

**APPENDIX A****CITY OF NAPLES**  
**STREETS & STORMWATER DEPARTMENT****RECOMMENDED MINIMUM PRACTICES FOR RIGHT-OF-WAY LANDSCAPING AND IRRIGATION MAINTENANCE**

1. Notwithstanding any requirements or mandates set forth in the City code or any ordinance, the technical provisions and specifications set forth herein are intended to provide information by which private entities (i.e., permittees) may understand the City of Naples' recommended minimum practices for maintenance of landscaping and irrigation improvements within public right-of-way and easements. Records of all final landscape and irrigation specification requirements that are issued by the City under individual right-of-way construction permits shall be retained and maintained by Permittees and made available to the City's representative upon request.
2. Mowing and Edging: Mowing and edging activities and locations shall include medians as well as roadside areas such as along swales and the outside edges of sidewalks abutting adjacent properties. All turf surfaces shall be mowed with mulching type mower equipment to eliminate the need to bag and transport grass clippings. Should bagging become necessary due to mechanical failure, weather conditions or related temporary circumstances the bagged clippings shall be collected and appropriately disposed in accordance with City regulations (Code Article II - Collection and Disposal: Sections 54-33 and 54-33). Grass shall be mowed at a height between three (3) and four (4) inches. The approximate frequency of mowing shall be on a weekly basis or fifty-two (52) times per year.
  - a. Mechanical edging of turf surfaces shall be done with each mowing along all sidewalk edges, back of concrete curbs, around all planting beds, utility service boxes, street light bases, sign posts, headwalls, guardrails, timer pedestals, drainage culverts and structures, fences, walls, trees and similar site features. Metal blade or mechanical edging is not permitted at locations that could damage underground utility lines. Grass root runners extending into mulched areas shall be cut and removed when the edging is performed. Edging is also required in all turf areas around isolated trees, sprinkler heads, valve boxes, shrubs and manholes. No herbicide shall be used for edging.
  - b. All sidewalks, street curbing or drainage gutters shall be cleaned after each mowing and edging activity. All sidewalks shall be kept clean but no clippings or other debris shall be blown or allowed to be deposited on other adjacent property or accumulate on right-of-way areas. All debris on streets, sidewalks and other areas within or adjacent to the right-of-way resulting from edging activities shall be removed and appropriately disposed in accordance with City regulations.
3. Sprinkler Placement - Requirements in Public Right-of-Way:
  - a. A licensed contractor or other authorized agent of a permittee must submit an application and secure a right-of-way construction permit to perform irrigation installation work or maintenance of irrigation systems in public right-of-way and easements. Appropriate drawings for proposed sprinkler or drip irrigation systems shall be submitted containing complete material specifications and the following minimum dimensions and related information:
    - i. Centerline of traveled way to property line/right-of-way line.
    - i. Edge of pavement to the nearest proposed irrigation line.
    - ii. Property lines to irrigation feeder lines.
    - iii. Edge of pavement to drainage swale centerline.

