

WATER EFFICIENT LANDSCAPE DESIGN MANUAL

2. Any re-landscaping of any property requiring discretionary review or issuance of a building permit with a total aggregate landscape in excess of 2,500 square feet, requires the submittal and approval of a Landscape Documentation Package.
3. Any previously approved Landscape Documentation Package that proposes revisions that amount to 10% or more, require the submittal and approval of a Modified Landscape Documentation Package.

SECTION 2 LANDSCAPE DOCUMENTATION PACKAGE

A. General Information

1. A Landscape Documentation Package (LDP) must be submitted to the Department of Planning & Development Services for all new construction projects that meet the applicability requirements of the Title 8, Division 6, Chapter 7, of the San Diego County Code of Regulatory Ordinances Relating to Water Conservation in Landscaping. The LDP shall address water conservation techniques and efficient irrigation systems. The owner or his agent shall be responsible for implementation of the LDP.
2. The LDP shall be prepared and certified by a California licensed landscape architect, licensed civil engineer or licensed architect. A California licensed landscape contractor may prepare and certify the LDP for the homeowner of a single family residence if evidence of a signed contract with the property owner, acknowledging that the contractor will also install the landscaping, is provided. Personal property owners may also prepare plans and specifications for any property owned by that person.
3. The LDP must be submitted and approved before a building permit will be issued. The landscape architect, civil engineer, architect, or landscape contractor shall conduct periodic site visits during construction

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to observe and ensure that the landscaping and irrigation system are being installed per the approved Landscape Documentation Package and shall certify to such as part of the Certificate of Completion requirements.

4. The LDP consists of:
 - a. Project Information
 - b. Soil Management Report (sec.86.708)
 - c. Landscape Design Plan (sec.86.709)
 - d. Irrigation Design Plan (sec.86.709)
 - e. Grading Design Plan (sec.86.710)
 - f. Water Efficient Landscape Worksheet (sec.86.711)
5. The LDP must be approved by the Director of Planning & Development Services in order to obtain Outdoor Water Use Authorization as described in the County Code of Regulatory Ordinances Section 86.704.

B. Project Information

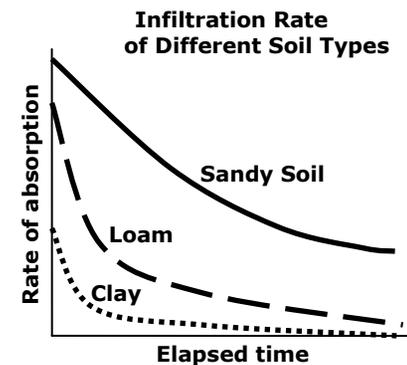
The applicant shall provide the following information:

1. Date of application
2. Project applicant/Property Owner & Contact Information
3. Project Address (including parcel and lot number(s))
4. Total irrigated landscape area (square feet)
5. Landscape type (e.g., new, existing, private, cemetery, home-owner installed, etc)
6. Water supply type (potable, recycled, well, graywater)
7. Checklist of all documents in Landscape Documentation Package

A rain barrel captures roof and gutter runoff to irrigate landscape.



Photograph Courtesy of Arid Solutions, Inc.



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C. Soil Management Report

1. In order to reduce runoff and encourage healthy plant growth, a soil management report must be submitted.
2. The analysis shall be completed by a properly certified or accredited laboratory using accepted industry protocol. The analysis shall be of the soil for the proposed landscaped areas of the project that include information about the soil texture, soil infiltration rate, pH, total soluble salts, sodium and percent of organic matter.
3. The report should also contain recommendations, which shall be implemented, about the type and amount of amendments necessary to sustain the vegetation proposed in the landscape design plan.
4. The information contained within the soils analysis report must be made available to the preparer of the required landscape and irrigation plans to make any necessary adjustments to the design relating to soil erosion, runoff, and plant establishment.
5. When a project involves mass grading of a site the applicant shall submit a soil management report that complies with subsection (1 & 2) above with the Certificate of Completion required by section 86.725.
6. In projects with multiple landscape installations (i.e. production home developments) a soil sampling rate of 1 in 7 lots or approximately 15% will satisfy this requirement. Large landscape projects shall sample at a rate equivalent to 1 in 7 lots.

D. Landscape Design Plan

For the efficient use of water, a landscape shall be carefully designed and planned for the intended function of the project.

1. General Submittal Requirements

- a. Submit two complete sets.

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- b. **Submit a copy of either the project's Standard Storm Water Quality Management Plan (SWQMP) or Priority Development Project Storm Water Quality Management Plan with all vegetated Best Management Practices (BMPs) highlighted. SWQMP must be a copy of the approved plan or most recent version, updated and highlighted for landscape review. See Section 2.D.11. Projects shall be compliant with all applicable Fact Sheets (Appendix E) within the County's Best Management Practice's Design Manual.**
- c. Plans must address fire safety issues and demonstrate compliance with State and County requirements for defensible space around buildings and structures.
- d. **Plans must be standard 24" X 36" blueprint sheets. Any other size must be approved in advance.**
- e. **Scale is 1" = 20' or smaller (such as: 1" = 10' or 1" = 5').**
- f. Plans must be legible, professionally prepared and a print of an original drawing. Photocopies are not acceptable.
- g. All sheets must be signed, stamped, and dated along with a renewal date by the professional licensed by the State of California who prepared the plans. Personal property owners preparing their own plans must sign and date the plans
- h. Each sheet must contain the following certification:
I am familiar with the requirements for landscape and irrigation plans contained in the County Landscape Water Conservation regulations, in Title 8, Division 6, Chapter 7. I have prepared this plan in compliance with those regulations. I certify that the plan implements those regulations to provide efficient use of water.

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2. Plan Requirements

Plans shall:

- a. Delineate and label each hydrozone by number, letter, or other method.
- b. Identify each hydrozone as very low, low, moderate, high water use or a special landscaped area.
- c. Show specific location of all vegetation, retained or planted, the plant spacing and plant quantities by container size. If seed is to be planted, the plan shall describe the seed mixes and applicable germination specifications.
- d. Include a legend listing the common and botanical plant names of **each plant shown on the drawing, including the species' plant factor.**
- e. Identify recreational areas (both passive and active) except on plans for single family residential projects.
- f. Identify areas permanently and solely dedicated to edible plants.
- g. Identify areas irrigated with recycled water, graywater and other non-potable water.
- h. Identify temporarily irrigated areas.
- i. Show all pervious and non-pervious hardscapes.
- j. Show all natural features.
- k. Identify the type, and surface area of all water features.
- l. Identify the type and amount of mulch for each area where mulch is applied.
- m. Identify any soil amendments, the type, and quantity.

