

APPROVED BY
BUREAU OF EXPLOSIVES

Don A/H
DATE 11/4/01

APPENDIX 51

LOADING AND BRACING PROCEDURES FOR STRATEGIC CONFIGURED LOAD (SCL) ON CONTAINER ROLL IN/OUT PLATFORM (CROP) - SCL #51

HMMWV TOW



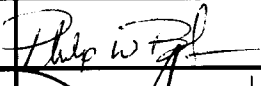


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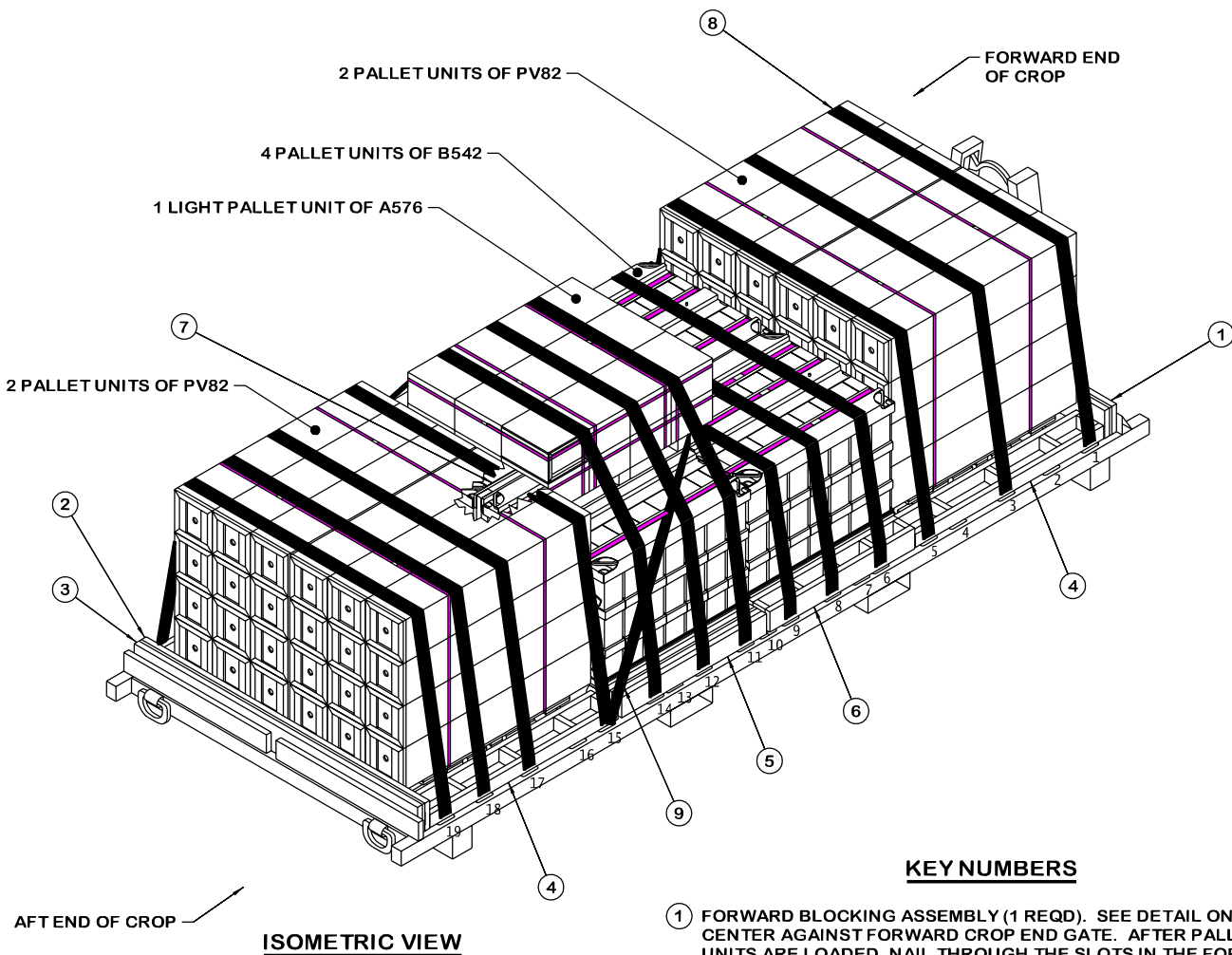
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NOTICE: THIS APPENDIX CANNOT STAND ALONE BUT MUST BE USED IN CONJUNCTION WITH THE BASIC CROP OUTLOADING PROCEDURES DRAWING 19-48-4905-CA17Q6.

