

STUDY ON USE OF UNGRADED LUMBER IN CERTAIN CIRCUMSTANCES

Presented by:

Robbie Davis

Chairman of the N.C. Building Code Council

The N.C. Building Code Council (“BCC”) submits these results of the study it conducted, with the help of the N.C. Department of Insurance, Office of State Fire Marshal – Engineering Division (“NCDOI”), pursuant to 2017 N.C. Sess. Law 211, § 11 regarding whether it would be appropriate to use lumber that has not been grade stamped under the authority of a lumber grading bureau in construction in North Carolina. The BCC appreciates the opportunity to study and comment on the use of graded versus ungraded lumber. The BCC was unable to finalize this study before its fourth quarterly meeting of December 12, 2017 and regrets any inconvenience from its late filing with the Joint Legislative Oversight Committee on Agriculture and Natural and Economic Resources.

2017 N.C. Sess. Law 211, § 11 requires the BCC to “study under what circumstances it would be appropriate to use lumber that has not been grade stamped under the authority of a lumber grading bureau in construction in North Carolina,” including by considering “cost, durability, public safety, and any other factors the [BCC] deems necessary.” The BCC interprets this Session Law to encompass the use of graded versus ungraded lumber in both residential and commercial buildings. For the reasons below, the BCC has determined that graded lumber, whether graded by machine or visually graded and stamped by a lumber grading bureau, is preferable to ungraded lumber for those buildings subject to the N.C. Residential Building Code (“Residential Code”) and N.C. Building Code (“Commercial Code”).

General Building Code Requirements for Graded Lumber

Briefly, the 2012 Residential Code requires graded lumber to be used for most structural purposes in new construction, including for floor framing, wall framing and roof framing. *See* Residential Code §§ 502.1, 602.1 and 802.1. Similarly, the 2012 Commercial Code requires that, for those types of new commercial construction that allow wood as a structural component, graded lumber be used. *See generally* Commercial Code, Ch. 23. The 2018 versions of the Residential and Commercial Codes, which will take effect on or about January 1, 2019, contain graded lumber requirements which are highly similar to those in the 2012 versions. Additionally, the 2015 N.C. Existing Building Code requires graded lumber be used for most changes, repairs, additions, alterations or changes in occupancy for residential and commercial buildings.

There are exceptions to the required use of graded lumber, however. For example, ungraded lumber can be used in certain farm buildings. *See* N.C. Gen. Stat. § 143-138(b)(4) (exempting certain farm buildings from all state building codes). Also, after conducting an inspection, a licensed engineer or architect can certify under seal that any “component or element” of a building, including lumber, complies with the Residential or Commercial Codes. *See* N.C. Gen. Stat. §§ 153A-352(c) and (d) and 160A-412(c) and (d) (requiring counties and cities, respectively, to accept such sealed writings). Finally, the NCDOI has issued an interpretation permitting, under Section 105 of the N.C. State Building Code: Administrative Code and Policies, the use of ungraded lumber for the construction of a house or accessory building on the owner’s land if:

1. The timber is cut from the owner’s land;
2. The structure is occupied by the owner or a member of his immediate family for a

- period of at least one year after the Certificate of Occupancy is issued;
3. The lumber meets the 19 percent moisture content requirement at the time of construction by being air dried or kiln dried; and
 4. The homeowner contacts the local building inspection department before the timber is cut to verify the source and use of the timber.

See http://www.ncdoi.com/OSFM/Engineering_and_Codes/Documents/Interpretations4/2012%20Residential/0602.1%20-%20Ungraded%20Lumber.pdf.

Benefits of Graded Versus Ungraded Lumber

By its nature, lumber has naturally occurring defects, such as knots or splits, that can reduce its strength and performance. Additionally, cut lumber may be very moist and, if installed while still moist, may be prone to rot or form mold. Fundamentally, lumber grades are intended to compensate for such shortcomings by standardizing lumber according to its physical characteristics, regardless of the manufacturer, species or log quality.

Lumber is graded using the American Lumber Standards, which are based on the structural integrity of a board. In the United States, there are six associations that develop and publish grade rules and issue grade stamps. Those associations are as follows: Redwood Inspection Service (RIS), Northeastern Lumber Manufacturers Association (NELMA), Northern Hardwood and Pine Manufacturers Association (NHPMA), Southern Pine Inspection Bureau (SPIB), West Coast Lumber Inspection Bureau (WCLB) and Western Wood Products Association. These grades take into account various factors – including the size and location of defects in lumber, the species of lumber and the slope of grain – in order to predict the load-bearing capacity of lumber. Additionally, the grades require that lumber be dried, by air or with

the use of a kiln, in order to lower its moisture content. Grading is performed by machine or else visually after lumber is cut into standard dimensions.

Properly graded and stamped lumber thus assures the public, building inspectors, builders and design professionals that the applicable mill or lumber grading bureau has taken responsibility for the structural integrity and durability of lumber. In contrast, the use of ungraded lumber in projects may result in inconsistent and deficient lumber with a higher risk of failure, both within individual buildings and larger, multi-building developments.

Additionally, graded lumber is preferable to ungraded lumber for financial reasons. For example, builders may offer warranties on new construction, premised in part on their confidence that the components of their buildings, including lumber, are of predictable quality. Additionally, insurers may be unwilling to provide coverage for new construction that has not been built according to the building codes, including particularly with appropriately graded lumber. Finally, many construction materials, such as nails and insulation, have been developed around standard sizes of graded lumber. Using such widely available, standardized construction materials results in greater savings for builders, designers and engineers.

In contrast, if ungraded lumber, without a stamp, were to arrive on a job site, builders and inspectors would not be able themselves to determine the grade because they are not certified to determine lumber grades. The builder or inspector would have to contract with an engineer or certified grader to inspect and report on the lumber. From a financial perspective, this would be more costly and time-consuming than using already graded lumber.

In summary, it is the BCC's position that the current North Carolina requirements that lumber be graded at the lumberyard and stamped appropriately result in more financially efficient structures and greater public safety.