APPROVED BY BUREAU OF EXPLOSIVES

DATE S

STINGER

LOADING AND BRACING WITH WOODEN DUNNAGE IN SIDE OPENING ISO OF THE COMPLETE ROUND CONTAINERS PACKED IN WIREBOUND AND/OR CONTAINERS AL LIMTNUM SINGLE OR PALLETIZED AND AND SINGLE)

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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-FLATCAR (T/COFC) RAIL CARRIER SERVICE. THESE SPECIFICATIONS MAY ALSO BE USED FOR LOADS THAT ARE TO BE MOVED BY MOTOR OR WATER CARRIERS.

	U.S. ARMY MATERII	EL C	OMM	AND DR	AWING
	APPROVED, U.S. ARMY MISSILE COMMAND	DRAFT	NAMZ	TECHNICIAN	ENGINEER
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	APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND	VALIDAT ENGINEE DIVIST	RING	TRANSPORTATION ENGINEERING DIVISION W. Arerus	ENGINEERING OFFICE
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	U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL	CLASS	OIZIVIO	N' DRAWING	FILE
		19	48	8203	GM15SR3

DO NOT SCALE

GENERAL NOTES

- THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- THE OUTLOADING PROCEDURES SPECIFIED IN THIS DRAWING ARE APPLICABLE TO LOADS OF THE STINGER GUIDED MISSILE PACKED IN WIREBOUND CONTAINER AND/OR ALUMINUM CONTAINER. SUBSE QUENT REFERENCE TO CONTAINER MEANS WIREBOUND AND/OR ALUMINUM CONTAINER WITH CONTENTS. ALSO, SUBSECUENT REFERENCE TO SKIDDED UNIT MEANS THE SKIDDED UNIT OF NINE (9) WIREBOUND CONTAINERS WITH CONTENTS AND SUBSEQUENT REFERENCE TO PALLETIZED UNIT MEANS THE PALLETIZED UNIT OF NINE (9) ALUMINUM CONTAINERS WITH CONTENTS. CAUTION: REGARDLESS OF THE QUANTITY OF UNITS TO BE SHIPPED, THE "MAXIMUM GROSS WEIGHT" OF THE CONTAINER MUST NOT BE EXCEEDED.
- FOR DETAILS OF THE WIREBOUND CONTAINER, SEE US ARMY MISSILE COMMAND DRAWING NO. 11509503 AND "WIREBOUND CONTAINER" DETAIL ON PAGE 3.

CONTAINER DIMENSIONS - - - 67-1/4" LONG X 13-1/8" WIDE X 10-1/2" HIGH (APPROX). GROSS WEIGHT - - - - - 77 POUNDS (APPROX).

FOR DETAILS OF THE ALUMINUM CONTAINER, SEE US ARMY MISSILE COMMAND DRAWING NO. 11486952 AND "ALUMINUM CONTAINER" DETAIL ON PAGE 4.

CONTAINER DIMENSIONS - - - 65-9/16" LONG X 13" WIDE X 13-3/8" HIGH (APPROX).

GROSS WEIGHT - - - - - 86 POUNDS (APPROX). CUBE - - - - - - - - 6.6 CUBIC FEET

E. FOR DETAILS OF THE UNITIZED WIREBOUND CONTAINERS, SEE US ARMY DARCOM DRAWING NO. 19-48-5239-GM20SR1 AND "SKIDDED UNIT" DETAIL ON PAGE 3.

SKIDDED UNIT DIMENSIONS - - - - - - 39-3/8" LONG X 67-1/4" WIDE X 36-1/2" HIGH (APPROX).

GROSS WEIGHT - - - - - 749 POUNDS (APPROX).

CUBE - - - - - 55.9 CUBIC FEET

F. FOR DETAILS OF THE PALLETIZED ALUMINUM CONTAINERS, SEE US ARMY DARCOM DRAWING NO. 19-48-5239-GM20SR1 AND "PALLETIZED UNIT" DETAIL ON PAGE 4.

PALLETIZED UNIT DIMENSIONS - - - - - - - 42" LONG X 67-1/4" WIDE X 45-5/8" HIGH (APPROX), GROSS WEIGHT - - - - - 952 POUNDS (APPROX).

- THE LOADS AS SHOWN ARE BASED ON 6,050 POUND 20' LONG BY 8' WIDE BY 8'-6" HIGH SIDE OPENING ISO CONTAINER WITH INSIDE DIMENSIONS OF 19'-4" LONG BY 89" WIDE BY 88" HIGH AND A MAXIMUM GROSS WEIGHT OF 52,910 POUNDS. THE LOAD IS DESIGNED FOR TRAILER/CONTAINER-ON-FLATCAR (T/COFC) SHIPMENT, HOWEVER, THE LOAD AS DESIGNED CAN ALSO BE MOVED BY MOTOR OR WATER CARRIERS. NOTICE: OTHER CONTAINERS OF THE SAME DESIGN CONFIGURATION CAN ALSO BE USED.
- H. WHEN LOADING THE UNITS, 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". EXCESSIVE SLACK CAN BE ELIMINATED FROM A LOAD BY LAMINATING ADDITIONAL PIECES OF APPROPRIATE THICKNESS TO THE SIDE FILL ASSEMBLIES. NAIL EACH ADDITIONAL PIECE TO THE VERTICAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE THICKNESS AND QUANTITY OF THE DUNNAGE LUMBER USED MAY BE ADJUSTED AS PEOLUTED TO EACT IT THE SIZE OF THE AS REQUIRED TO FACILITATE VARIANCE IN THE SIZE OF THE LADING UNIT.

