

ORIENT HEIGHTS STATION

Sustainable Design

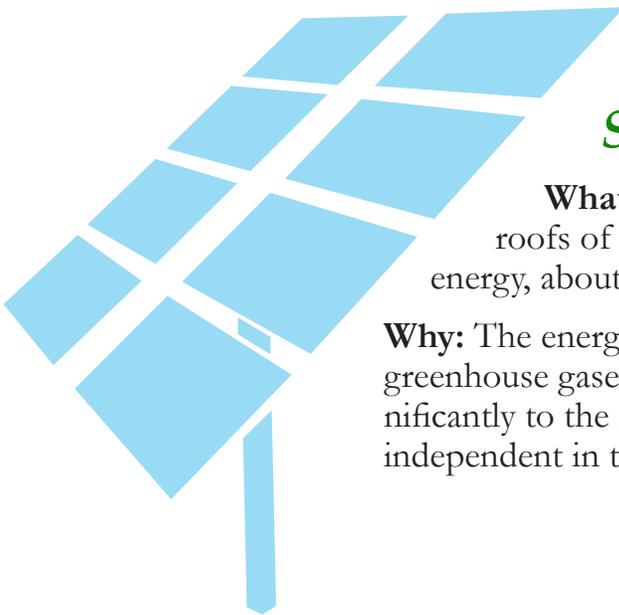
The station at Orient Heights along the Blue Line in East Boston has recently been renovated. As part of the renovation, the MBTA integrated a multitude of sustainable design elements that: 1) greatly increase the energy efficiency, commuter and employee comfort, bicycle and pedestrian access, and land-friendly practices of the station; and 2) decrease the greenhouse gas emissions, water use, and chemical runoff from the station. Below, some of the most noteworthy sustainable design elements are highlighted. Included are both the commuter station and the adjacent Employee Building.

Renewable Energy

Solar Panels

What: Solar panels on the south-facing roofs of the station produce 100 kilowatts of energy, about 20% of the energy required to run the station.

Why: The energy production of these solar panels results in zero greenhouse gases are emitted. This project also contributes significantly to the renewable energy market, and the MBTA is more independent in terms of energy production.



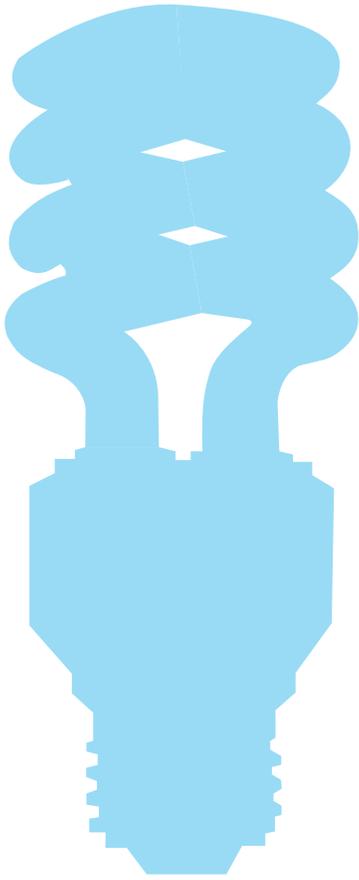
Vegetation

What: A permaculture garden is a self-sustaining community of plants that does not require irrigation and utilizes plants that develop mutually beneficial relationships. This garden incorporates only native, local plants.

Why: The garden provides a beautiful habitat for commuters and employees to enjoy. Using native plants reduces the negative effects of invasive plant and animal species and creates a habitat for native fauna. The garden also does not require irrigation, reducing overall water consumption at the station. Lastly, the soil is a permeable surface, reducing stormwater runoff, allowing for natural underground water filtration to occur.

Permaculture Garden





Efficient Lighting

Energy Efficient Light Bulbs

What: The station utilizes energy efficient fluorescent and LED light bulbs, which use far less energy than standard bulbs.

Why: Less energy is consumed, which means that fewer greenhouse gases are emitted into the air. The MBTA also pays a smaller energy bill, and less stress is placed on the energy utility.

Advanced Lighting Control System

What: The site lighting (streets and city) are controlled by a time clock, meaning they turn on at sundown and turn off at sunrise. The platform lighting is controlled by photo-cells that turn lights on appropriately based on the amount of natural light present. Lastly, the platform rooms' and the Employee Building's lights are controlled by motion sensors.

