2019 Annual Conference
March 13 -15 2019
Orlando, FL

TIMBER! Wood-frame Construction Claims and How They Come Crashing Down

Recent Trends in Wood-Frame Construction: Wood building increasing in prevalence and complexity, both in commercial and residential markets.

Unlike steel or concrete, wood is an organic living thing. It has imperfections, knots, and variations in grain: all properties that reduce the *reliability* of its strength. There are softwoods (Cedar, Pine, Spruce, Juniper) and hardwoods (Oak, Hickory, Cherry, Mahogany, Maple, Teak, Walnut). Most woods built centuries ago were hardwoods, now we build with softwoods because they regenerate more quickly. And of those, we are using younger softwoods because of high demand. Additionally, wood naturally dries and changes shape with age and load as we build, which is referred to as “checking” and “twisting”. Wood is cut, formed, transported, stored and installed in various temperature and moisture conditions. Then the building is enclosed and subjected to a completely different CONTROLLED environment with specific temperature and moisture conditions under which it will perform its useful life. Being an organic material, it naturally is sensitive to environmental changes and will change shape and perform differently. All of these factors mean that we’re building with a material that is consistently inconsistent and unlike our traditional building materials such as concrete and steel.

So, we try to “engineer” out these imperfections with use of engineered wood products such as Cross Laminated Timber (CLT), Glue Laminated Timber (Glu-Lam) and other products. These products are good for more commercial building applications, but they have their own set of inconsistencies in the way that they are manufactured, stored, transported and installed.

In addition, while Europe has been building with engineered wood products for decades, we here in the US are fairly new to it and there’s absolutely a learning curve associated with these materials in every phase of the production including design, manufacturing and installation.

So why do we want to build with this stuff anyway? Well, wood is inexpensive, easily accessible (especially with the current foreign trade challenges), goes up quickly, supports the "green" movement, supports the US economy, and let's face it…it's more aesthetically pleasing when left exposed as part of the architectural detail. Wood is in.

However, it has its challenges even beyond the physical properties described above. A few of these challenges include: Material integration issues (e.g. flexible wood connections with a more brittle building component), mold due to wet storage or transportation conditions, poor quality and workmanship in the field, fire safety concerns and political opposition (e.g. the Portland Cement Association rallying against wood-frame building).

The properties of wood were a non-sequitur during its early use. The origin of construction tells us building was for shelter. Hence, early builders utilized the materials available to them in the location of the intended structure. The earliest of documented shelters dates back to Neolithic times and evidences use of stones on the cliffs of Scotland. Meanwhile early Roman cultures are documented with a mortar-type substance similar to a modern day concrete, pozzolana. Yet other civilizations utilized large reed trees from the banks of rivers where their shelters were constructed. The Skara Brae of Scotland had no options in their building materials, they constructed with the natural resources available in their geographic location. Unlike the earliest of builders, modern day constructors have the ability to import materials – shipping building materials throughout the country to accommodate the demands (and desires) of construction. How else would we see wood-framed construction in the deserts of Arizona? And while I am happy to maintain hardwood floors reminiscent of my northwest roots in my Arizona home, shipping wood outside its native environment creates a host of climatization factors.

Due to its organic properties, it stands to reason timber requires a moist environment for cultivation. Thus, timber grows naturally in temperate and tropical areas; – the wet wilderness of the Pacific Northwest and humid region of the south American rain forests. But we know – that wood-based construction is not limited to these regions. Wood is shipped all over the world and subjected to different levels of humidity and environmental conditions. Woodworking specialists recommend all wood climatize for at least three days in each new environment for which it is subjected. Following this logic, timber imported from the rain forests of Brazil would spend days in a shipping container in its trek to a port in Los Angeles, United States. Acclimation one. From Los Angeles, the timber is loaded onto trucks for its journey across the United States, destination Florida. Acclimation two. Upon arrival to Florida, the wood sits in a lumberyard awaiting its final destination. Acclimation three. Finally, the timber is delivered to a new residential community where it is stacked on the jobsite awaiting use. Acclimation four. Properly acclimatized wood would be allowed to spend three days in each of the new subjected environments. But what is the construction industry standard practice for transport and arrival of new timber?

And not only are we concerned with the properties of timber, but also its integration with dissimilar materials. Wood flooring is placed on concrete, wood cabinets are hung on gypsum board, tile and composite roofs are fastened to wood sheathing.

What happens to the adjacent materials when wood expands and contracts with its subjected environmental changes? Why do tiles crack? Why do cabinets pull away from the wall? Why are their gaps in the corners of windows at the wall intersection? Movement is inevitable – but how can we promote an integrous structure while utilizing both organic and inorganic materials.

