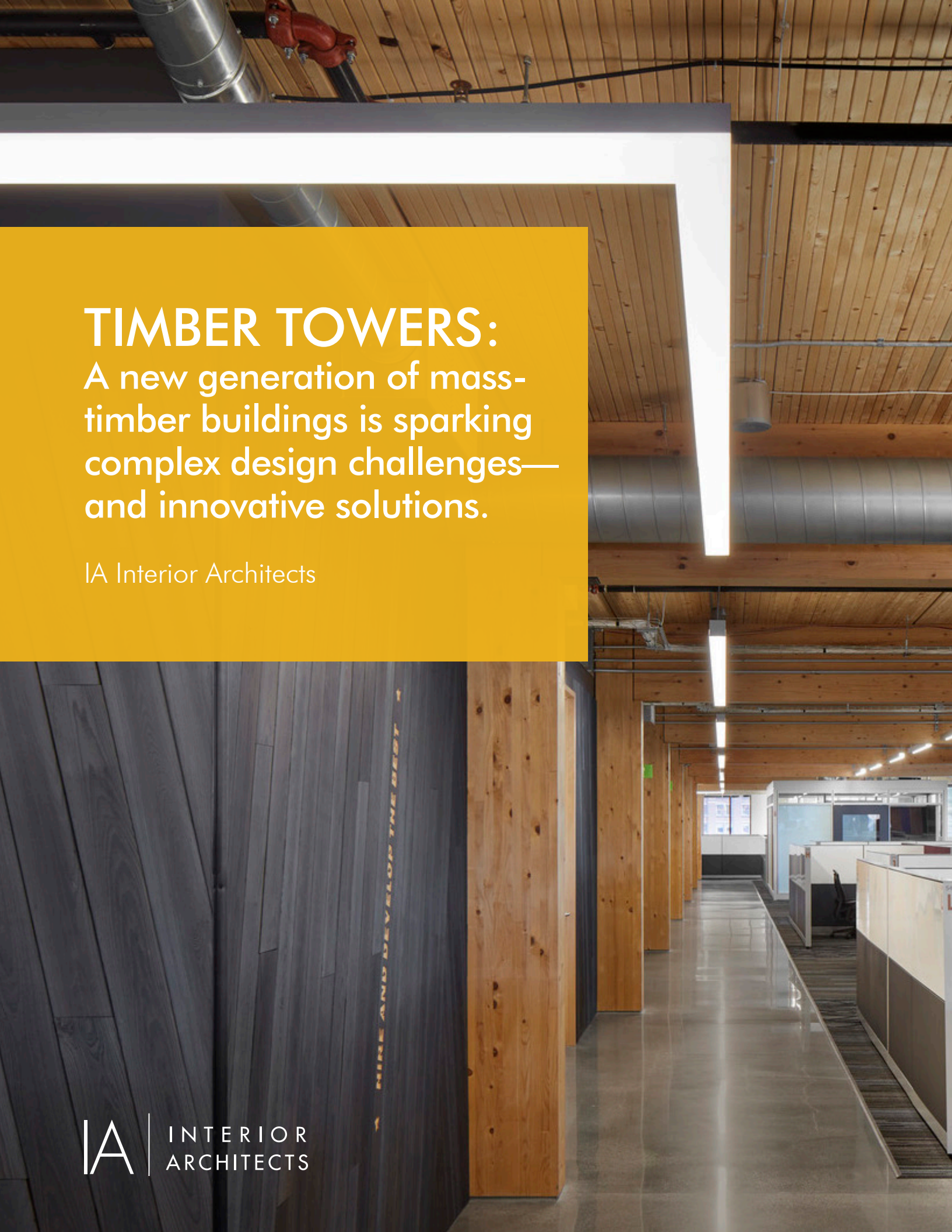

TIMBER TOWERS:

A new generation of mass-timber buildings is sparking complex design challenges—and innovative solutions.

