APPROVED BY
BUREAU OF EXPLOSIVES

D ~ /L

DATE ///0/0/

# **APPENDIX 38**

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

# SCL #38 - 155MM ILLUM M485A2

# **INDEX**

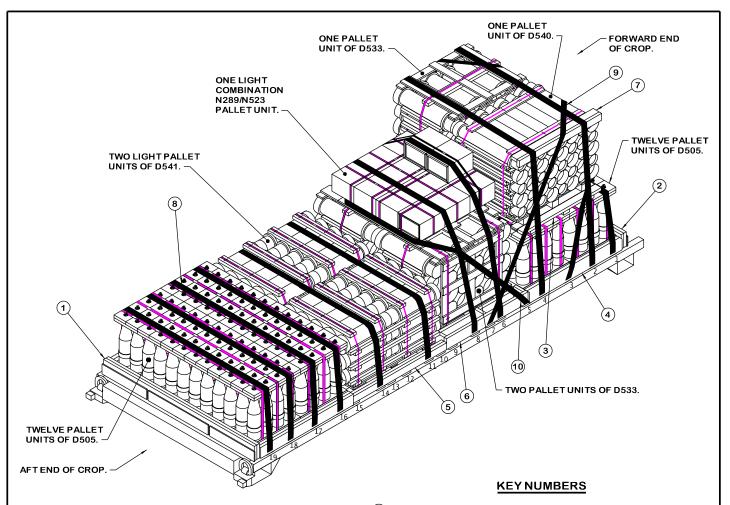
	PAGE(S)
CAL LOADING PROCEDURES	_
RAL NOTES AND SEQUENTIAL LOADING PROCEDURES	
ET UNIT DETAILS	4-6
ILS	7-8

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	LAURA FIEFFER		DO	NOTSCA	LE	
		REV.		WEB	SITE: HT	TP://WWW.D	AC.ARMY.MIL	
1. / / / / / / / / / / / / / / / / / / /	TECHNICIAN	BASIC		ļ · · · ·				
Smothy fore	120111101111	REV.		ן כ	DECEMBER 2000			
June 1	DRAFTSMAN	BASIC						
	_	REV.	1					
APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND	TRANSPORTA ENGINEERI	TION	william R. French				<del></del>	
S.G. FRANT WINTERNEE COMMINING	DIVISION		Sterick . Therein					
	VALIDATION ENGINEERING		TESTED	CLASS	DIVISION	DRAWING	FILE	
1 din E	DIVISION		try W/ Sian			4905/		
		(G	11 . 1 10 10	<b>]</b> 19	48	38	CA17Q6	
U.S. ARMY DEFENSE AMMUNITION CENTER	DIRECTORA	VIE	Johnne J. Coll			36		



# ISOMETRIC VIEW

# (KEY NUMBERS CONTINUED)

- (6) SIDE BLOCKING ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 8. INSTALL ONE ON EACH SIDE OF THE CROP ADJACENT TO THE D533 PALLET UNITS. AFTER THE HOLD-DOWN STRAPS ARE INSTALLED, NAIL THROUGH THE STRAP ATTACHMENT SLOTS OF TWO HOLD-DOWN STRAPS (ONE AT EACH END OF THE ASSEMBLY) INTO SIDE BLOCKING W/1-10d PARTIALLY DRIVEN NAIL AND BEND OVER SIDE OF HOOK.
- (7) STRAPPING BOARD ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 8. INSTALL ON THE EDGE OF THE D540 PALLET UNIT.
- 8 HOLD-DOWN STRAP, 3-INCH WIDE WEB STRAP TIEDOWN ASSEMBLY FOR CROP (11 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 NOTE "H" ON PAGE 3.
- 9 FORWARD END RESTRAINT STRAP, 3-INCH WIDE WEB STRAP TIEDOWN ASSEMBLY FOR CROP (2 REQD). INSTALL EACH STRAP FROM THE THIRD TIEDOWN ANCHOR ON ONE SIDE OF THE CROP (ONE ON EACH SIDE), OVER THE D505 AND D540 OR D533 PALLET UNIT, BACK DOWN TO THE SEVENTH TIEDOWN ANCHOR ON THE OPPOSITE SIDE OF THE CROP. THREAD BEHIND OTHER STRAPS AS NECESSARY. ALIGN SCUFF SLEEVES OVER ALL SHARP EDGES AND FIRMLY TENSION STRAP. SEE GENERAL NOTE "H" ON PAGE 3.
- 10 AFT END RESTRAINT STRAP, 3-INCH WIDE WEB STRAP TIEDOWN ASSEMBLY FOR CROP (1 REQD). INSTALL THE STRAP FROM THE FIFTH TIEDOWN ANCHOR ON ONE SIDE OF THE CROP, OVER THE D533 PALLET UNITS AND AROUND THE PALLET POSTS OF THE LIGHT N289/N523 COMBINATION PALLET UNIT, AND BACK DOWN TO THE FIFTH TIEDOWN ANCHOR ON THE OPPOSITE SIDE OF THE CROP. THREAD BEHIND OTHER STRAPS AS NECESSARY. ALIGN SCUFF SLEEVES OVER ALL SHARP EDGES AND FIRMLY TENSION STRAP. SEE GENERAL NOTE "H" ON PAGE 3.

