CITY OF COSTA MESA

P.O. BOX 1200 • 77 FAIR DRIVE • CALIFORNIA 92628-1200

DEVELOPMENT SERVICES DEPARTMENT

January 20, 2010

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

Dear Mr. Eching:

RE: WATER EFFICIENT LANDSCAPE ORDINANCE

In accordance with the requirements of AB 1881, on January 19, 2010, the Costa Mesa City Council held a public hearing and first reading of an ordinance to amend the City Zoning Code in compliance with the latest landscape water efficiency standards, and adopted by resolution, Water Efficient Landscape Guidelines that are as effective at water conservation as the DWR's updated Model Water Efficient Landscape Ordinance.

A copy of the ordinance and the guidelines are attached for your reference. The second reading of the ordinance is scheduled for the February 2, 2010 meeting of the City Council. The City anticipates the ordinance and the guidelines to be in effect by March 2, 2010. Since January 1, 2010, when the new state regulations went into effect, there have been no pending landscape projects that would be subject to the new regulations. If such landscape/irrigation applications are required or submitted, the City will proceed with plan check and submittal according to the new ordinance and guidelines.

If you have any questions, please contact Minoo Ashabi, Senior Planner at (714) 754-5610.

Sincerely,

Kimberly Brandt

KIMBERLY BRANDT, AICP
Acting Development Services Director

Attachment: Ordinance
City Council Resolution/Water Efficient Landscape Guidelines

cc: Minoo Ashabi, Senior Planner

ORDINANCE NO. 10- 2

AN ORDINANCE OF THE CITY COUNCIL OF COSTA MESA, CALIFORNIA ADOPTING ZONING CODE AMENDMENT CO-09-14, AMENDING TITLE 13, CHAPTER VII, LANDSCAPE STANDARDS OF THE COSTA MESA MUNICIPAL CODE REGARDING WATER EFFICIENT LANDSCAPE STANDARDS

THE CITY COUNCIL OF THE CITY OF COSTA MESA DOES HEREBY ORDAIN AS FOLLOWS:

SECTION 1: FINDINGS.

a. Consistent with the findings of the State Legislature, the City Council finds that:

1. The waters of the State are of limited supply and are subject to ever increasing demands;
2. The continuation of California's economic prosperity is dependent on the availability of adequate supplies of water for future uses;
3. It is the policy of the State to promote the conservation and efficient use of water and to prevent the waste of this valuable resource;
4. Landscapes are essential to the quality of life in California by providing areas for active and passive recreation and as an enhancement to the environment by cleaning air and water, preventing erosion, offering fire protection, and replacing ecosystems lost to development;
5. Landscape design, installation, maintenance, and management can and should be water efficient; and
6. Article X, Section 2 of the California Constitution specifies that the right to use water is limited to the amount reasonably required for the beneficial use to be served, and the right does not and shall not extend to waste or unreasonable method of use of water.

b. The City Council further finds that:

1. Orange County has an established, large reclaimed water infrastructure system;
2. Allocation-based and tiered water rate structures allow public agencies to document water use in landscapes;
3. Incentive-based water use efficiency programs have been actively implemented within Orange County since before 1991;
4. Current local design practices in new landscapes typically achieve the State Model Water Efficient Landscape Ordinance water use goals;
5. All water services within the City are metered;
6. Orange County is a leader in researching and promoting the use of smart automatic irrigation controllers with more than 4,500 installations as of June 2009;
7. All new irrigation controllers sold after 2012 within Orange County will be smart controllers;
8. Landscape plan submittal and review has been a long standing practice in Costa Mesa; and
9. The average rainfall in Orange County is approximately 12 inches per year.
10. Costa Mesa is served by two water purveyors, Irvine Ranch Water District (IRWD) and Mesa Consolidated Water District (MCWD). IRWD is implementing budget- based tiered-rate billing and/or enforcement of water waste prohibitions for all existing metered

landscaped areas throughout its service area, which includes a portion of City containing business and industrial parks south of the 405 Freeway. MCWD is implementing enforcement of water waste prohibitions for all existing metered landscaped areas within its jurisdiction by a water conservation ordinance (Ordinance No. 21) that has been in effect since September 2009.

c. Consistent with these findings, the purpose of the City's Water Efficient Landscape Ordinance is to establish an alternative model acceptable under AB 1881 as being at least as effective as the State Model Water Efficient Landscape Ordinance in the context of conditions in the City in order to:

1. Promote the benefits of consistent landscape ordinances with neighboring local and regional agencies;
2. Promote the values and benefits of landscapes while recognizing the need to invest water and other resources as efficiently as possible;
3. Establish a structure for planning, designing, installing, and maintaining and managing water efficient landscapes in *new construction* and rehabilitated projects;
4. Establish provisions for water management practices and water waste prevention for existing landscapes;
5. Use water efficiently without waste by setting a Maximum Applied Water Allowance as an upper limit for water use and reduce water use to the lowest practical amount; and
6. Encourage the use of economic incentives that promote the efficient use of water, such as implementing a budget-based tiered-rate structure.

SECTION 2: WATER EFFICIENT LANDSCAPE GUIDELINES. The submittal requirements for compliance with Assembly Bill 1881 are included in the Water Efficient Landscape Guidelines that are adopted by City Council Resolution No. 010-__ and may be amended from time to time by resolution of the City Council.

SECTION 3: TITLE 13. Title 13 of the Costa Mesa Municipal Code is hereby amended as follows:

a. Amend Chapter VII, Sections 13-101 and 13-101.1 as follows:

"Sec. 13-101. PURPOSE

It is the purpose of this chapter to establish reasonable requirements and standards for the design, installation, water conservation, and maintenance of landscape and irrigation to:

(1) Enhance the aesthetic appearance of the City by providing standards relating to quality, quantity, and functional aspects of landscaping for developments in all areas of the City.

(2) Address water conservation measures through the landscape and irrigation design.

(3) Encourage sustainable landscapes through landscape techniques that conserve, recycle, and reuse the resources that are invested in landscapes.

(4) Encourage landscape design that protects public health, safety, and welfare by minimizing the impact of all forms of physical and visual pollution, erosion, and unsightly conditions. This includes promoting the use of canopy trees in parking lots, and limiting the overall use of palm trees.

(5) Deter graffiti on walls, break up continuous asphalt and/or concrete surfaces on existing properties, screen incompatible land uses, cool and shade vehicles and hardscape areas, preserve the integrity of neighborhoods, and enhance pedestrian and vehicular corridors.

(6) Encourage applicants to take full advantage of the wide range of drought tolerant landscape materials and low water flow irrigation systems available within the framework established by this chapter.

(7) Establish water efficient landscape regulations, pursuant to State Assembly Bill 1881 and as effective as the State Model Water Efficient Landscape Ordinance.

(8) Promote the design, installation, and maintenance of landscaping in a manner that conserves regional water resources by ensuring that landscaping projects are not unduly water-needy and that irrigation systems are appropriately implemented to minimize water waste.

(9) Refer to the "Water Efficient Landscape Guidelines" adopted by City Council Resolution No. 10- to provide procedural and design guidance for project applicants for specified landscape installation or rehabilitation projects except for the R-1 (single-family residential) district.

Sec. 13-101.1 APPLICABILITY

(a) The provisions of this chapter apply to all zoning districts in the City.

(b) Landscaping and irrigation which is a part of a registered historical site, public park, or golf course facility, or new or rehabilitated cemeteries may be exempted from the provisions of this chapter when deemed necessary and appropriate by the planning division and consistent with the state's requirements.

(c) The Water Efficient Landscape Guidelines shall apply to projects that meet the following criteria unless exempted pursuant to the Water Efficiency Landscape Guidelines:

1. New landscape installations or landscape rehabilitation projects in nonresidential zones (except for cemeteries) with a landscaped area equal to or greater than 2,500 square feet.

