

Meeting Date: 11/17/2015

Report Type: Consent

Report ID: 2015-01039

Title: (Pass for Publication) Ordinance Relating to State Mandated Water Efficient Landscape Requirements

Location: Citywide

Recommendation: 1) Review an ordinance repealing and reenacting Chapter 15.92 in Title 15 of the Sacramento City Code relating to Water Efficient Landscape Requirements; and 2) pass for publication the ordinance title as required by City Charter section 32(c), with the ordinance to be considered for adoption on November 24, 2015.

Contact: Helen Selph, Associate Planner, (916) 808-7852, Community Development Department

Presenter: None

Department: Community Development Dept

Division: Long Range Planning

Dept ID: 21001222

Attachments:

- 1-Description/Analysis
- 2-Background - DWR Summary
- 3-Ordinance (Clean)
- 4-Ordinance (Redline)

City Attorney Review

Approved as to Form
Kourtney Burdick
11/12/2015 11:43:18 AM

Approvals/Acknowledgements

Department Director or Designee: Ryan Devore - 11/5/2015 3:56:20 PM

Description/Analysis

Issue Detail: On April 1, 2015, Governor Brown issued an Executive Order (EO B-29-15), directing the Department of Water Resources (DWR) to update the State's Model Water Efficient Landscape Ordinance (MWELo) through expedited regulation. The California Water Commission approved the revised MWELo on July 15, 2015. The Background summarizes the MWELo.

Local agencies (cities and counties) have until December 1, 2015, to adopt the MWELo or adopt their own ordinance, which must be at least as effective in conserving water as the MWELo. If local agencies do not take action by December 1, 2015, the MWELo becomes effective by default.

The City's Water Efficient Landscape Requirements (Chapter 15.92 of the Sacramento City Code), applies primarily to new landscapes in development projects. The Water Efficient Landscape Requirements were added to the City Code in 1992 in response to the Water Conservation in Landscaping Act, California Government Code, Sections 65591 et seq., and were later updated in 2009 to comply with a State-mandated update. DWR is now requiring another update. The draft Ordinance (Attachment 3) is essentially a reformatted version of the MWELo.

The most significant change in this recent update is that it will lower the size threshold for landscapes associated with new development projects that are subject to the ordinance. The previous size threshold ranged from 2,500 square feet to 5,000 square feet. The new threshold will include landscape areas as small as 500 square feet. This will require nearly every residential, commercial, industrial, and institutional new development project that requires a permit, plan check, or design review to undergo a comprehensive review of landscape plans at the time of building permit plan check.

Another significant change is that the update adds an annual reporting requirement for the City, the first of which is due December 31, 2015.

This update will also incorporate the following required changes to regulations for new and rehabilitated landscapes:

- Reduce "water budget" allowance for landscapes;
- Increase requirements for more efficient irrigation systems;
- Prohibit high water use plants, such as cool season turf, in median strips;
- Improve measures for onsite stormwater capture, such as improving soil friability;
- Provide incentives for graywater usage; and
- Create a new "prescriptive measures compliance option" for landscapes under 2,500 square feet.

Policy Considerations: The 2035 General Plan includes the following policy related to water-efficient landscapes in new development:

- **U 2.1.15 Landscaping.** The City shall continue to require the use of water-efficient and river-friendly landscaping in all new development, and shall use water conservation gardens (e.g.,

Glen Ellen Water Conservation Office) to demonstrate and promote water conserving landscapes.

Economic Impacts: None.

Environmental Considerations: The proposed ordinance is not subject to the provisions of the California Environmental Quality Act (CEQA), consistent with section 15061(b)(3) of the CEQA guidelines. Under this section, where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA.

Sustainability: The proposed ordinance is consistent with the City's sustainability goals because it will reduce water use in new residential landscapes by 20% and new commercial landscapes by 35% and will increase onsite storm-water capture.

Commission/Committee Action: None at this time.

Rationale for Recommendation: The DWR requires local agencies to update their Water Efficient Landscape Ordinances by December 1, 2015, in response to the severe drought that is affecting California. This recommendation is supported by the City's existing water conservation and sustainability policies.

Financial Considerations: Not applicable.

Local Business Enterprise (LBE): Not applicable.

Model Water Efficient Landscape Ordinance: 2015 Revision



Governor Brown's Drought Executive Order of April 1, 2015 (EO B-29-15) directed DWR to update the State's Model Water Efficient Landscape Ordinance (Ordinance) through expedited regulation. The California Water Commission approved the revised Ordinance on July 15, 2015.

Which Projects are Subject to the Ordinance?

New development projects that include landscape areas of 500 sq. ft. or more are subject to the Ordinance. This applies to residential, commercial, industrial and institutional projects that require a permit, plan check or design review. The previous landscape size threshold for new development projects ranged from 2500 sq. ft. to 5000 sq. ft.

The size threshold for existing landscapes that are being rehabilitated has not changed, remaining at 2500 sq. ft. Only rehabilitated landscapes that are associated with a building or landscape permit, plan check, or design review are subject to the Ordinance.

When Does the Ordinance Go into Effect?

Local agencies (cities and counties) have until December 1, 2015 to adopt the Ordinance or adopt their own ordinance, which must be at least as effective in conserving water as the State's Ordinance. Local agencies working together to develop a regional ordinance have until February 1, 2016 to adopt, but they are still subject to the December 2015 reporting requirements (see *Reporting Requirements* below). If a local agency does not take action on a water efficient landscape ordinance by the specified dates, the State's Ordinance becomes effective by default.

What are the Significant Revisions?

More Efficient Irrigation Systems

- Dedicated landscape water meters or submeters are required for residential landscapes over 5000 sq. ft. and non-residential landscapes over 1000 sq. ft.
- Irrigation systems are required to have pressure regulators and master shut-off valves.
- All irrigation emission devices must meet the national standard stated in the Ordinance to ensure that only high efficiency sprinklers are installed.
- Flow sensors that detect and report high flow conditions due to broken pipes and/or popped sprinkler heads are required for landscape areas greater than 5000 sq. ft.
- The minimum width of areas that can be overhead irrigated was changed from 8 feet to 10 feet; areas less than 10 feet wide must be irrigated with subsurface drip or other technology that produces no over spray or runoff.

Incentives for Graywater Usage

Landscapes under 2500 sq. ft. that are irrigated entirely with graywater or captured rainwater are subject only to the irrigation system requirements of Appendix D, Prescriptive Compliance Option.

Improvements in Onsite Stormwater Capture

Friable soil is required in planted areas to maximize water retention and infiltration. Four yards of compost per 1000 sq. ft. of area must be incorporated. Other recommended measures for increasing onsite stormwater retention are listed in the Ordinance.

Limiting the Portion of Landscapes that can be Planted with High Water Use Plants

The maximum amount of water that can be applied to a landscape is reduced from 70% of the reference evapotranspiration (ET_o) to 55% for residential landscape projects, and to 45% of ET_o for non-residential projects. This water allowance reduces the landscape area that can be planted with high water use plants such as cool season turf. For residential projects, the coverage of high water use plants is reduced from 33% to 25% of the landscaped area. In non-residential landscapes, planting with high water use plants is not feasible. However, unchanged in the Ordinance is the extra water allowance made for non-residential areas when used for specific functional areas, such as recreation and edible gardens. Extra water allowance is also made for landscapes irrigated with recycled water, as was the case in the previous ordinance.

The irrigation efficiency of devices used to irrigate landscapes is one of the factors that goes into determining the maximum amount of water allowed. Rather than having one default irrigation efficiency for the entire site, the revised Ordinance allows the irrigation efficiency to be entered for each area of the landscape. The site-wide irrigation efficiency of the previous ordinance was 0.71; the revised Ordinance defines the irrigation efficiency of drip as 0.81 and that of overhead spray as 0.75.

Median strips cannot be landscaped with high water use plants, precluding the use of cool season turf. Also because of the requirement to irrigate areas less than ten feet wide with subsurface irrigation or other means that produces no runoff or overspray, the use of cool season turf in parkways is limited.

Reporting Requirements

All local agencies will report on the implementation and enforcement of their ordinances to DWR by December 31, 2015. Local agencies developing a regional ordinance will report on their adopted regional ordinance by March 1, 2016. Reporting for all agencies will be due by January 31st of each year thereafter.

Prescriptive Checklist Option for Landscapes under 2500 sq. ft.

Projects with landscape areas under 2500 sq. feet may comply with the performance requirements of the Ordinance or conform to the prescriptive measures contained in Appendix D. Many will find that the Appendix D checklist simplifies compliance.

How Much Water Will Be Saved?

DWR estimates that a typical California landscape will use 12,000 gallons less a year, or 20 percent less than allowed by the 2009 ordinance. Commercial landscapes will cut water use by 35%. Over the next three years, it is predicted that 472,000 new homes associated with 20,000 acres of landscape will be built in California. With proper implementation and enforcement by local agencies, the Ordinance will lead to substantial water savings.

How Can I Get Additional Assistance?

In Fall 2015, DWR will release a guidance document to accompany the Ordinance. Training workshops for local agency staff and landscape professionals will be held throughout the State.

Contact Information:

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Updated 7/31/15

ORDINANCE NO.

Adopted by the Sacramento City Council

Date Adopted

AN ORDINANCE REPEALING AND ADDING CHAPTER 15.92 OF THE SACRAMENTO CITY CODE,
RELATING TO WATER EFFICIENT LANDSCAPE REQUIREMENTS

BE IT ENACTED BY THE COUNCIL OF THE CITY OF SACRAMENTO:

SECTION 1.

Chapter 15.92 of the Sacramento City Code is repealed.

SECTION 2.

Chapter 15.92 is added to the Sacramento City Code to read as follows:

Chapter 15.92 WATER EFFICIENT LANDSCAPE REQUIREMENTS

15.92.010 Purpose.

A. On April 1, 2015, Governor Jerry Brown issued Executive Order No. B-29-15 directing the California Department of Water Resources to update the state's model water efficient landscape ordinance. Local agencies, consistent with the Department's regulations and the Water Conservation in Landscaping Act (California Government Code sections 65591 et seq.), must, by December 1, 2015, adopt the model ordinance (as set forth in chapter 2.7 of division 2 of title 23 of the California Code of Regulations) or a water efficient landscape ordinance that is, based on evidence in the record, at least as effective in conserving water as the model ordinance.

B. The Legislature, in the Water Conservation in Landscaping Act, has made the following findings:

1. The waters of the state are of limited supply and are subject to ever increasing demands;
2. The continuation of California's economic prosperity is dependent on the availability of adequate supplies of water for future uses;
3. It is the policy of the state to promote the conservation and efficient use of water and to prevent the waste of this valuable resource;

4. Landscapes are essential to the quality of life in California by providing areas for active and passive recreation and as an enhancement to the environment by cleaning air and water, preventing erosion, offering fire protection, and replacing ecosystems lost to development;

5. Landscape design, installation, maintenance and management can and should be water efficient; and

6. Section 2 of Article X of the California Constitution specifies that the right to use water is limited to the amount reasonably required for the beneficial use to be served and the right does not extend to waste or unreasonable method of use.

C. Consistent with these legislative findings, the purpose of this chapter is to comply with the Water Conservation in Landscaping Act by adopting an ordinance based on the provisions of the updated model water efficient landscape ordinance issued by the California Department of Water Resources, that:

1. Promotes the values and benefits of landscaping practices that integrate and go beyond the conservation and efficient use of water;

2. Establishes a structure for planning, designing, installing, maintaining, and managing water efficient landscapes in new construction and rehabilitated landscape projects;

3. Establishes provisions for water management practices and water waste prevention for existing landscapes over one acre in size;

4. Promotes water efficiency by setting a maximum applied water allowance as an upper limit for water use and reducing water use to the lowest practical amount; and

5. Is consistent with landscape ordinances of neighboring local and regional agencies.

15.92.020 Applicability.

A. This chapter applies to all of the following landscape projects:

1. New construction projects with an aggregate landscape area equal to or greater than 500 square feet requiring a building or landscape permit, plan check, plan review, or design review;

2. Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, plan review, or design review;

3. Existing landscapes as described in section 15.92.220; and

4. Cemeteries. Recognizing the special landscape management needs of cemeteries, regulation of new and rehabilitated cemeteries is limited to sections 15.92.080, 15.92.150, and 15.92.160; and regulation of existing cemeteries is limited to section 15.92.220.

B. Any project with an aggregate landscape area of 2,500 square feet or less may comply with the performance requirements of this chapter or conform to the prescriptive measures contained in Appendix D.

C. For projects using treated or untreated graywater or rainwater captured on site, any lot or parcel within the project that has less than 2,500 square feet of landscape and meets the lot or parcel's landscape water requirement (estimated total water use) entirely with treated or untreated graywater or through stored rainwater captured on site is subject only to Appendix D section (5).

D. This chapter does not apply to:

1. Registered local, state, or federal historical sites;

2. Ecological restoration projects that do not require a permanent irrigation system;

3. Mined-land reclamation projects that do not require a permanent irrigation system; or

4. Existing plant collections, as part of botanical gardens and arboretums open to the public.

15.92.030 Fee.

A landscape documentation package application fee, to pay the City's administrative costs to process the application, is established and imposed pursuant to the terms of this chapter. The city council shall establish the fee amount by resolution.

