

SECTION 2A-3

LANDSCAPE DESIGN CRITERIA

PART 1 GENERAL

Intent: *To ensure that the Broward County School Board receives the highest quality of design and the services rendered and plans produced meet the level of competence as regulated by the State of Florida.*

1.1 Requirements

- A. Design/Build team for new schools shall include a Florida Registered Landscape Architect.
- B. Develop a comprehensive landscape design providing opportunities for student protection from the sun, as well as maximizing energy conservation for building power usage. Emphasize the main administration entrance, front façade and other facades that have visibility from the adjacent rights-of-way and adjacent facilities. Coordinate with architectural, civil, mechanical, and electrical work, and the construction process.
- C. The landscape design shall take into consideration the design grades, utility design and layout, lighting layouts, plazas, walks, drives, service areas, fencing, playfields, site furnishings, planting palette, irrigation design, maintenance considerations, vandalism, and expansion provisions.
- D. Additional Considerations:
 - 1. Maximize the retention of existing trees as a valuable natural resource.
 - 2. Improve environmental quality by following “NatureScape Broward” principles, www.broward.org/naturescape while recognizing the beneficial effects of landscaping upon the environment.
 - 3. Create an aesthetically pleasing, functional environment by conserving trees and other vegetation and requiring the planting of same.
 - 4. Use water and chemical conservation techniques; local native plants and gray water irrigation systems, where feasible; and, maintain existing natural habitat when consistent with teaching program. Gray water, where used for landscape irrigation systems, shall meet Department of Health and Department of Environmental Protection water quality standards.
 - 5. Place shrubs and trees so as not to obstruct visibility or create a hazard to the normal flow of personnel or vehicular traffic.
 - 6. Clear sites of hazardous, and invasive non-native and plant no future ones of these types.
 - 7. Incorporate Crime Prevention through Environmental Design (CPTED) principles and guidelines.
 - 8. Be harmonious with adjacent facilities.
 - 9. Every effort should be made to develop the site’s landscaped areas as an “Environmental Resource” that enhances student learning and safety while exhibiting environmental best management practices.
- E. Landscaping must not impede means of egress at egress windows and other paths of egress.
- F. Site design shall comply with Florida Building Code, SREF, applicable agencies and ordinances, BROWARD COUNTY SCHOOL BOARD Design Standards, and program requirements.

1.2 Qualifications (licensure, certifications, etc.)

- A. Licensure per FS 481 Part II

1. Site plans and landscape design plans shall be prepared, signed and sealed by a Registered Landscape Architect holding a current license to practice in the State of Florida in conformance with Florida Statute 481, Part II.
- B. Existing Conditions
 1. The designer shall utilize an approved engineering plan (if available) or a specific purpose survey as the base for all plan drawings.
 2. The designer shall conduct a tree survey showing the location of all existing trees and the location of native plant associations for the site being designed.
- C. Submittals

Submittals shall comply with the requirements of the Document Submittal Checklist. The submittals shall include the following:

 1. Phase I – Schematic Design Documents shall include:
 - a. A narrative of the design intent, water conservation measures, curriculum coordination, habitat creation and maintenance objectives.
 - b. A Preliminary Schematic Site Plan showing existing features to remain, property lines, proposed and existing utilities proposed buildings, athletic fields, play areas, vehicular circulation, parking, bicycle parking areas and tabulations, pedestrian circulation, required buffers, stormwater management areas, habitat/outdoor laboratories, building set backs, site area tabulations, and perimeter control (fencing/walls).
 - c. A Preliminary Landscape Plan showing existing trees or native plant associations to be saved, relocated or removed; the general location of trees, shrubs, groundcovers, decorative pavements, specialty gardens and appurtenant site furnishings.
 - d. A Preliminary Irrigation Zone Map showing the water source, high, medium and low water use areas and consumptive use tabulations.
 - e. All plans shall be produced at a scale of 1"= 40' minimum, on ANSI D (24"x36") size sheets.
 2. Phase II - Design Development Documents shall include:
 - a. Written responses to the comments from the Phase I submittal.
 - b. A tree removal/relocation plan.
 - c. A preliminary planting plan showing the location, size and species of trees, shrubs and groundcovers.
 - d. Preliminary plans for hardscape elements including pavements, lighting, site furnishings, signage and specialty gardens.
 - e. A preliminary irrigation plan showing the water source, point of connection, mainline, valves and controller locations, and source of power.
 - f. Outline specifications
 - g. Lifecycle Cost Analysis
 3. Phase III (50%) - Construction Documents:
 - a. Written responses to the comments from the Phase II submittal.
 - b. A tree removal/relocation plan as per Phase II.
 - c. A planting plan showing the location, size and species of trees, shrubs and groundcovers, details and tabulations of quantities as per Phase II.
 - d. Construction plans for hardscape elements including pavements, lighting, site furnishings, signage and specialty gardens, including details as per Phase II.
 - e. An irrigation plan showing the water source, point of connection, mainline, sleeves, valves and controller locations, source of power, emitter locations, details and tabulations as per Phase II.
 - f. All applicable Construction specifications (Refer to Part 4 Section 4.1 Construction Specifications).
 - g. Statement of Probable Construction Cost.
 4. Phase IV (100% - Construction Documents):
 - a. Written responses to the comments from the Phase III 50% submittal.
 - b. A tree removal/relocation plan as per Phase III.
 - c. A planting plan showing the location, size and species of trees, shrubs and groundcovers, details and tabulations of quantities as per Phase III.

- d. Construction plans for hardscape elements including, pavements, lighting, site furnishings, signage and specialty gardens including details as per Phase III.
- e. An irrigation plan showing the water source, point of connection, mainline, sleeves, valves and controller locations, source of power, emitter locations, details and tabulations as per Phase III.
- f. All applicable construction specifications and any special provisions as required by the design. (Refer to Part 4 Section 4.1 Construction Specifications).
- g. Final Statement of Probable Construction Cost as per Phase III.

1.3 Code Compliance

Intent: To ensure the Site Plans and Landscape Design Plans conform to the rules and regulations of the Federal Government, State of Florida, local jurisdiction and the criteria of the School Board of Broward County.

1. Site plans and landscape design plans shall conform to requirements enumerated herein, all applicable codes governing the development of land within the applicable jurisdiction as well as the Florida Building Code and the following guidelines:
 - a. State Requirements for Educational Facilities (SREF)
 - b. Americans with Disabilities Act (ADA)
 - c. Broward County Department of Environmental Management
 - d. Crime Prevention through Environmental Design (CPTED)
 - e. Leadership in Energy and Environmental Design (LEED)
 - f. LEED for Schools
 - g. NatureScape Broward Principles
 - h. Safe Schools Design Guidelines
 - i. Water Use Permitting

1.4 General Objectives

A. Environmental Stewardship

Intent: To protect, enhance and create ecologic systems/features to increase biodiversity, improve the sustainability of the site and supplement the core academic curricula. It is the intent of the School Board of Broward County to adopt, through its mission/vision statement, a strategic goal that focuses on environmental initiatives so that all projects in the district adhere to responsible environmental stewardship. To that end, these guidelines outline both general and specific criteria which the design team shall incorporate into their plans and specifications in order to implement this goal.

1. Where native plant communities exist, the design shall strive to preserve as many of these as possible.
2. On previously disturbed sites, a minimum of 30% of the site shall be restored to a native plant community in areas which are to remain as open-space.
3. Where possible, natural landscape areas shall be established on site.
4. Natural landscape areas created shall be ecosystems historically found in South Florida within plant hardiness zones 9 and 10. All plant material used for these zones shall be

Florida native species, consistent with the ecosystem selected. (Refer to Part 2 – Design Performance Standards)

5. Where no programmed functional use is possible, natural landscape areas shall be programmed for buffer areas, drainage facilities, and green spaces. Biodiversity shall be promoted by reducing the turf monoculture and substituting it with other native groundcovers.
6. The use of turf grasses shall be limited to areas with a programmed use (for example: active areas, recreation, gathering space, or athletic fields). All other open spaces shall be designed with low water/ chemical use plantings or Florida Friendly Surfaces (Refer to Documentation Examples Section B Florida Friendly Surface Definition & Examples)

B. Water Conservation

Intent: All new designs and renovations shall include water conservation techniques as follows: proper plant selection and placement; and efficient water distribution systems.

1. Eliminate the use of potable water as an irrigation source, unless absolutely necessary. An example would be adjacent to buildings due to iron staining problems. Otherwise, designer shall provide justification letter along with submittal.
2. Reclaimed/Re-use water shall be the primary source of irrigation whenever possible; and/or provide for potential connections to infrastructures with future capacity.
3. Harvest stormwater for supplemental irrigation by incorporating the following techniques:
 - a. Include cisterns to collect roof run off.
 - b. Include rain garden or bio-swales within parking areas to encourage groundwater recharge.
4. Designer shall divide the total landscaped area into water use zones based on landscape requirements. The Water Use Zones shall be implemented in the ratio listed below. The Low Water Use Zone shall be designed with temporary irrigation for plant establishment period only. (Refer to 2.3 Section B Water Use Zones)
 - a. High Water Use Zone – 20% Maximum total of landscape area, less athletic fields
 - b. Moderate Water Use Zone – 30% Maximum total of landscape area, less athletic fields
 - c. Low Water Use Zone – 50% Minimum total of landscape area, less athletic fields
(There is no maximum restriction on low water use zones)
5. Improve the efficiency of the irrigation system through Smart Technology. (See Reference page for Irrigation Association link)
 - a. Irrigation shall be designed to achieve 70% efficiency.
 - b. Irrigation efficiency shall be improved by using drip and micro-sprays in shrub areas where irrigation is required.
 - c. Irrigation controllers that monitor precipitation rates and soil moisture shall be used to control use of the system.
 - d. Precipitation rates shall be matched to the Water Use Zones: High, medium and low.

C. Aesthetics

Intent: To provide for an artistically arranged composition of the native, cultivated plant materials, and built elements to achieve a desired look and/or function ranging from low to high maintenance.

1. *Design intent* – the designer shall clearly state the design intent on the cover sheet of the plan set.

2. *Context* – The design shall acknowledge and respond to the neighborhood context. This shall be achieved by incorporating compatible materials, intensity of design, theme, etc., so as to be compatible with the existing conditions if so warranted.
3. *Curb appeal* -
 - a. The design shall present a unified aesthetic look along all public street frontages.
 - b. The design for street frontages shall have at least “Moderate Intensity Zone” Maintenance (Refer to Section E. Maintenance) unless the neighborhood context suggests naturalistic plantings which would allow for a Low Maintenance Level.

D. Environments for Outdoor Learning

Intent: The site design should provide for opportunities for outdoor learning through the creation of spaces suitable for impromptu gatherings as well as environments which may serve as outdoor laboratories or classrooms.

1. The design team shall interview the principal or his/her appointees to ascertain where opportunities exist to create environments which can serve as outdoor laboratories for existing curriculum or for the creation of new curricula.
2. The site design shall include a minimum of two designated outdoor classrooms which can accommodate up to 30 pupils. The outdoor classrooms should have provisions for seating and shade. (Refer to 2.2 Section D - Outdoor Classrooms (small outdoor gathering space)).
3. Native habitats should be developed with opportunities for interpretation/outdoor study by the science program.
4. Tended gardens or specialty gardens should be developed where appropriate to provide opportunities for interpretation or outdoor study by the science, history and/or mathematic departments or by the school Magnate Program, if applicable. Specialty gardens may include, but are not limited to: (Refer to Part 3 Section 3.3 – Functional Spaces Design Criteria)
 - a. Sensory gardens
 - b. Rock gardens (geological)
 - c. Ethnic gardens
 - d. Butterfly gardens

E. Maintenance (Establishment of Maintenance Intensity Zones)

The BROWARD COUNTY SCHOOL BOARD is using Maintenance Planning as a way to educate site managers of the best landscape management practices. The Landscape Maintenance Plan is a graphic and written plan prepared by the Landscape Architect for conveying site maintenance concepts and practices to the site maintenance manager.

Intent: The landscape design shall be created to increase in value over time while minimizing maintenance costs ranging from Low Intensity to High Intensity Maintenance Zones.

1. The landscape architect shall prepare a maintenance plan and specifications for all aspects of the landscape design.
2. The maintenance plan shall include a **Site Zoning Plan** that graphically identifies areas of high, medium, and low maintenance activities as appropriate to the desired or actual use of the site. (See BROWARD COUNTY SCHOOL BOARD Maintenance Plan Production Templates)

- a. High Intensity Maintenance Zones – Highest level of expected quality and utilization. High degree of stress on plant materials and wear and tear on pavements and site furnishings.
 - b. Moderate Intensity Maintenance Zone – High to moderate level of expected quality. Moderate level of expected or actual utilization. Low degree of stress on plant materials and impact to pavements and site furnishings.
 - c. Low Intensity Maintenance Zone – Moderate to low level of expected quality. Low level of expected or actual utilization.
3. Maintenance standards, specifications, and procedures shall be produced for High, Moderate, and Low intensity maintenance zones.
 4. A maintenance plan shall include tabulations of quantities of all maintenance activities as required by this section (i.e. sf/acres of maintenance intensity zones and sf/acres of the specific maintenance operation of that zone mowing, edging, etc...).

F. Crime Prevention through Environmental Design (CPTED)

Intent: The site design shall incorporate CPTED principles as outlined herein to provide for a safe environment for students, faculty and visitors, to prevent or deter criminal or mischievous activities.

Create an environment of natural surveillance where the user may see and be seen. All outdoor use areas or pedestrian routes shall be visible from within buildings and/or from public rights-of-way.

1. Areas with high pedestrian activity must be open and well-lit.
2. No dense plantings that would obstruct views or offer hiding places.
3. Achieve a minimum of 0.5 ft candles of illumination for all pedestrian routes. Entry areas and maintenance/ delivery areas shall attain a minimum of 1.0 candle illumination.
4. Create natural buffers/barriers that can provide security along perimeters, yet do not provide opportunities for hiding. (Refer to Part 3 Section 3.4 – Natural Existing Environment Criteria and Exhibits)

G. Invasive Species

Intent: To provide for the identification, management and/or eradication of exotic, invasive plants.

1. All landscape plans shall include a tree survey, prepared by a registered landscape architect or certified arborist, showing all trees and vegetative associations on the site.
2. All landscape plans shall include provisions for the location and eradication of plants listed as invasive exotic by NatureScape Broward and the Florida Exotic Pest Plant Council (most recent/updated version). [Refer to Reference Page for direct website link].
3. For new construction or renovation projects where significant exotic trees or vegetative communities exist and it is not feasible to remove them without mitigation, indigenous species shall be planted and to provide over time, replacement of the exotic species.

H. Sustainable /Green Landscape Design Criteria

Intent: The School Board of Broward County intends to implement sustainable, "green" standards as part of landscape design standards for schools in Broward County. One standard that provides for criteria adaptable to school use is that which is available by the U.S. Green Building Council through its LEED Certification program. This program is partially incorporated here for use in providing for sustainable landscapes on school campuses.

I. Sustainable Design

1. The SBBC requires use of sustainable design principles. This includes use of native plant materials, reduction of the need for fertilization and irrigation, control of pests and diseases, and integration of long-term balanced maintenance standards.

J. LEED Criteria

1. One significant source of criteria for sustainable design is found in LEED landscape-related LEED criteria shown below are an SBBC requirement when the criterion is applicable to the individual landscape under consideration.
 - a. Conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity. Do this by limiting Greenfield disturbance to 40 feet from buildings OR, restore or protect a minimum of 50% of the site area (excepting building footprint) with native or adapted vegetation.
 - b. Provide a high ratio of open space to development footprint to promote biodiversity. Do this by reducing impervious area by 25% of the local requirement for open space, OR if there is no open space requirement, provide open space adjacent to the building which at least equals the building footprint area. Or, if there is zoning but no open space requirement, provide 20% of the total site area in open space. Roof landscapes, landscaped ponds and landscaped wetlands can help achieve this credit and are encouraged.
 - c. Limit disruption to natural hydrology by one of the following: If Imperviousness is less than or equal to 50%, use landscape to help avoid post discharge rates from exceeding pre-discharge rates; or, implementing a storm discharge system that protects the receiving channel from erosion; or, if imperviousness is greater than 50%, reduce by 20% the post-discharge rate.
 - d. Water Efficiency: Reduce use of potable water for irrigation by 50%. One point is available.
 - e. Additional Water Efficiency: If the above criteria is achieved, an additional point is available by total elimination of use of potable or natural ground water for irrigation. This would allow using reuse water or captured rain water for irrigation.

PART 2 DESIGN PERFORMANCE STANDARDS

2.1 Existing Conditions:

The consultant shall provide a site inventory in accordance with the provisions outlined below. The consultant shall perform a comprehensive site investigation for the purpose of becoming familiar with and documenting the existing conditions which will present opportunities or constraints to the design of the site.

A. Site Survey
Reference Civil Design

Tree Survey

The tree survey shall be prepared by a Certified Arborist or Registered Landscape Architect and shall include: (Refer to Reference page for Tree Removal Specification Link)

1. Scientific name.
2. Common name.
3. Tree and/or palm height.
4. Canopy spread.
5. Grade elevation at base.

6. Trees shall be measured at diameter breast height (D.B.H.). A trees' D.B.H. is outside of the bark diameter at breast height (4'-6" above the existing ground plane).
7. Statement as to apparent health and vitality; absence/presence of disease and/or pests.
8. Recommendation of existing trees for preservation, relocation, or removal.

B. Site Inspection

The consultant shall perform a thorough site inspection to determine any opportunities or constraints the site may present. The site inspection documents shall cover at a minimum:

1. Hydrology and Drainage –
 - a. Identify watersheds and drainage break points.
 - b. Identify where water flows from building down spouts.
 - c. Identify major bodies of surface water.
 - d. Identify wet spots or areas of standing water (when and for what length of time).
2. Vegetation –
 - a. Identify and locate existing plant material.
 - b. Identify condition of existing plant material.
3. Microclimate –
 - a. Identify and locate areas exposed to intense summer afternoon sun.
 - b. Identify and locate areas that are shaded.
4. Existing Buildings –
 - a. Identify architectural style.
 - b. Overall building height.
 - c. Identify materials of façade.
 - d. Identify doors and windows. Note doors that are used most frequently.
 - e. Identify locations of downspouts.
 - f. Identify locations of overhangs and height above ground.
5. Utilities –
 - a. Locate and identify all utilities both above and below ground.
 - b. Location of existing irrigation system.
6. Views –
 - a. Identify views from inside the building looking out.
 - b. Identify views from off the site looking on.
7. Spaces and Senses –
 - a. Identify existing "outdoor rooms"
 - b. Identify the character and function of these "rooms".
 - c. Identify important views
 - d. Identify wind movement and direction
 - e. Identify disturbing or enhancing noises.
 - f. Identify unique or disturbing odors.
8. Site Functions –
 - a. Identify how the site is currently used (what, where, when, and how).
 - b. Identify location, time, and frequency for such things as:
 - o employee arrival and departure
 - o office hours
 - o work/maintenance
 - o parking of cars
 - o garbage pickup
 - o service/ deliveries
 - o outdoor activities (academic/sports)
 - o special functions

2.2 Site Planning: reference Civil and Architectural Design Criteria

The consultant shall prepare a preliminary site plan in accordance with the provisions outlined below when and if site design is the responsibility of the landscape designer.

A. Vehicular Access

1. Primary vehicular access shall be from a classified public roadway whenever possible.
2. Access for passenger vehicles and buses shall be separated whenever possible.
3. Access, circulation and parking for bicycles shall be separate from bus and passenger car traffic.
4. The primary site entrance shall be dedicated for staff and/or visitor traffic.
5. The entrance shall contain a sign stating the name of the facility.
6. The primary entrance shall be separate and distinct from bus entrances and utility entrances.
7. The primary entrance shall be acknowledged by a higher intensity of landscaping, decorative pavement, lighting or other means of creating a primary hierarchical relationship to the other entrances.

B. Parking Lots

1. *Locate trees/palms to avoid conflict with parking lot lighting (Palms at a ratio of 3 to 1 are preferred.)*
2. *Island ground cover shall be solid sod.*
3. *Provide landscaping areas equal to 20 percent of paved vehicular use area.*
4. *Verify landscaping requirements of the applicable municipality for additional items. If there are conflicts between the municipal code provisions and the landscape design criteria, utilize the stricter of the 2 provisions. Provide 10 feet-12 feet high canopy trees with 2 inches to 2-1/2 inches caliper trunk for every 40 feet at parking lot perimeters and one per every island (Palm trees at a 3 to 1 ratio are preferred). Utilize palm trees, (3 to 1) in portion of the parking lot that is adjacent to any property perimeter.*
5. *Islands must be provided no further apart than every 10 spaces and at the terminus of all parking rows.*
6. *Islands shall be the same width as a parking space and 3 feet shorter than the overall length of the adjacent parking space. Islands to be protected with continuous type "D" or "F" curbing.*
7. Light Setback - Locate trees/ palms to avoid conflict with parking lot lighting. Provide light setback of minimum 12' for shade trees and 7.5' for small trees and palms.
8. Vehicular Use Area - Provide landscaping areas equal to 20 percent of paved vehicular use area.
9. Tree Island Protection - Where feasible, islands must be provided no further apart than every 10 spaces and at the terminus of all parking rows. Islands shall be a minimum of 15' in width (inside of curb to inside of curb). Island to be protected with continuous type "D" or "F" curbing.

C. Outdoor Use Areas

1. Entry/arrival Points –
 - a. The primary building entrance shall be highlighted by enhanced landscape plantings, decorative pavements, lighting or other means of creating a primary, hierarchical relationship to other entrances.
 - b. The primary building entrance shall provide for sufficient paved surface to allow for small ceremonial gatherings of up to 50 people.
 - c. Primary building entrances shall provide shaded seating opportunities for at least 20 individuals.
2. Parking Areas –
 - a. Staff parking shall be segregated from visitor parking and placed away from the primary building entrance.
 - b. Staff parking spaces shall be no larger than 8.5 ft by 18 ft.
 - c. Visitor parking spaces shall be 10 ft by 18 ft.
 - d. Surfacing shall be permanent, stabilized materials which minimize stormwater run off.

- e. Primary stormwater treatment shall occur within the parking area by means of bio-swales or sub-surface drainage. (i.e. ex-filtration trenches)
 - f. Parking areas shall be planned for at least 50% canopy cover. (Canopy cover shall be calculated by utilizing 60% of a mature trees' canopy/spread.
 - g. Large shade tree or canopy planting areas shall have a minimum soil volume of 1,080 cubic feet.
3. Walkways –
- a. High-traffic walkways
 - o Corridors shall be designed with widths of 8'-10' min. - to allow high volume of users to move from space to space with minimum conflict.
 - o Corridors shall be constructed from concrete or other sustainable hardscape material.
 - o Landscaping around these areas should be minimal and not disrupt pedestrian flow.
 - o Landscape in areas adjacent to high traffic corridors should be able to withstand periodic foot traffic, tough herbaceous plants area ideal for these spaces.
 - b. Low-traffic walkways
 - o Corridors shall be designed with widths of 3'-6' min.
 - o Corridors shall be landscaped with drought tolerant native plants that require little maintenance.
 - o Landscaping adjacent to trails and/or sidewalks shall be low growing shrubs or groundcovers to help eliminate hiding places. (Refer to 1.2 Section F – Crime Prevention through Environmental Design)
 - o All vegetation around trails shall be free of thorns or harmful elements
4. Outdoor Classrooms (small outdoor gathering space).
(Refer to 1.2 Section D - Environments for Outdoor Learning)
- a. Outdoor classrooms shall provide ample shade by providing native canopy trees that will shade at least 80% of the space (at 60% maturity)
 - b. Seating shall be provided to accommodate 20-30 students with a front and center seat arrangement for the teacher.
 - c. Landscaping within and around these outdoor classrooms should stimulate senses such as sight, touch, smell, and sound to maximize the class interaction with nature.
 - d. Outdoor classrooms should be created in places that are free of distractions.
5. Large Outdoor Gathering Spaces –
- a. These spaces should have paved surfaces to accommodate 100-200 people.
 - b. Canopy trees shall be integrated in these spaces within planters to reduce heat islands.
6. Active Recreation Areas –
- a. Active recreation fields shall be turf grass. Use of drought tolerant species such as 'Paspalum' is encouraged.
 - b. Plantings shall be set back a minimum of 20 feet from any active recreation field to prevent injury or game related conflicts.
 - c. Spectator sitting areas shall have shaded seating for 20+ people.
7. Specialty Gardens (Butterfly Garden, Sensory Garden, Rock Garden, Herb Garden, Vegetable Garden, Created Ecosystems, etc.)
- a. Specialty gardens should be designed to tell a story and/ or serve as a supplemental educational tool for teachers.
 - b. Specialty gardens are highly interactive spaces. No hazardous materials or chemicals shall be used on or around them.
 - c. Science teachers could use these gardens as supplemental for education; locating them close to science classrooms would be most efficient.
8. Courtyards –

- a. *Planters or planted areas shall be at least 25 percent of the total courtyard square footage. Locate shade trees at potential gathering areas and to reduce heat island effect.*
 - b. *Provide surface and subsurface conditions for proper drainage of planted areas and planters.*
 - c. *Verify adequate percolation.*
 - d. *Raised planter seat walls shall be between 18 inches and 20 inches.*
 - e. *Curbed planter edges shall not be lower than 6 inches*
 9. **Grassed Areas –**
 - a. *Provide solid sodding of St. Augustine Floratam adjacent to all buildings, walkways, planted areas and parking areas. Provide Bahia Sod for right-of-ways and other large un-programmed areas. Alternatively, use of 'Paspalum' is encouraged to reduce maintenance and water use.*
 10. **Buffers and Perimeter Use Areas –**
 - a. *Landscape buffers shall be designed to be a visual and noise barrier to adjacent properties and serve as a created ecosystem for environmental education.*
 - b. *Buffers shall be designed to include drought tolerant trees and shrubs with a minimum of 90% native species*
 - c. *Buffers are to be low water use zones where irrigation will be used for establishment periods only.*
 - d. *Buffers along adjacent roads shall be designed with low growing understory plantings to allow vehicular surveillance of the site.*
- D. **Energy Conservation**
1. **Building Orientation –**
 - a. *Where economically feasible, buildings shall be oriented to minimize solar gain from the south and west.*
 - b. *Plantings shall be positioned so as to provide shading for a minimum of 50% of all south and west-facing building façades.*
 - c. *Provide for a minimum of 50% canopy coverage for all non-building or non-athletic field site area outside of clear zone. (Refer to 2.2 Section D – Active Recreation Areas)*
 - d. *Provide 100% shading for all air conditioning units.*
- E. **Preservation**
1. *Where native plant communities exist, the design shall strive to preserve as many of these as possible with at least a minimum of 10% of total site to be preserved as undisturbed open space.*
 2. *Native trees greater than 6" D.B.H. shall be preserved. Where it is not possible to preserve these trees, mitigation in the ratio of 1:2 for every inch of diameter shall be provided.*

2.3 Tree Protection

- A. **Use and Maintain Off-Season**
1. *The consultant shall prepare construction documents to provide methods and scheduling for effective tree and plant protection during the construction process that include all aspects of preparation and protection.*
 2. *Protective measures such as fencing, root pruning, construction pruning, mulching, irrigation, fertilization, and aeration shall comply with:*
 - a. *ANSI Z133.1 "Safety Requirements for Pruning, Trimming, Repairing, Maintaining and Removing Trees and for Cutting Brush"*
 - b. *NAA- REF.1 "Pruning Standards for Shade Trees."*
 - c. *NAA- REF.2 "Standard for Fertilizing Shade and Ornamental Trees"*
 3. *Provide 6-inch mulch layer over root zones of existing trees to remain during construction. Remove after construction activities are completed and before cleanup.*

4. Construction debris shall not be buried or left on site during/after construction to affect soil conditions adjacent to proposed construction, new or preserved plantings.
 5. Existing trees shall be scheduled not to have adjacent soil cuts or fill greater than 6-inches without special approval. For fill situations greater than 6 inches, artificial drainage structures shall be provided to promote oxygen exchange for root systems.
 6. Provide tree protection during construction through substantial completion.
 7. Necessary corrective or aesthetic pruning shall be included in scope of work and directed by a Certified Arborist or a Registered Landscape Architect in accordance with NAA – REF.1 “Pruning Standards for Shade Trees”.
- B. Tree Relocation
1. *Participate in a preliminary walk-trough for tree relocation and removals to comply with the appropriate agencies*
 2. Include tree relocation instructions on plans and in written specifications. Hand digging, tree spade, boxing, or other relocation methods shall comply with the following:
 - A. ANSI Z60.1 “America Standards for Nursery Stock”.
 - B. BAA REF.1 “Transplanting of Trees and Shrubs in the Southeastern U.S.”
 - C. FDOA “Grades and Standards for Nursery Plants, Part I & II”.
 3. Specify the level at which root stimulants, soil conditioners, minor element mixes, wetting agents and fertilizers shall be used by the contractor.
 4. Specify the fertilization and watering schedule, as well as the root pruning methods and standards to be utilized by the contractor.
 5. **Specify that the contractor is to provide maintenance and guarantee of transplanted materials for a period of one year after final acceptance.**

2.4 Wetlands

- A. Existing Wetlands
1. Existing wetlands are required to have a field if any changes and/or improvements are required.
 2. Prior to any wetland change, review of existing environmental permits is required.
 3. Preserve all/any-large native vegetation with the use of wetland islands and/or integration of existing vegetation with improved areas.
 4. Existing wetlands shall not be used as an irrigation area for any existing or proposed landscape area.
- B. Proposed Wetlands
1. Provide a minimum buffer of 50' (radial) in case of disturbance
 2. Landscape shall be of all native plantings.
 3. A planting depth shall be determined before construction.
 4. Location of control elevation required for placement of the wetland below the control elevation. (Refer to Local Drainage System and County Water Management District)
 5. Specific elevation shall be on a case-by-case basis in accordance with BROWARD COUNTY SCHOOL BOARD guidelines.
 6. Proposed wetlands can be used for irrigation, with approval and permit from school and/or city.
 7. Do not exceed 2" of grade elevation difference between designed and installed elevations.
- C. Features
1. Deep-water habitats and/or the use of sloughs are strongly encouraged on as many sites as possible.
 2. Boardwalks, upland buffers, and/or grass-paved trails with low maintenance are strongly encouraged.
 3. Site specific wetland opportunities may be approved by the school and on a case-by-case basis.
 4. Fences shall be used when there is a direct connection to and/or when adjacent to any high use area.

D. Wetland Mitigation Monitoring Plan

1. Mitigation may be monitored through the use of monitoring reports. This will be determined by BROWARD COUNTY SCHOOL BOARD on a project-by-project basis. Each report will include:
 - a. Summary of visual field observations, which includes the number and/or percent cover of plant species.
 - b. Comments and / or recommendations for permit compliance.
 - c. A photographic record
 - d. A hydrograph based on the staff gauge water level readings, with data being recorded bi-weekly
 - e. Observations of fish / wildlife utilization and sampling for aquatic macrofauna.
 - f. Evaluation of the success of the mitigation / maintenance effort.
2. Distribution of the report shall be at the discretion of the BROWARD COUNTY SCHOOL BOARD and may include the following submittals:
 - a. Summary of start up and annual monitoring reports for five years. (Total of 6 reports).
 - b. Start up and annual monitoring reports for five years. (Total of 6 reports).
 - c. Start and quarterly monitoring reports (total of 21 reports).
3. Wetland Maintenance
 - a. The maintenance shall be performed quarterly for a period of five years. This will provide a survival rate of 80% for the planted species and 80% coverage of desirable species. Replanting will be done if necessary to meet permit requirements.
 - b. Removal of exotic and nuisance vegetation and debris from the mitigation area is required in perpetuity. Exotic vegetation shall include such species as shown on the most current/updated list provided by the Florida Exotic Pest Plant Council.
 - c. Maintenance will be conducted quarterly and will use appropriate methods of control which includes but are not limited to cutting, mowing, chemical treatment, hand removal, or any combination thereof. The least disruptive method should be selected.

