

REV NO. 2 APPROVED BY US COAST GUARD <i>[Signature]</i>	REV NO. 2 APPROVED BUREAU OF EXPLOSIVES <i>[Signature]</i>
DATE <i>1/8/79</i>	DATE <i>1/10/79</i>
REVISION NO. 3 SIGNED <i>L.B. Dickey</i>	REVISION NO. 3 SIGNED <i>B.P. Baker</i>
DATE <i>2/10/86</i>	DATE <i>1/10/86</i>

# TOW

## LOADING AND BRACING<sup>Ⓢ</sup> IN MILVAN CONTAINERS<sup>⊕</sup> OF GUIDED MISSILE, PACKED ONE PER WIREBOUND WOODEN BOX (OVERPACK), UNPALLETIZED AND PALLETIZED, FOR SHIPMENT BY T/COFC CARRIER

- Ⓢ LOADING AND BRACING SPECIFICATIONS SET FORTH WITHIN THIS DRAWING ARE APPLICABLE TO LOADS THAT ARE TO BE SHIPPED BY TRAILER/CONTAINER-ON-FLAT-CAR ( T/COFC ) RAIL CARRIER SERVICE. THESE SPECIFICATIONS MAY ALSO BE USED FOR LOADS THAT ARE TO BE MOVED BY MOTOR OR WATER OR AIR CARRIERS. SEE GENERAL NOTE "R" ON PAGE 2.
- ⊕ 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.

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**DO NOT SCALE**

REVISIONS				DRAFTSMAN	PROJ ENG
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3	FEB 85	/	/	<i>[Signature]</i>	<i>[Signature]</i>
				CHECKER	LOG ENGRG OFFICE
				<i>[Signature]</i>	<i>[Signature]</i>
APPROVED BY: CHIEF OF ENGINEERS, U.S. ARMY MISSILE MATERIEL READINESS COMMAND					
APPROVED BY: CHIEF OF ENGINEERS, U.S. ARMY MATERIEL DEVELOPMENT AND ENGINEERING CENTER (DMDEC)					
U.S. ARMY MATERIEL DEVELOPMENT AND ENGINEERING CENTER AND SCHOOL					
U.S. ARMY DARCUM DRAWING					
FEBRUARY 1979					
		CLASS	DIVISION	DRAWING	FILE
		19	48	5933	GM 15TOI

## 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 THE TOW GUIDED MISSILE PACKED ONE PER WIREBOUND BOX (OVERPACK). SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CONTAINER WITH MISSILE COMPONENTS.
- C. FOR DETAIL OF THE WIREBOUND BOX, SEE DRAWING NO. 10224699 AND "WIREBOUND CONTAINER" DETAIL ON PAGE 3.
- CONTAINER DIMENSIONS --- 58-1/4" LONG BY 11-5/8" WIDE BY 11-5/8" HIGH.  
GROSS WEIGHT ----- 87 POUNDS (APPROX).  
CUBE ----- 4.9 CUBIC FEET.
- D. FOR DETAIL OF THE PALLETIZED UNITS, SEE U. S. ARMY MATERIEL COMMAND DRAWING NO. 19-48-5229 GM 20P4 AND "PALLET UNIT" DETAIL ON PAGE 3.
- 4-WIDE BY 3-HIGH UNIT
- PALLET UNIT DIMENSIONS --- 58-1/4" LONG BY 48" WIDE BY 39-3/4" HIGH.  
GROSS WEIGHT ----- 1,126 POUNDS (APPROX).  
CUBE ----- 64.3 CUBIC FEET.
- 3-WIDE BY 4-HIGH UNIT
- PALLET UNIT DIMENSIONS --- 58-1/4" LONG BY 35-1/4" WIDE BY 51-1/4" HIGH.  
GROSS WEIGHT ----- 1,112 POUNDS (APPROX).  
CUBE ----- 60.9 CUBIC FEET.
- E. THIS ITEM IS A DOT CLASS "A" EXPLOSIVE, AND A COAST GUARD CLASS IV-A. THE OUTLOADING PROCEDURES SPECIFIED HEREIN CAN ALSO BE UTILIZED FOR THE SHIPMENT OF THE DEPICTED CONTAINERS WHEN THEY ARE LOADED WITH AN ITEM WHICH IS IDENTIFIED DIFFERENTLY BY NOMENCLATURE THAN THE ITEM DESIGNATED WITHIN THE DRAWING TITLE.
- F. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN MILVAN CONTAINERS WHICH ARE 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.
- G. 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-FLAT-CAR SERVICE.
- H. 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 HEIGHT DIMENSIONS SPECIFIED WITHIN THIS DRAWING FOR THE INSTALLATION OF CROSS MEMBERS CONFORM WITH BUREAU OF EXPLOSIVES PAMPHLET 6C, WITH THE EXCEPTION THAT TWO (2) ADDITIONAL BELT RAILS HAVE BEEN SHOWN; ONE AT 72" AND ONE AT 83" HEIGHT 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 HEIGHTS 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 10 FOR THE DUNNAGING METHOD REQUIRED TO ELIMINATE AN EXCESSIVE LENGTHWISE VOID WITHIN A LOAD. SEE GENERAL NOTE "S".
- J. VOIDS BETWEEN THE LADING OR HOLD-DOWN ASSEMBLY AND CROSS MEMBERS MUST NOT EXCEED ONE-HALF INCH (1/2"). ADDITIONAL MATERIAL MAY BE ADDED, OR THINNER MATERIAL MAY BE USED TO ACHIEVE THE PROPER THICKNESS AS REQUIRED.
- K. 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.
- L. **CAUTION:** DO NOT NAIL DUNNAGE MATERIAL TO THE CONTAINER WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.
- M. A STAGGERED NAILING PATTERN WILL BE USED WHEREVER 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.

(CONTINUED AT RIGHT)

## MATERIAL SPECIFICATIONS

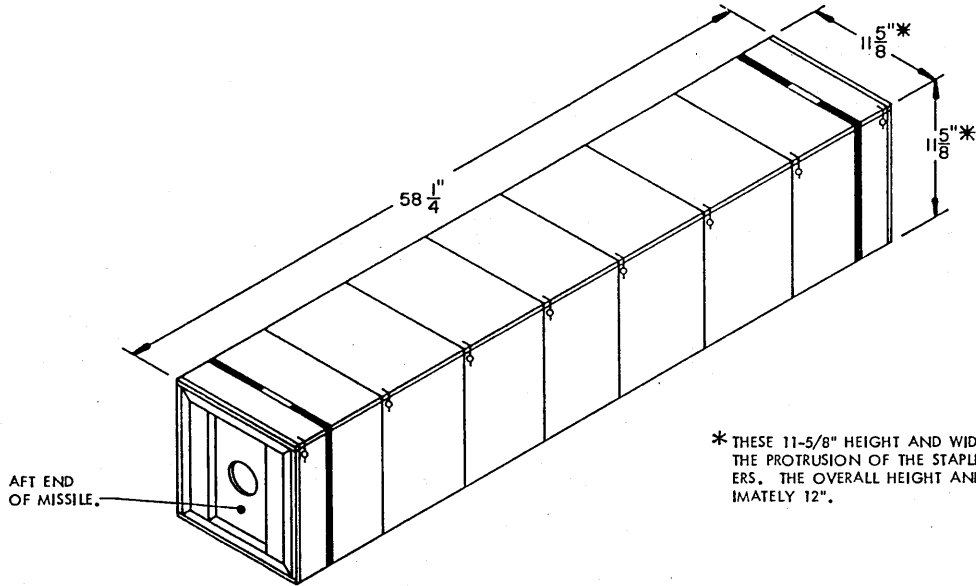
- LUMBER ----- : TM 743-200-1, DUNNAGE LUMBER, FED SPEC MM-L-751.
- NAILS ----- : FED SPEC FF-N-105; COMMON.
- WIRE ----- : FED SPEC QQ-W-461.
- STRAPPING, STEEL ---- : CLASS 1, TYPE I OR IV, HEAVY DUTY, FINISH A, B (GRADE 2), OR C, FED SPEC QQ-S-781.
- SEAL, STRAP ----- : TYPE D, STYLE I, II, OR IV, CLASS H, FINISH A, B (GRADE 2), OR C, FED SPEC QQ-S-781.
- STAPLE, STRAP ----- : COMMERCIAL GRADE.