IA Interior Architects

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IA INTERIOR ARCHITECTS TIMBER TOWERS

The age-old methodology of heavy-timber construction is becoming an increasingly popular and viable alternative to steel framing for high-rise commercial projects. This upsurge of mass-timber buildings across the country can be largely credited to advancements in fabrication techniques and improved performance of engineered-wood products. As more research and test results regarding laminated-wood structural elements like glulam beams become available, progressive jurisdictions—including many in the Pacific Northwest—are modifying building codes to be more amenable to their use. Last summer, for instance, Oregon passed a statewide alternate method for fully sprinklered mass-timber structures, permitting B-occupancy buildings to be up to 18 stories tall. The state also eliminated the requirement that nonstructural interior walls and their assemblies—including doors, frames, glazing, and other commercial-office staples—be fire rated, thus rendering the fit-out of these Type IV structures more cost-competitive with traditional steel buildings.

Mass-timber structures offer numerous benefits to both developers and occupants, from sustainability to biophilic beauty. The inherent "lightness" of the wood structure affords such buildings shorter concrete footings and less structural steel for support, which reduces their environmental footprint. And when prefab components and modular construction methods are leveraged, mass-timber buildings can also be erected in a faster-than-usual time frame. End users, meanwhile, enjoy the superior acoustic performance and woodsy, decidedly noncorporate feel of the interiors.

The exposed wood structure radiates like a lantern within the corten steel clad T3 tower in Minneapolis' industrial North Loop neighborhood.

Industrious Minneapolis. Photo Courtesy of Industrious

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Amenity blocks are pulled away from the densely spaced wood columns to highlight the post and beam connections.

But despite such advantages, timber towers do pose interior architecture challenges that potential tenants should be aware of and that demand creative problem solving—not to mention more deliberate coordination of trades and more time for the build-out. Among them:

- **A dense column grid:** Timber beam spans aren't as strong as steel and therefore require more frequent column placement, which translates to less efficiency in workstation layout—and less flexibility in program placement.
- **Minimal allowance for drop ceilings:** Code restrictions limit convenience openings for mechanical, electrical, and plumbing (MEP) systems in mass-timber buildings. Given that the timber member spans are typically uniform and, unlike steel, cannot be penetrated, any system requiring long runs—HVAC and sprinklers, for instance—must be accommodated within each bay between the beams or below the beams.
- **Mechanical Systems have nowhere to hide:** The ceiling is a strong visual and attentional focus of the HT interior; the eye is naturally drawn up toward the wood beams, meaning that any elements placed there—MEP pipes, ducts and raceway, low-voltage cable trays, sound masking, fire sprinklers—will become more apparent and potentially jarring.
- **Building code interpretation complications:** Many such buildings are of a hybrid nature, with concrete base and core and glulam framing, so don't fit squarely in the Type IV Heavy Tiber construction typology code-wise. Moreover, the Type IV codes were initially written with antiquated heavy-timber structures in mind—late-19th- and early-20th-century warehouses built with more combustible solid-wood columns and beams rather than with modern high-performance laminated elements.

Although the above challenges are hallmarks of mass-timber structures, they are not specific to them; indeed, traditional turn-of-last-century warehouse buildings pose many of the same roadblocks.

Confidential Internet Retailer. Photo by Corey Gaffer

IA INTERIOR ARCHITECTS TIMBER TOWERS

THE NEW FACE OF TIMBER CONSTRUCTION

As mass-timber construction gains traction, a short list of innovators is pushing the genre's cutting edge. Japanese supplier Sumitomo Forestry has proposed a 1,148-foot-tall, 70-story wooden skyscraper in Tokyo, while 18-story properties have already sprouted in Norway and Vancouver. In the U.S., Houston-headquartered Hines is the developer behind some of the most pioneering projects, a series of mixed-use complexes dubbed T3—an acronym of sorts for timber, transit, and technology. These include a six-story hybrid-HT building in Chicago slated for 2019 completion and an on-the-boards project in Collingwood, Australia, that was announced in April. Hines, in partnership with Invesco Real Estate, is also the name behind the two largest mass-timber structures in America: T3 North Loop in Minneapolis and T3 West Midtown in Atlanta, each encompassing more than 200,000 square feet.

