

CASE STUDY
500 County Center



Mass timber meets beauty, sustainability,
and budget goals for this California county

ocated in the heart of Silicon Valley, the County of San Mateo needed a new headquarters to meet the needs of their growing community. The County, which oversaw a \$4.9 billion budget in 2025, had three goals for the project: they wanted an iconic building, one that would demonstrate their commitment to sustainability, and it needed to be built to budget. The architects at Skidmore, Owings & Merrill (SOM) proposed a mass timber structure.



“We knew we could make the building special by virtue of the fact that it would use an innovative structural system,” said Javier Arizmendi, Design Principal and Design Lead for SOM. “We also knew mass timber would meet their sustainability values. This left budget. The contractor was already on board, which allowed us to develop real-time solutions that met the client’s financial goals.”

Upon its completion, 500 County Center was the nation’s first net-zero energy civic building constructed using mass timber, demonstrating wood’s suitability and economic viability for large-scale public projects.

Iconic Building Connects County with Community

SOM chose an H-shaped volume for the five-story structure, with ground floor public plazas that connect the city’s civic campus to the east with Redwood City’s commercial area to the west. The configuration also allowed natural ventilation and lighting to reduce thermal loads and improve occupant well-being for the County’s 600 employees. The ground level features public and civic spaces, including a large auditorium for the County’s Board of Supervisors’ chamber meetings. Upper floors contain offices, meeting rooms, and flex workspaces.

PROJECT DETAILS

500 County Center

LOCATION: Redwood City, California

STORIES: Five

SIZE: 208,000 square feet

CONSTRUCTION TYPE: IV-HT

COMPLETED: 2024

PROJECT TEAM

OWNER: San Mateo County /
Project Development Unit

ARCHITECT AND

STRUCTURAL ENGINEER: Skidmore, Owings & Merrill

GENERAL CONTRACTOR: Truebeck Construction

CONSTRUCTION MANAGER: Joeris General Contractors, LLC

MASS TIMBER SUPPLIER: SmartLam NA (CLT)

FASTENERS AND

CONNECTORS: Rothoblaas,
Simpson Strong-Tie

Connect with the 500 County
Center project team at

[https://www.woodworksinnovationnetwork.org/
projects/500-county-center](https://www.woodworksinnovationnetwork.org/projects/500-county-center)



The mass timber structure combines glue-laminated timber (glulam) beams and columns with 5-ply cross-laminated timber (CLT) decking. The wood framing was sized to provide a fire-resistance rating consistent with Type IV-HT requirements; steel braced frames provide lateral support. Wood is left prominently exposed throughout, giving San Mateo County the iconic design they wanted using a sustainable material that avoided the need for extra interior finishes. The project is on track to achieve LEED Platinum certification.

Innovative Design Meets Public Budget

With this important project, SOM showed that mass timber can be a cost-competitive structural solution, even for a publicly-funded project.

SOM started by evaluating structural options, including steel, concrete, and mass timber. This step was one of many where the contractor, Truebeck Construction, added value, says Eric Long, Structural Engineering Partner at SOM. “They provided real-time pricing that enabled us to evaluate each option, allowing us to learn that timber was competitive in terms of initial material costs. At the same time, we ran embodied carbon calculations for all three structural types. Of course, the timber did substantially better there.”

But the number one factor in wood’s overall cost competitiveness was speed of construction, explained Long. “Once we compared the steel, concrete, and timber systems, we determined that our use of wood would save about three months in the construction schedule, which was significant.”

Wood also helped reduce foundation mass. The site’s soft soil required that the building be constructed on a pile foundation, and wood’s relative light weight reduced both the number of piles and their required depth, saving time and money.

500 County Center occupies nearly the full footprint of the site, leaving little room for construction staging or material storage. The lightweight timber option allowed the use of mobile cranes; no tower cranes were needed to lift the prefabricated timber components directly from the delivery trailer into place. By using mass timber, SOM also avoided the need to bring concrete pump trucks into downtown Redwood City.



Optimization Started with Material Efficiency

While speed of construction was impactful, SOM also optimized the structure itself to meet San Mateo's budget.