2. New landscape installations or landscape rehabilitation projects in multi-family residential zones with a landscaped area equal to or greater than 2,500 square feet.

3. New golf courses and parks.

4. Modified landscaped area greater than 2,500 square feet affecting at least 50 percent of the total landscaped area; and planned to occur within one year."

c. Amend Chapter VII, Section 13-103, as follows:

"Sec. 13-103. GENERAL PROVISIONS AND SUBMITTAL REQUIREMENTS

(a) Requirements: Landscape and irrigation plans shall be required for all development projects requiring discretionary land use approval and for all City-initiated projects. For landscape projects subject to the Water Efficiency

Landscape Guidelines, landscape plans shall be prepared and certified by a California licensed landscape architect.

(b) Process:

(1) The plans shall be submitted to and approved by the planning division prior to issuance of any building permits, and shall be prepared in accordance with requirements listed in this chapter, Water Efficiency Landscape Guidelines (as applicable), and the City's Streetscape and Median Development Standards, which are incorporated herein by this reference, and which may be amended from time to time by resolution of the City Council. All unpaved areas shall be planted with an effective combination of trees, groundcover, turf, shrubbery and/or approved dry landscape materials."

(2) Landscape and irrigation plans shall be fully dimensioned and shall include, but shall not be limited to, the following:

a. List of plants (common and Latin names)
b. Plant size
c. Location
d. Irrigation plan
e. Hardscape (sidewalks, driveways, 6" continuous concrete curbing)
f. Water elements
g. Decorative features (boulders, sculptures, arbors, etc.)
h. Planting and irrigation details
i. Maintenance information
j. Any other information deemed necessary by the planning division

(3) **Modifications**: Any modification to an approved landscape or irrigation plan must be approved by the planning division prior to installation of the landscaping or irrigation system.

(4) **Approval**: All plan approvals by the Planning Division are subject to and dependent upon the applicant complying with all applicable ordinances, codes, regulations, and adopted policies.All landscape plans for projects subject to the Water Efficiency Landscape Guidelines shall be prepared under the direction of a California licensed landscape architect.

(5) All landscaping and irrigation materials shall be properly installed, inspected, and maintained in a healthy condition, prior to release of building utilities or the issuance of a Certificate of Occupancy, whichever is applicable or occurs first. Final inspection approvals or occupancy clearance shall not be granted until all of the landscaping and irrigation are installed in accordance with the approved plans.

(6) **Conflicting code sections**: When the provisions of this chapter conflict with other sections of the Municipal Code, the more stringent shall apply."

d. Amend Chapter VII, Section 13-104, as follows:

"Sec. 13-104. LANDSCAPE PLAN OBJECTIVES

(a) Each landscape plan shall be compatible with the shape and topography of the site and architectural characteristics of structure(s) on the site. Each landscape plan shall be compatible with the character of adjacent landscaping, provided the quality of the adjacent landscaping meets the standard of these guidelines. However, it is not the intent of this section to require the use of identical plant materials or

landscape designs. Where existing mature landscaping is in good, healthy condition, every effort shall be made to retain trees and mature landscaping.

(b) Each landscape plan shall illustrate a concern for design elements such as balance, scale, texture, form, water conservation, and unity.

(c) Each landscape plan shall address the functional aspects of landscaping such as grading, drainage, minimal runoff, erosion prevention, wind barriers, provisions for shade and reduction of glare, and water conservation. Each landscape plan shall demonstrate a concern for solar access, including exposure and shading of window areas.

(d) Landscaping shall be used to relieve solid, unbroken elevations, soften continuous wall expanses and deter graffiti.

(e) Landscaping shall be required to screen storage areas, trash enclosures, parking areas, public utilities, freeways, highways, and other similar land uses or elements which do not contribute to the enhancement of the surrounding area. Where possible, planting islands and perimeter landscaping shall be designed as concave-shaped swales instead of convex-shaped berms in order to capture runoff and reduce dependence on water. If mounding or berms are required as part of a project, the slopes shall not exceed a 3:1 (horizontal:vertical) ratio, nor shall they exceed 3 feet in height. Where plants are required for screening, such screening shall consist of the use of evergreen shrubs (minimum 5 gallons), vines and/or evergreen trees closely spaced.

(f) Water elements (pools, ponds, fountains, and other similar ornamental water features) incorporated into the project shall be of a design, shape, and size that minimizes water loss through evaporation. Recirculating water shall be used for decorative water features.

(g) Landscape and irrigation plans shall be designed and implemented to meet the water conservation measures described in the Water Efficient Landscape Guidelines as applicable."

e. Amend Chapter VII, Section 13-106, as follows:

"Sec. 13-106. REQUIRED LANDSCAPING MATERIALS

(a) All required landscaped areas, including landscaped areas within parking lots, shall consist of drought tolerant plant material and shall meet the following minimum requirements:

(1) Tree count: One tree (15-gallon or larger) shall be provided for every 200 square feet of landscaped area. 50 percent of all trees shall be evergreen. 25 percent of the required trees shall be 24-inch box or larger. Canopy trees for parking lot areas shall be included in the tree calculation. Canopy trees shall be installed throughout parking lot areas at the ratio of one tree per 6 parking spaces, with an average of 36 square feet of planter area provided per tree. Upon written request, the number of required trees may be reduced by the planning division when it is determined that an alternative design will meet the intent of section 13-104, LANDSCAPE PLAN OBJECTIVES.

a. **Tree count exception**: One tree (minimum 24-inch box or larger) shall be provided for every 300 square feet of landscaped area for automobile dealerships.

(2) Tree selection: Trees shall be selected based on their suitability and sustainability in tree wells, narrow planters, and medians. Trees shall also be

selected on the basis of quality and diversity as indicated below:

a. 24-inch box trees shall be a minimum 8 feet in height as measured from top of soil line in the box, and shall have a caliper of approximately 3 inches in diameter, 18 inches above the top of the root ball, or meeting with approval by the planning division. Selected trees shall be healthy, vigorous, and free from plant disease and insect pests. Selected trees shall be symmetrical and typical for variety and species. All trees shall have a normal and healthy root system free from being root bound. 15-gallon trees recently transplanted into 24-inch box, and 24-inch box recently transplanted into 36-inch box, and so forth, shall not be substituted for the required tree size.

b. Trees shall be selected from either the City's Recommended Street Tree Palette (Appendix B) or Private Property Tree Palette (Appendix D), included in the Streetscape and Median Development Standards. Trees not selected from these sources shall be approved or disapproved by the planning division based on the objectives in this chapter.

c. All trees shall be staked in accordance with standards contained in the Streetscape and Median Development Standards.

d. At least 2 different tree species shall be identified on plans and installed as part of the project landscaping.

e. Palm trees shall not be used in the landscaped street setback, except as an accent plant to highlight main driveway entrances, to accessorize the front of a building, or for unique or theme uses. Two palms shall constitute one tree in the ratio of required trees for required landscape areas. Palm trees shall not be used as a parking lot tree.

(3) Shrub count: One shrub shall be provided for every 25 square feet of open space. 60 per cent of the required shrubs shall be a minimum of 5 gallons. Upon written request, the number of required shrubs may be reduced by the planning division when it is determined that an alternative design will meet the objectives in this chapter.

(4) Groundcover: At least 70 per cent of all landscaped areas containing trees and shrubs shall be underplanted with groundcover, with the remaining areas to incorporate a minimum two-inch layer of uncontaminated compost or mulch. Decorative (commercial) bark is not acceptable. Groundcover shall be planted in a triangular-spaced pattern to ensure 100 percent coverage within one year of planting. A minimum 2-foot diameter clearance, measured from each tree trunk, shall be maintained free of groundcover or turf. Uncontaminated shredded mulch or compost shall be applied and maintained in these areas.

