

APPENDIX II

UNITIZING PROCEDURES FOR PROPELLING CHARGES PACKED IN CYLINDRICAL METAL CONTAINERS ON 4-WAY ENTRY PALLETS

PA68 SERIES CONTAINERS

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PALLET UNIT DATA						
ITEMS INCLUDED		HAZARD CLASSIFICATION ①				WEIGHT (LBS)
NSN	DODIC	DOT CLASS	CG CLASS	QD CLASS	COMP GROUP	
1320- 01-033-9994 01-067-3769	D532 D532	B B	II-A II-A	1.3 1.3	C C	1,333 TO 1,400

REVISIONS

REVISION NO. 1, DATED OCTOBER 1985, CONSISTS OF:

1. ADDING ITEMS BY NATIONAL STOCK NUMBER TO PALLET UNIT DATA CHART.
2. MODIFYING DUNNAGE ASSEMBLIES.

REVISION NO. 2, DATED JULY 1986, CONSISTS OF:

- CHANGING 1-3/4" STRAPPING TO 3/4" STRAPPING.

NOTICE: THIS APPENDIX CANNOT STAND ALONE BUT MUST BE USED IN CONJUNCTION WITH THE BASIC UNITIZATION PROCEDURES DRAWING 19-48-4042-20PM1001.

THIS DRAWING SUPERSEDES PART OF DRAWING 19-48-4042-1-2-5-11-14PM1000, DATED FEBRUARY 1965, AND REVISION 1, THERETO, DATED 29 AUGUST 1969.

- ① HAZARD CLASSIFICATION DATA CONTAINED IN THE ABOVE CHART IS FOR GUIDANCE AND INFORMATIONAL PURPOSES ONLY. VERIFICATION OF THE SPECIFIED DATA SHOULD BE MADE BY CONSULTING THE MOST RECENT JOINT HAZARD CLASSIFICATION SYSTEM LISTING OR OTHER APPROVED LISTING (S).

DO NOT SCALE

REVISIONS				DATE	BY	APPROVED	PROJECT ENGINEER
1	OCT 85	W.F.C. / W.F.C.	William F. Ernst SICAR-ESR / ANSMC-TMD	1985	W.F.C.	W.F.C.	W.F.C.
2	JULY 86	W.F.C. / W.F.C.	William F. Ernst SICAR-ESR / ANSMC-TMD	1986	W.F.C.	W.F.C.	W.F.C.
U. S. ARMY DARCOM DRAWING							
OCTOBER 1979							
CLASS	DIVISION	DRAWING	FILE				
19	48	4042A/ II	20PM 1001				

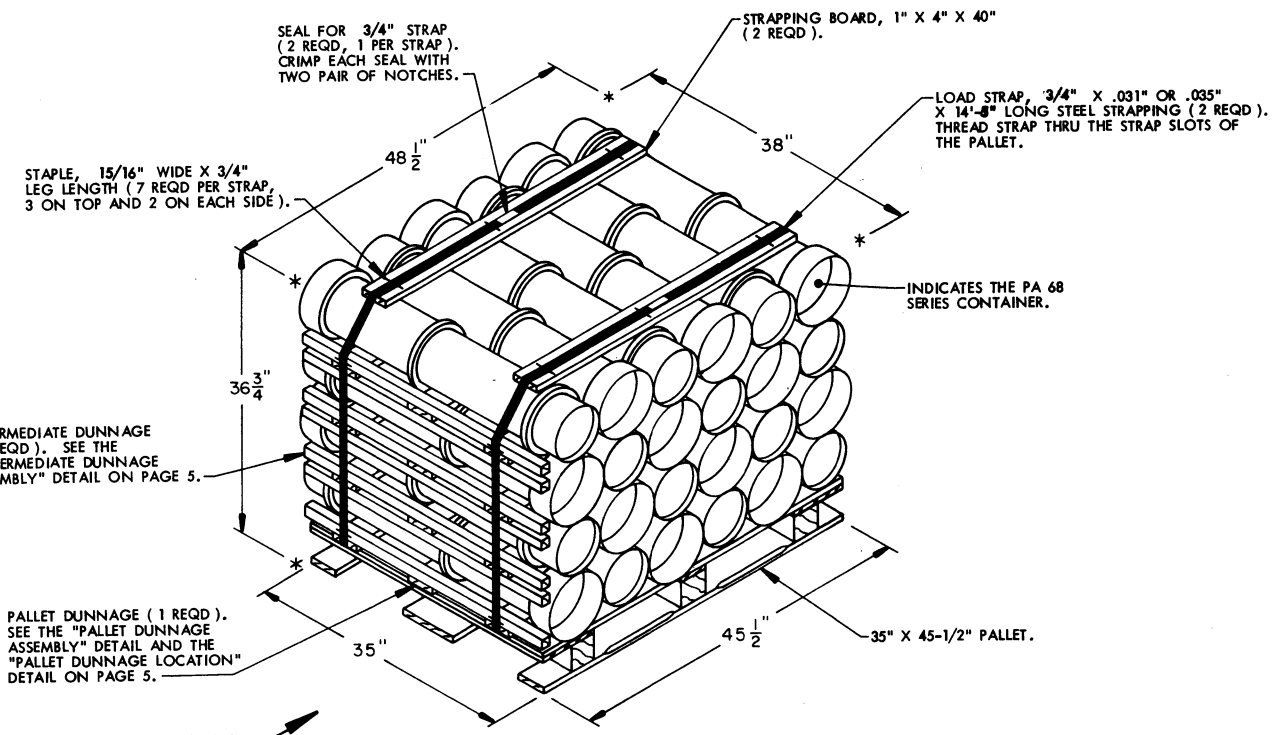
GENERAL NOTES

- A. THIS APPENDIX CANNOT STAND ALONE BUT MUST BE USED IN CONJUNCTION WITH THE BASIC UNITIZING PROCEDURES DRAWING 19-48-4042-20PM1001. TO PRODUCE AN APPROVED UNIT LOAD, ALL PERTINENT PROCEDURES, SPECIFICATIONS AND CRITERIA SET FORTH WITHIN THE BASIC DRAWING WILL APPLY TO THE PROCEDURES DELINEATED IN THIS APPENDIX. ANY EXCEPTIONS TO THE BASIC PROCEDURES ARE SPECIFIED IN THIS APPENDIX.
- B. DIMENSIONS, CUBE AND WEIGHT OF A PALLET UNIT WILL VARY SLIGHTLY DEPENDING UPON THE ACTUAL DIMENSIONS OF THE CONTAINER, WEIGHT OF THE SPECIFIED ITEM, AND METHOD OF UNITIZATION.
- C. OUTLOADING AND STORAGE OF THE ITEMS COVERED BY THIS APPENDIX SHALL BE ACCOMPLISHED IN ACCORDANCE WITH AMC (DARCOM) DRAWINGS IDENTIFIED WITHIN DA PAMPHLET 75-5.
- D. FOR METHOD OF SECURING A STRAP CUTTER TO THE PALLET UNIT, SEE DARCOM DRAWING 19-48-4127-20P1000.
- E. IF ITEMS COVERED HEREIN ARE UNITIZED PRIOR TO ISSUANCE OF THIS APPENDIX, THE CONTAINERS NEED NOT BE REUNITIZED SOLELY TO CONFORM TO THIS APPENDIX.
- F. THE UNITIZATION PROCEDURES DEPICTED HEREIN MAY ALSO BE USED FOR UNITIZING PROPELLING CHARGES WHEN IDENTIFIED BY A DIFFERENT NATIONAL STOCK NUMBER (NSN) THAN THOSE SHOWN ON THE COVER PAGE, PROVIDED THE ITEM IS PACKED IN THE PA68 SERIES CONTAINER. THE EXPLOSIVE CLASSIFICATION OF OTHER ITEMS MAY BE DIFFERENT THAN THOSE SHOWN.
- G. FOR DETAILS OF PA68 SERIES CONTAINER, SEE PICATINNY ARSENAL DRAWING NO. 9278205.

CONTAINER DIMENSIONS ----- 38" LONG BY 8-13/32" DIAMETER.
CONTAINER CUBE ----- 1.7 CUBIC FEET.
CONTAINER WEIGHT
(WITH CHARGE) ----- 50 POUNDS (APPROX).

