

Freres Lumber Company, Inc.

Located in Lyons, Oregon

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A Revolution in Mass Timber

Editorial by: Tyler Freres

Mass Timber is set to revolutionize modern construction. After a century using only concrete and steel frames in multi-story structures, architects, engineers, and developers are opening their minds to this new building material. The promise of mass timber is that we can build taller wood buildings, faster, with less waste and less labor. Mass Timber buildings can be built with more precision, let customers experience the natural beauty of the material, and even sequester carbon in the process. Wood could likely be the sexy “new” material of the next century, billed as the greenest building material available. It is completely renewable, completely recyclable, and has none of the byproducts typical of steel and concrete construction. What’s not to love?



Aerial view of Plant 6-Freres MPP Facility.



Kyle Freres, Ted Freres, Rob Freres, Tyler Freres with new Mass Plywood Panel product

We are at the beginning of this epic journey away from concrete and steel, so it is safe to predict that the hurdles and setbacks could exceed the successes for the immediate foreseeable future. The Mass Timber Ad-hoc Committee, American Wood Council, and the Softwood Lumber Board have done a phenomenal job proposing code changes to the International Building Code (IBC) to permit mass timber buildings up to 12 stories unprotected for fire and 18 stories covered with gypsum wall board. The process is long, however, and the IBC is not expected to adopt the proposed changes until 2021. Most states will not adopt the proposed changes for 2-5 years after that. Doing the quick math, this all means that mass timber will not be readily accepted for multi-story construction until 2023 to 2026. The good news is that Oregon and Washington have both approved special alternate methods for approval of buildings that meet the proposed IBC code changes.

One could assume that without an easy path towards code approval, mass timber projects would not be progressing beyond the design phase. However, amazingly enough, there are mass timber projects rapidly

advancing across the US, regardless of the fact that some states haven’t shown a willingness to expedite code changes. We have quoted and delivered projects as far away from Oregon as New York and Atlanta. If current demand, even considering all the hurdles mass timber projects are tackling, is indicative of future demand, then this new mass timber market is set to surprise everyone.

Mass timber is being embraced because North America has an ethos of building with wood. Century old factories are still impressively standing with massive solid timber beams joined by complicated connections. Traditional floors are made from ship-lapped dimensional lumber. We are less developing a new system of construction than we are rediscovering the construction system used prior to concrete and steel.



Plant 6: MPP Product with a flange

Continued from page 8

Despite the widespread interest and growth potential, the reality of bringing mass timber to market is much more difficult than it sounds, however. Typical lumber or veneer manufacturers don't have the expertise to graduate to "engineered wood" manufacturers. You might assume that gluing wood together is easy and that there is a sufficient roadmap to guide a potential manufacturer. What we have seen, however, is that there are enough dead-end routes that every manufacturer makes mistakes. No one is immune and mistakes are extremely costly. The nightmare scenario for any manufacturer is panel failure at any stage of the building life. Unlike selling truckloads of wood, the panel manufacturer is going to own the risk entailed with a building through its lifetime.

One of the most significant problems is the development period until project development. Mass timber projects are long in development and quick in implementation. There might be months of design/build guidance prior to getting a project on the books or before any cash trades hands. The construction industry is not currently set up to prepay wood panel producers for services provided prior to beginning building construction. A contractor must know that the structural wood elements to a building must be paid, at least in part, prior to panel delivery and that must be built into the cash flow structure of the project. It is very different from selling a truckload of wood with short payment terms. Cash flow is king, and it remains a significant hurdle in mass timber development. I expect that there will continue to be manufacturers who fail as they try to manage the capital requirements to install a mass timber production facility while simultaneously trying to bring their new product to market.



MPP "Lounge" Designed by Lever Architecture. Engineered by KPFF.

product. There is no standardization. The risk of inferior and superior products is large which will create a tiered marketplace. Customers care about spans, efficiency, and cost. The companies that can deliver in these areas will succeed.

In a perfect world, the savings in time and labor that result from constructing buildings out of pre-fabricated wood panels would lead to immediate adoption across all building sectors. The reality is that many building projects that are currently exploring mass timber are designed to utilize standard light wood frame construction. We are not competing against our mass timber peers, but rather against this extremely efficient construction system that is restricted by code to only build up to 5 stories with a concrete podium. These 5- and 6-story buildings represent the bulk of the current market and are extremely competitive from a pricing perspective. We can truly say that mass timber has come into its own when we can provide more environmentally desirable buildings that are cost competitive with light wood frame construction and developers and contractors understand the cost tradeoff.



International Mass Timber Conference Manufacturing Tour at world's first Mass Plywood Panel manufacturing facility, owned and operated by Freres Lumber Co. in Mill City, Oregon.



MPP used in construction at OSU's Advanced Wood Products laboratory. Typical panel dimensions were 3" thick by 12' wide by 42' long.

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