

*D. L. K.*

DATE 10/12/00

# APPENDIX 46

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

### SCL #46 - 105MM HE M1

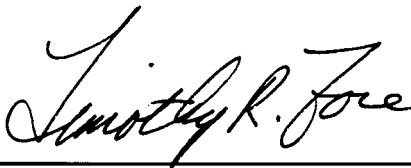
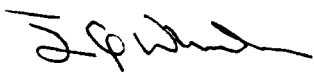
#### INDEX

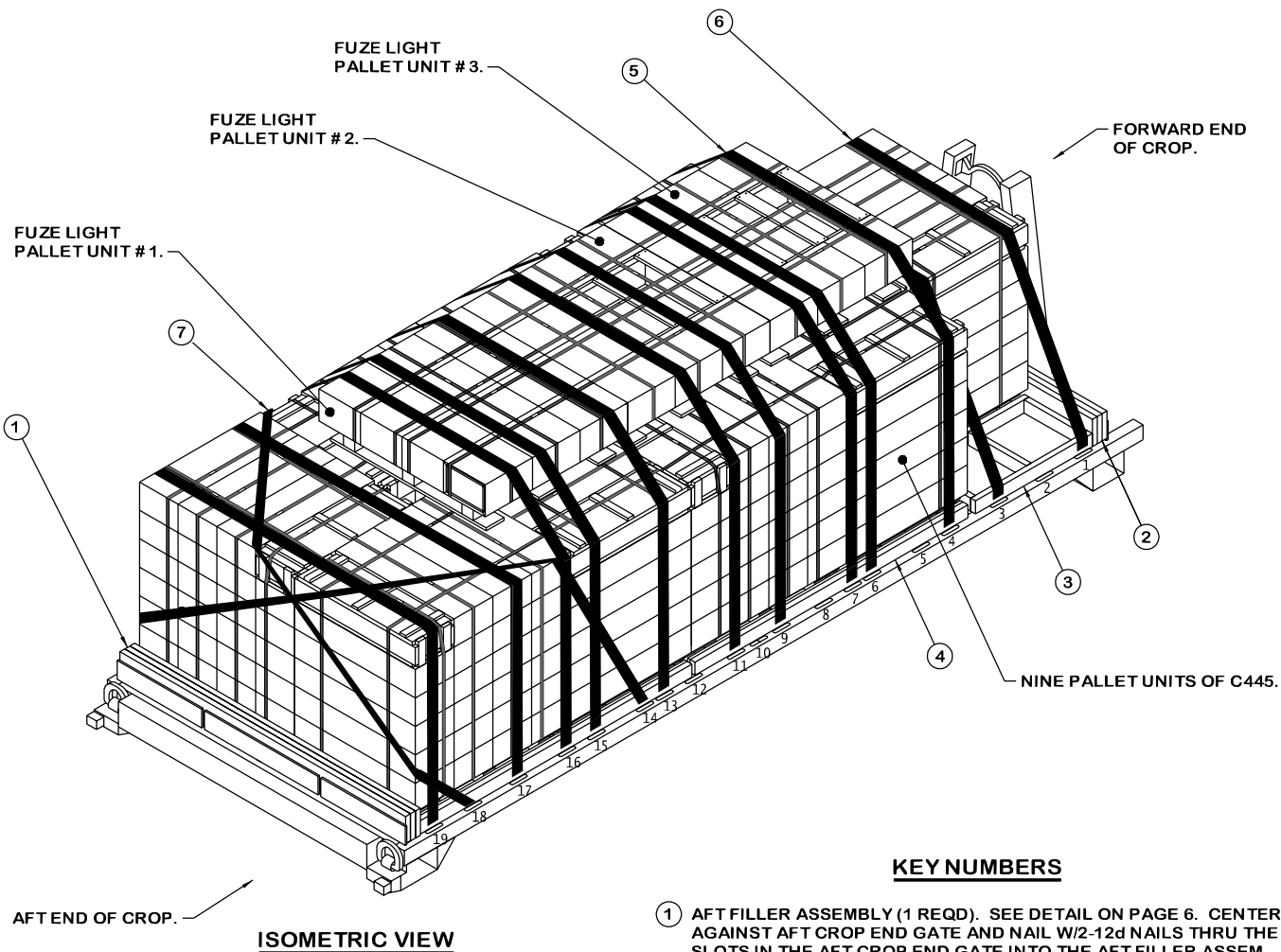
| <u>ITEM</u>   | <u>PAGE(S)</u> |
|---|----------------|
| TYPICAL LOADING PROCEDURES - - - - -                      | 2              |
| GENERAL NOTES AND SEQUENTIAL LOADING PROCEDURES - - - - - | 3              |
| PALLET UNIT DETAILS - - - - -                             | 4-5            |
| DETAILS - - - - -   | 6              |