## (GENERAL NOTES CONTINUED FROM LEFT)

- N. PORTIONS OF THE CONTAINERS DEPICTED WITHIN THIS DRAWING, SUCH AS ONE OF THE SIDE WALLS, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.
- O. WHEN ANY STRAP IS SEALED AT AN END-OVER-END LAP JOINT, TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) PAIR OF CRIMPS PER SEAL MUST BE USED TO SEAL THE JOINT. WHEN ANY STRAP IS INSTALLED AROUND A BELT RAIL OR A CROSS MEMBER WITH A LAP-BACK-ON-SELF JOINT, ONE (1) SEAL WITH TWO (2) PAIR OF CRIMPS WILL BE USED.
- P. **MAXIMUM LOAD WEIGHT CRITERIA:**
- BECAUSE OF THE LIGHT WEIGHT OF THE AMMUNITION, A LOAD WEIGHT WILL NEVER EXCEED ANY WEIGHT RESTRICTION CRITERIA.
- SEE THE SPECIAL NOTE SECTION OPPOSITE THE BASIC LOADS FOR INSTRUCTIONS WHICH MUST BE APPLIED IF A CONTAINER IS TO BE LOADED WITH LESS UNITS THAN SHOWN IN THE BASIC LOADS ON PAGES 4 AND 8.
- R. **SPECIAL T/COFC NOTES:**
- CAUTION:** LOADED CONTAINERS MUST BE ON CHASSIS EQUIPPED WITH TWO BOGIE ASSEMBLIES WHEN BEING MOVED IN TOFC SERVICE, REGARDLESS OF LOAD WEIGHT WITHIN THE CONTAINERS.
  - 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.
  - 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 OVER-HANG THE END OF THE CAR IF IT IS PLACED AT THE A-END. TWENTY-FOOT AND 40-FOOT UNITS CAN BE LOADED ON THE SAME CAR.
  - THE LOAD BLOCKING COMPONENT DESIGNATED AS "CROSS MEMBER" HEREIN, IS IDENTIFIED AS "BEAM ASSEMBLY" WITHIN TM 55-8115-200-24, DATED SEPTEMBER 1972. THE BEAM ASSEMBLY IS FURTHER IDENTIFIED AS NSN 8115-00-165-6623 (FORMERLY FSN 8115-165-6623).
  - THE THICKNESS OF THE BEARING PIECES OF THE FILLER GATE AS DETAILED ON PAGE 12 MUST BE ADJUSTED AS REQUIRED, TO COMPLY WITH THE DIMENSIONAL VARIANCE OF THE BOX, SO AS TO NOT ALLOW MORE THAN ONE AND ONE-HALF INCH (1-1/2") VOID ACROSS THE WIDTH OF A BRACED LOAD. ADJUSTMENTS CAN BE MADE BY USING A DIFFERENT THICKNESS BEARING PIECE OR BY LAMINATING ADDITIONAL PIECES TO THE SPECIFIED BEARING PIECES ON ONE OR BOTH SIDES OF THE LOAD. ADJUSTMENTS CAN ALSO BE MADE BY ADJUSTING THE THICKNESS OF THE FILLER PIECES AND THE TIE PIECES.
  - TO FACILITATE LOADING OPERATIONS, THE FILLER GATES CAN BE WIRE TIED TO THE CONTAINER BELT RAILS ON EACH SIDE OF THE CONTAINER. SECURE THE VERTICAL PIECES OF A GATE TO A BELT RAIL WITH AN 18" LONG PIECE OF NO. 14 GAGE WIRE POSITIONED NEAR THE TOP OF THE VERTICALS. INSTALL THE WIRE TO FORM A COMPLETE LOOP THROUGH THE HOLES IN THE BELT RAIL AND AROUND A VERTICAL PIECE, BRING THE ENDS TOGETHER AND TWIST TAUT.
- V. **CONVERSION TO METRIC EQUIVALENTS:**
- DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENT MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS 0.454KG.

## REVISIONS

- REVISION NO. 1, DATED MAY 1974, CONSISTS OF:
- INSTALLING SIDE FILL GATES WITHIN THE UNPALLETIZED LOADS.
  - REMOVING THE TOMMING (HOLD-DOWNS) FROM THE TOP OF THE PALLETIZED LOADS.
- REVISION NO. 2, DATED FEBRUARY 1979, CONSISTS OF:
- CHANGING THE CONFIGURATION OF "SPACER ASSEMBLY B" ON PAGE 9.
  - CHANGING OUTLOADING PROCEDURES TO CONFORM TO 1 ABOVE AND TO CURRENT STANDARDS.
- REVISION NO. 3, DATED FEBRUARY 1985, CONSISTS OF:
- ADDING PROCEDURES FOR THE 3-WIDE BY 4-HIGH PALLET UNIT.
  - UPDATING DRAWING FORMAT.



\* THESE 11-5/8" HEIGHT AND WIDTH DIMENSIONS DO NOT INCLUDE THE PROTRUSION OF THE STAPLED WIRE AND THE WIRE LOOP FASTENERS. THE OVERALL HEIGHT AND WIDTH DIMENSIONS ARE APPROXIMATELY 12".

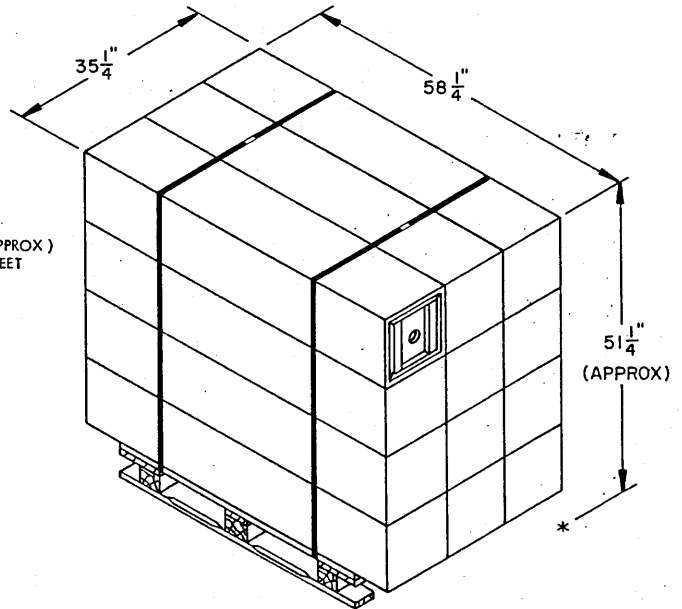
CONTAINER UNIT DATA

GROSS WEIGHT ----- 87 POUNDS (APPROX).  
 CUBE ----- 4.9 CUBIC FEET.

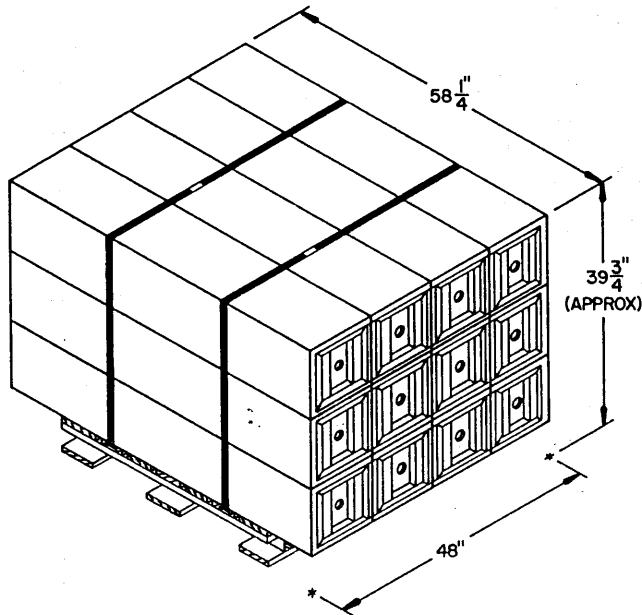
WIREBOUND CONTAINER

PALLET UNIT DATA:

NUMBER OF CONTAINER: ----- TWELVE (12)  
 GROSS WEIGHT ----- 1,112 LBS (APPROX)  
 CUBE ----- 60.9 CUBIC FEET



PALLET UNIT (3-WIDE BY 4-HIGH)



PALLET UNIT (4-WIDE BY 3-HIGH)

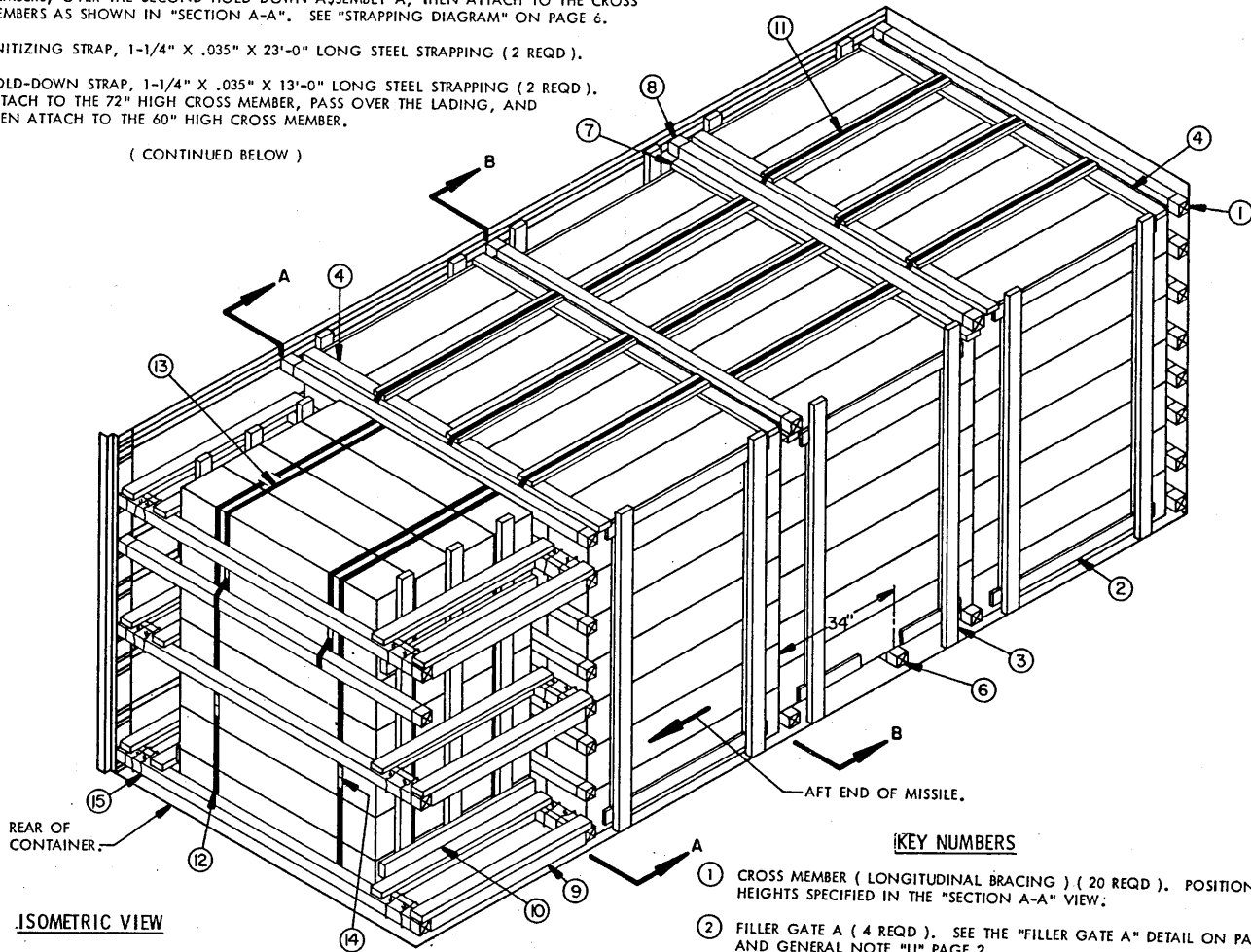
PALLET UNIT DATA:

NUMBER OF CONTAINERS ----- TWELVE (12)  
 GROSS WEIGHT ----- 1,126 LBS (APPROX)  
 CUBE ----- 64.3 CUBIC FEET

(KEY NUMBERS CONTINUED FROM RIGHT)

- 9 SPACER ASSEMBLY ( 6 REQD ). SEE THE "SPACER ASSEMBLY A" DETAIL ON PAGE 5.
- 10 RETAINER GATE ( 2 REQD ). SEE THE "RETAINER GATE" DETAIL ON PAGE 7.
- 11 HOLD-DOWN STRAP, 1-1/4" X .035" X 24'-0" LONG STEEL STRAPPING ( 3 REQD ). PRE-POSITION. ATTACH TO THE 48" AND 60" HIGH CROSS MEMBERS AT THE FRONT OF THE LOAD, THREAD OVER HOLD-DOWN ASSEMBLY A, UNDER THE 83" HIGH CROSS MEMBERS, OVER THE SECOND HOLD-DOWN ASSEMBLY A, THEN ATTACH TO THE CROSS MEMBERS AS SHOWN IN "SECTION A-A". SEE "STRAPPING DIAGRAM" ON PAGE 6.
- 12 UNITIZING STRAP, 1-1/4" X .035" X 23'-0" LONG STEEL STRAPPING ( 2 REQD ).
- 13 HOLD-DOWN STRAP, 1-1/4" X .035" X 13'-0" LONG STEEL STRAPPING ( 2 REQD ). ATTACH TO THE 72" HIGH CROSS MEMBER, PASS OVER THE LADING, AND THEN ATTACH TO THE 60" HIGH CROSS MEMBER.

( CONTINUED BELOW )



ISOMETRIC VIEW

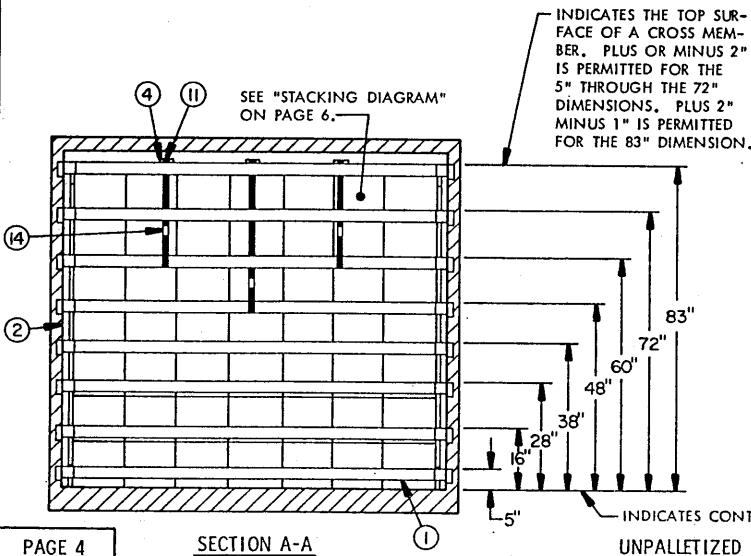
( KEY NUMBERS CONTINUED FROM ABOVE )

- 14 SEAL FOR 1-1/4" STRAPPING ( 14 REQD, 2 PER STRAP ). SEE GENERAL NOTE "O" ON PAGE 2.
- 15 TIE WIRE, NO. 14 GAGE WIRE 18" LONG ( 24 REQD ). INSTALL TO FORM A COMPLETE LOOP AROUND THE SPACER ASSEMBLY AND THE CROSS MEMBER, BRING THE ENDS TOGETHER AND TWIST TAUT. SECURE TO THE SPACER ASSEMBLY WITH A PARTIALLY DRIVEN 10d NAIL BENT OVER THE WIRE, OR WITH A STRAP STAPLE.

KEY NUMBERS

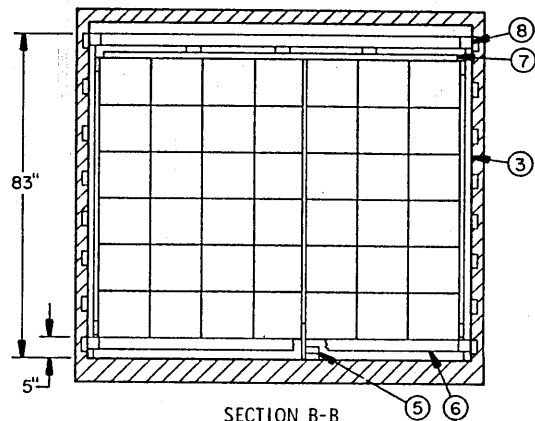
- 1 CROSS MEMBER ( LONGITUDINAL BRACING ) ( 20 REQD ). POSITION AT THE HEIGHTS SPECIFIED IN THE "SECTION A-A" VIEW.
- 2 FILLER GATE A ( 4 REQD ). SEE THE "FILLER GATE A" DETAIL ON PAGE 12 AND GENERAL NOTE "U" PAGE 2.
- 3 FILLER GATE B ( 2 REQD ). SEE THE "FILLER GATE B" DETAIL ON PAGE 12.
- 4 HOLD-DOWN ASSEMBLY ( 2 REQD ). SEE THE "HOLD-DOWN ASSEMBLY A" DETAIL ON PAGE 5.
- 5 SUPPORT ( 1 REQD ). SEE THE "SUPPORT" DETAIL ON PAGE 5. POSITION UNDER PIECE MARKED 6 NEAR THE CENTER OF THE LOAD.
- 6 CROSS MEMBER ( RISER ) ( 3 REQD ). POSITION AT THE HEIGHT SPECIFIED IN THE "SECTION B-B" VIEW.
- 7 HOLD-DOWN ASSEMBLY ( 1 REQD ). SEE THE "HOLD-DOWN ASSEMBLY B" DETAIL ON PAGE 5.
- 8 CROSS MEMBER ( HOLD-DOWN ) ( 2 REQD ). POSITION AT THE HEIGHT SPECIFIED IN THE "SECTION B-B" VIEW.

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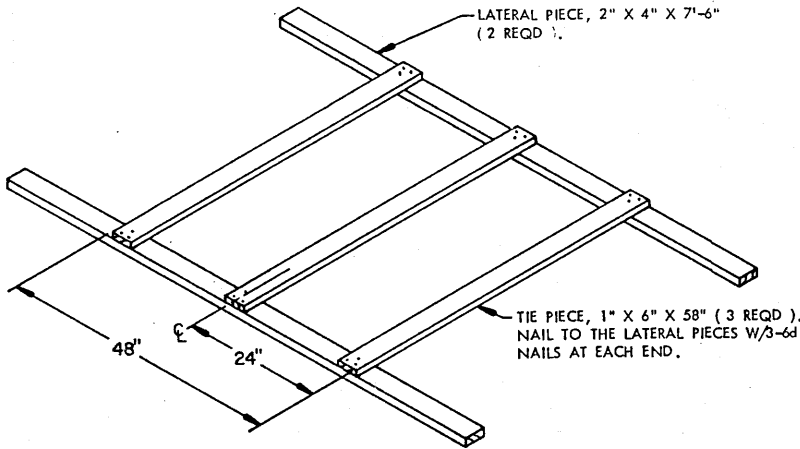


SECTION A-A

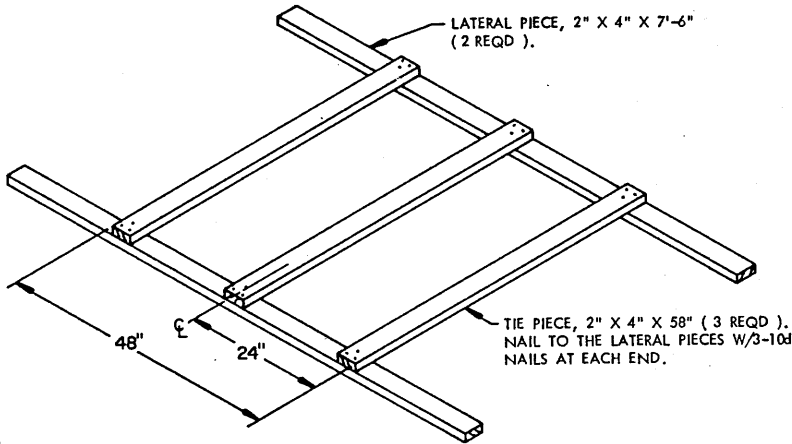
UNPALLETIZED LOAD



SECTION B-B



**HOLD-DOWN ASSEMBLY A**

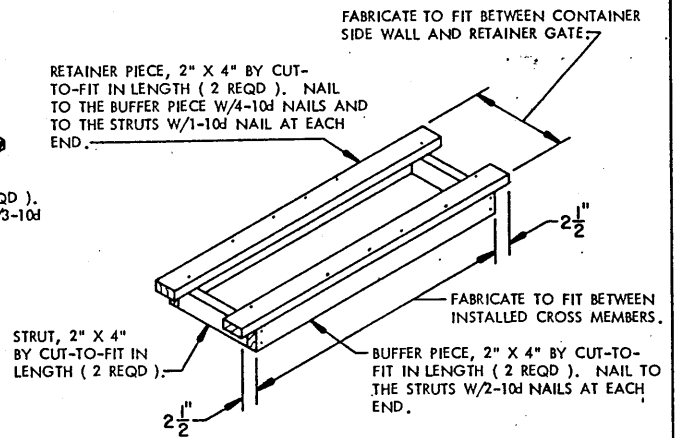


**HOLD-DOWN ASSEMBLY B**

SEE GENERAL NOTE "J" ON PAGE 2.