(CONTINUED AT RIGHT)

MATERIAL SPECIFICATIONS

LUMBER - - - - - -: SEE TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC MM-L-751.

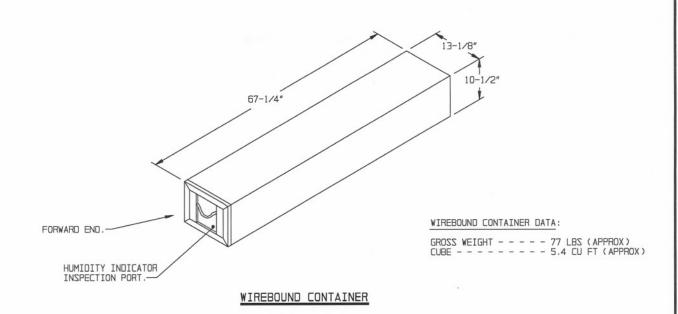
NAILS ----: FED SPEC FF-N-105; COMMON.

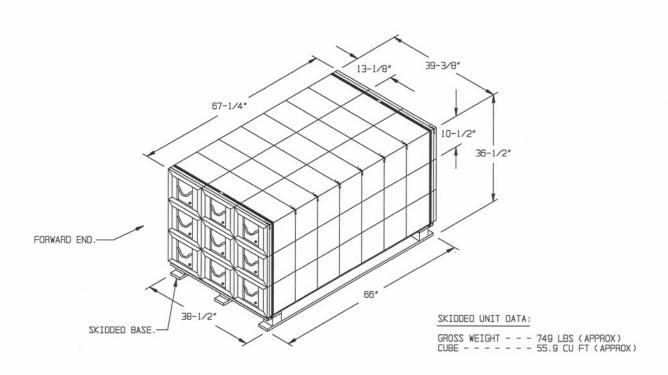
COMMERCIAL ITEM DESCRIPTION A-A-55057,

TYPE A, CONSTRUCTION AND INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D. IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER INTERIOR OR AN EXTERIOR GRADE MAY BE SUBSTITUTED.

(GENERAL NOTES CONTINUED)

- J. DUNNAGE LUMBER SPECIFIED IS OF NOMINAL SIZE. FOR EXAMPLE, I" 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.
- K. A STAGGERED NAILING PATTERN WILL BE USED WHENEVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES OR WHEN LAMINATING DUNNAGE. ADDITIONALLY, TH 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 NATL IN A LOWER PIECE.
- L. IN SOME CONTAINERS THERE IS A SLOT AT THE CORNERS OF THE ENDWALLS. A PIECE OF DUNNAGE MATERIAL MUST BE LAMINATED TO THE BUFFER PIECES OF THE END BLOCKING ASSEMBLY TO PROVIDE A FLAT SURFACE FOR THE 1" X 4" OR 2" X 4" 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 THE ENDWALL OF THE CONTAINER PIECE IS NOT REQUIRED WHEN THE ENDWALL OF THE CONTAINER
- M. <u>CAUTION</u>: DO NOT NAIL DUNNAGE MATERIAL TO THE CONTAINER WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.
- PORTIONS OF THE CONTAINER DEPICTED WITHIN THIS DRAWING, SUCH AS THE SIDE DOORS, HAVE NOT BEEN SHOWN IN THE LOAD VIEW FOR CLARITY PURPOSES.
- O. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS 0.454 KG
- P. REQUIREMENTS CITED WITHIN THE BUREAU OF EXPLOSIVES PAMPHLET 6C APPLY WHEN THE SHIPMENT MOVES BY TRAILER/ CONTAINER-ON-FLATCAR (T/COFC). SPECIAL T/COFC NOTES
 - 1. A LOADED CONTAINER MUST BE ON A CHASSIS EQUIPPED WITH TWO BOGIE ASSEMBLIES WHEN BEING MOVED IN TOFC
 - THE LOAD LIMIT OF A T/COFC RAILCAR 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.
- Q. DURING INTRASTATE AND/OR INTERSTATE MOVES BY MOTOR CARRIER, A PROPER CHASSIS OR MODIFIED FLATBED TRAILER
 MUST BE USED TO PRECLUDE VIOLATION OF ONE OR MORE "WEIGHT LAWS" APPLICABLE TO THE STATE OR STATES INVOLVED.
- R. THE QUANTITY OF LADING UNITS SHOWN IN THE LOADS MAY BE REDUCED FOR SHIPMENT, IF DESIRED. WHEN A CONTAINER IS TO BE 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
 - IF THE LOAD ON PAGE 4 IS TO BE REDUCED, SEE THE "OMITTED UNIT ASSEMBLY A" DETAIL ON PAGE 5. LADING UNITS NORMALLY MAY BE ELIMINATED FROM THE CENTER OF LADING THE LOAD. IF THE LOADS ON PAGES 8 AND 12 ARE TO BE REDUCED, SEE THE "OMITTED CONTAINER ASSEMBLY A" DETAIL ON PAGE 5. CONTAINERS MUST BE OMITTED FROM THE TOP LAYERS ONLY FOR THE LOADS ON PAGES 4, 8 AND
 - 2. IF THE LOAD ON PAGE 10 IS TO BE REDUCED, SEE THE "TYPICAL REDUCED LOAD PROCEDURES" ON PAGE 19.
 - 3. THE DEPICTED PROCEDURES WILL BE FOLLOWED AS CLOSELY AS POSSIBLE, MAKING ONLY THOSE ADJUSTMENTS TO THE DUNNAGE WHICH ARE REQUIRED TO ACCOMMODATE THE NUMBER OF UNITS TO BE SHIPPED.

