



CASE STUDY

Government

Facility at a glance

Name

Arizona Department of Administration and Department of Environmental Quality facilities

Location

Phoenix, AZ USA

Facility size

2 Mid-rise office buildings

Issue

Conserve energy and use resources wisely to meet LEED standards

Solution

20 Daikin Self-Contained units providing high efficiency HVAC comfort

Arizona Department of Environmental Quality

Daikin Self-Contained Air Conditioning Systems Help Two Buildings Owned by the State of Arizona Achieve LEED® Certification and Significantly Reduce Energy Costs

Green buildings save green in Arizona

In Phoenix, Arizona, where the temperatures can soar well above 110°F in the summer, the state government is always looking for ways to conserve energy and use resources more wisely. Since research shows that new commercial construction can achieve dramatic energy savings using an integrated design approach and carefully implemented energy-performance strategies, the State of Arizona adopted LEED (Leadership in Energy and Environmental Design) guidelines for their new buildings. LEED provides a framework for assessing building performance and meeting goals for sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality.

When two new state buildings were up for bid – the Arizona Department of Administration (ADOA) and the Department of Environmental Quality (ADEQ) – recent State mandates required that the buildings be designed to take advantage of all energy saving initiatives consistent with LEED certification. Opus West, a member of the Opus Group – a national, award-winning full service architectural and engineering firm submitted the winning designs for the buildings. To comply with the State of Arizona's energy conservation goals, Opus West utilized a number of energy conservation methods such as high performance glazing to lower energy consumption. For heating, ventilating and air conditioning, the building design relied on floor-by-floor vertical self-contained units.



Arizona Department of Administration

Daikin representatives, Climatec, and Rick Sturm, President of Cornerstone Engineering, the mechanical design engineers for the project, felt that they had the ideal solution for the State of Arizona using Daikin SWP Self-Contained Air Conditioning Units.



The Daikin SWP units offered tremendous design flexibility – with 75 pre-engineered compressor and coil combinations, air and waterside economizer capability and variable frequency drive fan control – versus other self-contained systems being considered for the project. Using a waterside economizer to precondition outside air with cooling tower water, Daikin was able to mix and match coil sizes, rows, fans and compressors to more closely match the load of the overall system.

This design flexibility resulted in the Daikin units offering an energy use rating that measured below 0.7 KW/ ton. While the equipment cost of the Daikin self-contained units was higher, Arizona law requires that all energy saving components or designs to be evaluated. If the payback for the additional cost is eight years or less, then the component or design change has to be made. After reviewing all submittal data, Sturm was able to demonstrate to Opus West and the State of Arizona that the added cost of the Daikin units was paid back in 27 months of operation. In addition, the high efficiency of the Daikin units helped both buildings achieve LEED certification.

But energy efficiency is only part of earning LEED certification. Indoor Air Quality (IAQ) also plays an important role and the Daikin self-contained units offer outstanding IAQ. With a stainless steel, sloped IAQ drain pan, double wall construction, filtration flexibility and dehumidification control, the Daikin self-contained units help discourage microbial growth and airborne particles.

The unique design of the Daikin unit also solved other problems. The Daikin SWP offers a flexible fan rotation to match the duct configuration and minimize the required fan motor horsepower. Along with the unit's smooth discharge design, this reduces the duct borne noise levels. The unit cabinet is constructed of heavy gage steel, which significantly reduces radiated noise levels making it easier to achieve sound levels of NC 35 in the office environment.

In addition, the units are easy to service and maintain. Daikin self-contained systems have a frame and panel design that provides easy access to all system components. Coupled with Daikin's MicroTech® II unit controllers and their Protocol Selectability™ feature, the units provide easy BAS integration and quick access to system diagnostics.

The Daikin Self-contained units come fully assembled and factory tested. They provide lower system first cost by eliminating expensive chiller water piping; they also take up less space than centralized systems. The contractor spends less time installing the equipment, which saves on labor costs.

The State of Arizona has been very pleased with the performance of the Daikin Self-contained units and their ability to save the state some green while operating green. The original order for 8 Daikin SWP070s for the Arizona Department of Administration Building quickly turned into an order for 12 more Daikin SWP 070s for the Arizona Department of Environmental Quality Building.