CASE STUDY

Collaborative Life Sciences Building & Skourtes Tower

INTERFACEENGINEERING

The CLSB buildings *were designed to provide a collaborative educational environment for our healthcare and dental programs. Our extensive design team reflected a similar commitment to collaboration and innovation, and Interface played a key role: their creative MEP systems will serve the building and its various users for years to come.*

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OREGON HEALTH & SCIENCE UNIVERSITY

THE SCIENCE OF

Conservation

The Collaborative Life Sciences Building (CLSB) and Skourtes Tower is a true collaboration between Portland State University, Oregon State University, Oregon Health & Science University, the architecture/construction team, and Interface Engineering, lead MEP engineer. **The state-of-the-art $290 million LEED Platinum teaching and research facility is meant to foster collaboration in undergraduate and graduate education among students and instructors from multiple institutions.** Because the facility was rapidly designed using IPD at co-located spaced, the design team brought the same spirit of collaboration to their process.

Completed on schedule in June 2014 and within budget, CLSB expands the universities' education offerings while Skourtes Tower replaces OHSU's former dental school, which needed an estimated $25 million in deferred maintenance. CLSB and Skourtes Tower provide a better solution. Designed with noteworthy energy, water, and money saving features, it encourages interaction between students and instructors from different fields of study, providing a simulated "real-life" learning experience. **The modern facility also includes the latest technologies, including one of the largest dental vacuum systems in the country [right]**, which serves the expanded 200-chair program.

In addition, the project houses lecture halls, classrooms, teaching and research laboratories, including an underground, low-vibration microscopy lab with electron microscopes. It also contains a simulation center, specialty research areas, office space, and the OSU College of Pharmacy.

With an $82 million portion, after a $2 million increase due to OHSU's expanded scope, Interface designed several high-performance systems throughout the facility, including radiant heat /cooling systems with displacement ventilation, variable air volume labs, heat recovery ventilation between sources, occupancy sensors to reduce lab hood exhaust, heat recovery from refrigeration equipment, rainwater reuse, and parking garage light daylight sensors. As a result, the project is expected achieve 45% energy and 60% water savings – a remarkable achievement for a building that has significant demands on both resources.

Meeting the challenge

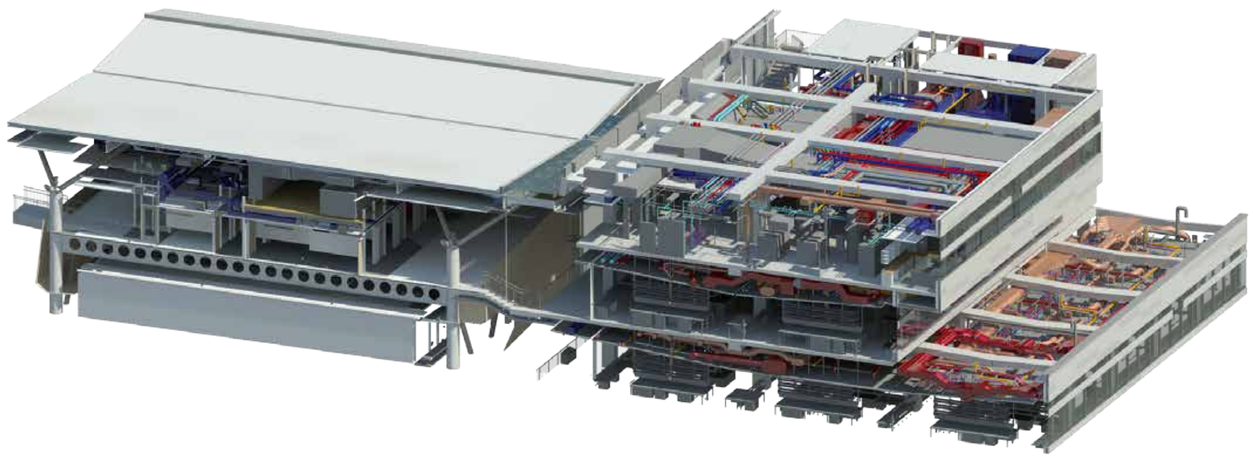
To achieve LEED Platinum in an advanced medical environment, Interface brought its healthcare expertise and an extensive understanding of the South Waterfront District to the process. As a key player in OHSU's first LEED Platinum facility and CLSB's neighbor, the Center for Health & Healing, Interface understood how to integrate the building's complex systems with the architecture and site for optimal performance. The designs met the aggressive criteria for resource conservation, cost savings, and the unprecedented design and construction schedule, all while providing improved occupant comfort and health for the building's users.