- 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 REV.	RICHARD GARSIDE	DO NOT SCALE			
	TECHNICIAN	BASIC REV.		WEBSITE: HTTP://WWW.DAC.ARMY.MIL			
	DRAFTSMAN	BASIC REV.		JUNE 2001			
APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND  U.S. ARMY DEFENSE AMMUNITION CENTER	TRANSPORTATION ENGINEERING DIVISION						
	VALIDATION ENGINEERING DIVISION			CLASS	DIVISION	DRAWING	FILE
	ENGINEERING DIRECTORATE			19	48	4905/ 51	CA17Q6



ISOMETRIC VIEW

(KEY NUMBERS CONTINUED)

- ⑥ SIDE BLOCKING ASSEMBLY C (2 REQD). SEE DETAIL ON PAGE 7. INSTALL ALONG SIDE OF CROP ADJACENT TO THE FORWARD B542 PALLET UNITS. AFTER HOLD-DOWN STRAPS ARE INSTALLED, NAIL THROUGH THE STRAP ATTACHMENT SLOTS OF THE HOLD-DOWN STRAPS INTO THE ASSEMBLY W/1-10d PARTIALLY DRIVEN NAIL AND BEND OVER SIDE OF HOOK.
- ⑦ SPACER ASSEMBLY (1 REQD). SEE DETAIL ON PAGE 6. INSTALL BETWEEN AFT B542 PALLET UNITS. USED TO PROVIDE ADDITIONAL WIDTH FOR THE A576 PALLET UNIT TO POSITION BETWEEN THE LUGS OF THE B542 PALLET UNIT.
- ⑧ HOLD-DOWN STRAP, 3-INCH WIDE CROP STRAP (13 REQD). INSTALL EACH 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 NOTE "H" ON PAGE 3.
- ⑨ TOP PALLET END RESTRAINT STRAP, 3-INCH WIDE CROP STRAP (1 REQD). INSTALL THE STRAP TO EXTEND FROM THE FIFTEENTH TIEDOWN ANCHOR ON ONE SIDE OF CROP, AROUND THE FRONT OF THE A576 PALLET UNIT, TO THE FIFTEENTH TIEDOWN ANCHOR ON THE OPPOSITE SIDE OF THE CROP. ALIGN SCUFF SLEEVES OVER ALL SHARP EDGES AND FIRMLY TENSION STRAP. SEE GENERAL NOTE "H" ON PAGE 3.

KEY NUMBERS

- ① FORWARD BLOCKING ASSEMBLY (1 REQD). SEE DETAIL ON PAGE 6. CENTER AGAINST FORWARD CROP END GATE. AFTER PALLET UNITS ARE LOADED, NAIL THROUGH THE SLOTS IN THE FORWARD CROP END GATE INTO THE FORWARD BLOCKING ASSEMBLY W/2-12d NAILS. LEAVE THE NAIL HEADS PROTRUDING THROUGH THE SLOTS TO PROVIDE LATERAL RESTRAINT.
- ② AFT BLOCKING ASSEMBLY (1 REQD). SEE DETAIL ON PAGE 6. CENTER AGAINST AFT CROP END GATE, THEN MOVE ASSEMBLY FORWARD, SLIDING CLEATS UNDER PALLET UNITS. INSTALL AFT FILLER AFTER AFT BLOCKING ASSEMBLY IS IN PLACE.
- ③ AFT FILLER, 1" OR 2" X 8" X 7'-4" (AS REQD). LAMINATE THE FIRST PIECE TO THE AFT BLOCKING ASSEMBLY W/8 NAILS OF A SUITABLE SIZE (6d NAILS FOR 1" THICK MATERIAL OR 10d NAILS FOR 2" THICK MATERIAL). LAMINATE EACH ADDITIONAL PIECE TO THE PREVIOUS PIECE IN A LIKE MANNER. CENTER AGAINST AFT CROP END GATE AND NAIL THROUGH UPPER CORNER OF OPENING IN AFT CROP END GATE INTO THE AFT FILLER W/2-12d NAILS. LEAVE THE NAIL HEADS PROTRUDING AND BENT OVER VERTICAL TUBE OF END GATE TO PROVIDE LATERAL AND VERTICAL RESTRAINT.
- ④ SIDE BLOCKING ASSEMBLY A (4 REQD). SEE DETAIL ON PAGE 7. INSTALL ALONG SIDE OF CROP ADJACENT TO THE PV82 PALLET UNITS. AFTER HOLD-DOWN STRAPS ARE INSTALLED, NAIL THROUGH THE STRAP ATTACHMENT SLOTS OF THE HOLD-DOWN STRAPS INTO THE ASSEMBLY W/1-10d PARTIALLY DRIVEN NAIL AND BEND OVER SIDE OF HOOK.
- ⑤ SIDE BLOCKING ASSEMBLY B (2 REQD). SEE DETAIL ON PAGE 7. INSTALL ALONG SIDE OF CROP ADJACENT TO THE AFT B542 PALLET UNITS. AFTER HOLD-DOWN STRAPS ARE INSTALLED, NAIL THROUGH THE STRAP ATTACHMENT SLOTS OF THE HOLD-DOWN STRAPS INTO THE ASSEMBLY W/1-10d PARTIALLY DRIVEN NAIL AND BEND OVER SIDE OF HOOK.

