County of Riverside
Guide to California Friendly Landscaping

BOARD OF SUPERVISORS
Roy Wilson, Chairman
Jeff Stone, Vice-Chairman
Marion Ashley
Bob Buster
John F. Tavaglione

TRANSPORTATION LAND MANAGEMENT AGENCY
Tony Carstens, Agency Director

PLANNING DEPARTMENT
Ron Goldman, Planning Director

March 2008
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Why Do We Need This Guide?</td>
<td>2</td>
</tr>
<tr>
<td>2. Who Does Ordinance No. 859 Apply To?</td>
<td>2</td>
</tr>
<tr>
<td>5. What Should I Know Before I Prepare My Irrigation Plan?</td>
<td>12</td>
</tr>
<tr>
<td>7. What Are The County's Installation And Maintenance Requirements?</td>
<td>21</td>
</tr>
<tr>
<td>8. How Is Recycled Water Used?</td>
<td>23</td>
</tr>
</tbody>
</table>

## Figures

- Figure 1 - *Sunset* Climate Zone Map                                  | 18   |
- Figure 2 - Water Budget Formula and Tables                           | 19   |
- Figure 3 - Blank Water Budget Calculation Form                        | 20   |

## Attachments

- Attachment A - Riverside County California Friendly Plant List
1. **Why Do We Need This Guide?**

The purpose of the Riverside County Guide to California Friendly Landscaping (Landscaping Guide) is to present practical standards for landscape and irrigation design for projects within Riverside County. Additionally, the Landscaping Guide is designed to assist landscape architects, irrigation designers, contractors, planners and the public in the selection of plant materials and irrigation methods that meet the objectives of Ordinance No. 859 and Ordinance No. 348. In order to conserve water in the drought prone state of California, legislation such as AB 325 and AB 1881 mandates the practice of water conservation.

Riverside County’s commitment to water conservation is exemplified in the adoption of standards and the implementation of guidelines which result in a reduction of landscape related water usage County-wide. It is the County’s goal to reduce landscape related water usage by at least twenty percent (20%) per site, through implementation of this Landscaping Guide. To meet this goal, Planting Plans and Irrigation Plans shall be prepared using the Water Budget Formula found on Figure 2 of this document.

2. **Who Does Ordinance No. 859 Apply To?**

A. On December 19, 2006, the Riverside County Board of Supervisors adopted Ordinance No. 859. This ordinance is applicable to all discretionary permits and/or approvals for the following:

1. Commercial development.
2. Industrial development.
3. Residential development:
   - Multi-family development
   - Single family common areas
   - Single family homes (Spring 2008)
   - Erosion control landscaping (slopes over 3 feet in vertical height)
   - Model homes (Spring 2008)
4. Road rights-of-way.
5. Parks and public lands.
7. Fuel modification areas:
   - Applicants are encouraged to consult with the County Fire Department, determine their fuel modification requirements, and select fire-resistant plant material. A detailed plan shall be prepared pursuant to specifications of the
What Are The County’s General Landscaping Design Guidelines?

Landscaping and proper irrigation is a critical component of any successful development project. Landscaping should define a sense of space by making a statement, ensuring community continuity, complementing good architectural design, and creating a cohesive finished product. Emphasis on California Friendly® design elements can achieve aesthetic objectives while acknowledging the practical water constraints of our unique geographic environment.

Conceptual Landscape Plans and/or Landscaping Minor Plot Plans shall incorporate the following design guidelines relative to their respective product type. Such plans shall also follow Section 4 of this Landscaping Guide and incorporate the use of drought-tolerant/water-efficient plants to reduce water demand. A rich variety of plantings and hardscape should be selected and integrated appropriately into the landscape design based on their intend uses. Conceptual Landscaping and Planting Plans shall be prepared by a Landscape Architect licensed by the State of California and shall consist of plants found in the Riverside County California Friendly Plant List (Plant List) included in this Guide as Attachment A.

A. Single Family Residential Design Guidelines:

1. Trees, shrubs, and groundcover shall be incorporated within single-family development projects to create a comfortable and aesthetically pleasing environment for residents and those viewing from public areas. The following minimum standard shall be applied to front-yard typical landscaping plans:

- Invasive plants are prohibited near MSHCP conservation areas.