Once a year, groom ornamental grasses. Do not mow.



Buffalo Grass



California Meadow Sedge

3. Plant Material

- a. Landscaping includes the planting and maintenance of trees,

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groundcover, shrubs, vines, flowers, or turf varieties. In addition, when appropriate for the site and intended use, the landscaping may include natural features such as rock and stone or structural features including, but not limited to, fountains, pools, art work or pervious pathways.

- b. Plants shall be selected and planted appropriately based upon their adaptability to the climatic, geologic and topographical conditions of the project site. Low-water use, deep-rooted plants and native species are highly recommended, as well as plants that are well-suited for the soil type that exists on site.
- c. Plants shall be grouped into hydrozones with plant species having similar water demands and by their soil, sun, shade, and maintenance requirements.
- d. Within hazardous fire areas, highly flammable plant materials and mulches, such as straw or small wood chips, should be avoided. Refer to the plant list in Appendix H for plants that are both ignition resistive and low water use. Also see Section 2.D.7.
- e. Plant material at full maturity shall not obscure sight distance for all roadway users. **Trees shall be planted a minimum of 24" from sidewalk.** Root barriers are required when used in parkways less than **3' wide and where specified.**
- f. Plant material used in landscapes within the wildland/urban interface should design and maintain a defensible, ignition resistive landscape. Projects are encouraged to use ignition-resistive, low water use plants that reduce the chance for embers from the plants to spread to either urban areas or wildlands.
- g. Plantings in transitional areas must consist of site adaptive and compatible native species and may also be combined with site adaptive and compatible non-native species. Invasive plant species



TURF MANAGEMENT

- **30% of San Diego's water is used to irrigate residential landscapes. Turf consumes the majority of that water.**
- **Turf should be at least 2 to 3 inches high.**
- **Leave grass clippings on the lawn**
- **Use warm season turf instead of cool season turf.**
- **As an alternative, try low water use ornamental grasses such as buffalo grass or California meadow sedge.**
- **Dethatch or aerate your lawn to allow water to penetrate the soil.**

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must not be planted in transitional areas and must be eradicated when and where they occur. See Section 2.D.6. and Appendix J.

4. Turf Areas

- a. Turf must be efficiently irrigated so as to avoid runoff or overspray.
- b. Turf shall not exceed 25% of the total aggregate landscape area for single family residences and multi-family residential projects.
- c. No turf is allowed in non-residential areas unless included in a special landscape area. In multi-family residential areas turf is only allowed where it is readily useable by residents and serves more than just an ornamental function.
- d. Only subsurface irrigation or other means that produces no runoff or overspray shall be used for turf in a landscaped areas where any dimension of the landscaped area is less than ten feet wide.
- e. Turf and all other high water use plants, characterized by a plant factor of 0.7 to 1.0 are prohibited in street medians.
- f. Turf shall not be allowed within 24 inches of impermeable surfaces unless it is irrigated with low volume or subsurface irrigation or unless the adjacent impermeable surfaces are designed and constructed to cause water to drain entirely into a landscaped area.
- g. Turf shall not be allowed on slopes where the grade is greater than 25 percent (4:1) and where the toe of the slope is adjacent to an impermeable hardscape.
- h. A ball field, park, golf course, cemetery and other similar use shall be designed to limit turf in any portion of the landscaped area not essential to operation of the facility.
- i. Turf shall not be allowed in a landscaped area if the turf cannot be irrigated without causing runoff, overspray or other wasteful water uses.

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- j. Turf is prohibited in parkways less than 10 feet wide, unless the parkway is adjacent to a parking strip and used to enter and exit vehicles. Any turf in parkways must be irrigated by sub-surface irrigation or other technology that creates no overspray or runoff.

5. Water Features

- a. Recirculating water systems must be used for water features.
- b. The surface area of a water feature shall be included in the high water use hydrozone unless the water feature is a pool or a spa and is equipped with a durable cover. If a cover is used, the pool or spa may be included in a moderate water use hydrozone.
- c. The total of all water features, excluding a swimming pool or spa, shall be limited to 15 percent of the total landscaped area of the project, or as determined by the Water Efficient Landscape Worksheet.
- d. If groundwater resources are proposed to be used, long term availability of this resource and the water quality must be approved to the satisfaction of the Director of Planning & Development Services.
- e. Where available, recycled water shall be used as a source of water for decorative water features.

6. Transitional Landscapes

- a. Transitional landscape areas are the areas between non-native landscapes and undeveloped areas. The plants specified for transitional landscapes, including slopes and other disturbed areas typically consist of a combination of site adaptive and compatible native and non-native species. The mix of native and non-native plant materials should generally vary, with areas contiguous to existing native vegetation being planned with predominantly native material.

