

RIVERSIDE  
CITYWIDE DESIGN GUIDELINES  
APPENDIX C: WATER EFFICIENT LANDSCAPING AND  
IRRIGATION DESIGN GUIDELINES

**Attachment 1 - P18-0608**  
**Water Efficient Landscape & Irrigation Design Guidelines**

ADOPTED XX 2018  
RESOLUTION No. #  
CITY OF RIVERSIDE

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**T**he continuation of the City of Riverside's economic prosperity is dependent on the availability of adequate supplies of water for future uses. The City's policy is to promote the efficient use of water and to prevent the waste of this valuable resource.

Landscapes are essential to the excellent quality of life in the City. In addition to providing areas for active and passive recreation, creating visual interest and providing spatial definition, landscapes should play a vital role in enhancing the environment. Landscapes can achieve this by cleaning air and water, preventing erosion, providing low impact drainage solutions, offering fire protection, and replacing ecosystems that have been lost or damaged due to development.

Landscape design, installation, maintenance, and management can and should be water efficient. Riverside's climate creates an opportunity to select a rich variety of plantings that are also drought-tolerant and water-efficient. The privilege to use water is limited to the amount reasonably required for the beneficial use of the community. This privilege does not extend to the unreasonable use or waste of this precious natural resource. The Zoning Code, Title 19.570 – Water Efficient Landscaping and Irrigation together, along with these Citywide Design Guidelines are intended to ensure that the City's water supply is used efficiently.

We can achieve water conservation by raising the public awareness of the need to conserve water through education, and motivation to embrace an effective water conservation program.



*An attractive and inviting landscape can improve the quality of our lives.*



*Creative landscape design can help restore a natural habitat disturbed by land development.*





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### MAP OF WATER SUPPLY BASINS



Riverside's water supply begins as pure rain and snow that is naturally filtered through the sand and gravel of the Bunker Hill and Riverside Basins in San Bernardino and Riverside. This water settles in pools deep in the earth and is then tapped for domestic use by numerous wells operated by Riverside Public Utilities.



*Reducing or even eliminating turf can minimize water use and, at the same time, maximize the aesthetic value of the landscape.*



*Installing the most efficient irrigation management and delivery systems available can reduce your landscape irrigation water use by 50%*

### REDUCING OUR LANDSCAPE WATER USE



*Using a climate-appropriate plant palette and water features that utilize a recirculating system can create a beautiful water-conserving landscape.*

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### I. WHY WATER EFFICIENCY AND CONSERVATION ARE IMPORTANT

Water is a valuable natural resource, and how it is managed today will affect how accessible it will be in the future. Riverside's primary water supplies come from underground sources fed by rain and snow falling in the San Bernardino Mountains and local foothills. Riverside Public Utilities has developed an Urban Water Management Plan ([www.riversidepublicutilities.com](http://www.riversidepublicutilities.com)) that provides both historic and projected water use. The plan summarizes several future water supply projects and programs that will achieve near complete water independence. With this principal goal set, Riverside's water resources are exceedingly valuable and need to be resolutely protected. According to the Department of Water Resources, landscape water use typically exceeds 50% of a single residential property's total water use, making water efficient landscape design essential to preserving Riverside's water resources.

Drought is a constant element of the City and State's climate. Experts believe that the changes in rain and snowfall patterns will result in longer periods of drought in the future. Although the City of Riverside may not always be in a state of drought, it is of vital importance to increase water efficiency and conservation to help prevent the severe effects of drought. The State's population is expected to grow consistently and significantly. This increase in population will create an increase in the need for water.

The effects of these issues result in the need to reduce water usage by increasing water efficiency and conservation. The City of Riverside has established these guidelines in order to approach these issues and provide ways to accomplish water efficiency and conservation in the landscape. Riverside Public Utilities, the Western Municipal Water District, and the Eastern Municipal Water District are helping promote water efficiency and conservation by providing educational resources and offering rebates for both residential and commercial customers who participate in their many water efficiency programs such as: installing weather-based irrigation controllers, water conserving landscape designs, turf reduction and/or replacement, and high efficiency irrigation systems. These and other methods can help ensure that our water resources will be available for our City's thriving future.

*For further educational resources and possible rebate programs visit the following websites:*



*Riverside Public Utilities*  
[www.riversidepublicutilities.com](http://www.riversidepublicutilities.com)



*Western Municipal Water District*  
[www.wmwd.com](http://www.wmwd.com)



*Eastern Municipal Water District*  
[www.emwd.org](http://www.emwd.org)





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### II. CITYWIDE WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES



These Guidelines have been established to supplement the requirements of the City's Water Efficient Landscaping and Irrigation standards, Chapter 19.570 of the Zoning Code (Title 19 of the Riverside Municipal Code) by enhancing upon and clarifying those requirements through narrative, illustrative and photographic examples of best practices in water efficient landscape design. They also serve as a guide for developers, landscape architects and other design professionals to establish well designed landscape and irrigation plans to successfully reduce water usage, increase water efficiency and promote conservation.

#### A. WHEN DO THE GUIDELINES APPLY?

- New construction with a total landscape area equal to or greater than 500 square feet that requires a building or landscape permit, plan check or design review.
- Rehabilitated landscape projects with a total landscape area equal to or greater than 2,500 square feet that requires a building or landscape permit, plan check or design review.
- Existing landscapes with a total landscape area over one acre that exhibit potential water inefficiency or waste may be subject to review by the water purveyor to evaluate water use and provide recommendations as necessary to achieve greater water efficiency.
- New and existing cemeteries are subject to limited sections of the Guidelines. Refer to the City's Chapter 19.570.090 for additional information.
- All public projects shall comply with these guidelines.





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### B. LANDSCAPE AND IRRIGATION DESIGN, REVIEW AND CERTIFICATION GUIDELINES

#### 1. PLANTING DESIGN AND PLAN GUIDELINES

- A. Climate appropriate plant material shall be selected to promote the efficient use of water. The following resources offer reference plant lists: Sunset Western Garden Book, Western Municipal Water District's at [www.wmwd.com](http://www.wmwd.com), and Riverside County Guide to California Friendly Landscaping (Landscaping Guide) at [www.rctlma.com](http://www.rctlma.com). Also, refer to Section V. of these guidelines, Climate Appropriate Plants for the City of Riverside.
- B. Any plant may be selected for the landscape, providing that the water budget calculations 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 the Special Landscape Areas. Also, the Estimated Total Water Use (ETWU) must not exceed the Maximum Applied Water Allowance (MAWA). Refer to Section IV. Examples and Worksheets for additional guidance on how to calculate the ETWU and MAWA.
- C. Plants shall be classified according to their water use, such as high, moderate, low and very low. These classifications shall be listed from the Water Use Classification of Landscape Species (WUCOLS), [www.ucanr.edu](http://www.ucanr.edu), or from horticultural researchers with academic institutions or professional associations as approved by the California Department of Water Resources (DWR), [www.water.ca.gov](http://www.water.ca.gov).
- D. Plants with the same water use classification shall be grouped together in hydrozones with regard to their water, soil, sun, and shade requirements and in relationship to buildings. Refer to Section IV. Examples and Worksheets, B. Graphic Illustration of Hydrozone Areas for further clarification.
- E. Hydrozones with different water needs shall be irrigated separately. Deviation from these groupings are discouraged, but shall be allowed under the following provisions.
  1. Mixed hydrozones shall only consist of two proximate classifications: low mixed with moderate, moderate mixed with high.
  2. Hydrozone classification shall be the plant classification of the highest water using plant. For example, if a hydrozone consists of both moderate and low water use plants, the moderate classification shall be used.



*Landscapes should be designed with the various elements that affect water use in mind so that plants can be easily separated into hydrozones.*

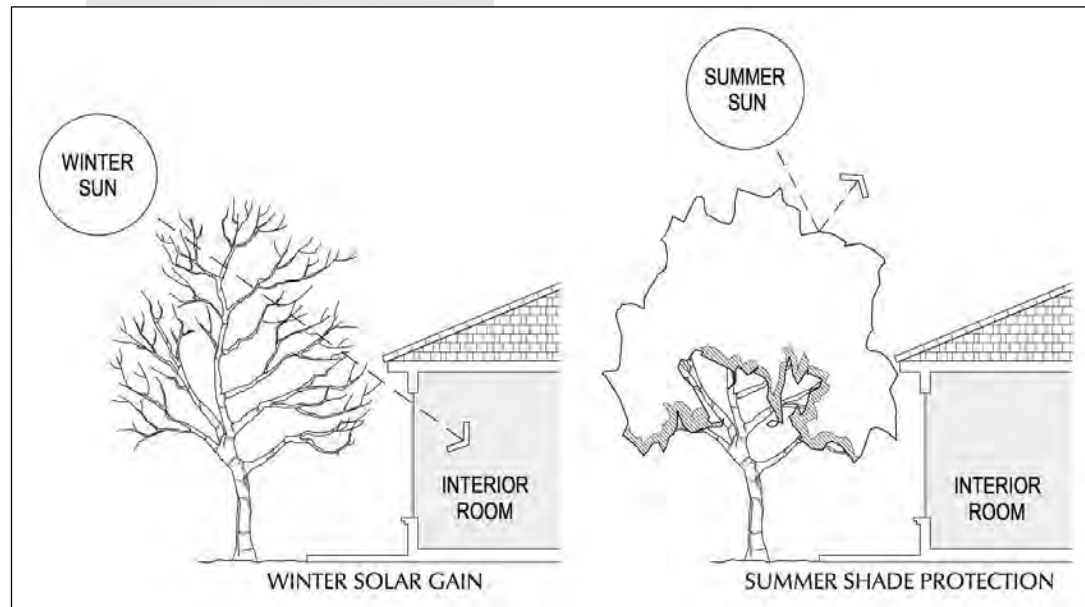




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- F. Trees for shade shall be provided for residential, commercial and industrial buildings, parking lots and open space areas. These trees can be deciduous or evergreen and are to be incorporated for the purpose of energy conservation and the efficient use of water.
- G. Plants shall be placed in a manner considerate of solar orientation to maximize summer shade and winter solar gain.
- H. To help retain soil moisture and promote plant health, all exposed soil surfaces of non-turf areas within the developed landscape area shall be mulched with a minimum three inch (3") layer of material, except in areas with groundcover planted from flats, where mulch depth shall be one and one half inches (1 ½"). In hydro-seeded areas, the mulch component of the seed-mulch slurry meets the requirement.
- I. For slope conditions, mulch products shall be carefully selected to help stabilize and control soil erosion. Typically, coarse shredded mulch will knit together and resist migration. Additional stabilizing materials may be necessary on large, steep slopes.



- J. Recycled or post-consumed organic mulch shall be used over inorganic or virgin materials, unless they are unavailable or prohibited by fuel modification restrictions.
- K. Soil amendments shall be incorporated into the soil according to the recommendations of the soil report, and what is appropriate for selected plant material.
- L. Prior to planting, any compacted soil shall be transformed to a friable or crumbly texture to provide the optimum soil condition for plant health and drainage.

*A deciduous tree placed to the south or the west side of the building can provide summer shade protection and still allow winter solar gain.*

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- M. Turf areas shall be designed to comply with the water budget and in response to functional needs, such as active play areas of parks, sports fields and golf courses.
- N. Turf is not allowed on slopes greater than 25% where the toe of the slope is adjacent to an impermeable hardscape. A 25% slope means a one foot of vertical elevation change for every four feet in horizontal length.
- O. Plant selection for projects in fire-prone areas shall address fire safety and prevention. A defensible space or zone around a building or structure is required per Public Resources Code Section 4291(a) and (b). Fire-prone plant materials and highly flammable mulches shall be avoided. Refer to Riverside County Fire Department Fire Protection, [www.rvcfire.com](http://www.rvcfire.com), for additional information.

*For landscape design guidelines in fire-prone areas visit the following website:*



*Cal Fire*  
[www.fire.ca.gov](http://www.fire.ca.gov)

*To review a list of California's invasive species visit the following website:*

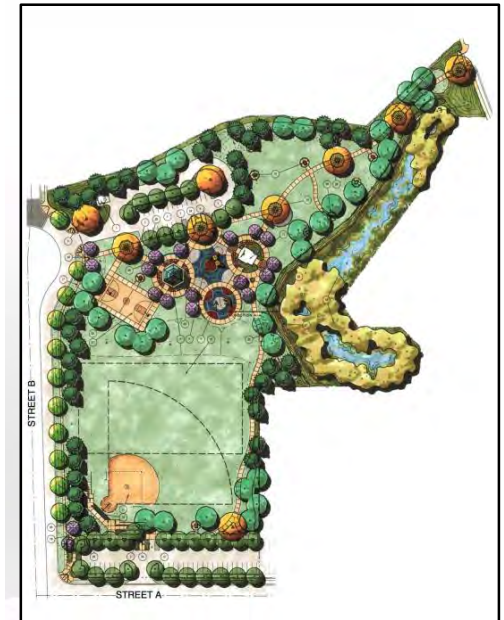


***Don't Plant a Pest!***

*California Invasive Plant Council*  
[www.cal-ipc.org](http://www.cal-ipc.org)

- P. Invasive species of plants shall be avoided especially near parks, buffers, greenbelts, bodies of water, and open spaces because of their potential to cause harm to environmentally sensitive areas.

1. When a project is located in the Sycamore Canyon, Canyon Springs, Mission Grove, or Canyon Crest neighborhoods the Multiple Species Habitat Conservation Plan (MSHCP), Table 6.2, "Plants that Should be Avoided Adjacent to the MSHCP Conservation Area" shall be consulted to avoid the use of invasive plant species. The MSHCP and referenced Table 6.2 can be found at the Western Riverside County Regional Conservation Authority website, [www.wrc-rca.org](http://www.wrc-rca.org).



*Turf areas can provide space for active play in a park setting.*



*In residential projects turf can provide a small passive play area or allow high use pedestrian traffic areas.*





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- Q. When feasible, natural vegetation and native plant species are to be preserved and protected.
- R. Decorative water features shall use re-circulating water systems.
- S. Pool and spa covers are highly recommended to help reduce water loss due to evaporation.
- T. Recycled water shall be used where available as the source for irrigation, and decorative water features, consistent with the provisions of Zoning Code, Title 19.570.060 – Recycled Water and Municipal Code, Title 14.28 – Mandatory Use of Recycled Water.
- U. Landscape areas provide numerous stormwater best management practice opportunities that encourage on-site detention and infiltration of storm water such as:
  1. Infiltration beds, swales, and basins that allow water to collect and percolate into the ground,
  2. Constructed wetlands and detention ponds that detain water, handle excessive flow, and filter pollutants,
  3. Rain harvesting or catchment technologies (e.g., rain gardens, cisterns, etc.), and
  4. Permeable paving elements (e.g., permeable pavers or blocks, permeable concrete, or decomposed granite).



*Swales like this dry streambed (right) and permeable paving, such as the permeable pavers and decomposed granite pathway (left), can provide design interest as well as creative drainage solutions for any type of project.*



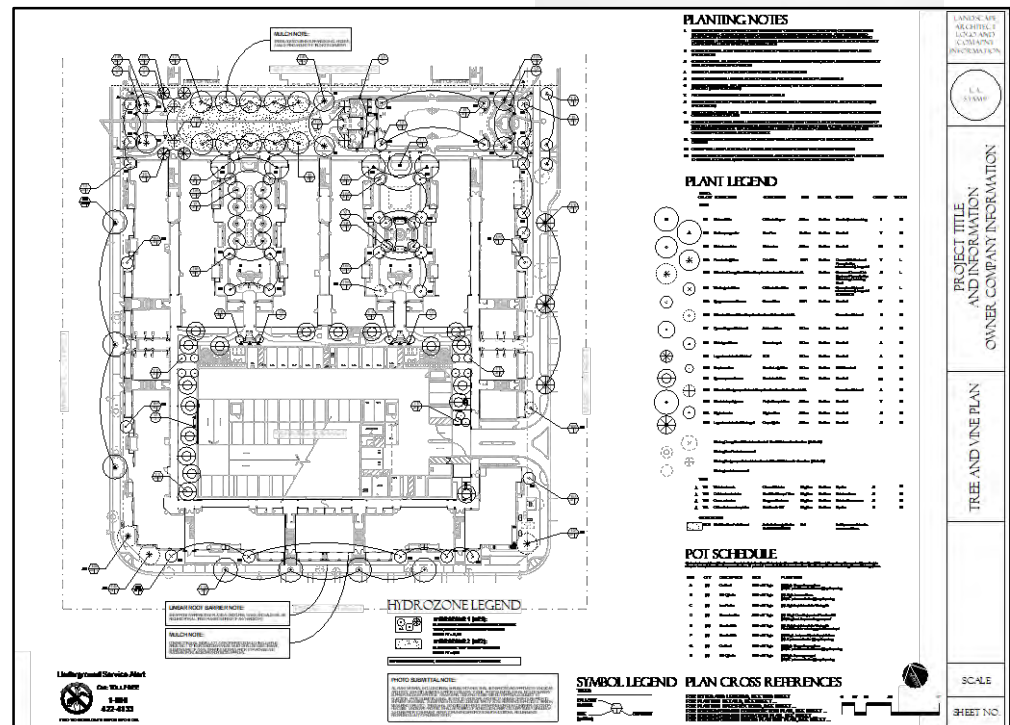
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V. The following can be used as a required items checklist for the completion of the Planting Plan:

- ☐ New and existing trees, shrubs, ground covers, and turf areas within the proposed landscape area, each clearly delineated by symbol and/or callout,
- ☐ Planting legend indicating:
  - All plant species by botanical name and common name,
  - Individual plant spacing,
  - Quantities of each plant species by container size (e.g., 24" Box, 15 gallon, 4" pots, or flats), and
  - Water Use Classification of Landscape Species (WUCOLS) plant classification for each plant.
- ☐ Designation of hydrozones,
- ☐ Total area, in square feet, devoted to landscaping, and a breakdown of each area by hydrozone in square feet,
- ☐ Property lines, streets, and street names,
- ☐ Building locations, driveways, sidewalks, retaining walls, and other hardscape features,
- ☐ Appropriate scale and north arrow,
- ☐ Any special landscape areas (SLA) as defined in Section III. Definitions for Water Efficient Landscaping and Irrigation Design Guidelines,
- ☐ Type of mulch and application depth,
- ☐ Recommended soil amendments, type and infiltration rate,
- ☐ Type and surface area of any water feature,
- ☐ Identify pervious and non-pervious hardscapes,
- ☐ Type and installation details of any applicable stormwater best management practices,
- ☐ Planting specifications and details, and

*Below is an example Planting Plan that illustrates the required information as outlined in this Section.*





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- ❑ Water Efficient Landscape Worksheet. Refer to Section IV. Examples and Worksheets for provided form.

