

# LOADING AND BRACING (TL & LTL) IN VAN TRAILERS<sup>⊕</sup> OF 155MM M982 EXCALIBUR PROJECTILES PACKED IN PA179 CYLINDRICAL METAL CONTAINERS

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**⊕ CAUTION:** THE PROCEDURES SHOWN HEREIN ARE ONLY APPLICABLE TO HIGHWAY MOVEMENTS, NOT TRAILER-ON-FLATCAR (TOFC) MOVEMENTS.

## U.S. ARMY MATERIEL COMMAND DRAWING

<p>APPROVED, U.S. ARMY JOINT MUNITIONS COMMAND</p> <p><b>NESBITT. RICHARD. L.1230413831</b></p> <p><small>Digitally signed by NESBITT. RICHARD.L.1230413831 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=NESBITT.RICHARD. L.1230413831 Date: 2008.09.18 06:32:36 -05'00'</small></p>		<p><b>CAUTION: VERIFY PRIOR TO USE AT WWW.DAC.ARMY.MIL THAT THIS IS THE MOST CURRENT VERSION OF THIS DOCUMENT. THIS IS PAGE 1 OF 24.</b></p>			
		<b>DO NOT SCALE</b>		<b>SEPTEMBER 2008</b>	
		ENGINEER OR TECHNICIAN	BASIC REV.	<b>MICHAEL BARTOSIAK</b>	
		TRANSPORTATION ENGINEERING DIVISION		<p><b>FIEFFER.LAURA. A.1230375727</b></p> <p><small>Digitally signed by FIEFFER.LAURA. A.1230375727 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, ou=FIEFFER.LAURA. A.1230375727 Date: 2008.09.05 14:11:41 -05'00'</small></p>	
<p>APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND</p> <p><b>CARNEY.GARY. BURTON.10387 08038</b></p> <p><small>Digitally signed by CARNEY.GARY. BURTON.1038708038 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=CARNEY.GARY. BURTON.1038708038 Date: 2008.09.22 07:32:00 -05'00'</small></p> <p>U.S. ARMY DEFENSE AMMUNITION CENTER</p>		VALIDATION ENGINEERING DIVISION	BARICKMAN. PHILIP. W.1230202202	TESTED	CLASS
		ENGINEERING DIRECTORATE	FIEFFER.LAURA. A.1230375727		DIVISION
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					<b>4243/55</b>
					<b>11PM1004</b>

## GENERAL NOTES

(GENERAL NOTES CONTINUED)

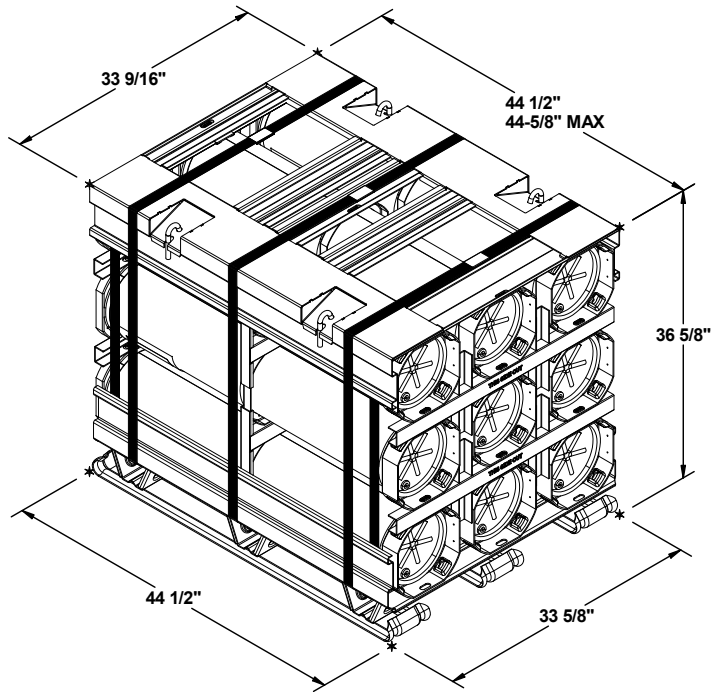
- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE SPECIFIED OUTLOADING PROCEDURES ARE APPLICABLE TO PALLETIZED 155MM M982 EXCALIBUR PROJECTILES PACKED IN PA179 CONTAINERS. SUBSEQUENT REFERENCE TO PALLET UNIT HEREIN MEANS PALLET UNIT WITH AMMUNITION ITEMS. SEE PAGE 3 AND AMC DRAWING 19-48-4231/55-20PM1006 FOR DETAILS OF THE PALLET UNIT.
- C. THE OUTLOADING PROCEDURES DEPICTED WITHIN THIS DOCUMENT ARE APPLICABLE FOR SHIPMENTS IN CONVENTIONAL TYPE VAN TRAILERS AND APPLY TO TRAILERS HAVING WOOD, OR WOOD AND METAL, OR ALL METAL FLOORS. REGARDLESS OF THE DIMENSIONS OF THE VAN TRAILERS SHOWN, THE PROCEDURES ARE ALSO APPLICABLE FOR TRAILERS WHICH ARE 89" THRU 99" IN WIDTH AND FOR TRAILERS OF OTHER LENGTHS FROM THE SHORTEST TO THE LONGEST AVAILABLE (REF: 24' TO 53'), AND FOR STRAIGHT TRUCK VANS. THE SPECIFIED BRACING IS ADEQUATE FOR LOADS WEIGHING UP TO AND INCLUDING THE MAXIMUM WEIGHTS PERMITTED BY LAW.
- D. SELECTION OF A VEHICLE FOR THE TRANSPORT OF THE DESIGNATED ITEM IS THE RESPONSIBILITY OF THE ORIGINATING CARRIER AND THE SHIPPER. ONLY VEHICLES IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPLICABLE REGULATORY DOCUMENTS WILL BE SELECTED FOR USE.
- E. GROSS WEIGHT AND AXLE DISTRIBUTION OF WEIGHT FOR A LOAD WILL BE THE RESPONSIBILITY OF THE CARRIER. THE CARRIER WILL ADVISE THE SHIPPER OF APPLICABLE LOADING REQUIREMENTS, AND THE SHIPPER WILL LOAD ACCORDINGLY. THE TOTAL WEIGHT OF THE LADING, OF THE DUNNAGE, OF THE TRACTOR, AND OF THE SEMITRAILER CARRYING THE LADING MUST NOT EXCEED THE MAXIMUM GROSS WEIGHT ALLOWED FOR THE STATE OR STATES THRU WHICH THE LOAD IS TO BE TRANSPORTED BY MOTOR CARRIER. LIKEWISE, THE GROSS WEIGHT ON A SINGLE OR TANDEM AXLE MUST NOT EXCEED THE MAXIMUM ALLOWABLE WEIGHT. IF THERE IS ANY DOUBT AS TO WHETHER THE TOTAL GROSS WEIGHT OR AXLE WEIGHT EXCEEDS THE MAXIMUM ALLOWED, WEIGHT SHOULD BE VERIFIED BY ACTUALLY WEIGHING THE LOADED VEHICLE.
- F. **NOTICE:** A SHIPMENT WILL BE POSITIONED IN THE TRAILER CONSISTENT WITH STATE WEIGHT LAWS. THE NUMBER OF LADING UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE TRAILER TO BE LOADED OR THE QUANTITY TO BE SHIPPED. COMBINATIONS OF THE OUTLOADING PROCEDURES SPECIFIED MAY BE USED, HOWEVER, THE APPROVED METHODS SHOWN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING, AND STAYING OF THE DESIGNATED ITEMS.
- G. THE "LOAD AS SHOWN" FOR MOST OF THE FULL LOADS DEPICTED HEREIN IS BASED ON AN APPROXIMATE LADING WEIGHT OF 40,000 POUNDS. THE SPECIFIED BLOCKING AND BRACING FOR THE FULL LOADS IS ADEQUATE FOR THE RETENTION OF LOADS, UP TO 47,000 POUNDS, IF IT IS DESIRED TO INCREASE THE LADING WEIGHT.
- H. OTHER TYPES OF LADING ITEMS MAY BE LOADED ON A TRAILER WHICH IS PARTIALLY LOADED WITH THE DESIGNATED ITEM, PROVIDING THE TOTAL LOAD IS COMPATIBLE, EXISTING DIRECTIVES ARE NOT VIOLATED, AND THE OTHER LADING ITEMS ARE BLOCKED AND BRACED TO EQUAL THE BLOCKING AND BRACING CRITERIA SPECIFIED HEREIN.
- J. SOME LOADS ARE SHOWN IN TRAILERS HAVING ROUNDED CORNERS AT THE FORWARD END. IF THE CONVENTIONAL VAN TRAILER BEING USED IS EQUIPPED WITH A SQUARE FRONT OR WITH AN INSTALLED BULKHEAD, OMIT THE FORWARD BLOCKING ASSEMBLY, AND POSITION THE PALLET UNITS DIRECTLY AGAINST THE FORWARD PORTION OF THE TRAILER.
- K. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF ONE SEAL WITH TWO PAIR OF NOTCHES WILL BE USED TO SEAL THE JOINT WHEN A NOTCH-TYPE SEALER IS BEING USED. A MINIMUM OF TWO SEALS, BUTTED TOGETHER WITH TWO PAIR OF CRIMPS PER SEAL WILL BE USED TO SEAL THE JOINT WHEN A CRIMP-TYPE SEALER IS BEING USED. REFER TO THE "END-OVER-END LAP JOINT DETAILS" ON PAGE 3 FOR GUIDANCE.

(CONTINUED AT RIGHT)

## MATERIAL SPECIFICATIONS

- LUMBER** - - - - - : SEE TM 743-200-1 (DUNNAGE LUMBER) AND VOLUNTARY PRODUCT STANDARD PS 20.
- NAILS** - - - - - : ASTM F1667; COMMON STEEL NAIL (NLCMS OR NLQMS).
- STRAPPING, STEEL** - - : ASTM D3953; FLAT STRAPPING, TYPE 1, HEAVY DUTY, FINISH A, B (GRADE 2), OR C.
- SEAL, STRAP** - - - - : ASTM D3953; CLASS H, FINISH A, B (GRADE 2), OR C, DOUBLE NOTCH TYPE, STYLE I, II, OR IV.
- ANTI-CHAFING MATERIAL** - - - - - : MIL-PRF-121 (OR EQUAL); NEUTRAL BARRIER MATERIAL.

- L. A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES. ALSO, A STAGGERED NAILING PATTERN WILL BE USED WHEN DUNNAGE IS NAILED TO THE FLOOR OF THE TRANSPORTING VEHICLE, OR WHEN LAMINATING DUNNAGE. THE NAILING PATTERN WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL DOES NOT PENETRATE INTO OR NEAR A CRACK BETWEEN FLOOR BOARDS. ADDITIONALLY, THE NAILING PATTERN FOR AN UPPER PIECE OF LAMINATED DUNNAGE WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL FOR THAT PIECE WILL NOT BE DRIVEN THROUGH THE PIECE ONTO OR RIGHT BESIDE A NAIL IN A LOWER PIECE.
- M. POWER DRIVEN STAPLES MAY BE USED AS ALTERNATIVE FASTENERS FOR NAILS WHEN CONSTRUCTING DUNNAGE ASSEMBLIES THAT ARE TO BE USED IN THE DELINEATED TRAILER LOADS SHOWN THROUGHOUT THIS DRAWING. THE STAPLES TO BE USED MUST BE EQUAL IN LENGTH TO THE SPECIFIED NAIL SIZE AND MUST BE SUBSTITUTED ON A ONE STAPLE FOR ONE NAIL BASIS. STAPLES WHICH ARE 2-1/2" OR LESS IN LENGTH SHOULD BE IN ACCORDANCE WITH ASTM F1667 AS NEARLY AS PRACTICABLE. STAPLES THAT ARE LONGER THAN 2-1/2" WILL BE A COMMERCIAL GRADE, OF A QUALITY EQUIVALENT TO THOSE MANUFACTURED BY SENCO PRODUCTS INCORPORATED. NOTE: STAPLES WILL NOT BE SUBSTITUTED FOR NAILS IN ANY LOAD RESTRAINING FLOOR DUNNAGE APPLICATION.
- N. THE UNBLOCKED SPACE ACROSS THE WIDTH OF A LOAD BAY IS NOT TO EXCEED 6". EXCESSIVE SLACK CAN BE ELIMINATED FROM A LOAD BY LAMINATING ADDITIONAL PIECES OF APPROPRIATE THICKNESS TO THE ANTI-SWAY BRACES OR SIDE FILL ASSEMBLIES. NAIL EACH ADDITIONAL PIECE TO THE BUFFER PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE THICKNESS AND QUANTITY OF THE LUMBER OR THE LENGTH OF THE STRUTS USED IN THESE ASSEMBLIES MAY BE ADJUSTED AS REQUIRED TO FACILITATE VARIANCE IN THE SIZE OF THE PALLET UNIT.
- O. **CAUTION:** WHEN POWER OR PNEUMATIC NAILERS ARE BEING USED IN THE APPLICATION OF NAILED FLOORLINE BLOCKING OR BRACING, PALLET UNITS BEING LOADED INTO THE CONVEYANCE MUST BE POSITIONED TO ALLOW A CLEAR PATH OF EXIT FOR THE OPERATOR AT ALL TIMES, SHOULD AN EMERGENCY EXIT BECOME NECESSARY.
- P. IF THE SPACE AT THE REAR OF THE LOAD, BETWEEN THE PALLET UNITS AND THE REAR DOOR MEASURES 1-1/2" OR LESS REAR BLOCKING IS NOT REQUIRED. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 1-1/2" BUT LESS THAN 9", USE THE "REAR BLOCKING ASSEMBLY A" AS DEPICTED ON PAGE 23. IF THE VOID AT THE REAR OF THE LOAD IS 9" OR GREATER, USE THE "REAR BLOCKING ASSEMBLY B", AS SHOWN ON PAGE 23. **NOTE:** REAR BLOCKING ASSEMBLIES MAY BE REPLACED WITH A COMBINATION OF "REAR BLOCKING ASSEMBLY B", AS SHOWN ON PAGE 23 AND NAILED HEADERS AT THE REAR OF THE LOAD, PROVIDED THE TRAILER IS CONFIGURED SUCH AS TO ALLOW NAILING IN THE AREA IN QUESTION. REFER TO THE LOAD ON PAGE 6 AND THE HEADER NAILING CHARTS ON PAGE 7 FOR GUIDANCE. **CAUTION:** THE NAILED HEADER METHOD IS REQUIRED WHEN LOADING VAN TRAILERS EQUIPPED WITH ROLL-UP TYPE DOORS.
- Q. PORTIONS OF THE TRAILERS, SUCH AS SIDEWALLS, ENDWALLS, AND ROOFS, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.
- R. THE PALLET UNITS THAT DO NOT CONTAIN A FULL QUANTITY OF ITEMS CAN BE TRANSPORTED. SEE THE "SHIPMENT OF A PARTIAL PALLET UNIT" DETAILS ON PAGE 18.
- S. THESE PROCEDURES CAN ALSO BE UTILIZED FOR THE SHIPMENT OF PALLET UNITS OF PA179 CONTAINERS WHEN THEY ARE LOADED WITH AN ITEM OTHER THAN THE SPECIFIED PROJECTILE, OR WHEN THEY ARE EMPTY.
- T. DUNNAGE LUMBER SPECIFIED IS OF NOMINAL SIZE. FOR EXAMPLE, 1" X 4" MATERIAL IS ACTUALLY 3/4" THICK BY 3-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE.
- U. 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.
- V. ANTI-CHAFING MATERIAL MAY BE INSTALLED AT POINTS OF CONTACT BETWEEN PALLET UNITS AND THE VAN TRAILER OR INDIVIDUAL PALLET UNITS, IF DESIRED, TO PREVENT CHAFING DAMAGE TO CONTAINERS ON THE PALLET UNITS.



