Platte Fifteen

Adolfson & Peterson Construction

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12 - Best Building Project | General Contractor ($40 - $70 Million)

In the heart of downtown sits the Platte Fifteen building, Denver's first facility to utilize sustainable Cross-laminated timber (CLT). Featuring highly efficient floor plates and zero lot line construction, this unique 5-story (150,418-sf) building earned a Best Project award in the Office/Retail/Mixed-Use Development category from ENR Mountain States. Other amenities and features include 10-ft full height glass, a fitness center, 2 stories (85,000 sf) of below grade parking, a rooftop deck with unobstructed views of downtown Denver and the Rocky Mountains, usable common areas, a secured lobby, bike storage and a commuter locker room.

The benefits of CLT are numerous. It is lightweight but strong, with excellent acoustic, fire, seismic and thermal performance. Wood production emits much less carbon dioxide than concrete or steel and the growing trees actually sequester the CO2, keeping it trapped within its fibers, avoiding emission into the atmosphere. The project used a wood product volume that U.S and Canadian forests can produce in just seven minutes. The total potential carbon benefit of the building is equivalent to taking 1066 cars off the road for a year and the energy to operate 474 homes for a year.

While CLT proved the best material for the job, it did pose a cost challenge. It became important that the entire team work together with input from all stakeholders early in the construction process to make the most informed financial decisions. Making the higher cost of wood palatable to the owner meant working directly with the manufacturer to find creative ways of mitigating cost exposure. CLT was uncharted territory – for AP and the state of Colorado – which meant that planning costs and researching design logistics would have to be carefully done. Choosing an experienced wood manufacturer early was imperative. The manufacturer's expert knowledge was invaluable in finding more efficient and optimal designs, going beyond what the project team's engineers and designers could provide. The project team took several trips to Canada before construction began to evaluate wood buildings and research manufacturing. From these

visits they were able to navigate the aesthetic challenges of CLT structures and discover creative cost mitigation.

To ensure perfect execution of the prefabricated CLT pieces in the field, AP's BIM team worked closely with trade partners, structural engineers and the architect to create a virtual mockup of the exterior skin of the building. By creating a coordination model that consolidated structural, architectural and glazing details in one place, the team was able to walk through sequencing, connections and other critical details. This allowed them to visualize the sequence of installation and identify issues with the design details that were not apparent in the 2D drawings. Needed adjustments were discussed, and a clear path forward was agreed upon long before construction began. Once the digital mockup was complete, the team built physical mockups to ensure everything came together correctly. The team coordinated every detail, down to 2" penetrations that where pre-drilled in Canada by the manufacturer prior to shipping to Denver.

To preserve the clean look and feel of the CLT materials, AP coordinated every location where piping, conduits and ductwork would need to penetrate the CLT panels. This information was added to the CLT shop drawings, so it could be incorporated into the manufacturing process. By cutting and drilling these openings in the factory rather than on-site, the beautiful, clean look of the material was preserved while increasing efficiency in the field. Not only is this approach more collaborative and cheaper than correcting issues in the physical model, it also ensures an efficient construction process. This allowed for more prefabrication, thus, better schedule certainty.

This project was the first project in AP's history in Colorado to utilize a tower crane. With the crane, there was a constant flow of material being hoisted to the upper floors. Certified riggers were always using outrigger landing platforms, and signaling whistles were used constantly when the loads were on the move. This was compounded by the zero-lot line of the project, so we had to utilize two different permanent project-long street closures in order to stage materials to off-load. The City of Denver's Right of Way Services allowed the project team to shift traffic lanes on both Platte Street and 15th Street and a "just in time" delivery schedule was utilized for the entire project.

Constructing the subgrade required a dewatering system since the mat slab was located below the water table. This proved to be harder than expected on an already tight site, as the South Platte River was within a couple hundred yards downhill. AP, the erosion designer, the City of Denver Storm Water Division came up with a clever mitigation solution to keep Colorado waters clean during the construction.

