

D. H.

DATE 1/18/01

APPENDIX 103

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

**ROCKETS PALLETIZED ON WOODEN AND METAL
PALLET; INCLUDES THREE UNIQUE PALLET UNIT
CONFIGURATIONS PER LOAD**



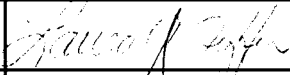
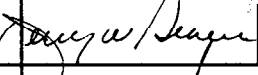

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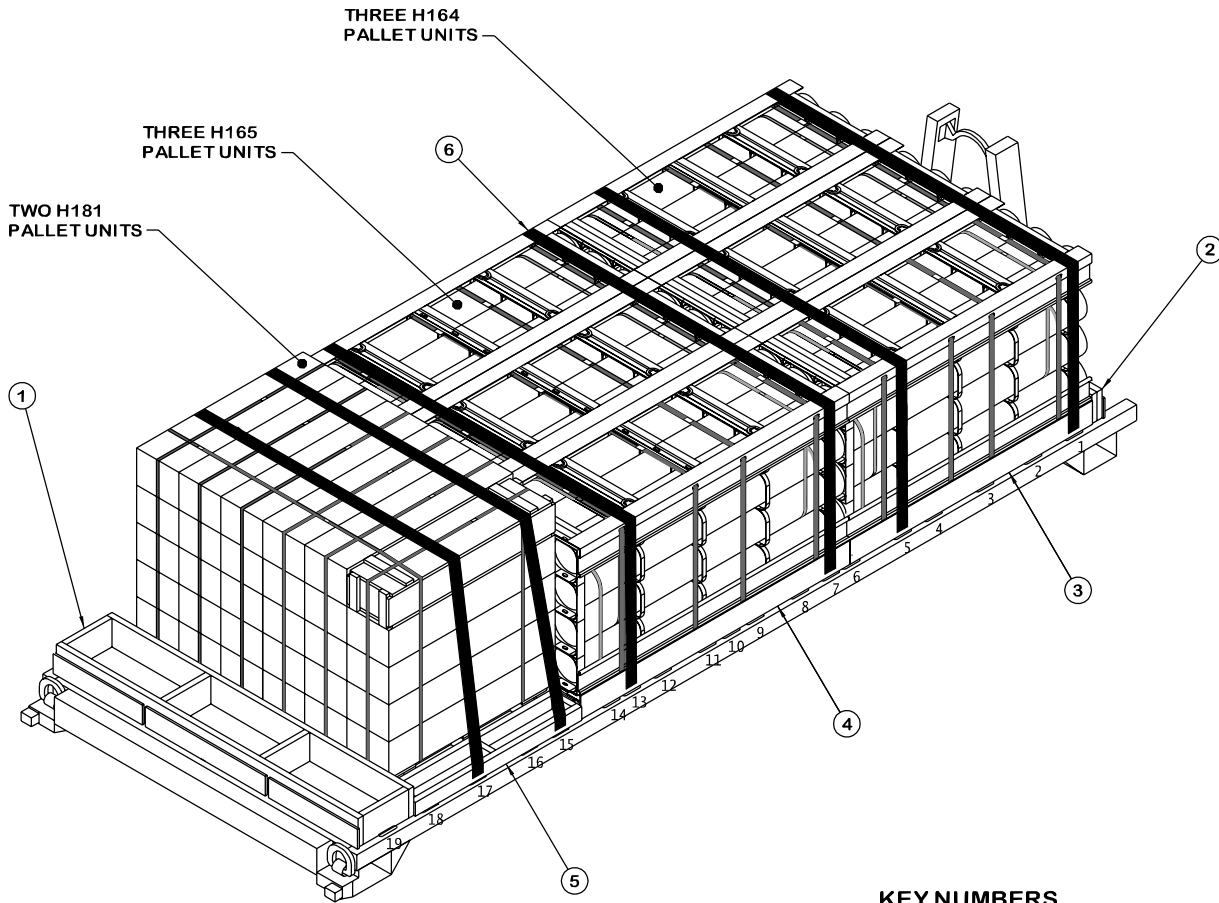
**NOTICE: THIS APPENDIX CANNOT STAND ALONE BUT MUST BE USED IN CONJUNCTION WITH
THE BASIC CROP OUTLOADING PROCEDURES DRAWING 19-48-4906-CA17Q7.**

