



Planning and Design for Sustainability

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*"Today's mighty oak is just yesterday's nut that held its ground."
-Anonymous*



Benefits of Building Green

- Utility Savings

"Average school energy use in 2005/2006 was \$1.15/s.f., of which electricity was 63% and natural gas 34%. For the 30 green schools reviewed in this report, the average energy reduction compared with conventional design is 33%, indicating an average savings of \$.38/s.f. per year in green schools."
-"Greening America's Schools: Costs and Benefits," 2006
- Healthier Students

"Measures to control the indoor environment and change current building factors can result in a 10% - 30% reduction in allergy and asthma symptoms and related costs."
-"Fast Facts: Indoor Air Quality and Schools," U.S. EPA
- Stewardship of Natural Resources



Sustainable Communities


Implement a recycling program.


- Recycling is a domestic industry that puts money back into the United States' economy. Re-using waste materials reduces the need to import raw material from foreign markets.
 - "Because so many of them are recycled, aluminum cans account for less than 1 percent of the total waste stream, according to EPA estimates."
 - www.aluminum.org
- Many districts already recycle paper, aluminum and glass. Consider including lesser known recyclables such as batteries, computer equipment, printer and photocopier cartridges and cell phones.
- Building system components:
 - Carpet, concrete, steel, asphalt, plastics, glass





Sustainable Communities

Purchase green products.


- Look for products that have these labels:
 - 

Energy Star products meet the U.S. Department of Energy's requirements for energy efficiency.
www.energystar.gov
 - 

Green-e retail products have been certified by a independent organization for their use of renewable energy and reduction in greenhouse gas emissions.
www.green-e.org
 - 

Green Seal is an independent, non-profit organization that certifies products based on scientific requirements that meet their environmental standards.
www.greenseal.org
 - 

The Forest Stewardship Council independently certifies wood products that come from forests that meet certain social, economic and ecological management requirements.
www.fsc.org





Sustainable Communities

Start a green club.

- Encourage high school students to start a club that fosters interest in green activities and issues of sustainability.
- Suggested activities the club could participate in include:
 - the Adopt-a-Highway cleanup program
 - collect and empty recycle bins throughout the school
 - plant a garden and use organic growing practices

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Sustainable Communities

Promote alternative transportation.

- In districts without widely accessible means of public transportation, walking, biking, riding the bus and carpooling are viable means of alternative transportation.
- Encourage teacher participation in carpooling as a means of setting an example for parents and students.
- Encourage parent participation by emphasizing the financial and time management savings of sharing school commute duties.

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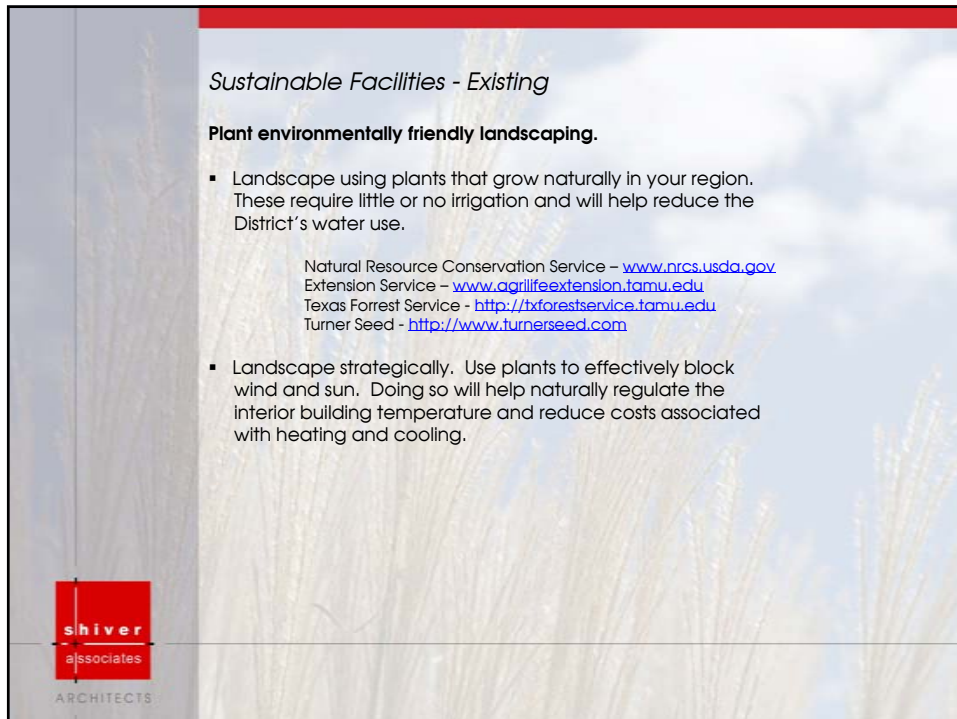


Sustainable Communities

Fuel bus fleets with biodiesel.

