GUIDELINES

FOR IMPLEMENTATION OF THE CITY OF ROSEMEAD WATER EFFICIENT LANDSCAPE ORDINANCE

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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 applicants proposing new landscape or landscape rehabilitation projects that are subject to Chapter 13.08 of the City of Rosemead Municipal Code. This document is also intended for use and reference by City staff in reviewing and approving designs and verifying compliance with Chapter 13.08.

(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 (Laird, Water Conservation), Chapter No. 559;

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

(3) Los Angeles County Fire Code Regulations in Title 32 for fuel modification in landscapes;

(4) Water Conservation, Water Supply Shortage, and Drought Response Regulations of the Local Water Purveyor(s) and those contained in Sections 13.04.040 – 13.04.060 of Chapter 13.04 (Water Conservation) of the Rosemead Municipal Code pertaining to Phase I, II, and III water shortage regulations;

(5) Local and State Regulations governing use of Recycled Water;

(6) Rosemead Municipal Code;

(7) Zoning Code;

(8) Building Code;

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

(10) Conditions of approval for a specific project

1.2 Applicability

See Section 13.08.030 of Chapter 13.08 of the City of Rosemead Municipal Code.

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.

2.1 Landscape Documentation Package

(a) A Landscape Documentation Package is required to be submitted by the applicant for review and approval prior to the issuance of ministerial permits and prior to the start of construction. Unless otherwise directed by the City, the Landscape Documentation Package must 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 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 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 Manager or his or her designee 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) a Water Efficient Landscape Worksheet for the landscape project;

(b) water budget calculations for the landscape project

(c) hydrozone information table for the landscape project; and

(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 landscaped area.

2.2 Water Efficient Landscape Calculations and Alternatives

(a) The applicant must provide the calculated Maximum Applied Water Allowance (MAWA) and Estimated Applied Water Use (EAWU) for the landscaped area as

part of the Landscape Documentation Package submittal to the City. The MAWA and EAWU shall be calculated based on completing the Water Efficient Landscape Worksheets (in accordance with the sample worksheets in **Appendix B**).

(b) The EAWU allowable for the landscaped area may not exceed the MAWA. The MAWA must 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 must 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 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 City.

(c) Water budget calculations must adhere to the following requirements:

(1) The MAWA must 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 must 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* must 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 other 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 must 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 must 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 applicant or the City.

(6) For calculation of the EAWU, the area of a water feature is 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, is defined as a very low water use hydrozone with a plant factor of 0.1.

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

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

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

(1) The Maximum Applied Water Allowance must 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 must 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 must be completed by the applicant, or his/her designee, as follows:

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

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

(b) The soil analysis may include:

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 applicant, or his/her designee, must comply with one of the following:

(a) If significant mass grading is not planned, the soil analysis report must 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 must be submitted to the City as part of the Certification of Completion.

(c) The soil analysis report must 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 applicant, or his/her designee, must submit documentation verifying implementation of soil analysis report recommendations to the local agency with the Certification of Completion.

2.4 Landscape Design Plan

(a) For the efficient use of water, a landscape must be carefully designed and planned for the intended function of the project. The following design criteria must 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 City and local tree ordinances or tree shading guidelines; and

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

(b) Each hydrozone must 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 must 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 Los Angeles County, where applicable. When conflicts between water conservation and fire safety design elements exist, the fire safety requirements 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, may 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 must be used for water features.

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

(c) The surface area of a water feature must 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 must 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 must be used on slopes.

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

(d) Soil amendments must 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, must:

(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 must 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 City of Rosemead Water Efficient Landscape Ordinance (Rosemead Municipal Code Chapter 13.08) 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.

2.5 Irrigation Design Plan

(a) For the efficient use of water, an irrigation system must meet all the requirements listed in this section and the manufacturer's recommendations. The irrigation system and its related components must be planned and designed to allow for proper installation, management, and maintenance. An irrigation design plan meeting the following design criteria must 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 are required for irrigation scheduling in all irrigation systems.

(c) The irrigation system must 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 must 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 must be measured at the point of connection. These pressure and flow measurements must be conducted at the design stage. If the measurements are not available at the design stage, the measurements must be conducted at installation.

(d) Sensors (rain, freeze, wind, etc.), either integral or auxiliary, that suspend or alter irrigation operation during unfavorable weather conditions are 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) are 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 are required to protect the water supply from contamination by the irrigation system. A project applicant must refer to the applicable City 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 must 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, must be utilized when designing irrigation systems.

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

(k) Average irrigation efficiency for the project must 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) In mulched planting areas, the use of low volume irrigation is required to maximize water infiltration into the root zone.

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

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

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

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

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

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

(2) Hydrozone

(a) Each valve must 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 must be selected based on what is appropriate for the plant type within that hydrozone.

(c) Where feasible, trees must 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 are not permitted.

(f) On the landscape design plan and irrigation design plan, hydrozone areas must 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, must 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 City of Rosemead Water Efficient Landscape Ordinance (Rosemead Municipal Code Chapter 13.08) 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.

[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 must 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, must 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. The Landscape Grading Design Plan shall be prepared in compliance with the City of Rosemead Building Code or comply with Section 2.6 (b) and (c).

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

(1) height of graded slopes;

(2) drainage patterns;

(3) pad elevations;

(4) finish grade; and

(5) storm water retention improvements, if applicable.