**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<br>OPERATIONS SUPPORT COMMAND<br><br>   | ENGINEER                                  | BASIC                     |                      | <b>DO NOT SCALE</b>  |          |             |        |
|  |   | REV.                      |                      | WEBSITE: <a href="http://www.dac.army.mil">HTTP://WWW.DAC.ARMY.MIL</a> |          |             |        |
|  | TECHNICIAN                                | BASIC                     | PATRICK DOUGHERTY    | <b>OCTOBER 2000</b>  |          |             |        |
|  |   | REV.                      |                      |  |          |             |        |
|  | DRAFTSMAN                                 | BASIC                     |                      |  |          |             |        |
|  |   | REV.                      |                      |  |          |             |        |
| APPROVED BY ORDER OF COMMANDING GENERAL,<br>U.S. ARMY MATERIEL COMMAND<br><br><br><br>U.S. ARMY DEFENSE AMMUNITION CENTER | TRANSPORTATION<br>ENGINEERING<br>DIVISION | <i>William R. Fennell</i> |                      | CLASS  | DIVISION | DRAWING     | FILE   |
|  | VALIDATION<br>ENGINEERING<br>DIVISION     | <i>Patrick B. ...</i>     | TESTED<br><i>pub</i> | 19   | 48       | 4905/<br>46 | CA17Q6 |
|  | ENGINEERING<br>DIRECTOR/AIE               | <i>Mark J. Cole</i>       |                      |  |          |             |        |



**ISOMETRIC VIEW**

**KEY NUMBERS**

- (KEY NUMBERS CONTINUED)
- ① AFT FILLER ASSEMBLY (1 REQD). SEE DETAIL ON PAGE 6. CENTER AGAINST AFT CROP END GATE AND 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 ASSEMBLY (1 REQD). SEE DETAIL ON PAGE 6. POSITION HEADER WITH CLEATS UNDER THE FORWARD PALLET AND CENTERED ON THE CROP. LAMINATE A 2" X 8" X 7'-4" FILL PIECE TO THE HEADER W/8-10d NAILS. LAMINATE ADDITIONAL FILL PIECES (AS REQUIRED) TO THE FIRST IN A SIMILAR MANNER. AFTER THE PALLET UNITS ARE LOADED, NAIL THROUGH THE HOLES IN THE FORWARD CROP END GATE W/2-12d NAILS INTO THE FORWARD FILLER PIECES, LEAVING THE NAIL HEADS PROTRUDING THROUGH THE HOLES TO PROVIDE LATERAL AND VERTICAL RESTRAINT.
  - ③ SPACER ASSEMBLY (2 REQD). SEE DETAIL ON PAGE 6. POSITION A SPACER ASSEMBLY ON EACH SIDE OF FRONT PALLET UNIT. NAIL THROUGH THE STRAP ATTACHMENT SLOTS OF THE FORWARD END RESTRAINT STRAPS W/1-10d PARTIALLY DRIVEN NAIL AT EACH LOCATION AND BEND OVER SIDE OF HOOK.
  - ④ SIDE BLOCKING ASSEMBLY, 2" X 4" X 7'-0" AND 1" X 4" X 7'-0" (4 EACH REQD). LAMINATE W/8-6d NAILS. POSITION AGAINST THE CHIMNEY STACKED PALLET UNITS ON BOTH SIDES OF THE CROP AS SHOWN.
  - ⑤ HOLD-DOWN STRAP, 3-INCH WIDE WEB STRAP TIEDOWN ASSEMBLY FOR CROP (10 REQD). INSTALL EACH HOLD-DOWN STRAP TO EXTEND FROM THE DESIGNATED TIEDOWN ANCHOR ON ONE SIDE OF CROP, OVER THE TOP OF THE CHIMNEYED C445 AND LIGHT PALLET UNITS (AS NECESSARY), 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.
  - ⑥ FORWARD END RESTRAINT STRAP, 3-INCH WIDE WEB STRAP TIEDOWN ASSEMBLY FOR CROP (2 REQD). INSTALL STRAPS FROM THE FIRST AND THIRD TIEDOWN ANCHOR ON ONE SIDE OF THE CROP OVER THE FORWARD C445 PALLET UNIT AND BACK DOWN 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.
  - ⑦ AFT END RESTRAINT STRAP, 3-INCH WIDE WEB STRAP TIEDOWN ASSEMBLY FOR CROP (2 REQD). INSTALL EACH STRAP FROM THE FOURTEENTH TIEDOWN ANCHOR ON ONE SIDE OF THE CROP, AROUND AND OVER THE C445 PALLET UNITS, AND BACK DOWN TO EIGHTEENTH 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.