- H. THE SPECIFIED UNITIZING PROCEDURES SHOWN HEREIN DEPICT THREE DIFFERENT METHODS FOR UNITIZING THE PA68 SERIES CONTAINERS:
1. UNIT "A" DEPICTS CONTAINERS UNITIZED ON FLAT DUNNAGE WITH EVERY OTHER CONTAINER ALTERNATED (BASE END, BELL END, BASE END) INDIVIDUALLY AND BY LAYERS. SEE DETAILS ON PAGES 4 AND 5.
 2. UNIT "B" DEPICTS CONTAINERS UNITIZED ON FLAT DUNNAGE. SEE DETAILS ON PAGES 6 AND 7.
 3. UNIT "C" DEPICTS CONTAINERS UNITIZED ON ROUTED DUNNAGE. SEE DETAILS ON PAGES 8 AND 9.
- ALTHOUGH UNIT "A" DEPICTS THE PREFERRED METHOD OF UNITIZING THE PA68 SERIES CONTAINER, ALL THREE METHODS ARE APPROVED FOR USE.
- J. IF DEEMED MORE ECONOMICAL FOR SHIPPING AND STORAGE BY THE RESPONSIBLE COMMAND, THE UNITS DEPICTED IN THE FOLLOWING PAGES MAY BE INCREASED BY ONE COMPLETE LAYER OF CONTAINERS. FOR FURTHER UNITIZATION GUIDANCE, SEE SPECIAL NOTE 1 ON PAGES 4, 6, AND 8.

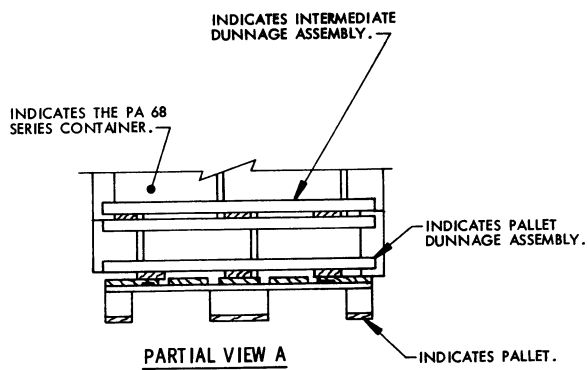
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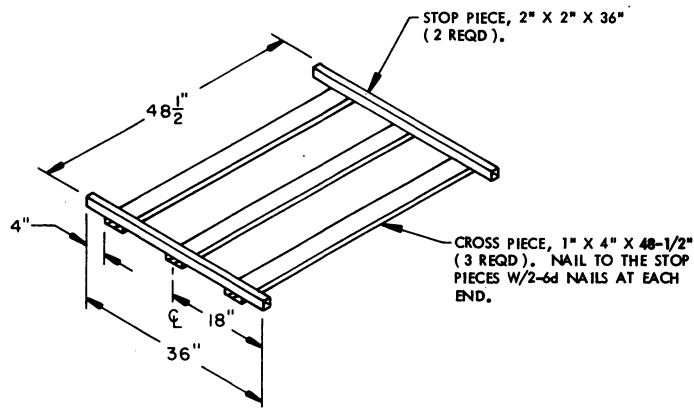


ISOMETRIC VIEW

SPECIAL NOTES:

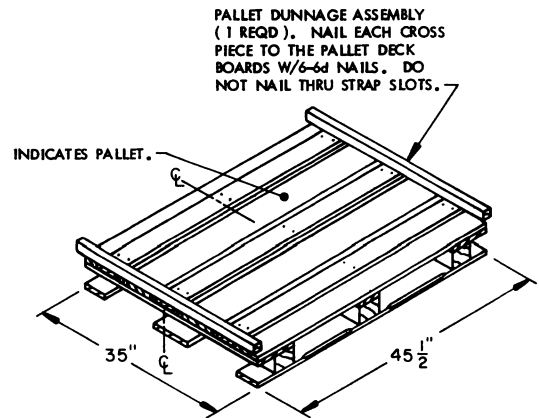
1. THE UNIT DEPICTED ABOVE MAY BE INCREASED BY ONE COMPLETE LAYER OF CONTAINERS BY THE ADDITION OF ONE INTERMEDIATE DUNNAGE ASSEMBLY AND SIX CONTAINERS, AND BY INCREASING THE STRAP LENGTHS APPROPRIATELY. THIS WILL RESULT IN AN OVERALL UNIT HEIGHT OF 44-3/8". ALSO, 1-1/4" STRAPPING MUST BE SUBSTITUTED FOR THE 3/4" STRAPPING.



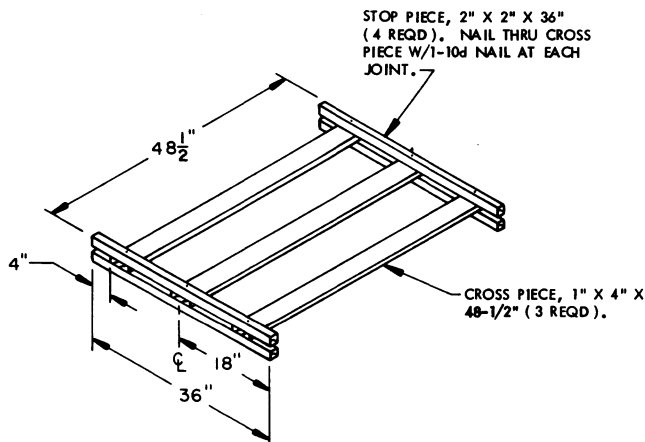


PALLET DUNNAGE ASSEMBLY

(1 REQD)



PALLET DUNNAGE LOCATION



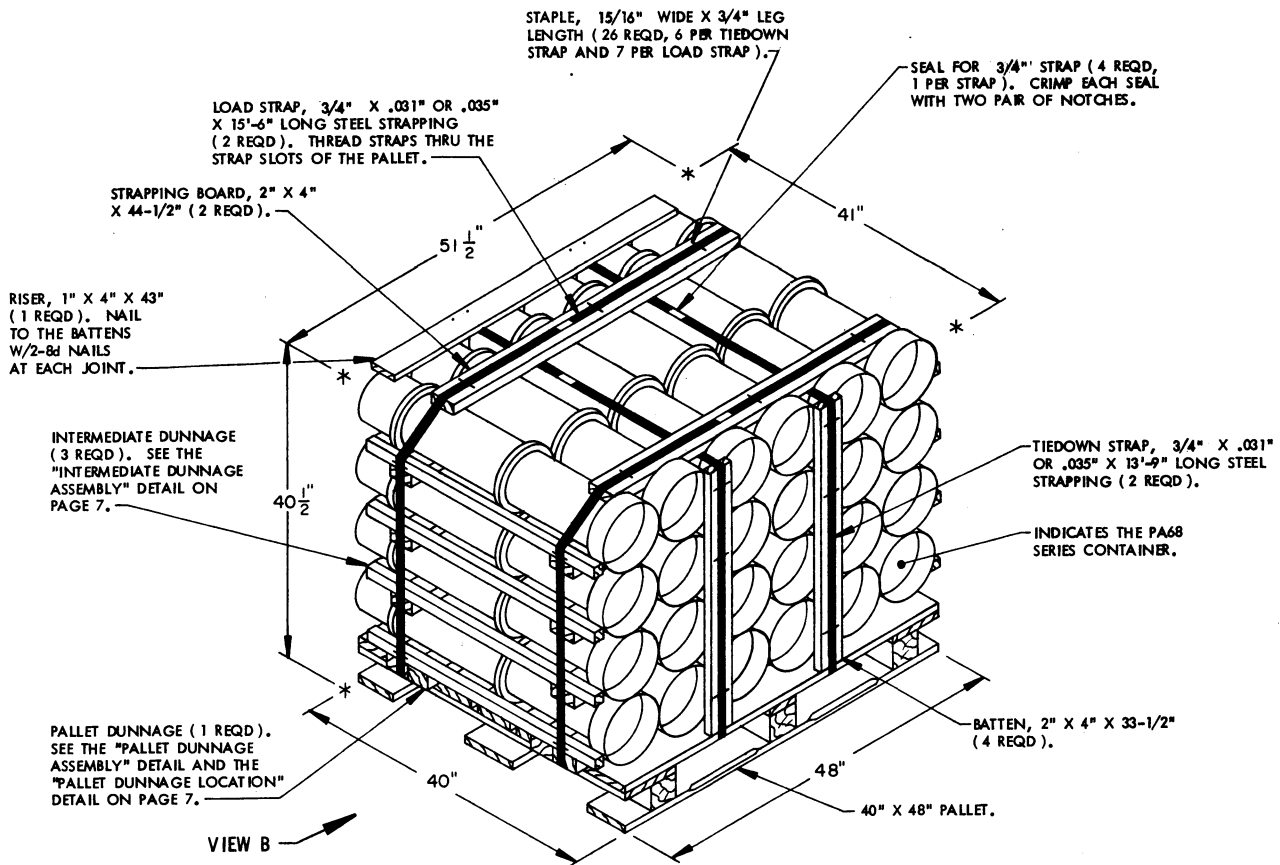
INTERMEDIATE DUNNAGE ASSEMBLY

(3 REQD)

BILL OF MATERIAL			
LUMBER	NO. REQD	LINEAR FEET	BOARD FEET
1" X 4" X 40"	2	6.67	2.22
1" X 4" X 48-1/2"	12	48.50	16.17
2" X 2" X 36"	14	42.00	14.00
NAILS	NO. REQD	POUNDS	
6d (2")	30	0.18	
10d (3")	36	0.55	
PALLET, 35" X 45-1/2"	1	REQD-	65 LBS
STEEL STRAPPING, 3/4" X .031" OR .035"	28.00	REQD-	2.06 LBS
SEAL FOR 3/4" STRAP	2	REQD-	NIL
STRAP STAPLE, 15/16" X 3/4"	14	REQD-	NIL