In addition to the high groundwater table, the project's two stories of underground parking meant that a typical drilled-pier foundation system was not an option. Instead the structure sits on a waterproofed 32-in slab of concrete designed to support the structural loads and columns of the floors above, while preventing water intrusion from below. Within this 32-in slab is a complicated system of piping ranging from 4-in pipes to 8-in pipes, designed to capture and funnel storm and sanitary water away from the building's foundation and into a designated sand/water interceptor. From there the water is filtered and clean water is pumped into the City's sewer system. With this type of foundation, a permanent dewatering system is unnecessary, which eliminates the costly maintenance over the lifetime of the building.

Designing and installing a fall protection system proved a challenge, as all the building's structure is exposed final product, which means it was impossible to fasten or anchor to the structure. The project team's solution involved making temporary framed panels that acted as both guardrails and weather protection, spanning from floor to floor without damaging the finish on the columns and exposed ceiling and slab.

The Canadian structural erection crew required additional training to adapt to US OSHA standards. The team ensured success by reiterating appropriate fall protection anchorage points throughout the project and held daily foreman's huddles and monthly All-Hands Safety meetings.

In constructing Denver's first CLT building, the team felt a deep responsibility to educate the public on the benefits and features of CLT. Since the material was so new to the Denver market, many stakeholders and students were unaware of its intricacies, advantages and logistics. The

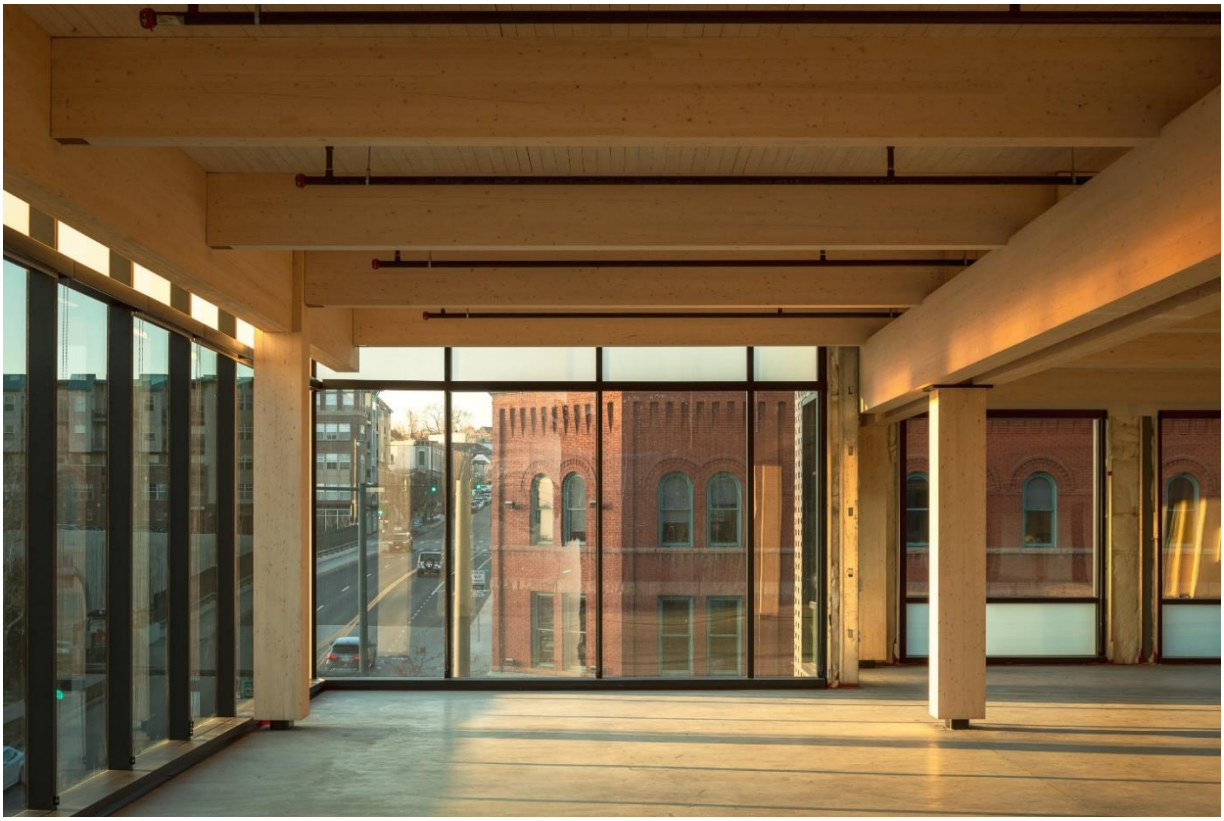
team contacted the construction management and architecture departments of surrounding higher education facilities, giving students tours of the building and providing first-hand education on CLT construction. Colorado School of Mines conducted moisture testing on the building – contributing to mass timber testing in a dryer climate rather than in Pacific Northwest areas where they had previously tested.

