ST. TAMMANY PARISH
LOW IMPACT DEVELOPMENT GUIDEBOOK

PREPARED FOR: ST. TAMMANY PARISH
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1. INTRODUCTION

PURPOSE OF THE GUIDEBOOK

St. Tammany Parish developed this guidebook to ensure that future developments reflect the Parish's values of a sustainable environment for the health of its people, resources, and natural environment. This guidebook for developers, planners, government employees, and designers provides strategies to reduce peak runoff from major storm events, reduce flooding, recharge groundwater, reduce subsidence, and filter pollutants from runoff.

OUR CHANGING CLIMATE

A changing climate has led to a steep increase in natural disasters, leaving many communities at risk. Not only has Southern Louisiana experienced an increase in the frequency and intensity of rainstorms, but it also faces a dual threat of ever-stronger hurricanes and a shrinking coastline that in the past reduced the impacts of storm surges.

With more intense rainstorms, drainage systems, also known as grey infrastructure, sized and constructed for less intense and less frequent storms are quickly overwhelmed. Intense storms drop more rainfall over a short period of time. As a result, the risk of flooding has greatly increased in areas that have never flooded before. Flood levels have increased dramatically in areas previously expected to occasionally flood.

Mean daily temperatures and average highs are rising year over year with each year surpassing the prior's new record temperature. The status quo of new development exacerbates higher temperatures by removing tree canopies and green spaces that help to cool the air. Air temperatures under tree canopies have been documented to be as much as ten (10) degrees Fahrenheit lower. More pavement and less green space create the urban heat island effect which describes the higher temperatures in more urbanized areas compared to surrounding less dense, more green areas. Heat-related deaths are becoming increasingly common. The elderly, the very young, and those with respiratory or cardiac medical conditions are the most vulnerable to experiencing severe health trauma or death from extreme heat.

St. Tammany Parish has experienced 46 percent growth in population and commensurate increased land development in the last ten years. This rapid pace of development causes a strain on the Parish's infrastructure, if not done sustainably. To create a more resilient parish that can adapt and withstand the pressures of climate change and development, principles of Low Impact Development (LID) should be incorporated into all new development projects. LID provides many benefits as described below.

WHAT IS LOW IMPACT DEVELOPMENT?

Low Impact Development (LID) is a planning and design approach that conserves existing vegetation, hydrology, topography, and wildlife habitat as much as possible. This requires that a site plan, large or small, works with existing site and surrounding conditions to incorporate buildings, roadways, parking lots, and other features. LID aims to conserve a site's pre-development hydrology by taking advantage of its existing natural features and drainage patterns. Existing trees and vegetation are protected, and developers work with existing topography, limiting grading and the extent of cut and fill on site.

Nature-based solutions, which mimic natural ecological functions, are used in the planning and design of stormwater management systems (green infrastructure), open space, and recreation areas. Utilizing natural processes such as infiltration, evapotranspiration, and detention, LID can be applied on a variety of development scales to restore and conserve habitats and watersheds. LID promotes public health, safety, and welfare by providing greater protection for and conservation of water resources, ecological processes, environmental quality, and community character. Conserving water resources helps protect quality of life and promote environmentally sustainable economic growth.

2. LID STRATEGIES

MANAGE STORMWATER WHERE IT LANDS

In order to decrease runoff, each development site should maximize stormwater storage as close as possible to where rainfall lands. This can be accomplished by utilizing existing green spaces and forest stands, designing distributed green infrastructure facilities, and planning detention/retention ponds as central amenity features. The result is less stormwater runoff that enters the drainage system due to ground infiltration and evapotranspiration by plants.

MINIMIZE IMPERVIOUS SURFACES

Impervious material does not allow for the infiltration of stormwater into the soil. Impervious material such as concrete, asphalt, and rooftops should be minimized to reduce runoff. Less paving and the use of pervious paving can be used for parking and pedestrian walkways and plazas. Multi-story buildings can contain the same square feet of space, but in a smaller footprint and with a smaller rooftop. The cost of two-story residences can be readily offset by reduced length of linear infrastructure using cluster development.

INTRODUCE MORE NATIVE VEGETATION

Vegetation, particularly trees, intercept and transpire rainwater as it falls and stores water in leaves, branches, and roots. In addition, plant roots and soil microbes filter stormwater and prevent erosion. Trees provide shade to reduce air temperatures which minimizes the urban heat island effect. Carbon and other pollutants are removed from the air and sequestered in the plants and soil. Native plants have proven to be best suited to perform all of the ecological services and they are more resilient to stresses in the soils and climate in which they naturally grow. Wildlife species need plants for shelter and food, even in highly urbanized areas. Native plants are naturally well-suited to provide these for birds, butterflies, and other wildlife.

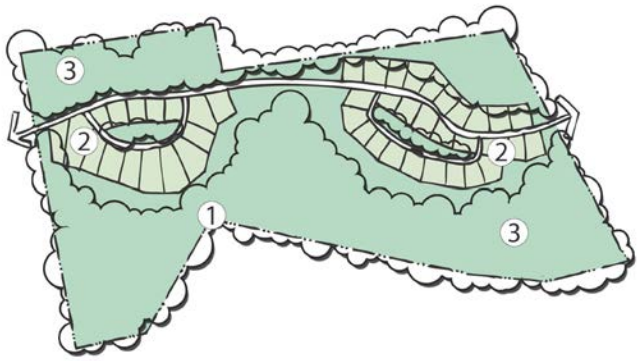
MINIMIZE GRADING

Regrading the topography of a site, usually for the purpose of making the site flatter, creates adverse impacts for the environment and one should take care to consider the existing topography of a site. The existing site topography was formed by its hydrology, soils, and land cover. Some changes to the existing topography will be needed to accommodate development, but must be selectively designed to maximize use of existing hydrologic patterns. Furthermore, when soils are severely disturbed, valuable topsoil is lost and erosion is likely to occur. Any trees or other vegetative cover is typically removed when grading, which destroys tree canopies and wildlife habitats. In fact, more of the natural environment can be conserved and development costs can be reduced if changes to the site's topography are minimized. The cost of development is reduced when less of the site's topography and land cover are disturbed.

INCREASE CLUSTER DEVELOPMENT

Clustering commercial developments provides the opportunity to use shared parking lots, fewer entry drives, reduced pavement, and reduced development footprints. This approach reduces the cost of commercial development compared to development of single parcels, each with its own drive aisle and parking requirements.

Clustering residential dwellings provides the opportunity for even more development cost savings. Many homeowners seek to live in suburban developments for more space, or even to experience more rural, natural landscapes. Typical residential subdivision developments often obliterate the existing natural landscapes, subdivide all the land into residential lots of the same size, line up the lots down long stretches of roads, and expect each resident to create the more rural, natural landscapes they desire on each lot.



Example of clustering lots to preserve existing open space

Filling the project site with parking lots and roads requires massive regrading of the topography and redesign of the natural hydrology into drainage pipe systems. The cost of this approach is very high while it, at the same time, destroys the natural landscape that could otherwise be an attraction for residents. Clustering dwellings on smaller parcels while preserving substantial amounts of the natural landscape, particularly forested areas, allows residents to enjoy the natural landscape, preserves wildlife habitats, assists in stormwater management and can form a sense of place for the development.

In addition, less clearing and grading, shorter roads, and reduced lengths of utilities saves development costs. The reduced length of infrastructure also reduces the cost of operations and maintenance.

CONSERVE NATURAL GREEN SPACES

Closely related to the strategies of minimizing grading and utilizing the existing hydrology of a site, conserving natural green spaces provides multiple benefits in land development. Forests should be conserved in larger stands and used to fulfill stormwater management and landscaping requirements. Large, contiguous forests can better sustain themselves, provide areas for residents to experience nature close to where they live, and provide healthier habitat for wildlife. Wetlands, whether or not jurisdictional, should be conserved. Their presence in unaltered spaces is proof that they are managing large quantities of stormwater and that they should continue to do so as part of the site's low impact development strategy.

3. BENEFITS OF LID

Low impact development provides a myriad of benefits in the environment, hazard mitigation, economics, health, and quality of life. Typical development patterns and methods, on the other hand, can exacerbate hazards and adversely impact the environment and economics. Grey infrastructure consisting of catch basins, large pipe drainage systems, and canals are designed to provide a single benefit of draining stormwater away from buildings to reduce flood risk. The benefits of employing LID practices include the following:

REDUCED FLOOD RISK

Planning a site using LID principles conserves and employs existing hydrologic patterns, topography, and vegetation which reduces the volume and rate of stormwater runoff that would occur using a typical development approach. Instead of becoming runoff, much rainfall infiltrates into the ground and is taken up by plants. Refer to the Site Planning section for more information on how to plan with, conserve, and mimic natural systems.

RECHARGE GROUND WATER

Naturally occurring hydrological stormwater flows move slowly through vegetation, allowing water time to infiltrate into the soil and recharge groundwater. Vast areas of impermeable paving and rooftops along with the traditional approach of removing stormwater off of a site as quickly as possible have intervened in the water cycle and adversely affected water tables.

IMPROVED WATER QUALITY

Rainfall evaporates, is intercepted by plants, and taken up by plants. The remaining rainfall infiltrates into the ground, or becomes stormwater runoff that eventually outfalls into a waterbody. The U.S. Environmental Protection Agency (EPA) designates water bodies as impaired or not impaired for fishing and for swimming. Non-impaired waterbodies do not contain clean drinkable water, but rather are not so polluted to potentially infect a swimmer or to affect the aquatic habitat such that some species no longer survive there.

Stormwater runoff that flows through existing vegetation or planted green infrastructure facilities is not only reduced in volume but also filtered by the plants, soil, and microbes. Heavy metals, carbon, nutrients, suspended sediments, bacteria, and other pollutants are reduced before stormwater flows into municipal drainage systems and waterbodies. Some pollutants are taken up by plants, some are stored in the soil, and some are broken down into non-hazardous forms. Some herbicides are also broken down. Stormwater runoff that flows vertically through green infrastructure facilities that are not plants, such as pervious paving or underground storage tanks, allow suspended sediments to settle at the bottom. Some pollutants are attached to sediment and, therefore, settle at the bottom.

