Policy Code: 9040 High Performance Building Design Criteria

The Board of Education supports the construction of school facilities that are designed to be cost-efficient, durable and sensitive to the environment. High Performance Schools (HPS) are designed to improve the learning environment while saving energy, materials and natural resources. These criteria can be met only when an integrated approach to design is used from concept introduction to building commissioning. The Board of Education takes its role as stewards of taxpayer funds seriously and supports efforts to design and construct schools that not only are cost efficient to build but will reduce operational expenses over the life-span of the building.

The Board of Education supports the definition of High Performance Schools provided above and will incorporate it during the design and construction phases of school development. In accordance with HPS standards, the Board desires that the following design characteristics and practices be incorporated into every school design and renovation project to the extent feasible, recognizing constraints associated with budgets, sites and other such factors.

- Develop in an Appropriate and Environmentally Sensitive Manner
- Reduce the Use of Water
- Provide High Efficiency HVAC and Lighting
- Use Materials That Conserve Raw Resources
- Promote Positive Indoor Air Quality
- Provide Balanced Temperature
- Design the School for Visual Comfort
- Limit Excessive Noise
- Provide Training for All Personnel
- Provide for Building Commissioning
- Design For Safety
- Encourage Community Use
- Provide Educationally Stimulating Architecture

In order to accomplish the desired outcomes, design standards established by the Leadership in Energy and Environmental Design (LEED) will be employed, recognizing constraints associated with budgets, sites and other such factors. The LEED rating systems will be implemented, to the maximum extent possible, in the planning, construction, renovation, maintenance, and operation of new and existing facilities.

Architects and contractors will provide at the bidding phase their experience related to LEED standards. Each architect and contractor employed by the Board of Education shall provide the Board with written documentation verifying their compliance with the LEED guidelines during the planning and construction phase of the building. For new school construction and major renovation projects, administration will recommend whether to apply for a specific LEED certification level. If, due to the issue of excessive costs or site issues, a guideline cannot be met, the architect or contractor must submit written justification to the Superintendent or designee as well as any alternative plans to reach the desired outcome. Architects and contractors are also required to meet the requirements of Policy 9010- Site Selection and Policy 9020-Facility Design.

Adopted: 3/21/02

Revised: 8/12/10

Regulations

Site

2.1 Erosion and Sediment control

- Design a system that controls and reduces the amount of erosion and runoff from the site
- Stockpile topsoil for later use
- Prevent sedimentation from entering sewers or stream

2.2 Site Selection

- Provide 100 foot buffers from any wetland area and 50 feet from any free flowing water streams
- Building can be sited no lower than 5 feet above the 100 year flood plain
- Avoid agricultural land as defined by the Farmland Trust
- Avoid land with extreme slopes or hill

2.5 Alternative Transportation

- Locate building within 1/2 mile of an existing or planned trail, greenway, bikeway or bus line
- Provide bike racks and storage for 10% of the building occupants if appropriate
- Provide preferred parking for carpools and alternative vehicles
- Provide easy bike and pedestrian access to the building site

2.6 Site Disturbance

- Preserve a minimum of 30% of the site in undeveloped space if possible without reducing programmatic features of the school
- Ensure that any cultural landmarks as identified by the state or local government remain undisturbed

2.7 Stormwater Management

- Implement a stormwater management plan that does not increase the rate or quantity of runoff from the site

2.8 Heat Islands

- Provide shade (within 5 years) on at least 30% of non-roof impervious surface on the site or use an open grid pavement system, with less than 50% impervious surface, for 50% of the parking area
- Use high reflectance and low emissivity roofing on 75% of the roof area

2.9 Light Pollution

- On school maintained and controlled land, design exterior lighting that the cutoff angle does not exceed 45%
- Design lighting to prevent reflection onto another property

Water

3.1 Water Efficient Landscaping

- Reduce potable water consumption used for landscape irrigation by 50% by using drip systems, well water or storm water runoff.
- Limit landscape irrigation and use drought resistant plants

3.2 Wastewater Technology

- Reduce municipally provided potable water for building sewage flow by using gray water or waterless fixtures

3.3 Water Use Reduction

- Reduce aggregate water use by a minimum of 20% than the base, not including irrigation, after meeting EPA 1992 fixture performance requirements. Smith Middle and Scroggs Elementary would provide baseline use data.