(5) Turf: Turf incorporated into the landscape design shall not exceed 50 per cent of the total landscaping area. All turf shall be of a drought tolerant variety. Redwood headerboard, or other material acceptable by the planning division, shall be installed to separate turf from planter and groundcover areas.

(b) Street trees located within the public parkway, or any public right-of-way, shall be approved by the public services department.

(c) The plant material selected shall be suitable for the given soil and climate conditions. Plant selection shall take into consideration water conservation through appropriate use, and groupings of plants that are well adapted to particular sites and to particular watering needs, climatic, geological or topographical conditions.

(d) Materials such as crushed rock, redwood chips, pebbles and stone are not satisfactory substitutes for live plant materials although their limited use may be approved by the planning division. Uncontaminated mulch, shredded bark, or

compost may be used to fulfill part of the groundcover requirement as noted in section 13-106(a). Uncontaminated mulch, shredded bark, and/or compost used as a groundcover shall maintain a consistent 2-inch minimum layer and provide complete coverage under shrubs and trees.

(e) Artificial plants are prohibited.

(6)_Water Conservation: For projects that are subject to Water Efficient Landscape Guidelines, landscape and irrigation plans shall meet all the specified requirements."

f. Amend Chapter VII, Section 13-107, as follows:

"Sec. 13-107. IRRIGATION REQUIREMENTS

(a) All landscaped areas shall be provided with an approved irrigation system Landscaped areas shall be provided with an automatically time-controlled sprinkler system when the site is zoned commercial or industrial, or when the site is zoned residential and permits more than 2 dwelling units.

(b) Irrigation system: Irrigation system shall consist of underground piped water lines with low water flow sprinklers and/or a drip or trickle irrigation system. The system chosen shall be designed to provide adequate coverage to all plant material, existing and proposed. Water meter and line sizes shall be calculated from total water demand, which should be, at least, the sum of the maximum irrigation demand and all building demand. Due to varying irrigation requirements, separate control valves and/or sprinkler/emitter heads shall be used when shrubs and turf all appear on the same landscape plan. The irrigation system shall be designed so that overspray, runoff, and low-head drainage onto streets, sidewalks, windows, walls, and fences are minimized. Automatic systems for watering cycles shall be scheduled to maximize ground infiltration rates and further minimize runoff.

(c) Acceptable watering time: Landscaped areas should be watered consistent with the requirements of the applicable water district to provide maximum benefit to the plant material and to reduce unnecessary water loss through drift and evaporation.

(d) Reclaimed water systems: Irrigation systems for projects one acre or more in area shall use reclaimed water whenever such water is available to the site. The systems shall be subject to appropriate health standards and review by the applicable water agency."

SECTION 4: ENVIRONMENTAL DETERMINATION. The project has been reviewed for compliance with the California Environmental Quality Act (CEQA), the CEQA guidelines, and the City's environmental procedures, and has been found to be exempt pursuant to Section 15061 (b) (3) (general rule) of the CEQA Guidelines, in that the City Council hereby finds that it can be seen with certainty that there is no possibility that the passage of this ordinance amending the zoning code will have a significant effect on the environment.

SECTION 5: INCONSISTENCIES. Any provision of the Costa Mesa Municipal Code or appendices thereto inconsistent with the provisions of this ordinance, to the extent of such inconsistencies and or further, is hereby repealed or modified to the extent necessary to affect the provisions of this ordinance.

SECTION 6: APPLICABILITY. The provisions of this ordinance shall be applicable to all properties within City limits as applicable noted hereto.

SECTION 7: SEVERABILITY. If any provision or clause of this ordinance or the application thereof to any person or circumstances is held to be unconstitutional or otherwise invalid by any court of competent jurisdiction, such invalidity shall not affect other provisions or clauses or applications of this ordinance which can be implemented without the invalid provision, clause or application; and to this end, the provisions of this ordinance are declared to be severable.

SECTION 8: PUBLICATION. This Ordinance shall take effect and be in full force thirty (30) days from and after the passage thereof, and prior to the expiration of fifteen (15) days from its passage shall be published once in the ORANGE COAST DAILY PILOT, a newspaper of general circulation, printed and published in the City of Costa Mesa or, in the alternative, the City Clerk may cause to be published a summary of this Ordinance and a certified copy of the text of this Ordinance shall be posted in the office of the City Clerk five (5) days prior to the date of adoption of this Ordinance, and within fifteen (15) days after adoption, the City Clerk shall cause to be published the aforementioned summary and shall post in the office of the City Clerk a certified copy of this Ordinance together with the names and member of the City Council voting for and against the same.

PASSED AND ADOPTED this _____ day of _____ 2010.

_____
ALLAN R. MANSOOR
Mayor of the City of Costa Mesa

ATTEST:

_____
City Clerk of the City of Costa Mesa

APPROVED AS TO FORM:

_____
City Attorney

STATE OF CALIFORNIA)
)ss
COUNTY OF ORANGE)

I, JULIE FOLCIK, City Clerk and ex-officio Clerk of the City Council of the City of Costa Mesa, hereby certify that the above foregoing Ordinance No. 10-2 as introduced and considered section by section at a regular meeting of said City Council held on the ____ day of _____, 2010, and thereafter passed and adopted as a whole at the regular meeting of said City Council held on the ____ day of _____, 2010, by the following roll call vote:

AYES:

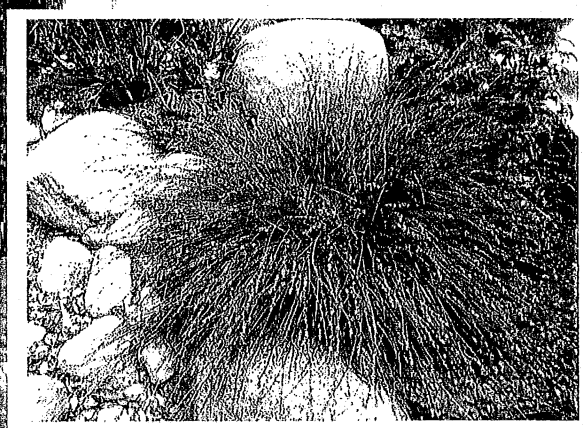
NOES:

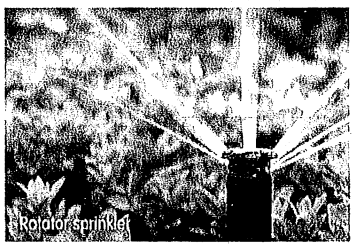
ABSENT:

IN WITNESS WHEREOF, I have hereby set my hand and affixed the Seal of the City of Costa Mesa this ___ day of _____, 2010.

_____
City Clerk
City of Costa Mesa

EXHIBIT A





Water Efficient Landscape Guidelines

January 2010

City of Costa Mesa Planning Division
2nd floor, Fair Drive
Costa Mesa, CA 9262/
(714) 754-5245

Costa Mesa

TABLE OF CONTENTS

Section **Page No.**

1. Purpose and Applicability 1
   - a. Purpose 1
   - b. Applicability 2
2. Submittal Requirements for New Landscape Installations or Landscape Rehabilitation Projects 3
   - 2.1 Elements of the Landscape Documentation Package 3
   - 2.2 Water Efficient Landscape Calculations and Alternatives 4
   - 2.3 Soil Management Report 5
   - 2.4 Landscape Design Plan 6
   - 2.5 Irrigation Design Plan 8
   - 2.6 Grading Design Plan 12
   - 2.7 Certification of Completion 12
   - 2.8 Post-Installation Irrigation Scheduling 13
   - 2.9 Post-Installation Landscape and Irrigation Maintenance 13
3. Provisions for Existing Landscapes 14

Appendix A – Example Certification of Design A-1

Appendix B – Water Efficient Landscape Worksheet B-1

Appendix C – Reference Evapotranspiration (ETo) Table C-1

Appendix D – Example Installation Certificate of Completion D-1

Appendix E - Definitions E-1

SECTION 1

Purpose:

Water Conservation for Landscaping and Irrigation

a) The primary purpose of these Guidelines is to provide procedural and design guidance for project applicants proposing landscape installation or rehabilitation projects that are subject to the requirements of the of Title 13, Chapter VII, Landscape Standards, of the Costa Mesa Municipal Code. This chapter represents the landscaping requirements of the City of Costa Mesa, and for purposes of this document, is referred to as the "Water Efficient Landscape Guidelines."

