COUNTY OF ORANGE LANDSCAPE IRRIGATION CODE AND IMPLEMENTATION GUIDELINES

Adopted December 15, 2009

OC Planning

714.667.8888 714.834.4772

www.ocplanning.net

ocpCustomerCare@ocpw.ocgov.com

OC PLANNING
A DIVISION OF OC PUBLIC WORKS

ORDINANCE NO. 09-010

AN ORDINANCE OF THE COUNTY OF ORANGE,
CALIFORNIA, AMENDING SECTIONS
7-9-132.2, 7-9-77.8, 7-9-78.8, 7-9-79.8, 3-13-7 AND ADDING SECTION 7-9-133
OF THE CODIFIED ORDINANCES OF THE COUNTY OF ORANGE
REGARDING LANDSCAPE IRRIGATION.

The Board of Supervisors of the County of Orange, California, ordains as follows:

SECTION 1. Sec. 7-9-132.2 is hereby amended as follows:

Section 7-9-132.2. Landscaping.

Landscaping, consisting of trees, shrubs, vines, ground cover, turf, or any combination thereof, shall be installed and maintained subject to the following standards:

(a) Boundary landscaping is required for a minimum depth equal to the required setback distance or ten (10) feet (whichever is less) along all property lines abutting streets except for the required street openings.
(b) Landscaping along all streets and boundaries shall be in compliance with section 7-9-137.5, "Fences and walls."
(c) Any landscaped area shall be separated from an adjacent parking or vehicular area by a wall or curb at least six (6) inches higher than the adjacent parking or vehicular area.
(d) Permanent watering facilities shall be provided for all landscaped areas and be operated and maintained in an efficient manner.
(e) Required landscaping shall be maintained in a neat, clean and healthy condition. This shall include proper pruning, mowing of lawns, weeding, removal of litter, fertilizing and watering as needed, and replacement of plants when necessary.
(f) For landscape projects subject to section 7-9-133.2 of this Zoning Code, a Landscape Documentation Package as defined in section 7-9-133.3 shall be submitted and approved pursuant to the requirements set forth in section 7-9-133.3 and 7-9-133.4 and the Guidelines applicable thereto prior to the issuance of building permits. A Certificate of Completion shall be submitted and approved prior to the closure of the permit.

SECTION 2: Sections 7-9-133, 7-9-133.1, 7-9-133.2, 7-9-133.3, 7-9-133.4, 7-9-133.5 and 7-9-133.6 are added to read as follows:

Section 7-9-133. Landscape and Irrigation.

This section and sections 7-9-133.1 through 7-9-133.6 shall apply to all planting, irrigation, and landscape-related improvements including landscape projects as defined, within the unincorporated area of the County of Orange. These sections may be referred to collectively as the "Landscape Irrigation Code."

Section 7-9-133.1. Purpose.

The purpose of the following provisions is to comply with the requirements of Government Code section 65595 to enact an ordinance that is at least as effective in conserving water as the State Model Water Efficient Landscape Ordinance developed pursuant to the requirements of section 65595 in the context of conditions in the County of Orange, in order to:

(a) provide for water conservation and appropriate use and groupings of plants that are well adapted to particular sites, climatic, soil or topographic conditions;

(b) establish a program that includes a maximum amount of water to be applied through the irrigation system based on climate, landscape size, irrigation efficiency and plant needs;

(c) encourage the capture and retention of stormwater onsite to improve water use efficiency or water quality;

(d) encourage the use of recycled water, where appropriate, to reduce demand on potable water supplies;

(e) provide for use of automatic irrigation systems and schedules, soil assessment and management as appropriate to the location and to encourage healthy plant growth;

(f) promote the values and benefits of landscapes while recognizing the need to invest water and other resources as efficiently as possible;

(g) establish a structure for planning, designing, installing, and maintaining and managing water efficient landscapes in new construction and rehabilitated projects;

(h) establish provisions for water management practices and water waste prevention for existing landscapes;

(i) 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

(j) encourage the use of economic incentives that promote the efficient use of water, such as implementing a budget based tiered-rate structure.

Section 7-9-133.2. Applicability.