Energy and Atmosphere

4.1 Minimum Energy Performance

- Design building to meet ASHRAE/IESNA 90.1, state or local energy codes, whichever is more stringent

4.2 CFC Reduction

- Zero use of CFC-based refrigerants in HVAC systems
- Check for other CFC materials, products and systems and make sure that all are CFC-free

4.3 Optimal Energy Efficiency

- Increase energy performance by a minimum of 20% in new buildings and 10% in existing structures above those described in 4.1. as demonstrated by simulation using Energy Cost Budget Method described in section 11 of ASHRAE/IESNA 90.1

4.4 Renewable Energy

- During building design, consider the use of high temperature solar or geothermal assisted technologies to provide a portion of the total energy use of the building

Material and Resources

5.1 Storage and Collection of Recyclables

- Provide an easily accessible location that serves the entire building for the collection, separation and storage of recyclables

5.3 Construction Waste Management

- During the design process, develop a checklist that focuses on the reduction of construction waste from a design function
- Develop a waste management plan that includes a reuse area, recycling area for separation, and a lunch area that provides for recycling
- Recycle or salvage at least 75% of grading and clearing debris by weight
- Recycle or salvage at least 50% of construction and demolition debris by weight

5.4 Resource Reuse

- Specify salvaged or refurbished materials for a minimum of 2% of the building materials excluding furniture, fixtures and equipment

5.5 Recycled Content

- Specify that a minimum of 20% of building and site materials contain an aggregate average of 20% post-consumer content or 40% post industrial content

5.6 Local Materials

- Specify that a minimum of 20% of building and site materials are manufactured regionally within a 500 mile radius

5.9 Durable Materials

- Review materials used in the building for durability to ensure appropriate life cycle costs for roofs, HVAC, structure systems, finishes, furniture, fixtures and equipment

Indoor Environment

6.1 Minimum Indoor Air Quality

- Meet the minimum requirements of standard ASHRAE 62-1999, Ventilation for Acceptable Indoor Air Quality
- Explore installation of CO monitoring systems if called for

6.2 Tobacco Smoke Control

- All guidelines met

6.3 CO2 Monitoring

- Install a permanent CO2 monitoring system with a concentration towards high occupancy areas with parameters set at no more than 530 parts per million when compared to outside air or 1,000 parts per million for indoor air

6.4 Ventilation Effectiveness

- For mechanically ventilated buildings, design systems that result in air exchange effectiveness greater than 0.9 as determined by ASHRAE 129-1997
- In building renovations, continue the same exchange effectiveness

6.5 Construction IAQ Management

- During construction, meet SMACNA IAQ guidelines and protect stored on-site or installed absorptive materials from moisture damage
- Replace air filters regularly to maintain system cleanliness during construction and just before occupancy
- Flush the building with 100% filtered and conditioned air for a period of not less than 30 days prior to occupancy as schedule permits

6.6 Low-emitting Materials

- Meet or exceed VOC limits for adhesives, sealants, paints, carpets and composite wood products using the following guidelines

- South Coast Air Quality Management Rule #1168
- Bay Area Air Resources, Reg.8 Rule 51
- Green Seal requirements
- Carpet and Rug Institute Green Label program

6.7 Indoor Chemical and Pollutants

- Design to minimize cross contamination of regularly occupied areas by using grates and grills for dirt and particulate
- Separate outside exhausts so that no air recirculation occurs from custodial, laboratory or copying/printing rooms take place
- Provide appropriate drainage systems for liquid waste
- Implement and insure good housekeeping processes within the building

6.8 System Control

- Provide one operable window and one lighting control panel per 200 square feet for all occupied areas
- Provide controls for individual airflow, temperature and lighting for regularly occupied areas to teachers and staff within accepted parameters

6.9 Thermal Comfort

- Comply with ASHRAE Standard 55-1992, addenda 1995 for thermal comfort standards
- Provide permanent temperature and humidity monitoring to allow operators to control and adjust performance

6.10 Daylighting and Views

- Achieve a minimum Daylight Factor of 2% without creating cooling problems due to excessive glazing, in 75% of all space occupied for critical visual tasks excluding low occupancy support areas
- Achieve a direct line of sight to the exterior from 90% of all regularly occupied spaces

6.11 Contaminant Monitoring

- Explore installation of independent monitoring systems for ozone, radon, nitric oxide, sulfur dioxide or fungus and mold

6.12 Acoustic Quality

- Design and select materials that generate less noise and those that dampen noise during the construction process
- Reduce noise generating equipment so that the maximum decibel reading level at the property line is 50db
- Meet all local noise ordinances

Commissioning

A. Training

- Provide training to all employees about the systems that exits, these include the following:
  - HVAC systems
  - Lighting systems
  - Plumbing and water conservation systems
  - CO_2, temperature, and other monitoring systems
  - Passive or active solar, geo-thermal or bio mass systems
  - Irrigation systems
  - Control and management systems

B. Review

- Provide all stakeholders with review opportunities before occupancy of the building
- Provide all stakeholders with an opportunity to review the building after one year of occupancy
- Provide data concerning temperature, humidity and energy consumption to all stakeholders after 1 month, 6 months, 12 months and 24 months
- Require all stakeholders to use HPS features as designed or to report problems immediately to responsible authorities.

Each architect and contractor employed by the Board of Education shall provide the Board with written documentation verifying their compliance with the guidelines presented both during the planning and construction phase of the building. Architects and contractors will provide at the bidding phase their experience related to high performance school standards. If, due to the issue of excessive costs or site issues, a guideline cannot be met, the architect or contractor must submit written justification to the Superintendent or designee as well as any alternative plans to reach the desired outcome. Architects and contractors are also required to meet the requirements of Policy 9010- Site Selection and Policy 9020-Facility Design.