- iv. Swale centerline to all nearest proposed irrigation lines.
  - v. Edge of pavement to property line/right-of-way line.
  - vi. Irrigation line installation to sidewalk/ bikeway (where applicable).
  - vii. Width of driveway(s) and distance to side property line(s).
  - viii. Size and depth of proposed irrigation lines and sprinkler heads.
  - ix. Street name and address information and also the subdivision name (including lot, block, and unit numbers).
  - x. Irrigation sprinkler heads shall be placed no closer than twenty-four (24) inches from the centerline or flow-line of drainage swales, a minimum of six (6) feet from the edge of pavement and a minimum of six (6) inches away from a sidewalk / bikeway edge. On collector streets sprinkler heads shall be installed a minimum of eight (8) feet from the edge of pavement. Exceptions to these standards will be allowed for urban street sections and for existing and future sidewalk locations.
  - xi. PVC irrigation conduit and other pipes shall be pushed and not jetted under sidewalks at a minimum depth of seven (7) inches measured from the topside of the functional sidewalk / bikeway surface.
  - xii. PVC irrigation conduit and other pipes proposed for installation beneath commercial or public driveways shall be pushed at a minimum depth of twenty (20) inches measured from the topside of the functional driveway surface.
  - xiii. PVC irrigation conduit and other pipes proposed for installation beneath private driveways shall be pushed at a minimum depth of nine (9) inches measured from the topside of the functional driveway surface.
  - xiv. Drawings shall be complete in content clearly depicting all work that will be performed by the permittee in right-of-way and easements.
  - xv. Discharge of water spray from sprinkler systems shall be directed away from the traveled way and sidewalks / bikeways.
  - xvi. The permittee is responsible to operate and maintain the irrigation/sprinkler system in accordance with specifications herein.
  - xvii. Whenever necessary for construction, repair, maintenance, expansion, alteration or improvement of public right-of-way, as determined and authorized by the City Streets & Stormwater Director, each affected property owner (i.e., permittee) shall have sprinkler systems or conflicting components thereof permanently or temporarily removed from the right-of-way and reset or relocated thereon at the sole expense of the permittee or abutting property owner.
4. Weeding: Eradication and removal of weed growth in plant beds, sidewalk areas (asphalt, concrete or pavers), guardrail bases, curb and gutter joints as well as other similar locations such as mulched areas shall be performed by chemical or manual means. The removal of weeds shall be accomplished on a weekly basis or as necessary to provide a weed free and well-maintained area.
  5. General Site Pruning: General site pruning shall be defined as the pruning of any plant's foliage below a pruning datum line which is measured ten (10) feet above the existing or proposed ground level or finished

grade.

- a. All groundcover, shrubby, canopy trees, palm trees and similar landscaping between ground level or finished grade and the ten (10) foot pruning datum line shall be inspected and pruned on a weekly or as needed basis to maintain the proper or required visibility heights for safe sight distance for vehicular and pedestrian movements, and the desired shape or form shall be accomplished in accordance with standard industry practice or as determined by the City's representative. Pruning shall also include removal of water sprouts, suckers and any dead or diseased foliage or branches.
  - b. On an as-required frequency, ornamental grasses such as Fountain Grass, Florida Gamma or Fakahatchee Grass shall be pruned in a pyramidal shape to a twelve (12) inch or twenty-four (24) inch height based upon the type of plant. Ornamental type grasses such as Liriope Muscari 'Evergreen Giant', shall only be pruned at the direction and approval of the City's representative or by a qualified and licensed landscape maintenance contractor.
  - c. Plant material and trees with a canopy over pedestrian sidewalks and bikeways shall be maintained at a minimum height of one hundred twenty (120) inches above the existing or proposed ground level or finished grade. Shrubbery and groundcover adjacent to pathways and sidewalks shall be pruned to maintain a minimum one (1) foot horizontal clearance from the edge of pathways and sidewalks. It is recommended that adjacent shrubs and groundcovers be maintained so that they deflect away or are rounded away from pathways and sidewalks.
6. Trash Removal: All right-of-way sites shall be maintained in a clean and aesthetically pleasing condition by removing all trash or debris including but not limited to paper, bottles, cans, miscellaneous waste and horticultural debris. All debris and trash shall be removed upon turf surfaces prior to initiating turf-mowing operations.
- a. The end disposal or final destination for all trash and debris resulting from landscape maintenance activities shall be at a properly authorized landfill or waste disposal facility.
7. Street Cleaning/Sweeping: A four (4) foot wide strip of motor vehicle lanes parallel to the centerline of a road or alleyway, with such width being measured either from the edge of street pavements or from the face of street curb and gutters including turn lanes, shall be cleaned with each landscape mowing/maintenance activity including the removal of any accumulated debris or objectionable growth so as to maintain an aesthetically pleasing and safe street condition.
8. Traffic Control: Permittees and landscape maintenance contractors shall comply with City regulations pertaining to minimum requirements for maintenance of traffic control measures for work performed within public right-of-way (i.e., Section 8 of this Handbook) and also the various standards and criteria promulgated by FDOT.
- a. Permittees are responsible to obtain copies and become familiar with all FDOT maintenance of traffic control manuals, drawings, specifications and related documents. Strict adherence to FDOT traffic control standards and design criteria will be enforced under authorized right-of-way construction permits. To assist in achieving safe visibility of workers within public right-of-way, all persons undertaking landscape construction or maintenance activities shall wear FDOT approved and certified high visibility (i.e., bright day glow red/orange colored) safety vests.
9. Canopy Tree and Palm Pruning: For the purposes of this Handbook canopy trees are defined as any large shrub, tree or palm with foliage extending above or higher than the ten (10) foot pruning datum line.
- a. All canopy trees and palms shall be pruned on an as-needed frequency to create and maintain a seventeen (17) foot canopy clearance over roadways and a ten (10) foot canopy clearance over all sidewalks, pathways and bikeways. Canopy trees shall be selectively pruned so as to thin the interior canopy of cross branches and to shape the overall canopy or envelope of the trees. The City's representative shall approve the person or persons assigned to perform pruning activities with

