

Green Building

NPS Atlantic Research Center

National Park Service
U.S. Department of Interior

Highlands Center
At Cape Cod National
Seashore



Green Building Choices

When the time came to build the new National Park Service (NPS) Atlantic Research Center laboratory and classroom, Cape Cod National Seashore took the opportunity to lead in the sustainable redevelopment of the Highlands Center buildings. The Atlantic Research Center's two buildings demonstrate many principles of "green" building, from the reuse of the buildings themselves to the fresh paint coating the walls.

The Federal Energy Management Program pledged \$25,000 through the assistance of the National Renewable Energy Laboratory to provide design input to make the facilities as sustainable as possible. The funding also provides guidance for future projects (as summarized in the "Building and Site Design and Rehabilitation Handbook).

Building and Equipment Reuse

In the reduce-reuse-recycle mantra, it's often the last of the three step process, recycling, that gets all the attention. Making an effort to reduce the amount of waste produced in the first place and to reuse materials wherever possible is where the real green savings add up.

When it came time to choose a site for the new Atlantic Research Center (ARC) at Cape Cod National Seashore, the Park Service chose to renovate existing buildings rather than tear them down and start anew. Using the existing footprint minimized ground disturbance, while saving the structure diverted the demolished materials from the waste stream.

Another important re-use feature of the ARC was made possible by a generous donation from the Intel Corporation. Intel donated approximately \$30,000 in laboratory equipment and furnishings that they no longer use, including three laboratory fume hoods, slate top laboratory workbenches and cabinets, stainless steel racks, an autoclave, and an air compressor. Again, by reusing materials the ARC kept functional items out of the waste stream, conserved raw materials, and created no additional pollution through the manufacturing process.

Wood Products

Sustainable wood products are an integral part of ecologically friendly building practices. The Forest Stewardship Council (FSC) and/or

SmartWood, a program of the Rainforest Alliance, have certified new lumber used in the Atlantic Research Center, including hardwood and softwood lumber, hardwood veneer and particleboard. FSC and SmartWood certification assures that wood is harvested from forestlands that are managed in an environmentally friendly manner. The certification guidelines follow strict standards that take into account sustainability, ecological diversity, and socioeconomic responsibility.

**Highs and Lows:
Ceilings and
Floors**

The lab's new ceilings are suspended acoustical systems that have been manufactured from sustainable and recycled products. The acoustical units are composed of mineral fiber (mineral wool recycled from steel production and cellulose fiber from recycled newsprint) with a recycled content of 66-78%. The suspension system is made of hot dipped galvanized steel which is 25% recycled material. The durable materials will minimize the need for frequent replacements and trips to the landfill, while the light-reflectance will decrease lighting needs in the building.

The linoleum flooring is manufactured from readily renewable, natural raw materials. Linseed oil, extracted from the seeds of the flax plant, is the principal raw material. Cork powder, much of which comes from scraps collected after wine cork production, is also a key ingredient.

The bathroom floors provided another opportunity for using recycled materials. The tiles lining the floor are recycled glass ceramic tiles, made from 20% post-consumer and post-industrial recycled glass.

Energy Efficiency

Windows can be a huge source of energy loss from buildings. At the ARC however, the window units were manufactured to conform to Energy Star Northern/Central Region compliance standards. Energy Star is a US Environmental Protection Agency and Department of Energy program designed to increase energy savings through strict efficiency standards.

Invisible in the finished building, insulation is nonetheless key to making a building energy efficient. Proper insulation maximizes a building's energy efficiency and minimizes heating and cooling system losses. The roof of the ARC is insulated using material with a thermal resistance, or R-value, of 38, while the walls are R-19. The Classroom building has a crawl space with R-38 insulation. The boiler efficiency for the classroom is an impressive 90% or above. It uses liquefied petroleum gas, or propane.

Paint

Many conventional paint products contain volatile organic compounds (VOCs), which are emitted as gasses that harm the environment and human health. Paint used on the interior walls of the ARC is acrylic latex paint that emits zero or low levels (less than 100 g/l) of VOCs.