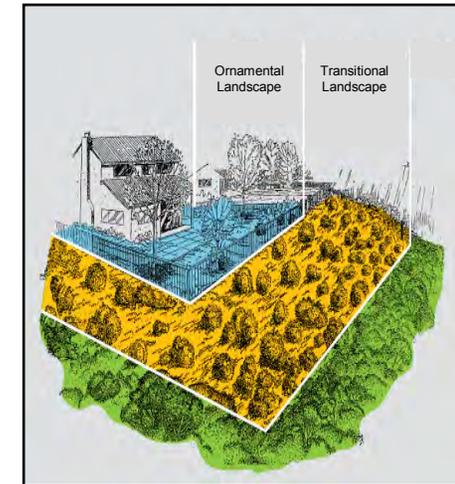
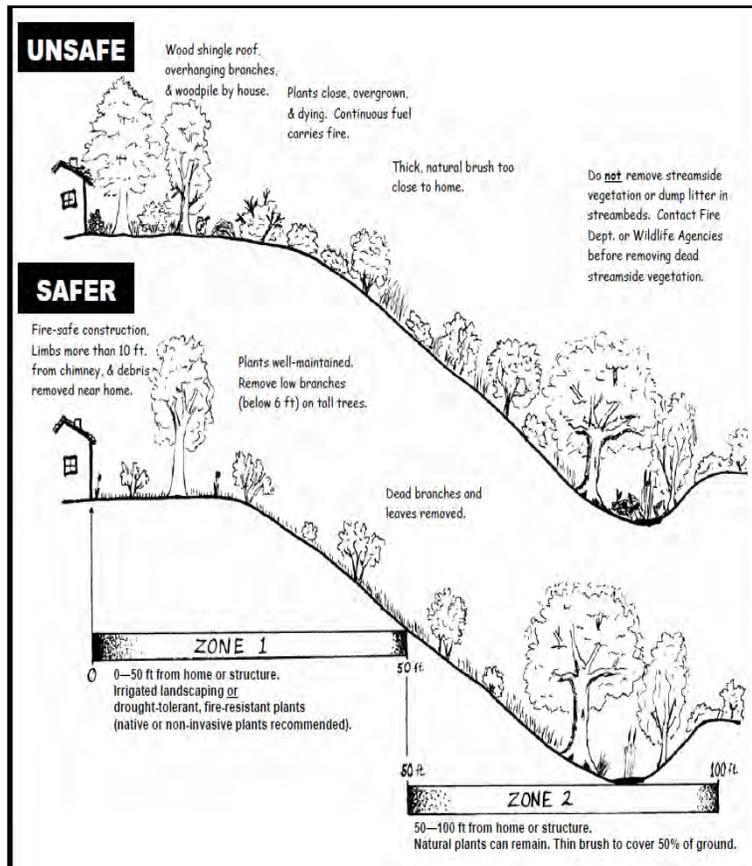


Illustration of a Transitional Landscape

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- b. Invasive (i.e., those capable of reproducing and spreading into native, non-irrigated areas and displacing those communities) non-native plant species are prohibited in all transitional landscapes. Invasive plants that sprout in transition areas shall be promptly abated. The irrigation in a transitional area shall not influence adjacent vegetation.



7. Fuel Management

a. Combustible vegetation must be cleared in a 100-foot radius from any structure. Combustible vegetation is any material that left in its natural state will readily ignite, burn and cause fire to move to any structure or other vegetation. Examples are dry grass, brush, weeds, litter, waste and dead and dying vegetation. See the Undesirable Plant List in Appendix I for plants to avoid.

i. The first 50 feet from the structure may be permanently irrigated and planted with ignition resistive plants which must be maintained all year around.

ii. Within the remaining 50 feet of the 100-foot area, all dead and dying vegetation must be removed and the remaining vegetation must be thinned by 50 percent.

b. Vegetation can only be removed or thinned by mowing, cutting or grazing. The root structure must be left intact to prevent erosion. Do not completely remove or disturb the existing plant root system.

c. No irrigated or non-native landscaping is allowed within an open space easement.

- d. Trees that overhang or touch your structures must be trimmed back away from the structure.
- e. Remove any tree limbs within 10 feet of your chimney.

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- f. For fire truck access, remove trees and shrubs within 10 feet of each side of your driveway.
- g. Avoid planting trees under or near electrical lines. If the trees grow into overhead lines or make contact with overhead lines under windy conditions, they could cause a fire.
- h. Existing trees should be pruned by cutting off any branches up to 6 feet above the ground and the vegetation beneath the canopy of the tree should be trimmed to prevent ground fires from spreading upward into trees.
- i. Vary the height of plants and adequately space them. Taller plants need to be spaced wider apart.
- j. To conserve water, plant low water use trees and shrubs that can be maintained by deep watering as infrequently as once or twice a month. Trees and shrubs shall be watered separately.
- k. Work with your neighbors to clear common areas between houses, and prune areas of heavy vegetation that are a fire threat to both properties.
- l. If you have a heavily wooded area on your property, removing dead, weak or diseased trees may improve growing conditions. This will leave you with a healthy mixture of both new and older trees.
- m. Except in hazardous fire areas, any removed trees may be chipped and used as mulch provided the depth of the mulch does not exceed six inches. In hazardous fire areas, highly flammable mulch such as straw or small size wood chips must not be used.
- n. **Don't forget to legally dispose of all your cut vegetation. You may contact your local landfill to inquire about green waste recycling. Open burning may not be allowed. Contact your fire agency for more information.**
- o. Stack firewood and scrap wood piles at least 30 feet from any



Properly maintained defensible space saves property and lives.

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Vegetated slopes prevent erosion.

structure and clear away any combustible vegetation within 10 feet of the piles. Many homes have survived as a fire moved past it, only to burn later from a wood pile that caught fire after the firefighters had moved on to protect other homes.

- p. Check and clean your roofs and gutters on all structures several times during the spring, summer and fall to remove debris that can easily ignite from a spark.
- q. Check with your local fire district for additional requirements.

8. Slope Erosion Control

- a. At a minimum, all manufactured slope areas shall be covered within 10 days of completion of grading with hydroseed/mulch, punched straw mulch, jute netting or other approved geotextile material capable of controlling surface soil erosion.
- b. Except where approved otherwise, all slopes and any other areas disturbed in conjunction with grading activities shall be maintained until vegetation is well established, with coverage equal to at least 70 percent of coverage, as compared to the native background plants is achieved. This threshold must be met before occupancy of the site will be permitted.
- c. A minimum of 50 percent of the total slope area of manufactured slopes shall be planted with deep rooting plantings (i.e., those with a typical root depth of approximately 5 feet or greater). For seeded plantings, at least 50 percent of the viable seed count shall be deep rooting species.
- d. All plant materials on manufactured slopes shall be appropriate to the site conditions, shall be water efficient when established and shall be adequately spaced to control soil erosion.
- e. All slopes in excess of 15 feet shall be planted with rooted container stock at an average rate of one per 100 square feet unless approved otherwise by the Director of Planning & Development Services.

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Containers shall be a minimum of one gallon for shrubs and five gallons for trees. All container stock shall be provided with a temporary irrigation system.

