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**Attachment 500-3 - Landscaping Preventative Maintenance Requirements**

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## 1 Staff Qualifications

### 1.1 Landscaping Supervisor

Landscaping Supervisor must be knowledgeable in the area of responsibility and have a minimum of 12 months experience in the past 24 months, performing in the same capacity on projects of similar size and scope. Supervisor must show continuing education in regards to the landscape and irrigation industry (i.e. class and/or seminars). Supervisor must have completed at least one of the following:

- Arizona certified Landscaping Professional program or acceptable equivalent
- Twelve semester hours of Horticulture/Plant care from accredited college
- Certified Arborist Program as established by the International Society of Arboriculture
- Other recognized certification programs that require the same level of plant care knowledge/experience

### 1.2 Irrigation Technician(s)

Irrigation technician(s) must be knowledgeable in the area of responsibility and have a minimum of 12 months experience in the past 24 months performing in the same capacity on projects of similar size and scope. Irrigation worker must show continuing education in regards to the landscape and/or irrigation industry Plant Preventative Maintenance.

### 1.3 Backflow Prevention Certifiers

Backflow Prevention Certifiers must be certified for the work they perform.

## 2 General Plant Maintenance

### 2.1 Tree and Plant Growth

Perform all horticultural techniques necessary to promote and maintain healthy growth of trees and plants, including staking, tying, removing or loosening ties, and removing stakes, as needed. Special devices used to tie up plants to retaining walls shall be maintained. Add, maintain, and adjust present wire net devices around plants and trees as necessary to protect plant material from pests.

### 2.2 General Trimming

Growth which restrict drivers' view of signs and safety devices, or which is creating other sight distance problems for drivers must be pruned. Plants repetitively causing these issues may be removed. Pruning of plant material that is in bloom is discouraged. Schedules should include sufficient time to achieve pruning when plants are dormant. Remove and legally dispose all cuttings by the end of the daily work shift.

### 2.3 Tree Trimming

Trees must be trimmed as needed to:

- facilitate visual inspection of the irrigation system
- remove dead, diseased, or injured wood; control or direct growth covering roadway signs or causing a sight distance problem to the public
- remove crossed limbs
- eliminate growth encroaching on roadway, and
- raise the canopy.

Acceptable practices for pruning include:

- Crown cleaning

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- crown thinning
- crown raising
- vista pruning, and
- crown reduction.

Unacceptable practices include:

- Topping
- lion tailing, and
- pollarding.

### **2.4 Shrub Trimming**

Shrubs shall be trimmed as necessary to:

- facilitate visual inspection of the irrigation system
- remove dead, diseased, or injured wood
- control or direct growth
- eliminate growth encroaching on roadway, and
- raise the canopy as needed.

No shrubs will be sheared for aesthetic purposes.

### **2.5 Palm Tree Trimming**

All palm trees must be trimmed/skinned so no more than 1 year growth is present.

## **3 Plant Removal/Replanting**

### **3.1 Removal**

Developer shall remove and dispose of plants, shrubs, and trees which are severely distressed or which die as a result of storm damage, age, pests, or disease. All plants being removed must be noted in MIS upon removal from the job site.

### **3.2 Replacement**

Developer shall replace any plant, shrub, or tree which dies or is severely damaged as a result of neglect, inadequate care, or inadequate maintenance, or application of chemicals, including runoff and drift onto adjacent properties. Replacement plants must be nearest size nursery stock available to the plant being replaced.. Planting methods will be in accordance with standard horticultural practices.

### **3.3 Potential Survival and Growth**

The soil area of the chemically affected plant(s) and planting pit must be treated with activated charcoal and other soil amendments that may be required to enhance the potential survival and growth of the replacement plants.

## **4 Weed Control**

### **4.1 Non-Granite Areas/Native Vegetation**

Developer's pesticide technician must be able to identify various wild flowers and desirable native grasses versus noxious weeds.

Native grasses must be cut, as needed, after seed heads have matured and as directed by the Project Manager or their Representative.