- Biodiesel is an alternative fuel derived from animal and vegetable oils. It is usually blended with a percentage of typical petroleum based diesel. The most common biodiesel blend is B20, which consists of 20% biodiesel and 80% regular petroleum based diesel.
- Biodiesel is a sustainably sourced fuel that has fewer environmentally damaging emissions than traditional petroleum based diesel, yet maintains similar levels of performance.

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Sustainable Facilities - Existing

Plant environmentally friendly landscaping.

- Landscape using plants that grow naturally in your region. These require little or no irrigation and will help reduce the District's water use.

Natural Resource Conservation Service - www.nrcs.usda.gov
Extension Service - www.agrilifeextension.tamu.edu
Texas Forrest Service - <http://txforrestservice.tamu.edu>
Turner Seed - <http://www.turnerseeds.com>
- Landscape strategically. Use plants to effectively block wind and sun. Doing so will help naturally regulate the interior building temperature and reduce costs associated with heating and cooling.

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Sustainable Facilities – Existing

Recapture rainwater for use in irrigation.

- Collect and store water rainfall runoff or air conditioner condensate for later use in irrigation.

From The *Texas Manual on Rainwater Harvesting* (2005):

- “The Lady Bird Johnson Wildflower Research Center in Austin, Texas, harvests 300,000 gallons of rainwater annually from almost 19,000 square feet of roof collection area for irrigation of its native plant landscapes.”
- “During hot, humid months, moisture-laden air passing over the cooling coils of a residential air conditioner can produce 10 or more gallons per day of water. Industrial facilities produce thousands of gallons per day of condensate. An advantage of condensate capture is that its maximum production occurs during the hottest month of the year, when irrigation need is greatest.”



Sustainable Facilities – Existing

Purchase electricity from green sources.

- Districts located in deregulated areas have the option of switching to a green energy provider. The Texas Electric Choice website lists providers that use 100% renewable energy sources.



Photo courtesy Christopher Crawford



Sustainable Facilities – Existing

Implement an indoor air quality management program.


- Improving ventilation, water tightness and insulation will increase the quality of a school’s indoor air and, as a result, improve the health of its students.
 - “The United States incurs annual costs and productivity losses estimated at \$10 to \$20 billion related to ‘sick building syndrome’ caused by poor indoor air quality.”
 - Sick Building Syndrome Studies and the Compilation of Normative and Comparative Values (2001)*
- Develop a comprehensive IAQ management plan using the Tools for Schools kit provided by the United States Environmental Protection Agency. www.epa.gov/iaq/schools/



Sustainable Facilities – Existing

Retrocommission energy systems.

- Have a building commissioning agent ensure that the school’s heating, ventilation, air conditioning and refrigeration systems are calibrated and functioning properly.
 - Commissioning
 - Testing and Balancing
 - Scheduled maintenance
 - Fresh Air requirements
 - Energy efficiency
- The American Society of Heating, Refrigeration and conditioning Engineers defines commissioning as: “a quality-oriented process for achieving, verifying, and documenting that the performance of facilities, systems, and assemblies meets defined objectives and criteria.”



Sustainable Facilities – Existing

Install on-site renewable energy.

