4LEAF, INC.
Building
07/15/2022
Reviewed For
Code Compliance

Lot 10 Cobble Hill Place, Highland Estates, San Mateo County CA.

Landscape Maintenance Plan

Overview: Using natural landscaping techniques to maintain this property will create a landscape that is healthy, resource-efficient, sustainable, and cost-effective to manage. When natural landscaping techniques are applied in landscape design, construction, and long-term maintenance, there are many benefits, including easier maintenance, lower costs, and higher property values.

It is the Owner's expectation that the Contractor's proposal will comply with these natural landscaping-based standards and specifications. It should be the Contractor's expectation that the Owner will only consider awarding the contract to a Contractor whose bid shows compliance. The Contractor shall also expect to be held to these standards throughout the course of the contract.

The following standard outlines the scope of maintenances services and responsibilities required of the Contractor but may not be inclusive to the entire scope of services. The specifications outline the quantity and category of work required.

Other parts of the contract **(not included here)** provide definitions of terms used and other contract requirements such as insurance and licensing standards, code enforcement, hours of work, work authorizations, site locations, etc.

1. GENERAL MAINTENANCE STANDARDS

1.1. GUARANTEE AND REPLACEMENT

1.1.1. Contractor shall replace, at no additional cost to Owner, any plant materials damaged as a result of improper maintenance attention or procedures. Replacement plant material shall be of the same size and variety as the dead or damaged material. Replacement plant material shall be procured from nurseries that have a Phytophthora management program. Samples of each Plant Material shall be tested for Phytophthora and other pathogens at the nursery prior to ordering and certified by the nursery to be disease free prior to delivery to the job site. Contractor shall reject Plant Materials that are contaminated with Phytophthora and other pathogens. Submit to Landscape Architect and Owner's Representative disease free certifications from nurseries. Replace plant material within two weeks of identification of damage. Alternatives to size, variety and scheduling of replacement only by written permission of Owner.

1.1.2. Contractor is not responsible for losses, repair or replacement of damaged work or plant material resulting from theft, extreme weather conditions, vandalism, vehicular incidents (other than Contractor's vehicles) or the acts of others over whom they have no reasonable control.

1.1.3. Contractor shall inform Owner on a monthly basis of plant losses not covered by warranty and unrelated to the maintenance activities. Provide Owner with the cause of the plant loss, and provide recommendations for replacement along with pricing for replacement.

1.2. CONTRACTOR STAFF TRAINING AND EXPERIENCE

1.2.1. Contractor will provide staff able to perform work at the highest standards of horticultural excellence. Key staff shall have current knowledge of best management practices (BMP's) regarding: safety, hazardous materials spill response, plant health, pruning, integrated pest management, pesticide application, and irrigation maintenance. Owner reserves the right to demand the replacement of Contractor's staff who do not meet the owner's standards for safety, professionalism, or horticultural knowledge.

1.2.2. All work shall be performed under the direct on-site supervision of a qualified landscape professional with a minimum of five years combined horticultural education and experience. Preference will be given to an individual with at least a two year horticultural degree or Certified Landscape Technician (CLT), combined with two years work experience, or greater.

1.2.3. All irrigation maintenance and repairs shall be performed by, or under the direct supervision of, a Certified Irrigation Technician (CIT) or Certified Irrigation Auditor.

1.2.4. All pruning will be performed by, or under the direct on-site supervision of, staff with documented education and training in proper and naturalistic pruning techniques. Pruning of trees greater than six inches DBH will only be performed by an ISA certified Arborist. Regularly decontaminate pruning equipment to prevent spread of disease.

1.3. OWNER/CONTRACTOR COMMUNICATION

1.3.1. Contractor to provide a supervisor to act on Owner's behalf regarding all matters pertaining to the performance of the Landscape Maintenance Service. Contractor must notify Owner when the supervisor will be on vacation or other leave of absence and who will serve as a substitute.

1.3.2. Provide Owner with an emergency contact list identifying the names, positions held, and phone numbers of key maintenance personnel. Provide mobile and pager numbers for the landscape maintenance manager and site supervisor.