IMPROVE AIR QUALITY

Plants intercept rainfall and, along with soils, capture and sequester pollutants, including carbon and particulate matter, through photosynthesis. Reduced carbon and particulates in the air makes for more healthful air to breath and, therefore, less hazardous to vulnerable populations, such as the elderly, small children, and those with respiratory or cardiovascular disease.

REDUCED URBAN HEAT ISLAND EFFECT

Shade trees reduce temperatures in the air and on the surfaces under their canopies. Plants reduce air temperatures through photosynthesis, evaporation, and transpiration. Days with higher than normal temperatures are becoming more frequent and record highs are increasing every year, which adversely affects the work of those with outdoor jobs, the health of those with respiratory or cardiovascular medical issues, increased dehydration and heat stroke in the very young and very old, the viability of plants and crops, wildlife habitats and wildlife survival, and increased energy use and potential brownouts.

Urban heat island effect causes higher temperatures in areas with more impervious cover, like in highly urban areas.

HEALTHIER POPULATIONS

Improved water and air quality, reduced urban heat island effects, and reduced flood risks provided by LID strategies contribute to residents being healthier. In addition, street trees, green open spaces, and green infrastructure encourage people to walk for exercise and to carry out local errands. This activates residential and commercial streets which makes them safer, more engaging, and more attractive.

CONSERVED NATURAL HABITATS

St. Tammany Parish is known for its rolling terrain, rivers, and forests. People who work on the South shore of Lake Pontchartrain and live on the North shore to be in this setting have known this truth for many years which is why the population is increasing. The use of LID strategies guides development to conserve, protect, and utilize the natural environment as a key feature in the new neighborhood or commercial development. LID offers the only opportunity to conserve the natural landscape of the parish other than to stop developing the land altogether, which is an unworkable and unrealistic strategy.

ECONOMIC COST SAVINGS

As described previously in the LID Strategies, working with the natural environment to plan development sites, utilize existing hydrology and topography, and cluster development while conserving natural areas that create a sense of place and identity for the community. Development costs are reduced by cleaning and grading less land, shorter roadway lengths, and reducing the length of utilities. The conserved natural landscape makes these developments more attractive and potentially worth more in the marketplace.

GENERATE ECONOMIC ACTIVITY

Throughout the country, green infrastructure and recreation projects have catalyzed land development nearby. The Lafitte Greenway in New Orleans is a recent local example in which properties along the three-mile greenway, many of them vacant or dilapidated, were purchased and developed into restaurants, bars, a bike shop, and other retail businesses.

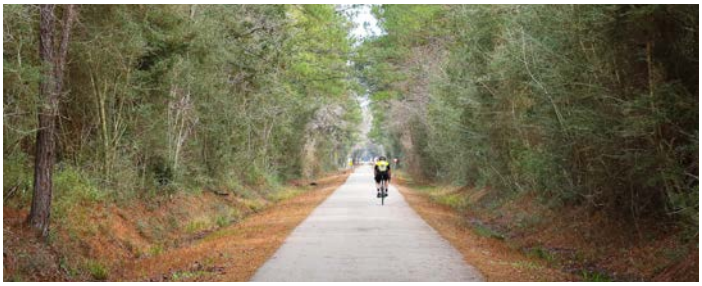
The Tammany Trace trailheads have experienced increased economic activity since opening. Additional activities and development at key points along the Trace could be facilitated by offering more community events and incentives for land development.

IMPROVE ENVIRONMENTAL EQUITY

Communities of color are more likely to have fewer trees, less green open space, and broken or non-existent drainage systems. As a result, the health of residents in these communities is at a higher level of risk. Property damages from flooding in these communities are also at higher risk levels. More trees and green infrastructure in new developments and retrofitted projects in existing communities will help to mitigate the impacts and improve equity.

IMPROVED QUALITY OF LIFE

The cumulative results of the above-described benefits translates into improvement in the overall quality of life for members of the community. By taking walks in the woods on Fountainbleau State Park, fully immersing in nature at campgrounds for a weekend, or going out to Lake Pontchartrain to experience the lake's beauty and wide-open air are activities made possible by green spaces that actively enrich the lives of the people and organisms that utilize them.



Cycling the Tammany Trace; Image courtesy of www.outdoorproject.com

Kayaking on Cane Bayou

4. GREEN INFRASTRUCTURE FACILITIES

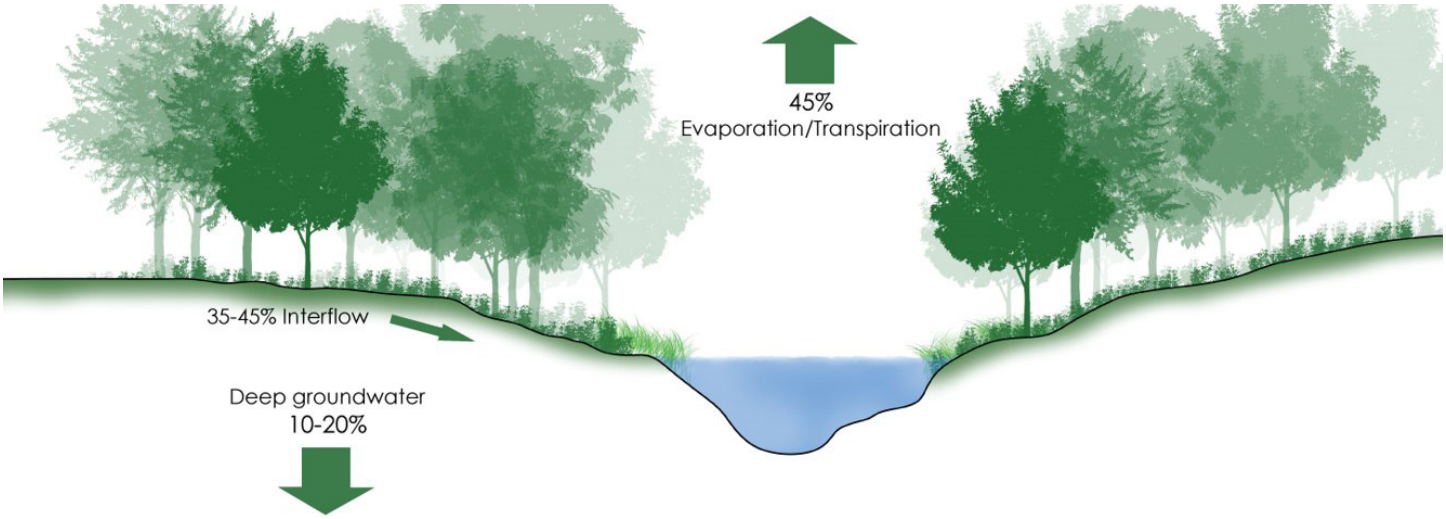
WHAT IS GREEN INFRASTRUCTURE?

Green infrastructure facilities perform one or more of the following functions: detention, infiltration, and/or filtration of stormwater. On undisturbed lands the natural hydrology redistributes stormwater based on soil type, existing typology, and vegetative cover. GI facilities mimic these natural conditions and serve as a supplement for the natural functionality of hydrology absent in built spaces.

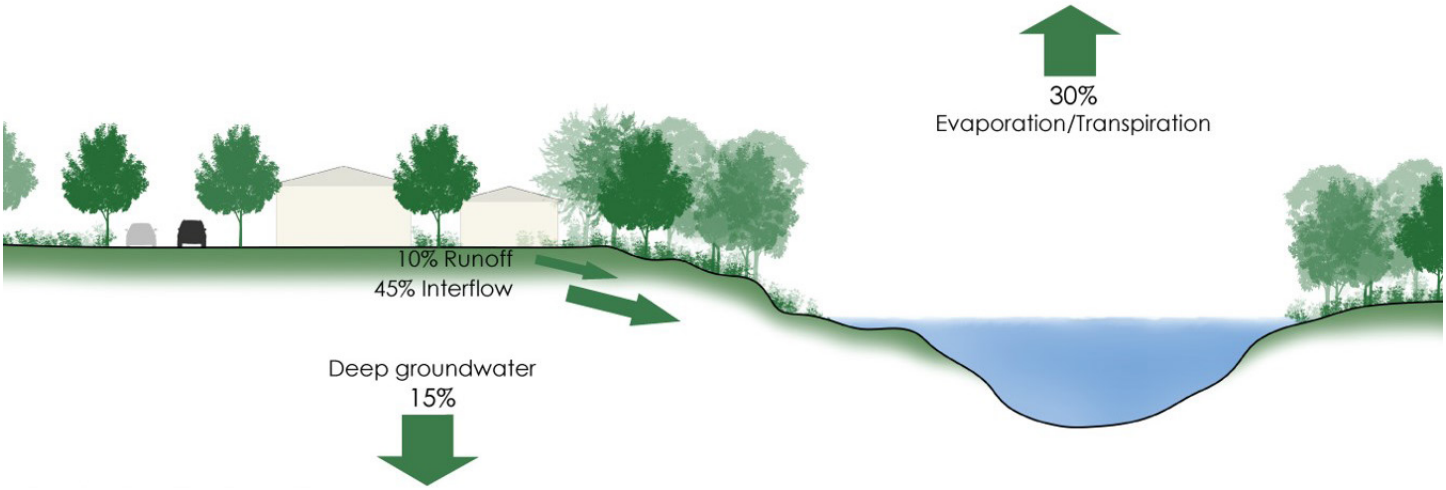
GI facilities temporarily detain stormwater and by extension reduce the demand on grey infrastructure drainage systems particularly when storm intensity is high during the first hours of rainfall. The most efficient, impactful, and cost-effective locations for stormwater detention are as close as possible to where runoff naturally accumulates.

