REPORT TO LAW & LEGISLATION COMMITTEE
City of Sacramento

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915 I Street, Sacramento, CA 95814-2671

CONSENT
December 1, 2009

Honorable Members of the
Law and Legislation Committee

Title: Water Efficient Landscape Ordinance M09-042

Location/Council District: Citywide

Recommendation: Review an **Ordinance** repealing and adding Chapter 15.92 to the Sacramento City Code relating to water efficient landscape and irrigation, and forward a recommendation of approval to the City Council.

Contact: Joy Patterson, Principal Planner, (916) 808-5607

Presenter: Not Applicable

Departments: Community Development

Divisions: Current Planning

Organization No: 21001010

Description/Analysis:

Issue: The City is required to adopt a new water efficient landscape ordinance by January 1, 2010. If the City fails to adopt an ordinance by that date, the updated model water efficient landscape ordinance approved by the State Department of Water Resources (DWR) will apply within the City as a matter of law.

In 1992, Chapter 15.92 was added to the Sacramento City Code (Ord. No. 92-064) to establish requirements for water conservation in landscaping for industrial, commercial, office, and multi-family residential developments, common areas, and parks and other public recreation areas. This chapter established standards and procedures for the design, installation, and management of landscapes for the purpose of avoiding excessive water demands and minimizing landscape vulnerability to periods of severe drought.

Chapter 15.92 was adopted in response to the enactment of the State Water Conservation in Landscaping Act in 1990. That law directed the State Department of Water Resources (DWR) to prepare a model water efficient landscape ordinance and required cities and counties to either adopt a local

landscape water conservation ordinance or adopt findings that a water efficient landscape ordinance was unnecessary due to local topographical, geographic or climatic conditions, or water supply. Chapter 15.92 was likely based on DWR's original model ordinance.

More recently, the State legislature adopted the Water Conservation and Landscaping Act of 2006 that directed DWR to prepare an updated model water efficient landscape ordinance by January 1, 2009. Similar to the earlier statute, the 2006 Act requires cities and counties to adopt either DWR's model ordinance or its own ordinance that is at least as effective as the model ordinance in regard to water conservation (opting out is no longer provided for). If the City fails to adopt an ordinance as described, DWR's updated model ordinance will apply within the City as a matter of law. The deadline for the City to act is January 1, 2010. The City must notify DWR by January 31, 2010 as to whether it is subject to the updated model ordinance or, if not, submit to DWR a copy of its local ordinance.

Because DWR did not approve and distribute the updated model ordinance until October of this year, staff has not had an opportunity to thoroughly evaluate the updated model ordinance. However, the January 1, 2010 deadline for adoption must still be met. For this reason, the draft ordinance presented for the committee's consideration and recommendation has made minimal changes to the updated model ordinance, with modifications limited to those needed to conform the model ordinance to the City's code and organizational structure. No changes have been made to any of the performance measures or standards for landscape and irrigation water efficiency. Staff recommends that the proposed ordinance be adopted to meet the January 1, 2010 deadline. Once in place, staff can monitor its implementation and, if further revisions are needed to make it more workable based on feedback from City staff, stakeholders, or per State direction, this can be done during 2010 or later as needed.

Attachment 1 contains background and explanatory materials provided by DWR on the updated model ordinance and the requirements of the Water Conservation and Landscaping Act of 2006. Attachment 2 is a copy of the current Chapter 15.92. Attachment 3 is a copy of the proposed ordinance.

Policy Considerations: The proposed ordinance is consistent with the City's Strategic Plan goal to achieve sustainability and livability in the City of Sacramento.

Environmental Considerations:

California Environmental Quality Act (CEQA): The proposed ordinance is not subject to the provisions of CEQA pursuant to Section 15061(c)(2). This section states that an activity that will not result in a direct or reasonably

foreseeable indirect physical change in the environment is not subject to CEQA.

Sustainability Considerations: Water conservation and efficient water use is important for maintaining and protecting the water supply during dry years and minimizing the City's carbon footprint by reducing the demand for water diversion and treatment. The City's efforts benefit California's river resources by reducing the region's surface water demand.

Committee/Commission Action: None

Rationale for Recommendation: The proposed ordinance updates the City's water conserving landscape requirements in Chapter 15.92 to conform with State law.

Financial Considerations: None.

Emerging Small Business Development (ESBD): No goods or services are being purchased under this report.

Respectfully Submitted by: Joe Patterson for David Kwong
Planning Manager

Approved by: Joe Patterson for David Kwong
Acting Director of Community Development

Recommendation Approved:

for Patti Bishop
RAY KERRIDGE
City Manager

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Attachment 1

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

OCT 0 8 2009

Cities and Counties:

Adoption of the Updated Model Water Efficient Landscape Ordinance

Your action is required to conserve water supplies and comply with State law. The Water Conservation in Landscaping Act of 2006 (Assembly Bill 1881, Laird) requires cities and counties, including charter cities and charter counties, to adopt landscape water conservation ordinances by January 1, 2010. In accordance with this law, the Department of Water Resources (DWR) has prepared an updated Model Water Efficient Landscape Ordinance (MWELO) for your use, please see Enclosure 1. Text of the updated MWELO is also posted on DWR's Water Use and Efficiency Branch website at http://www.water.ca.gov/wateruseefficiency/landscapeordinance/. All local agencies (cities, counties, cities and counties, charter cities and charter counties) have until January 1, 2010, to adopt DWR's updated MWELO or their own local water efficient landscape ordinance. If a local agency has not adopted its own ordinance on or before January 1, 2010, the updated MWELO shall apply within the jurisdiction of that local agency as of that date.

DWR is working with local agencies and governments to conduct outreach activities including workshops to assist implementation of water efficient landscape ordinances. For October and November workshops, please see Enclosure 2. For questions on the updated MWELO and information on DWR's outreach activities, please e-mail mweo@water.ca.gov or contact us at (877) 693-5610 (877-MWELO10), so that a member of our staff can provide personalized service.

Each local agency has until January 31, 2010, to either notify DWR that it has adopted DWR's updated MWELO; or submit to DWR a copy of its adopted water efficient landscape ordinance, a copy of its findings, and evidence that its water efficient landscape ordinance is at least as effective at conserving water as DWR's updated MWELO. Please submit all notifications and documents to:

Mr. Simon Eching
California Department of Water Resource
Water Use and Efficiency Branch
Post Office Box 942836
Sacramento, California 94236-0001

Cities and Counties
OCT 08 2009
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In California's warm, dry climate, more than half of urban water supplies may be used for landscape irrigation. Ensuring efficient landscapes in new developments and reducing water waste in existing landscapes are among the most cost-effective ways to stretch our limited water supplies and ensure that we continue to have the water we need. Other benefits include reduced irrigation runoff, reduced pollution of waterways, drought resistance, and less green waste.