- Trees, shrubs, and groundcover shall be incorporated within single-family development projects to create a comfortable and aesthetically pleasing environment for residents and those viewing from public areas. The following minimum standard shall be applied to front-yard typical landscaping plans:

- County’s Planning Department and Fire Department.

- Flood Control Areas:
  - Retention/detention basins
  - Water quality swales (‘bioswales’)

- Development adjacent to Multiple Species Habitat Conservation Plan (MSHCP) and other conservation areas:
  - Applicants are required to consult with the Environmental Programs Department (EPD) to determine acceptable plant species that may be planted within the vicinity of MSHCP conserved lands.

B. In the event that the water purveyor for a proposed project has adopted more stringent water-efficient landscape requirements, the more stringent guidelines shall take precedence.
Minimum Front Yard Landscaping Standard

<table>
<thead>
<tr>
<th>County-Wide Guidelines</th>
<th>Minimum Shrubs(^1) (5 gal.) and Groundcover</th>
<th>Minimum Trees</th>
<th>Automatic Irrigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>50%(^2)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Corner Lot Returns</td>
<td>50%(^2)</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

Notes:

\(^1\) Of this amount, 60% shall be 5 gal. foundation shrubs and 40% shall be 1 gal. shrubs. 50% of the area underneath the shrubs shall be covered by a vegetative, drought-tolerant groundcover.

\(^2\) Calculating number of shrubs: Area for shrubs to be divided by 25 sq. ft. The resulting number is the total number of shrubs that must be planted to achieve full coverage.

\(^3\) The 24" box tree shall be a minimum 2" caliper and the 15 gal. tree shall be a minimum 1" caliper.

1. Landscape architects and designers are strongly encouraged to use clinging vines, espaliers, trellises, and shrubs to enhance the architecture and define attractive private open spaces.

2. Landscape architects and designers are encouraged to use visual focal points such as boulders, landscape mounds, planter beds, etc.

3. To the extent feasible, existing mature trees and shrubs that represent the existing significant landscaping elements shall be preserved.

4. Vegetative ground cover that will absorb rainwater and reduce runoff shall be used. Permeable surfaces should be used wherever possible to reduce paving.

5. Air conditioning, mechanical equipment, and trash enclosures shall be screened from the public right-of-way with suitable plantings.

6. Landscaping shall be included as part of the design for a fence or wall. It should be used to soften and
screen large masses of blank wall surface area and deter graffiti.

9. Model homes shall display a sign indicating that the home features water efficient planting and irrigation. The sign shall be displayed in the front yard and be clearly visible to home buyers.

10. Turf areas shall be used sparingly in response to functional needs and shall be in compliance with the Water Budget Formula (Section 6 of this Guide).

11. Soil amendments improve the water holding capacity of the soil, adjust soil pH, provide nutrients, and improve drainage. Agronomic soil tests are required to determine the recommended types, rates, and application methods of soil amendments. Implementation of the recommendations is required to help ensure optimum soil conditions for the specified plants.

12. Metropolitan Water District of Southern California (MWD) also has a California Friendly® rebate program available for model home and front yard landscaping. MWD rebate approved plans will be deemed compliant with Ordinance No. 859 and the Landscaping Guide subject to Planning Department review.

B. Multi-Family Residential Design Guidelines:

1. Trees, shrubs, and groundcover should be incorporated within multi-family development projects to create a comfortable and aesthetically pleasing environment for residents and those viewing from public areas.

2. Landscape architects and designers shall use clinging vines, espaliers, trellises, and shrubs to enhance the architecture and define useful public and private spaces.

3. Landscape architects and designers shall integrate visual focal points such as boulders, landscaped mounds or berms, sculpture, and public art into their planting design.

4. Planting plans shall utilize hardy native or drought tolerant trees, shrubs, and groundcover that are easy to water and maintain.

5. Paved areas, especially parking lots, must incorporate adequate shading. Off-street parking and shading plans shall comply with provisions in Section 18.12 of Ordinance No. 348.
6. Seating options in landscaped areas should be provided. They shall be constructed of durable, easy-care material such and treated with a graffiti resistant coating.

7. Entrances to alleys must be landscaped. Walls in alleys abutting residential uses shall be screened with landscaping such as clinging vines. Landscape areas adjacent and between garages in alley-loaded residential areas are encouraged.

