GUIDELINES

FOR IMPLEMENTATION OF THE CITY OF TUSTIN WATER EFFICIENT LANDSCAPE ORDINANCE

(DECEMBER 2015)

TABLE OF CONTENTS

Section **Page No.**

1. Purpose and Applicability 1
   - 1.1 Purpose 1
   - 1.2 Applicability 1
2. Submittal Requirements for New Landscape Installations or Landscape Rehabilitation Projects 2
   - 2.2 Elements of the Landscape Documentation Package 3
   - 2.3 Water Efficient Landscape Calculations and Alternatives 4
   - 2.4 Soil and Stormwater Management 7
   - 2.5 Landscape Design Plan 8
   - 2.6 Irrigation Design Plan 12
   - 2.7 Grading Design Plan 16
   - 2.8 Certification of Completion 17
   - 2.9 Post-Installation Irrigation Scheduling 18
   - 2.10 Post-Installation Landscape and Irrigation Maintenance 19
3. Provisions for Existing Landscapes 19
4. Public Education 19

Appendix A: Prescriptive Compliance Option 20
Appendix B: Certification of Landscape Design 23
Appendix C: Water Efficient Landscape Worksheet 24
Appendix D: Reference Evapotranspiration Table 26
Appendix E: Certificate of Completion 29
Appendix F: Definitions 31
Appendix G: Irrigation Plan Checklist 37
Appendix H: Inspection Affidavit 38

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 Water Efficient Landscape Ordinance. 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 Ordinance. The general purpose of the Water Efficient Landscape Ordinance 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 designed and installed 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 Ordinance and these Guidelines apply to all of the following landscape projects. In the event of a conflict between the Ordinance and the Guidelines, the Ordinance shall apply.

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

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

(3) New or rehabilitated landscape projects with an aggregate landscape area of 2,500 square feet or less may comply with the performance requirements of this ordinance or conform to the prescriptive measures contained in Appendix A; and

(4) For new or rehabilitated projects using treated or untreated graywater or rainwater capture on site, any lot or parcels within the project that has less than 2,500 square feet of landscape area and meets the lot or parcel's landscape water requirement (Estimated Total Water Use) entirely with the treated or untreated graywater or though stored rainwater capture on site is subject only to Appendix A Section (5).

(B) The requirements of the Guidelines may be partially or wholly waived, at the discretion of the City or its designee, for landscape rehabilitation projects that are limited to replacement plantings with equal or lower water needs and where the irrigation system is found to be designed, operable and programmed consistent with minimizing water waste in accordance with local water purveyor regulations.

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

(1) Registered local, state, or federal historical sites;

(2) Ecological restoration projects that do not require a permanent irrigation system; or

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

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 City. Discretionary projects with conditions of approval may be approved administratively by City staff, or acted on formally by the Planning Commission, City Council, or other jurisdictional authority. A typical standard condition of approval reads:

"Landscaping for the project shall be designed to comply with the City's Water Efficient Landscape Ordinance and with the Guidelines for Implementation of the Water Efficient Landscape Ordinance."

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 Water Efficient Landscape Ordinance requirements independently of the need for discretionary approval include, but are not limited to, swimming pools, fountains or ponds, retaining walls, and overhead trellises.

2.2 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 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:

(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 landscape area (square feet) and rehabilitated landscape 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) 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

(j) Any other information the City deems relevant for determining whether the landscape project complies with the Water Efficient Landscape Ordinance 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) Water Efficient Landscape Worksheet (optional at discretion of the City) for the landscape project;

(b) Hydrozone information table (optional at the discretion of the City) for the landscape project; and

(c) Water budget calculations (optional at the discretion of the City) for the landscape project.

(3) 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.

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

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

(6) 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 landscape area.

2.3 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 landscape 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 C**) which contain information on the plant factor, irrigation method, irrigation efficiency and area associated with each hydrozone. Calculations are then made to show that the evapotranspiration adjustment factor (ETAF) for the landscape project does not exceed a factor of 0.55 for residential areas and 0.45 for non-residential areas, exclusive of Special Landscape Areas. The ETAF for a

landscape project is based on the plant factors and irrigation methods selected. The Maximum Applied Water Allowance is calculated based on the maximum ETAF allowed (0.55 for residential areas and 0.45 for non-residential areas) and expressed as annual gallons required. The EAWU is calculated based on the plants used and irrigation method selected for the landscape design.

(B) The EAWU allowable for the landscape area shall not exceed the MAWA. The MAWA shall be calculated using an evapotranspiration adjustment factor (ETAF) of 0.55 for residential areas and 0.45 for non-residential areas, except for the portion of the MAWA applicable to any Special Landscape Areas within the landscape project, which shall be calculated using an ETAF of 1.0. Where the design of the landscape 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 Worksheet and equations presented in **Appendix C**.