- 1 AFT FILLER ASSEMBLY (1 REQD). SEE DETAIL ON PAGE 7. CENTER AGAINST AFT CROP END GATE 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 (6d NAILS FOR 1" 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) PALLET SUPPORT ASSEMBLY (1 REQD). SEE DETAIL ON PAGE 7. POSITION THE ASSEMBLY ON TOP OF THE D505 PALLET UNITS SO THAT ASSEMBLY LATERAL PIECES ARE CROSSWISE ON THE LOAD AND FIT BETWEEN THE LIFTING RINGS OF THE D505 PROJECTILES. CENTER THE ASSEMBLY LATERALLY AND LONGITUDINALLY ON THE D505 PALLET UNITS.
- 4 D505 SIDE BLOCKING, 1" X 6" X 54" (SINGLE) AND 2" X 6" X 54" (DOUBLED) (4 REQD). LAMINATE ONE 2" X 6" PIECE TO THE SECOND 2" X 6" PIECE W/5-104 NAILS, AND LAMINATE THE 1" X 6" PIECE TO THE 2" X 6" PIECES W/5-64 NAILS. POSITION AGAINST THE D505 PALLETS ON BOTH SIDES OF THE CROP AS SHOWN, WITH THE 1" X 6" PIECE AGAINST THE PALLET UNITS. AFTER THE HOLD-DOWN STRAPS ARE INSTALLED, NAIL THROUGH THE STRAP ATTACHMENT SLOTS OF TWO HOLD-DOWN STRAPS (ONE AT EACH END OF THE ASSEMBLY) INTO THE SIDE BLOCKING W/1-10d NAIL PARTIALLY DRIVEN AND BENT OVER SIDE OF HOOK.
- (5) D541 SIDE BLOCKING, 2" X 4" X 55" (DOUBLED) (2 REQD). LAMINATE THE FIRST PIECE TO THE SECOND PIECE W/4-10d NAILS. INSTALL ONE ON EACH SIDE OF THE CROP ADJACENT TO THE D541 PALLET UNITS. AFTER THE HOLD-DOWN STRAPS ARE INSTALLED, NAIL THROUGH THE STRAP ATTACHMENT SLOTS OF TWO HOLD-DOWN STRAPS (ONE AT EACH END OF THE ASSEMBLY) INTO THE SIDE BLOCKING W/1-10d NAIL PARTIALLY DRIVEN AND BENT OVER SIDE OF HOOK.

(CONTINUED AT LEFT)

