

**CITY OF SEASIDE
RESOURCE MANAGEMENT SERVICES**

440 Harcourt Avenue
Seaside, CA 93955

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February 2, 2010

Mr. Simon Eching
California Department of Water Resources
Water Use and Efficiency Branch
P.O. Box 942836
Sacramento, CA 94236-0001

Subject: Efficient Landscape Ordinance Notification

Dear Mr. Eching;

This letter serves as notification to the Department of Water Resources that the City of Seaside is within the jurisdictions of the Monterey Peninsula Water Management District (MPWMD) and Marina Coast Water District (MCWD) boundaries and therefore is subject to both MPWMD's and MCWD's ordinances and standards. Copies will be sent via e-mail.

If you have any questions regarding this issue, please do not hesitate to contact me at (831) 899-6733.

Sincerely,

Mark McClain
Building Official
City of Seaside

MARINA COAST WATER DISTRICT

ORDINANCE NO. 41

AN ORDINANCE AMENDING Ordinance 40 to CHAPTER 3.36
OF THE
DISTRICT CODE

Be it ordained by the Board of Directors of
Marina Coast Water District
as follows:

Section 1. Authority. This ordinance is enacted pursuant to Sections 375, 375.5 and 30000 and following of the California Water Code.

Section 2. Findings.

A. This ordinance is considered for action by the Board of Directors at a regularly scheduled and noticed meeting. The agenda was posted in accordance with County Water District law with opportunity for public review in advance of the meeting and public comment during consideration of the ordinance by the Board. The District has followed the procedures for notice, public participation and adoption set forth in Section 375 of the California Water Code.

B. The protection, conservation, and replenishment of the underground water supplies is one of the main functions of a County Water District. (Atchinson Etc. Ry Co. V. Kings Co. Water District, (1956) 47 Cal. 2d 140, 146). The District has the power to perform all acts necessary to carry out fully the provision of the County Water District Law (Water Code 31001), may establish rules and regulations for the distribution and use of water (Water Code 31024), may undertake a water conservation program to reduce water use (Water Code 31035), and may commence and maintain actions and proceedings to prevent interference with or diminution of any natural subterranean supply of water which may (a) be used or useful for any purpose of the District, (b) be of common benefit to the land or its inhabitants, or (c) endanger the inhabitants or land (Water Code 31082).

Wasteful water use practices in the area served by the District constitute a potential threat to, and an unacceptable diminution of the District's underground water supplies. The prevention of water waste is an economically and environmentally feasible way to protect, conserve and prevent unacceptable diminution of the District's underground water supplies.

D. Contamination, seawater intrusion, or failure of the water system infrastructure may lead to a potable water shortage emergency in the District's groundwater supplies.

E Based upon the above findings, the District legal counsel advises, and the Board finds, that actions taken pursuant to this ordinance are categorically exempt from CEQA according to 14 California Code of Regulations 15301 and 15307.

Section 3. Purpose Of Ordinance. The purpose of this ordinance is to amend the District Code, Chapter 3.36 to include water conservation requirements for New Construction and provide a revised Water Shortage Contingency Plan.

Section 4. General Provisions. Chapter 3.36 of the District Code is hereby amended as follows:

(i)Chapter 3.36

WATER CONSERVATION

Sections:

- 3.36.010 Purpose.**
- 3.36.020 Application.**
- 3.36.030 Mandatory restrictions on water waste.**
- 3.36.035 Water Shortage Contingency Plan**
- 3.36.040 Enforcement and administration.**
- 3.36.050 Violations and notices.**
- 3.36.060 Nuisances, abatement, injunctive relief.**

3.36.010 Purpose.

The purpose of this chapter is to establish standards and procedures for water conservation, to reduce or eliminate the waste of water in the District, and enable implementation of the District's Water Shortage Contingency Plan. (Amended during 3.02 supplement: Ord. 25 § 3, 1993; Resolution No. 2005-40 amended the WSC Plan.)

3.36.020 Application.

A. This chapter shall apply within the District, and compliance with the provisions of this chapter shall be a condition of water service within the District and in all areas outside the District to which the District provides water service.

B. The District shall work cooperatively with the Fort Ord Reuse Authority and other land use jurisdictions within the Ord Community Service area including the Cities of Seaside, Del Rey Oaks, Marina, and Monterey; and UCMBEST; CSUMB; US Army; and the County of Monterey to facilitate the adoption of ordinances and regulations to

conserve water, including inspection of installations made pursuant to this chapter. (Ord. 25 § 5, 1993)

C All references to *Standard Specifications* contained in this chapter shall refer to the latest versions of the District *Standard Plans And Specifications For Construction Of Domestic Water, Sewer, And Recycled Water Facilities and Procedures, Guidelines And Design Requirements*.

3.36.030 Mandatory restrictions on water waste.

A. Repair of Plumbing, Sprinkler and Irrigation System. Any owner, manager, or person responsible for the day-to-day operation of any premises shall within seventy-two (72) hours after such person first learns of such leaks, breaks, or defects, initiate steps to repair any leaking, broken or defective water pipes, faucets, plumbing fixtures, other water service appliances, sprinklers, watering or irrigation systems, or distribution systems which cause or may cause water waste and shall thereafter diligently and promptly pursue such repair work to completion, unless a variance is obtained from the District.

B. Watering/Irrigation.

1. No person shall water grass, lawns, groundcover, shrubbery, and open ground between the hours of 10 AM and 5 PM except as provided below:

a. Persons may water between the hours of 10 AM and 5 PM using any of the following three methods:

- i. Drip irrigation;
- ii. By hand, using a bucket; and/or
- iii. By hand, using a hose with an automatic shutoff nozzle.

b. The General Manager may grant an administrative variance for methods other than those included in “a” above if:

i. The person requesting the variance is now using, or will use as a condition to the granting of the variance, water-conserving irrigation practices approved by the General Manager that minimize water evaporation losses, and that assure that no substantial amount of water is permitted to run off the area of application. Recycled Water use shall be in accordance with *Chapter 4.28 Recycled Water*.

ii. As a condition of granting a variance, the General Manager may require the water user to post, at locations conspicuous to view, notices of the variance.

c. In lieu of granting a variance, the General Manager may, at his/her discretion, refer a variance request directly to the Board for its decision.

2. No person shall allow grass, lawns, groundcover, shrubbery, and open ground to be watered at any time while it is raining.

3. No person shall use, suffer, or permit the use of water for agricultural irrigation in a manner or to an extent which substantially conflicts with or deviates from best management practices in the County of Monterey or which allows water to run to waste.

C. Washing of Vehicles. No person shall use a water hose to wash any car, truck, boat, trailer, bus, recreational vehicle, camper, aircraft, tractor, or any other vehicle, or any portion thereof, unless the hose is equipped with an automatic shutoff nozzle.

D. Cleaning of Structures. No person shall use water through a hose to clean the exterior of any building or structure unless such hose is equipped with a shutoff nozzle.

E. Cleaning of Surfaces. No person shall use water through a hose to clean any sidewalk, driveway, roadway, parking lot, or any other outdoor paved or hard surfaced area, except where necessary to protect public health or safety. The use of water from a bucket for cleaning food, grease, oil, or other stains or spillage from surfaces is permissible.

F. Water Spillage. No person shall cause, suffer, or permit water to spill into streets, curbs, or gutters. No person shall use any water in any manner that results in runoff beyond the immediate area of use. Every person is deemed to have under his/her control at all times his/her water distribution lines and facilities, and to know the manner and extent of his/her water use and excess runoff.

G. Swimming Pools and Spas. No person shall empty and refill a swimming pool or spa except to prevent or repair structural damage or to comply with public health regulations. All pools and spas shall be covered to prevent evaporative losses when not in use.

H. Fountains. No person shall use water to operate or maintain levels in decorative fountains, unless such water is recirculated in the fountain.

I. Visitor-Serving Facilities. The owner and manager of each hotel, motel, restaurant, convention and other visitor-serving facility shall ensure that such facility displays, in places visible to all customers, placards or decals approved by the District, promoting public awareness of the need for water conservation and/or advising the public that waste of water is prohibited.

J. Public And Quasi-Public Entities. All public and quasi-public entities shall display, in visible locations in all restrooms, kitchens, and dining areas, placards or decals approved by the District, promoting public awareness of the need for water conservation and/or advising the public that waste of water is prohibited. Placement of placards or decals by a quasi-public entity of a type not specifically mentioned in this chapter shall not be required unless the General Manager gives written notice to the entity that this chapter is applicable to the entity so notified and that placement of placards or decals is required.

K. Restaurants. Restaurants in the District shall not serve water to restaurant customers, except upon request of the customer.

L. Commercial Car Washes. No person in charge of the operation of any commercial car wash facility shall suffer or permit the washing of any boat or vehicle in such facility or on its premises, other than by the following methods.

1. Use of mechanical automatic car wash facilities utilizing water recycling equipment;

2. Use of a hose that operates on a timer for limited time periods and shuts off automatically at the expiration of the time period;

3. Use of a hose equipped with an automatic shutoff nozzle; and/or

4. Use of bucket and hand washing.

M. Construction.

1. No potable water may be used for compacting or dust control purposes in construction activities where there is a reasonably available source of recycled or other non-potable water approved by the California State Department of Health Services and appropriate for such use.

2. All water hoses used in connection with any construction activities shall be equipped with an automatic shutoff nozzle when an automatic shutoff nozzle can be purchased or otherwise obtained for the size or type of hose in use.

N. Use of Hydrants. No person may tap into any fire hydrant for any purpose other than fire suppression or emergency aid, without first obtaining written approval from the District Engineer or his/her designee.

O. Agricultural Dust Control. No potable water may be used for dust control purposes in agricultural activities where there is a reasonably available source of recycled or other non-potable water appropriate for such use.. Recycled Water use shall be in accordance with *Chapter 4.28 Recycled Water*.

P. Maintenance/Training. No person shall use water for routine water system flushing for normal maintenance, routine sewer system flushing for normal maintenance, and/or fire personnel training except as approved in advance in writing by the General Manager, District Engineer, or his/her designee.

