Altieri

JULIS ROMO RABINOWITZ BUILDING & LOUIS A. SIMPSON INTERNATIONAL BUILDING PRINCETON UNIVERSITY

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ARCHITECT
KPMB Architects

LOCATION
Princeton, New Jersey

SIZE
197,000 SF

COMPLETED
2017

AWARDS
2022 Governor General's Medal in Architecture, Royal Architectural Institute of Canada
2018 Award of Design Excellence, Ontario Association of Architects
2018 Honorable Mention, SCUP Excellence in Architecture for Building Additions, Renovation or Adaptive Reuse

The development of the Julis Romo Rabinowitz Building & Louis A. Simpson International Building was intended to reinforce the University's "commitment to evolving its physical campus through the preservation and adaptive reuse of its existing resources to continuously foster scholarly and collegial exchange."[1] The project brought together 15 units from 10 buildings across campus, established a new hub for learning and collaboration, and repurposed 86% of the existing historically significant building while introducing additions within the existing footprint. The result is a 197,000 square-foot building consisting of classrooms, conference rooms, and common spaces, and the successful integration of heritage stone façades, arched entryways, and original wood-paneled elements, with contemporary glass rooftop pavilions, light-filled atriums, and a deliberate connection to exterior courtyards and quadrangles.

The A/E team was challenged to preserve the building's heritage and to underscore the University's ethos of sustainability. The keys to the success of the building lay in the architectural vision and the design and seamless integration of an especially complex infrastructure of building systems that prioritize the architecture and optimize energy efficiency while maintaining occupant comfort. Specifically, project scope required inventive systems design to address key attributes/goals:

Multiplicity of spaces with high degree of occupancy and load variability The building is supported by an infrastructure of decoupled, completely active systems, and combinations of thousands of devices and sequences, the integration of which maximizes energy efficiency. Decoupled systems, while not quite as responsive, allow for optimal efficiency within a flexible, unusually dense, multi-zone system. Humidity control is centralized. Room temperature is controlled by individual room controls, where each of the hundreds of individual rooms – classroom, office, conference room, gathering space – is its own zone, providing opportunity for optimal room temperature control. Sensors – occupancy, temperature, humidity, CO_2, exterior door and window contacts – are integrated and provide information directly to the systems.

Preservation of heritage windows and stone surrounds inherently at odds with energy efficiency The goal of preserving the heritage windows and stone surrounds guided two treatments. Active chilled beams and passive radiant heating panels were integrated in the ceilings above the windows to preserve the existing heritage details of the windows and their stone surrounds. Windows were made operable, with integrated window sensors channeling open/closed information to the building systems, indicating when HVAC is needed. Each window switch – when opened – shuts down a chilled beam.

Device integration to support architectural vision Imperative to the success of the project was the ability of the design team to anticipate the impact that architectural goals have on systems designs. To facilitate uncompromised architectural expression, the team identified systems strategies that did not dictate the architecture, but rather disappeared into the architecture. Organization and integration were of paramount priority given the sheer number of devices necessary to achieve energy efficiency/optimization and occupant comfort in hundreds of zones over more than five (5) building levels. Successful integration of thousands of sensors, diffusers, lights, and other devices relied on strategies including detailed Reflected Ceiling Plans to ensure that devices were seamlessly integrated and visually discreet.

Monitoring to ensure high performance of energy efficiency measures post-occupancy Integrating the network of devices with the Building Management System was critical to the building's energy efficiency performance. The extensive use of sensors in the building allows for monitoring of sequences, zones, building loads, occupancy/vacancy. Regular post-occupancy monitoring ensures energy optimization in the high performance mechanical systems serving the building.

All existing mechanical, plumbing, electrical, fire protection and fire alarm, lighting and lighting control systems were removed and replaced with new systems based on University Standards, NJ Building Codes, and requirements for a minimum of LEED Silver certification. All infrastructure requirements were closely coordinated with the University.

[1]Society for College and University Planning