the condition that such individuals prune canopy trees and palms only under the direction of a Licensed Landscape Architect, Arborist, Tree Surgeon or other approved licensed landscape related professional. Pruning work shall be performed in accordance with specifications set forth under ANSI AS300 (Standard Practices for Trees, Shrubs, and other Woody Plant Maintenance) with such pruning also being accomplished in a professional manner in accordance with pruning standards of the National Arborist Association or accepted local trade standards and practices.

- b. Palm trees shall be pruned to a "Tropical Cut" or to a nine (9) o'clock and three (3) o'clock angle from the horizontal at the base of the palm's bud or lowest fronds. Approximately seven (7) to ten (10) green fronds shall be left at the head of the palm tree after pruning. The pruning shall include removal of all palm nuts, brown or dead seed stalks and lower growth fronds.
- c. Pruning work shall be done in a professional manner in accordance with acceptable trade standards and practices. Maintenance workers shall not climb upon palm trees with tree spikes to remove palm fronds. Rather, the pruning shall be accomplished by the use of a ladder, boom truck or lift crane equipment and all resultant debris from the pruning shall be removed and appropriately disposed. The site shall be left in a clean and neat manner.
- d. When periodic heavy pruning work is being performed within roadway travel ways utilizing lift crane equipment or a boom truck, adjacent through traffic lanes or turn lanes to the work area shall be closed using appropriate traffic control devices and signage in accordance with current FDOT traffic control standards and specifications and specific directives of the City.

10. Fertilization: City requirements for fertilization of landscape plantings within public right-of-way and easements are set forth below.

- a. Granular fertilization of shrubs and groundcovers shall be applied mechanically or by hand in a twelve (12) inch wide radius ring around the base of the plants. Granular fertilization of trees and palms shall be determined by the caliper (diameter) of the trunk and broadcast around the plant's base from a distance of 12 inches to the drip line of the palm whenever possible. An 8 oz. cup volume approximately equals one (1) pound of fertilizer material. Subject to specific provisions for fertilization as contained hereinafter, trees and palms shall generally receive one (1) cup of fertilizer for each one (1) inch of caliper and shrubs and groundcovers shall receive one (1) cup per three (3) feet of height or spread or one-half (1/2) cup per eighteen inches (18") of height or spread. All applied fertilizer shall be appropriately removed and properly disposed from the surfaces of all sidewalks, concrete curbing and asphalt pavements.
- b. For turf areas and plant beds containing shrubs, groundcover plantings and trees, fertilizer (13-3-13) shall be applied shall be applied at a rate of ten (10) pounds per each one thousand (1,000) square foot area for all turf plant bed surfaces. Four applications of (13-3-13) fertilizer should be applied yearly. The above notwithstanding, permittees shall maintain turf areas in accordance with the Florida Lawn Handbook (latest or most current edition) as published by the University of Florida - Institute of Food and Agricultural Science.
- c. The following provisions for fertilization as recommended by the City of Naples is a copied document (Palm Nutrition Guide<sup>1</sup> by Timothy K. Broschat<sup>2</sup>) having copyright authority by the University of Florida, Institute of Food and Agricultural Sciences (UF/IFAS) for the people of the State of Florida. (Note: UF/IFAS retains all rights under all conventions, but permits free reproduction by all agents and offices of the Cooperative Extension Service and the people of the State of Florida. Permission is granted to others to use these materials in part or in full for educational purposes, provided that full credit is given to the UF/IFAS, citing the publication, its source, and date of publication).
  - i. Palms are among the most important ornamental plants in Florida landscapes and production nurseries. Palms suffer quickly and conspicuously from improper mineral nutrition, whether due to insufficient or incorrect fertilization. They also may exhibit

certain nutritional disorders in unique ways compared to other ornamental plants. Some nutritional problems in palms are difficult to diagnose accurately because symptoms of several different mineral deficiencies may overlap. In this guide, nutritional disorders common on palms in the landscape, production field, and container nursery are discussed and illustrated. Fertilization recommendations for palms in these situations are also provided.

