



## A&E Sustainability Report – FY09

### 1) How have OSU Architectural & Engineering Services' construction and/or renovation projects included green building features?

*For example: adopting a green building policy, using LEED certification or incorporating green building design into new buildings, renovations, and retrofits of existing buildings.*

- a) Became member of the USGBC (U.S. Green Building Council)*
- b) Adopted Oklahoma HB3394, High Performance Green Buildings, as codified in Section 213 of Title 61, which requires:*
  - (1) Achieve the highest performance certification attainable when constructing or renovating public buildings, where the increased cost for high-performance certification can be recouped from decreased operation costs within five (5) years, including the time value of money (HB 3394).*
  - (2) The increased initial cost is limited to five percent (5%) of the total cost of design and construction.*
  - (3) The certification is per either the US Green Building Council's LEED design rating system (Leadership in Energy and Environmental Design) or Green Building Initiative's Green Globes rating system.*
  - (4) Meet ENERGY STAR designation from the United States Environmental Protection Agency.*
  - (5) Determine optimal performance level using life-cycle cost analysis.*
  - (6) Confirm performance through third-party post construction review and verification.*

- (7) Minor construction (< 5,000 s.f.) and small renovations shall, to the greatest extent possible, be consistent with the standards for high-performance certification.
- c) *Adopted Labs 21* guidelines for laboratory design.
- d) *Green Standards*: Have developed the following green building design standards (BDS) that all project architects are to incorporate into their design & construction work:
  - (1) BDS 15995, Commissioning (108 pages) which addresses mechanical, plumbing, electrical and building envelope commissioning, including associated checklists. This standard requires documentation to meet LEED Energy & Atmosphere (EA) Prerequisite 1, Fundamental Commissioning For New Construction and Major Revisions, and documentation to meet EA Credit 3; Enhanced Commissioning.
  - (2) BDS 18115, Building Energy & Environmental Standards (16 pages) which contain the requirements of HB3394 as well as an extensive list of green goals, standards and guidelines.
    - (a) All new buildings and major renovations (in excess of 5,000 g.s.f.) will be designed to exceed by a minimum of 20% for new construction and 10% for major renovations ANSI/ASHRAE/IESNA Standard 90.1 latest edition, Energy Standard for Buildings Except Low-Rise Residential Buildings.
  - (3) Other BDS sections (54 BDS) currently updating all building design standards to include LEED requirements (already include the basics such as low VOC, but will expand to include recyclability percentage requirement, bio-based products, manufacturer within 500 miles of site, green manufacturing, furniture, site accessories, etc.).
- e) *Integrated Sustainable Design Requirements into A&E Capital Projects Manual*. Manual lists project development procedures and requirements. Manual has been presented to all OSU System and A&M Colleges Fiscal Affairs Officers and Physical Plant Directors, and will be presented later this year (July) at the Board of Regents/College Presidents Study Session.

- f) *Sustainability Made an Evaluation Criterion:* Sustainable policy, procedures, practices, sustainable personnel (LEED and Green Advantage), experience, achievements were made an evaluation criterion in the selection of on-call consultants, architects, engineers, landscape architects, contractors and construction management at risk firms involved in design and construction of facilities managed by OSU A&E Services.
- g) *Sustainable/Green Presentation:* Developed a PowerPoint “Go Green” presentation of 53 slides to present the advantages and cost of sustainability, as well as numerous examples for presentation to our internal clients.
- h) *Building Systems Commission Presentation:* Developed a PowerPoint Building Systems Commissioning Presentation of 53 slides to present the advantages, procedures, and cost of building systems commissioning for presentation to our internal clients.
- i) *Building Envelope Commission Presentation:* Developed a PowerPoint Building Envelope Commissioning Presentation of 53 slides to present the advantages, procedures, and cost of building envelope commissioning for presentation to our internal clients.
- j) *Campus (OSU-Stillwater) Landscape Master Plan will be updated in FY10 (July 1, 2009 – June 30, 2010) and will address sustainable site, sustainable site accessories, outdoor environmental quality, shade trees and shrubbery adjacent to buildings for reduction of cooling loads, minimize turf areas and select native species and grasses, specify mulches for plantings to retain soil moisture, select drought tolerant plant species, use efficient irrigation systems that utilize technologies such as drip irrigation, moisture sensors and weather data-based controllers, match system to water use, incorporate gray water systems, utilize a subsoil drainage system to capture site and rain water and reuse for irrigation, other considerations.*

k) *Green Team Personnel: During the last year, A&E Services has achieved following green certifications and/or staff:*