**WATER EFFICIENT LANDSCAPE WORKSHEET**

Reference  $ET_o$  for the area  $ET_o = 56.4$

**Estimated Total Water Use (ETWU):**  
ETWU is calculated using the following formula:  $(ET_o) (.62) (ETAF) (LA)$  where  $ETWU/ETAF$  is  $PF/IE$

Hydrozone # / Planting Description	Plant Factor (PF)	Irrigation Method	Irrigation Efficiency (IE)	ETAF (PF/IE)	Landscape Area (sq. ft.)	ETAF x Landscape Area	Estimated Total Water Use (ETWU) gallons/yr
<b>Regular Landscape Areas</b>							
H2#							
H2#							
H2#							
H2#							
H2#							
H2#							
					Totals	(A)	(B)
<b>Special Landscape Areas</b>							
H2#							
H2#							
H2#							
					Totals	(C)	(D)
					Estimated Total Water Use in gallons per year, ETWU Total		
					Maximum Annual Water Allowance in gallons per year, MAWA Total		
					MAWA calculation: $(ET_o) (.62) [(ETAF \times LA) + ((1-ETAF) \times SLA)]$		
					where nonresidential MAWA ETAF is 0.45 and residential MAWA ETAF factor is 0.55		
					MAWA - ETWU = must be a positive number		
<b>ETAF Calculations:</b>							
<b>Regular Landscape Areas</b>							
Total ETAF x Area					(B)		
Total Area					(A)		
Average ETAF					B / A		
Average ETAF for Regular Landscape Areas must be 0.45 or below for nonresidential areas and 0.55 or below for residential areas.							
<b>All Landscape Areas</b>							
Total ETAF x Area					(B+D)		
Total Landscape Area (LA)					(A+C)		
Site-wide ETAF					(B+D) / (A+C)		
The calculation results shown in red need to meet the stated requirements for the water budget to be considered compliant.							

Water budget calculations shall be 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 the Special Landscape Areas. Also, the Estimated Total Water Use (ETWU) must not exceed the Maximum Applied Water Allowance (MAWA).

- Maximum Applied Water Allowance (MAWA)

The MAWA for the total landscape area is calculated as follows:

$$MAWA \text{ (in gallons)} = (ET_o) (0.62) [(ETAF \times LA) + ((1-ETAF) \times SLA)]$$

Where:

**MAWA** Maximum Applied Water Allowance, in gallons per year

**$ET_o$**  Reference Annual Evapotranspiration Rate, in inches per year is 56.4 for the City of Riverside. Refer to this Appendix, Section III. Definitions for monthly  $ET_o$  values

**0.62** Conversion Factor, to gallons

**ETAF** ET Adjustment Factor (ETAF) for the MAWA calculations are as follows: ETAF is 0.55 for residential areas and 0.45 for non-residential areas.

**LA** Landscape Area including SLA, in square feet

**SLA** Special Landscape Area (SLA), in square feet. Refer to the Definitions for additional information regarding SLA

Refer to Section IV. Examples and Worksheets for additional guidance on how to calculate the ETWU and MAWA. Also, see the City of Riverside's website, [www.riversideca.gov](http://www.riversideca.gov)

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- Estimated Total Water Use (ETWU)

The ETWU for each designated hydrozone is calculated as follows:

$$ETWU \text{ (in gallons)} = (ET_o) (0.62) (ETAF \times LA)$$

Where:

*ETWU* Estimated Total Water Use, in gallons per year

*0.62* Conversion Factor, to gallons

*ET<sub>o</sub>* Reference Annual Evapotranspiration Rate, in inches per year is 56.4 for the City of Riverside. Refer to this Appendix, Section III. Definitions for monthly *ET<sub>o</sub>* values.

*PF* Plant Factor (PF) of the hydrozone, refer to the Hydrozone Classification chart at right for the corresponding Hydrozone Plant Factor Range and Median Values

All water features shall be included in the high water use hydrozone and temporarily irrigated areas shall be included in the low water use hydrozone

*IE* Irrigation Efficiency (IE) of the hydrozone, refer to the Irrigation Equipment chart at right for the corresponding IE factors

*ETAF* ET Adjustment Factor (ETAF) for the ETWU is calculated by dividing the Plant Factor (PF) by the Irrigation Efficiency factor (IE),  $ETAF = PF/IE$

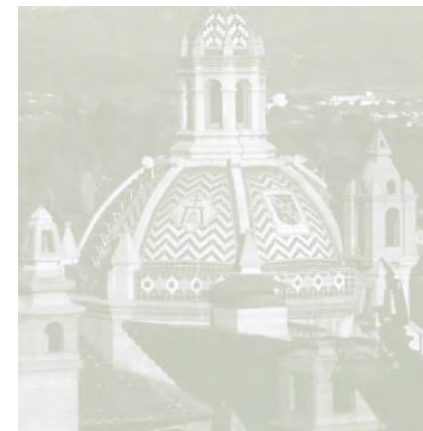
The ETAF for SLA is 1.0, and the ETAF for existing non-rehabilitated landscapes is assumed at 0.8

*LA* Landscape Area of each hydrozone, in square feet

*SLA* Special Landscape Area (SLA), in square feet. Refer to the Definitions for additional information regarding SLA

Hydrozone Classification	Hydrozone Plant Factor Range	Median Value
VL Very Low	0 – 0.1	0.1
L Low	0.1 – 0.3	0.2
M Moderate	0.4 – 0.6	0.5
H High	0.7 – 0.9	0.8

Irrigation Equipment	IE
Drip	0.81
Spray heads	0.75





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### i. Determining hydrozone plant factor (PF):

- When a hydrozone area contains plants with two proximate plant classifications, the plant classification of the highest water using plant shall be used.
- For most landscape situations the median numeric plant factor for each hydrozone should be selected as the PF to use in calculating the ETWU. The hydrozone can be further adjusted to the top or bottom of the designated plant factor range when taking the plant species water use needs, planting density and microclimate into consideration. For example, a densely planted hydrozone consisting of moderate plants may be determined to be at the top of the *Moderate* range, and would therefore adjust the PF up to 0.6, whereas the same hydrozone less densely planted and protected from climate factors such as sun or wind may be determined to be at the bottom of the *Moderate* range, and would therefore adjust the PF down to 0.4. Refer to Hydrozone Classification chart for hydrozone classifications, hydrozone plant factor ranges and median values.



*Soil samples should be collected and submitted to an agronomic soils lab for analysis and recommendations as early as possible to allow a more thoughtful and thorough planting and irrigation design.*

### □ A Soil Management Report shall be obtained by the project applicant, or a designee, in order to reduce runoff and encourage healthy plant growth.

- Submit soil samples to a laboratory for analysis and recommendations. Soil sampling shall be conducted in accordance with laboratory protocols.
- Soil analysis shall include:
  - soil texture,
  - infiltration rate,
  - pH,
  - total soluble salts,
  - sodium,
  - percent organic matter, and
  - recommendations

SOILS LABORATORY 1234 Main Street City, State and Zip Code (012) 345-6789			SOIL ANALYSIS REPORT:	
			Location:	
			Requested by:	
ammonium bicarbonate/DTPA extractable - mg/kg soil			13-113-28	Sample ID Number
Interpretation of data			12"	Sample Description
low	moderate	high	elements	data
0-7	8-15	over 15	phosphorus	10.27 moderate
0-59	60-120	121-180	potassium	43.83 low
0-3	4-10	over 10	iron	11.03 high
0-05	0.6-1.0	over 1.0	manganese	3.06 high
0-0.9	1.0-1.5	over 1.5	zinc	1.27 moderate
0-0.2	0.3-0.5	over 0.5	copper	2.16 high
0-0.1	0.2-0.5	over 1.0	boron	0.25 moderate
			calcium	371.52 moderate
			magnesium	104.08 high
			sodium	31.94 very low
			sulfur	38.32 low
			molybdenum	n d very low
			nickel	0.10 very low
The following trace elements may be toxic. The degree of toxicity depends upon the pH of the soil, soil texture, organic matter, and the concentrations of the individual elements as well as to their interactions.			aluminum	n d very low
			arsenic	0.02 very low
			barium	1.85 very low
			cadmium	0.03 very low
			chromium	0.02 very low
			cobalt	0.08 very low
			lead	0.68 very low
			lithium	0.26 very low
			mercury	n d very low
			selenium	0.04 very low
The pH optimum depends upon soil organic matter and clay content- for clay and loam soils: under 5.2 is too acidic; 6.5 to 7 is ideal; over 8.0 is too alkaline. The ECe is a measure of the soil salinity: 1-2 affects a few plants; 2-4 affects some plants; > 4 affects many plants.			silver	n d very low
			strontium	1.76 very low
			tin	n d very low
			vanadium	0.35 very low
			Saturation Extract	
			pH value	7.14 moderate
			ECe (milli-mho/cm)	4.06 very high
			calcium	584.1 millieq/l
			magnesium	111.7 29.2
			sodium	53.3 9.2
			potassium	2.4 2.3
			cation sum	2.4 0.1
			problems over 150 ppm	40.8
			chloride	118 3.3
			nitrate as N	349 24.9
			phosphorus as P	0.3 0.0
			sulfate as S	107.3 6.7
			anion sum	107.3 35.0
			toxic over 800	
			boron as B	0.38 low
			increasing problems start at 3	0.5 very low
			est. gypsum requirement-lbs./1000 sq. ft.	5
			relative infiltration rate	fair/slow
			estimated soil texture	sandy loam
			lime (calcium carbonate)	no
			organic matter	low/fair
			moisture content of soil	1.1%
			half saturation percentage	13.5%



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- In projects with multiple landscape installations (i.e. production home developments) a soil sampling rate of 1 in 7 lots or approximately 15% shall be applied.
- The project applicant, or a designee, shall comply with one of the following conditions:
  - 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
  - If significant mass grading is planned and not yet performed, the soil analysis report shall be submitted to the local agency as part of the Certificate of Compliance.
- Soil analysis report shall be made available, in a timely manner, to the professionals preparing the landscape design plans and irrigation design plans to make any necessary adjustments to the design plans.
- The project applicant, or a designee, shall submit documentation verifying implementation of soil analysis report recommendations to the City with the Certificate of Completion.



*Soil amendments can be homogeneously incorporated to the recommended soil depth by hand or by equipment, whichever is appropriate for the given project.*



### SOILS LABORATORY

1234 Main Street  
City, State and Zip Code  
(012) 345-6789

Report date: 01-02-13

Project applicant or landscape architecture firm  
9876 Center Street  
City, State and Zip Code

RE: Project Name  
Sample Identification

The soil is near neutral with a pH of 7.14. The salinity is elevated at 4.06 millimhos/cm. Nitrate nitrogen is very high. Phosphorus is modest. Potassium is low. The micronutrients should be sufficient for plant growth. Sulfur is low.

#### Recommendations

For general soil preparation for turf, ground cover and shrub areas:  
Broadcast the materials listed below uniformly and incorporate homogeneously to a depth of 6 inches:  
The rates are per 1,000 square feet.

Potassium sulfate (0-0-50) – 8 pounds  
Triple superphosphate (0-45-0) – 4 pounds  
agricultural gypsum - 15 pounds  
good quality soil amendment – several cubic yards, depending on the material

For preparation of backfill mix for boxed trees/container plants, uniformly blend the following materials into clean excavated soil.  
Rates are per cubic yard:

Potassium sulfate (0-0-50) – 1/3 pound  
Triple superphosphate (0-45-0) – 1/4 pound  
agricultural gypsum – 1 pound  
good quality soil amendment – about 15% by volume, depending on the material

Irrigate deeply after planting if the plant palette is sensitive to elevated salts.

For site maintenance, apply calcium ammonium nitrate (27-0-0) at 4 pounds per 1,000 square feet, when nitrogen is needed. Monitor the site with periodic soil testing.





## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES



*Proper irrigation design and ongoing maintenance can eliminate over-spray onto sidewalks and structures.*



- W. Planting Plans and Irrigation Plans shall be drawn at the same size and attain adequate scale so that the plan information and text are easily read.
- X. The Planting Plan shall contain the following statement: "I have complied with the criteria of the City's Chapter 19.570, Water Efficient Landscaping and Irrigation, and applied them for the efficient use of water in the landscape design plan."
- Y. The Planting Plan shall be prepared, wet-stamped, and signed by a landscape architect as defined in this Section III. Definitions for Water Efficient Landscaping and Irrigation Design Guidelines. Any plans submitted without the signature of a California licensed landscape architect shall not be accepted for review.

### 2. IRRIGATION DESIGN AND PLAN GUIDELINES

- A. Irrigation systems shall be designed to allow for proper installation, management, and maintenance of water efficient irrigation equipment to ensure the highest level of conservation.
- B. All irrigation systems shall be designed to prevent runoff, over-spray, lowhead drainage and other similar conditions where water flows off-site onto non-targeted areas, such as adjacent property, non-irrigated areas, hardscape areas, roadways, or structures.
- C. Recycled water irrigation systems shall be used whenever possible. In some cases, the irrigation system shall be designed for the future use of recycled water. Refer to Municipal Code, Title 14.28 – Mandatory Use of Recycled Water.
- D. Water systems designed to utilize recycled water shall be designed, and specify required irrigation equipment, to meet all applicable standards of the California Regional Water Quality Control Board, the Riverside County Health Department, and the water purveyor.
- E. Graywater systems promote the efficient use of water and may assist in on-site landscape irrigation.
- F. Dedicated water service meters are required for non-residential irrigated landscapes over 1,000 square feet. For residential irrigated landscapes of 5,000 square feet or more a dedicated water service meter, private meter, or sub-meter is required.
- G. Static water pressure at the system point of connection shall be determined at the design stage. If the static water pressure is not available at the design stage, it shall be verified at the time of installation.

## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES



- H. Dynamic or operating water pressure shall be calculated using the peak water demand of the irrigation system.
- I. 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.
- J. The installation of pressure regulating devices such as in-line pressure regulators, booster pumps, or other devices are required when the static pressure is below or significantly above the required dynamic pressure to operate each irrigation emission device or to properly operate the irrigation system.
- K. It is highly recommended that an inquiry be made to the local water purveyor about peak water operating demands on the water supply system.
- L. 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.
- M. Manual shut-off valves, such as a gate valve, ball valve, or butterfly valve, shall be required and shall be installed 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 mainline break) or routine repair.
- N. Backflow prevention devices shall be required to protect the water supply from contamination by the irrigation system. The project applicant shall refer to applicable public health agency codes for additional backflow prevention requirements.
- O. 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 square feet or more.
- P. Master shut-off valves are required on all projects except 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.
- Q. 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.



*Soil sensors allow irrigation management by monitoring the available moisture within the plant root zone.*



*Weather sensors work with smart controllers by using real-time weather measurements of temperature, rainfall, wind, humidity and solar radiation.*







## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES



*Properly installed swing joints can protect irrigation head breakage that results in high volume run off.*



- R. In mulched planting areas, the use of low volume irrigation is required to maximize water infiltration into the root zone.
- S. Sprinkler heads and other emission devices operating on the same control valve shall have matched precipitation rates.
- T. Relevant information from the soil management plan, such as soil type and infiltration rate, shall be utilized when designing the irrigation system.
- U. Swing joints, or other riser-protection components, are required on all risers subject to damage that are adjacent to hardscapes or in high traffic areas of turfgrass.
- V. Check valves or anti-drain valves are required on all sprinkler heads where low point drainage could occur.
- W. Head to head coverage is recommended. However, sprinkler spacing shall be designed to achieve the highest possible distribution uniformity using the manufacturer's recommendations.
- X. Long, narrow, or irregularly shaped planting areas including turf that is less than ten (10) feet in width in any direction shall be irrigated with subsurface irrigation or other means that produce no run-off or overspray.
- Y. Sloped planting areas greater than 25% (4:1) shall not be irrigated with a precipitation rate exceeding 0.75 inches per hour. This restriction may be modified if the landscape designer submits an alternative design or technology, and clearly demonstrates no runoff or erosion will occur. Prevention of runoff and erosion must be confirmed during the irrigation audit.





## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES



- Z. 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. If left unplanted the surfacing of the setback may be mulch, gravel, or other porous material.

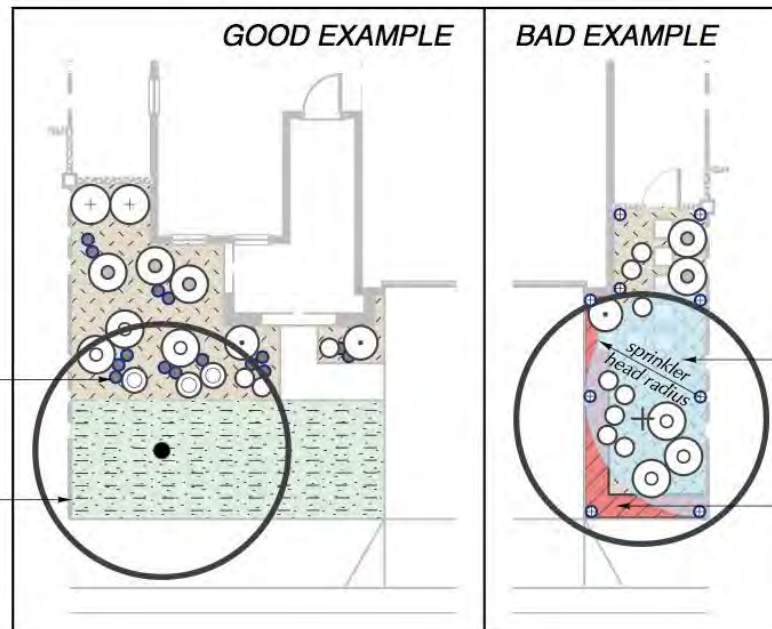
These restrictions may be modified if:

1. The landscape area is adjacent to permeable surfacing and no runoff occurs,
2. The adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping, or
3. The irrigation designer specifies an alternative design or technology, as part of the submittal, and clearly demonstrates strict adherence to the irrigation design plan requirements. Prevention of overspray and runoff must be confirmed during the irrigation audit.



*Low volume emitters placed within the shrub root zone maximizes irrigation efficiency.*

*Sub-surface drip irrigation in the turf area complies with the prohibited overhead irrigation within the 24" setback area.*



*Subsurface drip line irrigation can be used for a wide variety of planting situations. It is one option for narrow parkways or a planted 24" setback area from non-permeable surfaces.*

*Overhead irrigation, such as sprinkler heads, installed in a sparsely planted landscape results in inefficient water management by applying water to non-planted areas.*

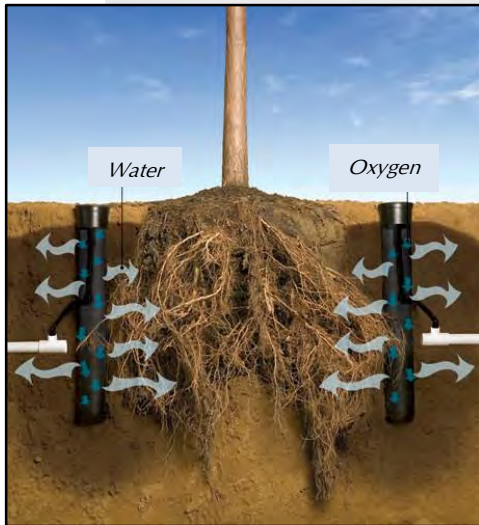
*Overhead irrigation is not allowed within the 24" setback area of any non-permeable surface (setback area shown in red) as it can create overspray and water run-off situations.*



## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES

*The irrigation requirements of trees vary by species and where they are located in the landscape. They will benefit from being on a separate valve from other surrounding plant material.*

*By using root irrigation devices (see below), water and oxygen are provided directly to the root zone promoting healthy plant growth.*



### AA. Hydrozones:

1. Each valve shall irrigate a hydrozone with similar site, slope, sun exposure, soil conditions, and plant materials with similar water use.
2. Overhead spray heads, drip emitters or other irrigation emission devices shall be selected based on what is appropriate for the plant type within that hydrozone.
3. Where feasible, trees shall be placed on separate valves from shrubs, groundcover, and turf to allow the watering requirements of the trees to be addressed apart from the surrounding plant material.

### BB. The following can be used as a required items checklist for the completion of the Irrigation Plan:

- ☐ Location and size of water meter(s), service laterals, and backflow preventers,
- ☐ Location, size, and type of all components of the irrigation system, including but not limited to automatic controllers, sensors, main and lateral lines, valves, sprinkler heads and nozzles, pressure regulator, drip and low volume irrigation equipment,
- ☐ Irrigation point of connection (POC) to the water system,
- ☐ Static water pressure at POC,
- ☐ The areas irrigated by each valve, with valve notation, size and related gpm (gallons per minute) clearly shown,
- ☐ Hydrozones:
  - Number, letter or other notation shall designate each hydrozone,
  - A Hydrozone Information Table shall be prepared to include each hydrozone. At a minimum, the table shall include hydrozone notation, type of irrigation equipment, hydrozone classification (low, moderate or high) and related square footage,
- ☐ Irrigation legend shall site the following:
  - Manufacturer name, model number, and general description for all specified irrigation devices,
  - Separate symbols for all irrigation devices with different spray patterns, spray radius, drip flow rates, drip emitter and line spacing, and precipitation rates,

## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES



- Flow rates in gallons per minute (gpm) and/or gallons per hour (gph), and design operation pressure in pounds per square inch (psi) for each irrigation device,
- Precipitation or Application rate in inches per hour (in/hr) for each irrigation device,
- ❑ Irrigation system details for assembly and installation, and
- ❑ Irrigation schedules shall be developed, managed, and evaluated to utilize the minimum amount of water required to maintain plant health. The following criteria shall be used to develop the irrigation schedules:
  - Irrigation schedules shall be regulated by an automatic controller using current reference  $E_t$  data or soil moisture sensor data.
  - Overhead irrigation shall be scheduled between the hours of 6:00 p.m. and 10:00 a.m. In weather conditions such as wind, rain, or freezing temperatures, overhead irrigation should not be operated. If the local purveyor has imposed stricter watering restrictions, those shall apply.
  - Irrigation schedules shall be developed and submitted for each of the following conditions:
    - Plant establishment,
    - Established landscape, and
    - Temporarily irrigated areas.
  - Each irrigation schedule shall consider for each station all of the following that apply:
    - Irrigation interval,
    - Irrigation run times,
    - Number of cycle starts required to avoid run-off,
    - Total monthly applied water,
    - Application rate of irrigation device,
    - Soil type and related infiltration rate,
    - Root and plant depth,

*Soil type affects the rate at which water is absorbed into the ground. The more porous the soil, the higher absorption or infiltration rate it will have.*

*The infiltration rate (in/hr) of the site soil is to be compared to the application rate (in/hr) of the irrigation device. This is to ensure that the applied water will be absorbed into the ground rather than creating wasteful run-off.*



**Sand**  
Extremely porous  
Allows quick  
water flow



**Loam**  
Porous  
Retains moisture  
Optimal soil type



**Clay**  
Non-porous  
Slow to absorb  
and drain water





## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES



*Simple repairs and keeping shrubs clear of irrigation devices can prevent unnecessary water waste.*



- Slope factor,
- Shade or sun factor, and
- Irrigation uniformity or efficiency.

CC. Planting Plans and Irrigation Design Plans shall be drawn at the same size and scale.

DD. The Irrigation Plan shall contain the following statement: "I have complied with the criteria of the City's Chapter 19.570, Water Efficient Landscaping and Irrigation, and applied them for the efficient use of water in the irrigation design plan."

EE. The Irrigation Design Plan shall be prepared, wet-stamped, and signed by a California licensed landscape architect or certified irrigation designer, as defined in Section III. Definitions for Water Efficient Landscaping and Irrigation Design Guidelines.

### 3. LANDSCAPE AND IRRIGATION MAINTENANCE SCHEDULE

It is critical to properly maintain the landscape and irrigation to achieve the optimum level of water efficiency.

- A. A regular maintenance schedule shall be prepared and submitted with the Certificate of Compliance to the Planning Department, property owner, and water purveyor (if applicable). This regular maintenance schedule is intended to be continuously implemented for the life of the project.
- B. A regular maintenance schedule shall include, but not be limited to the following:
  1. Routine inspections, auditing, adjustments, and repair of the irrigation system and its components,
  2. Aerating and de-thatching of turf areas,
  3. Topdressing with compost,
  4. Replenishing mulch,
  5. Fertilizing, and



*Fertilizers can be added by hand over the planting area with a hand spreader.*



*A fertigation device can be used to provide a liquid fertilizer through irrigation lines*



## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES



6. Pruning and weeding in all landscape areas and removing any obstructions to irrigation devices.

- C. Repair of all irrigation equipment shall be done with the originally installed components or their equivalents or with components with greater efficiency.
- D. A project applicant or owner is encouraged to implement established landscape industry sustainable Best Practices or environmentally friendly practices for all landscape maintenance activities.

### 4. CERTIFICATE OF COMPLIANCE

- A. Prior to issuance of a Certificate of Occupancy or final inspection for a project subject to this Appendix and the Zoning Code, Title 19.570 – Water Efficient Landscaping and Irrigation, a regular maintenance schedule and a Certificate of Compliance shall be submitted to the Planning Department certifying that the landscaping has been completed in accordance with the approved planting, irrigation, soil management, and grading design plans for the project. Refer to Section IV. Examples and Worksheets for provided form.

The Certificate of Compliance shall include the following:

1. Detailed project and property owner information,
2. Detailed contact information and certification by either the signer of the landscape design plan, the signer of the irrigation design plan, or the licensed landscape contractor that the landscape project has been installed per the approved Landscape Documentation Package,
  - a. Where there have been significant changes made in the field during construction, “as-built” or record drawings shall be included with the certification.
  - b. A diagram of the irrigation plan showing hydrozones shall be kept with the irrigation controller for subsequent management purposes.
3. Detailed contact information and certification by the Irrigation Auditor,
4. Irrigation scheduling parameters used to set the controller,
5. Landscape and irrigation maintenance schedule,



COMMUNITY DEVELOPMENT DEPARTMENT  
PLANNING DIVISION  
3900 MAIN STREET – THIRD FLOOR, RIVERSIDE, CA 92522  
PHONE: (951) 826-5371 / FAX: (951) 826-5981  
www.riversideca.gov/planning

#### CERTIFICATE OF COMPLIANCE

- POST-INSTALLATION INSPECTION (CHECK ALL BOXES FOR COMPLETION)
- ☐ Plant sizes, locations, and quantities are installed per Planning Division staff or City Planning Commission (CPC) approved plans, details and specifications.
  - ☐ Irrigation systems are installed per Planning Division staff or CPC approved plans, details and specifications. Evidence of irrigation field inspection, prior to backfilling, shall be attached.
  - ☐ Landscape Irrigation Audit has been performed and corrections have been completed as identified in the audit.
  - ☐ Soil analysis report and documentation verifying implementation of soil analysis report recommendations.
  - ☐ Copy of this certification has been provided to owner/manager and the City of Riverside Planning Division.

#### PROJECT INFORMATION

Planning Case Number(s): \_\_\_\_\_  
Project Name: \_\_\_\_\_  
Project Address/Location: \_\_\_\_\_  
Assessor's Parcel Number(s): \_\_\_\_\_

#### PROPERTY OWNER OF HIS/HER DESIGNEE

I/we certify that I/we have received copies of all of the documents, including a set of the approved landscape and irrigation plans and Certificate of Compliance, and that it is our responsibility to see that the project is maintained in accordance with the Landscape and Irrigation Maintenance Schedule.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

#### CERTIFICATE OF COMPLIANCE

##### LANDSCAPE ARCHITECT RESPONSIBLE FOR LANDSCAPE AND/OR IRRIGATION DESIGN

Firm/Company Name: \_\_\_\_\_  
Contact Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Daytime Telephone: (\_\_\_\_) \_\_\_\_\_ Facsimile: (\_\_\_\_) \_\_\_\_\_  
E-Mail Address: \_\_\_\_\_  
License/Certification Number: \_\_\_\_\_

##### AUDITOR RESPONSIBLE FOR IRRIGATION AUDIT

Firm/Company Name: \_\_\_\_\_  
Contact Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Daytime Telephone: (\_\_\_\_) \_\_\_\_\_ Facsimile: (\_\_\_\_) \_\_\_\_\_  
E-Mail Address: \_\_\_\_\_  
License/Certification Number: \_\_\_\_\_

I/we certify that, based upon periodic site observations and a final inspection at project completion, the landscaping and irrigation of the above-identified project has been substantially completed in accordance with the City of Riverside's Water Efficient Landscape and Irrigation Ordinance and the landscape planting and irrigation installation conform with the criteria and specifications of the approved landscape and irrigation plans approved by the City of Riverside Planning Division.

Landscape Architect Signature & Date: \_\_\_\_\_ Auditor Signature & Date: \_\_\_\_\_

ATTACH THE FOLLOWING DOCUMENTS, IF NOT ALREADY SUBMITTED TO THE PLANNING DIVISION (ALONG WITH ANY ADDITIONAL MATERIALS VERIFYING IMPLEMENTATION):

- ☐ Landscape Irrigation Audit Report
- ☐ Landscape Maintenance and Irrigation Schedules
- ☐ Soil Management Plan

PLANNING CASE NUMBER: \_\_\_\_\_ DATE RECEIVED: \_\_\_\_\_  
PLANNER'S INITIALS: \_\_\_\_\_

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Revised: 12/2012



## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES

6. Soil analysis report and documentation verifying implementation of
7. Irrigation audit report that includes inspection, system tune-up, system test with distribution uniformity, and reporting of overspray or run off that causes overland flow. Refer to the Zoning Code, Title 19.570 – Water Efficient Landscaping and Irrigation, Section 19.570.050 for additional restrictions and requirements.



### 5. STORMWATER MANAGEMENT AND RAINWATER RETENTION

- A. Stormwater management practices minimize runoff and increase infiltration, which recharges groundwater and improves water quality. The following elements can be incorporated into landscape projects to improve on-site stormwater and dry weather runoff capture:
  1. Grade impervious surfaces, such as driveways, to drain to vegetated areas.
  2. Minimize the area of impervious surfaces.
  3. Incorporate pervious and porous surfaces that will minimize runoff, such as: gravel, permeable pavers, and pervious concrete.
  4. Direct runoff from paved surfaces and roof areas into landscape areas to maximize site water capture.
  5. Incorporate rain gardens, cisterns and other rain catchment systems.
  6. Incorporate infiltration landscape areas, swales, basins and drywells to provide opportunities for percolation into the soil.
  7. Consider constructed wetlands and ponds that retain water, equalize excess flow, and filter pollutant

*A certified landscape irrigation auditor shall conduct periodic and a final evaluation of the installed irrigation system by collecting field data and performing related calculations to verify that the system has been installed in accordance with the City of Riverside's Water Efficient Landscaping and Irrigation Ordinance, Zoning Code, Title 19.570*

*Signs help illustrate the applied water efficient landscape principles utilized in the landscape. In this case, the sign calls attention to a rainwater harvesting system installed to help conserve*



## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES



### 6. PUBLIC EDUCATION

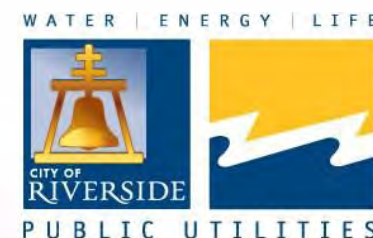
A. Education is a critical component to promote and ensure the efficient use of water in landscapes. The use of appropriate principles of design, installation, management and maintenance that save water is encouraged in the community.

1. The City of Riverside offers several informative and illustrative landscape and irrigation design resources, as well as rebate programs, for the efficient use of water in both the residential and commercial landscape. Please visit the following website for directed guidance:

- City of Riverside at [www.riversideca.gov](http://www.riversideca.gov)
- Riverside Public Utilities at [www.riversidepublicutilities.com](http://www.riversidepublicutilities.com)
- GreenRiverside at [www.greenriverside.com](http://www.greenriverside.com)
- Western Municipal Water District at [www.wmwd.com](http://www.wmwd.com)
- Eastern Municipal Water District at [www.emwd.org](http://www.emwd.org)

2. In addition to the websites listed above, the following are good resources for water conservation landscape ideas and selecting climate appropriate plant material:

- Sunset Western Garden Book
- Western Municipal Water District's plant list at [www.wmwd.com](http://www.wmwd.com) and their link to Inland Empire Waterwise Gardening at [www.wmwd.watersavingplants.com](http://www.wmwd.watersavingplants.com)
- Riverside County Guide to California Friendly Landscaping (Landscaping Guide) at [www.rctlma.com](http://www.rctlma.com)
- Water Saving - Garden Friendly, Inland Empire at [www.watersavinggardenfriendly.com](http://www.watersavinggardenfriendly.com)
- Metropolitan Water District of Southern California's Be Water Wise at [www.bewaterwise.com](http://www.bewaterwise.com)
- Also, refer to Section V. of these guidelines, Climate Appropriate Plants for the City of Riverside.