These provisions apply to all of the following landscape projects in all zoning districts:

(a) new landscape installations or landscape rehabilitation projects by public agencies or private non-residential developers, except for cemeteries, with a landscaped area, including pools or other water features but excluding hardscape, equal to or greater than 2,500 square feet, and which are otherwise subject to a discretionary approval of a

landscape plan, or which otherwise require a ministerial permit for a landscape or water feature;

(b) new landscape installations or landscape rehabilitation projects by developers or property managers of single-family and multi-family residential projects or complexes with a landscaped area, including pools or other water features but excluding hardscape, equal to or greater than 2,500 square feet, and which are otherwise subject to a discretionary approval of a landscape plan, or which otherwise require a ministerial permit for a landscape or water feature;

(c) new landscape installation projects by individual homeowners (whether homeowner provided or homeowner hired) on single-family or multi-family residential lots with a total project landscaped area, including pools or other water features but excluding hardscape, equal to or greater than 5,000 square feet, and which are otherwise subject to a discretionary approval of a landscape plan, or which otherwise require a ministerial permit for a landscape or water feature.

Section 7-9-133.3. Definitions.

The following definitions apply to the specialized terms used in these provisions.

(a) "Applied water" means the portion of water supplied by the irrigation system to the landscape.

(b) "Budget based tiered-rate structure" means tiered or block rates for irrigation accounts charged by the retail water agency in which the block definition for each customer is derived from lot size or irrigated area, and the evapotranspiration requirements of landscaping.

(c) "Ecological restoration project" means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

(d) "Estimated Applied Water Use" means the average annual total amount of water estimated to be necessary to keep plants in a healthy state, calculated as provided in the Guidelines. It is based on the reference evapotranspiration rate, the size of the landscape area, plant water use factors, and the relative irrigation efficiency of the irrigation system.

(e) "ET adjustment factor" or "ETAF" is equal to the plant factor divided by the irrigation efficiency factor for a landscape project, as described in the Guidelines. The ETAF is calculated in the context of local reference evapotranspiration, using site-specific plant factors and irrigation efficiency factors that influence the amount of water that needs to be applied to the specific landscaped area.

A combined plant mix with a site-wide average plant factor of 0.5 (indicating a moderate water need) and average irrigation efficiency of 0.71 produces an ET adjustment factor of (0.7) = (0.5/0.71), which is the standard of water use efficiency generally required by this

Landscape Irrigation Code and the Guidelines; except that the ETAF for a Special Landscape Area shall not exceed 1.0.

(f) "Guidelines" refers to the Guidelines for Implementation of the Landscape Irrigation Code as adopted by the Board of Supervisors of the County of Orange, which describes procedures, calculations, and requirements for landscape projects subject to this Landscape Irrigation Code.

(g) "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 this Landscape Irrigation Code.

(h) "Homeowner provided landscaping" means 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, for purposes of this Zoning Code, is a person who owns fee title to a dwelling. This definition excludes speculative homes, which are not owner-occupied dwellings and which are subject under this ordinance to the requirements applicable to developer-installed residential landscape projects.

(i) "Irrigation efficiency" means the measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The minimum average irrigation efficiency for purposes of Landscape Irrigation Code is 0.71. Greater irrigation efficiency can be expected from well designed and maintained systems.

(j) "Landscape Documentation Package" means the documents required to be provided to the County for review and approval of landscape design projects, as described in the Guidelines and Section 7-9-133.4.

(k) "Landscape project" means total area of landscape in a project as provided in the definition of "landscaped area" meeting the requirements of Section 7-9-132.2.

(l) "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).

(m) "Local agency" means a city or county, including a charter city or charter county, that is authorized to implement, administer, and/or enforce any of the provisions of the Landscape Irrigation Code on behalf of the County. The local agency may be responsible for the enforcement or delegation of enforcement of this the Landscape Irrigation Code,

including but not limited to, design review, plan check, issuance of permits and inspection of a landscape project.

(n) "Local water purveyor" means any entity, including a public agency, city, county or private water company that provides retail water service.

(o) "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 the Guidelines. It is based upon the area's reference evapotranspiration, the ET Adjustment Factor, and the size of the landscaped area. The Estimated Applied Water Use shall not exceed the Maximum Applied Water Allowance.

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

(q) "New construction" means, for the purposes of this the Landscape Irrigation Code, a new building with a landscape or other new landscape such as a park, playground, or greenbelt without an associated building.