Educating municipalities was also a must. The team conducted tours for the City of Denver to aid in early adoption of the tall mass timber code provisions approved for the 2021 International Building Code (IBC). South Metro Fire Department was given tours to help them understand mass timber from a fire fighting standpoint. The team also brought in surety partners to inform them of the difference between mass timber and light frame construction, allowing them to better detail risk exposure. Lastly, Wood Products Council, Woodworks, conducted the first acoustic testing for an office of this type on the Platte Fifteen building.

The look of CLT captured the OZ Architecture team's imagination because of its inherent beauty and authenticity, as well as the opportunity to provide a sustainably built solution. Exploring the use of mass timber is beneficial environmentally and creates wonderfully warm, natural, biophilic spaces that enrich human experiences. Biophilic design reconnects people with nature and is said to have positive physical and mental health impacts, along with increased productivity for the building's occupants.

OZ was inspired by the architectural character and context of the neighborhood and spent time studying the facades of the surrounding historic brick buildings for inspiration in terms of proportion, scale and detail. They felt it was important to respect this historic site and reinterpret it in a contemporary way as part of this transformational opportunity for the City. Overall, this will result in a working environment where people can enjoy a warm, inviting atmosphere naturally enriched using mass timber. In turn, the architect proved that wood is a cost-viable, sustainable structural option with regenerative benefits for mid-rise commercial construction. The curtain wall system that makes up most of the facade on both Platte St. and 15th St., shows the wood structure at all the upper floors. To top it off, the rooftop patio features three different planter boxes and a large Cumaru wood seating area that tenants can enjoy throughout the day.


15th

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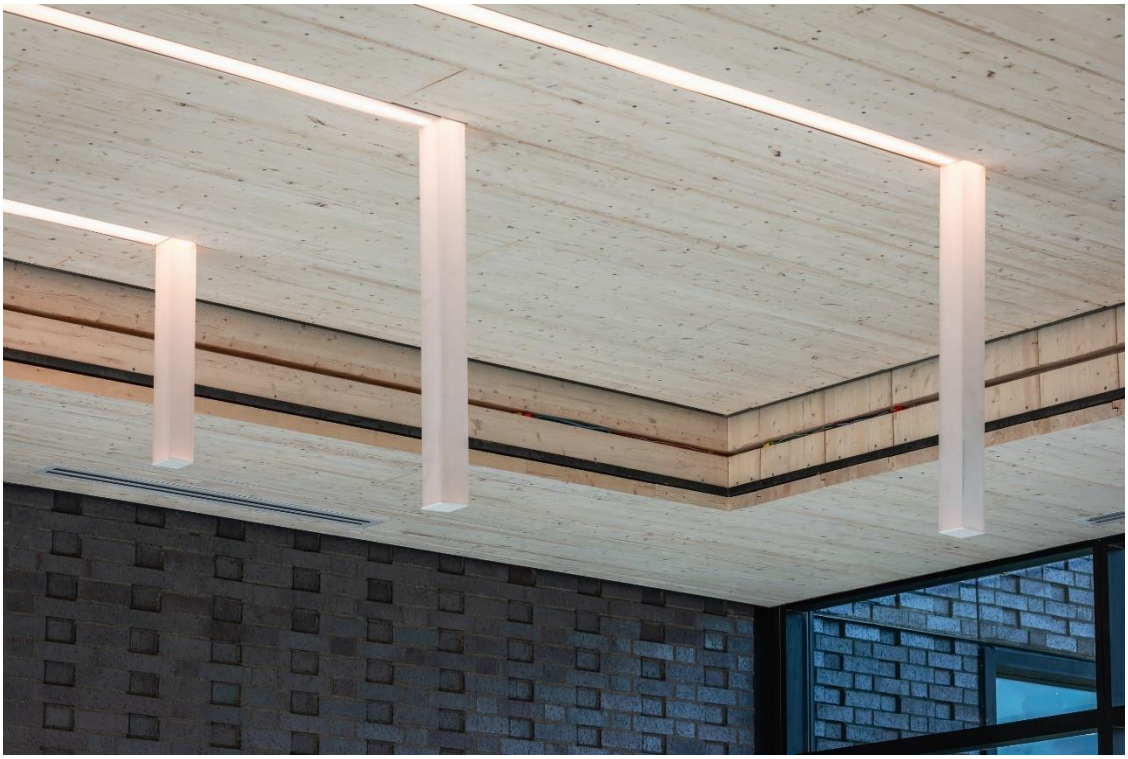

