

CASE STUDY
The Soto



Mass timber office sets the tone for
10-acre mixed-use development

When developer Hixon Properties partnered with the Cavender family to transform the former site of an auto dealership into a 10-acre mixed-use development, they knew the first building would set the tone for others to come. So, they chose mass timber.

The Soto, a six-story office building located just blocks from San Antonio's famed River Walk, anchors the first phase of the project, creating an iconic business address for firms committed to attracting and retaining top talent.





“We knew mass timber would be compelling and would allow us to aesthetically differentiate ourselves in the marketplace,” said Hunter Kingman, Vice President – Acquisitions and Development for Hixon Properties. “This is an up-and-coming neighborhood, and we wanted something that would entice prospective tenants to choose us. Our decision to use wood for The Soto allowed us to ‘set our flag in the ground’ in terms of quality and execution for the balance of the portfolio. We wanted to put our best foot forward with this first building.”

The first mass timber office building in Texas, The Soto features dramatic roof canopies that showcase dowel-laminated timber (DLT) panels and glue-laminated timber (glulam) beams to pedestrians below. Angled structural columns also extend to the street, giving people a closer look at the wood and firmly planting the unique structure in the neighborhood.

Five levels of glulam and DLT-framed office space sit over below-grade concrete parking and a one-story concrete podium with ground floor restaurant and retail space. Future development in the area will include food, beverage, and entertainment establishments; apartments; and retail businesses.

The Soto’s façade uses both brick and glass, oriented to minimize solar heat gain and give nearby commuters a view of the exposed wood structure inside. The design team incorporated zinc at the recessed plane above the breezeway to help break down the overall building massing. “This also helped us showcase the glass ‘treehouse’ volume where so much of the mass timber is on display,” said Mike Smith, Senior Project Architect for BOKA Powell. “The mass timber is particularly noticeable at night, when the interior spaces are illuminated.”

PROJECT DETAILS

The Soto

LOCATION: San Antonio, Texas

STORIES: Six stories

SIZE: 141,500 square feet

CONSTRUCTION TYPE: Type IV

COMPLETED: 2020

WOOD DESIGN

AWARD
WINNER

PROJECT TEAM

DEVELOPER: Hixon Properties Incorporated

ARCHITECT OF RECORD: BOKA Powell Architects

DESIGN ARCHITECT: Lake | Flato Architects

STRUCTURAL ENGINEER: Danysh & Associates
(Base building)

STRUCTURAL ENGINEER: StructureCraft
(Timber structure)

GENERAL CONTRACTOR: Thos. S. Byrne, Inc.

TIMBER INSTALLER: StructureCraft

GLULAM SUPPLIER: HASSLACHER Group

TIMBER PANEL SUPPLIER: StructureCraft

UNDERFLOOR AIR SYSTEM: Global Integrated Flooring
Solutions (Global IFS)

Connect with the Soto project team at

<https://www.woodworksinnovationnetwork.org/projects/the-soto>



WOODWORKS
INNOVATION
NETWORK

Inside, the 25,000-square-foot floor plates and 20x30-foot grid provide flexibility for the speculative multi-tenant space, set off by the mass timber ceilings.

Differentiation was a key design goal since there were several other major office developments planned in San Antonio at the time. “Hixon wanted to set themselves apart,” said Todd Wascher, a partner at Lake|Flato. “Many of their prospective tenants have younger employees who want to work in an environment that is fresh, new, and environmentally friendly. We think The Soto is all that.”

Value Proposition = Value Added

Their decision to use wood aligns with Hixon’s sustainability ethos and high quality investment philosophy.

“We also considered concrete, which is the predominant building material for commercial projects here in San Antonio,” said Kingman. “At the time of our initial planning, we found a five to 10 percent cost premium for the mass timber. But when we started to factor in likely savings for other line items—the cost of debt associated with a shorter construction schedule, for example—the numbers were much closer. When you see the time-lapse video of our construction, it looked like we pressed ‘fast forward’ during timber installation. In 12 weeks, we went from having one level of concrete podium to six stories of building. So, there was an initial premium for the mass timber, but when we considered the overall project budget, we saved in other ways.”

Kingman added that tenant finish costs with mass timber are also lower. “We’ve found that, relative to our competitive set of office buildings in San Antonio, tenants are able to achieve the same level of quality in their finish-outs for meaningfully lower cost,” he said. “When the structure doubles as a significant component of your finish, there are relative savings that can be captured. I believe isolating the cost of timber to just the structural line item of a project budget is a mistake and doesn’t properly capture its overall value. With The Soto being part of our larger development, we’re confident that our decision to use mass timber and build a project of this character and quality will continue to positively impact the surrounding neighborhood.”

UFAD: The Big Decision

Hixon’s choice to use mass timber, which is both renewable and sustainable, is indicative of the other environmentally friendly building features within. The Soto uses an underfloor air distribution (UFAD) system, which efficiently delivers improved air quality and mechanical efficiency, and offers lower tenant improvement costs.