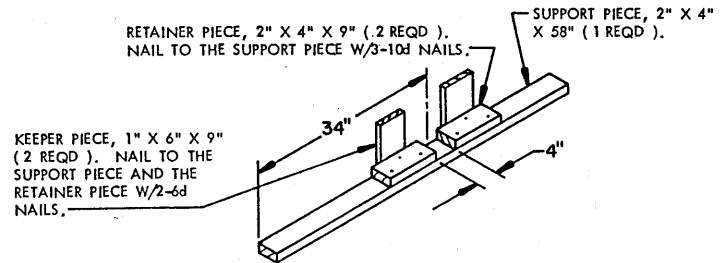
**SPECIAL NOTES:**

1. THE LOAD AS SHOWN ON PAGE 4 DEPICTS A 168-CONTAINER LOAD IN A MILVAN CONTAINER.
2. IF A MILVAN CONTAINER IS TO BE LOADED WITH LESS CONTAINERS THAN SHOWN IN THE LOAD VIEW ON PAGE 4, A "FILLER" ASSEMBLY MAY BE USED TO FILL THE VOID FOR AN OMITTED CONTAINER. THE FILLER MUST BE USED IN THE TOP LAYER ONLY, AND NEAR THE CENTER OF THE LOAD, IF POSSIBLE. IF A "FILLER" ASSEMBLY MUST BE USED ADJACENT TO A CROSS MEMBER CARE MUST BE EXERCISED TO INSURE THAT CROSS MEMBERS CONTACT THE BUFFER BOARD OF THE FILLER.
3. SEE THE "ALTERNATIVE LOADING PATTERN" AND THE "ALTERNATIVE HOLD-DOWN METHOD" DETAILS ON PAGES 6 AND 7 FOR SHIPPING PARTIAL BAYS.
4. SPECIFICATIONS FOR THE "BASIC LOAD", FOR THE "ALTERNATIVE LOADING PATTERN", AND FOR THE "ALTERNATIVE HOLD-DOWN METHOD" SHOWN ON PAGES 6 AND 7 WILL BE APPLIED SEPARATELY OR IN COMBINATION TO BLOCK AND BRACE OTHER THAN 168-CONTAINER LOADS.
5. THE SPACER ASSEMBLY NEED NOT BE FABRICATED FOR A DRIVE FIT. THE ASSEMBLY SHOULD BE FABRICATED SO THAT IT CAN BE EASILY INSTALLED. HOWEVER, IT MUST FIT TIGHT ENOUGH SO AS TO NOT ALLOW MORE THAN ONE-HALF INCH ( 1/2" ) VOID ACROSS THE WIDTH OF A BRACED LOAD.



**SPACER ASSEMBLY A**

SEE SPECIAL NOTE "5" ABOVE.

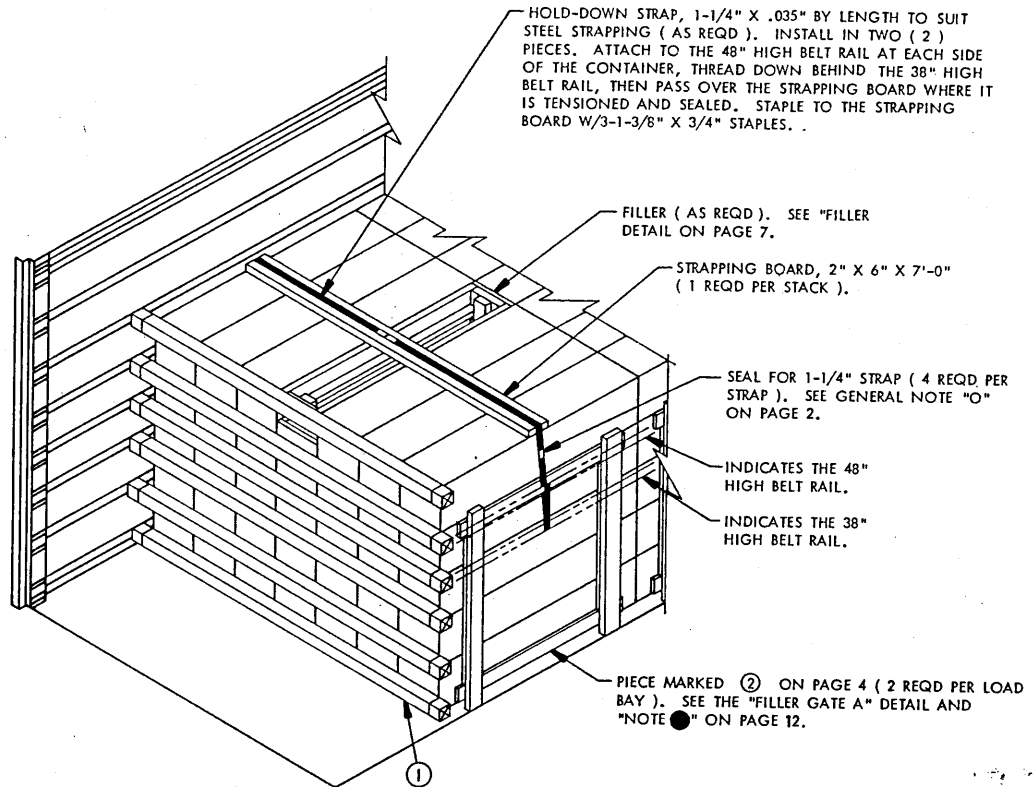


**SUPPORT**

**LOAD AS SHOWN**

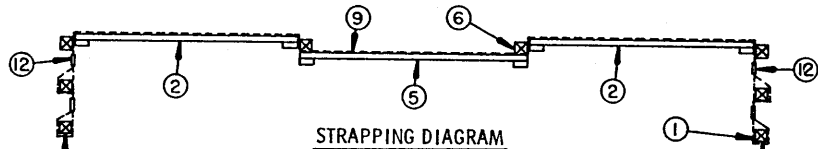
ITEM	QUANTITY	WEIGHT ( APPROX )
WIREBOUND CONTAINER	168	13,944 LBS
DUNNAGE		697 LBS
CONTAINER		5,700 LBS
<b>TOTAL GROSS WEIGHT</b>		<b>20,341 LBS</b>

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	118	36
1" X 6"	38	20
2" X 4"	320	214
NAILS	NO. REQD	POUNDS
6d ( 2" )	172	1-1/4
10d ( 3" )	188	2-3/4
STEEL STRAPPING, 1-1/4" X .035"	147' REQD	21 LBS
SEALS FOR 1-1/4" STRAPPING	14 REQD	1/2 LB
NO. 14 GAGE WIRE	36' REQD	1/2 LB
CROSS MEMBER		25 REQD



**ALTERNATIVE LOADING PATTERN**

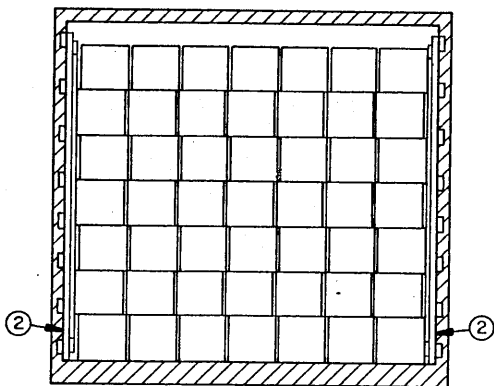
THE DETAIL ABOVE SPECIFIES A BLOCKING METHOD TO BE USED IN A "REDUCED-LOAD" CONTAINER LOAD. THIS METHOD DEPICTS SPECIFICATIONS FOR OUTLOADING A 34-CONTAINER BAY AND ALSO SPECIFIES A HOLD-DOWN METHOD FOR A FIVE-CONTAINER HIGH LOAD BAY. THIS METHOD CAN BE USED IN COMBINATION WITH THE "BASIC LOAD" ON PAGE 4 AND/OR THE "ALTERNATIVE HOLD-DOWN METHOD" DEPICTED ON PAGE 7. THIS METHOD WILL ALSO BE USED FOR A FOUR-CONTAINER HIGH LOAD BAY.