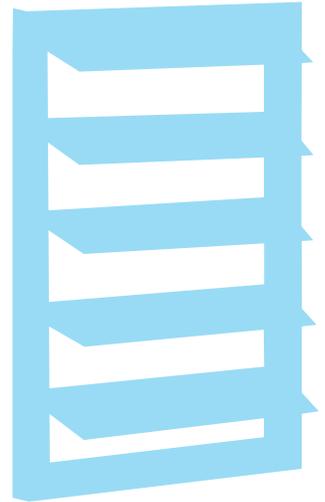
Why: With the help of these advanced lighting controls, the MBTA consumes only the necessary amount of energy, resulting in fewer greenhouse gas emissions and less stress placed on the energy utility. The MBTA also saves money, as energy and lighting are only used when necessary for commuters and employees.

Ventilation

Passive Natural Ventilation through Operable Louvers

What: The louvers used at this station are operable slats connected to the windows that can be opened or closed depending upon airflow needs and outdoor and indoor air temperatures.

Why: The louvers allow for natural ventilation which decreases the need to run mechanical ventilation, therefore using less energy and producing fewer greenhouse gases. Natural airflow will also enhance the commuter experience.

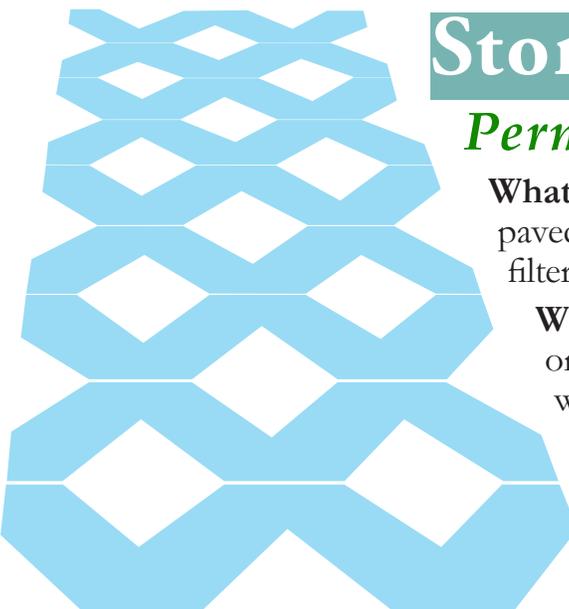


Energy Efficient Heating, Ventilation, and Air Conditioning (HVAC)

What: The HVAC unit at this station is highly energy efficient. HVAC units are mechanical heating, ventilation, and air conditioning units utilized when natural ventilation is not enough to maintain the necessary heating, ventilation, and air conditioning health and safety requirements and commuter comfort standards.

Why: An energy efficient HVAC unit consumes less energy than a traditional HVAC unit, thereby producing fewer greenhouse gases and putting less stress on the energy utility. The HVAC unit will also help to ensure a comforting and enjoyable commuter and employee experience within the station.





Stormwater Management

Permeable Surface

What: The station's rear traffic island uses permeable paved surfacing. Permeable paved surfaces allow water to filter through the manmade surface and into the soil beneath.

Why: Natural soil filtration decreases the burden placed on stormwater treatment facilities by large volumes of water gathered in storm drains. Less water treatment means less energy consumed, which means fewer greenhouse gases produced. Permeable surfaces also decrease the volume of hazardous chemicals flowing into the natural environment as a result of stormwater runoff of traditional impermeable surfaces.

Green Roof

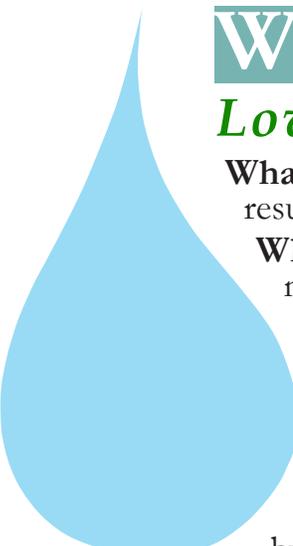
What: A green roof is a roof on a building partially or completely covered by a growing medium (such as soil), often with a water-proofing membrane, drainage system, and rainwater reclamation (the collection and reuse of rainwater).

Why: The green roof at the station acts as a rainwater collection and contaminant filtering basin, reducing the rate and quantity of stormwater and chemical runoff from the roof. This results in less soil erosion and chemical intrusion into the land below, less stress on the station's stormwater management system and the city's stormwater treatment plants, and fewer manholes and pipes constructed at the station.

Underground Infiltration Beds

What: An underground infiltration bed is a system of pipes and pervious surfaces below the pavement that collects stormwater, filters it, and then discharges it back into the groundwater table rather than into the city drainage system.

Why: By filtering stormwater and discharging it back into the groundwater, infiltration beds drastically reduce the stress placed on the city's stormwater drainage and treatment systems. Consequently, there is also less contaminant runoff from the station into the surrounding land as well as less erosion of the soil around the station.



Water Consumption

Low Flow Faucets and Showerheads

What: The Employee Building uses low flow faucets and showerheads, resulting in significant reductions in water consumption.

