

ATHERTON SUSTAINABILITY ATTRIBUTES - ELEMENTS/APPROACHES

Date: 09.7.2016v3

Category	ATTRIBUTE	EXTENT	Required by Cal Green	Required by Local Code	First Cost Low/Mod/High	Net Zero	notes	Design Cost to include w/Bid	Must Include in Base Bid	Can be Bid Alternate	Added Cost to Retrofit	
ENERGY												
Lighting												
1	Electrical	Energy Monitoring	Each panelboard and large piece of equipment	N	N	L	Y	Important for net-zero to verify energy usage and production and to identify problem areas of high energy use for reduction	Y	N	Y	L
3		Microgrid	Police Station battery powered off of PV system	N	N	H - approx. \$1.4M	N	Adds additional level of redundancy for power outages, reduces reliance on fossil fuels in the event that trucks cannot get through to deliver fuel (or in the event that fuel is prioritized for places like hospitals and it is difficult to get in time), provides opportunity to use the police station as a safe refuge where community members can come to charge phones and get in touch with loved ones during a major emergency Space for batteries is currently not included in building layout.	N	N but recommended	Y	H
1	Lighting	LED lighting	Site and building interior	N*	N*	L - no add	N**	* Not explicitly required by code, but LED makes achieving code requirements for lighting power density, as well as controls requirements, much easier ** Not explicitly required for LEED or Net-zero, but makes achieving energy targets much easier and more cost effective	Y	N but recommended	Y	H
1	PVs	PVs	Exterior Roof	N	N	M - app \$1M (12 yrs)	Y	PV system can reduce size of Emergency Generator.	N	N	Y	L
Mechanical												
3	Geo Exchange	Water Source Heat Pumps	Geothermal field with ~45 wells.	N	N	H	Y	Water source heat pumps provide excellent energy efficiency. Any alternate mechanical system would need to reach the efficiency of this system.	Y	Y	N	N/A
2	Solar Thermal	Solar thermal heating	Located at Police Building to support showers only	N	N	L	N	Solar thermal systems will work to preheat domestic hot water and reduce the energy needed to heat the buildings.	Y	N	Y	M
2	Energy Recovery Units	Energy recovery off of exhaust air for preheat or precooling of ventilation air.	Provided for all ventilation air.	N	N	L	Y	This system reduces the heating and cooling demand for the building by significantly reducing the ventilation heating and cooling load. This results in a reduction in size of the heat pumps, pumps, piping, and geothermal wells. Initial cost of Energy Recovery system would be offset by reduction in cost for traditional Mechanical systems.	N	Y	N	N/A
1	Displacement or Underfloor Ventilation	High air quality, personal comfort, low sound	Library building	N	N	L - no add	N	This ventilation scheme reduces energy usage by increasing economizer hours throughout the year. Reductions in equipment and ductwork sizes.	N	Y	N	N/A
1	Energy Monitoring	Measurement of building systems by end use	Campus wide	N	N	L	Y	Important for net-zero to verify energy usage and production and to identify problem areas of high energy use for reduction. You cannot manage what you don't measure.	Y	N	Y	L
Water												
1	On-site Well	Well with power source and pressure tank for onsite non-potable demands	One well for entire site	N	N	L	NA	Well allows for groundwater exchange concept	N	N	Y	L
2	Graywater	Treatment for Passive Irrigation	At Library	N	N	M	NA	Reduces reliance on well for irrigation	Y	N	Y	M
1	Rainwater Harvesting	Treatment for reuse as irrigation and/or toilet flushing	Collection and reuse at Library Building. Tie collection system for Police / Admin Bldg into Library treatment and reuse system.	N	?	M	NA	Reduces reliance on well for irrigation	N	N	Y	L
1	Stormwater Infiltration	underground storage for permeability and compliane	site water	N	N	H	Y	City Council rejected: Reduces reliance on well for irrigation / flushing. Requires additional room for equipment and plumbing fixtures to be provided with dual connections.	Y	N	Y	H
3	Blackwater	Treatment for unconditional reuse	All building wastewater	N	Y	M	NA	City Council rejected: Reduces reliance on well for irrigation / flushing. Requires additional room for equipment and plumbing fixtures to be provided with dual connections.	Y	N	Y	H
2	Dual Plumbing	Use non-potable water for flushing toilets	Library Building and Potentially Police / Admin Bldg	N	N	M	NA	Net zero requires no potable water to be used for non-potable demands.	N	N	Y	H