(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 D**. For geographic areas not covered in **Appendix D**, data from other cities, or zip codes, located nearby in the same reference evapotranspiration zone may be used.

(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 or from horticultural researchers with academic institutions or professional associations as approved by the California Department of water Resources (DWR). The plant factor ranges from 0 to 0.1 for very low water use plants, 0.1 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 Landscape Areas (SLA) shall be set at 1.0. For calculation of the EAWU, the ETAF for SLA shall be calculated as the SLA plant factor divided by the SLA irrigation efficiency factor.

(9) Irrigation efficiency (IE) of the irrigation heads used within each hydrozone shall be assumed to be as follows, unless otherwise indicated by the irrigation equipment manufacturer's specifications or demonstrated by the project applicant:

Irrigation Method	**DU_{LQ}**	**DU_{LH}***	**EU**	**IE****
Spray nozzles	65%	79%		71%
High efficiency spray nozzles	70%	82%		73%
Multi stream/Multi trajectory rotary (MSMT) nozzles	75%	85%		76%
Stream rotor nozzle	70%	82%		73%
Microspray	75%	85%		76%
Bubblers			85%	77%
Drip emitter			90%	81%
Subsurface drip			90%	81%

*$DU_{LH} = .386 + (.614)(DU_{LQ})$
** IE (spray) = (DU_{LH})(IME)
** IE (drip) = Emission uniformity (EU)(IME)

(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 C**. The reference evapotranspiration (ETo) values used for this calculation are from the Reference Evapotranspiration Table in **Appendix D** 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.

2.4 Soil and Stormwater Management

(A) All planted landscape areas are required to have friable soil to maximize retention and infiltration. On engineered slopes, only amended planting holes need meet this requirement.

(B) 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.

(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) In projects with multiple landscape installations (i.e. production home developments or common interest developments that are installing landscaping) a soil sampling rate of 1 in 7 lots or approximately 15% will satisfy this requirement; evenly disbursed throughout the development. Large landscape projects shall sample at a rate equivalent to 1 in 7 lots or approximately 15% landscape area. 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 local agency as part of the Landscape Documentation Package; or

(b) If significant mass grading is planned, the soil analysis report shall be submitted to the City 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.

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

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

(1) Grade impervious surfaces, such as driveways, during construction to drain into vegetated areas.

(2) Minimize the area of impervious surfaces such as paved areas, roof, and concrete driveways.

(3) Incorporate pervious or porous surfaces (e.g. gravel, permeable pavers or blocks, pervious or porous concrete) that minimize runoff.

(4) Direct runoff from paved surfaces and roof areas into planting beds or landscape areas to maximize site water capture and reuse.

(5) Incorporate rain gardens, cisterns, and other rain harvesting or catchment systems.

(6) Incorporate infiltration beds, swales, basins, and drywells to capture stormwater and dry weather runoff and increase percolation into the soil.

(7) Consider constructed wetlands and ponds that retain water, equalize excess flow, and filter pollutants.

2.5 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 landscape area provided the EAWU in the landscape area does not exceed the MAWA. Methods to achieve water efficiency shall include one or more of the following:

(2) Protection and preservation of non-invasive water-conserving plant, tree and turf species;

(3) Selection of water-conserving plant, tree and turf species;

(4) Selection of plants based on local climate suitability, disease and pest resistance;

(5) Selection of trees based on applicable City and local tree ordinances or tree shading guidelines, and size at maturity as appropriate for the planting area; and

(6) Selection of plants from local and regional landscape program plant lists.

(7) Selection of plants from local Fuel Modification Plan Guidelines.

(B) Each hydrozone shall have plant materials with similar water use; with the exception of hydrozones with plants of mixed water use, as specified in Section 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. Methods to achieve water efficiency shall include one or more of the following:

(1) Use the Sunset Western Climate Zone System, or equivalent generally accepted models, 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); allow for adequate soil volume for healthy root growth 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) High water use plants, characterized by a plant factor of 0.7 to 1.0, are prohibited in street medians.

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

(G) The use of invasive plant species plant species, such as those listed by the California Invasive Plat Council, is strongly discouraged.

(H) 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) Soil Preparation, Mulch and Amendments

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

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

(c) For landscape installations, compost at a rate of a minimum of four cubic yards per 1,000 square feet of permeable area shall be incorporated to a depth of six inches into the soil. Soils with greater than 6% organic matter in the top 6 inches of soil are exempt from adding compost and tilling.