The answers lie in understanding the various properties of the different building materials. Acknowledging the expected movement and integrating a plan which allows for expansion and contraction can prevent the unwanted damage commonly seen when dissimilar materials are not allowed to move freely together as a system. Expansion joints, caulking, and intended spacing are all intentional construction elements which anticipate the organic properties of wood (and other dissimilar materials). The depth of literature available on joining dissimilar materials seems to suggest welders and other metal workers are ahead of the curve in their understanding in this respect.

And while the properties of timber may create a challenge in building, sometimes the greatest danger is man-related. With the arrival of the Green Movement in the 1970's – Americans sought ways to achieve higher levels of environmentally friendliness. In many ways' "friendliness" was interchanged with efficiency. Efficiencies in heating and cooling were identified in residential (and commercial) construction as a pathway to minimizing waste. One theory promulgated escaped heating and cooling created energy waste. As a result, both builders and consumers alike sought construction which reduced consumption… and the airtight building concept was born. And while this new green construction may have reduced energy consumption, it neglected the impact of a new "airtight" construction on the organic properties of timber. Thus, as a built structure was buttoned up - the inside was sealed away from the outside. And while the intention of this building philosophy was to reduce waste and secure cleaner air and water, it failed to account for the organic properties of a built environment. And so, as a "sealed up" green home was exposed to a changing climate, the freeze-thaw cycle, and other naturally occurring environmental conditions (rain, humidity, sunshine), its new-found efficiency designs failed to allow the building materials to breathe and expand and contract with the changing of exposures. Thus, moisture exposed materials which previously maintained adequate air movement to dry naturally were permitted to remain in place (unknowingly) with higher moisture contents. Gypboard, roofing materials, flooring – all were starved of their essential need to co-exist with the external environment. So, while energy efficiency may have increased, the lifespan of building materials decreased. The lessons learned from a hermetically sealed structure have trickled down and builders have begun to understand the organic nature of many building materials and we see more accommodation for a built structure to breathe as intended. But the same understanding cannot be said for all property owners.

Not only does the integrity of a structure require understanding by the constructor regarding the organic properties of timber at the time of construction, but also the post-construction inhabitants who are charged with the structure's future care. Newton's First Law tells us that what is in motion stays in motion. That is to say the last day of construction is the first day of deterioration of a structure (vis a vis its components).

All building materials have a life span. Absence maintenance and intervention, building materials' life expectancy will trend toward failure. Re-staining decks, re-painting exterior cladding, regrading landscaping, re-finishing hardwood floors are all ways which building owners can intervene in a building's lifespan and reset the natural trajectory of deterioration. The built environment is a natural structure. And just like our aging skin and bodies, requires a little TLC to promote a healthy and extended life.

While insurance is neither the only, nor the optimal way, to address liability related to wood-frame construction, it is critical to note that entities participating in wood-frame construction must maintain an appropriate insurance policy. The scope of coverage provided is often just as important as the definitions of the services covered.

Carrier appetite is a key factor in obtaining coverage, as some environmental and construction-related professional liability markets will not write or are restrictive with respect to contractors who participate in wood-frame construction regardless of the percentage of their work relating to wood-frame construction. Additional markets may not write entities performing any residential work, while others limit their appetite to exclude single-family home construction and/or set coverage restrictions on claims involving wood-frame or habitational projects such as heightened deductibles, sublimit, etc. Some markets look at companies on a case-by-case basis, reviewing a potential insured's business globally, noting their work/project history, company policies, and more as part of their consideration. Carriers consider the specific work performed by the contractor, including whether they transport and store wood, their level of experience and prior involvement in wood-framing (along with claim history, of course), procedure of contract review including indemnification agreements in their standard contracts, pre-qualifications for subcontractors, protection taken via contract to ensure adequacy of insurance coverage maintained by downstream parties, and more.

The pollution/ environmental markets will certainly focus on the significant amount of mold-related claims in wood-framing construction. Beyond pollution/environmental exposure, it is imperative those entities working on these projects are adequately addressing their professional liability exposures as well. Mold claims often include allegations of errors and omissions in professional services: in other words, a professional error may lead to moisture build-up or encapsulation with subsequent mold growth which should be addressed in a well-placed professional liability policy without pollution/mold exclusions. Typical wood-frame construction claims also involve allegations concerning structural design flaws, project mismanagement, and various other claims which are common throughout the construction industry and not exclusive to wood-frame projects.