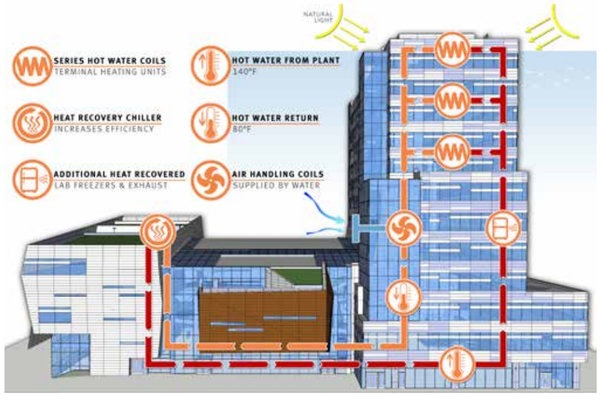
The completion was made possible on a very short time-line (32 months for design and construction) using advanced BIM techniques [below]. Interface's model provided consistent data for wind dispersion analysis, smoke control and life safety calculations, energy modeling, lighting calculations, and HVAC loads. Because the fast pace dictated an overlap of design and construction, Interface's progressive modeling techniques also allowed for real time coordination of trades. "Lock-down" of design at systematic intervals permitted designers to contribute useful information up to the last minute.

Concepts were vetted in real time because of the early BIM modeling and collocation of team members. The BIM model translated design information to the field electronically in the form of construction coordinates, and the automated process increased the speed of layout. In spite of the complex programming, large sections of floor slabs were successfully poured at two week intervals.

Future value

CLSB and Skourtes Tower's unique heat recovery system layout can be used for future building applications. **The air space in the atrium is used as a repository for heat rejected from surrounding lecture halls and offices, and the heat is reclaimed for use in conditioning laboratory air [right].**



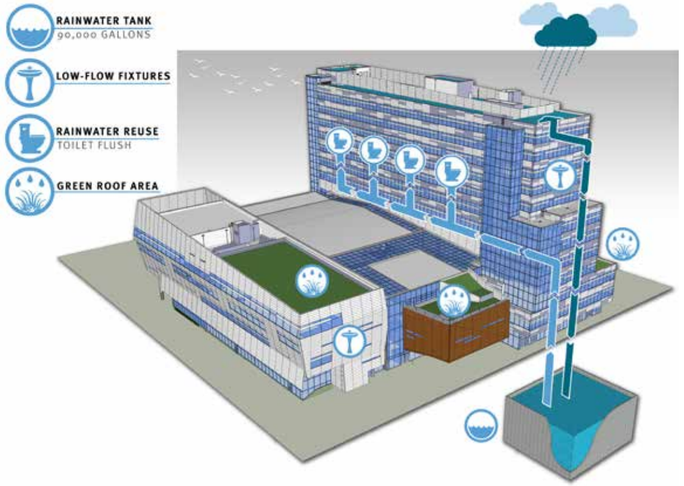


The space use of the atrium dictated the use of Computational Fluid Dynamics modeling to determine that egress paths were sufficiently clear of smoke for existing during a fire.

The use of a heat recovery chiller and the strategic integration of how the systems are laid out allow significant savings on the heating bills. Cooling is enhanced by careful selection of chillers. Fan static pressure is decreased by use of dual purpose heating/cooling coils. This lowers operating costs significantly since the laboratory fans run 24/7. Use of multiple small plenum fans in air handlers saved space and provided more program area in a smaller building footprint. Evaporative humidification supplied with heat by the heat recovery chiller gave the Vivarium a humidification system with a very high heating Coefficient of Performance (5.0). Following the completion of Center for Health & Healing, CLSB and Skourtes Tower is the second project OHSU, along with Interface, has completed in the past 10 years to achieve LEED Platinum status. This supports OHSU's commitment to constructing buildings that minimize carbon impact and demonstrates their environmental stewardship, providing a positive public perception.

Social, economic, and sustainable development considerations

The Interface team included multiple sustainable features during construction and tenant occupation. Inclusion of



green roofs and toilets flushed with rainwater are just a few factors that helped CLSB and Skourtes Tower achieve LEED Platinum status [above]. Even with constant design revisions the job remained completely paperless. Along with extensive BIM use and computerized kiosks with the construction team, the project saved an estimated $10 million in printing and labor costs, in addition to saving thousands of pounds of paper.

The project also serves a vital role for the client and the region. By utilizing a former brownfield site, OHSU created a community asset that demonstrates their environmental stewardship.

Special measures were taken to assure isolation of vibration for the microscopy lab. Sources of possible vibration interruption included mechanical fans, nearby light rail, and barges passing in the nearby Willamette River.

