## City of El Cajon Water Efficient Landscape Design Manual

The Planning Division has prepared this Landscape Design Manual to assist the public. This manual supplements Chapter 17.195 of the El Cajon Municipal Code and is intended to be a guide to assist in the design, maintenance, permitting, and installation of water efficient landscapes and irrigation systems.

The Landscape Design Manual contains five major sections:

Section One discusses basic principals related to water efficient landscaping.

Section Two includes a list of resources and Web links to aide in the planning, design, installation, and maintenance of water efficient landscapes.

Section Three includes sample calculations for projects requiring approval of a Landscape Documentation Package and Certificate of Completion. These examples are based upon hypothetical landscape projects and are intended to help applicants understand and complete the required Water Efficient Landscape Worksheet.

Section Four provides technical information, including the reference evapotranspiration rate ($ET_O$) for El Cajon. Section Four also provides a listing of drought tolerant, low water use plants that are appropriate for the inland valleys of Southern California, such as the El Cajon Valley.

Section Five includes all the necessary forms and worksheets required to submit applications for Landscape Documentation Packages and Certificates of Completion.

## Section One: Basic Water Efficient Landscape Principals

Basic Principals - Water is a costly and vitally important natural resource of statewide importance. In order to conserve this important resource, landscaped areas should be designed to use water as efficiently as possible. The following basic principals of water conservation in landscaping are simple. Adherence to these basic principals will help to prevent water waste, reduce monthly water bills, and ensure that landscaped areas continue to thrive:

Principal No. 1 - Plants have adapted to life in a variety of different climate regimes ranging from cold to hot and from wet to dry. In order to create a healthy and thriving artificial landscape that does not require frequent and costly supplemental watering, plants must be selected that are appropriate for the climate regime in which they are placed. In other words, if you live in a hot dry place, you should select plants that are adapted to survive in a hot and dry climate without the need for frequent supplemental watering.

Principal No. 2 – Turf areas and decorative water features consume large amounts of water. In order to reduce the amount of water necessary to maintain a healthy and thriving landscape, minimize the areas dedicated to turf and decorative water features.

Principal No. 4 – A much larger landscaped area may be maintained with the same amount of water required for a smaller area, if the plants selected are low water users. Assuming the presence of a fixed water budget, the selection of high water use plants significantly reduces the size of the planting area.

Principal No. 5 – An efficient irrigation system is necessary to maintain a cost effective, healthy, and water efficient landscape. The use of water efficient irrigation technology such as programmable timers, micro-spray emitters, bubblers and drip lines, is essential to water conservation efforts. The proper maintenance of irrigation systems is also essential to water conservation.

Principal No. 6 – Early morning watering avoids excessive evaporation. Evening watering is only second best because watering at night encourages fungal growth that can damage plants. Watering during the heat of the day is inefficient because much of the water applied to the landscape area is lost to evaporation.

Principal No. 7 – Excessive evaporation and run-off from landscaped areas can be minimized by the use of soil amendments and mulches that retain water and prevent soil erosion.

## Section Two: Water Efficient Landscape Resources

Resources – The following agencies and resources are available to assist those interested in establishing and maintaining water efficient landscaping:

California Department of Water Resources – This state agency is responsible for coordinating and managing water resources at the state level. Their Website includes useful conservation information, printable brochures, and links to a variety of online resources dedicated to the management and conservation of water resources. To access these online resources, or to obtain telephone contact information for the Department of Water Resources, visit their Website at www.water.ca.gov.

San Diego County Water Authority – This is a public agency serving the San Diego region as a wholesale supplier of water. The Water Authority works through its 24 member agencies to provide a safe, reliable water supply to the San Diego region. Their Website offers online tools to assist water conservation efforts. To access these tools and other information related to water conservation, visit them on the Web at www.sdcwa.org.

Helix Water District – Helix Water District is the primary water purveyor for El Cajon. Helix offers free water use evaluation and consultation services to its customers upon request. Their Website offers online tools to assist water conservation efforts. To access these tools and services contact Helix Water District by phone at 619.466.0585 or visit them on the Web at www.hwd.com.