*The City of Riverside and Riverside Public Utilities will continue to make every effort to assist in the design and plan preparation process. From the home-owner looking to rehabilitate his front lawn area to the experienced landscape architect developing a large scale mixed-use project, there are resources available through the many agencies and related websites listed here.*





## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES

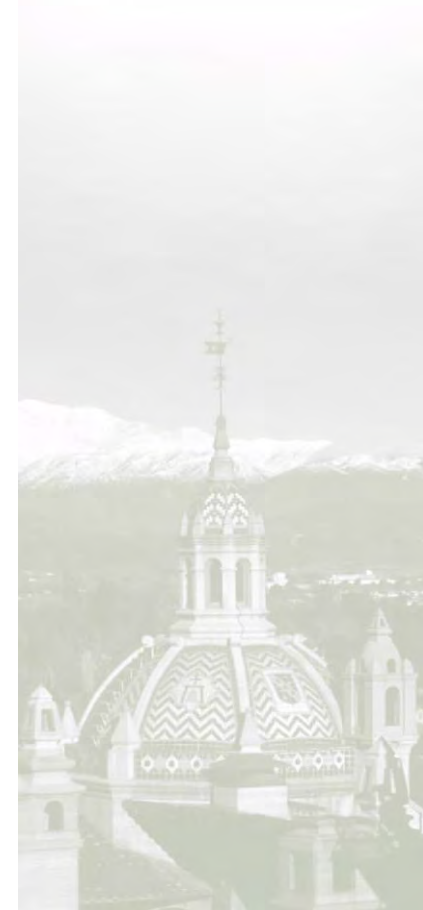
### III. DEFINITIONS FOR WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES

Applied Water	The portion of water supplied by the irrigation system to the landscape.
Automatic Irrigation Controller	A timing device used to remotely control valves that operate an irrigation system. Automatic irrigation controllers are able to self-adjust and schedule irrigation events using either evapotranspiration (weather-based) or soil moisture data.
Backflow Prevention Device	A safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.
Best Management Practices	The methods or techniques found to be the most effective and practical in achieving an objective while making the optimum use of available resources.
Certificate of Compliance	The form and related documents required under this Appendix, Section II., B., 4.- Certificate of Compliance.
Certified Irrigation Designer	A person certified to design irrigation systems by an accredited academic institution, a professional trade organization, or other program such as the US Environmental Protection Agency's WaterSense irrigation designer certification program and Irrigation Association's Certified Landscape Irrigation Designer program.
Certified Landscape Irrigation Auditor	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.
Check valve or Anti-Drain Valve	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 head when the sprinkler is off.

## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES



Compost	The safe and stable product of controlled biologic decomposition of organic materials that is beneficial to plant growth.
Controller	See Automatic Irrigation Controller
Conversion Factor (0.62)	The number that converts acre-inches per acre per year to gallons per square foot per year.
Distribution Uniformity	The measure of the uniformity of irrigation water over a defined area.
Deciduous Tree or Shrub	A plant that sheds or loses foliage during a specific season or stage of growth.
Defensible Space	The natural and landscaped area around a structure that has been designed and maintained to reduce fire danger.
Dynamic Water Pressure	The measure of water pressure, in pounds per square inch (psi), while the irrigation system is in operation. Also see Operating Pressure.
Drip Irrigation	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.
Ecological Restoration Project	A project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.
Effective Precipitation or Usable Rainfall (EPPT)	The portion of total precipitation that becomes available for plant growth.
Emitter	A drip irrigation emission device that delivers water slowly from the system to the soil.
Established Landscape	The time at which plants in the landscape have developed significant root growth into the soil. Typically, most plants are established after one or two years of growth.
Establishment Period of the Plants	The first year after installing the plants in the landscape or the first two years if irrigation will be terminated after establishment. Typically, most plants are established after one or two years of growth. Native habitat mitigation areas and trees may need three to five years for establishment.





## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES

Estimated Total Water Use (ETWU)

The total estimated annual water used for the landscape as described in Section II. B. 1. Planting Design and Planting Guidelines.

ET Adjustment Factor (ETAF)

The factor used to calculate the Maximum Annual Water Allowance (MAWA) is 0.55 for residential areas and 0.45 for non-residential areas, 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.

The ETAF used to calculate the Estimated Total Water Used (ETWU) for new and existing (non-rehabilitated) Special Landscape Areas (SLA) shall not exceed 1.0 and for existing non-rehabilitated landscapes shall be assumed as 0.8.

Evapotranspiration Rate (ETo)

The quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time. The monthly and annual evapotranspiration rate for the City of Riverside is as follows:

JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANNUAL Eto
2.5	2.9	4.2	5.3	5.9	6.6	7.2	6.9	5.4	4.1	2.9	2.6	56.4

Evergreen Tree or Shrub

A plant that retains foliage throughout all of the seasons.

Flow Rate

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.

Flow Sensor

An inline device installed at the supply point of the irrigation system that produces a repeatable signal proportional to flow rate. Flow sensors must be connected to an automatic irrigation controller, or flow monitor capable of receiving flow signals and operating master valves. This combination flow sensor/controller may also function as a landscape water meter or submeter.

Friable

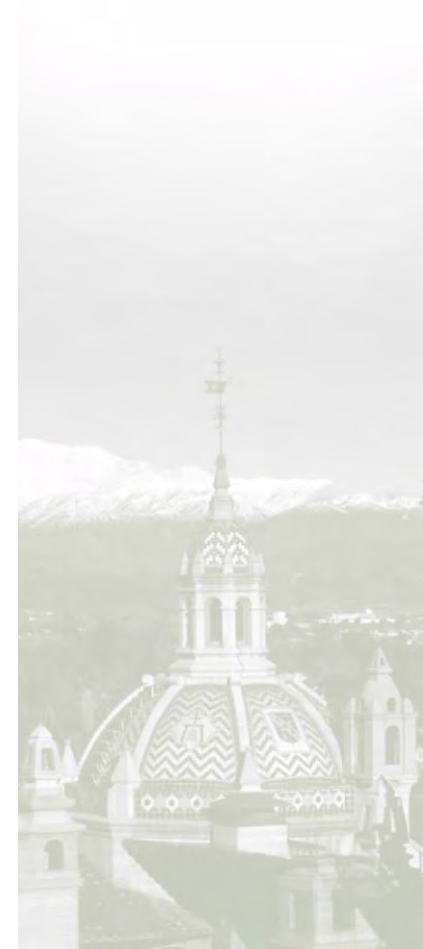
A soil condition that is easily crumbled or loosely compacted down to a minimum depth per planting material requirements, whereby the root structure of newly planted material will be allowed to spread unimpeded.



## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES

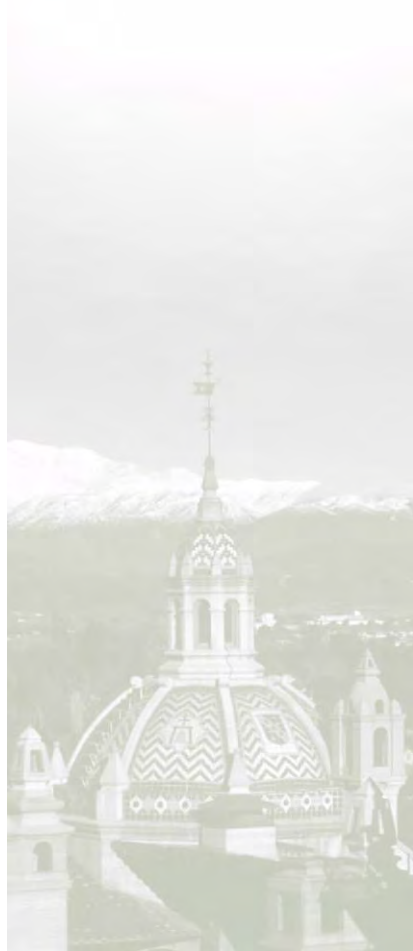


Fuel Modification Plan Guideline	A guideline from a local fire authority to assist residents and businesses that are developing land or building structures in a fire hazard severity zone.
Graywater	Untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful 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. Health and Safety Code Section 17922.12.
Hardscapes	Any durable material (pervious and non-pervious).
Homeowner-provided Landscaping	Any landscaping either installed by a private individual for a single-family residence or installed by a licensed contractor hired by a homeowner. A homeowner, for the purposes of this Appendix, is a person who occupies the dwelling he or she owns. This excludes speculative homes, which are not owner-occupied dwellings.
Hydrozone	A portion of the landscaped area having plants with similar water needs. A hydrozone may be irrigated or non-irrigated.
Infiltration Rate	The rate of water entry into the soil expressed as a depth of water per unit of time (e.g., inches per hour).
Invasive Plant Species	A species of plants, not historically found in California, which spread outside cultivated areas and can damage environmental or economic resources. Invasive species may be regulated by County agricultural agencies as noxious species. Noxious weeds means any weed designated by the Weed Control Act and identified on a Regional District noxious weed control list. Lists of invasive plants are maintained at the California Invasive Plant Inventory and USDA invasive and noxious weeds database.
Irrigation Audit	An in-depth evaluation of the irrigation system performance 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





## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES

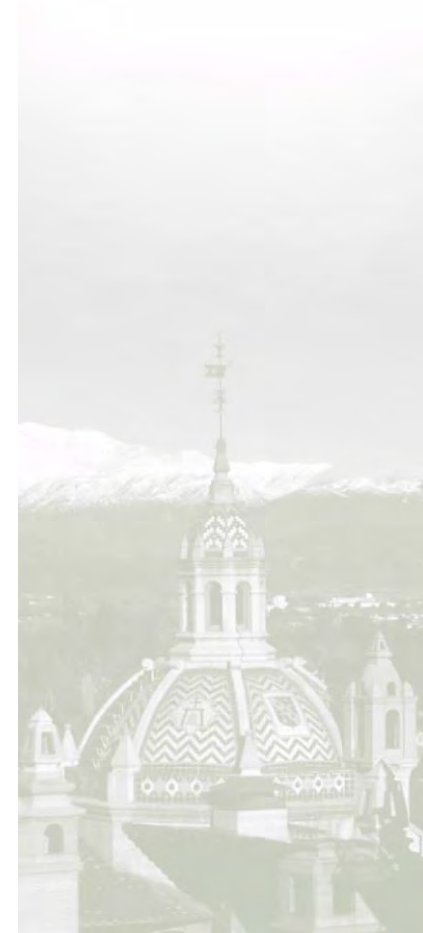


Irrigation Efficiency (IE)	<p>schedule. The audit must be conducted in a manner consistent with the Irrigation Association's Landscape Irrigation Auditor Certification program or other U.S. Environmental Protection Agency "WaterSense" labeled auditing program.</p> <p>The measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. For these guidelines, the irrigation efficiency is 0.75 for overhead spray devices and 0.81 for drip systems.</p>
Irrigation Survey	<p>An evaluation of an irrigation system that is less detailed than an irrigation audit. An irrigation survey includes, but is not limited to: inspection, system test, and written recommendations to improve performance of the irrigation system.</p>
Irrigation Water Use Analysis	<p>An analysis of water use data based on meter readings and billing data.</p>
Landscape Architect	<p>A person who holds a license to practice landscape architecture in the State of California per the Business and Professions Code, Section 5615.</p>
Landscape Area	<p>All the planting areas, turf areas, and water features in a landscape design plan subject to the Maximum Applied Water Allowance calculation. 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).</p>
Landscape Contractor	<p>A person licensed by the State of California to construct, maintain, repair, install, or subcontract the development of landscape systems.</p>
Landscape Documentation Package	<p>The documents required under Section II. B. Landscape and Irrigation Design, Review, and Certification Guidelines.</p>
Landscape Project	<p>The total area of landscape in a project as defined in "landscape area" for the purposes of this Appendix.</p>
Landscape Water Meter	<p>An inline device installed at the irrigation supply point that measures the flow of water into the irrigation system and is connected to a totalizer to record water use.</p>

## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES



Lateral Line	The water delivery pipeline that supplies water to the emitters or sprinklers from the valve.
Local Agency	The City of Riverside is responsible for adopting and implementing these guidelines. The local agency is also responsible for the enforcement of the related ordinance, including but not limited to, approval of a permit and plan check or design review of a project.
Local Water Purveyor	Any entity, including a public agency, city, county, or private water company that provides retail water service.
Low Volume Irrigation	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 is specifically designed to apply small volumes of water slowly at or near the root zone of plants.
Main Line	The pressurized pipeline that delivers water from the water sources to the valve or outlet.
Master Shut-Off Valve	An automatic valve installed at the irrigation supply point that controls water flow into the irrigation system. When this valve is closed water will not be supplied to the irrigation system. A master valve will greatly reduce any water loss due to a leaky station valve.
Maximum Applied Water Allowance (MAWA)	The upper limit of annual applied water for the established landscape area as outlined in Section II., B. Landscape and Irrigation Design, Review, and Certification Guidelines. It is based upon the area's reference evapotranspiration, the ET Adjustment Factor, and the size of the landscape area. The Estimated Total Water Use shall not exceed the Maximum Applied Water Allowance. Special Landscape Areas, including recreation areas, areas permanently and solely dedicated to edible plants such as orchards and vegetable gardens, and areas irrigated with recycled water are subject to the MAWA with an ETAF not to exceed 1.0. $MAWA = (ET_o) (0.62) [(ETAF \times LA) + ((1-ETAF) \times SLA)]$ .
Median	An area between opposing lanes of traffic that may be unplanted or planted with trees, shrubs, perennials, and ornamental grasses.







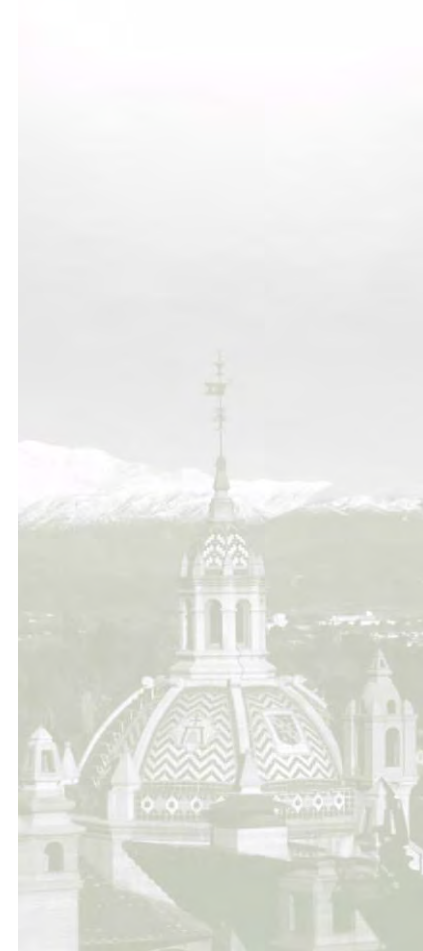
## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES

Microclimate	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.
Mined-land Reclamation Projects	Any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.
Mulch	Any organic material such as leaves, bark, straw, compost, or inorganic mineral materials such as rocks, gravel, and 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.
New Construction	For the purposes of this Appendix, a new building with a landscape or other new landscape, such as a park, playground, or greenbelt without an associated building.
Non-Potable Water	See Recycled Water, Reclaimed Water, or Treated Sewage Effluent Water.
Operating Pressure	The pressure at which the parts of an irrigation system are designed by the manufacturer to operate.
Overhead Sprinkler Irrigation Systems	An irrigation system that delivers water through the air (e.g., spray heads and rotors).
Overspray	The irrigation water that is delivered beyond the target area.
Parkway	The area between a sidewalk and the curb or traffic lane. It may be planted or unplanted, and with or without pedestrian egress.
Permit	An authorizing document issued by local agencies for new construction or rehabilitated landscapes.
Pervious	Any surface or material that allows the passage of water through the material and into the underlying soil. Examples of pervious paving materials include, but are not limited to permeable concrete, porous asphalt, paving stones and decomposed granite.

## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES

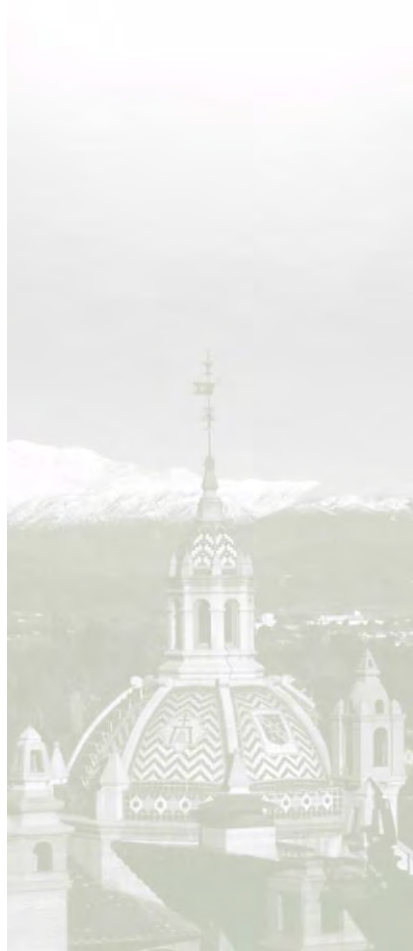


Plant Factor (PF)	<p>A factor, when multiplied by ETo, estimates the amount of water needed by plants.</p> <p>For purposes of this Appendix,</p> <p>Plant factor range:</p> <table> <tr> <td>Very low water use</td><td>0 to 0.1</td></tr> <tr> <td>Low water use</td><td>0.1 to 0.3</td></tr> <tr> <td>Moderate water use</td><td>0.4 to 0.6</td></tr> <tr> <td>High water use</td><td>0.7 to 1.0</td></tr> </table> <p>Plant factors cited in this Appendix are derived from the publication "Water Use Classification of Landscape Species". Plant factors may also be obtained from horticultural researchers from academic institutions or professional associations as approved by the California Department of Water Resources (DWR).</p>	Very low water use	0 to 0.1	Low water use	0.1 to 0.3	Moderate water use	0.4 to 0.6	High water use	0.7 to 1.0
Very low water use	0 to 0.1								
Low water use	0.1 to 0.3								
Moderate water use	0.4 to 0.6								
High water use	0.7 to 1.0								
Potable Water	Water that has been tested and possibly treated to be safe for human consumption.								
Precipitation Rate	The rate of application of water measured in inches per hour								
Project Applicant	The individual or entities submitting a Landscape Documentation Package 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.								
Rain Sensor or Rain Sensing Shutoff Device	A component that automatically suspends an irrigation event when it rains.								
Record or As-Built Drawings	A set of reproducible drawings which show significant changes in the work made during construction and which are usually based on drawings marked up in the field and other data furnished by the contractor.								
Recreational Area	Areas, excluding private single family residential areas, designated for active play, recreation or public assembly in parks, sports fields, picnic grounds, amphitheaters or golf course tees, fairways, roughs, surrounds and greens.								
Recycled Water, Reclaimed	Treated or recycled wastewater of a quality suitable for non-potable								





## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES



Water or Treated Sewage Effluent Water	uses such as landscape irrigation and water features. This water is not intended for human consumption.
Reference Evapotranspiration or ETo	A standard measurement of environmental parameters that affect the water use of plants. ETo is expressed in inches per day, month, or year, 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 so that regional differences in climate can be accommodated. The annual reference ETo for the City of Riverside is 56.4.
Rehabilitated Landscape	A re-landscaping project that requires a permit, plan check, or design review, and where the modified landscape area is equal to or greater than 2,500 square feet.
Residential Landscape	Any landscapes surrounding single or multi-family homes.
Run-off	Water that 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.
Smart Controller	See Automatic Irrigation Controller
Solar gain	The increase in temperature in a space or structure that results from solar radiation.
Soil Moisture Sensing Device or Soil Moisture Sensor	A device that measures the amount of water in the soil. The device may also suspend or allow an irrigation event.
Soil Texture	The classification of soil based on its percentage of sand, silt, and clay.
Special Landscape Area (SLA)	An area of the landscape dedicated solely to edible plants, recreational areas, areas irrigated with recycled water, or water features using recycled water.
Sprinkler or Spray Head	A device that delivers water through a nozzle.
Static Water Pressure	The measure of the municipal pipeline water supply pressure, in pounds per square inch (psi), when water is not flowing.
Station	An area served by one valve, or by a set of valves, that operate simultaneously.



## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES



Swing Joint	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.
Submeter	A metering device to measure water applied to the landscape that is installed after the primary utility water meter.
Turf	A ground cover surface of mowed grass. Annual blue grass, Kentucky blue grass, Perennial rye grass, Red fescue, and Tall fescue are cool-season grasses. Bermuda grass, Kikuyu grass, Seashore Paspalum, St. Augustine grass, Zoysia grass, and Buffalo grass are warm-season grasses.
Valve	A device used to control the flow of water in the irrigation system.
Water Conserving Plant Species	A plant species identified as having a very low or low plant factor.
Water Feature	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 or stormwater best management practices that are not irrigated and used solely for water treatment or stormwater retention are not water features and, therefore, are not subject to the water budget calculation.
Watering Window	The time of day irrigation is allowed.
WUCOLS	The Water Use Classification of Landscape Species published by the University of California Cooperative Extension, the Department of Water Resources, current edit





## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES

### IV. EXAMPLES AND WORKSHEETS

#### A. WATER EFFICIENT LANDSCAPE WORKSHEET CALCULATIONS

Water budget calculations shall be 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 the Special Landscape Areas. Also, the Estimated Total Water Use (ETWU) must not exceed the Maximum Applied Water Allowance (MAWA).

##### MAXIMUM APPLIED WATER ALLOWANCE (MAWA)

$$\text{MAWA (in gallons)} = (\text{Eto})(0.62) [(\text{ETAF} \times \text{LA}) + ((1-\text{ETAF}) \times \text{SLA})]$$

Where:

- ETo**= Annual Reference Evapotranspiration Rate, in inches per year  
Annual ETo for the City of Riverside is 56.4
- 0.62**= Conversion Factor, to gallons
- ETAF**= For the MAWA, ET Adjustment Factor (ETAF), is 0.55 for residential areas, and 0.45 for non-residential areas
- LA**= Total Landscape Area including SLA, in square feet
- SLA**= Special Landscape Area, in square feet

Hydrozone Classification	Hydrozone Plant Factor Range	Median Value
VL Very Low	0 – 0.1	0.1
L Low	0.1 – 0.3	0.2
M Moderate	0.4 – 0.6	0.5
H High	0.7 – 0.9	0.8

##### ESTIMATED TOTAL WATER USE (ETWU)

$$\text{ETWU (in gallons)} = (\text{Eto})(0.62) (\text{ETAF}) (\text{LA})$$

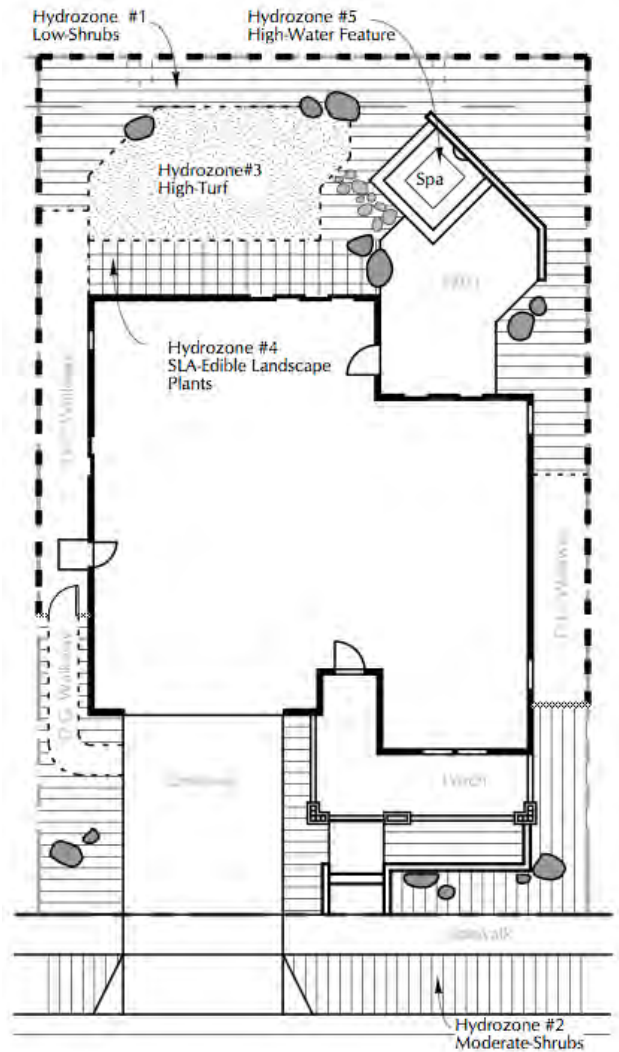
Where:

- ETo**= Annual Reference Evapotranspiration Rate, in inches per year  
Annual ETo for the City of Riverside is 56.4
- 0.62**= Conversion Factor, to gallons
- ETAF**= For the ETWU, ET Adjustment Factor (ETAF), is the Plant Factor (PF) of the Hydrozone divided by the Irrigation Efficiency (IE), PF/IE
- PF**= Plant Factor of the Hydrozone, refer to chart at right as a guide in specifying the appropriate Hydrozone Plant Factor
- IE**= Irrigation Efficiency, refer to chart at right as a guide in specifying the appropriate Irrigation Efficiency

Irrigation Equipment	IE
Drip	0.81
Spray heads	0.75

The ETAF for Special Landscape Areas (SLA) shall not exceed 1.0 and the ETAF for existing, non-rehabilitated landscapes shall be assumed as 0.8

# APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES



## HYDROZONE AREAS

## WATER EFFICIENT LANDSCAPE WORKSHEET

### EXAMPLE OF RESIDENTIAL PROJECT

Reference ETo for the area **ETo=** 56.4

#### Estimated Total Water Use (ETWU):

ETWU is calculated using the following formula: (Eto) (.62) (ETAF) (LA) where ETWU ETAF is PF/IE

Hydrozone # / Planting Description	Plant Factor (PF)	Irrigation Method	Irrigation Efficiency (IE)	ETAF (PF/IE)	Landscape Area (sq. ft.)	ETAF x Landscape Area	Estimated Total Water Use (ETWU) gallons/yr
<b>Regular Landscape Areas</b>							
HZ1 - Low Shrubs	0.2	Drip	0.81	0.25	1,010	249	8720
HZ2 - Moderate Shrubs	0.5	Drip	0.81	0.62	400	247	8634
HZ3 - High Cool Season Turf	0.8	Spray	0.75	1.07	300	320	11190
HZ5 - High Water Features	0.9	-	0.81	1.11	64	71	2487
						0	0
						0	0
				<b>Totals</b>	<b>1,774</b>	<b>887</b>	
<b>Special Landscape Areas</b>							
HZ4 - Edible planting				1	150	150	5245
				<b>Totals</b>	<b>150</b>	<b>150</b>	
Estimated Total Water Use in gallons per year, ETWU Total							<b>36276</b>
Maximum Annual Water Allowance in gallons per year, MAWA Total							<b>39363</b>
MAWA calculation: (Eto) (.62) [(ETAFxLA) + ((1-ETAF) x SLA)] where non-residential MAWA ETAF is 0.45 and residential MAWA ETAF factor is 0.55							<b>MAWA - ETWU= 3087</b>

must be a positive number

#### ETAF Calculations:

##### Regular Landscape Areas

Total ETAF x Area	887
Total Area	1,774
<b>Average ETAF</b>	<b>0.50</b>

Average ETAF for Regular Landscape Areas must be 0.45 or below for non-residential areas and 0.55 or below for residential areas.

##### All Landscape Areas

Total ETAF x Area	1037
Total Landscape Area (LA)	1,924
Sitewide ETAF	0.54

The calculation results shown in red need to meet the stated requirements for the water budget to be considered compliant.



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# WATER EFFICIENT LANDSCAPE WORKSHEET

Reference ETo for the area **ETo**= 56.4

## Estimated Total Water Use (ETWU):

ETWU is calculated using the following formula: (Eto) (.62) (ETAF) (LA)

Hydrozone # / Planting Description	Plant Factor (PF)	Irrigation Method	Irrigation Efficiency (IE)	ETAF (PF/IE)	Landscape Area (sq. ft.)	ETAF x Landscape Area	Estimated Total Water Use (ETWU) gallons/yr
Regular Landscape Areas							
HZ#							
HZ#							
HZ#							
HZ#							
HZ#							
HZ#							
				Totals			
Special Landscape Areas							
HZ#				1			
HZ#				1			
HZ#				1			
				Totals			
Estimated Total Water Use in gallons per year, ETWU Total							
Maximum Annual Water Allowance in gallons per year, MAWA Total							

MAWA calculation: (Eto) (.62) [(ETAFxLA) + ((1-ETAF) x SLA)]

where non-residential MAWA ETAF is 0.45  
and residential MAWA ETAF factor is 0.55

**MAWA - ETWU=**  
must be a positive number

## ETAF Calculations:

Regular Landscape Areas

Total ETAF x Area	0
Total Area	0
Average ETAF	

Average ETAF for Regular Landscape Areas must be 0.45 or below for non-residential areas and 0.55 or below for residential areas.

All Landscape Areas

Total ETAF x Area	
Total Landscape Area (LA)	
Sitewide ETAF	



COMMUNITY DEVELOPMENT DEPARTMENT  
PLANNING DIVISION  
3900 MAIN STREET – THIRD FLOOR, RIVERSIDE, CA 92522  
PHONE: (951) 826-5371 / FAX: (951) 826-5981  
[www.riversideca.gov/planning](http://www.riversideca.gov/planning)

## B. CERTIFICATE OF COMPLIANCE

### CERTIFICATE OF COMPLIANCE

#### POST-INSTALLATION INSPECTION (CHECK ALL BOXES FOR COMPLETION)

- ☐ Plant sizes, locations, and quantities are installed per Planning Division staff or City Planning Commission (CPC) approved plans, details and specifications.
- ☐ Irrigation systems are installed per Planning Division staff or CPC approved plans, details and specifications. Evidence of irrigation field inspection, prior to backfilling, shall be attached.
- ☐ Landscape Irrigation Audit has been performed and corrections have been completed as identified in the audit.
- ☐ Soil analysis report and documentation verifying implementation of soil analysis report recommendations
- ☐ Copy of this certification has been provided to owner/manager and the City of Riverside Planning Division.

#### PROJECT INFORMATION

Planning Case Number(s): \_\_\_\_\_

Project Name: \_\_\_\_\_

Project Address/Location: \_\_\_\_\_

Assessor's Parcel Number(s): \_\_\_\_\_

#### PROPERTY OWNER OF HIS/HER DESIGNEE

I/we certify that I/we have received copies of all of the documents, including a set of the approved landscape and irrigation plans and Certificate of Completion, and that it is our responsibility to see that the project is maintained in accordance with the Landscape and Irrigation Maintenance Schedule.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Property Owner of Record (PRINT NAME): \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Daytime Telephone: (\_\_\_\_) \_\_\_\_\_ Facsimile: (\_\_\_\_) \_\_\_\_\_

E-Mail Address: \_\_\_\_\_



## CERTIFICATE OF COMPLIANCE

### LANDSCAPE ARCHITECT RESPONSIBLE FOR LANDSCAPE AND/OR IRRIGATION DESIGN

Firm/Company Name: \_\_\_\_\_  
Contact Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Daytime Telephone: (\_\_\_\_) \_\_\_\_\_ Facsimile: (\_\_\_\_) \_\_\_\_\_  
E-Mail Address: \_\_\_\_\_  
License/Certification Number: \_\_\_\_\_

### AUDITOR RESPONSIBLE FOR IRRIGATION AUDIT

Firm/Company Name: \_\_\_\_\_  
Contact Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Daytime Telephone: (\_\_\_\_) \_\_\_\_\_ Facsimile: (\_\_\_\_) \_\_\_\_\_  
E-Mail Address: \_\_\_\_\_  
License/Certification Number: \_\_\_\_\_

I/We certify that, based upon periodic site observations and a final inspection at project completion, the landscaping and irrigation of the above-identified project has been substantially completed in accordance with the City of Riverside's Water Efficient Landscape and Irrigation Ordinance and the landscape planting and irrigation installation conform with the criteria and specifications of the approved landscape and irrigation plans approved by the City of Riverside Planning Division.

\_\_\_\_\_  
Landscape Architect Signature & Date      Auditor Signature & Date

ATTACH THE FOLLOWING DOCUMENTS, IF NOT ALREADY SUBMITTED TO THE PLANNING DIVISION (ALONG WITH ANY ADDITIONAL MATERIALS VERIFYING IMPLEMENTATION):

- ☐ Landscape Irrigation Audit Report
- ☐ Landscape Maintenance and Irrigation Schedules
- ☐ Soil Management Plan

PLANNING CASE NUMBER: \_\_\_\_\_  
PLANNER'S INITIALS: \_\_\_\_\_ DATE RECEIVED: \_\_\_\_\_



## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES

### V. CLIMATE-APPROPRIATE PLANTS FOR THE CITY OF RIVERSIDE

The following list is provided as a guide to selecting climate-appropriate plants for the landscape. Plant species not shown can be considered but should be evaluated using the same criteria illustrated on the provided list.

#### ESTIMATED PLANT CLASSIFICATION CATAGORY

The estimated plant classification information was obtained from Water Use Classification of Landscape Species (WUCOLS IV) and can be used to select and group plants into homogeneous hydrozones such as High (H), Moderate (M), Low (L) and Very Low (VL). Additionally, these classifications shall be used to determine the hydrozone plant factor (PF) involved in calculating the Estimated Total Water Use (ETWU). Refer to this Appendix, Section II., 1., P. (13)(b) – Estimating Total Water Use (ETWU) for further information.

#### NATIVE SPECIES CATEGORY

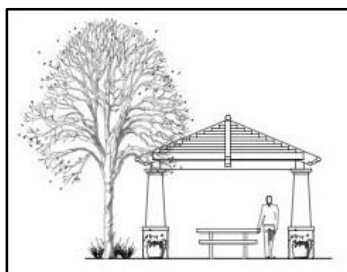
By utilizing native plant species in the landscape we can introduce California's natural beauty and diversity. Some added benefits of landscaping with native plants can be lowering the required water use and maintenance. Natives also encourage beneficial wildlife and insects that will reduce the need for harmful pesticides.