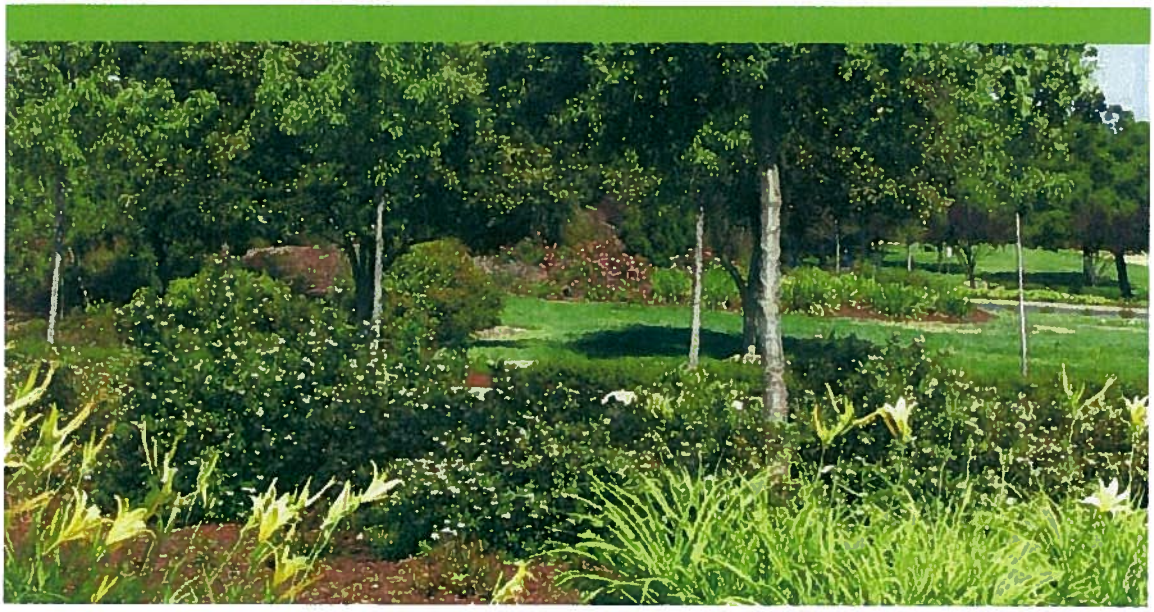
Thank you for your help conserving California's water supplies.

Sincerely,

Lester A. Snow
Director

Enclosures

cc: California Urban Water Suppliers



The Updated Model Water Efficient Landscape Ordinance

CALIFORNIA DEPARTMENT OF WATER RESOURCES

Landscapes are essential to the quality of life in California. They provide areas for recreation, enhance the environment, clean the air and water, prevent erosion, offer fire protection and replace ecosystems lost to development.

California's economic prosperity and environmental quality are dependant on an adequate supply of water for beneficial uses. In California, about half of the urban water used is for landscape irrigation. Ensuring **efficient landscapes** in new developments and reducing water waste in existing landscapes are the most cost-effective ways to stretch our limited water supplies and ensure that we continue to have sufficient water for California to prosper.

The Water Conservation in Landscaping Act of 2006 (Assembly Bill 1881, Laird) requires cities, counties, and charter cities and charter counties, to adopt landscape water conservation ordinances by January 1, 2010. Pursuant to this law, the Department of Water Resources (DWR) has prepared a Model Water Efficient Landscape Ordinance (Model Ordinance) for use by local agencies. The Model Ordinance was approved by the Office of Administrative Law on September 10, 2009. The Model Ordinance became effective on September 10.

All local agencies must adopt a water efficient landscape ordinance by **January 1, 2010.** The local agencies may adopt the state Model Ordinance, or craft an ordinance to fit local conditions. In addition, several local agencies may collaborate and craft a region-wide ordinance. In any case, the adopted ordinance must be as effective as the Model Ordinance in regard to water conservation.

For more information, please visit our web site at
http://www.water.ca.gov/wateruseefficiency/landscapeordinance/

DWR October 2009

Model Water Efficient Landscape Ordinance
CALIFORNIA DEPARTMENT OF WATER RESOURCES

Important points to consider...

Water purveyors have an important role.
The enabling statute was directed to local agencies that make land use decisions and approve land development. Active participation by water purveyors can make the implementation, enforcement and follow-up actions of an ordinance more effective.

Most new and rehabilitated landscapes are subject to a water efficient landscape ordinance. Public landscapes and private development projects including developer installed single family and multi-family residential landscapes with at least 2500 sq. ft. of landscape area are subject to the Model Ordinance .

Homeowner provided landscaping at single family and multi-family homes are subject to the Model Ordinance if the landscape area is at least 5000 sq. ft

Existing landscapes are also subject to the Model Ordinance.
Water waste is common in landscapes that are poorly designed or not well maintained. Water waste (from runoff, overspray, low head drainage, leaks and excessive amounts of applied irrigation water in landscapes is prohibited by Section 2, Article X of the California Constitution.

Any landscape installed prior to January 1, 2010, that is at least one acre in size may be subject to irrigation audits, irrigation surveys or water use analysis programs for evaluating irrigation system performance and adherence to the Maximum Applied Water Allowance as defined in the 1992 Model Ordinance with an Evapotranspiration Adjustment Factor (ETAF) of 0.8. Local agencies and water purveyors (designated by the local agency) may institute these or other programs to increase efficiency in existing landscapes.

All new landscapes will be assigned a water budget.
The water budget approach is a provision in the statute that ensures a landscape is allowed sufficient water. There are two water budgets in the Model Ordinance; the Maximum Applied Water Allowance (MAWA) and the Estimated Total Water Use (ETWU).

The MAWA, is the water budget used for compliance and is an annual water allowance based on landscape area, local evapotranspiration and ETAF of 0.7. The ETWU is an annual water use estimation for design purposes and is based on the water needs of the plants actually chosen for a given landscape. The ETWU may not exceed the MAWA.

Water efficient landscapes offer multiple benefits.
Water efficient landscapes will stretch our limited water supplies. Other benefits include reduced irrigation runoff, reduced pollution of waterways, less property damage, less green waste, increased drought resistance and a smaller carbon footprint.