Padre Dam Municipal Water District – Padre Dam Municipal Water district provides water service to a limited area of El Cajon including Gillespie Field, the industrial area west of Gillespie Field, and a residential area located along the base of Fletcher Hills. This residential service area is located generally north of Grossmont College Drive and South of Weld Boulevard. Padre Dam offers free water use evaluation and consultation services to its customers upon request. Their Website offers online tools to assist water conservation efforts. To access these tools and services contact Padre Dam Municipal Water District by phone at 619.258.4680 or visit them on the Web at www.padredam.org.

Water Conservation Garden at Cuyamaca Community College – The Water Conservation Garden, or simply "The Garden," is a non-profit corporation dedicated to promoting water conservation in the southern California landscape through excellent exhibits and programs that educate and inspire the public. The Garden has nearly five acres of displays that showcase water conservation through a series of beautiful themed gardens, such as a native plant garden and a vegetable garden. The Garden offers tours, classes, and functional exhibits on a variety of

landscape design and water conservation-related topics such as: irrigation system design and maintenance, rainwater harvesting, the use of mulch, etc. Contact The Garden by phone at 619.660.0614, or visit their Website at www.thegarden.org.

California Urban Water Conservation Council – The California Urban Water Conservation Council (CUWCC) is a partnership of water suppliers, environmental groups, and others interested in conserving California's water resources. Their Website provides a variety of on-line resources for those interested in conserving water in the home and in landscaped areas. Visit the CUWCC Website at www.cuwcc.com.

## Section Three: Examples

The following examples are based upon hypothetical landscape projects and are training aides for applicants that must complete the Water Efficient Landscape Worksheet.

**Example One:** This example is based upon a hypothetical landscape project located in El Cajon, CA, consisting of 10,000-square feet of irrigated landscaping at a new industrial development. This example includes 5 irrigation circuits controlled by a single programmable irrigation controller and one point of connection to the water main. There are no water features or special landscaped areas in this example. The landscape area includes:

- 1,000 sq. ft. of mesa oak trees and silver buffaloberry shrubs (very low water use plants) irrigated by drip lines
- 6,000 sq. ft of western redbud trees, and manzanita bushes (low water use plants) irrigated by bubblers
- 2,000 sq. ft. of New Zealand flax (moderate water use plant) irrigated by bubblers
- 500 sq .ft planted with white alder trees and dahlias (high water use plants) irrigated by pop-up spray heads
- 500 sq. ft planted with white alder trees and marmalade bush (high water use plants) irrigated by pop-up spray heads

Step No. 1 – Calculate the Maximum Applied Water Allowance (MAWA)

The MAWA is calculated in Section A of the Water Efficient Landscape Worksheet. Use the following formula to calculate MAWA, and show your calculations in the space provided at the bottom of Section A.

MAWA = (ETo) (0.62) [(0.7 x LA) + (0.3 x SLA)]

Eto = 57.33 inches per year
LA = 10,000-square feet
SLA = 0

MAWA = (57.33) (0.62) [(0.7 x 10,000) + (0.3 x 0)]
MAWA = (57.33) (0.62) [(7,000) + 0]
MAWA = (57.33) (0.62) (7,000)

**MAWA = 248,812 gallons per year**

Step No. 2 – Fill out the Hydrozone Information Table

The Hydrozone Information Table is Section B of the Water Efficient Landscape Worksheet. Instructions for filling out the table are provided as endnotes at the bottom of the table. Use as many tables as neccessary to list all areas of the landscape project.

**Water Efficient Landscape Worksheet - Section B -Hydrozone Information Table**

**Point of Connection Number: 1**

| Hydrozone Designator | Controller # | Valve # | Irrigation Method | % Total LA | PF | HA | IE | (PF*HA) / IE |
|---|---|---|---|---|---|---|---|---|
| Very Low | 1 | A | D | 10% | .10 | 1,000 | .80 | 125 |
| Low | 1 | B | B | 60% | .30 | 6,000 | .80 | 2,250 |
| Moderate | 1 | C | B | 20% | .50 | 2,000 | .80 | 1,250 |
| High | 1 | D | S | 5% | .80 | 500 | .55 | 727 |
| High | 1 | E | S | 5% | .80 | 500 | .55 | 727 |
| **Special Landscape Areas* (SLA)** | | | | | | | | |
| | | | | | N/A | | N/A | |
| | | | | | N/A | | N/A | |
| | | | | | N/A | | N/A | |
| | | | | | N/A | | N/A | |
| **Summary Totals:** | | | | **100%** | | **10,000** | | **5,079** |

**Instructions and Endnotes:**

All landscaped areas in the project must be listed. Use a separate table or set of tables for each point of connection to the water main. Use as many tables as necessary to list all hydrozones in the landscape.

