SACRAMENTO County

New Animal Care Facility

LEED Elements

Construction Activity Pollution Prevention

We reduced pollution from construction activities by controlling soil erosion, waterway sedimentation, and airborne dust generation by creating an Erosion and Sedimentation Control Plan. The project implemented vegetative biofilters, temporary seeding and mulching, earth dikes, silt fencing, sediment traps, and sediment basins during construction. In addition, no maintenance of vehicles was permitted on site, and all construction vehicles were required to wash their tires when entering and exiting the site.

Site Selection

Before planning began, we chose a site with no sensitive environmental elements. The project was not developed on land that was specifically identified as habitat for any species on Federal or State threatened endangered lists. The project site was selected to find a suitable building location to minimize the building's environmental impact.

Bicycle Storage and Changing Rooms

To reduce pollution and land development impacts from automobile use, we designed the building with bicycle racks. We also installed a shower as a convenience for those who want to bike to work or go for a run at lunchtime. These strategies reduce parking needs and encourage occupants to use alternative forms of transportation.

Low-Emitting and Fuel-Efficient Vehicles

So that we could help to reduce pollution and land development impacts from automobile use, we provided preferred parking close to the building entrance for low-emitting and zero-emission vehicles.

Parking Capacity

In order to reduce pollution and land development impacts from single-occupancy vehicle use and to reward eco-friendly modes of transportation, we carefully controlled the parking lot size and provided carpool spots for staff.

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Protect and Restore Habitat

To conserve existing natural areas and restore damaged areas, we limited our plantings to native or adapted plants. Also, we carefully sited the building to minimize disruption. Over 50% of the site area (excluding the building footprint) was protected with native or adapted vegetation. Native/adapted plants are plants indigenous to a locality or cultivars of native plants that are adapted to the local climate and are not considered invasive species or noxious weeds.

Maximized Open Space

We were committed to providing a high ratio of open space to development footprint to promote biodiversity, and dedicated over 20% of our site to native plantings and pedestrian areas for the community to enjoy.

Stormwater Design – Quality Control

By treating stormwater runoff on site, the building reduces the amount of stormwater that goes directly to our streams, rivers, lakes and oceans thus lessening the amount of contaminants that reach our waterways.

Heat Island Effect

Asphalt and other dark-colored surface materials absorb and re-radiate heat, causing urban areas to often be hotter than rural areas on any given day; this is called the “Heat Island Effect.” Sacramento Animal Shelter has mitigated the heat island effect by choosing light-colored and reflective surface materials for the roof and site hardscape. Specifically, the light-colored concrete used in the hardscape has a solar reflectance index value greater than 29, while the ‘cool roof’ has a solar reflectance index value greater than 78.

Water Efficient Landscaping

Sacramento Animal Shelter has taken numerous approaches to reducing its water usage. Efficient irrigation systems and drought tolerant plants combine to successfully reduce the site’s irrigation needs by 50%. A soil/climate analysis was conducted to determine appropriate plant material and to design the landscape with native or adapted plants to reduce irrigation requirements. A large percentage of the landscaped area is planted with a native fescue grass mix. Once the fescue is established the irrigation system will be taken out of operation unless needed for reseeding. Subsurface drip irrigation is used in all of the interior planter areas where drainage and watering is confined to small areas.

Also, a three inch layer of mulch is specified for all planter areas. Mulch reduces evaporation, which decreased the amount of irrigation needed for the site, especially during the hot season.

Indoor Water Use Reduction

Stopping wasteful water use is one of the easiest steps we can take to ensure there will be adequate water to meet everyone's needs. At Sacramento Animal Shelter, we cut our indoor water use by over 40 percent compared to a conventional building by installing low-flush toilets, low-flow urinals and low-flow faucets. A dual-flush toilet uses 67 percent less water than a traditional single-flush toilet. Choosing more efficient fixtures is an example of a simple environmentally-sound choice all buildings can easily make, be they new construction or renovations.

Fundamental Commissioning

In order to verify that the building's energy-related systems are installed, calibrated, and perform efficiently, Sacramento Animal Shelter has undergone a "commissioning" process. This means that the design of the HVAC and lighting systems, as well as the daily operations of the systems have been reviewed by a third party energy commissioner to ensure that all HVAC systems maximize their potential. Commissioning reduces energy costs, maintenance costs, and occupant discomfort. The cost of commissioning is recovered in less than 5 years on average based on energy savings alone. In fact, studies have found that commissioning resulted in energy savings of $0.02 - $0.19 per square foot, and $0.23 - $6.96/sf in reduced maintenance and operations costs.

Minimum Energy Performance

Although most commercial buildings are content to follow the simplest energy baseline requirements, Sacramento Animal Shelter's energy performance was analyzed in a custom computer model which took modern energy-saving technologies into account.

Fundamental Refrigerant Management

This project's mechanical design prohibits the use of chlorofluorocarbon (CFC) refrigerants, which have been implicated in ozone depletion and contribute to global warming.

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Optimized Energy Performance

Sacramento Animal Shelter is designed to use 21% less energy than California's energy code (Title 24) which sets the required minimum energy efficiency for buildings.

Enhanced Commissioning

Building commissioning is a quality-assurance process that verifies that a completed building's systems (lighting, plumbing, heating and cooling) were installed and are performing as intended. Although LEED requires basic commissioning, we went further and followed advanced commissioning practices to ensure that we were getting the exact systems, equipment and performance we specified.

Enhanced Refrigerant Management

In order to reduce ozone depletion and position Sacramento Animal Shelter as an early adopter of the requirements of the Montreal Protocol, we chose all air conditioning refrigerants to minimize both ozone depletion and global warming impact. Specifically, the refrigerants used in this project have relatively low global warming potential and are free of both Chlorofluorocarbons (CFCs) and Hydrochlorofluorocarbons (HCFCs), both of which contribute to ozone depletion.

Green Power

We're offsetting the carbon dioxide emissions associated with our energy use by purchasing green power certificates that support local renewable energy projects. This helps fund the installation of renewable energy generation across California. including photovoltaic arrays and wind turbines. Thanks to the green power certificates, Sacramento Animal Shelter is able to source 35% of its electricity from off-site renewable sources.

Storage and Collection of Recyclables

Sacramento Animal Shelter is committed to implementing a comprehensive recycling program. The building provides collection and storage areas including clearly marked recycling stations for all recyclable materials such as plastics, metals, paper, cardboard and glass. This separated recycling is then moved to an outdoor trash enclosure area for recycling pick-up.

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New Animal Care Facility

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Construction Waste Management

Overall, more than 75% of waste material from construction of Sacramento Animal Shelter was diverted from the landfill and redirected back to the manufacturing process. Recycled waste material included wood, cardboard, drywall, stucco, and metal. Additionally, all asphalt from the demolished parking lot on site was ground up and used as base for a new parking lot for the project.

Recycled Content

Over 10% of materials used for the project contain pre and post consumer recycled content, further minimizing our impact on landfills by giving a second wind to previously used materials. The project team established a project goal for recycled content materials and identified material suppliers that could help the project team achieve this goal. Choosing recycled content products helps increase demand for building products that incorporate recycled content materials, thereby reducing impacts resulting from extraction and processing of virgin materials.

Regional Materials

Over 10% of materials used in the project, including concrete, gypsum board, wood paneling and trim, were extracted and manufactured within 500 miles of the site, either in California, southern Oregon, or western Nevada. Sourcing regional materials shortens the distance materials travel, thus minimizing the cost of transport and reducing the overall environmental impact.

Minimum IAQ Performance

To enhance the indoor air quality at Sacramento Animal Shelter, we designed the ventilation systems to meet or exceed the outdoor air ventilation rates set by the science of the American Society of Heating, Refrigeration, and Air Conditioning Engineers.

Environmental Tobacco Smoke Control

Since minimizing the exposure of building occupants to tobacco smoke is a priority, smoking is prohibited at Sacramento Animal Shelter, including within 25 feet of all openings and entrances.

SACRAMENTO County

New Animal Care Facility

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Increased Ventilation

Sacramento Animal Shelter's occupants will enjoy superior indoor air quality thanks to increased ventilation – 30% more fresh air is brought into the building than in conventional ventilation systems. The building uses high performance filters that filter out more particles in the air than typical filters, as well as low velocity air systems that monitor air-flow quietly, further contributing to the comfort of occupants. The HVAC system also incorporates carbon dioxide sensors throughout the building. When the number of people in the building increases, the sensors react to the higher CO2 levels and signal the HVAC system to supply additional fresh air.

Construction IAQ Management

Our contractors took care to protect air quality throughout the construction process by using filters and coverings to protect ducts from collecting dust and mold. And, after they finished construction, they used a higher than normal level of filtration to purge the building and HVAC ducts of dust and other contaminants. The two week long flush out period removed dust from the heating and air conditioning system and allowed for the off-gassing of harmful particles while the building was still unoccupied

Low-Emitting Materials

Many modern building materials contain synthetic chemicals that evaporate—or 'off gas'—over time. However, it was important to us to build a healthy environment with excellent indoor air quality – which is why the paints, sealants, and adhesives that cover our walls and hold down our floors contain little or no Volatile Organic Compounds (VOCs). All wood is free of urea-formaldehyde and the building has the lowest emitting carpets available to date.

Indoor Chemical & Pollutant Source Control

In order to minimize exposure of Sacramento Animal Shelter's occupants to hazardous particulates and chemical pollutants during the life of the building, we provided isolated exhaust systems for contaminants in all the 'chemical storage' areas like janitor closets and copy rooms. We also put in permanent walk-off grates to keep pollutants outside, and installed high-efficiency filters in all the air handling units.

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Controllability of Systems, Lighting and Thermal Comfort

It was important to Sacramento Animal Shelter's designers to provide a high level of lighting and thermal control by individual occupants to allow adjustments to suit individual needs, or the needs of meeting attendees. An adjustable environment is one of the best predictors of increased worker productivity and comfort.

Thermal Comfort

To heighten the comfort level within Sacramento Animal Shelter, we designed an HVAC system that in both cooling and heating mode creates an indoor environment suitable to the majority of its occupants based on ASHRAE Standard 55. Our design assumptions will be verified after occupancy via a thermal comfort survey, which will be administered to building occupants by the University of California's Center for the Built Environment (CBE).

Green Building Education

As one of the fastest growing economic sectors, green building has a tremendous impact on the quality of our daily lives and on the health and vitality of the natural environment that supports life itself. By sharing the steps that Sacramento Animal Shelter took toward creating a more efficient, environmentally sound and healthy building, we hope to create a catalyst for innovation. For more information about LEED and the US Green Building Council please visit www.usgbc.org.