

Filing Category: DESIGN—Wood (038)

**ANTHONY POWER BEAMS**  
**ANTHONY FOREST PRODUCTS COMPANY**  
309 NORTH WASHINGTON  
EL DORADO, ARKANSAS 71730

## 1.0 SUBJECT

Anthony Power Beams.

## 2.0 DESCRIPTION

### 2.1 General:

Anthony Power Beams comply with the requirements noted in Section 2303, Item 2, of the 1997 *Uniform Building Code*™ (UBC) and ~~Section 2303.1.3 of the 2000 *International Building Code*® (IBC).~~

Anthony Power Beams are glue-laminated timber members fabricated to combinations 28F-E 1, 28F-E 2, 30F-E 1 and 30F-E 2. The beams consist of southern pine lumber that is E-rated and/or visually graded before laminating into rectangular cross sections meeting industry standards for depth, width and appearance. Individual laminations are 2 inches (51 mm) or less in net thickness. Beams having widths of 3½ and 5½ inches (89 and 140 mm) are available with a maximum depth of 24¾ inches (620 mm). Seven-inch-wide (178 mm) beams have a maximum depth of 28⅞ inches (733 mm).

Quality control for lumber grading and beam fabrication is monitored by the American Institute of Timber Construction (AITC) (AA-670) in accordance with the approved quality control manual. Beams meet the requirements of ANSI/AITC A190.1-92 and the additional requirements of evaluation report ER-5745 and AITC's quality control procedures applicable to these lay-up combinations.

### 2.2 Materials:

**2.2.1 Adhesives:** Face and end-joint bonding adhesives comply with ASTM D 2559 for exterior or wet use.

**2.2.2 End Joints:** End joints comply with ANSI/AITC A190.1-92 and AITC quality control requirements.

**2.2.3 Lumber:** Grade requirements are set forth in Table 2 for lumber used in various laminations associated with combinations listed in this report. Grade specifications are in-

cluded in the Standard Specifications for Structural Glued-laminated Timber of Softwood Species and the supplemental requirements of AITC for these layup combinations.

**2.2.4 Layup:** Manufacturing grade and layup requirements for the grade combination are noted in Table 2. Manufacturing details are provided by AITC and are included in the plant production procedures manual. Lamination grades and zones are as defined in the AITC Standard Specification for Structural Glued-laminated Timber of Softwood Species.

### 2.3 Design:

Design values are noted in Table 1. The design and installation requirements for structural glued-laminated beams and connections must comply with the code.

### 2.4 Identification:

Anthony Power Beams are identified by a stamp bearing the name of the Anthony Forest Products Company, the plant location, the lumber combination, the evaluation report number (ICBO ES ER-5263), and the logo of the quality control agency (American Institute of Timber Construction, or AITC). Additionally, the 28F-E1 and 30F-E1 unbalanced grades of beams are marked with a "TOP" stamp.

## 3.0 EVIDENCE SUBMITTED

Reports of load tests and a quality control manual.

## 4.0 FINDINGS

**That the Anthony Power Beams described in this report comply with the 1997 *Uniform Building Code*™ and the ~~2000 *International Building Code*®~~, subject to the following conditions:**

- 4.1 The beams are fabricated and identified in accordance with this report and installed in accordance with the code.
- 4.2 The beams are fabricated at the Anthony Forest Products facilities in El Dorado, Arkansas, and Washington, Georgia, under a quality control program with follow-up inspections by the American Institute of Timber Construction (AA-670).

This report is subject to re-examination in two years.

\* deleted by City of Los Angeles

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**Table 1**  
**Design Values for**  
**Structural Glued Laminated Timber for**  
**Normal Duration Of Load And Dry Conditions Of Use** <sup>1,2,3</sup>

Combination Symbol <sup>4</sup>	Species-Outer Laminations/Core Laminations <sup>5</sup>	Bending About X-X Axis						Bending About Y-Y Axis					Axially Loaded		
		Loaded Perpendicular to Wide Faces of Laminations						Loaded Parallel to Wide Faces of Laminations					Tension Parallel to Grain, F <sub>t</sub>	Compression Parallel to Grain, F <sub>c</sub>	Modulus of Elasticity, E
		Extreme Fiber in Bending, F <sub>bx</sub> <sup>6</sup>		Compression Perpendicular to Grain, F <sub>cLx</sub> <sup>8</sup>		Shear Parallel to Grain (Horizontal) F <sub>vx</sub>	Modulus of Elasticity, E <sub>x</sub> <sup>10</sup>	Extreme Fiber in Bending, F <sub>by</sub>	Compression Perpendicular to Grain, F <sub>cLy</sub> <sup>8</sup>	Shear Parallel to Grain (Horizontal), F <sub>vy</sub>	Shear Parallel to Grain (Horizontal) (For members with multiple piece laminations which are not edge glued), <sup>9</sup> F <sub>vy</sub>	Modulus of Elasticity, E <sub>y</sub>			
		Tension Zone Stressed in Tension	Compression Zone Stressed in Tension <sup>7</sup>	Tension Face	Compression Face										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
The following combination is <b>NOT BALANCED</b> and is for either dry or wet use.															
28F-E1	SP/SP	2800	1400	740	740	290	2.1	1600	560	175	90	1.7	1300	1850	1.7
The following combination is <b>BALANCED</b> and is for either dry or wet use.															
28F-E2	SP/SP	2800	2800	740	740	290	2.1	1600	560	175	90	1.7	1300	1850	1.7
The following combination is <b>NOT BALANCED</b> , is only for nominal widths, 6 in. or less, and is for either dry or wet use.															
30F-E1	SP/SP	3000	1500	740	740	290	2.1	1750	560	175	90	1.7	1250	1750	1.7
The following combination is <b>BALANCED</b> , is only for nominal widths, 6 in. or less, and is for either dry or wet use.															
30F-E2	SP/SP	3000	3000	740	740	290	2.1	1750	560	175	90	1.7	1250	1750	1.7
Wet-use factors <sup>2</sup>		0.8	0.8	0.53	0.53	0.875	0.833	0.8	0.53	0.875	0.875	0.833	0.8	0.73	0.833

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 psi = 6.8948 kPa.

<sup>1</sup> The combinations in this table are applicable to members consisting of 4 or more laminations and are intended primarily for members stressed in bending due to loads applied perpendicular to the wide faces of the laminations. Design values are tabulated, however, for loading both perpendicular and parallel to the wide faces of the laminations.

<sup>2</sup> The tabulated design values are for dry conditions of use. To obtain wet-use design values, multiply the tabulated values by the factors shown at the bottom of the table.

<sup>3</sup> The tabulated design values are for normal duration of loading. For other durations of loading, see *Uniform Building Code* 2304.3.4 or Part 2.3.2 of the ANSI/APFA National Design Specifications for Wood Construction (NDS-97).

<sup>4</sup> The combinations symbols relate to a specific combination of grades and species. The first two numbers in the combination symbol correspond to the design value in bending shown in Column 3. The letter "E" in the combination symbol indicates the combination is made from E-rated (E) lumber in the outer zones.

<sup>5</sup> The symbol used here is SP for Southern Pine.

<sup>6</sup> The tabulated design values for bending about the X-X axis in this table are applicable to a member 12 in. deep, 5-1/8 in. wide, 21 ft. long, uniformly loaded and used for a simple span. For larger members, F<sub>bx</sub> shall be modified by a volume factor, C<sub>v</sub>, determined by the following equation.

$$C_v = K_L \left[ \left( \frac{5.125}{b} \right)^{\frac{1}{20}} \left( \frac{12}{d} \right)^{\frac{1}{20}} \left( \frac{21}{L} \right)^{\frac{1}{20}} \right] \leq 1.0$$

where: K<sub>L</sub> = 1.0 for uniform loading, 1.09 for single concentrated loads, 0.96 for 2 equal concentrated loads at 1/3 points of span.  
 b = width (in.); d = depth (in.); L = span (ft)

<sup>7</sup> Design values in this column are for extreme fiber stress in bending when the member is loaded such that the compression zone laminations are subjected to tensile stresses. For more information, see AITC 117-Design, 1.4.1.3.

<sup>8</sup> The compression perpendicular to grain design values in this Table are not subject to the duration of load adjustments.

<sup>9</sup> These values for shear parallel to grain (horizontal), F<sub>vy</sub>, apply to members manufactured using multiple piece laminations with unbonded edge joints. For members manufactured using single piece laminations or using multiple piece laminations with bonded edge joints, the shear parallel to grain (horizontal) values in column 11 apply. For members with 5, 7 or 9 laminations, the values in column 12 shall be reduced by 20%. Unbonded edge joints occurring in adjacent laminations shall be at least 1-1/2 inches apart.

<sup>10</sup> The modulus of elasticity is limited to 2.0x10<sup>6</sup> psi for combinations 28F-E1 and 28F-E2 with beam depths exceeding 20-5/8 inches or 15 laminations at 1.375 inch thickness.