This document is also intended for use and reference by City staff in reviewing and approving designs and verifying compliance with the Water Efficient Landscape Guidelines. The general purpose of the Water Efficient Landscape Guidelines is to promote the design, installation, and maintenance of landscaping in a manner that conserves regional water resources by ensuring that landscaping projects are not unduly water-needy and that irrigation systems are appropriately implemented to minimize water waste.

Other regulations affecting landscape design and maintenance practices are potentially applicable and should be consulted for additional requirements. These regulations include but may not be limited to:

- State of California Assembly Bill 1881;
- National Pollutant Discharge Elimination Permit for the Municipal Separate Storm Sewer System;
- Orange County Fire Authority Regulations for Fuel Modification in the Landscape;
- Water Conservation and Drought Response Regulations of the Local Water Districts;
- Regulations of the Local Water Districts governing use of Recycled Water;
- Costa Mesa Zoning Code;
- Latest adopted California Building Code;
- Specific Plans, Master Plans, General Plan, or similar land use and planning documents; and
- Conditions of approval for a specific project

APPLICABILITY:

The provisions of the Water Efficient Landscape Guidelines shall apply to the following public agency and private development landscape projects:

1. New landscape installations or landscape rehabilitation projects in nonresidential zones (except for cemeteries) with a landscaped area equal to or greater than 2,500 square feet.

2. New landscape installations or landscape rehabilitation projects in multi-family residential zones with a landscaped area equal to or greater than 2,500 square feet.

3. New golf courses and parks.*

For purpose of applicability of these guidelines, landscape area includes pools or other water features but excludes hardscape areas. A landscape rehabilitation project involves:

- Modified landscaped area greater than 2,500 square feet affecting at least 50 percent of the total landscaped area; and planned to occur within one year.

The requirements may be modified, wholly or partially waived by the Development Services Director or his/her designee in unique cases where the overall intent of water conservation guidelines are met and innovative water conservation approaches other than specified in the guidelines are proposed.

Unless otherwise determined by the City, the Water Efficient Landscape Ordinance and these Guidelines do not apply to:

- Registered local, state, or federal historical sites;
- Ecological restoration projects that do not require a permanent irrigation system; and,
- Existing landscape areas connected to the Orange County Water District Green Acres Project reclaimed water system upon the effective date of this program.

* Parks, sports fields and gold courses are considered recreational areas (Appendix E), receive additional allowance in calculation of the overall Maximum Applied Water Allowance (MAWA) and are subject to Evapotranspiration adjustment factor (ETAF) of 1.0.

SECTION 2

REVIEW AND APPROVAL PROCEDURE:

Submittal Requirements for New Landscape Installations or Landscape Rehabilitation Projects

Elements of the Landscape Documentation Package:

A Landscape Documentation Package is required to be submitted by the project applicant for review and approval prior to the issuance of ministerial permits for landscape or water features by the City, and prior to start of construction. Unless otherwise directed by the City, the Landscape Documentation Package shall include the following elements either on plan sheets or supplemental pages as directed by the City:

A) **Project Information**, including, but not limited to, the following:

1. Date;
2. Project name;
3. Project address, parcel, and/or lot number(s);
4. Total landscaped area (square feet) and rehabilitated landscaped area (if applicable);
5. Project type (e.g., new, rehabilitated, public, private, homeowner-installed);
6. Water supply type (e.g., potable, recycled) and identification of the local water district;
7. Checklist or index of all documents in the Landscape Documentation Package;
8. Project contacts, including contact information for the project applicant and property owner;
9. A Certification of Design in accordance with **Exhibit A** of these Guidelines that includes a landscape professional's professional stamp as applicable, signature, contact information (including email and telephone number), license number, and date, certifying the statement that "The design of this project complies with the requirements of the City's Water Efficient Landscape Ordinance" and shall bear the signature of the landscape professional as required by law; and any other information the City deems relevant for determining whether the landscape project complies with the Water Efficient Landscape Ordinance and these Guidelines.
10. Maximum Applied Water Allowance (MAWA) and Estimated Applied Water Use (EAWU) expressed as annual totals including, but not limited to, the following:
    - A Water Efficient Landscape Worksheet for the landscape project;
    - Hydrozone information table for the landscape project; and
    - Water budget calculations for the landscape project.
11. A soil management report or specifications, or specification provision requiring soil testing and amendment recommendations and implementation to be accomplished during construction of the landscape project.
12. A landscape design plan for the landscape project.
13. An irrigation design plan for the landscape project.
14. A grading design plan, unless grading information is included in the landscape design plan for the landscape project or unless the landscape project is limited to replacement planting and/or irrigation to rehabilitate an existing landscaped area.

[Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.]

B) Water Efficient Landscape Calculations and Alternatives

The project applicant shall provide the calculated Maximum Applied Water Allowance (MAWA) and Estimated Applied Water Use (EAWU) for the landscaped area as part of the Landscape Documentation Package submittal to the City. The MAWA and EAWU shall be calculated based on completing the Water Efficient Landscape Worksheets (in accordance with the sample worksheets in **Appendix B**).

The EAWU allowable for the landscaped area shall not exceed the MAWA. The MAWA shall be calculated using an evapotranspiration adjustment factor (ETAF) of 0.7 except for the portion of the MAWA applicable to any special landscaped areas within the landscape project, which shall be calculated using an ETAF of 1.0. Where the design of the landscaped area can otherwise be shown to be equivalently water-efficient, the project applicant may submit alternative or abbreviated information supporting the demonstration that the annual EAWU is less than the MAWA, at the discretion of and for the review and approval of the local agency.

a) Water budget calculations shall adhere to the following requirements:

1. The MAWA shall be calculated using the Water Efficient Landscape Worksheets and equation presented in **Appendix B** on page B-1. The example calculation on page B-1 is a hypothetical example to demonstrate proper use of the equation.

2. The EAWU shall be calculated using the Water Efficient Landscape Worksheets and equation presented in Appendix B on page B-2. The example calculation on page B-2 is a hypothetical example.

3. For the calculation of the MAWA and EAWU, a project applicant shall use the ETo values from the closest location listed the Reference Evapotranspiration Table in **Appendix C,** with reference to the CIMIS Evapotranspiration Zones Map, Department of Water Resources, 1999.

4. For calculation of the EAWU, the plant water use factor shall be determined as appropriate to the project location from the Water Use Efficiency of Landscape Species (WUCOLS) Species Evaluation List. The plant factor is 0.1 for very low water use plants, 0.2 to 0.3 for low water use plants, 0.4 to 0.6 for moderate water use plants, and 0.7 to 1.0 for high water use plants.

5. For calculating the EAWU, the plant water use factor shall be determined for each valve hydrozone based on the highest-water-use plant species within the zone. The plant factor for each hydrozone may be required to be further refined as a "landscape coefficient," according to protocols defined in detail in the WUCOLS document, to reflect planting density and microclimate effects on water need at the option of the project applicant or the City.