UNIT DATA

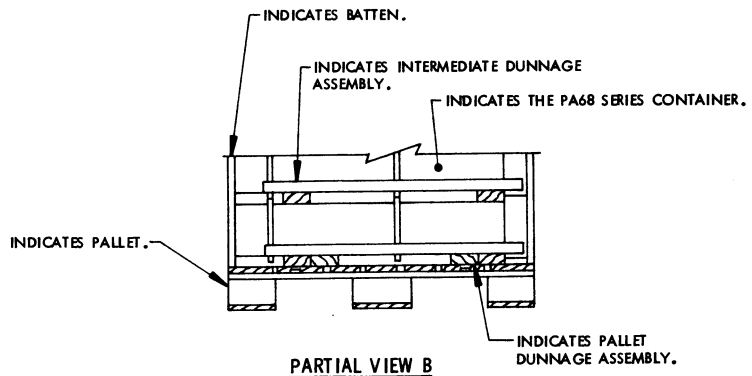
	WEIGHT
CUBE ----- 38.6 CUBIC FEET (APPROX)	
CONTAINER, PA68 SERIES --24 EA @ 50 LBS -----	1,200 LBS (APPROX)
DUNNAGE -----	68 LBS
PALLET -----	65 LBS
TOTAL WEIGHT -----	1,333 LBS (APPROX)



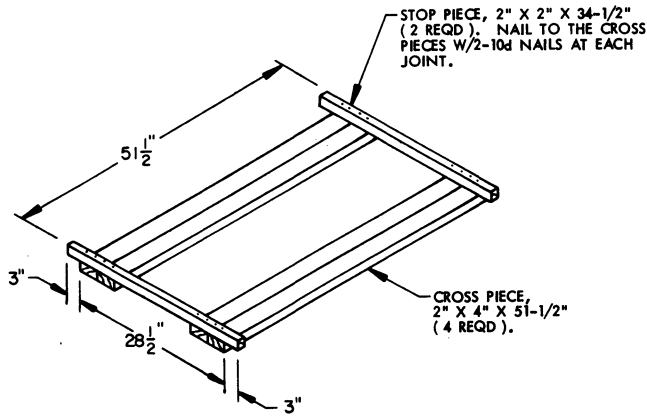
ISOMETRIC VIEW

SPECIAL NOTES:

1. THE UNIT DEPICTED ABOVE MAY BE INCREASED BY ONE COMPLETE LAYER OF CONTAINERS BY THE ADDITION OF ONE INTERMEDIATE DUNNAGE ASSEMBLY AND SIX CONTAINERS, AND BY INCREASING STRAP LENGTHS APPROPRIATELY. THIS WILL RESULT IN AN OVERALL UNIT HEIGHT OF 48-7/8". ALSO, 1-1/4" STRAPPING MUST BE SUBSTITUTED FOR THE 3/4" STRAPPING.
2. IF DESIRED, A 2" X 6" PIECE CAN BE SUBSTITUTED FOR EACH SET OF TWO (SIDE BY SIDE) 2" X 4" PIECES ON THE PALLET DUNNAGE ASSEMBLY. EACH 2" X 6" PIECE WILL BE NAILED TO THE PALLET W/6-8d NAILS.

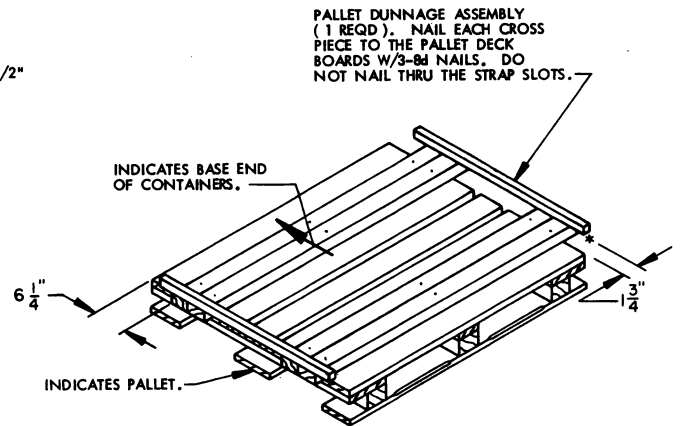


UNIT B (FLAT DUNNAGE)

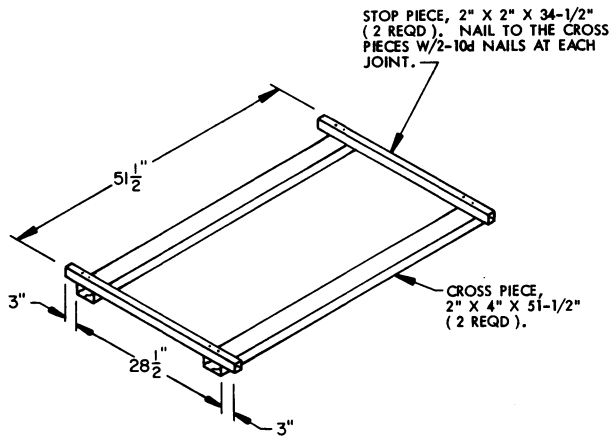


PALLET DUNNAGE ASSEMBLY

(1 REQD)



PALLET DUNNAGE LOCATION



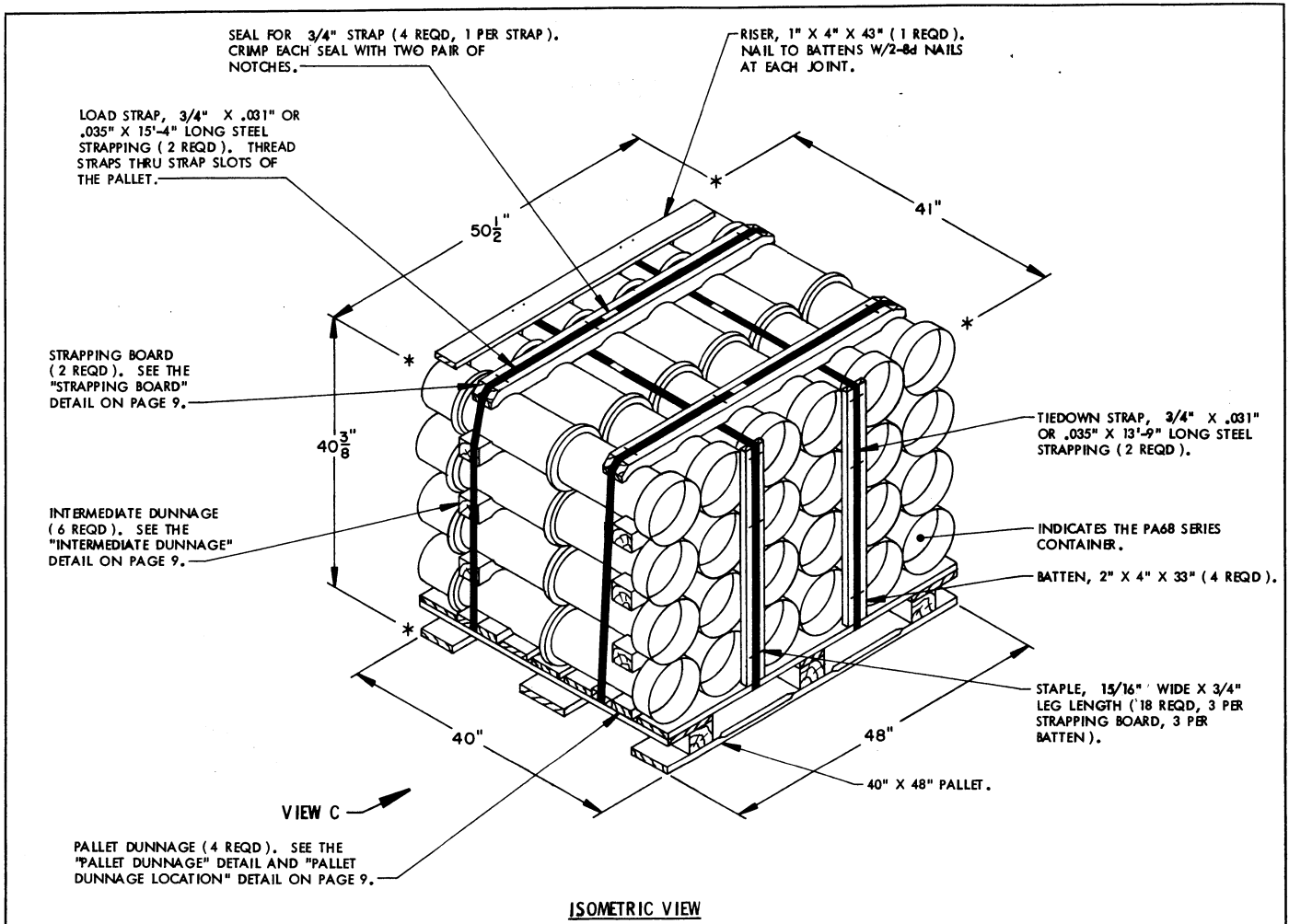
INTERMEDIATE DUNNAGE ASSEMBLY

(3 REQD)

