

Historic - DEEP ENERGY RETROFIT



Petersen Engineering implements IBEA energy cost savings and occupant comfort measures through a deep energy retrofit with Bruss Construction - Portsmouth, NH

Building Overview

The project entailed repairing the Petersen Engineering office at 335 Maplewood Ave Portsmouth, NH in a manner that meets both preservation and sustainability goals. Petersen Engineering wanted to showcase techniques and materials that promote both preservation and sustainability. IBEA and Petersen Engineering have used this project as an education tool to demonstrate how sustainability goals support the preservation of New Hampshire's historic buildings. The project received approval by the Historic District Commission on January 6, 2010. One month later, Bruss Construction of Bradford, NH began the delicate task of repairing years of neglect and misguided renovations.

IBEA's Role

IBEA conducted an existing conditions survey and developed a deferred maintenance priority list. IBEA developed an in-depth report analyzing sustainability efforts designed to increase occupant comfort, maintain building durability and greatly reduce energy use.

Results

The exterior walls were wrapped in 3" of polyisocyanurate rigid insulation and the roof received 6" of the same. Wood framed, double pane windows were installed to match the historic nature of the original windows, with the added benefit of Low E coatings, gas-filled chambers and R-3 insulating value. Installing 6" of rigid

foam insulation over the existing roof maintained the exposed post and beam construction. The sill plate (sill beam in this case) was completely replaced and sections of unsound foundation were repaired with poured concrete to accommodate a new slab. To replace the dirt floor in the basement, Bruss Construction installed a water permeable geotextile fabric, crushed stone, 1 1/2" of extruded polystyrene rigid foam board and a fully sealed polyethylene vapor retarder barrier with 3" of finished concrete slab. Today, the building operates at 33 kBtu/square foot energy load, or one third of the national average for office energy use.

Impact

IBEA, Petersen Engineering and Bruss Construction together preserved the historic nature of the building, increased indoor comfort, building durability and made a lasting impact on the Historic District Commission. The Commission was floored by how well the team maintained the building's historic features while making it a highly energy efficient building with the structural integrity to last at least another 100 years. Owners of other historic buildings should take note: energy efficiency and historic preservation can go hand-in-hand!

- 37% Energy savings (kWh)
- 39% Natural gas use reduction
- 6,720 lbs emissions reductions (CO2 lbs/yr)
- 2,416 square foot - Office Building
- Energy project cost: \$145,375