Q. Indiscriminate Use. No person shall cause, suffer, or permit the indiscriminate running of water not otherwise prohibited above which is wasteful and without reasonable purpose.

R. Public Health and Safety. These regulations shall not be construed to limit water use which is immediately necessary to protect public health or safety.

S. New Construction.

1. In all New Construction, the following applies:

a. Only High Efficiency Toilets (HET) that meet the District's *Standard Specifications* shall be installed. Dual flush toilets qualify as HET.

b. There shall be one control valve, or one set of hot and cold valves required for each Low Flow Showerhead which shall be defined to provide no more than 2.5 gallon per minute.

c. A Hot Water Recirculation System or Point-of-Use Hot Water Heater shall supply water to hot water fixtures further than ten linear feet of pipe away from the hot water heater.

d. All urinals installed will be Zero Water Use Urinals, in that they shall not use water to flush waste.

e. All residential units equipped with clothes washer connections shall have installed High Efficiency (HE) Clothes Washer(s) meeting District *Standard Specifications*.

2. All New Construction shall conform with District *Standard Specifications* for *Landscaping and Irrigation Systems* and the requirements of the State of California Model Landscape Ordinance, Title 23, Division 2, California Code of Regulations Chapter 2.7 or applicable local ordinances superseding the state ordinance.

T. New Additions, Renovations, or Remodels. This sub-section includes but is not limited to projects in which the replacement or addition of plumbing-fixtures is included.

1. All new additions, renovations, or remodels that involve any plumbing fixture additions and require District review and approval must install:

a. Ultra Low Flow Toilets (ULFT), High Efficiency Toilets (HET), or zero water use urinals (in place of water use urinals); and,

b. Low Flow Showerheads with a maximum flow capacity of 2.5 gallons per minute; and,

c. New additions, renovations, or remodels must also include the retrofitting of all existing toilets and showerheads with low flow showerheads, ULFT's or HET's.

2. All renovations/remodels that do not require plan checks by the District, but do involve a change in a toilet must replace at least that toilet with an ULFT or a HET. All renovations/remodels that do not require plan checks by the District, but do involve the change of a showerhead must replace at least that showerhead with a Low Flow Showerhead.

U. Retrofitting Existing Hotels/Motels and Apartment Buildings. All existing hotels/motels, and apartment buildings shall, within six and twelve (12) months, respectively, following the effective date of the ordinance codified in this chapter, be retrofitted with Low Flow Showerheads.

V. Retrofitting Upon Change of Ownership or Use.

1. All existing residential structures shall, at the time of ownership change, be retrofitted, if not already so, with HET's or ULFT's with a maximum tank size, flush volume, or flush system volume of 1.6 gallons per flush. Low Flow Showerheads with a maximum flow capacity of 2.5 gallons per minute shall be installed.

2. All existing commercial and industrial structures shall, at the time of ownership change or change of use, be retrofitted, if not already so, with HET's or ULFT's with a maximum tank size, flush volume, or flush system of 1.6 gallons per flush. Low Flow Showerheads with a maximum flow capacity of 2.5 gallons per minute shall be installed. High Efficiency Clothes Washing Machines using a maximum of 8.5 gallons of water per cubic foot of laundry, shall also be installed. All urinals will be retrofitted to zero water use urinals.

W. Metering.

1. All water use shall be metered, unless recognized by the District or if the use from a fire hydrants by authorized persons for public health and safety purposes.

2. New Construction.

a. Newly constructed multifamily dwelling units, including condominiums, and detached units (carriages houses/granny units) will be metered individually as of the effective date of the ordinance codified in this chapter.

b. Newly constructed motel/hotel units of less than one thousand (1000) square feet will be exempt from the requirement to individually meter.

c. Newly constructed hotel/motel units greater than or equal to one thousand (1000) square feet shall be separately metered.

d. Newly constructed time-share units will be separately metered.

3Conversion of Existing Structures. The following existing units shall be individually metered upon conversion:

- a. Multifamily units converted into condominiums or timeshare units;
- b. Motel/hotel units converted into multifamily units, time-share units or condominiums;
- c. Time-share units converted into multifamily units, condominiums or motel/hotel units;
- d. Condominium units converted into multifamily units, time-share units or motel/hotel units.

4. Other Multifamily Water Uses. All other uses within multifamily dwelling complexes, such as irrigation systems and laundry rooms, shall be metered separately, subject to the approval of the District Engineer or his/her designee.

5. Meter Location. Meters shall be located at the property boundary or the public utility easement. Exact meter locations are subject to District Engineer approval or his/her designee.

-6. Meter Type and Size. The District shall approve the size and type of meters required. The Owner shall pay for the meters and construct their connections in accordance with the District's *Standard Specifications*. (Ord. 33 § (4)(B)—(F), 1998; Ord. 25 § 6, 1993)

3.36.035 Water Shortage Contingency Plan

The District maintains a Water Shortage Contingency Plan in conformance with the Water Code Section 10632. Provisions of that Plan will be enforced through this Chapter.

3.36.040 Enforcement and administration.

The General Manager and all officers and employees of the District, including all exofficio officers and employees, shall enforce all the provisions of this chapter. The General Manager shall implement and administer this chapter. The General Manager shall report to the Board of Directors all factors which affect the implementation of this chapter and shall maintain a separate file of violations of this chapter and a file of any requests for variances from this chapter. (Ord. 25 § 7, 1993)

3.36.050 Violations and notices.

A. If any person fails or refuses to comply with this chapter, the General Manager or his/her agent shall provide that person with written notice of the violation and an opportunity to correct the noncompliance. The written notice shall:

1. Be posted or presented at the site of the noncompliance;
2. State the time, date, and place of violation;
3. State a general description of the violation;
4. State the means to correct the violation;
5. State a date by which correction is required; and,
6. State the possible consequences of failing to correct the violation.

7. A copy of the written notice shall be mailed to the address of the violation, to the party who is billed for the water, or to the Owner of the property, as appropriate.

B. Each person who receives a written notice of violation shall pay to the District an administrative fee of one hundred dollars (\$100.00) for the first notice and two hundred dollars (\$200.00) for the second notice, and five hundred dollars (\$500.00) for each additional violation within one year. To encourage cooperative water conservation, the General Manager may waive payment of the fee for the first or second notice.

C. If a person fails to correct the violation within the time specified in the written notice, the General Manager shall take one or more of the following actions:

1. Give the person one or more additional written notices of the violation;
2. Refuse to initiate water service to the site of the violation, if water service has not yet begun or has been discontinued;
3. Terminate water service to the site of the violation, in accordance with the District's ordinances and procedures for terminating water service;
4. Abate the violation as a nuisance in accordance with Section 3.36.060 of this chapter;
5. Impose a use fee of four (4) times the regular water rate for each unit (hcf) of water that the District estimates is wasted. (Ord. 25 § 8, 1993)

3.36.060 Nuisances, abatement, injunctive relief.

A. Any violation of this chapter is declared to be a public nuisance.

B. The District may summarily abate the public nuisance and the District's attorney may, upon order of the Board of Directors, bring civil suit or other action to enjoin or abate the nuisance.

C. In a civil proceeding brought to abate a nuisance or to obtain injunctive relief under this chapter, any person who creates or maintains a public nuisance in violation of this chapter shall be liable for the costs of abatement, including but not limited to the following:

1. Costs of investigation;

2. Costs of labor and parts to repair any affected water system or premises, to bring such water system or premises into compliance with this chapter, or to install facilities necessary to assure compliance with this chapter;

3. Court costs;

4. Attorneys fees and costs, including the fees and costs of experts employed by the attorney; and,

5. Costs of monitoring compliance.

D. If any person causes, suffers, or permits a public nuisance to continue after written notice is given to such person by the District directing such person to cease the nuisance, and such continuation goes beyond the time set for abatement in the notice, then such person shall be liable to the District for the following:

1. The costs of abatement set forth above;

2. Any other costs of enforcement imposed by the court; and

3. A civil penalty of fifty (50) percent of those costs (subsections (D)(1) and (2) of this section), payable to the District. (Ord. 25 § 9, 1993).

E. This does not preclude the District from taking action against individuals for unauthorized taking of water under Penal Code Section 498.

a. Effective Date. This Ordinance shall take effect 60 days following adoption,

b. Publication and Posting. Within 15 days after adoption, the District shall publish, in a newspaper published in Monterey County and circulated within the district, a summary of this ordinance with the names of those directors voting for and against adoption, and shall post in the district office a certified copy of the full text of this ordinance as adopted along with the names of those directors voting for and against adoption.

c. Notice of Exemption. The Secretary is authorized and directed to give due notice of exemption of this ordinance from the provisions of CEQA, pursuant to Title 14, California Code of Regulations, section 15062.

d. Existing Charges. Existing fees and charges in effect when this ordinance is adopted shall remain in effect unless specifically changed by this ordinance.

e. Severability. If any section, subsection, sentence, clause, or phrase of this ordinance is for any reason held to be unconstitutional or invalid, or superseded by some other provision of law, such provisions shall be severed from and shall not affect the validity of the remaining provisions of this ordinance. The Board hereby declares that it would have passed this ordinance and each section, subsection, sentence, clause, or phrase thereof irrespective of the fact that any other part thereof be unconstitutional or invalid, or superseded by some other provision of law. The parts of this ordinance which are not unconstitutional, invalid, or superseded shall remain in full force and effect and shall be enforced according to their terms.

f. Interpretation. Words and Phrases used in this ordinance shall be read conjunctively with and shall have the same meaning as in prior District ordinances and the District Code, unless specifically changed by this ordinance or unless the context requires some other construction. If there is any inconsistency between this ordinance and prior provisions, this ordinance shall control.

APPENDIX 43

CERTIFICATE OF COMPLETION



Marina Coast Water District

11 Reservation Road, Marina, Ca 93933

831-384-6131

Water Conservation Department

831-883-5905

Fax 831-384-0197

CERTIFICATE OF COMPLETION

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

Project Information:

Date
Project Name
Project Location
Project Address

Project Applicant:

Applicant's Name	
Title	
Company	
Applicant's Address	
City	Phone Number
State	Fax Number
Zip Code	Email

Project Owner or Designee:

Name	
Title	
Company	
Applicant's Address	
City	Phone Number
State	Fax Number
Zip Code	Email

CERTIFICATE OF COMPLETION

Page # 2

SOIL MANAGEMENT REPORT

Choose one of the following statements:

A) “The Soil Management Report was previously submitted and approved by the District as part of the Landscape Documentation Package.

