MEDIUM TACTICAL EQUIPMENT MAINTENANCE FACILITY (TEMF), BLDG 11980
JOINT BASE LEWIS-MCCHORD (JBLM), WASHINGTON

47.1% reduction in energy costs (LEED)

54.3% reduction in water use

89.3% of construction waste diverted from the landfill

LEED Facts

Medium TEMF, Bldg 11980
Joint Base Lewis-McChord (JBLM), WA

[redacted]

LEED for New Construction Version 2.2
Certification awarded January 13, 2011

Gold	45
Sustainable Sites	10/14
Water Efficiency	5/5
Energy & Atmosphere	11/17
Materials & Resources	5/13
Indoor Environmental Quality	10/15
Innovation & Design	4/5

*Out of a possible 69 points

Photography Courtesy of: US Army Engineer District, Seattle

MEDIUM TACTICAL EQUIPMENT MAINTENANCE FACILITY (TEMF), BLDG 11980

TEMF Receives LEED Gold Certification

PROJECT BACKGROUND

Responding to the President's 2007 transformation initiative to "Grow the Force", Joint Base Lewis McChord began making preparations for an increased active soldier population. Part of this transformation included the post expanding its North Fort installation. This medium sized Tactical Equipment Maintenance Facility (TEMF) is an answer to the deployment support requirements of Growing the Force.

The TEMF combines a motor-pool for large equipment with supporting administrative and training functions. The main building features high bay repair workspace with natural daylighting and a heated floor slab; it was construction without any interior columns allowing a 10 ton overhead bridge crane to run the length of the 13,000 SF. Adjacent to the repair bays is a vehicle service corridor with a maintenance pit allowing vehicles to be serviced with an assembly line's efficiency. Specialized Repair benches, which repair smaller components, are served with Weapons and ComSec Vaults for high levels of security. The Administrative functions of the building are on the second floor and provide management and training areas. The main building governs the use of the 210,640 SF vehicle hardstand, the 6,000 SF Organizational Storage Building, and equips seven deployment service containers (SATS, ASLMS and ComVan). The TEMF has communication infrastructures for both NIPRNET (Navy Protocol) and SIPRNET (Secret Protocol).

UNIQUE PROJECT FEATURES

Being located on an Army expansion made this project distinct when compared to conventional projects. The site, was classified as a Brownfield (not uncommon on a LEED project), but among the pollutants mitigating on this site were "UXO's", which is short for "Un-Exploded Ordnances"- this site literally was historically used for bombing practice. Construction was halted and the site was evacuated six different times during excavation.

Several sustainable technologies are showcased in this building. The most innovative is a "Solar Air Heating" system. Often known as "SolarWall", it's both a passive cooling and active heating system. It works by capturing the sun's radiant energy into a column of air trapped in a cavity created within a special metal wall panel. During hot periods of the day it creates a chimney effect and passively channels hot air away from the building. This uses no energy and allows the building to remain cooler than a conventional building. When the building needs to be heated, the captured warm air is mechanically pulled into the HVAC system.

Because the air is pre-heated, it greatly reduces the energy demand on the boilers feeding the air handlers. Heat recovery plates within the air handlers also reduce the energy demands of the HVAC. This system is used in harmony with a low intensity radiant floor throughout the large open repair and service bays.

Another technology used to reduce energy demand had the added benefits of increasing user comfort. Solar tube skylights with parabolic lenses to track the sun's movement combined with large areas of translucent panels (KalWall) daylight the repair bays and admin areas. Daylight harvesting systems further reduce the power demands on the lighting by measuring the light levels provided from the windows and automatically reducing the number of lamps operating. This allows a consistent level of light. All windows, skylights, and doors meet Anti-Terrorism Force Protection requirements for blast protection.

Going beyond the technologies showcased within the building, it is important to look at the construction of the building. Materials were chosen to create a "thermally broken" building envelope, which is the most efficient assembly possible. Materials with very low thermal conductivity are included vertically in the wall assembly to reduce "thermal bridging" - conducting energy (heat) from one side of the assembly to the other through. In addition to R-38 batt insulation in the roof system, rigid blocking was installed to thermally break the metal roof panels from the metal purlins. The exterior cladding is an insulated sandwich panel of metal paneling and rigid insulation, and the foundation is a thickened slab edge with rigid insulation wrapping the slab edge to thermally separate the building from the cold ground adjacent. High-performance windows, thermally broken translucent panels, and insulated coiling doors were selected to complete the enhanced building envelope.

This project was extremely successful in achieving its sustainability goals because everyone involved was very excited about the LEED process. The Design-Build contracting method of this project allowed the Architect and the Contractor to coordinate all the sustainability goals early in the project and offer a greater performing facility to the Corps of Engineers as betterments to the Firm Fixed Price contract.

"In the past, you would have to spend more money for LEED-certified buildings and it would take 20 years to see a return. In today's market, adding green features doesn't cost as much, and you can see the efficiency of a LEED-certified building almost immediately. I'm very proud of our Bristol team for going beyond the basic requirements to create greater savings for our client and for the taxpayers."

Tracy Willis, Project Manager, Bristol Design Build Services, LLC

U.S. Army Engineer District, Seattle

Architect: Belay Architecture
Civil Engineer: Bristol Environmental and Engineering Services Corporation
Commissioning Agent: Joel Rasmussen, LNS Engineers
Contractor: Bristol Design Build Services
Electrical Engineer: Wood Harbinger
LEED Consultant: Belay Architecture
Mechanical Engineer: FSi Consulting Engineers
Owner: Fort Lewis Directorate of Public Works

Project Size: 34,509 square feet
Total Project Cost: $13,773,283
Cost per square foot: $371

Photography Courtesy of: US Army Engineer District, Seattle

ABOUT LEED

The LEED green building certification program is the national benchmark for the design, construction, and operations of green buildings. Visit the U.S. Green Building Council's Web site at www.usgbc.org to learn more about LEED and green buildings.

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