8. Pedestrian walkways should be safe, visually attractive, and well defined by landscaping and lighting.

9. Landscaping shall be included as part of the design for the fence or wall. It should be used to soften and screen large masses of blank wall surface area and to deter graffiti.

10. Planting plans shall complement the landscape elements between the proposed project, surrounding streetscapes, and adjacent publicly maintained landscaping to ensure community continuity and character.

11. Turf areas shall be used sparingly in response to functional needs and shall be in compliance with the Water Budget Formula (Section 6 of this Guide).

12. Soil amendments improve the water holding capacity of the soil, adjust soil pH, provide nutrients, and improve drainage. Agronomic soil tests are required to determine the recommended types, rates, and application methods of soil amendments. Implementation of the recommendations is required to help ensure optimum soil conditions for the specified plants.

13. Model homes shall display a sign indicating that the home features water efficient planting and irrigation. The sign shall be displayed in the front yard and be clearly visible to home buyers.

C. Commercial, Mixed Use, and Industrial Design Guidelines:

1. Landscaping is required to be in scale with adjacent buildings and be of appropriate size at maturity to accomplish its intended goals. A balance of deciduous and evergreen trees should be used.

2. Landscaping shall be incorporated around the base of buildings (except loading or service areas) to soften the edge between the parking lot, structure(s),
This recreation center is themed after the local wine country.

Vines soften fences and walls and deter graffiti. They shall have designated valves for irrigation.

Park Master Plan and Photo

and street. Such landscaping should be accentuated at entrances to provide a focal point.

3. New projects proposed adjacent to existing residential land uses shall incorporate adequate landscape screening/buffering.

4. Berming in conjunction with landscaping should be used at the building edge to reduce structure mass and height along façades.

5. Evergreen trees and shrubs shall be used whenever a landscape screen or buffer is required.

6. Service areas, equipment, and solid enclosures must be screened using landscaping such as tall shrubs and clinging vines especially those properties whose side yard fronts a primary street or abuts a residential property.

7. Design and locate perimeter planters and plantings for the purpose of creating a physical barrier, providing a visual screen, and shading the parking area. The parking lot and perimeter landscape shall also be designed for safe and convenient pedestrian circulation throughout, including designated paths across perimeter planters.

8. Plans shall comply with provisions in Section 18.12 of Ordinance No. 348.

9. Landscaping shall be included as part of the design for the fence or wall. It should be used to soften and screen large masses of blank wall surface area and to deter graffiti.

10. Hardscape amenities such as benches, seating areas, and trellises, shall be included and designed to be consistent with the landscaping.

11. Landscaping plans shall complement the landscape and hardscape elements between the proposed project, surrounding streetscapes, and adjacent publicly maintained landscaping to ensure community continuity and character.

12. Turf areas shall be used sparingly in response to functional needs and shall be in compliance with the Water Budget Formula (Section 6 of this Guide).

13. Soil amendments improve the water holding capacity of the soil, adjust soil pH, provide nutrients, and improve drainage. Agronomic soil tests are required to determine the recommended types, rates, and application methods of soil amendments. Im-
plementation of the recommendations is required to help ensure optimum soil conditions for the specified plants.

C. Park Design Guidelines:

1. A balance of deciduous and evergreen trees shall be used.

2. Landscaping shall be included as part of the design for the fence or wall. It should be used to soften and screen large masses of blank wall surface area and to deter graffiti.

3. Landscaping shall complement the landscape and hardscape elements between the proposed project, surrounding streetscapes, and adjacent publicly maintained landscaping to ensure community continuity and character.

4. Plans shall comply with provisions of Section 18.12 of Ordinance No. 348.

5. Seating options and drinking fountains in landscaped areas should be provided. Seating and drinking fountains should be constructed of durable, easy-care material such as concrete and shall be treated with a graffiti resistant coating.

6. Adequate lighting shall be incorporated into the landscape design pursuant to the prevailing local or state standards.

7. Sprinklers or other emitters shall be positioned so that no irrigation water shall come in contact with drinking fountains, picnic tables, benches, playground equipment, buildings, or other hardscape features.

8. Soil amendments improve the water holding capacity of the soil, adjust soil pH, provide nutrients, and improve drainage. Agronomic soil tests are required to determine the recommended types, rates, and application methods of soil amendments. Implementation of the recommendations is required to help ensure optimum soil conditions for the specified plants.