2.5 Water Conservation

A. Soil analysis (Refer to Part 3 Section 3.2 Soil Analysis and Restoration)

1. Identify the following:
 - a. Soil type:
 - o acidic or alkaline
 - o sandy, clay, or gravel
 - b. Percent organic content
 - c. Fertility of the soil
 - d. Depth of topsoil layer
 - e. Depth to bedrock
 - f. Depth to water table
 - g. General rate of percolation
 - h. The limitations for building on the various soil types

Water use zones

1. Plants shall be grouped according to their supplemental water requirements.
2. Water use zones shall be defined for new construction or renovated landscapes as stated below:
 - a. *High Water Use Zone* – 20% maximum of the total landscaped area maximum.
 - b. *Moderate Water Use Zone* – 30% maximum of the total landscaped area.
 - c. *Low Water Use Zone* – 50% minimum of the total landscaped area.
3. High water use zone maximum water consumption shall not exceed 4 inches per month or maximum set forth by the Water Management District (whichever is greater).
4. Moderate water use zone maximum water consumption shall be limited to 2 inches per month.
5. Low water use zone maximum water consumption shall be limited to 1 inch per month.

E. Irrigation efficiency criteria

(Refer to Part 2.8 Irrigation Systems)

1. Precipitation rates for all sprays and emitters within the same zone shall be matched.
2. Systems designed to supply 70 gallons per minute or more shall incorporate a means to measure irrigation water use, and maintain a 95% minimum accuracy across the flow range.
3. Irrigation designer shall provide post-construction documents that list maintenance activities and schedules, operational schedule, design precipitation rates, water shut-off method, controller operational guide, and methods for reducing water flow after the landscape has become established
4. All new or renovated systems shall provide flow meters on the intake side of the pump or water source.

F. Re-use water, stormwater run off, and cisterns

1. Irrigation systems shall connect to city or county re-use lines whenever possible.
2. The use of stormwater run off for supplemental irrigation is strongly encouraged.
3. The use of cisterns for capturing stormwater runoff and for supplemental irrigation is strongly encouraged.

2.6 Earthwork See Civil Design Criteria

To provide for the conservation of in situ soils, reduce wind and hydraulic erosion, and ensure soils are suitable for the planned land use.

Requirements:

A. Conservation

1. The site design shall strive to preserve native plant communities to the greatest extent possible.
2. Where the site must be disturbed, stockpile topsoil for re-use on site.

B. Design Requirements

1. The design drawings must include an Erosion and Sedimentation Control Plan conforming to the requirements of the EPA (most current/updated version) construction general permit or local conditions, whichever is more stringent.
2. Soil testing to ensure soils have the appropriate horticultural characteristics to support the intended use.
 - a. The plans and specifications shall show the number and location of percolation, and soil tests to be performed. The contractor shall engage an independent testing agency to perform the tests and analysis.
 - b. The topsoil shall be tested for pH, organic content and nutrient content. A recommendation shall be made by the testing agency as to the type and quantity of soil amendments required to bring the nutrient content and pH to satisfactory levels for planting.
 - c. Monitor surface and subsurface soils before and after fill operations to confirm percolation and compaction levels comply with playfield and proposed planting requirements.
 - d. Planting soils for trees and shrubs shall contain a minimum of 10% and a maximum of 30% well-composted organics.
 - e. Soil pH shall be between 6.0 and 7.0, and preferably 6.8.
 - f. Soil fertility specifications shall conform to the recommendation of the testing agency.
3. Berming shall be used to provide visual interest, ecological variation and screening:
 - a. Berms shall have variation in height and width. (Meandering or undulating)
 - b. Berms shall have a minimum height of 1 foot and a maximum height of 3 feet.
 - c. 60% of the berm shall be a minimum of 2 feet in height.
 - d. Finished grade slopes for berms shall not exceed 1:4 (25%).
4. Slopes

- a. All retention, berms, and other landforms shall not exceed 1:4 slope (25%).
- b. Slopes shall be sodded, planted, or stabilized to prevent erosion.

2.7 Planting Design

A. Specific Requirements

- 1. Provide tree or palm canopy to reduce sun exposure or heat gain at the following locations:
 - a. Outdoor uncovered play area.
 - b. Bus/parent drop-off, waiting, or congregating areas.
 - c. Unroofed courtyards.
 - d. The building perimeter especially the east, west and south orientations.
 - e. A/C units to increase unit efficiency.
 - f. Paved areas of service yards, parking, areas, and hard courts.
 - g. Areas set aside for outdoor instructional space educational activities.

B. Context

- 1. Environmental – To the extent possible, planting design shall conform to the existing native plant communities of the site. When feasible, the design shall also include ecotones such as pine Flatwoods, wet prairie, etc.
- 2. Cultural/ neighborhood – To the extent practical, or as directed by the BROWARD COUNTY SCHOOL BOARD project manager, the design shall be compatible with the existing landscape style of the area.

C. Traffic articulation

- 1. Ingress – Enhance main entrance area with signage and signature plantings to provide way-finding and minimize confusion when there are multiple entrances.

D. Right Plant, Right Place

(Refer to Reference page for Florida Power and Light (FPL) Right Tree, Right Place Guidelines and Regulations)

- 1. Analyze soil, sunlight exposure, and water source of the site. Plants selected should thrive under the conditions noted.
- 2. Eliminate turf (except athletic fields) and replace with native plants or Florida friendly surfaces (see BROWARD COUNTY SCHOOL BOARD specifications for Florida friendly surfaces).
- 3. Depending on design space/areas, plants selected should be low maintenance and require little supplemental irrigation. (Refer to 1.2 Section E. for Maintenance Guidelines)

E. Plant groups and supplemental irrigation needs

- 1. Plants shall be grouped based on similar supplemental irrigation needs.
- 2. Planting zones shall be irrigated based on the average evapo-transpiration rates of the plants within each zone.

F. Reference Broward County School Board material standard specifications

(Refer to Reference page for Broward County School Board Facilities and Construction Management link)

- 1. All Site Clearing shall be completed in accordance with Section 02110
- 2. All Earthwork shall be completed in accordance with Section 02200
- 3. All Landscape Irrigation shall be completed in accordance with Section 02811
- 4. All Seeding shall be completed in accordance with Section 02931
- 5. All Sodding shall be completed in accordance with Section 02931
- 6. All trees, shrubs, groundcovers and turf grasses shall be planted in accordance with Section 02950

G. Florida Grades and Standards

1. Unless otherwise noted, all plant materials shall be Florida No. 1 or better as specified in the Grades and Standards for Nursery Plants, Florida Department of Agriculture and Consumer Services, latest edition. (Refer to Reference page for Florida Grades & Standards for Trees & Palms Guidelines)

H. Planting and Related Work

Refer to the following for trees and landscaping:

1. Landscaped areas and other turf areas shall receive a 4-inch minimum topping of an 80 percent sand and 20 percent muck (organic) topsoil mix according to grading plan and compaction of 85 percent.
2. All tree, palms and bedding areas shall be amended by the addition of a soil moisturizer.
3. Planting soil for trees shall be a mixture of 60 percent sand and 40 percent muck by volume.
4. Planting soil for palms shall be a mixture of 80 percent sand and 20 percent muck.
5. Planting categories shall include 80% native or indigenous species in each of the following categories: shade trees, small trees, palms, shrubs, and ground cover (excluding sod or turf grasses). Provide 3 to 5 different plant types for each category. Provide low maintenance xerophytes when possible.
6. Follow the State Requirements for Educational Facilities (SREF) and Florida Building code (most recent/updated version) [Refer to Reference page for Florida Department of Education SREF link]
7. Plant material with thorns, stickers, aggressive root systems, or which are poisonous shall not be utilized.
8. Palm specifications shall include overall size, clear trunk, and grey wood requirements when appropriate. Palms shall be resistant to lethal yellowing disease.
9. Plant material that produce berries are limited to remote site locations. Do not use Washington Palms, Queen Palms, or Royal Palms in areas with limited access for maintenance.
10. Select trees for locations based on ultimate size of tree, and ease of maintenance/replacement.
11. The intention to match trees for size, multiple trunks, or other visual criteria shall be noted in construction documents.
12. Specify landscaped and sodded areas to be completed at least 1 months before final completion.
13. Topsoil mix, sod, and other landscaping materials shall be certified by suppliers for compliance with specified requirements. Furthermore, topsoil and planting soil shall be tested by the contractor.
14. Contractor shall replace at no additional cost to BROWARD COUNTY SCHOOL BOARD the following:
 - a. Grassed areas in unsightly or damaged condition for 180 days after BROWARD COUNTY SCHOOL BOARD final completion.
 - b. Trees, palms, shrubs, and ground cover for 1 year after final completion.
15. Project Landscape Architect shall approve representative plant material before planting.
16. Provide clear sight line zones for vehicular drives, entrances, and at potential areas of pedestrian and vehicular conflict.
17. Do not provide access to roofs and compromise security by planting large trees closer than 20 feet to buildings.
18. Provide root barrier system for all large canopy trees if these are located adjacent to paved areas.
19. Landscape design shall recognize area designated for relocatable buildings and future building expansion areas.
20. All planting is to be done in accordance with The School Board of Broward County, Florida, Facilities and Construction Management Department Material Standard Specifications.

2.8 Athletic Fields

A. Design Criteria

Athletic facilities shall be designed in conformance with National Little League Association and National High School Athletic Standards and shall include: (Refer to 2.2 Section D Outdoor Use Areas)

1. Baseball and Softball fields should be oriented so that batter is not facing the setting sun.
2. Install 4 inches of sand clay surface for all baseball/softball fields.
3. Field shall be raised a minimum of 1' above existing drain(s).
4. Provide 8" veneer of well-drained sand underneath grass/turf area that contains 80% sand and 20% organic.
5. Where and when feasible, construct provisions for surface drainage.
6. Create an open space environment with optimum grass viability.
7. Provide a minimum of 1% slope and a maximum 3% slope on athletic field areas for field slopes.

B. Turf Type

1. Use *Cynodon dactylon* 419 (Bermuda grass) and/or *Paspalum vaginatum* 'Sea Dwarf' (Sea Dwarf Seashore Paspalum) as main turf type for programmed athletic fields.
2. Use *Paspalum notatum* (Bahia grass) and/or *Paspalum vaginatum* 'Sea Dwarf' (Sea Dwarf Seashore Paspalum) as turf for non-programmed active recreation fields.

C. Integrated Field Plan/Field Overlap

1. All non-competition fields shall be designed for maximum overlap of functions (multi-purpose fields).

2.9 Irrigation Systems

The irrigation system shall be designed to conform with the requirements of all applicable codes and follow the best irrigation practices as set forth by the Irrigation Association. Should any conflict exist, the requirements of the codes shall prevail. It is the responsibility of the owner/installation contractor to insure the entire system is installed according to all applicable laws, rules, regulations and conventions. Irrigation contractor shall be responsible for obtaining all required permits according to federal, state and local laws.

A. Water Use Zones

1. Plants shall be grouped according to their supplemental water requirements.
2. Water use zones shall be defined for new construction or renovated landscapes as stated below:
 - a. High (20% maximum of total landscaped area)
 - o High water use zones shall include active use turf areas and sports fields.
 - o High water use zones shall be irrigated using rotors, sprays, or rotary nozzles.
 - o Water consumption for High water use zones shall not exceed 1.5 inches per week.
 - b. Moderate (30% maximum of total landscaped area)
 - o Moderate water use zones shall include shrub areas adjacent to buildings, areas with heavy foot traffic, and focal areas.
 - o Moderate water use zones shall be irrigated using drip line or drip emitters when adjacent to buildings or hardscape. Rotary nozzles or sprays may be used in areas not adjacent to buildings or hardscape.
 - o Water consumption for Moderate water use zones shall not exceed 1 inch per week.
 - c. Low-No (50% maximum of total landscaped area)
 - o Low-No water use zones shall be temporary for establishment purposes and during times of drought. Plant types include native shrub areas, Bahia sod with light foot traffic, and meadows.
 - o Low-No water use zones shall be irrigated with sprays or rotary nozzles.
 - o Water consumption for Low - No water use zones shall not exceed 0.5 inches per week.

B. Equipment

1. Overhead Sprays

a. Sprays

- 6" popup sprays for turf, 12" popup sprays for shrub areas. Risers shall not be used along pedestrian paths or roadways.
- Check valve, pressure regulator, and restricted flow options.
- Matched precipitation rate nozzles.

b. Rotary

- 6" popup sprays for turf, 12" popup sprays for shrub areas.
- Check valve and restricted flow options.

c. Rotors

- Popup, gear driven rotors.
- Check valve and restricted flow options.
- Turf caps for sports fields.

d. Installation

- Check valves must be installed at irrigation heads as needed to prevent low head drainage and puddling.
- Nozzle precipitation rates for all heads within each zone must be matched to within 20% of one another.
- No water spray from irrigation systems shall be applied under roof overhangs.
- Irrigated areas shall not be less than four (4) feet wide, except when next to contiguous property or using micro or drip irrigation.

- Spray heads shall be installed 4" from sidewalks or curbed roadways and 12" from uncurbed roadways and building foundations. Rotors shall be installed 4" from sidewalks or curbed roadways, 12" from building foundations, and 36" from uncurbed roadways.

2. Drip/Micro

1. Drip line
2. Drip emitters
3. Bubblers
4. Filtration

3. Valves

a. Remote Control Valves

- Pressure regulating and self cleaning options.

b. Installation

- Locate valves prior to excavation. Insure that their location provides for easy access and that there is no interference with physical structures, plants, trees, poles, etc. Valve boxes must be placed a minimum of 12" and a maximum of 15" from the edge of pavement, curbs, etc. and the top of the box must be 2" above finish grade. No valve boxes shall be installed in turf areas without approval by the irrigation designer - only in shrub beds. Never install in sport field areas.

4. Pipe

a. Laterals

- Class 200 PVC.
- Minimum pipe size: 3/4".

b. Mainline

- Class 200 PVC.

c. Sleeves and Conduit

- Schedule 40 PVC.
- The sleeve diameter shall be twice the size of the pipe it is carrying.
- Minimum pipe size: 2".

5. Installation
 - a. The installation of tracer wire along mainlines and laterals is strongly encouraged to permit easy location and prevent inadvertent cutting of pipes. If the water supply for the irrigation system is from a well, a constant pressure flow control device or pressure tank with adequate capacity shall be required to minimize pump "cycling".
 - b. When laying out mainlines place a maximum of 18" away from either the back of curb, front of walk, back of walk, or other hardscape to allow for ease in locating and protection from physical damage. Install all lateral pipe near edges of pavement or against buildings whenever possible to allow space for plant root balls. Always install piping inside project properties boundary.
 - c. Main line pipe depth measured to the top of pipe shall be 36" minimum, including at vehicular crossings.
 - d. Lateral line depths measured to top of pipe shall be:
 - a. 18" minimum for 3/4"-3" PVC with a 30" minimum at vehicular crossings;
 - o 24" minimum for 4" PVC and above with a 30" minimum at vehicular crossings.
 - e. **The Contractor shall maintain irrigation system for a 12 month period after installation.**
6. Source
 - a. Reuse and Stormwater
 - o Whenever possible, reuse shall be used as the source for irrigation.
 - o Rainwater collection systems are an acceptable source for irrigation, as well as surface stormwater (recharged by reuse) by lake-draw.
 - b. Well
 - o When reuse or stormwater is not available a well and pump station shall be used as the source.
 - c. Potable
 - o When a well or reuse/stormwater source is determined to be economically unfeasible a potable source shall be considered as a last option.
 - o The designer shall submit a letter to the project manager justifying the use of the potable source. The letter shall contain all such sources have been investigated.
 - o Potable irrigation systems shall have their own meter and backflow preventer
7. System Equipment
 - o Flow Sensors
8. Irrigation Plan
 - a. The irrigation plan shall show the following but not be limited to
 - o Irrigation point(s) of connection (POC) and design capacity.
 - o Water meter size and location.
 - o Reduced-pressure backflow prevention devices for each irrigation POC on potable water systems.
 - o Major components of the irrigation system, including all pumps, controllers, filters, valves, and pipe sizes.
 - o Number each zone (valve) and indicate the size and flow rate in gallons per minute (GPM).
 - o Identify location of rain shut-off devices or soil moisture sensors.
 - b. Zone schedule
 - o Precipitation rate expressed in inches per hour for each zone.
 - o Total flow rate (flow velocity not to exceed five (5) feet per second) in gallons per minute (GPM) and operating pressure pounds per square inch (PSI) for each spray, rotor, and bubbler zone and gallons per hour (GPH) and operating pressure for low-flow irrigation zones.
 - o All new trees and/or large palms shall have irrigation bubblers for establishment and supplemental irrigation.
 - o Bubblers for new trees and/or large palms shall be on a separate zone from all other irrigation zones.
 - o Indicate the type of material each zone will cover, such as turf, shrub, or drip.

- c. Irrigation legend
 - Separate symbols for all irrigation equipment with different spray patterns, precipitation rates, and pressure compensating devices.
 - General description of equipment.
 - Manufacturer's name and model number for all specified equipment.
 - Spray radius per nozzle, flow rate, and specified PSI.
 - Specify purple equipment for non-potable/reuse systems.
- d. Water Conservation and Permitting
 - All irrigating systems shall be equipped with a rain gauge or soil moisture sensors.
 - Automatic shut-off devices shall be installed on all systems to prevent unnecessary watering.
 - All planting beds shall have either drip or micro-spray emitters.

2.10 Site Furnishings – See Architectural Design Criteria

The consultant shall provide site furnishings in accordance with the provisions outlined below.

- A. Recycled Materials
 - 1. If feasible, 50% of all site furnishing, pedestrian paving, playground structures, bike racks, trash receptacles, signage, and any other furnishings shall be made from recycled materials.
 - 2. Site furnishings and all other materials shall be obtained from within 500 miles from the site.
- B. Bicycle Racks
 - 1. The number of bicycle racks shall equal 5% of the proposed student body.
 - 2. Bicycle storage areas shall be protected by a 10-foot-high enclosure with lockable entrance.
- C. Signage
 - 1. The site plan shall include way-finding signage, which identifies buildings, administrative offices, cafeteria and auditorium.
- D. Seating
 - 1. Provide seating for 30% (minimum) of the design student body within the student courtyard.
 - 2. Provide seating for 20 persons (minimum) at the primary administrative entrance and all entrances to auditoriums.
 - 3. A minimum of 80% of all outdoor seating shall be shaded by vegetation or other means.
- E. Trash Receptacles
 - 1. Provide one (1) trash receptacle every 200 feet along pedestrian routes.
 - 2. Provide a minimum of two (2) trash receptacles at the primary administration entrance and at each auditorium entrance.
- F. Additional Requirements
 - 1. Provide adequate outdoor furnishings located on site to include, but not limited to:
 - a. Bicycle racks.
 - b. Outdoor signage.
 - c. Flag poles.
 - d. Built-in benches
 - e. Trash receptacles
 - 2. High Density Recycled plastic may be used for site furnishings in place of prohibited wood products and conditional uses of aluminum materials. Provide adequate bracing and support to reduce deflection.

2.11 Fences and Gates See Architectural Design Criteria

- A. All fencing shall be done in accordance with The School Board of Broward County, Florida, Facilities and Construction Management Department Material Standard Specifications. All fencing shall comply with applicable zoning requirements. An ordinance will have precedence over a design criteria item. Coordinate fencing plan review with appropriate agencies and BROWARD COUNTY SCHOOL BOARD.
- B. Fencing materials, including framing, 9 gauge, 2 inch mesh fabric, hardware, and ancillary materials, shall be black vinyl-coated, hot dipped galvanized steel and conform to the appropriate ASTM standards.
- C. For permanent chain link fencing, provide top and bottom rails and an additional mid-rail for chain link fencing 8 feet or higher. Barbed wire use is not allowed at educational facilities. Provide top and bottom knuckled selvage for chain link fencing
- D. Fencing shall be as follows:
 - 1. 6 feet high chain link at site perimeter or other materials accepted by BROWARD COUNTY SCHOOL BOARD on a per condition basis.
 - 2. 10 feet high chain link around bicycle storage.
- E. Fence Openings
 - 1. Provide 3 feet wide lockable gates to fenced areas and as follows:
 - a. At service yards with two separate 3 feet wide by fence height pedestrian gates and a vehicular gate to provide a 20 feet clear opening at appropriate locations.
 - b. To other fenced areas according to program requirements.

PART 3 SITE DESIGN AND ANALYSIS

Intent: To ensure that the Broward County School Board identifies and utilizes the existing site conditions for environmental stewardship purposes and quality land use management. Creating opportunity for habitat restoration without compromising water management practices, functional spaces and/or the existing natural environment

3.1 Context

This process begins with an analysis of the site – assessing the existing conditions both from a functional or program standpoint as well as examining the environmental conditions. Included in this assessment is a review of historic records to get an idea of the pre-development site conditions. This assessment will help guide the design of restored habitat(s). The idea is to integrate the ecological heritage of the site with the current functions and uses.

3.2 Soil analysis and vegetation restoration

Intent: To protect, create, and enhance both existing and proposed ecologic systems and unique features to increase biodiversity and improve sustainability of site; thereby, establishing mini-ecosystems on site, which shall increase plant and animal biodiversity.

- A. Site Synthesis

The site synthesis process combines the historical data – in this case, indigenous conditions and habitats that inhabited the school site prior to development with the current land-use. The process is to review soil maps for the county and identify the major soil type for a given school

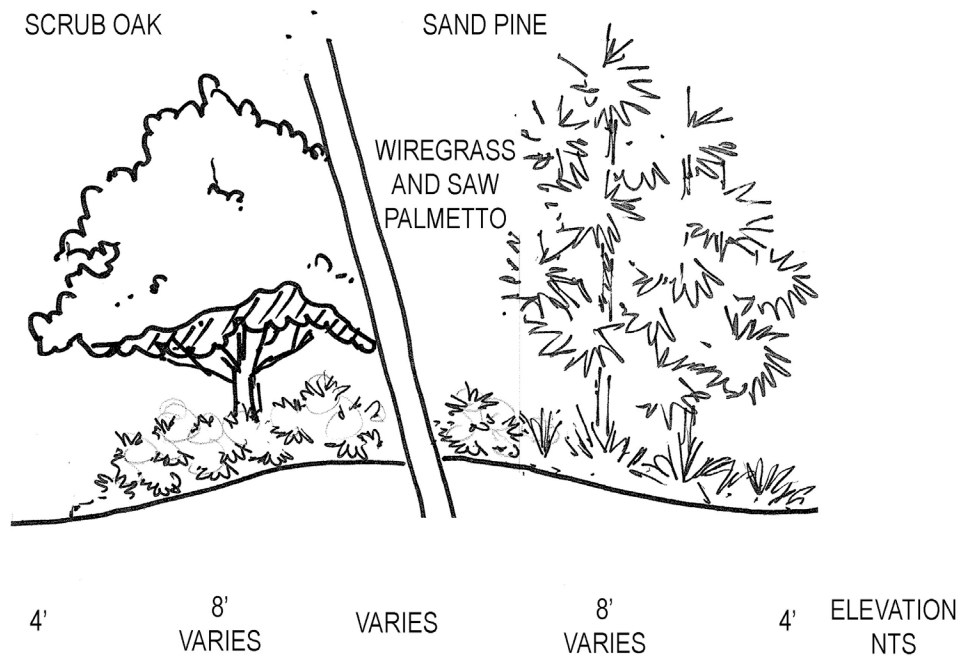
site. For each soil type/classification there is an associated habitat type. This process will guide the designer on what habitat types to use in the restoration process. The following habitat – soil association/plant associations shall be used in non-programmed areas at the site.

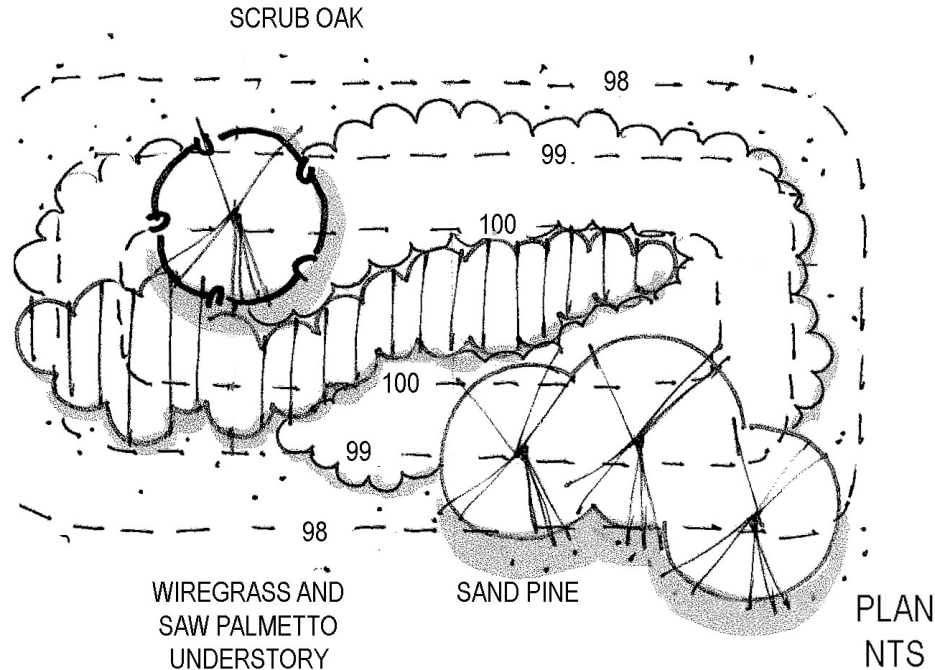
B. Soil Zones Criteria and Exhibits

Soils Types of Coastal Ridges (2 Soil Types) Plan& Elevation 3.2-1

1. **Paolo-St. Lucie Association (knolls and ridges)** - To restore natural habitats within the Paolo soil classification; implementing native canopy and understory plant communities, providing a low to moderate maintenance plan through adherence of specified design outline, water usage, and preservation methods. Paolo soils are excessively drained, nearly level, sandy soils modified for urban land use, most of the existing vegetation remains near Pompano and Deerfield Beach.

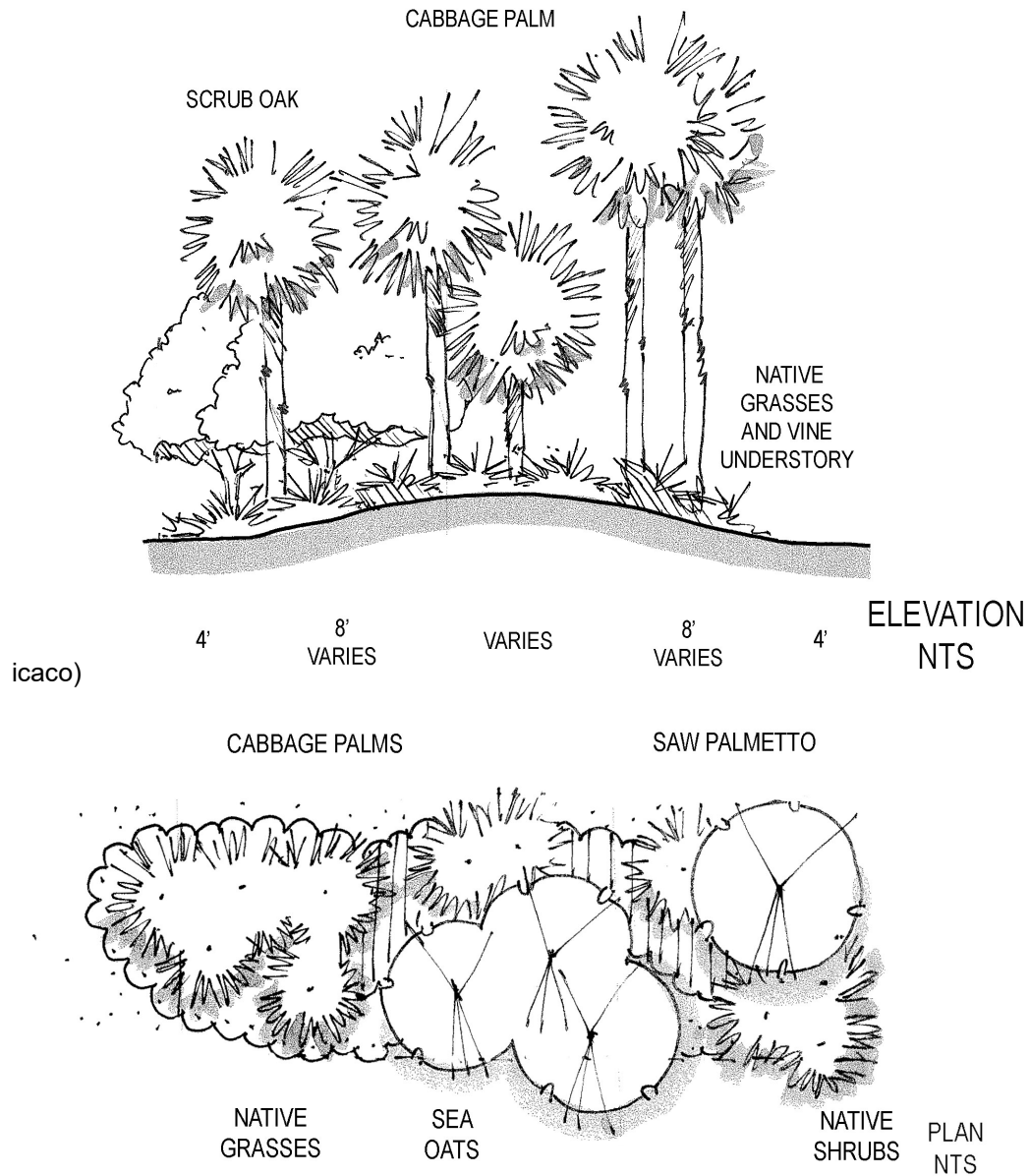
- a. Canopy vegetation: Scrub Oak (*Quercus dumosa*)
- b. Understory vegetation: Sea Oats (*Uniola paniculata*), Bottlebrush grass (*Aristida spiciformis*), Wiregrass (*Aristida stricta* var. *beyrichiana*), Sawgrass (*Cladium jamaicense*), Elliott's lovegrass (*Eragrostis elliottii*), Purple lovegrass (*Eragrostis spectabilis*), muhly/Hairgrass (*Muhlenbergia capillaries*), Saw palmetto (*Serenoa repens*)