- 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  | ENGINEER | BASIC | | DO NOT SCALE | | | |
| | | REV. | | WEBSITE: HTTP://WWW.DAC.ARMY.MIL | | | |
| | TECHNICIAN | BASIC | PATRICK DOUGHERTY | DECEMBER 2000 | | | |
| | | REV. | | | | | |
| | DRAFTSMAN | BASIC | | | | | |
| | | REV. | | | | | |
| APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND  | TRANSPORTATION ENGINEERING DIVISION | |  | CLASS | DIVISION | DRAWING | FILE |
| | VALIDATION ENGINEERING DIVISION | |  TESTED | | | | |
| | ENGINEERING DIRECTORATE | |  | | | | |
| U.S. ARMY DEFENSE AMMUNITION CENTER | | | | 19 | 48 | 4906/ 103 | CA17Q7 |

FORWARD END
OF CROP



AFT END OF CROP

ISOMETRIC VIEW

(KEY NUMBERS CONTINUED)

- ⑥ HOLD-DOWN STRAP, 3-INCH WIDE WEB STRAP TIEDOWN ASSEMBLY FOR CROP (6 REQD). INSTALL EACH HOLD-DOWN STRAP TO EXTEND FROM THE DESIGNATED TIEDOWN ANCHOR ON ONE SIDE OF CROP, OVER THE TOP OF THE PALLET UNITS, TO THE CORRESPONDING 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 "G" ON PAGE 3.

KEY NUMBERS

- ① AFT FILLER ASSEMBLY (1 REQD). SEE DETAIL ON PAGE 5. CENTER AGAINST AFT CROP END GATE WITH THE CLEATS FACING FORWARD AND, AFTER THE PALLET UNITS ARE LOADED, NAIL W/2-12d NAILS THRU THE SLOTS IN THE AFT CROP END GATE INTO THE AFT FILLER ASSEMBLY, LEAVING THE NAIL HEADS PROTRUDING THRU THE SLOTS TO PROVIDE LATERAL RESTRAINT.
- ② FORWARD FILLER, 1" OR 2" X 8" X 7'-4" (AS REQD). LAMINATE EACH PIECE TO THE PREVIOUS PIECE W/8 NAILS OF A SUITABLE SIZE (10d NAILS FOR 2" THICK MATERIAL). CENTER AGAINST FORWARD CROP END GATE AND, AFTER THE PALLET UNITS ARE LOADED, NAIL W/2-12d NAILS THRU THE HOLES IN THE FORWARD CROP END GATE INTO THE FORWARD FILLER PIECES, LEAVING THE NAIL HEADS PROTRUDING THRU THE HOLES TO PROVIDE LATERAL AND VERTICAL RESTRAINT.
- ③ SIDE BLOCKING ASSEMBLY A (2 REQD). SEE DETAIL ON PAGE 5. POSITION THE SIDE BLOCKING ASSEMBLY "A" AGAINST THE FORWARD ROW OF PALLET UNITS ON BOTH SIDES OF THE CROP AS SHOWN WITH THE RETAINER CLEATS RECESSED UNDER THE PALLET UNITS.
- ④ SIDE BLOCKING ASSEMBLY B (2 REQD). SEE DETAIL ON PAGE 5. POSITION THE SIDE BLOCKING ASSEMBLY "B" AGAINST THE CENTER ROW OF PALLET UNITS ON BOTH SIDES OF THE CROP AS SHOWN WITH THE RETAINER CLEATS RECESSED UNDER THE PALLET UNITS.
- ⑤ SPACER ASSEMBLY (2 REQD). SEE DETAIL ON PAGE 5. POSITION THE SPACER ASSEMBLY AGAINST THE AFT PALLET UNITS ON EACH SIDE OF THE CROP. AFTER THE HOLD-DOWN STRAPS ARE INSTALLED, NAIL THROUGH THE STRAP ATTACHMENT SLOTS OF EACH HOLD-DOWN STRAP INTO THE SPACER ASSEMBLIES W/1-10d NAIL PARTIALLY DRIVEN AND BENT OVER SIDE OF HOOK.