- ii. Nutritional Disorders in the Landscape or Production Field -Nitrogen. Nitrogen deficiency is relatively uncommon in Florida landscape palms, compared to other elements such as K, Mg, and Mn. Symptoms of N deficiency include an overall light green color and decreased vigor of the palm ( Plate 1 ). It is easily corrected by applying any N fertilizer to the soil. Leaf color quickly darkens in response to either soil or foliar fertilization.



- iii. Potassium deficiency is perhaps the most widespread and serious of all disorders in Florida palms. Symptoms occur first on oldest leaves and affect progressively newer leaves as the deficiency becomes more severe. Symptoms vary among palm species, but typically begin as translucent yellow or orange spots on the leaflets( Plate 2 ). These may or may not be accompanied by necrotic spots. Leaflets will typically have areas of necrosis along their margins ( Plate 3 ). As the symptoms progress, leaflets or entire leaves will become withered or frizzled in appearance ( Plate 4 ). The midrib usually remains alive on K-deficient leaves, although it may be orange in color instead of green in some species. In date palms ( Phoenix spp.), symptoms are slightly different in that older leaves show an orange-brown discoloration near the tip ( Plate 5 ). It is also the leaflet tips, rather than the margins, that become necrotic as the deficiency progresses. The color of the chlorotic region in Phoenix leaves is a dull orange or even tan ( Plate 5 ), in contrast to the bright yellow of Mg deficiency ( Plate 6 ).



Plate 2.



Plate 3.



Plate 4.



Plate 5.



Plate 6.

Potassium is translocated from older to new leaves as required by the palm. In severe deficiencies, the canopy will be greatly reduced in size due to the removal of K from all leaves. Once all K has been removed from older leaves, the palm will go into a state of decline, with reduced trunk diameter (pencil-pointing), and the emergence of small, frizzled or chlorotic new leaves. Without prompt treatment, these palms will usually die. K deficiency affects all species of palms, but is most severe in royal, queen, coconut, areca, and spindle palms. Treatment requires broadcast soil applications of sulfur-

coated potassium sulfate at rates of 3 to 8 lbs. per tree 4 times per year plus one-third as much controlled release magnesium fertilizer to prevent a K--Mg imbalance (and resulting Mg deficiency), from occurring. Symptomatic leaves on K-deficient palms will never recover and must be replaced by new, healthy leaves. In severely deficient palms, this means replacing the entire canopy, a process that may take 2 years or longer. Foliar sprays with K fertilizers are ineffective in correcting the problem since the amount of K supplied by a foliar spray is insignificant compared to the amount needed to correct the problem.

- iv. Magnesium deficiency is also quite common in Florida palms, but especially in *Phoenix canariensis*. As with K deficiency, symptoms occur first on the oldest leaves and progress up through the canopy. Typical symptoms are a broad light yellow band along the margin of the older leaves with the center of the leaf remaining distinctly green ( Plate 6 ). In severe cases, leaflet tips may become necrotic, but Mg deficiency is rarely, if ever, fatal to palms. Magnesium deficiency is best treated preventatively since treatment of deficient palms takes considerable time. As with K deficiency, symptomatic leaves will never recover and must be replaced by new healthy leaves. On acid soils, dolomite and magnesium oxide are excellent slow release Mg sources, but on neutral to alkaline soils more soluble forms such as kieserite (a less soluble form of magnesium sulfate) or preferably, coated kieserite are required. They should be applied at rates of 2 to 4 lbs per tree 4 times per year plus coated potassium sulfate at the same rate to correct the problem and prevent a K--Mg imbalance from occurring.
- v. Manganese deficiency or "frizzletop" is a common problem in palms growing in the alkaline soils that cover much of south Florida. Symptoms occur only on new leaves which emerge chlorotic, weak, reduced in size, and with extensive necrotic streaking in the leaves ( Plate 7 ). As the deficiency progresses, succeeding leaves will emerge completely withered, frizzled, or scorched in appearance and greatly reduced in size ( Plate 8 and Plate 9 ). Later, only necrotic petiole stubs will emerge and death of the bud quickly follows.



