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 architecturally 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 granit 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 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)

**PROJECT DETAILS**

- **LOCATION:** San Antonio, Texas
- **STORIES:** Six stories
- **SIZE:** 141,500 square feet
- **CONSTRUCTION TYPE:** Type I
- **COMPLETED:** 2020

Connect with the Soto project team at [https://www.woodworksinnovationnetwork.org/projects/the-soto](https://www.woodworksinnovationnetwork.org/projects/the-soto)
and duct runs,” said Kingman. “But we also needed to know rather than cover it up with ceiling-hung HVAC equipment to use mass timber, so we wanted to highlight the material, a couple of months to study it. “We were spending a bit moreUFAD was new to Hixon, so they put their design on hold for lower tenant improvement costs.

improved air quality and mechanical efficiency, and offers 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 Fire and Protection

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 features an underfloor air distribution (UFAD) system, which efficiently delivers improved air quality and mechanical efficiency, and offers lower tenant improvement costs.

UFAD uses less towers, so you then have design on hold for a couple of months to study it. “We were spending a bit more rather than cover it up with ceiling-hung HVAC equipment and duct runs,” said Kingman. “We also needed to know that UFAD would work, because we can’t build a building that doesn’t cost properly in San Antonio. Texas. So, we tested our mass timber building features and overall project, to make sure it’s a system that would perform mechanically and have the ventilation your feet expected of a Class A office. We have discovered UFAD was going to be a good fit for the Soto.”

Since the design team wanted to maximize interior floor height and maintain depths of the raised floor, they chose a modular tower UFAD system from global integrated flooring solutions (Global IFS), Jones Thompson, Regional Sales Manager for Global IFS, & they recommended a design using three towers on each floor instead of having two large mechanical rooms on each end of the floor plate. This eliminated any potential risk for blockout under the floor and reduced the height of the raised access floor.

Value Proposition = Value Added

The Soto is all that.”

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was a learning experience for them as well. “We also do our own vibration analysis to make sure that what’s happening in our building is in line with what we design,” he said. “We were pleased to see that the system worked as well.”

Wascher stated that keeping a highly occupied office key to performance. “This means you can’t stop a demanding and between tenants affected using because it would block the air flow. It’s just something to keep in mind.”

An apparent aspect of the UFAD system resides in the more energy-efficient building and helped transform the space, keeping the interior clean, reduced, driven, and water- proof visually and ideally. “Air fans are doing the biggest components to office buildings,” said Kingman. “With the UFAD system, tenants can isolate the air flow by each individual person and adjust the air flow as they desire. It basically personalized an.”

CASE STUDY

Between the raised access floor panels and the gypcrete, noncombustible surface as the top plane of the plenum.

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 interior access floor panels and the gypcrete, the plenum depth was only 6 inches.

UFAD and Fire Protection

Once Hixon made the decision to occupy the UFAD system, Boris Pavlic worked closely with DLT’s building officials, with their MEP consultant, Integrated Design, 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 noncombustibility requirements for conditioned spaces per the 2015 International Building Code (IBC), since plenum spaces of a certain depth required sprinklers. “We were able to install a 1/2-gauge pier over the most tenant borders floor panels, essentially removing the combustible surface within the Connor space,” said Kingman.

The raised floor system includes a 3-foot-square grid of pedestals supporting a truly thick resilient and concrete panels for the flooring. This, in turn, provided a noncombustible surface as the top plane of the plenum. Between the interior access floor panels and the gypcrete, the plenum depth was only 6 inches.
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 required DLT panels above portions of the return air system that fall 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 facade, 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 have some rigidity and deflection 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 facade while maintaining tight deflections, so StructureCraft added steel around the perimeter and extended it into the building, while keeping the steel hidden. Essentially, the facade is supported by the timber columns,” said Vincenzo da Sesso. “We used steel beams to transfer the load, but it’s the glulam columns that support the weight of the facade. We also broke the brick facade every two stories, creating gaps as relief joints.”

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

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

632 cars off the road for a year

EQUIVALENT TO:
Energy to operate 316 homes for a year

The Soto

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. “We’re committed to the sustainability benefits, our primary gain 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. Hiring of our prospective tenants has downsized their footprint from where they were pre-pandemic, but they’re willing to pay a premium for the space they do lease. They’re seeing The Soto’s value proposition and walking on the quality of the office space as it really stands out.”

The decision’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 the space and say, ‘This is going to help’,” Kingman said. “We were able to present our leasing activity in spite of the overall market conditions.”

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