**STRAPPING DIAGRAM**

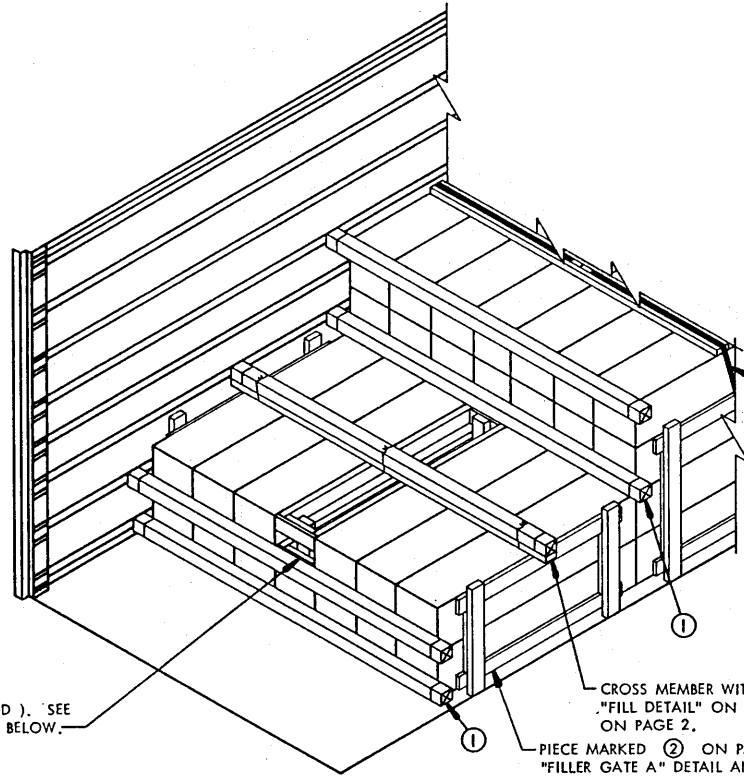
AT THE REAR OF THE FULL-WIDTH PORTION OF THE LOAD, ATTACH THE TWO OUTSIDE STRAPS TO THE 60" HIGH CROSS MEMBER, AND ATTACH THE CENTER STRAP TO THE 48" HIGH CROSS MEMBER.

AT THE FRONT OF THE LOAD, ATTACH THE TWO OUTSIDE STRAPS TO THE 48" HIGH CROSS MEMBER, AND ATTACH THE CENTER STRAP TO THE 60" HIGH CROSS MEMBER.



**STACKING DIAGRAM**

THE STACKING DIAGRAM DETAIL ABOVE DEPICTS THE PROPER STACKING PATTERN TO USE WHEN LOADING A MILVAN CONTAINER. EXCEPT WHERE SPACE BETWEEN BOXES IS TO BE ALLOWED FOR THE INSTALLATION OF THE RISER SUPPORT ASSEMBLY, MARKED AS PIECE ②, BOXES WITHIN ALTERNATE LAYERS OF A STACK ARE TO BE POSITIONED TOWARD OPPOSITE SIDES OF THE MILVAN CONTAINER. IT IS PERMITTED TO DISTRIBUTE A SMALL AMOUNT OF EXCESS LATERAL VOID BETWEEN BOXES WITHIN A LAYER IF DESIRED, PROVIDING THE CRITERIA OF GENERAL NOTE "T" ON PAGE 2 IS NOT VIOLATED RELATIVE TO THE MAXIMUM ALLOWABLE EXCESS VOID ACROSS THE WIDTH OF A LOAD.



FILLER (AS REQD.). SEE "FILLER" DETAIL BELOW.

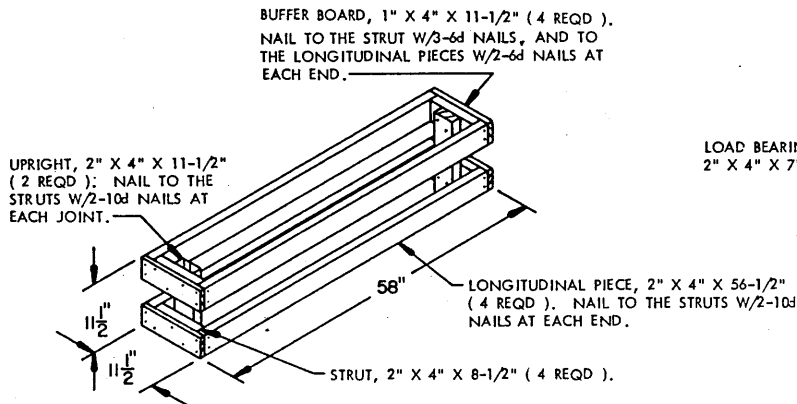
HOLD-DOWN STRAP, SEE "ALTERNATIVE LOADING PATTERN" DETAIL ON PAGE 6.

CROSS MEMBER WITH FILL MATERIAL (AS REQD.). SEE "FILL DETAIL" ON PAGE 12 AND GENERAL NOTE "J" ON PAGE 2.

PIECE MARKED ② ON PAGE 4 (2 REQD PER LOAD BAY). SEE THE "FILLER GATE A" DETAIL AND "NOTE ●" ON PAGE 12.

**ALTERNATIVE HOLD-DOWN METHOD**

THE DETAIL ABOVE SPECIFIES A HOLD-DOWN METHOD TO BE USED IN A "REDUCED-LOAD" CONTAINER LOAD. THIS METHOD DEPICTS SPECIFICATIONS FOR OUTLOADING A 13-CONTAINER BAY AND ALSO SPECIFIES A HOLD-DOWN METHOD FOR A TWO-CONTAINER HIGH LOAD BAY. THIS METHOD CAN BE USED IN COMBINATION WITH THE "BASIC LOAD" ON PAGE 4 AND/OR THE "ALTERNATIVE LOADING PATTERN" DEPICTED ON PAGE 6. THIS METHOD WILL ALSO BE USED FOR A THREE-CONTAINER HIGH LOAD BAY.



BUFFER BOARD, 1" X 4" X 11-1/2" (4 REQD.). NAIL TO THE STRUT W/3-6d NAILS, AND TO THE LONGITUDINAL PIECES W/2-6d NAILS AT EACH END.

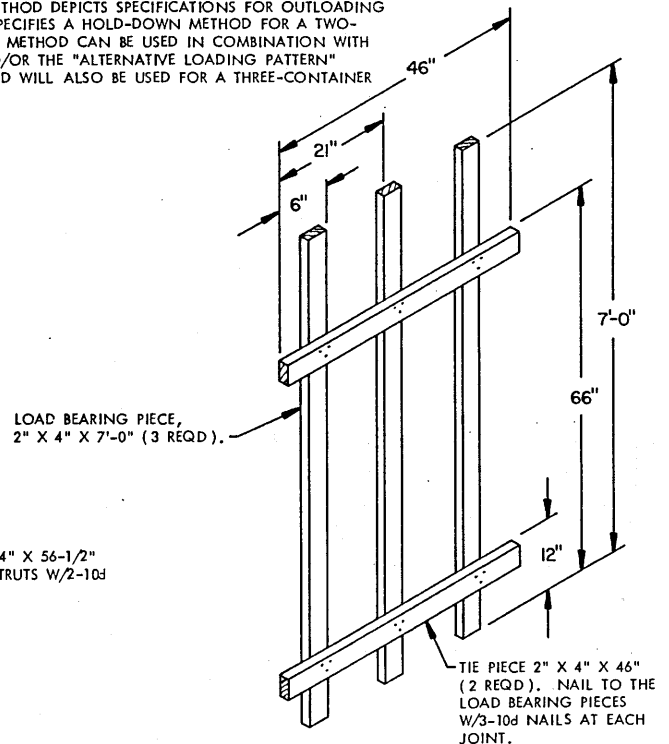
UPRIGHT, 2" X 4" X 11-1/2" (2 REQD.); NAIL TO THE STRUTS W/2-10d NAILS AT EACH JOINT.

LONGITUDINAL PIECE, 2" X 4" X 56-1/2" (4 REQD.). NAIL TO THE STRUTS W/2-10d NAILS AT EACH END.

STRUT, 2" X 4" X 8-1/2" (4 REQD.).