The Department of Water Resources will offer technical assistance.
The Department plans to offer a series of workshops, publications and other assistance for successful adoption and implementation of the Model Ordinance or local water efficient landscape ordinances. Information regarding these resources may be found on the DWR website: **http://www.water.ca.gov/wateruseefficiency/landscapeordinance/**
Questions on the Model Ordinance may be sent by e-mail to DWR staff at: **mweo@water.ca.gov.**

Attachment 2

Chapter 15.92 LANDSCAPING REQUIREMENTS FOR WATER CONSERVATION

15.92.010 Purpose.

The purpose of this chapter is to define the standards and procedures for the design, installation, and management of landscapes in order to utilize available plant, water, land, and human resources to the greatest benefit of the people of the city. Skillful planting and irrigation design, appropriate use of plants, and intelligent landscape management can assure landscape development that avoids excessive water demands and that is less vulnerable to periods of severe drought. The regulations contained in this chapter shall be known as the city "water conserving landscape requirements." (Prior code § 9.30.1400)

15.92.020 Applicability.

These requirements shall be applicable to new and rehabilitated landscaping for industrial, commercial, office and institutional developments; to parks and other public recreational areas; to multi-family (four or more units) residential and PUD common areas; to model home complexes with three or more model homes; and to city road medians and corridors. (Prior code § 9.30.1401)

15.92.030 Implementation.

To assure that the purpose of this chapter is carried out, improvement plans and building permits will not be approved until a submittal conforming to the specific provisions of this chapter shall have been approved by the city department of planning and development. A fee set by resolution of the city council shall accompany the submittal. (Prior code § 9.30.1402)

15.92.040 Exceptions.

The director may authorize conditional exceptions to any of the design and improvement standards in this chapter. Such exceptions may be granted if the director finds in writing that the proposed design or improvement is in substantial compliance with the purpose and intent of the standard to be excepted.

This chapter shall not be applied so as to modify landscaping requirements set forth as a condition on a special permit or other land use entitlements. (Prior code § 9.30.1403)

15.92.050 Definitions.

Unless the context specifically indicates otherwise, the meaning of terms used in this chapter shall be as defined in this section.

"Amendment" means any material added to the soil to alter the pH or improve the physical properties of the soil.

"Application rate" means the rate of irrigation (inches/hour or gallons per minute) at which water is applied by an irrigation system.

"Automatic control valve" means a valve in an irrigation system which is activated by an automatic electric controller via an electric control wire.

"Automatic irrigation system" means an irrigation system that can be controlled without manual manipulation and which operates on a preset program.

"Contour" means a line drawn on a plan which connects all points of equal elevation above or below a known or assumed reference point.

"Controller" means an automatic timing device with enclosure, which signals automatic valves to open and close on a preset program.

"Conversion factor" means the number 0.62 is used to convert the maximum applied water allowance from acre-inches per acre per year to gallons per square foot per year.

"Coverage" is a general term used with respect to the spacing of sprinkler heads, which defines the manner in which water is applied.

Cycle. In irrigation, the complete operation of a controller station.

"Designer" means a person authorized to practice landscape architecture pursuant to Business and Professions Code Division 3, Chapter 3.5.

"Director" means the director of the planning and development department, or the director's designee.

"Drip irrigation" means low volume irrigation.

"Estimated applied water use" means the amount of annual applied water recommended in the irrigation schedule.

ET Adjustment Factor. The number 0.8 is used to adjust for plant factors and irrigation efficiency when determining the amount of water that needs to be applied to the planting area.

"Grading" means earthwork performed to alter the natural contours of an area to be planted.

"Hydrozone" means a portion of the planting area having plants grouped according to water need.

"Infiltration rate" means the rate (inches per hour) in which water moves through soil under natural conditions.

"Irrigation system" means a complete connection of system components, including the water distribution network and the necessary irrigation equipment and downstream from the backflow prevention device.

"Maximum applied water allowance" means the desired limit of annual applied water for the established planting area.

"Median" means a planted area which separates two roadways or divides a portion of a road into two or more lanes.

"Mulch" means materials such as bark or sawdust placed on the soil surface to retain moisture, retard weed growth, or prevent erosion.

"Overspray" means water which is discharged from a pop-up or spray head which lands outside of the planting area.

"P.S.I" means pounds per square inch gauge water pressure.

"Percolation" means the movement of water through soil.

"Permeability" means the quality of a soil which allows water and air to pass through it.

"Planting area" means the parcel area less building pad(s), driveway(s), patio(s), deck(s), walkway(s) and parking area(s). Planting area includes water bodies (i.e., fountains, ponds, lakes) and natural areas.

"Planting plan" means a plan showing the features, contours, and dimensions of a plot of land, along with the location and dimensions of elements to be constructed.

"Point of connection" means the point at which the irrigation system is connected to the public water system. This location is normally identified by the point at which a water meter is located or will be installed.

"Precipitation rate" means the amount of water, in inches per hour, discharged by a group of sprinkler heads.

"Rain shutoff" means a feature of an automated irrigation system which interrupts the normal irrigation cycle when it detects a significant amount of rainfall.

"Reference evapotranspiration" or "ETo" means an estimate of the annual evapotranspiration of a large field of four-inch to seven-inch tall, cool-season grass that is well watered. For the city of Sacramento, the ETo is 51.9.

"Rehabilitated landscape" means any planting area in which fifty (50) percent of existing landscape materials are replaced or modified within any twelve (12) month period. Examples include a change of plants or ground cover, installation of a new irrigation system, and grading modifications.

"Runoff" means water which is not absorbed by the soil to which it is applied. Runoff usually occurs when water is applied at too great a rate or when water is applied to a steep slope.

"Station" means a position on an automatic irrigation controller which indicates the control point of automatic irrigation valves.

"Tensiometer" (or "moisture sensor") means an instrument for measuring the moisture content of the soil and capable of interrupting the irrigation cycle when excessive or adequate moisture is detected.

"Toe of slope" means a horizontal section located at the base of a slope.

"Turf" means a surface layer of earth containing grass with its roots. (Prior code § 9.30.1404)

15.92.060 Submittals.

The following shall be submitted to the city, planning and development department, for review and approval:

A. Planting Plan. The planting plan shall be drawn on project base sheets in a clear and legible fashion.

1. A scale of no smaller than 1 inch = 40 feet shall be used.

2. Plan. The planting plans shall accurately and clearly identify:

a. Landscape materials, trees, shrubs, ground cover, turf, etc. Planting symbols shall be clearly drawn and plants labeled by botanical name, common names, container size, spacing and quantities of each group of plants indicated;

b. Property lines;

c. Streets, driveways, walkways, and other paved areas;

d. Building and structures including elevation if applicable;

e. Natural features: rock outcropping, existing oak and ornamental trees, shrubs, etc., to remain;

f. Tree staking, soil preparation details, and any other applicable details.