**PALLET UNIT**

GROSS WEIGHT - - - - - 1,649 LBS  
 CUBE - - - - - 31.7 CU FT



ONE SEAL WITH  
 TWO PAIR OF  
 NOTCHES.

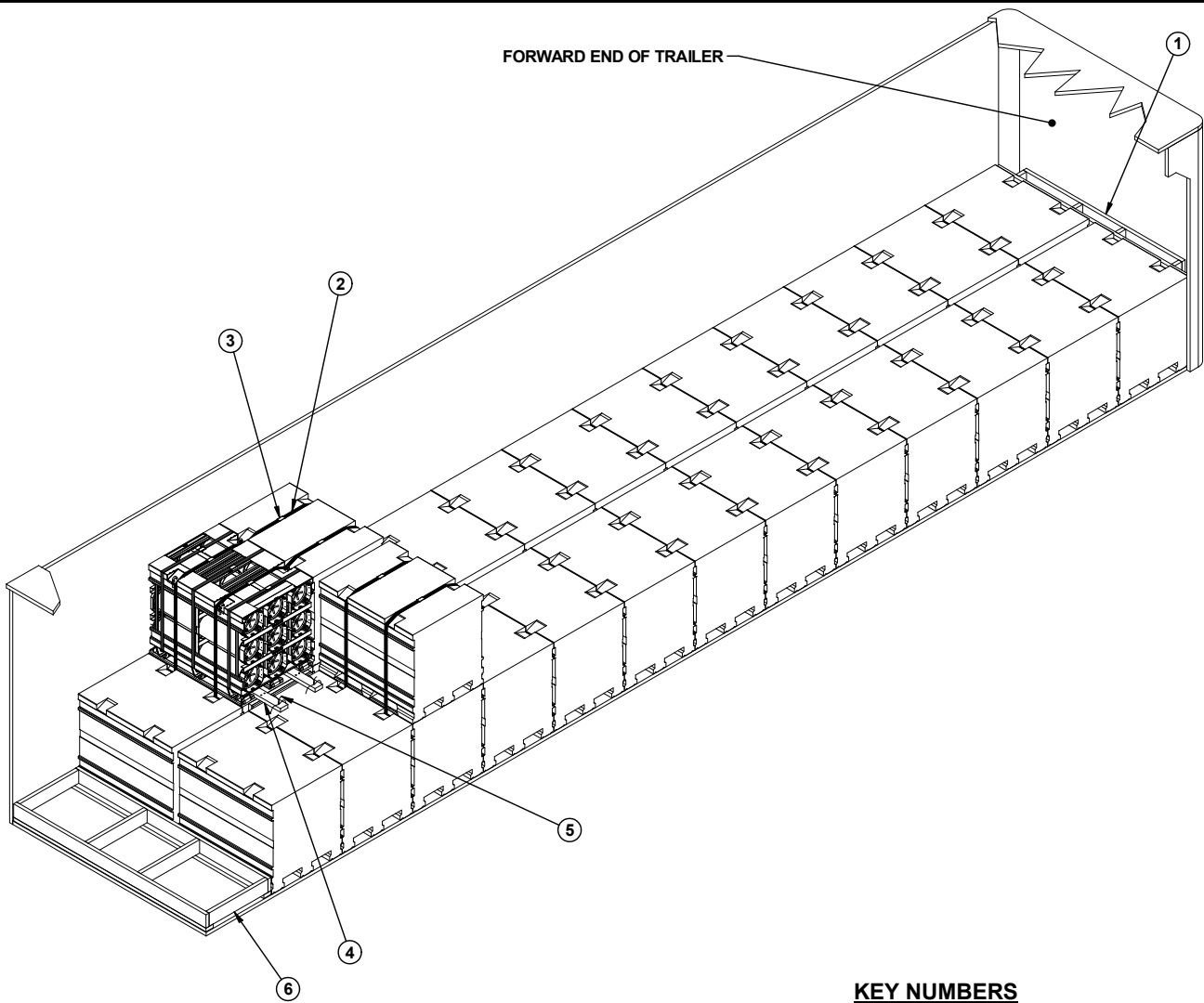
**STRAP JOINT A**  
 METHOD OF SECURING A  
 STRAP JOINT WHEN USING  
 A NOTCH-TYPE SEALER.



TWO SEALS, BUTTED  
 TOGETHER, WITH  
 TWO PAIR OF CRIMPS  
 EACH SEAL.

**STRAP JOINT B**  
 METHOD OF SECURING A  
 STRAP JOINT WHEN USING  
 A CRIMP-TYPE SEALER.

**END-OVER-END LAP JOINT DETAILS**



**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① FORWARD BLOCKING ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 19 AND SPECIAL NOTE 1 ON PAGE 5.
- ② UNITIZING STRAP, 1-1/4" X .035" OR .031" OR .029" X 18'-9" LONG STEEL STRAPPING (6 REQD). INSTALL PRIOR TO LOADING SO AS TO ENIRCLE THE UPPER AND LOWER PALLET UNITS IN STACKS ADJACENT TO ONE-HIGH STACKS OR TO THE DOOR. SEE SPECIAL NOTE 4 ON PAGE 5.
- ③ SEAL FOR 1-1/4" STRAPPING (2 OR 4 REQD). NOTCH SINGLE SEALS WITH TWO PAIR OF NOTCHES OR CRIMP DOUBLE SEALS WITH TWO PAIR OF CRIMPS EACH.
- ④ TOP-OF-LOAD ANTI-SWAY BRACE A (1 REQD). SEE THE DETAIL ON PAGE 19.
- ⑤ TIE WIRE, .0800" DIA 24" LONG (2 REQD). INSTALL THE WIRE TO FORM A COMPLETE LOOP AROUND THE TOP-OF-LOAD ANTI-SWAY BRACE AND THE TIEDOWN STRAP ON THE ADJACENT PALLET UNIT.
- ⑥ REAR BLOCKING ASSEMBLY B (1 REQD). SEE THE DETAIL ON PAGE 23 AND SPECIAL NOTE 3 ON PAGE 5.

**BILL OF MATERIAL**

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	3	1
2" X 4"	40	27
2" X 6"	53	53
NAILS	NO. REQD	POUNDS
6d (2")	3	0.02
10d (3")	106	1.63
STEEL STRAPPING, 1-1/4" - 105' REQD		15 LBS
SEAL FOR 1-1/4" STRAPPING - 6 REQD		NIL
WIRE, .0800" DIAMETER - 4' REQD		NIL

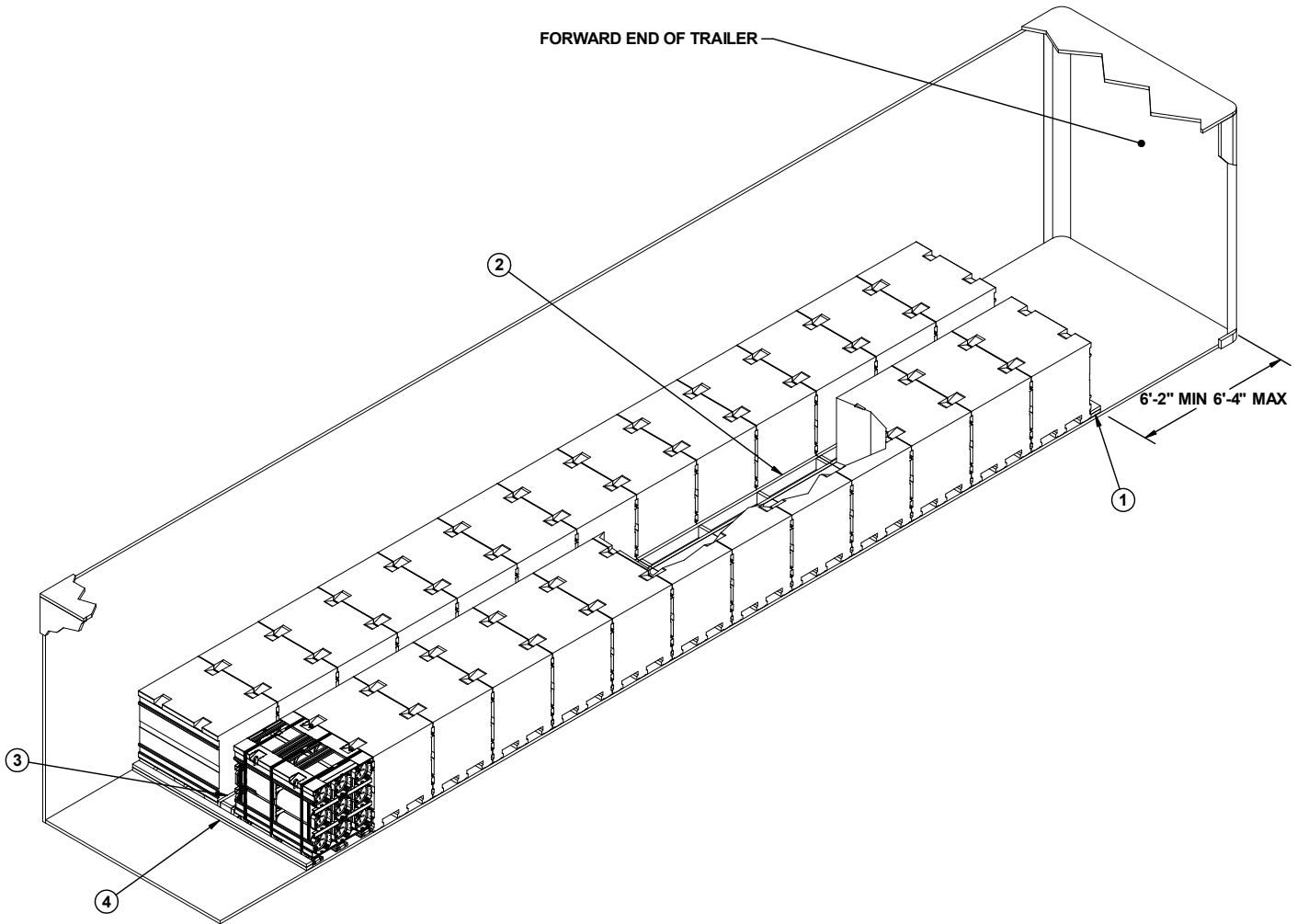
**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	29	47,821 LBS
DUNNAGE		179 LBS
<b>TOTAL WEIGHT</b>		<b>48,000 LBS (APPROX)</b>

**SPECIAL NOTES:**

1. A 40'-0" LONG BY 7'-8" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER WITH ROUNDED CORNERS IS SHOWN. TRAILERS OF OTHER DIMENSIONS CAN BE USED. IF A TRAILER WITH SQUARE FRONT CORNERS IS TO BE LOADED, THE FORWARD BLOCKING ASSEMBLY MAY BE OMITTED.
2. ANTI-SWAY BRACES ARE REQUIRED WHEN THE SPACE BETWEEN LATERALLY ADJACENT UNITS IS GREATER THAN 6", AS MEASURED FROM PALLET ADAPTER TO PALLET ADAPTER.
3. IF THE SPACE AT THE REAR OF THE LOAD IS 1-1/2" OR LESS, REAR BLOCKING IS NOT REQUIRED. IF THE VOID AT THE REAR OF THE LOAD IS 9" OR GREATER AS SHOWN IN THE LOAD ON PAGE 4, USE THE "REAR BLOCKING ASSEMBLY B", AS SHOWN. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 1-1/2" BUT LESS THE 9", USE THE "REAR BLOCKING ASSEMBLY A" AS DEPICTED ON PAGE 22. REAR BLOCKING ASSEMBLIES MAY BE REPLACED WITH NAILED HEADERS AT THE REAR OF THE LOAD, PROVIDED THE TRAILER IS CONFIGURED SUCH AS TO ALLOW NAILING IN THE AREA IN QUESTION. REFER TO THE LOAD ON PAGE 6 AND THE HEADER NAILING CHARTS ON PAGE 7 FOR GUIDANCE. IF THE TRAILER IS EQUIPPED WITH A METAL THRESHOLD PLATE AND IT INTERFERES WITH THE NAILING OF THE REAR HEADER, ONE OF THE REAR BLOCKING ASSEMBLIES DESCRIBED ABOVE MUST BE INSTALLED.
4. UNITIZING STRAPS MUST BE APPLIED AROUND THE TWO-HIGH STACKS THAT ARE IMMEDIATELY ADJACENT EITHER LATERALLY OR LONGITUDINALLY TO THE ONE-HIGH UNITS. THE UNITIZING STRAPS MUST BE INSTALLED PRIOR TO FINAL POSITIONING OF THE STACK. IF A STACK AT THE REAR OF THE LOAD IS MORE THAN ONE UNIT HIGH, UNITIZING STRAPS MUST BE INSTALLED AROUND EACH OF THE REARMOST STACKS IN EACH APPLICABLE ROW. THE TOP-OF-LOAD ANTI-SWAY BRACE IS ONLY REQUIRED FOR THE BRACING OF AN ODD UNIT IN THE SECOND LAYER. IF ANOTHER PALLET UNIT IS POSITIONED OPPOSITE THE ODD UNIT, OMIT THE TOP-OF-LOAD ANTI-SWAY BRACE.
5. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED, OR TO SUIT THE WEIGHT OF THE UNIT BEING LOADED. A 1-TIER LOAD CAN BE REDUCED BY OMITTING ONE OR MORE FULL LOAD UNITS FROM THE LOAD; OR, ONE OR MORE UNITS CAN BE OMITTED FROM THE TOP TIER.
6. REFER TO PAGE 18 FOR GUIDANCE IN THE SHIPMENT OF PARTIAL PALLET UNITS.

