U-M Health D. Dan and Betty Kahn Health Care Pavilion

Project Description

The adult inpatient hospitals of Michigan Medicine have consistently experienced high demand for inpatient rooms and surgical suites. This high demand has led to capacity constraints, impacting access for patients with high acuity and complex care needs. At the March and December 2018 meetings, the Board of Regents authorized the appointment of HOK Group, Inc., as architect to initiate design of the Clinical Inpatient Tower (CIT) project along with pre-construction planning. The proposed 690,000-gross-square- foot CIT project accommodates an inpatient care program with 264 single-occupancy patient rooms and 23 surgical/interventional radiology suites. This patient care expansion supports the clinical strategy of Michigan Medicine, increasing capacity to accommodate tertiary and quaternary care needs. Specifically, the patient program emphasizes improved access to clinical neurosciences and cardiac care services. Relocation of existing clinical services from University Hospital will allow for future redesign and growth for patient programs remaining in that facility. The facility design will emphasize sustainability with the expectation to achieve Leadership in Energy and Environmental Design (LEED) Platinum certification. When completed, the building is expected to exceed current energy efficiency standards by approximately 20 percent as compared to the State of Michigan building code for energy performance.

Commitment to Energy Conservation and Sustainability

The University of Michigan and Michigan Medicine have been dedicated to sustainability and energy conservation over an extended period. This nationally recognized commitment has informed sustainability approaches and shaped facilities into being good stewards of the environment. This has translated into campuses and buildings that not only use less energy, create less carbon, and use less water, but are also healthier for all who come to receive and deliver clinical care, develop research, and educate the next generation of leaders.

In the summer of 2019, as the design of The Pavilion was under development, The University of Michigan and Michigan Medicine requested the design team, HOK and AEI to refine the design that would allow The Pavilion to achieve USGBC Platinum Certification under LEED v4 for Healthcare New Construction and Major Renovations green building certification program. Along with design enhancements, the project included documentation measures to capitalize on the other sustainable commitments the university has made in energy savings infrastructure like the Central Utility Plant.

As a LEED Platinum Healthcare design, The Pavilion is on track to be a 'first of its kind' leader in sustainability, especially given the size and intensity of program components. No other project of this scale in North America is currently on track to achieve this standard.

The Pathway to Achieving Energy Efficiency and LEED Platinum Certification

As a pioneer in sustainability, The University of Michigan and Michigan Medicine's goal is to have The Pavilion be at the forefront of sustainable healthcare design. The Pavilion design uses a multi-pronged and holistic approach to the site and the building design that minimizes energy and water use while maximizing benefits to patients and staff. The multi-pronged approach includes the following.

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Setting New Ground for Energy Conservation: Foundational Approach to Project Success

Healthcare projects by nature are among the most intensive projects for energy and ventilation requirements due to the spaces and the type of care being provided and that they operate 24 hours a day. The Pavilion contains primarily high acuity beds with the provision that all Universal Care beds can flex to ICU capability, a dedicated ICU unit, 23 surgical suites, food service and diagnostic imaging. These requirements push the energy demand to the higher end of an already high healthcare energy use category.

Energy conservation design starts with understanding the baseline for how the building codes define what constitutes energy savings and what is required. The governing building code for The Pavilion defining energy consumption and conservation is ASHRAE 90.1 - 2013. This code established standards for energy use required to be code compliant. The Pavilion design is set to achieve an estimated energy savings of 20% below this target. Including the high-performance university central utility plant, the overall energy savings is estimated to be 71% electricity, 19% natural gas, and 49% carbon emissions when compared to a ASHRAE 90.1-2013 baseline design. These energy savings are achieved thru a combination of creative design and thoughtful selection of building systems and materials.

Several of the key design aspects that mitigate energy use include: a high-performance exterior façade with 23% vision to glass to wall surface to control heat gain and loss while keeping patients and staff comfortable ; maximizing natural light and views; strategies to recover and to reuse energy created by the building in its natural operation (using heat recovery chillers and regenerative drive elevators); implementation of high efficiency lighting, fans with efficient distribution, advanced controls and connection to a central cogeneration plant.

Sustainability Strategies for Environmental Consciousness and Health

A key component of The Pavilion's mission and objective is to promote and help patients recover and regain health while also providing an environment that will attract and retain physicians, clinicians, and staff. There are several ways that this is being achieved through sustainability initiatives.

Transportation. There are two strategies to help minimizes vehicular mode of travel. The first strategy capitalizes on The Pavilion site location. It provides easy access to the UM and Ann Arbor Transit Authority bus system. The second strategy addresses the use of bicycles. The Pavilion provides covered bicycle parking adjacent to the staff entry and is equipped with staff showering facilities to encourage bicycle use as a primary mode of transportation.

Site. There are two strategies to enhance the natural environment of the site in keeping with the broader campus landscaping approach. The first strategy is to restore 50% of the project site with natural landscape plantings that are harmonious and native to Michigan and drought tolerant. The second strategy is to provide places of respite on the site around the building for staff, patients and patients' families to connect with nature and restore themselves. In addition, an extensive storm water management system will collect and hold storm water during heavy rain events and aide in water control downstream and reduction in erosion.

The Building - The Pavilion. One key aspect of health and wellbeing for staff and physicians is to have direct access to natural light. The design of the Pavilion maximizes natural light to patients, visitors, and staff. Vision glass is judiciously focused in patient, circulation, and staff areas. The placement of the glass and the height of the building at 12 stories, maximizes views of the campus and City of Ann Arbor.

Use of Water. Conserving water in an ever-changing climate is critical both economically as well as environmentally. The Pavilion is estimated to use 40% less water than a standard hospital by the careful selection of plumbing fixtures and the design of the process water systems.

Material Choices. Materials assembled and installed in The Pavilion have been carefully selected to reduce

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negative impacts on the environment while also providing optimal indoor air quality. The use of low emitting and healthy materials throughout contributes to health, wellness, and improved air quality. In addition, sourcing products locally when possible is a strategy to minimize and reduce manufacturing and distribution impacts, including transportation of materials to the site. An example of this is the selection and subsequent design of the structural system which resulted in a reduction in the embodied carbon of the building by nearly 10%

Construction and Tracking of Materials and Building System Installation. Strategies to minimize waste and maximize recycling throughout construction of The Pavilion will be utilized throughout construction . Also, commissioning will occur for the exterior enclosure of the building and all mechanical and electrical systems installed. The process, referred to as 'commissioning' requires a third party (not the designer or the builder) to monitor, test and document that systems specified are installed and operated as intended. The commissioning process is essential for high performance and complex facilities such as The Pavilion . To further promote efficiency and maintain high performance operations over time , documentation will be provided to the building-managers with detailed information about how the building is intended to operate and be maintained.

Carbon Neutral Ready

The university has a deep and documented track record of energy conservation and sustainability. As this commitment progresses toward a carbon neutral campus, U-M will work toward the development of campus energy source(s) to deliver clean energy (not fossil fuel generated) across the campus. When this occurs, some modification to existing buildings and their systems will likely be required. The Pavilion design has considered this evolving future and provides flexibility and readiness to minimize cost and disruption at the time of switching over to carbon-free sources of energy.

The Pavilion represents a significant commitment to the State and its citizens for a much-needed high acuity healthcare environment to treat and care for patients. That care environment will set a new standard nationally as a 'first in class' for sustainability and energy conservation while providing exceptional patient care for The University of Michigan and Michigan Medicine.