BILL OF MATERIAL			
LUMBER	NO. REQD	LINEAR FEET	BOARD FEET
1" X 4" X 43"	1	3.58	1.19
2" X 2" X 34-1/2"	8	23.00	15.33
2" X 4" X 33-1/2"	4	11.17	7.44
2" X 4" X 44-1/2"	2	7.42	4.94
2" X 4" X 51-1/2"	10	42.92	28.61
NAILS		NO. REQD	POUNDS
8d (2-1/2")		16	0.17
10d (3")		40	0.62
PALLET, 40" X 48" ----- 1 REQD --- 80 LBS			
STEEL STRAPPING, 3/4" X .031" OR .035" --- 58.50' REQD --- 4.18 LBS			
SEAL FOR 3/4" STRAP ----- 4 REQD --- NIL			
STRAP STAPLE, 15/16" X 3/4" ----- 26 REQD --- NIL			

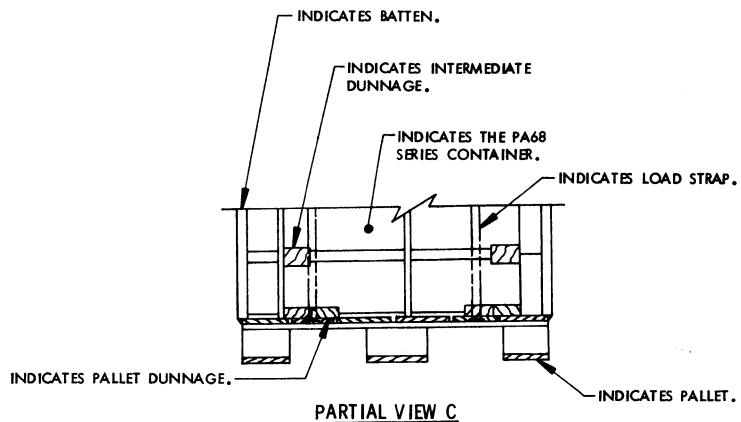
UNIT DATA

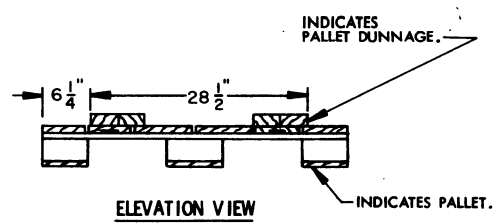
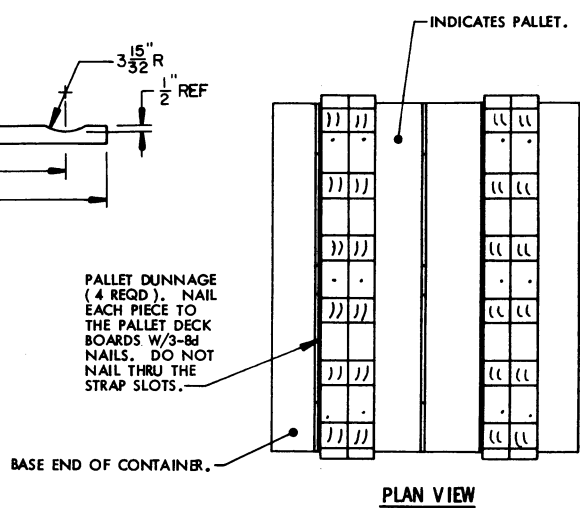
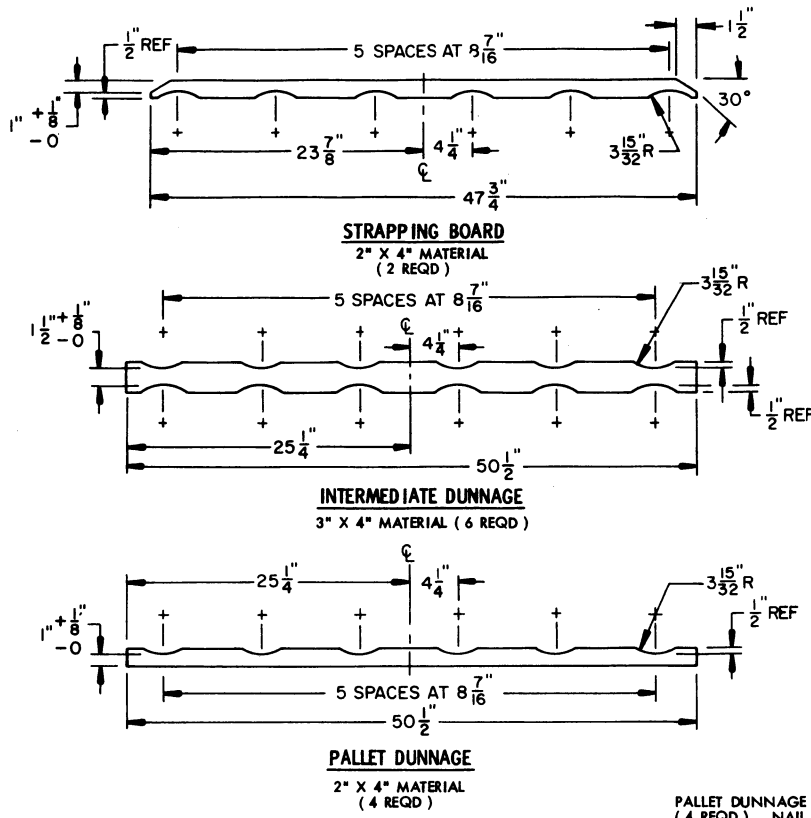
	WEIGHT
CJBE ----- 49.5 CUBIC FEET (APPROX)	
CONTAINER, PA68 SERIES ----- 24 EA @ 50 LBS -----	1,200 LBS (APPROX)
DUNNAGE -----	120 LBS
PALLET -----	80 LBS
TOTAL WEIGHT -----	1,400 LBS (APPROX)



SPECIAL NOTES:

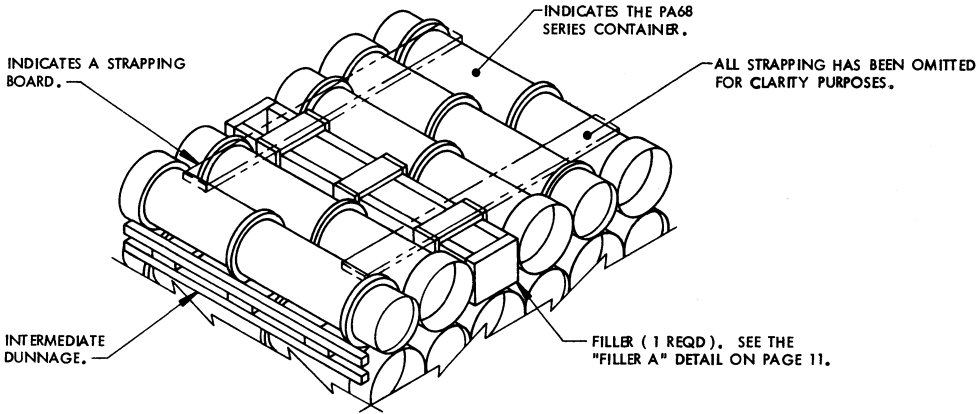
1. THE UNIT DEPICTED ABOVE MAY BE INCREASED BY ONE COMPLETE LAYER OF CONTAINERS BY THE ADDITION OF TWO INTERMEDIATE DUNNAGE PIECES AND SIX CONTAINERS, AND BY INCREASING STRAP LENGTHS APPROPRIATELY. THIS WILL RESULT IN AN OVERALL UNIT HEIGHT OF 48-3/4". ALSO, 1-1/4" STRAPPING MUST BE SUBSTITUTED FOR 3/4" STRAPPING.
2. IF DESIRED, A 2" X 6" PIECE CAN BE SUBSTITUTED FOR EACH SET OF TWO (SIDE BY SIDE) 2" X 4" PIECES OF PALLET DUNNAGE. EACH 2" X 6" PIECE WILL BE NAILED TO THE PALLET W/6-8d NAILS.