All designations listed in the table must be consistent with designations shown on the landscape and irrigation plans. Each hydrozone must be listed as a separate record in the table and must be supplied by it's own valve, or set of valves with the same irrigation schedule.

The abbreviations listed in the table have the following meanings: HA = hydrozone area, IE = irrigation efficiency, LA = landscape area, PF = plant factor

Use the following abbreviations to indicate the irrigation method: MS = micro-spray, S = spay, R = rotor, B = bubbler, D = drip

Use the following numbers to indicate the irrigation efficiency (IE) for the irrigation method proposed: MS = 0.80, S = 0.55, R= 0.70, B = 0.80, D = 0.80

The plant factor listed shall be the plant factor for the highest water use plant in the hydrozone. Plant factor data shall be from WUCOLS and the values shall be listed as follows in the hydrozone information table: High = 0.80, Moderate = 0.50, Low = 0.30, Very Low = 0.10

Perform the calculation indicated at the top of the final column for each row in the table and list the result for each row in the final column. Add the results listed in the final column together and enter the cumulative value at the bottom of the final column in the row labeled "Summary Totals." This cumulative value shall be used in the formula for determining ETWU as indicated in Section C of the Water Efficient Landscape Worksheet.

*Note that hydrozones in special landscaped areas utilize a simplified calculation resulting from the additional ETAF allowance for special landscaped areas. For hydrozones in special landscape areas, simply list the hydrozone area in the "HA" column of the table and then list the same number again in the final column of the table.

Step No. 3 – Calculate the Estimated Total Water Use (ETWU)

The project's ETWU is calculated in Section C of the Water Efficient Landscape Worksheet. ETWU is calculated by multiplying the reference evapotranspiration rate by the conversion factor of 0.62, and also by the number listed at the bottom of the final column of the Hydrozone Information Table. The conversion factor of 0.62 is used to express ETWU in gallons per year.

ETWU = ($ET_0$) (0.62) (total from final column of Hydrozone Information Table)

ETWU = (57.33) (0.62) (5,079)

**ETWU = 180,531 gallons per year**

The project's estimated total water use (ETWU) does not exceed the project's maximum applied water allowance (MAWA.) Therefore, the proposed landscape project meets the water efficiency criteria established in Chapter 17.195 of the Zoning Ordinance.

**Example Two:** This example is based upon a hypothetical landscape project located in El Cajon, CA, consisting of 12,500 sq. ft. of irrigated landscaping at a new multi-family development. Unlike the last example, this example includes landscape areas that mix plants of different water use characteristics within the same area [see Section 17.195.260(B)(4)] It also includes a special landscape area with 500 sq. ft. of edible plants, and it includes a swimming pool and hot tub with a combined surface area of 1,000 sq. ft.

As indicated in Chapter 17.195, when plants of different water use categories are mixed within a hydrozone, the entire hydrozone is considered to be in the water use category of the highest water use plant within the hydrozone. Also keep in mind that plants within a special landscaped area are permitted to use a modified ETAF. This modification results in a simplified calculation in the Hydrozone Information Table for special landscaped areas.

This example includes 6 irrigation circuits controlled by a single programmable irrigation controller. The pool and hot tub are not on a programmable timer. Rather, the water is supplied via a valve that is actuated by a decrease in the water level of the pool. The water is delivered via a pipe located in the side of the pool, below the water line. Therefore, the irrigation efficiency for the pool and spa may be listed as 100%. The pool and spa are considered to be high water use areas when listing the plant factor and the pool's hydrozone. There are no other water features or special landscaped areas in this example.

