

GEATAIN ENGINEERING

CASE STUDY-1916 PARK AVENUE



BACKGROUND

1916 Park Avenue is a 6-story commercial building, constructed in 1872, located in Harlem, New York. 1916 Park Avenue has traditionally housed manufacturing, artistic and loft-styled tenants. Recently, more traditional office space tenants have leased space. Approximately 29 percent of all operating expenses were spent on electricity and fossil fuels.

Due to its age, many types of equipment were showing significant aging and were consuming large amounts of energy. Manual switches for fluorescent T12 bulbs kept lighting on for long hours, windows needed to be opened in the winter to prevent overheating, the boiler cycled too frequently, tenants often complained and legacy equipment broke down.

HOW GEATAIN ENGINEERING HELPED

Geatain Engineering followed ASHRAE Level II standards to evaluate the whole building for energy improvements. Met with manager and operators to understand building history, challenges and long-term planning. Reviewed available operating records and equipment operating manuals. Determined energy use intensities and benchmarked building using Portfolio Manager. Completed visual inspections over different seasons to assess actual operating condition of equipment. Evaluated utility data to complete end-use breakdowns. Used BIN tables to evaluate benefits of different measures. Identified capital improvements, low-cost improvements and possible interactions. Determine measure capital costs, savings, payback, IRR, NPV and related financial analysis. Recommended methods of measurement and verification. Met with manager and operators to review recommendations.

For more than eight years, Geatain Engineering has met with the manager to discuss ongoing building developments. Based on the objective evaluation of energy bills, walk-through surveys, building evaluation and client direction, measures were prioritized to focus on lighting, heating and cooling. Based on



CHALLENGES

- Nearly 150 years old, 1916 Park Avenue needed to replace many legacy building systems.

SOLUTIONS

- Split unit electrification
- LED lighting
- Controls evaluation
- Natural ventilation
- Low flow aerators

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the analysis, LED technology proved to be very cost effective and the manager has replaced nearly every bulb with LED lighting, saving \$11,700 annually.

The next focus centered on the existing boiler that is over 35 years old. Eight years ago, the boiler was operating well however, older boilers eventually deteriorate. Over the past three years, the owner spent over \$40,000 to repair the boiler several times. Responsively, the Manager and Geatain have discussed cost-effective boiler alternatives. At the same time, tenants had been expressing an interest in more centralized cooling. These two factors, the boiler deterioration and tenant central cooling preferences caused deeper consideration of several alternatives, resulting in several split units being installed. Currently, approximately 60% of the building is heated and cooled by split units. Given the age and recent performance of the boiler, additional split units may be installed, helping decrease fossil fuel use.

In the last year or two, several additional measures have been pursued. Geatain has completed a BIN analysis to determine savings from greater use of natural ventilation. This impartial analysis revealed savings of \$1,600 for the entire building, with reduced heating and cooling operation during the spring and fall. Geatain Engineering has also BIN analyzed the cost effectiveness of modifying temperatures setpoints, building management systems and real time energy management. Due to the growing traditional office nature of 1916 Park Avenue, Geatain Engineering adapted and focused on smart strip and plug outlet controls savings, determining an annual savings of \$2,800. The legacy heat timer heating controls is another source of savings. Geatain Engineering presented several alternative technologies, focusing on locating sensors throughout the space to objectively measure actual temperatures and provide targeted heating levels. Through simple operational adjustments, annual savings would exceed \$5,100. Geatain Engineering evaluated 80-gallon baseline electric heaters, low flow electric heaters, hybrid baseline heat pumps and hybrid low flow heat pumps. The operational variance for these four alternatives differed by 30%, ultimately leading to the low flow electric alternative being recommended, for an annual savings of \$1,100. Low flow aerators have been installed throughout the building to reduce hot water consumption.

Through the years, Geatain Engineering discussed several renewable energy alternatives with two different managers. Two impartial solar evaluations showed returns that did not meet owner return standards, so solar was not pursued.

BENEFITS

Since 1916 Park Avenue uses almost exclusively LED lighting and uses electric split units in 20% of the spaces, the building has been a good success story for energy efficiency. Continuing plans may call for greater use of split units and decreased fossil fuel use. Other focus areas include savings from plug outlet controls, greater use of natural ventilation and centralized HVAC controls.