(CONTINUED AT LEFT)

**RECOMMENDED SEQUENTIAL PROCEDURES**

1. PREFABRICATE ONE AFT FILLER ASSEMBLY, ONE FORWARD FILLER ASSEMBLY, TWO SPACER ASSEMBLIES, AND TWO SIDE BLOCKING ASSEMBLIES.
2. POSITION THE AFT FILL ASSEMBLY, PIECE MARKED ①, TIGHT AGAINST THE AFT CROP END GATE. CENTER THE FILL ASSEMBLY ON THE GATE.
3. PLACE TWO C445 PALLET UNITS ON THE CROP WITH THE SHORT SIDE OF ONE PALLET AGAINST THE LONG SIDE OF THE OTHER PALLET UNIT AS SHOWN ON PAGE 2. PALLET UNITS SHALL BE CENTERED ON THE CROP AND TIGHT AGAINST THE AFT FILLER ASSEMBLY WITH THE CLEATS ON THE FILL ASSEMBLY PROTRUDING UNDER THE TWO PALLET UNITS. NAIL TWO 12d RETAINER NAILS INTO THE AFT FILLER ASSEMBLY AS INSTRUCTED IN KEY NUMBER ①.
4. CENTER TWO C445 PALLET UNITS ON THE CROP WITH THE PALLET UNIT'S ORIENTATION OPPOSITE FROM THE FIRST TWO PALLET UNITS SO THAT THE FOUR PALLET UNITS COMBINED FORM A CHIMNEY PATTERN. ENSURE ALL PALLETS ARE TIGHT AGAINST EACH OTHER.
5. PLACE FOUR C445 PALLET UNITS IN A CHIMNEY PATTERN TIGHT AGAINST THE PREVIOUSLY LOADED PALLET UNITS.
6. CENTER ONE C445 PALLET UNIT CROSSWISE ON THE CROP, TIGHT AGAINST THE FORWARD CHIMNEY STACK.
7. CENTER THE FORWARD FILL ASSEMBLY, PIECE MARKED ②, AGAINST THE FRONT PALLET UNIT WITH THE CLEATS PROTRUDING UNDER THE PALLET. NOTE: THE FORWARD FILLER ASSEMBLY MAY NEED TO BE FABRICATED IN THE FIELD WITH THE CLEATS NAILED TO THE HEADER AND PLACED IN POSITION WITH THE CLEATS UNDER THE FRONT PALLET. LAMINATE FILL PIECES TO THE HEADER AS REQUIRED. SEE THE FORWARD FILLER ASSEMBLY DETAIL ON PAGE 6. NAIL TWO 12d RETAINER NAILS INTO THE FORWARD FILLER ASSEMBLY AS INSTRUCTED IN KEY NUMBER ②.
8. PLACE THE THREE LIGHT PALLET UNITS OF FUZES ON TOP OF THE LOAD AS SHOWN ON PAGE 2 WITH THE FIRST LIGHT PALLET UNIT POSITIONED IN THE CENTER AND FLUSH WITH THE FORWARD TWO PALLETS UNITS IN THE CHIMNEY STACK.
9. PLACE A SPACER ASSEMBLY, PIECE MARKED ③, ON BOTH SIDES OF THE FRONT PALLET UNIT.
10. POSITION THE SIDE BLOCKING ASSEMBLY, PIECE MARKED ④, AGAINST THE SIDES OF THE CHIMNEY PATTERNED PALLET UNITS AS SHOWN ON PAGE 2.
11. INSTALL THE TEN HOLD-DOWN STRAPS AS NOTED IN KEY NUMBER ⑤.
12. INSTALL THE TWO FORWARD END RESTRAINT STRAPS AS NOTED IN KEY NUMBER ⑥ AND NAIL THROUGH WEB STRAP ATTACHMENT SLOTS AS NOTED IN KEY NUMBER ③.
13. INSTALL THE AFT END RESTRAINT STRAPS AS NOTED IN KEY NUMBER ⑦.