- f. Turf shall not be allowed on slopes where the grade is greater than 25 percent (4:1) and where the toe of the slope is adjacent to an impermeable hardscape unless the turf is irrigated with low volume or subsurface irrigation.
- g. Slopes greater than 25% shall not be irrigated with an irrigation system with a precipitation rate exceeding 0.75 inches per hour. This restriction may be modified if the landscape designer specifies an alternative design or technology, as part of the Landscape Documentation Package, and clearly demonstrates no runoff or erosion will occur. Prevention of runoff and erosion must be confirmed for approval of a Certificate of Completion.

9. Groundcovers

Herbaceous groundcovers shall be planted at a distance that will typically ensure 100 percent coverage within one year of installation.

10. Mulch and Amendments

- a. A minimum three inch (3") layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers, or direct seeding applications where mulch is contraindicated.
- b. To provide habitat for beneficial insects and other wildlife, up to 5% of the landscape area may be left without mulch, designated insect habitat must be included in the landscape design plan as such.
- c. Stabilizing mulching products shall be applied on slopes that meet current engineering standards.
- d. The mulching portion of the seed/mulch slurry in hydro-seed applications shall meet the mulching requirements.



MULCH TIPS

- **Organic mulch absorbs and retains water so do not irrigate areas covered with organic mulch until the mulch dries out (about once a week).**
- **Use gravel mulch in areas planted with succulents.**



Mulch can be a decorative ground cover that reduces evaporation and weeds.

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- e. Highly flammable mulch material, such as straw or small size wood chips, shall not be used in a "Hazardous Fire Areas". Inorganic mulches such as decomposed granite, gravel, or rocks may be used instead.
- f. Preserve and reuse as much site topsoil as possible.
- g. Amend disturbed soil with compost and prevent recompaction. Compacted soils shall be transformed to a friable condition.
- h. Follow the recommendations from the soil analysis report. See Section 2.C.
- i. Organic mulch materials made from recycled or postconsumer products/materials shall take precedence over inorganic materials or virgin forest products unless the recycled post-consumer organic products are not locally available. Organic mulches are not required where prohibited by County Fire Code.
- J. To meet the requirements of (g) above, install compost at a rate of a minimum of four cubic yards per 1,000 sq. ft. of permeable area shall be incorporated to a depth of six inches into the soil. Soils with greater than 6% organic matter in the top 6 inches of soil are exempt from adding compost and tilling.

11. Drainage

- a. Landscape plans shall show the location and installation details of all vegetated stormwater best management practices required for on-site retention and infiltration of stormwater. Refer to the Fact Sheets **(Appendix E)** within the **County's Best Management Practice's Design Manual** for additional information. Examples include, but are not limited to:
 - Infiltration beds, swales, and basins that allow water to collect and soak into the ground.

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- Constructed wetlands and retention ponds that retain water, handle excess flows, and filter pollutants
 - Pervious or porous surfaces (e.g., permeable pavers or blocks, pervious or porous concrete, etc.) that minimize runoff.
- b. No drainage shall flow or collect in such a manner as to allow breeding by mosquitoes or any other vermin.
 - c. Low areas that may cause standing water shall be filled and replanted.

12. Vehicular Use Areas Not Within the Street Right of Way

- a. Landscape improvements, including, but not limited to, plants, berms, signs, and structures shall be selected, positioned, and maintained to avoid obstructing views of motorists near intersections of aisles, drives, and pedestrian walkways.
- b. Trees shall be selected and maintained such that, at mature size, scaffold branches are a minimum of 60 inches above the finish grade as measured at the trunk.
- c. Plant materials with known surface root problems shall not be used in vehicular use areas, paved pedestrian walkways, and structures with poured concrete slabs.
- d. The plans shall certify that landscaping when planted and at full maturity shall not obscure sight distance for all roadway users.

13. Planting in the Right of Way

- a. All public right of way areas between a newly developed property or rehabilitated landscapes and the existing sidewalk or street edge shall be fully landscaped for erosion control purposes and community character. Trees shall not be planted in the right of way unless pursuant to an encroachment permit issued by the Department of Public Works.



Surface roots have raised the sidewalk.

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SMALL CHANGES FOR BIG SAVINGS

- **The easiest and most effective action you can take to conserve water is to reduce overwatering and runoff.**
- **Install a smart controller.**
- **If you have an old sprinkler system, replace the heads with newer, more efficient heads.**
- **Replace sprinkler heads with mini rotors to reduce runoff. Mini rotors have a reduced precipitation rate which allows time for water to penetrate the soil.**
- **Use rotors to water large areas of 25 feet by 25 feet or larger.**
- **Water in 2 to 3 short cycles rather than one long cycle.**
- **Switch to drip irrigation for watering trees and shrubs.**

- Plans shall include a statement indicating who is responsible for on-going maintenance, including runoff and overspray prevention, repairs of broken or malfunctioning irrigation equipment, replacement of dead, dying, or diseased vegetation, and continual compliance with the project's approved water calculations.
- Turf shall not be planted in the public right of way.
- Trees shall be planted a minimum of 24" from sidewalk. Root barriers are required when used in parkways less than 3' wide and where specified.

14. Screening Requirements

- When plant materials are used to satisfy screening requirements, planting shall be spaced and sized to ensure 100 percent screening within two years of installation.
- All plant material will be spaced according to acknowledged characteristics of the plant's growth and any restrictions or requirements of the local fire district as applicable.

15. Staking

- All trees which are not self-supporting must be staked or cabled.
- Stakes or cables are to be removed once the tree is self-supporting.

E. Irrigation Design Plan

1. General Information

- Submit two complete sets.
- Plans must be standard 24" X 36" blueprint sheets. Any other size must be approved in advance.
- Scale is 1" = 20' or smaller (such as: 1" = 10' or 1" = 5').