(CONTINUED AT LEFT)

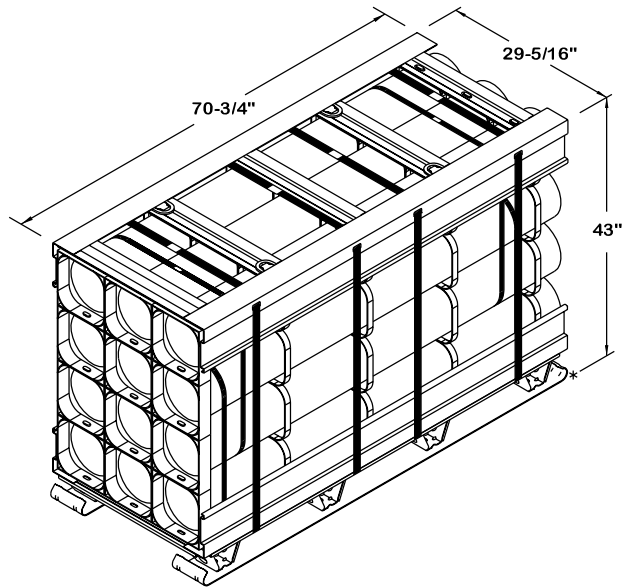
GENERAL NOTES

- 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 EIGHT PALLET UNITS. SEE PAGE 4 FOR DETAIL OF THE TYPICAL PALLET UNIT. AN M3A1 (HYUNDAI) CROP IS SHOWN AS TYPICAL. OTHER MANUFACTURER'S CROPS CAN BE USED FOR THE LOAD SHOWN ON PAGE 2. ACTUAL CROP CONFIGURATION WILL DETERMINE WHETHER THE LOADING STARTS AT THE AFT OR THE FORWARD END OF THE CROP. THE AFT AND FORWARD END FILLER 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 CLEATS (AFT FILLER ASSEMBLY) AND RETAINING NAILS (FORWARD AND AFT FILLERS). 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 BOXES 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. UNUSED WEB STRAP TIEDOWN ASSEMBLIES MUST BE SECURED AS DELINEATED IN GENERAL NOTE "K.13" IN THE BASIC PROCEDURE DRAWING 19-48-4906-CA17Q7.
- H. 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" | 27 | 18 |
| 2" X 8" | 34 | 45 |
| NAILS | NO. REQD | POUNDS |
| 6d (2") | 24 | 1/4 |
| 10d (3") | 64 | 1 |
| 12d (3-1/4") | 4 | 1/4 |
| HARDBOARD, 1/8" - - - 12.45 SQ FT REQD - - - - 6 LBS | | |

