

Executive Summary

Analysis I – Backup Generator Analysis

This analysis looked into the relative benefit of utilizing a buildings existing backup generator as an energy source in an attempt to reduce peak electrical demand and thereby reduce electricity costs. It was determined that the existing Cummins 300 kW diesel generator was not a viable candidate for such an activity but larger natural gas generators could be. Based upon the proposed Caterpillar 450 kW N.G. generator, this resulted in an annual savings of \$6,054 with an initial cost of \$176,400 and a payback period of 36.5 years. Along the same lines, a Caterpillar 1040 kW N.G. generator resulted in an annual savings of \$135,300 with an initial cost of \$507,700 and a payback period of 4.1 years. The cost per square foot when computed based upon new construction area was found to be \$16.31.

Analysis II – Green Roof Analysis

This analysis investigated the relative benefit of incorporating a modular green roof onto 2175 K Street. It was determined that a system such as the one chosen would cost the owner an additional \$105,900 or \$19.26 per square foot to install a GreenGrid® modular green roof. Based upon the existing single-ply EPDM roof as a base, the green roof would result in an annual savings of \$5,056 or 32,800 kWhrs based upon an electric rate of \$0.1543. This system has a payback period of 20.9 years. When the cost of the existing design is factored in, the payback period drops to 9 years. The cost per square foot when computed based upon new construction area was found to be \$3.14.

Analysis III – Curtain Wall Redesign Analysis

This analysis researched the relative benefit of changing the existing curtain wall with a super insulated Schuco FW 50+.SI curtain wall. In addition, based upon the selected system, the benefit of including solar collectors within the glazing was analyzed. The resulting figures are as follows; when simply using the super insulated curtain wall system, the initial cost was \$808,000 which works out to an added cost of \$38,500 with an annual savings of \$132,600. This resulted in a payback period of 5.8 years but the associated added cost was recovered in the first year. When solar collectors were added to the non-vision glass, the initial cost was \$846,000, with an annual savings of \$138,700, and a payback period of 5.3 years. When solar collectors were included in the vision glass, the initial cost was \$962,000, with an annual savings of \$152,600, and a payback period of 5.6 years. With both solar collection options, the added cost was recovered the first year. The cost per square foot when computed based upon new construction area was found to be \$1.14 based upon a super insulated system.

Analysis IV – Smart Power Strips Analysis

This analysis looked into the relative benefit of implementing a system of Smart Power Strips within an office building setting. Based upon the planned 400 tenants, an annual savings of \$105,600 was calculated. The initial cost of this system was found to be just under \$12,000, with a payback period of only 0.11 years or 1.36 months. The cost per square foot when computed based upon new construction area was found to be \$0.36.