"In a competitive, hard-nosed, got-to-meet-the-budget environment, you need to put the work into material optimization," said Long. "Optimization starts with bay size, so grid spacing was key. I once heard someone at the International Mass Timber Conference say that you can never recover from a bad grid, and there's truth to that. That's why we put so much effort into studying our options. We started by considering a 30x30-foot grid but ended up with a 20x35-foot perimeter bay and a 20x30-foot core bay."

Arizmendi added, "To meet budget, we also knew that we had to design a building that was simple in form and highly repetitive structurally. So, we designed a chassis of sorts, one that could give us the simplicity and directness of efficient mechanical distribution and the benefits of repetition."

SOM reduced the number of pieces by running the 65-foot-long beams in only one direction; this also reduced the number of crane picks and resulted in the need for fewer connectors. They located four steel-framed cores, formed using buckling-restrained steel braced frames to house elevators and egress stairs, at the center of the H shape, which allowed for easy transfer of lateral loads from the wood structure.

Optimization continued with their CLT specification. The spans required 5-ply panels, and SOM wanted the bottom plies to match the Douglas fir beams and columns. To economize, they used less expensive Sitka spruce for the three inner plies, effectively designing their own custom panel to meet the structural properties needed for span and vibration requirements. Savings from this effort "were significant," said Long.

Double Beams, Quadruple Advantage

500 County Center features the use of double glulam beams throughout the building, with 8.75 x 25.5-inch beams running on either side of each column. Glulam columns were all sized with 12-inch widths so the doubled beams would align from column to column. When a bigger column was needed to meet structural loading requirements, SOM varied its depth. For example, edge columns are 12x12 inches and interior columns are 12x23 inches.

There were four advantages to this approach, said Long. "Number one is that it allowed the beams to run continuous past the columns, sharing the moment demand between negative and positive moment. This helped make the beams smaller. Number two is that it shortened the span of the CLT. With columns spaced at 20 feet on center and a beam on either side, the CLT only needed to span the inside dimension of the beam-to-beam dimension, not column-to-column.



“So, the CLT span is 18 feet 6 inches vs. a full 20 feet. In addition to material optimization, this allowed 5-ply panels to work for floor vibration instead of requiring a 7-ply panel. The third advantage came from the fact that a continuous beam is stiffer; we got better floor vibration performance even with shallower beams. And finally, the use of double beams reduced the depth of the members, allowing more natural light into the building.”

SOM’s choice of glulam direction was also deliberate. “The fact that we have double beams running in just one direction allowed us to align mechanical, electrical, plumbing, and sprinkler distribution,” added Long. “The trunk lines for these systems are run over the top of some enclosed offices and below the beam, but all branch lines from that trunk are set up high, parallel with the beam. This allowed us to reduce each floor height by 7 inches, saving money, including exterior wall costs.” The floor-to-floor heights were 18 feet 7 inches on the ground-floor; upper levels are 13 feet 5 inches.

Designing for Construction

SOM holds a strong ‘design for construction’ philosophy, and this was evident with 500 County Center.

They designed custom connections that allowed the double beams to sit on either side of the columns. The configuration required no screws or bolts; installers placed a steel bucket

on top of each column and sat the beams on its horizontal shelves. The next column, with pre-threaded, pre-epoxied rods, was then set on top. The assembly required just four nuts.

The team also worked to efficiently integrate the wood structure with other building elements such as mechanical and other systems, minimizing the need for pre-cut holes or penetrations and running sprinkler lines, electrical, and other services between beams where possible.

“Part of the cost-benefit analysis included looking not just at the mass timber, but at other materials as well,” said Arizmendi. “We wanted to leave the timber exposed, which would reduce our need for other finish materials. While this reduced cost, it also adds excitement, giving people the opportunity to occupy a building with all that wood instead of being surrounded by gypboard and acoustical ceilings.”

Collaboration was critical. The general contractor was engaged early and worked closely with SOM to release bid packages. Once the mass timber fabricator/installer came on board, they all worked together to optimize the glulam and CLT panel layouts, connection details, and installation plans.





Acoustics Management

SOM wanted to create a warm, inviting environment for employees and the public by maximizing the amount of exposed wood, but they needed to also manage acoustics. “Our goal was to leave 60 percent of the CLT ceilings exposed, so we needed to be cognizant of the acoustical performance of the different spaces,” said Arizmendi.

They started by specifying a 3/4-inch acoustical underlayment placed on top of the CLT, then added a 3-inch gypcrete topping slab. The assembly provided an STC rating of 50.

