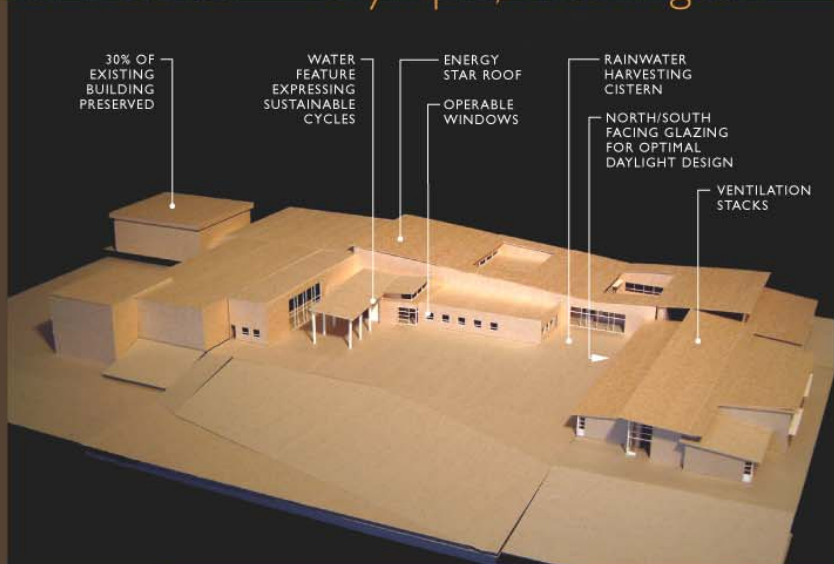


## Where does outside end and inside begin?

Sometimes the line blurs. Thresholds are crossed without notice as clustered classrooms reach into the surrounding environment and bring the outside in, capitalizing on opportunities for daylighting, natural ventilation and views.

From the start, Olympia School District has been dedicated to building a holistic design laboratory that yields a sustainable, high performance school. Along the way, Washington Middle School was selected as one of five pilot projects in Washington State to test and document various sustainable design strategies. When complete, the building will bring high performance elements into the realm of students, facilitating the learning process. From landscape design to the rainwater harvesting system and choice of building materials, the project expresses and promotes thoughtful environmental design at every turn, and will stand as a valuable case study for future school projects.

# washington middle school



AERIAL VIEW

Owner:  
Olympia School District

Architect:  
Mahlum Architects

Landscape Architect:  
The Berger Partnership

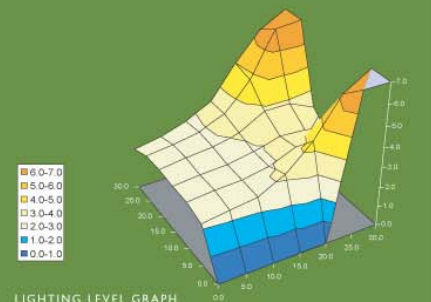
Civil Engineers:  
Coughlin Porter Lundeen

Structural Engineers:  
Putnam Collins Scott Associates

Mechanical Engineer:  
Abacus

Electrical Engineer:  
Travis Fitzmaurice & Associates

Cost Consultant:  
The Robinson Company



LIGHTING LEVEL GRAPH



DAYLIGHTING ANALYSIS OF TYPICAL CLASSROOM

### THE MAJOR SUSTAINABLE PRACTICES IMPLEMENTED:

An eco-charrette was held early on in the project to identify the goals of the owner, the users, and the design team. Full cooperation between the owner, the consultant team, and the utilities vests the team and the users, an important strategy in **propagating environmentally responsible thinking**.

The site and 30% of the existing school building were preserved. The reuse of existing infiltration galleries and addition of new storm chambers maximize ground **water recharge opportunities**. The natural "kettle" depression serves as the final step in on-site infiltration, contributing to regional groundwater recharge. A bioswale provides pollutant and sediment removal to help maintain the natural infiltration rates to the ground water table.

**Electrical consumption will be reduced by 50%, and gas consumption by 25%.** The Energy Star roof and additional building envelope insulation (R-30 Roof, R-21 Walls, and U 0.4 Windows) yield a high-performance building envelope. CFD modeling optimizes the natural ventilation and passive cooling design.

