White River High School

Nestled beneath stunning Mt. Rainier, White River High School was designed to make the highest use of the site for views to nature and student learning through the school's innovative Career Path model.

FLOOR SPACE: 227,000 ft^2
BUDGET: $ 37 million ($163/ft^2 construction costs)
BUILDING POPULATION: 1600 high school students (capacity), 130 Teachers and staff
CONSTRUCTION DATES: Completed January 2003
OWNER: White River School District, Washington
ARCHITECT: INTEGRUS Architecture
GENERAL CONTRACTOR:
STRUCTURAL ENGINEERS: INTEGRUS Architecture
MECHANICAL ENGINEERS: MW Consulting Engineers
ELECTRICAL ENGINEERS: Sparling
CIVIL ENGINEERS: AHBL, Inc.
LANDSCAPE ARCHITECTS: David Evans & Associates; Cascade Design Collaborative
WETLAND CONSULTING: Adolfson Associates, Inc.

PROJECT NOTES

SITE AND WATER

Minimize Site Impact: Previously clear-cut areas were used for the building footprint, parking and stormwater detention to avoid additional clearing. Cut and fill were balanced, eliminating the need to import or export material.

Honor the Terrain: The building and its wings follow the natural contours of the site and have multiple floors to reduce footprint. One three-story wing is built into the slope to protect the natural look of the site.

Wetlands Preservation and Construction: On-site wetlands were protected through an aggressive stormwater management system. An additional wetland area was constructed as an educational resource.

Alternative Transportation Encouraged: A system of paths, along with shower and changing facilities, encourages pedestrian and bicycle access and use.

ENERGY AND ATMOSPHERE

Maximize Use of Daylight. Access to daylight was optimized by orienting academic clusters north-south along the south-facing slop. Louvered sunshades and interior light shelves reduce glare and heat gain and provide an even distribution of natural light inside classrooms.

Energy and Life Cycle Cost Analysis: Systems and envelope designs were optimized on the basis of life cycle cost, not just first cost.

MATERIALS AND RESOURCES

Recycled-Content Materials: Structural steel, concrete (with minimum 15% fly-ash), aluminum, wood fiber products, insulation, ceramic tile, carpet, and gypsum board all contained recycled material.

Durable and Expressive: Integral colored concrete for floors, wood beams and purlins for structure, pre-finished corrugated metal panels for roofing and siding, and ground-face CMU and brick for walls reduce the need for ongoing maintenance and the frequency of future replacement.

Reduce: Exposed structure in major public spaces minimizes the need for unnecessary layering of finish materials. Early programming studies able to reduce the space requirement by 25,000ft^2.

INDOOR ENVIRONMENTAL QUALITY

Low VOC Materials: The project used low volatile organic compound (VOC) carpets, paints, and sealers and formaldehyde-free composite wood products.

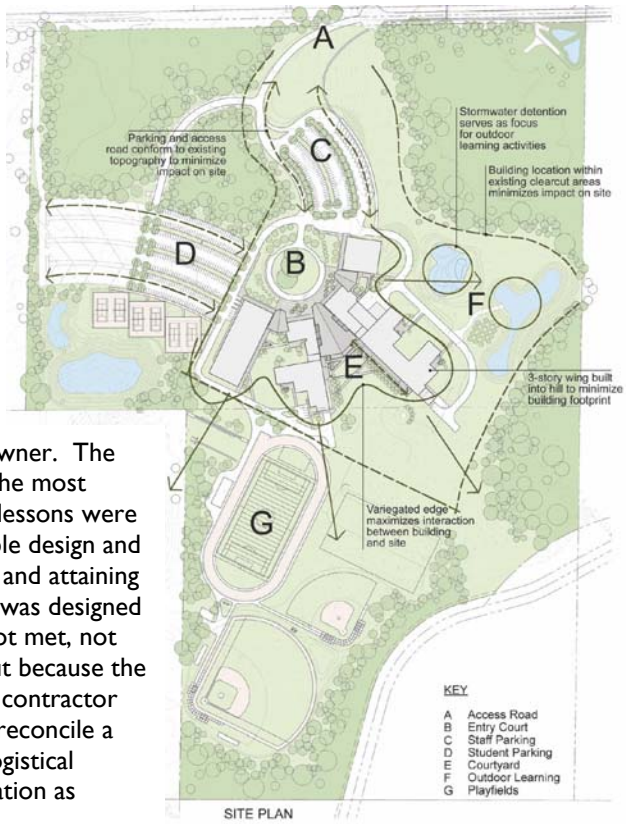
Fresh Air: Operable sash windows in academic and public spaces provide user-controlled fresh air.

WHITE RIVER HIGH SCHOOL

CASCADIA REGION GREEN BUILDING COUNCIL

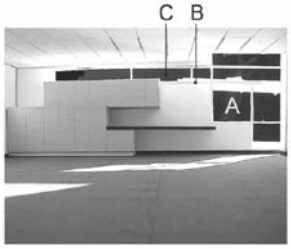
Using LEED™ to Steer a Course for Green Design

Sustainable goals for the project were identified and elaborated as part of a collaborative public process that involved students, parents, educators, staff, and representatives of the community. Through this process, the future users of the facility became familiar with and supportive of viable sustainable concepts that were eventually incorporated into the building. The process began with tours of existing educational facilities and the formulation of design goals to create a shared vision for the project. Design charettes provided opportunities to explore the organization of building program areas based on educational curriculum needs and existing site features. From the beginning of the project, the design team worked with the School District to set goals for sustainability. The result was a decision to pursue a LEED™ rating. Consulting engineers were also included in the design process, helping to optimize the efficiency of building systems. The LEED™ system and sustainable goals checklist kept the design team focused on sustainability throughout the project.



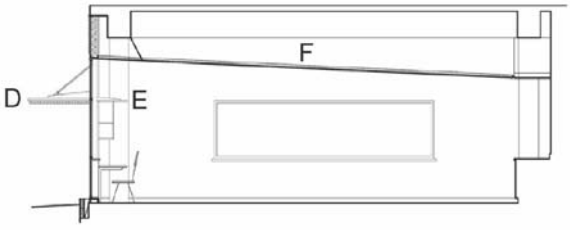
SITE PLAN

The project provided valuable insight into the relationship between sustainable design as good practice and potential savings to the owner as a selling point for implementation. The sustainable concepts easiest to implement were those that clearly yielded value to the owner. The most practical strategies and solutions were oftentimes the most sustainable, both for the site and building design. Other lessons were those that arose from the discrepancy between sustainable design and its implementation and the mechanisms for documenting and attaining LEED certification for the project. Although the project was designed and specified to achieve a LEED™ rating, this goal was not met, not because it failed to meet the necessary design criteria, but because the architect, owner, and contractor team were unable to reconcile a commitment to the logistical process of documentation as



KEY

A View windows with view to sky above and ground below. Placed at side wall to maximize reflected light.
B Light shelf built into casework.
C Clerestory windows for daylighting.
D Steel bar grate sunshade on south side with 45 degree cut off.
E Light shelf at clerestory.
F Suspended ceiling slopes upward at 1/2" per foot, reflecting light and increasing height of clerestory.



Daylight modeling helps designers see the patterns and penetrations of light during different times of the day and year.

Several techniques to emphasize views and daylight use were employed to great effect.

Acknowledgements: Thanks to INTEGRUS Architecture for providing photographs and information for this case study. Prepared by O'Brien & Co.