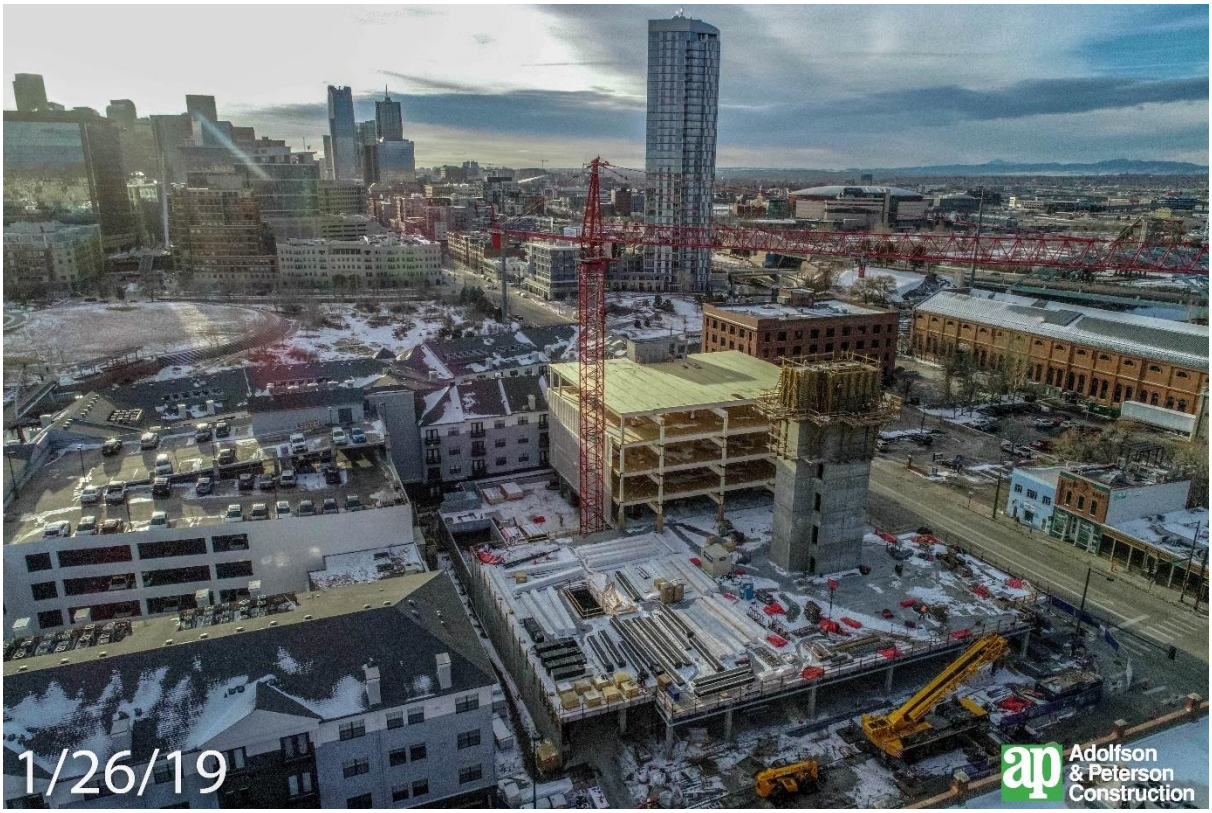
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