

Red Truck, Green Building

MANY CITIES ARE CHOOSING TO BUILD LEED-CERTIFIED, ENVIRONMENTALLY CONSCIOUS FACILITIES

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The building design and construction industry is constantly changing. New products and systems flood the market. New codes and regulations are adopted each year. Fire departments looking at a new building project are often faced with concepts and terms with which they are unfamiliar. One of the current buzz words is LEED. Will your new station be a “green building” or LEED-certified? The process probably already felt complicated enough with issues like construction management-at-risk and regulations like ADA. Now you may be adding LEED to the list of things to consider.

What is LEED? LEED (Leadership in Energy and Environmental Design) is a nationally recognized rating system developed by the U.S. Green Building Council for measuring a building’s energy efficiency and environmental impact. A building can be awarded LEED certification by meeting certain prerequisites and earning credits through the design, construction and operational processes. LEED acknowledges performance in five major areas of human and environmental health: sustainable sites,

water efficiency, energy and atmosphere, materials and resources, and indoor environmental quality.

Innovation in design, a sixth category, recognizes additional credits for efforts that are not encompassed in the other five areas. Depending on the number of credits achieved, a building can be awarded one of four LEED certification levels: certified, silver, gold or platinum. According to the USGBC, LEED provides building owners and operators with the tools they need to have an immediate and measurable impact on the performance of their buildings. LEED-certified buildings have reduced operating costs and healthier occupants and conserve natural resources.

With energy costs skyrocketing and an ever-increasing need to protect our environment and natural resources, more municipalities are choosing to set an example for their communities by building “green.” Some cities, like Plano, are now committed to building only LEED-certified government buildings. If your department or city is contemplating building a green building, there are several important things to keep in mind.

The higher levels of certification can require more sophisticated designs and potentially higher initial costs, but they are more environmentally friendly and energy efficient and bring greater long-term utility-cost savings and benefits to the community. Since LEED is a total-building design approach, the decision to go green needs to be made early, preferably even before a site is selected. Many people understand that LEED involves the use of sustainable building materials, but this is only part of the equation. Once you decide to pursue LEED certification, the right project team needs to be assembled. Architects, engineers, contractors and a commissioning agent with knowledge and experience of the LEED rating system can help guide you through the process.

Case Study: Fire Station No. 12/EOC Complex, City of Plano

We currently are nearing design completion of Plano Fire Station No. 12/EOC Complex, which will be submitted for LEED silver certification. The first step in the LEED process



A design plan for Plano Fire Station No. 12/EOC Complex, which will be a “green building.”

was meeting with the city to select credits that are not only achievable but affordable. Sustainable solutions the project team has implemented are described in the five LEED rating system categories.

1) **Sustainable Sites:** Roofs and parking paving are light-colored, reflective surfaces to reduce the heat gain inside and outside of the building. This will save on cooling costs and reduce the “heat island” effect of urban areas. Exterior lighting is designed and specified to meet LEED and IECC light trespass regulations, as well as Plano’s dark-sky requirements.

2) **Water Efficiency:** The LEED rating system requires at least 20 percent to 30 percent water reduction to achieve points in this category, but the Plano design will save about 60 percent. A gray water system recovers the water from the showers and sinks and stores it in underground tanks. The water is treated and reused to operate the toilets’ flush valves. The treated water runs in a separate piping system to ensure there is no cross contamination into the drinking water. The urinals are water-free, and the recent improvements in both filtration and ease of use have eliminated the odor and maintenance problems that previously affected this technology.

3) **Energy & Atmosphere:** The design is 20 percent to 25 percent more energy efficient than comparable buildings. The HVAC system is a programmable, multi-zoned, variable refrigerant volume heat recovery type. The system operates by using variable-speed outdoor compressors that allow the system as a whole to diversify and share the load among all of the

building zones. This way, the system will not overcondition at any given point, thus achieving a significantly higher level of efficiency. The system not only meets the efficiency requirements but also uses environmentally friendly refrigerant. A combination of energy-efficient light fixtures, manual and programmable lighting controls and daylight-harvesting solar-tube skylights direct natural sunlight down a reflective tube into a diffuser. Even on a cloudy day, the skylights alone can provide enough illumination for the space. All walls and roofs have higher levels of insulation than code requires. Exterior windows insulated glass with roof overhangs and sunscreens installed on southern and western building facades.

4) **Materials & Resources:** More than 40 percent of all construction materials are locally manufactured. Building materials contain more than 20 percent recycled content. The rubber flooring consists of 90 percent recycled tires. The aggregate for the concrete is crushed pieces from demolished concrete. In many areas that would typically feature tile, the floor finish is polished, and stained structural-concrete slab. This reduces construction materials and provides durable, long-lasting floors that have a look similar to polished stone. More than 75 percent of construction waste will be diverted from landfills by recycling.

5) **Indoor Environmental Quality:** Interior finishes have low or zero volatile organic compound (VOC) content, meaning superior indoor air quality for occupants. Recessed entry mats are provided at all exterior doors and the doors into the apparatus bays to pre-



Lobby, corridor and break-room floors in the EOC and Logistics Buildings are polished, stained concrete similar to those in this photo of the Wiginton Hooker Jeffry office. This was a less costly, durable and resource-conserving alternative to porcelain tile or other hard-surface floor coverings.

vent contaminants from entering the living quarters. All rooms that house contaminants, such as cleaners and other chemicals, are vented directly to the exterior. An additional 30 percent of outside air is brought into the building’s HVAC system. Individual thermal and lighting controls are provided at dorm rooms and offices.

A new building project is exciting for any fire department. The decision to pursue LEED certification may seem like an added complication. It can be more restrictive and involves more study and documentation, but a strong project team and thoughtful planning simplifies the process. The LEED rating system tends to force the project team and city to explore innovative, green solutions they may have otherwise ignored. Green buildings and LEED-certified buildings are proven to cost less to operate and maintain, are healthier for their occupants and are environmentally responsible. The benefits of building green are rewarding not only to the owner and users but to the surrounding community and even future generations.

You and your city leaders may determine that economics or other factors limit your ability to achieve the higher levels of certification, but you may wish to apply green building concepts that are economically feasible. Other programs such as Energy Star provide alternative benchmarks for energy-efficient design.

For more information on green design, go to www.usgbc.org or www.energystar.gov.

Contributing source: MD Engineering, LLP – MEP Engineer

TEXAS FIRE CHIEF

A Publication of the
Texas Fire Chiefs
Association

Fire Chief of the Year:
Cedar Hill's Steve Pollock

**Red Truck,
Green Building:**
Constructing
Environmentally
Friendly Facilities

'Courage to be Safe'
Training Session
Could Save Lives

**Vehicle Infrastructure
Integration:**
Technology Helps
Eliminate Traffic Accidents

Tax-Exempt Financing:
Get the Gear Your
Department Needs Now