

WASHINGTON STATE UNIVERSITY
TROY HALL
PULLMAN, WASHINGTON



Reused/Recycled Materials

In the design of the project, with the exception of a few new openings the entire exterior envelope was strengthened and preserved. Exterior facade materials removed were reused, and new materials have been selected based on their recycled content as well as the affect they have on creating a definitivte local character in keeping with the existing building.

Sustainable Exterior Enhancements

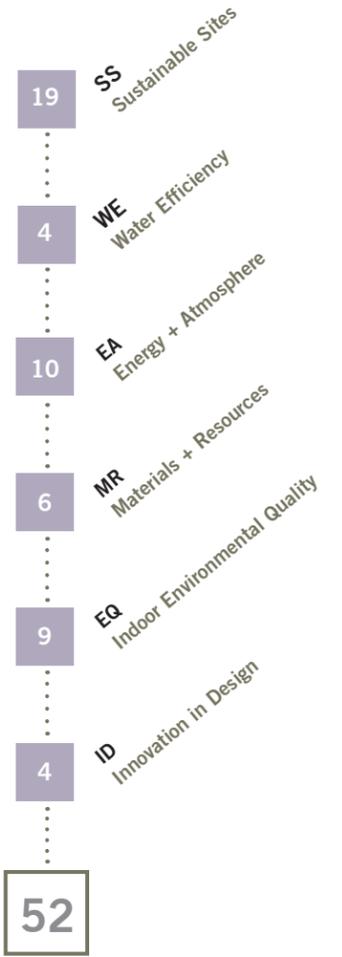
A mix of native plants and plants adapted to the weather patterns of the area, minimal lawn cover, and an efficient irrigation system have contributed to a 53% reduction in potable water use for irrigation. A combination of shading from vegetation and high reflectance paving for the hardscape will reduce heat absorption, contributing to the reduction of the sites heat island effect.



LEED SILVER
LEED® BD+C

LEED® Certification

The renovation and addition to the Troy Hall received LEED Silver Certification. LEED-NC v3 is a rating and certification system developed by the U.S. Green Building Council that verifies “a building project is environmentally responsible, profitable and a healthy place to live and work.” There are four rating levels ranked from lowest to highest: LEED certified, LEED Silver, LEED Gold, and LEED Platinum. Credits must be attained in five main categories: Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials & Resources, and Indoor Environmental Quality. Additional credits can be earned through Innovation in Design. The Troy Hall acheived 52 points to earn its LEED Silver status.



Transformation

Troy Hall a shuttered 1920s dairy science building – once home to the WSU Creamery and Ferdinand’s Ice Cream Shoppe – has been remade into a modern interdisciplinary science education and research facility for the Department of Chemistry and the School of the Environment to respond to the demand for STEM program area. The 50,000 square foot, four-story facility is one of the first adaptive reuse preservation projects delivered with the design-build delivery method in Washington State; the result is a modern facility that restores the historic exterior and reinvigorates a beloved campus landmark.

Program

Troy Hall’s new mission includes academic instruction, multidisciplinary interaction and cutting edge research for STEM programs in the Department of Chemistry and School of the Environment. The new design for the interior and addition, maximizes assignable research and teaching space while creating additional spaces for communication and collaboration across disciplines to occur around a communicating stair, meetings areas and vertical collaboration and lounge spaces. Seating alcoves clustered around the lab and classrooms entries create easily accessible “break-out” space. The flexible lab environments support the requirements for interdisciplinary research and collaboration between the chemistry program and the engineering, agriculture, biotechnology, medicine, dentistry, nursing, pharmacy and veterinary programs.

Overall Goals

A major goal of the owner has been to have the building continue to serve an educational tool and provide a public face, showcasing the university’s and students’ commitment to environmental issues. During project planning, eco-charrettes were held to establish sustainability benchmarks and explore ideas that could bring this goal to fruition. Additional study was undertaken to create an energy efficient design and integrate the building with a more native surrounding landscape.