(d) A minimum three inch (3″) layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas,

creeping or rooting groundcovers, or direct seeding applications where mulch is contraindicated. To provide habitat for beneficial insects and other wildlife, up to 5% of the landscape area may be left without mulch. Designated insect habitat must be included in the landscape design plan as such.

(e) Stabilizing mulching products shall be used on slopes that meet current engineering standards such as those detailed in the USDA/USAID Low-Volume Roads Engineering Best Management Practices Field Guide.

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

(g) Organic mulch materials made from recycled or post-consumer shall take precedence over inorganic materials or virgin forest products unless the recycled post-consumer organic products are not locally available. Organic mulches are not required where prohibited by local fuel Modification Plan Guidelines or other applicable local ordinances.

(I) The landscape design plan, at a minimum, shall:

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

(2) Identify each hydrozone as low, moderate, high water, or mixed water use. Temporarily irrigated areas of the landscape 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, and 24-hour retention or infiltration capacity of any applicable storm water best management practices that encourage on-site retention and infiltration of storm water. Project applicants shall refer to the local agency or regional Water Quality Control Board for information on any applicable stormwater technical

requirements. Storm water best management practices are encouraged in the landscape design plan and examples are provided in Section 2.4(C)-(D).

(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 Water Efficient Landscape Ordinance 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.

2.6 Irrigation Design Plan

(A) This section applies to landscape areas requiring permanent irrigation, not areas that require temporary irrigation solely for the plant establishment period. For the efficient use of water, an irrigation system shall meet all the requirements listed in this section and the 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) Landscape water meters, defined as either a dedicated water service meter or private sub meter, shall be installed for all non-residential irrigated landscapes of 1,000 sq. ft. but not more than 5,000 sq. ft. (the level at which Water Code 535 applies) and residential irrigated landscapes of 5,000 sq. ft. or greater. A landscape water meter may be either:

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

2. A privately owned meter or sub meter.

(b) Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data with non-volatile memory shall be required for irrigation scheduling in all irrigation systems, recommending U.S. EPA WaterSense labeled devices as applicable.

(c) 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.

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

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.

(e) 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.

(f) A master shutoff valve shall be as close as possible to the point of connection and is required on all projects; with the exception for landscapes that make use of technologies that allow for the individual control of sprinklers that are individually pressurized in a system equipped with low pressure shut down features.

(g) Flow sensors that detect high flow conditions created by system damage or malfunction are required for all non-residential landscapes and residential landscapes of 5,000 sq. ft. or larger. The flow sensor must be in combination with a master shut-off valve.

(h) Manual isolation valves (such as a gate valve, ball valve, or butterfly valve) shall be required downstream of 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.

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

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

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

(l) All irrigation emission devices must meet the requirements set in the American National Standards Institute (ANSI) standard, American Society of Agricultural and Biological Engineers'/International Code Council's (ASABE/ICC) 802-2014 "Landscape Irrigation Sprinkler and Emitter Standard, All Sprinkler heads installed in the landscape must document a distribution uniformity low quarter of 0.65 or higher using the protocol defined in ASBE/ICC 802-2014.

(m) Average irrigation efficiency (IE) 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 as listed in Section 2.3(C)(9).

(n) 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.

(o) In mulched planting areas, the use of low volume irrigation (drip or low volume overhead irrigation) is required to maximize water infiltration into the root zone; with the exception of areas with fuel modification requirements and/or those that require plant establishment to comply with local grading ordinances.

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

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

(r) Swing joint components are required on all sprinklers subject to damage that are adjacent to hardscapes or in high traffic areas of turf.

(s) Check valves or anti-drain valves are required on all sprinkler heads where low point drainage could occur.

(t) Areas less than ten (10) feet in width in any direction shall be irrigated with subsurface irrigation or other means that produces no runoff or overspray.

(u) Overhead irrigation shall not be permitted within 24 inches of any non-permeable surface. Allowable irrigation within the setback from non-permeable surfaces may include drip, drip line, or other low flow non-spray technology. The setback area may be planted or unplanted. The surfacing of the setback may be mulch, gravel, or other porous material. These restrictions may be modified if:

1. the landscape area is adjacent to permeable surfacing and no runoff occurs; or

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

3. 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.

4. slopes greater than 25% shall not be irrigated with an irrigation system with a application 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.

(2) Hydrozone

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

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

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

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

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 Water Efficient Landscape Ordinance and applied them accordingly for the efficient use of water in the irrigation design plan;" and

7. the signature of a California-licensed landscape professional.

2.7 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 landscape 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 landscape area.