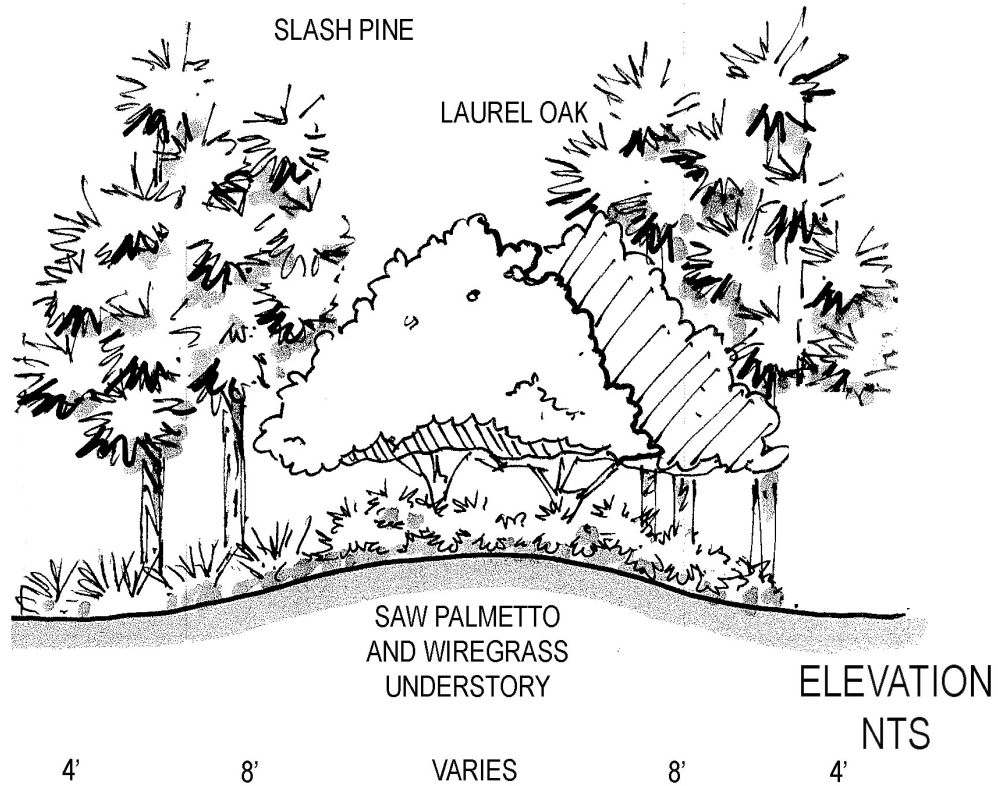
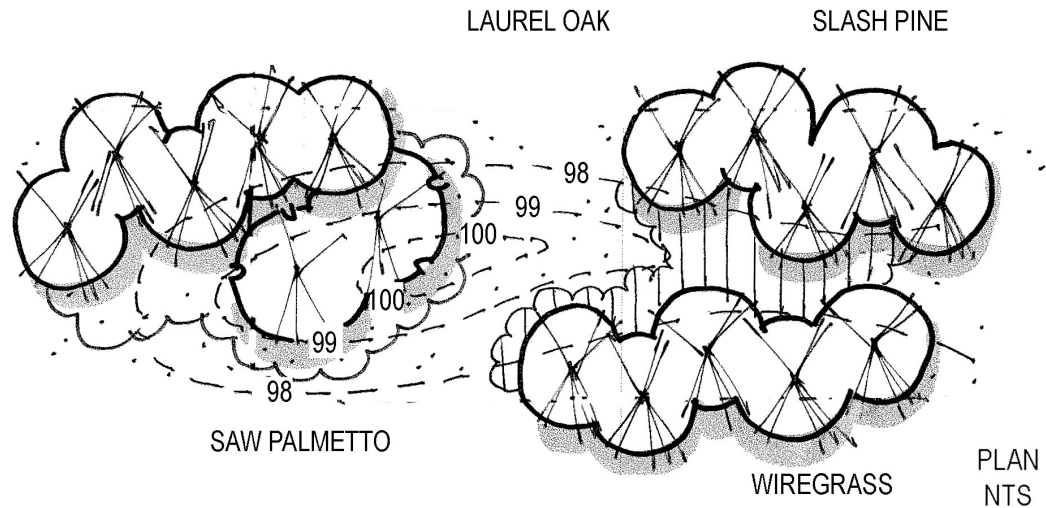
2. **Palm Beach-Beaches Association (coastal hammocks) Plan & elevation 3.2-2** – To restore coastal hammock habitats using native canopy and understory vegetation commonly found within palm beach soil type. The use of native plants and sustainable materials provide opportunities for outdoor learning sites and preservation methods. A moderate to high intensity maintenance plan is needed for the overall continuation of specified goals and plant material. Palm beach soils are excessively drained, nearly level to sloping, sandy soils with fine shell fragments, beaches.
 - a. Canopy vegetation: sea grape (*Coccoloba uvifera*), cabbage palm (*Sabal palmetto*), saw palmetto (*Serenoa repens*), Scrub Oak (*Quercus dumosa*), other oak species, railroad vine (*Ipomoea pes-caprae*), beach dune sunflower (*Helianthus debilis*), sea oats (*Uniola paniculata*), sea purslane (*Sesuvium portulacastrum*), saltgrass (*Distichlis spicata*). Coastal hammocks vegetation: live oak (*Quercus virginiana*), cabbage palm (*Sabal palmetto*), strangler fig (*Ficus aurea*), tamarind (*Lysiloma latisiliquum*), live oak (*Quercus virginiana*), gumbo-limbo/west Indian birch tree (*Bursera simaruba*), mastic (*Mastichodendron foetidissimum*), West Indian mahogany (*Swietenia mahagoni*)
 - b. Understory vegetation: *Metopium toxiferum*, red bay (*Persea borbonia*), wax myrtle (*Myrica cerifera*), dahoon holly (*Ilex cassine*), sweetbay (*Magnolia virginiana*), florida myrsine

(*Myrsine floridana*), buttonwood (*Conocarpus erectus*), and coco plum (*Chrysobalanus*



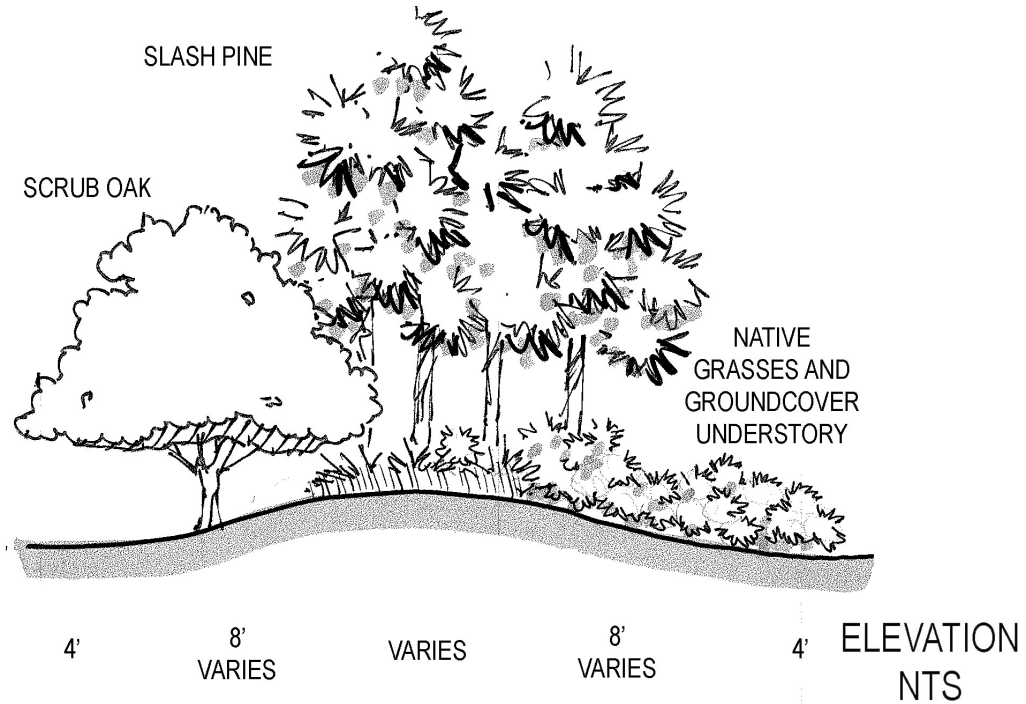
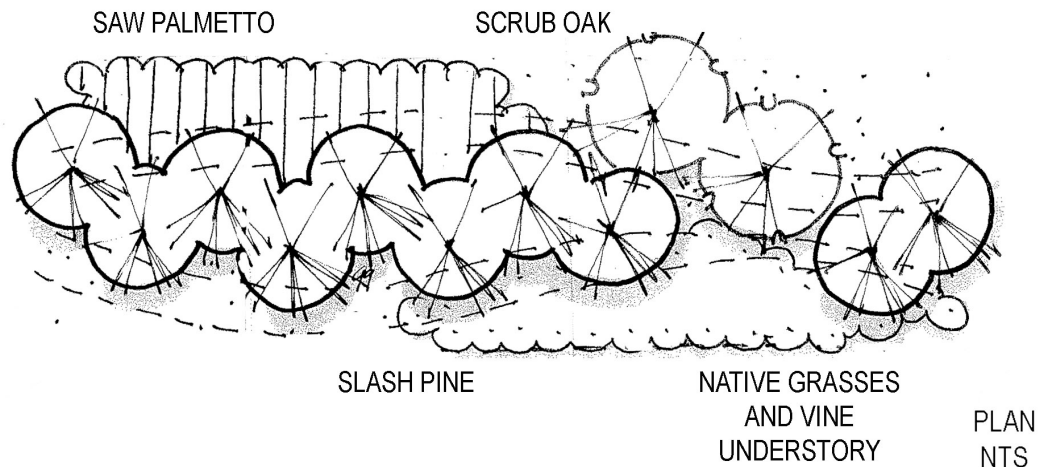
C. **Soils of the low ridges, knolls, and Flatwoods (4 Soil Types)**

3. **Dade Association (Plan and Elevation 3.2-3)** – To restore low Flatwood Dade soil classification habitats using native canopy and understory vegetation commonly found within Dade soil type. The use of native plants and sustainable materials provide opportunities for outdoor learning sites and preservation methods. A low to moderate intensity maintenance plan is needed to maintain site initiatives. Dade soils are well-drained, nearly level sandy soils. Landscape consists of the coastal ridge located south of Middle river while the area is separated by broad low sloughs and drainage ways.
 - a. Canopy vegetation: slash pine (*Pinus elliottii*), live oak (*Quercus virginiana*), laurel oak (*Quercus laurifolia*), Scrub Oak (*Quercus dumosa*),
 - b. Understory vegetation: saw palmetto (*Serenoa repens*), Wiregrass (*Aristida stricta* var. *beyrichiana*) and Sea Oats (*Uniola paniculata*)



4. **Duette-Pomello Association (broad knolls and ridges in east) Plan and Elevation**
3.2-4 – To restore low flatwood duette soil classification habitats using native canopy and understory vegetation commonly found within duette soil type. The use of native plants and sustainable materials provide opportunities for outdoor learning sites and preservation methods. A low to moderate intensity maintenance plan is needed to maintain site initiatives. Duette soils are moderately well-drained, nearly level and gently sloping sandy soils. Location area includes narrow ridge of Pine Island.
 - a. Canopy vegetation: slash pine (*Pinus elliottii*), laurel oak (*Quercus laurifolia*), Scrub Oak (*Quercus dumosa*),

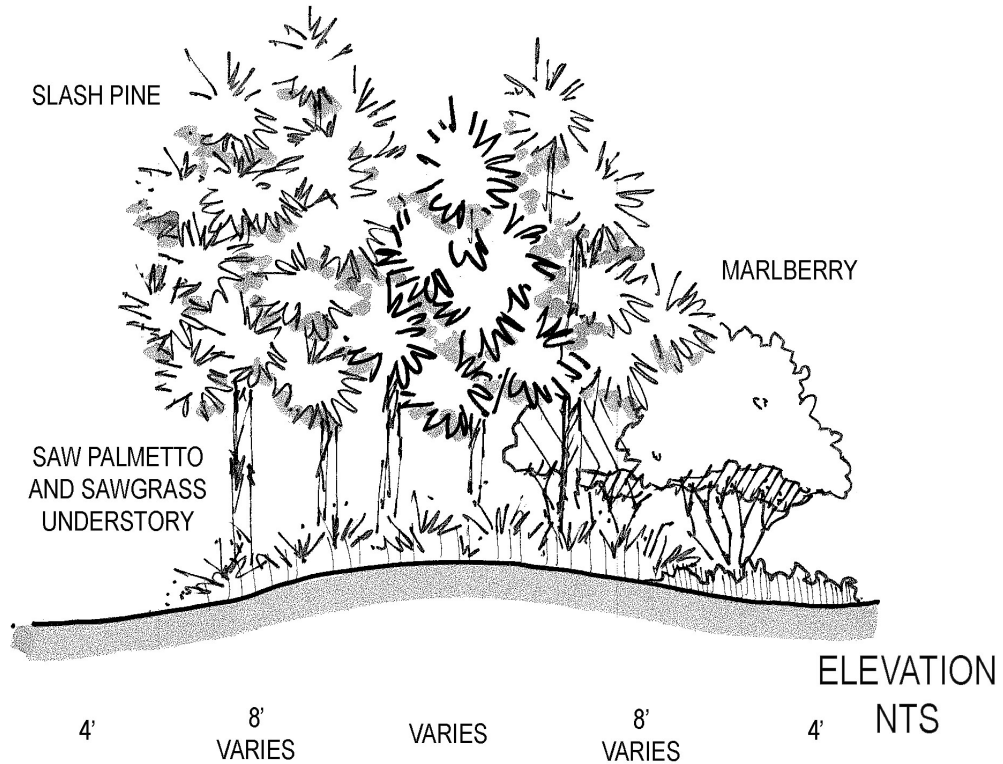
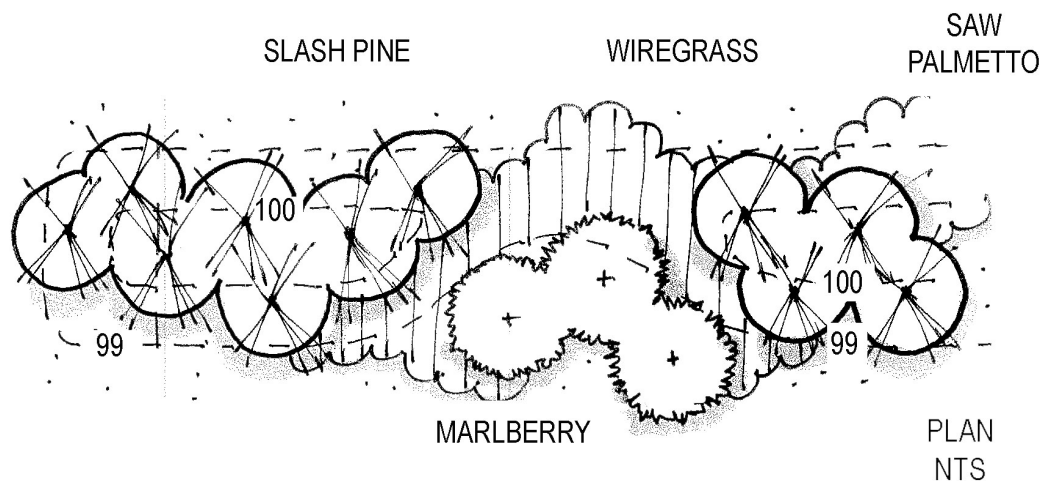
- b. Understory vegetation: saw palmetto (*Serenoa repens*), sea oats (*Uniola paniculata*), Wiregrass (*Aristida stricta* var. *beyrichiana*), muhly/Hairgrass (*Muhlenbergia capillaries*).



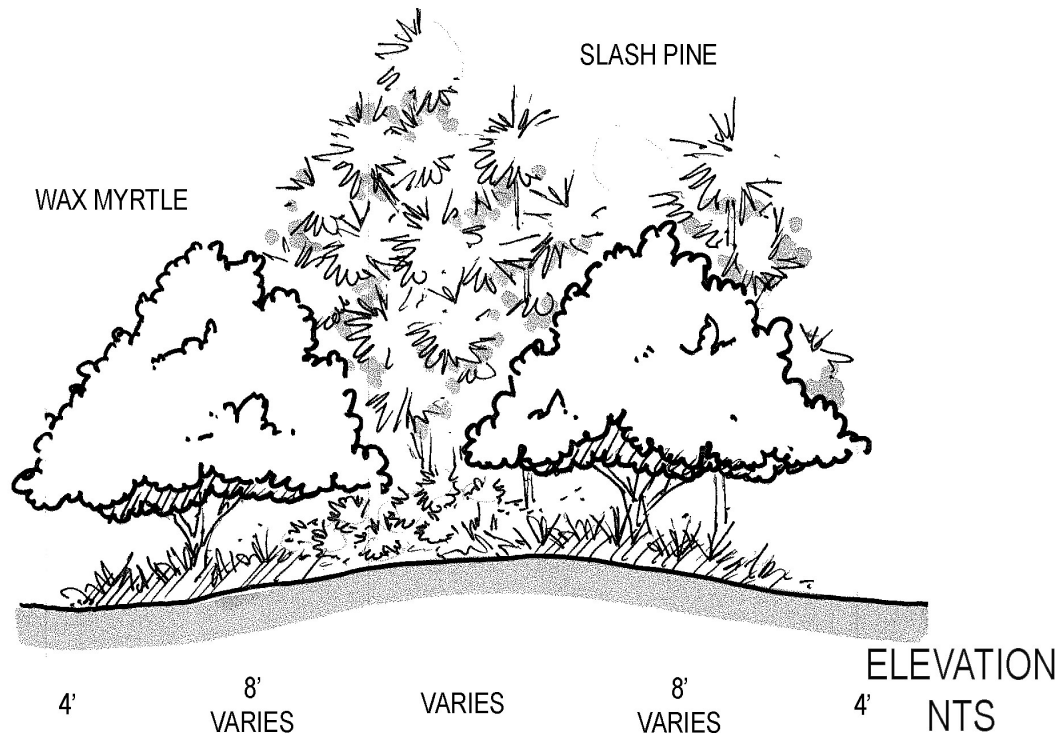
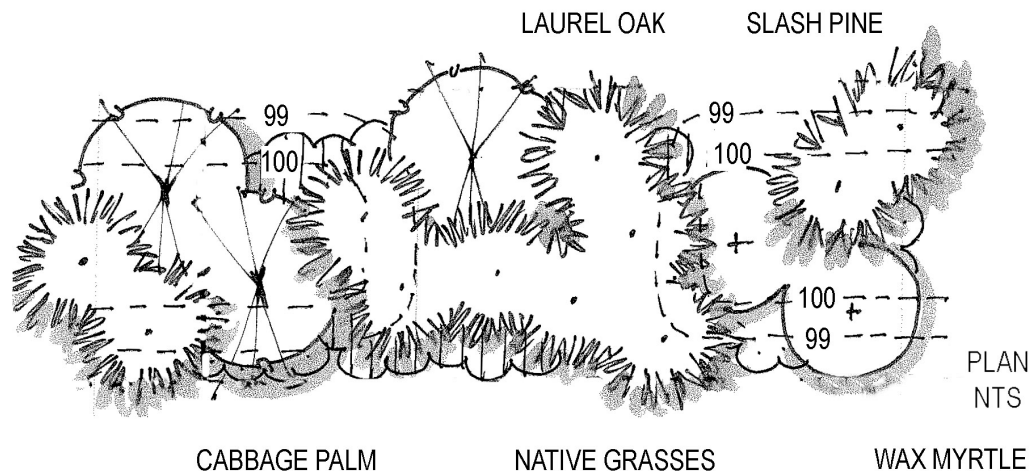
5. **Immokalee-Pompano Association (Plan and Elevation 3.2-5)** –To restore low Flatwood Immokalee-Pompano soil classification habitats using native canopy and understory vegetation commonly found within Immokalee-Pompano soil type. The use of native plants and sustainable materials provide opportunities for outdoor learning sites and preservation methods. A low to moderate intensity maintenance plan is needed to maintain

site initiatives. Immokalee-Pompano soils are poorly drained, nearly level sandy soils. Landscape has broad low ridges interspersed with sloughs and broad flats.

- a. Canopy vegetation: slash pine (*Pinus elliottii*),
- b. Understory vegetation: saw palmetto (*Serenoa repens*), Wiregrass (*Aristida stricta* var. *beyrichiana*), Elliott's lovegrass (*Eragrostis elliottii*), Purple lovegrass (*Eragrostis spectabilis*), muhly/Hairgrass (*Muhlenbergia capillaries*), and sea oats (*Uniola paniculata*).

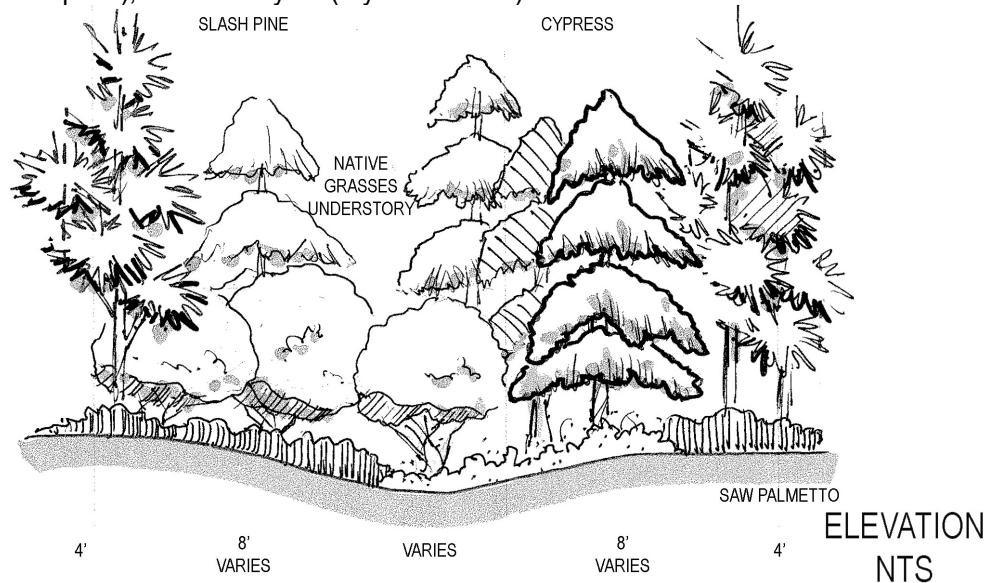


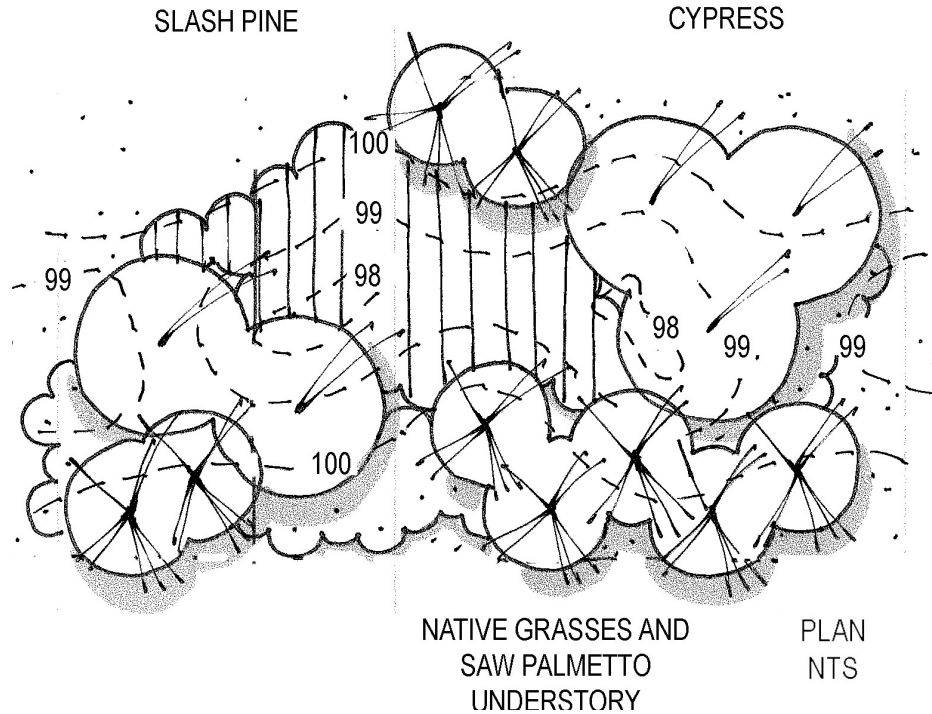
6. **Immokalee-Association (Plan and Elevation 3.2-6)** – To restore low Flatwood Immokalee soil classification habitats using native canopy and understory vegetation commonly found within Immokalee soil type. The use of native plants and sustainable materials provide opportunities for outdoor learning sites and preservation methods. A low to moderate intensity maintenance plan is needed to maintain site initiatives. Poorly drained, nearly level, sandy soils. Landscape: broad low ridges interspersed with grassy sloughs (SE part of soil survey).
- a. Canopy vegetation: slash pine (*Pinus elliottii*), laurel oak (*Quercus laurifolia*)
 - b. Understory vegetation: saw palmetto (*Serenoa repens*), wax myrtle (*Myrica cerifera*), Wiregrass (*Aristida stricta* var. *beyrichiana*), Elliott's lovegrass (*Eragrostis elliottii*), Purple lovegrass (*Eragrostis spectabilis*), muhly/Hairgrass (*Muhlenbergia capillaries*), and sea oats (*Uniola paniculata*).



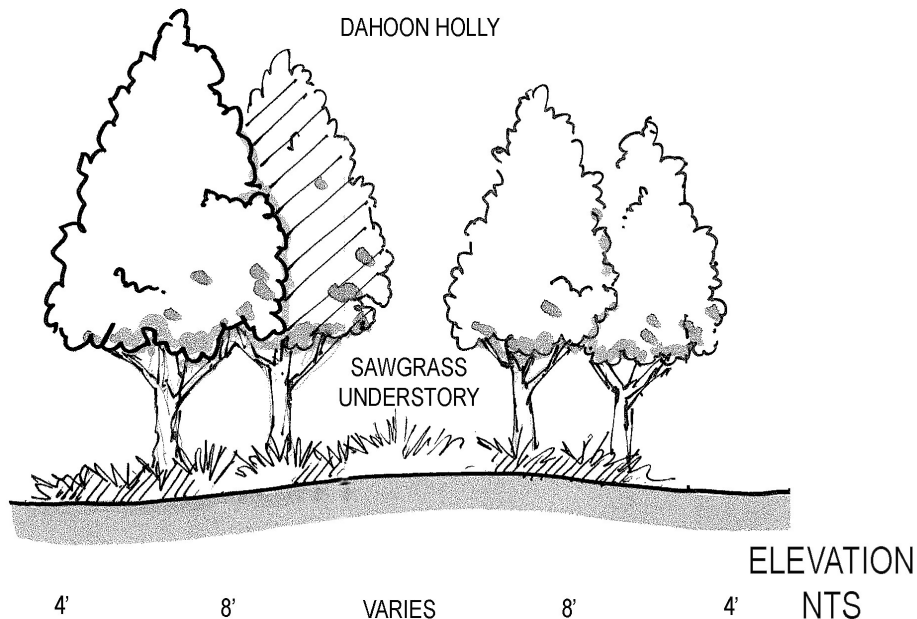
D. Soils of the low Flatwoods, sloughs, and marshes (2 Soil Types)

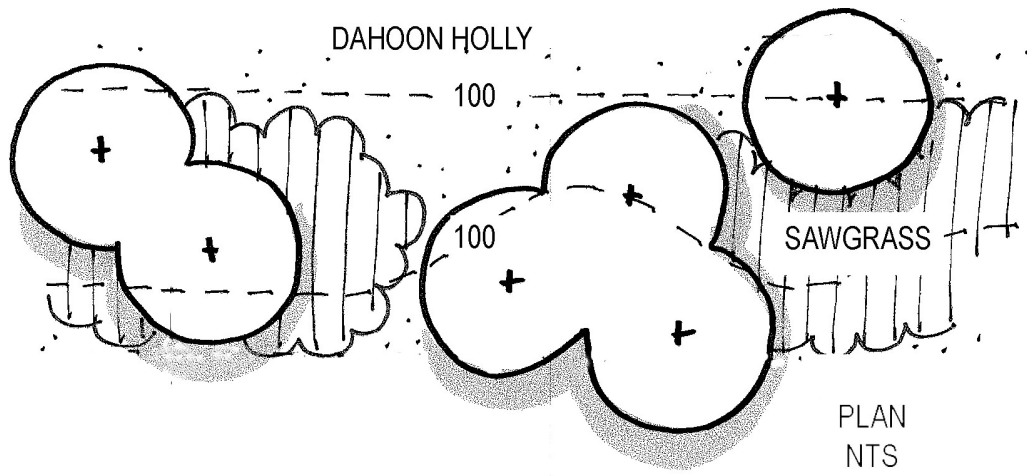
7. **Hallandale-Margate Association (Plan and Elevation 3.2-7)** – To restore low Flatwood Hallandale soil classification habitats using native canopy and understory vegetation commonly found within Hallandale soil type. The use of native plants and sustainable materials provide opportunities for outdoor learning sites and preservation methods. A low to moderate intensity maintenance plan is needed to maintain site initiatives. Hallandale soils are poorly drained, nearly level sandy soils. Landscape: soils on broad flats and low terraces interspersed with drainage ways and ponds or depressions (E of Everglades and W of Atlantic ridge).
- a. Canopy vegetation: slash pine (*Pinus elliotii*) and cypress (*Taxodium distichum*) (Cypress more common in drainage ways and depressions)
 - b. Understory vegetation: Sea Oats (*Uniola paniculata*), Bottlebrush grass (*Aristida spiciformis*), Wiregrass (*Aristida stricta* var. *beyrichiana*), Sawgrass (*Cladium jamaicense*), Elliott's lovegrass (*Eragrostis elliotii*), Purple lovegrass (*Eragrostis spectabilis*), muhly/Hairgrass (*Muhlenbergia capillaries*), saw palmetto (*Serenoa repens*), and wax myrtle (*Myrica cerifera*).





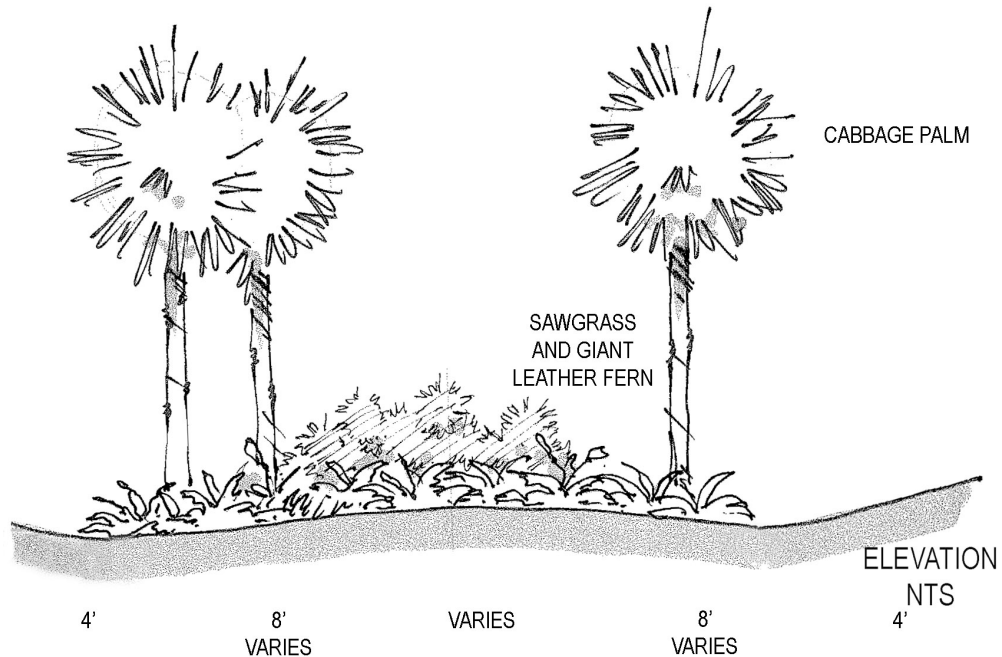
8. **Lauderhill-Dania Association (Plan and Elevation 3.2-8)** – To restore low flatwood Lauderhill soil classification habitats using native canopy and understory vegetation commonly found within Lauderhill soil type. The use of native plants and sustainable materials provide opportunities for outdoor learning sites and preservation methods. A low to moderate intensity maintenance plan is needed to maintain site initiatives. Lauderhill soils are very poorly drained, nearly level organic soils. Landscape: soils on broad flats (W part of soil survey and E part of Everglades).
- Canopy vegetation: Dahoon Holly (*Ilex cassine*)
 - Understory vegetation: Sawgrass (*Cladium jamaicense*)

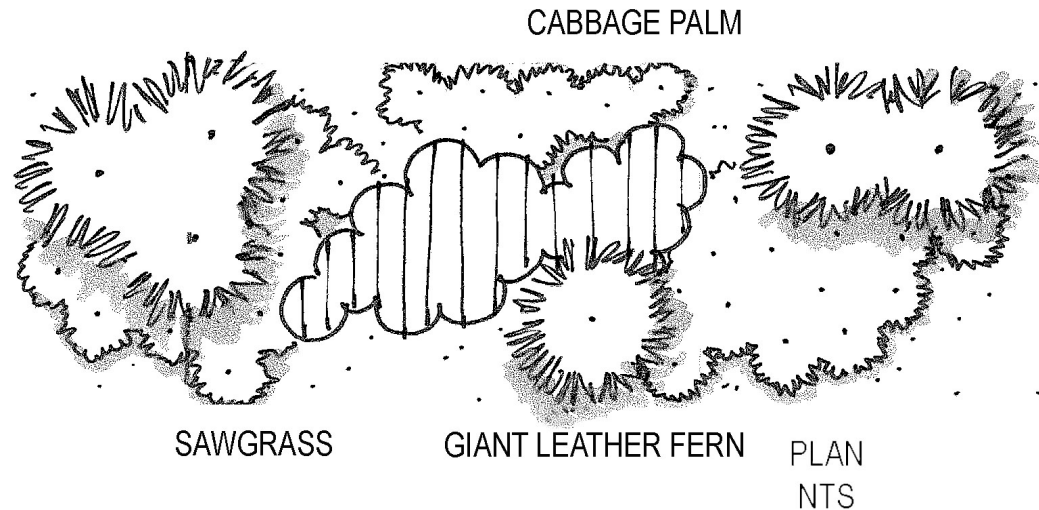




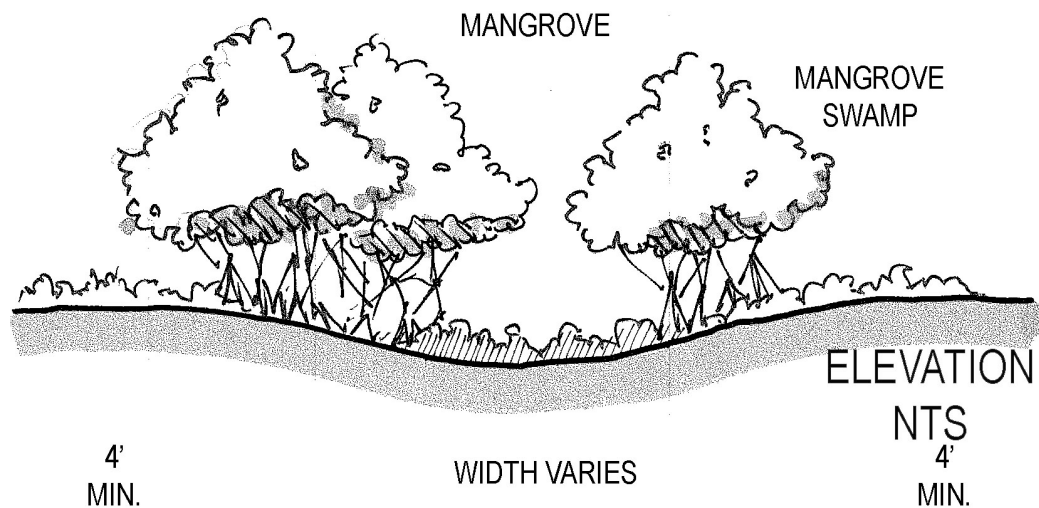
E. Soils of the coastal lowlands and tidal swamps (2 Soil Types)

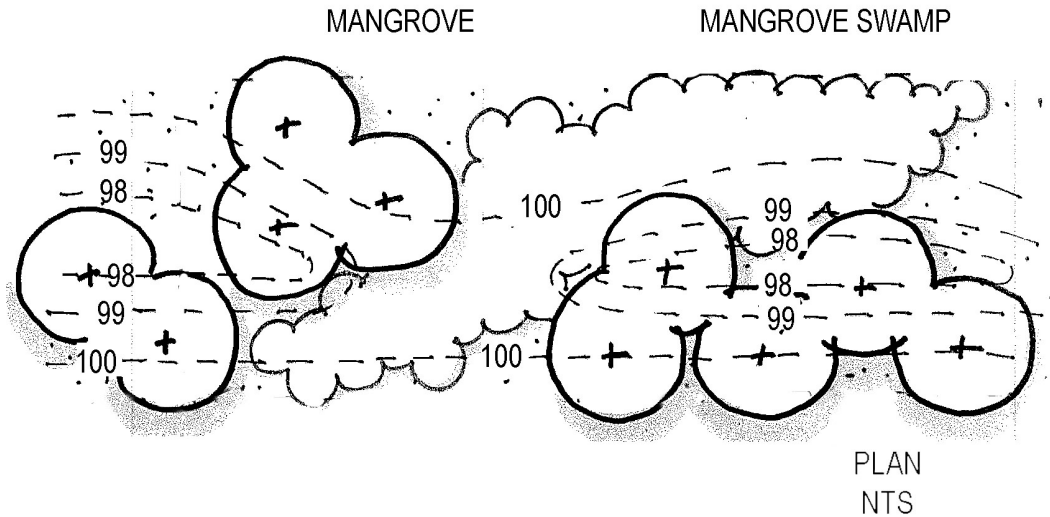
9. **Udorthents- Pennsuco Association (coastal lowlands and swamps) Plan and Elevation 3.2-9** – To restore coastal lowland and swamp Udorthents soil classification habitats using native canopy and understory vegetation commonly found within Udorthents soil type. The use of native plants and sustainable materials provide opportunities for outdoor learning sites and preservation methods. Udorthents soils are modified by spreading mixed limestone fragments, sand, and shell fill material over natural surface, very poorly drained, loamy soils underlain by limestone. Location: SE part of county and runs along Port everglades South to county line.
 - a. Canopy vegetation: a few cabbage palm (*Sabal palmetto*) in some areas.
 - b. Understory vegetation: Sawgrass (*Cladium jamaicense*), giant leather fern (*Acrostichum danaeifolium*), Swamp area mainly consists of mangrove trees red mangrove (*Rhizophora mangle* L.) and white mangrove (*Laguncularia racemosa* L.).