PERKINS+WILL



Preserve History

The team set out to preserve as much of the original building’s historic character as possible, while expanding usable space. The team was able to salvage all four walls of the 1920 exterior façade and the terracotta from the original entrance, which was deconstructed, restored and relocated to the building’s new front entrance. However, the interior floors and walls and roof were completely removed allowing the establishment of consistent floor to floor heights more usefull to today’s lab environments. the building footprint was enlarged with a new 6,000 square foot addition to the north that houses a large communicating stair, offices and informal gathering spaces.

Energy Conservation

Troy Hall is a chemistry teaching and research laboratory. Buildings of this nature inherently have high energy use profiles. To reduce this profile the design team worked with the University in several ways. The team selected more efficient fume hoods than currently used at the University. In a typical lab building, outside air is conditioned only to be immediately exhausted due to laboratory equipment and fume hood air exchange requirements. A concerted design effort resulted in the transfer of air from other parts of the building to the labs to reduce the amount of outside air conditioned, drastically reducing energy use. A heat recovery coil was added to the exhaust air stream to extract energy for reuse elsewhere before loosing it to the environment; this resulted in heating, cooling and fan energy savings. To prevent conditioned air from escaping through the building envelope, spray foam insulation was used to provide a continuous air and vapor retarder on the 1.5 foot thick exterior brick walls. The uninsulated windows of the historic facade were replaced with thermally broken frames and insulated glazing, upping the window R value and reducing solar heat gain while allowing plenty of light to enter the building. The new insulated glazing on the addition of the building is shaded by the vertical and horizontal overhangs of the building addition.

Sustainable Exterior Enhancements

- 1 The project reuses and maintains most of the existing historical exterior masonry facade.
- 2 Excessive heat gain at the site is reduced with the introduction of highly reflective paving and roofing.
- 3 The site design maximizes open space by protecting significant existing plantings and providing a total of 63% vegetated open space and 21% pedestrian-oriented open space of the total project site.
- 4 The building is adjacent to a multitude of public transport options, as well as campus and neighborhood services such as libraries, stores, and restaurants which encourage pedestrian travel and reduce vehicular use.

Water Conservation

- 5 Plant irrigation reduction of potable water of 53% was achieved through the use of native/adaptive, plants, minimal lawn cover and efficient irrigation to conserve local and regional potable water sources.
- 6 Low flow fixtures and low flush toilets and urinals reduce the overall water use by over 30%.

Energy Conservation

- 7 All energy systems are installed and calibrated to perform at the highest level to ensure energy savings.
- 8 Highly efficient HVAC systems provide a 23% energy cost savings when compared to baseline systems as demonstrated through simulated energy modeling
- 9 To reduce maintenance and operation costs, an effective commissioning process was implemented which included a systems manual that provides operating information to allow optimal building operation.
- 10 An abundance of natural daylight from the atrium skylights and glass walls reduce the energy demand for artificial lighting. Dimming switches allow the occupants to control their lighting needs and automatic sensors detect when people are present in the room.
- 11 In order to reduce the amount of reheat energy within the building, the ventilation air from the office is transferred to the laboratories as make up air. This reduces the amount of outside air that needs to be conditioned and reheated, dramatically reducing the energy consumption in the building.
- 12 The design team worked with the University to decrease the fume hood face velocity and air change rates below University standards (but within a safe levels) to also reduce the amount exhaust air and outside air. This resulted in heating, cooling and fan energy savings.



Reused/Recycled Materials

- 14 Over 75% of the construction waste was diverted from the landfill and either recycled or reused.

Healthy Indoor Environment

- 14 Interior materials have been selected based on their low-emitting qualities and recycled content. Certified wood was used in millwork and laboratory cabinets.
- 15 All the materials and assemblies incorporate low-emitting and formaldehyde-free products.
- 16 The project utilizes sustainability sourced materials (FSC certified wood) and provides 20% of materials (by cost) with recycled content.
- 17 Openings made in the roof, floors and several walls improve access to views and daylight for staff and visitors.
- 18 Ground floor entrance directly connect to a feature stair that leads to laboratories and offices, encouraging student health with vertical circulation.