(CONTINUED AT LEFT)

RECOMMENDED SEQUENTIAL PROCEDURES

1. PREFABRICATE FORWARD BLOCKING ASSEMBLY, AFT BLOCKING ASSEMBLY, SPACER ASSEMBLY, FOUR OF SIDE BLOCKING ASSEMBLY A, TWO OF SIDE BLOCKING ASSEMBLY B, AND TWO OF SIDE BLOCKING ASSEMBLY C.
2. INSTALL FORWARD BLOCKING ASSEMBLY, AS NOTED IN KEY NUMBER ①.
3. LOAD ONE ROW OF TWO PALLET UNITS OF PV82 AGAINST THE FORWARD BLOCKING ASSEMBLY. CENTER THE ROW Laterally ON THE CROP AND POSITION TIGHT AGAINST THE FORWARD BLOCKING ASSEMBLY.
4. LOAD FIRST ROW OF TWO PALLET UNITS OF B542 AGAINST THE FORWARD ROW OF PV82. CENTER THE ROW Laterally ON THE CROP AND POSITION TIGHT AGAINST THE ROW OF PV82.
5. LOAD SECOND ROW OF TWO PALLET UNITS OF B542 AGAINST THE FIRST ROW OF B542. THE SPACER ASSEMBLY WILL STAND UPRIGHT BETWEEN THE B542 PALLET UNITS IN THIS ROW, AS NOTED IN KEY NUMBER ⑦. CENTER THE ROW Laterally ON THE CROP AND POSITION TIGHT AGAINST THE FIRST ROW OF B542.
6. LOAD ONE ROW OF TWO PALLET UNITS OF PV82 AGAINST THE SECOND ROW OF B542. CENTER THE ROW Laterally ON THE CROP AND POSITION TIGHT AGAINST THE SECOND ROW OF B542.
7. INSTALL AFT BLOCKING ASSEMBLY, AS NOTED IN KEY NUMBER ②.
8. INSTALL AFT FILLER PIECES TO A TIGHT FIT BETWEEN AFT BLOCKING ASSEMBLY AND AFT CROP END GATE, AS NOTED IN KEY NUMBER ③.
9. LOAD ONE A576 LIGHT PALLET UNIT ON TOP OF THE SECOND ROW OF B542 PALLET UNITS, BETWEEN THE LUGS OF THE B542 PALLET UNITS.
10. INSTALL FOUR OF SIDE BLOCKING ASSEMBLY A, AS NOTED IN KEY NUMBER ④.
11. INSTALL TWO OF SIDE BLOCKING ASSEMBLY B, AS NOTED IN KEY NUMBER ⑤.
12. INSTALL TWO OF SIDE BLOCKING ASSEMBLY C, AS NOTED IN KEY NUMBER ⑥.
13. INSTALL FOURTEEN CROP STRAPS, AS NOTED IN KEY NUMBERS ⑧ AND ⑨.
14. NAIL TWO 12d RETAINING NAILS THRU THE SLOTS IN FORWARD CROP END GATE INTO THE FORWARD BLOCKING ASSEMBLY, LEAVING THE NAIL HEADS PROTRUDING THRU THE SLOTS TO PROVIDE LATERAL RESTRAINT.
15. NAIL TWO 12d RETAINING NAILS THRU UPPER CORNER OF OPENING IN AFT CROP END GATE INTO THE AFT FILLER, LEAVING THE NAIL HEADS PROTRUDING AND BENT OVER VERTICAL TUBE OF END GATE TO PROVIDE LATERAL AND VERTICAL RESTRAINT.