Signature: _____
Signature of Property Owner or Representative

B) “Due to mass grading, I was exempt from submitting the Soil Management Report as part of the Landscape Documentation Package. I have attached the Soil Management Report to this Certificate of Completion.

Signature: _____
Signature of Property Owner or Representative

LANDSCAPE IRRIGATION AUDIT REPORT

Choose one of the following statements:

A) “I have attached to this Certificate of Completion the Landscape Irrigation Audit Report as required by the District.

Signature: _____
Signature of Property Owner or Representative

CERTIFICATION OF INSTALLATION ACCORDING TO THE LANDSCAPE DOCUMENTATION PACKAGE

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

Signature: _____ License # _____
Landscape Designer, Landscape Architect, or the Licensed Landscape Contractor

CERTIFICATE OF COMPLETION

Page # 3

LANDSCAPE IRRIGATION CONTROLLER SETTINGS

"I have attached to this Certificate of Completion the updated, as-built parameters for setting the irrigation schedule. All controllers are operating on a controller that utilizes:

Check one of the following Adjusted daily ET Real-time soil moisture readings

Signature: _____ License # _____
Landscape Designer, Landscape Architect, or the Licensed Landscape Contractor

OWNERS STATEMENT OF PROJECT COMPLETION

Please answer the questions below:

1. Date the Landscape Documentation Package was submitted to the District _____
2. Date the Landscape Documentation Package was approved by the District _____

"I certify that I have received copies of all the District approved documents within the Landscape Documentation Package and have in my possession copies of the attached documents that will fulfill my document submission requirements to the District.

I understand that it is my responsibility to see that the project is maintained in accordance with all documentation submitted to the District."

Signature of Property Owner or Representative: _____

APPENDIX 31

WATER EFFICIENT LANDSCAPE WORKSHEET



Marina Coast Water District

11 Reservation Road, Marina, Ca 93933

831-384-6131

Water Conservation Department

831-883-5905

Fax 831-384-0197

WATER EFFICIENT LANDSCAPE WORKSHEET

This document is required as part of the Landscape Documentation Package submitted to the District for plan check procedures. As needed, please attach additional worksheets showing any required calculations.

Project Information:

Date
Project Name
Project Location
Project Address

Project Applicant:

Applicant's Name	
Title	
Company	
Applicant's Address	
City	Phone Number
State	Fax Number
Zip Code	Email

Project Owner or Designee:

Name	
Title	
Company	
Applicant's Address	
City	Phone Number
State	Fax Number
Zip Code	Email

Landscape Site Data Table

For each complete project site, each individual lot, and each individual landscape water meter, the applicant shall provide the square footage and acreage for the categories shown in the table below. The same information for each individual metered area is to be provided later in the Summary of Water Consumption section.

In some instances, as required, the site data requested may be presented in a format different than that shown below. It is requested that the document provided to the District be a separate 8.5"x11" attached document.

Categories	Site	Typ. Lot
1) Total project area	acres	acres
	sq. ft.	sq. ft.
2) Area of structures, hardscape	acres	acres
	sq. ft.	sq. ft.
3) Area of non-irrigated open space	acres	acres
	sq. ft.	sq. ft.
4) Landscape area (irrigated planting area)	acres	acres
	sq. ft.	sq. ft.
A) Landscape plantings	acres	acres
	sq. ft.	sq. ft.
B) Ornamental turf	acres	acres
	sq. ft.	sq. ft.
i) Special landscape area	acres	acres
	sq. ft.	sq. ft.

Irrigation Station Information Table

Please complete the Irrigation Station Information Table on the next page. The detailed information entered into the table(s) shall then be summarized and used in the calculations of the projects Maximum Applied Water Allowance and Estimated Total Water Use. Use as many tables as necessary to provide the required information for the complete site.

Example calculations can be found in Section 700 of the Marina Coast Water District Procedures, Guidelines, and Design Requirements.

Water Budget Calculation - Maximum Applied Water Allowance

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

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

where:

MAWA = Maximum Applied Water Allowance (gallons per year)

ET_o = Local, Historical Reference Evapotranspiration Rate (inches per year)(Marina CA, 36.2")

0.7 = ET Adjustment Factor (0.8 for existing projects built before 2007)

LA = Landscaped Area including the designated 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 = _____ Units _____ Acre-Ft.

Show Calculations Here:

Estimated Total Water Use Calculation

Individual irrigation zones or valve stations shall be grouped into representative hydrozones according to the highest plant factor found within the irrigated area. Then, the square footage of all individual stations within a particular hydrozone shall be summed into the total square footage for the hydrozone.

A) When it is determined that there is only one hydrozone, the following formula shall be used to calculate the project’s Estimated Total Water Use.

$$ETWU = (ETo)(0.62)[(PF \times HA)/IE + SLA] \quad \text{Where:}$$

ETWU = Estimated Total Water Use per year (gallons)

ETo = Local, Historical Reference Evapotranspiration Rate (inches per year) (Marina CA, 36.2”)

PF = Highest of a Hydrozone’s Plant Factors. Derived from WUCOLS.

HA =Individual Hydrozone Area [high, medium, and low water use areas] (square feet)

Low Water Use Hydrozone	Moderate Water Use	High Water Use Hydrozone
Plant Factor 0.0-0.3	Plant Factor 0.4-0.6	Plant Factor 0.7-1.0

SLA = Special Landscape Area (square feet)

0.62 = Conversion Factor

IE = Expected Irrigation Efficiency (%), (sprays 75%, Rotors 80%, stream rotors 85%, Drip 90%)

B) When there are multiple hydrozones, the Hydrozone Information Table below shall be used to find the Adjusted Area. Then the following formula shall be used:

$$ETWU = (ETo)(0.62)(Adjusted \text{ Area} + SLA)$$

Hydrozone	Plant Water Use Category (WUCOLS)	Highest Plant Factor (WUCOLS)	Area (square feet)	Expected Irrigation Efficiency (IE)(%)	Adjusted Area PF x Area/IE (square feet)
Sum of Adjusted Area					
SLA					

Show Calculations Here:

SECTION 700

**DESIGN CRITERIA FOR
LANDSCAPING AND IRRIGATION SYSTEMS**

700.1 DESCRIPTION

These Marina Coast Water District (District) requirements promote efficient water use through landscape design and irrigation management appropriate to the local climate.

700.2 APPLICABILITY

After January 1, 2010, these landscape design criteria apply to:

- New construction and rehabilitated landscapes for public agency projects and private development projects with a landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, or design review;
- New construction and rehabilitated landscapes which are developer-installed in single-family and multi-family residential projects with a landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, or design review;
- New construction landscapes which are homeowner-provided and/or homeowner-hired in single-family and multi-family residential projects with a total project landscape area equal to or greater than 5,000 square feet requiring a building or landscape permit, plan check, or design review;

These design criteria do not apply to:

- Registered local, state, or federal historical sites;
- Ecological restoration projects that do not require a permanent irrigation system;
- Mined-land reclamation projects that do not require a permanent irrigation system; or
- Plant collections, as part of botanical gardens and arboretums open to the public.

There are often other applicable regulations of the local jurisdiction that may apply to particular projects. The more restrictive criteria of all regulatory agencies shall apply. One local agency may designate another agency, such as a city or special district, to implement some or all of the design standards contained in this document. It is important that applicants meet with all their local regulative authorities to verify compliance with various planning and development standards and ordinances.

700.3 DEFINITIONS

The terms used in this document have the meaning set forth below:

Applied Water: The portion of water supplied by the irrigation system to the landscape.

MARINA COAST WATER DISTRICT

Automatic Irrigation Controller: 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: 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: The document signed by the owner of the landscape project verifying the landscape and irrigation system was installed according to approved plans.

Certified Irrigation Designer: 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 Water Sense Irrigation Designer certification program and Irrigation Association's Certified Irrigation Designer program.

Certified Landscape Irrigation Auditor: 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 Water Sense Irrigation Auditor certification program and Irrigation Association's Certified Landscape Irrigation Auditor program.

Check Valve or Anti-Drain Valve: A valve located under a sprinkler head or other location in the irrigation system to hold water in the system to prevent drainage from the lower elevation sprinkler heads when the system is off.

Common Interest Developments: Community apartment projects, condominium projects, planned developments, and stock cooperatives per Civil Code Section 1351.

Conversion factor (0.62): The number that converts acre-inches per acre per year to gallons per square foot per year.

Drip Irrigation: 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: A project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

Effective Precipitation or Usable Rainfall (Eppt): The portion of total precipitation which becomes available for plant growth.

Emitter: A drip irrigation emission device that delivers water slowly from the system to the soil.

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

Establishment Period: The first year after installing the plants in the landscape or the first two years if irrigation will be terminated after establishment.

Estimated Total Water Use (ETWU): An estimate of the total water required for the landscape annually.

ET Adjustment Factor (ETAF): 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 $(0.7) = (0.5/0.71)$. ETAF for a Special Landscape Area shall not exceed 1.0. ETAF for existing non-rehabilitated landscapes is 0.8.

Evapotranspiration Rate: The quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time.

Flow Rate: The rate at which water flows through pipes, and valves and emission devices, measured in gallons per minute, gallons per hour, or cubic feet per second.

Hardscapes: Any durable material (pervious and non-pervious).

Homeowner-provided Landscaping: Any landscaping either installed by a private individual for a single family residence or installed by a licensed contractor hired by a homeowner. A homeowner is a person who occupies the dwelling he or she owns. This excludes speculative homes, which are not owner-occupied dwellings.

Hydrozone: A portion of the landscaped area having plants with similar water needs. A hydrozone may be irrigated or non-irrigated.

