

Sustainable Design at BNL's Research Support Building – Greg Flett, Barbara Pierce, Joe Torre



The Research Support Building

As the first occupants are moving into BNL's new Research Support Building (RSB), the project team will be submitting their application to the U.S. Green Building Council for LEED certification. LEED stands for "Leadership in Energy and Environmental Design." LEED is a voluntary rating system designed and administered by the U.S. Green Building Council. To achieve LEED certification, you must get enough credits from a 'menu' of options. The purpose is to ensure that buildings are environmentally friendly and sustainable during design, construction, and operation. The RSB is a 65,000 square foot office building that will house various administrative and support functions, such as the housing and transportation offices and the credit union.

Early in the project it was decided the best way to meet DOE's sustainability requirements would be to achieve LEED certification. This required careful attention to the details of LEED requirements, options and documentation requirements during design and construction. While some LEED options are standard practice in all BNL buildings, such as no smoking and recycling, others are new practices for BNL. The RSB is Brookhaven's first LEED project. To start the process, the project manager, Greg Flett, took the appropriate training and examination to become a LEED Accredited Professional.

The next step was to include LEED design requirements in the scope of work for the architect and engineer. A careful examination of LEED credits led to a set, which were desirable and deemed possible. The construction specifications were written to include general LEED requirements, as well as specific requirements for materials, waste management and indoor air quality. The project team was also expanded to include a commissioning agent and personnel to assist with LEED documentation requirements.

LEED certification requires fundamental commissioning of building systems as a prerequisite, and includes a credit for more detailed commissioning by an independent commissioning authority. Although commissioning incurs additional costs during construction, ensuring that everything works as designed will minimize operation and maintenance problems as the building is occupied. BNL will attain the additional credit, and plans to use commissioning in further construction activities.

Commissioning is in the LEED category of Energy & Atmosphere. Also in this category is energy efficiency. The RSB will attain another credit by designing the building to be 15% more energy-efficient than the applicable ASHRAE Energy Standard.

Two other areas where the RSB has gone beyond normal BNL construction practices are waste management and the use of recycled and local materials. The RSB will get at least one, and possibly two, points for diverting between 50% and 75% of the construction, demolition, and land clearing debris from landfill disposal. This required a lot of effort on the part of the construction firm and BNL's construction supervisors. The RSB will also get the maximum possible number of credits for using materials with recycled content and materials that are extracted and manufactured within the region. Locally manufactured materials support the local economy and reduce transportation impacts. To achieve these credits, it was critical the construction specifications included the LEED requirements, and the relevant parties knew what was required of them.

In the area of Indoor Environmental Quality, materials such as sealants, paints and carpets will have little or no VOC emissions, thus making the building healthier and more comfortable for its occupants. Also, the RSB will achieve credits for having Indoor Air Quality Management Plans during construction and before occupancy. These protect air distribution systems, for example, from moisture and contamination during construction. The picture below shows how the ends of unconnected ducts were covered. LEED certification also requires strict attention to erosion and sedimentation control during construction. The picture below shows hay bales protecting a storm water inlet, one sedimentation control measure utilized at the RSB. Future construction activities at BNL will incorporate these same control activities.

LEED also allows for points for 'Innovation in Design.' BNL will apply for at least one such point, for using bio-based hydraulic fluid in the RSB elevator, instead of petroleum-based hydraulic fluid. BNL is located on an EPA-designated sole source aquifer that is very susceptible to groundwater contamination. Spills of any amount of petroleum to soils are reportable to the NYSDEC and spill remediation needs to be adequately addressed to ensure that the product does not enter the region's drinking water. Although

bio-based hydraulic fluid costs about 2 ½ times that of petroleum-based fluid, it was considered worth the reduction in risk to the fragile water supply.

As the first LEED facility constructed at BNL, the RSB provided challenges to the project management team. These challenges were met and hurdles overcome due to the project manager's determination and the dedication of the team. Future construction and renovation projects at BNL will benefit from the RSB success.



Covered Ducts



Sedimentation Control