UFAD was new to Hixon, so they put their design on hold for a couple of months to study it. “We were spending a bit more to use mass timber, so we wanted to highlight the material, rather than cover it up with ceiling-hung HVAC equipment and duct runs,” said Kingman. “But we also needed to know that UFAD would work, because we can’t have a building that

doesn’t cool properly in San Antonio, Texas. So, we took time to educate ourselves and tour other projects, to make sure it’s a system that would perform mechanically and have the solid feel under your feet expected of a Class A office. We soon discovered UFAD was going to be a good fit for The Soto.”

Since the design team wanted to maximize interior floor height and minimize depth of the raised floor, they chose a modular air tower UFAD system from Global Integrated Flooring Solutions (Global IFS). James Thompson, Regional Sales Manager for Global IFS, said they recommended a design using three air towers on each floor instead of having two large mechanical rooms on each end of the floor plate. This eliminated any potential need for ductwork under the floor and reduced the height of the raised access floor.

Pietro Vinco da Sesso, Senior Associate of Structural Engineering for StructureCraft, said The Soto was the first time they’d used a raised floor system with their DLT, so it was a learning experience for them as well. “We always do our own vibration analysis to make sure that whatever is installed is in line with what we design,” he said. “We were pleased to see that the system worked so well.” Wascher added that having a tightly sealed underfloor cavity is key to performance. “This means you can’t drop a demising wall between tenants into that cavity because it would block the air flow. It’s just something to keep in mind.”

All agreed that their use of the UFAD system resulted in a more energy-efficient building and helped transform the space, keeping the interior clean, modern, sleek, and warm—both visually and literally. “Air drafts are among the biggest complaints in office buildings,” said Kingman. “With the UFAD system, tenants can isolate the air to each individual person and adjust the air flow as they desire. It’s basically personalized air.”

UFAD and Fire Protection

Once Hixon made the decision to incorporate the UFAD system, BOKA Powell worked closely with San Antonio building officials; with their MEP consultant, Integral Group; and with Dynamic Systems, a local installer. Their goal was to optimize the plenum assembly design to handle the required volume of pressurized conditioned air while also addressing the non-combustibility requirements for concealed spaces per the 2015 International Building Code (IBC), since plenum spaces of a certain depth required sprinklers. “We were able to include a 1-inch gypcrete pour over the mass timber floor panels, essentially removing the combustible surface from within the concealed space,” said Smith.

The raised floor system includes a 2-foot-square grid of pedestals supporting a 1-inch-thick metal pan and concrete panels for the flooring. This, in turn, provided a noncombustible surface as the top plane of the plenum. Between the raised access floor panels and the gypcrete, the plenum depth was only 6 inches.



Engineers used the concrete core for lateral, and sheathing installed over the DLT panels served as the diaphragm.

“In early schematic design, we worked closely with the City of San Antonio’s Development Services Department,” Smith explained. “In general, all other concealed spaces, such as the exposed DLT panels above portions of the return air system that fur down into the ceiling of the core, were addressed through an application of ½-inch gypsum board per IBC Section 718.2.1 for fire blocking materials.”

Thompson noted that UFAD design is getting easier. “The 2021 IBC now allows for underfloor air distribution without requiring additional protection measures, as long as everything in the space is mechanical or electrical equipment rated to be in an underfloor plenum.”

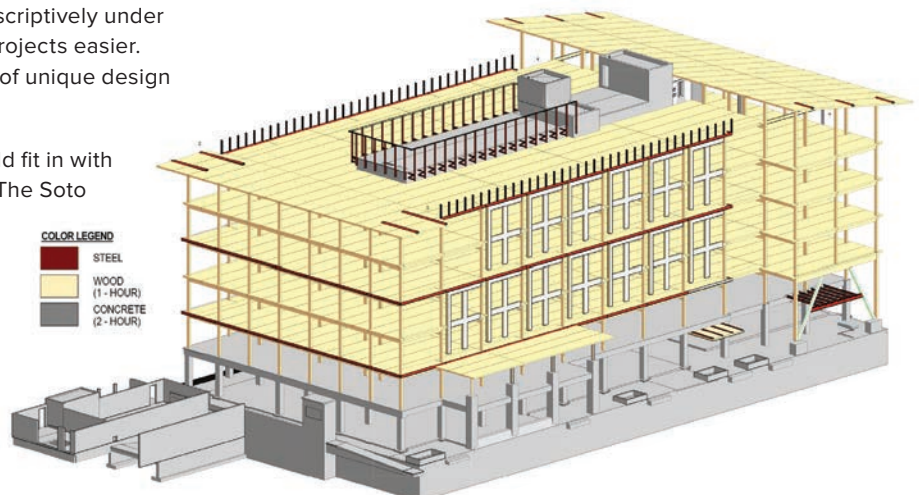
Design Challenges

Because they were using the 2015 IBC, the team had to make alternate means requests related to several aspects of the design that are now allowed prescriptively under the 2021 IBC—which will make future projects easier. That said, The Soto also had a number of unique design considerations.