- Photovoltaics and fuel cells can both be integrated into existing systems:
 - Photovoltaics convert solar energy into direct current. This current is then transferred to an inverter which converts it to alternating current. This AC current is then sent to a distribution panel for use or sent back to the utility company.
 - Fuel cells run on hydrogen. They operate much like large batteries. Fuel cells produce both electricity and heat and their only waste product is water.
 - Fuel Cell Cost and durability
 - Hydrogen Storage
 - Hydrogen Production and Distribution
 - Public Acceptance

www1.eere.energy.gov/hydrogenandfuelcells/



Sustainable Facilities – New

LEED For Schools

- When starting the design of a new school facility, consider following the design guidelines of the U.S. Green Building Council's Leadership in Environmental and Energy Design (LEED) program.
- LEED for Schools is a good guide to use as a baseline for building sustainably even if certification is not pursued.
- LEED is divided into seven different areas of new project construction:
 - Sustainable Sites
 - Water Efficiency
 - Energy and Atmosphere
 - Materials and Resources
 - Indoor Air Quality
 - Innovation in Design
 - Regional Priority



Sustainable Facilities – New

Sustainable Sites:


- The Sustainable Sites section of LEED covers all construction that takes place on the new building’s land. This includes things like landscaping, storm water runoff and paving.
- Before any of the Sustainable Sites credits can be achieved, the project must meet two prerequisites:
 - 1: *Construction activity pollution prevention*
This requires the creation and implementation of an erosion and sedimentation control plan (SWPPP)
 - 2: *Environmental site assessment*
A site assessment must be done according to ASTM’s E1527-05 requirement to determine whether or not the site has been contaminated. Phase 1 Environmental Survey.



Sustainable Facilities – New

Sustainable Sites:

- *Credit 1: Site Selection*
A site should not be used if it meets any of the following criteria:
 - Has been designated prime farmland by the U.S. Department of Agriculture
 - Is on previously undeveloped land with an elevation lower than that of the 100-year flood as designated by FEMA
 - Is identified as habitat for threatened or endangered species
 - Is within 100 feet of wetlands
 - Was previously undeveloped and is within 50 feet of a body of water
 - Was public park land prior to the owner acquisition (unless land of equal or greater value has been provided in trade)



Sustainable Facilities – New

Sustainable Sites

- *Credit 2: Development Density and Community Connectivity*
 - Option 1: Development Density
The site must have been previously developed and located in a community with a density of at least 60,000 s.f./acre. (Goal is to increase density)
 - Option 2: Community Connectivity
The site:
 - a. Is located on a previously developed site.
 - b. Is within ½ mile of a residential area or neighborhood with a density average of 10 units/acre.
 - c. Is within ½ mile of a minimum of 10 basic services.
 - d. Has pedestrian access between the and services.



Sustainable Facilities – New

Sustainable Sites

- *Credit 3: Brownfield Redevelopment*

If the site is determined to be contaminated during the evaluation required by SS Pre-requisite 2, the project will receive this credit if the owners decide to remediate that contamination rather than choose an alternate site.



Sustainable Facilities – New

Sustainable Sites


- *Alternative Transportation*
 - 4.1: Public Transportation Access
The school site is within walking distance of 80% of students or it is within walking distance of a rail station or bus stop.
 - 4.2: Bicycle Storage and Changing Rooms
The school has secure bike racks and provides riders shower and changing facilities within the building.
 - 4.3: Low-Emitting and Fuel-Efficient Vehicles
Designate 5% of preferred parking spaces for use by low emitting and fuel-efficient vehicles require that 20% of busses and district maintenance vehicles use an alternative fuel or are low-emitting and fuel-efficient.
 - 4.4: Parking Capacity
Keep parking at minimum zoning requirements while providing preference to carpools, add no new parking or provide 25% fewer spaces than the standard listed in the 2003 ITE study.



Sustainable Facilities – New

Sustainable Sites

- *Site Development*
 - 5.1: Protect or Restore Habitat
On previously undeveloped sites, limit site disturbance so as to disrupt as little of the natural habitat as possible. On previously developed sites, restore a required minimum 20% of the site area with native or adapted vegetation.
 - 5.2: Maximize Open Space
Depending on the site's zoning requirements, provide the minimum required percentage of open space on the site.



Sustainable Facilities – New

Sustainable Sites


- *Stormwater Design*
 - 6.1: Quantity Control
Depending on the site's existing imperviousness, implement a storm water management plan that reduces the required amounts of discharge, erosion and storm water runoff. (SWPPP)
 - 6.2: Quality Control
Implement a storm water management plan that reduces site imperviousness, promotes water infiltration and treats the runoff from 90% of the average rainfall.



