



Sustainable Development Standards Manual



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Development Services Department*

INTRODUCTION

Sustainable Design incorporates a community's natural resources as integral design options. It combines environmental with human resources and celebrates continuity, uniqueness and place making.

Purpose and Goals of this Manual

The purpose of this manual is to supplement the information found in Zoning Code Article 5, Part 8: Sustainable Development Standards, which is intended to promote sustainable development practices as a means of addressing global climate change, protect natural resources, and ensure a high quality of life for future city residents. More specifically, Zoning Code Article 5, Part 8 is intended to require new development to use a basic level of site and building site options that conserve energy, promote a healthy landscape, support public health and safety, and otherwise increase the development's sustainability. Applicants seeking Major Site Plan approval are required to achieve a certain number of *points* for sustainable design options. By requiring applicants to implement sustainable design elements into their projects the impact of the built environment on the natural environment is minimized and neighborhoods that endure are created.

This manual provides additional information about the sustainable design options listed in Zoning Code. It is not the intent of this Manual, however, to provide the wealth of scientific or other technical information about sustainability and best practices. Rather this manual provides and overview of the benefits of sustainable practices which may have the most benefit for the City. Additionally, the manual lists the preferred locations of sustainable practices within the City. Images of the sustainable design options are included and help convey the practicality and applicability of implementing the design options.

Ultimately, the goal of this manual is to assist property owners and developers in selecting and implementing the optimal sustainable design options for their projects. This manual will also help elected officials, staff members, and other stakeholders determine and prioritize sustainable design in City projects. The information provided in this manual is intended to ensure all stakeholders are aware of the importance of sustainability, encourage a greener city and improve the City's environmental quality, environmental infrastructure, and resiliency.

Sustainability Goals

The City's commitment to address issues such as sea level rise, increased vulnerability to flooding, energy efficiency, sense of place and community identity, access to natural resources, and increased usage of a multimodal transit system are reflected throughout various adopted plans including the City's Strategic Plan, Complete Streets Manual, Parks Master Plan, Comprehensive Plan, and Stormwater Master Plan. Further the City supports Broward County Climate Change Action Plan Report and the Broward County Resiliency Report "Working Towards Resilient Coastal Communities: Pompano Beach (2014)". Together these adopted plans and reports demonstrate the City's desire to create a sustainable community which is economically vital, has high livability qualities, and preserves environmental resources critical to the City's economy and general quality of life.

While all sustainability efforts are valued by the City, the following categories, and the order in which they are presented, reflect the sustainable goals of the City:

1. Stormwater Management and Flood Protection
2. Renewable Energy and Energy Conservation
3. Water Conservation
4. Certified Green Development
5. Active Design

How this Manual Works

Sustainable design options are presented in five categories (the five Sustainable Goals of the City listed above). Within each category basic information is provided that describes the goal and expected outcomes followed by the design options. The manual provides basic information regarding the design options.

Following the information on the categories and design options is a list of development types and/or locations with preferred design options.

The Appendix includes the specific requirements for certain design option to be eligible to receive the points. For other design options, such as Low Impact Development (LID) design, best practices are included in the Appendix. Applicants may also refer to industry accepted technical manuals. Images of the design options implemented in contexts similar to Pompano Beach are included.

Sustainability Points

The information presented in this manual is used to determine the number of points assigned to the various sustainable design options listed in Zoning Code §155.5802.B. The number of points corresponds to the level of achievement of one or more of the sustainable goals of the city (listed above), as well as the specific categories addressed. For instance a design option which has a significant impact on addressing stormwater management will be worth more points than a design option which has a less significant impact on stormwater management. Further, a design option that addresses stormwater management will be worth more points than a design option that addresses bicycle facilities. Finally, a design option that addresses multiple categories will typically be worth more points than a design option that solely addresses one category. Additional considerations for points include the impact on improving citywide sustainability, improving resiliency, improving public health, and if it is a place making mechanism.

Unlisted Sustainable Design Options (Aka “Other Design Options”)

The design options included in the manual are not intended to be an exclusive list of all design options. Applicants are encouraged to propose other sustainable design options, especially those that may relate better to their development. Further, since sustainable technology continues to evolve, it is the expectation that this manual will be updated to include new design options accordingly.

Applicants requesting sustainable design points via an “Other / Unlisted Sustainable Design Option” shall have their request evaluated by the Development Services Director utilizing the same criteria listed above in the Sustainability Points section. Additionally, points will be awarded based on the points listed for design options with a similar impact as the requested “Other / Unlisted Sustainable Design Option”. Points will not be awarded for an “Other / Unlisted Sustainable Design Option” which is otherwise required by the Zoning Code, Code of Ordinances, Building Code, or Florida Fire Prevention Code. Further, due to the incentives available for brownfield redevelopment throughout the Zoning Code, brownfield redevelopment shall not be eligible for sustainable points.

Adopted by Reference

The following documents are adopted by reference: Broward County Climate Change Action Plan Report (May 4, 2010); Broward County Resiliency Report “Working Towards Resilient Coastal Communities: Pompano Beach (2014)”; and “Native Plants for Coastal Restoration: What, When, and How for Florida” (2007).

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CATEGORY 1: STORMWATER MANAGEMENT AND FLOOD REDUCTION

A. BASIC INFORMATION

The goal of this category is two-fold, retain and treat stormwater onsite and reduce the City's vulnerability to flooding. Both economic development and quality of life is significantly impacted by flooding. The negative consequences of stormwater contaminated with trash, oil, and other toxins entering natural bodies of water are well established. Therefore managing stormwater runoff is a top priority for the City.