1.3.3. Attend meetings and site inspections of the grounds as requested by Owner

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1.4. MAINTENANCE RECORD KEEPING

1.4.1. Contractor shall maintain a computerized log of activities performed, schedules, additional service repairs, and documentation of each application of fertilizer, pesticide (includes herbicides), and/or other chemicals. Provide a written copy monthly.

1.4.2. If Pesticides are determined necessary and only as a last resort, Pesticide application records shall be kept by the Contractor on all pesticide (includes herbicide) applications for a minimum of seven (7) years. Such records shall be completed in accordance with all applicable laws and regulations. The following information shall be recorded at a minimum for each application:

- The location where the pesticide or herbicide was applied.
- The year, month, day, and time the pesticide or herbicide was applied.
- Purpose of application.
- The person or firm who supplied the pesticide or herbicide which was applied.
- Trade name of the pesticide or herbicide which was applied, amount and concentration.
- Method and rate of application.
- The temperature and direction and estimated velocity of the wind at the time the pesticide or herbicide was applied.
- The name and license number of the pesticide or herbicide applicator.
- Applicator apparatus license plate number or equipment number (if applicable).
- Any other information reasonably required by the Owner.

1.4.3. Supply the Owner with written copies of chemical application records monthly.

1.5. LANDSCAPE SERVICE SCHEDULING

1.5.1. Establish a schedule and Gantt (or equal to) chart for regular maintenance activities by area and submit to Owner for review. Contractor to review proposed schedules with Owner at the regularly scheduled meetings and adjust as necessary to avoid conflicts.

2. SCOPE OF WORK

2.1. GENERAL PRACTICE GUIDELINES FOR MATERIALS AND EXECUTION

2.1.1. This document is intended as a benchmark of the Owner's minimum standards for maintenance, repair and improvements. However, the Owner respects the Contractor as a professional and as such, will take under consideration, any and all recommendations made by the Contractor.

2.1.2. Contractor shall furnish all labor, equipment, and materials necessary to complete the maintenance of plantings, as specified herein. It is the intent of the Owner that this site be maintained in a resource-efficient, sustainable, and cost-effective manner.

2.1.3. Maintenance shall consist of soil building, mulch replacement, pruning, irrigation, IPM, weed/ /disease control, litter control and any other procedures consistent with good horticultural practice necessary to ensure normal, vigorous, and healthy growth of landscape plantings and bioswale plantings and functionality.

2.1.4. When performing any work requiring subsurface excavation, Contractor shall take care to avoid damage to existing utilities and vegetation, and shall "Call 811-Before You Dig- Safe Digging Partner or Eq local utility.

2.1.5. Contractor is encouraged to use non-polluting devices like rakes and brooms when feasible. Owner prefers that blowers and other power equipment are preferably electric, low-decibel, or low-fossil fuel consumption, and low-emissions models.

2.1.6. Contractor is encouraged to develop cultural practices which incorporate on-site recycling of organic materials, such as leaves and grass clippings, and the use of recycled materials in its maintenance operations.

3. MATERIALS AND EXECUTION – INTEGRATED PEST MANAGEMENT AND PESTICIDE APPLICATIONS

3.1 INTEGRATED PEST MANAGEMENT:

A. Goals

An integrated pest management program shall be implemented to:

1. maintain healthy, attractive plants, maximize resistance to pests and out-compete weeds;
2. monitor for presence of pests and to evaluate pest impact to plant health and appearance, and nuisance to the public;
3. provide control treatments that have minimal negative effects on all but the pest and that protect air and water quality.

Contractor shall assume pesticides are potentially hazardous to human and environmental health. Preference shall be given to reasonably available non-pesticide alternatives when considering the use of pesticides on Agency property.

B. Insects and diseases

1. Key plant and key pests

Contractor shall identify primary plant species and cultivars in the landscape (key plants) and the pests that commonly cause significant harm to plant health or appearance (key pests).

2. Monitoring

Contractor shall monitor landscape areas to identify presence of beneficial insects and pests, determine populations, life stage, and degree of damage to plants. Key plants:key pests will be monitored closely during normal periods of pest activity. This information will be the basis on which pest control methods are initiated. Records of monitoring activity shall be kept.