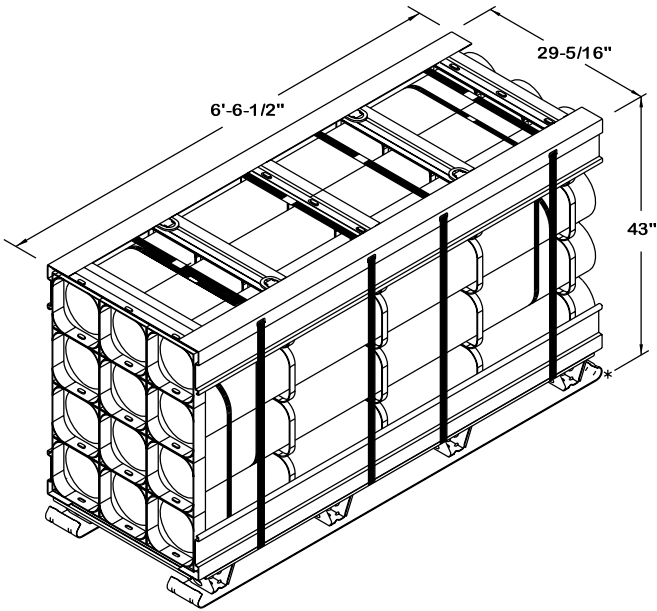
LOAD AS SHOWN

| ITEM | QUANTITY | WEIGHT (APPROX) |
|------------------------|-------------------|---------------------|
| H164 PALLET UNIT | - - - 3 - - - - - | 6,087 LBS |
| H165 PALLET UNIT | - - - 3 - - - - - | 6,717 LBS |
| H181 PALLET UNIT | - - - 2 - - - - - | 4,402 LBS |
| DUNNAGE | - - - - - | 134 LBS |
| CROP | - - - - - | 3,800 LBS |
| TOTAL WEIGHT - - - - - | | 21,140 LBS (APPROX) |



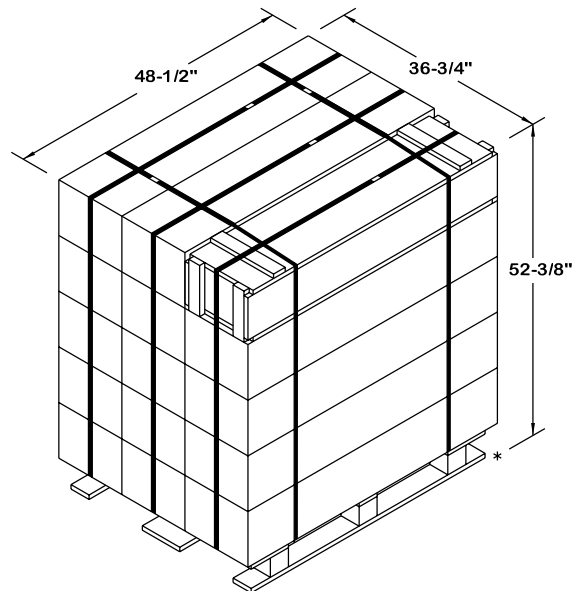
H164 PALLET UNIT DETAIL

GROSS WEIGHT - - - - - 2,029 LBS (APPROX)
 CUBE - - - - - 51.6 CUBIC FEET (APPROX)



H165 PALLET UNIT DETAIL

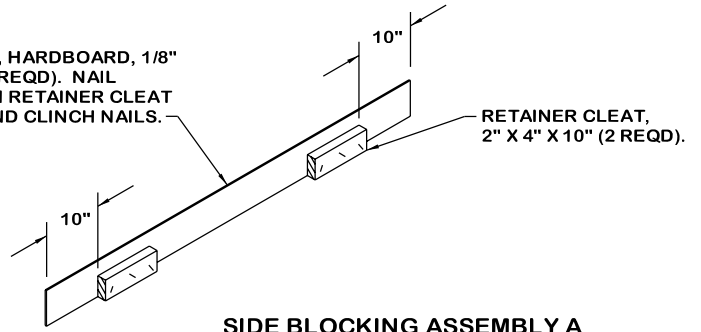
GROSS WEIGHT - - - - - 2,239 LBS (APPROX)
 CUBE - - - - - 57.3 CUBIC FEET (APPROX)



H181 PALLET UNIT DETAIL

GROSS WEIGHT - - - - - 2,201 LBS (APPROX)
 CUBE - - - - - 54.0 CUBIC FEET (APPROX)