GI facilities provide a longer residence time for water to infiltrate into the ground by detaining stormwater. Infiltration even occurs in soils comprised of high clay content. This is because plant roots can maneuver between small voids in even the densest types of soil. Over time, plant roots "pipe" into the soil, redistributing water and air deeper into the soil, which increases the soil permeability.

GI facilities that filter stormwater slow down runoff and allow sediments time to settle out as it is actively conveyed. The additional time also provides an opportunity for plants and soil microbes to remove or break-down harmful pollutants in the runoff. The resulting water that eventually is discharged into a nearby waterbody is cleaner and less harmful to aquatic life.



Hydrologic Cycle: Natural Conditions

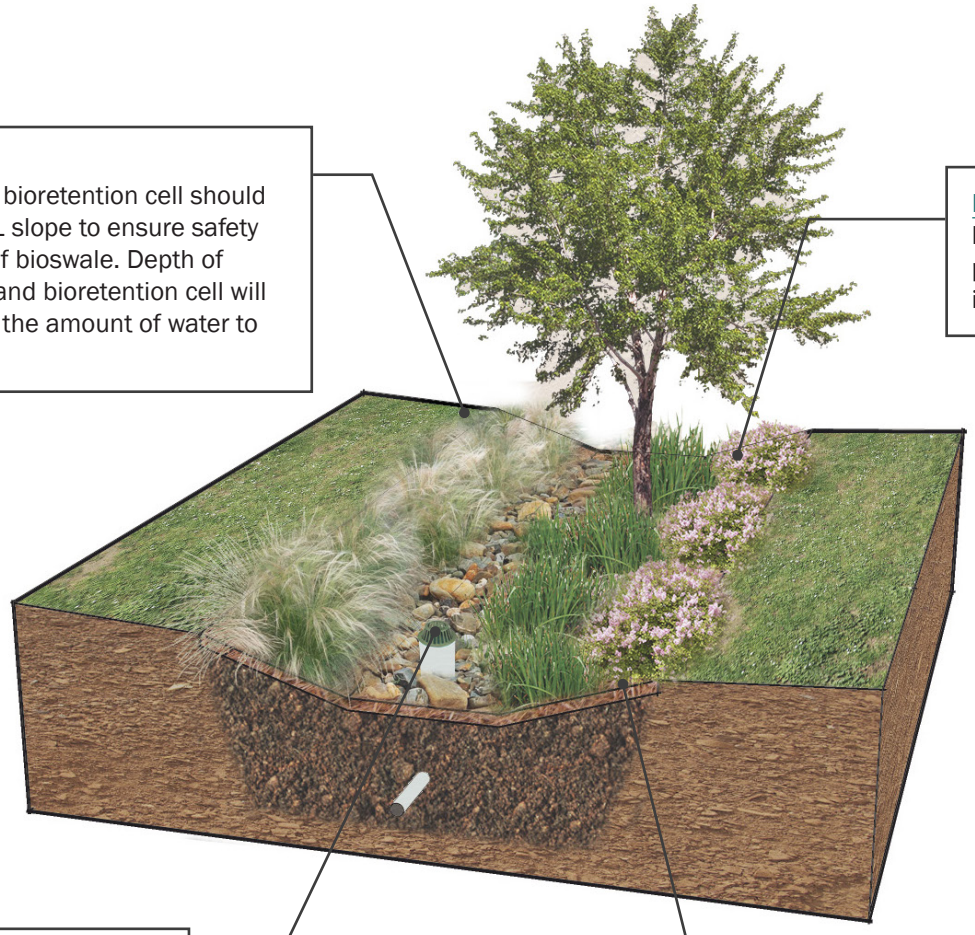


Hydrologic Cycle: With Green Infrastructure

BIORETENTION CELLS

Bioretention cells are defined land areas planted with water-tolerant plants. Bioretention cells are designed to detain stormwater to allow both infiltration and filtration. These are similar to rain gardens.

Bioretention Cell, City Park; New Orleans, LA



SLOPE
Side slopes of bioretention cell should not exceed 3:1 slope to ensure safety and function of bioswale. Depth of ponding area and bioretention cell will vary based on the amount of water to be detained.

NATIVE PLANTS
Native, water-loving plant species thrive in bioretention cells.

OVERFLOW
Standpipe and underdrain take care of any excess stormwater to prevent flooding.

INFLOW
Stormwater flows into bioretention cell from surrounding pervious and impervious surfaces.

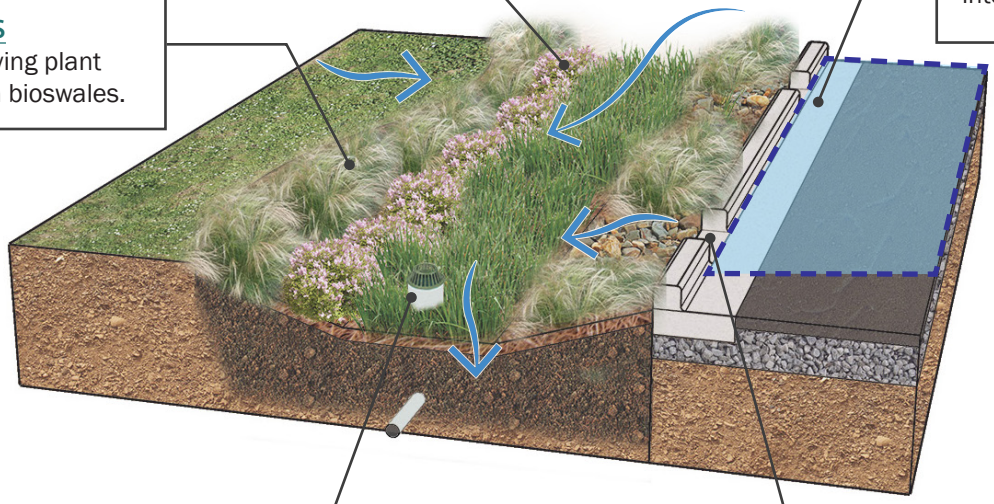
BIOSWALES

Bioswales are shallow channels with wide side slopes that use suitable plants to slow stormwater and filter out pollutants. A bioswale differs from a bioretention cell in that the bioswale functions as a conveyance of stormwater while also storing and infiltrating flow, whereas bioretention cells detain the stormwater and biologically retains pollutants from the water.

Bioswale, New Orleans City Hall; New Orleans, LA

CONVEYANCE
Stormwater runoff slowly moves through planted bioswale. This process helps remove pollutants before entering into local waterways.

NATIVE PLANTS
Native, water-loving plant species thrive in bioswales.



DRAINAGE AREA
Stormwater from impervious areas flow into bioswale.

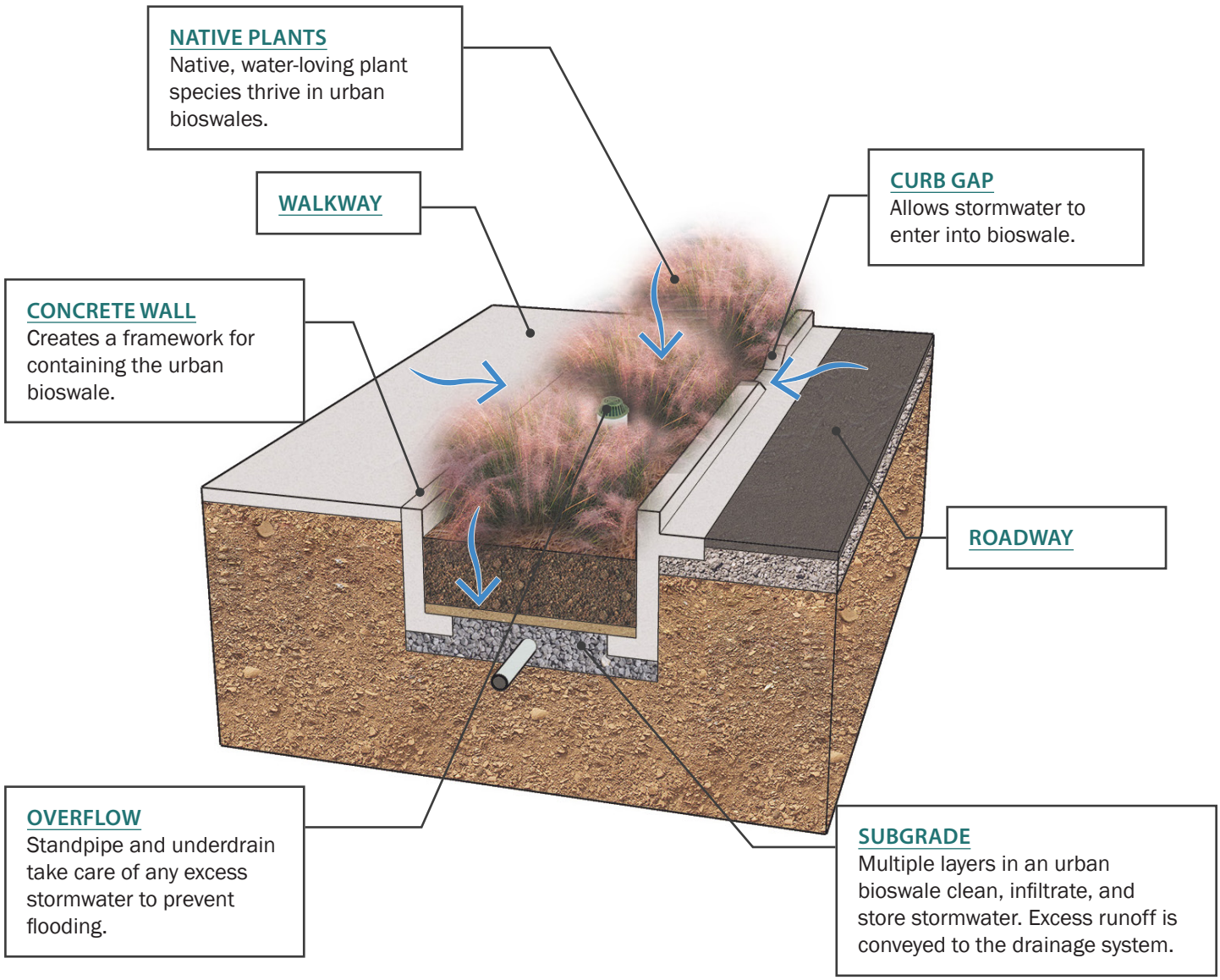
OVERFLOW
Standpipe and underdrain take care of any excess stormwater to prevent flooding.