(B) The project applicant shall submit a landscape grading plan that indicates finished configurations and elevations of the landscape 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 landscape 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 signature of the landscape professional, as required by law.

2.8 Certification of Completion

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

(B) 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.

(C) Certification of Completion of the landscape project shall be obtained 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 Water Efficient Landscape Ordinance for the efficient use of water in the landscape."

(a) Where there have been significant changes (as deemed by the local permitting agency) made in the field during construction, these "as-built" or record drawings shall be included with the certificate

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

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

(3) An irrigation audit report from a local agency landscape irrigation auditor or third party certified landscape irrigation auditor, 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 City. Example Inspection Affidavit is included as **Appendix H**.

(a) Landscape audits shall not be conducted by the person who designed or installed the landscape.

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

2.9 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.

2.10 Post-Installation Landscape and Irrigation Maintenance

(A) Landscapes shall be maintained to ensure water use efficiency in accordance with the Tustin City Code.

3. Provisions for Existing Landscapes

(A) Irrigation of all landscape 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 City.

(B) The City and/or the regional or 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 landscape areas in the City 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.

4. Public Education

(A) Publications. Education is a critical component to promote the efficient use of water in landscapes. The use of appropriate principles of design, installation, management, and maintenance that save water is encouraged in the community.

(B) Model Homes. All model homes that are landscaped shall use signs and written information to demonstrate the principles of water efficient landscapes as described.

(1) Signs shall be used to identify the model as an example of a water efficient landscape featuring elements such as hydrozones, irrigation equipment, and others that contribute to the overall water efficient theme. Signage shall include information about the site water use as designed per the local ordinance; specify who designed and installed the site water efficient landscape; and demonstrate low water use approaches to landscaping such as using appropriate plants, alternative water sources, or rainwater catchment systems.

(2) Information shall be provided about designing, installing, managing, and maintaining water efficient landscapes.

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PRESCRIPTIVE COMPLIANCE OPTION

(A) This appendix contains prescriptive requirements which may be used as a compliance option to the Ordinance.

(B) Compliance with the following items is mandatory and must be documented in a landscape plan in order to use the prescriptive compliance option:

(1) Submit a Landscape Documentation Package which includes the following elements:

(a) Date

(b) Project applicant

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

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

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

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

(g) Contact information for the project applicant and property owner

(h) Applicant signature and date with statement, "I agree to comply with the requirements of the prescriptive compliance option to the MWELO"

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

(3) Plant material shall comply with all of the following:

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

(average WUCOLS plan factor 0.3) for 100% of the plant area excluding edibles and areas using recycled water;

(b) A minimum three inch (3") 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.

(4) Turf shall comply with all of the following:

(a) Turf shall not exceed 25% of the landscape area in residential areas, and turf shall not be planted in non-residential areas

(b) Turf shall not be planted on sloped areas which exceed a slope of 1 foot vertical elevation change for every 4 feet of horizontal length;

(c) Turf is prohibited in parkways less than 10 feet wide, unless the parkway is adjacent to a parking strip and used to enter and exit vehicles. Any turf in parkways must be irrigated by sub-surface irrigation, or by other technology that creates no overspray or runoff.

(5) Irrigation systems shall comply with the following:

(a) Automatic irrigation controllers are required and must use evapotranspiration or soil moisture sensor data

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

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

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

(e) All irrigation emission devices must meet the requirements set in the ANSI standard, ASABE/ICC802-2014. "Landscape irrigation Sprinkler and Emitter Standard." All Sprinkler heads installed in the landscape must document a distribution uniformity low quarter of 0.65 or higher using the protocol defined in ASABE/ICC 802-2014.

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

Appendix B: Certification of Landscape Design

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 Tustin Water Efficient Landscape Ordinance (City Code Sections 9701-9706) and the City of Tustin Guidelines for Implementation of the City of Tustin 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 Tustin Guidelines for Implementation of the City of Tustin Water Efficient Landscape Ordinance.

_____ _____
Print Name Date

_____ _____
Signature License Number

_____
Address

_____ _____
Telephone E-mail Address

Landscape Design Professional's Stamp
(If applicable)

Appendix C: Water Efficient Landscape Worksheet

WATER EFFICIENT LANDSCAPE WORKSHEET

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

Landscape Area Sector Type (select one): [ ] Residential [ ] Non-Residential

Reference Evapotranspiration (ETo)[a]: _____

	Hydrozone #/Planting Description	Location	Plant Factor[b] (PF)	Irrigation Method[c]	Irrigation Efficiency[c] (IE)	ETAF (PF/IE)	Landscape Area (sq-ft)	ETAF x Area	Estimated Total Water Use[d] (ETWU)
Regular Landscape Area									
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									

Average	***Total***	***Total***

Average ETAF for Regular Landscape Areas[e] (circle one): **In Compliance** **Not In Compliance**

Special Landscape Area

SLA-1							
SLA-2							
SLA-3							
SLA-4							
SLA-5							

Totals | | |

Total Landscape Area	
Site wide ETAF	
ETWU Total	
Maximum Allowed Water Allowance (MAWA)[f]	

WORKSHEET INFORMATION & EQUATIONS

[a] Local monthly evapotranspiration rates are listed in Appendix D.

