

g. Identify soil amendments, type, and quantity;

h. Identify type and surface area of water features;

i. Identify hardscapes (pervious and non-pervious);

j. Identify location and installation details of any applicable stormwater best management practices that encourage on-site retention and infiltration of stormwater.

Stormwater best management practices are encouraged in the landscape design plan and examples include, but are not limited to:

(1) Infiltration beds, swales and basins that allow water to collect and soak into the ground;

(2) Constructed wetlands and retention ponds that retain water, handle excess flow and filter pollutants; and

(3) Pervious or porous surfaces that minimize runoff.

k. Identify any applicable rain harvesting or catchment technologies including but not limited to, rain gardens and cisterns;

l. Contain the following statement: "I have complied with the criteria of the ordinance and applied them for the efficient use of water in the landscape design plan;" and

m. Bear the signature of a licensed landscape architect, licensed landscape contractor or any other person authorized to design a landscape.

G. Irrigation Design Plan.

1. For the efficient use of water, an irrigation system shall meet all the requirements listed in this section and the manufacturers' recommendations. The irrigation system

and its related components shall be planned and designed to allow for proper installation, management, and maintenance. An irrigation design plan meeting the following design criteria shall be submitted as part of the Landscape Documentation Package.

a. System.

(1) Dedicated landscape water meters are highly recommended on landscape areas to facilitate water management.

(2) Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data shall be required for irrigation scheduling in all irrigation systems.

(3) The irrigation system shall be designed to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance.

(a) If the static pressure is above or below the required dynamic pressure of the irrigation system, pressure-regulating devices such as inline pressure regulators, booster pumps or other devices shall be installed to meet the required dynamic pressure of the irrigation system.

(b) Static water pressure, dynamic or operating pressure and flow reading of the water supply shall be measured at the point of connection. These pressure and flow measurements shall be conducted at the design stage. If the measurements are not available at the design stage, the measurements shall be conducted at installation.

(4) Sensors (rain, freeze, wind, etc.), either integral or auxiliary, that suspend or alter irrigation operation during unfavorable weather conditions shall be required on all irrigation systems, as appropriate for local climatic conditions. Irrigation should be avoided during windy or freezing weather or during rain.

(5) Manual shut-off valves, such as a gate valve, ball valve, or butterfly valve, shall be required, as close as possible to the point of connection of the water supply, to minimize water loss in case of an emergency, such as a main line break, or routine repair.

(6) Backflow prevention devices shall be required to protect the water supply from contamination by the irrigation system. A project applicant shall refer to the applicable chapters of the municipal code for additional backflow prevention requirements.

(7) High flow sensors that detect and report high flow conditions created by system damage or malfunction are recommended.

(8) The irrigation system shall be designed to prevent runoff, low head drainage, overspray, or other similar conditions where irrigation water flows onto non-targeted areas, such as adjacent property, non-irrigated areas, hardscapes, roadways or structures.

(9) Relevant information from the soil management plan, such as soil type and infiltration rate, shall be utilized when designing irrigation systems.

(10) The design of the irrigation system shall conform to the hydrozones of the landscape design plan.

(11) The irrigation system must be designed and installed to meet, at a minimum, the irrigation efficiency criteria as described in Section 13.22.040 D. regarding the Maximum Applied Water Allowance.

(12) The project applicant shall comply with the peak water operating demands (on the water supply system) or water restrictions that may impact the effectiveness of the irrigation system.

(13) In mulched planting areas, the use of low volume irrigation is required to maximize water infiltration into the root zone.

(14) Sprinkler heads and other emission devices shall have matched precipitation rates, unless otherwise directed by the manufacturer's recommendations.

(15) Head to head coverage is recommended. However, sprinkler spacing shall be designed to achieve the highest possible distribution uniformity using the manufacturer's recommendations.

(16) Swing joints or other riser-protection components are required on all risers subject to damage that are adjacent to high traffic areas.

(17) Check valves or anti-drain valves are required for all irrigation systems.