**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 #46. SEE PAGES 4 AND 5 FOR DETAILS OF THE PALLET UNITS. AN M3A1 (HYUNDAI) 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 M3A1 CROP. FOR AN M3 (SUMMA) 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"      | 28          | 10         |
| 2" x 3"      | 4           | 2          |
| 2" x 4"      | 49          | 33         |
| 2" x 8"      | 44          | 59         |
| NAILS        | NO. REQD    | POUNDS     |
| 6d (2")      | 32          | 1/4        |
| 10d (3")     | 68          | 1          |
| 12d (3-1/4") | 4           | 1/4        |

**LOAD AS SHOWN**

| ITEM                 | QUANTITY | WEIGHT (APPROX)     |
|----------------------|----------|---------------------|
| C445 PALLET UNIT     | 9        | 26,568 LBS          |
| #1 LIGHT PALLET UNIT | 1        | 591 LBS             |
| #2 LIGHT PALLET UNIT | 1        | 479 LBS             |
| #3 LIGHT PALLET UNIT | 1        | 507 LBS             |
| DUNNAGE              |          | 210 LBS             |
| CROP                 |          | 3,800 LBS           |
| TOTAL WEIGHT         |          | 32,155 LBS (APPROX) |

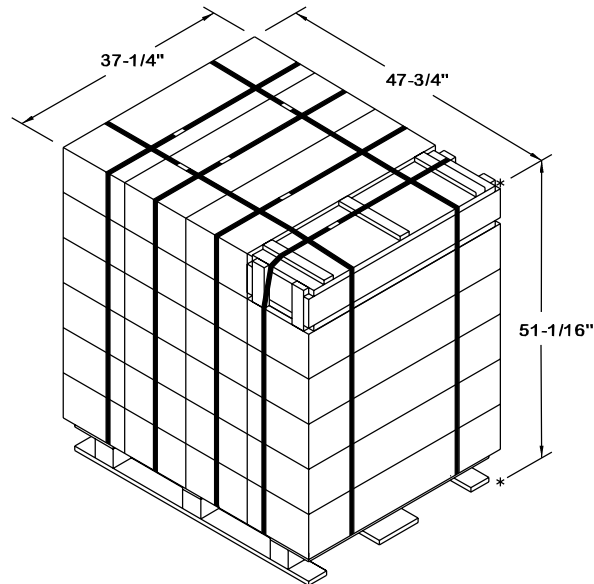
## SCL #46 COMPOSITION CHART

| DODIC  | NSN              | NOMENCLATURE                                   | UNIT DWG  | REQD | UNITS REQD | HC    |
|--------|------------------|--|-----------|------|------------|-------|
| C445 * | 1315-00-028-4857 | CARTRIDGE, 105MM HE M1 W/PLASTIC CLOSING PLUG  | 4116/45   | 432  | 9 PALLETS  | 1. 2E |
| N290   | 1390-01-283-6532 | FUZE, ARTILLERY ELECTRONIC TIME M767 W/BOOSTER | 4116/156S | 224  | 14 BOXES   | 1. 2D |
| N340   | 1390-01-132-7481 | FUZE, POINT DETONATING M739A1                  | 4116/156  | 112  | 7 BOXES    | 1. 2D |
| N464   | 1390-01-202-1710 | FUZE, PROXIMITY M732                           | 4116/156G | 112  | 7 BOXES    | 1. 2D |