10. **Arents-Association (plan and Elevation 3.2-10)** – To restore coastal lowland and swamp Arents soil classification habitats using native canopy and understory vegetation commonly found within Arents soil type. The use of native plants and sustainable materials provide opportunities for outdoor learning sites and preservation methods. Arents soils are modified by spreading sandy fill material over natural soil surface and Urban land, mostly in low coastal areas. Location: East part of survey and North of Port Everglades. Very little natural vegetation. A few small areas near Intracoastal waterway have mangrove swamps as well as Hugh Taylor Birch State Park, red mangrove (*Rhizophora mangle* L.) and white mangrove (*Laguncularia racemosa* L.).





3.3 Functional Spaces Design Criteria

Intent: To provide important learning, open, and outdoor areas for academic learning while helping to restore and maintain important existing/proposed ecosystems.

A. Definition

Schools have uniquely functional spaces associated with them. These spaces and uses need to be addressed in the design process. Proper design can enhance these spaces and uses. Enhanced spatial design can therefore, heighten the general experiences of students and other users of these functional spaces.

The following narratives and sketches help to describe the design principles.

B. Design Intent & Criteria

1. Entry / Arrival

Intention: Entry plantings should 'announce' the entry. They should be sufficiently different from their context or surrounding plantings to signify their special distinction. The intent is to help guide a visitor into the school site and into the proper entry into the main building.

- Plantings should be selected and positioned to help guide the visitor to entry points – both into the school property and also to guide the visitor to the school building's main, or ceremonial, entry.
- At the school property's entry – for safety reasons, the plantings need to respect sight visibility concerns that are found at an intersection of a driveway with a public road.
- The plantings also need to subscribe to CPTED principles if positioned near a walkway – for both plantings at the parcel's entry and also planting around the school building's main entry.
- At the main building entry – other materials, such as pavers or colored concrete or other specialty materials, should be employed to help define and distinguish the entry area.
- At the entry, the primary focus is moving people in and out of the space. The area gathers traffic from multiple directions – it is a node that both disperses pedestrians and gathers pedestrians at the entry. It can also serve as ceremonial space that functions as the threshold or gateway into the school.

- f. Plantings should include color or other accents to draw the eye to them. The general intent is that the planting arrangements and choice of materials should be distinctly different in some way with their context to signify or announce the entry.

2. Parking Areas

Intention: To provide shade to the paved parking areas to reduce heat load while also providing pervious area for stormwater treatment.

- a. Landscape islands should be planted with two or three tiers of plant material: overhead canopy for shade, lower groundcovers and/or sod and, possibly a medium-height shrub mass. Groundcovers in lieu of sod should be preferred if long-term maintenance costs are factored into the decision.
- b. Give consideration to car-door swing zones and sight lines (visibility triangles at intersections of drive aisles) when positioning shrubs and trees or palms within the island.
- c. Periodically, pedestrians may take refuge on an island to avoid a passing automobile. Planting arrangements on the island – on the side, next to the drive aisle and/or on the ends of the island -- should accommodate this need.
- d. Landscape islands can also be designed to accept some stormwater run-off from the parking lot. E.g. breaks in the island curb and/or flumes. Choose plants accordingly - materials that can survive both wet and dry periods. These mini 'bioswales' make the landscape islands multi-functional.
- e. If the parking lots are designed with medians, the median can become a 'bioswale'. Consider directing run-off from the parking lot into them to help treat the 'first flush' of run-off. Choose plant materials that can tolerate both wet and dry conditions and that will aid in the cleansing of the run-off.
- f. In the design of the medians, consider movements of pedestrians and placement of trees and palms. Some orientations may require pedestrians to cross the median to enter the school or access a walk. Factor in pedestrian movement in the design of the plantings for the median. crossing points in the median may be included or such movements may be discouraged by design. For narrow medians, align trees/palms with the parking stalls. Consider potential overhang of the automobiles in the placement of medium shrubs.

3. Sidewalks & Trails –

Intention: Landscaping adjacent to walks and trails should help to define and direct the circulation patterns and enhance the experience.

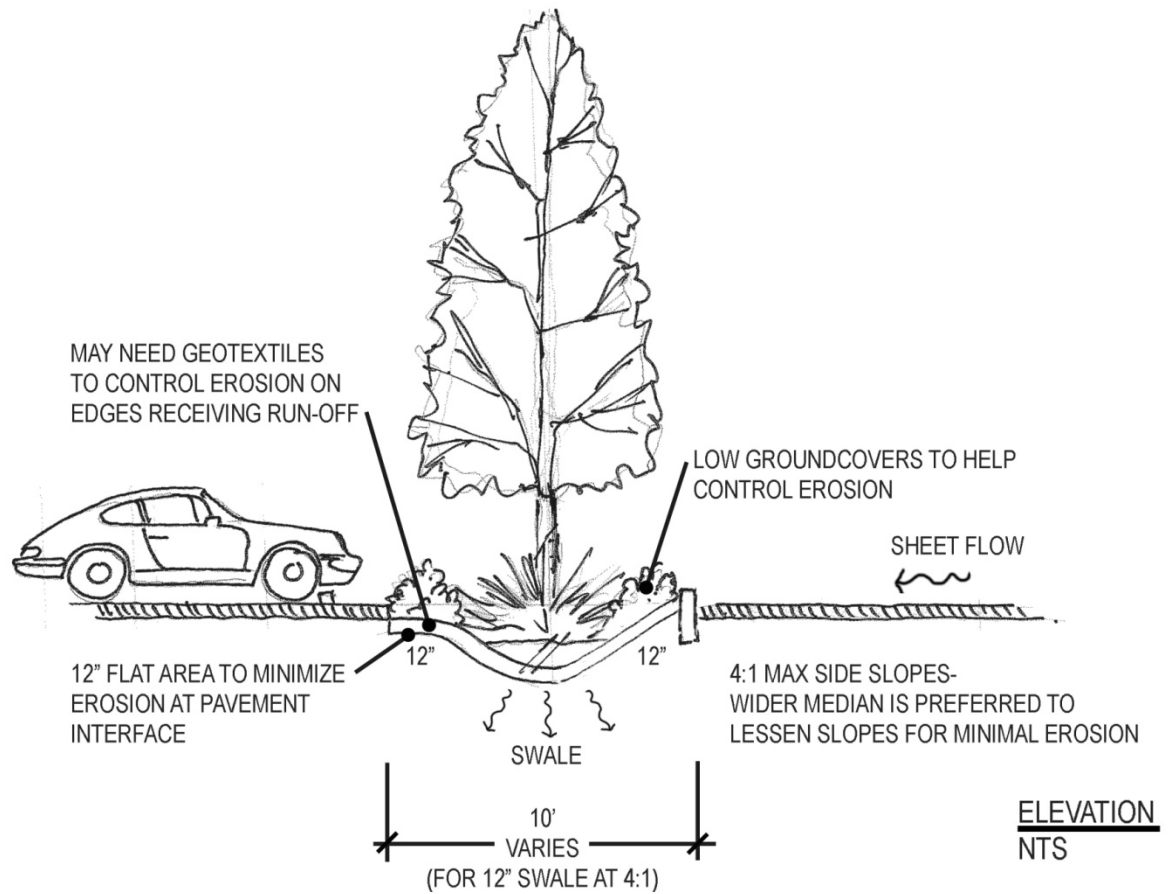
- a. High Traffic Corridor – pedestrian traffic along these main exterior corridors is such that plantings bordering them should be selected to be able to accommodate some foot traffic.
- b. At entries or along walkways: need to provide small gathering spaces or seating areas off the main circulation route(s). These spaces will provide needed areas for students to gather and socialize or study and to help mitigate circulation problems with students congregating on the walks. Where space permits, design the spaces to promote social interaction. Provide seating and other site amenities as needed and provide shade and visual interest in the plantings. Plantings should follow CPTED guidelines.
- c. Trails – The trails shall serve as avenues of learning through existing or created/restored habitats. Trails can be rather narrow – e.g. 4'-6' width. For placement of plant materials adjacent to the trails, apply CPTED principles in regards to creating a safe corridor. In some areas, plan for gathering spaces for group instruction. These nodes should be placed periodically along the trail – e.g. 200' O.C. or at points of interest. The trail should meander and should vary in width, if possible. Likewise, the distance between plant material on each side of the trail should vary too. Within the habitats, design narrower mulched paths between habitats and shrub masses for more intimate exploration. The main trail shall be accessible so the surface materials need to meet ADA-related codes. Alternative materials such as 'soil cement' are encouraged.

4. **Outdoor Classrooms or Large Outdoor Gathering Spaces –**
Intention – extends the classroom experience to exterior spaces to diversify the learning environment.
 - a. **Outdoor Classrooms –** Design the outdoor rooms to accommodate a typical class. Include a 'stage' area and seating. Arrange the elements so the 'stage area' is easily visible and there are minimal distraction with adjacent spaces or uses. Typical dimensions may be 25-foot overall dimension. Stage area about 100 square feet seating in a semi-circle or in a radiating series of half-circles from the stage area. The outdoor space(s) shall be accessible so the ground/surface material needs meet ADA-related codes. Alternative materials such as 'soil cement' are encouraged. Consider alternative seating materials, such as timbers or smooth boulders or tree stumps.
 - b. **Large Outdoor Gathering Spaces –** In the form of plazas or courtyards or amphitheaters. For amphitheaters, arrange plant materials so as to not obstruct view lines to a stage or podium area. Include provisions for providing shade to all outdoor classroom and gathering spaces. Where possible include canopy trees in planters. For a healthy tree, provide expanded tree pits under the plaza surface for root growth. The expanded root zone could be backfilled with a "CU-Structural Soil" or an equivalent strategy that will take into account providing the roots adequate moisture and oxygen and drainage and a suitable growing medium (soil).
5. **Specialty Gardens –**
Intention – Specialty Gardens can vary in size, intention and function. Primarily, they are to serve as living laboratories for the school. They could tell a story or narrative or serve for a study guide for a specific area of study (History, Biology, Ecology, Geology, Mathematics, etc...). The gardens are to be interactive environments – to be tended by a class or several classes to augment the curriculum. The gardens can be agricultural/horticultural plots and can be somewhat rigid in form and layout or they can be organic in form.
 - a. A suggested list of garden types may include:
 - Butterfly Gardens
 - Agricultural Plots
 - Geological or Rock Gardens
 - Rainwater Gardens
 - Sculpture Gardens
 - Historic Reenactment Gardens

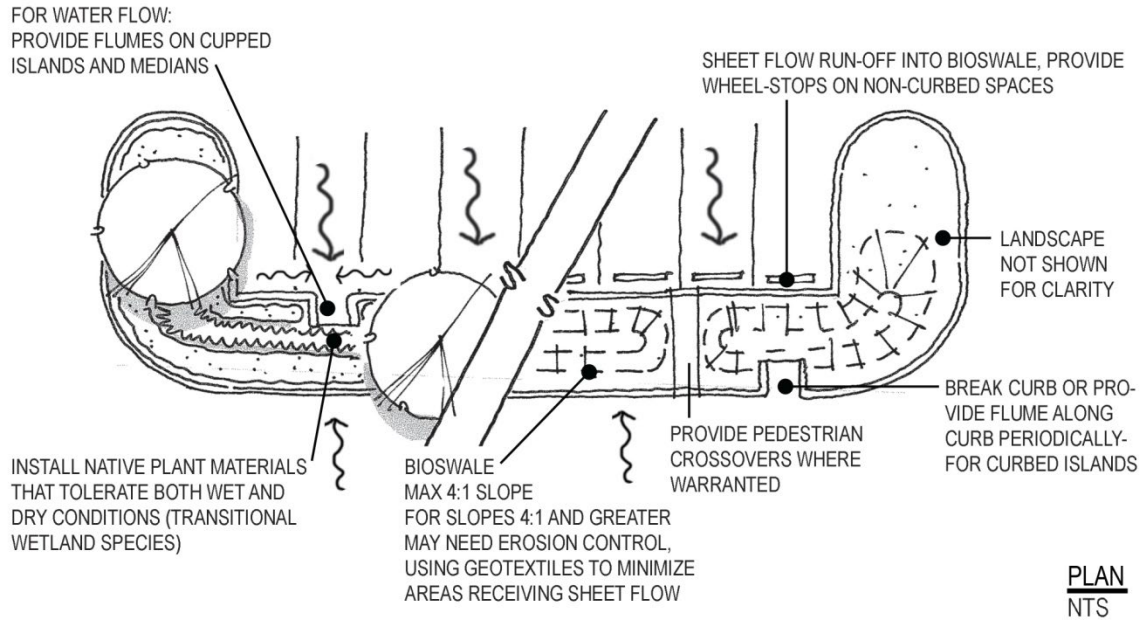
C. Graphic Details/Sections

1. Bioswale - Plan and Elevation 3.3-1

- a. If the parking lots are designed with medians, the median can become a 'Bioswale'. Consider directing run-off from the parking lot into them to help treat the 'first flush' of run-off. Choose plant materials that can tolerate both wet and dry conditions and that will aid in the cleansing of the run-off.
- b. In the design of the medians, consider movements of pedestrians and placement of trees and palms. Some orientations may require pedestrians to cross the median to enter the school or access a walk. Factor in pedestrian movement in the design of the plantings for the median. crossing points in the median may be included or such movements may be discouraged by design. For narrow medians, align trees/palms with the parking stalls. Consider potential overhang of the automobiles in the placement of medium shrubs.

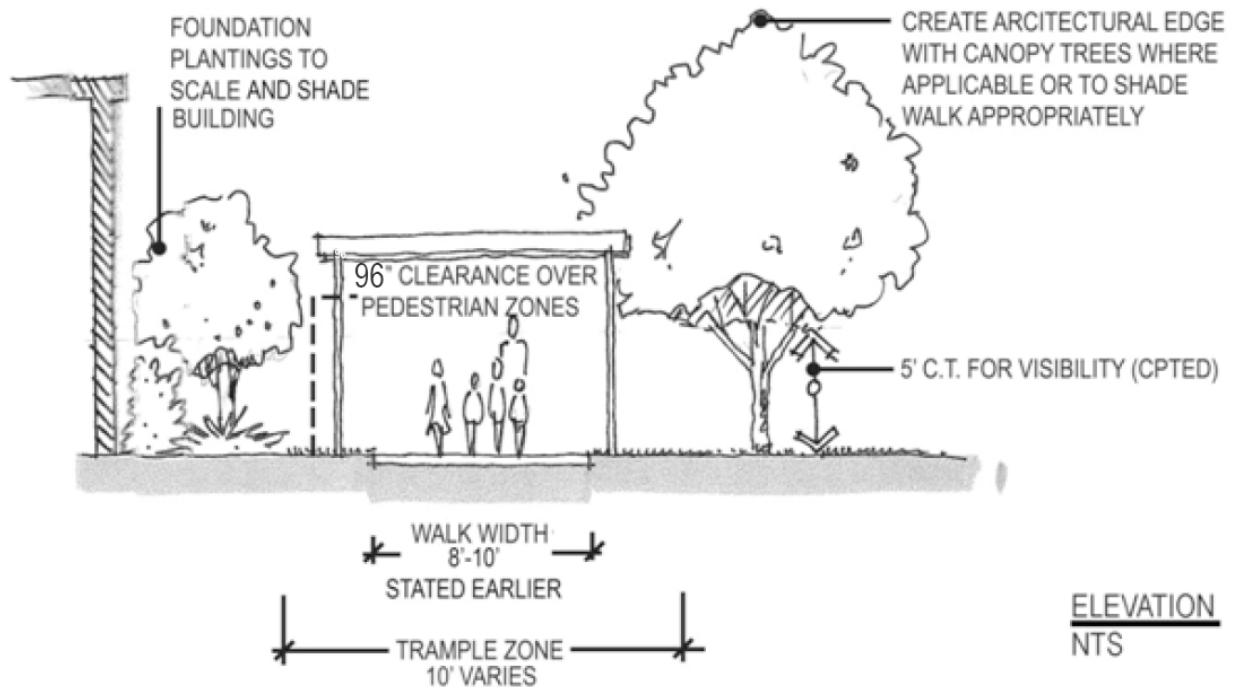


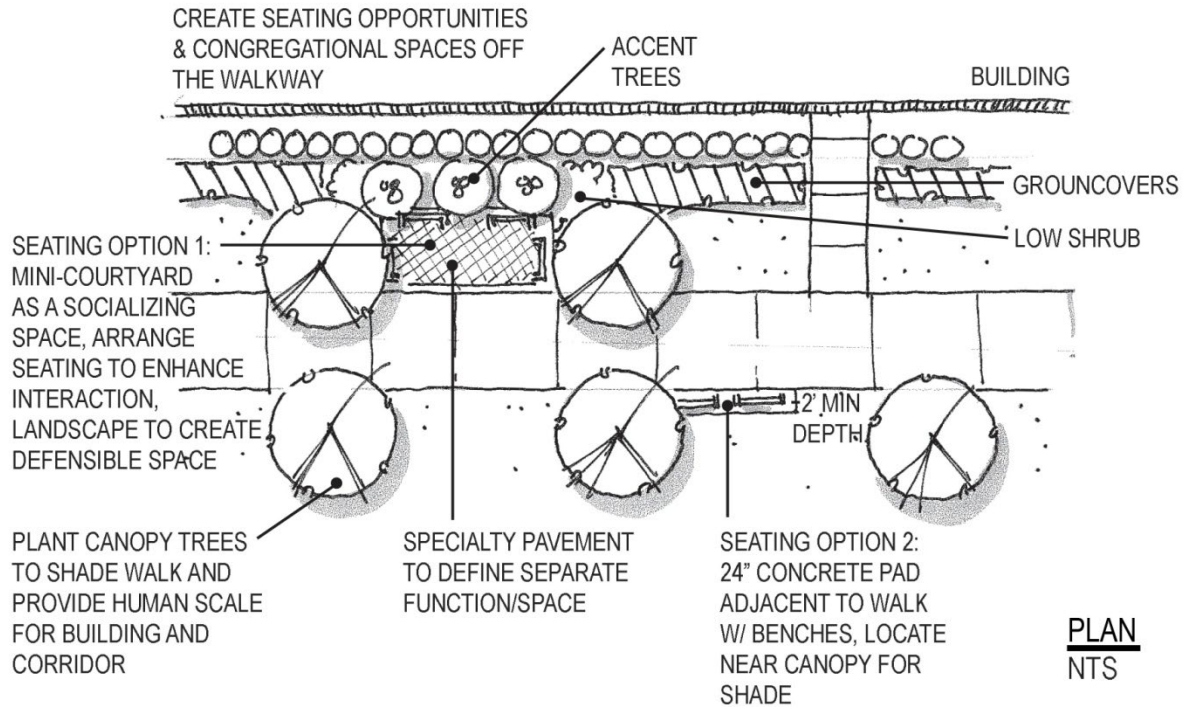
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2. High Traffic Corridor Plan & Elevation 3.3-2

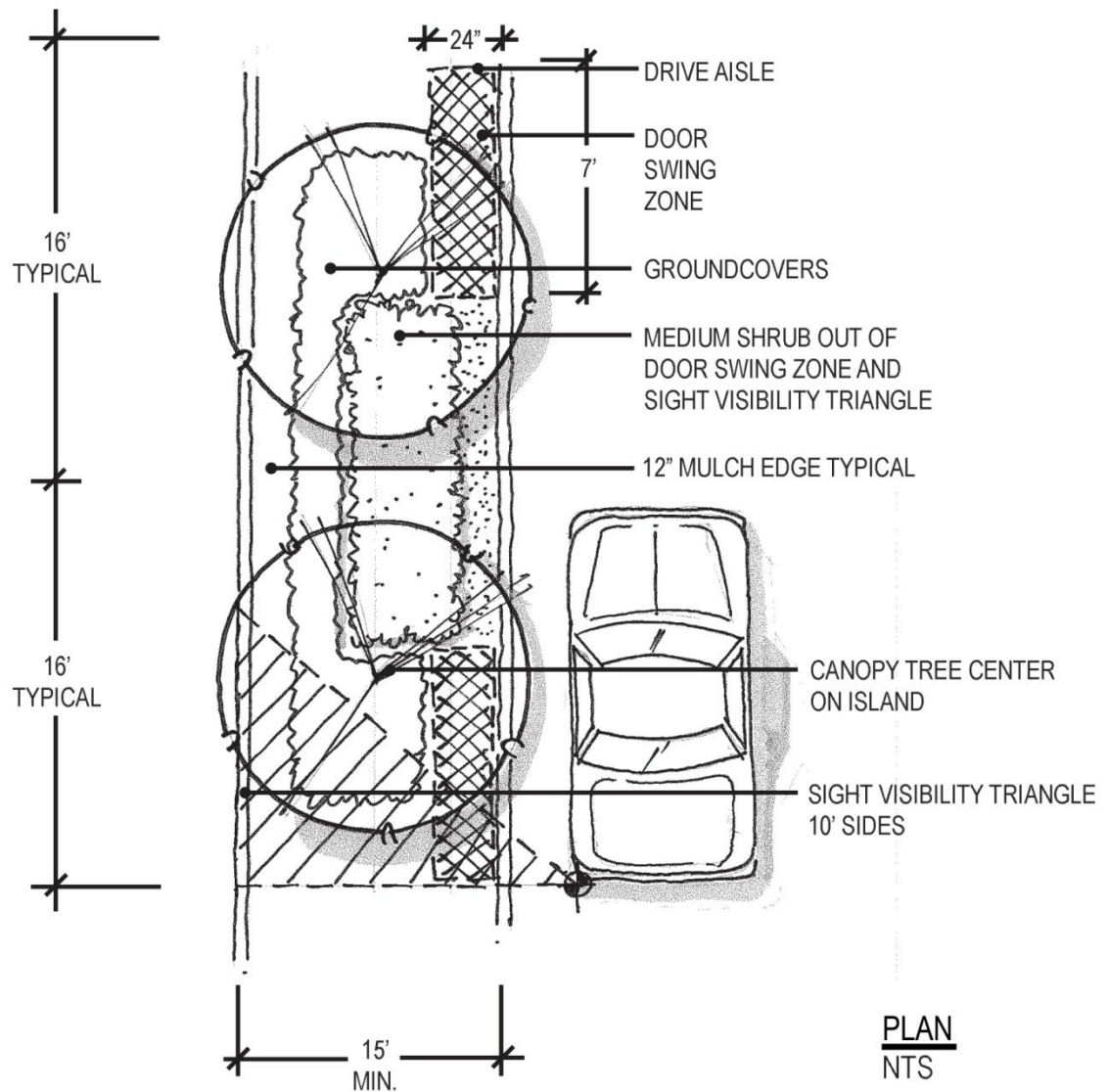
- a. **High Traffic Corridor** – pedestrian traffic along these main exterior corridors is such that plantings bordering them should be selected to be able to accommodate some foot traffic.



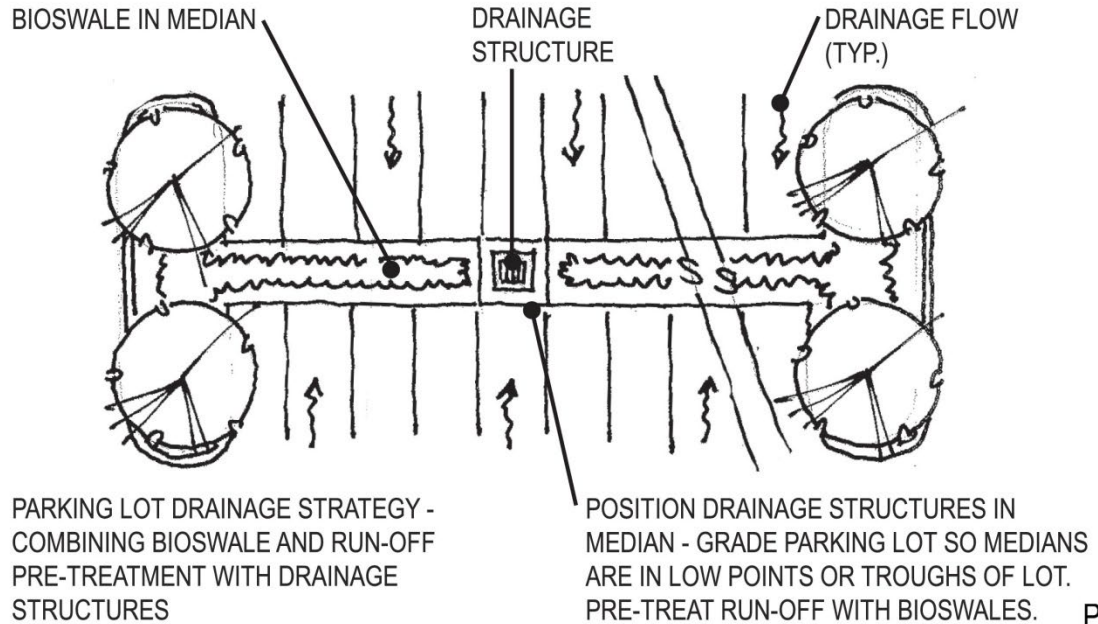


3. Landscape Island Plan 3.3-3

- Landscape islands should be planted with two or three tiers of plant material: overhead canopy for shade, lower groundcovers and/or sod and a medium-height shrub mass. Groundcovers in lieu of sod should be preferred if long-term maintenance costs are factored into the decision.
- Give consideration to door swing zones and sight lines (visibility triangles at intersections of drive aisles) when positioning shrubs and trees or palms within the island.
- Periodically, pedestrians may take refuge on an island to avoid a passing automobile. Planting arrangements on the island – on the side, next to the drive aisle and/or on the ends of the island -- should accommodate this need.
- Landscape islands should also be designed to accept stormwater run-off from the parking lot. E.g. breaks in the island curb and/or flumes. Choose plants accordingly - materials that can survive both wet and dry periods. These mini 'bioswales' make the landscape islands multi-functional.



