

*J.A. Fleckman*

DATE 8/19/91

# HELLFIRE

## LOADING AND BRACING WITH WOODEN DUNNAGE IN COMMERCIAL CONTAINERS OF GUIDED MISSILE PACKED ONE PER METAL CONTAINER, UNPALLETIZED AND PALLETIZED (9 PER PALLET)

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- 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 CARRIERS. SEE GENERAL NOTE "N" ON PAGE 2.

U.S. ARMY MATERIEL COMMAND DRAWING			
APPROVED, U.S. ARMY MISSILE COMMAND  <i>Carl W. Honea</i>	DRAFTSMAN	TECHNICIAN	ENGINEER
	P. BELLICH	R. HAYNES	
APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND  <i>William F Ernst</i>	VALIDATION ENGINEERING DIVISION	TRANSPORTATION ENGINEERING DIVISION	LOGISTICS ENGINEERING OFFICE
	<i>JFK</i>	<i>W. Jernika</i>	<i>W.F. Ernst</i>
NOVEMBER 1982			
U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL	CLASS	DIVISION	DRAWING
REVISION NO. 1	DECEMBER 1991		FILE
SEE THE REVISION LISTING ON PAGE 2	19	48	8150 GM15HF2

DO NOT SCALE

## GENERAL NOTES

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1, AND ALIGNMENTS TM 743-200-1, (CHAPTER 5).
- B. THE OUTLOADING PROCEDURES SPECIFIED WITHIN THIS DOCUMENT ARE APPLICABLE TO THE HELLFIRE GUIDED MISSILE PACKED ONE (1) EACH PER UNSEALED, SEALED OR STRETCHED SHIPPING AND STORAGE CONTAINER OR NINE (9) EACH PER PALLET UNIT. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CONTAINER WITH MISSILE COMPONENTS; SUBSEQUENT REFERENCE TO PALLET UNIT HEREIN MEANS THE PALLET UNIT WITH NINE (9) MISSILE CONTAINERS.
- C. FOR DETAIL OF THE UNSEALED CONTAINER, SEE APN DRAWING 13012182 AND THE "UNSEALED CONTAINER UNIT" DETAIL ON PAGE 3.
- CONTAINER DIMENSIONS - 76-1/4" LONG BY 15-1/2" WIDE BY 16-1/2" HIGH  
GROSS WEIGHT ----- 175 POUNDS (APPROX)  
CUBE ----- 11.3 CUBIC FEET
- FOR DETAIL OF THE SEALED CONTAINER, SEE APN DRAWING 13155079 AND THE "SEALED CONTAINER UNIT" DETAIL ON PAGE 3.
- CONTAINER DIMENSIONS - 76" LONG BY 14-5/8" WIDE BY 16-1/2" HIGH  
GROSS WEIGHT ----- 185 POUNDS (APPROX)  
CUBE ----- 10.6 CUBIC FEET
- SEE THE "STRETCHED CONTAINER UNIT" DETAIL ON PAGE 3.
- CONTAINER DIMENSIONS - 84" LONG BY 14-5/8" WIDE BY 16" HIGH  
GROSS WEIGHT ----- 203 POUNDS  
CUBE ----- 11.4 CUBIC FEET
- D. FOR DETAIL OF THE PALLET UNITS, SEE US ARMY DARCOM DRAWING 1948-5250-GM20HF1 AND THE "PALLET UNIT" DETAILS ON PAGE 4.
- UNSEALED PALLET UNIT DIMENSIONS - 76-1/4" WIDE BY 46-1/2" LONG BY 53" HIGH  
GROSS WEIGHT ----- 1,669 POUNDS (APPROX)  
CUBIC ----- 109.8 CUBIC FEET
- SEALED PALLET UNIT DIMENSIONS --- 76" WIDE BY 44-3/8" LONG BY 53" HIGH  
GROSS WEIGHT ----- 1,749 POUNDS (APPROX)  
CUBE ----- 103.4 CUBIC FEET
- STRETCHED PALLET UNIT DIMENSIONS - 84" WIDE BY 44-3/8" LONG BY 53" HIGH  
GROSS WEIGHT ----- 1,921 POUNDS (APPROX)  
CUBE ----- 114.3 CUBIC FEET
- E. THIS ITEM IS A DOT CLASS "A" EXPLOSIVE. THESE PROCEDURES CAN ALSO BE UTILIZED FOR THE SHIPMENT OF THE CONTAINERS WHEN THEY ARE LOADED WITH AN ITEM OTHER THAN THE SPECIFIED GUIDED MISSILE, OR WHEN THEY ARE EMPTY.
- F. THE LOAD AS SHOWN IS BASED ON A 4,700 POUND 20' LONG BY 8' WIDE BY 8'-6" HIGH INTERMODAL COMMERCIAL CONTAINER WITH INSIDE DIMENSIONS OF 19'-4" LONG BY 92" WIDE BY 95" HIGH. THE LOAD IS DESIGNED FOR TRAILER/CONTAINER-ON-FLAT-CAR (T/TOFC) SHIPMENT, HOWEVER, THE LOAD AS DESIGNED CAN ALSO BE MOVED BY OTHER SURFACE MODES OF TRANSPORT. NOTICE: OTHER CONTAINERS OF THE SAME DESIGN CONFIGURATION CAN BE USED.
- G. WHEN LOADING MISSILE CONTAINERS OR PALLET UNITS, THEY ARE TO BE POSITIONED SO AS TO ACHIEVE A TIGHT LOAD (TIGHT AGAINST THE CONTAINER FRONT WALL AND/OR THE FORWARD BLOCKING ASSEMBLY AND SIDE FILL ASSEMBLY).

(CONTINUED AT RIGHT)

## MATERIAL SPECIFICATIONS

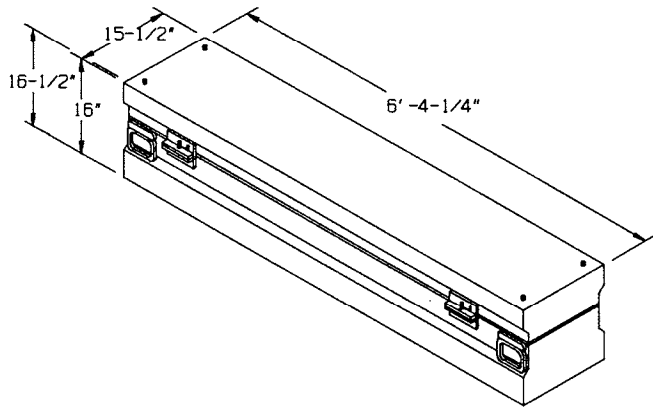
LUMBER ----- : TM 743-200-1, DUNNAGE LUMBER, FED SPEC MM-L-751  
NAILS ----- : FED SPEC FF-N-105; COMMON  
WIRE ----- : FED SPEC QQ-W-461.

## (GENERAL NOTES CONTINUED)

- G. ALTHOUGH A TOTAL OF ONE AND ONE-HALF INCHES (1-1/2") OF UNBLOCKED SPACE ACROSS THE WIDTH OF A LOAD BAY IS PERMITTED, LATERAL VOIDS WITH THE LOAD ARE TO BE HELD TO A MINIMUM. EXCESSIVE SLACK CAN BE ELIMINATED FROM A LOAD BY LAMINATING ADDITIONAL PIECES OF APPROPRIATE THICKNESS TO THE LOAD BEARING PIECES ON THE SIDE FILL ASSEMBLIES ON ONE OR BOTH SIDES OF THE CONTAINER. NAIL EACH ADDITIONAL PIECE TO A LOAD BEARING PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE THICKNESS OF THE VERTICAL PIECES MAY BE ADJUSTED AS REQUIRED TO FACILITATE VARIANCE IN THE LENGTH OF THE CONTAINER AND/OR PALLET UNIT.
- H. 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.
- J. A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES OR WHEN LAMINATING DUNNAGE.
- K. IN SOME CONTAINERS, SUCH AS SOME ALL STEEL CONTAINERS, THERE IS A SLOT AT THE CORNERS OF THE FORWARD WALL. A PIECE OF DUNNAGE MATERIAL MUST BE LAMINATED TO THE BUFFER PIECES ON THE FORWARD BLOCKING ASSEMBLY TO PROVIDE A FLAT SURFACE FOR THE 2" X 6" BUFFER PIECES. A PIECE OF 2" X 4, 2" X 3", OR A SPECIAL WIDTH PIECE CUT-TO-FIT CAN BE USED. THIS FILL PIECE WILL BE NAILED WITH ONE APPROPRIATELY SIZED NAIL EVERY 12". THIS PIECE IS NOT REQUIRED WHEN THE FRONT WALL OF THE CONTAINER IS SMOOTH AND FLAT.
- L. CAUTION: DO NOT NAIL DUNNAGE MATERIAL TO THE CONTAINER WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.
- M. PORTIONS OF THE CONTAINER DEPICTED WITH THIS DRAWING, SUCH AS ONE OF THE SIDE WALLS, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.
- N. REQUIREMENTS CITED WITHIN THE BUREAU OF EXPLOSIVES PAMPHLET 6C APPLY WHEN THE SHIPMENT MOVES BY TRAILER/CONTAINER-ON-FLAT-CAR (T/COFC). SPECIAL T/COFC NOTES FOLLOW.
1. A LOADED CONTAINER MUST BE ON A CHASSIS EQUIPPED WITH TWO BOGIE ASSEMBLIES WHEN BEING MOVED IN TOFC SERVICES.
  2. THE LOAD LIMIT OF A T/COFC RAIL CAR 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.
- O. DURING INTRASTATE AND/OR INTERSTATE MOVES BY MOTOR CARRIER, A PROPER CHASSIS/MODIFIED FLAT BED TRAILER MUST BE USED TO PRECLUDE VIOLATION OF ONE OR MORE "WEIGHT LAWS" APPLICABLE TO THE STATE OR STATES INVOLVED.
- P. WHEN LOADING MISSILE CONTAINERS OR PALLET UNITS, THEY ARE TO BE POSITIONED SO AS TO ACHIEVE A TIGHT LOAD (TIGHT AGAINST THE CONTAINER FRONT WALL AND/OR THE FORWARD BLOCKING ASSEMBLY AND SIDE FILL ASSEMBLY).

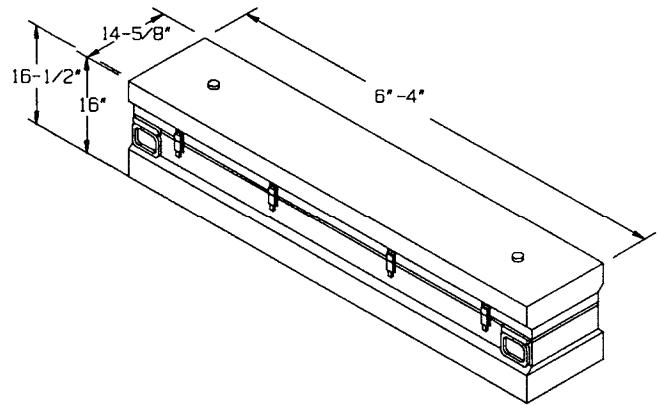
## REVISION

REVISION NO. 1, DATED DECEMBER 1991, CONSISTS OF:  
ADDING PROCEDURES FOR STRETCHED CONTAINER AND PALLET UNIT.