**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.**

|        |                  |   |         |  |  |       |
|--------|------------------|---|---------|--|--|-------|
| C445 * | 1315-00-028-4861 | CARTRIDGE, 105MM HE M1 W/PLASTIC CLOSING PLUG | 4116/45 |  |  | 1. 2E |
|--------|------------------|---|---------|--|--|-------|

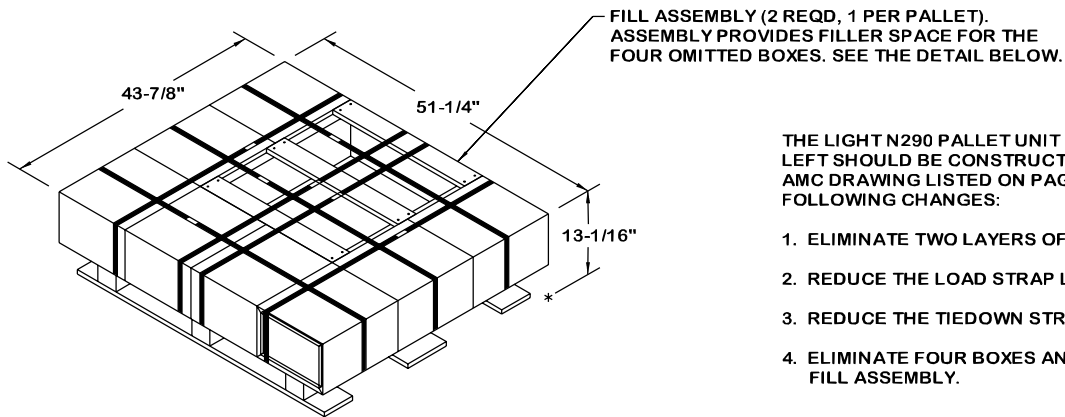
\* USE OF ALTERNATE STOCK NUMBER IS CONTINGENT UPON UNITIZING IN ACCORDANCE WITH THE PROVISIONS OF AMC UNITIZING DRAWING 19-48-4116/45-20PA1002.



### C445 PALLET UNIT DETAIL

|                              |                    |
|------------------------------|--------------------|
| 24 BOXES OF 105MM CARTRIDGES |                    |
| (2 PER BOX) AT 120 LBS       | 2,880 LBS (APPROX) |
| DUNNAGE                      | 7 LBS              |
| PALLET                       | 65 LBS             |

|              |                     |
|--------------|---------------------|
| TOTAL WEIGHT | 2,952 LBS (APPROX)  |
| CUBE         | 52.6 CU FT (APPROX) |



**LIGHT PALLET UNIT**

SEE THE TABLE BELOW FOR ASSEMBLING THE LIGHT PALLET UNITS WITH THE PROPER QUANTITY OF FUZES BY DODIC.

NOTE: THE LIGHT PALLET UNIT DEPICTED ABOVE CONTAINS 8 BOXES OF FUZES (FOUR LESS THAN A FULL LAYER). CROP SHALL HAVE 2 PALLETS AS SHOWN AND ONE FULL LAYER PALLET (28 BOXES TOTAL). LIGHT PALLET UNITS WILL CONSIST OF FUZES AS LISTED BY DODIC AND QUANTITY OF BOXES IN THE TABLE BELOW:

| LIGHT PALLET UNIT QUANTITY OF BOXES BY DODIC |      |      |      |
|--|------|------|------|
| PALLET #                                     | N290 | N340 | N464 |
| 1  | 12   | -    | -    |
| 2  | 1    | 7    | -    |
| 3  | 1    | -    | 7    |

THE LIGHT N290 PALLET UNIT DEPICTED AT LEFT SHOULD BE CONSTRUCTED IAW THE AMC DRAWING LISTED ON PAGE 4 WITH THE FOLLOWING CHANGES:

1. ELIMINATE TWO LAYERS OF BOXES (24 BOXES).
2. REDUCE THE LOAD STRAP LENGTH TO 11'-3".
3. REDUCE THE TIEDOWN STRAP LENGTH TO 10'-1".
4. ELIMINATE FOUR BOXES AND REPLACE WITH A FILL ASSEMBLY.