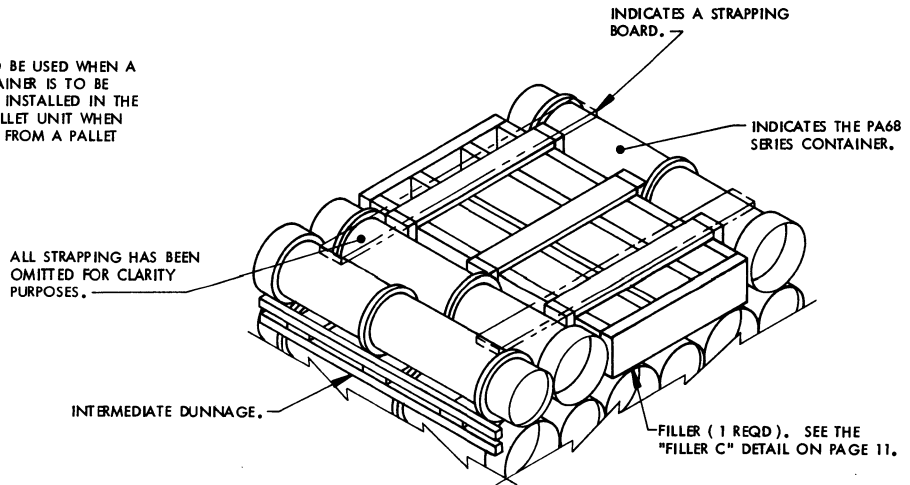
BILL OF MATERIAL			
LUMBER	NO. REQD	LINEAR FEET	BOARD FEET
1" X 4" X 43"	1	3.58	1.19
2" X 4" X 33"	4	11.00	7.33
2" X 4" X 47-3/4"	2	7.96	5.31
2" X 4" X 50-1/2"	4	16.83	11.22
3" X 4" X 50-1/2"	6	25.25	25.25
NAILS		NO. REQD	POUNDS
8d (2-1/2")		16	0.17
PALLET, 40" X 48"		1 REQD	80 LBS
STEEL STRAPPING, 3/4" X .031" OR .035"		38.17' REQD	4.16 LBS
SEAL FOR 3/4" STRAP		4 REQD	NIL
STRAP STAPLE, 15/16" X 3/4"		18 REQD	NIL

UNIT DATA		WEIGHT
CUBE	48.38 CUBIC FEET (APPROX)	
CONTAINER, PA68 SERIES	24 EA @ 50 LBS	1,200 LBS (APPROX)
DUNNAGE		105 LBS
PALLET		80 LBS
TOTAL WEIGHT		1,385 LBS (APPROX)



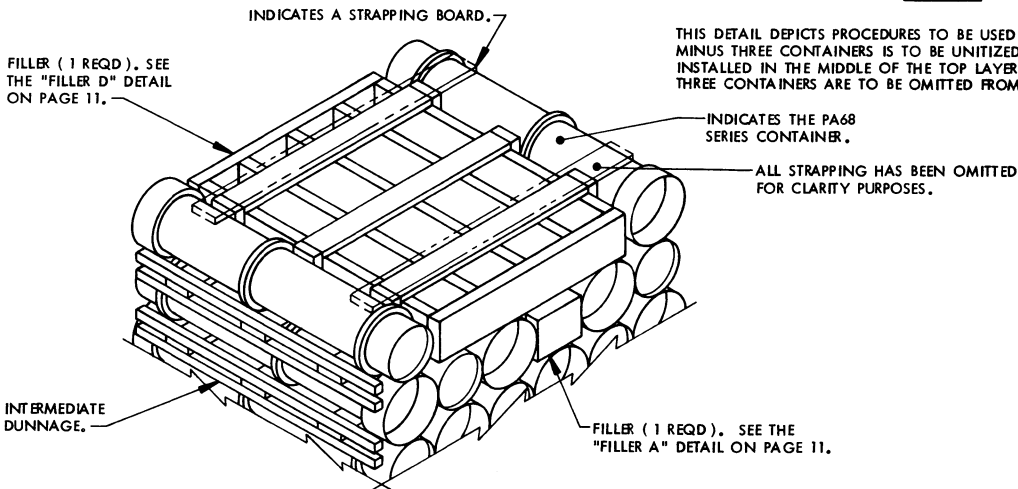
DETAIL A

THIS DETAIL DEPICTS PROCEDURES TO BE USED WHEN A STANDARD UNIT MINUS ONE CONTAINER IS TO BE UNITIZED. THIS ASSEMBLY MUST BE INSTALLED IN THE MIDDLE OF THE TOP LAYER OF A PALLET UNIT WHEN ONE CONTAINER IS TO BE OMITTED FROM A PALLET UNIT.



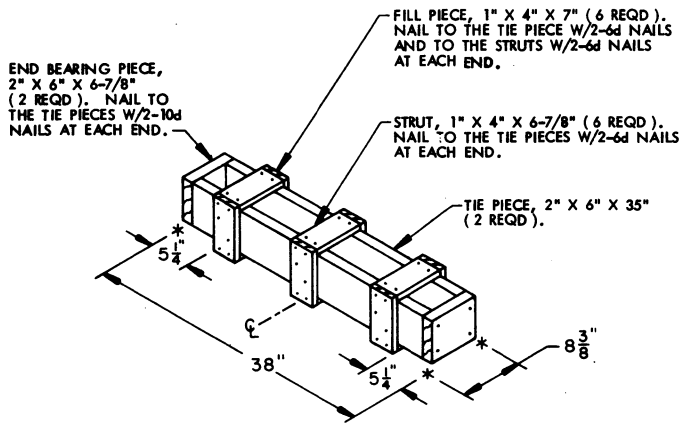
DETAIL B

THIS DETAIL DEPICTS PROCEDURES TO BE USED WHEN A STANDARD UNIT MINUS THREE CONTAINERS IS TO BE UNITIZED. THIS ASSEMBLY MUST BE INSTALLED IN THE MIDDLE OF THE TOP LAYER OF A PALLET UNIT WHEN THREE CONTAINERS ARE TO BE OMITTED FROM A PALLET UNIT.



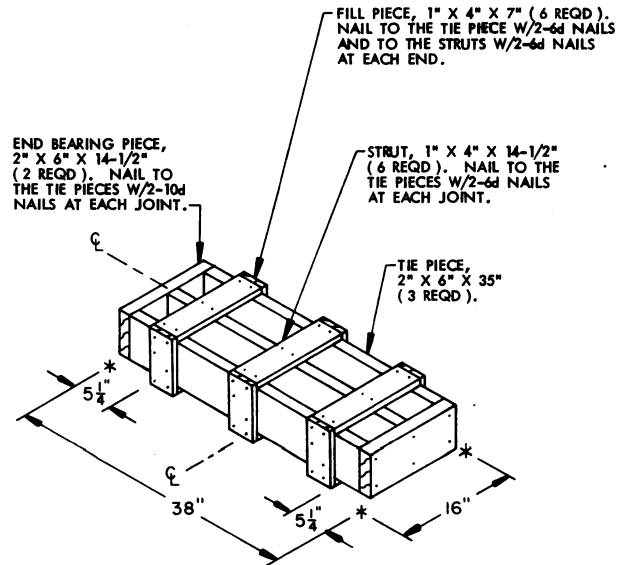
DETAIL C

THIS DETAIL DEPICTS PROCEDURES TO BE USED WHEN A STANDARD UNIT MINUS FIVE CONTAINERS IS TO BE UNITIZED. THESE ASSEMBLIES MUST BE INSTALLED IN THE MIDDLE OF THE TOP LAYER OR LAYERS OF A PALLET UNIT WHEN FIVE CONTAINERS ARE TO BE OMITTED FROM A PALLET UNIT. A COMBINATION OF FILLERS MUST BE USED WHEN FIVE OR LESS CONTAINERS ARE TO BE OMITTED FROM A PALLET UNIT. WHEN SIX CONTAINERS ARE TO BE OMITTED, A COMPLETE LAYER MUST BE OMITTED.



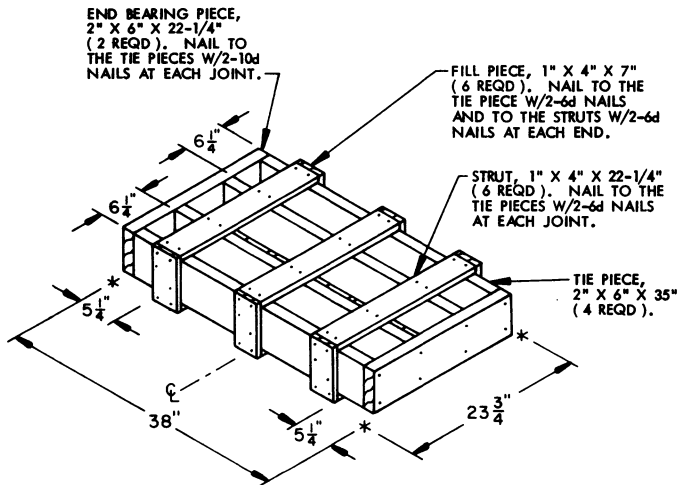
FILLER A

THIS FILLER IS TO BE USED WHEN ONE CONTAINER IS TO BE OMITTED FROM A PALLET UNIT, OR IN COMBINATION WITH OTHER FILLER ASSEMBLIES.