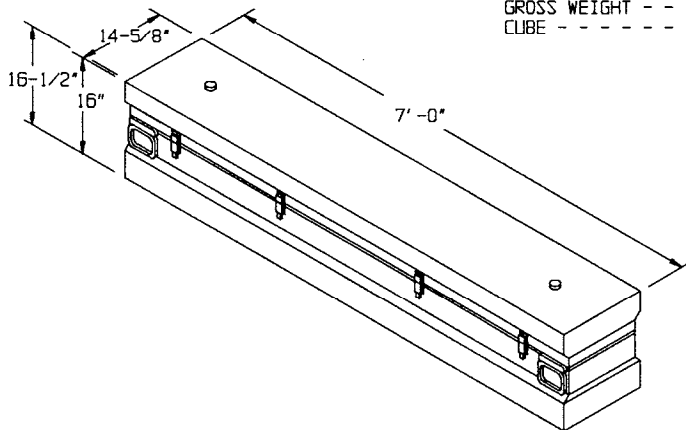
**UNSEALED CONTAINER**

GROSS WEIGHT - - - - - 175 LBS (APPROX)  
 CUBE - - - - - 11.3 CUBIC FEET



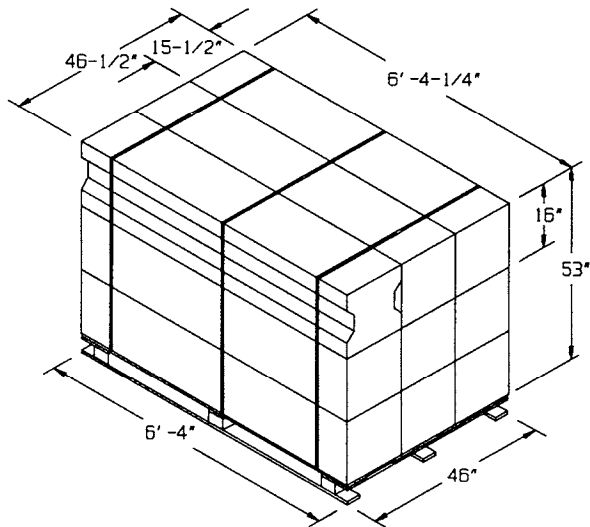
**SEALED CONTAINER**

GROSS WEIGHT - - - - - 185 LBS (APPROX)  
 CUBE - - - - - 10.6 CUBIC FEET



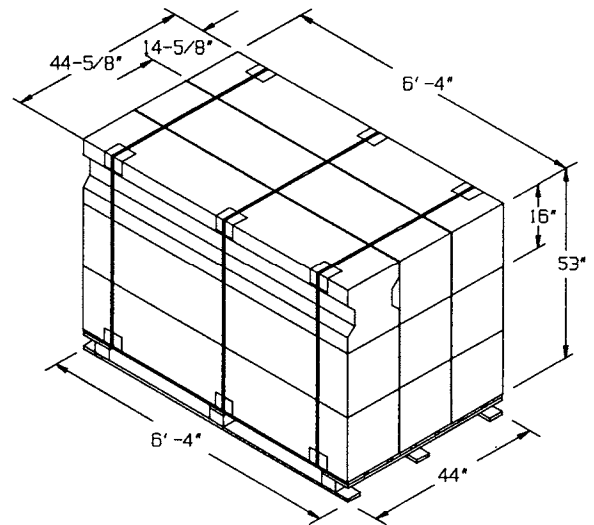
**STRETCHED CONTAINER**

GROSS WEIGHT - - - - - 203 LBS (APPROX)  
 CUBE - - - - - 11.4 CUBIC FEET



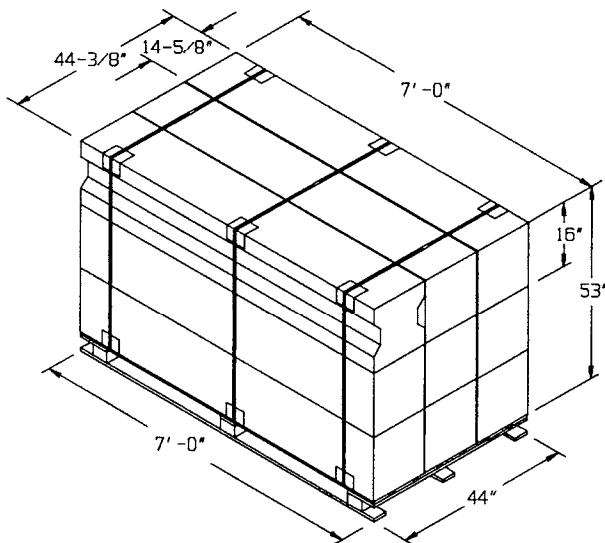
**UNSEALED PALLET UNIT**

GROSS WEIGHT - - - - - 1,669 LBS (APPROX)  
 CUBE - - - - - 108.7 CUBIC FEET



**SEALED PALLET UNIT**

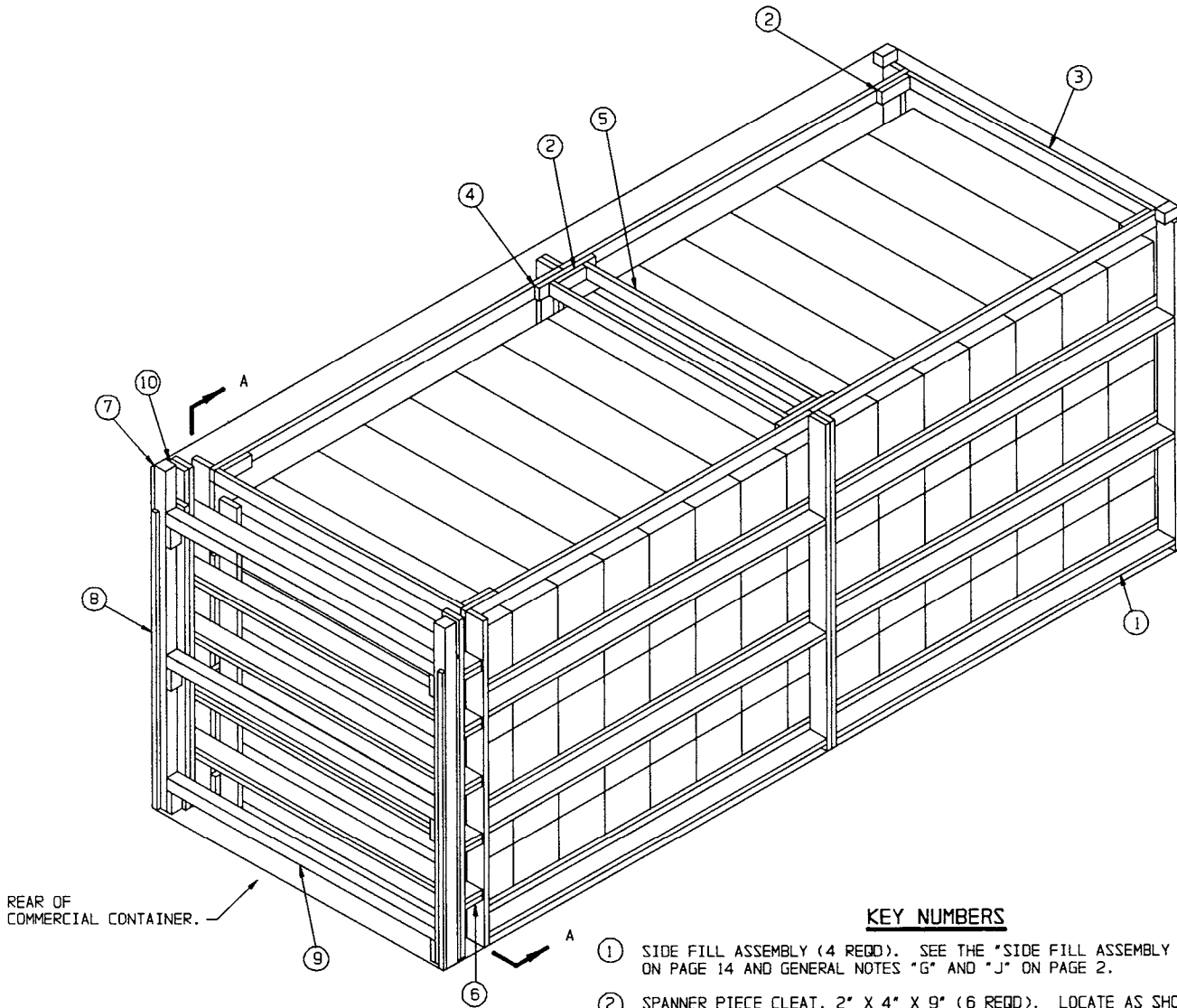
GROSS WEIGHT - - - - - 1,749 LBS (APPROX)  
 CUBE - - - - - 103.4 CUBIC FEET



**STRETCHED PALLET UNIT**

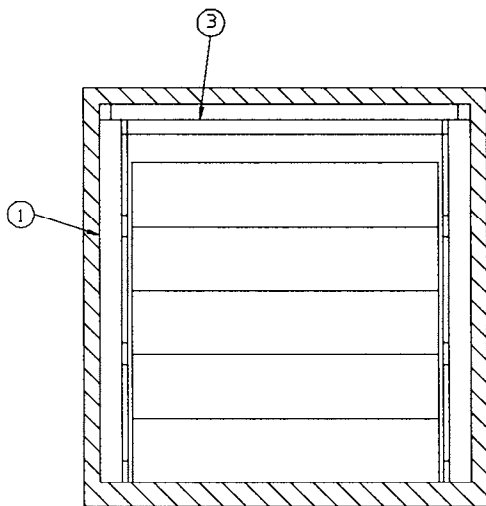
GROSS WEIGHT - - - - - 1,921 LBS (APPROX)  
 CUBE - - - - - 114.3 CUBIC FEET

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REAR OF  
COMMERCIAL CONTAINER.

