GREEN BUILDING

EPA

NEW ENGLAND REGIONAL LABORATORY

U. S. Environmental Protection Agency

Letter to the People of New England

EPA New England has a duty as an environmental agency to lead by example. Our new laboratory in North Chelmsford, Mass. is a testament to our commitment to "walk the talk" in achieving a high level of environmental performance in all of our daily operations.

The 66,000-square-foot building incorporates an array of environmental features, including energy efficient heating and cooling systems, active solar power and lighting, recycled materials, environmentally friendly landscaping, improved indoor air quality measures and support for wind-powered electricity to run the building.

We hope the benefits of the North Chelmsford lab will extend beyond the site itself, providing inspiration and a concrete example that others can follow and improve upon as new technologies become available. This brochure includes descriptions of the many environmental features in the building and contacts for more information.

I hope you will join us in promoting energy efficiency and creating a better environment for New England.

Robert W. Varney
Regional Administrator
EPA New England

Resources

EPA ENERGY STAR®
http://www.energystar.gov
The U.S. Environmental Protection Agency ENERGY STAR® program provides information on EPA initiatives to promote energy efficiency in buildings.

EPA Labs 21st century
www.epa.gov/labs21century
Laboratories for the 21st century (Labs21) is sponsored by the U.S. Environmental Protection Agency and the U.S. Department of Energy. It is a voluntary initiative dedicated to improving the environmental performance of U.S. laboratories. Labs21 is designed to improve laboratory energy and water efficiency, encourage the use of renewable energy sources, and promote environmental stewardship.

Energy Efficiency

The building and it's components have been designed to minimize energy consumption. We worked with our local utility and participated in its energy conservation program, Massachusetts Electric Design 2000plus. Based on these efforts, the laboratory is at least 35 percent more energy efficient than a typical laboratory. The energy efficient systems in the building include: six modular gas-fired boilers, two water-cooled chillers, daylight dimmers, occupancy sensors, skylights, energy-efficient lights, high-efficiency motors and variable flow pumping systems, variable air volume heating and cooling systems with night and low occupancy system setbacks, insulated windows, highly rated insulation, and automated building management and monitoring systems.

Water Efficiency

Water in the building will be conserved with the use of electronic sensors on plumbing fixtures in restrooms. Outside, native trees and shrubs requiring little water have been planted, and water diverted from roof drains will replenish on-site wetlands. The lab uses a well on the property to supply a portion of it's non-potable water for minor irrigation.

Solar Power

Photovoltaic (solar energy producing cells) awnings shade the office windows on the outside and reduce glare and heat gain, thus reducing the amount of cooling needed. In addition, the awnings supply approximately 2000 watts daily to the regional electric grid. Special skylights in the corridors with reflective tubing systems bring daylight deep into the building, reducing the need for artificial light.

Green Power

EPA New England made a commitment to power its new laboratory in North Chelmsford, Mass. with 100 percent green power. Our electricity contractor, Green Mountain Power of Vermont, will generate or purchase wind-powered electricity which matches the electrical consumption of our North Chelmsford lab, estimated at close to 2 million kilowatt hours per year. While this will not generate cost savings, it will help us achieve environmental benefits by reducing greenhouse gases that would have been emitted from conventional power sources.

Landscape Design

Xeriscape incorporates many environmental factors into the property's landscape design, including soil type, use of native plants, minimal turf area, minimal need for irrigation, mulches, and appropriate maintenance schedules. By using native plants that require little watering, are well-suited to the climate and resist pests, we reduce the need for irrigation and pesticides.

Waste Handling

Sanitary wastewater from the lab is being sent to the Lowell Regional Wastewater Utility. All wastewater generated in laboratory portions of the building are piped to a state-of-the-art acid neutralization system. This system uses a two-stage neutralization process and a 500-gallon holding tank, which is activated if the wastewater is not completely neutralized during the two-stage process. This system will prevent any contaminants from entering the regional wastewater facility. The building will also recycle the solid waste it generates.

Indoor Air Quality

A healthy indoor environment is a critical safety concern in a laboratory setting. The largest sources of indoor air contaminants are interior building materials, office furniture and equipment. Before any material was used in this building, it was examined for possible effects on indoor air quality in addition to its general environmental impact. Materials with contaminants above EPA-designated levels were not used. Measures taken to ensure indoor air quality at the lab included the: use of ultra-low volatile organic compound (VOC) paints, sealants and adhesives; strict control of formaldehyde and other potential indoor air contaminants in construction materials; off-gassing materials (with off-gassing potential) before any materials that would absorb off-gases were installed; cleaning of all duct work; replacement of filters before the building was occupied; and the specifications for environmentally preferable cleaning materials. Prior to occupancy, an independent indoor air quality consultant tested the building to ensure that it was within EPA-specified requirements. An Indoor Air Quality Control Plan will be used during the occupancy of the building.

Environmentally Preferable Materials

Building plans utilized the resources naturally available on the site—such as solar, natural shading and drainage—to avoid generating unnecessary debris and to minimize site demolition. All soil and gravel on the site was stockpiled and graded for later use as fill or loam. Blasted rock outcroppings were crushed with a portable on-site processing plant and totaled approximately 17,500 tons. The crushed stone was used as base material for concrete paving; sub-base for bituminous concrete pavement; backfill for footings, structures and pipe bedding; and for under-drain filter aggregate. Reuse of materials avoided disposal costs and was sufficient to complete the landscaping and fill work with only a minimal amount of fine grading material (sand) brought in for finish grading.

Materials used in construction contained the highest recycled content available. Using them eliminated pollution from extraction of new materials, transportation and manufacturing. Additionally, it reduced the need to dispose of the recovered materials and encouraged recycling in the industry. The following recycled materials were used in construction: fly-ash containing concrete (use of this type of concrete diverted 126 tons of fly-ash from becoming part of the waste stream), steel, gypsum wallboard, ceiling tiles, insulation and hydromulch.

U.S. EPA New England Regional Laboratory (NERL)

Water runoff from the roof replenishes on-site wetlands

Original boulders provide a natural wall

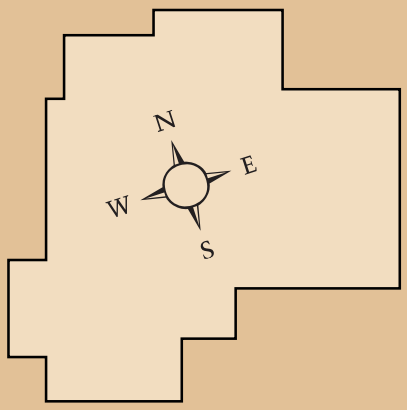
Xeriscape design uses native plants and minimal lawn

Leadership in Energy & Environmental Design

LEED is a rating system developed by the U.S. Green Building Council. Buildings are evaluated against a series of standards and points are assigned. The data for the lab's LEED application is being developed. Based on all of the green features incorporated into the building, it is expected to receive at least a silver rating.

Northside offices reduce required cooling

Southside loading dock maximizes snow and ice melt



Energy efficient insulated windows

Higher set windows allow more natural light deeper into the building

Photovoltaic window shades produce energy

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