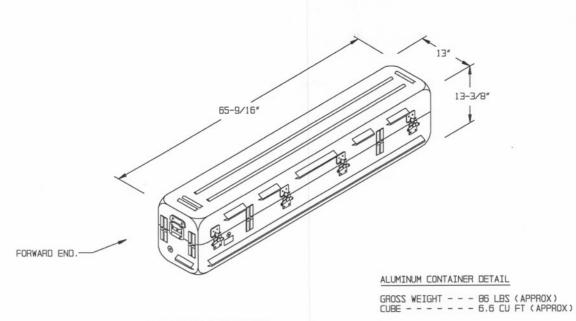




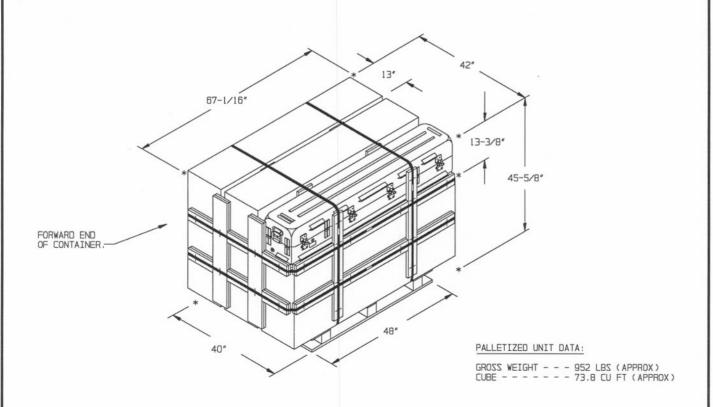
WIREBOUND CONTAINER AND UNITIZATION DETAILS

PAGE 3

SKIDDED UNIT OF NINE (9) GUIDED MISSILES, PACKED ONE (1) PER WIREBOUND (WOODEN) BOX

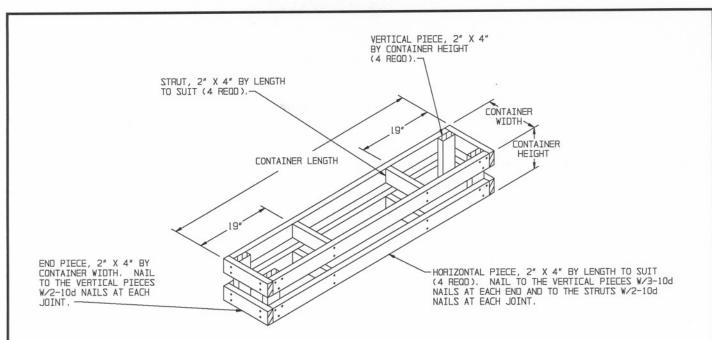


ALUMINUM CONTAINER

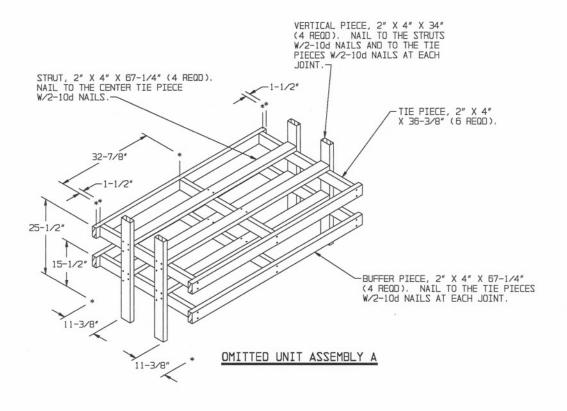


PALLETIZED UNIT OF NINE (9) GUIDED MISSILES PACKED ONE (1) PER ALUMINUM CONTAINER

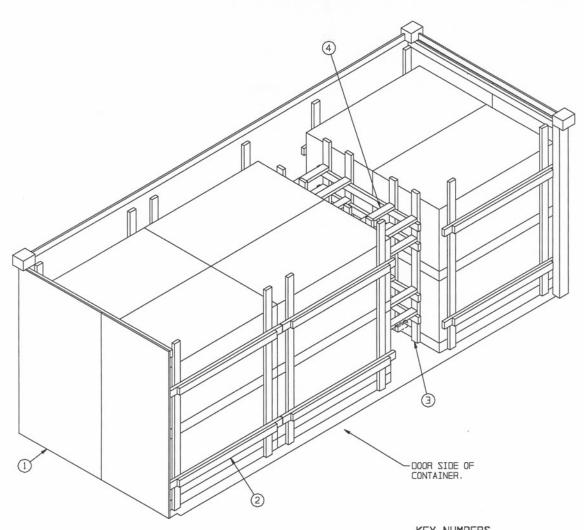
ALUMINUM CONTAINER AND PALLETIZATION DETAILS



OMITTED CONTAINER ASSEMBLY A



DETAILS



ISOMETRIC VIEW

KEY NUMBERS

- (1) END BLOCKING ASSEMBLY (2 REOD). SEE THE "END BLOCKING ASSEMBLY A" DETAIL ON PAGE 14.
- SIDE FILL ASSEMBLY (6 REOD). SEE THE "SIDE FILL A" DETAIL ON PAGE 17.
- ③ CENTER GATE (2 REOD). SEE THE "CENTER GATE A" DETAIL ON PAGE 18.
- (4) STRUT, 2" X 4" BY LENGTH TO SUIT (REF: 25-3/4") (16 REOD). NAIL TO PIECE MARKED (3) W/2-10d NAILS AT EACH JOINT.