B. Irrigation Plan. The irrigation plan shall be drawn on project base sheets in a clear and legible fashion.

1. The scale shall be equal to that used for the planting plan.

2. Plan. The irrigation plan shall accurately and clearly identify:

a. Flow rate and P.S.I. at the point of connection;

b. Coverage of all components of the irrigation system, including main and lateral lines;

c. Valves;

d. Controllers;

e. Heads;

f. Quick couplers;

g. Head precipitation rates;

h. Meter size;

i. Moisture sensor devices;

j. Rain switches;

k. Backflow prevention device.

C. Sloped Areas. Sloped areas shall be indicated by contour lines (this may be shown on grading plan).

D. Soils Report. Unless excused pursuant to Section 15.92.110 of this chapter, a soils report shall be prepared by a soil testing company and submitted with the plans. Soil samples shall be sufficiently numerous to account for any soil variations that may be present in the planting area. As a minimum, the following shall be included:

1. Soil infiltration;

2. Soil texture test;

3. Cation exchange capacity;

4. Soil fertility, including tests for nitrogen, potassium, phosphorous, pH, organic matter, and specific conductance (E.C.).

Amendments shall be added to correct for problems as noted by the soils report. A copy of the soils report shall be attached to the irrigation schedule which will be delivered to the owner and controller operator.

E. Irrigation Schedule. An annual irrigation program with a minimum four-season water schedule shall be required for both the plant establishment period and established landscape. The water schedule shall include run time and frequency of irrigation for each station. The estimated applied water use shall not exceed the maximum applied water allowance. A copy of the schedule shall be delivered, along with as-builts and any other information normally forwarded to the owner and controller operator. (Prior code § 9.30.1405)

15.92.070 Irrigation system design criteria.

A. Irrigation systems shall be designed so that the application rate does not exceed the infiltration rate of the soil and will minimize overspray and runoff. The designer shall refer to Section 15.92.120 of this chapter, Soil infiltration rates, and the results of the soil tests to meet these design criteria. In general, low volume sprinkler heads, drip emitters and pressure compensation bubblers shall be used throughout the system.

B. Irrigation stations shall be separated (e.g., drip vs. overhead spray systems). Additional control valves shall be installed to account for different site specific characteristics (i.e., full sun/full shade, level/sloping, shrubs/lawns, street trees, etc.).

C. Maximum sprinkler spacing for both turf and non-turf areas shall be fifty (50) percent of the diameter of the throw. (Example: thirty (30) foot diameter nozzle should be no more than fifteen (15) feet apart.) Spacing of sprinklers shall take into account on-site wind conditions.

D. All irrigation systems shall be operated by an automatic controller. At a minimum, each controller shall have a rain shutoff operation, a seven-day calendar, two independent programs, and three cycles/day capabilities.

E. The irrigation schedule shall provide a complete watering cycle that avoids runoff and overspray.

F. All turf areas shall utilize either pop-up rotary impact heads or spray heads with a minimum riser height of six inches. (Prior code § 9.30.1406)

15.92.080 Maximum applied water allowance—Estimated applied water use—Turf and plant selection.

A. Maximum Applied Water Allowance. A landscape's maximum applied water allowance shall be calculated using the following formula:

MAWA = (ETo) (0.8) (PA) (0.62) where:

MAWA = Maximum applied water allowance (gallons per year)

ETo = Reference evapotranspiration (inches per year)

0.8 = ET adjustment factor

PA = Planting area (square feet)

0.62 = conversion factor (to gallons per square foot)

Example: Assume a planting area of 50,000 square feet.

MAWA = (ETo) (.8) (PA) (.62)

= (51.9 inches) (.8) (50,000 square feet) (.62)

Maximum applied water allowance = 1,287,120 gallons per year (or 1.721 hundred-cubic-feet per year: 1,287,120/748 = 1,721)

B. Estimated Applied Water Use.

1. The estimated applied water use shall not exceed the maximum applied water allowance.

2. A calculation of the estimated applied water use shall be submitted with the planting plan. It may be calculated by totaling the amount of water recommended in the irrigation schedule.

C. Turf Selections and Use.

1. Turf shall not be permitted in areas six feet or less in width or in median strips.

2. Under no circumstances shall turf be installed on slopes greater than twenty (20) percent. The toe of any sloping section shall be a minimum of twenty-four (24) inches behind a curb or sidewalk.

3. Turf areas which exceed two thousand five hundred (2500) square feet are required to use soil moisture sensors and rain shutoff devices as a part of the irrigation system. Device type and installation shall be per manufacturer's recommendations.

4. Turf shall not be installed within ten (10) feet of the dripline of native oak trees.

5. Turf shall be of a variety well suited to the local climate.

D. Non-Turf Selections.

1. Plants selected for use in non-turf areas should be well suited or adaptable to the climate of this region. Plants should be grouped in hydrozones according to their water needs and irrigated separately. To use species other than those listed by the director pursuant to Section 15.92.130 of this chapter, the designer may provide the city with information indicating the water requirements of the species. Information may include the listing of a plant in an acceptable reference stating its water requirement characteristics, comparing it to a species in the plant list, field data, etc.

2. A minimum of two inches of an organic mulch shall be placed in shrub areas on the soil surface after planting. Nonporous materials shall not be placed under the mulch. (Prior code § 9.30.1407)

15.92.090 Landscape certificate.

Upon completion of the installation of the landscaping, the designer shall certify that the landscape complies with all requirements of this chapter. Certification shall be accomplished by completion of a landscape certificate on a form approved by the director. Failure to submit a complete and accurate landscape certificate will delay final approval of the project and/or discontinue water service. (Prior code § 9.30.1408)

15.92.100 Model home landscape criteria.

A. For each subdivision with three or more model homes, the developer shall submit a landscape plan and install landscaping for one model home which incorporates the requirements of this chapter. The intent of this requirement is to demonstrate to prospective home buyers the feasibility and aesthetic qualities of water conserving landscape design. The landscape plan shall be reviewed and approved by the director prior to the opening of the model home complex.

B. Signs identifying aspects of the water conserving landscape design and irrigation system shall be placed around the model. All signage shall be reviewed by the director as part of the model home complex/temporary sales office permit. All signage shall be installed prior to the opening of the model home complex. These signs should be clearly marked on the landscape plan for the model. The following criteria shall be used in developing and placing the signs.

1. Front Yard Sign Identifying Model. A sign large enough to be visible from the street and sidewalk (minimum size two feet by two feet, maximum size three feet by three feet) shall be located in front of the model home. The sign shall indicate that the model is landscaped with water conserving plant materials and irrigation systems.

2. Other Exterior Signs. A sign shall be placed within the landscaped area identifying the irrigation system used, the different sub-areas of the landscape, and any other features that contribute to the overall water conserving theme.

