

# Innovation Meets History:

## Close-Custody Expansion

### Case Study in Washington

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Photos by Juliann Tallino Photography

The administration building was one of the seven buildings in the WSP North close-custody expansion. The glass lobby faces the parking lot and provides separate access for visitors and staff.

**T**he Washington State Penitentiary (WSP) in Walla Walla is the oldest prison in the state. Built in 1885, the prison has undergone several expansion projects throughout the years. In 2004, facing a statewide shortage of 3,000 beds, another expansion to the historic prison was essential to keep pace with a rising inmate population. To solve its growing space problem, the Washington Department of Corrections turned to HDR Architecture and Turner Construction Co., in a joint venture, to design-build a Leadership

in Energy and Environmental Design (LEED) silver-certified correctional facility. In fact, four different WSP North close-custody expansion buildings earned this designation as part of the collective team effort, a feat not accomplished before.

The 270,000-square-foot WSP North close-custody expansion consisted of 768 close-custody beds, 100 intensive management beds, 98 segregation beds and support services buildings, including administration, recreation, education and food service.

A project of this scale and complexity presented many unique obstacles. First, the project needed to work around original structures and a historic cemetery constructed in the 1880s, when the site housed a territorial prison for the Northwest. Second, because the LEED silver certification was made mandatory in 2005 by the Washington State Legislature for all state-funded building projects, it was imperative that the team push the creativity envelope to meet the DOC's unique functional requirements for these buildings while addressing the high-performance demands of LEED certification.

## Incorporating LEED

LEED is the most established sustainable benchmark of design, construction and facility operation. When a project earns LEED certification, the owner knows the project will operate more efficiently, promote occupant well-being and have a reduced impact on the environment. LEED buildings normally cost less to operate as well. Consequently, LEED certification represents a higher value to the facility owner and, in the case of government-owned buildings, to taxpayers as well. With unprecedented construction cost escalations during the past five years, everything a facility owner can do to reduce the lifetime cost of a facility represents sound financial stewardship of taxpayer dollars.

LEED is a point-based green building assessment rating system comprised of five basic sustainable design categories:

- Sustainable site development;
- Water efficiency;
- Energy efficiency and renewable energy integration;
- Low-impact building materials and natural resources; and
- Indoor environmental quality.

In addition to these five categories, another category awards credit points to projects that achieve innovative sustainable design, construction and/or operative measures. Each of these categories was exhaustively explored as part of the WSP North close-custody expansion project.

The LEED process for WSP began with a sustainable design workshop at which all building stakeholders brainstormed, set goals and designated LEED credit points as "Yes," "Maybe" or "No." This process enabled the team to identify seven buildings as viable LEED projects: the administration building, a core services facility, an intensive management/segregation unit and four identical close-custody housing units. Using LEED as a central organizational tool helped the team focus on a "whole building" design approach, which resulted in buildings that work on a comprehensive scale.

LEED is well-suited to the design-build delivery process because many of the sustainable design strategies driven by LEED happen during construction. Thus, it is important for the contractor to be part of the design team from the beginning of the design process. That way, when the project starts, the contractor is already well informed about its responsibilities regarding LEED. This yields a greater understanding of the sustainable goals and proper implementation needed to achieve them.

"The LEED certifications achieved at WSP were the result of a highly collaborative effort between the DOC, HDR, Turner, the city of Walla Walla, the State Department of Ecology and others," explained Dave Jansen, director of capital programs for the DOC. "Statewide, 22 DOC buildings are LEED certified silver and gold, and eight of the silver [certifications] are here at the WSP penitentiary." That number includes the seven buildings in the WSP North close-custody expansion as well as the prison's new warehouse complex.



This is an interior shot of the dayroom in one of the four identical close-custody housing units. To the left is a large security glass panel to bring natural light into the dayroom.



This is a view from the tower of the administration building. The center touch security monitor is flanked by split screen video monitors.



The seven yellow buildings comprise the WSP North close-custody expansion. The red line indicates new portions of the double-fence perimeter security.

## Achieving Silver Certification

Due to security concerns and budget constraints, many of the common sustainable features available to most projects (such as low-flush toilets or operable windows) were simply not feasible to the design-build team to help earn LEED credit points. Essentially, buildings that are inmate-accessible have multiple restrictions that are not conducive to earning LEED credit points. But, by working closely with the DOC, the team was able to achieve LEED silver certification.

**Sustainable site development.** One of the first choices a building owner must make is deciding where to build. The right site selection combined with an integrated design approach, can substantially improve how the building serves the owner and its occupants. Such variables as energy performance, interior lighting, heating and cooling, and water use are all affected by site design. Because site development/design is one of the first design issues, devoting special attention to getting a building started well will provide a positive “trickle down” effect on subsequent sustainable design opportunities.