*Blue-Eyed Grass*



*Purple Needlegrass*

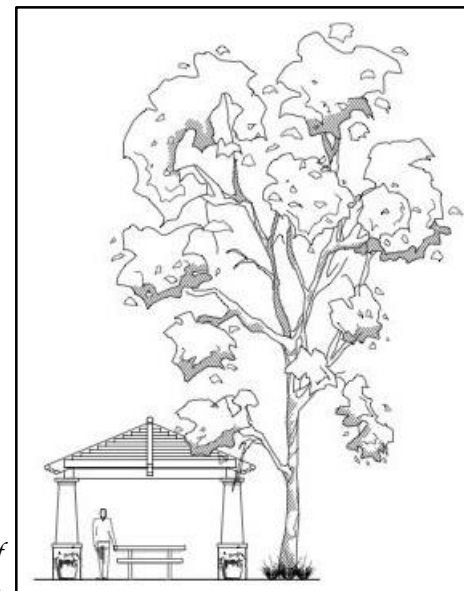
#### MATURE HEIGHT AND WIDTH CATAGORIES



The mature height and mature width information was obtained from several reputable sources and should be used to select the appropriately sized tree, shrub, groundcover or vine that is in scale with the project.

*Tree selected compliments the picnic structure and is in scale.*

*Tree selected is too tall and out of scale with the picnic structure.*



# APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES



## PLANTING AREA CATAGORIES



### Large Planting Areas of 25' or more:

This category includes large open landscape such as: parks, multi-family residential common open spaces and large slope areas. In some cases, large residential lots can consist of large planting areas.

### Medium Planting Areas between 6' and 25':

Medium sized planting areas consist of a wide range of landscape settings. This category includes building foundation planting areas found in commercial and industrial sizes, as well as, most residential landscapes.

### Small Planting Areas between 2' and 6':

Small scale landscapes can be defined as areas that have limiting boundaries such as, parkways, medians and parking lot planter islands. Plants appropriate for border landscape areas can also be found within this category.







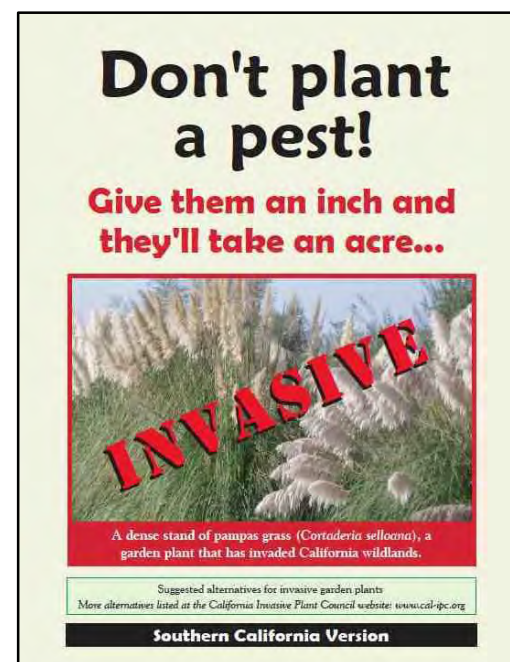
## APPENDIX C: WATER EFFICIENT LANDSCAPING AND IRRIGATION DESIGN GUIDELINES

### INVASIVE PLANTS



Refer to the California Invasive Plant Council's (Cal-IPC) website at [www.cal-ipc.org](http://www.cal-ipc.org) for a current list of known and potentially invasive plants to avoid using in the landscape. Cal-IPC's 'Don't Plant a Pest' program and information can also be found on the website listed above. This program can assist in selecting appropriate alternatives to undesirable invasive plant species.

Invasive species are a leading threat to biodiversity. By using invasive plants there is a potential that they may overtake natural plant communities in our local environment. They can also negatively impact the native wildlife in sensitive ecosystems. They impede our ability to enjoy Riverside's most beautiful landscapes, both aesthetically and recreationally.



# CLIMATE-APPROPRIATE PLANTS FOR THE CITY OF RIVERSIDE

Botanical Name	Common Name	Estimated Plant Water Use Classification L - Low M - Moderate H - High	Native Species ● all species ■ select species	Mature Height	Mature Width	Large Planting Area	Medium Planting Area	Small Planting Area
<b>TREES</b>								
Acacia baileyana	Bailey acacia	L		20-30 ft.	20-40 ft.	x	x	
Acacia cultriformis	knife acacia	L		10-15 ft.	10-15 ft.		x	
Acacia farnesiana (see Vachellia farnesiana)								
Acacia longifolia	Sydney golden wattle	L		20 ft.	20 ft.		x	
Acacia pendula	weeping acacia	M		25 ft.	15 ft.		x	x
Acacia stenophylla	eumong/shoestring acacia	L		30 ft.	20 ft.		x	x
Acacia willardiana	palo blanco	L		20 ft.	10 ft.		x	x
Aesculus californica	California buckeye	L	●	10-20 ft.	30 ft.	x	x	
Afrocarpus gracilior (Podocarpus gracilior)	African fern pine	M		20-60 ft.	10-20 ft.	x	x	
Agonis flexuosa	peppermint tree	L		25-35 ft.	15-30 ft.		x	x
Albizia julibrissin	silk tree	L		40 ft.	40 ft.	x		
Aloe spp.	aloe	L	■	varies			x	x
Arbutus 'Marina'	Marina arbutus	M		25-30 ft.	25-35 ft.	x	x	
Arbutus unedo	strawberry tree	L		8-35 ft.	8-35 ft.		x	
Arecastrum romanzoffianum (see Syagrus romanzoffiana)								
Bauhinia variegata (purpurea)	purple orchid tree	M		20-35 ft.	20-35 ft.		x	
Brachychiton acerifolius	flame tree	M		60-70 ft.	30 ft.	x	x	
Brachychiton discolor	Queensland lace bark	M		40-60 ft.	30 ft.	x	x	
Brachychiton populneus	bottle tree	L		30-50 ft.	30 ft.	x	x	
Brahea armata	blue hesper palm	L		20-40 ft.	12-25 ft.		x	x
Brahea edulis	Guadalupe palm	L	●	30 ft.	15 ft.		x	x
Butia odorata (Butia capitata)	pindo palm	L		10-20 ft.	10-15 ft.		x	
Callistemon citrinus	bottle brush	L		10-15 ft.	10-15 ft.		x	
Callistemon viminalis	weeping bottle brush	M		20-30 ft.	15 ft.	x	x	
Calodendrum capense	cape chestnut	M		20-40 ft.	20-40 ft.	x	x	
Cassia leptophylla	gold medallion tree	M		20-25 ft.	30 ft.	x		
Catalpa speciosa	western catalpa	M		40-60 ft.	20-40 ft.	x	x	
Cedrus atlantica	Atlas cedar	M		60 ft.	30 ft.	x		
Cedrus deodora	deodar cedar	M		80 ft.	40 ft.	x		
Ceiba speciosa (Chorisia speciosa)	floss silk tree	L		30-60 ft.	30-60 ft.	x		
Celtis occidentalis	common hackberry	M		40-50 ft.	40-50 ft.	x		
Ceratonia siliqua	carob	L		20 ft.	20 ft.	x		

# CLIMATE-APPROPRIATE PLANTS FOR THE CITY OF RIVERSIDE

Botanical Name	Common Name	Estimated Plant Water Use Classification L - Low M - Moderate H - High	Native Species ● all species ■ select species	Mature Height	Mature Width	Large Planting Area	Medium Planting Area	Small Planting Area
Cercidium (see Parkinsonia)								
Cercis occidentalis	western redbud	L	●	10-18 ft.	10-18 ft.		x	
Chamaerops humilis	Mediterranean fan palm	L		20 ft.	20 ft.		x	x
Chilopsis linearis	desert willow	L	●	15-30 ft.	10-20 ft.		x	
Chitalpa tashkentensis	chitalpa	L		20-30 ft.	20-30 ft.	x	x	
Chorisia speciosa (see Cieba speciosa)								
Cinnamomum camphora	camphor tree	M		50 ft.	60 ft.	x		
Citrus spp.	orange, lemon etc.	M		varies				
Cordyline australis	New Zealand cabbage tree	M		20-30 ft.	10 ft.			
Corymbia citriodora (Eucalyptus citriodora)	lemon scented gum	M		45-90 ft.	15-45 ft.	x		
Corymbia ficifolia (Eucalyptus ficifolia)	red flowering gum	M		25-40 ft.	25-40 ft.	x	x	
Cotinus coggygia	smoke tree	L		12-15 ft.	12-15 ft.		x	x
Cupaniopsis anacardioides	carrotwood	M		40 ft.	30 ft.	x	x	
Cupressus arizonica ssp. arizonica	Cuayamaca cypress	L		40 ft.	20 ft.	x	x	
Cupressus sempervirens	Italian cypress	L		60 ft.	5-10 ft.		x	x
Dracaena draco	dragon tree	L		20 ft.	30 ft.		x	
Elaeocarpus decipiens	Japanese blueberry tree	-		30-60 ft.	20-30 ft.	x	x	
Eriobotrya deflexa	bronze loquat	M		15-30 ft.	15-30 ft.		x	x
Erythrina coralloides	naked coral tree	M		30 ft.	30 ft.	x	x	
Erythrina x bidwillii	Bidwell's coral tree	M		24-30 ft.	24-30 ft.	x	x	
Eucalyptus camaldulensis	red gum	L		60-100 ft.	40-60 ft.	x		
Eucalyptus citriodora (see Corymbia citriodora)								
Eucalyptus ficifolia (see Corymbia ficifolia)								
Eucalyptus nicholii	Nichol's willow leaf peppermint	M		30-40 ft.	20-30 ft.	x	x	
Eucalyptus polyanthemus	silver dollar gum	L		30-75 ft.	15-45 ft.	x		
Eucalyptus sideroxylon	red iron bark	L		50-100 ft.	40-60 ft.	x		
Eucalyptus torquata	coral gum	M		18-36 ft.	15-30 ft.		x	
Eucalyptus viminalis	mannan gum	M		40-120 ft.	50 ft.	x		
Ficus carica	edible fig	M		15-30 ft.	15-30 ft.		x	
Ficus microcarpa	Indian laurel fig/ laurel fig	M		25-30 ft.	35-40 ft.	x		
Ficus microcarpa 'Green Gem'	green gem ficus	M		20-30 ft.	20-30 ft.	x		
Ficus rubiginosa	rusty leaf fig	M		20-50 ft.	30-50 ft.	x		
Fraxinus augustifolia 'Raywood'	raywood ash	M		20-30 ft.	25 ft.	x		



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Fraxinus velutina	Arizona ash	M	●	30 ft.	30-40 ft.	x		
Geijera parviflora	Australian willow	M		25-30 ft.	20 ft.		x	
Ginkgo biloba	maiden hair tree	M		35-50 ft.	15-25 ft.	x	x	
Gleditsia triacanthos	honey locust	L		35-70 ft.	25-35 ft.	x		
Hymenosporum flavum	sweet shade	M		12-40 ft.	9-20 ft.		x	x
Jacaranda mimosifolia	jacaranda	M		25-40 ft.	15-30 ft.	x		
Jubaea chilensis	Chilean wine palm	M		50-60 ft.	25 ft.		x	
Juglans c. californica	Southern California black walnut	L	●	15-30 ft.	15-30 ft.		x	
Juniperus scopulorum 'Tolleson's'	Tolleson's juniper	M		20 ft.	10 ft.		x	
Koelreuteria bipinnata	Chinese flame tree	M		20-40 ft.	20-40 ft.	x	x	
Koelreuteria paniculata	golden rain tree	L		20-35 ft.	20-40 ft.	x	x	
Lagerstroemia indica and hybrids	crape myrtle	M		varies			x	
Lagerstroemia fauriei	Japanese crape myrtle	M		20-30 ft.	20-30 ft.		x	
Laurus nobilis 'Saratoga'	sweet bay	L		12-40 ft.	12-40 ft.	x	x	
Leptospermum laevigatum	Australian tea tree	L		10-30 ft.	10-30 ft.	x	x	
Ligustrum lucidum	glossy privet	M		20-40 ft.	20-40 ft.		x	
Lophostemon confertus	Brisbane box	M		35-40 ft.	25 ft.	x	x	
Magnolia grandiflora	southern magnolia	M		80 ft.	60 ft.	x		
Magnolia x soulangiana	saucer magnolia	M		25 ft.	25 ft. +		x	
Magnolia stellata	star magnolia	M		10 ft.	20 ft.		x	x
Malus spp.(edible)	apple	M	■	varies			x	
Maytenus boaria	mayten tree	M		30-50 ft.	30-50 ft.		x	
Melaleuca linariifolia	flax leaf paper bark	L		20-30 ft.	20-25 ft.		x	
Melaleuca nesophila	pink melaleuca	L		15-20 ft.	15-20 ft.		x	
Melaleuca quinquinervia	cajeput tree	M		20-40 ft.	15-25 ft.	x	x	
Nolina recurvata (Beaucarnea recurvata)	bottle palm	L		12-15 ft.	9-12 ft.		x	
Olea europaea	olive	L		25-30 ft.	25-30 ft.	x		
Parkinsonia aculeata	Mexican palo verde/ Jerusalem thorn	L		15-30 ft.	15-30 ft.		x	
Parkinsonia florida (Cercidium)	blue palo verde	VL	●	35 ft.	30 ft.	x	x	
Parkinsonia microphyllum (Cercidium)	little leaf palo verde	L	●	20 ft.	20 ft.		x	
Parkinsonia praecox (Cercidium)	palo brea tree	L		20 ft.	20 ft.		x	
Phoenix canariensis	Canary Island date palm	L		60 ft.	50 ft.	x		
Phoenix dactylifera	date palm	L		80 ft.	20-40 ft.	x	x	

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Botanical Name	Common Name	Estimated Plant Water Use Classification L - Low M - Moderate H - High	Native Species ● all species ■ select species	Mature Height	Mature Width	Large Planting Area	Medium Planting Area	Small Planting Area
Phoenix reclinata	Senegal date palm	M		20-30 ft.	20-30 ft.		x	
Phoenix roebelenii	pigmy date palm	M		6-10 ft.	6-8 ft.			x
Pinus eldarica	afghan pine	L		30-80 ft.	15-25 ft.	x	x	
Pinus canariensis	Canary Island pine	M		50-80 ft.	20-35 ft.	x	x	
Pinus coulteri	Coulter pine	L	●	30-60 ft.	25-40 ft.	x	x	
Pinus halepensis	Aleppo pine	L		30-60 ft.	20-40 ft.	x		
Pinus pinea	Italian stone pine	L		40-80 ft.	40-60 ft.	x		
Pistacia chinensis	Chinese pistache	M		30-60 ft.	30-50 ft.	x	x	
Pittosporum undulatum	victorian box	M		30-40 ft.	30-40 ft.	x	x	
Platanus racemosa	California sycamore	M	●	30-80 ft.	20-50 ft.	x		
Platanus wrightii	Arizona sycamore	M		80 ft.	55 ft.	x		
Platanus x acerifolia	London plane	M		40-80 ft.	30-40 ft.	x		
Podocarpus henkelii	long leaf yellow wood	M		30-50 ft.	15-20 ft.		x	
Podocarpus gracilior (see Afrocarpus gracilior)								
Populus fremontii	western cottonwood	M	●	40-60 ft.	30 ft.	x		
Populus nigra 'Italica'	Lombardy poplar	M		40-100 ft.	15-30 ft.	x		
Prosopis chilensis	Chilean mesquite	L		30 ft.	30 ft.	x	x	
Prunus spp. (ornamental)	flowering plum	M	■	varies			x	
Punica granatum	pomegranate	L		varies			x	x
Pyrus calleryana cultivars	Callery pear	M		varies			x	
Pyrus kawakamii	evergreen pear	M		15-30 ft.	15-30 ft.		x	
Quercus agrifolia	coast live oak	L	●	20-70 ft.	20-80 ft.	x		
Quercus douglasii	blue oak	L	●	30-50 ft.	40-70 ft.	x		
Quercus engelmannii	mesa oak	L	●	40-50 ft.	70-80 ft.	x		
Quercus ilex	holly oak	L		30-60 ft.	30-60 ft.	x	x	
Quercus suber	cork oak	L		30-60 ft.	30-60 ft.	x		
Quercus virginiana	southern live oak	M		40-80 ft.	60-100 ft.	x		
Raphiolepis 'Majestic Beauty'	majestic beauty	M		15-20 ft.	8-10 ft.		x	x
Rhus lancea	African sumac	L		20-30 ft.	20-35 ft.		x	
Robinia x ambigua 'Purple Robe'	locust	L		40 ft.	30 ft.	x		
Sambucus spp.	elderberry	L	■	varies			x	
Sapium sebiferum	Chinese tallow tree	M		30-40 ft.	25-30 ft.		x	
Schinus molle	California pepper tree	L		25-40 ft.	25-40 ft.	x	x	

