLITS WHEN NAILING.