[b] The following table can be used for common plant factors:

Plant Factor	PF
Very low water use plant	0.1
Low water use plant	0.2
Medium water use plant	0.5
High water use plant	0.8
Lawn	0.8
Pool, spa, or other water feature	1.0

[c] *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. The following *irrigation efficiency* may be obtained for the listed irrigation heads with an *Irrigation Management Efficiency* of 90%:

Irrigation Method	IE
Spray nozzles	71%
High efficiency spray nozzles	73%
Multi stream/Multi trajectory rotary (MSMT) nozzles	76%
Stream rotor nozzle	73%
Microspray	76%
Bubblers	77%
Drip emitter	81%
Subsurface drip	81%

[d] Estimated Total Water Use (ETWU) is the annual gallons required

$$ETWU = (ETo) \times (0.62) \times (ETAF \times Area)$$

where, ETo = annual evapotranspiration rate in inches per year
0.62 = factor used to convert inches per year to gallons per square foot
ETAF = plant factor ÷ irrigation efficiency

[e] Average ETAF for Regular Landscape Areas must be 0.55 or below for residential areas, and 0.45 or below for nonresidential areas.

[f] Maximum Allowed Water Allowance (MAWA) is the annual gallons allowed

$$MAWA = (ETo) \times (0.62) \times [(ETAF \times LA) + ((1-ETAF) \times SLA)]$$

where, ETo = annual evapotranspiration rate in inches per year
0.62 = factor used to convert inches per year to gallons per square foot
ETAF = plant factor ÷ irrigation efficiency
LA = total (site wide) landscape area in square feet
SLA = total special landscape area

Appendix D: Reference Evapotranspiration Table

REFERENCE EVAPOTRANSPIRATION (ET_O) TABLE

City	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total (inches per year)
Aliso Viejo	2.6	2.5	3.6	4.3	5.1	5.1	5.6	5.6	4.7	3.4	2.6	2.0	47.1
Anaheim	2.7	2.7	3.3	4.6	5.3	5.6	5.9	6.0	5.1	3.4	2.6	2.0	49.2
Atwood	2.7	2.8	3.5	4.9	5.6	6.2	6.5	6.5	5.5	3.6	2.7	2.0	52.5
Balboa	2.6	2.4	3.4	4.2	4.9	4.5	5.1	5.1	4.4	3.3	2.5	2.0	44.4
Balboa Island	2.6	2.4	3.4	4.2	4.9	4.6	5.2	5.2	4.5	3.3	2.5	2.0	44.7
Brea	2.7	2.8	3.4	4.8	5.5	6.0	6.4	6.4	5.4	3.6	2.7	2.0	51.8
Buena Park	2.6	2.5	3.6	4.4	5.3	5.3	6.0	5.8	4.9	3.5	2.5	2.0	48.4
Capistrano Beach	2.6	2.5	3.5	4.2	5.0	4.7	5.3	5.3	4.6	3.3	2.5	2.0	45.4
Corona Del Mar	2.6	2.5	3.4	4.2	4.9	4.6	5.2	5.2	4.5	3.3	2.5	2.0	44.9
Costa Mesa	2.6	2.5	3.5	4.2	5.0	4.8	5.4	5.3	4.6	3.3	2.5	2.0	45.6
Coto De Caza	2.6	2.5	3.7	4.5	5.5	5.6	6.2	6.1	5.1	3.6	2.6	2.0	49.8
Cypress	2.6	2.5	3.5	4.3	5.2	5.1	5.7	5.6	4.7	3.4	2.5	2.0	47.2
Dana Point	2.6	2.5	3.5	4.2	4.9	4.7	5.2	5.2	4.5	3.3	2.5	2.0	45.1
El Modena	2.7	2.7	3.4	4.7	5.4	5.9	6.2	6.2	5.3	3.5	2.7	2.0	50.7
Foothill Ranch	2.6	2.5	3.7	4.5	5.5	5.6	6.3	6.1	5.1	3.6	2.6	2.0	50.1
Fountain Valley	2.7	2.6	3.2	4.4	4.9	5.0	5.3	5.4	4.8	3.2	2.6	2.0	46.0
Fullerton	2.7	2.7	3.3	4.6	5.3	5.7	6.0	6.0	5.2	3.4	2.6	2.0	49.7
Garden Grove	2.7	2.7	3.2	4.5	5.0	5.2	5.5	5.6	4.9	3.3	2.6	2.0	47.2
Huntington Beach	2.6	2.5	3.4	4.2	4.9	4.7	5.3	5.2	4.5	3.3	2.5	2.0	45.0
Irvine (North)	2.6	2.5	3.7	4.5	5.4	5.5	6.1	6.0	5.0	3.6	2.6	2.1	49.5
Irvine (South)	2.6	2.5	3.6	4.4	5.3	5.2	5.8	5.7	4.8	3.4	2.6	2.0	47.9