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- d. Plans must be legible, professionally prepared and a print of an original drawing. Photocopies are not acceptable.
- e. For the efficient use of water, an irrigation system shall meet all requirements listed in the Water Conservation in Landscaping regulations as well as the manufacturer's specifications.
- f. The irrigation system and its related components shall be planned and designed to allow for proper installation, management, and maintenance.
- g. The designated landscape architect, civil engineer, architect, irrigation consultant or landscape contractor shall conduct periodic site visits during construction to ensure that the landscaping and irrigation system are being installed per the approved Landscape Document Package and shall certify to such as part of the Certificate of Completion requirements. Preliminary inspection shall include, but not be limited to, mainline, lateral lines, control wires, communication wires, and sprinkler head layout. Personal property owners who have prepared plans and specifications for property they own, shall also perform irrigation installation inspections throughout construction.
- h. All sheets must be signed, stamped (licensed professionals only), and dated along with a renewal date by the property owner or professional licensed by the State of California who prepared the plans.
- i. Each sheet must contain the following certification:

I am familiar with the requirements for landscape and irrigation plans contained in the County Landscape Water Conservation regulations, in Title 8, Division 6, Chapter 7 of the San Diego County Code of Regulatory Ordinances. I have prepared this plan in compliance with



SAVE WATER

- **Learn how to operate your irrigation controller.**
- **Water between midnight and 6 a.m. to avoid evaporation and wind.**
- **Do not irrigate when it rains. Wait until the soil dries out.**
- **Check your irrigation system every month for:**
 - **leaking valves or heads**
 - **misaligned heads**
 - **runoff**
 - **puddles**

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those regulations. I certify that the plan implements those regulations to provide efficient use of water.

Irrigation plans prepared by a California certified irrigation designer shall include the following statement:

I have complied with the criteria of the Water Conservation in Landscaping Ordinance and the Water Efficient Landscape Design Manual and applied them accordingly for the efficient use of water in the irrigation design plan. I certify that the plan implements those regulations to provide efficient use of water.

2. Plan Requirements

Plans, at a minimum shall:

- a. Depict the location of a dedicated separate landscape water meter for all irrigated landscape projects greater than 5,000 square feet and all non-residential irrigated landscapes of 1,000 sq. ft. or more. Dedicated landscape water meters are not required for single family residences and landscapes with less than 5,000 square feet. However, they are highly recommended to help facilitate water management. A flow sensor attached to an automatic controller may also function as a landscape water meter or submeter.
- b. Show the locations of the pipes that supply water for outdoor use and the pipes that connect to any dedicated irrigation meter.
- c. Show the location of recycled irrigation pipes and water meter.
- d. Conform to the hydrozones of the landscape plan.
- e. Illustrate a system that efficiently irrigates each hydrozone without wasting water and without exceeding the MAWA. The irrigation system shall be designed to meet or exceed an average irrigation efficiency of 0.75.

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- f. Provide that only low volume or subsurface irrigation will be used to irrigate any vegetation within 24 inches of an impermeable surface unless the adjacent impermeable surfaces are designed and constructed to cause water to drain entirely into a landscaped area.

3. Water Supply

- a. When recycled water is available within the basin containing the project site or when a Reclamation Master Plan indicating the availability of recycled water in the future has been adopted by either the County or a special district, the applicant shall incorporate the use of recycled water into the project design. If the project will also be using potable water, the original project shall provide for a dual distribution system for all landscaped areas. Projects proposing the use of recycled water must first submit irrigation plans through the Department of Environmental Health for approval prior to submitting final landscape plans to the Department of Planning & Development Services.
- b. Untreated and recycled water supplies shall be clean and free of suspended particles, algae, or chemicals that may form insoluble precipitates in the equipment or may be detrimental to plantings.
- c. Landscapes using recycled water are considered Special Landscape Area. The ET Adjustment Factor for new and existing (non-modified) Special Landscape Areas shall not exceed 1.0.
- d. Graywater may be used legally in the County of San Diego when designed and installed in accordance with the regulations stated in the California Plumbing Code (California Code of regulations Title 24, Part 5, and Chapter 16A, Part 1) and under permit and inspection by San Diego County Department of Environmental Health.
- e. If groundwater resources are proposed to be used, potential availability must be demonstrated to the satisfaction of the Director of Planning & Development Services.



Overspray creates runoff and wastes water.

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HOW TO READ YOUR WATER METER

Water is typically measured by the cubic foot which equals approximately 7.5 gallons.

Your water meter records how much water you use in the same way the odometer in your car records how many miles you travel.

To check your daily water use:

- 1. Record the reading on your meter on Day 1.**
- 2. Twenty-four hours later, record the new reading.**
- 3. Subtract the reading on Day 1 from the reading on Day 2.**
- 4. Multiply the answer by 7.5.**
- 5. The result is the number of gallons you have used in the last 24 hours.**

4. Runoff and Overspray.

- a. All irrigation systems shall be designed to avoid runoff, seepage, low head drainage, overspray or other similar conditions onto adjacent property, non-irrigated areas, walks, roadways or structures. Systems benefiting from flushing shall accommodate the water generated by the flushing without erosion or disturbance to the planting. Water used for flushing shall be channeled into adjacent drainage structures (swales, gutter, etc.) where possible.
- b. Overhead irrigation shall not be permitted within 24 inches of an impermeable surface. Allowable irrigation within the setback from impermeable surfaces may include drip, drip line, or other low flow non-spray technology. The setback area may be planted or unplanted. The surfacing of the setback may be mulch, gravel or other porous material. These restrictions may be modified if:
 - i. The landscape area is adjacent to permeable surfacing and no overspray and runoff occurs; or
 - ii. The adjacent impermeable surfaces are designed and constructed to drain entirely to landscaping; or
 - iii. The irrigation designer specifies an alternative design or technology and clearly demonstrates strict adherence to irrigation system design criteria as described in the Water Conservation in Landscaping regulations and this manual. Prevention of overspray and runoff must be confirmed as part of the Certificate of Completion.

5. Application Rate

The water delivery rate of the irrigation system shall take into account the slope gradient and percolation rate of the soil in order to minimize runoff.

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6. Uniformity and Use

The irrigation system shall deliver water efficiently and uniformly. Water used for irrigation shall be minimized to the amount needed to maintain adequate plant health and growth.

7. Backflow Prevention

Approved backflow prevention units are required on all potable water irrigation systems. Installation shall comply with all applicable health and safety standards.

8. Electrical Service

Electrical service for the irrigation system controllers shall be indicated and referenced on the irrigation plans, including the use of battery operated valves or solar powered controllers.

