The projects profiled in this book are those submitted to the Council on Tall Buildings and Urban Habitat’s 2022 Global Awards program. See page 308 to learn more about this program.
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NON-BUILDING
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The David Rubenstein Forum
Chicago, United States

The David Rubenstein Forum at the University of Chicago is prominently located on Chicago’s Midway Plaisance across from the Rockefeller Memorial Chapel. The building addresses multiple communities with components that are stacked, rotated, and oriented not only towards the University campus and downtown Chicago, but also towards the Woodlawn neighborhood immediately south of the University campus. The building serves as a hub for the broad range of people and activities at the University of Chicago, while its design rethinks and improves the traditional convention center. The building’s flexible spaces can accommodate formal and informal gatherings, as well as much needed multipurpose meeting spaces for workshops, symposia, and lectures.

The building comprises a two-story base and a slender, eight-story tower organized as a stack of neighborhoods, each coalescing around a private social lounge. A fulcrum point in the massing of the tower—the stitch line—balances the opposing north and south cantilevers to create a self-supporting structure similar to a seesaw, allowing for large cantilevers with a minimal amount of concrete. The lower floors of the building are porous and dynamic, with connections to the campus and community, as well as publicly accessible exhibits of important artwork and historical documents. To reduce the excess gross square footage of the vertical tower, the social spaces were pulled back on alternating floors to increase floor plate efficiency and exterior surface area, which also resulted in structurally cantilevered meeting rooms. The 40-foot cantilever—one of the longest spanning concrete cantilevers in the city—at the north entry of the building welcomes visitors and provides a space to congregate before and after events. To the south, a bosque of twenty red maple trees forms a canopy under which outdoor events can be held and connects the building to the new Campus South Walk, which unifies the landscape design and pedestrian connectivity of several campus buildings south of the Midway Plaisance.

The project achieves LEED-Gold certification and establishes a connection to the natural environment. The building integrates bird-safe technology into its glass façade to protect the bird migration zone along the Mississippi Flyway, on which it is located. Its curtain walls are coated with a clear film printed with an ultraviolet pattern resembling a spider web, which is visible to birds but invisible to humans. The building and the landscape increase the permeable surface area of the site and reduce strain on Chicago’s overtaxed sewer infrastructure. Green roofs absorb and retain storm water from the building, which is then directed to rain gardens in the Campus South Walk for natural sequestration and the creation of an overlook feature. The remaining landscape design incorporates native flora planted in small depressions, which act as natural buffers and redirect the surface water to temporary storage areas for percolation, becoming a garden feature. The building was designed with large curtain walls that bring large amounts of natural light into all meeting rooms, thereby cutting down on energy costs. In addition, it uses energy efficient conditioning systems that achieve indoor comfort levels primarily via passive radiant technology, significantly mitigating its carbon footprint.

Completion Date: September 2020
Height: 52 m (171 ft)
Stories: 10
Area: 9,000 sq m (96,875 sq ft)
Primary Function: Education
Owner/Developer: University of Chicago
Architects: Brininstool + Lynch (architect of record); Diller Scofidio + Renfro (architect of record)
Structural Engineer: LERA Consulting Structural Engineers (design)
MEP Engineer: Primera Engineering (design)
Main Contractor: Turner Construction Company
Other CTBUH Member Consultants: Thornton Tomasetti (façade); GEI Consultants (geotechnical); Brininstool + Lynch (interiors); SYSKA Hennessy Group (vertical transportation)
Other CTBUH Member Supplier: AMSYSCO (post-tensioning)
The 40-foot cantilever at the north entry of the building welcomes visitors and provides a space to congregate before and after events.
Right: Floor to ceiling curtain wall windows allow for natural light to pour into Friedman Hall with views towards the Campus and Rockefeller memorial Chapel.

Below: Green roofs absorb and retain storm water from the building.

Opposite Top: Section.

Opposite Bottom: The opposing north and south cantilevers create a self-supporting structure similar to a seesaw, which allows deeper cantilevers with a minimal amount of concrete.
The Museum of the Future is located on the main arterial spine in Dubai’s central business district. The site was selected due to its ability to connect the Dubai metro and the Emirates Towers retail, commercial, and hotel spaces through the new building’s podium structure, creating a vital pedestrian pathway to link the city to the site. The building also became a pivotal visual touchstone for Dubai’s residents and visitors. The podium structure raises the museum above the metro line and replaces the trees that surrounded the carpark with a green hill structure. This scalable, vegetative hill connects the museum and restaurants at different levels. The museum’s cultural context is provided by using the ancient art form of Arabic calligraphy as its fenestration, which further reflects the city of Dubai by using the quotes of its ruler.

The project is comprised of three main elements: the green hill, the museum, and the void. The green hill represents the earth, with its roots in place, time, and history. The inspiration for the landscaped hill was to elevate the building in an unobstructed way above the adjacent metro and create greenery in elevation—an uncommon feature in Dubai—where visitors can enjoy a park environment while engaging with the museum. The torus shaped building represents mankind’s ability to innovate and construct the limits of present-day engineering and construction methodology that has been represented in significant structures throughout the ages. A primary inspiration was to create a form that represents the UAE Prime Minister’s vision of the future where the physical building embodies floors and spaces that represent an understanding of the future as we know it today and possibly for the next few years. In contrast, the void created by the building’s shape represents the unknown and those who seek it, and, in the process, innovate and discover new horizons and ideas that help guide humanity towards a better future.

The building’s lobby has a double helix central stair that connects the metro to the ground floor and connects the lobby to the museum. The central stair runs throughout the atrium space, encouraging visitors to descend through the levels to experience the undulating volume of the space with changing light through the calligraphy fenestration. Three panoramic bullet elevators with 35 person capacities ascend through the full height of the building within the atrium. This is further enhanced by one of the world’s largest elevators capable of carrying more than 120 people, or large exhibit pieces, to all floors.