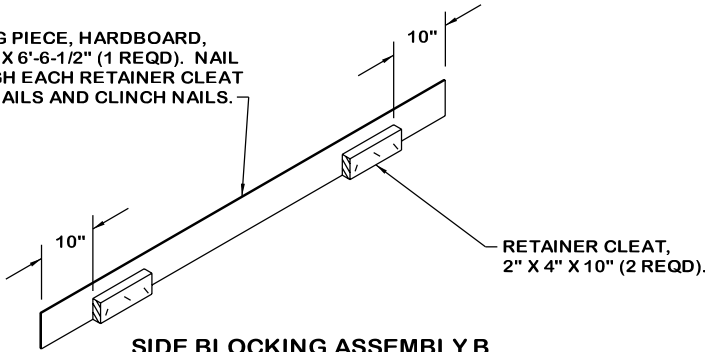
BEARING PIECE, HARDBOARD, 1/8" X 6" X 70-3/4" (1 REQD). NAIL THROUGH EACH RETAINER CLEAT W/3-6d NAILS AND CLINCH NAILS.



SIDE BLOCKING ASSEMBLY A

POSITION ASSEMBLY WITH CLEATS RECESSED UNDER THE PALLET UNITS. FIELD CHECK IT AGAINST PALLET UNITS TO VERIFY PROPER CLEAT LOCATION.

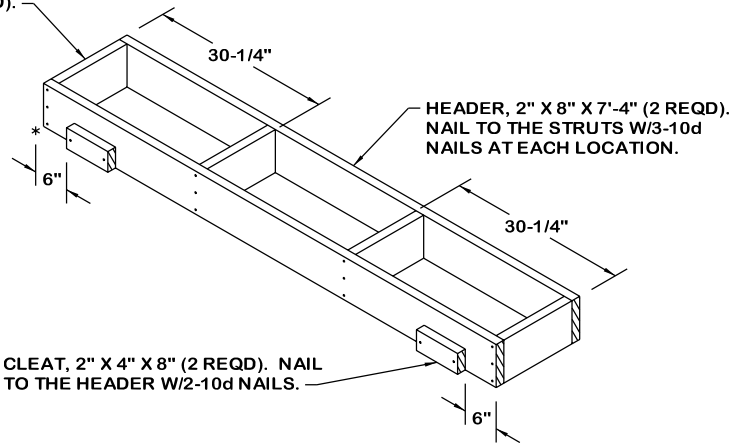
BEARING PIECE, HARDBOARD, 1/8" X 6" X 6'-6-1/2" (1 REQD). NAIL THROUGH EACH RETAINER CLEAT W/3-6d NAILS AND CLINCH NAILS.



SIDE BLOCKING ASSEMBLY B

POSITION ASSEMBLY WITH CLEATS RECESSED UNDER THE PALLET UNITS. FIELD CHECK IT AGAINST PALLET UNITS TO VERIFY PROPER CLEAT LOCATION.

STRUT, 2" X 8" X 13-1/4" (4 REQD).

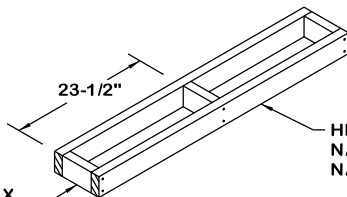


HEADER, 2" X 8" X 7'-4" (2 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH LOCATION.

CLEAT, 2" X 4" X 8" (2 REQD). NAIL TO THE HEADER W/2-10d NAILS.

AFT FILLER ASSEMBLY

THIS AFT FILLER ASSEMBLY WILL BE PLACED AT THE REAR OF THE LOAD WITH THE CLEATS RECESSED UNDER THE AFT PALLET UNITS. FIELD CHECK IT AGAINST PALLET UNITS TO VERIFY PROPER CLEAT LOCATIONS.



HEADER, 2" X 4" X 48-1/2" (2 REQD). NAIL TO THE STRUTS W/2-10d NAILS AT EACH LOCATION.

STRUT, 2" X 4" X 5-5/8" (3 REQD).

SPACER ASSEMBLY

THIS SPACER ASSEMBLY WILL BE PLACED ON BOTH SIDES OF THE CROP AT THE REAR OF THE LOAD.