9. Plans shall conform to the standards and be approved by the maintenance district responsible for perpetual maintenance.
D. Entry Monument Guidelines:

1. Monuments shall define a sense of space, individuality, and arrival. Each monument should be different from adjacent tracts and hold their own style.

2. To define a sense of arrival and place, entry monument shall incorporate 5 gallon or greater size shrubs, and boulders, annual color plants, lighting or other distinct visual focal points.

3. Monuments shall incorporate signature trees that complement the community theme. A minimum 36 inch box or larger shall be used. Where only one signature tree is incorporated in the monument landscaping plan, such a tree shall be a 42 inch box size or greater. Entry lighting shall be used on signature trees.

4. What Should I Know Before I Prepare My Planting Plan?

Plant species must be selected from the Plant List included as Attachment A of this Landscaping Guide. The species listed are not guaranteed for all situations. Consultation with a landscape architect, arborist, the proposed maintenance entity, or a local plant nursery is recommended.

The following minimum design standards, together with the appropriate elements of Section 3, shall be incorporated into Conceptual Landscape Plans and/or Landscaping Minor Plot Plans:

A. Planting plans for permits and/or approvals described in Section 2 shall be prepared by a Landscape Architect licensed by the State of California.

B. Plants shall be selected based on their level of maintenance, durability, mature widths and heights, aesthetic appeal, and thematic qualities. A greater percentage of “low” or “very low” water use plant species is strongly encouraged.

C. Shade trees shall be provided for residential, commercial and industrial building parking lot and open space areas. They shall be incorporated to provide natural cooling opportunities and for the purpose of energy and water conservation.

D. In order to incorporate plant species other than those listed, the project applicant must provide the Planning Director with the following:

1. Water use requirements per Water Use Classification of Landscape Species (WUCOLS III) or field data verifying the plant’s landscape (crop) coefficient.
2. Plant species description from Sunset Western Garden Book or other comparable source.

3. Comparison to a similar species included in the plant list.

E. Plant species must be selected based on their appropriate plant hardiness climate zones as defined by Sunset Western Garden Book. The climate zones are also depicted in Figure 1 and are noted on the Plant List included as Attachment A of this Landscaping Guide.

F. All non-turf planting areas (except hydroseeded areas) must be mulched on a regular basis to retain moisture, suppress weeds, and moderate soil temperature. Mulch depth, type, and maintenance replenishment frequency must be noted on plans.

1. Planting areas shall be mulched with a three inch (3”) minimum layer of organic wood mulch. Areas of groundcover planted from flats shall be mulched with a one and one half inch (1 1/2”) minimum layer of organic mulch.

2. Some maintenance districts require differing mulch thicknesses. The more stringent (thicker) requirement shall prevail.

3. Color enhanced mulches are discouraged.

4. Mulch may be omitted for native revegetation projects upon the recommendation of the project biologist.
5. Planting areas in the desert regions (Sunset Climate Zones 11 and 13) shall be mulched with a two inch (2") layer of decomposed granite (DG) /gravel mulch.
   - One inch (1") minus granite mulch is suggested for aesthetic purposes.

G. Turf shall be used as a functional recreational element and not solely for aesthetic purposes.

1. Small, irregularly shaped turf areas shall be avoided.

2. Turf areas shall be sized and shaped to minimize overspray and runoff.

3. Lower water use, warm season turf grasses are encouraged. Grasses such as Bermuda, which are dormant (brown) in the winter, are acceptable if the maintenance entity over-seeds with perennial rye on an annual basis during the dormancy period.

4. Turf is prohibited within County road rights-of-way, unless the turf areas are contiguous to turf areas within parks, residential front yards, cemeteries or golf courses.

5. Turf is prohibited on slopes greater than 4:1.

6. Turf areas less than eight feet (8’) in width shall be irrigated with subsurface irrigation or other low volume irrigation technology.

H. Plants must be grouped and irrigated on separate valve zones (hydrozones) based on their water use requirements, slope aspect, and sun/shade microclimate.

I. Shrubs shall be designed so that their mature width will not require excessive pruning. Excessive pruning is discouraged.

J. The contractor shall tag one plant of each variety with the plant’s scientific name, and cultivar or variety if applicable, and common name. This is to ensure that accurate replacement plants are installed if necessary.

K. To prevent graffiti, self-clinging vines shall be planted to ensure full coverage of the public facing side of all walls.

