Design Standard
Sustainability

Purpose

Educational institutions have the ability to influence the ideals and principles of our future decision makers; as such, East Side Union High School District (ESUHSD) holds an important role in promoting sustainability. ESUHSD is passionate about our responsibility to strive for the highest standards achievable in terms of sustainability to encourage positive change through example.

ESUHSD regards capital projects as an opportunity to demonstrate through action our support of sustainable design and construction, and have received recognition for our efforts including the following:

- 2013 Silicon Valley Water Conservation Award

Design Standard

To truly embrace the value of sustainability, environmental, social, and economic excellence must be equally considered. The elements below should be taken into account when designing capital projects for ESUHSD:

- Recycled materials
- Indoor environmental quality
- Energy and water conservation
- Natural lighting
- Local manufacturing
- Landscaping with water-frugal plants
- Public transportation usage
- Bicycle transportation
- Embedded energy
- Other sustainable fundamentals

ESUHSD's goal is to design for sustainability and - when it makes sense - seek external recognition and/or design to external criteria. At the programming phase, coordinate a discussion with the Facilities Director to seek guidance as to required certifications, incentive, rebate and other programs to participate in for the project, including but not limited to:

- Leadership in Energy and Environmental Design (LEED) certification
- California High Performance Schools (CHPS) certification
- Sustainable Santa Clara County (SSCC)
- Savings By Design (PG&E)
- Acterra: Action for a Healthy Planet
- Coalition for Adequate School Housing (C.A.S.H.)

Appendix A to this Sustainability Design Standard is a compilation of ideas and concepts that should be considered for incorporation into each capital project. Designers should consider Appendix A the starting point, not an inclusive list of possible measures toward sustainability.

Approved Manufacturers

- Not applicable

Substitutes Allowed?

- Not applicable

Associated Design Standards and Construction Specifications

- Not applicable

End of Document

(Appendix A follows)

Appendix A to Sustainability Design Standard

APPROACH	BENEFIT	COST INCREASE	TECHNOLOGY STATUS	APPLICATION
Solar Income				
Building Integrated PV's	• Renewable Energy • Incorporate into Shading Device • No Impact to Roof • Reduce Long Term Energy Costs	When Integrated, payback can be reduced significantly	Mature	• Locate along south façade
Building Integrated Solar Water Heating	• Renewable Energy • No Impact to Roof • Can be used as a Double Facade • Reduce Energy Costs	Low	Mature	• Locate with south orientation and either integrate into shading or penthouse wall • Could have roofing system with domestic water heating • Consider for swimming pools
Outside Air Preheating	• Renewable Energy • Double as a Penthouse Wall • Reduce Energy Costs	Low	Mature	• Integrate into façade or penthouse walls • Buildings with 100% outside air requirements
Wind Income				
Wind Turbine	• Renewable Energy • Reduce Energy Costs	High	Emerging For Small System Application	• Utilize vertical axis type wind turbines
Natural Ventilation	• Renewable Energy • Potentially Gives Occupant Control Over Their Space • Reduce Energy Costs • Potentially Reduce Ductwork, Fans, Shafts, Floor to Floor Heights	Low to None	Mature	• Operable windows • Lobby areas • Transient spaces • Consider wind direction and stack pressures

APPROACH	BENEFIT	COST INCREASE	TECHNOLOGY STATUS	APPLICATION
Ground Water				
Geothermal Slab Cooling	• Renewable Cooling Source • Reduce Energy Costs • Potentially Reduce Ductwork, Fans, Shafts, Floor to Floor Heights	Medium	Emerging	• Consider in locations of high water table for floor hydronic cooling or ceiling radiant cooling systems • Design shall take into account condensation concerns
Geothermal Heat Pumps	• Reduce Energy Costs • Potentially Reduce Ductwork, Fans, Shafts, Floor to Floor Heights	Low	Mature	• Consider in locations of high water table for floor hydronic cooling or ceiling radiant cooling systems • Makes most design sense in locations where gas heating is not available
Rain				
Rain Water Harvesting	• Reduce Campus Wide Water Use	High	Mature	• Could be used for landscape, grey water, CUP make up water
Architectural / Engineering				
Durable Materials	• Improved Service Life • Reduced Life Cycle Cost	Low	Mature	• Continuous hinges on exterior doors, heavy doors, doors taller than 7’ • FRL on walls near high traffic areas • Concrete floors • Minimum 20 year warranted roof membranes • Institutional grade restroom partitions • Ceramic tile restroom wall and floor finishes, with epoxy grout • Mechanically fastened signage

APPROACH	BENEFIT	COST INCREASE	TECHNOLOGY STATUS	APPLICATION
Maintainable Design	• Reduced Maintenance Burden • Reduced Life Cycle Cost	Low	Mature	• Commercially-available, replaceable finishes • Campus-standard paint finishes, to reduce quantity of paint inventory • Architectural datums on walls that are graffiti targets, to reduce re-paint area • Distributed, well-designed custodial and maintenance rooms, to reduce service travel time • Service access for MEP systems
Double Facade	• Reduce Heat Gain • More Even Year-round Temperature (Better Occupant Comfort) • Can Double For Solar Wall or Solar Water Heating • Will Reduce Mechanical Equipment Sizes and Space Requirements • Reduced Energy Costs	Medium to High	Mature	• South atrium or façades for water heating, preheating OSA, shed cooling load, and recycle building heat loss
Daylighting	• Natural Light Improves Productivity • Reduced Lighting Demand • Reduced Energy Costs • Can Double as Shading Device	Low	Mature	• Utilize double shading device (see CHPS) with daylighting • Incorporate into skylights