**TABLE 2 - MANUFACTURING**  
**Grade Requirements for Members Stressed Principally in Bending and Loaded**  
**Perpendicular to the Wide Faces of Laminations<sup>1,2,3</sup>**

Combination Symbol	Depth of Member	Tension Lamination <sup>4</sup>	Minimum Grade of Lamination <sup>5</sup>									
			Percent/Grade/Species Each Zone					Fraction/Edge Knot Each Zone <sup>6</sup>				
			Outer Tension Zone <sup>7</sup>	Inner Tension Zone <sup>8</sup>	Core	Inner Comp. Zone <sup>8</sup>	Outer Comp. Zone	Outer Ten. Zone	Inner Ten. Zone	Core	Inner Comp. Zone	Outer Comp. Zone
1	2	3	4	5	6	7	8	9	10	11	12	13
The following combination is <b>NOT BALANCED</b> and is for either dry or wet use												
28F-E1	4 lams to 13.75 in.  > 13.75 in.	Special Provisions	10%2.3E 3-12 +10%N1D 2.3E  5%2.3E 5-16 +5%N1D 2.3E	10%N1D  15%N1D	N2M  N2M	10%N1D  15%N1D	10%N1D 2.3E  10%N1D 2.3E	1/3  1/5	--  --	--  --	--  --	--  --
The following combination is <b>BALANCED</b> and is for either dry or wet use												
28F-E2	4 lams to 13.75 in.  > 13.75 in.	Special Provisions	10%2.3E 3-12 +10%N1D 2.3E  5%2.3E 5-16 +5%N1D 2.3E	10%N1D  15%N1D	N2M  N2M	10%N1D  15%N1D	10%2.3E 3-12 +10%N1D 2.3E  5%2.3E 5-16 +5%N1D 2.3E	1/3  1/5	--  --	--  --	--  --	1/3  1/5
30 F member sizes are limited to 4 and 6 inch nominal widths. The following combination is <b>NOT BALANCED</b> and is for either dry or wet use												
30F-E1	4 lams to 13.75 in.  > 13.75 in.	Special Provisions	10%2.3E 3-12 +10%N1D 2.3E  5%2.3E 5-16 +5%N1D 2.3E	10%N1D  15%N1D	N2M  N2M	20%N1D  15%N1D	10%N1D 2.3E  15%N1D 2.3E	1/3  1/5	--  --	--  --	--  --	--  --
30 F member sizes are limited to 4 and 6 inch nominal widths. The following combination is <b>BALANCED</b> and is for either dry or wet use												
30F-E2	4 lams to 13.75 in.  > 13.75 in.	Special Provisions	10%2.3E 3-12 +10%N1D 2.3E  5%2.3E 5-16 +5%N1D 2.3E	10%N1D  15%N1D	N2M  N2M	10%N1D  15%N1D	10%2.3E 3-12 +10%N1D 2.3E  5%2.3E 5-16 +5%N1D 2.3E	1/3  1/5	--  --	--  --	--  --	1/3  1/5

For SI: 1 inch = 25.4 mm, 1 psi = 6.8948 kPa.

<sup>1</sup> The combinations in this table are primarily applicable to members stressed in bending due to a load applied perpendicular to the wide faces of the laminations.

<sup>2</sup> All combinations are applicable to members with four or more laminations.

<sup>3</sup> The combinations in Table 2 have been established based on procedures given in ASTM D3737 as modified by subsequent research.

<sup>4</sup> In addition to the basic requirements for 302-24 tension laminations given in AITC 117-Manufacturing, additional grading restrictions as set forth in quality control requirements are required.

<sup>5</sup> Percent values are based on the total depth of the member. All fractional number of laminations shall be rounded upward to the next whole number. For the inner tension and compression zones, the resulting excess of percentage resulting from rounding upward of the outer zone is permitted to be subtracted from the inner zone requirements.

When lamination thickness exceeds 1-3/8 in., divide the depth of the member by the actual thickness of the laminations used and multiply by 1-3/8 in. Use this depth to obtain the percentage of grades required for the various zones. For instance, if a member 15 in. deep is laminated with 1-1/2 in. thick laminations, divide 15 in. by 1-1/2 in. and multiply by 1-3/8 in. Enter the table with the depth of 13.75 in. to determine the percentage of grades to use. The actual depth of the member shall be used to determine the tension lamination requirements from column 3.

<sup>6</sup> Where slope of grain is not tabulated, it shall be the slope of grain required for the grade.

<sup>7</sup> See "Grade Categories" in quality control requirements for the slope of grain.

<sup>8</sup> The modulus of elasticity of the No. 1 D grade shall be monitored periodically by the long span E method of testing described in Appendix of AITC 117-Manufacturing to make certain that an average modulus of elasticity of 2.0x10<sup>6</sup> psi be maintained.