Environmental Summary

SUSTAINABLE SITE
During construction, several measures were taken to ensure minimal construction impact on the community. A perimeter silt fence and stabilized construction entry were installed to prevent erosion on site and sedimentation of waterways to the surrounding sites. Storm drains and drywells also have protected inlets. All construction workers were trained in dust control measures.

Community Connectivity was achieved when the City selected a site that was surrounded by a wide variety of commercial, service and residential uses including one main Post Office.

Alternative transportation is aided by providing bicycle racks with changing areas and showers for staff, providing separate parking for low emitting and a fuel-efficient vehicle, providing carpool parking and by limiting parking to the smallest number of spaces that will keep the building available to the public. Spaces can be provided in the future for recharging electric vehicles. The surviving plants were salvaged, and new planting was selected from native and dry climate plants with form and surface texture approximating the original natural setting.

Nearly 57% of the site is restored to native and adapted planting. No mowing or fertilization is required. By meeting the 20% landscaped area requirement, as well as exceeding local open area requirements by 25%, the plan has become a model in the midst of less indigenous development. Much of the open area is in the storm water detention area that helps prevent flooding in the neighborhoods. A combination of allowable materials and cost did not permit obtaining the heat island credit. However, the light colored roofing did lead to that heat island credit in the structure.

Arizona set early standards for reducing light pollution with the Kirti Pkm Ordinance. Further implementation by the City of Scottsdale prevents light pollution to adjacent properties, so credit in this area resulted from pre-LEED standards.

WATER EFFICIENCY
After an initial adaptation period, water to landscape will be removed. There will be no lawn, broad leaf trees or other plants that were once imported to the area. Water from the roof is channeled into arroyos where planting is more intensive. Additional water savings were achieved within the building through future selection for a total 53% water consumption reduction.

ENERGY AND ATMOSPHERE
All systems in the building will undergo enhanced commissioning to assure the City that its new building works as designed. This includes testing of systems, creation of manuals and training of building system operators. The mechanical system design was compared with baseline testing of systems, creation of manuals and training of building system operators. This is closely linked to extensive daylighting of all regularly occupied areas. Air quality control starts before occupancy, when a “blue blow” lasting several days uses 14,000 cubic feet of air per square foot of building to clear out all existing smoke, fumes, off-gassing and contaminants; airflow is then controlled for the following month. This is effective because no ventilation is required due to a large window area, particle board, plywood, sealants, paints, coatings and carpets. The carpet was even made in a certified low-polluting factory. Return air vents and door closing through friction caused by cleaning products out of the air in occupied rooms. Air quality is then maintained by high-level filters.

A regular cleaning program contract by the City maintains the entry mat, which stops dirt at the door. Temperatures can also be adjusted in certain areas for individual comfort.

Lighting and energy systems are computer controlled and occupancy sensors turn off lights when rooms are unoccupied. Dimming controls also increase room flexibility. Changes in refrigerants for air conditioning systems have made all cooling products available that have less effect on the ozone level. The air handling system uses a “fan wall” for greater efficiency and less down time if a single fan fails unit. Walls are insulated to R-19 and roofs to R-30. The windows are dual pane with low-E coating and are turquoise in color to block infrared heat (a 50% reduction in solar heat capture). The systems are designed to help reduce peak electrical loads by providing 25% of maximum power consumption. The system is mounted on the staff area roof but is not visible from most neighboring locations.

MATERIALS AND RESOURCES
Building design includes locating and selecting recyclable materials to minimize garbage that needs to be transported to landfills. This is a library district policy.

Additionally, an astounding 95% of all construction materials have been recycled. Construction had progressed for several months before the garbage container was dumped for the first time.

The recycled content of materials reached 26%, and regional materials accounted for well over 26% of all products certified Wood for 56% of wood usage. Products also meet low emission standards. At the close of construction, the contractor will provide the actual totals for the project.

Some examples include: 60% use of recycled steel; 60% of counter tops (Paperstone) are recycled; 90% of cabinet material in the cafe (Kiri Board) is recycled; 70% of restroom counter tops are recycled glass; 75% of the aluminum in the curtain wall is recycled; and 94% of the material in the tire stops is recycled along with 100% of the gravel before parking surfaces.

INDOOR ENVIRONMENTAL QUALITY
Indoor air quality improvements start by meeting accepted standards, and improves from there. This is an issue in a hot climate where increased ventilation requires additional cooling. Several methods led to the clean air an Appaloosa Library.

First was to not allow smoking anywhere in the building. By monitoring both the carbon dioxide level in various rooms and the quality of outside air, the air can be provided to maintain comfort without overheating and losing energy. An economist function also allows air to be passed directly into the building without heating or cooling under certain conditions. A special louvre allows this to be controlled automatically.

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ENVIRONMENTAL FACTORS IN THE DESIGN OF APPALOOSA BRANCH LIBRARY

Energy is one of the biggest costs of one’s daily life. According to the LEED program, the USGBC organization has developed a rating system for buildings that tries to make buildings more energy efficient and environmentally friendly. Appaloosa Branch Library was designed with an initial agreement between DWL Architects + Planners, DSA Architects and the Scottsdale Library Staff to create a building that was not only functional but would be the most appropriate regional and microclimatic aspects of this North Scottsdale site.

With a renewed national interest in the environment, and Scottsdale’s commitment to the LEED program, it was assumed that an environmental statement should go beyond current design trends, must be understandable by the neighbors and, of course, had to still meet the budget. The design team took the position of first analyzing all aspects of the site design to optimize orientation and access and then developed conceptual designs. The LEED program was applied later to review and then enhance initial applications. This resulted in a building that uses 31% less energy and 53% less water than a conventional library.

The original budget projected a building area of 20,000 square feet, but the architects and construction manager were able to create a 21,242 square feet of building on four and a half acres of site while sharing within the budget. The space includes usable outdoor spaces.

The site has a complex with a 4-foot elevation change that is potentially subject to flooding either in the previous arroyo alignment or as sheet flow—a conformal layer of water rushing down the dikes following the contour at a relatively even depth. The design result was location of the building on the high portion of the site with a protective berm at the west end, while the east end was raised above the arroyos to the north and south. To make that work, a bridge was created to provide a dramatic crossing over the arroyo as an entry experience. The perforated deck allows visitors to see the arroyo below and introduces sound that adds interest during the passage into the building. A screen was added to the west side of the bridge where native vines provide sun shading. Meanwhile, after a storm, water shoots from large scuppers at the west end of the building and lands on rock clusters to break the impact before flowing into an arroyo. Once the ground was excavated, it was determined that the existing natural clusters were ideal in the foundation area. This is a very common situation. As the environmental factors and functional components were simultaneously resolved, we developed the notion of the building as a mirage.
DWL & Greenbuild ‘09
WE JOINED THE GREENBUILD ‘09 CONFERENCE AS AN EXHIBITOR TO SHARE SOME OF THE LESSONS AND EXPERIENCES WE HAVE ENCOUNTERED THROUGH WORKING ON APPALOOSA BRANCH LIBRARY.

POTENTIAL LEED CERTIFICATION: LEED NC 2.2 – GOLD (42 POINTS ATTEMPTED)