MODEL
BAY-FRIENDLY LANDSCAPE MAINTENANCE SPECIFICATIONS

Model Bay-Friendly Landscaping Maintenance Specifications

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Section 1: General Information

1.1. Project goals

Bay-Friendly Landscape Maintenance practices shall be employed to minimize waste, protect air and water quality, conserve energy and water, and protect natural ecosystems (refer to Bay-Friendly Landscape Guidelines, www.BayFriendly.org).

1.2. General scope of work

This work shall include all supervision, labor, materials, equipment, tools, supplies and services to maintain in a superior condition all landscape areas, irrigation and drainage systems and other related work. All work shall be performed in a workmanlike manner, using quality equipment, Bay-Friendly methods and materials.

1.3. Site description

A. Work to be done is located at _____ and identified on the enclosed maps and plans. This area is owned or supervised by _____, hereafter referred to as Agency, with _____ acting as agent, hereafter referred to as Agency Representative.

B. Landscape inventory

Turf _____ft^2

Ground cover _____ft^2

Annual color _____ ft^2

Shrubs _____ft^2

Trees _____ft^2

Hard surfaces/sidewalks _____ft^2

Parking areas _____ft^2

1.4. Limits of work: Specified work does not include:

A. Installation or replacement of plants, except for those damaged or allowed to decline or die by the Contractor;

B. Repair and/or modification of the irrigation system, except for those specified in section 3.4 Water Management.

1.5. Supplemental Documents

A. Site maps

1. A site map will be provided and shared between the Agency and the Contractor. The map shall identify general plant palette, landscape features, building and parking footprints, streets and addresses.
2. An irrigation plan identifying locations of meters, valves, controllers, and types of irrigation equipment specified for the site will be provided.
3. A planting plan or list of all existing plants will be provided for use by the Contractor in developing pest management programs and irrigation schedules.

B. Initial soil analysis

Results of soil analyses from samples collected at the project area shall be provided to Contractor, if available.

C. Water budget calculations (MAWA)

Calculations of Maximum Allowable Water Allowances for the project area will be provided to the Contractor, if available.

1.6. Supplemental Resources

A. StopWaste.Org www.BayFriendly.org
   1. Bay-Friendly Landscape Guidelines
   2. A Landscaper's Guide to Grasscycling
   3. A Landscaper's Guide to Mulch

B. *A Guide to Estimating Irrigation of Water Needs of Landscape Plantings*, California Dept of Water Resources, http://cdec.water.ca.gov

C. *Irrigation water audits*, Irrigation Association, www.irrigation.org, and the Irrigation Technology Research Center, www.itrc.org.

D. *California Irrigation Management Information System*, www.cimis.water.ca.gov, Waste management and recycling, www.ciwmb.ca.gov.

E. *The Weed Worker's Handbook, A Guide to Techniques for Removing Bay Area Invasive Plants*, The Watershed Council (510) 231-5655 and the California , Invasive Plant Council (510) 843-3902

F. *Pests of Landscape Trees and Shrubs: An Integrated Pest Management Guide*, 2nd ed., UC Publication 3359, http://www.ipm.ucdavis.edu

G. *A Field Guide to Compost Use*, The Composting Council, 114 South Pitt Street, Alexandria, Virginia 22314, (703) 739-2401, http://www.compostingcouncil.org/index.cfm

Section 2: General Requirements

2.1. Contractor requirements

A. Qualifications

1. Contractor must have a valid California C-27 contractor's license authorized by the State of California.
2. Contractor must have assigned to the project at least one employee possessing a California State Chemical Applicator's License for the control of weeds, plant diseases and other pests.
3. Contractor must have assigned to the project at least one employee who has successfully completed the Pollution Prevention Training & Certification Program For Surface Cleaners issued by the Bay Area StormWater Management Agencies Association **(**BASMAA).
4. It is preferred that the Contractor have assigned to the project at least one employee who is a Certified Irrigation Contractor (Irrigation Association).
5. It is preferred that the Contractor have assigned to the project at least one employee who is a Certified Arborist or Certified Tree Worker (International Society of Arboriculture).
6. It is preferred that the Contractor have assigned to the project at least one employee who has experience or training in Integrated Pest Management (IPM) techniques.
7. It is preferred that the Contractor have assigned to the project at least one employee who has experience or training in Bay-Friendly Landscaping practices.

B. Insurance

Contractor shall maintain insurance required in the bid documents throughout the contract period.

2.2. Compliance with laws, ordinances and policies

All services rendered shall be provided in accordance with all ordinances, resolutions, statutes, rules, laws and regulations of the Agency, and any Federal, State, or local governmental agency having jurisdiction in effect at the time service is provided

A. Contractor must adhere to the Agency's Landscape Water Conservation Ordinance No.____. A copy may be obtained at _____.

B. Contractor must adhere to the Agency's Integrated Pest Management and Pesticide Use Policy. A copy may be obtained at _____.

C. Contractor must adhere to the Agency's Tree Preservation and Protection Ordinance No.____. A copy may be obtained at _____.

D. Contractor must adhere to the Agency's Stormwater Pollution Prevention Plan (SWPPP) for the site and any Stormwater Management and Erosion Control policy. A copy may be obtained at _____.

E. Contractor must adhere to the Agency's Environmental Purchasing Policy. A copy may be obtained at_____.

2.3. Work requirements

A. Work schedule

1. Contractor is to provide Agency with a weekly work schedule describing the work to be preformed in the Project Area.
2. The Contractor shall conduct all operations during the hours of 7:00 a.m. to 5:00 p.m. Monday through Friday, unless otherwise approved by the Agency. Contractor may not work on any Federal, State, or local holidays.
3. Any non-emergency work that may be deemed hazardous or disruptive (i.e., chemical spraying, tree pruning, etc.) shall be scheduled at least two (2) weeks in advance with the Agency's representative. For emergency work, Contractor must obtain written approval from Agency's representative prior to commencing work.
4. Agency reserves the right to change schedules for special events, conflicts with adjacent property owners/tenants within five (5) working days advance notice.

B. Protection of existing property

1. Contractor must protect all existing plant materials, site improvements, structures, facilities, utilities, and natural areas from damage, both above and below ground. Any damages shall be reported immediately to the Agency's representative. Any damages caused by Contractor shall be corrected and/or paid for by the Contractor at no cost to the Agency.
2. Contractor shall protect property from accidental chemical, fuel, oil or other contaminate spills.
3. Contractor shall not wash or blow soil, chemicals, litter, mulch, soil amendments or other materials into storm drains.

C. Safety

Contractor must at all times exercise necessary precautions to provide for the protection of the public and employees.

1. Traffic Lane Closure

Landscape maintenance services conducted in the roadway center medians must be performed in a safe manner. The contractor is required to perform traffic diverting lane closures prior to beginning any trimming operations in the center median. Litter pickup does not require a lane closure.

All lane closure activities must comply with [put in your preferred reference here such as the Federal Highway Manual on Uniform Traffic Control Devices (MUTCD) http://www.dot.ca.gov/hq/traffops/signtech/mutcdsupp/supplement.htm], and follow notification requirements of the Police and Fire Departments.

2. Chemical Applications

Note: Bay-Friendly Landscaping emphasizes Integrated Pest Management (IPM) practices to control pests and diseases in the landscape. IPM uses 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.

Contractor shall apply all chemicals in a safe manner and according to label instructions and Agency, State and Federal requirements. A California Chemical Applicators license is required by the contractor for chemical applications. The Contractor shall mix and apply chemicals to protect against accidental spills and drift to non-target areas, and to insure safety of the applicator. Any spilled chemicals, as well as contaminated soil, water, and/or landscape materials must be removed from the Project and disposed of in accordance with the Agency requirements. The Contractor shall maintain applicator's licenses and records of applications as required by the State.

A Chemical Work Report shall be completed for each chemical application. The Contractor is responsible for submitting chemical usage reports to the County Agricultural Department. Copies are to be sent to the Agency's representative as part of the Contractor's monthly report.

