



Cedar Glulam Design in Exterior Applications

National building codes require the use of naturally durable species or pressure preservative treated wood in exterior applications. Specifically addressing glulam products in these applications, the International Residential Code states the following:

R319.1.5 Exposed glued-laminated timbers.

The portions of glued-laminated timbers that form the structural supports of a building or other structure and are exposed to weather and not properly protected by a roof, eave or similar covering shall be pressure treated with preservative, or be manufactured from naturally durable or preservative-treated wood.

Alaska yellow cedar (AYC) and Port Orford cedar (POC) are two such durable species. Boise Glulam currently manufactures both AYC and POC glulam products. When designing structural components in exterior applications, moisture content shall be considered. Wood strength and stiffness properties decrease with an increase in moisture content. Allowable glulam design values assume a moisture content of 16% or less. If a beam or column application is subjected to conditions that may cause a sustained moisture content greater than 16%, wet-use factors shall be applied. Below is a table that contains the wet-use factors for glulam, per the 2005 National Design Specification (NDS) for Wood Construction:

Design Stress	Bending: F_b	Modulus of Elasticity: E	Horizontal Shear: F_v	Compression Parallel to Grain: $F_{c\parallel}$	Compression Perpendicular to Grain: $F_{c\perp}$
Wet-Use Factor	0.8	0.833	0.875	0.73	0.53

Ultimately, it is a project's design professional of record and/or building official that should determine whether an exposed application shall be considered wet-use. This determination depends on the local climate, the amount of exposure, proximity to soil, etc. If a determination is not made by the project's design or code enforcement official, wet-use conditions should be assumed. It is recommended that exterior column applications be considered wet use, due to the higher probability of exposure. Cedar glulam products shall not be used in ground or below ground contact applications, or marine environments. The project's designer should consult a connector/fastener manufacturer in regards to coating recommendations for those products. For further information, please feel free to contact Boise Cascade EWP Engineering at 800.232.0788.