Infiltration Rate: 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: Species of plants not historically found in California that spread outside cultivated areas and can cause damage to environmental or economic resources. Invasive species may be regulated by county agricultural agencies as noxious species. "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: 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 run off that causes overland flow, and preparation of an irrigation schedule.

Irrigation Efficiency (IE): The measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The minimum average irrigation efficiency for purposes of these design standards is 0.71. Greater irrigation efficiency can be expected from well designed and maintained systems.

Irrigation Survey: 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

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recommendations to improve performance of the irrigation system.

Irrigation Water Use Analysis: An analysis of water use data based on meter readings and billing data.

Landscape Architect: A person who holds a license to practice landscape architecture in the state of California (Business and Professions Code, Section 5615).

Landscape Area: All of 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 nondevelopment (e.g., open spaces and existing native vegetation).

Landscape Coefficient: A coefficient used in the MCWD ET-based irrigation scheduling spreadsheets to calculate water loss from unique landscape plantings or hydrozones. It is product of three individual factors having an effect on water loss of landscape plantings; plant species, vegetation density, and microclimate. The plant species factor range is 0.1 to 0.9, the range for planting density is 0.5 – 1.3, and the range for individual microclimates is 0.5 – 1.4. More specific information on calculating a landscape coefficient can be found in the Department of Water Resources 1999 publication “Water Use Classification of Landscape Species.”

Landscape Contractor: A person licensed by the state of California to construct, maintain, repair, install, or subcontract the development of landscape systems.

Landscape Documentation Package: Collectively, all the documents required and submitted to the District for plan check procedures and construction documentation.

Landscape Project: The total area of landscape in a project as defined in “Landscape Area” and meeting the requirements of section 700.2.

Lateral Line: The water delivery pipeline that supplies water to the emitters or sprinklers from the valve.

Local Agency: A city or county, including a charter city or charter county, that is responsible for adopting and implementing the ordinance. The local agency is also responsible for the enforcement of this ordinance, including but not limited to, approval of a permit and plan check or design review of a project.”

Local Water Purveyor: Any entity, including a public agency, city, county or private water company that provides retail water service.

Low Volume Irrigation: 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: The pressurized pipeline that delivers water from the water source to the valve or outlet.

Maximum Applied Water Allowance (MAWA): The upper limit of annual applied water for the established landscaped area. It is based upon the area’s reference evapotranspiration, the ET

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Adjustment Factor and the size of the landscaped area. The Estimated Total Water Use calculated for the same area shall not exceed the Maximum Applied Water Allowance. Special Landscape Areas, including recreational turf areas and areas permanently and solely dedicated to edible plants such as orchards and vegetable gardens are subject to the MAWA but are given an additional allocation of water equal to 30% of the local reference evapotranspiration rate. ETAF for these areas shall not exceed 1.0.

Microclimate: 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: Any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.

Mulch: Any organic material such as leaves, bark, straw 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 Construction: A new building with a landscape or other new landscape, such as a park, playground, or greenbelt without an associated building.

Operating Pressure: The water pressure, at which the parts of an irrigation system are, as designed by the manufacturer, too operate.

Overhead Sprinkler Irrigation Systems: Systems that deliver water through the air (e.g., spray heads and rotors).

Overspray: The irrigation water which is delivered beyond the target area.

Permit: An authorized document issued by local agencies for a new construction or rehabilitated landscapes.

Pervious: 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: A factor, when multiplied by the ETo estimates the amount of water needed by plants. For purposes of these standards, the plant factor shall be the highest of the various plant species coefficients for a specific hydrozone. The plant factor range for a low water use plant grouping is 0 to 0.3, the plant factor range for a moderate water use plant grouping is 0.4 to 0.6, and the plant factor range for a high water use plant grouping is 0.7 to 1.0. More information on calculating plant factors can be found in the Department of Water Resources 2000 publication "Water Use Classification of Landscape Species (WUCOLS)."

Precipitation Rate: The rate of application of water measured in inches per hour.

Project Applicant: The individual or entity submitting a Landscape Documentation Package to request a permit, plan check, or design review from the District. A project applicant may be the property

owner or his/her designee.

Rain Sensor or Rain Sensing Shutoff Device: A component which automatically suspends an irrigation event when it rains.

Record Drawing or As-builts: 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 Turf: Turf area dedicated to active play such as parks, sports fields and golf courses. These are areas where turf provides a playing surface. Areas of turf used for ornamental purposes, special events, or as preserved open space, and plantings of grasses used to control erosion or used as an ornamental feature are not considered areas of recreational turf.

Recycled Water, Reclaimed Water, or Treated Sewage Effluent Water: 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 (ET_o): A standard measurement of environmental parameters which affect the water use of plants. ET_o is given in inches per day, month, or year and is an estimate of the evapotranspiration of a large field of four- to seven-inch tall, cool season turf that is well watered. Reference evapotranspiration is used as the basis of determining the Maximum Applied Water Allowances so that regional differences in climate can be accommodated.

Rehabilitated Landscape: Any re-landscaping project that requires a permit, plan check or design review. The modified landscape area is equal to or greater than 2,500 square feet, is 50% of the total landscape area, and the modifications are completed within one year.

Runoff: 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: A device that measures the amount of water in the soil. The device may also suspend or initiate an irrigation event.

Soil Texture: The classification of soil based on its percentage of sand, silt, and clay.

Special Landscape Area (SLA): An area of the landscape dedicated solely to edible plants, water features, or Recreational Turf.

Sprinkler Head: A device which delivers water through a nozzle.

Static Water Pressure: The pipeline or municipal water supply pressure when water is not flowing.

Station: An area served by one valve or by a set of valves that operate simultaneously.

Swing Joint: 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: A groundcover surface of mowed grass. Annual bluegrass, Kentucky bluegrass, Perennial ryegrass, Red fescue, and Tall fescue are common cool-season grasses. Bermudagrass, Kikuyugrass, Seashore Paspalum, St. Augustinegrass, Zoysiagrass, and Buffalo grass are common warm season grasses.

Valve: A device used to control the flow of water in the irrigation system.

Water Conserving Plant Species: A plant species identified as having a low plant factor.

Water Feature: 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 MAWA and ETWU calculations. The area of water features is considered as a high water use hydrozone of the landscape area when calculating the ETWU of a metered area. Constructed wetlands used for on-site wastewater treatment or storm water best management practices that are not irrigated and used solely for water treatment or storm water retention are not water features and, therefore, are not subject to the water budget calculation.

Watering Window: The time of day irrigation is allowed.

WUCOLS: 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.

700.4 PROCEDURES

Prior to construction, the project applicant shall:

- 1) Submit payment to the District for plan check procedures.
- 2) Submit three (3) copies of the Landscape Documentation Package to the District for plan check procedures, the development of comments, and if required, a listing of requested revisions. The Landscape Documentation Package will to be reviewed as many times as needed until the District requirements and standards are satisfied.
- 3) Receive the District's authorization to construct and record the date of the District authorization in the Certificate of Completion.
- 4) Submit a copy of the District approved Landscape Documentation Package to the planning department of the local jurisdiction to facilitate issuance of a permit to construct.
- 5) Submit a copy of the District approved Landscape Documentation Package to the property owner or his/her designee.

Prior to construction, the District shall:

- 1) Provide the project applicant with an outline of the District's procedures for project authorization.
- 2) Provide a receipt for payment of fees, deposits, and charges.
- 3) Review the submitted Landscape Documentation Package, develop comments, and if required, request revisions to the documents submitted by the project applicant.
- 4) Approve or deny the Landscape Documentation Package; and
- 5) Upon approval, provide District authorization to construct.

After completion of the landscape project installation, the applicant shall:

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- 1) Have an irrigation audit performed immediately following the completion of construction or rehabilitation and prior to submission of the Certificate of Completion to the District. The irrigation audit report shall be submitted to the District for acceptance.
- 2) Submit a completed MCWD Certificate of Completion and a set of record drawings (as-built drawings) to the District for acceptance. If the submitted documents are denied, the District shall provide information to the project applicant regarding reapplication, appeal or other assistance.

After all requested documentation is received and compliance with the standards is verified, the District shall:

- 1) Provide a signed copy of the Certificate of Completion to the applicant.
- 2) Keep a record of the documentation for water use evaluation.
- 3) 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.

700.5 PENALTIES

The District may establish penalties for noncompliance with these standards.

700.6 REQUIRED DESIGN ELEMENTS FOR IRRIGATION SYSTEMS USING RECYCLED WATER.

Local agencies, during development review, shall determine the extent to which developments shall use recycled water for landscape irrigation. As set forth in the District Water Code, where recycled water is not immediately available for use when the design area is ready for construction, and if the District or local jurisdiction has determined that recycled water will be supplied in the future, the on-site facilities shall be designated to use recycled water. The irrigation system shall be designed and constructed to meet all the District's Standards and Specifications. Provisions shall be made as directed by the District and specifications followed to prepare and allow for connection to the recycled water facilities when they become available.

- 1) The installation of recycled water irrigation systems (dual distribution systems) shall be required to allow for the current and future use of recycled water, unless a written exemption has been granted by the District.
- 2) Irrigation systems shall make use of recycled water unless a written exemption has been granted by the District, stating that recycled water meeting all health standards is not available and will not be available in the foreseeable future.
- 3) The recycled water irrigation systems shall be designed and operated in accordance with all local and state rules and regulations.

In preparation for the conversion to recycled water, and as referred to below, an On-Site Recycled Water User Plan shall be prepared by the applicant, owner, developer, or customer and submitted to the District. Required elements of this document are outlined in Appendix 19.

700.7 TEMPORARY IRRIGATION SYSTEM DESIGN

Before design submittals, the developer shall obtain approval from the District for any temporary irrigation system designs.

Please refer to Section 600 of the District's Procedures, Guidelines, and Design Requirements for the specific use of recycled water in temporary irrigation systems.

700.8 WATER METERS FOR IRRIGATION

Points of connection to the water distribution system and meter locations shall be approved by the District. Consideration shall be given to the likelihood that if not already provided, recycled water may become available, and appropriate irrigation system points of connection may change. Provisions shall be made, as directed by the District and these specifications, to design the irrigation system in a manner that allows for connection to the recycled water facilities as these facilities become available. Meters shall be located at the property boundary or in the public utility easement.

