

*W. Gordon*

DATE 3/04/01

# APPENDIX 102

## LOADING AND BRACING PROCEDURES FOR AMMUNITION LOADED ON CONTAINER ROLL IN/OUT PLATFORM (CROP)

SEPARATE LOADING PROJECTILES PALLETIZED  
ON WOODEN AND METAL PALLETS; INCLUDES  
LARGE & SMALL PALLET UNIT CONFIGURATIONS

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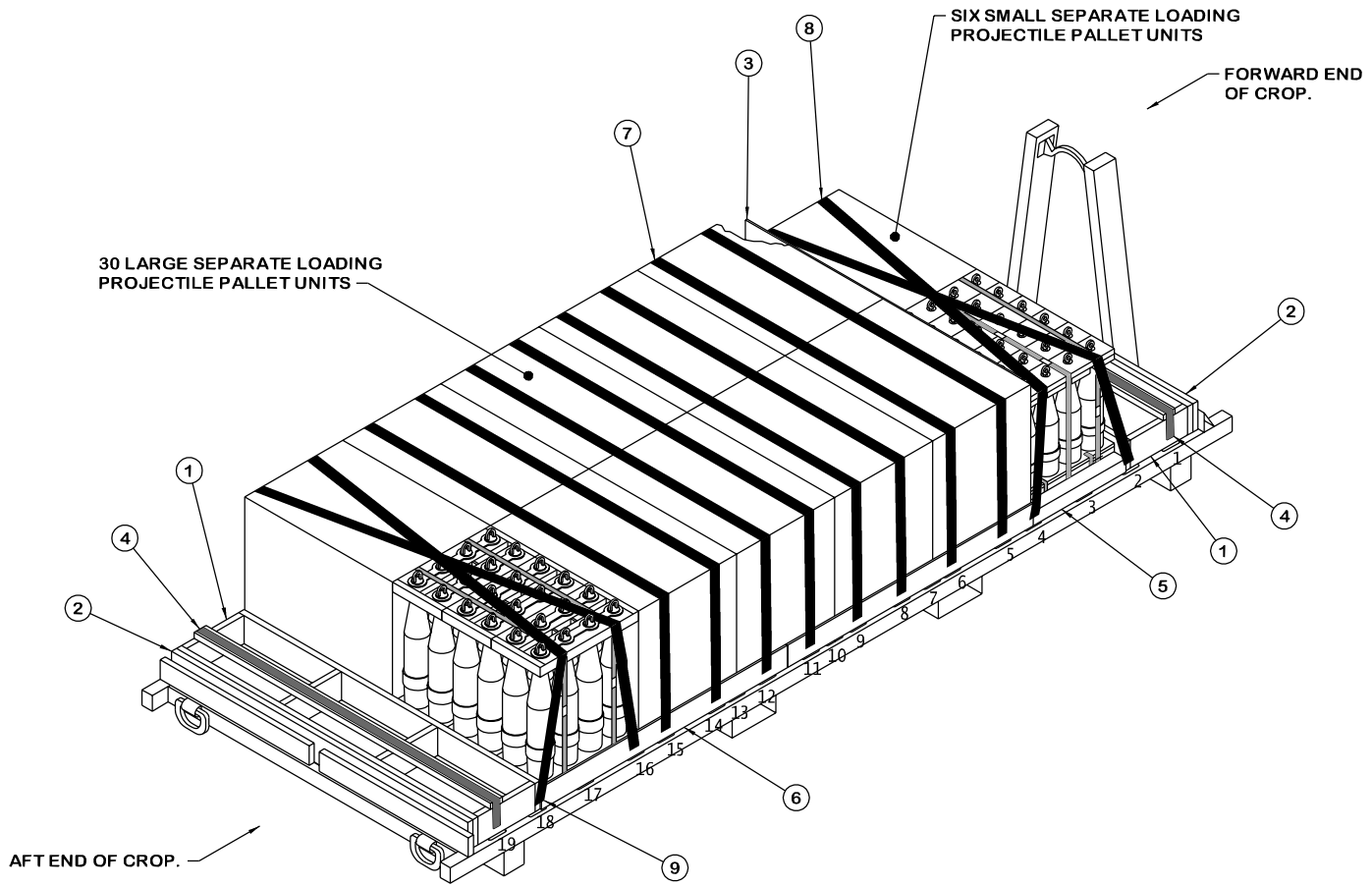
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**NOTICE:** THIS APPENDIX CANNOT STAND ALONE BUT MUST BE USED IN CONJUNCTION WITH THE BASIC CROP OUTLOADING PROCEDURES DRAWING 19-48-4906-CA17Q7.