- 1. PREFABRICATE TWO END BLOCKING ASSEMBLIES A, SIX SIDE FILL A ASSEMBLIES AND TWO CENTER GATE A ASSEMBLIES.
- 2. INSTALL ONE END BLOCKING ASSEMBLY, TWO SIDE FILL ASSEMBLIES AND LOAD EIGHT SKIDDED UNITS.
- 3. INSTALL ONE END BLOCKING ASSEMBLY, ONE SIDE FILL ASSEMBLY AND LOAD FOUR SKIDDED UNITS.
- 4. INSTALL THE TWO CENTER GATES, SIXTEEN STRUTS AND THREE SIDE FILL ASSEMBLIES.

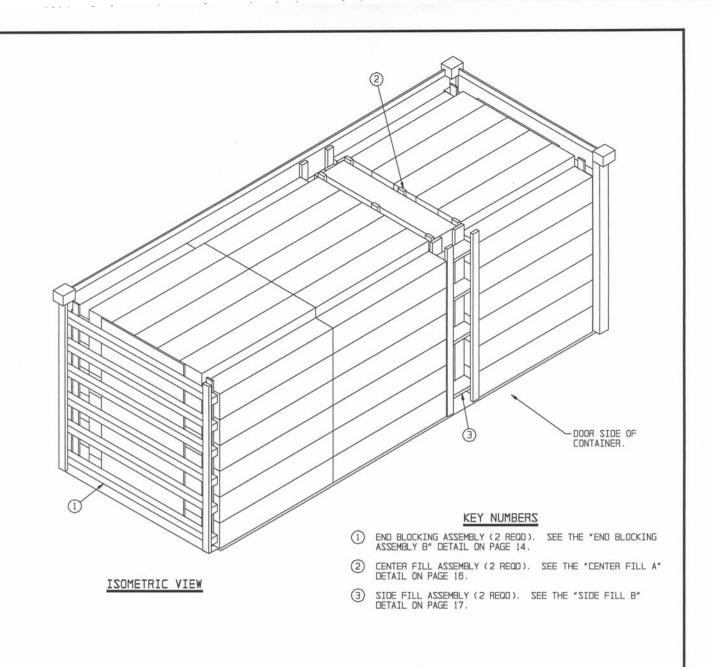
E	BILL OF MATERIAL											
LUMBER	LINEAR FEET	BOARD FEET										
2" X 4"	352	235										
NAILS	NO. REOD	ZDNUOP										
6d (2") 10d (3")	22 244	1/4 3-3/4										
PLYW00D, 3/4"	101.53 SQ FT R	EQD 209.41 LBS										

NWOHZ ZA DAOL

<u>ITEM</u>								′					WEIGHT	(APPROX)
														LBS
-	-	-	-	-	-	-	-	-	-	-	-	-	684	LBZ
-	-	-	-	-	-	-	-	-	-	-	-	-	6,050	LBZ
	-				-	1	12	12 -		12	12	12	12	12 8,988

TOTAL WEIGHT - - - - - - 15,722 LBS (APPROX)

