

## SHOWCASE PROJECT: CITY OF SEATTLE: EMP MUSEUM

### SOLUTION OVERVIEW

The City of Seattle retained McKinstry's Energy Services group to conduct a Directed Engineering Study of the EMP Museum, an iconic museum in downtown Seattle. Working closely with the facilities staff and Vulcan's real estate group, the team assessed the building's existing systems to identify potential energy conservation measures that would help facilitate the upgrade and/or replacement of existing aging, failing, or inefficient infrastructures.

The study consisted of information gathering and detailed on-site interviews with facilities staff. Four key components were included:

- Addressing aging and/or inefficient HVAC equipment and associated control systems.
- Lowering operating costs through utility savings as well as lower maintenance and repair expenses.
- Reducing greenhouse gas emissions and EMP's overall carbon footprint.
- Improving the net operating budget by lowering building operating expenses and preserving the asset value.

### SECTOR TYPE

Local Government

### LOCATION

Seattle, Washington

### PROJECT SIZE

140,000 Square Feet

### FINANCIAL OVERVIEW

Project Cost \$1.54 Million

### SOLUTIONS

EMP's Directed Engineering Study produced eight recommended Facility Improvement Measures, which are expected to deliver \$106,000 in annual utility savings (gas, electric, water/sewer) and an annual operational savings of \$55,000. The measures provide a better than life cycle cost effective opportunity for replacing aging and inefficient mechanical HVAC and lighting systems in the museum.

EMP's energy retrofits were initiated in November 2011 and completed on November 1, 2012. The

Facility Improvement Measures include:

- Replacing the existing non-condensing boiler with a high efficiency condensing boiler (9% energy savings).
- Installing a heat recovery chiller for efficient heating water and chilled water generation (6% energy savings).
- Retrofitting one 350-ton chiller with a variable frequency drive (3% energy savings).
- Removing the carbon filter banks on the outside air intake of seven AHU's (.3% energy savings).
- Optimizing airside systems, including space temperature control, ventilation, humidity controls, interior air distribution, and airside economizer operation (2% energy savings).
- Replacing specific lighting fixtures that operate inefficiently, including the replacement of incandescent, halogen or HID lamps with energy-efficient LED sources (7% energy savings).
- Incorporating plumbing upgrades including changing the building water closet flushometers to dual flush valves, and the urinals to ultra-low flow fixtures.
- Retro-Commissioning the building's mechanical systems, including airside and waterside systems (2% energy savings).

## **OTHER BENEFITS**

Seattle's EMP Museum showcase project will provide documentation for several LEED<sup>®</sup> Existing Buildings (EB) certification credits and will be key to achieving the goal of LEED EB certification in the near future.

EMP Museum would like to graciously acknowledge McKinstry, Vulcan, Toshiba, Green Building Services, Philips and Candela for their critical support in the Better Buildings Challenge.

## Annual Energy Use

(Source EUI)

Baseline(2011)



Actual(2015)



**Energy Savings**

**22%**

## Annual Energy Cost

Baseline(2011)



Actual(2015)



**Cost Savings**

**\$80,000**