CURB GAPS
Allows stormwater to enter into bioswale.

URBAN BIOSWALES

Urban Bioswales are similar to a typical bioswale, but with constrained edges, such as concrete walls. The planting surface is several inches below the wall edges and typically flat with a sloping subsurface that can be open to the subgrade or enclosed along the bottom. A perforated pipe should slope with the subgrade.

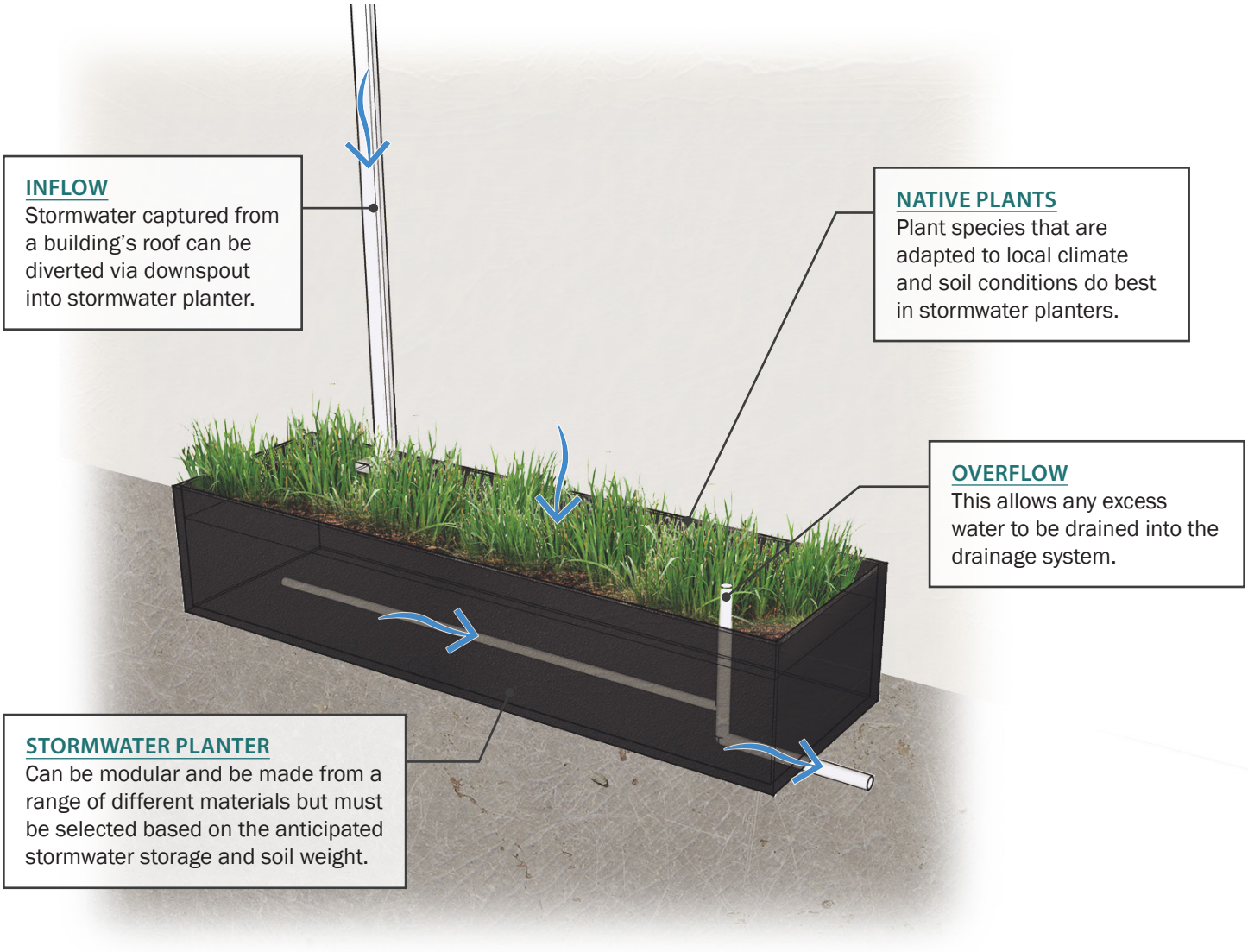
Urban Bioswale; Portland, OR



STORMWATER PLANTERS

Similar to bioswales and bioretention cells, Stormwater Planters are often smaller and more constrained by hard edges. Stormwater planters are typically positioned above ground or partially above ground and receive inflow from roofs or canopies through downspouts.

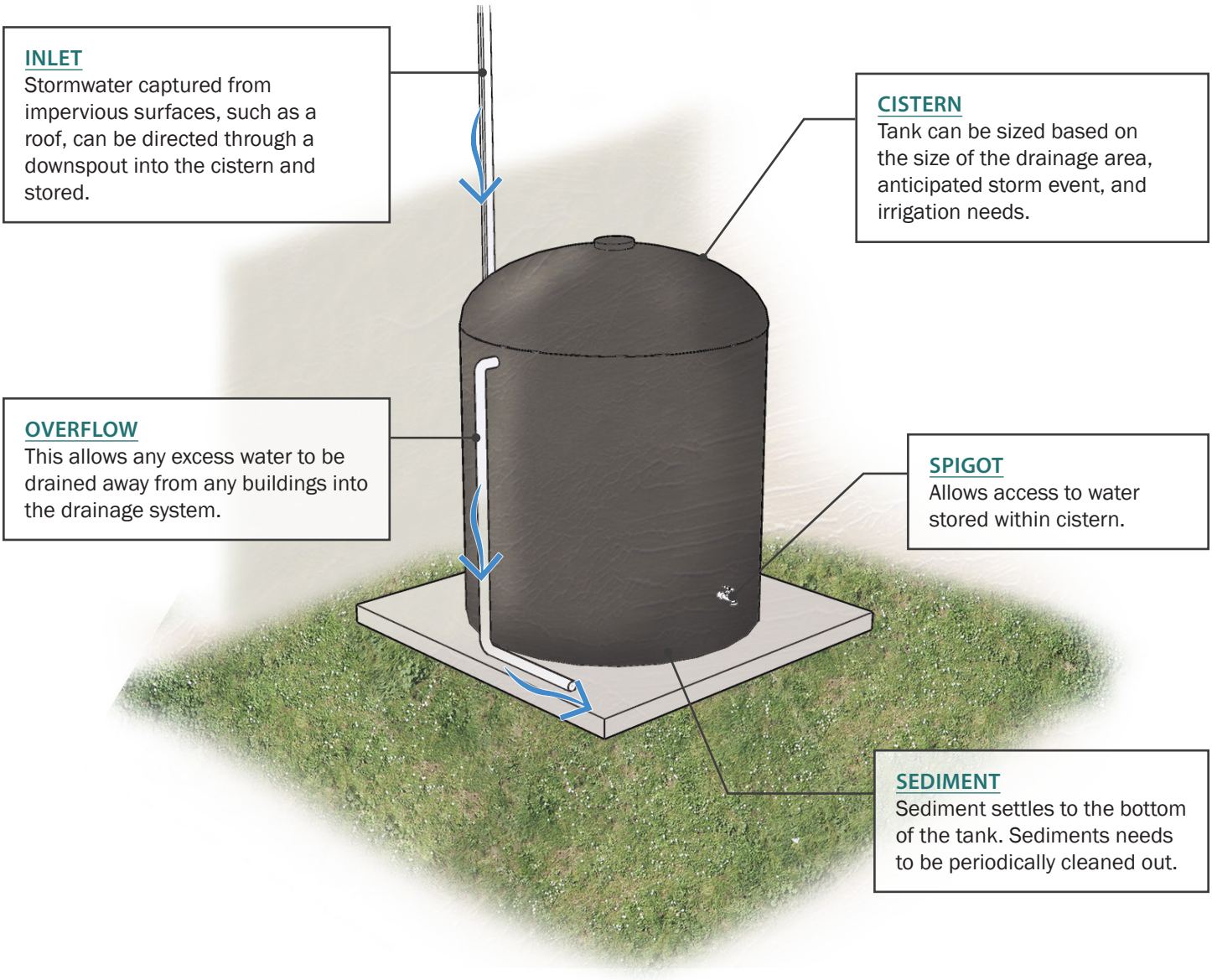
Stormwater Planter, Treme Community Center; New Orleans, LA



RAINWATER HARVESTING

A system that collects rainwater from roofs or other impervious surfaces and temporarily stores it until it can be used for gray water applications, such as irrigation. Each system has a designated area from which it collects water, an inlet into the system, an outlet to access the water for later use, and an overflow, for when the water collected exceeds the system's capacity.

