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I had to do a lot of layout revision to make this readable. It still looks a bit choppy.

Regards,
Rich

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CLT STUDY: ENCOURAGING RESULTS

BUILDING INDUSTRY RECEPTIVE TO CROSS-LAMINATED
TIMBER BUT MORE EDUCATION NEEDED TO BOOST CLT
AWARENESS IN WOOD PRODUCTS SECTOR.

BY RICHARD VLOSKY, RAJAN PARAJULI,
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PHOTOS BY SMARTLAM, LLC.

As chronicled in the May/June issue of Forest Landowner magazine (“CLT Gains Momentum”), mass timber products such as cross-laminated timber (CLT) are becoming widely prevalent in the design and construction sector.

Being a cost-effective, carbon efficient, durable, and sustainable building option, mass timber construction already has had a profound impact in residential and non-residential applications in Europe. Likewise, it has been reaching new heights in Canada, and is recently gaining momentum in the United States.

Envisioned as a substitute for the traditional building materials of concrete, masonry, and steel, these new timber products should excite forestry stakeholders. While the Pacific Northwest has been leading efforts in both production and consumption of mass timber products for the past several years, mass timber is still relatively new to the Southern United States.

The most widespread mass timber product is CLT, which already has proven to be a remarkable alternative to traditional building materials such as concrete and steel. The CLT concept is similar to plywood, except for the use of dimensional lumber instead of veneer layers.

CLT panels consist of an odd number of layers (typically three to nine) of dimensional lumber stacked perpendicular to the adjacent layers and then glued together to form structural panels. With this configuration, adjacent layers reinforce the entire panel, adding to dimensional stability, exceptional strength, and rigidity in both directions.

CLT panels consist of only two materials: lumber and adhesive. While locally produced softwood lumber is primarily used in CLT panel manufacturing, some initiatives have recently explored the possibility of using underutilized hardwoods in CLT manufacturing in the United States.

CLT has been used for more than 30 years in Europe and Australia, including single and multi-family residential buildings, schools, and office buildings. CLT panels are ready-to-use with lengths up to 60 feet and widths up to 10 feet, used in structural walls, ceilings and roofs. CLT panels are typically prefabricated with pre-cut openings for doors, windows, and stairs. As its strength is equivalent to concrete and steel to replace in multistory buildings, CLT has been used as both a standalone system in construction as well as in hybrid applications with steel and concrete.

As the United States looks for ways to reduce its carbon footprint, the commercial construction industry and architects are searching for more sustainable products that are cost effective, energy efficient, structurally sound, and environmentally friendly. A key component of an integrated campaign to replace concrete and steel with engineered wood products in modern residential and commercial buildings is to conduct baseline research to provide information on the efficacy of using wood in these applications.

Previous research and development to date has focused on using Douglas fir and other species from the Pacific Northwest region. For this study, the Louisiana Forest Products Development Center, Louisiana State University Agricultural Center partnered with funding and non-funding entities to conduct an analysis of the awareness, understanding, perceptions, and current use of cross-laminated timber (CLT) in the U.S. South, which previously has not been studied.

THE STUDY

This study was conducted to better understand the dynamics of CLT production in the nation's southern wood supply from the non-residential builders, architects, and engineers (structural, civil, and architectural).

Mail-based survey techniques were used to assess the current market knowledge base for CLT in the South. Study partners helped to review and revise the study instruments, and provide general support and knowledge for the study.

In addition, stakeholders such as state and local economic development entities were included in discussions over the duration of the project. For the survey component, random samples were taken from the demand/influencer sectors.

Pre-notification postcards, a first survey mailing with a postage-paid envelope, reminder postcards, and a second survey mailing were sent to all study recipients. After accounting for undeliverable surveys, primarily firms that had gone out of business, incomplete surveys, and non-responses, the adjusted response rates were: non-residential builders (10 percent, 87 useable responses), architects (14 percent, 116 useable responses), and engineers (12 percent, 228 useable responses).