9. Hydrozones

- a. Each valve shall irrigate a hydrozone with similar site, slope, sun exposure, soil conditions, and plant materials with similar water use.
- b. Sprinkler heads and other emission devices shall be selected based on what is appropriate for the plant type within that hydrozone.
- c. Where feasible, trees shall be placed on separate valves from shrubs, groundcovers, and turf.
- d. Individual hydrozones that mix plants of moderate and low water use plants or moderate and high water use plants, may be allowed if the plant factor of the higher water using plant is used for calculations.
- e. High water use plants shall not be permitted in a low, or very low water use hydrozone, but low, or very low water use plants may be allowed in a high water use hydrozone if the plants are of the type that tolerate the additional water.

Hydrozone Plan



Hydrozone	Plant Water Use Type(s)
1	Moderate
2	Special Landscape Area
3	Moderate
4	High
5	High
6	Low

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WHY ARE PARTS OF MY LAWN TURNING BROWN?

Typically these dry spots occur because overhead spray is not distributing water evenly.

1. Place several small containers with straight sides around your lawn in even rows and on brown spots.
2. Run your irrigation system for 15 minutes.
3. Using a ruler, measure the amount of water in each container.
4. If there is a significant difference in the amount of water in each container, water is not being applied evenly.
5. Make sure that the spray isn't blocked by tall vegetation.
6. Change the rate and direction of spray by adjusting the screw on the top of the nozzle head.
7. Different heads have different application (precipitation) rates. Replace heads so that you have the same (or matched) precipitation rates throughout the area.

- f. On the landscape design plan and irrigation design plan, hydrozone areas shall be designated by number, letter, or other designation. On the irrigation design plan, designate the areas irrigated by each valve, and assign a number to each valve. Use this valve number in the Water Efficient Landscape Worksheet (see Appendix C). This table can also assist with pre and final inspections of the irrigation system and programming the controller.

10. Scheduling and Lateral Systems

- a. Each lateral system shall be capable of meeting the minimum needs of the mature plant material during peak demands.
- b. Lateral systems shall be divided by exposure (sun/shade, etc.), plant material (turf/shrub/trees, etc.), differing plant water requirements (tropical/low water using, etc.), elevation, and by type of application equipment (drip, spray, etc.), to the degree that is both practical and feasible.
- c. Spray system heads of different manufacturers or of different basis types (drip, bubbler, stream, low gallonage, standard, impact etc.) shall have consistent operating characteristics on any single lateral circuit.
- d. Spray heads on the same lateral circuit shall be balanced for matched precipitation rates within 5 percent from the average for any different arcs of coverage or operating radii.
- e. Separately controlled lateral systems shall be used when head or nozzle precipitation rate varies more than 15 percent from the average application in the area.
- f. Specially designed adjustable nozzles shall be used for odd shaped areas, maintaining even application rates.
- g. After plants are established, the irrigation system is to provide sufficient water to sustain plants in a healthy, growing condition.

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11. Design Pressure

- a. The system design pressure and the recorded static pressure or hydraulic gradeline information (with the recording date) shall be indicated on the plans.
- b. When the pressure reading is less than 40 psi, more than five years old, or is not available, the pressure shall be calculated from the hydraulic gradient (contact individual Water District Engineers) and the site elevation. The calculated pressure, meter elevation and hydraulic gradient shall be indicated on the plans.
- c. When the actual measured or calculated minimum pressure is above 40 psi, irrigation systems shall include compensating design or equipment modifications.

12. Pressure Constraints

- a. Irrigation systems shall be designed to operate correctly at the lowest available operational pressure expected during the year and shall withstand water system surges.
- b. Pressure loss within lateral piping circuits shall not exceed 20 percent of the designed operating pressure of the equipment on that circuit.
- c. Pressure regulating devices shall be installed on any systems with a static inlet pressure at the point of connection greater than 80 psi unless specifically approved by the Director of Planning & Development Services. Pressure shall be regulated to a pressure adequate to operate the equipment at designed pressures with all incidental and line losses included. Where the pressure within the system exceeds 80 psi (due to elevation drops, etc.) a pressure reducing valve shall be used to reduce pressure to designed levels.

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Smart Controllers

- d. The irrigation system shall be designed to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance.
- e. If the static pressure is above or below the required dynamic pressure of the irrigation system, pressure regulating devices such as inline pressure regulators, booster pumps or other devices shall be installed to meet the required dynamic pressure of the irrigation system.
- f. Static water pressure, dynamic or operating pressure and flow reading of the water supply shall be measured at the point of connection. These pressure and flow measurements shall be conducted at the design stage. If the measurements are not available at the design stage, the measurements shall be conducted at installation.

13. Velocity Constraints

Irrigation system piping shall be sized such that velocities remain below 5 feet per second for metal piping and 6 feet per second for PVC piping.

14. Coverage

- a. Sprinkler heads and other emission devices shall have matched precipitation rates, unless otherwise directed by the manufacturer's specifications.
- b. Head to head coverage is recommended. However, sprinkler spacing shall be set to achieve distribution uniformity using the manufacturer's specifications.

15. Equipment Protection

- a. Any irrigation equipment located within 24 inches of pedestrian and vehicular use areas shall be located entirely below grade, including the use of pop-up type heads, or otherwise adequately protected from potential damage.

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- b. Pop-ups heads shall be installed with swing joints or other flexible assembly. Swing joints shall be installed in lines at all abrupt changes of grade.
- c. Swing joints or other riser-protection components are required on all risers subject to damage that are adjacent to high traffic areas.

16. Broken or Malfunctioning Equipment

- a. Flow sensors that detect and report 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 larger.
- b. 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.

17. Control Systems

- a. Automatic control systems are required, and must be able to accommodate all aspects of the design, including multiple schedules, repeat cycles, evapotranspiration or soil moisture sensing and rain sensing override devices. Control mechanisms for an evapotranspiration (weather based) system or soil moisture detecting systems, utilizing non-volatile memory shall be accommodated within the controller enclosure. All control circuits shall be designed to operate one valve at a time unless otherwise approved by the Director of Planning & Development Services.
- b. Controller units shall be enclosed in secure, weather and vandal resistant, locking housings manufactured expressly for that purpose or located within a structure.
- c. All irrigation systems shall be adjusted seasonally and as weather and plant conditions warrant. Scheduling tools may be found at: www.cimis.water.ca.gov.