FORWARD END OF TRAILER



**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① FORWARD HEADER, 2" X 6" BY TRAILER WIDTH MINUS 1/2" (DOUBLED) (1 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/9-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/9-20d NAILS. SEE THE HEADER NAILING CHARTS ON PAGE 7.
- ② ANTI-SWAY BRACE FOR THREE PALLET UNITS (4 REQD). SEE THE "ANTI-SWAY BRACE OR SIDE FILL ASSEMBLY" DETAIL ON PAGE 21.
- ③ ANTI-SWAY BRACE FOR ONE PALLET UNIT (1 REQD). SEE THE "ANTI-SWAY BRACE OR SIDE FILL ASSEMBLY" DETAIL ON PAGE 21.
- ④ REAR HEADER, 2" X 4" BY TRAILER WIDTH MINUS 1/2" (DOUBLED) (1 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/18-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/18-10d NAILS. SEE THE HEADER NAILING CHARTS AND SPECIAL NOTE 3 ON PAGE 7.

**BILL OF MATERIAL**

LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	17	11
2" X 6"	98	98
NAILS	NO. REQD	POUNDS
10d (3")	153	2.35
20d (4")	9	0.32

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT - - - - -	26 - - - - -	42,874 LBS
DUNNAGE - - - - -	- - - - -	221 LBS
<b>TOTAL WEIGHT - - - - -</b>		<b>43,095 LBS (APPROX)</b>

FORWARD HEADER NAILING CHART*	
# NAILS	MAX. LOAD WEIGHT (LBS)
3	15,000
4	20,000
5	25,000
6	30,000
7	35,000
8	40,000
9	45,000

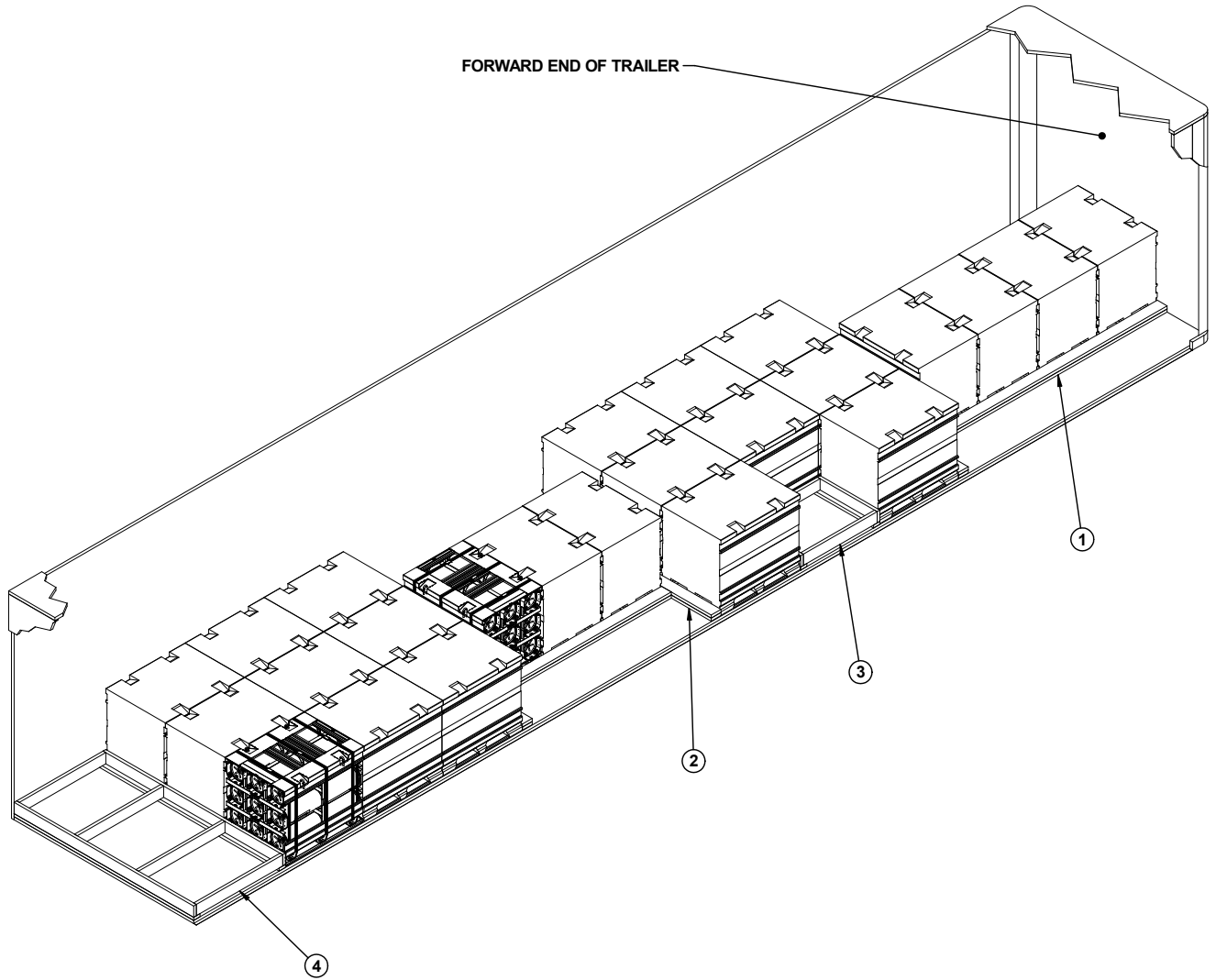
\* HEADERS AT THE FRONT END OF A LOAD OR AT THE FRONT END OF A DIVIDED LOAD WILL BE DOUBLED 2" X 6" MATERIAL. THE NUMBER OF NAILS INDICATED ABOVE REFERS TO THE NUMBER OF NAILS USED IN EACH LAMINATION OF A HEADER, FOR EXAMPLE 8 NAILS MEANS THE FIRST BOARD IS NAILED TO THE TRAILER FLOOR W/8-10d NAILS, AND THE SECOND BOARD IS LAMINATED TO THE FIRST W/8-20d NAILS, FOR A TOTAL OF 8-10d AND 8-20d NAILS PER HEADER. A MINIMUM OF 6 PAIRS OF NAILS WILL BE USED FOR TRAILER WIDTH HEADERS.

REAR HEADER NAILING CHART^	
# NAILS	MAX. LOAD WEIGHT (LBS)
6	15,000
7	17,500
8	20,000
9	22,500
10	25,000
11	27,500
12	30,000
13	32,500
14	35,000
15	37,500
16	40,000
17	42,500
18	45,000

^HEADERS AT THE REAR OF A FULL LOAD OR AT THE REAR END OF A DIVIDED LOAD WILL BE DOUBLED 2" X 4" MATERIAL. THE NUMBER OF NAILS INDICATED ABOVE REFERS TO THE NUMBER OF NAILS USED IN EACH LAMINATION OF A HEADER, FOR EXAMPLE 8 NAILS MEANS THE FIRST BOARD IS NAILED TO THE TRAILER FLOOR W/8-10d NAILS, AND THE SECOND BOARD IS LAMINATED TO THE FIRST W/8-10d NAILS, FOR A TOTAL OF 16-10d NAILS. A MINIMUM OF 6 PAIRS OF NAILS WILL BE USED FOR TRAILER WIDTH HEADERS. NOTE: REAR HEADERS MAY BE HANDLED IN THE SAME MANNER AS FORWARD HEADERS, USING 2" X 6" MATERIAL WITH 10d AND 20d NAILS, IF DESIRED.

**SPECIAL NOTES:**

1. A 48'-0" LONG BY 8'-2" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER IS SHOWN. TRAILERS OF OTHER DIMENSIONS CAN BE USED.
2. ANTI-SWAY BRACES MAY BE OMITTED WHEN THE SPACE BETWEEN LATERALLY ADJACENT UNITS IS 6" OR LESS, AS MEASURED FROM PALLET ADAPTER TO PALLET ADAPTER.
3. IF THE SPACE AT THE REAR OF THE LOAD, BETWEEN THE PALLET UNITS AND THE REAR DOOR MEASURES 1-1/2" OR LESS, REAR BLOCKING IS NOT REQUIRED. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 1-1/2" BUT LESS THAN 9", USE THE "REAR BLOCKING ASSEMBLY A" AS DETAILED ON PAGE 22 OR A NAILED HEADER, AS SHOWN. IF THE SPACE AT THE REAR OF THE LOAD IS 9" OR GREATER, USE THE "REAR BLOCKING ASSEMBLY B" AS DETAILED ON PAGE 23 OR A NAILED HEADER, AS SHOWN. IF THE TRAILER IS EQUIPPED WITH A METAL THRESHOLD PLATE AND IT INTERFERES WITH THE NAILING OF THE REAR HEADER, ONE OF THE REAR BLOCKING ASSEMBLIES DESCRIBED ABOVE MUST BE INSTALLED.
4. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED, OR TO SUIT THE WEIGHT OF THE UNIT BEING LOADED.
5. REFER TO PAGE 18 FOR GUIDANCE IN THE SHIPMENT OF PARTIAL PALLET UNITS.



**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① SIDE BLOCKING, 2" X 6" BY LADING LENGTH (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/1-10d NAIL EVERY 24". LAMINATE THE SECOND PIECE TO THE FIRST W/1-10d NAIL EVERY 24". INSTALLATION MAY BE CONSTRUCTED FROM RANDOM LENGTHS OF PIECES.
- ② INTERMEDIATE HEADER, 2" X 6" BY TRAILER WIDTH MINUS 1/2" (DOUBLED) (3 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/6-10d NAILS. LAMINATE THE SECOND PIECE TO THE FIRST W/6-20d NAILS. SEE THE HEADER NAILING CHARTS ON PAGE 7.
- ③ SPACER ASSEMBLY A (1 REQD). SEE THE DETAIL ON PAGE 20.
- ④ REAR BLOCKING ASSEMBLY B (1 REQD). SEE THE DETAIL ON PAGE 23 AND SPECIAL NOTE 2 ON PAGE 9.

**BILL OF MATERIAL**

LUMBER	LINEAR FEET	BOARD FEET
2" x 4"	23	15
2" x 6"	174	174
NAILS	NO. REQD	POUNDS
10d (3")	154	2.37

**LOAD AS SHOWN**

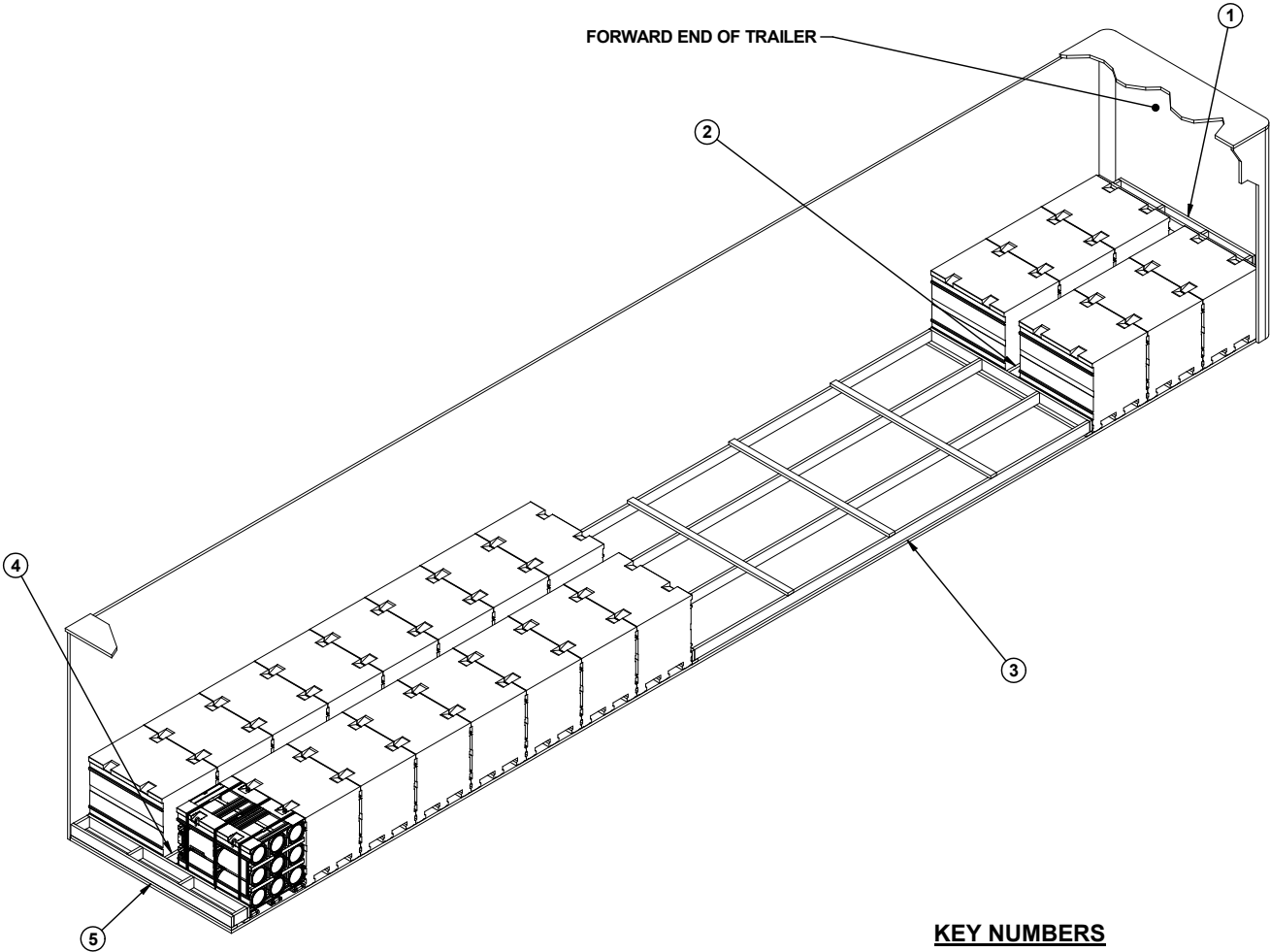
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	24	39,576 LBS
DUNNAGE		366 LBS
<b>TOTAL WEIGHT</b>		<b>39,942 LBS (APPROX)</b>