Hixon wanted a brick exterior that would fit in with the neighborhood, but this meant that The Soto would become one of the first projects in North America to combine mass timber, a material with a natural tendency to creep, with a masonry façade, which is sensitive to deflection.

“We chose DLT because it’s prettier, in my opinion; we were also eager to work with StructureCraft, who manufactures it,” Kingman said. “But high design sometimes creates high design issues. We wanted to hang masonry off the side of the building, which took some ingenuity and creativity from our structural engineering team.”

Mass timber floor panels (or even glulam spandrel beams) spanning 20 feet are not stiff enough to support a brick façade while maintaining tight deflections, so StructureCraft added steel around the perimeter and extended it into the building, while keeping the steel hidden. “Essentially, the façade is supported by the timber columns,” said Vinco da Sesso. “We used steel beams to transfer the load, but it’s the glulam columns that support the weight of the façade. We also broke the brick façade every two stories, creating gaps as relief joints.”



Premium Space Provides Tenant Appeal

While aesthetics were the initial reason Hixon chose mass timber, the sustainability benefits of wood were also important. “We try to be thoughtful in how we approach our projects,” said Kingman. “Often, we make decisions that require more upfront investment because we believe these attributes will lead to greater long-term value. We think sustainability is important for everyone. The opportunity to encapsulate carbon in a structure is unique; it’s a small solution to a big problem, a step in the right direction.”

Hixon’s decision to use wood came with shorter-term advantages as well.

“While we’re proud of the sustainability benefits, our primary goal is to lease office space,” said Kingman. “We felt that using mass timber was the best way to attract the tenants we wanted.”

He added, “Post-COVID, we’ve experienced a real ‘flight to quality.’ Many of our prospective tenants have downsized their footprint from where they were prior, but they are willing to pay a premium for the space they do lease. They’re seeing The Soto’s value proposition, and banking on the quality of the office space as a key to recruit and retain talent.”

The Soto’s use of mass timber has given Hixon an advantage at a time when the entire commercial office leasing market needs all the help it can get. “Regardless of whether employers are asking for a full or a partial return to the office, potential tenants look at this space and say, ‘This is going to help,’” Kingman said. “We’re quite pleased with our leasing activity in spite of the overall market conditions.”



The Soto



Volume of wood products used:
90,000 cubic feet



U.S. & Canadian forests grow this much wood in:
7 minutes



Carbon stored in the wood:
2,155 metric tons of CO₂



Avoided greenhouse gas emissions:
834 metric tons of CO₂



TOTAL POTENTIAL CARBON BENEFIT:
2,988 metric tons of CO₂

EQUIVALENT TO:



632 cars off the road for a year



Energy to operate 316 homes for a year

Source: US EPA

Estimated by the Wood Carbon Calculator for Buildings, based on research by Sarthre, R. and J. O’Connor, 2010, A Synthesis of Research on Wood Products and Greenhouse Gas Impacts, FPInnovations. Note: CO₂ on this chart refers to CO₂ equivalent.

Reducing Carbon Footprint

The use of wood lowers a building’s carbon footprint in two ways. Wood continues to store carbon absorbed by the trees while they were growing, keeping it out of the atmosphere for the lifetime of the building—longer if the wood is reclaimed at the end of the building’s service life and re-used. Meanwhile, the regenerating forest continues the cycle of carbon absorption. Wood products also require less energy to produce than other building materials, and most of that comes from renewable biomass (e.g., bark and sawdust) instead of fossil fuels. Substituting wood for fossil fuel-intensive materials is a way to avoid greenhouse gas emissions and reduce embodied carbon.

Disclaimer: The information in this publication, including, without limitation, references to information contained in other publications or made available by other sources (collectively “information”) should not be used or relied upon for any application without competent professional examination and verification of its accuracy, suitability, code compliance and applicability by a licensed engineer, architect or other professional. Neither the Wood Products Council nor its employees, consultants, nor any other individuals or entities who contributed to the information make any warranty, representative or guarantee, expressed or implied, that the information is suitable for any general or particular use, that it is compliant with applicable law, codes or ordinances, or that it is free from infringement of any patent(s), nor do they assume any legal liability or responsibility for the use, application of and/or reference to the information. Anyone making use of the information in any manner assumes all liability arising from such use.

Funding provided in part by the Softwood Lumber Board
WoodWorks is an equal opportunity provider.

Images: Erika Brown Edwards, Travis W Baker (p.6 top),
Cheyne Smith (construction photos), BOKA Powell (p.5 drawing)
WW-CS-033 The Soto © 2022 WoodWorks