(r) "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.

(s) "Permit" means an authorizing document issued by local agencies for new construction or rehabilitated landscape.

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

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

(v) "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.

(w) "Reference evapotranspiration" or "ETo" means is 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 A of the 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.

(x) "Rehabilitated landscape" means any re-landscaping project that meets the applicability criteria of Section 7-9-133.2, where the modified landscape area is greater than 2,500 square feet, is at least 50% of the total landscape area and the modifications are planned to occur within one year.

(y) "Smart Automatic irrigation controllers" means an automatic timing device used to remotely control valves that operate an irrigation system and which schedules irrigation events using either evapotranspiration (weather-based) or soil moisture data.

(z) "Special landscape area" 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.

(aa) "Turf" means a ground cover surface of mowed grass. Annual bluegrass, Kentucky bluegrass, Perennial ryegrass, Red fescue, and Tall fescue are cool-season grasses. Bermuda grass, Kikuyu grass, Seashore Paspalum, St. Augustine grass, Zoysia grass, and Buffalo grass are warm-season grasses.

(bb) "Valve" means a device used to control the flow of water in an irrigation system.

(cc) "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.

Section 7-9-133.4. Implementation Procedures and Landscape Documentation Package.

(a) Prior to installation of planting, irrigation, and landscape-related improvements including landscape projects, a Landscape Documentation Package shall be submitted to the County for review and approval of all landscape projects subject to the provisions of this Landscape Irrigation Code. Any Landscape Documentation Package submitted to the County shall comply with the provisions of the Guidelines.

(b) The Landscape Documentation Package shall include a certification by a professional appropriately licensed in the State of California, stating that the landscape design and water use calculations have been prepared by or under the supervision of the licensed professional and are certified to be in compliance with the provisions of this Landscape Irrigation Code and of the Guidelines.

(c) As part of the Landscape Documentation Package, landscape and irrigation system plans shall be prepared and certified by a professional appropriately licensed in the State of California prior to the issuance of building permits and the application for a Landscape Documentation Package as defined in sections 7-9-133.3 and this section 7-9-133.4. Landscape and irrigation plans shall be submitted to the County for review and approval with appropriate water use calculations and include:

(1) Project Description – A summary of the project, property, provisions for water conservation technologies, plant use and groupings, the use of recycled water (if any), the capture and retention of stormwater onsite, and any special issues that the Plan Check reviewer would need to be aware of;
(2) Water Efficient Landscape Worksheet – a report of analysis and calculations for establishing an Estimated Annual Water Use budget that shall not exceed the Maximum Applied Water Allowance. The Maximum Applied Water Allowance shall be determined from an Evapotranspiration Adjustment Factor of 0.7 based on an average Irrigation Efficiency (IE) of 0.71 and an average Plant Factor (except for Special Landscape Areas) of 0.5;
(3) Soil Management Plans – to be submitted, as appropriate, as a grading permit application of soil assessment and management to prevent excessive erosion and runoff, as required under Section 7-1-805 of the County of Orange Grading and Excavation Code and Grading Manual;
(4) Landscape Design Plans – to be submitted per County of Orange requirements and include fire prevention (defensible space and fuel modification) requirements with approval(s) from the local fire authority;
(5) Irrigation Design Plans – to be submitted per County of Orange requirements and include provisions for the use of automatic irrigation systems and irrigation schedules based on climatic conditions, specific terrains, soil types, and other environmental conditions while minimizing irrigation overspray and runoff;
(6) Grading Plans – to be submitted, as appropriate, as a grading permit application when required under Section 7-1-805 of the County of Orange Grading and Excavation Code and Grading Manual.

(d) Verification of compliance of the landscape installation with the approved plans shall be obtained through a Certificate of Use and Occupancy or Permit Final process, as provided below and in the Guidelines.

(e) Prior to final inspection, closure of a building or grading permit, and issuance of a Certificate of Use and Occupancy, the following must be submitted to demonstrate compliance with section 7-9-133.4:

(1) Certification by either the signer of the landscape design plan, the signer of the irrigation design plan, or the licensed landscape contractor that the landscape project has been installed per the approved Landscape Documentation Package;
(2) documentation of the irrigation scheduling parameters used to set the controller(s);
(3) documentation of the specified landscape and irrigation maintenance schedule; and

(4) provisions for landscape maintenance practices that foster long-term landscape water conservation; and
(5) an irrigation system audit report.