GENERAL NOTES

- A. THIS APPENDIX CANNOT STAND ALONE BUT MUST BE USED IN CONJUNCTION WITH THE BASIC LOADING PROCEDURES DRAWING 19-48-4905-CA17Q6. 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 SCL #51. SEE PAGES 4 AND 5 FOR DETAILS OF THE 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 SEQUENTIAL LOADING PROCEDURES DEPICTED AT LEFT DESCRIBE THE SEQUENCE USED TO LOAD AN M3 CROP. FOR AN M3A1 (HYUNDAI) CROP, SEQUENTIAL LOADING PROCEDURES 2 THROUGH 7 MUST BE REVERSED. ACTUAL CROP CONFIGURATION WILL DETERMINE WHETHER THE SEQUENTIAL LOADING STARTS AT THE AFT OR THE FORWARD END OF THE CROP.
- C. THE LOADING PROCEDURES DEPICTED HEREIN MAY ALSO BE USED FOR OUTLOADING SIMILAR SCL LOADS WHEN IDENTIFIED BY DIFFERENT NATIONAL STOCK NUMBERS (NSN) THAN WHAT IS SHOWN ON PAGE 4, PROVIDED THE OVERALL PALLET UNIT DIMENSIONS DO NOT VARY FROM WHAT IS DELINEATED HEREIN.
- D. LIGHT PALLET UNITS MUST BE CONSTRUCTED IN ACCORDANCE WITH THE GUIDELINES DELINEATED IN THE BASIC UNITIZATION PROCEDURES DRAWING APPLICABLE TO THAT PALLET UNIT.
- E. 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.
- F. ALTERNATE NSN/DODIC COMBINATIONS ARE SHOWN IN THE CHART ON PAGE 4. THESE ALTERNATES MAY BE SUBSTITUTED FOR SOME OR ALL THE DEPICTED NSN/DODICS IF NECESSARY DUE TO THE ITEMS OR QUANTITIES ON HAND.
- G. 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.
- H. 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 19-48-4905-CA17Q6.
- 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
1" X 4"	15	5
2" X 3" ACTUAL	8	6
2" X 4"	61	41
1" X 6"	8	4
2" X 6"	41	41
1" X 8"	15	10
2" X 8"	30	40
NAILS	NO. REQD	POUNDS
6d (2")	48	1/4
10d (3")	242	3-3/4
12d (3-1/4")	4	NIL

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
A576 PALLET UNIT	1	1,886 LBS
B542 PALLET UNIT	4	7,900 LBS
PV82 PALLET UNIT	4	4,448 LBS
DUNNAGE		291 LBS
CROP		3,800 LBS

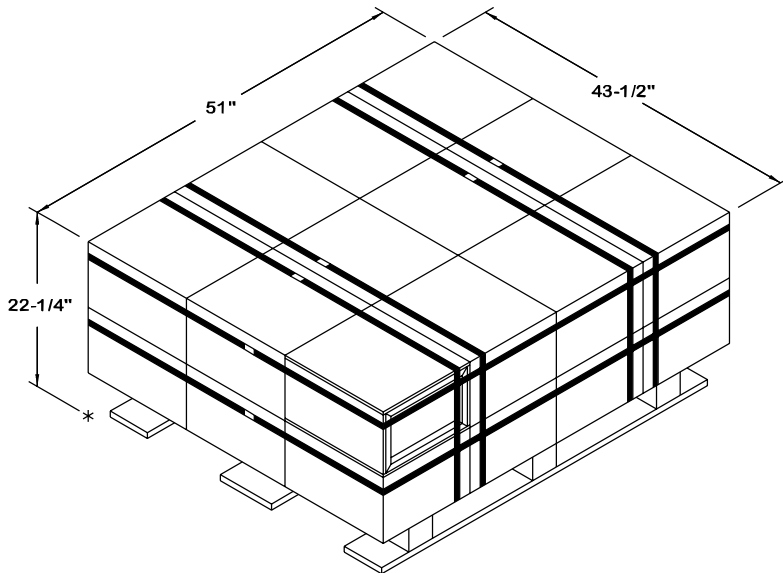
TOTAL WEIGHT - - - - - 18,325 LBS (APPROX)