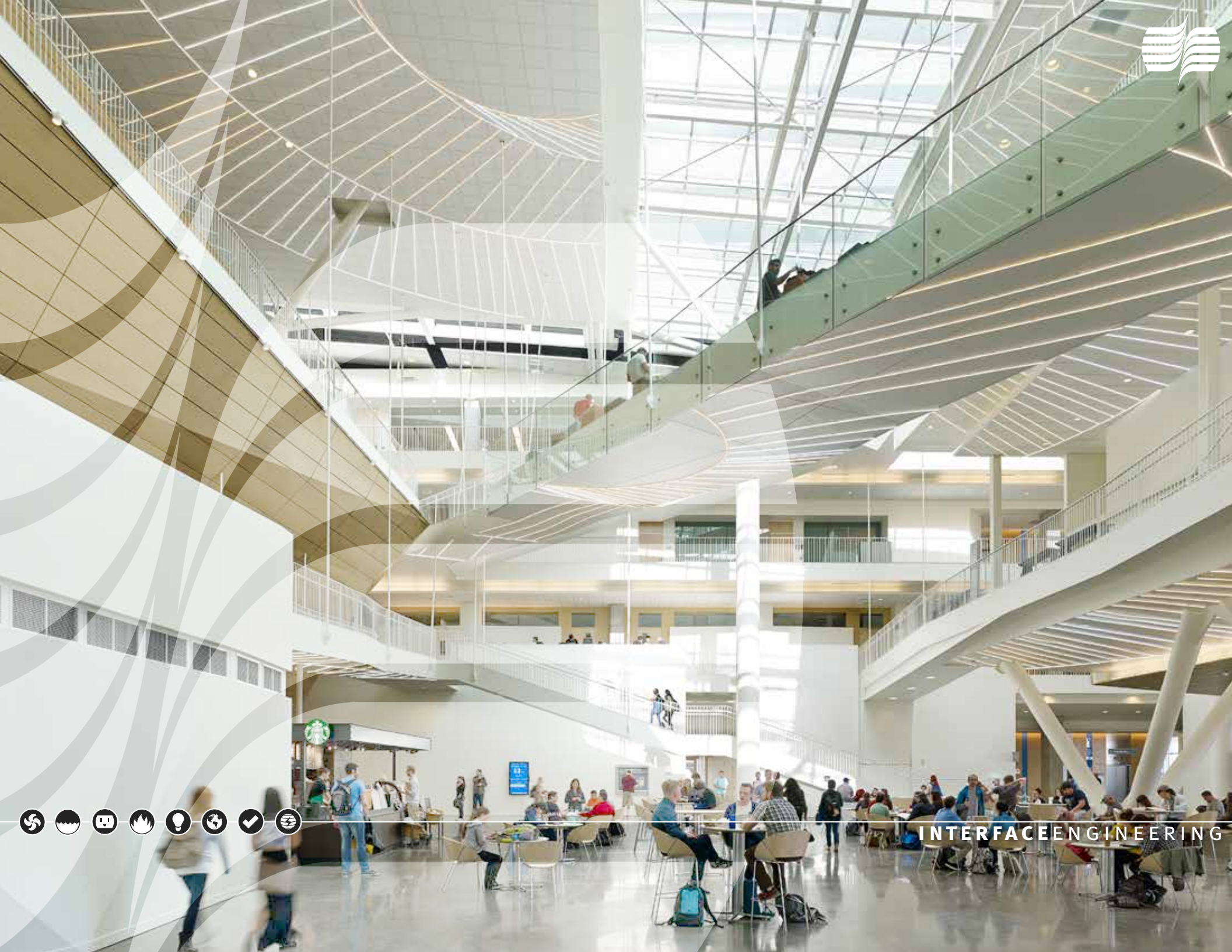
200
DENTAL
CHAIRS

Throughout CLSB, **26 different piping systems are used to aid the facility for real world education.** In OHSU's School of Dentistry portion, large dental vacuum systems pushed the limits on design ingenuity and cost control. Large pipe sizes were not readily available in tin copper, which created code discussions when the alternate material of stainless steel was considered.

Use of the BIM model translates design information to the field electronically in the form of construction coordinates. The process once automated, increased speed of layout. In spite of the complexity of embedded hangers and floor penetrations for piping, ductwork, and conduit, large sections of floor slabs were poured at two week intervals. The BIM model should prove to be a resource for ongoing operations and maintenance, as well as future renovations over the life of the building.

Truly living up to its name, the Collaborative Life Sciences Building required extensive collaboration between the design and construction team throughout each phase of the project. By implementing progressive BIM modeling techniques, the latest laboratory technologies, and innovative high-performance systems, Interface was able to meet the demands of a short project time-line and deliver a truly remarkable building that will serve as a model for future research facilities.

Architecture: CO Architects with SERA
Photography: Jeremy Bitterman
www.interfaceengineering.com



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