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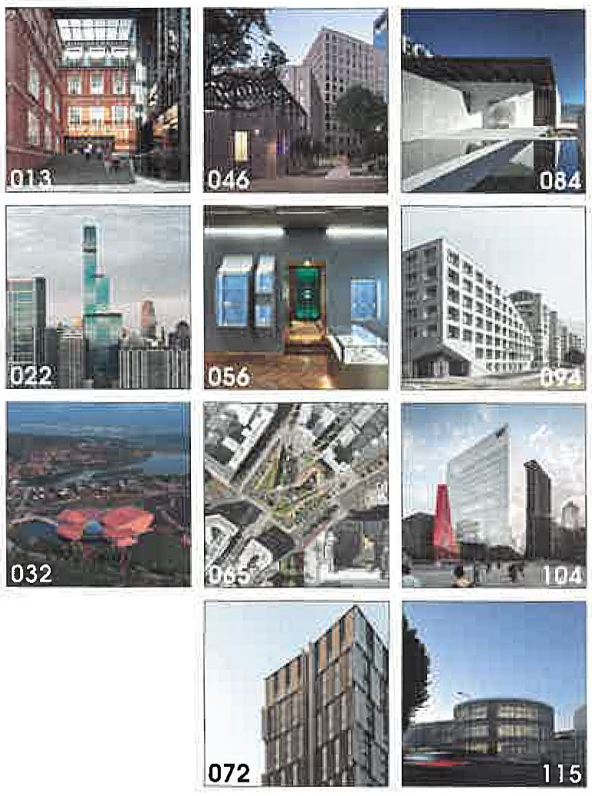

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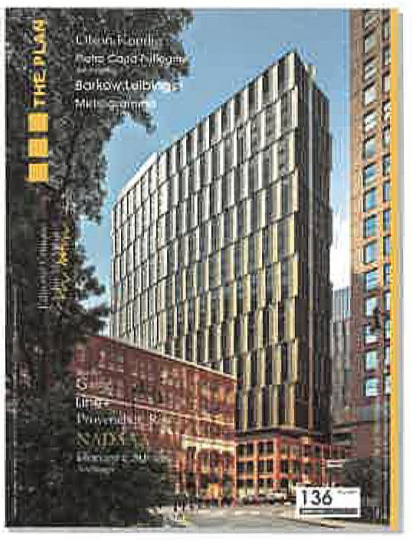

COVER
"MIT Site 4" Multifunctional Complex
Cambridge, Massachusetts, USA
NADAAA

Photo © John Horner
courtesy of NADAAA

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Publisher
PAOLO MAGGIOLI
Maggioli S.p.A.
Via del Carpino, 8
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THE PLAN
Art & Architecture Editions
Via del Pratello, 8 - Italy
T +39. 051.227634
F +39. 051.220099
E abbonamenti@theplan.it
W theplan.it
CCAP 0610 U 89003

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"MIT SITE 4" MULTIFUNCTIONAL COMPLEX

THE ELEGANT BALANCE OF FORM AND TECHNOLOGY

CAMBRIDGE, MASSACHUSETTS, USA

Cutaway view
The program creates a connection between urban, academic, and retail spaces and a direct link to transport systems

NADAAA

Nader Tehrani

Architectural firm NADAAA is dedicated to bridging design disciplines; from landscape to urbanism, architecture to interiors, and industrial design to furniture, with a focus on craft, construction and digital fabrication.

Located across the River Charles from Boston, the city of Cambridge, Massachusetts, has recently been in the grip of a building boom triggered by its prestigious universities. This testifies to what can be described as institutional American architecture reaching maturity after taking on board many of the lessons coming from Europe and embracing issues ranging from restoration and adaptive use to energy efficiency, social sustainability, and innovative building materials. An example of this new approach is the recently inaugurated graduate student housing - this perhaps an inadequate term - at the Cambridge Gateway. Designed by NADAAA and Perkins+Will, the university building stands at the top of the huge triangle occupied by the Massachusetts Institute of Technology between Main Street and Memorial Drive.