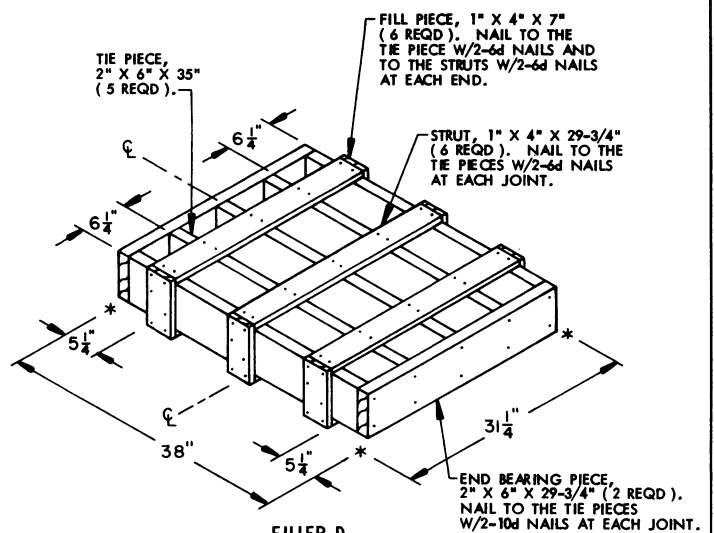
FILLER B

THIS FILLER IS TO BE USED WHEN TWO CONTAINERS ARE TO BE OMITTED FROM A PALLET UNIT, OR IN COMBINATION WITH OTHER FILLER ASSEMBLIES.



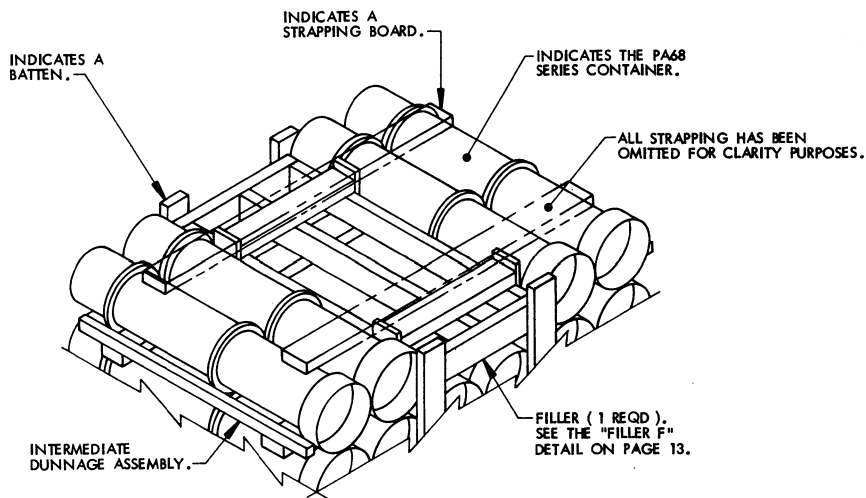
FILLER C

THIS FILLER IS TO BE USED WHEN THREE CONTAINERS ARE TO BE OMITTED FROM A PALLET UNIT, OR IN COMBINATION WITH OTHER FILLER ASSEMBLIES.



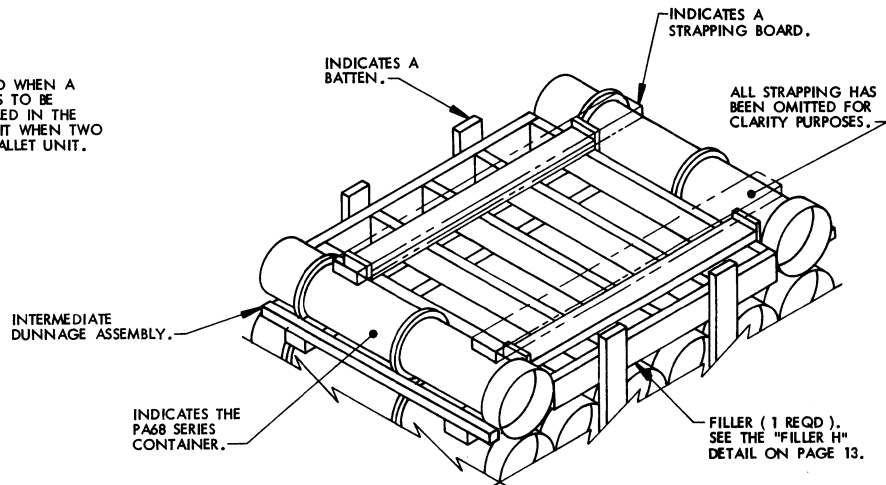
FILLER D

THIS FILLER IS TO BE USED WHEN FOUR CONTAINERS ARE TO BE OMITTED FROM A PALLET UNIT, OR IN COMBINATION WITH OTHER FILLER ASSEMBLIES.



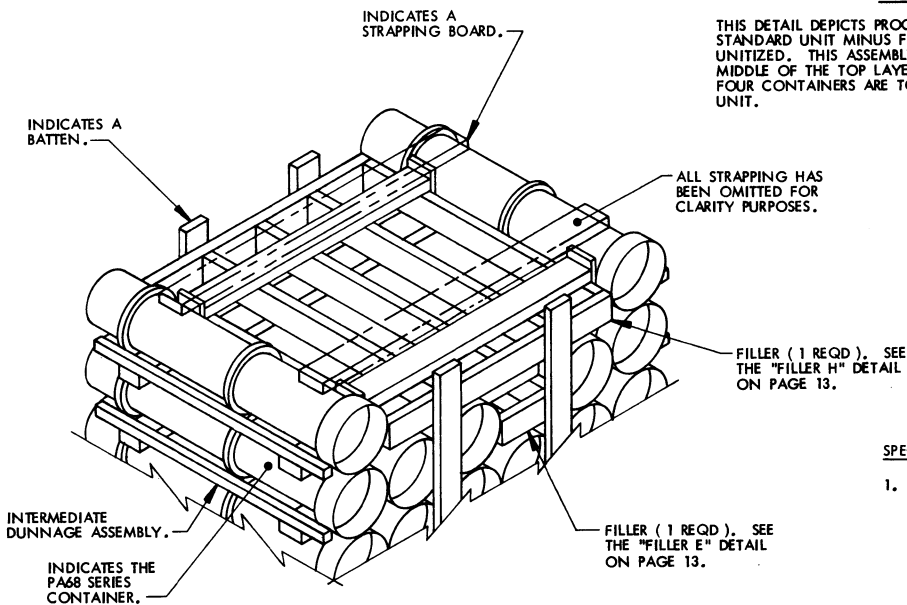
DETAIL D

THIS DETAIL DEPICTS PROCEDURES TO BE USED WHEN A STANDARD UNIT MINUS TWO CONTAINERS IS TO BE UNITIZED. THIS ASSEMBLY MUST BE INSTALLED IN THE MIDDLE OF THE TOP LAYER OF A PALLET UNIT WHEN TWO CONTAINERS ARE TO BE OMITTED FROM A PALLET UNIT.



DETAIL E

THIS DETAIL DEPICTS PROCEDURES TO BE USED WHEN A STANDARD UNIT MINUS FOUR CONTAINERS IS TO BE UNITIZED. THIS ASSEMBLY MUST BE INSTALLED IN THE MIDDLE OF THE TOP LAYER OF A PALLET UNIT WHEN FOUR CONTAINERS ARE TO BE OMITTED FROM A PALLET UNIT.

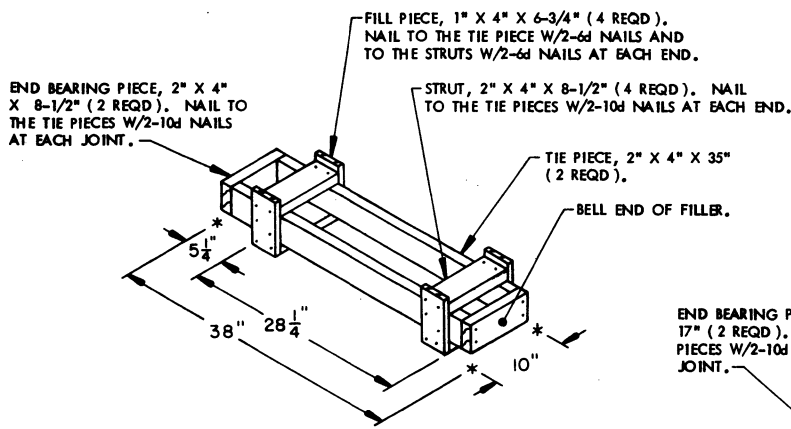


DETAIL F

THIS DETAIL DEPICTS PROCEDURES TO BE USED WHEN A STANDARD UNIT MINUS FIVE CONTAINERS IS TO BE UNITIZED. THESE ASSEMBLIES MUST BE INSTALLED IN THE MIDDLE OF THE TOP LAYER OR LAYERS OF A PALLET UNIT WHEN FIVE CONTAINERS ARE TO BE OMITTED FROM A PALLET UNIT. A COMBINATION OF FILLERS MUST BE USED WHEN FIVE OR LESS CONTAINERS ARE TO BE OMITTED FROM A PALLET UNIT. WHEN SIX CONTAINERS ARE TO BE OMITTED, A COMPLETE LAYER MUST BE OMITTED.