15.92.040 Definitions.

As used in this chapter:

“Appendix A” means Appendix A, Reference Evapotranspiration (ET_o) Table, set out at the end of this chapter.

“Appendix B” means Appendix B, Sample Water Efficient Landscape Worksheet, set out at the end of this chapter.

“Appendix C” means Appendix C, Sample Certificate of Completion, set out at the end of this chapter.

“Appendix D” means Appendix D, Prescriptive Compliance Option, set out at the end of this chapter.

“Applied water” means the portion of water supplied by the irrigation system to the landscape.

“Automatic irrigation controller” means a timing device used to remotely control valves that operate an irrigation system. Automatic irrigation controllers are able to self-adjust and schedule irrigation events using either evapotranspiration (weather-based) or soil moisture data.

“Backflow prevention device” means a safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.

“Certificate of completion” means the document required under section 15.92.090.

“Certified irrigation designer” means a person certified to design irrigation systems by an accredited academic institution, a professional trade organization or other program such as the U.S. Environmental Protection Agency’s WaterSense irrigation designer certification program and Irrigation Association’s Certified Irrigation Designer program.

“Certified landscape irrigation auditor” means a person certified to perform landscape irrigation audits by an accredited academic institution, a professional trade organization or other program such as the U.S. Environmental Protection Agency’s WaterSense irrigation auditor certification program and Irrigation Association’s Certified Landscape Irrigation Auditor program.

“Check valve” or “anti-drain valve” means a valve located under a sprinkler head or other location in the irrigation system, to hold water in the system to prevent drainage from sprinkler heads when the sprinkler is off.

“Common interest developments” means community apartment projects, condominium projects, planned developments, and stock cooperatives per Civil Code section 4100.

“Compost” means the safe and stable product of controlled biologic decomposition of organic materials that is beneficial to plant growth.

“Conversion factor (0.62)” means the number that converts acre-inches per acre per year to gallons per square foot per year.

“Director” means the chief building official.

“Distribution uniformity” means the measure of the uniformity of irrigation water over a defined area.

“Drip irrigation” means any non-spray low volume irrigation system utilizing emission devices with a flow rate measured in gallons per hour. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

“Ecological restoration project” means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

“Effective precipitation” or “usable rainfall” (Eppt) means the portion of total precipitation that becomes available for plant growth.

“Emitter” means a drip irrigation emission device that delivers water slowly from the system to the soil.

“Established landscape” means the point at which plants in the landscape have developed significant root growth into the soil. Typically, most plants are established after one or two years of growth.

“Establishment period of the plants” means the first year after installing the plant in the landscape or the first two years if irrigation will be terminated after establishment. Typically, most plants are established after one or two years of growth. Native habitat mitigation areas and trees may need three to five years for establishment.

“Estimated total water use” (ETWU) means the total water used for the landscape as described in section 15.92.080.

“Evapotranspiration adjustment factor” (ETAF) means a factor of 0.55 for residential areas and 0.45 for non-residential areas, that, when applied to reference evapotranspiration, adjusts for plant factors and irrigation efficiency, two major influences upon the amount of water that needs to be applied to the landscape. The ETAF for new and existing (non-rehabilitated) special landscape areas shall not exceed 1.0. The ETAF for existing non-rehabilitated landscapes is 0.8.

“Evapotranspiration rate” means the quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time.

“Flow rate” means the rate at which water flows through pipes, valves and emission devices, measured in gallons per minute, gallons per hour, or cubic feet per second.

“Flow sensor” means an inline device installed at the supply point of the irrigation system that produces a repeatable signal proportional to flow rate. Flow sensors must be connected to an automatic irrigation controller, or flow monitor capable of receiving flow signals and operating master valves. This combination flow sensor/controller may also function as a landscape water meter or submeter.

“Friable” means a soil condition that is easily crumbled or loosely compacted down to a minimum depth per planting material requirements, whereby the root structure of newly planted material will be allowed to spread unimpeded.

“Fuel modification plan guideline” means guidelines from a local fire authority to assist residents and businesses that are developing land or building structures in a fire hazard severity zone.

“Graywater” means untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. “Graywater” includes, but is not limited to, wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs, but does not include wastewater from kitchen sinks or dishwashers.

“Hardscapes” means any durable material (pervious and non-pervious).

“Hydrozone” means a portion of the landscaped area having plants with similar water needs and rooting depth. A hydrozone may be irrigated or non-irrigated.

“Infiltration rate” means the rate of water entry into the soil expressed as a depth of water per unit of time (e.g., inches per hour).

“Invasive plant species” means species of plants not historically found in California that spread outside cultivated areas and can damage environmental or economic resources. Invasive species may be regulated by county agricultural agencies as noxious species. Lists of invasive plants are maintained at the California Invasive Plant Inventory and USDA invasive and noxious weeds database.

“Irrigation audit” means an in-depth evaluation of the performance of an irrigation system conducted by a Certified Landscape Irrigation Auditor. An irrigation audit includes, but is not limited to: inspection, system tune-up, system test with distribution uniformity or

emission uniformity, reporting overspray or runoff that causes overland flow, and preparation of an irrigation schedule. The audit must be conducted in a manner consistent with the Irrigation Association's Landscape Irrigation Auditor Certification program or other U.S. Environmental Protection Agency "WaterSense" labeled auditing program.

"Irrigation efficiency" (IE) means the measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The irrigation efficiency for purposes of this chapter are 0.75 for overhead spray devices and 0.81 for drip systems.

"Irrigation survey" means an evaluation of an irrigation system that is less detailed than an irrigation audit. An irrigation survey includes, but is not limited to: inspection, system test, and written recommendations to improve performance of the irrigation system.

"Irrigation water use analysis" means an analysis of water use data based on meter readings and billing data.

"Landscape architect" means a person who holds a license to practice landscape architecture in the State of California under Business and Professions Code section 5615.

"Landscape area" means all the planting areas, turf areas, and water features in a landscape design plan subject to the maximum applied water allowance calculation. The landscape area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or non-pervious hardscapes, and other non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation).

"Landscape contractor" means a person licensed by the State of California to construct, maintain, repair, install, or subcontract the development of landscape systems.

"Landscape documentation package" means the documents required under section 15.92.070.

"Landscape project" means total area of landscape in a project as defined in "landscape area."

"Landscape water meter" means an inline device installed at the irrigation supply point that measures the flow of water into the irrigation system and is connected to a totalizer to record water use.

“Lateral line” means the water delivery pipeline that supplies water to the emitters or sprinklers from the valve.

“Local water purveyor” means the City of Sacramento, or any other public or private entity that provides retail water service.

“Low volume irrigation” means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip, drip lines, and bubblers. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

“Main line” means the pressurized pipeline that delivers water from the water source to the valve or outlet.

“Master shut-off valve” is an automatic valve installed at the irrigation supply point that controls water flow into the irrigation system. When this valve is closed water will not be supplied to the irrigation system. A master valve will greatly reduce any water loss due to a leaky station valve.

“Maximum applied water allowance” (MAWA) means the upper limit of annual applied water for the established landscaped area as specified in section 15.92.080. It is based upon the area’s reference evapotranspiration, the ET Adjustment Factor, and the size of the landscape area. The estimated total water use shall not exceed the maximum applied water allowance. Special landscape areas, including recreation areas, areas permanently and solely dedicated to edible plants such as orchards and vegetable gardens, and areas irrigated with recycled water are subject to the MAWA with an ETAF not to exceed 1.0. $MAWA = (ET_o) (0.62) [(ETAF \times LA) + ((1-ETAF) \times SLA)]$.

“Median” is an area between opposing lanes of traffic that may be unplanted or planted with trees, shrubs, perennials, and ornamental grasses.

“Microclimate” means the climate of a small, specific area that may contrast with the climate of the overall landscape area due to factors such as wind, sun exposure, plant density, or proximity to reflective surfaces.

“Mined-land reclamation projects” means any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.

“Mulch” means any organic material such as leaves, bark, straw, compost, or inorganic mineral materials such as rocks, gravel, or decomposed granite left loose and applied to the soil surface for the beneficial purposes of reducing evaporation, suppressing weeds, moderating soil temperature, and preventing soil erosion.

“New construction” means, for the purposes of this chapter, a new building with a landscape or other new landscape, such as a park, playground, or greenbelt without an associated building.

“Non-residential landscape” means landscapes in commercial, institutional, industrial and public settings that may have areas designated for recreation or public assembly. It also includes portions of common areas of common interest developments with designated recreational areas.

“Operating pressure” means the pressure at which the parts of an irrigation system are designed by the manufacturer to operate.

“Overhead sprinkler irrigation systems” or “overhead spray irrigation systems” means systems that deliver water through the air (e.g., spray heads and rotors).

“Overspray” means the irrigation water that is delivered beyond the target area.

“Parkway” means the area between a sidewalk and the curb or traffic lane. It may be planted or unplanted, and with or without pedestrian egress.

“Permit” means an authorizing document issued for new construction or rehabilitated landscapes.

“Pervious” means any surface or material that allows the passage of water through the material and into the underlying soil.

“Plant factor” or “plant water use factor” is a factor, when multiplied by ETo, estimates the amount of water needed by plants. For purposes of this chapter, the plant factor range for very low water use plants is 0 to 0.1, the plant factor range for low water use plants is 0.1 to 0.3, the plant factor range for moderate water use plants is 0.4 to 0.6, and the plant factor range for high water use plants is 0.7 to 1.0. Plant factors cited in this chapter are derived from the publication “Water Use Classification of Landscape Species.” Plant factors may also be obtained from horticultural researchers from academic institutions or professional associations as approved by the California Department of Water Resources.

“Project applicant” means the individual or entity submitting a landscape documentation package required under section 15.92.070 to request a permit, plan check, plan review, or design review from the city. A project applicant may be the property owner or his or her designee.

“Rain sensor” or “rain sensing shutoff device” means a component that automatically suspends an irrigation event when it rains.

“Record drawing” or “as-builts” means a set of reproducible drawings that show significant changes in the work made during construction and that are usually based on drawings marked up in the field and other data furnished by the contractor.

“Recreational area” means areas, excluding private single family residential areas, designated for active play, recreation or public assembly in parks, sports fields, picnic grounds, amphitheaters or golf course tees, fairways, roughs, surrounds and greens.

“Recycled water,” “reclaimed water,” or “treated sewage effluent water” means treated or recycled waste water of a quality suitable for nonpotable uses such as landscape irrigation and water features. This water is not intended for human consumption.

“Reference evapotranspiration” or “ET_o” means a standard measurement of environmental parameters that affect the water use of plants. ET_o is expressed in inches per day, month, or year as represented in Appendix A, and is an estimate of the evapotranspiration of a large field of four- to seven-inch tall, cool-season grass that is well watered. Reference evapotranspiration is used as the basis of determining the maximum applied water allowances so that regional differences in climate can be accommodated.

“Rehabilitated landscape” means any re-landscaping project that requires a permit, plan check, plan review, or design review, meets the requirements of section 15.92.020, and the modified landscape area is equal to or greater than 2,500 square feet.

“Residential landscape” means landscapes surrounding single or multifamily homes.

“Run off” means water that is not absorbed by the soil or landscape to which it is applied and flows from the landscape area. For example, run off may result from water that is applied at too great a rate (application rate exceeds infiltration rate) or when there is a slope.

“Soil moisture sensing device” or “soil moisture sensor” means a device that measures the amount of water in the soil. The device may also suspend or initiate an irrigation event.

“Soil texture” means the classification of soil based on its percentage of sand, silt, and clay.

“Special landscape area” (SLA) means an area of the landscape dedicated solely to edible plants, recreational areas, areas irrigated with recycled water, or water features using recycled water.

“Sprinkler head” or “spray head” means a device that delivers water through a nozzle.

“Static water pressure” means the pipeline or municipal water supply pressure when water is not flowing.

“Station” means an area served by one valve or by a set of valves that operate simultaneously.

“Swing joint” means an irrigation component that provides a flexible, leak-free connection between the emission device and lateral pipeline to allow movement in any direction and to prevent equipment damage.

“Submeter” means a metering device to measure water applied to the landscape that is installed after the primary utility water meter.

“Turf” means a ground cover surface of mowed grass. Annual bluegrass, Kentucky bluegrass, Perennial ryegrass, Red fescue, and Tall fescue are cool-season grasses. Bermudagrass, Kikuyugrass, Seashore Paspalum, St. Augustinegrass, Zoysiagrass, and Buffalo grass are warm-season grasses.

“Valve” means a device used to control the flow of water in the irrigation system.

“Water conserving plant species” means a plant species identified as having a very low or low plant factor.

“Water feature” means a design element where open water performs an aesthetic or recreational function. Water features include ponds, lakes, waterfalls, fountains, artificial streams, spas, and swimming pools (where water is artificially supplied). The surface area of water features is included in the high water use hydrozone of the landscape area. Constructed wetlands used for on-site wastewater treatment or stormwater best management practices that are not irrigated and used solely for water treatment or stormwater retention are not water features and, therefore, are not subject to the water budget calculation.

“Watering window” means the time of day irrigation is allowed.

“WUCOLS” means the Water Use Classification of Landscape Species published by the University of California Cooperative Extension and the Department of Water Resources, 2014.