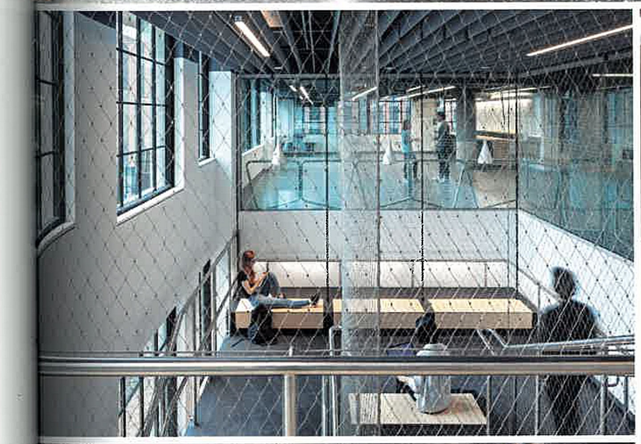
Practically opposite Kendall Square, the 29-story, 100-m high building - now the highest in Cambridge - is part of a new multi-use complex that acts as the eastern "gateway" into the campus. Part of a wider urban regeneration project, the planned urban development has englobed a series of old buildings and parking areas to create residential, academic, research and retail spaces over six buildings as well as a swathe of interconnected external areas for a total of 167,000 sq. m.

The historic buildings included in the project's large precinct were retained, given new dignity, and put to new use. In compliance with this private university's general development plan, the permeability of the new complex was another must. Accordingly, public, semi-public and private spaces are linked seamlessly, making the area not just an amenity for the academic community but also for residents around Kendall Square.

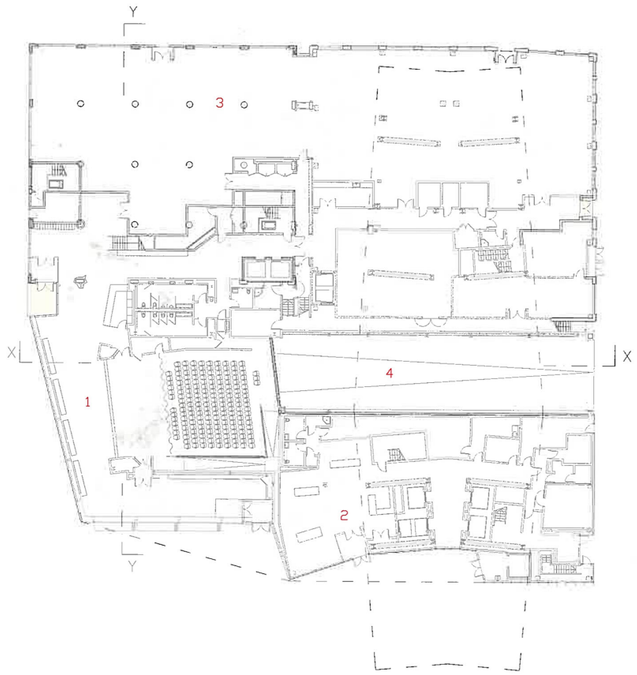
The opportunities the project offered were put to excellent use by the compositional brilliance and technological know-how of Nader Tehrani, founder of the Boston-based architecture firm NADAAA, and former professor at MIT where he was Head of the Architecture Department for four years. The new architectural complex, known simply as MIT "Site 4", comprises a retail frontage opening onto the north-west corner of the block created from a pre-existing building, the MIT Welcome Center, a university admissions office, a childcare facility and, above these in the rest of the huge tower, 454 studio and one- and two-bedroom apartments for graduate students. The result of much of Tehrani's research into façade design over recent decades, this horizontal tower has quickly become the iconic symbol of the new complex. Rightly so, as its many special features lend it a particular elegance in very mundane surroundings. The tower's distinctive appearance stems from a brilliant combination of technical know-how to meet the structural requirements and ingenious artistic flair. Like all the other buildings on the plot, it is supported by a composite steel and reinforced concrete podium with a below grade underground parking system. The tower rises from a historic building whose burnt brick structural façade was the only element preserved, the interiors being completely re-built to meet the new requirements. For this reason, the first four levels of the tower are a combination of steel columns and vertical connectors with cores of reinforced concrete. These give way on the fifth floor to huge projecting hybrid reticular beams, made of steel and reinforced concrete elements that support the weight of the tower. From this level up, the frame is in reinforced concrete, a system of cast-in-place perimeter columns and beams supporting the floor slabs. A bit like Gio Ponti's high-rise tower in Milan, the building has been angled to benefit from solar exposure. Each end seems vertically sliced off, an effect enhanced by imposing metal end strips. This, together with the tower's slightly skewed perspective dematerializes the huge massing of the dormitory. The graduated color palette of the exterior reinforces this effect. The anodized aluminum panels on the east and west façades of the tower go from a burnished coffee color at the base, similar to the brick of the building immediately below - which, aptly, houses a public foodcourt - through to a creamy white, like the layers of a mocaccino!