- (1) 1 - LEED-AP (Accredited Professional) and have four (4) others who will take the LEED-AP examination later this fiscal year.
- (2) 2 - GreenAdvantage<sup>®</sup> certified construction project managers with one (1) other who will take the Green Advantage certification test later this fiscal year.
- (3) 2 – certified commissioning agents and have one (1) other that will take the Certified Commissioning Authority (CxA) examination later this fiscal year, as administered by AABC (Associated Air Balance Council). The one who takes the examination later this year will take the LEED option portion of the examination.
- (4) 2 – ICC/ICBO Plan Examiners currently studying to pass the ICBO plan examiner examination later this fiscal year, as administered by the International Code Council / International Conference of Building Officials.
- (5) 2 – ICC/ICBO Building Inspectors currently studying to pass the ICBO building inspector examination later this fiscal year, as administered by the International Code Council / International Conference of Building Officials.

l) *LEED/Sustainable Projects in design and/or construction:*

(1)



Ardmore Institute for Agricultural Biosciences Facility

- Possibility of being first LEED project in Oklahoma
- Includes construction waste material control and recycling for 50% of the waste
- (a) LEED-NC (Silver)
- (b) Construction Amount: \$12,760,000
- (c) Square Feet: 40,287
- (d) Construction Start: June 2009
- (e) Construction Completion: October 2010

(2)



OSU-Oklahoma City – Engineering  
Technology Building

- Geothermal with 10KW wind generator demonstration unit
- (a) LEED-NC (Silver)
- (b) Construction Amount: \$4,700,000
- (c) Square Feet: 24,713
- (d) Construction Start: January 2010
- (e) Construction Completion: January 2011

(3)



NEO (Northeastern Oklahoma A&M College)  
– Science Building Addition (stand-alone  
building)

- High efficiency boiler and chiller shared between two buildings
- (a) LEED-NC (Certified)
- (b) Construction Amount: \$3,200,000
- (c) Square Feet: 11,935
- (d) Construction Start: August 2009
- (e) Construction Completion: July 2010

(4)



NEO (Northeastern Oklahoma A&M College)  
– Cunningham Hall Renovation

- High efficiency boiler and chiller shared between two buildings
- (a) LEED-EB (Certified)
- (b) Construction Amount: \$2,000,000
- (c) Square Feet: 23,184
- (d) Construction Start: May 2010
- (e) Construction Completion: March 2011

(5)



OSU-Okmulgee – Rural Health & Technology Center

- Ground-source heat pumps and geothermal wells for whole building heating and cooling
- Natural lighting supplemented by high-efficient fixtures to over 75% of rooms
- (a) Not a LEED building
- (b) Construction Amount: \$5,600,000
- (c) Square Feet: 21,985
- (d) Construction Start: April 2008
- (e) Construction Completion: July 2009

(6)



OSU-Stillwater – Interdisciplinary Science & Research Building

- 75% of furniture to be sustainable (cradle-to-cradle certified, 45% recycle content, bio-based components, sustainable manufacturer)
- (a) Not a LEED certified building
- (b) Construction Amount: \$70,000,000
- (c) Square Feet: 124,000
- (d) Construction Start: July 2007
- (e) Construction Completion: Fall 2010

(7)



## OSU-System & A&M Colleges

– Small new construction and renovation projects (>\$158,000 and/or >5,000 sf) managed by A&E Services meet the intent of HB3394 (refer to b above), using BDS 18115, Building Energy & Environmental Standards, as a guide/checklist (refer to 1d above).