15.92.050 Landscape documentation package—Required.

No person shall construct or install a new landscape project or rehabilitated landscape project unless a landscape documentation package for the project has been approved by the director.

15.92.060 Landscape documentation package—Submittal—Action by director.

A. Prior to construction of a landscape project, the project applicant shall submit a completed landscape documentation package to the director.

B. Prior to construction of a landscape project, the director shall:

1. Provide the project applicant with the procedures for permits, plan checks, plan reviews, or design reviews;

2. Review the landscape documentation package submitted by the project applicant;

3. Approve or deny the landscape documentation package;

4. Issue a permit or approve the plan check, plan review, or design review for the project applicant; and

5. Upon approval of the landscape documentation package, submit a copy of the water efficient landscape worksheet to the local water purveyor.

C. Upon approval of the landscape documentation package by the director, the project applicant shall:

1. Receive a permit or approval of the plan check, plan review, or design review and record the date of the permit in the certificate of completion;

2. Submit a copy of the approved landscape documentation package along with the record drawings, and any other information to the property owner or designee; and

3. Submit a copy of the water efficient landscape worksheet to the local water purveyor.

15.92.070 Landscape documentation package—Application—Contents— Fee.

A. The landscape documentation package shall include the following six elements:

1. The following project information:

a. Date of application;

b. Project applicant;

- c. Project address (if available, parcel and/or lot number(s));
- d. Total landscape area (square feet);
- e. Project type (e.g., new, rehabilitated, public, private, cemetery, homeowner-installed);
- f. Water supply type (e.g., potable, recycled, private well) and the local water purveyor if the applicant is not served by a private well;
- g. Checklist of all documents in landscape documentation package;
- h. Project contacts to include contact information for the project applicant and property owner; and
- i. Applicant signature and date with statement: "I agree to comply with the requirements of Sacramento City Code Chapter 15.92 and submit a complete landscape documentation package."

2. The project's water efficient landscape worksheet, including the:

- a. Hydrozone information table; and
- b. Water budget calculations, including:
 - i. The maximum applied water allowance (MAWA), and
 - ii. The estimated total water use (ETWU);
- 3. A soil management report;
- 4. A landscape design plan;
- 5. An irrigation design plan; and
- 6. A grading design plan.

B. The package shall be accompanied by payment of the nonrefundable landscape document package application fee.

15.92.080 Water efficient landscape worksheet.

A. A project applicant shall complete the Water Efficient Landscape Worksheet in Appendix B, that contains information on the plant factor, irrigation method, irrigation efficiency, and area associated with each hydrozone. Calculations are then made to show that the ETAF for the landscape project does not exceed a factor of 0.55 for residential areas and 0.45 for non-residential areas, exclusive of special landscape areas. The ETAF for a landscape project is based on the plant factors and irrigation methods selected. The maximum applied water allowance is calculated based on the maximum ETAF allowed (0.55 for residential areas and 0.45 for non-residential areas) and expressed as annual gallons required. The ETWU is calculated based on the plants used and irrigation method selected for the landscape design. ETWU must be below the MAWA.

1. In calculating the maximum applied water allowance and estimated total water use, a project applicant shall use the ETo values from the Reference Evapotranspiration Table in Appendix A.

B. Water budget calculations shall adhere to the following requirements:

1. The plant factor used shall be from WUCOLS or from horticultural researchers with academic institutions or professional associations as approved by the California Department of Water Resources. The plant factor ranges from 0 to 0.1 for very low water using plants, from 0.1 to 0.3 for low water use plants, from 0.4 to 0.6 for moderate water use plants, and from 0.7 to 1.0 for high water use plants.

2. All water features shall be included in the high water use hydrozone and temporarily irrigated areas shall be included in the low water use hydrozone.

3. All special landscape areas shall be identified and their water use calculated as shown in Appendix B.

4. ETAF for new and existing (non-rehabilitated) special landscape areas shall not exceed 1.0.

15.92.090 Soil management report.

To reduce runoff and encourage healthy plant growth, the project applicant, or the project applicant's designee, shall complete, submit, and implement a soil management report as provided in this section.

A. Submit soil samples to a laboratory for analysis and recommendations, in accordance with the following:

1. Soil sampling shall be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plants.

2. The soil analysis shall include:
 - a. Soil texture;
 - b. Infiltration rate determined by laboratory test or soil texture infiltration rate table;
 - c. pH;
 - d. Total soluble salts;
 - e. Sodium;
 - f. Percent organic matter; and
 - g. Recommendations.

3. In projects with multiple landscape installations (i.e. production home developments) a soil sampling rate of 1 in 7 lots or approximately 15% will satisfy this requirement. Large landscape projects shall sample at a rate equivalent to 1 in 7 lots.

B. The project applicant, or the project applicant's designee, shall comply with one of the following:

1. If significant mass grading is not planned, the soil analysis report shall be submitted to the city as part of the landscape documentation package; or

2. If significant mass grading is planned, the soil analysis report shall be submitted to the city as part of the certificate of completion.

C. The soil analysis report shall be made available, in a timely manner, to the professionals preparing the landscape design plans and irrigation design plans to make any necessary adjustments to the design plans.

D. The project applicant, or the project applicant's designee, shall submit documentation verifying implementation of soil analysis report recommendations to the city with the certificate of completion.

15.92.100 Landscape design plan.

A. For the efficient use of water, a landscape shall be carefully designed and planned for the intended function of the project. A landscape design plan meeting the

following design criteria shall be submitted as part of the landscape documentation package.

1. Plant Material

a. Any plant may be selected for the landscape, providing the estimated total water use in the landscape area does not exceed the maximum applied water allowance. Methods to achieve water efficiency shall include one or more of the following:

- i. Protection and preservation of native species and natural vegetation;
- ii. Selection of water-conserving plant, tree, and turf species, especially local native plants;
- iii. Selection of plants based on local climate suitability, disease and pest resistance;
- iv. Selection of trees based on applicable local tree ordinances or tree shading guidelines, and size at maturity as appropriate for the planting area; and selection of plants from local and regional landscape program plant lists.
- v. Selection of plants from local fuel modification plan guidelines.

b. Each hydrozone shall have plant materials with similar water use, with the exception of hydrozones with plants of mixed water use, as specified in section 15.92.110.A.2.d.

c. Plants shall be selected and planted appropriately based upon their adaptability to the climatic, geologic, and topographical conditions of the project site. Methods to achieve water efficiency shall include one or more of the following:

- i. Use the Sunset Western Climate Zone System, that takes into account temperature, humidity, elevation, terrain, latitude, and varying degrees of continental and marine influence on local climate;
- ii. Recognize the horticultural attributes of plants (i.e., mature plant size, invasive surface roots) to minimize damage to property or infrastructure (e.g., buildings, sidewalks, power lines); allow for adequate soil volume for healthy root growth; and
- iii. Consider the solar orientation for plant placement to maximize summer shade and winter solar gain.

d. Turf is not allowed on slopes greater than 25% where the toe of the slope is adjacent to an impermeable hardscape and where 25% means one foot of vertical elevation change for every four feet of horizontal length (rise divided by run x 100 = slope percent).

e. High water use plants, characterized by a plant factor of 0.7 to 1.0, are prohibited in street medians.

f. A landscape design plan for projects in fire-prone areas shall address fire safety and prevention. A defensible space or zone around a building or structure is required under California Public Resources Code section 4291(a) and (b). Avoid fire-prone plant materials and highly flammable mulches.

g. The use of invasive plant species, such as those listed by the California Invasive Plant Council, is strongly discouraged.

h. The architectural guidelines of a common interest development shall not prohibit or include conditions that have the effect of prohibiting the use of low-water use plants as a group.

2. Water Features

a. Recirculating water systems shall be used for water features.

b. Where available, recycled water shall be used as a source for decorative water features.

c. Surface area of a water feature shall be included in the high water use hydrozone area of the water budget calculation.

d. Pool and spa covers are highly recommended.

3. Soil Preparation, Mulch, and Amendments

a. Prior to the planting of any materials, compacted soils shall be transformed to a friable condition. On engineered slopes, only amended planting holes need meet this requirement.

b. Soil amendments shall be incorporated according to recommendations of the soil report and what is appropriate for the plants selected (see section 15.92.090).

c. For landscape installations, compost at a rate of a minimum of four cubic yards per 1,000 square feet of permeable area shall be incorporated to a depth of six

inches into the soil. Soils with greater than six percent organic matter in the top six inches of soil are exempt from adding compost and tilling.

d. A minimum three-inch layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers, or direct seeding applications where mulch is contraindicated. To provide habitat for beneficial insects and other wildlife, up to five percent of the landscape area may be left without mulch. Designated insect habitat must be included in the landscape design plan as such.

e. Stabilizing mulching products shall be used on slopes that meet current engineering standards.

f. The mulching portion of the seed/mulch slurry in hydro-seeded applications shall meet the mulching requirement.

g. Organic mulch materials made from recycled or post-consumer materials shall take precedence over inorganic materials or virgin forest products unless the recycled post-consumer organic products are not locally available. Organic mulches are not required where prohibited by local fuel modification plan guidelines or other provisions of the city code.

B. The landscape design plan, at a minimum, shall:

1. Delineate and label each hydrozone by number, letter, or other method;
2. Identify each hydrozone as low, moderate, high water, or mixed water use. Temporarily irrigated areas of the landscape shall be included in the low water use hydrozone for the water budget calculation;
3. Identify recreational areas;
4. Identify areas permanently and solely dedicated to edible plants;
5. Identify areas irrigated with recycled water;
6. Identify type of mulch and application depth;
7. Identify soil amendments, type, and quantity;
8. Identify type and surface area of water features;
9. Identify hardscapes (pervious and non-pervious);

10. Identify location, installation details, and 24-hour retention or infiltration capacity of any applicable stormwater best management practices that encourage on-site retention and infiltration of stormwater. Project applicants shall refer to chapter 13.16 (stormwater management and discharge control) and the Central Valley Regional Water Quality Control Board for information on any applicable stormwater technical requirements. Stormwater best management practices are encouraged in the landscape design plan and examples are provided in section 15.92.200.

11. Identify any applicable rain harvesting or catchment technologies as discussed in section 15.92.200 and their 24-hour retention or infiltration capacity;

12. Identify any applicable graywater discharge piping, system components and areas of distribution;

13. Contain the following statement: "I have complied with the criteria of Sacramento City Code Chapter 15.92 and applied them for the efficient use of water in the landscape design plan"; and

14. Bear the signature of a licensed landscape architect, licensed landscape contractor, or any other person authorized to design a landscape. (See sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the California Business and Professions Code, section 832.27 of title 16 of the California Code of Regulations, and section 6721 of the California Food and Agriculture Code.)

15.92.110 Irrigation design plan.

A. This section applies to landscaped areas requiring permanent irrigation, not areas that require temporary irrigation solely for the plant establishment period. 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.

1. Irrigation System

a. Landscape water meters, defined as either a dedicated water service meter or private submeter, shall be installed for all non-residential irrigated landscapes of 1,000 square feet but not more than 5,000 square feet (the level at which California Water Code section 535 applies) and residential irrigated landscapes of 5,000 square feet or greater. A landscape water meter may be either:

i. A customer service meter dedicated to landscape use provided by the local water purveyor; or

- ii. A privately owned meter or submeter.
- b. Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data utilizing non-volatile memory shall be required for irrigation scheduling in all irrigation systems.
- c. If the water pressure is below or exceeds the recommended pressure of the specified irrigation devices, the installation of a pressure regulating device is required to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance.
- i. 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.
- ii. 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.
- d. 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.
- e. 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.
- f. Backflow prevention devices approved by the director and in compliance with section 13.04.240 of this code shall be required to protect the water supply from contamination by the irrigation system.
- g. Flow sensors that detect high flow conditions created by system damage or malfunction are required for all on non-residential landscapes and residential landscapes of 5,000 square feet or larger.
- h. Master shut-off valves are required on all projects except landscapes that make use of technologies that allow for the individual control of sprinklers that are individually pressurized in a system equipped with low pressure shut down features.

- i. 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.
- j. Relevant information from the soil management plan, such as soil type and infiltration rate, shall be utilized when designing irrigation systems.
- k. The design of the irrigation system shall conform to the hydrozones of the landscape design plan.
- l. The irrigation system must be designed and installed to meet, at a minimum, the irrigation efficiency criteria as described in section 15.92.080 regarding the maximum applied water allowance.
- m. All irrigation emission devices must meet the requirements set in the American National Standards Institute (ANSI) standard, American Society of Agricultural and Biological Engineers'/International Code Council's (ASABE/ICC) 802-2014 "Landscape Irrigation Sprinkler and Emitter Standard." All sprinkler heads installed in the landscape must document a distribution uniformity low quarter of 0.65 or higher using the protocol defined in ASABE/ICC 802-2014.
- n. The project applicant shall consult with the local water purveyor about peak water operating demands (on the water supply system) or water restrictions that may impact the effectiveness of the irrigation system.
- o. In mulched planting areas, the use of low volume irrigation is required to maximize water infiltration into the root zone.
- p. Sprinkler heads and other emission devices shall have matched precipitation rates, unless otherwise directed by the manufacturer's recommendations.
- q. Head to head coverage is recommended. However, sprinkler spacing shall be designed to achieve the highest possible distribution uniformity using the manufacturer's recommendations.
- r. Swing joints or other riser-protection components are required on all risers subject to damage that are adjacent to hardscapes or in high traffic areas of turfgrass.
- s. Check valves or anti-drain valves are required on all sprinkler heads where low point drainage could occur.

t. Areas less than ten feet in width in any direction shall be irrigated with subsurface irrigation or other means that produces no runoff or overspray.

u. 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:

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

ii. The adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping; or

iii. 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 section 15.92.110.A.1.i. Prevention of overspray and runoff must be confirmed during the irrigation audit.

v. Slopes greater than 25% shall not be irrigated with an irrigation system with an application 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.