- 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 MATERIEL COMMAND DRAWING

APPROVED, U.S. ARMY OPERATIONS SUPPORT COMMAND  <i>Timothy R. Free</i>	ENGINEER	BASIC	WALTER GORDON		DO NOT SCALE			
		REV.			WEBSITE: <a href="http://www.dac.army.mil">HTTP://WWW.DAC.ARMY.MIL</a>			
	TECHNICIAN	BASIC			JANUARY 2001			
		REV.						
APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND  <i>W. Gordon</i>  U.S. ARMY DEFENSE AMMUNITION CENTER	TRANSPORTATION ENGINEERING DIVISION	<i>Sandra G. Feffer</i>						
	VALIDATION ENGINEERING DIVISION	<i>Walter Gordon</i> TESTED		CLASS	DIVISION	DRAWING	FILE	
	ENGINEERING DIRECTORATE	<i>William R. Smith</i>		19	48	4906/ 102	CA17Q7	



**ISOMETRIC VIEW**

NOTE: PALLET UNITS SHOWN ARE BUNDLED WITH THREE PALLET UNITS PER BUNDLE; HOWEVER, PALLET UNITS ARE NOT REQUIRED TO BE BUNDLED.

**(KEY NUMBERS CONTINUED)**

- ⑦ HOLD-DOWN STRAP, 3-INCH WIDE WEB STRAP TIEDOWN ASSEMBLY FOR CROP (8 REQD). INSTALL EACH HOLD-DOWN STRAP TO EXTEND FROM THE DESIGNATED TIEDOWN ANCHOR ON ONE SIDE OF CROP, OVER TOP OF PALLET UNITS, TO CORRESPONDING TIEDOWN ANCHOR ON OPPOSITE SIDE OF CROP. ALIGN SCUFF SLEEVES OVER ALL SHARP EDGES AND FIRMLY TENSION STRAP. SEE GENERAL NOTES "F" AND "H" ON PAGE 3.
- ⑧ FORWARD HOLD-DOWN STRAP, 3-INCH WIDE WEB STRAP TIEDOWN ASSEMBLY FOR CROP (2 REQD). INSTALL EACH STRAP FROM THE SECOND TIEDOWN ANCHOR ON ONE SIDE OF THE CROP (ONE ON EACH SIDE), OVER THE TOP OF THE PALLET UNITS AND BACK DOWN TO THE FOURTH TIEDOWN ANCHOR ON THE OPPOSITE SIDE OF THE CROP. ALIGN SCUFF SLEEVES OVER ALL SHARP EDGES AND FIRMLY TENSION STRAP. SEE GENERAL NOTES "F" AND "H" ON PAGE 3.
- ⑨ AFT HOLD-DOWN STRAP, 3-INCH WIDE WEB STRAP TIEDOWN ASSEMBLY FOR CROP (2 REQD). INSTALL EACH STRAP FROM THE EIGHTEENTH TIEDOWN ANCHOR ON ONE SIDE OF THE CROP (ONE ON EACH SIDE), OVER THE TOP OF THE PALLET UNITS AND BACK DOWN TO THE SIXTEENTH TIEDOWN ANCHOR ON THE OPPOSITE SIDE OF THE CROP. ALIGN SCUFF SLEEVES OVER ALL SHARP EDGES AND FIRMLY TENSION STRAP. SEE GENERAL NOTES "F" AND "H" ON PAGE 3.