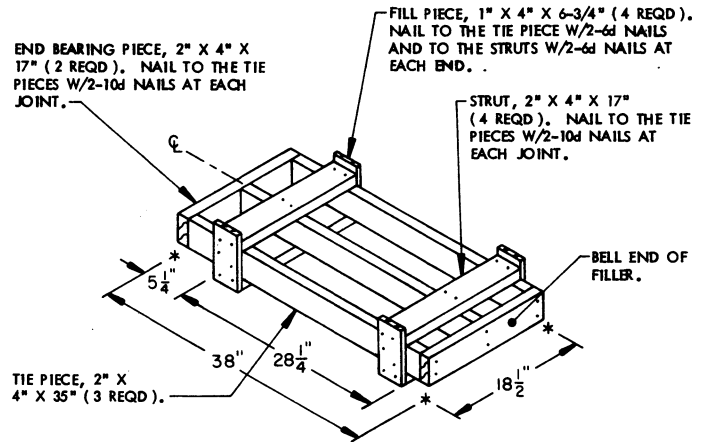
SPECIAL NOTE:

1. WHEN USING FILLER ASSEMBLIES FOR OMITTING TWO, THREE, OR FOUR CONTAINERS FROM A PALLET UNIT, THE LENGTH OF THE BATTENS MUST BE ADJUSTED SO THAT TIGHTENING OF THE TIEDOWN STRAPS DOES NOT DAMAGE (I.E., BREAK OR SPLIT) THE ENDS OF THE BATTENS.



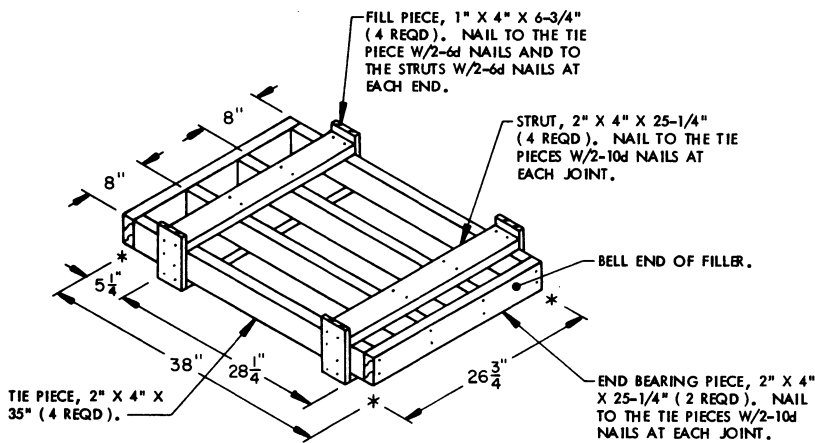
FILLER E

THIS FILLER IS TO BE USED WHEN ONE CONTAINER IS OMITTED FROM A PALLET UNIT, OR IN COMBINATION WITH OTHER FILLER ASSEMBLIES.



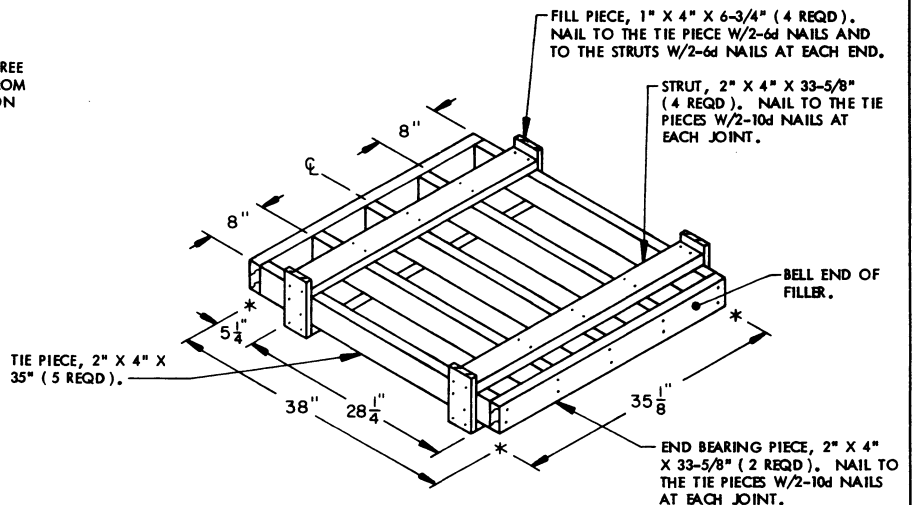
FILLER F

THIS FILLER IS TO BE USED WHEN TWO CONTAINERS ARE TO BE OMITTED FROM A PALLET UNIT, OR IN COMBINATION WITH OTHER FILLER ASSEMBLIES.



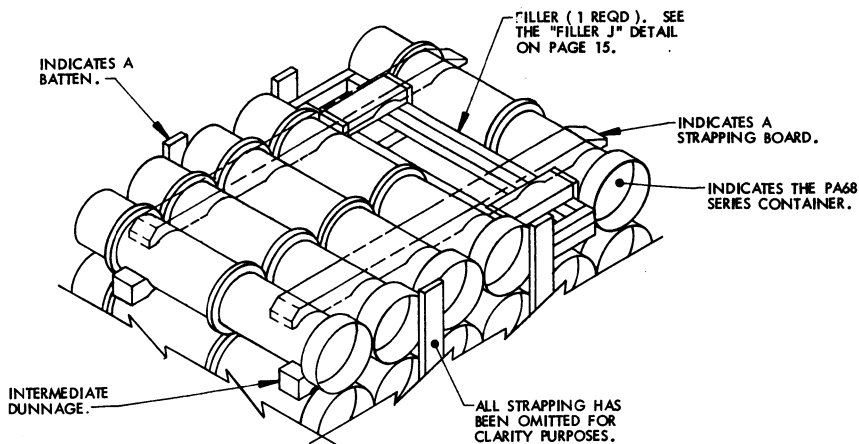
FILLER G

THIS FILLER IS TO BE USED WHEN THREE CONTAINERS ARE TO BE OMITTED FROM A PALLET UNIT, OR IN COMBINATION WITH OTHER FILLER ASSEMBLIES.



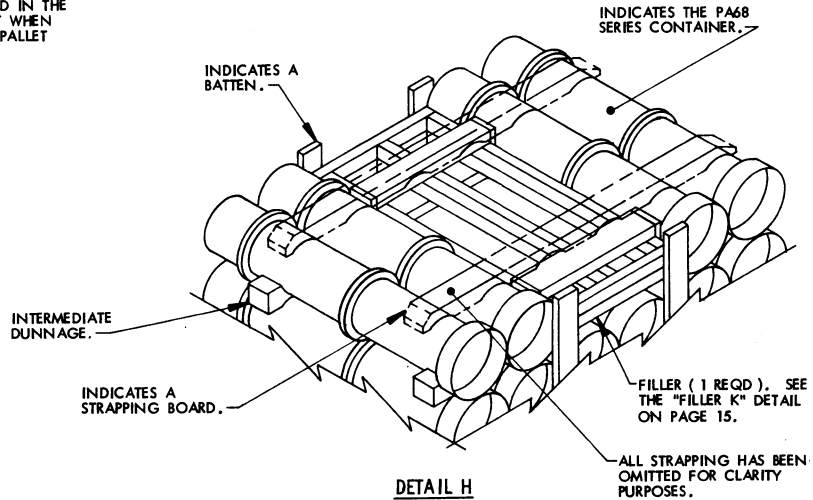
FILLER H

THIS FILLER IS TO BE USED WHEN FOUR CONTAINERS ARE TO BE OMITTED FROM A PALLET UNIT, OR IN COMBINATION WITH OTHER FILLER ASSEMBLIES.