D. Contractor's Personnel and Supervision

1. Contractor shall provide a list including all Contractor's and subcontractor's employees assigned to work site and include work schedule and assignment. Contractor must update list within 3 business days of any change. All Contractor's employees assigned to the Project must demonstrate they are United States citizens or have a legal right to work in the United States.
2. The Contractor shall assign a qualified trained supervisor to oversee work performed at the work site and to act as the Contractor's liaison with the Agency representative. This supervisor must inspect the Project daily (Monday through Friday) except holidays and provide direction to the Contractor's workers and/or subcontractors. This supervisor shall speak, write, read and understand English and be capable of writing schedules, monthly reports noting any deficiency that needs correcting and major projects for the coming month. This supervisor shall have at least three (3) years of landscape maintenance supervision experience.
3. All Contractor's personnel shall adhere to basic public works standards for working attire including; uniform shirts with Contractor's name or logo clearly visible at all times when working at all locations, proper shoes and other equipment required by State Safety Regulations. Shirts are to be maintained in a neat and presentable condition.

4. All Contractor vehicles are to have a readable sign with Contractor's name or logo and telephone number. Trucks are to be kept in a clean and presentable condition.

E. Subcontracting

A portion of the work covered by these specifications may be subcontracted with prior approval of the Agency. Contractor shall supervise subcontractor and guarantee work quality. Subcontractors and their qualifications must be submitted to the Agency thirty (30) days before working at the site. All subcontractors assigned to the Project must demonstrate they are United States citizens or have a legal right to work in the United States. It is preferred that subcontractors have training in Bay-Friendly Landscaping or other experience in sustainable landscape practices.

F. Supplies and Equipment

1. Fuel conservation and low emission equipment

The Contractor will implement strategies in work operations to reduce fossil fuel consumption and emissions, such as:

a. Use hand-powered equipment when possible.
b. Minimize use of gas-powered blowers, especially on planting beds.
c. Select smallest, most fuel efficient equipment to accomplish task.
d. Consider vehicles that operate on natural gas or biodiesel.
e. Maintain equipment properly and keep it well tuned.
f. Emphasize employee carpooling to Project.

2. Use local products and suppliers

The Contractor shall use local products and suppliers (produced within 150 miles from the project site) to the extent possible to minimize fuel consumption and emissions.

3. Use recycled and salvaged materials

The Contractor shall use salvaged and recycled-content products where possible Materials for reuse may be found by contacting the CalMax website at www.ciwmb.ca.gov or at www.stopwaste.org .

4. Equipment refueling and repair

The Contractor shall refuel and repair equipment in a safe manner to protect against accidental spills. Limit refueling to specific areas on a site. Measures shall be taken to prevent, control, and clean-up spills. Clean-ups should be immediate, automatic and routine and performed by a trained staff member or a licensed cleaning company. Contact the local emergency response team agencies to report all spills.

G. Reporting and inspecting

1. The Contractor shall submit a written report each month stating all contract work completed. The report shall show the work completed during each week contract work was accomplished, and shall be submitted with and cover the same work as the Contractor's billing statement for the previous month's work. The report shall include documentation of stormwater and irrigation inspections, IPM monitoring, soil and pest management treatments and other chemical applications.
2. Unusual horticultural problems such as pests, disease and damages that are beyond the scope of the Contractor's responsibility shall be brought to the attention of the Agency representative immediately.
3. The Agency, through a designated representative, shall make periodic inspections to insure that complete and continuous maintenance is fulfilled. In addition, the Agency may obtain the services of an approved horticultural specialist to inspect plantings and make recommendations for improvements in the maintenance program.

H. Work Performance

1. Contractor is responsible for (a) having thoroughly investigated and considered the scope of services to be performed, (b) carefully considering how the services should be performed, and (c) fully understanding the facilities, difficulties, and restrictions attending to the performance of the services required. Contractor is responsible to investigate the area and be fully acquainted with the conditions.

2. Should the Contractor discover any latent or unforeseeable conditions, which will materially affect the performance of services, Contractor shall immediately inform the Agency of such fact and shall not proceed except at Contractor's risk until written instructions are received from the Agency.
3. Plants, irrigation systems, etc., damaged by traffic accidents or vandalism, shall be reported immediately to the Agency.

I. Extra Work

1. New and unforeseen work will be classed as extra work when determined by the Agency that such work is not covered by these specifications. Upon notification that extra work will be required, the Contractor shall submit an itemized, written cost proposal for such work to the Agency. The Agency shall retain the right to reject such cost proposal and perform the extra work with Agency forces or other contractors. Should the proposal be acceptable to the Agency, the Contractor shall be advised in writing, and upon receipt of such written notification, shall begin the work within five (5) working days or as agreed to between the Contractor and the Agency.
2. The Contractor shall do such extra work in accordance with the agreement for extra work and with the provisions of these specifications and shall furnish all labor, materials and equipment. Payment for extra work performed shall be as agreed to by the Contractor and the City and as bid. Compensation for material will not exceed Contractor cost plus 10%. Contractor must provide invoice copies to be compensated for material.

J. Emergency Work

1. Contractor shall supply office, pager and home phone numbers of employee responsible for emergencies. Said employee shall be fluent in English.
2. Agency will provide Contractor with emergency numbers for Agency's representatives and emergency personnel. Said employee shall be fluent in English.

Section 3: Landscape Standards and Maintenance Requirements

3.1 Overview

A. Bay-Friendly Landscape Principles and Objectives

Contractor shall maintain the specified landscape in an integrated approach, consistent with the principles set forth in the Bay-Friendly Landscape Guidelines, www.BayFriendly.org. The seven Bay-Friendly principles are:

1. Landscape locally – The Project landscape is part of a larger natural ecosystem of the San Francisco Bay Area. The materials and methods used to maintain the Project can support the health, diversity and sustainability of the Bay.
2. Landscape for less to the landfill – Reducing waste starts with not generating plant debris in the first place by fertilizing, irrigating and pruning judiciously, grasscycling, mulching and composting plant debris. Using recycled content, salvaged, durable or local materials conserves resources and reduces the amount of energy consumed by the landscape.
3. Nurture the soil – Create a healthy soil that supports a healthy landscape by protecting the soil from compaction and erosion, replenishing organic matter and mulching, using slow-release and organic fertilizers and minimizing use of chemicals that harm beneficial soil organisms.
4. Conserve water – Use California's water supply efficiently by reducing irrigation requirements, irrigating according to plant need, maximizing irrigation system performance, increasing the water holding capacity of the soil and using recycled water.
5. Conserve energy – Conventional landscapes are fossil fuel consumptive. Nationally it is estimated that lawn mowers consume 400 million gallons of gas. Look for opportunities to conserve fuel and energy by choosing and maintaining materials and equipment for fuel conservation.
6. Protect water and air quality –Reduce runoff, reduce contaminants in runoff through an integrated pest management (IPM) program, and increase the soil's ability to remove pollutants from runoff through steps such as mulching bare soil. Reduce air pollution by reducing fossil fuel consumption, recycling plant debris on –site and planting trees to remove CO2 and absorb air pollutants.,
7. Protect and maintain wildlife habitat – The Project may provide food, water, shelter and nesting sites for birds, butterflies, beneficial insects and animals that contribute to the ecological diversity of the Bay. Methods to protect them include minimizing application of chemicals by implementing an integrated pest management (IPM) program, and conserving flowers, berries, fruits, seed heads, low branch cover, and natural vegetation in open space areas.

B. Applicable standards and Best Management Practices (BMP's).

Contractor shall adhere to applicable professional standards as defined by a professional organization including:

1. American National Standard for Tree Care Operations - ANSI A300, Parts 1 and 2
2. International Society of Arboriculture BMP for Tree and Shrub Fertilization, and BMP for Tree Pruning.
3. Irrigation Association BMPs
4. Bay-Friendly Landscape Guidelines

3.2 Site Analysis

A. Contractor shall characterize the Project's microclimate(s) and range in exposures as a precursor for developing the water management program.

B. Contractor shall identify plants species present in the Project landscape

1. Contractor will determine key plant species present
2. Contractor will determine plant water use classification for each plant species present as a precursor for developing the water management program. Plant water use classifications may be found in "A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California" (Univ. of Calif. Cooperative Extension, 2000).
3. Contractor will identify any plants in the Project landscape that are protected from removal or damage by ordinance, and adhere to all protection requirements.

