

Questions & Answers
About Proposed New Design Values for
Visually Graded Southern Pine Dimension Lumber
(upon ALSC approval)

October 7, 2011

1 **Q – How are design values derived?**
A – Design values provide guidance for designers to calculate the performance of a structural system and are assigned to six basic lumber properties. Design values for stiffness, as well as the major strength properties of bending, tension and compression parallel-to-grain, are based on data from destructive testing of samples of commercially-produced structural lumber. Design values for the minor strength properties of shear and compression perpendicular-to-grain are based on published clear-wood properties.

Design values for structural lumber go through a rigorous approval process. As the rules-writing agency for Southern Pine lumber, the Southern Pine Inspection Bureau (SPIB) is responsible for developing and publishing design values for Southern Pine. All testing and data analysis must be completed in accordance with approved standards. Proposed design values are submitted to the American Lumber Standard Committee (ALSC). Design values are approved by the ALSC Board of Review following a careful review and recommendation from the U.S. Forest Products Laboratory.

2 **Q – How often are design values changed?**
A – Design values have changed multiple times over the years based on available test data. The lumber industry conducts ongoing testing and invests millions of dollars to provide the most accurate and reliable design values for structural lumber. Comprehensive lumber testing is conducted as new technology becomes available or as warranted by changing resource data. The first significant lumber tests began in the 1920s, resulting in design values based on the strength of small clear-wood specimens. The last major change occurred in 1991 when design values for Southern Pine and other North American species were published based on In-Grade testing of full-size samples of commercially produced lumber.

3 **Q – What prompted the latest testing of Southern Pine lumber?**
A – Since 1994, SPIB has conducted an annual resource monitoring program developed in collaboration with the U.S. Forest Products Laboratory. Although the level established to trigger additional testing was never reached, overall trends in the annual test data suggested a possible shift in the resource mix. These trends, along with anecdotal external information, prompted SPIB to conduct an enhanced testing program.

4 **Q – What testing and data analysis was done?**
A – SPIB and Timber Products Inspection selected full-size No.2 2x4 specimens following a sampling plan approved by ALSC. SPIB and Timber Products conducted destructive tests in bending and tension, plus gathered stiffness and property data, all in accordance with established ASTM standards. SPIB also performed the data analysis in conformance with ASTM standards and then submitted the results to ALSC. SPIB's data analysis is currently being reviewed by FPL.

5 **Q – What were the test results?**
A – The test data indicated reductions in stiffness, as well as bending and tension strength, as compared to previously published design values.

6**Q – Which design values will change?**

A – Design values for visually graded Southern Pine dimension lumber will be reduced for four of the six basic lumber properties:

- Bending (F_b)
- Tension parallel-to-grain (F_t)
- Compression parallel-to-grain (F_c)
- Modulus of Elasticity (E and E_{min})

Proposed new design values for these four properties may be reduced as summarized in the table below.

<i>Proposed New Design Values for Visually Graded Southern Pine Dimension Lumber</i>	<i>CHANGE (approximate)</i>
Bending	-30%
Tension	-20%
Compression	-35%
Modulus of Elasticity	-200,000 psi
Shear	No Change
Compression Perpendicular	No Change
Specific Gravity	No Change

7**Q – What about the design values for the other basic lumber properties?**

A – Design values for the minor strength properties of shear parallel-to-grain (F_v) and compression perpendicular-to-grain ($F_{c\perp}$) are based on specific gravity. The average specific gravity observed from the latest testing of No.2 2x4s was not found to be different enough from the published Southern Pine specific gravity value of 0.55 to warrant a proposed change at this time. Because specific gravity is not proposed to change, the design values for shear and compression-perpendicular-to-grain are also not proposed to change.