Landscape irrigation use, excluding that used around single-family dwellings with landscape area less than 5000 square feet, shall have dedicated landscape water meters.

700.9 LANDSCAPE DOCUMENTATION PACKAGE

The applicant shall submit the following items for review and approval by the District. These submittals are consistent with state guidelines promoting water conservation in landscape projects. The documents below, identified with an asterisk, are available as standard District forms and can be obtained in electronic format at the District website, <http://www.mcwd.org/engr.html>.

The Landscape Documentation Package shall include the following elements:

- 1) On-Site Recycled Water User Plan (not required of single-family residential projects or those projects with granted exemption from the use of recycled water)
- 2) * MCWD Water Efficient Landscape Worksheet
- 3) * MCWD ET-Based Irrigation Schedule for the Establishment Period
- 4) * MCWD ET-Based Irrigation Schedule for the Mature Landscape
- 5) Irrigation System Map
- 6) Individual Station Maps
- 7) Landscape and Irrigation System Maintenance Schedule(s)
- 8) Soil Management Report
- 9) Landscape Design Plan
- 10) Irrigation Design Plan
- 11) Grading Design Plan

- 12) Technical Specifications (if available)
- 13) * MCWD Certificate of Completion (submitted after project completion)
 - a) Landscape Irrigation Audit Report
 - b) Documentation verifying implementation of the soil report recommendations
- 14) Public Information Plan (applicable to development projects consisting of eight or more homes)

700.9.1 On-Site Recycled Water User Plan

Refer to Section 600.4.12 for details on this requirement.

An example of an On-site Recycled Water Users Plan is shown in Appendix 19.

700.9.2 MCWD Water Efficient Landscape Worksheet

A project applicant shall complete the MCWD Water Efficient Landscape Worksheet which contains the following sections:

- 1) Project Information
- 2) Checklist of Submitted Documentation
- 3) Landscape Site Data Table
- 4) Irrigation Station Information Table(s)
- 5) Water Budget Calculations
 - a) Maximum Applied Water Allowance (MAWA)
 - b) Estimated Total Water Use (ETWU)
- 6) Calculation of Effective Precipitation and the Effective Precipitation Disclosure Statement (optional)
- 7) Owners agreement to comply

An example of the MCWD Water Efficient Landscape Worksheet is shown in Appendix 31.

The MCWD Water Efficient Landscape Worksheet is available as a standard District form and can be obtained in electronic format at the District website, <http://www.mcwd.org/engr.html>.

700.9.2.1 Landscape Site Data Table

For each complete project site, each individual lot, and each individual landscape water meter, the applicant shall provide the square footage and acreage for the categories shown in the table below.

Example Landscape Site Data Table

Categories	Site	Typ. Lot	Meter
1) Total project area	acres	acres	N/A
	sq. ft.	sq. ft.	
2) Area of structures, hardscape	acres	acres	N/A
	sq. ft.	sq. ft.	
3) Area of non-irrigated open space	acres	acres	N/A
	sq. ft.	sq. ft.	
4) Landscape area (irrigated planting area)	acres	acres	acres
	sq. ft.	sq. ft.	sq. ft.
A) Landscape plantings	acres	acres	acres
	sq. ft.	sq. ft.	sq. ft.
B) Ornamental turf	acres	acres	acres
	sq. ft.	sq. ft.	sq. ft.
i) Special landscape area	acres	acres	acres
	sq. ft.	sq. ft.	sq. ft.

In some instances, as required, the site data requested may be presented in a format different than the District provided format as shown above and as found in the Water Efficient Landscape Worksheet. It is requested that the document provided to the District be a separate 8.5"x11" attached document(s).

The data requested in the Landscape Site Data Table may also be shown on the landscape plans.

700.9.2.2 Irrigation Station Information Table(s)

Information contained in the Irrigation Station Information Table is to be used to help program the irrigation controller at the landscape site. Each station shall be a unique portion of the landscaped area having plants of similar water needs and/or water application devices. An Irrigation Station Information Table shall be completed for each metered point of connection. Individual stations are to be identified by controller and valve identification numbers or letters. All water features shall be included and identified as a unique station and shall be assigned a plant factor of 1.0.

700.9.2.3 Calculation of Maximum Applied Water Allowance

The Maximum Applied Water Allowance (MAWA) is the upper limit of annual applied water for the established landscaped area. It is based upon the area’s reference evapotranspiration, the ET Adjustment Factor and the size of the landscaped area. Special Landscape Areas, including recreational turf areas and areas permanently and solely dedicated to edible plants such as orchards and vegetable gardens are subject to the MAWA but are given an additional allocation of water equal to 30% of the local reference evapotranspiration rate.

The Maximum Applied Water Allowance calculation shall adhere to the following requirements:

- 1) Where there are multiple service connections at a single project, the MAWA calculation shall be completed for the whole site and each individual landscape meter connection.
- 2) The project applicant shall use a local, historical, reference evapotranspiration (ET_o) value from the table below (Source: California Irrigation Management Information System).

Region	ET Values												Total ET
Castroville	1.4	1.7	3.0	4.2	4.6	4.8	4.0	3.8	3.0	2.6	1.6	1.4	36.2
Monterey	1.7	1.8	2.7	3.5	4.0	4.1	4.3	4.2	3.5	2.8	1.9	1.5	36.0
Salinas	1.6	1.9	2.7	3.8	4.8	4.7	5.0	4.5	4.0	2.9	1.9	1.3	39.1

- 3) The surface area of water features shall be included in the calculation of Landscape Area.
- 4) Special Landscape Area shall be identified. Special Landscape Areas include recreational turf areas and areas permanently and solely dedicated to edible plants such as orchards and vegetable gardens.

The landscape project's Maximum Applied Water Allowance shall be calculated using this equation:
 $MAWA = (ET_o)(0.62)[(0.7 \times LA) + (0.3 \times SLA)]$

where:

MAWA = Maximum Applied Water Allowance (gallons per year)

- ET_o = Local, Historical Reference Evapotranspiration Rate (inches per year)
- 0.7 = ET Adjustment Factor
- LA = Landscaped Area including the designated 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)

The example calculations below are hypothetical to demonstrate proper uses of the equations and do not represent an existing and/or planned landscape project.

Example MAWA Calculation #1:

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 or recreational turf areas). To calculate MAWA, the annual reference evapotranspiration value for Fresno is 51.1 inches.

$$\begin{aligned} \text{MAWA} &= (\text{ET}_o)(0.62)[(0.7 \times \text{LA})+(0.3 \times \text{SLA})] \\ \text{MAWA} &= (51.1 \text{ inches})(0.62)[(0.7 \times 50,000 \text{ square feet}) + (0.3 \times 0)] \\ &= 1,108,870 \text{ gallons per year} \end{aligned}$$

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)

Example MAWA Calculation #2:

In this next hypothetical example, the landscape project in Fresno, CA has the same ET_o 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 soccer field. This 2,000 square foot area of recreational turf is considered to be a Special Landscape Area.

$$\begin{aligned} \text{MAWA} &= (\text{ET}_o) (0.62)[(0.7 \times \text{LA})+(0.3 \times \text{SLA})] \\ \text{MAWA} &= (51.1 \text{ inches})(0.62)[(0.7 \times 50,000 \text{ square feet}) + (0.3 \times 2,000 \text{ square feet})] \\ &= 31.68 \times [35,000 +600] \text{ gallons per year} \\ &= 31.68 \times 35,600 \text{ gallons per year} \\ &= 1,127,808 \text{ gallons per year or } 1,508 \text{ hundred-cubic-feet per year} \end{aligned}$$

700.9.2.4 Calculation of Estimated Total Water Use

The Estimated Total Water Use shall be calculated using the equation shown below. Estimated Total Water Use; the sum of the Estimated Water Use for all individual hydrozones within a specific area shall not exceed the MAWA calculation for the same area.

Where there are multiple service connections at a single project, the calculation should be completed for the complete project and each individual landscape meter connection.

- 1) The project applicant shall use a local, historical, reference evapotranspiration (ET_o) value from the table below (Source: California Irrigation Management Information System).

Region	ET Values												Total ET
Castroville	1.4	1.7	3.0	4.2	4.6	4.8	4.0	3.8	3.0	2.6	1.6	1.4	36.2
Monterey	1.7	1.8	2.7	3.5	4.0	4.1	4.3	4.2	3.5	2.8	1.9	1.5	36.0
Salinas	1.6	1.9	2.7	3.8	4.8	4.7	5.0	4.5	4.0	2.9	1.9	1.3	39.1

- 2) The surface area of water features shall be included in the calculation and assigned a high water use plant factor of 1.0.
- 3) Hydrozones classified as Special Landscape Area shall be identified. There is no plant factor multiplier for the Special Landscape Area.
- 4) The plant factor used shall be the highest of the various plant species coefficients for a specific hydrozone. The plant factor range for a low water use plant grouping is 0 to 0.3, the plant factor range for a moderate water use plant grouping is 0.4 to 0.6, and the plant factor range for a high water use plant grouping is 0.7 to 1.0.
- 5) Temporarily irrigated areas shall be included as a low water use hydrozone.

$$ETWU = (ET_o)(0.62)[(PF \times HA/IE) + SLA]$$

Where:

ETWU = Estimated Total Water Use per year (gallons)

ET_o = Local, Historical Reference Evapotranspiration Rate (inches per year)

PF = Highest of a Hydrozone’s Plant Factors. Derived 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 = Hydrozone’s Expected Irrigation Efficiency (minimum 0.71)

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Example ETWU Calculation #1:

The total landscape area is 50,000 square feet. The plant water use category, highest plant factor, hydrozone area, and each hydrozone’s expected irrigation efficiency are shown in the table below. The product of these three values equals the Adjusted Area of an individual hydrozone. The ETo value is 51.1 inches per year. There are no Special Landscape Areas (recreational turf area or area permanently and solely dedicated to edible plants).