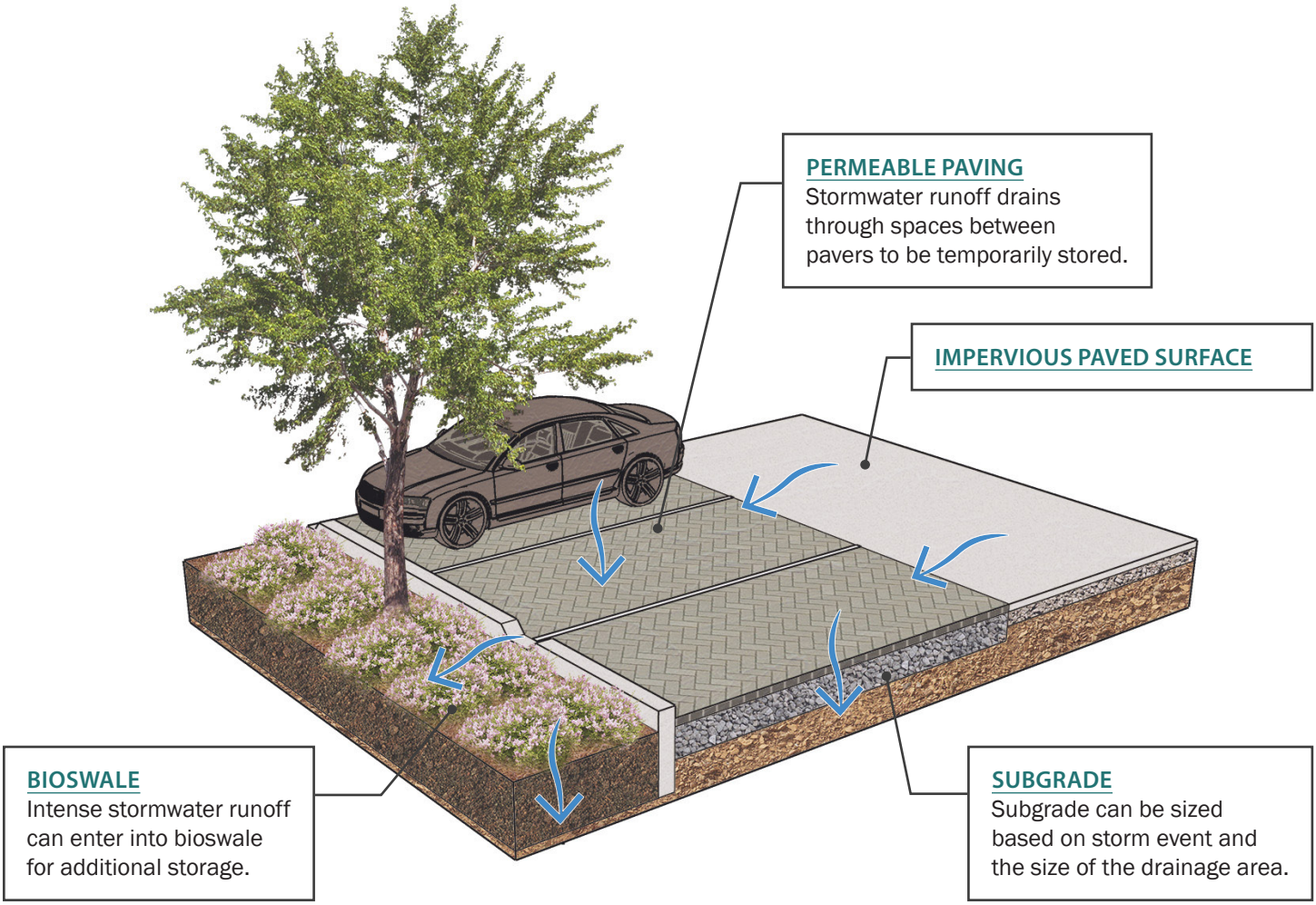
Rainwater Harvesting Cisterns



PERVIOUS PAVING

Pervious paving is an alternate form of paving that allows the movement of stormwater through the subbase materials, such as stone, and into storage space for infiltration or slowed release.

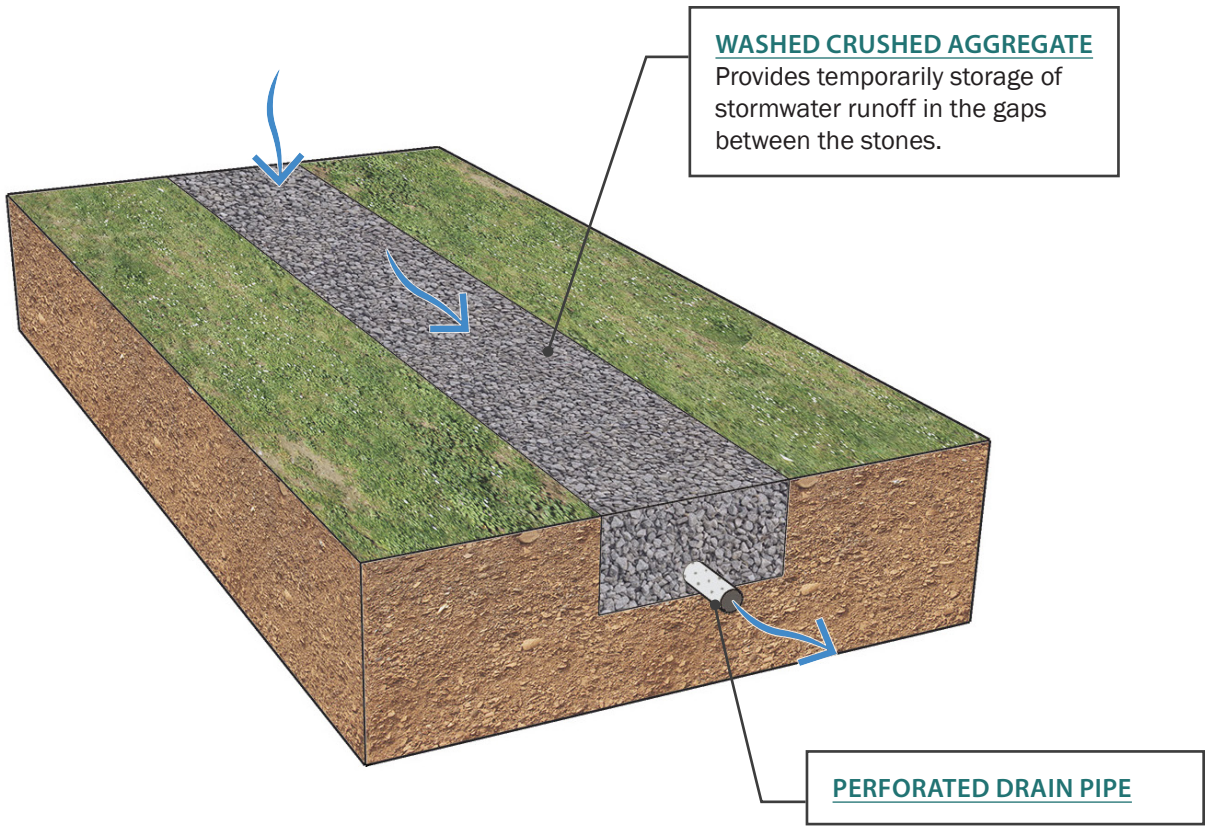
Pervious Pavers, Bayou Metairie Park; Metairie, LA



INFILTRATION TRENCHES

Also known as a French drain, Infiltration Trenches consists of an aggregate filled trench that detains and infiltrates stormwater. The filtration benefits of soil and pollutant uptake by vegetation are absent in the green infrastructure facility but maintenance of the installation is simplified.

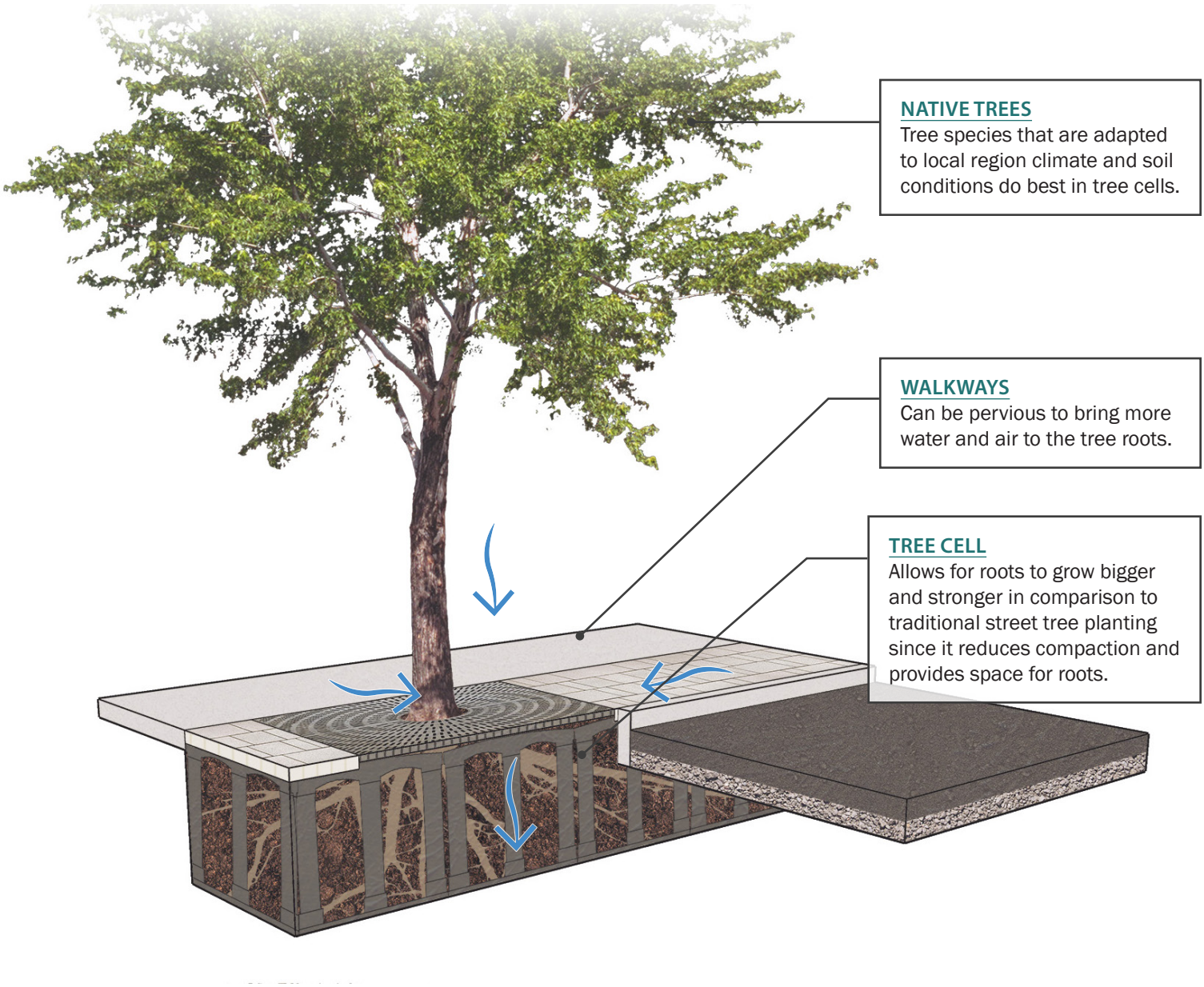
Infiltration Trench, Residential Property; New Orleans, LA



STRUCTURAL SOIL CELLS

Structural Soil Cells are stackable modules, generally made from plastic, which are filled with soil under pavement. They are strong enough to hold up pavement without compacting the soil they are filled with. This gives ample room for adjacent tree roots to grow outside of the confined spaces of typical tree cells in urban applications. These cells promote the longevity of trees.