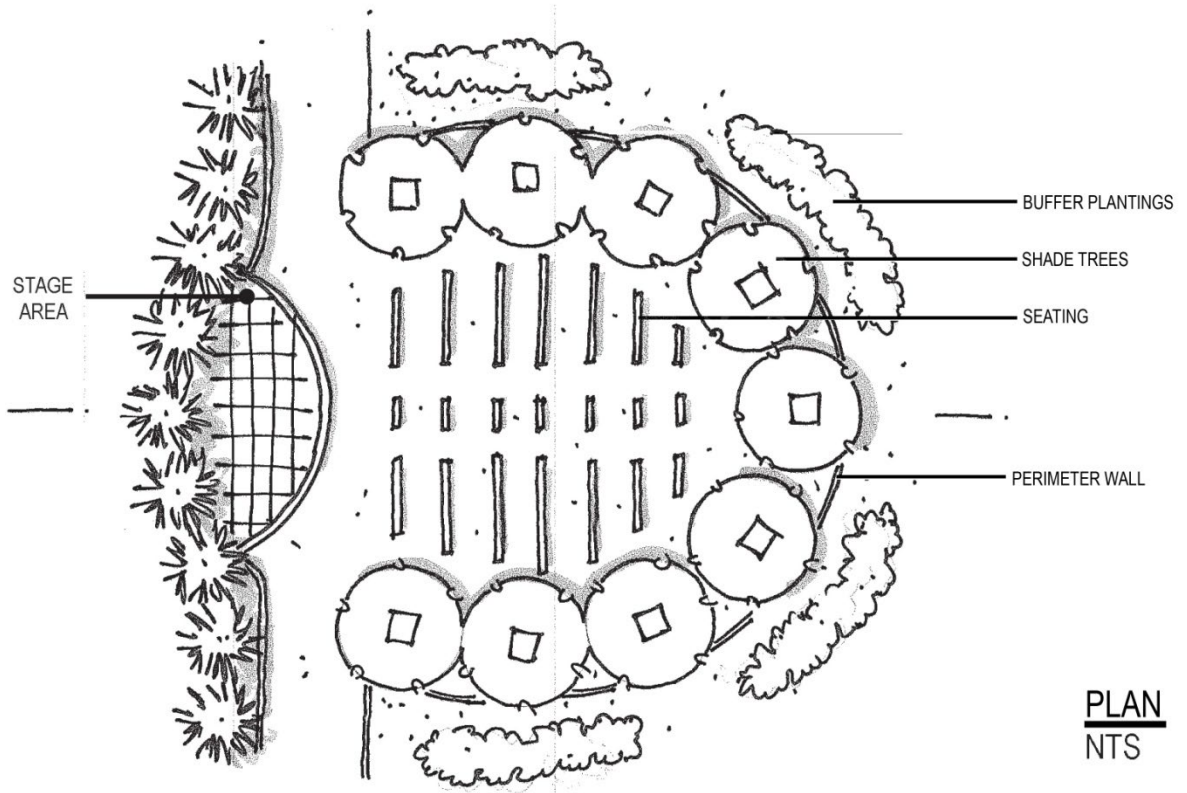
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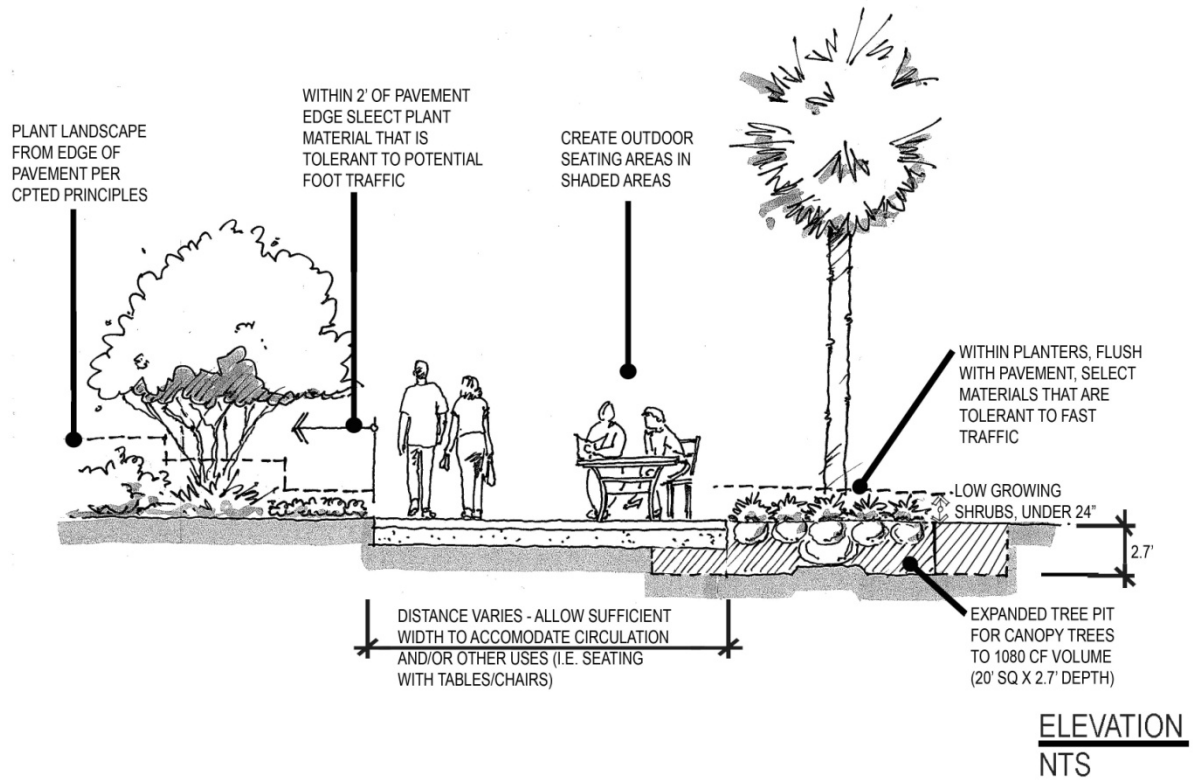
PLAN
NTS

4. Outdoor Classroom Plan 3.3-4

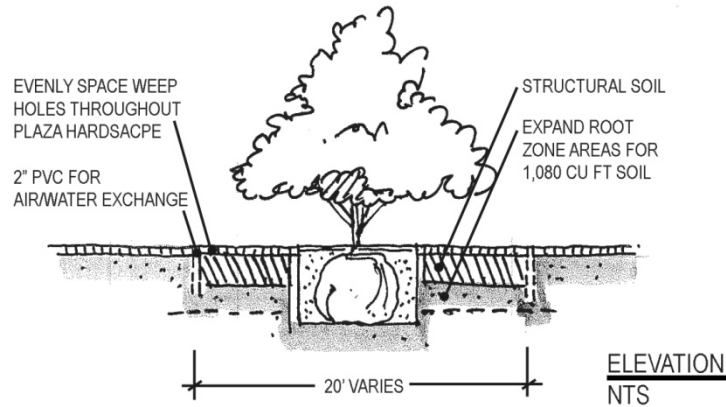
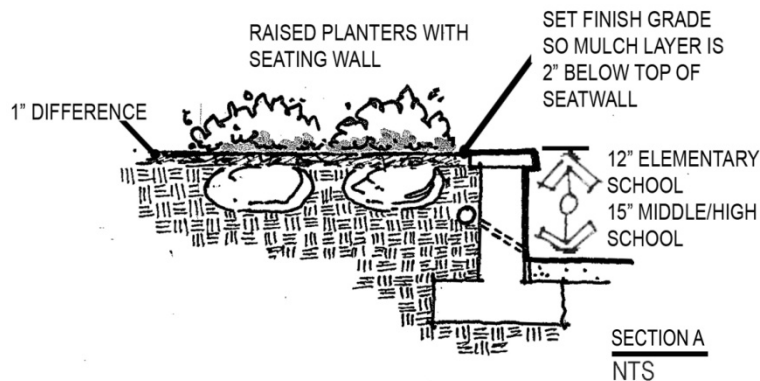
- a. Outdoor Classrooms – Design the outdoor rooms to accommodate a typical class. Include a 'stage' area and seating. Arrange the elements so the 'stage area' is easily visible and there are minimal distractions with adjacent spaces or uses. Typical dimensions may be 25-foot overall dimension. Stage area about 100 s.f. seating in a semi-circle or in a radiating series of half-circles from the stage area. The outdoor space(s) shall be accessible so the ground/surface material need to meet ADA-related codes. Alternative materials such as 'soil cement' are encouraged. Consider alternative seating materials, such as timbers or smooth boulders or tree stumps.
- b. Large Outdoor Gathering Spaces – In the form of plazas or courtyards or amphitheaters. For amphitheaters, arrange plant materials so as to not obstruct view lines to a stage or podium area. Include provisions for providing shade to all outdoor classroom and gathering spaces. Where possible include canopy trees in planters. For a healthy tree, provide expanded tree pits under the plaza surface for root growth. The expanded root zone could be backfilled with a "CU-Structural Soil" or an equivalent strategy that will take into account providing the roots adequate moisture and oxygen and drainage and a suitable growing medium (soil).

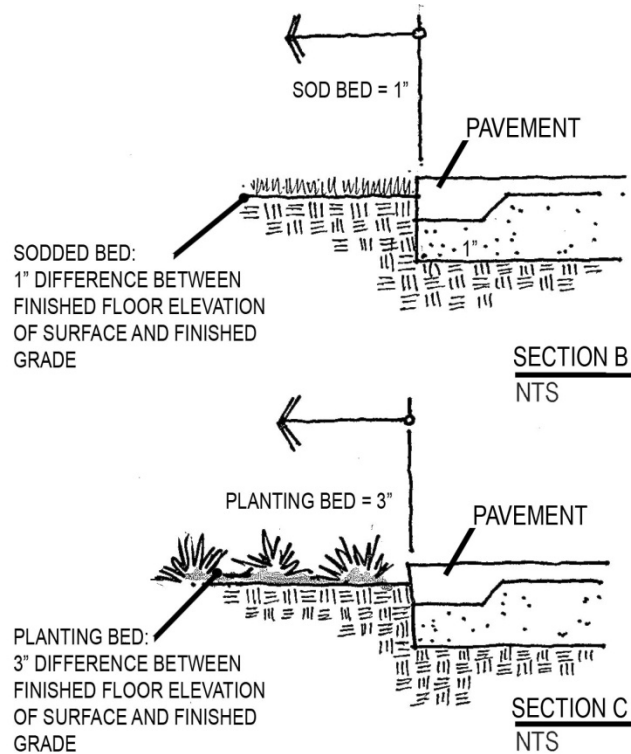


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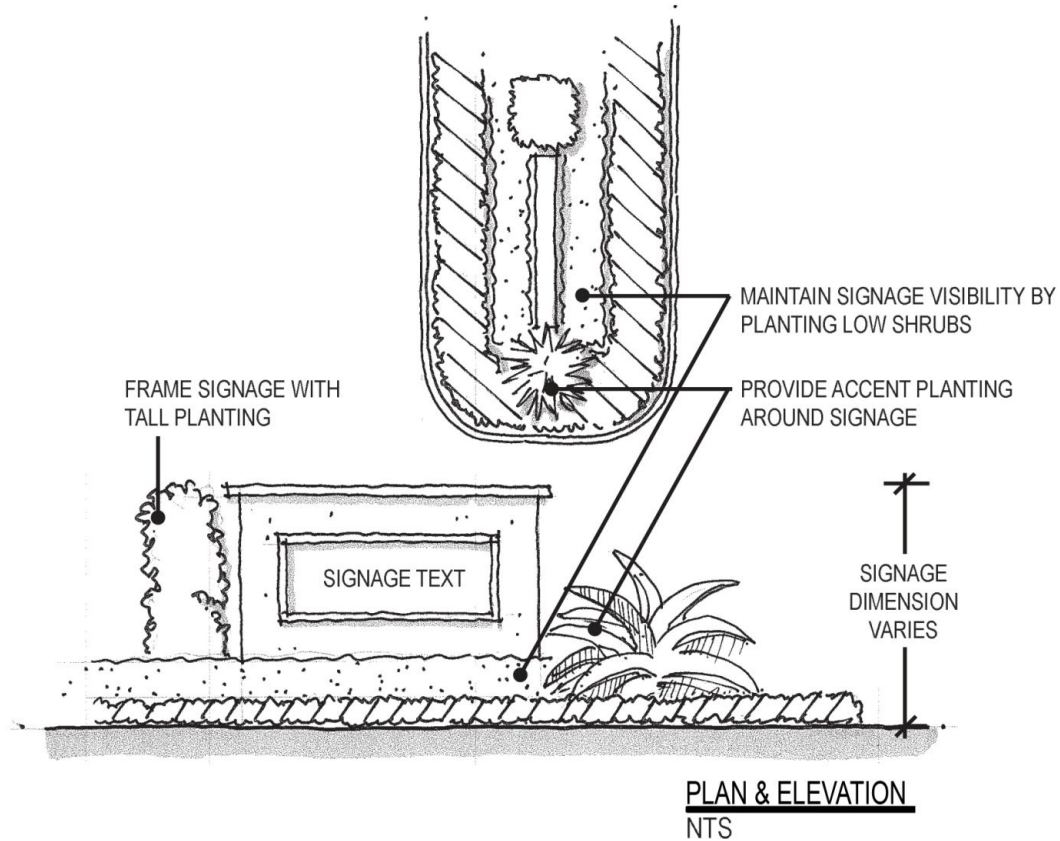
5. Planting Zones/Seating Wall Details 3.3-5





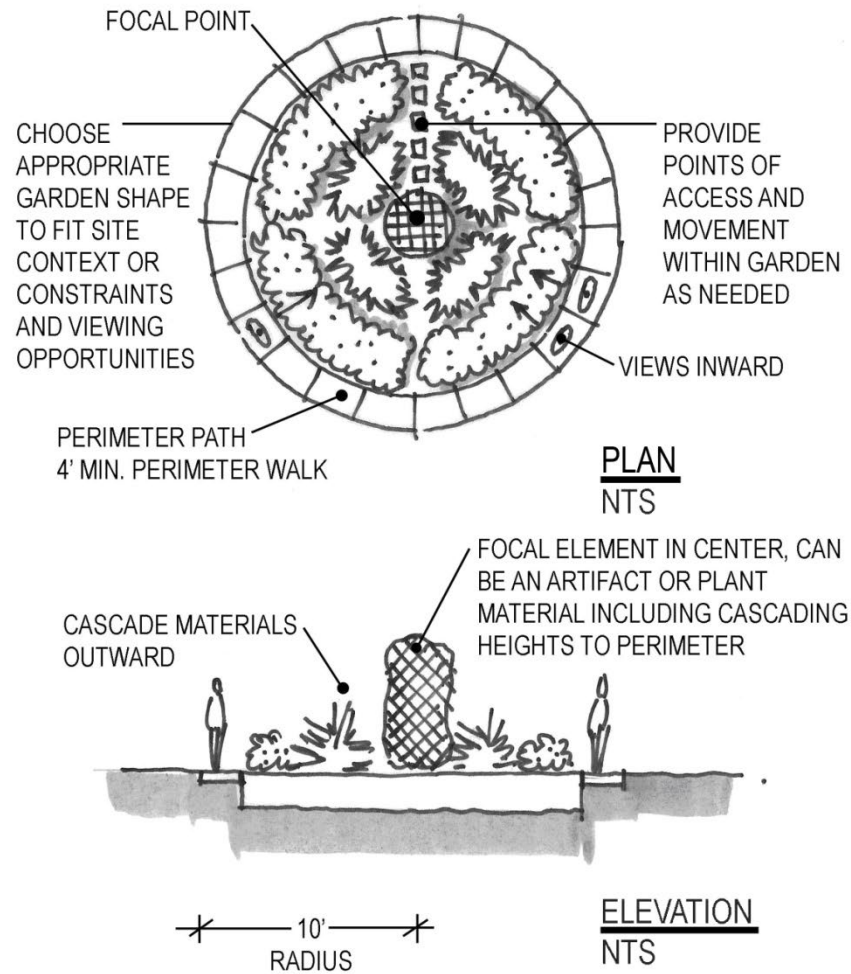
6. Property and Entry Improvements 3.3-6

- a. Plantings should include color or other accents to draw the eye to them. The general intent is that the entry arrangements and choice of materials should be distinctly different in some way with their context to signify or announce the entry.
- b. Plantings should be selected and positioned to help guide the visitor to entry points.
- c. At the school property's entry – for safety reasons, the plantings need to respect sight visibility concerns that are found at an intersection of a driveway with a public road.



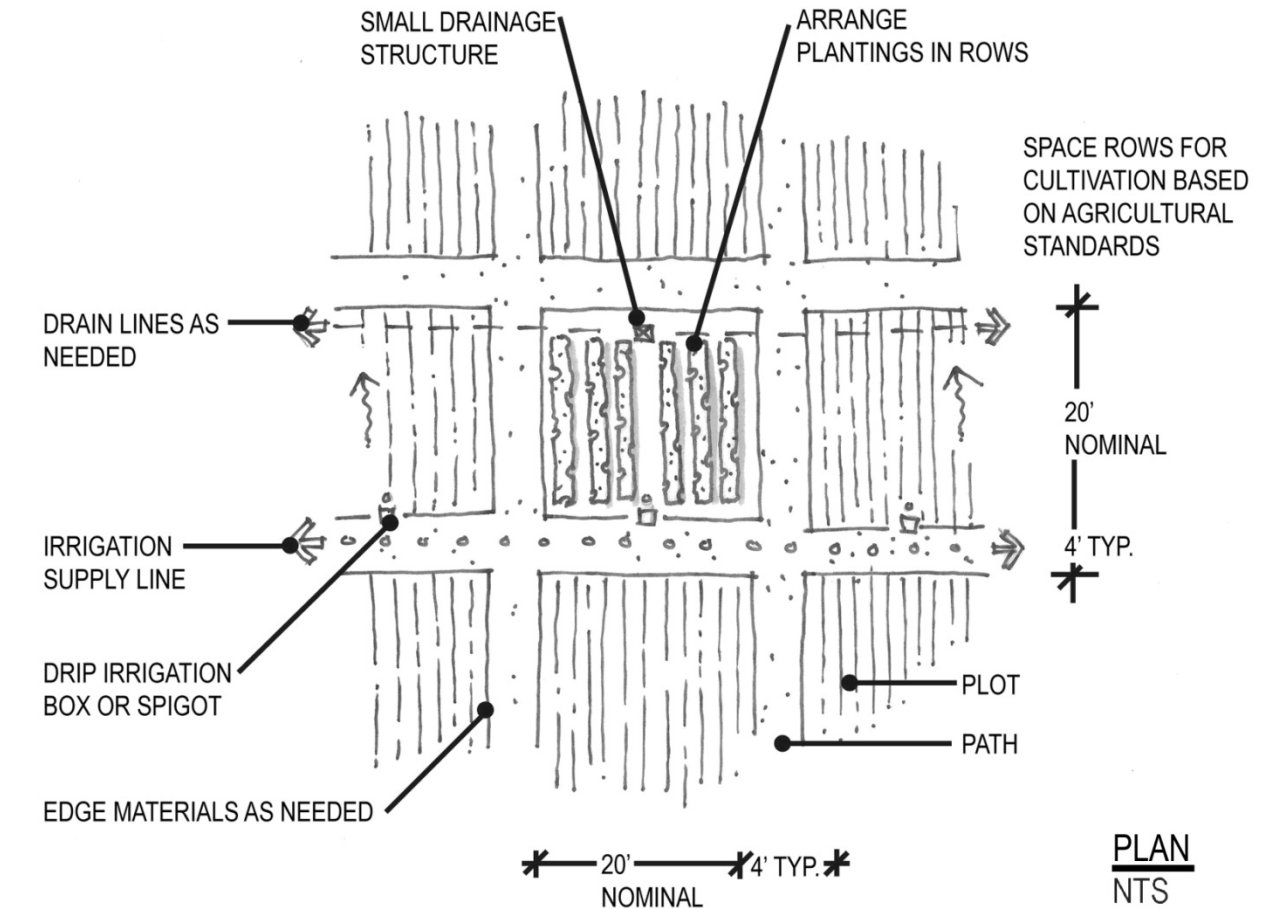
7. Specialty Garden #1 Plan & Elevation 3.3-7

- a. Intention – Specialty Gardens can vary in size, intention and function. Primarily, they are to serve as living laboratories for the school. They could tell a story or narrative or serve for a study guide for a specific ecological or nature niche. The gardens are to be interactive with students – to be tended by a class or several classes to augment the curriculum.
- b. Suggested Garden types:



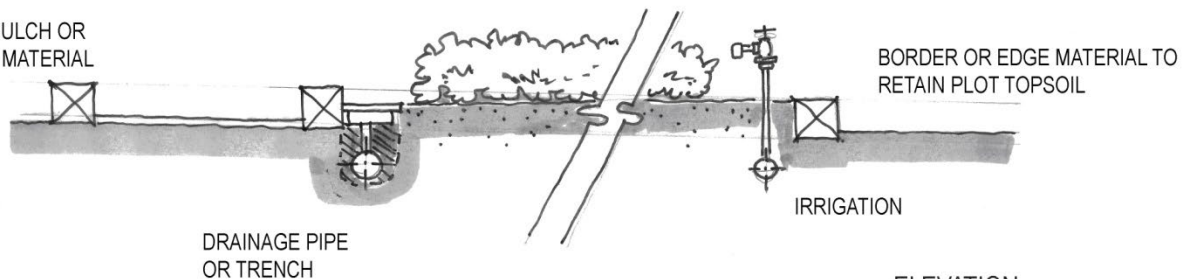
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Specialty Garden #2 – Plan and Elevation 3.3-8



SLOPE PLOT (2%)
FOR DRAINAGE
20' X 20' PLOT "MODULE" WITH 4' BORDERING
MULCHED PATH, GROUP AND ARRANGE "MODULES" AS NECESSARY

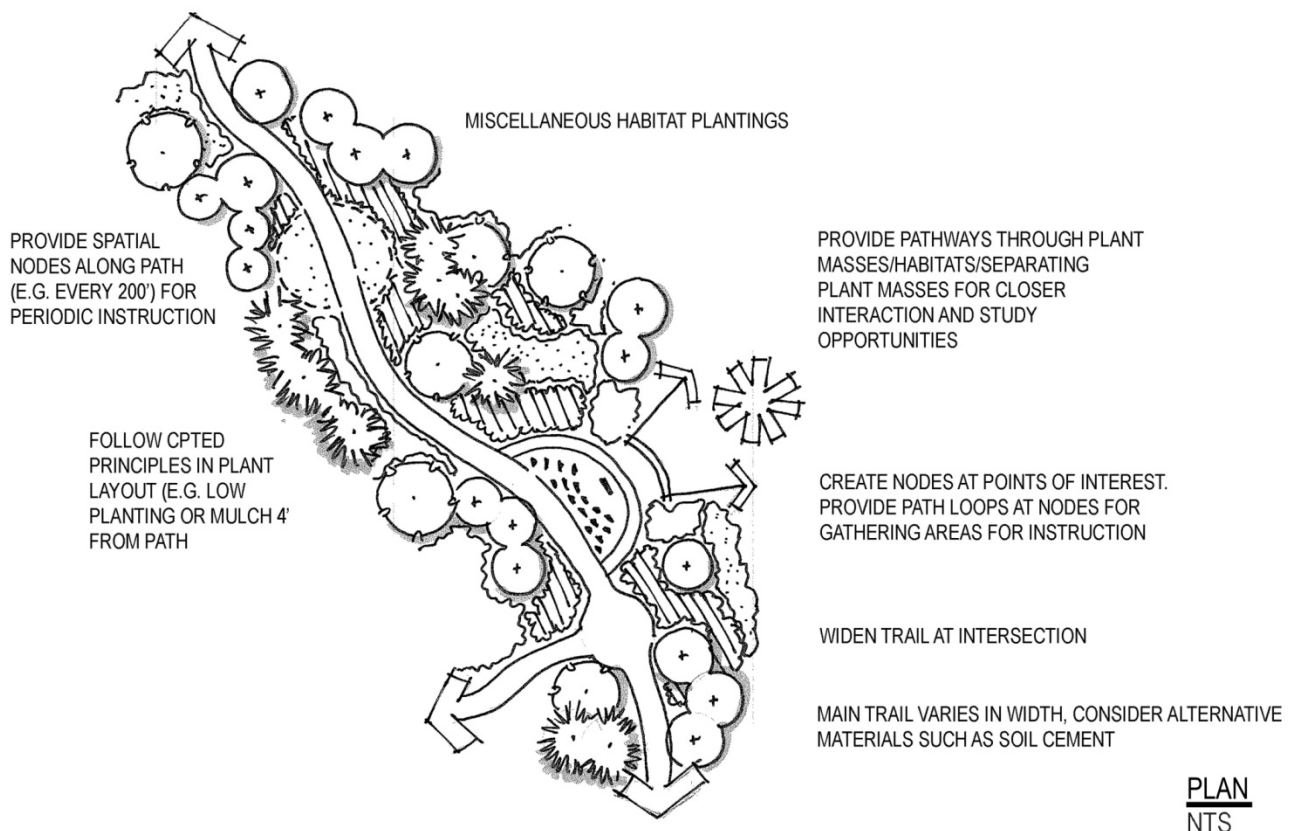
PATH - MULCH OR
SIMILAR MATERIAL



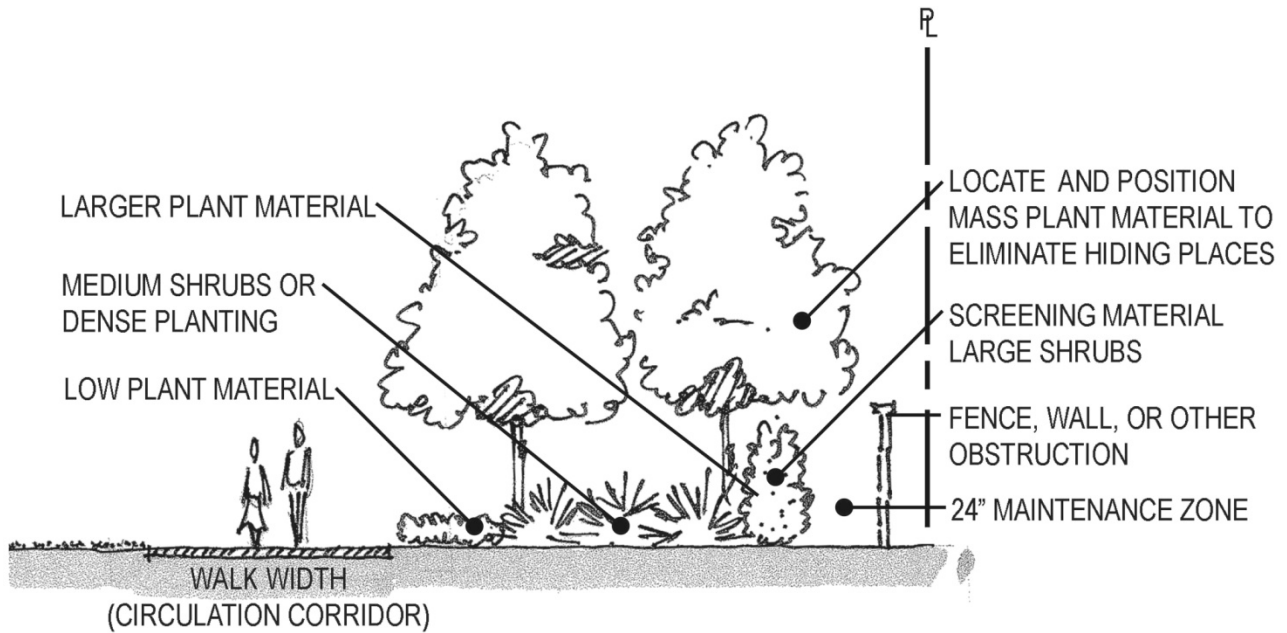
ELEVATION
NTS

8. Walkway Trail Plan 3.3-9

- a. Trails – The trails shall serve as avenues of learning through existing or created/restored habitats. Trails can be rather narrow – e.g. 4'-6' width or wide – e.g. 8'-12' to accommodate large number of pedestrians.
- b. For placement of plant materials adjacent to the trails, apply CPTED principles in regards to creating a safe corridor. Plan nodes for gathering spaces for group instruction. These nodes should be placed periodically along the trail – e.g. 200' O.C. or at points of interest. The trail should meander and should vary in width, if possible. Likewise, the distance between plant materials on each side of the trail should vary too. Within the habitats, design narrower mulched paths between habitats and shrub masses for more intimate exploration. The main trail shall be accessible so the surface materials need to meet ADA related codes. Alternative materials such as 'soil cement' or pervious pavements are encouraged.
- c. Seating Areas – At entries or along walkways: need to provide small gathering spaces or seating areas off the main circulation route(s). These spaces will provide needed areas for students to gather and socialize or study and to help mitigate circulation problems with students congregating on the walks. Where space permits, design the spaces to promote social interaction. Provide seating and other site amenities as needed and provide shade and visual interest in the plantings. Plantings should follow CPTED guidelines.

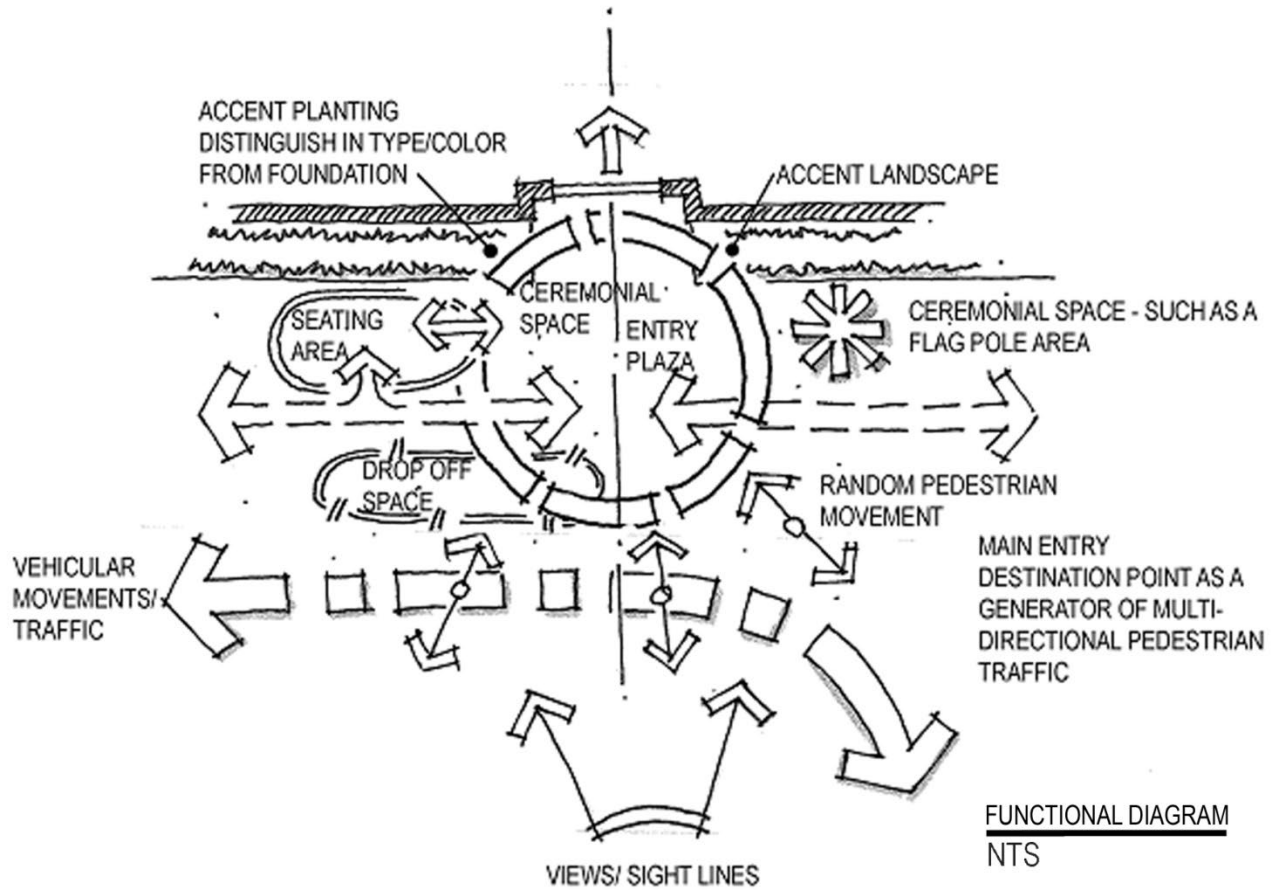
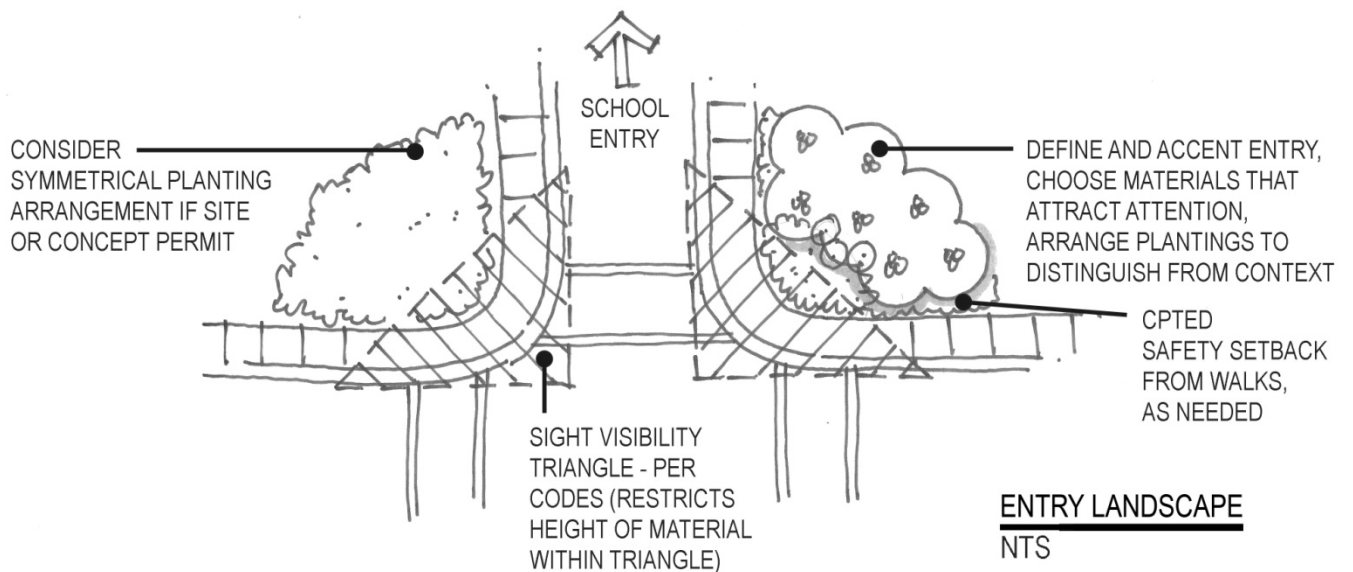


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9. Main Building Entry – Entry Diagram 3.3-10

- A. At the entry, the primary focus is moving people in and out of the space. The area gathers traffic from multiple directions (it is a node, which disperses and gathers pedestrians at the entry). It can also serve as ceremonial space that functions as the threshold or gateway into the school.
- B. The plantings also need to subscribe to CPTED principles if positioned near a walkway for both plantings at the parcel's entry and also planting around the school building's main entry.
- C. At the main building entry – other materials, such as pavers or colored concrete or other specialty materials shall be employed to help define and distinguish the entry area.
- D. Plantings should include color or other accents to draw the eye to them. The general intent is that the planting arrangements and choice of materials should be distinctly different in some way with their context to signify or announce the entry.