**SPECIAL NOTES:**

1. A 48'-0" LONG BY 8'-5" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER IS SHOWN. TRAILERS OF OTHER DIMENSIONS CAN BE USED.
2. IF THE SPACE AT THE REAR OF THE LOAD IS 1-1/2" OR LESS, REAR BLOCKING IS NOT REQUIRED. IF THE VOID AT THE REAR OF THE LOAD IS 9" OR GREATER AS SHOWN IN THE LOAD ON PAGE 4, USE THE "REAR BLOCKING ASSEMBLY B", AS SHOWN. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 1-1/2" BUT LESS THE 9", USE THE "REAR BLOCKING ASSEMBLY A" AS DEPICTED ON PAGE 22. REAR BLOCKING ASSEMBLIES MAY BE REPLACED WITH NAILED HEADERS AT THE REAR OF THE LOAD, PROVIDED THE TRAILER IS CONFIGURED SUCH AS TO ALLOW NAILING IN THE AREA IN QUESTION. REFER TO THE LOAD ON PAGE 6 AND THE HEADER NAILING CHARTS ON PAGE 7 FOR GUIDANCE. IF THE TRAILER IS EQUIPPED WITH A METAL THRESHOLD PLATE AND IT INTERFERES WITH THE NAILING OF THE REAR HEADER, ONE OF THE REAR BLOCKING ASSEMBLIES DESCRIBED ABOVE MUST BE INSTALLED.
3. IF DESIRED, SIDE FILL ASSEMBLIES SHOWN IN THE "ANTI-SWAY BRACE OR SIDE FILL ASSEMBLY" DETAIL ON PAGE 21, MAY BE USED IN LIEU OF THE SIDE BLOCKING. SEE THE LOAD ON PAGE 12 FOR DETAILS.
4. THE SPLIT IN THE LOAD CONFIGURATION ON PAGE 8 IS SHOWN AS TYPICAL ONLY. PALLETS MAY BE SHIFTED FORE OR AFT, THE QUANTITY IN EACH LOAD BAY MAY BE ADJUSTED, OR ALL THE PALLETS MAY BE GROUPED TOGETHER IN ONE LOAD BAY AS NEEDED TO SUIT THE QUANTITY TO BE SHIPPED, OR TO SUIT THE WEIGHT OF THE UNIT BEING LOADED.
5. REFER TO PAGE 18 FOR GUIDANCE IN THE SHIPMENT OF PARTIAL PALLET UNITS.

FORWARD END OF TRAILER



**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① FORWARD BLOCKING ASSEMBLY (1 REQD). SEE DETAIL ON PAGE 19 AND SPECIAL NOTE 1 ON PAGE 11.
- ② ANTI-SWAY ASSEMBLY FOR 3 PALLET UNITS (3 REQD). SEE "ANTI-SWAY BRACE OR SIDE FILL ASSEMBLY" DETAIL ON PAGE 21.
- ③ CENTER SPACER ASSEMBLY A (1 REQD). SEE DETAIL ON PAGE 21.
- ④ ANTI-SWAY ASSEMBLY FOR 2 PALLET UNITS (1 REQD). SEE "ANTI-SWAY BRACE OR SIDE FILL ASSEMBLY" DETAIL ON PAGE 21.
- ⑤ REAR BLOCKING ASSEMBLY B (1 REQD). SEE DETAIL ON PAGE 23 AND SPECIAL NOTE 3 ON PAGE 11.

**BILL OF MATERIAL**

LUMBER	LINEAR FEET	BOARD FEET
2" x 4"	69	46
2" x 6"	215	215
NAILS	NO. REQD	POUNDS
10d (3")	262	4.03

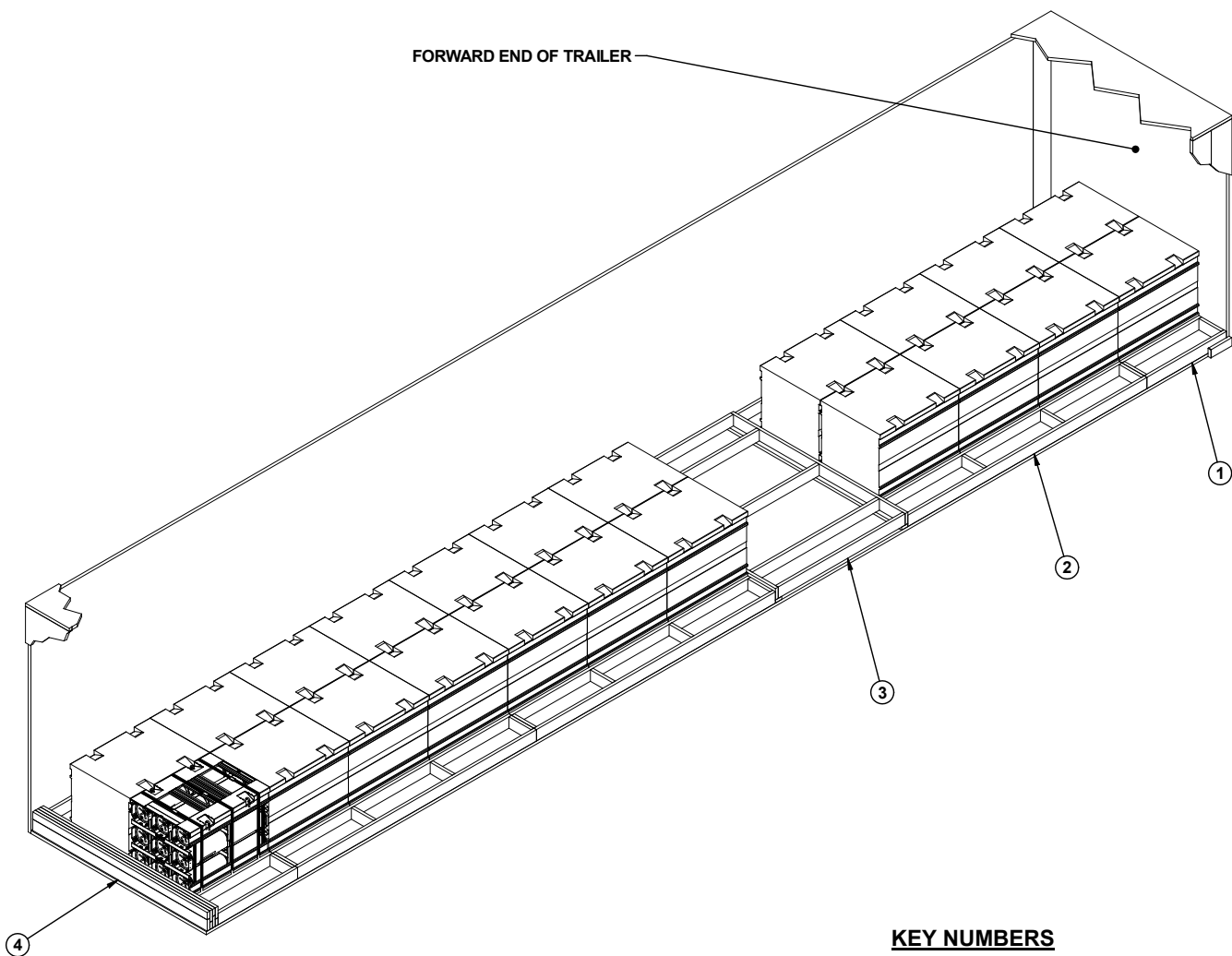
**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	22	36,278 LBS
DUNNAGE		527 LBS
<b>TOTAL WEIGHT</b>		<b>36,805 LBS (APPROX)</b>

**SPECIAL NOTES:**

1. A 53'-0" LONG BY 8'-2" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER WITH ROUNDED CORNERS IS SHOWN. TRAILERS OF OTHER DIMENSIONS CAN BE USED. IF A TRAILER WITH SQUARE FRONT CORNERS IS TO BE LOADED, THE FORWARD BLOCKING ASSEMBLY MAY BE OMITTED.
2. ANTI-SWAY BRACES MAY BE OMITTED WHEN THE SPACE BETWEEN LATERALLY ADJACENT UNITS IS 6" OR LESS, AS MEASURED FROM PALLET ADAPTER TO PALLET ADAPTER.
3. IF THE SPACE AT THE REAR OF THE LOAD, BETWEEN THE PALLET UNITS AND THE REAR DOOR MEASURES 1-1/2" OR LESS REAR BLOCKING IS NOT REQUIRED. IF THE VOID AT THE REAR OF THE LOAD IS 9" OR GREATER, USE THE "REAR BLOCKING ASSEMBLY B", AS SHOWN. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 1-1/2" BUT LESS THE 9", USE THE "REAR BLOCKING ASSEMBLY A" AS DEPICTED ON PAGE 22. REAR BLOCKING ASSEMBLIES MAY BE REPLACED WITH NAILED HEADERS AT THE REAR OF THE LOAD, PROVIDED THE TRAILER IS CONFIGURED SUCH AS TO ALLOW NAILING IN THE AREA IN QUESTION. REFER TO THE LOAD ON PAGE 6 AND THE HEADER NAILING CHARTS ON PAGE 7 FOR GUIDANCE. IF THE TRAILER IS EQUIPPED WITH A METAL THRESHOLD PLATE AND IT INTERFERES WITH THE NAILING THE HEADER, ONE OF THE REAR BLOCKING ASSEMBLIES DESCRIBED ABOVE MUST BE INSTALLED.
4. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED, OR TO SUIT THE WEIGHT OF THE UNIT BEING LOADED.
5. REFER TO PAGE 18 FOR GUIDANCE IN THE SHIPMENT OF PARTIAL PALLET UNITS.

FORWARD END OF TRAILER



**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① SIDE BLOCKING ASSEMBLY FOR 1 PALLET UNIT (4 REQD). SEE "ANTI-SWAY BRACE AND SIDE BLOCKING ASSEMBLY" DETAIL ON PAGE 21 AND SPECIAL NOTE 3 ON PAGE 13.
- ② SIDE BLOCKING ASSEMBLY FOR 3 PALLET UNITS (6 REQD). SEE "ANTI-SWAY BRACE AND SIDE BLOCKING ASSEMBLY" DETAIL ON PAGE 21 AND SPECIAL NOTE 3 ON PAGE 13.
- ③ CENTER SPACER ASSEMBLY B (1 REQD). SEE THE DETAIL ON PAGE 22 AND SPECIAL NOTE 5 ON PAGE 13.
- ④ REAR BLOCKING ASSEMBLY A (1 REQD). SEE THE DETAIL ON PAGE 22 AND SPECIAL NOTE 2 ON PAGE 13.

**BILL OF MATERIAL**

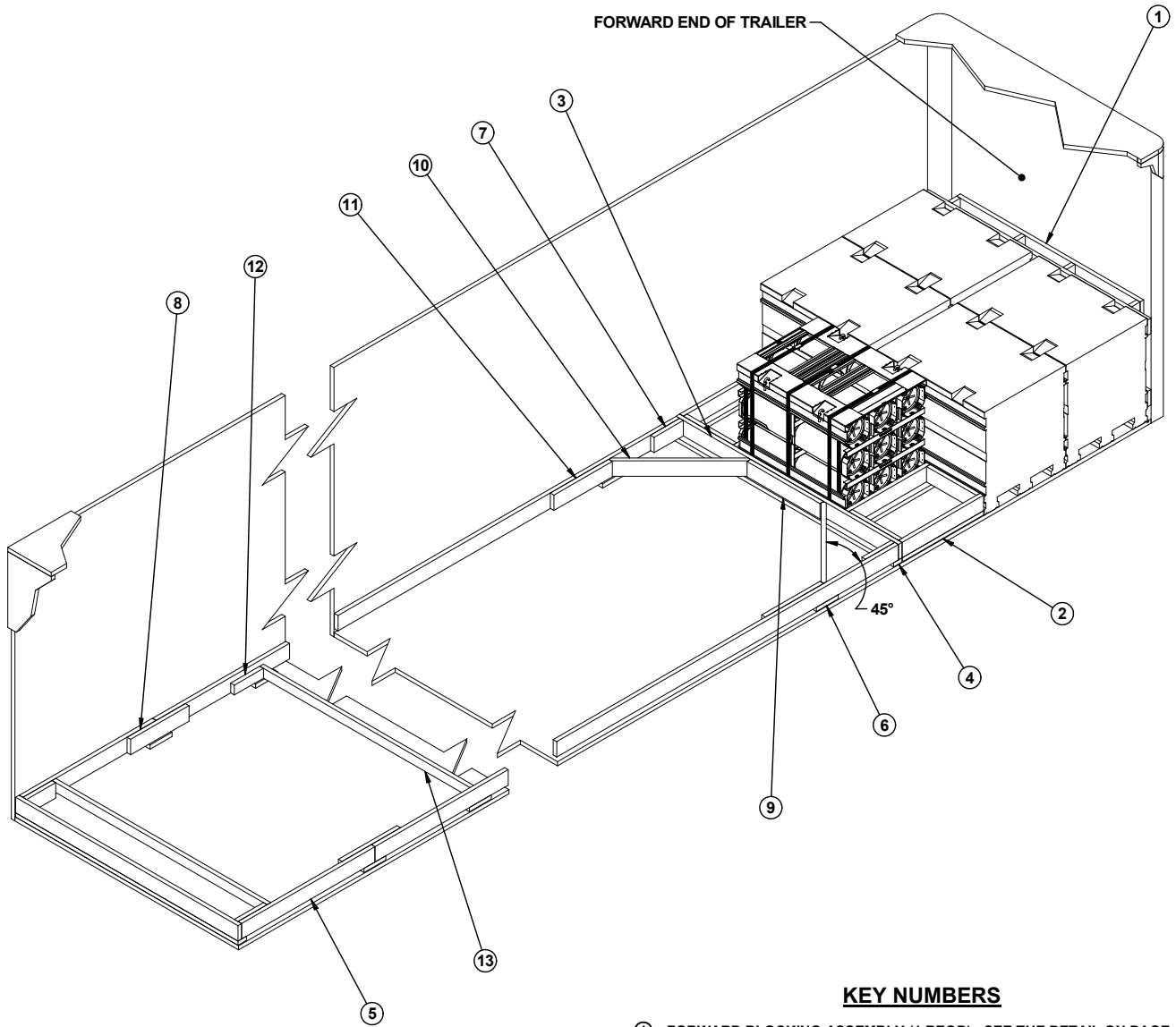
LUMBER	LINEAR FEET	BOARD FEET
2" x 4"	33	22
2" x 6"	276	276
NAILS	NO. REQD	POUNDS
10d (3")	286	4.40