Plate 7.



Plate 8.





Plate 9.

- vi. Manganese deficiency is primarily caused by the element's insolubility at high pHs. In palms such as coconut that are not normally affected by the problem, cold soil temperatures during the winter and spring months reduce root activity and thus the uptake of micronutrients (especially Mn). Coconut palms severely deficient in Mn during the winter and spring will usually grow out of the problem without special treatment once soil temperatures warm up in late spring. Other palms such as queen, paurotis, and pygmy date palms, are highly susceptible to Mn deficiency and must be treated with soil or foliar applications of manganese sulfate or they will likely die.
- vii. Iron deficiency is relatively uncommon in landscape palms and is not usually caused by a lack of Fe in the soil, or even by high soil pH, as in many other plants. Iron deficiency usually appears on palms growing in poorly-aerated soils or those that have been planted too deeply. Waterlogged soils and deep planting effectively suffocate the roots and reduce their effectiveness in taking up nutrients such as Fe. Deficiency symptoms appear first on the new leaves and in most palms consist of uniformly chlorotic new leaves ( Plate 10 ). As the deficiency progresses, new leaves will show extensive tip necrosis and reduced leaf size. Early symptoms in queen palms include pea-sized green spots on otherwise yellowish new leaves ( Plate 11 ).



Plate 10.





Plate 11

Iron deficiency symptoms can sometimes be temporarily alleviated by regular foliar applications of iron sulfate, but long term correction will only occur when the poor soil aeration or improper planting depth that caused the deficiency, are corrected. Diagnosis of nutrient deficiencies by visual symptoms alone can be difficult, since some of the symptoms overlap considerably in some species. For instance, Mn and late-stage K deficiencies are easily confused on queen and royal palms and K and Mg deficiencies are very similar in pygmy date palms. Correct diagnosis can only be assured if leaf nutrient analysis is performed on symptomatic palms.

- viii.** Nutritional Disorders in Container Grown Palms: Palms growing in containers are susceptible to the same deficiencies that landscape palms experience, but the relative importance of the various deficiencies, as well as the causes, are different. Container media generally are more acid and have greater nutrient holding capacities than Florida native soils. Thus leaching and insolubility of nutrients are much less of a problem. Also, container grown palms are often fertilized with more complete slow release fertilizers or regular liquid fertilization which prevent most deficiencies from occurring. In containers, N deficiency is the most common deficiency and is caused simply by insufficient N in the medium ( Plate 1 ). It is typically the most limiting element in container production, whereas K, Mg, and Mn are much more limiting in landscape situations. Potassium deficiency can occur in containers if fertilizers having low K analysis are used, and Mg deficiency will occur if insufficient or low grade dolomite is added to the medium. Amendment of container media with dolomite is absolutely essential unless other sources of Ca and Mg are used in the fertilization program. Sulfur deficiency occasionally occurs in containers if sulfate fertilizers are not used. Symptoms are virtually identical to those of Fe deficiency and can only be correctly diagnosed by leaf nutrient analysis. Manganese deficiency is much less common in containers since the growing medium is usually acid and Mn is much more soluble at lower pHs. Iron deficiency is quite common in container grown palms ( Plate 10 ). Containers generally provide poor soil aeration at the bottom of the pot where palm roots typically are concentrated and Fe deficiency is usually the result. Planting palms more deeply than they were originally growing, will have the same effect and is a major cause of chronic Fe deficiency in container grown palms. Although foliar sprays with iron sulfate may temporarily correct the problem, permanent correction can only be achieved by replanting the palms at the correct depth and in new, well-drained media. For this reason it is important to use a container medium that will not quickly break down, resulting in finer particles and reduced aeration. Our studies have shown that dibbling of slow release fertilizers (as opposed to surface application) prevents the rapid breakdown of container media and greatly reduces nutritional problems associated with poor soil aeration. Other essential elements such as P, Ca, Cu, Zn, B, and Cl, are occasionally found to be deficient if one of these elements is omitted from the fertilizer program, but such deficiencies are generally quite rare in container production or in landscapes.
- ix.** Palm Fertilization Programs - Field Nurseries: Little or no research exists on fertilization rates for field-grown palms and rates will vary with the soil type and size of the palms. In

general, granular fertilizers should be applied to the soil at a rate of 1.5 lbs. /100 sq. ft. of canopy area 4 times per year or 1 lb./100 sq. ft. 6 times per year. Rates or frequency of application can be reduced in low rainfall areas or on soils that have a moderately high cation exchange capacity. Fertilizers should be uniformly broadcast under the canopy of the palm rather than concentrating it in bands where some roots may be injured and others are never in contact with any fertilizer.