3. Controls

"Bay-Friendly Landscaping" seeks to control pests without harming non-target organisms, or negatively affecting air and water quality and public health. It relies on IPM which uses a range of cultural, mechanical, physical, and biological control methods before using pesticides. Chemical controls are applied only when monitoring indicates that preventative and non-chemical methods are not keeping pests below acceptable levels. When pesticides are required, the least toxic and the least persistent pesticide that will provide adequate pest control is applied. Pesticides are not applied on a prescheduled basis.

a. Cultural/Mechanical/physical methods. A number of maintenance practices or modifications of them can make the environment unfavorable for pest reproduction, movement, or survival. Often simply modifying an existing maintenance practice, such as timing of pruning or fertilization, can produce positive results,. Other mechanical or physical practices may specifically combat plant pests or increase host resistance. Key treatments include:

1) Fostering a healthy soil, judicious fertilization only when needed, and managing irrigation appropriately.
2) Pruning to remove infected or infested branches and shoots. Time pruning to avoid periods of insect infestation. For example prune pines and eucalyptus in the winter (December-February) when bark beetles and borers are inactive.
3) Removing fallen twigs, leaves, and fruit that contains disease inoculum.
4) Mulching soil surface to reduce weeds and to reduce splashing and the drops of mud that would protect spores deposited on plant surfaces.
5) Trapping insects using sticky surfaces (also used for monitoring). Mechanical traps can be used to control rodents.
6) Bringing to attention of Agency plants that are disease or insect prone and suggesting resistant plant replacements or those better suited to the site and microclimate

b. Biological methods

Biological controls are pesticides of natural origin that have limited or no adverse effects on the environment or beneficial organisms. Determining the effective biological control and proper timing of application are critical to success in pest control.

The Contractor shall consider the following biological control methods when cultural/mechanical/physical methods are not adequate to lower pest populations to the target level.

1) *Bacillus thuringiensis* (Bt)
2) Parasitic nematodes
3) Pheromone traps
4) Beneficial insect release and conservation

c. Pesticides

The term pesticide applies to insecticides, fungicides and other substances used to control pests. Antimicrobial agents are not included in this definition of pesticides.

1) Least toxic pesticides

When cultural, mechanical, physical and biological controls have provided inadequate pest control, the Contractor may select and apply an appropriate least-toxic pesticide as a last resort. Least-toxic pesticides have a high LD-50, low residual, and narrow range of toxicity. Application must be timed to the appropriate life stage of the pest.

Examples are:

a. insecticidal soaps,
b. horticultural oils,
c. herbicidal soaps,
d. neem,
e. Pyriproxyfen insect growth regulator (e.g. Distance IGR)

2) Restricted chemicals

Organophosphate-containing pesticides have been found to persist in the environment and cause water quality impairment of some creeks, streams, and arroyos in Alameda County. They are restricted from use. Examples include:

a. diazinon, trade names Spectracide®, Knox-out® and
b. chlorpyrifos, trade names Dursban®, Pageant®)

c. malathion and carbaryl (trade name Sevin®)

Water quality agencies recommend against using pyrethroids and pyrethrins containing piperonyl butoxide (PBO). These chemicals are restricted from use.

Pyrethrins are toxic to birds, fish, and beneficial insects, should be used only as a last resort, and carefully applied to avoid runoff and contact with non-target plants.

Contractor shall not apply any Toxicity Category I or II Pesticide Product, any pesticide containing a chemical identified by the State of California as a chemical known to the State to cause cancer or reproductive toxicity pursuant to the California Safe Drinking Water and Toxic Enforcement Act of 1986, and any pesticide classified as a human carcinogen, probable human carcinogen or possible human carcinogen by the United States Environmental Protection Agency, Office of Prevention, Pesticides and Toxic Substances.

3) All chemical applications shall be performed by a licensed, trained technician. Contractor must be a licensed Pest Control Operator as required by the State of California, registered in Alameda Co., and strictly adhere to all laws.

4. Notice of pesticide use
   a. Signs shall be posted at least three days before application of the pesticide product and remain posted at least four days after application of the pesticide.
      1) Signs shall be posted (i) at every entry point where the pesticide is applied if the pesticide is applied in an enclosed area, and (ii) in highly visible locations around the perimeter of the area where the pesticide is applied if the pesticide is applied in an open area.
      2) Signs shall be of a standardized design that are easily recognizable to the public and workers.
      3) Signs shall contain the name and active ingredient of the pesticide product, the target pest, the date of pesticide use, the signal word indicating the toxicity category of the pesticide product, the date for re-entry to the area treated, and the name and contact number for the City department responsible for the application.
   b. Contractor shall not be required to post signs in right-of-way locations that the general public does not use for recreational purposes. However, Contractor shall notify Agency in writing three days prior to pesticide applications in the right-of-way areas.
   c. Contractor may obtain authorization from the Agency to apply a pesticide without providing a three-day advance notification in the event of a public health emergency or to comply with worker safety requirements. Signs shall be posted for at least four days after application of the pesticide, as described in the Section above, 3.5.B.4.a., *Notice of Pesticide Use*
5. Recordkeeping and reporting
   a. Contractor shall maintain records of all pest management activities. Each record shall include the following information:
      1) target pest;
      2) type and quantity of pesticide used;
      3) site of the pesticide application;
      4) date the pesticide was used;
      5) name of the pesticide applicator;
      6) application equipment used;
      7) prevention and other non-chemical methods of control used.
   b. Contractor shall submit the pest management record to Agency on a monthly basis.

C. Weed management
   1. Landscapes shall be maintained in a healthy and attractive manner using" **Bay-Friendly**" methods.

2. Identify key weeds

   Contractor will identify key weeds present and design weed manage program to target those species.

3. Invasive plants

   Invasive plant species may have been included in the plantings inadvertently. Seedlings and/or suckers from those plants shall be removed by the Contractor. Refer to www.bayfriendly.org or www.cal-ipc.org for a list of invasive species. Remove all invasive plants not planted intentionally as noted in the Section below, 3.5.C.4, *Controls*. When invasive plants are an intended part of the landscape please notify Agency and propose a replacement option.

4. Controls

   a. Cultural/Mechanical/physical methods will be used as the first choice in weed management.

      1) Monitor planting areas frequently to identify and eradicate weeds early in the growth stage prior to their setting seed.
      2) Cut or pull weeds by hand or using hand operated equipment where possible.
      3) Mow large areas to reduce weed growth, and eliminate species that are not tolerant of mowing. Mowing is especially effective when done prior to seed set. Mowing also reduces fire hazard in open spaces.
      4) Goats may be used to manage weed growth, where appropriate. Goats must be well managed and plants fenced to avoid damage to non-target plants.
      5) Mulches shall be maintained at all times over soil surface that is not covered by vegetation. (see also Section 3.3 E, *Incorporate Organic Soil Amedments*)
      6) Sheet mulching, a layered system of non-plastic weed barrier overlain by mulch, shall be employed where possible.
      7) Propane-fueled flamers may be used in winter and spring with required permits and approval by the Fire Marshall to kill early-season, non-grass weeds by heating the cells until they burst. The weed quickly wilts and dies.

   b. Least toxic herbicides may be employed by Contractor as a last resort. Examples are:

      1) Fatty acid potassium salts (herbicidal soaps e.g. Safer's Superfast Weed and Grass Killer® Dr. Bronner's Peppermint Anti-Bacterial Soap)[1]
      2) Acetic and citric acids (e.g. Nature's Glory Weed and Grass Killer RTU®)
      3) Clove, citrus, mint and thyme oil (e.g. Matran II®, Xpress®)
      4) Corn gluten
      5) Low-toxic, low-residual herbicide [e.g. glyphosate (Round-up®), glufosinate-ammonium (Finale®), pelargoic acid (Scythe®)

   c. Restricted herbicides that may not be used because they have been identified as ground water contaminants are (trade names in parentheses):

      1) Atrazine (Aatrex)
      2) Simazine (Princep)
      3) Bromacil (Hyvar, Krovar)
      4) Prometon (Pramitol)
      5) Bentazon (Basagran)
      6) Norflurazon (Solicam, Predict, Zorial)

   d. Restricted herbicides that may not be used because they have been identified as a compost contaminant are:

      1) Picloram
      2) Clopyralid

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[1] Trade names are used only as examples and are not intended as an endorsement.

D. Vertebrate pests

1. Identify key pests that significantly affect plant health and appearance. Accurate identification is critical to appropriate control. Common vertebrate pests are:
   a. Rodents including rats, mice, voles, moles, gophers
   b. Deer
   c. Rabbits
2. Controls
   a. Mechanical/physical/cultural methods shall be implemented as a first course of action. Preferred treatments include:
      1) Exclusion – Protect plants from damage by grazing animals with fences or cages.
      2) Habitat modification – Reduce cover at the periphery of the project as needed to solve problem.
      3) Application of repellents that are suitable for use in public areas.
      4) Traps may be used where mechanical/physical/cultural methods have been insufficient to control moles, voles, gophers, rats and mice.
      5) Encouragement of predators – owl boxes

b. Least toxic rodenticides

MATERIALS AND EXECUTION – TREES, SHRUBS, VINES, GROUNDCOVER MAINTENANCE

3.2 TREES, SHRUBS, VINES AND GROUNDCOVER PRUNING

3.2.1. Pruning in general should be avoided as planting design is intended to allow plants to grow to mature size. Pruning must only be performed when necessary by trained personnel in accordance with accepted horticultural practices. Prune to enhance the natural growth and shape of plant materials and intended function of the planting. Plantings are designed to grow together and to the edges of the beds to minimize weed infestation and maximize water conservation. Shearing is only permitted for formal hedges. Prune back branches as needed when interfering with walks, buildings, signage, fire control utilities, site lighting, security/safety visibility, site lighting, and vehicular circulation. Prune dead and broken branches quarterly and more frequently as required. Regularly decontaminate pruning equipment to prevent spread of disease.

3.2.2. Street trees shall be pruned to maintain adherence to City or County sight distance requirements, to maintain visibility of street name signs, protect trees from vehicle damage, and maintain pedestrian safety.

3.2.3. Prune plantings bi-annually (only as necessary) on a rotational basis appropriate to site, need, season and plant species. Discuss significant pruning work with Owner prior to work beginning.

3.2.4. Prune clean and just outside the branch collar in accordance with accepted horticultural practices. Pruning must only be performed by trained personnel. Replace plant materials that are disfigured or damaged due to improper pruning at no additional cost to Owner.

3.2.5. Periodically inspect and adjust tree staking and guying to prevent damage to the cambium layer. Remove guys and stakes as soon as trees are established and self-supporting (generally two years or less).

3.2.6. Prune trees as required and appropriate in compliance with ANSI A300 (Part 1), "Tree, Shrub, and Other Woody Plant Maintenance—Standard Practices (Pruning)."

3.2.7. The Additional Services of an ISA-certified arborist are required for pruning on any trees larger than six inches DBH (diameter at breast height as measured at four and one-half feet about the existing grade at the base of the tree) and any branches larger than four inches in diameter. This is considered an additional service.

4. MATERIALS AND EXECUTION - GENERAL AREA MAINTENANCE

4.1 LEAF AND BRANCH REMOVAL

4.1.1. Keep walks, patios, planting beds, roadway, gutters and areas free of leaves and branches on a weekly basis throughout the year.

4.1.2. Leaves shall be mulch mowed or left in planting areas throughout winter, spring and summer when leaf fall is not excessive and plant health is not adversely affected. As much as possible, leaves can be blown or raked under the shrubs or groundcover and into the wood chip mulch.

4.1.3. In autumn leaf removal shall occur at each visit as needed to prevent smothering of turf and groundcovers and excessive clumping when mulch mowing. Owner's preference is that whenever safety and plant health are not compromised that leaves remain on-site and are incorporated into mulch under plantings. Remove leaves from site only as needed to maintain a neat appearance and the health of the planting.

4.1.4. Excessive branch and debris cleanup from storm damage is not included in the contract work and is considered an additional service at Owner's request.

4.2. LANDSCAPE DEBRIS REMOVAL

4.2.1. Remove biodegradable landscape debris (turf clippings (limited to only those times when mulch mowing is not possible), leaves, branches, annuals, dead plant material, etc.) to yard refuse recycling facility. Acceptable sites include topsoil producing facilities and/or other facilities, which utilize yard waste for landscape purposes. No biodegradable material should be disposed of as garbage, except noxious weed debris.