Stormwater is defined as water that accumulates on land as a result of storms. While new development (and redevelopment) is required to install drainage systems designed to handle certain level of storms (such as a 10-year storm lasting 24 hours and delivering 10 inches of rain), the volume of rain frequently exceeds system designs. During South Florida's rainy season, when one rain event quickly follows another rain event, drainage systems throughout the City cannot effectively handle the stormwater runoff and flooding occurs. After heavy rains it is normal for rainwater to take 24 to 72 hours before it completely percolates into the ground. The resulting flooding adds an incredible amount of stress to the City's stormwater infrastructure and causes damages to both the City's transportation and utility infrastructure.

Further, as urban development continues, more of the City is covered by impervious surfaces (streets, buildings) that do not retain precipitation and thus produce greater volumes of polluted runoff.

Reducing pollutants from entering the groundwater or surface water should be considered for all developments, regardless of location. The City prefers sites be designed as Low Impact Development (LID), which encourages management of stormwater on site through vegetated treatment networks. Therefore many of the design options listed in this category integrate LID design principles. The goal of LID and its various design components are to enhance water recharge capabilities of development sites; reduce the number and size of traditional stormwater retention/detention facilities; minimize the size and extent of structural components of the stormwater system; and improve the quality of stormwater that flows to receiving basins or natural water bodies.

Managing stormwater and reducing seasonal flooding is a particular challenge in areas of the City with limited pervious areas, such as large industrial developments or uses with large surface parking lots. While required to handle certain level of storms, these developments are particularly encouraged to implement additional design options that increase on-site stormwater management and decrease flooding. The design options in this section include those that retain stormwater on-site and, in some cases, treat the stormwater.

B. DESIGN OPTIONS

Increased Pervious Area with LID Design is a site that provides twice the required amount (200%) of the minimum pervious area and designs the pervious area with Low Impact Development (LID) design techniques. ***Specific LID design requirements are included in the appendix, however applicants may request to utilize other LID best practices.*



Preferred Locations: Increased Pervious Area with LID Design is preferred for industrial uses, residential uses, and any location in the city that has increased vulnerability to flooding.

Vehicular Use Area Designed with LID Design Techniques are parking lots and other vehicular use areas designed in order to manage stormwater on site through a vegetated treatment network. Techniques including shallow bio-retention, rain gardens, curb cuts and inverted medians that direct stormwater into vegetated areas, drought tolerant ground covering in lieu of sod, and increased use of trees. Pervious pavement may also be used. ***Specific LID design requirements are included in the appendix, however applicants may request to utilize other LID best practices.*



Preferred Locations: Vehicular Use Area Designed with LID Design Techniques is preferred for sites with large parking lots, such as shopping centers, institutional uses, office buildings, and municipal parking lots. However the benefits of low impact design for parking lots are beneficial citywide.

Dry Retention Area Designed with LID Design Techniques are dry retention areas designed as either rain gardens or other bio-retention areas. Both of these LID techniques utilize soil, plants, and microbes to treat stormwater. Raingardens are depressions filled with soil media (referred to as bio-retention soil), topped with mulch, and planted with dense Florida-Friendly Landscaping vegetation. If designed properly, LID dry retention areas are capable of removing nitrogen, phosphorous, metals, hydrocarbons, and pathogens through filtration, sedimentation, plant uptake, and biological processes. Ideally dry retention areas designed with LID design techniques should be located to receive runoff from hard surfaces such as roofs, downspouts, parking lots, or driveways. Preferred plant species include deep-rooted plants and grasses which grow naturally in wetland habitats, but which can also withstand periods of drought. Dry retention areas designed with LID design techniques are not intended to be ponds. Their design should limit retaining water for no more than 72 hours after rain ceases. ***Specific LID design requirements are included in the appendix, however applicants may request to utilize other LID best*



practices.

Preferred Locations: Dry Retention Area Designed with LID Design Techniques are preferred for sites with dry retention.

Roof Runoff Diverted to Planter Boxes

are a bio-retention treatment control device specifically located to capture the stormwater runoff from roofs. The boxes can be comprised of a variety of materials, such as brick or concrete, (usually chosen to be the same material as the adjacent building or sidewalk) and are filled with gravel on the bottom (to house an underdrain system), planting soil media, and vegetation. ****Specific LID design requirements are included in the appendix, however applicants may request to utilize other LID best practices.**



Preferred Locations: Preferred locations for Roof Runoff Diverted to Planter Boxes are sites along Dixie Highway, Downtown Pompano Beach, East Atlantic Boulevard, and other locations within the City with minimal setbacks and reduced pervious requirements. The image on the left shows that planter boxes can be very minimal in width and are therefore complimentary to an active pedestrian realm.

Roof Runoff Diverted to Bio-Retention Area is the diversion of 100% of roof runoff to either a rain garden, bio-swale, or similar LID landscaped area. ****Specific LID design requirements are included in the appendix, however applicants may request to utilize other LID best practices.**



Preferred Locations: Preferred locations for Roof Runoff Diverted to Bio-Retention Area is preferred for industrial developments, or other developments with expansive roof areas. The image shows a rain garden at the University of Florida. The downspouts of the roof were realigned to direct all runoff to the rain garden. The sunny location helps ensure the rain garden can dry in between periods of rain events.

Dune Restoration is the reestablishment of the City's beachfront dune system in a design that achieves the optimal dune width, height, slope, elevation, and vegetation and dirt materials. These standards will result in a sustainable interconnected dune system which helps stabilize shorelines. The dunes act as flexible barriers to ocean storm surges and waves. In addition, they provide a habitat for many animals, including migratory birds. ****Specific design requirements are included in the appendix.**



Preferred Locations: Dune Restoration are ideal for all oceanfront uses.