Sustainable Facilities – New

Sustainable Sites

- *Heat Island Effect*
 - 7.1: Non-roof
Reduce the site's heat island effect by covering 50% of the parking or adjusting 50% of the general site hardscape by providing that it will be shaded by landscaping within 5 years, is shaded with solar panels, is shaded by architectural structures that have a **Solar Reflective Index (SRI)** of 29 or greater, that the hardscape itself has an SRI of 29 or use an open grid paving system that is 50% pervious.
 - 7.2: Roof
Use roofing materials that have an SRI of 29 or greater or install a vegetated roof that covers at least 50% of the total roof area.





Sustainable Facilities – New

Sustainable Sites

- *Credit 8: Light Pollution Reduction*
 - Interior Lighting
Between 11pm and 5am, dim all the interior lights or shield openings in the building envelope so that interior luminance does not increase the exterior lighting.
 - Exterior Lighting
Light only enough to provide safety and comfort, and control exterior lighting based on the requirements of IESNA Standard 90.1-2007.

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Sustainable Facilities – New

Sustainable Sites

- *Credit 9: Site Master Plan*


The intent of this credit is to ensure that future development is also sustainable. To achieve this credit, four of the Sustainable Sites credits must already have been achieved for the project (1, 5.1, 5.2, 6.1, 6.2, 7.1, 8). These credits must then be recalculated using data from the master plan to determine whether it is meeting LEED criteria.

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Sustainable Facilities – New

Sustainable Sites


- *Credit 10: Community/Joint Use of Facilities*
 - Option 1:
Ensure that at least three school spaces are made available for use by the general public and that these space have a separate entry that allows the rest of the school can remain secured. The spaces that can be used include **auditoriums, gymnasiums, cafeteria/cafeteriums, computer labs and media center, one or more classrooms, the playing fields and/or joint parking.**
 - Option 2:
Engage a contract with local or community organizations to provide at least 2 dedicated-use spaces within the building. Some examples of dedicated-use spaces include a **commercial office, health clinic, community service center, police office, library or media center, parking lot and one or more commercial sector businesses.**
 - Option 3:
Ensure that at least two of the spaces that are available for joint public use are owned by other entities but are available to students.



Sustainable Facilities – New

Water Efficiency:

- Water Efficiency credits are intended to reduce the drain the building will have on community water supplies and quality.
- These credits have one prerequisite:
 - 1: *Water Use Reduction*
The building must use a total of **20% less** water than the amount calculated for the building's baseline.



Sustainable Facilities – New

Water Efficiency

- *Credit 1: Water Efficient Landscaping*
 - Option 1:
Reduce potable water use for **irrigation by 50%** of a calculated baseline by methods that include irrigation efficiency, using captured rainwater, using recycled wastewater, using non-potable public water or choosing native and adaptive plant species that require little irrigation.
 - Option 2:
Do not use potable water for irrigation through the water options mentioned before or by planting vegetation that requires no permanent irrigation system. A temporary system is allowed for plan establishment as long as it is removed within one year. (runoff, storm water collection, grey water)



Sustainable Facilities – New

Water Efficiency

- *Credit 2: Innovative Wastewater Technologies*
 - Option 1:
Reduce potable water use for building sewage conveyance by 50% through using water-conserving fixtures or non-potable water.
 - Option 2:
Treat 50% of wastewater on site so that it meets tertiary standards. This water must then be infiltrated or used on site.




Sustainable Facilities – New

Water Efficiency

- *Credit 3: Water Use Reduction*

Reduce the building's water use beyond what is required in prerequisite 1. Each percentage increase is worth an increased number of points.

Percentage Reduction	Points
30%	2
35%	3
40%	4



Sustainable Facilities – New

Water Efficiency

- *Credit 4: Process Water Use Reduction*

The building must have:


- No refrigeration equipment using once-through cooling with potable water.
- No garbage disposal (Compost)
- At least 4 process items that have a water use below certain standard levels or have documentation showing a 20% water use reduction from a benchmark or industry standard. (specify high efficiency equipment)



Sustainable Facilities – New

Energy and Atmosphere:

- Energy and Atmosphere credits are intended to reduce the building's need to draw from the energy grid and lower emissions.
- These credits have three prerequisites:
 - 1: *Fundamental Commissioning of Building Energy Systems*
A designated commissioning authority must verify that the project's energy-related systems are installed, calibrated and perform according to the owner's requirements.
 - 2: *Minimum Energy Performance*
A total building improvement of 10% over a baseline rating.
 - 3: *Fundamental Refrigerant Management*
Ensure that there is zero use of CFC-based refrigerants used in the building's HVAC systems.