1. Hydrozone

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

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

c. Where feasible, trees shall be placed on separate valves from shrubs, groundcovers, and turf to facilitate the appropriate irrigation of trees. The mature size and extent of the root zone shall be considered when designing irrigation for the tree.

d. Individual hydrozones that mix plants of moderate and low water use, or moderate and high water use, may be allowed if:

i. The plant factor calculation is based on the proportions of the respective plant water uses and their plant factor; or

- ii. The plant factor of the higher water using plant is used for calculations.
- e. Individual hydrozones that mix high and low water use plants shall not be permitted.

f. 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. Use this valve number in the Hydrozone Information Table (see Appendix B, Section A). This table can also assist with the irrigation audit and programming the controller.

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

- 1. The location and size of separate water meters for landscape;
- 2. The 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;
- 3. The static water pressure at the point of connection to the public water supply;
- 4. The flow rate (gallons per minute), application rate (inches per hour), and design operating pressure (pressure per square inch) for each station;
- 5. The recycled water irrigation systems as specified in section 15.92.180;
- 6. The following statement: "I have complied with the criteria of Chapter 15.92 of the Sacramento City Code and applied them accordingly for the efficient use of water in the irrigation design plan"; and
- 7. The signature of a licensed landscape architect, certified irrigation designer, licensed landscape contractor, or any other person authorized to design an irrigation system. (See sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the California Business and Professions Code, section 832.27 of title 16 of the California Code of Regulations, and section 6721 of the California Food and Agricultural Code.)

15.92.120 Grading design plan.

A. 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 grading plan prepared by a civil engineer that meets the minimum criteria specified in this section and submitted pursuant to chapter 15.88 (grading, erosion, and sediment control) 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. The grading design plan shall contain the following statement: "I have complied with the criteria of Sacramento City Code Chapter 15.92 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.

B. The project applicant shall comply with any additional requirements specified in chapter 15.88 and any regulations or other requirements adopted to implement or administer chapter 15.88.

15.92.130 Certificate of completion.

A. A certificate of completion in substantial conformance with Appendix C shall include the following six elements:

1. Project information sheet that contains:
 - a. Date;
 - b. Project name;
 - c. Project applicant name, telephone, and mailing address;
 - d. Project address and location; and
 - e. Property owner name, telephone, and mailing address;

2. 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;

a. Where there have been significant changes made in the field during construction, these "as-built" or record drawings shall be included with the certification;

b. A diagram of the irrigation plan showing hydrozones shall be kept with the irrigation controller for subsequent management purposes.

3. The irrigation scheduling parameters used to set the controller (see section 15.92.140);

4. The landscape and irrigation maintenance schedule (see section 15.92.150);

5. The irrigation audit report (see section 15.92.160); and

6. The soil analysis report (if not submitted with the landscape documentation package) and documentation verifying implementation of soil report recommendations (see section 15.92.090).

B. The project applicant shall:

1. Submit the signed certificate of completion to the city for review; and

2. Ensure that copies of the approved certificate of completion are submitted to the local water purveyor and property owner or his or her designee.

C. The director shall approve or deny the certificate of completion. If the certificate of completion is denied, the director shall provide information to the project applicant regarding reapplication, appeal, or other assistance.

15.92.140 Irrigation scheduling.

A. 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 in accordance with the requirements of article XI of chapter 13.04 (outdoor water conservation).

3. For implementation of the irrigation schedule, particular attention shall be paid to irrigation run times, emission device, flow rate, and current reference evapotranspiration, so that applied water meets the ETWU. Total annual applied water shall be less than or equal to the MAWA. Actual irrigation schedules shall be regulated by automatic irrigation controllers using current reference evapotranspiration data or soil moisture sensor data.

4. Parameters used to set the automatic controller shall be developed and submitted with the certificate of completion 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.

15.92.150 Landscape and irrigation maintenance schedule.

A. Landscapes shall be maintained to ensure water use efficiency. A regular maintenance schedule shall be submitted with the certificate of completion.

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

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

D. A project applicant is encouraged to implement established landscape industry sustainable best practices for all landscape maintenance activities.

15.92.160 Irrigation audit, irrigation survey, and irrigation water use analysis.

A. All landscape irrigation audits shall be conducted by a city landscape irrigation auditor or a third party certified landscape irrigation auditor. Landscape audits shall not be conducted by the person who designed the landscape or installed the landscape.

B. In large projects or projects with multiple landscape installations (i.e. production home developments), an auditing rate of 1 in 7 lots or approximately 15% will satisfy this requirement.

C. For new construction and rehabilitated landscape projects installed after December 1, 2015, as described in section 15.92.020:

1. The project applicant shall submit an irrigation audit report with the certificate of completion to the city that may include, but is 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, including configuring irrigation controllers with application rate, soil types, plant factors, slope, exposure and any other factors necessary for accurate programming;

2. The director shall develop and administer programs that may include, but not be limited to, irrigation water use analysis, irrigation audits, and irrigation surveys for compliance with the maximum applied water allowance.

15.92.170 Irrigation efficiency.

For the purpose of determining estimated total water use, average irrigation efficiency is assumed to be 0.75 for overhead spray devices and 0.81 for drip system devices.

15.92.180 Recycled water.

A. The installation of recycled water irrigation systems shall allow for the current and future use of recycled water.

B. All recycled water irrigation systems shall be designed and operated in accordance with all applicable local and state laws.

C. Landscapes using recycled water are considered special landscape areas. The ETAF for new and existing (non-rehabilitated) special landscape areas shall not exceed 1.0.

15.92.190 Graywater systems.

Graywater systems promote the efficient use of water and are encouraged to assist in on-site landscape irrigation. All graywater systems shall conform to chapters 16 and 16A of part 5 of the California Code of Regulations.

15.92.200 Stormwater management and rainwater retention.

A. 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 rainwater retention and infiltration are encouraged.

B. Project applicants shall comply with all applicable provisions of chapter 13.16 of this code and any regulations or other requirements adopted to implement or administer chapter 13.16.

C. All planted landscape areas are required to have friable soil to maximize water retention and infiltration as required by section 15.92.100.A.3.

D. It is strongly recommended that landscape areas be designed for capture and infiltration capacity that is sufficient to prevent runoff from impervious surfaces (i.e. roof and paved areas) from either: (1) the one inch, 24-hour rain event; or (2) the 85th percentile, 24-hour rain event, or additional capacity as required by any applicable local, regional, state, or federal regulation.

E. It is recommended that stormwater projects incorporate any of the following elements to improve on-site storm water and dry weather runoff capture and use:

1. Grade impervious surfaces, such as driveways, during construction to drain to vegetated areas.
2. Minimize the area of impervious surfaces such as paved areas, roof and concrete driveways.
3. Incorporate pervious or porous surfaces (e.g., gravel, permeable pavers or blocks, pervious or porous concrete) that minimize runoff.
4. Direct runoff from paved surfaces and roof areas into planting beds or landscaped areas to maximize site water capture and reuse.
5. Incorporate rain gardens, cisterns, and other rain harvesting or catchment systems.
6. Incorporate infiltration beds, swales, basins and drywells to capture storm water and dry weather runoff and increase percolation into the soil.
7. Consider constructed wetlands and ponds that retain water, equalize excess flow, and filter pollutants.

15.92.210 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 chapter.

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. Signage shall include information about the site water use as designed in accordance with this chapter; specify who designed and installed the water efficient landscape; and demonstrate low water use approaches to landscaping such as using native plants, graywater systems, and rainwater catchment systems.

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

15.92.220 Provisions for existing landscapes.

A. This section applies to existing landscapes over one acre in size that were installed before December 1, 2015.

B. For existing landscapes that have metered water service, the city may conduct or may require the property owner to provide 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 MAWA for existing landscapes. The MAWA for existing landscapes shall be calculated as: $MAWA = (0.8) (ET_o)(LA)(0.62)$.

C. For existing landscapes that do not have metered water service, the city may conduct or may require the property owner to provide irrigation surveys and irrigation audits to evaluate water use and provide recommendations as necessary to prevent water waste.

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

15.92.230 Effective precipitation.

The director may consider effective precipitation (25% of annual precipitation) in tracking water use and may use the following equations to calculate maximum applied water allowance:

A. For residential areas: $MAWA = (ET_o - Eppt) (0.62) [(0.55 \times LA) + (0.45 \times SLA)]$; or

B. For non-residential areas: $MAWA = (ET_o - EPPT) (0.62) [(0.45 \times LA) + (0.55 \times SLA)]$.

15.92 Appendix A. Reference evapotranspiration (ETo) table.

City of Sacramento	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
	1.0	1.8	3.2	4.7	6.4	7.7	8.4	7.2	5.4	3.7	1.7	.9

15.92 Appendix B. Sample water efficient landscape worksheet.

WATER EFFICIENT LANDSCAPE WORKSHEET

This worksheet is filled out by the project applicant and it is a required element of the Landscape Documentation Package.

Reference Evapotranspiration (ET_o)

Hydrozone # /Planting Description ^a	Plant Factor (PF)	Irrigation Method ^b	Irrigation Efficiency (IE) ^c	ETAF (PF/IE)	Landscape Area (sq. ft.)	ETAF x Area	Estimated Total Water Use (ETWU) ^e	
Regular Landscape Areas								
				Totals	(A)	(B)		
Special Landscape Areas								
				1				
				1				
				1				
				Totals	(C)	(D)		
			ETWU Total					
			Maximum Allowed Water Allowance (MAWA) ^e					

^aHydrozone #/Planting Description

- E.g
 1.) front lawn
 2.) low water use plantings
 3.) medium water use planting

^bIrrigation Method

- overhead spray
 or drip

^cIrrigation Efficiency

- 0.75 for spray head
 0.81 for drip

^dETWU (Annual Gallons Required)

= $E_{to} \times 0.62 \times ETAF \times Area$
 where 0.62 is a conversion factor that converts acre-inches per acre per year to gallons per square foot per year.

^eMAWA (Annual Gallons Allowed) = $(E_{to}) (0.62) [(ETAF \times LA)$

+ $((1-ETAF) \times SLA)]$

where 0.62 is a conversion factor that converts acre-inches per acre per year to gallons per square foot per year, LA is the total landscape area in square feet, SLA is the total special landscape area in square feet, and ETAF is .55 for residential areas and 0.45 for non-residential areas.

ETAF Calculations

Regular Landscape Areas

Total ETAF x Area	(B)
Total Area	(A)
Average ETAF	$B \div A$

Average ETAF for Regular Landscape Areas must be 0.55 or below for residential areas, and 0.45 or below for non-residential areas.

All Landscape Areas

Total ETAF x Area	$(B+D)$
Total Area	$(A+C)$
Sitewide ETAF	$(B+D) \div (A+C)$

15.92 Appendix C. Sample certificate of completion.

CERTIFICATE OF COMPLETION

This certificate is filled out by the project applicant upon completion of the landscape project.

PART 1. PROJECT INFORMATION SHEET

Date		
Project Name		
Name of Project Applicant	Telephone No.	
	Fax No.	
Title	Email Address	
Company	Street Address	
City	State	Zip Code

Project Address and Location:

Street Address		Parcel, tract or lot number, if available.
City		Latitude/Longitude (optional)
State	Zip Code	

Property Owner or his/her designee:

Name	Telephone No.	
	Fax No.	
Title	Email Address	
Company	Street Address	
City	State	Zip Code

Property Owner

"I/we certify that I/we have received copies of all the documents within the Landscape Documentation Package and the Certificate of Completion and that it is our responsibility to see

that the project is maintained in accordance with the Landscape and Irrigation Maintenance Schedule.”

Property Owner Signature

Date

Please answer the questions below:

1. Date the Landscape Documentation Package was submitted to the city_____
2. Date the Landscape Documentation Package was approved by the city_____
3. Date that a copy of the Water Efficient Landscape Worksheet (including the Water Budget Calculation) was submitted to the local water purveyor_____

PART 2. CERTIFICATION OF INSTALLATION ACCORDING TO THE LANDSCAPE DOCUMENTATION PACKAGE

“I/we certify that based upon periodic site observations, the work has been completed in accordance with the Chapter 15.92 of the Sacramento City Code and that the landscape planting and irrigation installation conform with the criteria and specifications of the approved Landscape Documentation Package.”

Signature*	Date	
Name (print)	Telephone No.	
	Fax No.	
Title	Email Address	
License No. or Certification No.		
Company	Street Address	
City	State	Zip Code

*Signer of the landscape design plan, signer of the irrigation plan, or a licensed landscape contractor.

