New American Embassy, Oslo, Norway

Sustainable Design

The new American Embassy in Oslo exemplifies environmentally sustainable design. The project reflects the commitment of the U.S. Department of State to creating a sustainable built environment in keeping with standards established by the United States Green Building Council’s Leadership in Energy and Environmental Design (LEED®) program. Sustainable design also embraces Norway’s culture of environmental responsibility. EYP Architecture & Engineering’s design employs site-specific as well as culturally inspired features. The project is registered with the goal of achieving a certification level of LEED Silver or better.

Sustainable Design Features

Restored Riparian Environment

The design will restore the riparian environment of a seasonal stream that runs northwest to southeast through the site. Mature trees line both banks of the streambed, and an existing stand of trees will be preserved to the northwest. The redirected stream will become a key landscape feature meandering through the Embassy grounds. The streambed will also contribute to stormwater management. Grading the site will channel a significant amount of rainwater runoff through the swale of the streambed to a detention basin, slowing the flow of stormwater into the city’s storm-sewer system.
Green Roofs

Sloping sod roofs are a feature of traditional Norwegian house design. In addition to providing significant insulation, green roofs contribute to stormwater management by retaining rainwater runoff, allowing evaporation to reduce the volume of flow into the storm-sewer system. The design employs two different types of green roofs.

The Embassy’s Support Annex will be built entirely below grade to minimize its visual impact on the landscape. The design takes advantage of the rising terrain along the site’s southwestern edge to create an expansive green roof capable of sustaining trees.

The green roof of the Chancery’s entry lobby will serve as an inviting garden terrace accessible from the cafeteria, whose lofty ceilings and three walls of tall windows will frame the Embassy’s primary public space.
Preservation of Existing Landscape

The preservation of existing landscape is fundamental to sustainable design. In addition to the seasonal stream and its adjacent tree line, the design will retain two additional natural features. A very dense and mature stand of trees along the southwestern edge of the site will create a visual buffer between the edge of the Embassy grounds and the neighboring Huseby Woods.

![Photo of SW tree line](image)

At the northeast corner of the site, a rock outcropping manifests the underlying geology. The design will enhance the visual impact of this feature, allowing it to define the landscape in a primary corner of the Embassy grounds.

![Perspective toward Main Entry Pavillion](image)
Natural Light

Maximizing the use of natural daylight is a significant design consideration, especially in the latitude of Norway. Reduced dependence on artificial lighting saves energy, reduces operating costs, and provides health benefits. Windows nearly three meters tall will maximize the brief hours of winter daylight, take advantage of mid-summer’s long days and help mitigate the effects of Seasonal Affective Disorder (SAD), a condition common in northern climes.

Ground-source Heat Exchange

The ground-source heat exchange system is an invisible but significant feature of sustainable design. A network of more than 40 ground-source heat exchange wells up to 200 meters below the surface will enable the Embassy to meet more than 45 percent of its heating load with an entirely renewable energy source. This geothermal system takes advantage of stored energy within the ground for heating applications while using the ground as a heat sink for cooling applications. In principle, the warmer subterranean water provides a heat source during the winter months. In addition to reducing energy consumption and operating costs, this design features meets Norwegian energy codes, which require new construction to meet more than 40 percent of heating load with renewable resources.

LEED Design

The LEED for New Construction program evaluates projects against a point system. This project is currently tracking between LEED Silver and LEED Gold. Some key LEED design features include:
Sustainable Sites

- Alternative Transportation: locating the site within 300 meters of public transportation (T-Bahn) and including more than 45 bicycle parking spaces
- Maximize Open Space: restoring the streambed and siting a structure underground to create an open, park-like environment in which above-grade buildings occupy only 14 percent of the site

Water Efficiency

- Water Efficient Landscapes: using native species of trees, meadow grasses, and wildflowers to create a landscape that can be sustained without irrigation once it is established
- Innovative Wastewater Technologies/Water Use Reduction: ultra-low-flow toilet fixtures, waterless urinals, and low-flow lavatory faucets and shower heads

Energy and Atmosphere

- Optimize Energy Performance: the current computer-generated energy model shows the design exceeds the efficiency of the baseline measurement, as determined by ASHRAE 90.1 2007, by more than 35 percent
- Enhanced Refrigeration Management: using chemical refrigerants in heating, ventilating, and air conditioning (HVAC) equipment that minimize or eliminate ozone-depleting emissions

Materials and Resources

- Construction Waste Management: sorting and recycling to divert more than 50 percent of construction waste from landfills
- Regional Materials: materials that are extracted, harvested or recovered, and manufactured within 500 miles (805 kilometers) of the project site

Indoor Environmental Quality

- Low-emission Materials: adhesives, sealants, paints and coatings, flooring systems, and composite wood products that emit low levels of volatile organic compounds (VOCs)
- Controllability of Systems – Lighting and Thermal Comfort: individual lighting and thermostatic temperature controls and task lighting within systems workstations

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