**ISOMETRIC VIEW**



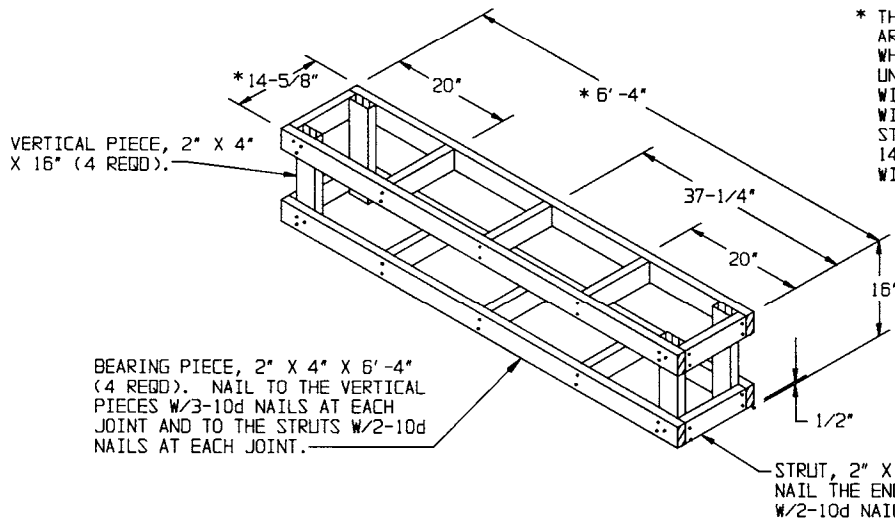
**SECTION A-A**

**KEY NUMBERS**

- ① SIDE FILL ASSEMBLY (4 REQD). SEE THE "SIDE FILL ASSEMBLY A" DETAIL ON PAGE 14 AND GENERAL NOTES "G" AND "J" ON PAGE 2.
- ② SPANNER PIECE CLEAT, 2" X 4" X 9" (6 REQD). LOCATE AS SHOWN AND NAIL TO PIECE MARKED ④ AND/OR SIDE BLOCKING ASSEMBLY A W/3-8d NAILS.
- ③ SPANNER PIECE, 2" X 4" MATERIAL, CUT TO A LENGTH THAT WILL PROVIDE FOR A TIGHT FIT (REF: 6'-6") (2 REQD). TOENAIL TO EACH SIDE BLOCKING ASSEMBLY A W/2-10d NAILS AT EACH END.
- ④ SPLICE FOR TIE PIECES, 2" X 4" X 18" (2 REQD). NAIL TO TWO LONGITUDINALLY ADJACENT TIE PIECES OF THE SIDE BLOCKING ASSEMBLIES W/3-10d NAILS AT EACH END.
- ⑤ SPANNER PIECE, 2" X 4" MATERIAL, CUT TO A LENGTH THAT WILL PROVIDE FOR A TIGHT FIT (REF: 6'-3") (2 REQD). TOENAIL TO PIECES MARKED ④ W/2-12d NAILS AT EACH END.
- ⑥ REAR BLOCKING ASSEMBLY (1 REQD). SEE THE "REAR BLOCKING ASSEMBLY A" DETAIL ON PAGE 14 AND GENERAL NOTE "G" ON PAGE 2.
- ⑦ DOOR POST VERTICAL (2 REQD). SEE THE "DOOR POST VERTICAL A" DETAIL ON PAGE 16 AND "DETAIL A" ON PAGE 17.
- ⑧ DOOR POST VERTICAL RETAINER (2 REQD). SEE THE DETAIL AND "VIEW A" ON PAGE 18. NAIL THROUGH THE HOLES INTO THE DOOR POST VERTICAL W/4-10d NAILS.
- ⑨ DOOR SPANNER, 4" X 4" MATERIAL, CUT TO A LENGTH THAT WILL PROVIDE FOR A DRIVE FIT (REF: 7'-1-3/8") (3 REQD). TOENAIL TO THE 4" X 4" DOOR POST VERTICAL PIECES W/2-12d NAILS AT EACH END. SEE THE "BEVEL CUT" DETAIL ON PAGE 17.
- ⑩ FILL MATERIAL, 6" WIDE BY 7'-0" LONG MATERIAL (AS REQD). NAIL TO THE BUFFER PIECE OF THE REAR BLOCKING ASSEMBLY W/7-10d NAILS. CAUTION: DO NOT NAIL TO THE DOOR POST VERTICAL, PIECE MARKED ⑦. SEE "DETAIL C" ON PAGE 17.

SPECIAL NOTES:

1. THE LOAD AS SHOWN ON PAGE 6 DEPICTS A 75-CONTAINER (SEALED) LOAD IN A COMMERCIAL CONTAINER.
2. IF A COMMERCIAL CONTAINER IS TO BE LOADED WITH LESS MISSILE CONTAINERS THAN SHOWN IN THE LOAD VIEW ON PAGE 6, A "FILLER ASSEMBLY" AS SHOWN ON THIS PAGE MAY BE USED TO FILL THE VOID IN A LOAD FOR AN OMITTED CONTAINER. THE FILLER ASSEMBLY MUST BE USED IN THE TOP LAYER ONLY, AND NEAR THE CENTER OF THE LOAD, IF POSSIBLE.
3. THE SAME PROCEDURES WILL BE USED FOR SHIPMENT OF UNSEALED CONTAINERS, HOWEVER, ONLY 14 STACKS OF 5 CONTAINERS FOR A TOTAL LOAD OF 70 CONTAINERS WILL BE SHIPPED.



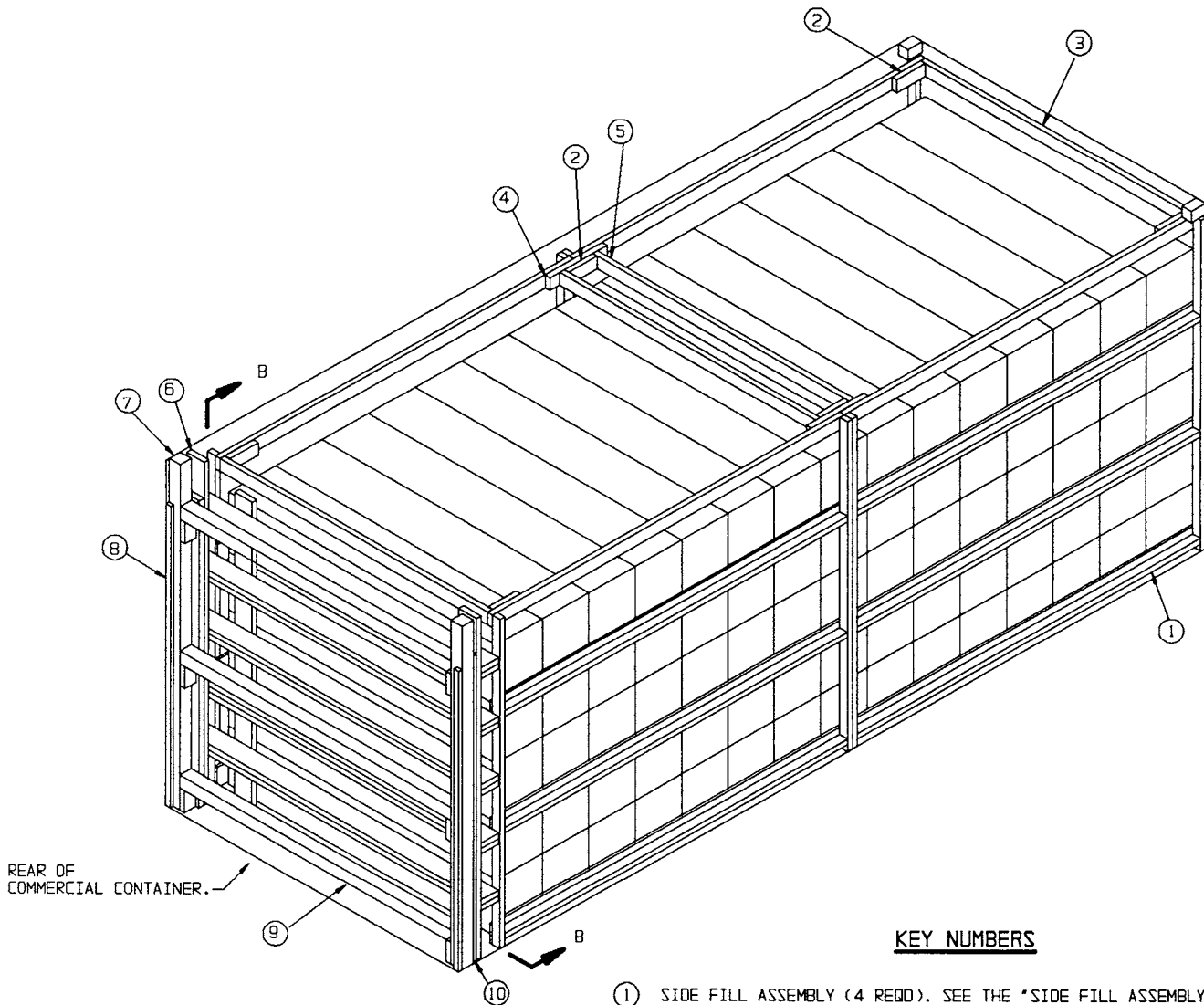
\* THE DIMENSIONS SHOWN ON THE DETAIL AT LEFT ARE FOR USE WITH THE SEALED CONTAINER. WHEN USING THE FILLER TO REPLACE AN UNSEALED CONTAINER, THE 6'-4" DIMENSION WILL BE 6'-4-1/4" AND THE 14-5/8" DIMENSION WILL BE 15-1/2". THESE DIMENSIONS FOR THE STRETCHED CONTAINER WILL BE 7'-0" AND 14-5/8" RESPECTIVELY. ALL OTHER DIMENSIONS WILL REMAIN UNCHANGED.

FILLER ASSEMBLY

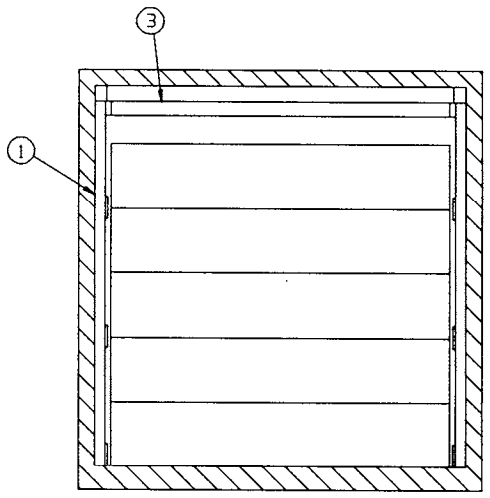
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	73	49
2" X 6"	382	382
4" X 4"	38	51
NAILS	NO. REQD	POUNDS
8d (2-1/2")	18	1/4
10d (3")	297	4-3/4
12d (3-1/4")	20	1/2
DOOR POST VERTICAL RETAINER -- 2 REQD -- 64 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
MISSILE CONTAINER-	75	13,875 LBS
DUNNAGE		1,034 LBS
COMMERCIAL CONTAINER		4,700 LBS
<b>TOTAL WEIGHT</b>		<b>19,609 LBS (APPROX)</b>