4.2.2. Remove and properly dispose of moss from curbs, stairs and walkways.

4.3. LANDSCAPE TRASH REMOVAL

4.3.1. Remove all trash from landscaping beds, on a weekly basis. For large amounts of trash, or if there is no approved trash container onsite, Contractor shall haul it away for appropriate disposal.

4.4. MULCH REPLACEMENT

4.4.1. Once annually Contractor shall replenish mulch to maintain a depth of no less than three inches (3") in all planting areas. All tree wells to be re-mulched annually. Established beds where plant foliage or groundcover completely covers the soil surface require no additional mulch. Keep mulch at least two to three inches (2 – 3") away from the crown of plants and trees.

4.4.2. Mulch shall be medium or fine natural wood chips, clean arborists wood chips. "Red" or dyed bark mulch, " Gorilla Hair" or dust shall not be used.

4.5. BIOSWALE MAINTENANCE: Employ Best Management Practices whenever possible:

4.5.1. Monthly: Regularly inspect for signs of erosion, obstructions or unhealthy vegetation

4.5.2. Monthly: Remove Weeds and invasive plants shall be removed

4.5.3. Monthly: Remove trash and debris that has washed into the bioretention area or the inlet channels or pipes

4.5.4. Monthly: Check facility a few days after a rain storm to make sure that there is not standing water after 2 days.

4.5.5. AS-NEEDED basis: Cut back dead stems of herbaceous plants in March and remove from the facility

4.5.6. AS-NEEDED basis: Water new plants during initial establishment of plant growth (first 18 months) and extreme droughts.

4.5.7. AS-NEEDED basis: Remove fallen leaves from the areas and Mulch shall be medium or fine natural wood chips, clean arborists wood chips. "Red" bark mulch or dust shall not be used.

5. MATERIALS AND EXECUTION - IRRIGATION

5.1. GENERAL IRRIGATION SYSTEM OPERATION

5.1.1. Contractor is responsible for providing a staff completely trained and familiarized with the setup, monitoring and maintenance of the irrigation system at Owner's sites.

5.1.2. Contractor is responsible for understanding the capacities and capabilities of the irrigation system and ensuring that system modifications do not cause landscape water demand to exceed the hydraulic capacity of the system.

5.1.3. Contractor will establish appropriate time intervals for each valve zone in the irrigation systems and adjust during the operating season as necessary.

- Adjustments should be based on local evapo-transpiration (ET) data as much as possible.
- Operate systems only during night hours. Daytime operation is permitted only when inspecting or testing the system, after fertilizer application, for new installations and during extreme temperatures.
- Run times shall be sufficient to allow for saturation of the root zone without run off. This may require "cycle and soak" scheduling in spray zones. Allow adequate run times in drip irrigation zones.

5.1.4. Contractor will manage all irrigation systems for peak efficiency and water conservation. Check for proper water application rates by inspecting soil moisture and health of plant materials on a weekly basis. Adjust the irrigation frequencies as required to correct over or under watering.

5.1.5. Contractor shall manage irrigation schedules so that irrigation is applied more deeply, but less frequently, rather than small amounts on a daily basis.

5.1.6. Contractor and Owner will work in collaboration during water supply shortages and under drought conditions to develop an irrigation strategy that best preserves and protects the site's landscape investment.

5.2. IRRIGATION SYSTEM MONITORING

5.2.1. Irrigation system monitoring and inspections to include the following:

- Visually inspect all irrigated landscape areas once weekly from April thru September to identify potential leaks as evidenced by water related plant stress, surface water or erosion, broken or damaged equipment, and paved surfaces or building walls/windows affected by irrigation.
- Visually inspect the operation of all irrigation valve zones once monthly from April through September to identify coverage problems, misdirected nozzles, broken or damaged equipment, hard-scape or building overspray, pressure problems and system leaks.

5.2.2. Provide the following written irrigation system management reports to Owner's Project Manager.

- Summary of additional services, system repairs and renovations, general operations and recommendations once monthly from April through September.
- Summary o major renovations, replacements and equipment changes along with proposed renovations/upgrades and associated budget recommendations once annually.