Sustainable Facilities – New

Energy and Atmosphere:

- *Credit 1: Optimize Energy Performance*

This credit is worth 1-19 points which are based on the percentage achievement over the prerequisite baseline performance.

- Option 1
Demonstrate the percentage improvement over the baseline through a whole building energy simulation.
- Option 2
Comply with the prescriptive measures listed in the Advanced Energy Design Guide for K-12 School Buildings.
- Option 3
Comply with the prescriptive measures listed in the Advanced Buildings Core Performance Guide.




Sustainable Facilities – New

Energy and Atmosphere:

- *Credit 2: On-site Renewable Energy*

Use on-site renewable energy. The 1-7 points of this credit are determined by the percentage of the building's annual energy cost covered by renewable sources.

Percentage Renewable Energy	Points
1%	1
3%	2
5%	3
7%	4
9%	5
11%	6
13%	7



Sustainable Facilities – New

Energy and Atmosphere:

- *Credit 3: Enhanced Commissioning*

This credit is achieved when the commissioning agent from Prerequisite 1 implements commissioning activities in addition to previous requirements.



Sustainable Facilities – New

Energy and Atmosphere:

- *Credit 4: Enhanced Refrigerant Management*
 - Option 1
Don't use refrigerants. (Integrate passive cooling/heating)
 - Option 2
Choose refrigerants for the HVAC systems that minimize or eliminate the emission of environmentally harmful compounds. (environmentally friendly refrigerants/NO CFC)



Sustainable Facilities – New

Energy and Atmosphere:

- *Credit 5: Measurement and Verification*
 - Option 1
Develop a measurement and verification plan in accordance with the Option D: Calibrated Simulation plan in the International Performance Measurement & Verification Protocol from April, 2003. This must last for at least a year of post-construction occupancy.
 - Option 2
Develop a measurement and verification plan in accordance with the Option B: Energy Conservation Measure Isolation plan from the same International Performance Measurement & Verification Protocol document.





Sustainable Facilities – New

Energy and Atmosphere:

- *Credit 6: Green Power*

The owner shall sign a 2-year renewable contract to provide at least **35%** of the building's electricity from renewable sources. The electricity use will be determined by the quantity, not the cost of the electricity. This quantity will be determined from the previous baseline or through an estimated baseline energy use.




Sustainable Facilities – New

Materials and Resources:

- This section focuses on the sustainability of the specific materials used in the building construction.
- There is one prerequisite:
 - 1: *Storage and Collection of Recyclables*
The building must have an easily accessible area dedication to the collection of various recyclables. These must include, at minimum, paper, corrugated cardboard, glass, plastics and metals.





Sustainable Facilities – New

Materials and Resources:

- *Building Reuse*

Reusing existing building materials saves cultural resources, reduces waste and reduces the environmental impact of new buildings.

- 1.1: Maintain Existing Walls, Floors and Roof
Reusing 75%-95% of an existing building is worth 1-2 points.
- 1.2: Maintain Interior Nonstructural Elements
This point is earned by saving at least 50% of an existing building's nonstructural elements.



Sustainable Facilities – New

Materials and Resources:

- *Credit 2: Construction Waste Management*

To reduce landfill debris, two points can be earned by recycling or salvaging 50%-75% of construction waste from the new building.





Sustainable Facilities – New

Materials and Resources:

- *Credit 3: Materials Reuse*

This point is earned by using salvaged, refurbished or reused materials for a total of **5%-10%** of the total value of materials used on the project.

- Fly Ash
- Recycled concrete and asphalt
- Steel
- Recycled carpet
- Glass (Terrazzo)
- Carpet

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Sustainable Facilities – New

Materials and Resources:

- *Credit 4: Recycled Content*

Use project materials that, in total, account for **10%-20%** of the total materials cost of the project. The recycled content should be calculated by adding the total of the postconsumer recycled content to half of the pre-consumer recycled content.

Post consumer products are worth twice the value of pre-consumer products.

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Sustainable Facilities – New

Materials and Resources:

- *Credit 5: Regional Materials*

Regional materials are those that have been extracted, harvested, recovered and manufactured within **500 miles of the site**. To achieve the point, these materials must account for a minimum of **10%-20%** the total materials cost for the project.