**ISOMETRIC VIEW**



**SECTION B-B**

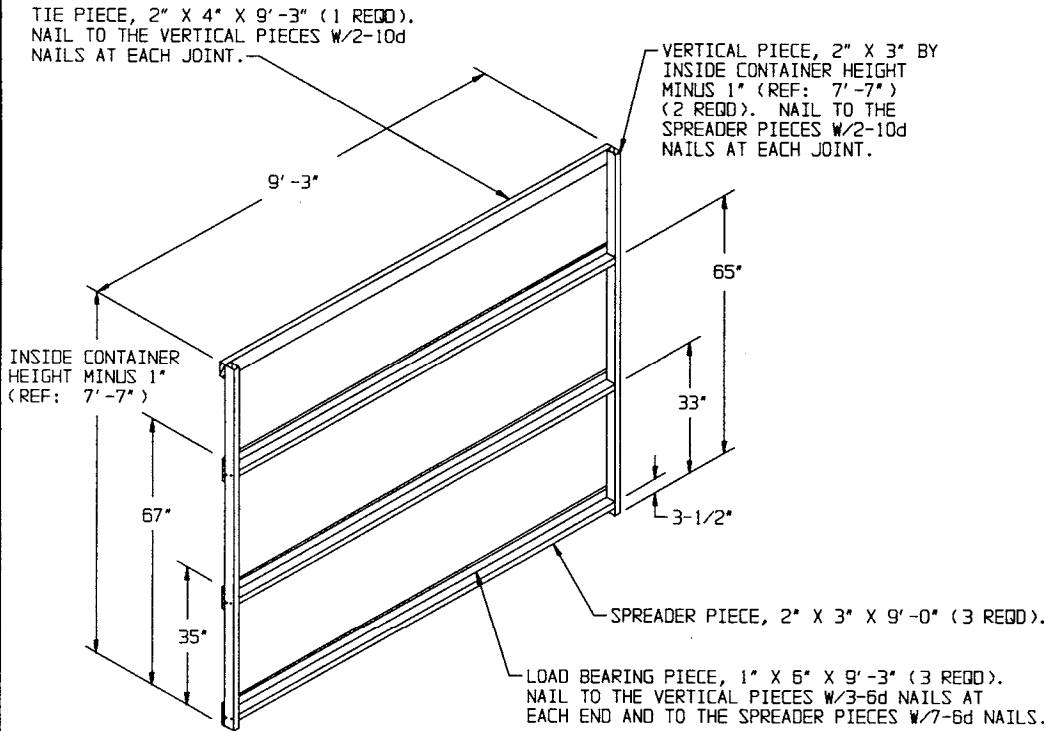
**KEY NUMBERS**

- ① SIDE FILL ASSEMBLY (4 REQD). SEE THE "SIDE FILL ASSEMBLY B" DETAIL ON PAGE 9 AND GENERAL NOTES "G" AND "J" ON PAGE 2.
- ② SPANNER PIECE CLEAT, 2" X 4" X 9" (6 REQD). LOCATE AS SHOWN AND NAIL TO PIECE MARKED ④ AND/OR SIDE BLOCKING ASSEMBLY A W/3-8d NAILS.
- ③ SPANNER PIECE, 2" X 4" MATERIAL, CUT TO A LENGTH THAT WILL PROVIDE FOR A TIGHT FIT (REF: 7'-0") (2 REQD). TOENAIL TO EACH SIDE BLOCKING ASSEMBLY A W/2-10d NAILS AT EACH END.
- ④ SPLICE FOR TIE PIECES, 2" X 4" X 18" (2 REQD). NAIL TO TWO LONGITUDINALLY ADJACENT TIE PIECES OF THE SIDE BLOCKING ASSEMBLIES W/3-10d NAILS AT EACH END.
- ⑤ SPANNER PIECE, 2" X 4" MATERIAL, CUT TO A LENGTH THAT WILL PROVIDE FOR A TIGHT FIT (REF: 6'-9") (2 REQD). TOENAIL TO PIECES MARKED ④ W/2-12d NAILS AT EACH END.
- ⑥ REAR BLOCKING ASSEMBLY (1 REQD). SEE THE "REAR BLOCKING ASSEMBLY A" DETAIL ON PAGE 14 AND GENERAL NOTE "J" ON PAGE 2.
- ⑦ DOOR POST VERTICAL (2 REQD). SEE THE "DOOR POST VERTICAL A" DETAIL ON PAGE 16 AND "DETAIL A" ON PAGE 17.
- ⑧ DOOR POST VERTICAL RETAINER (2 REQD). SEE THE DETAIL AND "VIEW A" ON PAGE 18. NAIL THROUGH THE HOLES INTO THE DOOR POST VERTICAL W/4-10d NAILS.
- ⑨ DOOR SPANNER, 4" X 4" MATERIAL, CUT TO A LENGTH THAT WILL PROVIDE FOR A DRIVE FIT (REF: 7'-1-3/8") (3 REQD). TOENAIL TO THE 4" X 4" DOOR POST VERTICAL PIECES W/2-12d NAILS AT EACH END. SEE THE "BEVEL CUT" DETAIL ON PAGE 17.
- ⑩ FILL MATERIAL, 6" WIDE BY 7'-0" LONG MATERIAL (AS REQD). NAIL TO THE BUFFER PIECE OF THE REAR BLOCKING ASSEMBLY W/7-10d NAILS. CAUTION: DO NOT NAIL TO THE DOOR POST VERTICAL, PIECE MARKED ⑦. SEE "DETAIL C" ON PAGE 17.



**SPECIAL NOTES:**

1. THE LOAD AS SHOWN ON PAGE 8 DEPICTS A 75-CONTAINER (SEALED) LOAD IN A COMMERCIAL CONTAINER.
2. IF A COMMERCIAL CONTAINER IS TO BE LOADED WITH LESS MISSILE CONTAINERS THAN SHOWN IN THE LOAD VIEW ON PAGE 8, A "FILLER ASSEMBLY" AS SHOWN ON PAGE 7 MAY BE USED TO FILL THE VOID IN A LOAD FOR AN OMITTED CONTAINER. THE FILLER ASSEMBLY MUST BE USED IN THE TOP LAYER ONLY, AND NEAR THE CENTER OF THE LOAD, IF POSSIBLE.



**SIDE FILL ASSEMBLY B**

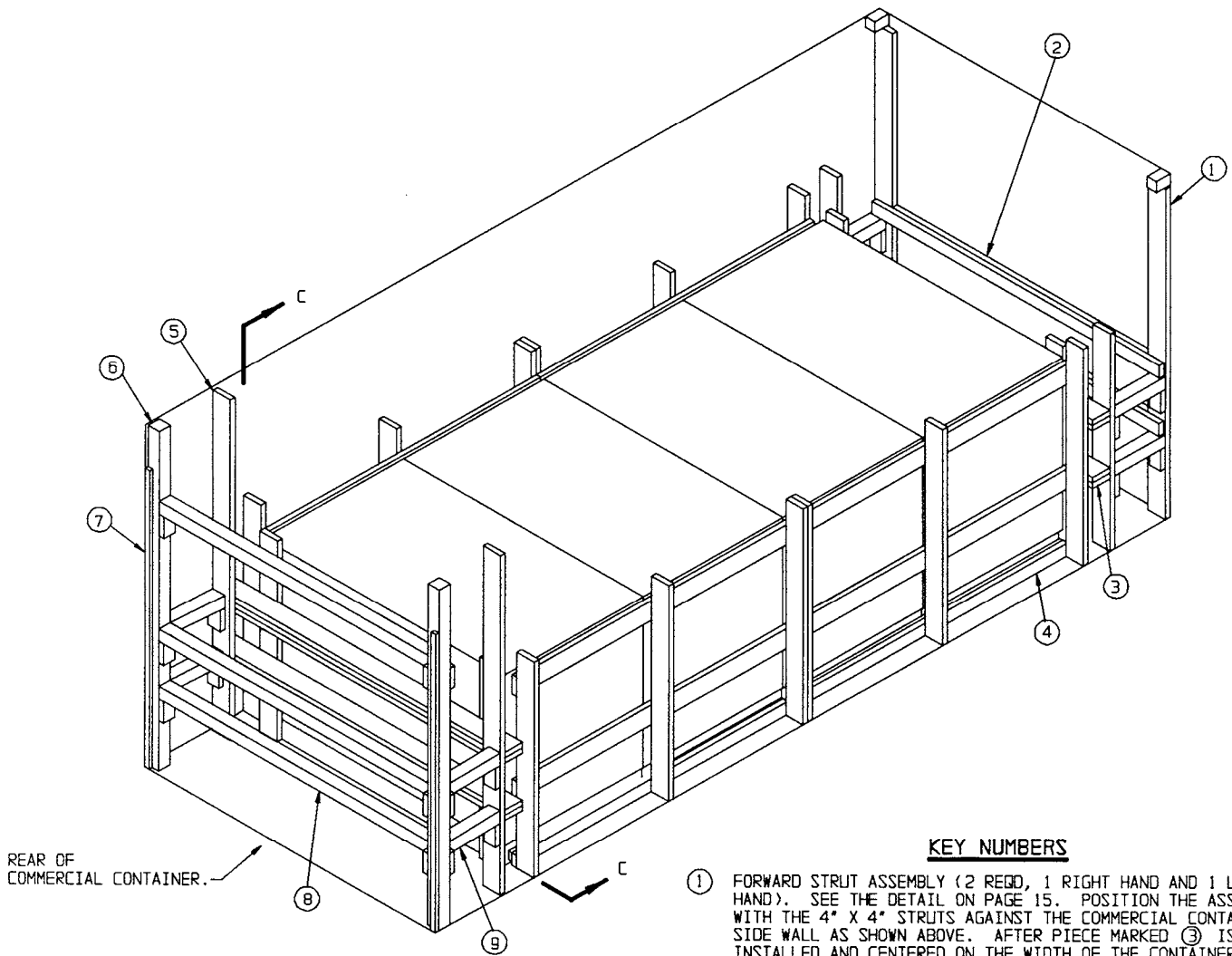
THE SIDE BLOCKING ASSEMBLY MUST BE ADJUSTED AS REQUIRED SO AS TO NOT ALLOW MORE THAN ONE AND ONE-HALF (1-1/2") VOID ACROSS THE WIDTH OF A BRACED LOAD. THE WIDTH AND/OR THE THICKNESS OF THE VERTICAL PIECES, AND/OR LOAD BEARING PIECES SHOULD BE ADJUSTED AS REQUIRED.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	111	56
2" X 3"	169	85
2" X 4"	73	49
2" X 6"	120	120
4" X 4"	37	50
NAILS	NO. REQD	POUNDS
6d (2")	72	1/2
8d (2-1/2")	18	1/4
10d (3")	233	3-1/4
12d (3-1/4")	20	1/2
DOOR POST VERTICAL RETAINER -- 2 REQD -- 64 LBS		

**LOAD AS SHOWN**

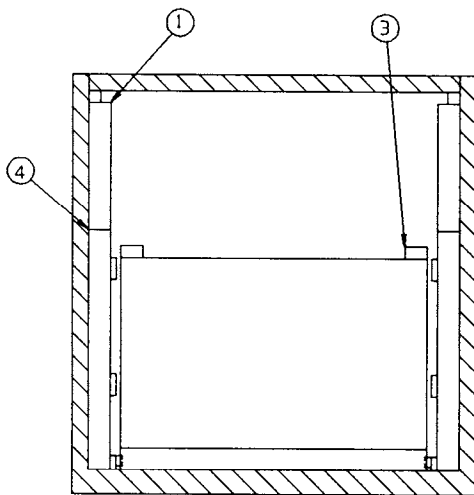
ITEM	QUANTITY	WEIGHT (APPROX)
MISSILE CONTAINER	-- 75	15,225 LBS
DUNNAGE	-----	789 LBS
COMMERCIAL CONTAINER	-----	4,700 LBS

TOTAL WEIGHT ----- 20,714 LBS (APPROX)



REAR OF  
COMMERCIAL CONTAINER.