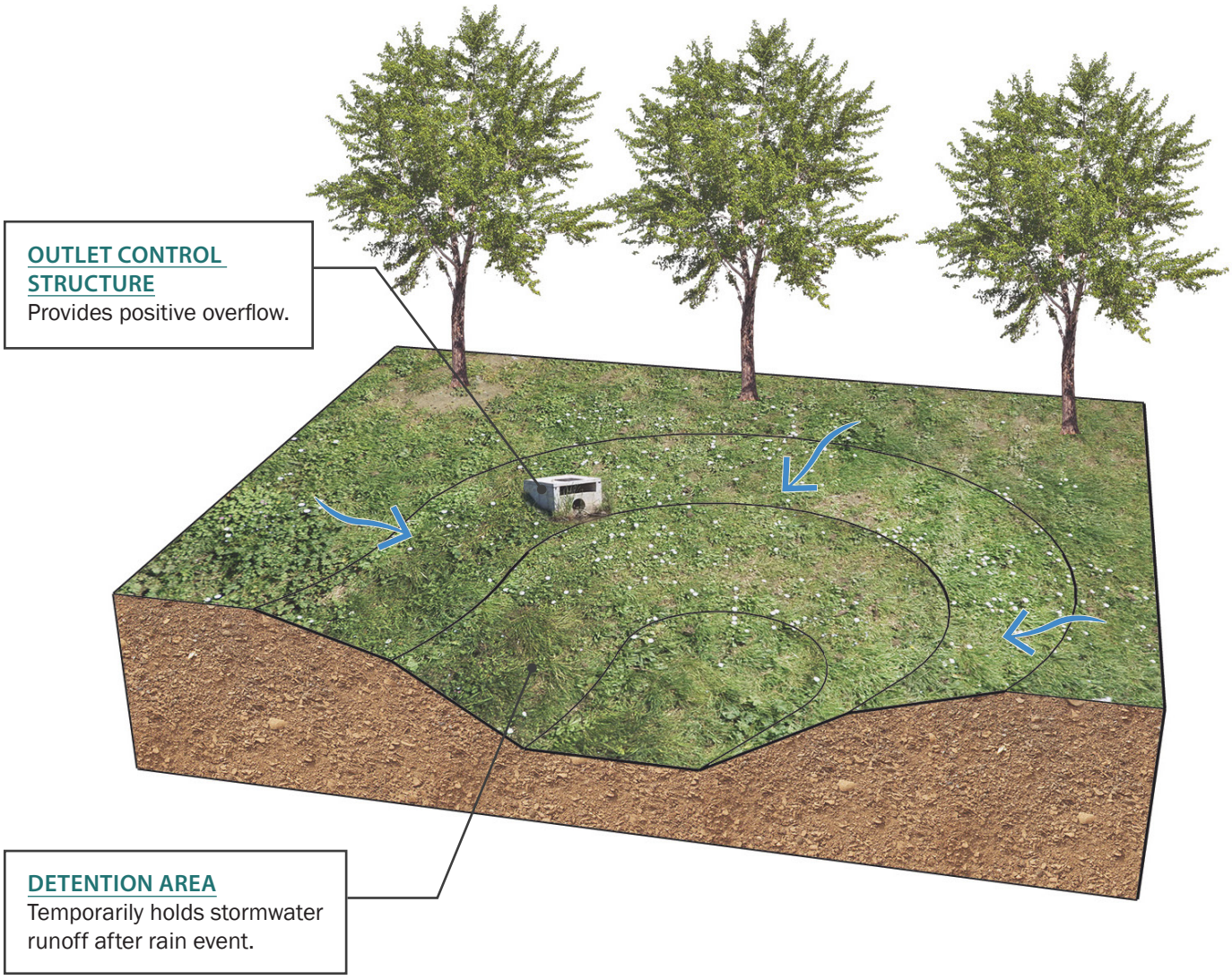
Structural Soil Cells, Lincoln Center; New York, NY



DETENTION BASINS

Detention basins are used to detain larger volumes of stormwater during rain events. The basin collects stormwater from surfaces, bioswales, drainage ditches, and drainage pipes and detains it until the water level reaches the height of a weir. Water flows over the weir and slowly discharges runoff into a water body or municipal drainage system, which reduces not only the peak flow but also the volume of water that is discharged. Detention allows time for suspended sediments, solids, and other pollutants to settle to the bottom.

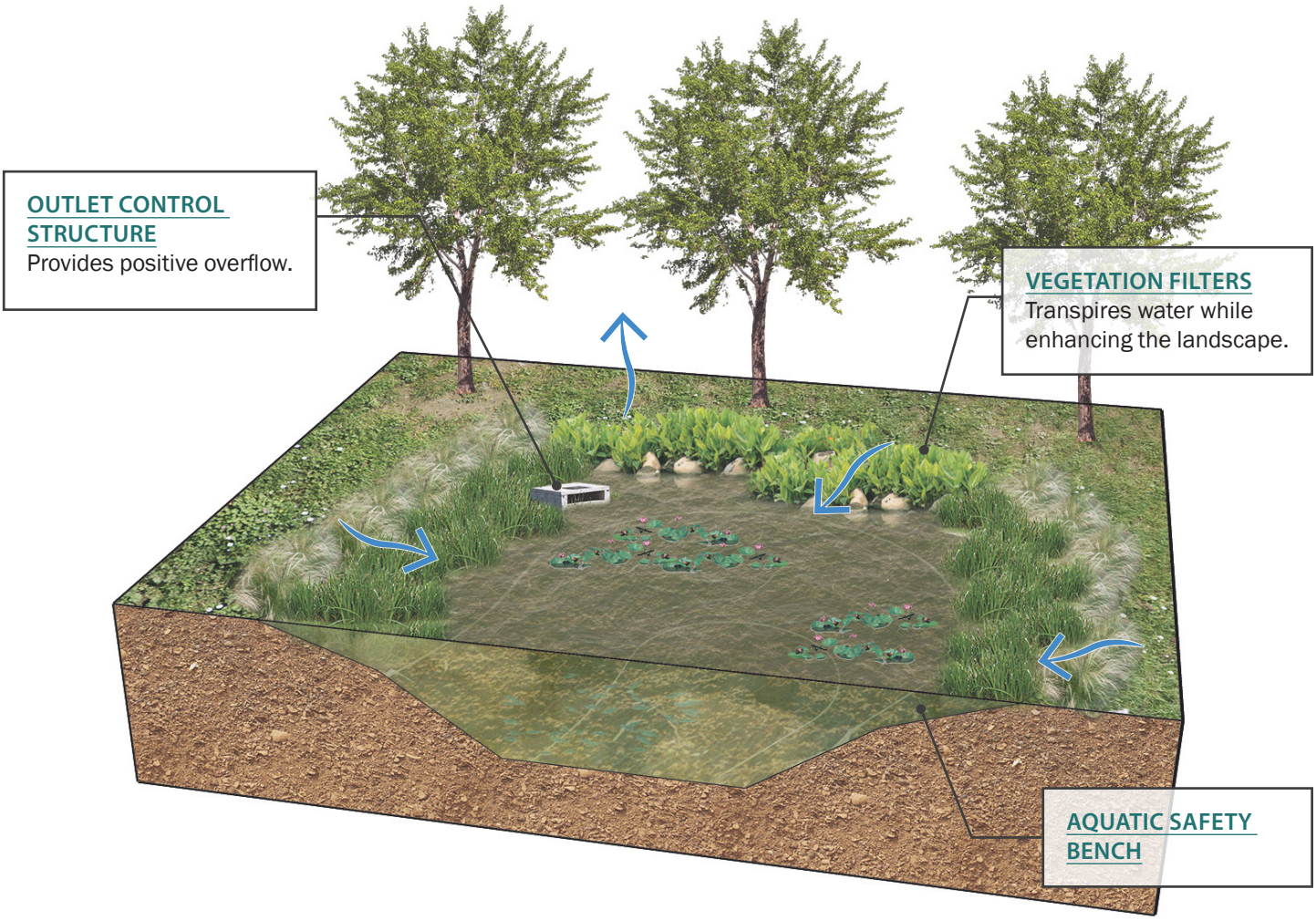
Detention Basin, NORA Stormwater Lot; New Orleans, LA



RETENTION BASINS

Retention basins are composed of an excavated ponding area that receives stormwater runoff from surfaces, bioswales, drainage ditches, and drainage pipes. The basin maintains a permanent pool of water while accommodating additional water storage (in the freeboard) during storm events.

Retention Basin, Woman's Hospital; Baton Rouge, LA



5. MAINTENANCE

REGULAR MAINTENANCE

Regular maintenance will be needed on site to ensure the long-term, lasting performance and function of the proposed green infrastructure facilities. During routine maintenance inspections, the facilities should be evaluated to determine if they are functioning as intended. Poorly maintained green infrastructure can severely diminish the expected returns on investment both financially and ecologically. The lack or delay of proper green infrastructure maintenance causes economic impacts, such as flooding. In addition, delaying maintenance of traditional grey infrastructure, compared to regularly planned preventive maintenance (PPM), increases the cost to remediate problems and often disturbs the local fabric such as streets and neighborhoods for longer periods of time. Green infrastructure alternatively will be less costly to maintain on a regular basis rather than waiting for performance problems to reveal themselves.