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	22	36,278 LBS
DUNNAGE		579 LBS
<b>TOTAL WEIGHT</b>		<b>36,857 LBS (APPROX)</b>

SPECIAL NOTES:

1. A 48'-0" LONG BY 8'-2" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER WITH SQUARE FRONT CORNERS IS SHOWN. TRAILERS OF OTHER DIMENSIONS CAN BE USED. IF A TRAILER WITH ROUNDED CORNERS IS TO BE LOADED, THE FORWARD BLOCKING ASSEMBLY SHOWN ON PAGE 19 MUST BE USED.
2. IF THE SPACE AT THE REAR OF THE LOAD, BETWEEN THE PALLET UNITS AND THE REAR DOOR IS 1-1/2" OR LESS, REAR BLOCKING IS NOT REQUIRED. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 1-1/2" BUT LESS THAN 9", USE THE "REAR BLOCKING ASSEMBLY A" AS SHOWN. IF THE SPACE AT THE REAR OF THE LOAD IS 9" OR GREATER, USE THE "REAR BLOCKING ASSEMBLY B" AS DETAILED ON PAGE 23. REAR BLOCKING ASSEMBLIES MAY BE REPLACED WITH NAILED HEADERS AT THE REAR OF THE LOAD, PROVIDED THE TRAILER IS CONFIGURED SUCH AS TO ALLOW NAILING IN THE AREA IN QUESTION. REFER TO THE LOAD ON PAGE 6 AND THE HEADER NAILING CHARTS ON PAGE 7 FOR GUIDANCE. IF THE TRAILER IS EQUIPPED WITH A METAL THRESHOLD PLATE AND IT INTERFERES WITH THE NAILING THE HEADER, ONE OF THE REAR BLOCKING ASSEMBLIES DESCRIBED ABOVE MUST BE INSTALLED.
3. IF DESIRED, NAILED SIDE BLOCKING MAY BE USED IN LIEU OF THE SIDE FILL ASSEMBLIES SHOWN IN THE LOAD ON PAGE 12. SEE THE LOAD ON PAGE 8 FOR GUIDANCE ON SIDE BLOCKING.
4. THE LOADING PROCEDURES SHOWN ON PAGE 12 ARE LIMITED TO 1-LAYER LOADS; PALLET UNITS WILL NOT BE STACKED.
5. THE SPLIT IN THE LOAD CONFIGURATION ON PAGE 11 IS SHOWN AS TYPICAL ONLY. PALLETS MAY BE SHIFTED FORE OR AFT, THE QUANTITY IN EACH LOAD BAY MAY BE ADJUSTED, OR ALL THE PALLETS MAY BE GROUPED TOGETHER IN ONE LOAD BAY AS NEEDED TO SUIT THE QUANTITY TO BE SHIPPED, OR TO SUIT THE WEIGHT OF THE UNIT BEING LOADED.
6. REFER TO PAGE 18 FOR GUIDANCE IN THE SHIPMENT OF PARTIAL PALLET UNITS.



**ISOMETRIC VIEW**

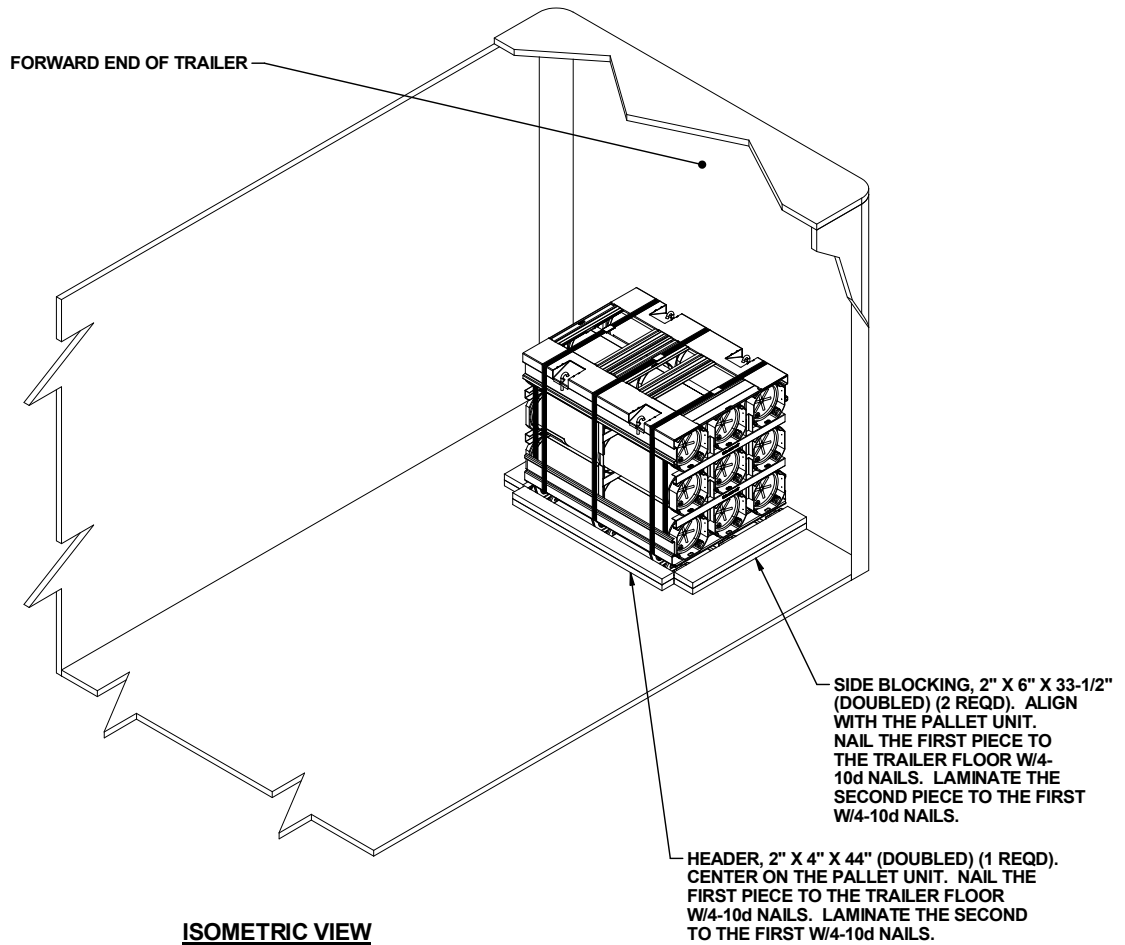
**KEY NUMBERS**

- ① FORWARD BLOCKING ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 19.
- ② SPACER ASSEMBLY A (2 REQD). SEE DETAIL ON PAGE 21.
- ③ HEADER, 2" X 6" BY TRAILER WIDTH MINUS 1/2" IN LENGTH (2 REQD).
- ④ HEADER AND SIDE STRUT SUPPORT, 2" X 4" BY TRAILER WIDTH MINUS 1/2" IN LENGTH (2 REQD). NAIL TO THE BOTTOM EDGE OF A HEADER W/1-10d NAIL EVERY 8".
- ⑤ SIDE STRUT, 2" X 6" BY CUT-TO-FIT BETWEEN THE FORWARD AND REAR HEADERS (2 REQD).
- ⑥ RISER PIECE, 2" X 4" X 9" (AS REQD). CENTER UNDER THE JOINTS OF THE DIAGONAL BRACE AND BACK-UP CLEAT, AND UNDER THE JOINTS OF THE STRUT BRACE RETAINING CLEAT AND STRUT BRACE, AND UNDER THE SPLICE OF SIDE STRUT IF APPLICABLE. NAIL TO SIDE STRUT W/2-10d NAILS.
- ⑦ POCKET CLEAT, 2" X 6" X 12" (4 REQD). NAIL TO A SIDE STRUT W/3-10d NAILS. TOENAIL TO THE ADJACENT HEADER W/3-12d NAILS.
- ⑧ SPLICE PIECE, 2" X 6" X 24" (AS REQD). CENTER ON JOINT OF PIECE AND NAIL TO SIDE STRUT W/4-10d NAILS AT EACH END.
- ⑨ CENTER CLEAT, 2" X 6" X 30" (1 REQD). NAIL TO A HEADER W/6-10d NAILS.
- ⑩ DIAGONAL BRACE, 2" X 6" BY CUT-TO-FIT (2 REQD). DOUBLE BEVEL EACH END WITH 45° CUTS. INSTALL AT A 45° ANGLE AS SHOWN AND TOENAIL TO THE ADJACENT HEADER AND SIDE STRUT W/2-16d NAILS AT EACH END.
- ⑪ BACK-UP CLEAT, 2" X 6" X 24" (2 REQD). NAIL TO A SIDE STRUT W/8-10d NAILS.
- ⑫ STRUT BRACE RETAINING CLEAT, 2" X 4" X 12" (AS REQD). NAIL TO A SIDE STRUT W/3-10d NAILS.
- ⑬ STRUT BRACE, 2" X 4" BY TRAILER WIDTH MINUS 3" IN LENGTH (MINIMUM OF ONE REQUIRED). NAIL TO THE POCKET CLEATS AND/OR TO THE STRUT BRACE RETAINING CLEATS, W/2-12d NAILS AT EACH END.

**TYPICAL LTL (5-UNIT)**

**SPECIAL NOTES:**

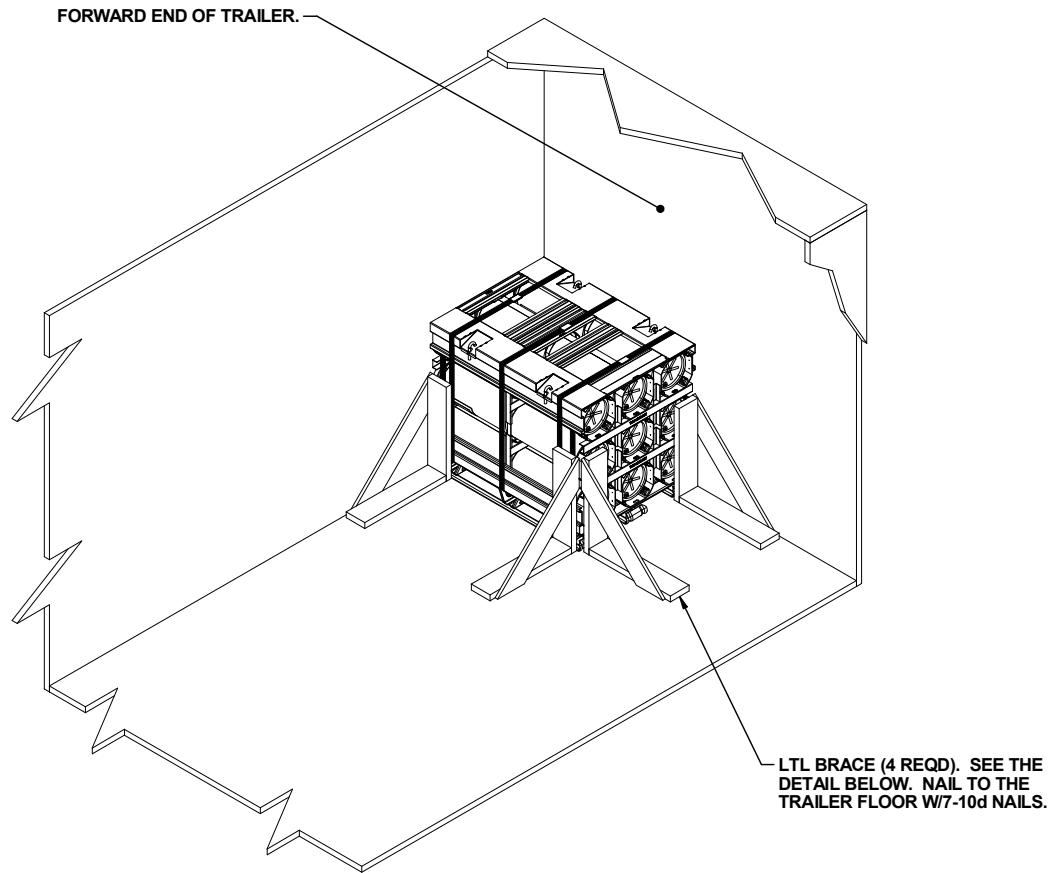
1. A FIVE UNIT LTL IS SHOWN IN A 7'-8" WIDE VAN TRAILER. OTHER WIDTH TRAILERS MAY BE USED.
2. DEPENDING ON THE NUMBER OF UNITS BEING LOADED, EACH OF THE SIDE STRUTS MAY NEED TO BE FORMED FROM MORE THAN ONE PIECE OF MATERIAL. IF SUCH IS THE CASE, THE SIDE STRUTS MUST BE SPLICED. SPLICING CAN BE ACCOMPLISHED BY CENTERING A 2" X 6" X 24" PIECE ON THE JOINT OF THE SIDE STRUTS AND NAILING IT TO THE SIDE STRUTS W/4-10d NAILS AT EACH END. CAUTION: A RISER PIECE MUST BE POSITIONED UNDER EACH SPLICE JOINT. IF DESIRED, THE STRUT BRACE PIECE(S) MAY BE NAILED TO THE SPLICE PIECES IN LIEU OF USING ADDITIONAL STRUT BRACE RETAINING CLEATS.
3. ALL LOADS CONFIGURED IN ACCORDANCE WITH THE DETAILS ON PAGE 14, REGARDLESS OF THEIR SIZE, REQUIRE ONE STRUT BRACE POSITIONED AT THE REAR OF THE TRAILER AND NAILED TO POCKET CLEAT. IF THE SIDE STRUTS ARE LONGER THAN 7'-0", AN ADDITIONAL STRUT BRACE, AND TWO STRUT BRACE RETAINING CLEATS, AND TWO RISER PIECES MUST BE APPLIED FOR EVERY 7'-0" OF SIDE STRUT LENGTH.
4. THE "K" BRACE BLOCKING IS ADEQUATE FOR RETAINING A MAXIMUM LTL OF 20,000 POUNDS.
5. TRAILERS EQUIPPED WITH ROLL-UP TYPE DOORS MAY BE USED; HOWEVER, THE NAILED-HEADER METHOD OF REAR BLOCKING MUST BE INSTALLED IN LIEU OF THE "K" BRACE TYPE BLOCKING. REFER TO PAGE 6 AND THE HEADER NAILING CHARTS ON PAGE 7 FOR GUIDANCE. NOTE THAT THE NAILED-HEADER METHOD OF REAR BLOCKING MAY ALSO BE USED IN TRAILERS EQUIPPED WITH HINGED DOORS AND NAILABLE FLOORS.
6. REFER TO PAGE 18 FOR GUIDANCE IN THE SHIPMENT OF PARTIAL PALLET UNITS.



