ICC-ES Evaluation Report

ESR-2982

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Subject to renewal March 2025

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES **Section: 06 17 00—Shop-Fabricated Structural Wood**	**REPORT HOLDER:** **LAMCO FOREST PRODUCTS INC.** **ADDITIONAL LISTEE:** **BLUELINX CORPORATION**	**EVALUATION SUBJECT:** **LAMCO-LFL® ADVANCED ENGINEERED LUMBER**	

1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:

- 2015, 2012 and 2009 *International Building Code®* (IBC)
- 2015, 2012 and 2009 *International Residential Code* (IRC)
- 1997 *Uniform Building Code™* (UBC)

Property evaluated:

Structural

1.2 Evaluation to the following green code(s) and/or standards:

- 2022 California Green Building Standards Code (CALGreen), Title 24, Part 11
- 2020, 2015, 2012 and 2008 ICC 700 *National Green Building Standard™* (ICC 700-2020, ICC 700-2015, ICC 700-2012 and ICC 700-2008)

Attributes verified:

See Section 2.1

2.0 USES

LAMCO-LFL® Advanced Engineered Lumber (AEL) products described in this evaluation report are used as alternatives to sawn lumber for floor, wall and roof structural members. These structural applications include use as beams, headers, joists, rafters, columns, plates, truss chords and truss webs. The products are also used as components for built-up members.

3.0 DESCRIPTION

3.1 General:

The LAMCO-LFL® AEL described in this report is an alternative to the materials described in Chapter 23 of the IBC and UBC and complies with the requirements of Section 2303.1.10 of the 2015 IBC (Section 2303.1.9 of the 2012 and 2009 IBC). Portions of Chapters 5, 6 and 8 of the IRC are applicable to the LAMCO-LFL® AEL material described in this report.

The wood properties, species, adhesive, manufacturing parameters and finished product thickness, width (depth) and length must meet the requirements noted in the quality documentation that contains the manufacturing standard. LAMCO-LFL® AEL is available in thicknesses of $1^{7}/_{16}$ inches (36.5 mm) and

$1^1/_2$ inches (38.1 mm), widths (depths) of $2^1/_2$ (63.5 mm) to 16 inches (356 mm), and lengths up to 32 feet 1 inch (9780 mm). The grades and corresponding reference allowable stress design values for LAMCO-LFL® AEL are given in Table 1.

The attributes of the wood joists have been verified as conforming to the provisions of (i) CALGreen Section A4.404.3 for efficient framing techniques; (ii) ICC 700-2020 Sections 608.1(2), 11.608.1(2) and 13.104.3.1(4) for resource-efficient materials; (iii) ICC 700-2015 and ICC 700-2012 Sections 608.1(2), 11.608.1(2) and 12(A).608.1 for resource-efficient materials; and (iv) ICC 700-2008 Section 607.1(2) for resource-efficient materials. Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. These codes or standards often provide supplemental information as guidance.

3.2 Material:

LAMCO-LFL® AEL is comprised of short segments of visually graded or MSR black spruce and jack pine lumber, glued edgewise with compound tongue and groove horizontal joints and glued lengthwise with vertical finger joints. Phenol-resorcinol-formaldehyde or polyurethane adhesives are used for both edge and finger joints, in accordance with the approved quality documentation. All adhesives are HRA (Heat Resistant Adhesive) and qualified in accordance with ASTM D2559.

4.0 DESIGN AND INSTALLATION

4.1 Design:

LAMCO-LFL® AEL is designed as solid-sawn lumber in accordance with the applicable code and the ANSI/AWC/AF&PA *National Design Specification® for Wood Construction* (NDS) except as modified in this report. The reference design values for LAMCO-LFL® AEL are given in Table 1 and are for normal load duration. Adjustment factors applied to LAMCO-LFL® AEL shall be in accordance with Section 4.3.1 of the NDS and Tables 4A and 4C of the NDS *Supplement, Design Values for Wood Construction* (NDS Supplement), except as follows:

1) Instead of using NDS size factor, C_F:
   a. K_d must be applied to F_b in accordance with Footnote 1 of Table 1, as applicable,
   b. K_L must be applied to F_t in accordance with Footnote 2 of Table 1, and
   c. 1.00 must be applied to Fc.
2) C_{fu} must be 1.10.
3) C_r must be 1.04.
4) C_M must be in accordance with Table 4A of the NDS Supplement for 1.6E LAMCO-LFL® AEL, and in accordance with Table 4C of the NDS Supplement for 1.7E, 1.9E, and 2.1E LAMCO-LFL® AEL.

Modulus of elasticity (E) values in this report are shear-free modulus of elasticity. Calculated deflections of flexural members must account for combined bending and shear deflection when using shear-free modulus of elasticity (See Footnote 3 of Table 1).

4.2 Installation:

LAMCO-LFL® AEL must be installed in accordance with this report, the manufacturer's published installation instructions, the NDS, the applicable code, and standard framing practice as applied to solid-sawn lumber.