6. For calculation of the EAWU, the area of a water feature shall be defined as a high water use hydrozone with a plant factor of 1.0.

7. For calculation of the EAWU, a temporarily irrigated hydrozone area, such as an area of highly drought-tolerant native plants that are not intended to be irrigated after they are fully established, shall be defined as a very low water use hydrozone with a plant factor of 0.1.

8. For calculation of the MAWA, the ETAF for special landscaped areas shall be set at 1.0. For calculation of the EAWU, the ETAF for special landscaped areas shall be calculated as the special landscaped area (SLA) plant factor divided by the SLA irrigation efficiency factor.

b) Irrigation efficiency shall be calculated using the worksheet and equation presented in **Appendix B** on page B-2.

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

- The Maximum Applied Water Allowance shall be calculated using the equation presented in **Appendix B**. The example calculation in **Appendix B** is hypothetical to demonstrate proper use of the equation and does not represent an existing and/or planned landscape project. The reference evapotranspiration (ETo) values used in this calculation are from the Reference Evapotranspiration Table in **Appendix C** and are for planning purposes only. For actual irrigation scheduling, automatic irrigation controllers are required and shall use current ETo data, such as from the California Irrigation Management Information System (CIMIS), other equivalent data, or soil moisture sensor data.

C) Soil Management Report

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

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

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

3. The soil analysis may include, but is not limited to:

   - Soil texture;
   - Infiltration rate determined by laboratory test or soil texture infiltration rate table;
   - PH;
   - Total soluble salts;
   - Sodium;
   - Percent organic matter; and
   - Recommendations.

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

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

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

The project applicant, or his/her designee, shall submit documentation verifying implementation of soil analysis report recommendations to the City with the Certification of Completion.
[Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.]

D) Landscape Design Plan

For the efficient use of water, a landscape shall be carefully designed and planned for the intended function of the project. At the landscape design plan meeting, the following design criteria shall be submitted as part of the Landscape Documentation Package.

a) Plant Material

Any plant may be selected for the landscaped area consistent with the landscape requirements of Title 13 and provided that the EAWU in the landscaped area does not exceed the MAWA. To encourage the efficient use of water, the following is highly recommended:

1. Protection and preservation of non-invasive water-conserving plant species and water-conserving turf;

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

3. Selection of plants based on disease and pest resistance;

4. Selection of trees based on applicable City and local tree ordinances or tree shading guidelines; and

5. Selection of plants from local and regional landscape program plant lists.

6. Each hydrozone shall have plant materials with similar water use, with the exception of hydrozones with plants of mixed water use, as specified in Section 2.5(a)(2)(D) of these Guidelines.

7. Plants shall be selected and planted appropriately based upon their adaptability to the climatic, geologic, and topographical conditions of the project site. To encourage the efficient use of water, the following is highly recommended for inclusion in the landscape design plan:

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

    b. Recognize the horticultural attributes of plants (i.e., mature plant size, invasive surface roots) to minimize damage to property or infrastructure (e.g., buildings, sidewalks, and power lines); and

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

    d. Turf is discouraged 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).

8. A landscape design plan for projects in fire-prone areas and fuel modification zones shall comply with requirements of the Costa Mesa Fire Department, where applicable. When conflicts between water conservation and fire safety design elements exist, the fire safety requirements as required by Costa Mesa Fire Chief shall have priority.

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

10. The architectural guidelines of a common interest development, which include community apartment projects, condominiums, and planned developments shall not prohibit or include conditions that have the effect of prohibiting the use of water efficient plant species as a group.

b) Water Features:

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

2. Where available and consistent with public health guidelines, recycled water shall be used as a source for decorative water features.

3. The surface area of a water feature shall be included in the high water use hydrozone area of the water budget calculation.

4. Pool and spa covers are highly recommended.

c) Mulch and Amendments:

1. A minimum two inch (2") layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers, or direct seeding applications where mulch is contraindicated.

2. Stabilizing mulching products shall be used on slopes.

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

4. Soil amendments shall be incorporated according to recommendations of the soil report and what is appropriate for the plants selected (see Section 2.3 of these Guidelines).

d) The landscape design plan, at a minimum, shall:

1. Delineate and label each hydrozone by number, letter, or other method;

2. Identify each hydrozone as low, moderate, high water, or mixed water use. Temporarily irrigated areas of the landscaped area shall be included in the low water use hydrozone for the water budget calculation;

3. Identify recreational areas;

4. Identify areas permanently and solely dedicated to edible plants;

5. Identify areas irrigated with recycled water;

6. Identify type of mulch and application depth;

7. Identify soil amendments, type, and quantity;

8. Identify type and surface area of water features;

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

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

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

12. Constructed wetlands and retention ponds that retain water, handle excess flow, and filter pollutants; and pervious or porous surfaces (e.g., permeable pavers or blocks, pervious or porous concrete, etc.) that minimize runoff.

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

14. Contain the following statement: "I have complied with the criteria of the Water Efficient Landscape Ordinance and applied them for the efficient use of water in the landscape design plan;" and

15. Include the signature of a California-licensed landscape professional.

[Note: Authority Cited: Section 65595, Reference: Section 65596, Government Code and Section 1351, Civil Code.]

E) Irrigation Design Plan

For the efficient use of water, an irrigation system shall meet all the requirements listed in this section and the manufacturer's recommendations. The irrigation system and its related components shall be planned and designed to allow for proper installation, management, and maintenance. An irrigation design plan meeting the following design criteria shall be submitted as part of the Landscape Documentation Package.

a) System

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

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

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

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

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

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

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

8. Backflow prevention devices shall be required to protect the water supply from contamination by the irrigation system. A project applicant shall refer to the applicable City code (i.e., public health) for additional backflow prevention requirements.

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

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

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

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

13. Average irrigation efficiency for the project shall be determined in accordance with the EAWU calculation sheet in **Appendix B**. Unless otherwise indicated by the irrigation equipment manufacturer's specifications or demonstrated by the project applicant, the irrigation efficiency of the irrigation heads used within each hydrozone shall be assumed to be:
    - Pop-up stream rotator heads = 75%
    - Stream rotor heads = 75%
    - Microspray = 75%

- Bubbler = 80%
- Drip emitter = 85%
- Subsurface irrigation = 90%

14. It is highly recommended that the project applicant inquire with the local water districts about peak water operating demands (on the water supply system) or water restrictions that may impact the effectiveness of the irrigation system.

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

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

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

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

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

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

21. 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:

    - The landscaped area is adjacent to permeable surfacing and no runoff occurs; or

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

    - The irrigation designer for the landscape project specifies an alternative design or technology, as part of the Landscape Documentation Package, and clearly demonstrates strict adherence to the irrigation system design criteria in Section 2.5 (a)(1)(H) hereof. Prevention of overspray and runoff must be confirmed during an irrigation audit.

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

b) Hydrozone

- Each valve shall irrigate a hydrozone with similar site, slope, sun exposure, soil conditions, and plant materials with similar water use.
- Sprinkler heads and other emission devices shall be selected based on what is appropriate for the plant type within that hydrozone.
- Where feasible, trees shall be placed on separate valves from shrubs, groundcovers, and turf.
- Individual hydrozones that mix plants of moderate and low water use or moderate and high water use may be allowed if:
- The plant factor calculation is based on the proportions of the respective plant water uses and their respective plant factors; or
- The plant factor of the higher water using plant is used for the calculations.
- Individual hydrozones that mix high and low water use plants shall not be permitted.
- 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.

c) The irrigation design plan, at a minimum, shall contain:

- The location and size of separate water meters for landscape;
- The location, type, and size of all components of the irrigation system, including controllers, main and lateral lines, valves, sprinkler heads, moisture sensing devices, rain switches, quick couplers, pressure regulators, and backflow prevention devices;
- Static water pressure at the point of connection to the public water supply;
- Flow rate (gallons per minute), application rate (inches per hour), and design operating pressure (pressure per square inch) for each station;
- Irrigation schedule parameters necessary to program smart timers specified in the landscape design;
- The following statement: "I have complied with the criteria of the Water Efficient Landscape Ordinance and applied them accordingly for the efficient use of water in the irrigation design plan;" and
- The signature of a California-licensed landscape professional.

[Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.]

F) Grading Design Plan

For the efficient use of water, grading of a landscape project site shall be designed to minimize soil erosion, runoff, and water waste. Finished grading configuration of the landscaped area, including pads, slopes, drainage, post-construction erosion control, and storm water control Best Management Practices, as applicable, shall be shown on the Landscape Plan unless this information is fully included in separate Grading Plans for the project, or unless the project is limited to replacement planting and/or irrigation to rehabilitate an existing landscaped area.

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

1. Height of graded slopes;
2. Drainage patterns;
3. Pad elevations;
4. Finish grade; and
5. Storm water retention improvements, if applicable.

b) To prevent excessive erosion and runoff, it is highly recommended that the project applicant:

1. Grade 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; and
3. Avoid soil compaction in landscaped areas.
4. The Grading Design Plan shall contain the following statement: "I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the grading design plan" and shall bear the signature of the landscape professional, as required by law.

[Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.]

G) Certification of Completion

Landscape project installation shall not proceed until the Landscape Documentation Package has been approved by the City and any ministerial permits required are issued.

The project applicant shall notify the City at the beginning of the installation work and at intervals, as necessary, for the duration of the landscape project work to schedule all required inspections.

Certification of Compliance of the landscape project stating that the project meets the requirements of the Water Efficient Landscape Guidelines shall be obtained prior to issuance of a Certificate of Use and Occupancy or the final building permit. The following shall be submitted by the applicant prior to issuance of a Certificate of Compliance:

- A Landscape Installation Certificate of Completion in the form included as **Appendix D** of these Guidelines, which shall include: (i) certification by a landscape professional that the landscape project has been installed per the approved Landscape Documentation Package; and (ii) the following statement: "The landscaping has been installed in substantial conformance to the design plans, and complies with the provisions of the Water Efficient Landscape Ordinance for the efficient use of water in the landscape."

- Documentation of the irrigation scheduling parameters used to set the controller(s);

- An irrigation audit report from a certified irrigation auditor, documentation of enrollment in local water District's water conservation programs, and/or documentation that the MAWA and EAWU information for the landscape project has been submitted to the local water districts.

[Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.]

H) Post-Installation Irrigation Scheduling

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

- Irrigation scheduling shall be regulated by automatic irrigation controllers.

- Overhead irrigation shall be scheduled in accordance with the Irvine Ranch Water District, and Mesa Consolidated Water District requirements. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.

[Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.]

I) Post-Installation Landscape and Irrigation Maintenance

Landscapes shall be maintained to ensure water use efficiency in accordance with existing requirements of Costa Mesa Municipal Code, Irvine Ranch Water District, and Mesa Consolidated Water District requirements as may be amended from time to time.

SECTION 3

Provisions for Existing Landscapes

Irrigation of all landscaped areas shall be conducted in a manner conforming to the rules and requirements and shall be subject to penalties and incentives for water conservation and water waste prevention, as determined and implemented by the local water districts and as may be mutually agreed by the City.

The City and/or the regional or local water districts may administer programs such as irrigation water use analyses, irrigation surveys and/or irrigation audits, tiered water rate structures, water budgeting by parcel, or other approaches to achieve landscape water use efficiency community-wide to a level equivalent to or less than would be achieved by applying a MAWA calculated with an ETAF of 0.8 to all landscaped areas in the City over one acre in size.

The architectural guidelines of a common interest development, including apartments, condominiums and planned developments, shall not prohibit or include conditions that have the effect of prohibiting the use of low-water use plants as a group.

Appendix A

CERTIFICATION OF LANDSCAPE DESIGN

I hereby certify that:

(1) I am a professional appropriately licensed in the State of California to provide professional landscape design services.

(2) The landscape design and water use calculations for the property located at _____

_____

(provide street address or parcel number(s)) were prepared by me or under my supervision.

(3) The landscape design and water use calculations for the identified property comply with the requirements of the City of Costa Mesa Water Efficient Landscape Ordinance (Municipal Code Sections 13-101 through 13-108) and the City of Costa Mesa Guidelines for Implementation of the City of Costa Mesa Water Efficient Landscape Ordinance.

(4) The information I have provided in this Certificate of Landscape Design is true and correct and is hereby submitted in compliance with the City of Costa Mesa Water Efficient Guidelines for Implementation of the City of Costa Mesa Water Efficient Landscape Guideliness.

_____ _____

Print Name Date

_____ _____

Signature License Number

_____

Address

_____ _____

Telephone E-mail Address

Landscape Design Professional's Stamp
(If applicable)

EXAMPLE WATER EFFICIENT LANDSCAPE WORKSHEET

This worksheet is filled out by the *project applicant* for each Point of Connection. Please complete all sections of the worksheet.

Point of Connection # 1

Maximum Applied Water Allowance (MAWA)

Total *MAWA* = (ETo x 0.7 x LA in Sq. Ft. x *0.62*) + (ETo x 1.0 x *SLA* in Sq. Ft. x *0.62*) = Gallons per year for LA+*SLA*

where:
MAWA = *Maximum Applied Water Allowance* (gallons per year)
ETo = Reference Evapotranspiration **Appendix C** (inches per year)
0.7 = *Evapotranspiration Adjustment Factor (ETAF)*
1.0 = ETAF for *Special Landscaped Area*
LA = *Landscaped Area* (square feet)
0.62 = *Conversion factor* (to gallons per square foot)
SLA = *Special Landscaped Area* (square feet)

Example Calculation: a hypothetical landscape project in Santa Ana, CA with an irrigated landscaped area of 40,000 square feet with 10,000 square feet of *Special Landscaped Area*. To calculate *MAWA*, the annual *reference evapotranspiration* value for Santa Ana is 48.2 inches as listed in the Reference Evapotranspiration Table in **Appendix C**.

	ETo		ETAF		LA or *SLA* (ft^2)		Conversion		*MAWA* (Gallons Per Year)
MAWA for LA =	48.2	x	0.7	x	40,000	x	*0.62*	=	836,752
MAWA for *SLA* =	48.2	x	1.0	x	10,000	x	*0.62*	=	298,840
Total *MAWA* =					50,000				1,135,592 Gallons per year for LA+*SLA*

Estimated Applied Water Use

EAWU = ETo x *KL* x LA x *0.62* ÷ *IE* = Gallons per year	
where: *EAWU = Estimated Applied Water Use* (gallons per year) ETo = Reference Evapotranspiration **Appendix C** (inches per year) K_L = *Landscape Coefficient* LA = *Landscaped Area* (square feet) *0.62 = Conversion factor* (to gallons per square foot) *IE = Irrigation Efficiency = IME x DU (See definition in Appendix E for example IE percentages)* *IME = Irrigation Management Efficiency (90%)* *DU = Distribution Uniformity of irrigation head*	$K_L = K_s \times K_d \times K_{mc}$ K_s = species factor (range = 0.1-0.9) (see *WUCOLS* list for values) K_d = density factor (range = 0.5-1.3) (see *WUCOLS* for density value ranges) K_{mc} = *microclimate* factor (range = 0.5-1.4) (see *WUCOLS*) WUCOLS – ***www.owue.water.ca.gov/docs/wucols00.pdf***