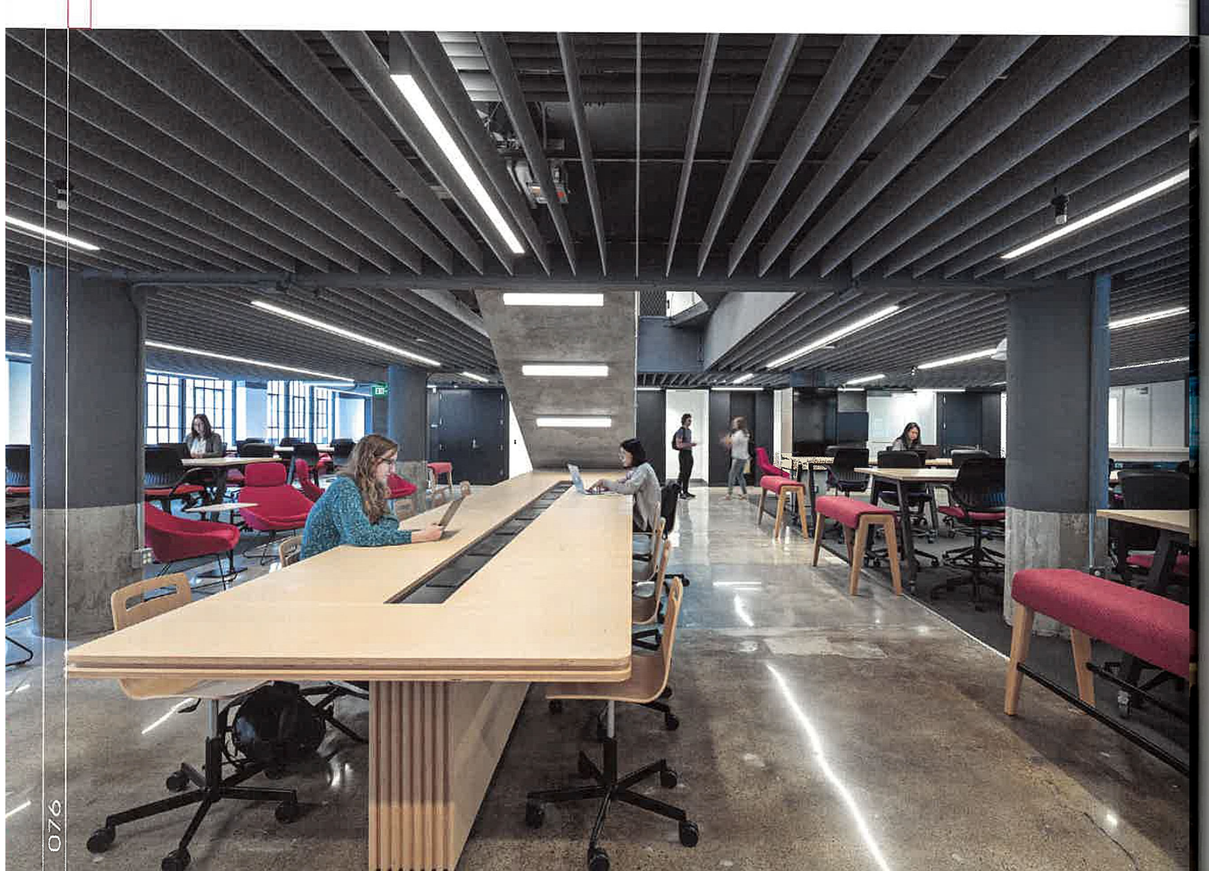
The external pre-manufactured partitions are three-m high engineered aluminum panels attached to frames fastened to the building's structural columns. Arranged in vertical series of three, the panels are staggered towards the south or north by one third their width in an ashlar-like setting. The aluminum panels, each weighing 1.9 t, are secured by J-shaped brackets to the floor slab above and anchored to the slab below. This alternating array, together with the inclination of the panels, sets up of a play of light and shadow, creating an ever-changing surface aspect while at the same time protecting the apartments and lower community floors from direct solar exposure. The apartments in fact face west and east, the long internal distribution corridor on each floor opening out at several points to create relaxation and socialization areas. The interiors are finished in unrendered reinforced concrete while the floors are in polished concrete. Walls are clad in maple wood, and the same timber is used for the false ceilings. The other areas available both to the dormitory inhabitants and the general public include a panoramic roof terrace, a large plaza above the 200-seat auditorium and a new children's playground.