SCL #51 COMPOSITION CHART

DODIC	NSN	NOMENCLATURE	UNIT DWG	REQD	UNITS REQD	HC
A576 ▲	1305-00-028-6603	CTG, CAL .50 4 API M8/1 API-T M20 LINKED	4116/14	4,800	1 LT PLT	1.4G
B542	1310-01-319-1541	CTG, 40MM HEDP M430 32/BELT	4232/21	5,376	4 PALLETS	1.1E
PV82 ●	1410-01-370-2289	GM, SURFACE ATTACK BGM-71F-1 (TOW-2B)	5229	48	4 PALLETS	1.1E

NOTE: THE DODICS LISTED BELOW MAY BE USED AS ALTERNATES FOR THE DODICS WITH MATCHING SYMBOLS SHOWN ABOVE IF THE QUANTITY OF THE DODICS SHOWN ABOVE IS INSUFFICIENT.

A540 ▲	1305-00-935-2017	CTG, CAL .50 4 API M8/1 TR M1/M17 LINKED	4116/14			1.4G
PD62 ●	1410-01-229-9948	GM, SURFACE ATTACK BGM-71E (TOW-2A)	5229			1.1E
PE96 ●	1410-01-300-0254	GM, SURFACE ATTACK BGM-71E-1B (TOW-2A)	5229			1.1E
PV18 ●	1410-01-322-5333	GM, SURFACE ATTACK BGM-71F (TOW-2B)	5229			1.1E
PV47 ●	1410-01-313-5376	GM, SURFACE ATTACK BGM-71E-3B (TOW-2A)	5229			1.1E

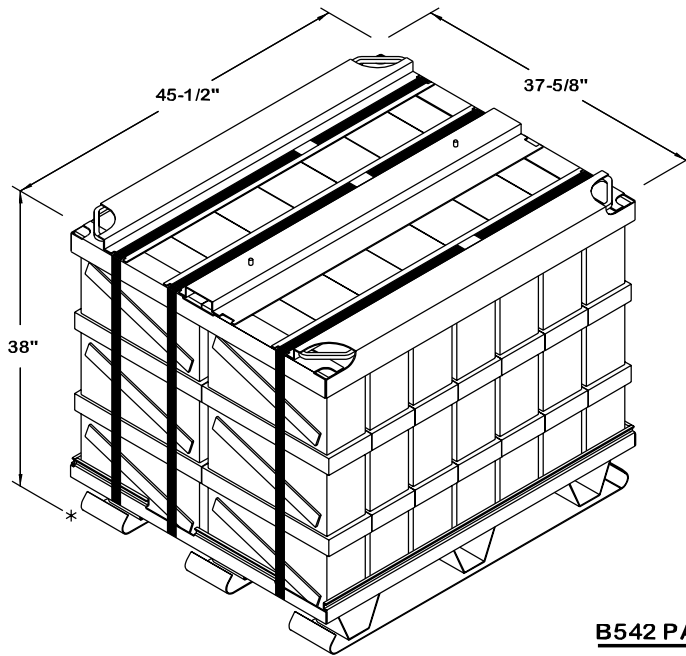


THE A576 LIGHT PALLET UNIT SHOULD BE CONSTRUCTED IAW THE AMC DRAWING LISTED ABOVE WITH THE FOLLOWING CHANGES:

1. ELIMINATE TWO LAYERS OF BOXES (24 BOXES).
2. ELIMINATE TWO HORIZONTAL STRAPS.
3. REDUCE THE TIEDOWN STRAP LENGTH TO 11'-2".