C. Soil tests

1. Contractor shall collect and submit soil samples to an accredited and approved testing laboratory, annually for 3 years during the transition to a Bay-Friendly landscape and then when planning a renovation and when experiencing ongoing problems. At a minimum one soil sample shall be collected from turf and one from shrub/ground cover areas that are representative of site conditions. Sample collection procedures shall adhere to recommendations of the soil testing laboratory. Contractor shall request that the laboratory make recommendations based on an 'organic' approach to soil and landscape management. Submit soil lab report and any proposed soil amendments and cost adjustments to Agency Representative for written approval. After review and written approval by the Owner, amend the soils according to said laboratory's recommendations. The approved soils laboratory recommendations shall be considered a part of this specification. Analyses to be performed include:

   pH, electrical conductivity, nitrate, ammonium, phosphorus, potassium, calcium, saturation percent, sodium, chloride, sodium adsorption ratio, boron, % sand-silt-clay, lime, % organic

2. Contractor shall determine infiltration rate and drainage characteristics within the Project. This information shall be considered when scheduling irrigation.

D. Topography and potential for runoff

Contractor shall assess topography within the Project and evaluate potential for runoff. This information shall be considered when scheduling irrigation and determining need for erosion control measures.

3.3 Soil & Nutrition Management

A. Goals

A healthy, biologically diverse soil is required to sustain a healthy landscape. A basic concept of Bay-Friendly Landscaping is to cultivate a functional, living soil foodweb which shall then provide nutrient elements as needed to sustain healthy and attractive plants while avoiding excessive growth that might attract pests and/ or need to be removed through pruning, edging or mowing. Landscape maintenance activities shall be implemented to nurture biological activity, provide organic material, and protect soil from damage. Bay and riparian water quality and soil and aquatic habitat shall be protected by controlling soil erosion.

B. Contractor shall protect soil from compaction by:

1. Cultivating soil when it is moderately moist; wet and dry soils shall not be cultivated.
2. Scheduling maintenance operations that require driving equipment over the soil (e.g. mowing turf) when the soil is dry.
3. Confining traffic to paved areas.
4. When temporary access is needed over non-paved areas, distribute the load over the soil with 6" thick coarse organic mulch or reusable planks.

C. Contractor shall protect the soil from erosion by:

1. Maintaining vegetative cover over the soil to the extent possible.
2. Placing compost berms, blanket, socks or tubes along slopes to slow water.
3. Maintaining a minimum of 2" mulch [substitute 'minimum of 3" 'if required by the Agency's water conservation ordinance]cover over bare soil.
4. Minimizing use of blowers in planting beds and on turf.
5. Using coarse mulch on slopes to avoid washing of mulch into storms drains.
6. Create leaf repositories in planting beds as appropriate.

D. Soil and plant tissue analysis

1. Contractor shall submit soil samples for testing as described in Section 3.2 – Site Analysis. The types and quantities of fertilizer and/or soil amendments to be applied shall be determined from the results of the soil analysis and shall be based on an 'organic' approach to soil management.
2. Where plant micronutrient deficiencies are suspected, plant tissue analyses are recommended to determine need for fertilizer application.

E. Incorporate organic soil amendments

1. Contractor shall incorporate composted organic amendments into soil prior to planting annuals or replanting damaged turf or ground cover.
   a. Planting beds for annuals and ground covers: Incorporate 2-4" of compost into the top 6-12" of soil
   b. Turf: Incorporate 1-2" (3 1/3 – 6 2/3 cubic yards) compost into the top 5-7" of soil
2. Compost shall be a well decomposed, stable, weed free organic matter source. The product shall be certified through the US Composting Council's (USCC) Seal of Testing Assurance Program (STA) Program (a compost testing and information disclosure program). It shall be derived from agricultural and/or food waste and/or yard trimmings. The product shall contain no substances toxic to plants, will possess no objectionable odors and shall not resemble the feedstock (the original materials from which it was derived.

   Before delivery of the compost, the supplier will submit proof of STA certification and a copy of lab analysis performed by a laboratory that is enrolled in the US Composting Council's CAP and using the approved Test Methods for the Evaluation of Composting and Compost (TMECC). The lab report shall verify:

   a. Feedstock Materials shall be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
   b. Organic Matter Content: 50% - 60% by dry wt. preferred, 35-70% acceptable
   c. Carbon and Nitrogen Ratio: C:N < 25:1 plus at least one measure of stability and at least one measure of toxicity.
   d. Maturity/Stability: shall have a dark brown color and a soil-like odor. In addition any one of the following is required to indicate stability
      1) Oxygen Test < 1.3 O_2 / unit TS / hr
      2) Specific oxy. Test < 1.5 O_2 / unit BVS / hr
      3) Respiration test < 8 *C / unit VS / day*
      4) Dewar test < 20 *Temp. rise (^oC)*
      5) Solvita® > 5 *Index value*
   e. Toxicity: any one of the following measures is sufficient to indicate non-toxicity.
      1) NH_4- : NO_3-N < 3
      2) Ammonium < 500 *ppm, dry basis*
      3) Seed Germination > 80 *% of control*
      4) Plant Trials > 80*% of control*
      5) Solvita® > 5 *Index value*
   f. Nutrient Content: provide analysis detailing nutrient content including N-P-K, Ca, Na, Mg, S, and B.
      1) Total Nitrogen content 0.9% or above preferred.
      2) Boron: Total shall be <80 ppm; Soluble shall be <2.5 ppm
   g. Salinity: Must be reported; may vary but < 4.0 mmhos/cm preferred. Soil should also be tested: <2.5 mmhos/cm is preferred for soil/compost blend but may vary with plant species.
   h. pH: pH shall be between 6.5 and 8. May vary with plant species.
   i. Particle size: 95% passing a 1/2" screen.
   j. Bulk density: shall be between 500 and 1100 dry lbs/cubic yard
   k. Moisture Content shall be between 35% - 55% of dry solids.
   l. Inerts: compost shall be relatively free of inert ingredients, including glass, plastic and paper, < 0.1 % by weight or volume.
   m. Weed seed/pathogen destruction: provide proof of process to further reduce pathogens (PFRP). For example, turned windrows must reach min. 55C for 15 days with at least 5 turnings during that period.
   n. Select Pathogens: Salmonella <3 MPN/4grams of TS, or Coliform Bacteria <10000 MPN/gram.
      1) Trace Contaminants Metals (Lead, Mercury, Etc.) Product must meet US EPA, 40 CFR 503 regulations.
3. The delivery tags indicating the quantity delivered to the job site shall be submitted by contractor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or heat (120F) upon delivery or rewetting will not be accepted.

F. Maintain organic mulch

1. Contractor shall maintain a minimum of 2" [substitute 'minimum of 3" 'if required by the Agency's water conservation ordinance] of coarse organic mulch at all times over soil surface that is not covered by vegetation. Mulch shall be applied so that it is below grade (curb, edging,etc.) by half an inch Some additional grading preparation and grading of areas adjacent to sidewalks or edging, etc. may be required to keep the finish grade of the mulch at an appropriate level. Mulch materials shall be chipped or shredded green waste, wood chips from pruning operations, or chipped landscape prunings. When available, use materials generated on-site. Shredded redwood bark mulch ("Gorilla hair") shall be avoided. Non porous material (e.g. plastic weed barriers) shall not be placed under the mulch.
2. Sheet mulching shall be employed where possible.

G. Retain natural leaf litter and clippings

1. To conserve nutrients on-site and protect the soil surface, Contractor shall retain natural leaf drop under trees or in shrub beds. Select only tree and shrub beds that will not allow leaf litter or mulch to wash out into storm drains. Where leaf litter detracts from landscape appearance due to large leaf size, it is preferable that leaves be chopped and returned to landscape beds. Remove diseased leaves that would provide inoculums for plant infection.
2. Contractor shall practice grasscycling (discussed further in Section 4.1 *Turf Management*)

H. Fertilizers and other soil amendments

1. Bay-Friendly Landscaping relies on organic fertilizers and soil amendments from natural sources that release elements slowly, which shall be preferred.
2. Additional amendments and fertilizers that are approved for use by the Organics Materials Research Institute (OMRI) for use in crop production are approved for use in landscape. See www.omri.org. Contractor must supply fertilizer and soil amendment labels including the guaranteed analysis identifying components of the material and the percent nutrient content. Contractor is required to apply the appropriate amount of fertilizer to supply the specified quantity of nutrient as determined by soil analysis and/or plant tissue analysis.
3. Contractor shall apply and manage fertilizers and amendments to prevent pollution of surface and ground water and to avoid creating a nitrogen draft in the soil or toxicity to plants.
4. Application frequency

   Fertilizers shall be applied on a prescription base only. Application frequency shall be determined by plant need and assessed through soil and/or tissue analyses. For biding purposes the following maximum annual number of applications are provided.

   a. Trees, shrubs, woody ground covers: One time per year
   b. Herbaceous ground covers, perennials Two times per year
   c. Annuals and turf: Four times per year

5. Restricted materials. Fertilizers that are not approved or are restricted for use in crop production by OMRI shall be applied only after review and written approval by the Agency Representative.