DEEP ROOT SYSTEMS

- **Deep root systems use less water.**
- **Deep root systems require less frequent irrigation.**
- **Encourage deep rooting:**
 - **Water in 2 to 3 short cycles rather than one long cycle with at least 30 minutes delay between each short cycle.**
 - **Slowly increase the number of days between waterings until you irrigate only 1 or 2 days per week. If necessary, increase the number of short cycles.**
 - **In winter, irrigate only after the top 2 or 3 inches of soil dries out.**

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- d. All control systems shall include weather sensors (rain, freeze, wind, ect.) appropriate to local climatic conditions, either integral or auxiliary, that will suspend or alter irrigation operation during unfavorable weather conditions acceptable to the Director of Planning and Development Services and installed per manufacture's recommendations.
- e. Irrigation systems must be self-adjusting and schedule irrigation events using either evapotranspiration (weather-based) or soil moisture sensor data.

18. Valves

- a. Shutoff Valves: Globe or ball valves shall be provided at points of connection and loop or zone isolation points to divide the irrigation system into controllable units, and to avoid draining long runs of piping for system repairs. For manifold remote control valves, the globe or ball valve shall be equal to or larger than the size of the largest control valve in the manifold.
- b. Remote Control Valves: Control valves shall be manifolded when the main line is greater than two inches in diameter and installed in individual valve boxes. Valves shall be of slow closing design, and automatically close in the event of power failure. Valves shall be sized to provide adequate pressure differential for proper operation.
- c. Quick Coupling Valves/Hose Bibs: Quick coupler valves or hose bibs shall be spaced at 100 foot intervals, maximum, and as needed to logically service areas. Quick coupling valves located with valve manifolds shall be separate and up stream of the manifold shutoff valve.
- d. Check valves or anti-drain valves are required for all irrigation systems.

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19. Piping

All piping shall be as per the following charts:

Acceptable Pipe Materials

Location	Use	Material	Type	Notes
Above grade	Pressure Mains	Copper	Type "L"	Any Size
		Galvanized Steel	Sch 40	Threaded
		Red Brass	Sch 40	Threaded
	Lateral Lines	Copper	Type "L"	Any Size
		Galvanized Steel	Sch 40	Threaded
		Polyethylene	UV-Resistant	Drip Systems and Mulch Required
		Flexible PVC	Algae Resistant	Drip Systems and Mulch Required
		PVC	Sch 40	< 2"
		PVC	UVR-Sch 409	Any Size
	Fittings	Copper	Type "L"	Any Size
		Galvanized Steel	Sch 40	Threaded
		Molded Plastic	UV Resistant	Drip Systems
		PVC	Sch 40	W/Flex PVC pipe
		PVC	Sch 40	Any Size*
		PVC	UVR-Sch 40	Any Size
Red Brass		Sch 40	Threaded	

NOTE: When dissimilar metals are connected together, dielectric fittings are required.

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Acceptable Pipe Materials

Location	Use	Material	Type	Notes	
Below Grade	Pressure Mains	Copper	Type "L"	Any Size	
		PVC	Class 315	≥ 2"	
		PVC	Sch 40	< 1½"	
		Red Brass	Sch 50	Threaded	
	Lateral Lines	Copper	Type "L"		
		Galvanized Steel	Sch 40	Any Size	
		Polyethylene	UV-Resistant	Drip Systems	
		Flexible PVC	Algae Resistant	Drip Systems	
		PVC	Class 315	½"	
		PVC	Class 200	≥ ¾"	
		PVC	Sch 40	Any Size	
	Fittings	Cast Iron	Class 250	Threaded	
		Copper	Type "L"	Drip Systems	
		Galvanized Steel	Sch 40	Any Size	
		Nylon or ABS	Specialty	Threaded	
		PVC	Sch 40	Any Size	
		Red Brass	Sch 40	Threaded	

NOTE: When dissimilar metals are connected together, dielectric fittings are required.

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20. Trench Widths

- a. Trenches for irrigation pressure lines shall be excavated wide enough to allow a minimum of 8 inches between parallel pipe lines, and 8 inches from lines of other trades.
- b. Lines shall not be installed parallel and directly over one another.
- c. At least three inches of vertical clearance shall be maintained between crossing irrigation lines; and the minimum transverse angle shall be 45 degrees.

21. Trench Depths

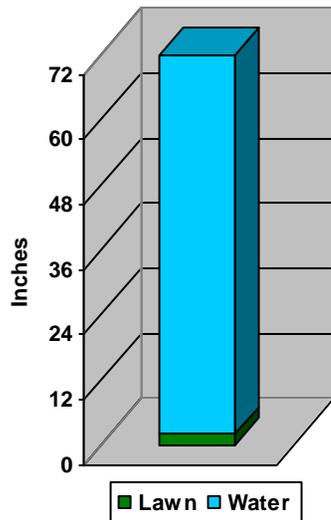
The following trench depths shall be observed:

Trench Depths

Line Type	Location	Size	Depth (min.)
Pressure main	Within landscape	< 3" I.D.	18"
		≥ 3" I.D.	24"
		≥ 4" I.D.	30"
	Under vehicular paving	< 3" I.D.	30"
		< 3" I.D.	36"
		≥ 3" I.D.	36"
Non-pressure lateral	Within landscape	< 3" I.D.	12"
		≥ 3" I.D.	18"
	Under vehicular paving	< 3" I.D.	24"
		< 3" I.D.	30"
		≥ 3" I.D.	30"

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The amount of water needed to irrigate 2 inches of cool season turf for one year.



22. Sleeving

- All pipe and wire under vehicular paving shall be installed in PVC schedule 40 sleeves.
- Sleeves shall be at least twice the diameter of the pipe or wire bundle to be enclosed, with a minimum two inch size.
- Sleeving locations shall be marked at each end at the time of installation with a painted spot on the back face of the curb or other similar marking.

23. Backfill

- Backfill material shall be clean and free of debris, large rocks, and objects with sharp edges.
- Finish grade of all trenches must conform to adjacent grades without dips, sunken areas, humps or other irregularities.