PART 3. IRRIGATION SCHEDULING

Attach parameters for setting the irrigation schedule the controller per section 15.92.140 of the Sacramento City Code.

PART 4. SCHEDULE OF LANDSCAPE AND IRRIGATION MAINTENANCE

Attach schedule of Landscape and Irrigation Maintenance per section 15.92.150 of the Sacramento City Code.

PART 5. LANDSCAPE IRRIGATION AUDIT REPORT

Attach Landscape Irrigation Audit Report per section 15.92.160 of the Sacramento City Code.

PART 6. SOIL MANAGEMENT REPORT

Attach soil analysis report, if not previously submitted with the Landscape Documentation Package per section 15.92.090 of the Sacramento City Code.

Attach documentation verifying implementation of recommendations from soil analysis report per section 15.92.090 of the Sacramento City Code.

15.92 Appendix D. Prescriptive compliance option.

A. In accordance with section 15.92.020.B, this appendix contains the prescriptive measures that a project may comply with as an alternative to complying with the other provisions of this chapter.

B. Compliance with the following is mandatory and must be documented on a landscape plan to use the prescriptive compliance option:

1. A landscape documentation package that includes the following elements:
 - a. Date;
 - b. Project applicant;
 - c. Project address (if available, parcel and/or lot number(s));
 - d. Total landscape area (square feet), including a breakdown of turf and plant material;
 - e. Project type (e.g., new, rehabilitated, public, private, cemetery, homeowner-installed);
 - f. Water supply type (e.g., potable, recycled, well) and identify the local retail water purveyor if the applicant is not served by a private well;
 - g. Contact information for the project applicant and property owner; and
 - h. Applicant signature and date with statement, "I agree to comply with the requirements of the prescriptive compliance option to Chapter 15.92 of the Sacramento City Code."
2. A compost rate of at least four cubic yards per 1,000 square feet to a depth of six inches into landscape area (unless contra-indicated by a soil test);
3. Plant material that complies with all of the following:
 - a. For residential areas, climate adapted plants that require occasional, little, or no summer water (average WUCOLS plant factor 0.3) for 75% of the plant area excluding edibles and areas using recycled water. For non-residential areas, climate adapted plants that require occasional, little, or no summer water (average WUCOLS plant factor 0.3) for 100% of the plant area excluding edibles and areas using recycled water;

b. A minimum three-inch layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers, or direct seeding applications where mulch is contra-indicated.

4. Turf that complies with all of the following:

a. Turf does not exceed 25% of the landscape area in residential areas, and there shall be no turf in non-residential areas;

b. Turf shall not be planted on sloped areas that exceed a slope of one foot vertical elevation change for every four feet of horizontal length;

c. Turf is prohibited in parkways less than ten feet wide, unless the parkway is adjacent to a parking strip and used to enter and exit vehicles. Any turf in parkways must be irrigated by sub-surface irrigation or by other technology that creates no overspray or runoff.

5. Irrigation systems that comply with the following:

a. Automatic irrigation controllers are required and must use evapotranspiration or soil moisture sensor data and utilize a rain sensor.

b. Irrigation controllers shall be of a type that does not lose programming data in the event the primary power source is interrupted.

c. Pressure regulators shall be installed on the irrigation system to ensure the dynamic pressure of the system is within the manufacturers recommended pressure range.

d. Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) shall be installed as close as possible to the point of connection of the water supply.

e. All irrigation emission devices must meet the requirements set in the ANSI standard, ASABE/ICC 802-2014 – "Landscape Irrigation Sprinkler and Emitter Standard." All sprinkler heads installed in the landscape must document a distribution uniformity low quarter of 0.65 or higher using the protocol defined in ASABE/ICC 802-2014.

f. Areas less than ten feet in width in any direction shall be irrigated with subsurface irrigation or other means that produces no runoff or overspray.

6. For non-residential projects with landscape areas of 1,000 square feet or more, a private submeter that measures landscape water use.

C. At the time of final inspection, the permit applicant must provide the owner of the property with a certificate of completion, certificate of installation, irrigation schedule, and a schedule of landscape and irrigation maintenance.

ORDINANCE NO.

Adopted by the Sacramento City Council

Date Adopted

**AN ORDINANCE REPEALING AND ADDING CHAPTER 15.92 OF THE SACRAMENTO CITY CODE,
RELATING TO WATER EFFICIENT LANDSCAPE REQUIREMENTS**

BE IT ENACTED BY THE COUNCIL OF THE CITY OF SACRAMENTO:

SECTION 1.

Chapter 15.92 of the Sacramento City Code is repealed.

SECTION 2.

Chapter 15.92 is added to the Sacramento City Code to read as follows:

Chapter 15.92 WATER EFFICIENT LANDSCAPE REQUIREMENTS

15.92.010 Purpose.

A. On April 1, 2015, Governor Jerry Brown issued Executive Order No. B-29-15 directing the California Department of Water Resources to update the state's model water efficient landscape ordinance. Local agencies, consistent with the Department's regulations and the Water Conservation in Landscaping Act (California Government Code sections 65591 et seq.), must, by December 1, 2015, adopt the model ordinance (as set forth in chapter 2.7 of division 2 of title 23 of the California Code of Regulations) or a water efficient landscape ordinance that is, based on evidence in the record, at least as effective in conserving water as the model ordinance.

B. The Legislature, in the Water Conservation in Landscaping Act, has made the following findings:

1. The waters of the state are of limited supply and are subject to ever increasing demands;

2. The continuation of California's economic prosperity is dependent on the availability of adequate supplies of water for future uses;

3. It is the policy of the state to promote the conservation and efficient use of water and to prevent the waste of this valuable resource;

4. Landscapes are essential to the quality of life in California by providing areas for active and passive recreation and as an enhancement to the environment by cleaning air and water, preventing erosion, offering fire protection, and replacing ecosystems lost to development;

5. Landscape design, installation, maintenance and management can and should be water efficient; and

6. Section 2 of Article X of the California Constitution specifies that the right to use water is limited to the amount reasonably required for the beneficial use to be served and the right does not extend to waste or unreasonable method of use.

C. Consistent with these legislative findings, the purpose of this chapter is to comply with the Water Conservation in Landscaping Act by adopting an ordinance based on the provisions of the updated model water efficient landscape ordinance issued by the California Department of Water Resources, that:

1. Promotes the values and benefits of landscaping practices that integrate and go beyond the conservation and efficient use of water;

2. Establishes a structure for planning, designing, installing, maintaining, and managing water efficient landscapes in new construction and rehabilitated landscape projects;

3. Establishes provisions for water management practices and water waste prevention for existing landscapes over one acre in size;

4. Promotes water efficiency by setting a maximum applied water allowance as an upper limit for water use and reducing water use to the lowest practical amount; and

5. Is consistent with landscape ordinances of neighboring local and regional agencies.

15.92.020 Applicability.

A. This chapter applies to all of the following landscape projects:

1. New construction projects with an aggregate landscape area equal to or greater than 500 square feet requiring a building or landscape permit, plan check, plan review, or design review;

2. Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, plan review, or design review;

3. Existing landscapes as described in section 15.92.220; and

4. Cemeteries. Recognizing the special landscape management needs of cemeteries, regulation of new and rehabilitated cemeteries is limited to sections 15.92.080, 15.92.150, and 15.92.160; and regulation of existing cemeteries is limited to section 15.92.220.

B. Any project with an aggregate landscape area of 2,500 square feet or less may comply with the performance requirements of this chapter or conform to the prescriptive measures contained in Appendix D.

C. For projects using treated or untreated graywater or rainwater captured on site, any lot or parcel within the project that has less than 2,500 square feet of landscape and meets the lot or parcel's landscape water requirement (estimated total water use) entirely with treated or untreated graywater or through stored rainwater captured on site is subject only to Appendix D section (5).

D. This chapter does not apply to:

1. Registered local, state, or federal historical sites;

2. Ecological restoration projects that do not require a permanent irrigation system;

3. Mined-land reclamation projects that do not require a permanent irrigation system; or

4. Existing plant collections, as part of botanical gardens and arboretums open to the public.

15.92.030 Fee.

A landscape documentation package application fee, to pay the City's administrative costs to process the application, is established and imposed pursuant to the terms of this chapter. The city council shall establish the fee amount by resolution.

15.92.040 Definitions.

As used in this chapter:

“Appendix A” means Appendix A, Reference Evapotranspiration (ETo) Table, set out at the end of this chapter.

“Appendix B” means Appendix B, Sample Water Efficient Landscape Worksheet, set out at the end of this chapter.

“Appendix C” means Appendix C, Sample Certificate of Completion, set out at the end of this chapter.

“Appendix D” means Appendix D, Prescriptive Compliance Option, set out at the end of this chapter.

“Applied water” means the portion of water supplied by the irrigation system to the landscape.

“Automatic irrigation controller” means a timing device used to remotely control valves that operate an irrigation system. Automatic irrigation controllers are able to self-adjust and schedule irrigation events using either evapotranspiration (weather-based) or soil moisture data.

“Backflow prevention device” means a safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.

“Certificate of completion” means the document required under section 15.92.090.

“Certified irrigation designer” means a person certified to design irrigation systems by an accredited academic institution, a professional trade organization or other program such as the U.S. Environmental Protection Agency’s WaterSense irrigation designer certification program and Irrigation Association’s Certified Irrigation Designer program.

“Certified landscape irrigation auditor” means a person certified to perform landscape irrigation audits by an accredited academic institution, a professional trade organization or other program such as the U.S. Environmental Protection Agency’s WaterSense irrigation auditor certification program and Irrigation Association’s Certified Landscape Irrigation Auditor program.

“Check valve” or “anti-drain valve” means a valve located under a sprinkler head or other location in the irrigation system, to hold water in the system to prevent drainage from sprinkler heads when the sprinkler is off.

“Common interest developments” means community apartment projects, condominium projects, planned developments, and stock cooperatives per Civil Code section 4100.

“Compost” means the safe and stable product of controlled biologic decomposition of organic materials that is beneficial to plant growth.

“Conversion factor (0.62)” means the number that converts acre-inches per acre per year to gallons per square foot per year.

“Director” means the chief building official.

“Distribution uniformity” means the measure of the uniformity of irrigation water over a defined area.

“Drip irrigation” means any non-spray low volume irrigation system utilizing emission devices with a flow rate measured in gallons per hour. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

“Ecological restoration project” means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

“Effective precipitation” or “usable rainfall” (Eppt) means the portion of total precipitation that becomes available for plant growth.

“Emitter” means a drip irrigation emission device that delivers water slowly from the system to the soil.

“Established landscape” means the point at which plants in the landscape have developed significant root growth into the soil. Typically, most plants are established after one or two years of growth.

“Establishment period of the plants” means the first year after installing the plant in the landscape or the first two years if irrigation will be terminated after establishment. Typically, most plants are established after one or two years of growth. Native habitat mitigation areas and trees may need three to five years for establishment.

“Estimated total water use” (ETWU) means the total water used for the landscape as described in section 15.92.080.

“Evapotranspiration adjustment factor” (ETAF) means a factor of 0.55 for residential areas and 0.45 for non-residential areas, that, when applied to reference evapotranspiration, adjusts for plant factors and irrigation efficiency, two major influences upon the amount of water that needs to be applied to the landscape. The ETAF for new and existing (non-rehabilitated) special landscape areas shall not exceed 1.0. The ETAF for existing non-rehabilitated landscapes is 0.8.

“Evapotranspiration rate” means the quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time.

“Flow rate” means the rate at which water flows through pipes, valves and emission devices, measured in gallons per minute, gallons per hour, or cubic feet per second.

“Flow sensor” means an inline device installed at the supply point of the irrigation system that produces a repeatable signal proportional to flow rate. Flow sensors must be connected to an automatic irrigation controller, or flow monitor capable of receiving flow signals and operating master valves. This combination flow sensor/controller may also function as a landscape water meter or submeter.

“Friable” means a soil condition that is easily crumbled or loosely compacted down to a minimum depth per planting material requirements, whereby the root structure of newly planted material will be allowed to spread unimpeded.

“Fuel modification plan guideline” means guidelines from a local fire authority to assist residents and businesses that are developing land or building structures in a fire hazard severity zone.

“Graywater” means untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. "Graywater" includes, but is not limited to, wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs, but does not include wastewater from kitchen sinks or dishwashers.

“Hardscapes” means any durable material (pervious and non-pervious).

“Hydrozone” means a portion of the landscaped area having plants with similar water needs and rooting depth. A hydrozone may be irrigated or non-irrigated.

“Infiltration rate” means the rate of water entry into the soil expressed as a depth of water per unit of time (e.g., inches per hour).

“Invasive plant species” means species of plants not historically found in California that spread outside cultivated areas and can damage environmental or economic resources. Invasive species may be regulated by county agricultural agencies as noxious species. Lists of invasive plants are maintained at the California Invasive Plant Inventory and USDA invasive and noxious weeds database.

“Irrigation audit” means an in-depth evaluation of the performance of an irrigation system conducted by a Certified Landscape Irrigation Auditor. An irrigation audit includes, but is not limited to: inspection, system tune-up, system test with distribution uniformity or

emission uniformity, reporting overspray or runoff that causes overland flow, and preparation of an irrigation schedule. The audit must be conducted in a manner consistent with the Irrigation Association’s Landscape Irrigation Auditor Certification program or other U.S. Environmental Protection Agency “WaterSense” labeled auditing program.

