



Artists for Humanity Epicenter

Boston,
Massachusetts

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Artists for Humanity Epicenter – Boston, Massachusetts

Artists for Humanity (AFH) constructed in 2004 a four-story building for its activities in Boston, Massachusetts. The building is called Epicenter. AFH, a non-profit organization founded in 1990 by Susan Rodgers, hires Boston teens to create and sell artwork (McKenna, 2006).

The mission of AFH is to bridge economic, racial, and social divisions and provide underserved youth with the keys to self-sufficiency through paid employment in the arts (Home: Artists for Humanity, 2008).

The decision to build green came from the youth of AFH. Epicenter is a simple, functional building that achieves the highest levels of sustainability on a tight budget. The 23,500 square foot center costs \$183 per sq. ft. to build. Utility incentives and grants from the Massachusetts Green Buildings Initiative reduced AFH's cost to \$ 168 per sq. ft. Energy costs are estimated to be only \$.56 per sq. ft. or 82% less than the standard building in this area. The building offers an opportunity for increased public awareness about green design among the immediate community and beyond (LEED case studies, 2008).

Epicenter achieved platinum LEED status.

Sustainable Sites (10 of 14 points)

The biggest single factor here is transportation. Should this weigh so heavily in site selection? The criteria for public transportation can be met easily in older northeastern cities but this may be meaningless in smaller cities in the mid-west or southwest where there is little public transportation. Can one building be held responsible for broad public policy? The criterion for public transportation does not address frequency which is crucial to have an impact on actual use. The impact from a bus that runs every 10 minutes will be significant versus one that runs every 90 minutes.

While it is admirable to include bicycle racks and alternative fuel vehicles as criteria, it is only at a token percentage of 5% and 3% respectively. AFH for example didn't get points for the alternative fuel vehicle but could have done so by having only 1 regular employee drive an

alternative fuel car. If this employee would have taken public transportation instead, what has been gained or rather lost in this example?

One major aspect left out in site selection is the neighborhood impact of the building and its function in the community. Shouldn't it be appropriate in site selection to look beyond the building site itself and look at the broader impact to the surrounding area? This may be difficult to measure but it deserves focus in future standards.

Stormwater management needs greater weight particularly in the older cities of the northeast which have combined sewer operations (CSO). Philadelphia is about to implement a new requirement (proposed ordinance) to capture the first inch of any rain storm on site before release to the sewers. The requirement will apply to all redevelopment of site as well as new development. Green roofs and porous pavement parking will be the norm. Getting a point under the current LEED system just to maintain the status quo of the site wouldn't cut it.

On the positive side, the fact that the site selection issue receives this level of emphasis in building design shows the importance placed on environmental impact.

AFH points out the following green strategies on their site: limit parking area, use light-colored pavement to reduce heat island effect, select an already developed portion of a site for new development.

Water Efficiency (4 out of 5 points)

In the future water and wastewater management will receive as much emphasis as energy. Water is a limited resource and re-processing on site of greywater for sanitary and cleaning purposes will become standard. The LEED targets are a good first step but green buildings as part of a sustainable community will need to be part of a system of water re-use and wastewater recovery for energy. One example of a model of a sustainable city using wastewater as a resource is Hammarby Sjostad, in Stockholm, Sweden (Welcome to hammarbysjostad.se, 2008). Hammarby has an environmental goal to reduce water consumption per capita by 50% to 90 liters/person/day. Thanks to eco-friendly installations consumption is already down 20%. A new wastewater treatment plant for about 600 of the residents is currently under evaluation. Biogas is extracted from the sewerage sludge and use in transportation or gas stoves in the flats. The

biosolids are used in agriculture and purified wastewater is sent to the district heating and cooling plant before being discharge to the lake.

At Epicenter rainwater is collected from the roof and sent to an underground storage tank via a glass tube so all can see it. This process furnishes water for irrigation for the small landscape garden and also washing and flushing in the restrooms (Campbell, 2006). Use of automatic shut-off valves on faucets and low-flow sinks and toilets add to the water efficiency.

