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Standard Practices for Establishing Stress Grades for Structural Members Used in Log Buildings[1]

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INTRODUCTION

These practices are based on the assumption that structural members in log buildings can be stress-graded by methods that derive from accepted standards for conventional solid sawn lumber and round timbers. It is assumed that the material to be graded bears enough similarity to either sawn lumber or round timber, both in dimensional properties and in use, to warrant application of stress-grading standards written for sawn-lumber or round-timber, or both. These practices, such as Practices D245 and D2899, cannot be applied directly because the structural members used in log buildings are generally neither perfectly rectangular nor perfectly round in section. These practices use certain conventions regarding cross-sectional dimensions that make it possible to extend established stress-grading methodologies to cover the members used in log buildings.

Where log member characteristics deviate from sawn lumber or round timber standards, there may be uncertainty as to the exact effect of the deviation on strength properties. To compensate for this uncertainty, some design stress values are herein derived with practices that are, by engineering judgment, conservative. The philosophy guiding this approach is that while the absence of experimental data may make a measure of conservatism unavoidable, the reliability of design stress values must not be achieved through wood quality or size requirements that are an unnecessary burden on the wood resource.

In general, the sawing, cutting, and shaving required to bring a piece to its final shape must be completed before it can be visually graded using the principles in these practices. Small cuts may be allowed after grading if it can be shown that either (*1*) the cuts do not affect the grade, or (*2*) the grade takes the additional cuts into consideration.

Both sawn lumber standards and round timber standards are herein referenced, because these two stress-grading methodologies can be assumed to apply to two different types of structural members used in log buildings: wall-logs and round timber beams. Since wall-logs must be provided with a means of joining together (for example, tongue-and-groove joints), they resemble sawn lumber and are treated as such in the standard. Rafters, purlins, and beams, on the other hand, are sometimes left as round logs, except for a small amount of sawing to provide a flat nailing surface. These practices thus deal with stress-grading of wall-logs and round-timber beams separately.

1. Scope

1.1 These practices cover the visual stress-grading principles applicable to structural wood members of nonrectangular shape, as typically used in log buildings. These practices are meant to supplement the ASTM standards listed in Section 2, which cover stress-grading of sawn lumber and round timbers. Pieces covered by these practices may also be used in building types other than log buildings.

1.2 The grading provisions used as illustrations herein are not intended to establish grades for purchase, but rather to show how stress-grading principles are applied to members used in log buildings. Detailed grading rules for commercial stress grades which serve as purchase specifications are established and published by agencies that formulate and maintain such rules and operate inspection facilities covering the various species.

1.3 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical

[1] These practices are under the jurisdiction of ASTM Committee D07 on Wood and are the direct responsibility of Subcommittee D07.02 on Lumber and Engineered Wood Products.

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