228 Landscape Design

228.1 General

Landscape refers to any vegetation, mulches, and irrigation systems. Designs may include hardscape features (e.g., street furniture, specialty paving, tree grates, walls, planters, fountains, fences, landscape lighting). Hardscape-only projects are not landscape projects. Landscape may be constructed as a standalone project or as a component of a roadway project.

Plants included in a landscape project are expected to grow in value for many years after final acceptance. Trees have proven to be the plants most resilient and most likely to grow in value. Landscapes composed of vast areas and quantities of ornamental shrubs and other plants have proven to be the most difficult to care for and least likely to grow in value.

Plants need adequate amounts of quality space above and below ground to grow in value. To assure that quality space is provided, coordinate the Landscape Plan with other component plans.

Modification for Non-Conventional Projects:
Replace the above paragraph with the following: Plants need adequate amounts of quality space above and below ground to grow in value. To assure that quality space is provided, coordinate the Landscape Plan with other component plans and the Landscape Opportunity Plan.

For Landscape Plan content refer to ***FDM 329***.

228.2 Landscape Design Requirements

Develop landscape designs that are consistent with the following documents:

- ***Subsection 334.044(26), Florida Statutes (F.S.)*** – Department powers and duties
- ***Section 335.167, F.S.*** – State highway construction and maintenance; Florida-Friendly landscaping
- ***Section 373.185, F.S.*** – Local Florida-friendly landscaping ordinances

- ***Florida-Friendly Best Management Practices for Protection of Water Resources***
- ***Highway Beautification Policy***, ***Topic Number 000-650-011***
- Florida's Highway Beautification Programs, ***www.MyFloridaBeautiful.com***

Landscape designs are to comply with the following requirements:

(1) Landscape design is to include large plants with combined value of 50% or more of the estimated value of all plants specified in the plans. Large plants are defined as:

- Shrubs, trees and cycads, 7 gallons or greater
- Single-trunk palms
- Clustering Palms, 6-foot height or greater

(2) Landscape design is to:

(a) Preserve required sight distance, lateral offset, and clear zone.

i. Within clear sight triangles, select ground cover plants (i.e., naturally low-growing plants) with maximum mature height ≤ 18 inches.

ii. Do not select plants that will require routine maintenance to preserve sight distance.

iii. Select trees with clear trunk(s) or limbed up to 5 feet minimum above the sight line datum (see ***FDM 212***, ***Figure 212.11.2***).

(b) Enhance air and water quality.

(c) Prevent roadside erosion.

(d) Conserve and enhance urban forests.

(e) Benefit pollinators.

(f) Preserve visibility of community aesthetic features and highway signing.

(g) Preserve the view of permitted outdoor advertising signs. See ***FDM 228.5*** for view zone requirements.

(h) Complement the performance, function, and aesthetic quality of stormwater systems.

(i) Minimize or eliminate the need for irrigation, especially with potable water, following plant establishment.

(j) Minimize or eliminate the need to amend or remove and replace existing soil.

(k) Resist destructive insects and diseases; and minimize or eliminate the need for routine treatment.

(l) Be compatible with existing and proposed ITS devices, above and below ground utilities.

(m) Be compatible with a maintaining agency's preferences, abilities, and resources.

(3) Irrigation system design requirements include:

(a) A reliable water source and means of delivery.

(b) Compatible with the maintaining agency's preferences, abilities, and resources.

(c) Avoid overspray into the roadway, sidewalks, or any other paved surfaces, buildings, transit stops.

(d) Compliance with state and local requirements; e.g., ***Florida Building Code***, ***Water Management Districts***, ***Florida Administrative Code***.

(e) Conservation of water; e.g., control system technologies including SMART irrigation technologies, reclaimed and reuse sources.

(f) Durable materials that are traffic rated and ultraviolet light resistant.

(g) Compliance with requirements set forth by local governmental entity and water management districts.

228.2.1 Landscape Design Considerations

Consider the following elements during the development of the landscape design:

(1) Change the characteristics of the roadway corridor to encourage lower operating speeds.