The tower's distinctive appearance stems from a brilliant combination of technical know-how to meet the structural requirements and ingenious artistic flair.

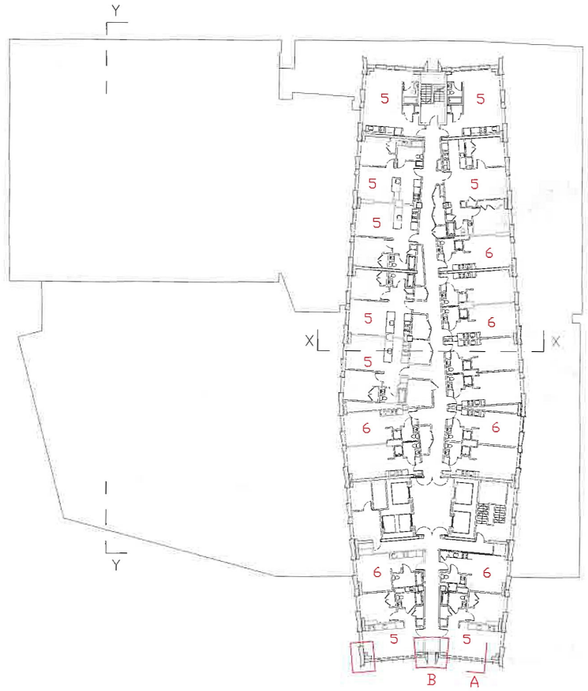


First level plan - Scale 1:600





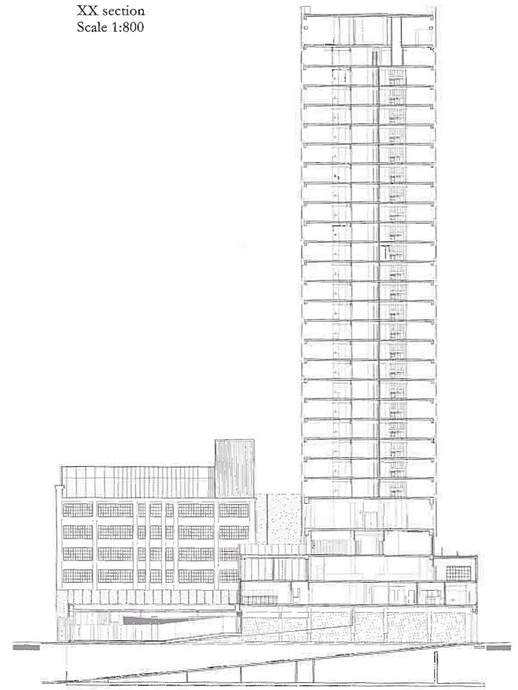
Eighth level plan - Scale 1:600



1- MIT Welcome Center
2- Residential lobby
3- Retail