**FILLER**

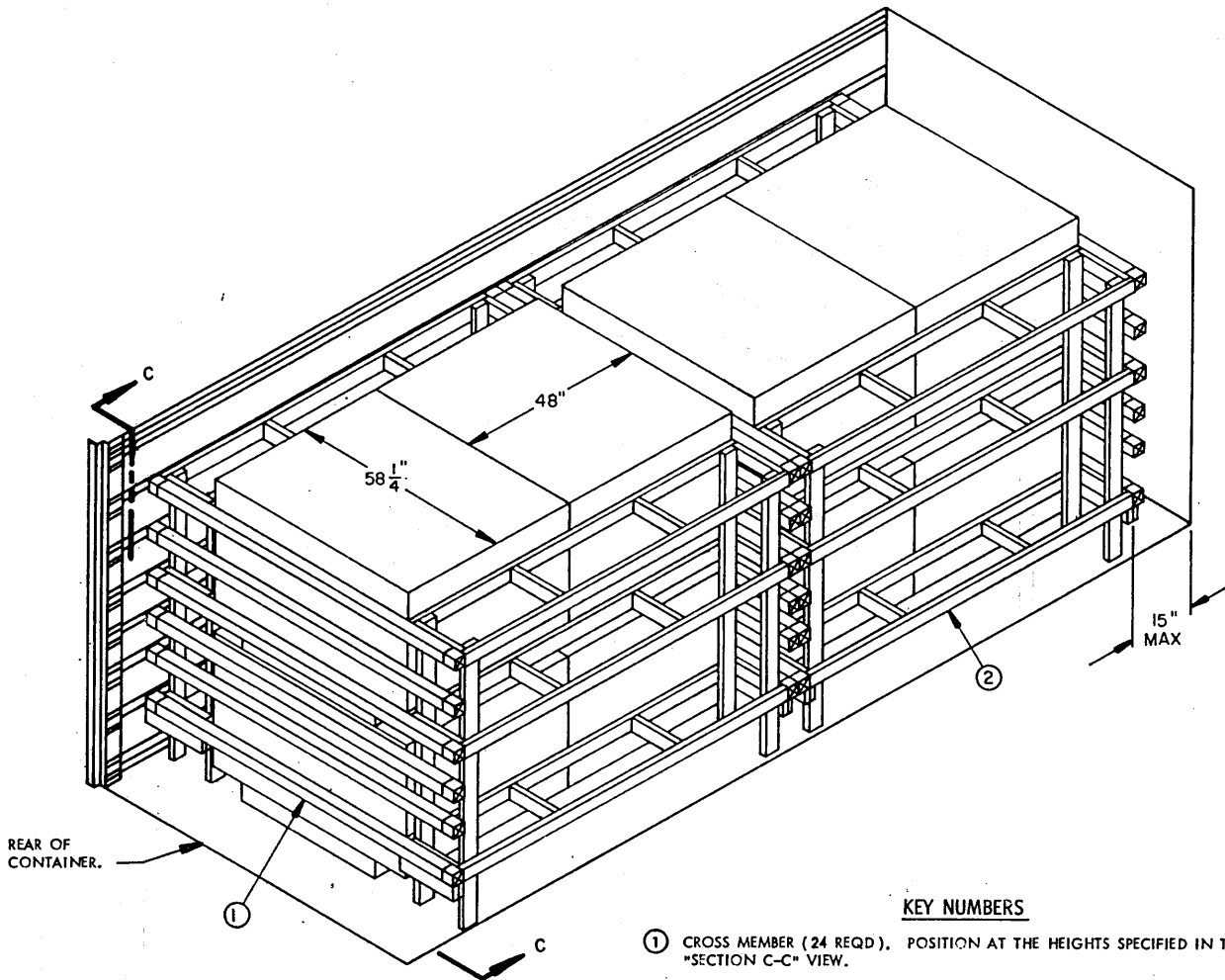
SEE SPECIAL NOTE 2 ON PAGE 5.



LOAD BEARING PIECE, 2" X 4" X 7'-0" (3 REQD.).

TIE PIECE 2" X 4" X 46" (2 REQD.). NAIL TO THE LOAD BEARING PIECES W/3-10d NAILS AT EACH JOINT.

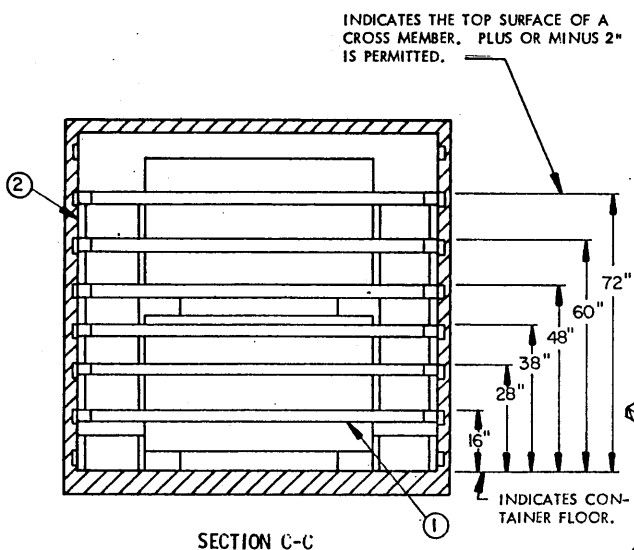
**RETAINER GATE**



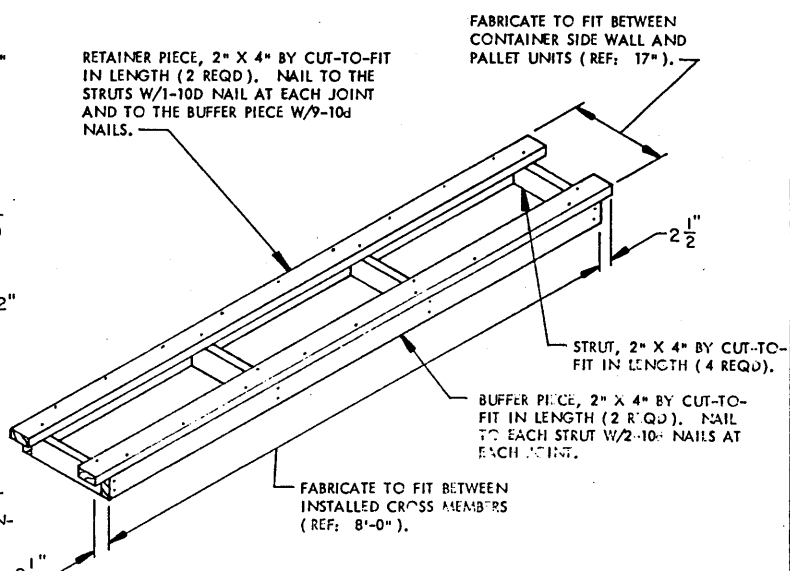
**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① CROSS MEMBER (24 REQD). POSITION AT THE HEIGHTS SPECIFIED IN THE "SECTION C-C" VIEW.
- ② SPACER ASSEMBLY (4 REQD). SEE "SPACER ASSEMBLY B" DETAIL ON PAGE 9.



**SECTION C-C**

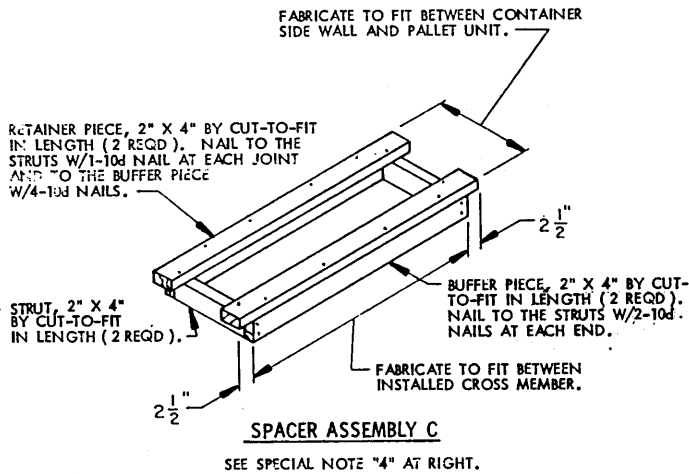


**SPACER ASSEMBLY D**

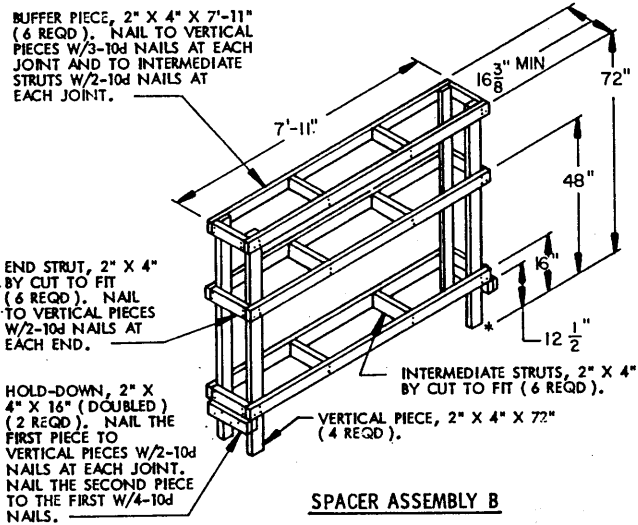
SEE SPECIAL NOTE "A" ON PAGE 9.

**PALLETIZED LOAD FOR 4-WIDE BY 3-HIGH UNIT**

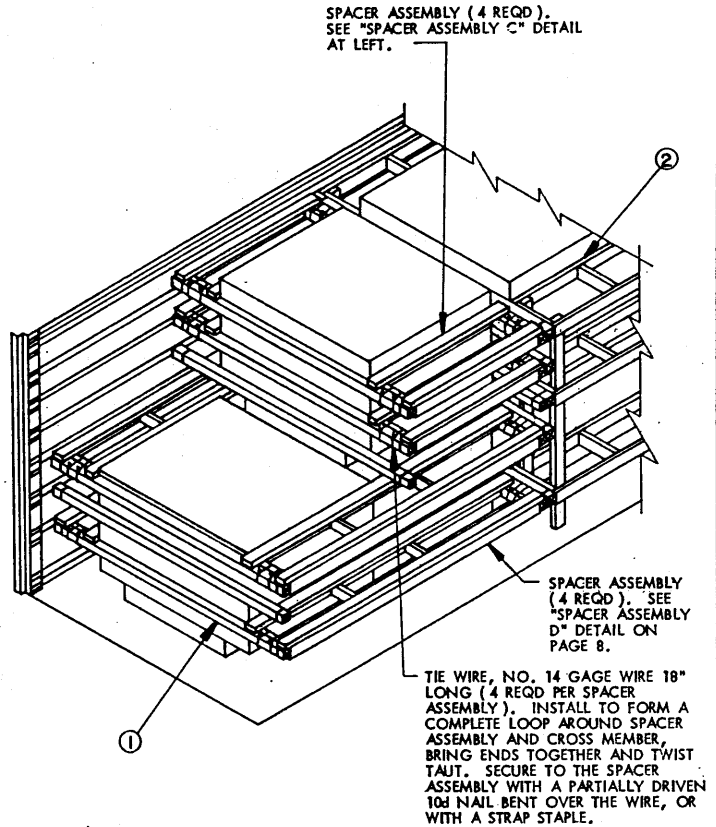




**SPACER ASSEMBLY C**  
SEE SPECIAL NOTE "4" AT RIGHT.



**SPACER ASSEMBLY B**



**ALTERNATIVE LOADING PATTERN**

THE DETAIL ABOVE SPECIFIED A BLOCKING METHOD TO BE USED IN A "REDUCED-LOAD" CONTAINER LOAD.