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Sustainable Facilities – New

Materials and Resources:

- *Credit 6: Rapidly Renewable Materials*

This requires using rapidly renewable materials and products for **2.5%** of the total cost of the building supplies. Rapidly renewable materials are made from plants that are typically planted and harvested within a 10-year lifecycle. Some examples include:

- Bamboo
- Wool
- Cotton insulation
- agrifiber
- Linoleum
- Wheatboard
- Strawboard
- Cork.

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Sustainable Facilities – New

Materials and Resources:

- *Credit 7: Certified Wood*

The Forest Stewardship Council (FSC) is an international organization that certifies forest operations meet social, economic and sustainability standards. This point is achievable by using FSC certified materials for **50% (based on cost)** of the wood-based materials used on the project.




Sustainable Facilities – New

Indoor Environmental Quality:

- Indoor environmental quality focuses on the sensory perceptions of the building's occupants and attempts to reduce or eliminate any unwanted effects of the building's materials, air quality and lighting.
- There are three prerequisites:
 - 1: *Minimum Indoor Air Quality Performance*
The building must meet the minimum requirements of sections of Standard 62.1-2007 written by the American Society of Heating, Refrigeration and Air Conditioning Engineers. It must also meet certain requirements based on whether the building is mechanically or naturally ventilated.
 - 2: *Environmental Tobacco Smoke (ETS) Control*
No smoking will be allowed in the building and on-property smoking will not take place within 25' of entries, outdoor air intakes and operable windows.
 - 3: *Minimum Acoustical Performance*
Background noise from HVAC systems must be no greater than 45 dBA and classrooms must have sound-absorptive finishes and reverberation time requirements to comply with the American National Standards Institute's Standard S12.60-2002.





Sustainable Facilities – New

Indoor Environmental Quality:

- *Credit 1: Outdoor Air Delivery Monitoring*

The building must have a permanent monitoring system to check that the ventilation system maintains minimum requirements and that an alarm will sound if the carbon dioxide level varies 10% or more from the design values. (Energy management system with CO2 sensors)

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Sustainable Facilities – New

Indoor Environmental Quality:

- *Credit 2: Increased Ventilation*

- Mechanically Ventilated Spaces
Increase outdoor air ventilation rates by at least **30%** above those established in prerequisite 1 (ASHRAE standard).
- Naturally Ventilated Spaces
Design natural ventilation systems that will meet requirements set forth in the Chartered Institution of Building Services Engineers (CIBSE) Application Manual 10: 2005, Natural Ventilation in Non-domestic Buildings.

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Sustainable Facilities – New

Indoor Environmental Quality:

- *Construction Indoor Air Quality Management Plan*
 - 3.1: During Construction
Use air control measures set forth by the Sheet Metal and Air Conditioning National Contractors Association, protect stored on-site materials from moisture damage, permanently installed air handlers used during construction should use filtration media with a MERV rating of 8, and smoking must be prohibited within the building and 25 feet from building entrances once the project is enclosed.
 - 3.1: Before Occupancy
After construction and before occupancy, the building should be flushed using one of two prescribed paths. Or air testing can be done base on EPA standards to be sure that contaminant levels are not too high.




Sustainable Facilities – New

Indoor Environmental Quality:

- *Low-Emitting Materials*

A maximum of four points can be earned by meeting the requirements set forth by any of these low VOC emitting options.

 - 4.1: Adhesives and Sealants
 - 4.2: Paints and Coatings
 - 4.3: Flooring Systems
 - 4.4: Composite Wood and Agrifiber Products
 - 4.5: Furniture and Furnishings
 - 4.6: Ceiling and Wall Systems



Sustainable Facilities – New

Indoor Environmental Quality:

- *Credit 5: Indoor Chemical and Pollutant Source Control*

Use the following strategies to minimize the introduction of pollutants through the building entry.

- At doors, install permanent entry systems such as grates, grills, and slotted systems to catch dirt as people enter. Roll-out mats are acceptable when a service is contracted to clean them on a weekly basis.
- Provide sufficient exhaust to spaces where hazardous gases or chemicals are stored or used such as science labs, art rooms, copying and printing rooms, etc. (negative pressure)
- In mechanically ventilated buildings, regularly install new filtration media with a MERV value of 13 or higher for supply side.
- Provide containment for the disposal of hazardous liquid wastes.



Sustainable Facilities – New

Indoor Environmental Quality:

- *Controllability of Systems*

Provide occupants with high levels of individual control over thermal and lighting systems.