LIGHT A576 PALLET UNIT DETAIL

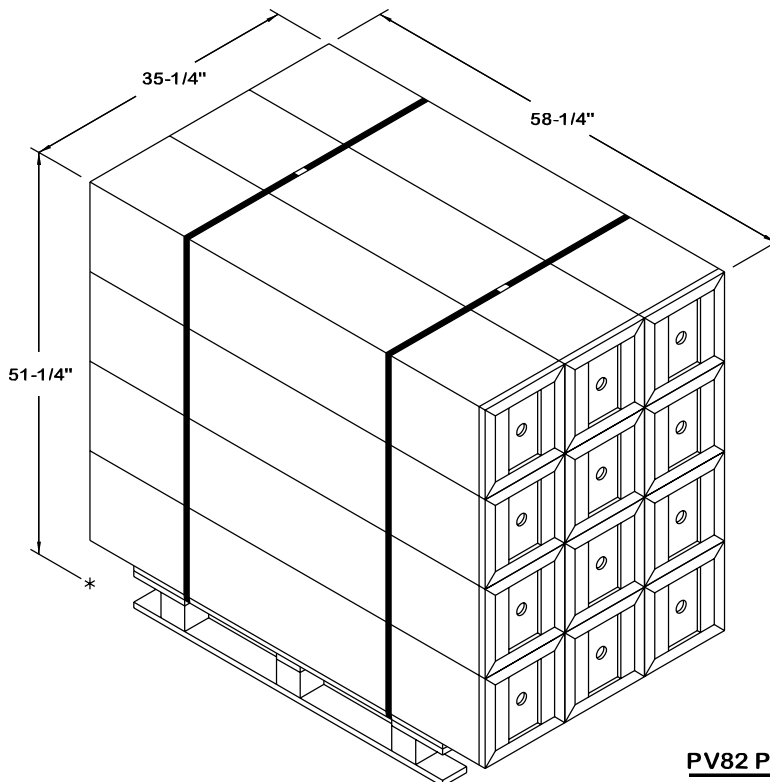
24 BOXES OF .50 CAL CTG (200 PER BOX) AT 75 LBS	1,800 LBS (APPROX)
DUNNAGE	6 LBS
PALLET	80 LBS
TOTAL WEIGHT	1,886 LBS (APPROX)
CUBE	28.5 CU FT (APPROX)



B542 PALLET UNIT DETAIL

42 BOXES OF 40MM CTG (32 PER CNTR) AT 42 LBS	-----	1,764 LBS (APPROX)
DUNNAGE	-----	112 LBS
PALLET	-----	99 LBS

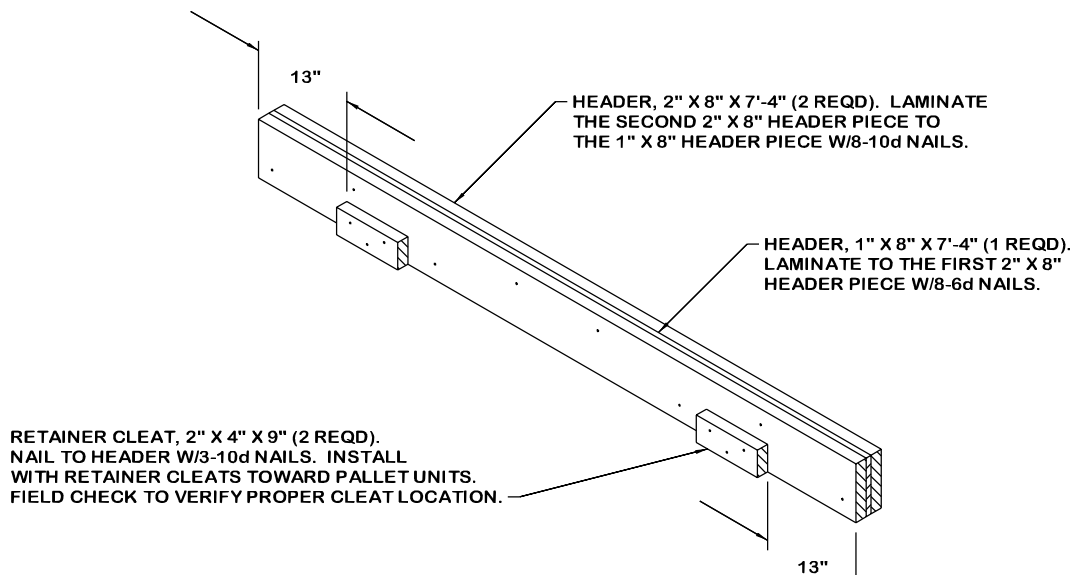
TOTAL WEIGHT	-----	1,975 LBS (APPROX)
CUBE	-----	37.6 CU FT (APPROX)



