Finn Hill Junior High School & Environmental Adventure School

LAKE WASHINGTON SCHOOL DISTRICT :: KIRKLAND, WASHINGTON

From the start, Finn Hill Junior High School and the co-located Environmental Adventure School effort was dedicated to building a highly energy-efficient educational campus. A foundational goal for this district's third generation high-performance school was to design a facility building upon information gathered through post occupancy evaluations from the previous two schools, and innovative energy management tools utilized throughout the district.

The resulting 120,515 SF school energizes the surrounding environment by integrating outdoor circulation and connections with the surrounding forest. The design also incorporates numerous sustainable elements such as extensive natural daylighting, energy-efficient envelope design, materials choices, and the potential for integrating photovoltaic systems.

Various tools and models were developed to study the relative effects of different assembly R-values and glazing areas on the energy target, allowing the team to be aware of the choices made with relation to daylighting, design and materials, and the effect that they had on the overall heating load. The result is a well-insulated envelope with strategically placed high-performance windows for daylight. To validate the selected options, an energy model of the entire building was created to confirm the performance.

MECHANICAL SYSTEM

The major heating workhorse will be a central air-cooled heat pump, which will have a Coefficient of Performance of 2.8 to 4.0 (i.e. 280-400% efficiency). The heated air will be delivered by a heat recovery ventilator at each pod, which recovers heat from exhaust air streams. Each classroom will have individual control through the central control system.

OPERABLE WINDOWS

All spaces, except the kitchen where it is prohibited by health code, are provided with operable windows. Operable windows will provide natural cooling, and the central control system will display a red or green light near the teacher's workstation to advise whether opening the windows is energy-efficient or not.

PHOTOVOLTAICS

PVs are integrated into one learning cluster ('pod') with built-in capacity to add more in the future. Over 70% of the roof of this single-story building is pitched to the south to optimize use.

DAYLIGHTING

All regular classrooms have 2% daylighting for 100% of their floor area, and all regularly occupied spaces are provided with daylight and views, including the kitchen and the custodial office.

Energy Use Intensity:
27 kBtu/SF/yr

Percent CO_2 Reduction:
79%

Energy Star Design Rating:
89

Annual Savings Statistics (compared to an average building EPA Rating of 50):

Energy Savings:
11,800,000 kBtu

CO_2 Savings:
196 Metric Tons CO_2

Building/Space Type:
K-12 School

Total Gross Floor Area:
120,515 SF

Estimated Occupancy:
September 2011

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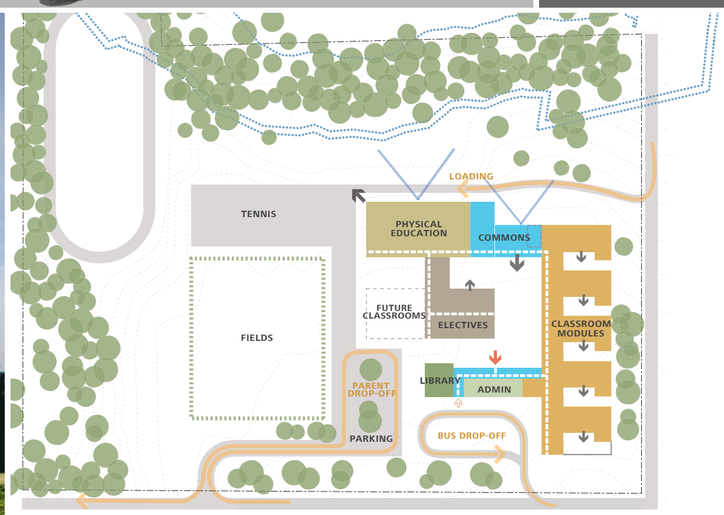
A building dashboard touchscreen will display energy use data in the main gallery and be available via the school network and on the web.

To compliment the dashboard, an LED light sculpture – conceived of as a 'family' – will pulse and glow depending on the overall health of the building.



DESIGNED TO EARN THE ENERGY STAR

The estimated energy performance for this design meets US EPA criteria. The building will be eligible for ENERGY STAR after maintaining superior performance for one year.

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