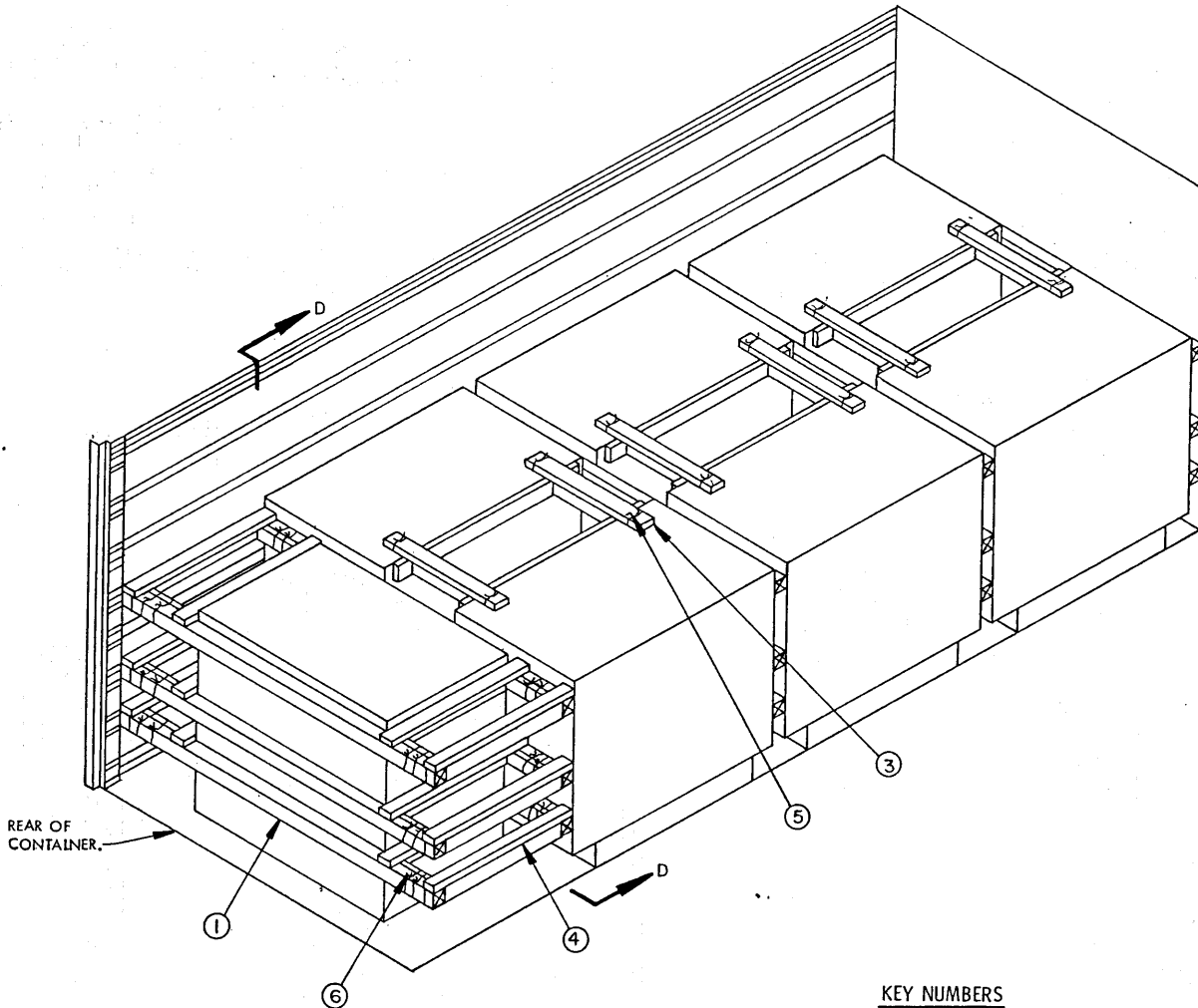
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	361	241
NAILS	NO. REQD	POUNDS
10d (3")	400	7
CROSS MEMBER	-----	24 REQD

**SPECIAL NOTES:**

1. THE LOAD AS SHOWN ON PAGE 8 DEPICTS A 8-PALLET UNIT LOAD IN A MILVAN CONTAINER.
2. IF A CONTAINER IS TO BE LOADED WITH LESS UNITS THAN SHOWN ON PAGE 8, PALLET UNITS SHOULD BE ELIMINATED FROM THE REAR OF THE LOAD. FOR EXAMPLE, IF ONLY SEVEN UNITS ARE TO BE LOADED, THE METHOD SPECIFIED BY THE "ALTERNATIVE LOADING PATTERN" SHOWN BELOW MUST BE APPLIED. SEE SPECIAL NOTE 5 BELOW.
3. SPECIFICATIONS FOR THE "BASIC LOAD" SHOWN ON PAGE 8, AND THE "ALTERNATIVE LOADING PATTERN" SHOWN BELOW WILL BE APPLIED SEPARATELY OR IN COMBINATION TO BLOCK AND BRACE OTHER THAN EIGHT-UNIT LOADS.
4. THE SPACER ASSEMBLIES NEED NOT BE FABRICATED FOR A DRIVE FIT, THE ASSEMBLY SHOULD BE FABRICATED SO THAT IT CAN BE EASILY INSTALLED. HOWEVER, IT MUST FIT TIGHT ENOUGH SO AS TO NOT ALLOW MORE THAN ONE-HALF INCH (1/2") VOID ACROSS THE WIDTH OF A BRACED LOAD.
5. WHEN A "REDUCED-LOAD" CONTAINER LOAD IS TO BE SHIPPED, CARE MUST BE TAKEN TO INSURE THAT THE CENTER OF GRAVITY OF THE REDUCED-LOAD IS WITHIN 12" (FORE OR AFT) OF THE CENTER OF GRAVITY OF THE CONTAINER.

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	8	8,360 LBS
DUNNAGE	-----	482 LBS
CONTAINER	-----	5,700 LBS
TOTAL GROSS WEIGHT	-----	14,542 LBS



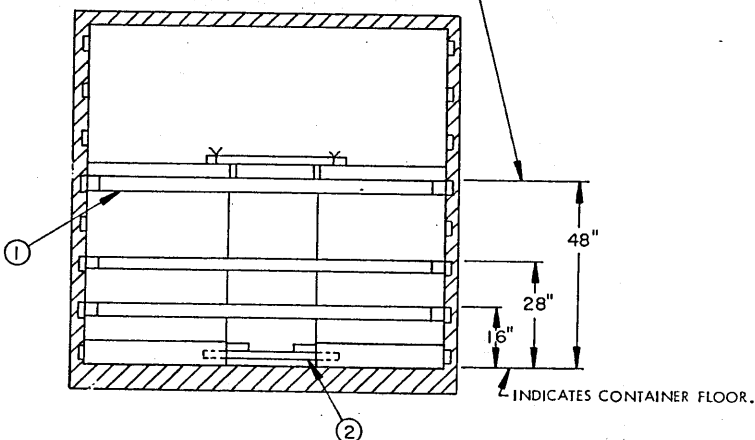
REAR OF CONTAINER.

ISOMETRIC VIEW

KEY NUMBERS

- ① CROSS MEMBER (15 REQD). POSITION AT THE HEIGHTS SPECIFIED IN THE "SECTION D-D" VIEW.
- ② ANTI-SWAY BRACE (3 REQD). SEE THE "ANTI-SWAY BRACE" DETAIL ON PAGE 11.
- ③ TOP ANTI-SWAY BRACE (3 REQD). SEE "TOP ANTI-SWAY BRACE" DETAIL ON PAGE 11.
- ④ SPACER ASSEMBLY (6 REQD). SEE "SPACER ASSEMBLY C" DETAIL ON PAGE 9.
- ⑤ TIE WIRE, NO. 14 GAGE WIRE 12" LONG (12 REQD). INSTALL THE WIRE TO FORM A COMPLETE LOOP AROUND THE LOAD STRAP OF THE UNIT AND THE RETAINER PIECE OF THE TOP ANTI-SWAY BRACE, BRING ENDS TOGETHER AND TWIST TAUT.
- ⑥ TIE WIRE, NO. 14 GAGE WIRE 18" LONG (24 REQD). INSTALL TO FORM A COMPLETE LOOP AROUND THE SPACER ASSEMBLY AND THE CROSS MEMBER, BRING THE ENDS TOGETHER AND TWIST TAUT. SECURE TO THE SPACER ASSEMBLY WITH A STRAP STAPLE.