Acoustics were especially important in the main floor’s public hearing room. To manage sound in that space, they added a special noise control ceiling attached to the CLT deck. The deflection spring hanger, designed for acoustically-separated systems, simplified installation of the ceiling assembly. Elsewhere in the building, strategically-placed wood wall baffles provide extra sound absorption.

A Building Loved

The County of San Mateo wanted their new headquarters to reflect both the values of the community and their commitment to environmental stewardship. Redwood City has a historical connection to the timber industry, so the use of wood also resonated with the city’s past.

Energy for the net-zero energy building comes from solar arrays on the building’s roof and on the adjacent parking garage. The building is designed to save energy through efficient mechanical systems along with natural lighting and ventilation, including operable windows for fresh air.

“People have told us they appreciate how the building performs, looks, and smells,” said Arizmendi. “But the most rewarding feedback came from the District Attorney, who told me they love the building because it contributed to bringing everyone back to the office. You almost forget the other things that the building is accomplishing because at the end of the day, it’s all about the people who actually occupy it. They don’t talk about the fact that it’s a net-zero energy building; they just say, ‘I love being here.’”

He added, “I recently heard something that really struck me—‘buildings which last the longest are beautiful buildings.’ People want to be in a building like this. And owners like San Mateo County want buildings like this because it aligns with their values.”

Optimizing the Future

Beauty, sustainability, and occupant comfort were all important to the County of San Mateo. But like all civic entities, they also had a fixed budget.

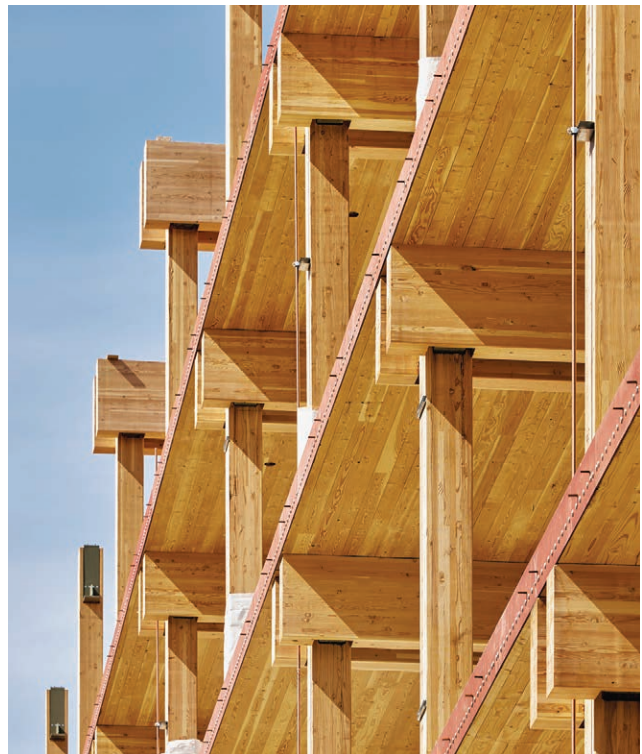
“Of course, mass timber brings side benefits like sustainability, but I think the biggest driver in the timber advantage is speed of construction,” explained Long. “Our experience here helped us fully realize the value of designing for construction. If we really want timber to win out, we’ve got to emphasize how fast and easy it is to build. Speed of construction is where you’re going to get most of your savings. We focused on optimization—orienting the beams in one direction, reducing the number of crane picks, simplifying and having fewer connections, integrating mechanical systems with the structure, eliminating finishes ... these things all added up to make the building easier and faster to build.”

Both Long and Arizmendi see a bright future for mass timber public projects.

“There’s a lot of interest in these types of buildings,” said Arizmendi. “It comes from different angles. Sometimes it’s about prefabrication, easier installation, the economics of it all. At other times, it comes from the quality of the internal space and the low-embodied carbon.”

He added, “San Mateo County deserves credit for taking a risk with this project, showing us that mass timber is a building type that can be built for a reasonable budget. They needed an emblematic, sustainable building designed to budget. This project is a good example of a beautiful building sustainably built at a cost that is affordable for a public agency.”





Supporting Sustainable Forests

500 County Center includes **163,857** cubic feet of wood products. It takes North American forests **13 minutes** to grow this volume of wood.

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.

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