City	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total (inches per year)
La Habra	2.6	2.5	3.7	4.5	5.6	5.6	6.4	6.2	5.1	3.6	2.6	2.0	50.4
La Palma	2.6	2.5	3.6	4.4	5.3	5.2	5.8	5.7	4.8	3.4	2.5	2.0	47.8
Ladera Ranch	2.6	2.5	3.6	4.4	5.3	5.3	5.9	5.8	4.9	3.5	2.6	2.1	48.4
Laguna (South)	2.6	2.5	3.5	4.3	5.1	4.9	5.5	5.5	4.7	3.4	2.5	2.0	46.5
Laguna Beach	2.6	2.5	3.5	4.3	5.1	4.9	5.5	5.4	4.6	3.4	2.5	2.0	48.4
Laguna Niguel	2.6	2.5	3.5	4.3	5.1	4.9	5.5	5.5	4.7	3.4	2.5	2.0	46.5
Laguna Woods	2.6	2.5	3.6	4.4	5.3	5.2	5.8	5.7	4.9	3.5	2.6	2.0	48.0
Lake Forest	2.6	2.5	3.7	4.4	5.4	5.4	6.1	5.9	5.0	3.5	2.6	2.1	49.2
Lido Isle	2.6	2.4	3.4	4.2	4.9	4.6	5.1	5.1	4.4	3.3	2.5	2.0	44.4
Los Alamitos	2.6	2.5	3.5	4.3	5.1	4.9	5.5	5.4	4.6	3.4	2.5	2.0	46.4
Midway City	2.6	2.5	3.5	4.3	5.1	4.9	5.5	5.5	4.7	3.4	2.5	2.0	46.5
Mission Viejo	2.6	2.5	3.7	4.4	5.4	5.4	6.0	5.9	4.9	3.5	2.6	2.0	48.9
Monarch Bay	2.6	2.5	3.5	4.2	4.9	4.7	5.2	5.2	4.5	3.3	2.5	2.0	45.1
Newport Beach	2.6	2.5	3.5	4.2	5.0	4.7	5.3	5.3	4.5	3.3	2.5	2.0	45.4
Orange	2.7	2.7	3.3	4.6	5.3	5.7	6.0	6.0	5.2	3.4	2.7	2.0	49.7
Placentia	2.7	2.7	3.4	4.7	5.4	5.9	6.2	6.2	5.3	3.5	2.7	2.0	50.9
Rancho Santa Margarita	2.6	2.5	3.7	4.4	5.5	5.5	6.1	6.0	5.0	3.6	2.6	2.0	49.5
Rossmoor	2.6	2.5	3.5	4.3	5.1	4.9	5.5	5.4	4.6	3.4	2.5	2.0	46.4
San Clemente	2.6	2.5	3.5	4.3	5.1	4.9	5.4	5.4	4.7	3.4	2.6	2.0	46.4
San Juan Capistrano	2.6	2.5	3.6	4.4	5.4	5.4	6.0	5.9	4.9	3.5	2.6	2.0	48.8
Santa Ana	2.6	2.6	3.4	4.5	5.2	5.3	5.7	5.7	4.9	3.4	2.6	2.0	47.8
Seal Beach	2.6	2.5	3.4	4.2	5.0	4.7	5.3	5.3	4.5	3.3	2.5	2.0	45.4
Silverado Canyon	2.6	2.5	3.7	4.5	5.6	5.8	6.5	6.3	5.2	3.6	2.6	2.0	51.0
Stanton	2.6	2.5	3.5	4.3	5.2	5.1	5.7	5.6	4.7	3.4	2.5	2.0	47.4