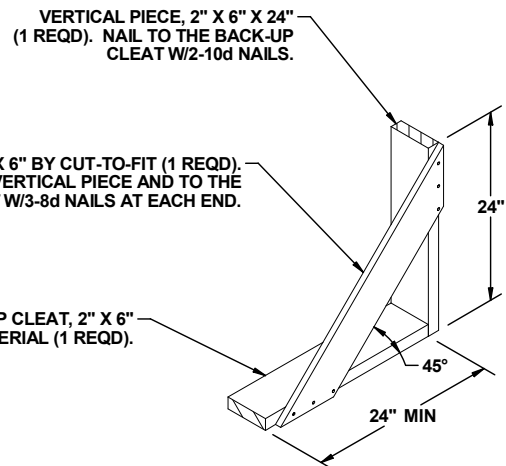
**SPECIAL NOTES:**

1. A ONE UNIT LTL IS SHOWN IN A 40'-0" LONG BY 7'-8" WIDE VAN TRAILER. OTHER LENGTH AND WIDTH TRAILERS MAY BE USED.
2. THE POSITIONING OF A UNIT IS OPTIONAL. UNITS MAY BE LOCATED IN THE CORNER OF THE TRAILER. IF THE TRAILER DOES NOT HAVE A SQUARE FRONT, A FORWARD BLOCKING ASSEMBLY MUST BE INSTALLED WHEN POSITIONING A UNIT THE CORNER OF THE TRAILER. SEE DETAIL OF THE FORWARD BLOCKING ASSEMBLY ON PAGE 19.
3. MORE THAN ONE PALLET UNIT CAN BE SHIPPED. THE LOAD SHOULD BE FORMED IN ROWS, WITH THE UNITS POSITIONED AGAINST OPPOSITE SIDE WALLS. THE PROPER ANTI-SWAY BRACES, IF REQUIRED, WILL BE INSTALLED BETWEEN THE LATERALLY ADJACENT UNITS. SEE THE LOAD ON PAGE 6 FOR DETAILS.
4. THE HEADER AS APPLIED ABOVE FOR LONGITUDINAL BRACING WILL SUPPORT 10,000 POUNDS OF LADING; A TRAILER WIDTH HEADER WILL SUPPORT UP TO A FULL TRAILER LOAD OF PALLET UNITS. SEE THE HEADER NAILING CHARTS ON PAGE 7.





**ISOMETRIC VIEW**

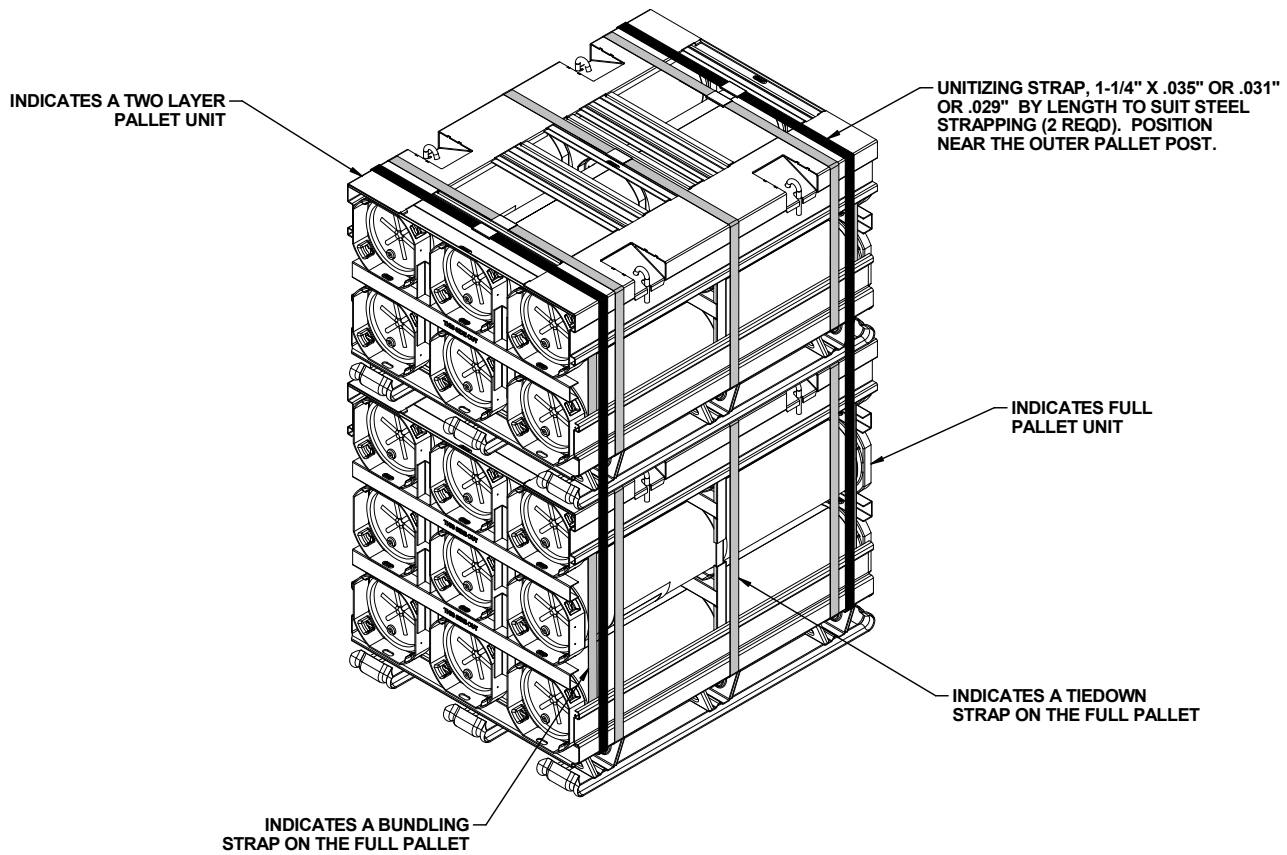


**LTL BRACE**

**SPECIAL NOTES:**

1. A ONE UNIT LTL IS SHOWN IN A 40'-0" LONG BY 7'-8" WIDE VAN TRAILER. OTHER LENGTH AND WIDTH TRAILERS MAY BE USED.
2. THE POSITIONING OF A UNIT IS OPTIONAL. UNITS MAY BE LOCATED IN THE CORNER OF THE TRAILER. IF THE TRAILER DOES NOT HAVE A SQUARE FRONT, A FORWARD BLOCKING ASSEMBLY MUST BE INSTALLED WHEN POSITIONING A UNIT THE CORNER OF THE TRAILER. SEE DETAIL OF THE FORWARD BLOCKING ASSEMBLY ON PAGE 19.
3. MORE THAN ONE PALLET UNIT CAN BE SHIPPED. THE LOAD SHOULD BE FORMED IN ROWS, WITH THE UNITS POSITIONED AGAINST OPPOSITE SIDE WALLS. THE PROPER ANTI-SWAY BRACES, IF REQUIRED, WILL BE INSTALLED BETWEEN THE LATERALLY ADJACENT UNITS. SEE THE LOAD ON PAGE 6 FOR DETAILS.
4. EACH LTL BRACE AS APPLIED FOR LONGITUDINAL BRACING WILL SUPPORT 2,000 POUNDS OF LADING; HOWEVER, NOT LESS THAN TWO BRACES WILL BE USED AGAINST EACH PALLET UNIT ACROSS THE WIDTH OF THE TRAILER.

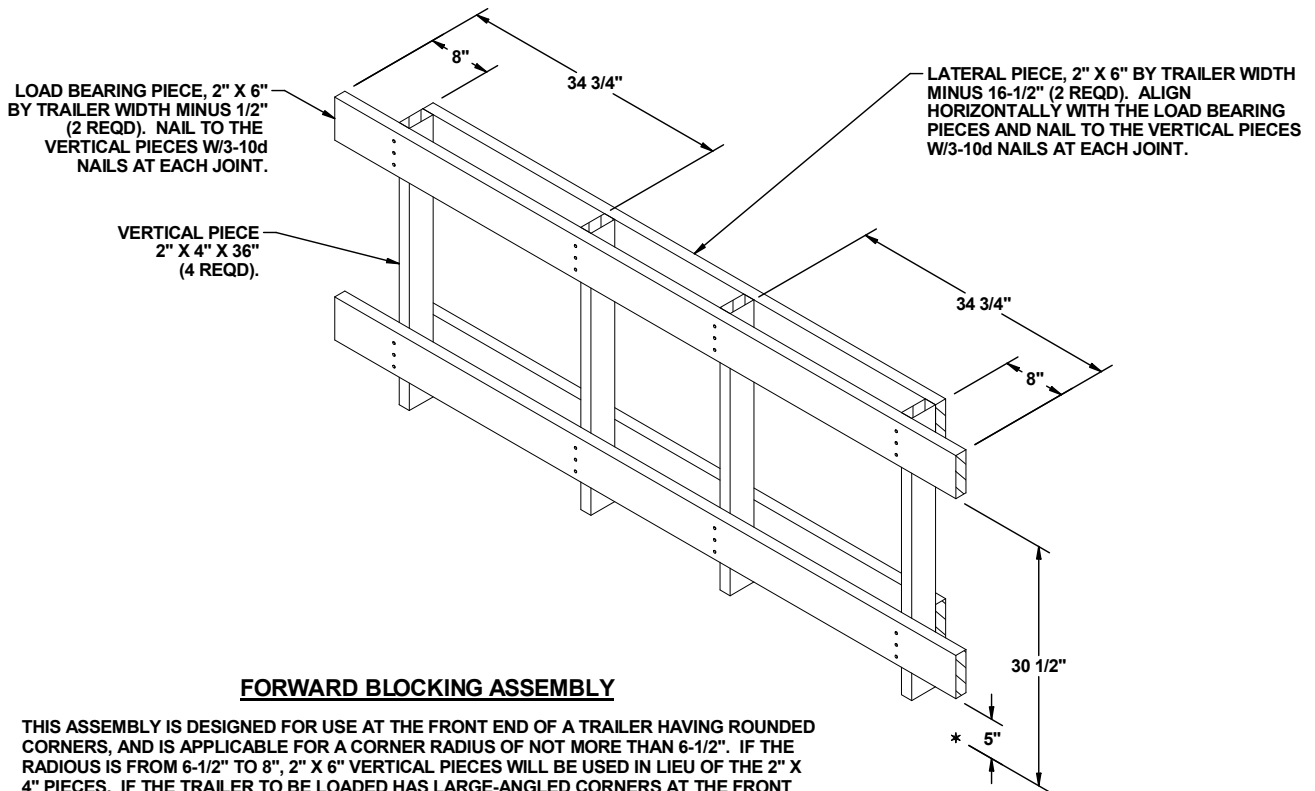
**TYPICAL LTL (1-UNIT)**



**SECUREMENT OF A PARTIAL PALLET UNIT ON  
TOP OF A FULL PALLET UNIT**

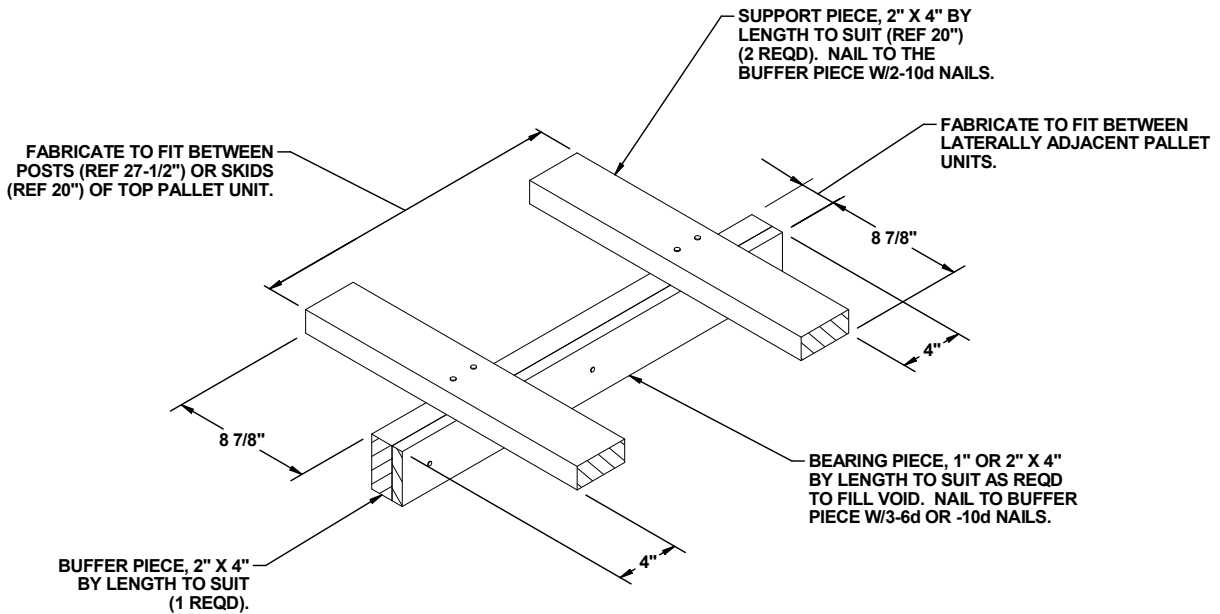
**SPECIAL NOTES:**

1. SHIPMENTS OF PALLET UNITS OF EXCALIBUR PROJECTILES SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE. HOWEVER THE END OF A LOT OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LESS-THAN-FULL PALLET UNITS WITHIN A LOAD. THE PROCEDURES ON THIS PAGE ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF THESE PARTIAL UNITS.
2. A PARTIAL PALLET UNIT MUST CONSIST OF TWO FULL LAYERS IN ORDER FOR THE TOP AND BOTTOM PALLET ADAPTER ASSEMBLIES TO PROPERLY FUNCTION. A LAYER MAY CONSIST OF EMPTY CONTAINERS AS DESCRIBED IN THE GENERAL NOTES OF AMC DRAWING 19-48-4231/55-20PM1006.
3. A LESS-THAN-FULL HEIGHT PALLET UNIT CAN BE SHIPPED BY POSITIONING IT EITHER ON THE TOP TIER OF A LOAD OR ON THE TOP OF A LOWER PORTION OF A LOAD WHEN THE LOAD CONTAINS A PARTIAL TIER IN THE END OF THE TRAILER. THE PARTIAL UNIT WILL BE STRAPPED TO THE PALLET UNIT DIRECTLY BELOW WITH TWO VERTICAL UNITIZING STRAPS. SEE THE "SECUREMENT OF A PARTIAL PALLET UNIT ON TOP OF A FULL PALLET UNIT" VIEW ABOVE FOR GUIDANCE.
4. A PARTIAL PALLET UNIT MUST NOT BE POSITIONED ON THE REARMOST PALLET UNIT IN THE LOAD.