The aspiration was to make the design, the fabrication, and its operational resources as sustainable as possible using innovative technologies. As part of this strategy, the project achieved LEED Platinum certification by using passive solar design, low-energy and low-water engineering solutions, recovery strategies for both energy and water, and by building integrated renewables from an off-site solar farm located on the rooftops of nearby carparks. To reduce solar gain and heat island effect, more than two thirds of the building’s area is situated below the green roof of the podium.
Single-Site Scale

The "Single-Site Scale" designation refers to a building or set of buildings and the immediate adjacencies. In this section, projects that strive to break the boundary between a building and its surroundings are examined. Key features include delivering culturally sensitive and appropriate schemes, activating the local environment for artists and designers, and creating public green space otherwise unavailable to tenants and citizens.

King Portland Centre, Toronto, Canada

Working with the site’s amoeba-shaped property lines and complex urban condition, the development of King Portland Centre (see page 30) has created a network of laneways (see Figure 3) between King and Adelaide Streets to generate a vibrant inner block life lined with shops and cafés that encourages pedestrian discovery and a dynamic street life in a space that would otherwise be unused. The development is carefully knit into the heritage fabric of the neighborhood, connecting to the district’s brick-and-beam industrial character. Respecting both the material form and scale of the neighborhood, the development weaves itself into the site beside the existing Victorian building to the east and the historic rowhouses to the north along the parallel laneway.

The development is set back from King Street and features two-story brick arches that frame the ground floor and connect to the district’s brick-and-beam industrial character, allowing for it to effortlessly blend into the existing streetscape. The materiality lends a sense of solidity, permanence, and timelessness to the site. The masonry continues into the laneways, with clay bricks on the ground creating an intimate ambience for diners and pedestrians.
Green terraces offer outdoor spaces for the office workers and residents, and three levels of underground parking accommodate the needs of the 376,737 square feet (35,000 square meters) of new space added to the block. Pedestrian access is encouraged through the series of interconnected mews-like routes through the site. These mid-block connections and inventive uses of public laneways for pedestrian routes and patio space have created a unique and vibrant public space for the neighborhood and contributed to transforming it into a village-like community in the heart of the city.

**King Portland Centre**
features a network of public laneways full of shops and cafes, encouraging a dynamic street life.

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**Figure 1:** King Portland Centre generates a dynamic street life in a network of public laneways that would otherwise be unused.

**Figure 2:** The development features two-story brick arches that frame the ground floor and connect to the district’s brick-and-beam industrial character.

**Figure 3:** Ground floor site plan showing the public laneways created within the development.
Working in tandem with a range of related disciplines, the world’s tall building constructors often must innovate to solve complex on-site issues that may appear to be unique to the location, but then prove to have broader applicability. The projects featured in this section applied techniques that include pre-molded GFRC panel forms; an integrated truss platform-based hydraulic climbing form work system and an all-steel variable-angle inclined climbing attached lifting scaffolding system; an existing steel structure that was retained, modified, and adaptively incorporated; innovative modular system designs and procedures; and pre-lift and strand jacking practices.

One Thousand Museum, Miami, United States

One Thousand Museum (see page 303) features undulating exoskeleton columns that make the project both an instant landmark and an engineering breakthrough. The tower is the first of its kind, consisting of 5,000 lightweight glass-fiber reinforced concrete (GFRC) panels. An innovative system was needed to build the structural form work of the tower, as its serpentine exoskeleton (see Figure 1) not only twists and curves as it climbs up the building, but the detailing of the structural column profiles constantly changes (see Figure 3). The forms required to pour the exoskeleton change with...
each floor lift. After a lengthy study of constantly modifying conventional column forms for each lift, it became apparent that the cost and time required would be prohibitive. Instead, the team used a firm in Dubai that had been successful with pre-molded GFRC panel forms to pour intricate pattern walls, leaving the form panels in place as the finished pattern product. However, this system had never been utilized to form major structural support columns for a high-rise tower. Working in concert with numerous structural engineers, the team was able to design the exoskeleton columns to meet all engineering requirements.

The main challenge for the construction team was the intricate logistics of the permanent form work for the structure being fabricated and shipped from Dubai. Each level of column forms was unique to that level and could not be used for any other location on the building. To ensure quality control during fabrication, the team placed a full-time representative in the Dubai casting facility to monitor the quality of the castings before packing. This team member was responsible for making sure the sequence of production matched the levels being constructed in Miami and, in addition, oversaw the packaging of the shipping containers.

As the containers were received at the port of Miami, they were offloaded at a storage facility, unpacked and inspected, and had their final location in the structure confirmed. This ensured that any shipping damage that might occur could be discovered and addressed in time to meet the installation schedule. The panels were then loaded and trucked to the site in a sequence in time to be picked from the trucks and craned to their final position. This reduced the risk of damage...
To best serve the inhabitants of the increasingly dense global urban environment, city-shapers must approach the city through an interdisciplinary lens, integrating the tall building into the urban fabric by considering its role as essential urban infrastructure. As the world rebuilds and responds to COVID-19, never before has the marshaling of different perspectives been more critical in the pursuit of livable, sustainable, and healthy urban communities.

This volume highlights the very best innovations and projects, spanning the range of disciplines involved in city-making, from urban design, to interiors, to specialized engineering, all converging to make the city more resilient and enduring.

The Tall Buildings + Urban Habitat book is produced annually by the Council on Tall Buildings and Urban Habitat (CTBUH), the global authority on the inception, design, construction, and operation of tall buildings and future cities.