Section 7-9-133.5. Landscape Water Use Standards.

(a) For applicable landscape installation or rehabilitation projects subject to Section 7-9-133.2 of this Landscape Irrigation Code, the Estimated Applied Water Use allowed for the landscaped area shall not exceed the MAWA calculated using an ET adjustment factor of 0.7, except for Special Landscaped Areas where the MAWA is calculated using an ET adjustment factor of 1.0; or the design of the landscaped area shall otherwise be shown to be equivalently water-efficient in a manner acceptable to the County; as provided in the Guidelines.

(b) Irrigation of all landscaped areas shall be conducted in a manner conforming to the rules and requirements of the local water purveyor, and shall be subject to penalties and incentives for water conservation and water waste prevention, as determined and implemented by the local water purveyor, or as mutually agreed by local water purveyor and the County.

(c) These Landscape Water Use Standards shall 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.

(d) Only Sections 2.8 and 2.9 of the Guidelines shall apply to new landscape installations or landscape rehabilitation projects at cemeteries.

(e) Existing landscapes installed before January 1, 2010 that exceed one acre shall comply with the requirements of their retail water purveyor to meet the landscape Maximum Applied Water Allowance.

Section 7-9-133.6. Guidelines.

(a) Detailed guidelines for the application and implementation of this Landscape Irrigation Code, including technical compliance and calculations are set forth in Appendix A to the Landscape Irrigation Code, entitled, "Guidelines for Implementation of the Orange County of Orange Landscape Irrigation Code" which is incorporated by reference and made a part of this Landscape Irrigation Code.

(b) The authority to implement and modify these Guidelines as appropriate is delegated to the Planning Commission. Any such action of the Planning Commission may be appealed to the Board of Supervisors as provided in section 7-9-150 of this Zoning Code.

(c) The Guidelines are complementary to the regulations of the Orange County Zoning Code. If an issue arises between the Guidelines and the Zoning Code that is not sufficiently clear, the Zoning Code shall prevail.

SECTION 3. Sec. 7-9-77.8 is hereby amended as follows:

Sec. 7-9-77.8. R2 "Multifamily Dwellings" – Site Development Standards.

(a) Building site area. Seven thousand two hundred (7,200) square feet minimum except per section 7-9-126.1.
(b) Building height. Thirty-five (35) feet maximum except per section 7-9-126.1.
(c) Area per unit. One thousand (1,000) square feet minimum net land area per dwelling unit except per section 7-9-126.1.
(d) Distance between principal structures. Ten (10) feet minimum.
(e) Building setbacks. Per sections 7-9-127, 7-9-128, and 7-9-137.
(f) Off-street parking. Per section 7-9-145.
(g) Lights. All lights shall be designed and located so that direct light rays shall be confined to the premises.

SECTION 4. Section 7-9-78.8 is hereby amended as follows:

Sec. 7-9-78.8. R3 "Apartment" – Site Development Standards.

(a) Building site area. Seven thousand two hundred (7,200) square feet minimum except per section 7-9-126.1.
(b) Building height. Sixty-five (65) feet maximum except per section 7-9-126.1.
(c) Area per unit. One thousand (1,000) square feet minimum net land area per dwelling unit unless otherwise provided for by an approved use permit.
(d) Distance between principal structures. Fifteen (15) feet minimum.
(e) Building setbacks. Per sections 7-9-127, 7-9-128, and 7-9-137.
(f) Off-street parking. Per section 7-9-145.
(g) Lights. All lights shall be designed and located so that direct light rays shall be confined to the premises.

SECTION 5. Section 7-9-79.8 is hereby amended as follows:

Sec. 7-9-79.8. R4 "Suburban Multifamily Residential" – Site Development Standards.

(a) Building site area. Seven thousand two hundred (7,200) square feet minimum except per section 7-9-126.1.
(b) Building height. Thirty-five (35) feet maximum except per section 7-9-126.1.
(c) Area per unit. Three thousand (3,000) square feet minimum net land area per dwelling unit except per section 7-9-126.1.
(d) Distance between principal structures. Fifteen (15) feet minimum.