Example Calculation:

	ETo		KL		LA		Conversion		*IE*		*EAWU (Gallons per year)*
Special Landscaped Area	48.2	x	1.00	x	10,000	x	*0.62*	÷	0.75	=	398,453
Cool Season Turf	48.2	x	1.00	x	0	x	*0.62*	÷	0.71	=	0
Warm Season Turf	48.2	x	0.65	x	0	x	*0.62*	÷	0.71	=	0
High Water Using Shrub	48.2	x	0.70	x	0	x	*0.62*	÷	0.71	=	0
Medium Water Using Shrub	48.2	x	0.50	x	15,000	x	*0.62*	÷	0.65	=	344,815
Low Water Using Shrub	48.2	x	0.30	x	25,000	x	*0.62*	÷	0.75	=	298,840
Very Low Water Using Shrub	48.2	x	0.20	x	0	x	*0.62*	÷	0.71	=	0
Other	48.2	x	0.50	x	0	x	*0.62*	÷	0.71	=	0
Other	48.2	x	0.50	x	0	x	*0.62*	÷	0.71	=	0
Total *EAWU* =					50,000						1,042,109 Gallons per year

Compare *EAWU* with *MAWA*.
The *EAWU* (1,042,109 gallons per year) is less than *MAWA* (1,135,592 gallons per year). For this example, the water budget complies with the *MAWA*.

List *sprinkler heads*, microspray, and drip *emitters* here along with average *precipitation rate* and *Distribution Uniformity of Irrigation Head*.

***Sprinkler Head* Types**	**Average *Precipitation Rate***	***Distribution Uniformity of Irrigation Head***
Drip		
Microspray		
Bubbler		
Low precipitation rotating nozzles		
Stream rotors		

WATER EFFICIENT LANDSCAPE WORKSHEET

This worksheet is filled out by the *project applicant* for each Point of Connection. Please complete all sections of the worksheet.

Point of Connection #__

Maximum Applied Water Allowance (MAWA)

Total *MAWA* = (ETo x 0.7 x LA in Sq. Ft. x *0.62*) + (ETo x 1.0 x *SLA* in Sq. Ft. x *0.62*) = Gallons per year for LA+*SLA*

where:

MAWA = *Maximum Applied Water Allowance* (gallons per year)
ETo = *Reference Evapotranspiration* **Appendix C** (inches per year)
0.7 = *Evapotranspiration Adjustment Factor* (ETAF)
1.0 = ETAF for *Special Landscaped Area*
LA = *Landscaped Area* (square feet)
0.62 = *Conversion factor* (to gallons per square foot)
SLA = *Special Landscaped Area* (square feet)

MAWA Calculation:

	ETo		ETAF		LA or *SLA* (ft^2)		Conversion		*MAWA* (Gallons Per Year)
MAWA for LA =		x	0.7	x		x	*0.62*	=	
MAWA for *SLA* =		x	1.0	x		x	*0.62*	=	
Total *MAWA* =									

Estimated Applied Water Use

EAWU = ETo x *KL* x LA x *0.62* ÷ *IE* = Gallons per year

where:

EAWU = *Estimated Applied Water Use* (gallons per year)
ETo = Reference Evapotranspiration **Appendix C** (inches per year)
K_L = *Landscape Coefficient*
LA = *Landscaped Area* (square feet)
0.62 = *Conversion factor* (to gallons per square foot)
IE = *Irrigation Efficiency* = *IME x DU*
IME = *Irrigation Management Efficiency (90%)*
DU = *Distribution Uniformity of irrigation head*

$K_L = K_s \times K_d \times K_{mc}$

K_s = species factor (range = 0.1-0.9) (see *WUCOLS* list for values)
K_d = density factor (range = 0.5-1.3) (see *WUCOLS* for density value ranges)
K_{mc} = *microclimate* factor (range = 0.5-1.4) (see *WUCOLS*)

WUCOLS – ***www.owue.water.ca.gov/docs/wucols00.pdf***

EAWU Calculation:

	ETo		KL		LA		Conversion		*IE*		*EAWU* (Gallons Per Year)
Special Landscaped Area		x		x		x	*0.62*	÷		=	
Cool Season Turf		x		x		x	*0.62*	÷		=	
Warm Season Turf		x		x		x	*0.62*	÷		=	
High Water Using Shrub		x		x		x	*0.62*	÷		=	
Medium Water Using Shrub		x		x		x	*0.62*	÷		=	
Low Water Using Shrub		x		x		x	*0.62*	÷		=	
Very Low Water Using Shrubs		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
Other		x		x		x	*0.62*	÷		=	
Total *EAWU* =											

List *sprinkler heads*, microspray, and drip *emitters* here along with average *precipitation rate* and *Distribution Uniformity of Irrigation Head*.

***Sprinkler Head* Types**	**Average *Precipitation Rate***	***Distribution Uniformity of Irrigation Head***
Drip		
Microspray		
Bubbler		
Low precipitation rotating nozzles		
Stream rotors		

Reference Evapotranspiration (ETo) Table

Appendix C - Reference Evapotranspiration (ETo) Table*													
County and City	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual ETo**
Orange													
Irvine	2.2	2.5	3.7	4.7	5.2	5.9	6.3	6.2	4.6	3.7	2.6	2.3	49.6
Laguna Beach	2.2	2.7	3.4	3.8	4.6	4.6	4.9	4.9	4.4	3.4	2.4	2.0	43.2
Santa Ana	2.2	2.7	3.7	4.5	4.6	5.4	6.2	6.1	4.7	3.7	2.5	2.0	48.2

* The values in this table were derived from: 1) California Irrigation Management Information System (CIMIS) 2) Reference Evapotranspiration Zones Map, UC Dept. of Land, Air & Water Resources and California Dept of Water Resources 1999, 3) Reference Evapotranspiration for California, University of California, Department of Agriculture and Natural Resources (1987) Bulletin 1922 4) Determining Daily Reference Evapotranspiration, Cooperative Extension UC Division of Agriculture and Natural Resources (1987), Publication Leaflet 21426

LANDSCAPE INSTALLATION CERTIFICATE OF COMPLETION

I hereby certify that:

(1) I am a professional appropriately licensed in the State of California to provide professional landscape design services.

(2) The landscape project for the property located at _____

_____

(provide street address or parcel number(s) was installed by me or under my supervision.

(3) The landscaping for the identified property has been installed in substantial conformance with the approved Landscape Documentation Package and complies with the requirements of the City of Costa Mesa Water Efficient Landscape Guideliness (Municipal Code Sections 13-101 through 13-108) and the City of Costa Mesa Water Efficient Landscape Guidelines for the efficient use of water in the landscape.

(4) The information I have provided in this Landscape Installation Certificate of Completion is true and correct and is hereby submitted in compliance with the City of Costa Mesa Guidelines for Implementation of the City of Costa Mesa Water Efficient Landscape Guideliness.

_____ _____

Print Name Date

_____ _____

Signature License Number

_____

Address

_____ _____

Telephone E-mail Address

Landscape Design Professional's Stamp
(If Appropriate)

Appendix E

Definitions

The terms used in these *Guidelines* have the meaning set forth below:

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

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

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

"*Certified Landscape Irrigation Auditor*" means an irrigation professional trained and certified to perform and develop an audit report on the condition of the irrigation system.

"*Certification of Design*" means the certification included as Exhibit E of these Guidelines that must be included in the *Landscape Documentation Package* pursuant to Section 2.1 of these Guidelines.

"*City*" means the City of Costa Mesa or its authorized designee.