3.4 Natural Environment Design Criteria

Intent: To help maintain and establish important ecosystems on site; increase plant and animal biodiversity through the use of native planting and groundcovers.

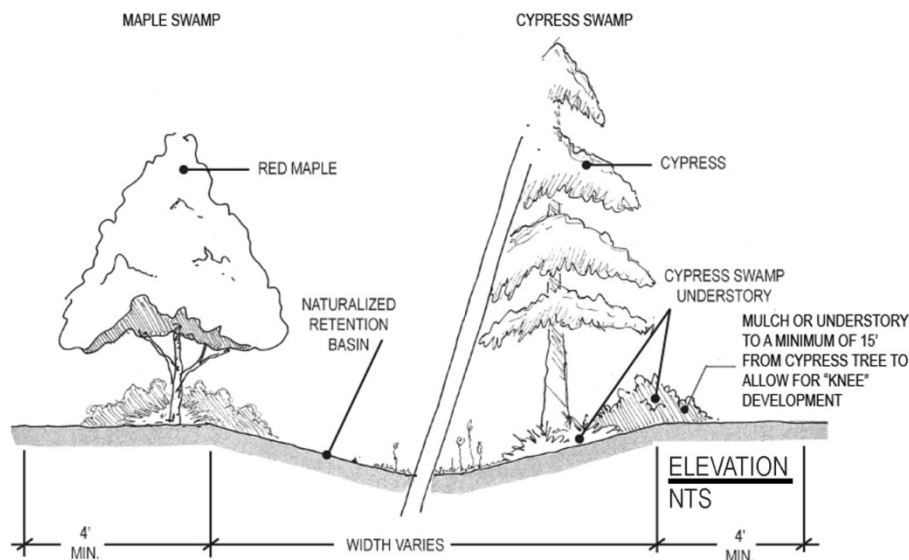
A. Design Intent & Criteria

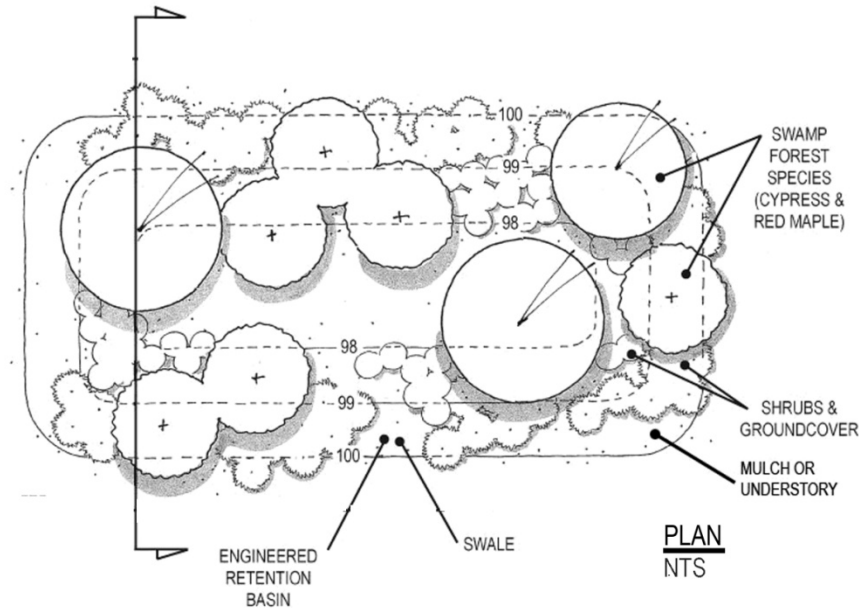
The design intent is to modify current conditions and uses on the school site or create new environments to simulate native Florida habitats. This will be achieved through re-creating native canopy, understory vegetation, and maintaining proposed habitat conditions. Enhancing educational opportunities for outdoor learning and furthering environmental stewardship practices will be a desirable result as well.

Retention areas can be modified to become cypress swamps/domes and/or freshwater marshes or seasonal ponds. In upland areas, the un-used school property (that is mostly a sod field) can be restored back to a pine Flatwood or Flatwood meadow or oak hammock, etc. It is intended that these environments be preserved or created in areas not programmed for functional uses such as buffers or stormwater treatment areas (retention ponds/swales). The following are design guidelines for development of habitats in these seldom-used school site areas.

B. Proposed Buffers

1. **Natural Retention Cypress Swamp (Plan and elevation 3.4-1)** – The design intent is to create a wet retention area with vegetation commonly found within a Cypress Swamp. A low to high moderate maintenance plan is needed for the overall continuation of specified goals and plant material. Plant species should include:
 - a. Canopy conifers: cypress (*Taxodium distichum*),
 - b. Hardwood Swamp: cabbage palm (*Sabal palmetto*), southern red maple (*Acer rubrum*), pond apple (*Annona glabra*), water ash (*Fraxinus caroliniana*), loblolly bay (*Gordonia lasianthus*), sweet gum (*Liquidambar styraciflua*), sweet bay (*Magnolia virginiana*), black gum (*Nyssa aquatica*), swamp bay (*Persea palustris*), guava (*Psidium guajava*), coastal plain willow (*Salix caroliniana*)
 - c. Understory vegetation: buttonbush (*Cephalanthus occidentalis*), coco plum (*Chrysobalanus icaco*), sweet pepperbush (*Clethra alnifolia*), black titi (*Cliftonia monophylla*), titi (*Cyrilla racemiflora*), dahoon holly (*Ilex cassine*), gallberry (*Ilex glabra*), Virginia willow (*Itea virginica*), fetterbush (*Lyonia lucida*), wax myrtle (*Myrica cerifera*), northern bayberry (*Myrica heterophylla*), Myrsine (*Myrica guianensis*), wild coffee (*Psychotria sulzneri/undata*), blackberry (*Rubus argutus*), sparkleberry (*Vaccinium arboreum*) Vines: pepper vine (*Ampelopsis arborea*), strangler fig (*Ficus aurea*), wild banyan tree (*Ficus citrifolia*), bamboo-vine (*Smilax laurifolia*), summer grape (*Vitis aestivalis*), calusa grape (*Vitis shuttleworthii*) *Possibility of epiphytes: bromeliads and orchids growing on trees



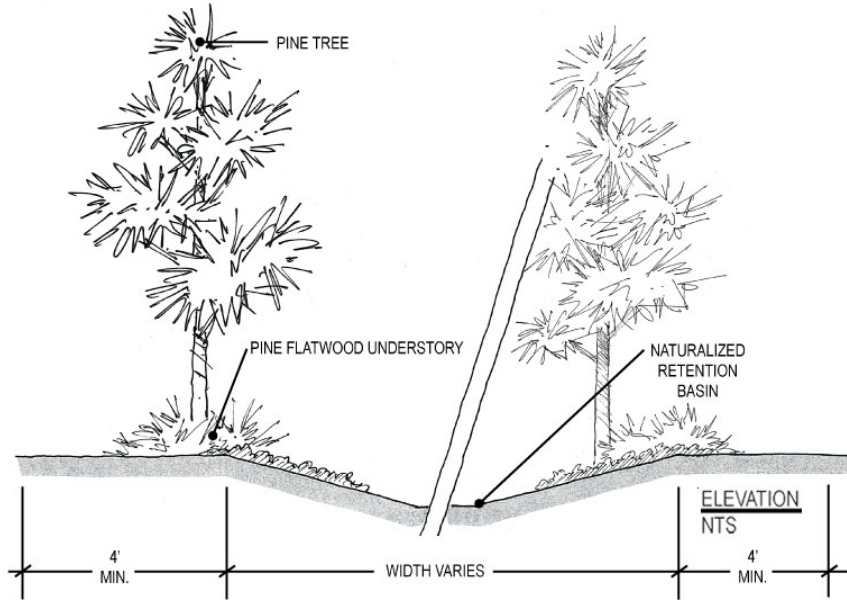
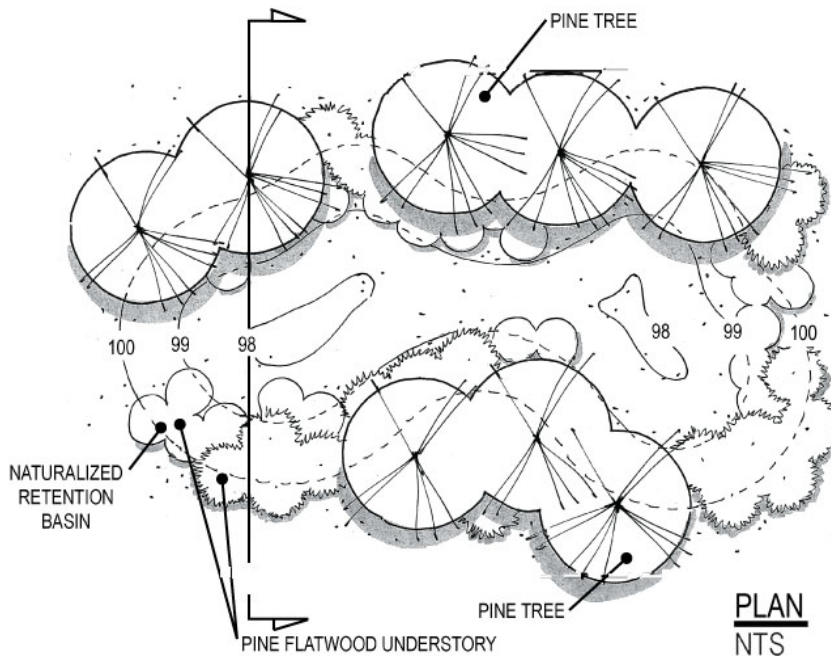


2. **Natural Retention Pine Flatwoods (Wet Flatwoods)* Plan and Elevation 3.4-2 –**

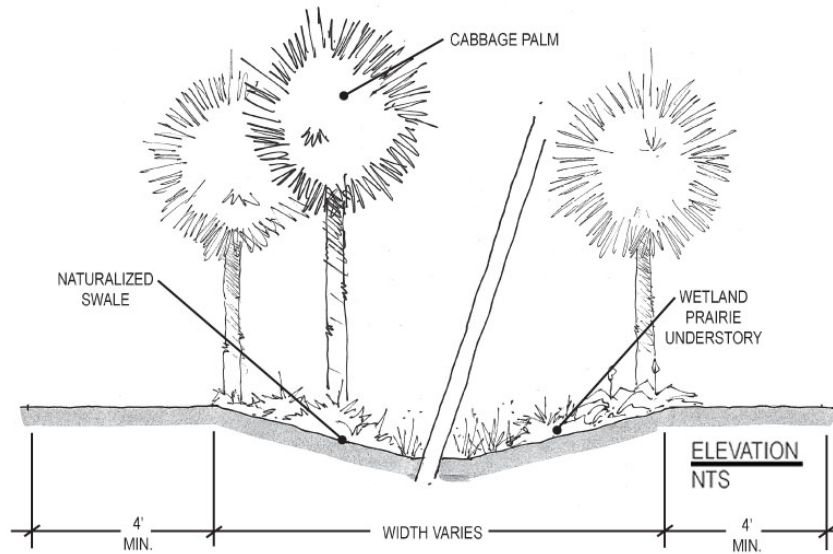
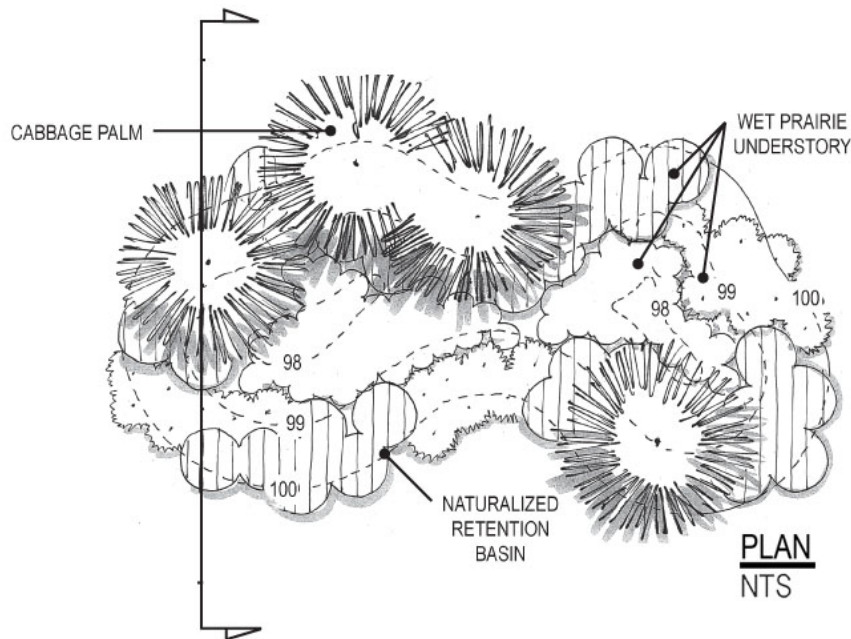
The design intent is to create a naturalistic retention area/buffer using native canopy and understory commonly found within a Pine Flatwood Community. The use of native plants and naturally occurring materials provide opportunities for the creation of educational outdoor learning spaces, restoring natural habitats and promoting environmental stewardship for students as well as staff.

- a. Canopy vegetation: slash pine (*Pinus elliottii*), pond pine (*Pinus serotina*), cabbage palm (*Sabal palmetto*)
- b. Understory vegetation: (mixed hydrophytic shrubs) wax myrtle (*Myrica cerifera*), gallberry (*Ilex glabra*), Bottlebrush grass (*Aristida spiciformis*), Wiregrass (*Aristida stricta* var. *beyrichiana*), Sawgrass (*Cladium jamaicense*), Elliott's lovegrass (*Eragrostis elliottii*), Purple lovegrass (*Eragrostis spectabilis*), muhly/Hairgrass (*Muhlenbergia capillaries*), forbs - (mesic flatwoods)*
- c. Canopy vegetation: slash pine (*Pinus elliottii*), longleaf pine (*P. palustris*)
- d. Understory vegetation: saw palmetto (*Serenoa repens*), rusty lyonia (*Lyonia ferruginea*), gallberry (*Ilex glabra*), wax myrtle (*Myrica cerifera*), and wiregrass (*Aristida stricta* var. *beyrichiana*)

*existence of vegetation depends on: latitude, soils, and hydroperiod



3. **Natural Retention Wet Prairie (Plan and Elevation 3.4-3)** - The design intent is to create a naturalistic buffer/retention area using canopy and understory vegetation commonly found within a wet prairie community. A low to high moderate maintenance plan is needed for the overall continuation of specified goals and plant material.
 - a. Canopy vegetation: Slash pine (*Pinus elliottii*), Cabbage Palm (*Sabal palmetto*)
 - b. Understory vegetation: Sawgrass (*Cladium jamaicense*), Wiregrass (*Aristida stricta* var. *beyrichiana*), herbaceous species: florida gamma grass (*Tripsacum floridana*), muhly grass (*Muhlenbergia capillaries*), cordgrass (*Spartina bakeri*), fakahatchee grass (*Tripsacum dactyloides*) and wetland pants



3.5 Stormwater Habitat Criteria

Intent: To help maintain and establish important ecosystems on site and increase plant and animal biodiversity through the use of native planting and groundcovers while avoiding mixing turf monoculture with this landscape.

A. Design Intent & Criteria

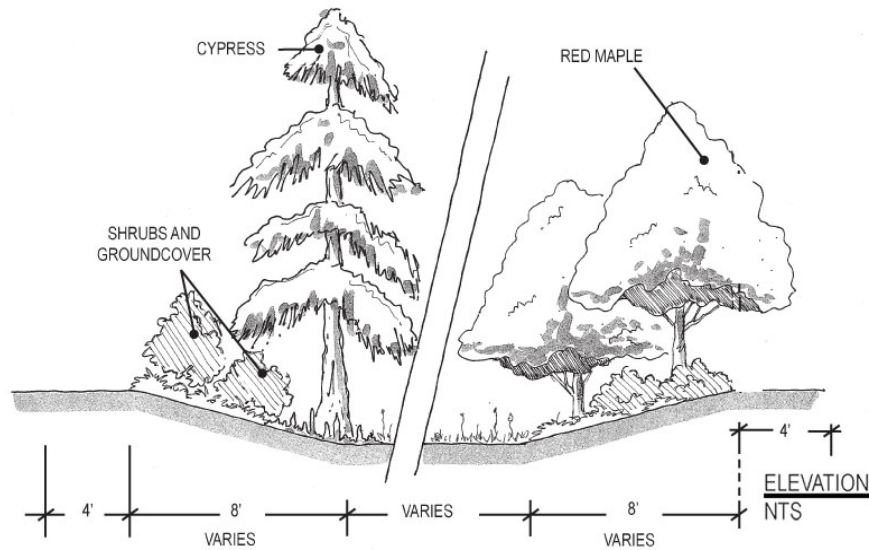
The design intent is to modify existing Stormwater Management Facilities on the school site to simulate natural habitat. Retention areas can be modified to become cypress swamps/domes and/or freshwater marshes or seasonal ponds. The intent of stormwater habitat is to re-create

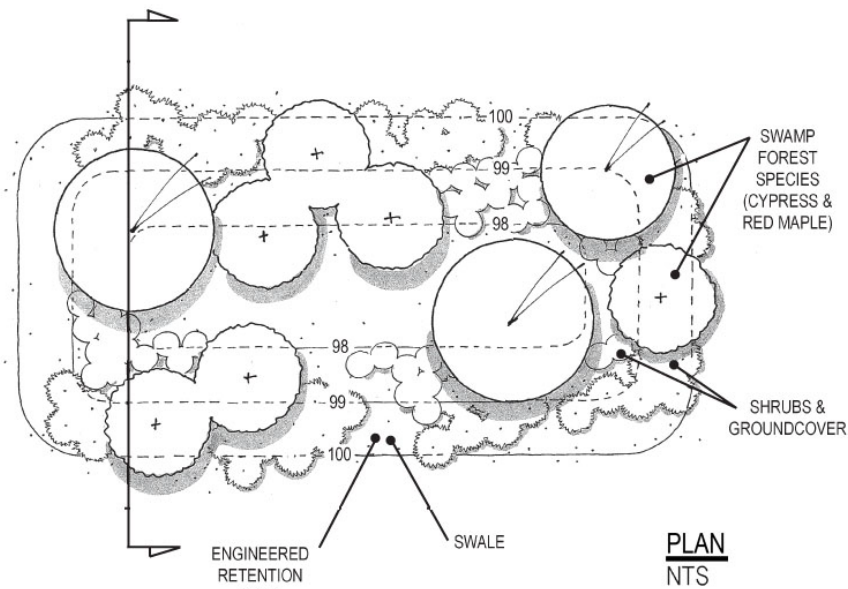
native canopy, understory vegetation, and maintain proposed habitat conditions while creating educational opportunities for outdoor learning and furthering environmental stewardship practices.

1. **Engineered Retention Cypress Swamp (Plan and Elevation 3.5-1)** – To create cypress swamp habitats using native canopy and understory vegetation commonly found within cypress swamp communities; to soften the edge of an engineered retention basin. A low to moderate intensity maintenance plan is needed for the overall continuation of specified goals and plant material.

- a. Canopy conifers: cypress (*Taxodium distichum*), slash pine (*Pinus elliottii*), longleaf pine (*P. palustris*)
- b. Canopy palms: cabbage palm (*Sabal palmetto*)
- c. Canopy hardwoods: southern red maple (*Acer rubrum*), pond apple (*Annona glabra*), water ash (*Fraxinus caroliniana*), loblolly bay (*Gordonia lasianthus*), sweet gum (*Liquidambar styraciflua*), sweet bay (*Magnolia virginiana*), black gum (*Nyssa aquatica*), swamp bay (*Persea palustris*), guava (*Psidium guajava*), coastal plain willow (*Salix caroliniana*)
- d. Understory vegetation: buttonbush (*Cephalanthus occidentalis*), coco plum (*Chrysobalanus icaco*), sweet pepperbush (*Clethra alnifolia*), black titi (*Cliftonia monophylla*), titi (*Cyrilla racemiflora*), dahoon holly (*Ilex cassine*), gallberry (*Ilex glabra*), Virginia willow (*Itea virginica*), fetterbush (*Lyonia lucida*), wax myrtle (*Myrica cerifera*), northern bayberry (*Myrica heterophylla*), Myrsine (*Myrica guianensis*), wild coffee (*Psychotria sulzneri/undata*), blackberry (*Rubus argutus*), sparkleberry (*Vaccinium arboretum*)
- e. Vines: pepper vine (*Ampelopsis arborea*), strangler fig (*Ficus aurea*), wild banyan tree (*Ficus citrifolia*), bamboo-vine (*Smilax laurifolia*), summer grape (*Vitis aestivalis*), calusa grape (*Vitis shuttleworthii*)

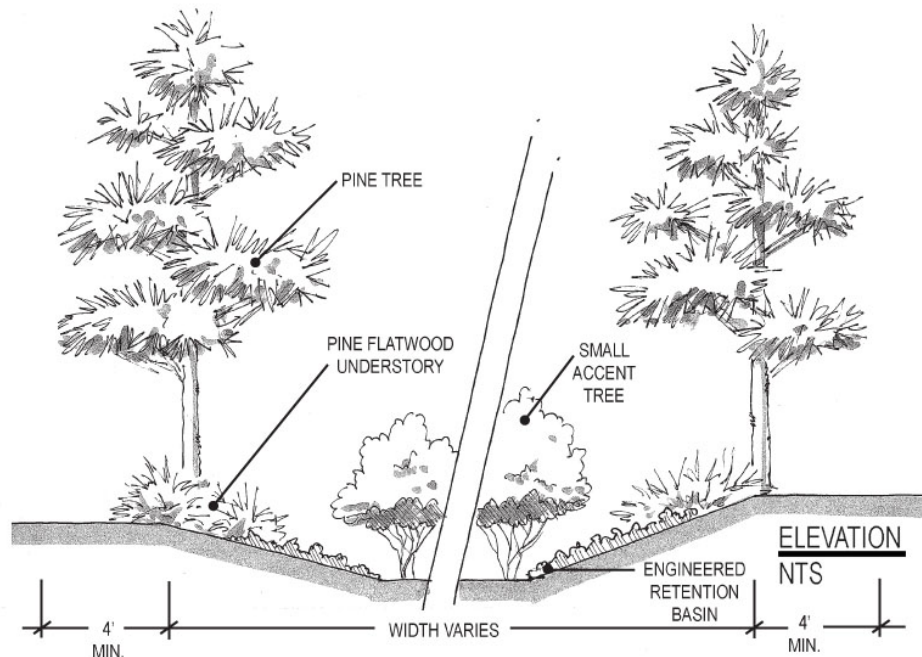
*Possibility of epiphytes: bromeliads and orchids growing on trees

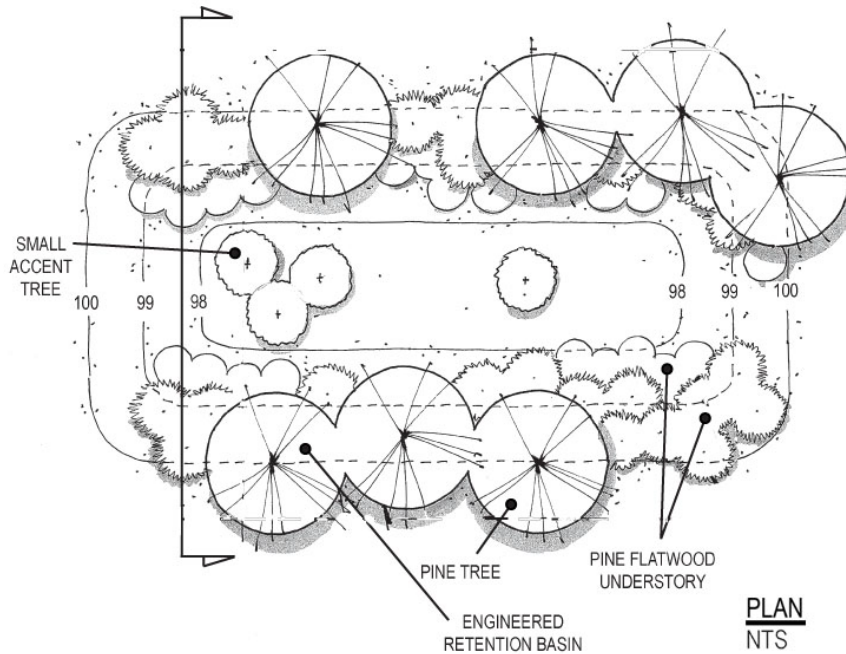




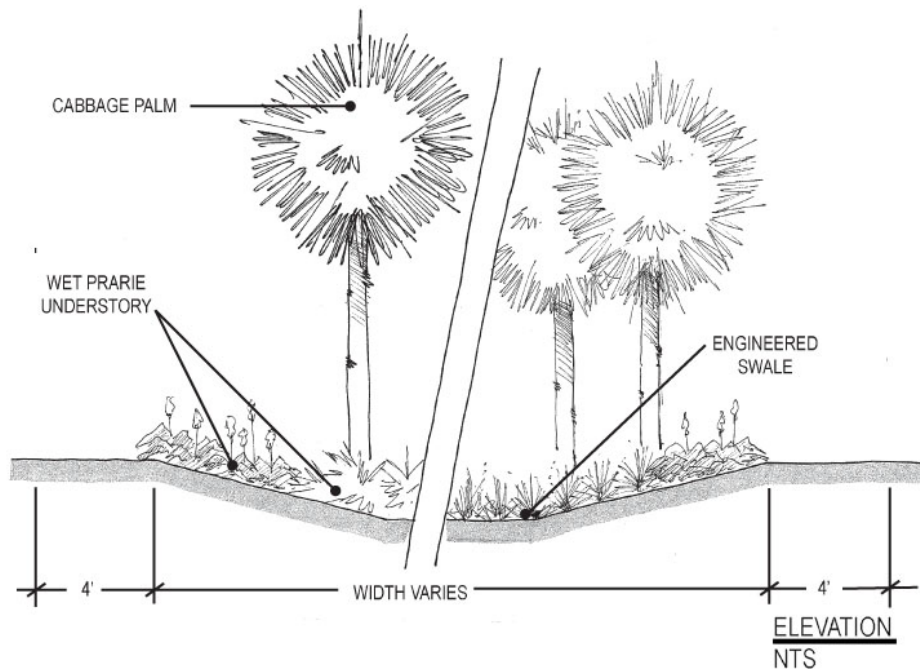
2. **Engineered Retention Pine Flatwood (Plan and Elevation 3.5-2)** – To create pine Flatwood habitats using native canopy and understory vegetation commonly found within pine Flatwood communities; softening the edges of an engineered retention basin. A low to moderate intensity maintenance plan is needed for the overall continuation of specified goals and plant material.
 - a. Canopy vegetation: slash pine (*Pinus elliottii*), longleaf pine (*P. palustris*), pond pine (*Pinus serotina*), cabbage palm (*Sabal palmetto*)
 - b. Understory vegetation: (mixed hydrophytic shrubs) wax myrtle (*Myrica cerifera*), gallberry (*Ilex glabra*), Bottlebrush grass (*Aristida spiciformis*), Wiregrass (*Aristida stricta* var. *beyrichiana*), Sawgrass (*Cladium jamaicense*), Elliott's lovegrass (*Eragrostis elliottii*), Purple lovegrass (*Eragrostis spectabilis*), muhly/Hairgrass (*Muhlenbergia capillaries*), forbs (mesic flatwoods)*
 - c. Understory vegetation: saw palmetto (*Serenoa repens*), rusty lyonia (*Lyonia ferruginea*), gallberry (*Ilex glabra*), wax myrtle (*Myrica cerifera*), and wiregrass (*Aristida stricta* var. *beyrichiana*)

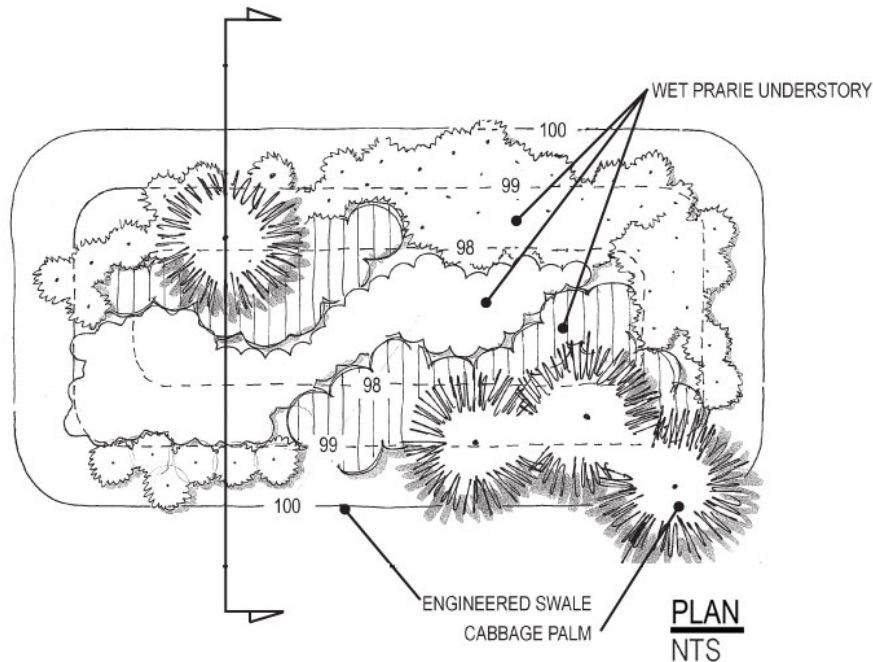
*existence of vegetation depends on: latitude, soils, and hydroperiod