UNITIZED WIREBOUND CONTAINER LOAD



WIREBOUND CONTAINER LOAD

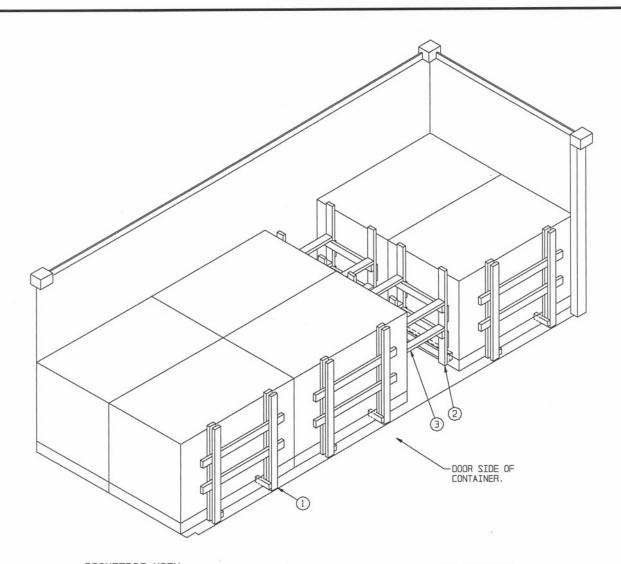
- PREFABRICATE TWO END BLOCKING ASSEMBLIES B, TWO CENTER FILL A ASSEMBLIES AND TWO SIDE FILL B ASSEMBLIES.
- INSTALL ONE END BLOCKING ASSEMBLY AND LOAD ONE HUNDRED AND FOUR CONTAINERS.
- 3. INSTALL ONE END BLOCKING ASSEMBLY AND LOAD FIFTY-TWO CONTAINERS.
- INSTALL ONE SIDE FILL ASSEMBLY, LOAD EIGHT CONTAINERS, INSTALL TWO CENTER FILL ASSEMBLIES AND ONE SIDE FILL ASSEMBLY.

В	ILL OF MATERIA	L							
LUMBER	LINEAR FEET BOARD FEET								
1" X 4" 2" X 4" 2" X 6" 2" X 8" 4" X 4"	28 98 28 12 86	9 65 28 16 115							
NAILS	NO. REOD	POUNDS							
6d (2") 10d (3")	192 112	1-1/4 1-3/4							
PLYW00D, 1/2" - PLYW00D, 3/4" -	44.67 SQ FT R	EOD 61.42 LBS EOD 115.50 LBS							

NWOHZ ZA DAOJ

ITEM	QUANTITY	WEIGHT (APPROX)
DUNNAGE	164 	646 LBS
TOTAL	WEIGHT	- 19,324 LBS (APPROX)

WIREBOUND CONTAINER LOAD



ISOMETRIC VIEW

KEY NUMBERS

- ① SIDE FILL ASSEMBLY (3 REOD). SEE THE "SIDE FILL C" DETAIL ON PAGE 18.
- (3) STRUT, 2" X 4" BY LENGTH TO SUIT (REF: 27-1/2") (8 REOD). NAIL TO PIECE MARKED (2) W/2-10d NAILS AT EACH END.

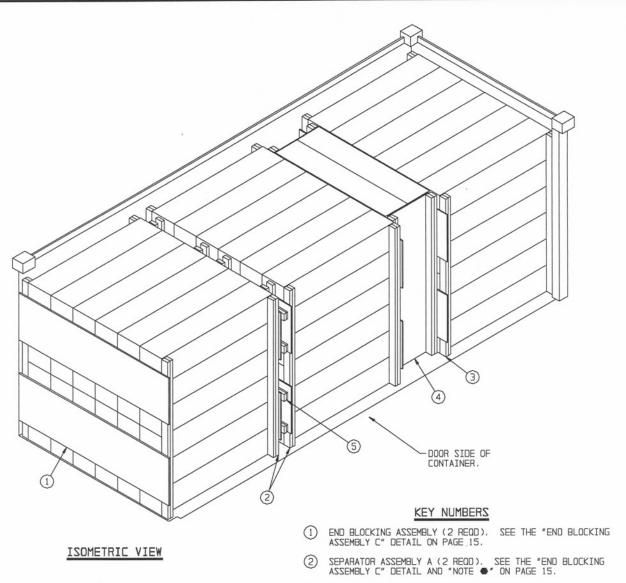
- 1. PREFABRICATE THREE SIDE FILL C ASSEMBLIES AND FOUR CENTER GATE B ASSEMBLIES.
- 2. LOAD SIX PALLET UNITS AND INSTALL TWO CENTER GATES AND STRUTS.
- 3. INSTALL THREE SIDE FILL ASSEMBLIES.

Е	BILL OF MATERIA	L
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	169	113
NAILS	NO. REOD	ZDNUO9
10d (3*)	176	2-3/4

NWOHZ ZA DAOL

ITEM						QU	JAN	NT:	IT۱	<u> </u>					WEIGHT	(APP	ROX)
PALLET UNIT		_	_	_	_	_	E	3	_	_	_	_	-	_	5,712	LBS	
DUNNAGE -	-	-	-	_	_	-	-	-	-	-	-	-	-	-	229	LBS	
CONTAINER	-	_	-	-	-	-	-	-	-	-	-	-	-	-	6,050	LBZ	
Т	01	AL	. 1	VE:	IG	ΗŤ	-	-	-	-	-	-	-	-	11,991	LBZ	(APPROX)

PALLETIZED ALUMINUM CONTAINER LOAD



- SEPARATOR ASSEMBLY (2 REQD). SEE THE "SEPARATOR B" DETAIL ON PAGE 15.
- 4) FILL PIECE, PLYWOOD, 1/2" X 24" X 80" (2 REQD).