Green Roofs are rooftops planted with vegetation and contain a waterproof membrane. They consist of a vegetative layer that grows in a specially-designed soil, which sits on top of a drainage layer. They provide temporary storage of rainwater and can both retain and permanently remove rainwater. Since stormwater runoff from rooftops is a major contributor to groundwater contamination, especially in urban areas, green roofs are especially beneficial for pollution control. In addition to reducing stormwater volume, the extensive benefits of green roofs include reducing surface temperatures and heat island effect, reduce noise pollution, reduce roof maintenance costs, increase building energy performance, increase the life of the roof, increase biodiversity and habitats for birds and butterflies. Green roofs developed as community gardens have the additional benefit of creating a local, healthy food source.

Based on the depth of the media (and intended use) green roofs are either considered passive or active. Active green roofs are typically more expensive to construct and maintain due to additional substrate material, plant selection, added structural reinforcement, and safety design options. The top two images show passive green roofs in Florida. Green roofs in South Florida are more challenging to develop when compared to more mild climates. Florida native plant material and irrigation systems must be installed



Preferred Locations: Green Roofs are preferred for buildings with large, expansive roofs, such as industrial buildings and self-storage buildings. Green roofs are also preferred within the City's pedestrian oriented corridors. The top image shows the visually pleasing aesthetics of a green roof on a single-story retail building in Downtown Disney. The middle image is a green roof on a courthouse Miami. The bottom image is an active green roof on an office building in Aventura. Similar uses, such as hotels and parking garages, offer opportunities to install a green roof. Also locations declared food desserts by the Transforming Our Community's Health (TOUCH) Initiative are ideal locations for roof top community gardens.

Parking Garages can significantly reduce the amount of paved areas and are an essential component to compact development. This image is of a parking garage that integrates public art into the façade. Parking garages can also include green walls or green roofs, thereby further decreasing stormwater runoff.



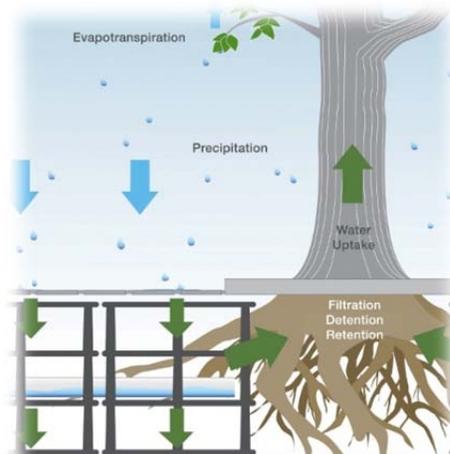
Preferred Locations: Preferred locations for Parking Garages are the City's transit-oriented districts as well as throughout the barrier island. They are a benefit citywide to multifamily residential projects due to the added benefit of protected parking for residents.

Pervious Pavement allows stormwater to percolate through the paving and into the ground before it runs off. This process is able to reduce stormwater runoff volumes and minimize the pollutants in the stormwater. Pervious pavement has successfully been implemented in vehicular use areas and pedestrian areas. The image shows permeable pavers used for the parking spaces, while standard asphalt is used for the drive aisle. Pervious pavement does require ongoing maintenance, which should be considered when choosing to implement this design feature. *** Specific LID design requirements are included in the appendix, however applicants may request to utilize other LID best practices.*



Preferred Locations: Preferred locations for Pervious Pavement is for sidewalks, recreation trails, off-street and on-street parking spaces, as well as other paved areas citywide.

Modular Suspended Pavement System are modular structures that provide un-compacted soil volumes under paved surfaces and can support extreme loading weights, thereby making it possible to provide urban trees with large soil volumes even in urban areas with little open space. The un-compacted soil volume in soil cells can also be used for stormwater treatment, creating a bioretention system under paved surfaces. Using structural cells with bioretention soil, stormwater becomes an asset as a way to water the trees. The trees in turn will help cleanse and abstract storm water runoff.



Preferred Locations: Preferred locations for Modular Suspended Pavement System is property within the city's Transit Oriented District, plazas, and any trees impacted by hardscape.

CATEGORY 2: WATER CONSERVATION

A. BASIC INFORMATION

Water Conservation recognizes the value of potable water, the energy required to make water potable, the need to more efficiently use potable water, the need to increase the reuse of non-potable water, and the promotion of water-efficient products. Rainfall is our region's primary source for replenishing our limited freshwater supply and with forecasts calling for continuing extreme dry conditions, water conservation is more important than ever. The City has been subject to a two-day-a-week year-round landscape irrigation restriction to protect water resources and prevent additional water restrictions that may be needed if a water shortage occurs.

The City promotes water conservation through various ways, most notable the OASIS reuse program. The City pulls Broward County wastewater that has been cleaned, treated and is destined for the ocean outfall, into the reuse plant. At the plant, the water is further filtered, disinfected and tested before being sent to irrigation customers through high service pumps. Other important programs include the distribution of plumbing retrofits and educational campaigns.

Water conservation is also an important energy conversation technique. The City of Pompano Beach's drinking water requires a significant amount of energy to be produced. The water is pumped from the Biscayne aquifer to the land surface at two wellfield sites and transported to the water treatment plant. At the plant, the water is membrane softened or lime softened and filtered, fluoridated and disinfected prior to entering the water distribution system.

Water conservation includes design options both inside the structure as well as outside of structures. While presented as a stormwater management technique, rainwater harvesting is an important water conservation component.