3. Interior Signs or Displays. A drawing, or combination of drawings, shall be displayed inside the model providing a schematic of the landscape. These drawings

shall include a key identifying the plants in the yards. The drawings may be a simplified rendering of the landscape plan itself, using common names rather than the Latin names for the plants. The drawing(s) should be colorful and easy to read. A one-page handout of the schematic (black and white acceptable) shall be available at the model or the sales office.

Literature describing water conserving landscapes shall be available to individuals touring the model. Copies of all literature and handouts shall be placed on file with the city planning division. (Prior code § 9.30.1409)

15.92.110 City soil map.

No soils report shall be required if the soil type can be determined by reference to the city soil map maintained by the director and the soil is amended as required by the director; provided, however, that a soils report shall be required if substantial amounts of soil are imported to the property. (Prior code § 9.30.1410)

15.92.120 Soil infiltration rates.

Soil Texture, Type	**Percent of Slope Infiltration Rate (IR) Inches/Hour**				
	0—4%	5—8%	8—12%	12—16%	Over 16%
Coarse Sand	1.25	1.00	.75	.50	.31
Medium Sand	1.06	.85	.64	.42	.27
Fine Sand	.94	.75	.56	.38	.24
Loamy Sand	.88	.70	.53	.35	.22
Sandy Loam	.75	.60	.45	.30	.19
Fine Sandy Loam	.63	.50	.38	.25	.16
Very Fine Sandy Loam	.59	.47	.35	.24	.15
Loam	.54	.43	.33	.22	.14
Silt Loam	.50	.40	.30	.20	.13
Silt	.44	.35	.26	.18	.11
Sandy Clay	.31	.25	.19	.12	.08
Clay Loam	.25	.20	.15	.10	.06
Silty Clay	.19	.15	.11	.08	.05
Clay	.13	.10	.08	.05	.03
	Note: Rates based on full cover. These figures decrease with time and percent of cover. Derived from USDA information.				

(Prior code § 9.30.1411)

15.92.130 List of relative water requirements of commonly used plants.

The director shall develop a list of plants that are commonly used in landscape designs with water requirement classifications of low, medium, and high to assist landscape designers to group species of similar water demands to facilitate efficient irrigation. Upon the request of a landscape designer, the director shall classify any plant not included on the director's list as low, medium, or high water use. (Prior code § 9.30.1412)

Attachment 3

ORDINANCE NO.

Adopted by the Sacramento City Council

Date Adopted

AN ORDINANCE REPEALING AND ADDING CHAPTER 15.92 TO THE SACRAMENTO CITY CODE RELATING TO WATER EFFICIENT LANDSCAPE AND IRRIGATION AND MAKING FINDINGS (M09-042)

DRAFT

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 Title 15 of the Sacramento City Code, to read as follows:

Chapter 15.92 WATER EFFICIENT LANDSCAPE REQUIREMENTS

15.92.010 Purpose.

A. The Water Conservation in Landscaping Act, California Government Code §§ 65591 et seq., requires local agencies to adopt one of the following, on or before January 1, 2010:

1. The updated model water efficient landscape ordinance issued by the California Department of Water Resources on October 8, 2009, and set forth in Chapter 2.7 of Division 2 of Title 23 of the California Code of Regulations; or

2. A water efficient landscape ordinance that is, based on evidence in the record, at least as effective in conserving water as the updated model water efficient landscape ordinance issued by the California Department of Water Resources.

B. In the Water Conservation in Landscaping Act, the State Legislature made the following findings:

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

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

3. That 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. That 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. That landscape design, installation, maintenance and management can and should be water efficient; and

6. That 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 and shall 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, and to:

1. Promote the values and benefits of landscapes while recognizing the need to invest water and other resources as efficiently as possible;

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

3. Establish provisions for water management practices and water waste prevention for existing landscapes;

4. Use water efficiently without waste by setting a Maximum Applied Water Allowance as an upper limit for water use and reduce water use to the lowest practical amount; and

5. Promote the benefits of consistent landscape ordinances with neighboring local and regional agencies.

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15.92.020 Applicability.

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

1. New landscape projects and rehabilitated landscape projects with a landscape area equal to or greater than 2,500 square feet that are installed by or under the direction of the City, or by or under the direction of another public agency for which a city-issued building or landscape permit, plan check, plan review, or design review is required under this code;

2. Developer-installed new landscape projects and rehabilitated landscape projects with a landscape area equal to or greater than 2,500 square feet and for which a city-issued building or landscape permit, plan check, plan review, or design review is required under this code;

3. Owner-installed new landscape projects and rehabilitated landscape projects with a landscape area equal to or greater than 2,500 square feet and for which a city-issued building or landscape permit, plan check, plan review, or design review is required under this code;

4. Homeowner-installed landscape project that is a new landscape project with a landscape area equal to or greater than 5,000 square feet for which a city-issued building or landscape permit, plan check, plan review, or design review is required under this code.

B. Existing landscapes shall be subject only to the provisions of Section 15.92.210.

C. New and rehabilitated cemeteries shall be subject only to the provisions of Sections 15.92.080, 15.92.150, and 15.92.160. Existing cemeteries shall be subject only to the provisions of Section 15.92.210.

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. Plant collections, as part of botanical gardens and arboretums open to the public.

15.92.030 Fees.

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A. The following fees are established and imposed pursuant to the provisions of this chapter:

1. Landscape Document Package application fee.

B. The city council shall establish the amounts of the forgoing fee by resolution.

15.92.040 Exceptions.

A. The director may authorize conditional exceptions to any of the design and improvement standards in this chapter. Such exceptions may be granted if the director finds in writing that the proposed design or improvement is in substantial compliance with the purpose and intent of the standard to be excepted.

B. This chapter shall not be applied so as to modify landscaping requirements set forth as a condition on a special permit or other land use entitlement.

15.92.050 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 Example Calculations of WAMA and ETWU 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 an automatic timing device used to remotely control valves that operate an irrigation system. Automatic irrigation controllers 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 15.92.130.

"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 US 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 US 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.

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

"Developer-installed landscape project" means a landscape project installed by or under the direction of the developer of a development project.

"Director" means the director of the Community Development Department or the director's authorized designee.

"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 which 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.

"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.

"Estimated Total Water Use" (ETWU) means the total water used for the landscape as described in Section 15.92.080.

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"ET adjustment factor" (ETAF) means a factor of 0.7, 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. A combined plant mix with a site-wide average of 0.5 is the basis of the plant factor portion of this calculation. For purposes of the ETAF, the average irrigation efficiency is 0.71. Therefore, the ET Adjustment Factor is (0.7)=(0.5/0.71). ETAF for a Special Landscape Area shall not exceed 1.0. ETAF for existing non-rehabilitated landscape projects 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.

