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SECTION 3

Riverside County Guide to Water Efficient Landscape Requirements

3.1 Purpose

- 3.1.1 This guide is designed to assist landscape architects, irrigation designers, contractors, planners and the public in the selection of plant materials and irrigation methods that meet the objectives of Ordinances 859 and 348.
- 3.1.2 In order to conserve water in the drought prone state of California, legislation such as AB325 and 1818 mandates the practice of water conservation.
- 3.1.3 Riverside County's commitment to water conservation is exemplified in the adoption of standards that result in a reduction of water usage County-wide, while maintaining a high level of quality landscaping. It is the County's goal to reduce irrigation water usage by 20% through implementation of these requirements.

3.2 Applicability

- 3.2.1 Ordinance 859 and these guidelines are applicable to all discretionary permits and/or approvals for the following:
1. Commercial Development
 2. Industrial Development
 3. Residential Development
 - a. Multi-family Development
 - b. Single Family Common Areas
 - c. Single Family Front Yards
 - (1.) The project applicant shall provide home buyers with sample water efficient planting and irrigation plans, outdoor water conservation pamphlets from the water purveyor (if available), and additional educational material as approved by the Planning Director upon the sale of each dwelling unit within the project.
 - (2.) Please note that the Metropolitan Water District of Southern California (MWD) also has a California Friendly® rebate program available for front yard typical landscaping. MWD rebate approved plans will be deemed compliant with Ordinance 859 and these guidelines subject to Planning Department review.
 - d. Single Family Erosion control landscaping (slopes over 3' in vertical height)
 - e. Model Homes



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- (1.) A sign indicating that the model home features water efficient planting and irrigation shall be displayed in the front yard of each model home which is clearly visible to home buyers.
- (2.) Please note that the Metropolitan Water District of Southern California (MWD) also has a California Friendly® rebate program available for model home landscaping. MWD rebate approved plans will be deemed compliant with Ordinance 859 and these guidelines subject to Planning Department review.

- f. Fuel Modification Zones
4. Road rights-of-way
5. Parks and Public Lands
6. Flood Control Areas
 - a. Retention/ Detention Basins
 - b. Water Quality Swales ('Bioswales')
7. Multiple Species Habitat Conservation Plan (MSHCP) areas
 - a. Applicants are required to consult with the Environmental Programs Department (EPD) to determine acceptable plant species within, and adjacent to, MSHCP areas.

3.2.2 In the event that the water purveyor for a proposed project has adopted more stringent water-efficient landscape requirements, the project shall comply with those requirements.

3.3 Planting Requirements

- 3.3.1 Low water use plant species as defined by the Water Use Classifications of Landscape Species (WUCOLS III) based on the project's applicable WUCOLS zone are strongly encouraged for non-turf planting areas. (WUCOLS zones are also listed on the County of Riverside California Friendly Plant List for convenience.)
- 3.3.2 Plants must be grouped/ irrigated on separate valve zones (hydrozones) based on their water use requirements, slope aspect, and sun/shade microclimate.
 - a. If low water use plants (that can also survive/flourish with medium water application) are used in a medium water use hydrozone, they must be counted as medium water use in the irrigation calculations
- 3.3.3 Plant species must be selected from the "County of Riverside California Friendly Plant List" as shown in Appendix 'A' and available online at <http://www.tlma.co.riverside.ca.us/planning/content/devproc/landscape/landscape.html> . Regarding plants on the list, note the following:



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- a. The species listed are not guaranteed for all situations. Consultation with a landscape architect, arborist, the proposed maintenance entity, local nurseries and the County department(s) having review authority of the landscape plans is recommended.
 - b. In order to incorporate plant species other than those listed, the project applicant must provide the Planning Director (or Transportation Department for projects under their review) with the following:
 - c. Water use requirements per WUCOLS III or field data verifying the plant's landscape (crop) coefficient.
 - d. Plant species description from Sunset Western Garden Book or other source.
 - e. Comparison to a similar species included in the plant list
- 3.3.4 Plants shall be selected based on their level of maintenance, durability, mature widths and heights, aesthetic appeal, and thematic qualities.
- 3.3.5 Do not use thorny plants where their placement could be hazardous to public safety such as near sidewalks or trails.
- 3.3.6 Plant species must be selected based on their appropriate plant hardiness climate zones as defined by Sunset Western Garden Book. (Sunset climates zones are also listed on the County of Riverside California Friendly Plant List for convenience.)
- 3.3.7 All non-turf planting areas must be mulched to retain moisture, suppress weeds, and moderate soil temperature. Mulch depth and type must be noted on plans.
 - a. Planting areas shall be mulched with a three inch (3") minimum layer of organic mulch. (Areas of groundcover planted from flats shall be mulched with a one and one half inch (1 1/2") minimum layer of organic mulch.)
 - b. Some maintenance districts require differing mulch thicknesses. The more stringent (thicker) requirement shall prevail.
 - c. Color enhanced mulches are prohibited.
 - d. Mulch may be omitted for native revegetation projects upon the recommendation of the project biologist.
 - e. Planting areas in the desert regions (Sunset Climate Zones 11 and 13) shall be mulched with a two inch (2") layer of decomposed granite/ gravel mulch.
 - f. 1" minus (sieve gradation /size) decomposed granite mulch is suggested for aesthetic purposes.
 - g. Cobble groundcover areas within the public R.O.W. must be grouted in place unless commercial/industrial private maintenance.
 - h. Mulch shall be omitted for hydroseeded areas.
- 3.3.8 Turf shall be used as a functional recreational element rather than solely for aesthetic purposes.



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- a. Small, irregularly shaped turf areas shall be avoided.
- b. Lower water use, warm season turf grasses are encouraged. Grasses such as Bermuda that are dormant (brown) in the winter are acceptable if the maintenance entity over-seeds with perennial rye on an annual basis during the dormancy period.
- c. If over-seeding is not a practice of the maintenance entity, a deep-rooting, drought resistant, hybrid tall fescue is encouraged.
- d. Turf is prohibited within County road rights-of-way, unless the turf areas are contiguous to turf areas within parks.

3.3.9 Shrubs shall be designed so that their mature width will not require excessive pruning.

3.3.10 Street lights shall be shown on plans, and trees shall be located with a minimum of twenty foot (20') clearance from street lights.

3.3.11 Vines shall be planted along all walls at ten feet (10') on center as a graffiti prevention measure.

3.3.12 Plans must note or specify that site-specific agronomic soils test(s) are required, and that contractors are required to follow the test result report recommendations for amending the soil.

3.3.13 Planting plans shall include the following:

- a. Proposed trees, shrubs, groundcover, and vines clearly indicated.
- b. Legend including plant symbol, genus, species, common name, spacing, size, quantity, water use per applicable WUCOLS III zone, and detail reference (for example P-1, P-2, etc.).
- c. Indicate and label existing trees and vegetation to remain or to be removed.
- d. Notes, details, and specifications
- e. Root barrier noted for trees within 6' of hardscape. Root barriers shall be placed in a linear fashion along edges of hardscape, not encircling the tree root ball.

Also See "General Requirements for Landscape Plans" section for additional requirements.

3.4 Irrigation Requirements

Irrigation systems shall be designed, constructed, managed, and maintained to achieve the highest overall efficiency possible. Efficiency is measured by the amount of water beneficially used to sustain plant life divided by the amount of water applied. Efficiency is affected by the attributes of the controller, method of irrigation, irrigation equipment, proper hydrozoning, site topography, condition and size of plants, and weather conditions.



