

PUBLIC WORKS FACILITY | BG70 0002 | LEED PRESENTATION FEB 18, 2020

Category	Construction Item	Cost	Points	Cost Per Point	LEED Statement Environmental Impact and/or Savings
LT	Green Vehicles Public Charging station	\$17,000	1	\$17,000	Reduce pollution by promoting alternatives to conventionally fueled automobiles. Well to Wheel Emissions (US Dept of Energy) Conventional gas powered vehicles emit over 11,400 pounds of CO2 annually while an electric vehicle emits around 4,100 pounds of CO2 (taking into account its power source).
SS	Light Pollution Fixtures with full cutoff	\$25,000	1	\$25,000	Increase night sky access, improve visibility, and reduce the consequence of development for wildlife and people. "Missing the Dark" (US National Library of Medicine, National Institutes of Health) "The ecologic effects of artificial light have been well documented. Light pollution has been shown to affect both flora and fauna...The connection between artificial light and sleep disorders is a fairly intuitive one. Difficultie: with adjusting the circadian clock can lead to a number of sleep disorders..."
WE	Indoor Water Use Reduction Utilize greywater system	\$50,000	1	\$50,000	Install equipment within the project scope to reduce water consumption by 50% from the baseline. Greywater harvesting is gently used water (usually water from sinks) and is most often harvested to flush toilets in a building. The supply can be steady and predictable, unlike rainwater, and can meet most of the toilet flushing needs. Using an average of 1.3 gallons to flush the fixtures in the facility at least 3X per day per person equals 110 gallons of water per day or 40,000 gallons annually.
WE	Water Metering Install additional meters: hot water, indoor plumbing reclaimed water	\$18,000	1	\$18,000	To support water management and identify opportunities for additional water savings by tracking water consumption. Tracking consumption may identify opportunities to reduce consumption.
EA	Optimize Energy Performance Upgrade HVAC to VRF system Installation of Solar Panels	\$165,000 \$150,000	9* 7*	\$16,500 \$13,636	Achieve increasing levels of energy performance beyond the prerequisite standard to reduce environmental and economic harms associated with excessive energy use. Analyze efficiency measures, focus on load reduction and project potential energy savings. VRF: Simple payback on costs of system is 20-30 years depending on installation method and maintenance. Solar: Simple payback on system is 11 years. Combined savings projected at \$19,000 per year (initially). Both systems impact points in other categories. VRF TOTAL=10 SOLAR TOTAL=11
EA	Advanced Energy Metering Install additional meters	\$60,000	1	\$60,000	To support energy management and identify opportunities for additional energy savings by tracking building-level and system-level energy use. Tracking consumption may identify opportunities to reduce consumption.
EA	Demand Response Install equipment to participate in program	\$35,000	1	\$35,000	Increase participation in demand response technologies and programs the make energy distribution systems more efficient, increase grid reliability and reduce greenhouse emissions. Demand response programs are offered by many utilities for energy consumers for enrollment. Common examples of reduction include turning up the temperature on a thermostat to reduce air conditioning load, turning off certain lights, or shifting the time of use of some energy consuming devices out of the peak demand period. The load avoided for a single facility may be small, but when many customers participate it creates a meaningful energy demand reduction for the utility. <i>Energy has a demand response program.</i>
EA	Renewable Energy Production Installation of Solar Panels Cost is shown in Optimize Energy Perf.		4*		To reduce the environmental and economic harms associated with fossil fuel energy by increasing self-supply of renewable energy USGBC.org Renewable energy is clean energy unlike fossil fuels used to produce traditional electricity. "Traditional electricity is sourced from fossil fuels such as coal and natural gas. When fossil fuels are burned to produce electricity, they emit harmful gases that are the primary cause of air pollution and global climate change. ...they are also a finite resource. Because of this, the price is constantly fluctuating and can increase in a short period of time." System impacts points in other category. SOLAR TOTAL = 11 Carbon Impact over the life of the system: same as planting 72,603 trees, driving reduced by 6,232,000 automobile miles, or displacing CO2 emissions from electric use of 353 homes.
MR	Building Life-Cycle Impact Reduction Consult and Implementation	\$25,000	3	\$8,333	Identifying strategies to reduce harm done to the environment by the building during its life cycle. Perform life cycle analysis to determine life cycle impacts of building to the environment and demonstrate 10% of these impacts based on industry standard baseline building. Depending on results of analysis the points could range from 1-4.
MR	Waste Management Demolition and Construction	\$15,000	2	\$7,500	Reduce construction and demolition waste disposed of in landfills by recovering, reusing and recycling materials. These dollars provide for the necessary time and equipment to divert 75% of the demolition and construction waste. EPA 2017 Diverting materials from landfills reduces greenhouse gas emissions. Landfills are the third largest source of human-produced methane in the US.
IEQ	Indoor Air Quality Assessment Flush out and Air Testing	\$20,000	1	\$20,000	Establish better quality indoor air in the building after construction and during occupancy EPA -"Concentrations of VOCs are consistently higher indoors (up to 10x) than outdoors" Indoor air pollutants aggravate allergies and asthma leading to lost work time and reduced productivity. Harvard's Healthy Buildings research studied a LEED Platinum building constructed in 2016: "Participants scored 61% higher during the Green condition and 101% higher during the Green+ condition compared to when those same participants were in the Conventional environment. CO2 was also found to have a similar effect on cognitive function scores, even at levels previously thought to be benign." ..." increase the productivity of an employee by \$6,500 a year." Increase in productivity by \$6500 per year = \$52,000 in one year for admin staff only could be 2 points depending on results of test
IEQ	Interior Lighting Choose 4 of 8 lighting strategies: light sources with a CRI of 80+ use light sources with a rated life of 24,000 hours meet thresholds for surface reflectance meet ratios for wall to surface illuminance meet ratios for wall to ceiling illuminance	\$50,000	1	\$50,000	To promote occupants' productivity, comfort, and well-being by providing high-quality lighting. Michigan State University Study 2018 "The study, funded by the National Institutes of Health, is the first to show that changes in environmental light, in a range normally experienced by humans, leads to structural changes in the brain." Americans, on average, spend about 90 percent of their time indoors, according to the EPA.