**FUZE LIGHT PALLET UNIT # 1**

|  |       |                  |
|--|-------|------------------|
| 12 BOXES OF N290 FUZES<br>(16 PER BOX) AT 42 LBS | ----- | 504 LBS (APPROX) |
| DUNNAGE  | ----- | 7 LBS            |
| PALLET   | ----- | 80 LBS           |

|              |       |                     |
|--------------|-------|---------------------|
| TOTAL WEIGHT | ----- | 591 LBS (APPROX)    |
| CUBE         | ----- | 17.0 CU FT (APPROX) |

**FUZE LIGHT PALLET UNIT # 2**

|   |       |                  |
|---|-------|------------------|
| 1 BOX OF N290 FUZES<br>(16 PER BOX) AT 42 LBS   | ----- | 42 LBS (APPROX)  |
| 7 BOXES OF N340 FUZES<br>(16 PER BOX) AT 46 LBS | ----- | 322 LBS (APPROX) |
| DUNNAGE   | ----- | 35 LBS           |
| PALLET  | ----- | 80 LBS           |

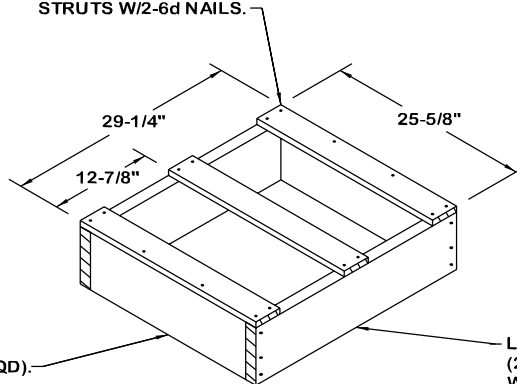
|              |       |                     |
|--------------|-------|---------------------|
| TOTAL WEIGHT | ----- | 479 LBS (APPROX)    |
| CUBE         | ----- | 17.0 CU FT (APPROX) |

**FUZE LIGHT PALLET UNIT # 3**

|   |       |                  |
|---|-------|------------------|
| 1 BOX OF N290 FUZES<br>(16 PER BOX) AT 42 LBS   | ----- | 42 LBS (APPROX)  |
| 7 BOXES OF N464 FUZES<br>(16 PER BOX) AT 50 LBS | ----- | 350 LBS (APPROX) |
| DUNNAGE   | ----- | 35 LBS           |
| PALLET  | ----- | 80 LBS           |

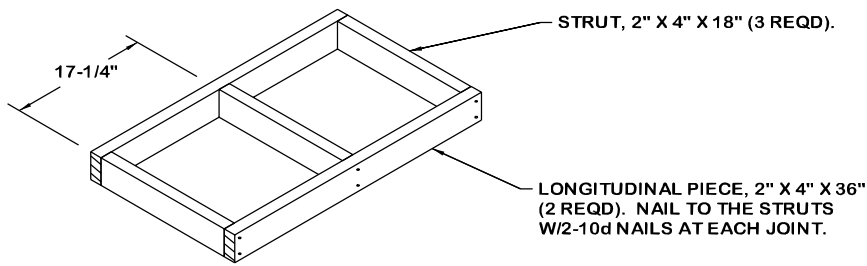
|              |       |                     |
|--------------|-------|---------------------|
| TOTAL WEIGHT | ----- | 507 LBS (APPROX)    |
| CUBE         | ----- | 17.0 CU FT (APPROX) |

TIE PIECE, 1" X 4" X 25-5/8" (3 REQD).  
NAIL TO LONGITUDINAL PIECES W/2-6d  
NAILS AT EACH END AND NAIL TO THE  
STRUTS W/2-6d NAILS.