(18) Narrow or irregularly shaped areas, including turf, less than eight feet in width in any direction shall be irrigated with subsurface irrigation or low volume irrigation system.

(19) Overhead irrigation shall not be permitted within 24 inches of any non-permeable surface. Allowable irrigation within the setback from non-permeable surfaces may include drip, drip line, or other low flow non-spray technology. The setback area may be

planted or unplanted. The surfacing of the setback may be mulch, gravel, or other porous material. These restrictions may be modified if:

(a) The landscape area is adjacent to permeable surfacing and no runoff occurs; or

(b) The adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping; or

(c) The irrigation designer specifies an alternative design or technology, as part of the Landscape Documentation Package and clearly demonstrates strict adherence to irrigation system design criteria in Subsection (8). Prevention of overspray and runoff must be confirmed during the irrigation audit.

(20) Slopes greater than 25 percent shall not be irrigated with an irrigation system with a precipitation rate exceeding 0.75 inches per hour. This restriction may be modified if the landscape designer specifies an alternative design or technology, as part of the Landscape Documentation Package, and clearly demonstrates no runoff or erosion will occur. Prevention of runoff and erosion must be confirmed during the irrigation audit.

b. Hydrozone.

(1) Each valve shall irrigate a hydrozone with similar site, slope, sun exposure, soil conditions and plant materials with similar water use.

(2) Sprinkler heads and other emission devices shall be selected based on what is appropriate for the plant type within that hydrozone.

(3) Where feasible, trees shall be placed on separate valves from shrubs, groundcovers and turf.

(4) Individual hydrozones that mix plants of moderate and low water use or moderate and high water use, may be allowed if:

(a) Plant factor calculation is based on the proportions of the respective plant water uses and their plant factor; or

(b) The plant factor of the higher water using plant is used for calculations.

(5) Individual hydrozones that mix high and low water use plants shall not be permitted.

(6) On the landscape design plan and irrigation design plan, hydrozone areas shall be designated by number, letter or other designation. On the irrigation design plan, designate the areas irrigated by each valve, and assign a number to each valve.

2. The irrigation design plan, at a minimum shall contain:

a. Location and size of separate water meters for landscape;

b. Location, type and size of all components of the irrigation system, including controllers, main and lateral lines, valves, sprinkler heads, moisture sensing devices, rain switches, quick couplers, pressure regulators and backflow prevention devices;

c. Static water pressure at the point of connection to the public water supply;

d. Flow rate (gallons per minute), application rate (inches per hour) and design operating pressure (pressure per square inch) for each station;

e. Recycled water irrigation systems as specified in Section 13.22.040 N.;

f. The following statement: "I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the irrigation design plan;" and

g. The signature of a licensed landscape architect, certified irrigation designer, licensed landscape contractor or any other person authorized to design an irrigation system.

H. Grading Design Plan. For the efficient use of water, grading of a project site shall be designed to minimize soil erosion, runoff and water waste. A grading plan shall be submitted as part of the Landscape Documentation Package. A comprehensive grading plan prepared by a civil engineer for other local agency permits satisfies this requirement.

1. The project applicant shall submit a landscape grading plan that indicates finished configurations and elevations of the landscape area including:

- a. Height of graded slopes;
- b. Drainage patterns;
- c. Pad elevations;
- d. Finish grade; and
- e. Stormwater retention improvements, if applicable.

2. To prevent excessive erosion and runoff, it is highly recommended that project applicants:

- a. Grade so that all irrigation and normal rainfall remains within property lines and does not drain on to non-permeable hardscapes;
- b. Avoid disruption of natural drainage patterns and undisturbed soil; and
- c. Avoid soil compaction in landscape areas.

3. The grading design plan shall contain the following statement: "I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the grading design plan" and shall bear the signature of a licensed professional as authorized by law.