4- Garage ramp
5- Apartment
6- Studio

North elevation
Scale 1:800

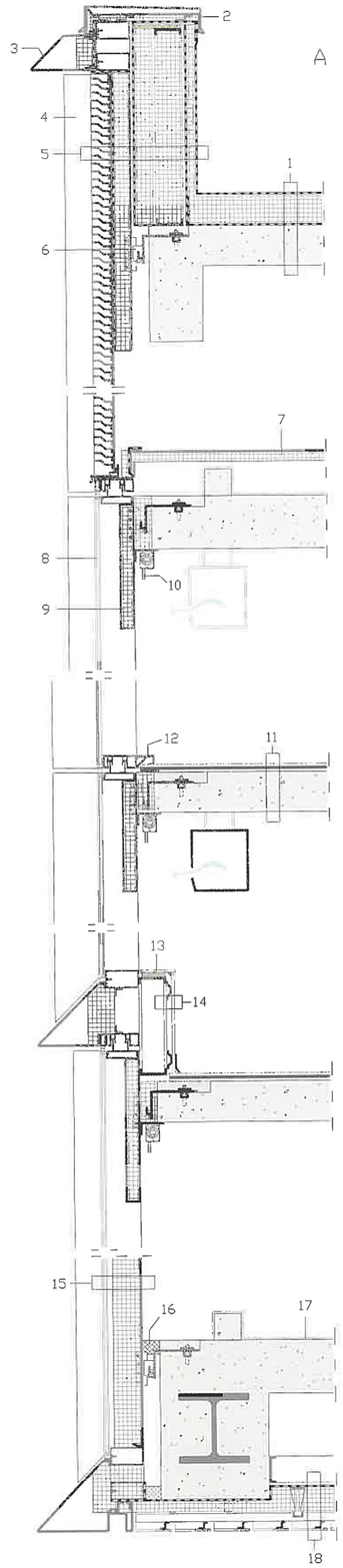
XX section
Scale 1:800

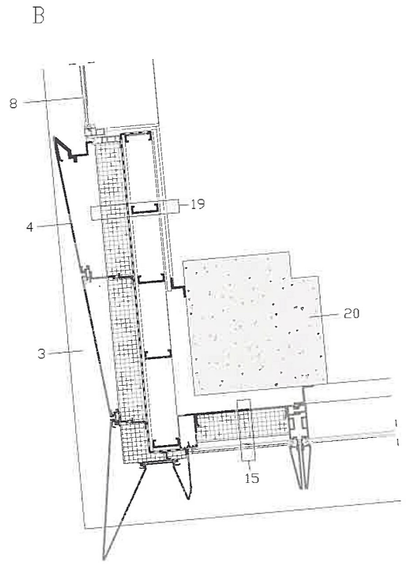


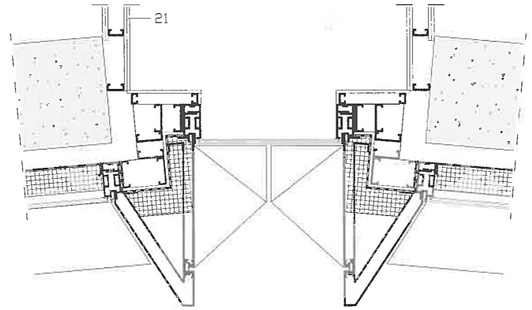
YY section - Scale 1:800

Detail A: Southern façade
Vertical section - Scale 1:30
Detail B: Horizontal section of seventh floor - Scale 1:30