APPROACH	BENEFIT	COST INCREASE	TECHNOLOGY STATUS	APPLICATION
High Levels of Insulation	• Reduce Heat Gain / Heat Loss • More Even Year-round Temperature (Better Occupant Comfort) • Will Reduce Mechanical Equipment Sizes and Space Requirements • Reduced Energy Costs	Low, When Considering Mechanical Savings	Mature	• At walls and roofs (also applies if using radiant slabs)
Efficient Visible Glass	• Reduce Heat Gain / Heat Loss • More Even Year-round Temperature (Better Occupant Comfort) • Will Reduce Mechanical Equipment Sizes and Space Requirements • Reduced Energy Costs	Low, When Considering Mechanical Savings	Mature	
Orientation	• Reduce Heat Gain / Heat Loss • Reduce Glare, Better Daylighting • Will Reduce Mechanical Equipment Sizes and Space Requirements • Reduced Energy Costs	Low to None	No Technology	• North/South work spaces and East West spaces for transient and unoccupied areas
Programming (Relaxed Temperatures)	• Will Reduce Mechanical Equipment Sizes and Space Requirements • Reduced Energy Costs	None	No Technology	• Review opportunities to relax temperature constraints in transient areas

APPROACH	BENEFIT	COST INCREASE	TECHNOLOGY STATUS	APPLICATION
Thermal Mass	• Reduce Heat Gain / Heat Loss • More Even Year-round Temperature (Better Occupant Comfort) • Will Reduce Mechanical Equipment Sizes and Space Requirements • Reduced Energy Costs	Low to None	No Technology	• Use of high levels of thermal mass integrated with radiant floor, wall or ceilings
Green Roof	• Reduce Heat Gain / Heat Loss • Makes Roof a Useable Outdoor Space • Will Reduce Mechanical Equipment Sizes and Space Requirements • Reduced Energy Costs	Medium	Emerging Products/Mature	• Along accessible roofs. Do not incorporate where utilizing rainwater harvesting strategies
Indoor Environmental Quality	• Improved Productivity • Reduced Absenteeism due to Illness • Solar Shades Reduce Eye Strain associated with Glare • Solar Shades allow visual connection to Outdoor Environment	Low to None	Mature	• Specify low VOC paints, carpets, floor finishes, acoustic finishes, furnishings • Specify solar shades • Design adequate exhaust and ventilation near emitting equipment, such as printers

APPROACH	BENEFIT	COST INCREASE	TECHNOLOGY STATUS	APPLICATION
Central Utility Plant for Chilled Water Production	• Lower Maintenance Cost than Distributed Plants • Larger System Allows for More Efficient Technologies • Reduction in Electrical Demand Charges • Reduction in Energy Charges • Single Location for CUP Effluents	Minimal Cost Increase over Decentralized Plants	Mature	• Centrifugal chiller with VFD's • Ice storage • Cooling tower with VFD's • Primary constant volume pumping with variable secondary pumping
Heating Only Energy Recovery with Run-Around Coils	• Allows for 100% Outside Air Delivery Without Energy Deficit • Simple Controls • Less Mechanical Equipment / Piping • Smaller Boiler Plant • Reduced Energy Costs	None, Less than Conventional	Mature, Will Require Detailed Engineering	• All 100% outside air locations
Variable Volume Diffusers	• Allows for Better Temperature Control (Better Occupant Comfort) • Simple Controls • Less Mechanical Equipment • Reduced Energy Costs	None, Less than Conventional	Mature	• Where there are offices or rooms that require a lot of single exposure VAV boxes
Microturbine	• Reduced Grid Losses to Campus • Reduced Energy Costs • Reduced Boiler Plant Size	Low to Medium	Mature	• Locate at buildings where heat rejection warrants the use such as pools

APPROACH	BENEFIT	COST INCREASE	TECHNOLOGY STATUS	APPLICATION
Displacement Ventilation	• Reduced Chiller Plant Requirements / More Hours of Economizer Use • Reduced Boiler Plant Requirements, Less Reheat • Better Contaminant Control	Low to None	Mature, Will Require Detailed Engineering and Modeling	• In locations that could be accompanied with radiant slabs, high odor locations (locker rooms, etc.), high occupant areas (student unions, cafeterias, libraries, etc.)
Thermal Storage Systems	• Reduced Chiller Plant Space and Equipment • Reduced Energy Costs and Demand Costs	Low	Mature	• CUP for chilled water
Fan Wall Systems	• Reduced Air Handler Space and Equipment • Reduced Energy Costs • Better Sound Control	Low to None	Emerging Product	• All large air handling units
Heat and Mass Exchange	• Reduced Chiller Plant Space and Equipment • No Cooling Penalty Due to 100% Outside Air System • Reduced Energy Costs	Low to None	Emerging Product	• All 100% outside air units
Low Flow Fixtures	• Reduced Water Use • Reduced Energy Costs	Low	Mature	• Dual flush toilets • Low flush urinals • Low flow lavatory faucets • Oxygenated shower heads • Non-chemical water treatment systems
Lighting	• Reduced Energy Use	Low to None	Mature	• Energy efficient lighting and lighting controls

End of Appendix A to Sustainability Design Standard