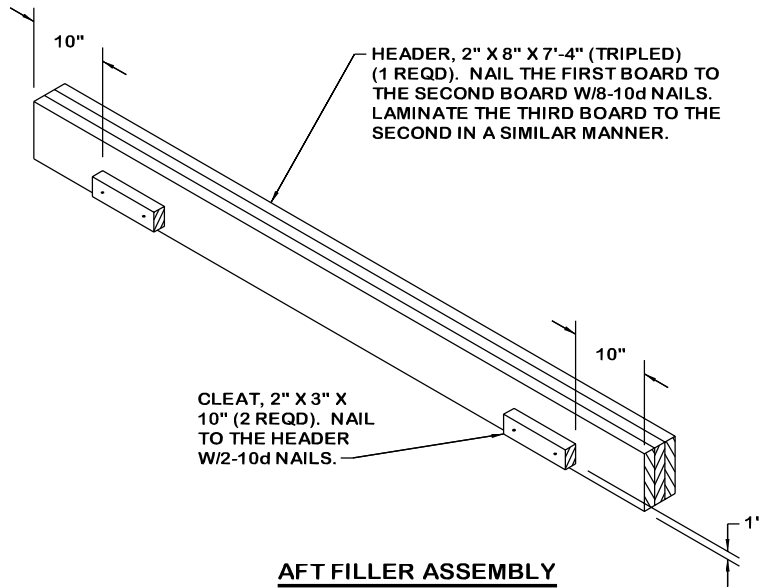
**FILL ASSEMBLY**

THIS FILL ASSEMBLY WILL BE USED TO PROVIDE FILLER SPACE FOR THE FOUR OMITTED BOXES IN CONSTRUCTING THE FUZE LIGHT PALLET UNITS NUMBERS 2 AND 3 AS DETAILED ABOVE AND AS SHOWN ON TOP OF THE CROP LOAD ON PAGE 2.



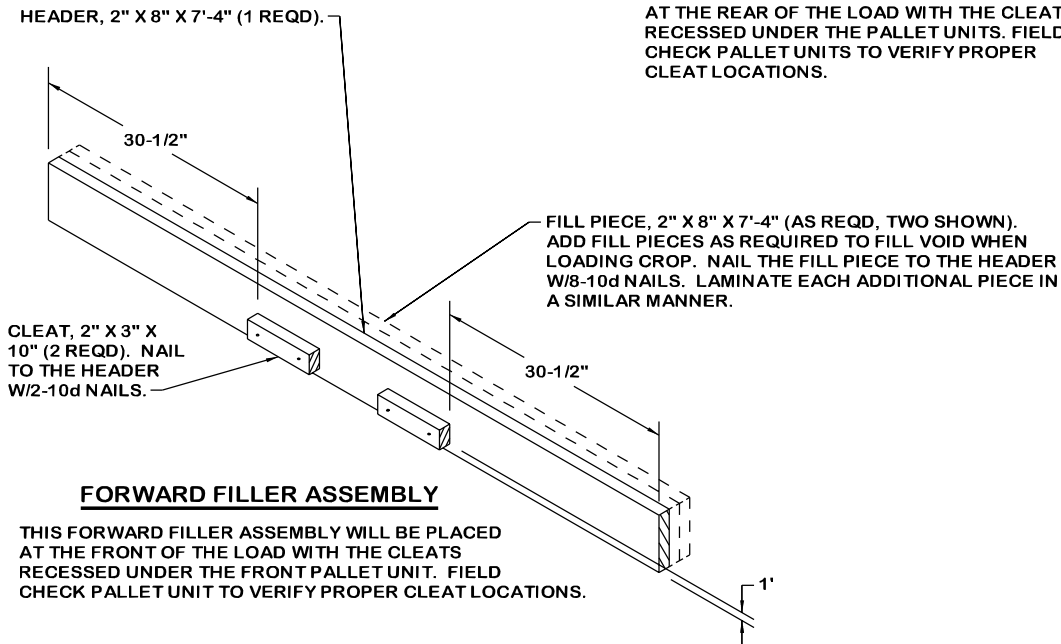
**SPACER ASSEMBLY**

THIS SPACER ASSEMBLY WILL BE USED TO STABILIZE THE PALLET UNIT AT THE FRONT OF THE CROP AS SHOWN ON PAGE 2.



**AFT FILLER ASSEMBLY**

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



**FORWARD FILLER ASSEMBLY**

THIS FORWARD FILLER ASSEMBLY WILL BE PLACED AT THE FRONT OF THE LOAD WITH THE CLEATS RECESSED UNDER THE FRONT PALLET UNIT. FIELD CHECK PALLET UNIT TO VERIFY PROPER CLEAT LOCATIONS.