

**Modify subsection 01 81 13 Sustainable Design Requirements per the following (deletions are shown struck through and additions are double underlined). Remainder of section is unchanged.**

## **01 81 13 Sustainable Design Requirements**

### .01 Owner General Requirements and Design Intent

A. Design Intent: Apply integrated, holistic, sustainable design principles to achieve a high-performance facility that effectively balances environmental responsibility, resource efficiency, occupant comfort and well-being for new and renovated building projects.

The sustainable design principles shall:

1. Reduce environmental impact and the ecology of the site by considering building orientation, natural solar shading, incorporating renewable resource use and other innovative environmental impact reduction designs.
2. Ensure resource conservation when considering the use of land, water, materials & building in the most efficient & effective manner through the use of pre-used construction materials, use of construction materials made from recycled materials, the minimizing construction waste, measures for efficient water use and other cost effective resource conservation designs and activities.
3. Ensure the health & well-being of the building occupants & visitors through the use of low VOC materials (paint, cleaners etc.), efficient thermal envelope and integrated HVAC design to ensure thermal comfort, with fresh air to maintain indoor air quality and other indoor environmental enhancing designs.
4. Optimize energy efficiency through integrated systems building design, including but not limited to using the following:
  - a. High performance facility shell (thermal envelope) per 01 83 00 Facility Shell Performance Requirements
  - b. Passive heating/cooling
  - c. Higher efficiency equipment than minimum required by building code
  - d. Selecting equipment with adequate steps of capacity and achieving high part load system performance matched to building varying load profile
  - e. Energy reduction control strategies
  - f. Energy recovery
  - g. Maximizing the use of natural day lighting
  - h. Energy efficient electric lighting and automatic controls
  - i. On site renewable energy sources
  - j. Other innovative, cost-effective, energy conservation designs.

B. Advanced Energy Performance Target: All facilities shall achieve a minimum of at least 30% energy savings over the latest version of the ASHRAE 90.1 standard.

Documentation of compliance shall be by complying with either:

1. Prescriptive Methods of High Performance Building Design Guides and Standards developed to achieve that target, or
2. Performance Rating Method as prescribed in ASHRAE 90.1 utilizing a computer-based, whole building, hourly-basis, annual energy simulation.

C. High-Performance Design Standard: All building projects shall comply with the latest version of ASHRAE Standard 189.1 Standard for the Design of High-Performance Green Buildings.

1. This shall apply to:
  - a. New buildings and their systems
  - b. New additions and renewals of buildings and their systems
  - c. New systems and equipment in existing buildings, including Level 1, 2 and 3 Alterations, as defined in the International Existing Building Code, Chapter 4.
2. Any exceptions shall require approval by the OPP Project Manager, and exceptions by the OPP Project Manager shall require approval by one of the Associate Vice Presidents.

## .02 LEED Certification Requirements

- A. All new and renewed facilities shall be Leadership in Energy and Environmental Design (LEED) certified.
- B. LEED Certification shall follow the current version of the "PSU Policy based on LEED for New Construction and Major Renovations Version 2.2".
- ~~A. All facilities shall achieve a minimum of at least 30% energy savings over the latest version of the ASHRAE 90.1 standard. Documentation of compliance shall be according to the Energy Cost Budget Method as prescribed in ASHRAE 90.1 utilizing a whole building energy simulation.~~

**END of revision**

### **Update Commentary:**

Section was updated primarily for the following reasons:

- 1) *To further describe sustainable design objectives.*
- 2) *To revise language to allow prescriptive option (for smaller, lower budget projects) for obtaining energy optimization target of 30% better than ASHRAE 90.1.*
- 3) *To adopt ASHRAE Standard 189.1 as High Performance "Green" Standard for the University.*

*Note the following from ASHRAE Journal, June 2010*

[http://www.ashrae.org/docLib/20100622\\_AJGuidetoStandard1891.pdf](http://www.ashrae.org/docLib/20100622_AJGuidetoStandard1891.pdf) :

#### Summary

The intent of the energy efficiency section is to significantly reduce the energy consumption of new buildings through reductions in energy losses through the building envelope, increased efficiencies in mechanical systems, reduced lighting loads, and other energy saving measures. Standard 189.1 requires that buildings comply with Standard 90.1-2007 and then, in general, adds more stringent requirements. **Standard 189.1 requires that either on-site renewable energy is used as a prescriptive option, that renewable energy certificates are purchased (only allowed in some cases), or that the building complies with the performance option and uses additional energy-saving measures to make up the deficiency from not using on-site renewable energy.**

-- Page S28

#### Conclusions

Based on an initial analysis, Standard 189.1 yields significant energy savings over previous standards. **In a weighted average, savings are approximately 30% relative to Standard 90.1-2007, with roughly one-third of those savings attributable to renewable energy and two-thirds attributable to energy efficiency.**

--Page S32