8**Q – Which grades and sizes are proposed to change?**

A – New design values are proposed to change for all grades and all sizes of visually graded Southern Pine dimension lumber 2” to 4” thick, 2” and wider. “All grades” includes Select Structural, No.1, No.2, No.3, Stud, Construction, Standard and Utility. “All sizes” includes 2x2s through 2x12s (and wider), 3x3s through 3x12s (and wider), and 4x4s through 4x12s (and wider).

9**Q – How can design values for all grades and all sizes be proposed to change when only No.2 2x4s were tested?**

A – The Southern Pine industry will fill out the full In-Grade testing matrix, sampling Select Structural 2x4s, No.2 and Select Structural 2x8s, and No.2 and Select Structural 2x10s. Testing is scheduled to be completed by Spring 2012. In the interim, ASTM D1990 – the standard for the determination of design values based on tests of full-size pieces of lumber – includes procedures for determining design values for untested grades, sizes and major strength properties.

10**Q – Will the Southern Pine Grading Rules Change?**

A – No. Lumber grades and the rules that define each grade will not change. Only the design values associated with the visual grades of Southern Pine dimension lumber are proposed to change.

11**Q – What About Dense Lumber?**

A – Test results did not indicate enough of a difference between Dense, unclassified and NonDense lumber to continue publishing three different design values for each lumber grade. The result will be a simplified table with design values assigned by lumber grade without density classifications.

12**Q – Will I still be able to specify Dense lumber?**

A – Yes. The SPIB Grading Rules will not change. Dense lumber will remain an option for Southern Pine users requiring Dense material, such as proprietary grades for laminated beams. If Dense lumber is specified, it will have the same new design values as the corresponding unclassified lumber grade.

13**Q – What caused the Southern Pine design values to change?**

A – SPIB did not specifically study why a change occurred, but a change in the timber resource mix is one of many variables that can affect the strength of structural lumber.

14**Q – What about design values for other North American structural lumber species?**

A – Southern Pine is the only lumber species that has been monitored on an annual basis since 1994. This monitoring experience allowed the Southern Pine industry to be the first to conduct an enhanced testing program, making Southern Pine lumber the most tested species in America. Rules-writing agencies responsible for other species are in different stages for evaluating design values.

15**Q – Will there be more testing done on Southern Pine lumber?**

A – Yes. The Southern Pine industry will fill out the full In-Grade testing matrix, sampling Select Structural 2x4s, No.2 and Select Structural 2x8s, and No.2 and Select Structural 2x10s. SPIB and Timber Products Inspection will conduct destructive tests in bending, tension parallel-to-grain and compression parallel-to-grain, plus gather stiffness and property data. Testing is scheduled to be completed by Spring 2012.

16**Q – Will other North American structural lumber species be required to conduct regular testing?**

A – Going forward, ALSC will require destructive testing for the main structural softwood lumber species at least every three years. Southern Pine will continue to be tested on an annual basis.

17**Q – What effect will the new design values have on maximum spans?**

A – Impacts on end uses will depend on the specific application but, in general, maximum spans for typical joist and rafter applications will be reduced.

18**Q – What are the grading options for dimension lumber?**

A – There are two primary grading methods used to sort structural softwood lumber and to assign appropriate design values – visual grading and mechanical grading. Mechanically graded lumber includes Machine Stress Rated (MSR) lumber and Machine Evaluated Lumber (MEL).

19**Q – How will I be able to get the same maximum spans as before?**

A – One option is to specify a higher grade and/or larger size of visually graded Southern Pine lumber. Another option is to specify mechanically graded lumber. For example, possible substitutes for visually graded No.2 2x4 Southern Pine lumber include 1650f-1.5E Machine Stress Rated (MSR) or M-12 Machine Evaluated Lumber (MEL).

20**Q – What about design values for Mixed Southern Pine?**

A – Mixed Southern Pine will have the same design values as Southern Pine. Southern Pine includes the four main species of loblolly, longleaf, shortleaf and slash. Mixed Southern Pine includes Virginia Pine and Pond Pine.