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Native shrub species will be left to grow in a natural state and will not be trimmed, pruned, or removed, unless impeding traffic or as directed by the Project Manager or their Representative. Native shrubs must not be allowed to become invasive of one another and form dense thickets.

In the area around plants, Developer shall maintain free of weeds and grass, either a 5-foot radius or the area to the outer edge of the canopy, whichever is greater. A 3-foot radius must be maintained free of weeds and grass around the base of signs, delineators, utility poles, guardrails, fence lines, cable barriers, and other highway fixtures.

All annual and perennial weeds within non-granite areas must be treated with an approved herbicide before reaching 3 inches in height. All weeds and grasses in expansion joints of paved slopes and sidewalks must also be treated with an approved herbicide before reaching 3 inches in height.

If weeds develop beyond 3 inches in height prior to treatment, Developer shall be responsible for manual removal of the weeds, removal and disposal of cut debris, restoration of the disturbed area to its original condition, and application of an approved pre-emergent herbicide to the area.

### **4.2 Granite Areas**

All granite areas within the project must be treated with an approved, pre-emergent herbicide at least once per year. This application will be shown on the annual and monthly schedules. Some variability will be allowed for weather conditions.

The entire granite area is to be maintained free of weeds and grasses. All annual and perennial weeds within granite areas will be treated with an approved herbicide before reaching 3 inches in height.

Disposal must be in a legal manner. All disturbed granite and earth must be restored to original condition when manual weeding is completed.

### **4.3 Hardscape Areas**

Weeds in hardscape areas, including but not limited to slope paving, sidewalks, and capped raised medians and gore points, must be treated in the same manner as the granite areas.

## **5 Pesticides and Pesticide Application**

Developer shall furnish all pesticides, equipment, and labor to provide pest control services. Prior to pesticide application, Developer shall provide a listing of all materials and chemicals annually at the maintenance meeting. All pesticides used must be labeled for landscape use. Restricted use pesticides with an LD 50 number lower than 500 are NOT be permitted on this project.

All pesticides used must be in the original manufacturers marked containers and tank-mixed on site. Developer shall provide storage of chemicals at off-site locations, delivering to the work site only sufficient equipment and materials to complete daily tasks.

Developer shall apply all pesticides in strict compliance with the manufacturer's instructions as they appear on the label, and as approved by the rules and regulations of the agency issuing Developer's pesticide license.

Developer shall maintain on site the Material Safety Data Sheets (MSDS) and current labels for each product used on this contract for ready reference.

Gallons of water used from the irrigation system supply for spray mix must be recorded on the daily work report.

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## 6 Other Pest Control

Developer shall control pests within the contracted area. Pests may include, but are not limited to mosquitos, ants, bees, rodents, insects, gophers, and other pests which burrow, crawl, fly, nest or otherwise reside within the contracted area. Pests which infest plants must be treated with an approved pesticide.

Developer shall take all normal precautions common to the trade and institute proper procedures for the control of insects, bees, pests, or disease, including clean-up and removal of standing water or other mosquito vectors. Developer shall be responsible for all damages resulting from improper procedures or the failure to take normal precautions.

Developer shall note on the Daily Work Report all pest intrusions by describing the location, the pest to be controlled, and the method of control.

## 7 Irrigation

### 7.1 General Irrigation

Developer shall:

- Provide all labor and equipment necessary for inspection, maintenance, operation, and repair of the existing irrigation system.
- See that all trees and shrubs receive the proper amount of water to maintain health and vigor. This will involve adjusting the irrigation systems for appropriate seasonal frequencies.
- A watering schedule must be prepared by someone specialized in irrigation, such as a horticulturist or water administrator. The detailed schedule must be submitted annually at the maintenance meeting. This schedule must list water requirements for specific species of plants and be entered in to the controllers. Developer shall adhere to the watering schedule and any changes to the schedule, or deviation from it, must be noted in the MIS.
- Developer shall establish an annual water budget and set a monthly percentage of that budget to determine a maximum monthly usage. This information must be included in Developer's annual irrigation plan.
- Be responsible for daily surveillance of the irrigation system to assure that all component features are operating as designed. These component features include, but are not limited to, back flow preventers, controllers, valves, pressure regulators, filters, water lines, emitters, sensing devices, and the entire electrical system.
- Alarms showing on controlers must be rectified, and an entry made in MIS of the occurance.
- Report through the MIS any malfunction of the irrigation system which requires emergency repair for the safety of the public or to protect the landscaping.
- Notify the Project Manager's Representative to inspect all subsurface repairs to the irrigation system prior to backfilling.