The landscape area in this example includes:

- 1,000 sq. ft. of mesa oak trees (very low water use plants) and manzanita bushes (low water use plant) irrigated by drip lines
- 6,000 sq. ft of western redbud trees, African sumac trees, and purple sage bushes (low water use plants) irrigated by bubblers
- 2,000 sq. ft. of New Zealand flax (moderate water use plant) mixed with prostrate rosemary (low water use plant) irrigated by micro-spray emitters
- 500 sq .ft planted with white alder trees, turf grass, and dahlias (high water use plants) irrigated by pop-up spray heads
- 1,500 sq. ft. turf play area (high water use plant) irrigated by pop-up spray heads
- 500 sq .ft community vegetable garden (high water use plants – special landscape area) irrigated by spray heads on risers
- A pool and hot tub with a combined surface area of 1,000-sq. ft. which is designated as a high water use area and which includes a water supply system with 100% irrigation efficiency

Step No. 1 – Calculate the Maximum Applied Water Allowance (MAWA)

The MAWA is calculated in Section A of the Water Efficient Landscape Worksheet. Use the following formula to calculate MAWA, and show your calculations in the space provided at the bottom of Section A.

MAWA = (ETo) (0.62) [(0.7 x LA) + (0.3 x SLA)]

Eto = 57.33 inches per year
LA = 12,500-square feet
SLA = 500

MAWA = (57.33) (0.62) [(0.7 x 12,500) + (0.3 x 500)]
MAWA = (57.33) (0.62) [(8,750) + (150)]
MAWA = (57.33) (0.62) (8,900)

**MAWA = 316,345 gallons per year**

Step No. 2 – Fill out the Hydrozone Information Table

The Hydrozone Information Table is Section B of the Water Efficient Landscape Worksheet. Instructions for filling out the table are provided as endnotes at the bottom of the table. Use as many tables as neccessary to list all of the hyrdozones in the landscape project area.

**Water Efficient Landscape Worksheet - Section B -Hydrozone Information Table**

**Point of Connection Number: 1**

| Hydrozone Designator | Controller # | Valve # | Irrigation Method | % Total LA | PF | HA | IE | (PF*HA) / IE |
|---|---|---|---|---|---|---|---|---|
| Low | 1 | A | D | 7% | .30 | 1,000 | .80 | 375 |
| Low | 1 | B | B | 42% | .30 | 6,000 | .80 | 2,250 |
| Moderate | 1 | C | MS | 14% | .50 | 2,000 | .80 | 1,250 |
| High (Part Turf) | 1 | D | S | 4% | .80 | 500 | .55 | 727 |
| High (Turf) | 1 | E | S | 22% | .80 | 1,500 | .55 | 2,181 |
| High (Pool and Spa) | N/A | PS-1 | N/A | 7% | .80 | 1,000 | 1 | 1,250 |
| **Special Landscape Areas* (SLA)** | | | | | | | | |
| High | 1 | F | S | 4% | N/A | 500 | N/A | 500 |
| | | | | | N/A | | N/A | |
| | | | | | N/A | | N/A | |
| | | | | | N/A | | N/A | |
| **Summary Totals:** | | | | **100%** | | **12,500** | | **8,533** |

**Instructions and Endnotes:**

All landscaped areas in the project must be listed. Use a separate table or set of tables for each point of connection to the water main. Use as many tables as necessary to list all hydrozones in the landscape.

All designations listed in the table must be consistent with designations shown on the landscape and irrigation plans. Each hydrozone must be listed as a separate record in the table and must be supplied by it's own valve, or set of valves with the same irrigation schedule.

The abbreviations listed in the table have the following meanings: HA = hydrozone area, IE = irrigation efficiency, LA = landscape area, PF = plant factor

Use the following abbreviations to indicate the irrigation method: MS = micro-spray, S = spay, R = rotor, B = bubbler, D = drip

Use the following numbers to indicate the irrigation efficiency (IE) for the irrigation method proposed: MS = 0.80, S = 0.55, R= 0.70, B = 0.80, D = 0.80

The plant factor listed shall be the plant factor for the highest water use plant in the hydrozone. Plant factor data shall be from WUCOLS and the values shall be listed as follows in the hydrozone information table: High = 0.80, Moderate = 0.50, Low = 0.30, Very Low = 0.10

Perform the calculation indicated at the top of the final column for each row in the table and list the result for each row in the final column. Add the results listed in the final column together and enter the cumulative value at the bottom of the final column in the row labeled "Summary Totals." This cumulative value shall be used in the formula for determining ETWU as indicated in Section C of the Water Efficient Landscape Worksheet.

*Note that hydrozones in special landscaped areas utilize a simplified calculation resulting from the additional ETAF allowance for special landscaped areas. For hydrozones in special landscape areas, simply list the hydrozone area in the "HA" column of the table and then list the same number again in the final column of the table.