24. On-Grade Irrigation Systems

- Permanent on-grade systems may only be allowed for selective watering of native areas or areas with highly erosive or rocky soils where trenching would disturb or loosen unstable materials and requires approval of the Director of Planning and Development Services.
- On-grade piping shall not be allowed adjacent to pedestrian traffic.
- All on-grade lines shall be secured to slopes every ten feet or less. The ends of all laterals shall also be staked.
- On-grade lateral piping is allowed for temporary systems and irrigation in revegetation areas.

25. Drip and Sub-surface Irrigation Systems

- All components shall be of non-corrosive materials.

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- b. Separate or multiple outlet emitters shall be of self-flushing, pressure compensating design.
- c. The design of drip systems shall provide balanced water supplies to plant materials of different sizes irrigated with a common lateral line.
- d. All drip systems shall be adequately filtered and regulated per the **manufacturer's recommended design parameters.**
- e. All systems shall be capable of flushing out accumulated particulate matter. Design shall provide a means for flushing with a minimum of erosion or disruption to the surrounding landscape. Water from flushing shall be accommodated back into the site, where feasible.
- f. Emitters shall be protected from soil or root incursion and easily accessible. Metal studs may be required at underground emitters if necessary for easy location with a metal detector.

26. Special Irrigation Systems

Special systems shall be allowed at the discretion of the Director of Planning & Development Services.

F. Grading Design Plan

1. The grading on the project site shall be designed for the efficient use of water by minimizing soil erosion, runoff and water waste, resulting from **precipitation and irrigation. Plans shall be signed by the project's** California licensed landscape professional, or the private property owner.
2. Projects that require a grading permit and plans may submit a copy of these plans to satisfy the requirements of the Landscape Documentation Package as long as the required information is available on the plans.
3. The grading plan shall demonstrate grading has been designed to avoid **obstructing roadway users' views of pedestrian crossings, driveways,** roadways, other vehicular travel ways, traffic signs, and traffic signals. Sight distances lines, as provided by a California registered Civil



PLANTING HINTS

- **Plant in the fall when less water is required to establish the plants.**
- **Plant high water use plants in shady areas that are protected from the wind.**
- **For each irrigation zone, choose plants that need the same amount of water and sunlight.**
- **Use compost rather than fertilizer.**
- **Only use the minimum amount of fertilizer necessary.**
 - **Fertilizers result in higher water use.**
 - **Fertilizers encourage rapid growth which increases**

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Highest Plant Factor	Hydrozone Category
0.0—0.1	Very low water use
0.2 – 0.3	Low water use
0.4 – 0.6	Medium water use
0.7 – 1.0	High water use



Example of a landscape using low water use plants

Engineer using the sight distance requirements defined in the County Public Road Standards, shall be shown on the plans as applicable. The plan shall also demonstrate compliance with requirements defined in the Landscape Architecture chapter of the most current Caltrans Highway Design Manual.

4. The grading design plan shall contain the following information:
 - a. Finished configurations and elevations of the landscaped areas.
 - b. Bottom and top of graded slope elevations.
 - c. Drainage patterns.
 - d. Pad Elevation
 - d. Finished grade and pad elevations.
 - e. Stormwater retention improvements:
 - Where feasible storm water must be captured and retained on site to improve water use efficiency and water quality.
 - Where feasible, rain water harvesting methods must be implemented.
 - Water harvesting containers must be operated in a manner that excludes trash, insects (including mosquitoes), animals, and children.
 - Where feasible, pervious hard surfaces shall be installed to harvest and cleanse rain water.
 - f. All Structural BMP's shall be labeled
5. Projects that are not required to prepare grading plans for a grading permit shall provide sufficient information on the landscape plans to verify slope heights and drainage patterns. All applicable grading,

WATER EFFICIENT LANDSCAPE DESIGN MANUAL

drainage, and stormwater improvement information must be shown on the landscape design plan or by separate sheet.

6. Areas planned for vegetation should be protected from soil compaction activities and shall be transformed to a friable condition.
7. Retain and protect native topsoil and vegetation where practical.
8. Stockpile and reuse good quality topsoil.

G. Water Efficient Landscape Worksheet

See Appendix C for the required Worksheet to verify that the project's Estimated Total Water Use (ETWU) does not exceed the project's Maximum Applied Water Allowance (MAWA).

1. For the calculations of the MAWA, the evapotranspiration adjustment factor (ETAF) is equal to 0.55 for residential areas and 0.45 for non-residential areas except for special landscaped areas where the additional ET adjustment is 1-ETAF, pursuant to the County Code of Regulatory Ordinances Section 86.711.
2. For calculation of the ETWU, a project applicant shall use the evapotranspiration values from the Reference Evapotranspiration (ET_o) Table or the average annual ET_o value based on the County classification of the Community Planning Area where the site is located. See Appendix A for the ET_o Table and information on County classifications and corresponding average ET_o values.
3. Each hydrozone in the landscape plan must be categorized (very low, low, moderate, high water use or special landscaped area) based on the plant within the hydrozone with the highest plant factor. The applicant shall utilize the Water Use Classification of Landscape Species publication (WUCOLS) to determine plant factors (crop coefficients).
4. High water use plants cannot be planted in a low, or very low water use hydrozone.

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5. All surface area of water features shall be included in a high water use hydrozone.
6. Temporarily irrigated areas shall be included in a low water use hydrozone.
7. Artificial turf shall be included in a low water use hydrozone.
8. After the appropriate hydrozone category has been established, the ETWU calculation will utilize a plant factor for each hydrozone category as shown on the Worksheet in Appendix C.

SECTION 3 **PRESCRIPTIVE COMPLIANCE OPTION**

A. General Information

1. Those projects eligible to utilize and electing to use the Prescriptive Compliance Option, as per PDS form 410 in appendix B, to comply with the County of San Diego County Code of Regulatory Ordinances, the following items are mandatory and must be submitted to the Director of Planning & Development Services.
2. Any project with an aggregate landscape area from 500 square feet to below 2,500 square feet per section 86.703 (b).
3. Any lot or parcel within a project with less than 2,500 square feet of aggregate landscaped area that meets the Estimated Total Water Use (ETWA) requirements, found in Section 86.713 entirely with treated or untreated graywater, or through stored rainwater captured on site. These projects need only comply with the requirements of Section 86.722(a)(5) & (6). See (sec. 86.702 (b)).
4. The Prescriptive Compliance Option Plan consists of: