

Decatur Fire Station No. 2

Decatur Fire Station No. 2 is on track to receive LEED Silver Certification from the U.S. Green Building Council. LEED certification provides independent, third-party verification that a building project meets the highest green building and performance measures. All certified projects receive a LEED plaque, which is the nationally recognized symbol demonstrating that a building is environmentally responsible, profitable and a healthy place to live and work. There are both environmental and financial benefits to earning LEED certification.

LEED-certified buildings:

- Lower operating costs and increased asset value.
- Reduce waste sent to landfills.
- Conserve energy and water.
- Healthier and safer for occupants.
- Reduce harmful greenhouse gas emissions.
- Qualify for tax rebates, zoning allowances and other incentives in hundreds of cities.
- Demonstrate an owner's commitment to environmental stewardship and social responsibility.

Decatur Fire Station No. 2 will receive points in all the following LEED categories:

- Sustainable Sites.
- Water Efficiency.
- Energy & Atmosphere.
- Materials & Resources.
- Indoor Environmental Quality.
- Innovation & Design Process.

Fire Station Construction Green Facts (by LEED category)

Sustainable Sites (SS)

✓ **SS Prerequisite 1: Construction Activity Pollution Prevention**

Sedimentation is the largest polluter of Georgia's water ways. To prevent polluting sediments from leaving the site during construction, a perimeter fence to trap silt was provided. After the underground storm water system was installed sediment traps and filter fabric were used to keep sediments from entering it. Large crushed rock known as 'construction exit' was used in the parking area to trap sediments from the tires of construction vehicles before they left the site.

✓ **SS Credit 1: Site Selection**

It's important to reduce the environmental impact from the location of a building on a site.

The new Fire Station No. 2 was located on the same site as the old station, so previously undeveloped land was not used. Also, great care was taken to place the new building so that the fine old oak trees in the back yard would be preserved.

✓ **SS Credit 2: Community Connectivity**

If a facility is located where people already live and work, they are more likely to walk to it, and the need for new infrastructure is reduced.

The new Fire Station No. 2 is within a ½ mile walking distance of many private businesses and public services including parks, a medical facility, a community, a fitness center, a police station, several restaurants, a laundry, a school, a convenience grocery as well as several kinds of retail shops.

✓ **SS Credit 4.1: Alternative Transportation - Public Transportation Access**

The use of public transportation reduces pollution from automobiles

The new Fire Station No. 2 is within a block of two MARTA bus stops for routes that connect to rail stations and points beyond.

✓ **SS Credit 4.2: Alternative Transportation – Bicycle Storage & Changing Rooms**

It is important to make biking to work easier.

The new Fire Station No. 2 has a bike rack and three bathrooms / changing rooms with showers for fire fighters biking to work.

✓ **SS Credit 6.1: Storm Water Management: Quantity Control**

We must divert as much water as possible from the storm water system

Underneath the driveway of Fire Station No. 2 there is a 42" diameter pipe about 70' long that holds water for slow release from the site to mimic natural hydrological conditions. The water is released from the site at about the same rate that would take place in a natural wooded site.

✓ **SS Credit 6.2: Storm Water Management: Quality Control**

Water that enters the storm water system to recharge our aquifers should be as clean as possible.

Fire Station No. 2 has an underground filter that captures oil and grit before they go into the storm water system. This filter also traps nitrogen hydrocarbons and metals.

✓ **SS Credit 7.1: Heat Island Effect: Non-Roof**

Sites get over-heated when too many hard or dark materials are used and there is not enough shade. This is bad for the microclimate.

56% of the paved areas on the site of Fire Station No. 2 are concrete and therefore they reflect light rather than absorb it and heat up.

✓ **SS Credit 7.2: Heat Island Effect: Roof**

Roofs are among the biggest surfaces of a building and therefore should be designed to avoid overheating.

A measurement called the Solar Reflectance Index (SRI) is used to determine whether materials reflect the sun's energy or store it as heat. The roof of Fire Station No. 2 is a white rubber-like material with a very high SRI rating.

Water Efficiency (WE)

✓ **WE Credit 1.1 & 1.2: Water Efficient Landscaping**

We need to reduce the billions of gallons of water our country uses each day for homes, commercial buildings, agriculture and recreation.

The drought tolerant plants on site at Fire Station No. 2 are native or adapted to this climate. Therefore they do not require irrigation and no irrigation system has been provided.

✓ **WE Credit 3.1 & 3.2: Water Use Reduction**

It is important to maximize efficiency in plumbing fixtures to reduce the burden on our water supply and wastewater treatment systems.

All the faucets and shower heads in Fire Station No.2 are low flow fixtures. Less water is used each time they are turned on, and the lavatory faucets turn off automatically. The toilets are dual-flush so they are much more efficient. Compared to a standard building with the same number of plumbing fixtures, Fire Station No. 2 reduces water use by 35.8%.

Energy and Atmosphere (EA)

It is important that we reduce the amount of energy our buildings require. The energy that we do use should be as benign as possible.

✓ **EA Prerequisite 1: Fundamental Commissioning of the Building Energy Systems**

We must make sure that our building systems perform as efficiently as possible

Energy Ace, Inc was hired as an independent third party to ensure that the building's mechanical, electrical and domestic hot water systems were design, installed and calibrated to operate as intended by the designed and the Owner's operational needs.

✓ **EA Prerequisite 2: Minimum Energy Performance**

Every building should at least meet the minimum code requirements for efficient buildings

Fire Station No. 2 was designed holistically so that the building 'envelope' – its foundation, walls and roof - as well as its heat and air, electrical and lighting systems maximize energy performance.

✓ **EA Prerequisite 3: Fundamental Refrigerant Management**

Our buildings should not discharge chemicals into the atmosphere that damage the protective ozone layer in the earth's upper atmosphere.

The cooling liquid in the air conditioning system in Fire Station No.2 contains no chlorofluorocarbons (CFC's). CFC's are proven to cause this damage.

✓ **EA Credit 1: Optimize Energy Performance**

Not only should our buildings meet the minimum code requirements for efficient buildings, but they should exceed them. Decatur Fire Station #2 achieved a **24.8% energy savings** over the baseline building, which earned 5 LEED points! Energy Ace, Inc created an energy model during the design of the station to simulate its energy consumption as compared to a baseline version of the same building that only meets the minimum energy code. Energy Saving Features include:

- Energy efficient lighting including occupancy sensors,
- Increased levels of insulation in the walls and roof
- High Performance insulating glass with exterior awnings for shading
- Energy efficient HVAC system

✓ **EA Credit 2: On Site Renewable Energy**

Solar power is among the most benign sources of energy. Decatur Fire Station #2 has a solar hot water heater that should replace about 2.5% of the energy use of the building with solar power. The solar panels for the system can be seen on the back of the station's glass tower.

✓ **EA Credit 3: Enhanced Commissioning**

The design team must work on sustainability from the start and follow through after the building is in use.

Energy Ace, Inc reviewed the construction documents to help ensure that the documents were consistent with the City of Decatur's sustainability goals. During construction Energy Ace visited the site to verify that the construction was being completed as designed and to help identify problems early so they could be addressed. Energy Ace will continue to visit the station throughout the first year of its occupancy.

Materials & Resources (MR)

✓ **MR Prerequisite 1: Storage & Collection of Recyclables**

We must recycle to reduce the amount of waste we produce on a daily basis.

Decatur Fire Station #2 has a group of containers for recycling including separate bins for paper, corrugated cardboard, glass, plastics and metals.

✓ **MR Credit 2: Construction Waste Management**

We must recycle to reduce the amount of waste we produce during construction.

By separating and organizing construction waste, the Decatur Fire Station construction team has diverted 86% of it from landfills into recycling.

✓ **MR Credit 4.1 and 4.2: Recycled Content**

When we use recycled materials in construction, we do our best to leave natural resources where they belong (where they come from).

About 20% of the building materials in Fire Station No. 2 are recycled including the structural steel and concrete block.

✓ **MR Credit 5: Regional Materials**

Using materials that come from our region supports indigenous resources and reduces pollution and resource use from transportation

About 16% of the materials used for Fire Station No. 2 have been extracted and manufactured within a 500 mile radius of the building.

Indoor Environmental Quality (EQ)

✓ **EQ Prerequisite 1: Minimum Indoor Air Quality Performance**

We spend most of our time indoors, so the air quality should be good and clean.

Decatur Fire Station #2 will be very well ventilated. The forced air system will bring in fresh air. This should save energy and money by reducing the need for air conditioning.

✓ **EQ Prerequisite 2: Environmental Tobacco Smoke Control**

We should reduce our exposure to second hand smoke.

Decatur Fire Station #2 will have a no-smoking policy.

✓ **EQ Credit 3.1: Construction Indoor Air Quality Management Plan**

Construction activities can soil the building interior and its ductwork.

The construction team for Fire Station No. 2 followed a plan of construction that prevented moisture damage to stored materials, kept installed material clean, and prevented contaminants from entering the heating and air conditioning ducts.

✓ **EQ Credit 4.1: Low Emitting Materials: Adhesives & Sealants**

✓ **EQ Credit 4.2: Low Emitting Materials: Paints & Coatings**

It is important to reduce the bad-smelling and irritating chemicals that are often used in building construction.

The Decatur Fire Station #2 construction team has used only low-emitting materials in these categories to improve the well-being and comfort of installers and building occupants.

✓ **EQ Credit 6.1: Controllability of Systems: Lighting**

Building users should have good control over the lights they use to work and live by.

Most of the rooms in Fire Station No.2 have separate lighting controls as do work areas within each room. This is not the norm in commercial buildings. Productivity and pleasure in the work place will be better and energy use and money will be saved when those areas that need light can be turned on and others turned off.

✓ **EQ Credit 6.2: Controllability of Systems: Thermal Comfort**

Building users should have good control over their heating and air conditioning and have fresh air.

The main rooms in Fire Station No.2 have separate controls for the heating and air conditioning, so differing needs can be met for different activities. Perhaps even more importantly, every room in the Fire Station except two of the five sleeping quarters has windows that can be opened for fresh, circulating air.

✓ **EQ Credit 7.1: Thermal Comfort: Design**

A comfortable environment supports well-being and productivity.

The heating and air conditioning system for Fire Station No.2 is designed around humidity and fresh air as well as simply temperature.

✓ **EQ Credit 7.2: Thermal Comfort: Verification**

A good thermal design is important, but making sure it works is too.

About six months after Fire Station No. 2 is opened, the occupants will be surveyed about how comfortable and efficient their environment is. Corrective action will be taken if needed.

✓ **EQ Credit 8.1: Daylight 75% of Spaces**

✓ **EQ Credit 8.2: Views for 90% of Spaces**

Healthy work environments provide their occupants with a sense of connection between the indoors and outdoors.

86% of the spaces in Fire Station No. 2 have daylight and operating windows. The two of the five sleeping quarters without daylight will be good for daytime sleeping for fire fighters. All the windows not only let light in, but they are positioned so that people can see out. That is they are at eye level, not skylights or high windows

Added Points of Interest

- ✓ **Upholstery fabrics in Fire Station No. 2 are 100% recycled**
- ✓ **The resilient flooring in the fitness room for Fire Station No. 2 is recycled rubber**
- ✓ **Fire Station No. 2 light bulbs are all fluorescent or LED - cool and long lasting**
- ✓ **Most of Fire Station No. 2 appliances are Energy Star rated.**

The Fire Station No. 2 Tower

A society that values sustainability will have a strong sense of its dependence on the planet Earth

The glass tower at Fire Station No. 2 is a 'sun-tracker'. The blue color band and the red '2' that can be seen moving across the glass of the tower are both created by the sun passing through colored glass mounted on the tower.

The blue band is the tower's 'gnomon'. A gnomon is traditionally the raised triangle on a sun dial that casts a shadow to tell the time and day. The red '2', of course, represents the name of the Fire Station. The sun to the south of the tower strikes these stained glass surfaces and projects their color onto the face of the white glass. Each hour of the day and each day of the year the blue band and color red glass will demonstrate the height and angle of the most important star.