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Botanical Name	Common Name	Estimated Plant Water Use Classification L - Low M - Moderate H - High	Native Species ● all species ■ select species	Mature Height	Mature Width	Large Planting Area	Medium Planting Area	Small Planting Area
Schinus terebinthefolius	Brazilian pepper tree	M		30 ft.	30 ft.		x	
Sequoiadendron giganteum	giant sequoia	M	●	60-100 ft.	30-50 ft.	x		
Sophora japonica	Japanese pagoda tree	M		50-70 ft.	50-70 ft.	x		
Strelitzia nicolai	giant bird of paradise	M		30 ft.	30 ft.		x	
Syagrus romanzoffiana	queen palm	M		50 ft.	20-25 ft.		x	
Tabebuia impetiginosa	purple or pink trumpet tree	M		25-50 ft.	25-50 ft.		x	
Thevetia thevetioides	giant thevetia	M		12 ft.	12 ft.		x	x
Tipuana tipu	tipu tree	M		20-40 ft.	30-60 ft.	x		
Trachycarpus fortunei	windmill palm	M		30 ft.	10 ft.		x	x
Tristaniopsis laurina	Water gum	M		45 ft.	30 ft.	x	x	
Ulmus parvifolia	Chinese evergreen elm	M		40-60 ft.	50-70 ft.	x		
Umbellularia californica	California bay	M	●	20-25 ft.	20-25 ft.	x		
Vachellia farnesiana (Acacia farnesiana)	sweet acacia	VL		20 ft.	15-25 ft.		x	
Vitex agnus-castus	chaste tree	M		25 ft.	25 ft.		x	
Washingtonia filifera	California fan palm	L		60 ft.	20 ft.		x	x
Washingtonia robusta	Mexican fan palm	L		100 ft.	10 ft.		x	x
Zelkova serrata	saw leaf zelkova	M		60 ft.	60 ft.	x		

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<b>SHRUBS</b>								
Abelia x grandiflora	glossy abelia	M		8 ft.	5 ft.		x	
Achillea millefolium & hybrids	common yarrow	L	■	2-3 ft.	2-3 ft.		x	x
Aeonium spp.	Canary Island rose	L		varies			x	x
Agapanthus africanus	lily-of-the-Nile	M		1-2 ft.	2-3 ft.		x	x
Agapanthus orientalis	lily-of-the-Nile	M		3-5 ft.	2-3 ft.		x	x
Agave spp.	agave	L		varies		x	x	
Aloe spp.	aloe	L	■	varies		x	x	x
Alyogyne huegelii	blue hibiscus	L		5-8 ft.	5-8 ft.		x	
Anigozanthos flavidus & hybrids	kangaroo paw	L		varies			x	x
Anisacanthus spp.	desert honeysuckle	L		4 ft.	4 ft.		x	
Anisodonteia scabrosa	false mallow	M		4-6 ft.	4-6 ft.		x	
Anisodonteia X hypomadarum	South African mallow	M		4 ft.	4 ft.		x	
Arbutus unedo 'Compacta'	compact strawberry tree	L		6-10 ft.	5-6 ft.	x	x	
Arctostaphylos spp.	manzanita	L	■	varies		x	x	
Asparagus densiflorus 'Myers'	Myers asparagus	M		2 ft.	3-4 ft.		x	x
Asparagus densiflorus 'Sprengeri'	Sprenger asparagus	M		2-3 ft.	3-6 ft.		x	x
Aspidistra elatior	cast iron plant	M		2 ft.	2-3 ft.		x	x
Atriplex spp.	saltbush	VL	■	varies			x	
Baccharis 'Centennial'	bentennial baccharis	L	●	3 ft.	4-5 ft.	x	x	
Baileya multiradiata	desert marigold	L	●	1-1 1/2 ft.	1-2 ft.		x	x
Bambusa spp.	clumping bamboo			varies		x	x	x
Berberis spp.	barberry	L/M per species	■	varies		x	x	x
Bougainvillea spp.	bougainvillea	L		3-6 ft.	3-6 ft.	x	x	
Bouteloua curtipendula	sideoats gramma	L	●	1-2 ft.	2 ft.		x	x
Bouteloua gracilis	blue gramma	L	●	1 1/2-2 ft.	1 ft.		x	x
Buddleia marrubiifolia	wooly butterfly bush	L		5 ft.	5 ft.	x	x	
Bulbine frutescens	stalked bulbine	L		1 ft.	2-3 ft.			x
Buxus microphylla japonica	Japanese boxwood	M		4-6 ft.	4-6 ft.		x	x
Caesalpineia gilliesii	desert bird of paradise	L		10 ft.	8 ft.	x	x	
Caesalpineia mexicana	Mexican bird of paradise	L		10-12 ft.	6-8 ft.	x	x	
Caesalpineia pulcherrima	dwarf poinciana	M		10 ft.	10 ft.	x	x	
Calamagrostis spp.	feather reed	M	■	2-3 ft.	2-3 ft.		x	x



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Botanical Name	Common Name	Estimated Plant Water Use Classification L - Low M - Moderate H - High	Native Species ● all species ■ select species	Mature Height	Mature Width	Large Planting Area	Medium Planting Area	Small Planting Area
<i>Calliandra californica</i>	Baja fairy duster	L	●	5 ft.	5-6 ft.		x	
<i>Calliandra eriophylla</i>	fairy duster	VL	●	3 ft.	4-5 ft.		x	
<i>Calliandra haematocephala</i>	pink powder puff	M		10 ft.	10 ft.	x		
<i>Calliandra tweedii</i>	Trinidad flame bush	M		6-8 ft. +	6-8 ft. +	x		
<i>Callistemon citrinus</i>	bottle brush	L		10-15 ft.	10-15 ft.	x		
<i>Callistemon 'Little John'</i>	dwarf bottle brush	L		3 ft.	3 ft.		x	x
<i>Camellia sasanqua</i>	sasanqua camellia	M		varies		x	x	
<i>Campanula</i> spp.	bell flower	M		varies				x
<i>Carex buchanani</i>	leatherleaf sedge	M		3 ft.	2 1/2 ft.		x	x
<i>Carex conica</i>	snowline sedge	M		2 ft.	2 ft.		x	x
<i>Carex elata 'Aurea'</i>	Bowles golden sedge	M		2 1/2 ft.	1 1/2 ft.		x	x
<i>Carex flaggallifera</i>	New Zealand sedge	M		3 ft.	2-2 1/2 ft.		x	x
<i>Carex morrowii expallida</i>	Japanese sedge	M		1 ft.	1 1/2 ft.		x	x
<i>Carex pansa</i>	California meadow sedge	M	●	6-8 in.	1 ft.			x
<i>Carex tumulicola</i>	Berkeley sedge	L	●	6-8 in.	1 ft.			x
<i>Carissa</i> spp.	Natal plum	M		2-4 ft.	3-6 ft.		x	
<i>Carpenteria californica</i>	bush anemone	M	●	4-6 ft.	4-6 ft.	x	x	
<i>Ceanothus</i> spp.	California lilac	L	■	3-15 ft.	3-15 ft.	x	x	
<i>Centaurea cineraria</i>	dusty miller (cineraria)	M		1 ft.	1 ft.			x
<i>Choisya ternata</i>	Mexican orange	M		6-8 ft.	6-8 ft.	x	x	
<i>Cistus</i> spp.	rockrose	L		3-6 ft.	3-6 ft.	x	x	
<i>Clivia miniata</i>	Kaffir lily	M		2 ft.	2 ft.			x
<i>Cocculus laurifolius</i>	laurel leaf cocculus	M		25 ft.	25 ft.	x		
<i>Convolvulus cneorum</i>	bush morning glory	L		2-4 ft.	2-4 ft.		x	x
<i>Coprosma x kirkii</i>	creeping coprosma	M		1-3 ft.	4-6 ft.	x	x	
<i>Coprosma repens</i>	mirror plant	M		10 ft.	6 ft.	x	x	
<i>Cordyline stricta</i>	palm lily	M		15 ft.	6 ft.	x		
<i>Cotoneaster congestus</i>	Pyrenees cotoneaster	M		3 ft.	3 ft.		x	
<i>Cotoneaster glaucophyllus</i>	bright bead cotoneaster	M		5 ft.	5 ft.	x	x	
<i>Cotoneaster parneyi</i>	Parney cotoneaster	M		8 ft.	10 ft.	x		
<i>Cotoneaster salicifolius</i>	willowleaf cotoneaster	M		15-18 ft.	15-18 ft.	x		
<i>Crassula</i> spp.	crassula	L		1-4 ft.	1-4 ft.		x	x
<i>Cuphea</i> spp.	cuphea	M		1-3 ft.	1-3 ft.		x	x

## CLIMATE-APPROPRIATE PLANTS FOR THE CITY OF RIVERSIDE

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<i>Cycas revoluta</i>	sago palm	M		2-3 ft. +	4-6 ft.		x	
<i>Dalea bicolor</i>	dalea (bicolor)	L		8 ft.	5-6 ft.	x		
<i>Dasyllirion</i> spp.	desert spoon	L		3-5 ft.	4-5 ft.	x	x	
<i>Dendromecon harfordii</i>	island bush poppy	L	●	8-20 ft.	8-20 ft.	x		
<i>Dendromecon rigida</i>	bush poppy	L	●	4-8 ft.	4-6 ft.	x		
<i>Deschampsia caespitosa</i>	tufted hairgrass	L	●	1-2 ft.	2 ft.		x	x
<i>Dianella revoluta</i> cultivars	flax lily	L		varies	varies	x	x	x
<i>Dianella tasmanica</i>	Tasmin flax lily	M		3-4 ft.	1-2 ft.		x	
<i>Dianthus</i> spp.	pink/carnation	M		1-1 1/2 ft.	1-1 1/2 ft.		x	x
<i>Dietes bicolor</i>	fortnight lily	M		2-3 ft.	3 ft.		x	
<i>Dietes iridioides</i>	fortnight lily	M		3-4 ft.	3-4 ft.		x	
<i>Dodonaea viscosa</i> 'Purpurea'	purple hopseed bush	M		10-15 ft.	10-15 ft.	x		
<i>Dudleya</i> spp.	dudleya, live forever	L	●	1 1/2 ft.	1-2 ft.			x
<i>Echeveria</i> spp.	hens and chickens	L		3-6 in.	1 1/2 ft.			x
<i>Echinocactus</i> spp.	barrel cactus	L	■	4 ft.	2 1/2 ft.		x	
<i>Echinopsis</i> spp.	torch cactus	L		4-12 in.	varies		x	x
<i>Echium candicans</i>	pride of Madeira	L		5-6 ft.	6-10 ft.	x		
<i>Elaeagnus pungens</i>	silverberry	L		10-15 ft.	10-15 ft.	x		
<i>Elymus magellanicus</i> (also <i>Agropyron</i> )	Magellan wheatgrass	M		1 1/2 ft.	1 1/2 ft.			x
<i>Encelia californica</i>	California encelia	L	●	3 ft.	4 ft.		x	
<i>Encelia farinosa</i>	brittle bush	L	●	3 ft.	4 ft.		x	
<i>Epilobium</i> spp. (see <i>Zauchneria</i> )								
<i>Eriogonum fasciculatum</i>	California buckwheat	L	●	1-3 ft.	4 ft.		x	
<i>Escallonia</i> 'Compakta'	compact escallonia	M		3 ft.	3 ft.		x	
<i>Escallonia</i> 'Frades'	Frades escallonia	M		5-6 ft.	5-6 ft.	x	x	
<i>Euryops pectinatus</i>	shrub daisy	L		3-6 ft.	3-6 ft.		x	
<i>Feijoa sellowiana</i>	pineapple guava	M		10-25 ft.	10-25 ft.	x		
<i>Felicia amelloides</i>	blue marguerite	M		1 1/2 ft.	4-5 ft.		x	
<i>Ferocactus</i> spp.	barrel cactus	L	■	8-9 ft.	3 ft.	x	x	
<i>Festuca californica</i>	California fescue	M	●	2-3 ft.	1-2 ft.		x	x
<i>Festuca glauca</i>	blue fescue	M		1 ft.	10 in.			x
<i>Fouquieria splendens</i>	ocotillo	L	●	8-25 ft.	5-10 ft.	x		
<i>Fremontodendron</i> spp.	flannel bush	L	●	20 ft.	12 ft.	x		

## CLIMATE-APPROPRIATE PLANTS FOR THE CITY OF RIVERSIDE

Botanical Name	Common Name	Estimated Plant Water Use Classification L - Low M - Moderate H - High	Native Species ● all species ■ select species	Mature Height	Mature Width	Large Planting Area	Medium Planting Area	Small Planting Area
Gaillardia x grandiflora	blanket flower	M		2-4 ft.	1 1/2 ft.		x	x
Galvesia speciosa	island bush snapdragon	L	●	3 ft.	5 ft.		x	
Gardenia spp.	gardenia	M		varies			x	
Garrya elliptica	coast siltkassel	M	●	10-20 ft.	10-20 ft.	x		
Geranium 'Johnson's Blue'	Johnson's blue geranium	M		1 1/2-2 ft.	2 ft.			x
Geranium sanguineum	bloody cranesbill	M		8-18 in.	2 1/2 ft.			x
Grevillea 'Noellii'	Noel's grevillea	L		4 ft.	4-5 ft.	x	x	
Grewia occidentalis	lavender star flower	M		6-10 ft.	6-10 ft.	x		
Helictotrichon sempervirens	blue oat grass	M		2-3 ft.	2-3 ft.		x	x
Hemerocallis spp.	day lily	M		varies			x	x
Hesperaloe parviflora	red/ yellow yucca	L		3-4 ft.	3-4 ft.		x	x
Heteromeles arbutifolia	toyon	L	●	6-10 ft.	6-10 ft.	x		
Heuchera maxima	island alum root	M	●	1-2 ft.	3-4 ft.		x	x
Heuchera sanguinea	coral bells	M		1-2 ft.	1-2 ft.			x
Hibiscus rosa-sinensis	Chinese hibiscus	M		8-15 ft.	5-8 ft.	x	x	
Ilex cornuta and varieties	Chinese holly	M		varies		x	x	
Ilex vomitoria and varieties	yaupon	L		varies			x	
Imperata cylindrica 'Rubra'	Japanese blood grass	M		1-2 ft.	1 ft.			x
Iris douglasiana	Douglas iris	M	●	1 1/2-2 ft.	1-1 1/2 ft.			x
Iris spp.	bearded iris	M	■	varies			x	x
Juncus effusus	soft rush	M	●	2 1/2 ft.	2 1/2 ft.		x	
Juncus patens	California gray rush	M	●	2 ft.	2 ft.		x	
Juniperus spp.	juniper	L	■	varies		x	x	x
Justicia brandegeana	shrimp plant	M		3-4 ft.	3-4 ft.		x	
Justicia californica	chuparosa	L	●	6 ft.	6 ft.	x	x	
Kalanchoe spp.	kalanchoe, garden varieties	L		1-2 ft.	1-2 ft.		x	x
Kniphofia uvaria and hybrids	red hot poker	L		varies			x	
Lantana camara	bush lantana	L		6 ft.	6 ft.	x	x	
Lantana montevidensis and hybrids	trailing lantana	L		varies			x	
Laurus nobilis	sweet bay	L		12-40 ft.	12-40 ft.	x		
Lavandula spp.	lavender	L		2-4 ft.	2-6 ft.		x	
Lavatera assurgentiflora	tree mallow	L	●	12 ft.	12 ft.	x		
Lavatera maritima	California tree mallow	M		8 ft.	4 ft.	x		

## CLIMATE-APPROPRIATE PLANTS FOR THE CITY OF RIVERSIDE

Botanical Name	Common Name	Estimated Plant Water Use Classification L - Low M - Moderate H - High	Native Species ● all species ■ select species	Mature Height	Mature Width	Large Planting Area	Medium Planting Area	Small Planting Area
Leonotis leonurus	lion's tail	L		6 ft.	6 ft.	x		
Leptospermum scoparium	New Zealand tea tree (shrub varieties)	M		4-12 ft.	4-8 ft.	x		
Leucophyllum spp.	Texas ranger	L		varies		x	x	
Leymus 'Canyon Prince'	canyon prince rye	M		4 ft.	3 ft.		x	
Ligustrum japonicum and varieties	Japanese privet	M		varies		x		
Limonium perezii	statice	M		3 ft.	2-3 ft.		x	x
Liriope muscari varieties	lilyturf	M		1-1 1/2 ft.	1-2 ft.			x
Lobelia laxiflora	Mexican bush lobelia	VL		3 ft.	6 ft.	x	x	
Loropetalum chinense	fringe flower	-		6-10 ft.	6-10 ft.	x		
Mahonia aquifolium	Oregon grape	M		6 ft.	5 ft.	x	x	
Mahonia 'Golden Abundance'	golden abundance mahonia	M		6 ft.	5 ft.	x		
Mahonia nervosa	longleaf mahonia	M		2-3 ft.	3 ft.	x	x	
Mahonia nevinii	Nevin mahonia	L		6 ft.	6 ft.	x		
Melaleuca armillaris	bracelet honey-myrtle	M		12-15 ft.	15-30 ft.	x		
Mimulus aurantiacus	sticky monkey flower	L	●	4 1/2 ft.	4 1/2 ft.		x	x
Miscanthus sinensis varieties	eulalia grass	M		varies			x	
Molinia caerulea	Moor grass	-		varies			x	
Muhlenbergia capillaris	hairy awn muhly	-		3 ft. +	6 ft.	x	x	
Muhlenbergia rigens	deer grass	M	●	4 ft. +	4 ft.	x	x	
Myrsine africana	African boxwood	M		8 ft.	6 ft.	x	x	
Myrtus communis	true myrtle	M		5-6 ft.	4-5 ft.	x	x	
Nandina domestica	heavenly bamboo	M		varies			x	
Nandina spp.	compact, upright heavenly bamboo	M		4-6 ft.	3 ft.		x	
Nandina spp.	low growing heavenly bamboo	M		1-3 ft.	1-3 ft.		x	x
Nassella pulchra	feather grass	L	●	3 ft.	2 ft.		x	
Nassella tenuissima	Mexican feather grass	L		2 ft.	2-3 ft.		x	x
Nephrolepis exaltata 'Bostoniensis'	Boston fern	M		3 ft.	4 ft.		x	
Nerium oleander	oleander	L		20 ft.	12 ft.	x		
Nolina microcarpa	bear grass	VL	■	3 ft.	6 ft.	x	x	
Ophiopogon japonicus	mondo grass	M		6-8 in.	6-8 in.			x
Opuntia macrocentra	prickly pear cactus	L		4 ft.	6 ft.		x	
Opuntia microdasys	bunny ears	L		2-3 ft.	4-5 ft.		x	
Osmanthus fragrans	sweet olive	M		10 ft.	6-8 ft.	x		