Step No. 3 – Calculate the Estimated Total Water Use (ETWU)

The project's ETWU is calculated in Section C of the Water Efficient Landscape Worksheet. ETWU is calculated by multiplying the reference evapotranspiration rate by the conversion factor of 0.62, and also by the number listed at the bottom of the final column of the Hydrozone Information Table. The conversion factor of 0.62 is used to express ETWU in gallons per year.

ETWU = ($ET_0$) (0.62) (total from final column of Hydrozone Information Table)

ETWU = (57.33) (0.62) (8,533)

**ETWU = 303,302 gallons per year**

The project's estimated total water use (ETWU) does not exceed the project's maximum applied water allowance (MAWA.) Therefore, the proposed landscape project meets the water efficiency criteria established in Chapter 17.195 of the Zoning Ordinance.

## Section Four: Technical Information

Section Four of the manual provides the reference evapotranspiration rate ($ET_O$) for El Cajon. This section also provides a listing of drought tolerant, low water use plants that are appropriate for the inland valleys of Southern California, such as the El Cajon Valley.

Reference Evapotranspiration: Reference evapotranspiration (ETo) is a standardized measurement of environmental parameters that affect the water use of plants. ETo is given in inches per year and is an estimate of the ETo of a large field of four-inches to seven-inches tall, cool season turf that is well watered. Reference ETo is used as the basis of determining the maximum applied water allowance so that regional differences in climate can be accommodated. The reference evapotranspiration rate for El Cajon is 57.33 inches per year. This rate is based upon information from CIMIS Station No. 153, located in Escondido, California.

"Nifty Fifty" drought tolerant plant list: The staff at the Water Conservation Garden at Cuyamaca Community College prepared the list provided below. It contains plants that are well adapted to life in hot and arid environments such as the El Cajon Valley. The list is intended to provide landscape professionals, developers, and property owners with a resource to facilitate the planning and design of water efficient landscapes. However, it should be noted that there is no requirement to use the specific plants listed.

## Nifty-50 Plants for Water-Smart Landscapes

These plants have been selected because they are attractive, often available in retail nurseries, non-invasive, easy to maintain, long-term performers, scaled for residential landscapes, and of course, after established - drought tolerant. The plants are listed in descriptive categories such as shrubs, trees, and ground covers. The plant's botanical name is listed first, and the common name is listed second. Plants that are native to California are indicated as such.

### Shrubs:

**Botanical Name / Common Name**

1. Arctostaphylos species and hybrids / Manzanita (Native)
2. Ceanothus species and hybrids / California Lilac (Native)
3. Cercis occidentalis / Western Redbud (Native)
4. Chamelaucium uncinatum / Geraldton Waxflower
5. Cistus species / Rockrose
6. Grevillea species and hybrids / Grevillea
7. Heteromeles arbutifolia / Toyon (Native)
8. Leucophyllum species / Texas Ranger
9. Mahonia aquifolium / Oregon Grape (Native)
10. Myrtus communis / Common Myrtle
11. Rosmarinus officinalis / Rosemary
12. Westringia fruticosa / Coastal Rosemary

### Succulents

13. Aeonium species / Aeonium
14. Agave species and hybrids / Agave
15. Aloe species and hybrids / Aloe

16. Calandrinia grandiflora / Rock Purslane

17. Dudleya species and hybrids / Live Forever (Native)

18. Echeveria species and hybrids / Hens-and-Chickens

**Vines**

19. Bougainvillea hybrids / Bougainvillea

20. Mascagnia macroptera / Yellow Orchid Vine

21. Vitis californica / California Wild Grape (Native)

**Groundcover**

22. Ceanothus griseus horizontalis species and hybrids / Carmel Creeper (Native)

23. Dymondia margaretae / Silver Carpet

24. Lampranthus species / Ice Plant

25. Lantana montevidensis / Trailing Lantana

26. Rosmarinus officinalis 'Huntington Carpet' / Huntington Carpet Rosemary

• Rosmarinus officinalis 'Lockwood de Forest' / Lockwood de Forest Rosemary

• Rosmarinus officinalis 'Prostrata' / Prostrate Rosemary

• Rosmarinus officinalis 'Santa Barbara' / Santa Barbara Rosemary

27. Sedum species and hybrids / Stonecrop

28. Thymus pseudolanuginosus / Woolly Thyme

**Ornamental Grasses and Grass-like Plants**

29. Cordyline australis / New Zealand Cabbage Tree

30. Muhlenbergia capillaris / Pink Muhly Grass

31. Pennisetum setaceum 'Rubrum' / Red Fountain Grass

32. Phormium tenax and some species and hybrids / New Zealand Flax

**Perennials**

33. Anigozanthos species and hybrids / Kangaroo Paws

34. Encelia californica / California Sunflower

35. Lavandula species and hybrids / Lavender

36. Mimulus, Native species and hybrids / Monkey flower (Native)

37. Penstemon, Native species / Penstemon

• Penstemon heterophyllus / Foothill Penstemon (Native)