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3.4 Water Management

A. Water conservation goals

Landscapes shall be irrigated to maintain plant appearance and health, and managed to conserve water and avoid overspray and water damage to Agency's hardscape and property.

B. Irrigation system assessment

1. Irrigation application rates and distribution uniformity are best assessed through an irrigation audit. Contractor is encouraged to perform an irrigation audit bi-annually (refer to www.itrc.org) or to schedule an audit with the water district that is the service provider to that property.
2. If a water audit is not performed, the Contractor shall inventory of the irrigation system at the start of the job. For each hydrozone determine the irrigation type and nozzle size, spacing and gallonage (from manufacturer's literature).

C. Irrigation scheduling – water budget method

The water budget approach to irrigation scheduling shall be used to match plant need with water application and avoid over-irrigation and overspray.

1. Irrigation intervals and frequency shall be suitable for weather conditions, soil infiltration rates, and plant species' rooting depth and water requirements within each hydrozone. Calculation methods are described in *A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California*, available from the Dept. of Water Resources, Sacramento, CA.
2. Irrigation frequency shall be based on ET (evapotranspiration) data (available through CIMIS). Irrigation shall be applied at approximately 60% allowable depletion (AD) for turf and annuals, 70% for non-drought tolerant and 90% for drought tolerant plantings.
3. Irrigation duration within each hydrozone shall be based on the soil infiltration rate, species water requirement and rooting depth within the hydrozone, and the application rate and distribution uniformity of the irrigation system within that zone. Enough water shall be applied at each irrigation cycle to wet through the depth of root zone. Where runoff occurs, the application time shall be divided into shorter time intervals and repeated as needed.
4. Irrigation frequency for each hydrozone shall be adjusted a minimum of every four weeks to reflect ET expected in the next month.
5. For sites with controllers that monitor ET and adjust schedules automatically, the Contractor shall program the controller according to manufacturer specifications, and monitor to ensure that frequency is appropriate.
6. Whenever possible, landscape irrigation shall be scheduled between 2:00 a.m. and 10:00 a.m. to avoid irrigating during times of high wind or high temperature.

D. Irrigation monitoring

1. Contractor shall monitor soil moisture within plant root zones using a soil probe or shovel and adjust irrigation schedules accordingly if a soil moisture sensor is not signaling the irrigation controller.
2. Contractor shall observe irrigation system in operation to identify and correct water runoff or standing water problems as noted in the Section below 3.4.*F Maintenance and Repair.*
3. Contractor shall determine irrigation run time demand monthly by recording water meter reading before and after irrigation (if site has a separate irrigation meter). This data should be reconciled with run times and flow rates to determine if there is unusual consumption which may indicate stuck valves or leaks.

E. Irrigation with recycled water

For landscapes irrigated with recycled water and containing salt-sensitive plants, the Contractor should increase irrigation frequency and duration to allow for elevated salts in the water and reduce salt accumulation in the root zone.

1. As a general guideline it is recommended that irrigation frequency adjusted to 50% allowable depletion (AD) for turf and annuals, 60% for non-drought tolerant plantings and 80% for drought tolerant plantings.
2. Once a month during the summer, irrigation duration should be increased by 20% to leach salts below plant root zones.

F. Irrigation system maintenance and repair

1. Contractor shall maintain the irrigation system for optimum performance, as per manufacturers specifications, by inspecting the entire system on an ongoing basis. This includes cleaning and adjusting all sprinkler and bubbler heads, drip emitters and valves for proper coverage.
2. Contractor shall inspect the irrigation system in operation to ensure proper function according to the following schedule:

April – October	Weekly
November – March	Monthly (when system operating)

3. All malfunctioning equipment shall be repaired prior to the next scheduled irrigation.
4. All irrigation replacement parts shall be of the same manufacturer, type, and application rates as existing, or approved equals or upgrades.
5. Irrigation system pressure shall be checked and adjusted at least monthly during season of operation.
6. Twice a year, at a minimum, the Contractor shall:
   a. Ensure all flush valve/cap locations are visible.

b. Ensure valve boxes are visible and can be opened.
c. Inspect valves, filters, and pressure regulators for damage or leaks. Check wire splices.
d. Clean valve boxes of dirt and debris.
e. Flush filters. A hose can be attached to the flush cap to keep water out of the valve box.
f. Inspect and clean filters. Replace damaged or torn filters.
g. Flush laterals.
h. Make sure plants have adequate numbers of drip emitters for their size.
i. Test backflow preventers.

7. Sprinkler heads shall be modified as needed to avoid overspray.
8. Where possible and appropriate, recommend to Agency where sprinklers could be converted to drip or bubblers.
9. Contractor shall maintain and submit monthly documentation of irrigation checks and as built plans of any changes or adjustments to the system. See Section 2.3.G.1. *Reporting and Inspecting*.

3.5 Integrated Pest Management (IPM)

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 nonpesticide alternatives when considering the use of pesticides on Agency property.

B. Insects and diseases

1. Key plant: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 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

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.

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

5) Encouragement of predators – owl boxes

b. Least toxic rodentcides

3.6 Plant Growth Control

A. Goals

The goals of plant growth control are to maintain healthy, attractive plants within the planting space allotted with minimal removal and disposal of vegetative growth.

B. Pruning

1. Selective pruning

Plants shall be pruned selectively to remove individual stems or branches that extend beyond the natural conformation of the plant to a lateral branch or at the point of attachment.

Woody groundcovers shall be selectively pruned to control growth towards pavements rather than edged.

2. Hedging and shearing

a. Existing hedges that have been maintained by shearing in the past and that do not have adequate space to grow to mature plant size can continue to be maintained by shearing. Suggest to Agency alternative plantings to these existing hedges that can be maintained in their natural shape for future renovations

b. For hedges that have not yet been maintained by shearing: shearing of plants into formal shapes shall be avoided as this destroys the natural form of the plant and generates excessive waste.

1) Plants having adequate space for development shall instead be selectively pruned on an as needed basis.

2) Where plant size must be controlled because of inadequate space for the plant, prune to reduce size by cutting individual branches or stems to interior lateral branches at appropriate locations. Contractor will notify Agency where hedges could be replaced with size-appropriate plants to eliminate requirement for shearing.

3. Tree Pruning

Tree pruning shall be preformed only by trained, experienced personnel. An I.S.A. Certified Arborist or Tree Worker is to be present at all times during pruning. See Section 3.5.C.,*Pruning,* for additional requirements.

C. Fire management/defensible space

For projects that adjoin open space areas, manage growth of grasses shrubs and trees to minimize fire risk. Contractor shall maintain vegetation clearances as required by the Alameda County Fire Marshall. Where recommended clearances would negatively affect plant health or environmental quality, Contractor will contact the Fire Marshall for a field inspection and recommendation. See also Section 4.5.B. *Fire Management.*

D. Irrigation and fertilization programs shall be designed to avoid excessive plant growth that would require additional pruning or mowing to manage.

3.7 Waste Management

A. Goals

Bay Friendly landscapes are maintained to minimize producing waste and to use as much of the plant debris generated on-site as is possible and to recycle plant debris and discarded materials to the maximum extent feasible at appropriate recycling centers to avoid adding it to landfill.

B. Retain natural leaf litter

To conserve nutrients on-site and protect the soil surface, Contractor shall retain natural leaf drop and other organic materials in shrub beds. Select sites where leaves will not enter the storm drain. Where leaf litter detracts from landscape appearance due to large leaf size, it is preferable that leaves be chopped and returned to landscape beds. Remove diseased leaves that would provide inoculum for plant infection.

C. Grasscycle

Contractor will leave grass clippings on the lawns after mowing, from at least April through October,. Sports turf may be excluded 'in season' when clippings will interfere with play.

D. Debris removal and clean-up

Contractor shall keep all landscaped areas, walkways, building entries and exits free from trash and debris. Debris clean up with brooms and rakes is preferred to blowers.

E. Producing mulch from site generated untreated and unpainted wood and plant debris

Contractor is encouraged to chip all vegetative materials and wood and use on site as mulch.