**KEY NUMBERS**

- ① END BLOCKING ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 5. CENTER ON DECK OF CROP AND ENSURE STRAPPING BOARD IS IN LINE WITH ANCHOR. SEE GENERAL NOTE "B" ON PAGE 3.
- ② FILL PIECE, 1" OR 2" X 8" X 7'-4" (2 REQD). NAIL TO AN END BLOCKING ASSEMBLY W/8 EVENLY SPACED NAILS OF A SUITABLE SIZE (6d FOR 1" THICK MATERIAL AND 10d FOR 2" THICK MATERIAL). ONE FILL PIECE MAY BE PREFABRICATED WITH AN END BLOCKING ASSEMBLY.
- ③ SEPARATOR ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 5. INSTALL BETWEEN THE LARGE AND SMALL PALLET UNITS.
- ④ RETAINER STRAP, 2-INCH WIDE WEB STRAP TIEDOWN ASSEMBLY (2 REQD). INSTALL TO EXTEND FROM A TIEDOWN RING ON SIDE OF CROP, OVER TOP OF STRAPPING BOARD OF END BLOCKING ASSEMBLY, TO CORRESPONDING TIEDOWN RING ON OPPOSITE SIDE OF CROP. POSITION STRAP SCUFF SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTE "F" ON PAGE 3.
- ⑤ SIDE FILL PIECE A, 4" X 4" X 27'-1/2" (2 REQD). INSTALL ONE PIECE ON EACH SIDE OF CROP ADJACENT TO THE SMALL PALLET UNITS. SEE GENERAL NOTE "G" ON PAGE 3.
- ⑥ SIDE FILL PIECE B, 5-3/4" X 6'-1" X 1/2" THICK PLYWOOD (4 REQD). INSTALL TWO PIECES ON EACH SIDE OF CROP ADJACENT TO THE LARGE PALLET UNITS. SEE GENERAL NOTE "G" ON PAGE 3.

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**GENERAL NOTES**

- A. THIS APPENDIX CANNOT STAND ALONE BUT MUST BE USED IN CONJUNCTION WITH THE BASIC LOADING PROCEDURES DRAWING 19-48-4906-CA17Q7. TO PRODUCE AN APPROVED 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. THE OUTLOADING PROCEDURES DEPICTED IN THIS DRAWING ARE APPLICABLE TO LOADS OF 36 PALLET UNITS OF PROJECTILES. SEE PAGE 4 FOR DETAILS OF THE TYPICAL PALLET UNITS. AN M3 (SUMMA) CROP IS SHOWN AS TYPICAL. OTHER MANUFACTURER'S CROPS CAN BE USED FOR THE LOAD SHOWN ON PAGE 2. THE AFT AND FORWARD END BLOCKING ASSEMBLIES OR PIECES MUST BE RESTRAINED FROM MOVING IN BOTH THE LATERAL AND VERTICAL DIRECTIONS. THIS IS ACCOMPLISHED IN THE LOAD SHOWN ON PAGE 2 WITH A 2" WEB STRAP TIEDOWN ASSEMBLY. IF THE CONFIGURATION OF A CROP IS SUCH THAT VERTICAL OR LATERAL RESTRAINT CANNOT BE PROVIDED, ADDITIONAL RESTRAINT METHODS, TO INCLUDE HOLD DOWN PIECES, RETAINING NAILS, AND/OR 2" WIDE WEB STRAP TIEDOWN ASSEMBLIES MUST BE INSTALLED.
- C. THE LOADING PROCEDURES DEPICTED HEREIN MAY BE USED FOR OUTLOADING PALLET UNITS WITH DIMENSIONS OTHER THAN WHAT IS SHOWN ON PAGE 4, PROVIDED THE OVERALL PALLET UNIT DIMENSIONS RESULT IN A LOAD THAT IS CONTAINED WITHIN AN ENVELOPE OF 211" L X 89" W X 73-1/2" H.
- D. DIMENSIONS, CUBE AND WEIGHT OF THE PALLET UNITS WILL VARY SLIGHTLY DEPENDING UPON THE ACTUAL DIMENSIONS OF THE PROJECTILES AND THE WEIGHT OF THE SPECIFIC ITEM BEING UNITIZED.
- E. DIMENSIONS GIVEN FOR DUNNAGE ASSEMBLIES WILL BE FIELD CHECKED PRIOR TO THEIR ASSEMBLY. PALLET UNITS MUST FIT SNUGLY AGAINST THE DUNNAGE ASSEMBLIES. THIS GUIDANCE MUST BE APPLIED PRIOR TO BEGINNING AN OUTLOADING OPERATION. ALSO, DUE TO VARIATION OF PALLET UNIT DIMENSIONS, ADJUSTMENTS MAY BE REQUIRED AS TO THE LOCATION OF CERTAIN PIECES ON DUNNAGE ASSEMBLIES.
- F. ALL WEB STRAP TIEDOWN ASSEMBLIES MUST HAVE THE EXCESS LENGTH OF THE STRAP SECURED. ROLL UP AND BUNDLE THE EXCESS LENGTH OF WEB STRAP, SECURING WITH CABLE TIES. SEE THE "STRAP END SECUREMENT" DETAIL AND GENERAL NOTE "K.12" IN THE BASIC PROCEDURE DRAWING 19-48-4906-CA17Q7.
- G. EACH END OF THE SIDE FILL PIECES MUST BE SECURED BY NAILING A 10d NAIL THRU A 3" WEBSTRAP HOOK SLOT. SEE "STRAP HOOK DETAIL" AND GENERAL NOTE "G.2" IN THE BASIC PROCEDURES DRAWING 19-48-4906-CA17Q7.
- H. UNUSED WEB STRAP TIEDOWN ASSEMBLIES MUST BE SECURED AS DELINEATED IN GENERAL NOTE "K.13" IN THE BASIC PROCEDURE DRAWING 19-48-4906-CA17Q7.
- J. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES, AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS 0.454 KG.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	15	10
2" X 8"	55	74
4" X 4"	5	6
NAILS	NO. REQD	POUNDS
6d (2")	6	NIL
10d (3")	80	1-1/4
PLYWOOD, 1/2" - - -	31.91 SQ FT REQD - - -	43.88 LBS
2" WEBSTRAP TIEDOWN ASSEMBLY - - - - -	2 REQD - - - - -	11 LBS