1. Certificate of Completion.

1. The Certificate of Completion shall include the following six elements:

a. Project information sheet that contains:

(1) Date;

(2) Project name;

(3) Project applicant name, telephone, and mailing address;

(4) Project address and location; and

(5) Property owner name, telephone, and mailing address;

b. Certification by either the signer of the landscape design plan, the signer of the irrigation design plan, or the licensed landscape contractor that the landscape project has been installed per the approved Landscape Documentation Package, where there have been significant changes made in the field during construction, these "as-built" or record drawings shall be included with the certification;

c. Irrigation scheduling parameters used to set the controller;

d. Landscape and irrigation maintenance schedule;

e. Irrigation audit report; and

f. Soil analysis report, if not submitted with Landscape Documentation Package, and documentation verifying implementation of soil report recommendations.

2. The project applicant shall:

a. Submit the signed Certificate of Completion to the City for review; and

b. Ensure that copies of the approved Certificate of Completion are submitted to the local water purveyor and property owner or his or her designee.

3. The City shall:

a. Receive the signed Certificate of Completion from the project applicant; and

b. Approve or deny the Certificate of Completion. If the Certificate of Completion is denied, the City shall provide information to the project applicant regarding reapplication, appeal or other assistance.

J. Irrigation Scheduling.

For the efficient use of water, all irrigation schedules shall be developed, managed, and evaluated to utilize the minimum amount of water required to maintain plant health.

Irrigation schedules shall meet the following criteria:

1. Irrigation scheduling shall be regulated by automatic irrigation controllers.

2. Overhead irrigation shall be scheduled between 8:00 p.m. and 9:00 a.m. unless weather conditions prevent it. If allowable hours of irrigation differ from Chapter 13.10 (Water Waste Prohibitions and Water Supply Shortage Plans), the stricter of the two shall apply. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.

3. For implementation of the irrigation schedule, particular attention must be paid to irrigation run times, emission device, flow rate, and current reference evapotranspiration, so that applied water meets the Estimated Total Water Use. Total annual applied water shall be less than or equal to Maximum Applied Water Allowance (MAWA). Actual irrigation schedules shall be regulated by automatic irrigation controllers using current reference evapotranspiration data (e.g., CIMIS) or soil moisture sensor data.

4. Parameters used to set the automatic controller shall be developed and submitted for each of the following:

- a. The plant establishment period;
- b. The established landscape; and
- c. Temporarily irrigated areas.

5. Each irrigation schedule shall consider for each station all of the following that apply:

- a. Irrigation interval (days between irrigation);
- b. Irrigation run times (hours or minutes per irrigation event to avoid runoff);
- c. Number of cycle starts required for each irrigation event to avoid runoff;
- d. Amount of applied water scheduled to be applied on a monthly basis;
- e. Application rate setting;
- f. Root depth setting;
- g. Plant type setting;
- h. Soil type;

i. Slope factor setting;

j. Shade factor setting; and

k. Irrigation uniformity or efficiency setting.

K. Landscape and Irrigation Maintenance Schedule.

1. Landscapes shall be maintained to ensure water use efficiency. A regular maintenance schedule shall be submitted with the Certificate of Completion.

2. A regular maintenance schedule shall include, but not be limited to, routine inspection; adjustment and repair of the irrigation system and its components; aerating and dethatching turf areas; replenishing mulch; fertilizing; pruning; weeding in all landscape areas and removing and obstruction to emission devices. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.

3. Repair of all irrigation equipment shall be done with the originally installed components or their equivalents.

4. A project applicant is encouraged to implement sustainable or environmentally-friendly practices for overall landscape maintenance.

L. Irrigation Audit, Irrigation Survey and Irrigation Water Use Analysis.

1. All landscape irrigation audits shall be conducted by a certified landscape irrigation auditor.

2. For new construction and rehabilitated landscape projects as described in Section 13.22.020:

a. The project applicant shall submit an irrigation audit report with the Certificate of Completion to the City including but not limited to: inspection, system tune-up, system test with distribution uniformity, reporting overspray or run off that causes overland flow, and preparation of an irrigation schedule; and

b. The City will administer a program for compliance with the Maximum Applied Water Allowance.