F. Producing compost from site generated plant debris

Where appropriate space is available, Contractor is encouraged to compost site-generated green waste and reuse on site. Site must be approved by agency, have a water hook-up nearby, be in an area that discourages interaction with public and be regularly monitored. Contractor should have knowledge of compost basics such as: C:N ratio, proper moisture content, and proper aeration.

G. Recycle waste

Contractor shall separate all plant debris that cannot be reused on site and other discarded materials that are readily recyclable and transport to appropriate recycling facilities.

If lawn clippings, shrub and tree trimmings, or prunings must be removed from site, they must be kept free of other types of debris and transported to a local composting facility or transfer station that offers a separate processing (and often discounts) of plant debris for composting.

3.8. Landscape repair/refurbishment

When landscapes are repaired and/or refurbished, the Contractor will employ Bay-Friendly landscape guidelines to enhance the sustainability of the landscape, reduce waste and protect watersheds. Refer to the Bay-Friendly landscape guidelines at www.BayFriendly.org .

A. Replace high input plants with species better suited to location and use. Species should be selected that are:
   1. appropriate size at maturity for planting site
   2. native to region and/or drought tolerant
   3. resistant to significant pests
   4. non-invasive
   5. increase diversity of the plant palette.

B. Reduce amount of area occupied by high water use plantings where possible (e.g. replace turf with drought-tolerant ground cover). Suggest alternative plantings to Agency for decorative turf especially turf areas less than 8 feet wide.

C. Reuse materials removed from the landscape that are in good condition.

D. When buying new materials, select recycled content materials where possible.

E. When irrigation systems are replaced or upgraded, install high efficiency systems.

Section 4: Landscape Specifications for Plant Types and Landscape Zones

4.1 Turf

A. Standards for Health and Appearance

Turf shall be maintained to sustain an attractive appearance, and good health with deep roots uniform green color, and uniform density with no bare spots,

B. Protect Environmental Resources

Turf shall be maintained using materials and methods that protect environmental quality and human health, conserve water and energy, minimize waste, and reuse and recycle materials to the extent possible.

C. Mowing and Edging

1. Turf shall be mowed and edged at regular intervals to maintain a neat appearance and healthy growth.
2. Grasscycling shall be employed for all turf areas (see A Bay-Friendly Landscaping Guide to Grasscycling, available at www.BayFriendly.org.). Grasscycling requires an integrated management system of irrigation, mowing height, and mowing frequency. Key components are:
   a. Mow often, at least once a week during the growing season.
   b. Mow when the turf is dry; at least on the day following irrigation.
   c. Maintain equipment to keep blades sharp and balanced; usually sharpen once a week. Keep area under the mower deck clean. Mulching mowers are more effective, but not required for grasscycling.
   d. Leave clippings on the turf. A second pass over clumps or windrows may be necessary if clippings are long. Clipping may not be left on turf in clumps or windrows.
   e. Seasonal rains may require temporarily halting of grasscycling because of excessive moisture. The clippings must be picked up and used as a mulch or transported to a plant debris recycling facility. Do not use grass clippings as a mulch if an herbicide has been applied to the turf.
2. Turf will be mowed at a height appropriate for the species of turf:
   a. Tall fescue 2-3”
   b. Bluegrass, ryegrass, red fescue 1.5-2.5”
   c. Dichondra, bermudagrass 0.5-1.0”
3. Turf will be cut with appropriately sized equipment which will give a neat appearance without rutting, sliding over or scalping the turf.
4. Mowing patterns will be changed weekly or however often necessary to avoid rutting.
5. Turf areas adjacent to pavements shall be edged on a vertical plane every other mowing.
6. A stringtrimmer or shears shall be used to trim around valve boxes, headerboards, etc. in the turf, on a regular basis to maintain a neat appearance.
7. Turf shall be maintained away from the base of features in the turf at the following distances:
   a. Trees 24”
   b. Signs and similar features 4”
   c. Buildings and other structures 4”
8. Clippings will be removed from paved surfaces the day of the mowing and edging.
9. Contractor shall take care to avoid damaging plants, equipment, signs, buildings, vehicles, etc. during turf maintenance operations. Any trees which have more than 50% of the circumference of the trunk tissue removed or damaged by string trimmers or mowers shall be considered destroyed and shall be replaced at the Contractor’s expense with like species and size.

D. Leaf Litter

1. Mulch leaf litter with mowers as needed throughout the fall and winter months. Large concentrations of leaves may require pickup. Rakes are preferred for leaf litter removal over blowers.
2. Leaf litter will not be allowed to accumulate to the point that it will damage or kill turf.

3. Leaf litter that is removed from turf will be either chopped and used on-site, or transported to a plant debris recycling facility.

E. Aerating and De-thatching

1. Aerate turf in traffic areas once a year. Aerate turf in low use areas every two years. Use equipment with hollow tines that removes a soil core. Topdress with ¼ inch fine compost. Overseed to fill in thin spots and to crowd out weeds.
2. Dethatch turf when thatch accumulates to a one-half inch thickness by cutting with a vertical mower. Thatch shall be raked and either composted for use elsewhere, or transported to a greenwaste recycling facility.
3. Aeration and dethatching activities should be scheduled to coincide with active growth period of the turf species, avoid hot weather conditions, and avoid peak time of crabgrass and other weed seed germination.

F. Water Management

1. Turf shall be irrigated to provide adequate water to maintain an attractive, green, healthy turf, and moderate growth rate during its growing season, without stimulating excessive growth rates.
2. The water budget approach to irrigation scheduling shall be used to match turf need with water application and avoid over-irrigation (see Section 3.4, *Water Management*)
3. Irrigation frequency under normal conditions should not exceed three times per week.

G. Soil and Nutrition Management

1. Contractor shall incorporate composted organic amendments into soil prior to planting annuals or replanting damaged turf or ground cover as per Sections 3.3.D, *Soil and Plant Tissue Analysis* and 3.3.E., *Incorporate Organic Soil Amendments.*
2. Fertilization shall be managed to provide moderate, not excessive, turf growth, and to avoid polluting surface and ground waters. Grasscycling reduces the fertilization requirement of turfgrass by 15-20%.
3. Fertilizer applications are to be made on a prescription basis only when soil and/or plant tissue analyses identify specific deficiencies. For bidding purposes plan to apply approximately 3.5-4.5 lbs. of actual nitrogen to cool season grasses per year in four applications. Include the available nitrogen from grasscycling and applying compost as a topdressing in the calculations of actual nitrogen.
4. Contractor shall select fertilizers that are released over a period of time, are predominantly organic and derived from natural sources, are produced locally, and will not pollute surface and ground water when properly used to provide primary nutrient needs of turf (see also Section 3.3 *Soil and Nutrition Management*).

H. Pest Management (see also Section 3.4, *Integrated Pest Management*)

1. Contractor is responsible for monitoring turf to identify and assess pest problems, and for taking action to control pests that affect turf health and appearance when pest populations or damage exceed established thresholds.
2. Contractor shall employ integrated pest management procedures (see also Section 3.5, *Integrated Pest Management*).
3. Contractor shall select pest controls to provide adequate pest control without harming non-target organisms, or negatively affect air and water quality and public health. Pest management shall rely first on cultural, mechanical, physical, and biological control methods. Chemical controls may be 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 will be applied. Pesticides may not be applied on a prescheduled basis.
4. Contractor may not apply restricted chemicals that may harm water resources.

4.2 Ground Cover

A. Standards for Health and Appearance

Ground covers shall be maintained to sustain an attractive, healthy, normal color for the species, and uniform density with no bare spots. Ground covers shall be kept free of trash and debris.

B. Protect Environmental Resources

Ground cover shall be maintained using materials and methods that protect environmental quality and human health, conserve water and energy, minimize waste, and reuse and recycle materials to the extent possible.

C. Edging and Mowing

1. Ground covers shall be trimmed on a regular basis to maintain pavements and other features clear of vegetation.
2. The edge of woody ground covers (e.g. rosemary, cotoneaster) shall be maintained by pruning individual branches or stems to interior lateral branches a minimum of 6" and maximum of 12" from the edge of pavement.
3. The edge of herbaceous ground covers (e.g. hypericum) may be maintained using turf edging equipment.
4. When ground covers become excessively woody or develop thatch in excess of 4", the Contractor shall prune the planting severely to rejuvenate it. For most woody ground covers, prune to approximately 6-8" height. Herbaceous ground covers may be mowed at an appropriate height, generally 4-6". This treatment shall only be applied in the late winter/early spring when ET is low and regrowth will occur quickly.
5. Handling of plant debris

   Contractor is encouraged to chip all vegetative materials use on site as mulch and/or compost and use as soil amendment.