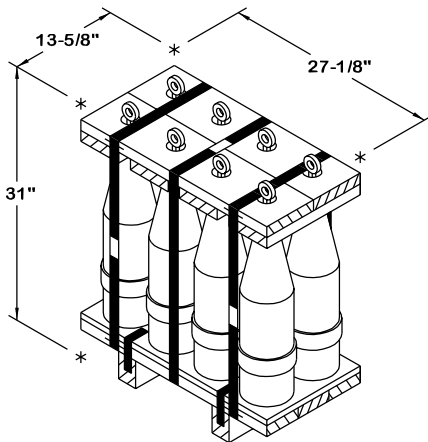
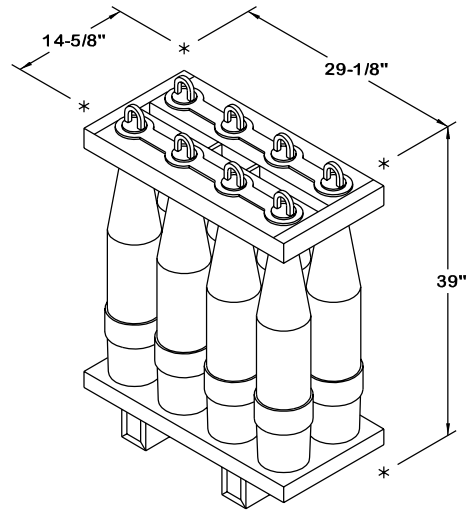
**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
SMALL SLP PALLET UNIT - - -	6 - - - -	5,382 LBS
LARGE SLP PALLET UNIT - - -	30 - - - -	24,900 LBS
DUNNAGE - - - - -	- - - - -	237 LBS
CROP - - - - -	- - - - -	3,800 LBS
TOTAL WEIGHT - - - - -		34,319 LBS (APPROX)