Energy and Atmosphere (17 of 17 points)

Two items stand out in this category for the Epicenter – the photovoltaic (PV) solar panels on the roof and no refrigeration for cooling. The PV panels cover the roof and the building is configured to capture maximum sunlight. These solar panels will produce approximately 58 MWh of electricity per year. This represents 160% of the yearly electricity needs. Electricity is 32% of the total energy requirements. On a sunny day in the summer, the solar panels generate more energy than needed. The excess is sold to the electric grid. No batteries are used to store the excess. On days when not enough electricity is generated AFH buys electricity from the grid. Because electricity is more expensive than natural gas the excess electricity sold to the grid will pay for the remaining energy needs. A \$520,000 grant from the Massachusetts Technology Collaboration and a \$200,000 grant from the utility NSTAR provided 70% of the funding for the PV solar installation. Without these grants the payback period would be about 17 years. Obviously solar energy is not yet an economical alternative. The entire roof wears an umbrella of PV panels. They act as a sunshade by floating a couple of feet above the roof (Campbell, 2006). There is no possibility for a green roof here, but, the panels provide some of the same advantages regarding insulation.

A fan system eliminates the need for air conditioning (McKenna, 2006). This is helped by the fact that it is located in south Boston and not south Dallas. The cooling load is maintained by the efficient building envelope and the shaded roof mentioned above. Exhaust fans are used to cool the building at night. Ceiling fans and operable windows are employed to daytime cooling. If a refrigeration cooling system were used the electricity would triple.

Green strategies that the Epicenter includes: minimize number of east and west windows, use large exterior windows and high ceilings to increase daylighting, use operable windows, use

water heaters with energy efficiency rating in the top 20%, use high-efficiency T8 florescent lamps, site the building for southern exposure, use modulating photoelectric daylight sensors and occupancy sensors for lighting controls, and with the HVAC distribution system use variable drives for fans.

Materials and Resources (5 of 13 points)

AFH's Epicenter did not receive points for three major material component areas – building reuse, resource reuse, and local/regional materials. AFH originally planned to retrofit the existing building, a livery, with renewable technologies but the approach was not cost effective or structurally feasible.

Is reuse a good and valid category for LEED? Yes, if nothing else it will cause some to ask whether the existing structure can be used in some way. Instead of the usual American approach of leveling and starting over, we may start to view old buildings as a resource. This is a good start. Next, if the building can't be reused can the materials at least be salvaged? Again this is an important concept that LEED uses in changing our mindset from waste to resource.

The last of the three categories, local or rapidly renewable materials, are categories that LEED finally looks beyond the building to the impact on the larger environment. The impact from transportation, greenhouse gas emissions, and other destructive forces from the material content of a structure are hidden and LEED should be commended for bringing them to light.

The Epicenter was properly managed during the construction phase to divert at least 75% of construction waste from landfill disposal. Restrooms, stairwell guardrails, coffee tables, and other items are built from recycled materials (McKenna, 2006). The students designed these areas. Epicenter's space was designed to be adaptable for future needs. AFH is a dynamic group of artists, programs, and curricula that changes frequently. Most of the studios are designed for multiple uses. Interior partitions are demountable for relocation. Electrical systems, computer networking, and audio-visual wiring is left exposed to facilitate change.

Indoor Environmental Quality (12 of 15 points)

LEED emphasis on indoor air quality (IAQ) is commendable. The last "energy crisis" in the 1970's led to sealing buildings so tightly that no air escaped. Ventilation (air exchange) was

viewed as costly. At the same time we were slowly starting to realize that many of our modern materials and furnishings were emitting harmful toxins into the air. The focus was definitely not on IAQ. Productivity suffered. Not only does IAQ focus on the occupants but also the workers during the construction phase. Was this influenced by asbestos litigation over the past few decades? No matter, it is a very valid focus.

In the Epicenter the first floor gallery entrance is a functional overhead door that brings both light and ventilation to the space. Diffuse light, ideal for artwork penetrates deep into the building from the north year-round and from the south in the winter. The south side uses blinds to control solar penetration in the summer. The building has no air conditioning. Instead, fans, an interior air shaft with louvers and windows that can be opened keep the building comfortable (The Boston Globe, 2004). High ceilings and an open floor plan contribute to daylighting.

Innovation and Design Process (5 of 5 points)

This is the area where LEED awards extra points for innovative performance not specifically addressed elsewhere. For AFH the design process was a collaborative effort between staff, students and professionals. The design concept evolved from a series of workshops. All desired an iconic building that would exhibit AFH's identity as a cutting-edge, socially conscience, activist, and community-focused organization. They wanted a building with a strong and memorable presence in South Boston and notable in the greater Boston area. Clear, simple, function, strong, green, and affordable were attributes that needed to be met.

A former student who was a recent architectural graduate of Rhode Island School of Design was the facilitator for the design process. Three afternoons a week he taught students at AFH about architecture. The students built models of the project, made daylight study models, and designed their own version of the building. Three students from these classes went on to study architecture.

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