Lower School
Oregon Episcopal School

Portland, Oregon
Completed 2016
43,000 SF
Campus area: 59 acres
Student capacity: 400

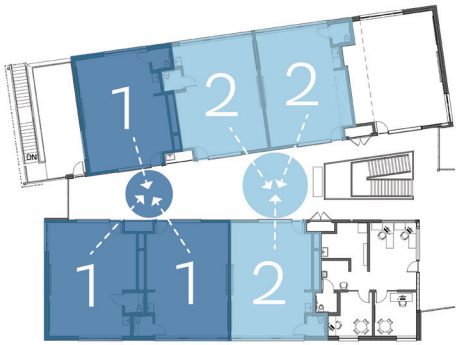
Cost: $11.7M, $272 / sf
Path to Net Zero (Energy Trust of Oregon)

Design summary

The OES Lower School faculty and leadership began shifting their teaching process toward more active learning and Reggio Emilia-inspired pedagogy, seeking to give Lower School students more agency in their own learning. However, their 1965-era Beginning and Lower Schools, built for traditional modalities, made this increasingly difficult and severely limited teachers' ability to fully incorporate these new methods. It was this desire to evolve their pedagogy that ultimately led to the construction of the new Lower School.

The design for the new facility reflects the OES community's desire for open spaces that encourage the exchange of tools, knowledge, and creativity; flexible learning spaces that are adaptable to changing curriculum needs and evolving technology; gathering spaces that support interaction at different levels and scales; and a design that embraces nature and the outdoors as a teaching tool. The new building is home to students in Pre-K through 5th grade, and it features flexible classrooms, dedicated group collaboration spaces, adaptable science labs and art studios, multi-purpose gathering and performance space, and ample access to the outdoors.

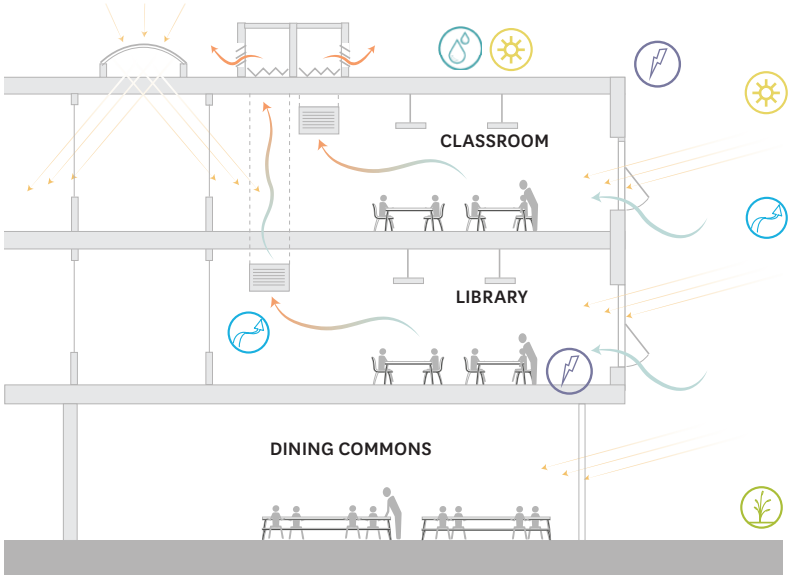
The use of natural materials, daylight, and integrated sustainability strategies allowed this project to become a pilot project for the Energy Trust of Oregon's then-brand new Path to Net Zero program that guides and supports teams through the design process with a focus on energy-efficiency strategies to achieve Net Zero. With the addition of a future solar panel array, the project will achieve Net Zero Energy.



Programming Concepts: Affinity Commons

Because certain grades have an "affinity" in the learning development of the students, the open spaces between these groups of classrooms came to be known as the "affinity commons." Organizing each grade room with a triangular relationship to the center, and creating a view between all three, created a grade affinity space. These spaces offer teaching teams the ability to coordinate their activities at certain times, give students choice in how they want to learn, and provide opportunity for students to take an activity outside the room while still being connected and supervised. The "Affinity Commons" are then designed to provide flexibility for how and what the teachers and students need.