Once the insurer provides a quote, it is critical to assess the coverage being offered, particularly as pertains to wood-frame construction since coverage may be carved out from standard insuring agreements, especially in the environmental and construction-related professional liability insurance marketplace where there are no standardized policy forms, unlike the ISO-based CGL marketplace. Key areas of concern include identifying what exclusions/limitations/definitions and coverage conditions are provided? What is the type of mold/bacteria coverage provided? How has the carrier defined professional and/or contracting services? Will the carrier offer claims-made coverage or occurrence coverage? What policy limits are offered, and how do the self-insured retentions/deductibles look? These are only some of the important factors to consider. What appears to be the best coverage may not be the optimal solution for the insured.

Let's explore the liability conversation a bit further. With wood-frame construction, the risk for claims and liability exposure is not limited to the framer. Rather, claims could be brought against the whole range of players in the chain of commerce for the lumber products and the construction of the project, including lumber mills and lumberyards, suppliers, distributors, subcontractors, general contractors, and developers/owners. However, the liability exposures will differ for each. Construction contracts are critical to protect the construction parties involved in a wood-frame project as in any construction project. However, for wood-frame construction, the responsibilities of the various players may be more complicated. Also, as discussed below, the advent of technology and delivery method changes also should be considered carefully in the construction contracts.

Risk transfer is one of the key items in construction contracts and all involved in wood-frame construction must ensure that they have carefully crafted their contracts. Oftentimes, the supplier and lumberyard parties view their roles as disconnected from liability in a construction defect claim. However, for wood-frame construction, the condition of the timber and the handling by the lumberyard may very well come into play. Thus, it is critical for these supplier parties to ensure that they are careful in their contracts. Often, these transactions are simply conducted using a purchase order or invoice without any terms or considerations for the potential liability. This impacts the subcontractor who is procuring the materials as well (or the owner or general contractor, depending in the project delivery and details).

General contractors have the least direct contact and control over the materials used. However, in the contracts with the subcontractors, and sometimes the suppliers directly, the general contractor can ensure that it is calling for and requiring certain types of products, requiring properly handling and storage of the timber materials, and that it is looking carefully at the design issues to ensure that the unique properties and considerations of timer materials is considered and/or raised in RFIs to the design team.

As the designers, the architect and engineer must be aware of the properties of wood and engineered wood products as the source of many of the problems may emerge from the design. When the owner is seeking a certain “look,” the design team may not take the challenges of wood into account. If the design team is working with contractors who have not used engineered wood products, careful attention to details and specifications on certain products may be required.

The use of wood-frame high rise projects is also trending in construction in the United States. Projects are starting to use more large-scale structural wood systems, including heavy timbers, engineered framing systems, and other modern wood products. The number of new buildings of this kind has been trending modestly upward, spurred by such benefits as sustainability, cost effectiveness, and reduced construction impact. There have been podium-type concrete and light-framed hybrids used in the U.S., and heavier “mass timber” structures elsewhere.

Many discussions of the increased use of drones in the construction process and in forensic investigation have been had over the last few years. However, with wood-frame and structural wood systems being used on high rise projects, builders and developers are starting to integrate these technologies to document the construction process, the moisture content, and the integration of the various systems. Where less consideration has been given is to the impact of the increase of design-build delivery methods on wood-frame projects. The selection of the materials and design of the systems carry additional ramifications for all in the construction process. Is the lumber supplier making a recommendation to the subcontractor on what products to use? Does the design team have a clear understanding of the details and impacts of the different products? Is the general contractor ensuring that the subcontractor is properly storing and handling the materials? All of these issues become blurred when all of the parties involved have a more free-flowing responsibility for making these decisions on the design, constructability, and workmanship.

When these claims turn into legal disputes, a whole host of other challenges can emerge. Plaintiff’s attorneys have been getting creative with strategy. Since designers have less insurance (and may have exhausted limits), they opt to settle out those parties early, removing them from the case, effectively making the case joint and several. Additionally, the evasive nature of the origin of a water intrusion claim results in experts struggling to define a root cause and therefore properly assign liability. If one cannot trace the origin, then who’s to determine culpability? If the exterior wall contractor and the wood-framer both performed quality work, it could simply the intersection of incompatible materials that caused the breach…leaving either both parties or neither parties liable! So, we’re back to the design team’s professional liability policy, where there’s likely little opportunity for recovery.

In conclusion, it's important to recognize the dynamic properties of wood as a building material, and the risk implications of wood in the construction, post-construction, and maintenance phases of a building life cycle. Proper diligence in risk assessment and mitigation processes at all phases of construction operations, procuring the appropriate insurance policies and coverage, and securing effective and enforceable indemnity and contractual risk transfer are the building blocks to successful risk management for wood-frame construction projects.