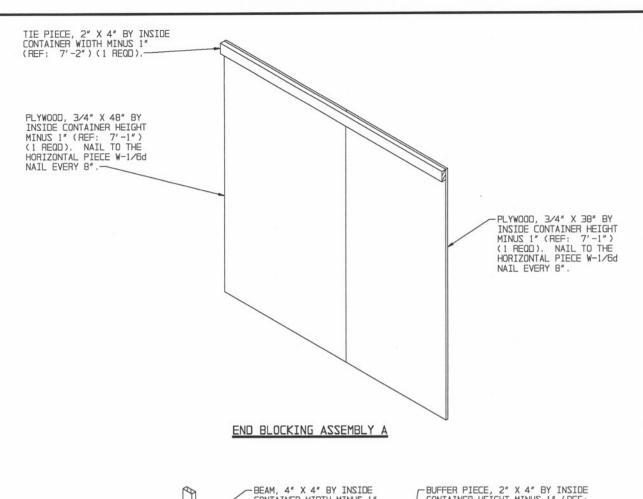
- PREFABRICATE TWO END BLOCKING ASSEMBLIES C, TWO SEPARATOR A ASSEMBLIES, TWO SEPARATOR B ASSEMBLIES AND ONE CENTER FILL B ASSEMBLY.
- INSTALL ONE END BLOCKING ASSEMBLY AND LOAD THIRTY-SIX CONTAINERS.
- INSTALL ONE END BLOCKING ASSEMBLY AND LOAD THIRTY-SIX CONTAINERS.
- 4. INSTALL ONE SEPARATOR B ASSEMBLY, POSITION ONE PLYWOOD FILL PIECE AGAINST RETAINER PIECE OF SEPARATOR B, LOAD TWELVE CONTAINERS AND INSTALL THE REMAINING PLYWOOD FILL PIECE
- 5. INSTALL ONE SEPARATOR B ASSEMBLY AND LOAD ONE STACK OF SIX CONTAINERS AGAINST WALL SIDE OF CONTAINER.
- 6. INSTALL THE TWO SEPARATOR A ASSEMBLIES, LOAD THE REMAINING THIRTY CONTAINERS AND INSTALL THE CENTER FILL ASSEMBLY.

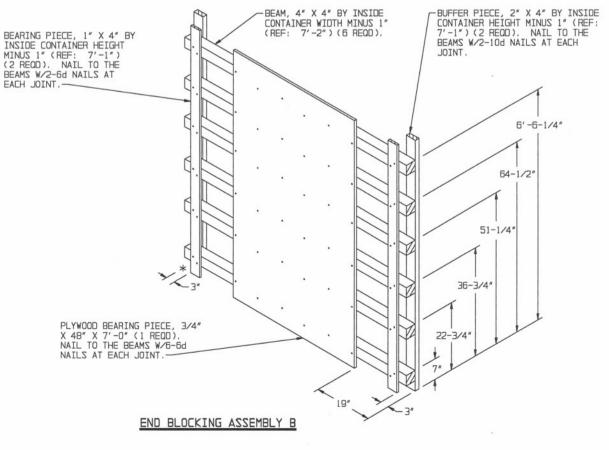
BILL OF MATERIAL LUMBER LINEAR FEET BOARD FEET 1" X 4" 29 9 2" X 4" 296 197											
LUMBER	LINEAR FEET	BOARD FEET									
		9 197									
NAILS	NO. REOD	ZDNU09									
6d (2") 10d (3")	128 144	3/4 2-1/4									

NWOHZ ZA DADJ

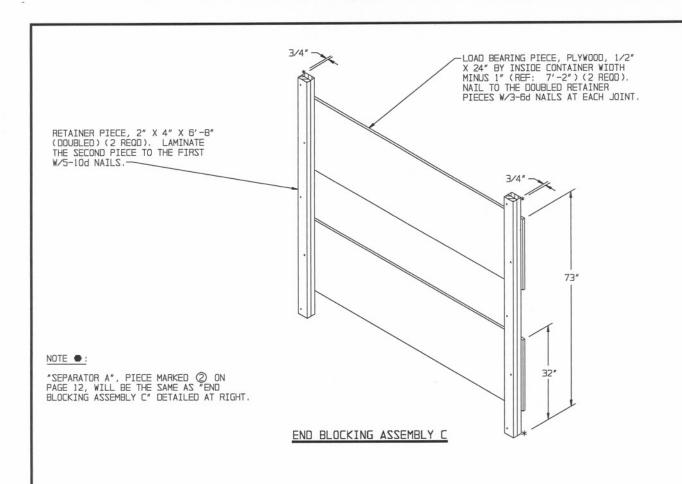
ITEM							JAN	IT.	IT	Y					WEIGHT (APPROX)				
CONTAINER																LBZ			
DUNNAGE -																			
CONTAINER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,050	LB2			
	TO:	ΓΑΙ	- 1	VE:	IGH	HT.	_	_	_	_	_	_	_	_	16,940	LBZ	(APP	ROX))