(e) Building setbacks. Per sections 7-9-127, 7-9-128, and 7-9-137.
(f) Off-street parking. Per section 7-9-145.
(g) Lights. All lights shall be designed and located so that direct light rays shall be confined to the premises.

SECTION 6. Section 3-13-7 is hereby amended as follows:

Sec. 3-13-7. Standards for developed property.

All developed real property in county territory shall be maintained at so that its condition is not less than described in the following standards.

(1) Condition of structures. Structures shall not be partially destroyed, abandoned, unsecured, or permitted to remain in a state of partial construction for more than thirty (30) days. Buildings or structures shall not be boarded up for a period in excess of ten (10) days without a valid demolition or building permit on file, except in compliance with sections 7-1-18 and following of this Code.
(2) Building exteriors and roofs. Exterior building surfaces and roofs shall be maintained free of significant surface cracks, missing materials, warping, dry rot which either threaten the structural integrity, or result in a dilapidated, decaying, disfigured, or partially ruined appearance.
(3) Use of tarps. Excluding emergency repairs, it is prohibited to use tarps for roof and building repairs. Additionally, the use of tarps for vehicle covers, or temporary canopies, enclosures, and/or awnings is prohibited in any outdoor area visible from any public right-of-way.
(4) Paint. Painted surfaces on buildings, trash enclosures, walls, retaining walls, fences, and structures shall be maintained in order to prevent decay, excessive checking, cracking, peeling, chalking, dry rot, warping, or termite infestation.
(5) Graffiti. All structures, equipment, walls, and fencing on the property shall be maintained free of graffiti pursuant to Division 16 of Title 3 of this Code.
(6) Lighting. All exterior light fixtures shall be maintained in good working order free of broken lamps, lenses, and light bulbs. Furthermore, the structural integrity of all supporting poles and mounting fixtures shall be maintained. All insulation and connections shall be intact and free of exposed wire.
(7) Windows. Broken windows and glass doors and the use of materials other than glass as a replacement or covering of windowpanes are prohibited.
(8) Window screens. All window and glass door screens shall be maintained free of tears, rips, and holes. On residential rental properties, window screens are required on all windows.
(9) Trash bins. Trash bins or dumpsters shall be kept within an enclosed building, trash enclosure, or screened from public view to the maximum extent feasible. Overflowing trash bins or dumpsters due to inadequate number of bins and/or request for service from the trash hauler is prohibited. Use of commercial trash bins for residential uses in the R-1 zone is prohibited.
(10) Walls, fences, and trash enclosures. All walls, retaining and crib walls, and fences abutting public rights-of-way (including alleys), and trash enclosures, shall be maintained

free of significant surface cracks, dry rot, warping, deterioration, leaning, missing panels or blocks which either threaten the structural integrity, or result in a dilapidated, decaying, disfigured, or partially ruined appearance.

(11) Parking areas, sidewalks. Parking areas, private alleys, driveways, sidewalks, and walkways shall be maintained free of potholes, cracks, breaks, lifting, and other deteriorated conditions.

(12) Signs. All signs shall be maintained in order to prevent deterioration, disrepair, and unsightliness.

(13) Excavations. Excavations, abandoned wells, shafts, basements, and other holes shall be properly secured to prevent access by unauthorized persons.

(14) Landscaping. Landscaping shall be maintained pursuant to section 7-9-132 et. seq. of this Code. All landscaping visible from public rights-of-way shall be maintained in a healthy condition free of dying, dead, diseased, decayed, discarded and/or overgrown vegetation.

(15) Parkway landscaping. In residential areas, the public parkway shall be landscaped and maintained by the adjacent property owner(s). The landscaping shall be maintained in a healthy condition free of dying, dead, diseased, decayed, discarded and/or overgrown vegetation.

(16) Drainage. Onsite drainage improvements shall be maintained in order to prevent deterioration, disrepair, and ineffectiveness.

(17) Rodent and vermin control. All property, including landscaped areas, buildings, and structures, shall be maintained free of rodents and other vermin.

(18) Outdoor drying. In all residential zones or residential developments, the outdoor airing and/or drying of laundry, clothes, other household linens, or food is permitted only in rear or side yards, provided that the items are not visible from public rights-of-way.

(19) Pools. Barrier fencing and gates for swimming pools and spas shall be maintained as required by the California Building Code. Swimming pools and spas shall not contain unfiltered or stagnant water.

(20) Address numerals. Street address numerals shall be maintained pursuant to following:

a. Single-family units. Street addresses shall be visible from the public street and may be displayed either on the front door, on the fascia adjacent to the main entrance, or on another prominent location. When the property has alley access, address numerals shall be displayed in a prominent location visible from the alley. Numerals shall be a minimum six (6) inches in height with not less than one-half-inch stroke and shall contrast sharply with the background.

b. Multi-family units. Street address shall be visible from the public street and shall be displayed on the complex identification sign. If there is no complex identification sign, the street address may be displayed on the fascia adjacent to the main entrance or on another prominent location. When the property has alley access, address numerals shall be displayed in a prominent location visible from the alley. Street address numerals shall be a minimum six (6) inches in height with not less than one-half-inch stroke and shall contrast sharply with the background. Identification of individual units shall be provided adjacent to the unit entrances. Letters or numerals shall be four (4) inches in height with not less than one-quarter-inch stroke and shall contrast sharply with the background.

c. Nonresidential properties. Street address shall be visible from the public street and shall be displayed on the freestanding sign. If there is no freestanding sign, the street

address may be displayed on the fascia adjacent to the main entrance or on another prominent location. When the property has alley access, address numerals shall be displayed in a prominent location visible from the alley. Numerals shall be a minimum twelve (12) inches in height with not less than three-quarters-inch stroke and shall contrast sharply with the background. Identification of individual units shall be provided adjacent to the unit entrances. Letters or numerals shall be four (4) inches in height with not less than one-quarter-inch stroke and shall contrast sharply with the background.

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GUIDELINES
(APPENDIX A)

FOR IMPLEMENTATION OF THE COUNTY OF ORANGE LANDSCAPE IRRIGATION CODE

OC PUBLIC WORKS
NOVEMBER 2009

11/18/09

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1. Purpose and Applicability

1.1 Purpose

(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 *Landscape Irrigation Code*. This document is also intended for use and reference by County staff in reviewing and approving designs and verifying compliance with the *Landscape Irrigation Code*. The general purpose of the *Landscape Irrigation Code* 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.

(b) 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:

(1) State of California Assembly Bill 1881;

(2) National Pollutant Discharge Elimination Permit for the Municipal Separate Storm Sewer System;

(3) Orange County Fire Authority Regulations for Fuel Modification in the Landscape;

(4) Water Conservation and Drought Response Regulations of the Local Water Purveyor;

(5) Regulations of the Local Water Purveyor governing use of Recycled Water;

(6) Zoning Code;

(7) Building Code;

(8) Specific Plans, Master Plans, General Plan, or similar land use and planning documents; and

(9) Conditions of approval for a specific project.

1.2 Applicability

(a) The Water Efficient Landscape Guidelines shall apply to landscaping projects that are subject to the County of Orange Landscape Irrigation Ordinance.

2. Submittal Requirements for New Landscape Installations or Landscape Rehabilitation Projects

(a) Discretionary approval is typically required for landscape projects that are subject to site plan reviews, or where a variance from a local building code is requested, or other procedural processes apply such that standard or special conditions of approval may be required by the County. Discretionary projects with conditions of approval may be approved administratively by county staff, or acted on formally by the Planning Commission, Board of Supervisors, or other jurisdictional authority. A typical standard condition of approval reads:

> "*Landscaping for the project shall be designed to comply with the County's Landscape Irrigation Code and with the Guidelines for Implementation of the Landscape Irrigation Code.*"

Landscape or water features that typically require a ministerial permit (i.e., a building, plumbing, electrical, or other similar permit), thereby triggering compliance with the *Landscape Irrigation Code* requirements independently of the need for discretionary approval include, but are not limited to, swimming pools, fountains or ponds, retaining walls, and overhead trellises.