# CLIMATE-APPROPRIATE PLANTS FOR THE CITY OF RIVERSIDE

Botanical Name	Common Name	Estimated Plant Water Use Classification L - Low M - Moderate H - High	Native Species ● all species ■ select species	Mature Height	Mature Width	Large Planting Area	Medium Planting Area	Small Planting Area
Pennisetum spp.	fountain grass (no self sowing selections)	-		varies			x	x
Penstemon hybrids	border penstemon	M	■	2-4 ft.	3 ft.		x	x
Penstemon heterophyllus varieties	penstemon	-	●	1 1/2-2 ft.	2-3 ft.		x	
Phlomis fruticosa	Jerusalem sage	L		4 ft.	4 ft.		x	
Phormium hybrids	flax	M		varies		x	x	x
Photinia x fraseri	Fraser photinia	M		15 ft.	15 ft.	x		
Pittosporum crassifolium	evergreen pittosporum	M		25 ft.	20 ft.	x		
Pittosporum tobira	mock orange	M		15 ft.	15 ft.	x		
Pittosporum tobira 'Wheeler's Dwarf'	dwarf pittosporum	M		2-3 ft.	4-5 ft.		x	
Plumbago auriculata (campense)	cape plumbago	M		6 ft.	10 ft.	x		
Podocarpus macrophyllus maki	shrubby yew pine	M		8-15 ft.	2-4 ft.	x		
Prunus caroliniana	Carolina laurel cherry, compact varieties	M		10 ft.	8 ft.	x		
Prunus ilicifolia	holly leaf cherry	VL	●	10-25 ft.	10-25 ft.	x		
Prunus lyonii	Catalina cherry	L	●	15-20 ft.	15-20 ft.	x		
Punica granatum 'Nana'	dwarf pomegranate	M		3 ft.	6 ft.		x	
Pyracantha spp.	firethorn	M		4-10 ft.	4-10 ft.	x		
Rhamnus californicus	coffeeberry	L	●	15 ft.	8 ft.	x		
Rhaphiolepis spp.	Indian hawthorne	M		5 ft.	6 ft.	x	x	
Rhapis excelsa	lady palm	M		5-12 ft.	5-12 ft.	x		
Rhus integrifolia	lemonade berry	L		10 ft.	10 ft.	x		
Rhus laurina	laurel sumac		●	15 ft.	15 ft.	x		
Rhus ovata	sugar bush	L	●	10 ft.	10 ft.	x		
Ribes aureum	golden currant	L	●	6 ft.	6 ft.	x	x	
Romneya coulteri	Matilija poppy	L	●	6-8 ft.	6-8 ft.	x	x	
Rosa californica	California wild rose	L	●	3-9 ft.	3-9 ft.		x	
Rosa, bush hybrids	rose	M		varies			x	
Rosa rugosa	Ramona's rose	-		3-6 ft.	3-6 ft.		x	
Rosmarinus officinalis	rosemary, upright varieties	L		5-7 ft.	2-5 ft.		x	
Rudbeckia hirta and varieties	Gloriosa daisy	M		1-4 ft.	1 1/2 ft.		x	x
Salvia spp.	sage	L	■	varies		x	x	x
Salvia 'Dara's Choice'	Sonoma sage	L	●	2-3 ft.	3-6 ft.		x	x
Salvia 'Mrs. Beard'	Mrs. Beard sage	-	●	2-4 ft.	4-6 ft.		x	x
Salvia clevelandii & hybrids	Cleveland/Alan Chickering etc.	L	●	5 ft.	8 ft.	x	x	

# CLIMATE-APPROPRIATE PLANTS FOR THE CITY OF RIVERSIDE

Botanical Name	Common Name	Estimated Plant Water Use Classification L - Low M - Moderate H - High	Native Species ● all species ■ select species	Mature Height	Mature Width	Large Planting Area	Medium Planting Area	Small Planting Area
Salvia greggii & hybrids	autumn sage	L		4 ft.	4 ft.		x	
Salvia mexicana	Mexican sage	-		10 ft. +	3-5 ft.	x		
Salvia sonomensis	creeping/Sonoma sage	-	●	1 ft.	3-4 ft.		x	x
Salvia spathacea	hummingbird/pitcher sage	-	●	1-2 ft.	3-4 ft.		x	x
Sambucus spp.	elderberry	L	■	30 ft.	20 ft.	x		
Santolina spp.	lavender cotton	L		2 ft.	3 ft.		x	
Senecio cineraria	dusty miller	L		2-3 ft.	2-3 ft.		x	x
Senna artemesioides (Cassia artemesioides)	feathery cassia/senna	L		5 ft.	5 ft.		x	
Senna spectabilis (Cassia excelsa)	senna/cassia (spectabilis/excelsa)	L		6 ft.	6 ft.	x		
Sesleria autumnalis	autumn moor grass	-		8-18 in.	8-18 in.		x	x
Sesleria caerulea	blue moor grass	-		6-8 in.	6-8 in.		x	x
Simmondsia chinensis	jojoba	VL	●	6 ft.	6 ft.	x		
Stachys byzantina	lamb's ears	M		1 1/2 ft.	2 ft.		x	x
Strelitzia reginae	bird of paradise	M		5-6 ft.	5-6 ft.		x	
Syzygium paniculatum varieties	Australian brush cherry	M		varies		x		
Teucrium cossonii majoricum	Majorcan germander	L		8 in.	1 1/2 ft.			x
Teucrium fruticans	bush germander	L		4-8 ft.	4-8 ft.	x		
Thevetia peruviana	yellow oleander	M		8 ft. +	8 ft. +	x		
Thuja occidentalis varieties	American arborvitae, garden selections	M		varies		x		
Trichostema lanatum	woolly/mountain blue curls	L	●	3-5 ft.	4-8 ft.		x	
Tulbaghia violacea	society garlic	M		10-24 in.	1-2 1/2 ft.		x	x
Verbena stricta	hoary vervian	M		3 ft.	1 1/2 ft.		x	x
Viburnum japonicum	Japanese viburnum	M		15 ft.	12 ft.	x		
Viburnum tinus and varieties	laurustinus	M		varies		x		
Westringia 'Morning Light'	morning light westringia	L		3 ft.	3 ft.	x	x	
Westringia fruticosa	coast rosemary	L		3-6 ft.	5-8 ft.	x	x	
Woodwardia fimbriata	giant chain fern	M	●	4-5 ft.	3 ft.		x	
Xylosma congestum	shiny xylosma	M		10 ft.	10 ft.	x		
Yucca spp.	yucca	L	■	varies		x	x	
Zauschneria californica 'Everett's Choice'	Everett's choice California fuschia	L	●	2-4 in.	3-5 ft.			x
Zauschneria californica varieties	California fuschia	L	●	varies			x	x
Zephyranthes spp.	zephyr flower	M		6-15 in.	1 ft.		x	x

## CLIMATE-APPROPRIATE PLANTS FOR THE CITY OF RIVERSIDE

Botanical Name	Common Name	Estimated Plant Water Use Classification L - Low M - Moderate H - High	Native Species ● all species ■ select species	Mature Height	Mature Width	Large Planting Area	Medium Planting Area	Small Planting Area
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# CLIMATE-APPROPRIATE PLANTS FOR THE CITY OF RIVERSIDE

Botanical Name	Common Name	Estimated Plant Water Use Classification L - Low M - Moderate H - High	Native Species ● all species ■ select species	Mature Height	Mature Width	Large Planting Area	Medium Planting Area	Small Planting Area
<b>GROUND COVERS</b>								
Abelia x grandiflora 'Prostrata'	prostrate glossy abelia	M		1 1/2-2 ft.	4-5 ft.		x	
Acacia redolens	prostrate acacia, low-growing forms	L		2 ft.	12 ft.	x		
Achillea tomentosa	woolly yarrow	L		6-10 in.	1 1/2 ft.			x
Arctostaphylos cultivars	manzanita, ground cover cultivars	L	■	varies			x	
Arctotheca calendula	cape weed	M		6-12 in.	1 1/2-2 ft.		x	x
Armeria maritima	sea pink	M	●	6-10 in.	1 ft.		x	x
Artemisia caucasica	silver spreader	L	●	3-6 in.	2 ft.		x	x
Baccharis pilularis cvs.	dwarf coyote brush	L	●	8-24 in.	6 ft.	x	x	
Bougainvillea spp.	bougainvillea	L		1 1/2-4 ft.	6-30 ft.	x		
Campanula portenschlagiana	Dalmatian bellflower	M		4-6 in.	2 ft.		x	x
Campanula poscharskyana	Serbian bellflower	M		8 in.	2 ft.		x	x
Carissa macrocarpa	Natal plum, spreading varieties	M		1-2 ft.	4 ft.		x	
Ceanothus cultivars	ceanothus, low-growing forms	L	■	1-2 1/2 ft.	15 ft.	x	x	
Cerastium tomentosum	snow in summer	M		6-8 in.	2-3 ft.		x	x
Convolvulus sabatius	ground morning glory	L		1-2 ft.	3 ft.		x	
Coprosma petriei 'Verde vista'	verde vista coprosma	M		1-3 ft.	4-6 ft.		x	
Coreopsis auriculata 'Nana'	dwarf coreopsis	L		5-6 in.	2 ft.		x	x
Cotoneaster spp. (ground covers)	cotoneaster	M		1-3 ft.	6-15 ft.	x	x	
Dalea capitata	dalea (capitata)	-		8 in.	3 ft.		x	
Dalea greggii	trailing indigo bush	L		1 1/2 ft.	6 ft.	x	x	
Drosanthemum floribundum	rosea ice plant	L		6 in.	5 ft.		x	
Dymondia margaretae	dymondia	L		2-3 in.	20 in.		x	x
Erigeron karvinskianus	fleabane	M		10-20 in.	3 ft.		x	x
Euonymus fortunei	euonymus, prostrate forms	M		1/2-2 ft.	varies		x	
Fragaria spp.	strawberry	M	■	4-8 in.	1-1 1/2 ft.			x
Gazania hybrids	gazania	M		6-10 in.	3-4 ft.			x
Graptopetalum spp.	graptopetalum	L		7 in.	1 ft.			x
Helianthemum nummularium	sunrose	-		6-8 in.	3 ft.			x
Hypericum calycinum	Aaron's beard	M		1 ft.	3-4 ft.		x	x
Iberis sempervirens	evergreen candy tuft	M		8-12 in.	8-12 in.			x
Iva hayesiana	poverty weed	L	●	1 ft.	3 ft.		x	x
Lampranthus spp.	trailing ice plant	L		1 ft.	1 1/2-2 ft.			x



## CLIMATE-APPROPRIATE PLANTS FOR THE CITY OF RIVERSIDE

Botanical Name	Common Name	Estimated Plant Water Use Classification L - Low M - Moderate H - High	Native Species ● all species ■ select species	Mature Height	Mature Width	Large Planting Area	Medium Planting Area	Small Planting Area
Lantana montevidensis	trailing lantana	L		2 ft.	3-6 ft.		x	
Lonicera japonica 'Halliana'	Hall's honeysuckle	L		2 ft. +	15-30 ft.	x		
Mahonia repens	creeping mahonia	M		1 ft.	3 ft.		x	x
Myoporum parvifolium & cvs.	myoporum	L		3-6 in.	9 ft.	x	x	
Myoporum 'Pacificum'	pacifica saltbush	M		2 ft.	30 ft.	x		
Osteospermum spp.	African daisy	L		6-12 in.	2-4 ft.		x	
Pelargonium peltatum	ivy geranium	M		1 ft.	5 ft.		x	x
Rosemarinus 'Prostratus'	trailing rosemary	L		2 ft.	8 ft.		x	
Scaevola 'Mauve Clusters'	fan flower	M		4-6 in.	3-5 ft.		x	
Sedum spp.	stone crop	L	■	varies			x	x
Senecio mandraliscae	kleinia	M		1-1 1/2 ft.	2 ft.		x	x
Teucrium x lucidrys	germander	L		1 ft.	2 ft.			x
Teucrium cossonii majoricum	Majorcan germander	L		9 in.	2 1/2 ft.			x
Trachelospermum asiaticum	Asian star jasmine	M		18 in.	5 ft.		x	x
Trachelospermum jasminoides	star jasmine	M		2 ft.	10 ft.		x	x
Verbena gooddingii	Goodding verbena	L	●	1 1/2-2 ft.	3-4 ft.		x	
Verbena lilacina	lilac verbena	L	●	1 ft.	3 ft.		x	x
Verbena peruviana	Peruvian verbena	L		18 in.	3 ft.		x	
Verbena rigida	vervian	M		1-2 ft.	3-4 ft.		x	x
Vinca minor	periwinkle	M		4-6 in.	1 1/2 ft.		x	x
Zinnia grandiflora	prairie zinnia	M		1 ft.	1 1/2 ft.			x

## CLIMATE-APPROPRIATE PLANTS FOR THE CITY OF RIVERSIDE

Botanical Name	Common Name	Estimated Plant Water Use Classification L - Low M - Moderate H - High	Native Species ● all species ■ select species	Mature Height	Mature Width	Large Planting Area	Medium Planting Area	Small Planting Area
<b>VINES</b>								
Bignonia capreolata	cross vine	-		40-60 ft.	x			
Bougainvillea spp.	bougainvillea	L		15-30 ft.	x			
Campsis spp.	trumpet creeper	M		40 ft.	x			
Cissus incisa	Texas grape ivy	M		30-50 ft.	x			
Cissus rhombifolia	grape ivy	M		20 ft.	x	x		
Clytostoma callistigioides	violet trumpet vine	M		15-25 ft.				
Distictis buccinatoria	blood red trumpet vine	M		20-30 ft.	x	x		
Ficus pumila	creeping fig	M		40-60 ft.	x	x		
Gelsemium sempervirens	Carolina jessamine	M		20 ft.		x		
Hardenbergia violacea	lilac vine	M		10 ft.		x	x	
Hedera helix	English ivy	M		20 ft.		x		
Jasminum polyanthum	pink jasmine	M		20 ft.		x		
Lonicera japonica	Japanese honeysuckle	L		30 ft.	x	x		
Lonicera sempervirens	trumpet honeysuckle	M		10-20 ft.		x		
Macfadyena unguis-cati	cat's claw	L		25-40 ft.	x	x		
Pandorea jasminoides	bower vine	M		20-30 ft.	x	x		
Parthenocissus quinquefolia	Virginia creeper	M		20 ft.		x	x	
Parthenocissus tricuspidata	Boston ivy	M		20 ft.		x	x	
Passiflora spp.	passion vine	M		20-30 ft.		x		
Rosa banksiae	Lady Banks rose	M		20 ft.	x	x		
Rosa spp	climbing roses	M		varies	x	x		
Vigna caracalla	snail vine	M		10-20 ft.		x		
Vitis californica	California wild grape	L	●	30 ft.	x			
Vitis girdiana	desert grape	L	●	30 ft.	x			
Wisteria spp.	wisteria	M		15-30 ft.	x			

## CLIMATE-APPROPRIATE PLANTS FOR THE CITY OF RIVERSIDE

Botanical Name	Common Name	% of ET (Annual Average)	Temperature Adaptation	Comments
<b>TURF</b>				
<i>Cynodon dactylon</i> 'Santa Ana'	Santa Ana Bermuda	60% of ET	warm-season	Requires over-seeding of Perennial Rye during dormancy
<i>Cynodon dactylon</i> 'Tifdwarf'	Tifdwarf Bermuda	60% of ET	warm-season	Requires over-seeding of Perennial Rye during dormancy
<i>Cynodon dactylon</i> 'Tifgreen'	Tifgreen Bermuda	60% of ET	warm-season	Requires over-seeding of Perennial Rye during dormancy
<i>Cynodon dactylon</i> 'Tifway'	Tifway Bermuda	60% of ET	warm-season	Requires over-seeding of Perennial Rye during dormancy
<i>Cynodon dactylon</i> 'U-3'	U-3 Bermuda	60% of ET	warm-season	Requires over-seeding of Perennial Rye during dormancy
<i>Cynodon dactylon</i> 'GN-1'	GN-1 Bermuda	60% of ET	warm-season	Requires over-seeding of Perennial Rye during dormancy
<i>Festuca arundinacea</i>	Tall Fescue	80% of ET	cool-season	Select hybrids such as 'Marathon' or 'Medallion'
<i>Stenotaphrum secundatum</i>	St. Augustine	60% of ET	warm-season	Requires regular dethatching
<i>Zoysia</i> 'Victoria'	Victoria Zoysiagrass	60% of ET	warm-season	Requires regular dethatching
<i>Buchloe</i> 'UC Verde'	UC Verde Buffalograss	60% of ET	warm-season	Requires infrequent mowing