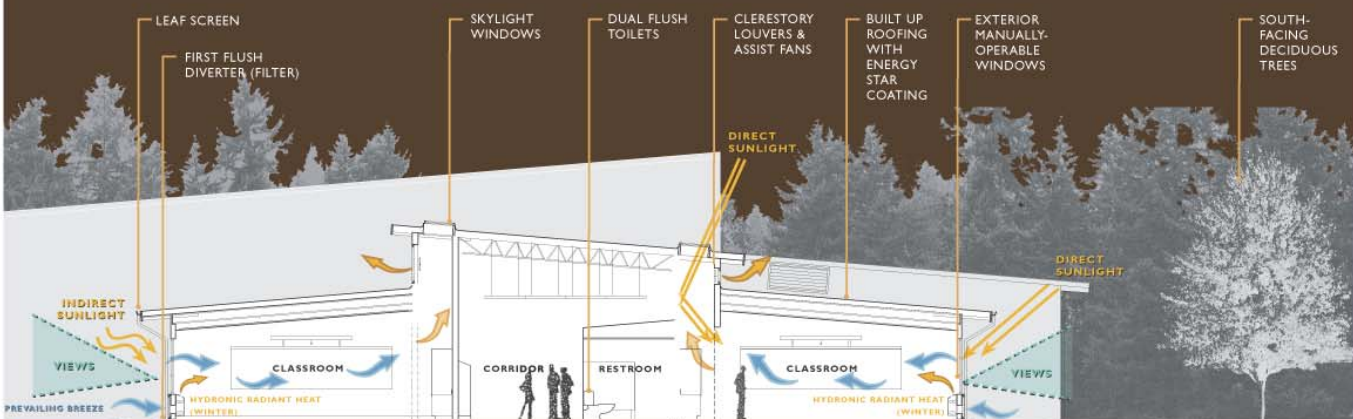
Classrooms are heated by fanless convectors with outside air dampers. High efficiency condensing boilers (>90% efficient) supply the convectors, while the energy management and control system (EMCS) monitors the system for real-time district trouble-shooting. **Extensive daylighting design**, optimized by Betterbricks Lighting Design Lab studies, uses active daylighting controls to automatically adjust electric lighting as light levels allow.

The design reduces the site's demand of City of Olympia water by over 15%. **Water saving strategies** include rainwater harvesting for flushing toilets, dual flush toilets and waterless urinals, automatic super low-flow water fixtures and equipment.

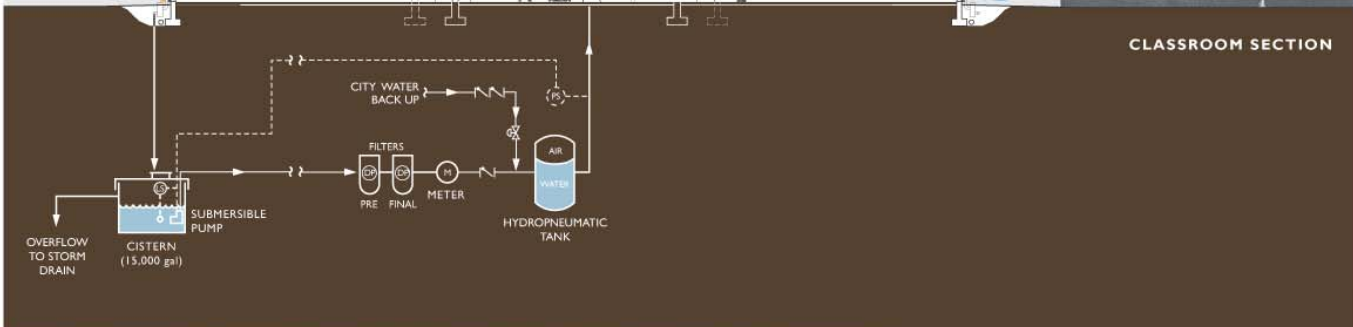
**User recycling** is promoted through design, and construction recycling is outlined in the project's specifications. Low VOC emitting, recycled, local materials are specified throughout the project.

**Indoor environmental quality takes high priority** in this project. Classrooms have operable windows, high ceilings with clerestory windows and skylights. Larger spaces are tempered by the use of displacement ventilation, and common areas through ventilation cooling. Air-conditioning is limited to areas like computer labs with exceptional cooling loads. Natural ventilation assist-fans promote the ventilation stack effect in classrooms, while CO2 controls help regulate fresh air changes.

Participation in programs like the Puget Sound Energy Efficiency Grant, and the Washington Sustainable Schools Pilot Program furthers the school district's **commitment to sustainability** and community development.



CLASSROOM SECTION



SITE PLAN

OCCUPANCY:  
AUGUST 2006

GRADES HOUSED:  
6, 7, 8

PUPIL CAPACITY:  
800

SITE SIZE:  
20 ACRES

GROSS AREA:  
98,000 SF

AREA PER PUPIL:  
118 SF

PROJECT COST:  
\$11,800,000

COST PER SF:  
\$120

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