### 7.2 Irrigation System Inspection

In addition to daily Surveillance, Developer shall conduct a formal monthly Inspection of the irrigation system addressing at least the areas shown in the Monthly Irrigation Inspection Checklist, Table 7-1.

### 7.3 Inspection Report

Inspection must be completed and necessary repairs completed by the end of the month. Results of the Inspection must be recorded on the Monthly Irrigation Inspection Checklist and

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completion of Inspection on the Daily Work Report. Reports must be entered into the MIS within 10 days of completion of each Inspection.

<b>Table 7-1 Monthly Irrigation Inspection Checklist</b>		
<b>Item No.</b>	<b>Description</b>	<b>X Indicates Services Completed</b>
1	All emitters for even water distribution over area covered within plant canopy.	
2	Pressure at all electric remote control valves. Clean boxes as needed.	
3	Pressure at all pressure regulators. Clean boxes as necessary.	
4	Gallonage/hour at five emitters per valve.	
5	Pressure at two end caps from same lateral line as emitter check (Item 4). Record valve and regulator number.	
6	Verify zero flow with only master valve open and record pressure.	
7	Verify that the water meter, flow monitor, and controller agree on flow rates.	
8	Clen component cabinets and the controller enclosure area.	
9	Check and record ohms reading for each valve output (all outputs off).	
10	Flush the filter(s) and check pressure gauge(s).	
11	Check system for leakage and malfunctioning components.	
12	Reset total flow counter in flow monitor to zero.	

### 7.4 Irrigation Water Distribution

#### 7.4.1 Emitters

Emitters must be kept properly positioned for even water distribution within the area of the canopy. Check at random to determine the flow rate in gallons per hour during the monthly irrigation Inspection. When the emitter shows that the flow rate is twice that of the designed flow, the emitter must be replaced by Developer. When the tested emitters have failed, five additional emitters must be checked to determine flow rates. When the majority of emitters fail, the entire section for the tested valve will be replaced. Developer shall replace all failed emitters as part of the Maintenance Services Work.

#### 7.4.2 Irrigation Line

Line cleaning stubs must be flushed and pressure checked at least monthly. Results of the line cleaning stubs pressure checks shall be noted on the Daily Work Report.

#### 7.4.3 Water Efficiency

Developer shall ensure that water is used efficiently and not wasted. Developer shall water by hand or by other ADOT approved means when the irrigation system is temporarily out of order. In case of interruptions, Developer shall create a notification within the MIS for any such occurrence.

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## 8 Repairs to Irrigation System

Developer shall furnish all labor, equipment, pipe, repair parts and kits, and supplies to make repairs, replacements, and adjustments to the irrigation systems as part of the irrigation maintenance service.

All replacement parts and installation procedures must be same as original unless otherwise approved by the Project Manager's Representative.

## 9 Herbicides

ADOT has approved the following herbicides to be utilized for weed control for this contract. Additional products may be approved upon request and evaluation by ADOT.

<b>Table 9-1 Approved Herbicides for Weed Control</b>	
<b>Product Name</b>	<b>Active Ingredient</b>
Surflan	Oryzalin
Pendulum	Pendimethalin
Carricade	Prodiamine
Roundup	Glyphosate
Reward	Diquat dibromide
Poast	Sethoxydim
Fusilade	Fluazifop Butyl
Endurance	Prodiamine
Galary	Isoxaben
Clean	Amine 2,4 Dichloro-Phenoxyacetic acid

All herbicides shall have an approved dye added to facilitate inspection after application