Fertility varies greatly among soil types in south Florida, but certain nutrient elements are consistently lacking in all soil types and must be applied through fertilization. These are nitrogen (N), potassium (K), magnesium (Mg), and manganese (Mn). A good balanced fertilizer for south Florida should provide N, P, K, and Mg in a 2:1:3:1 ratio and contain sulfur (S), about 1 to 2% Fe and Mn, and trace amounts of zinc (Zn), copper (Cu) and boron (B). It is very important that the N, K, and Mg be present in controlled release forms such as resin- or sulfur-coated products. If water soluble N, K, and Mg sources must be used, but they should be applied more frequently (at least monthly) and at lower rates (3/4 lb./100 sq. ft.) to compensate for the rapid leaching of these elements through the soil.

Foliar fertilization is a fairly common practice in palm production. It is a rather inefficient method for providing macronutrient elements such as N, K, and Mg, but is very useful for supplying micronutrients such as Mn and Fe to the plants when soil conditions prevent adequate uptake of these elements by the roots. Foliar fertilization is best used as a supplement for a normal soil fertilization program, particularly for micronutrients.

Liquid fertilization programs are not the most efficient delivery system for field nurseries, especially when overhead irrigation is used. The soluble nature of liquid fertilizer results in leaching or runoff of a great deal of the nutrients before uptake by the roots. To compensate, the grower often increases either rates or frequency of application, which results in waste and the potential for ground or surface water contamination. If drip irrigation is used in the field, injection of liquid fertilizer through the system may be cost-effective, and the problems inherent in overhead delivery may be minimized. A constant fertilization program delivering approximately 150 ppm of both N and K (and 1/3 as much Mg), will probably be adequate. It is a good idea to have your soil and irrigation water tested before formulating the nutrient analysis of your solution fertilizer.

For containerized palms, a fertilizer having a N-P 2 O 5 -K 2 O ratio of 3-1-2 is recommended. An 18-6-12 or similar slow release fertilizer can be incorporated into the container medium at planting time according to the manufacturer's recommended rate. As discussed previously, dibbling of slow release fertilizers (as opposed to surface application) is recommended over surface application and even incorporation. The extra labor costs will be offset by the added longevity of the container soil, reduced weed growth, and consequently, better growth of the crop. One and a half to 3 pounds of a micronutrient amendment (rate depends on product), should also be incorporated into a cubic yard of planting medium. Approximately 8 to 12 lbs of dolomite per cubic yard incorporated into the mix will increase the pH of most media to 6-6.5 and provide calcium and magnesium for the duration of the crop. If constant liquid fertilization programs will be used instead, approximately 150 ppm of both N and K will probably be adequate. When soil temperatures drop below 65°F fertilization rates should be reduced. A monthly foliar fertilization with a soluble micronutrient spray is favored by a number of growers. Many palm species respond favorably to such a program.

Fertilization of palms in the landscape does not differ appreciably from recommendations for palm field nurseries. Slow release palm special fertilizers like those described in the field nursery section should be applied uniformly to the entire ornamental planting area (or at least the entire palm canopy area) at a rate of 1.5 lbs./100 sq. ft. 4 time per year or 1 lb./100 sq. ft. 6 times per year. Since roots of ornamental groundcovers, shrubs, or broadleaf trees are often intermingled with those of palms in the landscape and share the same soil conditions, these other ornamental plants will also benefit from this fertilization method.