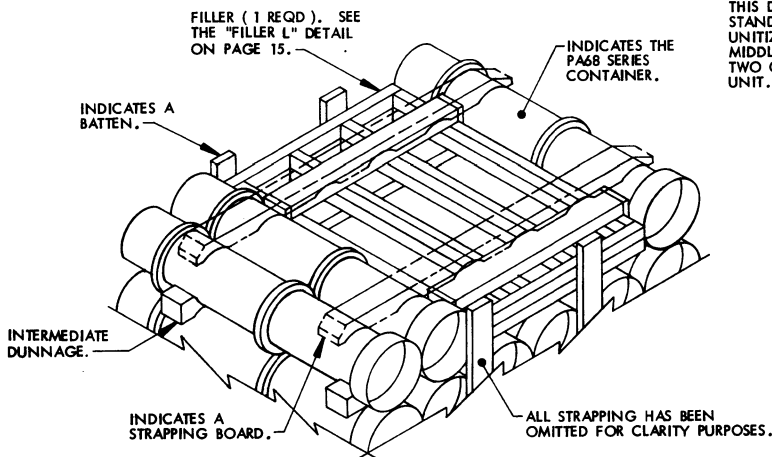
DETAIL G

THIS DETAIL DEPICTS PROCEDURES TO BE USED WHEN A STANDARD UNIT MINUS ONE CONTAINER IS TO BE UNITIZED. THIS ASSEMBLY MUST BE INSTALLED IN THE MIDDLE OF THE TOP LAYER OF A PALLET UNIT WHEN ONE CONTAINER IS TO BE OMITTED FROM A PALLET UNIT.



DETAIL H

THIS DETAIL DEPICTS PROCEDURES TO BE USED WHEN A STANDARD UNIT MINUS TWO CONTAINERS IS TO BE UNITIZED. THIS ASSEMBLY MUST BE INSTALLED IN THE MIDDLE OF THE TOP LAYER OF A PALLET UNIT WHEN TWO CONTAINERS ARE TO BE OMITTED FROM A PALLET UNIT.



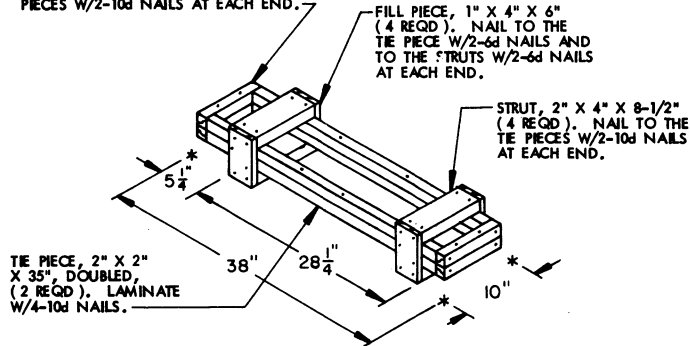
DETAIL J

THIS DETAIL DEPICTS PROCEDURES TO BE USED WHEN A STANDARD UNIT MINUS THREE CONTAINERS IS TO BE UNITIZED. THIS ASSEMBLY MUST BE INSTALLED IN THE MIDDLE OF THE TOP LAYER OF A PALLET UNIT WHEN THREE CONTAINERS ARE TO BE OMITTED FROM A PALLET UNIT.

SPECIAL NOTES:

1. DETAILS HAVE BEEN SHOWN FOR OMITTING ONE, TWO OR THREE CONTAINERS FROM A STANDARD PALLET UNIT. WHEN FOUR CONTAINERS ARE TO BE OMITTED FROM A STANDARD PALLET UNIT, "FILLER M" IS TO BE USED. SEE THE "FILLER M" DETAIL ON PAGE 15. A COMBINATION OF FILLERS MUST BE USED WHEN FIVE OR LESS CONTAINERS ARE TO BE OMITTED FROM A STANDARD PALLET UNIT. WHEN SIX CONTAINERS ARE TO BE OMITTED, A COMPLETE LAYER MUST BE OMITTED. ALL FILLER ASSEMBLIES MUST BE INSTALLED IN THE MIDDLE OF THE TOP LAYER OR LAYERS OF A PALLET UNIT.
2. WHEN USING FILLER ASSEMBLIES FOR OMITTING TWO, THREE, OR FOUR CONTAINERS FROM A PALLET UNIT, THE LENGTH OF THE BATTENS MUST BE ADJUSTED SO THAT TIGHTENING OF THE TIEDOWN STRAPS DOES NOT DAMAGE (I.E., BREAK OR SPLIT) THE ENDS OF THE BATTENS.

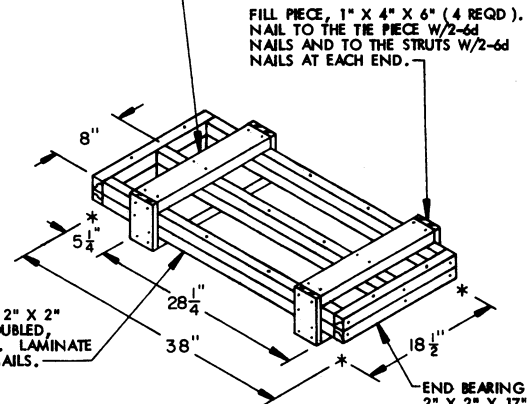
END BEARING PIECE, 2" X 2" X 8-1/2", DOUBLED, (2 REQD). LAMINATE W/2-10d NAILS AND NAIL TO THE TIE PIECES W/2-10d NAILS AT EACH END.



FILLER J

THIS FILLER IS TO BE USED WHEN ONE CONTAINER IS TO BE OMITTED FROM A PALLET UNIT, OR IN COMBINATION WITH OTHER FILLER ASSEMBLIES.

STRUT, 2" X 4" X 17" (4 REQD). NAIL TO THE TIE PIECES W/2-10d NAILS AT EACH JOINT.

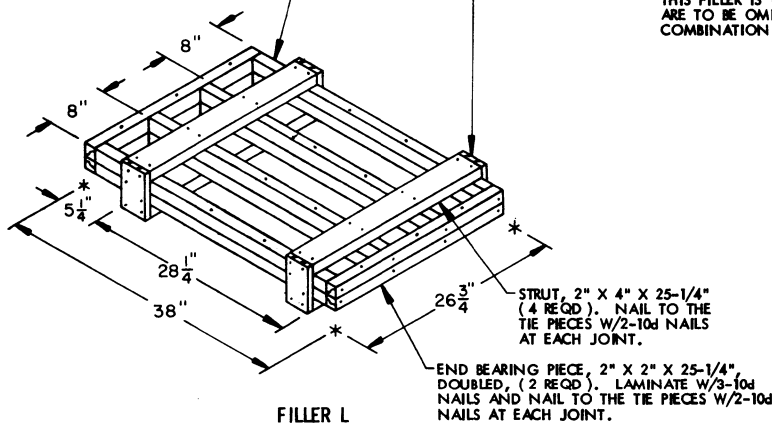


FILLER K

THIS FILLER IS TO BE USED WHEN TWO CONTAINERS ARE TO BE OMITTED FROM A PALLET UNIT, OR IN COMBINATION WITH OTHER FILLER ASSEMBLIES.

TIE PIECE, 2" X 2" X 35", DOUBLED, (4 REQD). LAMINATE W/4-10d NAILS.

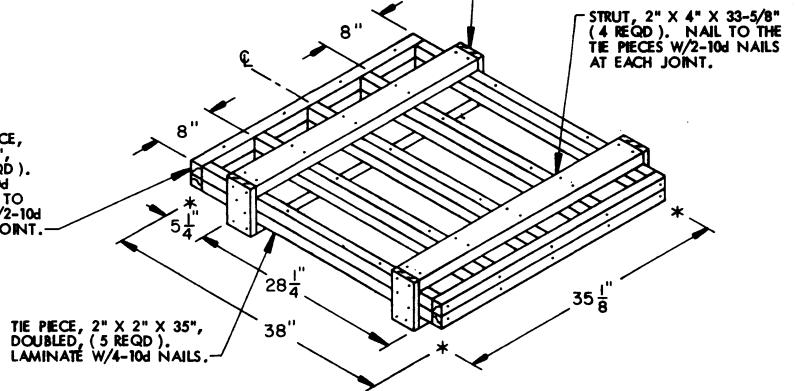
FILL PIECE, 1" X 4" X 6" (4 REQD). NAIL TO THE TIE PIECE W/2-6d NAILS AND TO THE STRUTS W/2-6d NAILS AT EACH END.



FILLER L

THIS FILLER IS TO BE USED WHEN THREE CONTAINERS ARE TO BE OMITTED FROM A PALLET UNIT, OR IN COMBINATION WITH OTHER FILLER ASSEMBLIES.

FILL PIECE, 1" X 4" X 6" (4 REQD). NAIL TO THE TIE PIECE W/2-6d NAILS AND TO THE STRUTS W/2-6d NAILS AT EACH END.



FILLER M

THIS FILLER IS TO BE USED WHEN FOUR CONTAINERS ARE TO BE OMITTED FROM A PALLET UNIT, OR IN COMBINATION WITH OTHER FILLER ASSEMBLIES.

SPECIAL NOTE:

- IF THE 2" X 2" DUNNAGE LUMBER SPECIFIED FOR THE TIE AND END BEARING PIECES OF THE FILLER ASSEMBLIES IS NOT READILY AVAILABLE, TWO NOMINAL SIZE 2" X 2" PIECES CAN BE MADE BY RIPPING (SAWING) A PIECE OF NOMINAL SIZE 2" X 4" LUMBER ON THE CENTER LINE OF ITS 3-1/2" WIDTH.