ISOMETRIC VIEW



SECTION C-C

KEY NUMBERS

- ① FORWARD STRUT ASSEMBLY (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE DETAIL ON PAGE 15. POSITION THE ASSEMBLY WITH THE 4" X 4" STRUTS AGAINST THE COMMERCIAL CONTAINER SIDE WALL AS SHOWN ABOVE. AFTER PIECE MARKED ③ IS INSTALLED AND CENTERED ON THE WIDTH OF THE CONTAINER, NAIL THROUGH THE REAR BUFFER PIECE ON EACH FORWARD STRUT ASSEMBLY INTO EACH BEAM ASSEMBLY OF PIECE MARKED ③ W/2-12d NAILS AT EACH JOINT. SEE SPECIAL NOTE 2 ON PAGE 11.
- ② SPREADER ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 16. POSITION AS SHOWN, IMMEDIATELY ABOVE THE TOP AND BOTTOM STRUTS AND NAIL TO THE FORWARD STRUT ASSEMBLY W/2-10d NAILS AT EACH JOINT.
- ③ FORWARD BLOCKING ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 15 AND GENERAL NOTE "J" ON PAGE 2.
- ④ SIDE FILL ASSEMBLY (4 REQD). SEE THE "SIDE FILL ASSEMBLY C" DETAIL ON PAGE 15 AND GENERAL NOTE "G" ON PAGE 2.
- ⑤ REAR BLOCKING ASSEMBLY (1 REQD). SEE THE "REAR BLOCKING ASSEMBLY B" DETAIL ON PAGE 16.
- ⑥ DOOR POST VERTICAL (2 REQD). SEE THE "DOOR POST VERTICAL B" DETAIL ON PAGE 16 AND "DETAIL B" ON PAGE 17.
- ⑦ DOOR POST VERTICAL RETAINER (2 REQD). SEE THE DETAIL AND "VIEW A" ON PAGE 18. NAIL THROUGH THE HOLES INTO THE DOOR POST VERTICAL W/4-10d NAILS.
- ⑧ DOOR SPANNER, 4" X 4" MATERIAL, CUT TO A LENGTH THAT WILL PROVIDE FOR A DRIVE FIT (REF: 7'-1-3/8") (3 REQD). TOENAIL TO THE 4" X 4" DOOR POST VERTICAL PIECES W/2-12d NAILS AT EACH END. SEE THE "BEVEL CUT" DETAIL ON PAGE 17. AFTER INSTALLING THE BOTTOM AND THE TOP DOOR SPANNERS, THE STRUTS, PIECES MARKED ⑨ ARE TO BE INSTALLED.
- ⑨ STRUT, 4" X 4" BY CUT TO FIT (4 REQD). TOENAIL TO THE BUFFER PIECES OF THE REAR BLOCKING ASSEMBLY AND TO THE DOOR POST VERTICAL W/2-12d NAILS AT EACH END. SEE THE "BEVEL CUT" DETAIL ON PAGE 17.

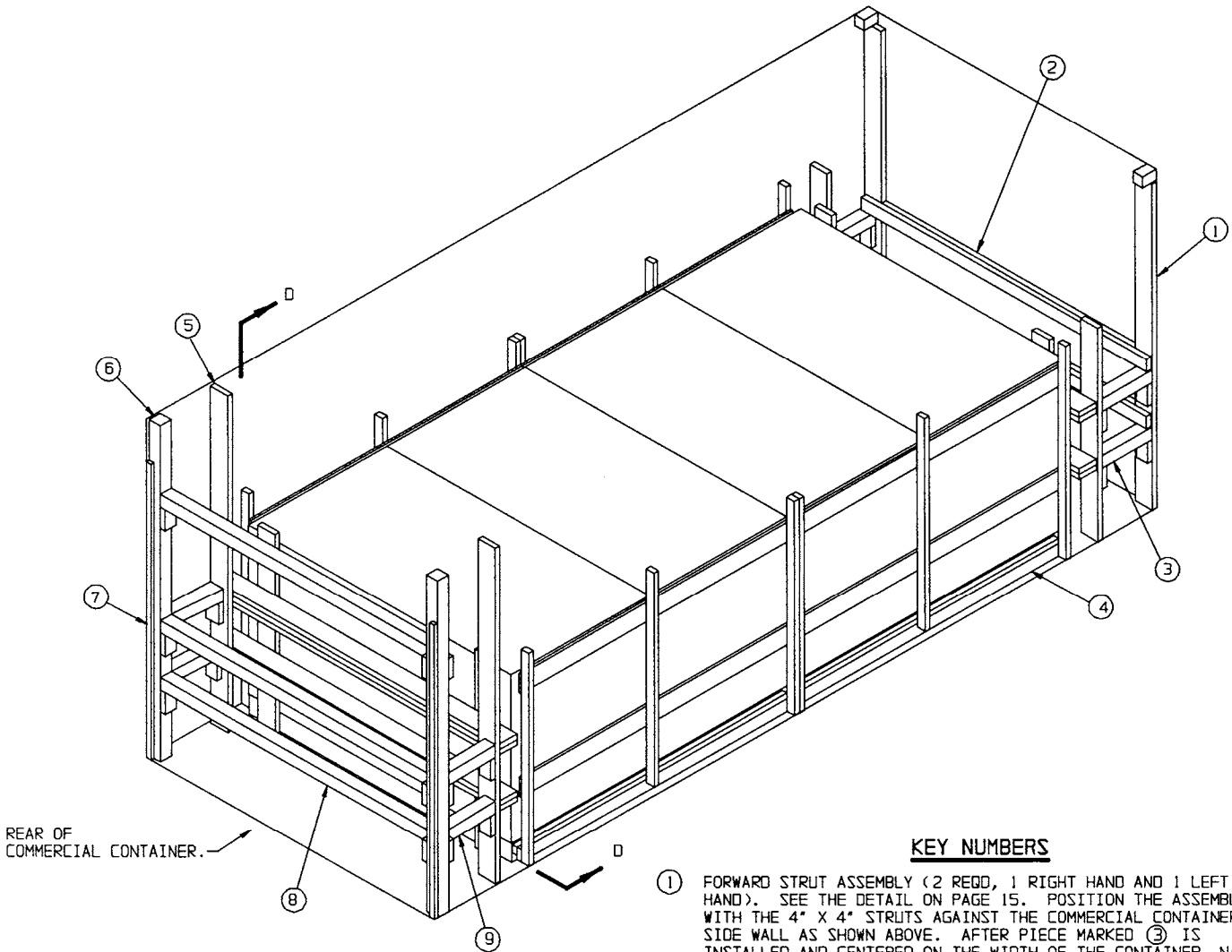
SPECIAL NOTES:

1. THE LOAD AS SHOWN ON PAGE 10 DEPICTS A 4-PALLET UNIT (SEALED) LOAD IN A COMMERCIAL CONTAINER.
2. WHEN A COMMERCIAL CONTAINER IS TO BE LOADED WITH A REDUCED QUANTITY OF PALLET UNITS, THE LENGTHWISE CENTER OF GRAVITY OF A LOAD MUST BE WITHIN 12", IN EITHER DIRECTION, OF THE MIDPOINT OF THE COMMERCIAL CONTAINER. THE LENGTH OF THE STRUTS IN THE FORWARD STRUT ASSEMBLIES, PIECES MARKED ①, AND THE LENGTH OF THE STRUTS, PIECES MARKED ②, MUST BE ADJUSTED AS NECESSARY TO MEET THIS CENTER OF GRAVITY REQUIREMENT.
3. THE SAME PROCEDURES MAY ALSO BE USED FOR SHIPMENT OF PALLETIZED UNSEALED CONTAINERS, HOWEVER, THE LENGTH OF THE SIDE BLOCKING ASSEMBLIES WILL HAVE TO BE INCREASED.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" x 3"	29	20
2" x 4"	69	42
2" x 6"	236	236
4" x 4"	48	64
NAILS	NO. REQD	POUNDS
8d (2-1/2")	36	1/2
10d (3")	258	4
12d (3-1/4")	28	1/2
DOOR POST VERTICAL RETAINER -- 2 REQD -- 64 LBS		

LOAD AS SHOWN

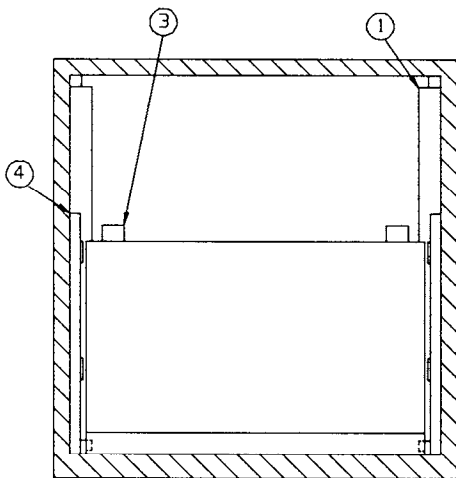
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	4	6,676 LBS
DUNNAGE		829 LBS
COMMERCIAL CONTAINER		4,700 LBS
TOTAL WEIGHT		12,205 LBS (APPROX)



**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① FORWARD STRUT ASSEMBLY (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE DETAIL ON PAGE 15. POSITION THE ASSEMBLY WITH THE 4" X 4" STRUTS AGAINST THE COMMERCIAL CONTAINER SIDE WALL AS SHOWN ABOVE. AFTER PIECE MARKED ③ IS INSTALLED AND CENTERED ON THE WIDTH OF THE CONTAINER, NAIL THROUGH THE REAR BUFFER PIECE ON EACH FORWARD STRUT ASSEMBLY INTO EACH BEAM ASSEMBLY OF PIECE MARKED ③ W/2-12d NAILS AT EACH JOINT. SEE SPECIAL NOTE 2 ON PAGE 13.
- ② SPREADER ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 16. POSITION AS SHOWN, IMMEDIATELY ABOVE THE TOP AND BOTTOM STRUTS AND NAIL TO THE FORWARD STRUT ASSEMBLY W/2-10d NAILS AT EACH JOINT.
- ③ FORWARD BLOCKING ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 15 AND GENERAL NOTE "J" ON PAGE 2.
- ④ SIDE FILL ASSEMBLY (4 REQD). SEE THE "SIDE FILL ASSEMBLY D" DETAIL ON PAGE 13 AND GENERAL NOTE "G" ON PAGE 2.
- ⑤ REAR BLOCKING ASSEMBLY (1 REQD). SEE THE "REAR BLOCKING ASSEMBLY B" DETAIL ON PAGE 16.
- ⑥ DOOR POST VERTICAL (2 REQD). SEE THE "DOOR POST VERTICAL B" DETAIL ON PAGE 16 AND "DETAIL B" ON PAGE 17.
- ⑦ DOOR POST VERTICAL RETAINER (2 REQD). SEE THE DETAIL AND "VIEW A" ON PAGE 18. NAIL THROUGH THE HOLES INTO THE DOOR POST VERTICAL W/4-10d NAILS.
- ⑧ DOOR SPANNER, 4" X 4" MATERIAL, CUT TO A LENGTH THAT WILL PROVIDE FOR A DRIVE FIT (REF: 7'-1-3/8") (3 REQD). TOENAIL TO THE 4" X 4" DOOR POST VERTICAL PIECES W/2-12d NAILS AT EACH END. SEE THE "BEVEL CUT" DETAIL ON PAGE 17. AFTER INSTALLING THE BOTTOM AND THE TOP DOOR SPANNERS, THE STRUTS, PIECES MARKED ⑨ ARE TO BE INSTALLED.
- ⑨ STRUT, 4" X 4" BY CUT TO FIT (4 REQD). TOENAIL TO THE BUFFER PIECES OF THE REAR BLOCKING ASSEMBLY AND TO THE DOOR POST VERTICAL W/2-12d NAILS AT EACH END. SEE THE "BEVEL CUT" DETAIL ON PAGE 17.