Most landscapes tend to be a mosaic of turf and ornamental plants. Although the line of demarcation between turf and ornamental plantings may appear to be distinct above ground, the root systems of palms, broadleaf trees, and shrubs usually extend well into the turf area and share the soil with turf roots. Turf fertilizers typically are high in N relative to K and tend to have controlled release N, but water soluble K and often no Mg or micronutrients. When these products are used on turf in the vicinity of palms they often result in K deficiency being induced on palms growing nearby due to their high N to K ratio. Even if these turf fertilizers have a reasonable N to K ratio in their analysis, the controlled release N, but soluble K can result in a severe N to K imbalance over time due to differential leaching of the K. Therefore it is recommended that turfgrass growing within 30 ft of any palm or broadleaf tree or 10 ft of any shrub be fertilized only with the "palm special" landscape fertilizers discussed in the field nursery section above.

### **Footnotes**

1. This document is SS-ORH-02, a series of the Environmental Horticulture Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Publication date: July 1992. Revised: July 2000. Please visit the EDIS Web site at <http://edis.ifas.ufl.edu>.

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11. Mulching: Organic mulch areas with no mulch or new planting areas shall have mulch placed to provide for a maximum of two (2) to three (3) inches of a non-compacted or unsettled depth measured from the existing soil grade. The area to receive the mulch shall be raked level to establish the proper finished grade and all weeds shall be removed prior to the placement of the mulch. Replenish mulch areas on an as-needed frequency to maintain an aesthetically pleasing appearance.
12. Lane Closures: Lane closures for median maintenance shall be limited. No lane closures shall occur until all required traffic control devices such as lane closed signs, advance warning signs, arrow boards, traffic cones and other measures have been installed under the direction and approval of the City.
13. Irrigation Systems: Irrigation systems within public right-of-way shall be checked and repaired as necessary. Each zone shall be manually turned on at the valve periodically and a thorough inspection conducted to ensure proper operations of the system. Existing quick coupling valves shall be inspected and operated frequently to ensure proper functionality. Maintenance responsibilities by permittees will include cleaning and adjustment of heads, nozzles, installation or replacement of risers, repair of minor PVC pipe line breaks, repair of other subsurface piping or restricted sprinkler lines, replacement of damaged valve boxes/lids and

proper adjustment of controller and rain shut off switches for optimum settings and operations. Where required, permittees shall maintain on site reclaimed water irrigation signage.

- a. Subsurface Irrigation Systems: No excavation or mechanical metal edging around plant beds shall be done within public right-of-way. Mechanical metal blade edging is permitted along the back of curbing.

Weekly Service Requirements:

A visual inspection of the subsurface irrigation systems shall be performed weekly to determine if the systems are functioning normally and if pipe leaks, piping damage and flooded areas exist. Permittees shall undertake necessary repairs promptly. Inspections shall also include review and re-setting of irrigation controllers and in-ground moisture sensor adjustments or adjustments to other rain sensing devices as needed.

System Computer/ Controller:

- i. Operate, adjust and set controller to provide proper operation of the systems.
- ii. Diagnose and repair electrical and mechanical malfunctions.
- iii. Monitor and adjust system zone moisture levels based upon moisture sensor readings.
- iv. Operate controller on automatic, manual and single trip operation.
- v. Monitor controller standby battery backup and replace as required.
- vi. Inspect automatic control assemblies and quick coupling valves.
- vii. Review control valve assembly and by-pass system for proper settings.
- viii. Open zone control valve assemblies and quick coupling valve boxes to review valves for leaks, proper pressure gauge operation, proper settings and to ensure the appurtenances are not clogged with debris or mulch.

Pump Sites:

- ix. Inspect pumps for proper operations.
- x. Permittees shall also monitor proper operations of well water flows and readings in accordance with City codes.
- xi. Review system water source connections to include water meters, backflow preventers, gate valve points of connection and main lines for proper operation.

Monthly Service Requirements:

Automatic Control Valve Assembly

- xii. Manually operate valves, and clean valve assembly filters.

Backflow Assembly

- xiii. Review assembly for proper operation and clean filter as needed.

Quick Coupling Valves

- xiv. Review boxes and operate valve.