B. DESIGN OPTIONS

Water Conservation Via Landscape Design is the design of landscapes that minimize the use of water by the planting of drought tolerant plant material and the design of irrigation systems that conserve water use. Often, the biggest use of water is outdoors for lawn and landscape irrigation. Therefore design techniques which include soil amendments, grouping plants with similar water requirements and proper maintenance are critical aspects water conservation landscape design. Reducing or eliminating sod is an important component of sustainable landscape design. In narrow areas, sod can be replaced with drought tolerant ground coverings. *****Specific design requirements are included in the appendix.***



Preferred Locations: The preferred locations for Water Conservation Via Landscape Design is city-wide. However uses with greater green space, such as planned residential developments and parks, are especially encouraged to

implement this design option. The above image shows ground coverings, used in lieu of sod, in a median.

Florida Water Star Certification is a water conservation certification program in Florida for new and existing homes and commercial developments. Standards and guidelines for water efficiency are included for: Indoor fixtures and appliances, Landscape design, and Irrigation systems



Preferred Locations: The preferred locations for Florida Water Star Certification is residential and commercial developments. The above courtyard is at a Florida Water Star certified office building in Orlando.

Stormwater Harvesting is the capture, diversion, and storage of roof runoff for later reuse. It is predominately used to provide water for non-potable activities, such as for landscape irrigation, decorative ponds, and supply for cooling towers, evaporative coolers, fluid coolers and chillers. Larger sites may store water in onsite ponds or lakes, while smaller sites might store water in rain barrels or tanks. The below image shows a large rain harvesting tank used for an educational building in Seattle. ***Specific design requirements are included in the appendix.*



Preferred Locations: Preferred locations for Stormwater Harvesting are sites with large roofs and minimal pervious space, such as industrial sites. Rainwater harvesting is also preferred in locations with a large amount of landscaping, such as parks and multifamily residential developments. Single Family properties are also ideal locations for rain barrels. Shopping centers and other locations with water fountains are encouraged to use rainwater harvesting for the water.

CATEGORY 3: RENEWABLE ENERGY AND ENERGY CONSERVATION

A. BASIC INFORMATION

The City is committed to greenhouse gas reduction and therefore increasing the usage of renewable energy and increasing energy performance are also important goals. Renewable energy is fuel sources that restore themselves over short periods of time and do not diminish. Such fuel sources include the sun, wind, moving water, organic plant and waste material (eligible biomass), and the earth's heat (geothermal). The purpose of renewable energy production is to reduce the environmental and economic harms associated with fossil fuel energy. Renewable energy production also increases the City's resiliency as businesses and institutions that are powered by solar or other forms of renewable energy are able to remain in operation even when the power grid is inactive (i.e. power outages caused by hurricanes). Similarly, residential uses that utilize renewable energy sources are less likely to be impacted by power outages.

Increasing renewable energy production can be easily achieved in both small residential projects, such as use of solar heating to heat swimming pools, as well as in large developments, such as solar panels on the roof of a gas station canopy. Oceanfront developments are encouraged to include vertical axis wind turbines which both produce renewable energy and can be aesthetically interesting.

For many sites in Pompano Beach, energy conservation focuses mostly on the building. Focusing on the building makes sense since buildings account for the majority of electricity use and associated greenhouse gas emissions. Improving energy conservation not only decreases the City's reliance on nonrenewable energy sources, but reduces costs to building owners and tenants. Energy conservation also strives for providing occupants with a comfortable, safe, and attractive living and work environment. Increased energy conservation is achieved via architecture, landscaping, intelligent operation of the structures, and/or structural elements.

B. DESIGN OPTIONS

Photovoltaic Energy Production

are photovoltaic cells, designed to turn the sun's energy into electricity. Depending on the size of the roof, the energy needs of the building, and the amount of panels or shingle installed, solar energy can be used to power an entire building's energy needs. However smaller installations, commonly seen in residential uses, can be utilized for heating water for showering, swimming pools, and space heating. Roof-mounted photovoltaic cells must be in accordance with Florida Fire Prevention Code.



Preferred Locations: The preferred locations for Photovoltaic Energy Production are buildings with large, expansive roofs, particularly warehouse developments, big box retail (see top image), and large institutional projects. The top image shows that portions of the roof must be left uncovered in order to preserve adequate fire access. Smaller commercial use roof structures, such as gas station canopies, are also a preferred location, such as gas station canopies (see bottom left image). Solar energy can also be used for outdoor lighting.

Solar Heated Water is the use of solar energy specifically for water heating purposes, either for indoor water use (i.e. showers, laundry) or for pool use. According to energy.gov, solar pool heating is the most cost-effective use of solar energy in many climates. Pool water is pumped through the filter and then through the solar collector(s), where it is heated before it is returned to the pool. In hot climates, the collector(s) can also be used to cool the pool during peak summer months by circulating the water through the collector(s) at night. For indoor water use, the solar heated water is stored in a tank. In two-tank systems, the solar water heater preheats water before it enters the conventional water heater. In one-tank systems, the back-up heater is combined with the solar storage in one tank.



Preferred Locations: While traditionally single family homes have solar heated pools, Solar Heated Water is a preferred option for multifamily developments that include individual or club house pools, as well as community center and hotel pools. Solar heating of indoor water is also preferred for multifamily developments and hotels, as well as certain institutional uses and industrial uses that utilize hot water, such as schools or laundry facilities.

Wind Driven Energy Production are a renewable energy source that converts the kinetic energy in the wind into mechanical power. Based on the orientation of the roter, wind turbines are referred to as vertical axis or horizontal access. wind turbines.



Preferred Locations: The preferred locations for Wind Driven Energy Production are locations with access to wind, including beachfront properties. The image on the left shows vertical wind turbines on a beachfront hotel. Other preferred locations include sites with large open spaces, such as large parking lots or parks. The image on the right shows vertical wind mills at a Broward County Park.

Electric Vehicle Charging Stations incentive the use of electric or plug-in hybrid vehicles. The chargers should be sited at parking spots with access to power. However access to the electric grid is not necessary as some locations are able to power the charging stations with solar energy. When possible, stations should be installed in preferred parking spaces closest to the building, creating a premium parking stall.