“Irrigation efficiency” (IE) means the measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The irrigation efficiency for purposes of this chapter are 0.75 for overhead spray devices and 0.81 for drip systems.

“Irrigation survey” means an evaluation of an irrigation system that is less detailed than an irrigation audit. An irrigation survey includes, but is not limited to: inspection, system test, and written recommendations to improve performance of the irrigation system.

“Irrigation water use analysis” means an analysis of water use data based on meter readings and billing data.

“Landscape architect” means a person who holds a license to practice landscape architecture in the State of California under Business and Professions Code section 5615.

“Landscape area” means all the planting areas, turf areas, and water features in a landscape design plan subject to the maximum applied water allowance calculation. The landscape area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or non-pervious hardscapes, and other non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation).

“Landscape contractor” means a person licensed by the State of California to construct, maintain, repair, install, or subcontract the development of landscape systems.

“Landscape documentation package” means the documents required under section 15.92.070.

“Landscape project” means total area of landscape in a project as defined in “landscape area.”

“Landscape water meter” means an inline device installed at the irrigation supply point that measures the flow of water into the irrigation system and is connected to a totalizer to record water use.

“Lateral line” means the water delivery pipeline that supplies water to the emitters or sprinklers from the valve.

“Local water purveyor” means the City of Sacramento, or any other public or private entity that provides retail water service.

“Low volume irrigation” means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip, drip lines, and bubblers. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

“Main line” means the pressurized pipeline that delivers water from the water source to the valve or outlet.

“Master shut-off valve” is an automatic valve installed at the irrigation supply point that controls water flow into the irrigation system. When this valve is closed water will not be supplied to the irrigation system. A master valve will greatly reduce any water loss due to a leaky station valve.

“Maximum applied water allowance” (MAWA) means the upper limit of annual applied water for the established landscaped area as specified in section 15.92.080. It is based upon the area’s reference evapotranspiration, the ET Adjustment Factor, and the size of the landscape area. The estimated total water use shall not exceed the maximum applied water allowance. Special landscape areas, including recreation areas, areas permanently and solely dedicated to edible plants such as orchards and vegetable gardens, and areas irrigated with recycled water are subject to the MAWA with an ETAF not to exceed 1.0. $MAWA = (ET_o) (0.62) [(ETAF \times LA) + ((1-ETAF) \times SLA)]$.

“Median” is an area between opposing lanes of traffic that may be unplanted or planted with trees, shrubs, perennials, and ornamental grasses.

“Microclimate” means the climate of a small, specific area that may contrast with the climate of the overall landscape area due to factors such as wind, sun exposure, plant density, or proximity to reflective surfaces.

“Mined-land reclamation projects” means any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.

“Mulch” means any organic material such as leaves, bark, straw, compost, or inorganic mineral materials such as rocks, gravel, or decomposed granite left loose and applied to the soil surface for the beneficial purposes of reducing evaporation, suppressing weeds, moderating soil temperature, and preventing soil erosion.

“New construction” means, for the purposes of this chapter, a new building with a landscape or other new landscape, such as a park, playground, or greenbelt without an associated building.

“Non-residential landscape” means landscapes in commercial, institutional, industrial and public settings that may have areas designated for recreation or public assembly. It also includes portions of common areas of common interest developments with designated recreational areas.

“Operating pressure” means the pressure at which the parts of an irrigation system are designed by the manufacturer to operate.

“Overhead sprinkler irrigation systems” or “overhead spray irrigation systems” means systems that deliver water through the air (e.g., spray heads and rotors).

“Overspray” means the irrigation water that is delivered beyond the target area.

“Parkway” means the area between a sidewalk and the curb or traffic lane. It may be planted or unplanted, and with or without pedestrian egress.

“Permit” means an authorizing document issued for new construction or rehabilitated landscapes.

“Pervious” means any surface or material that allows the passage of water through the material and into the underlying soil.

“Plant factor” or “plant water use factor” is a factor, when multiplied by ETo, estimates the amount of water needed by plants. For purposes of this chapter, the plant factor range for very low water use plants is 0 to 0.1, the plant factor range for low water use plants is 0.1 to 0.3, the plant factor range for moderate water use plants is 0.4 to 0.6, and the plant factor range for high water use plants is 0.7 to 1.0. Plant factors cited in this chapter are derived from the publication “Water Use Classification of Landscape Species.” Plant factors may also be obtained from horticultural researchers from academic institutions or professional associations as approved by the California Department of Water Resources.

“Project applicant” means the individual or entity submitting a landscape documentation package required under section 15.92.070 to request a permit, plan check, plan review, or design review from the city. A project applicant may be the property owner or his or her designee.

“Rain sensor” or “rain sensing shutoff device” means a component that automatically suspends an irrigation event when it rains.

“Record drawing” or “as-builts” means a set of reproducible drawings that show significant changes in the work made during construction and that are usually based on drawings marked up in the field and other data furnished by the contractor.

“Recreational area” means areas, excluding private single family residential areas, designated for active play, recreation or public assembly in parks, sports fields, picnic grounds, amphitheaters or golf course tees, fairways, roughs, surrounds and greens.

“Recycled water,” “reclaimed water,” or “treated sewage effluent water” means treated or recycled waste water of a quality suitable for nonpotable uses such as landscape irrigation and water features. This water is not intended for human consumption.

“Reference evapotranspiration” or “ETo” means a standard measurement of environmental parameters that affect the water use of plants. ETo is expressed in inches per day, month, or year as represented in Appendix A, and is an estimate of the evapotranspiration of a large field of four- to seven-inch tall, cool-season grass that is well watered. Reference evapotranspiration is used as the basis of determining the maximum applied water allowances so that regional differences in climate can be accommodated.

“Rehabilitated landscape” means any re-landscaping project that requires a permit, plan check, plan review, or design review, meets the requirements of section 15.92.020, and the modified landscape area is equal to or greater than 2,500 square feet.

“Residential landscape” means landscapes surrounding single or multifamily homes.

“Run off” means water that is not absorbed by the soil or landscape to which it is applied and flows from the landscape area. For example, run off may result from water that is applied at too great a rate (application rate exceeds infiltration rate) or when there is a slope.

“Soil moisture sensing device” or “soil moisture sensor” means a device that measures the amount of water in the soil. The device may also suspend or initiate an irrigation event.

“Soil texture” means the classification of soil based on its percentage of sand, silt, and clay.

“Special landscape area” (SLA) means an area of the landscape dedicated solely to edible plants, recreational areas, areas irrigated with recycled water, or water features using recycled water.

“Sprinkler head” or “spray head” means a device that delivers water through a nozzle.

“Static water pressure” means the pipeline or municipal water supply pressure when water is not flowing.

“Station” means an area served by one valve or by a set of valves that operate simultaneously.

“Swing joint” means an irrigation component that provides a flexible, leak-free connection between the emission device and lateral pipeline to allow movement in any direction and to prevent equipment damage.

“Submeter” means a metering device to measure water applied to the landscape that is installed after the primary utility water meter.

“Turf” means a ground cover surface of mowed grass. Annual bluegrass, Kentucky bluegrass, Perennial ryegrass, Red fescue, and Tall fescue are cool-season grasses. Bermudagrass, Kikuyugrass, Seashore Paspalum, St. Augustinegrass, Zoysiagrass, and Buffalo grass are warm-season grasses.

“Valve” means a device used to control the flow of water in the irrigation system.

“Water conserving plant species” means a plant species identified as having a very low or low plant factor.

“Water feature” means a design element where open water performs an aesthetic or recreational function. Water features include ponds, lakes, waterfalls, fountains, artificial streams, spas, and swimming pools (where water is artificially supplied). The surface area of water features is included in the high water use hydrozone of the landscape area. Constructed wetlands used for on-site wastewater treatment or stormwater best management practices that are not irrigated and used solely for water treatment or stormwater retention are not water features and, therefore, are not subject to the water budget calculation.

“Watering window” means the time of day irrigation is allowed.

“WUCOLS” means the Water Use Classification of Landscape Species published by the University of California Cooperative Extension and the Department of Water Resources, 2014.

15.92.050 Landscape documentation package—Required.

No person shall construct or install a new landscape project or rehabilitated landscape project unless a landscape documentation package for the project has been approved by the director.

15.92.060 Landscape documentation package—Submittal—Action by director.

A. Prior to construction of a landscape project, the project applicant shall submit a completed landscape documentation package to the director.

B. Prior to construction of a landscape project, the director shall:

1. Provide the project applicant with the procedures for permits, plan checks, plan reviews, or design reviews;

2. Review the landscape documentation package submitted by the project applicant;

3. Approve or deny the landscape documentation package;

4. Issue a permit or approve the plan check, plan review, or design review for the project applicant; and

5. Upon approval of the landscape documentation package, submit a copy of the water efficient landscape worksheet to the local water purveyor.

C. Upon approval of the landscape documentation package by the director, the project applicant shall:

1. Receive a permit or approval of the plan check, plan review, or design review and record the date of the permit in the certificate of completion;

2. Submit a copy of the approved landscape documentation package along with the record drawings, and any other information to the property owner or designee; and

3. Submit a copy of the water efficient landscape worksheet to the local water purveyor.

15.92.070 Landscape documentation package—Application—Contents— Fee.

A. The landscape documentation package shall include the following six elements:

1. The following project information:

a. Date of application;

b. Project applicant;

- c. Project address (if available, parcel and/or lot number(s));
 - d. Total landscape area (square feet);
 - e. Project type (e.g., new, rehabilitated, public, private, cemetery, homeowner-installed);
 - f. Water supply type (e.g., potable, recycled, private well) and the local water purveyor if the applicant is not served by a private well;
 - g. Checklist of all documents in landscape documentation package;
 - h. Project contacts to include contact information for the project applicant and property owner; and
 - i. Applicant signature and date with statement: "I agree to comply with the requirements of Sacramento City Code Chapter 15.92 and submit a complete landscape documentation package."
- 2. The project's water efficient landscape worksheet, including the:
 - a. Hydrozone information table; and
 - b. Water budget calculations, including:
 - i. The maximum applied water allowance (MAWA), and
 - ii. The estimated total water use (ETWU);
 - 3. A soil management report;
 - 4. A landscape design plan;
 - 5. An irrigation design plan; and
 - 6. A grading design plan.
- B. The package shall be accompanied by payment of the nonrefundable landscape document package application fee.

15.92.080 Water efficient landscape worksheet.

A. A project applicant shall complete the Water Efficient Landscape Worksheet in Appendix B, that contains information on the plant factor, irrigation method, irrigation efficiency, and area associated with each hydrozone. Calculations are then made to show that the ETAF for the landscape project does not exceed a factor of 0.55 for residential areas and 0.45 for non-residential areas, exclusive of special landscape areas. The ETAF for a landscape project is based on the plant factors and irrigation methods selected. The maximum applied water allowance is calculated based on the maximum ETAF allowed (0.55 for residential areas and 0.45 for non-residential areas) and expressed as annual gallons required. The ETWU is calculated based on the plants used and irrigation method selected for the landscape design. ETWU must be below the MAWA.

1. In calculating the maximum applied water allowance and estimated total water use, a project applicant shall use the ETo values from the Reference Evapotranspiration Table in Appendix A.

B. Water budget calculations shall adhere to the following requirements:

1. The plant factor used shall be from WUCOLS or from horticultural researchers with academic institutions or professional associations as approved by the California Department of Water Resources. The plant factor ranges from 0 to 0.1 for very low water using plants, from 0.1 to 0.3 for low water use plants, from 0.4 to 0.6 for moderate water use plants, and from 0.7 to 1.0 for high water use plants.

2. All water features shall be included in the high water use hydrozone and temporarily irrigated areas shall be included in the low water use hydrozone.

3. All special landscape areas shall be identified and their water use calculated as shown in Appendix B.

4. ETAF for new and existing (non-rehabilitated) special landscape areas shall not exceed 1.0.

15.92.090 Soil management report.

To reduce runoff and encourage healthy plant growth, the project applicant, or the project applicant's designee, shall complete, submit, and implement a soil management report as provided in this section.

A. Submit soil samples to a laboratory for analysis and recommendations, in accordance with the following:

1. Soil sampling shall be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plants.

2. The soil analysis shall include:

a. Soil texture;

b. Infiltration rate determined by laboratory test or soil texture infiltration rate table;

c. pH;

d. Total soluble salts;

e. Sodium;

f. Percent organic matter; and

g. Recommendations.

3. In projects with multiple landscape installations (i.e. production home developments) a soil sampling rate of 1 in 7 lots or approximately 15% will satisfy this requirement. Large landscape projects shall sample at a rate equivalent to 1 in 7 lots.

B. The project applicant, or the project applicant's designee, shall comply with one of the following:

1. If significant mass grading is not planned, the soil analysis report shall be submitted to the city as part of the landscape documentation package; or

2. If significant mass grading is planned, the soil analysis report shall be submitted to the city as part of the certificate of completion.

C. The soil analysis report shall be made available, in a timely manner, to the professionals preparing the landscape design plans and irrigation design plans to make any necessary adjustments to the design plans.