# RECOMMENDED SEQUENTIAL PROCEDURES

- PREFABRICATE THE AFT FILLER ASSEMBLY, ONE PALLET SUPPORT ASSEMBLY, TWO SIDE BLOCKING ASSEMBLIES, ONE STRAPPING BOARD ASSEMBLY, AND LAMINATE TWO SETS OF D540 SIDE BLOCKING PIECES AND FOUR SETS OF D505 BLOCKING PIECES. AS-SEMBLE THE LIGHT N289/N523 COMBINATION PALLET UNIT.
- 2. INSTALL THE AFT FILLER ASSEMBLY.
- 3. LOAD TWO ROWS OF SIX PALLET UNITS OF D505 AGAINST THE AFT END FILLER ASSEMBLY, CENTERING THE ROWS LATERALLY ON THE CROP.
- LOAD ONE ROW OF TWO LIGHT PALLET UNITS OF D541 AGAINST THE D505 PALLET UNITS, CENTERING THE ROWS LATERALLY ON THE CROP.
- 5. LOAD ONE ROW OF TWO PALLET UNITS OF D533 AGAINST THE D541 PALLET UNITS, CENTERING THE ROWS LATERALLY ON THE CROP.
- 6. LOAD TWO ROWS OF SIX PALLET UNITS OF D505 AGAINST THE D533 PALLET UNITS, CENTERING THE ROWS LATERALLY ON THE CROP.
- 7. INSTALL THE FORWARD FILLER PIECES.
- 8. INSTALL ONE PALLET SUPPORT ASSEMBLY AS DELINEATED IN KEY NUMBER  $(\mathfrak{F})$ .
- 9. LOAD ONE D540 PALLET UNIT AND ONE D533 PALLET UNIT ON TOP OF THE PALLET SUPPORT ASSEMBLY, ALIGNING THE PALLET SKIDS WITH THE PALLET SUPPORT ASSEMBLY LONGITUDINAL PIECES.
- 10. LOAD THE LIGHT COMBINATION N289/N523 PALLET UNIT ON TOP OF THE TWO D533 PALLET UNITS, TIGHT AGAINST THE D540 AND UPPER D533 PALLET UNITS, ALIGNING THE PALLET SKIDS WITH THE TIE PIECES OF THE D533 PALLET UNIT TOP DUNNAGE ASSEMBLIES.
- 11. INSTALL THE TWO SIDE BLOCKING ASSEMBLIES, ONE ON EITHER SIDE OF THE D533 PALLET UNITS.
- 12. INSTALL THE TWO LAMINATED SETS OF D541 SIDE BLOCKING PIECES, ONE ON EITHER SIDE OF THE D541 PALLET UNITS.
- 13. INSTALL THE FOUR LAMINATED SETS OF D505 SIDE BLOCKING PIECES, ONE ON EITHER SIDE OF THE D505 PALLET UNITS.
- 14. INSTALL THE STRAPPING BOARD ASSEMBLY ON THE D540 PALLET UNIT.
- INSTALL 11 HOLD-DOWN STRAPS AS DELINEATED IN KEY NUMBER
   8.
- 16. INSTALL THE TWO FORWARD END RESTRAINT STRAPS AS DELINEATED IN KEY NUMBER  $\ensuremath{\mathfrak{G}}$  .
- 17. INSTALL THE AFT END RESTRAINT STRAP AS DELINEATED IN KEY NUMBER  $\stackrel{\frown}{10}$  .
- 18. NAIL THROUGH THE STRAP ATTACHMENT SLOT OF A HOLD-DOWN STRAP INTO EACH END OF THE SIDE BLOCKING ASSEMBLIES AND SIDE BLOCKING PIECES W/1-10d PARTIALLY DRIVEN NAIL AND BEND OVER SIDE OF HOOK.
- NAIL TWO 12d RETAINING NAILS THRU THE SLOTS IN THE AFT CROP END GATE AS DELINEATED IN KEY NUMBER 1.
- 20. NAIL THE TWO REMAINING 12d RETAINING NAILS THRU THE HOLES IN THE FORWARD CROP END GATE AS DELINEATED IN KEY NUMBER 2.

### BILL OF MATERIAL LUMBER LINEAR FEET BOARD FEET x\_3" " (ACTUAL) X 4" X 6" 49 33 42 X 8" 30 40 NAILS NO. REOD POUNDS 6d (2") 1/2 10d (3") 81 1 - 1/412d (3-1/4")4 1/4

## **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 #38. SEE PAGES 4 THRU 6 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 6 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.

# **LOAD AS SHOWN**

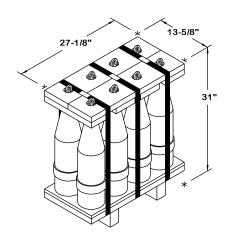
D505 PALLET UNIT 24 18,768 LBS D533 PALLET UNIT 3 3,480 LBS D540 PALLET UNIT 1 1,306 LBS LIGHT D541 PALLET UNIT 2 2,146 LBS COMBO N289/N523 PALLET UNIT - 1 643 LBS DUNNAGE 3,800 LBS CROP 3,800 LBS	ITEM	QUANTITY	$\underline{\text{WEIGHT}}$ (APPROX)
2,000 203	D533 PALLET UNIT	3 1 2 1	3,480 LBS 1,306 LBS 2,146 LBS 643 LBS

TOTAL WEIGHT - - - - - - 30, 413 LBS (APPROX)