Preferred Locations: The preferred locations for Electric Vehicle Charging Stations are parking lots or garages throughout the City. The above image is the University of Central Florida's solar powered electric charging stations. The solar panels also offer shading on the parking spaces.

Energy Star Rated Appliances are certified as energy efficient consumer products and include washers, dryers, dishwashers, refrigerators, freezers, lighting fixtures, ceiling fans, televisions and similar appliances. While the Florida Building Code requires all new air conditioning and water heater units to be Energy Star Rated, it does not require the aforementioned list to be Energy Star Rated.



Preferred Locations: The preferred locations for Energy Star Rated Appliances are residential uses, restaurants, hotels, and institutional uses.

Energy Star Rated Roofing includes roof coatings and shingles that include solar reflective index material which reduce surface temperatures of the roof by significant amounts. The amount of energy needed to cool the building is therefore decreased. Roof coatings can be part of the original structure, or as the image shows, can be retrofitted on an existing structure. Energy Star Rated shingles look like standard roof shingles and come in a variety of colors, including dark colors, even dark browns and grays.



Preferred Locations: The preferred locations for Energy Star Rated Roofing are large, expansive roofs found on larger buildings. Existing roofs on large flat roofs can be easily retrofitted with Energy Star Rated coatings. Angled roofs, particularly in residential developments, are a preferred location for Energy Star Rated shingles.

Energy Star Rated Windows are windows that allow sunlight in but block solar heat gain. This is achieved either via coatings or via gas sealant. Electrochromic glazing provides a dynamic solution to control solar heat gain and light, while preserving the view and connection to the outdoors. Electrochromics provides the capability to control solar gain and light levels based on outdoor conditions without blocking the view. Lighting, heating and cooling consume at least 65 percent of the energy used in a typical building, and effectively controlling solar heat gain has a major impact on all three factors.

Preferred Locations: The preferred locations for Energy Star Rated Windows is residential developments, office buildings, and retail uses which often have numerous windows and are occupied during the day.

Energy Commissioning is a quality-oriented process for achieving, verifying, and documenting that the performance of facilities, systems, and assemblies meets defined objectives and criteria. The Florida Building Code requires an Energy Commissioning Plan for nonresidential buildings with a total cooling capacity of 480,000 Btu/h or greater. While not required for residential buildings or hotels, as well as nonresidential buildings which do not meet the above threshold, a Commissioning Plan not only certifies the energy performance of a building, it is also an effective mechanism for demonstrating increased energy performance. It reflects not only the use of energy star or other energy efficient materials including appliances, roofing, windows, and insulation, but also reflects the energy savings by using window coverings and other architectural techniques.

Preferred Locations: The preferred locations for Energy Commissioning is all multifamily residential buildings and visitor accommodation uses citywide. Additionally warehousing and office buildings are encouraged to demonstrate increased energy performance via a Commissioning Plan.

Heat Reducing Pavement (also referred to as cool pavement) is the using of paving materials on sidewalks, parking lots, and streets that reflect more solar energy, enhance water evaporation, or have been otherwise modified to remain cooler than conventional pavements. The image shows the use of heat reducing pavement in a parking lot.



Preferred Locations: The preferred locations for Heat Reducing Pavement are developments with large surface parking lots, including shopping centers and office parks.

CATEOGRY 4: CERTIFIED GREEN DEVELOPMENT

A. BASIC INFORMATION

Buildings can have a major impact on the natural environment during their duration of construction, renovation, demolition and occupancy process. The building process uses energy, water and other resources that may be costly and negatively impacting its surrounding environment. There are state and national agencies and organizations that certify both buildings and sites as sustainable. A sustainable site can be a reflection of landscaping, water conservation, and other sustainability measures. Applicants requesting points as a Certified Green Development will need to provide documentation throughout the application and development process to ensure the project is on target to receive the certification.

B. DESIGN OPTIONS

LEED Certification (Leadership in Energy & Environmental design), is a green building certification program that recognizes best-in-class building strategies and practices. To receive LEED certification, building projects satisfy prerequisites and earn points to achieve different levels of certification.



Florida Green Building Coalition offers projects in Florida certifications to encourage building owners to adopt green and sustainable strategies during the design and construction of their project and to receive recognition for their efforts.



Energy Star Rated Certified Building is a government-backed program for certifying energy-efficient buildings.



Other National or State Recognized Green Building Certification is a building or site which has been certified as "green development" or "sustainable development" by a recognized certification organization.

Preferred Locations: The preferred locations for Certified Green Development are citywide.

CATEGORY 5: ACTIVE DESIGN

A. BASIC INFORMATON

Architecture, urban design, and site design can improve public health by designing developments that encourage walking, bicycling, and other forms of active transportation and recreation. Architecture, urban design, and site design can also create a community where residents, workers, and visitors can relax, recreate, gather together or enjoy solitude. By providing civic and public spaces, the City fosters community pride, defines the public realm, and supports urban culture. Ensuring access to beaches, the intercoastal waterway, parks and other recreational facilities, are also important attributes of a sustainable community. Active Design also considers the capacity of all people to access and utilize open spaces safely, regardless of age or ability.

Active design includes the provision of onsite recreational facilities and access to off-site recreation facilities. Onsite facilities are those amenities that are located directly onsite, such as a playgrounds, recreation paths, shaded courtyards, or similar design options. Offsite access to recreational facilities includes access to abutting waterways, including boat docks or pedestrian paths, access to the City’s beaches, via dedicated public easements, or direct access to a City park or plaza. It is important that the design of onsite facilities and/or access to offsite facilities are safe, appealing, and comfortable and therefore encourage daily physical activity and avoid pedestrian injuries.