City	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total (inches per year)
Sunset Beach	2.6	2.5	3.4	4.2	5.0	4.7	5.3	5.2	4.5	3.3	2.5	2.0	45.0
Surfside	2.6	2.5	3.4	4.2	5.0	4.7	5.3	5.2	4.5	3.3	2.5	2.0	45.0
Trabuco Canyon	2.6	2.5	3.7	4.5	5.5	5.6	6.2	6.1	5.1	3.6	2.6	2.0	49.8
Tustin	2.7	2.7	3.3	4.6	5.3	5.6	5.9	5.9	5.1	3.4	2.7	2.0	49.2
Villa Park	2.7	2.7	3.4	4.7	5.4	5.9	6.2	6.2	5.3	3.5	2.7	2.0	50.8
Westminster	2.6	2.5	3.5	4.3	5.1	4.9	5.5	5.5	4.7	3.4	2.5	2.0	46.5
Yorba Linda	2.7	2.8	3.5	4.9	5.7	6.3	6.6	6.6	5.6	3.7	2.7	2.0	53.1

* The values in this table were derived from California Irrigation Management Information System (CIMIS) Spatial CIMIS data by zip code. Cities with multiple zip codes present monthly averages.

Appendix E: Certificate of Completion

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 for:_____ _____(project name, mailing address and telephone).

(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 Tustin Water Efficient Landscape Ordinance (City Code Sections 9701-9706) and the City of Tustin Guidelines for Implementation of the City of Tustin Water Efficient Landscape Ordinance for the efficient use of water in the landscape.

(4) The following elements are attached hereto:

a. Irrigation scheduling parameters used to set the controller;

b. Landscape and irrigation maintenance schedule;

c. Irrigation audit report; and

d. Soil analysis report, if not submitted with Landscape Documentation Package, and documentation verifying implementation of the soil report recommendations.

(5) The site installation complies with the following:

a. The required irrigation system has been installed according to approved plans and specifications and if applicable, any prior approved irrigation system alternatives.

_____ Yes ____ No

b. Sprinklers comply with ASABE/ICC 802-2014 Landscape Irrigation Sprinkler & Emitter Standard.

_____ Yes ____ No

(6) 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 Tustin Guidelines for Implementation of the City of Tustin Water Efficient Landscape Ordinance.

Print Name	Date
Signature	License Number

Address

Telephone	E-mail Address

Landscape Design Professional's Stamp
(If Appropriate)

DEFINITIONS

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

"Aggregate" area pertains to production home neighborhoods, common interest developments, or other situations where multiple parcels are undergoing landscape development as one project, but may eventually be individually owned or maintained.

"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.

"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.

"City" means the City of Tustin Community Development Department or 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 landscape 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 landscape area, such as pavements or walls. Pools and other water features are considered part of the landscape area and not considered hardscapes for purposes of these Guidelines.

“Graywater” means a system intreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthy processing, manufacturing, or operating wastes. Graywater includes, but is not limited to, wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs, but does not include wastewater from kitchen sinks or dishwashers as per the Health and Safety Code (Section 17922.12). Graywater systems promote the efficient use of water and are encouraged to assist in on-site landscape irrigation. All graywater systems shall conform to the California Plumbing Code (Title 24, Part 5, Chapter 16) and any applicable local ordinance standards.

“Hydrozone” means a portion of the landscape 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 landscape 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%:

Irrigation Method	**DU_{LQ}**	**DU_{LH}***	**EU**	**IE****
Spray nozzles	65%	79%		71%
High efficiency spray nozzles	70%	82%		73%
Multi stream/Multi trajectory rotary (MSMT) nozzles	75%	85%		76%
Stream rotor nozzle	70%	82%		73%
Microspray	75%	85%		76%
Bubblers			85%	77%
Drip emitter			90%	81%
Subsurface drip			90%	81%

*DU_{LH} = .386 + (.614)(DU_{LQ})
** IE (spray) = (DU_{LH})(IME)
** IE (drip) = Emission uniformity (EU)(IME)

"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 landscape areas and special landscape 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 landscape area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or non-

pervious hardscapes, and other non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation).

“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.

“Low volume overhead irrigation” means aboveground irrigation heads with an upper flow limit of 0.5 GPM.

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

“Manual Isolation Valve” means a valve such as a gate valve, ball valve, or butterfly valve installed downstream of the point of connection of the water supply to shutdown water flow through mainline piping for routine maintenance and emergency repair.

“Master shut-off valve” an electronic valve such as a solenoid valve installed as close as possible to the point of connection and is used in conjunction with a flow sensor and flow monitoring controller technology to automatically shutdown system wide water flow in the event of high flow conditions such as mainline pipe break.

“Maximum Applied Water Allowance” or “MAWA” means the upper limit of annual applied water for the established landscape 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 landscape 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 landscape 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 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 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 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 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 landscape area. For example, runoff may result from water that is applied at too great a rate (application rate exceeds infiltration rate) or when there is a slope.

