Energy and water efficient border control station, Van Buren, United States

Project data

| Project group | Building and civil engineering works |
| Client | US General Services Administration |
| Project background | Public commission |
| Estimated start of construction | November 2011 |

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Comment of the Holcim Awards jury North America

The jury commended the project for the adroit synthesis of design and technology, successfully applying state-of-the-art features of sustainability in a government project with its regulatory implications. The design is dignified, simple and elegant. Instead of a "noisy" appearance it is well integrated into the context and creates the maximum spatial quality out of the rather simple program of the border station.

Project description by author

United States Land Ports of Entry, border crossings, are part of expanded American anti-terrorism efforts. The designs are required to support inspection services, maintain officer safety and welcome visitors to the U.S. The ports must convey the dignity, enterprise and stability of the U.S. government in a durable, 100-year structure complying with the LEED Energy Independence Act.

The new United States Land Port of Entry – Van Buren, Maine, port site meets rigorous operational and security demands. Officers are provided a panoramic view of the secure area from their primary workspace, including vehicles entering the site as well as those exiting the secured perimeter. Regional staffing availability demands operational security with minimal on-site staff. Enhanced visual surveillance allows as few as two officers to operate the port. Comfort and safety in the heavy snow and icy conditions required a canopy configuration to provide shelter as officers move about the site. The “Z” form supports port operations and creates a coherent, sleek configuration, protecting officers from wind, snow.

The port design fuses the abstraction of the cultural and landscape context with concepts essential to port operations and security. The St. John River Valley is profoundly influenced by its roots in the Acadian culture, a heritage visible in the original settlement of long narrow plantations followed by other communities. Abstracting Acadian land divisions and regional cultural and landscape patterns as referenced in the building form creates a coherent, sleek configuration, protecting officers from wind, snow.

The site plan's zonal composition provides unique opportunities to establish and maintain visual access to the landscape through a series of visual thresholds. The “Z” form supports port operations and creates a coherent, sleek configuration, protecting officers from wind, snow.

Environmental quality and resource efficiency – Planet

Projected purchased energy usage is 48% of national standard. Fixtures achieve 90% water savings. No irrigation is required. Ground-coupled heat pump, peaking bio-diesel boilers, LED lights, lighting control systems reduce fossil fuel consumption. Building automation system allows remote browser and set point maintenance. Project type and remote location require durable robust materials and low maintenance profiles. The port's secure area reduced to 3.8ha (9.4ac) of the 9.5ha (21ac) site.

The project's commercial capability will increase trade and travel through town, adding economic growth to a depressed region. As security is a primary government function, the port is resilient to economic fluctuation. The port was designed well within budget, strategically directing resources toward pragmatic functional and sustainable goals, while providing a powerful design experience.

Contextual and aesthetic impact – Proficiency

Sleek architectural forms are tautly wrapped and detailed with patterns derived from the region's natural and cultural context. Abstracting Acadian land divisions and regional agrarian landforms, the site design consists of a series of mounds that simultaneously create a bio-swale system for filtering water and a cohesive experience of the site. Similar to the building's patterning, the site's rhythmic elements blur the distinction between secured and unsecured areas. Architecture and landscape combine to create a new cultural and ecological amenity from a former rail loading facility. The design conveys a welcoming experience, responsive to the local context while conveying federal dignity and stability.

Innovation and transferability – Progress

Located on a remote site, proven, easily maintained systems were critical to the port's success. Passive strategies included natural ventilation, daylight harvesting and water conserving fixtures and low-VOC materials. A ground-coupled heat pump reduces off-site energy resource demands. Evacuated tube solar heats hot water. The back ventilated cavity of the exterior wall tempers intake air. Zoned lighting and occupancy sensors maximize efficiency. A bio-diesel boiler provides peak demand heat. LED lamps provide the majority of the site lighting. Site water is collected by a system of swales, landforms, and planted check dams to promote on-site infiltration while filtering runoff. Site patterns are developed from regional cultural and landscape patterns as referenced in the building envelope. Yet, the strategies are applicable to all new U.S. Canadian ports. The project is committed to sharing actual whole-project energy and water usage data for at least 5 years.

Ethical standards and social equity – People

Border crossings connect U.S. and Canadian border towns socially and economically. Workshops engaged the community in the design process. The new port is sensitively inserted, enhancing and expanding the crossing experience, an important part of the communities' family and work lives. Strict occupational health and safety and gender and minority hiring equity quotas improve staff experience. Design and construction costs are reported quarterly, scrutinized for fairness, accuracy, and waste.

Relevance to target issues by author

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