Active design also includes other features which encourages residents and visitors to walk, bike, use boats, and use transit.

Projects located adjacent to the City’s major transportation corridors are encouraged to implement design options which improve the walkability of streets both within and adjacent to their developments. Large planned developments should consider the walkability of internal sidewalks. Developments adjacent to the beach, waterways, and parks are encourage to allow for public access to these natural resources. All developments are encouraged to offer bicycle parking that is safe, secure, and offers shelter.

B. DESIGN OPTIONS

Enhanced Recreation Paths include bicycle paths, trails, and other facilities created for pedestrian traffic whose design encourages year-round use. Design components accommodate pedestrians, skaters, bicyclists, and wheelchair users. ***Specific design requirements are included in the appendix.*



Preferred Locations: The preferred locations for Enhanced Recreation Paths are large residential developments, locations adjacent to an existing recreation path, properties along a major corridor, or properties within the Transit Oriented District.

Enhanced Private Recreation Spaces refers to outdoor recreational amenities provided onsite exclusively to residents or occupants of the site, in order to encourage public health and exercise. Typical design options include shaded playgrounds, recreation facilities, or boating facilities, but does not include pools or club houses. ***Specific design requirements are included in the appendix.*



Preferred Locations: The preferred locations for Enhanced Private Recreation Spaces are multifamily residential projects and institutional uses.

Public Recreation Spaces is the provision of dedicated public space on private property. Examples include playgrounds, plazas, and amphitheatres which are open to the public and whose design ensures that all people, regardless of age or ability, are able to access and utilize open spaces safely. The image is of the public amphitheater at a shopping center in Delray Beach. The amphitheater hosts many public events, including concerts, at a privately developed shopping center. ***Specific design requirements are included in the appendix.*



Preferred Locations: The preferred locations for Public Recreation Spaces are shopping centers, office buildings, residential projects, institutional uses, and sites within the Transit Oriented District.

Access to Public Park ensures the public's access to and enjoyment of City Parks. This design option is specific to properties directly abutting a City Park. In some instances the access will be similar to the image, and offer direct access from a building to a park. In other instances, the access will be via a dedicated entrance from the private property to the public park. Signage, bicycle and automobile parking, and other inviting features should encourage access to the abutting park. ***Specific design requirements are included in the appendix.*



Preferred Locations: The preferred locations for Access to Public Park properties abutting a City park.

Public Access to Waterway or Beach ensures the public's access to and enjoyment of the City's most valuable natural resources. Access can be linear, such as beach access along the side of a property. At a minimum, linear access should include lighting and signage. For properties abutting a waterway, dedicated access that traverses the waterway is highly desirable. Visual access, should include pedestrian amenities such as seating and lighting. Properties which include physical access, such as boat or kayak docks, may be eligible for additional sustainable points. ***Specific design requirements are included in the appendix.*



Preferred Locations: The preferred locations for Public Access to a Waterway or Beach are any waterfront or beachfront property.

Streetscape-Oriented Site Design refers to buildings which are placed along the front (or street side) property line in an effort to frame the street and create an interesting, pedestrian-oriented streetscape.



Preferred Locations: The preferred locations for Streetscape-Oriented Site Design are properties located along major arterials with a Zoning District which does not require a front or street side yard setback.

Public Art creates a walkable, welcoming community with a strong sense of place, while giving the City a meaning and providing the public with a unique and enjoyable experience. Public art can be implemented as a stand along art piece, or can easily be integrated into functional components of a site, such as bicycle parking (see in the image), benches, landscape design options, or shading. ***Specific design requirements are included in the appendix.*



Preferred Locations: The preferred locations for Public Art are shopping centers, public plazas, properties along a major corridor, or properties within the Transit Oriented District.

Indoor Bicycle Parking contains storage areas inside commercial or retail buildings for bicycle commuters.



Preferred Locations: The preferred locations for Indoor Bicycle Parking are residential developments, hotels, office buildings, institutional uses, and retail uses.

Bicycle Lockers are enclosures that are designed to secure usually one bicycle per unit. They are used as parking options for bicycle commuters as a secure option for both long and short term parking and storage.



Preferred Locations: The preferred locations for Bicycle Lockers are office buildings, institutional uses, and shopping centers.

Bicycle Shelters are storage facilities that provide bicyclists with covered bike parking to protect against the elements and are compatible with a large variety of bicycle racks.



Preferred Locations: The preferred locations for Bicycle Shelters are residential uses, office buildings, institutional uses, and shopping centers.

List of Preferred Locations / Project Types and design options

The below information is presented as a guide for property owners, developers, and other stakeholders. It lists the City's preferred sustainable design options for specific project locations and project types. This list is provided simply as a recommendation and applicants may apply for any points listed in Table 155.5802.B.

Residential Development

Residential Development is one of the greatest consumers of potable water, including for bathing, washing clothes and dishes, flushing toilets, watering lawns and gardens, and maintaining pools. Therefore integrating design options that address water conservation are highly preferred. Also preferred for residential development are design options that increase recreation opportunities for residents. Finally, implementing design options that increase the energy efficiency of the site, building, or its various components not only ensure the affordability of housing in the City, but increase the amount of money residents can therefore spend at the City's restaurants and shops. Below are the preferred design options for residential uses:

- Double Pervious Area Designed with LID Design Techniques
- Water Conservation Via Landscape Design
- Florida Water Star Certification
- Stormwater Harvesting
- Enhanced Recreation Paths
- Enhanced Private Recreation Spaces
- Electric Vehicle Charging Stations
- Indoor Bicycle Parking
- Solar Heating of Water
- Energy Star Rated Appliances
- Energy Star Rated Roofing
- Energy Star Rated Windows
- Energy Commissioning
- Pervious Pavement
- LEED Certification
- Florida Green Building Coalition Certification
- Energy Star Rated Building
- Access to Public Park
- Access to Waterways or Beach
- Streetscape-Oriented Site Design