(2) Protect, conserve, complement, and enhance natural roadside vegetation, scenic resources, and natural features.

(3) Screen unfavorable views.

(4) Reduce stormwater runoff.

(5) Sequester carbon.

(6) Create high-quality transportation facilities and travel experiences that create value for residents and Florida's tourism sector.

(7) Provide shade and comfort for pedestrians, bicyclists, and transit riders.

(8) Mitigate heat-island effect.

(9) Support community efforts for economic development, urban revitalizations, and aesthetic enhancements.

(10) Relocate existing vegetation.

(11) Selectively clear and thin existing vegetation.

(12) Provide time and space for natural regeneration and succession of native plants.

(13) Reforest with native trees.

(14) Select Florida-native plants with known provenance (original source of plants stock) as close to planting site as possible.

(15) Select and place plants to minimize impacts to natural areas.

(16) Select and place plants to minimize the need to maintain uniform height and spacing to sustain design intent.

(17) Select recycled and recyclable materials.

(18) Select a diverse mix of plants. A rule of thumb is that the most sustainable landscapes have an uneven aged mix of no more than 10 percent of the same species, 20 percent of the same genus, and 30 percent of the same family.

Modification for Non-Conventional Projects:
Delete ***FDM 228.2.1*** and see the RFP for requirements.

228.2.2 Soil Enhancements

The selection of trees and other landscape materials is based on their ability to establish, thrive, and grow in value over time. Analyze existing soil conditions early in the design process and select plant species that can thrive in the existing conditions.

Highly-disturbed soils (e.g., those located in medians, embankments, roundabouts) are often densely-compacted, rocky, and infertile. These soil conditions may negatively impact plant establishment by inhibiting root growth, reducing water infiltration, and increasing run-off. Soil enhancements may be specified when existing soils inhibit plant establishment and growth.

Analyze and document the existing soils during the analysis phase, including a preliminary soil analysis supported by an appropriate number of test pits based on site-specific conditions. Advanced soil analysis may be performed, at the Department's discretion, when preliminary analysis indicates the existing soils are not suitable for plant

establishment and growth. Appropriate soil enhancements should be based on the results of the analysis.

Soil enhancement options include the following:

- Soil scarification (a.k.a., soil structural improvement)
- Soil amendments
- Full soil replacement with Landscape Soil

Soil scarification includes mechanically loosening the existing soils to accommodate plant establishment and growth.

Soil amendments include mixing of organic soils, inorganic soils, or minerals with the existing soils. Soil amendments help support plant growth by providing nutrients, increasing water retention and transmission, and reducing erosion. Mineral amendments (e.g., nitrogen, phosphorus, potassium) improve soil fertility and pH levels.

Full soil replacement with Landscape Soil is only warranted when both of the following conditions are met:

- All other soil enhancement measures will not improve the quality of the existing soil enough to support establishment and growth of plants; and,
- Affected trees or palms are included in the same project

Landscape Soil material requirements are included in ***Standard Specification*** ***987-2.4***. When urban raised medians, bulb-outs, sidewalk tree pits, and central area roundabouts are being designed specifically to accommodate future trees, the District Design Engineer may authorize the designer to include Landscape Soil.

Soil enhancements are typically limited to areas proposed as planting beds or individual tree or palm planting pits. Ensure individual planting pits are sized appropriately to accommodate the mature size of the root ball. Excavation for amendments or replacement soil cannot occur within two feet from the back of any curb or from any structure.

Provide documentation to the Project Manager or District Landscape Architect justifying the need for soil enhancements. Required information for soil enhancements on landscape plan sheets is included in ***FDM 329.6.1***.

Include the cost of soil scarification or amendment or landscape soil replacement in the lump sum cost.

228.2.3 Landscape Construction Cost Estimate

Estimate the cost for all proposed landscape improvements, including care during the installation and plant establishment period. Incidental costs are included in the cost of the plants, as described in ***FDM 329***.

Submit a PDF of the cost estimate to the Department Project Manager. The cost estimate is typically generated using an excel spread sheet. Do not include the cost estimate in the construction contract documents. It is intended solely for use by the Department.