Why: Less water is drawn from the natural environment, where it is necessary for healthy ecosystem functioning. This contributes to less stress on water utilities and water treatment facilities.

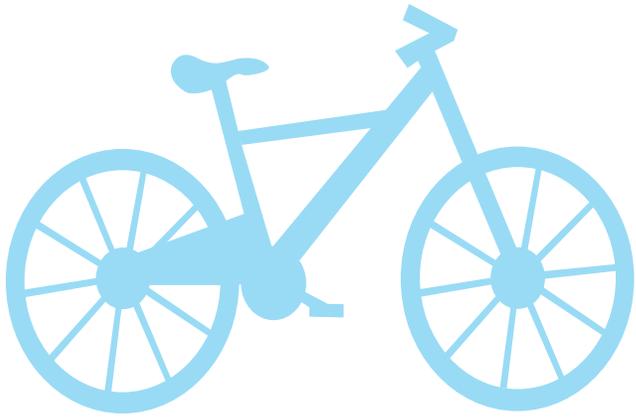
No Irrigation Systems

What: This station does not utilize any irrigation systems, neither for the green roof nor for the permaculture garden.

Why: Far less water is consumed, there is no energy consumed by an irrigation system, and you never get soaked walking by when the water turns on!



Commuter Access



Bicycle Racks

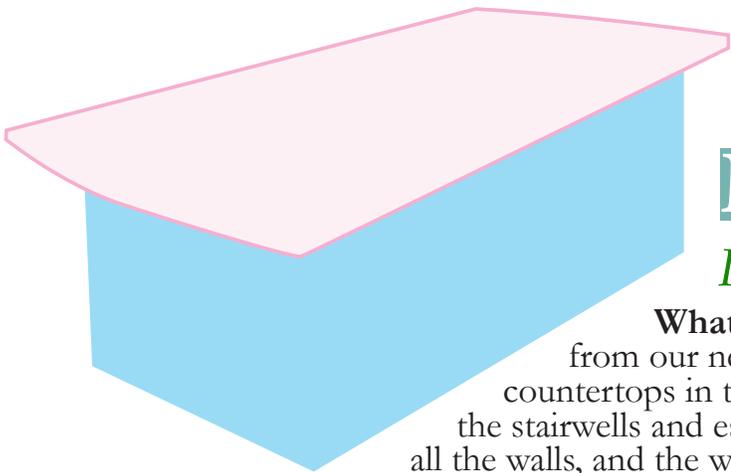
What: This station has bicycle racks that can accommodate fifty bicycles, providing commuters with ample space to ride to the station and lock their bicycles.

Why: More people will ride their bikes to the station instead of driving, causing less traffic congestion and fewer greenhouse gas emissions. This contributes to an enhanced commuter experience and healthier living.

Efficient and Safe Pedestrian and Bus Access

What: The new station has unique lanes for bus and car drop-off, allowing buses to get in and out quickly and efficiently. The pedestrian walkways have also been designed efficiently to ensure pedestrian safety and ease of access.

Why: The separation of bus and car lanes will increase vehicle flow and decrease traffic congestion, thereby decreasing greenhouse gas emissions of idling vehicles and saving commuters time. Pedestrian traffic flow will also be enhanced, making the station safer and also minimizing pedestrian-induced disruption of vehicular traffic flow.



Materials

Pink Granite from Deer Isle

What: The locally sourced pink granite comes from our neighboring state of Maine. It is used in countertops in the Employee Building, the railings of the stairwells and escalator shafts, the treads for stairs, the bases of all the walls, and the window sills and headers.

Why: Sourcing materials locally drastically reduces the transportation costs associated with transporting materials, consequently reducing the greenhouse gas emissions associated with long-distance transportation. Buying locally also supports local businesses, thereby strengthening the local and regional economy and supporting our local communities and businesses.

Salvaged and Reused Signage from Old Station

What: The MBTA has salvaged the signage from the old Orient Heights Station and is reusing it as the station signage for the newly renovated station.

Why: Reusing materials eliminates the need to recycle or dispose of old material or to identify new sources of material, reducing our impact on land resources. Repurposing the old signage also contributes to a sense of connectedness to the past and future of the community, reinforcing the MBTA's vision of sustainable development.



Pollutants

No Volatile Organic Compounds

What: Volatile Organic Compounds (VOCs) are toxic chemicals emitted as a gas from certain solids, such as paint.

Concentrations are consistently higher indoors (up to ten times) than outdoors. Many have short- and long-term negative health impacts.

Why: The No-VOC paint used at this station contributes nothing to this pollution and public health problem. This means there will be negligible indoor VOC concentrations, providing for a healthier environment for both commuters and employees.