SCL #38 COMPOSITION CHART							
DODIC	NSN	NOMENCL ATURE	UNIT DWG	REQD	UNITS REQD	НС	
D5 05	1320-00-935-2091	PROJ, 155MM ILLUMINATING M485A2	7549275	192	24 PALLETS	1.3G	
D533	1320-01-093-6856	CHG, PROPELLING 155MM RB M119A2 W/O PRIMER	4042A/9	72	3 PALLETS	1.3C	
D5 40	1320-00-935-1922	CHG, PROPELLING 155MM GB M3	4042 A/3	80	1 PALLET	1.3C	
D541	1320-00-935-1923	CHG, PROPELLING 155MM WB M4A2	4042A/2	60	2 LIGHT PLTS	1.3C	
N289*	1390-01-282-6038	FUZE, ELECTRONIC TIME W/O BOOSTER M762	4116/156S	208	13 BOXES	1. 4S	
N523	1390-01-481-2024	PRIMER, PERCUSSION M82	4116/158G	200	1 BOX	1. 4S	
NOTE: THE DODICE LISTED BELOW MAY BE USED AS ALTERNATES FOR THE DODICE WITH MATCHING							

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.

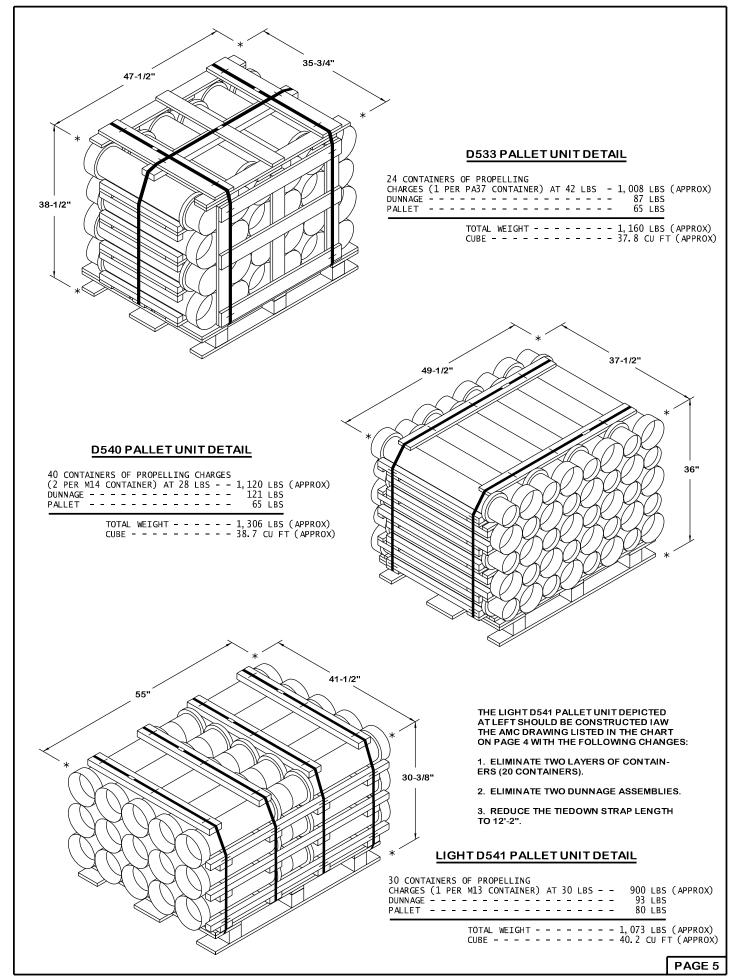
N285*	1390-01-247-4013	FUZE, MTSQ W/O BOOSTER M577A1	4116/156		1. 4S

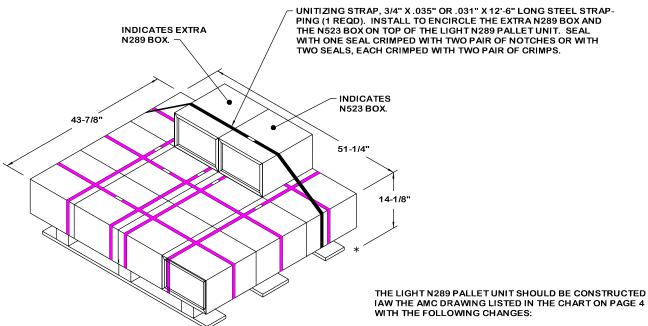


# **D505 PALLET UNIT DETAIL**

8 155MM CTG AT 93.125 LBS - - - - - 745 LBS (APPROX)
DUNNAGE AND PALLET - - - - - - 37 LBS

TOTAL WEIGHT - - - - - 782 LBS (APPROX)
CUBE - - - - - - - 6.7 CU FT (APPROX)