Passive Design Strategies



Healthy Building Materials
Natural, long life-cycle building materials create healthy learning spaces that don't emit toxic chemicals and ensure the building endures a long lifetime

Natural Ventilation
Roof ventilation shafts improve occupant comfort and reduce mechanical cooling

Stormwater Management
All rainwater on roof and run-off from parking lot travels through runnels and treated in sub-surface treatment facility

Daylight and Views
All spaces have access to natural light and views to nature. Skylights provide light at the core of the building and stairwells bring light to the ground floor

Wetland Remediation
Zone north of loop road to be revitalized back into a natural wetland and teaching grounds

Thermal Envelope
High performance envelope lowers dependency on energy to heat/cool building

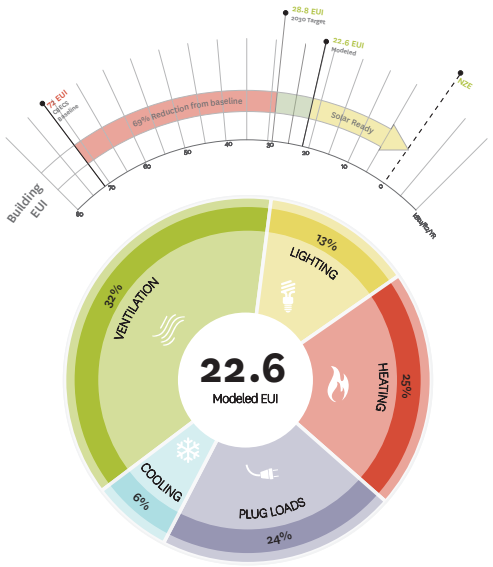
Renewable Energy
Roof designed for future energy-producing photovoltaic panels

Natural Playscape
Low-intensive landscaping and natural materials have low impact on environment

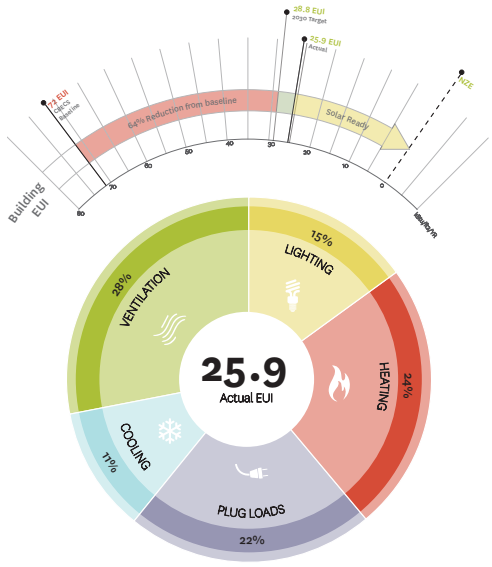
Building Orientation
Minimized windows on East and West facades to control glare and heat gain

Operable Windows
All rooms have operable windows allowing occupants to control their environment

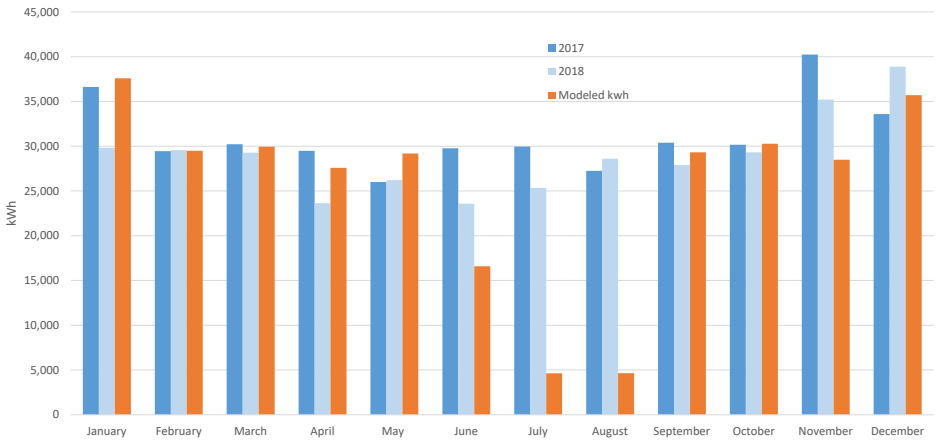
Thermal Mass
Exposed concrete floors acts as a thermal mass reducing demand on energy to heat/cool the building



Energy Use Intensity (EUI) is the amount of energy a building uses per year per square foot. By 2030, Hacker is driven to design buildings that can fully operate with power generated on-site or by sustainable sources



2018 Actual EUI by use type



2017 Actual Energy Use: **27.8 EUI**
2018 Actual Energy Use: **25.9 EUI**
Modeled Energy Use: **22.6 EUI**

Key Sustainability Strategies

The design team focused on several sustainable design strategies including thoughtful solar orientation, natural daylighting, enhanced thermal envelope, and natural, passive ventilation - all aimed at eliminating the need for mechanical cooling. The building is oriented on an east/west axis to optimize daylight on the north and south, and its geometry is split lengthwise to allow for light and air to penetrate the building center. Classrooms are also naturally ventilated; a stack ventilation system directly communicates via sensors with the user-operable windows and mechanical system. With the future addition of a solar panel array, the project will generate enough energy on site to achieve Net Zero Energy.