Hydrozone	Plant Water Use Category	Highest Plant Factor (PF)	Area (square feet)	Irrigation Efficiency (IE)	Adjusted Area PF x Area/IE (square feet)
1	High	0.8	7,000	0.71	7,887
2	High	0.7	10,000	0.71	9,859
3	Medium	0.5	16,000	0.71	11,268
4	Low	0.3	7,000	0.71	2,958
5	Low	0.2	10,000	0.71	2,817
		Sum	50,000		34,789
	SLA		0		0

$$ETWU = (51.1)(0.62)(34,789 + 0)$$

$$= 1,102,185 \text{ gallons per year}$$

Compare ETWU with MAWA. The ETWU (1,102,185 gallons per year) is less than MAWA (1,108,870 gallons per year). In this example, the water budget complies with the MAWA.

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Example ETWU Calculation #2:

The total landscape area is 50,000 square feet, 2,000 square feet of which is a soccer field. The soccer field area is considered to be a Special Landscape Area. The plant water use category, highest plant factor, hydrozone area, and each hydrozone’s expected irrigation efficiency are shown in the table below. The product of these three values equals the Adjusted Area of an individual hydrozone. The reference evapotranspiration value is 51.1 inches per year.

Hydrozone	Plant Water Use Type(s)	Highest Plant Factor (PF)	Area (square feet)	Irrigation Efficiency (IE)	Adjusted Area PF x Area/IE (square feet)
1	High	0.8	7,000	0.71	7,887
2	High	0.7	9,000	0.71	8,873
3	Medium	0.5	15,000	0.71	10,563
4	Low	0.3	7,000	0.71	2,958
5	Low	0.2	10,000	0.71	2,817
		Sum	48,000		33,098
6	SLA		2,000		2,000

$$\begin{aligned} \text{ETWU} &= (51.1)(0.62)(33,098 + 2,000) \\ &= 1,111,975 \text{ gallons per year} \end{aligned}$$

Compare ETWU with MAWA. For this example:

$$\begin{aligned} \text{MAWA} &= (51.1)(0.62)[(0.7 \times 50,000) + (0.3 \times 2000)] \\ &= 31.68 \times [35000 + 600] \\ &= 31.68 \times 35,600 \\ &= 1,127,808 \text{ gallons per year} \end{aligned}$$

The ETWU (1,111,975 gallons per year) is less than MAWA (1,127,808 gallons per year). For this example the water budget complies with the MAWA.

700.9.3 MCWD ET-Based Irrigation Schedule for the Establishment Period

This spreadsheet illustrates how the watering frequency and watering duration change when using an ET-based irrigation controller. The spreadsheet shows that watering frequency and duration change each month of the first year, based upon specific site characteristics, plant water requirements, and historical evapotranspiration data for the region. Typically, the MCWD ET-Based Irrigation Schedule for the Establishment Period shows a more frequent application of water due to the young landscape plantings smaller root depth and/or a desired, lower Maximum Allowable Depletion (MAD) of soil moisture.

Each ET-based irrigation controller at a site will generate its own unique irrigation schedule based on the site data entered or received. Actual irrigation schedules may differ from those produced in the MCWD ET-Based Irrigation Schedules.

Each ET-based irrigation controller installed at a site may operate irrigation valves on only one associated metered connection.

The MCWD ET-Based Irrigation Schedule for the Establishment Period includes an Estimated Applied Water Use calculation. The Estimated Applied Water Use is an estimate of the total annual amount of water that will be applied through the ET-based Irrigation system.

An example MCWD ET-Based Irrigation Schedule for the Establishment Period is shown in Appendix 36.

The MCWD ET-Based Irrigation Schedule for the Establishment Period is available as a standard District form and can be obtained in electronic format at the District website, <http://www.mcwd.org/engr.html>.

700.9.4 MCWD ET-Based Irrigation Schedule for the Mature Landscape

This spreadsheet illustrates how the watering frequency and watering duration change when using an ET-based irrigation controller. The spreadsheet shows that watering frequency and duration change each month, based upon specific site characteristics, plant water requirements, and historical evapotranspiration data for the region. Typically, the MCWD ET-Based Irrigation Schedule for the Mature Landscape shows a more infrequent application of water, when compared to the watering schedule for the establishment period, due to the mature landscape plantings deeper root depth and/or a higher permitted Maximum Allowable Depletion (MAD) of soil moisture.

Each ET-based irrigation controller at a site will generate its own unique irrigation schedule based on the site data entered or received. Actual irrigation schedules may differ from those produced in the MCWD ET-Based Irrigation Schedules.

Each independent ET-based irrigation controller installed at a site may operate irrigation valves on only one associated metered connection.

The MCWD ET-Based Irrigation Schedule for the Mature Landscape includes an Estimated Applied Water Use calculation. The Estimated Applied Water Use is an estimate of the total annual amount of water that will be applied through the ET-based Irrigation system.

An example MCWD ET-Based Irrigation Schedule for the Mature Landscape is shown in Appendix 37.

The MCWD ET-Based Irrigation Schedule for the Mature Landscape is available as a standard District form and can be obtained in electronic format at the District website, <http://www.mcwd.org/engr.html>.

700.9.5 Irrigation System Map

An 8.5 x 11” Irrigation System Map shall be submitted as part of the Landscape Documentation Package. The map shall be provided to the installation contractor for attachment inside each irrigation controller. The map shall illustrate and clearly identify the following:

- 1) Location of the unique site in relation to major roadways, landscape markers, buildings, site features, and/or other adjacent properties.
- 2) Areas of recycled water use shall be clearly delineated from areas of potable water use.
- 3) Location of potable and/or recycled water distribution lines.
- 4) Meter locations
- 5) Controller locations
- 6) Valve locations

An example Irrigation System Map is shown in Appendix 39.

700.9.6 Individual Station Maps

8.5 x 11” Individual Station Maps shall be prepared showing the location of irrigation system control and application components and clearly identifying separate application areas by station. These maps shall be provided to the installation contractor for attachment inside each irrigation controller.

The map shall illustrate, clearly identify and include the following:

- 1) Location of potable and/or recycled water distribution lines.
- 2) Valve location and station number
- 3) Description of area watered
- 4) Illustration of area watered
- 5) Application device used
- 6) Unique station statistics including:
 - a) flow rate
 - b) application rate
 - c) station efficiency

- d) designed operating pressure
- 7) Unique Hydrozone information (used to program the controller) including:
 - a) plant factor
 - b) soil type
 - c) sun exposure
 - d) slope
 - e) allowable water deficiency
 - f) root zone depth

An example Individual Station Map is shown in Appendix 40.

700.9.7 Landscape and Irrigation System Maintenance Schedules

Maintenance schedules satisfying the following conditions shall be submitted as part of the Landscape Documentation Package:

- 1) The designer shall specify the recommended service periods and tasks required to adequately maintain the landscape plant material. The Landscape Maintenance Schedule shall include but not be limited to fertilization, weed control, pruning, mowing, mulching, staking, aerating, de-thatching, and removing litter.
- 2) The Irrigation Maintenance Schedule will specify the recommended service periods and tasks required to adequately maintain the irrigation equipment and monitor water use. The Irrigation Maintenance Schedule shall include but not be limited to checking, cleaning, adjusting, and repairing application devices; checking service laterals and monitoring for leaks, checking and/or adjusting the automatic controls, cleaning strainers, adjusting pressures, and monitoring consumption.

Whenever possible, repair of irrigation equipment shall be done with the originally specified materials or their equivalents. Project applicants are encouraged to implement sustainable or environmentally-friendly practices for overall landscape maintenance.

A sample Landscape and Irrigation System Maintenance Schedule is available in Appendix 41.

700.9.8 Soil Management Report

A Soil Management Report shall be submitted to the District as part of the Landscape Documentation Package. Only when mass grading is planned; and therefore the soil sample collection delayed, will the soil analysis and soil amendment recommendation be submitted separately from the Landscape Documentation Package. In such cases, in addition to the soil analysis and soil amendment recommendation, documentation verifying implementation of the soil amendment recommendations must be submitted with the Certificate of Completion once construction is complete.

The Soil Management Report shall include a laboratory soil analysis and a professional recommendation specifying the quantity and type of soil amendment to be incorporated into the soil to achieve

horticultural suitability. Multiple recommendations may be required for individual hydrozones, plant species, or plant type.

The soil analysis shall include:

- 1) Determination of soil texture, indicating the percentage of organic matter.
- 2) A specification of the type and quantity of soil amendments and fertilizers to be incorporated into each 1000 square feet of planting area.
- 3) An approximate soil infiltration rate (either measured or derived from soil texture/infiltration rate tables.) A range of infiltration rates shall be noted where appropriate.
- 4) Measure of pH, and total soluble salts.
- 5) A specification of the type and quantity of mulch material required to provide at least a two inch deep layer of mulch to all planting areas (except turf).

A sample Soil Analysis and Soil Amendment Recommendation is available in Appendix 42.

700.9.9 Landscape Design Plan

A landscape design plan meeting the following requirements shall be submitted as part of the landscape documentation package.

700.9.9.1 Water Features

- 1) Recirculating water shall be used for water features.
- 2) Pool and spa covers are highly recommended.
- 3) The surface area of water features shall be included in the water use calculations and assigned a high water use plant factor of 1.0.
- 4) Where available, recycled water shall be used in water features.

700.9.9.2 Plant Selection and Grouping

- 1) Any plants may be used in the landscape, providing the Estimated Total Water Use does not exceed the Maximum Applied Water Allowance. The selection of water-conserving plant and turf species is highly recommended.
- 2) Plants having similar water use shall be grouped together in distinct hydrozones that are irrigated by separate valves.
- 3) Avoid invasive plant species.
- 4) Fire prevention needs shall be addressed in areas that are fire prone. Consider and address fire safety and prevention when selecting landscape plants. Avoid fire-prone plant materials and highly

flammable mulch materials. Information about fire prone areas and appropriate landscaping for fire safety is available from local fire departments or the California Department of Forestry.