To accomplish this, a site plan of the location of each green infrastructure facility and a description of how it should function must be provided to inspection and maintenance personnel.

A log of maintenance visits, observations, corrective actions needed, and follow up visits should be recorded and maintained. These are invaluable when maintenance personnel change.

Frequency of maintenance will depend on the type of green infrastructure and time of year. The most important maintenance needs are during the first two growing seasons for the plants, typically two spring seasons when the plants are getting established and may need more water, weeding, and mulch to thrive.

As with traditional drainage systems on a development site, it is the responsibility of the land owner to maintain stormwater management systems. To ensure green infrastructure is properly maintained, the following strategies are recommended.

1. The Parish to update and maintain a GIS database of green infrastructure installations approved and permitted by the Parish for private development as well as that implemented by the Parish. Developers will already be required to submit location, type, size, capacity, and date of installation to obtain a certificate of occupancy. The Parish's GIS database would include point entities for each project and point attributes of type, size, capacity.
2. Green infrastructure facilities would be recorded as a covenant to a property to "run with the land."
3. The Owner/Operator would pay for biannual inspections and reports conducted by certified stormwater inspectors who will compare conditions with the as-built drawings and stormwater plan for the property. Inspectors would test for infiltration rate, erosion, plant health, trash and debris, and operability of inlets, outlets, and conveyance (pipes and swales). The Parish should upload the reports in the GIS LID database.
4. Parish would randomly inspect a number of properties each year in unannounced visits.
5. For non-compliance, owners would have 14 days to remedy and would pay for revisit of Parish inspector.
6. If owner continues non-compliance, fines or other penalties should be employed.

TRAINING

Training of maintenance staff will be required as green infrastructure facilities are not typical gardens. Periodic retraining of maintenance staff as well as training of new staff will be needed and should be planned for. Certification for green infrastructure maintenance personnel is very helpful in enhancing the understanding of green infrastructure. Training allows staff to become more familiar with various types of facilities, how they function, and what types of maintenance are typically performed throughout the year. Two certifications are offered locally, both of which are ANSI certified nationally: the National Green Infrastructure Certification Program (NGICP) offered by Environment International, Inc. and the Clean Water Certificate (CWC) offered by the Center for Watershed Protection.

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APPENDIX

RECOMMENDED LOW IMPACT DEVELOPMENT REQUIREMENTS

FOR INCORPORATION INTO ST. TAMMANY PARISH LAND DEVELOPMENT CODE

RESIDENTIAL SUBDIVISIONS

SITE CLEARING

- Permit required prior to any clearing for subdivisions
- Site clearing plan submitted for site clearing permit shall show the minimum clearing area for construction of the subdivision
  - Clearing of residential lots shall not exceed 80% of the lot area
    - *Includes setbacks*
    - *Except Conservation Subdivisions*
- Application shall include a Wetland Jurisdictional Determination (JD) performed by a qualified professional.
- Understory growth can be removed to enable topographic surveying
- Diseased or decaying trees shall be allowed to be removed with prior approval
- Limited removal of vegetation for the sole purpose of conducting a topographical survey of the existing site shall not be deemed a violation of this code as long as no grubbing is performed
- Site Clearing permit shall be obtained prior to building permits

STORMWATER MANAGEMENT AREA (SMA)

- Stormwater management for subdivisions shall maximize the preservation and use of the existing natural environment
- A Stormwater Management Plan and a plan for management of the SMA shall be submitted with site clearing applications
- Pervious surfaces shall be at least 30% of developable site surface
  - Excludes wetlands
  - Excludes retention/detention ponds
  - Excludes drainageways
  - Includes buffers
- Maximize preservation of natural hydrology
  - Map existing surface hydrology for the site and adjacent properties
  - Identify the receiving waterbody
  - Stormwater Management Area shall be a minimum of 25% of site
    - *Includes perimeter buffers*
    - *Includes riparian buffers as measured from the top of each bank*
    - *Wetlands indicated in Wetland Jurisdictional Determination*
    - *Natural woodland communities*
    - *Softwood woodland communities (pine communities) at a minimum of 1,000 square feet in area when measured from the drip line of the associated perimeter trees*
    - *Hardwood woodland communities at a minimum of 3,000 square feet in area when measured from the drip line of the associated perimeter trees*
    - *No cut or fill allowed within the dripline*
    - *Natural woodland communities protected area shall be cordoned off with survey flags prior to clearing*
    - *May include only 50% of golf courses and sports fields*
    - *Does not include retention/detention ponds water area at high-water mark*
    - *Impact fees shall be reduced by 10% for subdivisions exceeding minimum requirements*
- STP standard stormwater calculator shall be used to determine stormwater volume and rate of discharge for a 100-year storm
- Manage first 1” of each and every storm to filter pollutants through adequately sized vegetated green infrastructure employing native plants
- Vegetated stormwater management facilities, green infrastructure, shall be planted exclusively with native plants
- Retention/detention ponds
  - Location and design of retention ponds as accessible amenities shall be incentivized with 5% additional dwelling units and smaller lots
  - Retention ponds shall have gentle side-slopes (max 1:3.5), littoral shelves, native plants, natural shape, aeration system
  - Wetland forebay or sediment basin required where site runoff is discharged
  - 12-foot perimeter access road outside of riparian edge is required
  - 30-foot undisturbed vegetative buffer around ponds required
    - *Outside of perimeter access road*
    - *Disturbance allowed for entry to perimeter access road*
- Vegetated green infrastructure, riparian buffers, and landscape plans, details, and specifications shall be designed and stamped by a Louisiana licensed landscape architect
- Formal Stormwater Management Area maintenance is limited to include weeding and mowing of any landscaped areas and the removal of litter, debris, and sediment only in active use areas. Weeding and mowing are prohibited in wetlands, all buffer areas, Native Woodland Preservation Areas, meadows, wildlife corridors, game preserves, or similar conservation-oriented areas that are to be left undisturbed.
- Stream or habitat restoration may be allowed where

required for environmental sustainability
- In community centers/common areas with parking, bays shall be constructed of pervious paving
- Wastewater treatment or disposal systems are not allowed within the SMA
- Each phase of a phased development shall meet minimum requirements
- The SMA shall be permanently protected
  - SMA shall be protected in perpetuity by a binding legal instrument that is recorded with the deed
  - SMA legal protection instrument shall include clear restrictions on use and management of the SMA as set forth in this code.
- Floodplains
  - Disincentivize development in floodplains
  - Grading in floodplains
    - *No net fill*
    - *Soil fill and cut limited to 2 feet max. for development infrastructure*
    - *Buildings shall be post and beam construction*
    - *Chainwalls or any obstruction of water flow below finished floor structure is not allowed*
    - *Any fill for roads must not impede surface water flow*
    - *More culverts*
    - *Higher capacity culverts*
- Residential lots in or partially in floodplains shall be a minimum of 1 acre in size
  - Except for Conservation Developments
- Wetlands
  - Preservation of all wetlands on site (no disturbance or development) shall be incentivized with 5% additional dwelling units
  - All wetland areas disturbed shall be mitigated
  - Maximum acreage of wetlands mitigated shall be 15% of the wetlands on the site
  - Wetlands contiguous with wetlands on adjacent properties shall remain contiguous
  - Adverse impacts to adjacent and nearby wetlands not allowed
- Flood Risk Reduction
  - Reduce Post-Construction Runoff rate to 10% less than Pre-construction Runoff rate.
  - Stormwater Management Areas shall detain to 125% of 100-year rainfall event (to partially mitigate existing flood risk and future unforeseen additions or expansion of developments on lots)
- Water Quality
  - Water bodies shall be protected from receiving site runoff, sediment, concrete, chemicals, petroleum products, and other substances during construction as per DEQ requirements
  - Incentivize Water Quality Impact Study and the use of bioretention cells by reducing the minimum Stormwater Management Area from 45% to 40% for Conservation Developments.
  - Incentivize Water Quality Impact Study and the use of bioretention cells by reducing the minimum Stormwater Management Area from 20% to 15% for other subdivisions
- Natural Environment Preservation
  - Minimum natural green space shall be 25%
    - *Includes perimeter buffers*
    - *Includes riparian buffers*
    - *Does not include retention/detention pond*
  - Incentives for higher % of natural green space
    - *Reduce impact fees*
    - *Increase allowable overall density*
- Conservation Subdivisions
  - Conservation Developments allow smaller lot dimensions in exchange for Stormwater Management Area. This allows more efficient layout of lots, streets, and utilities, and protects the character of the area through the preservation of wetlands, recreation areas, and the protection of unique site features and scenic vistas. Conservation Subdivisions require less roadway and utility infrastructure. As such Conservation Subdivisions is St. Tammany Parish's preferred subdivision development approach.
  - Not a new zoning category, can be employed on any land that allows residential development
  - No variances required
  - An option, the preferred option, for subdivision development
  - Incentivize less clearing, more conserved natural areas, more GI
  - Minimum 45% Stormwater Management Area (SMA)
    - *A minimum of 60% of SMA shall be contiguous*
    - *Not bisected by roadway*
    - *Includes perimeter buffers*
    - *Includes riparian buffers*
    - *May include only 50% of golf courses and sports fields*
    - *Does not include retention/detention ponds water area at high-water mark*
    - *Density bonuses are allowed for Conservation Subdivisions*
    - *Reduced lot sizes*
    - *Minimum lot size of 60-foot road frontage and 100-foot lot depth*
- Buffers
  - Around sides and back of property
  - 25 feet undisturbed on sides and back of property
  - Along front of property
  - 15 feet undisturbed along from of property
    - *Except entrance roads along front*
    - *Construction access roads shall be located where permanent roads will be constructed*
  - Undisturbed buffer areas shall not be extensively managed. Removal of invasive species and structurally damaged, diseased or dying vegetation that presents a hazards, nuisances or unhealthy conditions to the inhabitances or their property
  - Buffer areas that have been previously cleared or logged shall be planted with native trees in a natural pattern to create a buffer