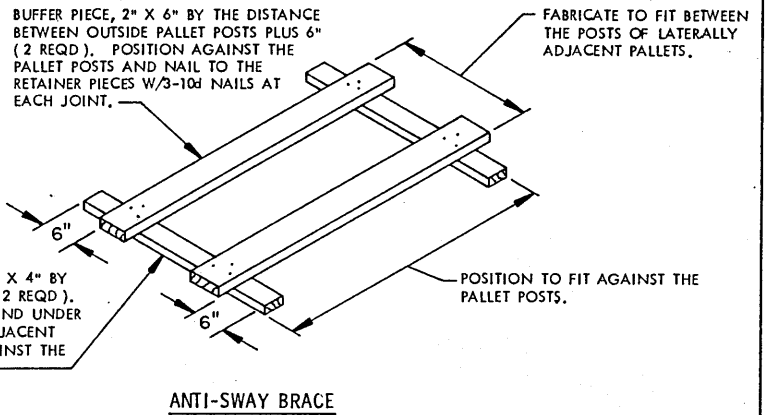
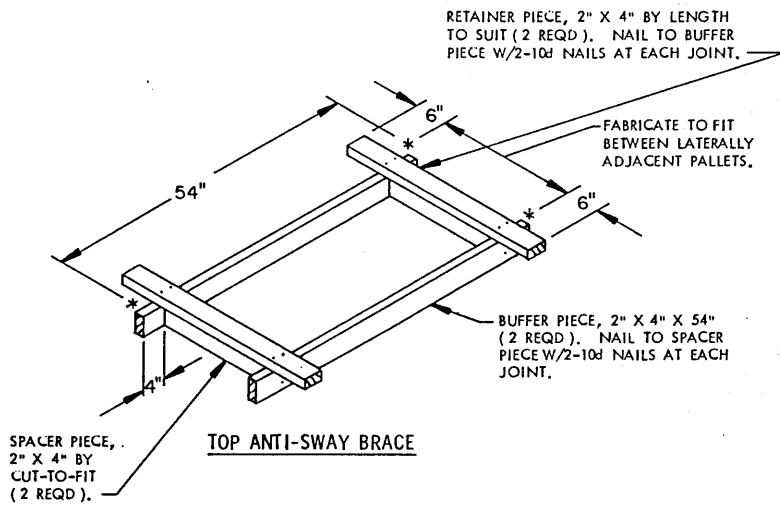
INDICATES THE TOP SURFACE OF A CROSS MEMBER. PLUS OR MINUS 2" IS PERMITTED.



SECTION D-D

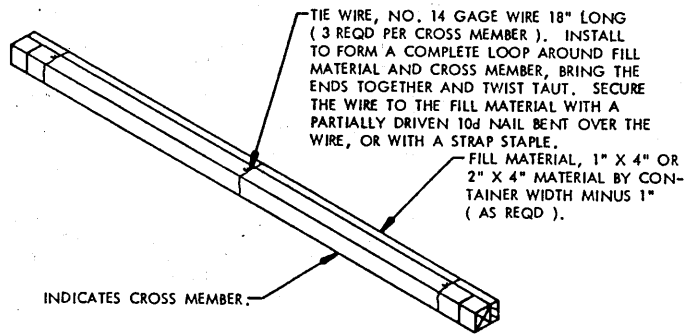
**SPECIAL NOTES:**

1. THE LOAD AS SHOWN ON PAGE 10 DEPICTS A 7-PALLET UNIT LOAD IN A MILVAN CONTAINER.
2. IF A CONTAINER IS TO BE LOADED WITH LESS UNITS THAN SHOWN ON PAGE 10, PALLET UNITS SHOULD BE ELIMINATED FROM THE REAR OF THE LOAD, AND THE LOAD SHOULD BE SHIFTED SO THAT THE CENTER OF GRAVITY OF THE LOAD IS WITHIN 12" (FORE OR AFT) OF THE CENTER OF GRAVITY OF THE CONTAINER.
3. THE SPACER ASSEMBLIES NEED NOT BE FABRICATED FOR A DRIVE FIT, THE ASSEMBLY SHOULD BE FABRICATED SO THAT IT CAN BE EASILY INSTALLED. HOWEVER, IT MUST FIT TIGHT ENOUGH SO AS TO NOT ALLOW MORE THAN A 1/2" VOID ACROSS THE WIDTH OF A LOAD BAY.



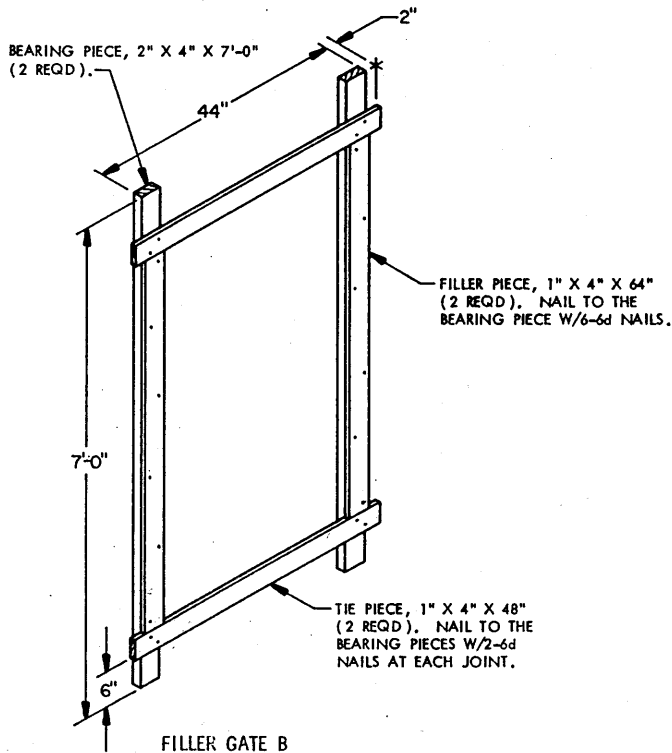
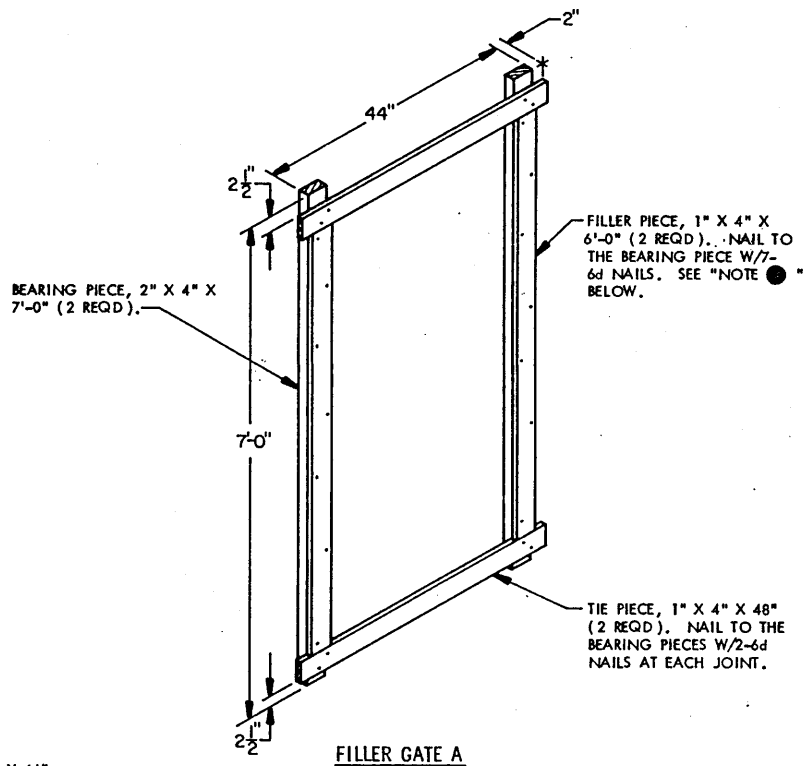
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	160	107
2" X 6"	22	22
NAILS	NO. REQD	POUNDS
10d (3")	204	3-1/4
WIRE, 14 GAGE	44' REQD	1 LB
CROSS MEMBER		15 REQD

LOAD AS SHOWN		
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	7	7,784 LBS
DUNNAGE		262 LBS
CONTAINER		5,700 LBS
TOTAL WEIGHT		13,746 LBS



**FILL DETAIL**

THIS DETAIL DEPICTS METHOD OF POSITIONING FILL MATERIAL BETWEEN CROSS MEMBER AND LADING, WHEN THE VOID BETWEEN THE TWO IS GREATER THAN ONE INCH (1") FOR LONGITUDINAL BRACING OR ONE-HALF INCH (1/2") FOR VERTICAL BRACING. THIS METHOD CAN BE USED ON THE SIDE OF A LONGITUDINAL-BRACING CROSS MEMBER OR ON THE BOTTOM OF A HOLD-DOWN CROSS MEMBER.



**NOTE "●":**

ALTERNATIVE LOADING PATTERNS FOR UNPALLETIZED LOADS WILL REQUIRE A FILLER GATE OF VARYING HEIGHTS. THIS IS ACHIEVED BY CHANGING THE LENGTHS OF THE FILLER PIECE AND THE BEARING PIECE IN THE GATE AS FOLLOWS:

	FILLER PIECE	BEARING PIECE
2 CONTAINER HIGH STACK	12"	24"
3 CONTAINER HIGH STACK	24"	36"
4 CONTAINER HIGH STACK	36"	48"
5 CONTAINER HIGH STACK	48"	60"
6 CONTAINER HIGH STACK	60"	72"

WHEN STEEL STRAPPING IS USED FOR A HOLD-DOWN, AS SHOWN ON PAGES 6 AND 7, THE HEIGHT OF THE GATE WILL BE DECREASED BY 12".