L. Plans must note or specify that a site specific agronomic soils test is required and that contractors are required to follow the report’s recommendations for amending the soil. Planting specifications and details including the recommendations from the soils analysis are required if applicable. A copy of the soil test shall be delivered to the Planning Department’s Landscape Section.

M. If low water use plants (those that can also survive/flourish with medium water application) are used in a medium water
use hydrozone, they must be counted as medium water use in the irrigation calculations.

N. The Planting Plan shall be prepared at the same scale as the Irrigation Plan and, at a minimum, shall identify the following:

1. Proposed and existing trees, shrubs, ground covers, vines and turf areas indicated within the developed landscape area and within publicly maintained landscape areas within 200 feet (200') of proposed project site.

2. Legend including plant symbol, genus, species, common name, spacing, size, quantity of each type of plant by container size, water use per applicable WUCOLS III Zone, and detail call-out (i.e.: P-1, P-2, P-3, etc.).

3. Location of each hydrozone.

4. Individual trees, shrubs, and groundcover plants at their average growth size to ensure coverage of the area to be landscaped.

5. Labels for all existing trees and vegetation that will either remain or be removed.

6. Location of street lights. Trees shall be located so that there is a minimum of ten feet (10') of clearance with respect to the lights.

7. Root barrier noted for trees within six feet of hardscape.

8. Property lines, limit-of-work lines, streets, and street names.

9. Building locations, driveways, sidewalks, and other hardscape features.

10. Topographic elevation lines to determine slope.

11. Appropriate four inch (4") graphic scale, title block, page numbers, and north arrow, notes, details, and specifications.

12. Existing land uses adjacent to the boundaries of the project site.

What Should I Know Before I Prepare My Irrigation Plan?

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

Landscaping Minor Plot Plans shall reflect the following minimum design standards:
A. High efficiency irrigation methods (e.g. drip, MP rotators, microsprays) shall be utilized.

B. Rotors and spray heads shall be designed and installed with minimized overspray onto paved surfaces, structures, and non-vegetated areas. The design shall be head-to-head coverage with matched precipitation heads and a maximum of fifty percent (50%) diameter overlap. Rotors and spray heads shall be zoned separately. Half rotors and full rotors shall be zoned separately unless matched precipitation nozzles are used.

C. For drip line installations, in-line pressure regulators shall be used per factory recommendations for the specific irrigation products being used. If drip line is being installed, it must be filtered at the valve along with any other necessary equipment.

D. Irrigation systems shall be zoned according to plant water use, slope aspect, and sun/shade microclimate. If low water use plants (that can also survive/flourish with medium water application) are used within a medium water use hydrozone, they must be counted as medium water use in the irrigation calculations.

E. Low head drainage is not permitted. Check valves are recommended.

F. With the exception of single family residential units, all irrigation plans shall be designed for recycled water in areas that are scheduled for recycled water in the future.

G. Projects must include a “smart” irrigation controller with the following attributes:

1. Real-time, weather based program adjustment capability.

2. On-site weather station or external ETo input.

3. Rain sensors shall be placed within an unobstructed natural rainfall area and located above the irrigation spray pattern.

4. Master valve (or simultaneous operations).

5. Flow Sensor.

6. Multiple start times.

7. Minimum of two programs.

H. Systems shall be scheduled so that the irrigation precipitation rate does not exceed the infiltration rate of the soil.

I. A baseline irrigation schedule shall be provided on the plans for the six-month initial plant establishment period. The
contractor shall adjust the schedule to meet site specific requirements and use the baseline schedule to set the weather-based controller. The schedule currently in effect shall be posted in the controller.

J. A second baseline irrigation schedule shall be provided on the plans which incorporates the specific water needs of the plants throughout the post-establishment calendar year. The contractor shall adjust the schedule to meet site specific requirements and use the baseline schedule to set the weather-based controller. The schedule currently in effect shall be posted in the controller.

K. The irrigation schedules shall include the recommended irrigation days per week, number of cycles per day, minutes of run times per cycle, and estimated amount of applied irrigation water, expressed in gallons per month and gallons per year.

L. The controller shall be operational and set to real-time weather prior to the completion of the 90-day maintenance period of the installing contractor.

M. Pressure loss calculations for valve with worse condition.

N. Commercial projects shall include a Central Controller programmed to distinguish irregular flows (e.g. broken valve, line, spray head, etc.), temporarily shut off the affected branch or the entire system, and send an immediate electronic message to the maintenance entity.

O. Residential Front Yard Typical Irrigation Plans must demonstrate that sufficient capacity exists on the specified irrigation controller to supply adequate additional zones for future side and backyard landscaping. More than one controller per residential unit shall be avoided.

P. The Irrigation Plan shall be prepared at the same scale as the Planting Plan and, at a minimum, shall identify the following:

1. Location and size of service lateral(s) and water meter(s).

2. Point of connection (POC) location and static pressure at POC.

3. Total flow rate (gallons per minute) and designed operating pressure (psi) for each overhead spray and bubbler circuit, and total flow rate (gallons per

---

**How Can I Find A “Smart” Controller?**

The Irrigation Association regularly tests “smart” controllers and provides a list of recommended controllers for commercial or private use. Below are the tested and recommended smart controllers from the Association’s 2007 list. For more information and a current list of controllers, see the Irrigation Association’s web site located at: [http://www.irrigation.org/SWAT/Industry/ia-tested.asp](http://www.irrigation.org/SWAT/Industry/ia-tested.asp)

- Alex-Tronix Enercon Plus
- Alex-Tronix Smart Clock
- Aqua Conserve Aqua ET-9
- Calsense ET2000e
- ETwater Smart Controller
- Hunter ET System
- Hydrosaver ETIC
- Irritrol Smart Dial
- Rain Bird ET Manager
- Rain Master RME Eagle
- Toro Intelli-Sense
- Weathermatic SL1600
- WeatherTRAK
hour) and design operating pressure (psi) for each drip and low volume irrigation circuit.

4. Location, size, and type of all irrigation components including, but not limited to, smart controller, central controller (backflow prevention device, ball valves, anti-drain check valves, pressure supply (main) line, lateral lines, pipe sizing, valves, spray heads, rotors, drip, low volume irrigation equipment, gallons per minute, pressure regulators, and pumps. Water sense components are strongly recommended.

5. Hydraulic Calculation worksheet including flow rate (gallons per minute) and design operating pressure.

6. Precipitation rate (inches per hour) for each spray type circuit.

7. Irrigation legend with the symbol, manufacturer name, model number (or non-proprietary description for publicly funded projects), separate symbols for irrigation equipment with different spray patterns, spray radius, and precipitation rate.

8. Location, size, and type (high, medium, low) of each hydrozone.

9. Topographic elevation lines to determine slope.

10. Irrigation system details for assembly and installation.

11. Calculation for the project’s landscape Water Budget. (Section 6 of this Guide).

6. What Is A Water Budget And How Is It Calculated?

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

The County of Riverside uses the formula and tables included in Figure 2 to determine water budgets. Figure 2, the information below, and the sample worksheet following are designed to assist you in calculating a Water Budget for inclusion in your Irrigation Plan.
A. Maximum Annual Water Allowance and Evapotranspiration Rate (ETo).

ETo, or Annual Reference Evapotranspiration Rate, is the quantity of water evaporated from adjacent soil surfaces and transpired by plants in terms of inches for a particular climate zone. Your total square footage of landscape and ET0 are essential components of the MAWA formula. Because ET0 rates vary according to climate, the ET0 rate must be identified for your project in order to calculate MAWA. ET0 data is taken from the California Irrigation Management Information System (CIMIS). Table 1 on Figure 2 will help you find your ET0 for insertion into Space B of your landscape water budget formula. If your project is not within one of the weather station areas listed, use the closest representative station.

B. Estimated Annual Water Use (EAWU).

The formula for EAWU is calculated for each hydrozone separately, then the total of all hydrozones is divided by the Irrigation System Operation Efficiency (IS). In addition to the square footage of each hydrozone, the EAWU calculation relies on several other key factors. One is the average Plant Factor (PF) that is established by the WUCOLS III for plants that are considered high, medium, low, and very low based on their water requirements. For purposes of the Water Budget Formula, turf is considered to have a high water requirement. Refer to Table 2 to establish your PF for each hydrozone and enter the number in Space D of your Water Budget Formula on Figure 2.

The water use requirements also vary according to regional climate zones. Plant categories used in the calculation must be from the appropriate WUCOLS Regional Zones as defined below and the corresponding Sunset Zones found on Figure 1 of this Landscaping Guide:

<table>
<thead>
<tr>
<th>WUCOLS III Region</th>
<th>Corresponding Sunset Zones</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2, 3, 14, 15, 16, 17</td>
</tr>
<tr>
<td>2</td>
<td>8, 9</td>
</tr>
<tr>
<td>3</td>
<td>22, 23, 24</td>
</tr>
<tr>
<td>4</td>
<td>18, 19, 20, 21</td>
</tr>
<tr>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>6</td>
<td>13</td>
</tr>
</tbody>
</table>

Another key factor in calculating EAWU is the Irrigation Efficiency (IE). The IE is derived from measurements and estimates of the irrigation application method performance within controlled environmental conditions. Table 3 provides...
COUNTY OF RIVERSIDE GUIDE TO CALIFORNIA FRIENDLY LANDSCAPING

FIGURE 2
WATER BUDGET FORMULA AND CHARTS

INSTRUCTIONS FOR FILLING OUT WATER BUDGET FORMULA

1. To Find MAWA

**STEP 1:** Calculate your total square footage of the landscape area and insert that number into Space A. (Round the number to the nearest hundred).

**STEP 2:** Find your city on the Reference Evapotranspiration Chart (1) and insert the number in Space B.

**STEP 3:** Multiply \( A \times 0.62 \times B \times 0.8 \), put the answer in space C and divide by 748. This gives you your MAWA in gallons.

2. To Find EAWU For Each Hydrozone

**STEP 1:** Find your plant factor (CHART 2) for the hydrozone remembering to use the highest plant factor per hydrozone. If you have medium and a low in the same hydrozone, the factor is medium. Place that number in Space D.

**STEP 2:** Calculate your square footage for the hydrozone (Round to the nearest hundred) and put number in space E. Next, insert the hydrozone irrigation efficiency number from (CHART 3) into Space F.

**STEP 3:** Multiply ETo (From Chart 1) x D x E x 0.62, then divide that number by F x 748. This will give you the EAWU number for Space G.

**STEP 4:** Repeat steps 1-3 for each hydrozone.

**STEP 5:** Add all G’s and put number into Space H.

**STEP 6:** Divide H by .85 and that will give you your Total EAUW (Space I). This is the irrigation system operating efficiency.

**STEP 7:** To find J, Subtract I (EAUW) from MAWA and that will give you the total water use for the project. The resulting number must be positive.

**BE SURE TO RUN EAWU CALCULATION FOR EACH HYDROZONE WITHIN YOUR PROJECT.**
**FIGURE 3**

The following blank work sheet may be modified as-needed for each project and shall be included on all Irrigation Plan submittals.

### Riverside County Ordinance 859 Landscape Water Use Calculations WORKSHEET

1. **Maximum Annual Water Allocation (MAWA)**
   - **INPUT** the total square footage of landscape = [ ] x .62
   - **INPUT** the Hist. ET for the area = [ ] x .8
   - **MAWA** = [ ] gal / yr
   - **MAWA** = 748 gal / yr

2. **Estimated Annual Water Use (EAWU)**
   - **Hydrozone #1**
     - **INPUT** square footage of hydrozone = [ ]
     - **INPUT** hydrozone irrigation efficiency = [ ]
     - **EAWU** = [ ] cu ft / yr
   - **Hydrozone #2**
     - **INPUT** square footage of hydrozone = [ ]
     - **INPUT** hydrozone irrigation efficiency = [ ]
     - **EAWU** = [ ] cu ft / yr
   - **Hydrozone #3**
     - **INPUT** square footage of hydrozone = [ ]
     - **INPUT** hydrozone irrigation efficiency = [ ]
     - **EAWU** = [ ] cu ft / yr
   - **Hydrozone #4**
     - **INPUT** square footage of hydrozone = [ ]
     - **INPUT** hydrozone irrigation efficiency = [ ]
     - **EAWU** = [ ] cu ft / yr
   - **Hydrozone #5**
     - **INPUT** square footage of hydrozone = [ ]
     - **INPUT** hydrozone irrigation efficiency = [ ]
     - **EAWU** = [ ] cu ft / yr

   **SubTotal EAWU** = [ ] cu ft / yr

   **Input Irrigation System Operation Factor** = 0.85

   **Total EAWU** = [ ] cu ft / yr

   **MAWA - EAWU** = [ ] cu ft / yr

   *(this number must be positive)*
the IE factor to be used in Space F of the Water Budget Formula on Figure 2.

The final factor in calculating EAWU is the Irrigation System Operation Efficiency. This number is derived from the efficiency of the controller. Since “smart” controllers are required by the County per Ordinance No. 859, the IS factor shall be 0.85. This figure has been inserted in the Water Budget Formula for you.

An EAWU calculation must be performed for each hydrozone within the proposed project.

C. Finalizing the Water Budget Calculations.

Add together the EAWU subtotals for each hydrozone within the proposed project, this will be the Sub-Total EAWU. Now, divide this number by 0.85. The resulting number will be the Total EAWU. Subtract the Total EAWU number from the MAWA. The resulting number must be positive. If the number is negative, then adjustments will need to be made to the Planting Plan (e.g. use more vegetation types that consume less water) and/or the Irrigation Plan (e.g. use more efficient application methods).

A Water Budget Formula shall be completed and included on all Irrigation Plans submitted to the County. A blank Water Budget Form is provided as Figure 3 and may also be downloaded from the Landscape Review link on the County Planning Department website: www.tlma.co.riverside.ca.us/planning.

7. What Are the County’s Installation and Maintenance Requirements?

Correct installation and consistent landscape maintenance is paramount to water efficient landscaping and water conservation. Regardless of the efficiency of the irrigation design and installation, a landscape can quickly lose its efficiency and aesthetic appeal without proper maintenance. To ensure that the Planting and Irrigation Plans are installed properly and maintained throughout a minimum plant establishment period, the County Planning Department will conduct the following series of site visits:

A. Installation Inspection

Personnel will, at a minimum, confirm that the irrigation system is installed according to the approved Irrigation Plan, the soil preparation and landscaping is completed as indicated in the approved Planting Plan, the project has met its Conditions of Approval, and the performance security has
been approved and executed. Upon successful completion of this Installation Inspection, a Certificate of Completion will be issued to the project applicant.

B. Six Month Establishment Inspection

Personnel will, at a minimum, confirm that the irrigation system is operating at its maximum efficiency, the plantings are alive, the current irrigation schedule is posted in the controller, and any replacement components of either the landscape or irrigation reflect the original approved Irrigation and Planting Plans.

C. One Year Post-Establishment Inspection

Personnel will, at a minimum, perform an irrigation audit to confirm that the irrigation system is functioning properly and operating at its maximum level of efficiency, verify that plants are established and thriving, and ensure that the post-establishment irrigation schedule is programmed and posted in the controller, and confirm that any remaining Conditions of Approval are met. If components of either the irrigation system or the landscape have been replaced, personnel will confirm that their replacement components reflect the original approved Irrigation and Planting Plans. Upon successful completion of the Post-Establishment Inspection, the landscaping/irrigation component of the performance bond will be deemed complete.

D. At the Planning Director’s discretion, projects may be required to maintain an annual maintenance inspection schedule to ensure that the following obligations are met:

1. Smart controllers are monitored and adjusted for maximum operating efficiency and irrigation application equipment is calibrated to provide maximum efficiency.

2. Non-functioning irrigation and hardscape components are replaced with identical or better components.

3. Plant materials that fail to thrive are replaced with identical plant materials or those with similar water requirements.

4. Minimum mulching levels are maintained.

5. Plants are pruned to eliminate irrigation application interference.
8. How is Recycled Water Used?

Recycled water determined to be available pursuant to Section 13550 of the California State Water Code shall be used for appropriate non-potable uses whenever it: a) provides a beneficial use to the customer, b) is economically and technically feasible, c) is consistent with applicable regulatory requirements, and d) is in the best interests of public health, safety, and welfare. With the exception of non-common areas of single-family home residential developments, irrigation systems must be designed and installed to accommodate the current or future use of recycled water for irrigation. Such plans shall be developed in accordance with standards and policies of the applicable recycled water purveyor. Recycled water systems shall be designed to meet regulatory requirements of the California Department of Public Health and the local recycled water purveyor.

For more information concerning this Landscaping Guide, please contact:

Kristi Lovelady, Administrative Manager
Riverside County Planning Department
Landscape Program
951-955-0781

Photo: Courtesy Eastern Municipal Water District.
Attachment A

County of Riverside
California Friendly Plant List