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

"Homeowner-installed landscape project" means a landscape project installed in an owner-occupied single-family residence or residential development of four (4) or fewer residential units, by or under the direction of the owner-occupants of the residence or the unit(s).

"Hydrozone" means a portion of the landscaped area having plants with similar water needs. 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 weeds. "Noxious weeds" means any weed designated by the Weed Control Regulations in the Weed Control Act and identified on a Regional District noxious weed control list. 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.

"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

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practices. The minimum average irrigation efficiency is 0.71. Greater irrigation efficiency can be expected from well designed and maintained 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 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 the total area of landscape in a project as defined in "landscape area."

"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 to the project.

"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.

"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

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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.

"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, and 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 landscape project" means new landscaping installed in conjunction with the construction of a new building, or other new landscaping not associated with construction of a new building, such as a park, playground, or greenbelt.

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

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

"Overspray" means irrigation water which is delivered beyond the target area.

"Owner-installed landscape project" means a landscape project installed by or under the direction or approval of the owner of a building or other development and that is not a homeowner-installed landscape project.

"Permit" means an authorizing document issued for new landscape or rehabilitated landscape projects.

"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. The plant factor range for low water use plants is 0 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 Department of Water Resources 2000 publication "Water Use Classification of Landscape Species".

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"Precipitation rate" means the rate of application of water measured in inches per hour.

"Project applicant" means the individual or entity submitting a Landscape Documentation Package required under Section15.92.070, to request a permit, plan check, or design review. A project applicant may be the property owner or his or her designee.

"Rain sensor" or "rain sensing shutoff device" means a component which automatically suspends an irrigation event when it rains.

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

"Recreational area" means areas dedicated to active play such as parks, sports fields, and golf courses where turf provides a playing surface.

"Recycled water", "reclaimed water", or "treated sewage effluent water" means treated or recycled waste water of a quality suitable for non-potable 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 set forth at the end of this chapter, 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 Allowance so that regional differences in climate can be accommodated.

"Rehabilitated landscape project" means any re-landscaping project that requires a permit , plan check, 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, is 50% or more of the total landscape area, and the modifications are completed within one year.

"Runoff" means water which is not absorbed by the soil or landscape to which it is applied and flows from the landscape area. For example, runoff 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.

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"Special Landscape Area" (SLA) means an area of the landscape dedicated solely to edible plants, areas irrigated with recycled water, water features using recycled water and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface.

"Sprinkler head" means a device which 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.

"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 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, the Department of Water Resources and the Bureau of Reclamation, 2000.

15.92.055 Landscape Documentation Package--Required.

No person shall construct or install a new landscape project or rehabilitated landscape project to which this chapter applies unless a Landscape Document Package for the project has been approved as required by this chapter.

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15.92.060 Landscape Documentation Package—Application—Submittal—Action by director.

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

1. Provide the project applicant with the procedures for permits, plan checks, 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 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.

B. Prior to construction, the project applicant shall:

1. Submit a completed Landscape Documentation Package to the director.

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 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 his/her 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.

A. The Landscape Documentation Package shall include the following seven (7) 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;

6. A grading design plan; and

7. A nonrefundable Landscape Document Package application fee in the amount established by resolution of the city council.

15.92.080 Landscape Documentation Package—Application--Water Efficient Landscape Worksheet.

A. A project applicant shall complete a Water Efficient Landscape Worksheet containing the following two sections and substantially conforming to the Sample Water Efficient Landscape Worksheet in Appendix B:

1. A hydrozone information table for the landscape project; and

2. A water budget calculation for the landscape project. For the calculation of the Maximum Applied Water Allowance (MAWA) and Estimated Total Water Use (ETWU), 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. The plant factor ranges from 0 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 described below.

4. ETAF for Special Landscape Areas shall not exceed 1.0.

C. The Maximum Applied Water Allowance shall be calculated using the equation:

$$MAWA = (ETo)\ (0.62)\ [(0.7 \times LA) + (0.3 \times SLA)]$$

Where:

MAWA = Maximum Applied Water Allowance (gallons per year)
ETo = Reference Evapotranspiration (inches per year)
0.62 = Conversion Factor (to gallons)
0.7 = ET Adjustment Factor (ETAF)
LA = Landscape Area including SLA (square feet)
0.3 = Additional Water Allowance for SLA
SLA = Special Landscape Area (square feet)

D. The Estimated Total Water Use shall be calculated using the equation below. The sum of the Estimated Total Water Use calculated for all hydrozones shall not exceed MAWA.

$$ETWU = (ETo)(0.62)\left(\frac{PF\ x\ HA}{IE} + SLA\right)$$

Where:

ETWU = Estimated Total Water Use per year (gallons)
ETo = Reference Evapotranspiration (inches)
PF = Plant Factor from WUCOLS
HA = Hydrozone Area [high, medium, and low water use areas] (square feet)
SLA = Special Landscape Area (square feet)
0.62 = Conversion Factor
IE = Irrigation Efficiency (minimum 0.71)

E. Example hypothetical calculations for MAWA and ETWU are contained in Appendix D.

15.92.090 Landscape Document Package—Application--Soil Management Report.

A. In order to reduce runoff and encourage healthy plant growth, a soil management report shall be completed by the project applicant, or his/her designee, as follows:

1. Submit soil samples to a laboratory for analysis and recommendations.

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

b. The soil analysis may include:

i. Soil texture;

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

iii. pH;

iv. Total soluble salts;

v. Sodium;

vi. Percent organic matter; and

vii. Recommendations.

2. The project applicant, or his/her designee, shall comply with one of the following:

a. If significant mass grading is not planned, the soil analysis report shall be submitted as part of the Landscape Documentation Package; or

b. If significant mass grading is planned, the soil analysis report shall be submitted as part of the Certificate of Completion.

3. 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.

4. The project applicant, or his/her designee, shall submit documentation verifying implementation of soil analysis report recommendations with Certificate of Completion.

15.92.100 Landscape Document Package-- Application--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. To encourage the efficient use of water, the following shall be considered:

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

ii. Selection of water-conserving plant and turf species; and

iii. Selection of plants based on disease and pest resistance.

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. To encourage the efficient use of water, the following is highly recommended:

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

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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); 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 1 foot of vertical elevation change for every 4 feet of horizontal length (rise divided by run x 100 = slope percent).

e. 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 per Public Resources Code Section 4291(a) and (b). Avoid fire-prone plant materials and highly flammable mulches.

f. The use of invasive and/or noxious plant species is strongly discouraged.

g. The architectural guidelines of a common interest development, which include community apartment projects, condominiums, planned developments, and stock cooperatives, 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. Mulch and Amendments:

a. A minimum two inch (2") 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.

b. Stabilizing mulching products shall be used on slopes.