Modification for Non-Conventional Projects:
Delete ***Section 228.2.3.***

228.3 Landscape Opportunity Plan

A landscape opportunity plan is typically prepared during the roadway concept plan development to accommodate future projects.

A landscape opportunity plan may be prepared when any of the following occur:

(1) Landscape is not part of a roadway project, and landscape is anticipated to be designed and installed as a subsequent Maintenance-let project.

(2) Landscape is not part of a roadway project, but landscape improvements are part of a simultaneous JPA or LAP project.

(3) Irrigation sleeves are included in a roadway project, but placement and details are not shown in the contract plans.

(4) When there is high probability that landscape will be installed with a subsequent project. Areas within a municipality, county boundaries, urban areas, high-visibility areas, areas adjacent to barriers or sound walls, embankments, median plantings, scenic highways or areas programmed for Highway Beautification Grants, and areas indicated in the District's Landscape Branding Document.

Modification for Non-Conventional Projects:
Add the following and see the RFP for requirements: (5) When proposed landscape or existing vegetation are to be preserved, the Department may create Landscape Opportunity Plans.

Consider the following elements during the development of the landscape opportunity plan:

(1) Through coordination with other disciplines, provide adequate space (both above and below ground) for the existing and proposed landscape. Assure landscape areas will have soil suitable for plants to grow in value.

(2) Specify areas and construction methods to preserve the existing and future landscape planting areas.

(3) Coordinate with other component plans to provide adequate quality space for plant growth for the desired landscape design intent. Coordinate early in the process with Roadway, Utility, Drainage, Signage, ITS, and other disciplines, to analyze competing uses of the R/W. Preserve landscape opportunities to the greatest extent possible.

(4) Identify the location of Outdoor Advertising sign faces and view zones within project limits; see ***FDM 228.5***.

To prevent future costly and difficult retrofits, roadway projects may include provisions for landscape (e.g., irrigation sleeves, space for planting, preservation of existing vegetation) when a subsequent standalone landscape project is planned.

228.3.1 Required Information

The landscape opportunity plan is typically produced as a roll plot format, 1" = 200' maximum. An alternate format may be approved by the Department's project manager. Submit the completed landscape opportunity plan to the Department project manager.

Provide a legend, notes, and details as needed. Delineate areas for future landscape plantings in bubble format that explicitly convey design intent, such as:

- Areas with trees and shrubs for buffering differing land uses
- Trees to frame desirable views
- Trees and ground cover areas for stabilization of embankments
- Trees to shade sidewalks
- Shrubs for pedestrian channelization

For context and legibility include the following:

(1) Proposed improvements and existing elements to remain

(2) Existing vegetation or areas to remain undisturbed

(3) Wetland jurisdictional lines

(4) Drainage retention areas

(5) Utilities

228.4 Landscape Maintenance Plan

A maintenance plan is a written or graphic guide that describes the design intent including mature size and form of plant material, offsets required to maintain clear sight, and minimum tree spacing.

Coordinate with the maintaining agency to assure compatibility with maintenance resources, abilities, and practices. The maintenance methods for plants, and watering frequency for irrigation system, will be determined by the maintaining agency.

Submit a PDF of a landscape maintenance plan for proposed landscape improvements, including the irrigation system, to the Department Project Manager. Include the landscape maintenance plan in the maintenance agreement when maintained by a local governmental entity, and in the maintenance contract when maintained by the Department.

Modification for Non-Conventional Projects:
Delete second paragraph above and see the RFP for requirements.

228.4.1 Landscape Design Intent and Maintenance Performance Requirements

Convey the design intent and performance requirements in the Landscape Maintenance Plan.