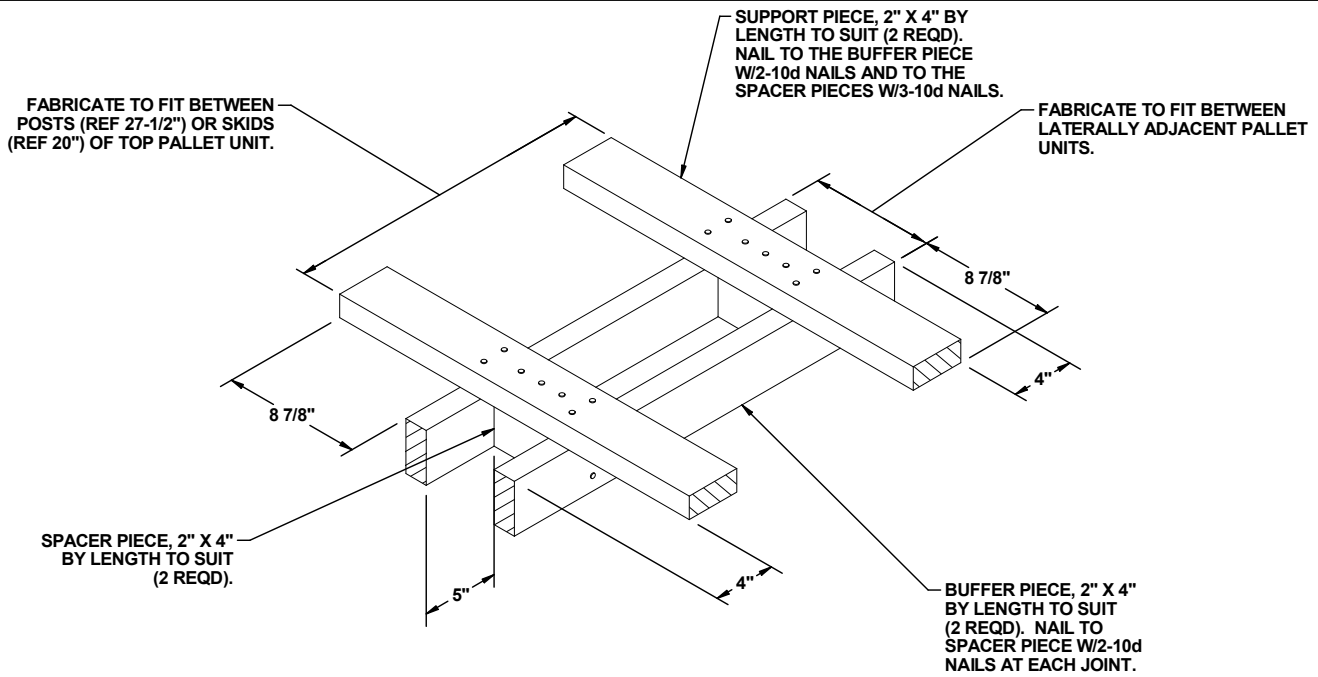
**FORWARD BLOCKING ASSEMBLY**

THIS ASSEMBLY IS DESIGNED FOR USE AT THE FRONT END OF A TRAILER HAVING ROUNDED CORNERS, AND IS APPLICABLE FOR A CORNER RADIUS OF NOT MORE THAN 6-1/2". IF THE RADIUS IS FROM 6-1/2" TO 8", 2" X 6" VERTICAL PIECES WILL BE USED IN LIEU OF THE 2" X 4" PIECES. IF THE TRAILER TO BE LOADED HAS LARGE-ANGLED CORNERS AT THE FRONT END, REFER TO PAGE 24 FOR GUIDANCE.



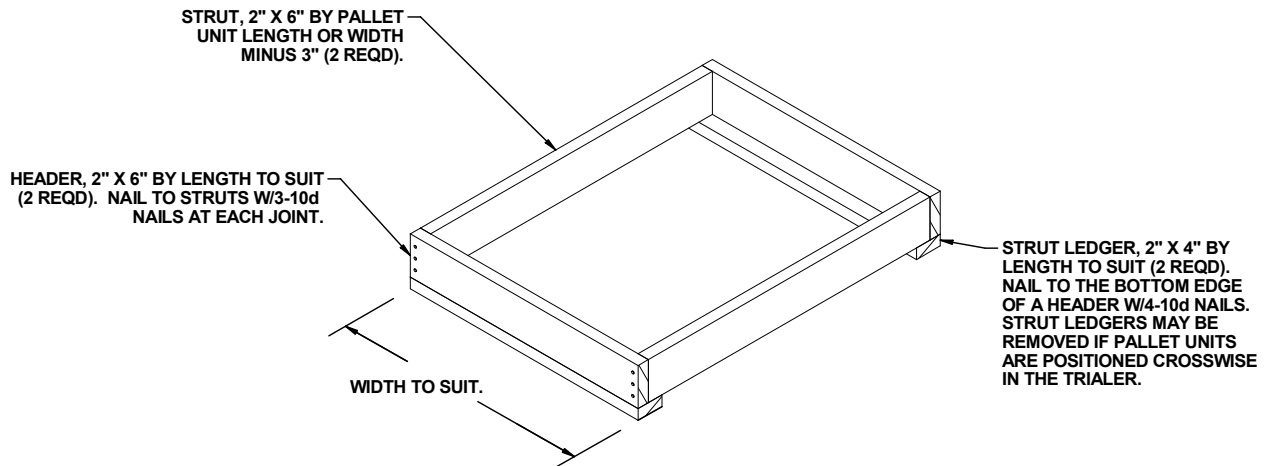
**TOP-OF-LOAD ANTI-SWAY BRACE A**

THIS ASSEMBLY IS DESIGNED FOR THE LATERAL BRACING OF A PALLET UNIT IN A SECOND LAYER WHEN THERE IS NOT A PALLET UNIT DIRECTLY OPPOSITE IT WHEN SPACING BETWEEN PALLET UNITS IS LESS THAN 5" AND GREATER THAN 1-1/2". POSITION 8-7/8" END OF THE SUPPORT PIECE WITHIN THE TOP PALLET UNIT. LAMINATE APPROPRIATE SIZED BEARING PIECES TO THE BUFFER PIECE AS REQUIRED TO FILL THE SPACING BETWEEN PALLETS. FOR SPACING BETWEEN PALLET UNITS LESS THAN 2", THE BEARING PIECE SHALL NOT BE USED. FOR SPACING BETWEEN PALLET UNITS THAT EXCEEDS 5", USE TOP-OF-LOAD ANTI-SWAY BRACE "B" SHOWN ON PAGE 20.



**TOP-OF-LOAD ANTI-SWAY BRACE B**

THIS ASSEMBLY IS DESIGNED FOR THE LATERAL BRACING OF A PALLET UNIT IN A SECOND LAYER WHEN THERE IS NOT A PALLET UNIT DIRECTLY OPPOSITE IT WHEN SPACING BETWEEN PALLET UNITS IS 5" OR MORE. POSITION 8-7/8" END OF THE SUPPORT PIECE WITHIN THE TOP PALLET UNIT.



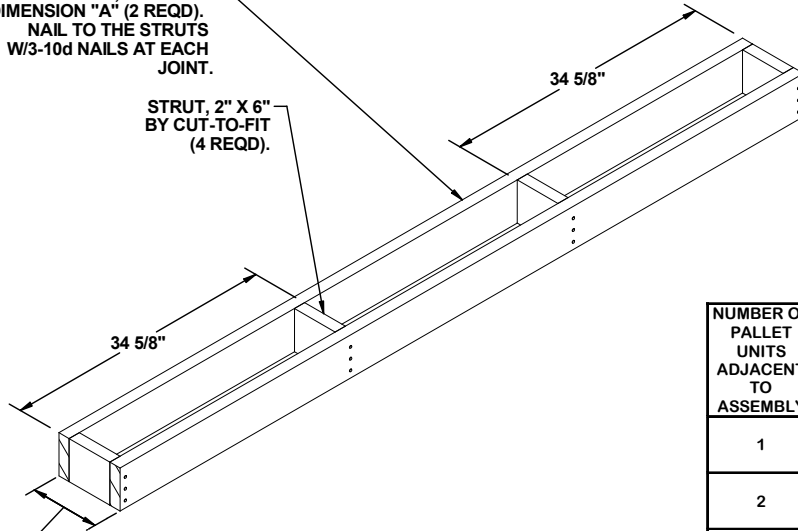
**SPACER ASSEMBLY A**

THIS ASSEMBLY IS DESIGNED TO REPLACE ONE PALLET UNIT.

BUFFER PIECE, 2" X 6" BY DIMENSION "A" (2 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

STRUT, 2" X 6" BY CUT-TO-FIT (4 REQD).

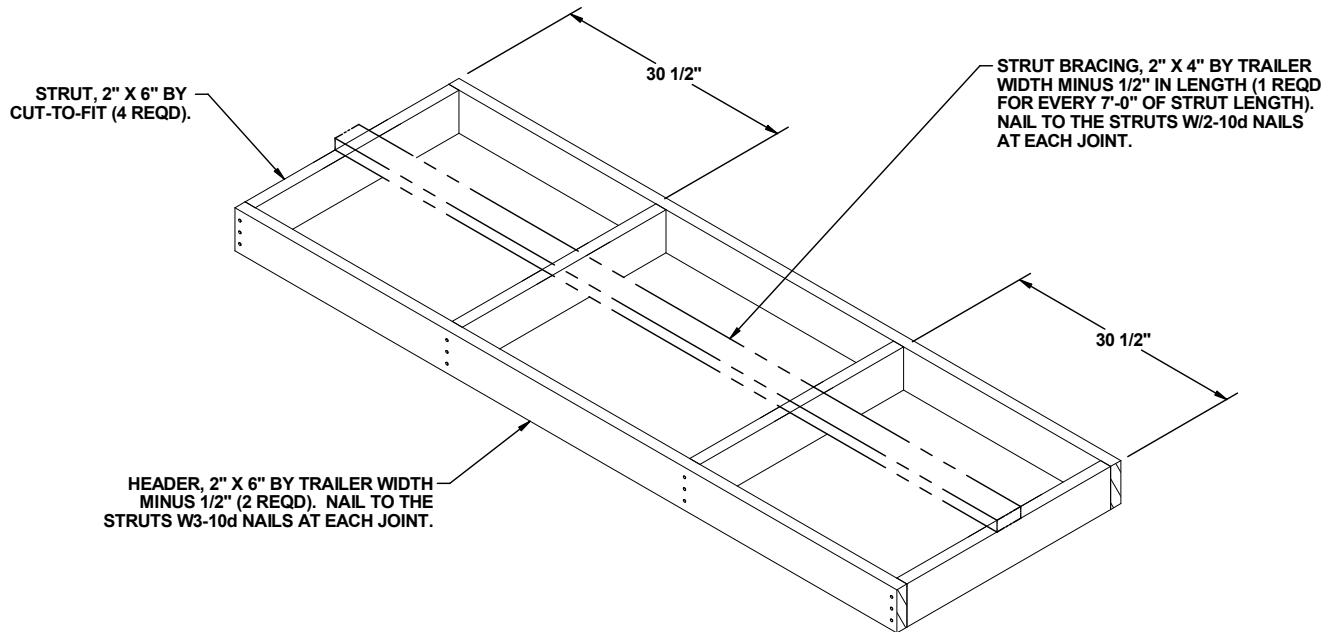
FABRICATE TO FIT BETWEEN ADJACENT PALLET UNITS OR BETWEEN PALLET UNIT AND SIDE WALL OF THE TRAILER.