One of the design strategies used by the team was eliminating post-development storm water run-off from the project site. The onsite storm water management system replicates the natural hydrologic cycle of the site’s predevelopment condition by providing rainwater to vegetation and recharging the aquifer. In addition, the team also treated all storm water run-off to avoid contamination of the receiving aquifer.

A public bus stop installed less than 25 yards from the project site provides public transportation access for staff and visitors, which increases the use of alternative transportation to and from the prison. Bicycle locker racks and showering facilities were incorporated as well to accommodate users of alternative commuting.

**Water efficiency.** Buildings require large volumes of water for mechanical operation and occupant needs. However, water is becoming a scarce resource. Implementing water efficiency measures can reduce potable water withdrawals, and often saves money. In addition, sustainable water use protects natural water bodies from contamination. For the WSP projects, the installation of low-flow and waterless urinals in the administration building reduced total potable water demand for domestic purposes by more than 20 percent. The team also specified a “smart” automated irrigation system controlled by moisture sensors, which reduces water demand by more than 50 percent compared with a code-compliant system.

Sub-meters were installed to provide supplemental information concerning electricity, natural gas and potable water consumption at the expansion. An integral part of a measurement and verification plan, these sub-meters will allow the DOC to monitor consumption of these resources throughout the life of the buildings. They also support the security mission of the facility by helping facility operators quickly detect and respond to operational anomalies.

**Energy and the environment.** The impact that energy generation and consumption has on the environment is broad and long-lived. Harvesting of various fuel sources

from the earth, whether it is coal, natural gas, oil, wood or hydropower, is destructive to natural habitats. Transporting, processing and burning fuels places an additional burden on the environment. Sustainable energy management promotes energy efficiency as the first means to reduce these negative impacts. Examples used in the WSP expansion include:

- A computer-simulated energy model of proposed designs provided key life-cycle analysis information, which assisted in increasing energy efficiency rates (ranging from 10 percent to 25 percent improvements) beyond the state's already rigorous energy efficiency requirements.
- The exterior lighting design of the entire prison campus, including the expansion, meets the strict criteria of the Illumination Engineers Society of North America's Recommended Practice Manual, even though the illumination levels in this manual are less than what is usually found in prisons. Not only does this reduce light pollution and energy consumption, but, in fact, the WSP North close-custody light pollution reduction plan was so progressive that the U.S. Green Building Council awarded each LEED project a credit point for innovation in design.
- A design energy analysis was provided by the PacifiCorp Utility to help the design-build team identify cost-effective energy conservation measures to include in the design and facility operation.
- Third-party commissioning agents reviewed design and construction documents, reviewed construction and provided functional performance testing of all electrical and mechanical systems upon completion of construction.

**Building materials and natural resources.** The materials used in creating a building can substantially influence how sustainable a building is. Harvesting, mining, transporting, processing, fabricating, shipping and installing building materials causes increased pressure on ecosystems. The project team established ground rules early in the process regarding material and resource use; each party had jurisdiction over their respective components of the project to best control these aspects.

The project team used the utmost care when specifying eco-friendly materials. Despite the relatively isolated location, the team was able to incorporate more than 10 percent recycled content materials, while more than 20 percent of construction materials were manufactured within 500 miles of the project site. These measures helped reduce the negative environmental impacts from fossil fuel consumption in harvesting and transporting natural materials.

Tracking all construction and site waste was also a key element in the LEED process. The total construction waste diversion rate exceeded 95 percent — an accomplishment few projects can boast.

**Indoor environmental quality.** The average person will spend most of his or her life indoors, yet too often little concern is given to the overall safety and well-being of occupants. To promote sustainable indoor environments the design team modeled daylight exposure, assessed

natural ventilation and individual control of personal environments, and provided interiors that are free of toxins. The result is an interior environment that safeguards occupant health, is pleasant to dwell in and reduces operating costs.

One key consideration in any prison operation is the personnel who operate and secure the facility. By providing personnel with a more pleasant and healthy indoor environment, the DOC should realize additional reductions in operational costs as a result of reduced absenteeism, longer staff retention rates and greater productivity. At WSP, this was accomplished by using sealants, adhesives, paints and coatings, carpeting and composite wood products that met the "zero" to "low" thresholds for volatile organic compounds. Where feasible, distributed mechanical system controls were installed to regulate and monitor comfort levels beyond what is required by building code.

## In the End

As implementation of sustainable strategies in high-security environments increases, it is imperative that clients, designers and contractors work together toward achieving a sustainable project that does not negatively impact the facility's security requirements. While LEED can be a useful project tool, it is important to remember that security and operational concerns must remain a top priority. That said, incorporating a team committed to sustainability, with an integrated design approach from the beginning of the process, will yield a design that is information-driven and optimized. The design-build experience of the WSP North close-custody expansion proves that LEED can help the state, the designers and the contractor to articulate and achieve sustainable performance goals that support the critical mission of a correctional facility.

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