T3 North Loop, designed by Vancouver firm Michael Green Architecture, is located in a formerly gritty warehouse district and auspiciously sited right at the juncture of three transit routes: an elevated highway, a bike trail, and a light-rail station. Hines used timber as a differentiator to attract tenants, recognizing that the market puts a premium on office spaces that are enjoyable to work in—as these treehouse-like environments inevitably are. The project has drawn considerable fanfare in the architectural community and the regional press for its innovative use of mass timber, yet the facade is surprisingly unassuming: nearly impossible to spot within the dense historic neighborhood courtesy of its simpatico scale and modest formal qualities, which pay homage to the warehouse district's timber-centric heritage. Cor-Ten exterior cladding further enables the building to fold into the area's menagerie of muted industrial textures.

The interior of T3 Minneapolis, with its raw-lumber structure, feels engaging, forest-like, and human. Sunlight streaming through 9-foot-high perimeter windows penetrates deep into the floor plate, setting aglow the beautiful exposed bones: the blonde-wood columns and glulam beams, the lightweight concrete slab, the slatted ceiling deck of beetle-kill pine. Warm, diffused light radiates throughout, conjuring both airiness and coziness.

A custom ceiling system was developed for the demountable rooms to eliminate the need for structural connections to the pristine wood deck above.

Confidential Internet Retailer. Photo by Corey Gaffer

IA INTERIOR ARCHITECTS TIMBER TOWERS

IA MEETS T3

It was precisely the spatial character that IA's client, a prominent tech company, was searching for. Having helped the client navigate numerous real-estate hunts in various cities, our team was well-versed in the company's corporate values and aesthetic preferences. This is an entity that prioritizes talent and, accordingly, seeks spaces that can be sculpted into a high-quality work environment capable of supporting recruitment and retention efforts. The client also favored leasing space in an eco-conscious building as a strategy to promote worker health and wellbeing. T3 North Loop fit the bill on all fronts, and so the client leased two full floors, totaling just under 70,000 square feet. (IA was also retained to oversee the interior architecture of another workspace at T3 Minneapolis: a 34,000-square-foot coworking facility for Industrious.)

The primary design challenge was how to maintain the characteristics of warmth and airiness, which the client wished to accentuate via an open-plan workspace, while also accommodating an ambitious program and significant infrastructure without the aid of a drop ceiling. The client wished to keep the ceiling open to the deck, composed of unfinished 2-inch pine slats that smell of fresh-cut lumber and provide a pleasing acoustic effect. The plans examiner permitted drop ceilings only to conceal MEP and required sprinklers within the plenum as well as below the ceiling. Further complicating matters, the landlord forbid the fastening of equipment and devices to the beams and columns so as not to cause irreparable damage to the perfectly clean, virgin wood.

Charred wood sheaths all conference room blocks to contrast the warm of the structure and environmental graphics are routed into the wood to expose the warm core.

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IA INTERIOR ARCHITECTS TIMBER TOWERS

A warm, coworking-inspired space overlooks the industrial North Loop in Minneapolis.