**LARGE SEPARATE LOADING PROJECTILE PALLET UNIT DETAIL**

8 155MM CTG AT 102-3/4 LBS - - - - - 822 LBS (APPROX)  
 DUNNAGE AND PALLET - - - - - 75 LBS

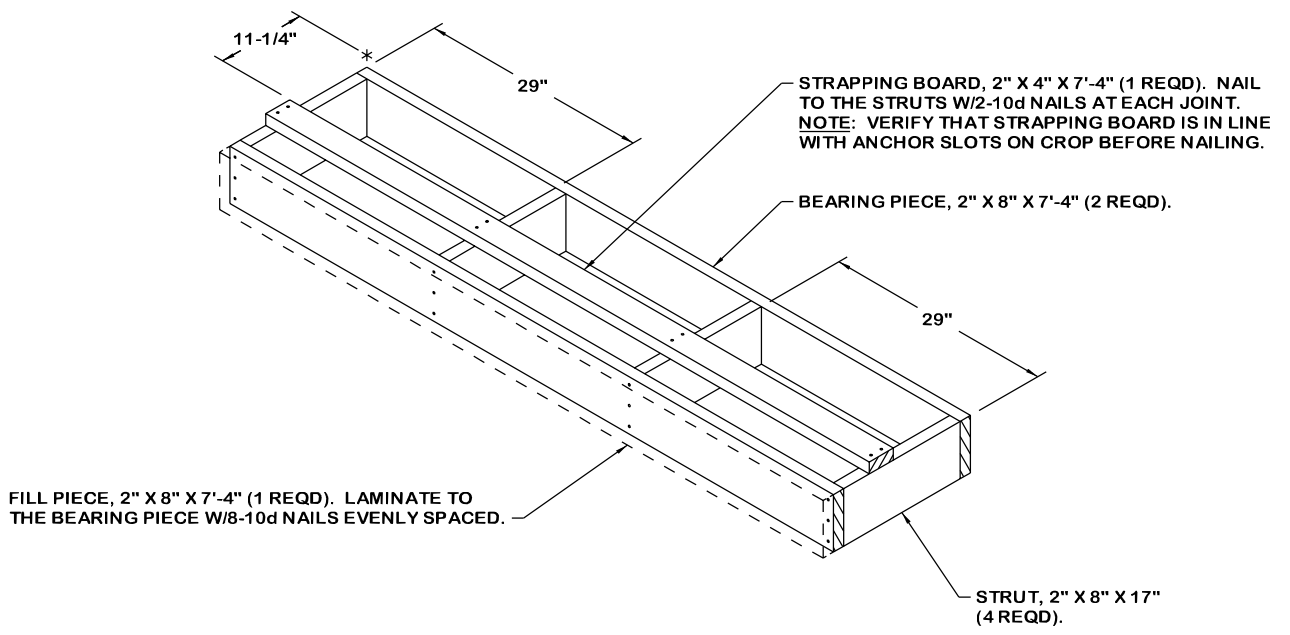
TOTAL WEIGHT - - - - - 897 LBS (APPROX)  
 CUBE - - - - - 9.6 CU FT (APPROX)



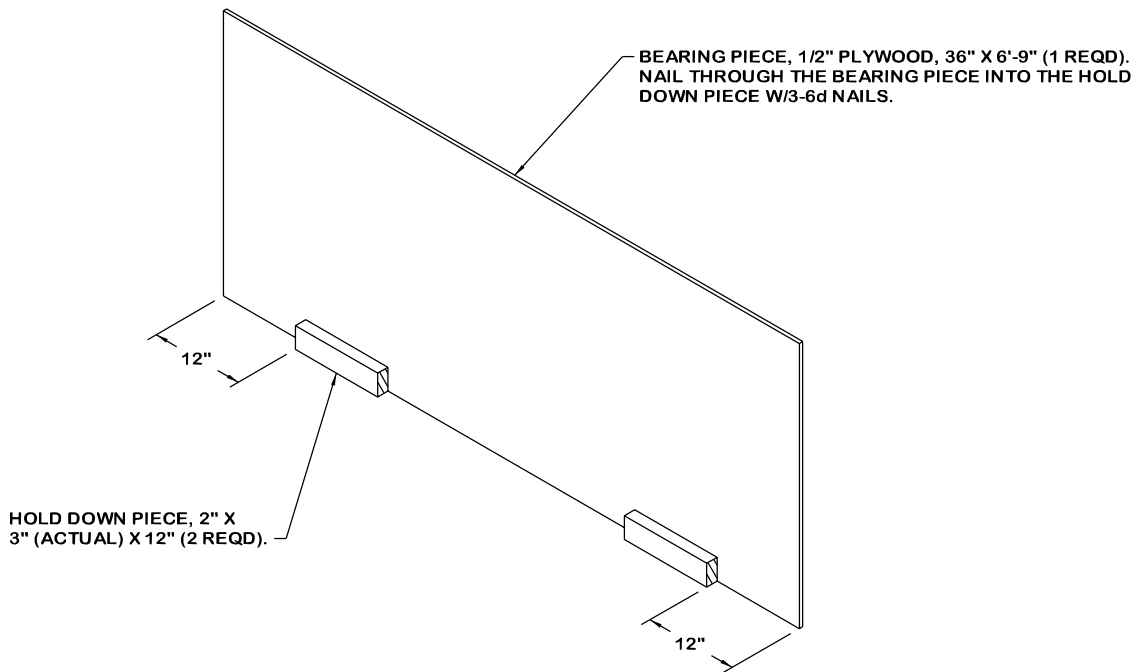
**SMALL SEPARATE LOADING PROJECTILE PALLET UNIT DETAIL**

8 155MM CTG AT 98-1/2 LBS - - - - - 788 LBS (APPROX)  
 DUNNAGE AND PALLET - - - - - 42 LBS

TOTAL WEIGHT - - - - - 830 LBS (APPROX)  
 CUBE - - - - - 6.6 CU FT (APPROX)



**END BLOCKING ASSEMBLY**



**SEPARATOR ASSEMBLY**