1- Roof comprising waterproofing membrane, 1/2" (12.5 mm) protective panel, 5 7/8" (150 mm) rigid insulation, vapor barrier, 9" (230 mm) reinforced concrete slab
2- Aluminum flashing
3- Shaped aluminum composite material transom
4- Shaped aluminum composite material mullion
5- Façade comprising fixed aluminum louvers, UV-resistant membrane, 4" (100 mm) rigid insulation, metal plate, waterproofing membrane, 4" (100 mm) rigid insulation, 5/8" (16 mm) gypsum sheathing, 6 1/8 x 1 5/8" (155x40 mm) metal C-profile framing with insulation, 5/8" (16 mm) gypsum sheathing, fire-retardant vapor barrier, 1 5/8" (40 mm) rigid insulation, 1/2" (12.5 mm) glass mat gypsum wall board, waterproofing membrane
6- Steel plates and profiles anchoring façade to slab
7- Sheet metal flooring on insulation
8- Full-height glazed façade with aluminum framing and 3/8 - 1/2 - 1/4" (10/13/6 mm) aluminum glazing unit
9- Aluminum sandwich panel with insulation core
10- Roller blind
11- Luxury vinyl tile flooring, acoustic matting, leveling layer, 9" (230 mm) reinforced concrete slab
12- Metal profile closure and trim
13- Simulated stone sill
14- Interior wall comprising 5/8" (16 mm) plasterboard, metal Ω profile supports, 6 1/8 x 1 5/8" (155x40 mm) metal C-profile framing
15- Full-height opaque glass façade with aluminum mullions and transoms and 3/8 - 1/2 - 1/4" (10/13/6 mm) aluminum glazing unit, 6 1/8" (155 mm) rigid insulation, shaped aluminum plate closure
16- Perimeter fire-resistant joint
17- Waterproof epoxy resin flooring
18- Suspended ceiling comprising phenolic panels, metal Z-profile framing, 5 1/2" (140 mm) rigid insulation, waterproofing membrane, 5/8" (16 mm) plasterboard, 6 1/8 x 1 5/8" (155x40 mm) metal C-profile framing
19- Interior wall comprising 5/8" (16 mm) plasterboard, metal Ω profile supports, 6 1/8 x 1 5/8" (155x40 mm) metal C-profile framing, 5/8" (16 mm) plasterboard, vapor barrier, 5 7/8" (150 mm) rigid insulation
20- Exposed reinforced concrete column
21- Wall comprising double 1 1/4" (32 mm) plasterboard with 4 x 1 5/8" (100x40 mm) metal C-profile framing







CREDITS

Location: Cambridge, Massachusetts, USA **Completion Date:** 2020 - **Client:** Massachusetts Institute of Technology - **Gross Floor Area:** 39,600 m^2 - **Architect:** NADAAA - **Principals in Charge:** Nader Tehrani, Katherine Faulkner **Project Manager:** Harry Lowd - **Project Architect:** Tom Beresford - **Architect of Record:** Perkins+Will - **Principal in Charge:** David Damon - **Project Manager:** Andrew Grote - **Project Architect:** Grace Nugroho **Main Contractor:** Turner Construction

Consultants
Structural: Odeh Engineers - **MEP/FP:** Arup **Envelope:** Studio NYL - **Civil:** Nitsch Engineering - **Landscape:** Landworks Studio, Hargreaves Associates - **Lighting:** Lam Partners - **Acoustics:** Acentech **Elevators:** Syska Hennessey Group - **Code:** Jensen Hughes - **Childcare Consultant:** DW Arthur Associates

Exterior Lighting: BEGA Gantenbrink-Leuchten

Text: Luca Maria Francesco Fabris, Politecnico di Milano - BUCEA Expert
Photography: John Horner
Portrait image: Carmen Maldonado, courtesy of NADAAA