In an effort to respect and showcase as much of the structure as possible, the IA team held back all new-built elements within the column grid, rather than "burying" the columns within enclosed rooms; this highlights the rhythmic quality the columns bestow on the space. As for the mechanical systems, we made a number of shrewd moves to hide them or otherwise minimize their visual impact by artful organization. Some key design solutions:

- **Strategically sited mechanical systems:** Wrapping the concrete core is a narrow bay in which the beam depths are more than a foot shallower than they are in the rest of the building. The IA team identified early on that labs, IT, the mailroom, restrooms, and other support spaces requiring a dropped acoustic ceiling would ideally be placed in this bay. The drop ceiling could thus screen from view the large mechanical units that serve the entire floor, while the shallower beams around the core allow for MEP units to be installed continuously from bay to bay.
- **Deftly routed ductwork:** The ductwork that branched off the large units and that could not be hidden (because of the client's desire to leave the ceiling open to the deck) was also treated thoughtfully. To achieve a consistent layout and to reduce visual "noise," we coordinated with the engineer to run the ducting tight against the west side of every beam and, against the east, a custom-designed conduit tray. Extending down each bay is a single fire/sprinkler line, flanked by minimalist linear indirect light fixtures that flood the deck above with soft, warm illumination.
- **Structurally supported freestanding elements:** Another major challenge was finding a solution to accommodate the full-height demountable wall system the client uses for shared offices and huddle rooms, which typically requires a support that fastens to the structure. We collaborated with the workstation vendor, HNI Allsteel, to develop a custom structural "lid" for the freestanding panels that incorporated the required ACT ceiling, a light fixture, and an air diffuser—a solution that met functional needs while preserving flexibility.

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IA INTERIOR ARCHITECTS TIMBER TOWERS

- **Programmatic elements placed to maximize daylight access:** Workstations are located along the perimeter of the floor plate, so staffers can enjoy the benefits of natural light and exterior views. Also sited along the window walls are more relaxed alternative work areas, breakout spots for teams to huddle around white boards, and a small kitchen.
- **Fostering transparency:** Spaces like perimeter conference and training rooms necessitating tall acoustical partitions that would block daylight from penetrating into the core were designed with clerestory windows and additional sidelights. These funnel sunshine into adjacent corridors and keep the interior architecture feeling airy and radiant.
- **Aesthetic cues taken from the architecture:** Branding elements reference the qualities of the building itself. For instance, the proliferation of wood elements drove the color and materials palette, down to the upholstery selection. A unique element of the new glulam beams and columns is their superior performance under heat; the adhesives used to laminate the wood elements renders them inherently more resistant to fire than single heavy-timber units, which allows the beams to withstand a longer burn time prior to failure. We highlighted this functional characteristic as an aesthetic feature, using the ancient Japanese Shou Sugi Ban finishing technique—a sort of char effect—to give the wood slats used to clad support spaces a beautiful patina; a semi-opaque glaze lends beautiful depth and color variation. IA-designed murals and graphic elements routed out of the wood expose the contrasting warm inner layer. We even used this technique to create hidden "Easter eggs"—environmental graphics celebrating the client's core principles.

MEPFP is methodically organized to minimise the visual clutter in the structural bays while eliminating connections to all beams and columns.

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CONCLUSION

Despite significant press and informational coverage of the mass-timber typology from a construction and architecture standpoint, there's been less such discussion of the *interiors* of said buildings, which offer unique attributes as well as significant challenges. But when approached from an informed perspective, these complexities are in fact opportunities that can be exploited and celebrated. Moreover, many of the spatial solutions applicable to mass timber buildings have implications well beyond the genre, notably projects for which the tenant favors both an open-plan layout and an exposed ceiling to telegraph an industrial vibe—preferences increasingly common among clients of all stripes. Indeed, these same strategies suit any interior that demands extra thinking about placement of mechanical systems and programmatic elements.

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Warm indirect lighting highlights the open structural bays.

Industrious Minneapolis. Photo Courtesy of Industrious

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A custom rebar screen metaphorically contrasts the inverted relationship of the steel and wood structures while physically stabilizing the cantilevered whiteboard wall.

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Project Designer: Tate Stiles
Project Architect: Julie Knorr
Job Captain: Donna Williamson
Workplace Strategist: Allison Plavecski
Environmental Graphics/Branding: Maria Felenyuk
Designers: Katie Mathweg and Andie Watling
Lighting Designer: Gary Bouthillette

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