D. The project applicant, or the project applicant's designee, shall submit documentation verifying implementation of soil analysis report recommendations to the city with the certificate of completion.

15.92.100 Landscape design plan.

A. For the efficient use of water, a landscape shall be carefully designed and planned for the intended function of the project. A landscape design plan meeting the

following design criteria shall be submitted as part of the landscape documentation package.

1. Plant Material

a. Any plant may be selected for the landscape, providing the estimated total water use in the landscape area does not exceed the maximum applied water allowance. Methods to achieve water efficiency shall include one or more of the following:

i. Protection and preservation of native species and natural vegetation;

ii. Selection of water-conserving plant, tree, and turf species, especially local native plants;

iii. Selection of plants based on local climate suitability, disease and pest resistance;

iv. Selection of trees based on applicable local tree ordinances or tree shading guidelines, and size at maturity as appropriate for the planting area; and selection of plants from local and regional landscape program plant lists.

v. Selection of plants from local fuel modification plan guidelines.

b. Each hydrozone shall have plant materials with similar water use, with the exception of hydrozones with plants of mixed water use, as specified in section 15.92.110.A.2.d.

c. Plants shall be selected and planted appropriately based upon their adaptability to the climatic, geologic, and topographical conditions of the project site. Methods to achieve water efficiency shall include one or more of the following:

i. Use the Sunset Western Climate Zone System, that takes into account temperature, humidity, elevation, terrain, latitude, and varying degrees of continental and marine influence on local climate;

ii. Recognize the horticultural attributes of plants (i.e., mature plant size, invasive surface roots) to minimize damage to property or infrastructure (e.g., buildings, sidewalks, power lines); allow for adequate soil volume for healthy root growth; and

iii. Consider the solar orientation for plant placement to maximize summer shade and winter solar gain.

d. Turf is not allowed on slopes greater than 25% where the toe of the slope is adjacent to an impermeable hardscape and where 25% means one foot of vertical elevation change for every four feet of horizontal length (rise divided by run x 100 = slope percent).

e. High water use plants, characterized by a plant factor of 0.7 to 1.0, are prohibited in street medians.

f. A landscape design plan for projects in fire-prone areas shall address fire safety and prevention. A defensible space or zone around a building or structure is required under California Public Resources Code section 4291(a) and (b). Avoid fire-prone plant materials and highly flammable mulches.

g. The use of invasive plant species, such as those listed by the California Invasive Plant Council, is strongly discouraged.

h. The architectural guidelines of a common interest development shall not prohibit or include conditions that have the effect of prohibiting the use of low-water use plants as a group.

2. Water Features

a. Recirculating water systems shall be used for water features.

b. Where available, recycled water shall be used as a source for decorative water features.

c. Surface area of a water feature shall be included in the high water use hydrozone area of the water budget calculation.

d. Pool and spa covers are highly recommended.

3. Soil Preparation, Mulch, and Amendments

a. Prior to the planting of any materials, compacted soils shall be transformed to a friable condition. On engineered slopes, only amended planting holes need meet this requirement.

b. Soil amendments shall be incorporated according to recommendations of the soil report and what is appropriate for the plants selected (see section 15.92.090).

c. For landscape installations, compost at a rate of a minimum of four cubic yards per 1,000 square feet of permeable area shall be incorporated to a depth of six

inches into the soil. Soils with greater than six percent organic matter in the top six inches of soil are exempt from adding compost and tilling.

d. A minimum three-inch layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers, or direct seeding applications where mulch is contraindicated. To provide habitat for beneficial insects and other wildlife, up to five percent of the landscape area may be left without mulch. Designated insect habitat must be included in the landscape design plan as such.

e. Stabilizing mulching products shall be used on slopes that meet current engineering standards.

f. The mulching portion of the seed/mulch slurry in hydro-seeded applications shall meet the mulching requirement.

g. Organic mulch materials made from recycled or post-consumer materials shall take precedence over inorganic materials or virgin forest products unless the recycled post-consumer organic products are not locally available. Organic mulches are not required where prohibited by local fuel modification plan guidelines or other provisions of the city code.

B. The landscape design plan, at a minimum, shall:

1. Delineate and label each hydrozone by number, letter, or other method;
2. Identify each hydrozone as low, moderate, high water, or mixed water use. Temporarily irrigated areas of the landscape shall be included in the low water use hydrozone for the water budget calculation;
3. Identify recreational areas;
4. Identify areas permanently and solely dedicated to edible plants;
5. Identify areas irrigated with recycled water;
6. Identify type of mulch and application depth;
7. Identify soil amendments, type, and quantity;
8. Identify type and surface area of water features;
9. Identify hardscapes (pervious and non-pervious);

10. Identify location, installation details, and 24-hour retention or infiltration capacity of any applicable stormwater best management practices that encourage on-site retention and infiltration of stormwater. Project applicants shall refer to chapter 13.16 (stormwater management and discharge control) and the Central Valley Regional Water Quality Control Board for information on any applicable stormwater technical requirements. Stormwater best management practices are encouraged in the landscape design plan and examples are provided in section 15.92.200.

11. Identify any applicable rain harvesting or catchment technologies as discussed in section 15.92.200 and their 24-hour retention or infiltration capacity;

12. Identify any applicable graywater discharge piping, system components and areas of distribution;

13. Contain the following statement: “I have complied with the criteria of Sacramento City Code Chapter 15.92 and applied them for the efficient use of water in the landscape design plan”; and

14. Bear the signature of a licensed landscape architect, licensed landscape contractor, or any other person authorized to design a landscape. (See sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the California Business and Professions Code, section 832.27 of title 16 of the California Code of Regulations, and section 6721 of the California Food and Agriculture Code.)

15.92.110 Irrigation design plan.

A. This section applies to landscaped areas requiring permanent irrigation, not areas that require temporary irrigation solely for the plant establishment period. 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.

1. Irrigation System

a. Landscape water meters, defined as either a dedicated water service meter or private submeter, shall be installed for all non-residential irrigated landscapes of 1,000 square feet but not more than 5,000 square feet (the level at which California Water Code section 535 applies) and residential irrigated landscapes of 5,000 square feet or greater. A landscape water meter may be either:

i. A customer service meter dedicated to landscape use provided by the local water purveyor; or

- ii. A privately owned meter or submeter.

- b. Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data utilizing non-volatile memory shall be required for irrigation scheduling in all irrigation systems.

- c. If the water pressure is below or exceeds the recommended pressure of the specified irrigation devices, the installation of a pressure regulating device is required to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance.
 - i. 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.

 - ii. 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.

- d. 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.

- e. 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.

- f. Backflow prevention devices approved by the director and in compliance with section 13.04.240 of this code shall be required to protect the water supply from contamination by the irrigation system.

- g. Flow sensors that detect high flow conditions created by system damage or malfunction are required for all on non-residential landscapes and residential landscapes of 5,000 square feet or larger.

- h. Master shut-off valves are required on all projects except landscapes that make use of technologies that allow for the individual control of sprinklers that are individually pressurized in a system equipped with low pressure shut down features.

- i. 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.
- j. Relevant information from the soil management plan, such as soil type and infiltration rate, shall be utilized when designing irrigation systems.
- k. The design of the irrigation system shall conform to the hydrozones of the landscape design plan.
- l. The irrigation system must be designed and installed to meet, at a minimum, the irrigation efficiency criteria as described in section 15.92.080 regarding the maximum applied water allowance.
- m. All irrigation emission devices must meet the requirements set in the American National Standards Institute (ANSI) standard, American Society of Agricultural and Biological Engineers'/International Code Council's (ASABE/ICC) 802-2014 "Landscape Irrigation Sprinkler and Emitter Standard." All sprinkler heads installed in the landscape must document a distribution uniformity low quarter of 0.65 or higher using the protocol defined in ASABE/ICC 802-2014.
- n. The project applicant shall consult with the local water purveyor about peak water operating demands (on the water supply system) or water restrictions that may impact the effectiveness of the irrigation system.
- o. In mulched planting areas, the use of low volume irrigation is required to maximize water infiltration into the root zone.
- p. Sprinkler heads and other emission devices shall have matched precipitation rates, unless otherwise directed by the manufacturer's recommendations.
- q. Head to head coverage is recommended. However, sprinkler spacing shall be designed to achieve the highest possible distribution uniformity using the manufacturer's recommendations.
- r. Swing joints or other riser-protection components are required on all risers subject to damage that are adjacent to hardscapes or in high traffic areas of turfgrass.
- s. Check valves or anti-drain valves are required on all sprinkler heads where low point drainage could occur.

t. Areas less than ten feet in width in any direction shall be irrigated with subsurface irrigation or other means that produces no runoff or overspray.

u. 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:

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

ii. The adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping; or

iii. 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 section 15.92.110.A.1.i. Prevention of overspray and runoff must be confirmed during the irrigation audit.

v. Slopes greater than 25% shall not be irrigated with an irrigation system with an application 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.

1. Hydrozone

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

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

c. Where feasible, trees shall be placed on separate valves from shrubs, groundcovers, and turf to facilitate the appropriate irrigation of trees. The mature size and extent of the root zone shall be considered when designing irrigation for the tree.

d. Individual hydrozones that mix plants of moderate and low water use, or moderate and high water use, may be allowed if:

i. The plant factor calculation is based on the proportions of the respective plant water uses and their plant factor; or

ii. The plant factor of the higher water using plant is used for calculations.

e. Individual hydrozones that mix high and low water use plants shall not be permitted.

f. 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. Use this valve number in the Hydrozone Information Table (see Appendix B, Section A). This table can also assist with the irrigation audit and programming the controller.

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

1. The location and size of separate water meters for landscape;

2. The 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;

3. The static water pressure at the point of connection to the public water supply;

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

5. The recycled water irrigation systems as specified in section 15.92.180;

6. The following statement: "I have complied with the criteria of Chapter 15.92 of the Sacramento City Code and applied them accordingly for the efficient use of water in the irrigation design plan"; and

7. The signature of a licensed landscape architect, certified irrigation designer, licensed landscape contractor, or any other person authorized to design an irrigation system. (See sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the California Business and Professions Code, section 832.27 of title 16 of the California Code of Regulations, and section 6721 of the California Food and Agricultural Code.)

15.92.120 Grading design plan.

A. 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 grading plan prepared by a civil engineer that meets the minimum criteria specified in this section and submitted pursuant to chapter 15.88 (grading, erosion, and sediment control) 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. The grading design plan shall contain the following statement: "I have complied with the criteria of Sacramento City Code Chapter 15.92 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.

B. The project applicant shall comply with any additional requirements specified in chapter 15.88 and any regulations or other requirements adopted to implement or administer chapter 15.88.

15.92.130 Certificate of completion.

A. A certificate of completion in substantial conformance with Appendix C shall include the following six elements:

1. Project information sheet that contains:
 - a. Date;
 - b. Project name;
 - c. Project applicant name, telephone, and mailing address;
 - d. Project address and location; and
 - e. Property owner name, telephone, and mailing address;

2. 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;

a. Where there have been significant changes made in the field during construction, these “as-built” or record drawings shall be included with the certification;

b. A diagram of the irrigation plan showing hydrozones shall be kept with the irrigation controller for subsequent management purposes.

3. The irrigation scheduling parameters used to set the controller (see section 15.92.140);

4. The landscape and irrigation maintenance schedule (see section 15.92.150);

5. The irrigation audit report (see section 15.92.160); and

6. The soil analysis report (if not submitted with the landscape documentation package) and documentation verifying implementation of soil report recommendations (see section 15.92.090).

B. The project applicant shall:

1. Submit the signed certificate of completion to the city for review; and

2. Ensure that copies of the approved certificate of completion are submitted to the local water purveyor and property owner or his or her designee.

C. The director shall approve or deny the certificate of completion. If the certificate of completion is denied, the director shall provide information to the project applicant regarding reapplication, appeal, or other assistance.

15.92.140 Irrigation scheduling.

A. 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 in accordance with the requirements of article XI of chapter 13.04 (outdoor water conservation).

3. For implementation of the irrigation schedule, particular attention shall be paid to irrigation run times, emission device, flow rate, and current reference evapotranspiration, so that applied water meets the ETWU. Total annual applied water shall be less than or equal to the MAWA. Actual irrigation schedules shall be regulated by automatic irrigation controllers using current reference evapotranspiration data or soil moisture sensor data.

4. Parameters used to set the automatic controller shall be developed and submitted with the certificate of completion 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.

15.92.150 Landscape and irrigation maintenance schedule.

A. Landscapes shall be maintained to ensure water use efficiency. A regular maintenance schedule shall be submitted with the certificate of completion.

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

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

D. A project applicant is encouraged to implement established landscape industry sustainable best practices for all landscape maintenance activities.

15.92.160 Irrigation audit, irrigation survey, and irrigation water use analysis.

A. All landscape irrigation audits shall be conducted by a city landscape irrigation auditor or a third party certified landscape irrigation auditor. Landscape audits shall not be conducted by the person who designed the landscape or installed the landscape.

B. In large projects or projects with multiple landscape installations (i.e. production home developments), an auditing rate of 1 in 7 lots or approximately 15% will satisfy this requirement.