2.1 Elements of the Landscape Documentation Package

(a) 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 County prior to start of construction. Unless otherwise directed by the County, the *Landscape Documentation Package* shall include the following elements either on plan sheets or supplemental pages as directed by the County:

(1) Project Information, including, but not limited to, the following:

(a) date;

(b) project name;

(c) project address, parcel, and/or lot number(s);

(d) total landscaped area (square feet) and rehabilitated landscaped area (if applicable);

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

(f) water supply type (e.g., potable, recycled, or well) and identification of the local retail water purveyor if the *project applicant* is not served by a private well;

(g) checklist or index of all documents in the *Landscape Documentation Package*;

(h) project contacts, including contact information for the *project applicant* and *property owner*;

(i) 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 County's *Landscape Irrigation Code*" and shall bear the signature of the *landscape professional* as required by law; and

(j) any other information the County deems relevant for determining whether the landscape project complies with the *Landscape Irrigation Code* and these *Guidelines*.

(2) *Maximum Applied Water Allowance* (*MAWA*) and *Estimated Applied Water Use* (*EAWU*) expressed as annual totals including, but not limited to, the following:

(a) a *Water Efficient Landscape Worksheet* (optional at discretion of the County) for the landscape project;

(b) *hydrozone* information table (optional at the discretion of the County) for the landscape project; and

(c) water budget calculations (optional at the discretion of the County) for the landscape project.

(3) An erosion and sediment control plan pursuant to the County Grading Code. 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, may be required if determined necessary by the Plan Check Manager.

(4) A landscape design plan for the landscape project.

(5) An irrigation design plan for the landscape project.

(6) A grading design plan, if determined necessary by the Plan Check Manager, 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.]

2.2 Water Efficient Landscape Calculations and Alternatives

(a) 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 County. The *MAWA* and *EAWU* shall be calculated based on completing the *Water Efficient Landscape Worksheets* (in accordance with the sample worksheets in **Appendix B**).

(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.

(c) 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**. For geographic areas not covered in **Appendix C**, data from cities located nearby in the same reference evapotranspiration zone may be used, as found in the CIMIS Reference 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 *County*.

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

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

(d) The *Maximum Applied Water Allowance* shall adhere to the following requirements:

(1) 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.

2.3 Soil Management Report

(a) In order to reduce *runoff* and encourage healthy plant growth, a soil management report shall be completed by the *project applicant*, or his/her designee, if determined necessary by the Plan Check Manager, as follows:

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

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

(b) The soil analysis may include, but is not limited to:

1. soil texture;

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

3. pH;

4. total soluble salts;

5. sodium;

6. percent organic matter; and

7. recommendations.

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

(a) if significant mass grading is not planned, the soil analysis report shall be submitted to the County as part of the Landscape Documentation Package; or

(b) If significant mass grading is planned, the soil analysis report shall be submitted to the *County* as part of the *Certification of Completion*.

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

(d) The *project applicant*, or his/her designee, shall submit documentation verifying implementation of soil analysis report

recommendations to the local agency with the Certification of Completion.

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

2.4 Landscape Design Plan

(a) For the efficient use of water, a landscape shall be carefully designed and planned for the intended function of the project. The following design criteria shall be submitted as part of the *Landscape Documentation Package*:

(1) Plant Material

(a) Any plant may be selected for the *landscaped area* provided 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 County and local tree ordinances or tree shading guidelines; and

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

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

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

(1) 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;

(2) 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

(3) 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).

(e) A landscape design plan for projects in fire-prone areas and fuel modification zones shall comply with requirements of the local Fire Authority, where applicable. When conflicts between water conservation and fire safety design elements exist, the fire safety requirements shall have priority.

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

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

(1) Water Features

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

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

(c) The surface area of a water feature shall be included in the high water use *hydrozone* area of the water budget calculation.

(d) Pool and spa covers are highly recommended.

(2) *Mulch* and Amendments

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

(b) Stabilizing mulching products shall be used on slopes.

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

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

(h) 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:

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

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

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

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

(12) contain the following statement: "I have complied with the criteria of the a *Landscape Irrigation Code* and applied them for the efficient use of water in the landscape design plan;" and

(13) bear the signature of a California-licensed *landscape professional*.

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

2.5 Irrigation Design Plan

(a) 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*.

(1) System

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

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

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

1. 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.

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

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

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

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

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

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

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

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

(k) 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%

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

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

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

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

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

(q) Narrow or irregularly shaped areas, including turf, less than eight (8) feet in width in any direction shall be irrigated with subsurface irrigation, a *low volume irrigation* system, or another water-efficient technology.