Shopping Centers

Large parking lots and large roof areas make shopping centers prime locations for design options that address stormwater management and flood protection. Shopping areas can also become new town centers and have the ability to generate the City's sense of place. Finally, shopping centers can promote the use of a multimodal transit system by integrating design options that encourage bike riding, improve the pedestrian experience, and promote the use of alternative energy vehicles. Below are the preferred design options for Shopping Centers:

- LID Design of the Vehicular Use Area
- Florida Water Star Certification
- Parking Garages
- Streetscape-Oriented Site Design
- Electric Vehicle Charging Stations
- Public Recreation Spaces
- Public Art
- Stormwater Harvesting

- Heat Reducing Pavement
- Roof Runoff Diverted To Planter Boxes
- Photovoltaic Energy Production
- Solar Outdoor Lighting of VUA
- Bicycle Shelters
- LEED Certification
- Florida Green Building Coalition Certification
- Energy Star Rated Building
- Modular Suspended Pavement System

Office Buildings

Office buildings, whether used for commercial or institutional uses, should integrate design options that improve the work environment for the employees. Further, addressing water usage and water conservation are priorities, especially related to bathroom usage. Design options that encourage employees to utilize a multimodal transit system can make a significant impact. Below are the preferred design options for Office Buildings:

- Energy Star Rated Roofing
- Energy Star Rated Windows
- Energy Commissioning
- Electric Vehicle Charging Stations
- Double Pervious Area Designed with LID Design Techniques
- Vehicular Use Area Designed with LID Design Techniques
- Bicycle Lockers
- Bicycle Shelters
- Indoor Bicycle Parking
- Heat Reducing Pavement
- LEED Certification
- Florida Green Building Coalition Certification
- Energy Star Rated Building
- Photovoltaic Energy Production
- Stormwater Harvesting
- Public Recreation Spaces
- Streetscape-Oriented Site Design

Institutional Uses

Institutional Uses, which may include schools, medical facilities, government buildings, community centers, etc... have the opportunity to address the needs of their employees, visitors, and operating budgets by implementing sustainable design options. Efficiency and environmental stewardship is the core components of the design options preferred for these uses. Below are the preferred design options for Institutional Uses (However the preferred uses may be dependent on the type of institutional use.):

- Double Pervious Area Designed with LID Design Techniques
- Vehicular Use Area Designed with LID Design Techniques
- Photovoltaic Energy Production
- Solar Heating of Water
- Electric Vehicle Charging Stations
- Energy Star Rated Roofing
- Energy Star Rated Windows
- LID designed Parking Lots
- Bicycle Lockers
- Bicycle Shelters

- Indoor Bicycle Parking
- LEED Certification
- Florida Green Building Coalition Certification
- Energy Star Rated Building
- Dry Retention Area Designed with LID Design Techniques
- Roof Runoff diverted to Bio-Retention Area

Industrial and Warehouse Developments

Large expansive buildings, large parking lots needed to accommodate trucks and heavy equipment, and sites developed prior to annexation have resulted in areas of City which are more flood prone and should implement design options focused on stormwater management and flood protection. Below are the preferred design options for Industrial and Warehouse Developments:

- Double Pervious Area Designed with LID Design Techniques
- Vehicular Use Area Designed with LID Design Techniques
- Dry Retention Area Designed with LID Design Techniques
- Bio-swales
- Roof Runoff Diverted to Bio-Retention Area
- Green Roofs
- Onsite Photovoltaic Energy production
- Energy Star Rated Roofing
- LEED Certification
- Florida Green Building Coalition Certification
- Energy Star Rated Building
- Water Conservation Via Landscape Design
- Florida Water Star Certification
- Stormwater Harvesting
- Energy Commissioning

Oceanfront and Waterfront Development

Properties abutting the City's beach or waterways offer specific opportunities to implement design options that address coastal hazards and improve the City's natural resources. Below are the preferred design options for ocean and waterfront development:

- Dune restoration
- Access to Waterways or Beach
- Public Recreation Spaces
- Parking Garages
- Solar Heating of Water
- Photovoltaic Energy Production
- Wind Driven Energy Production
- Double Pervious Area Designed with LID Design Techniques
- Vehicular Use Area Designed with LID Design Techniques
- Florida Water Star Certification
- Stormwater Harvesting
- Pervious Pavement
- LEED Certification
- Florida Green Building Coalition Certification
- Energy Star Rated Building
- Enhanced Recreation Paths
- Bicycle Shelters
- Indoor Bicycle Parking

- Streetscape-Oriented Site Design

Transit Oriented Development

Properties located within the City's TO District typically have lower pervious requirement than other areas of the City. Further these properties are required to be designed in a way that is more transit and pedestrian oriented. The preferred design options reflect the needs and urban form of this District:

- Modular Suspended Pavement System
- Indoor Bicycle Parking
- Parking Garages
- Bicycle Shelters
- Public Art
- Public Recreation Spaces
- Stormwater Harvesting
- Heat Reducing Pavement
- Roof Runoff Diverted to Planter Boxes
- Solar Heating of Water
- Enhanced Onsite Private Recreation Spaces
- Electric Vehicle Charging Stations
- Enhanced Recreation Paths
- Public Access to Waterways or Beach
- Public Access to Park
- LEED Certification
- Florida Green Building Coalition Certification
- Energy Star Rated Building
- Florida Water Star Certification

APPENDIX

Design Requirements

Compliance with the following standards is required in order to receive applicable design option points.

