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**Maverick Gardens HOPE VI Development  
Leadership in Energy and Environmental Design (LEED), Energy Star Products and  
Healthy Public Housing Initiatives**

Maverick Garden's development team facilitated a fully integrated design process with financial assistance from Massachusetts Technology Collaborative. The design process required the development team members to meet numerous times to identify high priority green, energy efficient and renewable energy investments. That process resulted in an integration of a broad hierarchy of green, energy efficient, healthy, safe and durable initiatives to enhance the living experience for the residents. Under the Energy Star Home initiative, the project has adopted standards for insulation, windows, air leakage, HVAC equipment, appliances (refrigerators, dishwasher), and light bulbs. The low-rise buildings are targeting a Home Energy Rating Services (HERS) score of 88 and 89, and the mid-rise building is targeting a HERS score of 86.

Perhaps the most exciting and innovative component is the team's focus on receiving LEED certification for the Phase 1 – Midrise A building. The Leadership in Energy and Environmental Design (LEED) for Homes program is a voluntary initiative under the U.S. Green Building Council (USGBC) designed to promote the transformation of the mainstream home building industry towards more sustainable practices. The USGBC has developed a rating system to evaluate how a building meets sustainable-design criteria. Based on the number of credits or points the building earns, one of 4 levels of LEED Certification is awarded: certification, silver, gold, or platinum. To receive a LEED certification, building owners must register their building with the USGBC and work with a team of designers, engineers and energy professionals to define the measures it will implement to achieve certification. The Maverick Gardens project received a Green Building Design and Construction Grant in the amount of \$477,675 from the Massachusetts Technology Collaborative through its Renewable Energy Trust Fund Program. The purpose of the grant is to implement measures in the Phase 1 midrise building that produce valuable energy savings and new sources for renewable energy. As part of this LEED certification process, the project includes solar panels, cogeneration (Tecogen), absorption chiller/heater, and material recycling.

- ◆ **Solar Panels:** The photovoltaic (PV) system will consist of 112, ASE 330-watt-dc modules mounted on the roof of the mid-rise building. Concentrating the PV as an architectural feature on the mid-rise building focused community attention to the renewable energy concept and the team's green building agenda.
  
- ◆ **Cogeneration Systems:**
  - ◆ **Space Heating & Domestic Hot Water Production:** Through the application of advanced engineering technology, Tecogen's reciprocating gas engine utilizes the by-products of combustion to create two distinct usable energy sources: electricity and hot water. The system works as follows: an automobile engine fueled by natural gas drives a generator to produce electricity while simultaneously capturing the heat found in the high temperature exhaust gas to heat water for use in domestic hot water or space

heating needs. Thus, the cost of operating the gas “engine” is equivalent to that which would be paid for electricity alone with the added benefit of “free” hot water.

- ◆ **Absorption Chiller/Heater:** The Broad Natural Gas absorption chiller uses heat instead of mechanical energy to provide cooling. The absorption chiller/heater combines a space heating boiler with a commercial air conditioning system utilizing the inherent energy available when a solution (refrigerant) is subjected to heat and/or compression. Capitalizing on the energy produced in this thermal dynamic process eliminates the need for a large electrical motor normally associated with commercial air conditioning systems. In addition to the electrical savings, hot water is simultaneously produced during this process providing a secondary or co-generation potential to heat water for domestic purposes or space heating needs.
- ◆ **Roof:** Use of a white colored high albedo energy star compliant roof membrane is a key factor in the use of energy and for controlling heating and cooling costs in the building.
- ◆ **Envelope:** In order to minimize energy consumption, a tightly sealed highly efficient building envelope was designed. The envelope R-value is 20% higher than required by Massachusetts Energy Code. Additionally, fiberglass windows with double glazed Low-E glazing have been specified as part of the envelope. Using fiberglass helps control condensation, and thermal bridging, ultimately lowering heating and cooling costs and loads and prolonging the life of the building components.
- ◆ **Materials, Resources and Recycling:** Use of recycled materials on the project has been included in the specifications such as slag in concrete, use of steel w/ a high percentage of recycled material, and carpet made from recycled material. Additionally, up to 50% of the construction waste generated from the project will be recycled.
- ◆ **Commissioning:** The developer and architects will incorporate a process that will verify and insure that fundamental building elements and systems are designed, installed and calibrated to operate as intended. A well thought-out and applied commissioning program can pay for itself through improved pre-construction coordination/communication. This translates into a reduction in costly change orders, while maintaining the project’s construction schedule. Ongoing operational benefits include optimization of energy use, improved documentation and more thorough training of building staff. Ultimately, commissioning is part of a sustainable design approach because it aids in the construction of a building that possesses the lowest life cycle cost ownership.
- ◆ **Ventilation:** Each unit is provided with ventilation that exceeds code requirements, supplying fresh air directly from outside. Additionally, air sealing that was a result of the LEED requirement toward no-smoking specified high performance air sealing so that the transfer of smoke from unit to unit or unit to corridor was eliminated. Contractor quality assurance and testing is specified in order to ensure the required containment.
- ◆ **Materials:** In order to reduce the environmental factors that trigger asthma episodes, consideration has been taken to install Low-VOC and various “natural” appointments such as Marmoleum natural sheet flooring, all wet areas (kitchens & baths) will be provided with smooth cleanable surfaces that do not trap moisture and will, therefore, reduce mold production. Specifically, 15 units have been targeted to be carpet-free and another 15 will have significantly reduced amount of carpet with Marmoleum flooring in all bedrooms. These units will be made available to prospective residents with asthma to further reduce the potential asthma episodes. Wipeable surfaces such as semi-gloss paint and metal louver blinds have been selected to facilitate cleaning and reduce amount of dust in the home.

- **No Smoking Areas:** Several apartments will be designated non-smoking as well as all common areas in an effort to reduce the impact on those residents most vulnerable to the negative aspects of tobacco smoke.
- **Energy Star Participation:** Maverick Gardens development team has striven to incorporate components of the Energy Star building design criteria along with adhering to the higher energy efficiency standards associated with installing Energy Star rated equipment, appliances and lighting. Energy Star compliant, residential new construction requirements include best practice suggestions in the areas of insulation ratings, types and levels, building air sealing strategies, interior ventilation standards, suggestions on building wall design and competent integration such as windows and doors. Energy Star participation includes a collaborative design and implementation process whereby Energy Star staff review and make suggestions on the initial building design, provide in-process site visits and final testing of the completed building. In addition, Energy Star provides incentives and rebates for implementation of high efficiency lighting, ventilation, appliance and equipment into the building design and operation.