(2) Hydrozone

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

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

(c) Where appropriate, 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:

1. the *plant factor* calculation is based on the proportions of the respective plant water uses and their respective *plant factors*; or

2. the *plant factor* of the higher water using plant is used for the 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*.

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

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

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

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

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

5. irrigation schedule parameters necessary to program smart timers specified in the landscape design;

6. the following statement: "I have complied with the criteria of the *Landscape Irrigation Code* and applied them accordingly for the efficient use of water in the irrigation design plan;" and

7. the stamp and signature of a California-licensed *landscape professional.*

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

2.6 Grading Design Plan

(a) 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*.

(b) The *project applicant* shall submit a landscape grading plan if determined necessary by the Plan Check Manager, 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.

(c) 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*.

(d) 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 stamp and signature of the *landscape professional,* as required by law.

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

2.7 Certification of Completion

(a) Landscape project installation shall not proceed until the *Landscape Documentation Package* has been approved by the County and any ministerial permits required are issued.

(b) The *project applicant* shall notify the County 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.

(c) *Certification of Completion* of the landscape project shall be met through a Certificate of Use and Occupancy or a *Permit* Final. The requirements for the Final Inspection and *Permit* Closure include submittal of:

(1) *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 *Landscape Irrigation Code* for the efficient use of water in the landscape."

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

(3) An irrigation audit report, documentation of enrollment in regional or local water purveyor's water conservation programs, and/or documentation that the MAWA and EAWU information for the *landscape*

project has been submitted to the local water purveyor, may be required at the option of the County.

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

2.8 Post-Installation Irrigation Scheduling

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

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

(2) *Overhead* irrigation shall be scheduled in accordance with the local water purveyor's Water Conservation Ordinance. 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.]

2.9 Post-Installation Landscape and Irrigation Maintenance

(a) Landscapes shall be maintained to ensure water use efficiency in accordance with existing regulations.

3. Provisions for Existing Landscapes

(a) 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 purveyor* and as may be mutually agreed by the *County*.

(b) The *local water purveyor* 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 *County* over one acre in size.

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

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 County of Orange Landscape Irrigation Code (OCCO Sections __ _____) and the County of Orange Guidelines for Implementation of the County of Orange Landscape Irrigation Code.

(4) The information I have provided in this Certificate of Landscape Design is true and correct and is hereby submitted in compliance with the County of Orange Guidelines for Implementation of the County of Orange Landscape Irrigation Code.

_____ _____
Print Name Date

_____ _____
Signature License Number

_____
Address

_____ _____
Telephone E-mail Address

Landscape Design Professional's Stamp

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 K_L 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		K_L		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 K_L 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		K_L		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		

Appendix C

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													

Appendix D

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 County of Orange Landscape Irrigation Code (OCCO Sections _____) and the County of Orange Guidelines for Implementation of the County of Orange Landscape Irrigation Code 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 County of Orange Guidelines for Implementation of the County of Orange Landscape Irrigation Code.

_____ _____
Print Name Date

_____ _____
Signature License Number

_____
Address

_____ _____
Telephone E-mail Address

Landscape Design Professional's Stamp

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

"*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.

"*County*" means the County of Orange or its authorized designee.

"*Common interest developments*" means community apartment projects, condominium projects, planned developments, and stock cooperatives 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, that, when applied to reference evapotranspiration, adjusts for plant factors and irrigation efficiency, two major

influences upon the amount of water that needs to be applied to the landscape. A combined plant mix with a site-wide average of 0.5 is the basis of the plant factor portion of this calculation. For purposes of the ETAF, the average irrigation efficiency is 0.71. Therefore, the ET Adjustment Factor is (0.7) = (0.5/0.71). ETAF for a Special Landscape Area shall not exceed 1.0. ETAF for existing non-rehabilitated landscapes is 0.8.

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

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

"*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 *County* 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 *County* 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*.

"*Microclimate*" 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 *local water purveyor*, 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 *Landscape Irrigation Code*, 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 local agency. 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 Allowance*s.

"*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

"*Landscape Irrigation Code*" means Ordinance No. _____, adopted by the Orange County Board of Supervisors on _____,

"*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*