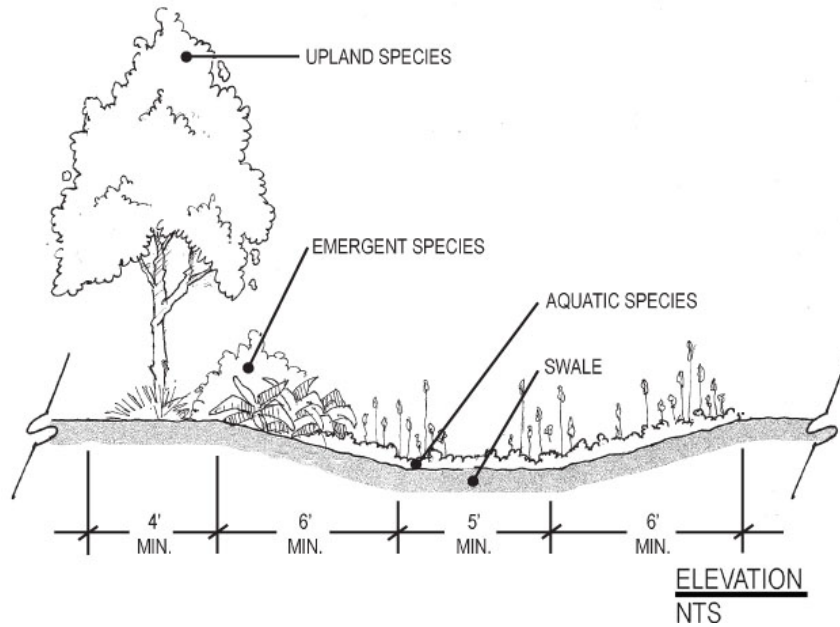
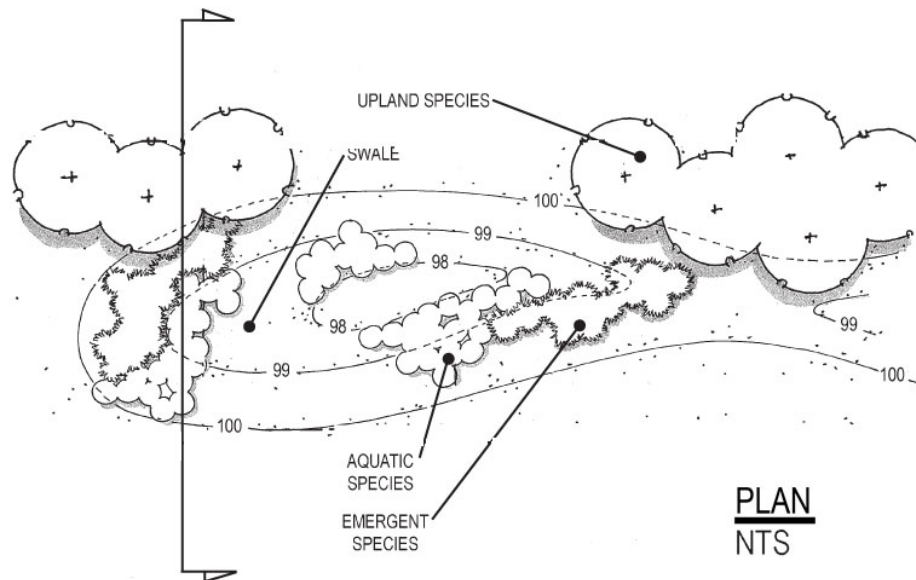
3. **Engineered Retention Wet Prairie (Plan and Elvation 3.5-3)** – To create these open landscapes using native canopy and understory vegetation commonly found within wet prairie communities; softening the edges of an engineered retention. A low to high moderate maintenance plan is needed for the overall continuation of specified goals and plant material.
 - a. Canopy vegetation: slash pine (*Pinus elliottii*)
 - b. Understory vegetation: sawgrass (*Cladium jamaicense*), Wiregrass (*Aristida stricta* var. *beyrichiana*), herbaceous species: florida gamma grass (*Tripsacum floridana*), muhly grass (*Muhlenbergia capillaries*), cordgrass (*Spartina bakeri*), fakahatchee grass (*Tripsacum dactyloides*) and wetland pants



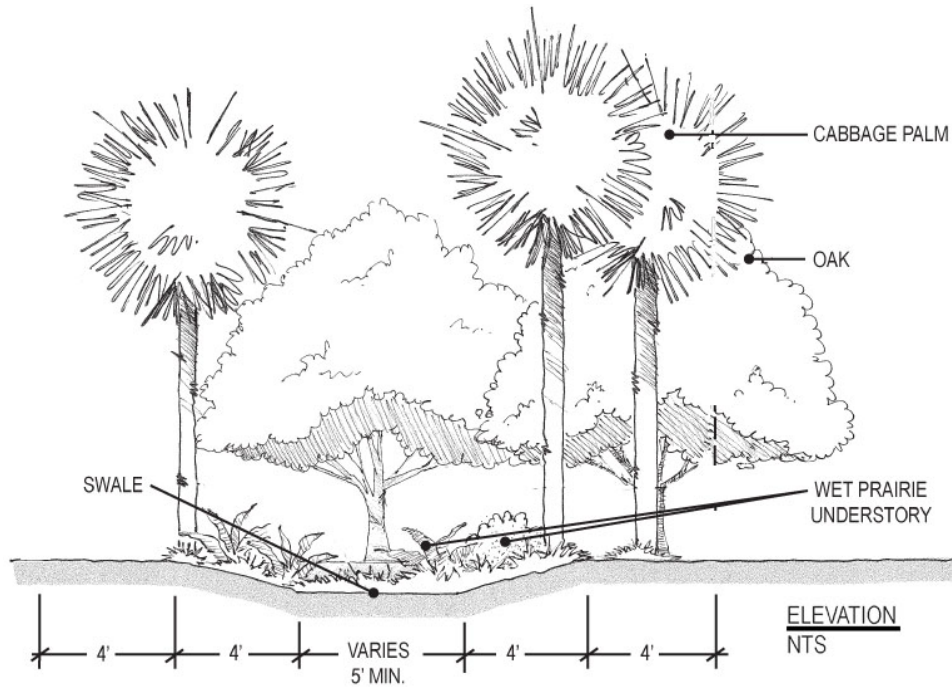
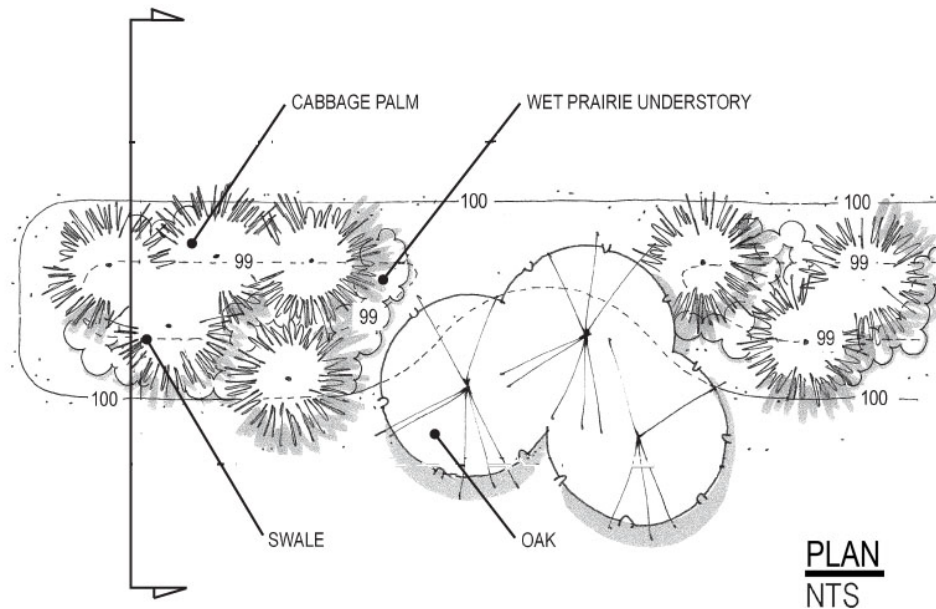


A. Existing Stormwater Management Facility Mitigation

4. **Natural Existing Fresh Water Swale (Plans and Elevation 3.5-4)** – The design intent is to soften the hard edges of an engineered swale using native canopy and understory vegetation commonly found within a fresh water swale community. A low to high moderate maintenance plan is needed for the overall continuation of specified goals and plant material.
 - a. Understory herbaceous/wetland wetlands: yellow colicroot (*Aletris lutea*), blue waterhyssop (*Bacopa caroliniana*), herb of grace (*Bacopa monnieri*), American bluehearts (*Buchnera americana*), sawgrass (*Cladium jamaicense*), southern swamp-lily (*Crinum americanum*), sandswamp whitetop (*Dichromena latifolia*), Gulf Coast spikerush (*Eleocharis cellulosa*), alligatorlily (*Hymenocallis palmeri*), musky mint (*Hyptis alata*), bighead rush (*Juncus megacephalus*), pineland waterwillow (*Justicia angusta*), seashore mallow (*Kosteletzkya virginica*), southern cutgrass (*Leersia hexandra*), ludwigia water-primrose (*Ludwigia* sp.), pickerelweed (*Pontederia cordata*), mermaid-weed (*Proserpinaca* sp.), horned beakrush (*Rhynchospora inundata*), rose of Plymouth (*Sabatia stellaris*), American cupscale (*Sacciolepis striata*), arrowhead (*Sagittaria lancifolia*), little bluestem (*Schizachyrium scoparium*), saltmeadow cordgrass (*Spartina patens*), thalia; fire flag (*Thalia geniculata*), cattail (*Typha* sp.), Richard's yellow-eyed-grass (*Xyris jupicai*)



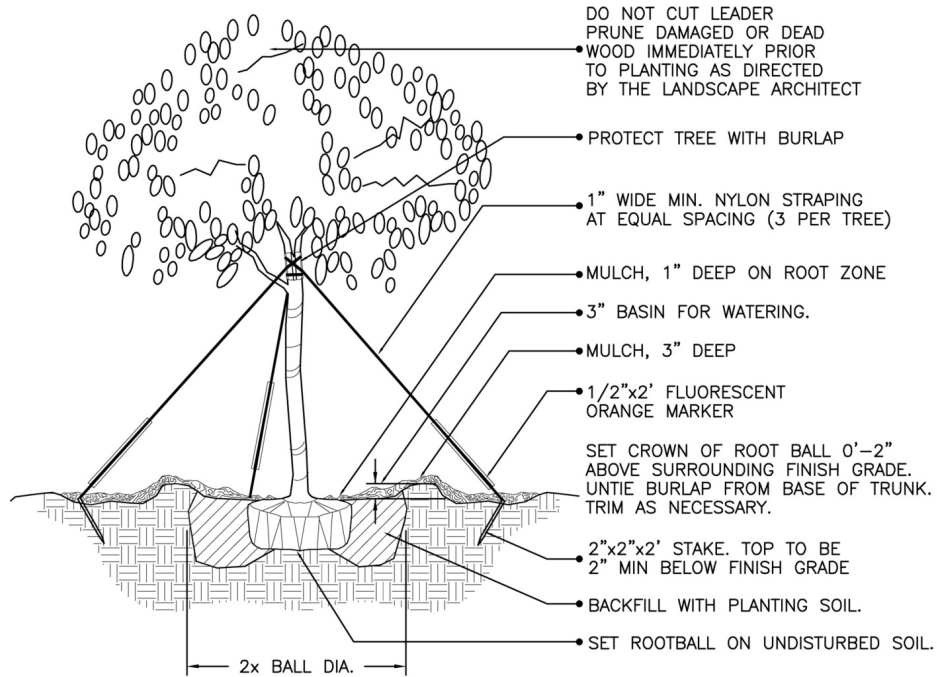
5. **Palm Oak Association/Existing Swale (Plans and elevations 3.5-5)** – The design intent is to soften the hard edges of an engineered swale using native canopy and understory vegetation commonly found within a palm oak association habitat. A low to high moderate maintenance plan is needed for the overall continuation of specified goals and plant material.
 - a. Canopy vegetation: cabbage palm (*Sabal palmetto*), live oak (*Quercus virginiana*), laurel oak (*Quercus laurifolia*), paurotis palm (*Acoelorrhaphe wrightii*), pigeon plum (*Coccoloba diversifolia*), gumbo limbo (*Bursera simaruba*), Mahogany (*Swietenia mahagoni*)
 - b. Understory vegetation: gallberry (*Ilex glabra*), wild coffee (*Psychotria sulzneri/undata*), Myrsine (*Myrica guianensis*), firebush (*Hamelia patens*), cocoplum (*Chrysobalanus icaco*), simpsons stopper (*Myrcianthes fragrans*), florida privet (*Forestiera segregatas*)



4.2 Construction Details

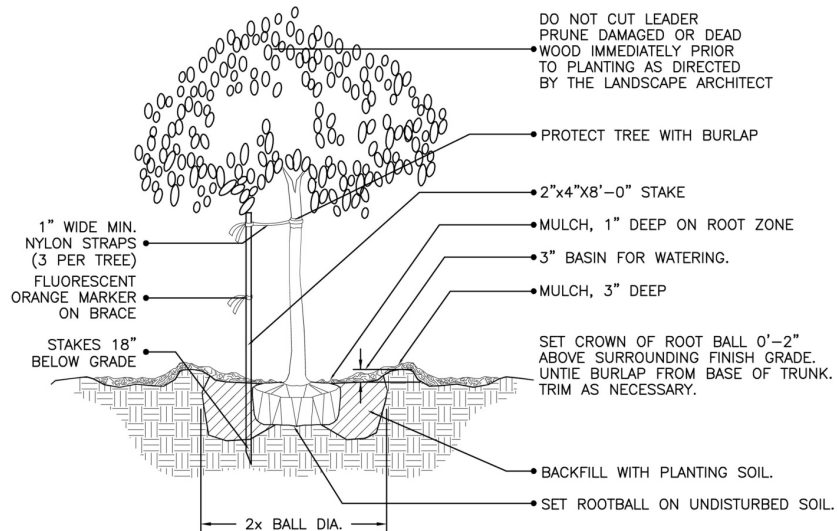
A. Landscape Construction Details

1. Typical details for installation of plant materials are as shown for typical installation conditions. Non-typical or special conditions should be brought to the attention of the Broward County School Board project manager for approval prior to use. Standard Landscape Installation Details shall be referenced on all plans. See link for standard details. (http://www.broward.k12.fl.us/facilities_construction/)



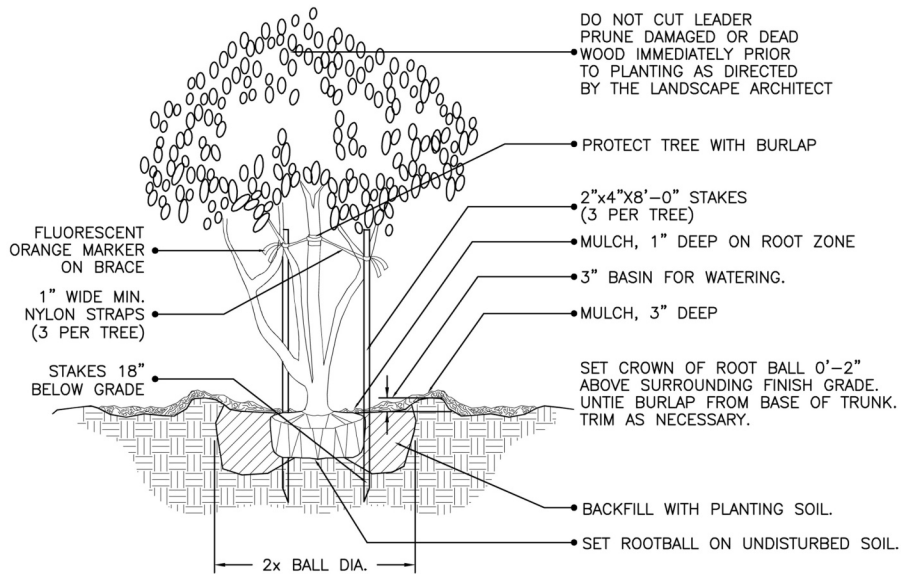
(2" cal. and over) LARGE TREE PLANTING DETAIL

NTS.



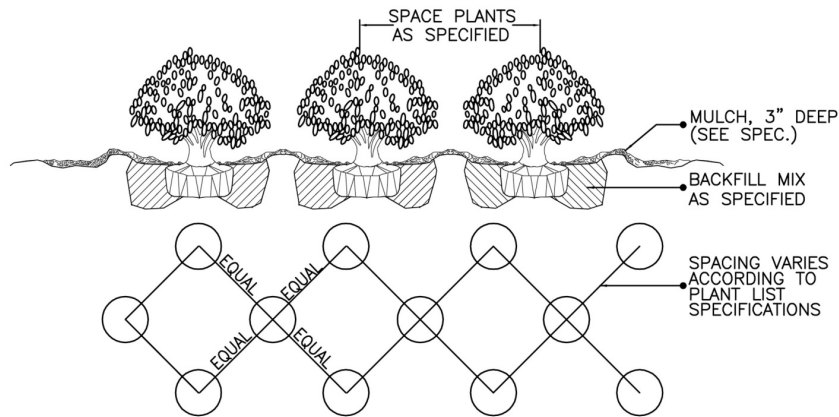
(2" cal. and under) SMALL TREE PLANTING DETAIL

NTS.



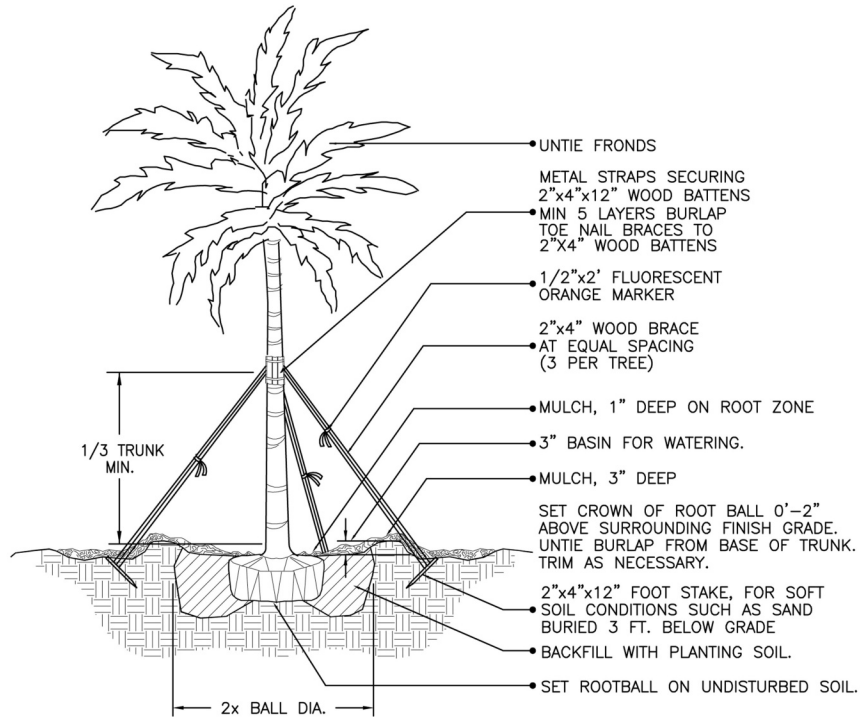
MULTI- TRUNK AND SMALL TREE (2" cal. and under) PLANTING DETAIL

NTS.



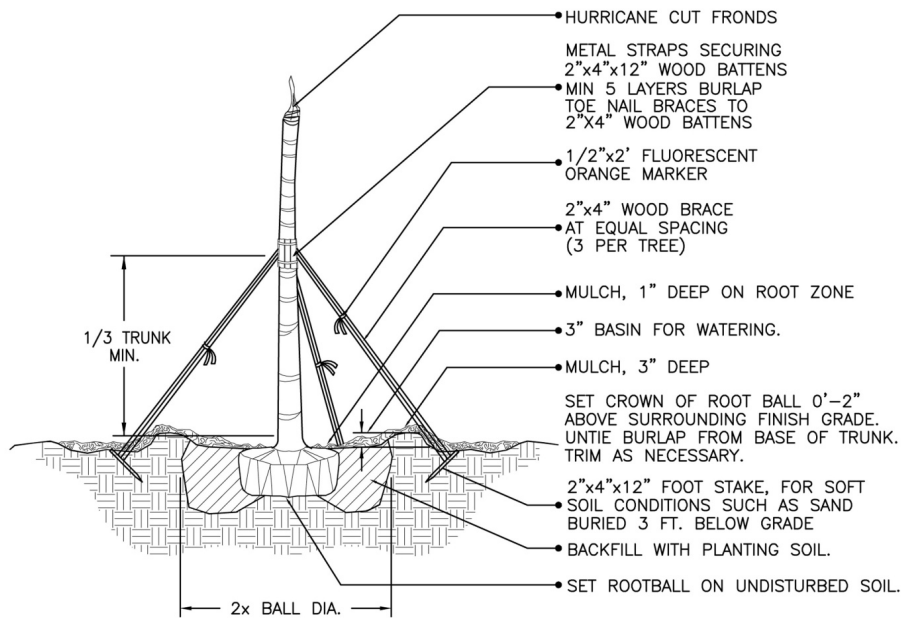
SHRUB / GROUNDCOVER SPACING / PLANTING DETAIL

NTS.



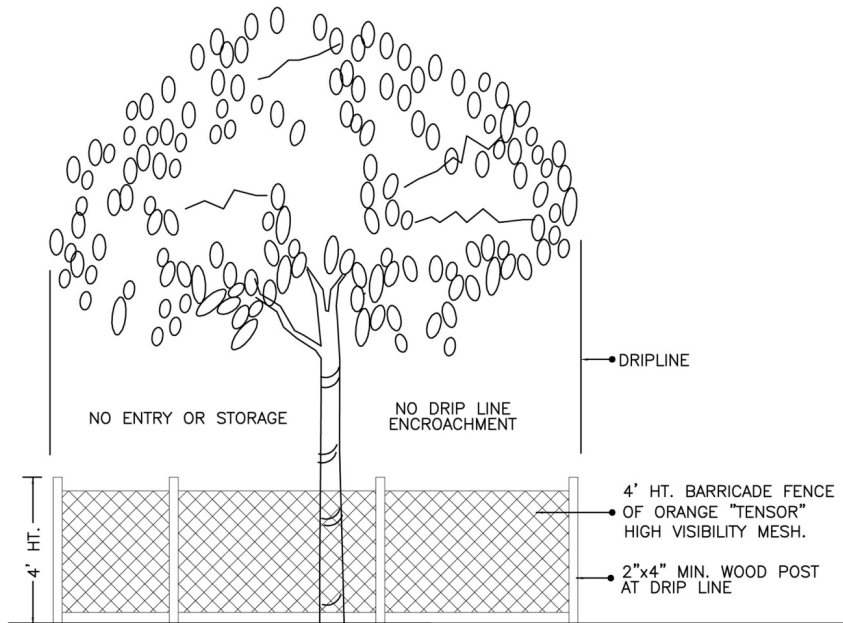
LARGE PALM PLANTING DETAIL

N.T.S.



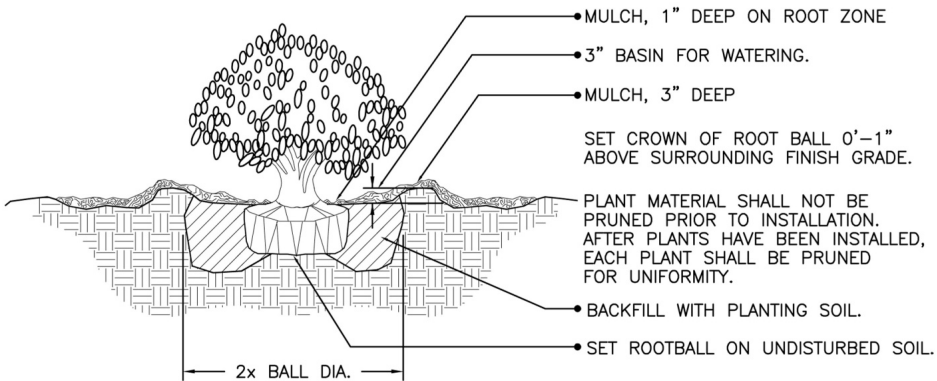
CIGARED SABAL PALM PLANTING DETAIL

N.T.S.



TREE PRESERVATION BARRICADE FENCING DETAIL

N.T.S.



SHRUB PLANTING DETAIL

N.T.S.

PART 4 MAINTENANCE

Intent: Maintenance of landscape is critical to long-term success of planting and irrigation systems. Therefore, the intent of this section is to ensure that proper intensity and type of maintenance is provided for each landscape project in the school system.

4.1 Maintenance Intensity Zones

Maintenance for each landscape project is first assigned a level of intensity of maintenance needed:

low, medium, and high. These intensity levels are then described as to the relative amount and kind of maintenance needed. The next section schedules for maintenance practices.

A. Turf

1. Mowing
 - a. *High Intensity Zones*– Maintain optimum turf grass height for active use applications.
 - b. *Moderate Intensity Zones* – Periodic mowing to control undesirable plant growth or to comply with local ordinances or regulations.
 - c. *Low Intensity Zone* –Annual mowing or less frequent.
2. Watering
 - a. *High Intensity Zones*
 - Water as required to provide optimum soil moisture levels to meet evapotranspiration rates.
 - Turf condition: Uniformly green with vigorous growth.
 - Irrigation coverage: 100%
 - b. *Moderate Intensity Zones*
 - Water is required to provide minimum soil moisture levels to meet evapotranspiration rates.
 - Turf condition: Green with vigorous growth limited dry areas acceptable.
 - Irrigation coverage: 100%
 - c. *Low Intensity Zones*
 - Not required, or some manual watering required.
 - Irrigation coverage: None
3. Aeration/Dethatching
 - a. *High Intensity Zones*-
 - Once per year or more as required by specific on-site conditions.
 - b. *Moderate Intensity Zones*
 - Once every other year or less as required by specific on-site conditions.
 - c. *Low Intensity Zones*- Not required.
4. Edging
 - a. *High Intensity Zones*
 - Periodic mechanical edging along walks, curbing, fencing and other hard surface areas. Chemical edging along plant bed lines.
 - b. *Moderate Intensity Zone*
 - Periodic mechanical or chemical edging along walks, curbing, fencing and other hard surfaces areas. Chemical edging along plant bed lines.
 - c. *Low Intensity Zone*- Not required.
5. General Comments
 - a. Dead and severely stressed lawn areas are unacceptable in High and Medium maintenance zone. New seeding/ sodding should comply with specifications provided in this guide.

B. Trees and Shrubs

1. Fertilizing
 - a. *High Intensity Zones*
 - Deep root feeding three times annually, which may include foliar fertilization.

- b. Moderate Intensity Zone
 - o Deep root feeding once annually
 - c. Low Intensity Zone- Not required.
 - 2. Insect/Disease Control
 - a. High Intensity Zones
 - o Trees and shrubs should be free from insect and disease infestations or damage.
 - b. Moderate Intensity Zone
 - o As needed to prevent spread of insect or disease problems to plantings located in High and Medium maintenance zones.
 - c. Low Intensity Zone- Not required.
 - 3. Pruning
 - a. High Intensity Zones
 - o Prune trees and shrubs a minimum of once yearly for shaping and as a required for immediate removal of all dead and damaged branches.
 - b. Moderate Intensity Zone
 - o Prune as required removing dead or damaged branches and providing for desired shape.
 - c. Low Intensity Zone
 - o Remove dead or potentially hazardous trees, shrubs and limbs as needed.
 - 4. Watering
 - a. High Intensity Zones
 - o Provide supplemental irrigation to maintain optimum soil moisture levels.
 - b. Moderate Intensity Zone
 - o Provide supplemental irrigation to maintain adequate soil moisture levels to avoid stress.
 - c. Low Intensity Zone- Required for plant establishment only.
 - 5. General Comments
 - o Dead and severely stressed or damaged trees and shrubs found in High and Moderate maintenance zones should be replaced. New plant installation should comply with specifications and installation details provided by the Landscape Architect.
- C. Plant Beds
 - 1. Mulching
 - a. High Intensity Zones
 - o Uniform thickness of organic or inorganic mulch applied periodically as needed depending on mulch decomposition rate.
 - b. Moderate Intensity Zone
 - o Uniform thickness of organic or inorganic mulch applied every year or as needed depending on mulch decomposition rate.
 - c. Low Intensity Zone- Not required, following initial planting.
 - 2. Weed Control
 - a. High Intensity Zones
 - o Pre and post-emergent weed control is required. Weeds limited to less than 2% of plant bed area.
 - b. Moderate Intensity Zone
 - o Weed control as necessary to prevent spread of weeds into High and Moderate Maintenance Zone plant beds. Weeds limited to no more than 30% of bed area.
 - c. Low Intensity Zone- Remove exotic/invasive species once annually.
 - 3. Edging
 - a. High Intensity Zones
 - o Mechanical edging bi-weekly to maintain neat, clean appearance.
 - b. Moderate Intensity Zone
 - o Mechanical or chemical edging minimum of three times each year.
 - c. Low Intensity Zone- Not required.

D. General

1. Irrigation
 - a. High Intensity Zones
 - Check and adjust irrigation emitter, filters and timer monthly to insure optimum soil moisture levels. Calibrate twice per year.
 - b. Moderate Intensity Zone
 - Check and adjust irrigation emitter, timer, and pump (if present) at least 3 times per year to insure adequate soil moisture levels, uniform coverage, and spray direction.
 - c. Low Intensity Zone- Not required.
2. Site Furnishings and Play Equipment
 - a. All Elements Require High Level of Maintenance
 - Inspect at least 3 times per year and maintain as needed to keep all site furnishings and play equipment safe, functional, and in good repair (rust removal, paint, wood replacement, etc...)
3. Hardscape
 - a. All Elements Require High Level of Maintenance
 - Inspect at least 3 times per year and maintain as needed to keep hard surface areas safe and functional.
 - Remove marks, paint and gum from sidewalks.
 - Adjust walks, paint walls, fill full cracks, chips and paint; and clean with pressure washer.
4. Leaf/Litter Pickup
 - a. High Intensity Zones
 - Leaf and litter pick-up, at least weekly, to keep zone free of debris at all times.
 - b. Moderate Intensity Zone
 - Leaf pick-up as required preventing unsightly appearance or turf and shrub damage. Litter-free.
 - c. Low Intensity Zone-
 - Litter pick-up at least three times per year

4.2 Maintenance Specifications

- A. Landscape Maintenance Appearance and Performance Specifications

The following specifications describe all horticultural and technical landscape operations required for the proper maintenance of the site's landscape. Each specification is divided into two sections. The appearance section describes how the site should appear upon completion of the operation. The performance section describes how the operations shall be conducted. Equipment or technical requirements may be a part of the Performance section. These specifications shall be used by the maintenance staff as a procedural manual and by the manager for evaluating work completed. Timing and frequency of all operations is specified
- B. Trash Pick-up
 1. Appearance
 - a. Property shall remain clean and litter free.
 2. Performance
 - a. During each scheduled visit to the property, all landscaped areas will be patrolled to remove and dispose of accumulated trash, litter and/ or debris.
 - b. Trash not generated from the detail rotation may be placed into any available on-site trash containers or receptacles.
 - c. If there are recycling containers on site, the collected trash shall be separated and disposed in the proper receptacle.
 - d. During each scheduled visit, police the sites for dead or fallen limbs and remove and dispose of them. In case of excessive storm debris (Hurricane Force Winds), an additional service contract shall be submitted to Broward County School Board for approval.

C. Turf Grass

General –

Turf grass areas represent a highly visible component of the landscape and often are required to support intensive, specialized activities. Turf grass areas also require the greatest amount of resources to maintain at the optimum functional and aesthetic level. Routine turf grass maintenance includes mowing, line trimming, fertilization, pest and weed control, aeration, de-thatching, edging, and irrigation.

1. Mowing

a. Appearance

- All areas adjacent to turf, whether paved or landscaped, shall be left free from clippings.
- Mowing pattern shall create straight lines.
- Cut leaf blades shall exhibit a clean-cut edge. No ragged or torn edges shall be acceptable.
- Any visible clumps of clippings shall be removed from the property each visit.

b. Performance

- High and moderate level maintenance areas shall be mowed weekly from April 1 through October 31 and bi-weekly during the non-growing season November 1 through March 31.
- Low-level maintenance areas shall be mowed bi-weekly from April 1 through October 31 and monthly during the non-growing season November 1 through March 31.
- Mowing height will be in accordance with attached technical addendum (Site-specific Maintenance Plan) with no more than one-third of the grass blade removed per cutting, unless otherwise specified by the design intent or site manager.
- Mower blades shall be kept sufficiently sharp and properly adjusted to provide a cleanly cut blade of grass. Mowing pattern shall be varied when appropriate to prevent rutting and minimize compaction.

2. Edging

a. General

- Damage to pavements, plant materials or apparent structures shall not be acceptable. The contractor shall be responsible for repairs to or replacement of damaged items at the discretion of the owner and at no additional cost to the client.
- Chemical edging operations shall be carried out only by certified, bondable personnel, according to all local State and Federal laws, codes, rules and ordinances. The applicator shall be responsible for the knowledge of and adherence to these regulations.

b. Appearance:

- All edging operations shall follow existing pavements, curbs, other hard surfaces and planting beds and shall exhibit clean, free-flowing lines.
- Chemical edging shall not extend further than four inches from the structure edge or bed edge being treated.

c. Performance:

- The frequency of edging shall be based on the horizontal growth rate of the turf.
- Edging operations shall closely (within 2 inches) follow existing bed or structure .