NUMBER OF PALLET UNITS ADJACENT TO ASSEMBLY	NUMBER OF STRUTS	DIMENSION "A"
1	2	34-5/8"
2	3	67-1/2"
3	4	8'-4-3/4"

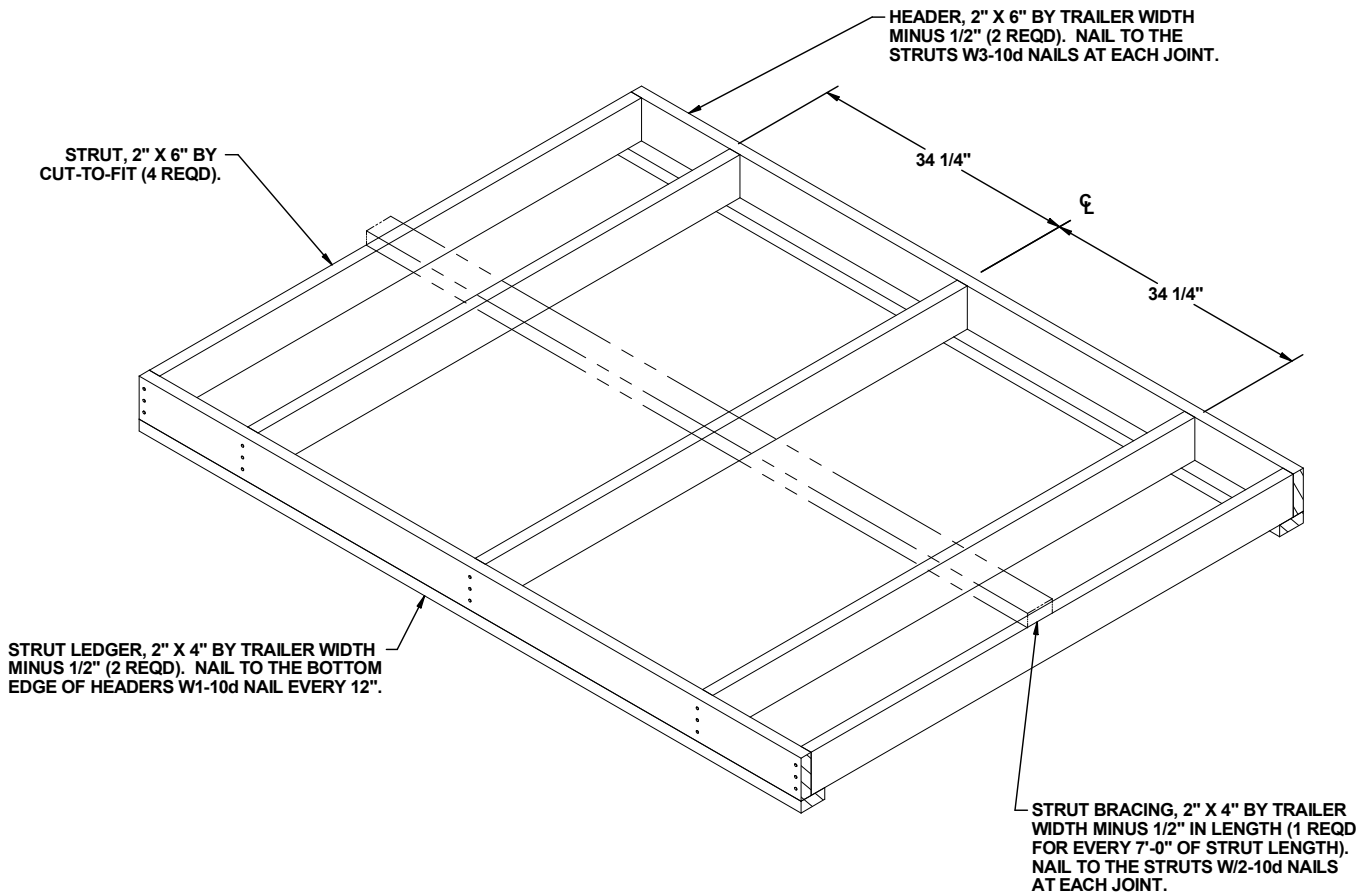
**ANTI-SWAY BRACE OR SIDE FILL ASSEMBLY**

THE ASSEMBLY DEPICTED ABOVE IS FOR USE WITH THREE PALLET UNITS. SEE THE CHART ABOVE FOR DIMENSIONS FOR ASSEMBLIES TO BE USED WITH VARYING NUMBER OF PALLET UNITS.



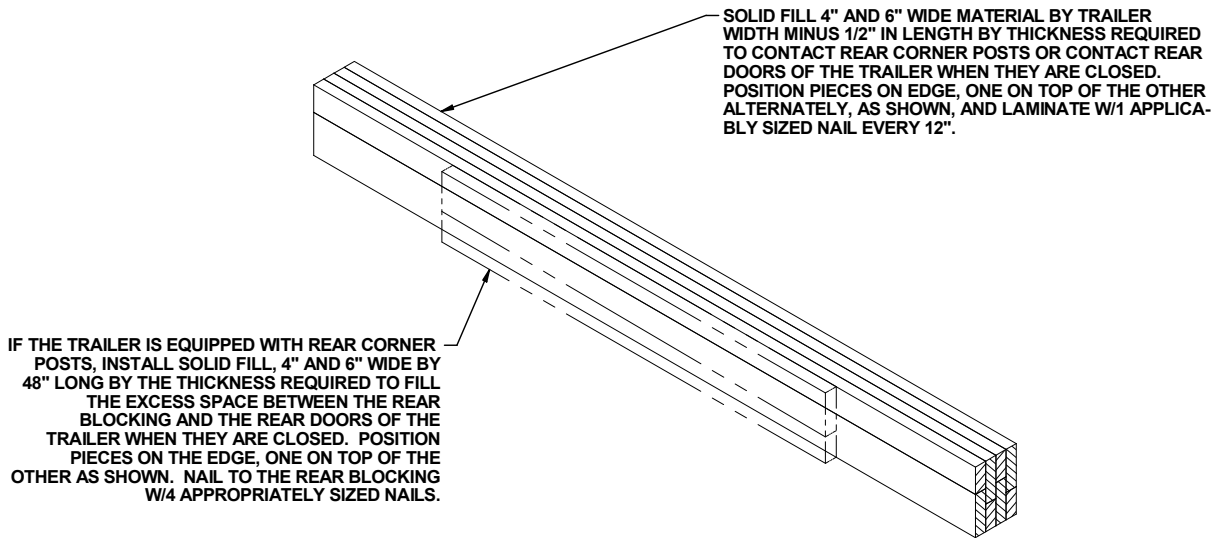
**CENTER SPACER ASSEMBLY A**

THIS CENTER SPACER ASSEMBLY IS DESIGNED FOR USE WITH PALLET UNITS POSITIONED AGAINST THE TRAILER WALLS.



**CENTER SPACER ASSEMBLY B**

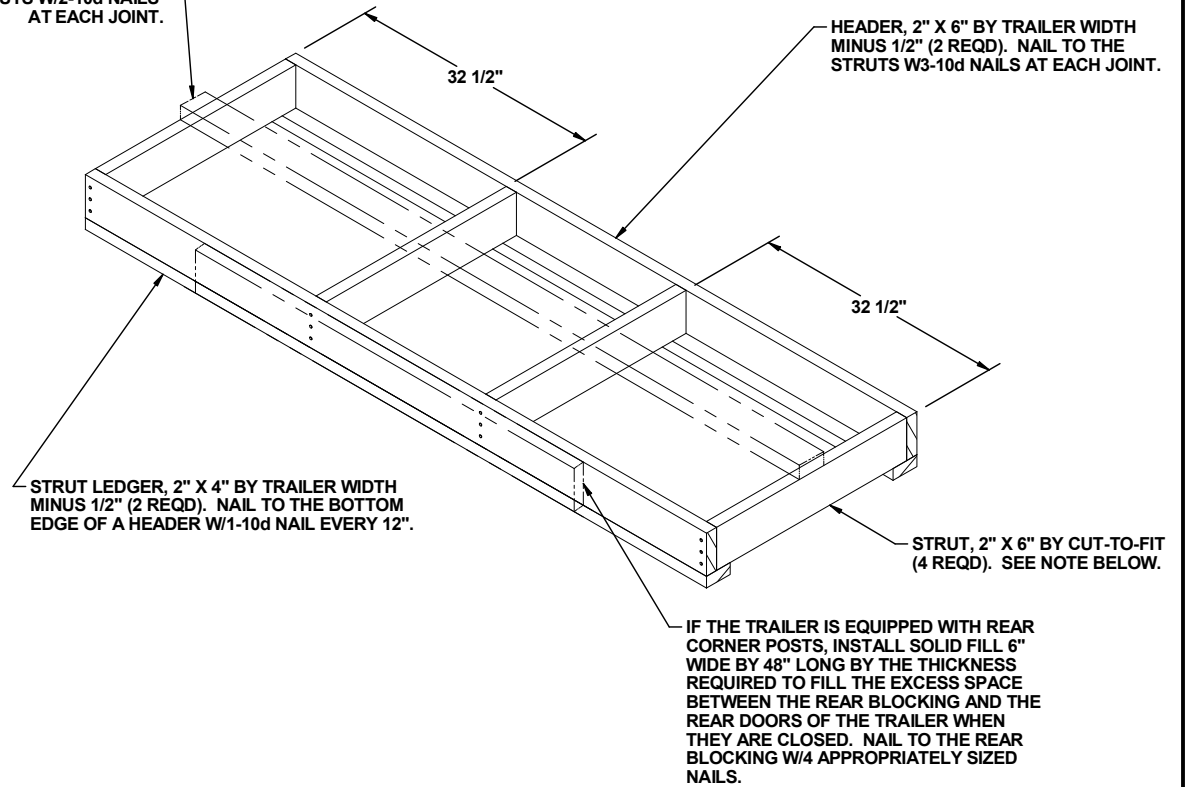
THIS CENTER SPACER ASSEMBLY IS DESIGNED FOR USE WITH PALLET UNITS WITH SIDE FILL ASSEMBLIES OR SIDE BLOCKING.



**REAR BLOCKING ASSEMBLY A**

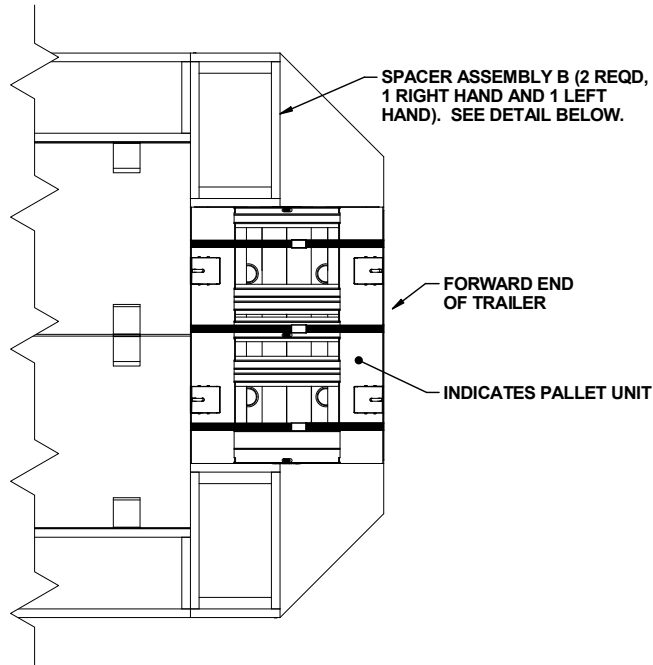
THIS ASSEMBLY IS DESIGNED FOR USE AT THE REAR OF A LOAD WHEN THE SPACE BETWEEN THE LADING AND THE TRAILER DOORS IS GREATER THAN 1-1/2" BUT LESS THAN 9".

STRUT BRACING, 2" X 4" BY TRAILER WIDTH MINUS 1/2" IN LENGTH (1 REQD FOR EVERY 7'-0" OF STRUT LENGTH). NAIL TO THE STRUTS W/2-10d NAILS AT EACH JOINT.



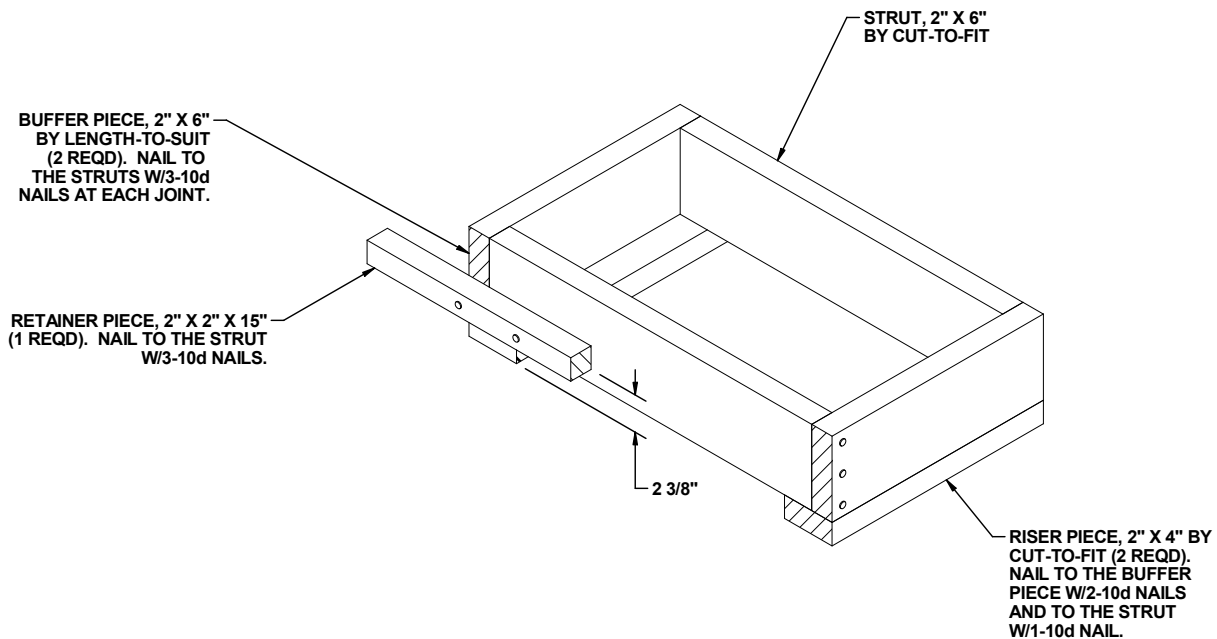
#### **REAR BLOCKING ASSEMBLY B**

THIS ASSEMBLY IS DESIGNED FOR USE AT THE REAR OF A LOAD WHEN THE SPACE BETWEEN THE LADING AND THE TRAILER DOOR IS MORE THAN 9" AND THE PALLET UNITS ARE LENGTHWISE IN THE TRAILER.



**ALTERNATE FORWARD LOADING PATTERN**

THIS PROCEDURE IS APPLICABLE TO THE LOADING OF ONE PALLET UNIT IN THE FORWARD END OF A VAN TRAILER HAVING LARGE-ANGLED FRONT CORNERS (REF: 18"). THE PROCEDURES MAY ALSO BE USED IN TRAILERS HAVING SQUARE CORNERS, OR ROUNDED FRONT CORNERS, OR ANGLED CORNERS OF ANOTHER SIZE. A 8'-2" WIDE TRAILER IS SHOWN, NARROWER TRAILERS CAN BE USED.



**SPACER ASSEMBLY B**

THIS ASSEMBLY IS DESIGNED FOR LATERAL BRACING OF ONE PALLET UNIT LOCATED AT THE FRONT OF AN ANGLED-CORNER VAN TRAILER AS SHOWN IN THE "ALTERNATIVE FORWARD LOADING PATTERN" VIEW ABOVE. RIGHT HAND AND LEFT HAND SPACER ASSEMBLIES ARE REQUIRED.