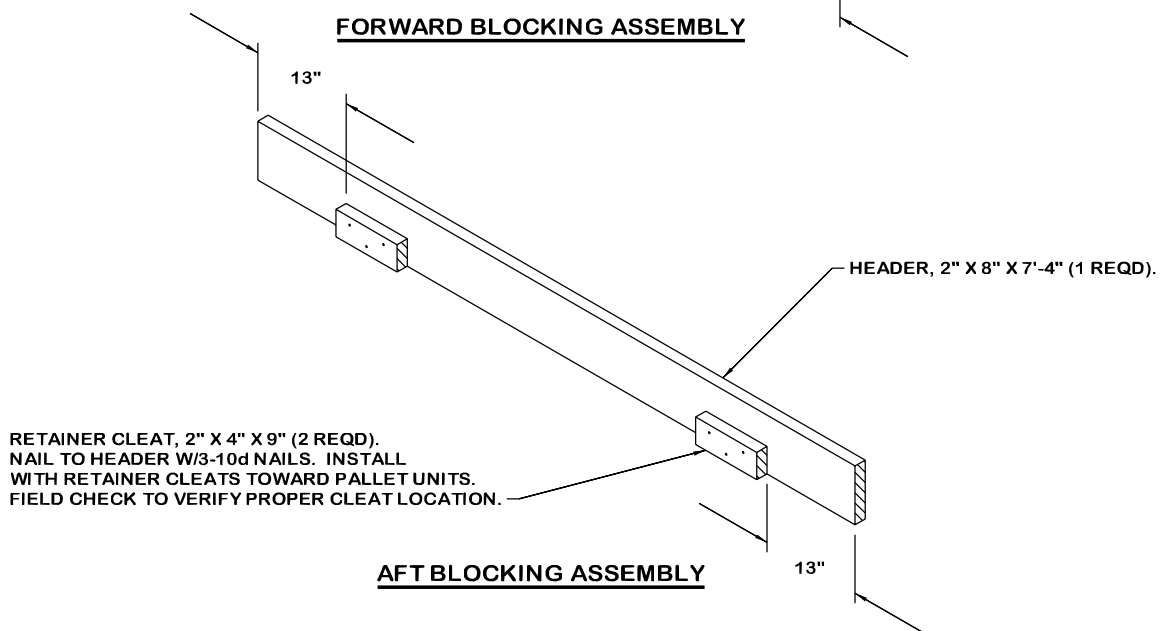
PV82 PALLET UNIT DETAIL

12 CNTRS OF TOW MISSILES (1 PER CNTR) AT 87 LBS	--	1,044 LBS (APPROX)
DUNNAGE	-----	3 LBS
PALLET	-----	65 LBS

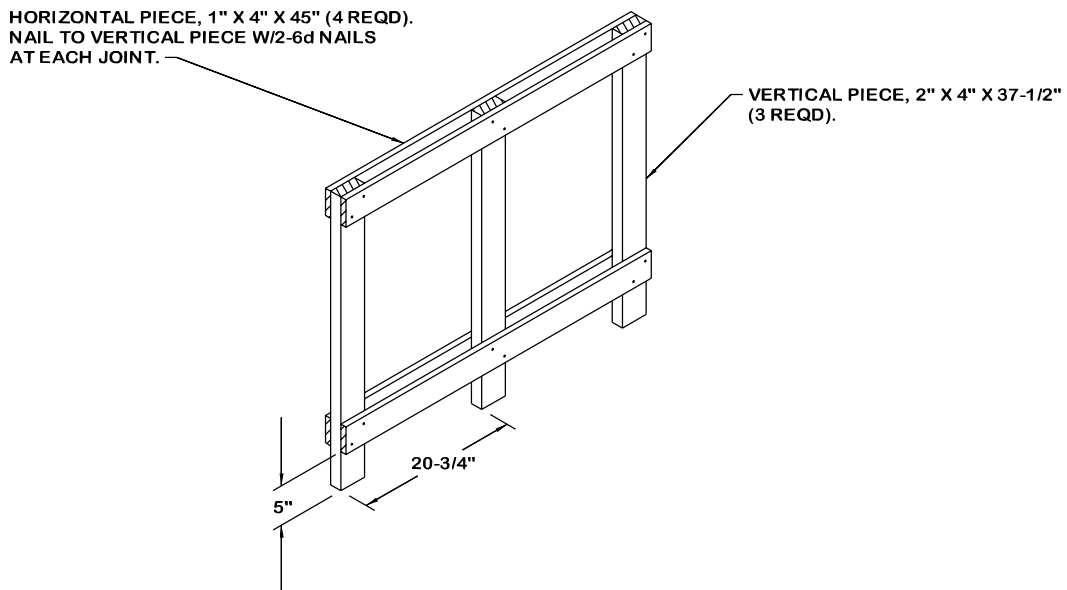
TOTAL WEIGHT	-----	1,112 LBS (APPROX)
CUBE	-----	60.9 CU FT (APPROX)