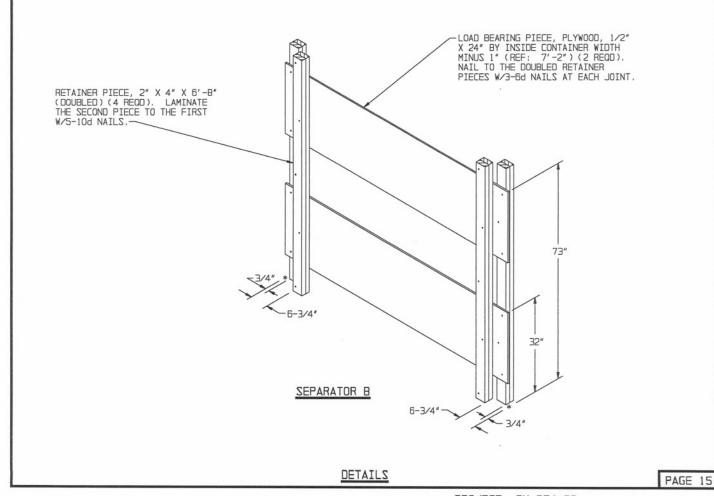
UNPALLETIZED ALUMINUM CONTAINER LOAD

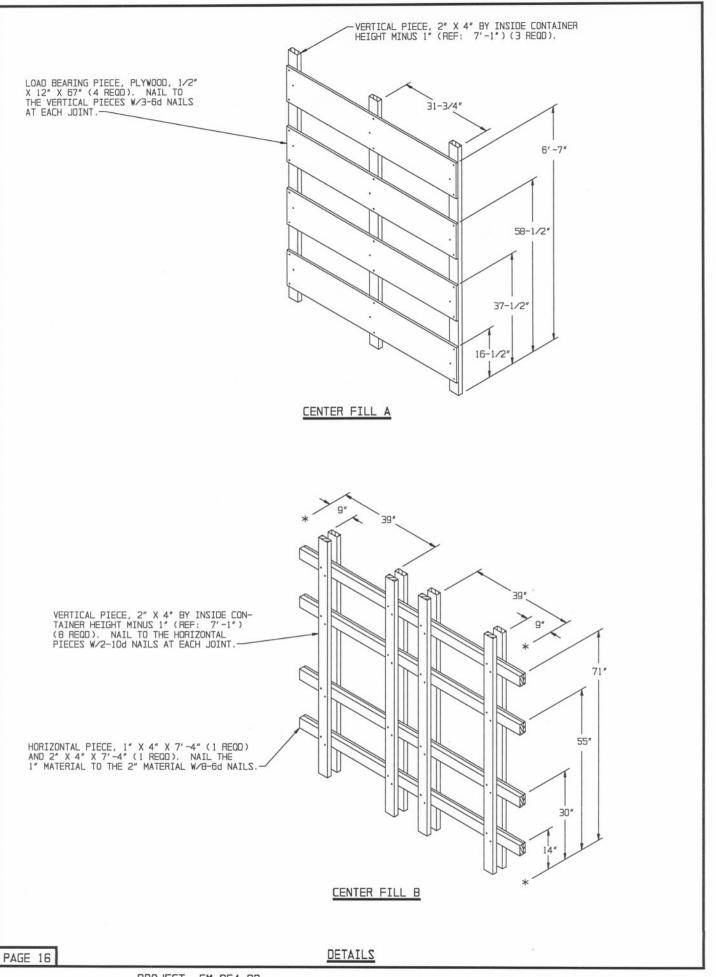


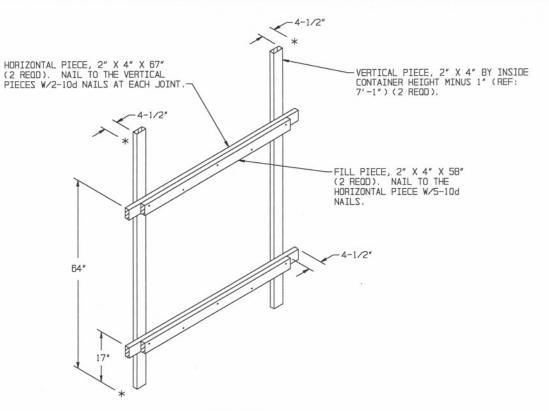


DETAILS

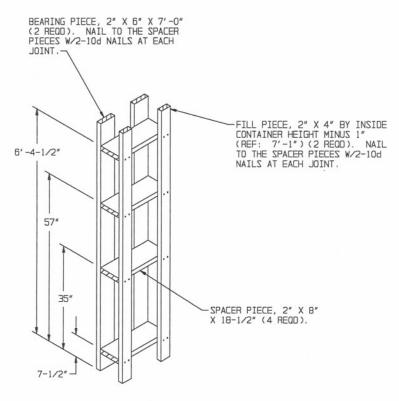






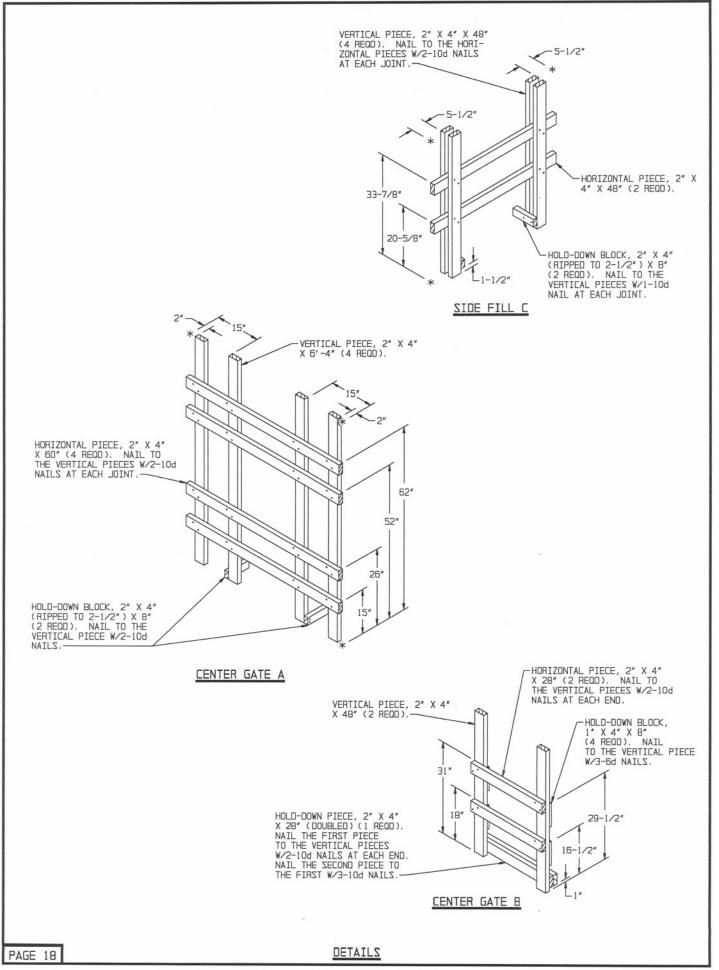


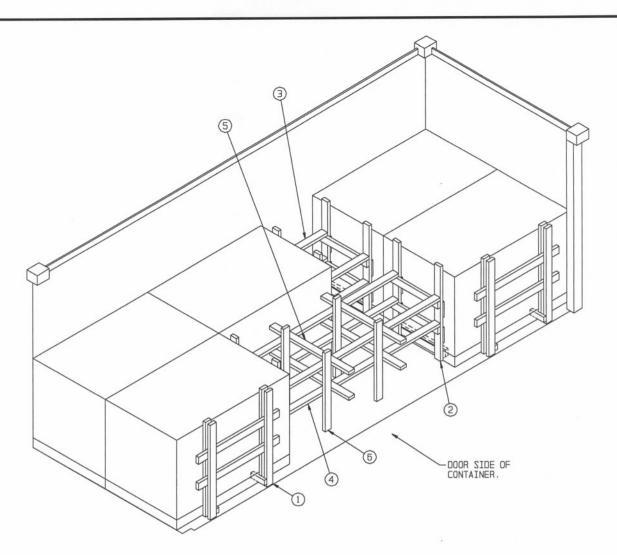
SIDE FILL A



SIDE FILL B

DETAILS





ISOMETRIC VIEW

KEY NUMBERS

- \bigodot SIDE FILL ASSEMBLY (2 REOD). SEE PIECE MARKED \bigodot ON PAGE 10.
- $\ensuremath{\bigcirc}$ CENTER GATE (4 REQD). SEE PIECE MARKED $\ensuremath{\bigcirc}$ ON PAGE 10.
- ③ STRUT, 2" X 4" BY LENGTH TO SUIT (REF: 27-1/2") (4 REOD). NAIL TO PIECE MARKED ② W/2-10d NAILS AT EACH END.
- (4) STRUT, 2" X 4" BY LENGTH TO SUIT (REF: 7'-10") (4 REOD). NAIL TO PIECE MARKED (2) W/2-10d NAILS AT EACH END.
- (5) HORIZONTAL STRUT BRACING, 2" X 4" BY LENGTH TO SUIT (REF: 47") (4 REOD). NAIL TO THE STRUTS, PIECE MARKED (4), W/2-10d NAILS AT EACH JOINT.
- (6) VERTICAL STRUT BRACING, 2" X 4" X 40" (4 REQD). NAIL TO PIECE MARKED (4) W/2-10d NAILS AT EACH JOINT.

TYPICAL REDUCED LOAD PROCEDURES FOR PALLETIZED ALUMINUM CONTAINER LOAD