Dune Restoration:

1. Dune width: 50 to 100 feet as measured perpendicular (shore-normal) to the shoreline.
2. Dune height: 3 to 4 feet above the back beach berm (surface of sand).
3. Dune Crest Elevation (NAVD): +11.5 to +13.0 feet above mean sea level.
4. Distance from mean high water line: landward of the ECL or minimum 100 feet landward of mean high water line.
5. Slope: 1:10 to 1:5 on seaward slope; 1:1.5 max. on dune ridge (peak); average 1:3 on landward slope.
6. Vegetation: minimum 3 species indigenous to area; > 70 percent composed of dune grasses; zoned seaward pioneers (railroad vine, seaside purslane), middle sand trapping grasses (sea oats, bitter panicum, marshhay), landward dune grasses and shrubs (saw palmetto, sea grape, bay cedar, sea lavender, necklace pod, etc.); invasive plant removal qualifies for mitigation.
7. Sand: Sand placed on the beach or seaward of the frontal dune shall be predominately of quartz, carbonate or similar material and shall meet the following criteria:
 - a. Silt, clay or colloids passing the #230-sieve (4.0phi) shall not exceed 5% by weight;
 - b. Not contain greater than 5% by weight of fine gravel retained on the #4-sieve (- 2.25phi);
 - c. Not contain coarse gravel, cobbles or material retained on the three-quarter inch sieve in a percentage or size greater than found on the native beach;
 - d. Not contain construction debris, toxic material above background levels, clay balls, or other foreign matter;
 - e. Not contain frangible carbonate material that would result in cementation of the beach;
 - f. Material shall have a moist Munsell color value of 6 or lighter; and
 - g. Mean grain sizes shall fall between 0.25 mm and 0.55 mm.
8. Access: angle paths toward Southeast; sand paths 3 ft. wide for single family, 5-ft max. width MFD; walkovers 4-ft wide max. SFD, 6-ft. wide max MFD; sand paths acceptable for lower height dunes (<11.5 ft NAVD); beach mats ok in dune areas.
9. Post and rope: ok in high traffic areas if meet DEP guideline.
10. Sand fences: not recommended due to concerns with interference with sea turtle nesting.

Enhanced Recreation Paths:

- 1) Minimum Length is ¼ linear mile;
- 2) Minimum width is 10 feet;
- 3) Pervious pavement and/or heat reducing pavement is required;
- 4) The use of differing pavement materials, markings, or other means that demarcate space for various modes of pedestrian traffic is required;

- 5) Shading, either via landscaping or canopies or both, which increases the year-round usage, is required; and
- 6) Sufficient lighting, including the use of solar lighting for areas not located near a power source is required.
- 7) While not required, recreation paths that connect to an adjacent park or open space are highly desirable and are eligible for extra points.

Public Recreation Spaces

- 1) Public Easement shall be provided
- 2) The space shall be either 5% of the total site area or 2,500 sq ft, whichever is greater.
- 3) If paved, pervious pavement and/or heat reducing pavement is required;
- 4) Shading, either via landscaping or canopies or both, is required;
- 5) Sufficient lighting, including the use of solar lighting for areas not located near a power source, is required;
- 6) Pedestrian features such as benches and trash receptacles are required;
- 7) Wayfinding signage shall be provided that indicates the public access;
- 8) The recreation space shall be in a location that encourages use by the public; and
- 9) The recreation space shall be designed in a manner that is open to the public and it shall not be used for sidewalk café purposes.
- 10) While not required, additional features such as amphitheater, water fountains or water features, and public art are eligible for extra points.

Enhanced Private Recreation Spaces

- 1) The space shall be either 5% of the total site area or 2,500 sq ft, whichever is greater.
- 2) The space shall be fully shaded.
- 3) If paved, pervious pavement and/or heat reducing pavement is required.
- 4) Sufficient lighting, including the use of solar lighting for areas not located near a power source, is required.
- 5) Eligible spaces include:
 - o Fully shaded play grounds or tot lots or similar outdoor recreation areas
 - o Kayak and/or boat ramps and dockage (In order to be eligible for the points, the kayak and/or boat ramps and dockage shall be available for all residents and not permanently leased.)
 - o Community Gardens
- 6) Swimming pools, club houses, and indoor gyms are not eligible for points.

Public Access to Public Park

- 1) Public Easement shall be provided
- 2) Bicycle Racks shall be provided
- 3) Wayfinding signage shall be provided that indicates the public access
- 4) Lighting shall be provided, as well as features to ensure safety.
- 5) While not required, off-street parking spaces are highly desirable for certain parks and may be eligible for extra points.

Public Access to Waterways or Beach

- 1) Public Easement shall be provided

- 2) Minimum width is 10 feet;
- 3) Pervious pavement and/or heat reducing pavement is required;
- 4) Shading, either via landscaping or canopies or both, is required; and
- 5) Sufficient lighting, including the use of solar lighting for areas not located near a power source, is required;
- 6) Pedestrian features such as benches and trash receptacles are required;
- 7) Wayfinding signage shall be provided that indicates the public access; and
- 8) For public access to the beach, showers are required.
- 9) While not required, public access along the waterway with public boats dockage or ramps is highly desirable and are eligible for extra points.

Public Art

- 1) Option 1 - A fee equal to 1 percent of the project's construction costs; OR
- 2) Option 2 - A piece of artwork valued at 1 percent of the project's construction costs.
 - a. The artwork shall be accessible to the public and may be displayed in the building's common areas, public open spaces or areas along the street abutting the building.
 - b. Public art proposed for public areas shall be required to receive approval from the City Commission.

LID Design Requirements

***Based on select pages from “Orange County Florida
Low Impact Development Practices Design &
Implementation Guidelines Manual, June 2014”***

(Next pages)