5.3. IRRIGATION SYSTEM MAINTENANCE, WINTERIZATION AND RE-ACTIVATION

5.3.1. Run-off of water from irrigation systems into or onto streets, sidewalks, stairs, or gutters is not permitted. Immediately make adjustments, repairs, or replacements required to correct the source of the run-off.

5.3.2. Clean and adjust bubblers and valves as required. Clean drip irrigation valve strainers as required. Properly prune plantings and/or debris affecting access to valves, and reset/raise valve boxes, which have settled during the winter shutdown months.

5.3.3. Flush out lateral lines and adjust heads and nozzles at the beginning of each operating season.

5.3.4. Contractor shall be responsible for all costs associated with damage resulting from improper irrigation winterization and re-activation procedures, and for all damage resulting from failure to winterize or re-activate in a timely fashion. The Contractor is not responsible for freeze damage to piping left pressurized year around per the direction of Owner.

5.3.5. Provide for inspection and testing of backflow prevention valves annually, as required by law.

5.4. IRRIGATION SYSTEM REPAIR AND RENOVATION

5.4.1. Provide 24 hour per day, 7 days a week emergency response to immediately replace or repair broken, damaged or inoperable irrigation components which pose damage or safety hazards to persons or property. Prepare Proposals for all other repair or replacement work.

5.4.2. All repairs to the system shall be identical to the original installation, unless approved otherwise in advance by the Owner. If a change to the installation will result in lower future maintenance costs, less frequent breakage, or an increase in public safety, request authorization to make the change from the Owner.

5.4.3. Replacement of system components shall be the same manufacturer and model as original equipment, or better as authorized by Owner.

5.4.4. The following repair activities are considered additional services:

- Troubleshooting and repair of controller components.
- Damage by other than Contractor vehicles.
- Pedestrian or vandalism damage.
- Special event damage.
- Construction related damage by other than Contractor's activities.
- Storm related damage.
- Product failure.

5.4.5. Provide the following repair or replacement work at no cost to Owner:

- Damage due to Contractor maintenance activities.
- Damage due to work by Contractor's construction activities.

5.4.6. Inform Owner in shutting off the systems during emergencies.

Redline all irrigation repairs or renovations which represent changes to the existing irrigation on current record drawing prints and submit to Owner.

6. MATERIALS AND EXECUTION – EXISTING AND TRANSPLANTED TREES

6.1. LONG TERM MAINTENANCE

6.1.1. Irrigate trees according to species requirements.

6.1.2. Where turf is present around trees, establish a turf-free area at least 1-foot from the trunk.

6.1.3. Place 4- to 6-inches of wood chips within turf-free area and any landscape beds.

6.1.4. Prune trees as required to maintain good structure. All pruning shall be completed by an ISA Certified Arborist or Tree Worker and adhere to the latest editions of the American National Standards for tree work (Z133 and A300) and International Society of Arboriculture Best Management Practices, Pruning.

6.1.5. For newly installed trees, loosen the support stake after one year. Remove the support stake at the end of the second growing season.

6.1.6. For relocated trees, ensure the surface water drains away from the trunk.

6.1.7. For relocated trees, the soil moisture of the rootball and the surrounding backfill shall be monitored during the first growing season following transplanting. The rootball and backfill should remain evenly moist, but never saturated. The tree should be irrigated when the root zone is dry as determined using a soil probe. Irrigation should be sufficient to wet the root zone to the depth of the planting hole. The contractor shall not rely solely on the automatic irrigation system to water the trees, as hand watering may be required to achieve uniform soil moisture.

6.1.8. Inspect all trees once per month during the growing season for insect, disease and cultural problems. Treat problems that are severe enough to limit performance.

6.1.9. Maintain 1-foot wide clear zone around the trunk of all trees.

6.1.10. Avoid herbicide use in the vicinity of trees. Applicators should check the label for potential movement of the active ingredient to non-target plants such as trees.

6.1.11. Inspect the lower trunk and base following storms and periods of high wind. Look for changes in orientation, soil mounding, and the appearance of cracks in the lower trunk.