   If ground cover prunings must be removed from site, they must be kept free of other types of inorganic debris and transported to a local composting facility or transfer station that offers a separate processing (and often discounts) of plant debris for composting.

D. Mulching

1. Contractor shall maintain a minimum of 2" [substitute 'minimum of 3" 'if required by the Agency's water conservation ordinance] of coarse organic mulch at all times over bare soil areas that is not covered by ground cover. Mulch shall be applied so that it is below grade (curb, edging,etc.) by half an inch Some additional grading preparation and grading of areas adjacent to sidewalks or edging, etc. may be required to keep the finish grade of the mulch at an appropriate level. Mulch materials shall be chipped or shredded plant debris wood chips from pruning operations. When available, utilize chipped plant prunings generated on-site.

E. Water Management

1. Ground cover shall be irrigated to provide adequate water to maintain an attractive, green, healthy plants, and moderate growth rate during its growing season.
2. The water budget approach to irrigation scheduling shall be used to match ground cover need with water application and avoid over-irrigation (see Section 3.4, *Water Management*)

F. Soil and Nutrition management (see also Section 3.3, *Soil & Nutrition Management*)

1. Contractor shall incorporate composted organic amendments into soil prior to planting annuals or replanting damaged turf or ground cover as per Sections 3.3.D, *Soil and Plant Tissue Analysis* and 3.3.E., *Incorporate Organic Soil Amendments.*
2. Fertilization shall be managed to provide moderate, not excessive, growth, and avoid polluting surface and ground waters.
3. Fertilizer applications are to be made on a prescription basis only when soil and/or plant tissue analyses identify specific deficiencies. For bidding purposes plan to apply 1-2 lbs. of actual nitrogen to ground cover areas in two applications annually.
4. Contractor shall select fertilizers that are released over a period of time, predominately are organic and derived from natural sources, are produced locally, and will not pollute surface and ground water when properly used to provide primary nutrient needs of the ground cover.

G. Pest management

1. Contractor is responsible for monitoring ground cover to identify, assess pest problems and taking action to control pests that affect ground cover health and appearance when pest populations or damage exceed established thresholds.

2. Contractor shall employ integrated pest management procedures (see also Section 3.5, *Integrated Pest Management*).
3. Contractor shall select pest controls to provide adequate pest control without harming non-target organisms, or negatively affect air and water quality and public health. Pest management shall rely first on cultural, mechanical, physical, and biological control methods. Chemical controls may be 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 will be applied. Pesticides may not applied on a prescheduled basis.
4. Contractor shall not apply restricted chemicals that may harm water resources.

4.3 Annual Color

A. Standards for Health and Appearance

Annual color beds shall be maintained to sustain an attractive, healthy, plants and uniform density with no bare spots. Annual beds shall be kept free of weeds, trash and debris. Weeds shall be controlled using methods consistent with Section 3.5, *Integrated Pest Management.*

B. Protect Environmental Resources

Annual color beds shall be maintained using materials and methods that protect environmental quality and human health, conserve water and energy, minimize waste, and reuse and recycle materials to the extent possible.

C. Contractor shall suggest to Agency where annual color beds could be converted to perennial beds that provide color over several seasons and minimize waste.

D. Annual color shall be planted only in designated beds or pots and hydrozoned. Provide two installations per year: one in the early spring, and one in the late fall. Select species appropriate for the exposure and microsite conditions. Avoid species requiring excessive irrigation and fertilization to sustain.

E. Mulching

1. Contractor shall maintain a minimum of 2” [substitute ‘minimum of 3” ‘if required by the Agency’s water conservation ordinance] of coarse organic mulch at all times over bare soil areas that is not covered by ground cover. Mulch shall be applied so that it is below grade (curb, edging,etc.) by half an inch Some additional grading preparation and grading of areas adjacent to sidewalks or edging, etc. may be required to keep the finish grade of the mulch at an appropriate level. Mulch materials shall be chipped or shredded plant debris wood chips from pruning operations. When available, utilize chipped plant prunings generated on-site.

F. Contractor shall prune annual plants monthly or more to remove spent flowers before seed is formed.

G. Water Management

1. Annual color shall be irrigated to provide adequate water to maintain an attractive, green, healthy plants and moderate growth rate during the growing season.
2. The water budget approach to irrigation scheduling shall be used to match plant need with water application and avoid over-irrigation (see Section 3.5)
3. Maximum irrigation frequency under normal conditions should not exceed two times per week.

H. Soil and Nutrition Management

1. Contractor shall incorporate composted organic amendments into soil prior to planting annuals or replanting damaged turf or ground cover as per Sections 3.3.D, *Soil and Plant Tissue Analysis* and 3.3.E., *Incorporate Organic Soil Amendments.*
2. Fertilization shall be managed to provide moderate, not excessive, growth, and to avoid polluting surface and ground waters.
3. Fertilizer applications are to be made on a prescription basis only when soil and/or plant tissue analyses identify specific deficiencies.
4. Contractor shall select fertilizers that are released over a period of time, are predominantly organic and derived from natural sources, are produced locally, and will not pollute surface and ground water when properly used to provide primary nutrient needs of annual color (see also Section 3.4).

I. Pest Management (see also Section 3.6)

1. Contractor is responsible for monitoring annual color to identify and assess pest problems, and for taking action to control pests that affect turf health and appearance.
2. Contractor shall employ integrated pest management procedures (see also Section 3.6).
3. Contractor shall select pest controls to provide adequate pest control without harming non-target organisms, or negatively affect air and water quality and public health. Pest management shall rely first on cultural, mechanical, physical, and biological control methods. Chemical controls may be 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 will be applied. Pesticides may not be applied on a prescheduled basis.
4. Contractor may not apply restricted chemicals that may harm water resources.

J. Handling of plant debris

Contractor is encouraged to use all vegetative materials as a feedstock for compost.

If plant debris must be removed from site, it must be kept free of other types of debris and transported to a local composting facility or transfer station that offers a separate processing (and often discounts) of plant debris for composting.

4.4 Shrubs

A. Standards for Health and Appearance

Shrubs shall be maintained to sustain an attractive and healthy plant that is characteristic for the species.

B. Protect Environmental Resources

Shrubs shall be maintained using materials and methods that protect environmental quality and human health, conserve water and energy, minimize waste, and reuse and recycle materials to the extent possible.

C. Pruning

1. Selective pruning
   a. Shrubs shall be pruned selectively only as necessary to enhance their natural shape.
   b. Where plant size must be controlled because of inadequate space for the plant, prune to reduce size by cutting individual branches or stems to interior lateral branches at appropriate locations
2. Hedging and shearing
   a. Existing hedges that have been maintained by shearing in the past and that do not have adequate space to grow to mature plant size can continue to be maintained by shearing. Suggest to Agency alternative plantings to these existing hedges that can be maintained in their natural shape for future renovations
   b. For hedges that have not yet been maintained by shearing: shearing of plants into formal shapes shall be avoided as this destroys the natural form of the plant and generates excessive waste.
      3) Plants having adequate space for development shall instead be selectively pruned on an as needed basis.
      4) Where plant size must be controlled because of inadequate space for the plant, prune to reduce size by cutting individual branches or stems to interior lateral branches at appropriate locations. Contractor will notify Agency where hedges could be replaced with size-appropriate plants to eliminate requirement for shearing.
3. Trimmings generated by pruning shall either be chipped and used as mulch on the site, or transported to a plant debris recycling facility.

D. Mulching

1. Contractor shall maintain a minimum of 2” [substitute ‘minimum of 3” ‘if required by the Agency’s water conservation ordinance] of coarse organic mulch at all times over bare soil areas surrounding shrubs. Mulch shall be applied so that it is below grade (curb, edging,etc.) by half an inch Some additional grading preparation and grading of areas adjacent to sidewalks or edging, etc. may be required to keep the finish grade of the mulch at an appropriate level. Mulch

materials shall be chipped or shredded composed green waste, wood chips from pruning operations, or chipped landscape prunings generated on-site.