• Penstemon parryi / Parry's Beardtongue (Native)

• Penstemon spectabilis / Showy Penstemon (Native)

38. Salvia species Sage

• Salvia Africana lutea / Dune Sage

• Salvia chamaedryoides / Gernander Sage

• Salvia clevelandii / Cleveland Sage

• Salvia leucantha / Mexican Bush Sage

• Salvia greggii / Autumn Sage

39. Tagetes, perennial / Perennial Marigold

• Tagetes lemmonii / Copper Canyon Daisy

• Tagetes lucida / Mexican Tarragon

40. Verbena peruviana / Peruvian Verbena

**Trees**

41. Arbutus 'Marina' / Strawberry Tree

42. Butia capitata / Pindo Palm

43. Chitalpa tashkentensis / Chitalpa (Native)

44. Geijera parviflora / Australian Willow

45. Lagerstroemia indica / Crape Myrtle

46. Laurus nobilis / Sweet Bay

47. Olea europaea 'Swan Hill' / Fruitless Olive

48. Parkinsonia x 'Desert Museum' / Desert Museum Palo Verde

49. Pistacia chinensis / Chinese Pistache

50. Quercus agrifolia / Coast Live Oak (Native)

## Section Five: Forms for Landscape Documentation Package and Certificate of Completion

The application forms and worksheets included in this section are required for approval of a Landscape Documentation Package and Certificate of Completion. In addition to the application form, applicants for a Landscape Documentation Package must also complete all sections (A, B, and C) of the Water Efficient Landscape Worksheet. Examples of how to complete the worksheet are provided in Section Three of this design manual. The examples are based upon hypothetical landscape projects and are only intended as training aides.

**CITY OF EL CAJON ● PLANNING DIVISION ● (619) 441-1741**

## LANDSCAPE DOCUMENTATION PACKAGE

**APPLICATION NO. _____**

Landscape Professional of Record (applicant): _____

Address: _____
Street No. City State Zip

Phone: (_____) _____

License or certification number and type: _____

_____

Property owner's name: _____

Address: _____
Street No. City State Zip

Phone: (_____) _____

Property owner's signature: _____

Subject property is located on the _____

_____, and is

addressed as _____.

Assessor's parcel number: _____

Zoning designation: _____

Associated building permit or planning file number: _____

Brief description of landscape project including project area, special landscape areas, and water features: _____

_____

_____

_____

_____

**City Use Only:**
Date Filed: _____ Received by: _____

In addition to the application form, applicant's must submit the following items:

1. Filing fee of $160.
2. Photocopy of deed including complete and accurate legal description of the subject property. Name of property owner on deed must correspond with name and signature on application or letter of authorization.
3. Landscape site plan (5 copies) prepared as follows:
   - _____A. Maximum sheet size shall be 24" x 36."
   - _____B. Plan shall be to a standard engineer or architect's scale (minimum 1" = 40'.)
   - _____C. North arrow oriented to top of page (irregularly shaped lots may orient to side if necessary.)
   - _____D. Plan shall include a vicinity map indicating adjacent street(s) and nearest cross streets.
   - _____E. Title block shall be in lower right hand corner (see attached blank title block for applicant's use.)
   - _____F. Plan shall include the location and accurate dimensions of:
     - _____ 1) All property lines
     - _____ 2) All easements
     - _____ 3) All existing and proposed structures
     - _____ 4) All existing and proposed fences or walls
     - _____ 5) Existing and proposed improvements within the public right-of-way
     - _____ 6) All on-site parking areas and driveways
     - _____ 7) All areas of existing or proposed landscaping including all existing or proposed water features (including swimming pools and hot tubs)
     - _____ 8) All existing geological features and areas of natural vegetation that will be retained
     - _____ 9) Any existing or proposed freestanding signs
     - _____ 10) Any other notable project features that affect site design (i.e., common recreation areas, trash enclosures, utility equipment, etc.)
   - _____G. A "Notes" section shall be provided which gives information on:
     - _____ 1) Area of subject property
     - _____ 2) Square footage of all parking areas and driveways
     - _____ 4) Square footage of total "landscaped area" including "special landscaped areas" as defined in ECMC Section 17.195.020.
     - _____ 5) Square footage devoted exclusively to "special landscaped areas" as defined in ECMC Section 17.195.020.