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- 3.4.1 Projects must include a “smart” irrigation controller with the following attributes:
- Real-time, weather based program adjustment capability.
 - Project must have an on-site weather station or external ETo input.
 - Rain sensors shall be placed within an unobstructed natural rainfall area and shall be located above the irrigation spray pattern.
 - Master valve (or simultaneous operations)
 - Multiple start times
 - Minimum of two programs
- 3.4.2 High efficiency irrigation methods (for example, drip, ‘MP rotators’, micro-sprays) are encouraged.
- 3.4.3 Rotors and spray heads shall be designed and installed with minimized overspray onto paved surfaces, structures, and non-vegetated areas. The design shall be head-to-head coverage with a maximum of 60% diameter overlap. Rotors and spray heads shall be zoned separately. Half rotors and full rotors shall be zoned separately, unless matched precipitation nozzles are used.
- 3.4.4 For drip applications, in-line pressure regulators shall be used per factory recommendations for the specific irrigation products being used.
- 3.4.5 Irrigation systems shall be zoned according to plant water use, slope aspect, and sun/shade microclimate.
- 3.4.6 Anti-drain check valves shall be designed and installed at strategic points to prevent low head drainage.
- 3.4.7 Irrigation systems shall be scheduled so that the irrigation precipitation rate does not exceed the infiltration rate of the soil.
- 3.4.8 Recycled water must be used for irrigation if available. Plans must also be designed for recycled water for areas that are scheduled for recycled water in the future. Recycled water irrigation plans shall be reviewed and approved by the governing water purveyor to satisfy the requirements of the Riverside County Health Department.
- Also see “Recycled Water Irrigation” section.*
- 3.4.9 A baseline irrigation schedule shall be provided on the plans for the initial 90-day plant establishment period and established landscape. The contractor shall adjust the schedule to meet site specific requirements and use the baseline schedule to set the weather-based controller. The schedule currently in effect shall be posted in the controller.



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3.4.10 Controller shall be operational and set to real-time weather upon the completion of the 90 day maintenance period.

Also see “Landscape Inspections” section.

3.4.11 Irrigation Plans shall also include the following:

- a. Location and size of service lateral(s) for irrigation water meter(s)
- b. Location and size of irrigation water meter(s)
- c. Static Water Pressure at point of connection (POC)
- d. Location, size and type of all irrigation components including, but not limited to, controller, backflow prevention device, ball valves, pressure supply line (include class or schedule of pipe), lateral lines (include class or schedule of pipe), pipe sizing, valves, spray heads, rotors, drip, low volume irrigation equipment, gallons per minute, pressure regulators, and pumps.
- e. Hydraulic Calculation worksheet including flow rate (gallons per minute) and design operating pressure.
- f. Irrigation legend with the symbol, manufacturer name, model number (or non-proprietary description for publicly funded projects)

3.5 Water Budget Calculations

Water budgets are used to assist designers and governing authorities. They are a tool to verify compliance with the state requirements for water conservation and they assist with water demand management. A water budget determines how much water a particular landscape needs over a specified period of time. The Maximum Annual Water Allowance (MAWA) is calculated and compared to the Estimated Annual Water Use (EAWU) to verify the landscape is not exceeding allowed water use.

3.5.1 Maximum Annual Water Allowance (MAWA) = $ET_o \times 80\% \times S.F. \times 0.62 / 7.48$

- ET_o = Annual Reference Evapotranspiration Rate (the quantity of water evaporated from adjacent soil surfaces and transpired by plants) in inches for a particular climate zone.
- 80% = The percentage of ET_o allowed per Ordinance 859
- S.F. = Landscaped area in square feet.
- 0.62 = Conversion factor for inches to gallons
- 7.48 = Conversion factor for gallons to cubic feet (C.F.)

Since ET_o rates vary according to climate, the ET_o rate must be identified for the project. County of Riverside Reference ET_o data, obtained from California Irrigation Management Information System (CIMIS) - Department of Water Resources Office weather stations in Riverside County is shown below:



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CIMIS Station	Location	Ref. ETo
24	Thermal	73.03
25	Rancho Mirage	71.40
34	Rancho California	49.54
36	Blythe	71.40
44	UC Riverside (Riverside)	56.37
55	Palm Desert	72.77
62	Temecula	66.14
118	Cathedral City	57.06
130	Temecula East	49.54
135	Blythe Northeast	70.80
136	Oasis	71.40
141	Mecca	62.68
151	Ripley	71.40
154	Salton Sea North	71.65
162	Indio	71.40
176	La Quinta	71.40
179	Winchester	57.33

If the project is not within one of the weather station areas listed, use the closest representative weather station.

3.5.2 Estimated Annual Water Use (EAWU)= $ETo \times PF \times S.F. \times 0.62 / (IE \times 7.48)$

The formula is calculated for each hydrozone separately, then the total of all hydrozones is divided by the Irrigation System Operation Efficiency (IS).

- PF = Average Plant Factor based on WUCOLS III

WUCOLS III categorizes plants as high (H), medium (M), low (L), and very low (VL) based on water requirements.

Plant Category	Average Plant Factor
H	0.8
M	0.5
L	0.2
VL	0.1

The water use requirements also vary according to regional climate zones. Plant categories used in the calculation must be from the appropriate WUCOLS Regional Zones as defined below:



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WUCOLS III Region	Corresponding Sunset Zones
1	14, 15, 16, 17
2	8, 9
3	22, 23, 24
4	18, 19, 20, 21
5	11
6	13

- IE = Irrigation Efficiency is derived from measurements and estimates of the irrigation application method performance within controlled environmental conditions.

<u>Application Method</u>	<u>IE Factor</u>
Drip	0.90
Bubblers	0.85 (with proper run times)
MP Rotators	0.75
Rotors	0.75
Microsprays	0.70
Spray Heads	0.60

- IS = Irrigation System Operation Efficiency is derived from the efficiency of the controller.

<u>Controller Type</u>	<u>IS Factor</u>
“Smart” Controller	0.85 (Required)

3.5.3 The following water use calculation worksheet shall be completed and included on all landscape plans. It can be downloaded at

<http://www.tlma.co.riverside.ca.us/planning/content/devproc/landsape/landscape.html>

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SEE NEXT PAGE FOR CALCULATIONS WORKSHEET



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Riverside County Ordinance 859 Landscape Water Use Calculations
SAMPLE - (Insert Project Name)
 (For projects with more than 1 hydrozone)

1 Maximum Annual Water Allowance (MAWA)

INPUT the total square footage of landscape = S.F.
 INPUT the Hist. ETo for the area =

MAWA = 38,016 cu ft / yr

2 Estimated Annual Water Use (EAWU)

Hydrozone # 1 INPUT Plant Factor = (Turf)
 INPUT square footage of hydrozone =
 INPUT hydrozone irrigation efficiency =
 EAWU = cu ft / yr

Hydrozone # 2 INPUT Plant Factor = (High)
 INPUT square footage of hydrozone =
 INPUT hydrozone irrigation efficiency =
 EAWU = cu ft / yr

Hydrozone # 3 INPUT Plant Factor = (Med)
 INPUT square footage of hydrozone =
 INPUT hydrozone irrigation efficiency =
 EAWU = cu ft / yr

Hydrozone # 4 INPUT Plant Factor = (Low)
 INPUT square footage of hydrozone =
 INPUT hydrozone irrigation efficiency =
 EAWU = cu ft / yr

Hydrozone # 5 INPUT Plant Factor = (Very Low)
 INPUT square footage of hydrozone =
 INPUT hydrozone irrigation efficiency =
 EAWU = cu ft / yr

SubTotal EAWU = cu ft / yr
 Input Irrigation System Operation Factor
Total EAWU = 20,188

EAWU < MAWA = 17,828 cu ft / yr
 (this number must be positive)

Figure 3-1 – Water Use Calculations Worksheet



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3.6 Water Efficient Landscape Maintenance

Perpetual landscape maintenance is paramount to water efficient landscaping and water conservation. Regardless of the efficiency of the irrigation design and installation, a landscape can quickly lose its efficiency with the lack of proper maintenance. The following list contains continual maintenance responsibilities:

- a. Monitoring and adjustment of “smart” controllers
- b. Repairing of broken/ leaking/ clogged/ malfunctioning irrigation equipment
- c. Calibrating irrigation application equipment to provide maximum efficiency
- d. Maintaining minimum mulch levels
- e. Pruning plants to eliminate irrigation application interference
- f. Replacement of equipment with identical equipment
- g. Replacement of plant materials with plants of identical water use requirements