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**Arizona State University
Tempe, Arizona
Spring 2008, Building Design**

BACKGROUND

Hassayampa Academic Village (HAV) is a coed freshman community at Arizona State University (ASU) that provides double-occupancy accommodations with suite-style bathrooms. Amenities include: 24-hour campus security and front desk services, tutoring center, academic advising, laundry facilities, vending machines, wireless zones, study lounges, air conditioning, and Ethernet ports for each student.

Campus Profile

ASU is a four-year, public university that is creating a new model for American higher education through an unprecedented combination of academic excellence, entrepreneurial energy and broad access. Comprising four differentiated campuses, this New American University is a single, unified institution that positively impacts the economic, social, cultural and environmental health of the communities it serves. ASU research is inspired by real-world application and blurs the boundaries that traditionally separate academic disciplines. The distinguished faculty includes recipients of prestigious academic and professional honors, including the Nobel Prize and membership in the National Academies. As a result of its dedication to excellence in research, ASU was named to Research Extensive (formerly Research I) status in 1994, recognizing the university as a premier research institution. ASU serves more than 64,000 students in metropolitan Phoenix, Arizona, the nation's fifth largest city. The university champions intellectual and cultural diversity, and welcomes students from all fifty states and more than one hundred nations across the globe.

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GOALS AND ACCOMPLISHMENTS

Goals

The goal for this project was to create community, collegiality, connectivity and contemporary creativity for a Leadership in Energy and Environmental Design (LEED) certified project. The project targets for the future are:

- To meet its budget and schedule for completion, and to achieve LEED Certification.
- To confirm that the buildings and engineered systems perform as anticipated.

Accomplishments

- Currently submitting HAV for LEED review in anticipation of the project achieving Silver rating.

- HAV was completed under budget and ahead of schedule, and we were therefore able to add in additional amenities to the project.
- ASU Facilities Management has established new policies governing cleaning-chemical standards, which require the use of sustainable and green products along with working on a comprehensive recycling program.

Challenges and Responses

One of the challenges included the scale of the project (550,000 square feet, 1920 beds, two phases on a fast-track schedule). Due to the size and the duration of the project (four years), the team had to be flexible in managing change. In four years, technology and products change, team members may change and goals may change, creating challenges that can impact a project's outcome.

We responded to these challenges with a strong team vision and collaborative attitude. In focusing on problem solving for the "best interest of the project" and meeting project goals, we were able to be flexible, accept change, and adapt to the evolving needs of the project. This allowed us to continue to maintain the sustainable and contemporary stature of the buildings. Overall, this very successful project was the result of a clear team vision that included the university, design team and the contractor.

ENGAGEMENT AND SUPPORT

Leaders and Supporters

The HAV leaders and supporters are: ASU Residential Life, ASU Student Affairs, ASU Student Council (presented requests regarding food-service area) and ASU Capital Planning and Facilities Management.

Funding and Resources

The total project cost was \$88.9 million. The choice of materials and the construction processes used on site allowed for over 50 percent of the construction waste material to be diverted from landfills and directed to local recycling facilities. Ten percent of the building materials used recycled content, including fly ash in the concrete and selected interior finish materials. Twenty percent of the building materials were manufactured locally, and 75 percent of those materials were harvested locally. Locally manufactured items included precast concrete planks (manufactured 14 miles from HAV), gypsum board (manufactured 272 miles from HAV), and casework and cabinetry (manufactured 112 miles from HAV). The total cost of regionally manufactured products as a percentage of the cost of all materials was approximately 21 percent.

Community Outreach and Education

HAV promotes higher density urban development to conserve land and reduce the need for automobiles. The project also encourages use of alternative methods of transportation onto campus.

The HAV project was featured in the 2007 International Conference tour of the Association of College and University Housing Officers. It was also featured in a local publication, *Talking Stick*.

Campus Climate Action: Your School's Carbon Footprint

Listed below are many of the HAV design and construction activities that reduced carbon dioxide emissions and provided sustainable building practices.

Sustainable sites: HAV employs a white, Energy Star-labeled acrylic elastomeric coating over the roof area of the project. This measure increases energy efficiency of the building and limits the project's contribution to the heat island effect generated in part by building roofs. LEED standards call for using Energy Star-compliant (highly reflective) and high-emissivity roofing for a minimum of 75 percent of the

roof surface. HAV exceeds this benchmark by employing such roofing for over 99 percent of the building roof area. On the ground surface, the paved portion of the site is 15 percent asphalt and 85 percent concrete. This light-colored concrete pavement is a very high-albedo material with a reflectance of at least 0.3 and helps limit the heat island effect from this project.

Water efficiency: The site design includes reduction in water used for irrigation by 50 percent by using indigenous desert landscaping as the predominate material. A number of strategies were employed to achieve this minimized water usage at HAV. First, substantial areas of the site were not planted at all, but treated in xeriscape fashion of decomposed granite and other inert mulches that require no water. All new plants are native species or well adapted to the desert region's climate; once established they require little water to survive and thrive. A multi-valve, automatically controlled drip irrigation system was designed for use with these plants with the goal of limiting water use in accordance with ASU standards. All measures help limit water use to a fraction of that applied to conventionally landscaped sites. Water efficiency is further enhanced by reducing the building water usage by 40 percent through the use of domestic water, low-flow shower heads, toilets and faucets. This realizes significant savings given that there are over 480 residential showers and toilets and 960 residential sinks in the building suites. These savings allows the project to request an Innovation Point for substantially exceeding the 30 percent threshold requirement for general water efficiency LEED credits.

Energy and atmosphere: Energy simulation data demonstrate a 25 percent savings through the use of occupancy sensors in public spaces, window shades and reduced wattage criteria for lighting as a result of the abundance of natural lighting throughout the village. In addition, all of the washing machines purchased for residential laundry rooms are Energy Star rated, using 40 percent less energy than standard non-Energy Star machines.

Indoor environmental quality: Interior finishes used in the residence hall were selected to be no or low volatile organic compound (VOC) emitting materials, including carpets, paints and adhesives. This is an important design element in improving indoor air quality inside buildings, especially for residence halls where occupants spend a significant amount of their time. In addition, indoor chemical and pollutant sources are controlled by providing direct exhaust ventilation from the janitor closets to the exterior, and there are floor-to-ceiling wall partitions around all rooms with chemical use, so the air from these rooms does not mix with the air in general areas. Each residential suite has approximately 36 square feet of glass or 28 percent of the exterior wall and curtain wall in public spaces yielding 75 percent of the spaces with daylight and 90 percent of the spaces with outdoor views.

CLOSING COMMENT

We hope this project is an inspiration for other university officials and students to continue planning and performing sustainable projects within their campus environments.