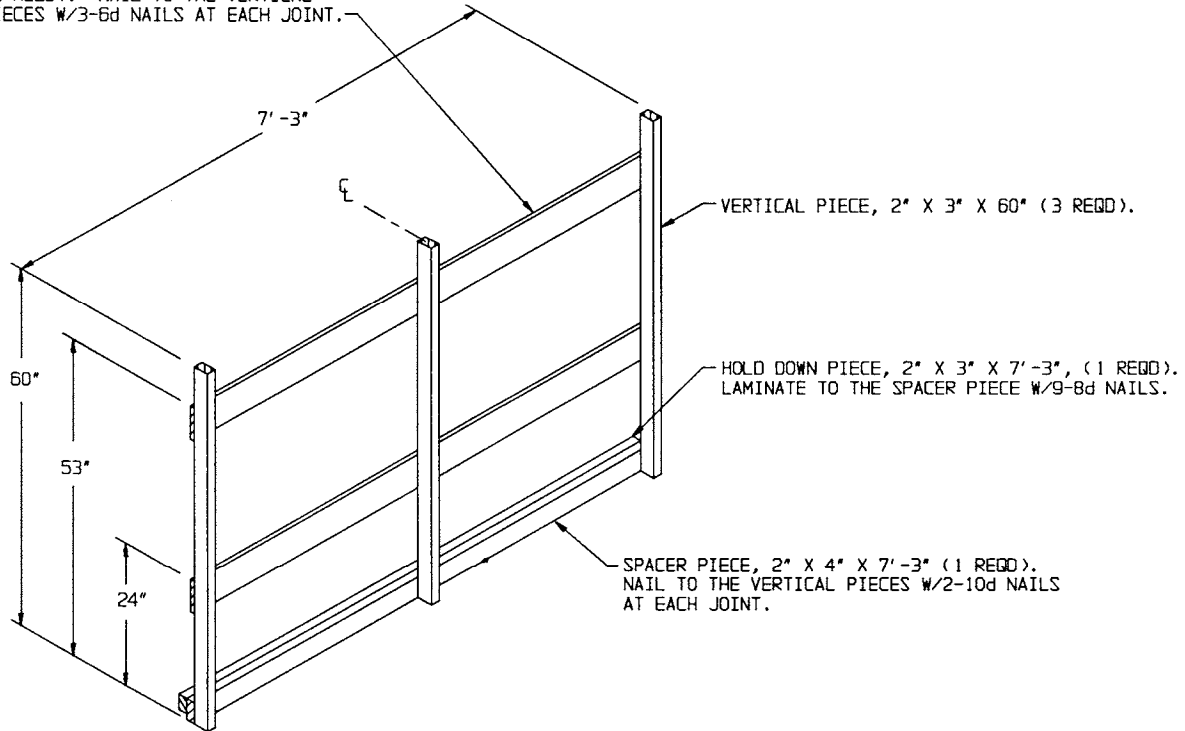


**SECTION D-D**

SPECIAL NOTES:

1. THE LOAD AS SHOWN ON PAGE 12 DEPICTS A 4-PALLET UNIT (STRETCHED) LOAD IN A COMMERCIAL CONTAINER.
2. WHEN A COMMERCIAL CONTAINER IS TO BE LOADED WITH A REDUCED QUANTITY OF PALLET UNITS, THE LENGTHWISE CENTER OF GRAVITY OF A LOAD MUST BE WITHIN 12", IN EITHER DIRECTION, OF THE MIDPOINT OF THE COMMERCIAL CONTAINER. THE LENGTH OF THE STRUTS IN THE FORWARD STRUT ASSEMBLIES, PIECES MARKED ①, AND THE LENGTH OF THE STRUTS, PIECES MARKED ②, MUST BE ADJUSTED AS NECESSARY TO MEET THIS CENTER OF GRAVITY REQUIREMENT.

LOAD BEARING PIECE, 1" X 6" X 7'-3"  
(2 REQD). NAIL TO THE VERTICAL  
PIECES W/3-6d NAILS AT EACH JOINT.



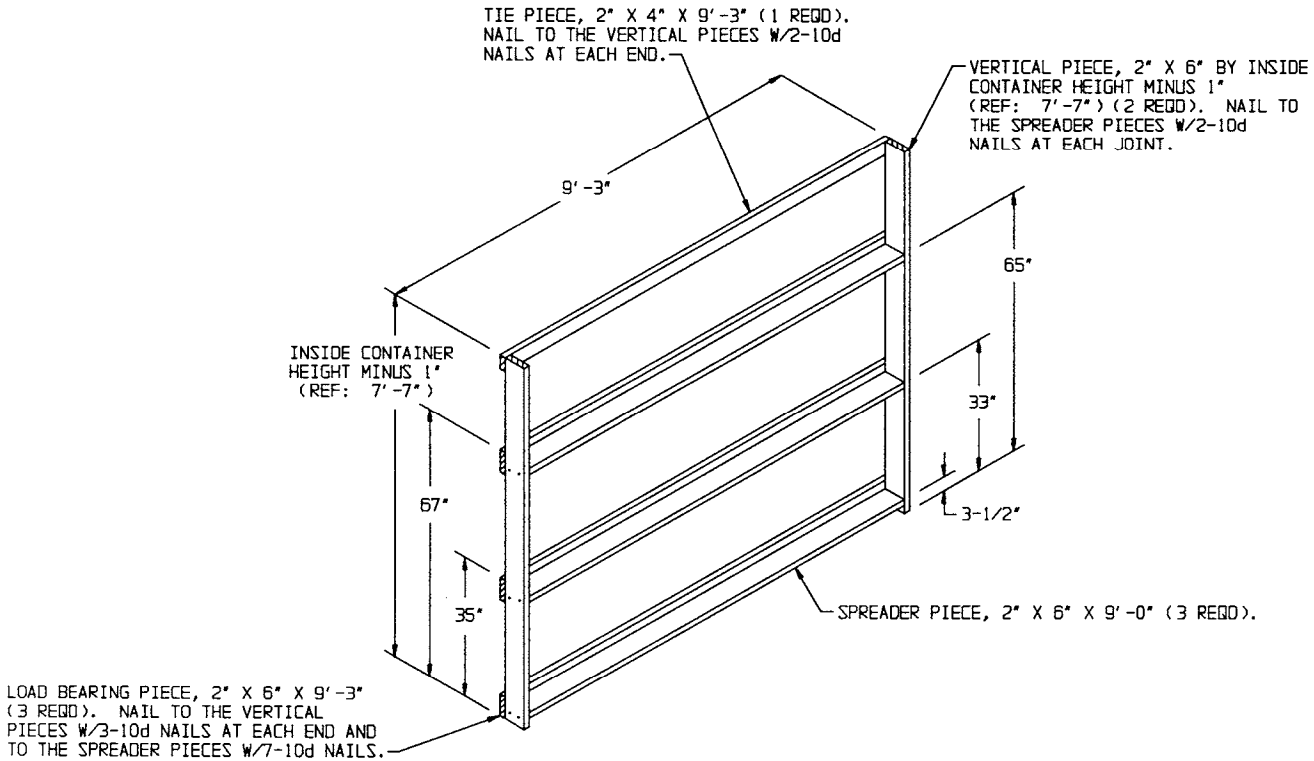
SIDE FILL ASSEMBLY D

THIS SIDE BLOCKING ASSEMBLY MUST BE ADJUSTED AS REQUIRED SO AS TO NOT ALLOW MORE THAN ONE AND ONE-HALF INCHES (1-1/2") VOID ACROSS THE WIDTH OF A BRACED LOAD. THE WIDTH AND/OR THE THICKNESS OF THE VERTICAL PIECES AND/OR LOAD BEARING PIECES SHOULD BE ADJUSTED AS REQUIRED.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	58	29
2" X 3"	89	45
2" X 4"	69	46
2" X 6"	121	121
4" X 4"	48	64
NAILS	NO. REQD	POUNDS
6d (2")	72	1/2
8d (2-1/2")	36	1/2
10d (3")	275	4-1/4
12d (3-1/4")	28	1/2
DOOR POST VERTICAL RETAINER -- 2 REQD -- 64 LBS		

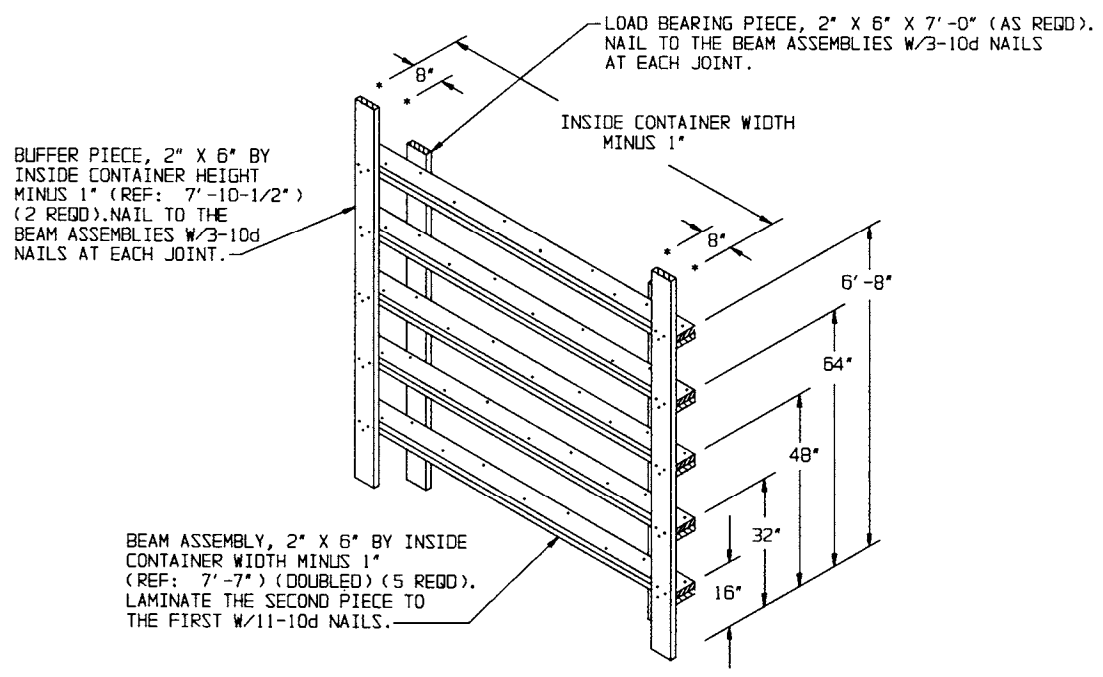
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	4	7,684 LBS
DUNNAGE		679 LBS
COMMERCIAL CONTAINER		4,700 LBS
TOTAL WEIGHT		13,063 LBS (APPROX)



**SIDE FILL ASSEMBLY A**

THE SIDE BLOCKING ASSEMBLY MUST BE ADJUSTED AS REQUIRED SO AS TO NOT ALLOW MORE THAN ONE AND ONE-HALF INCHES (1-1/2") VOID ACROSS THE WIDTH OF A BRACED LOAD. THE WIDTH AND/OR THE THICKNESS OF THE VERTICAL PIECES AND/OR LOAD BEARING PIECES SHOULD BE ADJUSTED AS REQUIRED.



**REAR BLOCKING ASSEMBLY A**

THIS ASSEMBLY IS DESIGNED FOR USE IN THE LOADS SHOWN ON PAGES 6 AND 8.