- 6.1: Lighting
In administrative offices, provide individual controls for 90% of occupants. Provide lighting system controls for all learning spaces and, in classrooms, provide a system that operates in both general illumination and A/V modes. (IBC Energy Code)
- 6.2: Thermal Comfort
50% of building occupants should have individual comfort controls in workspaces. Each multi-occupant space should also have it's own controls.






Sustainable Facilities – New

Indoor Environmental Quality:

- *Thermal Comfort*
 - 7.1: Design
Design HVAC systems and the building envelope to meet the requirements of ASHRAE Standard 55-2004.
 - 7.2: Verification
Conduct a thermal comfort survey of occupants 6 to 18 months after the building is complete. Develop a plan for corrective action based on the results.

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Sustainable Facilities – New

Indoor Environmental Quality:

- *Daylight and Views*
 - 8.1: Daylight
To achieve up to three points, the project must achieve daylighting in 75%-90% of classroom spaces. A third point is available by daylighting 75% of all the remaining spaces but only after 75% lighting has been achieved in the classrooms.
 - 8.2: Views
Provide a line of site to building occupants by placing glazing in 90% of regularly occupied areas. Glazing should be at a height between 30" and 7'-6" above the floor.

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Sustainable Facilities – New

Indoor Environmental Quality:

- *Credit 9: Enhanced Acoustical Performance*

Increase the acoustic performance over that prescribed in prerequisite 3.

- The building shell, classroom partitions and other core partitions should be designed to meet the Sound Transmission Class (STC) requirements of ANSI Standard S12.60-2002.
- HVAC system background noise should be reduced from 45dBA to 40dBA.



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Sustainable Facilities – New

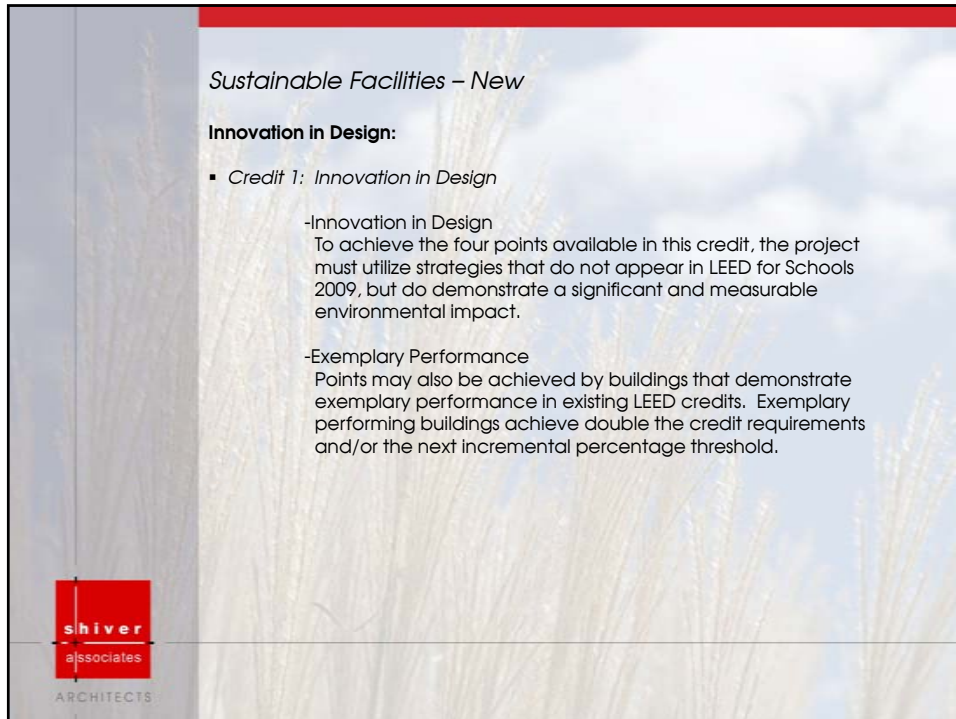
Indoor Environmental Quality:

- *Credit 10: Mold Prevention*

Before achieving this credit, the project must meet the criteria required for IEQ Credits 3.1, 7.1 and 7.2. Then the building must also provide HVAC systems designed to limit indoor humidity to 60%. The building owner must also implement an IAQ management program based on the EPA document, Building Air Quality: A Guide for Building Owners and Facility Managers.