- 5) Plants should be selected appropriately based upon their pest and disease resistance, and adaptability to the climatic, geologic, and topographical conditions of the site. Protection and preservation of native species and natural areas is encouraged.
- 6) The selection of trees shall be based on applicable local tree ordinances or tree shading guidelines. The planting of appropriate trees is encouraged wherever it is consistent with the other provisions of these design criteria. Consider the solar orientation for plant and tree placement to maximize summer shade and winter solar gain. Avoid underground utilities. Recognize that plantings of considerable size may be limited in rights of ways and easements.
- 7) The use of turf is discouraged where other low water use plants or alternative landscape materials are appropriate. The District recommends that no more than 25% of the irrigated landscape area be planted with low-water demand varieties of turf, providing the Estimated Total Water Use is within the Maximum Applied Water Allowance. Local agency restrictions on turf shall be followed. Large turf areas should be limited to only those approved by the responsible agency as recreational space. Turf areas with overhead irrigation should be bordered by planting beds or alternative permeable landscape materials to prevent the migration of surface runoff outside the target area. Small "pocket lawns" less than 500 square feet in size are not permitted unless low volume irrigation is used. The overhead application of water to these small turf areas is not permitted. 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).

700.9.9.3 Landscape Design Plan Requirements

- 1) The landscape design plan shall contain the following signed statement:

"I have complied with the criteria of the design standards and applied them accordingly for the efficient use of water in the landscape design plan"

The statement shall be signed by a licensed landscape architect, licensed landscape contractor or any other applicable landscape professional, person, licensed or unlicensed, as listed in the Business and Professions Code, California Code of Regulations, or Food and Agriculture Code.

Note: Authority Cited: Section 65595, Gov. Code and Section 1353.8, Civil Code. Reference: Section 65596, Gov. Code and Section 1353.8, Civil Code.

- 2) Delineate and label each hydrozone by number, letter, or other method. Identify each hydrozone as low, medium, or high water use by finding the highest of the various plant species coefficients for a specific hydrozone.
- 3) Landscape materials, trees, shrubs, groundcover, turf, and other vegetation. Planting symbols shall be clearly drawn and plants labeled by botanical name, common name, container size, spacing, and quantities of each group of plants indicated.
- 4) Property lines and street names.
- 5) Streets, driveways, walkways, and other paved areas.

- 6) Pools, ponds, water features, fences, and retaining walls.
- 7) Existing and proposed buildings and structures including elevation if applicable.
- 8) Natural features including but not limited to rock outcroppings, existing trees, shrubs that will remain.
- 9) Tree staking, plant installation, soil preparation details, and any other applicable planting and installation details.
- 10) Clearly delineate Special Landscape Areas including areas permanently and solely dedicated to edible plants and recreational turf areas.
- 11) At least two inches of mulch material on top of the soil surface shall be specified for planting beds.
- 12) Stabilizing mulching products shall be used on slopes.
- 13) Laboratory soil analysis and a professional recommendation shall specify the quantity and type of soil amendment to be incorporated into the soil to achieve horticultural suitability. Multiple recommendations may be required for individual hydrozones, plant species, or plant type.
- 14) Identify the location and installation details of any applicable storm water best management practices that encourage on-site retention and infiltration of storm water. Project applicants shall refer to the local agency or Regional Water Quality Control Board for information on any storm water ordinances and storm water management plans. Storm water 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;
 - c) Pervious or porous surfaces (e.g., permeable pavers or blocks, pervious or porous concrete, etc.) that minimize runoff;
 - d) Identify any applicable rain harvesting or catchment technologies (e.g., rain gardens, cisterns, etc.).

700.9.10 Irrigation Design Plan

These irrigation design requirements promote the efficient use of applied water.

An irrigation design plan meeting the following design criteria shall be submitted as part of the Landscape Documentation Package.

- 1) Overhead irrigation is permitted for turf, seeded grass areas, and areas planted with ground covers that spread by rhizomes or runners. Otherwise, low volume irrigation is required to maximize water infiltration into the root zone, reduce evaporative water loss, and prevent runoff.
- 2) Overhead spray irrigation systems are prohibited in roadway median strips, parking islands, roadside planting strips and other narrow areas bordered by hardscape and measuring less than eight feet in width. In these areas where planter width is greater than eight feet, fan-type spray nozzles are not permitted. The use of low trajectory and low precipitation rate stream type nozzles is permitted and encouraged.

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- 3) Overhead irrigation shall not be permitted within 24 inches of any non-permeable surface. Allowable irrigation within the setback from non-permeable surfaces may include drip, drip line, or other low flow non-spray technology. The setback area may be planted or unplanted. The surfacing of the setback may be mulch, gravel, or other porous material. These restrictions may be modified if:
 - a) The landscape area is adjacent to permeable surfacing and no overspray and runoff occurs;
 - b) Or the adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping;
 - c) Or the irrigation designer specifies an alternative design or technology, as part of the Landscape Documentation Package, and clearly demonstrates strict adherence to irrigation system design criteria. Prevention of overspray and runoff must be confirmed during an irrigation audit.
- 4) Slopes greater than 25% shall not be irrigated with an irrigation system having 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 irrigation audit.
- 5) The District may require the use of drip irrigation or low volume application devices in certain cases where it is determined during plan check procedures that otherwise permitted overhead spray irrigation may result in waste of water due to excessive runoff or wind drift away from the application target.
- 6) Soil types and water infiltration rates shall be considered when designing irrigation systems. All irrigation systems shall be designed to avoid runoff, low head drainage, overspray, or other similar conditions where applied water could flow outside the Landscape Area, onto adjacent property, into non-irrigated areas, and onto walks, roadways, or structures. Proper irrigation equipment and schedules, including features such as repeat cycles, shall be used to closely match application rates to infiltration rates, therefore minimizing applied water runoff.
- 7) Special attention shall be given to avoid runoff on slopes and to avoid overspray in narrow planting areas with a width less than eight feet, and in median strips over eight feet in width.
- 8) The height of all sprinklers risers shall exceed the height of mature plant material. Appropriate sprinkler offset or height clearance shall be provided when placed adjacent to parking stalls.
- 9) The design of the irrigation system shall conform to the hydrozones of the landscape design plan.
 - 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) 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:

- 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 Irrigation Station Information Table (Appendix 31). This table can also assist with pre- and final inspections of the irrigation system, and programming the controller.

700.9.10.1 Irrigation Design Plan Requirements

The irrigation design plan submitted to the local agency shall follow standard industry practices and applicable local agency requirements. The irrigation plans shall include the following:

- 1) The irrigation design plan shall contain the following signed statement:

“I have complied with the criteria of the design standards and applied them accordingly for the efficient use of water in the irrigation design plan”

The statement shall be signed by a licensed landscape architect, licensed landscape contractor or any other applicable landscape professional, person, licensed or unlicensed, as listed in the Business and Professions Code, California Code of Regulations, or Food and Agriculture Code.

Note: Authority Cited: Section 65595, Gov. Code. Reference: Section 65596, Gov. Code.

- 1) The irrigation design plan shall be drawn on project base sheets. It shall be separate from, but use the same format and scale as, the landscape design plan.
- 2) Location, size, area served (square feet), yearly water requirement (acre-feet), and peak flow rate of separate connections and water meters for the landscape.
- 3) Location, type, size, model, manufacturer of all components of the irrigation system, including automatic controllers, main and lateral lines, valves, sprinkler heads, moisture sensing devices, rain switches, quick couplers, filters, and backflow prevention devices.
- 4) Flow, pressure, radius, application rate, sprinkler offset, and sprinkler pattern for specified application devices.
- 5) Static water pressure at the point of connection to the public water supply.
- 6) Expected dynamic pressure and flow rate when designed with booster pumps.
- 7) Flow rate (gallons per minute), valve number, controller number, application rate (inches per hour), and design operating pressure (psi) for each station.
- 8) The irrigation window shall be clearly identified on all schedules and in the irrigation notes. For recycled water, the irrigation window is from 9:00 P.M. to 6:00 A.M. and for potable water, 5:00P.M. to 10:00 A.M..

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- 9) Clear differentiation shall be shown between recycled water irrigation systems and potable water irrigation systems.
- 10) Specifications required of Section 600 – Design Criteria, Recycled Water Facilities. Irrigation system designs for recycled water use shall be prepared to meet all standards required for submission of an On-Site Recycled Water User Plan and the request for recycled water service.
- 11) Pipe separation, trenching, wiring, connection, flow control, backflow prevention, filtration, pipe routing, coverage, and any other applicable irrigation and related electrical installation details.
- 12) Meter Data - The following information shall be provided and shown at each proposed meter location shown on the plans:
 - a) The meter location and size (inches).
 - b) The peak flow through the meter (gpm).
 - c) The (static) design pressure available at the meter (psi).
 - d) The total area served through the irrigation meter (acres).
 - e) An estimate of the yearly water requirement through the meter (acre-feet).
- 13) Irrigation Equipment Legend - For irrigation systems, a legend showing the pertinent data for the materials used in the system shall be recorded on the plans. The legend shall include a pipe schedule listing pipe sizes and materials of construction, a listing of valve types and quick couplers (quick couplers are not permitted for residential dual plumbed homes), and the following information for each type of sprinkler head:
 - a) Manufacturer name and model number.
 - b) Sprinkler radius (feet).
 - c) Operating pressure (psi).
 - d) Flow (gpm).
 - e) Sprinkler pattern.
- 14) Irrigation Details - The following irrigation details and notes shall be provided on each plan set
 - a) Irrigation System Schematic Layout: Potable Water and Recycled Water Services
 - b) Irrigation Plan Legend
 - c) Automatic Controller
 - d) Rain Shut-off Switch
 - e) Buried Electric Remote Control Valve
 - f) Pipe Trenching
 - g) Pipe Trenching Under Pavement

- h) Sprinkler Installation and Offset from Hardscape
- i) Backflow Prevention Unit (when required)
- j) Wye or Basket Strainer
- k) Pressure Reducing Valve
- l) General On-Site Recycled Water Notes

15) Sheets to be Included - The following sheets shall be included in the set:

- a) Cover sheet showing project location and all recycled and potable on-site water lines.
- b) Irrigation application sheet showing coverage areas by individual stations and meters.
- c) Irrigation plans and irrigation details.