Pump Sites

- xv. On an as-needed frequency trouble shoot each pump station, checking amperage draw and document the results for future reference.
- xvi. Manually run the system to check for proper coverage and to ensure that no sprinkler head and nozzle are spraying onto the roadway. Clean and adjust sprinkler heads and nozzles and irrigation shields to ensure proper coverage.
- xvii. Permittees shall check all zone wiring and solenoid conditions through the use of an OHM meter and document the results for future reference.
- xviii. Permittees shall clean the strainers filters and inspect them for wear at the pump station.
- xix. Manually run the system with open flush caps and review sprinkler head indicators located at the end of zones.
- xx. Review pressure gauge readings at control valve assemblies for each zone, as well as gauges located at the end of zones where present to determine the system and porous piping is functioning properly.
- xxi. Check, analyze and adjust flow control devices as required.

Quarterly Service Requirements:

- xxii. Review all subsurface system piping, valve assemblies, wiring, moisture sensors and controllers for overall operation and provide adjustments as required to assure proper operation and irrigation application.

b. Conventional Pop-up Irrigation Systems:

Weekly Service Requirements:

- i. Each median zone shall be manually turned on at the valve to ascertain proper operation of the system.
- ii. Repair system for any blown-off heads, broken lines or leaks around heads or valves.
- iii. Check the controller and rain sensing devices for proper operation and settings.
- iv. Permittees shall further adjust all sprinkler heads to ensure that all landscaped areas receive one hundred percent (100%) irrigation coverage.
- v. Within all work areas the Developer shall review the plant material and turf for dry conditions and if found correct the problem.

Monthly Service Requirements:

- vi. Each median zone shall be manually turned on at the valve to ascertain proper operation of the system.

- vii. Manually run the system, clean and adjust sprinkle heads/nozzles and concrete donuts as necessary to ensure proper coverage and that there are no sprinkler heads/nozzles spraying directly onto the roadway.
  - viii. Each median and side right-of-way zone shall be manually turned on at the valve to ascertain proper operation of the system.
  - ix. Repair system for any blown-off head, broken lines or leaks around heads or valves.
  - x. Check the controllers and rain sensors for proper operation and settings.
  - xi. Permittees shall further adjust all sprinkler heads to ensure that all landscaped areas receive one hundred percent (100%) irrigation coverage.
  - xii. Within all work areas permittees shall review the plant material and turf for dry conditions and if found correct the problem.
- c. General Service Requirements for Irrigation Systems:
- i. Should South Florida Water Management District (SFWMD), the City of Naples or other governing agency establish water restrictions the irrigation systems shall be inspected and all other controllers set to the mandated hours of operation.
  - ii. Replace defective heads or nozzles, install or replace defective risers and repair minor breaks or restricted sprinkler lines.
  - iii. Replace damaged valve boxes/lids.
  - iv. Inspect, clean, and replace, if necessary, screen/filters within the sprinkler heads.
  - v. Keep all grass and mulch out of all valve boxes. All valve boxes in sod areas are to be kept at sod level. All valve boxes in plant beds are to be kept two inches (2") above finished mulch.
  - vi. One hundred percent (100%) irrigation coverage shall be maintained within all irrigated landscaped areas.
  - vii. Notification to the City's representative is required when acts of vandalism or accidents have occurred to the irrigation system. Photos shall be taken and provided to the City's representative.
- d. Miscellaneous Irrigation Maintenance Responsibilities:
- i. Should the temperature be forecast to be below thirty-four (34) degrees, permittees shall be responsible for turning the irrigation system off in order to protect plants from possible freeze damage.
  - ii. It shall be responsibility of permittees to notify the City's representative of any irrigation problems or additional irrigation maintenance needs that may be the responsibility of the City.
  - iii. Irrigation service personnel by permittees shall trouble shoot time clocks, i.e. power-in 110 volt and 24-volt fuses, 24 volts output when necessary.
  - iv. Irrigation services personnel by permittees shall also trouble shoot any pump start relay, main fuses and capacitors when necessary.

14. Brick Pavers: All median brick paving and other paver brick areas such as driveways and pedestrian crossings shall be appropriately maintained to ensure that brick surfaces are safe for pedestrian use and reasonably free of markings, breakages, gum, debris and excessive dirt deposits. Upon finding damaged areas, permittees shall clean-up debris if present and flag-off the areas with protective barriers or high visibility hazard tape for follow up repairs. Damaged areas shall be repaired promptly.
15. Pest Control: Trees, palms, shrubs, groundcovers and sod shall be closely monitored for pests and diseases and must be treated appropriately by a licensed Pest Control Operator approved by the City.