2. Sheet mulching shall be employed at installation, where possible.

E. Water Management

1. Shrubs shall be irrigated to provide adequate water to maintain an attractive, healthy plants, and moderate growth rate during their growing season.
2. The water budget approach to irrigation scheduling shall be used to match shrub need with water application and avoid over-irrigation (see Section 3.4 *Water Management*)

F. Soil and Nutrition Management (see also Section 3.3, *Soil & Nutrition Management*)

1. Fertilization shall be managed to provide moderate, not excessive, growth, to and avoid polluting surface and ground waters.
2. Fertilizer applications are to be made on a prescription basis only when soil and/or plant tissue analyses identify specific deficiencies. Additional fertilization of mature shrubs maintained with mulch may not be necessary.
3. Contractor shall select fertilizers that are released over a period of time, predominantly are organic and derived from natural sources, are produced locally, and will not pollute surface and ground water when properly used to provide primary nutrient needs of the ground cover.

G. Pest Management

1. Contractor is responsible for monitoring shrubs to identify, assess pest problems and taking action to control pests that affect shrub health and appearance when pest populations or damage exceed established thresholds.
2. Contractor shall employ integrated pest management procedures (see also Section 3.5, *Integrated Pest Management*).
3. Contractor shall select pest controls to provide adequate pest control without harming non-target organisms, or negatively affect air and water quality and public health. Pest management shall rely first on cultural, mechanical, physical, and biological control methods. Chemical controls may be 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 will be applied. Pesticides may not applied on a prescheduled basis.
4. Contractor shall not apply restricted chemicals that may harm water resources.

4.5 Trees

A. Standards for Health and Appearance

Trees shall be maintained to sustain an attractive, healthy and structurally stable plant that is characteristic for the species.

B. Protect Environmental Resources

Trees shall be maintained using materials and methods that protect environmental quality and human health, conserve water and energy, minimize waste, and reuse and recycle materials to the extent possible.

C. Pruning

1. All tree pruning shall be performed only by trained, experienced personnel. An I.S.A. Certified Arborist or Tree Worker is to be present at all times during pruning. Arborist must have a State of Calif. Contractors License for Tree Service (C61-D49).
2. All pruning shall be in accordance with the Best Management Practices for Pruning (International Society of Arboriculture, 2002) and adhere to the most recent editions of the American National Standard for Tree Care Operations (Z133.1) and Pruning (A300).
3. Young trees shall receive annual pruning for up to five years after planting by personnel trained in pruning to develop tree structure. The purpose of the pruning is to direct the tree into the appropriate form for the species and the site and to develop a strong branch structure. Trees with codominant trunks and multiple branch attachments shall be pruned to correct those defects over a period of several years.
4. Trees shall be pruned in the following manner:

a. Clear the crown of diseased, crossing, weak and dead branches. Trees shall not be routinely thinned.
b. Provide 14' vertical clearance over roads, 8' over walkways;
c. Reduce end weight on heavy, horizontal branches
d. Create a strong central trunk with lateral branches spaced vertically and horizontally.
e. Interior branches shall not be stripped out.
f. No more than 20% of live foliage shall be removed within the trees.
g. Trees shall not be climbed with spurs.
h. Branch removal or reduction cuts (thinning cuts) are to be employed rather than heading cuts. Trees shall not be topped or headed back.
i. No green palm fronds shall be removed above a horizontal line drawn across the base of the crown.

5. Schedule pruning to avoid time of bud break, flowering and leaf drop on live branches, and to avoid peak periods of insect and disease activity for pests to which the tree species is susceptible.
6. Pruning operations shall be conducted in a manner that does not damage surrounding and understory plants and structures.

D. Staking

1. Tree stakes, ties and guys shall be checked regularly to ensure trees are not being damaged. Adjust ties and stake as necessary to prevent girdling and wounding.
2. Tree stakes shall be removed within two years of planting. For trees unable to stand alone after two years, Contractor will shorten the stakes and lower the ties to 3-4' height. If after the third year the tree will not stand without a stake, Contractor will inspect to determine cause of instability, and make recommendations to Agency for corrective action.
3. If new ties are needed to secure tree to stake, use ties composed of recycled materials. The tie must be broad, have a smooth surface where it contacts the trunk, and provide some elasticity. Wire covered with hose, tubing or other materials, and covered electrical wire are not acceptable materials.

E. Mulching

1. Contractor shall maintain a minimum of 2" [substitute 'minimum of 3" 'if required by the Agency's water conservation ordinance] of coarse organic mulch at all times over bare soil areas surrounding trees taking care not to place mulch against trunks. Mulch shall be applied so that it is below grade (curb, edging,etc.) by half an inch Some additional grading preparation and grading of areas adjacent to sidewalks or edging, etc. may be required to keep the finish grade of the mulch at an appropriate level. Mulch materials shall be chipped or shredded plant debris and/or wood chips from pruning operations. When available, utilize chipped landscape prunings generated on-site.
2. Sheet mulching shall be employed at installation, where possible.

F. Water Management

1. Trees shall be irrigated to encourage deep root growth and to provide adequate water to maintain an attractive, healthy plants, and a moderate growth rate during their growing season.
2. The water budget approach to irrigation scheduling shall be used to match shrub need with water application and avoid over-irrigation (see Section 3.4, *Water Management*)

G. Soil and Nutrition Management (see also Section 3.3, *Soil & Nutrition Management*)

1. Fertilization shall be managed to provide moderate, not excessive, growth, and to avoid polluting surface and ground waters.
2. Fertilizer applications are to be made on a prescription basis only when soil and/or plant tissue analyses identify specific deficiencies. Additional fertilization of mature trees may not be necessary.
3. Contractor shall select fertilizers that are released over a period of time, are predominantly organic and derived from natural sources, are produced locally, and will not pollute surface and ground water when properly used to provide the primary nutrient needs of the tree.

H. Pest management

1. Contractor is responsible for monitoring trees to identify, assess pest problems and taking action to control pests that affect tree health and appearance when pest populations or damage exceed established thresholds.
2. Contractor shall employ integrated pest management procedures (see also Section 3.5, *Integrated Pest Management*).
3. Contractor shall select pest controls to provide adequate pest control without harming non-target organisms, or negatively affect air and water quality and public health. Pest management shall rely first on cultural, mechanical, physical, and biological control methods. Chemical controls may be 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 will be applied. Pesticides may not applied on a prescheduled basis.
4. Contractor may not apply restricted chemicals that may harm water resources.

4.6 Open Space & Meadows

A. Standards for Health and Appearance

Open space area shall be maintained to sustain an attractive, healthy plant community that is capable of supporting wildlife.

B. Fire Management

1. Contractor shall maintain vegetation clearances and manage fuel loads as required by the Alameda County Fire Marshall. Where recommended clearances would negatively affect plant health, Contractor will contact the Fire Marshall for a field inspection and recommendation.
2. Herbaceous growth shall be managed to minimize fire hazard by mowing on a frequency to meet Alameda County Fire Marshall requirements.
3. Goats may be used to manage growth, where appropriate. Plants that need protection must be fenced and goats well-managed to prevent damage to non-target plants.

C. Soil and Nutrition Management

1. Contractor shall protect soil from compaction by:
   a. Scheduling maintenance operations that require driving equipment over the soil (e.g. mowing, pruning) when the soil is dry.
   b. Confining traffic to paved areas.
   c. When temporary access is needed over non-paved areas, distribute the load over the soil with 6” thick coarse organic mulch or wood planks.
2. In planted areas, Contractor shall maintain a minimum of 3” of coarse organic mulch at all times over soil surface that is not covered by vegetation. Mulch materials shall be chipped or shredded plant debris, wood chips from pruning operations. When available, utilize chipped landscape prunings generated on-site.
3. Sheet mulching shall be employed where possible.

D. Protect soil from erosion

Contractor shall protect the soil from erosion by:

1. Maintaining vegetative cover over the soil to the extent possible.
2. Placing compost berms, blanket, socks or tubes along slopes to slow water.
3. Maintaining mulch cover over bare soil.

E. Invasive species

Invasive plant species shall be eradicated from open space areas to the extent possible using methods described in Section 3.5.C.,*Weed Management.* Refer to www.cal-ipc.org for a list of invasive species.

4.7 Bioswales and biorention areas

A. Standards for Health and Appearance and Function

Bioswales and biorention areas remove pollutants from the stormwater by filtering runoff slowly through an active layer of soil. They shall be maintained to ensure that flow is not obstructed, erosion

is prevented and they continue to be effective without causing flooding or harboring vectors and in accordance with the site's Stormwater Control Plan's Operation and Maintenance Plan, if available.