"*Common interest developments*" means community apartment projects, condominium projects, and planned developments per Civil Code Section 1351

"*Distribution Uniformity*" or "*DU*" is a measure of how uniformly an irrigation head applies water to a specific target area and theoretically ranges form zero to 100 percent.

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

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

"*Estimated Applied Water Use*" or "*EAWU*" means the annual total amount of water estimated to keep plants in a healthy state. It is based on factors such as reference *evapotranspiration rate*, the size of the *landscaped area*, *plant water use factors*, and the *irrigation efficiency* within each hydrozone.

"*Evapotranspiration adjustment factor*" or "*ETAF*" means a factor of 0.7 (average irrigation efficiency).

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

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

"*Hardscapes*" means any durable material or feature (*pervious* and *non-pervious*) installed in or around a *landscaped area*, such as pavements or walls. Pools and other water features are considered part of the *landscaped area* and not considered *hardscapes* for purposes of these Guidelines.

"*Hydrozone*" means a portion of the *landscaped area* having plants with similar water needs and typically irrigated by one *valve*/controller station. A *hydrozone* may be irrigated or non-irrigated.

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

"*Invasive plants species*" or "*noxious*" means species of plants not historically found in California that spread outside cultivated areas and can damage environmental or economic resources. *Invasive plant species* may be regulated by county agricultural agencies as *noxious species*.

"*Irrigation audit*" means an in-depth evaluation of the performance of an irrigation system conducted by a *Certified Landscape Irrigation Auditor*. An *irrigation audit* includes, but is not limited to: inspection, system tune-up, system test with distribution uniformity or emission uniformity, reporting overspray or runoff that causes overland flow, and preparation of an irrigation schedule.

"*Irrigation Management Efficiency*" or "*IME*" means the measurement used to calculate the *irrigation efficiency* of the irrigation system for a landscaped project. A 90% IME can be achieved by using evaportranspiration controllers, soil moisture sensors, and other methods that will adjust irrigation run times to meet plant water needs.

"*Irrigation efficiency*" or "*IE*" means the measurement of the amount of water beneficially used divided by the amount of water applied to a *landscaped area*. *Irrigation efficiency* is derived from measurements and estimates of irrigation system characteristics and management practices. The minimum average *irrigation efficiency* for purposes of these *Guidelines* is 0.71. Greater *irrigation efficiency* can be expected from well designed and maintained systems. The following irrigation efficiency may be obtained for the listed irrigation heads with an IME of 90%:

a. Pop-up stream rotator heads = 75%

b. Stream rotor heads = 75%

c. Microspray = 75%

d. Bubbler = 80%

e. Drip emitter = 85%

f. Subsurface irrigation = 90%

"*Landscape coefficient*" (K_L) is the product of a *plant factor* multiplied by a density factor and a *microclimate* factor. The *landscape coefficient* is derived to estimate water loss from irrigated *landscaped areas* and *special landscaped areas*.

"*Landscape Documentation Package*" means the package of documents that a *project applicant* is required to submit to the *City* pursuant to Section 2.1 of these Guidelines.

"Landscape Installation Certificate of Completion" means the certificate included as Exhibit F of these *Guidelines* that must be submitted to the *City* pursuant to Section 2.7(a)(1) of hereof.

"*Landscape professional*" means a licensed *landscape architect*, licensed landscape contractor, or any other *person* authorized to design a landscape pursuant to Sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the California Business and Professions Code, Section 832.27 of Title16 of the California Code of Regulations, and Section 6721 of the California Food and Agriculture Code.

"*Landscaped area*" means all the planting areas, *turf* areas, and *water features* in a landscape design plan subject to the *Maximum Applied Water Allowance* and *Estimated Applied Water Use* calculations. The *landscaped area* does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other *pervious* or *non-pervious hardscapes*, and other non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation).

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

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

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

"*Maximum Applied Water Allowance*" or "*MAWA*" means the upper limit of annual applied water for the established *landscaped area,* as specified in Section 2.2 of these *Guidelines*. It is based upon the area's *reference evapotranspiration*, the *ETAF*, and the size of the *landscaped area*. The *Estimated Applied Water Use* shall not exceed the *Maximum Applied Water Allowance*.

"M*icroclimate*" means the climate of a small, specific area that may contrast with the climate of the overall landscaped area due to factors such as wind, sun exposure, plant density, or proximity to reflective surfaces.

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

"*Non-pervious*" means any surface or natural material that does not allow for the passage of water through the material and into the underlying soil.

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

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

"Person" means any natural person, firm, joint venture, joint stock company, partnership, public or private association, club, company, corporation, business trust, organization, public or private agency, government agency or institution, school district, college, university, any other user of water provided by the City or the local water districts, or the manager, lessee, agent, servant, officer, or employee of any of them or any other entity which is recognized by law as the subject of rights or duties.

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

"*Plant factor*" or "*plant water use factor*" is a factor, when multiplied by *ETo*, that estimates the amount of water needed by plants. For purposes of this *Water Efficient Landscape Ordinance*, the *plant factor* range for low water use plants is 0 to 0.3; the *plant factor* range for moderate water use plants is 0.4 to 0.6; and the *plant factor* range for high water use plants is 0.7 to 1.0. *Plant factors* cited in these *Guidelines* are derived from the Department of Water Resources 2000 publication "Water Use Classification of Landscape Species."

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

"*Project applicant*" means the person submitting a *Landscape Documentation Package* required under Section 2.1 to request a permit, plan check, or design review from the City A *project applicant* may be the property owner or his or her designee.

"*Property owner*" or "*owner*" means the record owner of real property as shown on the most recently issued equalized assessment roll.

"*Reference evapotranspiration*" or "*ETo*" means a standard measurement of environmental parameters which affect the water use of plants. *ETo* is given expressed in inches per day, month, or year as represented in Appendix C of these Guidelines, and is an estimate of the evapotranspiration of a large field of four to seven-inch tall, cool-season grass that is well watered. *Reference evapotranspiration* is used as the basis of determining the *Maximum Applied Water Allowances*.

"*Recycled water*" or "*reclaimed water*" means treated or recycled waste water of a quality suitable for non-potable uses such as landscape irrigation and *water features*. This water is not intended for human consumption.

"*Runoff*" means water which is not absorbed by the soil or landscape to which it is applied and flows from the landscaped 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.

"*Special Landscaped Areas*" or "*SLA*" means an area of the landscape dedicated solely to edible plants such as orchards and vegetable gardens, areas irrigated with *recycled water*, *water features* using *recycled water*, and areas dedicated to active play such as parks, sports fields, golf courses, and where *turf* provides a playing surface.

"*Sprinkler head*" means a device which delivers water through a nozzle.

"*Static water pressure*" means the pipeline or municipal water supply pressure when water is not flowing.

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

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

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

"*Valve*" means a device used to control the flow of water in an irrigation system

"*Water Efficient Landscape Guideliness*" means Ordinance No. _____, adopted by the City Council on _____, 2010, and codified in the Municipal Code in [chapter/title/division/sections 13-101 through 13-108].

"*Water Efficient Landscape Worksheets*" means the worksheets required to be completed pursuant to Section 2.2 of these *Guidelines* and which are included in Appendix B hereof.

"*Water feature*" means a design element where open water performs an aesthetic or recreational function. *Water features* include ponds, lakes, waterfalls, fountains, artificial streams, spas, and swimming pools (where water is artificially supplied). The surface area of *water features* is included in the high water use *hydrozone* of the *landscaped area.* Constructed wetlands used for on-site wastewater treatment, habitat protection, 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*" means the time of day irrigation is allowed.

"*WUCOLS*" means the Water Use Classification of Landscape published by the University of California Cooperative Extension, the Department of Water Resources, and the Bureau of Reclamation, 2000. *www.owue.water.ca.gov/docs/wucols00*