- Setbacks
  - Clearing, excavation, or fill shall not be allowed in setbacks
  - Except for entry drives
- Scenic Rivers, Laterals, and Waterways
  - A minimum 50-foot riparian buffer shall be preserved and undisturbed along scenic rivers, laterals, and Waters of the United States
- Green Open Space
  - Green Open Space shall be a minimum of 25% of the site area
  - Stormwater Management Areas vegetated with native plants shall be counted in the Green Open Space requirement
  - Accessible for use by residents
    - *Each residential lot shall be within 1/4 mile of and connected to amenities, green open spaces, and common areas*
    - *Measured in a straight line without regard for streets or walkways*
  - Walking trails around amenity retention/detention ponds are required and shall be counted in the Green Open Space requirement
  - Does not include retention/detention pond water area at high water level
  - Meadows, wildlife corridors, or similar conservation areas shall be counted in the Green Open Space requirement
- Plant Materials
  - Shall comply with the following
    - *Class A trees: 4 to 4.5 inch caliper min., 18 feet tall, min., balled and burlapped, and trees must be planted full, trimming is prohibited.*
    - *Class B trees: 1.5 to 2 inch caliper min., 8-9 foot tall, min., balled and burlapped or container, multi-trunk species shall have between 3 and 5 stems, and trees must be planted full, trimming is prohibited.*
    - *Shrubs: 10 gallon, min., 4 to 5 feet tall, min., multi- trunk species shall have between 3 and 5 stems, and shrubs must be planted full, trimming is prohibited.*
    - *Plant shrubs in a triangular pattern to create a visual barrier*
    - *American Standards for Nursery Stock, as published by the American Nursery and Landscape Association*
    - *In accordance with applicable provisions set forth by the latest edition in effect at the time of such work*
    - *Shall be true to and labeled by scientific name, variety, and size.*
    - *Native plants*
    - *SMAs shall be planted with a diversity of native species*

DEFINITIONS

ALLOWABLE FILL ALLOWANCE The amount of fill estimated for the development of a lot including the total fill for the primary structure pad, back slopes and driveway. The Allowable Fill Allowance does not include the 1.25 factor used in the Drainage Impact Study for the overall development.

FILL OR FILLING The deposition of any material including, but not limited to, dirt, concrete, and other inert materials, that is placed above nature existing grade to raise its grade, smooth its features, or elevate a structure.

GREEN INFRASTRUCTURE Includes bioswales, bioretention cells, rain gardens, detention ponds including their buffer areas, retention ponds including their buffer area but excluding the actual surface of the permanent water surface, planted with 85% native plants to improve water quality and increase on-site Stormwater storage. Open grass or turf drainage channels used for stormwater conveyance shall not be counted as green infrastructure.

GRUBBING The act of removing trees and other vegetation by the roots of any area greater than 8 feet in one direction. Removal of trees of 6 inch DBA or smaller for purposes of performing a survey shall not be considered grubbing. Removal of trees 6 inches or greater shall be considered grubbing.

NATIVE WOODLANDS PRESERVATION AREA An existing woodland area comprising of native trees, circular in nature with uneven edges and an undisturbed strip of native shrubs and grass extending 25 feet beyond the drip line of the out trees. For hardwood woodland native stands of the minimum size of the protected area shall be 3000 square feet (sf). For softwood woodland native stands the minimum protected area shall be 1000 sf.

NATURAL EXISTING GRADE The natural elevation of land prior to any man made changes or prior to a proposed change of grade. The natural elevation of land as established by a certified existing topographic survey.

NET DENSITY Area remaining after Stormwater Management Area has been subtracted from total acreage of parcel.

PARISH DISTRICT AUTHORITY Either the Parish District Administrator for areas within a Consolidated Gravity Drainage District or Parish Engineer for areas outside of the Consolidated Gravity Drainage Districts unless such districts do not have a designated drainage engineer.

PERIMETER VEGETATIVE BUFFER A 25 feet undisturbed vegetative perimeter buffer zone along all sides of a development.

RESIDENTIAL CONSERVATION SUBDIVISION AREA Total acreage of parcel, including Stormwater Management Area.

RIPARIAN BUFFER A 50 feet undisturbed perimeter buffer zone along each side of all existing drainage laterals and channels measured from the top of the bank. The drainage laterals and channel as identified as Lake, River, and Canals by a blueline on the latest edition of the USGS US Topo 7.5-minute map and/or identified on map labeled Canal Dug to Date, prepared by Louisiana Department of Public Works, dated February 1963 and updated July 2, 1974.

STORMWATER MANAGEMENT AREA (SMA) Undeveloped green areas of a subdivision development over five (5) acres in size comprising a specified percentage of the total development parcel. The SMA is composed of the 25 feet undisturbed vegetative perimeter buffer zone, the 50 feet undisturbed riparian buffer zone along each side of existing drainage laterals and channels within the parcel, the 50 feet undisturbed buffer perimeter buffer zone along the edge of any existing wetlands, any Native Woodlands Preservation Areas of undisturbed existing woodland tree clusters, any Green Infrastructure, and any Open Green Space designated for permanent recreational use. Specific allocated areas unobstructed by buildings from the ground upward, except for walks, paths, landscaping or other site features in public, common or other private ownership. Yards of individual lots occupied by dwellings shall not constitute part of the SMA.

TREE, CLASS A Any self-supporting woody plant of a species which normally grows to an overall height of a minimum of 50 feet, usually with one main stem or trunk although some species may have multiple trunks, and with many branches. A list of Class A native trees can be found in Appendix D.

TREE, CLASS B Any self-supporting woody plant of a species which normally grows to an overall height of a minimum of 25 feet, with one or more main stem or trunk and many branches. A list of species considered to be Class B native trees can be found in Appendix D.

ALLOWABLE PLANTS FOR STORMWATER MANAGEMENT AREAS

1. Class A native tree species:

Common Name	Scientific Name
American beech	Fagus grandifolia
American elm	Ulmus americana
American sycamore	Platanus occidentalis
Ash species	Fraxinus Spp.
Black cherry	Prunus serotina
Blackjack oak	Quercus marilandica
Bald cypress	Taxodium distichum
Blackgum	Nyssa sylvatica
Cherrybark oak	Quercus falcata (var.) pagodifolia
Hackberry	Celtis laevigata
Laurel oak	Quercus laurifolia
Loblolly pine	Pinus taeda
Longleaf pine	Pinus palustris
Nuttall oak	Quercus nuttallii
Overcup oak	Quercus lyrata
Pecan	Carya illinoinensis
Pond cypress	Taxodium ascendens
Red maple	Acer rubrum L. Var. rubrum
Red oak	Quercus falcata
Slash pine	Pinus elliottii
Shumard oak	Quercus shumardii
Southern magnolia	Magnolia grandiflora
Southern live oak	Quercus virginiana
Southern sugar maple	Acer barbatum
Spruce pine	Pinus glabra
Swamp red maple	Acer Rubrum drummondii
Swamp chestnut oak	Quercus michauxii
Sweetbay magnolia	Magnolia virginiana
Sweetgum	Liquidambar styraciflua
Tulip poplar	Liriodendron tulipifera
White oak	Quercus alba
Willow oak	Quercus phellos
Winged elm	Ulmus alata

(Note: Pine trees shall count as 2/3 of a Class 'A' tree.)

2. Class B native tree species:

Common Name	Scientific Name
American hornbeam	Carpinus caroliniana
American plum	Prunus americana
American snowbell	Styrax americanus
Big leaf snowbell	Styrax grandifolius
Black willow	Salix nigra
Cassine or dahoon holly	Ilex cassine
Cherry laurel	Prunus caroliniana
Eastern redbud	Cercis canadensis
Flowering dogwood	Cornus florida
Green hawthorn	Crataegus viridis
Groundsel bush	Baccharis halimifolia
Hop-hornbeam	Ostrya virginiana
Mexican plum	Prunus mexicana
Parsley hawthorn	Crataegus marshallii
Persimmon	Diospyros virginiana
Possumhaw	Ilex decidua
Possumhaw viburnum	Viburnum nudum
Red bay	Persea borbonia
Red buckeye	Aesculus pavia
Red mulberry	Morus rubra
River birch	Betula nigra
Silver bell	Halesia diptera
Southern bayberry	Myrica heterophylla
Southern catalpa	Catalpa bignonioides
Southern crab apple	Malus angustifolia
Smooth sumac	Rhus glabra
SwampTiti	Cyrilla racemiflora
Tree huckleberry	Vaccinium arboreum
Wax myrtle	Myrica cerifera
Weeping yaupon	Ilex vomitoria pendula
Western mayhaw	Crataegus opaca
Winged sumac	Rhus copallinum
White fringetree	Chionanthus virginicus
Yaupon	Ilex vomitoria

3. Native shrubs

Common Name	Scientific Name
American beauty berry	Callicarpa americana
Arrowwood	Viburnum dentatum
Blueberry/huckleberry	Vaccinium species
Coastal sweet pepper bush	Clethra alnifolia
Dahoon holly	Ilex myrtifolia
Dwarf palmetto	Sabal minor
Dwarf yaupon	Ilex vomitoria nana
Elderberry	Sambucus canadensis
Fetterbush	Lyonia lucida
Florida anise tree	Illicium floridanum
Gallberry	Ilex glabra
Honeybells (dwarf available)	Agarista populifolia
Oakleaf hydrangea	Hydrangea quercifolia
Orange azalea	Rhododendron austrinum
Southern cane	Arundinaria gigantea
Sweet mountain azalea	Rhododendron canescens
Sweet shrub	Calycanthus floridus
Swamp azalea	Rhododendron serrulatum
Virginia sweetspire	Itea virginica
Winterberry	Ilex verticillata