3. Line Trimming

a. General:

- Line trimming shall be used to cut turf grasses in locations which cannot be safely accessed by mowing equipment.
- Line trimmers shall not be used for trimming groundcovers or shrubs unless otherwise specified in these documents.
- At no time shall line trimmers be used to maintain any small section of turf that can be mowed by a 21" rotary mower.

b. Appearance

- Scalping shall not be acceptable.
 - Grass shall be trimmed to the same desired height as determined by the mowing operation.
 - c. Performance
 - String trimming shall occur with each mowing operation.
 - Clippings shall be picked up or dispersed so that they are not noticeable.
- 4. Blowing
 - a. General:
 - The blowing operation will be limited to the debris generated by this scope of work.
 - Sufficient care will be taken to ensure that the blowing operation does not interfere with pedestrian traffic.
 - b. Appearance:
 - Vehicles, landscape areas, hardscaped surfaces shall be free from clippings, dust and debris.
 - c. Performance
 - Debris shall be blown back into turf area
 - Blowing shall be done after each mowing, line trimming, and/ or edging operation
- 5. Fertilization
 - a. General:
 - All granular fertilizers will be custom blended and include a well-balanced, micro-nutrient package complete with minor and trace elements.
 - Fertilizers selected will be specific to the needs of the property and appropriate to the turf being fertilized.
 - Supplemental applications or required follow-up treatments will be provided at no charge.
 - Irrigation system shall be fully operational prior to any fertilizer application.
 - During Spring season, a complete fertilizer such as 16-4-8 shall be used with at least 30% of the nitrogen in slow-release form.
 - During Fall season, a complete fertilizer such as 12-2-14 shall be used
 - Refer to typical fertilization schedules below for specific grass fertilization needs.
 - b. Appearance
 - Turf grass areas are to be uniformly green with no sign of striping due to improper fertilizer application.
 - Fertilizer dust or granules shall not be evident on turf grass blades, nor shall fertilizer be present on paved surfaces.
 - Spot burning resulting from over-application or chlorotic spots resulting from missed application shall be unacceptable, and shall be repaired at no cost to the client.
 - c. Performance
 - All hardscape surfaces will be blown off immediately following any granular fertilizer application to prevent staining.
 - Liquid fertilizers will be applied in an overlapping pattern to prevent streaking or an inconsistent color.
 - Perform a soil test every year. The test shall form the basis for a lawn fertility program, and recommendations from the soil tests should take precedence over specifications given here.
 - Typical application rate is 1 pound of nitrogen per 1,000 s.f.
 - Refer to typical fertilization schedules below for specific grass fertilization needs.
 - d. *Zoysia grass annual fertilization schedule*
For the South Florida region
 - Low level of maintenance
 - Complete fertilizer (N,P,K) shall be applied during April
 - Moderate level of maintenance
 - Complete fertilizer (N,P,K) shall be applied during February and November.
 - Nitrogen only in a slow release form shall be applied in June and August.

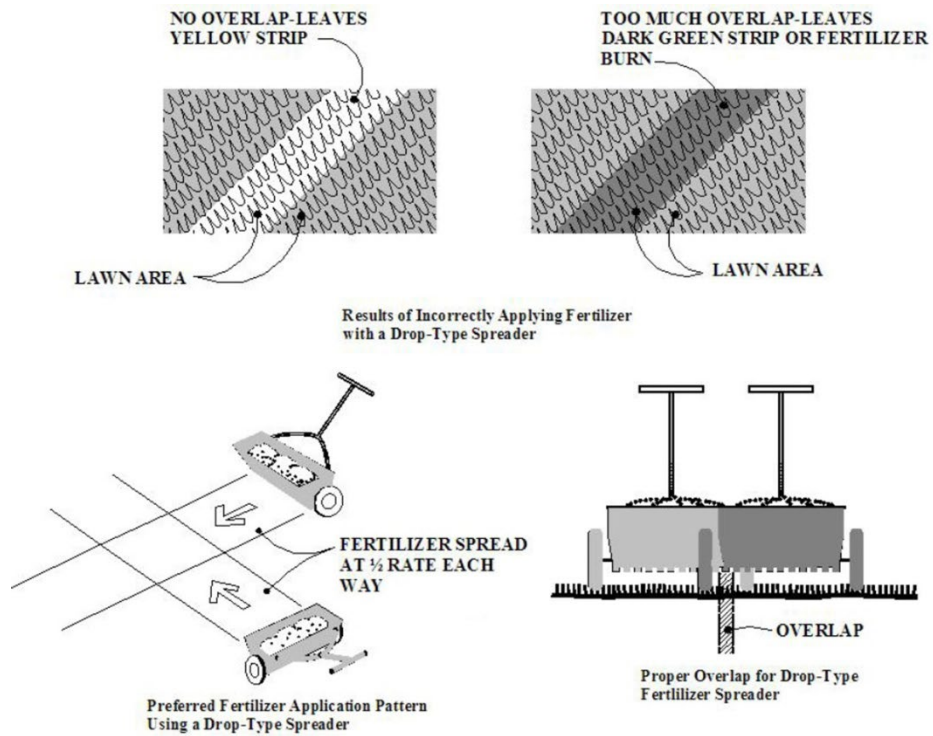
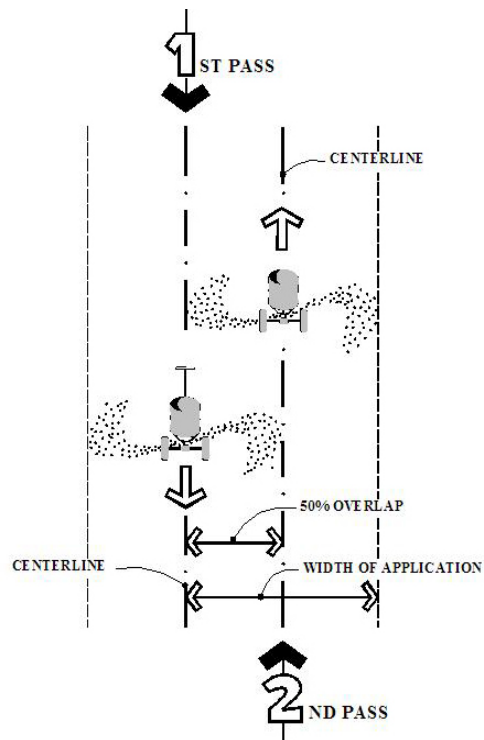
- Nitrogen-only fertilizer shall be applied during April.
- High level of maintenance
 - Complete fertilizer (N,P,K) shall be applied during February and November.
 - Nitrogen only in a slow release form shall be applied in May, July and September.
 - Nitrogen-only fertilizer shall be applied during April.
- e. *Bermuda grass annual fertilization schedule*

For the South Florida region

 - Low level of maintenance
 - Complete fertilizer (N,P,K) shall be applied during April.
 - Moderate level of maintenance
 - Complete fertilizer (N,P,K) shall be applied during February and November.
 - Nitrogen only in a slow release form shall be applied in July and September.
 - Nitrogen-only fertilizer shall be applied during March.
 - High level of maintenance
 - Complete fertilizer (N,P,K) shall be applied during February, May and November.
 - Nitrogen only in a slow release form shall be applied in April, June and September.
 - Nitrogen-only fertilizer shall be applied during March.
 - Iron application only in July.
- f. *St. Augustine grass annual fertilization schedule*
 - Low level of maintenance
 - for the South Florida region (Not to be used in low maintenance areas)
 - Moderate level of maintenance
 - Complete fertilizer (N,P,K) shall be applied during February and November.
 - Nitrogen only in a slow release form shall be applied in June and August.
 - Nitrogen-only fertilizer in April.
 - High level of maintenance
 - Complete fertilizer (N,P,K) shall be applied during February and November.
 - Nitrogen only in a slow release form shall be applied in May, July, and September.
 - Nitrogen-only fertilizer in April.
- g. *Bahia grass annual fertilization schedule*

for the South Florida region

 - Low level of maintenance
 - Complete fertilizer shall be applied during April
 - Moderate level of maintenance
 - Complete fertilizer shall be applied during February and October.
 - Iron application only in June.
 - High level of maintenance
 - Complete fertilizer shall be applied during February and October.
 - Nitrogen only in a slow release form shall be applied in June.
 - Nitrogen-only fertilizer in April.
 - Iron application only in August.



D. Trees and Shrubs

General- Trees and shrubs represent a significant long-term investment for most landscape sites. Significant costs were incurred for original plant installation work. Continued plant care is essential in order to protect this investment and to insure the high visual and functional quality of the site. Routine plant maintenance requirements include pruning, fertilization, mulching, weed I.D. and control, pest control, and other miscellaneous maintenance procedures.

Trees

1. Fertilization:

a. General:

- Trees in lawn areas exposed to lawn fertilizations will not receive reduced fertilization.
- Application rate will be 1 lb. of Nitrogen per 1,000 s.f. or equivalent.
- All fertilizers should contain equal amounts of nitrogen and potassium and 30% of both should be available in slow release form.

b. Performance

- Ornamental trees planted less than 5 years shall be fertilized 3 times per year during the months of February, May, and September for high and medium maintenance areas.
- Ornamental trees more than 5 years old shall be fertilized 2 times per year during the months of March and September for high and medium maintenance areas.
- Ornamental trees in low maintenance areas shall not be fertilized.
- All fertilizers in high maintenance areas shall be deep root fertilized.
- All fertilizers in medium maintenance areas shall be applied by deep root techniques at the drip line.

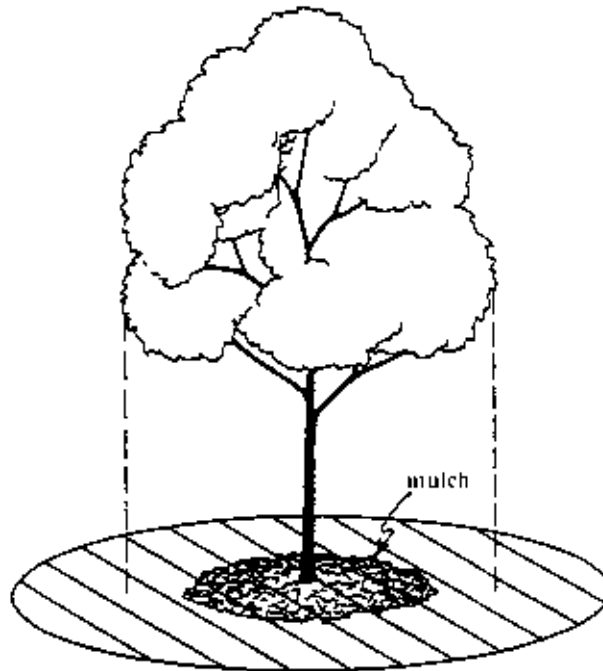


Figure shows cross-hatched area below the drip line of the canopy as the appropriate zone for fertilization . Keeping the fertilizer away from the trunk. *FCNP Manual, III-16*

2. Pest Control:

a. General:

- Contractor shall practice Integrated Pest Management (I.P.M.) to control insects, diseases and weeds.
- Weekly monitoring will be done. Spot treat as needed using least toxic methods.

- b. Appearance
 - o Trees shall remain pest free
 - c. Performance:
 - o Spot treatment as needed using least toxic methods.
3. Pruning:
- a. General:
 - o The clearance height of trees shall only be raised for the purposes of providing safe passage for pedestrians, vehicles and mowers, or to improve visibility in parking lots and building entries.
 - o All dead, diseased, broken, crossing branches, water sprouts and suckers shall be removed as they occur.
 - o Tool shall be treated with a disinfectant solution after pruning diseased wood.
 - o Disposal of any debris generated during pruning shall be in accordance with local ordinances and regulations.
 - b. Appearance
 - o Trees shall be maintained to keep a natural appearance, unless the design intent states otherwise.
 - c. Performance
 - o Pruning will be done once per year in the winter months (November thru January)
 - o No more than $\frac{1}{4}$ (25%) of the crown shall be removed at one time.
 - o The raising of hardwood canopies up to a safe passage height of 8'. The height of trees shall only be raised for the purposes of providing for pedestrians, vehicles and mowers, or to improve visibility in parking lots and building entries.
 - o Branches shall be pruned just outside the branch collar.
 - o Crape Myrtles shall be trimmed once per year in the winter months. Trimming should include the removal of old blooms, sucker growth and any cross branching. Pruning shall be done in such a way that cuts are no less than 12" away from previous year's cuts.

Palms

1. Fertilization:
- a. General
 - o Palms shall be fertilized so as to exhibit a healthy appearance free from chlorosis and stunting.
 - o Mature palms in the landscape to receive a complete granular fertilizer formulated for palms like: 8-4-12 that contains additional Mg and a complete micronutrient amendment.
 - o 4 applications per year for High Maintenance Areas, 2 times per year for Moderate maintenance areas at a rate of 5 to 8 lbs per application. Low Maintenance Areas will not require fertilization.
 - o Palms less than 8' receive the same frequency of fertilizer applications as a mature palm but the rate is reduced to 1½ to 2 lbs per application.
2. Pest Control:
- a. General:
 - o Contractor shall practice Integrated Pest Management (I.P.M.) to control insects, diseases and weeds.
 - o Weekly monitoring will be done, along with spot treatment as needed using least toxic methods.
 - b. Appearance
 - o Palms shall remain pest free
 - c. Performance:

- Insecticide: For high maintenance palms, like many date palms, Chlorpyfos shall be applied every 3 months with a fungicide.
- Fungicide: For high maintenance palms, like many date palms, Spectro90 or Cleary's 3336 shall be sprayed on the fronds every 3 months.

Shrubs

1. Fertilization:
 - a. General:
 - Ornamental shrubs in low maintenance areas shall not be fertilized.
 - Shrubs in lawn areas exposed to lawn fertilizations shall not be supplementally fertilized.
 - Application rate will be 1 lbs. of Nitrogen per 1,000 s.f. or equivalent.
 - All fertilizers should contain equal amounts of nitrogen and potassium and 30% of both should be available in slow release form.
 - b. Performance:
 - Ornamental shrubs planted less than 5 years shall be fertilized 3 times per year during the months of February, May, and September for high and medium maintenance areas.
 - Ornamental shrubs more than 5 years old shall be fertilized 2 times per year during the months of March and September for high and medium maintenance areas.
2. Pest Control:
 - a. General:
 - Contractor shall practice Integrated Pest Management (I.P.M.) to control insects, diseases and weeds.
 - Weekly monitoring will be done. Along with spot treatment as needed using least toxic methods.
 - b. Appearance:
 - All shrubs shall remain pest free
 - c. Performance:
 - Spot treatment as needed using least toxic methods
3. Pruning:
 - a. General:
 - Electric or gas powered shears will only be allowed to maintain hedge rows areas as specified in the design drawings or maintenance plan.
 - Tool shall be treated with a disinfectant solution after pruning diseased plants.
 - Disposal of any debris generated during pruning shall be in accordance with local ordinances and regulations.
 - b. Appearance:
 - Shrubs will be pruned by hand as needed to ensure proper informal shape, fullness, and bloom.
 - c. Performance:
 - Pruning will be done once per year in the winter months (November thru January)
4. Detail Rotation:

Bed Lines

 - a. General:
 - Chemical edging will be allowed in low maintenance areas only.
 - b. Appearance:
 - All bed lines shall be maintained in a manner that is consistent with the original design of the landscape areas.
 - c. Performance:
 - Bed lines shall be maintained bi-weekly with gas or electric edgers

Weed Control

- d. Appearance:
 - o Bed areas and cracks in the hardscaping area to be left weed free after each detail rotation.
- e. Performance:
 - o Pre-emergent and post-emergent chemicals shall be used as needed
 - o Weeds larger than 3" in height shall be pulled by hand.

5. Mulching

- a. General:
 - o Color and type of mulch must match the original design intent, unless specified by the maintenance plan.
 - o Prior to the installation of mulch, all plants within the bed shall be properly trimmed, all beds shall be properly edged and all weeds shall be either removed or sprayed with a non-selective herbicide.
 - o Mulch shall be applied on an as-needed basis determined by Broward County School ground maintenance supervisor.
- b. Appearance:
 - o Mulch must be free of noxious weeds and seeds, diseases, and harmful insects.
 - o No clumps larger than 6" may be visible upon completion
- c. Performance:
 - o Edges along concrete, curbs, or sidewalks shall be trenched to a depth of 4", to help prevent the new mulch from washing onto any hardscape surface.
 - o Clean up: all hardscape and shrubs must be free of all mulch debris

E. Irrigation

1. General:

- o Plants have, through the ages, adapted themselves to many climatic conditions. Plants growing in the desert receive little water, while those thriving in the tropics receive rain on a daily basis. Some plants have even adapted themselves to growing in areas where their root systems are partially or completely covered by water.
- o It is not unusual for a healthy vigorous plant to transpire an amount of water equal to many times its own weight in one day. Since water is primarily made available to plants through their root systems, the moisture content of the soil, especially during the growing season, is critical to growth and survival. Most plants generally prefer moist, not wet, soil conditions and will show signs of stress from over- or under-watering.

2. Appearance:

- o Supplemental irrigation shall be supplied so that plant materials shall not exhibit a wilted appearance. All irrigation components shall be mounted out of sight as detailed in the construction plans or in an inconspicuous, but accessible location. Areas to receive supplemental irrigation shall remain free from ponding and run-off associated with the irrigation system.
- o Supplemental irrigation shall not over-spray onto pavements, non-irrigated areas or structures.
- o Avoid build-up of iron deposits on structures, walks, and plant materials. Clean-up when present.

3. Performance:

- Irrigation inspections shall be performed periodically as specified. Prepare and maintain an irrigation system maintenance schedule.
- A full inspection shall include verifying and adjusting the irrigation program, testing and adjusting the rain sensor, checking and servicing filters, manual running of each zone and inspection of each emitter, test the precipitation rate of each zone and inspect the coverage of each zone.
- Partial inspections shall include verifying and adjusting the irrigation program, manually running each zone, inspecting and adjusting emitters as required, and visually inspecting the coverage of each zone

4. Minimum Recommended Irrigation Maintenance Procedures

- Every irrigation zone should be checked monthly and written reports generated describing the date(s) each zone was inspected, problems identified, date problems repaired, and a list of materials used in the repair. At minimum, these inspections should include the following tasks:
 - Turn on each zone from the controller to verify automatic operation.
 - Check schedules to ensure they are appropriate for the season, plant and soil type, and irrigation method. Refer to the design drawing or consult an Irrigation Association certified auditor for methods used in determining proper irrigation scheduling requirements.
 - Check remote control valve to ensure proper operation.
 - Check setting on pressure regulator to verify proper setting, if present.
 - Check flow control and adjust as needed; ensure valve closure within 10-15 seconds after deactivation by controller.
 - Check for leaks - mainline, lateral lines, valves, heads, etc.
 - Check all heads as follows:
 - Proper set height (top of sprinkler is 1" below mow height)
 - Verify head pop-up height - 6" in turf, 12" in ground cover, and pop-up on riser in shrub beds.
 - Check wiper seal for leaks - if leaking, clean head and re-inspect. If still leaking, replace head with the appropriate head with pressure regulator and built-in check valve.
 - All nozzles checked for proper pattern, clogging, leaks, correct make & model, etc. - replace as needed
 - Check for proper alignment - perfectly vertical; coverage area is correct; minimize overspray onto hardscape.
 - Riser height raised/lowered to accommodate plant growth patterns and ensure proper coverage.
 - Verify the pop-up riser retracts after operation. If not, repair/replace as needed.
- Check controller/Central Control Unit (C.C.U.) grounds for resistance (10 ohms or less) once per year. Submit written reports.
- Check rain shut-off device monthly to ensure it functions properly.
- Inspect all filters monthly and clean/repair/replace as needed.
- Inspect backflow devices by utilizing a properly licensed backflow inspector. This should be done annually at a minimum.
- Inspect all valve boxes to ensure they are in good condition, lids are in place and locked.
- Check pump stations for proper operation, pressures, filtration, settings, etc. - refer to pump station operations manual.
- Check and clean intake screens on all suction lines quarterly, at minimum. Clean and/or repair, as needed.
- Winterize, if applicable. Follow manufacturer recommendations and blow out all lines and equipment using compressed air.
- Conduct additional inspections, maintenance tasks, etc... particular to the site.

F. Hardscape Maintenance

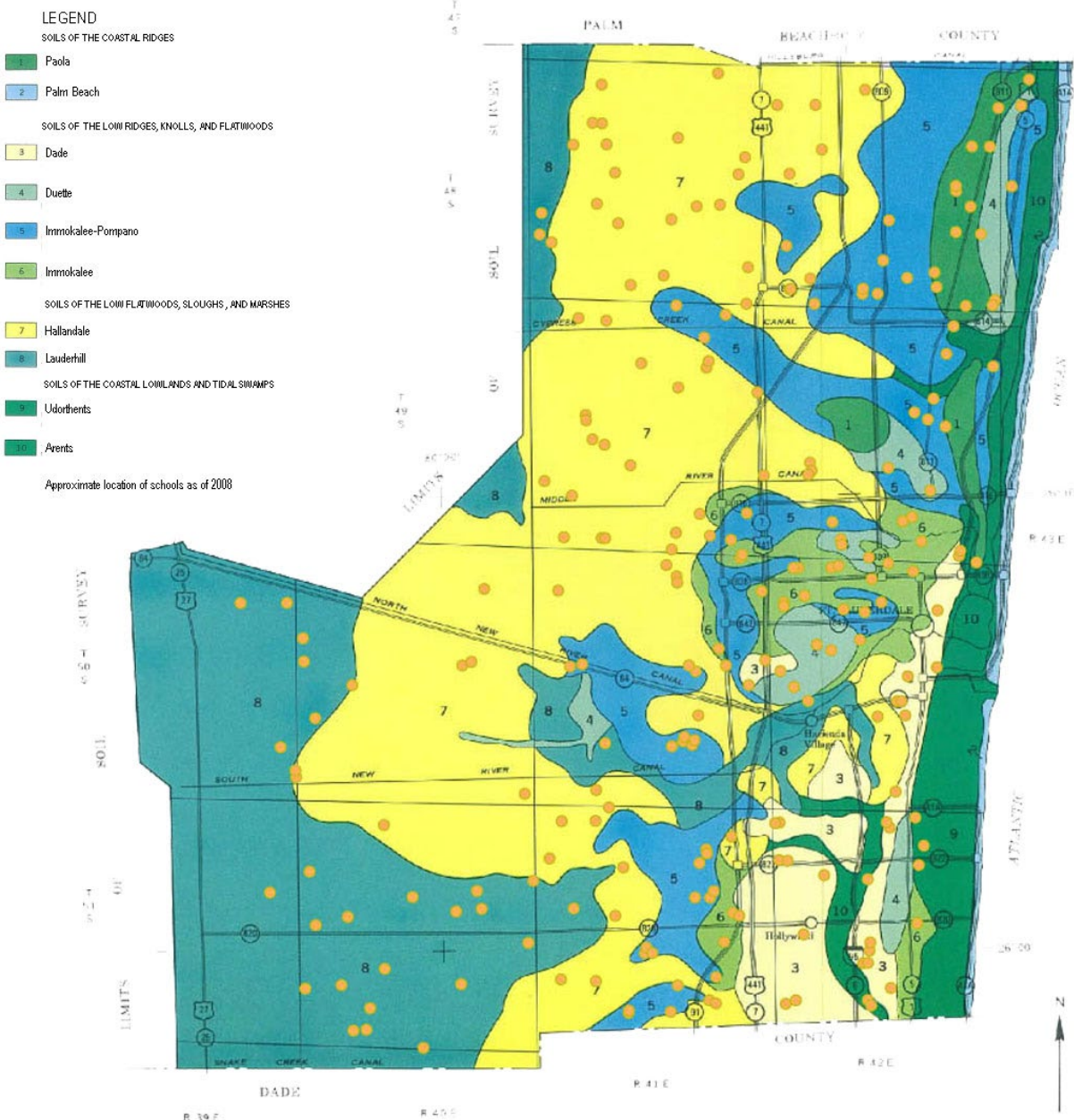
1. Lighting
 - a. Appearance:
 - o All lights shall be in working order at all times
 - b. Performance:
 - o All lights, parking areas, play areas, recreational facilities, and common areas shall be checked once a month.
 - o Replace broke parts within 1 week of inspection, like globes, fixtures, and burnt bulbs
 - o Measure lumens once per year and replace bulbs when they fall below 50% of their design luminosity.
2. Hard Surfaced Play Courts
 - a. General:
 - o All paints used on the courts shall be a suitable outdoor paint that is non-slip.
 - o Cracks that are trip and fall hazards (1\2 inch difference) shall be repaired.
 - o Weeds found on the courts shall be treated with the appropriate herbicide.
 - o Any trees or shrubs that encroach on the court or the air space above it shall be pruned back.
 - b. Appearance:
 - o Courts shall maintain a clean appearance .
 - o Goals shall be maintained and nets replaced when worn out
 - c. Performance:
 - o Courts shall be pressure-washed once per year in the spring.
 - o Painted lines on the court shall be inspected once per year and repainted as needed
 - o Basketball courts shall be swept regularly and inspected for damage to the court surface or the goals.
3. Play Areas
 - a. General:
 - o Play areas and tot lots should be inspected monthly by maintenance staff to help insure the safety and well being of the users
 - o All elements of the play area shall be evaluated, not just the structures.
 - o Test overall stability for all equipment and check for proper assembly, installation and ground anchoring.
 - o Check the depths of sand, mulch, or other porous materials to ensure they remain at the depths they were designed.
 - o Play equipment should be inspected once per month to maintain safe and proper working order.
 - b. Appearance:
 - o No standing water in the play area that will make the site unusable or unsafe
 - o Structures shall be free from rust, staining and clipping.
 - c. Performance:
 - o Annually test overall stability for all equipment and check for proper assembly, installation and ground anchoring.
 - o Monthly check for protruding bolts and nuts and make repairs.
 - o Monthly check for bent, broken or worn pipes and sharp edges and make the necessary repairs or replacements.
 - o Fill holes that pose a trip and fall hazard as needed.
 - o Annually cover all exposed concrete footings.
 - o Annually check for rusty equipment and refurbish accordingly; sand, prime, and repaint.

- Monthly check climbers to make sure that all fittings are tight and objects do not move.
 - Monthly inspect all S-hooks and ensure that they are closed and not worn more than 25%.
 - Monthly check for proper lubrication on moving pieces of equipment.
 - Annually check for worn bearings and replace with new ones.
 - Monthly check for loose springs or castings and tighten.
4. Swimming Pools
- a. General:
 - All maintenance operations shall be carried out in accordance with all Public Health Department requirements.
 - b. Appearance:
 - Pool decks shall be free and clear from debris, stains or cracks.
 - The pool water shall be clear.
 - Pool sides and bottom shall be free of debris, alga or scale.
 - Plantings shall be free of dead or diseased plantings.
 - c. Performance:
 - Weekly check filtering equipment.
 - Vacuum pool daily and keep it in a clean and sanitary condition.
 - Safety equipment shall be in its intended location and in good working order.
 - Water levels shall be maintained at proper elevation.
 - Daily check chemical levels.
 - Hose down deck weekly or as required removing any debris or dirt.
 - Annually pressure wash the pool deck.
 - Fences or walls shall be continuous, free from graffiti, with self-cleaning gate.
 - Check the bathroom facilities on a daily basis for trash and supply restocking.
 - Annually check water fountains for proper working order.
5. Trails
- a. Appearance
 - Trails shall be kept free of weeds and overgrowth of vegetation.
 - Trails shall maintain a smooth level surface, free of holes.
 - b. Performance
 - Adjacent vegetation shall be pruned twice per year so that it does not encroach on the trail.
 - Exercise equipment shall be inspected monthly and kept in good working order.
6. Meadow Areas
- a. General:
 - Meadow conditions have been created within the landscape to increase the biodiversity of the site, reduce water consumption, and reduce maintenance costs.
 - b. Appearance:
 - Meadow areas are intended to be a naturalistic landscape containing a mix of herbaceous plant species with various leaf and flower types.
 - Meadow areas are to be left free of trash, debris and undesirable plant species.
 - c. Performance:
 - Meadow areas shall be mowed to a height of 8 inches once annually during the month of December.
 - Remove exotic/invasive plant species once in March, June and September.
 - Inspect and remove trash and debris twice a month.
7. Wetland Areas
- a. General:

- Wetland areas have been created within the landscape to increase the bio-diversity of the site, reduce water consumption, recharge the surficial aquifer and reduce maintenance costs.
- b. Appearance:
 - Wetland areas are intended to be a naturalistic landscape containing a mix of herbaceous and woody plant species.
 - Wetland areas are to be left free of trash, debris and undesirable plant species.
- c. Performance:
 - Inspect for and remove trash and debris twice a month.
 - Remove exotic/invasive plant species once in March, June and September.

PART 6 REFERENCES

Soils Map



Websites

- American National Standard Institute, ANSI 300 "Safety Requirements for Pruning, Trimming, Repairing, Maintaining and Removing Trees and for Cutting Brush" & ANSI Z133.1 "Safety Requirements for Tree Care Operators"
<http://www.ansi.org/>
- American Standards for Nursery Stock
<http://anla.org/>
- Broward County Department of Environmental Management – Tree Removal License Application
http://www.broward.org/environment/licenses_apps.htm#Removal
- Broward County Municipal Code
http://www.municode.com/resources/code_list.asp?stateID=9
- Broward County Public Schools
<http://www.browardschools.com/>
- Florida Department of Agriculture & Consumer Services, Division of Plant Industries - FDOA "Grades and Standards for Nursery Plants, Part I & II"
<http://www.doacs.state.fl.us/pi/pubs.html>
- Florida Department of Education – State Requirements for Educational Facilities (SREF) and Florida Building Code
<http://www.fldoe.org/edfacil/sref.asp>
- Florida Department of Community Affairs – Florida Building Code
<http://www.floridabuilding.org/c/default.aspx>
- Florida Departments of Education – Safe Schools Design Guidelines
http://www.fldoe.org/edfacil/safe_schools.asp
- Florida Exotic Pest Plant Council – Invasive/Exotic Plant List
<http://www.fleppc.org/list/list.htm>
- Florida Grades & Standards for Trees & Palms
http://prohort.ifas.ufl.edu/grades_standards.htm
- Florida Power and Light (FPL) – Right Tree, Right Place Guidelines and Regulations
http://www.fpl.com/residential/trees/right_tree_right_place.shtml
- Florida Department of Transportation (FDOT), Designs and Standards for Design, Construction, Maintenance, and Utility Operations on the State Highway System, Index 544 Landscape Installation
<http://www.dot.state.fl.us/rddesign/CS/CS.htm>
- Florida Department of Transportation (FDOT), Designs and Standards for Design, Construction, Maintenance, and Utility Operations on the State Highway System, Index 544 Landscape Installation, Index 546 Sight Distances at Intersections
<http://www.dot.state.fl.us/rddesign/CS/CS.htm>
- US Green Building Council Home page –
<http://www.usgbc.org/Default.aspx>
- LEED Rating Systems -
<http://www.usgbc.org/DisplayPage.aspx?CMSPageID=222>
- LEED for Schools –
<http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1586>
- LEED Promotional information for School education –
<http://www.buildgreenschools.org/>
- LEED for Schools Rating System Truncated Guide Book -
<http://www.usgbc.org/ShowFile.aspx?DocumentID=2593>
- LEED for Schools Check List-
<http://www.usgbc.org/ShowFile.aspx?DocumentID=4188>
- International CPTED Association (ICA) - Crime Prevention through Environmental Design (CPTED)
<http://www.cpted.net/>
- Florida Green Building Home Page –
<http://www.floridagreenbuilding.org/db/>
- Green Local Government Standard rating system (Reference guide and application tool files) –

<http://www.floridagreenbuilding.org/db/?q=node/5751>

- NatureScape Broward Principles
<http://www.broward.org/naturescape/getcertified.htm>
- State of Florida Statutes – FS 481 Architecture, Interior Design, and Landscape Architecture, (Part II)
http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=Ch0481/PART02.HTM
- South Florida Water Management District – Rules and Regulations for High Water/Maximum Water Consumption & Xeric Guide
http://www.sfwmd.gov/portal/page?_pageid=2754,19862620&_dad=portal&_schema=PORTAL
- The Florida Stormwater, Erosion, and Sedimentation Control Inspector's Manual
http://www.dep.state.fl.us/water/nonpoint/ero_man.htm
- The School Board of Broward County (SBBC) – Facilities and Construction Management
http://www.broward.k12.fl.us/facilities_construction/
- United States Access Board – American with Disabilities Act (ADA) and Accessibility Guidelines for Buildings and Facilities (ADAAG)
<http://www.access-board.gov/adaag/html/adaag.htm>
- United States Green Building Council - Leadership in Energy and Environmental Design (LEED)
<http://www.usgbc.org/DisplayPage.aspx?CategoryID=19>
- Stormwater Pollution Prevention Plan
<http://cfpub.epa.gov/npdes/stormwater/swppp.com>