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Sustainable Facilities – New

Innovation in Design:

- *Credit 1: Innovation in Design*
 - Innovation in Design
To achieve the four points available in this credit, the project must utilize strategies that do not appear in LEED for Schools 2009, but do demonstrate a significant and measurable environmental impact.
 - Exemplary Performance
Points may also be achieved by buildings that demonstrate exemplary performance in existing LEED credits. Exemplary performing buildings achieve double the credit requirements and/or the next incremental percentage threshold.


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Sustainable Facilities – New

Innovation in Design:

- *Credit 2: LEED Accredited Professional*

The project receives a point if at least one main participant of the project team has attained LEED accreditation.


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Sustainable Facilities – New

Innovation in Design:

- *Credit 3: The School as a Teaching Tool*

To achieve the point, a curriculum must be designed based on the sustainable features of the building and implemented within 10 months of LEED certification. It must meet local or state curriculum standards, be approved by administrators and provide 10 or more hours of classroom instruction per year, per full-time student.

- Use the building as a learning tool

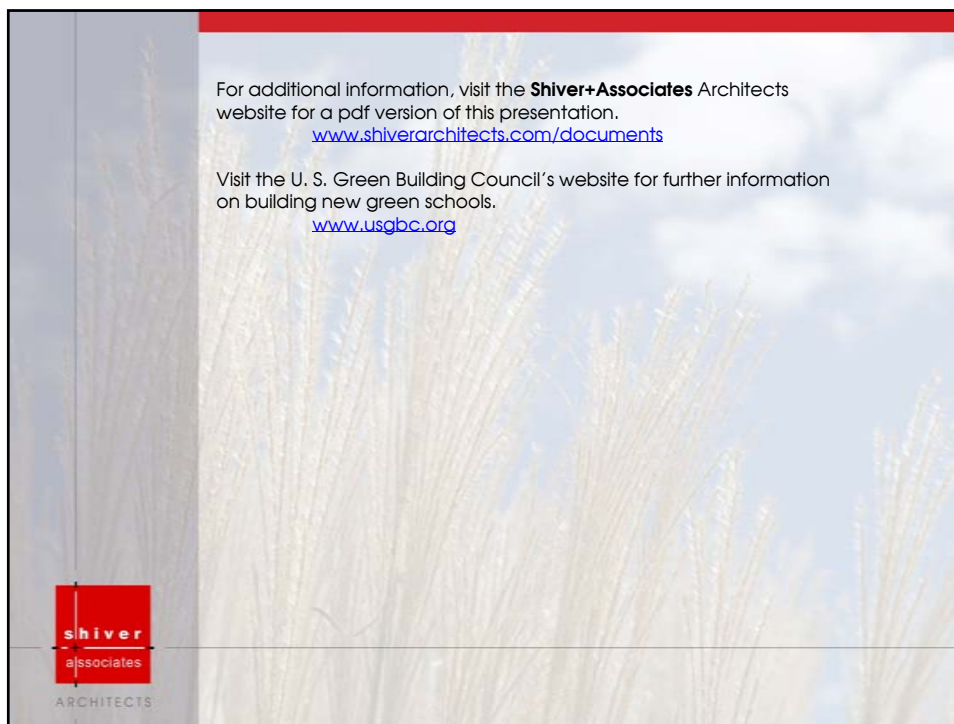


Sustainable Facilities – New

Regional Priority:

- The Regional Priority section consists of one credit that is worth up to four points. Points are gained by achieving one of the credits that the USGBC has rated as especially important in the project's region.
- Some of the Regional Priority credits for Central and East Texas include:
 - Sustainable Sites Credit 3: Brownfield Redevelopment
 - Sustainable Sites Credit 5.1: Site Development – Protect or Restore Habitat
 - Sustainable Sites Credit 6.1: Storm water Design – Quantity Control
 - Sustainable Sites Credit 6.2: Storm water Design – Quality Control
 - Water Efficiency Credit 2: Innovative Wastewater Technologies
 - Energy and Atmosphere Credit 2: On-Site Renewable Energy
 - Materials and Resources Credit 2: Construction Waste Management





For additional information, visit the **Shiver+Associates** Architects website for a pdf version of this presentation.
www.shiverarchitects.com/documents

Visit the U. S. Green Building Council's website for further information on building new green schools.
www.usgbc.org