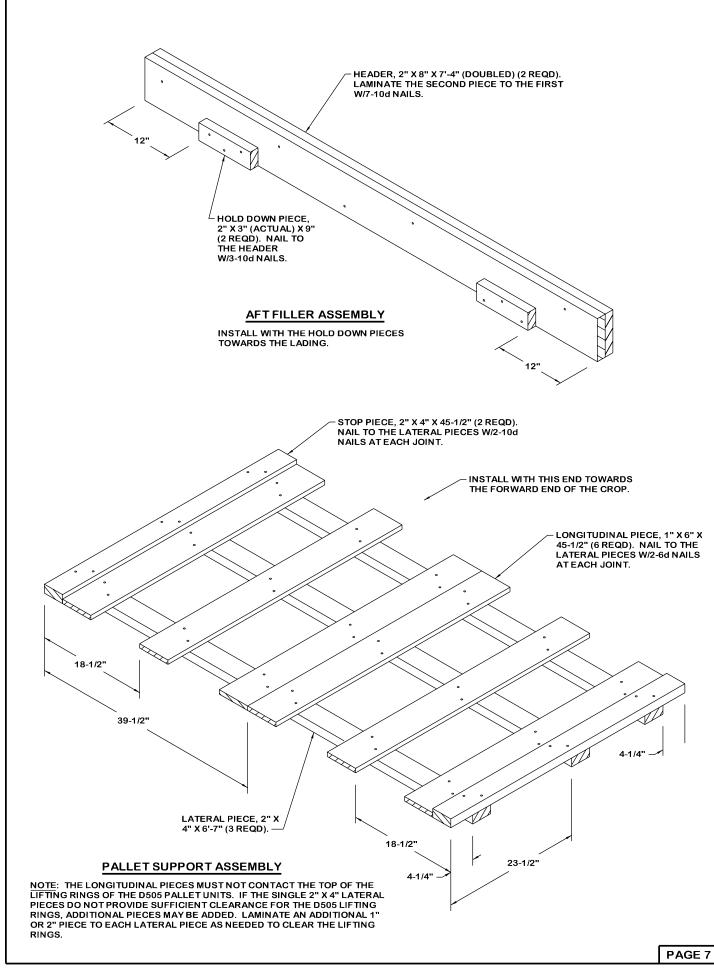
SPECIAL NOTE:

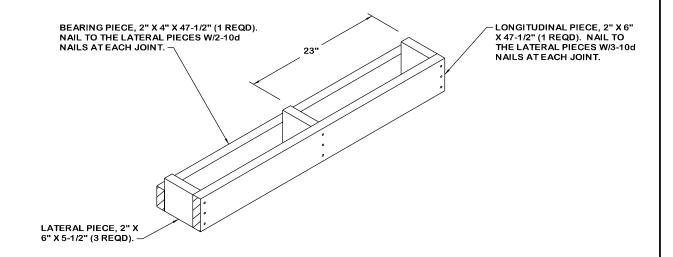
ALIGN THE TWO EXTRA BOXES WITH THE OUTER CENTER BOXES ON THE PALLET UNIT. INSTALL THE UNITIZING STRAP OVER THE TWO BOXES, TOWARDS THE CENTER OF THE PALLET UNIT, AS SHOWN ABOVE.

- 1. ELIMINATE TWO LAYER OF BOXES (24 BOXES).
- 2. REDUCE THE TIEDOWN STRAP LENGTH TO 9'-10".
- 3. REDUCE THE LOAD STRAP LENGTH TO 11'-1".

# LIGHT N289/N523 COMBINATION PALLET UNIT DETAIL

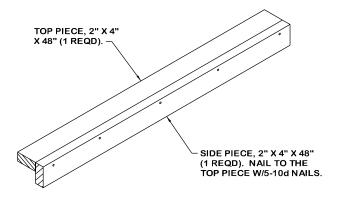
13 BOXES OF N289 FUZES (16 PER BOX) AT 40 LBS 1 BOX OF PRIMERS (200 PER BOX) AT 34 LBS DUNNAGE	
TOTAL WEIGHT	





# **SIDE BLOCKING ASSEMBLY**

INSTALL WITH THE BEARING PIECE AGAINST THE LADING.



# STRAPPING BOARD ASSEMBLY