4.3 Connections:

Allowable lateral and withdrawal load values for nails installed in the wide face or the edge of the members are as provided in the NDS for sawn lumber with a specific gravity of as shown in Table 2. Allowable lateral load values for bolts installed in the edge of the members and loaded parallel to grain and allowable lateral load values for bolts installed in the wide face of the members and loaded either parallel or perpendicular to grain are as provided in the NDS for sawn lumber with a specific gravity as shown in Table 2. Edge distance, end distance and fastener spacing must be in accordance with Chapter 12 of the 2015 NDS for the 2015 IBC (Chapter 11 of the 2012 and 2005 NDS for the 2012 and 2009 IBC, respectively).

5.0 CONDITIONS OF USE:

The LAMCO-LFL® Advanced Engineered Lumber as described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 Design stresses must comply with the values noted in this report.

5.2 Design value adjustment factors shall be applied as required in Section 4.1 and Table 1 of this report.

5.3 Fabrication and connection restrictions must comply with this report.

5.4 The material is limited to use in dry areas in which its moisture content will not exceed 16 percent.

5.5 Use of the material as rim board or load-bearing or shear wall studs, or in fire-resistive applications, is outside the scope of this report.

5.6 The use of fire-retardant or preservative treatments with LAMCO-LFL® AEL is outside the scope of this report.

5.7 Design calculations and details for specific applications must be furnished to the code official to verify compliance with this report and the applicable code. The documents must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.8 LAMCO-LFL® AEL is produced at the LAMCO Forest Products manufacturing plant located in Saint Felicien, Quebec, Canada, with quality control inspections by ICC-ES and PFS Corporation (AA-652).

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Structural Wood-based Products (AC47), approved June 2016 (editorially revised August 2016).

7.0 IDENTIFICATION

7.1 The LAMCO-LFL® Advanced Engineered Lumber is identified with stamps noting the product and company or listee names (LAMCO or BlueLinx), respectively, plant number (#628), the grade designation, the name of the third-party inspection agency (PFS), the date of manufacture and the evaluation report number (ESR-2982).

7.2 The report holder's contact information is the following:

LAMCO FOREST PRODUCTS INC.
760 CHEMIN DE LA MORAINE
SAINT FELICIEN, QUEBEC G8K 0A1
CANADA
(418) 679-2647
www.lamcoforest.com

7.3 The Additional Listee's contact information is the following:

BLUELINX CORPORATION
4300 WILDWOOD PARKWAY
ATLANTA, GEORGIA 30339
(770) 953-7000
www.bluelinxco.com

TABLE 1—LAMCO-LFL AEL REFERENCE DESIGN VALUES (PSI)

PROPERTY	GRADE			
	1.6E	1.7E	1.9E	2.1E
Bending (F_b)	1200[1]	1800[1]	2300[1]	2300[1]
Tension (F_t)	1300[2]	1585[2]	1800[2]	2175[2]
Longitudinal Shear (F_v)	135	180	205	250
Compression Perpendicular to Grain ($F_{c\perp}$)	425	595	675	675
Compression Parallel (F_c)	1600	1925	2190	2660
Modulus of Elasticity[3] (E) ($x10^6$)	1.6	1.7	1.9	2.1
Modulus of Elasticity for Beam and Column Stability (E_{min}) ($x10^6$)	0.793	0.862	0.968	1.039

For **SI:** 1 psi = 6.895 kPa.

[1]The tabulated F_b value for the 1.6E grade is based on a reference depth of 12 inches. For depths other than 12 inches multiply F_b by $K_d = (12/d)^{0.34}$, where d is the depth in inches.

Tabulated F_b values for the 1.7E, 1.9E, and 2.1E grades are based on a reference depth of 12 inches. For depths other than 12 inches multiply F_b by $K_d = (12/d)^{0.25}$, where d is the depth in inches.

Maximum values for F_b K_d must not exceed 1,570 psi for 1.6E, 2,166 psi for 1.7E, 2,455 psi for 1.9E, and 2,795 psi for 2.1E grades.

[2]The tabulated F_t value for the1.6E grade is based on a reference length of 24 inches. Multiply F_t by K_L, where $K_L = (24/L)^{0.15}$, where L is the length in inches.

Tabulated F_t values for the 1.7E and 1.9E grades are based on a reference length of 88 inches (7 feet – 4 inches). For lengths greater than 88 inches, multiply F_t by $K_L = (88/L)^{0.1335}$, where L is the length in inches.

Tabulated F_t value for the 2.1E grade is based on a reference length of 88 inches (7 feet – 4 inches). For lengths greater than 88 inches, multiply F_t by $K_L = (88/L)^{0.125}$, where L is the length in inches.

[3]The tabulated reference modulus of elasticity values are the shear-free modulus of elasticity. Calculated deflections of flexural members must account for combined bending and shear deflection when using shear-free modulus of elasticity. For example, the deflection of a uniformly loaded single span beam is calculated as follows:

$$\Delta = \frac{5\,W L^4}{32\,E\,b\,h^3} + \frac{12\,W L^2}{5\,E\,b\,h}$$

where

Δ = deflection in inches (mm)
W = uniformly distributed load in pounds/inch (N/mm)
L = span in inches (mm)
E = shear-free modulus of elasticity in psi (MPa)
b = width of beam in inches (mm), and
h = depth of beam in inches (mm).

TABLE 2—LAMCO-LFL AEL EQUIVALENT SPECIFIC GRAVITY (ESG) FOR CONNECTION DESIGN

Grade	1.6E	1.7E	1.9E	2.1E
Equivalent Specific Gravity (ESG)	0.42	0.42	0.46	0.50