“Special Landscape 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 community pools and spas, 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 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 Ordinance” means Ordinance No. 1465 adopted by the City Council on December 15, 2015, and codified in the Municipal Code in Sections 9701-9706 of the Tustin City Code.

“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 landscape 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

Appendix G: Irrigation Plan Checklist

This is a voluntary compliance tool template developed by the Irrigation Association.

IRRIGATION PLAN CHECKLIST

Please complete the following checklist by checking all appropriate categories under APPLICANT column, indicating compliance with these content requirements. All submitted plans shall contain the following information:

LANDSCAPE PLAN NUMBER: _____

NAME OF PROJECT: _____

Applicant			Planner
[ ]	1.	Prevailing winds	[ ]
[ ]	2.	Slope aspect and degree of slope	[ ]
[ ]	3.	Soil type and infiltration rate	[ ]
[ ]	4.	Vegetation type	[ ]
[ ]	5.	Microclimates	[ ]
[ ]	6.	Expansive or hazardous soil conditions	[ ]
[ ]	7.	Water harvesting potential	[ ]
[ ]	8.	Available water supply, including non-potable and recycled water	[ ]
All pertinent system information is indicated, including:			
[ ]	9.	Irrigation zones substantially corresponding to hydrozones on the landscape plan and labeled by precipitation rates and method of application	[ ]
[ ]	10.	Water meters	[ ]
[ ]	11.	Tap-in location	[ ]
[ ]	12.	Static water pressure at the point of connection	[ ]
[ ]	13.	System controller	[ ]
[ ]	14.	Rain sensor/shut-off device	[ ]
[ ]	15.	Backflow preventers	[ ]
[ ]	16.	Shut-off valves and zone control valves	[ ]
[ ]	17.	Main line and lateral piping	[ ]
[ ]	18.	Sprinkler heads	[ ]
[ ]	19.	Bubblers and drip irrigation tubing runs	[ ]
[ ]	20.	Type and size of main irrigation system components	[ ]
[ ]	21.	Total required operating pressure for each control valve/zone	[ ]
[ ]	22.	Graphic depiction of the locations of irrigation system components	[ ]
[ ]	23.	Total required operating pressure for each control valve/zone	[ ]
[ ]	24.	Any supplemental stormwater and/or runoff harvesting	[ ]
System design is in conformance with the following standards:			
[ ]	25.	Certification of Professional Qualifications, attached	[ ]
[ ]	26.	Pedestrian surfaces located on plan	[ ]
[ ]	27.	Equipment installed flush with grade for safety	[ ]
[ ]	28.	Compliance with local codes	[ ]
[ ]	29.	Overspray onto impervious areas minimized	[ ]

Appendix H: Inspection Affidavit

This is a voluntary compliance tool template developed by the Irrigation Association.

IRRIGATION INSPECTION AFFIDAVIT
(To be submitted in conformance with Code Section 309.C)

Irrigation Plan File No: _____ Name of Project: _____

Irrigation Plan Designer: _____ Inspector: _____

Date(s) of Inspection: _____

This project was inspected within the limits of customary access for compliance with the approved irrigation plan on file in City Planning. At least two (2) inspections were conducted. The findings are as follows:

(Check One)	Yes	No
A. Inspection during construction to check main line in open trench:		
1. Location of main line conforms to as-built plan	_____	_____
2. Size of main line conforms to plan	_____	_____
3. Depth of main line conforms to plan	_____	_____
4. Main line condition is undamaged	_____	_____
5. Main line pressure tested with water and meter to check for visible leaks	_____	_____
6. Specific observations attached if needed	_____	_____
B. Inspection after completion of system installation prior to seeding or sodding:		
1. Settling along trenches is absent	_____	_____
2. System components (i.e., controller, backflow preventer, rain sensor, etc.) installed as specified	_____	_____
3. Rotary heads pressure tested	_____	_____
4. System activated for observation of compliance	_____	_____
5. Landscape components are not blocking application	_____	_____
6. Each station complies with design / as-built plan	_____	_____
7. Matched precipitation rates provided by zone	_____	_____
8. As-built plan provided to owner	_____	_____
9. Specific observations attached as needed	_____	_____

I hereby certify that I am qualified to submit this irrigation inspection affidavit based on the qualification indicated below: (check one)

☐ Certified Irrigation Designer certified by The Irrigation Association, indicate year of certification _____

State: _____ Licensed No. _____

State Agency Phone No. (_____) _____

_____ _____

Name (PRINT) Signature

Date

DRAFT