M. Irrigation Efficiency.

For the purpose of determining Maximum Applied Water Allowance, average irrigation efficiency is assumed to be 0.71. Irrigation systems shall be designed, maintained, and managed to meet or exceed an average landscape irrigation efficiency of 0.71.

N. Recycled Water.

1. The installation of recycled water irrigation systems shall allow for the current and future use of recycled water, unless a written exemption has been granted as described in Subsection 2.

2. Irrigation systems and decorative water features shall use recycled water unless a written exemption has been granted by the City stating that recycled water meeting all public health codes and standards is not available and will not be available for the foreseeable future.

3. All recycled water irrigation systems shall be designed and operated in accordance with all applicable City and State laws.

4. Landscapes using recycled water are considered Special Landscape Areas. The ET Adjustment Factor for Special Landscape Areas shall not exceed 1.0.

O. Stormwater Management.

1. Stormwater management practices minimize runoff and increase infiltration which recharges groundwater and improves water quality. Implementing stormwater best management practices into the landscape and grading design plans to minimize runoff and to increase on-site retention and infiltration are encouraged.

2. Project applicants shall refer to the City or Regional Water Quality Control Board for information on any applicable stormwater ordinances and stormwater management plans.

3. Rain gardens, cisterns, and other landscapes features and practices that increase rainwater capture and create opportunities for infiltration and/or onsite storage are recommended.

P. Public Education.

1. Publications. The City shall provide information to owners of new, single-family residential homes regarding the design, installation, management and maintenance of water efficient landscapes.

2. Model Homes. All model homes that are landscaped shall use signs and written information to demonstrate the principles of water efficient landscapes described in this ordinance.

a. Signs shall be used to identify the model as an example of a water efficient landscape featuring elements such as hydrozones, irrigation equipment and others that contribute to the overall water efficient theme.

b. Information shall be provided about designing, installing, managing, and maintaining water efficient landscapes.

Q. Environmental Review. The City must comply with the California Environmental Quality Act (CEQA), as appropriate, for each project.

13.22.050 – Provisions for Existing Landscapes.

A. Irrigation Audit, Irrigation Survey and Irrigation Water Use Analysis.

1. This section shall apply to all existing landscapes that were installed before January 1, 2010 and are over one acre in size.

a. For all landscapes in Subsection A.1. that have a water meter, the City shall administer programs that may include, but not be limited to, irrigation water use analyses, irrigation surveys and irrigation audits to evaluate water use and provide recommendations as necessary to reduce landscape water use to a level that does not exceed the Maximum Applied Water Allowance for existing landscapes. The Maximum Applied Water Allowance for existing landscapes shall be calculated as: $MAWA = (0.8)(ET_o)(LA)(0.62)$.

b. For all landscapes in Subsection A.1. that do not have a meter, the local agency shall administer programs that may include, but not be limited to, irrigation surveys and

irrigation audits to evaluate water use and provide recommendations as necessary in order to prevent water waste.

2. All landscape irrigation audits shall be conducted by a certified landscape irrigation auditor.

B. Water Waste Prevention.

1. Landscapes shall not waste water resulting from inefficient irrigation. Runoff from leaving the target landscape due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots or structures is prohibited.

2. Restrictions regarding overspray and runoff may be modified if:

a. The landscape area is adjacent to permeable surfacing and no runoff occurs; or

b. The adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping.

SECTION 3. The City Clerk shall certify the adoption of this ordinance and shall cause this ordinance to be published by title and summary.

SECTION 4. This ordinance shall take effect upon publication.

Signed and approved this _____ day of _____, 2010.

Bill Bogaard
Mayor of the City of Pasadena

I HEREBY CERTIFY that the foregoing ordinance was adopted by the City Council of the City of Pasadena at its meeting held this _____ day of _____, 2010, by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

Date Published:

Mark Jomsky, CMC
City Clerk

Approved as to form:

A handwritten signature in black ink, appearing to read "Theresa E. Fuentes", written over a horizontal line.

Theresa E. Fuentes
Assistant City Attorney

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