(1) For individual plants or groups of plants, describe design intent and performance requirements such as:

- (a) Screen adjoining land use
- (b) Provide shade to sidewalk
- (c) Reduce stormwater velocity
- (d) Maintain full foliage
- (e) Reestablish natural roadside edge
- (f) Maintain naturally-appearing forest
- (g) Maintain clear trunk to X feet
- (h) Maintain at height no less than X feet
- (i) Maintain height no greater than X feet
- (j) Maintain plant health, form, and spread
- (k) Maintain condition of hardscape, lighting, benches, and site amenities
- (l) Preserve sigh distance
- (m) Preserve lateral offset and vertical clearances as defined in ***FDM 215***
- (n) Preserve access
- (o) Keep mulch replenished
- (p) Keep turn or beds edged
- (q) Keep weeds from view or from affecting plant growth or health

(2) For irrigation system maintenance, describe design intent and performance requirements such as:

- (a) The frequency of scheduled inspections
- (b) Detailed requirements associated with the system components inspection against the original design parameters
- (c) Adjustments necessitated over time as the landscape matures

(d) A written or graphic guide describing the plant water needs across changing weather conditions at the station or zone level

(e) Performance requirements necessary to maintain and manage the following:

i. Performance of backflow prevention
ii. Water supply and pressure requirements
iii. Desired operating pressure for pressure regulators
iv. Filters and filtration requirements
v. Operation of controller, including battery backup
vi. Sensors
vii. Valve flow and operation
viii. Flow regulators
ix. Head adjustment and spray pattern
x. Testing requirements
xi. Manufacturer specifications and user manuals
xii. Winterization requirements (if applicable)
xiii. Future audit requirements

228.4.2 Landscape Maintenance Cost Estimate

Estimate the cost for all proposed landscape maintenance activities, including irrigation system. The cost estimate is typically generated using an excel spread sheet. Consult with the District Landscape Architect and District Maintenance staff when developing the cost estimate. During design, a preliminary cost estimate allows the maintaining agency to evaluate the landscape plan and determine if revisions are necessary.

Submit a PDF of the cost estimate to the Department Project Manager. Do not include the maintenance cost estimate in the construction contract documents. It is intended solely for use by the Department and maintaining agency.

Include the landscape maintenance cost estimate as an exhibit to the maintenance agreement when landscape and irrigation is to be maintained by a local governmental entity.

Include the landscape maintenance cost estimate as an exhibit to the maintenance contract when landscape and irrigation is to be maintained by the Department.

228.5 Outdoor Advertising Signs

When a legally erected and permitted outdoor advertising sign view zone is within the project limits, the landscape architect will notify the sign owner (permittee) in writing that a highway landscape project is proposed.

Use the ***Outdoor Advertising Database*** to verify the permit status of all permitted outdoor advertising signs located within 1,000 feet of the project limits. Some permitted outdoor advertising signs may not be erected or visible at the time of design, but still must meet view zone requirements. A permitted outdoor advertising sign has one of five possible statuses:

- active
- revoked
- expired
- voided
- canceled

For erected outdoor advertising signs with a permit status of “expired”, “cancelled”, or “revoked”, contact the State Outdoor Advertising Administrator to determine if there is a view zone.

In accordance with ***Chapter 479, F.S.***, in the absence of an agreement, the view zone will be within an area beginning at a point on the edge of pavement perpendicular to the edge of the sign facing nearest the highway and continuing in the direction of approaching traffic for a distance of:

- 350 feet for posted speed limits of 35 mph or less,
- 500 feet for posted speed limits over 35 mph.
- Through approval of an agreement or an ***Application to Permit Vegetation Management at Outdoor Advertising Sign***, (Form Number 650-050-06) an alternate view zone may exist. Refer to the ***Outdoor Advertising Database*** or Contact the State Outdoor Advertising Administrator to verify location of view zones within the project limits.
- At any time, the Department District can request an alternate view zone. An alternate view zone can be established by agreement of both parties; the sign owner and the District Office (most likely the District Maintenance Engineer or designee). Using a letter of agreement, Department Districts may agree to alternate view zones when the alternate is in the best interest of the people of Florida, and when the alternate will not interfere with or prevent the Department from achieving transportation design, construction or operational objectives.

Information for permitted signs may be obtained by contacting:

State Outdoor Advertising Administrator
Florida Department of Transportation
605 Suwannee Street, MS 22
Tallahassee, Florida 32399-0450

Modification for Non-Conventional Projects:
Delete ***FDM 228.5*** above and see the RFP for requirements.