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

d. 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).

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 and installation details of any applicable stormwater best management practices that encourage on-site retention and infiltration of stormwater. Stormwater best management practices are encouraged in the landscape design plan and examples include, but are not limited to:

a. Infiltration beds, swales, and basins that allow water to collect and soak into the ground;

b. Constructed wetlands and retention ponds that retain water, handle excess flow, and filter pollutants; and

c. Pervious or porous surfaces (e.g., permeable pavers or blocks, pervious or porous concrete, etc.) that minimize runoff.

11. Identify any applicable rain harvesting or catchment technologies (e.g., rain gardens, cisterns, etc.);

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12. 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

13. 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 Business and Professions Code, Section 832.27 of Title16 of the California Code of Regulations, and Section 6721 of the Food and Agriculture Code.)

15.92.110 Landscape Document Package-- Application--Irrigation Design Plan.

A. 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. Dedicated landscape water meters are recommended on landscape areas smaller than 5,000 square feet to facilitate water management.

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

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

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

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

h. 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.

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

j. The design of the irrigation system shall conform to the hydrozones of the landscape design plan.

k. 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.

l. 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.

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

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

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

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

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q. Check valves or anti-drain valves are required for all irrigation systems.

r. Narrow or irregularly shaped areas, including turf, less than eight (8) feet in width in any direction shall be irrigated with subsurface irrigation or low volume irrigation system.

s. 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 the irrigation system design criteria specified in subsection (A)(1)(h), above. Prevention of overspray and runoff must be confirmed during the irrigation audit.

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

2. 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.

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

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i. 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 Sacramento City Code Chapter 15.92 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 Business and Professions Code, Section 832.27 of Title 16 of the California Code of Regulations, and Section 6721 of the Food and Agricultural Code.)

15.92.120 Landscape Document Package-- Application--Grading Design Plan.

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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 of this code 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 of this code 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 (6) elements:

1. Project information sheet that contains:

a. Project name;

b. Project applicant name, telephone, and mailing address;

c. Project address and location; and

d. Property owner name, telephone, and mailing address.

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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, provided that
where there have been significant changes made in the field during construction, the "as-built" or record drawings shall be included with the certification;

3. The irrigation scheduling parameters used to set the controller required by Section 15.92.140;

4. The landscape and irrigation maintenance schedule required by Section 15.92.150;

5. The irrigation audit report required by Section 15.92.160; and

6. The soil analysis report, if not submitted with Landscape Documentation Package, and documentation verifying implementation of soil report recommendations required by Section 15.92.090.

B. The project applicant shall:

1. Submit the signed Certificate of Completion to the director for review;

2. Ensure that copies of the approved Certificate of Completion are submitted to the local water purveyor, if different than the City, and the 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 of this code.

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 Estimated Total Water Use (ETWU). Total annual applied water shall be less than or equal to Maximum Applied

Water Allowance (MAWA). Actual irrigation schedules shall be regulated by automatic irrigation controllers using current reference evapotranspiration data 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.

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

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

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

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

A. For new landscape and rehabilitated landscape projects, the project applicant shall submit an irrigation audit report with the Certificate of Completion that shall 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.

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

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

15.92.180 Recycled Water.

A. Irrigation systems and decorative water features for new landscape and rehabilitated landscape projects shall use recycled water unless a written determination is made by the local water purveyor that recycled water meeting all public health codes and standards is not available to the project.

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

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

15.92.190 Stormwater Management.

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 retention and infiltration are encouraged.

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

C. 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.

15.92.200 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.

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

15.92.210 Provisions for Existing Landscapes.

This section shall apply to all existing landscapes installed prior to the effective date of the ordinance that adopted this chapter and that have a landscape area over one acre in size.

A. For existing landscapes that have a metered irrigation 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 Maximum Applied Water Allowance for existing landscapes. The Maximum Applied Water Allowance (MAWA) for existing landscapes shall be calculated as: MAWA = (0.8) (ETo)(LA)(0.62).

B. For existing landscapes that do not have a metered irrigation 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.

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

15.92.220 Effective Precipitation.

The director may consider Effective Precipitation (25% of annual precipitation) in tracking water use and may use the following equation to calculate Maximum Applied Water Allowance:

MAWA= (ETo - Eppt) (0.62) [(0.7 x LA) + (0.3 x SLA)].

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Appendix A. Reference Evapotranspiration (ETo) Table.

City of Sacramento	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual ETo
	1.0	1.8	3.2	4.7	6.4	7.7	8.4	7.2	5.4	3.7	1.7	0.9	51.9

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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.
Please complete all sections (A and B) of the worksheet.

SECTION A. HYDROZONE INFORMATION TABLE

Please complete the hydrozone table(s) for each hydrozone. Use as many tables as necessary to provide the square footage of landscape area per hydrozone.

Hydrozone*	Zone or Valve	Irrigation Method**	Area (Sq. Ft.)	% of Landscape Area
	Total			**100%**

**** Hydrozone***
HW = High Water Use Plants
MW = Moderate Water Use Plants
LW = Low Water Use Plants

*****Irrigation Method***
MS = Micro-spray
S = Spray
R = Rotor
B= Bubbler
D= Drip
O = Other

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SECTION B. WATER BUDGET CALCULATIONS

Section B1. Maximum Applied Water Allowance (MAWA)

The project's Maximum Applied Water Allowance shall be calculated using this equation:

MAWA = (ETo) (0.62) [(0.7 x LA) + (0.3 x SLA)]

where:

MAWA = Maximum Applied Water Allowance (gallons per year)
ETo = Reference Evapotranspiration from Appendix A (inches per year)
0.7 = ET Adjustment Factor (ETAF)
LA = Landscaped Area includes Special Landscape Area (square feet)
0.62 = Conversion factor (to gallons per square foot)
SLA = Portion of the landscape area identified as Special Landscape Area (square feet)
0.3 = the additional ET Adjustment Factor for Special Landscape Area (1.0 - 0.7 = 0.3)

Maximum Applied Water Allowance = _____gallons per year

Show calculations.

Effective Precipitation (Eppt)

If considering Effective Precipitation, use 25% of annual precipitation. Use the following equation to calculate Maximum Applied Water Allowance:

MAWA= (ETo – Eppt) (0.62) [(0.7 x LA) + (0.3 x SLA)]

Maximum Applied Water Allowance = _____gallons per year

Show calculations.