21**Q – Will design values for other Southern Pine lumber products change?**

A – Design values for other Southern Pine lumber products covered by the SPIB's Grading Rules – such as mechanically graded lumber, timbers and specialty items – will not change.

22**Q – Will design values for Southern Pine laminated beams change?**

A – No. Laminated beams use special laminating grading rules requiring visual or mechanical overrides. Before being used in a beam, each piece of laminating stock lumber is evaluated based on more restrictive strength-reducing characteristics than required for visually graded lumber.

23**Q – When will the new design values become effective?**

A – ALSC's Board of Review must approve the proposed new design values before they become effective. ALSC may approve new design values as soon as their next meeting, scheduled for October 20, 2011. Or, ALSC may decide they need additional information, such as the results from SPIB's full In-Grade matrix test results, before granting final approval. Upon ALSC approval, SPIB will publish new design values for visually graded Southern Pine lumber in *Supplement No.9 to the 2002 Standard Grading Rules for Southern Pine Lumber*. The new design values will become effective on the date SPIB's Supplement becomes effective, about a day following ALSC's final approval.

24**Q – What does this mean for existing inventories of lumber in the supply chain?**

A – Existing inventory can still be used, but it may need to be used differently. Visually graded dimension lumber is identified with a grade mark that includes the grade name (e.g. No.2), but not the specific design values associated with that grade name. Therefore, existing inventory will have the new design values associated with it as of the effective date of SPIB's *Supplement No.9*. As before, Southern Pine grades and sizes should be used as specified on plans or construction drawings.

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Q – When will the new design values be in the building code?

A – The 2012 Edition of the *National Design Specification® for Wood Construction* is adopted by reference into the 2012 International Building Code®. If the new design values are approved at the October 20, 2011 ALSC Board of Review meeting, the American Wood Council (AWC) will include the new design values for visually graded Southern Pine dimension lumber in the printed version of the 2012 *NDS® Design Values for Wood Construction Supplement*. If the new design values are approved by ALSC at a later date, AWC will likely publish an addendum to the NDS Supplement at that time.

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Q – How will I know when new span tables and other related design publications based on the new design values are available?

A – The wood products industry will update documents related to new design values as quickly as possible after they are approved. [Click here](#) to receive update notices from the Southern Forest Products Association. Or visit industry association websites to look for:

- Southern Pine design values, span tables & product use information from the [Southern Forest Products Assn](#)
- Codes and Standards from the [American Wood Council](#)
- Southern Pine Grading Rules from the [Southern Pine Inspection Bureau](#)

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Q – Will these changes affect my existing home?

A – Like other building materials, wood products used in construction must meet building code requirements. The integrity of existing structures designed and built using design values meeting applicable building codes at the time of permitting does not change. When properly designed and built, light-frame wood construction includes repetitive structural systems for continued performance.

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Q – What impact will the new design values have on homes built in the future?

A – Homeowners should not notice much difference, but building designers may configure the individual pieces of lumber differently in the structural system. Building materials used in construction have guidelines for proper use. Wood product guidelines incorporating the new design values will continue to include a series of redundancies and checks and balances.

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Q – Should I continue to buy Southern Pine?

A – Yes. Southern Pine lumber remains one of the best construction products on the market today. It is the only lumber species that has been monitored annually since 1994, making it the most tested wood species in America. Southern Pine lumber continues to provide great value with its dependable strength and superior treatability against decay and termites. Southern Pine forests are some of the most productive and sustainable timberlands in the world, capturing large amounts of carbon from the air and storing it in lumber used every day. Southern Pine is grown and manufactured in the U.S. South, further improving local economies, reducing transportation costs and minimizing impacts on the environment.

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Q – Where can I get more information?

A – Visit www.southernpine.com for more information, including a complete listing of the new design values once they are approved.

SFPA is a nonprofit trade association that has represented manufacturers of Southern Pine lumber since 1915. Today, SFPA is the leading source of information about Southern Pine products for design-build professionals and consumers.

www.southernpine.com www.sfpa.org