### **2) In what ways has OSU Architectural & Engineering Services encouraged the use of alternative forms of transportation?**

*For example: coordinating a bicycle-sharing program, incorporating planning decisions that support a pedestrian-friendly or bike-friendly campus.*

- a) *All LEED Projects* coordinated by A&E Services (refer to 1l above) incorporate alternative fuel vehicle parking for a minimum of 3% of the building occupants.
- b) *All LEED Projects* coordinated by A&E Services (refer to 1l above) incorporate fixed mountings for securing bicycles for more than 5% of the building occupants.
- c) *All Projects* coordinated by A&E Services incorporate the “wheel & spoke” concept of an Inner Loop providing circulation around the exterior of the center core of buildings and an outer Loop providing circulation around the campus. The building being designed incorporates pedestrian-friendly sidewalk and bicycle circulation “spokes” that connect to the Inner and Outer loop.
- d) *Update to the OSU-Stillwater Campus Master Plan* (as mentioned in 1j) will incorporate planning decisions that support a pedestrian-friendly and bike-friendly campus.

**3) What steps has OSU Architectural and Engineering Services taken steps to improve energy efficiency and/or obtain energy from renewable sources?**

*For example: conducting a carbon emissions inventory, committing to a reduction in greenhouse gas emissions investing in energy-efficient appliances, developing an energy conservation program, installing on-site wind or solar facilities or making other renewable energy investments.*

- a) All building projects designed or managed by A&E Services incorporate Energy Star appliances.*
- b) All building projects designed or managed by A&E Services are required to exceed the ASHRAE energy standard for new construction by at least 20 percent and by at least 10 percent for major renovations.*
- c) When made available by EPA for higher education facilities, all new facilities and major renovations shall meet ENERGY STAR designation from the United States Environmental Protection Agency.*
- d) Building team required to achieve the highest energy efficiency and lowest energy consumption, lifecycle costing will justify, as determined by the Design team.*
- e) Building team required to incorporate the most energy-efficient materials, products, equipment and systems consistent with program and budget.*
- f) Building team required to incorporate renewable energy technologies at the earliest possible stages of design, whenever they are technically and economically feasible, as determined by the Design team.*
  - (1) OSU-Okmulgee – Rural Health & Technology Center (refer to 15) incorporates ground-source heat pumps and geothermal wells for whole building heating and cooling.*
  - (2) OSU-Oklahoma City – Engineering Technology Building (refer to 12) will incorporate ground source heat pumps with a geothermal field for total building heating and cooling, and a 10KW wind generator demonstration unit whose power output will be utilized to carry part of the building’s electrical load.*

- (3) *OSU-Stillwater central campus new construction (North Classroom Building, Architecture Building Renovation & Additions, Interdisciplinary Science Research Building, Old Central Renovation, Murray Hall Renovation, and Oklahoma Animal Diagnostic & Disease Laboratory Addition) are all tied into the campus steam and chilled water system for total heating and cooling.*
- g) Building team required to use energy sources with low environmental impact.*
- h) Building team required to consider the project's impact on the utility infrastructure of the existing building and institution.*
- i) Building team required to utilize an integrated design approach with all disciplines working together starting from conceptual design, to evaluate the energy performance of architectural design concepts (e.g.: orientation, massing, fenestration, treatment of façade, materials, insulation), mechanical and electrical design criteria and Section 18115 concepts to produce high performance buildings with low first costs and operating costs.*
- j) The OSU-Stillwater Centralized Campus Wide Energy Management System (EMS), a T.A.C. Niagara I/A system as managed by OSU Physical Plant Building Systems Group (BSG), monitors, controls space elements, and measures <number> building systems on the OSU-Stillwater campus. BSG has personnel monitoring and adjusting the various building systems <hours> per day.*

**4) Describe how OSU Architectural & Engineering Services encourages recycling and composting programs.**

*For example: materials recycled and composted, current waste diversion rate (the percentage of recyclable and/or compostable waste diverted from traditional disposal).*

- a) At the Ardmore Institute for Agricultural Biosciences Facility (refer to 1j above) the initial goal for the construction waste stream is that 30-40 percent will be sent to municipal landfills, 35-45 percent will be sent to specialty C&D (Construction & Demolition) landfills where further processing may occur, and 20 to 30 percent of C&D debris will be recycled. A waste management firm specializing in recycling will be responsible for recording and tracking the construction waste stream, with some initial separation of the construction waste stream being made at the construction site.*