RESULTS

In order to capture a “general influencer” profile, these three groups were combined for this article. As a baseline, we first asked about importance of various performance factors when specifying or using structural construction materials in general (including concrete, steel and wood). Top ranked is structural performance followed by durability over time. Ranked last was LEED environmental credits. We then focused on wood structural/engineered wood products that respondents actually used in the previous year.

Structural plywood and oriented strandboard were tied at the top with nearly 80 percent of respondents using both products. At the bottom of the list is a new product called mass plywood panels (MPP) with only 3 percent of respondents using this product. Next to last are cross-laminated panels (CLT) with 7 percent of respondents.

Whether or not they used CLT, 51 percent of respondents are “somewhat familiar” with the product and five percent are “very familiar.” The remaining 44 percent are “not familiar at all” with CLT.

A logical follow-up question we asked was “If CLT was available in your region, how likely would you be to use CLT in one of your building projects?” Tracking with familiarity, 33 percent of respondents are either “somewhat likely” or “very likely” to use CLT if it was available in their region. Only 10 percent were either “somewhat unlikely” or “not likely at all” to use CLT. The remaining 58 percent are uncertain.

These findings suggest that the lack of CLT awareness needs to be addressed as soon as possible for this product to gain exposure and be adopted in the U.S. South. In general for the United States, 60 percent of respondents believe CLT use

will either somewhat or significantly increase over the next year.

Obviously, if projected CLT growth does not take place in the South, other U.S. regions and species, other than Southern Yellow Pine (SYP), will be first to market. In fact, being a lead adopter is the least of respondents concerns with specifying/using SYP. Building codes and CLT availability are the greatest concerns.

The last question for respondents that are not specifying or using CLT, specifically examines what information or activities they believe would increase their understanding of CLT. Continuing education courses and an understanding of technical specifications are clearly the most important means and information, respectively.

For the 30 respondents that actually specified or used CLT, the study shows the reasons that they chose CLT over steel or concrete in the instances when they did so. There is a misconception that the installed cost of CLT exceeds that of steel or concrete. Clearly, this is not the case with the respondents with 100 percent stating that CLT provided a lower total cost.



Speed of construction has been shown to be much more rapid by using pre-cut CLT panels. In many cases, CLT buildings can be built at a rate of a story in less than a week. The



Cross-laminated timber (CLT) has gained industry in recent years as a strong bu

other reasons listed are inherently unique to wood

The U.S. South, meaning the 13 states from Virginia to Texas, has approximately 245 million acres of forestland, covering about 46 percent of the total land use (Oswalt et al. 2018). Of these, almost 85 percent is timberland (forestland capable of producing industrial wood), which produces about 60 percent of the nation's timber products.

The region is the largest wood basket in the world supporting vibrant forest product industries, and is projected to remain the dominant region for many decades to come. Several sawmills, pulp and OSB mills, and recently pellet mills, have been consuming much of the wood and fiber resources available throughout the region.

Recent data trends show that timber markets for softwood products in the South have rebounded since the 2007-2008

Great Recession, although not to pre-recession levels of demand.

Timber markets for both softwood and hardwood species are stable with significant investment in lumber manufacturing in the Southern Region. The supply is more than adequate to support a robust CLT industry. Low-value wood and small-diameter trees can also be used in mass timber production; there is a significant opportunity for the mass timber industry to grow from a perspective of raw-materials availability.

To date, International Beams in Dothan, Alabama, is the only mass timber producer in the study region (using SYP), which began production this year. With the abundance of SYP,

there are opportunities for CLT mills in the U.S. South to be part of the nascent but rapidly growing CLT sector.





and a foothold in the U.S. forest products building material alternative.

Rural towns, foresters, forest landowners and others in the CLT supply chain would benefit economically as has been shown with other types mills in the region. Aside from the economic benefits, the introduction of CLT would give architects and builders access to the material, allowing them to reduce the carbon footprint by building with wood instead of steel and concrete.

Region-wide success would be determined by architects, builders, engineers, and the public's acceptance of using timber as a substitute for conventional concrete and steel. Research, development, and successful examples will help to convince southern stakeholders and influencers as well as the general public of the soundness of using CLT. As we look to the future, perceptions can change, but it will take open minds and forward thinkers to take advantage of the resources in the U.S. South. ●