C. For new construction and rehabilitated landscape projects installed after December 1, 2015, as described in section 15.92.020:

1. The project applicant shall submit an irrigation audit report with the certificate of completion to the city that may include, but is 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, including configuring irrigation controllers with application rate, soil types, plant factors, slope, exposure and any other factors necessary for accurate programming;

2. The director shall develop and administer programs that may include, but not be limited to, irrigation water use analysis, irrigation audits, and irrigation surveys for compliance with the maximum applied water allowance.

15.92.170 Irrigation efficiency.

For the purpose of determining estimated total water use, average irrigation efficiency is assumed to be 0.75 for overhead spray devices and 0.81 for drip system devices.

15.92.180 Recycled water.

A. The installation of recycled water irrigation systems shall allow for the current and future use of recycled water.

B. All recycled water irrigation systems shall be designed and operated in accordance with all applicable local and state laws.

C. Landscapes using recycled water are considered special landscape areas. The ETAF for new and existing (non-rehabilitated) special landscape areas shall not exceed 1.0.

15.92.190 Graywater systems.

Graywater systems promote the efficient use of water and are encouraged to assist in on-site landscape irrigation. All graywater systems shall conform to chapters 16 and 16A of part 5 of the California Code of Regulations.

15.92.200 Stormwater management and rainwater retention.

A. 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 rainwater retention and infiltration are encouraged.

B. Project applicants shall comply with all applicable provisions of chapter 13.16 of this code and any regulations or other requirements adopted to implement or administer chapter 13.16.

C. All planted landscape areas are required to have friable soil to maximize water retention and infiltration as required by section 15.92.100.A.3.

D. It is strongly recommended that landscape areas be designed for capture and infiltration capacity that is sufficient to prevent runoff from impervious surfaces (i.e. roof and paved areas) from either: (1) the one inch, 24-hour rain event; or (2) the 85th percentile, 24-hour rain event, or additional capacity as required by any applicable local, regional, state, or federal regulation.

E. It is recommended that stormwater projects incorporate any of the following elements to improve on-site storm water and dry weather runoff capture and use:

1. Grade impervious surfaces, such as driveways, during construction to drain to vegetated areas.
2. Minimize the area of impervious surfaces such as paved areas, roof and concrete driveways.
3. Incorporate pervious or porous surfaces (e.g., gravel, permeable pavers or blocks, pervious or porous concrete) that minimize runoff.
4. Direct runoff from paved surfaces and roof areas into planting beds or landscaped areas to maximize site water capture and reuse.
5. Incorporate rain gardens, cisterns, and other rain harvesting or catchment systems.
6. Incorporate infiltration beds, swales, basins and drywells to capture storm water and dry weather runoff and increase percolation into the soil.
7. Consider constructed wetlands and ponds that retain water, equalize excess flow, and filter pollutants.

15.92.210 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 chapter.

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. Signage shall include information about the site water use as designed in accordance with this chapter; specify who designed and installed the water efficient landscape; and demonstrate low water use approaches to landscaping such as using native plants, graywater systems, and rainwater catchment systems.

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

15.92.220 Provisions for existing landscapes.

A. This section applies to existing landscapes over one acre in size that were installed before December 1, 2015.

B. For existing landscapes that have metered water service, the city may conduct or may require the property owner to provide 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 MAWA for existing landscapes. The MAWA for existing landscapes shall be calculated as: $MAWA = (0.8) (ETo)(LA)(0.62)$.

C. For existing landscapes that do not have metered water service, the city may conduct or may require the property owner to provide irrigation surveys and irrigation audits to evaluate water use and provide recommendations as necessary to prevent water waste.

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

15.92.230 Effective precipitation.

The director may consider effective precipitation (25% of annual precipitation) in tracking water use and may use the following equations to calculate maximum applied water allowance:

A. For residential areas: $MAWA = (ETo - Eppt) (0.62) [(0.55 \times LA) + (0.45 \times SLA)]$; or

B. For non-residential areas: $MAWA = (ETo - EPPT) (0.62) [(0.45 \times LA) + (0.55 \times SLA)]$.

15.92 Appendix A. Reference evapotranspiration (ETo) table.

<u>City of</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sept</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
<u>Sacramento</u>	<u>1.0</u>	<u>1.8</u>	<u>3.2</u>	<u>4.7</u>	<u>6.4</u>	<u>7.7</u>	<u>8.4</u>	<u>7.2</u>	<u>5.4</u>	<u>3.7</u>	<u>1.7</u>	<u>.9</u>

15.92 Appendix B. Sample water efficient landscape worksheet.

WATER EFFICIENT LANDSCAPE WORKSHEET

This worksheet is filled out by the project applicant and it is a required element of the Landscape Documentation Package.

Reference Evapotranspiration (ETo)

<u>Hydrozone # /Planting Description^a</u>	<u>Plant Factor (PF)</u>	<u>Irrigation Method^b</u>	<u>Irrigation Efficiency (IE)^c</u>	<u>ETAF (PF/IE)</u>	<u>Landscape Area (sq. ft.)</u>	<u>ETAF x Area</u>	<u>Estimated Total Water Use (ETWU)^e</u>
<u>Regular Landscape Areas</u>							
				<u>Totals</u>	<u>(A)</u>	<u>(B)</u>	
<u>Special Landscape Areas</u>							
				<u>1</u>			
				<u>1</u>			
				<u>1</u>			
				<u>Totals</u>	<u>(C)</u>	<u>(D)</u>	
				<u>ETWU Total</u>			
				<u>Maximum Allowed Water Allowance (MAWA)^e</u>			

^a**Hydrozone #/Planting Description**
E.g
1.) front lawn
2.) low water use plantings
3.) medium water use planting

^b**Irrigation Method**
overhead spray
or drip

^c**Irrigation Efficiency**
0.75 for spray head
0.81 for drip

^d**ETWU (Annual Gallons Required)**
= Eto x 0.62 x ETAF x Area
where 0.62 is a conversion factor that converts acre-inches per acre per year to gallons per square foot per year.

^e**MAWA (Annual Gallons Allowed) = (Eto) (0.62) [(ETAF x LA) + ((1-ETAF) x SLA)]**
where 0.62 is a conversion factor that converts acre-inches per acre per year to gallons per square foot per year, LA is the total landscape area in square feet, SLA is the total special landscape area in square feet, and ETAF is .55 for residential areas and 0.45 for non-residential areas.

ETAF Calculations

Regular Landscape Areas

<u>Total ETAF x Area</u>	<u>(B)</u>
<u>Total Area</u>	<u>(A)</u>
<u>Average ETAF</u>	<u>B ÷ A</u>

Average ETAF for Regular Landscape Areas must be 0.55 or below for residential areas, and 0.45 or below for non-residential areas.

All Landscape Areas

<u>Total ETAF x Area</u>	<u>(B+D)</u>
<u>Total Area</u>	<u>(A+C)</u>
<u>Sitewide ETAF</u>	<u>(B+D) ÷ (A+C)</u>

15.92 Appendix C. Sample certificate of completion.

CERTIFICATE OF COMPLETION

This certificate is filled out by the project applicant upon completion of the landscape project.

PART 1. PROJECT INFORMATION SHEET

<u>Date</u>		
<u>Project Name</u>		
<u>Name of Project Applicant</u>	<u>Telephone No.</u>	
	<u>Fax No.</u>	
<u>Title</u>	<u>Email Address</u>	
<u>Company</u>	<u>Street Address</u>	
<u>City</u>	<u>State</u>	<u>Zip Code</u>

Project Address and Location:

<u>Street Address</u>	<u>Parcel, tract or lot number, if available.</u>	
<u>City</u>	<u>Latitude/Longitude (optional)</u>	
<u>State</u>	<u>Zip Code</u>	

Property Owner or his/her designee:

<u>Name</u>	<u>Telephone No.</u>	
	<u>Fax No.</u>	
<u>Title</u>	<u>Email Address</u>	
<u>Company</u>	<u>Street Address</u>	
<u>City</u>	<u>State</u>	<u>Zip Code</u>

Property Owner

"I/we certify that I/we have received copies of all the documents within the Landscape Documentation Package and the Certificate of Completion and that it is our responsibility to see

that the project is maintained in accordance with the Landscape and Irrigation Maintenance Schedule.”

Property Owner Signature _____

Date _____

Please answer the questions below:

1. Date the Landscape Documentation Package was submitted to the city _____
2. Date the Landscape Documentation Package was approved by the city _____
3. Date that a copy of the Water Efficient Landscape Worksheet (including the Water Budget Calculation) was submitted to the local water purveyor _____

PART 2. CERTIFICATION OF INSTALLATION ACCORDING TO THE LANDSCAPE DOCUMENTATION PACKAGE

“I/we certify that based upon periodic site observations, the work has been completed in accordance with the Chapter 15.92 of the Sacramento City Code and that the landscape planting and irrigation installation conform with the criteria and specifications of the approved Landscape Documentation Package.”

<u>Signature*</u>	<u>Date</u>	
<u>Name (print)</u>	<u>Telephone No.</u>	
	<u>Fax No.</u>	
<u>Title</u>	<u>Email Address</u>	
<u>License No. or Certification No.</u>		
<u>Company</u>	<u>Street Address</u>	
<u>City</u>	<u>State</u>	<u>Zip Code</u>

*Signer of the landscape design plan, signer of the irrigation plan, or a licensed landscape contractor.

PART 3. IRRIGATION SCHEDULING

Attach parameters for setting the irrigation schedule the controller per section 15.92.140 of the Sacramento City Code.

PART 4. SCHEDULE OF LANDSCAPE AND IRRIGATION MAINTENANCE

Attach schedule of Landscape and Irrigation Maintenance per section 15.92.150 of the Sacramento City Code.

PART 5. LANDSCAPE IRRIGATION AUDIT REPORT

Attach Landscape Irrigation Audit Report per section 15.92.160 of the Sacramento City Code.

PART 6. SOIL MANAGEMENT REPORT

Attach soil analysis report, if not previously submitted with the Landscape Documentation Package per section 15.92.090 of the Sacramento City Code.

Attach documentation verifying implementation of recommendations from soil analysis report per section 15.92.090 of the Sacramento City Code.

15.92 Appendix D. Prescriptive compliance option.

A. In accordance with section 15.92.020.B, this appendix contains the prescriptive measures that a project may comply with as an alternative to complying with the other provisions of this chapter.

B. Compliance with the following is mandatory and must be documented on a landscape plan to use the prescriptive compliance option:

1. A landscape documentation package that includes the following elements:

a. Date;

b. Project applicant;

c. Project address (if available, parcel and/or lot number(s));

d. Total landscape area (square feet), including a breakdown of turf and plant material;

e. Project type (e.g., new, rehabilitated, public, private, cemetery, homeowner-installed);

f. Water supply type (e.g., potable, recycled, well) and identify the local retail water purveyor if the applicant is not served by a private well;

g. Contact information for the project applicant and property owner; and

h. Applicant signature and date with statement, "I agree to comply with the requirements of the prescriptive compliance option to Chapter 15.92 of the Sacramento City Code."

2. A compost rate of at least four cubic yards per 1,000 square feet to a depth of six inches into landscape area (unless contra-indicated by a soil test);

3. Plant material that complies with all of the following:

a. For residential areas, climate adapted plants that require occasional, little, or no summer water (average WUCOLS plant factor 0.3) for 75% of the plant area excluding edibles and areas using recycled water. For non-residential areas, climate adapted plants that require occasional, little, or no summer water (average WUCOLS plant factor 0.3) for 100% of the plant area excluding edibles and areas using recycled water;

b. A minimum three-inch layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers, or direct seeding applications where mulch is contra-indicated.

4. Turf that complies with all of the following:

a. Turf does not exceed 25% of the landscape area in residential areas, and there shall be no turf in non-residential areas;

b. Turf shall not be planted on sloped areas that exceed a slope of one foot vertical elevation change for every four feet of horizontal length;

c. Turf is prohibited in parkways less than ten feet wide, unless the parkway is adjacent to a parking strip and used to enter and exit vehicles. Any turf in parkways must be irrigated by sub-surface irrigation or by other technology that creates no overspray or runoff.

5. Irrigation systems that comply with the following:

a. Automatic irrigation controllers are required and must use evapotranspiration or soil moisture sensor data and utilize a rain sensor.

b. Irrigation controllers shall be of a type that does not lose programming data in the event the primary power source is interrupted.

c. Pressure regulators shall be installed on the irrigation system to ensure the dynamic pressure of the system is within the manufacturers recommended pressure range.

d. Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) shall be installed as close as possible to the point of connection of the water supply.

e. All irrigation emission devices must meet the requirements set in the ANSI standard, ASABE/ICC 802-2014 – “Landscape Irrigation Sprinkler and Emitter Standard.” All sprinkler heads installed in the landscape must document a distribution uniformity low quarter of 0.65 or higher using the protocol defined in ASABE/ICC 802-2014.

f. Areas less than ten feet in width in any direction shall be irrigated with subsurface irrigation or other means that produces no runoff or overspray.

6. For non-residential projects with landscape areas of 1,000 square feet or more, a private submeter that measures landscape water use.

C. At the time of final inspection, the permit applicant must provide the owner of the property with a certificate of completion, certificate of installation, irrigation schedule, and a schedule of landscape and irrigation maintenance.