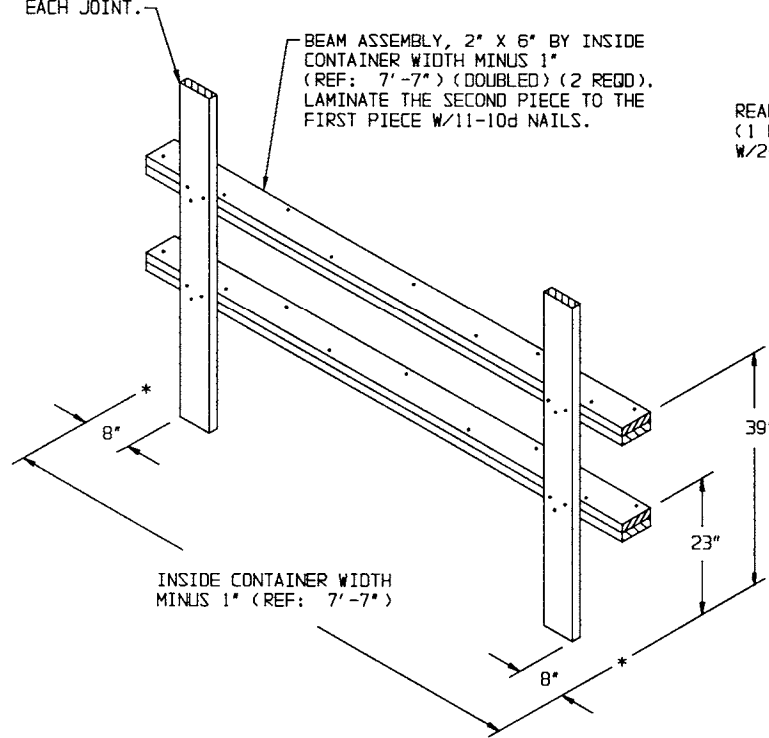
LOAD BEARING PIECE, 2" X 6" X 56"  
(2 REGD). NAIL TO THE BEAM  
ASSEMBLIES W/3-10d NAILS AT  
EACH JOINT.

BEAM ASSEMBLY, 2" X 6" BY INSIDE  
CONTAINER WIDTH MINUS 1"  
(REF: 7'-7") (DOUBLED) (2 REGD).  
LAMINATE THE SECOND PIECE TO THE  
FIRST PIECE W/11-10d NAILS.

FORWARD BUFFER PIECE, 2" X 6" BY INSIDE CONTAINER  
HEIGHT MINUS 1/2" (REF: 7'-7-1/2") (1 REGD).  
NAIL TO THE STRUTS W/2-10d NAILS AT EACH JOINT.

STRUT, 4" X 4" X 16" (2 REGD).

REAR BUFFER PIECE, 2" X 6" X 60"  
(1 REGD). NAIL TO THE STRUTS  
W/2-10d NAILS AT EACH JOINT.



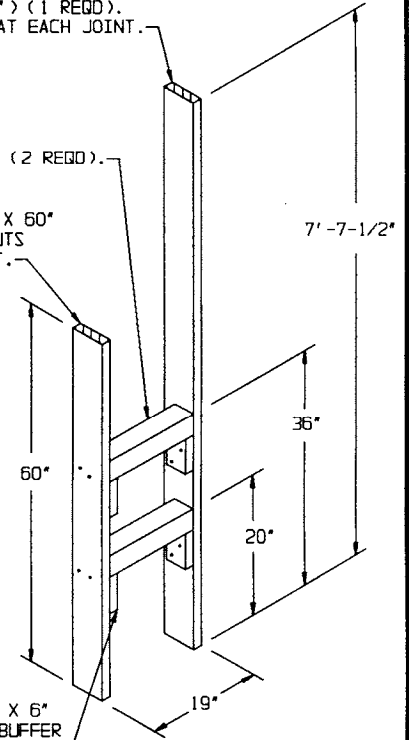
**FORWARD BLOCKING ASSEMBLY**

THIS ASSEMBLY IS DESIGNED FOR USE IN THE LOADS  
SHOWN ON PAGES 10 AND 12.

STRUT LEDGER, 2" X 4" X 6"  
(4 REGD). NAIL TO A BUFFER  
PIECE W/2-10d NAILS.

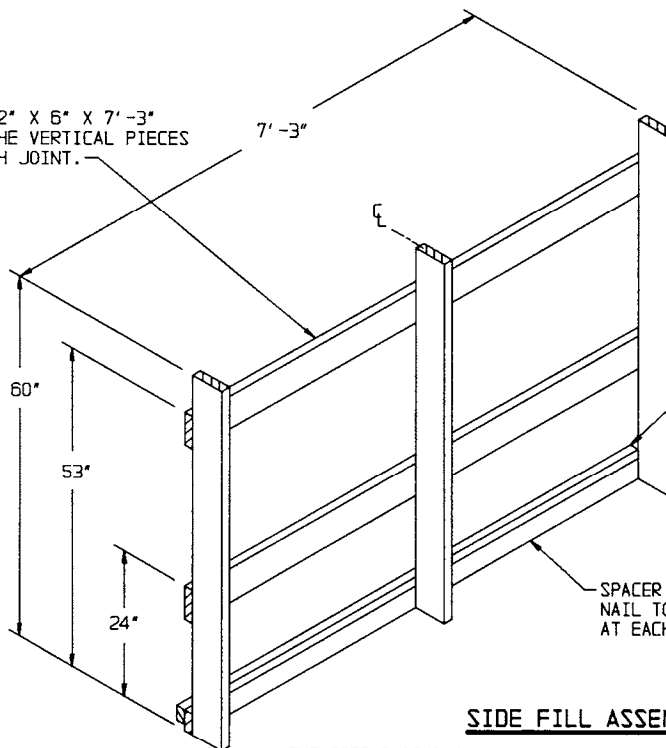
**FORWARD STRUT ASSEMBLY**

A "RIGHT HAND" FORWARD STRUT ASSEMBLY IS DEPICTED. A "LEFT  
HAND" ASSEMBLY IS ALSO REQUIRED AND WILL BE THE SAME AS THE  
ASSEMBLY DEPICTED ABOVE, EXCEPT THAT 4" X 4" STRUTS AND THE  
STRUT LEDGERS ARE ALIGNED ON THE OPPOSITE SIDE OF THE BUFFER  
PIECES. THIS ASSEMBLY IS FOR USE WITH "SEALED" AND  
"STRETCHED" CONTAINERS. THE SAME ASSEMBLY WILL BE USED WITH  
"UNSEALED" CONTAINERS EXCEPT THE STRUTS WILL BE 11" LONG  
INSTEAD OF 16" AND THE 19" WIDTH OF THE ASSEMBLY WILL BE 14".



LOAD BEARING PIECE, 2" X 6" X 7'-3"  
(2 REGD). NAIL TO THE VERTICAL PIECES  
W/3-10d NAILS AT EACH JOINT.

VERTICAL PIECE, 2" X 6" X 60"  
(3 REGD)



HOLD DOWN PIECE, 2" X 3" X 7'-3", (1 REGD).  
LAMINATE TO THE SPACER PIECE W/9-8d NAILS.

SPACER PIECE, 2" X 4" X 7'-3" (1 REGD).  
NAIL TO THE VERTICAL PIECES W/2-10d NAILS  
AT EACH JOINT.

**SIDE FILL ASSEMBLY C**

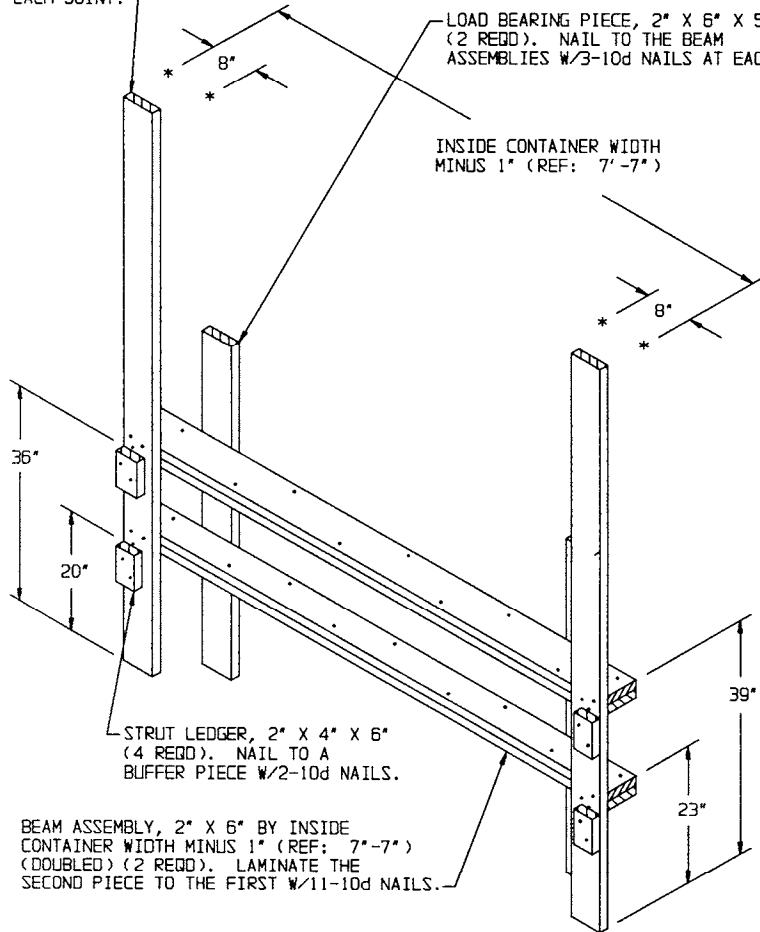
THE SIDE BLOCKING ASSEMBLY MUST BE ADJUSTED AS REQUIRED SO AS  
TO NOT ALLOW MORE THAN ONE AND ONE-HALF INCHES (1-1/2")  
VOID ACROSS THE WIDTH OF A BRACED LOAD. THE WIDTH AND/OR THE  
THICKNESS OF THE VERTICAL PIECES AND/OR LOAD BEARING PIECES  
SHOULD BE ADJUSTED AS REQUIRED.

**DETAILS**

BUFFER PIECE, 2" X 6" BY INSIDE CONTAINER HEIGHT MINUS 1/2" (REF: 7'-10-1/2") (2 REQD). NAIL TO THE BEAM ASSEMBLIES W/3-10d NAILS AT EACH JOINT.

LOAD BEARING PIECE, 2" X 6" X 56" (2 REQD). NAIL TO THE BEAM ASSEMBLIES W/3-10d NAILS AT EACH JOINT.

INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-7")



STRUT LEDGER, 2" X 4" X 6" (4 REQD). NAIL TO A BUFFER PIECE W/2-10d NAILS.

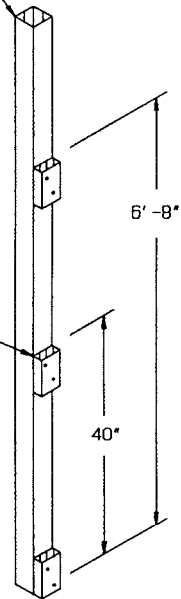
BEAM ASSEMBLY, 2" X 6" BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-7") (DOUBLED) (2 REQD). LAMINATE THE SECOND PIECE TO THE FIRST W/11-10d NAILS.

**REAR BLOCKING ASSEMBLY B**

THIS ASSEMBLY IS DESIGNED FOR USE IN THE LOADS SHOWN ON PAGES 10 AND 12.

VERTICAL PIECE, 4" X 4" BY INSIDE CONTAINER HEIGHT MINUS 1/2" (REF: 7'-10-1/2") (1 REQD).

STRUT LEDGER, 2" X 4" X 6" (3 REQD). NAIL TO THE VERTICAL PIECE W/2-10d NAILS.