700.9.10.2 Irrigation Equipment.

To promote water conservation the following equipment is required.

- 1) District-approved, weather- based irrigation controllers or soil moisture-based irrigation controllers shall be installed by the developer to control watering systems in:
 - a) All parcels and lots with irrigated landscape area equal to or greater than 500 square feet. This includes private residential home sites and lots where irrigated landscaping is probable.
 - b) Multiple parcels and lots served by a single point of connection and having an aggregate landscape area greater than 2,500 square feet.
- 2) All controllers must adjust watering parameters automatically based upon current, local reference evapotranspiration data, provided by a remote or localized weather-based information system, or based upon immediate, automated soil moisture measurements.
- 3) Irrigation controllers shall be capable of utilizing various input data to develop unique irrigation schedules for the plant establishment period and the established landscape. To develop the unique irrigation schedules, each irrigation controller shall consider 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;
 - d) Application rate setting;
 - e) Plant type setting;
 - f) Soil type;

- g) Slope factor setting;
 - h) Shade factor setting; and
 - i) Irrigation uniformity or efficiency setting.
- 4) Each independent ET-based irrigation controller installed at a site may operate irrigation valves on only one associated metered connection.
 - 5) All irrigation control systems shall be equipped with rain sensing devices to prevent irrigation during periods of rain unless otherwise specified by the device manufacturer.
 - 6) Sprinkler irrigation systems using potable water shall have a wye strainer located downstream of the meter and on the riser of the backflow prevention device. The backflow device and wye strainer may be replaced with a basket strainer, below grade in a box, when recycled water is used.
 - 7) A pressure-reducing valve must be installed down-stream of the strainer for each system using recycled water, unless otherwise determined to be inappropriate.
 - 8) On irrigation systems using recycled water, strainers and pressure-reducing valves shall be installed below grade in a purple colored rectangular box of sufficient size to easily allow repair or replacement of the unit(s).
 - 9) Bubbler flow rates shall not exceed 1.5 gallons per minute per device. Adjustable bubblers are not permitted.
 - 10) Pop-up sprinklers shall have a minimum riser height of 6-inches.
 - 11) All electronic irrigation control valves shall include design and construction features allowing trouble-free use in harsh conditions including use with non-potable, reclaimed effluent water. These advanced features include brass or industrial-strength nylon housing, flow control, port filtration, captured solenoid plungers, manual external bleeding, and “scrubber” type debris removal.
 - 12) Dedicated landscape water meters shall be installed for all landscape projects except for single family homes.
 - 13) Sprinkler heads and emitters shall have consistent application rates and match precipitation rates within each control valve circuit. Sprinkler heads shall be selected for proper area coverage, application rate, operating pressure, adjustment capability, and ease of maintenance.
 - 14) At a minimum, head to head coverage of sprinkler pattern overlap is required. Greater overlap may be required in windy situations. Sprinkler spacing shall be set to achieve distribution uniformity using the manufacturer’s specifications.
 - 15) Anti-drain (check) valves shall be designed into drip irrigation systems, at strategic points, to minimize or prevent low-head drainage.

- 16) In-head pressure regulation and check valve devices are required in overhead sprinklers when the device is available from the manufacturer.
- 17) It is recommended that soil moisture sensing devices be considered where appropriate.

700.9.10.3 Additional Irrigation Equipment for Large Landscapes

These requirements provide additional protection against water waste in larger landscape projects equal to or greater than 21,780 square feet (0.5 acre) of landscape area as defined in these design criteria. This equipment or equipment features are in addition to the requirements in sub-section 700.9.10.2.

- 1) The District-approved, weather- based irrigation controllers or soil moisture-based irrigation controllers installed in large landscapes must have water use monitoring, recording, and alarm features. The controllers must be capable of:
 - a) shutting off malfunctioning individual stations automatically without disrupting the remaining programs and;
 - b) shutting off the master control valves in the event of a mainline or valve failures.
- 2) Automatically operated master control valves must be installed to protect against water loss due to mainline breaks or system malfunction.
- 3) Flow meters must be installed to allow observation, water loss protection, and recording of irrigation parameters.

700.9.11 Grading Design Plan

For the efficient use of water, grading of a project site shall be designed to minimize soil erosion, runoff, and water waste. A grading design plan shall be drawn on project base sheets. It shall be separate from but use the same format as the landscape design plan. The grading design plan shall indicate finished configurations and elevations of the landscaped area, including the height of graded slopes, drainage patterns, pad elevations, and finish grade. The plan should clearly identify storm water retention improvements. To prevent excessive erosion and runoff, it is highly recommended that project applicants:

- 1) Grade the site so that all irrigation and normal rainfall remains within property lines and does not drain on to non-permeable hardscapes.
- 2) Avoid disruption of natural drainage patterns and undisturbed soil.
- 3) Avoid soil compaction in landscape areas.

The grading design plan shall contain the following signed statement:

“I have complied with the criteria of the design standards and applied them accordingly for the efficient use of water in the grading design plan”

The statement shall be signed by a licensed landscape architect, licensed landscape contractor or any other applicable landscape professional, person, licensed or unlicensed, as listed in the Business and Professions Code, California Code of Regulations, or Food and Agriculture Code.

Note: Authority Cited: Section 65595, Gov. Code and Section 1353.8, Civil Code. Reference: Section 65596, Gov. Code and Section 1353.8, Civil Code.

700.9.12 MCWD Certificate of Completion

The MCWD Certificate of Completion is available as a standard District form and can be obtained in electronic format at the District website, <http://www.mcwd.org/engr.html>.

Upon completion of the landscape and irrigation system installation, the Landscape Contractor and Landscape Architect, Irrigation Designer, Independent Landscape Consultant, or a licensed or certified landscape professional, shall conduct field observations and sign the MCWD Certificate of Substantial Completion verifying the landscape was installed according to the MCWD approved plans and specifications. The document is then signed by the owner or the owner's representative, recognizing that the project has been constructed as planned, the required irrigation audit performed, the soil report recommendations implemented, and that the owner now has responsibility to maintain the site. A copy of the signed Certificate of Completion is then to be delivered to the District, along with the irrigation audit report, for approval or denial. If denied, the District shall provide information to the project applicant regarding reapplication, appeal or other assistance.

This document also includes a statement recognizing the owner's responsibility to conduct an additional irrigation audits, performed by a Certified Landscape Irrigation Auditor, if the sites future water use exceeds the sites Maximum Applied Water Allowance. Water use of all landscapes over 5000 square feet with dedicated irrigation service connections shall be monitored by the District and water use compared to the calculated MAWA for the landscape area served.

An example Certificate of Completion is available in Appendix 43.

700.9.13 Irrigation Audit

For all projects too which these standards apply, and installed after January 1, 2010, the project applicant shall have an irrigation audit performed immediately following the completion of construction or rehabilitation and prior to submission of the Certificate of Completion to the District. The irrigation audit report shall be submitted to the District with the Certificate of Completion. The report may include, but is not limited to: inspection, system tune-up, system test with distribution uniformity, reporting overspray or run off that causes overland flow, and preparation of an irrigation schedule.

All irrigation audits submitted to the District, weather as part of the landscape documentation package or as required by the Water Conservation Ordinance shall:

- 1) Comply with the "Irrigation Association Certified Landscape Irrigation Auditor Training Manual (2004 or most current version).
- 2) All landscape irrigation audits shall be conducted by a Certified Landscape Irrigation Auditor.

The District will 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.

700.9.14 Public Education Plan

Development projects consisting of eight or more homes shall provide documentation to the District outlining a comprehensive plan to provide water conservation education materials and displays to new home owners within the development. The plan shall include the following actions by the developer:

- 1) Provide publications to owners of all new, single family residential homes regarding the design, installation, and maintenance of water efficient landscapes.
- 2) Provide literature about water efficient landscape design and the efficient use of landscape water throughout the community.
- 3) Demonstrate via signs and information the principles of water efficient landscapes in all model homes. The signs shall be used to identify the model as an example of a water efficient landscape and featuring elements such as hydrozones, irrigation equipment and others which contribute to the overall water efficient theme.
- 4) Information shall be provided at the model homes about designing, installing, and maintaining water efficient landscapes.
- 5) The installation of water efficient public demonstration gardens throughout the community is encouraged.

An example document outlining the work by one developer to fulfill this requirement is shown in Appendix 44.

700.10 DISTRICT PROVIDED LANDSCAPE DOCUMENTATION FORMS

Many of the documents mentioned in these design criteria are available as forms from the District staff or can be found on the District website at <http://www.mcwd.org/engr.html>. Examples of completed forms are also available as appendixes of this document and are available for viewing on the District website. Considerable effort has been made to make these application forms and landscape documentation forms simple to understand and easy to complete. These electronic forms provide the District with standard, uniform documents that include all the pertinent information necessary to understand, evaluate, comment, and process your application.

The District provided Landscape Documentation Forms and example landscape documents include the following:

- 1) MCWD Water Efficient Landscape Worksheet (Appendix 31)
 - a) Project Information
 - b) Checklist of Submitted Documentation
 - c) Landscape Site Data Table
 - d) Irrigation Station Information Table(s)
 - e) Water Budget Calculations
 - iii) Maximum Applied Water Allowance (MAWA)
 - iv) Estimated Total Water Use (ETWU)
 - v) Calculation of Effective Precipitation and the Effective Precipitation Disclosure Statement (optional)
 - f) Owners agreement to comply
- 2) On-Site Recycled Water User Plan (Appendix 19).
- 3) MCWD ET-Based Irrigation Schedule for the Establishment Period (Appendix 36)
- 4) MCWD ET-Based Irrigation Schedule for the Mature Landscape (Appendix 37)
- 5) Irrigation System Map (Appendix 39)
- 6) Individual Station Maps (Appendix 40)

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- 7) Landscape and Irrigation System Maintenance Schedule(s) (Appendix 41)
- 8) Soil Management Report (Appendix 42)
- 9) MCWD Certificate of Completion (Appendix 43)
 - a) Landscape Irrigation Audit Report
 - b) Documentation verifying implementation of the soil report recommendations.
- 10) Public Information Plan (Appendix 44)

END OF SECTION