B. Protect Environmental Resources

Bioswales depend on soils that are biologically active and held together by plant roots. They shall be maintained using materials and methods that support this biological activity, protect environmental quality and human health, conserve water and energy, minimize waste, and reuse and recycle materials to the extent possible.

C. Monitoring and inspection

1. Inspect inlets for channels and exposure of soils and report to the Agency if evidence of erosion is found. Examine rock or other material and report to the Agency if it requires replacement.
2. Inspect inlets and slopes for instability, erosion or obstructions. Report indications of problems to Agency.
3. Observe soil at the bottom of the swale for uniform infiltration. Confirm that irrigation is adequate but not excessive. Report water that does not drain within 48 hours of a storm.
4. Confirm that check dams and flow spreaders are in place and level. Report problems to Agency.

D. Sediment control

1. Clear minor obstructions and inspect for accumulation of sediment. Contractor shall remove accumulated sediment in bioswales by hand and around catch basins and culverts as necessary to maintain adequate flow.

E. Vegetation management

Examine vegetation to ensure that it is healthy, adequately but not overwatered, and dense enough to provide filtering. Remove debris. Prune large trees and shrubs as per previous Sections 4.4, *Shrubs* and 4.5 *Trees*. Weeds and invasive plant species shall be controlled as described in 3.5.C. *Weed Management.* Refer to www.cal-ipc.org for list of invasive species

F.Mowing

Grassy swales shall be mowed as needed to maintain adequate water flow. For bidding purposes assume 4 mowings per year. Remove no more than 1/3 of the length of the leaf blade. Clippings should be collected and either used elsewhere on-site or transported to a plant debris reycling facility.

G. Mosquito Abatement

Areas of seasonal water collection that do not drain within 48 hours shall either be filled with gravel/cobble or treated monthly with Bt (See Section 3.5.B.3, *Controls*)

4.8 Planter Boxes for Stormwater Management

A. Standards for Health and Appearance and Function

Planter boxes capture runoff from downspouts, plaza or paved areas. The runoff briefly floods the box and then percolates through an active layer of soil. They shall be maintained to continue to be effective, attractive and healthy.

B. Protect Environmental Resources

Planter boxes depend on soils that are biologically active. They shall be maintained using materials and methods that support this biological activity, protect environmental quality and human health, conserve water and energy, minimize waste, and reuse and recycle materials to the extent possible.

C. Monitoring and inspection

1. Examine downspouts or inlets from paving. Remove debris and separate organic matter for recycling. Check splash blocks or rocks. Report damaged pipes, downspouts, blocks or rocks that need replenishing.
2. Examine overflow pipe to make sure it can safely convey excess flows to a storm drain. Repair disconnected pipe or report damage to Agency.
3. Check underdrain piping to make sure it is intact and unobstructed. Report evidence of damage or malfunction to the Agency.
4. Check planter box for holes, cracks, rot or failure. Make minor repairs and report more significant damage to Agency.

D. Vegetation management

Examine vegetation to ensure that it is healthy, adequately but not overwatered, and dense enough to provide filtering. Remove debris. Prune large trees and shrubs as per previous sections on growth and waste management. Weeds and invasive plant species shall be controlled as described in Section 3.5.C., *Weed Management.* Refer to www.cal-ipc.org for list of invasive species

E. Soil and Nutrition Management

1. Check that the soil is at the appropriate depth to allow a reservoir of water above the soil surface and to function as a stormwater filter. Confirm that water is draining through soil within 3-4 hours after a storm event. Alleviate compaction or replace soil as needed, with soil that includes compost at a rate of 1 part compost to 3 parts soil.
2. Remove accumulations of sediment, litter or plant debris. Separate organic matter and handle as section on waste management. If plant debris must be removed from site, it must be kept free of other types of debris and transported to a local composting facility or transfer station that offers a separate processing (and often discounts) of plant debris for composting.

4.9 Hardscape

A. Debris removal and clean-up

Contractor shall keep all hardscape areas, walkways, building entries and exits free from trash and debris.

B. Surface cleaning

Contractor will clean hard surfaces as needed to remove accumulation of sediment, dirt, or other materials that distracts from the visual impact of the area or creates a safety hazard. Cleaning methods must be consistent with the Bay Area Stormwater Management Agencies Association. (BASMAA) criteria (listed below in Section 4.9.E., *BASMAA Certification*).

C. Root interference

Potential root damage to hardscapes shall be reported to Agency. Corrective action will be determined and directed as an extra service.

D. Pervious paving

Contractor shall clean the surface of pervious paving to remove fine debris and dirt as needed to maintain permeability (approximately four times per year). Pavement may be cleaned with street sweepers equipped with vacuums, water, and brushes, followed by high-pressure hosing of surface. If necessary, replace displaced aggregate fill with clean gravel. Cleaning methods must be consistent with the Bay Area Stormwater Management Agencies Association. (BASMAA) criteria (listed below in section 4.9.E., *BASMAA Certification*).

E. BASMAA Certification

Pollution Prevention Training & Certification Program For Surface Cleaners issued by the Bay Area StormWater Management Agencies Association **(**BASMAA) is required to perform surface cleaning work. BASMAA certification number: _____. http://www.basmaa.org/recognition/ All work should conform to BASMAA standards. BASMAA standards encourage the use of dry cleaning methods over wet such as the use of absorbing materials for oils and sweeping. It discourages the use of any soaps or solvents. It encourages directing wash water into the landscape or collection of waste water for disposal into a sanitary sewer instead of a storm drain. See their website for a thorough list of criteria.

Section 5: Definitions

Antimicrobial agent – Any substance or mixture of substances intended for inhibiting the growth of or destroying any bacteria, fungi pathogenic to human and other animals, or viruses declared to be pests under Section 12754.5 of the California Food and Agricultural Code, except slime control agents. Antimicrobial agents include, but are not limited to, disinfectants, sanitizers, bacteriostats, sterilizers, fungicides and fungistats.

Biodiesel – A fuel produced through a process in which organically-derived oils such as soybean or vegetable oil are combined with alcohol.

Bioswale - Channel constructed to improve the water quality of runoff, usually while also conveying it, through filtering by vegetation and other mechanisms that capture and hold water pollutants.

Blanket – Mat of organic, biodegradable materials such as coir fibers, straw or curled wood fiber, on or between photodegradable polypropylene or degradable natural fiber netting. The blanket is placed on the soil surface to protect from surface erosion.

Compost Berm – An erosion control device composed of linear mounds of compost placed along a slope to slow water movement and retain sediment.

Evaportranspiration (ET) – The combined loss of water from a given area, and during a specified period of time, by evaporation from the soil surface and by transpiration from plants.

Grasscycling – A turf management technique in which turf is mown frequently and clippings are left on the turf to return nutrients to the soil, thereby reducing fertilizer requirements by as much as 50%.

Hardscape – The hard-surface components of the landscape such as sidewalks, pavements, non-living features.

Hydrozone – A portion of a landscaped area having plants with similar water needs that are served by one irrigation valve or set of valves with the same schedule.

I.S.A. – International Society of Arboriculture, www.isa-arbor.com

Integrated Pest Management – A holistic approach to managing insects, plant disease, weeds and other pests so that their populations do not exceed a tolerable level by fostering an environment favorable for plants and other beneficial organisms and unfavorable for pests. If pest problems arise a variety of control techniques are considered, with least toxic pesticides being applied as a last resort.

Pesticide – As defined in Section 12753 of the California food and Agricultural Code, a pesticide includes any of the following: (a) Any spray adjuvant. (b) Any substance, or mixture of substances which is intended to be used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest, which may infest or be detrimental to vegetation, man, animals, or households, or be present in any agricultural or nonagricultural environment whatsoever. Antimicrobial agents are excluded from the definition of pesticide.

> "Toxicity Category I Pesticide Product" means any pesticide product that meets United States Environmental Protection Agency criteria for Toxicity Category I under Section 156.10 of Part 156 of Title 40 of the Code of Federal Regulations.
>
> "Toxicity Category II Pesticide Product" means any pesticide product that meets United States Environmental Protection Agency criteria for Toxicity Category II under Section 156.10 of Part 156 of Title 40 of the Code of Federal Regulations.

Sheet Mulching - A layered system of non-plastic weed barrier (e.g. recycled cardboard, newspaper) overlain by mulch that is used for soil improvement and weed control

Sock – Sleeve filled with mulch, straw, or other organic, biodegradable material to create long tube placed along a slope to slow water movement and retain sediment.

Tube – See sock.

Wattle – See sock.