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Section B2. Estimated Total Water Use (ETWU)

The project's Estimated Total Water Use is calculated using the following formula:

$$ETWU = (ETo)(0.62)\left(\frac{PF\,x\,HA}{IE} + SLA\right)$$

where:

ETWU = Estimated total water use per year (gallons per year)
ETo = Reference Evapotranspiration (inches per year)
PF = Plant Factor from WUCOLS (see Definitions)
HA = Hydrozone Area [high, medium, and low water use areas] (square feet)
SLA = Special Landscape Area (square feet)
0.62 = Conversion Factor (to gallons per square foot)
IE = Irrigation Efficiency (minimum 0.71)

Hydrozone Table for Calculating ETWU

Please complete the hydrozone table(s). Use as many tables as necessary.

Hydrozone	Plant Water Use Type(s)	Plant Factor (PF)	Area (HA) (square feet)	PF x HA (square feet)
			Sum	
	SLA			

Estimated Total Water Use = _____gallons

Show calculations.

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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

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

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 City_____
2. Date the Landscape Documentation Package was approved by City_____
3. Date that a copy of the Water Efficient Landscape Worksheet (including the Water Budget Calculation) was submitted to City, or other local water purveyor if applicable_____

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

"I/we certify that based upon periodic site observations, the work has been substantially completed in accordance with Sacramento City Code Chapter 15.92 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 on controller per Sacramento City Code Section 15.92.140.

PART 4. SCHEDULE OF LANDSCAPE AND IRRIGATION MAINTENANCE

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

PART 5. LANDSCAPE IRRIGATION AUDIT REPORT

Attach Landscape Irrigation Audit Report per Sacramento City Code Section 15.92.160.

PART 6. SOIL MANAGEMENT REPORT

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

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

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Appendix D -- Example Calculations of WAMA and ETWU

The example calculations below are hypothetical to demonstrate proper use of the equations and do not represent an existing and/or planned landscape project. The ETo values used in these calculations are from the Reference Evapotranspiration Table in Appendix A, for planning purposes only. For actual irrigation scheduling, automatic irrigation controllers are required and shall use current reference evapotranspiration data, such as from the California Irrigation Management Information System (CIMIS), other equivalent data, or soil moisture sensor data.

A. MAWA

Example MAWA calculation: a hypothetical landscape project in Fresno, CA with an irrigated landscape area of 50,000 square feet without any Special Landscape Area (SLA= 0, no edible plants, recreational areas, or use of recycled water). To calculate MAWA, the annual reference evapotranspiration value for Fresno is 51.1 inches as listed in the Reference Evapotranspiration Table in Appendix A.

MAWA = (ETo) (0.62) [(0.7 x LA) + (0.3 x SLA)]
MAWA = Maximum Applied Water Allowance (gallons per year)
ETo = Reference Evapotranspiration (inches per year)
0.62 = Conversion Factor (to gallons)
0.7 = ET Adjustment Factor (ETAF)
LA = Landscape Area including SLA (square feet)
0.3 = Additional Water Allowance for SLA
SLA = Special Landscape Area (square feet)

MAWA = (51.1 inches) (0.62) [(0.7 x 50,000 square feet) + (0.3 x 0)]
= 1,108,870 gallons per year

To convert from gallons per year to hundred-cubic-feet per year:
= 1,108,870/748 = 1,482 hundred-cubic-feet per year
(100 cubic feet = 748 gallons)

In this next hypothetical example, the landscape project in Fresno, CA has the same ETo value of 51.1 inches and a total landscape area of 50,000 square feet. Within the 50,000 square foot project, there is now a 2,000 square foot area planted with edible plants. This 2,000 square foot area is considered to be a Special Landscape Area.

MAWA = (ETo) (0.62) [(0.7 x LA) + (0.3 x SLA)]

MAWA = (51.1 inches) (0.62) [(0.7 x 50,000 square feet) + (0.3 x 2,000 square feet)]
= 31.68 x [35,000 + 600] gallons per year
= 31.68 x 35,600 gallons per year
=1,127,808 gallons per year or 1,508 hundred-cubic-feet per year

B. ETWU

Example ETWU calculation: landscape area is 50,000 square feet; plant water use type, plant factor, and hydrozone area are shown in the table below. The ETo value is 51.1 inches per year. There are no Special Landscape Areas (recreational area, area permanently and solely dedicated to edible plants, and area irrigated with recycled water) in this example.

Hydrozone	Plant Water Use Type(s)	Plant Factor (PF)*	Hydrozone Area (HA) (square feet)	PF x HA (square feet)
1	High	0.8	7,000	5,600
2	High	0.7	10,000	7,000
3	Medium	0.5	16,000	8,000
4	Low	0.3	7,000	2,100
5	Low	0.2	10,000	2,000
			Sum	24,700

*Plant Factor from WUCOLS

$$ETWU = (51.1)(0.62)\left(\frac{24{,}700}{0.71} + 0\right)$$

= 1,102,116 gallons per year

Compare ETWU with MAWA: For this example MAWA = (51.1) (0.62) [(0.7 x 50,000) + (0.3 x 0)] = 1,108,870 gallons per year. The ETWU (1,102,116 gallons per year) is less than MAWA (1,108,870 gallons per year). In this example, the water budget complies with the MAWA.

2. Example ETWU calculation: total landscape area is 50,000 square feet, 2,000 square feet of which is planted with edible plants. The edible plant area is considered a Special Landscape Area (SLA). The reference evapotranspiration value is 51.1 inches per year. The plant type, plant factor, and hydrozone area are shown in the table below.

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Hydrozone	Plant Water Use Type(s)	Plant Factor (PF)*	Hydrozone Area (HA) (square feet)	PF x HA (square feet)
1	High	0.8	7,000	5,600
2	High	0.7	9,000	6,300
3	Medium	0.5	15,000	7,500
4	Low	0.3	7,000	2,100
5	Low	0.2	10,000	2,000
			Sum	23,500
6	SLA	1.0	2,000	2,000

*Plant Factor from WUCOLS

$$ETWU = (51.1)(0.62)\left(\frac{23{,}500}{0.71} + 2{,}000\right)$$

= (31.68) (33,099 + 2,000)
= 1,111,936 gallons per year

Compare ETWU with MAWA. For this example:
MAWA = (51.1) (0.62) [(0.7 x 50,000) + (0.3 x 2,000)]
= 31.68 x [35,000 + 600]
= 31.68 x 35,600
=1,127,808 gallons per year

The ETWU (1,111,936 gallons per year) is less than MAWA (1,127,808 gallons per year). For this example, the water budget complies with the MAWA.

SECTION 3. Findings.

The City Council finds that Chapter 15.92 of the Sacramento City Code as adopted by this Ordinance is substantially the same, and is as effective, as the updated model water efficient landscape ordinance issued by the California Department of Water Resources on October 8, 2009, and set forth in Chapter 2.7 of Division 2 of Title 23 of the California Code of Regulations.

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