4*. Soil management report (2 copies) prepared in accordance with ECMC Section 17.195.250.
5. Planting and irrigation plans (5 copies each) prepared in accordance with ECMC Section 17.195.260 (when feasible, these plans may be incorporated with the required landscape site plan described above in item number 2.)
6. Water efficient landscape worksheet prepared in accordance with ECMC Section 17.195.270.

7. Landscape grading plan (5 copies) prepared in accordance with ECMC Section 17.195.280.

*NOTE: When a project involves mass grading of a site, the applicant shall submit the soil management report with the Certificate of Completion package required by ECMC Section 17.195.330, rather than submitting it with the Landscape Documentation Package.

NOTE: The plans required above shall be assembled and bound as plan sets.

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| | | |
|---|---|---|
| Sheet 1 | CITY OF EL CAJON | Sheet 1 |
| LANDSCAPE DOCUMENTATION PACKAGE NO. _____ | | |
| APPLICANT: _____<br>ASSESSOR PARCEL NO(S): _____<br>LANDSCAPE PROJECT DESRIPTION:<br>_____<br>_____ | | |
| DRAWN BY: _____<br>ADDRESS: _____<br>_____<br>PHONE: _____ | | APPROVED BY:<br>_____<br>DATE: _____ |

**Water Efficient Landscape Worksheet - Section A - Maximum Applied Water Allowance (MAWA)**

Calculate the Maximum Applied Water Allowance using this equation:

MAWA = (ETo) (0.62) [(0.7 x LA) + (0.3 x SLA)]

where:

MAWA = Maximum Applied Water Allowance (gallons per year)
ETo = Reference evapotranspiration rate for El Cajon (57.33 inches per year)
0.62 = Conversion factor (to gallons per square foot)
0.7 = ET Adjustment Factor (ETAF)
LA = Landscaped Area (total) including Special Landscape Area (square feet)
SLA = Portion of the total landscape area identified as Special Landscape Area (square feet)
0.3 = additional ET Adjustment Factor for Special Landscape Area (1.0 - 0.7 = 0.3)

**Maximum Applied Water Allowance = _____gallons per year**

Show calculations here:

## Water Efficient Landscape Worksheet - Section B -Hydrozone Information Table

| Hydrozone # | HA (sq.ft.) | % of Total LA | POC # | Controller # | Valve # | Irrigation Method | IE | PF | (PF*HA) / IE |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| **Special Landscape Areas* (SLA)** | | | | | | | | | |
| | | | | | | | N/A | N/A | |
| | | | | | | | N/A | N/A | |
| | | | | | | | N/A | N/A | |
| | | | | | | | N/A | N/A | |
| | | | | | | | N/A | N/A | |
| **Summary Totals:** | | **100%** | | | | | | | |

**Instructions and Endnotes:**

All landscaped areas in the project must be listed. Use as many tables as necessary to list all hydrozones.

All designations listed in the table must be consistent with designations shown on the landscape and irrigation plans. Each hydrozone must be listed as a separate record in the table and must be supplied by it's own valve, or set of valves with the same schedule.

The abbreviations listed in the table have the following meanings: HA = hydrozone area, LA = landscape area, POC = point of connection, IE = irrigation efficiency, PF = plant factor

Use the following abbreviations to indicate the irrigation method:
MS = micro-spray, S = spay, R= rotor, B = bubbler, D = drip

Use the following numbers to indicate the irrigation efficiency (IE) for the irrigation method proposed:
MS = 0.80, S = 0.55, R= 0.70, B = 0.80, D = 0.80

The plant factor listed shall be the plant factor for the highest water use plant in the hydrozone. Plant factor data shall be from WUCOLS and the values shall be listed as follows in the table:
High = 0.80, Moderate = 0.50, Low = 0.30, Very Low = 0.10

Perform the calculation indicated at the top of the final column for each hydrozone and list the results for each hydrozone in the final column of the table. Then add the results listed in the final column together and enter the cumulative value at the bottom of the final column in the row labeled "Summary Totals." This cumulative value shall be used in the formula for determining ETWU for the landscape project, as indicated in Section C of the Water Efficient Landscape Worksheet.

*Note that hydrozones in special landscaped areas utilize a simplified calculation resulting from the additional ETAF allowance for special landscaped areas. For hydrozones in special landscape areas, simply list the hydrozone area in the second column of the table and then list the same number again in the final column of the table.

**Water Efficient Landscape Worksheet - Section C - Estimated Total Water Use (ETWU)**

The project's Estimated Total Water Use is determined based upon the following formula as indicated in Chapter 17.195 of the Zoning Ordinance:

$$ETWU = (ETo)(0.62)\left(\frac{PF\,x\,HA}{IE} + SLA\right)$$

Where:

ETWU = Estimated total water use per year (gallons per year)
ETo = Reference Evapotranspiration rate for El Cajon (57.33 inches per year)
PF = Plant Factor from WUCOLS (see Definitions)
HA = Hydrozone Area [high, medium, and low water use areas] (square feet)
SLA = Special Landscape Area (square feet)
0.62 = Conversion Factor (to gallons per square foot)
IE = Irrigation Efficiency (minimum 0.71)

**HOWEVER,** it should be noted that for the purpose of calculating ETWU, the irrigation efficiency and plant factor values will vary from hyrdrozone to hydrozone depending upon the type of plants and irrigation methods proposed. Therefore, the final term in the ETWU calculation must be completed independently for each hydrozone, as required in the last column of the Hydrozone information table.

The resulting hydrozone water use calculations from the final column in the Hydrozone Information Table are added together at the bottom of the final column, and the resultant sum is entered as the final term of the overall ETWU calculation. Therefore, the modified (simplified) calculation used to determine the estimated total water use for the overall landscape project is as follows:

ETWU = ($ET_0$) (0.62) (total from final column of Hydrozone Information Table)

**Estimated Total Water Use = _____gallons**

Show calculations here:

# CERTIFICATE OF COMPLETION

## CITY OF EL CAJON

### DEPARTMENT OF COMMUNITY DEVELOPMENT

**200 Civic Center Way, El Cajon, CA 92020, 619.441.1741**

This certificate is to be completed by the landscape professional of record and property owner upon completion of the landscape project.

### Project Information

LDP Number: _____ Assessor's Parcel Number _____

Project Address: _____

_____

**Landscape Professional of Record (applicant)**

Name: _____

License or certification type and number: _____

Company Name: _____

Phone: _____ Fax: _____

Address: _____ Email: _____

_____

**Property Owner or Designated Property Manager**

Name: _____ Phone: _____

Title: _____ Fax: _____

Company: _____ Email: _____

Address: _____

_____

### Property Owner's Certification

"I/we certify that I/we have received copies of all the documents within the Landscape Documentation Package and the Certificate of Completion and that it is our responsibility to see that the project is maintained in accordance with the approved Maximum Applied Water Allowance and the Landscape and Irrigation Maintenance Schedule."

Property Owner's Signature _____ Date: _____

### Please answer the following questions:

1. Date the Landscape Documentation Package was submitted to the city _____
2. Date the Landscape Documentation Package was approved by the city _____
3. Date that a copy of the Water Efficient Landscape Worksheet (including the Water Budget Calculation) was submitted to your local water provider _____

### Certification of Installation According to the Landscape Documentation Package

"I/we certify that based upon periodic site observations, the landscaping and irrigation were installed as authorized by the approved landscape and irrigation plans, all approved soil amendments were implemented, the installed irrigation system is functioning as designed and approved, the irrigation control system was properly programmed in accordance with the irrigation schedule, and the person operating the system has received all required maintenance and irrigation plans."

Signature of Landscape Professional of Record:

_____ Date: _____

### Certificate of Completion Package Checklist:

- ☐ Irrigation Schedule
- ☐ Schedule of Landscape and Irrigation Maintenance
- ☐ Soil Management Report (If not previously submitted)
- ☐ "As-Built" plans (If significant changes were made after approval of the LDP)