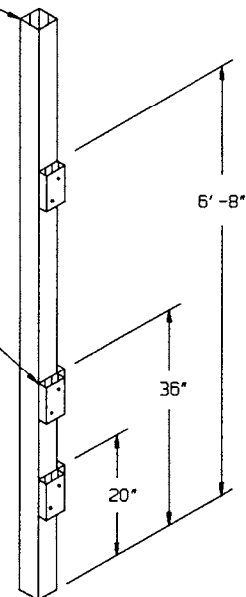


**DOOR POST VERTICAL A**

THIS ASSEMBLY IS DESIGNED FOR USE IN THE LOADS SHOWN ON PAGES 6 AND 8.

VERTICAL PIECE, 4" X 4" BY INSIDE CONTAINER HEIGHT MINUS 1/2" (REF: 7'-10-1/2") (1 REQD).

STRUT LEDGER, 2" X 4" X 6" (3 REQD). NAIL TO THE VERTICAL PIECE W/2-10d NAILS.

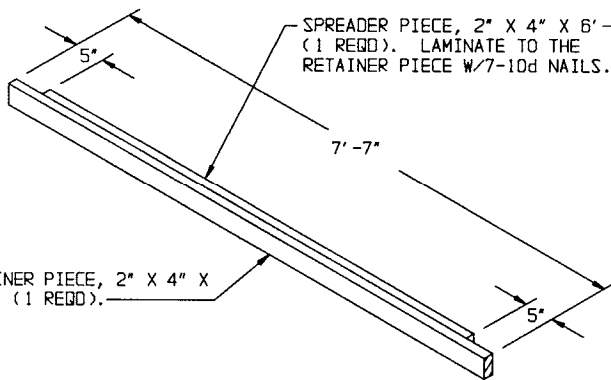


**DOOR POST VERTICAL B**

THIS ASSEMBLY IS DESIGNED FOR USE IN THE LOADS SHOWN ON PAGES 10 AND 12.

SPREADER PIECE, 2" X 4" X 6'-9" (1 REQD). LAMINATE TO THE RETAINER PIECE W/7-10d NAILS.

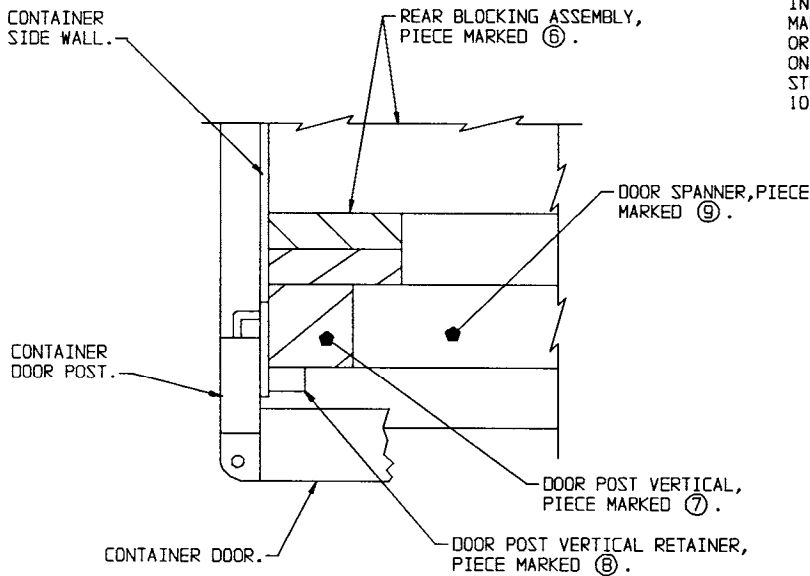
RETAINER PIECE, 2" X 4" X 7'-7" (1 REQD).



**SPREADER ASSEMBLY**

THIS ASSEMBLY IS DESIGNED FOR USE IN THE LOADS SHOWN ON PAGES 10 AND 12.

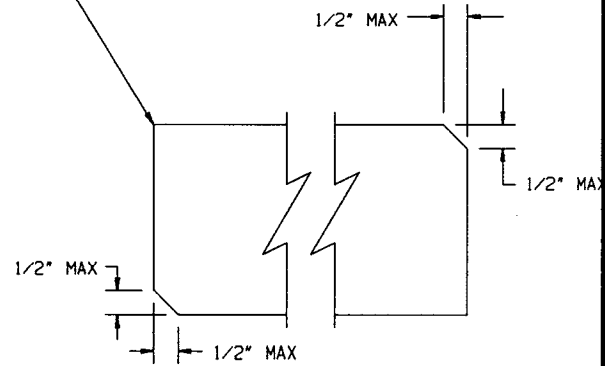




**DETAIL A**

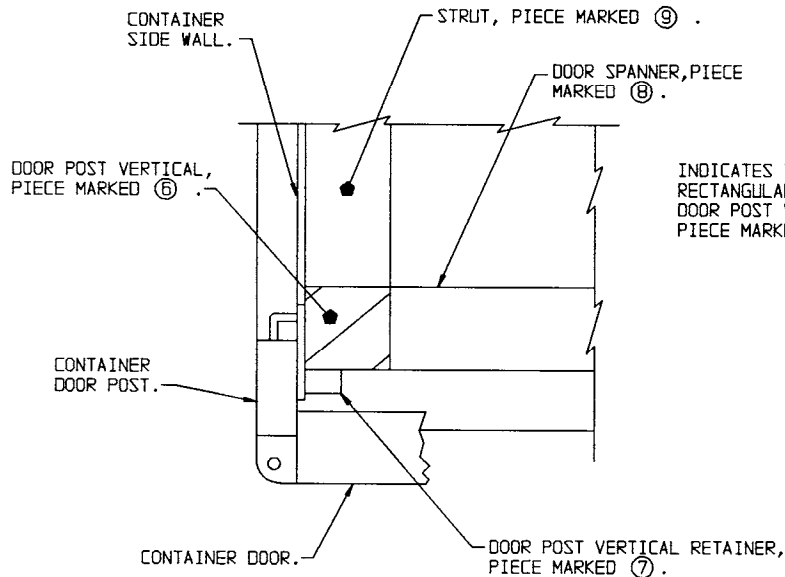
A PARTIAL PLAN VIEW OF THE LEFT REAR PORTION OF THE CONTAINER IS SHOWN DEPICTING THE PROPER POSITION OF THE DOOR POST VERTICAL AND ADJACENT DUNNAGE PIECES, AS APPLICABLE FOR THE LOAD ON PAGES 6 AND 8.

INDICATES DOOR SPANNER PIECE MARKED ⑨ ON PAGE 6 AND 8 OR DOOR SPANNER PIECE MARKED ⑧ ON PAGE 6, 10, AND 12 OR A STRUT PIECE MARKED ⑨ ON PAGES 10 AND 12.



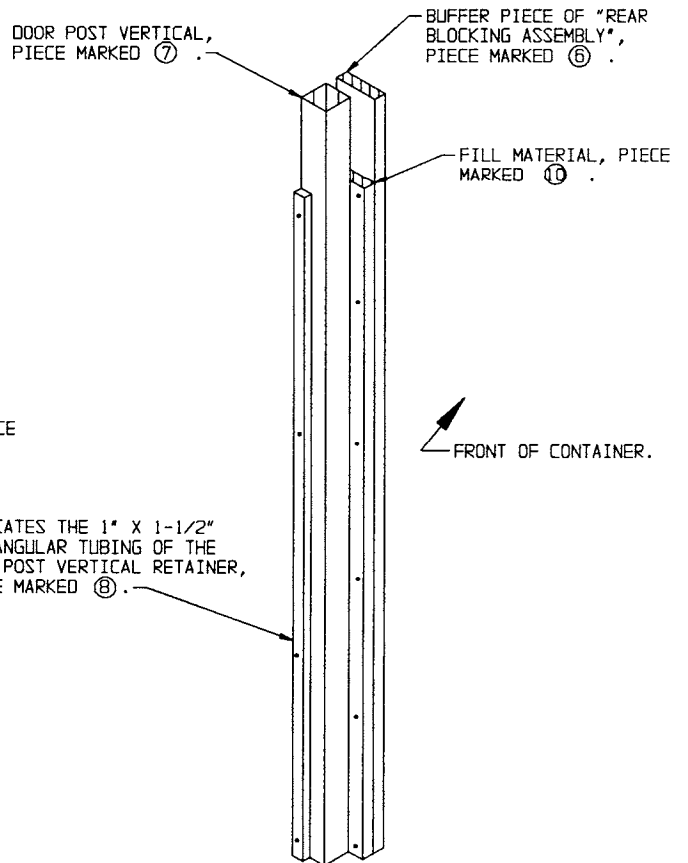
**BEVEL-CUT**

IF DESIRED, EACH END OF A DOOR SPANNER PIECE OR A STRUT MAY BE BEVEL-CUT AS SHOWN ABOVE TO FACILITATE THE ACHIEVEMENT OF A TIGHT DOOR-POST-TO-DOOR-POST FIT OR A TIGHT REAR-OF-LOAD FIT.



**DETAIL B**

A PARTIAL PLAN VIEW OF THE LEFT REAR PORTION OF THE CONTAINER IS SHOWN DEPICTING THE PROPER POSITION OF THE DOOR POST VERTICAL AND ADJACENT DUNNAGE PIECES, AS APPLICABLE FOR THE LOAD ON PAGES 10 AND 12.



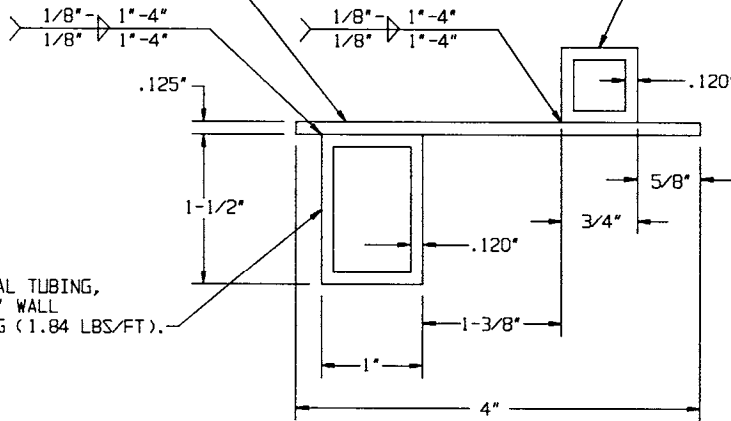
**DETAIL C**

DOOR SPANNERS AND STRUT LEDGERS HAVE BEEN OMITTED FOR CLARITY PURPOSES. THIS VIEW IS APPLICABLE FOR THE LOAD ON PAGES 6 AND 8.

**DETAILS**

STEEL STRIP, 1/8" THICK BY 4" WIDE  
BY 83" LONG (1.70 LBS/FT).

SQUARE STRUCTURAL TUBING, 3/4" SQUARE  
BY .120" WALL THICKNESS BY 83" LONG  
(1.03 LBS/FT).



RECTANGULAR STRUCTURAL TUBING,  
1-1/2" BY 1" BY .120" WALL  
THICKNESS BY 83" LONG (1.84 LBS/FT).

VIEW A

VIEW A  
SQUARE STRUCTURAL TUBING,  
3/4" SQUARE BY .120" WALL  
THICKNESS BY 83" LONG  
(1.03 LBS/FT).



RECTANGULAR STRUCTURAL TUBING,  
1-1/2" BY 1" BY .120" WALL  
THICKNESS  
BY 83" LONG (1.84 LBS/FT).

DRILL 5/32", 4 HOLES.

STEEL STRIP, 1/8" THICK BY 4" WIDE  
BY 83" LONG (1.70 LBS/FT).

DOOR POST VERTICAL RETAINER

DETAILS