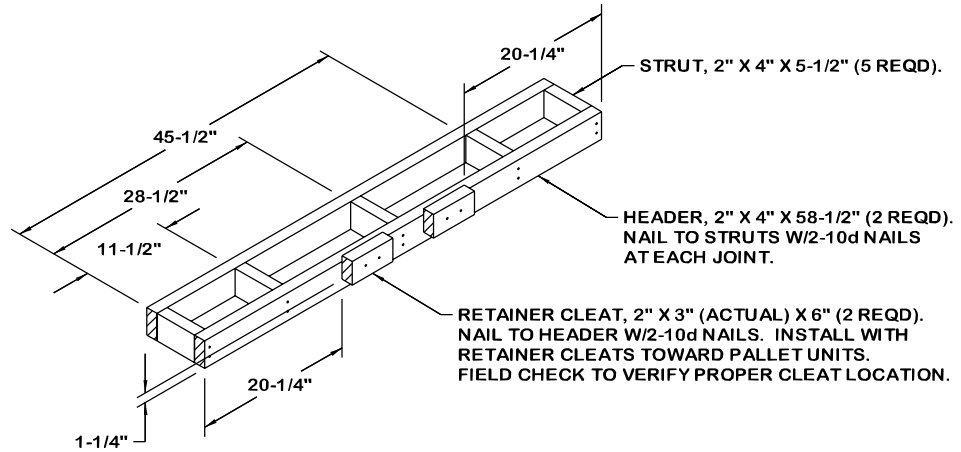
FORWARD BLOCKING ASSEMBLY



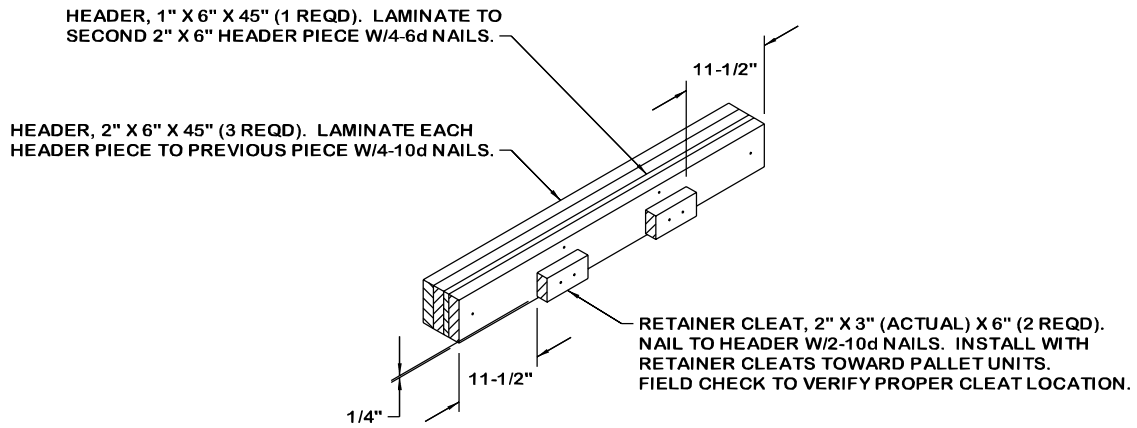
AFT BLOCKING ASSEMBLY



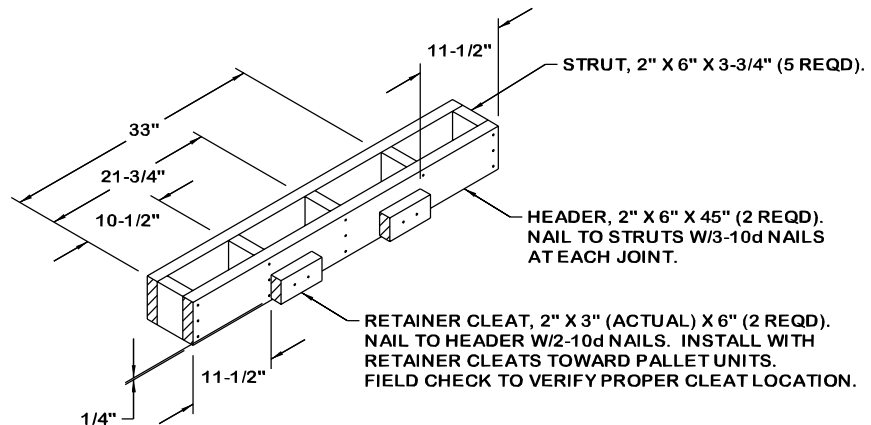
SPACER ASSEMBLY



SIDE BLOCKING ASSEMBLY A



SIDE BLOCKING ASSEMBLY B



SIDE BLOCKING ASSEMBLY C