(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 must contain the following statement: "I have complied with the criteria of the Rosemead Water Efficient Landscape Ordinance (Rosemead Municipal Code Chapter 13.08) and applied them accordingly for the efficient use of water in the grading design plan" and shall bear the signature of the landscape professional, as required by law.

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

2.7 Certification of Completion

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

(b) The applicant must 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 must be obtained prior to Planning and Building Department final inspection approvals. 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 must 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."

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

(3) An irrigation audit report from a certified 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.

[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 must be developed, managed, and evaluated to utilize the minimum amount of water required to maintain plant health. Irrigation schedules must meet the following criteria:

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

(2) Overhead irrigation must be in accordance with the Chapter 13.04 of the Rosemead Municipal Code and local water purveyor(s)' Water Conservation Ordinance. In addition, for purposes of the Water Efficient Landscape Ordinance, operation of overhead irrigation systems shall only be allowed between the hours of 5:00 pm and 9:00 am. 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 must be maintained to ensure water use efficiency in accordance with existing local agency code.

3. Provisions for Existing Landscapes

(a) Irrigation of all landscaped areas must be conducted in a manner conforming to the rules and requirements and must 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 upon 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 .

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

Appendix A

CERTIFICATION OF LANDSCAPE DESIGN

I hereby certify that:

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

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

_____

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

(3) The landscape design and water use calculations for the identified property comply with the requirements of the City of Rosemead Water Efficient Landscape Ordinance (Municipal Code Chapter 13.08) and the City of Rosemead Guidelines for Implementation of the City of Rosemead 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 Rosemead Guidelines for Implementation of the City of Rosemead Water Efficient Landscape Ordinance.

_____ _____

Print Name Date

_____ _____

Signature License Number

_____

Address

_____ _____

Telephone E-mail Address

Landscape Design Professional's Stamp
(If applicable)

EXAMPLE WATER EFFICIENT LANDSCAPE WORKSHEET

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

Point of Connection # 1

Maximum Applied Water Allowance (MAWA)

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

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

Example Calculation: a hypothetical landscape project in Rosemead, 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 Pasadena (closest City to Rosemead) is 52.3 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 =	52.3	x	0.7	x	40,000	x	*0.62*	=	907,927
MAWA for *SLA* =	52.3	x	1.0	x	10,000	x	*0.62*	=	324,260
Total *MAWA* =					50,000				1,232,187 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	52.3	x	1.00	x	10,000	x	*0.62*	÷	0.75	=	432,346
Cool Season Turf	52.3	x	1.00	x	0	x	*0.62*	÷	0.71	=	0
Warm Season Turf	52.3	x	0.65	x	0	x	*0.62*	÷	0.71	=	0
High Water Using Shrub	52.3	x	0.70	x	0	x	*0.62*	÷	0.71	=	0
Medium Water Using Shrub	52.3	x	0.50	x	15,000	x	*0.62*	÷	0.65	=	374,146
Low Water Using Shrub	52.3	x	0.30	x	25,000	x	*0.62*	÷	0.75	=	324,260
Very Low Water Using Shrub	52.3	x	0.20	x	0	x	*0.62*	÷	0.71	=	0
Other	52.3	x	0.50	x	0	x	*0.62*	÷	0.71	=	0
Other	52.3	x	0.50	x	0	x	*0.62*	÷	0.71	=	0
Total *EAWU* =					50,000						1,130,752 Gallons per year

Compare *EAWU* with *MAWA*.
The *EAWU* (1,130,752 gallons per year) is less than *MAWA* (1,232,187 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**
Los Angeles County													
Pasadena	2.1	2.7	3.7	4.7	5.1	6.0	7.1	6.7	5.6	4.2	2.6	2.0	52.3
Monrovia	2.2	2.3	3.8	4.3	5.5	5.9	6.9	6.4	5.1	3.2	2.5	2.0	50.2
* The values in this table were derived from:1) California Irrigation Management Information System (CIMIS) 2) Reference EvapoTranspiration Zones Map, UC Dept. of Land, Air & Water Resources and California Dept of Water Resources 1999, 3) Reference Evapotranspiration for California, University of California, Department of Agriculture and Natural Resources (1987) Bulletin 1922 4) Determining Daily Reference Evapotranspiration, Cooperative Extension UC Division of Agriculture and Natural Resources (1987), Publication Leaflet 21426													

LANDSCAPE INSTALLATION CERTIFICATE OF COMPLETION

I hereby certify that:

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

(2) The landscape project for the property located at _____ _____ (provide street address or parcel number(s)) was installed by me or under my supervision.

(3) The landscaping for the identified property has been installed in substantial conformance with the approved Landscape Documentation Package and complies with the requirements of the City of Rosemead Water Efficient Landscape Ordinance (Municipal Code Chapter 13.08 and the City of Rosemead Guidelines for Implementation of the City of Rosemead Water Efficient Landscape Ordinance for the efficient use of water in the landscape.

(4) The information I have provided in this Landscape Installation Certificate of Completion is true and correct and is hereby submitted in compliance with the City of Rosemead Guidelines for Implementation of the City of Rosemead 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:

"***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 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.

"***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.

"***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.

"***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.

"***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 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.

"***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*.

"***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.

"***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.

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

"***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.

"***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.

"***Water Efficient Landscape Ordinance***" means City of Rosemead Ordinance No. ____ and codified in Chapter 15.26 of the City the Municipal 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.

"***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*